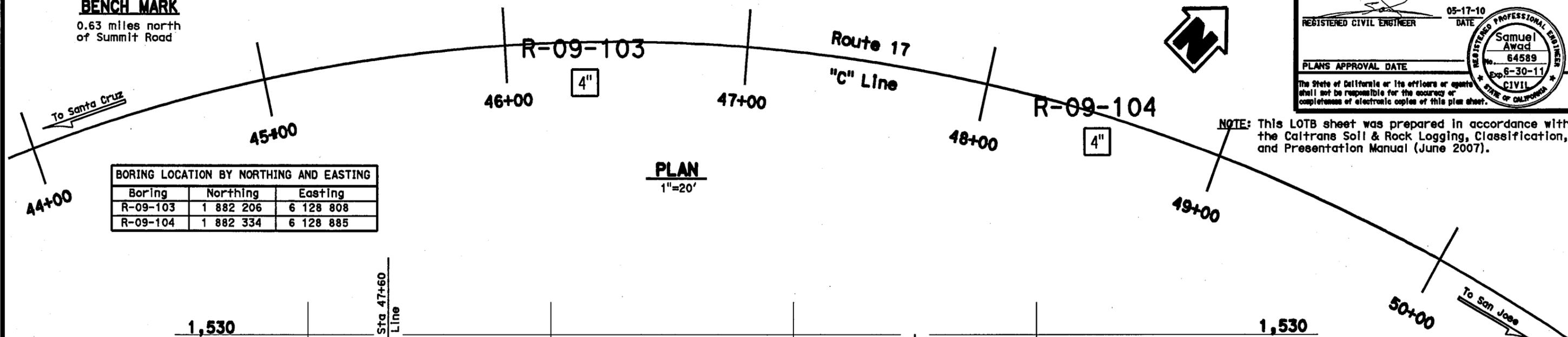


BENCH MARK
0.63 miles north
of Summit Road

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SCI	17			

REGISTERED CIVIL ENGINEER
DATE 05-17-10
PLANS APPROVAL DATE
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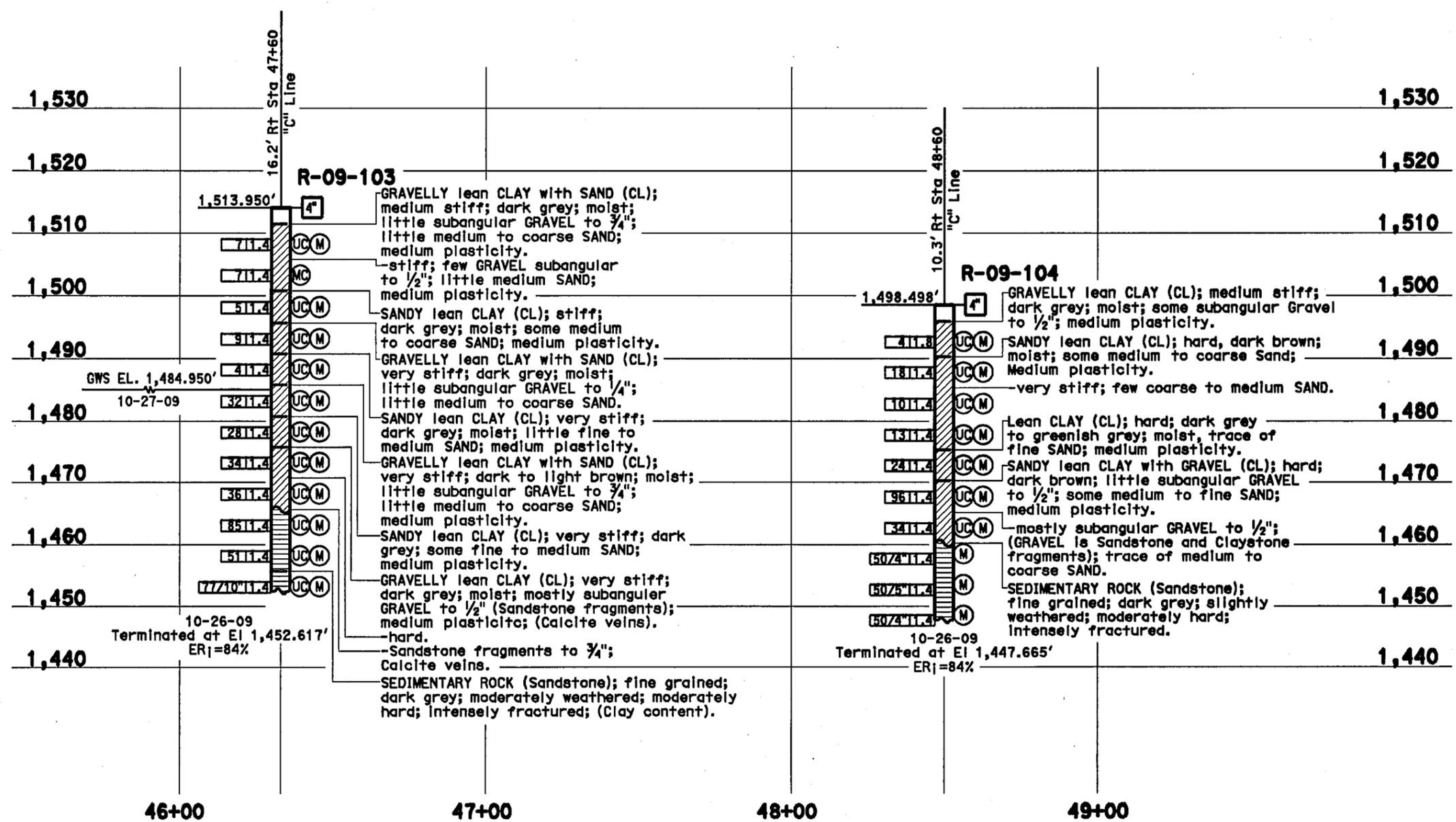
REGISTERED PROFESSIONAL ENGINEER
Samuel Awad
No. 64589
Exp. 6-30-11
CIVIL
STATE OF CALIFORNIA



BORING LOCATION BY NORTHING AND EASTING

Boring	Northing	Easting
R-09-103	1 882 206	6 128 808
R-09-104	1 882 334	6 128 885

PLAN
1"=20'



PROFILE
HOR. 1"=20'
VER. 1"=10'

ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA		DIVISION OF ENGINEERING SERVICES		BRIDGE No.		WET PAVEMENT CORRECTION PROJECT	
FUNCTIONAL SUPERVISOR		FIELD INVESTIGATION BY:		DEPARTMENT OF TRANSPORTATION		OFFICE OF GEOTECHNICAL		POST MILES		LOG OF TEST BORINGS 1 of 5	
NAME: H. Nikouli		A. Kaddoura		DESIGN BRANCH		0.0/2.8		REVISION DATES		SHEET OF	
DRAWN BY: M. Reynolds 03/10		CHECKED BY: R. Nashed		CU 04		EA 264901		DATE PLOTTED => 18-MAY-2010		FILE => 426490qd01.dgn	

BENCH MARK

0.64 miles north of Summit Road

BORING LOCATION BY NORTHING AND EASTING		
Boring	Northing	Easting
R-09-106	1 883 011	6 129 753
R-09-107	1 883 170	6 129 796
R-09-108	1 883 257	6 129 804

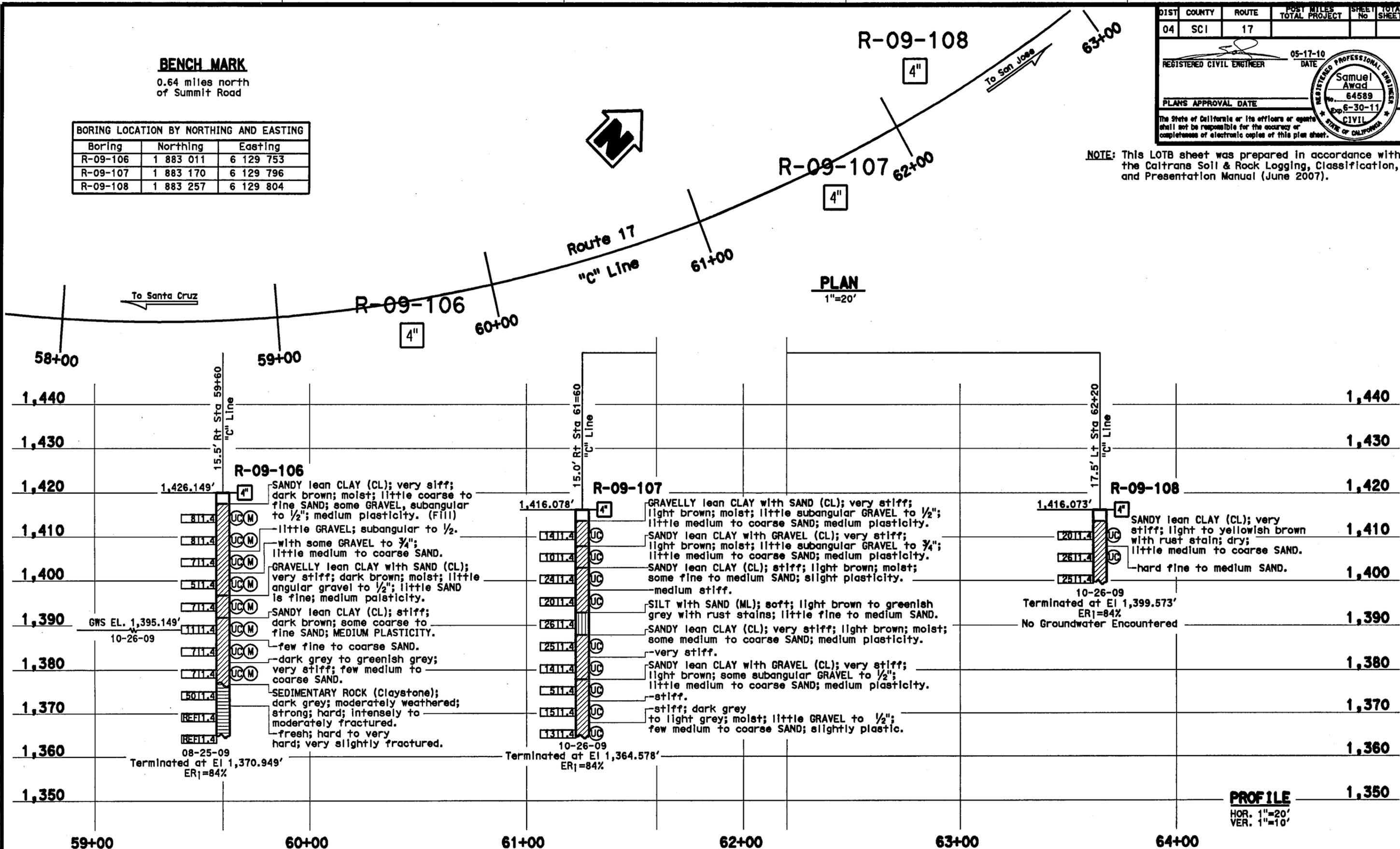
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SCI	17			

REGISTERED CIVIL ENGINEER
DATE 05-17-10

PLANS APPROVAL DATE

Samuel Awad
No. 64589
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NOTE: This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, and Presentation Manual (June 2007).



ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA		WET PAVEMENT CORRECTION PROJECT	
FUNCTIONAL SUPERVISOR NAME: H. NIKOUI	DRAWN BY: M. Reynolds 03/10 CHECKED BY: R. Nashed	FIELD INVESTIGATION BY: A. Kaddoura	DIVISION OF ENGINEERING SERVICES OFFICE OF GEOTECHNICAL DESIGN BRANCH		ARTICLE NO. POST MILES 0.0/2.8		LOG OF TEST BORINGS 2 of 5
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS				CU 04 EA 264901	REVISION DATES		SHEET OF

FILE => 426490qa02.dgn

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SCI	17			

REGISTERED CIVIL ENGINEER DATE 05-17-10

Samuel Awad
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PLANS APPROVAL DATE

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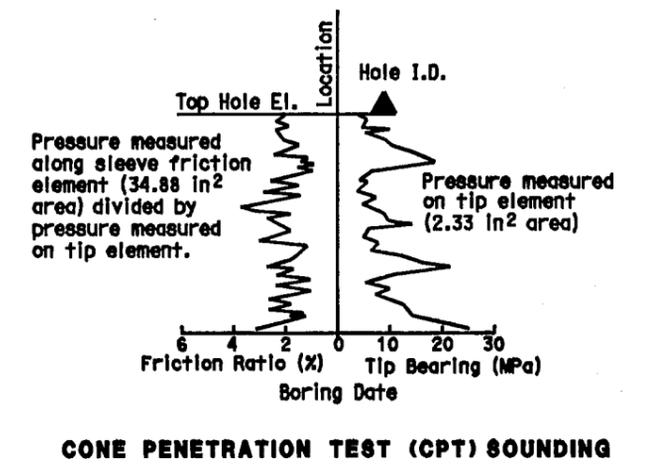
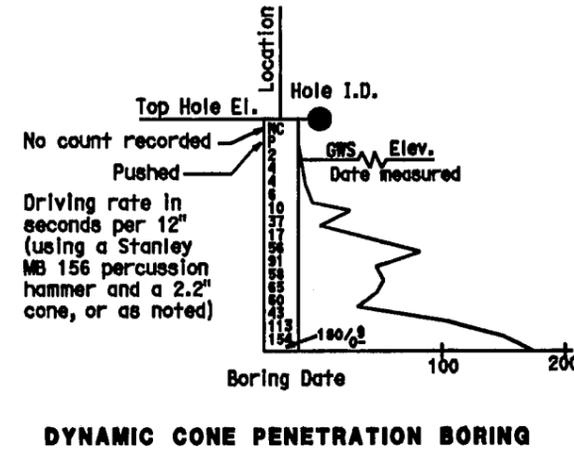
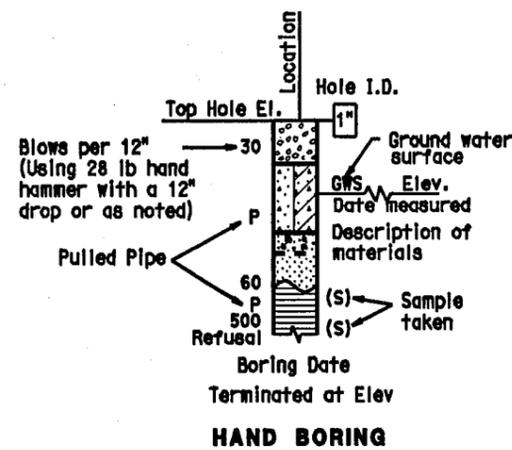
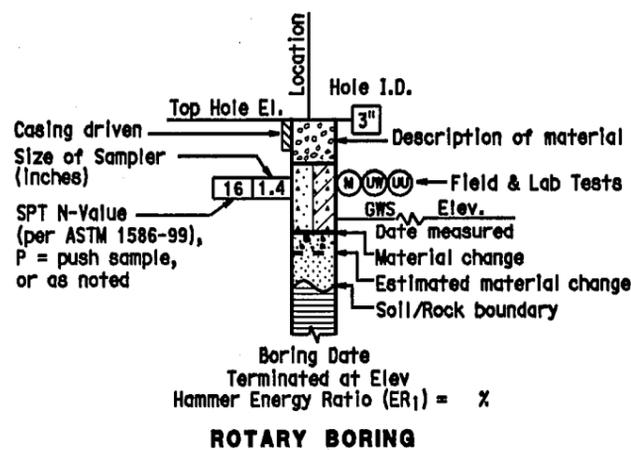
CEMENTATION	
Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

CONSISTENCY OF COHESIVE SOILS				
Description	Unconfined Compressive Strength (tsf)	Pocket Penetrometer Measurement (tsf)	Torvane Measurement (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 to 0.50	0.25 to 0.50	0.12 to 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 to 1.0	0.50 to 1.0	0.25 to 0.50	Penetrated several inches by thumb with moderate effort
Stiff	1 to 2	1 to 2	0.50 to 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2 to 4	2 to 4	1.0 to 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

BOREHOLE IDENTIFICATION		
Symbol	Hole Type	Description
	A	Auger Boring
	R	Rotary drilled boring
	P	Rotary percussion boring (air)
	R	Rotary drilled diamond core
	HD	Hand driven (1-inch soil tube)
	HA	Hand Auger
	D	Dynamic Cone Penetration Boring
	CPT	Cone Penetration Test (ASTM D 5778-95)
	O	Other

Note: Size in inches.

PLASTICITY OF FINE-GRAINED SOILS	
Description	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA		DIVISION OF ENGINEERING SERVICES		SOIL LEGEND	
FUNCTIONAL SUPERVISOR		PREPARED BY M. Reynolds 03/10		DEPARTMENT OF TRANSPORTATION		OFFICE OF GEOTECHNICAL		LOG OF TEST BORINGS 3 of 5	
NAME: H. Nikouli		CHECKED BY R. Nashed		A. Kaddoura		DESIGN BRANCH		0.0/2.8	
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		CU 04		EA 264901		DATE PLOTTED => 18-MAY-2010		REVISION DATES	

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SCI	17			

REGISTERED CIVIL ENGINEER DATE 05-17-10

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Samuel Awad
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STATE OF CALIFORNIA

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GROUP SYMBOLS AND NAMES			
Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
	Well-graded GRAVEL		Lean CLAY
	Well-graded GRAVEL with SAND		Lean CLAY with SAND
	Poorly graded GRAVEL		Lean CLAY with GRAVEL
	Poorly graded GRAVEL with SAND		SANDY lean CLAY
	Well-graded GRAVEL with SILT		SANDY lean CLAY with GRAVEL
	Well-graded GRAVEL with SILT and SAND		GRAVELLY lean CLAY
	Well-graded GRAVEL with CLAY		GRAVELLY lean CLAY with SAND
	Well-graded GRAVEL with CLAY and SAND		SILTY CLAY
	Well-graded GRAVEL with CLAY and SAND		SILTY CLAY with SAND
	Well-graded GRAVEL with CLAY and SAND		SILTY CLAY with GRAVEL
	Poorly graded GRAVEL with SILT		SANDY SILTY CLAY
	Poorly graded GRAVEL with SILT and SAND		SANDY SILTY CLAY with GRAVEL
	Poorly graded GRAVEL with CLAY		GRAVELLY SILTY CLAY
	Poorly graded GRAVEL with CLAY and SAND		GRAVELLY SILTY CLAY with SAND
	SILTY GRAVEL		SILT
	SILTY GRAVEL with SAND		SILT with SAND
	CLAYEY GRAVEL		SILT with GRAVEL
	CLAYEY GRAVEL with SAND		SANDY SILT
	SILTY, CLAYEY GRAVEL		SANDY SILT with GRAVEL
	SILTY, CLAYEY GRAVEL with SAND		GRAVELLY SILT
	Well-graded SAND		GRAVELLY SILT with SAND
	Well-graded SAND with GRAVEL		ORGANIC lean CLAY
	Poorly graded SAND		ORGANIC lean CLAY with SAND
	Poorly graded SAND with GRAVEL		ORGANIC lean CLAY with GRAVEL
	Well-graded SAND with SILT		SANDY ORGANIC lean CLAY
	Well-graded SAND with SILT and GRAVEL		SANDY ORGANIC lean CLAY with GRAVEL
	Well-graded SAND with CLAY		GRAVELLY ORGANIC lean CLAY
	Well-graded SAND with CLAY and GRAVEL		GRAVELLY ORGANIC lean CLAY with SAND
	Well-graded SAND with CLAY and GRAVEL		ORGANIC SILT
	Well-graded SAND with CLAY and GRAVEL		ORGANIC SILT with SAND
	Poorly graded SAND with SILT		ORGANIC SILT with GRAVEL
	Poorly graded SAND with SILT and GRAVEL		SANDY ORGANIC SILT
	Poorly graded SAND with CLAY		SANDY ORGANIC SILT with GRAVEL
	Poorly graded SAND with CLAY and GRAVEL		GRAVELLY ORGANIC SILT
	SILTY SAND		GRAVELLY ORGANIC SILT with SAND
	SILTY SAND with GRAVEL		ORGANIC fat CLAY
	CLAYEY SAND		ORGANIC fat CLAY with SAND
	CLAYEY SAND with GRAVEL		ORGANIC fat CLAY with GRAVEL
	SILTY, CLAYEY SAND		SANDY ORGANIC fat CLAY
	SILTY, CLAYEY SAND with GRAVEL		SANDY ORGANIC fat CLAY with GRAVEL
	PEAT		GRAVELLY ORGANIC fat CLAY
	PEAT		GRAVELLY ORGANIC fat CLAY with SAND
	COBBLES		ORGANIC elastic SILT
	COBBLES and BOULDERS		ORGANIC elastic SILT with SAND
			ORGANIC elastic SILT with GRAVEL
			SANDY ORGANIC elastic SILT
			SANDY ORGANIC elastic SILT with GRAVEL
			GRAVELLY ORGANIC elastic SILT
			GRAVELLY ORGANIC elastic SILT with SAND

FIELD AND LABORATORY TESTING	
(C)	Consolidation (ASTM D 2435)
(CL)	Collapse Potential (ASTM D 5333)
(CP)	Compaction Curve (CTM 216)
(CR)	Corrosivity Testing (CTM 643, CTM 422, CTM 417)
(CU)	Consolidated Undrained Triaxial (ASTM D 4767)
(DS)	Direct Shear (ASTM D 3080)
(EI)	Expansion Index (ASTM D 4829)
(M)	Moisture Content (ASTM D 2216)
(OC)	Organic Content-% (ASTM D 2974)
(P)	Permeability (CTM 220)
(PA)	Particle Size Analysis (ASTM D 422)
(PI)	Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
(PL)	Point Load Index (ASTM D 5731)
(PM)	Pressure Meter
(PP)	Pocket Penetrometer
(R)	R-Value (CTM 301)
(SE)	Sand Equivalent (CTM 217)
(SG)	Specific Gravity (AASHTO T 100)
(SL)	Shrinkage Limit (ASTM D 427)
(SW)	Swell Potential (ASTM D 4546)
(TV)	Pocket Torvane
(UC)	Unconfined Compression-Soil (ASTM D 2166)
(UC)	Unconfined Compression-Rock (ASTM D 2938)
(UU)	Unconsolidated Undrained Triaxial (ASTM D 2850)
(UW)	Unit Weight (ASTM D 4767)
(VS)	Vane Shear (AASHTO T 223)

APPARENT DENSITY OF COHESIONLESS SOILS	
Description	SPT N ₆₀ (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE	
Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS	
Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE		
Description	Size	
Boulder	> 12"	
Cobble	3" to 12"	
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA		DIVISION OF ENGINEERING SERVICES		SOIL LEGEND	
FUNCTIONAL SUPERVISOR		PREPARED BY M. Reynolds 03/10		DEPARTMENT OF TRANSPORTATION		OFFICE OF GEOTECHNICAL		LOG OF TEST BORINGS 4 of 5	
NAME: H. Nikouli		CHECKED BY R. Nashed		A. Kaddoura		DESIGN BRANCH		REVISION DATES	
OR LOTS SOIL LEGEND		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		CU 04		EA 264901		SHEET OF	
				FILE => 426490qa04.dgn					

REGISTERED CIVIL ENGINEER DATE 05-17-10

Samuel Awad
No. 64589
Exp. 6-30-11
CIVIL ENGINEER
STATE OF CALIFORNIA

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PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

REC = $\frac{\sum \text{Length of the recovered core pieces (inches)}}{\text{Total length of core run (inches)}} \times 100\%$

RQD = $\frac{\sum \text{Length of intact core pieces} \geq 4''}{\text{Total length of core run (inches)}} \times 100\%$

Boring location

Top Hole El. Hole I.D.

Begin drilled interval

End drilled interval

Boring Date

RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (PSI)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8" to 1 ft
Thinly bedded	1-1/4" to 3-5/8"
Very thinly bedded	3/8" to 1-1/4"
Laminated	Less than 3/8"

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 1/6" deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gauged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic features					General Characteristics
	Chemical Weathering-Discoloration and/or oxidation		Mechanical Weathering-Grain boundary conditions (disaggregation) primarily for granitics and some coarse-grained sediments	Texture and Solutioning		
	Body of Rock	Fracture Surfaces		Texture	Solutioning	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 3 feet.
Slightly fractured	Lengths from 1 to 3 feet with few lengths less than 1 foot or greater than 3 feet.
Moderately fractured	Lengths mostly in 4" to 1 foot range with most lengths about 8"
Intensely fractured	Lengths average from 1 to 4" with scattered fragmented intervals with lengths less than 4"
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES OFFICE OF GEOTECHNICAL DESIGN BRANCH	UNIQUE NO. POST MILE 0.0/2.8	ROCK LEGEND	
FUNCTIONAL SUPERVISOR	PREPARED BY M. Reynolds 03/10	FIELD INVESTIGATION BY:	A. Kaddoura				LOG OF TEST BORINGS 5 of 5	
NAME: H. Nikouli	CHECKED BY R. Nashed			CU 04 EA 264901	FILE => 426490qa05.dgn	REVISION DATES		SHEET 5 of 5

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

DATE PLOTTED => 14-FEB-2010

USER NAME => S110822 DATE PLOTTED => 18-MAY-2010