FINAL REPORT

Volume 2: Appendices

Dynamic Stability Analysis of Estates Dam

Oakland, California

NOVEMBER 2006

EBMUD

Prepared for
East Bay Municipal Utility District
375 Eleventh Street
Oakland, CA 94607

URS

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612

26814957.E0000

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Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Key to Log of Boring

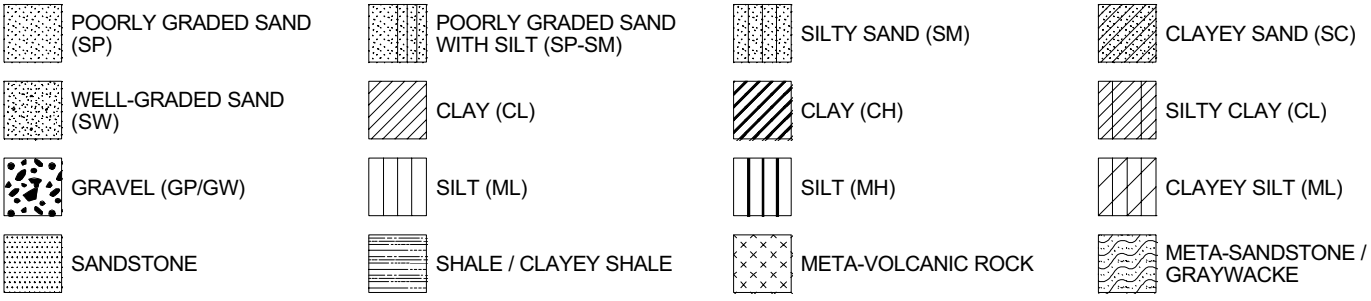
Elevation feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resistance	SAMPLES: Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11

COLUMN DESCRIPTIONS

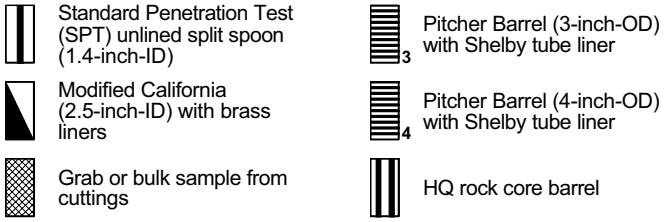
1. **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.
2. **Depth:** Depth in feet below the ground surface.
3. **Sample Type:** Type of sample collected at depth interval shown; sampler symbols are explained below.
4. **Sample Number:** Sample identification number. "NR" following sample number indicates no recovery.
5. **Sampling Resistance:** Number of blows required to advance driven sampler 12 inches beyond first 6-inch drive interval, or distance noted, using a 140-lb hammer with a 30-inch drop; hydraulic down-pressure for tube sampler.
6. **Recovery:** Percentage of driven or pushed sample length recovered; "NA" indicates data not recorded.
7. **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.
8. **Material Description:** Description of material encountered; may include relative density / consistency, moisture, color, and grain size.
9. **Water Content:** Water content of soil sample measured in laboratory, expressed as percentage of dry weight of specimen.
10. **Dry Unit Weight:** Dry weight per unit volume of soil measured in laboratory, expressed in pounds per cubic feet (pcf).
11. **Remarks and Other Tests:** Comments and observations regarding drilling or sampling made by driller or field personnel. Other field and laboratory test results, using the following abbreviations:

Gs	Specific gravity
HD	Hydrometer analysis, percent passing 5 microns
LL	Liquid Limit (from Atterberg Limits test), percent
PI	Plasticity Index (from Atterberg Limits test), percent
SA	Sieve analysis, percent passing #200 sieve
TX-CIU(R)	Isotropically consolidated undrained triaxial test

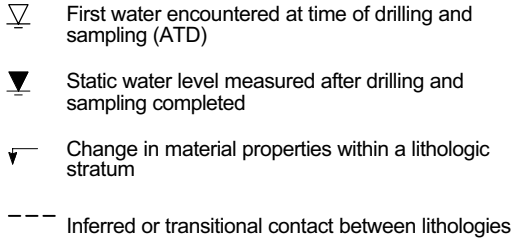
TYPICAL MATERIAL GRAPHIC SYMBOLS



TYPICAL SAMPLER GRAPHIC SYMBOLS



OTHER GRAPHIC SYMBOLS



GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Key to Log of Boring

KEY TO DESCRIPTIVE TERMS FOR ROCK

RQD: Rock Quality Designation; defined as the percent of intact core (pieces of sound core greater than 102 mm in length) in each coring interval; calculated as the sum of the lengths of intact core divided by the length of the core run.

DISCONTINUITY DESCRIPTORS

a Dip of discontinuity, measured relative to a plane normal to the core axis.

b **Discontinuity Type:**

- F - Fault
- J - Joint
- Sh - Shear
- Fo - Foliation
- V - Vein
- B - Bedding

c **Aperture (inches):**

- W - Wide (0.5-2.0)
- MW - Moderately Wide (0.1-0.5)
- N - Narrow (0.05-0.1)
- VN - Very Narrow (<0.05)
- T - Tight (0)

d **Type of Infilling:**

- Cl - Clay
- Ca - Calcite
- Ch - Chlorite
- Fe - Iron Oxide
- H - Healed
- No - None
- Py - Pyrite
- Qz - Quartz
- Sd - Sand
- Uk - Unknown

e **Amount of Infilling:**

- Su - Surface Stain
- Sp - Spotty
- Pa - Partially Filled
- Fi - Filled
- No - None

f **Surface Shape of Joint:**

- Pl - Planar
- Wa - Wavy
- St - Stepped
- Ir - Irregular

g **Roughness of Surface:**

- Slk - Slickensided [surface has smooth, glassy finish with visual evidence of striations]
- S - Smooth [surface appears smooth and feels so to the touch]
- SR - Slightly Rough [asperities on discontinuity surfaces are distinguishable and can be felt]
- R - Rough [ridges and side-angle steps are evident; asperities are clearly visible; surface feels very abrasive]
- VR - Very Rough [near-vertical steps and ridges occur on discontinuity surface]

ROCK SCRATCH HARDNESS

Description	Recognition
Soft	Applicable only to plastic material
Friable	Easily crumbled by hand; too soft to cut with a pocket knife
Low Hardness	Can be gouged deeply or carved with a pocket knife
Moderately Hard	Can be readily scratched by knife blade; scratch leaves heavy trace of dust and is readily visible after powder has been blown away
Hard	Can be scratched with a pocket knife only with difficulty; scratch produces little powder; traces of knife steel may be visible
Very Hard	Cannot be scratched with pocket knife; knife marks are left on surface

ROCK WEATHERING / ALTERATION

Description	Recognition
Residual Soil	Original minerals of rock have been entirely decomposed to secondary minerals, and original rock fabric is not apparent; material can be easily broken by hand
Completely Weathered/Altered	Original minerals of rock have been almost entirely decomposed to secondary minerals, although original fabric may be intact; material can be granulated by hand
Highly Weathered/Altered	More than half of the rock is decomposed; rock is weakened so that a minimum 2-inch-diameter sample can be broken readily by hand across rock fabric
Moderately Weathered/Altered	Rock is discolored and noticeably weakened, but less than half is decomposed; a minimum 2-inch-diameter sample cannot be broken readily by hand across rock fabric
Slightly Weathered/Altered	Rock is slightly discolored, but not noticeably lower in strength than fresh rock
Fresh/Unweathered	Rock shows no discoloration, loss of strength, or other effect of weathering/alteration

ROCK STRENGTH

Description	Recognition
Extremely Weak Rock	Can be indented by thumbnail
Very Weak Rock	Can be peeled by pocket knife
Weak Rock	Can be peeled with difficulty by pocket knife
Moderately Strong Rock	Can be indented 5 mm with sharp end of pick
Strong Rock	Requires one hammer blow to fracture
Very Strong Rock	Requires many hammer blows to fracture
Extremely Strong Rock	Can only be chipped with hammer blows

ROCK FRACTURING

Description	Recognition
Intensely Fractured	Fractures spaced less than 2 inches apart
Highly Fractured	Fractures spaced 2 inches to 1 foot apart
Moderately Fractured	Fractures spaced 1 foot to 3 feet apart
Slightly Fractured	Fractures spaced 3 feet to 10 feet apart
Massive	Fracture spacing greater than 10 feet

Figure A-1 (contd)

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-37

Date(s) Drilled	**4/6/05**	Logged By	**M. McKee**	Checked By	**T. Feldsher**
Drilling Method	**Rotary Wash**	Drill Bit Size/Type	**5-7/8-inch tri-cone bit**	Total Depth of Borehole	**57.5 feet**
Drill Rig Type	**Fraste Multi-Drill XL**	Drilling Contractor	**Pitcher Drilling Company**	Surface Elevation	**approx. 774 feet MSL**
Groundwater Level (s)	**Not measured due to drilling method**	Sampling Method(s)	**Grab, SPT, Modified California, Pitcher Barrel (3- and 4-inch-OD)**	Hammer Data	**Automatic trip hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Portland cement grout**	Location	**Crest of Dam, approx. 17.5 feet W of VQ-33, 8.5 feet S of building wall**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0						Asphaltic concrete 1 inch thick over 6 inches fine gravel (crushed rhyolite?)			Start at 07:40.
			1				CLAYEY SAND WITH GRAVEL (SC) [Fill] Moist, olive and brown, ~40% medium plasticity fines, ~25% fine gravel, mixed texture			
770										
	5		2	700 psi	100		Gravel grades coarser, trace clasts of dark gray to black clay	21.0	101.3	LL=47, PI=26 SA: %F=40, %G=25
			4							
765			3A	21	67		CLAYEY GRAVEL (GC) [Fill] Medium dense, very moist, olive gray, fine gravel, ~30% fines			
	10		3B 4A							
			4B	12	67		SANDY CLAY (CL) [Fill] Stiff to very stiff, slightly moist to moist, olive gray, medium plasticity fines, ~30-40% sand, ~5-10% gravel			LL=36, PI=18 SA: %F=52, %G=6 HD: 29%<5 microns
760			5	100 psi	97			19.5	111.0	TX-CIU(R)
	15						CLAYEY SAND (SC) [Fill] Medium dense, moist, grayish brown, fine- to medium-grained sand, ~45% fines, ~10% gravel	17.2	116.2	TX-CIU(R) SA: %F=45, %G=13 HD: 25%<5 microns
			6	100 psi	87		With clasts of black silty clay	17.3	115.4	Gs=2.761 SA: %F=49, %G=11 HD: 26%<5 microns TX-CIU(R)
755								17.2		LL=35, PI=17
								17.4	115.1	TX-CIU(R) SA: %F=44, %G=10 HD: 23%<5 microns
	20		7A 7B 7C	12	50					
750										
	25		8	100 psi	53		CLAYEY SAND WITH GRAVEL (SC) [Fill] Medium dense, very moist, bluish gray, ~30% fines, ~30% gravel			Fluid level drops to 18.6 ft bgs following Pitcher sampling; measured at 21.0 ft after 30 minutes.
			9A 9B	10	94		Becomes moist, bluish gray and brown to yellowish brown, ~40% fines, ~15% gravel Becomes yellowish brown and gray			SA: %F=40, %G=12 Driller uses polymer to stabilize circulation 29-30 ft.
745										
	30									

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-37

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Figure A-2

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-37

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / foot	SAMPLES Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30			150 psi			CLAYEY GRAVEL WITH SAND (GC) [Fill] Medium dense, very moist, bluish gray, trace clasts of dark gray to black clay			
		4	10	840 psi	73					
740										Driller notes drilling sticky, clayey at 34 ft.
	35						SANDY SILTY CLAY (CL) [Fill] Stiff, moist, dark grayish brown to grayish brown, medium plasticity fines, ~35% sand, ~5-10% fine gravel (angular meta-sandstone fragments), trace clasts of black to very dark gray clay (high plasticity)			
		3	11	100 psi	80			17.8 18.2	114.2	TX-CIU(R) LL=32, PI=16 SA: %F=53, %G=10
			12A 12B	27	50		SANDY CLAY (CL) [Native Soil] Very stiff, moist, yellowish brown with gray mottling, medium plasticity	20.4		LL=40, PI=22 SA: %F=66, %G=0
735	40									
				280 psi						
730		4	13	1440 psi	50		META-VOLCANIC ROCK [Franciscan Complex Bedrock] Reddish brown and yellowish brown, moderately weathered, weak, low hardness, intensely fractured, clay infilling in one narrow vertical fracture			
	45									
		3	14	700 psi	87		Becomes clayey, completely to highly weathered, very weak			Pitcher barrel cuts faster in last 6 inches.
725										
	50		15	31	67		CLAYEY SHALE [Franciscan Complex Bedrock] Black, highly weathered, very weak, intensely fractured			Drilling under rod weight at 51 ft.
720										
	55			100 psi						
		3	16	450 psi	100		META-SANDSTONE / GRAYWACKE [Franciscan Complex Bedrock] Gray, highly to moderately weathered, weak, moderately hard, intensely fractured			End drilling at 13:30; complete grouting at 14:40.
715							Bottom of boring at 57.5 feet			
	60									
710										
	65									

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-37

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Figure A-2

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-38

Date(s) Drilled	**3/28/05 and 3/29/05**	Logged By	**M. McKee**	Checked By	**T. Feldsher**
Drilling Method	**Rotary Wash**	Drill Bit Size/Type	**5-7/8-inch tri-cone bit; HQ core bit**	Total Depth of Borehole	**87.0 feet**
Drill Rig Type	**Fraste Multi-Drill XL**	Drilling Contractor	**Pitcher Drilling Company**	Surface Elevation	**approx. 774 feet MSL**
Groundwater Level (s)	**Not measured due to drilling method**	Sampling Method(s)	**Grab, SPT, Mod. California, Pitcher Barrel (3- and 4-in.); HQ core barrel**	Hammer Data	**Automatic trip hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Portland cement grout**	Location	**Crest of Dam, approx. 12.5 feet E of VQ-32, 8.5 feet S of building wall**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0						Asphaltic concrete 1-1/2 inches thick over 8 inches subangular gravel (crushed meta-volcanic rock)			Start at 08:30 on 3/28/05. Pavement cored with 6-inch barrel. Used 6-inch auger to 2.5 ft, then switched to rotary wash drilling.
			1				SANDY CLAY WITH GRAVEL (CL/CH) [Fill] Very stiff, moist to very moist, yellowish brown to olive brown and gray, medium to high plasticity fines, ~30% sand, ~15% fine to coarse gravel, mixed texture			
770										
	5		2 (3)	100 psi to 140 psi	97					
765			3A 3B	29	55		CLAYEY GRAVEL WITH SAND (GC) [Fill] Medium dense, very moist, olive and gray, fine to coarse gravel, ~25% fines, ~30% sand, mixed texture	11.0	127.5	LL=37, PI=20 SA: %F=25, %G=46
	10		4	17	33		CLAYEY SAND WITH GRAVEL (SC) [Fill] Medium dense, very moist, yellowish brown and gray, ~25% fines, ~25% gravel (chert, rhyolite, and quartzite fragments)			Coarse gravel stuck in SPT sampler shoe.
			5 (4)	700 psi 400 psi	90		SANDY CLAY WITH GRAVEL (CL) [Fill] Very stiff, moist, yellowish brown, gray, olive, and bluish gray, low to medium plasticity fines, ~30-35% fine- to medium-grained sand, ~15% fine gravel (includes serpentinite fragments), trace silt, mixed texture			
760				400 psi						
	15		6 (3)	100 psi	100		Becomes olive to olive brown, with clasts of black silty clay; decreasing gravel content (~5%)			
755										
	20		7A 7B	12	56		SANDY CLAY (CL) [Fill] Stiff, moist, yellowish brown and gray,			
			8	8	100		low to medium plasticity fines, few fine to coarse gravel, iron oxide-stained coarse-grained sand and sandstone fragments to 1/4 inch dia.			
750										
	25		9 (4)	100 psi	100			19.5	111.2	TX-CIU(R) LL=36, PI=20 SA: %F=54, %G=12
							Possible cobble-size rock fragments			Rocky drilling at 27-27.75 ft.
745							CLAYEY SAND WITH GRAVEL (SC) [Fill] Medium dense, moist to very moist, bluish gray and olive, fine- to coarse-grained sand, ~25-30% fines, ~35% fine to coarse gravel			
	30		10 (3)	140 psi	93					

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-38

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Figure A-3

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-38

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30	3	10	140 psi	93		CLAYEY SAND WITH GRAVEL (SC), medium dense, moist to very moist, bluish gray and olive, fine- to coarse-grained sand, ~25-30% fines, ~35% fine to coarse gravel [Fill] (continued)	9.3	136.5	SA: %F=26, %G=34
							Becomes olive to olive brown with gray fine gravel (serpentinite fragments) and clasts of brown sandy clay			
740			11A 11B	29	70					
	35		12	12	0					
							Becomes dense, very moist, bluish gray with clasts of yellowish brown clay, ~30-40% fines, ~15% gravel (sandstone and serpentinite fragments)			Gs=2.775 SA: %F=34, %G=16 HD: 17%<5 microns LL=29, PI=13
735								11.8		
	40	4	13	420 psi	77			10.6 13.8 14.1	132.5 124.0	TX-CIU(R) TX-CIU(R) LL=29, PI=13 SA: %F=38, %G=16 HD: 20%<5 microns
		3	14	100 psi	100					Driller reports smoother sampling at 44 ft.
730							SANDY SILTY CLAY (CL) [Weathered Serpentinite / Native Soil?] Very stiff, moist, black with green mottling, possibly organic, low to medium plasticity fines, ~40% sand, trace serpentinite fragments to 1/4 inch dia.	15.8 15.1	118.9	TX-CIU(R) LL=31, PI=14 SA: %F=60, %G=4
	45		15A 15B	28	89					
				600 psi			POORLY GRADED SAND (SP) [Serpentinite Clast?] Bluish gray, fine- to medium-grained sand (cuttings observed during Pitcher sampling)			
725			[NR]		0					
	50	4		700 psi						Hard material at 49.5 ft. Tip of sampler badly torn. Drill to 52 ft to attempt Pitcher sampling again.
							SANDY CLAY (CL) [Native Soil / Colluvium] Very stiff, moist to very moist, gray to olive brown, medium plasticity			
		4	16	100 psi to 140 psi	60			16.8 17.8	114.8	Gs=2.713 TX-CIU(R) LL=36, PI=18 SA: %F=64, %G=0 HD: 37%<5 microns
720	55									
			17A 17B	50/5.5"	100		CLAY (CL/CH) [Native Soil / Residual] Hard, olive brown, moist to very moist, medium to high plasticity, trace fine gravel (shale fragments), trace carbonate nodules			
							CLAYEY SHALE [Franciscan Complex Bedrock] Dark grayish brown to black, highly weathered, very weak to weak, low hardness, intensely fractured, sheared			End drilling for 3/28/05. Resume drilling 3/29/05 using HQ core bit and barrel.
715			Run 1		20					5.0-ft run; RQD=0%.
	60						Becomes black, weak to moderately strong			
			Run 2		85					2.0-ft run; RQD=0%.
710			Run 3		94					3.5-ft run; RQD=0%.
	65									

Figure A-3

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-38

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resistance, blows / foot	SAMPLES: Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	65					CLAYEY SHALE, black, highly weathered, weak to moderately strong, low hardness, intensely fractured [Bedrock] (continued)			
		Run 3		94		SANDSTONE [Franciscan Complex Bedrock] Gray, fine-grained, slightly weathered, strong to very strong, hard, quartz vein to 1/2 inch wide, intensely to highly fractured; discrete fractures dipping 15-50°, very narrow, no infilling or partial clay infilling, planar to irregular, slightly rough surfaces			3.5-ft run; RQD=0%.
705		Run 4		100		SHALE interbed, completely to highly weathered, intensely fractured, 68.5-68.8 ft			2.5-ft run; RQD=0%.
	70					50°, J, VN, Cl, Pa, Pl, SR			
		Run 5		80		CLAYEY SHALE, very weak, soft, intensely fractured 75°, J, N, Cl, Pa, Pl, SR			3.0-ft run; RQD=0%.
700						CLAYEY SHALE, dark grayish brown, completely to highly weathered, very weak, soft, intensely fractured			
	75	Run 6		88		Sandstone becomes highly to moderately weathered, very weak to weak, moderately hard, highly to moderately fractured CLAYEY SHALE, dark grayish brown, completely to highly weathered, very weak, soft, intensely fractured			4.0-ft run; RQD=0%.
						CLAYEY SHALE [Franciscan Complex Bedrock] Dark gray to black, highly weathered, very weak, intensely fractured, trace calcite veins to 0.1 inch wide; discrete fractures dipping 10-55°, very narrow to narrow, partially filled with calcite or clay, planar, smooth to slightly rough surfaces			
695						SANDSTONE [Franciscan Complex Bedrock] Gray, fine-grained, slightly weathered, weak, moderately hard, intensely fractured; discrete fractures dipping 15-45°, very narrow, no infilling, planar, slightly rough surfaces			
	80	Run 7		86		Quartz vein, moderately wide to wide SHALE interbed, dark gray, very weak, soft, intensely fractured			5.0-ft run; RQD=28%. Fluid loss of ~10 gal. at 83-84 ft.
		Run 8		96		Calcite vein, very narrow			3.0-ft run; RQD=46%.
690						CLAYEY SHALE, black, highly weathered, very weak, intensely fractured			
	85	Run 9		85		Sandstone grades fine- to medium-grained			Core barrel blocked off; stop run. 2.0-ft run; RQD=50%.
						Bottom of boring at 87.0 feet			End drilling at 15:12 on 3/29/05.
685						Downhole OYO suspension logging performed in uncased hole, then borehole backfilled with cement grout.			
	90								
680									
	95								
675									
	100								

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-38

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Figure A-3

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-39

Date(s) Drilled	**4/7/05**	Logged By	**M. McKee**	Checked By	**T. Feldsher**
Drilling Method	**Rotary Wash**	Drill Bit Size/Type	**5-7/8-inch tri-cone bit**	Total Depth of Borehole	**35.7 feet**
Drill Rig Type	**Fraste Multi-Drill XL**	Drilling Contractor	**Pitcher Drilling Company**	Surface Elevation	**approx. 755 feet MSL**
Groundwater Level (s)	**Not measured due to drilling method**	Sampling Method(s)	**Grab, SPT, Modified California, Pitcher Barrel (3- and 4-inch-OD)**	Hammer Data	**Automatic trip hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Portland cement grout**	Location	**Downstream bench road, 51.5 feet W of VQ-40, 7 feet S of bench wall**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
755	0						Asphaltic concrete 1 inch thick over 3 inches gravel/crushed rock			Start at 10:30.
			1				SILTY CLAY WITH SAND (CH) [Fill] Stiff, moist, olive, yellowish brown, and grayish brown, high plasticity fines, ~20% sand, ~5% fine gravel, mixed texture			
750	5		2	100 psi	84		Becomes grayish yellow to pale yellow; increasing gravel content			
			3	420 psi						
745	10		3	160 psi	76		CLAYEY SAND WITH GRAVEL (SC) [Fill] Medium dense, moist, grayish yellow to pale yellow, fine- to coarse-grained sand, ~25% medium plasticity fines, ~30% fine to coarse gravel (meta-volcanic fragments)	15.1	114.2	TX-CIU(R) LL=36, PI=19 SA: %F=26, %G=31
			4	840 psi						
740	15		4A 4B	22	56					Drilling softer at 16 ft.
			5	140 psi	80		SANDY CLAY / CLAYEY SAND WITH GRAVEL (CL/SC) [Fill] Stiff / medium dense, very moist, bluish gray, fine- to coarse-grained sand, ~20-25% fine gravel			
735	20		6	16	78		SILTY CLAY WITH SAND (CL) [Fill] Stiff to very stiff, moist, yellowish brown and gray grading to dark grayish brown, medium plasticity fines, ~20% sand, ~5-10% fine gravel			Fluid loss of ~30 gal. during Pitcher sampling.
			7	140 psi	70					Fluid level at 8.7 ft bgs after sampling, 11.5 ft after 10 min. Resume drilling with polymer added to drilling fluid.
730	25		8A 8B 8C	18	72		CLAYEY SAND (SC) [Fill] Medium dense, moist, gray to bluish gray and brown, fine- to medium-grained sand, ~45% low plasticity fines, ~10-15% fine gravel	16.9	116.2	LL=30, PI=12 SA: %F=47, %G=13
							CLAY WITH SAND (CH) [Native Soil / Colluvium] Stiff, moist, dark bluish gray, high plasticity fines, fine-grained sand, trace basalt / meta-volcanic fragments to 1/4 inch dia., trace rootlets			Harder drilling at 27.2 ft.
			9	140 psi 900 psi	100		CLAYEY SHALE [Franciscan Complex Bedrock] Olive and dark gray, completely to highly weathered, very weak to weak, low hardness, intensely fractured			
725	30									

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-39

URS

Figure A-4

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-39

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
725	30						CLAYEY SHALE [Franciscan Complex Bedrock], olive and dark gray, completely to highly weathered, very weak to weak, low hardness, intensely fractured (continued)			
		4	10	1600 psi	56					
720	35		11	45/2"	100		BASALT / META-VOLCANIC ROCK [Franciscan Complex Bedrock] Dark yellowish brown to reddish brown, completely to highly weathered, very weak, low hardness Bottom of boring at 35.7 feet			
715	40									
710	45									
705	50									
700	55									
695	60									
690	65									

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-39

URS

Figure A-4

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-40

Sheet 1 of 3

Date(s) Drilled	**3/30/05 and 3/31/05**	Logged By	**M. McKee**	Checked By	**T. Feldsher**
Drilling Method	**Rotary Wash**	Drill Bit Size/Type	**5-7/8-inch tri-cone bit; HQ core bit**	Total Depth of Borehole	**72.0 feet**
Drill Rig Type	**Fraste Multi-Drill XL**	Drilling Contractor	**Pitcher Drilling Company**	Surface Elevation	**approx. 747 feet MSL**
Groundwater Level (s)	**Not measured due to drilling method**	Sampling Method(s)	**Grab, SPT, Mod. California, Pitcher Barrel (3- and 4-in.); HQ core barrel**	Hammer Data	**Automatic trip hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Portland cement grout**	Location	**Downstream bench, approx. 5 feet W of boring B6, 7 feet S of bench wall**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0						Asphaltic concrete 1/2 inch thick over 4 inches clayey gravel			Start at 10:35 on 3/30/05. Pavement cored with 6-inch barrel. Used 6-inch auger to 2.5 ft, then switched to rotary wash drilling.
745			1				SANDY CLAY (CL) [Fill] Stiff to very stiff, moist, yellowish brown to olive brown, low plasticity fines, ~40% sand, ~5% fine gravel			
	5		2	420 psi 500 psi	87		Gravel grades coarse (basalt fragments to 2 inches)			
740			3	20	61		With clasts of yellowish brown and gray clay to 2 inches dia.			Hammer energy measurements taken for drive samples in this boring.
	10		4	100 psi to 140 psi	93		CLAYEY SAND WITH GRAVEL (SC) [Fill] Medium dense, moist, yellowish brown to olive brown, fine- to coarse-grained sand, ~30-35% medium plasticity fines, ~20-25% fine to coarse gravel	12.0 9.3 11.3 14.0	135.5 130.2	Gs=2.762 SA: %F=30, %G=25 LL=32, PI=16 TX-CIU(R) TX-CIU(R) LL=34, PI=17 SA: %F=36, %G=19
735										
	15		5	300 psi 600 psi	100					
730			6A 6B	9	58		CLAYEY GRAVEL (GC) [Fill] Medium dense, moist, dark yellowish brown, ~15-20% fines, ~10% sand			Fluid loss of ~40 gal. at 15.5-16 ft during Pitcher sampling. Refusal (cobbles) at 15.75 ft; tip of tube bent. Drill past obstruction; very easy drilling at 17 ft.
	20		7	5	52		SANDY CLAY (CL) [Fill] Medium stiff, very moist, yellowish brown, low plasticity fines, ~30-35% sand, ~10% fine gravel			
725							CLAY WITH SAND (CL/OL) [Fill] Stiff, moist, very dark gray and black, faintly mottled, organic to semi-organic, ~20% sand, <5% fine gravel			Gravelly drilling at 22.5 ft.
	25		8	<100 psi	100					
720										Gravelly drilling at 28 ft.
	30		9	140 psi	86		CLAYEY SAND / SANDY CLAY WITH GRAVEL (SC/CL) [Fill] Medium dense / stiff, moist, very dark gray and black, ~40-45% fine- to medium-grained sand, ~40-50% low plasticity fines, ~10-20% gravel	16.3	114.5	LL=28, PI=10 SA: %F=50, %G=11 HD: 25%<5 microns TX-CIU(R)

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-40

Figure A-5

URS

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-40

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
715	30		9	350 psi	86		CLAYEY SAND / SANDY CLAY WITH GRAVEL (SC/CL), medium dense / stiff, moist, very dark gray and black, faintly mottled, organic to semi-organic, ~40-45% fine- to medium-grained sand, ~40-50% low plasticity fines, ~10-20% fine gravel (serpentinite fragments and pockets of reddish brown chert), wood fragments, trace brick fragments to 1/8 inch dia. [Fill] (continued)	12.9 14.8	121.2	Gs=2.668 TX-CIU(R) LL=30, PI=11 SA: %F=38, %G=17 HD: 20%<5 microns
	35		10A 10B	20	83		SANDY CLAY WITH SILT (CL/CH) [Native Soil / Colluvium] Stiff, moist, bluish gray, medium to high plasticity			
710			11	22	89		CLAYEY SAND (SC) [Native Soil] Medium dense, very moist, bluish gray to gray, fine- to medium-grained sand			
							SILTY CLAY (CL/OL) [Native Soil] Stiff to very stiff, moist, bluish gray to gray, organic to semi-organic, trace sand			End drilling for 3/30/05 at 38 ft. Resume on 3/31/05. Stiffer drilling 39-40 ft; 250-psi down pressure to advance hole.
	40			140 psi						
705			12	300 psi to 400 psi	80		CLAYEY SANDSTONE [Franciscan Complex Bedrock] Olive brown, fine- to medium-grained, ~30-35% fines, highly weathered, very weak, low hardness to moderately hard, intensely fractured	14.3 15.1	117.5	TX-CIU(R) LL=31, PI=15 SA: %F=33, %G=2 Down pressure of 140 psi during drilling 40-45 ft.
	45		13	300 psi 420 psi 600 psi	100		Becomes weak, highly to moderately weathered			
700										
	50		14	87/6"	67		Becomes weak to moderately strong, moderately hard			
695							Becomes bluish gray, moderately weathered, weak, low hardness to moderately hard			Start coring with HQ core bit and barrel.
			Run 1		36		CLAYEY SHALE [Franciscan Complex Bedrock] Black, some sand, highly weathered, very weak, low hardness, intensely fractured; steeply dipping quartz vein in core at 52.7 ft			5.0-ft run; RQD=0%.
	55						Gray, more clayey, completely weathered, some calcite crystals			
690							Becomes blocky and differentially weathered (completely to slightly weathered), soft to low hardness; remains very weak, intensely fractured			
			Run 2		84					4.5-ft run; RQD=0%.
	60									
685							CLAYEY SANDSTONE [Franciscan Complex Bedrock] Gray to bluish gray, medium-grained, completely to moderately weathered, very weak to weak, low hardness to moderately hard, intensely fractured			
			Run 3		38		CLAYEY SHALE [Franciscan Complex Bedrock] Gray to black, completely to highly weathered, very weak, soft to low hardness			4.5-ft run; RQD=0%.
	65									

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-40

URS

Figure A-5

Project: Dynamic Stability of Estates Dam
Project Location: Piedmont, Alameda County, California
Project Number: 26814957

Log of Boring VQ-40

Elevation, feet	Depth, feet	SAMPLES: Type Number	SAMPLES: Sampling Resistance, blows / foot	SAMPLES: Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
680	65	Run 4		100		CLAYEY SHALE [Franciscan Complex Bedrock], gray to black, completely to highly weathered, very weak, soft to low hardness (continued) Carbonate nodules			4.8-ft run; RQD=0%.
675	70	Run 5		54		SANDSTONE [Franciscan Complex Bedrock] Bluish gray, locally clayey, highly to moderately weathered, weak, intensely fractured ←25°, J, MW-W, No-Cl, No-Pa, Pl, SR			2.2-ft run; RQD=32%.
						Bottom of boring at 72.0 feet Downhole OYO suspension logging performed in uncased hole Borehole backfilled with cement grout on 4/1/05.			End drilling at 16:00 on 3/31/04.
670	75								
665	80								
660	85								
655	90								
650	95								
	100								

Report: GEO_10B1A_OAK; File: OAK_ESTATESDAM.GPJ; 6/17/2005 VQ-40

URS

Figure A-5

Appendix B
SPT Energy Measurements

GREGG DRILLING AND TESTING, INC.
GREGG IN SITU, INC.
ENVIRONMENTAL AND GEOTECHNICAL INVESTIGATION SERVICES

April 4, 2005

Mark McKee
Robert Y. Chew Geotechnical
55 New Montgomery St, Suite 525
San Francisco, California 94105

Re: Standard Penetration Energy Measurements
Automatic Hammer on Gregg Drilling's Fraste Drill Rig (D30)
Estates Dam
California

Dear Mr. McKee

This report offers results of energy measurements and related calculations made on March 30, 2005 during standard penetration testing on Gregg Drilling's Fraste mud rotary drill rig. Dynamic tests were performed on an instrumented section of NWJ drill rod attached to the sampler rod string. All dynamic measurements were obtained and recorded using a Pile Driving Analyzer®.

Equipment:

SPT energy measurements were made on all SPT samplers driven by the hammer on Gregg Drilling's Fraste drill rig on March 30, 2005. The rig was tested on the Estate Dam in Northern California. Dynamic tests were made on all samples involving SPT. In total, 5 energy measurements were collected corresponding to 5 different samples at increasing depth.

Gregg used a Model PAK Pile Driving Analyzer (PDA) to acquire and process measurements of force and velocity with every impact of the automatic hammer on the sample rods. Two strain gauges mounted on a two foot section of NWJ rod measured force, while two piezoresistive accelerometers bolted on the same rod measured acceleration. The gauges were mounted approximately 6" from the top of the rod.
Analog signals from the gauges and accelerometers were collected, digitized, displayed in real-time, and stored by the PDA. Selected output from the PDA for each recorded impact of the hammer included:

- Maximum calculated rod top force (FMX)
- Maximum rod top velocity (VMX)
- Energy transfer in kips per foot (EMX)
- Blows per minute (BPM)
- Energy transfer ratio in % of maximum theoretical energy (ETR)

Data and Calculations:

The purpose of testing was to measure the energy transferred from the hammer to the drill rod and to calculate the energy efficiency of the hammer. The PDA measurements of force and velocity were reviewed after field testing and analyzed to calculate the transferred energy (EMX).

Energy transfer past the gauge location, EMX, is computed by the PDA using force and velocity records as follows:

$$EMX = \int_a^b F(t)\, V(t)\, dt$$

The time "a" corresponds to the start of the record when the energy transfer begins and "b" is the time at which energy transferred to the rod reaches a maximum value.

Results:

Table 1 summarizes the average calculated energies for each sample tested as well as the type of sample and depth. It is shown that the overall average energy for this system is 74.6%. Appendix A provides plots and tables of PDA results for all hammer blows at each sampling depth. The plots and tables present selected measured and calculated results as a function of blow number. The results include:

- the blow number
- depth
- BLC (blow count in blows per foot)
- FMX (maximum rod top force)
- VMX (maximum rod top velocity)
- EMX (transferred energy)
- BPM (blows per minute)
- ETR (energy transfer efficiency)

At the end of each table is a statistical evaluation of the results for each variable including the average, standard deviation, maximum, and what blow number this maximum occurred.
Note: Depth is calculated by entering the blow counts at each 6" marker. The PDA averages this distance with the number of blows in the interval to give an approximate distance increment per blow.

If you have any questions or comments on this report, please do not hesitate to call our office at (562) 427-6899.

Sincerely,

Kelly Robertson
Engineer

GREGG

Client: Robert Chew Geotechnical
Project: Estates Dam
Date: 3/30/2005

Table 1 - SPT Sample Summary

Sample #	Sampler	Sample Depth Below Ground Surface	Total Rod Length* (ft)	Total Blows Analyzed by PDA	Average Energy Transferred to Rods (% of Theoretical Max.)	Maximum Efficiency Recorded (%)	Minimum Efficiency Recorded (%)	Standard Deviation
1	SPT	7.50	14.3	24	68.2	72.8	61.2	4
2	~~SPT~~ MC	17.00	22.4	15	72.9	75.4	71.0	1
3	SPT	19.50	25.3	8	75.7	76.8	75.0	1
4	~~SPT~~ MC	35.00	40.4	28	78.2	84.7	40.4	12
5	SPT	36.50	41.3	29	78.0	81.2	76.0	2
				Average	74.6			

* Total rod length includes, sampler, rod, adaptors, and instrumented section below gauges

A wire connector for one of the gages came loose when driving sample # 4

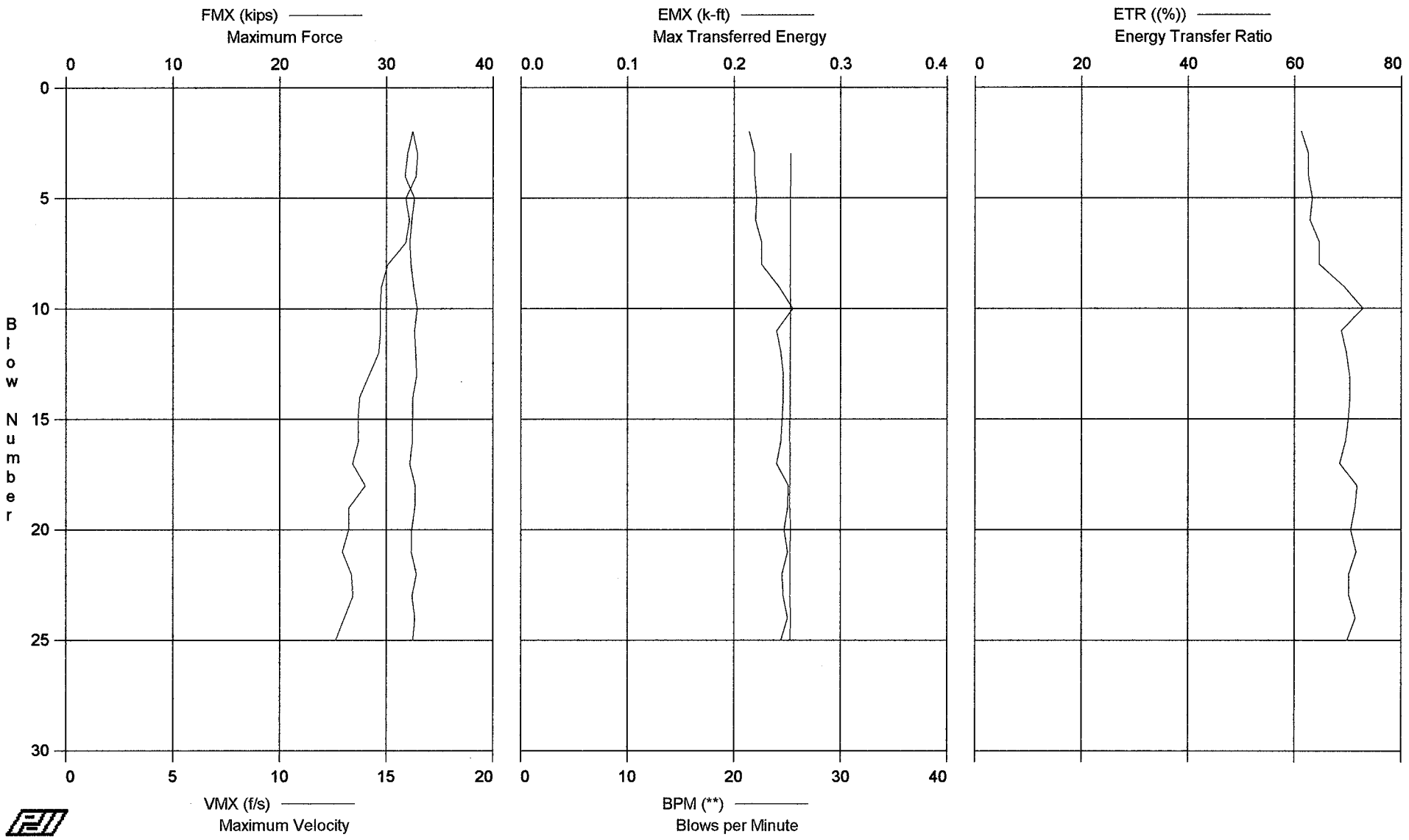
Appendix A

Gregg Drilling & Testing - Case Method Results

PDIPLOT Ver. 2004.1 - Printed: 12-Apr-2005

Test date: 30-Mar-2005

Estates Dam - Sample 1

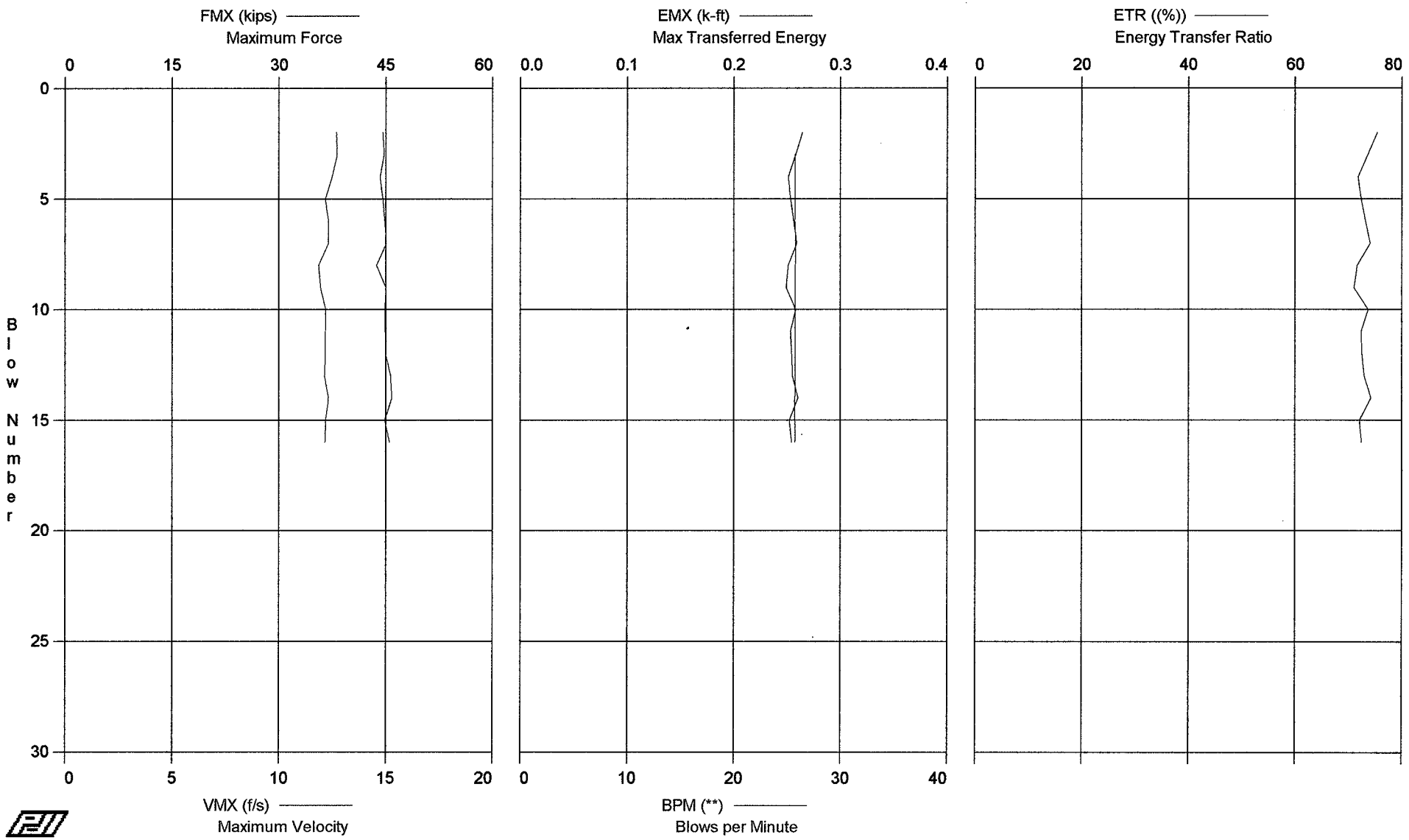


PDIPLOT Ver. 2004.1 - Printed: 12-Apr-2005

Gregg Drilling & Testing - Case Method Results

Test date: 30-Mar-2005

Estates Dam - Sample 2

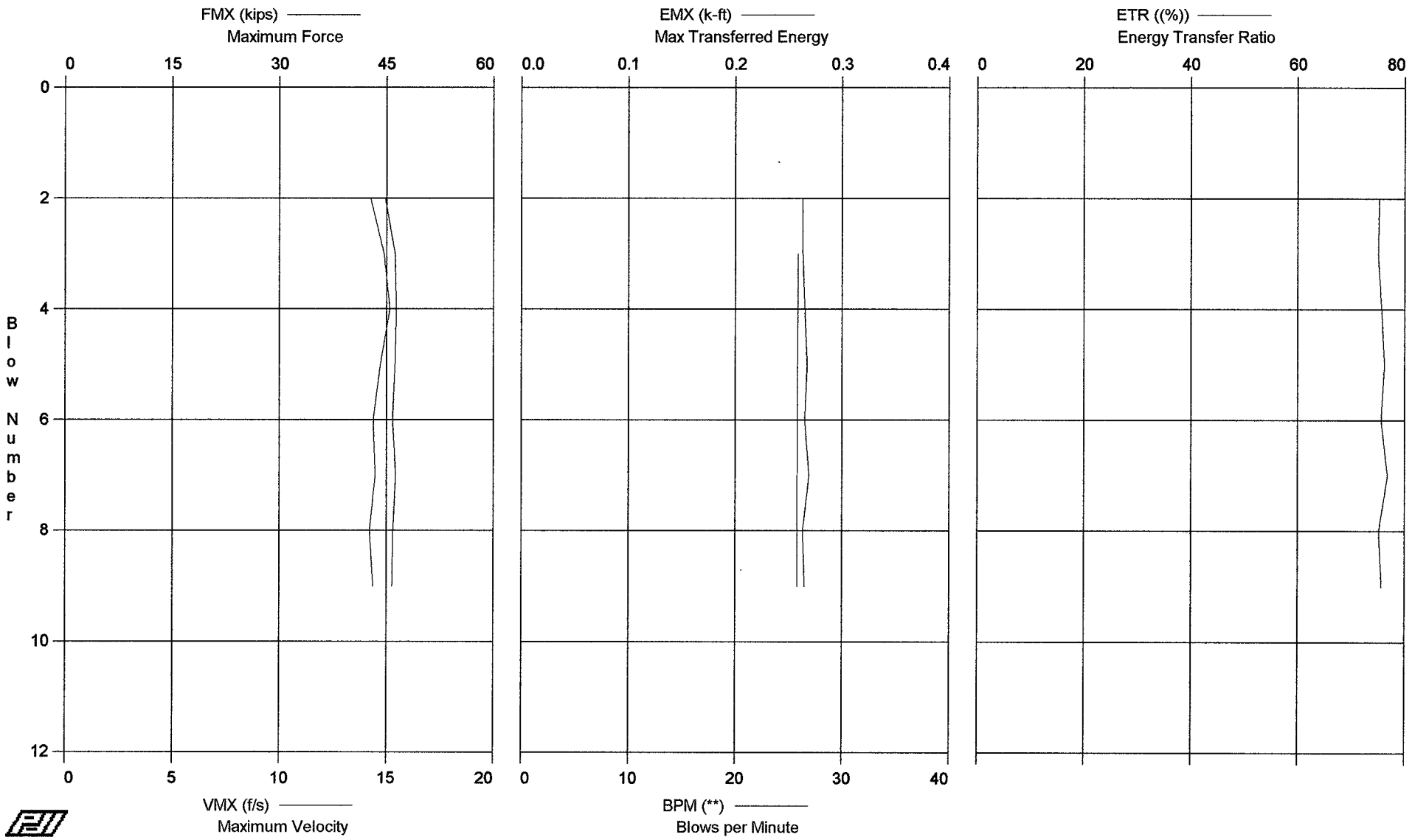


Gregg Drilling & Testing - Case Method Results

PDIPLOT Ver. 2004.1 - Printed: 12-Apr-2005

Test date: 30-Mar-2005

Estates Dam - Sample 3

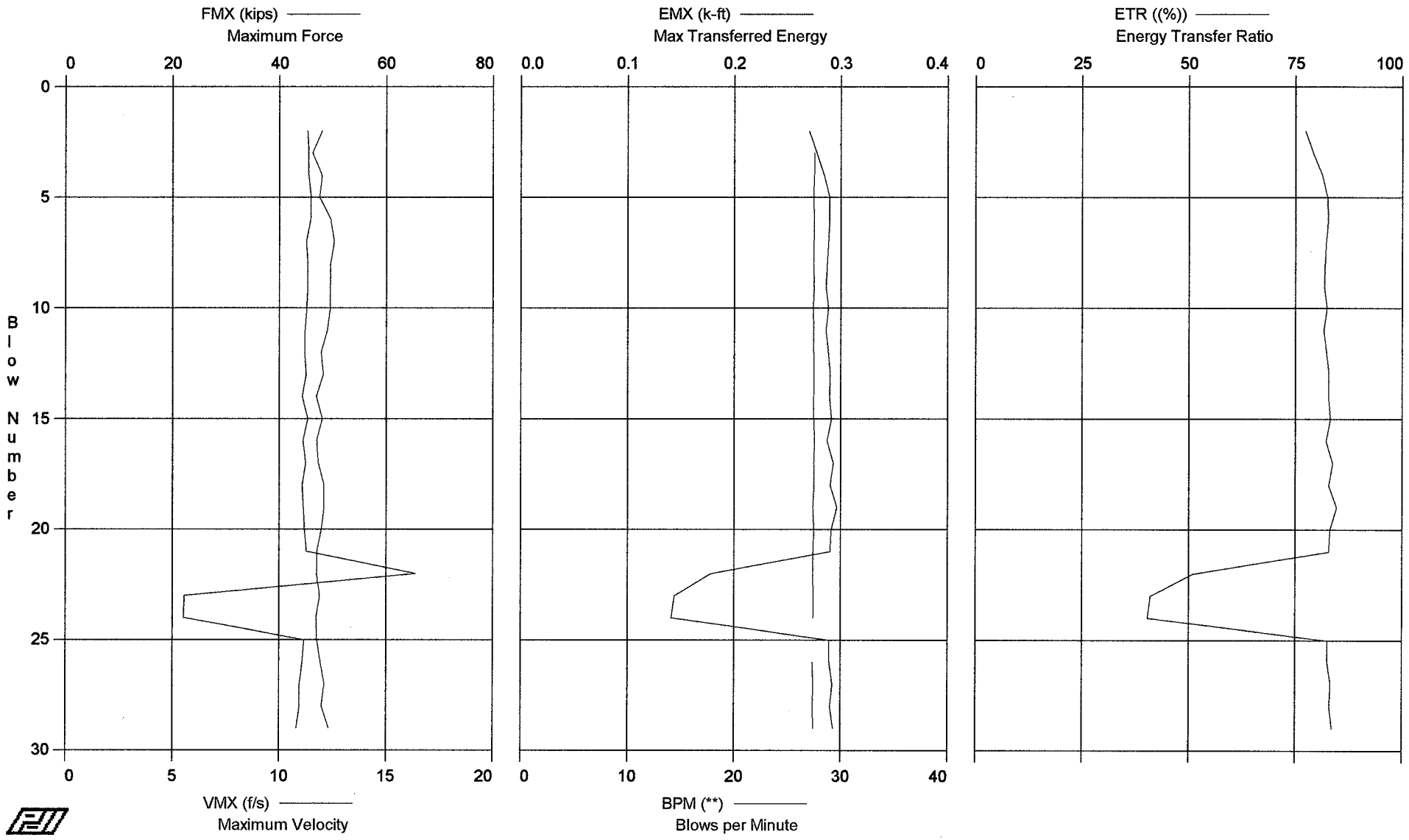


Gregg Drilling & Testing - Case Method Results

PDIPLOT Ver. 2004.1 - Printed: 12-Apr-2005

Test date: 30-Mar-2005

Estates Dam - Sample 4

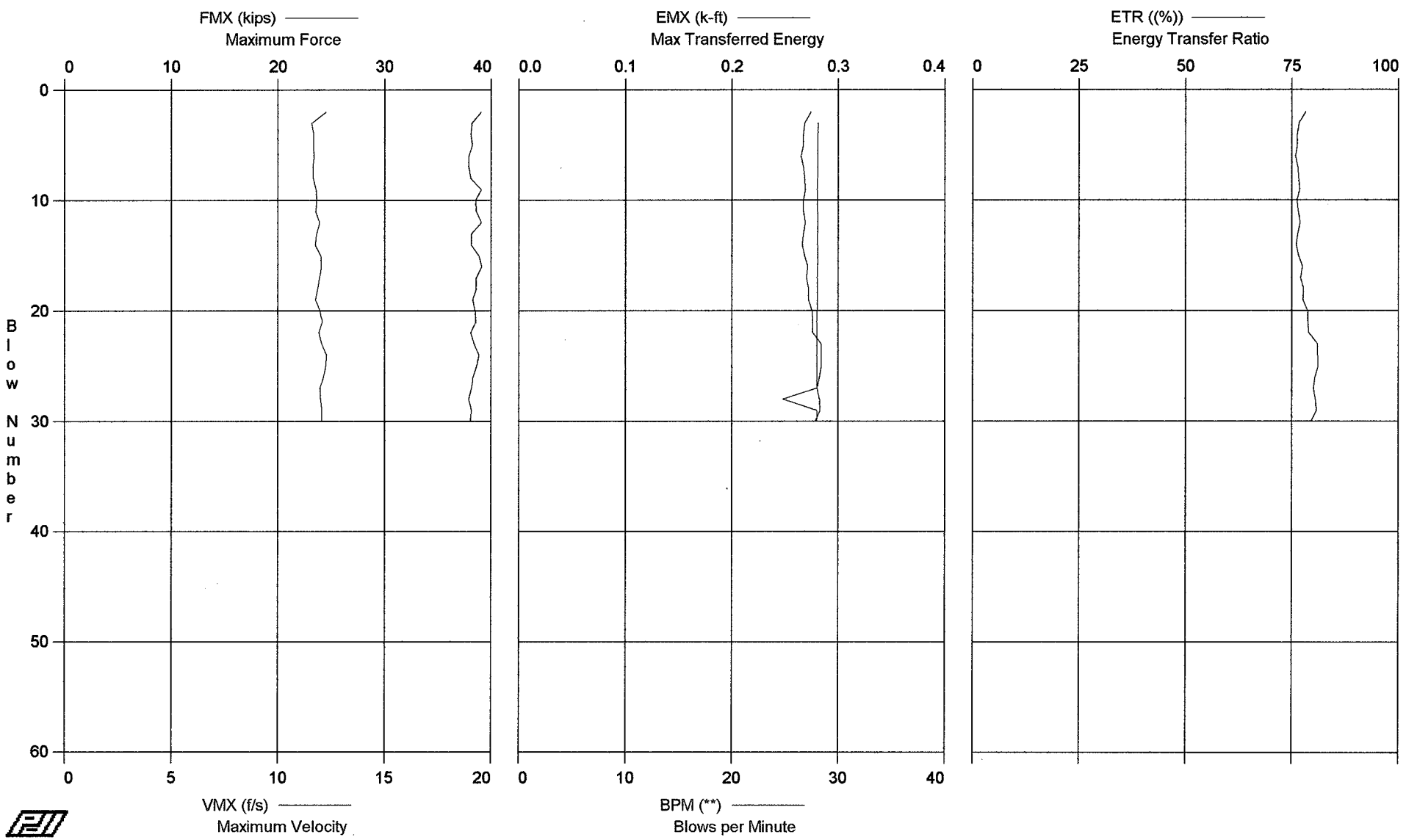


Gregg Drilling & Testing - Case Method Results

PDIPLOT Ver. 2004.1 - Printed: 12-Apr-2005

Test date: 30-Mar-2005

Estates Dam - Sample 5



Estates Dam - Sample 1
OP: Virgil baker/Mike Jones

SPT
Test date: 30-Mar-2005

AR: 1.51 in^2
LE: 14.29 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.35

FMX: Maximum Force
VMX: Maximum Velocity
EMX: Max Transferred Energy

BPM: Blows per Minute
ETR: Energy Transfer Ratio

BL#	depth ft	BLC bl/ft	FMX kips	VMX f/s	EMX k-ft	BPM **	ETR (%)
2	7.70	10	32	16.2	0.21	0.0	61.2
3	7.80	10	32	16.5	0.22	25.3	62.5
4	7.90	10	32	16.4	0.22	25.3	62.5
5	8.00	10	33	15.9	0.22	25.2	63.3
6	8.06	16	32	16.1	0.22	25.3	62.8
7	8.13	16	32	15.9	0.23	25.3	64.6
8	8.19	16	32	15.1	0.23	25.3	64.6
9	8.25	16	33	14.8	0.24	25.2	69.2
10	8.31	16	33	14.7	0.26	25.3	72.8
11	8.38	16	33	14.7	0.24	25.3	68.7
12	8.44	16	33	14.6	0.24	25.3	69.7
13	8.50	16	33	14.2	0.25	25.3	70.3
14	8.54	24	32	13.8	0.25	25.3	70.3
15	8.58	24	32	13.7	0.25	25.2	70.1
16	8.63	24	32	13.7	0.24	25.2	69.6
17	8.67	24	32	13.4	0.24	25.3	68.5
18	8.71	24	33	14.0	0.25	25.2	71.7
19	8.75	24	33	13.3	0.25	25.3	71.3
20	8.79	24	32	13.2	0.25	25.3	70.5
21	8.83	24	32	12.9	0.25	25.2	71.5
22	8.88	24	33	13.4	0.25	25.3	70.1
23	8.92	24	32	13.4	0.25	25.2	70.2
24	8.96	24	33	13.0	0.25	25.3	71.4
25	9.00	24	32	12.6	0.24	25.2	69.8
		Average	32	14.4	0.24	25.3	68.2
		Std. Dev.	0	1.2	0.01	0.0	3.5
		Maximum	33	16.5	0.26	25.3	72.8
		@ Blow#	10	3	10	3	10

Total number of blows analyzed: 24

Time Summary

Drive 55 seconds 12:28:30 PM - 12:29:25 PM (3/30/2005)

Estates Dam - Sample 2
OP: Virgil baker/Mike Jones

SPT
Test date: 30-Mar-2005

AR: 1.51 in^2
LE: 22.35 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.35

FMX: Maximum Force
VMX: Maximum Velocity
EMX: Max Transferred Energy

BPM: Blows per Minute
ETR: Energy Transfer Ratio

BL#	depth	BLC	FMX	VMX	EMX	BPM	ETR
	ft	bl/ft	kips	f/s	k-ft	**	(%)
2	17.14	14	45	12.7	0.26	0.0	75.4
3	17.21	14	45	12.7	0.26	25.8	73.6
4	17.29	14	44	12.5	0.25	25.8	71.8
5	17.36	14	45	12.2	0.25	25.8	72.4
6	17.43	14	45	12.3	0.26	25.7	73.2
7	17.50	14	45	12.3	0.26	25.8	74.0
8	17.60	10	44	11.9	0.25	25.8	71.7
9	17.70	10	45	11.9	0.25	25.7	71.0
10	17.80	10	45	12.2	0.26	25.7	73.7
11	17.90	10	45	12.2	0.25	25.7	72.3
12	18.00	10	45	12.2	0.25	25.8	72.5
13	18.13	8	46	12.1	0.26	25.7	73.0
14	18.25	8	46	12.3	0.26	25.7	74.2
15	18.38	8	45	12.2	0.25	25.7	72.1
16	18.50	8	46	12.1	0.25	25.8	72.4
		Average	45	12.3	0.26	25.7	72.9
		Std. Dev.	1	0.2	0.00	0.0	1.1
		Maximum	46	12.7	0.26	25.8	75.4
		@ Blow#	14	3	2	7	2

Total number of blows analyzed: 15

Time Summary

Drive 33 seconds 2:21:57 PM - 2:22:30 PM (3/30/2005)

Estates Dam - Sample 3
OP: Virgil baker/Mike Jones

SPT
Test date: 30-Mar-2005

AR: 1.51 in^2
LE: 25.29 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.35

FMX: Maximum Force
VMX: Maximum Velocity
EMX: Max Transferred Energy

BPM: Blows per Minute
ETR: Energy Transfer Ratio

BL#	depth ft	BLC bl/ft	FMX kips	VMX f/s	EMX k-ft	BPM **	ETR (%)
2	19.75	8	45	14.3	0.26	0.0	75.3
3	19.88	8	46	14.9	0.26	25.8	75.0
4	20.00	8	46	15.1	0.27	25.9	75.6
5	20.17	6	46	14.7	0.27	25.8	76.2
6	20.33	6	46	14.4	0.27	25.8	75.6
7	20.50	6	46	14.5	0.27	25.8	76.8
8	20.75	4	46	14.2	0.26	25.8	75.2
9	21.00	4	46	14.4	0.27	25.8	75.7
		Average	46	14.6	0.27	25.8	75.7
		Std. Dev.	0	0.3	0.00	0.0	0.5
		Maximum	46	15.1	0.27	25.9	76.8
		@ Blow#	4	4	7	4	7

Total number of blows analyzed: 8

Time Summary

Drive 16 seconds 2:42:32 PM - 2:42:48 PM (3/30/2005)

Estates Dam - Sample 4
OP: Virgil baker/Mike Jones

SPT
Test date: 30-Mar-2005

AR: 1.51 in^2
LE: 40.35 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.35

FMX: Maximum Force
VMX: Maximum Velocity
EMX: Max Transferred Energy

BPM: Blows per Minute
ETR: Energy Transfer Ratio

BL#	depth ft	BLC bl/ft	FMX kips	VMX f/s	EMX k-ft	BPM **	ETR (%)
2	35.11	18	45	12.0	0.27	0.0	77.3
3	35.17	18	45	11.6	0.28	27.5	79.2
4	35.22	18	45	12.0	0.28	27.5	81.2
5	35.28	18	46	11.9	0.29	27.4	82.5
6	35.33	18	46	12.4	0.29	27.5	82.6
7	35.39	18	45	12.6	0.29	27.4	82.2
8	35.44	18	45	12.4	0.29	27.4	81.9
9	35.50	18	45	12.4	0.29	27.5	81.8
10	35.55	20	45	12.4	0.29	27.4	82.4
11	35.60	20	45	12.2	0.29	27.4	81.6
12	35.65	20	45	11.9	0.29	27.4	82.3
13	35.70	20	45	12.1	0.29	27.5	82.8
14	35.75	20	44	11.7	0.29	27.4	82.7
15	35.80	20	45	12.0	0.29	27.4	83.2
16	35.85	20	44	11.8	0.29	27.5	82.1
17	35.90	20	45	11.8	0.29	27.4	83.8
18	35.95	20	44	12.1	0.29	27.5	82.8
19	36.00	20	44	12.1	0.30	27.4	84.7
20	36.05	20	45	12.0	0.29	27.5	83.1
21	36.10	20	45	11.8	0.29	27.4	82.8
22	36.15	20	65	11.7	0.18	27.4	51.0
23	36.20	20	22	11.9	0.14	27.4	41.0
24	36.25	20	22	11.7	0.14	27.4	40.4
25	36.30	20	45	11.8	0.29	0.0	82.6
26	36.35	20	44	11.9	0.29	27.3	82.5
27	36.40	20	44	12.1	0.29	27.4	83.3
28	36.45	20	44	12.0	0.29	27.4	83.0
29	36.50	20	43	12.3	0.29	27.4	83.7
		Average	44	12.0	0.27	27.4	78.2
		Std. Dev.	7	0.2	0.04	0.0	12.0
		Maximum	65	12.6	0.30	27.5	84.7
		@ Blow#	22	7	19	3	19

Total number of blows analyzed: 28

Time Summary

Drive 1 minute 6 seconds 4:24:57 PM - 4:26:03 PM (3/30/2005)

Estates Dam - Sample 5
OP: Virgil baker/Mike Jones

SPT
Test date: 30-Mar-2005

AR: 1.51 in^2
LE: 41.29 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.35

FMX: Maximum Force
VMX: Maximum Velocity
EMX: Max Transferred Energy

BPM: Blows per Minute
ETR: Energy Transfer Ratio

BL#	depth ft	BLC bl/ft	FMX kips	VMX f/s	EMX k-ft	BPM **	ETR (%)
2	36.63	16	39	12.2	0.27	0.0	78.2
3	36.69	16	38	11.6	0.27	28.1	76.7
4	36.75	16	38	11.7	0.27	28.1	76.3
5	36.81	16	38	11.7	0.27	28.1	76.2
6	36.88	16	38	11.7	0.27	28.1	75.9
7	36.94	16	38	11.6	0.27	28.1	76.4
8	37.00	16	38	11.7	0.27	28.0	76.6
9	37.05	22	39	11.8	0.27	28.0	76.9
10	37.09	22	38	11.8	0.27	28.0	76.2
11	37.14	22	39	11.8	0.27	28.0	76.4
12	37.18	22	39	11.9	0.27	28.1	76.9
13	37.23	22	38	11.8	0.27	28.0	76.4
14	37.27	22	38	11.7	0.27	28.0	76.0
15	37.32	22	39	12.0	0.27	28.1	76.5
16	37.36	22	39	12.0	0.27	28.0	77.4
17	37.41	22	39	11.9	0.27	28.0	77.0
18	37.45	22	39	11.9	0.27	28.0	77.7
19	37.50	22	38	11.8	0.27	28.0	77.6
20	37.55	22	38	12.0	0.28	28.0	78.6
21	37.59	22	39	12.1	0.28	28.0	78.8
22	37.64	22	38	11.9	0.28	28.0	79.0
23	37.68	22	38	12.1	0.28	28.0	81.1
24	37.73	22	39	12.3	0.28	28.0	81.0
25	37.77	22	39	12.2	0.28	28.0	81.2
26	37.82	22	38	12.1	0.28	28.0	80.5
27	37.86	22	38	12.0	0.28	28.0	80.1
28	37.91	22	38	12.0	0.28	24.8	80.5
29	37.95	22	38	12.1	0.28	27.9	80.8
30	38.00	22	38	12.0	0.28	28.0	79.5
		Average	38	11.9	0.27	27.9	78.0
		Std. Dev.	0	0.2	0.01	0.6	1.8
		Maximum	39	12.3	0.28	28.1	81.2
		@ Blow#	16	24	23	3	25

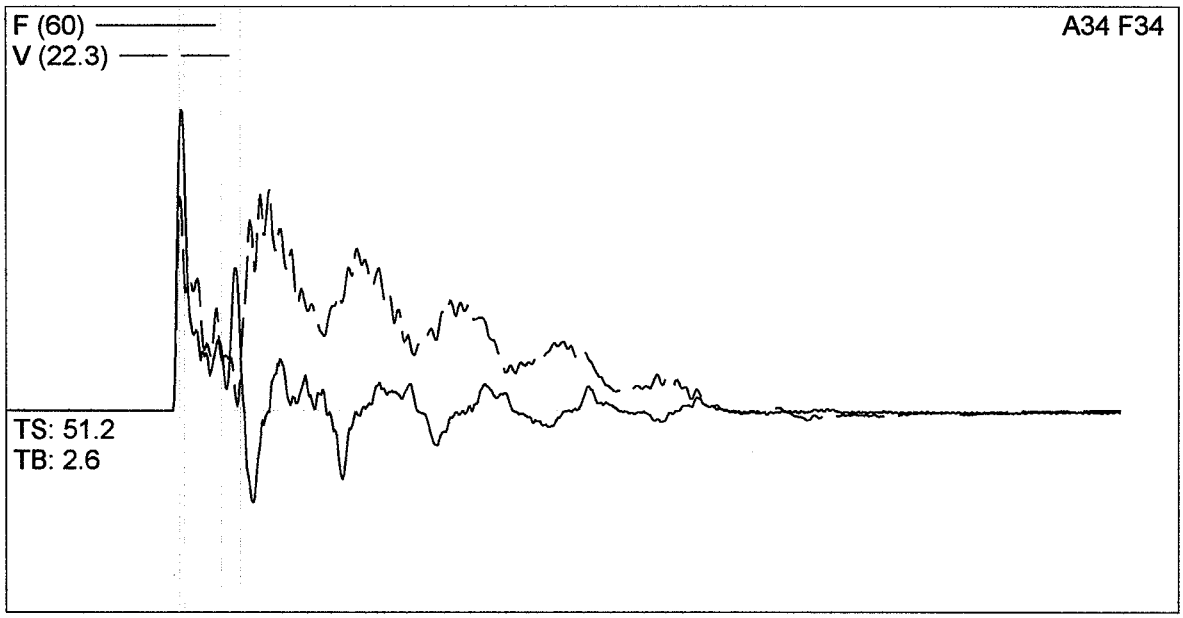
Total number of blows analyzed: 29

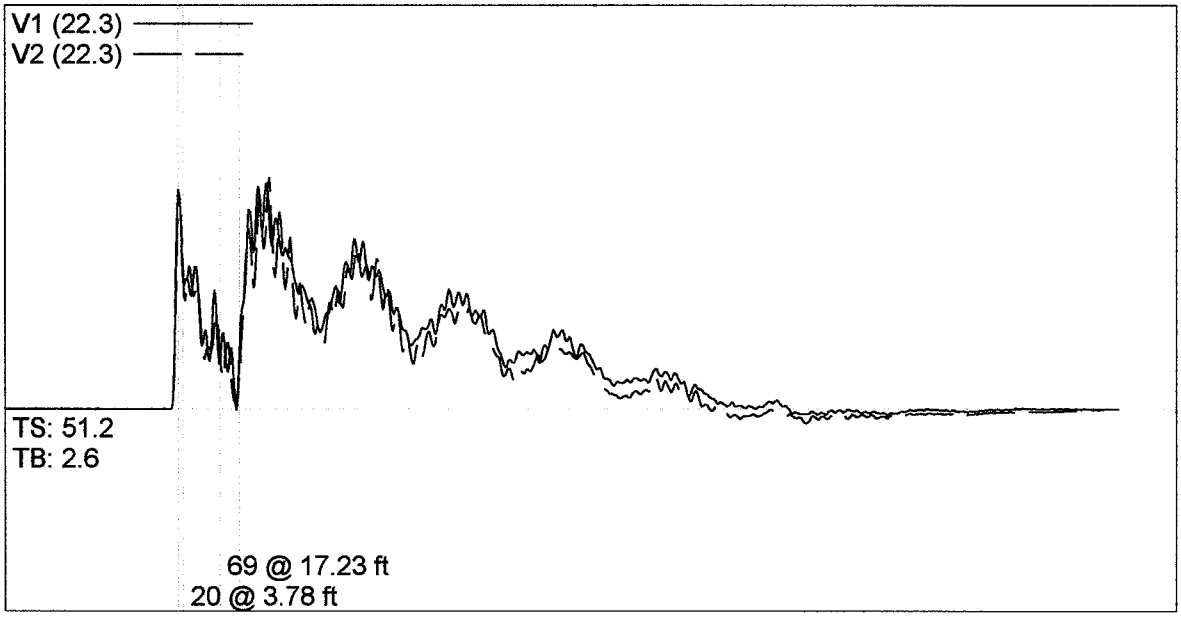
Time Summary

Drive 1 minute 4:40:00 PM - 4:41:00 PM (3/30/2005)

Gregg Drilling & Testing — Pile Driving Analyzer ®

Estates Dam — Sample 2





Project Information

PROJECT: Estates Dam
PILE NAME: Sample 2
DESCR: SPT/3" OD Mod Cal, Auto Hammer Calil
OPERATOR: Virgil baker/Mike Jones
FILE: Sample 2.W01
3/30/2005 2:22:04 PM
Blow Number 5

Pile Properties

LE	22.35 ft
AR	1.51 in^2
EM	30000 ksi
SP	0.492 k/ft3
WS	16807.9 f/s
EA/C	2.7 ksec/ft
2L/C	2.66 ms
JC	0.35 []
LP	17.36 ft

Quantity Results

FMX	45 kips
VMX	12.2 f/s
EMXc	0.25\k-ft
BPM	25.8 bpm
ETR	72.4 (%)
E2F	0.31 k-ft
RAT	1.1 []
ETR	72.4 (%)
DMX	1.24 in

Sensors

F3: [NWJ-1] 212.95 (1)
F4: [NWJ-2] 213.63 (1)
A3: [2252] 315 mv/5000g's (1)
A4: [2248] 320 mv/5000g's (1)
CLIP: OK
F3/F4: OK 1.03
V3/V4: OK 1.05

Appendix C
Downhole Geophysical Surveys

GEOVision
geophysical services
a division of Blackhawk Geometrics

ESTATES DAM

BORINGS VQ-38 AND VQ-40

SUSPENSION P & S VELOCITIES

April 28, 2005
Report 5264-01

ESTATES DAM

BORINGS VQ-38 AND VQ-40

SUSPENSION P & S VELOCITIES

Prepared for

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April 28, 2005
Report 5264-01

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APPENDICES

INTRODUCTION

OYO suspension velocity measurements were performed in two land borings on and adjacent to the Estates Reservoir Dam near Oakland, California, as a component of the evaluation of the dynamic stability of the dam. Suspension logging data acquisition was performed between March 29 and 31, 2005 by Rob Steller of GEOVision. The work was performed under subcontract with Robert Y. Chew Geotechnical, Inc., with Mark McKee as the field liaison for Robert Chew.

This report describes the field measurements, data analysis, and results of this work.

SCOPE OF WORK

This report presents the results of suspension velocity measurements collected on March 29 and 30, 2005, in the uncased borings designated VQ-38 and VQ-40, as detailed below. The purpose of these studies was to supplement stratigraphic information obtained during Robert Chew's soil sampling program and to acquire shear wave velocities and compressional wave velocities as a function of depth, which, in turn, can be used to characterize ground response to earthquake motion.

BORING DESIGNATION	DATE LOGGED	GENERAL LOCATION	ELEVATION (FEET)	HANDHELD GPS COORDINATES	
VQ-38	3/29/05	MIDDLE OF CREST	774	37°49.62′ N	122°12.99′ W
VQ-40	3/31/05	MIDDLE OF DOWNSTREAM SLOPE	747	37°49.62′ N	122°13.00′ W

Table 1. Boring locations and logging dates

The OYO Model 170 Suspension Logging Recorder and Suspension Logging Probe were used to obtain in-situ horizontal shear and compressional wave velocity measurements at 1.64 ft intervals. The acquired data was analyzed and a profile of velocity versus depth was produced for both compressional and horizontally polarized shear waves.

A detailed reference for the velocity measurement techniques used in this study is:

> Guidelines for Determining Design Basis Ground Motions, Report TR-102293, Electric Power Research Institute, Palo Alto, California, November 1993, Sections 7 and 8.

SUSPENSION INSTRUMENTATION

Suspension soil velocity measurements were performed using the Model 170 Suspension Logging system, manufactured by OYO Corporation. This system directly determines the average velocity of a 3.28 ft high segment of the soil column surrounding the boring of interest by measuring the elapsed time between arrivals of a wave propagating upward through the soil column. The receivers that detect the wave, and the source that generates the wave, are moved as a unit in the boring producing relatively constant amplitude signals at all depths.

The suspension system probe consists of a combined reversible polarity solenoid horizontal shear-wave source (S_H) and compressional-wave source (P), joined to two biaxial receivers by a flexible isolation cylinder, as shown in Figure 1. The separation of the two receivers is 3.28 ft, allowing average wave velocity in the region between the receivers to be determined by inversion of the wave travel time between the two receivers. The total length of the probe as used in this survey is 19 ft, with the center point of the receiver pair 12.1 ft above the bottom end of the probe. The probe receives control signals from, and sends the amplified receiver signals to, instrumentation on the surface via an armored 7 conductor cable. The cable is wound onto the drum of a winch and is used to support the probe. Cable travel is measured to provide probe depth data.

The entire probe is suspended by the cable and centered in the boring by nylon "whiskers", therefore, source motion is not coupled directly to the boring walls; rather, the source motion creates a horizontally propagating impulsive pressure wave in the fluid filling the boring and surrounding the source. This pressure wave is converted to P and S_H-waves in the surrounding soil and rock as it impinges upon the boring wall. These waves propagate through the soil and rock surrounding the boring, in turn causing a pressure wave to be generated in the fluid surrounding the receivers as the soil waves pass their location. Separation of the P and S_H-waves at the receivers is performed using the following steps:

1. Orientation of the horizontal receivers is maintained parallel to the axis of the source, maximizing the amplitude of the recorded S_H -wave signals.
2. At each depth, S_H-wave signals are recorded with the source actuated in opposite directions, producing S_H-wave signals of opposite polarity, providing a characteristic S_H-wave signature distinct from the P-wave signal.
3. The 7.02 ft separation of source and receiver 1 permits the P-wave signal to pass and damp significantly before the slower S_H-wave signal arrives at the receiver. In faster soils or rock, the isolation cylinder is extended to allow greater separation of the P- and S_H-wave signals.
4. In saturated soils, the received P-wave signal is typically of much higher frequency than the received S_H-wave signal, permitting additional separation of the two signals by low pass filtering.
5. Direct arrival of the original pressure pulse in the fluid is not detected at the receivers because the wavelength of the pressure pulse in fluid is significantly greater than the dimension of the fluid annulus surrounding the probe (foot versus inch scale), preventing significant energy transmission through the fluid medium.

In operation, a distinct, repeatable pattern of impulses is generated at each depth as follows:

1. The source is fired in one direction producing dominantly horizontal shear with some vertical compression, and the signals from the horizontal receivers situated parallel to the axis of motion of the source are recorded.
2. The source is fired again in the opposite direction and the horizontal receiver signals are recorded.
3. The source is fired again and the vertical receiver signals are recorded. The repeated source pattern facilitates the picking of the P and S_H-wave arrivals; reversal of the source changes the polarity of the S_H-wave pattern but not the P-wave pattern.

The data from each receiver during each source activation is recorded as a different channel on the recording system. The Model 170 has six channels (two simultaneous recording channels), each with a 12 bit 1024 sample record. The recorded data is displayed on a CRT display and on paper tape output as six channels with a common time scale. Data is stored on 3.5 inch floppy diskettes for further processing. Up to 8 sampling sequences can be summed to improve the signal to noise ratio of the signals.

Review of the displayed data on the CRT or paper tape allows the operator to set the gains, filters, delay time, pulse length (energy), sample rate, and summing number to optimize the quality of the data before recording. Verification of the calibration of the Model 170 digital recorder is performed every twelve months using a NIST traceable frequency source and counter, as outlined in Appendix B.

SUSPENSION MEASUREMENT PROCEDURES

Both borings were logged uncased, filled with polymer based drilling fluid. The boring probe was positioned with the mid-point of the receiver spacing at grade, and the mechanical and electronic depth counters were set to zero. The probe was lowered to the bottom of the boring, then returned to the surface, stopping at 1.64 ft intervals to collect data, as summarized below.

At each measurement depth the measurement sequence of two opposite horizontal records and one vertical record was performed, and the gains were adjusted as required. The data from each depth was printed on paper tape, checked, and recorded on diskette before moving to the next depth.

Upon completion of the measurements, the probe zero depth indication at grade was verified prior to removal from the boring.

BORING NUMBER	RUN NUMBER	DEPTH RANGE (FEET)	DEPTH AS DRILLED (FEET)	LOST TO SLOUGH/COLLAPSE (FEET)	SAMPLE INTERVAL (FEET)	DATE LOGGED
VQ-38	1	73.2 – 4.9	86	0.7	1.64	3/29/05
VQ-40	1	58.4 - 4.9	72	1.5	1.64	3/31/05

Table 2. Logging dates and depth ranges

SUSPENSION DATA ANALYSIS

The recorded digital waveforms were analyzed to locate the first minima on the vertical axis records, indicating the arrival of P-wave energy. The difference in travel time between receiver 1 and receiver 2 (R1-R2) arrivals was used to calculate the P-wave velocity for that 3.28 ft segment of the soil column. When observable, P-wave arrivals on the horizontal axis records were used to verify the velocities determined from the vertical axis data.

The P-wave velocity calculated from the travel time over the 7.02 ft interval from source to receiver 1 (S-R1) was calculated and plotted for quality assurance of the velocity derived from the travel time between receivers. In this analysis, the depth values as recorded were increased by 5.15 ft to correspond to the mid-point of the 7.02 ft S-R1 interval, as illustrated in Figure 1. Travel times were obtained by picking the first break of the P-wave signal at receiver 1 and subtracting 3.85 milliseconds, the calculated and experimentally verified delay from source trigger pulse (beginning of record) to source impact. This delay corresponds to the duration of acceleration of the solenoid before impact.

The recorded digital records were studied to establish the presence of clear S_H-wave pulses, as indicated by the presence of opposite polarity pulses on each pair of horizontal records. Ideally, the S_H-wave signals from the 'normal' and 'reverse' source pulses are very nearly inverted images of each other. Digital FFT - IFFT lowpass filtering was used to remove the higher frequency P-wave signal from the S_H-wave signal. Different filter cutoffs were used to separate P- and S_H-waves at different depths, ranging from 700 Hz in the slowest zones to 2000 Hz in the regions of highest velocity. At each depth, the filter frequency was selected to be at least twice the fundamental frequency of the S_H-wave signal being filtered.

Generally, the first maxima was picked for the 'normal' signals and the first minima for the 'reverse' signals, although other points on the waveform were used if the first pulse was distorted. The absolute arrival time of the 'normal' and 'reverse' signals may vary by +/- 0.2 milliseconds, due to differences in the actuation time of the solenoid source caused by constant mechanical bias in the source or by boring inclination. This variation does not affect the R1-R2 velocity determinations, as the differential time is measured between arrivals of waves created by the same source actuation. The final velocity value is the average of the values obtained from the 'normal' and 'reverse' source actuations.

As with the P-wave data, S_H-wave velocity calculated from the travel time over the 7.02 ft interval from source to receiver 1 was calculated and plotted for verification of the velocity derived from the travel time between receivers. In this analysis, the depth values were increased by 5.15 ft to correspond to the mid-point of the 7.02 ft S-R1 interval. Travel times were obtained by picking the first break of the S_H-wave signal at the near receiver and subtracting 3.85 milliseconds, the calculated and experimentally verified delay from the beginning of the record at the source trigger pulse to source impact.

Figure 2 shows an example of R1 - R2 measurements on a sample filtered suspension record. In Figure 2, the time difference over the 3.28 ft interval of 1.88 milliseconds for the horizontal signals is equivalent to an S_H-wave velocity of 1745 ft/sec. Whenever possible, time differences were determined from several phase points on the S_H-waveform records to verify the data obtained from the first arrival of the S_H-wave pulse. Figure 3 displays the same record before filtering of the S_H-waveform record with an 1400 Hz FFT - IFFT digital lowpass filter, illustrating the presence of higher frequency P-wave energy at the beginning of the record, and distortion of the lower frequency S_H-wave by residual P-wave signal.

SUSPENSION RESULTS

Suspension R1-R2 P- and S_H-wave velocities are plotted in Figures 4 and 5. The suspension velocity data shown in these figures are presented in Tables 3 and 4. P- and S_H-wave velocity data from R1-R2 analysis and quality assurance analysis of S-R1 data are plotted together in Figures A1 and A2 to aid in visual comparison. It must be noted that R1-R2 data is an average velocity over a 3.28 ft segment of the soil column; S-R1 data is an average over 7.02 ft, creating a significant smoothing relative to the R1-R2 plots. S-R1 data are presented in Tables A1 and A2. Good correspondence between the shape of the P- and S_H-wave velocity curves is observed for both these data sets. The velocities derived from S-R1 and R1-R2 data are in excellent agreement, providing verification of the higher resolution R1-R2 data.

Calibration procedures and records for the suspension measurement system are presented in Appendix B.

SUMMARY

Discussion of Suspension Results

Both P- and S_H-wave velocities were measured using the OYO Suspension Method in two uncased land borings at depths up to 73 ft below grade on Estates Reservoir Dam near Oakland, Califonia. Both borings were located in a suburban environment, and no significant signal contamination from cultural vibration was observed.

Quality Assurance

These velocity measurements were performed using industry-standard or better methods for both measurements and analyses. All work was performed under GEOVision quality assurance procedures, which include:

- Use of NIST-traceable calibrations, where applicable, for field and laboratory instrumentation
- Use of standard field data logs
- Use of independent verification of data by comparison of receiver-to-receiver and source-to-receiver velocities
- Independent review of calculations and results by a registered professional engineer, geologist, or geophysicist.

Data Reliability

P- and S_H-wave velocity measurement using the Suspension Method gives average velocities over a 3.28 ft interval of depth. This high resolution results in the scatter of values shown in the graphs. Individual measurements are very reliable with estimated precision of +/- 5%. Standardized field procedures and quality assurance checks add to the reliability of these data.

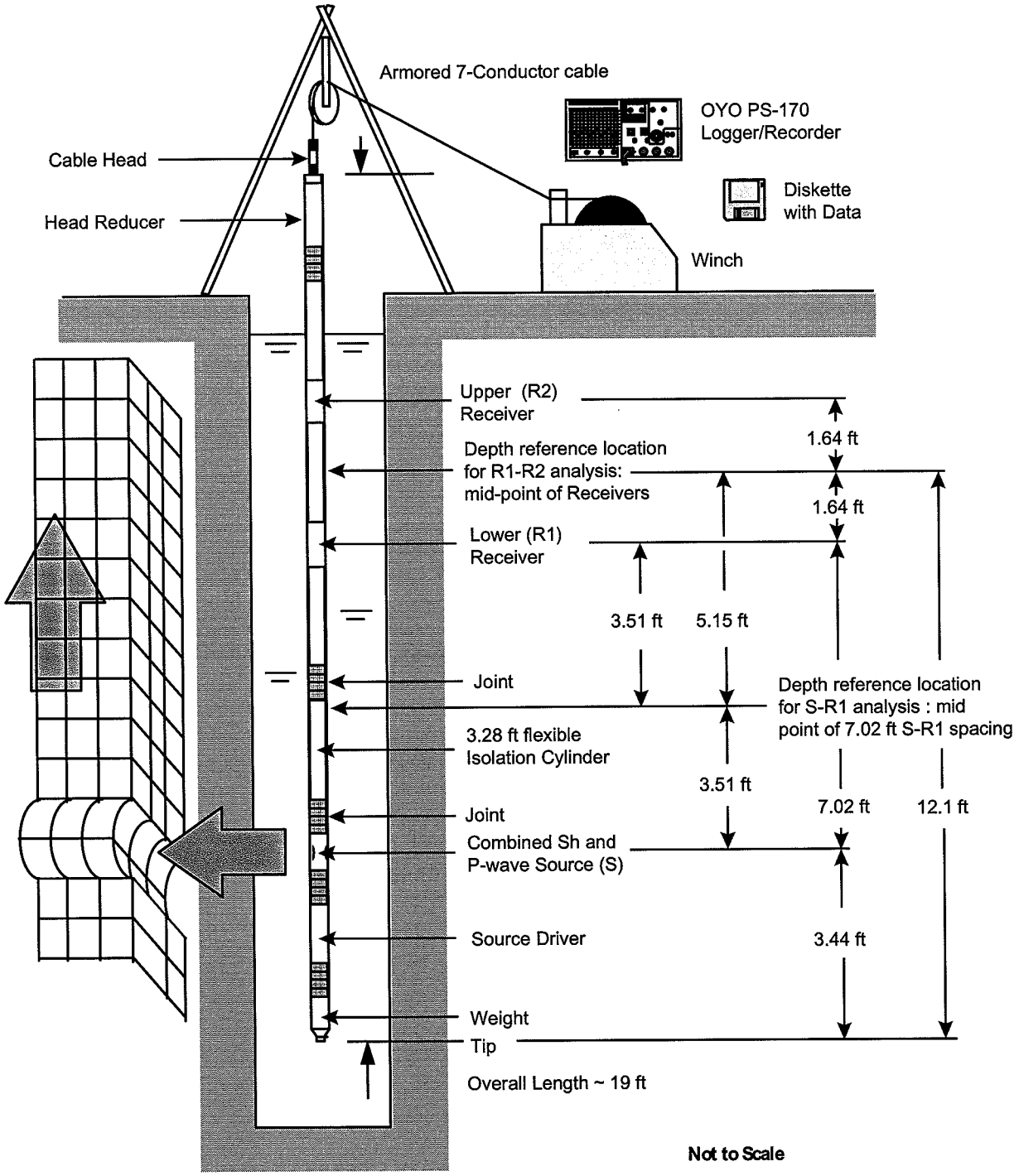


Figure 1. Concept illustration of P-S logging system

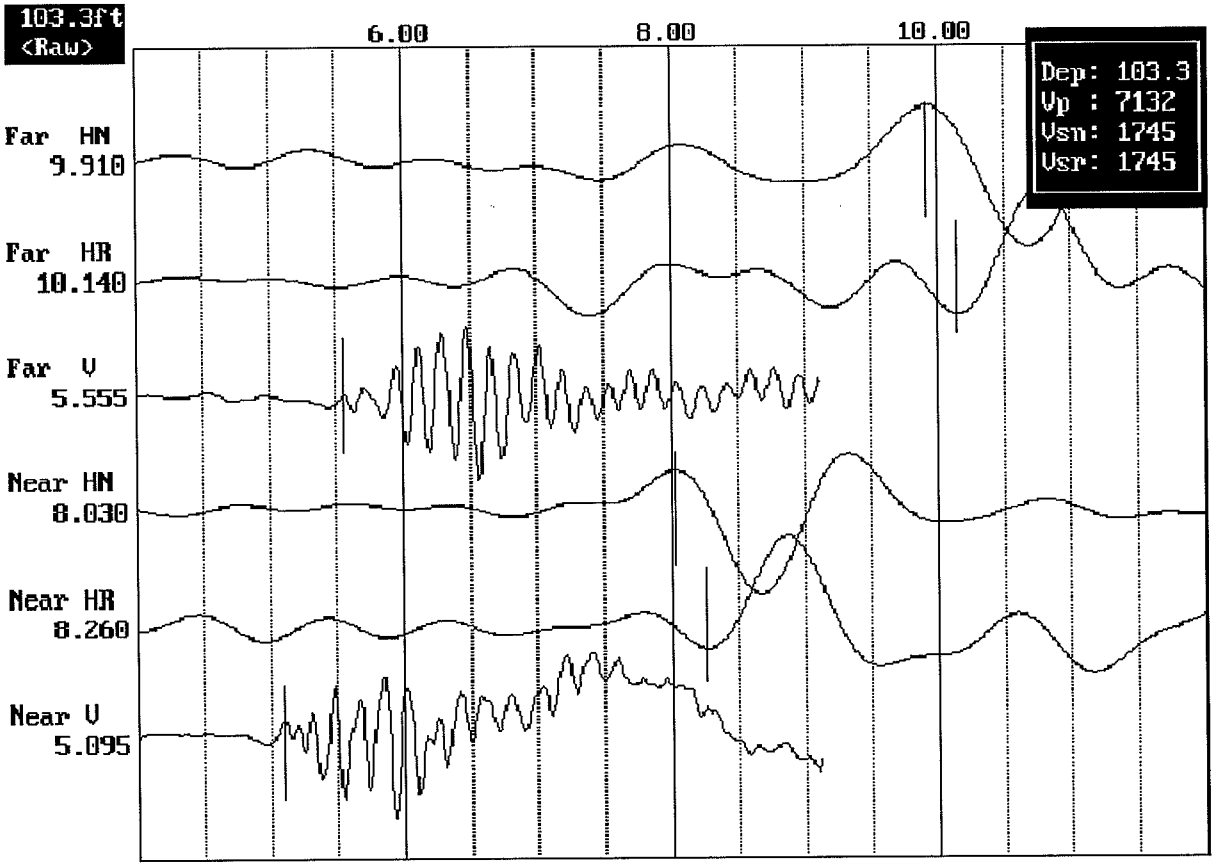


Figure 2. Example of filtered (1400 Hz lowpass) record

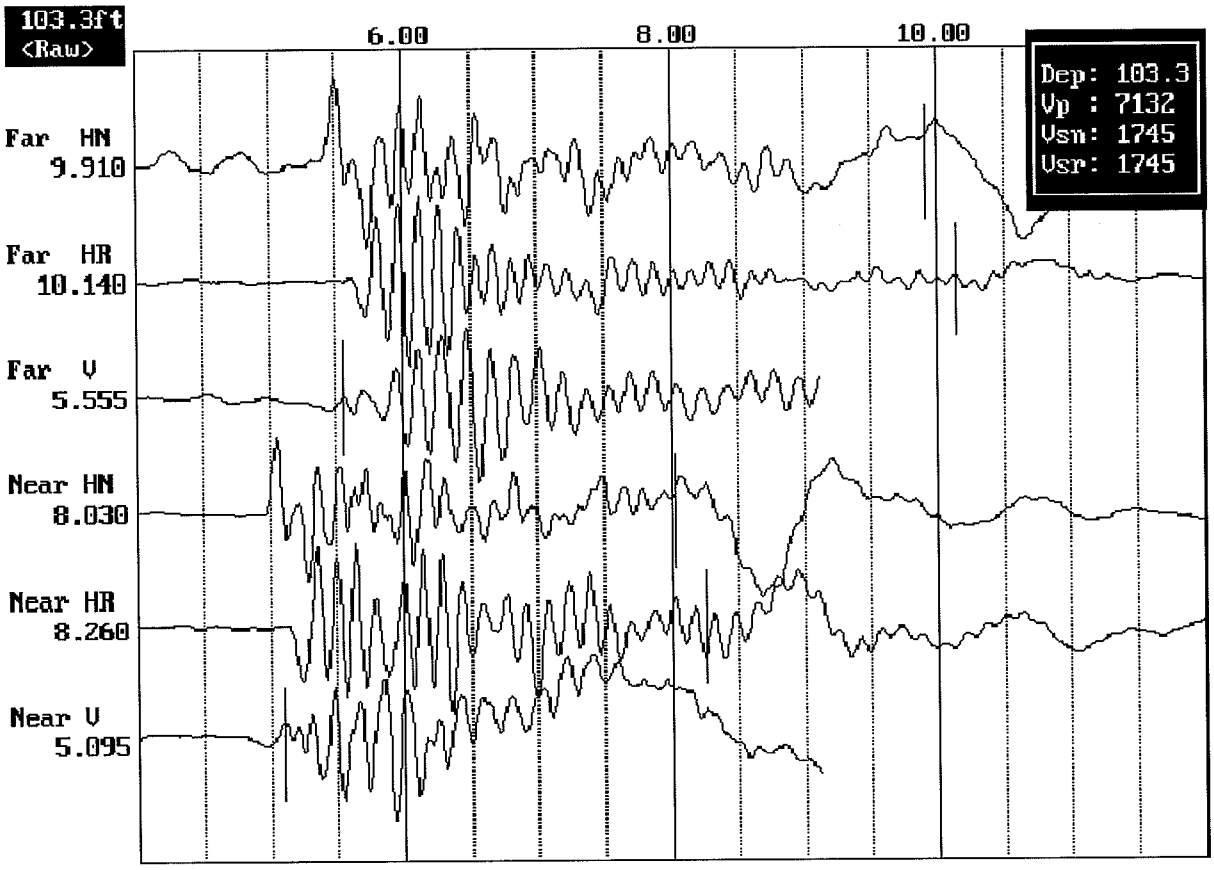


Figure 3. Example of unfiltered record

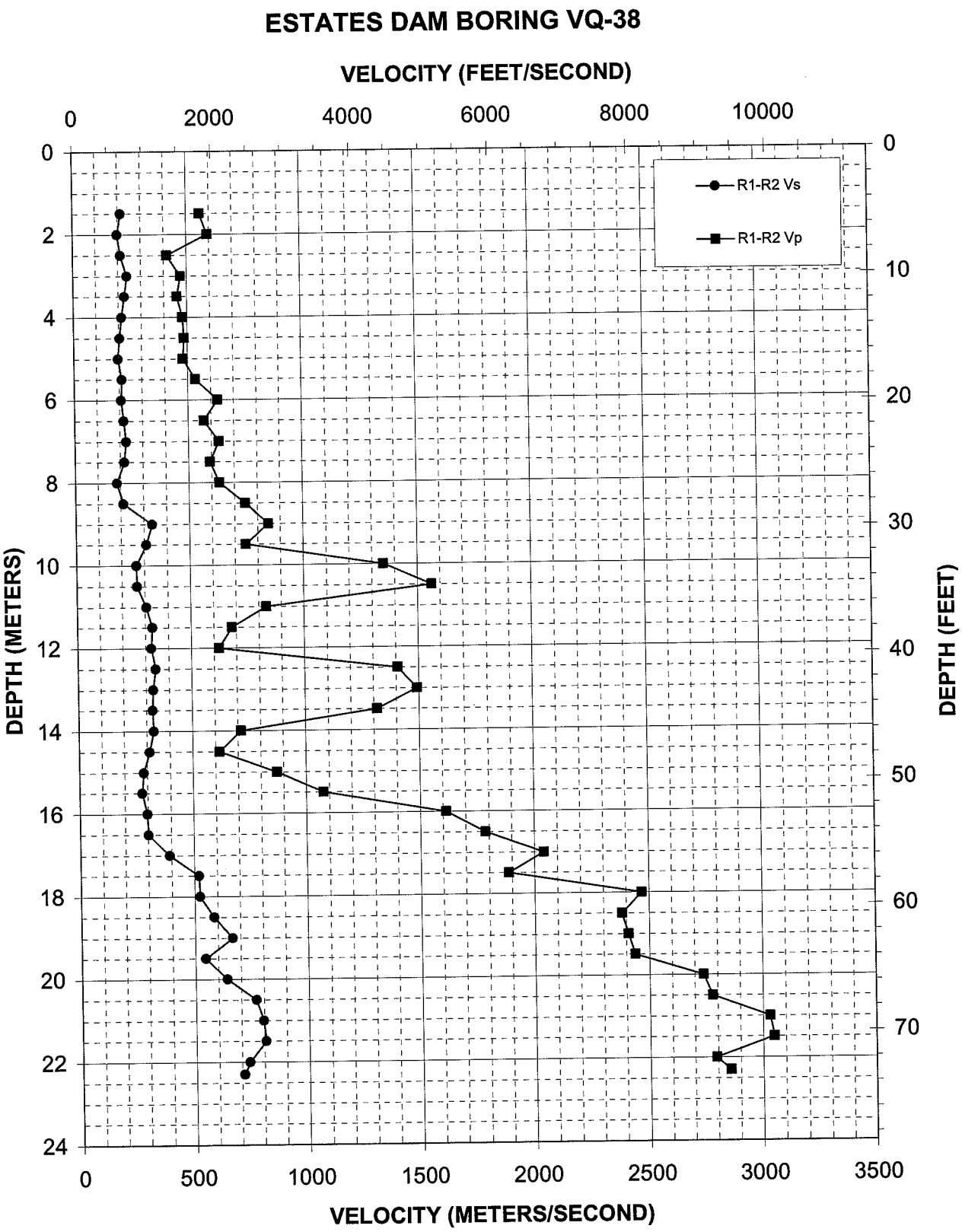


Figure 4. Boring VQ-38, Suspension P- and S_H-wave velocities

Depth		Pick Times						Velocity			
(m)	(feet)	Far-Hn (millisec)	Far-Hr (millisec)	Far-V (millisec)	Near-Hn (millisec)	Near-Hr (millisec)	Near-V (millisec)	$V\text{-}S_H$ (m/sec)	V-P (m/sec)	$V\text{-}S_H$ (ft/sec)	V-P (ft/sec)
1.5	4.9	17.16	16.82	8.63	12.50	12.12	6.84	214	559	701	1833
2.0	6.6	17.88	17.88	8.85	12.88	12.74	7.16	197	592	647	1941
2.5	8.2	17.98	18.16	9.46	13.30	13.34	7.05	211	415	691	1361
3.0	9.8	18.26	18.16	8.95	14.02	14.02	6.84	239	474	783	1555
3.5	11.5	18.42	18.44	9.96	14.00	14.06	7.77	227	457	746	1498
4.0	13.1	19.15	19.15	9.96	14.45	14.50	7.88	214	481	702	1577
4.5	14.8	19.16	18.90	8.92	14.04	14.22	6.87	204	488	670	1600
5.0	16.4	19.36	19.28	9.10	14.14	14.26	7.02	195	481	641	1577
5.5	18.0	19.40	19.32	8.81	14.56	14.72	6.94	212	535	695	1754
6.0	19.7	19.20	19.04	9.15	14.38	14.22	7.56	207	629	681	2063
6.5	21.3	18.22	18.14	9.10	13.58	13.58	7.34	217	568	713	1864
7.0	23.0	17.28	17.04	8.09	12.74	12.74	6.51	226	633	742	2076
7.5	24.6	16.96	16.98	8.16	12.36	12.38	6.48	217	595	713	1953
8.0	26.2	16.80	16.60	8.34	11.18	11.38	6.76	185	633	605	2076
8.5	27.9	16.34	16.28	8.10	11.50	11.68	6.76	212	746	695	2448
9.0	29.5	14.62	14.38	7.66	11.46	11.60	6.48	337	847	1105	2780
9.5	31.2	14.46	14.58	7.44	11.18	11.38	6.10	309	746	1013	2448
10.0	32.8	14.48	14.48	6.58	10.64	10.76	5.84	265	1351	868	4434
10.5	34.4	14.08	14.18	6.08	10.24	10.48	5.44	265	1563	870	5126
11.0	36.1	13.86	13.98	6.59	10.56	10.72	5.39	305	833	1000	2734
11.5	37.7	13.78	13.82	7.33	10.72	10.82	5.86	330	680	1083	2232
12.0	39.4	14.08	14.16	7.53	10.96	11.10	5.92	324	621	1062	2038
12.5	41.0	14.12	14.16	7.37	11.16	11.26	6.66	341	1408	1120	4621
13.0	42.7	14.36	14.48	7.14	11.30	11.48	6.47	330	1493	1083	4897
13.5	44.3	14.12	14.28	7.28	11.06	11.20	6.52	326	1316	1069	4317
14.0	45.9	14.08	14.28	7.36	11.06	11.24	5.96	330	714	1083	2343
14.5	47.6	14.14	14.22	7.06	10.92	11.00	5.44	311	617	1019	2025
15.0	49.2	13.52	13.58	6.63	9.96	10.08	5.48	283	870	929	2853
15.5	50.9	12.64	12.74	5.97	8.98	9.12	5.04	275	1075	901	3528
16.0	52.5	11.64	11.62	5.58	8.22	8.32	4.96	298	1613	976	5292
16.5	54.1	10.80	10.68	5.49	7.38	7.46	4.93	301	1786	988	5859
17.0	55.8	9.90	9.90	5.40	7.36	7.34	4.91	392	2041	1287	6696
17.5	57.4	9.00	9.32	5.34	7.22	7.26	4.81	521	1887	1709	6190
18.0	59.1	8.82	8.89	5.28	6.96	6.94	4.87	525	2469	1722	8101
18.5	60.7	8.28	8.36	5.22	6.51	6.71	4.80	585	2381	1919	7812
19.0	62.3	7.91	8.50	5.23	6.56	6.84	4.81	664	2410	2180	7906
19.5	64.0	8.45	8.47	5.15	6.63	6.62	4.74	545	2439	1788	8002
20.0	65.6	8.29	8.22	5.17	6.59	6.79	4.80	639	2740	2096	8989
20.5	67.3	7.94	8.05	5.06	6.59	6.79	4.70	766	2778	2514	9113
21.0	68.9	7.96	8.13	5.14	6.67	6.91	4.81	797	3030	2614	9942
21.5	70.5	7.81	7.89	5.14	6.53	6.69	4.81	808	3049	2651	10003
22.0	72.2	7.65	7.90	5.08	6.32	6.51	4.72	735	2793	2412	9164
22.3	73.2	7.61	7.79	5.10	6.21	6.38	4.75	712	2857	2335	9374

Table 3. Boring VQ-38, Suspension R1-R2 depth, pick times, and velocities

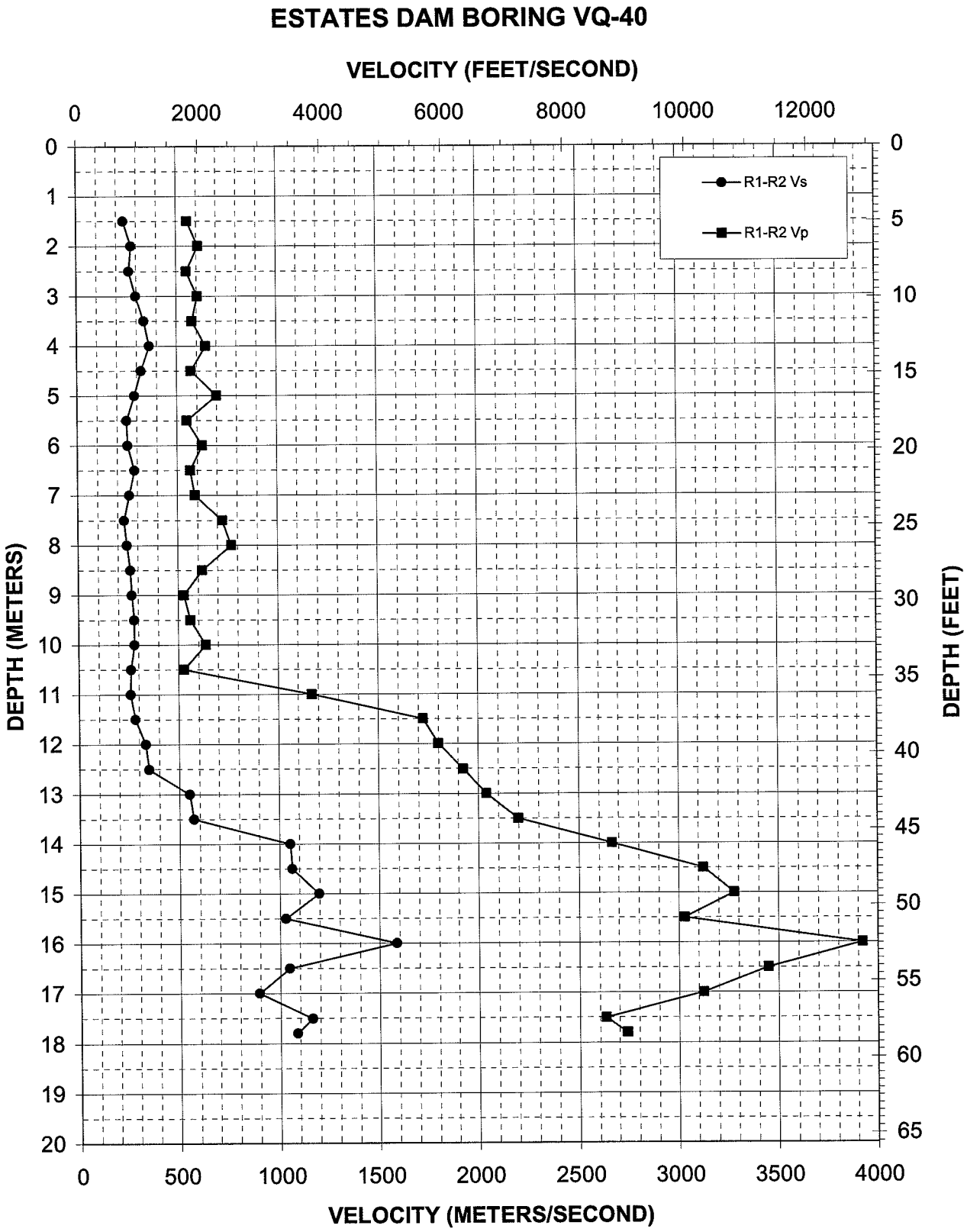


Figure 5. Boring VQ-40, Suspension P- and S_H-wave velocities

Depth		Pick Times						Velocity			
(m)	(feet)	Far-Hn (millisec)	Far-Hr (millisec)	Far-V (millisec)	Near-Hn (millisec)	Near-Hr (millisec)	Near-V (millisec)	$V\text{-}S_H$ (m/sec)	V-P (m/sec)	$V\text{-}S_H$ (ft/sec)	V-P (ft/sec)
1.5	4.9	15.16	15.08	8.45	10.82	10.98	6.65	237	556	777	1823
2.0	6.6	14.36	14.34	9.18	10.60	10.80	7.54	274	610	899	2001
2.5	8.2	14.36	14.54	8.93	10.72	10.62	7.12	265	552	868	1813
3.0	9.8	14.42	14.28	8.85	10.96	11.00	7.20	297	606	974	1988
3.5	11.5	14.62	14.62	8.78	11.60	11.70	7.05	337	578	1105	1896
4.0	13.1	14.78	14.90	8.86	12.04	12.16	7.31	365	645	1197	2117
4.5	14.8	15.54	15.40	8.78	12.34	12.38	7.03	322	571	1055	1875
5.0	16.4	16.56	16.60	8.63	13.06	13.14	7.20	287	699	943	2294
5.5	18.0	16.94	16.96	8.93	12.86	12.98	7.11	248	549	814	1803
6.0	19.7	17.04	17.06	8.95	13.04	13.16	7.35	253	625	831	2051
6.5	21.3	17.18	17.18	9.77	13.66	13.72	8.00	287	565	940	1854
7.0	23.0	16.96	16.92	9.65	13.08	13.06	7.95	258	588	848	1930
7.5	24.6	16.98	17.10	9.56	12.70	12.80	8.18	233	725	765	2377
8.0	26.2	16.66	16.68	9.62	12.58	12.64	8.32	246	769	808	2524
8.5	27.9	16.28	16.38	9.47	12.46	12.54	7.86	261	621	857	2038
9.0	29.5	15.70	15.82	9.01	12.00	12.06	7.12	268	529	880	1736
9.5	31.2	15.06	15.08	8.32	11.44	11.54	6.53	279	560	916	1838
10.0	32.8	14.88	14.96	7.60	11.26	11.40	6.03	279	637	914	2090
10.5	34.4	14.48	14.48	7.14	10.66	10.64	5.24	261	528	857	1731
11.0	36.1	13.50	13.58	6.06	9.66	9.72	5.20	260	1170	852	3837
11.5	37.7	12.44	12.39	5.76	8.83	8.89	5.18	281	1724	923	5657
12.0	39.4	10.84	10.85	5.66	7.86	7.83	5.10	333	1802	1094	5911
12.5	41.0	9.76	9.63	5.51	6.75	6.89	4.99	348	1923	1141	6309
13.0	42.7	7.65	8.08	5.36	5.84	6.27	4.87	552	2041	1813	6696
13.5	44.3	7.64	7.57	5.29	5.84	5.87	4.83	571	2198	1875	7211
14.0	45.9	6.89	6.67	5.15	5.81	5.85	4.77	1055	2667	3463	8749
14.5	47.6	6.94	7.16	5.17	5.97	6.25	4.85	1064	3125	3490	10253
15.0	49.2	6.81	6.98	5.03	5.96	6.16	4.73	1198	3279	3929	10757
15.5	50.9	7.13	7.37	5.17	6.17	6.39	4.84	1031	3030	3382	9942
16.0	52.5	7.02	6.96	5.18	6.35	6.37	4.93	1587	3922	5208	12866
16.5	54.1	6.84	7.44	5.19	5.77	6.60	4.90	1047	3448	3435	11313
17.0	55.8	7.76	8.11	5.21	6.64	7.00	4.89	897	3125	2942	10253
17.5	57.4	7.62	7.88	5.27	6.73	7.05	4.89	1163	2632	3815	8634
17.8	58.4	7.97	7.92	5.25	7.00	7.05	4.89	1087	2740	3566	8989

Table 4. Boring VQ-40, Suspension R1-R2 depth, pick times, and velocities

APPENDIX A

SUSPENSION VELOCITY MEASUREMENT QUALITY ASSURANCE SUSPENSION SOURCE TO RECEIVER ANALYSIS RESULTS

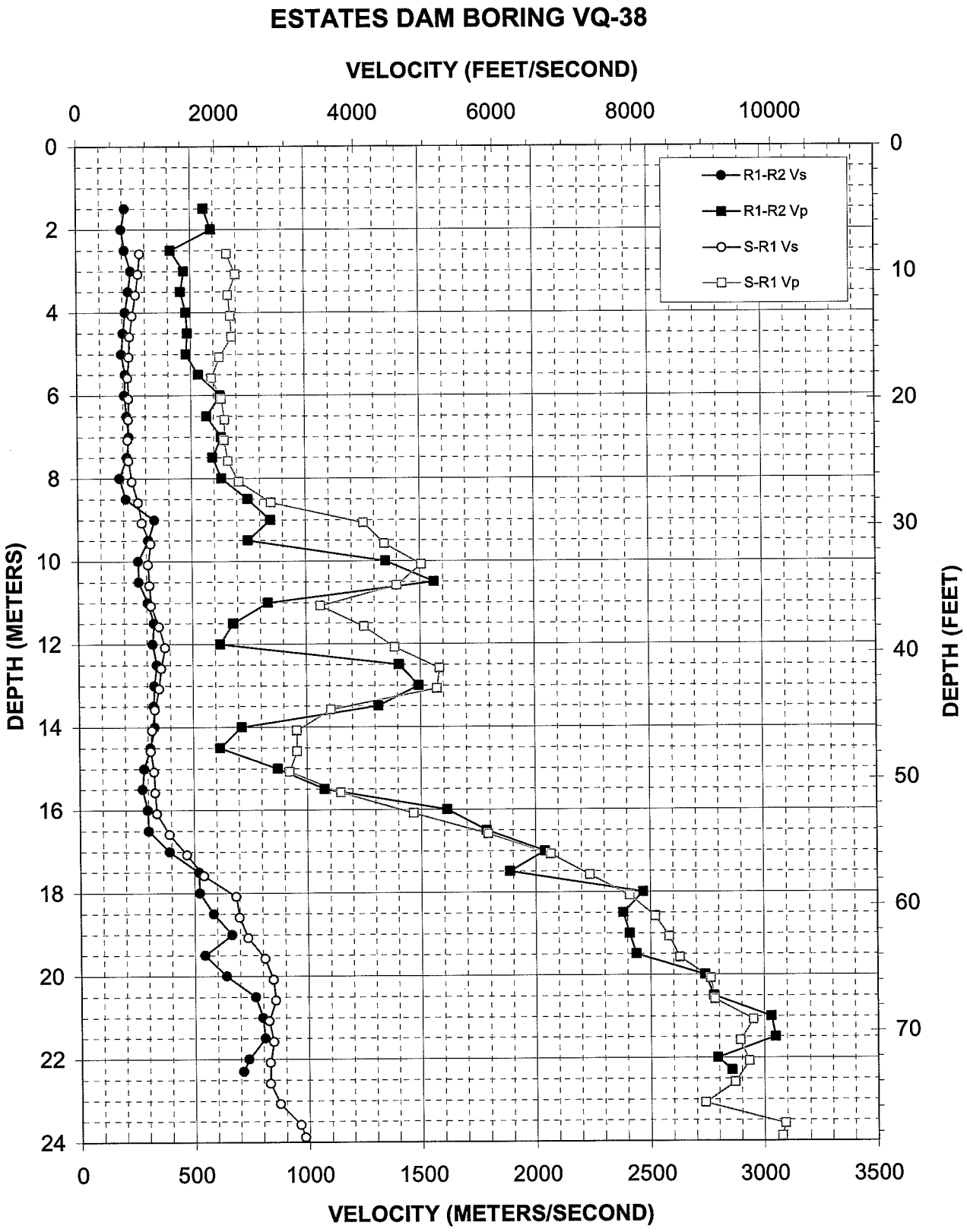


Figure A-1. Boring VQ-38, R1 - R2 high resolution analysis and S-R1 quality assurance analysis P- and S_H-wave data

Depth (meters)	Velocity		Depth (feet)	Velocity	
	V-S_H (m/sec)	V-p (m/sec)		V- S_H (ft/sec)	V-p (ft/sec)
2.6	280	664	8.5	919	2177
3.1	272	700	10.1	891	2297
3.6	260	668	11.8	852	2191
4.1	244	676	13.4	801	2218
4.6	234	682	15.0	766	2239
5.1	230	627	16.7	753	2058
5.6	223	593	18.3	730	1945
6.1	227	635	20.0	745	2082
6.6	225	650	21.6	738	2132
7.1	221	648	23.2	726	2125
7.6	225	664	24.9	738	2177
8.1	239	709	26.5	783	2327
8.6	265	851	28.2	869	2792
9.1	281	1254	29.8	923	4115
9.6	320	1348	31.4	1049	4422
10.1	307	1507	33.1	1007	4944
10.6	312	1400	34.7	1024	4593
11.1	320	1064	36.4	1049	3490
11.6	354	1254	38.0	1161	4115
12.1	379	1391	39.6	1242	4564
12.6	361	1584	41.3	1185	5197
13.1	352	1572	42.9	1154	5159
13.6	332	1107	44.6	1090	3632
14.1	320	956	46.2	1049	3136
14.6	312	956	47.9	1024	3136
15.1	326	923	49.5	1069	3030
15.6	330	1148	51.1	1084	3767
16.1	339	1466	52.8	1111	4810
16.6	392	1793	54.4	1287	5884
17.1	469	2067	56.1	1538	6780
17.6	544	2237	57.7	1784	7340
18.1	685	2411	59.3	2246	7910
18.6	698	2523	61.0	2289	8278
19.1	736	2583	62.6	2413	8476
19.6	810	2630	64.3	2657	8630
20.1	844	2764	65.9	2770	9069
20.6	854	2782	67.5	2803	9127
21.1	825	2952	69.2	2707	9686
21.6	844	2893	70.8	2770	9493
22.1	828	2932	72.5	2717	9621
22.6	830	2870	74.1	2723	9417
23.1	871	2740	75.7	2859	8989
23.6	962	3091	77.4	3157	10142
23.9	982	3078	78.4	3221	10098
24.6	367	1722	80.7	1205	5650
25.1	365	1736	82.3	1197	5696
25.6	369	1736	83.9	1211	5696
26.1	376	1709	85.6	1234	5606
26.6	390	1839	87.2	1280	6033
27.1	435	1824	88.9	1427	5983
27.6	570	1955	90.5	1869	6414

Table A-1. Boring VQ-38, S - R1 quality assurance analysis P- and S_H-wave data

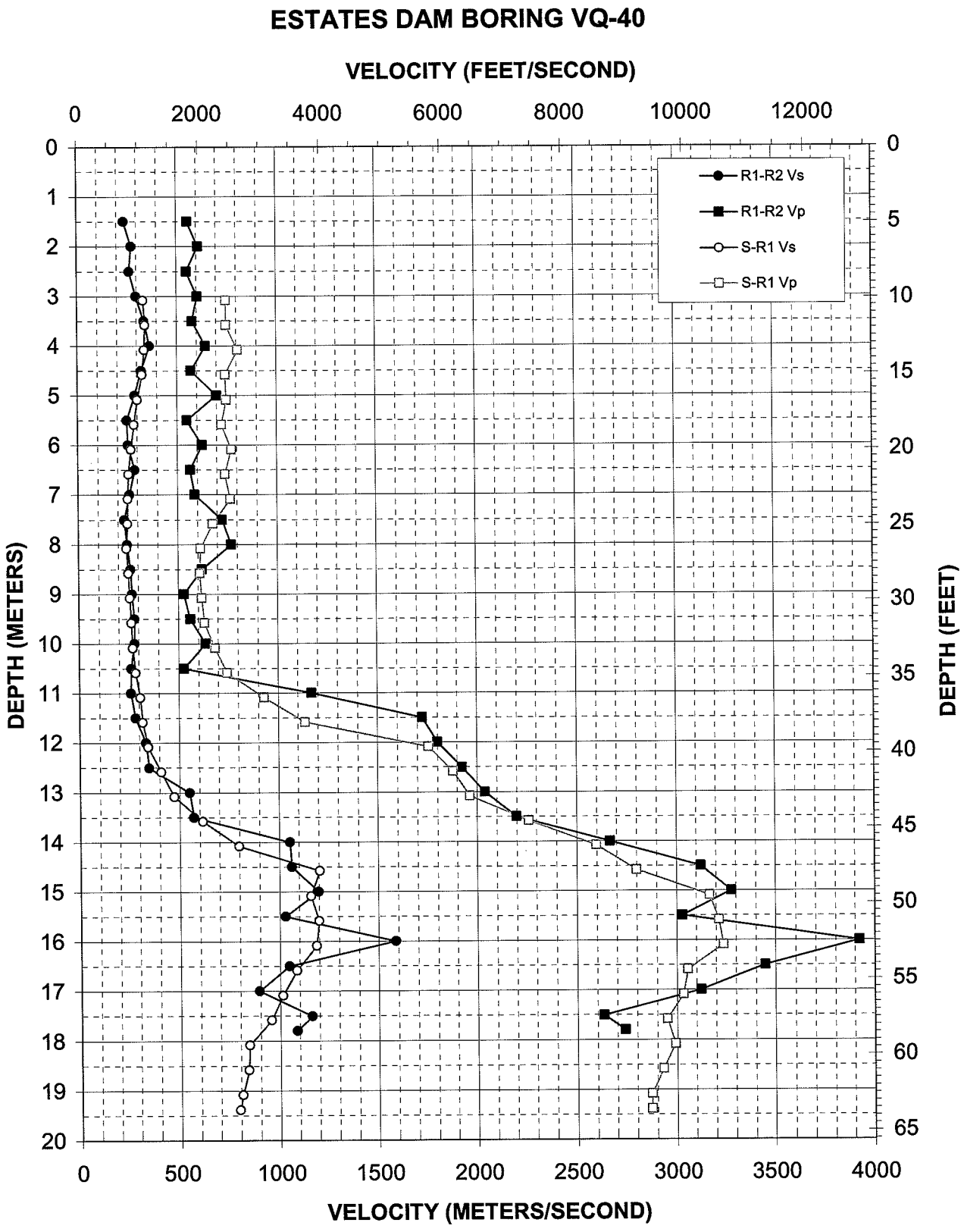


Figure A-2. Boring VQ-40, R1 - R2 high resolution analysis and S-R1 quality assurance analysis

Depth (meters)	Velocity		Depth (feet)	Velocity	
	V-S_H (m/sec)	V-p (m/sec)		V- S_H (ft/sec)	V-p (ft/sec)
3.1	333	748	10.1	1094	2455
3.6	343	748	11.8	1125	2455
4.1	336	807	13.4	1104	2647
4.6	327	743	15.0	1074	2438
5.1	303	748	16.7	993	2455
5.6	284	723	18.3	931	2373
6.1	269	772	20.0	883	2534
6.6	256	741	21.6	839	2430
7.1	250	767	23.2	821	2516
7.6	249	678	24.9	816	2225
8.1	242	615	26.5	794	2017
8.6	250	610	28.2	821	2000
9.1	257	618	29.8	845	2028
9.6	264	633	31.4	865	2076
10.1	271	685	33.1	889	2246
10.6	284	743	34.7	933	2438
11.1	306	929	36.4	1004	3049
11.6	317	1136	38.0	1039	3727
12.1	345	1757	39.6	1132	5765
12.6	409	1879	41.3	1341	6164
13.1	474	1964	42.9	1554	6443
13.6	616	2260	44.6	2023	7416
14.1	798	2599	46.2	2617	8526
14.6	1206	2800	47.9	3955	9186
15.1	1160	3168	49.5	3807	10393
15.6	1199	3215	51.1	3933	10547
16.1	1186	3239	52.8	3890	10626
16.6	1085	3056	54.4	3560	10027
17.1	1014	3035	56.1	3327	9957
17.6	956	2952	57.7	3136	9686
18.1	844	2993	59.3	2770	9820
18.6	841	2932	61.0	2759	9621
19.1	810	2874	62.6	2657	9430
19.4	795	2874	63.6	2608	9430

Table A-2. Boring VQ-40, S - R1 quality assurance analysis P- and S_H-wave data

APPENDIX B

OYO 170 VELOCITY LOGGING SYSTEM

NIST TRACEABLE

CALIBRATION PROCEDURE

TABLE B1

GEOVISION VELOCITY LOGGING EQUIPMENT DESCRIPTION AND CALIBRATION PROCEDURES

EQUIPMENT	FUNCTION	CALIBRATION REQUIREMENTS	MAINTENANCE REQUIREMENTS
OYO Model 170 Suspension Logging Data Logger	Records data from probe and sends control signals to probe	Every twelve months, calibrate sample clock using an NTIS-traceable external signal counter and signal generator per attached procedure. (see Attachment B2)	Diagnose and repair by manufacturer's authorized representative if sample clock is out of specification or instrument fails.
OYO Model 170 Suspension Logging Probe	Suspended in borehole to provide both seismic source and sense wave arrivals at two locations 1 meter apart	No sensor calibration is necessary, as amplitude is not important to the velocity measurement.	Repair as needed by manufacturer-trained personnel.
Winch System (several interchangeable models available)	The winch and cable suspend the probe in the borehole and connect it to the data logger	No calibration required	Repair as needed. Lubricate moving parts frequently, and keep cable clean.

ATTACHMENT B2

CALIBRATION PROCEDURE FOR GEOVISION'S VELOCITY LOGGING SYSTEM

1.0 OYO Model 170 Data Logger Unit

1.1 Purpose

The purpose of this calibration procedure is to verify that the sample clock of the OYO Model 170 is accurate to within 1%.

1.2 Calibration Frequency

The calibration described in this procedure shall be performed every twelve months minimum.

1.3 Test Equipment

- Function Generator, Krohn Hite 5400B or equivalent
- Frequency Counter, HP 5315A or equivalent, current NIST traceable calibration
- Test cable, function generator to OYO 170 Data Logger input channels

1.4 Procedure

- Connect function generator to OYO Model 170 data logger using test cable
- Set up function generator to produce a 100.0 Hz, 0.250 volt peak square wave
- Record a data record with 100 microsecond sample period
- Measure the square wave frequency in the digital data using the data logger's screen display or utility software

1.5 Calibration Criteria

The measured square wave frequency in the digital data must fall between 99.0 and 101.0 Hz to be deemed acceptable. If outside this range, the data logger must be repaired and retested.

Calibration Report

MICRO PRECISION CALIBRATION INC.
11562 Knott Avenue, Suite 3, Garden Grove, CA 92841
Ph. (714) 901-5659 Fax (714) 901-5649

Customer: GEOVISION Corona CA 92882

Account: 15214

Instrument: BB9414 Digital Universal Test Center

Mfg: Tenma	Model: 72-5085	Serial #: MB00006378
Size:	Resltn:	Location:

Cust Ctrl:	Dept:	P.O.:
Job Number: L19625	Report Number: 146108	Report Date: 081903

Work Performed: Inspected, cleaned, and calibrated.

Parts Replaced: None

Received Condition: In tolerance Returned Condition: In tolerance

Function Tested	
Multimeter	Function Generator cont'
AC/DC Volts & Current	Amplitude
Resistance & Capacitance	Sine wave distortion& flatness
Power Supply	Square wave symmetry, rise & fall time
Voltage	Triangle wave linearity
Current	TTL rise & fall time, output level
Ripple	
Frequency Counter	
Frequency range & Accuracy	
Input Sensitivity	
Function Generator	
Frequency	

Ctrl #	Manufacture, Model #, & Description of standards used for calibration	Due Date	Traceability
T1300	Hewlett Packard 33120A Arbitary Waveform Ge	011704	83836
J8300	Hewlett Packard 8657A Signal Generator	052704	137792
P5300	Tektronix THS710 Oscilloscope w/DMM	030504	133387
L1600	Hewlett Packard 34401A Multimeter	121803	97906

Services provided conform to ANSI/NCSL Z540-1-1994, ISO 10012-1:1992 or ISO/IEC 17025 as applicable.
All work performed complies with MPC Quality System QM 540-94, Rev 1e.

Environmental: 73 Deg F / 45% Rh

Uncertainty: Accuracy Ratio > 4:1

Cal Procedure: Manufacture Man

Technician: HOMERO E. CARDONA

Test Date: 081903

Cycle: 12

Due Date: 081904

Quality Approval: QC 3

Form Cert 2-25-02

GEOVision
geophysical services
a division of Blackhawk GeoServices

SEISMOGRAPH CALIBRATION DATA SHEET REV 7/11/02

INSTRUMENT DATA

SYSTEM MFR:	OYO	MODEL NO.:	3331
SERIAL NO.:	15014	CALIBRATION DATE:	6/17/04
BY:	R. STELLER	DUE DATE:	6/16/05
COUNTER MFR:	TENMA	MODEL NO.:	72-5085
SERIAL NO.:	MB00006378	CALIBRATION DATE:	8/19/03
BY:	MICRO PRECISION CAL	DUE DATE:	8/19/04
FCTN GEN MFR:	TENMA	MODEL NO.:	72-5085
SERIAL NO.:	MB00006378	CALIBRATION DATE:	8/19/03
BY:	MICRO PRECISION CAL	DUE DATE:	8/19/04

SYSTEM SETTINGS:

GAIN:	10
FILTER:	20 KHZ
RANGE:	100 mSEC
DELAY:	0
STACK: 1 (STD)	1
PULSE:	1.6 mSEC
DISPLAY:	VARIABLE
SYSTEM: DATE = CORRECT DATE & TIME	6/17/04 11:44 AM

PROCEDURE:

SET FREQUENCY TO 100.0HZ SQUAREWAVE WITH AMPLITUDE APPROXIMATELY 0.25 VOLT PEAK. RECORD BOTH ON DISKETTE AND PAPER TAPE. ANALYZE AND PRINT WAVEFORMS FROM ANALYSIS UTILITY. ATTACH PAPER COPIES OF PRINTOUT AND PAPER TAPES TO THIS FORM. AVERAGE FREQUENCY MUST BE BETWEEN 99.0 AND 101.0 HZ.

AS FOUND 100.0 AS LEFT 100.0

WAVEFORM	FILE NO	FREQUENCY	TIME FOR 9 CYCLES Hn	TIME FOR 9 CYCLES Hr	TIME FOR 9 CYCLES V	AVERAGE FREQ.
SQUARE	101	100.0	90.0	90.0	90.0	100.0
SQUARE	102	100.0	89.9	89.9	90.0	100.1
SINE	103	100.0	90.0	90.1	89.9	100.0
SINE	104	100.0	90.1	89.9	89.9	100.0

CALIBRATED BY: ROBERT STELLER 6/17/03 [signature]
NAME DATE SIGNATURE

Appendix D
Laboratory Testing

Appendix D
Laboratory Testing

This appendix presents the results of laboratory tests completed as part of the Estates Dam dynamic stability analysis.

The laboratory tests were conducted at the URS Pleasant Hill Laboratory. Prior to conducting the tests, the soil and rock samples were visually inspected in the laboratory. Appropriate tests were selected to assist in subsequent evaluation of material properties for use in the dynamic stability analyses. The types of tests performed are listed below, along with the ASTM standard procedure designations.

- In-Situ Moisture-density (ASTM D2216, D2937)
- Sieve analysis (ASTM D422)
- Hydrometer analysis (ASTM D422)
- Atterberg Limits (ASTM D4318)
- Specific Gravity (ASTM D854)
- Consolidated-undrained (CIU) triaxial strength with pore pressure measurements (ASTM D4267).

The laboratory tests were generally conducted in accordance with the noted ASTM standards. Consolidation pressures for the CIU tests were selected based on estimated overburden pressures at each sample depth and location. The test results are summarized in Table D-1. Summary plots of plasticity data are presented in Figures D-1 and D-2. Summary plots of gradation data are presented in Figures D-3 through D-7. The detailed lab sheets for the shear strength tests are also attached. Abbreviated test results for each sample are also included in the boring logs at the appropriate depths.

URS

ASTM D2937 Moisture Content, Wet & Dry Unit Weight

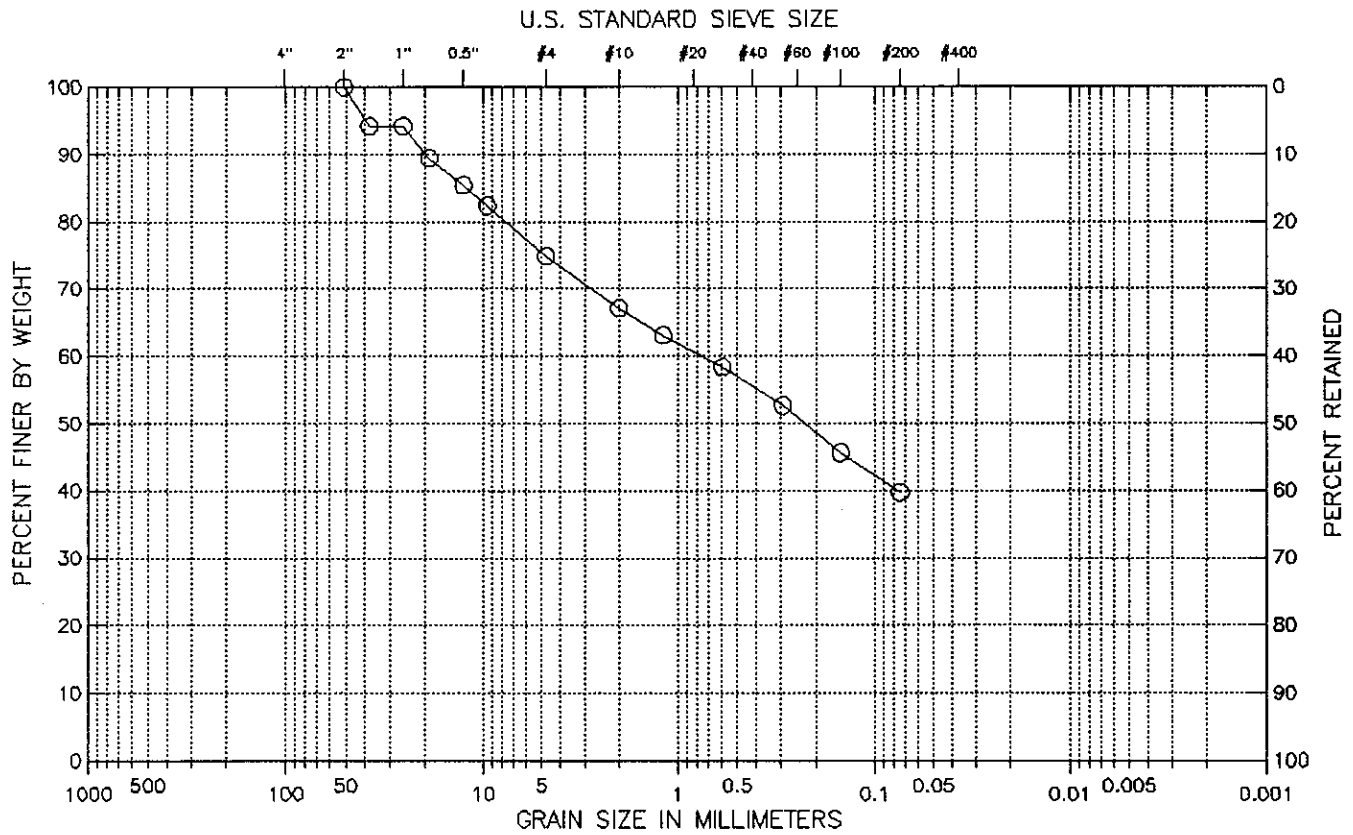
Project Name: Estates Dam Seismic Study **Project Number: 26814957.H0000**

Location: Piedmont, CA

Sample Number/Depth	Wet Unit Weight, pcf	Dry Unit Weight, pcf	Moisture Content, %	Sample Description
VQ-37-2 @ 5'	122.5	101.3	20.97	Grayish brown gravelly clayey sand (SC)
VQ-38-3B @ 9'	141.5	127.5	10.99	Brown clayey sandy gravel (GC)
VQ-38-10 @ 29'	149.2	136.5	9.29	Grayish brown slightly clayey sand with gravel
VQ-39-8A @ 25'	135.8	116.2	16.86	Dark gray brown clayey sand with gravel (SC)

URS

	Boring No. : VQ-37 Sample No: 2 Tested by : R. Taraya Filename : VQ37-002	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Fri May 06 2005



Classification :
(SC) Clayey sand with gravel
Visual Description :
Grayish brown gravelly clayey sand (SC)

Remarks :
Depth: 5.0 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 2
Location : Piedmont, CA
Soil Description : Grayish brown gravelly clayey sand (SC)
Remarks : Depth: 5.0 feet

Depth : 5.0 feet
Test Date : 05/02/2005
Test Method : ASTM D422/4318

Filename : VQ37-002
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
2"	2.000	50.80	0.00	0.00	100
1.5"	1.500	38.10	90.29	90.29	94
1"	1.012	25.70	0.00	90.29	94
0.75"	0.748	19.00	74.50	164.79	90
0.5"	0.500	12.70	63.27	228.06	85
0.375"	0.374	9.51	48.38	276.44	82
#4	0.187	4.75	118.06	394.50	75
#10	0.079	2.00	121.94	516.44	67
#16	0.047	1.19	63.66	580.10	63
#30	0.023	0.60	74.40	654.50	58
#50	0.012	0.30	89.80	744.30	53
#100	0.006	0.15	110.60	854.90	46
#200	0.003	0.07	93.50	948.40	40

Total Dry Weight of Sample = 1572.1

D85 : 12.1246 mm
D60 : 0.7557 mm
D50 : 0.2280 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand with gravel
AASHTO Group Symbol : A-7-6(7)
AASHTO Group Name : Clayey Soils

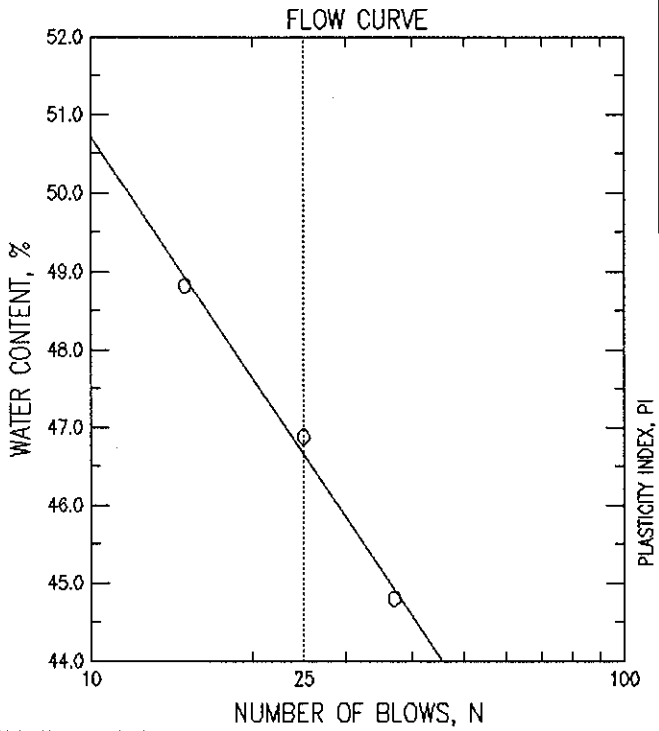
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-37
LOCATION Piedmont, CA		CHECKED BY S. Capps	SAMPLE NUMBER 2
SAMPLE DESCRIPTION Grayish brown gravelly clayey sand (SC)		DATE Fri May 06 2005	FILENAME VQ37-002

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	58	644	59		
WT. WET SOIL + TARE	26.06	26.88	26.14		
WT. DRY SOIL + TARE	21.33	22	21.19		
WT. WATER	4.73	4.88	4.95		
TARE WT.	10.77	11.59	11.05		
WT. DRY SOIL	10.56	10.41	10.14		
WATER CONTENT, W_N (%)	44.79	46.88	48.82		
NUMBER OF BLOWS, N	37	25	15		
ONE-POINT LIQUID LIMIT, LL	46.97	46.88	45.89		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	86				
WT. WET SOIL + TARE	34.55				
WT. DRY SOIL + TARE	30.42				
WT. WATER	4.13				
TARE WT.	10.85				
WT. DRY SOIL	19.57				
WATER CONTENT (%)	21.10				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	21.0
LIQUID LIMIT, LL	46.7
PLASTIC LIMIT, PL	21.1
PLASTICITY INDEX, PI	25.5
LIQUIDITY INDEX, LI*	-0.01

*LI = (W - PL)/PI

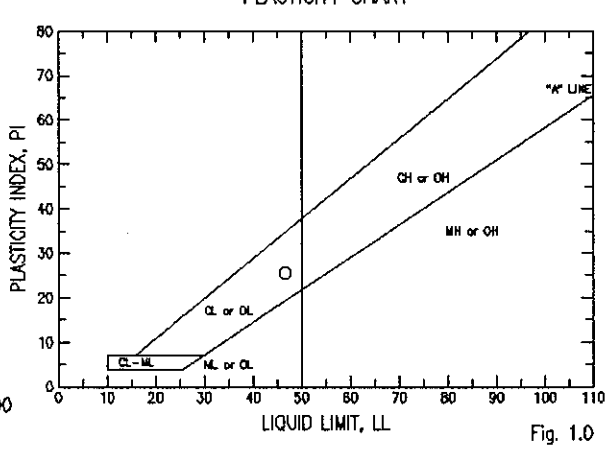


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 2
Location : Piedmont, CA
Soil Description : Grayish brown gravelly clayey sand (SC)
Remarks : Depth: 5.0 feet

Depth : 5.0 feet
Test Date : 05/02/2005
Test Method : ASTM D422/4318

Filename : VQ37-002
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ37-002	186.40	2088.10	1758.50	20.97

Average Moisture Content = 20.97

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	86	10.85	34.55	30.42	21.10

Plastic Limit = 21.10

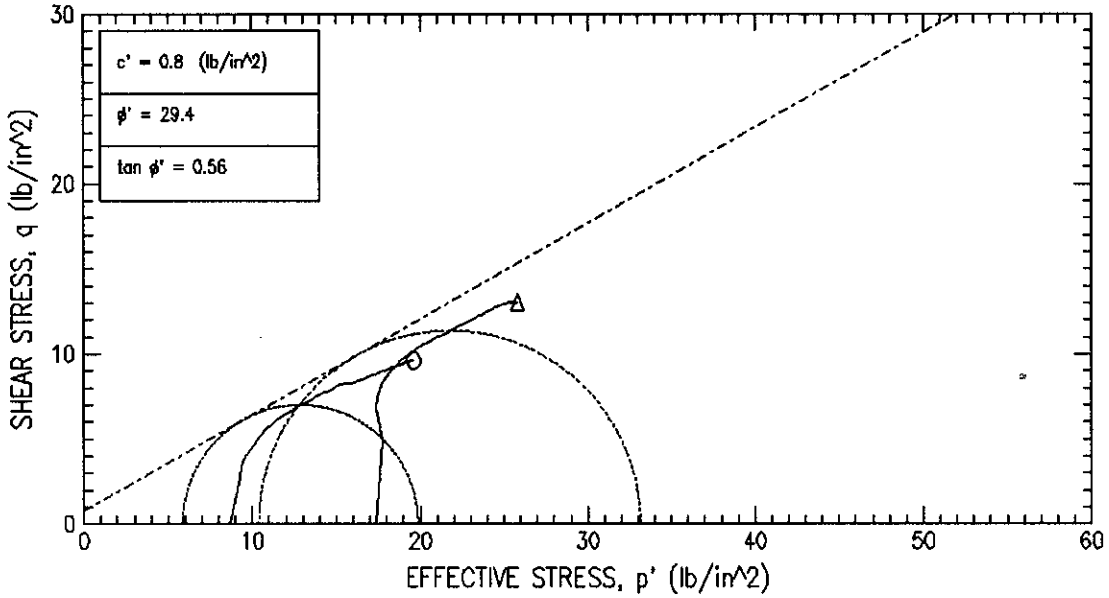
Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	58	10.77	26.06	21.33	37	44.79
2)	644	11.59	26.88	22.00	25	46.88
3)	59	11.05	26.14	21.19	15	48.82

Liquid Limit = 46.65
Plastic Index = 25.55

URS

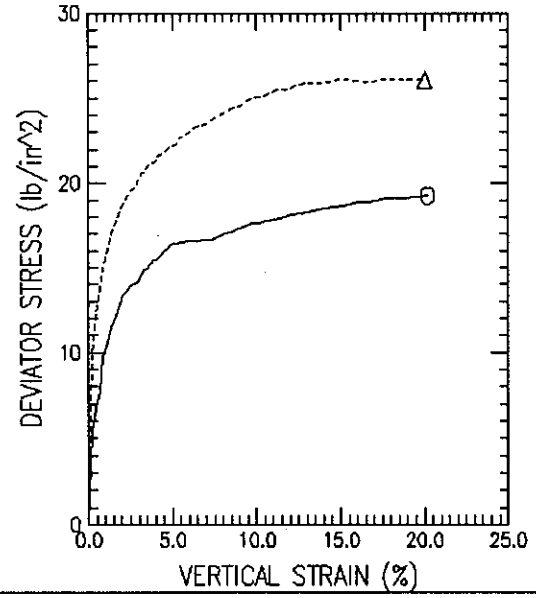
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-37-5A

VQ-37-5B



SYMBOL		O	Δ		
TEST NO.		VQ-37-5A	VQ-37-5B		
INITIAL	WATER CONTENT (%)	19.50	17.17		
	DRY DENSITY (lb/ft^3)	111.02	116.21		
	SATURATION (%)	95.14	95.46		
	VOID RATIO	0.574	0.504		
BEFORE SHEAR	WATER CONTENT (%)	19.27	14.25		
	DRY DENSITY (lb/ft^3)	113.46	124.89		
	SATURATION (%)	99.96	99.98		
	VOID RATIO	0.540	0.399		
	BACK PRESS. (lb/in^2)	80.00	80.00		
MINOR PRIN. STRESS (lb/in^2)		8.68	17.36		
MAX. DEV. STRESS (lb/in^2)		19.66	28.04		
TIME TO FAILURE (min)		1397.57	1189.98		
RATE OF STRAIN INCR (%/min)		0.00	0.00		
INITIAL DIAMETER (in)		2.86	2.86		
INITIAL HEIGHT (in)		5.95	5.95		
B-VALUE		97.80	97.20		

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown sandy clay (CL) with gravel

2) Grayish brown clayey sand (SC) with gravel

LL 36.30	PL 17.70	PI 18.60	GS 2.80

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 8.68 psi

2) TXCIU Test with Effective Pressure of 17.36 psi

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

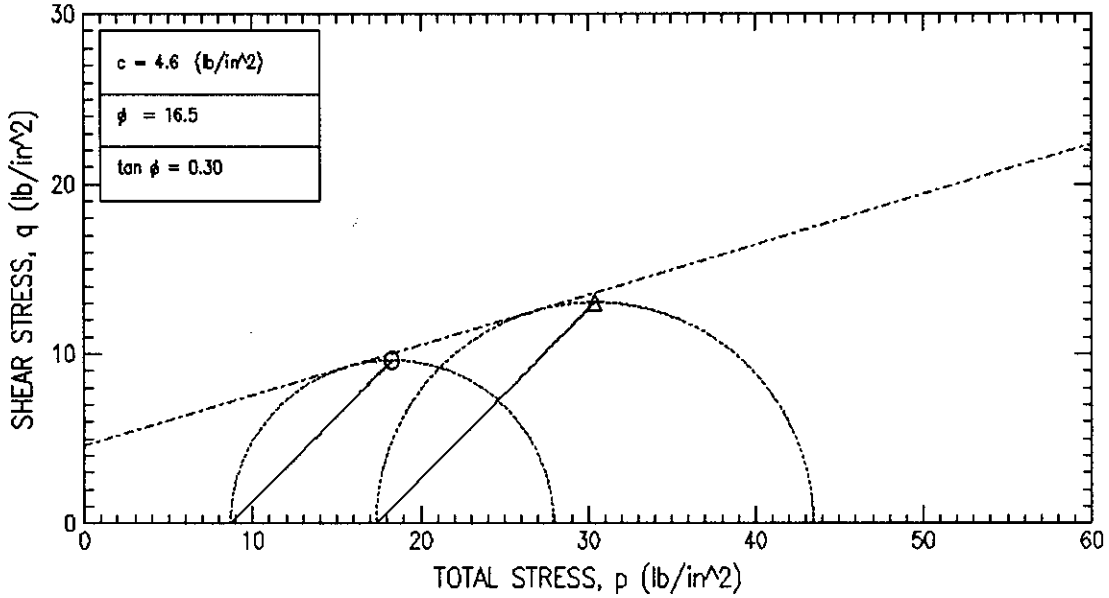
BORING NO. VQ-37	SAMPLE NO.	5A	5B
TECH. S. Capps	DEPTH/ELEV	13.0 feet	13.0 feet
LABORATORY	DATE	05/04/05	05/04/05

TRIAXIAL COMPRESSION TEST REPORT

Tue 05-10-:5, 15:59:08

URS

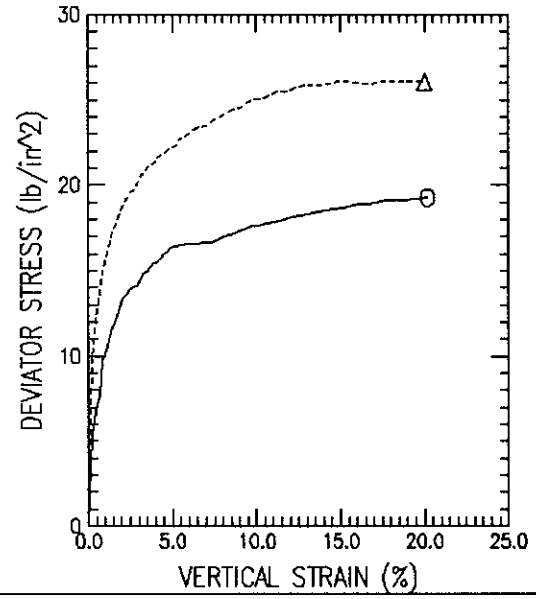
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-37-5A

VQ-37-5B



SYMBOL		O	Δ		
TEST NO.		VQ-37-5A	VQ-37-5B		
INITIAL	WATER CONTENT (%)	19.50	17.17		
	DRY DENSITY (lb/ft^3)	111.02	116.21		
	SATURATION (%)	95.14	95.46		
	VOID RATIO	0.574	0.504		
BEFORE SHEAR	WATER CONTENT (%)	19.27	14.25		
	DRY DENSITY (lb/ft^3)	113.46	124.89		
	SATURATION (%)	99.96	99.98		
	VOID RATIO	0.540	0.399		
	BACK PRESS. (lb/in^2)	80.00	80.00		
MINOR PRIN. STRESS (lb/in^2)		8.68	17.36		
MAX. DEV. STRESS (lb/in^2)		19.66	28.04		
TIME TO FAILURE (min)		1397.57	1189.98		
RATE OF STRAIN INCR (%/min)		0.00	0.00		
INITIAL DIAMETER (in)		2.86	2.86		
INITIAL HEIGHT (in)		5.95	5.95		
B-VALUE		97.80	97.20		

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown sandy clay (CL) with gravel

2) Grayish brown clayey sand (SC) with gravel

LL 36.30	PL 17.70	PI 18.60	GS 2.80

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 8.68 psi

2) TXCIU Test with Effective Pressure of 17.36 psi

PROJECT Estates Dam Seismic Study

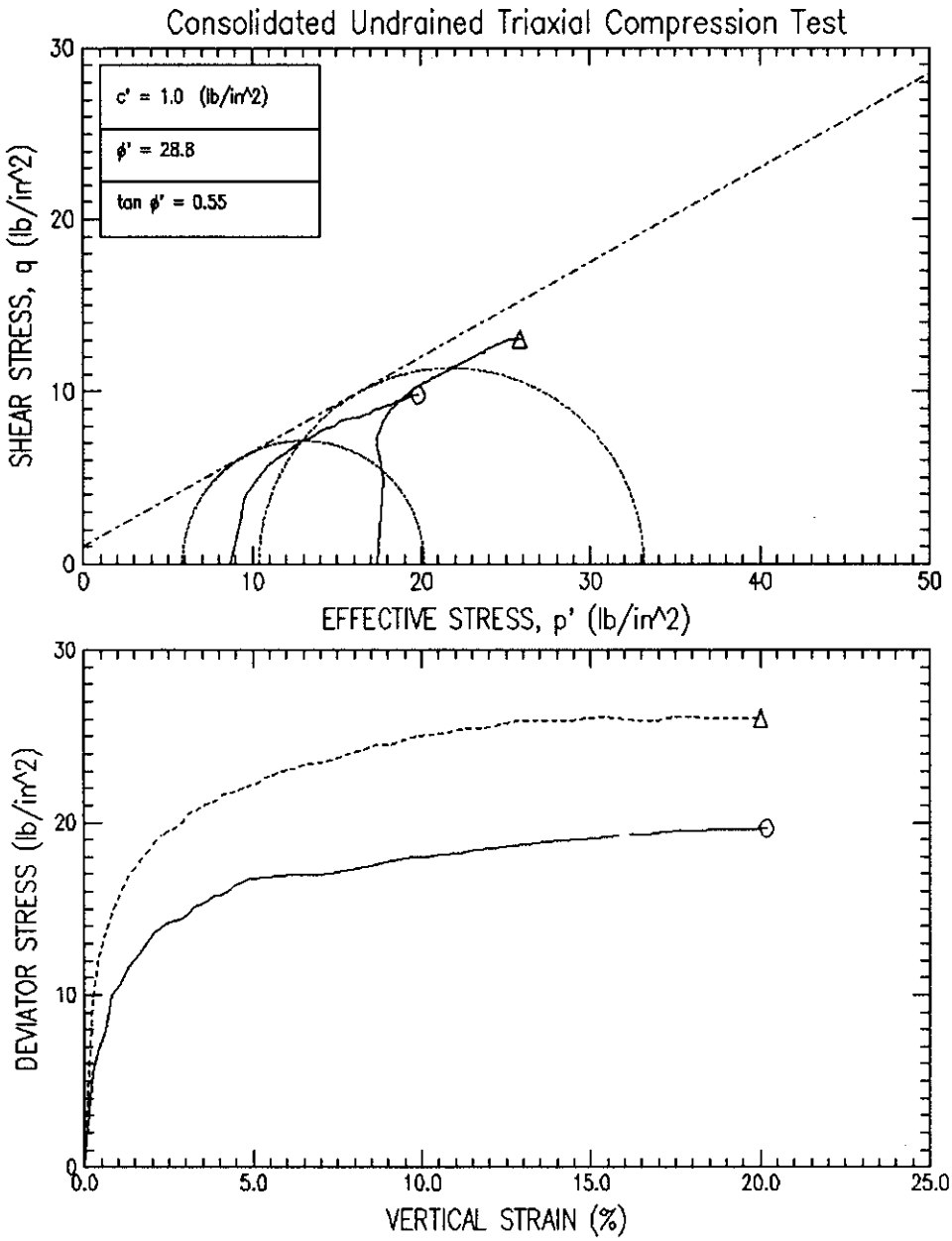
PROJECT NO.26814957

BORING NO. VQ-37	SAMPLE NO.	5A	5B
TECH. S. Capps	DEPTH/ELEV	13.0 feet	13.0 feet
LABORATORY	DATE	05/04/05	05/04/05

TRIAXIAL COMPRESSION TEST REPORT

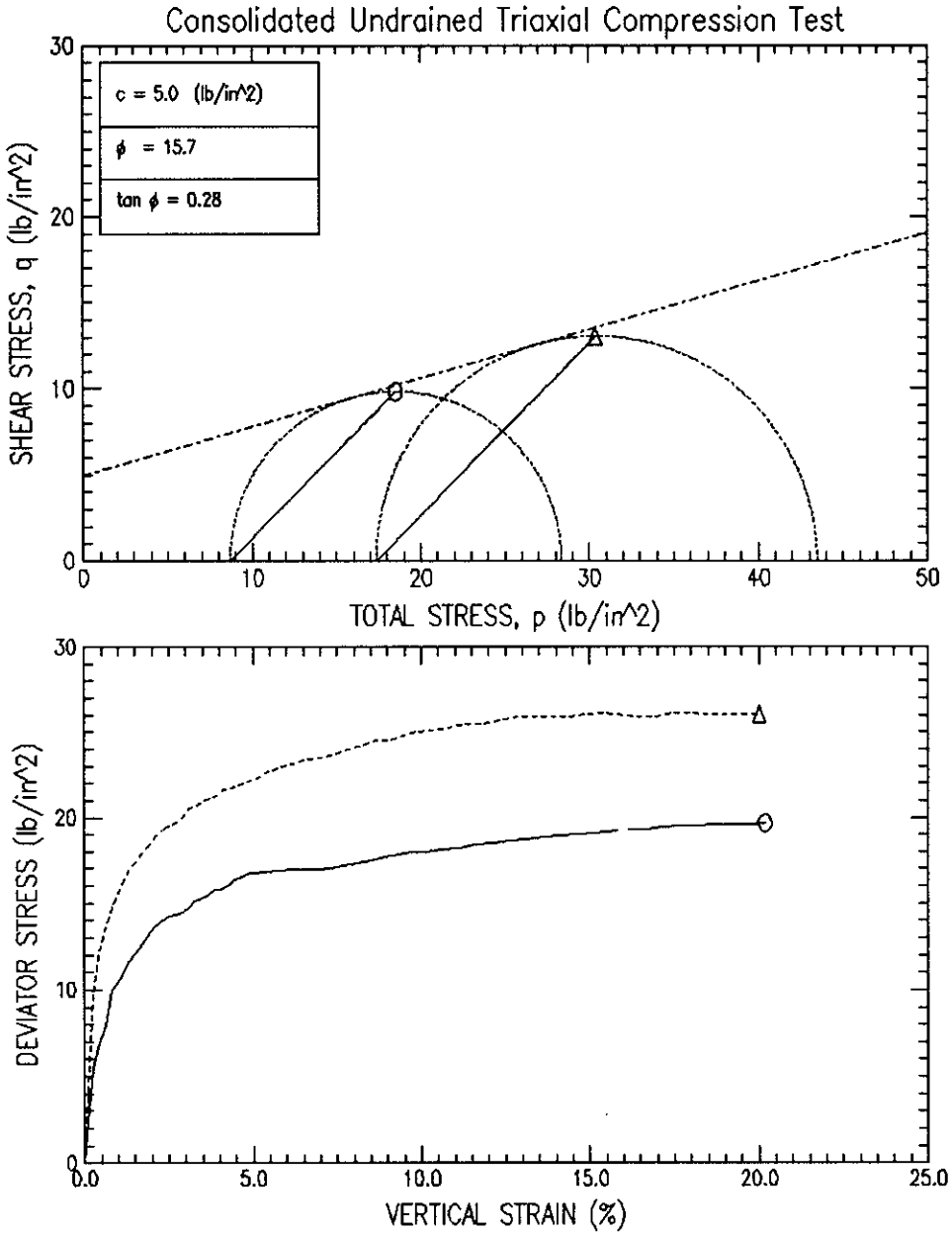
Tue 05-10-:5, 16:00:10

URS



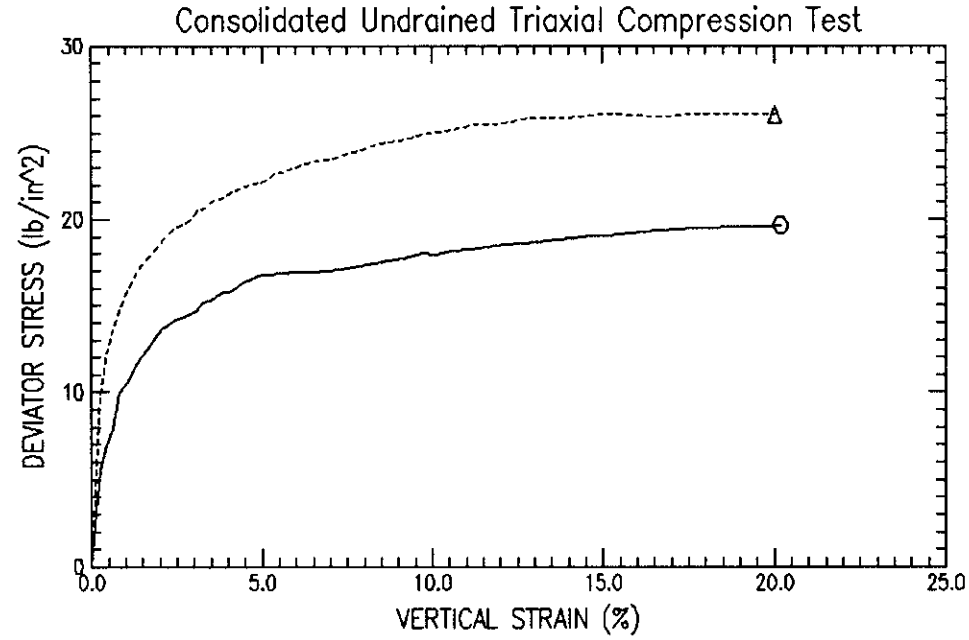
Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-37	5A	13.0 feet	VQ-37-5A	VQ37-5A.CIU	O
VQ-37	5B	13.0 feet	VQ-37-5B	VQ37-5B.CIU	Δ

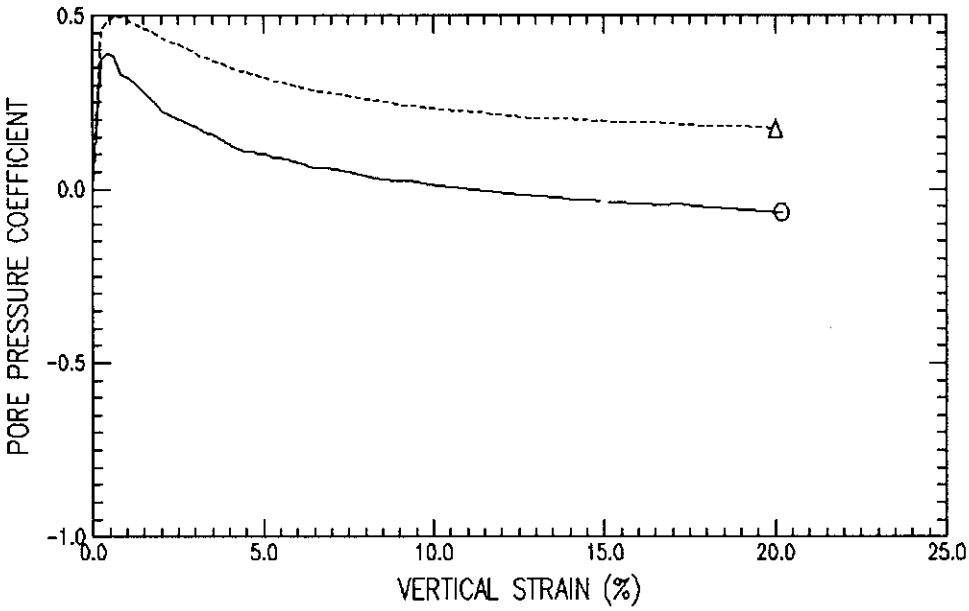
URS



Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-37	5A	13.0 feet	VQ-37-5A	VQ37-5A.CIU	O
VQ-37	5B	13.0 feet	VQ-37-5B	VQ37-5B.CIU	Δ

URS





Project Name : Estates Dam Seismic Study

Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-37	5A	13.0 feet	VQ-37-5A	VQ37-5A.CIU	O
VQ-37	5B	13.0 feet	VQ-37-5B	VQ37-5B.CIU	Δ

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-5A
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 5A Depth : 13.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 8.68 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	88.68	88.68	0.00	0.00	8.68	8.68	1.00	8.68	0.00
2)	0.24	94.11	88.68	2.07	0.38	12.04	6.61	1.82	9.32	2.71
3)	0.44	95.46	88.68	2.69	0.40	12.76	5.99	2.13	9.38	3.39
4)	0.64	96.43	88.68	3.04	0.39	13.40	5.64	2.37	9.52	3.88
5)	0.84	98.43	88.68	3.31	0.34	15.12	5.37	2.82	10.24	4.88
6)	1.05	99.00	88.68	3.38	0.33	15.62	5.30	2.95	10.46	5.16
7)	1.25	99.87	88.68	3.45	0.31	16.42	5.23	3.14	10.82	5.59
8)	1.45	100.40	88.68	3.38	0.29	17.02	5.30	3.21	11.16	5.86
9)	1.64	100.84	88.68	3.31	0.27	17.53	5.37	3.26	11.45	6.08
10)	1.86	101.50	88.68	3.18	0.25	18.32	5.51	3.33	11.91	6.41
11)	2.05	101.99	88.68	3.04	0.23	18.96	5.64	3.36	12.30	6.66
12)	2.25	102.23	88.68	2.97	0.22	19.26	5.71	3.37	12.49	6.77
13)	2.45	102.52	88.68	2.90	0.21	19.62	5.78	3.39	12.70	6.92
14)	2.65	102.69	88.68	2.83	0.20	19.86	5.85	3.39	12.85	7.00
15)	2.85	102.79	88.68	2.69	0.19	20.10	5.99	3.36	13.04	7.05
16)	3.05	103.02	88.68	2.62	0.18	20.39	6.06	3.37	13.23	7.17
17)	3.25	103.50	88.68	2.49	0.17	21.02	6.19	3.39	13.61	7.41
18)	3.47	103.60	88.68	2.42	0.16	21.18	6.26	3.38	13.72	7.46
19)	3.66	103.86	88.68	2.28	0.15	21.58	6.40	3.37	13.99	7.59
20)	3.87	104.11	88.68	2.14	0.14	21.97	6.54	3.36	14.26	7.72
21)	4.06	104.11	88.68	2.00	0.13	22.11	6.68	3.31	14.39	7.72
22)	4.27	104.37	88.68	1.87	0.12	22.50	6.81	3.30	14.66	7.84
23)	4.47	104.68	88.68	1.80	0.11	22.89	6.88	3.32	14.89	8.00
24)	4.67	104.81	88.68	1.80	0.11	23.01	6.88	3.34	14.95	8.06
25)	4.87	105.03	88.68	1.66	0.10	23.37	7.02	3.33	15.20	8.17
26)	5.07	105.09	88.68	1.66	0.10	23.43	7.02	3.34	15.23	8.20
27)	5.27	105.12	88.68	1.52	0.09	23.60	7.16	3.30	15.38	8.22
28)	5.48	105.14	88.68	1.52	0.09	23.62	7.16	3.30	15.39	8.23
29)	5.68	105.20	88.68	1.45	0.09	23.75	7.23	3.29	15.49	8.26
30)	5.89	105.23	88.68	1.32	0.08	23.91	7.37	3.25	15.64	8.27
31)	6.08	105.26	88.68	1.25	0.08	24.01	7.43	3.23	15.72	8.29
32)	6.48	105.25	88.68	1.04	0.06	24.21	7.64	3.17	15.93	8.28
33)	6.89	105.30	88.68	1.04	0.06	24.26	7.64	3.17	15.95	8.31
34)	7.29	105.35	88.68	0.90	0.05	24.45	7.78	3.14	16.12	8.34
35)	7.69	105.49	88.68	0.76	0.05	24.73	7.92	3.12	16.32	8.41
36)	8.09	105.67	88.68	0.63	0.04	25.04	8.05	3.11	16.55	8.49
37)	8.50	105.80	88.68	0.49	0.03	25.32	8.19	3.09	16.75	8.56
38)	8.90	105.97	88.68	0.42	0.02	25.55	8.26	3.09	16.91	8.65
39)	9.31	106.11	88.68	0.42	0.02	25.69	8.26	3.11	16.97	8.71
40)	9.71	106.30	88.68	0.28	0.02	26.02	8.40	3.10	17.21	8.81
41)	10.12	106.28	88.68	0.14	0.01	26.14	8.54	3.06	17.34	8.80
42)	10.61	106.45	88.68	0.08	0.00	26.38	8.61	3.06	17.49	8.88
43)	11.12	106.53	88.68	-0.06	-0.00	26.59	8.74	3.04	17.67	8.92
44)	11.62	106.69	88.68	-0.13	-0.01	26.82	8.81	3.04	17.82	9.00
45)	12.12	106.79	88.68	-0.27	-0.01	27.06	8.95	3.02	18.01	9.06
46)	12.62	106.89	88.68	-0.34	-0.02	27.23	9.02	3.02	18.13	9.11
47)	13.13	106.99	88.68	-0.41	-0.02	27.40	9.09	3.01	18.24	9.16
48)	13.63	107.11	88.68	-0.48	-0.03	27.59	9.16	3.01	18.37	9.22
49)	14.14	107.18	88.68	-0.61	-0.03	27.79	9.29	2.99	18.54	9.25
50)	14.64	107.30	88.68	-0.61	-0.03	27.91	9.29	3.00	18.60	9.31
51)	15.14	107.36	88.68	-0.75	-0.04	28.11	9.43	2.98	18.77	9.34
52)	16.16	107.55	88.68	-0.82	-0.04	28.37	9.50	2.99	18.94	9.44
53)	16.66	107.58	88.68	-0.89	-0.05	28.47	9.57	2.97	19.02	9.45
54)	17.16	107.68	88.68	-0.82	-0.04	28.50	9.50	3.00	19.00	9.50
55)	17.67	107.76	88.68	-0.96	-0.05	28.72	9.64	2.98	19.18	9.54
56)	18.17	107.78	88.68	-1.03	-0.05	28.81	9.71	2.97	19.26	9.55
57)	18.67	107.82	88.68	-1.10	-0.06	28.92	9.78	2.96	19.35	9.57
58)	19.68	107.85	88.68	-1.23	-0.06	29.09	9.91	2.93	19.50	9.59
59)	20.18	107.92	88.68	-1.30	-0.07	29.22	9.98	2.93	19.60	9.62

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-5A
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 5A Depth : 13.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 8.68 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	6.33	80.00	0.00	0.00	0.00	88.68	8.68
2)	0.014	0.24	6.35	82.07	35.21	35.21	5.55	94.11	12.04
3)	0.026	0.44	6.36	82.69	44.04	44.04	6.92	95.46	12.76
4)	0.038	0.64	6.37	83.04	50.49	50.49	7.92	96.43	13.40
5)	0.049	0.84	6.39	83.31	63.63	63.63	9.96	98.43	15.12
6)	0.062	1.05	6.40	83.38	67.50	67.50	10.55	99.00	15.62
7)	0.074	1.25	6.41	83.45	73.31	73.31	11.43	99.87	16.42
8)	0.086	1.45	6.42	83.38	76.97	76.97	11.98	100.40	17.02
9)	0.097	1.64	6.44	83.31	79.99	79.99	12.43	100.84	17.53
10)	0.110	1.86	6.45	83.17	84.51	84.51	13.10	101.50	18.32
11)	0.121	2.05	6.46	83.04	87.95	87.95	13.61	101.99	18.96
12)	0.133	2.25	6.48	82.97	89.67	89.67	13.84	102.23	19.26
13)	0.144	2.45	6.49	82.90	91.83	91.83	14.15	102.52	19.62
14)	0.157	2.65	6.50	82.83	93.12	93.12	14.32	102.69	19.86
15)	0.168	2.85	6.52	82.69	93.98	93.98	14.42	102.79	20.10
16)	0.180	3.05	6.53	82.62	95.70	95.70	14.65	103.02	20.39
17)	0.192	3.25	6.54	82.49	99.15	99.15	15.15	103.50	21.02
18)	0.205	3.47	6.56	82.42	100.01	100.01	15.25	103.60	21.18
19)	0.216	3.66	6.57	82.28	101.95	101.95	15.51	103.86	21.58
20)	0.228	3.87	6.59	82.14	103.88	103.88	15.77	104.11	21.97
21)	0.240	4.06	6.60	82.00	104.10	104.10	15.77	104.11	22.11
22)	0.252	4.27	6.61	81.87	106.04	106.04	16.03	104.37	22.50
23)	0.264	4.47	6.63	81.80	108.40	108.40	16.36	104.68	22.89
24)	0.276	4.67	6.64	81.80	109.48	109.48	16.48	104.81	23.01
25)	0.287	4.87	6.66	81.66	111.20	111.20	16.71	105.03	23.37
26)	0.299	5.07	6.67	81.66	111.85	111.85	16.77	105.09	23.43
27)	0.311	5.27	6.68	81.52	112.28	112.28	16.80	105.12	23.60
28)	0.323	5.48	6.70	81.52	112.71	112.71	16.83	105.14	23.62
29)	0.335	5.68	6.71	81.45	113.35	113.35	16.89	105.20	23.75
30)	0.347	5.89	6.73	81.31	113.79	113.79	16.91	105.23	23.91
31)	0.359	6.08	6.74	81.25	114.22	114.22	16.94	105.26	24.01
32)	0.382	6.48	6.77	81.04	114.65	114.65	16.93	105.25	24.21
33)	0.407	6.89	6.80	81.04	115.51	115.51	16.99	105.30	24.26
34)	0.430	7.29	6.83	80.90	116.37	116.37	17.04	105.35	24.45
35)	0.454	7.69	6.86	80.76	117.88	117.88	17.19	105.49	24.73
36)	0.477	8.09	6.89	80.63	119.60	119.60	17.36	105.67	25.04
37)	0.502	8.50	6.92	80.49	121.10	121.10	17.50	105.80	25.32
38)	0.525	8.90	6.95	80.42	122.83	122.83	17.67	105.97	25.55
39)	0.549	9.31	6.98	80.42	124.33	124.33	17.81	106.11	25.69
40)	0.573	9.71	7.01	80.28	126.27	126.27	18.01	106.30	26.02
41)	0.597	10.12	7.04	80.14	126.70	126.70	17.99	106.28	26.14
42)	0.626	10.61	7.08	80.07	128.64	128.64	18.16	106.45	26.38
43)	0.656	11.12	7.12	79.94	129.93	129.93	18.24	106.53	26.59
44)	0.686	11.62	7.16	79.87	131.87	131.87	18.41	106.69	26.82
45)	0.715	12.12	7.20	79.73	133.38	133.38	18.51	106.79	27.06
46)	0.745	12.62	7.25	79.66	134.88	134.88	18.61	106.89	27.23
47)	0.775	13.13	7.29	79.59	136.39	136.39	18.71	106.99	27.40
48)	0.804	13.63	7.33	79.52	138.11	138.11	18.84	107.11	27.59
49)	0.834	14.14	7.37	79.39	139.40	139.40	18.90	107.18	27.79
50)	0.864	14.64	7.42	79.39	141.13	141.13	19.03	107.30	27.91
51)	0.894	15.14	7.46	79.25	142.42	142.42	19.09	107.36	28.11
52)	0.954	16.16	7.55	79.18	145.65	145.65	19.29	107.55	28.37
53)	0.983	16.66	7.60	79.11	146.72	146.72	19.31	107.58	28.47
54)	1.013	17.16	7.64	79.18	148.45	148.45	19.42	107.68	28.50
55)	1.043	17.67	7.69	79.04	149.95	149.95	19.50	107.76	28.72
56)	1.072	18.17	7.74	78.97	151.03	151.03	19.52	107.78	28.81
57)	1.102	18.67	7.79	78.90	152.32	152.32	19.57	107.82	28.92
58)	1.161	19.68	7.88	78.77	154.47	154.47	19.60	107.85	29.09
59)	1.191	20.18	7.93	78.70	155.98	155.98	19.66	107.92	29.22

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-5A
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 5A Depth : 13.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 8.68 psi

Liquid Limit : 36.3 Plastic Limit : 17.7 Specific Gravity : 2.8

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-37-5A	VQ-37-5A
WT CONTAINER + WET SOIL (gm)	1330.00	1327.50
WT CONTAINER + DRY SOIL (gm)	1113.00	1113.00
WT WATER (gm)	217.00	214.50
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	1113.00	1113.00
WATER CONTENT (%)	19.50	19.27

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	19.50	19.27
VOID RATIO	0.57	0.54
WET DENSITY (lb/ft^3)	132.67	135.33
DRY DENSITY (lb/ft^3)	111.02	113.46
DEGREE OF SATURATION (%)	95.14	99.96

Maximum Shear Stress = 9.62 (lb/in^2) at a Vertical Strain of 20.18 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-5A
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 5A Depth : 13.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 8.68 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 36.3 Plastic Limit : 17.7 Specific Gravity : 2.8

INITIAL
Height : 5.945 (in) Dry Density : 111.02 (lb/ft^3)
Area : 6.424 (in^2) Moisture : 19.50 %
Void Ratio: 0.57
Saturation: 95.14 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 111.02 (lb/ft^3) Total Vert. Stress : 88.68 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 19.50 % Total Hori. Stress : 88.68 (lb/in^2
Void Ratio: 0.57 Pore Pressure : 0.00 (lb/in^2)
Saturation: 95.14 % Effect.Vert. Stress: 88.68 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 88.68 (lb/in^2

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 111.02 (lb/ft^3) Total Vert. Stress : 88.68 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 19.50 % Total Hori. Stress : 88.68 (lb/in^2
Void Ratio: 0.57 Pore Pressure : 0.00 (lb/in^2)
Saturation: 95.14 % Effect.Vert. Stress: 88.68 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 88.68 (lb/in^2

END OF SATURATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 111.02 (lb/ft^3) Total Vert. Stress : 88.68 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 19.27 % Total Hori. Stress : 88.68 (lb/in^2
dVCorr : 0.000 (in^3) Void Ratio: 0.57 Pore Pressure : 0.00 (lb/in^2)
Saturation: 94.05 % Effect.Vert. Stress: 88.68 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 88.68 (lb/in^2

END OF CONSOLIDATION - B
dH : 0.043 (in) Height : 5.902 (in) Dry Density : 113.46 (lb/ft^3) Total Vert. Stress : 88.68 (lb/in^2
dV : 0.823 (in^3) Area : 6.332 (in^2) Moisture : 19.27 % Total Hori. Stress : 88.68 (lb/in^2
Void Ratio: 0.54 Pore Pressure : 80.00 (lb/in^2
Saturation: 99.96 % Effect.Vert. Stress: 8.68 (lb/in^2)
Time : 0.00 (min) Effect.Hori. Stress: 8.68 (lb/in^2)

FAILURE DURING SHEAR
dH : 1.191 (in) Height : 4.754 (in) Dry Density : 113.46 (lb/ft^3) Total Vert. Stress : 108.34 (lb/in^
dV : 0.823 (in^3) Area : 7.932 (in^2) Moisture : 19.27 % Total Hori. Stress : 88.68 (lb/in^2
Strain : 20.18 % Void Ratio: 0.54 Pore Pressure : 78.70 (lb/in^2
Strength: 9.83 (lb/in^2) Saturation: 99.96 % Effect.Vert. Stress: 29.65 (lb/in^2
Time : 1397.57 (min) Effect.Hori. Stress: 9.98 (lb/in^2)

END OF TEST
dH : 1.191 (in) Height : 4.754 (in) Dry Density : 113.46 (lb/ft^3) Total Vert. Stress : 108.34 (lb/in^
dV : 0.823 (in^3) Area : 7.932 (in^2) Moisture : 19.27 % Total Hori. Stress : 88.68 (lb/in^2
Strain : 20.18 % Void Ratio: 0.54 Pore Pressure : 78.70 (lb/in^2
Saturation: 99.96 % Effect.Vert. Stress: 29.65 (lb/in^2
Time : 1397.57 (min) Effect.Hori. Stress: 9.98 (lb/in^2)

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-5B
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 5B Depth : 13.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 17.36 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	97.36	97.36	0.00	0.00	17.36	17.36	1.00	17.36	0.00
2)	0.25	107.15	97.36	4.48	0.46	22.66	12.87	1.76	17.77	4.89
3)	0.44	109.62	97.36	5.97	0.49	23.65	11.38	2.08	17.51	6.13
4)	0.64	110.94	97.36	6.75	0.50	24.18	10.60	2.28	17.39	6.79
5)	0.85	112.25	97.36	7.39	0.50	24.86	9.96	2.49	17.41	7.45
6)	1.06	113.18	97.36	7.68	0.49	25.50	9.68	2.63	17.59	7.91
7)	1.26	114.10	97.36	7.96	0.48	26.13	9.40	2.78	17.76	8.37
8)	1.46	114.63	97.36	8.03	0.46	26.60	9.33	2.85	17.96	8.64
9)	1.68	115.16	97.36	8.10	0.46	27.06	9.25	2.92	18.16	8.90
10)	1.89	115.69	97.36	8.10	0.44	27.59	9.25	2.98	18.42	9.17
11)	2.08	116.22	97.36	8.10	0.43	28.12	9.25	3.04	18.69	9.43
12)	2.29	116.56	97.36	8.10	0.42	28.45	9.25	3.07	18.85	9.60
13)	2.49	116.90	97.36	8.10	0.41	28.79	9.25	3.11	19.02	9.77
14)	2.70	117.04	97.36	8.03	0.41	29.01	9.33	3.11	19.17	9.84
15)	2.90	117.38	97.36	7.96	0.40	29.41	9.40	3.13	19.40	10.01
16)	3.11	117.89	97.36	7.89	0.38	30.00	9.47	3.17	19.73	10.27
17)	3.32	118.04	97.36	7.82	0.38	30.22	9.54	3.17	19.88	10.34
18)	3.53	118.36	97.36	7.75	0.37	30.61	9.61	3.19	20.11	10.50
19)	3.73	118.51	97.36	7.68	0.36	30.83	9.68	3.18	20.25	10.57
20)	3.93	118.65	97.36	7.53	0.35	31.11	9.82	3.17	20.47	10.64
21)	4.13	118.97	97.36	7.46	0.35	31.51	9.89	3.18	20.70	10.81
22)	4.35	119.11	97.36	7.39	0.34	31.71	9.96	3.18	20.84	10.87
23)	4.54	119.25	97.36	7.32	0.33	31.92	10.03	3.18	20.98	10.94
24)	4.74	119.39	97.36	7.25	0.33	32.13	10.11	3.18	21.12	11.01
25)	4.95	119.52	97.36	7.18	0.32	32.34	10.18	3.18	21.26	11.08
26)	5.16	119.66	97.36	7.11	0.32	32.54	10.25	3.18	21.40	11.15
27)	5.36	119.97	97.36	6.97	0.31	33.00	10.39	3.18	21.70	11.31
28)	5.56	120.11	97.36	6.97	0.31	33.14	10.39	3.19	21.76	11.37
29)	5.77	120.24	97.36	6.90	0.30	33.34	10.46	3.19	21.90	11.44
30)	5.98	120.37	97.36	6.75	0.29	33.61	10.60	3.17	22.11	11.51
31)	6.18	120.50	97.36	6.75	0.29	33.74	10.60	3.18	22.17	11.57
32)	6.59	120.76	97.36	6.54	0.28	34.21	10.81	3.16	22.51	11.70
33)	7.00	120.84	97.36	6.54	0.28	34.29	10.81	3.17	22.55	11.74
34)	7.41	121.09	97.36	6.40	0.27	34.69	10.96	3.17	22.82	11.87
35)	7.82	121.34	97.36	6.26	0.26	35.08	11.10	3.16	23.09	11.99
36)	8.23	121.59	97.36	6.19	0.26	35.40	11.17	3.17	23.28	12.12
37)	8.64	121.83	97.36	6.12	0.25	35.71	11.24	3.18	23.48	12.24
38)	9.05	121.90	97.36	5.90	0.24	35.99	11.45	3.14	23.72	12.27
39)	9.46	122.14	97.36	5.97	0.24	36.16	11.38	3.18	23.77	12.39
40)	9.87	122.37	97.36	5.83	0.23	36.54	11.52	3.17	24.03	12.51
41)	10.28	122.43	97.36	5.76	0.23	36.67	11.60	3.16	24.13	12.54
42)	10.79	122.63	97.36	5.69	0.23	36.94	11.67	3.17	24.30	12.64
43)	11.30	122.83	97.36	5.62	0.22	37.21	11.74	3.17	24.47	12.74
44)	11.81	122.86	97.36	5.48	0.21	37.37	11.88	3.15	24.63	12.75
45)	12.32	123.05	97.36	5.41	0.21	37.64	11.95	3.15	24.79	12.84
46)	12.84	123.23	97.36	5.26	0.20	37.96	12.09	3.14	25.03	12.94
47)	13.35	123.25	97.36	5.26	0.20	37.98	12.09	3.14	25.04	12.94
48)	13.87	123.26	97.36	5.26	0.20	37.99	12.09	3.14	25.04	12.95
49)	14.38	123.27	97.36	5.19	0.20	38.07	12.16	3.13	25.12	12.95
50)	14.89	123.44	97.36	5.12	0.20	38.32	12.23	3.13	25.28	13.04
51)	15.40	123.45	97.36	4.98	0.19	38.47	12.38	3.11	25.42	13.05
52)	16.42	123.30	97.36	4.98	0.19	38.31	12.38	3.10	25.34	12.97
53)	16.93	123.30	97.36	4.91	0.19	38.38	12.45	3.08	25.42	12.97
54)	17.45	123.45	97.36	4.84	0.19	38.61	12.52	3.08	25.56	13.05
55)	17.96	123.45	97.36	4.77	0.18	38.68	12.59	3.07	25.63	13.05
56)	18.48	123.44	97.36	4.77	0.18	38.67	12.59	3.07	25.63	13.04
57)	18.99	123.44	97.36	4.70	0.18	38.74	12.66	3.06	25.70	13.04
58)	20.01	123.42	97.36	4.55	0.17	38.86	12.80	3.04	25.83	13.03

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-5B
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 5B Depth : 13.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 17.36 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	6.12	80.00	0.00	0.00	0.00	97.36	17.36
2)	0.014	0.25	6.14	84.49	64.56	64.56	10.52	107.15	22.66
3)	0.026	0.44	6.15	85.98	81.07	81.07	13.18	109.62	23.65
4)	0.037	0.64	6.16	86.76	89.95	89.95	14.60	110.94	24.18
5)	0.049	0.85	6.18	87.40	98.84	98.84	16.00	112.25	24.86
6)	0.062	1.06	6.19	87.68	105.19	105.19	17.00	113.18	25.50
7)	0.073	1.26	6.20	87.96	111.53	111.53	17.98	114.10	26.13
8)	0.085	1.46	6.21	88.03	115.34	115.34	18.56	114.63	26.60
9)	0.097	1.68	6.23	88.11	119.15	119.15	19.13	115.16	27.06
10)	0.110	1.89	6.24	88.11	122.96	122.96	19.70	115.69	27.59
11)	0.121	2.08	6.25	88.11	126.77	126.77	20.27	116.22	28.12
12)	0.133	2.29	6.27	88.11	129.31	129.31	20.63	116.56	28.45
13)	0.144	2.49	6.28	88.11	131.84	131.84	21.00	116.90	28.79
14)	0.157	2.70	6.29	88.03	133.11	133.11	21.15	117.04	29.01
15)	0.168	2.90	6.31	87.96	135.65	135.65	21.51	117.38	29.41
16)	0.181	3.11	6.32	87.89	139.46	139.46	22.07	117.89	30.00
17)	0.192	3.32	6.33	87.82	140.73	140.73	22.22	118.04	30.22
18)	0.205	3.53	6.35	87.75	143.27	143.27	22.57	118.36	30.61
19)	0.216	3.73	6.36	87.68	144.54	144.54	22.72	118.51	30.83
20)	0.228	3.93	6.37	87.54	145.81	145.81	22.88	118.65	31.11
21)	0.240	4.13	6.39	87.47	148.35	148.35	23.23	118.97	31.51
22)	0.252	4.35	6.40	87.40	149.62	149.62	23.37	119.11	31.71
23)	0.264	4.54	6.41	87.33	150.89	150.89	23.52	119.25	31.92
24)	0.275	4.74	6.43	87.25	152.16	152.16	23.67	119.39	32.13
25)	0.287	4.95	6.44	87.18	153.42	153.42	23.82	119.52	32.34
26)	0.299	5.16	6.46	87.11	154.69	154.69	23.96	119.66	32.54
27)	0.311	5.36	6.47	86.97	157.23	157.23	24.30	119.97	33.00
28)	0.323	5.56	6.48	86.97	158.50	158.50	24.45	120.11	33.14
29)	0.335	5.77	6.50	86.90	159.77	159.77	24.59	120.24	33.34
30)	0.347	5.98	6.51	86.76	161.04	161.04	24.73	120.37	33.61
31)	0.359	6.18	6.53	86.76	162.31	162.31	24.87	120.50	33.74
32)	0.383	6.59	6.56	86.55	164.85	164.85	25.15	120.76	34.21
33)	0.406	7.00	6.58	86.55	166.12	166.12	25.23	120.84	34.29
34)	0.430	7.41	6.61	86.40	168.66	168.66	25.50	121.09	34.69
35)	0.454	7.82	6.64	86.26	171.20	171.20	25.77	121.34	35.08
36)	0.477	8.23	6.67	86.19	173.74	173.74	26.04	121.59	35.40
37)	0.501	8.64	6.70	86.12	176.27	176.27	26.30	121.83	35.71
38)	0.525	9.05	6.73	85.91	177.54	177.54	26.37	121.90	35.99
39)	0.549	9.46	6.76	85.98	180.08	180.08	26.63	122.14	36.16
40)	0.573	9.87	6.79	85.84	182.62	182.62	26.88	122.37	36.54
41)	0.597	10.28	6.82	85.76	183.89	183.89	26.95	122.43	36.67
42)	0.626	10.79	6.86	85.69	186.43	186.43	27.16	122.63	36.94
43)	0.656	11.30	6.90	85.62	188.97	188.97	27.37	122.83	37.21
44)	0.686	11.81	6.94	85.48	190.24	190.24	27.40	122.86	37.37
45)	0.715	12.32	6.98	85.41	192.78	192.78	27.60	123.05	37.64
46)	0.745	12.84	7.02	85.27	195.32	195.32	27.80	123.23	37.96
47)	0.775	13.35	7.07	85.27	196.59	196.59	27.82	123.25	37.98
48)	0.805	13.87	7.11	85.27	197.86	197.86	27.83	123.26	37.99
49)	0.835	14.38	7.15	85.20	199.13	199.13	27.84	123.27	38.07
50)	0.864	14.89	7.19	85.13	201.66	201.66	28.03	123.44	38.32
51)	0.894	15.40	7.24	84.98	202.93	202.93	28.04	123.45	38.47
52)	0.953	16.42	7.33	84.98	204.20	204.20	27.87	123.30	38.31
53)	0.983	16.93	7.37	84.91	205.47	205.47	27.87	123.30	38.38
54)	1.013	17.45	7.42	84.84	208.01	208.01	28.04	123.45	38.61
55)	1.042	17.96	7.46	84.77	209.28	209.28	28.04	123.45	38.68
56)	1.073	18.48	7.51	84.77	210.55	210.55	28.03	123.44	38.67
57)	1.102	18.99	7.56	84.70	211.82	211.82	28.03	123.44	38.74
58)	1.161	20.01	7.65	84.56	214.36	214.36	28.00	123.42	38.86

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-5B
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 5B Depth : 13.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 17.36 psi

Liquid Limit : 36.3 Plastic Limit : 17.7 Specific Gravity : 2.8

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-37-5B	VQ-37-5B
WT CONTAINER + WET SOIL (gm)	1365.00	1331.00
WT CONTAINER + DRY SOIL (gm)	1165.00	1165.00
WT WATER (gm)	200.00	166.00
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	1165.00	1165.00
WATER CONTENT (%)	17.17	14.25

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	17.17	14.25
VOID RATIO	0.50	0.40
WET DENSITY (lb/ft^3)	136.16	142.68
DRY DENSITY (lb/ft^3)	116.21	124.89
DEGREE OF SATURATION (%)	95.46	99.98

Maximum Shear Stress = 13.05 (lb/in^2) at a Vertical Strain of 17.45 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-5B
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 5B Depth : 13.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 17.36 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 36.3 Plastic Limit : 17.7 Specific Gravity : 2.8

INITIAL
Height : 5.945 (in) Dry Density : 116.21 (lb/ft^3)
Area : 6.424 (in^2) Moisture : 17.17 %
Void Ratio: 0.50
Saturation: 95.46 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 116.21 (lb/ft^3) Total Vert. Stress : 97.36 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 17.17 % Total Hori. Stress : 97.36 (lb/in^2
Void Ratio: 0.50 Pore Pressure : 0.00 (lb/in^2)
Saturation: 95.46 % Effect.Vert. Stress: 97.36 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.36 (lb/in^2

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 116.21 (lb/ft^3) Total Vert. Stress : 97.36 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 17.17 % Total Hori. Stress : 97.36 (lb/in^2
Void Ratio: 0.50 Pore Pressure : 0.00 (lb/in^2)
Saturation: 95.46 % Effect.Vert. Stress: 97.36 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.36 (lb/in^2

END OF SATURATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 116.21 (lb/ft^3) Total Vert. Stress : 97.36 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 14.25 % Total Hori. Stress : 97.36 (lb/in^2
dVCorr : 0.000 (in^3) Void Ratio: 0.50 Pore Pressure : 0.00 (lb/in^2)
Saturation: 79.24 % Effect.Vert. Stress: 97.36 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.36 (lb/in^2

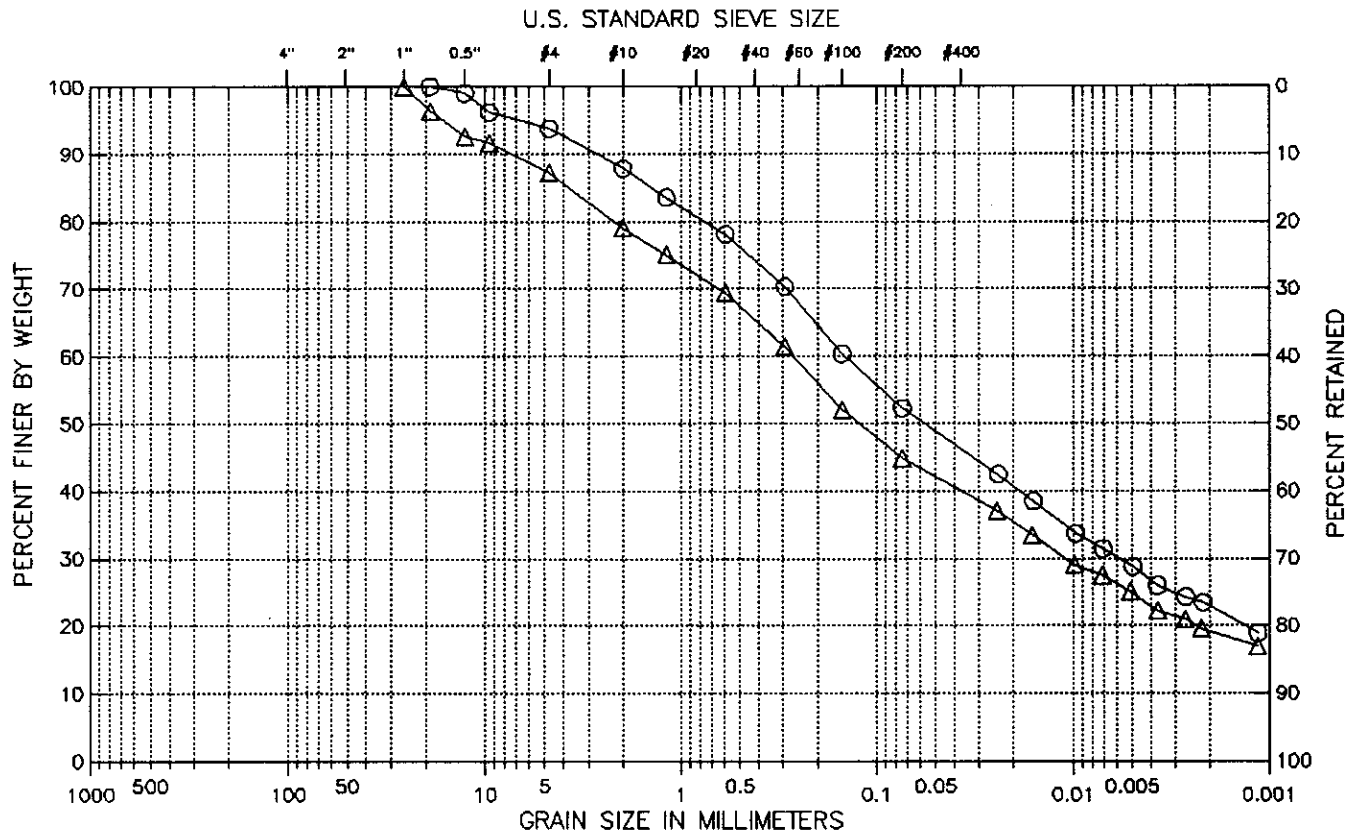
END OF CONSOLIDATION - B
dH : 0.141 (in) Height : 5.804 (in) Dry Density : 124.89 (lb/ft^3) Total Vert. Stress : 97.36 (lb/in^2
dV : 2.654 (in^3) Area : 6.123 (in^2) Moisture : 14.25 % Total Hori. Stress : 97.36 (lb/in^2
Void Ratio: 0.40 Pore Pressure : 80.00 (lb/in^2)
Saturation: 99.98 % Effect.Vert. Stress: 17.36 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 17.36 (lb/in^2

FAILURE DURING SHEAR
dH : 1.013 (in) Height : 4.932 (in) Dry Density : 124.89 (lb/ft^3) Total Vert. Stress : 125.40 (lb/in^
dV : 2.654 (in^3) Area : 7.418 (in^2) Moisture : 14.25 % Total Hori. Stress : 97.36 (lb/in^2
Strain : 17.45 % Void Ratio: 0.40 Pore Pressure : 84.84 (lb/in^2
Strength: 14.02 (lb/in^2) Saturation: 99.98 % Effect.Vert. Stress: 40.56 (lb/in^2
Time : 1189.98 (min) Effect.Hori. Stress: 12.52 (lb/in^2

END OF TEST
dH : 1.161 (in) Height : 4.784 (in) Dry Density : 124.89 (lb/ft^3) Total Vert. Stress : 125.36 (lb/in^
dV : 2.654 (in^3) Area : 7.655 (in^2) Moisture : 14.25 % Total Hori. Stress : 97.36 (lb/in^2
Strain : 20.01 % Void Ratio: 0.40 Pore Pressure : 84.56 (lb/in^2
Saturation: 99.98 % Effect.Vert. Stress: 40.80 (lb/in^2
Time : 1361.93 (min) Effect.Hori. Stress: 12.80 (lb/in^2

URS

Project : Estates Dam Seismic Study
Project No.: 26814957.H0000
Location: Piedmont, CA
Date : Tue May 10 2005



Symbol	Boring No.	Sample No.	Depth	Filename	Classification / Description
⊖	VQ-37	5A middle cut	13.0 feet	VQ37-05A	CL Sandy lean clay
△	VQ-37	5B bottom cut	13.0 feet	VQ37-05B	SC Clayey sand

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 5A middle cut
Location : Piedmont, CA
Depth : 13.0 feet
Test Date : 05/11/2005
Test Method : ASTM D422/4318
Filename : VQ37-05A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : Depth: 13.0 feet

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 100 gm
Specific Gravity = 2.8

Hydroscopic Moisture Content :
Weight of Wet Soil = 100 gm
Weight of Dry Soil = 96.45 gm
Moisture Content = 0.0368066

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	56.50	22.00	48.12	0.024	42	0.024
5.00	52.00	21.90	43.57	0.016	38	0.016
15.00	46.50	21.90	38.07	0.010	34	0.010
30.00	44.00	21.80	35.53	0.007	31	0.007
64.00	41.00	21.70	32.48	0.005	29	0.005
120.00	38.00	21.40	29.34	0.004	26	0.004
240.00	36.10	21.50	27.49	0.003	24	0.003
365.00	35.00	21.70	26.48	0.002	23	0.002
1440.00	30.00	21.50	21.39	0.001	19	0.001

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 5A middle cut
Location : Piedmont, CA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : Depth: 13.0 feet

Depth : 13.0 feet
Test Date : 05/11/2005
Test Method : ASTM D422/4318

Filename : VQ37-05A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	5.02	5.02	99
0.375"	0.374	9.51	15.37	20.39	96
#4	0.187	4.75	12.96	33.35	94
#10	0.079	2.00	31.43	64.78	88

Total Dry Weight of Sample = 548.8

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#16	0.047	1.19	4.66	4.66	84
#30	0.023	0.60	5.99	10.65	78
#50	0.012	0.30	8.54	19.19	70
#100	0.006	0.15	10.97	30.16	60
#200	0.003	0.07	8.92	39.08	52
Pan			57.37	96.45	0

Total Wet Weight of Sample = 100
Total Dry Weight of Sample = 96.45
Moisture Content = 0.0368066

D85 : 1.4173 mm
D60 : 0.1445 mm
D50 : 0.0571 mm
D30 : 0.0059 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : CL
ASTM Group Name : Sandy lean clay
AASHTO Group Symbol : A-6(8)
AASHTO Group Name : Clayey Soils

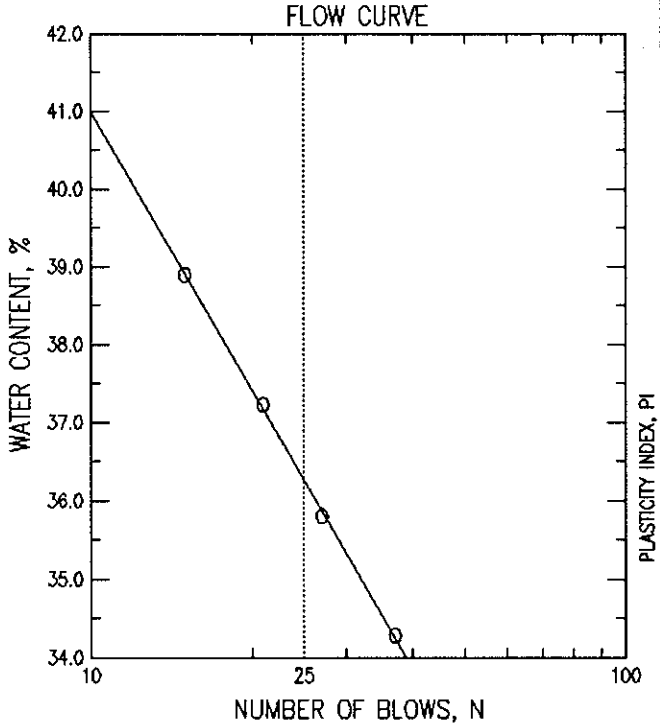
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-37
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	5A middle cut
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown sandy clay (CL) with gravel		Tue May 10 2005	VQ37-05A

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	34	41	33	54	
WT. WET SOIL + TARE	24.79	24.34	23.95	28.66	
WT. DRY SOIL + TARE	21.28	21	20.35	23.67	
WT. WATER	3.51	3.34	3.6	4.99	
TARE WT.	11.04	11.67	10.68	10.84	
WT. DRY SOIL	10.24	9.33	9.67	12.83	
WATER CONTENT, W_N (%)	34.28	35.80	37.23	38.89	
NUMBER OF BLOWS, N	37	27	21	15	
ONE-POINT LIQUID LIMIT, LL	35.94	36.13	36.45	36.56	

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	49				
WT. WET SOIL + TARE	31.8				
WT. DRY SOIL + TARE	28.64				
WT. WATER	3.16				
TARE WT.	10.75				
WT. DRY SOIL	17.89				
WATER CONTENT (%)	17.66				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	19.5
LIQUID LIMIT, LL	36.3
PLASTIC LIMIT, PL	17.7
PLASTICITY INDEX, PI	18.6
LIQUIDITY INDEX, LI*	0.10

*LI = (W - PL)/PI

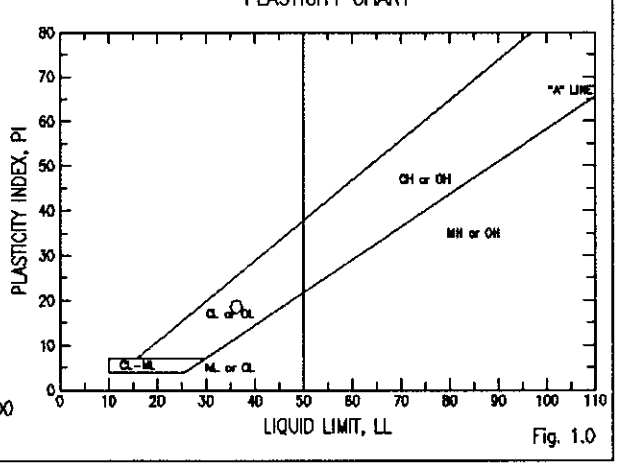


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 5A middle cut
Location : Piedmont, CA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : Depth: 13.0 feet

Depth : 13.0 feet
Test Date : 05/11/2005
Test Method : ASTM D422/4318

Filename : VQ37-05A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ37-5A	0.00	1330.00	1113.00	19.50

Average Moisture Content = 19.50

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 49	10.75	31.80	28.64	17.66

Plastic Limit = 17.66

Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 34	11.04	24.79	21.28	37	34.28
2) 41	11.67	24.34	21.00	27	35.80
3) 33	10.68	23.95	20.35	21	37.23
4) 54	10.84	28.66	23.67	15	38.89

Liquid Limit = 36.27
Plastic Index = 18.61

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 5B bottom cut
Location : Piedmont, CA
Depth : 13.0 feet
Test Date : 05/11/2005
Test Method : ASTM D422/4318
Filename : VQ37-05B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 13.0 feet

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 100 gm
Specific Gravity = 2.8

Hydroscopic Moisture Content :
Weight of Wet Soil = 100 gm
Weight of Dry Soil = 96.56 gm
Moisture Content = 0.0356255

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	55.00	22.00	46.62	0.024	37	0.024
5.00	50.50	22.00	42.12	0.016	33	0.016
15.00	45.00	21.90	36.57	0.010	29	0.010
30.00	43.00	21.80	34.53	0.007	27	0.007
61.00	40.00	21.70	31.48	0.005	25	0.005
124.00	36.60	21.40	27.94	0.004	22	0.004
240.00	35.00	21.50	26.39	0.003	21	0.003
362.00	33.20	21.60	24.64	0.002	20	0.002
1440.00	30.00	21.50	21.39	0.001	17	0.001

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 5B bottom cut
Location : Piedmont, CA
Depth : 13.0 feet
Test Date : 05/11/2005
Test Method : ASTM D422/4318
Filename : VQ37-05B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 13.0 feet

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	22.03	22.03	96
0.5"	0.500	12.70	23.09	45.12	93
0.375"	0.374	9.51	5.82	50.94	92
#4	0.187	4.75	27.14	78.08	87
#10	0.079	2.00	49.78	127.86	79

Total Dry Weight of Sample = 628.2

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#16	0.047	1.19	4.88	4.88	75
#30	0.023	0.60	6.99	11.87	69
#50	0.012	0.30	9.69	21.56	61
#100	0.006	0.15	11.43	32.99	52
#200	0.003	0.07	8.87	41.86	45
Pan			54.70	96.56	0

Total Wet Weight of Sample = 100
Total Dry Weight of Sample = 96.56
Moisture Content = 0.0356255

D85 : 3.7523 mm
D60 : 0.2660 mm
D50 : 0.1222 mm
D30 : 0.0110 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand
AASHTO Group Symbol : A-6(6)
AASHTO Group Name : Clayey Soils

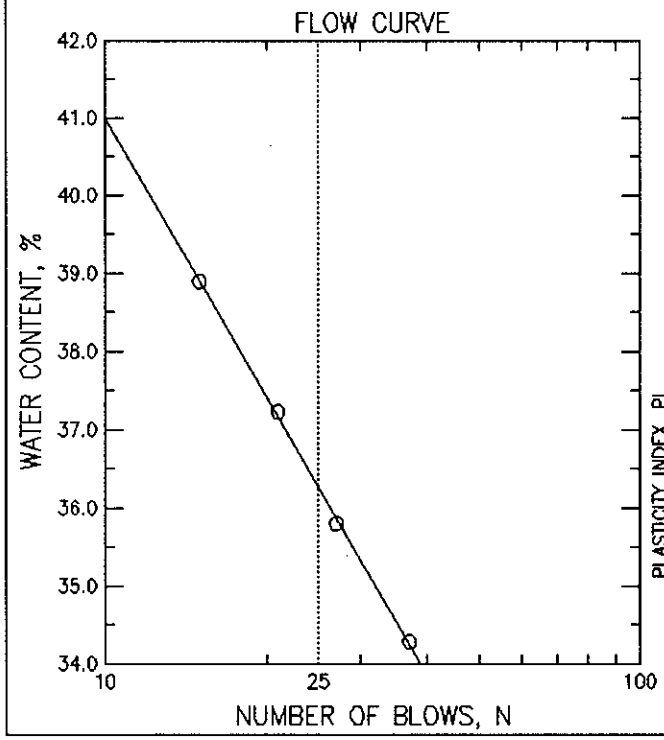
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-37
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	5B bottom cut
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown clayey sand (SC) with gravel		Tue May 10 2005	VQ37-05B

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	34	41	33	54	
WT. WET SOIL + TARE	24.79	24.34	23.95	28.66	
WT. DRY SOIL + TARE	21.28	21	20.35	23.67	
WT. WATER	3.51	3.34	3.6	4.99	
TARE WT.	11.04	11.67	10.68	10.84	
WT. DRY SOIL	10.24	9.33	9.67	12.83	
WATER CONTENT, W_N (%)	34.28	35.80	37.23	38.89	
NUMBER OF BLOWS, N	37	27	21	15	
ONE-POINT LIQUID LIMIT, LL	35.94	36.13	36.45	36.56	

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	49				
WT. WET SOIL + TARE	31.8				
WT. DRY SOIL + TARE	28.64				
WT. WATER	3.16				
TARE WT.	10.75				
WT. DRY SOIL	17.89				
WATER CONTENT (%)	17.66				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	17.2
LIQUID LIMIT, LL	36.3
PLASTIC LIMIT, PL	17.7
PLASTICITY INDEX, PI	18.6
LIQUIDITY INDEX, LI*	-0.03

*LI = (W - PL)/PI

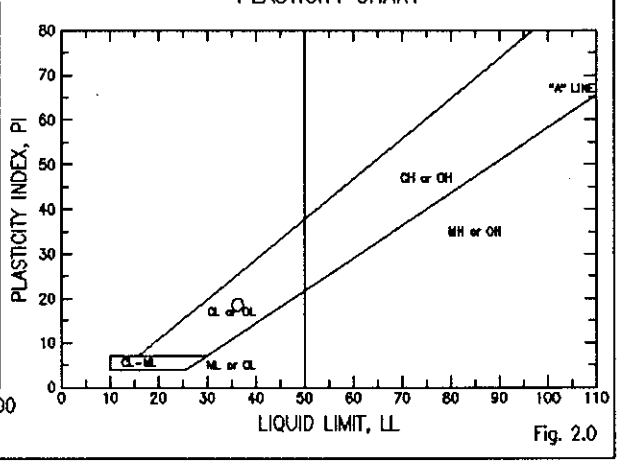


Fig. 2.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 5B bottom cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 13.0 feet

Depth : 13.0 feet
Test Date : 05/11/2005
Test Method : ASTM D422/4318

Filename : VQ37-05B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ37-5B	0.00	1365.00	1165.00	17.17

Average Moisture Content = 17.17

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 49	10.75	31.80	28.64	17.66

Plastic Limit = 17.66

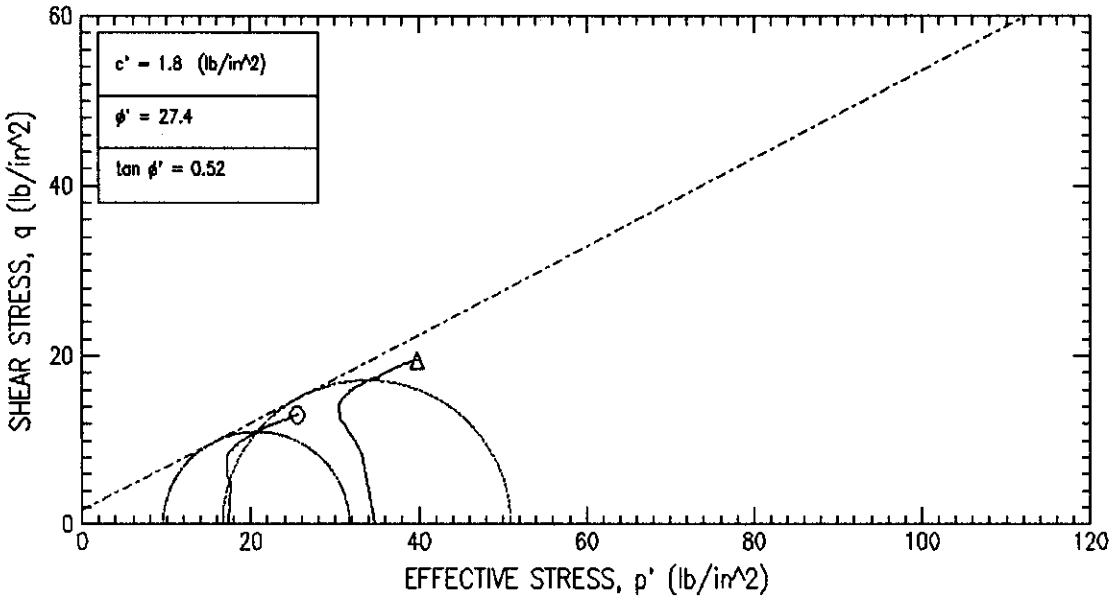
Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 34	11.04	24.79	21.28	37	34.28
2) 41	11.67	24.34	21.00	27	35.80
3) 33	10.68	23.95	20.35	21	37.23
4) 54	10.84	28.66	23.67	15	38.89

Liquid Limit = 36.27
Plastic Index = 18.61

URS

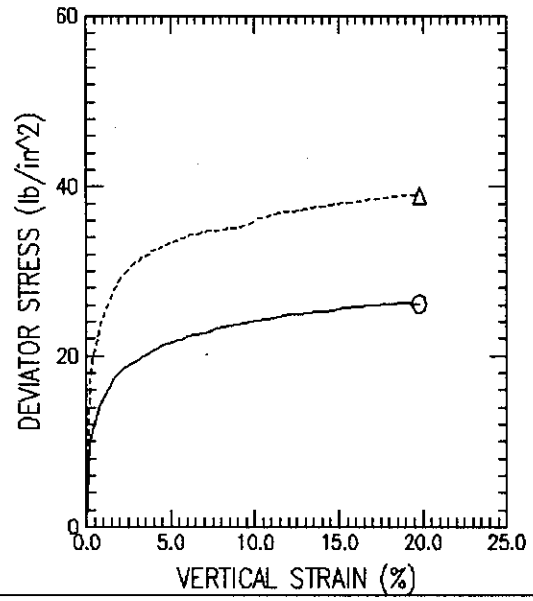
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-37-6A

VQ-37-6B



SYMBOL		○	△		
TEST NO.		VQ-37-6A	VQ-37-6B		
INITIAL	WATER CONTENT (%)	17.34	17.43		
	DRY DENSITY (lb/ft^3)	115.35	115.06		
	SATURATION (%)	96.97	96.76		
	VOID RATIO	0.494	0.497		
BEFORE SHEAR	WATER CONTENT (%)	15.88	15.39		
	DRY DENSITY (lb/ft^3)	119.79	120.91		
	SATURATION (%)	100.00	100.00		
	VOID RATIO	0.438	0.425		
	BACK PRESS. (lb/in^2)	80.00	80.00		
MINOR PRIN. STRESS (lb/in^2)		17.36	34.72		
MAX. DEV. STRESS (lb/in^2)		27.18	40.99		
TIME TO FAILURE (min)		1426.22	1536.87		
RATE OF STRAIN INCR (%/min)		0.00	0.00		
INITIAL DIAMETER (in)		3.85	3.85		
INITIAL HEIGHT (in)		7.99	7.99		
B-VALUE		99.00	98.70		

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Brown sandy clay with gravel

2) Grayish brown clayey sand (SC) with gravel

LL 34.62	PL 17.76	PI 16.86	GS 2.76

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 17.36 psi

2) TXCIU Test with Effective Pressure of 34.72 psi

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

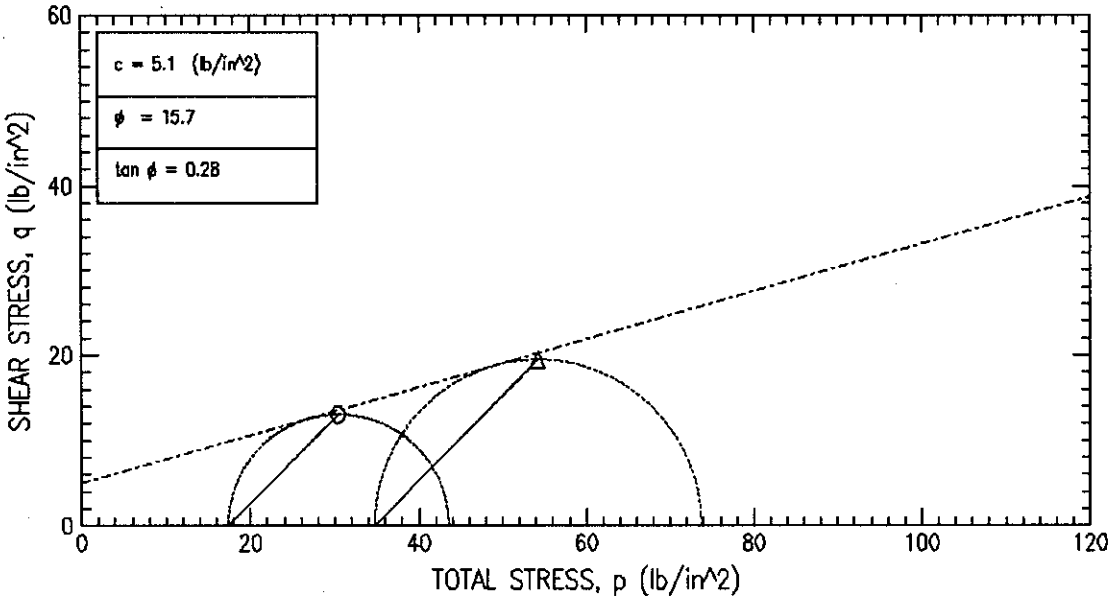
BORING NO. VQ-37	SAMPLE NO.	6A	6B		
TECH. S. Capps	DEPTH/ELEV	17.0 feet	17.0 feet		
LABORATORY	DATE	05/25/05	05/22/05		

TRIAXIAL COMPRESSION TEST REPORT

Thu 08-02-05, 13:54:23

URS

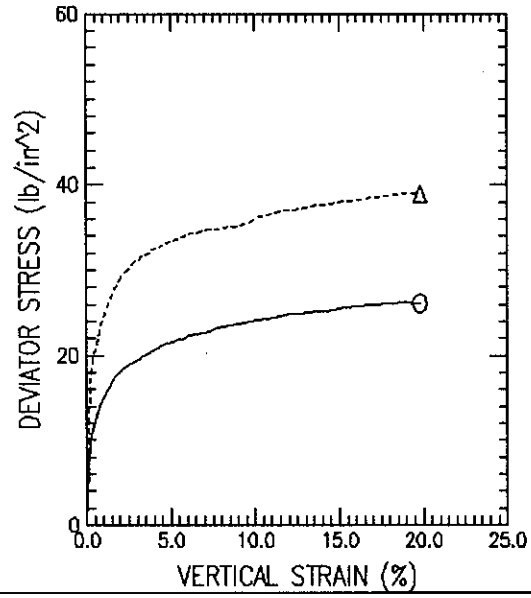
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-37-6A

VQ-37-6B



SYMBOL		○	△		
TEST NO.		VQ-37-6A	VQ-37-6B		
INITIAL	WATER CONTENT (%)	17.34	17.43		
	DRY DENSITY (lb/ft^3)	115.35	115.06		
	SATURATION (%)	96.97	96.76		
	VOID RATIO	0.494	0.497		
BEFORE SHEAR	WATER CONTENT (%)	15.88	15.39		
	DRY DENSITY (lb/ft^3)	119.79	120.91		
	SATURATION (%)	100.00	100.00		
	VOID RATIO	0.438	0.425		
	BACK PRESS. (lb/in^2)	80.00	80.00		
MINOR PRIN. STRESS (lb/in^2)		17.36	34.72		
MAX. DEV. STRESS (lb/in^2)		27.18	40.99		
TIME TO FAILURE (min)		1426.22	1536.87		
RATE OF STRAIN INCR (%/min)		0.00	0.00		
INITIAL DIAMETER (in)		3.85	3.85		
INITIAL HEIGHT (in)		7.99	7.99		
B-VALUE		99.00	98.70		

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Brown sandy clay with gravel

2) Grayish brown clayey sand (SC) with gravel

LL 34.62	PL 17.76	PI 16.86	GS 2.76

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 17.36 psi

2) TXCIU Test with Effective Pressure of 34.72 psi

PROJECT Estates Dam Seismic Study

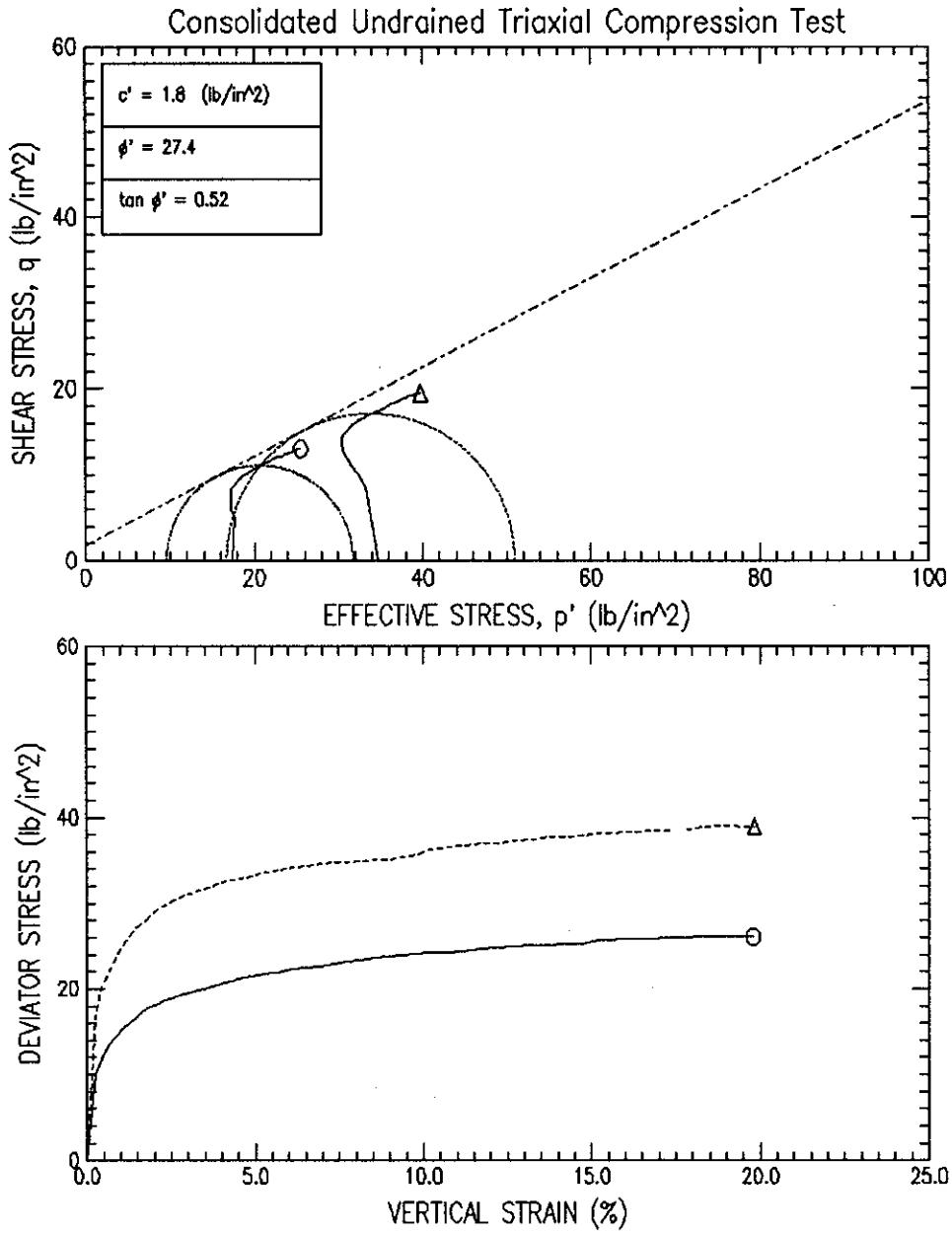
PROJECT NO.26814957

BORING NO. VQ-37	SAMPLE NO.	6A	6B
TECH. S. Capps	DEPTH/ELEV	17.0 feet	17.0 feet
LABORATORY	DATE	05/25/05	05/22/05

TRIAXIAL COMPRESSION TEST REPORT

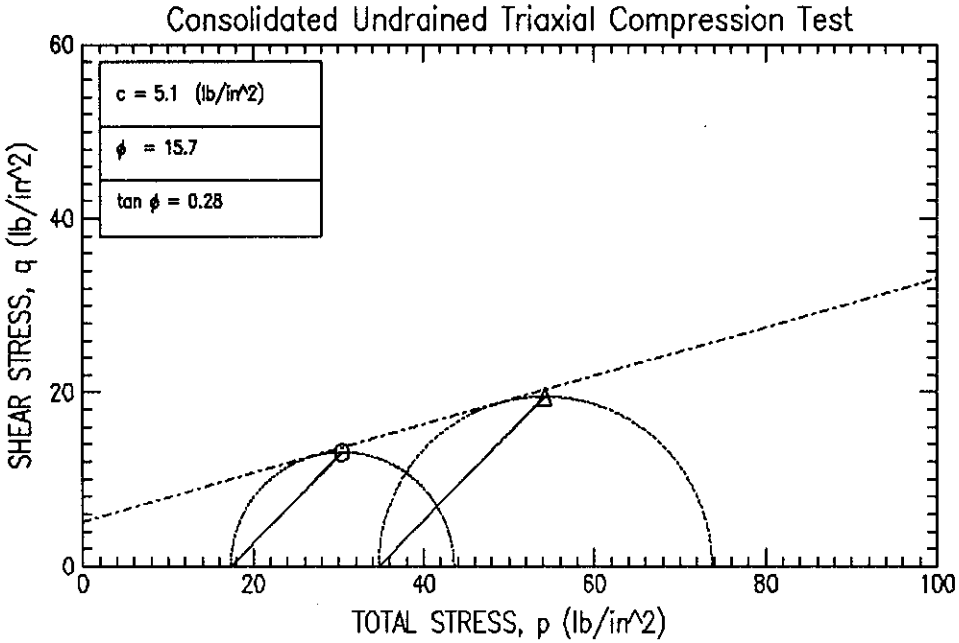
Thu 06-02-05, 13:53:45

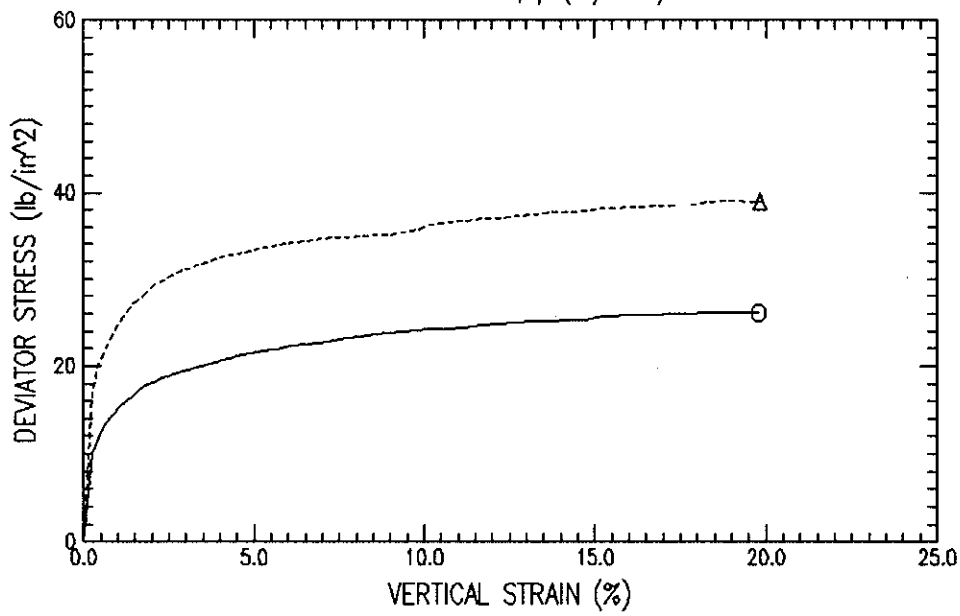
URS



Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-37	6A	17.0 feet	VQ-37-6A	VQ37-06A.CIU	O
VQ-37	6B	17.0 feet	VQ-37-6B	VQ37-06B.CIU	Δ

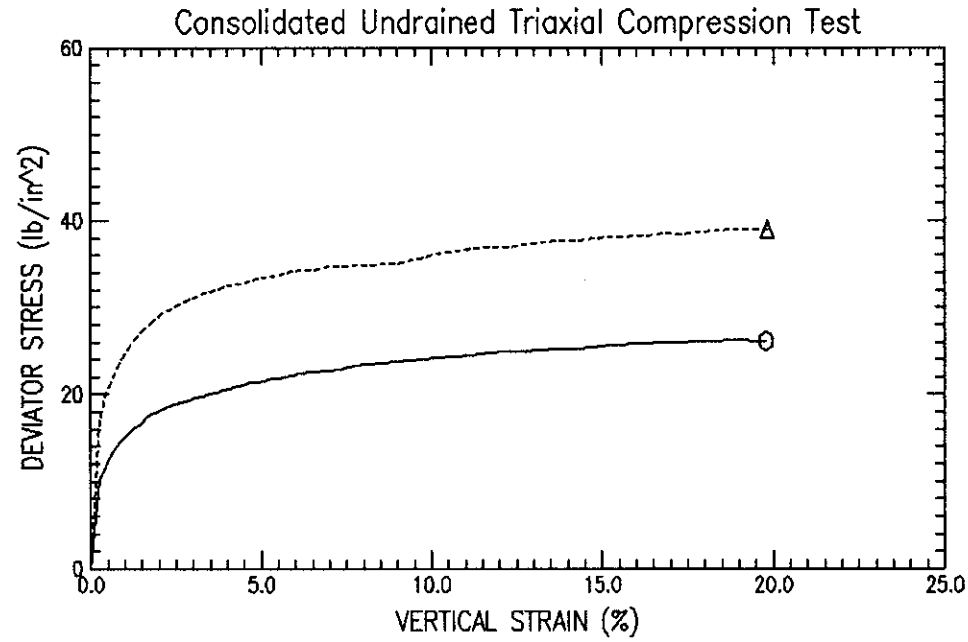
URS

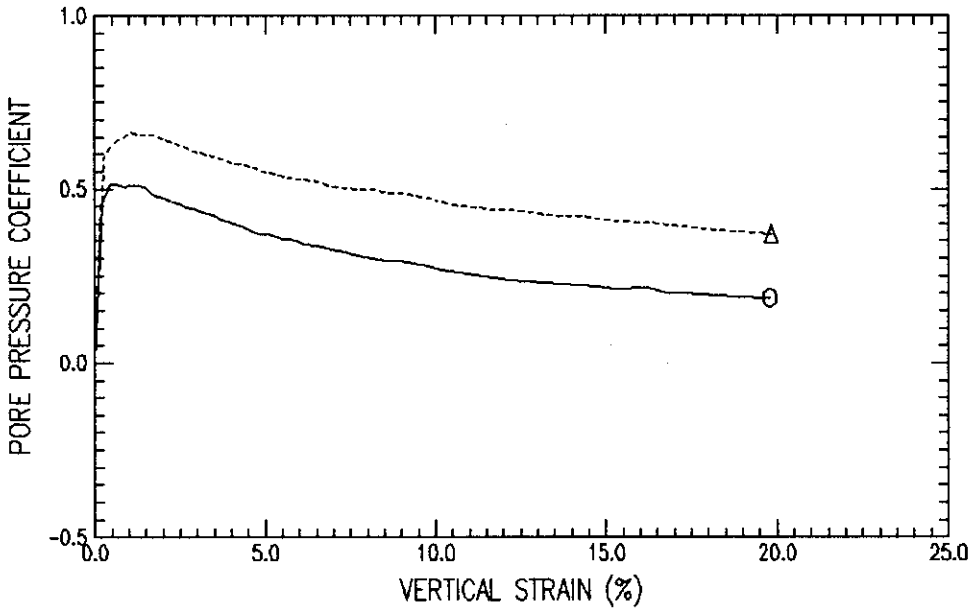




Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-37	6A	17.0 feet	VQ-37-6A	VQ37-06A.CIU	O
VQ-37	6B	17.0 feet	VQ-37-6B	VQ37-06B.CIU	Δ

URS





Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-37	6A	17.0 feet	VQ-37-6A	VQ37-06A.CIU	O
VQ-37	6B	17.0 feet	VQ-37-6B	VQ37-06B.CIU	Δ

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-6A
Boring No. : VQ-37 Test Date : 05/25/05 Tested by : S. Capps
Sample No. : 6A Depth : 17.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown sandy clay with gravel
Remarks : TXCIU Test with Effective Pressure of 17.36 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	97.36	97.36	0.00	0.00	17.36	17.36	1.00	17.36	0.00
2)	0.25	107.84	97.36	4.72	0.45	23.11	12.63	1.83	17.87	5.24
3)	0.44	109.55	97.36	6.02	0.49	23.52	11.33	2.08	17.43	6.10
4)	0.65	111.26	97.36	6.87	0.49	24.39	10.49	2.32	17.44	6.95
5)	0.85	112.38	97.36	7.32	0.49	25.06	10.03	2.50	17.54	7.51
6)	1.05	113.22	97.36	7.78	0.49	25.43	9.57	2.66	17.50	7.93
7)	1.25	114.05	97.36	8.17	0.49	25.87	9.19	2.82	17.53	8.34
8)	1.45	114.58	97.36	8.40	0.49	26.18	8.96	2.92	17.57	8.61
9)	1.66	115.41	97.36	8.47	0.47	26.93	8.88	3.03	17.91	9.02
10)	1.87	115.94	97.36	8.55	0.46	27.39	8.81	3.11	18.10	9.29
11)	2.06	116.19	97.36	8.55	0.45	27.63	8.81	3.14	18.22	9.41
12)	2.27	116.71	97.36	8.63	0.45	28.08	8.73	3.22	18.41	9.68
13)	2.47	116.96	97.36	8.63	0.44	28.33	8.73	3.25	18.53	9.80
14)	2.67	117.20	97.36	8.55	0.43	28.65	8.81	3.25	18.73	9.92
15)	2.88	117.44	97.36	8.55	0.43	28.89	8.81	3.28	18.85	10.04
16)	3.08	117.68	97.36	8.55	0.42	29.13	8.81	3.31	18.97	10.16
17)	3.28	117.92	97.36	8.47	0.41	29.44	8.88	3.31	19.16	10.28
18)	3.48	118.16	97.36	8.47	0.41	29.68	8.88	3.34	19.28	10.40
19)	3.69	118.39	97.36	8.32	0.40	30.07	9.04	3.33	19.55	10.52
20)	3.89	118.63	97.36	8.32	0.39	30.30	9.04	3.35	19.67	10.63
21)	4.09	118.86	97.36	8.24	0.38	30.62	9.11	3.36	19.86	10.75
22)	4.30	119.09	97.36	8.17	0.38	30.92	9.19	3.37	20.06	10.87
23)	4.50	119.33	97.36	8.17	0.37	31.16	9.19	3.39	20.17	10.98
24)	4.69	119.56	97.36	8.01	0.36	31.54	9.34	3.38	20.44	11.10
25)	4.90	119.65	97.36	7.94	0.36	31.71	9.42	3.37	20.56	11.14
26)	5.10	119.74	97.36	7.94	0.35	31.80	9.42	3.38	20.61	11.19
27)	5.31	119.97	97.36	7.86	0.35	32.10	9.50	3.38	20.80	11.30
28)	5.50	120.06	97.36	7.78	0.34	32.27	9.57	3.37	20.92	11.35
29)	5.71	120.14	97.36	7.78	0.34	32.36	9.57	3.38	20.96	11.39
30)	5.91	120.37	97.36	7.78	0.34	32.58	9.57	3.40	21.08	11.50
31)	6.12	120.59	97.36	7.63	0.33	32.96	9.72	3.39	21.34	11.62
32)	6.52	120.76	97.36	7.55	0.32	33.21	9.80	3.39	21.50	11.70
33)	6.93	120.93	97.36	7.40	0.31	33.53	9.95	3.37	21.74	11.79
34)	7.33	121.10	97.36	7.25	0.31	33.85	10.11	3.35	21.98	11.87
35)	7.73	121.53	97.36	7.17	0.30	34.36	10.18	3.37	22.27	12.09
36)	8.14	121.69	97.36	7.02	0.29	34.67	10.34	3.35	22.50	12.17
37)	8.54	121.85	97.36	6.94	0.28	34.91	10.41	3.35	22.66	12.25
38)	8.95	122.01	97.36	6.94	0.28	35.06	10.41	3.37	22.74	12.32
39)	9.36	122.16	97.36	6.79	0.27	35.37	10.57	3.35	22.97	12.40
40)	9.76	122.31	97.36	6.71	0.27	35.60	10.64	3.34	23.12	12.48
41)	10.16	122.46	97.36	6.48	0.26	35.98	10.87	3.31	23.42	12.55
42)	10.67	122.58	97.36	6.33	0.25	36.25	11.03	3.29	23.64	12.61
43)	11.18	122.70	97.36	6.18	0.24	36.52	11.18	3.27	23.85	12.67
44)	11.69	123.06	97.36	6.10	0.24	36.96	11.26	3.28	24.11	12.85
45)	12.19	123.17	97.36	5.95	0.23	37.22	11.41	3.26	24.32	12.91
46)	12.70	123.28	97.36	5.87	0.23	37.40	11.49	3.26	24.44	12.96
47)	13.20	123.38	97.36	5.79	0.22	37.58	11.56	3.25	24.57	13.01
48)	13.71	123.48	97.36	5.72	0.22	37.76	11.64	3.24	24.70	13.06
49)	14.22	123.57	97.36	5.64	0.22	37.93	11.71	3.24	24.82	13.11
50)	14.73	123.67	97.36	5.56	0.21	38.10	11.79	3.23	24.95	13.15
51)	15.23	124.00	97.36	5.49	0.21	38.51	11.87	3.25	25.19	13.32
52)	16.24	124.17	97.36	5.56	0.21	38.61	11.79	3.27	25.20	13.41
53)	16.75	124.25	97.36	5.26	0.20	38.99	12.10	3.22	25.54	13.45
54)	17.26	124.33	97.36	5.18	0.19	39.14	12.17	3.22	25.66	13.48
55)	17.76	124.41	97.36	5.10	0.19	39.30	12.25	3.21	25.77	13.52
56)	18.27	124.48	97.36	5.03	0.19	39.44	12.33	3.20	25.88	13.56
57)	18.77	124.54	97.36	4.95	0.18	39.59	12.40	3.19	26.00	13.59
58)	19.79	124.44	97.36	4.88	0.18	39.56	12.48	3.17	26.02	13.54

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-6A
Boring No. : VQ-37 Test Date : 05/25/05 Tested by : S. Capps
Sample No. : 6A Depth : 17.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown sandy clay with gravel
Remarks : TXCIU Test with Effective Pressure of 17.36 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.35	80.00	0.00	0.00	0.00	97.36	17.36
2)	0.019	0.25	11.38	84.73	119.22	119.22	10.48	107.84	23.11
3)	0.035	0.44	11.40	86.03	139.02	139.02	12.19	109.55	23.52
4)	0.051	0.65	11.43	86.87	158.82	158.82	13.90	111.26	24.39
5)	0.067	0.85	11.45	87.33	172.02	172.02	15.02	112.38	25.06
6)	0.083	1.05	11.47	87.79	181.92	181.92	15.86	113.22	25.43
7)	0.099	1.25	11.50	88.17	191.82	191.82	16.69	114.05	25.87
8)	0.115	1.45	11.52	88.40	198.42	198.42	17.22	114.58	26.18
9)	0.131	1.66	11.54	88.48	208.32	208.32	18.05	115.41	26.93
10)	0.147	1.87	11.57	88.55	214.92	214.92	18.58	115.94	27.39
11)	0.163	2.06	11.59	88.55	218.22	218.22	18.83	116.19	27.63
12)	0.179	2.27	11.62	88.63	224.82	224.82	19.35	116.71	28.08
13)	0.195	2.47	11.64	88.63	228.12	228.12	19.60	116.96	28.33
14)	0.210	2.67	11.66	88.55	231.42	231.42	19.84	117.20	28.65
15)	0.227	2.88	11.69	88.55	234.72	234.72	20.08	117.44	28.89
16)	0.243	3.08	11.71	88.55	238.02	238.02	20.32	117.68	29.13
17)	0.259	3.28	11.74	88.48	241.32	241.32	20.56	117.92	29.44
18)	0.275	3.48	11.76	88.48	244.62	244.62	20.80	118.16	29.68
19)	0.291	3.69	11.79	88.32	247.92	247.92	21.03	118.39	30.07
20)	0.307	3.89	11.81	88.32	251.22	251.22	21.27	118.63	30.30
21)	0.323	4.09	11.84	88.25	254.52	254.52	21.50	118.86	30.62
22)	0.339	4.30	11.86	88.17	257.82	257.82	21.73	119.09	30.92
23)	0.355	4.50	11.89	88.17	261.12	261.12	21.97	119.33	31.16
24)	0.370	4.69	11.91	88.02	264.42	264.42	22.20	119.56	31.54
25)	0.387	4.90	11.94	87.94	266.07	266.07	22.29	119.65	31.71
26)	0.403	5.10	11.96	87.94	267.72	267.72	22.38	119.74	31.80
27)	0.419	5.31	11.99	87.86	271.02	271.02	22.61	119.97	32.10
28)	0.434	5.50	12.01	87.79	272.67	272.67	22.70	120.06	32.27
29)	0.451	5.71	12.04	87.79	274.32	274.32	22.78	120.14	32.36
30)	0.467	5.91	12.07	87.79	277.62	277.62	23.01	120.37	32.58
31)	0.483	6.12	12.09	87.64	280.92	280.92	23.23	120.59	32.96
32)	0.515	6.52	12.14	87.56	284.22	284.22	23.40	120.76	33.21
33)	0.547	6.93	12.20	87.41	287.52	287.52	23.57	120.93	33.53
34)	0.578	7.33	12.25	87.25	290.82	290.82	23.74	121.10	33.85
35)	0.610	7.73	12.30	87.18	297.42	297.42	24.17	121.53	34.36
36)	0.642	8.14	12.36	87.02	300.72	300.72	24.33	121.69	34.67
37)	0.674	8.54	12.41	86.95	304.02	304.02	24.49	121.85	34.91
38)	0.706	8.95	12.47	86.95	307.32	307.32	24.65	122.01	35.06
39)	0.739	9.36	12.52	86.79	310.62	310.62	24.80	122.16	35.37
40)	0.770	9.76	12.58	86.72	313.92	313.92	24.95	122.31	35.60
41)	0.802	10.16	12.64	86.49	317.22	317.22	25.10	122.46	35.98
42)	0.842	10.67	12.71	86.33	320.52	320.52	25.22	122.58	36.25
43)	0.882	11.18	12.78	86.18	323.82	323.82	25.34	122.70	36.52
44)	0.922	11.69	12.85	86.10	330.42	330.42	25.70	123.06	36.96
45)	0.962	12.19	12.93	85.95	333.72	333.72	25.81	123.17	37.22
46)	1.002	12.70	13.00	85.87	337.02	337.02	25.92	123.28	37.40
47)	1.042	13.20	13.08	85.80	340.32	340.32	26.02	123.38	37.58
48)	1.082	13.71	13.16	85.72	343.62	343.62	26.12	123.48	37.76
49)	1.122	14.22	13.23	85.65	346.92	346.92	26.21	123.57	37.93
50)	1.162	14.73	13.31	85.57	350.22	350.22	26.31	123.67	38.10
51)	1.202	15.23	13.39	85.49	356.82	356.82	26.64	124.00	38.51
52)	1.282	16.24	13.55	85.57	363.42	363.42	26.81	124.17	38.61
53)	1.322	16.75	13.64	85.26	366.72	366.72	26.89	124.25	38.99
54)	1.362	17.26	13.72	85.19	370.02	370.02	26.97	124.33	39.14
55)	1.401	17.76	13.80	85.11	373.32	373.32	27.05	124.41	39.30
56)	1.442	18.27	13.89	85.03	376.62	376.62	27.12	124.48	39.44
57)	1.482	18.77	13.98	84.96	379.92	379.92	27.18	124.54	39.59
58)	1.562	19.79	14.15	84.88	383.22	383.22	27.08	124.44	39.56

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-6A
Boring No. : VQ-37 Test Date : 05/25/05 Tested by : S. Capps
Sample No. : 6A Depth : 17.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown sandy clay with gravel
Remarks : TXCIU Test with Effective Pressure of 17.36 psi

Liquid Limit : 34.62 Plastic Limit : 17.76 Specific Gravity : 2.761

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-37-6A	VQ-37-6A
WT CONTAINER + WET SOIL (gm)	3305.40	3264.20
WT CONTAINER + DRY SOIL (gm)	2817.00	2817.00
WT WATER (gm)	488.40	447.20
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	2817.00	2817.00
WATER CONTENT (%)	17.34	15.88

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	17.34	15.88
VOID RATIO	0.49	0.44
WET DENSITY (lb/ft^3)	135.34	138.80
DRY DENSITY (lb/ft^3)	115.35	119.79
DEGREE OF SATURATION (%)	96.97	100.00

Maximum Shear Stress = 13.59 (lb/in^2) at a Vertical Strain of 18.77 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-6A
Boring No. : VQ-37 Test Date : 05/25/05 Tested by : S. Capps
Sample No. : 6A Depth : 17.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown sandy clay with gravel
Remarks : TXCIU Test with Effective Pressure of 17.36 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 34.62 Plastic Limit : 17.76 Specific Gravity : 2.761

INITIAL
Height : 7.992 (in) Dry Density : 115.35 (lb/ft^3)
Area : 11.642 (in^2) Moisture : 17.34 %
Void Ratio: 0.49
Saturation: 96.97 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 115.35 (lb/ft^3) Total Vert. Stress : 97.36 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 17.34 % Total Hori. Stress : 97.36 (lb/in^2
Void Ratio: 0.49 Pore Pressure : 0.00 (lb/in^2)
Saturation: 96.97 % Effect.Vert. Stress: 97.36 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.36 (lb/in^2

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 115.35 (lb/ft^3) Total Vert. Stress : 97.36 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 17.34 % Total Hori. Stress : 97.36 (lb/in^2
Void Ratio: 0.49 Pore Pressure : 0.00 (lb/in^2)
Saturation: 96.97 % Effect.Vert. Stress: 97.36 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.36 (lb/in^2

END OF SATURATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 115.35 (lb/ft^3) Total Vert. Stress : 97.36 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 15.88 % Total Hori. Stress : 97.36 (lb/in^2
dVCorr : 0.000 (in^3) Void Ratio: 0.49 Pore Pressure : 0.00 (lb/in^2)
Saturation: 88.79 % Effect.Vert. Stress: 97.36 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.36 (lb/in^2

END OF CONSOLIDATION - B
dH : 0.100 (in) Height : 7.892 (in) Dry Density : 119.79 (lb/ft^3) Total Vert. Stress : 97.36 (lb/in^2
dV : 3.449 (in^3) Area : 11.352 (in^2) Moisture : 15.88 % Total Hori. Stress : 97.36 (lb/in^2
Void Ratio: 0.44 Pore Pressure : 80.00 (lb/in^2)
Saturation: 100.00 % Effect.Vert. Stress: 17.36 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 17.36 (lb/in^2

FAILURE DURING SHEAR
dH : 1.482 (in) Height : 6.510 (in) Dry Density : 119.79 (lb/ft^3) Total Vert. Stress : 124.54 (lb/in^
dV : 3.449 (in^3) Area : 13.976 (in^2) Moisture : 15.88 % Total Hori. Stress : 97.36 (lb/in^2
Strain : 18.77 % Void Ratio: 0.44 Pore Pressure : 84.96 (lb/in^2
Strength: 13.59 (lb/in^2) Saturation: 100.00 % Effect.Vert. Stress: 39.59 (lb/in^2
Time : 1426.22 (min) Effect.Hori. Stress: 12.40 (lb/in^2

END OF TEST
dH : 1.562 (in) Height : 6.430 (in) Dry Density : 119.79 (lb/ft^3) Total Vert. Stress : 124.44 (lb/in^
dV : 3.449 (in^3) Area : 14.152 (in^2) Moisture : 15.88 % Total Hori. Stress : 97.36 (lb/in^2
Strain : 19.79 % Void Ratio: 0.44 Pore Pressure : 84.88 (lb/in^2
Saturation: 100.00 % Effect.Vert. Stress: 39.56 (lb/in^2
Time : 1490.20 (min) Effect.Hori. Stress: 12.48 (lb/in^2

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic
Project No. : 26814957
Boring No. : VQ-37
Sample No. : 6B
Sample Type : Shelby
Location : Piedmont, CA
Test No. : VQ-37-6B
Test Date : 05/22/05
Depth : 17.0 feet
Elevation : NA
Tested by : S. Capps
Checked by : R. Taraya
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

Height : 7.992 (in)
Area : 11.642 (in^2)
Volume : 93.039 (in^3)
Piston Diameter : 0.000 (in)
Piston Friction : 0.00 (lb)
Piston Weight : 0.00 (gm)
Filter Correction : 0.00 (lb/in^2)
Membrane Correction : 0.00 (lb/in)
Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	114.72	114.72	0.00	0.00	34.72	34.72	1.00	34.72	0.00
2)	0.24	131.66	114.72	10.00	0.59	41.66	24.71	1.69	33.18	8.47
3)	0.45	134.95	114.72	12.53	0.62	42.42	22.19	1.91	32.30	10.12
4)	0.65	136.70	114.72	14.06	0.64	42.64	20.66	2.06	31.65	10.99
5)	0.85	138.44	114.72	15.36	0.65	43.07	19.35	2.23	31.21	11.86
6)	1.05	139.66	114.72	16.51	0.66	43.15	18.21	2.37	30.68	12.47
7)	1.26	140.88	114.72	17.20	0.66	43.67	17.52	2.49	30.60	13.08
8)	1.47	141.83	114.72	17.81	0.66	44.02	16.91	2.60	30.46	13.56
9)	1.67	142.54	114.72	18.19	0.65	44.34	16.52	2.68	30.43	13.91
10)	1.87	143.24	114.72	18.50	0.65	44.73	16.22	2.76	30.47	14.26
11)	2.07	143.93	114.72	18.73	0.64	45.20	15.99	2.83	30.59	14.61
12)	2.28	144.37	114.72	18.80	0.63	45.56	15.91	2.86	30.74	14.83
13)	2.48	144.81	114.72	18.80	0.62	46.00	15.91	2.89	30.96	15.05
14)	2.68	145.25	114.72	18.88	0.62	46.36	15.83	2.93	31.10	15.26
15)	2.89	145.68	114.72	18.88	0.61	46.80	15.83	2.96	31.32	15.48
16)	3.09	145.87	114.72	18.80	0.60	47.06	15.91	2.96	31.48	15.57
17)	3.29	146.30	114.72	18.88	0.60	47.41	15.83	2.99	31.62	15.79
18)	3.50	146.48	114.72	18.88	0.59	47.60	15.83	3.01	31.71	15.88
19)	3.70	146.66	114.72	18.73	0.59	47.93	15.99	3.00	31.96	15.97
20)	3.90	147.09	114.72	18.73	0.58	48.36	15.99	3.02	32.17	16.18
21)	4.11	147.26	114.72	18.65	0.57	48.61	16.06	3.03	32.34	16.27
22)	4.31	147.44	114.72	18.65	0.57	48.79	16.06	3.04	32.43	16.36
23)	4.51	147.62	114.72	18.57	0.56	49.04	16.14	3.04	32.59	16.45
24)	4.71	147.79	114.72	18.50	0.56	49.29	16.22	3.04	32.75	16.54
25)	4.92	147.97	114.72	18.27	0.55	49.69	16.45	3.02	33.07	16.62
26)	5.12	148.14	114.72	18.27	0.55	49.87	16.45	3.03	33.16	16.71
27)	5.33	148.31	114.72	18.19	0.54	50.11	16.52	3.03	33.32	16.80
28)	5.53	148.48	114.72	18.12	0.54	50.36	16.60	3.03	33.48	16.88
29)	5.73	148.65	114.72	18.04	0.53	50.61	16.68	3.03	33.64	16.97
30)	5.94	148.82	114.72	18.04	0.53	50.78	16.68	3.04	33.73	17.05
31)	6.14	148.99	114.72	18.04	0.53	50.94	16.68	3.05	33.81	17.13
32)	6.55	149.08	114.72	17.89	0.52	51.19	16.83	3.04	34.01	17.18
33)	6.95	149.41	114.72	17.58	0.51	51.82	17.14	3.02	34.48	17.34
34)	7.36	149.49	114.72	17.50	0.50	51.98	17.21	3.02	34.60	17.39
35)	7.76	149.58	114.72	17.43	0.50	52.15	17.29	3.02	34.72	17.43
36)	8.17	149.66	114.72	17.35	0.50	52.30	17.36	3.01	34.83	17.47
37)	8.58	149.74	114.72	17.04	0.49	52.69	17.67	2.98	35.18	17.51
38)	8.99	149.82	114.72	17.04	0.49	52.77	17.67	2.99	35.22	17.55
39)	9.39	150.13	114.72	16.97	0.48	53.15	17.75	3.00	35.45	17.70
40)	9.80	150.43	114.72	16.89	0.47	53.53	17.82	3.00	35.68	17.86
41)	10.20	150.96	114.72	16.66	0.46	54.30	18.05	3.01	36.18	18.12
42)	10.72	151.21	114.72	16.51	0.45	54.70	18.21	3.00	36.45	18.25
43)	11.22	151.46	114.72	16.36	0.45	55.10	18.36	3.00	36.73	18.37
44)	11.73	151.71	114.72	16.20	0.44	55.50	18.51	3.00	37.01	18.49
45)	12.25	151.72	114.72	16.20	0.44	55.51	18.51	3.00	37.01	18.50
46)	12.75	151.95	114.72	16.05	0.43	55.90	18.67	2.99	37.28	18.62
47)	13.25	152.18	114.72	15.90	0.42	56.28	18.82	2.99	37.55	18.73
48)	13.77	152.40	114.72	15.82	0.42	56.58	18.90	2.99	37.74	18.84
49)	14.27	152.40	114.72	15.82	0.42	56.58	18.90	2.99	37.74	18.84
50)	14.78	152.62	114.72	15.67	0.41	56.95	19.05	2.99	38.00	18.95
51)	15.29	152.83	114.72	15.51	0.41	57.31	19.20	2.98	38.25	19.05
52)	16.31	153.01	114.72	15.36	0.40	57.65	19.35	2.98	38.50	19.15
53)	16.82	153.21	114.72	15.21	0.40	58.00	19.51	2.97	38.75	19.24
54)	17.32	153.19	114.72	15.13	0.39	58.05	19.58	2.96	38.82	19.23
55)	17.83	153.37	114.72	14.90	0.39	58.46	19.81	2.95	39.14	19.33
56)	18.34	153.55	114.72	14.82	0.38	58.72	19.89	2.95	39.31	19.42
57)	18.84	153.73	114.72	14.75	0.38	58.98	19.97	2.95	39.47	19.51
58)	19.83	153.67	114.72	14.44	0.37	59.22	20.27	2.92	39.75	19.47

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic
Project No. : 26814957
Boring No. : VQ-37
Sample No. : 6B
Sample Type : Shelby
Location : Piedmont, CA
Test No. : VQ-37-6B
Test Date : 05/22/05
Depth : 17.0 feet
Elevation : NA
Tested by : S. Capps
Checked by : R. Taraya
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

Height : 7.992 (in)
Area : 11.642 (in^2)
Volume : 93.039 (in^3)
Piston Diameter : 0.000 (in)
Piston Friction : 0.00 (lb)
Piston Weight : 0.00 (gm)
Filter Correction : 0.00 (lb/in^2)
Membrane Correction : 0.00 (lb/in)
Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.26	80.00	0.00	0.00	0.00	114.72	34.72
2)	0.019	0.24	11.29	90.01	201.04	201.04	17.81	131.66	41.66
3)	0.035	0.45	11.31	92.53	240.56	240.56	21.26	134.95	42.42
4)	0.051	0.65	11.34	94.06	261.84	261.84	23.10	136.70	42.64
5)	0.067	0.85	11.36	95.37	283.12	283.12	24.92	138.44	43.07
6)	0.083	1.05	11.38	96.51	298.32	298.32	26.21	139.66	43.15
7)	0.099	1.26	11.41	97.20	313.52	313.52	27.49	140.88	43.67
8)	0.115	1.47	11.43	97.81	325.68	325.68	28.49	141.83	44.02
9)	0.131	1.67	11.45	98.20	334.80	334.80	29.23	142.54	44.34
10)	0.147	1.87	11.48	98.50	343.93	343.93	29.97	143.24	44.73
11)	0.163	2.07	11.50	98.73	353.05	353.05	30.70	143.93	45.20
12)	0.179	2.28	11.53	98.81	359.13	359.13	31.16	144.37	45.56
13)	0.195	2.48	11.55	98.81	365.21	365.21	31.62	144.81	46.00
14)	0.211	2.68	11.57	98.89	371.29	371.29	32.08	145.25	46.36
15)	0.227	2.89	11.60	98.89	377.37	377.37	32.54	145.68	46.80
16)	0.243	3.09	11.62	98.81	380.41	380.41	32.73	145.87	47.06
17)	0.259	3.29	11.65	98.89	386.49	386.49	33.19	146.30	47.41
18)	0.275	3.50	11.67	98.89	389.53	389.53	33.38	146.48	47.60
19)	0.291	3.70	11.70	98.73	392.57	392.57	33.57	146.66	47.93
20)	0.307	3.90	11.72	98.73	398.65	398.65	34.01	147.09	48.36
21)	0.323	4.11	11.75	98.66	401.69	401.69	34.20	147.26	48.61
22)	0.339	4.31	11.77	98.66	404.73	404.73	34.39	147.44	48.79
23)	0.355	4.51	11.80	98.58	407.77	407.77	34.57	147.62	49.04
24)	0.370	4.71	11.82	98.50	410.81	410.81	34.76	147.79	49.29
25)	0.387	4.92	11.85	98.27	413.85	413.85	34.94	147.97	49.69
26)	0.403	5.12	11.87	98.27	416.89	416.89	35.12	148.14	49.87
27)	0.419	5.33	11.90	98.20	419.93	419.93	35.30	148.31	50.11
28)	0.434	5.53	11.92	98.12	422.97	422.97	35.48	148.48	50.36
29)	0.451	5.73	11.95	98.04	426.01	426.01	35.66	148.65	50.61
30)	0.467	5.94	11.97	98.04	429.05	429.05	35.83	148.82	50.78
31)	0.483	6.14	12.00	98.04	432.09	432.09	36.01	148.99	50.94
32)	0.515	6.55	12.05	97.89	435.13	435.13	36.10	149.08	51.19
33)	0.547	6.95	12.10	97.58	441.21	441.21	36.45	149.41	51.82
34)	0.579	7.36	12.16	97.51	444.25	444.25	36.54	149.49	51.98
35)	0.610	7.76	12.21	97.43	447.29	447.29	36.63	149.58	52.15
36)	0.642	8.17	12.27	97.36	450.33	450.33	36.72	149.66	52.30
37)	0.675	8.58	12.32	97.05	453.37	453.37	36.80	149.74	52.69
38)	0.706	8.99	12.37	97.05	456.41	456.41	36.88	149.82	52.77
39)	0.738	9.39	12.43	96.97	462.49	462.49	37.21	150.13	53.15
40)	0.770	9.80	12.49	96.90	468.57	468.57	37.53	150.43	53.53
41)	0.802	10.20	12.54	96.67	477.69	477.69	38.09	150.96	54.30
42)	0.842	10.72	12.61	96.51	483.77	483.77	38.35	151.21	54.70
43)	0.882	11.22	12.69	96.36	489.85	489.85	38.61	151.46	55.10
44)	0.922	11.73	12.76	96.21	495.94	495.94	38.87	151.71	55.50
45)	0.963	12.25	12.83	96.21	498.98	498.98	38.88	151.72	55.51
46)	1.002	12.75	12.91	96.05	505.06	505.06	39.13	151.95	55.90
47)	1.042	13.25	12.98	95.90	511.14	511.14	39.37	152.18	56.28
48)	1.082	13.77	13.06	95.82	517.22	517.22	39.60	152.40	56.58
49)	1.122	14.27	13.14	95.82	520.26	520.26	39.60	152.40	56.58
50)	1.162	14.78	13.22	95.67	526.34	526.34	39.83	152.62	56.95
51)	1.202	15.29	13.30	95.52	532.42	532.42	40.04	152.83	57.31
52)	1.282	16.31	13.46	95.37	541.54	541.54	40.24	153.01	57.65
53)	1.322	16.82	13.54	95.21	547.62	547.62	40.45	153.21	58.00
54)	1.362	17.32	13.62	95.14	550.66	550.66	40.42	153.19	58.05
55)	1.402	17.83	13.71	94.91	556.74	556.74	40.62	153.37	58.46
56)	1.442	18.34	13.79	94.83	562.82	562.82	40.81	153.55	58.72
57)	1.481	18.84	13.88	94.75	568.90	568.90	40.99	153.73	58.98
58)	1.559	19.83	14.05	94.45	574.98	574.98	40.93	153.67	59.22

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic
Project No. : 26814957
Boring No. : VQ-37
Sample No. : 6B
Sample Type : Shelby
Location : Piedmont, CA
Test No. : VQ-37-6B
Test Date : 05/22/05
Depth : 17.0 feet
Elevation : NA
Tested by : S. Capps
Checked by : R. Taraya
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

Liquid Limit : 34.62 Plastic Limit : 17.76 Specific Gravity : 2.761

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-37-6	VQ-37-6
WT CONTAINER + WET SOIL (gm)	3299.80	3242.50
WT CONTAINER + DRY SOIL (gm)	2810.00	2810.00
WT WATER (gm)	489.80	432.50
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	2810.00	2810.00
WATER CONTENT (%)	17.43	15.39

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	17.43	15.39
VOID RATIO	0.50	0.42
WET DENSITY (lb/ft^3)	135.11	139.52
DRY DENSITY (lb/ft^3)	115.06	120.91
DEGREE OF SATURATION (%)	96.76	100.00

Maximum Shear Stress = 19.51 (lb/in^2) at a Vertical Strain of 18.84 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic
Project No. : 26814957
Boring No. : VQ-37
Sample No. : 68
Sample Type : Shelby
Location : Piedmont, CA
Test No. : VQ-37-68
Test Date : 05/22/05
Depth : 17.0 feet
Elevation : NA
Tested by : S. Capps
Checked by : R. Taraya
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

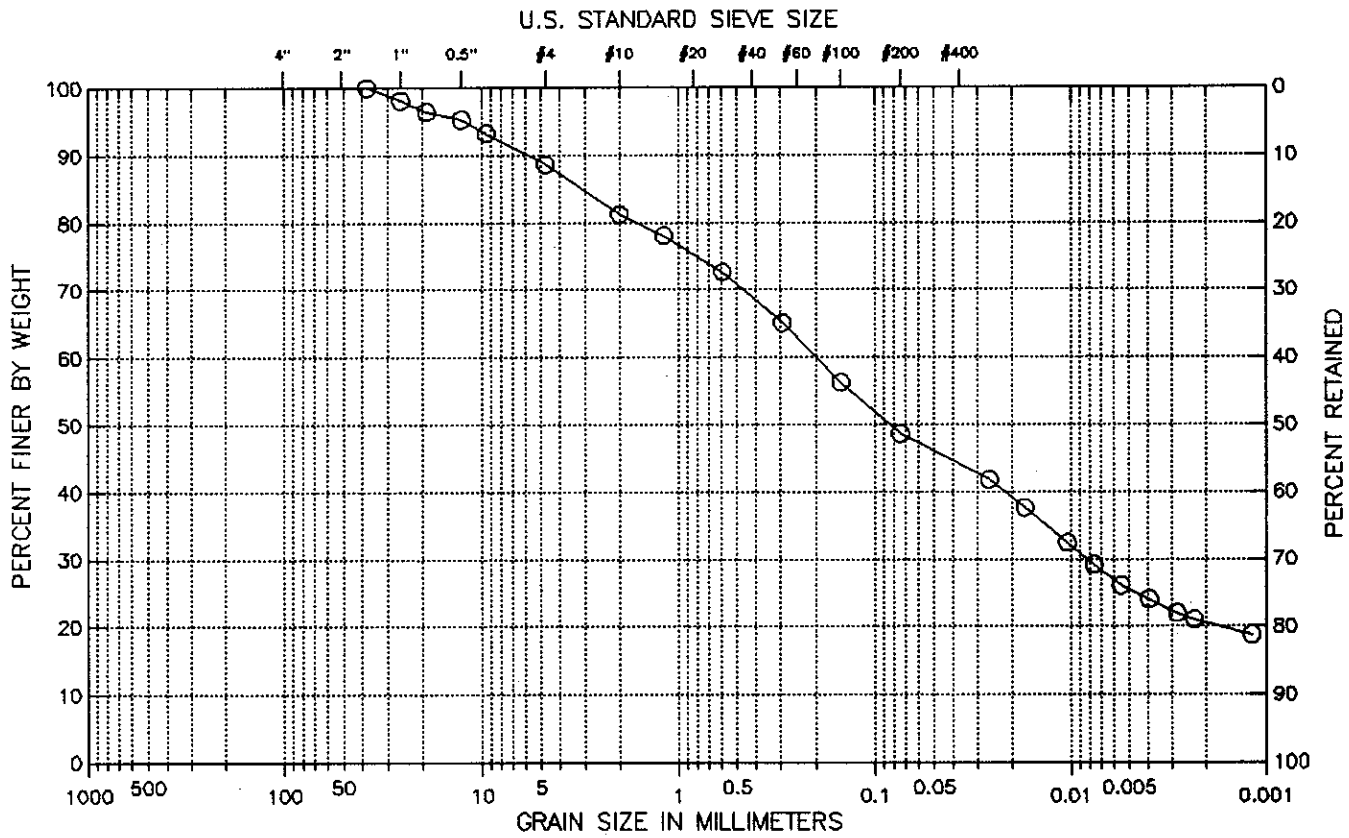
Height : 7.992 (in)
Area : 11.642 (in^2)
Volume : 93.039 (in^3)
Piston Diameter : 0.000 (in)
Piston Friction : 0.00 (lb)
Piston Weight : 0.00 (gm)
Filter Correction : 0.00 (lb/in^2)
Membrane Correction : 0.00 (lb/in)
Area Correction : Uniform

Liquid Limit : 34.62
Plastic Limit : 17.76
Specific Gravity : 2.761

INITIAL		Height : 7.992 (in)	Dry Density : 115.06 (lb/ft^3)			
		Area : 11.642 (in^2)	Moisture : 17.43 %			
		Void Ratio: 0.50				
		Saturation: 96.76 %				
Time : 0.00 (min)						
INITIALIZATION						
dH : 0.000 (in)	Height : 7.992 (in)	Dry Density : 115.06 (lb/ft^3)	Total Vert. Stress : 114.72 (lb/in^
dV : 0.000 (in^3)	Area : 11.642 (in^2)	Moisture : 17.43 %	Total Hori. Stress : 114.72 (lb/in^
	Void Ratio: 0.50		Pore Pressure : 0.00 (lb/in^2)
	Saturation: 96.76 %		Effect.Vert. Stress: 114.72 (lb/in^
Time : 0.00 (min)			Effect.Hori. Stress: 114.72 (lb/in^
END OF CONSOLIDATION - A						
dH : 0.000 (in)	Height : 7.992 (in)	Dry Density : 115.06 (lb/ft^3)	Total Vert. Stress : 114.72 (lb/in^
dV : 0.000 (in^3)	Area : 11.642 (in^2)	Moisture : 17.43 %	Total Hori. Stress : 114.72 (lb/in^
	Void Ratio: 0.50		Pore Pressure : 0.00 (lb/in^2)
	Saturation: 96.76 %		Effect.Vert. Stress: 114.72 (lb/in^
Time : 0.00 (min)			Effect.Hori. Stress: 114.72 (lb/in^
END OF SATURATION						
dH : 0.000 (in)	Height : 7.992 (in)	Dry Density : 115.06 (lb/ft^3)	Total Vert. Stress : 114.72 (lb/in^
dV : 0.000 (in^3)	Area : 11.642 (in^2)	Moisture : 15.39 %	Total Hori. Stress : 114.72 (lb/in^
dVCorr : 0.000 (in^3)	Void Ratio: 0.50		Pore Pressure : 0.00 (lb/in^2)
	Saturation: 85.44 %		Effect.Vert. Stress: 114.72 (lb/in^
Time : 0.00 (min)			Effect.Hori. Stress: 114.72 (lb/in^
END OF CONSOLIDATION - B						
dH : 0.131 (in)	Height : 7.861 (in)	Dry Density : 120.91 (lb/ft^3)	Total Vert. Stress : 114.72 (lb/in^
dV : 4.501 (in^3)	Area : 11.263 (in^2)	Moisture : 15.39 %	Total Hori. Stress : 114.72 (lb/in^
	Void Ratio: 0.42		Pore Pressure : 80.00 (lb/in^2
	Saturation: 100.00 %		Effect.Vert. Stress: 34.72 (lb/in^2
Time : 0.00 (min)			Effect.Hori. Stress: 34.72 (lb/in^2
FAILURE DURING SHEAR						
dH : 1.481 (in)	Height : 6.511 (in)	Dry Density : 120.91 (lb/ft^3)	Total Vert. Stress : 155.71 (lb/in^
dV : 4.501 (in^3)	Area : 13.878 (in^2)	Moisture : 15.39 %	Total Hori. Stress : 114.72 (lb/in^
Strain : 18.84 %	Void Ratio: 0.42		Pore Pressure : 94.75 (lb/in^2
Strength: 20.50 (lb/in^2)	Saturation: 100.00 %		Effect.Vert. Stress: 60.96 (lb/in^2
Time : 1536.87 (min)			Effect.Hori. Stress: 19.97 (lb/in^2
END OF TEST						
dH : 1.559 (in)	Height : 6.433 (in)	Dry Density : 120.91 (lb/ft^3)	Total Vert. Stress : 155.65 (lb/in^
dV : 4.501 (in^3)	Area : 14.048 (in^2)	Moisture : 15.39 %	Total Hori. Stress : 114.72 (lb/in^
Strain : 19.83 %	Void Ratio: 0.42		Pore Pressure : 94.45 (lb/in^2
	Saturation: 100.00 %		Effect.Vert. Stress: 61.20 (lb/in^2
Time : 1598.42 (min)			Effect.Hori. Stress: 20.27 (lb/in^2

URS

	Boring No. : VQ-37 Sample No: 6A middle cut Tested by : R. Taraya Filename : VQ37-06A	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Thu Jun 02 2005



Classification :
(SC) Clayey sand
Visual Description :
Grayish brown clayey sand (SC) with gravel

Remarks :
Depth: 17.0 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 6A middle cut
Location : Piedmont, CA
Depth : 17.0 feet
Test Date : 05/26/2005
Test Method : ASTM D422/4318
Filename : VQ37-06A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 17.0 feet

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 80 gm
Specific Gravity = 2.761

Hydroscopic Moisture Content :
Weight of Wet Soil = 80 gm
Weight of Dry Soil = 77.19 gm
Moisture Content = 0.0364037

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	49.00	21.90	40.57	0.026	42	0.026
5.00	45.00	21.80	36.53	0.017	38	0.017
15.00	40.00	21.70	31.48	0.010	32	0.010
30.00	37.00	21.40	28.34	0.008	29	0.008
60.00	34.00	21.30	25.30	0.005	26	0.005
120.00	32.00	21.50	23.39	0.004	24	0.004
240.00	30.00	21.40	21.34	0.003	22	0.003
360.00	29.00	21.70	20.48	0.002	21	0.002
1440.00	27.00	21.20	18.25	0.001	19	0.001

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 6A middle cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 17.0 feet

Depth : 17.0 feet
Test Date : 05/26/2005
Test Method : ASTM D422/4318

Filename : VQ37-06A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	36.08	36.08	98
0.75"	0.748	19.00	31.05	67.13	96
0.5"	0.500	12.70	22.62	89.75	95
0.375"	0.374	9.51	38.40	128.15	93
#4	0.187	4.75	89.52	217.67	89
#10	0.079	2.00	140.33	358.00	81

Total Dry Weight of Sample = 1962

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#16	0.047	1.19	2.92	2.92	78
#30	0.023	0.60	5.22	8.14	73
#50	0.012	0.30	7.20	15.34	65
#100	0.006	0.15	8.30	23.64	56
#200	0.003	0.07	7.36	31.00	49
Pan			46.19	77.19	0

Total Wet Weight of Sample = 80
Total Dry Weight of Sample = 77.19
Moisture Content = 0.0364037

D85 : 3.1202 mm
D60 : 0.1984 mm
D50 : 0.0840 mm
D30 : 0.0082 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand
AASHTO Group Symbol : A-6(6)
AASHTO Group Name : Clayey Soils

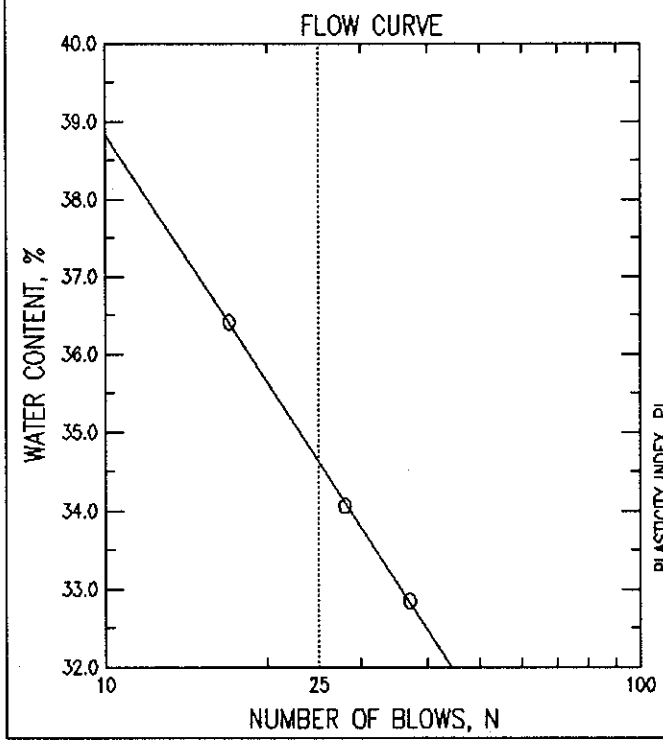
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-37
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	6A middle cut
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown clayey sand (SC) with gravel		Thu Jun 02 2005	VQ37-06A

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	38	37	36		
WT. WET SOIL + TARE	23.32	26.22	26.69		
WT. DRY SOIL + TARE	20.18	22.33	22.66		
WT. WATER	3.14	3.89	4.03		
TARE WT.	10.62	10.91	11.59		
WT. DRY SOIL	9.56	11.42	11.07		
WATER CONTENT, W_N (%)	32.85	34.06	36.40		
NUMBER OF BLOWS, N	37	28	17		
ONE-POINT LIQUID LIMIT, LL	34.44	34.53	34.74		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	33				
WT. WET SOIL + TARE	35.81				
WT. DRY SOIL + TARE	32.02				
WT. WATER	3.79				
TARE WT.	10.68				
WT. DRY SOIL	21.34				
WATER CONTENT (%)	17.76				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	17.2
LIQUID LIMIT, LL	34.6
PLASTIC LIMIT, PL	17.8
PLASTICITY INDEX, PI	16.9
LIQUIDITY INDEX, LI*	-0.04

*LI = (W - PL)/PI

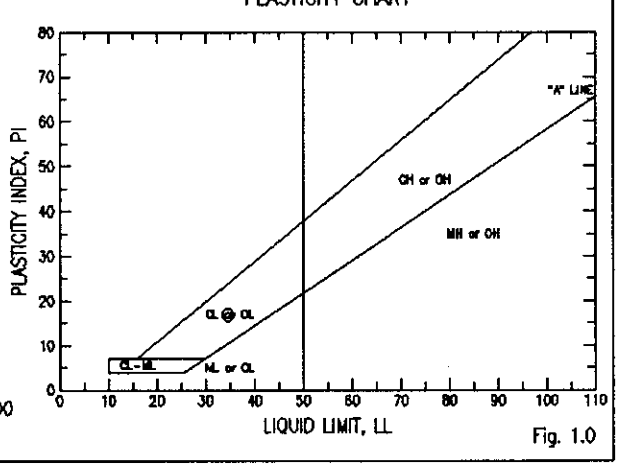


Fig. 1.0

URS

Thu Jun 02 13:46:02 2005

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 6A middle cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 17.0 feet

Depth : 17.0 feet
Test Date : 05/26/2005
Test Method : ASTM D422/4318

Filename : VQ37-06A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 33	10.68	35.81	32.02	17.76

Plastic Limit = 17.76

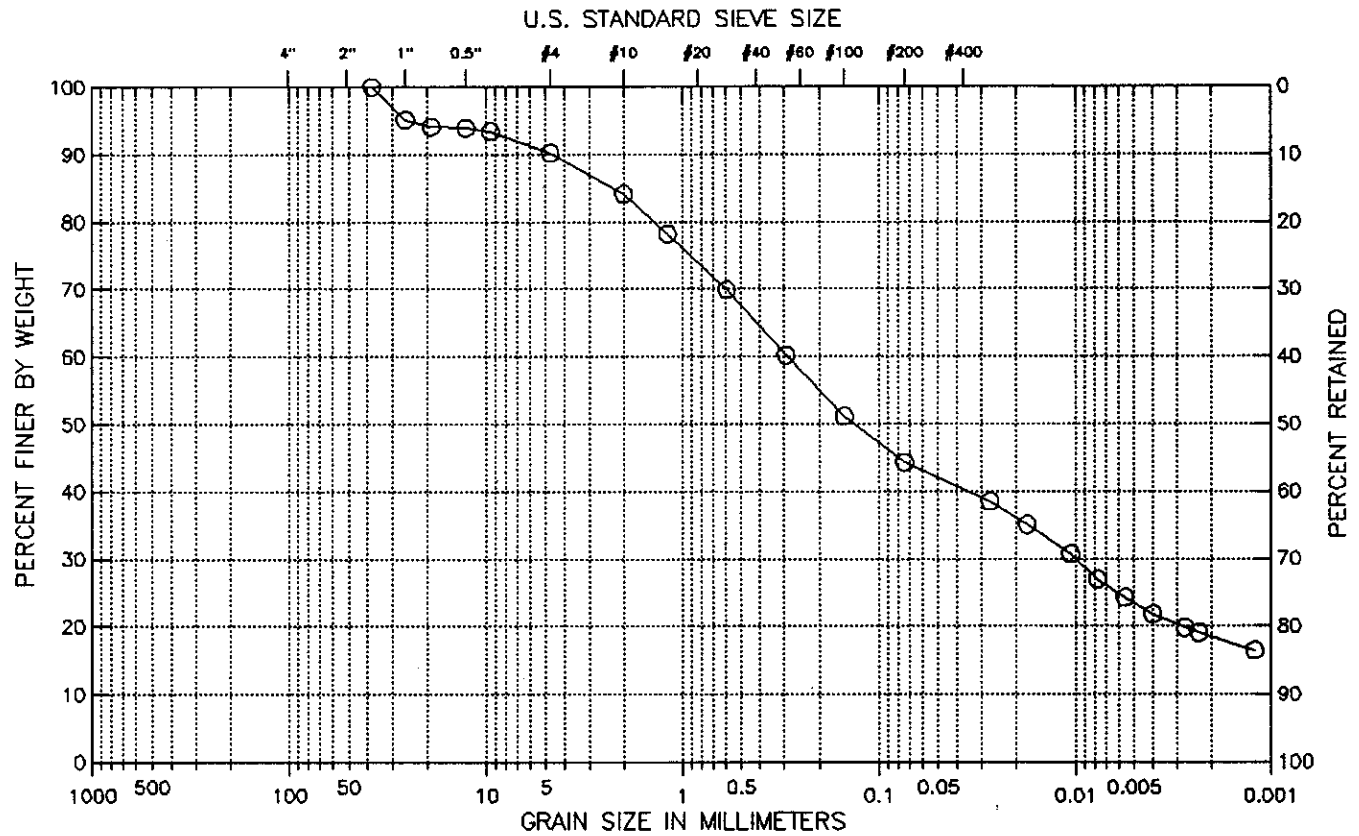
Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 38	10.62	23.32	20.18	37	32.85
2) 37	10.91	26.22	22.33	28	34.06
3) 36	11.59	26.69	22.66	17	36.40

Liquid Limit = 34.62
Plastic Index = 16.86

URS

	Boring No. : VQ-37 Sample No: 6B bottom cut Tested by : R. Taraya Filename : VQ37-06B	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Thu May 26 2005



Classification :
(SC) Clayey sand
Visual Description :
Grayish brown clayey sand (SC) with gravel

Remarks :
Depth: 17.0 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 6B bottom cut
Location : Piedmont, CA
Depth : 17.0 feet
Test Date : 05/26/2005
Test Method : ASTM D422/4318
Filename : VQ37-06B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 17.0 feet

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 80 gm
Specific Gravity = 2.761

Hydroscopic Moisture Content :
Weight of Wet Soil = 80 gm
Weight of Dry Soil = 77.36 gm
Moisture Content = 0.0341262

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	44.20	22.70	36.14	0.027	38	0.027
5.00	41.00	22.60	32.90	0.018	35	0.018
15.00	37.00	22.50	28.85	0.011	31	0.011
30.00	33.60	22.20	25.31	0.008	27	0.008
60.00	31.20	21.90	22.77	0.006	24	0.006
120.00	29.00	21.70	20.48	0.004	22	0.004
263.00	27.00	21.90	18.57	0.003	20	0.003
362.00	26.20	22.20	17.91	0.002	19	0.002
1440.00	24.30	21.10	15.51	0.001	17	0.001

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000 Depth : 17.0 feet
Boring No. : VQ-37 Test Date : 05/26/2005
Sample No. : 6B bottom cut Test Method : ASTM D422/4318
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 17.0 feet

Filename : VQ37-068
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	60.55	60.55	95
0.75"	0.748	19.00	13.48	74.03	94
0.5"	0.500	12.70	2.82	76.85	94
0.375"	0.374	9.51	5.27	82.12	93
#4	0.187	4.75	40.56	122.68	90
#10	0.079	2.00	76.11	198.79	84

Total Dry Weight of Sample = 1292

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#16	0.047	1.19	5.48	5.48	78
#30	0.023	0.60	7.61	13.09	70
#50	0.012	0.30	8.93	22.02	60
#100	0.006	0.15	8.30	30.32	51
#200	0.003	0.07	6.36	36.68	44
Pan			40.68	77.36	0

Total Wet Weight of Sample = 80
Total Dry Weight of Sample = 77.36
Moisture Content = 0.0341262

D85 : 2.2510 mm
D60 : 0.2903 mm
D50 : 0.1322 mm
D30 : 0.0100 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand
AASHTO Group Symbol : A-6(5)
AASHTO Group Name : Clayey Soils

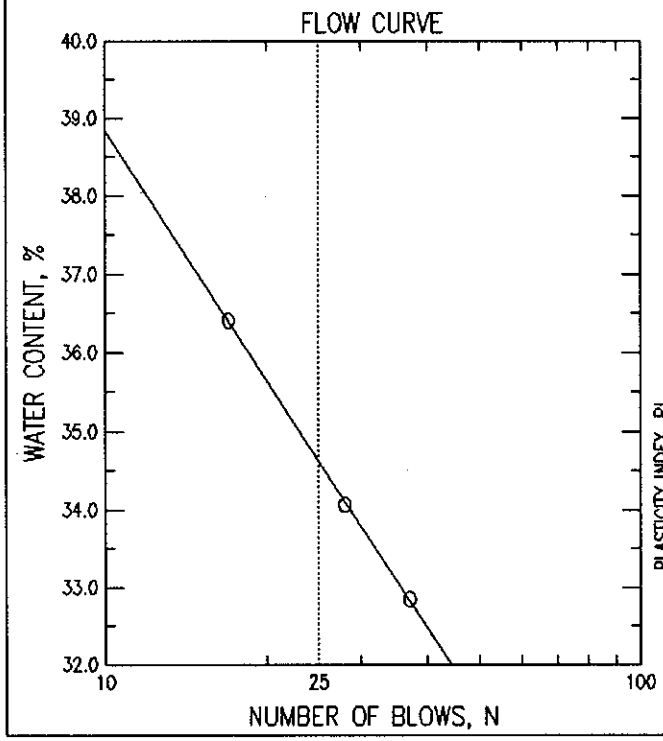
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-37
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	6B bottom cut
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown clayey sand (SC) with gravel		Thu May 26 2005	VQ37-06B

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	38	37	36		
WT. WET SOIL + TARE	23.32	26.22	26.69		
WT. DRY SOIL + TARE	20.18	22.33	22.66		
WT. WATER	3.14	3.89	4.03		
TARE WT.	10.62	10.91	11.59		
WT. DRY SOIL	9.56	11.42	11.07		
WATER CONTENT, W_N (%)	32.85	34.06	36.40		
NUMBER OF BLOWS, N	37	28	17		
ONE-POINT LIQUID LIMIT, LL	34.44	34.53	34.74		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	33				
WT. WET SOIL + TARE	35.81				
WT. DRY SOIL + TARE	32.02				
WT. WATER	3.79				
TARE WT.	10.68				
WT. DRY SOIL	21.34				
WATER CONTENT (%)	17.76				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	17.2
LIQUID LIMIT, LL	34.6
PLASTIC LIMIT, PL	17.8
PLASTICITY INDEX, PI	16.9
LIQUIDITY INDEX, LI*	-0.04

*LI = (W - PL)/PI

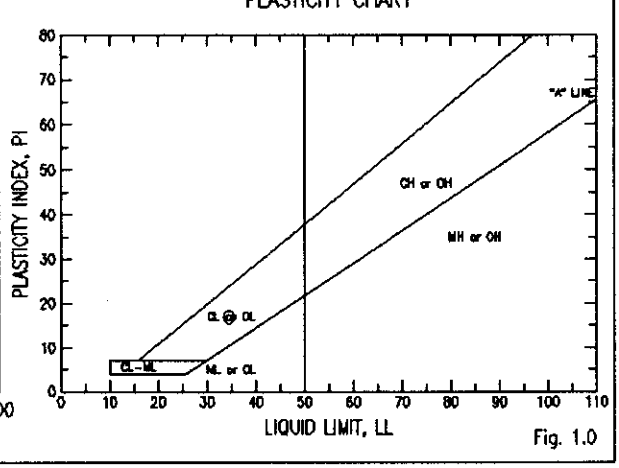


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 6B bottom cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 17.0 feet

Depth : 17.0 feet
Test Date : 05/26/2005
Test Method : ASTM D422/4318

Filename : VQ37-06B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ37-5B	0.00	1365.00	1165.00	17.17

Average Moisture Content = 17.17

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	33	10.68	35.81	32.02	17.76

Plastic Limit = 17.76

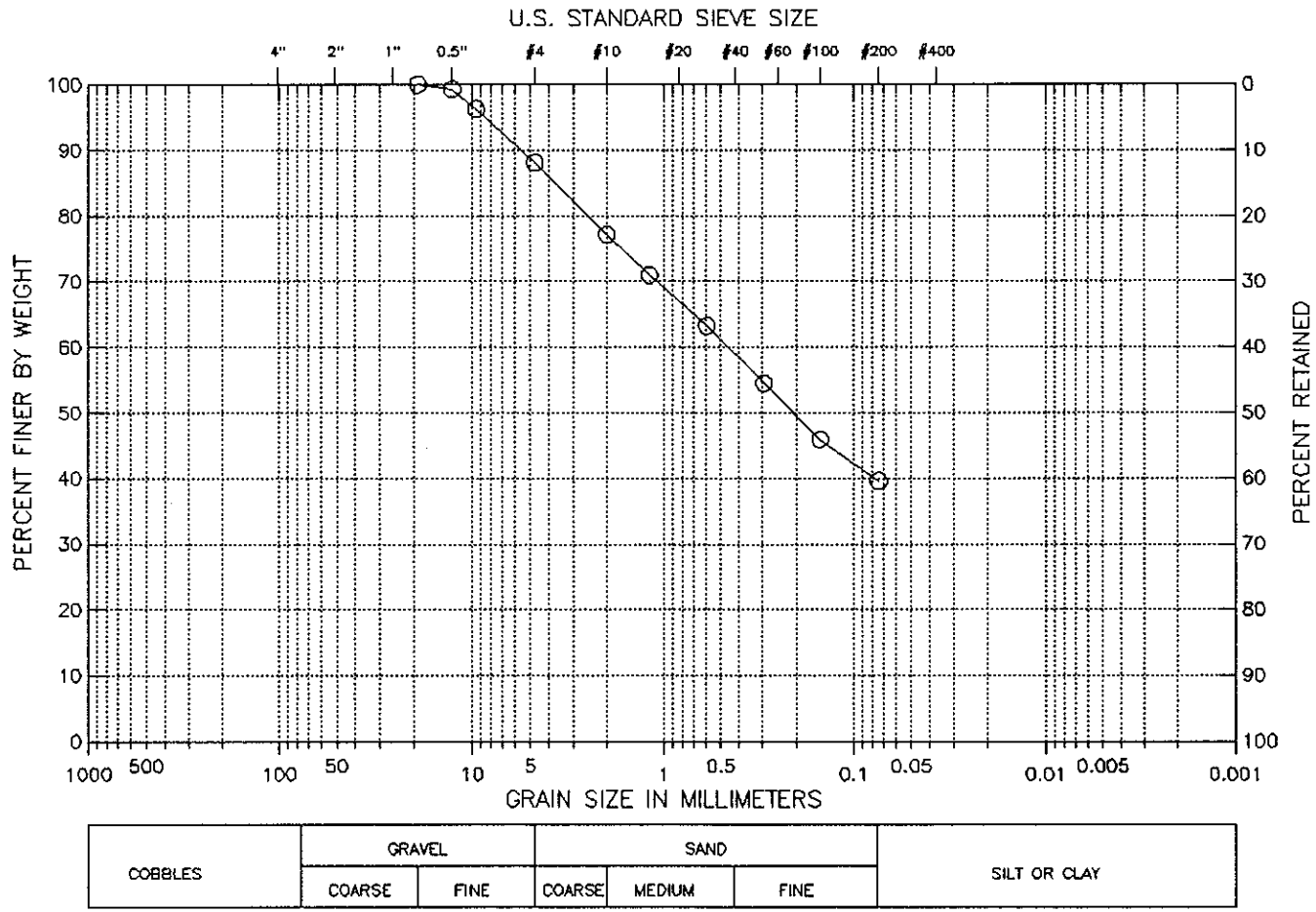
Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	38	10.62	23.32	20.18	37	32.85
2)	37	10.91	26.22	22.33	28	34.06
3)	36	11.59	26.69	22.66	17	36.40

Liquid Limit = 34.62
Plastic Index = 16.86

URS

	Boring No. : VQ-37 Sample No.: 9B Tested by : R. Taraya Filename : VQ37-09B	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Tue May 03 2005



Classification :

Visual Description :
Grayish brown clayey sand

Remarks :
Depth: 28.0 feet

Figure 1

URS

Tue May 03 09:18:47 2005

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 9B
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand
Remarks : Depth: 28.0 feet

Depth : 28.0 feet
Test Date : 05/02/2005
Test Method : ASTM D422

Filename : VQ37-09B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	3.94	3.94	99
0.375"	0.374	9.51	18.76	22.70	96
#4	0.187	4.75	49.64	72.34	88
#10	0.079	2.00	66.71	139.05	77
#16	0.047	1.19	37.87	176.92	71
#30	0.023	0.60	46.78	223.70	63
#50	0.012	0.30	53.60	277.30	54
#100	0.006	0.15	52.14	329.44	46
#200	0.003	0.07	38.36	367.80	40

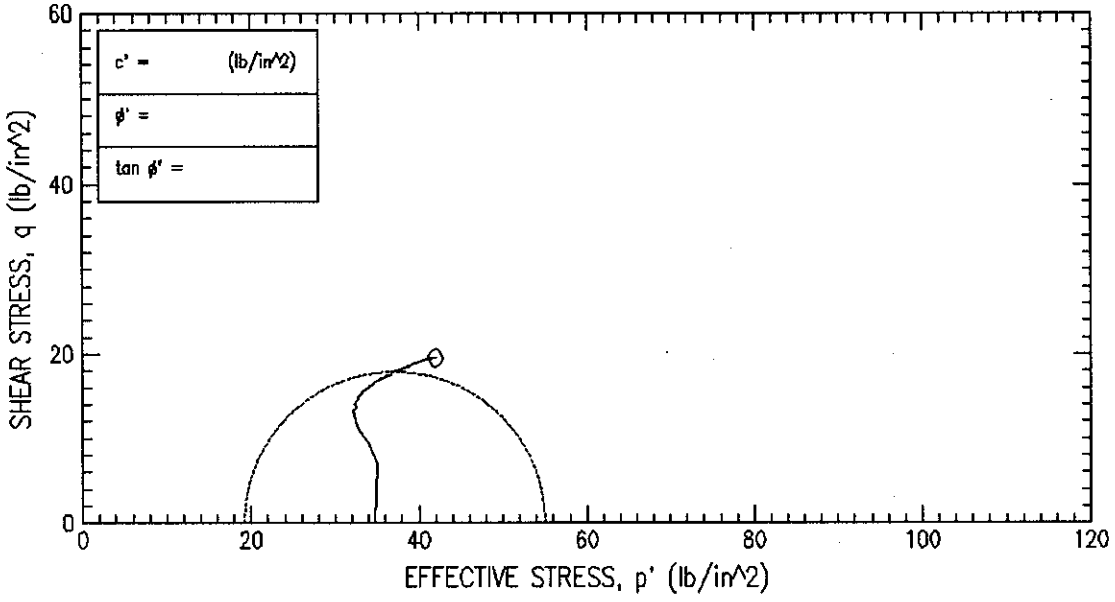
Total Dry Weight of Sample = 609.2

D85 : 3.7110 mm
D60 : 0.4581 mm
D50 : 0.2063 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

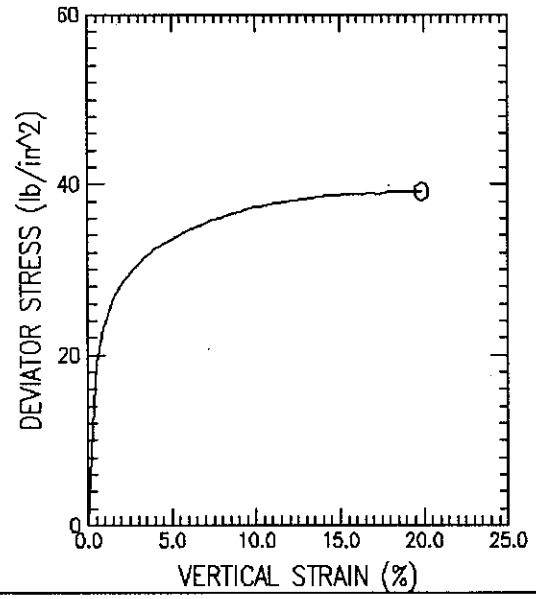
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-37-11



SYMBOL		○			
TEST NO.		VQ-37-11			
INITIAL	WATER CONTENT (%)	17.81			
	DRY DENSITY (lb/ft^3)	114.22			
	SATURATION (%)	97.49			
	VOID RATIO	0.502			
BEFORE SHEAR	WATER CONTENT (%)	16.06			
	DRY DENSITY (lb/ft^3)	119.02			
	SATURATION (%)	99.99			
	VOID RATIO	0.442			
	BACK PRESS. (lb/in^2)	80.00			
MINOR PRIN. STRESS (lb/in^2)		34.72			
MAX. DEV. STRESS (lb/in^2)		40.82			
TIME TO FAILURE (min)		1280.98			
RATE OF STRAIN INCR (%/min)		0.00			
INITIAL DIAMETER (in)		2.86			
INITIAL HEIGHT (in)		5.95			
B-VALUE		96.90			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown sandy clay (CL) with gravel

LL	PL	PI	GS
32.12	18.43	15.69	2.75

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 34.72 psi

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

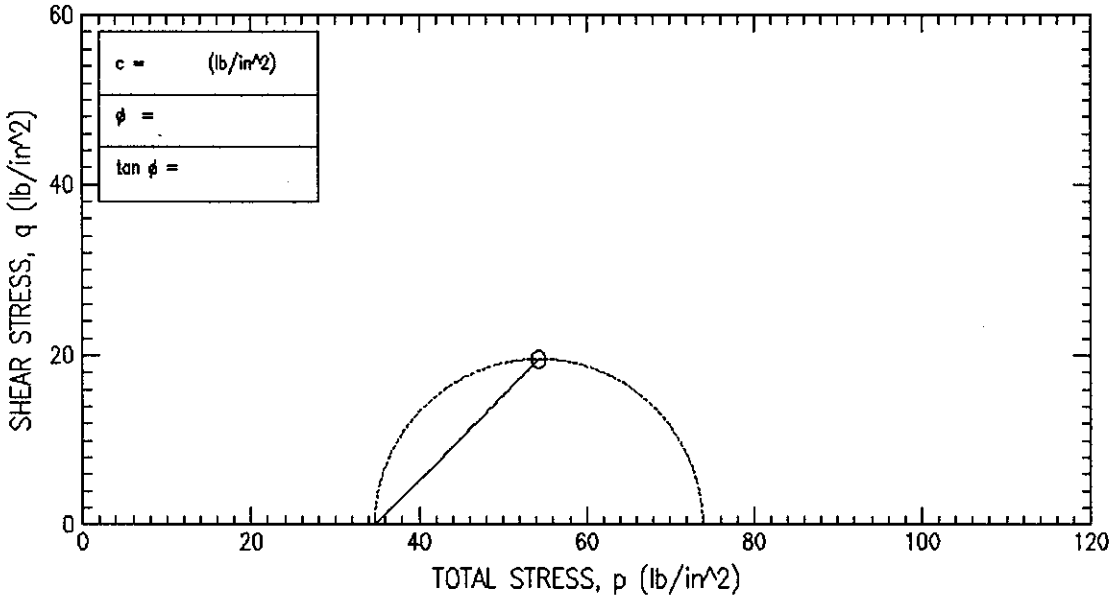
BORING NO. VQ-37	SAMPLE NO.	11			
TECH. S. Capps	DEPTH/ELEV	35.0 feet			
LABORATORY	DATE	05/04/05			

TRIAXIAL COMPRESSION TEST REPORT

Wed 05-11-:5, 11:34:07

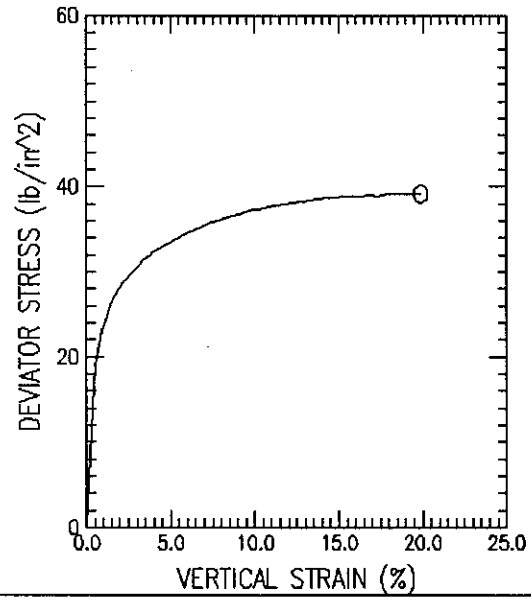
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-37-11



SYMBOL		○				
TEST NO.		VQ-37-11				
INITIAL	WATER CONTENT (%)	17.81				
	DRY DENSITY (lb/ft^3)	114.22				
	SATURATION (%)	97.49				
	VOID RATIO	0.502				
BEFORE SHEAR	WATER CONTENT (%)	16.06				
	DRY DENSITY (lb/ft^3)	119.02				
	SATURATION (%)	99.99				
	VOID RATIO	0.442				
	BACK PRESS. (lb/in^2)	80.00				
MINOR PRIN. STRESS (lb/in^2)		34.72				
MAX. DEV. STRESS (lb/in^2)		40.82				
TIME TO FAILURE (min)		1280.98				
RATE OF STRAIN INCR (%/min)		0.00				
INITIAL DIAMETER (in)		2.86				
INITIAL HEIGHT (in)		5.95				
B-VALUE		96.90				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown sandy clay (CL) with gravel

LL	PL	PI	GS
32.12	16.43	15.69	2.75

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 34.72 psi

PROJECT Estates Dam Seismic Study

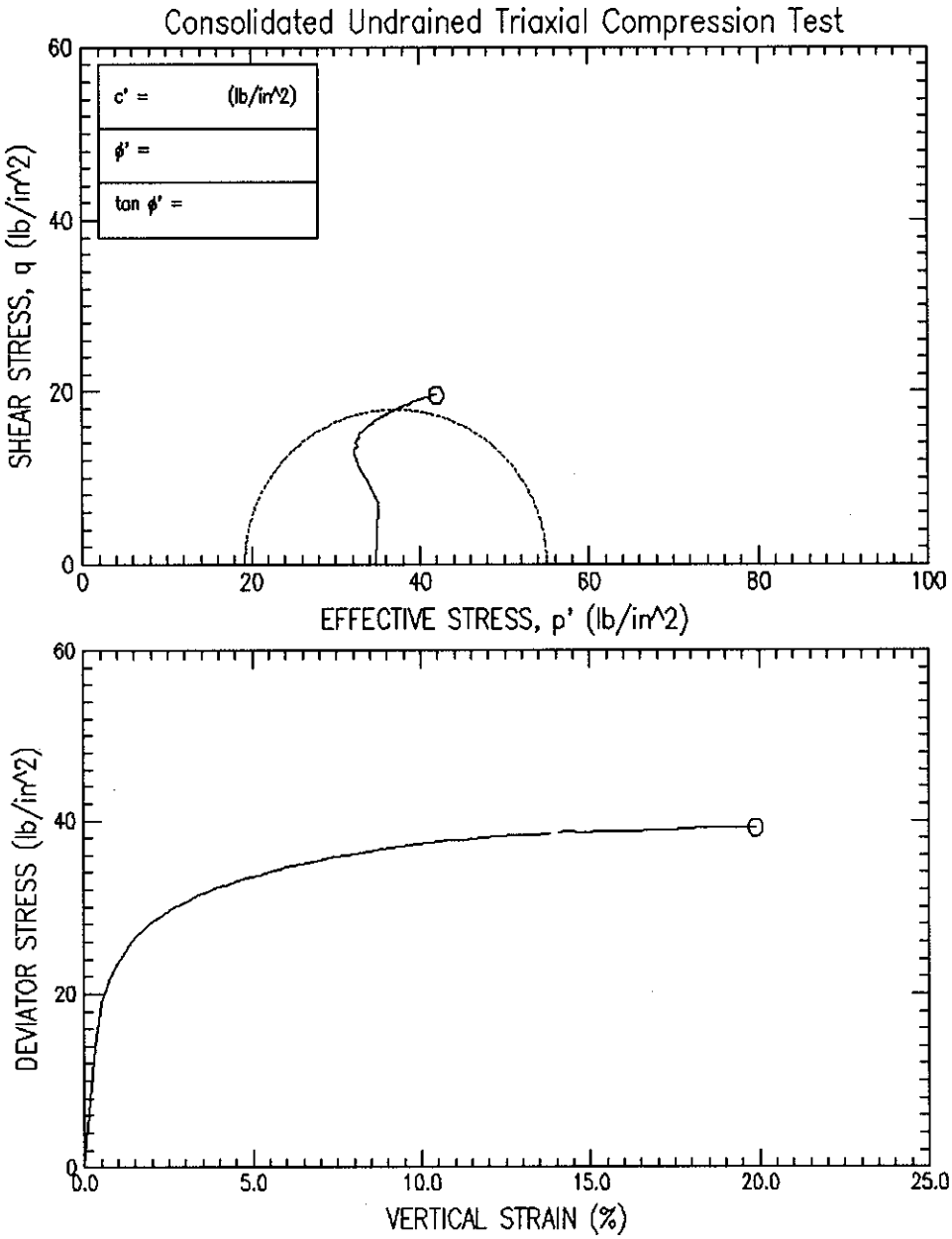
PROJECT NO.26814957

BORING NO. VQ-37	SAMPLE NO.	11	
TECH. S. Capps	DEPTH/ELEV	35.0 feet	
LABORATORY	DATE	05/04/05	

TRIAXIAL COMPRESSION TEST REPORT

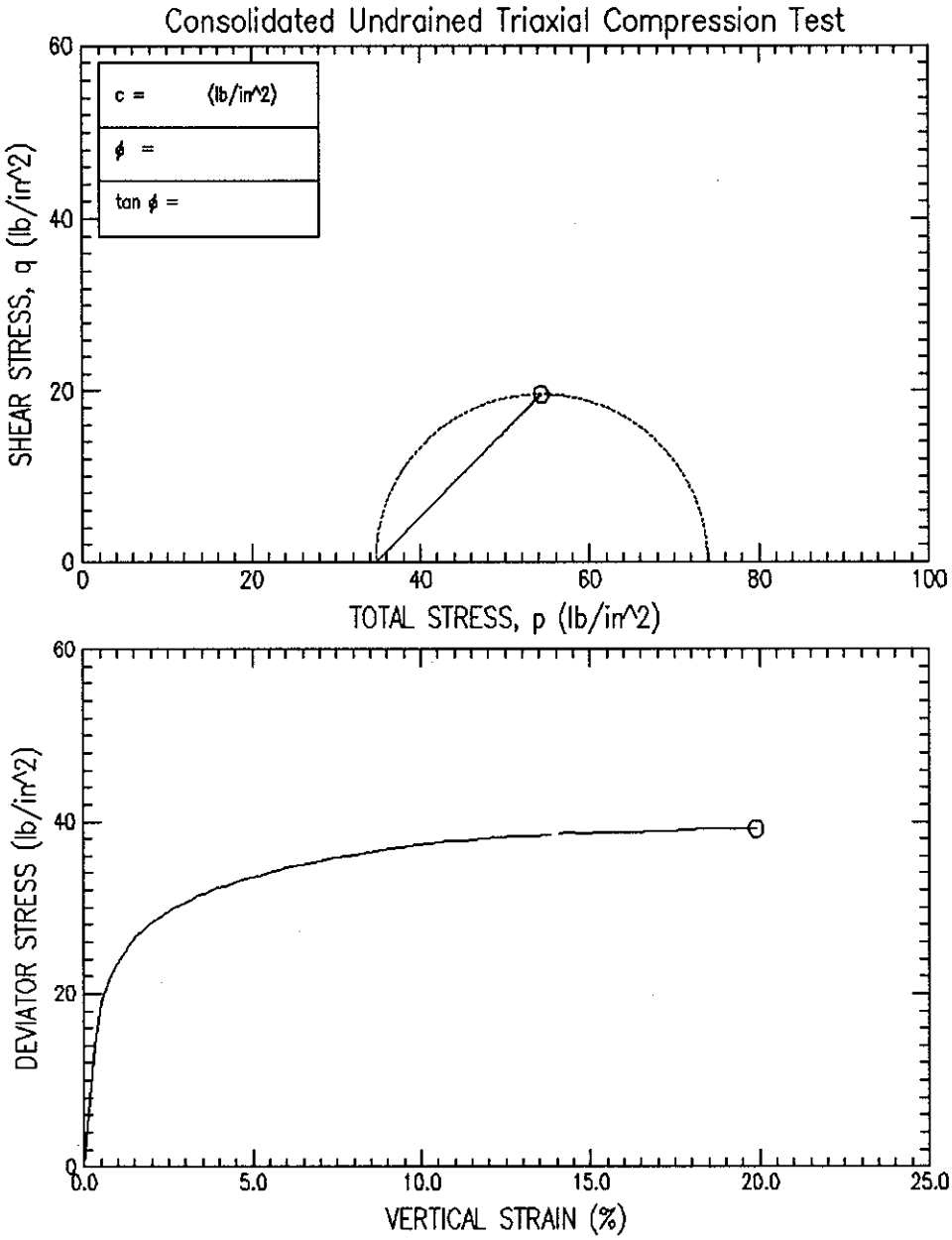
Wed 05-11-:5, 11:33:30

URS



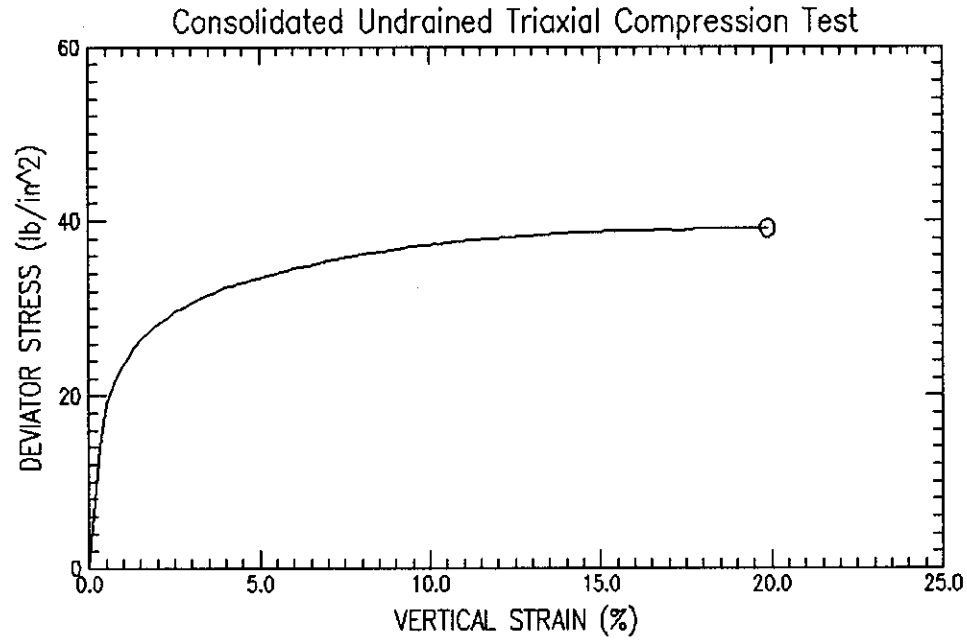
Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-37 Sample No : 11
Test Date : 05/04/05 Test No : VQ-37-11 Depth : 35.0 feet
Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

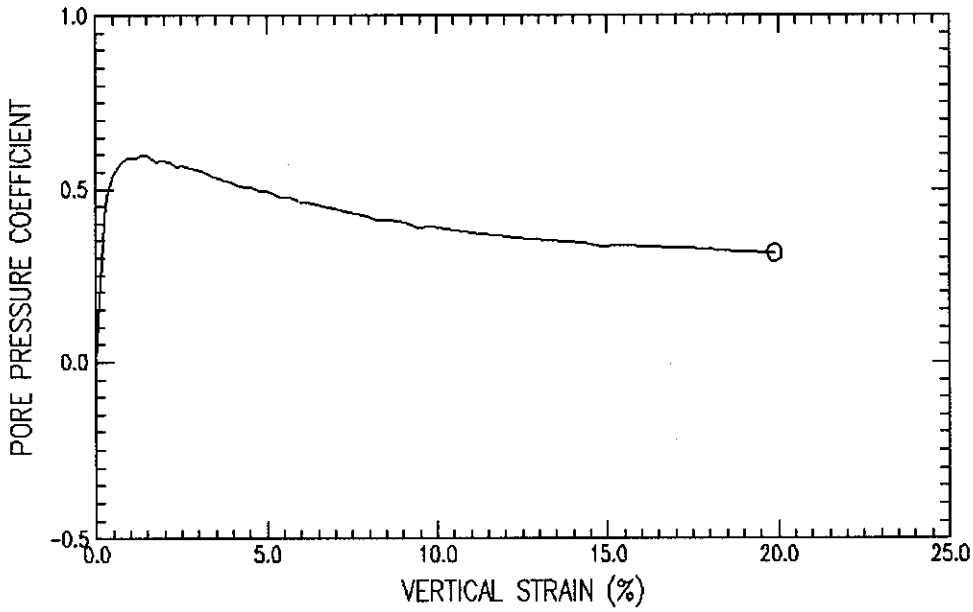
URS



Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-37 Sample No : 11
Test Date : 05/04/05 Test No : VQ-37-11 Depth : 35.0 feet
Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

URS





Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-37 Sample No : 11
Test Date : 05/04/05 Test No : VQ-37-11 Depth : 35.0 feet
Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

URS

Wed May 11 11:35:51 2005

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-11
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 11 Depth : 35.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	114.72	114.72	0.00	0.00	34.72	34.72	1.00	34.72	0.00
2)	0.33	128.75	114.72	6.71	0.48	42.03	28.00	1.50	35.02	7.01
3)	0.53	133.74	114.72	10.31	0.54	43.43	24.41	1.78	33.92	9.51
4)	0.74	136.15	114.72	12.30	0.57	43.85	22.42	1.96	33.13	10.72
5)	0.93	137.78	114.72	13.60	0.59	44.17	21.12	2.09	32.64	11.53
6)	1.14	139.06	114.72	14.37	0.59	44.69	20.35	2.20	32.52	12.17
7)	1.35	140.34	114.72	15.28	0.60	45.05	19.43	2.32	32.24	12.81
8)	1.54	141.28	114.72	15.82	0.60	45.46	18.90	2.41	32.18	13.28
9)	1.74	142.00	114.72	15.74	0.58	46.25	18.97	2.44	32.61	13.64
10)	1.96	142.71	114.72	16.36	0.58	46.35	18.36	2.52	32.36	14.00
11)	2.15	143.31	114.72	16.51	0.58	46.80	18.21	2.57	32.50	14.30
12)	2.35	143.80	114.72	16.43	0.57	47.37	18.28	2.59	32.83	14.54
13)	2.55	144.40	114.72	16.81	0.57	47.58	17.90	2.66	32.74	14.84
14)	2.76	144.77	114.72	16.89	0.56	47.88	17.82	2.69	32.85	15.03
15)	2.96	145.15	114.72	16.89	0.56	48.25	17.82	2.71	33.04	15.21
16)	3.18	145.62	114.72	16.97	0.55	48.65	17.75	2.74	33.20	15.45
17)	3.37	146.10	114.72	16.89	0.54	49.21	17.82	2.76	33.52	15.69
18)	3.57	146.36	114.72	16.81	0.53	49.54	17.90	2.77	33.72	15.82
19)	3.78	146.72	114.72	16.81	0.53	49.90	17.90	2.79	33.90	16.00
20)	3.98	147.09	114.72	16.81	0.52	50.27	17.90	2.81	34.09	16.19
21)	4.18	147.24	114.72	16.59	0.51	50.65	18.13	2.79	34.39	16.26
22)	4.39	147.49	114.72	16.59	0.51	50.90	18.13	2.81	34.51	16.38
23)	4.58	147.74	114.72	16.66	0.50	51.08	18.05	2.83	34.56	16.51
24)	4.79	147.99	114.72	16.51	0.50	51.48	18.21	2.83	34.84	16.64
25)	4.99	148.14	114.72	16.51	0.49	51.62	18.21	2.84	34.91	16.71
26)	5.19	148.38	114.72	16.43	0.49	51.95	18.28	2.84	35.12	16.83
27)	5.40	148.63	114.72	16.20	0.48	52.42	18.51	2.83	35.47	16.95
28)	5.60	148.87	114.72	16.28	0.48	52.59	18.44	2.85	35.51	17.08
29)	5.80	149.01	114.72	16.20	0.47	52.81	18.51	2.85	35.66	17.15
30)	6.01	149.36	114.72	15.97	0.46	53.38	18.74	2.85	36.06	17.32
31)	6.21	149.50	114.72	16.05	0.46	53.44	18.67	2.86	36.05	17.39
32)	6.61	149.76	114.72	15.74	0.45	54.02	18.97	2.85	36.49	17.52
33)	7.02	150.13	114.72	15.67	0.44	54.46	19.05	2.86	36.76	17.71
34)	7.42	150.50	114.72	15.51	0.43	54.98	19.20	2.86	37.09	17.89
35)	7.83	150.76	114.72	15.36	0.43	55.39	19.35	2.86	37.37	18.02
36)	8.23	151.01	114.72	14.90	0.41	56.10	19.81	2.83	37.96	18.15
37)	8.64	151.26	114.72	14.98	0.41	56.28	19.74	2.85	38.01	18.27
38)	9.05	151.50	114.72	14.82	0.40	56.68	19.89	2.85	38.28	18.39
39)	9.45	151.75	114.72	14.37	0.39	57.38	20.35	2.82	38.86	18.51
40)	9.86	151.98	114.72	14.60	0.39	57.38	20.12	2.85	38.75	18.63
41)	10.26	152.12	114.72	14.37	0.38	57.75	20.35	2.84	39.05	18.70
42)	10.77	152.41	114.72	14.21	0.38	58.19	20.50	2.84	39.35	18.84
43)	11.28	152.49	114.72	13.98	0.37	58.51	20.73	2.82	39.62	18.89
44)	11.79	152.67	114.72	13.91	0.37	58.76	20.81	2.82	39.79	18.98
45)	12.29	152.85	114.72	13.68	0.36	59.17	21.04	2.81	40.10	19.06
46)	12.80	153.02	114.72	13.60	0.36	59.42	21.12	2.81	40.27	19.15
47)	13.30	153.09	114.72	13.45	0.35	59.64	21.27	2.80	40.45	19.19
48)	13.81	153.25	114.72	13.37	0.35	59.88	21.34	2.81	40.61	19.27
49)	14.31	153.41	114.72	13.29	0.34	60.11	21.42	2.81	40.77	19.35
50)	14.83	153.37	114.72	12.91	0.33	60.46	21.80	2.77	41.13	19.33
51)	15.33	153.52	114.72	13.06	0.34	60.45	21.65	2.79	41.05	19.40
52)	16.34	153.53	114.72	12.91	0.33	60.61	21.80	2.78	41.21	19.40
53)	16.85	153.67	114.72	12.83	0.33	60.83	21.88	2.78	41.35	19.47
54)	17.36	153.61	114.72	12.76	0.33	60.85	21.96	2.77	41.40	19.45
55)	17.87	153.84	114.72	12.76	0.33	61.07	21.96	2.78	41.51	19.56
56)	18.37	153.87	114.72	12.61	0.32	61.26	22.11	2.77	41.68	19.57
57)	18.89	153.90	114.72	12.45	0.32	61.44	22.26	2.76	41.85	19.59
58)	19.89	153.86	114.72	12.30	0.31	61.56	22.42	2.75	41.99	19.57

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-11
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 11 Depth : 35.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	6.25	80.00	0.00	0.00	0.00	114.72	34.72
2)	0.019	0.33	6.27	86.72	91.67	91.67	14.62	128.75	42.03
3)	0.031	0.53	6.28	90.31	124.55	124.55	19.82	133.74	43.43
4)	0.043	0.74	6.30	92.30	140.63	140.63	22.33	136.15	43.85
5)	0.055	0.93	6.31	93.60	151.59	151.59	24.03	137.78	44.17
6)	0.067	1.14	6.32	94.37	160.36	160.36	25.36	139.06	44.69
7)	0.079	1.35	6.34	95.29	169.13	169.13	26.69	140.34	45.05
8)	0.091	1.54	6.35	95.82	175.71	175.71	27.68	141.28	45.46
9)	0.102	1.74	6.36	95.75	180.83	180.83	28.43	142.00	46.25
10)	0.115	1.96	6.38	96.36	185.94	185.94	29.17	142.71	46.35
11)	0.126	2.15	6.39	96.51	190.33	190.33	29.80	143.31	46.80
12)	0.138	2.35	6.40	96.44	193.98	193.98	30.31	143.80	47.37
13)	0.150	2.55	6.41	96.82	198.37	198.37	30.93	144.40	47.58
14)	0.162	2.76	6.43	96.90	201.29	201.29	31.32	144.77	47.88
15)	0.174	2.96	6.44	96.90	204.21	204.21	31.71	145.15	48.25
16)	0.186	3.18	6.46	96.97	207.87	207.87	32.20	145.62	48.65
17)	0.198	3.37	6.47	96.90	211.52	211.52	32.70	146.10	49.21
18)	0.210	3.57	6.48	96.82	213.71	213.71	32.97	146.36	49.54
19)	0.222	3.78	6.50	96.82	216.64	216.64	33.35	146.72	49.90
20)	0.233	3.98	6.51	96.82	219.56	219.56	33.73	147.09	50.27
21)	0.245	4.18	6.52	96.59	221.02	221.02	33.88	147.24	50.65
22)	0.257	4.39	6.54	96.59	223.21	223.21	34.14	147.49	50.90
23)	0.269	4.58	6.55	96.67	225.41	225.41	34.41	147.74	51.08
24)	0.281	4.79	6.57	96.51	227.60	227.60	34.67	147.99	51.48
25)	0.293	4.99	6.58	96.51	229.06	229.06	34.82	148.14	51.62
26)	0.304	5.19	6.59	96.44	231.25	231.25	35.08	148.38	51.95
27)	0.317	5.40	6.61	96.21	233.45	233.45	35.33	148.63	52.42
28)	0.329	5.60	6.62	96.28	235.64	235.64	35.59	148.87	52.59
29)	0.340	5.80	6.64	96.21	237.10	237.10	35.73	149.01	52.81
30)	0.352	6.01	6.65	95.98	240.02	240.02	36.09	149.36	53.38
31)	0.364	6.21	6.66	96.05	241.49	241.49	36.24	149.50	53.44
32)	0.388	6.61	6.69	95.75	244.41	244.41	36.52	149.76	54.02
33)	0.412	7.02	6.72	95.67	248.06	248.06	36.90	150.13	54.46
34)	0.435	7.42	6.75	95.52	251.72	251.72	37.28	150.50	54.98
35)	0.459	7.83	6.78	95.37	254.64	254.64	37.55	150.76	55.39
36)	0.483	8.23	6.81	94.91	257.56	257.56	37.82	151.01	56.10
37)	0.507	8.64	6.84	94.98	260.49	260.49	38.07	151.26	56.28
38)	0.531	9.05	6.87	94.83	263.41	263.41	38.33	151.50	56.68
39)	0.554	9.45	6.90	94.37	266.33	266.33	38.58	151.75	57.38
40)	0.578	9.86	6.93	94.60	269.26	269.26	38.83	151.98	57.38
41)	0.602	10.26	6.97	94.37	271.45	271.45	38.97	152.12	57.75
42)	0.632	10.77	7.01	94.22	275.10	275.10	39.27	152.41	58.19
43)	0.661	11.28	7.05	93.99	277.30	277.30	39.36	152.49	58.51
44)	0.691	11.79	7.09	93.91	280.22	280.22	39.55	152.67	58.76
45)	0.721	12.29	7.13	93.68	283.14	283.14	39.73	152.85	59.17
46)	0.750	12.80	7.17	93.60	286.07	286.07	39.91	153.02	59.42
47)	0.780	13.30	7.21	93.45	288.26	288.26	39.98	153.09	59.64
48)	0.810	13.81	7.25	93.38	291.18	291.18	40.15	153.25	59.88
49)	0.839	14.31	7.29	93.30	294.11	294.11	40.32	153.41	60.11
50)	0.869	14.83	7.34	92.92	295.57	295.57	40.28	153.37	60.46
51)	0.899	15.33	7.38	93.07	298.49	298.49	40.43	153.52	60.45
52)	0.958	16.34	7.47	92.92	302.14	302.14	40.44	153.53	60.61
53)	0.988	16.85	7.52	92.84	305.07	305.07	40.58	153.67	60.83
54)	1.018	17.36	7.56	92.76	306.53	306.53	40.53	153.61	60.85
55)	1.048	17.87	7.61	92.76	310.18	310.18	40.76	153.84	61.07
56)	1.077	18.37	7.66	92.61	312.38	312.38	40.79	153.87	61.26
57)	1.108	18.89	7.71	92.46	314.57	314.57	40.82	153.90	61.44
58)	1.166	19.89	7.80	92.30	318.22	318.22	40.79	153.86	61.56

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-11
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 11 Depth : 35.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

Liquid Limit : 32.12 Plastic Limit : 16.43 Specific Gravity : 2.75

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-37-11	VQ-37-11
WT CONTAINER + WET SOIL (gm)	1349.00	1329.00
WT CONTAINER + DRY SOIL (gm)	1145.05	1145.05
WT WATER (gm)	203.95	183.95
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	1145.05	1145.05
WATER CONTENT (%)	17.81	16.06

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	17.81	16.06
VOID RATIO	0.50	0.44
WET DENSITY (lb/ft^3)	134.56	138.14
DRY DENSITY (lb/ft^3)	114.22	119.02
DEGREE OF SATURATION (%)	97.49	99.99

Maximum Shear Stress = 19.59 (lb/in^2) at a Vertical Strain of 18.89 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-37-11
Boring No. : VQ-37 Test Date : 05/04/05 Tested by : S. Capps
Sample No. : 11 Depth : 35.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 34.72 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 32.12 Plastic Limit : 16.43 Specific Gravity : 2.75

INITIAL
Height : 5.945 (in) Dry Density : 114.22 (lb/ft^3)
Area : 6.424 (in^2) Moisture : 17.81 %
Void Ratio: 0.50
Saturation: 97.49 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 114.22 (lb/ft^3) Total Vert. Stress : 114.72 (lb/in^
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 17.81 % Total Hori. Stress : 114.72 (lb/in^
Void Ratio: 0.50 Pore Pressure : 0.00 (lb/in^2)
Saturation: 97.49 % Effect.Vert. Stress: 114.72 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 114.72 (lb/in^

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 114.22 (lb/ft^3) Total Vert. Stress : 114.72 (lb/in^
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 17.81 % Total Hori. Stress : 114.72 (lb/in^
Void Ratio: 0.50 Pore Pressure : 0.00 (lb/in^2)
Saturation: 97.49 % Effect.Vert. Stress: 114.72 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 114.72 (lb/in^

END OF SATURATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 114.22 (lb/ft^3) Total Vert. Stress : 114.72 (lb/in^
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 16.06 % Total Hori. Stress : 114.72 (lb/in^
dVCorr : 0.000 (in^3) Void Ratio: 0.50 Pore Pressure : 0.00 (lb/in^2)
Saturation: 87.93 % Effect.Vert. Stress: 114.72 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 114.72 (lb/in^

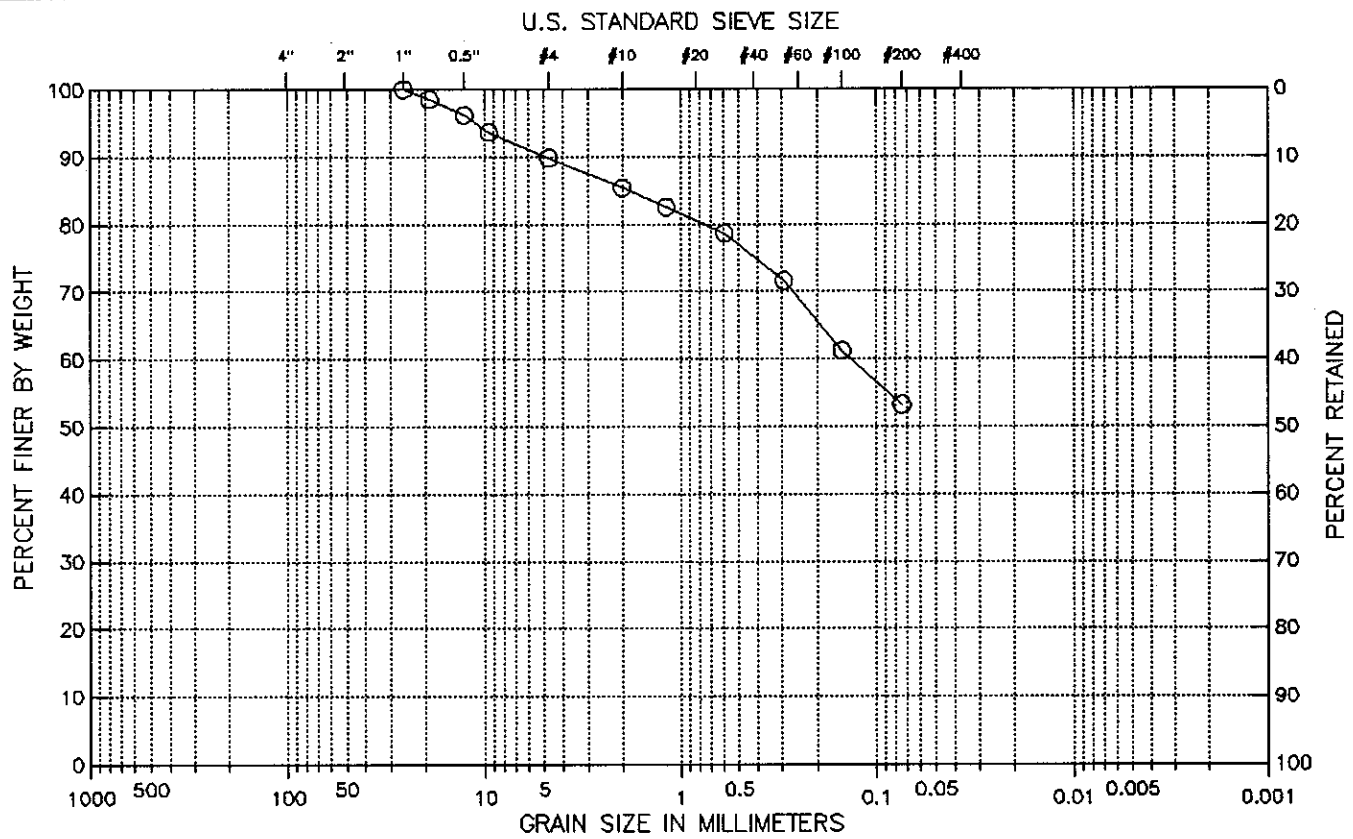
END OF CONSOLIDATION - B
dH : 0.081 (in) Height : 5.864 (in) Dry Density : 119.02 (lb/ft^3) Total Vert. Stress : 114.72 (lb/in^
dV : 1.540 (in^3) Area : 6.250 (in^2) Moisture : 16.06 % Total Hori. Stress : 114.72 (lb/in^
Void Ratio: 0.44 Pore Pressure : 80.00 (lb/in^2
Saturation: 99.99 % Effect.Vert. Stress: 34.72 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 34.72 (lb/in^2

FAILURE DURING SHEAR
dH : 1.108 (in) Height : 4.837 (in) Dry Density : 119.02 (lb/ft^3) Total Vert. Stress : 155.54 (lb/in^
dV : 1.540 (in^3) Area : 7.706 (in^2) Moisture : 16.06 % Total Hori. Stress : 114.72 (lb/in^
Strain : 18.89 % Void Ratio: 0.44 Pore Pressure : 92.46 (lb/in^2
Strength: 20.41 (lb/in^2) Saturation: 99.99 % Effect.Vert. Stress: 63.09 (lb/in^2
Time : 1280.98 (min) Effect.Hori. Stress: 22.26 (lb/in^2

END OF TEST
dH : 1.166 (in) Height : 4.779 (in) Dry Density : 119.02 (lb/ft^3) Total Vert. Stress : 155.51 (lb/in^
dV : 1.540 (in^3) Area : 7.802 (in^2) Moisture : 16.06 % Total Hori. Stress : 114.72 (lb/in^
Strain : 19.89 % Void Ratio: 0.44 Pore Pressure : 92.30 (lb/in^2
Saturation: 99.99 % Effect.Vert. Stress: 63.20 (lb/in^2
Time : 1350.42 (min) Effect.Hori. Stress: 22.42 (lb/in^2

URS

	Boring No. : VQ-37 Sample No: 11 Tested by : R. Taraya Filename : VQ37-011	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Wed May 11 2005



Classification :
(CL) Sandy lean clay
Visual Description :
Grayish brown sandy clay (CL) with gravel

Remarks :
Depth: 35.0 feet

Figure 1

URS

Wed May 11 11:30:51 2005

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 11
Location : Piedmont, CA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : Depth: 35.0 feet

Depth : 35.0 feet
Test Date : 05/10/2005
Test Method : ASTM D422/4318

Filename : VQ37-011
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	11.53	11.53	99
0.5"	0.500	12.70	19.35	30.88	96
0.375"	0.374	9.51	20.86	51.74	94
#4	0.187	4.75	30.63	82.37	90
#10	0.079	2.00	36.26	118.63	85
#16	0.047	1.19	22.92	141.55	83
#30	0.023	0.60	31.26	172.81	79
#50	0.012	0.30	57.59	230.40	72
#100	0.006	0.15	83.90	314.30	61
#200	0.003	0.07	65.20	379.50	53

Total Dry Weight of Sample = 811

D85 : 1.8678 mm
D60 : 0.1337 mm
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : CL
ASTM Group Name : Sandy lean clay
AASHTO Group Symbol : A-6(6)
AASHTO Group Name : Clayey Soils

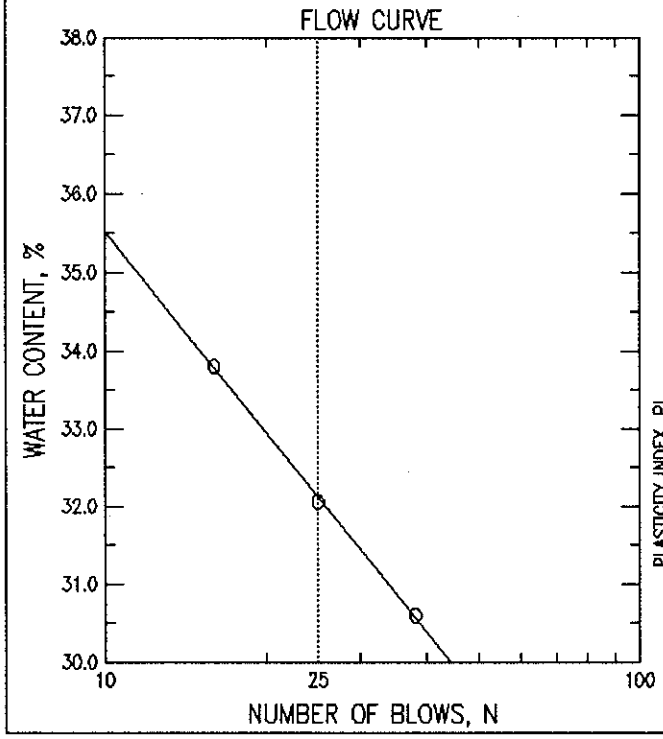
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-37
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	11
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown sandy clay (CL) with gravel		Wed May 11 2005	VQ37-011

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	84	80	71		
WT. WET SOIL + TARE	26.29	26.01	26.02		
WT. DRY SOIL + TARE	22.71	22.33	22.16		
WT. WATER	3.58	3.68	3.86		
TARE WT.	11.01	10.85	10.74		
WT. DRY SOIL	11.7	11.48	11.42		
WATER CONTENT, W_N (%)	30.60	32.06	33.80		
NUMBER OF BLOWS, N	38	25	16		
ONE-POINT LIQUID LIMIT, LL	32.19	32.06	32.02		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	60				
WT. WET SOIL + TARE	36.57				
WT. DRY SOIL + TARE	33.05				
WT. WATER	3.52				
TARE WT.	11.63				
WT. DRY SOIL	21.42				
WATER CONTENT (%)	16.43				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	18.2
LIQUID LIMIT, LL	32.1
PLASTIC LIMIT, PL	16.4
PLASTICITY INDEX, PI	15.7
LIQUIDITY INDEX, LI*	0.12

*LI = (W - PL)/PI

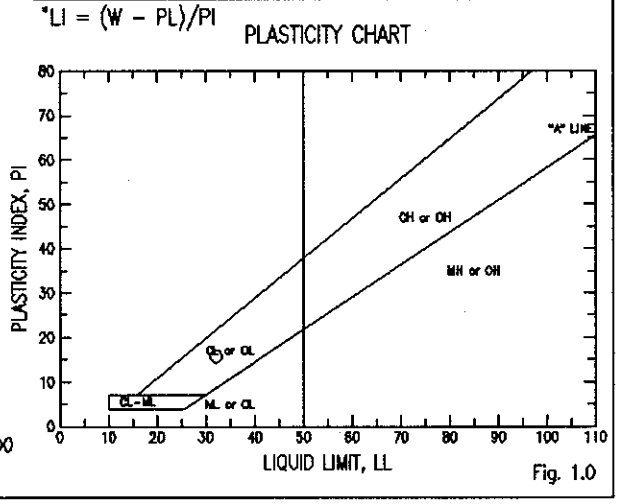


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 11
Location : Piedmont, CA
Soil Description : Grayish brown sandy clay (CL) with gravel
Remarks : Depth: 35.0 feet

Depth : 35.0 feet
Test Date : 05/10/2005
Test Method : ASTM D422/4318

Filename : VQ37-011
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ37-11	0.00	1349.00	1140.85	18.25

Average Moisture Content = 18.25

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 60	11.63	36.57	33.05	16.43

Plastic Limit = 16.43

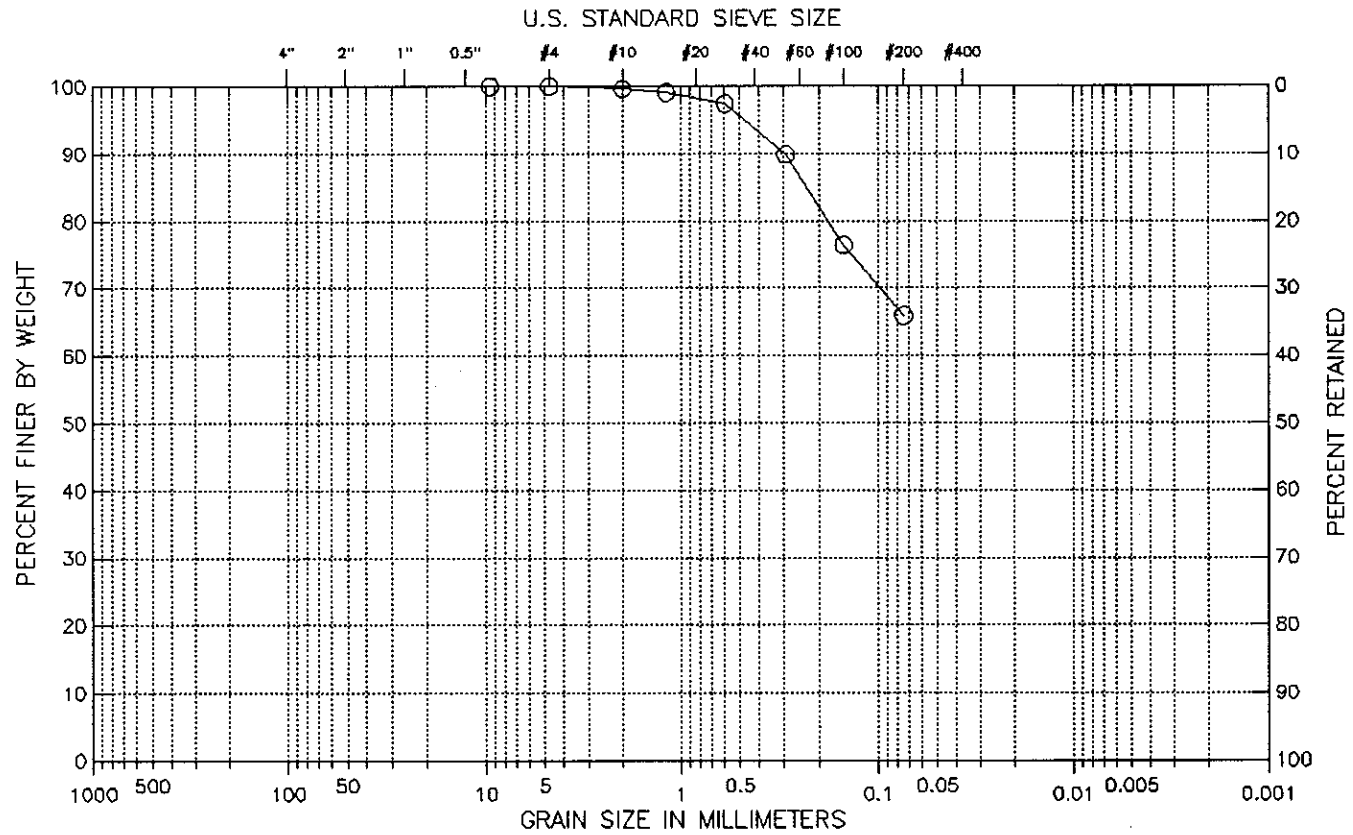
Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 84	11.01	26.29	22.71	38	30.60
2) 80	10.85	26.01	22.33	25	32.06
3) 71	10.74	26.02	22.16	16	33.80

Liquid Limit = 32.12
Plastic Index = 15.68

URS

	Boring No. : VQ-37 Sample No: 12B Tested by : R. Taraya Filename : VQ37-12B	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Tue May 03 2005



Classification :
(CL) Sandy lean clay
Visual Description :
Brown sandy clay (CL)

Remarks :
Depth: 38.5 feet

Figure 1

URS

Tue May 03 09:18:48 2005

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 12B
Location : Piedmont, CA
Soil Description : Brown sandy clay (CL)
Remarks : Depth: 38.5 feet

Depth : 38.5 feet
Test Date : 05/02/2005
Test Method : ASTM D422/4318

Filename : VQ37-12B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.14	0.14	100
#10	0.079	2.00	1.64	1.78	100
#16	0.047	1.19	2.01	3.79	99
#30	0.023	0.60	7.28	11.07	97
#50	0.012	0.30	31.97	43.04	90
#100	0.006	0.15	57.04	100.08	76
#200	0.003	0.07	44.59	144.67	66

Total Dry Weight of Sample = 424.4

D85 : 0.2305 mm
D60 : N/A
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

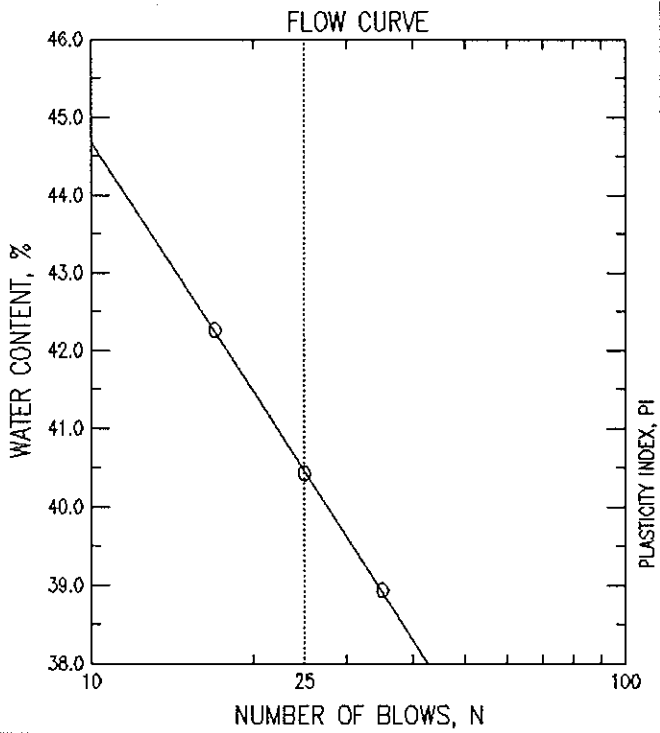
Soil Classification
ASTM Group Symbol : CL
ASTM Group Name : Sandy lean clay
AASHTO Group Symbol : A-7-6(14)
AASHTO Group Name : Clayey Soils

URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-37
LOCATION Piedmont, CA		CHECKED BY S. Capps	SAMPLE NUMBER 12B
SAMPLE DESCRIPTION Brown sandy clay (CL)		DATE Tue May 03 2005	FILENAME VQ37-12B

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	84	85	86		
WT. WET SOIL + TARE	26.65	26.52	26.45		
WT. DRY SOIL + TARE	22.27	21.98	21.81		
WT. WATER	4.38	4.54	4.64		
TARE WT.	11.02	10.75	10.83		
WT. DRY SOIL	11.25	11.23	10.98		
WATER CONTENT, W_N (%)	38.93	40.43	42.26		
NUMBER OF BLOWS, N	35	25	17		
ONE-POINT LIQUID LIMIT, LL	40.55	40.43	40.33		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	48				
WT. WET SOIL + TARE	39.23				
WT. DRY SOIL + TARE	34.8				
WT. WATER	4.43				
TARE WT.	10.85				
WT. DRY SOIL	23.95				
WATER CONTENT (%)	18.50				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	20.4
LIQUID LIMIT, LL	40.5
PLASTIC LIMIT, PL	18.5
PLASTICITY INDEX, PI	22.0
LIQUIDITY INDEX, LI*	0.08

*LI = (W - PL)/PI

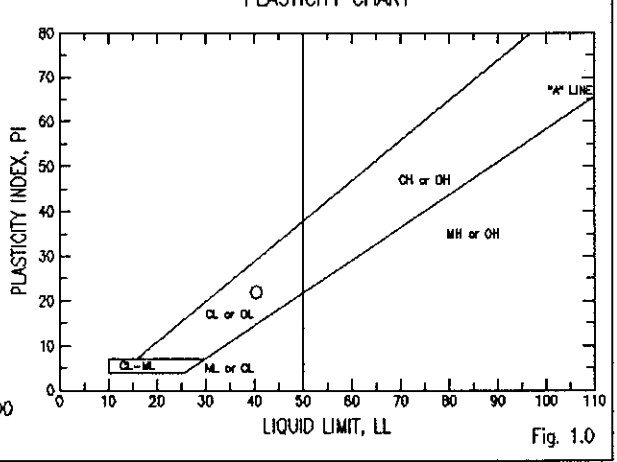


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-37
Sample No. : 12B
Location : Piedmont, CA
Soil Description : Brown sandy clay (CL)
Remarks : Depth: 38.5 feet

Depth : 38.5 feet
Test Date : 05/02/2005
Test Method : ASTM D422/4318

Filename : VQ37-12B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ37-12B	217.20	728.00	641.60	20.36

Average Moisture Content = 20.36

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 48	10.85	39.23	34.80	18.50

Plastic Limit = 18.50

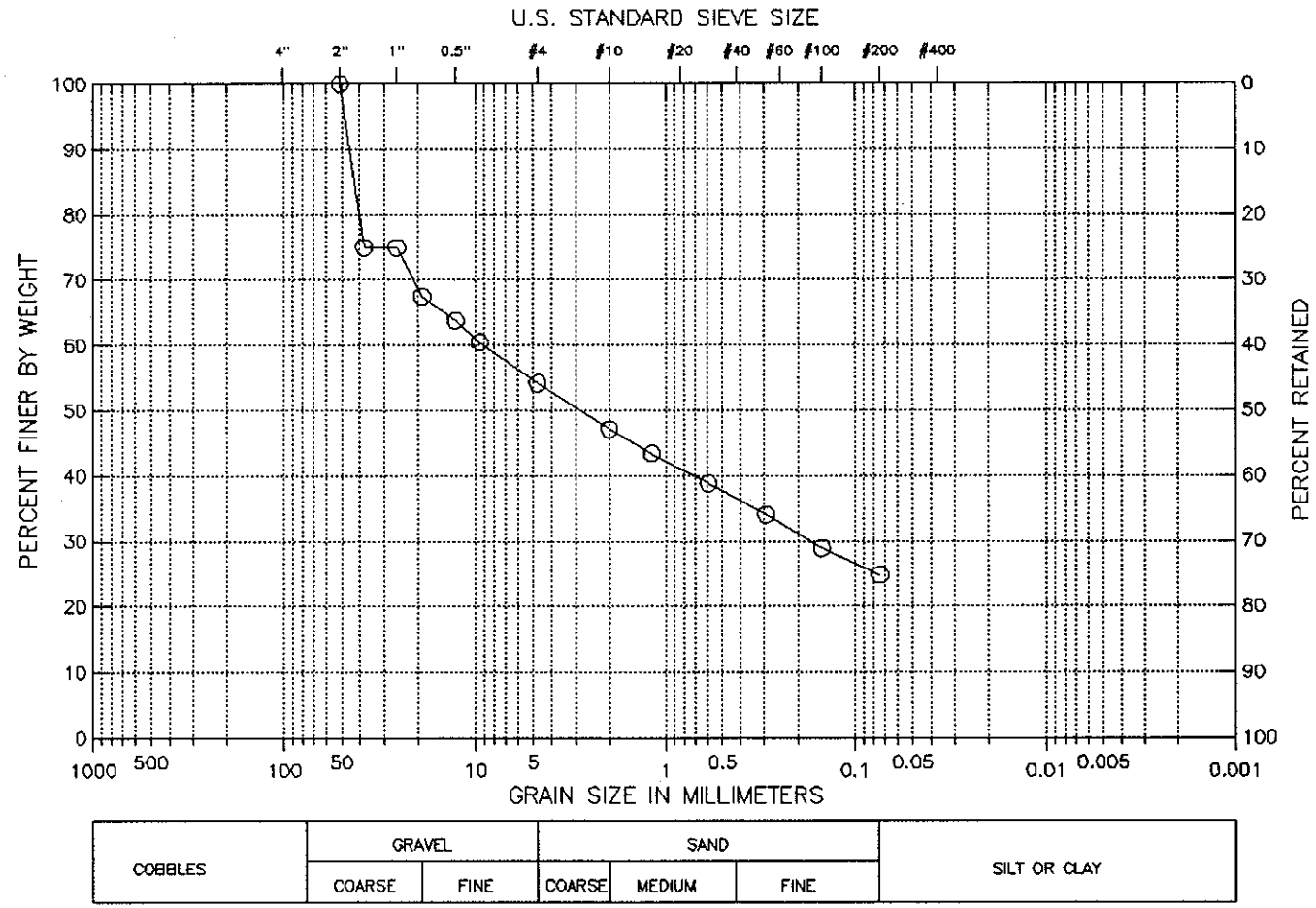
Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 84	11.02	26.65	22.27	35	38.93
2) 85	10.75	26.52	21.98	25	40.43
3) 86	10.83	26.45	21.81	17	42.26

Liquid Limit = 40.46
Plastic Index = 21.97

URS

	Boring No. : VQ-38 Sample No.: 3B Tested by : R. Taraya Filename : VQ38-03B	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Tue May 03 2005



Classification :
(GC) Clayey gravel with sand
Visual Description :
Brown clayey sandy gravel (GC)

Remarks :
Depth: 9.0 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 3B
Location : Piedmont, CA
Soil Description : Brown clayey sandy gravel (GC)
Remarks : Depth: 9.0 feet

Depth : 9.0 feet
Test Date : 05/02/2005
Test Method : ASTM D422/4318

Filename : VQ38-03B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
2"	2.000	50.80	0.00	0.00	100
1.5"	1.500	38.10	126.34	126.34	75
1"	1.012	25.70	-0.00	126.34	75
0.75"	0.748	19.00	37.72	164.06	68
0.5"	0.500	12.70	18.90	182.96	64
0.375"	0.374	9.51	16.38	199.34	61
#4	0.187	4.75	32.09	231.43	54
#10	0.079	2.00	35.47	266.90	47
#16	0.047	1.19	18.60	285.50	43
#30	0.023	0.60	23.30	308.80	39
#50	0.012	0.30	24.20	333.00	34
#100	0.006	0.15	25.80	358.80	29
#200	0.003	0.07	20.50	379.30	25

Total Dry Weight of Sample = 504.8

D85 : 42.7549 mm
D60 : 8.9938 mm
D50 : 2.8484 mm
D30 : 0.1721 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : GC
ASTM Group Name : Clayey gravel with sand
AASHTO Group Symbol : A-2-6(3)
AASHTO Group Name : Clayey Gravel and Sand

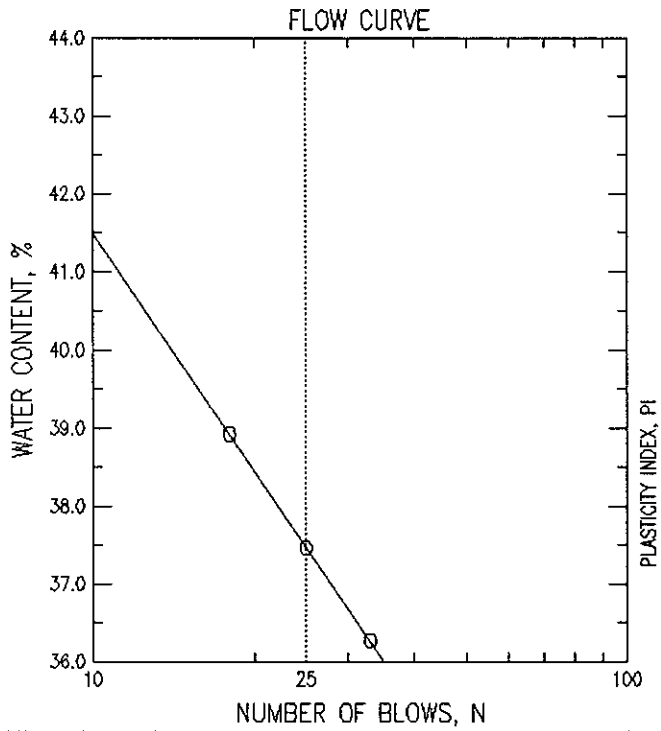
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-38
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	3B
SAMPLE DESCRIPTION		DATE	FILENAME
Brown clayey sandy gravel (GC)		Tue May 03 2005	VQ38-03B

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	38	25	46		
WT. WET SOIL + TARE	31.06	28.56	27.11		
WT. DRY SOIL + TARE	25.62	23.75	22.79		
WT. WATER	5.44	4.81	4.32		
TARE WT.	10.62	10.91	11.69		
WT. DRY SOIL	15	12.84	11.1		
WATER CONTENT, W_N (%)	36.27	37.46	38.92		
NUMBER OF BLOWS, N	33	25	18		
ONE-POINT LIQUID LIMIT, LL	37.51	37.46	37.40		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	45				
WT. WET SOIL + TARE	38.1				
WT. DRY SOIL + TARE	34.2				
WT. WATER	3.9				
TARE WT.	10.86				
WT. DRY SOIL	23.34				
WATER CONTENT (%)	16.71				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	11.0
LIQUID LIMIT, LL	37.5
PLASTIC LIMIT, PL	16.7
PLASTICITY INDEX, PI	20.8
LIQUIDITY INDEX, LI*	-0.28

*LI = (W - PL)/PI

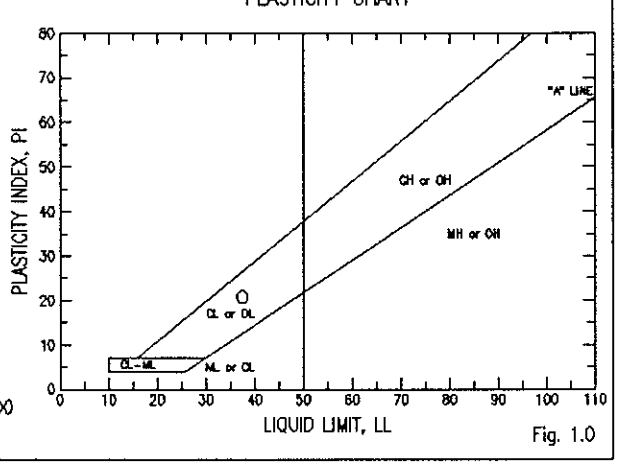


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 3B
Location : Piedmont, CA
Soil Description : Brown clayey sandy gravel (GC)
Remarks : Depth: 9.0 feet

Depth : 9.0 feet
Test Date : 05/02/2005
Test Method : ASTM D422/4318

Filename : VQ38-03B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ38-3B	188.00	748.30	692.80	10.99

Average Moisture Content = 10.99

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	45	10.86	38.10	34.20	16.71

Plastic Limit = 16.71

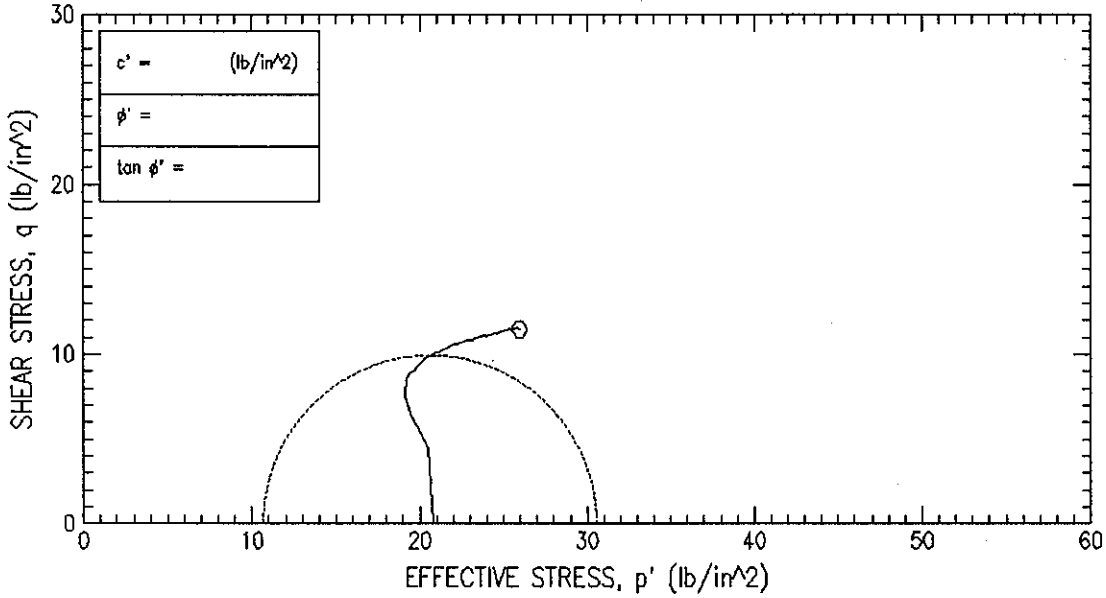
Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	38	10.62	31.06	25.62	33	36.27
2)	25	10.91	28.56	23.75	25	37.46
3)	46	11.69	27.11	22.79	18	38.92

Liquid Limit = 37.47
Plastic Index = 20.77

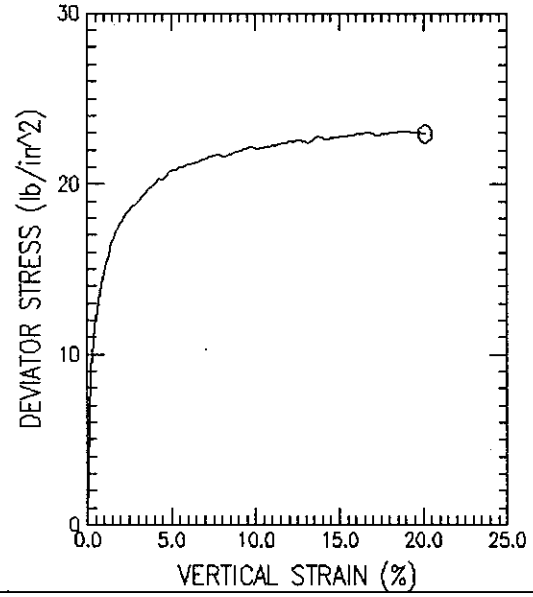
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-38-9



SYMBOL		○				
TEST NO.		VQ-38-9				
INITIAL	WATER CONTENT (%)	19.47				
	DRY DENSITY (lb/ft^3)	111.21				
	SATURATION (%)	96.67				
	VOID RATIO	0.560				
BEFORE SHEAR	WATER CONTENT (%)	18.29				
	DRY DENSITY (lb/ft^3)	115.00				
	SATURATION (%)	99.98				
	VOID RATIO	0.509				
	BACK PRESS. (lb/in^2)	80.00				
MINOR PRIN. STRESS (lb/in^2)		20.83				
MAX. DEV. STRESS (lb/in^2)		23.90				
TIME TO FAILURE (min)		1431.88				
RATE OF STRAIN INCR (%/min)		0.00				
INITIAL DIAMETER (in)		3.85				
INITIAL HEIGHT (in)		7.21				
B-VALUE		98.60				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Brown sandy clay (CL) with gravel

LL 36.12	PL 16.06	PI 20.06	GS 2.78

REMARKS:

1) TXCIU Test with Effective Pressure of 20.83 psi

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

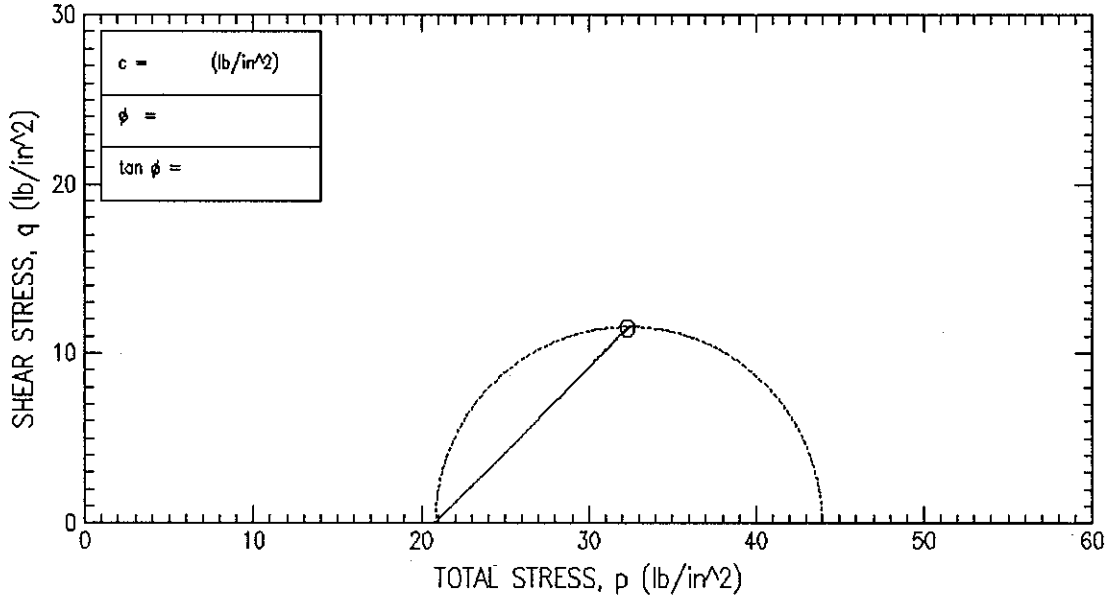
BORING NO. VQ-38	SAMPLE NO.	9			
TECH. S. Capps	DEPTH/ELEV	24.0 feet			
LABORATORY	DATE	05/19/05			

TRIAXIAL COMPRESSION TEST REPORT

Tue 05-24-05, 08:29:14

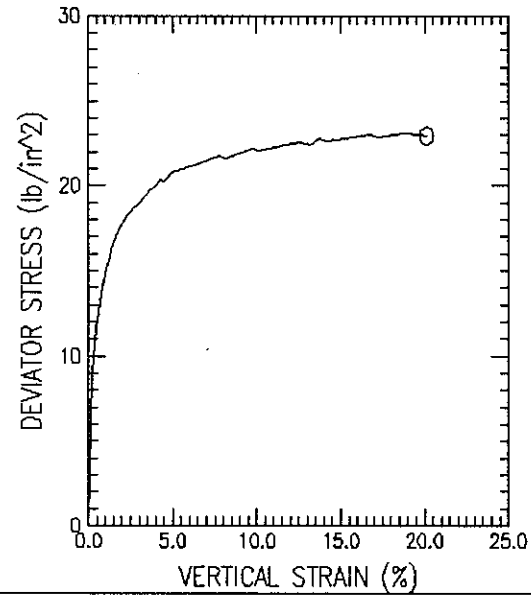
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-38-9



SYMBOL		O			
TEST NO.		VQ-38-9			
INITIAL	WATER CONTENT (%)	19.47			
	DRY DENSITY (lb/ft^3)	111.21			
	SATURATION (%)	96.67			
	VOID RATIO	0.560			
BEFORE SHEAR	WATER CONTENT (%)	18.29			
	DRY DENSITY (lb/ft^3)	115.00			
	SATURATION (%)	99.98			
	VOID RATIO	0.509			
	BACK PRESS. (lb/in^2)	80.00			
MINOR PRIN. STRESS (lb/in^2)		20.83			
MAX. DEV. STRESS (lb/in^2)		23.90			
TIME TO FAILURE (min)		1431.88			
RATE OF STRAIN INCR (%/min)		0.00			
INITIAL DIAMETER (in)		3.85			
INITIAL HEIGHT (in)		7.21			
B-VALUE		98.60			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Brown sandy clay (CL) with gravel

LL	PL	PI	GS
36.12	16.06	20.06	2.78

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 20.83 psi

PROJECT Estates Dam Seismic Study

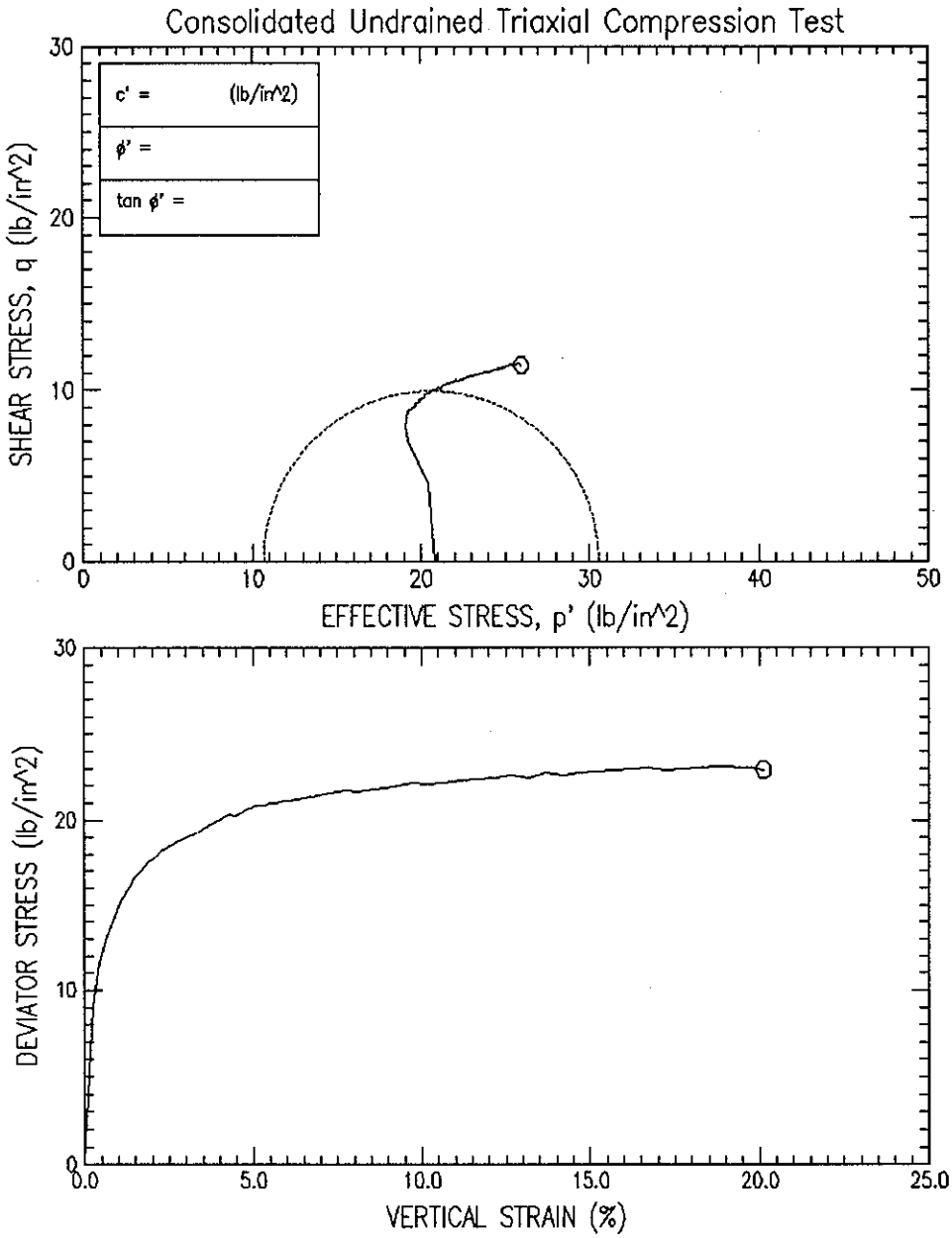
PROJECT NO.26814957

BORING NO. VQ-38	SAMPLE NO.	9			
TECH. S. Capps	DEPTH/ELEV	24.0 feet			
LABORATORY	DATE	05/19/05			

TRIAXIAL COMPRESSION TEST REPORT

Tue 05-24-05, 08:30:12

URS



Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-38 Sample No : 9
Test Date : 05/19/05 Test No : VQ-38-9 Depth : 24.0 feet
Description : Brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 20.83 psi

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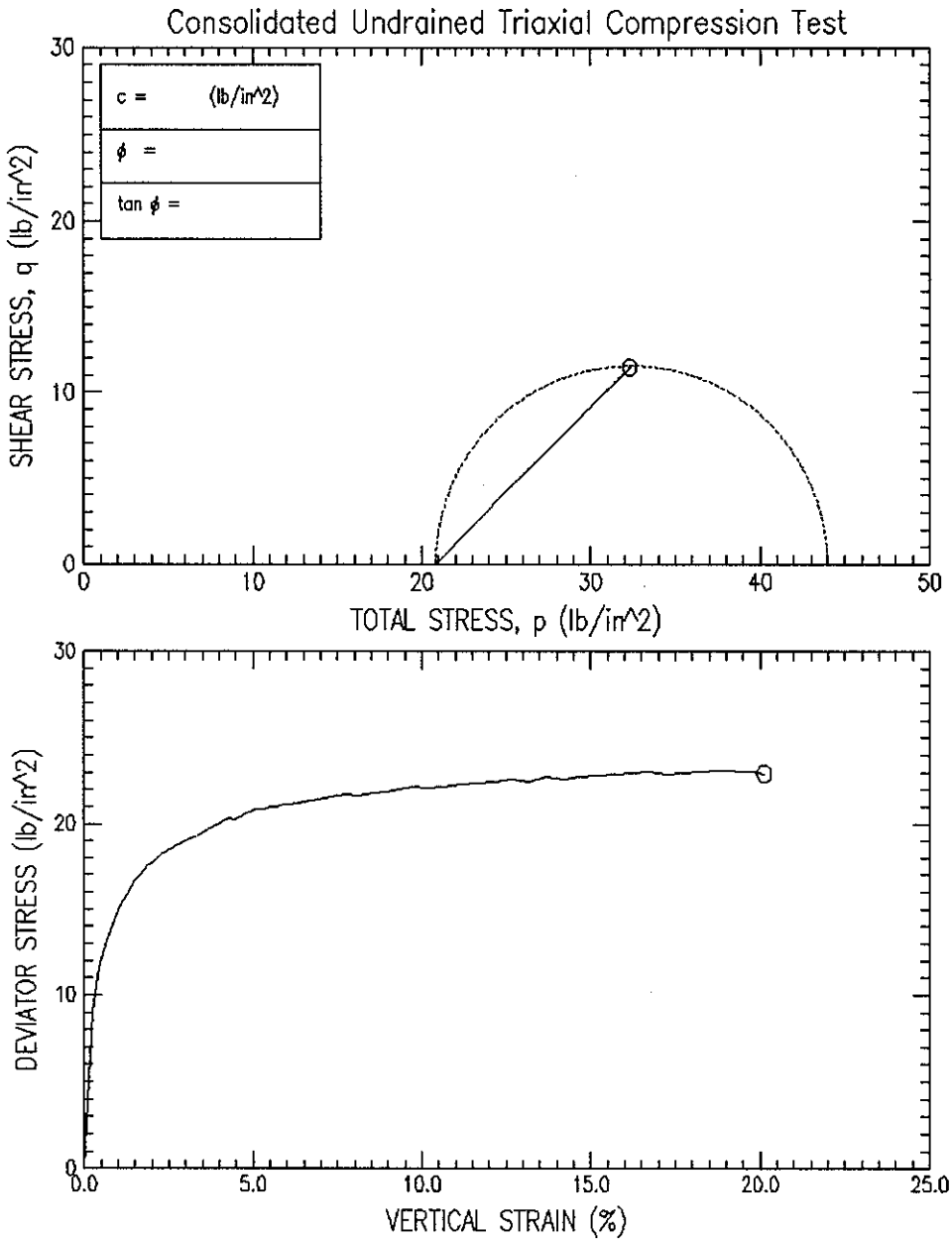

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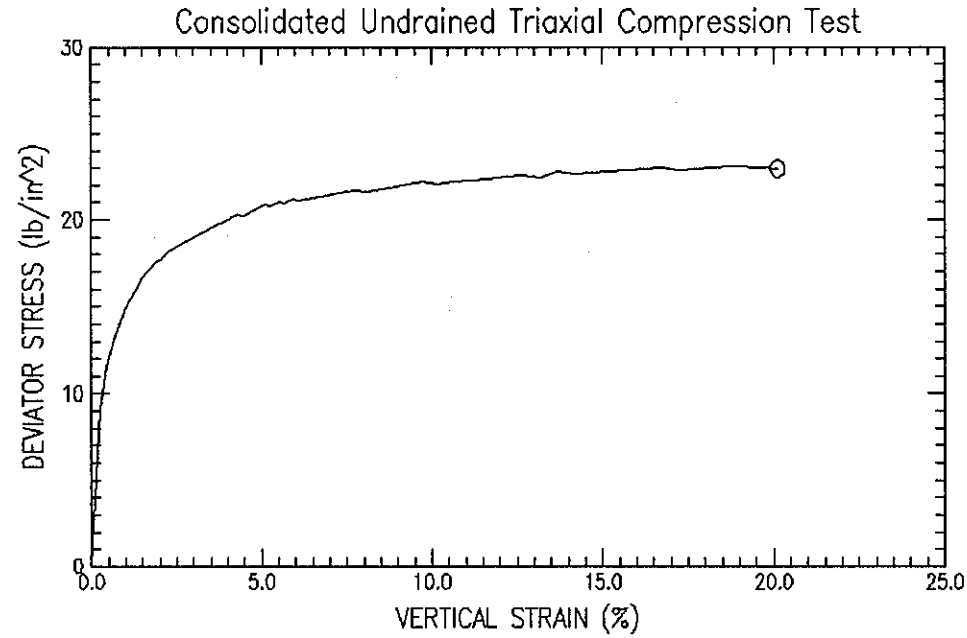
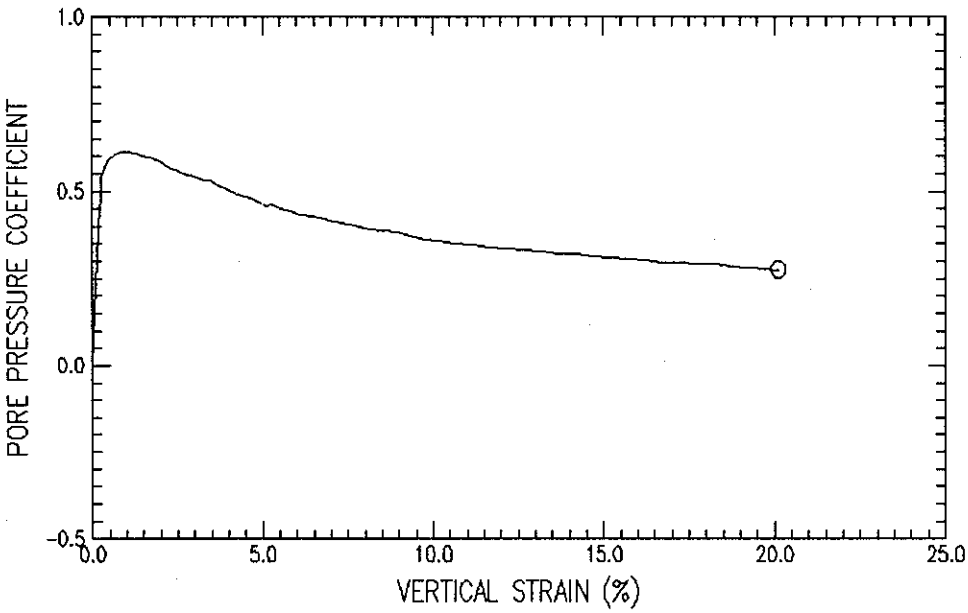




Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study

Project No : 26814957	Boring No : VQ-38	Sample No : 9
Test Date : 05/19/05	Test No : VQ-38-9	Depth : 24.0 feet

Description : Brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 20.83 psi

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-9
Boring No. : VQ-38 Test Date : 05/19/05 Tested by : S. Capps
Sample No. : 9 Depth : 24.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 20.83 psi

Height : 7.206 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 83.889 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	100.83	100.83	0.00	0.00	20.83	20.83	1.00	20.83	0.00
2)	0.24	109.88	100.83	4.88	0.54	25.00	15.95	1.57	20.47	4.52
3)	0.44	112.43	100.83	6.80	0.59	25.64	14.04	1.83	19.84	5.80
4)	0.65	113.95	100.83	7.94	0.61	26.01	12.89	2.02	19.45	6.56
5)	0.85	114.95	100.83	8.63	0.61	26.32	12.20	2.16	19.26	7.06
6)	1.05	115.94	100.83	9.25	0.61	26.70	11.59	2.30	19.14	7.55
7)	1.25	116.67	100.83	9.63	0.61	27.05	11.20	2.41	19.13	7.92
8)	1.45	117.40	100.83	9.93	0.60	27.47	10.90	2.52	19.19	8.29
9)	1.66	117.88	100.83	10.16	0.60	27.72	10.67	2.60	19.19	8.52
10)	1.86	118.35	100.83	10.32	0.59	28.04	10.52	2.67	19.28	8.76
11)	2.05	118.57	100.83	10.32	0.58	28.25	10.52	2.69	19.39	8.87
12)	2.26	119.04	100.83	10.24	0.56	28.80	10.59	2.72	19.70	9.10
13)	2.47	119.25	100.83	10.32	0.56	28.93	10.52	2.75	19.73	9.21
14)	2.67	119.46	100.83	10.24	0.55	29.23	10.59	2.76	19.91	9.32
15)	2.87	119.67	100.83	10.32	0.55	29.36	10.52	2.79	19.94	9.42
16)	3.07	119.89	100.83	10.24	0.54	29.65	10.59	2.80	20.12	9.53
17)	3.27	120.10	100.83	10.24	0.53	29.86	10.59	2.82	20.23	9.63
18)	3.48	120.30	100.83	10.32	0.53	29.99	10.52	2.85	20.25	9.74
19)	3.68	120.51	100.83	10.16	0.52	30.35	10.67	2.84	20.51	9.84
20)	3.88	120.72	100.83	10.16	0.51	30.56	10.67	2.86	20.61	9.94
21)	4.08	120.93	100.83	10.01	0.50	30.92	10.82	2.86	20.87	10.05
22)	4.28	121.13	100.83	9.93	0.49	31.20	10.90	2.86	21.05	10.15
23)	4.49	121.09	100.83	9.78	0.48	31.31	11.05	2.83	21.18	10.13
24)	4.69	121.29	100.83	9.78	0.48	31.51	11.05	2.85	21.28	10.23
25)	4.89	121.49	100.83	9.70	0.47	31.79	11.13	2.86	21.46	10.33
26)	5.09	121.69	100.83	9.55	0.46	32.15	11.28	2.85	21.71	10.43
27)	5.30	121.65	100.83	9.63	0.46	32.02	11.20	2.86	21.61	10.41
28)	5.50	121.85	100.83	9.48	0.45	32.38	11.36	2.85	21.87	10.51
29)	5.70	121.80	100.83	9.40	0.45	32.41	11.43	2.83	21.92	10.49
30)	5.90	122.00	100.83	9.32	0.44	32.68	11.51	2.84	22.10	10.59
31)	6.10	121.96	100.83	9.17	0.43	32.79	11.66	2.81	22.23	10.56
32)	6.51	122.11	100.83	9.09	0.43	33.02	11.74	2.81	22.38	10.64
33)	6.91	122.26	100.83	8.94	0.42	33.32	11.89	2.80	22.61	10.71
34)	7.32	122.40	100.83	8.86	0.41	33.54	11.97	2.80	22.76	10.79
35)	7.73	122.55	100.83	8.71	0.40	33.84	12.12	2.79	22.98	10.86
36)	8.12	122.45	100.83	8.48	0.39	33.97	12.35	2.75	23.16	10.81
37)	8.53	122.59	100.83	8.48	0.39	34.11	12.35	2.76	23.23	10.88
38)	8.94	122.73	100.83	8.40	0.38	34.33	12.43	2.76	23.38	10.95
39)	9.34	122.87	100.83	8.25	0.37	34.62	12.58	2.75	23.60	11.02
40)	9.75	123.00	100.83	8.02	0.36	34.98	12.81	2.73	23.90	11.09
41)	10.15	122.90	100.83	7.94	0.36	34.96	12.89	2.71	23.93	11.04
42)	10.66	123.01	100.83	7.79	0.35	35.22	13.04	2.70	24.13	11.09
43)	11.16	123.11	100.83	7.71	0.35	35.40	13.12	2.70	24.26	11.14
44)	11.67	123.21	100.83	7.64	0.34	35.58	13.19	2.70	24.39	11.19
45)	12.17	123.31	100.83	7.56	0.34	35.75	13.27	2.69	24.51	11.24
46)	12.68	123.41	100.83	7.49	0.33	35.93	13.35	2.69	24.64	11.29
47)	13.18	123.28	100.83	7.41	0.33	35.87	13.42	2.67	24.65	11.22
48)	13.69	123.59	100.83	7.33	0.32	36.27	13.50	2.69	24.88	11.38
49)	14.19	123.46	100.83	7.26	0.32	36.21	13.58	2.67	24.89	11.32
50)	14.70	123.55	100.83	7.18	0.32	36.37	13.65	2.66	25.01	11.36
51)	15.20	123.63	100.83	7.10	0.31	36.53	13.73	2.66	25.13	11.40
52)	16.21	123.79	100.83	6.95	0.30	36.85	13.88	2.65	25.37	11.48
53)	16.72	123.87	100.83	6.87	0.30	37.00	13.96	2.65	25.48	11.52
54)	17.23	123.73	100.83	6.80	0.30	36.94	14.04	2.63	25.49	11.45
55)	17.74	123.80	100.83	6.72	0.29	37.08	14.11	2.63	25.60	11.49
56)	18.24	123.87	100.83	6.72	0.29	37.15	14.11	2.63	25.63	11.52
57)	18.75	123.94	100.83	6.57	0.28	37.38	14.27	2.62	25.82	11.55
58)	19.76	123.86	100.83	6.41	0.28	37.45	14.42	2.60	25.93	11.51
59)	20.11	123.76	100.83	6.34	0.28	37.42	14.50	2.58	25.96	11.46

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-9
Boring No. : VQ-38 Test Date : 05/19/05 Tested by : S. Capps
Sample No. : 9 Depth : 24.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 20.83 psi

Height : 7.206 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 83.889 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.38	80.00	0.00	0.00	0.00	100.83	20.83
2)	0.017	0.24	11.41	84.88	106.79	106.79	9.36	109.88	25.00
3)	0.032	0.44	11.44	86.79	137.19	137.19	12.00	112.43	25.64
4)	0.046	0.65	11.46	87.94	155.43	155.43	13.56	113.95	26.01
5)	0.060	0.85	11.48	88.63	167.59	167.59	14.60	114.95	26.32
6)	0.075	1.05	11.51	89.24	179.75	179.75	15.62	115.94	26.70
7)	0.089	1.25	11.53	89.63	188.88	188.88	16.38	116.67	27.05
8)	0.104	1.45	11.55	89.93	198.00	198.00	17.14	117.40	27.47
9)	0.118	1.66	11.58	90.16	204.08	204.08	17.63	117.88	27.72
10)	0.133	1.86	11.60	90.31	210.16	210.16	18.12	118.35	28.04
11)	0.146	2.05	11.62	90.31	213.20	213.20	18.34	118.57	28.25
12)	0.161	2.26	11.65	90.24	219.28	219.28	18.83	119.04	28.80
13)	0.176	2.47	11.67	90.31	222.32	222.32	19.05	119.25	28.93
14)	0.190	2.67	11.70	90.24	225.36	225.36	19.27	119.46	29.23
15)	0.204	2.87	11.72	90.31	228.40	228.40	19.49	119.67	29.36
16)	0.219	3.07	11.75	90.24	231.44	231.44	19.70	119.89	29.65
17)	0.233	3.27	11.77	90.24	234.48	234.48	19.92	120.10	29.86
18)	0.248	3.48	11.79	90.31	237.52	237.52	20.14	120.30	29.99
19)	0.262	3.68	11.82	90.16	240.56	240.56	20.35	120.51	30.35
20)	0.276	3.88	11.84	90.16	243.60	243.60	20.57	120.72	30.56
21)	0.291	4.08	11.87	90.01	246.64	246.64	20.78	120.93	30.92
22)	0.305	4.28	11.89	89.93	249.68	249.68	20.99	121.13	31.20
23)	0.320	4.49	11.92	89.78	249.68	249.68	20.95	121.09	31.31
24)	0.334	4.69	11.94	89.78	252.72	252.72	21.16	121.29	31.51
25)	0.348	4.89	11.97	89.70	255.76	255.76	21.37	121.49	31.79
26)	0.363	5.09	12.00	89.55	258.80	258.80	21.57	121.69	32.15
27)	0.378	5.30	12.02	89.63	258.80	258.80	21.53	121.65	32.02
28)	0.392	5.50	12.05	89.47	261.84	261.84	21.74	121.85	32.38
29)	0.406	5.70	12.07	89.40	261.84	261.84	21.69	121.80	32.41
30)	0.420	5.90	12.10	89.32	264.88	264.88	21.89	122.00	32.68
31)	0.435	6.10	12.12	89.17	264.88	264.88	21.85	121.96	32.79
32)	0.464	6.51	12.18	89.09	267.92	267.92	22.00	122.11	33.02
33)	0.492	6.91	12.23	88.94	270.96	270.96	22.16	122.26	33.32
34)	0.521	7.32	12.28	88.86	274.00	274.00	22.31	122.40	33.54
35)	0.551	7.73	12.34	88.71	277.04	277.04	22.45	122.55	33.84
36)	0.579	8.12	12.39	88.48	277.04	277.04	22.36	122.45	33.97
37)	0.608	8.53	12.45	88.48	280.08	280.08	22.50	122.59	34.11
38)	0.637	8.94	12.50	88.40	283.12	283.12	22.65	122.73	34.33
39)	0.666	9.34	12.56	88.25	286.16	286.16	22.79	122.87	34.62
40)	0.695	9.75	12.61	88.02	289.20	289.20	22.93	123.00	34.98
41)	0.723	10.15	12.67	87.94	289.20	289.20	22.82	122.90	34.96
42)	0.759	10.66	12.74	87.79	292.24	292.24	22.93	123.01	35.22
43)	0.795	11.16	12.81	87.71	295.28	295.28	23.04	123.11	35.40
44)	0.831	11.67	12.89	87.64	298.32	298.32	23.15	123.21	35.58
45)	0.867	12.17	12.96	87.56	301.36	301.36	23.25	123.31	35.75
46)	0.903	12.68	13.04	87.48	304.40	304.40	23.35	123.41	35.93
47)	0.939	13.18	13.11	87.41	304.40	304.40	23.21	123.28	35.87
48)	0.975	13.69	13.19	87.33	310.48	310.48	23.54	123.59	36.27
49)	1.011	14.19	13.27	87.25	310.48	310.48	23.40	123.46	36.21
50)	1.047	14.70	13.35	87.18	313.52	313.52	23.49	123.55	36.37
51)	1.083	15.20	13.43	87.10	316.56	316.56	23.58	123.63	36.53
52)	1.155	16.21	13.59	86.95	322.64	322.64	23.75	123.79	36.85
53)	1.192	16.72	13.67	86.87	325.68	325.68	23.82	123.87	37.00
54)	1.228	17.23	13.75	86.79	325.68	325.68	23.68	123.73	36.94
55)	1.264	17.74	13.84	86.72	328.72	328.72	23.75	123.80	37.08
56)	1.300	18.24	13.92	86.72	331.76	331.76	23.83	123.87	37.15
57)	1.336	18.75	14.01	86.56	334.80	334.80	23.90	123.94	37.38
58)	1.408	19.76	14.19	86.41	337.84	337.84	23.81	123.86	37.45
59)	1.433	20.11	14.25	86.33	337.84	337.84	23.71	123.76	37.42

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-9
Boring No. : VQ-38 Test Date : 05/19/05 Tested by : S. Capps
Sample No. : 9 Depth : 24.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 20.83 psi

Liquid Limit : 36.12 Plastic Limit : 16.06 Specific Gravity : 2.78

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-38-9	VQ-38-9
WT CONTAINER + WET SOIL (gm)	2925.60	2896.70
WT CONTAINER + DRY SOIL (gm)	2448.85	2448.85
WT WATER (gm)	476.75	447.85
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	2448.85	2448.85
WATER CONTENT (%)	19.47	18.29

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	19.47	18.29
VOID RATIO	0.56	0.51
WET DENSITY (lb/ft^3)	132.86	136.03
DRY DENSITY (lb/ft^3)	111.21	115.00
DEGREE OF SATURATION (%)	96.67	99.98

Maximum Shear Stress = 11.55 (lb/in^2) at a Vertical Strain of 18.75 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-9
Boring No. : VQ-38 Test Date : 05/19/05 Tested by : S. Capps
Sample No. : 9 Depth : 24.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown sandy clay (CL) with gravel
Remarks : TXCIU Test with Effective Pressure of 20.83 psi

Height : 7.206 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 83.889 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 36.12 Plastic Limit : 16.06 Specific Gravity : 2.78

INITIAL
Height : 7.206 (in) Dry Density : 111.21 (lb/ft^3)
Area : 11.642 (in^2) Moisture : 19.47 %
Void Ratio: 0.56
Saturation: 96.67 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 7.206 (in) Dry Density : 111.21 (lb/ft^3) Total Vert. Stress : 100.83 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 19.47 % Total Hori. Stress : 100.83 (lb/in^
Void Ratio: 0.56 Pore Pressure : 0.00 (lb/in^2)
Saturation: 96.67 % Effect.Vert. Stress: 100.83 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 100.83 (lb/in^

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 7.206 (in) Dry Density : 111.21 (lb/ft^3) Total Vert. Stress : 100.83 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 19.47 % Total Hori. Stress : 100.83 (lb/in^
Void Ratio: 0.56 Pore Pressure : 0.00 (lb/in^2)
Saturation: 96.67 % Effect.Vert. Stress: 100.83 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 100.83 (lb/in^

END OF SATURATION
dH : 0.000 (in) Height : 7.206 (in) Dry Density : 111.21 (lb/ft^3) Total Vert. Stress : 100.83 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 18.29 % Total Hori. Stress : 100.83 (lb/in^
dVCorr : 0.000 (in^3) Void Ratio: 0.56 Pore Pressure : 0.00 (lb/in^2)
Saturation: 90.81 % Effect.Vert. Stress: 100.83 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 100.83 (lb/in^

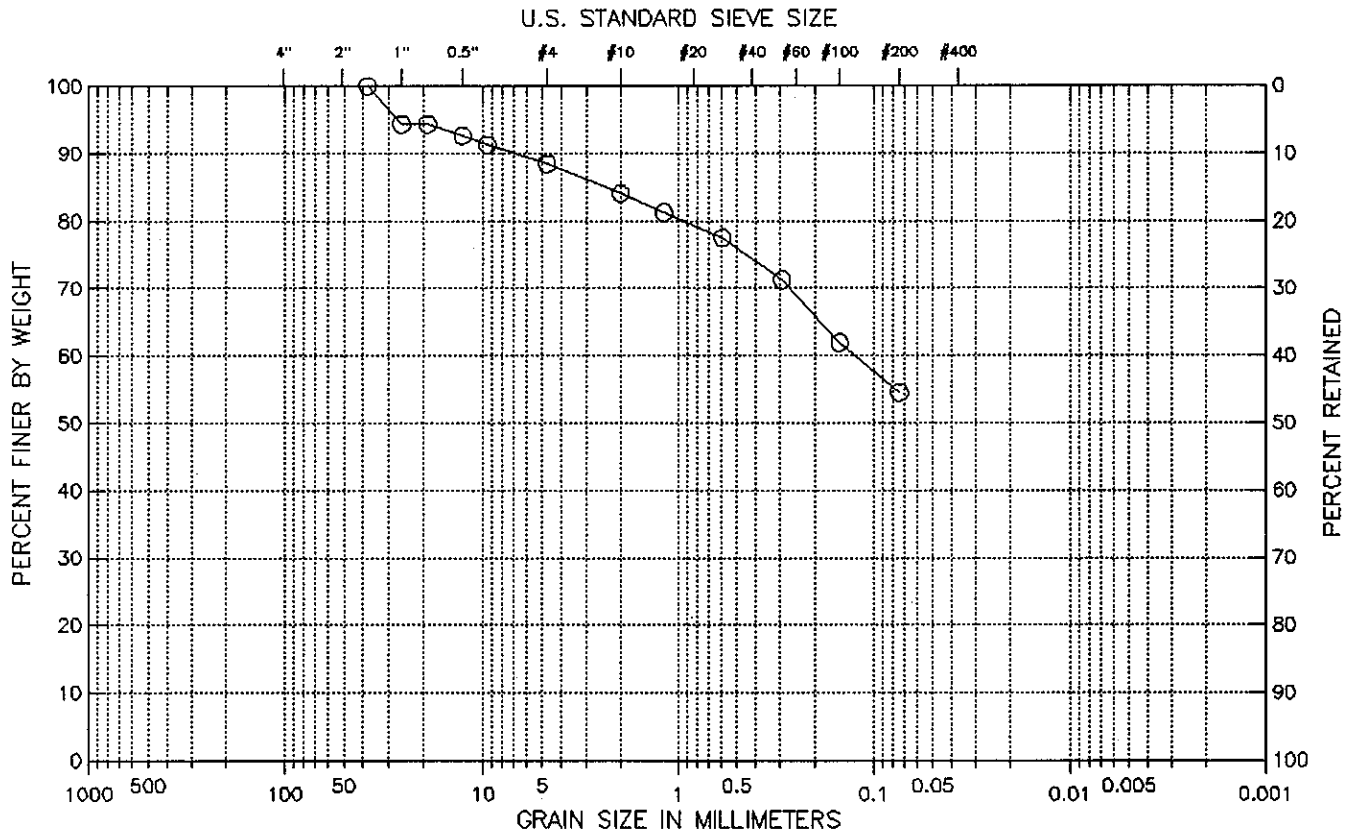
END OF CONSOLIDATION - B
dH : 0.080 (in) Height : 7.126 (in) Dry Density : 115.00 (lb/ft^3) Total Vert. Stress : 100.83 (lb/in^
dV : 2.763 (in^3) Area : 11.385 (in^2) Moisture : 18.29 % Total Hori. Stress : 100.83 (lb/in^
Void Ratio: 0.51 Pore Pressure : 80.00 (lb/in^2
Saturation: 99.98 % Effect.Vert. Stress: 20.83 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 20.83 (lb/in^2

FAILURE DURING SHEAR
dH : 1.336 (in) Height : 5.870 (in) Dry Density : 115.00 (lb/ft^3) Total Vert. Stress : 124.73 (lb/in^
dV : 2.763 (in^3) Area : 14.011 (in^2) Moisture : 18.29 % Total Hori. Stress : 100.83 (lb/in^
Strain : 18.75 % Void Ratio: 0.51 Pore Pressure : 86.56 (lb/in^2
Strength: 11.95 (lb/in^2) Saturation: 99.98 % Effect.Vert. Stress: 38.16 (lb/in^2
Time : 1431.88 (min) Effect.Hori. Stress: 14.27 (lb/in^2

END OF TEST
dH : 1.433 (in) Height : 5.773 (in) Dry Density : 115.00 (lb/ft^3) Total Vert. Stress : 124.54 (lb/in^
dV : 2.763 (in^3) Area : 14.251 (in^2) Moisture : 18.29 % Total Hori. Stress : 100.83 (lb/in^
Strain : 20.11 % Void Ratio: 0.51 Pore Pressure : 86.33 (lb/in^2
Saturation: 99.98 % Effect.Vert. Stress: 38.20 (lb/in^2
Time : 1525.50 (min) Effect.Hori. Stress: 14.50 (lb/in^2

URS

	Boring No. : VQ-38 Sample No.: 9 Tested by : R. Taraya Filename : VQ38-009	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Tue May 24 2005



Classification :
(CL) Sandy lean clay
Visual Description :
Brown sandy clay (CL) with gravel

Remarks :
Depth: 24.0 feet

Figure 1

URS

Tue May 24 08:23:47 2005

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 9
Location : Piedmont, CA
Soil Description : Brown sandy clay (CL) with gravel
Remarks : Depth: 24.0 feet

Depth : 24.0 feet
Test Date : 05/20/2005
Test Method : ASTM D422

Filename : VQ38-009
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	75.15	75.15	94
0.75"	0.748	19.00	0.00	75.15	94
0.5"	0.500	12.70	22.98	98.13	93
0.375"	0.374	9.51	17.08	115.21	91
#4	0.187	4.75	37.51	152.72	88
#10	0.079	2.00	57.88	210.60	84
#16	0.047	1.19	37.00	247.60	81
#30	0.023	0.60	49.25	296.85	78
#50	0.012	0.30	83.25	380.10	71
#100	0.006	0.15	122.70	502.80	62
#200	0.003	0.07	98.40	601.20	54

Total Dry Weight of Sample = 1321.2

D85 : 2.4079 mm
D60 : 0.1241 mm
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : CL
ASTM Group Name : Sandy lean clay
AASHTO Group Symbol : A-6(9)
AASHTO Group Name : Clayey Soils

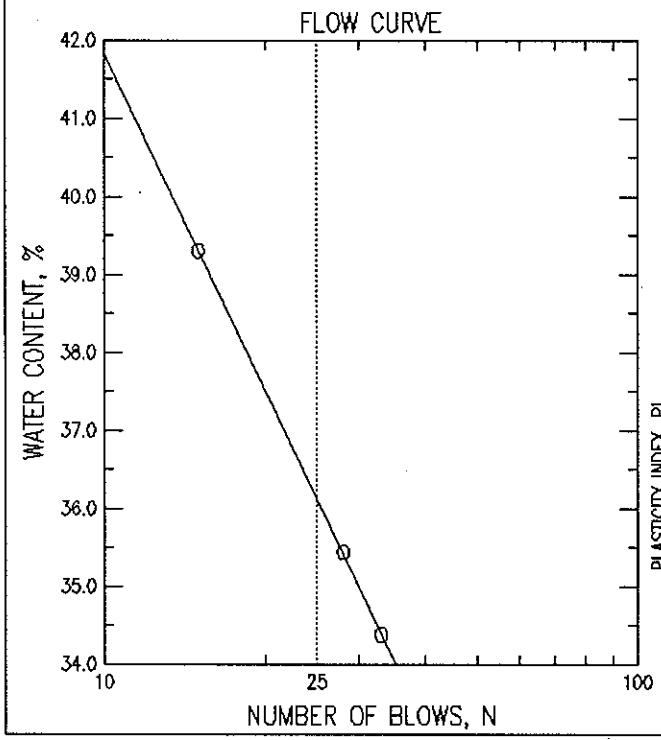
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-38
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	9
SAMPLE DESCRIPTION		DATE	FILENAME
Brown sandy clay (CL) with gravel		Tue May 24 2005	VQ38-009

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	85	61	87		
WT. WET SOIL + TARE	25.76	26.44	27.66		
WT. DRY SOIL + TARE	21.92	22.4	22.92		
WT. WATER	3.84	4.04	4.74		
TARE WT.	10.75	11	10.86		
WT. DRY SOIL	11.17	11.4	12.06		
WATER CONTENT, W_N (%)	34.38	35.44	39.30		
NUMBER OF BLOWS, N	33	28	15		
ONE-POINT LIQUID LIMIT, LL	35.55	35.93	36.95		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	37				
WT. WET SOIL + TARE	35.41				
WT. DRY SOIL + TARE	32.02				
WT. WATER	3.39				
TARE WT.	10.91				
WT. DRY SOIL	21.11				
WATER CONTENT (%)	16.06				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	19.5
LIQUID LIMIT, LL	36.1
PLASTIC LIMIT, PL	16.1
PLASTICITY INDEX, PI	20.1
LIQUIDITY INDEX, LI*	0.17

*LI = (W - PL)/PI

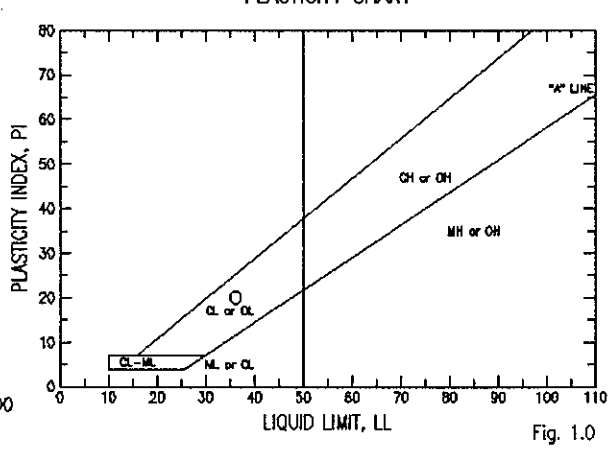


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 9
Location : Piedmont, CA
Soil Description : Brown sandy clay (CL) with gravel
Remarks : Depth: 24.0 feet

Depth : 24.0 feet
Test Date : 05/20/2005
Test Method : ASTM D422

Filename : VQ38-009
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ38-9	0.00	2925.60	2448.85	19.47

Average Moisture Content = 19.47

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 37	10.91	35.41	32.02	16.06

Plastic Limit = 16.06

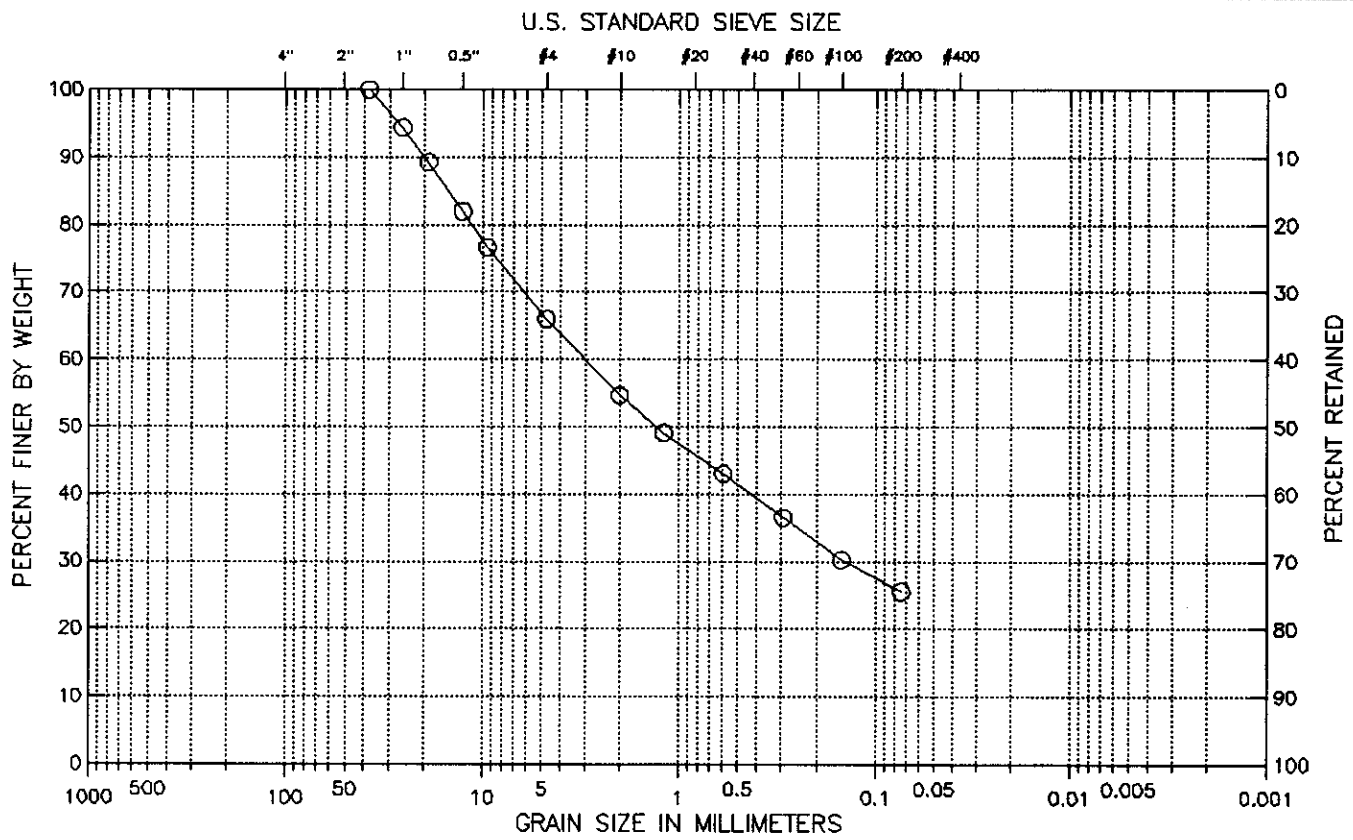
Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 85	10.75	25.76	21.92	33	34.38
2) 61	11.00	26.44	22.40	28	35.44
3) 87	10.86	27.66	22.92	15	39.30

Liquid Limit = 36.12
Plastic Index = 20.07

URS

	Boring No. : VQ-38 Sample No: 10 Tested by : R. Taraya Filename : VQ38-010	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Tue May 10 2005



Classification :

Visual Description :
Grayish brown slightly clayey sand with gravel

Remarks :
Depth: 29.0 feet

Figure 1

URS

Tue May 10 13:29:13 2005

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 10
Location : Piedmont, CA
Depth : 29.0 feet
Test Date : 05/10/2005
Test Method : ASTM D422
Filename : VQ38-010
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown slightly clayey sand with gravel
Remarks : Depth: 29.0 feet

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	76.38	76.38	94
0.75"	0.748	19.00	69.80	146.18	89
0.5"	0.500	12.70	100.22	246.40	82
0.375"	0.374	9.51	73.40	319.80	77
#4	0.187	4.75	145.50	465.30	66
#10	0.079	2.00	155.50	620.80	55
#16	0.047	1.19	75.70	696.50	49
#30	0.023	0.60	83.20	779.70	43
#50	0.012	0.30	89.30	869.00	37
#100	0.006	0.15	86.60	955.60	30
#200	0.003	0.07	63.60	1019.20	26

Total Dry Weight of Sample = 1368.88

D85 : 14.9794 mm
D60 : 3.0060 mm
D50 : 1.2926 mm
D30 : 0.1448 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-2-4(0)
AASHTO Group Name : Silty Gravel and Sand

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 10
Location : Piedmont, CA
Soil Description : Grayish brown slightly clayey sand with gravel
Remarks : Depth: 29.0 feet

Depth : 29.0 feet
Test Date : 05/10/2005
Test Method : ASTM D422

Filename : VQ38-010
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

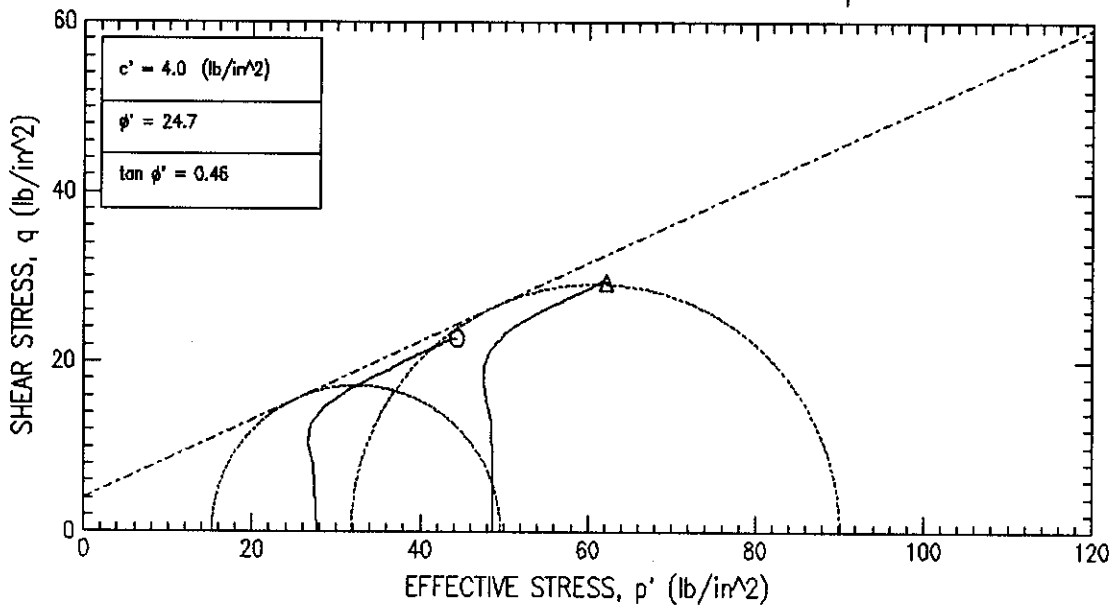
Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ37-10	184.72	1680.80	1553.60	9.29

Average Moisture Content = 9.29

URS

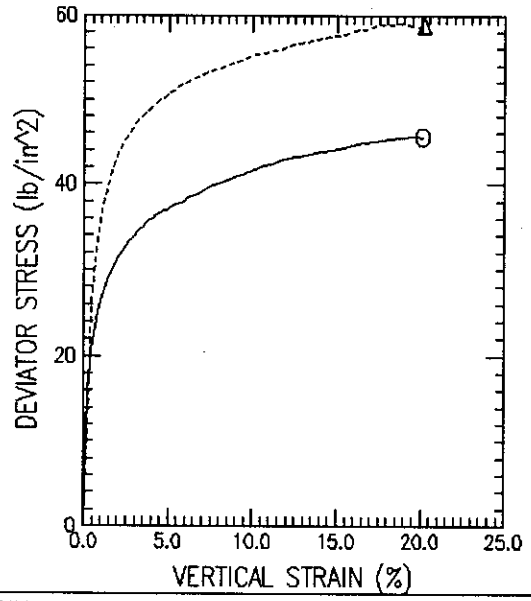
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-38-13A

VQ-38-13B



SYMBOL		O	Δ		
TEST NO.		VQ-38-13A	VQ-38-13B		
INITIAL	WATER CONTENT (%)	10.83	13.77		
	DRY DENSITY (lb/ft^3)	132.50	124.01		
	SATURATION (%)	96.16	96.41		
	VOID RATIO	0.307	0.396		
BEFORE SHEAR	WATER CONTENT (%)	9.74	12.23		
	DRY DENSITY (lb/ft^3)	136.30	129.28		
	SATURATION (%)	99.98	99.95		
	VOID RATIO	0.270	0.339		
	BACK PRESS. (lb/in^2)	70.00	70.00		
MINOR PRIN. STRESS (lb/in^2)		27.78	48.61		
MAX. DEV. STRESS (lb/in^2)		46.81	61.50		
TIME TO FAILURE (min)		1486.78	1443.68		
RATE OF STRAIN INCR (%/min)		0.00	0.00		
INITIAL DIAMETER (in)		3.85	3.85		
INITIAL HEIGHT (in)		7.99	7.99		
B-VALUE		99.30	98.90		

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown clayey sand (SC) with gravel

2) Grayish brown clayey sand (SC) with gravel

LL 29.46	PL 15.72	PI 13.74	GS 2.78

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 27.78 psi

2) TXCIU Test with Effective Pressure of 48.61 psi

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

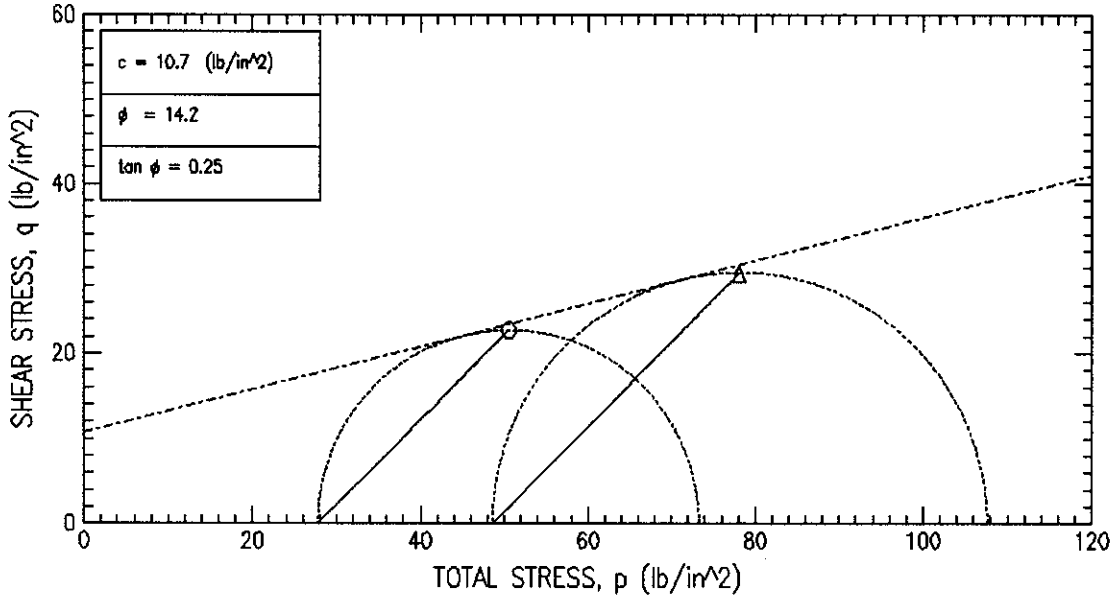
BORING NO. VQ-38	SAMPLE NO.	13A	13B
TECH. S. Capps	DEPTH/ELEV	38.5 feet	38.5 feet
LABORATORY	DATE	06/02/05	05/30/05

TRIAXIAL COMPRESSION TEST REPORT

Tue 06-07-05, 14:51:34

URS

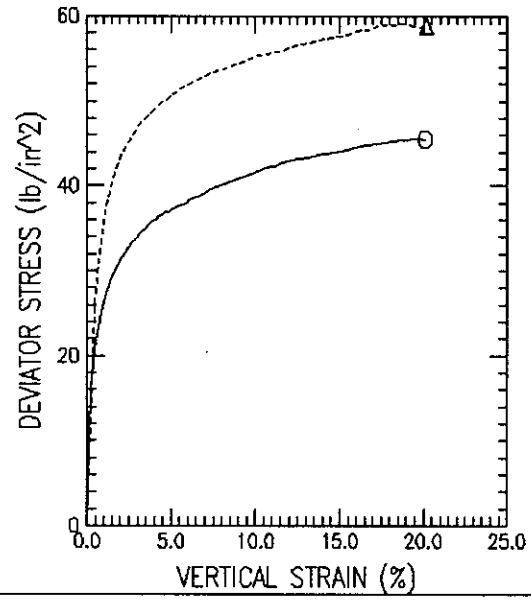
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-38-13A

VQ-38-13B



SYMBOL		○	△		
TEST NO.		VQ-38-13A	VQ-38-13B		
INITIAL	WATER CONTENT (%)	10.63	13.77		
	DRY DENSITY (lb/ft^3)	132.50	124.01		
	SATURATION (%)	96.16	96.41		
	VOID RATIO	0.307	0.396		
BEFORE SHEAR	WATER CONTENT (%)	9.74	12.23		
	DRY DENSITY (lb/ft^3)	136.30	129.28		
	SATURATION (%)	99.98	99.95		
	VOID RATIO	0.270	0.339		
	BACK PRESS. (lb/in^2)	70.00	70.00		
MINOR PRIN. STRESS (lb/in^2)		27.78	48.61		
MAX. DEV. STRESS (lb/in^2)		46.81	61.50		
TIME TO FAILURE (min)		1486.78	1443.68		
RATE OF STRAIN INCR (%/min)		0.00	0.00		
INITIAL DIAMETER (in)		3.85	3.85		
INITIAL HEIGHT (in)		7.99	7.99		
B-VALUE		99.30	98.90		

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown clayey sand (SC) with gravel

2) Grayish brown clayey sand (SC) with gravel

LL 29.46	PL 15.72	PI 13.74	GS 2.78

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 27.78 psi

2) TXCIU Test with Effective Pressure of 48.61 psi

PROJECT Estates Dam Seismic Study

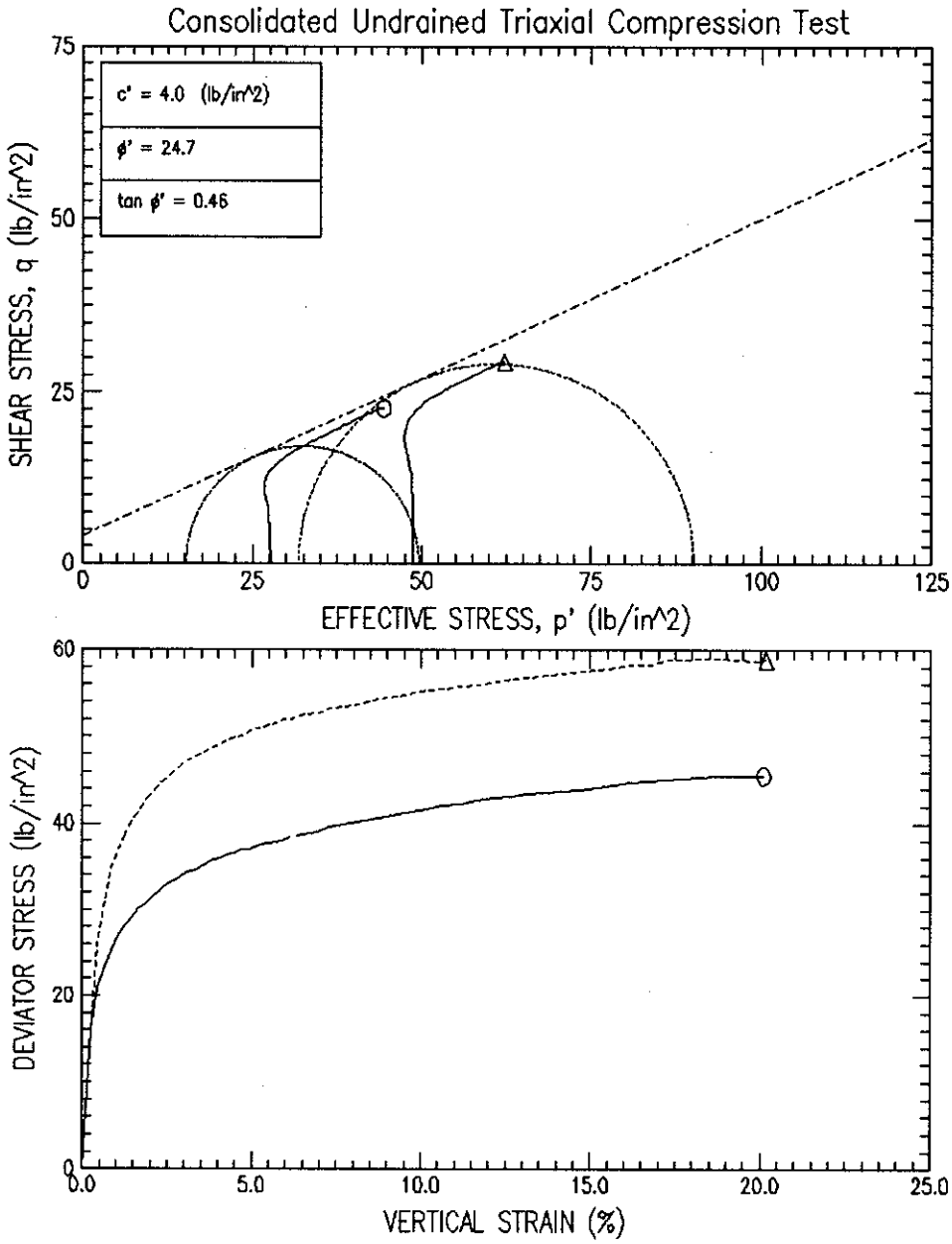
PROJECT NO.26814957

BORING NO. VQ-38	SAMPLE NO.	13A	13B
TECH. S. Capps	DEPTH/ELEV	38.5 feet	38.5 feet
LABORATORY	DATE	06/02/05	05/30/05

TRIAXIAL COMPRESSION TEST REPORT

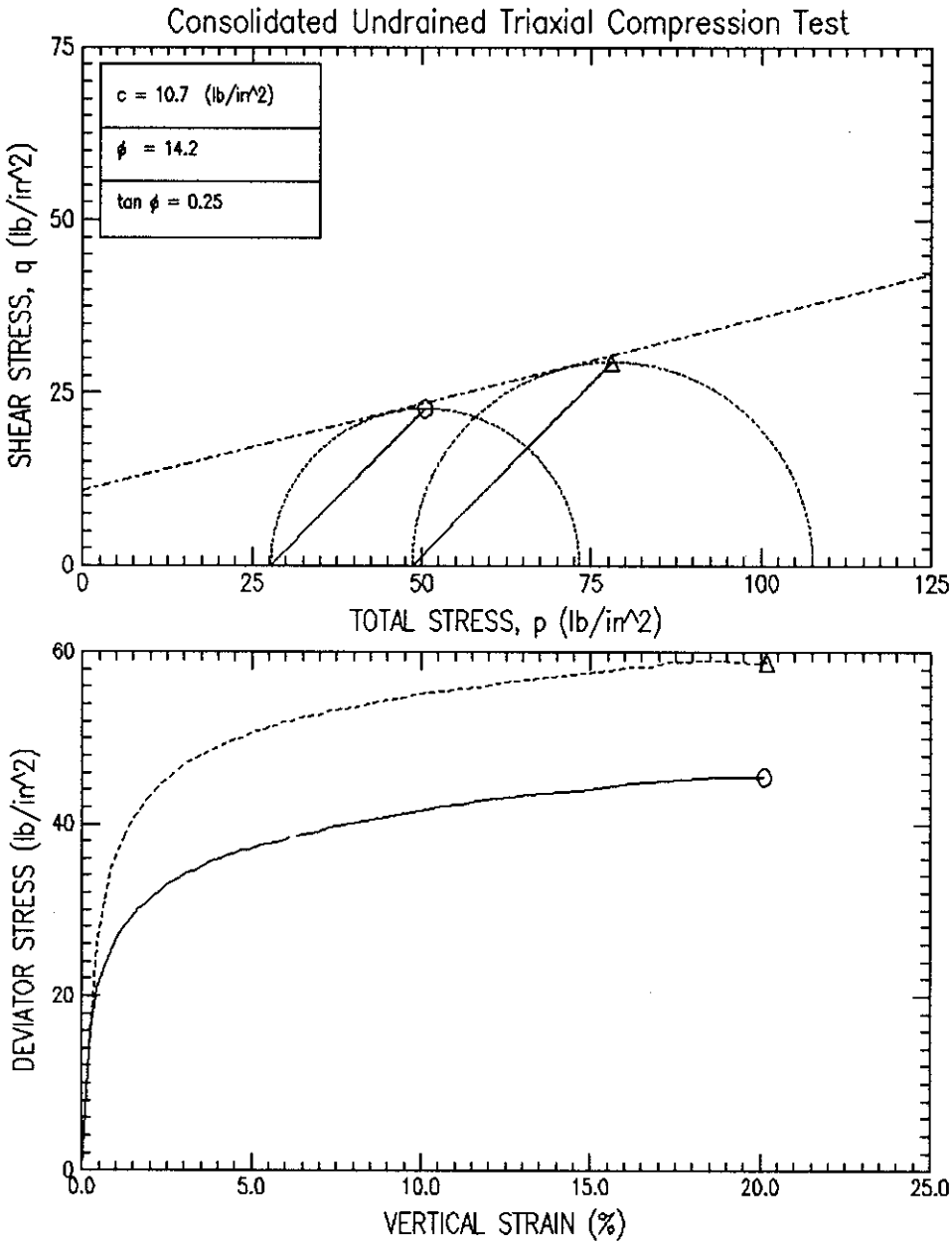
Tue 06-07-05, 14:50:31

URS



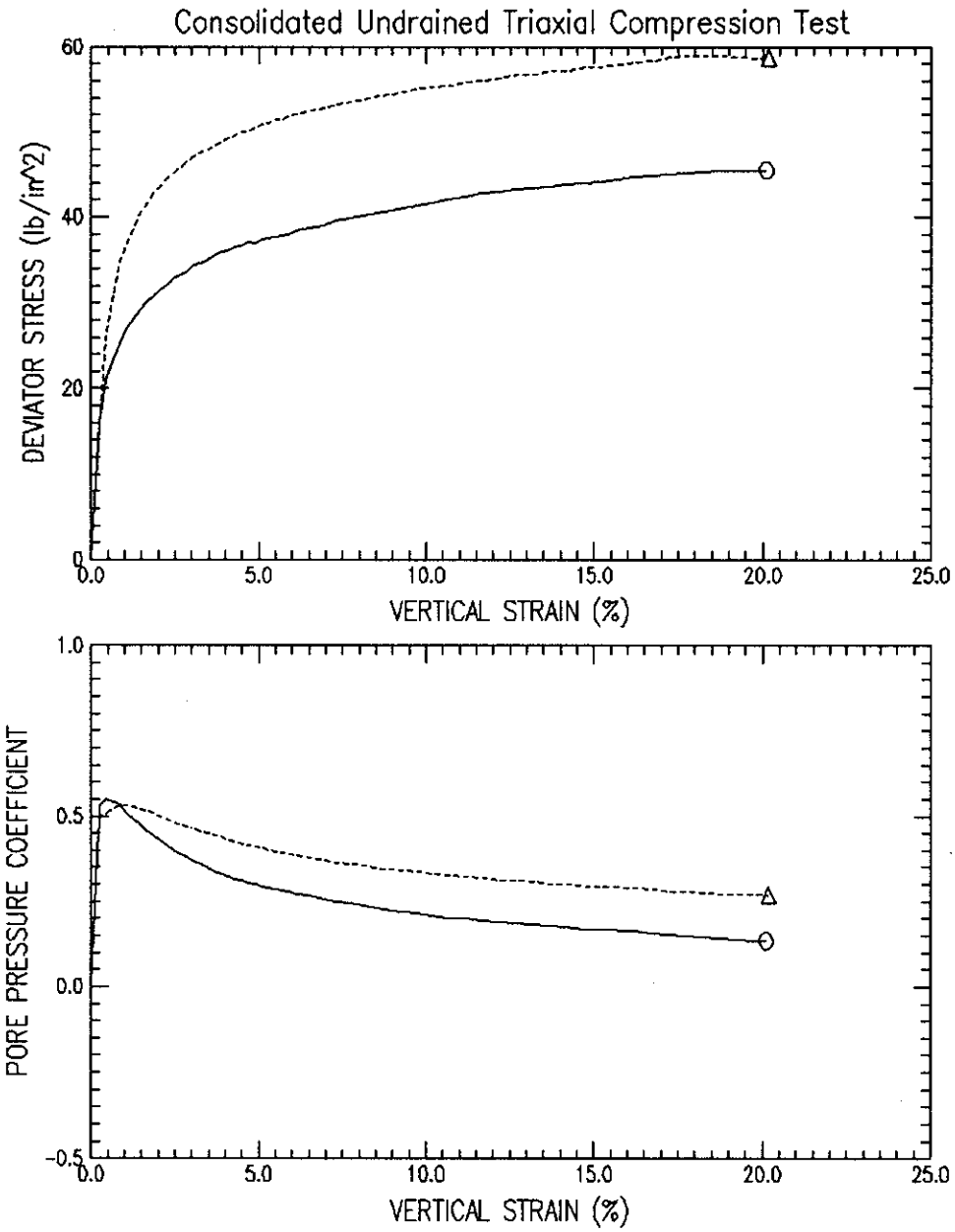
Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-38	13A	38.5 feet	VQ-38-13A	VQ38-13A.CIU	O
VQ-38	13B	38.5 feet	VQ-38-13B	VQ38-13B.CIU	Δ

URS



Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-38	13A	38.5 feet	VQ-38-13A	VQ38-13A.CIU	O
VQ-38	13B	38.5 feet	VQ-38-13B	VQ38-13B.CIU	Δ

URS



Project Name : Estates Dam Seismic Study

Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-38	13A	38.5 feet	VQ-38-13A	VQ38-13A.CIU	O
VQ-38	13B	38.5 feet	VQ-38-13B	VQ38-13B.CIU	Δ

URS

Tue Jun 07 14:45:35 2005 Page : 1

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-13A
Boring No. : VQ-38 Test Date : 06/02/05 Tested by : S. Capps
Sample No. : 13A Depth : 38.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	97.78	97.78	0.00	0.00	27.78	27.78	1.00	27.78	0.00
2)	0.24	113.81	97.78	8.53	0.53	35.29	19.25	1.83	27.27	8.02
3)	0.45	118.67	97.78	11.51	0.55	37.16	16.27	2.28	26.71	10.45
4)	0.66	121.20	97.78	12.74	0.54	38.46	15.04	2.56	26.75	11.71
5)	0.85	122.95	97.78	13.42	0.53	39.52	14.35	2.75	26.94	12.58
6)	1.05	124.69	97.78	13.73	0.51	40.96	14.05	2.92	27.50	13.45
7)	1.26	125.91	97.78	13.81	0.49	42.10	13.97	3.01	28.04	14.07
8)	1.46	126.87	97.78	13.81	0.47	43.07	13.97	3.08	28.52	14.55
9)	1.66	127.83	97.78	13.73	0.46	44.10	14.05	3.14	29.07	15.03
10)	1.86	128.53	97.78	13.58	0.44	44.95	14.20	3.17	29.58	15.38
11)	2.07	129.23	97.78	13.50	0.43	45.72	14.28	3.20	30.00	15.72
12)	2.27	129.92	97.78	13.27	0.41	46.65	14.51	3.22	30.58	16.07
13)	2.46	130.61	97.78	13.12	0.40	47.49	14.66	3.24	31.08	16.42
14)	2.67	131.05	97.78	12.96	0.39	48.08	14.81	3.25	31.45	16.63
15)	2.87	131.48	97.78	12.74	0.38	48.75	15.04	3.24	31.89	16.85
16)	3.07	132.16	97.78	12.58	0.37	49.58	15.20	3.26	32.39	17.19
17)	3.27	132.34	97.78	12.35	0.36	49.99	15.43	3.24	32.71	17.28
18)	3.48	132.77	97.78	12.20	0.35	50.57	15.58	3.25	33.07	17.50
19)	3.68	133.20	97.78	11.97	0.34	51.22	15.81	3.24	33.52	17.71
20)	3.88	133.62	97.78	11.82	0.33	51.80	15.96	3.25	33.88	17.92
21)	4.08	133.79	97.78	11.66	0.32	52.13	16.11	3.23	34.12	18.01
22)	4.28	134.21	97.78	11.51	0.32	52.70	16.27	3.24	34.48	18.22
23)	4.49	134.38	97.78	11.36	0.31	53.02	16.42	3.23	34.72	18.30
24)	4.68	134.80	97.78	11.20	0.30	53.59	16.57	3.23	35.08	18.51
25)	4.89	134.72	97.78	11.13	0.30	53.59	16.65	3.22	35.12	18.47
26)	5.10	135.13	97.78	10.98	0.29	54.15	16.80	3.22	35.48	18.67
27)	5.29	135.30	97.78	10.90	0.29	54.40	16.88	3.22	35.64	18.76
28)	5.49	135.46	97.78	10.82	0.29	54.64	16.96	3.22	35.80	18.84
29)	5.70	135.63	97.78	10.67	0.28	54.95	17.11	3.21	36.03	18.92
30)	5.90	135.79	97.78	10.59	0.28	55.19	17.19	3.21	36.19	19.00
31)	6.10	136.19	97.78	10.44	0.27	55.75	17.34	3.22	36.54	19.21
32)	6.51	136.51	97.78	10.29	0.27	56.22	17.49	3.21	36.86	19.36
33)	6.92	136.82	97.78	10.06	0.26	56.76	17.72	3.20	37.24	19.52
34)	7.31	137.37	97.78	9.83	0.25	57.55	17.95	3.21	37.75	19.80
35)	7.71	137.68	97.78	9.75	0.24	57.93	18.03	3.21	37.98	19.95
36)	8.11	137.98	97.78	9.60	0.24	58.39	18.18	3.21	38.28	20.10
37)	8.52	138.28	97.78	9.37	0.23	58.91	18.41	3.20	38.66	20.25
38)	8.93	138.57	97.78	9.14	0.22	59.43	18.64	3.19	39.03	20.39
39)	9.33	138.86	97.78	9.06	0.22	59.80	18.72	3.19	39.26	20.54
40)	9.74	139.14	97.78	8.99	0.22	60.15	18.79	3.20	39.47	20.68
41)	10.14	139.42	97.78	8.76	0.21	60.67	19.02	3.19	39.84	20.82
42)	10.65	139.88	97.78	8.53	0.20	61.35	19.25	3.19	40.30	21.05
43)	11.15	140.10	97.78	8.45	0.20	61.65	19.33	3.19	40.49	21.16
44)	11.65	140.55	97.78	8.22	0.19	62.33	19.56	3.19	40.94	21.38
45)	12.16	140.76	97.78	8.14	0.19	62.61	19.64	3.19	41.12	21.49
46)	12.66	140.96	97.78	7.99	0.19	62.97	19.79	3.18	41.38	21.59
47)	13.17	141.16	97.78	7.91	0.18	63.25	19.86	3.18	41.56	21.69
48)	13.67	141.36	97.78	7.76	0.18	63.59	20.02	3.18	41.81	21.79
49)	14.18	141.55	97.78	7.61	0.17	63.94	20.17	3.17	42.05	21.88
50)	14.68	141.73	97.78	7.45	0.17	64.27	20.32	3.16	42.30	21.97
51)	15.19	141.91	97.78	7.38	0.17	64.53	20.40	3.16	42.46	22.06
52)	16.19	142.47	97.78	7.30	0.16	65.17	20.48	3.18	42.82	22.35
53)	16.70	142.63	97.78	7.07	0.16	65.56	20.71	3.17	43.13	22.42
54)	17.20	142.79	97.78	7.00	0.16	65.79	20.78	3.17	43.29	22.50
55)	17.71	142.94	97.78	6.84	0.15	66.09	20.94	3.16	43.51	22.58
56)	18.22	143.08	97.78	6.69	0.15	66.39	21.09	3.15	43.74	22.65
57)	18.72	143.23	97.78	6.46	0.14	66.76	21.32	3.13	44.04	22.72
58)	19.73	143.28	97.78	6.23	0.14	67.05	21.55	3.11	44.30	22.75
59)	20.10	143.28	97.78	6.15	0.14	67.13	21.63	3.10	44.38	22.75

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-13A
Boring No. : VQ-38 Test Date : 06/02/05 Tested by : S. Capps
Sample No. : 13A Depth : 38.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.42	70.00	0.00	0.00	0.00	97.78	27.78
2)	0.019	0.24	11.45	78.53	188.88	188.88	16.49	113.81	35.29
3)	0.036	0.45	11.48	81.51	246.64	246.64	21.49	118.67	37.16
4)	0.052	0.66	11.50	82.74	277.04	277.04	24.09	121.20	38.46
5)	0.067	0.85	11.52	83.43	298.32	298.32	25.89	122.95	39.52
6)	0.083	1.05	11.55	83.73	319.60	319.60	27.68	124.69	40.96
7)	0.100	1.26	11.57	83.81	334.80	334.80	28.94	125.91	42.10
8)	0.115	1.46	11.59	83.81	346.97	346.97	29.93	126.87	43.07
9)	0.131	1.66	11.62	83.73	359.13	359.13	30.91	127.83	44.10
10)	0.147	1.86	11.64	83.58	368.25	368.25	31.63	128.53	44.95
11)	0.164	2.07	11.67	83.50	377.37	377.37	32.35	129.23	45.72
12)	0.180	2.27	11.69	83.27	386.49	386.49	33.06	129.92	46.65
13)	0.195	2.46	11.71	83.12	395.61	395.61	33.78	130.61	47.49
14)	0.212	2.67	11.74	82.97	401.69	401.69	34.22	131.05	48.08
15)	0.227	2.87	11.76	82.74	407.77	407.77	34.67	131.48	48.75
16)	0.243	3.07	11.79	82.58	416.89	416.89	35.37	132.16	49.58
17)	0.259	3.27	11.81	82.35	419.93	419.93	35.56	132.34	49.99
18)	0.275	3.48	11.84	82.20	426.01	426.01	35.99	132.77	50.57
19)	0.291	3.68	11.86	81.97	432.09	432.09	36.43	133.20	51.22
20)	0.307	3.88	11.88	81.82	438.17	438.17	36.87	133.62	51.80
21)	0.323	4.08	11.91	81.67	441.21	441.21	37.05	133.79	52.13
22)	0.339	4.28	11.94	81.51	447.29	447.29	37.48	134.21	52.70
23)	0.355	4.49	11.96	81.36	450.33	450.33	37.65	134.38	53.02
24)	0.371	4.68	11.99	81.21	456.41	456.41	38.08	134.80	53.59
25)	0.387	4.89	12.01	81.13	456.41	456.41	38.00	134.72	53.59
26)	0.404	5.10	12.04	80.98	462.49	462.49	38.42	135.13	54.15
27)	0.419	5.29	12.06	80.90	465.53	465.53	38.59	135.30	54.40
28)	0.435	5.49	12.09	80.82	468.57	468.57	38.76	135.46	54.64
29)	0.451	5.70	12.11	80.67	471.61	471.61	38.93	135.63	54.95
30)	0.467	5.90	12.14	80.59	474.65	474.65	39.10	135.79	55.19
31)	0.483	6.10	12.17	80.44	480.73	480.73	39.51	136.19	55.75
32)	0.515	6.51	12.22	80.29	486.81	486.81	39.84	136.51	56.22
33)	0.548	6.92	12.27	80.06	492.90	492.90	40.16	136.82	56.76
34)	0.579	7.31	12.33	79.83	502.02	502.02	40.73	137.37	57.55
35)	0.611	7.71	12.38	79.75	508.10	508.10	41.05	137.68	57.93
36)	0.642	8.11	12.43	79.60	514.18	514.18	41.36	137.98	58.39
37)	0.675	8.52	12.49	79.37	520.26	520.26	41.66	138.28	58.91
38)	0.707	8.93	12.54	79.14	526.34	526.34	41.96	138.57	59.43
39)	0.739	9.33	12.60	79.06	532.42	532.42	42.26	138.86	59.80
40)	0.771	9.74	12.66	78.99	538.50	538.50	42.55	139.14	60.15
41)	0.803	10.14	12.71	78.76	544.58	544.58	42.84	139.42	60.67
42)	0.843	10.65	12.79	78.53	553.70	553.70	43.31	139.88	61.35
43)	0.883	11.15	12.86	78.45	559.78	559.78	43.54	140.10	61.65
44)	0.922	11.65	12.93	78.22	568.90	568.90	44.00	140.55	62.33
45)	0.963	12.16	13.01	78.14	574.98	574.98	44.21	140.76	62.61
46)	1.002	12.66	13.08	77.99	581.06	581.06	44.42	140.96	62.97
47)	1.042	13.17	13.16	77.92	587.14	587.14	44.63	141.16	63.25
48)	1.083	13.67	13.23	77.76	593.22	593.22	44.83	141.36	63.59
49)	1.122	14.18	13.31	77.61	599.30	599.30	45.02	141.55	63.94
50)	1.163	14.68	13.39	77.46	605.38	605.38	45.21	141.73	64.27
51)	1.203	15.19	13.47	77.38	611.46	611.46	45.39	141.91	64.53
52)	1.282	16.19	13.63	77.30	626.66	626.66	45.97	142.47	65.17
53)	1.322	16.70	13.71	77.07	632.74	632.74	46.14	142.63	65.56
54)	1.362	17.20	13.80	77.00	638.82	638.82	46.30	142.79	65.79
55)	1.402	17.71	13.88	76.84	644.91	644.91	46.45	142.94	66.09
56)	1.442	18.22	13.97	76.69	650.99	650.99	46.60	143.08	66.39
57)	1.482	18.72	14.06	76.46	657.07	657.07	46.75	143.23	66.76
58)	1.562	19.73	14.23	76.23	666.19	666.19	46.81	143.28	67.05
59)	1.591	20.10	14.30	76.15	669.23	669.23	46.81	143.28	67.13

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CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-13A
Boring No. : VQ-38 Test Date : 06/02/05 Tested by : S. Capps
Sample No. : 13A Depth : 38.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Liquid Limit : 29.46 Plastic Limit : 15.72 Specific Gravity : 2.775

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ38-13A	VQ38-13A
WT CONTAINER + WET SOIL (gm)	3580.00	3551.20
WT CONTAINER + DRY SOIL (gm)	3235.89	3235.89
WT WATER (gm)	344.11	315.31
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	3235.89	3235.89
WATER CONTENT (%)	10.63	9.74

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	10.63	9.74
VOID RATIO	0.31	0.27
WET DENSITY (lb/ft^3)	146.59	149.58
DRY DENSITY (lb/ft^3)	132.50	136.30
DEGREE OF SATURATION (%)	96.16	99.98

Maximum Shear Stress = 22.75 (lb/in^2) at a Vertical Strain of 19.73 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-13A
Boring No. : VQ-38 Test Date : 06/02/05 Tested by : S. Capps
Sample No. : 13A Depth : 38.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 29.46 Plastic Limit : 15.72 Specific Gravity : 2.775

INITIAL							
		Height	: 7.992 (in)	Dry Density	: 132.50 (lb/ft^3)		
		Area	: 11.642 (in^2)	Moisture	: 10.63 %		
		Void Ratio	: 0.31				
		Saturation	: 96.16 %				
Time	: 0.00 (min)						
INITIALIZATION							
dH	: 0.000 (in)	Height	: 7.992 (in)	Dry Density	: 132.50 (lb/ft^3)	Total Vert. Stress	: 97.78 (lb/in^2
dV	: 0.000 (in^3)	Area	: 11.642 (in^2)	Moisture	: 10.63 %	Total Hori. Stress	: 97.78 (lb/in^2
		Void Ratio	: 0.31			Pore Pressure	: 0.00 (lb/in^2)
		Saturation	: 96.16 %			Effect.Vert. Stress	: 97.78 (lb/in^2
Time	: 0.00 (min)					Effect.Hori. Stress	: 97.78 (lb/in^2
END OF CONSOLIDATION - A							
dH	: 0.000 (in)	Height	: 7.992 (in)	Dry Density	: 132.50 (lb/ft^3)	Total Vert. Stress	: 97.78 (lb/in^2
dV	: 0.000 (in^3)	Area	: 11.642 (in^2)	Moisture	: 10.63 %	Total Hori. Stress	: 97.78 (lb/in^2
		Void Ratio	: 0.31			Pore Pressure	: 0.00 (lb/in^2)
		Saturation	: 96.16 %			Effect.Vert. Stress	: 97.78 (lb/in^2
Time	: 0.00 (min)					Effect.Hori. Stress	: 97.78 (lb/in^2
END OF SATURATION							
dH	: 0.000 (in)	Height	: 7.992 (in)	Dry Density	: 132.50 (lb/ft^3)	Total Vert. Stress	: 97.78 (lb/in^2
dV	: 0.000 (in^3)	Area	: 11.642 (in^2)	Moisture	: 9.74 %	Total Hori. Stress	: 97.78 (lb/in^2
dVCorr	: 0.000 (in^3)	Void Ratio	: 0.31			Pore Pressure	: 0.00 (lb/in^2)
		Saturation	: 88.11 %			Effect.Vert. Stress	: 97.78 (lb/in^2
Time	: 0.00 (min)					Effect.Hori. Stress	: 97.78 (lb/in^2
END OF CONSOLIDATION - B							
dH	: 0.075 (in)	Height	: 7.917 (in)	Dry Density	: 136.30 (lb/ft^3)	Total Vert. Stress	: 97.78 (lb/in^2
dV	: 2.595 (in^3)	Area	: 11.424 (in^2)	Moisture	: 9.74 %	Total Hori. Stress	: 97.78 (lb/in^2
		Void Ratio	: 0.27			Pore Pressure	: 70.00 (lb/in^2
		Saturation	: 99.98 %			Effect.Vert. Stress	: 27.78 (lb/in^2
Time	: 0.00 (min)					Effect.Hori. Stress	: 27.78 (lb/in^2
FAILURE DURING SHEAR							
dH	: 1.562 (in)	Height	: 6.430 (in)	Dry Density	: 136.30 (lb/ft^3)	Total Vert. Stress	: 144.59 (lb/in^
dV	: 2.595 (in^3)	Area	: 14.232 (in^2)	Moisture	: 9.74 %	Total Hori. Stress	: 97.78 (lb/in^2
Strain	: 19.73 %	Void Ratio	: 0.27			Pore Pressure	: 76.23 (lb/in^2
Strength	: 23.40 (lb/in^2)	Saturation	: 99.98 %			Effect.Vert. Stress	: 68.36 (lb/in^2
Time	: 1486.78 (min)					Effect.Hori. Stress	: 21.55 (lb/in^2
END OF TEST							
dH	: 1.591 (in)	Height	: 6.401 (in)	Dry Density	: 136.30 (lb/ft^3)	Total Vert. Stress	: 144.59 (lb/in^
dV	: 2.595 (in^3)	Area	: 14.298 (in^2)	Moisture	: 9.74 %	Total Hori. Stress	: 97.78 (lb/in^2
Strain	: 20.10 %	Void Ratio	: 0.27			Pore Pressure	: 76.15 (lb/in^2
		Saturation	: 99.98 %			Effect.Vert. Stress	: 68.43 (lb/in^2
Time	: 1514.10 (min)					Effect.Hori. Stress	: 21.63 (lb/in^2

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CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-13B
Boring No. : VQ-38 Test Date : 05/30/05 Tested by : S. Capps
Sample No. : 13B Depth : 38.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 48.61 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	118.61	118.61	0.00	0.00	48.61	48.61	1.00	48.61	0.00
2)	0.25	134.31	118.61	7.84	0.50	56.48	40.77	1.39	48.62	7.85
3)	0.45	144.54	118.61	13.12	0.51	61.42	35.49	1.73	48.45	12.96
4)	0.66	149.60	118.61	16.18	0.52	63.42	32.43	1.96	47.92	15.50
5)	0.86	153.37	118.61	18.40	0.53	64.97	30.21	2.15	47.59	17.38
6)	1.07	155.59	118.61	19.62	0.53	65.96	28.98	2.28	47.47	18.49
7)	1.27	157.29	118.61	20.47	0.53	66.83	28.14	2.37	47.49	19.34
8)	1.47	158.99	118.61	21.00	0.52	67.99	27.61	2.46	47.80	20.19
9)	1.67	160.18	118.61	21.46	0.52	68.71	27.15	2.53	47.93	20.78
10)	1.87	161.35	118.61	21.69	0.51	69.66	26.92	2.59	48.29	21.37
11)	2.08	162.27	118.61	21.69	0.50	70.58	26.92	2.62	48.75	21.83
12)	2.28	163.19	118.61	21.84	0.49	71.34	26.77	2.67	49.05	22.29
13)	2.49	163.85	118.61	21.77	0.48	72.08	26.84	2.69	49.46	22.62
14)	2.69	164.51	118.61	21.77	0.47	72.74	26.84	2.71	49.79	22.95
15)	2.89	165.16	118.61	21.84	0.47	73.32	26.77	2.74	50.04	23.28
16)	3.09	165.81	118.61	21.77	0.46	74.05	26.84	2.76	50.44	23.60
17)	3.30	166.21	118.61	21.69	0.46	74.52	26.92	2.77	50.72	23.80
18)	3.50	166.61	118.61	21.61	0.45	74.99	27.00	2.78	50.99	24.00
19)	3.70	167.01	118.61	21.46	0.44	75.55	27.15	2.78	51.35	24.20
20)	3.90	167.40	118.61	21.38	0.44	76.02	27.22	2.79	51.62	24.40
21)	4.11	167.79	118.61	21.15	0.43	76.63	27.45	2.79	52.04	24.59
22)	4.31	168.18	118.61	21.00	0.42	77.17	27.61	2.80	52.39	24.78
23)	4.52	168.56	118.61	20.85	0.42	77.71	27.76	2.80	52.74	24.98
24)	4.71	168.71	118.61	20.70	0.41	78.01	27.91	2.79	52.96	25.05
25)	4.92	169.09	118.61	20.70	0.41	78.39	27.91	2.81	53.15	25.24
26)	5.12	169.47	118.61	20.62	0.41	78.85	27.99	2.82	53.42	25.43
27)	5.32	169.60	118.61	20.39	0.40	79.21	28.22	2.81	53.72	25.50
28)	5.52	169.98	118.61	20.39	0.40	79.59	28.22	2.82	53.91	25.69
29)	5.73	170.11	118.61	20.24	0.39	79.88	28.37	2.82	54.12	25.75
30)	5.93	170.49	118.61	20.16	0.39	80.33	28.45	2.82	54.39	25.94
31)	6.14	170.61	118.61	20.08	0.39	80.53	28.53	2.82	54.53	26.00
32)	6.55	171.11	118.61	19.78	0.38	81.33	28.83	2.82	55.08	26.25
33)	6.95	171.37	118.61	19.55	0.37	81.82	29.06	2.82	55.44	26.38
34)	7.35	171.85	118.61	19.39	0.36	82.46	29.21	2.82	55.84	26.62
35)	7.75	172.10	118.61	19.24	0.36	82.85	29.37	2.82	56.11	26.74
36)	8.16	172.33	118.61	19.01	0.35	83.32	29.60	2.82	56.46	26.86
37)	8.56	172.80	118.61	18.71	0.35	84.10	29.90	2.81	57.00	27.10
38)	8.98	173.03	118.61	18.78	0.35	84.24	29.83	2.82	57.04	27.21
39)	9.38	173.26	118.61	18.71	0.34	84.55	29.90	2.83	57.23	27.32
40)	9.78	173.71	118.61	18.48	0.34	85.23	30.13	2.83	57.68	27.55
41)	10.19	173.92	118.61	18.17	0.33	85.75	30.44	2.82	58.10	27.66
42)	10.70	174.07	118.61	18.02	0.32	86.05	30.59	2.81	58.32	27.73
43)	11.21	174.44	118.61	17.94	0.32	86.50	30.67	2.82	58.58	27.91
44)	11.71	174.58	118.61	17.79	0.32	86.79	30.82	2.82	58.80	27.98
45)	12.22	174.93	118.61	17.63	0.31	87.30	30.97	2.82	59.14	28.16
46)	12.72	175.28	118.61	17.56	0.31	87.73	31.05	2.83	59.39	28.34
47)	13.23	175.40	118.61	17.40	0.31	87.99	31.20	2.82	59.60	28.39
48)	13.74	175.73	118.61	17.17	0.30	88.56	31.43	2.82	60.00	28.56
49)	14.24	175.84	118.61	17.10	0.30	88.74	31.51	2.82	60.13	28.62
50)	14.75	176.16	118.61	16.94	0.29	89.22	31.66	2.82	60.44	28.78
51)	15.26	176.26	118.61	16.94	0.29	89.31	31.66	2.82	60.49	28.82
52)	16.27	176.86	118.61	16.79	0.29	90.07	31.82	2.83	60.94	29.13
53)	16.78	176.94	118.61	16.64	0.29	90.30	31.97	2.82	61.13	29.16
54)	17.29	177.43	118.61	16.41	0.28	91.02	32.20	2.83	61.61	29.41
55)	17.79	177.50	118.61	16.33	0.28	91.16	32.28	2.82	61.72	29.44
56)	18.31	177.55	118.61	16.26	0.28	91.29	32.35	2.82	61.82	29.47
57)	18.81	177.61	118.61	16.03	0.27	91.58	32.58	2.81	62.08	29.50
58)	19.82	177.28	118.61	15.87	0.27	91.41	32.74	2.79	62.07	29.34
59)	20.18	177.43	118.61	15.80	0.27	91.64	32.81	2.79	62.22	29.41

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-13B
Boring No. : VQ-38 Test Date : 05/30/05 Tested by : S. Capps
Sample No. : 13B Depth : 38.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 48.61 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.32	70.00	0.00	0.00	0.00	118.61	48.61
2)	0.020	0.25	11.35	77.84	185.83	185.83	16.37	134.31	56.48
3)	0.036	0.45	11.38	83.12	307.44	307.44	27.03	144.54	61.42
4)	0.052	0.66	11.40	86.18	368.25	368.25	32.31	149.60	63.42
5)	0.068	0.86	11.42	88.40	413.85	413.85	36.23	153.37	64.97
6)	0.084	1.07	11.45	89.63	441.21	441.21	38.55	155.59	65.96
7)	0.100	1.27	11.47	90.47	462.49	462.49	40.33	157.29	66.83
8)	0.116	1.47	11.49	91.00	483.77	483.77	42.09	158.99	67.99
9)	0.132	1.67	11.52	91.46	498.98	498.98	43.33	160.18	68.71
10)	0.148	1.87	11.54	91.69	514.18	514.18	44.56	161.35	69.66
11)	0.164	2.08	11.56	91.69	526.34	526.34	45.52	162.27	70.58
12)	0.180	2.28	11.59	91.84	538.50	538.50	46.47	163.19	71.34
13)	0.196	2.49	11.61	91.77	547.62	547.62	47.16	163.85	72.08
14)	0.212	2.69	11.64	91.77	556.74	556.74	47.85	164.51	72.74
15)	0.228	2.89	11.66	91.84	565.86	565.86	48.53	165.16	73.32
16)	0.244	3.09	11.69	91.77	574.98	574.98	49.21	165.81	74.05
17)	0.260	3.30	11.71	91.69	581.06	581.06	49.62	166.21	74.52
18)	0.276	3.50	11.73	91.61	587.14	587.14	50.04	166.61	74.99
19)	0.291	3.70	11.76	91.46	593.22	593.22	50.45	167.01	75.55
20)	0.307	3.90	11.78	91.39	599.30	599.30	50.86	167.40	76.02
21)	0.324	4.11	11.81	91.16	605.38	605.38	51.27	167.79	76.63
22)	0.340	4.31	11.83	91.00	611.46	611.46	51.67	168.18	77.17
23)	0.356	4.52	11.86	90.85	617.54	617.54	52.07	168.56	77.71
24)	0.371	4.71	11.88	90.70	620.58	620.58	52.22	168.71	78.01
25)	0.387	4.92	11.91	90.70	626.66	626.66	52.62	169.09	78.39
26)	0.404	5.12	11.93	90.62	632.74	632.74	53.02	169.47	78.85
27)	0.420	5.32	11.96	90.39	635.78	635.78	53.16	169.60	79.21
28)	0.435	5.52	11.99	90.39	641.86	641.86	53.55	169.98	79.59
29)	0.452	5.73	12.01	90.24	644.91	644.91	53.69	170.11	79.88
30)	0.467	5.93	12.04	90.16	650.99	650.99	54.08	170.49	80.33
31)	0.484	6.14	12.06	90.08	654.03	654.03	54.21	170.61	80.53
32)	0.516	6.55	12.12	89.78	663.15	663.15	54.73	171.11	81.33
33)	0.548	6.95	12.17	89.55	669.23	669.23	54.99	171.37	81.82
34)	0.579	7.35	12.22	89.40	678.35	678.35	55.50	171.85	82.46
35)	0.611	7.75	12.28	89.24	684.43	684.43	55.76	172.10	82.85
36)	0.643	8.16	12.33	89.01	690.51	690.51	56.00	172.33	83.32
37)	0.675	8.56	12.38	88.71	699.63	699.63	56.49	172.80	84.10
38)	0.708	8.98	12.44	88.78	705.71	705.71	56.73	173.03	84.24
39)	0.739	9.38	12.50	88.71	711.79	711.79	56.97	173.26	84.55
40)	0.771	9.78	12.55	88.48	720.91	720.91	57.44	173.71	85.23
41)	0.803	10.19	12.61	88.17	726.99	726.99	57.66	173.92	85.75
42)	0.843	10.70	12.68	88.02	733.07	733.07	57.81	174.07	86.05
43)	0.883	11.21	12.75	87.94	742.19	742.19	58.20	174.44	86.50
44)	0.923	11.71	12.83	87.79	748.27	748.27	58.34	174.58	86.79
45)	0.963	12.22	12.90	87.64	757.39	757.39	58.71	174.93	87.30
46)	1.003	12.72	12.97	87.56	766.51	766.51	59.08	175.28	87.73
47)	1.043	13.23	13.05	87.41	772.59	772.59	59.20	175.40	87.99
48)	1.083	13.74	13.13	87.18	781.71	781.71	59.55	175.73	88.56
49)	1.123	14.24	13.20	87.10	787.79	787.79	59.66	175.84	88.74
50)	1.163	14.75	13.28	86.95	796.92	796.92	60.00	176.16	89.22
51)	1.203	15.26	13.36	86.95	803.00	803.00	60.09	176.26	89.31
52)	1.282	16.27	13.52	86.79	821.24	821.24	60.72	176.86	90.07
53)	1.323	16.78	13.61	86.64	827.32	827.32	60.80	176.94	90.30
54)	1.362	17.29	13.69	86.41	839.48	839.48	61.32	177.43	91.02
55)	1.402	17.79	13.77	86.33	845.56	845.56	61.39	177.50	91.16
56)	1.443	18.31	13.86	86.26	851.64	851.64	61.44	177.55	91.29
57)	1.482	18.81	13.95	86.03	857.72	857.72	61.50	177.61	91.58
58)	1.562	19.82	14.12	85.87	863.80	863.80	61.16	177.28	91.41
59)	1.590	20.18	14.19	85.80	869.88	869.88	61.32	177.43	91.64

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-13B
Boring No. : VQ-38 Test Date : 05/30/05 Tested by : S. Capps
Sample No. : 13B Depth : 38.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 48.61 psi

Liquid Limit : 29.28 Plastic Limit : 16.43 Specific Gravity : 2.775

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ38-13B	VQ38-13B
WT CONTAINER + WET SOIL (gm)	3445.70	3398.97
WT CONTAINER + DRY SOIL (gm)	3028.68	3028.68
WT WATER (gm)	417.02	370.29
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	3028.68	3028.68
WATER CONTENT (%)	13.77	12.23

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	13.77	12.23
VOID RATIO	0.40	0.34
WET DENSITY (lb/ft^3)	141.09	145.08
DRY DENSITY (lb/ft^3)	124.01	129.28
DEGREE OF SATURATION (%)	96.41	99.95

Maximum Shear Stress = 29.50 (lb/in^2) at a Vertical Strain of 18.81 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-13B
Boring No. : VQ-38 Test Date : 05/30/05 Tested by : S. Capps
Sample No. : 13B Depth : 38.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 48.61 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 29.28 Plastic Limit : 16.43 Specific Gravity : 2.775

INITIAL
Height : 7.992 (in) Dry Density : 124.01 (lb/ft^3)
Area : 11.642 (in^2) Moisture : 13.77 %
Void Ratio: 0.40
Saturation: 96.41 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 124.01 (lb/ft^3) Total Vert. Stress : 118.61 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 13.77 % Total Hori. Stress : 118.61 (lb/in^
Void Ratio: 0.40 Pore Pressure : 0.00 (lb/in^2)
Saturation: 96.41 % Effect.Vert. Stress: 118.61 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 118.61 (lb/in^

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 124.01 (lb/ft^3) Total Vert. Stress : 118.61 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 13.77 % Total Hori. Stress : 118.61 (lb/in^
Void Ratio: 0.40 Pore Pressure : 0.00 (lb/in^2)
Saturation: 96.41 % Effect.Vert. Stress: 118.61 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 118.61 (lb/in^

END OF SATURATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 124.01 (lb/ft^3) Total Vert. Stress : 118.61 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 12.23 % Total Hori. Stress : 118.61 (lb/in^
dVCorr : 0.000 (in^3) Void Ratio: 0.40 Pore Pressure : 0.00 (lb/in^2)
Saturation: 85.61 % Effect.Vert. Stress: 118.61 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 118.61 (lb/in^

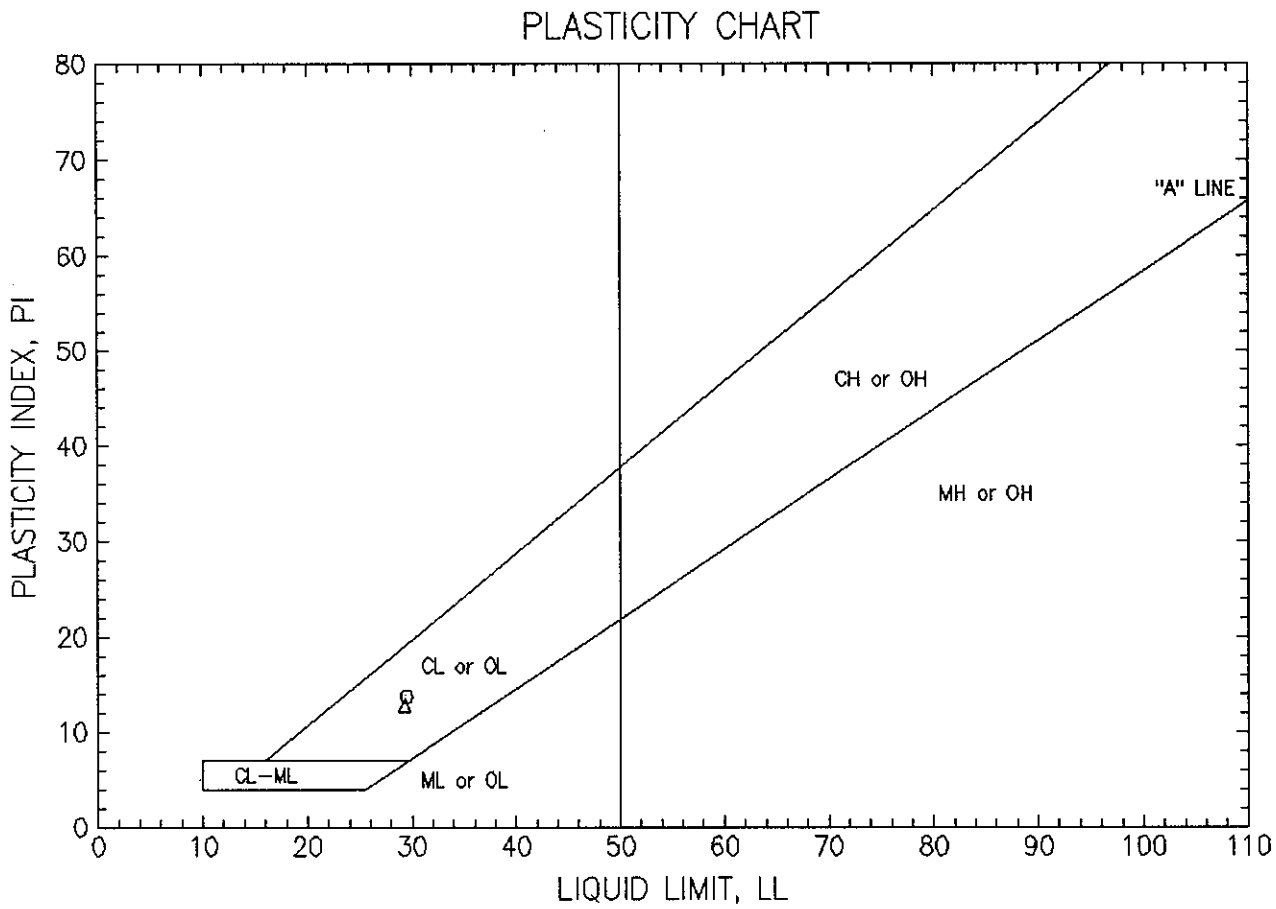
END OF CONSOLIDATION - B
dH : 0.110 (in) Height : 7.882 (in) Dry Density : 129.28 (lb/ft^3) Total Vert. Stress : 118.61 (lb/in^
dV : 3.789 (in^3) Area : 11.323 (in^2) Moisture : 12.23 % Total Hori. Stress : 118.61 (lb/in^
Void Ratio: 0.34 Pore Pressure : 70.00 (lb/in^2
Saturation: 99.95 % Effect.Vert. Stress: 48.61 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 48.61 (lb/in^2

FAILURE DURING SHEAR
dH : 1.482 (in) Height : 6.510 (in) Dry Density : 129.28 (lb/ft^3) Total Vert. Stress : 180.11 (lb/in^
dV : 3.789 (in^3) Area : 13.946 (in^2) Moisture : 12.23 % Total Hori. Stress : 118.61 (lb/in^
Strain : 18.81 % Void Ratio: 0.34 Pore Pressure : 86.03 (lb/in^2
Strength: 30.75 (lb/in^2) Saturation: 99.95 % Effect.Vert. Stress: 94.08 (lb/in^2
Time : 1443.68 (min) Effect.Hori. Stress: 32.58 (lb/in^2

END OF TEST
dH : 1.590 (in) Height : 6.402 (in) Dry Density : 129.28 (lb/ft^3) Total Vert. Stress : 179.93 (lb/in^
dV : 3.789 (in^3) Area : 14.186 (in^2) Moisture : 12.23 % Total Hori. Stress : 118.61 (lb/in^
Strain : 20.18 % Void Ratio: 0.34 Pore Pressure : 85.80 (lb/in^2
Saturation: 99.95 % Effect.Vert. Stress: 94.13 (lb/in^2
Time : 1546.07 (min) Effect.Hori. Stress: 32.81 (lb/in^2

URS

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Location : Piedmont, CA
Date : Tue Jun 07 2005

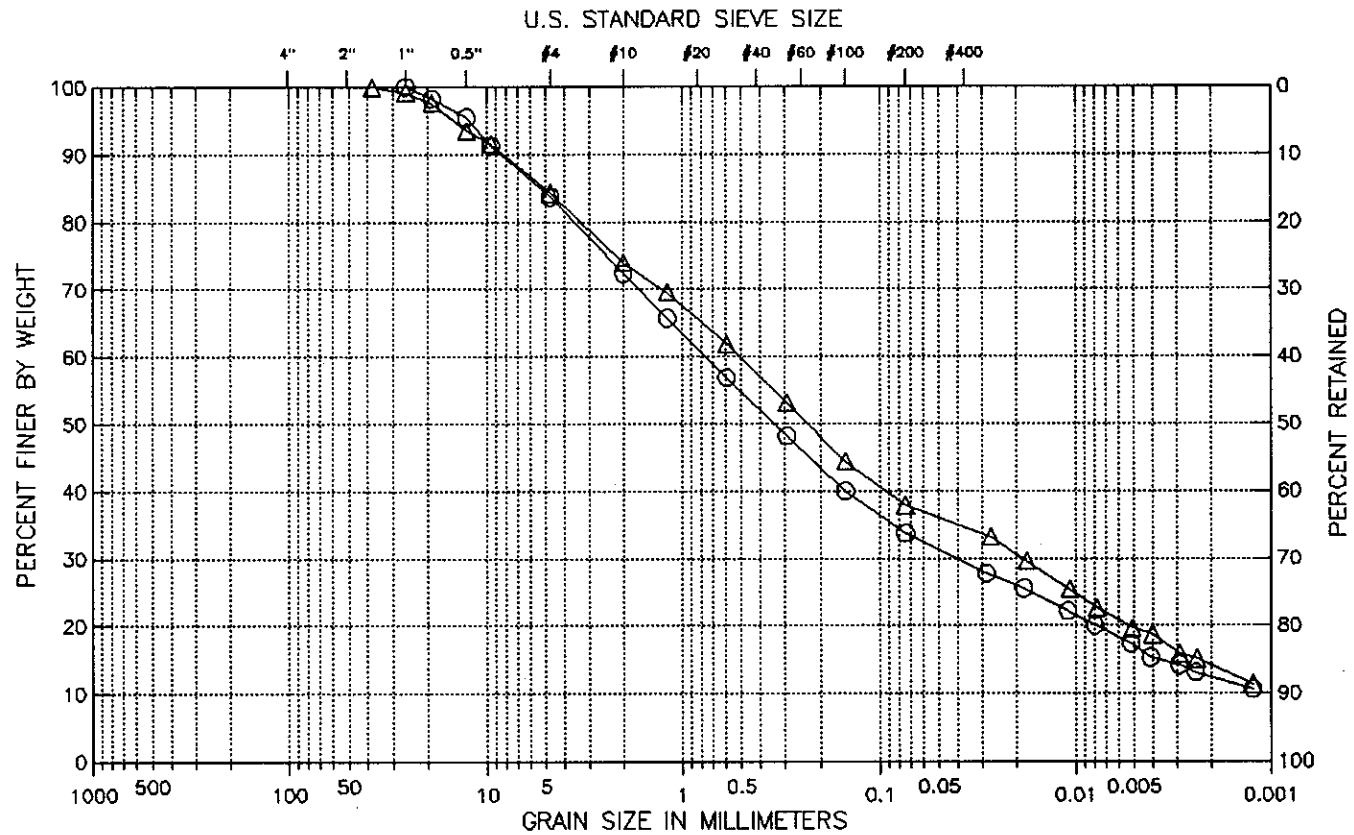


Symbol	Boring No.	Sample No.	Liquid Limit	Plastic Limit	Plasticity Index
○	VQ-38	13A middle cut	29.46	15.72	13.74
△	VQ-38	13B bottom cut	29.28	16.43	12.85

Figure 1

URS

Project : Estates Dam Seismic Study
Project No.: 26814957.H0000
Location: Piedmont, CA
Date : Tue Jun 07 2005



Symbol	Boring No.	Sample No.	Depth	Filename	Classification	/ Description
-O-	VQ-38	13A middle cut	38.5 feet	VQ38-13A	SC	Clayey sand with gravel
-Δ-	VQ-38	13B bottom cut	38.5 feet	VQ38-13B	SC	Clayey sand with gravel

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 13A middle cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 38.5 feet

Depth : 38.5 feet
Test Date : 06/07/2005
Test Method : ASTM D422/4318

Filename : VQ38-13A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 80 gm
Specific Gravity = 2.775

Hydroscopic Moisture Content :
Weight of Wet Soil = 80 gm
Weight of Dry Soil = 76.71 gm
Moisture Content = 0.0428888

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	38.50	22.10	30.17	0.029	28	0.029
5.00	36.10	22.10	27.77	0.018	26	0.018
15.00	32.50	22.00	24.12	0.011	22	0.011
30.00	30.20	21.90	21.77	0.008	20	0.008
73.00	27.40	21.60	18.84	0.005	17	0.005
121.00	25.50	21.00	16.66	0.004	15	0.004
242.00	24.30	20.90	15.41	0.003	14	0.003
360.00	23.00	21.20	14.25	0.002	13	0.002
1440.00	20.50	20.70	11.52	0.001	11	0.001

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 13B bottom cut
Location : Piedmont, CA
Depth : 38.5 feet
Test Date : 06/03/2005
Test Method : ASTM D422/4318
Filename : VQ38-13B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 38.5 feet

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 80 gm
Specific Gravity = 2.775

Hydroscopic Moisture Content :
Weight of Wet Soil = 80 gm
Weight of Dry Soil = 78.33 gm
Moisture Content = 0.0213201

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	44.30	22.30	36.06	0.027	33	0.027
5.00	40.40	22.20	32.11	0.018	30	0.018
15.00	36.00	22.00	27.62	0.011	25	0.011
30.00	33.10	21.70	24.58	0.008	23	0.008
73.00	30.00	21.30	21.30	0.005	20	0.005
120.00	28.90	21.60	20.34	0.004	19	0.004
240.00	26.00	21.20	17.25	0.003	16	0.003
360.00	25.00	21.60	16.44	0.002	15	0.002
1440.00	21.10	21.10	12.31	0.001	11	0.001

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000 Depth : 38.5 feet
Boring No. : VQ-38 Test Date : 06/07/2005
Sample No. : 13A middle cut Test Method : ASTM D422/4318
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 38.5 feet

Filename : VQ38-13A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	44.02	44.02	98
0.5"	0.500	12.70	68.89	112.91	96
0.375"	0.374	9.51	105.59	218.50	91
#4	0.187	4.75	190.80	409.30	84
#10	0.079	2.00	286.10	695.40	72

Total Dry Weight of Sample = 2590

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#16	0.047	1.19	7.00	7.00	66
#30	0.023	0.60	9.34	16.34	57
#50	0.012	0.30	9.29	25.63	48
#100	0.006	0.15	8.62	34.25	40
#200	0.003	0.07	6.67	40.92	34
Pan			35.79	76.71	0

Total Wet Weight of Sample = 80
Total Dry Weight of Sample = 76.71
Moisture Content = 0.0428888

D85 : 5.3460 mm
D60 : 0.7586 mm
D50 : 0.3420 mm
D30 : 0.0410 mm
D15 : 0.0037 mm
D10 : 0.0011 mm

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand with gravel
AASHTO Group Symbol : A-2-6(1)
AASHTO Group Name : Clayey Gravel and Sand

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000 Depth : 38.5 feet
Boring No. : VQ-38 Test Date : 06/03/2005
Sample No. : 13B bottom cut Test Method : ASTM D422/4318
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 38.5 feet

Filename : VQ38-13B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	18.61	18.61	99
0.75"	0.748	19.00	32.42	51.03	98
0.5"	0.500	12.70	87.62	138.65	94
0.375"	0.374	9.51	41.97	180.62	92
#4	0.187	4.75	155.75	336.37	84
#10	0.079	2.00	221.73	558.10	74

Total Dry Weight of Sample = 2178

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#16	0.047	1.19	4.67	4.67	70
#30	0.023	0.60	8.10	12.77	62
#50	0.012	0.30	9.35	22.12	53
#100	0.006	0.15	9.19	31.31	44
#200	0.003	0.07	6.94	38.25	38
Pan			40.08	78.33	0

Total Wet Weight of Sample = 80
Total Dry Weight of Sample = 78.33
Moisture Content = 0.0213201

D85 : 5.0726 mm
D60 : 0.5111 mm
D50 : 0.2315 mm
D30 : 0.0187 mm
D15 : 0.0023 mm
D10 : 0.0010 mm

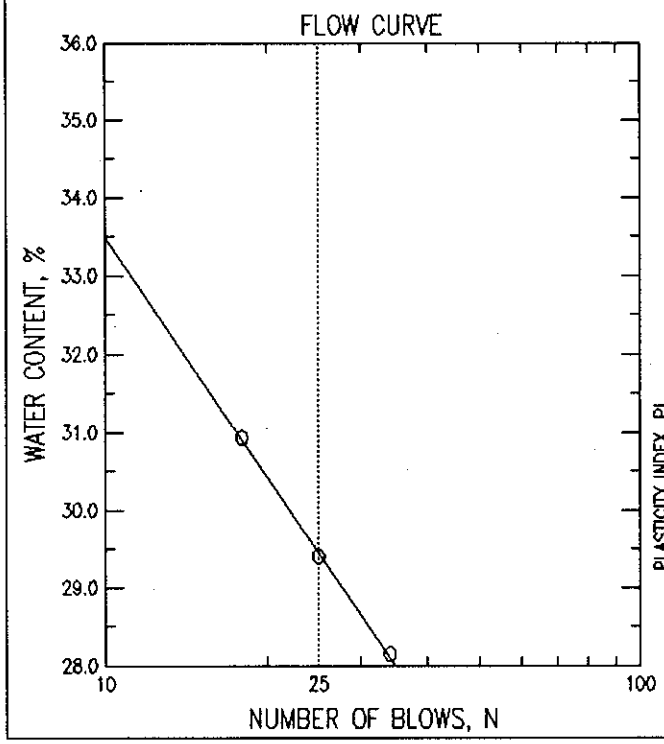
Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand with gravel
AASHTO Group Symbol : A-6(1)
AASHTO Group Name : Clayey Soils

URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-38
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	13A middle cut
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown clayey sand (SC) with gravel		Tue Jun 07 2005	VQ38-13A

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	82	85	87		
WT. WET SOIL + TARE	24.06	25.75	28.83		
WT. DRY SOIL + TARE	21.15	22.34	24.58		
WT. WATER	2.91	3.41	4.25		
TARE WT.	10.81	10.74	10.84		
WT. DRY SOIL	10.34	11.6	13.74		
WATER CONTENT, W_N (%)	28.14	29.40	30.93		
NUMBER OF BLOWS, N	34	25	18		
ONE-POINT LIQUID LIMIT, LL	29.21	29.40	29.73		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	36				
WT. WET SOIL + TARE	28.46				
WT. DRY SOIL + TARE	26.17				
WT. WATER	2.29				
TARE WT.	11.6				
WT. DRY SOIL	14.57				
WATER CONTENT (%)	15.72				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	11.8
LIQUID LIMIT, LL	29.5
PLASTIC LIMIT, PL	15.7
PLASTICITY INDEX, PI	13.7
LIQUIDITY INDEX, LI*	-0.29

*LI = (W - PL)/PI

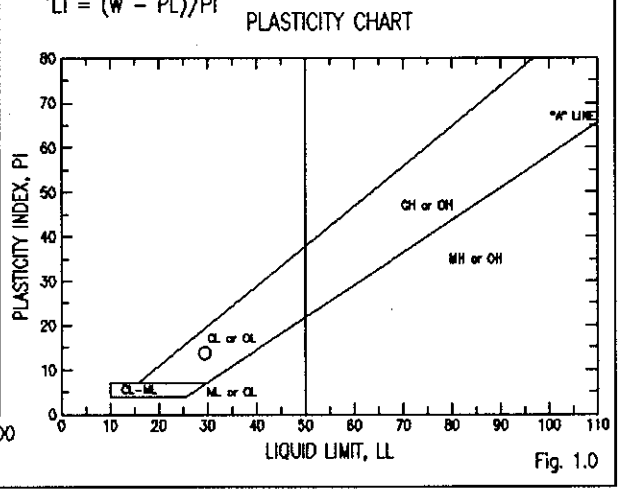


Fig. 1.0

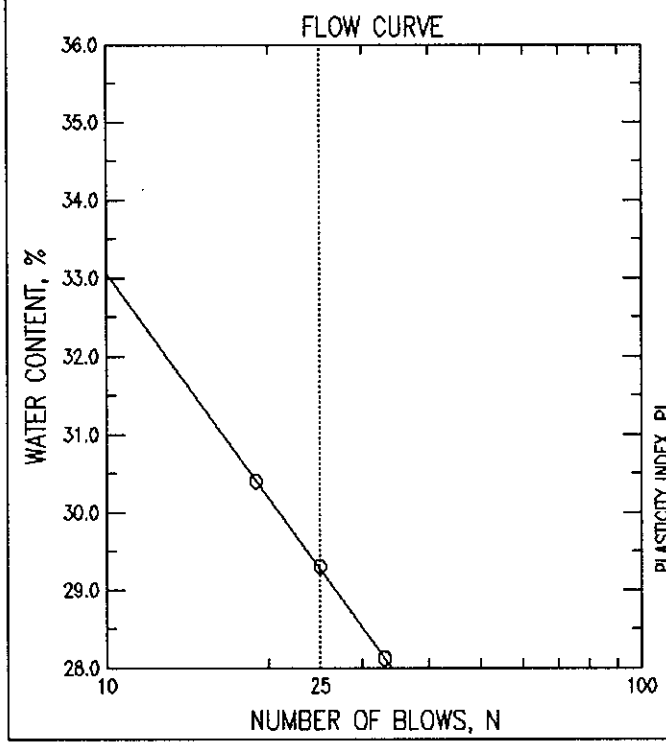
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-38
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	13B bottom cut
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown clayey sand (SC) with gravel		Fri Jun 03 2005	VQ38-13B

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	33	38	37		
WT. WET SOIL + TARE	26.96	27.85	27.66		
WT. DRY SOIL + TARE	23.38	23.95	23.76		
WT. WATER	3.58	3.9	3.9		
TARE WT.	10.65	10.64	10.93		
WT. DRY SOIL	12.73	13.31	12.83		
WATER CONTENT, W_N (%)	28.12	29.30	30.40		
NUMBER OF BLOWS, N	33	25	19		
ONE-POINT LIQUID LIMIT, LL	29.08	29.30	29.40		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	36				
WT. WET SOIL + TARE	34.46				
WT. DRY SOIL + TARE	31.23				
WT. WATER	3.23				
TARE WT.	11.57				
WT. DRY SOIL	19.66				
WATER CONTENT (%)	16.43				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	14.1
LIQUID LIMIT, LL	29.3
PLASTIC LIMIT, PL	16.4
PLASTICITY INDEX, PI	12.8
LIQUIDITY INDEX, LI*	-0.18

*LI = (W - PL)/PI

PLASTICITY CHART

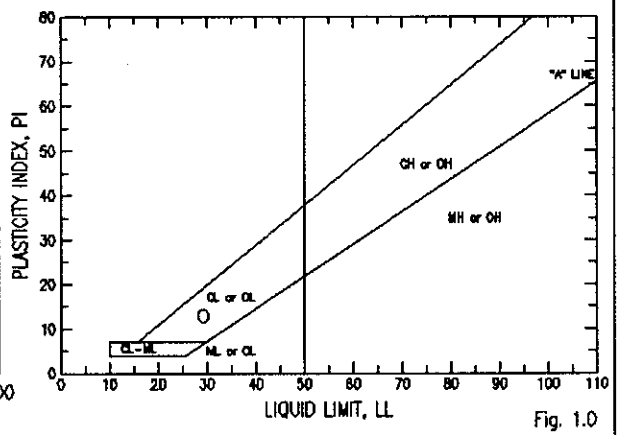


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 13A middle cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 38.5 feet

Depth : 38.5 feet
Test Date : 06/07/2005
Test Method : ASTM D422/4318

Filename : VQ38-13A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ38-13A	0.00	3616.40	3235.90	11.76

Average Moisture Content = 11.76

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 36	11.60	28.46	26.17	15.72

Plastic Limit = 15.72

Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 82	10.81	24.06	21.15	34	28.14
2) 85	10.74	25.75	22.34	25	29.40
3) 87	10.84	28.83	24.58	18	30.93

Liquid Limit = 29.46
Plastic Index = 13.74

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 13B bottom cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 38.5 feet

Depth : 38.5 feet
Test Date : 06/03/2005
Test Method : ASTM D422/4318

Filename : VQ38-13B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ38-13B	0.00	3455.70	3028.68	14.10

Average Moisture Content = 14.10

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	36	11.57	34.46	31.23	16.43

Plastic Limit = 16.43

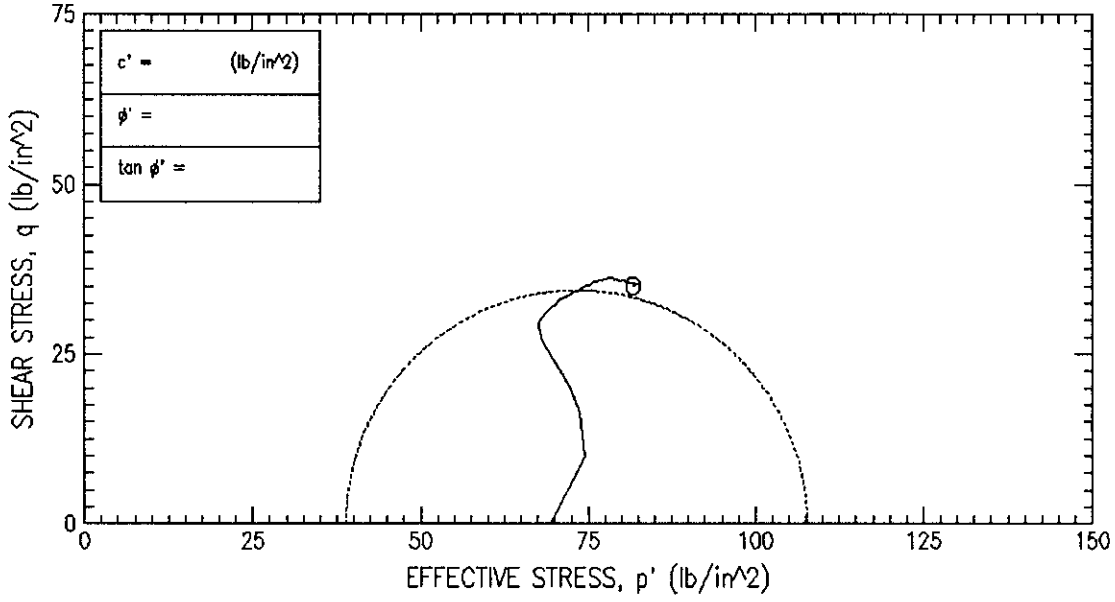
Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	33	10.65	26.96	23.38	33	28.12
2)	38	10.64	27.85	23.95	25	29.30
3)	37	10.93	27.66	23.76	19	30.40

Liquid Limit = 29.28
Plastic Index = 12.85

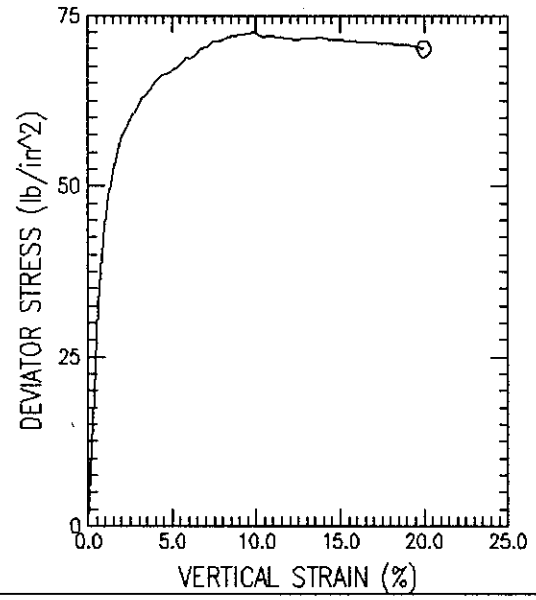
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-38-14



SYMBOL		O				
TEST NO.		VQ-38-14				
INITIAL	WATER CONTENT (%)	15.83				
	DRY DENSITY (lb/ft^3)	118.93				
	SATURATION (%)	95.95				
	VOID RATIO	0.459				
BEFORE SHEAR	WATER CONTENT (%)	14.53				
	DRY DENSITY (lb/ft^3)	123.56				
	SATURATION (%)	99.99				
	VOID RATIO	0.404				
	BACK PRESS. (lb/in^2)	70.00				
MINOR PRIN. STRESS (lb/in^2)		69.44				
MAX. DEV. STRESS (lb/in^2)		72.61				
TIME TO FAILURE (min)		670.40				
RATE OF STRAIN INCR (%/min)		0.01				
INITIAL DIAMETER (in)		2.86				
INITIAL HEIGHT (in)		5.95				
B-VALUE		98.30				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Dark gray brown sandy clay (CL)

LL 30.68	PL 16.83	PI 13.85	GS 2.78

REMARKS:

1) TXCIU Test with Effective Pressure of 69.44 psi

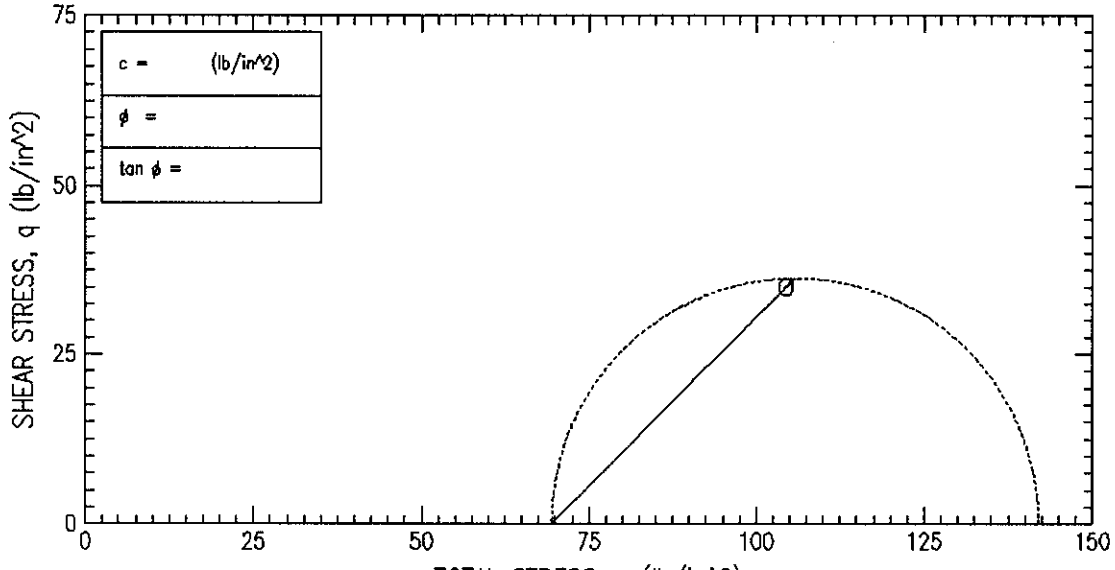
TYPE OF SPECIMEN Shelby			TYPE OF TEST CU (R)		
PROJECT Estates Dam Seismic Study					
PROJECT NO.26814957					
BORING NO. VQ-38	SAMPLE NO.	14			
TECH. S. Capps	DEPTH/ELEV	42.5 feet			
LABORATORY	DATE	05/11/05			

TRIAXIAL COMPRESSION TEST REPORT

Tue 05-17-:5, 13:17:43

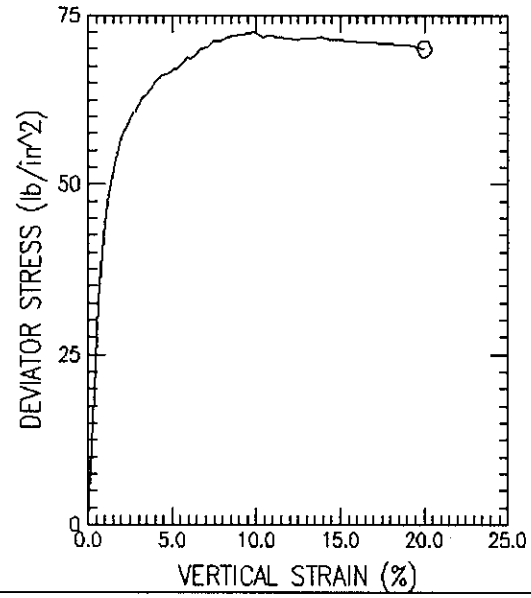
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-38-14



SYMBOL		O				
TEST NO.		VQ-38-14				
INITIAL	WATER CONTENT (%)	15.83				
	DRY DENSITY (lb/ft^3)	118.93				
	SATURATION (%)	95.95				
	VOID RATIO	0.459				
BEFORE SHEAR	WATER CONTENT (%)	14.53				
	DRY DENSITY (lb/ft^3)	123.56				
	SATURATION (%)	99.99				
	VOID RATIO	0.404				
	BACK PRESS. (lb/in^2)	70.00				
MINOR PRIN. STRESS (lb/in^2)		69.44				
MAX. DEV. STRESS (lb/in^2)		72.61				
TIME TO FAILURE (min)		670.40				
RATE OF STRAIN INCR (%/min)		0.01				
INITIAL DIAMETER (in)		2.86				
INITIAL HEIGHT (in)		5.95				
B-VALUE		98.30				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Dark gray brown sandy clay (CL)

LL 30.68	PL 16.83	PI 13.85	GS 2.78

REMARKS:

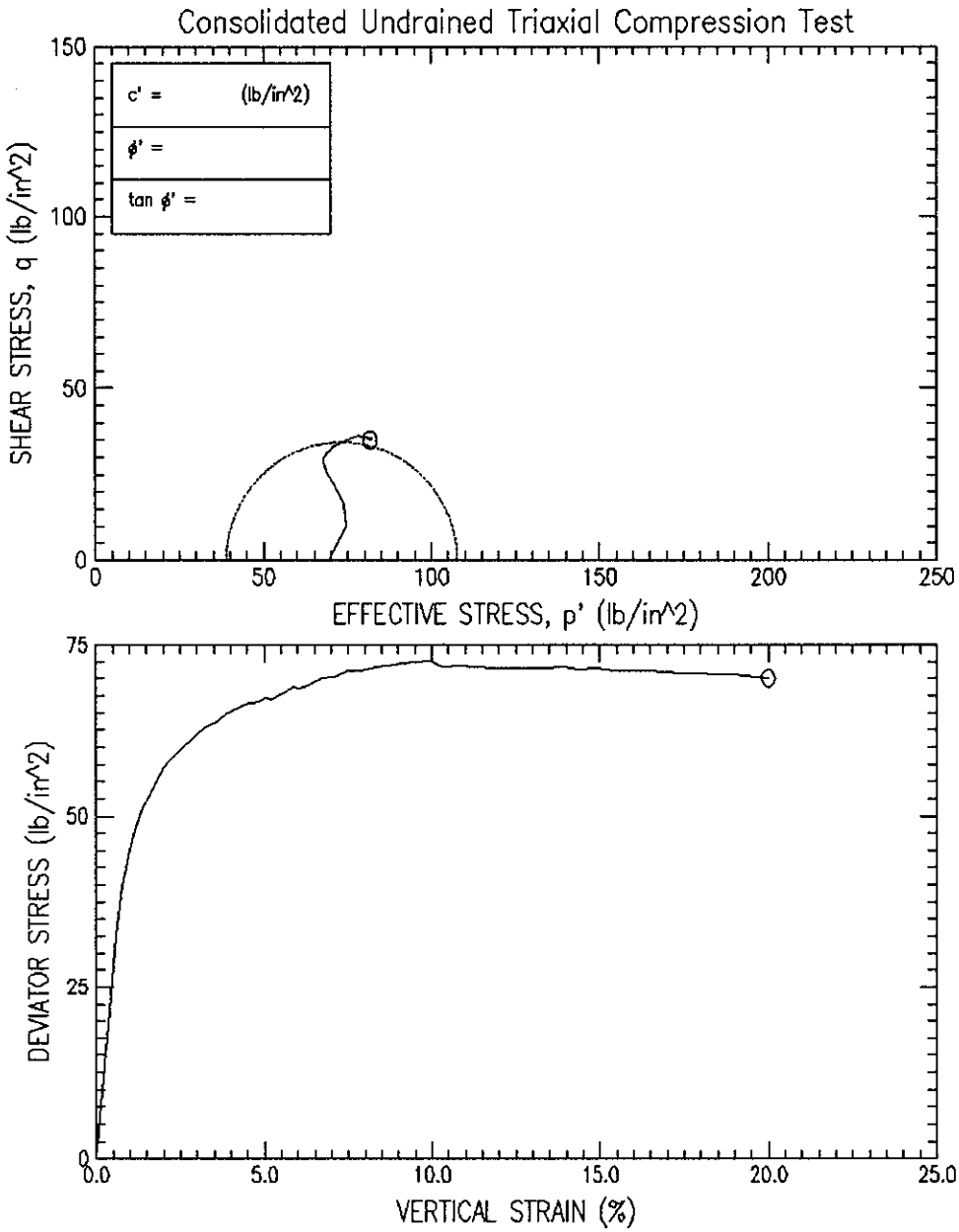
1) TXCIU Test with Effective Pressure of 69.44 psi

TYPE OF SPECIMEN Shelby		TYPE OF TEST CU (R)			
PROJECT Estates Dam Seismic Study					
PROJECT NO.26814957					
BORING NO. VQ-38	SAMPLE NO.	14			
TECH. S. Capps	DEPTH/ELEV	42.5 feet			
LABORATORY	DATE	05/11/05			

TRIAXIAL COMPRESSION TEST REPORT

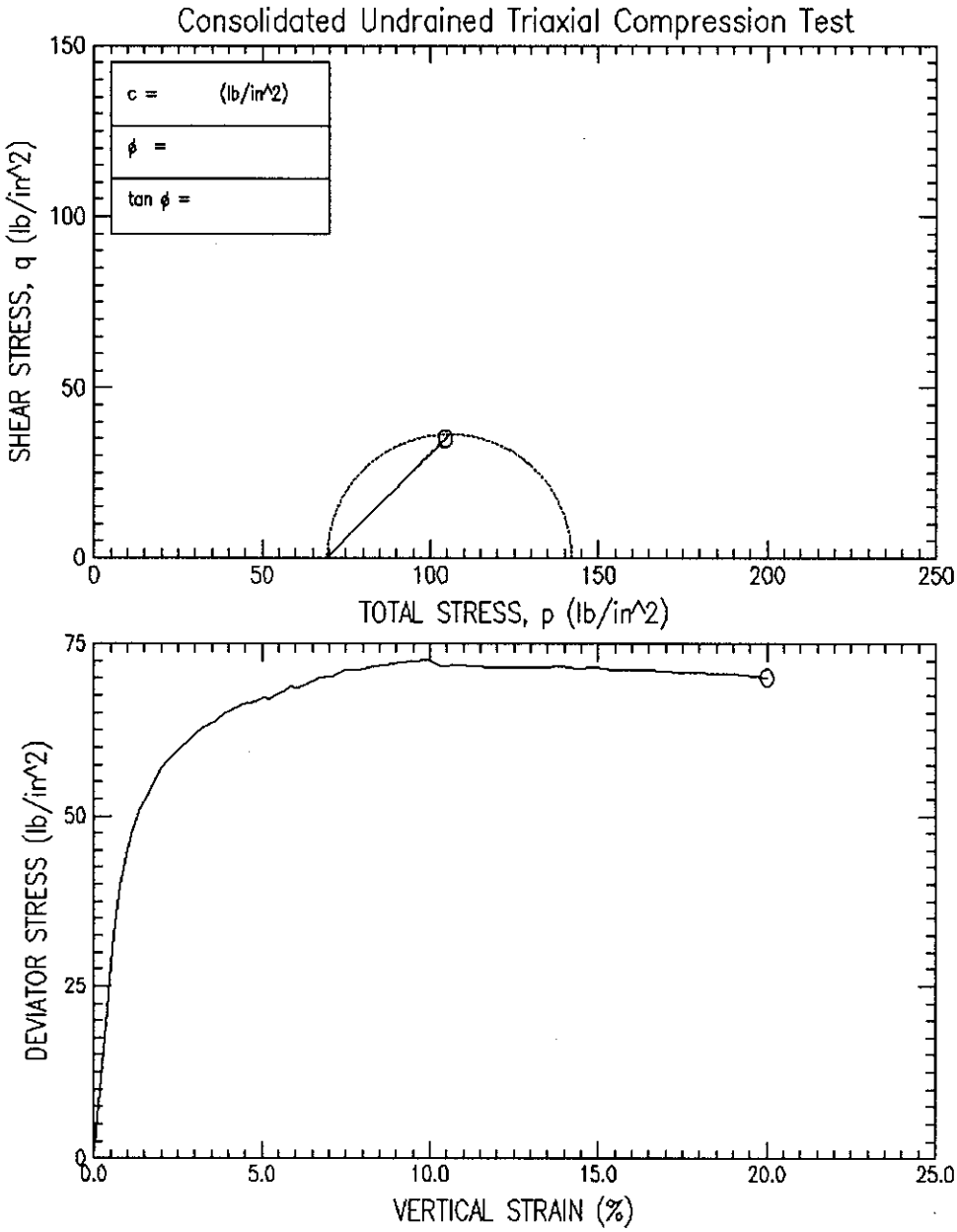
Tue 05-17-:5, 13:18:23

URS



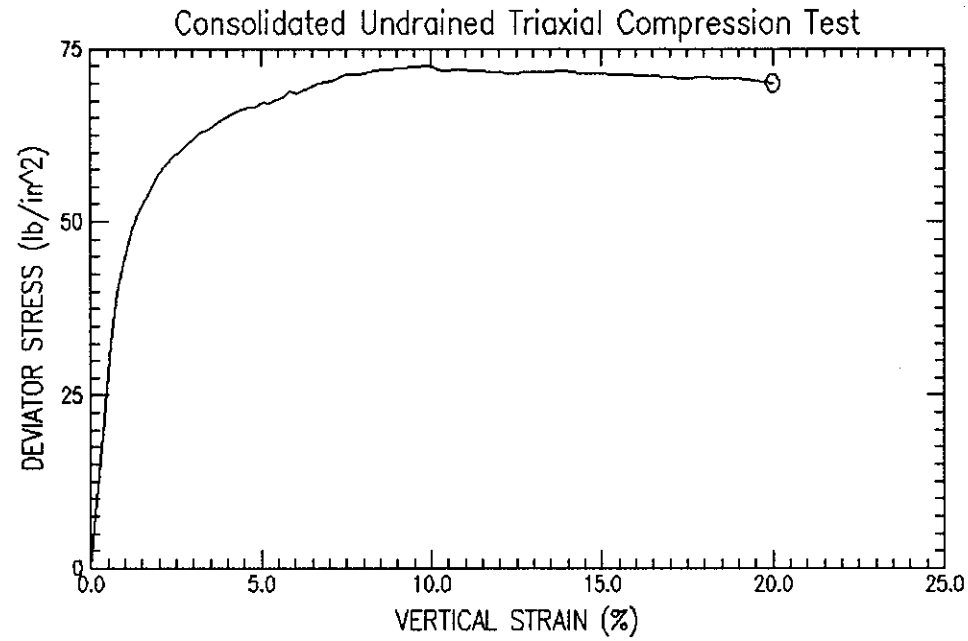
Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-38 Sample No : 14
Test Date : 05/11/05 Test No : VQ-38-14 Depth : 42.5 feet
Description : Dark gray brown sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 69.44 psi

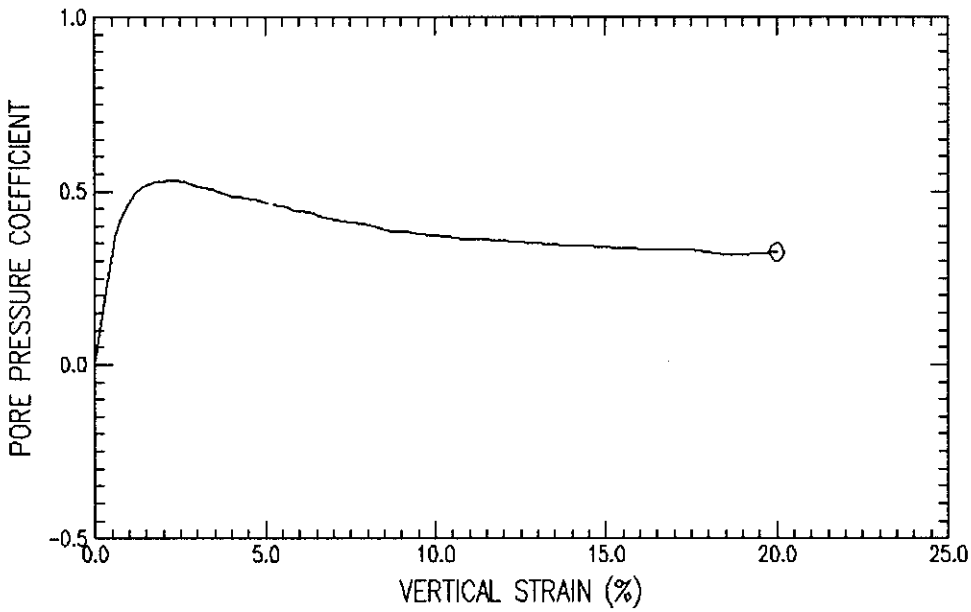
URS



Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-38 Sample No : 14
Test Date : 05/11/05 Test No : VQ-38-14 Depth : 42.5 feet
Description : Dark gray brown sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 69.44 psi

URS





Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-38 Sample No : 14
Test Date : 05/11/05 Test No : VQ-38-14 Depth : 42.5 feet
Description : Dark gray brown sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 69.44 psi

URS

Tue May 17 13:19:32 2005

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-14
Boring No. : VQ-38 Test Date : 05/11/05 Tested by : S. Capps
Sample No. : 14 Depth : 42.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Dark gray brown sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 69.44 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	139.44	139.44	0.00	0.00	69.44	69.44	1.00	69.44	0.00
2)	0.38	158.94	139.44	4.62	0.24	84.31	64.82	1.30	74.56	9.75
3)	0.58	172.11	139.44	12.05	0.37	90.06	57.39	1.57	73.73	16.34
4)	0.79	179.28	139.44	16.94	0.43	92.33	52.49	1.76	72.41	19.92
5)	0.98	183.62	139.44	20.47	0.46	93.16	48.97	1.90	71.07	22.09
6)	1.19	187.95	139.44	23.99	0.49	93.96	45.45	2.07	69.71	24.26
7)	1.40	190.63	139.44	26.13	0.51	94.50	43.31	2.18	68.90	25.60
8)	1.59	192.50	139.44	27.58	0.52	94.91	41.86	2.27	68.38	26.53
9)	1.79	194.47	139.44	28.96	0.53	95.50	40.48	2.36	67.99	27.51
10)	2.00	196.31	139.44	30.03	0.53	96.28	39.41	2.44	67.84	28.44
11)	2.20	197.57	139.44	30.87	0.53	96.70	38.56	2.51	67.63	29.07
12)	2.41	198.60	139.44	31.33	0.53	97.26	38.11	2.55	67.68	29.58
13)	2.61	199.62	139.44	31.64	0.53	97.98	37.80	2.59	67.89	30.09
14)	2.81	200.41	139.44	31.79	0.52	98.62	37.65	2.62	68.13	30.49
15)	3.01	201.43	139.44	31.87	0.51	99.56	37.57	2.65	68.56	30.99
16)	3.22	202.20	139.44	31.95	0.51	100.26	37.49	2.67	68.87	31.38
17)	3.42	202.64	139.44	31.87	0.50	100.77	37.57	2.68	69.17	31.60
18)	3.63	203.30	139.44	31.79	0.50	101.51	37.65	2.70	69.58	31.93
19)	3.84	204.18	139.44	31.79	0.49	102.38	37.65	2.72	70.01	32.37
20)	4.04	204.72	139.44	31.64	0.48	103.08	37.80	2.73	70.44	32.64
21)	4.24	205.15	139.44	31.72	0.48	103.43	37.72	2.74	70.58	32.85
22)	4.43	205.58	139.44	31.64	0.48	103.94	37.80	2.75	70.87	33.07
23)	4.65	205.87	139.44	31.72	0.48	104.16	37.72	2.76	70.94	33.22
24)	4.84	205.96	139.44	31.41	0.47	104.55	38.03	2.75	71.29	33.26
25)	5.05	206.60	139.44	31.18	0.46	105.42	38.26	2.76	71.84	33.58
26)	5.26	206.45	139.44	31.03	0.46	105.42	38.41	2.74	71.92	33.51
27)	5.45	207.09	139.44	30.95	0.46	106.14	38.49	2.76	72.31	33.83
28)	5.66	207.50	139.44	30.80	0.45	106.70	38.64	2.76	72.67	34.03
29)	5.86	208.24	139.44	30.57	0.44	107.67	38.87	2.77	73.27	34.40
30)	6.07	207.98	139.44	30.41	0.44	107.56	39.02	2.76	73.29	34.27
31)	6.28	208.49	139.44	30.26	0.44	108.22	39.18	2.76	73.70	34.52
32)	6.68	209.50	139.44	29.80	0.43	109.70	39.64	2.77	74.67	35.03
33)	7.09	209.75	139.44	29.42	0.42	110.32	40.02	2.76	75.17	35.15
34)	7.49	210.64	139.44	29.19	0.41	111.45	40.25	2.77	75.85	35.60
35)	7.89	210.65	139.44	28.96	0.41	111.69	40.48	2.76	76.08	35.61
36)	8.31	211.20	139.44	28.27	0.39	112.92	41.17	2.74	77.05	35.88
37)	8.71	211.42	139.44	27.81	0.39	113.61	41.63	2.73	77.62	35.99
38)	9.13	211.63	139.44	27.74	0.38	113.89	41.70	2.73	77.80	36.09
39)	9.53	211.84	139.44	27.43	0.38	114.40	42.01	2.72	78.21	36.20
40)	9.93	212.05	139.44	27.12	0.37	114.92	42.31	2.72	78.62	36.30
41)	10.34	211.19	139.44	26.51	0.37	114.67	42.93	2.67	78.80	35.87
42)	10.84	211.42	139.44	26.13	0.36	115.28	43.31	2.66	79.30	35.99
43)	11.35	211.21	139.44	25.90	0.36	115.31	43.54	2.65	79.43	35.89
44)	11.86	211.01	139.44	25.59	0.36	115.41	43.85	2.63	79.63	35.78
45)	12.38	210.90	139.44	25.36	0.35	115.53	44.07	2.62	79.80	35.73
46)	12.89	211.00	139.44	25.13	0.35	115.86	44.30	2.62	80.08	35.78
47)	13.39	210.99	139.44	24.90	0.35	116.09	44.53	2.61	80.31	35.78
48)	13.89	211.18	139.44	24.75	0.35	116.43	44.69	2.61	80.56	35.87
49)	14.40	210.86	139.44	24.52	0.34	116.34	44.92	2.59	80.63	35.71
50)	14.92	210.92	139.44	24.29	0.34	116.63	45.15	2.58	80.89	35.74
51)	15.43	210.70	139.44	24.06	0.34	116.63	45.38	2.57	81.00	35.63
52)	16.43	210.54	139.44	23.76	0.33	116.78	45.68	2.56	81.23	35.55
53)	16.95	210.39	139.44	23.68	0.33	116.71	45.76	2.55	81.23	35.48
54)	17.46	210.24	139.44	23.53	0.33	116.72	45.91	2.54	81.31	35.40
55)	17.96	210.30	139.44	23.22	0.33	117.08	46.22	2.53	81.65	35.43
56)	18.47	210.15	139.44	22.53	0.32	117.61	46.91	2.51	82.26	35.35
57)	18.98	210.09	139.44	22.61	0.32	117.48	46.83	2.51	82.15	35.32
58)	19.99	209.49	139.44	22.76	0.32	116.72	46.68	2.50	81.70	35.02

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-14
Boring No. : VQ-38 Test Date : 05/11/05 Tested by : S. Capps
Sample No. : 14 Depth : 42.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Dark gray brown sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 69.44 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	6.21	70.00	0.00	0.00	0.00	139.44	69.44
2)	0.022	0.38	6.24	74.62	121.63	121.63	19.50	158.94	84.31
3)	0.034	0.58	6.25	82.05	204.21	204.21	32.67	172.11	90.06
4)	0.046	0.79	6.26	86.95	249.52	249.52	39.84	179.28	92.33
5)	0.057	0.98	6.28	90.47	277.30	277.30	44.18	183.62	93.16
6)	0.069	1.19	6.29	93.99	305.07	305.07	48.51	187.95	93.96
7)	0.082	1.40	6.30	96.13	322.61	322.61	51.19	190.63	94.50
8)	0.093	1.59	6.31	97.58	335.03	335.03	53.06	192.50	94.91
9)	0.105	1.79	6.33	98.96	348.19	348.19	55.03	194.47	95.50
10)	0.117	2.00	6.34	100.03	360.61	360.61	56.87	196.31	96.28
11)	0.129	2.20	6.35	100.88	369.38	369.38	58.13	197.57	96.70
12)	0.141	2.41	6.37	101.33	376.69	376.69	59.16	198.60	97.26
13)	0.152	2.61	6.38	101.64	384.00	384.00	60.18	199.62	97.98
14)	0.164	2.81	6.39	101.79	389.84	389.84	60.97	200.41	98.62
15)	0.176	3.01	6.41	101.87	397.15	397.15	61.99	201.43	99.56
16)	0.188	3.22	6.42	101.95	403.00	403.00	62.76	202.20	100.26
17)	0.200	3.42	6.43	101.87	406.65	406.65	63.20	202.64	100.77
18)	0.212	3.63	6.45	101.79	411.77	411.77	63.86	203.30	101.51
19)	0.224	3.84	6.46	101.79	418.35	418.35	64.74	204.18	102.38
20)	0.236	4.04	6.48	101.64	422.73	422.73	65.28	204.72	103.08
21)	0.248	4.24	6.49	101.72	426.39	426.39	65.71	205.15	103.43
22)	0.259	4.43	6.50	101.64	430.04	430.04	66.14	205.58	103.94
23)	0.272	4.65	6.52	101.72	432.96	432.96	66.43	205.87	104.16
24)	0.283	4.84	6.53	101.41	434.42	434.42	66.52	205.96	104.55
25)	0.296	5.05	6.54	101.18	439.54	439.54	67.16	206.60	105.42
26)	0.307	5.26	6.56	101.03	439.54	439.54	67.01	206.45	105.42
27)	0.319	5.45	6.57	100.95	444.66	444.66	67.65	207.09	106.14
28)	0.331	5.66	6.59	100.80	448.31	448.31	68.06	207.50	106.70
29)	0.343	5.86	6.60	100.57	454.16	454.16	68.80	208.24	107.67
30)	0.355	6.07	6.62	100.42	453.43	453.43	68.54	207.98	107.56
31)	0.367	6.28	6.63	100.26	457.81	457.81	69.05	208.49	108.22
32)	0.391	6.68	6.66	99.80	466.58	466.58	70.06	209.50	109.70
33)	0.415	7.09	6.69	99.42	470.24	470.24	70.31	209.75	110.32
34)	0.438	7.49	6.72	99.19	478.27	478.27	71.20	210.64	111.45
35)	0.462	7.89	6.75	98.96	480.47	480.47	71.21	210.65	111.69
36)	0.486	8.31	6.78	98.27	486.31	486.31	71.76	211.20	112.92
37)	0.509	8.71	6.81	97.81	489.97	489.97	71.98	211.42	113.61
38)	0.534	9.13	6.84	97.74	493.62	493.62	72.19	211.63	113.89
39)	0.557	9.53	6.87	97.43	497.28	497.28	72.40	211.84	114.40
40)	0.581	9.93	6.90	97.13	500.93	500.93	72.61	212.05	114.92
41)	0.605	10.34	6.93	96.51	497.28	497.28	71.75	211.19	114.67
42)	0.634	10.84	6.97	96.13	501.66	501.66	71.98	211.42	115.28
43)	0.664	11.35	7.01	95.90	503.12	503.12	71.77	211.21	115.31
44)	0.694	11.86	7.05	95.59	504.58	504.58	71.57	211.01	115.41
45)	0.724	12.38	7.09	95.37	506.78	506.78	71.46	210.90	115.53
46)	0.753	12.89	7.13	95.14	510.43	510.43	71.56	211.00	115.86
47)	0.783	13.39	7.17	94.91	513.35	513.35	71.55	210.99	116.09
48)	0.812	13.89	7.22	94.75	517.74	517.74	71.74	211.18	116.43
49)	0.842	14.40	7.26	94.52	518.47	518.47	71.42	210.86	116.34
50)	0.872	14.92	7.30	94.29	522.12	522.12	71.48	210.92	116.63
51)	0.902	15.43	7.35	94.06	523.59	523.59	71.26	210.70	116.63
52)	0.961	16.43	7.44	93.76	528.70	528.70	71.10	210.54	116.78
53)	0.991	16.95	7.48	93.68	530.89	530.89	70.95	210.39	116.71
54)	1.021	17.46	7.53	93.53	533.09	533.09	70.80	210.24	116.72
55)	1.050	17.96	7.57	93.22	536.74	536.74	70.86	210.30	117.08
56)	1.080	18.47	7.62	92.53	538.93	538.93	70.71	210.15	117.61
57)	1.110	18.98	7.67	92.61	541.86	541.86	70.65	210.09	117.48
58)	1.169	19.99	7.77	92.76	544.05	544.05	70.05	209.49	116.72

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-14
Boring No. : VQ-38 Test Date : 05/11/05 Tested by : S. Capps
Sample No. : 14 Depth : 42.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Dark gray brown sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 69.44 psi

Liquid Limit : 30.68 Plastic Limit : 16.83 Specific Gravity : 2.78

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-38-14	VQ-38-14
WT CONTAINER + WET SOIL (gm)	1365.00	1349.67
WT CONTAINER + DRY SOIL (gm)	1178.46	1178.46
WT WATER (gm)	186.54	171.21
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	1178.46	1178.46
WATER CONTENT (%)	15.83	14.53

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	15.83	14.53
VOID RATIO	0.46	0.40
WET DENSITY (lb/ft^3)	137.75	141.51
DRY DENSITY (lb/ft^3)	118.93	123.56
DEGREE OF SATURATION (%)	95.95	99.99

Maximum Shear Stress = 36.30 (lb/in^2) at a Vertical Strain of 9.93 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-38-14
Boring No. : VQ-38 Test Date : 05/11/05 Tested by : S. Capps
Sample No. : 14 Depth : 42.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Dark gray brown sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 69.44 psi

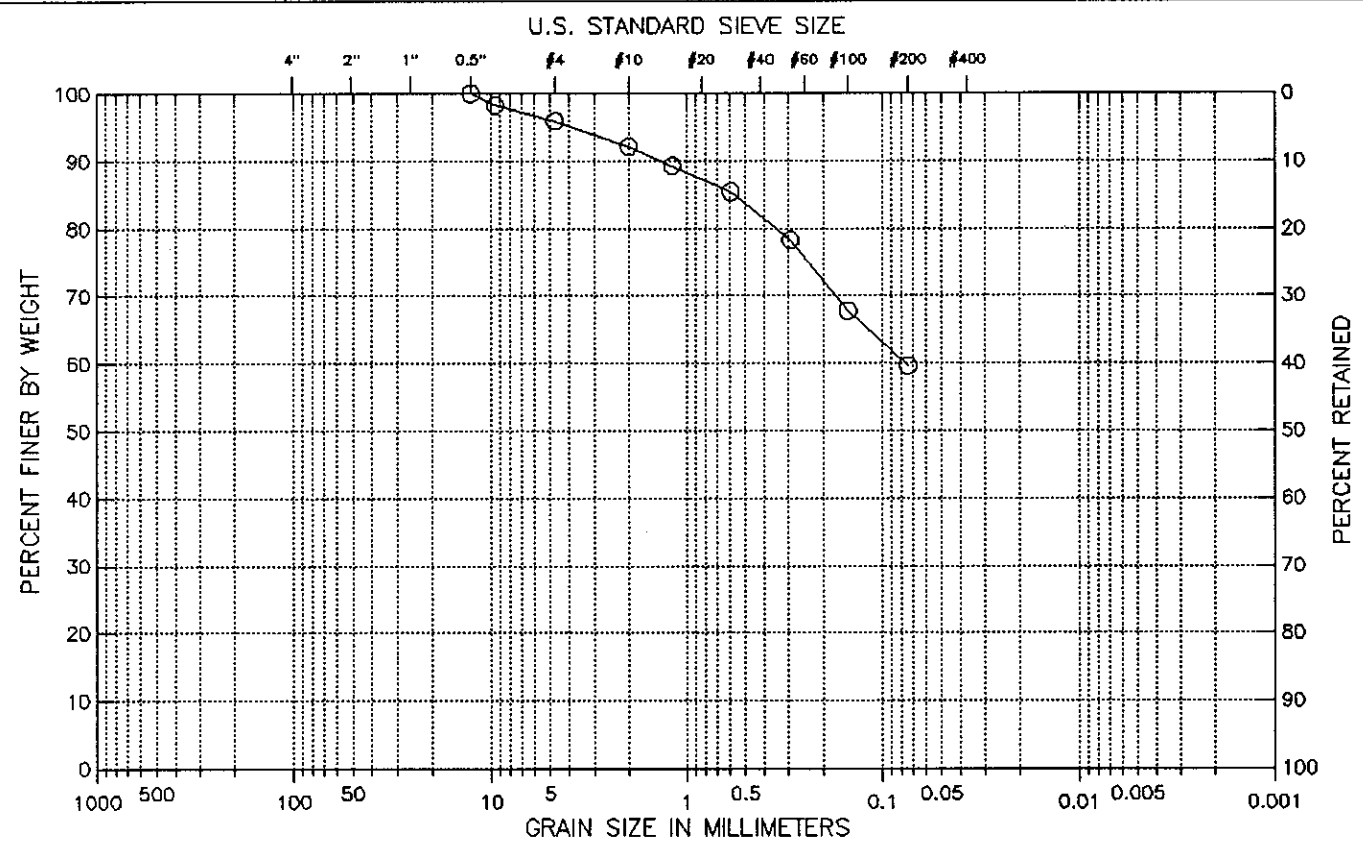
Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 30.68 Plastic Limit : 16.83 Specific Gravity : 2.78

INITIAL						
		Height : 5.945 (in)	Dry Density : 118.93 (lb/ft^3)			
		Area : 6.424 (in^2)	Moisture : 15.83 %			
		Void Ratio: 0.46				
		Saturation: 95.95 %				
Time : 0.00 (min)						
INITIALIZATION						
dH : 0.000 (in)		Height : 5.945 (in)	Dry Density : 118.93 (lb/ft^3)		Total Vert. Stress : 139.44 (lb/in^	
dV : 0.000 (in^3)		Area : 6.424 (in^2)	Moisture : 15.83 %		Total Hori. Stress : 139.44 (lb/in^	
		Void Ratio: 0.46			Pore Pressure : 0.00 (lb/in^2)	
		Saturation: 95.95 %			Effect.Vert. Stress: 139.44 (lb/in^	
Time : 0.00 (min)					Effect.Hori. Stress: 139.44 (lb/in^	
END OF CONSOLIDATION - A						
dH : 0.000 (in)		Height : 5.945 (in)	Dry Density : 118.93 (lb/ft^3)		Total Vert. Stress : 139.44 (lb/in^	
dV : 0.000 (in^3)		Area : 6.424 (in^2)	Moisture : 15.83 %		Total Hori. Stress : 139.44 (lb/in^	
		Void Ratio: 0.46			Pore Pressure : 0.00 (lb/in^2)	
		Saturation: 95.95 %			Effect.Vert. Stress: 139.44 (lb/in^	
Time : 0.00 (min)					Effect.Hori. Stress: 139.44 (lb/in^	
END OF SATURATION						
dH : 0.000 (in)		Height : 5.945 (in)	Dry Density : 117.55 (lb/ft^3)		Total Vert. Stress : 139.44 (lb/in^	
dV : 0.000 (in^3)		Area : 6.424 (in^2)	Moisture : 14.53 %		Total Hori. Stress : 139.44 (lb/in^	
dVCorr : 0.000 (in^3)		Void Ratio: 0.48			Pore Pressure : 0.00 (lb/in^2)	
		Saturation: 84.90 %			Effect.Vert. Stress: 139.44 (lb/in^	
Time : 0.00 (min)					Effect.Hori. Stress: 139.44 (lb/in^	
END OF CONSOLIDATION - B						
dH : 0.098 (in)		Height : 5.847 (in)	Dry Density : 123.56 (lb/ft^3)		Total Vert. Stress : 139.44 (lb/in^	
dV : 1.858 (in^3)		Area : 6.214 (in^2)	Moisture : 14.53 %		Total Hori. Stress : 139.44 (lb/in^	
		Void Ratio: 0.40			Pore Pressure : 70.00 (lb/in^2	
		Saturation: 99.99 %			Effect.Vert. Stress: 69.44 (lb/in^2	
Time : 0.00 (min)					Effect.Hori. Stress: 69.44 (lb/in^2	
FAILURE DURING SHEAR						
dH : 0.581 (in)		Height : 5.364 (in)	Dry Density : 123.56 (lb/ft^3)		Total Vert. Stress : 212.05 (lb/in^	
dV : 1.858 (in^3)		Area : 6.899 (in^2)	Moisture : 14.53 %		Total Hori. Stress : 139.44 (lb/in^	
Strain : 9.93 %		Void Ratio: 0.40			Pore Pressure : 97.13 (lb/in^2	
Strength: 36.30 (lb/in^2)		Saturation: 99.99 %			Effect.Vert. Stress: 114.92 (lb/in^	
Time : 670.40 (min)					Effect.Hori. Stress: 42.31 (lb/in^2	
END OF TEST						
dH : 1.169 (in)		Height : 4.776 (in)	Dry Density : 123.56 (lb/ft^3)		Total Vert. Stress : 209.49 (lb/in^	
dV : 1.858 (in^3)		Area : 7.767 (in^2)	Moisture : 14.53 %		Total Hori. Stress : 139.44 (lb/in^	
Strain : 19.99 %		Void Ratio: 0.40			Pore Pressure : 92.76 (lb/in^2	
		Saturation: 99.99 %			Effect.Vert. Stress: 116.72 (lb/in^	
Time : 1350.98 (min)					Effect.Hori. Stress: 46.68 (lb/in^2	

URS

Boring No. : VQ-38 Sample No: 14 Tested by : R. Taraya Filename : VQ38-014	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Tue May 17 2005



Classification :
(CL) Sandy lean clay
Visual Description :
Dark gray brown sandy clay (CL)

Remarks :
Depth: 42.5 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 14
Location : Piedmont, CA
Soil Description : Dark gray brown sandy clay (CL)
Remarks : Depth: 42.5 feet

Depth : 42.5 feet
Test Date : 05/11/2005
Test Method : ASTM D422/4318

Filename : VQ38-014
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	9.88	9.88	98
#4	0.187	4.75	13.24	23.12	96
#10	0.079	2.00	21.75	44.87	92
#16	0.047	1.19	16.19	61.06	89
#30	0.023	0.60	22.12	83.18	85
#50	0.012	0.30	40.66	123.84	78
#100	0.006	0.15	60.12	183.96	68
#200	0.003	0.07	46.55	230.51	60

Total Dry Weight of Sample = 571.1

D85 : 0.5700 mm
D60 : 0.0763 mm
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : CL
ASTM Group Name : Sandy lean clay
AASHTO Group Symbol : A-6(6)
AASHTO Group Name : Clayey Soils

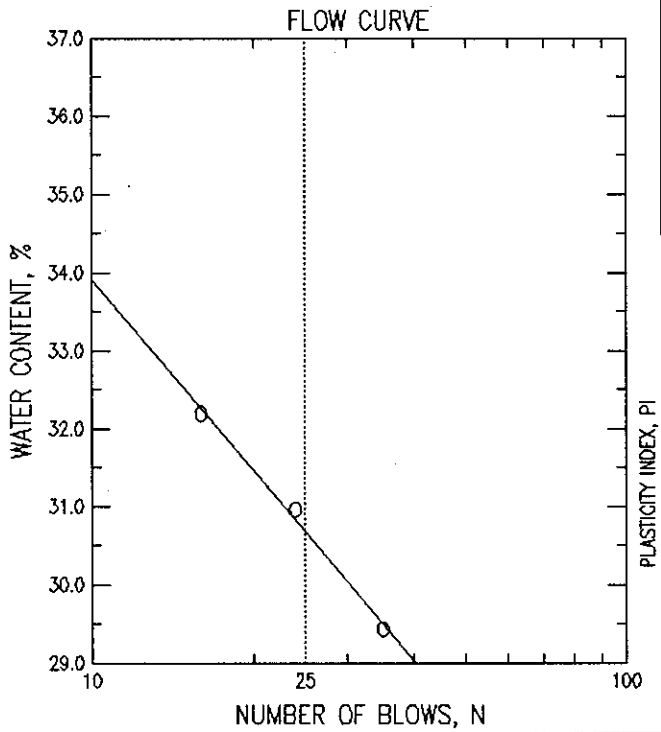
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-38
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	14
SAMPLE DESCRIPTION		DATE	FILENAME
Dark gray brown sandy clay (CL)		Tue May 17 2005	VQ38-014

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	82	75	66		
WT. WET SOIL + TARE	25.85	28.32	30.74		
WT. DRY SOIL + TARE	22.43	24.24	25.86		
WT. WATER	3.42	4.08	4.88		
TARE WT.	10.81	11.06	10.7		
WT. DRY SOIL	11.62	13.18	15.16		
WATER CONTENT, W_N (%)	29.43	30.96	32.19		
NUMBER OF BLOWS, N	35	24	16		
ONE-POINT LIQUID LIMIT, LL	30.66	30.80	30.50		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	27				
WT. WET SOIL + TARE	33.86				
WT. DRY SOIL + TARE	30.67				
WT. WATER	3.19				
TARE WT.	11.72				
WT. DRY SOIL	18.95				
WATER CONTENT (%)	16.83				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	15.1
LIQUID LIMIT, LL	30.7
PLASTIC LIMIT, PL	16.8
PLASTICITY INDEX, PI	13.8
LIQUIDITY INDEX, LI*	-0.13

*LI = (W - PL)/PI

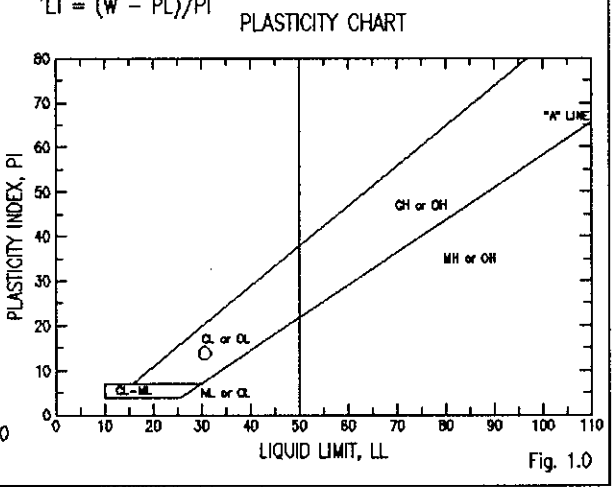


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 14
Location : Piedmont, CA
Soil Description : Dark gray brown sandy clay (CL)
Remarks : Depth: 42.5 feet

Depth : 42.5 feet
Test Date : 05/11/2005
Test Method : ASTM D422/4318

Filename : VQ38-014
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ38-14	0.00	1381.00	1200.00	15.08

Average Moisture Content = 15.08

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	27	11.72	33.86	30.67	16.83

Plastic Limit = 16.83

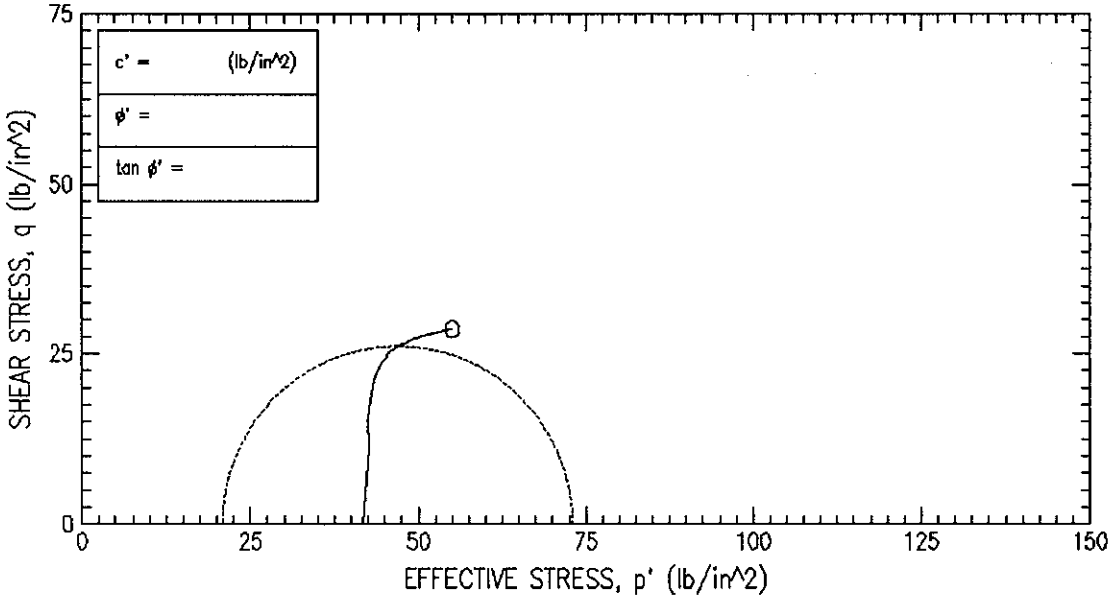
Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	82	10.81	25.85	22.43	35	29.43
2)	75	11.06	28.32	24.24	24	30.96
3)	66	10.70	30.74	25.86	16	32.19

Liquid Limit = 30.68
Plastic Index = 13.85

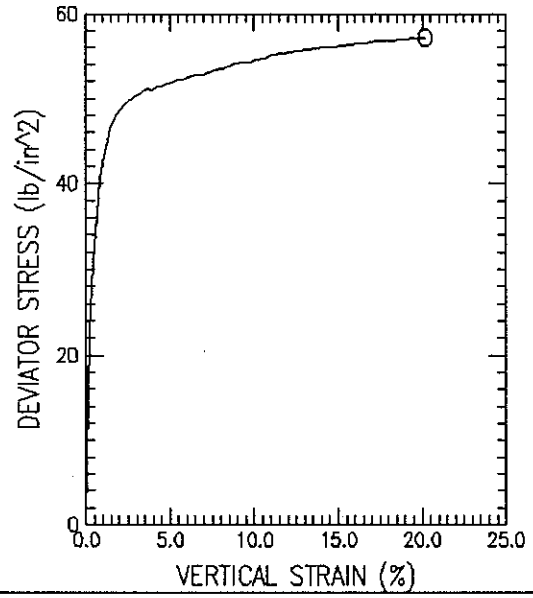
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ38-16



SYMBOL		○			
TEST NO.		VQ38-16			
INITIAL	WATER CONTENT (%)	16.85			
	DRY DENSITY (lb/ft^3)	114.76			
	SATURATION (%)	96.21			
	VOID RATIO	0.475			
BEFORE SHEAR	WATER CONTENT (%)	15.98			
	DRY DENSITY (lb/ft^3)	118.10			
	SATURATION (%)	100.00			
	VOID RATIO	0.433			
	BACK PRESS. (lb/in^2)	80.00			
MINOR PRIN. STRESS (lb/in^2)		41.67			
MAX. DEV. STRESS (lb/in^2)		57.19			
TIME TO FAILURE (min)		1522.47			
RATE OF STRAIN INCR (%/min)		0.00			
INITIAL DIAMETER (in)		3.85			
INITIAL HEIGHT (in)		7.99			
B-VALUE		98.40			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Dark gray sandy clay (CL)

LL	PL	PI	GS
35.65	17.71	17.94	2.71

REMARKS:

1) TXCIU Test with Effective Pressure of 41.67 psi

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

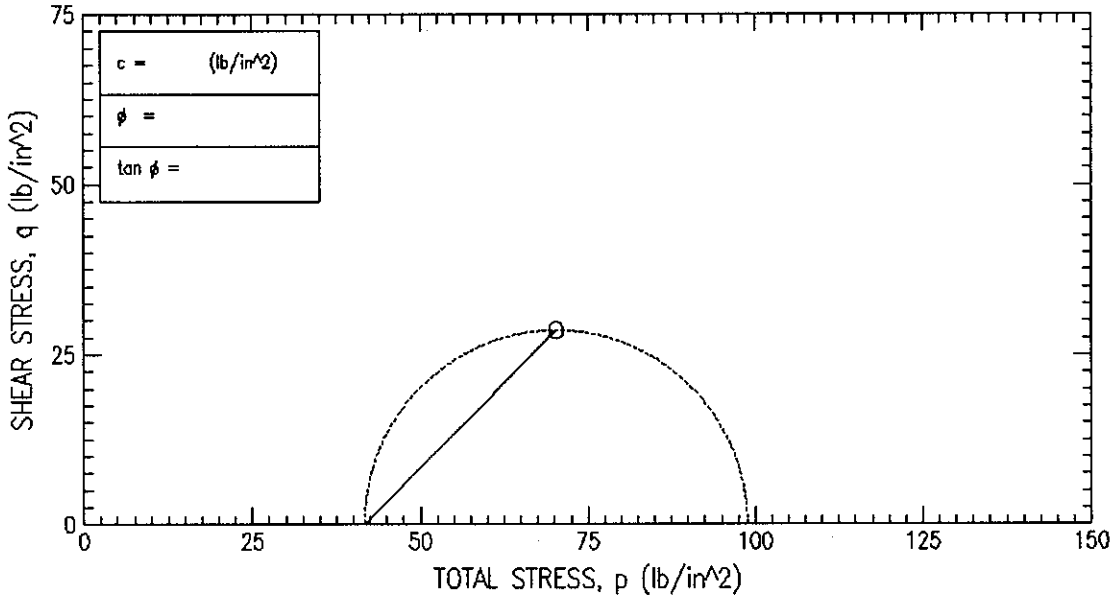
BORING NO. VQ-38	SAMPLE NO.	16			
TECH. S. Capps	DEPTH/ELEV	52.0 feet			
LABORATORY	DATE	05/16/05			

TRIAXIAL COMPRESSION TEST REPORT

Wed 05-18-05, 09:20:44

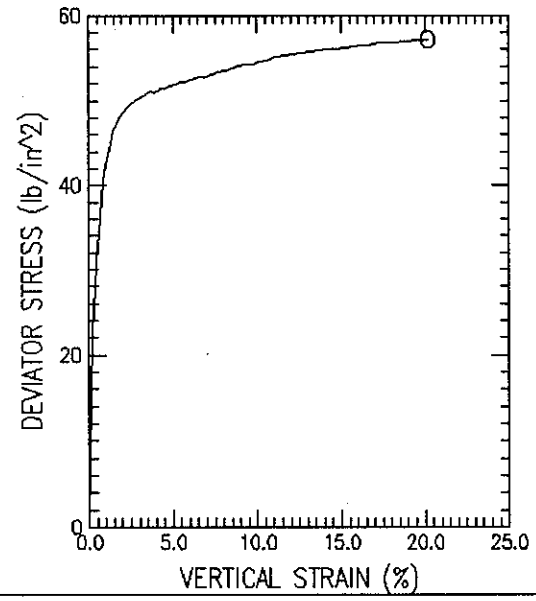
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ38-16



SYMBOL		O			
TEST NO.		VQ38-16			
INITIAL	WATER CONTENT (%)	16.85			
	DRY DENSITY (lb/ft^3)	114.76			
	SATURATION (%)	96.21			
	VOID RATIO	0.475			
BEFORE SHEAR	WATER CONTENT (%)	15.98			
	DRY DENSITY (lb/ft^3)	118.10			
	SATURATION (%)	100.00			
	VOID RATIO	0.433			
	BACK PRESS. (lb/in^2)	80.00			
MINOR PRIN. STRESS (lb/in^2)		41.67			
MAX. DEV. STRESS (lb/in^2)		57.19			
TIME TO FAILURE (min)		1522.47			
RATE OF STRAIN INCR (%/min)		0.00			
INITIAL DIAMETER (in)		3.85			
INITIAL HEIGHT (in)		7.99			
B-VALUE		98.40			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Dark gray sandy clay (CL)

LL 35.65	PL 17.71	PI 17.94	GS 2.71

REMARKS:

1) TXCIU Test with Effective Pressure of 41.67 psi

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

PROJECT Estates Dam Seismic Study

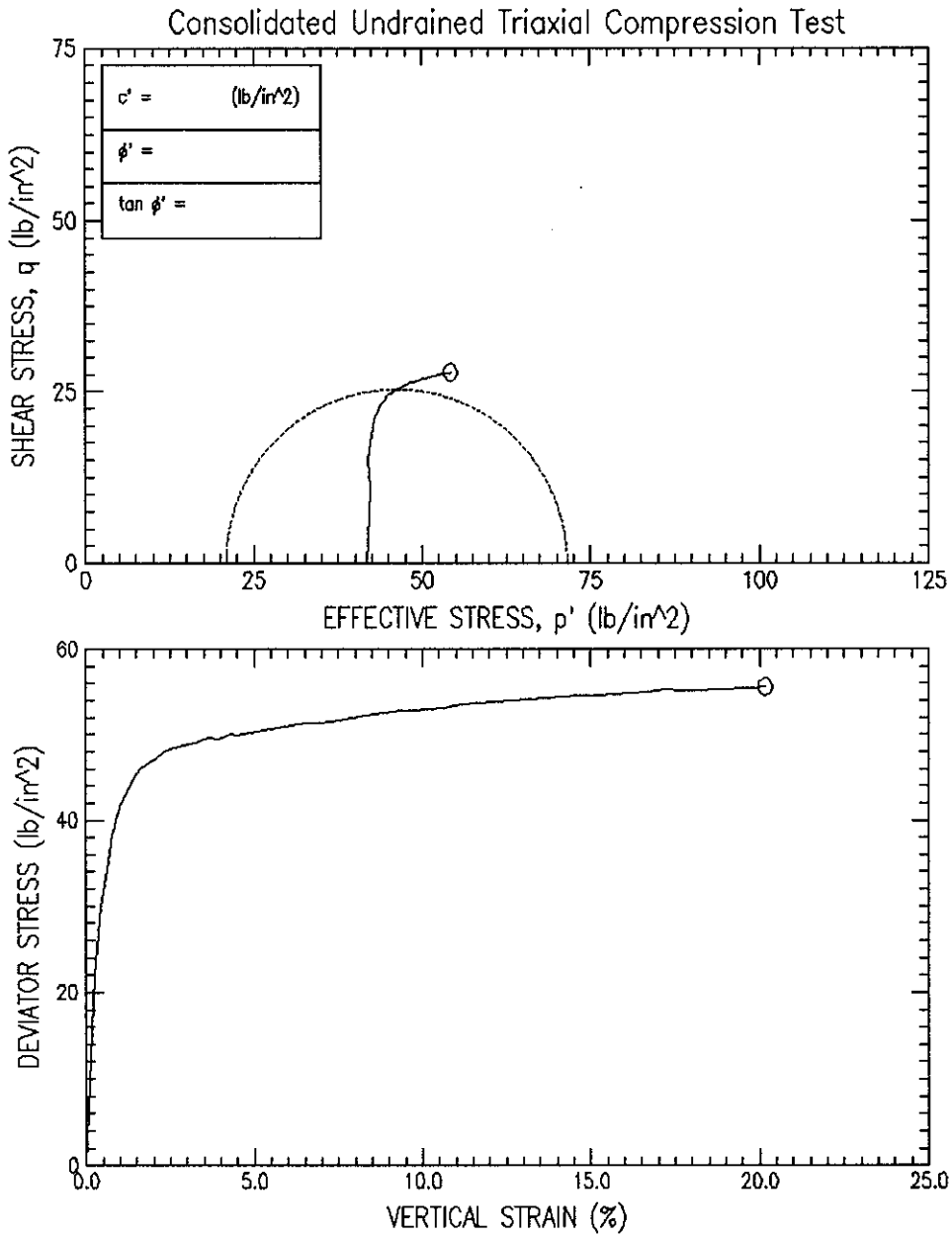
PROJECT NO.26814957

BORING NO. VQ-38	SAMPLE NO.	16			
TECH. S. Capps	DEPTH/ELEV	52.0 feet			
LABORATORY	DATE	05/16/05			

TRIAXIAL COMPRESSION TEST REPORT

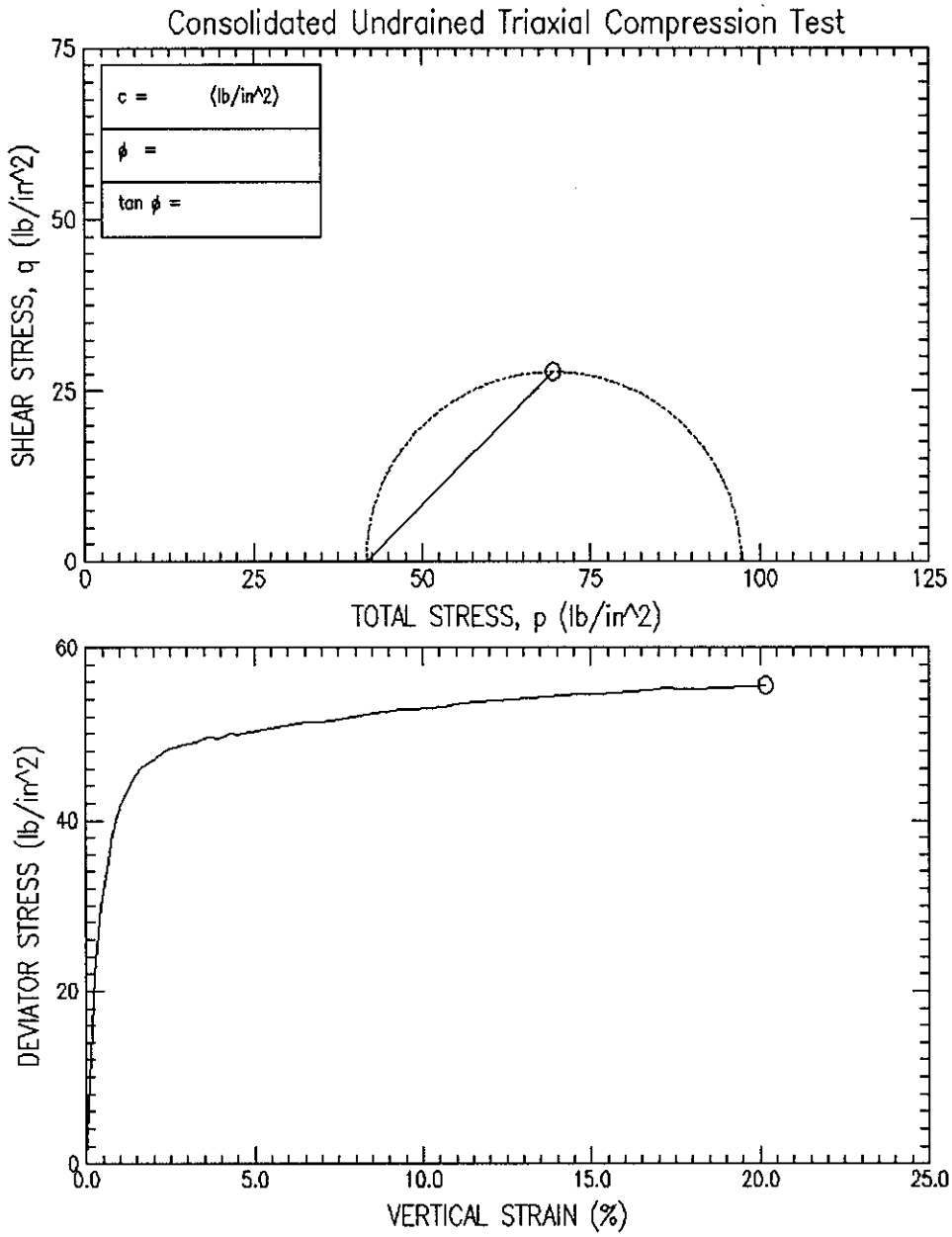
Wed 05-18-:5, 09:20:12

URS



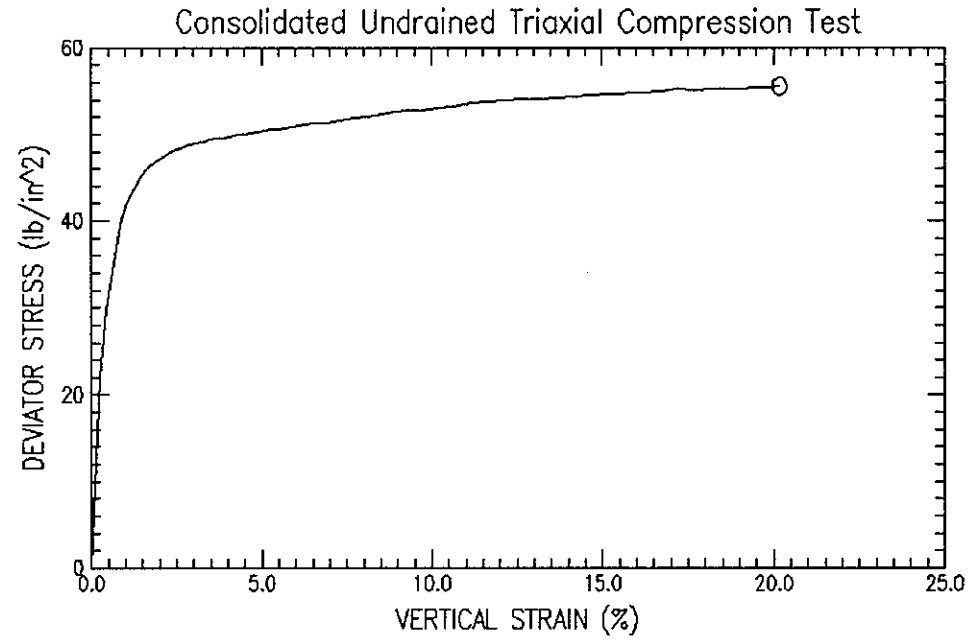
Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-38 Sample No : 16
Test Date : 05/16/05 Test No : VQ38-16 Depth : 52.0 feet
Description : Dark gray sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 41.67 psi

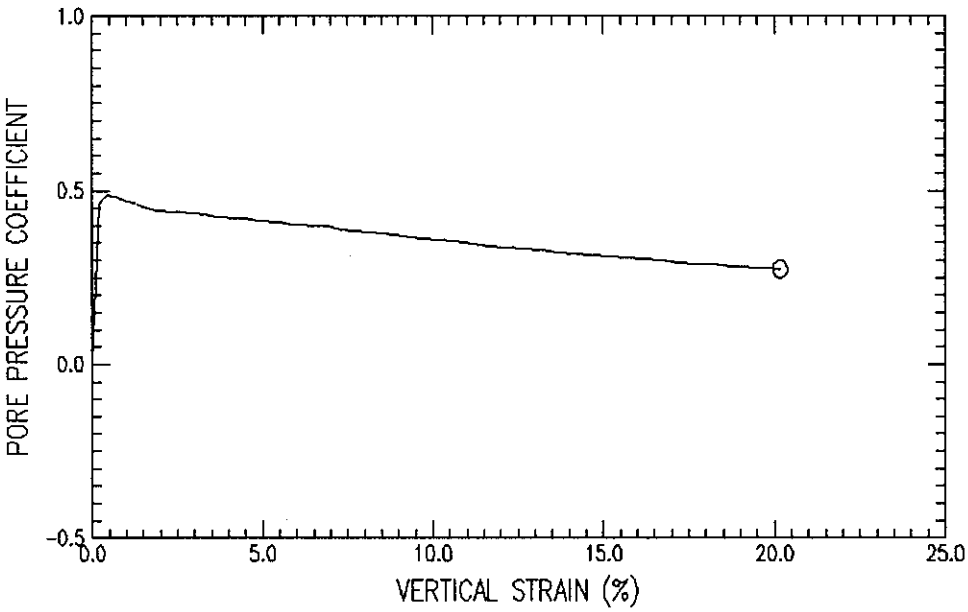
URS



Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-38 Sample No : 16
Test Date : 05/16/05 Test No : VQ38-16 Depth : 52.0 feet
Description : Dark gray sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 41.67 psi

URS





Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study

Project No : 26814957	Boring No : VQ-38	Sample No : 16
Test Date : 05/16/05	Test No : VQ38-16	Depth : 52.0 feet

Description : Dark gray sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 41.67 psi

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ38-16
Boring No. : VQ-38 Test Date : 05/16/05 Tested by : S. Capps
Sample No. : 16 Depth : 52.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Dark gray sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 41.67 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	121.67	121.67	0.00	0.00	41.67	41.67	1.00	41.67	0.00
2)	0.24	144.28	121.67	10.31	0.46	53.96	31.36	1.72	42.66	11.30
3)	0.45	152.44	121.67	14.60	0.47	57.84	27.07	2.14	42.46	15.39
4)	0.65	157.94	121.67	17.04	0.47	60.89	24.62	2.47	42.75	18.13
5)	0.85	162.35	121.67	18.80	0.46	63.54	22.86	2.78	43.20	20.34
6)	1.05	164.90	121.67	19.72	0.46	65.17	21.94	2.97	43.56	21.62
7)	1.26	166.65	121.67	20.26	0.45	66.39	21.41	3.10	43.90	22.49
8)	1.46	168.13	121.67	20.56	0.44	67.56	21.10	3.20	44.33	23.23
9)	1.66	169.09	121.67	20.79	0.44	68.29	20.87	3.27	44.58	23.71
10)	1.86	169.77	121.67	20.79	0.43	68.97	20.87	3.30	44.92	24.05
11)	2.07	170.19	121.67	20.87	0.43	69.32	20.79	3.33	45.06	24.26
12)	2.27	170.87	121.67	21.02	0.43	69.84	20.64	3.38	45.24	24.60
13)	2.46	171.29	121.67	21.18	0.43	70.11	20.49	3.42	45.30	24.81
14)	2.67	171.45	121.67	21.18	0.43	70.27	20.49	3.43	45.38	24.89
15)	2.87	171.86	121.67	21.25	0.42	70.60	20.41	3.46	45.51	25.10
16)	3.07	172.02	121.67	21.25	0.42	70.76	20.41	3.47	45.58	25.17
17)	3.28	172.17	121.67	21.18	0.42	70.99	20.49	3.46	45.74	25.25
18)	3.48	172.58	121.67	21.18	0.42	71.40	20.49	3.48	45.94	25.45
19)	3.68	172.72	121.67	21.02	0.41	71.70	20.64	3.47	46.17	25.53
20)	3.88	172.62	121.67	20.95	0.41	71.67	20.72	3.46	46.19	25.48
21)	4.08	172.77	121.67	20.95	0.41	71.82	20.72	3.47	46.27	25.55
22)	4.29	173.17	121.67	21.02	0.41	72.14	20.64	3.49	46.39	25.75
23)	4.49	173.06	121.67	20.95	0.41	72.11	20.72	3.48	46.41	25.70
24)	4.69	173.21	121.67	20.87	0.40	72.33	20.79	3.48	46.56	25.77
25)	4.89	173.35	121.67	20.87	0.40	72.48	20.79	3.49	46.64	25.84
26)	5.09	173.49	121.67	20.87	0.40	72.62	20.79	3.49	46.71	25.91
27)	5.30	173.64	121.67	20.79	0.40	72.84	20.87	3.49	46.85	25.98
28)	5.49	173.78	121.67	20.79	0.40	72.98	20.87	3.50	46.92	26.05
29)	5.70	173.92	121.67	20.64	0.40	73.27	21.02	3.49	47.15	26.12
30)	5.90	174.05	121.67	20.49	0.39	73.56	21.18	3.47	47.37	26.19
31)	6.10	174.19	121.67	20.49	0.39	73.70	21.18	3.48	47.44	26.26
32)	6.50	174.46	121.67	20.49	0.39	73.97	21.18	3.49	47.57	26.40
33)	6.91	174.48	121.67	20.41	0.39	74.07	21.25	3.48	47.66	26.41
34)	7.31	174.75	121.67	20.11	0.38	74.64	21.56	3.46	48.10	26.54
35)	7.71	175.01	121.67	19.95	0.37	75.05	21.71	3.46	48.38	26.67
36)	8.12	175.26	121.67	19.88	0.37	75.38	21.79	3.46	48.59	26.80
37)	8.52	175.52	121.67	19.80	0.37	75.71	21.87	3.46	48.79	26.92
38)	8.93	175.76	121.67	19.57	0.36	76.19	22.10	3.45	49.14	27.05
39)	9.33	176.01	121.67	19.34	0.36	76.66	22.33	3.43	49.49	27.17
40)	9.74	176.00	121.67	19.19	0.35	76.81	22.48	3.42	49.64	27.17
41)	10.14	176.24	121.67	19.11	0.35	77.13	22.55	3.42	49.84	27.29
42)	10.65	176.40	121.67	18.88	0.34	77.52	22.78	3.40	50.15	27.37
43)	11.15	176.81	121.67	18.65	0.34	78.15	23.01	3.40	50.58	27.57
44)	11.65	176.97	121.67	18.35	0.33	78.62	23.32	3.37	50.97	27.65
45)	12.17	177.11	121.67	18.19	0.33	78.92	23.47	3.36	51.19	27.72
46)	12.66	177.26	121.67	17.96	0.32	79.30	23.70	3.35	51.50	27.80
47)	13.17	177.40	121.67	17.81	0.32	79.59	23.86	3.34	51.72	27.87
48)	13.68	177.54	121.67	17.58	0.31	79.96	24.09	3.32	52.02	27.93
49)	14.18	177.67	121.67	17.43	0.31	80.24	24.24	3.31	52.24	28.00
50)	14.68	177.80	121.67	17.20	0.31	80.60	24.47	3.29	52.53	28.06
51)	15.19	177.91	121.67	16.97	0.30	80.94	24.70	3.28	52.82	28.12
52)	16.20	178.14	121.67	16.66	0.30	81.47	25.00	3.26	53.24	28.23
53)	16.70	178.24	121.67	16.43	0.29	81.80	25.23	3.24	53.52	28.29
54)	17.21	178.56	121.67	16.28	0.29	82.28	25.39	3.24	53.83	28.45
55)	17.71	178.43	121.67	16.05	0.28	82.38	25.62	3.22	54.00	28.38
56)	18.22	178.52	121.67	15.90	0.28	82.62	25.77	3.21	54.19	28.42
57)	18.73	178.60	121.67	15.67	0.28	82.93	26.00	3.19	54.46	28.46
58)	19.73	178.75	121.67	15.36	0.27	83.38	26.30	3.17	54.84	28.54
59)	20.17	178.86	121.67	15.21	0.27	83.65	26.46	3.16	55.05	28.60

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ38-16
Boring No. : VQ-38 Test Date : 05/16/05 Tested by : S. Capps
Sample No. : 16 Depth : 52.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Dark gray sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 41.67 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.42	80.00	0.00	0.00	0.00	121.67	41.67
2)	0.019	0.24	11.45	90.31	258.80	258.80	22.61	144.28	53.96
3)	0.035	0.45	11.47	94.60	353.05	353.05	30.77	152.44	57.84
4)	0.052	0.65	11.50	97.05	416.89	416.89	36.27	157.94	60.89
5)	0.067	0.85	11.52	98.81	468.57	468.57	40.68	162.35	63.54
6)	0.083	1.05	11.54	99.73	498.98	498.98	43.23	164.90	65.17
7)	0.099	1.26	11.57	100.26	520.26	520.26	44.98	166.65	66.39
8)	0.115	1.46	11.59	100.57	538.50	538.50	46.46	168.13	67.56
9)	0.131	1.66	11.61	100.80	550.66	550.66	47.42	169.09	68.29
10)	0.147	1.86	11.64	100.80	559.78	559.78	48.10	169.77	68.97
11)	0.164	2.07	11.66	100.88	565.86	565.86	48.52	170.19	69.32
12)	0.180	2.27	11.69	101.03	574.98	574.98	49.20	170.87	69.84
13)	0.195	2.46	11.71	101.18	581.06	581.06	49.62	171.29	70.11
14)	0.211	2.67	11.73	101.18	584.10	584.10	49.78	171.45	70.27
15)	0.227	2.87	11.76	101.26	590.18	590.18	50.19	171.86	70.60
16)	0.243	3.07	11.78	101.26	593.22	593.22	50.35	172.02	70.76
17)	0.260	3.28	11.81	101.18	596.26	596.26	50.50	172.17	70.99
18)	0.275	3.48	11.83	101.18	602.34	602.34	50.91	172.58	71.40
19)	0.292	3.68	11.86	101.03	605.38	605.38	51.05	172.72	71.70
20)	0.307	3.88	11.88	100.95	605.38	605.38	50.95	172.62	71.67
21)	0.323	4.08	11.91	100.95	608.42	608.42	51.10	172.77	71.82
22)	0.340	4.29	11.93	101.03	614.50	614.50	51.50	173.17	72.14
23)	0.355	4.49	11.96	100.95	614.50	614.50	51.39	173.06	72.11
24)	0.371	4.69	11.98	100.88	617.54	617.54	51.54	173.21	72.33
25)	0.387	4.89	12.01	100.88	620.58	620.58	51.68	173.35	72.48
26)	0.403	5.09	12.03	100.88	623.62	623.62	51.82	173.49	72.62
27)	0.419	5.30	12.06	100.80	626.66	626.66	51.97	173.64	72.84
28)	0.435	5.49	12.08	100.80	629.70	629.70	52.11	173.78	72.98
29)	0.451	5.70	12.11	100.65	632.74	632.74	52.25	173.92	73.27
30)	0.467	5.90	12.14	100.49	635.78	635.78	52.38	174.05	73.56
31)	0.483	6.10	12.16	100.49	638.82	638.82	52.52	174.19	73.70
32)	0.515	6.50	12.22	100.49	644.91	644.91	52.79	174.46	73.97
33)	0.547	6.91	12.27	100.42	647.95	647.95	52.81	174.48	74.07
34)	0.579	7.31	12.32	100.11	654.03	654.03	53.08	174.75	74.64
35)	0.611	7.71	12.38	99.96	660.11	660.11	53.34	175.01	75.05
36)	0.643	8.12	12.43	99.88	666.19	666.19	53.59	175.26	75.38
37)	0.675	8.52	12.48	99.80	672.27	672.27	53.85	175.52	75.71
38)	0.707	8.93	12.54	99.57	678.35	678.35	54.09	175.76	76.19
39)	0.739	9.33	12.60	99.34	684.43	684.43	54.34	176.01	76.66
40)	0.771	9.74	12.65	99.19	687.47	687.47	54.33	176.00	76.81
41)	0.803	10.14	12.71	99.12	693.55	693.55	54.57	176.24	77.13
42)	0.843	10.65	12.78	98.89	699.63	699.63	54.73	176.40	77.52
43)	0.883	11.15	12.85	98.66	708.75	708.75	55.14	176.81	78.15
44)	0.922	11.65	12.93	98.35	714.83	714.83	55.30	176.97	78.62
45)	0.963	12.17	13.00	98.20	720.91	720.91	55.44	177.11	78.92
46)	1.002	12.66	13.08	97.97	726.99	726.99	55.59	177.26	79.30
47)	1.043	13.17	13.15	97.81	733.07	733.07	55.73	177.40	79.59
48)	1.083	13.68	13.23	97.58	739.15	739.15	55.87	177.54	79.96
49)	1.122	14.18	13.31	97.43	745.23	745.23	56.00	177.67	80.24
50)	1.162	14.68	13.39	97.20	751.31	751.31	56.13	177.80	80.60
51)	1.203	15.19	13.47	96.97	757.39	757.39	56.24	177.91	80.94
52)	1.282	16.20	13.63	96.67	769.55	769.55	56.47	178.14	81.47
53)	1.322	16.70	13.71	96.44	775.63	775.63	56.57	178.24	81.80
54)	1.362	17.21	13.79	96.28	784.75	784.75	56.89	178.56	82.28
55)	1.402	17.71	13.88	96.05	787.79	787.79	56.76	178.43	82.38
56)	1.442	18.22	13.96	95.90	793.87	793.87	56.85	178.52	82.62
57)	1.482	18.73	14.05	95.67	799.96	799.96	56.93	178.60	82.93
58)	1.562	19.73	14.23	95.37	812.12	812.12	57.08	178.75	83.38
59)	1.597	20.17	14.31	95.21	818.20	818.20	57.19	178.86	83.65

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ38-16
Boring No. : VQ-38 Test Date : 05/16/05 Tested by : S. Capps
Sample No. : 16 Depth : 52.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Dark gray sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 41.67 psi

Liquid Limit : 35.65 Plastic Limit : 17.71 Specific Gravity : 2.713

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-38-16	VQ-38-16
WT CONTAINER + WET SOIL (gm)	3275.00	3250.51
WT CONTAINER + DRY SOIL (gm)	2802.75	2802.75
WT WATER (gm)	472.25	447.76
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	2802.75	2802.75
WATER CONTENT (%)	16.85	15.98

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	16.85	15.98
VOID RATIO	0.48	0.43
WET DENSITY (lb/ft^3)	134.10	136.97
DRY DENSITY (lb/ft^3)	114.76	118.10
DEGREE OF SATURATION (%)	96.21	100.00

Maximum Shear Stress = 28.60 (lb/in^2) at a Vertical Strain of 20.17 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ38-16
Boring No. : VQ-38 Test Date : 05/16/05 Tested by : S. Capps
Sample No. : 16 Depth : 52.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Dark gray sandy clay (CL)
Remarks : TXCIU Test with Effective Pressure of 41.67 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 35.65 Plastic Limit : 17.71 Specific Gravity : 2.713

INITIAL
Height : 7.992 (in) Dry Density : 114.76 (lb/ft^3)
Area : 11.642 (in^2) Moisture : 16.85 %
Void Ratio: 0.48
Saturation: 96.21 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 114.76 (lb/ft^3) Total Vert. Stress : 121.67 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 16.85 % Total Hori. Stress : 121.67 (lb/in^
Void Ratio: 0.48 Pore Pressure : 0.00 (lb/in^2)
Saturation: 96.21 % Effect.Vert. Stress: 121.67 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 121.67 (lb/in^

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 114.76 (lb/ft^3) Total Vert. Stress : 121.67 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 16.85 % Total Hori. Stress : 121.67 (lb/in^
Void Ratio: 0.48 Pore Pressure : 0.00 (lb/in^2)
Saturation: 96.21 % Effect.Vert. Stress: 121.67 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 121.67 (lb/in^

END OF SATURATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 114.76 (lb/ft^3) Total Vert. Stress : 121.67 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 15.98 % Total Hori. Stress : 121.67 (lb/in^
dVCorr : 0.000 (in^3) Void Ratio: 0.48 Pore Pressure : 0.00 (lb/in^2)
Saturation: 91.22 % Effect.Vert. Stress: 121.67 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 121.67 (lb/in^

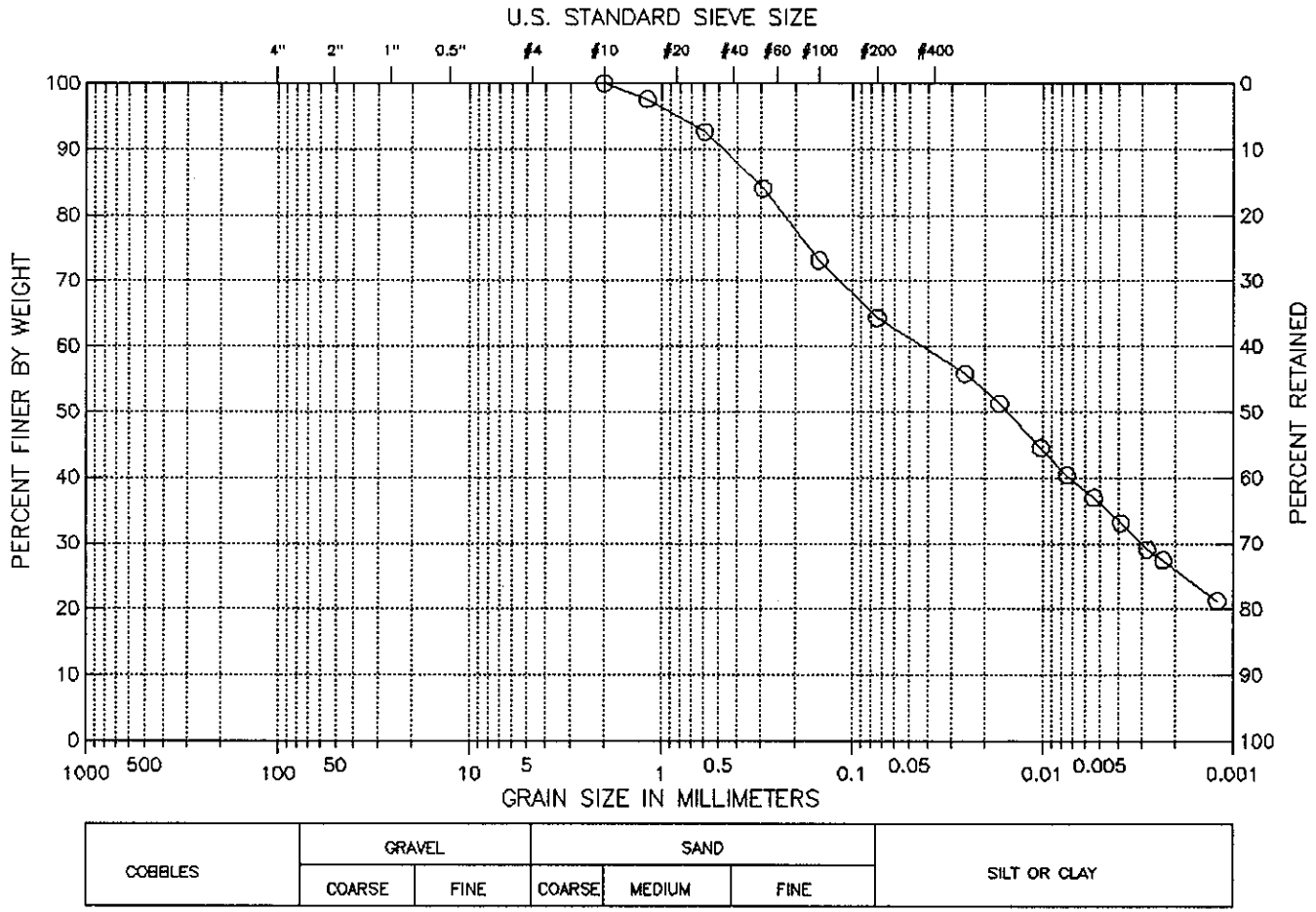
END OF CONSOLIDATION - B
dH : 0.076 (in) Height : 7.916 (in) Dry Density : 118.10 (lb/ft^3) Total Vert. Stress : 121.67 (lb/in^
dV : 2.633 (in^3) Area : 11.421 (in^2) Moisture : 15.98 % Total Hori. Stress : 121.67 (lb/in^
Void Ratio: 0.43 Pore Pressure : 80.00 (lb/in^2
Saturation: 100.00 % Effect.Vert. Stress: 41.67 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 41.67 (lb/in^2

FAILURE DURING SHEAR
dH : 1.597 (in) Height : 6.395 (in) Dry Density : 118.10 (lb/ft^3) Total Vert. Stress : 178.86 (lb/in^
dV : 2.633 (in^3) Area : 14.306 (in^2) Moisture : 15.98 % Total Hori. Stress : 121.67 (lb/in^
Strain : 20.17 % Void Ratio: 0.43 Pore Pressure : 95.21 (lb/in^2
Strength: 28.60 (lb/in^2)Saturation: 100.00 % Effect.Vert. Stress: 83.65 (lb/in^2
Time : 1522.47 (min) Effect.Hori. Stress: 26.46 (lb/in^2

END OF TEST
dH : 1.597 (in) Height : 6.395 (in) Dry Density : 118.10 (lb/ft^3) Total Vert. Stress : 178.86 (lb/in^
dV : 2.633 (in^3) Area : 14.306 (in^2) Moisture : 15.98 % Total Hori. Stress : 121.67 (lb/in^
Strain : 20.17 % Void Ratio: 0.43 Pore Pressure : 95.21 (lb/in^2
Saturation: 100.00 % Effect.Vert. Stress: 83.65 (lb/in^2
Time : 1522.47 (min) Effect.Hori. Stress: 26.46 (lb/in^2

URS

	Boring No. : VQ-38 Sample No: 16 Tested by : R. Taraya Filename : VQ38-016	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Wed May 18 2005



Classification :
(CL) Sandy lean clay
Visual Description :
Dark gray sandy clay (CL)

Remarks :
Depth: 52.0 feet

Figure 1

URS

Wed May 18 07:48:16 2005 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 16
Location : Piedmont, CA
Soil Description : Dark gray sandy clay (CL)
Remarks : Depth: 52.0 feet

Depth : 52.0 feet
Test Date : 05/16/2005
Test Method : ASTM D422/4318

Filename : VQ38-016
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 80 gm
Specific Gravity = 2.713

Hydroscopic Moisture Content :
Weight of Wet Soil = 80 gm
Weight of Dry Soil = 77.6 gm
Moisture Content = 0.0309278

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	52.00	22.40	43.80	0.026	56	0.026
5.00	48.50	22.30	40.26	0.017	51	0.017
15.00	43.30	22.20	35.01	0.010	45	0.010
30.00	40.20	21.80	31.73	0.007	40	0.007
60.00	37.50	21.80	29.03	0.005	37	0.005
120.00	34.40	21.90	25.97	0.004	33	0.004
240.00	31.30	21.90	22.87	0.003	29	0.003
360.00	30.00	21.90	21.57	0.002	27	0.002
1440.00	25.40	21.30	16.70	0.001	21	0.001

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#10	0.079	2.00	0.00	0.00	100
#16	0.047	1.19	1.84	1.84	98
#30	0.023	0.60	3.90	5.74	93
#50	0.012	0.30	6.64	12.38	84
#100	0.006	0.15	8.49	20.87	73
#200	0.003	0.07	6.81	27.68	64
Pan			49.92	77.60	0

Total Wet Weight of Sample = 80
Total Dry Weight of Sample = 77.6
Moisture Content = 0.0309278

D85 : 0.3190 mm
D60 : 0.0433 mm
D50 : 0.0153 mm
D30 : 0.0030 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : CL
ASTM Group Name : Sandy lean clay
AASHTO Group Symbol : A-6(10)
AASHTO Group Name : Clayey Soils

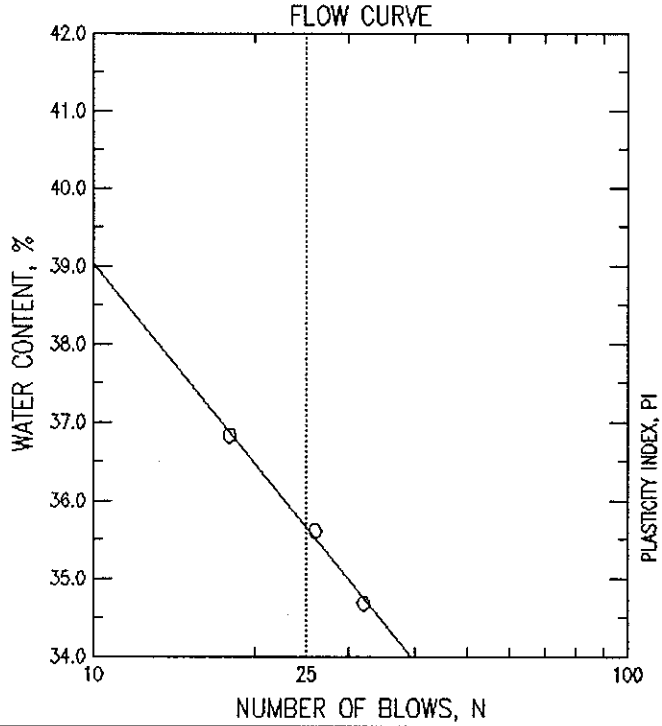
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-38
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	16
SAMPLE DESCRIPTION		DATE	FILENAME
Dark gray sandy clay (CL)		Wed May 18 2005	VQ38-016

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	53	54	55		
WT. WET SOIL + TARE	26.13	28.15	26.36		
WT. DRY SOIL + TARE	22.26	23.61	22.35		
WT. WATER	3.87	4.54	4.01		
TARE WT.	11.1	10.86	11.46		
WT. DRY SOIL	11.16	12.75	10.89		
WATER CONTENT, W_N (%)	34.68	35.61	36.82		
NUMBER OF BLOWS, N	32	26	18		
ONE-POINT LIQUID LIMIT, LL	35.73	35.78	35.39		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	37				
WT. WET SOIL + TARE	35.17				
WT. DRY SOIL + TARE	31.52				
WT. WATER	3.65				
TARE WT.	10.91				
WT. DRY SOIL	20.61				
WATER CONTENT (%)	17.71				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	17.8
LIQUID LIMIT, LL	35.7
PLASTIC LIMIT, PL	17.7
PLASTICITY INDEX, PI	17.9
LIQUIDITY INDEX, LI*	0.00

*LI = (W - PL)/PI

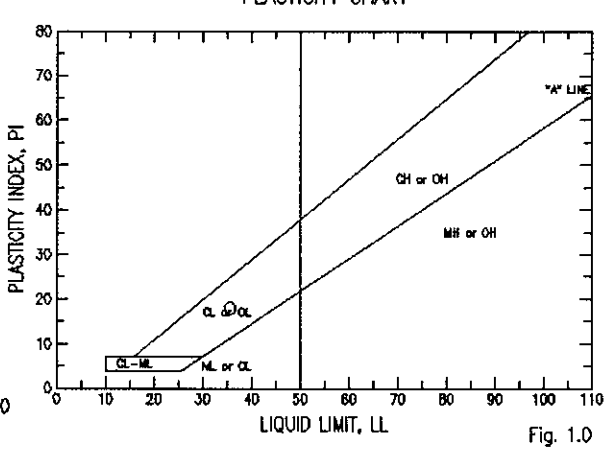


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-38
Sample No. : 16
Location : Piedmont, CA
Soil Description : Dark gray sandy clay (CL)
Remarks : Depth: 52.0 feet

Depth : 52.0 feet
Test Date : 05/16/2005
Test Method : ASTM D422/4318

Filename : VQ38-016
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ38-16	0.00	3301.40	2802.75	17.79

Average Moisture Content = 17.79

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 37	10.91	35.17	31.52	17.71

Plastic Limit = 17.71

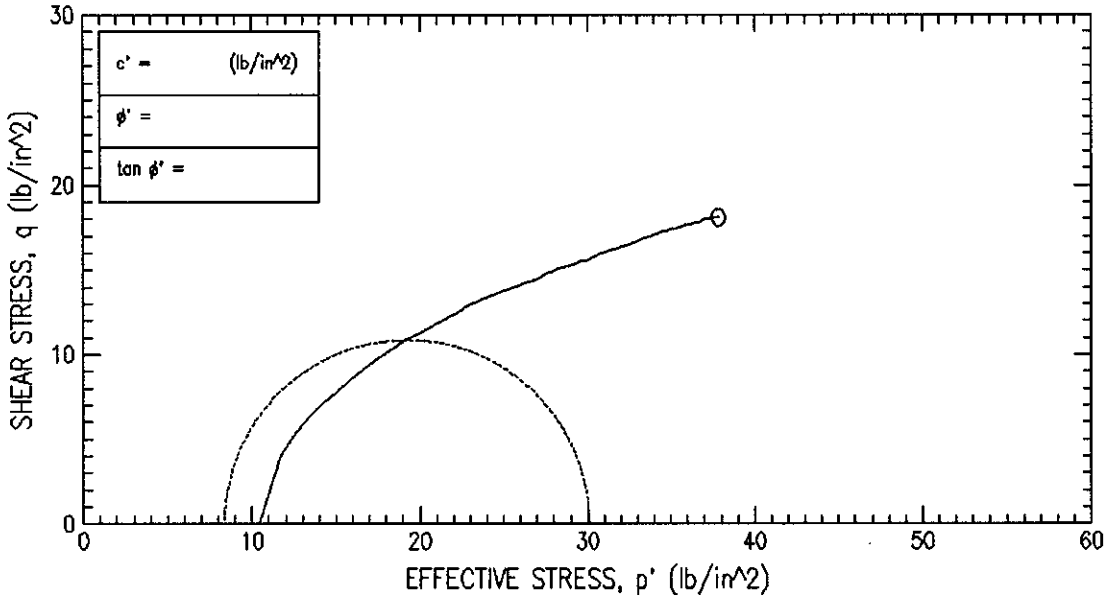
Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 53	11.10	26.13	22.26	32	34.68
2) 54	10.86	28.15	23.61	26	35.61
3) 55	11.46	26.36	22.35	18	36.82

Liquid Limit = 35.65
Plastic Index = 17.94

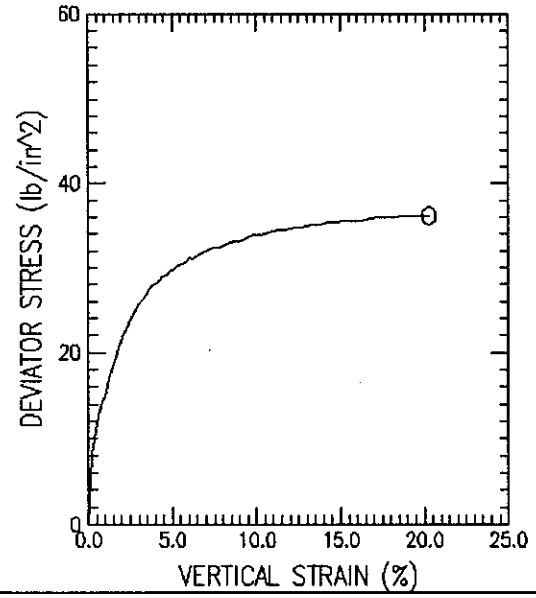
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-39-3



SYMBOL		○				
TEST NO.		VQ-39-3				
INITIAL	WATER CONTENT (%)	15.08				
	DRY DENSITY (lb/ft^3)	114.18				
	SATURATION (%)	85.62				
	VOID RATIO	0.476				
BEFORE SHEAR	WATER CONTENT (%)	17.17				
	DRY DENSITY (lb/ft^3)	115.10				
	SATURATION (%)	99.99				
	VOID RATIO	0.464				
	BACK PRESS. (lb/in^2)	80.00				
MINOR PRIN. STRESS (lb/in^2)		10.42				
MAX. DEV. STRESS (lb/in^2)		36.50				
TIME TO FAILURE (min)		1265.32				
RATE OF STRAIN INCR (%/min)		0.00				
INITIAL DIAMETER (in)		3.85				
INITIAL HEIGHT (in)		6.75				
B-VALUE		98.20				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Brown gravelly clayey sand (SC)

LL 35.50	PL 17.10	PI 18.40	GS 2.70

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 10.42 psi

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

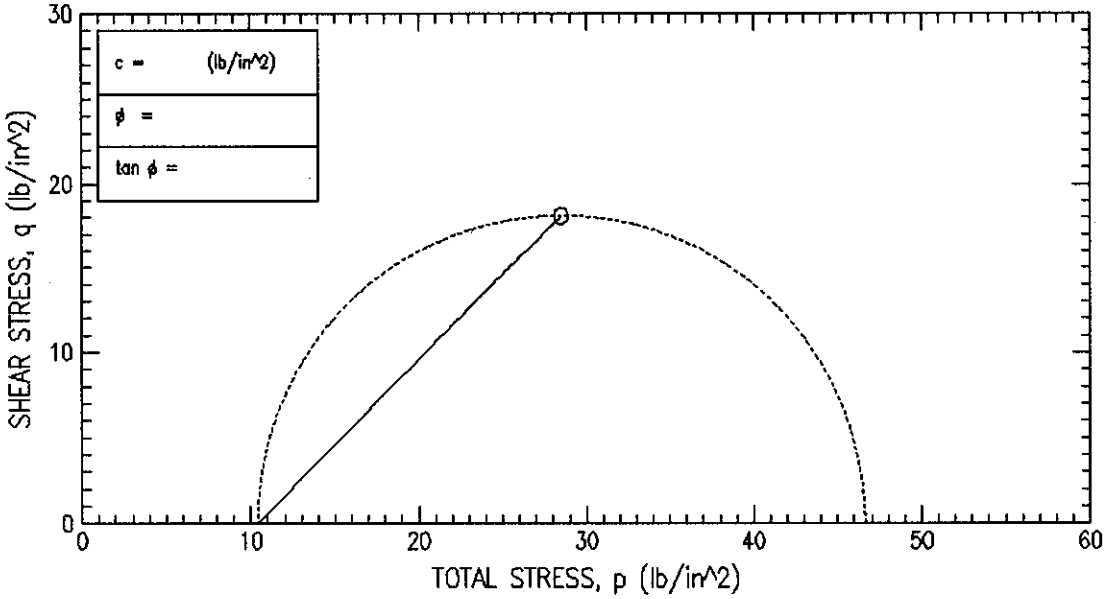
BORING NO. VQ-39	SAMPLE NO.	3			
TECH. S. Capps	DEPTH/ELEV	10.0 feet			
LABORATORY	DATE	05/09/05			

TRIAXIAL COMPRESSION TEST REPORT

Wed 05-11-:5, 11:55:52

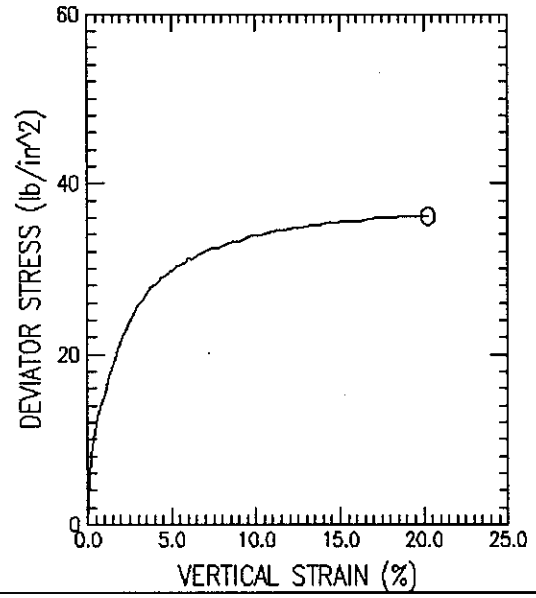
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-39-3



SYMBOL		O				
TEST NO.		VQ-39-3				
INITIAL	WATER CONTENT (%)	15.08				
	DRY DENSITY (lb/ft^3)	114.18				
	SATURATION (%)	85.62				
	VOID RATIO	0.476				
BEFORE SHEAR	WATER CONTENT (%)	17.17				
	DRY DENSITY (lb/ft^3)	115.10				
	SATURATION (%)	99.99				
	VOID RATIO	0.464				
	BACK PRESS. (lb/in^2)	80.00				
MINOR PRIN. STRESS (lb/in^2)		10.42				
MAX. DEV. STRESS (lb/in^2)		36.50				
TIME TO FAILURE (min)		1265.32				
RATE OF STRAIN INCR (%/min)		0.00				
INITIAL DIAMETER (in)		3.85				
INITIAL HEIGHT (in)		6.75				
B-VALUE		98.20				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Brown gravelly clayey sand (SC)

LL 35.50	PL 17.10	PI 18.40	GS 2.70

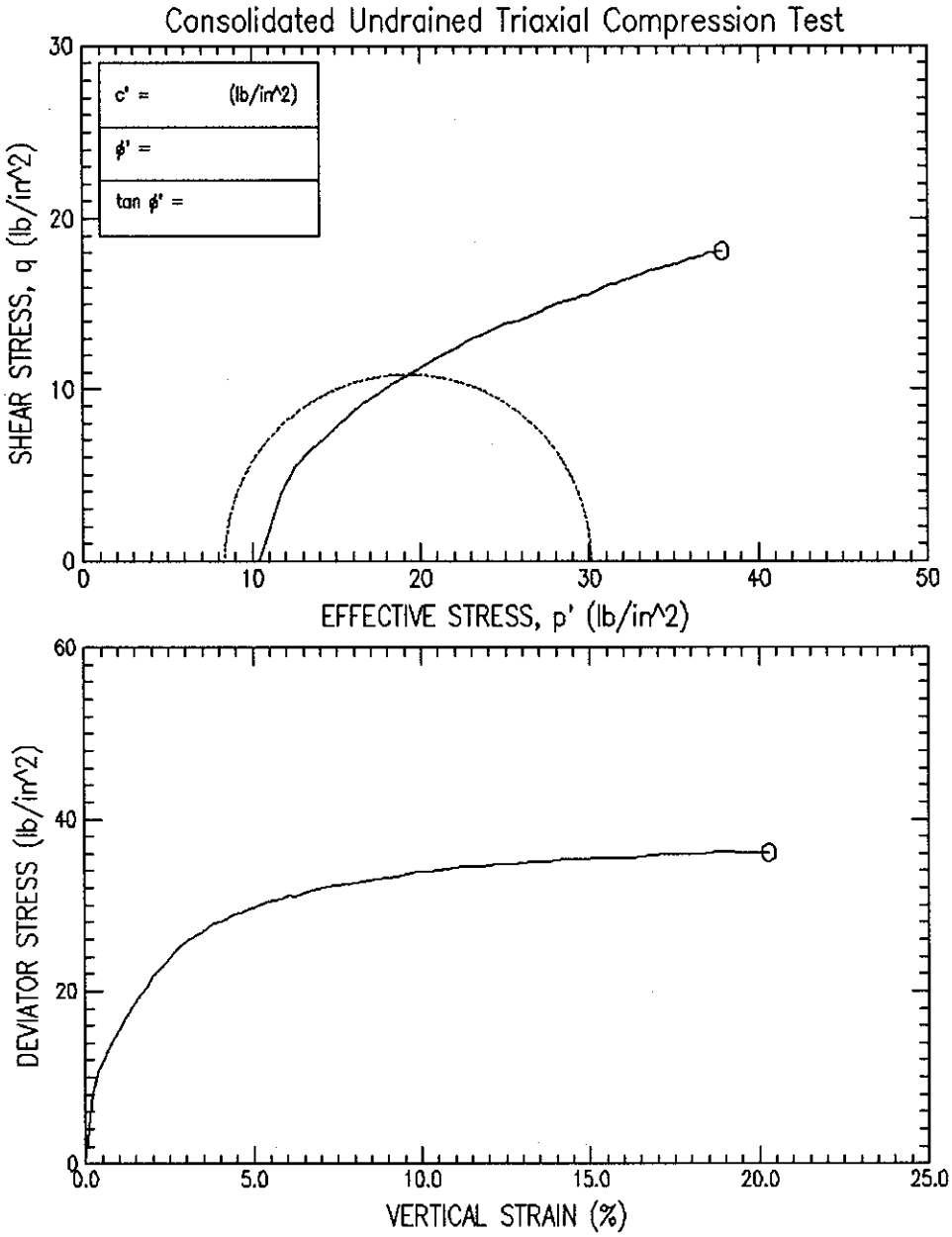
REMARKS:

1) TXCIU Test with Effective Pressure of 10.42 psi

TYPE OF SPECIMEN Shelby		TYPE OF TEST CU (R)				
PROJECT Estates Dam Seismic Study						
PROJECT NO.26814957						
BORING NO. VQ-39	SAMPLE NO.	3				
TECH. S. Capps	DEPTH/ELEV	10.0 feet				
LABORATORY	DATE	05/09/05				
TRIAXIAL COMPRESSION TEST REPORT						

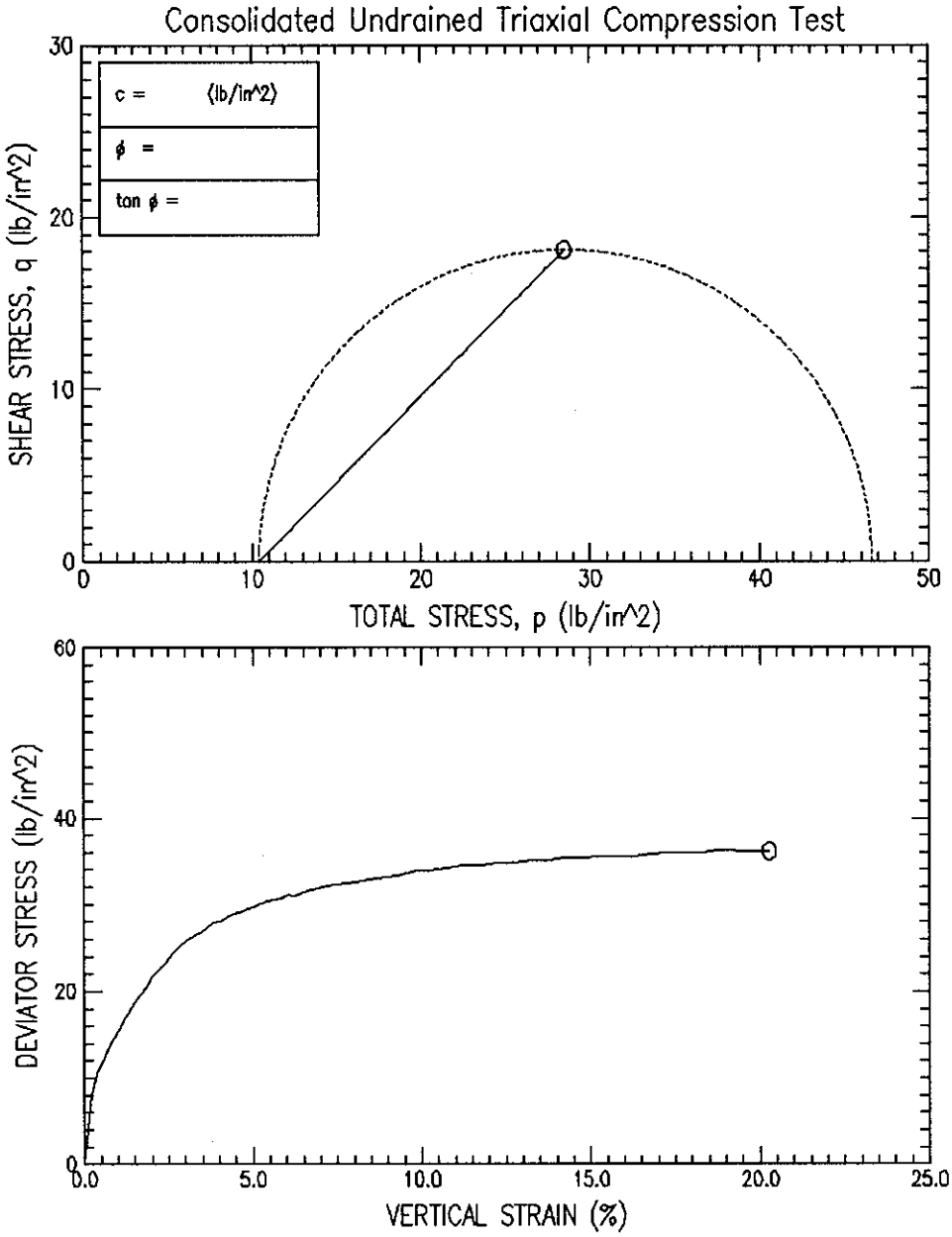
Wed 05-11-:5, 11:56:27

URS



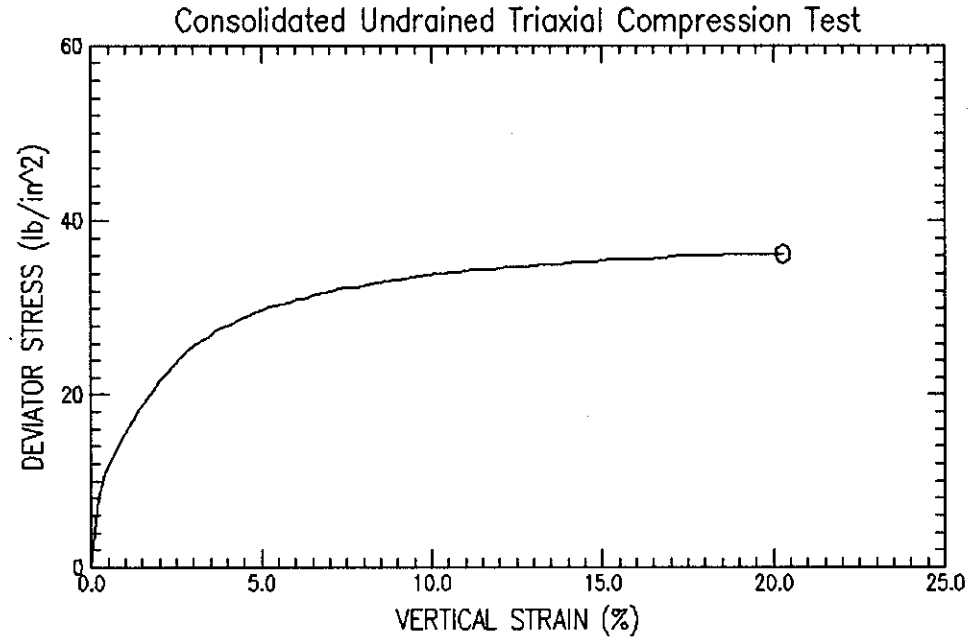
Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-39 Sample No : 3
Test Date : 05/09/05 Test No : VQ-39-3 Depth : 10.0 feet
Description : Brown gravelly clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 10.42 psi

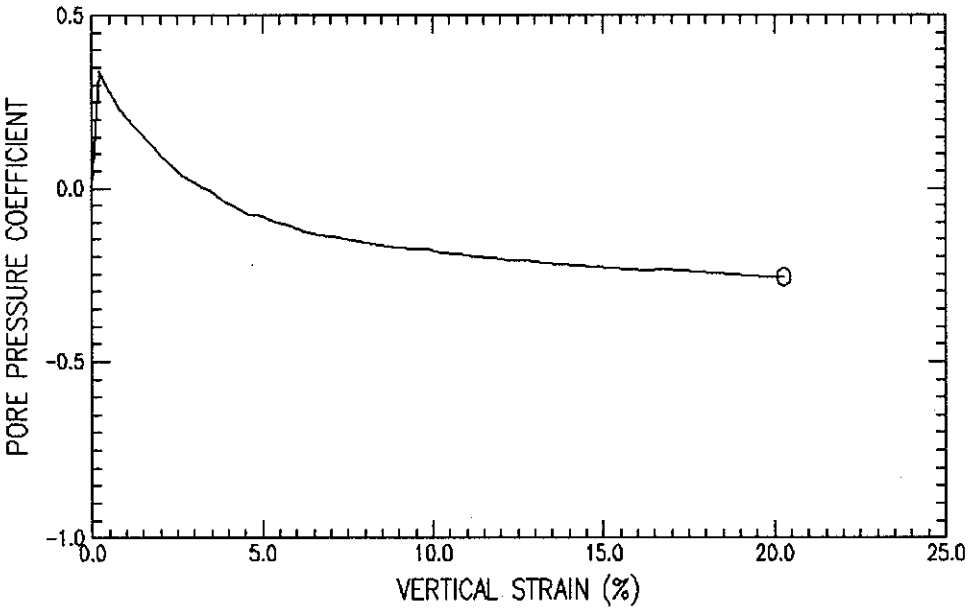
URS



Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-39 Sample No : 3
Test Date : 05/09/05 Test No : VQ-39-3 Depth : 10.0 feet
Description : Brown gravelly clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 10.42 psi

URS





Woodward Clyde Consultants
Project Name : Estates Dam Seismic Study
Project No : 26814957 Boring No : VQ-39 Sample No : 3
Test Date : 05/09/05 Test No : VQ-39-3 Depth : 10.0 feet
Description : Brown gravelly clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 10.42 psi

URS

Wed May 11 11:59:46 2005

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-39-3
Boring No. : VQ-39 Test Date : 05/09/05 Tested by : S. Capps
Sample No. : 3 Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown gravelly clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 10.42 psi

Height : 6.752 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 78.604 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	90.42	90.42	0.00	0.00	10.42	10.42	1.00	10.42	0.00
2)	0.21	98.51	90.42	2.73	0.34	15.77	7.68	2.05	11.73	4.04
3)	0.41	101.35	90.42	3.27	0.30	18.07	7.15	2.53	12.61	5.46
4)	0.61	103.14	90.42	3.34	0.26	19.79	7.07	2.80	13.43	6.36
5)	0.82	104.66	90.42	3.27	0.23	21.39	7.15	2.99	14.27	7.12
6)	1.02	105.92	90.42	3.19	0.21	22.72	7.22	3.15	14.97	7.75
7)	1.22	107.43	90.42	3.11	0.18	24.31	7.30	3.33	15.81	8.51
8)	1.42	108.68	90.42	2.96	0.16	25.72	7.45	3.45	16.58	9.13
9)	1.63	109.92	90.42	2.66	0.14	27.26	7.76	3.51	17.51	9.75
10)	1.82	110.91	90.42	2.43	0.12	28.48	7.99	3.56	18.23	10.24
11)	2.02	112.14	90.42	2.04	0.09	30.10	8.37	3.59	19.23	10.86
12)	2.22	112.86	90.42	1.74	0.08	31.12	8.68	3.59	19.90	11.22
13)	2.42	113.83	90.42	1.35	0.06	32.47	9.06	3.58	20.77	11.71
14)	2.63	114.80	90.42	0.97	0.04	33.82	9.44	3.58	21.63	12.19
15)	2.82	115.51	90.42	0.67	0.03	34.84	9.75	3.57	22.29	12.54
16)	3.03	116.21	90.42	0.44	0.02	35.77	9.98	3.58	22.88	12.90
17)	3.22	116.67	90.42	0.05	0.00	36.61	10.36	3.53	23.48	13.12
18)	3.43	117.11	90.42	-0.18	-0.01	37.29	10.59	3.52	23.94	13.35
19)	3.63	117.81	90.42	-0.56	-0.02	38.37	10.97	3.50	24.67	13.70
20)	3.82	118.26	90.42	-0.94	-0.03	39.19	11.36	3.45	25.28	13.92
21)	4.02	118.45	90.42	-1.32	-0.05	39.77	11.74	3.39	25.75	14.01
22)	4.22	118.89	90.42	-1.63	-0.06	40.51	12.05	3.36	26.28	14.23
23)	4.43	119.33	90.42	-1.94	-0.07	41.26	12.35	3.34	26.81	14.45
24)	4.63	119.51	90.42	-2.24	-0.08	41.75	12.66	3.30	27.21	14.55
25)	4.83	119.95	90.42	-2.32	-0.08	42.26	12.73	3.32	27.50	14.76
26)	5.03	120.13	90.42	-2.47	-0.08	42.60	12.89	3.31	27.74	14.86
27)	5.24	120.56	90.42	-2.78	-0.09	43.34	13.19	3.28	28.26	15.07
28)	5.43	120.75	90.42	-3.01	-0.10	43.75	13.42	3.26	28.59	15.16
29)	5.62	120.93	90.42	-3.16	-0.10	44.09	13.58	3.25	28.83	15.26
30)	5.83	121.11	90.42	-3.39	-0.11	44.50	13.81	3.22	29.15	15.34
31)	6.03	121.53	90.42	-3.70	-0.12	45.23	14.11	3.20	29.67	15.56
32)	6.23	121.47	90.42	-3.93	-0.13	45.39	14.34	3.16	29.87	15.52
33)	6.63	122.06	90.42	-4.31	-0.14	46.37	14.72	3.15	30.55	15.82
34)	7.03	122.41	90.42	-4.46	-0.14	46.87	14.88	3.15	30.87	16.00
35)	7.43	122.76	90.42	-4.77	-0.15	47.52	15.18	3.13	31.35	16.17
36)	7.84	122.86	90.42	-5.00	-0.15	47.85	15.41	3.10	31.63	16.22
37)	8.24	123.19	90.42	-5.30	-0.16	48.49	15.72	3.08	32.11	16.39
38)	8.64	123.52	90.42	-5.61	-0.17	49.13	16.03	3.07	32.58	16.55
39)	9.04	123.62	90.42	-5.76	-0.17	49.38	16.18	3.05	32.78	16.60
40)	9.44	123.94	90.42	-5.99	-0.18	49.93	16.41	3.04	33.17	16.76
41)	9.84	124.26	90.42	-6.07	-0.18	50.33	16.48	3.05	33.41	16.92
42)	10.24	124.35	90.42	-6.38	-0.19	50.72	16.79	3.02	33.75	16.96
43)	10.74	124.62	90.42	-6.60	-0.19	51.22	17.02	3.01	34.12	17.10
44)	11.25	124.89	90.42	-6.91	-0.20	51.80	17.33	2.99	34.56	17.24
45)	11.75	124.93	90.42	-7.06	-0.20	51.99	17.48	2.97	34.73	17.25
46)	12.24	125.19	90.42	-7.29	-0.21	52.48	17.71	2.96	35.09	17.39
47)	12.75	125.22	90.42	-7.37	-0.21	52.58	17.79	2.96	35.18	17.40
48)	13.26	125.47	90.42	-7.68	-0.22	53.14	18.09	2.94	35.62	17.52
49)	13.75	125.49	90.42	-7.75	-0.22	53.24	18.17	2.93	35.70	17.54
50)	14.25	125.74	90.42	-7.91	-0.22	53.64	18.32	2.93	35.98	17.66
51)	14.75	125.75	90.42	-8.06	-0.23	53.80	18.47	2.91	36.14	17.67
52)	15.26	125.98	90.42	-8.29	-0.23	54.27	18.70	2.90	36.49	17.78
53)	16.26	126.00	90.42	-8.52	-0.24	54.51	18.93	2.88	36.72	17.79
54)	16.77	126.22	90.42	-8.52	-0.24	54.73	18.93	2.89	36.83	17.90
55)	17.26	126.44	90.42	-8.67	-0.24	55.10	19.09	2.89	37.10	18.01
56)	17.76	126.43	90.42	-8.82	-0.25	55.25	19.24	2.87	37.25	18.01
57)	18.27	126.42	90.42	-8.90	-0.25	55.32	19.32	2.86	37.32	18.00
58)	18.77	126.63	90.42	-9.05	-0.25	55.68	19.47	2.86	37.57	18.10
59)	19.77	126.60	90.42	-9.28	-0.26	55.88	19.70	2.84	37.79	18.09
60)	20.27	126.58	90.42	-9.36	-0.26	55.93	19.78	2.83	37.85	18.08

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-39-3
Boring No. : VQ-39 Test Date : 05/09/05 Tested by : S. Capps
Sample No. : 3 Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown gravelly clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 10.42 psi

Height : 6.752 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 78.604 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.58	80.00	0.00	0.00	0.00	90.42	10.42
2)	0.014	0.21	11.60	82.74	94.63	94.63	8.15	98.51	15.77
3)	0.028	0.41	11.63	83.27	128.07	128.07	11.01	101.35	18.07
4)	0.041	0.61	11.65	83.35	149.35	149.35	12.82	103.14	19.79
5)	0.055	0.82	11.68	83.27	167.59	167.59	14.35	104.66	21.39
6)	0.068	1.02	11.70	83.20	182.79	182.79	15.63	105.92	22.72
7)	0.082	1.22	11.72	83.12	201.04	201.04	17.15	107.43	24.31
8)	0.096	1.42	11.75	82.97	216.24	216.24	18.41	108.68	25.72
9)	0.110	1.63	11.77	82.66	231.44	231.44	19.66	109.92	27.26
10)	0.123	1.82	11.79	82.43	243.60	243.60	20.65	110.91	28.48
11)	0.136	2.02	11.82	82.05	258.80	258.80	21.90	112.14	30.10
12)	0.149	2.22	11.84	81.74	267.92	267.92	22.62	112.86	31.12
13)	0.163	2.42	11.87	81.36	280.08	280.08	23.60	113.83	32.47
14)	0.177	2.63	11.89	80.98	292.24	292.24	24.58	114.80	33.82
15)	0.190	2.82	11.92	80.67	301.36	301.36	25.29	115.51	34.84
16)	0.204	3.03	11.94	80.44	310.48	310.48	26.00	116.21	35.77
17)	0.217	3.22	11.97	80.06	316.56	316.56	26.46	116.67	36.61
18)	0.231	3.43	11.99	79.83	322.64	322.64	26.91	117.11	37.29
19)	0.244	3.63	12.02	79.45	331.76	331.76	27.61	117.81	38.37
20)	0.257	3.82	12.04	79.06	337.84	337.84	28.06	118.26	39.19
21)	0.271	4.02	12.06	78.68	340.89	340.89	28.25	118.45	39.77
22)	0.285	4.22	12.09	78.37	346.97	346.97	28.70	118.89	40.51
23)	0.298	4.43	12.12	78.07	353.05	353.05	29.14	119.33	41.26
24)	0.312	4.63	12.14	77.76	356.09	356.09	29.33	119.51	41.75
25)	0.325	4.83	12.17	77.69	362.17	362.17	29.77	119.95	42.26
26)	0.339	5.03	12.19	77.53	365.21	365.21	29.95	120.13	42.60
27)	0.353	5.24	12.22	77.23	371.29	371.29	30.39	120.56	43.34
28)	0.365	5.43	12.24	77.00	374.33	374.33	30.57	120.75	43.75
29)	0.379	5.62	12.27	76.84	377.37	377.37	30.76	120.93	44.09
30)	0.393	5.83	12.30	76.61	380.41	380.41	30.94	121.11	44.50
31)	0.406	6.03	12.32	76.31	386.49	386.49	31.36	121.53	45.23
32)	0.420	6.23	12.35	76.08	386.49	386.49	31.30	121.47	45.39
33)	0.447	6.63	12.40	75.70	395.61	395.61	31.90	122.06	46.37
34)	0.473	7.03	12.45	75.54	401.69	401.69	32.25	122.41	46.87
35)	0.501	7.43	12.51	75.24	407.77	407.77	32.60	122.76	47.52
36)	0.528	7.84	12.56	75.01	410.81	410.81	32.70	122.86	47.85
37)	0.555	8.24	12.62	74.70	416.89	416.89	33.04	123.19	48.49
38)	0.582	8.64	12.67	74.39	422.97	422.97	33.37	123.52	49.13
39)	0.609	9.04	12.73	74.24	426.01	426.01	33.47	123.62	49.38
40)	0.636	9.44	12.79	74.01	432.09	432.09	33.79	123.94	49.93
41)	0.663	9.84	12.84	73.94	438.17	438.17	34.12	124.26	50.33
42)	0.690	10.24	12.90	73.63	441.21	441.21	34.20	124.35	50.72
43)	0.723	10.74	12.97	73.40	447.29	447.29	34.48	124.62	51.22
44)	0.758	11.25	13.05	73.09	453.37	453.37	34.75	124.89	51.80
45)	0.791	11.75	13.12	72.94	456.41	456.41	34.79	124.93	51.99
46)	0.825	12.24	13.19	72.71	462.49	462.49	35.05	125.19	52.48
47)	0.858	12.75	13.27	72.63	465.53	465.53	35.08	125.22	52.58
48)	0.893	13.26	13.35	72.33	471.61	471.61	35.33	125.47	53.14
49)	0.926	13.75	13.42	72.25	474.65	474.65	35.36	125.49	53.24
50)	0.960	14.25	13.50	72.10	480.73	480.73	35.60	125.74	53.64
51)	0.994	14.75	13.58	71.95	483.77	483.77	35.61	125.75	53.80
52)	1.027	15.26	13.66	71.72	489.85	489.85	35.85	125.98	54.27
53)	1.095	16.26	13.83	71.49	495.94	495.94	35.87	126.00	54.51
54)	1.129	16.77	13.91	71.49	502.02	502.02	36.09	126.22	54.73
55)	1.162	17.26	13.99	71.33	508.10	508.10	36.31	126.44	55.10
56)	1.196	17.76	14.08	71.18	511.14	511.14	36.30	126.43	55.25
57)	1.230	18.27	14.17	71.10	514.18	514.18	36.29	126.42	55.32
58)	1.264	18.77	14.25	70.95	520.26	520.26	36.50	126.63	55.68
59)	1.331	19.77	14.43	70.72	526.34	526.34	36.47	126.60	55.88
60)	1.365	20.27	14.52	70.64	529.38	529.38	36.45	126.58	55.93

URS

Wed May 11 11:59:58 2005

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-39-3
Boring No. : VQ-39 Test Date : 05/09/05 Tested by : S. Capps
Sample No. : 3 Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown gravelly clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 10.42 psi

Liquid Limit : 35.5 Plastic Limit : 17.1 Specific Gravity : 2.7

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-39-3	VQ-39-3
WT CONTAINER + WET SOIL (gm)	2711.20	2760.50
WT CONTAINER + DRY SOIL (gm)	2355.90	2355.90
WT WATER (gm)	355.30	404.60
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	2355.90	2355.90
WATER CONTENT (%)	15.08	17.17

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	15.08	17.17
VOID RATIO	0.48	0.46
WET DENSITY (lb/ft^3)	131.40	134.87
DRY DENSITY (lb/ft^3)	114.18	115.10
DEGREE OF SATURATION (%)	85.62	99.99

Maximum Shear Stress = 18.10 (lb/in^2) at a Vertical Strain of 18.77 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-39-3
Boring No. : VQ-39 Test Date : 05/09/05 Tested by : S. Capps
Sample No. : 3 Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown gravelly clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 10.42 psi

Height : 6.752 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 78.604 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 35.5 Plastic Limit : 17.1 Specific Gravity : 2.7

INITIAL
Height : 6.752 (in) Dry Density : 114.18 (lb/ft^3)
Area : 11.642 (in^2) Moisture : 15.08 %
Void Ratio: 0.48
Saturation: 85.62 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 6.752 (in) Dry Density : 114.18 (lb/ft^3) Total Vert. Stress : 90.42 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 15.08 % Total Hori. Stress : 90.42 (lb/in^2
Void Ratio: 0.48 Pore Pressure : 0.00 (lb/in^2)
Saturation: 85.62 % Effect.Vert. Stress: 90.42 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 90.42 (lb/in^2

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 6.752 (in) Dry Density : 114.18 (lb/ft^3) Total Vert. Stress : 90.42 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 15.08 % Total Hori. Stress : 90.42 (lb/in^2
Void Ratio: 0.48 Pore Pressure : 0.00 (lb/in^2)
Saturation: 85.62 % Effect.Vert. Stress: 90.42 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 90.42 (lb/in^2

END OF SATURATION
dH : 0.000 (in) Height : 6.752 (in) Dry Density : 114.18 (lb/ft^3) Total Vert. Stress : 90.42 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 17.17 % Total Hori. Stress : 90.42 (lb/in^2
dVCorr : 0.000 (in^3) Void Ratio: 0.48 Pore Pressure : 0.00 (lb/in^2)
Saturation: 97.51 % Effect.Vert. Stress: 90.42 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 90.42 (lb/in^2

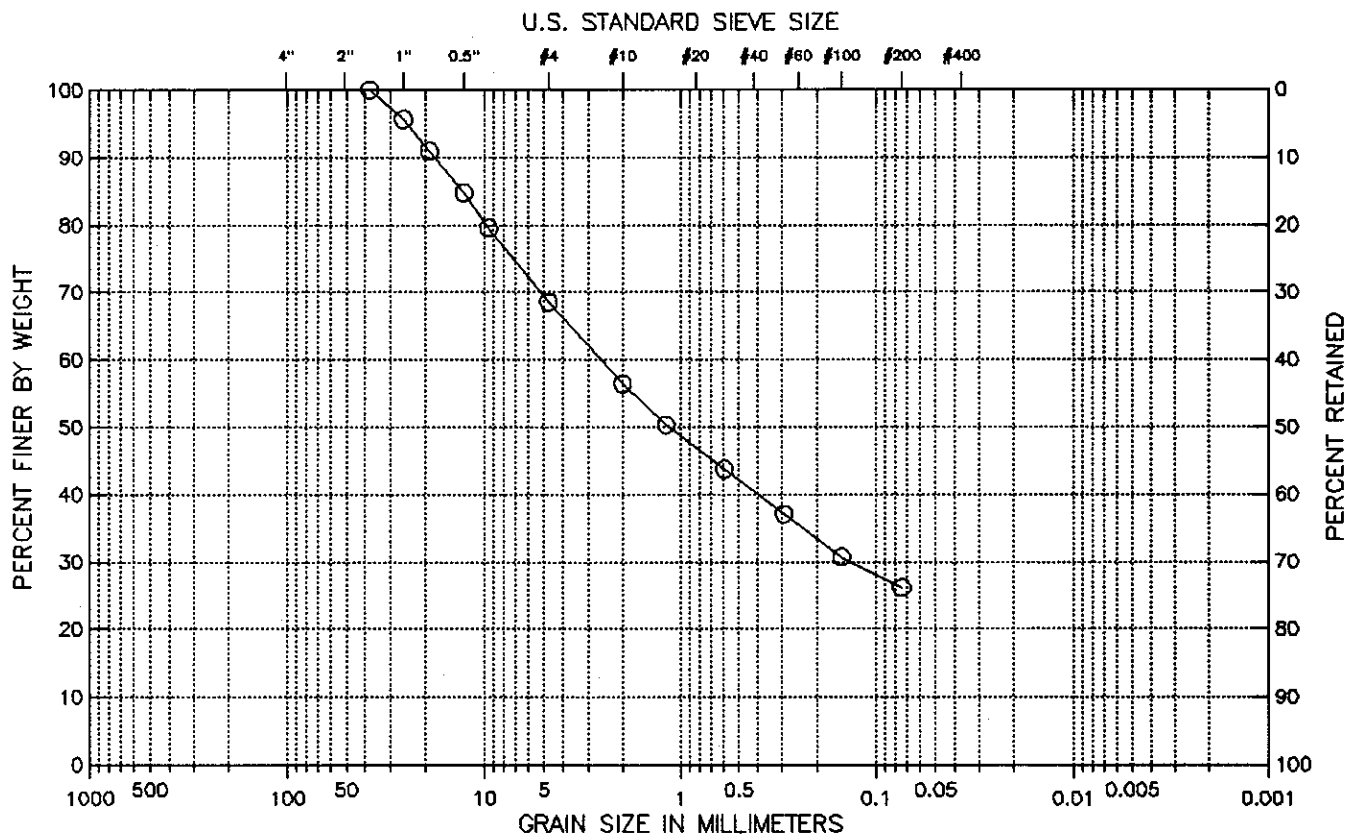
END OF CONSOLIDATION - B
dH : 0.018 (in) Height : 6.734 (in) Dry Density : 115.10 (lb/ft^3) Total Vert. Stress : 90.42 (lb/in^2
dV : 0.629 (in^3) Area : 11.579 (in^2) Moisture : 17.17 % Total Hori. Stress : 90.42 (lb/in^2
Void Ratio: 0.46 Pore Pressure : 80.00 (lb/in^2
Saturation: 99.99 % Effect.Vert. Stress: 10.42 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 10.42 (lb/in^2

FAILURE DURING SHEAR
dH : 1.264 (in) Height : 5.488 (in) Dry Density : 115.10 (lb/ft^3) Total Vert. Stress : 126.92 (lb/in^
dV : 0.629 (in^3) Area : 14.255 (in^2) Moisture : 17.17 % Total Hori. Stress : 90.42 (lb/in^2
Strain : 18.77 % Void Ratio: 0.46 Pore Pressure : 70.95 (lb/in^2
Strength: 18.25 (lb/in^2) Saturation: 99.99 % Effect.Vert. Stress: 55.97 (lb/in^2
Time : 1265.32 (min) Effect.Hori. Stress: 19.47 (lb/in^2

END OF TEST
dH : 1.365 (in) Height : 5.387 (in) Dry Density : 115.10 (lb/ft^3) Total Vert. Stress : 126.87 (lb/in^
dV : 0.629 (in^3) Area : 14.523 (in^2) Moisture : 17.17 % Total Hori. Stress : 90.42 (lb/in^2
Strain : 20.27 % Void Ratio: 0.46 Pore Pressure : 70.64 (lb/in^2
Saturation: 99.99 % Effect.Vert. Stress: 56.23 (lb/in^2
Time : 1370.27 (min) Effect.Hori. Stress: 19.78 (lb/in^2

URS

	Boring No. : VQ-39 Sample No: 3 Tested by : R. Taraya Filename : VQ39-003	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Wed May 11 2005



Classification :
(SC) Clayey sand with gravel
Visual Description :
Brown gravelly clayey sand (SC)

Remarks :
Depth: 10.0 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-39
Sample No. : 3
Location : Piedmont, CA
Soil Description : Brown gravelly clayey sand (SC)
Remarks : Depth: 10.0 feet

Depth : 10.0 feet
Test Date : 05/06/2005
Test Method : ASTM D422/4318

Filename : VQ39-003
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	59.24	59.24	96
0.75"	0.748	19.00	64.61	123.85	91
0.5"	0.500	12.70	84.60	208.45	85
0.375"	0.374	9.51	71.35	279.80	80
#4	0.187	4.75	151.70	431.50	69
#10	0.079	2.00	166.00	597.50	56
#16	0.047	1.19	83.90	681.40	50
#30	0.023	0.60	90.10	771.50	44
#50	0.012	0.30	91.20	862.70	37
#100	0.006	0.15	87.10	949.80	31
#200	0.003	0.07	62.00	1011.80	26

Total Dry Weight of Sample = 1371.1

D85 : 12.8694 mm
D60 : 2.5826 mm
D50 : 1.1526 mm
D30 : 0.1331 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand with gravel
AASHTO Group Symbol : A-2-6(2)
AASHTO Group Name : Clayey Gravel and Sand

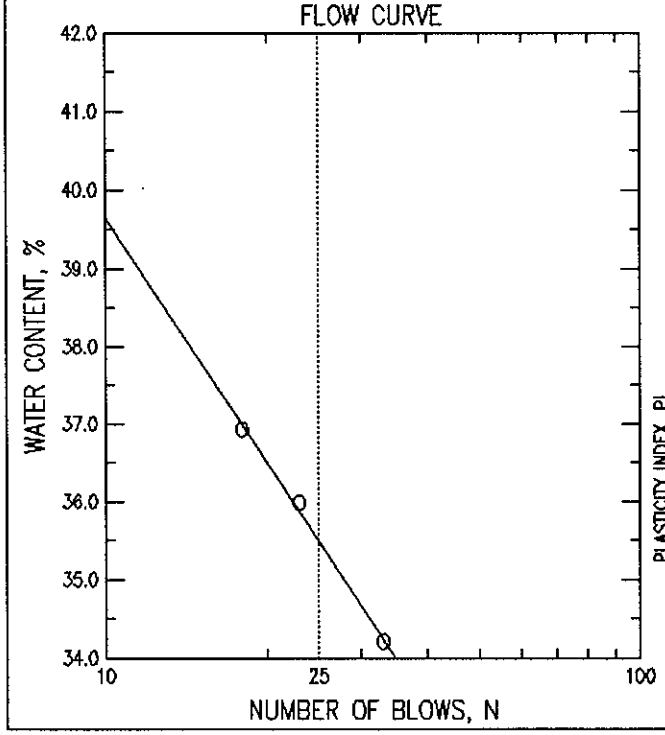
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-39
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	3
SAMPLE DESCRIPTION		DATE	FILENAME
Brown gravelly clayey sand (SC)		Wed May 11 2005	VQ39-003

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	61	62	63		
WT. WET SOIL + TARE	26.91	29.448	24.83		
WT. DRY SOIL + TARE	22.86	24.59	21.13		
WT. WATER	4.05	4.858	3.7		
TARE WT.	11.02	11.09	11.11		
WT. DRY SOIL	11.84	13.5	10.02		
WATER CONTENT, W_N (%)	34.21	35.99	36.93		
NUMBER OF BLOWS, N	33	23	18		
ONE-POINT LIQUID LIMIT, LL	35.37	35.62	35.49		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	10				
WT. WET SOIL + TARE	34.64				
WT. DRY SOIL + TARE	31.28				
WT. WATER	3.36				
TARE WT.	11.63				
WT. DRY SOIL	19.65				
WATER CONTENT (%)	17.10				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	15.1
LIQUID LIMIT, LL	35.5
PLASTIC LIMIT, PL	17.1
PLASTICITY INDEX, PI	18.4
LIQUIDITY INDEX, LI*	-0.11

*LI = (W - PL)/PI

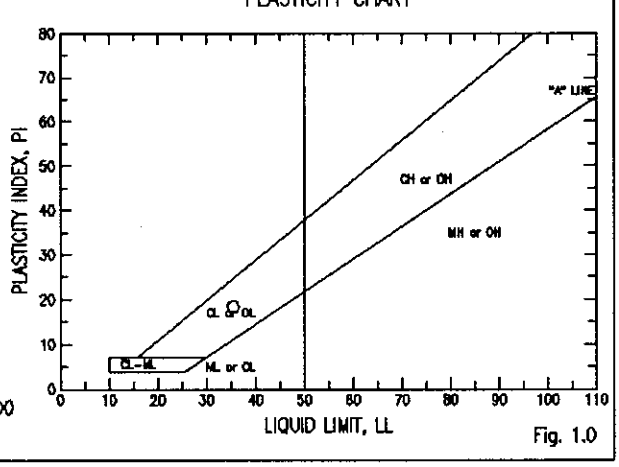


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-39
Sample No. : 3
Location : Piedmont, CA
Soil Description : Brown gravelly clayey sand (SC)
Remarks : Depth: 10.0 feet

Depth : 10.0 feet
Test Date : 05/06/2005
Test Method : ASTM D422/4318

Filename : VQ39-003
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ39-3	0.00	2711.20	2355.90	15.08

Average Moisture Content = 15.08

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	10	11.63	34.64	31.28	17.10

Plastic Limit = 17.10

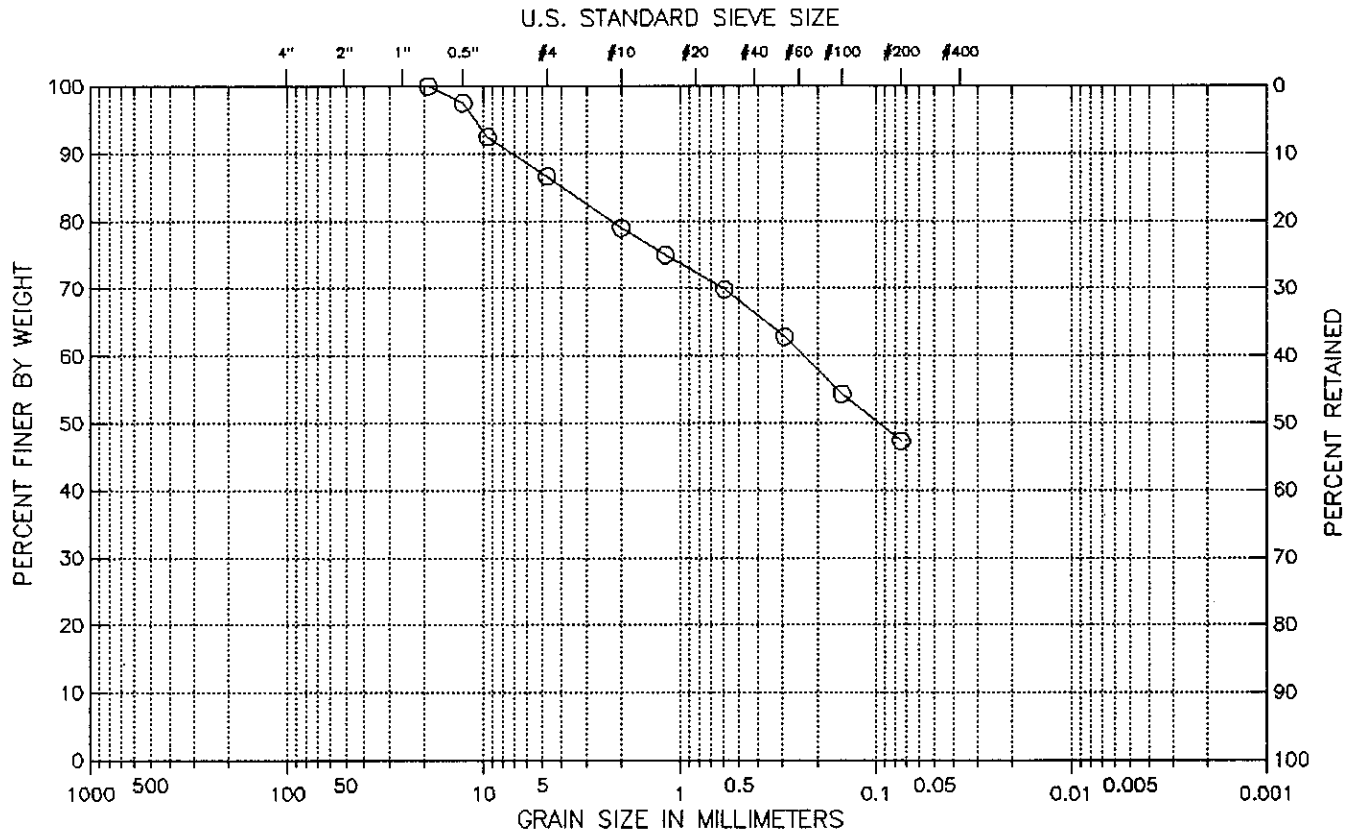
Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	61	11.02	26.91	22.86	33	34.21
2)	62	11.09	29.45	24.59	23	35.99
3)	63	11.11	24.83	21.13	18	36.93

Liquid Limit = 35.50
Plastic Index = 18.40

URS

	Boring No. : VQ-39 Sample No.: 8A Tested by : R. Taraya Filename : VQ39-08A	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Tue May 03 2005



Classification :
(SC) Clayey sand
Visual Description :
Dark gray brown clayey sand with gravel (SC)

Remarks :
Depth: 25.0 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-39
Sample No. : 8A
Location : Piedmont, CA
Depth : 25.0 feet
Test Date : 05/02/2005
Test Method : ASTM D422/4318
Filename : VQ39-08A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Dark gray brown clayey sand with gravel (SC)
Remarks : Depth: 25.0 feet

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	10.12	10.12	98
0.375"	0.374	9.51	20.37	30.49	92
#4	0.187	4.75	23.63	54.12	87
#10	0.079	2.00	31.24	85.36	79
#16	0.047	1.19	16.36	101.72	75
#30	0.023	0.60	20.71	122.43	70
#50	0.012	0.30	28.33	150.76	63
#100	0.006	0.15	34.59	185.35	54
#200	0.003	0.07	28.37	213.72	47

Total Dry Weight of Sample = 405.7

D85 : 3.9419 mm
D60 : 0.2350 mm
D50 : 0.0968 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand
AASHTO Group Symbol : A-6(3)
AASHTO Group Name : Clayey Soils

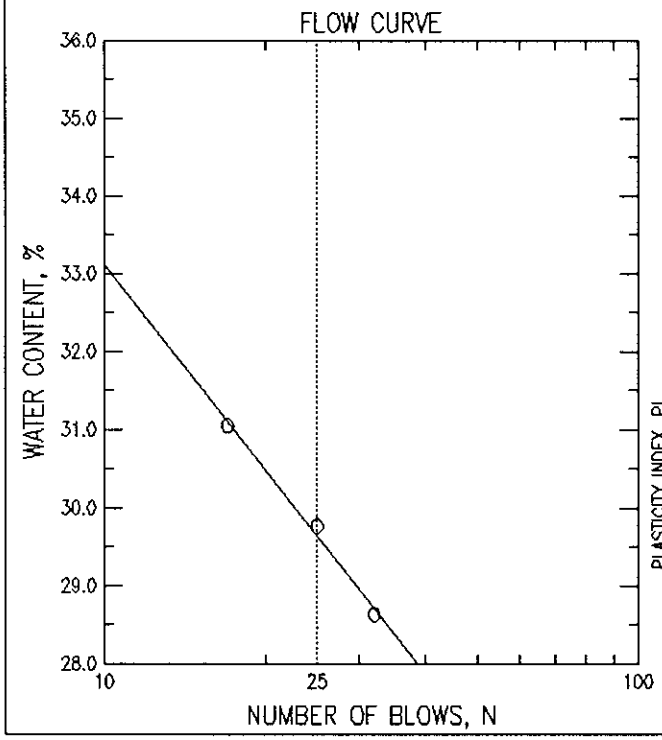
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-39
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	8A
SAMPLE DESCRIPTION		DATE	FILENAME
Dark gray brown clayey sand with gravel (SC)		Tue May 03 2005	VQ39-08A

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	58	64	71		
WT. WET SOIL + TARE	26.98	31.32	28.12		
WT. DRY SOIL + TARE	23.37	26.79	24		
WT. WATER	3.61	4.53	4.12		
TARE WT.	10.76	11.57	10.73		
WT. DRY SOIL	12.61	15.22	13.27		
WATER CONTENT, W_N (%)	28.63	29.76	31.05		
NUMBER OF BLOWS, N	32	25	17		
ONE-POINT LIQUID LIMIT, LL	29.50	29.76	29.63		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	80				
WT. WET SOIL + TARE	38.62				
WT. DRY SOIL + TARE	34.39				
WT. WATER	4.23				
TARE WT.	10.86				
WT. DRY SOIL	23.53				
WATER CONTENT (%)	17.98				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	16.9
LIQUID LIMIT, LL	29.6
PLASTIC LIMIT, PL	18.0
PLASTICITY INDEX, PI	11.7
LIQUIDITY INDEX, LI*	-0.10

*LI = (W - PL)/PI

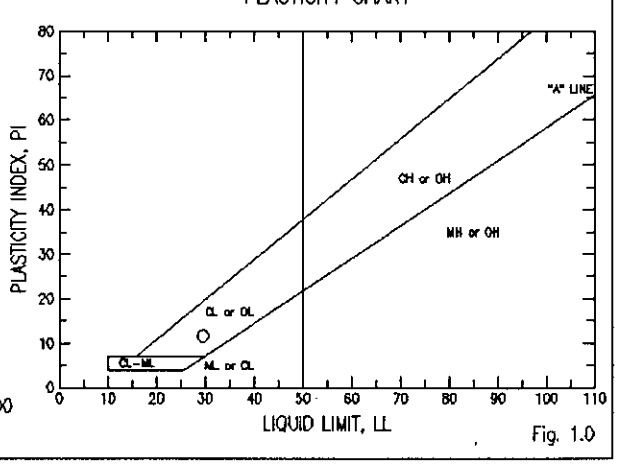


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-39
Sample No. : 8A
Location : Piedmont, CA
Soil Description : Dark gray brown clayey sand with gravel (SC)
Remarks : Depth: 25.0 feet

Depth : 25.0 feet
Test Date : 05/02/2005
Test Method : ASTM D422/4318

Filename : VQ39-08A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ39-8A	186.80	660.90	592.50	16.86

Average Moisture Content = 16.86

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	80	10.86	38.62	34.39	17.98

Plastic Limit = 17.98

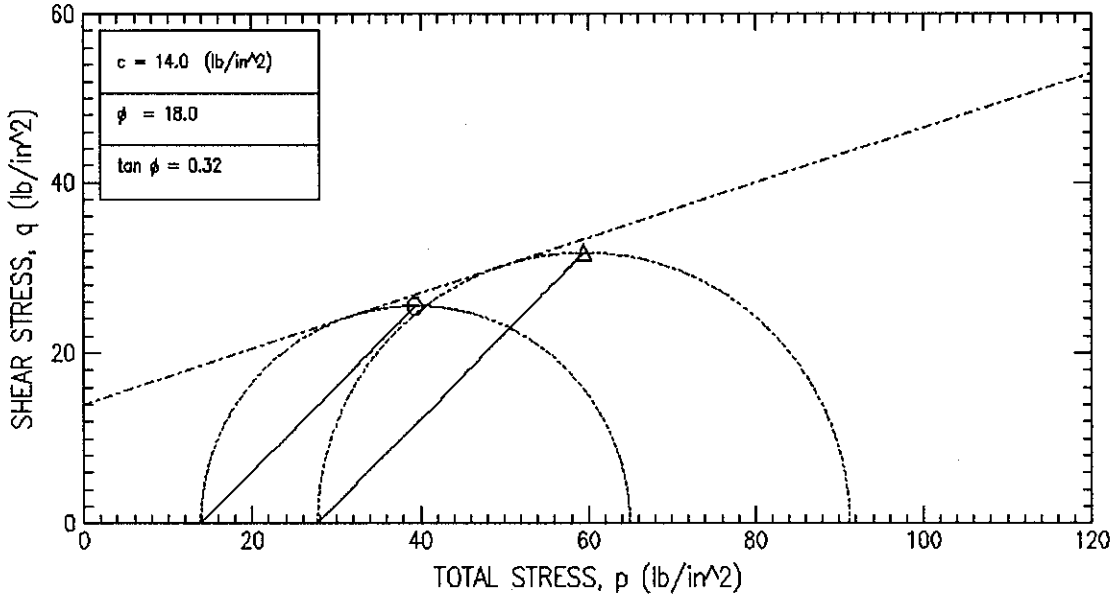
Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	58	10.76	26.98	23.37	32	28.63
2)	64	11.57	31.32	26.79	25	29.76
3)	71	10.73	28.12	24.00	17	31.05

Liquid Limit = 29.64
Plastic Index = 11.66

URS

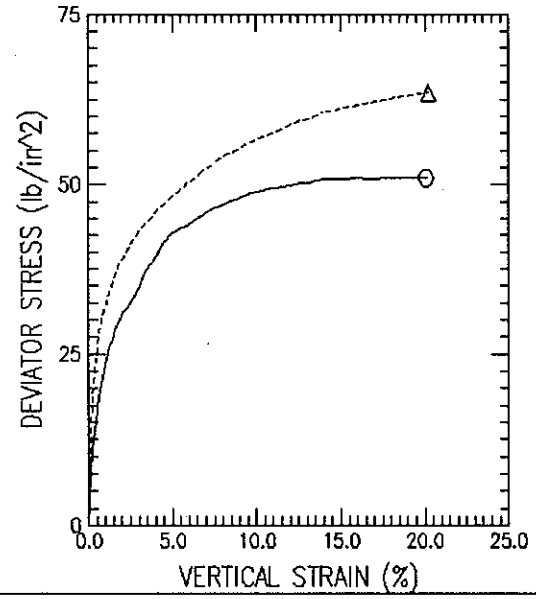
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-40-4A

VQ-40-4B



SYMBOL		○	△		
TEST NO.		VQ-40-4A	VQ-40-4B		
INITIAL	WATER CONTENT (%)	9.26	11.27		
	DRY DENSITY (lb/ft^3)	135.49	130.24		
	SATURATION (%)	93.97	94.38		
	VOID RATIO	0.272	0.332		
BEFORE SHEAR	WATER CONTENT (%)	9.27	10.41		
	DRY DENSITY (lb/ft^3)	137.21	134.53		
	SATURATION (%)	99.99	99.99		
	VOID RATIO	0.256	0.289		
	BACK PRESS. (lb/in^2)	80.00	80.00		
MINOR PRIN. STRESS (lb/in^2)		13.89	27.78		
MAX. DEV. STRESS (lb/in^2)		51.69	65.55		
TIME TO FAILURE (min)		1075.13	1196.35		
RATE OF STRAIN INCR (%/min)		0.00	0.00		
INITIAL DIAMETER (in)		2.86	2.86		
INITIAL HEIGHT (in)		5.95	5.95		
B-VALUE		98.10	97.70		

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown clayey sand (SC) with gravel

2) Grayish brown clayey sand (SC) with gravel

LL 31.65	PL 16.42	PI 15.23	GS 2.76	TYPE OF SPECIMEN Shelby	TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 13.89 psi

2) TXCIU Test with Effective Pressure of 27.78 psi

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

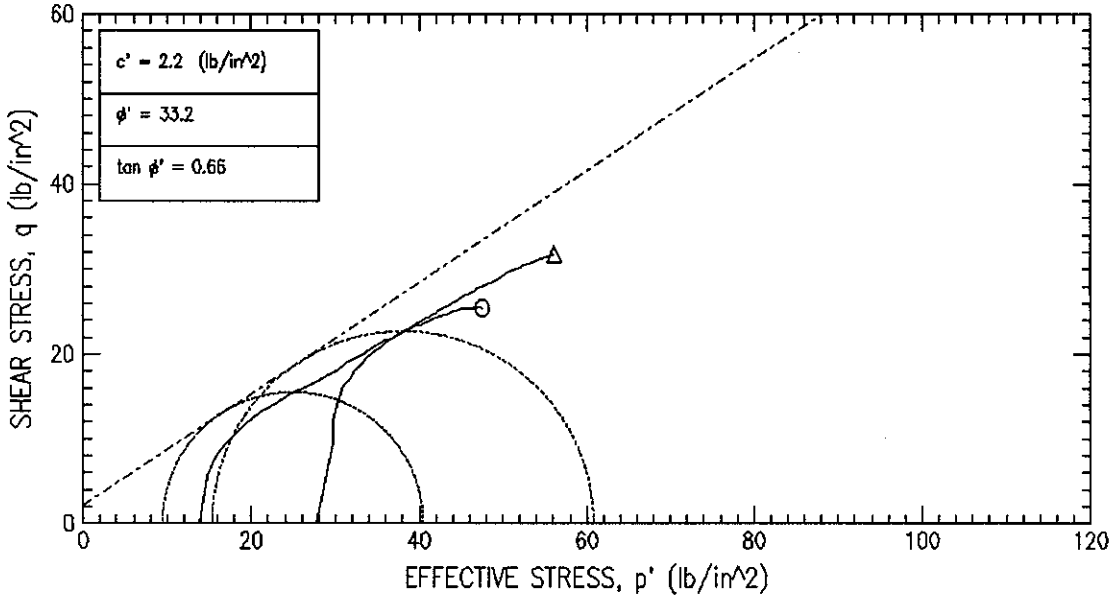
BORING NO. VQ-40	SAMPLE NO.	4A	4B		
TECH. S. Capps	DEPTH/ELEV	10.0 feet	10.0 feet		
LABORATORY	DATE	05/05/05	05/05/05		

TRIAXIAL COMPRESSION TEST REPORT

Wed 05-11-05, 09:46:42

URS

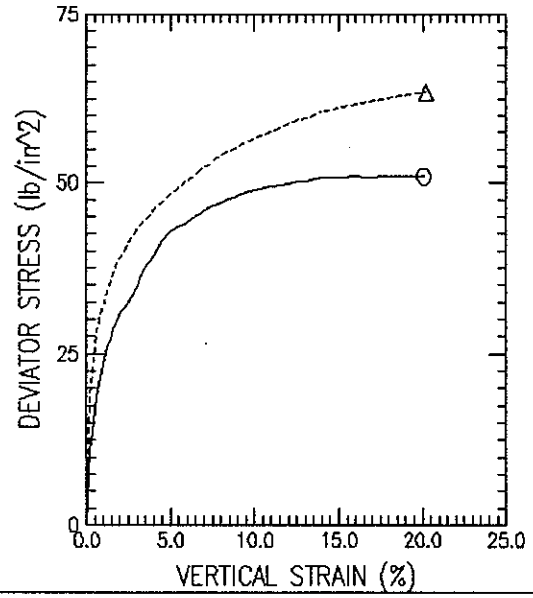
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-40-4A

VQ-40-4B



SYMBOL		○	△			
TEST NO.		VQ-40-4A	VQ-40-4B			
INITIAL	WATER CONTENT (%)	9.26	11.27			
	DRY DENSITY (lb/ft^3)	135.49	130.24			
	SATURATION (%)	93.97	94.38			
	VOID RATIO	0.272	0.332			
BEFORE SHEAR	WATER CONTENT (%)	9.27	10.41			
	DRY DENSITY (lb/ft^3)	137.21	134.53			
	SATURATION (%)	99.99	99.99			
	VOID RATIO	0.256	0.289			
	BACK PRESS. (lb/in^2)	80.00	80.00			
MINOR PRIN. STRESS (lb/in^2)		13.89	27.78			
MAX. DEV. STRESS (lb/in^2)		51.69	65.55			
TIME TO FAILURE (min)		1075.13	1196.35			
RATE OF STRAIN INCR (%/min)		0.00	0.00			
INITIAL DIAMETER (in)		2.86	2.86			
INITIAL HEIGHT (in)		5.95	5.95			
B-VALUE		98.10	97.70			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown clayey sand (SC) with gravel

2) Grayish brown clayey sand (SC) with gravel

LL 31.65	PL 16.42	PI 15.23	GS 2.76

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 13.89 psi

2) TXCIU Test with Effective Pressure of 27.78 psi

PROJECT Estates Dam Seismic Study

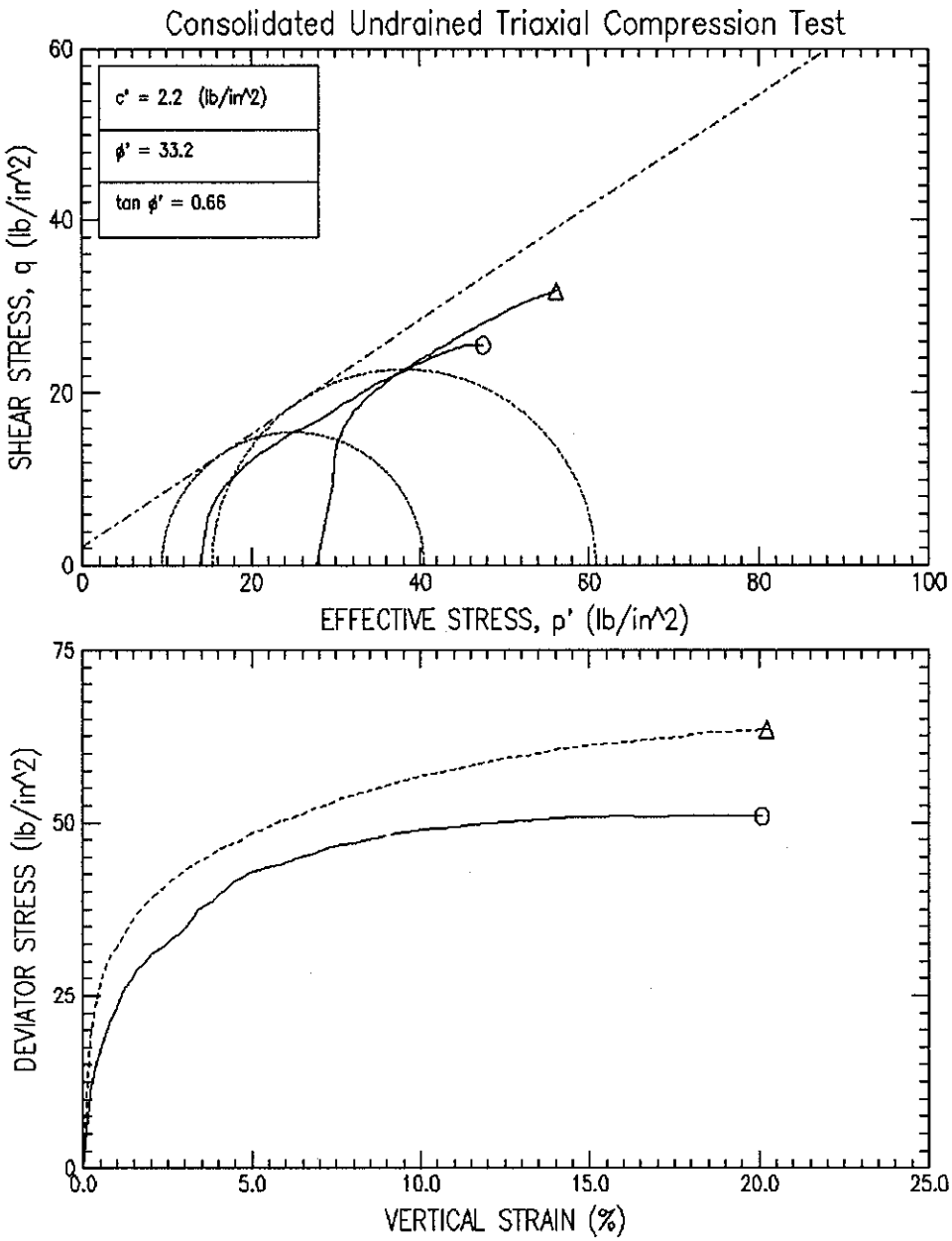
PROJECT NO.26B14957

BORING NO. VQ-40	SAMPLE NO.	4A	4B		
TECH. S. Capps	DEPTH/ELEV	10.0 feet	10.0 feet		
LABORATORY	DATE	05/05/05	05/05/05		

TRIAXIAL COMPRESSION TEST REPORT

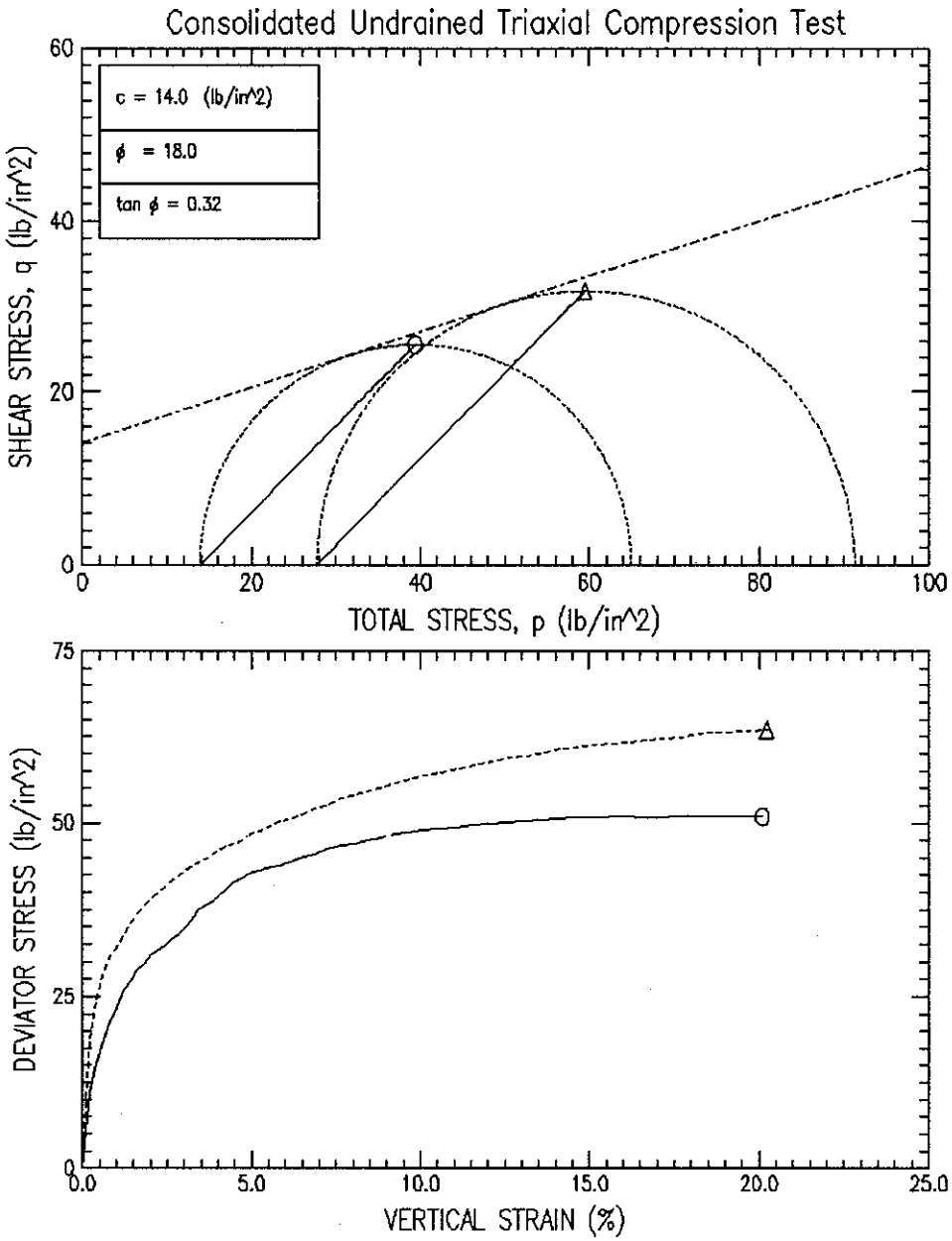
Wed 05-11-:5, 09:47:15

URS



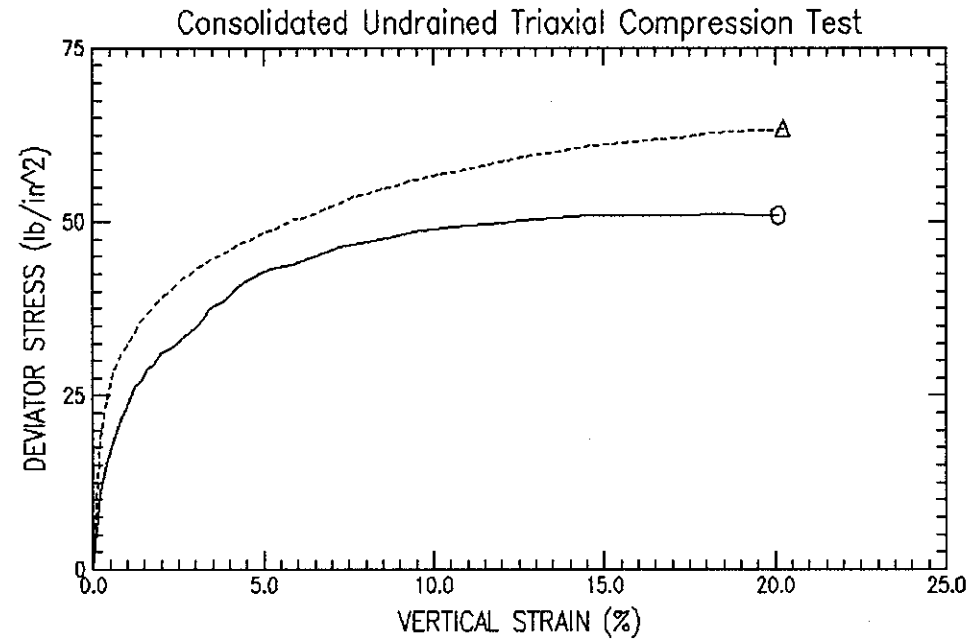
Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-40	4A	10.0 feet	VQ-40-4A	VQ40-4A.CIU	O
VQ-40	4B	10.0 feet	VQ-40-4B	VQ40-4B.CIU	Δ

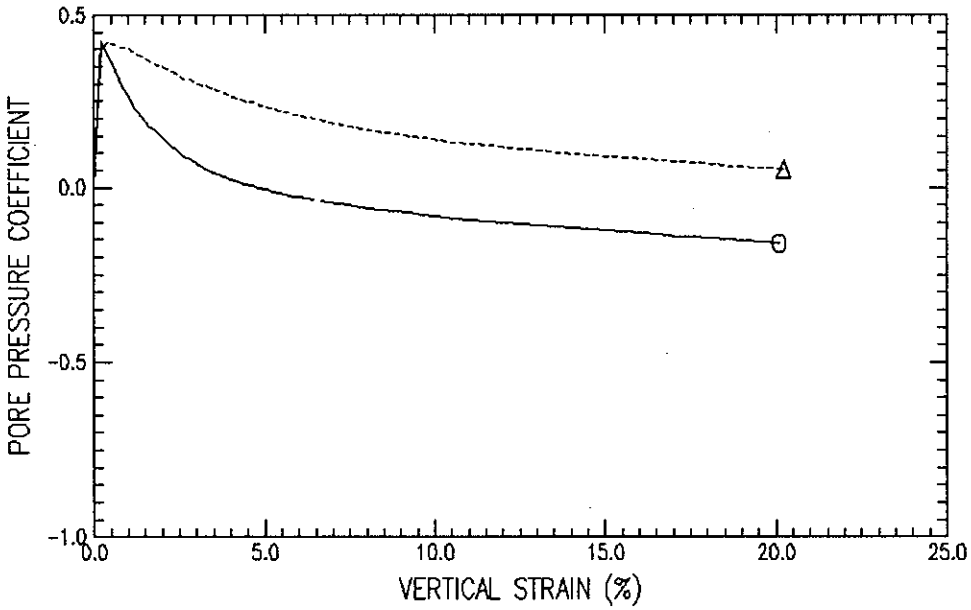
URS



Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-40	4A	10.0 feet	VQ-40-4A	VQ40-4A.CIU	O
VQ-40	4B	10.0 feet	VQ-40-4B	VQ40-4B.CIU	Δ

URS





Project Name : Estates Dam Seismic Study

Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-40	4A	10.0 feet	VQ-40-4A	VQ40-4A.CIU	O
VQ-40	4B	10.0 feet	VQ-40-4B	VQ40-4B.CIU	Δ

URS

Wed May 11 09:53:20 2005 Page : 1

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-4A
Boring No. : VQ-40 Test Date : 05/05/05 Tested by : S. Capps
Sample No. : 4A Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 13.89 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	93.89	93.89	0.00	0.00	13.89	13.89	1.00	13.89	0.00
2)	0.21	105.00	93.89	4.69	0.42	20.31	9.20	2.21	14.75	5.55
3)	0.41	109.16	93.89	5.86	0.38	23.30	8.03	2.90	15.67	7.64
4)	0.61	112.58	93.89	6.34	0.34	26.24	7.55	3.48	16.89	9.35
5)	0.80	115.36	93.89	6.34	0.30	29.02	7.55	3.84	18.28	10.73
6)	1.01	117.26	93.89	6.21	0.27	31.06	7.69	4.04	19.37	11.69
7)	1.22	120.02	93.89	5.93	0.23	34.09	7.96	4.28	21.02	13.06
8)	1.41	121.05	93.89	5.52	0.20	35.53	8.37	4.24	21.95	13.58
9)	1.61	122.63	93.89	5.10	0.18	37.53	8.79	4.27	23.16	14.37
10)	1.81	123.43	93.89	4.90	0.17	38.53	8.99	4.28	23.76	14.77
11)	2.01	124.94	93.89	4.48	0.14	40.46	9.41	4.30	24.93	15.52
12)	2.21	125.40	93.89	3.93	0.12	41.47	9.96	4.16	25.71	15.75
13)	2.41	126.21	93.89	3.52	0.11	42.69	10.37	4.12	26.53	16.16
14)	2.62	127.12	93.89	3.04	0.09	44.08	10.85	4.06	27.47	16.61
15)	2.82	127.89	93.89	2.76	0.08	45.13	11.13	4.06	28.13	17.00
16)	3.02	128.76	93.89	2.42	0.07	46.35	11.47	4.04	28.91	17.44
17)	3.21	129.82	93.89	2.07	0.06	47.75	11.82	4.04	29.78	17.97
18)	3.41	131.26	93.89	1.73	0.05	49.54	12.16	4.07	30.85	18.69
19)	3.63	132.02	93.89	1.52	0.04	50.50	12.37	4.08	31.43	19.06
20)	3.83	132.35	93.89	1.25	0.03	51.11	12.64	4.04	31.88	19.23
21)	4.02	133.30	93.89	0.90	0.02	52.40	12.99	4.03	32.70	19.71
22)	4.23	134.30	93.89	0.63	0.02	53.68	13.26	4.05	33.47	20.21
23)	4.43	135.11	93.89	0.42	0.01	54.69	13.47	4.06	34.08	20.61
24)	4.63	135.66	93.89	0.21	0.01	55.45	13.68	4.05	34.56	20.89
25)	4.82	136.24	93.89	-0.06	-0.00	56.31	13.95	4.04	35.13	21.18
26)	5.04	136.78	93.89	-0.27	-0.01	57.05	14.16	4.03	35.61	21.45
27)	5.23	137.07	93.89	-0.54	-0.01	57.62	14.44	3.99	36.03	21.59
28)	5.43	137.30	93.89	-0.75	-0.02	58.05	14.64	3.96	36.35	21.71
29)	5.62	137.52	93.89	-0.96	-0.02	58.48	14.85	3.94	36.67	21.82
30)	5.84	137.74	93.89	-1.16	-0.03	58.91	15.06	3.91	36.98	21.92
31)	6.03	138.06	93.89	-1.23	-0.03	59.29	15.12	3.92	37.21	22.08
32)	6.43	138.84	93.89	-1.58	-0.04	60.42	15.47	3.91	37.94	22.47
33)	6.83	139.45	93.89	-1.92	-0.04	61.38	15.81	3.88	38.59	22.78
34)	7.24	140.15	93.89	-2.20	-0.05	62.35	16.09	3.88	39.22	23.13
35)	7.64	140.63	93.89	-2.54	-0.05	63.17	16.43	3.84	39.80	23.37
36)	8.04	140.92	93.89	-2.82	-0.06	63.74	16.71	3.81	40.22	23.52
37)	8.44	141.42	93.89	-3.09	-0.07	64.51	16.98	3.80	40.75	23.76
38)	8.84	141.76	93.89	-3.30	-0.07	65.06	17.19	3.78	41.12	23.93
39)	9.25	142.30	93.89	-3.51	-0.07	65.80	17.40	3.78	41.60	24.20
40)	9.64	142.54	93.89	-3.85	-0.08	66.39	17.74	3.74	42.07	24.33
41)	10.06	142.89	93.89	-4.13	-0.08	67.02	18.02	3.72	42.52	24.50
42)	10.55	143.16	93.89	-4.40	-0.09	67.56	18.29	3.69	42.93	24.63
43)	11.05	143.30	93.89	-4.68	-0.09	67.98	18.57	3.66	43.27	24.70
44)	11.55	143.58	93.89	-4.88	-0.10	68.46	18.78	3.65	43.62	24.84
45)	12.05	143.71	93.89	-5.02	-0.10	68.73	18.91	3.63	43.82	24.91
46)	12.55	144.04	93.89	-5.30	-0.11	69.34	19.19	3.61	44.26	25.07
47)	13.06	144.21	93.89	-5.50	-0.11	69.71	19.40	3.59	44.56	25.16
48)	13.56	144.41	93.89	-5.71	-0.11	70.12	19.60	3.58	44.86	25.26
49)	14.07	144.60	93.89	-5.85	-0.12	70.45	19.74	3.57	45.10	25.36
50)	14.57	144.76	93.89	-6.05	-0.12	70.82	19.95	3.55	45.38	25.44
51)	15.07	144.75	93.89	-6.26	-0.12	71.01	20.15	3.52	45.58	25.43
52)	16.07	144.82	93.89	-6.61	-0.13	71.43	20.50	3.48	45.96	25.47
53)	16.58	144.76	93.89	-6.81	-0.13	71.58	20.70	3.46	46.14	25.44
54)	17.07	144.74	93.89	-7.09	-0.14	71.83	20.98	3.42	46.40	25.42
55)	17.58	144.84	93.89	-7.16	-0.14	72.00	21.05	3.42	46.52	25.47
56)	18.09	144.94	93.89	-7.36	-0.14	72.30	21.25	3.40	46.78	25.52
57)	18.58	144.93	93.89	-7.64	-0.15	72.57	21.53	3.37	47.05	25.52
58)	19.59	144.89	93.89	-7.98	-0.16	72.87	21.87	3.33	47.37	25.50
59)	20.09	144.81	93.89	-8.19	-0.16	73.00	22.08	3.31	47.54	25.46

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-4A
Boring No. : VQ-40 Test Date : 05/05/05 Tested by : S. Capps
Sample No. : 4A Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 13.89 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	6.37	80.00	0.00	0.00	0.00	93.89	13.89
2)	0.013	0.21	6.38	84.69	71.81	71.81	11.25	105.00	20.31
3)	0.024	0.41	6.40	85.86	98.93	98.93	15.47	109.16	23.30
4)	0.036	0.61	6.41	86.34	121.32	121.32	18.93	112.58	26.24
5)	0.048	0.80	6.42	86.34	139.62	139.62	21.74	115.36	29.02
6)	0.060	1.01	6.44	86.20	152.32	152.32	23.67	117.26	31.06
7)	0.072	1.22	6.45	85.93	170.62	170.62	26.46	120.02	34.09
8)	0.083	1.41	6.46	85.52	177.72	177.72	27.51	121.05	35.53
9)	0.096	1.61	6.47	85.10	188.49	188.49	29.11	122.63	37.53
10)	0.107	1.81	6.49	84.90	194.08	194.08	29.92	123.43	38.53
11)	0.119	2.01	6.50	84.48	204.42	204.42	31.44	124.94	40.46
12)	0.131	2.21	6.51	83.93	207.86	207.86	31.91	125.40	41.47
13)	0.143	2.41	6.53	83.52	213.67	213.67	32.73	126.21	42.69
14)	0.155	2.62	6.54	83.04	220.13	220.13	33.65	127.12	44.08
15)	0.167	2.82	6.56	82.76	225.73	225.73	34.43	127.89	45.13
16)	0.179	3.02	6.57	82.42	231.97	231.97	35.32	128.76	46.35
17)	0.190	3.21	6.58	82.07	239.51	239.51	36.39	129.82	47.75
18)	0.202	3.41	6.60	81.73	249.63	249.63	37.85	131.26	49.54
19)	0.215	3.63	6.61	81.52	255.22	255.22	38.61	132.02	50.50
20)	0.227	3.83	6.62	81.25	258.02	258.02	38.95	132.35	51.11
21)	0.238	4.02	6.64	80.90	264.91	264.91	39.91	133.30	52.40
22)	0.251	4.23	6.65	80.63	272.23	272.23	40.93	134.30	53.68
23)	0.262	4.43	6.67	80.42	278.26	278.26	41.75	135.11	54.69
24)	0.274	4.63	6.68	80.21	282.56	282.56	42.30	135.66	55.45
25)	0.285	4.82	6.69	79.94	287.08	287.08	42.89	136.24	56.31
26)	0.298	5.04	6.71	79.73	291.39	291.39	43.44	136.78	57.05
27)	0.310	5.23	6.72	79.45	293.97	293.97	43.73	137.07	57.62
28)	0.321	5.43	6.74	79.25	296.13	296.13	43.96	137.30	58.05
29)	0.333	5.62	6.75	79.04	298.28	298.28	44.19	137.52	58.48
30)	0.346	5.84	6.77	78.83	300.43	300.43	44.41	137.74	58.91
31)	0.357	6.03	6.78	78.77	303.23	303.23	44.73	138.06	59.29
32)	0.381	6.43	6.81	78.42	309.90	309.90	45.52	138.84	60.42
33)	0.405	6.83	6.84	78.08	315.50	315.50	46.14	139.45	61.38
34)	0.429	7.24	6.87	77.80	321.74	321.74	46.85	140.15	62.35
35)	0.452	7.64	6.90	77.46	326.48	326.48	47.34	140.63	63.17
36)	0.476	8.04	6.93	77.18	329.92	329.92	47.63	140.92	63.74
37)	0.500	8.44	6.96	76.91	334.88	334.88	48.13	141.42	64.51
38)	0.523	8.84	6.99	76.70	338.75	338.75	48.48	141.76	65.06
39)	0.548	9.25	7.02	76.49	344.13	344.13	49.02	142.30	65.80
40)	0.571	9.64	7.05	76.15	347.36	347.36	49.27	142.54	66.39
41)	0.595	10.06	7.08	75.87	351.45	351.45	49.62	142.89	67.02
42)	0.625	10.55	7.12	75.60	355.33	355.33	49.89	143.16	67.56
43)	0.654	11.05	7.16	75.32	358.34	358.34	50.04	143.30	67.98
44)	0.684	11.55	7.20	75.11	362.43	362.43	50.32	143.58	68.46
45)	0.714	12.05	7.24	74.98	365.45	365.45	50.45	143.71	68.73
46)	0.743	12.55	7.28	74.70	369.97	369.97	50.79	144.04	69.34
47)	0.773	13.06	7.33	74.49	373.41	373.41	50.96	144.21	69.71
48)	0.803	13.56	7.37	74.29	377.07	377.07	51.16	144.41	70.12
49)	0.833	14.07	7.41	74.15	380.73	380.73	51.36	144.60	70.45
50)	0.862	14.57	7.46	73.94	384.17	384.17	51.52	144.76	70.82
51)	0.892	15.07	7.50	73.74	386.33	386.33	51.51	144.75	71.01
52)	0.951	16.07	7.59	73.39	391.49	391.49	51.58	144.82	71.43
53)	0.982	16.58	7.64	73.19	393.43	393.43	51.52	144.76	71.58
54)	1.011	17.07	7.68	72.91	395.58	395.58	51.50	144.74	71.83
55)	1.041	17.58	7.73	72.84	398.81	398.81	51.60	144.84	72.00
56)	1.071	18.09	7.78	72.64	402.04	402.04	51.69	144.94	72.30
57)	1.100	18.58	7.82	72.36	404.41	404.41	51.69	144.93	72.57
58)	1.160	19.59	7.92	72.02	409.15	409.15	51.65	144.89	72.87
59)	1.189	20.09	7.97	71.81	411.08	411.08	51.57	144.81	73.00

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-4A
Boring No. : VQ-40 Test Date : 05/05/05 Tested by : S. Capps
Sample No. : 4A Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 13.89 psi

Liquid Limit : 31.65 Plastic Limit : 16.42 Specific Gravity : 2.762

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-40-4A	VQ-40-4A
WT CONTAINER + WET SOIL (gm)	1484.00	1484.20
WT CONTAINER + DRY SOIL (gm)	1358.27	1358.27
WT WATER (gm)	125.73	125.93
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	1358.27	1358.27
WATER CONTENT (%)	9.26	9.27

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	9.26	9.27
VOID RATIO	0.27	0.26
WET DENSITY (lb/ft^3)	148.03	149.93
DRY DENSITY (lb/ft^3)	135.49	137.21
DEGREE OF SATURATION (%)	93.97	99.99

Maximum Shear Stress = 25.52 (lb/in^2) at a Vertical Strain of 18.09 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-4A
Boring No. : VQ-40 Test Date : 05/05/05 Tested by : S. Capps
Sample No. : 4A Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 13.89 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 31.65 Plastic Limit : 16.42 Specific Gravity : 2.762

INITIAL
Height : 5.945 (in) Dry Density : 135.49 (lb/ft^3)
Area : 6.424 (in^2) Moisture : 9.26 %
Void Ratio: 0.27
Saturation: 93.97 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 135.49 (lb/ft^3) Total Vert. Stress : 93.89 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 9.26 % Total Hori. Stress : 93.89 (lb/in^2
Void Ratio: 0.27 Pore Pressure : 0.00 (lb/in^2)
Saturation: 93.97 % Effect.Vert. Stress: 93.89 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 93.89 (lb/in^2

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 135.49 (lb/ft^3) Total Vert. Stress : 93.89 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 9.26 % Total Hori. Stress : 93.89 (lb/in^2
Void Ratio: 0.27 Pore Pressure : 0.00 (lb/in^2)
Saturation: 93.97 % Effect.Vert. Stress: 93.89 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 93.89 (lb/in^2

END OF SATURATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 135.49 (lb/ft^3) Total Vert. Stress : 93.89 (lb/in^2
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 9.27 % Total Hori. Stress : 93.89 (lb/in^2
dVCorr : 0.000 (in^3) Void Ratio: 0.27 Pore Pressure : 0.00 (lb/in^2)
Saturation: 94.12 % Effect.Vert. Stress: 93.89 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 93.89 (lb/in^2

END OF CONSOLIDATION - B
dH : 0.025 (in) Height : 5.920 (in) Dry Density : 137.21 (lb/ft^3) Total Vert. Stress : 93.89 (lb/in^2
dV : 0.480 (in^3) Area : 6.370 (in^2) Moisture : 9.27 % Total Hori. Stress : 93.89 (lb/in^2
Void Ratio: 0.26 Pore Pressure : 80.00 (lb/in^2)
Saturation: 99.99 % Effect.Vert. Stress: 13.89 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 13.89 (lb/in^2

FAILURE DURING SHEAR
dH : 1.071 (in) Height : 4.874 (in) Dry Density : 137.21 (lb/ft^3) Total Vert. Stress : 145.58 (lb/in^
dV : 0.480 (in^3) Area : 7.777 (in^2) Moisture : 9.27 % Total Hori. Stress : 93.89 (lb/in^2
Strain : 18.09 % Void Ratio: 0.26 Pore Pressure : 72.64 (lb/in^2
Strength: 25.85 (lb/in^2) Saturation: 99.99 % Effect.Vert. Stress: 72.95 (lb/in^2
Time : 1075.13 (min) Effect.Hori. Stress: 21.25 (lb/in^2

END OF TEST
dH : 1.189 (in) Height : 4.756 (in) Dry Density : 137.21 (lb/ft^3) Total Vert. Stress : 145.46 (lb/in^
dV : 0.480 (in^3) Area : 7.972 (in^2) Moisture : 9.27 % Total Hori. Stress : 93.89 (lb/in^2
Strain : 20.09 % Void Ratio: 0.26 Pore Pressure : 71.81 (lb/in^2
Saturation: 99.99 % Effect.Vert. Stress: 73.65 (lb/in^2
Time : 1196.90 (min) Effect.Hori. Stress: 22.08 (lb/in^2

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-4B
Boring No. : VQ-40 Test Date : 05/05/05 Tested by : S. Capps
Sample No. : 4B Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	107.78	107.78	0.00	0.00	27.78	27.78	1.00	27.78	0.00
2)	0.22	126.68	107.78	7.53	0.40	39.14	20.24	1.93	29.69	9.45
3)	0.42	132.04	107.78	10.16	0.42	41.87	17.62	2.38	29.74	12.13
4)	0.61	135.91	107.78	11.72	0.42	44.18	16.06	2.75	30.12	14.06
5)	0.81	138.54	107.78	12.50	0.41	46.03	15.28	3.01	30.65	15.38
6)	1.02	140.18	107.78	13.00	0.40	47.18	14.78	3.19	30.98	16.20
7)	1.22	141.82	107.78	13.14	0.39	48.67	14.64	3.33	31.66	17.02
8)	1.42	143.45	107.78	13.49	0.38	49.95	14.28	3.50	32.12	17.83
9)	1.63	144.83	107.78	13.56	0.37	51.26	14.21	3.61	32.74	18.52
10)	1.83	145.96	107.78	13.56	0.36	52.39	14.21	3.69	33.30	19.09
11)	2.03	146.85	107.78	13.63	0.35	53.21	14.14	3.76	33.68	19.54
12)	2.23	147.73	107.78	13.49	0.34	54.23	14.28	3.80	34.26	19.98
13)	2.43	148.61	107.78	13.42	0.33	55.18	14.35	3.84	34.77	20.42
14)	2.63	149.49	107.78	13.14	0.32	56.34	14.64	3.85	35.49	20.85
15)	2.83	150.12	107.78	13.21	0.31	56.90	14.57	3.91	35.74	21.17
16)	3.04	150.98	107.78	12.93	0.30	58.05	14.85	3.91	36.45	21.60
17)	3.24	151.61	107.78	12.85	0.29	58.75	14.92	3.94	36.84	21.91
18)	3.44	152.23	107.78	12.71	0.29	59.52	15.06	3.95	37.29	22.23
19)	3.64	152.61	107.78	12.50	0.28	60.11	15.28	3.94	37.69	22.42
20)	3.84	153.23	107.78	12.43	0.27	60.80	15.35	3.96	38.07	22.73
21)	4.04	153.85	107.78	12.07	0.26	61.77	15.70	3.93	38.73	23.03
22)	4.25	154.45	107.78	12.00	0.26	62.45	15.77	3.96	39.11	23.34
23)	4.45	154.83	107.78	11.72	0.25	63.10	16.06	3.93	39.58	23.52
24)	4.66	155.20	107.78	11.72	0.25	63.47	16.06	3.95	39.76	23.71
25)	4.85	155.80	107.78	11.29	0.24	64.50	16.48	3.91	40.49	24.01
26)	5.06	156.40	107.78	11.29	0.23	65.10	16.48	3.95	40.79	24.31
27)	5.26	156.53	107.78	11.01	0.23	65.52	16.77	3.91	41.14	24.38
28)	5.46	157.13	107.78	11.01	0.22	66.11	16.77	3.94	41.44	24.67
29)	5.67	157.48	107.78	10.80	0.22	66.68	16.98	3.93	41.83	24.85
30)	5.87	158.07	107.78	10.66	0.21	67.41	17.12	3.94	42.27	25.15
31)	6.07	158.20	107.78	10.51	0.21	67.68	17.26	3.92	42.47	25.21
32)	6.48	158.90	107.78	10.23	0.20	68.67	17.55	3.91	43.11	25.56
33)	6.88	159.83	107.78	9.87	0.19	69.95	17.90	3.91	43.92	26.02
34)	7.29	160.51	107.78	9.59	0.18	70.92	18.18	3.90	44.55	26.37
35)	7.68	161.43	107.78	9.31	0.17	72.11	18.47	3.90	45.29	26.82
36)	8.10	161.86	107.78	9.02	0.17	72.84	18.75	3.88	45.79	27.04
37)	8.50	162.53	107.78	8.74	0.16	73.78	19.04	3.88	46.41	27.37
38)	8.90	162.96	107.78	8.60	0.16	74.36	19.18	3.88	46.77	27.59
39)	9.31	163.61	107.78	8.31	0.15	75.29	19.46	3.87	47.38	27.92
40)	9.71	164.03	107.78	8.10	0.14	75.92	19.67	3.86	47.80	28.12
41)	10.12	164.66	107.78	7.82	0.14	76.84	19.96	3.85	48.40	28.44
42)	10.62	165.00	107.78	7.53	0.13	77.47	20.24	3.83	48.85	28.61
43)	11.12	165.56	107.78	7.32	0.13	78.23	20.45	3.82	49.34	28.89
44)	11.63	166.10	107.78	7.11	0.12	78.99	20.67	3.82	49.83	29.16
45)	12.13	166.63	107.78	6.90	0.12	79.73	20.88	3.82	50.31	29.43
46)	12.64	167.16	107.78	6.61	0.11	80.54	21.16	3.81	50.85	29.69
47)	13.15	167.45	107.78	6.40	0.11	81.05	21.38	3.79	51.21	29.83
48)	13.66	167.95	107.78	6.12	0.10	81.83	21.66	3.78	51.74	30.08
49)	14.17	168.44	107.78	5.90	0.10	82.54	21.87	3.77	52.20	30.33
50)	14.66	168.72	107.78	5.69	0.09	83.03	22.09	3.76	52.56	30.47
51)	15.17	168.99	107.78	5.41	0.09	83.58	22.37	3.74	52.97	30.60
52)	16.18	169.50	107.78	5.05	0.08	84.44	22.72	3.72	53.58	30.86
53)	16.68	169.74	107.78	4.84	0.08	84.90	22.94	3.70	53.92	30.98
54)	17.19	169.98	107.78	4.63	0.07	85.35	23.15	3.69	54.25	31.10
55)	17.70	170.20	107.78	4.41	0.07	85.79	23.36	3.67	54.58	31.21
56)	18.20	170.63	107.78	4.20	0.07	86.42	23.58	3.67	55.00	31.42
57)	18.71	170.84	107.78	3.84	0.06	86.99	23.93	3.64	55.46	31.53
58)	19.71	171.05	107.78	3.49	0.06	87.56	24.29	3.61	55.92	31.64
59)	20.22	171.24	107.78	3.35	0.05	87.89	24.43	3.60	56.16	31.73

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-4B
Boring No. : VQ-40 Test Date : 05/05/05 Tested by : S. Capps
Sample No. : 4B Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	6.29	80.00	0.00	0.00	0.00	107.78	27.78
2)	0.013	0.22	6.30	87.54	122.97	122.97	19.52	126.68	39.14
3)	0.024	0.42	6.31	90.16	158.17	158.17	25.06	132.04	41.87
4)	0.036	0.61	6.33	91.72	183.77	183.77	29.05	135.91	44.18
5)	0.048	0.81	6.34	92.50	201.37	201.37	31.77	138.54	46.03
6)	0.060	1.02	6.35	93.00	212.57	212.57	33.47	140.18	47.18
7)	0.072	1.22	6.36	93.14	223.77	223.77	35.16	141.82	48.67
8)	0.083	1.42	6.38	93.50	234.97	234.97	36.85	143.45	49.95
9)	0.096	1.63	6.39	93.57	244.57	244.57	38.27	144.83	51.26
10)	0.107	1.83	6.40	93.57	252.57	252.57	39.44	145.96	52.39
11)	0.119	2.03	6.42	93.64	258.97	258.97	40.36	146.85	53.21
12)	0.131	2.23	6.43	93.50	265.37	265.37	41.27	147.73	54.23
13)	0.143	2.43	6.44	93.43	271.77	271.77	42.18	148.61	55.18
14)	0.155	2.63	6.46	93.14	278.17	278.17	43.08	149.49	56.34
15)	0.167	2.83	6.47	93.21	282.97	282.97	43.74	150.12	56.90
16)	0.179	3.04	6.48	92.93	289.37	289.37	44.63	150.98	58.05
17)	0.191	3.24	6.50	92.86	294.17	294.17	45.28	151.61	58.75
18)	0.203	3.44	6.51	92.72	298.97	298.97	45.92	152.23	59.52
19)	0.214	3.64	6.52	92.50	302.17	302.17	46.31	152.61	60.11
20)	0.226	3.84	6.54	92.43	306.97	306.97	46.95	153.23	60.80
21)	0.238	4.04	6.55	92.08	311.77	311.77	47.59	153.85	61.77
22)	0.250	4.25	6.57	92.01	316.57	316.57	48.21	154.45	62.45
23)	0.262	4.45	6.58	91.72	319.77	319.77	48.60	154.83	63.10
24)	0.274	4.66	6.59	91.72	322.97	322.97	48.98	155.20	63.47
25)	0.285	4.85	6.61	91.30	327.77	327.77	49.61	155.80	64.50
26)	0.298	5.06	6.62	91.30	332.57	332.57	50.22	156.40	65.10
27)	0.309	5.26	6.64	91.01	334.17	334.17	50.36	156.53	65.52
28)	0.321	5.46	6.65	91.01	338.97	338.97	50.97	157.13	66.11
29)	0.333	5.67	6.66	90.80	342.17	342.17	51.34	157.48	66.68
30)	0.345	5.87	6.68	90.66	346.97	346.97	51.95	158.07	67.41
31)	0.357	6.07	6.69	90.52	348.57	348.57	52.08	158.20	67.68
32)	0.381	6.48	6.72	90.23	354.97	354.97	52.81	158.90	68.67
33)	0.405	6.88	6.75	89.88	362.97	362.97	53.76	159.83	69.95
34)	0.429	7.29	6.78	89.60	369.37	369.37	54.47	160.51	70.92
35)	0.452	7.68	6.81	89.31	377.37	377.37	55.42	161.43	72.11
36)	0.476	8.10	6.84	89.03	382.17	382.17	55.87	161.86	72.84
37)	0.500	8.50	6.87	88.74	388.57	388.57	56.55	162.53	73.78
38)	0.523	8.90	6.90	88.60	393.37	393.37	57.00	162.96	74.36
39)	0.547	9.31	6.93	88.32	399.77	399.77	57.67	163.61	75.29
40)	0.571	9.71	6.96	88.11	404.57	404.57	58.10	164.03	75.92
41)	0.595	10.12	6.99	87.82	410.97	410.97	58.75	164.66	76.84
42)	0.625	10.62	7.03	87.54	415.77	415.77	59.11	165.00	77.47
43)	0.654	11.12	7.07	87.33	422.17	422.17	59.68	165.56	78.23
44)	0.684	11.63	7.11	87.11	428.57	428.57	60.24	166.10	78.99
45)	0.714	12.13	7.15	86.90	434.97	434.97	60.79	166.63	79.73
46)	0.743	12.64	7.20	86.62	441.37	441.37	61.33	167.16	80.54
47)	0.773	13.15	7.24	86.40	446.17	446.17	61.64	167.45	81.05
48)	0.803	13.66	7.28	86.12	452.57	452.57	62.15	167.95	81.83
49)	0.833	14.17	7.32	85.91	458.97	458.97	62.66	168.44	82.54
50)	0.862	14.66	7.37	85.69	463.77	463.77	62.95	168.72	83.03
51)	0.892	15.17	7.41	85.41	468.57	468.57	63.23	168.99	83.58
52)	0.951	16.18	7.50	85.06	478.17	478.17	63.76	169.50	84.44
53)	0.981	16.68	7.55	84.84	482.97	482.97	64.01	169.74	84.90
54)	1.011	17.19	7.59	84.63	487.77	487.77	64.25	169.98	85.35
55)	1.041	17.70	7.64	84.42	492.57	492.57	64.48	170.20	85.79
56)	1.071	18.20	7.69	84.20	498.97	498.97	64.92	170.63	86.42
57)	1.100	18.71	7.73	83.85	503.77	503.77	65.14	170.84	86.99
58)	1.159	19.71	7.83	83.49	511.77	511.77	65.36	171.05	87.56
59)	1.189	20.22	7.88	83.35	516.57	516.57	65.55	171.24	87.89

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-4B
Boring No. : VQ-40 Test Date : 05/05/05 Tested by : S. Capps
Sample No. : 4B Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Liquid Limit : 0 Plastic Limit : 0 Specific Gravity : 2.78

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-40-4B	VQ-40-4B
WT CONTAINER + WET SOIL (gm)	1452.80	1441.57
WT CONTAINER + DRY SOIL (gm)	1305.65	1305.65
WT WATER (gm)	147.15	135.92
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	1305.65	1305.65
WATER CONTENT (%)	11.27	10.41

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	11.27	10.41
VOID RATIO	0.33	0.29
WET DENSITY (lb/ft^3)	144.91	148.54
DRY DENSITY (lb/ft^3)	130.24	134.53
DEGREE OF SATURATION (%)	94.38	99.99

Maximum Shear Stress = 31.73 (lb/in^2) at a Vertical Strain of 20.22 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-4B
Boring No. : VQ-40 Test Date : 05/05/05 Tested by : S. Capps
Sample No. : 4B Depth : 10.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 0 Plastic Limit : 0 Specific Gravity : 2.78

INITIAL
Height : 5.945 (in) Dry Density : 130.24 (lb/ft^3)
Area : 6.424 (in^2) Moisture : 11.27 %
Void Ratio: 0.33
Saturation: 94.38 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 130.24 (lb/ft^3) Total Vert. Stress : 107.78 (lb/in^
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 11.27 % Total Hori. Stress : 107.78 (lb/in^
Void Ratio: 0.33 Pore Pressure : 0.00 (lb/in^2)
Saturation: 94.38 % Effect.Vert. Stress: 107.78 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 107.78 (lb/in^

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 130.24 (lb/ft^3) Total Vert. Stress : 107.78 (lb/in^
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 11.27 % Total Hori. Stress : 107.78 (lb/in^
Void Ratio: 0.33 Pore Pressure : 0.00 (lb/in^2)
Saturation: 94.38 % Effect.Vert. Stress: 107.78 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 107.78 (lb/in^

END OF SATURATION
dH : 0.000 (in) Height : 5.945 (in) Dry Density : 130.24 (lb/ft^3) Total Vert. Stress : 107.78 (lb/in^
dV : 0.000 (in^3) Area : 6.424 (in^2) Moisture : 10.41 % Total Hori. Stress : 107.78 (lb/in^
dVCorr : 0.000 (in^3) Void Ratio: 0.33 Pore Pressure : 0.00 (lb/in^2)
Saturation: 87.18 % Effect.Vert. Stress: 107.78 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 107.78 (lb/in^

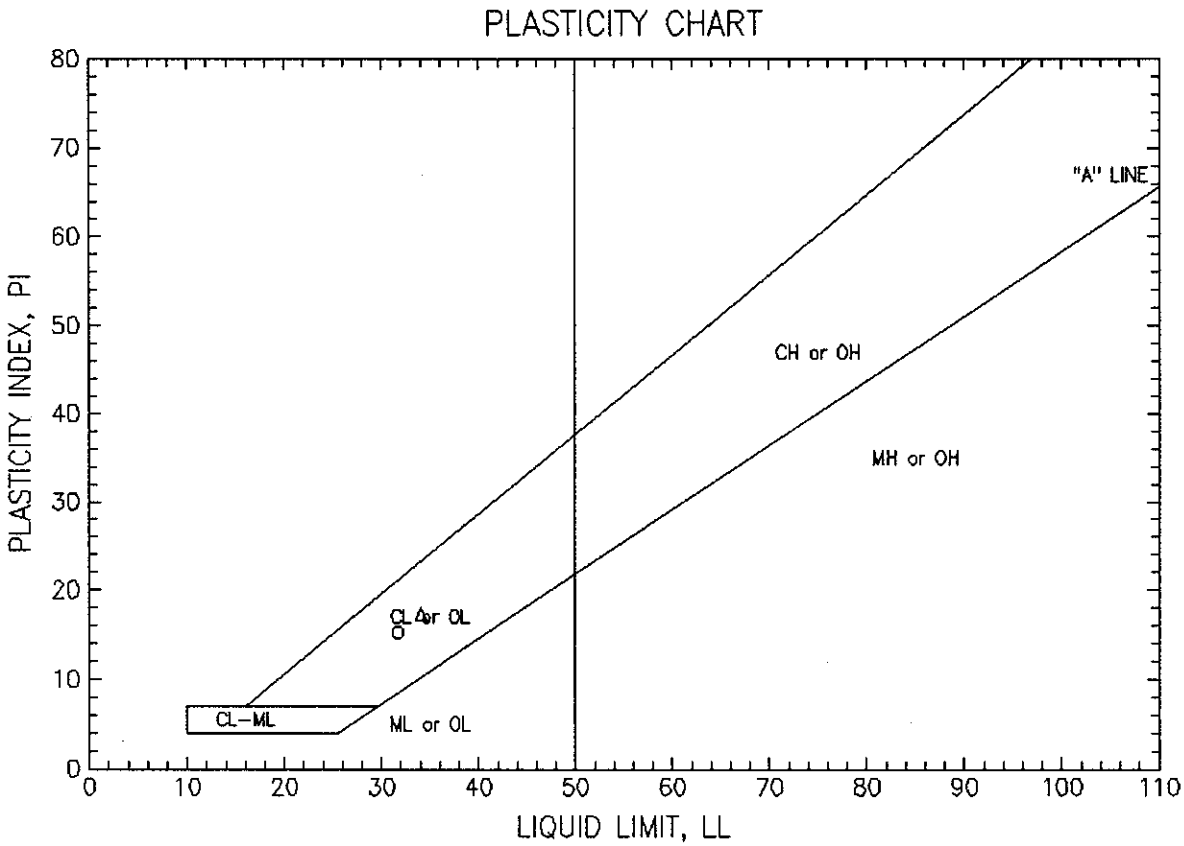
END OF CONSOLIDATION - B
dH : 0.064 (in) Height : 5.881 (in) Dry Density : 134.53 (lb/ft^3) Total Vert. Stress : 107.78 (lb/in^
dV : 1.220 (in^3) Area : 6.287 (in^2) Moisture : 10.41 % Total Hori. Stress : 107.78 (lb/in^
Void Ratio: 0.29 Pore Pressure : 80.00 (lb/in^2
Saturation: 99.99 % Effect.Vert. Stress: 27.78 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 27.78 (lb/in^2

FAILURE DURING SHEAR
dH : 1.189 (in) Height : 4.756 (in) Dry Density : 134.53 (lb/ft^3) Total Vert. Stress : 173.33 (lb/in^
dV : 1.220 (in^3) Area : 7.880 (in^2) Moisture : 10.41 % Total Hori. Stress : 107.78 (lb/in^
Strain : 20.22 % Void Ratio: 0.29 Pore Pressure : 83.35 (lb/in^2
Strength: 32.78 (lb/in^2)Saturation: 99.99 % Effect.Vert. Stress: 89.98 (lb/in^2
Time : 1196.35 (min) Effect.Hori. Stress: 24.43 (lb/in^2

END OF TEST
dH : 1.189 (in) Height : 4.756 (in) Dry Density : 134.53 (lb/ft^3) Total Vert. Stress : 173.33 (lb/in^
dV : 1.220 (in^3) Area : 7.880 (in^2) Moisture : 10.41 % Total Hori. Stress : 107.78 (lb/in^
Strain : 20.22 % Void Ratio: 0.29 Pore Pressure : 83.35 (lb/in^2
Saturation: 99.99 % Effect.Vert. Stress: 89.98 (lb/in^2
Time : 1196.35 (min) Effect.Hori. Stress: 24.43 (lb/in^2

URS

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Location : Piedmont, CA
Date : Wed May 11 2005

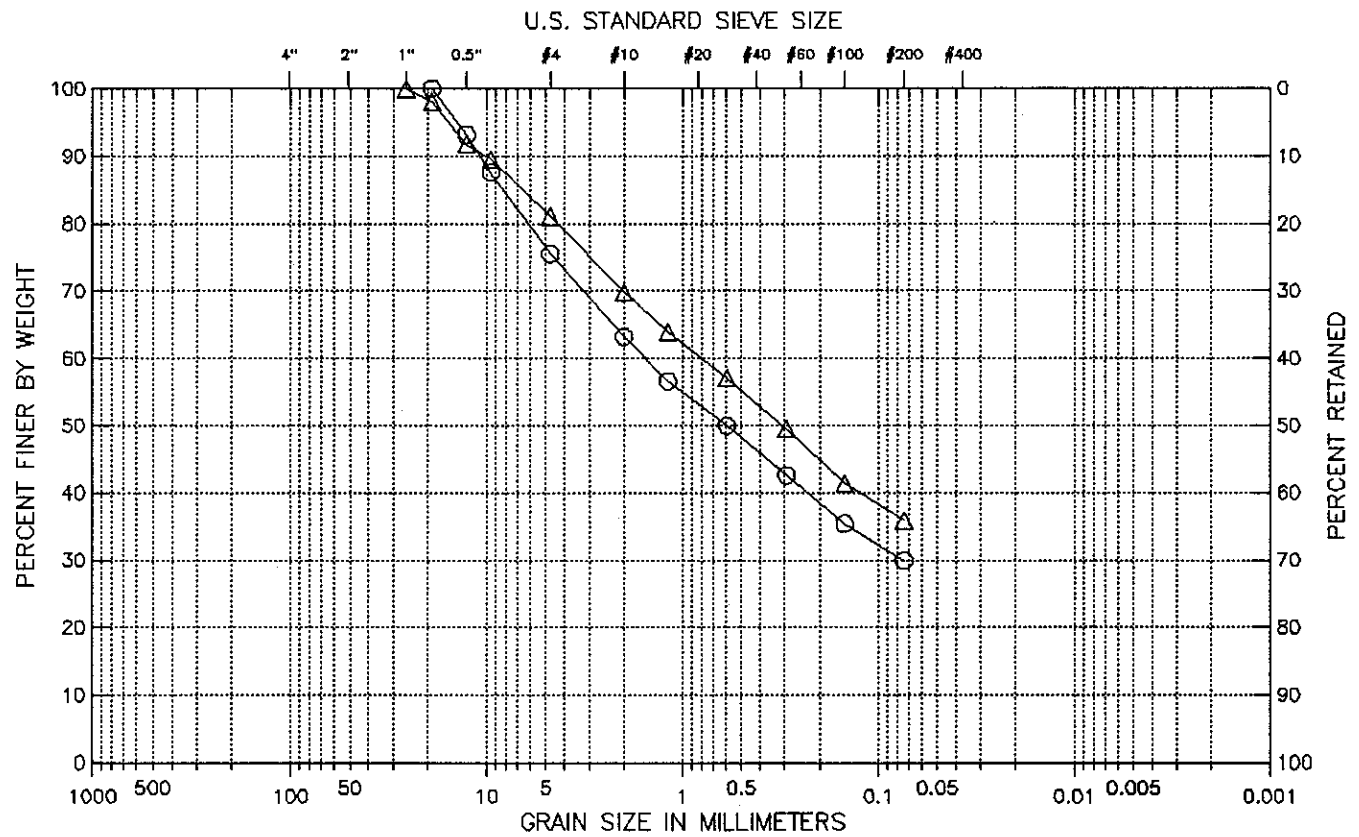


Symbol	Boring No.	Sample No.	Liquid Limit	Plastic Limit	Plasticity Index
O	VQ-40	4A	31.65	16.42	15.22
Δ	VQ-40	4B	34.09	16.76	17.33

Figure 1

URS

Project : Estates Dam Seismic Study
Project No.: 26814957.H0000
Location: Piedmont, CA
Date : Wed May 11 2005



Symbol	Boring No.	Sample No.	Depth	Filename	Classification	/ Description
-⊖-	VQ-40	4A	10.0 feet	VQ40-04A	SC	Clayey sand with gravel
-△-	VQ-40	4B	10.0 feet	VQ40-04B	SC	Clayey sand with gravel

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 4A
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 10.0 feet

Depth : 10.0 feet
Test Date : 05/10/2005
Test Method : ASTM D422/4318

Filename : VQ40-04A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	52.46	52.46	93
0.375"	0.374	9.51	42.90	95.36	88
#4	0.187	4.75	93.35	188.71	75
#10	0.079	2.00	94.79	283.50	63
#16	0.047	1.19	50.80	334.30	57
#30	0.023	0.60	51.20	385.50	50
#50	0.012	0.30	56.80	442.30	43
#100	0.006	0.15	54.90	497.20	35
#200	0.003	0.07	42.00	539.20	30

Total Dry Weight of Sample = 770.1

D85 : 8.1863 mm
D60 : 1.5563 mm
D50 : 0.5986 mm
D30 : 0.0742 mm
D15 : N/A
D10 : N/A

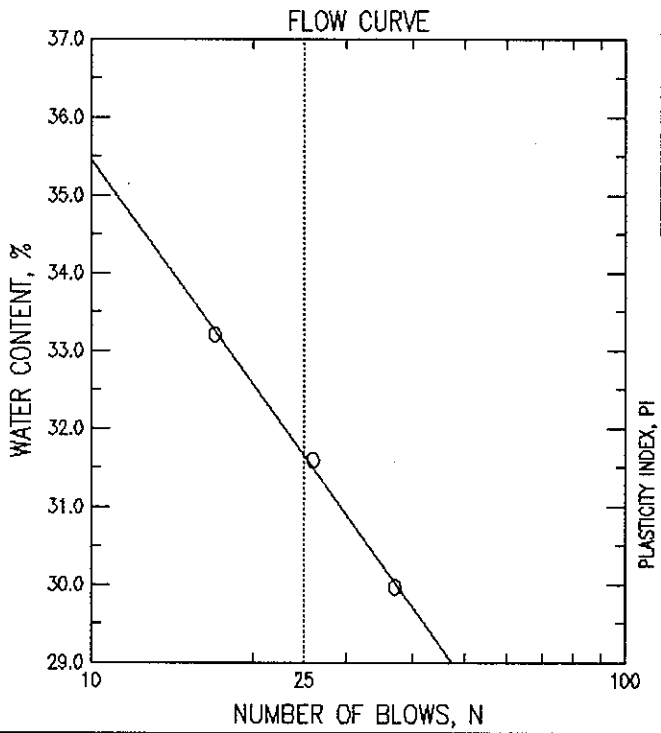
Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand with gravel
AASHTO Group Symbol : A-2-6(2)
AASHTO Group Name : Clayey Gravel and Sand

URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-40
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	4A
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown clayey sand (SC) with gravel		Wed May 11 2005	VQ40-04A

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	76	87	85		
WT. WET SOIL + TARE	27.66	27.99	27.88		
WT. DRY SOIL + TARE	23.84	23.88	23.61		
WT. WATER	3.82	4.11	4.27		
TARE WT.	11.09	10.87	10.75		
WT. DRY SOIL	12.75	13.01	12.86		
WATER CONTENT, W_N (%)	29.96	31.59	33.20		
NUMBER OF BLOWS, N	37	26	17		
ONE-POINT LIQUID LIMIT, LL	31.42	31.74	31.69		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	40				
WT. WET SOIL + TARE	33.96				
WT. DRY SOIL + TARE	30.68				
WT. WATER	3.28				
TARE WT.	10.71				
WT. DRY SOIL	19.97				
WATER CONTENT (%)	16.42				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	12.0
LIQUID LIMIT, LL	31.6
PLASTIC LIMIT, PL	16.4
PLASTICITY INDEX, PI	15.2
LIQUIDITY INDEX, LI*	-0.29

*LI = (W - PL)/PI

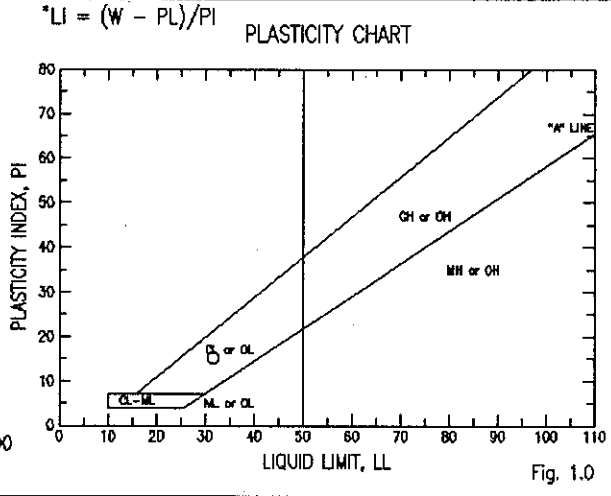


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 4A
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 10.0 feet

Depth : 10.0 feet
Test Date : 05/10/2005
Test Method : ASTM D422/4318

Filename : VQ40-04A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ40-4A	0.00	1484.00	1324.47	12.04

Average Moisture Content = 12.04

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 40	10.71	33.96	30.68	16.42

Plastic Limit = 16.42

Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 76	11.09	27.66	23.84	37	29.96
2) 87	10.87	27.99	23.88	26	31.59
3) 85	10.75	27.88	23.61	17	33.20

Liquid Limit = 31.65
Plastic Index = 15.22

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 4B
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 10.0 feet

Depth : 10.0 feet
Test Date : 05/10/2005
Test Method : ASTM D422/4318

Filename : VQ40-04B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	14.46	14.46	98
0.5"	0.500	12.70	50.02	64.48	92
0.375"	0.374	9.51	17.01	81.49	90
#4	0.187	4.75	66.27	147.76	81
#10	0.079	2.00	87.64	235.40	70
#16	0.047	1.19	46.40	281.80	64
#30	0.023	0.60	53.40	335.20	57
#50	0.012	0.30	59.30	394.50	50
#100	0.006	0.15	63.40	457.90	41
#200	0.003	0.07	43.00	500.90	36

Total Dry Weight of Sample = 781.4

D85 : 6.5415 mm
D60 : 0.7983 mm
D50 : 0.3086 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand with gravel
AASHTO Group Symbol : A-6(3)
AASHTO Group Name : Clayey Soils

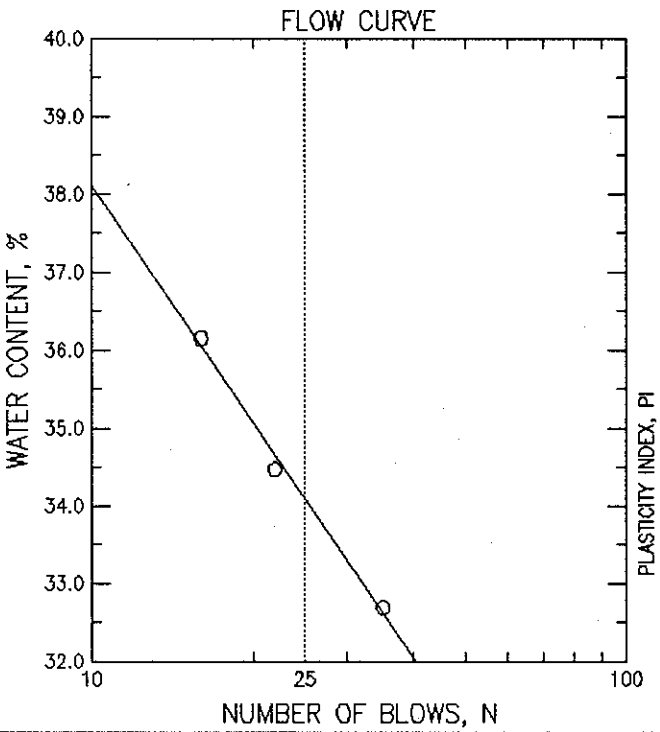
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-40
LOCATION Piedmont, CA		CHECKED BY S. Capps	SAMPLE NUMBER 4B
SAMPLE DESCRIPTION Grayish brown clayey sand (SC) with gravel		DATE Wed May 11 2005	FILENAME VQ40-04B

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	88	47	31		
WT. WET SOIL + TARE	27.51	26.83	26.67		
WT. DRY SOIL + TARE	23.48	22.79	22.69		
WT. WATER	4.03	4.04	3.98		
TARE WT.	11.15	11.07	11.68		
WT. DRY SOIL	12.33	11.72	11.01		
WATER CONTENT, W_N (%)	32.68	34.47	36.15		
NUMBER OF BLOWS, N	35	22	16		
ONE-POINT LIQUID LIMIT, LL	34.04	33.94	34.25		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	39				
WT. WET SOIL + TARE	43.08				
WT. DRY SOIL + TARE	38.57				
WT. WATER	4.51				
TARE WT.	11.66				
WT. DRY SOIL	26.91				
WATER CONTENT (%)	16.76				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	14.0
LIQUID LIMIT, LL	34.1
PLASTIC LIMIT, PL	16.8
PLASTICITY INDEX, PI	17.3
LIQUIDITY INDEX, LI*	-0.16

*LI = (W - PL)/PI

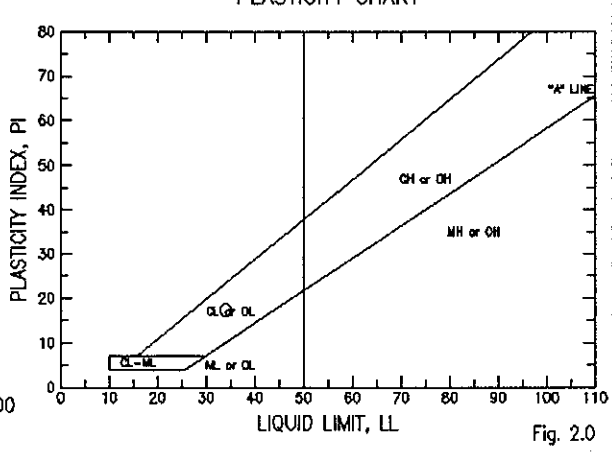


Fig. 2.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 4B
Location : Piedmont, CA
Depth : 10.0 feet
Test Date : 05/10/2005
Test Method : ASTM D422/4318
Filename : VQ40-04B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 10.0 feet

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ40-4B	0.00	1452.80	1274.86	13.96

Average Moisture Content = 13.96

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	39	11.66	43.08	38.57	16.76

Plastic Limit = 16.76

Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	88	11.15	27.51	23.48	35	32.68
2)	47	11.07	26.83	22.79	22	34.47
3)	31	11.68	26.67	22.69	16	36.15

Liquid Limit = 34.09
Plastic Index = 17.33

URS

Project Name: Estates Dam Seismic Study

Project Number: 26814957.H0000

Location: Piedmont, CA Date: 5/11/2005

Test Method: ASTM D854 Specific Gravity of Soils

Sample Number: VQ-40-4A & 4B Depth, ft: 10.0

Bottle Number: 3

Description: Grayish brown clayey sand (SC) with gravel

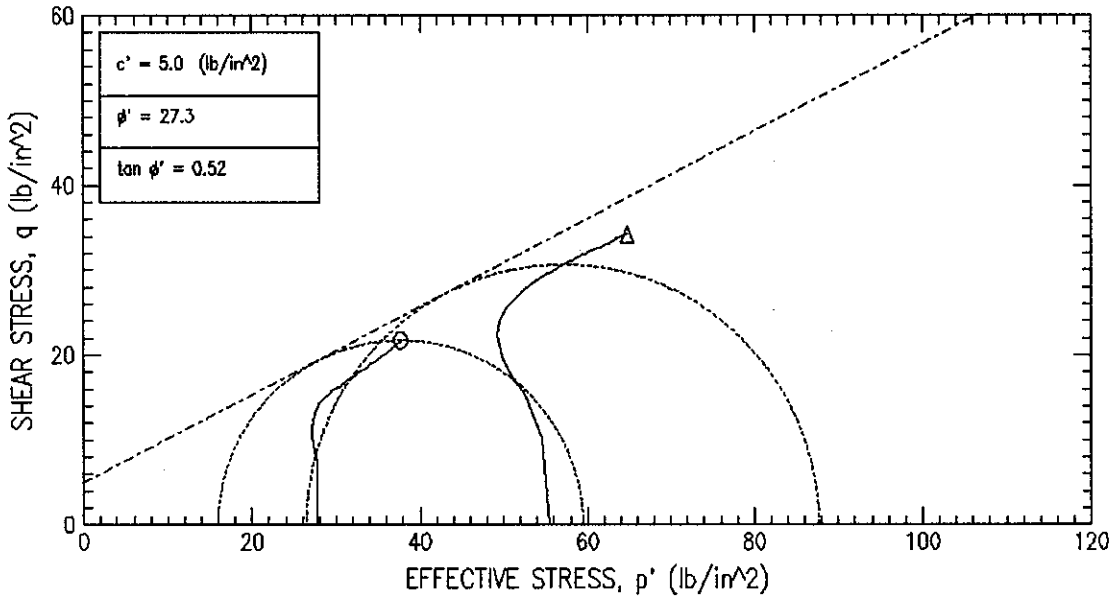
Determination Number	pycnometer + soil + water gms	pycnometer + water gms	temperature F	Specific Gravity
1	735.8	667.80	72.0	2.759
2	736.2	668.12	66.0	2.766
3	736.5	668.5	59.0	2.762

Average Specific Gravity 2.762

Oven dried soil + tare, gms	364.8
tare, gms	258.28
Oven dried soil	106.53

URS

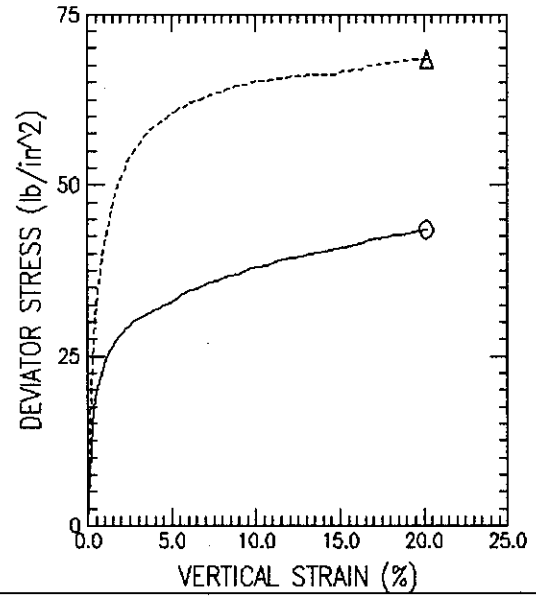
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-40-9A

VQ-40-9B



SYMBOL		○	△			
TEST NO.		VQ-40-9A	VQ-40-9B			
INITIAL	WATER CONTENT (%)	16.31	12.89			
	DRY DENSITY (lb/ft^3)	114.49	121.22			
	SATURATION (%)	95.80	92.13			
	VOID RATIO	0.454	0.373			
BEFORE SHEAR	WATER CONTENT (%)	15.44	11.67			
	DRY DENSITY (lb/ft^3)	117.91	126.95			
	SATURATION (%)	100.00	100.00			
	VOID RATIO	0.412	0.311			
	BACK PRESS. (lb/in^2)	70.00	70.00			
MINOR PRIN. STRESS (lb/in^2)		27.78	55.55			
MAX. DEV. STRESS (lb/in^2)		44.78	71.71			
TIME TO FAILURE (min)		1489.23	1484.97			
RATE OF STRAIN INCR (%/min)		0.00	0.00			
INITIAL DIAMETER (in)		3.85	3.85			
INITIAL HEIGHT (in)		7.99	7.99			
B-VALUE		98.70	98.50			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown clayey sand (SC) with gravel

2) Grayish brown clayey sand (SC) with gravel

LL	PL	PI	GS
27.99	18.33	9.66	2.67

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 27.78 psi

2) TXCIU Test with Effective Pressure of 55.55 psi

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

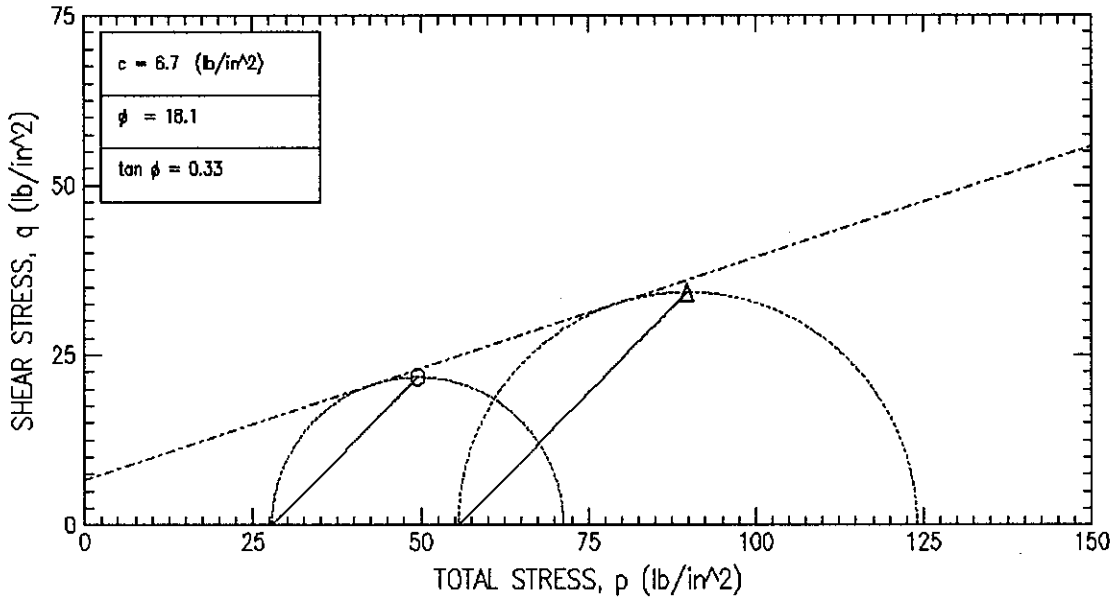
BORING NO. VQ-40	SAMPLE NO.	9A	9B		
TECH. S. Capps	DEPTH/ELEV	29.5 feet	29.5 feet		
LABORATORY	DATE	06/09/05	06/06/05		

TRIAXIAL COMPRESSION TEST REPORT

Tue 06-14-05, 14:22:51

URS

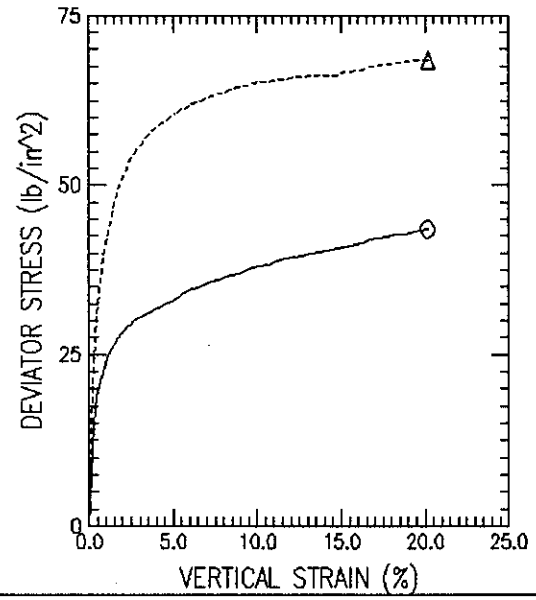
Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-40-9A

VQ-40-9B



SYMBOL		○	△		
TEST NO.		VQ-40-9A	VQ-40-9B		
INITIAL	WATER CONTENT (%)	16.31	12.89		
	DRY DENSITY (lb/ft^3)	114.49	121.22		
	SATURATION (%)	95.80	92.13		
	VOID RATIO	0.454	0.373		
BEFORE SHEAR	WATER CONTENT (%)	15.44	11.67		
	DRY DENSITY (lb/ft^3)	117.91	126.95		
	SATURATION (%)	100.00	100.00		
	VOID RATIO	0.412	0.311		
	BACK PRESS. (lb/in^2)	70.00	70.00		
MINOR PRIN. STRESS (lb/in^2)		27.78	55.55		
MAX. DEV. STRESS (lb/in^2)		44.78	71.71		
TIME TO FAILURE (min)		1489.23	1484.97		
RATE OF STRAIN INCR (%/min)		0.00	0.00		
INITIAL DIAMETER (in)		3.85	3.85		
INITIAL HEIGHT (in)		7.99	7.99		
B-VALUE		98.70	98.50		

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Grayish brown clayey sand (SC) with gravel

2) Grayish brown clayey sand (SC) with gravel

LL	PL	PI	GS
27.99	18.33	9.66	2.67

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

REMARKS:

1) TXCIU Test with Effective Pressure of 27.78 psi

2) TXCIU Test with Effective Pressure of 55.55 psi

PROJECT Estates Dam Seismic Study

PROJECT NO.26814957

BORING NO. VQ-40	SAMPLE NO.	9A	9B	
TECH. S. Capps	DEPTH/ELEV	29.5 feet	29.5 feet	
LABORATORY	DATE	06/09/05	06/06/05	

TRIAXIAL COMPRESSION TEST REPORT

Tue 06-14-05, 14:21:56

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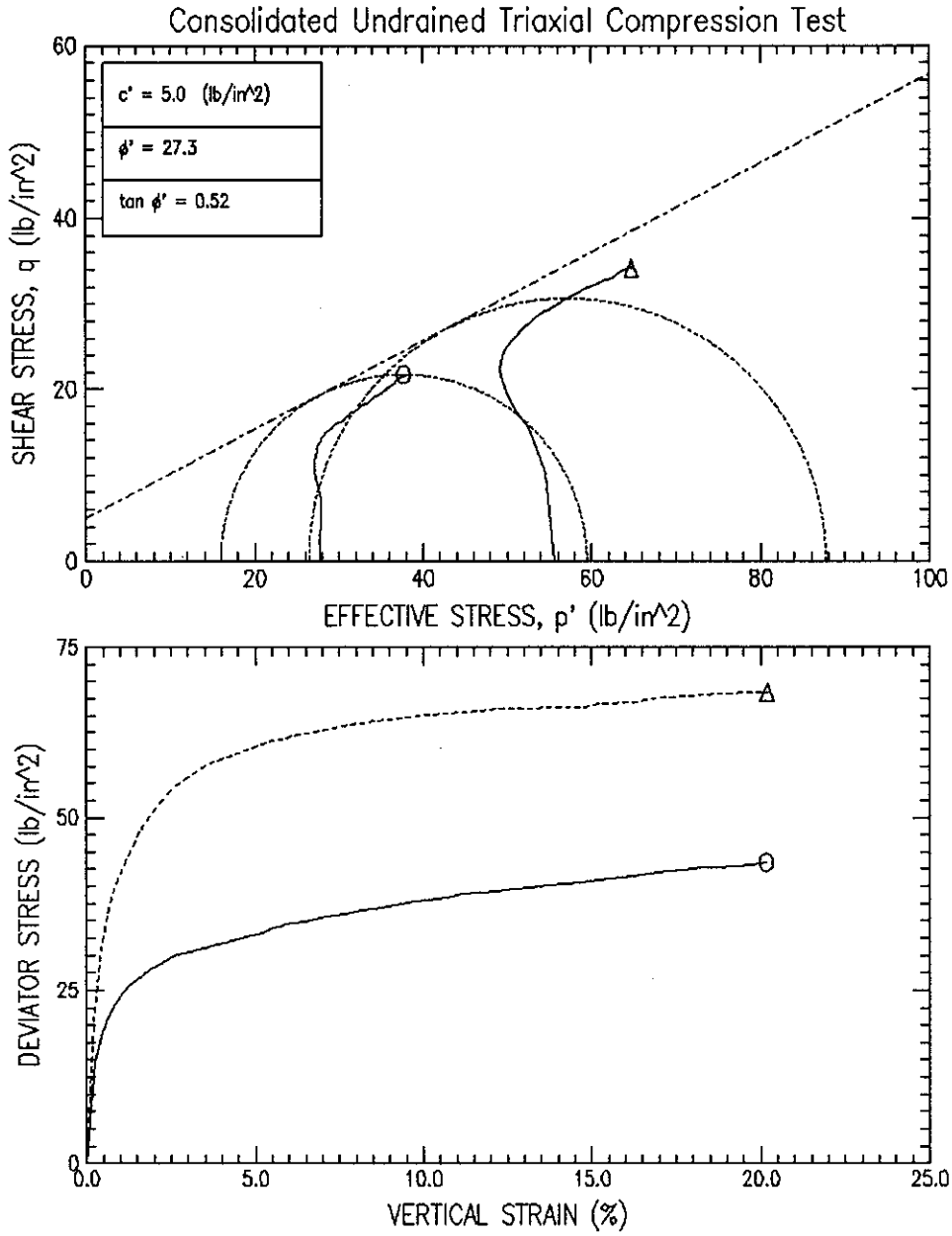

Project Name : Estates Dam Seismic Study					
Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-40	9A	29.5 feet	VQ-40-9A	VQ40-09A.CIU	O
VQ-40	9B	29.5 feet	VQ-40-9B	VQ40-09B.CIU	Δ

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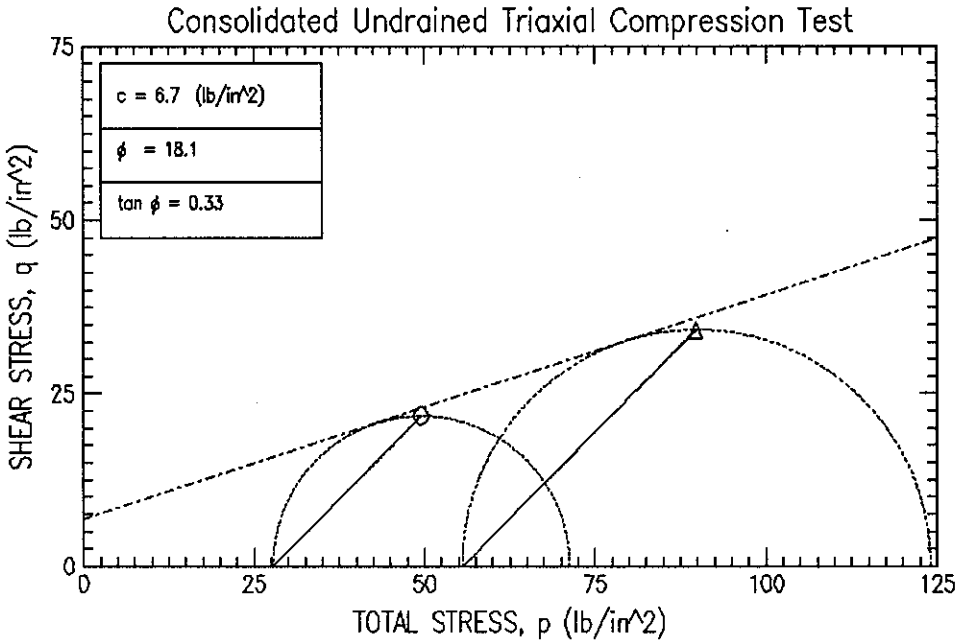

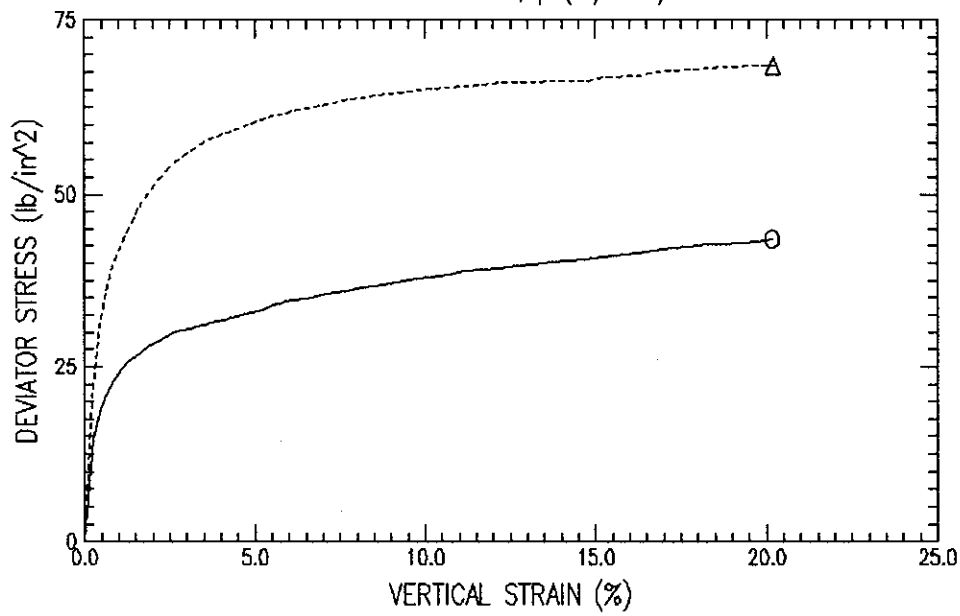

Project Name : Estates Dam Seismic Study

Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-40	9A	29.5 feet	VQ-40-9A	VQ40-09A.CIU	○
VQ-40	9B	29.5 feet	VQ-40-9B	VQ40-09B.CIU	△

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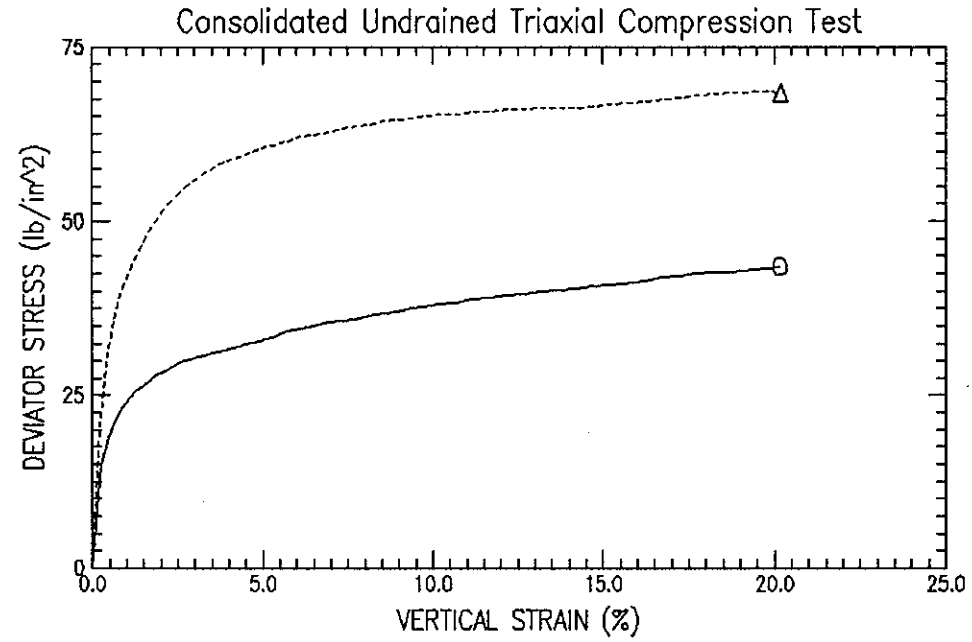
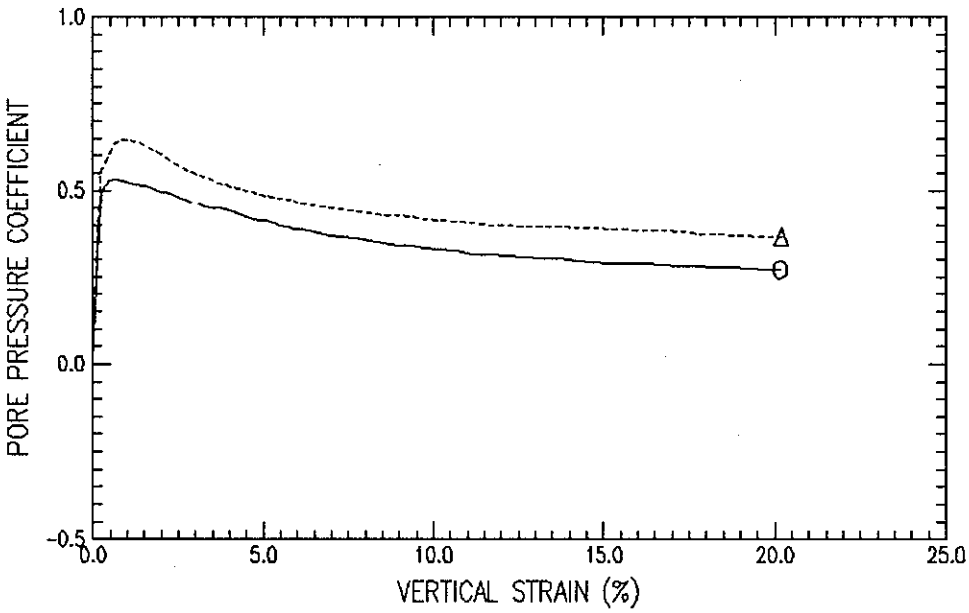




Project Name : Estates Dam Seismic Study

Boring No:	Sample No	Depth	Test No	Filename	Symbol
VQ-40	9A	29.5 feet	VQ-40-9A	VQ40-09A.CIU	O
VQ-40	9B	29.5 feet	VQ-40-9B	VQ40-09B.CIU	Δ

URS

Tue Jun 14 14:14:28 2005

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-9A
Boring No. : VQ-40 Test Date : 06/09/05 Tested by : S. Capps
Sample No. : 9A Depth : 29.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : None

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	97.78	97.78	0.00	0.00	27.78	27.78	1.00	27.78	0.00
2)	0.27	112.55	97.78	7.38	0.50	35.17	20.40	1.72	27.79	7.39
3)	0.47	116.69	97.78	9.98	0.53	36.71	17.80	2.06	27.25	9.46
4)	0.67	119.02	97.78	11.28	0.53	37.74	16.50	2.29	27.12	10.62
5)	0.87	120.83	97.78	12.20	0.53	38.63	15.58	2.48	27.10	11.52
6)	1.07	122.38	97.78	12.81	0.52	39.57	14.97	2.64	27.27	12.30
7)	1.27	123.41	97.78	13.19	0.51	40.22	14.58	2.76	27.40	12.82
8)	1.48	124.19	97.78	13.58	0.51	40.61	14.20	2.86	27.41	13.20
9)	1.68	124.97	97.78	13.81	0.51	41.16	13.97	2.95	27.56	13.59
10)	1.88	125.74	97.78	13.96	0.50	41.78	13.82	3.02	27.80	13.98
11)	2.08	126.26	97.78	14.11	0.50	42.14	13.67	3.08	27.90	14.24
12)	2.28	126.78	97.78	14.19	0.49	42.58	13.59	3.13	28.09	14.50
13)	2.48	127.29	97.78	14.19	0.48	43.10	13.59	3.17	28.35	14.76
14)	2.69	127.81	97.78	14.19	0.47	43.62	13.59	3.21	28.60	15.02
15)	2.89	128.07	97.78	14.11	0.47	43.95	13.67	3.22	28.81	15.14
16)	3.09	128.33	97.78	14.11	0.46	44.21	13.67	3.24	28.94	15.27
17)	3.29	128.59	97.78	14.04	0.46	44.55	13.74	3.24	29.15	15.40
18)	3.50	128.84	97.78	14.04	0.45	44.81	13.74	3.26	29.27	15.53
19)	3.70	129.10	97.78	14.11	0.45	44.99	13.67	3.29	29.33	15.66
20)	3.89	129.36	97.78	14.11	0.45	45.25	13.67	3.31	29.46	15.79
21)	4.10	129.62	97.78	13.96	0.44	45.66	13.82	3.30	29.74	15.92
22)	4.31	129.88	97.78	13.88	0.43	45.99	13.90	3.31	29.94	16.05
23)	4.50	130.14	97.78	13.73	0.42	46.41	14.05	3.30	30.23	16.18
24)	4.70	130.40	97.78	13.65	0.42	46.74	14.12	3.31	30.43	16.31
25)	4.91	130.65	97.78	13.58	0.41	47.08	14.20	3.31	30.64	16.44
26)	5.10	130.91	97.78	13.65	0.41	47.26	14.12	3.35	30.69	16.57
27)	5.31	131.17	97.78	13.58	0.41	47.59	14.20	3.35	30.90	16.70
28)	5.51	131.69	97.78	13.50	0.40	48.19	14.28	3.37	31.23	16.95
29)	5.71	131.95	97.78	13.50	0.40	48.45	14.28	3.39	31.36	17.08
30)	5.92	132.21	97.78	13.42	0.39	48.78	14.35	3.40	31.57	17.21
31)	6.13	132.47	97.78	13.42	0.39	49.04	14.35	3.42	31.70	17.34
32)	6.52	132.72	97.78	13.27	0.38	49.45	14.51	3.41	31.98	17.47
33)	6.93	133.24	97.78	13.12	0.37	50.12	14.66	3.42	32.39	17.73
34)	7.33	133.50	97.78	13.12	0.37	50.38	14.66	3.44	32.52	17.86
35)	7.73	133.76	97.78	13.04	0.36	50.72	14.74	3.44	32.73	17.99
36)	8.14	134.28	97.78	12.96	0.36	51.31	14.81	3.46	33.06	18.25
37)	8.54	134.53	97.78	12.74	0.35	51.80	15.04	3.44	33.42	18.38
38)	8.95	134.79	97.78	12.66	0.34	52.13	15.12	3.45	33.63	18.51
39)	9.35	135.31	97.78	12.74	0.34	52.57	15.04	3.49	33.81	18.76
40)	9.76	135.57	97.78	12.66	0.33	52.91	15.12	3.50	34.01	18.89
41)	10.16	135.83	97.78	12.58	0.33	53.24	15.20	3.50	34.22	19.02
42)	10.67	136.09	97.78	12.43	0.32	53.65	15.35	3.50	34.50	19.15
43)	11.17	136.60	97.78	12.28	0.32	54.33	15.50	3.50	34.91	19.41
44)	11.67	136.86	97.78	12.28	0.31	54.58	15.50	3.52	35.04	19.54
45)	12.18	137.12	97.78	12.20	0.31	54.92	15.58	3.53	35.25	19.67
46)	12.68	137.38	97.78	12.20	0.31	55.18	15.58	3.54	35.38	19.80
47)	13.19	137.64	97.78	12.05	0.30	55.59	15.73	3.53	35.66	19.93
48)	13.69	137.90	97.78	12.12	0.30	55.77	15.66	3.56	35.71	20.06
49)	14.20	138.15	97.78	12.05	0.30	56.11	15.73	3.57	35.92	20.19
50)	14.70	138.41	97.78	11.97	0.29	56.44	15.81	3.57	36.12	20.32
51)	15.21	138.67	97.78	11.89	0.29	56.78	15.89	3.57	36.33	20.45
52)	16.22	139.19	97.78	11.97	0.29	57.22	15.81	3.62	36.51	20.70
53)	16.72	139.71	97.78	12.05	0.29	57.66	15.73	3.67	36.69	20.96
54)	17.23	139.96	97.78	11.97	0.28	57.99	15.81	3.67	36.90	21.09
55)	17.73	140.22	97.78	11.89	0.28	58.33	15.89	3.67	37.11	21.22
56)	18.24	140.48	97.78	11.89	0.28	58.59	15.89	3.69	37.24	21.35
57)	18.74	140.48	97.78	11.82	0.28	58.66	15.96	3.68	37.31	21.35
58)	19.75	141.00	97.78	11.66	0.27	59.33	16.11	3.68	37.72	21.61
59)	20.15	141.26	97.78	11.82	0.27	59.44	15.96	3.72	37.70	21.74

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-9A
Boring No. : VQ-40 Test Date : 06/09/05 Tested by : S. Capps
Sample No. : 9A Depth : 29.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : None

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.42	70.00	0.00	0.00	0.00	97.78	27.78
2)	0.021	0.27	11.42	77.38	173.67	173.67	15.21	112.55	35.17
3)	0.037	0.47	11.42	79.98	222.32	222.32	19.48	116.69	36.71
4)	0.053	0.67	11.42	81.28	249.68	249.68	21.87	119.02	37.74
5)	0.068	0.87	11.42	82.20	270.96	270.96	23.74	120.83	38.63
6)	0.085	1.07	11.42	82.81	289.20	289.20	25.33	122.38	39.57
7)	0.100	1.27	11.42	83.20	301.36	301.36	26.40	123.41	40.22
8)	0.117	1.48	11.42	83.58	310.48	310.48	27.20	124.19	40.61
9)	0.133	1.68	11.42	83.81	319.60	319.60	28.00	124.97	41.16
10)	0.149	1.88	11.42	83.96	328.72	328.72	28.80	125.74	41.78
11)	0.165	2.08	11.42	84.11	334.80	334.80	29.33	126.26	42.14
12)	0.181	2.28	11.42	84.19	340.89	340.89	29.86	126.78	42.58
13)	0.196	2.48	11.42	84.19	346.97	346.97	30.39	127.29	43.10
14)	0.212	2.69	11.42	84.19	353.05	353.05	30.93	127.81	43.62
15)	0.229	2.89	11.42	84.11	356.09	356.09	31.19	128.07	43.95
16)	0.245	3.09	11.42	84.11	359.13	359.13	31.46	128.33	44.21
17)	0.260	3.29	11.42	84.04	362.17	362.17	31.73	128.59	44.55
18)	0.277	3.50	11.42	84.04	365.21	365.21	31.99	128.84	44.81
19)	0.293	3.70	11.42	84.11	368.25	368.25	32.26	129.10	44.99
20)	0.308	3.89	11.42	84.11	371.29	371.29	32.53	129.36	45.25
21)	0.324	4.10	11.42	83.96	374.33	374.33	32.79	129.62	45.66
22)	0.341	4.31	11.42	83.88	377.37	377.37	33.06	129.88	45.99
23)	0.357	4.50	11.42	83.73	380.41	380.41	33.32	130.14	46.41
24)	0.372	4.70	11.42	83.66	383.45	383.45	33.59	130.40	46.74
25)	0.388	4.91	11.42	83.58	386.49	386.49	33.86	130.65	47.08
26)	0.404	5.10	11.42	83.66	389.53	389.53	34.12	130.91	47.26
27)	0.420	5.31	11.42	83.58	392.57	392.57	34.39	131.17	47.59
28)	0.436	5.51	11.42	83.50	398.65	398.65	34.92	131.69	48.19
29)	0.452	5.71	11.42	83.50	401.69	401.69	35.19	131.95	48.45
30)	0.468	5.92	11.42	83.43	404.73	404.73	35.45	132.21	48.78
31)	0.485	6.13	11.42	83.43	407.77	407.77	35.72	132.47	49.04
32)	0.516	6.52	11.42	83.27	410.81	410.81	35.99	132.72	49.45
33)	0.548	6.93	11.42	83.12	416.89	416.89	36.52	133.24	50.12
34)	0.580	7.33	11.42	83.12	419.93	419.93	36.79	133.50	50.38
35)	0.612	7.73	11.42	83.04	422.97	422.97	37.05	133.76	50.72
36)	0.644	8.14	11.42	82.97	429.05	429.05	37.59	134.28	51.31
37)	0.676	8.54	11.42	82.74	432.09	432.09	37.85	134.53	51.80
38)	0.708	8.95	11.42	82.66	435.13	435.13	38.12	134.79	52.13
39)	0.740	9.35	11.42	82.74	441.21	441.21	38.65	135.31	52.57
40)	0.772	9.76	11.42	82.66	444.25	444.25	38.92	135.57	52.91
41)	0.804	10.16	11.42	82.58	447.29	447.29	39.18	135.83	53.24
42)	0.844	10.67	11.42	82.43	450.33	450.33	39.45	136.09	53.65
43)	0.884	11.17	11.42	82.28	456.41	456.41	39.98	136.60	54.33
44)	0.924	11.67	11.42	82.28	459.45	459.45	40.25	136.86	54.58
45)	0.964	12.18	11.42	82.20	462.49	462.49	40.51	137.12	54.92
46)	1.004	12.68	11.42	82.20	465.53	465.53	40.78	137.38	55.18
47)	1.044	13.19	11.42	82.05	468.57	468.57	41.05	137.64	55.59
48)	1.084	13.69	11.42	82.12	471.61	471.61	41.31	137.90	55.77
49)	1.124	14.20	11.42	82.05	474.65	474.65	41.58	138.15	56.11
50)	1.163	14.70	11.42	81.97	477.69	477.69	41.85	138.41	56.44
51)	1.204	15.21	11.42	81.89	480.73	480.73	42.11	138.67	56.78
52)	1.284	16.22	11.42	81.97	486.81	486.81	42.65	139.19	57.22
53)	1.324	16.72	11.42	82.05	492.90	492.90	43.18	139.71	57.66
54)	1.363	17.23	11.42	81.97	495.94	495.94	43.44	139.96	57.99
55)	1.403	17.73	11.42	81.89	498.98	498.98	43.71	140.22	58.33
56)	1.443	18.24	11.42	81.89	502.02	502.02	43.98	140.48	58.59
57)	1.483	18.74	11.42	81.82	502.02	502.02	43.98	140.48	58.66
58)	1.563	19.75	11.42	81.67	508.10	508.10	44.51	141.00	59.33
59)	1.595	20.15	11.42	81.82	511.14	511.14	44.78	141.26	59.44

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-9A
Boring No. : VQ-40 Test Date : 06/09/05 Tested by : S. Capps
Sample No. : 9A Depth : 29.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Liquid Limit : 27.99 Plastic Limit : 18.33 Specific Gravity : 2.668

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ40-9A	VQ40-9A
WT CONTAINER + WET SOIL (gm)	3252.00	3227.80
WT CONTAINER + DRY SOIL (gm)	2796.02	2796.02
WT WATER (gm)	455.98	431.78
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	2796.02	2796.02
WATER CONTENT (%)	16.31	15.44

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	16.31	15.44
VOID RATIO	0.45	0.41
WET DENSITY (lb/ft^3)	133.16	136.11
DRY DENSITY (lb/ft^3)	114.49	117.91
DEGREE OF SATURATION (%)	95.80	100.00

Maximum Shear Stress = 21.74 (lb/in^2) at a Vertical Strain of 20.15 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-9A
Boring No. : VQ-40 Test Date : 06/09/05 Tested by : S. Capps
Sample No. : 9A Depth : 29.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 27.78 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : None

Liquid Limit : 27.99 Plastic Limit : 18.33 Specific Gravity : 2.668

INITIAL
Height : 7.992 (in) Dry Density : 114.49 (lb/ft^3)
Area : 11.642 (in^2) Moisture : 16.31 %
Void Ratio: 0.45
Saturation: 95.80 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 114.49 (lb/ft^3) Total Vert. Stress : 97.78 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 16.31 % Total Hori. Stress : 97.78 (lb/in^2
Void Ratio: 0.45 Pore Pressure : 0.00 (lb/in^2)
Saturation: 95.80 % Effect.Vert. Stress: 97.78 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.78 (lb/in^2

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 114.49 (lb/ft^3) Total Vert. Stress : 97.78 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 16.31 % Total Hori. Stress : 97.78 (lb/in^2
Void Ratio: 0.45 Pore Pressure : 0.00 (lb/in^2)
Saturation: 95.80 % Effect.Vert. Stress: 97.78 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.78 (lb/in^2

END OF SATURATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 114.49 (lb/ft^3) Total Vert. Stress : 97.78 (lb/in^2
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 15.44 % Total Hori. Stress : 97.78 (lb/in^2
dVCorr : 0.000 (in^3) Void Ratio: 0.45 Pore Pressure : 0.00 (lb/in^2)
Saturation: 90.72 % Effect.Vert. Stress: 97.78 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 97.78 (lb/in^2

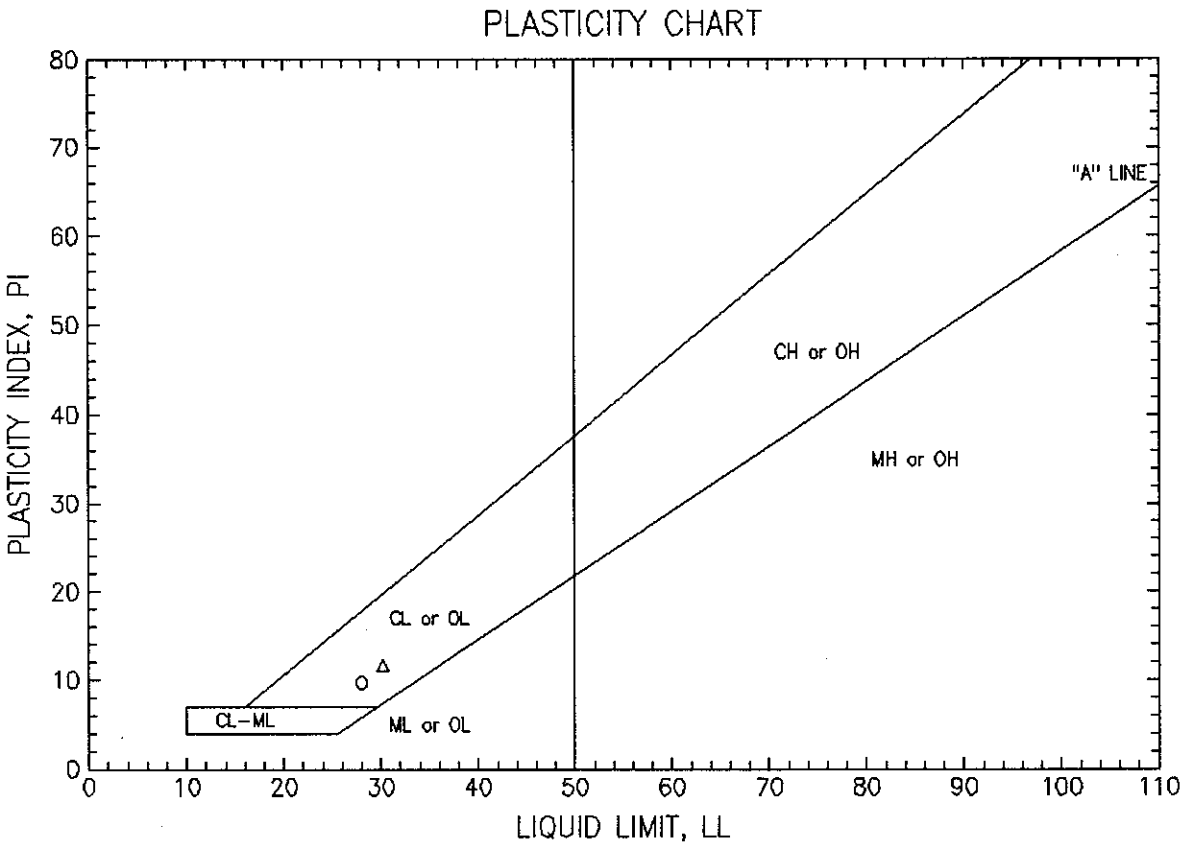
END OF CONSOLIDATION - B
dH : 0.078 (in) Height : 7.914 (in) Dry Density : 117.91 (lb/ft^3) Total Vert. Stress : 97.78 (lb/in^2
dV : 2.698 (in^3) Area : 11.415 (in^2) Moisture : 15.44 % Total Hori. Stress : 97.78 (lb/in^2
Void Ratio: 0.41 Pore Pressure : 70.00 (lb/in^2
Saturation: 100.00 % Effect.Vert. Stress: 27.78 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 27.78 (lb/in^2

FAILURE DURING SHEAR
dH : 1.595 (in) Height : 6.397 (in) Dry Density : 117.91 (lb/ft^3) Total Vert. Stress : 142.56 (lb/in^
dV : 2.698 (in^3) Area : 11.415 (in^2) Moisture : 15.44 % Total Hori. Stress : 97.78 (lb/in^2
Strain : 20.15 % Void Ratio: 0.41 Pore Pressure : 81.82 (lb/in^2
Strength: 22.39 (lb/in^2) Saturation: 100.00 % Effect.Vert. Stress: 60.74 (lb/in^2
Time : 1489.23 (min) Effect.Hori. Stress: 15.96 (lb/in^2

END OF TEST
dH : 1.595 (in) Height : 6.397 (in) Dry Density : 117.91 (lb/ft^3) Total Vert. Stress : 142.56 (lb/in^
dV : 2.698 (in^3) Area : 11.415 (in^2) Moisture : 15.44 % Total Hori. Stress : 97.78 (lb/in^2
Strain : 20.15 % Void Ratio: 0.41 Pore Pressure : 81.82 (lb/in^2
Saturation: 100.00 % Effect.Vert. Stress: 60.74 (lb/in^2
Time : 1489.23 (min) Effect.Hori. Stress: 15.96 (lb/in^2

URS

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Location : Piedmont, CA
Date : Tue Jun 14 2005

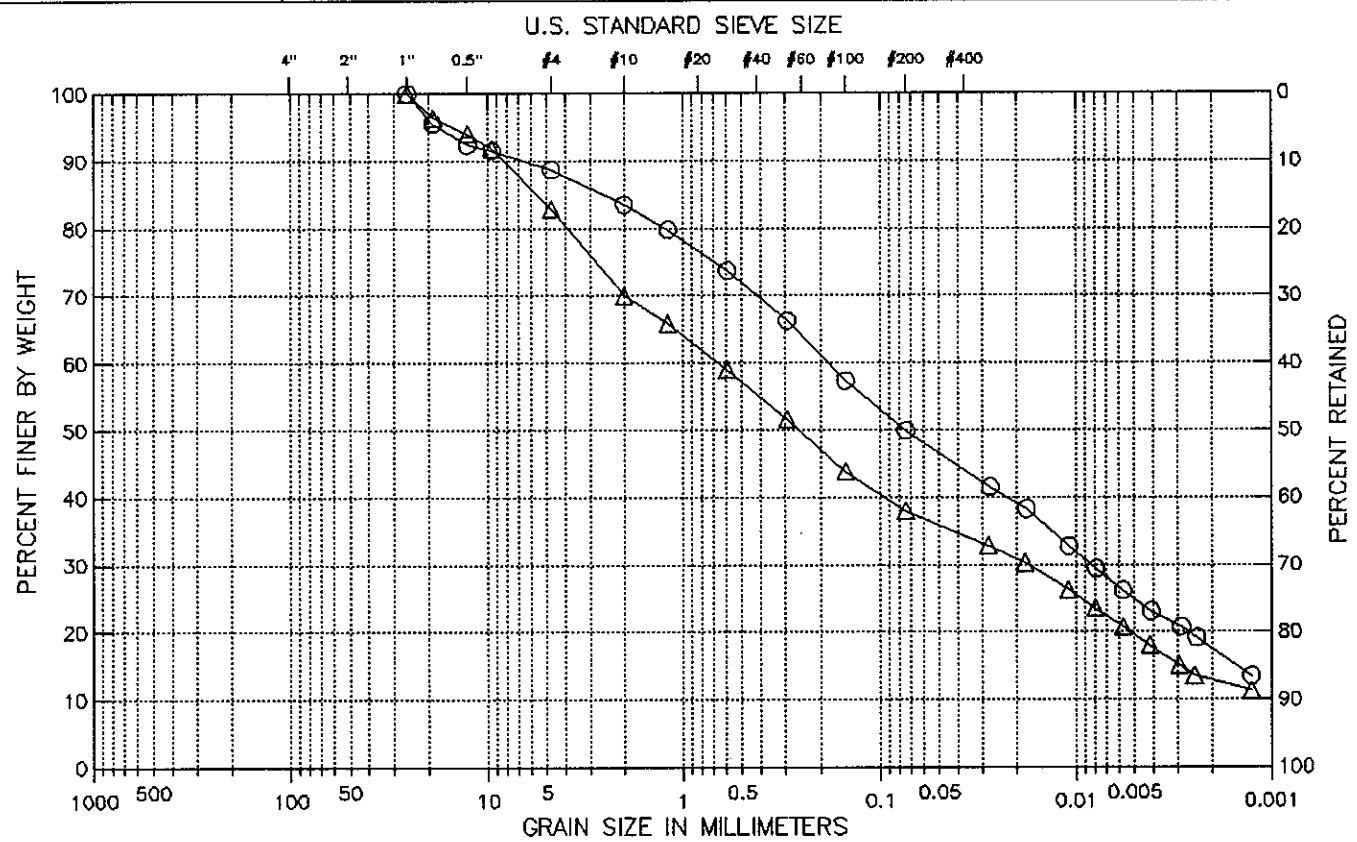


Symbol	Boring No.	Sample No.	Liquid Limit	Plastic Limit	Plasticity Index
O	VQ-40	9A middle cut	27.99	18.33	9.67
Δ	VQ-40	9B bottom cut	30.18	18.55	11.63

Figure 1

URS

Project : Estates Dam Seismic Study
Project No.: 26814957.H0000
Location: Piedmont, CA
Date : Tue Jun 14 2005



Symbol	Boring No.	Sample No.	Depth	Filename	Classification	/ Description
⊖	VQ-40	9A middle cut	29.5	VQ40-09A	SC	Clayey sand
△	VQ-40	9B bottom cut	29.5	VQ40-09B	SC	Clayey sand with gravel

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000 Depth : 29.5
Boring No. : VQ-40 Test Date : 06/14/2005
Sample No. : 9A middle cut Test Method : ASTM D422/4318
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 29.5 feet

Filename : VQ40-09A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 80 gm
Specific Gravity = 2.668

Hydroscopic Moisture Content :
Weight of Wet Soil = 80 gm
Weight of Dry Soil = 77.35 gm
Moisture Content = 0.0342599

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	47.00	21.90	38.57	0.028	42	0.028
5.00	44.00	21.80	35.53	0.018	38	0.018
15.00	39.00	21.50	30.39	0.011	33	0.011
30.00	36.00	21.30	27.30	0.008	29	0.008
60.00	33.00	21.30	24.30	0.006	26	0.006
120.00	30.00	21.60	21.44	0.004	23	0.004
251.00	27.80	21.60	19.24	0.003	21	0.003
360.00	26.00	22.30	17.76	0.002	19	0.002
1440.00	21.50	20.70	12.52	0.001	13	0.001

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 9A middle cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 29.5 feet

Depth : 29.5
Test Date : 06/14/2005
Test Method : ASTM D422/4318

Filename : VQ40-09A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	94.01	94.01	96
0.5"	0.500	12.70	67.51	161.52	92
0.375"	0.374	9.51	17.16	178.68	92
#4	0.187	4.75	61.74	240.42	89
#10	0.079	2.00	110.68	351.10	84

Total Dry Weight of Sample = 2189

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#16	0.047	1.19	3.40	3.40	80
#30	0.023	0.60	5.61	9.01	74
#50	0.012	0.30	7.00	16.01	66
#100	0.006	0.15	8.20	24.21	57
#200	0.003	0.07	6.92	31.13	50
Pan			46.22	77.35	0

Total Wet Weight of Sample = 80
Total Dry Weight of Sample = 77.35
Moisture Content = 0.0342599

D85 : 2.5659 mm
D60 : 0.1826 mm
D50 : 0.0747 mm
D30 : 0.0083 mm
D15 : 0.0015 mm
D10 : 0.0009 mm

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand
AASHTO Group Symbol : A-4(2)
AASHTO Group Name : Silty Soils

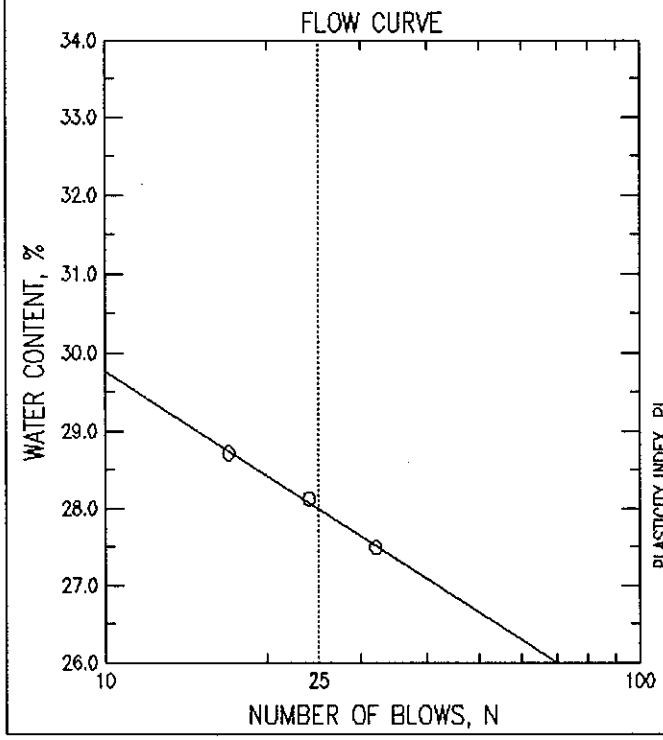
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-40
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	9A middle cut
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown clayey sand (SC) with gravel		Tue Jun 14 2005	VQ40-09A

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	52	58	57		
WT. WET SOIL + TARE	29.55	30.24	32.59		
WT. DRY SOIL + TARE	25.46	25.96	27.72		
WT. WATER	4.09	4.28	4.87		
TARE WT.	10.58	10.74	10.76		
WT. DRY SOIL	14.88	15.22	16.96		
WATER CONTENT, W_N (%)	27.49	28.12	28.71		
NUMBER OF BLOWS, N	32	24	17		
ONE-POINT LIQUID LIMIT, LL	28.32	27.98	27.41		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	59				
WT. WET SOIL + TARE	35.05				
WT. DRY SOIL + TARE	31.33				
WT. WATER	3.72				
TARE WT.	11.03				
WT. DRY SOIL	20.3				
WATER CONTENT (%)	18.33				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	16.3
LIQUID LIMIT, LL	28.0
PLASTIC LIMIT, PL	18.3
PLASTICITY INDEX, PI	9.7
LIQUIDITY INDEX, LI*	-0.21

*LI = (W - PL)/PI

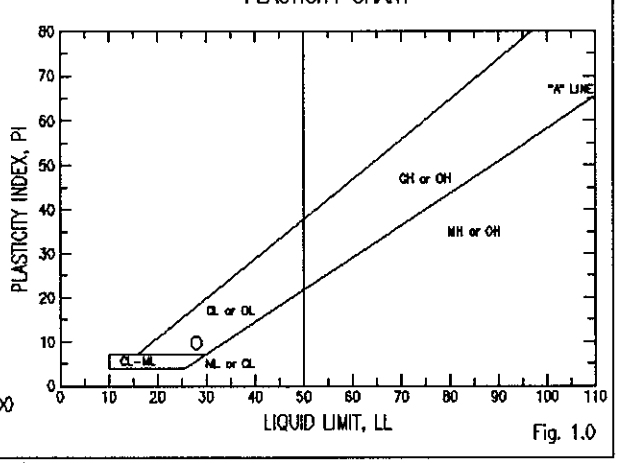


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 9A middle cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 29.5 feet

Depth : 29.5
Test Date : 06/14/2005
Test Method : ASTM D422/4318

Filename : VQ40-09A
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ40-9A	0.00	3252.00	2796.02	16.31

Average Moisture Content = 16.31

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	59	11.03	35.05	31.33	18.33

Plastic Limit = 18.33

Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	52	10.58	29.55	25.46	32	27.49
2)	58	10.74	30.24	25.96	24	28.12
3)	57	10.76	32.59	27.72	17	28.71

Liquid Limit = 27.99
Plastic Index = 9.67

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-9B
Boring No. : VQ-40 Test Date : 06/06/05 Tested by : S. Capps
Sample No. : 9B Depth : 29.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 55.55 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	125.55	125.55	0.00	0.00	55.55	55.55	1.00	55.55	0.00
2)	0.23	146.11	125.55	11.28	0.55	64.83	44.27	1.46	54.55	10.28
3)	0.43	156.31	125.55	18.32	0.60	67.98	37.23	1.83	52.61	15.38
4)	0.64	161.36	125.55	22.68	0.63	68.67	32.86	2.09	50.77	17.90
5)	0.83	165.11	125.55	25.44	0.64	69.67	30.11	2.31	49.89	19.78
6)	1.04	167.83	125.55	27.20	0.64	70.63	28.35	2.49	49.49	21.14
7)	1.25	170.02	125.55	28.58	0.64	71.44	26.97	2.65	49.21	22.24
8)	1.45	172.22	125.55	29.57	0.63	72.64	25.98	2.80	49.31	23.33
9)	1.65	174.15	125.55	30.19	0.62	73.96	25.36	2.92	49.66	24.30
10)	1.85	175.56	125.55	30.57	0.61	74.99	24.98	3.00	49.98	25.00
11)	2.06	176.96	125.55	30.80	0.60	76.16	24.75	3.08	50.46	25.71
12)	2.26	178.11	125.55	30.72	0.58	77.39	24.83	3.12	51.11	26.28
13)	2.46	179.26	125.55	30.80	0.57	78.46	24.75	3.17	51.61	26.86
14)	2.66	180.15	125.55	30.80	0.56	79.35	24.75	3.21	52.05	27.30
15)	2.87	181.04	125.55	30.64	0.55	80.39	24.90	3.23	52.65	27.74
16)	3.07	181.67	125.55	30.64	0.55	81.02	24.90	3.25	52.96	28.06
17)	3.27	182.30	125.55	30.57	0.54	81.73	24.98	3.27	53.35	28.37
18)	3.48	182.92	125.55	30.41	0.53	82.51	25.13	3.28	53.82	28.69
19)	3.68	183.54	125.55	30.26	0.52	83.28	25.29	3.29	54.28	29.00
20)	3.88	183.91	125.55	30.19	0.52	83.73	25.36	3.30	54.55	29.18
21)	4.09	184.28	125.55	29.96	0.51	84.33	25.59	3.29	54.96	29.37
22)	4.29	184.65	125.55	29.80	0.50	84.85	25.75	3.30	55.30	29.55
23)	4.50	185.02	125.55	29.57	0.50	85.44	25.98	3.29	55.71	29.73
24)	4.69	185.39	125.55	29.57	0.49	85.81	25.98	3.30	55.89	29.92
25)	4.90	185.75	125.55	29.42	0.49	86.32	26.13	3.30	56.23	30.10
26)	5.10	186.10	125.55	29.27	0.48	86.84	26.28	3.30	56.56	30.28
27)	5.31	186.46	125.55	29.19	0.48	87.27	26.36	3.31	56.81	30.46
28)	5.50	186.82	125.55	29.11	0.48	87.70	26.43	3.32	57.07	30.63
29)	5.71	186.93	125.55	29.04	0.47	87.89	26.51	3.32	57.20	30.69
30)	5.91	187.28	125.55	28.88	0.47	88.39	26.66	3.32	57.53	30.86
31)	6.12	187.63	125.55	28.65	0.46	88.97	26.89	3.31	57.93	31.04
32)	6.53	187.84	125.55	28.43	0.46	89.41	27.12	3.30	58.27	31.14
33)	6.93	188.29	125.55	28.35	0.45	89.94	27.20	3.31	58.57	31.37
34)	7.33	188.73	125.55	28.20	0.45	90.53	27.35	3.31	58.94	31.59
35)	7.74	189.16	125.55	28.04	0.44	91.12	27.51	3.31	59.31	31.81
36)	8.15	189.36	125.55	27.74	0.43	91.62	27.81	3.29	59.72	31.90
37)	8.55	189.78	125.55	27.58	0.43	92.20	27.97	3.30	60.08	32.12
38)	8.96	189.96	125.55	27.51	0.43	92.46	28.04	3.30	60.25	32.21
39)	9.36	190.14	125.55	27.35	0.42	92.79	28.19	3.29	60.49	32.30
40)	9.77	190.55	125.55	27.12	0.42	93.42	28.42	3.29	60.92	32.50
41)	10.18	190.72	125.55	26.97	0.41	93.75	28.58	3.28	61.16	32.58
42)	10.69	190.81	125.55	26.66	0.41	94.14	28.88	3.26	61.51	32.63
43)	11.19	191.12	125.55	26.59	0.41	94.53	28.96	3.26	61.75	32.79
44)	11.70	191.20	125.55	26.28	0.40	94.92	29.27	3.24	62.09	32.83
45)	12.21	191.50	125.55	26.36	0.40	95.14	29.19	3.26	62.17	32.98
46)	12.72	191.57	125.55	26.21	0.40	95.36	29.34	3.25	62.35	33.01
47)	13.22	191.63	125.55	26.13	0.40	95.50	29.42	3.25	62.46	33.04
48)	13.73	191.69	125.55	26.05	0.39	95.63	29.50	3.24	62.57	33.07
49)	14.24	191.74	125.55	26.05	0.39	95.69	29.50	3.24	62.59	33.10
50)	14.75	191.79	125.55	25.98	0.39	95.81	29.57	3.24	62.69	33.12
51)	15.26	192.26	125.55	25.90	0.39	96.36	29.65	3.25	63.01	33.36
52)	16.27	192.54	125.55	25.75	0.38	96.80	29.80	3.25	63.30	33.50
53)	16.78	192.99	125.55	25.82	0.38	97.17	29.73	3.27	63.45	33.72
54)	17.29	193.22	125.55	25.67	0.38	97.55	29.88	3.26	63.71	33.83
55)	17.79	193.44	125.55	25.44	0.37	98.00	30.11	3.25	64.05	33.94
56)	18.30	193.65	125.55	25.44	0.37	98.21	30.11	3.26	64.16	34.05
57)	18.81	193.85	125.55	25.36	0.37	98.49	30.18	3.26	64.34	34.15
58)	19.83	194.03	125.55	25.06	0.37	98.97	30.49	3.25	64.73	34.24
59)	20.18	193.93	125.55	24.98	0.37	98.95	30.57	3.24	64.76	34.19

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-98
Boring No. : VQ-40 Test Date : 06/06/05 Tested by : S. Capps
Sample No. : 98 Depth : 29.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 55.55 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	11.29	70.00	0.00	0.00	0.00	125.55	55.55
2)	0.018	0.23	11.31	81.28	243.60	243.60	21.53	146.11	64.83
3)	0.034	0.43	11.34	88.32	365.21	365.21	32.21	156.31	67.98
4)	0.050	0.64	11.36	92.69	426.01	426.01	37.50	161.36	68.67
5)	0.066	0.83	11.38	95.44	471.61	471.61	41.43	165.11	69.67
6)	0.082	1.04	11.41	97.20	505.06	505.06	44.28	167.83	70.63
7)	0.098	1.25	11.43	98.58	532.42	532.42	46.58	170.02	71.44
8)	0.114	1.45	11.45	99.57	559.78	559.78	48.87	172.22	72.64
9)	0.129	1.65	11.48	100.19	584.10	584.10	50.89	174.15	73.96
10)	0.146	1.85	11.50	100.57	602.34	602.34	52.37	175.56	74.99
11)	0.162	2.06	11.53	100.80	620.58	620.58	53.84	176.96	76.16
12)	0.178	2.26	11.55	100.72	635.78	635.78	55.05	178.11	77.39
13)	0.193	2.46	11.57	100.80	650.99	650.99	56.25	179.26	78.46
14)	0.210	2.66	11.60	100.80	663.15	663.15	57.18	180.15	79.35
15)	0.226	2.87	11.62	100.65	675.31	675.31	58.11	181.04	80.39
16)	0.242	3.07	11.65	100.65	684.43	684.43	58.77	181.67	81.02
17)	0.257	3.27	11.67	100.57	693.55	693.55	59.43	182.30	81.73
18)	0.273	3.48	11.70	100.42	702.67	702.67	60.08	182.92	82.51
19)	0.290	3.68	11.72	100.26	711.79	711.79	60.73	183.54	83.28
20)	0.306	3.88	11.75	100.19	717.87	717.87	61.12	183.91	83.73
21)	0.322	4.09	11.77	99.96	723.95	723.95	61.51	184.28	84.33
22)	0.337	4.29	11.79	99.80	730.03	730.03	61.90	184.65	84.85
23)	0.354	4.50	11.82	99.57	736.11	736.11	62.27	185.02	85.44
24)	0.369	4.69	11.84	99.57	742.19	742.19	62.66	185.39	85.81
25)	0.385	4.90	11.87	99.42	748.27	748.27	63.04	185.75	86.32
26)	0.401	5.10	11.90	99.27	754.35	754.35	63.41	186.10	86.84
27)	0.418	5.31	11.92	99.19	760.43	760.43	63.79	186.46	87.27
28)	0.433	5.50	11.95	99.12	766.51	766.51	64.16	186.82	87.70
29)	0.450	5.71	11.97	99.04	769.55	769.55	64.27	186.93	87.89
30)	0.465	5.91	12.00	98.89	775.63	775.63	64.65	187.28	88.39
31)	0.481	6.12	12.02	98.66	781.71	781.71	65.01	187.63	88.97
32)	0.514	6.53	12.08	98.43	787.79	787.79	65.23	187.84	89.41
33)	0.545	6.93	12.13	98.35	796.92	796.92	65.70	188.29	89.94
34)	0.577	7.33	12.18	98.20	806.04	806.04	66.16	188.73	90.53
35)	0.609	7.74	12.24	98.04	815.16	815.16	66.62	189.16	91.12
36)	0.641	8.15	12.29	97.74	821.24	821.24	66.82	189.36	91.62
37)	0.673	8.55	12.34	97.58	830.36	830.36	67.27	189.78	92.20
38)	0.705	8.96	12.40	97.51	836.44	836.44	67.46	189.96	92.46
39)	0.737	9.36	12.46	97.36	842.52	842.52	67.64	190.14	92.79
40)	0.769	9.77	12.51	97.13	851.64	851.64	68.07	190.55	93.42
41)	0.801	10.18	12.57	96.97	857.72	857.72	68.25	190.72	93.75
42)	0.841	10.69	12.64	96.67	863.80	863.80	68.34	190.81	94.14
43)	0.881	11.19	12.71	96.59	872.92	872.92	68.67	191.12	94.53
44)	0.921	11.70	12.78	96.28	879.00	879.00	68.76	191.20	94.92
45)	0.961	12.21	12.86	96.36	888.12	888.12	69.07	191.50	95.14
46)	1.001	12.72	12.93	96.21	894.20	894.20	69.14	191.57	95.36
47)	1.041	13.22	13.01	96.13	900.28	900.28	69.21	191.63	95.50
48)	1.081	13.73	13.09	96.05	906.36	906.36	69.26	191.69	95.63
49)	1.121	14.24	13.16	96.05	912.44	912.44	69.32	191.74	95.69
50)	1.160	14.75	13.24	95.98	918.52	918.52	69.37	191.79	95.81
51)	1.201	15.26	13.32	95.90	930.68	930.68	69.86	192.26	96.36
52)	1.280	16.27	13.48	95.75	945.88	945.88	70.16	192.54	96.80
53)	1.321	16.78	13.57	95.82	958.05	958.05	70.63	192.99	97.17
54)	1.360	17.29	13.65	95.67	967.17	967.17	70.87	193.22	97.55
55)	1.400	17.79	13.73	95.44	976.29	976.29	71.10	193.44	98.00
56)	1.440	18.30	13.82	95.44	985.41	985.41	71.31	193.65	98.21
57)	1.480	18.81	13.90	95.37	994.53	994.53	71.53	193.85	98.49
58)	1.560	19.83	14.08	95.06	1009.73	1009.73	71.71	194.03	98.97
59)	1.588	20.18	14.14	94.98	1012.77	1012.77	71.61	193.93	98.95

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-9B
Boring No. : VQ-40 Test Date : 06/06/05 Tested by : S. Capps
Sample No. : 9B Depth : 29.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 55.55 psi

Liquid Limit : 30.18 Plastic Limit : 18.55 Specific Gravity : 2.668

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ40-9B	VQ40-9B
WT CONTAINER + WET SOIL (gm)	3342.20	3306.10
WT CONTAINER + DRY SOIL (gm)	2960.50	2960.50
WT WATER (gm)	381.70	345.60
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	2960.50	2960.50
WATER CONTENT (%)	12.89	11.67

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	12.89	11.67
VOID RATIO	0.37	0.31
WET DENSITY (lb/ft^3)	136.85	141.77
DRY DENSITY (lb/ft^3)	121.22	126.95
DEGREE OF SATURATION (%)	92.13	100.00

Maximum Shear Stress = 34.24 (lb/in^2) at a Vertical Strain of 19.83 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Dam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-9B
Boring No. : VQ-40 Test Date : 06/06/05 Tested by : S. Capps
Sample No. : 9B Depth : 29.5 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : TXCIU Test with Effective Pressure of 55.55 psi

Height : 7.992 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 11.642 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 93.039 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 30.18 Plastic Limit : 18.55 Specific Gravity : 2.668

INITIAL
Height : 7.992 (in) Dry Density : 121.22 (lb/ft^3)
Area : 11.642 (in^2) Moisture : 12.89 %
Void Ratio: 0.37
Saturation: 92.13 %
Time : 0.00 (min)

INITIALIZATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 121.22 (lb/ft^3) Total Vert. Stress : 125.55 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 12.89 % Total Hori. Stress : 125.55 (lb/in^
Void Ratio: 0.37 Pore Pressure : 0.00 (lb/in^2)
Saturation: 92.13 % Effect.Vert. Stress: 125.55 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 125.55 (lb/in^

END OF CONSOLIDATION - A
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 121.22 (lb/ft^3) Total Vert. Stress : 125.55 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 12.89 % Total Hori. Stress : 125.55 (lb/in^
Void Ratio: 0.37 Pore Pressure : 0.00 (lb/in^2)
Saturation: 92.13 % Effect.Vert. Stress: 125.55 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 125.55 (lb/in^

END OF SATURATION
dH : 0.000 (in) Height : 7.992 (in) Dry Density : 121.22 (lb/ft^3) Total Vert. Stress : 125.55 (lb/in^
dV : 0.000 (in^3) Area : 11.642 (in^2) Moisture : 11.67 % Total Hori. Stress : 125.55 (lb/in^
dVCorr : 0.000 (in^3) Void Ratio: 0.37 Pore Pressure : 0.00 (lb/in^2)
Saturation: 83.41 % Effect.Vert. Stress: 125.55 (lb/in^
Time : 0.00 (min) Effect.Hori. Stress: 125.55 (lb/in^

END OF CONSOLIDATION - B
dH : 0.122 (in) Height : 7.870 (in) Dry Density : 126.95 (lb/ft^3) Total Vert. Stress : 125.55 (lb/in^
dV : 4.196 (in^3) Area : 11.289 (in^2) Moisture : 11.67 % Total Hori. Stress : 125.55 (lb/in^
Void Ratio: 0.31 Pore Pressure : 70.00 (lb/in^2
Saturation: 100.00 % Effect.Vert. Stress: 55.55 (lb/in^2
Time : 0.00 (min) Effect.Hori. Stress: 55.55 (lb/in^2

FAILURE DURING SHEAR
dH : 1.560 (in) Height : 6.432 (in) Dry Density : 126.95 (lb/ft^3) Total Vert. Stress : 197.26 (lb/in^
dV : 4.196 (in^3) Area : 14.080 (in^2) Moisture : 11.67 % Total Hori. Stress : 125.55 (lb/in^
Strain : 19.83 % Void Ratio: 0.31 Pore Pressure : 95.06 (lb/in^2
Strength: 35.86 (lb/in^2) Saturation: 100.00 % Effect.Vert. Stress: 102.20 (lb/in^
Time : 1484.97 (min) Effect.Hori. Stress: 30.49 (lb/in^2

END OF TEST
dH : 1.588 (in) Height : 6.404 (in) Dry Density : 126.95 (lb/ft^3) Total Vert. Stress : 197.16 (lb/in^
dV : 4.196 (in^3) Area : 14.143 (in^2) Moisture : 11.67 % Total Hori. Stress : 125.55 (lb/in^
Strain : 20.18 % Void Ratio: 0.31 Pore Pressure : 94.98 (lb/in^2
Saturation: 100.00 % Effect.Vert. Stress: 102.18 (lb/in^
Time : 1512.12 (min) Effect.Hori. Stress: 30.57 (lb/in^2

URS

Fri Jun 10 09:25:48 2005

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 9B bottom cut
Location : Piedmont, CA
Depth : 29.5
Test Date : 05/10/2005
Test Method : ASTM D422/4318
Filename : VQ40-09B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 29.5 feet

HYDROMETER

Hydrometer ID : 1734
Weight of air-dried soil = 80 gm
Specific Gravity = 2.668

Hydroscopic Moisture Content :
Weight of Wet Soil = 80 gm
Weight of Dry Soil = 76.79 gm
Moisture Content = 0.0418023

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
2.00	44.50	21.90	36.07	0.028	33	0.028
5.00	41.70	21.90	33.27	0.018	30	0.018
15.00	37.30	21.80	28.83	0.011	26	0.011
30.00	34.40	21.60	25.84	0.008	24	0.008
61.00	31.40	21.60	22.84	0.006	21	0.006
120.00	28.50	21.30	19.80	0.004	18	0.004
249.00	25.40	21.10	16.61	0.003	15	0.003
360.00	23.50	21.40	14.84	0.002	14	0.002
1440.00	21.20	21.00	12.36	0.001	11	0.001

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000 Depth : 29.5
Boring No. : VQ-40 Test Date : 05/10/2005
Sample No. : 9B bottom cut Test Method : ASTM D422/4318
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 29.5 feet

Filename : VQ40-09B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	77.83	77.83	96
0.5"	0.500	12.70	51.46	129.29	94
0.375"	0.374	9.51	47.58	176.87	92
#4	0.187	4.75	196.33	373.20	83
#10	0.079	2.00	277.00	650.20	70

Total Dry Weight of Sample = 2235.5

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#16	0.047	1.19	4.55	4.55	66
#30	0.023	0.60	7.60	12.15	59
#50	0.012	0.30	8.08	20.23	52
#100	0.006	0.15	8.59	28.82	44
#200	0.003	0.07	6.38	35.20	38
Pan			41.59	76.79	0

Total Wet Weight of Sample = 80
Total Dry Weight of Sample = 76.79
Moisture Content = 0.0418023

D85 : 5.6170 mm
D60 : 0.6590 mm
D50 : 0.2565 mm
D30 : 0.0176 mm
D15 : 0.0029 mm
D10 : 0.0009 mm

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand with gravel
AASHTO Group Symbol : A-6(1)
AASHTO Group Name : Clayey Soils

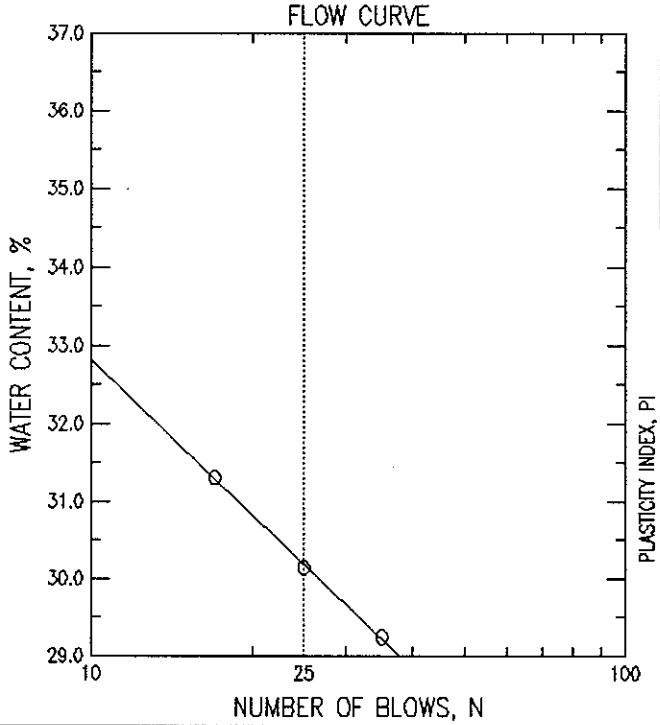
URS

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-40
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	9B bottom cut
SAMPLE DESCRIPTION		DATE	FILENAME
Grayish brown clayey sand (SC) with gravel		Fri Jun 10 2005	VQ40-09B

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	46	62	81		
WT. WET SOIL + TARE	28.55	27.01	28.45		
WT. DRY SOIL + TARE	24.74	23.33	24.22		
WT. WATER	3.81	3.68	4.23		
TARE WT.	11.71	11.12	10.71		
WT. DRY SOIL	13.03	12.21	13.51		
WATER CONTENT, W_N (%)	29.24	30.14	31.31		
NUMBER OF BLOWS, N	35	25	17		
ONE-POINT LIQUID LIMIT, LL	30.46	30.14	29.88		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	10				
WT. WET SOIL + TARE	30.28				
WT. DRY SOIL + TARE	27.36				
WT. WATER	2.92				
TARE WT.	11.62				
WT. DRY SOIL	15.74				
WATER CONTENT (%)	18.55				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	14.8
LIQUID LIMIT, LL	30.2
PLASTIC LIMIT, PL	18.6
PLASTICITY INDEX, PI	11.6
LIQUIDITY INDEX, LI*	-0.32

*LI = (W - PL)/PI

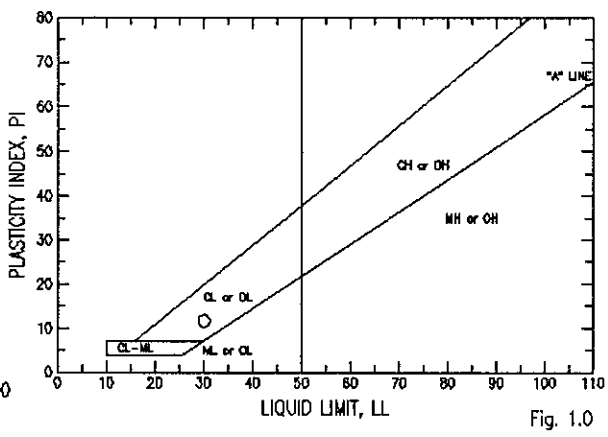


Fig. 1.0

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 9B bottom cut
Location : Piedmont, CA
Soil Description : Grayish brown clayey sand (SC) with gravel
Remarks : Depth: 29.5 feet

Depth : 29.5
Test Date : 05/10/2005
Test Method : ASTM D422/4318

Filename : VQ40-09B
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) VQ40-9B	0.00	3342.20	2911.07	14.81

Average Moisture Content = 14.81

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 10	11.62	30.28	27.36	18.55

Plastic Limit = 18.55

Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 46	11.71	28.55	24.74	35	29.24
2) 62	11.12	27.01	23.33	25	30.14
3) 81	10.71	28.45	24.22	17	31.31

Liquid Limit = 30.18
Plastic Index = 11.63

URS

Project Name: Estates Dam Seismic Study

Project Number: 26814957.H0000

Location: Piedmont, CA Date: 6/10/2005

Test Method: ASTM D854 Specific Gravity of Soils

Sample Number: VQ-40-9A & 4B Depth, ft: 29.5

Bottle Number: 3

Description: Grayish brown clayey sand (SC) with gravel

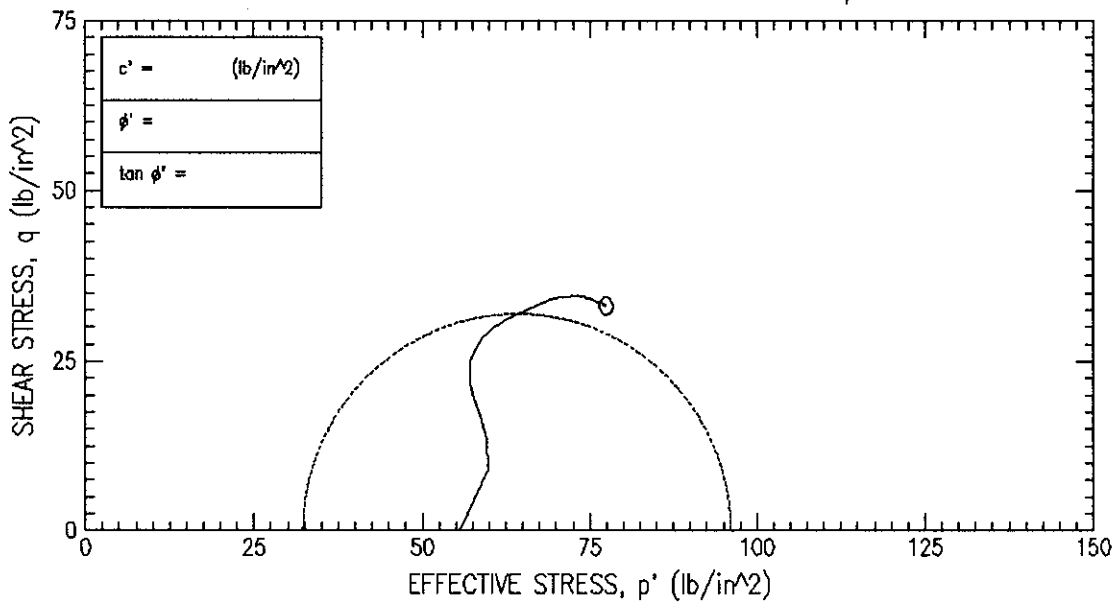
Determination Number	pycnometer + soil + water gms	pycnometer + water gms	temperature F	Specific Gravity
1	731.9	667.69	74.0	2.668
2	732.2	668.02	68.0	2.668
3	732.5	668.34	62.0	2.668

Average Specific Gravity 2.668

Oven dried soil + tare, gms	321.3
tare, gms	218.75
Oven dried soil	102.55

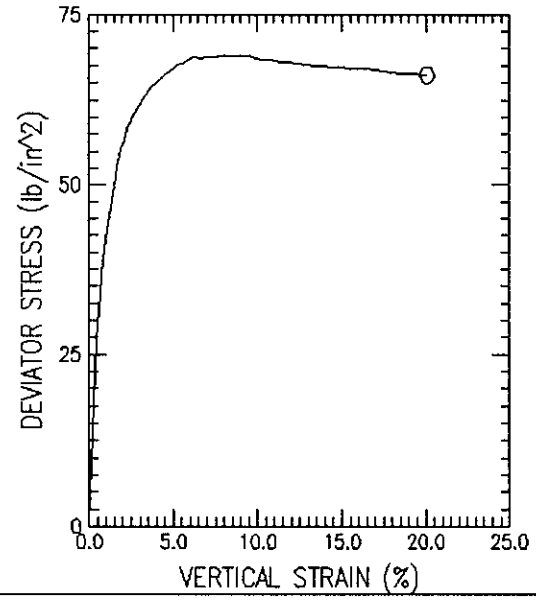
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-40-12



SYMBOL		O				
TEST NO.		VQ-40-12				
INITIAL	WATER CONTENT (%)	14.34				
	DRY DENSITY (lb/ft^3)	117.47				
	SATURATION (%)	83.60				
	VOID RATIO	0.477				
BEFORE SHEAR	WATER CONTENT (%)	13.05				
	DRY DENSITY (lb/ft^3)	127.29				
	SATURATION (%)	99.99				
	VOID RATIO	0.383				
	BACK PRESS. (lb/in^2)	70.00				
MINOR PRIN. STRESS (lb/in^2)		55.56				
MAX. DEV. STRESS (lb/in^2)		74.80				
TIME TO FAILURE (min)		581.62				
RATE OF STRAIN INCR (%/min)		0.00				
INITIAL DIAMETER (in)		2.86				
INITIAL HEIGHT (in)		5.95				
B-VALUE		98.70				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Brown clayey sand (SC)

LL 31.34	PL 16.07	PI 15.27	GS 2.78

REMARKS:

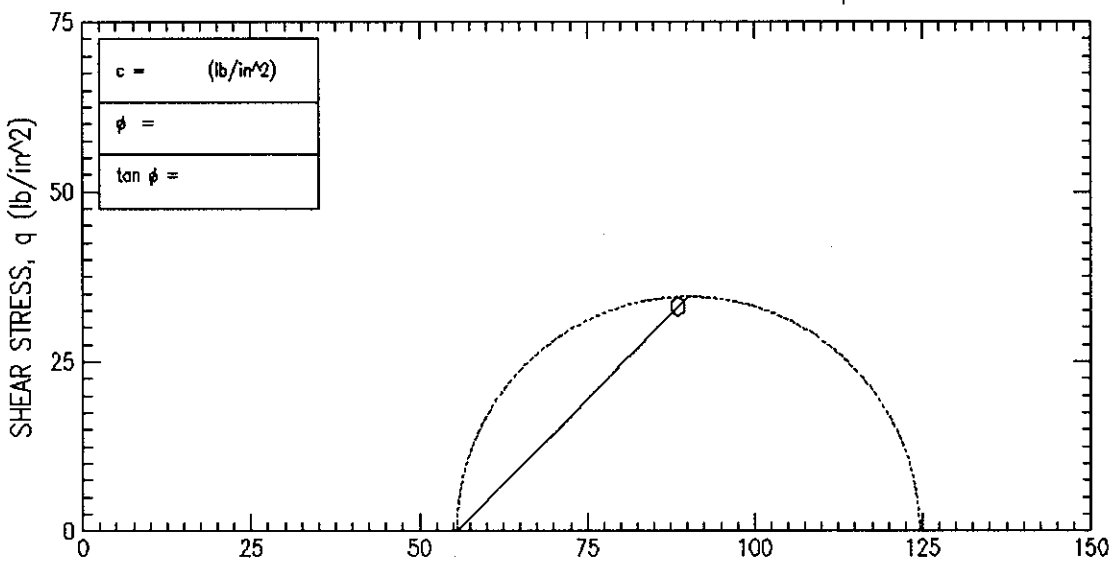
1) TXCIU Test with Effective Pressure of 55.56 psi

TYPE OF SPECIMEN Shelby		TYPE OF TEST CU (R)			
PROJECT Estates Sam Seismic Study					
PROJECT NO.26814957					
BORING NO. VQ-40	SAMPLE NO.	12			
TECH. S. Capps	DEPTH/ELEV	40.0 feet			
LABORATORY	DATE	05/11/05			
TRIAXIAL COMPRESSION TEST REPORT					

Tue 05-17-05, 13:29:02

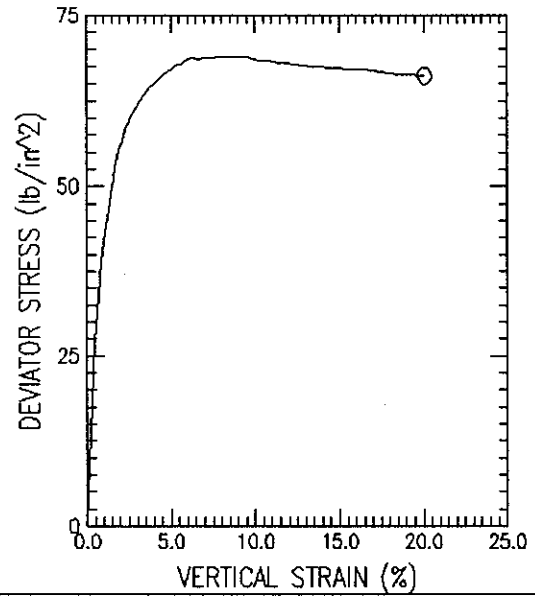
URS

Consolidated Undrained Triaxial Compression Test



FAILURE SKETCHES

VQ-40-12



SYMBOL		○			
TEST NO.		VQ-40-12			
INITIAL	WATER CONTENT (%)	14.34			
	DRY DENSITY (lb/ft^3)	117.47			
	SATURATION (%)	83.60			
	VOID RATIO	0.477			
BEFORE SHEAR	WATER CONTENT (%)	13.05			
	DRY DENSITY (lb/ft^3)	127.29			
	SATURATION (%)	99.99			
	VOID RATIO	0.363			
	BACK PRESS. (lb/in^2)	70.00			
MINOR PRIN. STRESS (lb/in^2)		55.56			
MAX. DEV. STRESS (lb/in^2)		74.80			
TIME TO FAILURE (min)		581.62			
RATE OF STRAIN INCR (%/min)		0.00			
INITIAL DIAMETER (in)		2.86			
INITIAL HEIGHT (in)		5.95			
B-VALUE		98.70			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Brown clayey sand (SC)

LL	PL	PI	GS
31.34	16.07	15.27	2.78

REMARKS:

1) TXCIU Test with Effective Pressure of 55.56 psi

TYPE OF SPECIMEN Shelby

TYPE OF TEST CU (R)

PROJECT Estates Sam Seismic Study

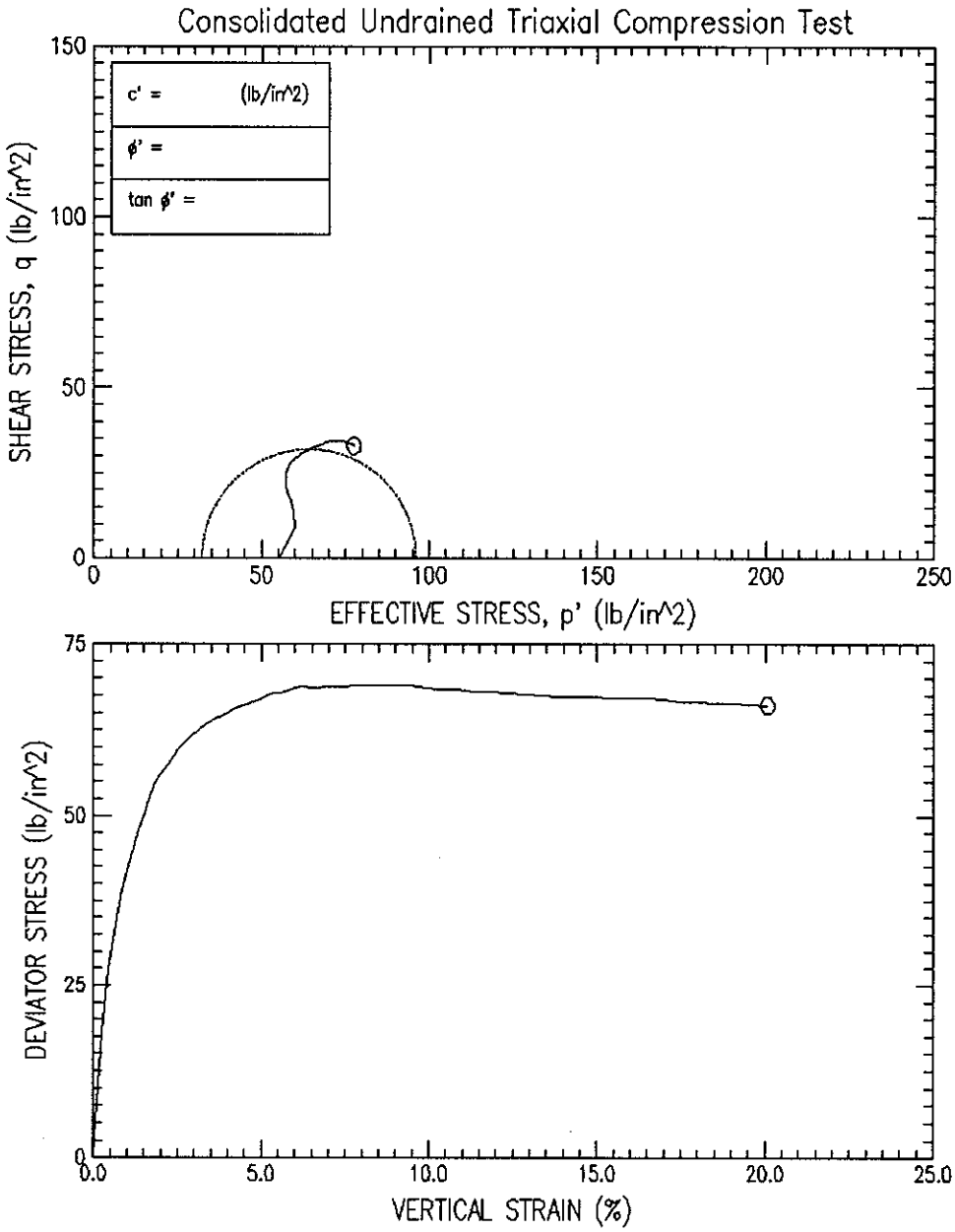
PROJECT NO.26814957

BORING NO. VQ-40	SAMPLE NO.	12			
TECH. S. Capps	DEPTH/ELEV	40.0 feet			
LABORATORY	DATE	05/11/05			

TRIAXIAL COMPRESSION TEST REPORT

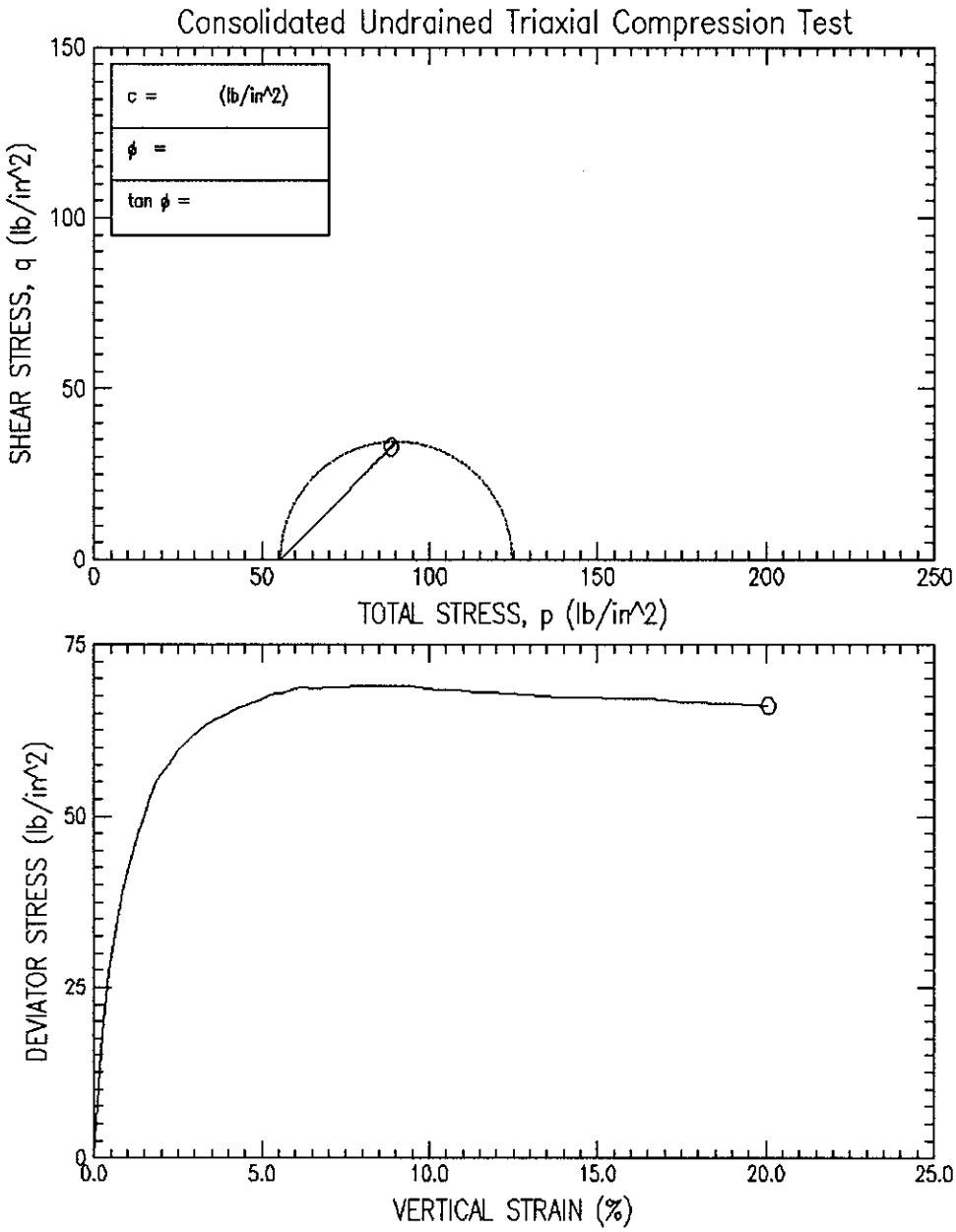
Tue 05-17-05, 13:29:47

URS



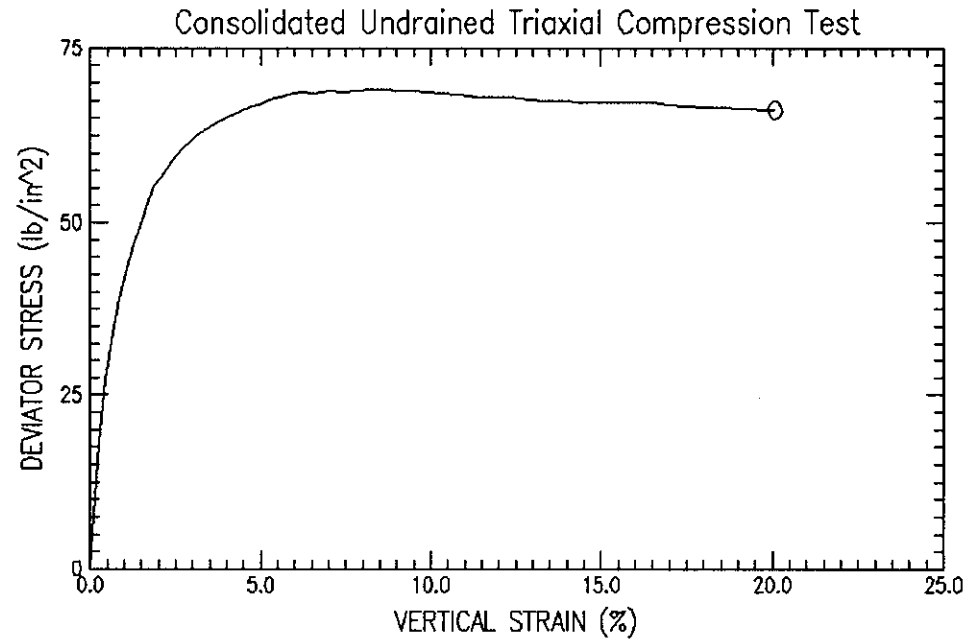
Woodward Clyde Consultants
Project Name : Estates Sam Seismic Study
Project No : 26814957 Boring No : VQ-40 Sample No : 12
Test Date : 05/11/05 Test No : VQ-40-12 Depth : 40.0 feet
Description : Brown clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 55.56 psi

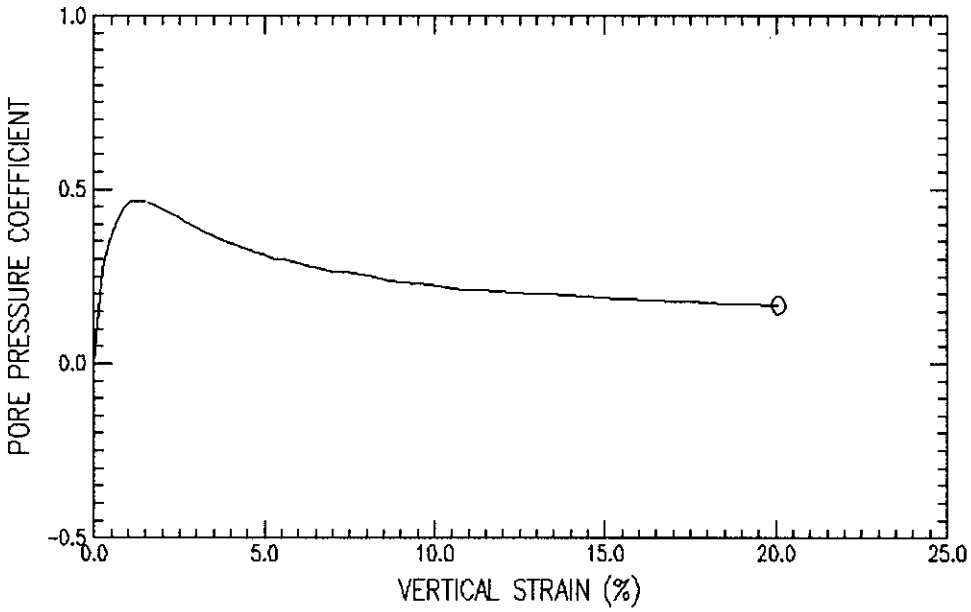
URS



Woodward Clyde Consultants
Project Name : Estates Sam Seismic Study
Project No : 26814957 Boring No : VQ-40 Sample No : 12
Test Date : 05/11/05 Test No : VQ-40-12 Depth : 40.0 feet
Description : Brown clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 55.56 psi

URS





Woodward Clyde Consultants
Project Name : Estates Sam Seismic Study
Project No : 26814957 Boring No : VQ-40 Sample No : 12
Test Date : 05/11/05 Test No : VQ-40-12 Depth : 40.0 feet
Description : Brown clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 55.56 psi

URS

Tue May 17 13:30:18 2005

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Sam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-12
Boring No. : VQ-40 Test Date : 05/11/05 Tested by : S. Capps
Sample No. : 12 Depth : 40.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 55.56 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	VERTICAL STRAIN (%)	TOTAL VERTICAL STRESS (lb/in^2)	TOTAL HORIZONTAL STRESS (lb/in^2)	EXCESS PORE PRESSURE (lb/in^2)	A PARAMETER	EFFECTIVE VERTICAL STRESS (lb/in^2)	EFFECTIVE HORIZONTAL STRESS (lb/in^2)	OBLIQUITY	EFFECTIVE p (lb/in^2)	q (lb/in^2)
1)	0.00	125.56	125.56	0.00	0.00	55.56	55.56	1.00	55.56	0.00
2)	0.25	143.76	125.56	4.90	0.27	68.86	50.65	1.36	59.75	9.10
3)	0.45	152.73	125.56	9.45	0.35	73.28	46.11	1.59	59.69	13.59
4)	0.66	159.55	125.56	13.86	0.41	75.69	41.70	1.82	58.69	17.00
5)	0.85	164.64	125.56	17.37	0.44	77.26	38.18	2.02	57.72	19.54
6)	1.06	168.93	125.56	20.13	0.46	78.80	35.43	2.22	57.11	21.69
7)	1.27	172.26	125.56	21.78	0.47	80.48	33.78	2.38	57.13	23.35
8)	1.48	175.38	125.56	23.23	0.47	82.15	32.33	2.54	57.24	24.91
9)	1.67	178.31	125.56	24.19	0.46	84.12	31.37	2.68	57.74	26.38
10)	1.89	180.84	125.56	24.81	0.45	86.02	30.75	2.80	58.38	27.64
11)	2.10	182.23	125.56	24.95	0.44	87.27	30.61	2.85	58.94	28.33
12)	2.30	183.80	125.56	24.95	0.43	88.85	30.61	2.90	59.73	29.12
13)	2.50	185.18	125.56	24.81	0.42	90.37	30.75	2.94	60.56	29.81
14)	2.71	186.36	125.56	24.47	0.40	91.89	31.09	2.96	61.49	30.40
15)	2.92	187.17	125.56	24.33	0.39	92.84	31.23	2.97	62.03	30.80
16)	3.12	187.97	125.56	23.98	0.38	93.98	31.57	2.98	62.78	31.21
17)	3.33	188.77	125.56	23.57	0.37	95.19	31.98	2.98	63.59	31.60
18)	3.53	189.38	125.56	23.30	0.37	96.08	32.26	2.98	64.17	31.91
19)	3.74	189.98	125.56	22.88	0.36	97.09	32.67	2.97	64.88	32.21
20)	3.94	190.40	125.56	22.54	0.35	97.86	33.02	2.96	65.44	32.42
21)	4.14	191.00	125.56	22.19	0.34	98.81	33.36	2.96	66.08	32.72
22)	4.35	191.41	125.56	21.99	0.33	99.42	33.57	2.96	66.49	32.93
23)	4.55	191.82	125.56	21.57	0.33	100.24	33.98	2.95	67.11	33.13
24)	4.76	192.23	125.56	21.23	0.32	101.00	34.33	2.94	67.66	33.34
25)	4.96	192.45	125.56	20.95	0.31	101.50	34.60	2.93	68.05	33.45
26)	5.17	193.03	125.56	20.61	0.31	102.42	34.95	2.93	68.68	33.74
27)	5.38	193.44	125.56	20.47	0.30	102.96	35.08	2.93	69.02	33.94
28)	5.59	193.47	125.56	20.26	0.30	103.20	35.29	2.92	69.24	33.95
29)	5.79	193.86	125.56	19.99	0.29	103.87	35.57	2.92	69.72	34.15
30)	6.00	194.07	125.56	19.71	0.29	104.35	35.84	2.91	70.10	34.26
31)	6.21	194.28	125.56	19.37	0.28	104.91	36.19	2.90	70.55	34.36
32)	6.61	194.17	125.56	18.89	0.28	105.28	36.67	2.87	70.97	34.31
33)	7.02	194.40	125.56	18.27	0.27	106.13	37.29	2.85	71.71	34.42
34)	7.43	194.28	125.56	18.06	0.26	106.22	37.50	2.83	71.86	34.36
35)	7.85	194.50	125.56	17.58	0.25	106.92	37.98	2.82	72.45	34.47
36)	8.26	194.55	125.56	17.10	0.25	107.45	38.46	2.79	72.95	34.49
37)	8.67	194.59	125.56	16.55	0.24	108.04	39.01	2.77	73.52	34.51
38)	9.07	194.46	125.56	16.20	0.24	108.25	39.36	2.75	73.80	34.45
39)	9.49	194.49	125.56	15.86	0.23	108.63	39.70	2.74	74.16	34.46
40)	9.89	194.18	125.56	15.58	0.23	108.60	39.98	2.72	74.29	34.31
41)	10.31	194.04	125.56	15.10	0.22	108.94	40.46	2.69	74.70	34.24
42)	10.82	193.99	125.56	14.62	0.21	109.37	40.94	2.67	75.16	34.22
43)	11.33	193.60	125.56	14.41	0.21	109.18	41.15	2.65	75.17	34.02
44)	11.85	193.54	125.56	14.27	0.21	109.27	41.28	2.65	75.28	33.99
45)	12.37	193.48	125.56	14.00	0.21	109.48	41.56	2.63	75.52	33.96
46)	12.87	193.26	125.56	13.72	0.20	109.53	41.84	2.62	75.68	33.85
47)	13.38	193.02	125.56	13.51	0.20	109.51	42.04	2.60	75.77	33.73
48)	13.90	192.95	125.56	13.31	0.20	109.64	42.25	2.60	75.94	33.70
49)	14.42	192.88	125.56	13.10	0.19	109.77	42.45	2.59	76.11	33.66
50)	14.93	192.80	125.56	12.89	0.19	109.90	42.66	2.58	76.28	33.62
51)	15.44	192.72	125.56	12.62	0.19	110.10	42.94	2.56	76.52	33.58
52)	16.47	192.71	125.56	12.27	0.18	110.43	43.28	2.55	76.86	33.58
53)	16.98	192.46	125.56	12.07	0.18	110.39	43.49	2.54	76.94	33.45
54)	17.50	192.20	125.56	12.00	0.18	110.20	43.56	2.53	76.88	33.32
55)	18.01	192.11	125.56	11.79	0.18	110.31	43.76	2.52	77.04	33.27
56)	18.53	191.99	125.56	11.52	0.17	110.47	44.04	2.51	77.25	33.22
57)	19.04	191.89	125.56	11.38	0.17	110.51	44.18	2.50	77.34	33.17
58)	20.06	191.67	125.56	11.17	0.17	110.49	44.38	2.49	77.44	33.05

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Sam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-12
Boring No. : VQ-40 Test Date : 05/11/05 Tested by : S. Capps
Sample No. : 12 Depth : 40.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 55.56 psi

Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

	CHANGE IN LENGTH (in)	VERTICAL STRAIN (%)	CORR. AREA (in^2)	PORE PRESSURE (lb/in^2)	DEV. LOAD (lb)	CORR. DEV. LOAD (lb)	DEV. STRESS (lb/in^2)	TOTAL VERTICAL STRESS (lb/in^2)	EFFECTIVE VERTICAL STRESS (lb/in^2)
1)	0.000	0.00	6.09	70.00	0.00	0.00	0.00	125.56	55.56
2)	0.014	0.25	6.10	74.91	120.42	120.42	19.73	143.76	68.86
3)	0.026	0.45	6.12	79.45	180.08	180.08	29.44	152.73	73.28
4)	0.038	0.66	6.13	83.86	225.78	225.78	36.83	159.55	75.69
5)	0.049	0.85	6.14	87.38	260.06	260.06	42.34	164.64	77.26
6)	0.062	1.06	6.16	90.13	289.26	289.26	47.00	168.93	78.80
7)	0.073	1.27	6.17	91.78	312.11	312.11	50.60	172.26	80.48
8)	0.086	1.48	6.18	93.23	333.69	333.69	53.99	175.38	82.15
9)	0.097	1.67	6.19	94.19	354.00	354.00	57.16	178.31	84.12
10)	0.109	1.89	6.21	94.81	371.77	371.77	59.90	180.84	86.02
11)	0.121	2.10	6.22	94.95	381.93	381.93	61.40	182.23	87.27
12)	0.133	2.30	6.23	94.95	393.35	393.35	63.11	183.80	88.85
13)	0.144	2.50	6.25	94.81	403.51	403.51	64.61	185.18	90.37
14)	0.157	2.71	6.26	94.47	412.39	412.39	65.88	186.36	91.89
15)	0.169	2.92	6.27	94.33	418.74	418.74	66.76	187.17	92.84
16)	0.181	3.12	6.29	93.99	425.09	425.09	67.63	187.97	93.98
17)	0.192	3.33	6.30	93.58	431.43	431.43	68.49	188.77	95.19
18)	0.204	3.53	6.31	93.30	436.51	436.51	69.15	189.38	96.08
19)	0.216	3.74	6.33	92.89	441.59	441.59	69.80	189.98	97.09
20)	0.228	3.94	6.34	92.54	445.40	445.40	70.26	190.40	97.86
21)	0.240	4.14	6.35	92.20	450.48	450.48	70.91	191.00	98.81
22)	0.252	4.35	6.37	91.99	454.28	454.28	71.35	191.41	99.42
23)	0.264	4.55	6.38	91.58	458.09	458.09	71.80	191.82	100.24
24)	0.275	4.76	6.39	91.23	461.90	461.90	72.24	192.23	101.00
25)	0.287	4.96	6.41	90.96	464.44	464.44	72.48	192.45	101.50
26)	0.299	5.17	6.42	90.61	469.52	469.52	73.11	193.03	102.42
27)	0.311	5.38	6.44	90.48	473.33	473.33	73.55	193.44	102.96
28)	0.323	5.59	6.45	90.27	474.60	474.60	73.58	193.47	103.20
29)	0.335	5.79	6.46	89.99	478.40	478.40	74.01	193.86	103.87
30)	0.347	6.00	6.48	89.72	480.94	480.94	74.24	194.07	104.35
31)	0.359	6.21	6.49	89.37	483.48	483.48	74.47	194.28	104.91
32)	0.382	6.61	6.52	88.89	484.75	484.75	74.35	194.17	105.28
33)	0.406	7.02	6.55	88.27	488.56	488.56	74.60	194.40	106.13
34)	0.430	7.43	6.58	88.06	489.83	489.83	74.46	194.28	106.22
35)	0.454	7.85	6.61	87.58	493.64	493.64	74.70	194.50	106.92
36)	0.478	8.26	6.64	87.10	496.18	496.18	74.75	194.55	107.45
37)	0.502	8.67	6.67	86.55	498.72	498.72	74.80	194.59	108.04
38)	0.525	9.07	6.70	86.20	499.98	499.98	74.66	194.46	108.25
39)	0.549	9.49	6.73	85.86	502.52	502.52	74.69	194.49	108.63
40)	0.573	9.89	6.76	85.58	502.52	502.52	74.36	194.18	108.60
41)	0.597	10.31	6.79	85.10	503.79	503.79	74.20	194.04	108.94
42)	0.626	10.82	6.83	84.62	506.33	506.33	74.15	193.99	109.37
43)	0.656	11.33	6.87	84.41	506.33	506.33	73.72	193.60	109.18
44)	0.686	11.85	6.91	84.28	508.87	508.87	73.67	193.54	109.27
45)	0.716	12.37	6.95	84.00	511.41	511.41	73.60	193.48	109.48
46)	0.745	12.87	6.99	83.72	512.68	512.68	73.35	193.26	109.53
47)	0.775	13.38	7.03	83.52	513.95	513.95	73.10	193.02	109.51
48)	0.805	13.90	7.07	83.31	516.49	516.49	73.02	192.95	109.64
49)	0.834	14.42	7.12	83.11	519.03	519.03	72.94	192.88	109.77
50)	0.864	14.93	7.16	82.90	521.57	521.57	72.86	192.80	109.90
51)	0.894	15.44	7.20	82.62	524.10	524.10	72.78	192.72	110.10
52)	0.953	16.47	7.29	82.28	530.45	530.45	72.76	192.71	110.43
53)	0.983	16.98	7.34	82.07	531.72	531.72	72.49	192.46	110.39
54)	1.013	17.50	7.38	82.00	532.99	532.99	72.21	192.20	110.20
55)	1.042	18.01	7.43	81.80	535.53	535.53	72.11	192.11	110.31
56)	1.073	18.53	7.47	81.52	538.07	538.07	71.98	191.99	110.47
57)	1.102	19.04	7.52	81.38	540.61	540.61	71.87	191.89	110.51
58)	1.161	20.06	7.62	81.18	545.68	545.68	71.63	191.67	110.49

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Sam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-12
Boring No. : VQ-40 Test Date : 05/11/05 Tested by : S. Capps
Sample No. : 12 Depth : 40.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 55.56 psi

Liquid Limit : 31.34 Plastic Limit : 16.07 Specific Gravity : 2.78

	BEFORE TEST	AFTER TEST
CONTAINER NO.	VQ-40-12	VQ-40-12
WT CONTAINER + WET SOIL (gm)	1346.50	1331.35
WT CONTAINER + DRY SOIL (gm)	1177.66	1177.66
WT WATER (gm)	168.84	153.69
WT CONTAINER (gm)	0.00	0.00
WT DRY SOIL (gm)	1177.66	1177.66
WATER CONTENT (%)	14.34	13.05

	BEFORE TEST	AFTER TEST
WATER CONTENT (%)	14.34	13.05
VOID RATIO	0.48	0.36
WET DENSITY (lb/ft^3)	134.31	143.90
DRY DENSITY (lb/ft^3)	117.47	127.29
DEGREE OF SATURATION (%)	83.60	99.99

Maximum Shear Stress = 34.51 (lb/in^2) at a Vertical Strain of 8.67 %

URS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

Project : Estates Sam Seismic Study Location : Piedmont, CA
Project No. : 26814957 Test No. : VQ-40-12
Boring No. : VQ-40 Test Date : 05/11/05 Tested by : S. Capps
Sample No. : 12 Depth : 40.0 feet Checked by : R. Taraya
Sample Type : Shelby Elevation : NA
Soil Description : Brown clayey sand (SC)
Remarks : TXCIU Test with Effective Pressure of 55.56 psi

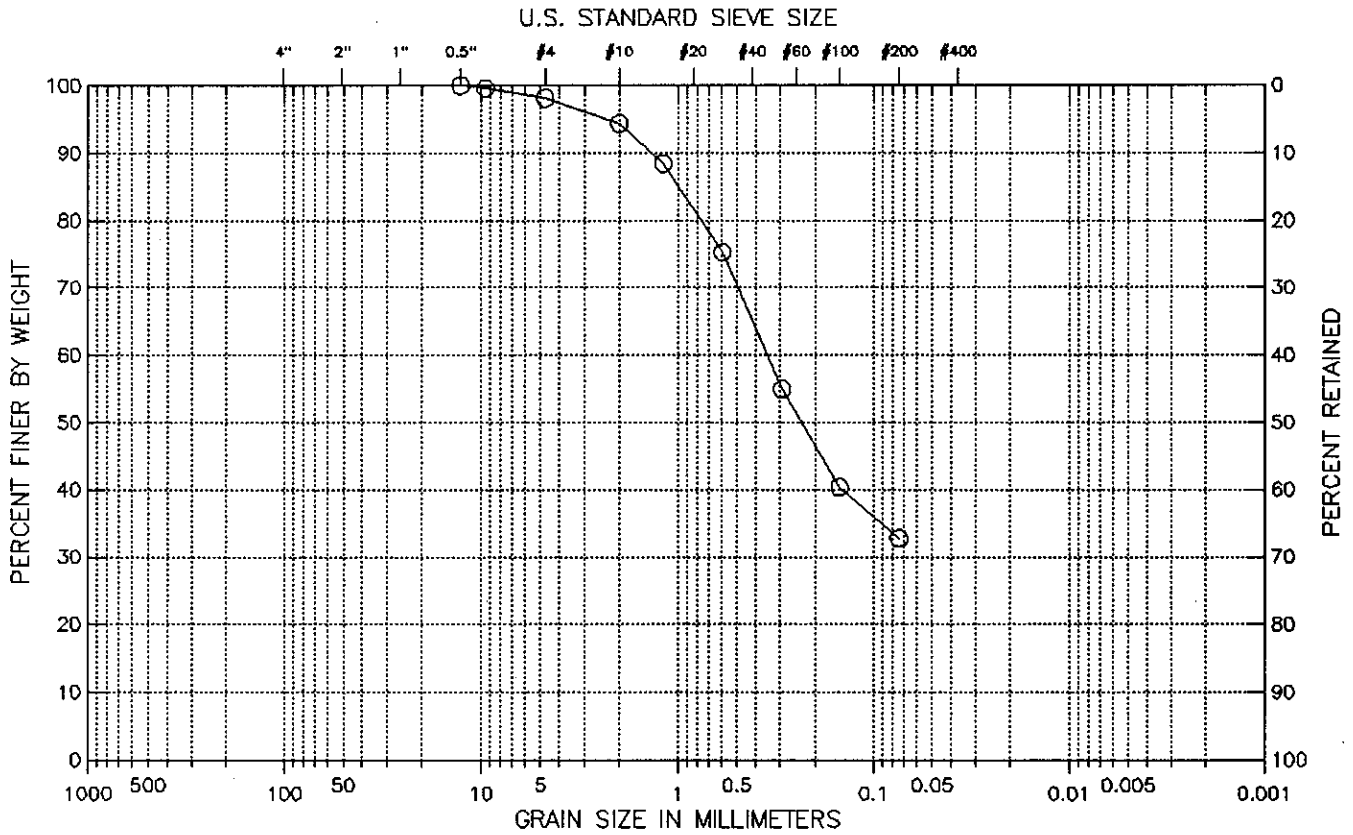
Height : 5.945 (in) Piston Diameter : 0.000 (in) Filter Correction : 0.00 (lb/in^2)
Area : 6.424 (in^2) Piston Friction : 0.00 (lb) Membrane Correction : 0.00 (lb/in)
Volume : 38.192 (in^3) Piston Weight : 0.00 (gm) Area Correction : Uniform

Liquid Limit : 31.34 Plastic Limit : 16.07 Specific Gravity : 2.78

INITIAL					
	Height : 5.945 (in)	Dry Density : 117.47 (lb/ft^3)			
	Area : 6.424 (in^2)	Moisture : 14.34 %			
	Void Ratio: 0.48				
	Saturation: 83.60 %				
Time : 0.00 (min)					
INITIALIZATION					
dH : 0.000 (in)	Height : 5.945 (in)	Dry Density : 117.47 (lb/ft^3)	Total Vert. Stress : 125.56 (lb/in^		
dV : 0.000 (in^3)	Area : 6.424 (in^2)	Moisture : 14.34 %	Total Hori. Stress : 125.56 (lb/in^		
	Void Ratio: 0.48		Pore Pressure : 0.00 (lb/in^2)		
	Saturation: 83.60 %		Effect.Vert. Stress: 125.56 (lb/in^		
Time : 0.00 (min)			Effect.Hori. Stress: 125.56 (lb/in^		
END OF CONSOLIDATION - A					
dH : 0.000 (in)	Height : 5.945 (in)	Dry Density : 117.47 (lb/ft^3)	Total Vert. Stress : 125.56 (lb/in^		
dV : 0.000 (in^3)	Area : 6.424 (in^2)	Moisture : 14.34 %	Total Hori. Stress : 125.56 (lb/in^		
	Void Ratio: 0.48		Pore Pressure : 0.00 (lb/in^2)		
	Saturation: 83.60 %		Effect.Vert. Stress: 125.56 (lb/in^		
Time : 0.00 (min)			Effect.Hori. Stress: 125.56 (lb/in^		
END OF SATURATION					
dH : 0.000 (in)	Height : 5.945 (in)	Dry Density : 117.47 (lb/ft^3)	Total Vert. Stress : 125.56 (lb/in^		
dV : 0.000 (in^3)	Area : 6.424 (in^2)	Moisture : 13.05 %	Total Hori. Stress : 125.56 (lb/in^		
dVCorr : 0.000 (in^3)	Void Ratio: 0.48		Pore Pressure : 0.00 (lb/in^2)		
	Saturation: 76.10 %		Effect.Vert. Stress: 125.56 (lb/in^		
Time : 0.00 (min)			Effect.Hori. Stress: 125.56 (lb/in^		
END OF CONSOLIDATION - B					
dH : 0.157 (in)	Height : 5.788 (in)	Dry Density : 127.29 (lb/ft^3)	Total Vert. Stress : 125.56 (lb/in^		
dV : 2.946 (in^3)	Area : 6.090 (in^2)	Moisture : 13.05 %	Total Hori. Stress : 125.56 (lb/in^		
	Void Ratio: 0.36		Pore Pressure : 70.00 (lb/in^2		
	Saturation: 99.99 %		Effect.Vert. Stress: 55.56 (lb/in^2		
Time : 0.00 (min)			Effect.Hori. Stress: 55.56 (lb/in^2		
FAILURE DURING SHEAR					
dH : 0.502 (in)	Height : 5.443 (in)	Dry Density : 127.29 (lb/ft^3)	Total Vert. Stress : 200.36 (lb/in^		
dV : 2.946 (in^3)	Area : 6.668 (in^2)	Moisture : 13.05 %	Total Hori. Stress : 125.56 (lb/in^		
Strain : 8.67 %	Void Ratio: 0.36		Pore Pressure : 86.55 (lb/in^2		
Strength: 37.40 (lb/in^2)	Saturation: 99.99 %		Effect.Vert. Stress: 113.81 (lb/in^		
Time : 581.62 (min)			Effect.Hori. Stress: 39.01 (lb/in^2		
END OF TEST					
dH : 1.161 (in)	Height : 4.784 (in)	Dry Density : 127.29 (lb/ft^3)	Total Vert. Stress : 197.19 (lb/in^		
dV : 2.946 (in^3)	Area : 7.618 (in^2)	Moisture : 13.05 %	Total Hori. Stress : 125.56 (lb/in^		
Strain : 20.06 %	Void Ratio: 0.36		Pore Pressure : 81.18 (lb/in^2		
	Saturation: 99.99 %		Effect.Vert. Stress: 116.01 (lb/in^		
Time : 1331.30 (min)			Effect.Hori. Stress: 44.38 (lb/in^2		

URS

	Boring No. : VQ-40 Sample No: 12 Tested by : R. Taraya Filename : VQ40-012	Project : Estates Dam Seismic Study Project No.: 26814957.H0000 Location: Piedmont, CA Date : Tue May 17 2005



Classification :
(SC) Clayey sand
Visual Description :
Brown clayey sand (SC)

Remarks :
Depth: 40.0 feet

Figure 1

URS

Tue May 17 13:00:28 2005

GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 12
Location : Piedmont, CA
Soil Description : Brown clayey sand (SC)
Remarks : Depth: 40.0 feet

Depth : 40.0 feet
Test Date : 05/17/2005
Test Method : ASTM D422/4318

Filename : VQ40-012
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	2.71	2.71	100
#4	0.187	4.75	9.34	12.05	98
#10	0.079	2.00	24.47	36.52	94
#16	0.047	1.19	38.69	75.21	88
#30	0.023	0.60	84.83	160.04	75
#50	0.012	0.30	131.66	291.70	55
#100	0.006	0.15	94.50	386.20	40
#200	0.003	0.07	49.30	435.50	33

Total Dry Weight of Sample = 647.8

D85 : 0.9945 mm
D60 : 0.3509 mm
D50 : 0.2337 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : SC
ASTM Group Name : Clayey sand
AASHTO Group Symbol : A-2-6(2)
AASHTO Group Name : Clayey Gravel and Sand

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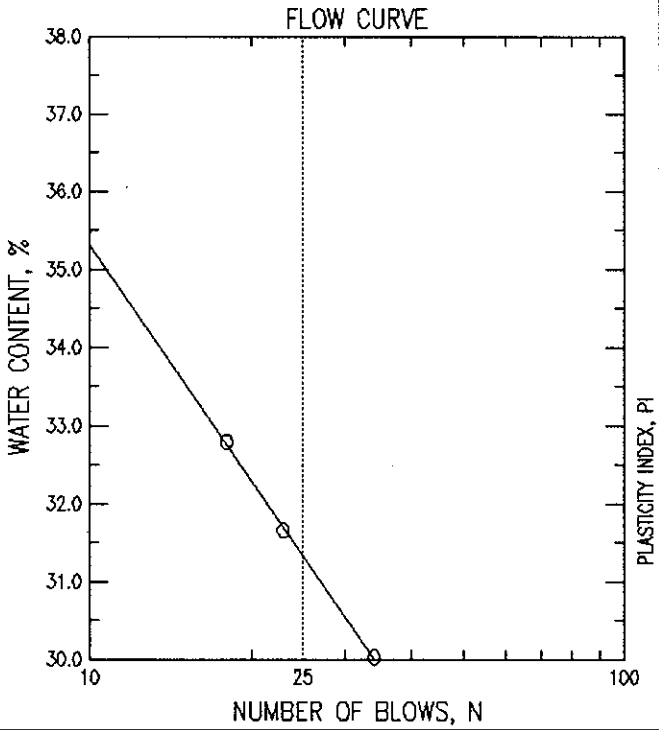
ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
Estates Dam Seismic Study	26814957.H0000	R. Taraya	VQ-40
LOCATION		CHECKED BY	SAMPLE NUMBER
Piedmont, CA		S. Capps	12
SAMPLE DESCRIPTION		DATE	FILENAME
Brown clayey sand (SC)		Tue May 17 2005	VQ40-012

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	40	44	59		
WT. WET SOIL + TARE	26.17	28.75	27.41		
WT. DRY SOIL + TARE	22.6	24.54	23.37		
WT. WATER	3.57	4.21	4.04		
TARE WT.	10.71	11.24	11.05		
WT. DRY SOIL	11.89	13.3	12.32		
WATER CONTENT, W_N (%)	30.03	31.65	32.79		
NUMBER OF BLOWS, N	34	23	18		
ONE-POINT LIQUID LIMIT, LL	31.16	31.34	31.51		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	88				
WT. WET SOIL + TARE	32.95				
WT. DRY SOIL + TARE	29.93				
WT. WATER	3.02				
TARE WT.	11.14				
WT. DRY SOIL	18.79				
WATER CONTENT (%)	16.07				



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	15.1
LIQUID LIMIT, LL	31.3
PLASTIC LIMIT, PL	16.1
PLASTICITY INDEX, PI	15.3
LIQUIDITY INDEX, LI*	-0.06

*LI = (W - PL)/PI

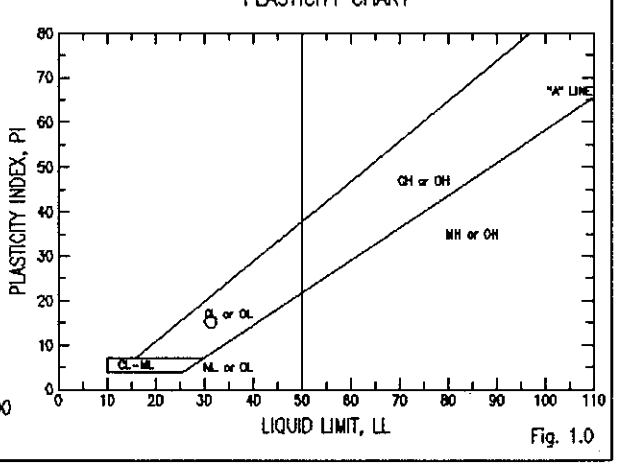


Fig. 1.0

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GEOTECHNICAL LABORATORY TEST DATA

Project : Estates Dam Seismic Study
Project No. : 26814957.H0000
Boring No. : VQ-40
Sample No. : 12
Location : Piedmont, CA
Soil Description : Brown clayey sand (SC)
Remarks : Depth: 40.0 feet

Depth : 40.0 feet
Test Date : 05/17/2005
Test Method : ASTM D422/4318

Filename : VQ40-012
Elevation : NA
Tested by : R. Taraya
Checked by : S. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	VQ39-3	0.00	2711.20	2355.90	15.08

Average Moisture Content = 15.08

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	88	11.14	32.95	29.93	16.07

Plastic Limit = 16.07

Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	40	10.71	26.17	22.60	34	30.03
2)	44	11.24	28.75	24.54	23	31.65
3)	59	11.05	27.41	23.37	18	32.79

Liquid Limit = 31.34
Plastic Index = 15.27

Appendix E
Site Geology

John Wakabayashi, Ph.D., P.G.
Geologic Consultant
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johnwako@sbcglobal.net

May 25, 2005

Lelio Mejia, Ph.D., P.E.
Principal and Vice President
URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612

Dear Dr. Mejia,

The following memorandum is a description of the site geology at Estates Dam. I have embedded the figure within the main Word file, so there is no need for a separate figure and text file.

Please contact me if you have any questions.

Sincerely,

John Wakabayashi
P.G. No. 5890

SITE GEOLOGY, ESTATES DAM
DRAFT FINAL

General

Estates Dam was constructed across a gully near a ridgetop in Piedmont, California. The rock at the damsite and surrounding the reservoir appears to be blueschist-facies metagraywacke of the Franciscan Complex. There is some uncertainty in the location of contacts between bedrock units at the dam and reservoir, because only two limited exposures of rock were found during the field reconnaissance and it was not clear whether those two exposures were actually in-place bedrock. This issue will be discussed further in the next section. The site of the dam and reservoir is surrounded by residential neighborhoods that have existed for decades. Bedrock exposures are scarce in this area, and many exposures are on private residential land. Residential development, including the cutting, grading, and filling associated with construction of homes and roads, has significantly altered the land surface, masking the natural geomorphology and distribution of surficial deposits that existed before.

The Hayward Fault is located about 430 meters (1400 feet) northeast of Estates Dam (Lienkaemper, 1992) (Fig. 1). The Hayward Fault in this area strikes subparallel to the Warren Freeway and is located slightly east of the freeway. This fault marks the contact between Franciscan Complex bedrock units to the west and Coast Range ophiolite, Great Valley Group with minor Franciscan Complex rocks to the east. Several different Franciscan Complex rock units crop out west of the Hayward fault and the strikes of their bedding, as well as the strikes of the bounding contacts, are slightly more westerly (by about 15 to 20 degrees) than that of the Hayward fault. This bedrock structural grain and resultant erosional contrasts may have influenced the general shape of the hills in this area because the ridgecrests trends have a similar orientation. The Franciscan rock units west of the Hayward fault, including those in the vicinity of the Estates Dam and Reservoir have a northeasterly dip.

Because of the modification of the land surface by development, assessment of geomorphology related to active faulting is difficult. The Franciscan bedrock of the site contains a number of small shears (EBMUD 1939; Shannon and Wilson, 1965b; Wahler and Associates, 1980), as is typical for these rocks. Most such structures formed over 80 million years ago, but there is no difference in physical appearance between old faults and active ones because both types of faults would have formed under brittle conditions. There are no stratigraphic overlap relationships or intrusive relationships to constrain the age of faults or shears in the dam site area. Examination of 1939 vintage air photos that predated most, but not all, of the development in the area does not reveal any geomorphic features indicative of active faulting passing through the dam or reservoir site.

The site geology is shown on Figure 1. The Franciscan bedrock units in the vicinity of the dam site will be described below, followed by a discussion of faulting at the dam site and slope stability in the area.

Franciscan Complex: Blueschist-facies metamorphic unit (KJfm on Fig. 1).

Most of this rock unit consists of weakly foliated blueschist-facies metagraywacke but bluish, schistose or phyllitic, metavolcanic rocks also are present; such rocks are commonly referred to as “blueschists”. None of the latter were found in the vicinity of the reservoir or dam. The metagraywacke appears to underlie the reservoir based on two outcrops observed in a field reconnaissance done on February 3, 2005. One apparent outcrop is located along the cutslope northwest of the reservoir, and the other outcrop was found beneath ivy that covers the cutslope

south of the southeast corner of the reservoir. The rocks comprising these two outcrops consist of weakly foliated metagraywacke. The interpretation that this rock type underlies the reservoir is dependent on these two outcrops being in place. Based on previous reports these small outcrops appear to represent the underlying bedrock, but there are two reasons for skepticism about these rocks: (1) the outcrops are small (less than a meter across), and (2) they occur significantly west of the western margin of this unit originally mapped by Wakabayashi (1984; note, however, that this mapping excluded rocks within the reservoir grounds). Earlier investigations (EBMUD 1939; Shannon and Wilson, 1965; Wahler Associates, 1980) had access to drill core samples or excavation exposures, but they described the rock as Franciscan sandstone, a description that would apply to the metagraywacke unit and the unfoliated graywacke unit to the west. If the two exposures of rock found on the perimeter of the reservoir are *not* in-place bedrock, then it is possible that the sandstone unit underlying the reservoir and the dam axis is the unfoliated sandstone of the Alcatraz terrane (see next section) instead of the foliated unit because this unit is thicker (broader in map view) both north and south of the reservoir area (Fig. 1). The following discussions of site geology will assume that the two outcrops observed along the perimeter of the reservoir are in place. One consequence of the two reservoir perimeter outcrops being metagraywacke is that it significantly changes the local bedrock distribution noted by Wakabayashi (1984) and reviewed in Wakabayashi (2005). In particular, the basis for the northeast-striking bedrock cross fault noted in the discussion of Wakabayashi (2005) would not exist.

The weakly foliated metagraywacke found in the reservoir vicinity is part of a belt, up to 400 meters (1300 feet) wide of similar rocks that extends northwest of Lake Temescal, an along-strike length of about 5 km (3 mi.); another belt of identical rocks crops out north of Berkeley, and these rocks have collectively been called the Angel Island nappe (Wakabayashi, 1992). The rock does not have a strong tendency to break along the foliation planes, probably because the foliation is comparatively weakly developed. Consequently the pattern of fracture in outcrops differs little from the unfoliated sandstone unit that structurally underlies it. Moreover, the metagraywacke and unfoliated sandstones weather to the same light tan color in surface outcrops, making the two units difficult to distinguish without closer inspection of freshly broken surfaces. The metagraywacke is hard and strong when fresh and ranges from little to intensely fractured.

Petrographic analysis shows the foliated metagraywacke to contain typical blueschist facies metamorphic minerals such as jadeite, lawsonite, and glaucophane in addition to common sandstone constituents such as quartz, albite, white mica, and chlorite, (Wakabayashi, 1992; 1999a). No fossil or isotopic age data are available on this unit in this area, but Wakabayashi (1992) correlated this unit to similar rocks on Angel Island that have yielded early Cretaceous fossils. An early to mid Cretaceous metamorphic age has been estimated for this unit by means of correlation to isotopically dated units of similar structural setting and lithology (Wakabayashi, 1992; 1999b).

In the reservoir area, the rocks strike northwesterly and dip northeast, similar to other Franciscan units in the area. The western boundary of this unit apparently passes just east of the axis of the dam, as constrained by the surface outcrops and by four boreholes, including two on the dam axis, that encountered Alcatraz terrane sandstone and sheared shale (Fig. 1). There is a profound difference in metamorphic grade between the metagraywacke unit and the unfoliated, prehnite-pumpellyite facies, graywacke unit to the west. The difference in metamorphic grade indicates that the contact between the two units must be a fault. Although there is no exposure of

the fault zone anywhere in the reservoir vicinity, a correlative contact between identical jadeite-bearing metagraywacke on the east and prehnite-pumpellyite facies graywacke on the west is exposed in El Cerrito in an inactive quarry (Wakabayashi, 1999a). Here the contact is marked by a shale matrix mélange zone (shear zone) that is 20 to 30 meters (60-100 feet) thick. Based on observations at this exposure the shear zone matrix is somewhat stronger than typical mélange matrix because it has undergone some recrystalization. However, it is still moderately to intensely fractured and, at best, moderately strong. Blocks observed in this shear zone at El Cerrito are mostly unfoliated graywacke that is hard and strong and little to intensely fractured. Such blocks appear to range up to at least 6 m (20 ft) in long dimension. Smaller blocks of hard and strong basalt and chert are also found at the El Cerrito locality. The maximum dimension of such blocks observed is about 3 m (10 feet).

Franciscan Complex: Alcatraz Terrane (Kfa on Fig. 1)

This unit consists of unfoliated sandstones and shales and it forms a belt parallel to and west of the foliated metagraywacke (Fig. 1). These rocks crop out in a belt up to 500 m (1600 feet) wide and it extends northwest of Lake Temescal, giving the belt a length of about 5 km (3 mi.) along strike and it also forms a separate belt of outcrops in El Cerrito. This unit strikes northwest and dips northeast, placing it structurally beneath the metamorphic unit. The sandstones petrographically resemble Alcatraz terrane rocks found in San Francisco and the unit occupies the same structural position within the Franciscan Complex in general, so they have been assigned to the Alcatraz terrane (Wakabayashi, 1992), which has a mid Cretaceous depositional age (Elder and Miller 1993). This unit ranges from well bedded to a "broken formation". The broken formation is essentially a unit consisting of some preserved sandstone and shale bedding but locally exhibiting block-in-matrix structure of sheared shale (matrix) and sandstone blocks. This broken formation texture is apparent in bedrock samples taken from the four new borings completed on and slightly downstream of the dam axis (locations shown on Fig. 1). This belt of rocks apparently narrows considerably in the vicinity of Estates Dam (Fig. 1) and passes west of the reservoir. The sandstones of this unit are hard and strong when fresh and range from little to intensely fractured. The sheared shale is soft and weak.

Franciscan Complex: Mélange including Marin Headlands Terrane rocks (KJfmh on Fig. 1)

This unit consists of a shale matrix, seldom exposed, with blocks of unfoliated sandstone (graywacke), chert, basalt (commonly called “greenstone”), and serpentinite. The chert and basalt are correlative to the Marin Headlands Terrane of Jurassic to mid Cretaceous age (Wakabayashi, 1992). The matrix foliation and bedding of included blocks strikes northwest and dip northeast, so the unit structurally underlies the Alcatraz terrane. Because the adjacent sandstone units both east and structurally above(Alcatraz terrane) and west and structurally below (Novato Quarry) consist of vastly different rocks of different origins, the bounding contacts of this mélange unit are considered faults; indeed the entire unit can be considered an ancient fault zone (Wakabayashi, 1992). Because the sheared matrix forms few exposures, the presence of this unit is mapped primarily on the basis of chert and basalt (Fig. 1). The presence of a large chert outcrop about 150 m (500 ft) south of the reservoir suggests that the eastern border of this unit passes close (likely less than 50 m) to the downstream toe of the dam (Fig. 1). This unit has widely varying physical characteristics. The matrix is generally friable and weak and intensely fractured to crushed, and weathering commonly alters the sheared shale to clay. When fresh, the sandstone blocks are commonly hard and strong to very strong and little to

intensely fractured. Fresh basalt blocks are generally hard and strong to very strong and massive to intensely fractured. Chert blocks are very hard and strong to very strong, and closely to intensely fractured, except for some recrystallized blocks that exhibit much wider fracture spacing.

Franciscan Complex: Novato Quarry Terrane (Knq on Fig. 1)

This is the westernmost belt of Franciscan rocks in the area and it consists of sandstones and shales that contain a significant amount of potassium feldspar. This unit was deposited in the late Cretaceous (Blake et al., 1984). It is the most extensive Franciscan rock unit in this part of the East Bay and it forms a belt of rocks that strikes northwest, dips northeast and includes Albany Hill and the exposures at Rockridge quarry. These rocks are commonly hard, strong, and little to intensely fractured.

Franciscan Complex: undifferentiated mélange (Kjfmel on Fig. 1)

This unit crops out directly west of the Hayward fault in the vicinity of Park Avenue (the major freeway interchange southeast of the reservoir site in Fig. 1). Limited exposures suggest that this unit consists of a sheared shale matrix with blocks that include serpentinite, the Franciscan metamorphic unit (KJfm) described above, and a variety of other rock types. On the basis of the included units and the local field relations, this unit probably formed in the Cretaceous. As with the mélange unit KJfmh described above, the physical properties of the rocks vary. The matrix is weak, but some of the blocks may be very hard and strong. The location of the western contact of this unit is poorly constrained owing to scarcity of outcrops, particularly the northern part of this contact. It is possible that this unit extends north and underlies most of the area of subdued topography northwest of the Warren Freeway-Park Avenue interchange and south of the end of the steep east-facing slope above Warren Freeway.

Dam fill and possible underlying native soil

The dam is composed primarily of heterogenous fill, that is mixed in color and physical character. Based on the lithology of the gravel, this fill appears to be derived from Franciscan source material similar to that present in the reservoir area. In the four borings drilled through the dam (VQ-37, 38, 39, 40; locations shown but not numbered on Fig. 1), a fine-grained unit, poor in gravel, fairly rich in organics, and of uniform color and texture, was encountered directly above bedrock. This unit was 10, 13, 7, and 6 feet thick in borings VQ-37, 38, 39, and 40, respectively. It is difficult to determine, on appearance alone, whether or not this unit is fill or native soil. In one boring, VQ-38, this unit appears to be fill based on an abrupt contact with underlying weathered bedrock that has a very different color. In other borings, the contact relations with underlying bedrock were not directly observed, so the origin of the unit in those borings is less certain. However, because this unit in VQ-37, 39, and 40, appears remarkably similar to the unit that appears to be fill in VQ-38, it is most likely that this unit is fill.

Faulting in dam site vicinity

The Hayward fault passes about 430 m (1400 ft.) northeast of the dam and is the only fault with demonstrated Holocene activity that has been mapped near the reservoir or dam (Fig. 1). The Franciscan rock units are bordered by faults and contain many minor faults and shears, as a consequence of subduction-related deformation that took place (for the units in the dam site area) in the Cretaceous (Wakabayashi, 1992; 1999b). There is no positive evidence for Holocene

reactivation of any of these features, either as independent faults or as structures that exhibit coseismic movement with earthquakes on the Hayward fault. However, geomorphic evidence that would normally be used to assess potential activity of structures in this area has been obscured or erased by development. There are no stratigraphic overlap relationships or intrusive relationships to constrain the age of faults or shears in the dam site area. The earliest set of air photos we examined was taken in 1939, a time that predated most, but not all, of the development in the reservoir vicinity. No lineaments or other geomorphic features that might be associated with active fault movement were noted in the dam vicinity, except for the Hayward fault as delimited by Lienkaemper (1992). Given the distance between the dam site and the Hayward fault, it is likely that any hypothetical active features passing through the dam site would not be independent faults, but rather ones that move sympathetically with earthquakes on the Hayward fault (the last major earthquake on which occurred in 1868). No evidence for 1868 surface deformation in the reservoir or dam area was noted in the various reports of the 1868 earthquake features reviewed by Lienkaemper (1992). The lack of surface geomorphology indicative of active fault movement in 1939 air photos and the lack of documentation of features related to surface displacement in 1868 suggest that the possibility of active fault movement through either the dam or reservoir is highly unlikely.

Slope Movement

Air photos also were examined for evidence of slope movement. This is important because large slides involving Franciscan rocks cover large portions of the East Bay hills north of Berkeley (mostly in the El Cerrito and Richmond Hills). In contrast, neither the 1939 air photos nor surface mapping show significant landslide features in the reservoir and dam vicinity. A major difference between this area and the region north of Berkeley is that the Franciscan bedrock in the latter area includes a much higher proportion of mélange (Wakabayashi 1984), the matrix of which is particularly prone to sliding. Air photos appear to show geomorphic features suggestive of either small slides or talus aprons at the base of the steep slope north and east of the reservoir and above Warren Freeway. A geomorphic feature of potential significance is an area of somewhat subdued topography that occurs southeast of the reservoir at the southern end of the steep east-facing slope above Warren Freeway described above. This feature has a shape that might suggest an eastward-directed, ancient landslide. The nature and distribution of bedrock outcrops cannot be used to rule out the possibility of an old slide mass in this area because no rock outcrops were found there, but there are at least two alternative explanations for the geomorphology in this area: (1) The area is underlain by the shale matrix melange unit Kjfmel as shown in Fig. 1 that cannot hold as steep slopes as the metagraywacke unit that forms the steep east-facing slope to the north. (2) The topography in the area is influenced by a right step along the Hayward fault. The second alternative is consistent with the width of the right (releasing, or transtensional) step observed along the Hayward fault in the vicinity of the Park Avenue-Warren Freeway interchange (Fig. 1) (Lienkaemper, 1992), but suggests that an active strand of the Hayward fault continues northwestward approximately marking the western boundary of the area of subdued topography. There is no geomorphology suggestive of an active fault trace in this area in the 1939 air photos, nor did Lienkaemper (1992) identify such a feature, either by direct examination or reviews of previous research. Consequently this second alternative is not considered a likely one. The first alternative is the interpretation shown on the map in Figure 1. That interpretation does not entirely rule out the possibility of a landslide in that area, given that the mélange unit is likely susceptible to sliding. However, if the area of subdued

topography is underlain by the mélange unit, it is a different bedrock type than that which underlies the dam and reservoir site.

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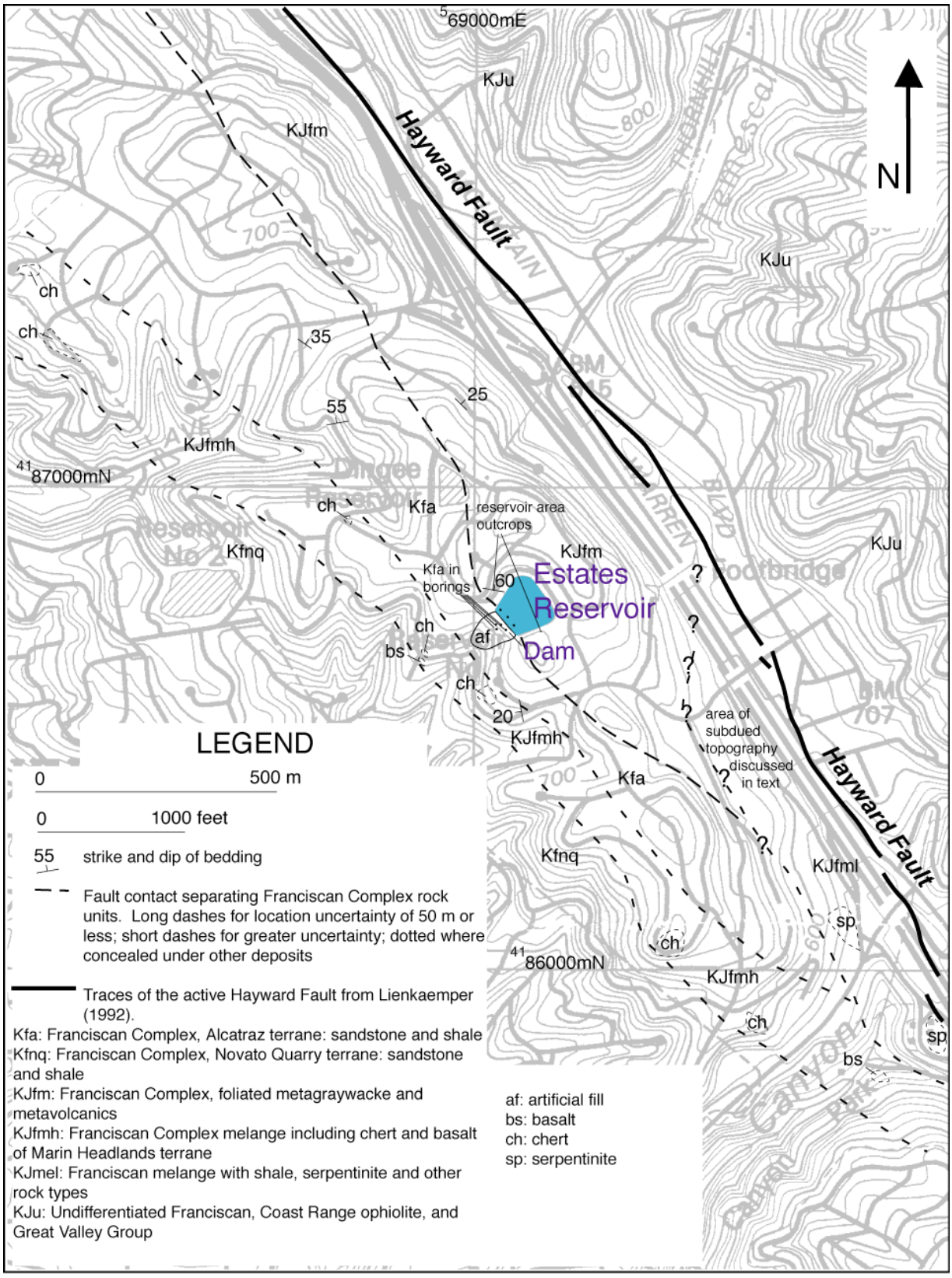

Figure 1: Geologic map of the Estates Reservoir area. Geologic mapping by J. Wakabayashi 1984, 2005; Hayward fault traces from Lienkaemper (1992)

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