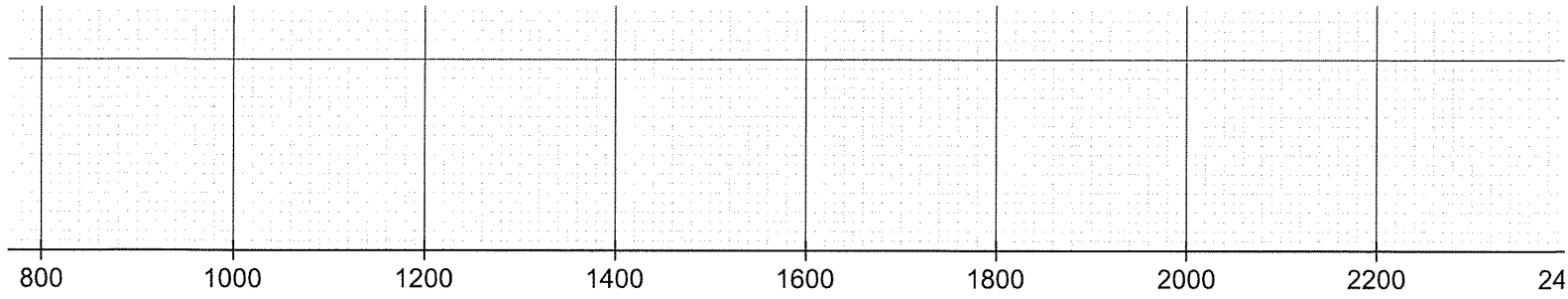
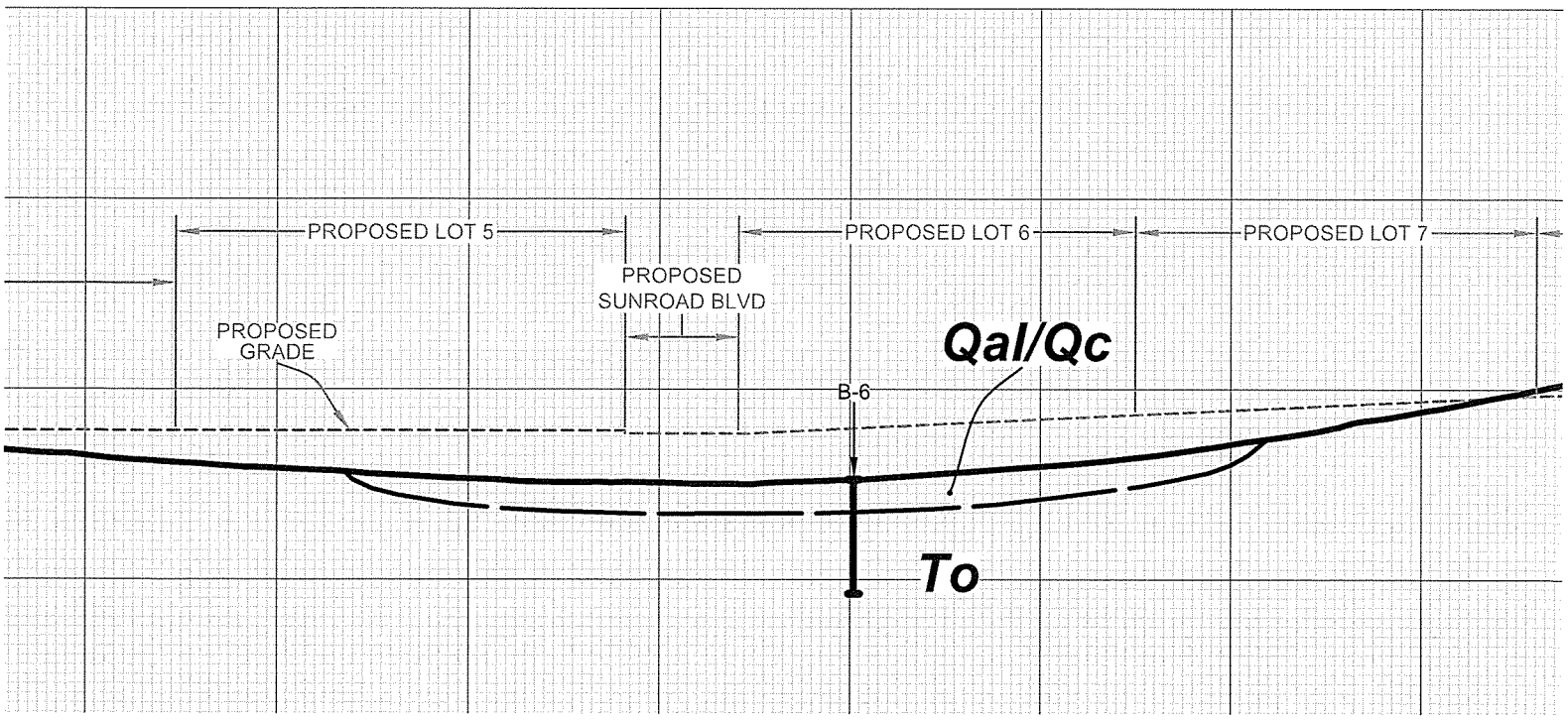


DISTANCE (FEET)

GEOLOGIC CROSS-SECTION C-C'

SCALE: 1" = 200' (Horiz.); 1" = 40' (Vert.)



ASSUMED CONDITIONS :

SLOPE HEIGHT	H	=	40 feet
SLOPE INCLINATION	2 : 1 (Horizontal : Vertical)		
TOTAL UNIT WEIGHT OF SOIL	γ_t	=	118.3 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	=	35 degrees
APPARENT COHESION	C	=	150 pounds per square foot
NO SEEPAGE FORCES			

ANALYSIS :

$\gamma c\phi$	=	$\frac{\gamma_t H \tan\phi}{C}$	EQUATION (3-3), REFERENCE 1
FS	=	$\frac{NcfC}{\gamma_t H}$	EQUATION (3-2), REFERENCE 1
$\gamma c\phi$	=	22.1	CALCULATED USING EQ. (3-3)
Ncf	=	60	DETERMINED USING FIGURE 10, REFERENCE 2
FS	=	1.9	FACTOR OF SAFETY CALCULATED USING EQ. (3-2)

REFERENCES :

1.....Janbu, N., Stability Analysis of Slopes with Dimensionless Parameters, Harvard Soil Mechanics, Series No. 46, 1954

2.....Janbu, N., Discussion of J.M. Bell, Dimensionless Parameters for Homogeneous Earth Slopes, Journal of Soil Mechanics and Foundation Design, No. SM6, November 1967.

SLOPE STABILITY ANALYSIS - FILL SLOPES

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EAST OTAY MESA CENTER MIXED-USE
SAN DIEGO, CALIFORNIA

RG / RS		DSK/GTYPD	DATE 07 - 20 - 2015	PROJECT NO. 06263 - 42 - 03	FIG. 5

Plotted:07/17/2015 1:58PM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\06263-42-03 East Otay Mesa Center Mixed Use\DETAILS\06263-42-03_(SSAF).dwg

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	= Infinite
DEPTH OF SATURATION	Z	= 3 feet
SLOPE INCLINATION	2 : 1 (Horizontal : Vertical)	
SLOPE ANGLE	i	= 26.6 degrees
UNIT WEIGHT OF WATER	γ_w	= 62.4 pounds per cubic foot
TOTAL UNIT WEIGHT OF SOIL	γ_t	= 118.3 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	= 35 degrees
APPARENT COHESION	C	= 150 pounds per square foot

SLOPE SATURATED TO VERTICAL DEPTH Z BELOW SLOPE FACE

SEEPAGE FORCES PARALLEL TO SLOPE FACE

ANALYSIS :

$$FS = \frac{C + (\gamma_t - \gamma_w)\ Z\ cos^2\ i\ tan\ \phi}{\gamma_t\ Z\ sin\ i\ cos\ i} = 2.1$$

REFERENCES :

1.....Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62

2.....Skempton, A. W., and F.A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81

SURFICIAL SLOPE STABILITY ANALYSIS - FILL SLOPES

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EAST OTAY MESA CENTER MIXED-USE
SAN DIEGO, CALIFORNIA

RG / RS		DSK/GTYPD	DATE 07 - 20 - 2015	PROJECT NO. 06263 - 42 - 03	FIG. 6

Plotted:07/17/2015 1:54PM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\06263-42-03 East Otay Mesa Center Mixed Use\DETAILS\06263-42-03_(SFSSA).dwg

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	= 40 feet
SLOPE INCLINATION	2 : 1 (Horizontal : Vertical)	
TOTAL UNIT WEIGHT OF SOIL	γ_t	= 132.3 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	= 35 degrees
APPARENT COHESION	C	= 500 pounds per square foot
NO SEEPAGE FORCES		

ANALYSIS :

$\gamma_{c\phi}$	=	$\frac{\gamma_t H \tan\phi}{C}$	EQUATION (3-3), REFERENCE 1
FS	=	$\frac{NcfC}{\gamma_t H}$	EQUATION (3-2), REFERENCE 1
$\lambda_{c\phi}$	=	7.0	CALCULATED USING EQ. (3-3)
Ncf	=	25	DETERMINED USING FIGURE 10, REFERENCE 2
FS	=	2.5	FACTOR OF SAFETY CALCULATED USING EQ. (3-2)

REFERENCES :

1.....Janbu, N., Stability Analysis of Slopes with Dimensionless Parameters, Harvard Soil Mechanics, Series No. 46, 1954

2.....Janbu, N., Discussion of J.M. Bell, Dimensionless Parameters for Homogeneous Earth Slopes, Journal of Soil Mechanics and Foundation Design, No. SM6, November 1967.

SLOPE STABILITY ANALYSIS - CUT SLOPES

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EAST OTAY MESA CENTER MIXED-USE
SAN DIEGO, CALIFORNIA

RG / RS		DSK/GTYPD	DATE 07 - 20 - 2015	PROJECT NO. 06263 - 42 - 03	FIG. 7

Plotted:07/17/2015 1:57PM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\06263-42-03 East Otay Mesa Center Mixed Use\DETAILS\06263-42-03_(SSAC).dwg

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	= Infinite
DEPTH OF SATURATION	Z	= 3 feet
SLOPE INCLINATION	2 : 1 (Horizontal : Vertical)	
SLOPE ANGLE	i	= 26.6 degrees
UNIT WEIGHT OF WATER	γ_w	= 62.4 pounds per cubic foot
TOTAL UNIT WEIGHT OF SOIL	γ_t	= 132.3 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	= 35 degrees
APPARENT COHESION	C	= 350 pounds per square foot

SLOPE SATURATED TO VERTICAL DEPTH Z BELOW SLOPE FACE

SEEPAGE FORCES PARALLEL TO SLOPE FACE

ANALYSIS :

$$FS = \frac{C + (\gamma_t - \gamma_w)\ Z\ cos^2\ i\ tan\ \phi}{\gamma_t\ Z\ sin\ i\ cos\ i} = 4.1$$

REFERENCES :

1.....Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62

2.....Skempton, A. W., and F.A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81

SURFICIAL SLOPE STABILITY ANALYSIS - CUT SLOPES

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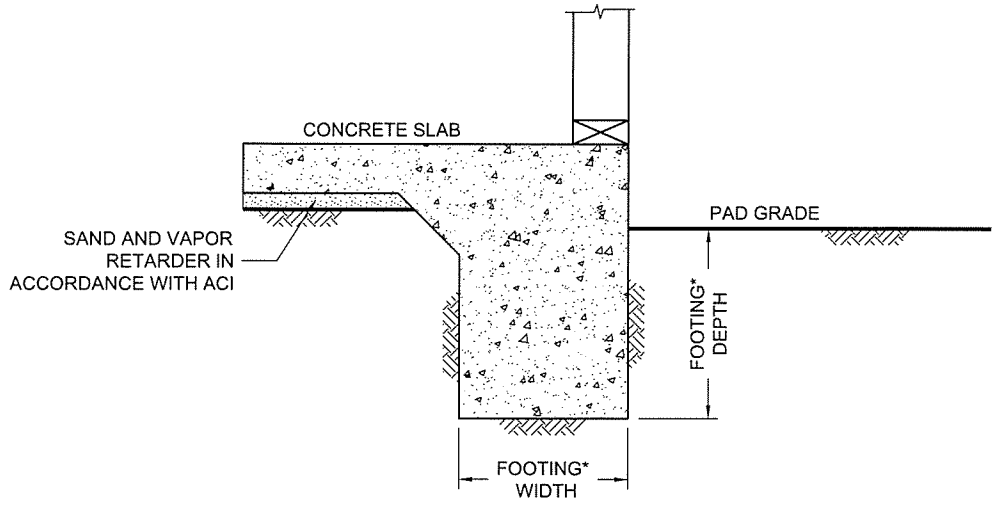
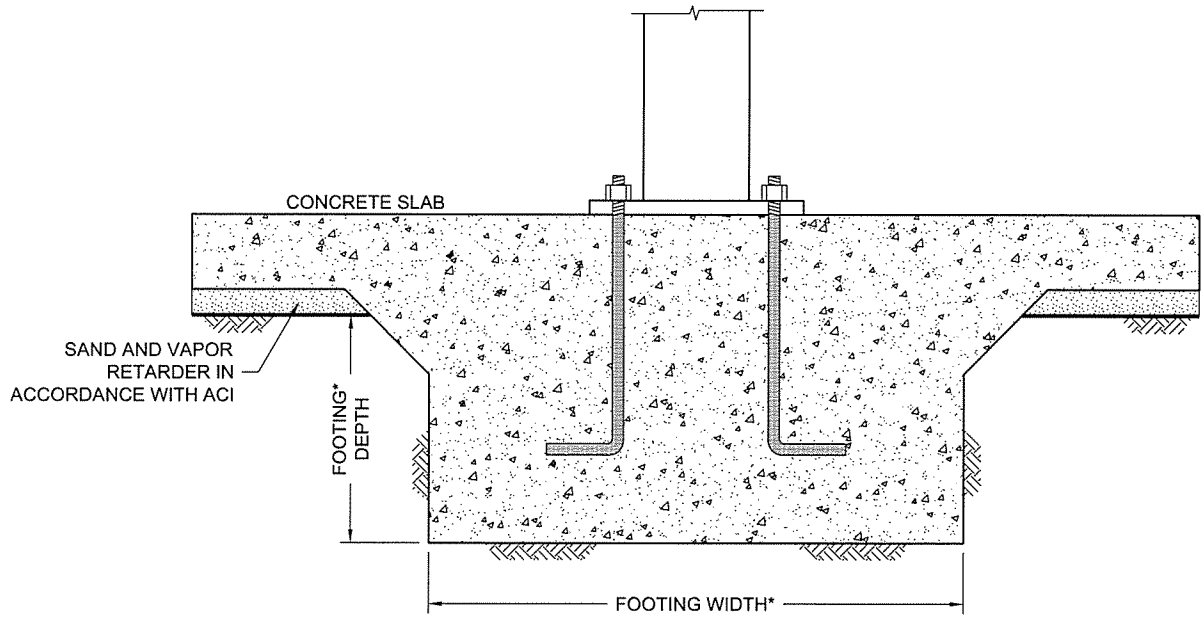
EAST OTAY MESA CENTER MIXED-USE
SAN DIEGO, CALIFORNIA

RG / RS		DSK/GTYPD	DATE 07 - 20 - 2015	PROJECT NO. 06263 - 42 - 03	FIG. 8

Plotted:07/17/2015 1:51PM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\06263-42-03 East Otay Mesa Center Mixed Use\DETAILS\06263-42-03_(SFSSA).(CUT-SLOPE).dwg





*....SEE REPORT FOR FOUNDATION WIDTH AND DEPTH RECOMMENDATION

NO SCALE

WALL / COLUMN FOOTING DIMENSION DETAIL

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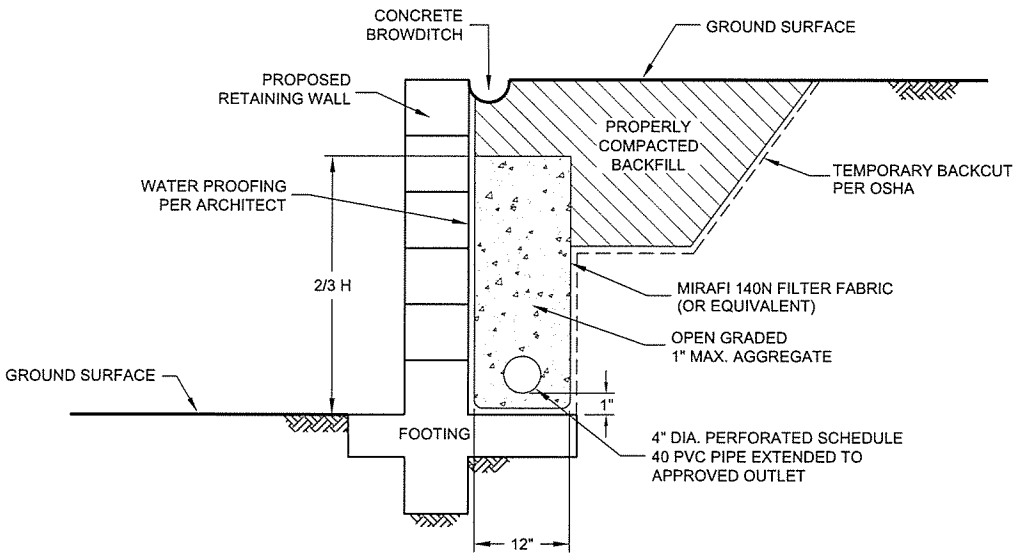
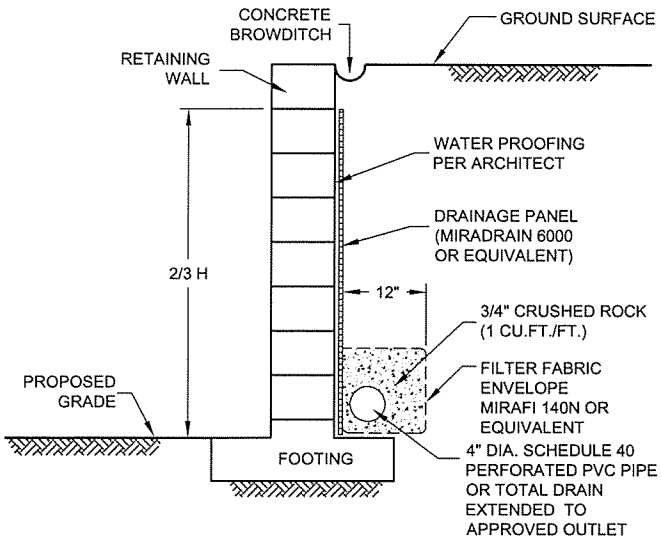
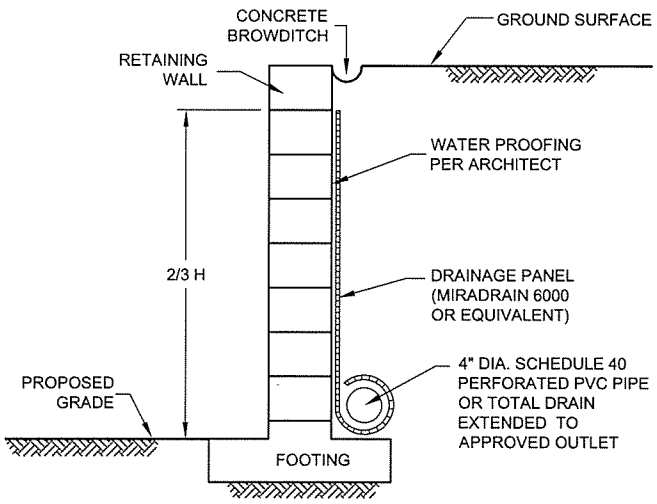
EAST OTAY MESA CENTER MIXED-USE
SAN DIEGO, CALIFORNIA

DATE 07 - 20 - 2015	PROJECT NO. 06263 - 42 - 03	FIG. 9

Plotted:07/17/2015 1:46PM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\06263-42-03 East Otay Mesa Center Mixed Use\DETAILS\06263-42-03_(COLFOOT2).dwg







NOTE :

DRAIN SHOULD BE UNIFORMLY SLOPED TO GRAVITY OUTLET OR TO A SUMP WHERE WATER CAN BE REMOVED BY PUMPING

NO SCALE

TYPICAL RETAINING WALL DRAIN DETAIL

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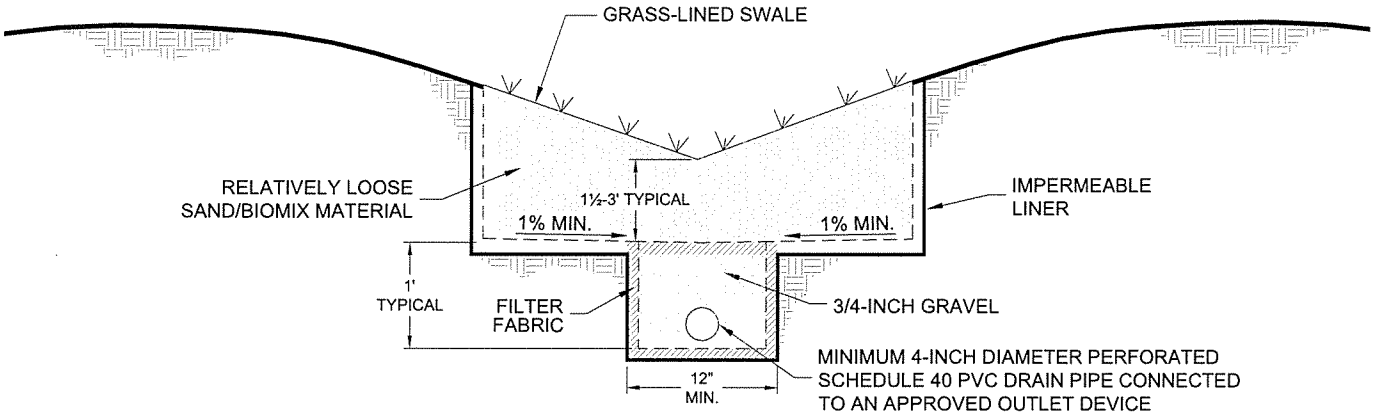
RG / RS		DSK/GTYPD

EAST OTAY MESA CENTER MIXED-USE
SAN DIEGO, CALIFORNIA

DATE 07 - 20 - 2015	PROJECT NO. 06263 - 42 - 03	FIG.10

Plotted:07/17/2015 1:47PM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\06263-42-03 East Otay Mesa Center Mixed Use\DETAILS\06263-42-03_(RWDD7A).dwg



NO SCALE

VEGETATED SWALE BIOFILTER DETAIL

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RG / CW		DSK/GTYPD

EAST OTAY MESA CENTER MIXED-USE
SAN DIEGO, CALIFORNIA

DATE 07 - 20 - 2015	PROJECT NO. 06263 - 42 - 03	FIG. 11

Y:\PROJECTS\06263-42-03 East Otay Mesa Center Mixed Use\DETAILS\VSBD_2 (Bioswale).dwg

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

The field investigation was performed between September 7 and September 20, 1990, and consisted of geologic mapping of 11 large-diameter exploratory borings and 26 exploratory trenches at the approximate locations shown on the attached Geologic Map, Figure 2 (Map Pocket). The borings were advanced to depths ranging from 20 feet to 90 feet below existing grade utilizing an E100 drill-rig equipped with a 30-inch-diameter bucket auger. The trenches were excavated utilizing a John Deere 710 backhoe and/or a John Deere 555 trackhoe.

Relatively undisturbed samples were obtained from the borings by driving a three-inch O. D. split-tube sampler into the soil mass with blows from the drill rig's Kelly bar falling 12 inches. The sampler was equipped with 1-inch by 2⅜-inch brass sampler rings to facilitate removal and testing. Disturbed samples of prevailing soils were also obtained from the borings and trenches.

The soil conditions encountered in the trenches were visually examined, classified, and logged in general conformance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D 2844). The logs of the exploratory borings and trenches are presented on Figures A-1 through A-45. The logs depict the various soil types encountered and indicate the depths at which samples were obtained.

FILE NO. 04581-03-01

BORING B 1

ELEVATION 572 DATE COMPLETED 9/10/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL** Soft, dry, dark gray, Sandy CLAY			
4					**OTAY FORMATION** Highly weathered, fractured, dry, whitish gray Silty fine SANDSTONE interbedded with Sandy SILTSTONE			
6	B1-1			SM		3/12"	103.3	16.1
8				CL	Hard, humid, fractured purplish CLAYSTONE, bedding attitude near horizontal			
10								
12	B1-2			SM	Very dense, humid, light gray Silty fine SANDSTONE	3/12"	105.8	16.6
14	B1-4			ML				
16	B1-3			SM	Purplish sandy siltstone from 14 to 15 feet Very dense, humid, light gray Silty fine SANDSTONE	5/12"	108.7	16.2
18								
20								
22	B1-5			ML	Very stiff to hard, humid, purplish-brown Clayey SILTSTONE. Contact gradational	3/12"	84.1	35.8
24				CH	Bentonite layer approximately 6 inches thick, attitude horizontal. Shear zone bedding plane fault 1/2 inch thick - horizontal			
26	B1-6			ML	Hard, humid, pinkish-gray, Clayey SILTSTONE	13/12"	125.7	10.5
28				SM	Grades into massive, gray, very fine silty sandstone at 27 feet			
	B1-7			ML	Grades into hard, purplish siltstone	10/12"	114.8	17.1

Figure A-1 Log of Test Boring B 1, page 1 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▩ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

BORING B 1

ELEVATION 572 DATE COMPLETED 9/10/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30		SM	at 29 feet Grades into hard, purplish siltstone at 29 feet (continued)			
32		SM	Very dense, moist, light gray, massive, fine Silty SANDSTONE			
34		CL	Hard claystone layer. Attitude near horizontal			
36		SM	Very dense, moist, light gray, massive, fine Silty SANDSTONE			
38		CL				
40	B1-8	SM	Hard claystone bed from 38.5 to 39.5 feet Very dense, moist, light gray, massive, fine Silty SANDSTONE	20/12"	129.3	6.0
42		SP	Very hard, well-cemented sandstone from 42.5 to 43.5			
44		SM	Very dense, moist, light gray, massive, fine Silty SANDSTONE			
46		SM	Very hard, moist, massive, light gray Sandy SILTSTONE			
48						
50	B1-9	SM	Very dense, moist, gray, massive fine Silty SANDSTONE	17/12"	106.6	20.6
52						
54						
56		CL	Very hard, massive, humid, purplish brown Silty CLAYSTONE			
58		CH	Very hard, purplish-gray, Bentonitic CLAY conchoidal fracturing			

Figure A-2 Log of Test Boring B 1, page 2 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

BORING B 1

ELEVATION 572 DATE COMPLETED 9/10/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
60	B1-10			CH	Very hard, purplish-gray, Bentonitic CLAY conchoidal fracturing (continued)	11/12"	65.5	54.6
62					Hard, pink BENTONITE			
64				ML	Shear zone, soft, highly remolded 1 to 3 inch thick. Attitude near horizontal 62 to 63 feet			
66					Very dense, moist, massive, dark gray fine Silty SANDSTONE			
68					Grades into very hard, light brown siltstone at 63.5 feet			
70								
72	B1-11			SM	Very dense, moist, massive, brownish-gray, very fine, Silty SANDSTONE		126.9	6.6
74								
76				SM	Very hard, moist, purplish-brown, massive Sandy SILTSTONE			
78								
80	B1-12			SM	Very dense, massive, fine SANDSTONE		117.1	13.3
82								
84				SM	Very hard, humid, massive, Sandy SILTSTONE			
86								
88								
					TRENCH TERMINATED AT 90 FEET		92.5	27.0

Figure A-3 Log of Test Boring B 1, page 3 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▨ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

BORING B 2

ELEVATION 576 DATE COMPLETED 9/11/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL** Loose, dry, dark gray Silty CLAY			
4				SM	**OTAY FORMATION** Medium dense, humid, fractured, weathered light grayish-brown Silty SANDSTONE			
6	B2-1					3/12"	102.6	17.4
8				CL	Hard, humid, purple, massive CLAYSTONE			
10	B2-2			SM	Grades into very dense massive, Silty SANDSTONE	9/12"	118.2	11.9
12								
14				CL	Hard, humid, purple claystone from 12.5 to 14 feet			
16	B2-3			SM	Grades into very dense massive, Silty SANDSTONE	8/12"	122.2	11.4
18								
20	B2-4			CL	Hard, purple, humid claystone from 19.5 to 20.5 feet	7/12"	108.9	19.0
22				SM	Grades into very dense massive, Silty SANDSTONE			
24								
26	B2-5			CH	Hard pink bentonite bed approximately horizontal from 24.5 to 25.5 feet	6/12"	111.3	11.4
				SM				
28				SP	Grades into very dense massive, Silty SANDSTONE			
				SM				
					Hard, well-cemented sandstone from			

Figure A-4 Log of Test Boring B 2, page 1 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▨ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

BORING B 2

ELEVATION 576 DATE COMPLETED 9/11/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	B2-6			SM	27 to 28 feet	14/12"	118.4	10.3
32					Very dense, massive, Silty SANDSTONE (continued)			
				CL	Hard, humid, brown Sandy CLAYSTONE			
34								
36				SM	Very dense, humid, massive, light gray, very fine Silty SANDSTONE			
38								
40	B2-7						105.7	9.8
42								
44								
46				CL	Hard, humid, dark gray Silty CLAYSTONE			
48								
50	B2-8			SM	Very dense, humid, massive, light gray, medium cemented, very fine Silty SANDSTONE	9/12"	103.3	13.9
52								
54								
56				CL	Hard, humid, purple, CLAYSTONE Grades into hard, dark gray bentonitic claystone at 56.5 feet			
58				CH	Hard, brittle, pinkish-brown BENTONITE			

Figure A-5 Log of Test Boring B 2, page 2 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▨ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

BORING B 2

ELEVATION 576 DATE COMPLETED 9/11/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
60	B2-9			SP	Very dense, humid, gray, massive fine SANDSTONE		64.4	57.4
62								
64								
66								
68								
					BORING TERMINATED AT 69 FEET			

Figure A-6 Log of Test Boring B 2, page 3 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

BORING B 3

ELEVATION 606 DATE COMPLETED 9/12/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL** Soft, dry, blackish-brown Sandy CLAY			
4				SC	**OTAY FORMATION** Fractured, weathered, dry, whitish-tan Clayey SANDSTONE			
6	B3-1					2/12"	99.2	20.6
8				SM	Very dense, moist, light gray, fine, massive, Silty SANDSTONE			
10				ML	Stiff, humid, light brown SILTSTONE (volcanic tuff)			
12	B3-2			SM	Very dense, moist, light gray, fine, massive, Silty SANDSTONE	6/12"	111.7	11.5
14	B3-3			CL	Hard, humid, purplish-brown CLAYSTONE	8/12"	112.7	15.1
16				SM	Very dense, moist, light gray, fine, massive, Silty SANDSTONE			
18								
20	B3-4					7/12"	113.5	9.9
22				SP	Well cemented SANDSTONE from 21 to 21.5 feet			
				SM				
24				CL	Very dense, moist, light gray, fine, massive, Silty SANDSTONE			
	B3-5				Hard, humid, purple, massive CLAYSTONE	16/12"	114.4	13.2
26				SP	Very dense, humid, light gray, fine SANDSTONE			
28				CL	Hard, humid, light brown, massive CLAYSTONE			

Figure A-7 Log of Test Boring B 3, page 1 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▨ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 3

ELEVATION 606 DATE COMPLETED 9/12/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	B3-6			SM	Hard, humid, massive, light gray Sandy SILTSTONE	14/12"	119.3	12.4
32								
34								
36				SM	Very dense, moist, light gray, very fine Silty SANDSTONE			
38					Hard, well cemented concretions from 37.5 to 39 feet			
40	B3-7			CL/SM	Hard purplish CLAYSTONE interbedded with very dense, light gray Silty SANDSTONE. Thickness of beds 1 to 2 feet, Contact gradational, general attitude near horizontal.		99.7	13.2
42								
44								
46								
48	B3-10				Shear zone. Bedding plane fault. Thickness approximately 1 inch. Attitude horizontal. Developed along purplish claystone (above) and gray siltstone (below) from 47.5 to 47.75 feet			
50	B3-8			SM-ML	Very dense, humid, light gray, fine Silty SANDSTONE interbedded with gray Shaley SILTSTONE	23/12"	116.6	14.9
52								
54				CL	Very hard, humid, purplish-brown CLAYSTONE, grades into clayey sandstone			
56				SM	Very dense, humid, massive, light gray, fine Silty SANDSTONE. Occasional cemented zones.			
58								

Figure A-8 Log of Test Boring B 3, page 2 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 3

ELEVATION 606 DATE COMPLETED 9/12/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
60	B3-9			SM	Very dense, humid, massive, light gray, fine Silty SANDSTONE. Occasional cemented zones. (continued)		105.7	13.2
62								
64								
66								
68								
70	B3-11			CL	Hard, humid, purplish-brown CLAYSTONE	20/12"	110.9	18.5
72								
74				SM	Very dense, humid, light gray Silty SANDSTONE with occasional siltstone zones			
76				CH	Hard, brittle, pinkish-brown bentonite seam. Thickness approximately 4 inches, poorly developed shear zone. Attitude near horizontal from 76.5 to 77 feet			
78				SM				
80	B3-12				Very dense, humid, light gray Silty SANDSTONE with occasional siltstone zones	50/12"	114.4	11.0
					BORING TERMINATED AT 81 FEET			

Figure A-9 Log of Test Boring B 3, page 3 of 3

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 4

ELEVATION 559 DATE COMPLETED 9/12/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	TOPSOIL/ALLUVIUM/COLLUVIUM Soft, dry, dark gray Sandy CLAY			
4					OTAY FORMATION Highly weathered, moist, whitish-tan			
6	B4-1			SM	Sandy SILT	2/12"	107.9	17.6
8				SM	Medium dense, humid, light gray Silty SAND			
10	B4-2			SM	Stiff, moist, fine Sandy SILTSTONE (volcanic tuff) Poorly developed shear zone attitude horizontal at 10 feet	1/12"	91.3	30.5
12				SM-ML	Very dense, moist, light grayish-brown, massive, very fine Silty SANDSTONE/ SILTSTONE			
14								
16	B4-3					4/12"	100.8	23.8
18				CL	Very hard, humid, purple-brown massive CLAYSTONE			
20	B4-4					4/12"	103.0	23.2
22				SM	Very dense, moist, massive, trace Silty SANDSTONE with trace of silt			
24								
					BORING TERMINATED AT 25 FEET			

Figure A-10 Log of Test Boring B 4, page 1 of 1

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▨ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 5

ELEVATION 547 DATE COMPLETED 9/12/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL/ALLUVIUM/COLLUVIUM** Soft, dry, dark gray Sandy CLAY Becomes moist, blackish-gray clay at 2.5 feet			
4								
6	B5-1			CL/SM	**OTAY FORMATION** Soft, moist to wet, mottled, highly weathered bioturbated CLAY Medium dense, moist, grayish-brown fine Silty SAND CaCO3 concentrations from 8 to 8.5 feet	1/12"	104.2	19.3
8								
10	B5-2			CL	Stiff, moist, purple-brown CLAYSTONE Well cemented concretion from 11 to 11.5 feet	3/12"	94.9	20.8
12								
14				SM	Very stiff, moist, dark gray, Sandy SILTSTONE			
16								
18	B5-3			ML	Hard, humid, gray SILTSTONE		103.2	20.9
20			▽		Light seepage at 20 feet			
22	B5-4						102.5	22.8
24								
					BORING TERMINATED AT 25 FEET			

Figure A-11 Log of Test Boring B 5, page 1 of 1

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▽ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 6

ELEVATION 539 DATE COMPLETED 9/12/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0			MATERIAL DESCRIPTION			
2		CL	ALLUVIUM\COLLUVIUM Medium stiff, dry-slightly damp, red-brown to gray-brown Sandy CLAY Very gravelly at 2.5 feet			
4		CL	OTAY FORMATION Medium stiff, moist, mottled red-brown and light tan Silty CLAY with CaCO3 seams; some interbedded medium dense, moist, gray-brown Silty fine SAND; highly weathered Becomes stiff at 5 feet			
6	B6-1			1/12"	102.3	21.1
8			Stiff moist-wet, light tan SILTSTONE			
10	B6-2	ML	Becomes wet from 11 to 11.5 feet	4/12"	108.5	20.5
12			Very dense, moist-wet, gray micaceous SANDSTONE, some interbedded hardened red-brown oxidized layers			
14		SM	Becomes saturated at 14 feet			
16	B6-3			3/12"	109.1	18.3
18			Highly cemented sandstone at 18.5 feet			
20	B6-4	CL	Stiff, saturated, light red-brown CLAYSTONE	5/12"	106.4	21.1
22		SM	Dense, saturated dark gray SANDSTONE			
24						
			BORING TERMINATED AT 25 FEET			

Figure A-12 Log of Test Boring B 6, page 1 of 1

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 7

ELEVATION 615 DATE COMPLETED 9/13/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0						
2		CL	**TOPSOIL** Soft, dry, dark gray Sandy CLAY Cobbles at 2.5 feet			
4			**OTAY FORMATION**			
6	B7-1	ML	Highly weathered, dry, whitish-tan, fractured calichified SILTSTONE. Numerous krotovinas along the topsoil contact	4/12"	91.7	15.5
8		SM	Stiff, humid, dark gray, fractured Sandy SILTSTONE			
10	B7-2	SM	Very dense, humid, light gray, massive weakly cemented fine Silty SANDSTONE	5/12"	109.7	12.0
12						
14		ML	Hard, humid, dark gray Sandy SILTSTONE. Bedding near horizontal.			
16	B7-3	SM	Very dense, humid, light gray, massive weakly cemented fine Silty SANDSTONE	10/12"	126.6	11.3
18						
20	B7-4			10/12"	118.6	11.8
22		SM	Volcanic tuff bed. Attitude horizontal from 22.5 to 23 feet			
24		SM-CL	Very stiff to hard, humid, purplish-brown Sandy SILTSTONE/CLAYSTONE			
26	B7-5			14/12"	124.8	10.6
28		SM	Very dense, humid, light gray, fine Silty SANDSTONE Bentonitic tuff seam. from 27.5 to 28 feet, Attitude horizontal Purple, hard, claystone from 28 to 28.5 feet			

Figure A-13 Log of Test Boring B 7, page 1 of 2

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▨ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▽ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 7

ELEVATION 615 DATE COMPLETED 9/13/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	B7-6			SM	Very dense, humid, light gray, fine Silty SANDSTONE (continued)	10/12"	109.3	22.2
32				CL	Hard, humid, purplish-brown, Silty CLAYSTONE			
				SP				
34				ML	Very dense, humid, gray massive SANDSTONE			
36				SP	Hard, purplish-brown siltstone from 34 to 35 feet			
38					Very dense, gray, massive SANDSTONE			
40					BORING TERMINATED AT 40 FEET			

Figure A-14 Log of Test Boring B 7, page 2 of 2

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 8

ELEVATION 539 DATE COMPLETED 9/13/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0			MATERIAL DESCRIPTION			
0		CL	**TOPSOIL** Loose, slightly damp to damp, yellow-brown CLAY with minor caliche, abundant grass and root matter			
2		CL				
4	B8-1		**ALLUVIUM/COLLUVIUM** Stiff, damp, brown, Sandy CLAY with Becomes dark brown CaCO3, from 3 to 4 feet	1/12"	110.9	12.1
6	B8-4	CL				
6	B8-2	SM	Dense, damp, gray-brown, Clayey fine to medium SAND with CaCo3	PUSH	87.8	31.7
8		SM	Stiff, moist, brown Sandy CLAY			
10	B8-3	SM	**OTAY FORMATION** Highly weathered, dense, moist, gray-brown Silty SAND with sub-horizontal layers of highly weathered white volcanic tuff Stiff, hard, moist, light gray-pinkish gray volcanic tuff at 8 feet	2/12"	97.1	26.6
14			Dense to hard, damp to moist, gray-brown Silty fine SAND with few interbedded layers of volcanic tuff			
16	B8-5			4/12"	105.9	20.1
18			Standing water at 19 feet			
20			BORING TERMINATED AT 20 FEET			

Figure A-15 Log of Test Boring B 8, page 1 of 1

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL ▮ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED) ⊠ ... DISTURBED OR BAG SAMPLE ▨ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 9

ELEVATION 553 DATE COMPLETED 9/13/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SC	**TOPSOIL** Loose, dry, dark brown, Clayey SAND with trace gravel			
2				CL	**COLLUVIUM** Stiff, damp, dark brown Sandy CLAY			
4					Stiff mottled dark red-brown and light tan sandy clay at 4 feet			
6	B9-1			SM	**OTAY FORMATION** Highly weathered, interbedded dense, damp gray SANDSTONE Krotovina at 5.5 feet	2/12"	104.8	11.5
8								
10	B9-2			SP	Very dense, damp, light brownish-gray SANDSTONE	3/12"	107.0	13.6
12								
14								
16	B9-3			SM-ML	Very dense to hard, damp, light pinkish-gray, tuffaceous SANDSTONE	5/12"	111.9	10.7
18				SP	Stiff, hard, damp, purplish-gray to white volcanic tuff SILTSTONE			
20	B9-4			CL	Very dense, damp, light gray-brown interlayered with pinkish-brown SANDSTONE			
22				SP	Medium stiff, damp to moist, light slightly pinkish-tan CLAYSTONE/BENTONITE Hard, damp, medium gray-brown SANDSTONE	7/12"	110.9	18.3
24								
					BORING TERMINATED AT 25 FEET			

Figure A-16 Log of Test Boring B 9, page 1 of 1

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 10

ELEVATION 518 DATE COMPLETED 9/13/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0		CL	TOPSOIL Loose, fractured, stiff, damp dark brown Sandy CLAY with little gravel			
2		CL	ALLUVIUM/COLLUVIUM Stiff, damp, dark brown, Sandy CLAY with gravel, subangular clasts to 3 inches.			
4			Base of gravels at 2.5 feet			
6	B10-1 B10-2	CL	OTAY FORMATION Stiff, mottled gray-brown to dark brown, Silty CLAY, highly weathered	PUSH	89.6	27.4
8		SP	Dense, moist, interbedded gray-brown SANDSTONE with brown siltstone/claystone			
10	B10-3		Becomes very dense to hard, damp, gray-brown sandstone, finely bedded	2/12"	94.1	29.9
12		ML	Highly cemented layer 4 to 6 inch thick at 9 feet			
14			Stiff, moist, light purplish-tan SILTSTONE Becomes medium stiff, finely bedded at 11.5 feet			
16	B10-4	SM	Very dense to hard, moist, medium gray-brown SANDSTONE 6 inch thick siltstone layer at 13 feet	2/12"	99.1	25.5
18			Highly cemented layer 1 to 2 inch thick at 17.5 feet			
20	B10-5		Siltstone layer 2 to 3 inch thick at 20 feet	6/12"	105.3	20.4
22			Siltstone layer 2 to 3 inch thick at 22 feet			
24						
26			Siltstone layer 2 to 3 inch thick, very hard at 25 feet			
28						
			BORING TERMINATED AT 28.5 FEET			

Figure A-17 Log of Test Boring B 10, page 1 of 1

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

BORING B 11

ELEVATION 558 DATE COMPLETED 9/13/90

EQUIPMENT E-100 BUCKET DRILL

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0		CL	**TOPSOIL** Highly fractured, stiff, slightly damp, dark brown, slightly gravelly, Sandy CLAY			
2		CL				
4		CL	**ALLUVIUM/COLLUVIUM** Stiff, damp, moist, dark brown, fine Sandy CLAY with little gravel			
6	B11-1	SM	Stiff, damp, grayish brown, CLAY, gravelly in lower 6 inches to 1 foot (subangular clasts to 5 inches)	2/12"	100.0	11.6
8		SM-CL	**OTAY FORMATION** Very dense, damp, gray brown Silty SANDSTONE			
10	B11-2	SP				
12		ML-CL	Medium stiff, damp, mottled purplish brown and light tan, SILTSTONE/ CLAYSTONE -Becomes stiff, at 7 feet	1/12"	96.4	23.2
14			Very dense, slightly damp, gray brown SANDSTONE			
16	B11-3	SM	Stiff to very stiff, damp, grayish tan and dark purplish brown SILTSTONE/ CLAYSTONE with interbedded, discontinuous seams of white volcanic tuff siltstone	8/12"	123.2	12.7
18		CL	Very dense to hard, damp, gray brown SANDSTONE			
20		ML	Very stiff, damp, light reddish brown CLAYSTONE with pressure faces			
			Hard, slightly damp, dark gray brown SILTSTONE			
			BORING TERMINATED AT 20 FEET			

Figure A-18 Log of Test Boring B 11, page 1 of 1

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▩ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 1

ELEVATION 607 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SC	**TOPSOIL** Loose, dry, slightly damp gray-brown, slightly Clayey fine to coarse SAND			
2				SC				
4				SM	**FLUVIAL TERRACE DEPOSITS** Soft-medium, stiff, damp-moist, dark gray-brown, Clayey fine to medium SAND with abundant subangular cobbles			
6				SM	**OTAY FORMATION** Medium dense, damp, mottled white and light yellow-brown SANDSTONE with CaCO3			
8				SM	Medium dense, dense, damp light gray Silty fine to coarse SAND			
					Very dense, damp, white - to light tan Silty SANDSTONE			
					TRENCH TERMINATED AT 9.5 FEET			

Figure A-19, Log of Test Trench T 1

ECKE

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ▨ ... CHUNK SAMPLE
- ⧗ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 2

ELEVATION 620 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL** Dark blackish-gray, soft, dry Sandy CLAY			
4				SW	**FLUVIAL TERRACE DEPOSITS** Dense, dry, whitish-gray, weathered SAND/COBBLES			
6				SW	Very dense, humid, light brown, cohesionless SAND/COBBLE (subrounded metavolcanic rock fragments)			
8								
10								
12	T2-1			SC	**OTAY FORMATION** Very dense, moist, light gray medium-cemented Clayey SANDSTONE			
					TRENCH TERMINATED AT 12.5 FEET			

Figure A-20, Log of Test Trench T 2

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▨ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 3

ELEVATION 611 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				SC	**TOPSOIL** Loose, slightly-damp, gray-brown, Clayey SAND Becomes dark-brown at 1 foot			
4				SW	**FLUVIAL TERRACE DEPOSITS** Dense, damp-moist, yellow-brown, slightly clayey, Gravelly SAND with some cobble to 10 inches Becomes gravelly sand with cobble, no clay at 6 feet			
6	T3-1							
8								
10								
12	T3-2			SM	**OTAY FORMATION** Dense, damp, light gray, Silty SANDSTONE			
					TRENCH TERMINATED AT 12 FEET			

Figure A-21, Log of Test Trench T 3

ECKE

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ▮ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ▨ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

TRENCH T 4

ELEVATION 611 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				SC-SM	**TOPSOIL/COLLUVIUM** Loose,to medium-dense, damp-dry, gray-brown Clayey, Silty SAND			
4	T4-1			CL	**FLUVIAL TERRACE DEPOSITS** Medium stiff,to stiff, moist, dark reddish-brown Sandy CLAY Becomes cobbly (metavolcanic rock fragments) at 4 feet			
6	T4-2			SM/SW	Dense, damp, light reddish-brown Silty, Gravelly SAND with cobbles Cobble size increases with depth			
8								
10					Boulders to 3 feet at 10 feet			
					TRENCH TERMINATED AT 11 FEET REFUSAL			

Figure A-22, Log of Test Trench T 4

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 5

ELEVATION 627 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SM-SC	**TOPSOIL** Loose, dryish damp, gray-brown Silty SAND			
2				SW	Becomes dark brown, clayey with abundant cobbles			
4					**TERRACE DEPOSITS** Dense, damp, light yellowish, reddish-brown, SAND/COBBLE to greater than 12 inches, Subangular Boulders to 2 feet, at 4.5 feet			
6								
8	T5-1	⊠		SM-SW	**OTAY FORMATION** Very dense, damp, light gray-brown, weakly cemented SANDSTONE			
10								
					TRENCH TERMINATED AT 10.5 FEET			

Figure A-23, Log of Test Trench T 5

ECKE

SAMPLE SYMBOLS: □ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 8

ELEVATION 607 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SC	**TOPSOIL** Loose to medium dense, damp, dark gray-brown clayey SAND with trace gravel			
2				SC-CL	**FLUVIAL TERRACE DEPOSITS** Medium dense, damp, gray-brown, Clayey SAND/Sandy CLAY with cobbles (meta-volcanic rock fragments)			
4				CL				
				SM				
6				SC-CL	Medium stiff, damp-moist dark red-brown Sandy CLAY			
				SM	**OTAY FORMATION** Very dense, slightly damp, light greenish-gray Silty SANDSTONE			
8					Medium dense, medium stiff, damp-moist, reddish brown, Clayey SAND/Sandy CLAY			
					Medium dense to dense, damp, white light gray-brown mottled CaCO3 cemented SANDSTONE			

TRENCH TERMINATED AT 8.5 FEET

Figure A-27, Log of Test Trench T 8

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

TRENCH T 9

ELEVATION 610 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SC	**TOPSOIL** Loose-medium dense, damp dark brown, Clayey SAND with cobbles, few boulders			
2				CL	**TERRACE DEPOSITS** Medium stiff, damp, yellow brown, Sandy CLAY			
4								
				CL	**OTAY FORMATION** Stiff, damp, pale yellow-brown Sandy CLAY with clay films on ped faces			
6	T9-1							
8				SP	Very dense, damp, light brown SANDSTONE			
10					TRENCH TERMINATED AT 10 FEET			

Figure A-28, Log of Test Trench T 9

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 10

ELEVATION 600 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				SC-CL	**TOPSOIL** Loose, damp, dark gray-brown, Clayey SAND/Sandy CLAY			
4				CL	**OTAY FORMATION** Medium dense, weathered, damp white-light tan, Sandy CLAY			
6				CL-SM CL/ML	Dense, damp, light gray-tan, Sandy CLAYSTONE/SILTSTONE			
					TRENCH TERMINATED AT 7 FEET			

Figure A-29, Log of Test Trench T 10

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 11

ELEVATION 612 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SC-CL	**TOPSOIL** Loose to medium dense, dry-damp, dark brown Clayey SAND with subangular to subrounded cobbles			
2								
				SC	Becomes stiff sandy clay at 1.5 feet			
4				SM	**OTAY FORMATION** Weathered, medium dense, damp, yellow-brown Clayey SAND			
6								
				CL-ML	Dense, damp, yellowish gray-brown SANDSTONE			
8					Dense, slightly damp, tan SILTSTONE/ CLAYSTONE			
					TRENCH TERMINATED AT 9 FEET			

Figure A-30, Log of Test Trench T 11

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 12

ELEVATION 605 DATE COMPLETED 9/7/90

EQUIPMENT JD 710 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SC-CL	**TOPSOIL** Loose to medium dense, damp, dark brown, Clayey SAND Becomes stiff sandy clay at 1.5 feet			
2								
4				SW-SM	**OTAY FORMATION** Dense, damp, yellow-brown, Silty fine to coarse SAND			
6				SM	Very dense, damp, gray-brown SANDSTONE			
				CL-ML	Medium dense, damp-moist, yellow-brown SILTSTONE/CLAYSTONE			
8								
10					TRENCH TERMINATED AT 10 FEET			

Figure A-31, Log of Test Trench T 12

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

TRENCH T 13

ELEVATION 560 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACK HOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2	T13-1			CL	**TOPSOIL** Loose, damp, dark brown Sandy CLAY			
4				CL	**OTAY FORMATION** Medium stiff, damp, mottled white to medium tan Sandy CLAY			
6				CL-ML	Dense, dry to slightly damp, light tan SILTSTONE/CLAYSTONE			
					TRENCH TERMINATED AT 7.5 FEET			

Figure A-32, Log of Test Trench T 13

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 14

ELEVATION 553 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**ALLUVIUM/COLLUVIUM** Soft to medium stiff, humid, blackish-gray Sandy CLAY			
4				CL	Stiff, moist, dark brown Sandy CLAY/ COBBLES			
6				CL				
				SC	Stiff, blackish-brown Sandy CLAY			
8				SC	**OTAY FORMATION** Dense, moist, whitish-brown, weathered Clayey SANDSTONE			
10					Very dense, moist, grayish-light brown medium to weakly cemented, poorly graded fine Clayey SANDSTONE			
12								
					TRENCH TERMINATED AT 13 FEET			

Figure A-33, Log of Test Trench T 14

ECKE

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ▨ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 15

ELEVATION 544 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**ALLUVIUM/COLLUVIUM** Soft, dry to humid, blackish-gray Sandy CLAY Numerous CaCO3 concentrations from 2 to 3 feet			
4				SC				
				CL	Medium dense, moist, dark brown Clayey SAND/COBBLES			
6				SC	Stiff moist, black CLAY			
8				SM	**OTAY FORMATION** Dense, moist, weathered, light brown Clayey SANDSTONE			
10					Very dense, moist, grayish-brown, poorly graded weakly cemented Silty SANDSTONE			
					TRENCH TERMINATED AT 10 FEET			

Figure A-34, Log of Test Trench T 15

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 16

ELEVATION 532 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	ALLUVIUM/COLLUVIUM Soft, dry, dark-gray, Sandy CLAY			
2				SC	Medium dense, moist, reddish-brown, Clayey SAND, some cobbles			
4				SC	OTAY FORMATION Medium dense, moist, light-brown Clayey SANDSTONE			
6					TRENCH TERMINATED AT 6 FEET			

Figure A-35, Log of Test Trench T 16

ECKE

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ▨ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 17

ELEVATION 548 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL** Medium stiff to stiff, humid, blackish gray, Sandy CLAY, with some cobbles			
4				SC	**OTAY FORMATION** Dense, moist, light brown, poorly graded, Clayey SANDSTONE			
6					TRENCH TERMINATED AT 6 FEET			

Figure A-36, Log of Test Trench T 17

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 18

ELEVATION 575 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL** Soft, dry, dark gray, Sandy CLAY with cobbles			
4								
6				SW	**FLUVIAL TERRACE DEPOSITS** Very dense, moist reddish-brown, well graded cohesionless SAND/COBBLES, occasional boulders Becomes moderately cemented, very slow trenching at 6.5 feet			
8								
10								
12								
14								
16								
18				SM	**OTAY FORMATION** Dense, moist, light gray, massive, fine SANDSTONE			
					TRENCH TERMINATED AT 19 FEET			

Figure A-37, Log of Test Trench T 18

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 19

ELEVATION 564 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**TOPSOIL** Soft, dry, dark grayish-brown Sandy CLAY			
2				SM	**OTAY FORMATION** Dense, light brown, dry, highly weathered SANDSTONE			
4								
6				SM	Dense, humid, grayish-brown, massive Silty SANDSTONE			
					TRENCH TERMINATED AT 6 FEET			

Figure A-38, Log of Test Trench T 19

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 20

ELEVATION 562 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**TOPSOIL** Soft, humid, blackish-gray Sandy CLAY			
2								
4				SM	**OTAY FORMATION** Medium dense, dry, whitish, light brown, highly weathered, Silty SANDSTONE			
6				SP	Very dense, humid, grayish-brown, massive SANDSTONE			
					TRENCH TERMINATED AT 7 FEET			

Figure A-39, Log of Test Trench T 20

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

TRENCH T 21

ELEVATION 563 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	TOPSOIL Soft, humid, dark gray, Sandy CLAY			
4				ML	OTAY FORMATION Medium dense, dry, whitish-tan, highly weathered SILTSTONE			
6				SM	Dense, humid, whitish-gray Silty SANDSTONE			
					TRENCH TERMINATED AT 7 FEET			

Figure A-40, Log of Test Trench T 21

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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FILE NO. 04581-03-01

TRENCH T 22

ELEVATION 537 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	ALLUVIUM/COLLUVIUM Soft, moist, blackish-brown Sandy CLAY			
4								
6				SC	OTAY FORMATION Highly weathered, moist, mottled whitish-tan, brown Clayey SAND, highly bioturbated			
8								
10				SM	Dense, moist to wet, gray, weakly cemented, fine Silty SANDSTONE			
					TRENCH TERMINATED AT 11 FEET			

Figure A-41, Log of Test Trench T 22

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

TRENCH T 23

ELEVATION 544 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	ALLUVIUM/COLLUVIUM Soft, moist, blackish-brown Sandy CLAY			
4								
6				SW	Medium dense, moist, reddish-brown fine to coarse SAND with cobbles			
8				SM	OTAY FORMATION Medium dense, wet, grayish-brown weathered, Silty SANDSTONE			
					TRENCH TERMINATED AT 9 FEET			

Figure A-42, Log of Test Trench T 23

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ▮ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

TRENCH T 24

ELEVATION 550 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	ALLUVIUM/COLLUVIUM Soft, dry, dark grayish-black Silty CLAY			
4				SC	OTAY FORMATION Medium dense, moist, highly weathered, grayish-brown, Clayey SANDSTONE			
6				SM	Dense, moist, gray, fine, Silty SANDSTONE			
8					TRENCH TERMINATED AT 8 FEET			

Figure A-43, Log of Test Trench T 24

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▽ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

TRENCH T 25

ELEVATION 442 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL** Soft, dry, black Sandy CLAY, rare cobbles Becomes moist at 2 feet			
4				SM	**OTAY FORMATION** Highly weathered, humid, whitish, Silty SANDSTONE			
6								
8				CH	Thin bentonite layer from 7 to 7.5 feet			
					SANTIAGO PEAK VOLCANICS Hard metavolcanic ROCK			
					TRENCH TERMINATED AT 9 FEET			

Figure A-44, Log of Test Trench T 25

ECKE

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ▨ ... CHUNK SAMPLE
- ⧗ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

FILE NO. 04581-03-01

TRENCH T 26

ELEVATION 445 DATE COMPLETED 9/10/90

EQUIPMENT JD 555 TRACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				CL	**TOPSOIL** Soft, dry, grayish-black Sandy CLAY, with angular boulders			
4				SM	**OTAY FORMATION** Highly weathered, dry, whitish-brown Sandy SILTSTONE			
6								
8				SM	Very dense, hard, moist, massive light gray Silty SANDSTONE			
10				CH	Hard, pinkish-brown bentonite from 10.5 to 11 feet			
12					**SANTIAGO PEAK VOLCANICS** Very hard, metavolcanic ROCK			
					TRENCH TERMINATED AT 12 FEET			

Figure A-45, Log of Test Trench T 26

ECKE

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ▨ ... CHUNK SAMPLE; ▽ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

APPENDIX B

APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM). The maximum dry density and optimum moisture content of samples were determined in accordance with Test Procedure D1557-78, Method A. In addition, relatively undisturbed ring samples were tested for in-place moisture and density, shear strength and consolidation characteristics. Expansion Index tests were also performed on six samples collected from the exploratory excavations. The results of the tests are presented in tabular and graphical form herein. Moisture-density relationships are presented on the boring logs.

TABLE B-I
SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS
ASTM D 1557-91

Sample No.	Description	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
T2-1	Light gray, Clayey SAND	113.7	15.5
T3-1	Yellowish-brown, well graded SAND	131.1	7.3
T9-1	Light brown CLAY	112.2	16.0
T13-1	Dark brown, Sandy CLAY	114.5	14.9
B1-4	Purplish, Sandy SILT	108.7	15.3
B8-4	Dark brown, Sandy CLAY	117.1	15.1

TABLE B-II
SUMMARY OF IN-PLACE MOISTURE DENSITY AND DIRECT SHEAR TEST RESULTS

Sample No.	Depth (feet)	Dry Density (pcf)	Moisture Content (%)	Unit Cohesion (psf)	Angle of Shear Resistance (degrees)
T2-1*	12	102.7	15.2	150	35
T3-1*	6	117.7	7.6	120	38
T9-1*	6	101.3	15.7	590	15
B1-10	60	65.5	54.6	2315	6
B2-2	10	118.2	11.9	530	35
B3-5	25	114.4	13.2	1460	11

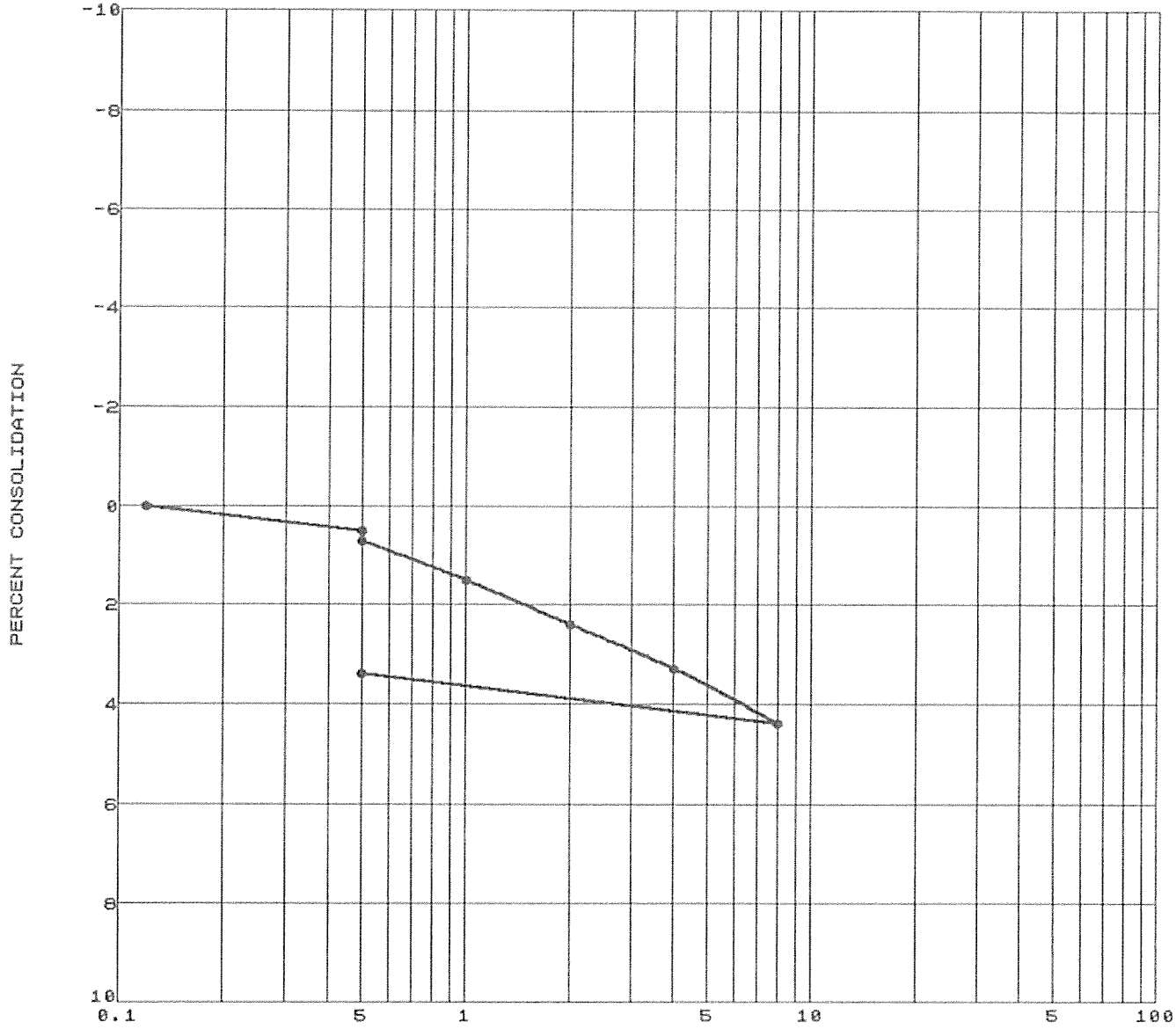
*Soil sample remolded approximately to 90 percent relative density at near optimum moisture content.

TABLE B-III
SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS

Sample No.	Moisture Content (%)		Dry Density (pcf)	Expansion Index
	Before Test	After Test		
T2-1	11.0	23.2	106.1	6
T3-1	6.4	13.2	125.1	0
T9-1	11.9	36.4	102.4	160
T13-1	11.7	34.9	103.8	115
B1-4	10.5	32.3	106.7	63
B8-4	9.2	31.4	111.8	88

File No. 04581-03-01

SAMPLE NO. B6-1



Initial Dry Density (pcf)	102.3	Initial Saturation (%)	87.2
Initial Water Content (%)	21.1	Sample Saturated at (ksf)	0.5

CONSOLIDATION CURVE

RANCON OTAY MESA

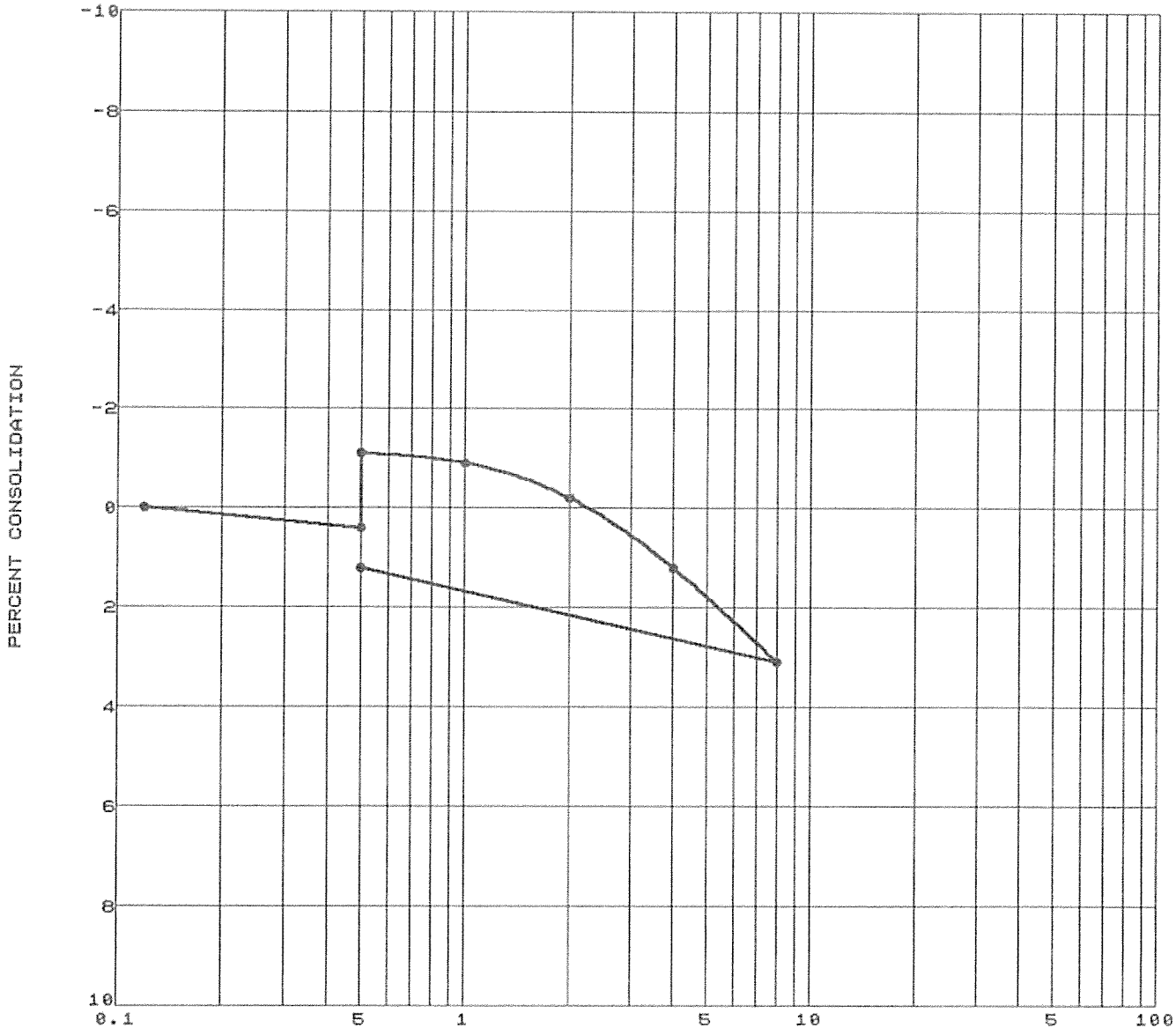
SAN DIEGO COUNTY, CALIFORNIA

ECKE

Figure B-1

File No. 04581-03-01

SAMPLE NO. B8-1



Initial Dry Density (pcf)	110.9
Initial Water Content (%)	12.1

Initial Saturation (%)	67.2
Sample Saturated at (ksf)	0.5

CONSOLIDATION CURVE

RANCON OTAY MESA

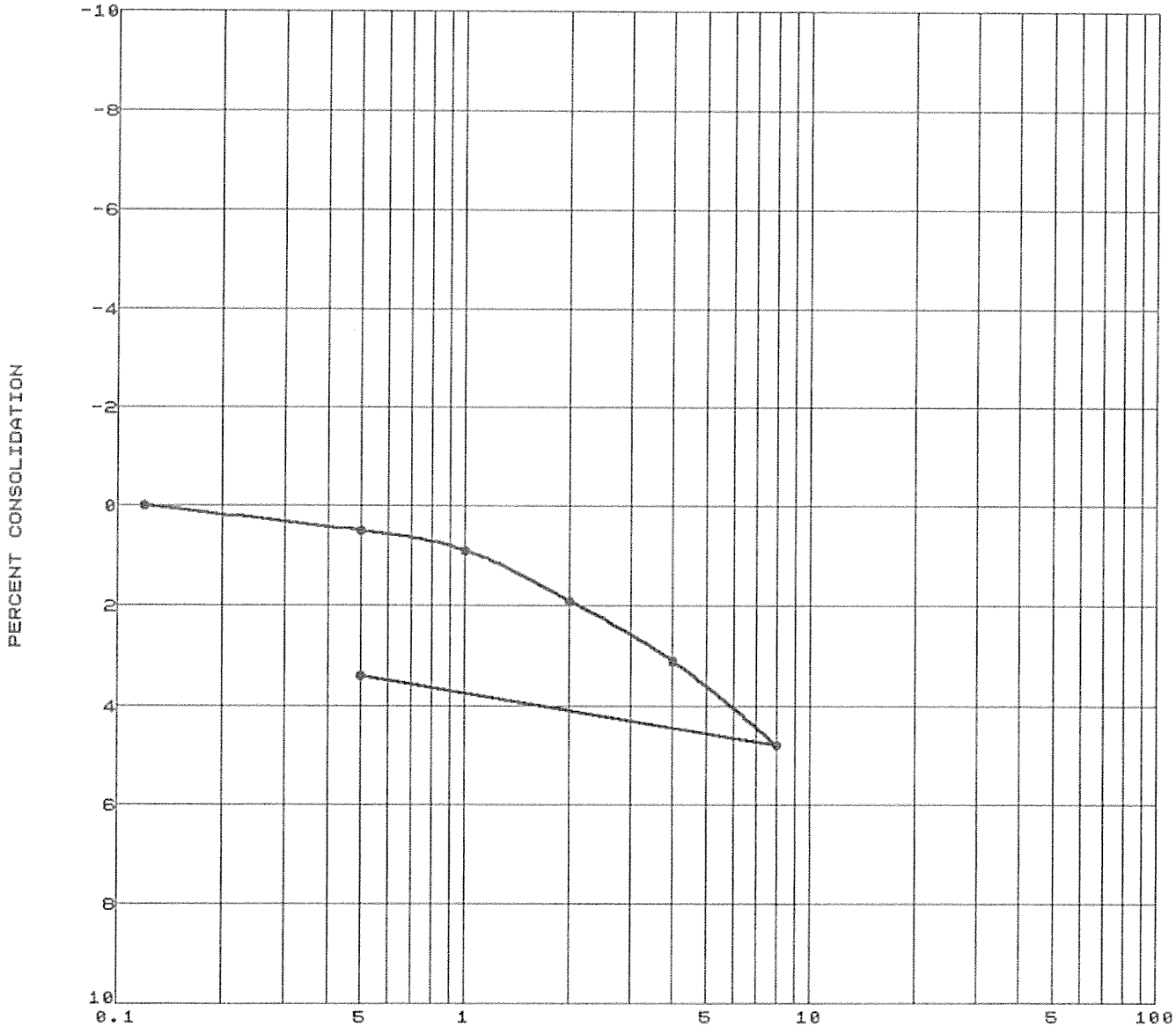
SAN DIEGO COUNTY, CALIFORNIA

ECKE

Figure B-2

File No. 04581-03-01

SAMPLE NO. B8-2



Initial Dry Density (pcf)	87.8	Initial Saturation (%)	92.9
Initial Water Content (%)	31.7	Sample Saturated at (ksf)	0.5

CONSOLIDATION CURVE

RANCON OTAY MESA

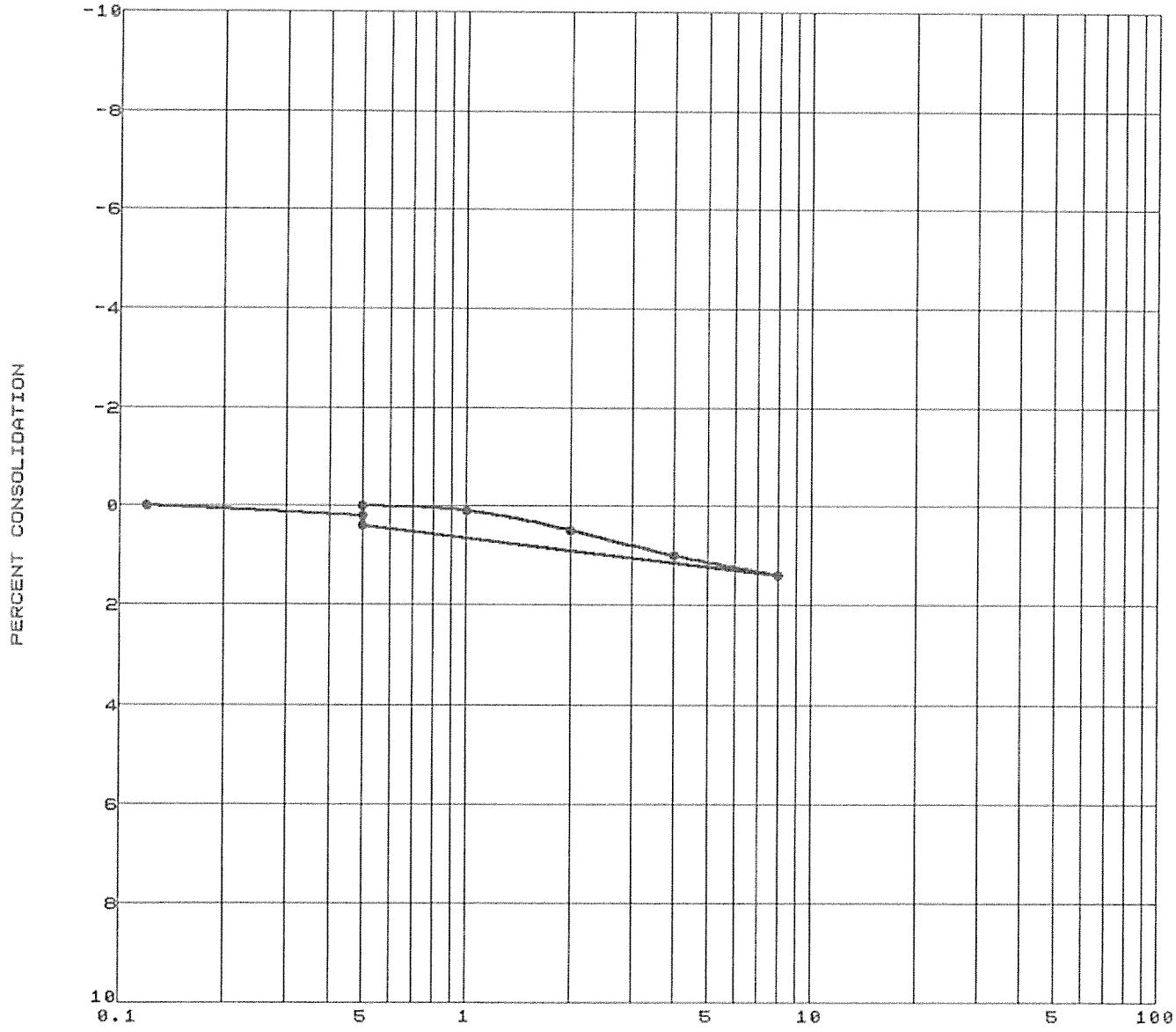
SAN DIEGO COUNTY, CALIFORNIA

ECKE

Figure B-3

File No. 04581-03-01

SAMPLE NO. B9-1



Initial Dry Density (pcf)	104.8
Initial Water Content (%)	11.5

Initial Saturation (%)	57.7
Sample Saturated at (ksf)	0.5

CONSOLIDATION CURVE

RANCON OTAY MESA

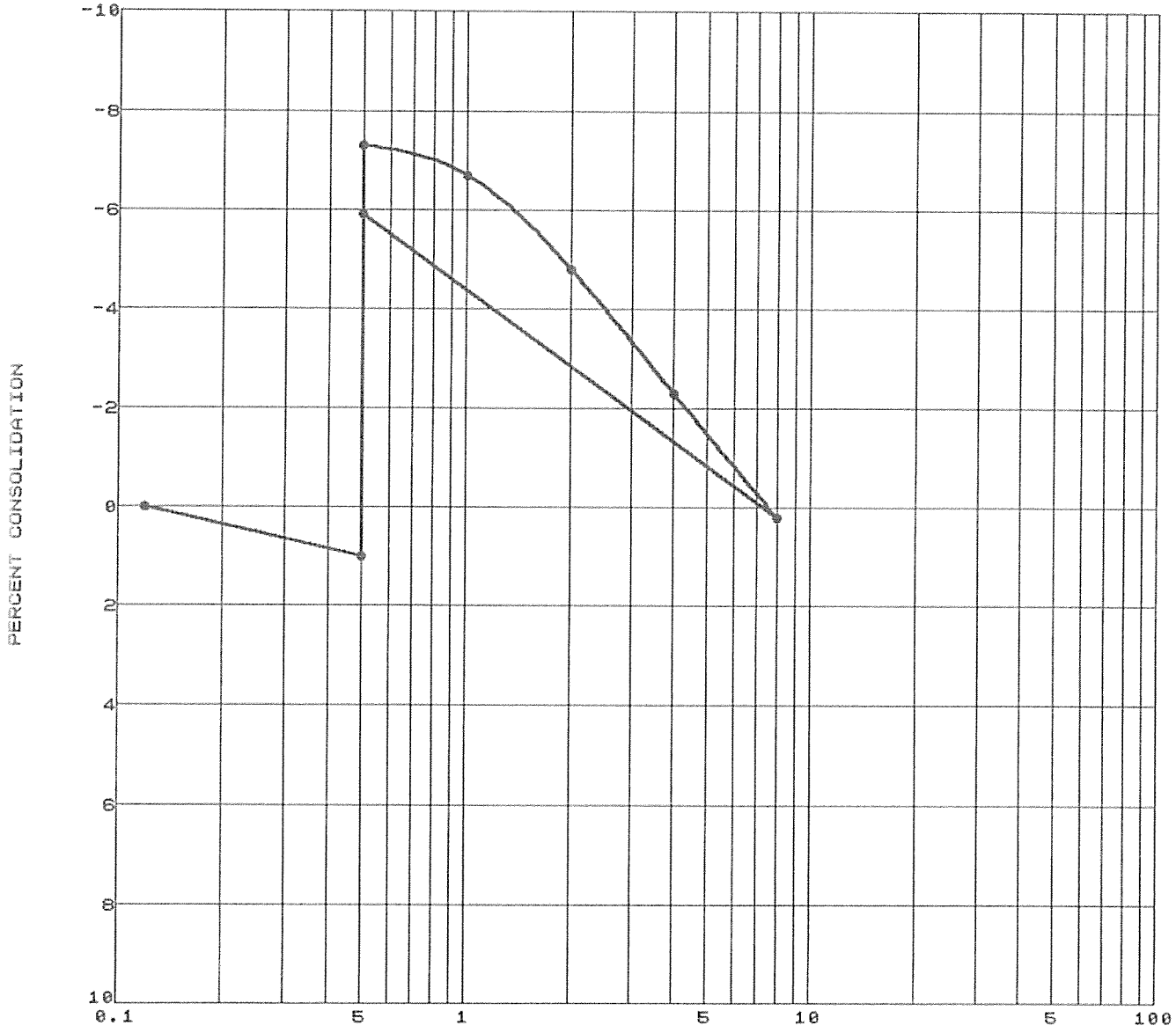
SAN DIEGO COUNTY, CALIFORNIA

ECKE

Figure B-4

File No. 04581-03-01

SAMPLE NO. B10-1



Initial Dry Density (pcf)	89.6
Initial Water Content (%)	27.4

Initial Saturation (%)	85.0
Sample Saturated at (ksf)	0.5

CONSOLIDATION CURVE

RANCON OTAY MESA

SAN DIEGO COUNTY, CALIFORNIA

ECKE

Figure B-5