

MAJOR DIVISIONS					TYPICAL NAMES
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS, GRAVEL-SAND
			GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM		SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS, GRAVELLY SANDS
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC		CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half < #200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
		OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
		CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
		OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
		Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS	
HIGHLY ORGANIC SOILS					

UNIFIED SOIL CLASSIFICATION SYSTEM

PS	Percent Saturation				
SG	Specific Gravity				
Consol	Consolidation	Tx	2630 (240)		Unconsolidated Undrained Triaxial
LL	Liquid Limit (in %)	Tx sat	2100 (575)		Unconsolidated Undrained Triaxial, saturated prior to test
PL	Plastic Limit (in %)	DS	3740 (960)		Consolidated Drained Direct Shear
PI	Plasticity Index	FVS	1320		Field Vane Shear
TS	Total Saturation Moisture Content	UC	4200		Unconfined Compression
SA	Sieve Analysis	LVS	500		Laboratory Vane Shear
<input type="checkbox"/>	Undisturbed Sample	C			Concrete Compressive Strength
<input checked="" type="checkbox"/>	Bulk Sample	PE			Petrographic Examination
<input checked="" type="checkbox"/>	Standard Penetration Test	Perm			Permeability
<input type="checkbox"/>	Sample Attempt with No Recovery	SE			Sand Equivalent

KEY TO TEST DATA



KLEINFELDER

Geotechnical, Materials and Environmental Engineering

SOIL CLASSIFICATION CHART AND KEY TO TEST DATA

COYOTE CREEK LEVEE

Marin County, California

PLATE

A-1

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Sample Interval (feet)	Blows/ Foot *	DEPTH (FEET)	EQUIPMENT: Mobile B-53 LOGGED BY: Jared Pratt	ELEVATION: 6.0' ** START DATE: 2-11-03 FINISH DATE: 2-11-03
					0	MOTTLED GRAY AND OLIVE SAND WITH SILT AND GRAVEL (SP-SM), dense, moist	
				42/11"			
				22		MOTTLED YELLOW BROWN AND DARK GRAY GRAVELLY SANDY CLAY (CL), very stiff, moist	
				12	5		
						Very soft drilling 6.0' or 6.5'	
						DARK GRAY CLAY (CH), soft to medium stiff, moist, abundant organic matter (Bay Mud)	
				3			

BOTTOM OF BORING 8.5 FEET
No Groundwater Encountered

* Converted to equivalent standard penetration blow counts.
** Existing ground surface at time of drilling.

KLEINFELDER
Geotechnical, Materials and Environmental Engineering

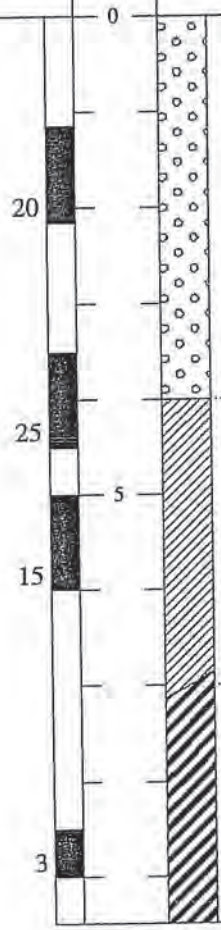
PROJECT NUMBER **26449** DATE **MAR 2003**

LOG OF BORING KB-1
COYOTE CREEK LEVEE
Marin County, California

PLATE
A-2

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Sample Interval (feet)	Blows/ Foot *	DEPTH (FEET)	EQUIPMENT: Mobile B-53	ELEVATION: 6.5' **
						LOGGED BY: Jared Pratt	START DATE: 2-11-03
							FINISH DATE: 2-11-03

4% Minus #200



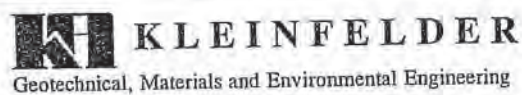
MOTTLED GRAY AND BLACK GRAVEL WITH SAND (GP), medium dense, moist

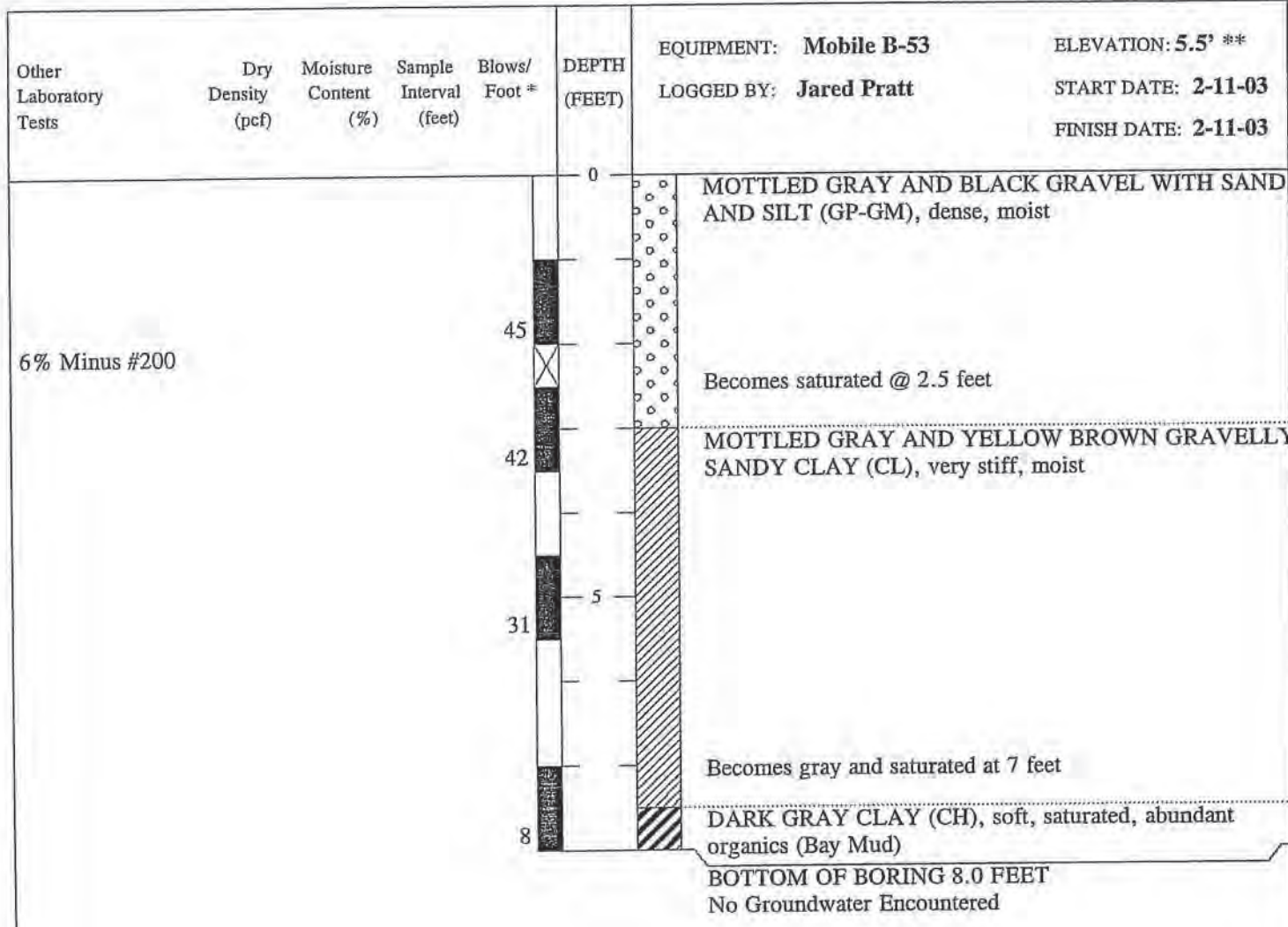
MOTTLED DARK GRAY AND OLIVE GRAVELLY CLAY WITH SAND (CL), stiff, moist

GRAY CLAY (CH), soft to medium stiff, moist, organic matter (Bay Mud)

BOTTOM OF BORING 9.5 FEET
No Groundwater Encountered

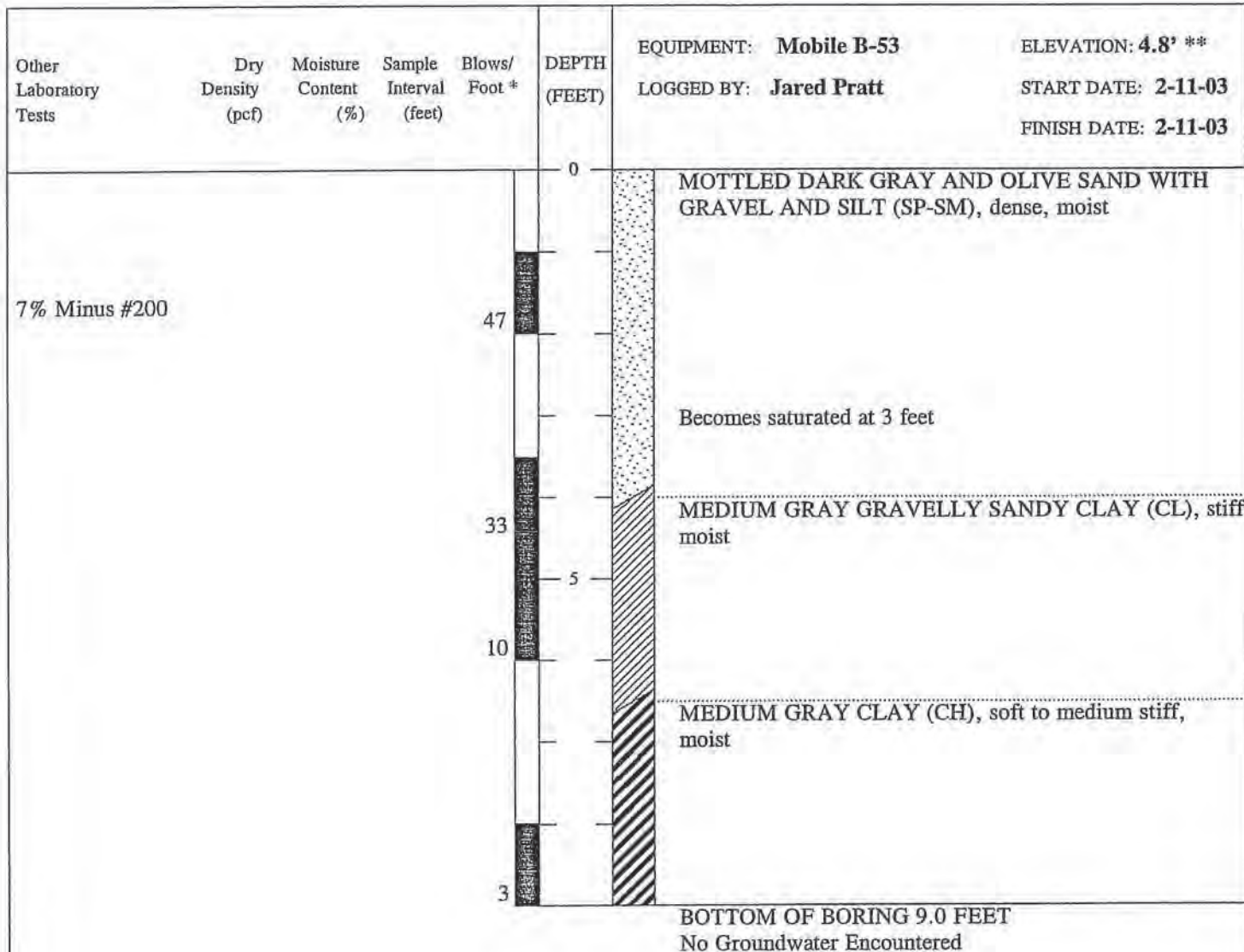
* Converted to equivalent standard penetration blow counts.
 ** Existing ground surface at time of drilling.





6% Minus #200

* Converted to equivalent standard penetration blow counts.
 ** Existing ground surface at time of drilling.



* Converted to equivalent standard penetration blow counts.
 ** Existing ground surface at time of drilling.

A Report Prepared for:

Marin County Flood Control
3501 Civic Center Drive Room 304
San Rafael, CA 94903


Attn: Mr. Timotheus Hampton

**GEOTECHNICAL INVESTIGATION REPORT
CREST-MARIN CREEK BOX CULVERT
MILL VALLEY, CALIFORNIA**


Kleinfelder Job No: 78045

Prepared by:

Reviewed by:



Mark H. Stanley, G.E.
Geotechnical Engineer 2397



Terry Craven G.E.
Principal Engineer

KLEINFELDER, INC.
2240 Northpoint Parkway
Santa Rosa, CA 95407
(707) 571-1883






December 29, 2006

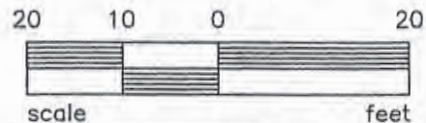
Copyright 2006 Kleinfelder, Inc.
All Rights Reserved

UNAUTHORIZED USE OR COPYING OF THIS DOCUMENT IS STRICTLY PROHIBITED BY
ANYONE OTHER THAN THE CLIENT FOR THE SPECIFIC PROJECT.



EXPLANATION

- B-1  HAND AUGER BORING
- CPT-2  CONE PENETRATION TEST
- DC-3  DYNAMIC CONE PENETRATION TEST



KLEINFELDER

PROJECT NO. 78045

DATE DEC 2006

**SITE PLAN
CREST MARIN CREEK BOX CULVERT**

Mill Valley, California

PLATE

2

Base: County of Marin GIS Data Site, 2003

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		DESCRIPTIVE NAMES	
GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
	GRAVELS WITH OVER 12% FINES	GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
		GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS WITH OVER 12% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
		SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
		SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
	OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
	Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS	
HIGHLY ORGANIC SOILS			

FIELD SAMPLING

- MODIFIED CALIFORNIA SAMPLE
- DISTURBED, BAG OR BULK SAMPLE
- STANDARD PENETRATION TEST
- SHELBY TUBE SAMPLE
- 3-1/2" I.D. CONTINUOUS CORE SAMPLE
- UNRETAINED PORTION OF SAMPLE
- WATER LEVEL OBSERVED IN BORING (at given post-drilling time)
- WATER LEVEL OBSERVED IN BORING (at time of drilling)
-
-
-

LABORATORY TESTS

- LL LIQUID LIMIT
- PI PLASTICITY INDEX
- SA SIEVE ANALYSIS
- #200 PERCENT PASSING #200 SIEVE
- RV RESISTANCE VALUE
- EI EXPANSION INDEX
- DS DIRECT SHEAR
- TxUU TRIAXIAL SHEAR-UNCONSOLIDATED UNDRAINED
- UC UNCONFINED COMPRESSION
- SG SPECIFIC GRAVITY
- PP POCKET PENETROMETER SHEAR STRENGTH (1sf)

NOTES: Blow counts represent the number of blows of a A-1-pound hammer falling 30-inches required to drive a sampler the last 12-inches of an 18-inch penetration. The blow counts have been converted to standard N-value blow counts.

The lines separating strata on the logs represent approximate boundaries only. The actual transition may be gradual. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil strata and groundwater observed at the boring location on the date of drilling only.



KLEINFELDER

BORING LOG LEGEND

Crest Marin Creek
Box Culvert
Mill Valley, California

A-1

PROJECT NUMBER 78045

DATE DEC 2007

PLATE

WILDCAT DYNAMIC CONE LOG

Kleinfelder
2240 Northpoint Parkway
Santa Rosa, CA 95407

PROJECT NUMBER: 78045
DATE STARTED: 12-11-2006
DATE COMPLETED: 12-11-2006

HOLE #: DC-1

CREW: Chiara Goitein & Martin Pucci

PROJECT: Crest Marin Creek

ADDRESS: Mill Valley, California

LOCATION: Station 10+25 Creek Centerline

SURFACE ELEVATION: 2.0'
WATER ON COMPLETION: At Surface (El. 2.0)
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm ²	GRAPH OF CONE RESISTANCE				N'	TESTED CONSISTENCY	
			0	50	100	150		NON-COHESIVE	COHESIVE
	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
1 ft	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
2 ft	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
3 ft	0	0.0					0	VERY LOOSE	VERY SOFT
1 m	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
4 ft	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
5 ft	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
6 ft	0	0.0					0	VERY LOOSE	VERY SOFT
2 m	0	0.0					0	VERY LOOSE	VERY SOFT
	0	0.0					0	VERY LOOSE	VERY SOFT
7 ft	1	3.4					0	VERY LOOSE	VERY SOFT
	3	10.3	**				2	VERY LOOSE	SOFT
	2	6.8	•				1	VERY LOOSE	VERY SOFT
8 ft	2	6.8	•				1	VERY LOOSE	VERY SOFT
	2	6.8	•				1	VERY LOOSE	VERY SOFT
	2	6.8	•				1	VERY LOOSE	VERY SOFT
9 ft	3	10.3	**				2	VERY LOOSE	SOFT
	3	10.3	**				2	VERY LOOSE	SOFT
	4	13.7	***				3	VERY LOOSE	SOFT
3 m 10 ft	2	6.8	•				1	VERY LOOSE	VERY SOFT
	4	12.2	***				3	VERY LOOSE	SOFT
	3	9.2	**				2	VERY LOOSE	SOFT
	2	6.1	•				1	VERY LOOSE	VERY SOFT
11 ft	3	9.2	**				2	VERY LOOSE	SOFT
	3	9.2	**				2	VERY LOOSE	SOFT
	4	12.2	***				3	VERY LOOSE	SOFT
12 ft	4	12.2	***				3	VERY LOOSE	SOFT
	4	12.2	***				3	VERY LOOSE	SOFT
	4	12.2	***				3	VERY LOOSE	SOFT
4 m 13 ft	5	15.3	****				4	VERY LOOSE	SOFT

NOTE: Tip advance 2.05m under self weight.

LABORATORY			FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/foot *				
		0.275	Torvane					Construction Debris (rip rap) & Grass
						Fill		
						CH/MH		SILTY CLAY - mottled brown, moist, soft. (Bay Mud Crust)
						CH/MH		CLAY - gray, moist to wet, very soft. (Bay Mud)
								Change to Dynamic Cone See Dynamic Cone Log DC-2, Plate A-4
								becomes soft
								BOTTOM OF BORING DC-2 @ 16.1 FEET

* Converted to equivalent standard penetration blow counts.
 ** Based on Winzler & Kelly preliminary Site Plan elevations dated 2006

SURFACE ELEVATION: **4.0** **
 TOTAL DEPTH: **16.1 feet**
 GROUND WATER DEPTH: ∇ **2.0 feet at time of drilling**

LOGGED BY: **C. Goltsein**
 EQUIPMENT: **Hand Auger**
 DIAMETER of BORING: **2.5**
 DATE DRILLED: **12-11-06**



KLEINFELDER

LOG OF EXPLORATION
BORING B-2 Station 10+50
 Crest Marin Creek
 Box Culvert
 Mill Valley, California

PROJECT NUMBER **78045**

DATE **Dec 2006**

PLATE

A-3

1 of 1

WILDCAT DYNAMIC CONE LOG

Kleinfelder
2240 Northpoint Parkway
Santa Rosa, CA 95407

PROJECT NUMBER: 78045
DATE STARTED: 12-11-2006
DATE COMPLETED: 12-11-2006

HOLE #: DC-2
CREW: Chiara Goitein & Martin Pucci
PROJECT: Crest Marin Creek
ADDRESS: Mill Valley, CA
LOCATION: Station 10+50, 15 feet left of center line

SURFACE ELEVATION: 4 ft
WATER ON COMPLETION: Elev + 2 feet
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm ²	GRAPH OF CONE RESISTANCE				N'	TESTED CONSISTENCY	
			0	50	100	150		NON-COHESIVE	COHESIVE
1 ft	0	0.0					0	VERY LOOSE	VERY SOFT
1 ft	0	0.0					0	VERY LOOSE	VERY SOFT
1 ft	0	0.0					0	VERY LOOSE	VERY SOFT
1 ft	0	0.0					0	VERY LOOSE	VERY SOFT
2 ft	0	0.0					0	VERY LOOSE	VERY SOFT
2 ft	0	0.0					0	VERY LOOSE	VERY SOFT
2 ft	0	0.0					0	VERY LOOSE	VERY SOFT
3 ft	0	0.0					0	VERY LOOSE	VERY SOFT
3 ft	0	0.0					0	VERY LOOSE	VERY SOFT
4 ft	0	0.0					0	VERY LOOSE	VERY SOFT
4 ft	0	0.0					0	VERY LOOSE	VERY SOFT
5 ft	0	0.0					0	VERY LOOSE	VERY SOFT
5 ft	0	0.0					0	VERY LOOSE	VERY SOFT
6 ft	1	3.9					1	VERY LOOSE	VERY SOFT
6 ft	1	3.9					1	VERY LOOSE	VERY SOFT
6 ft	1	3.9					1	VERY LOOSE	VERY SOFT
7 ft	1	3.4					0	VERY LOOSE	VERY SOFT
7 ft	1	3.4					1	VERY LOOSE	VERY SOFT
8 ft	2	6.8					1	VERY LOOSE	VERY SOFT
8 ft	1	3.4					0	VERY LOOSE	VERY SOFT
9 ft	2	6.8					1	VERY LOOSE	VERY SOFT
9 ft	2	6.8					1	VERY LOOSE	VERY SOFT
10 ft	2	6.8					1	VERY LOOSE	VERY SOFT
10 ft	2	6.8					1	VERY LOOSE	VERY SOFT
11 ft	3	10.3					2	VERY LOOSE	VERY SOFT
11 ft	3	10.3					2	VERY LOOSE	VERY SOFT
12 ft	3	9.2					1	VERY LOOSE	VERY SOFT
12 ft	3	9.2					1	VERY LOOSE	VERY SOFT
12 ft	3	9.2					1	VERY LOOSE	VERY SOFT
13 ft	4	12.2					2	VERY LOOSE	VERY SOFT
13 ft	4	12.2					2	VERY LOOSE	VERY SOFT
13 ft	4	12.2					2	VERY LOOSE	VERY SOFT
13 ft	4	12.2					3	VERY LOOSE	VERY SOFT

Note: Hand Auger to 5 feet

WILDCAT DYNAMIC CONE LOG

PROJECT NUMBER: 78045

HOLE #: DC-2

PROJECT: Crest Marin Creek

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm ²	GRAPH OF CONE RESISTANCE	N ^o	TESTED CONSISTENCY	
					NON-COHESIVE	COHESIVE
	4	11.1	0	3	VERY LOOSE	SOFT
	3	8.3	..	2	VERY LOOSE	SOFT
14 ft	4	11.1	...	3	VERY LOOSE	SOFT
	4	11.1	...	3	VERY LOOSE	SOFT
	4	11.1	...	3	VERY LOOSE	SOFT
15 ft						
16 ft						
5 m						
17 ft						
18 ft						
19 ft						
6 m						
20 ft						
21 ft						
22 ft						
7 m						
23 ft						
24 ft						
25 ft						
8 m						
26 ft						
27 ft						
28 ft						
29 ft						
9 m						

Note: Hand Auger to 5 feet

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/foot *	Sample				
73	19.5					1	ML/MH	SILT - light brown, dry to moist, very stiff, abundant rootlets and root. (Fill) plastic erosion control sheet @ 3"	
						2	CH/MH	SILTY CLAY WITH SOME GRAVEL - mottled dark brown, moist, medium stiff to stiff, abundant rootlets. (Fill)	
104	24.1	2.21 0.5	TXUU Torvane			3			
						4		BOTTOM OF BORING DC-4 @ 4 FEET	
						5			
						6			
						7			
						8			
						9			
						10			
						11			
						12			
						13			
						14			
						15			
						16			
						17			
						18			
						19			
						20			

* Converted to equivalent standard penetration blow counts.

** Based on Winzler & Kelly preliminary Site Plan elevations dated 2006

SURFACE ELEVATION: 4.0 **
TOTAL DEPTH: 4.0 feet
GROUND WATER DEPTH: ∇ 2.0 feet at time of drilling

LOGGED BY: C. Goitein
EQUIPMENT: Hand Auger
DIAMETER of BORING: 2.5
DATE DRILLED: 12-12-06



**LOG OF EXPLORATION
BORING B-4 Station 12+50**
Crest Marin Creek
Box Culvert
Mill Valley, California

PLATE

A-6

1 of 1

PROJECT NUMBER 78045

DATE Dec 2006

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/foot *	Sample				
						1	CH/MH	SILTY CLAY WITH SAND AND GRAVEL- dark brown, mottled, moist, medium stiff, medium to coarse sand, gravel up to 1", organic matter	
78	40.9	0.25	Torvane			2			
						3	CH/MH	SILTY CLAY- dark gray with brown mottles, wet, soft (bay mud crust) becomes very soft organic matter	
44	104.2	0.125	Torvane			4			
						5			
						6			
						7			
						8			
						9			
						10			
						11			
						12			
						13			
						14			
						15			
						16			
						17			
						18			
						19			
						20			

* Converted to equivalent standard penetration blow counts.
 ** Based on Winzler & Kelly preliminary Site Plan elevations dated 2006

SURFACE ELEVATION: 4.5 **
 TOTAL DEPTH: 4.5 feet
 GROUND WATER DEPTH: ∇ 2.5 feet at time of drilling

LOGGED BY: C. Goitein
 EQUIPMENT: Hand Auger
 DIAMETER of BORING: 2.5
 DATE DRILLED: 12-12-06



LOG OF EXPLORATION BORING B-5 Station 14+50
 Crest Marin Creek
 Box Culvert
 Mill Valley, California

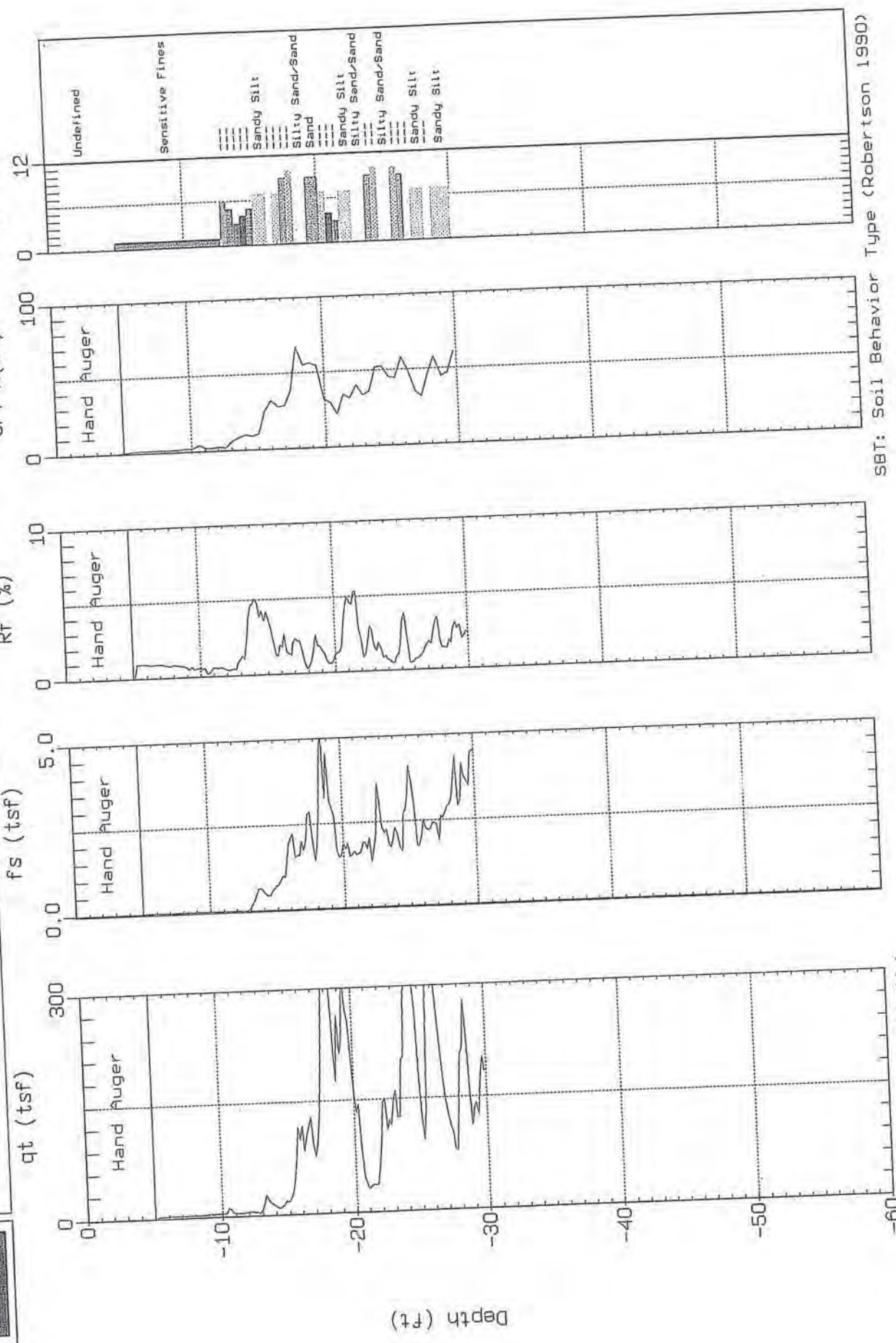
PLATE
A-7
 1 of 1



KLEINFELDER

Geologist: M. STANLEY
Date: 12/11/06 10:08

Site: CREST MARIN CREEK
Location: CPT-1



SBT: Soil Behavior Type (Robertson 1990)

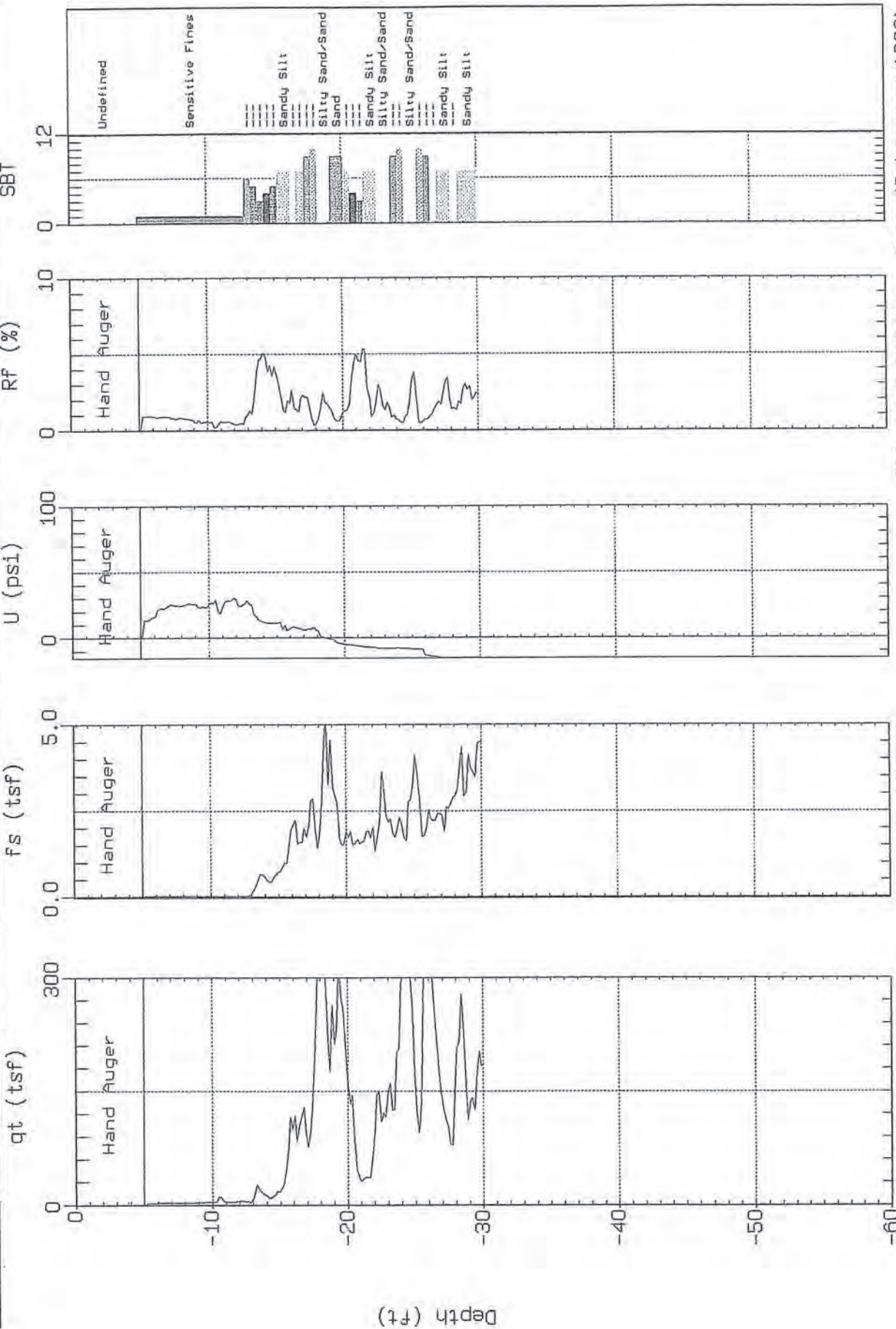
Max. Depth: 30.02 (ft)
Depth Inc.: 0.164 (ft)



KLEINFELDER

Site: CREST MARIN CREEK
Location: CPT-1

Geologist: M. STANLEY
Date: 12/11/06 10:08



SBT: Soil Behavior Type (Robertson 1990)

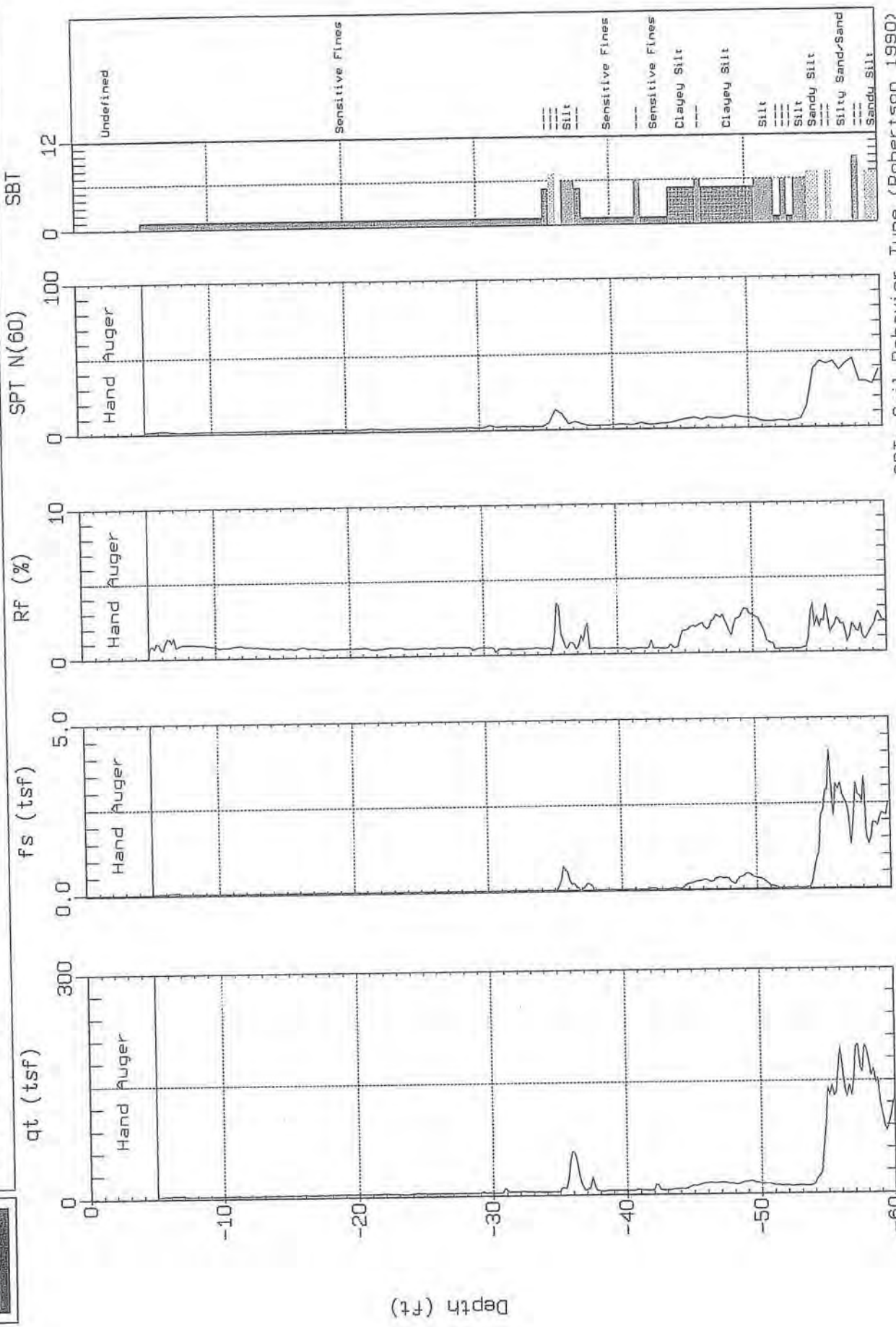
Max. Depth: 30.02 (ft)
Depth Inc.: 0.164 (ft)



KLEINFELDER

Site: CREST MARIN CREEK
Location: CPT-2

Geologist: M. STANLEY
Date: 12/14/06 09:29



SBT: Soil Behavior Type (Robertson 1990)

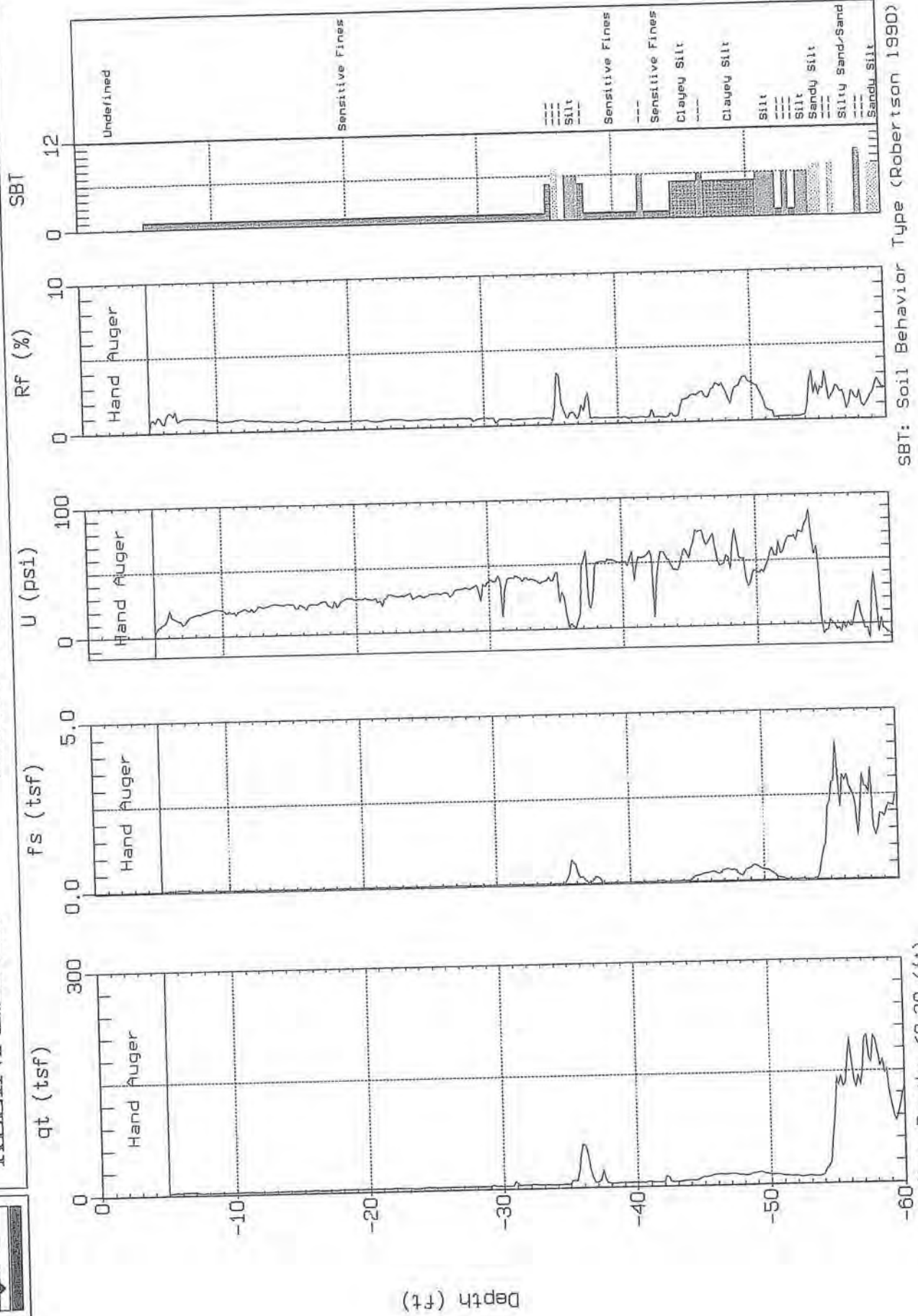
Max. Depth: 60.20 (ft)
Depth Inc.: 0.164 (ft)



KLEINFELDER

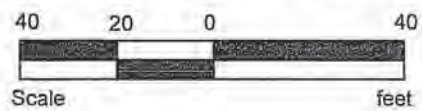
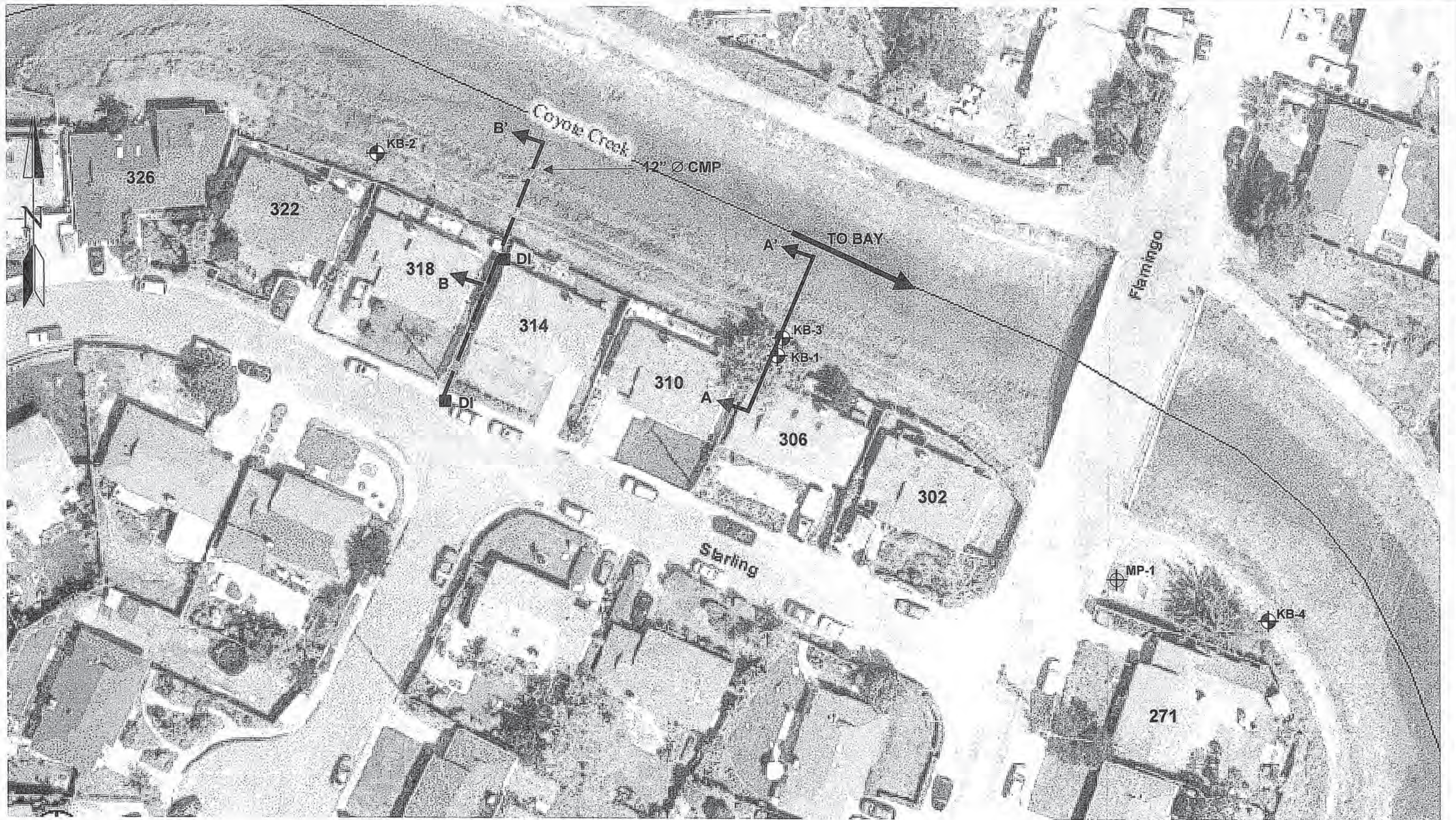
Site: CREST MARIN CREEK
Location: CPT-2

Geologist: M. STANLEY
Date: 12/14/06 09:29



SBT: Soil Behavior Type (Robertson 1990)

Max. Depth: 60.20 (ft)
Depth Inc.: 0.164 (ft)



KB-1 APPROXIMATE BORING LOCATION
(KLEINFELDER, 2006)



MP-1 APPROXIMATE BORING LOCATION
(MILLER PACIFIC 2002)



DI DROP INLET



BORING LOCATIONS

PROJECT NO. 71626 Date: OCT 2006

Coyote Creek Levee Seepage
Marin County, California

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS					DESCRIPTIVE NAMES
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM		SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS, GRAVELLY SANDS
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC		CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half < #200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

FIELD SAMPLING

- MODIFIED CALIFORNIA SAMPLE
- DISTURBED, BAG OR BULK SAMPLE
- STANDARD PENETRATION TEST
- SHELBY TUBE SAMPLE
- 3-1/2" I.D. CONTINUOUS CORE SAMPLE
- UNRETAINED PORTION OF SAMPLE
- WATER LEVEL OBSERVED IN BORING (at given post-drilling time)
- WATER LEVEL OBSERVED IN BORING (at time of drilling)

LABORATORY TESTS

- LL LIQUID LIMIT
- PI PLASTICITY INDEX
- SA SIEVE ANALYSIS
- #200 PERCENT PASSING #200 SIEVE
- RV RESISTANCE VALUE
- EI EXPANSION INDEX
- DS DIRECT SHEAR
- Tx/UJ TRIAXIAL SHEAR-UNCONSOLIDATED UNDRAINED
- UC UNCONFINED COMPRESSION
- SG SPECIFIC GRAVITY
- PP POCKET PENETROMETER SHEAR STRENGTH (tsf)

NOTES: Blow counts represent the number of blows of a -pound hammer falling 30-inches required to drive a sampler the last 12-inches of an 18-inch penetration. The blow counts have been converted to standard N-value blow counts.

The lines separating strata on the logs represent approximate boundaries only. The actual transition may be gradual. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil strata and groundwater observed at the boring location on the date of drilling only.



KLEINFELDER

BORING LOG LEGEND

**Coyote Creek Levee Seepage
Marin County, California**

PLATE

A-1


PROJECT NUMBER 71626

DATE Oct 2006

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample				
45	12.7		Seive Analysis See Plate B-1 -200=18%	25	1	[Symbol]	ML	SILTY SAND / SANDY SILT- dark brown. (Fill)	
	15.4						GC	CLAYEY GRAVEL WITH SAND- brown, olive brown and orange, very moist, medium dense, angular to subangular gravels to 2 inches, locally very plastic. (Fill)	
	75.6	Seive Analysis See Plate B-1 -200=74%	11	3	[Symbol]	CL	SANDY CLAY WITH GRAVEL- mottled brown with olive brown, wet, stiff (Fill)		
						CH	CLAY WITH SAND AND GRAVEL- mottled brown and olive brown, wet, stiff. (Bay Mud)		
						CH	CLAY- gray, wet, very plastic, abundant organic matter. (Bay Mud)		
		95.2			8	6			
					7	7			
					8				
* Converted to equivalent standard penetration blow counts. ** Existing ground surface at time of drilling.									

BOTTOM OF BORING KB-1 @ 8 FEET
No Free Water Encountered

SURFACE ELEVATION: 4.3** TOTAL DEPTH: 8.0 feet GROUND WATER DEPTH: ∇ feet at time of drilling ∇ feet	LOGGED BY: HSC EQUIPMENT: Little Beaver - Solid Flight DIAMETER of BORING: 4 inches DATE DRILLED: 5-26-05
---	--

 KLEINFELDER	LOG OF EXPLORATION BORING KB-1 Coyote Creek Levee Seepage Marin County, California	PLATE
		A-2
PROJECT NUMBER 71626	DATE Oct 2006	1 of 1

LABORATORY				FIELD		Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample			
126	4.7		Seive Analysis See Plate B-1 -200=19%	62		1	ML	SANDY SILT WITH TRACE GRAVELS- dark red brown, dry, hard, gravels up to 1/4 inch. (Fill)
						2	GP	SILTY SANDY GRAVEL- gray, dry, very dense, gravels up to 1 inch. (Fill)
						3	SC	CLAYEY SAND- red brown, dry, very dense, gravels up to 1 inch. (Fill)
104	21.8		Seive Analysis See Plate B-1 -200=44% Seive Analysis See Plate B-1 -200=42%	47		4		
						5	GP	SANDY GRAVEL- gray, moist, medium dense, gravels up to 1.5 inches. (Fill)
						6	SC	CLAYEY SAND WITH GRAVEL- dark red brown, moist, loose. (Fill)
54	76.2			30		7		
						8	CH	CLAY- dark gray, wet, stiff, contains abundant roots and organic matter. (Bay Mud)
				9		9		
				8		8		
				5		5		
						11		BOTTOM OF BORING KB-2 @ 10.5 FEET No Free Water Encountered
						12		
						13		
						14		
						15		
						16		
						17		
						18		
						19		
						20		

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

SURFACE ELEVATION: 7.5 **
TOTAL DEPTH: 10.5 feet
GROUND WATER DEPTH: ∇ feet at time of drilling
 ∇ feet

LOGGED BY: JJP
EQUIPMENT: Mobile B-53 - Solid Flight
DIAMETER of BORING: 6 inches
DATE DRILLED: 6-13-06



LOG OF EXPLORATION BORING KB-2

Coyote Creek Levee Seepage
Marin County, California

PLATE

A-3

1 of 1

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample				
						1	ML	SANDY SILT WITH TRACE GRAVELS- brown, dry, hard, gravels up to 3/4 inches. (Fill)	
						2	GP	SANDY GRAVEL WITH SILT- gray, dry, dense, gravels up to 1 inch. (Fill)	
						3	GC	CLAYEY GRAVEL WITH SAND- mottled dark gray and dark red brown, moist, dense, gravels up to 3/4 inches. (Fill)	
						4			
						5			
						6			
	13.2		Seive Analysis See Plate B-1 -200=30%			7	SC	CLAYEY SAND- mottled dark gray, yellow brown and olive gray, wet, loose. (Fill)	
	12.4		Seive Analysis See Plate B-2 -200=49%			8			
						9	CH	CLAY WITH TRACE SAND- dark gray, wet, medium stiff, contains abundant organic matter. (Bay Mud)	
						10			
54	72.0					11		BOTTOM OF BORING KB-3 @ 11 FEET No Free Water Encountered	
						12			
						13			
						14			
						15			
						16			
						17			
						18			
						19			
						20			

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

SURFACE ELEVATION: 7.5 **
TOTAL DEPTH: 11.0 feet
GROUND WATER DEPTH: ∇ feet at time of drilling
∇ feet

LOGGED BY: JJP
EQUIPMENT: Mobile B-53 - Solid Flight
DIAMETER of BORING: 6 inches
DATE DRILLED: 6-13-06



LOG OF EXPLORATION BORING KB-3
Coyote Creek Levee Seepage
Marin County, California

PLATE
A-4
1 of 1

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample				
						1	CL	SANDY GRAVELLY CLAY- mottled gray and red brown, dry, very stiff, gravels up to 3/4 inches. (Fill)	
						2	CL	GRAVELLY SANDY CLAY- mottled red brown and yellow brown, dry, very stiff to hard, gravels up to 1/2 inches. (Fill)	
125	10.9					3	GP	SANDY GRAVEL- gray, moist, medium dense, gravels up to 1 inch. (Fill)	
						4	CL	GRAVELLY SANDY CLAY- mottled red brown and gray, moist, hard, gravels up to 3/4 inches. (Fill)	
						5			
						6			
133	5.9					7			
						8	SC	CLAYEY SAND WITH GRAVEL- gray, wet, dense, gravels up to 2 inches. (Fill)	
111	15.2		Seive Analysis See Plate B-2 -200=38%			9			
			Seive Analysis See Plate B-2 -200=44%			10			
			Seive Analysis See Plate B-2 -200=42%			11			
125	13.2					12			
						13			
126	11.4					14			
						15			
						16			
46	95.2					17	CH	CLAY- dark gray, wet, medium stiff, contains moderate amounts of organic matter. (Bay Mud)	
						18			
						19			
						20			
						21			
						22			
						23			
						24			
						25			
						26			
						27			
						28			
						29			
						30			
						31			
						32			
						33			
						34			
						35			
						36			
						37			
						38			
						39			
						40			
						41			
						42			
						43			
						44			
						45			
						46			
						47			
						48			
						49			
						50			
						51			
						52			
						53			
						54			
						55			
						56			
						57			
						58			
						59			
						60			
						61			
						62			
						63			
						64			
						65			
						66			
						67			
						68			
						69			
						70			
						71			
						72			
						73			
						74			
						75			
						76			
						77			
						78			
						79			
						80			
						81			
						82			
						83			
						84			
						85			
						86			
						87			
						88			
						89			
						90			
						91			
						92			
						93			
						94			
						95			
						96			
						97			
						98			
						99			
						100			

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

SURFACE ELEVATION: 8.0 **
TOTAL DEPTH: 12.5 feet
GROUND WATER DEPTH: ∇ feet at time of drilling
∇ feet

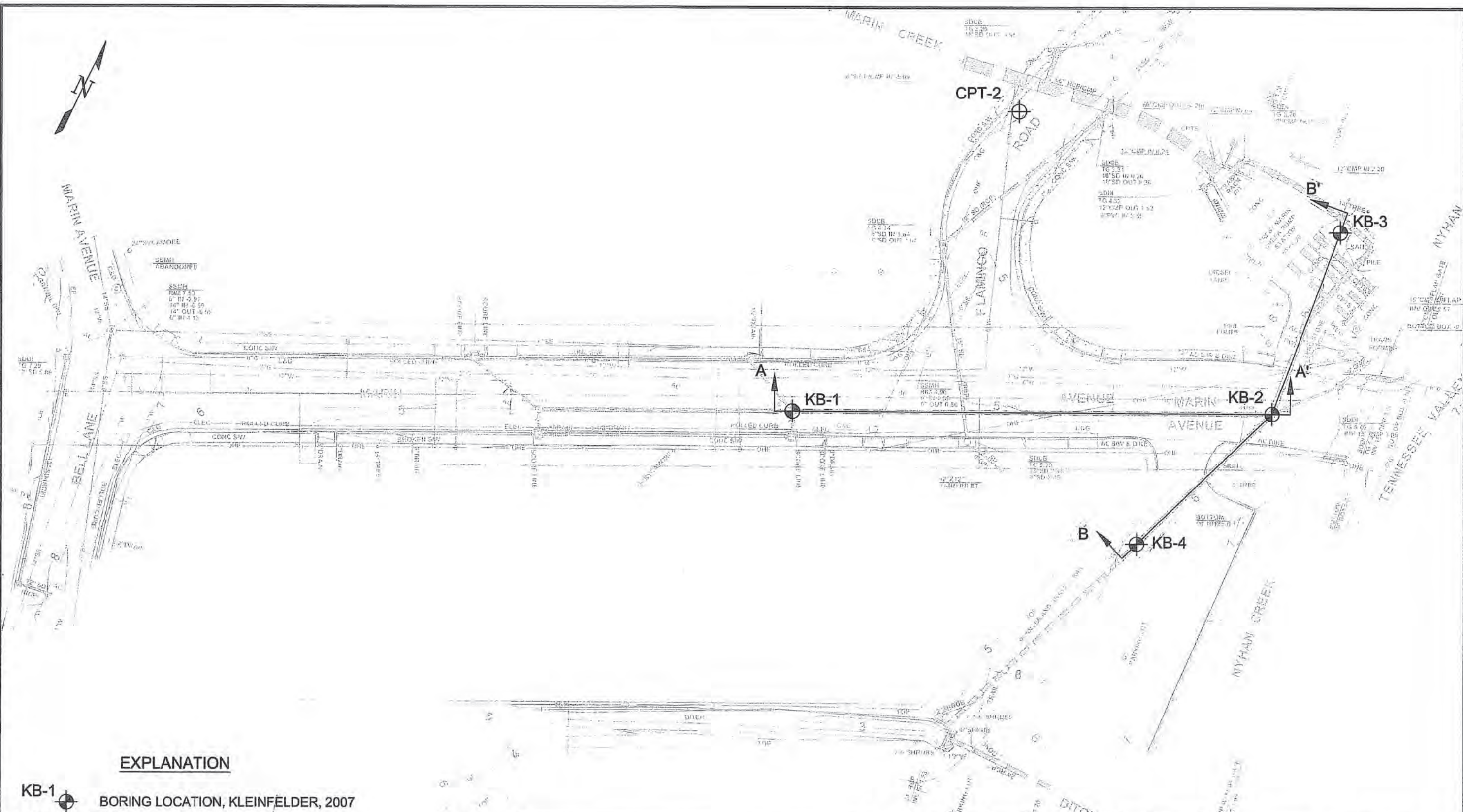
LOGGED BY: JJP
EQUIPMENT: Mobile B-53 - Solid Flight
DIAMETER of BORING: 6 inches
DATE DRILLED: 6-13-06





LOG OF EXPLORATION BORING KB-4
Coyote Creek Levee Seepage
Marin County, California

PLATE
A-5
1 of 1

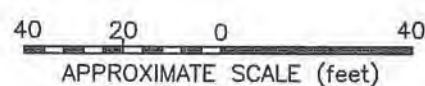
ATTACHED IMAGES: XRef: MARIN AVE TOPO: XRef: MARIN AVE HC
 ATTACHED XREFS: CAD FILE: U:\GEO TECH_PROJECTS\Projects\Active\82984 Marin Ave Storm Drain\cad LAYOUT: Layout1
 File-L:\2005\05\PROJ



EXPLANATION

- KB-1  BORING LOCATION, KLEINFELDER, 2007
- CPT-2  CPT LOCATION, KLEINFELDER, 2006

Base: 95% Submittal Marin Ave Drainage Improvement Project
 Plans, Winzler & Kelly Consulting Engineers, April 4, 2007



© by Kleinfelder Inc., 2007

DRAWN BY: P. Hubbard	
REVISED BY:	
CHECKED BY: M. Stanley	
DATE: 05/07	APPROVED BY:

SITE PLAN	
MARIN AVENUE DRAINAGE IMPROVEMENT PROJECT	
MILL VALLEY, CALIFORNIA	
PROJECT NO. 82984-2	FILE NAME: 82984-1.dwg

KLEINFELDER

2240 Northpoint Parkway
 Santa Rosa, CA 95407-5009
 PH. 707-571-1883 FAX. 707-571-8713
 www.kleinfelder.com

PLATE
2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		DESCRIPTIVE NAMES	
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 15% FINES	GP POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 15% FINES	GM SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
		GRAVELS WITH OVER 15% FINES	GC CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW WELL GRADED SANDS, GRAVELLY SANDS
		CLEAN SANDS WITH LITTLE OR NO FINES	SP POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 15% FINES	SM SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
		SANDS WITH OVER 15% FINES	SC CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half < #200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	ML INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
		OL ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	MH INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
		CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
		OH ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS		Pt PEAT AND OTHER HIGHLY ORGANIC SOILS	

FIELD SAMPLING

	CALIFORNIA SAMPLE 2.5" I.D.
	MODIFIED CALIFORNIA SAMPLE 2" I.D.
	DISTURBED, BAG OR BULK SAMPLE
	STANDARD PENETRATION TEST
	SHELBY TUBE SAMPLE
	3-1/2" I.D. CONTINUOUS CORE SAMPLE
	UNRETAINED PORTION OF SAMPLE
	WATER LEVEL OBSERVED IN BORING (at given post-drilling time)
	WATER LEVEL OBSERVED IN BORING (at time of drilling)

LABORATORY TESTS

LL	LIQUID LIMIT
PI	PLASTICITY INDEX
SA	SIEVE ANALYSIS
#200	PERCENT PASSING #200 SIEVE
TV	TORVANE SHEAR STRENGTH (tsf)
EI	EXPANSION INDEX
DS	DIRECT SHEAR
Tx/UU	TRIAxIAL SHEAR-UNCONSOLIDATED UNDRAINED
UC	UNCONFINED COMPRESSION
SG	SPECIFIC GRAVITY
PP	POCKET PENETROMETER SHEAR STRENGTH (tsf)

NOTES: Blow counts represent the number of blows of a 140-pound hammer falling 30-inches required to drive a sampler the last 12-inches of an 18-inch penetration. Field blow counts (not-converted).

The lines separating strata on the logs represent approximate boundaries only. The actual transition may be gradual. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil strata and groundwater observed at the boring location on the date of drilling only.



BORING LOG LEGEND

Marin Avenue Drainage Improvement Project
Mill Valley, California

PLATE

A-1

PROJECT NUMBER 82984

DATE May 2007

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/foot *	Sample				
114	12.7			30		0	AC	ASPHALT = 4" thick	
						1	SC	CLAYEY SAND- reddish brown, moist, medium dense, fine to coarse grained sand	
						2	GC	CLAYEY GRAVEL- mottled yellow brown & dark brown, moist, medium dense, fine to coarse grained sand, angular gravel to 0.75" diameter.	
88	36.2	1.41	VS = 0.5 PP = 1.75	12	Push	3	SC/CL	CLAYEY SAND/SANDY CLAY- reddish brown, moist, medium dense, fine to coarse grained sand	
						4	CH/CL	CLAY- very dark brown, moist, soft, organics present (Bay Mud Crust)	
42	96.5		VS = 0.325 PP = 0	Push	Push	5	ML	SILT- gray to dark gray, moist to wet, medium stiff (Bay Mud Crust)	
						6		CLAY- dark gray, moist to wet, soft, abundant organics (Bay Mud)	
						7			
41	124.0	0.78	PP = 0 VS = 0.15	Push	Push	8			
						9	CH		
			PP = 0.25 VS = 0.17	12	Push	10			
						11			
						12			
						13		BOTTOM OF BORING KB-1 @ 12.5 FEET Caved to 11 feet upon removal of augers. No Free Water Encountered	
						14			
						15			
						16			
						17			
						18			
						19			
						20			

* Field blow counts (not-converted).
 ** Elevations obtained from County of Marin, Department of Public Works, Marin Avenue Drainage Improvement Project, Plan no. C-101 & C-102

SURFACE ELEVATION: 4.8 **
 TOTAL DEPTH: 12.5 feet
 GROUND WATER DEPTH: ∇ feet at time of drilling
 ∇ feet

LOGGED BY: C. Goitein
 EQUIPMENT: Simco Track Rig
 DIAMETER of BORING: 3.5"
 DATE DRILLED: 5-18-07



**LOG OF EXPLORATION
 BORING KB-1**
 Marin Avenue Drainage Improvement Project
 Mill Valley, California

PLATE

A-2

PROJECT NUMBER 82984

DATE May 2007

1 of 1

LABORATORY				FIELD		Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/foot *	Sample			
						1	AC	ASPHALT = 3 feet thick
				57		2		
						3	SC	GRAVELLY SAND WITH CLAY- gray brown, moist, loose, fine to coarse grained sand, angular gravel up to 0.5" diameter (fill)
				10		4		
						5	GC/CL	CLAY WITH GRAVEL/GRAVEL WITH CLAY- dark brown, gray, wet, very loose/very soft (Bay Mud with gravel fill)
						6		
				Push		7		
				Push		8		CLAY- very dark gray, wet, very soft (Bay Mud)
				Push		9		
				Push		10		
61	60.6		PP = 0	Push		11		Sample dropped out of sampler, collected sample via sand catcher
				Push		12	CH	
				Push		13		
				Push		14		
	70.9			Push		15		Sample dropped out of sampler, collected sample via sand catcher
				Push		16		
				Push		17		
						18		BOTTOM OF BORING KB-2 @ 17.5 FEET Caved to 10 feet upon removal of augers. No Free Water Encountered
						19		
						20		

* Field blow counts (not-converted).
 ** Elevations obtained from County of Marin, Department of Public Works, Marin Avenue Drainage Improvement Project, Plan no. C-101 & C-102

SURFACE ELEVATION: **6.3****
 TOTAL DEPTH: **17.5 feet**
 GROUND WATER DEPTH: ∇ **5.0 feet at time of drilling**
 ∇ **feet**

LOGGED BY: **C. Goitein**
 EQUIPMENT: **Simco Track Rig**
 DIAMETER of BORING: **3.5"**
 DATE DRILLED: **5-18-07**



LOG OF EXPLORATION BORING KB-2
Marin Avenue Drainage Improvement Project
Mill Valley, California

PLATE
A-3
 1 of 1

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/foot *	Sample				
134	8.1					1	SW	SAND- gray-yellow brown, dry to moist, loose, fine grained sand (fill)	
						2	GC/CL	GRAVELLY CLAY/CLAYEY GRAVEL- dark brown, moist, loose/medium dense, fine to coarse grained sand, angular gravel to 0.75" diameter (fill)	
						3			
						4			
						5			
						6		Gravel up to 1.5" diameter Mottled yellowish brown and olive brown	
54	76.7		PP = 0 PP = 0.5 (Sandy) VS = 0.2			7	CH	CLAY- bluish gray & very dark gray, moist to wet, very soft, organics present (Bay Mud) Peat	
						8			
						9		Sandy clay lenses (SC/CH)	
71	51.8	0.610	VS = 0.165			10	CH	Dark gray, some shell fragments	
						11			
						12		Sandy clay lense at 11.8 feet to 12 feet	
						13		Wet Sandy lense at 13.3 to 13.5 feet Shell fragments	
						14			
						15		BOTTOM OF BORING KB-3 @ 14.5 FEET Caved to 13 feet upon removal of augers. Water measured at 11 feet 3 hours after drilling	
						16			
						17			
						18			
						19			
						20			

* Field blow counts (not-converted).
 ** Elevations obtained from County of Marin, Department of Public Works, Marin Avenue Drainage Improvement Project, Plan no. C-101 & C-102

SURFACE ELEVATION: 6.1 **
 TOTAL DEPTH: 14.5 feet
 GROUND WATER DEPTH: ∇ feet at time of drilling
 ∇ 11.0 feet +3 hours

LOGGED BY: C. Goitein
 EQUIPMENT: Simco Track Rig
 DIAMETER of BORING: 3.5"
 DATE DRILLED: 5-18-07



LOG OF EXPLORATION BORING KB-3
 Marin Avenue Drainage Improvement Project
 Mill Valley, California

PLATE

A-4

1 of 1

PROJECT NUMBER 82984

DATE May 2007

LABORATORY				FIELD		Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/foot *	Sample			
120	12.1			21		1	GM/SM	CLAYEY SAND WITH GRAVEL/CLAYEY GRAVEL WITH SAND- gray brown, dry to moist, medium dense, angular gravel to 0.75" diameter
						2		CLAY- greenish gray, moist, wet, very soft, organics present (Bay Mud)
			PP = 0.5 VS = 0.6	9		3		
						4		Abundant organics
						5		
						6		
				6		7	CH	
44	114.8	1.04	VS = 0.2			8		
47	93.4				Push	9		
						10		dark gray
			PP = 0 VS = 0.15		Push	11		sandy clay and sand lenses
						12		BOTTOM OF BORING KB-4 @ 11.5 FEET Water measured at 4 feet 4 hours after drilling
						13		
						14		
						15		
						16		
						17		
						18		
						19		
						20		

* Field blow counts (not-converted).
 ** Elevations obtained from County of Marin, Department of Public Works, Marin Avenue Drainage Improvement Project, Plan no. C-101 & C-102

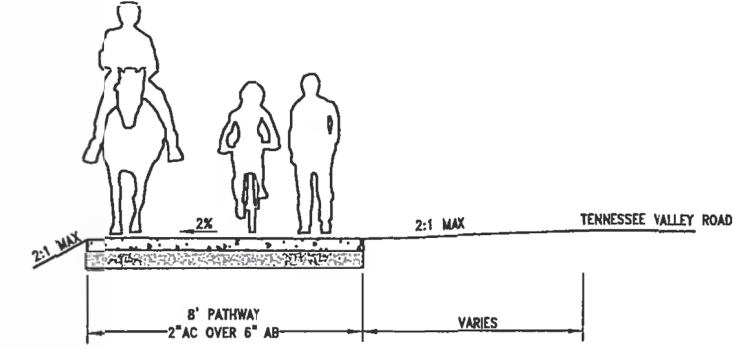
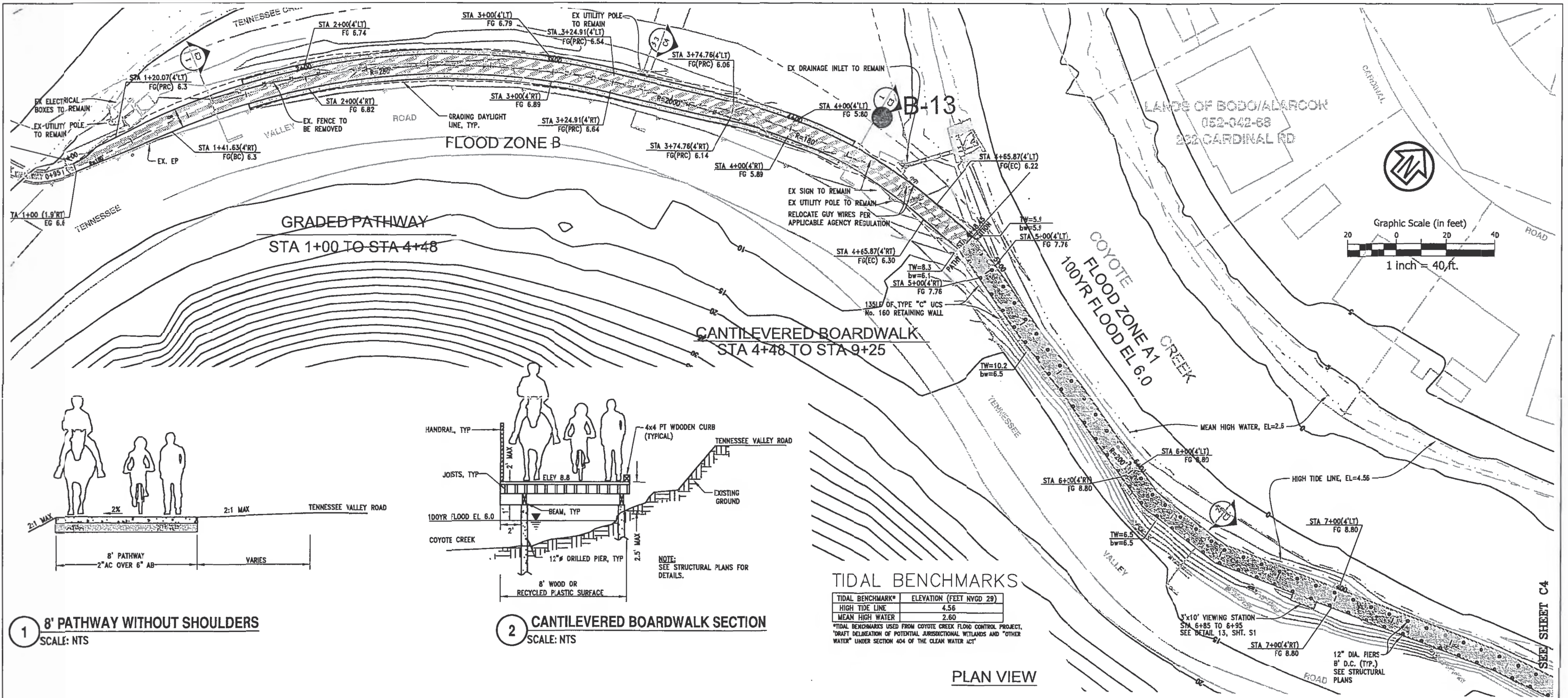
SURFACE ELEVATION: 5.6 **
 TOTAL DEPTH: 11.5 feet
 GROUND WATER DEPTH: ∇ feet at time of drilling
 ∇ 4.0 feet +4 hours

LOGGED BY: C. Goitein
 EQUIPMENT: Simco Track Rig
 DIAMETER of BORING: 3.5"
 DATE DRILLED: 5-18-07

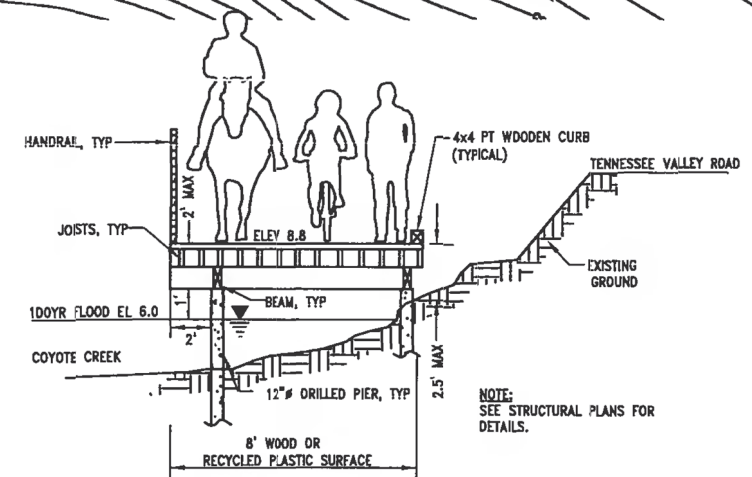


LOG OF EXPLORATION BORING KB-4
 Marin Avenue Drainage Improvement Project
 Mill Valley, California

PLATE
A-5
 1 of 1



1 8' PATHWAY WITHOUT SHOULDERS
SCALE: NTS

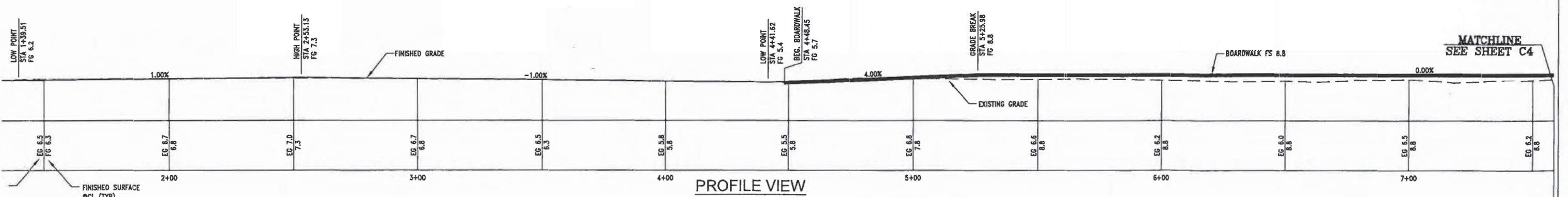


2 CANTILEVERED BOARDWALK SECTION
SCALE: NTS

TIDAL BENCHMARKS

TIDAL BENCHMARK*	ELEVATION (FEET NYGD 29)
HIGH TIDE LINE	4.56
MEAN HIGH WATER	2.60

*TIDAL BENCHMARKS USED FROM COYOTE CREEK FLOOD CONTROL PROJECT, "DRAFT DELINEATION OF POTENTIAL JURISDICTIONAL WETLANDS AND "OTHER WATER" UNDER SECTION 404 OF THE CLEAN WATER ACT"



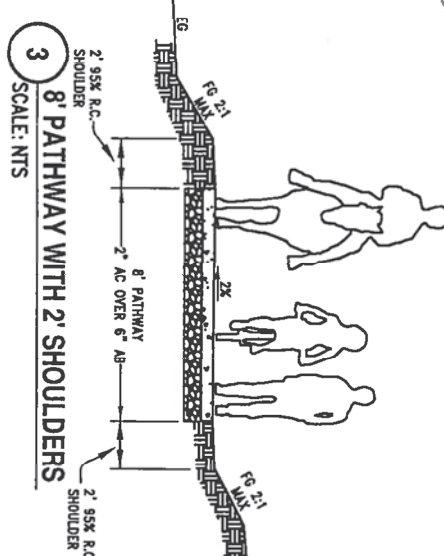
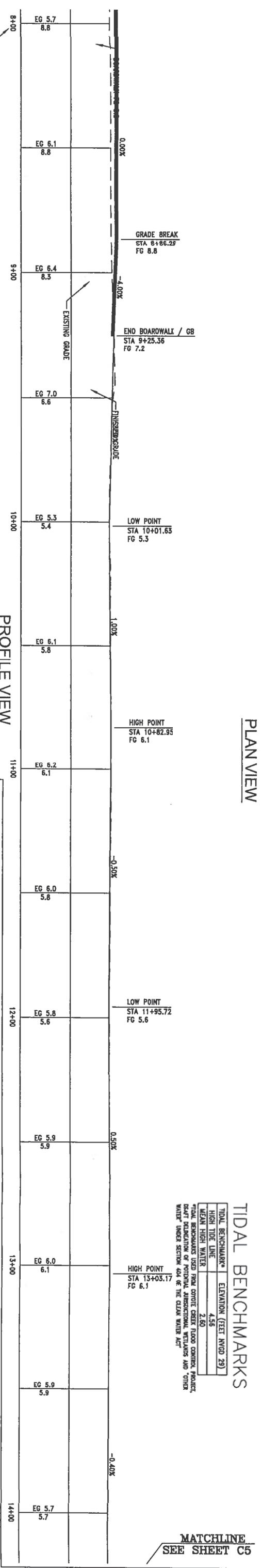
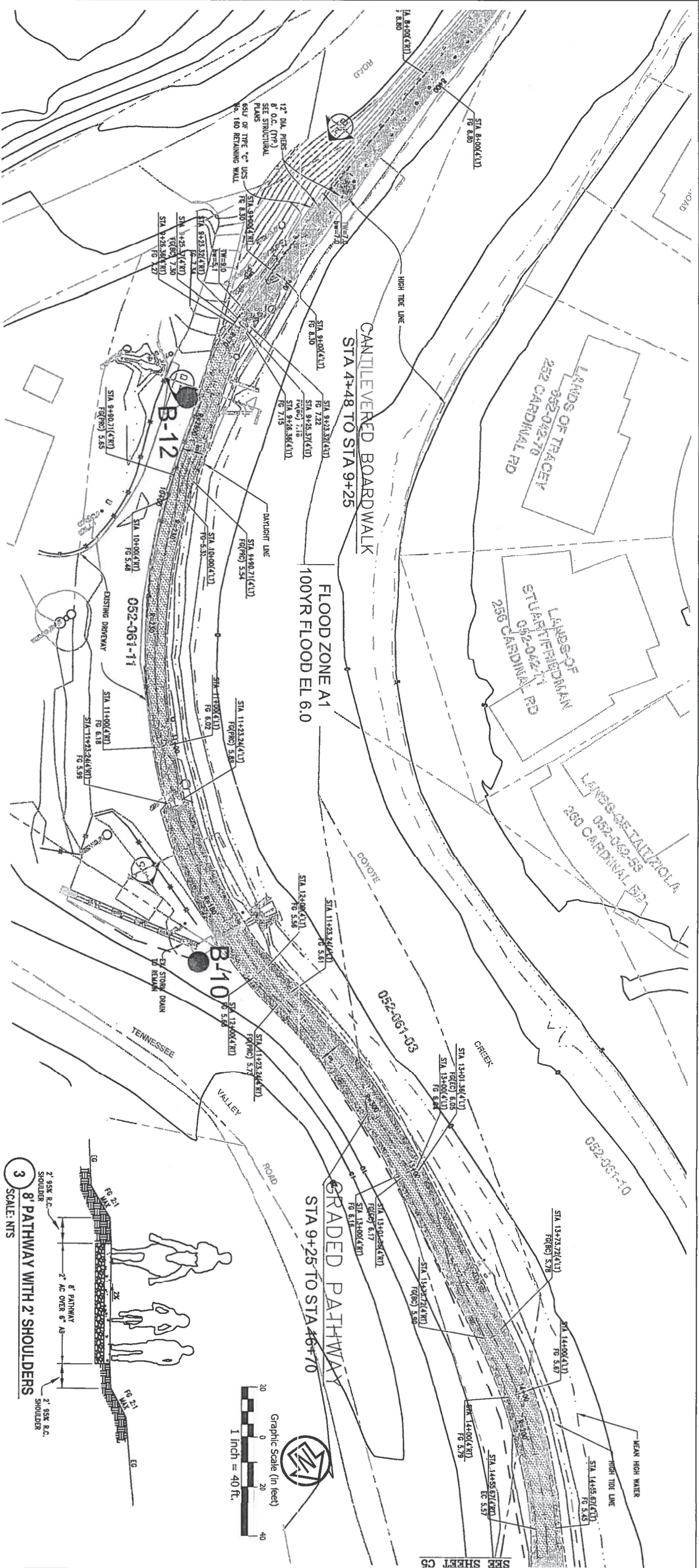
REFERENCE:
TENNESSEE VALLEY - MANZANITA CONNECTOR PATHWAY
75% CD SUBMITTAL TO THE COUNTY OF MARIN
(SHEET C3), BY CSW / STUBER-STROEH ENGINEERING GROUP, INC., DATED 11-7-08

LEGEND
● B-13 NCE BORING LOCATION

Nichols Consulting Engineers, Chtd.
501 Canal Blvd., Suite I
Pt. Richmond, California 94804
(510) 215-3620

Site Plan - 1 of 5
Tennessee Valley / Manzanita Connector Pathway
Geotechnical Investigation
Marin County, California

DRAWN: YG FILE NAME: 3820.320004.dwg PROJECT NUMBER: 382 03 20 APPROVED: TJC DATE: 1/09 REVISED DATE:



TIDAL BENCHMARKS

TIDAL BENCHMARK*	ELEVATION (FEET MGD 29)
HIGH TIDE LINE	4.58
MEAN HIGH WATER	2.80

*TIDAL BENCHMARKS USED FROM OFFICE CHECK FLOOD CONTROL DISTRICT. THESE BENCHMARKS ARE FOR INFORMATION ONLY AND OTHER WATER UNDER SECTION 404 OF THE CLEAN WATER ACT.

PROFILE VIEW

LEGEND

● B-12 NCE BORING LOCATION

REFERENCE:
 TENNESSEE VALLEY - MANZANITA CONNECTOR PATHWAY
 75% CD SUBMITTAL TO THE COUNTY OF MARIN
 (SHEET C4), BY CSW / STUBER-STROEH ENGINEERING GROUP, INC., DATED 11-7-08

Nichols Consulting
 Engineers, Chd.
 501 Canal Blvd., Suite 1
 Pt. Richmond, California 94804
 (510) 215-3620

Site Plan - 2 of 5
 Tennessee Valley / Manzanita Connector Pathway
 Geotechnical Investigation
 Marin County, California

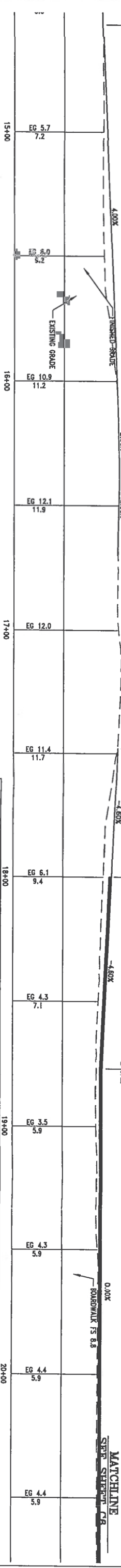
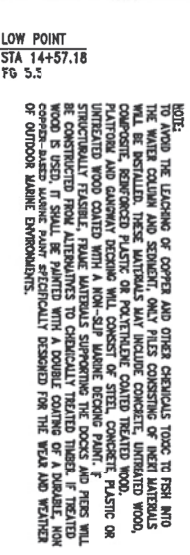
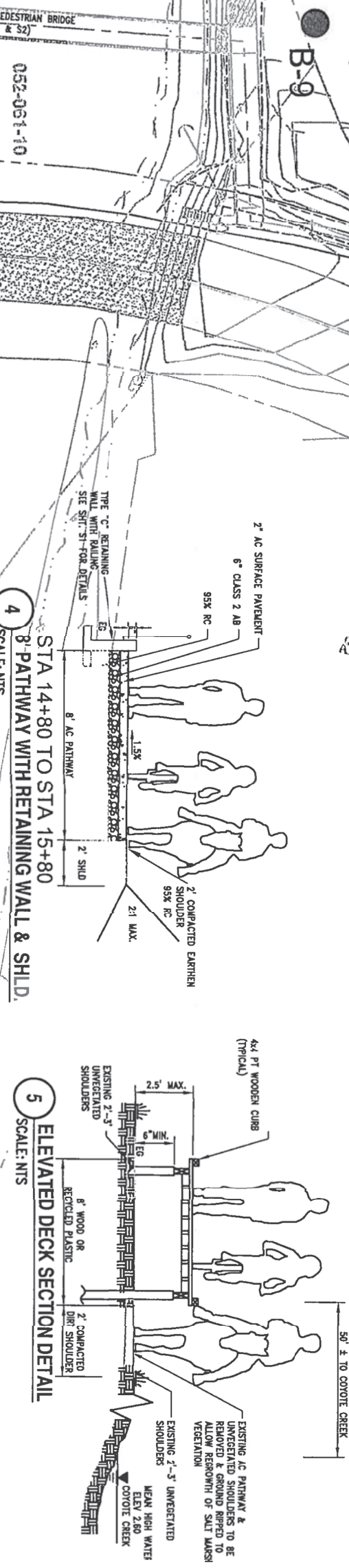
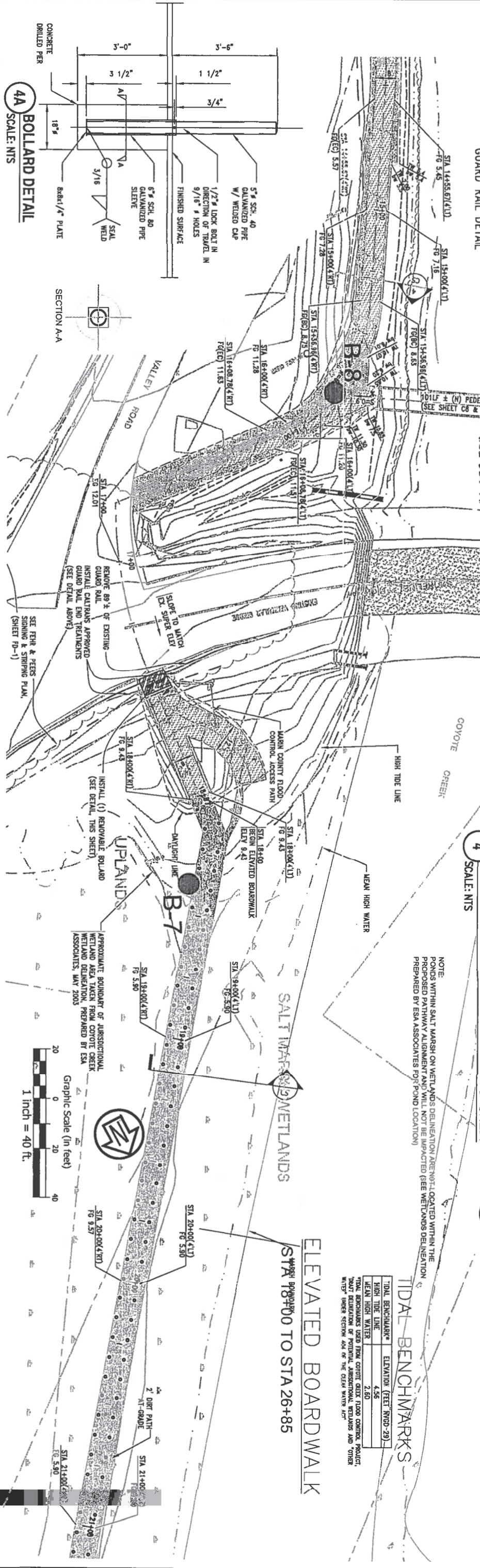
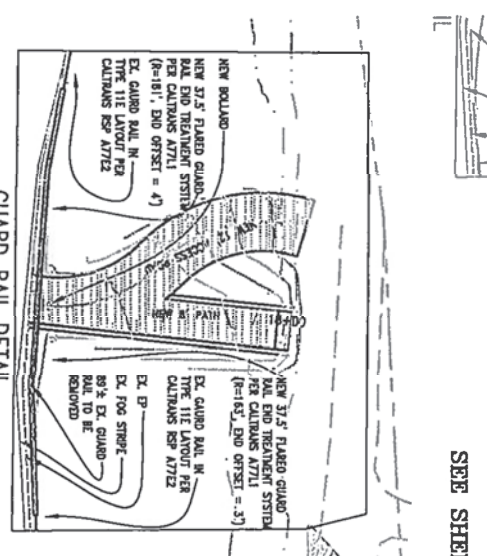
DRAWN YG
FILE NAME 3820320004.dwg
PROJECT NUMBER 382.03.20

APPROVED TPD
DATE 1/09
REVISED DATE

FIGURE 2

MATCHLINE
 SEE SHEET C5

SEE SHEET C5



REFERENCE:
 TENNESSEE VALLEY - MANZANITA CONNECTOR PATHWAY
 75% CD SUBMITTAL TO THE COUNTY OF MARIN
 (SHEET C5), BY CSW/ STUBER-STROEHL ENGINEERING GROUP, INC., DATED 11-7-08

LEGEND
 B-8 NCE BORING LOCATION

PROFILE VIEW

PLAN VIEW

Scale: 1 inch = 40 ft.

TIDAL BENCHMARKS

TOTAL BENCHMARK*	ELEVATION (FEET MVD-29)
HIGH TIDE	4.56
MEAN HIGH WATER	2.80

*TOTAL BENCHMARKS USED FROM COYOTE CREEK RIVER CONTROL PROJECT. TARGET ELEVATION OF POTENTIAL JURISDICTIONAL WETLANDS AND OTHER WATERS UNDER SECTION 404 OF THE CLEAN WATER ACT.

Site Plan - 3 of 5
 Tennessee Valley / Manzanita Connector Pathway
 Geotechnical Investigation
 Marin County, California

Nichols Consulting Engineers, Chd.
 501 Canal Blvd, Suite I
 Pt. Richmond, California 94804
 (510) 215-3620

DRAWN: YG
 PROJECT NUMBER: 3R20N320002.dwg
 APPROVED: [Signature]
 DATE: 1/00
 REVISED DATE: [Blank]

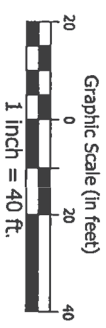
FIGURE 3

MEAN HIGH WATER

COYOTE CREEK

ELEVATED BOARDWALK

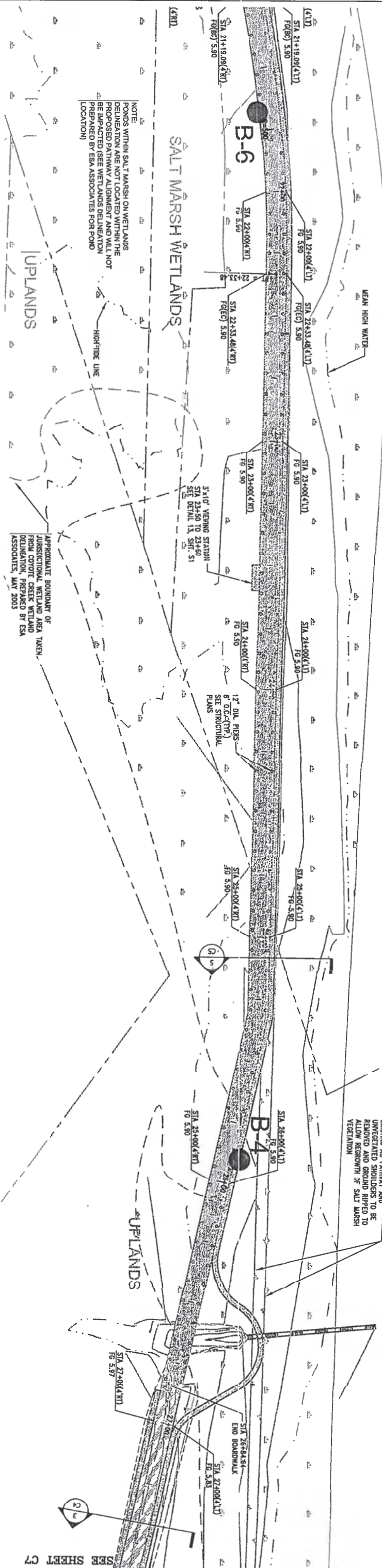
STA 18+00 TO STA 26+85



TIDAL BENCHMARKS

TIDAL BENCHMARK	ELEVATION (FEET NAVD 29)
HIGH TIDE LINE	4.58
MEAN HIGH WATER	2.50

TOTAL BENCHMARKS USED FROM COYOTE CREEK FLOOD CONTROL PROJECT, TIDAL DELINEATION OF POTENTIAL ASSOCIATIONAL WETLANDS AND OTHER WATER UNDER SECTION 404 OF THE CLEAN WATER ACT



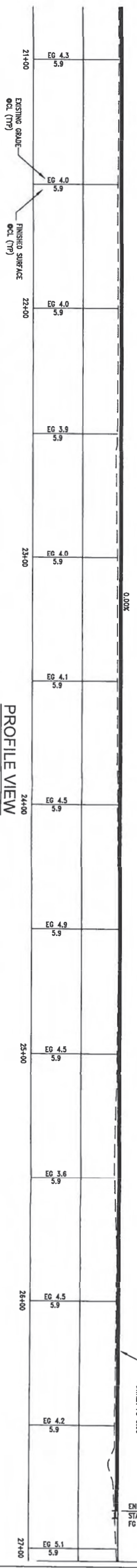
NOTE:
PONDS WITHIN SALT MARSH ON WETLANDS DELINEATION ARE NOT LOCATED WITHIN THE PROPOSED PATHWAY ALIGNMENT AND WILL NOT BE IMPACTED (SEE WETLANDS DELINEATION PREPARED BY ESA ASSOCIATES FOR POND LOCATION)

APPROXIMATE BOUNDARY OF JURISDICTIONAL WETLAND AREA TAKEN FROM COYOTE CREEK WETLAND DELINEATION, PREPARED BY ESA ASSOCIATES, MAY 2003

EXISTING AC PATHWAY AND UNGRADED SHOULDERS TO BE REMOVED AND GROUND RIPPED TO ALLOW REBIRTH OF SALT MARSH VEGETATION

NOTE:
TO AVOID THE LEACHING OF COPPER AND OTHER CHEMICALS TOXIC TO FISH INTO THE WATER COLUMN AND SEDIMENT, ONLY PILES CONSISTING OF NEAT MATERIALS WILL BE INSTALLED. THESE MATERIALS MAY INCLUDE CONCRETE, UNTREATED WOOD, COMPOSITE, REINFORCED PLASTIC OR POLYMER, COATED TREATED WOOD, PLATFORM AND GASKET, DECKING WILL CONSIST OF STEEL, CONCRETE, PLASTIC OR UNTREATED WOOD COATED WITH A NON-SOLUBLE BARRIER PAINT. IF STRUCTURALLY FEASIBLE, FISH TOXIC CHEMICALS APPLYING THE DECKS AND PILES WILL BE OBTAINED FROM MANUFACTURERS WHO CHEMICALLY TREAT ALL WOOD AND PILES TO BE USED IN CONTACT WITH WATER. CHEMICALLY TREATED WOOD SHALL BE PAINTED WITH A DURABLE, NON-COPPER-BASED MARINE PAINT SPECIFICALLY DESIGNED FOR THE WEAR AND WEATHER OF OUTDOOR MARINE ENVIRONMENTS.

PLAN VIEW



PROFILE VIEW

MATCHLINE
SEE SHEET C7

END BOARDWALK
STA 26+84.84
FG 5.9

BOARDWALK FS 5.90

LEGEND

● B-4 NCE BORING LOCATION

REFERENCE:
TENNESSEE VALLEY - MANZANITA CONNECTOR PATHWAY
75% CD SUBMITTAL TO THE COUNTY OF MARIN
(SHEET C6), BY CSW / STUBER-STROEH ENGINEERING GROUP, INC., DATED 11-7-08



Nichols Consulting
Engineers, Chtd.
501 Canal Blvd., Suite I
Pt. Richmond, California 94804
(510) 215-3620

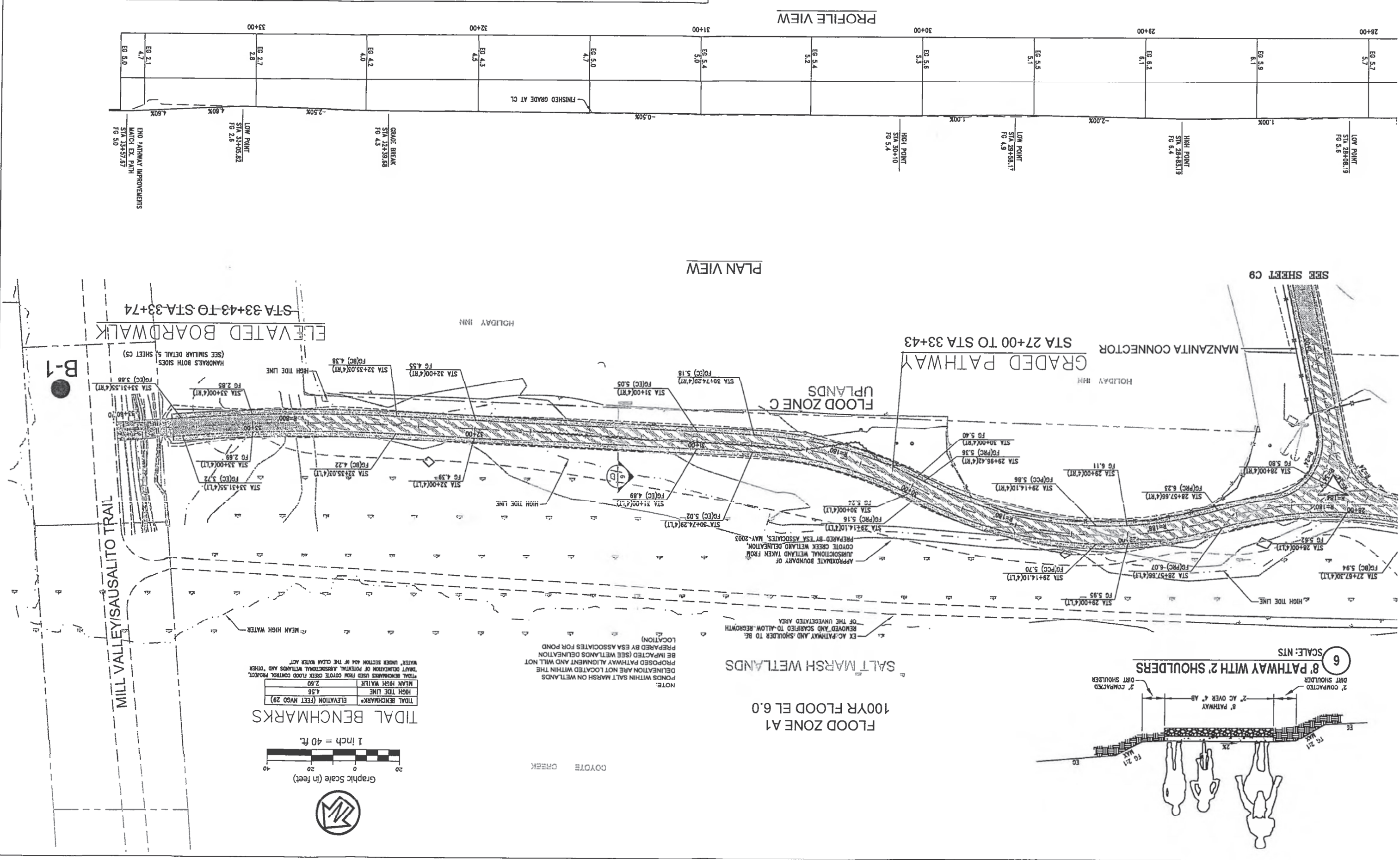
Site Plan - 4 of 5
Tennessee Valley / Manzanita Connector Pathway
Geotechnical Investigation
Marin County, California

DRAWN: YG FILE NAME: 3820.320004.dwg PROJECT NUMBER: 382.0.3.20 APPROVED: DATE: 1/00 REVISED DATE:

REFERENCE: TENNESSEE VALLEY - MANZANITA CONNECTOR PATHWAY 75% CD SUBMITTAL TO THE COUNTY OF MARIN (SHEET C7), BY CSW / STUBER-STROE ENGINEERING GROUP, INC., DATED 11-7-08

LEGEND
● B-1 NCE BORING LOCATION

Nichols Consulting Engineers, Chtd.
501 Canal Blvd., Suite I
Pt. Richmond, California 94804
(510) 215-3620
Marin County, California
PROJECT NUMBER 3820320004.dwg
DATE 1/09
APPROVED
FIGURE 5



FLOOD ZONE A1
100YR FLOOD EL. 6.0

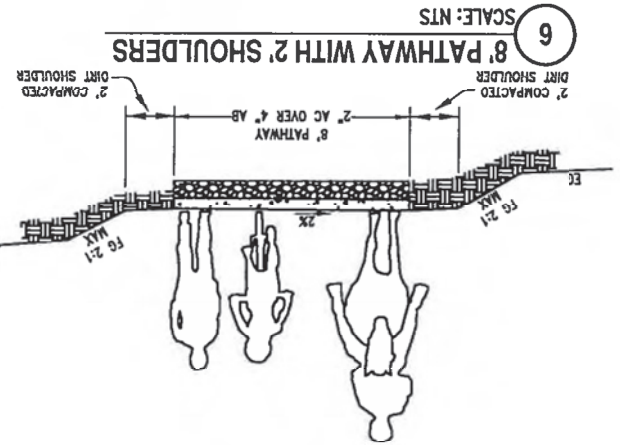
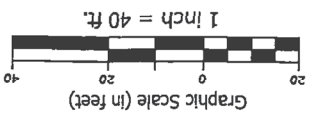
SALT MARSH WETLANDS

NOTE:
PONDS WITHIN SALT MARSH ON WETLANDS DELINEATION ARE NOT LOCATED WITHIN THE PROPOSED PATHWAY ALIGNMENT AND WILL NOT BE IMPACTED (SEE WETLANDS DELINEATION PREPARED BY ESA ASSOCIATES FOR POND LOCATION)

TIDAL BENCHMARKS

TIDAL BENCHMARK*	ELEVATION (FEET MGD 29)
MEAN HIGH WATER	4.56
HIGH TIDE LINE	2.60

*TIDAL BENCHMARKS USED FROM COYOTE CREEK FLOOD CONTROL PROJECT. TRAIL DELINEATION OF POTENTIAL WETLANDS AND OTHER WATER UNDER SECTION 404 OF THE CLEAN WATER ACT.



SCALE: NTS

6 8' PATHWAY WITH 2' SHOULDERS

2' COMPACTED DIRT SHOULDER
2' AC OVER 4" AB
8' PATHWAY
2' AC OVER 4" AB
2' COMPACTED DIRT SHOULDER

EG 2.1
EG 4.7
EG 5.0

EG 2.1
EG 4.7
EG 5.0

EG 2.1
EG 4.7
EG 5.0

EG 2.1
EG 4.7
EG 5.0

EG 2.1
EG 4.7
EG 5.0

EG 2.1
EG 4.7
EG 5.0

EG 2.1
EG 4.7
EG 5.0



Nichols Consulting Engineers, Chrd.
501 Canal Blvd, Suite I
Richmond, CA 94804
(510) 215-3620

Material Properties for Soil Classification
Tennessee Valley / Manzanita Connector Pathway
Geotechnical Investigation
Martin County, California

A-1

FIGURE

3820320002.dwg

Note: Where laboratory data are not available, the field classifications given above provide a general indication of material properties; the classifications may require modification based on judgment or laboratory testing.

Wet	-	Requires drying to obtain optimum moisture content for compaction
Moist	-	Near the optimum moisture content for compaction
Dry	-	Requires additional moisture to obtain optimum moisture content for compaction

NATURAL MOISTURE CONTENT

Consistency	Approximate Blows/foot (SPT)	Undrained Shear Strength (psf)
very soft	<2	0-250
soft	2-4	250-500
medium stiff	4-8	500-1,000
stiff	8-15	1,000-2,000
very stiff	15-30	2,000-4,000
hard	>30	>4,000

CONSISTENCY OF FINE-GRAINED SOILS

Relative Density	Standard Penetration Test Blow Count (blows per foot)
very loose	<4
loose	4-10
medium dense	10-30
dense	30-50
very dense	>50

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Nichols Consulting Engineers, Chtd.
 501 Canal Blvd, Suite I
 Richmond, CA 94804
 (510) 215-3620
 Marin County, California
 Tennessee Valley / Manzanita Connector Pathway
 Geotechnical Investigation
 Soil Classification Chart and Test Key

FIGURE

SOURCE: ASTM D2488-93 and Unified Soil Classification System (D2487-93)

3820320001.dwg

<p> HQ Core Sampler SPT Sampler Modified California Sampler Shelby or Osterberg Sampler Pitcher Barrel Grab or Bulk Sample First-encountered groundwater level Static groundwater level (10YR4/4) Munsell soil color / 1990 edition Permeability Consolidation Liquid Limit (%) Plasticity Index (%) Expansion Index (%) Specific Gravity Particle Size Analysis MA -200=55% Percent Passing No. 200 Sieve </p>	<p> - Unconsolidated Undrained Triaxial Shear (FM) OR (S) (1500) (field moisture or saturated) - Consolidated Undrained Triaxial Shear (P) (1500) (with or without pore pressure measurement) TXUU 3000 (1500) - Consolidated Drained Triaxial Shear (P) (1500) (with or without pore pressure measurement) TXCD 3000 (1500) - Simple Shear Consolidated Undrained (P) (1500) (with or without pore pressure measurement) SSCU 3000 (1500) - Simple Shear Consolidated Drained (1500) SSCD 3000 (1500) - Consolidated Drained Direct Shear (1500) DSCD 3000 (1500) - Consolidated Compression UC 500 - Laboratory Vane Shear LVS 1000 </p>
--	--

TEST KEY

MAJOR DIVISIONS		SYMBOLS		TYPICAL NAMES		
FINE-GRAINED SOILS OVER 50% < No. 200 SIEVE SIZE	HIGHLY ORGANIC SOILS	PT		Peat and other highly organic soils	Coliche	
		OH		Organic clays of medium to high plasticity, organic silts		
		CH		Inorganic clays of high plasticity, fat clays		
	SILTS & CLAYS LIQUID LIMIT GREATER THAN 50%	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
		OL		Organic silts and organic silty clays of low plasticity		
		CL		Inorganic clays of low to medium plasticity, grovelly clays, sandy clays, silty clays, lean clays		
		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity		
	COARSE-GRAINED SOILS OVER 50% > No. 200 SIEVE SIZE	SANDS MORE THAN 1/2 OF COARSE FRACTION < NO. 4 SIEVE SIZE	SC		Clayey sands, sand-clay mixtures	
			SM		Silty sands, sand-silt mixtures	
			SP		Poorly graded sands or grovelly sands, little or no fines	
GRAVELS MORE THAN 1/2 OF COARSE FRACTION > NO. 4 SIEVE SIZE		SW		Well-graded sands or grovelly sands, little or no fines		
		GC		Clayey gravels, gravel-sand-clay mixtures		
		GM		Silty gravels, gravel-sand-silt mixtures		
GRAVELS LESS THAN 1/2 OF COARSE FRACTION > NO. 4 SIEVE SIZE	GP		Poorly graded gravels or gravel-sand mixtures, little or no fines			
	GW		Well-graded gravels or gravel-sand mixtures, little or no fines			
	GW		Well-graded gravels or gravel-sand mixtures, little or no fines			



Nichols Consulting Engineers, Chtd. 501 Canal Blvd., Suite I Richmond, CA 94804 (510) 215-3620

Marin County, California Geotechnical Investigation Tennessee Valley / Manzanita Connector Pathway

Physical Properties Criteria for Rock Descriptions

A-3

FIGURE

3820320005.dwg

I CONSOLIDATION OF SEDIMENTARY ROCKS; usually determined from unweathered samples.

Largely dependent on cementation.

U = unconsolidated

P = poorly consolidated

M = moderately consolidated

W = well consolidated

II BEDDING OF SEDIMENTARY ROCKS

Splitting Property

Thickness

Massive Greater than 4.0 ft. Very thick bedded Thick-bedded Thin-bedded Very thin-bedded Laminated Thinly laminated

Blocky 2.0 to 4.0 ft.

Slabby 0.2 to 2.0 ft.

Flaggy 0.05 to 0.2 ft.

Shaly or platy 0.01 to 0.05 ft.

Papery Less than 0.01 ft.

III FRACTURING

Intensity

Very little fractured Greater than 4.0

Occasionally fractured 1.0 to 4.0

Moderately fractured 0.5 to 1.0

Closely fractured 0.1 to 0.5

Intensely fractured 0.05 to 0.1

Crushed Less than 0.05

IV HARDNESS

1. Soft - Reserved for plastic material alone

2. Low hardness - can be gouged deeply or carved easily with a knife blade

3. Moderately hard - can be readily scratched by a knife blade; scratch leaves a heavy trace of dust and is readily visible after the powder has been blown away.

4. Hard - can be scratched with difficulty; scratch produces little powder and is often faintly visible.

5. Very hard - cannot be scratched with knife blade, leaves a metallic streak.

V STRENGTH

1. Plastic or very low strength

2. Frable - crumbles easily by rubbing with fingers

3. Weak - An unfractured specimen of such material will crumble under light hammer blows.

4. Moderately strong - Specimen will withstand a few heavy hammer blows before breaking

5. Strong - Specimen will withstand a few heavy hammer blows and will yield with difficulty

6. Very Strong - Specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.

VI WEATHERING

- The physical and chemical disintegration and decomposition of rocks and minerals by natural processes such as oxidation, reduction, hydration, solution, carbonation, and freezing and thawing.

D. Deep - Moderate to complete mineral decomposition; extensive disintegration: deep and thorough discoloration, many fractures, all extensively coated or filled with oxides, carbonates and/or clay or silt.

M. Moderate - Slight change or partial decomposition of minerals, little disintegration: cementation little to unaffected. Moderately intense discoloration. Moderately coated fractures.

L. Little - No megascopic decomposition of minerals; little to no effect on normal cementation. Slight and intermittent, or localized discoloration. Few stains on fracture surfaces.

F. Fresh - Unaffected by weathering agents. No disintegration or discoloration. Fractures usually less numerous than joints.

Dated 1/9/08		Logged By Ryan Blunck		Checked By Ryan Shafter	
Drilling Method Rotary Wash		Drill Bit 6-inch Solid Flight Auger and 4/8-inch drag bit		Total Depth of Borehole 52.5 feet bgs	
Drill Rig Falling 1500		Drilling Contractor Pitcher Drilling		Approximate Surface Elevation Ground Surface	
Groundwater Level and Date Measured 1 feet ATD		Sampling Method(s) Mod. Cal, Shelby Tube		Hammer 140lb Rope + Cathead, 30-inch Data Drop	
Borehole Tremie Grout Backfill		Location (See Site Plan)			

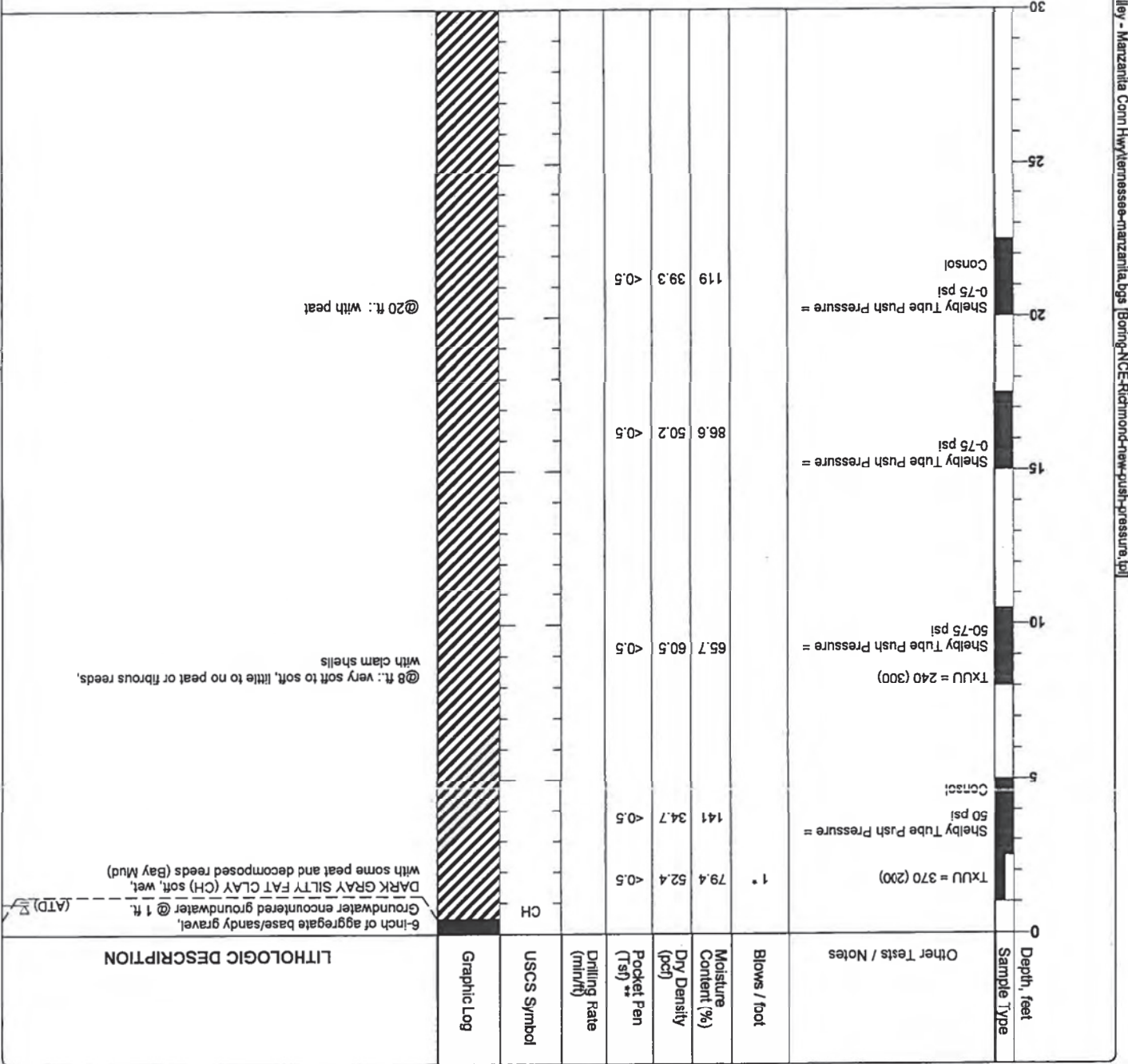
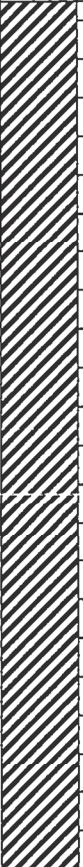


Figure A-4

Nichols Consulting Engineers, Child
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 Ft. Richmond, California 94804

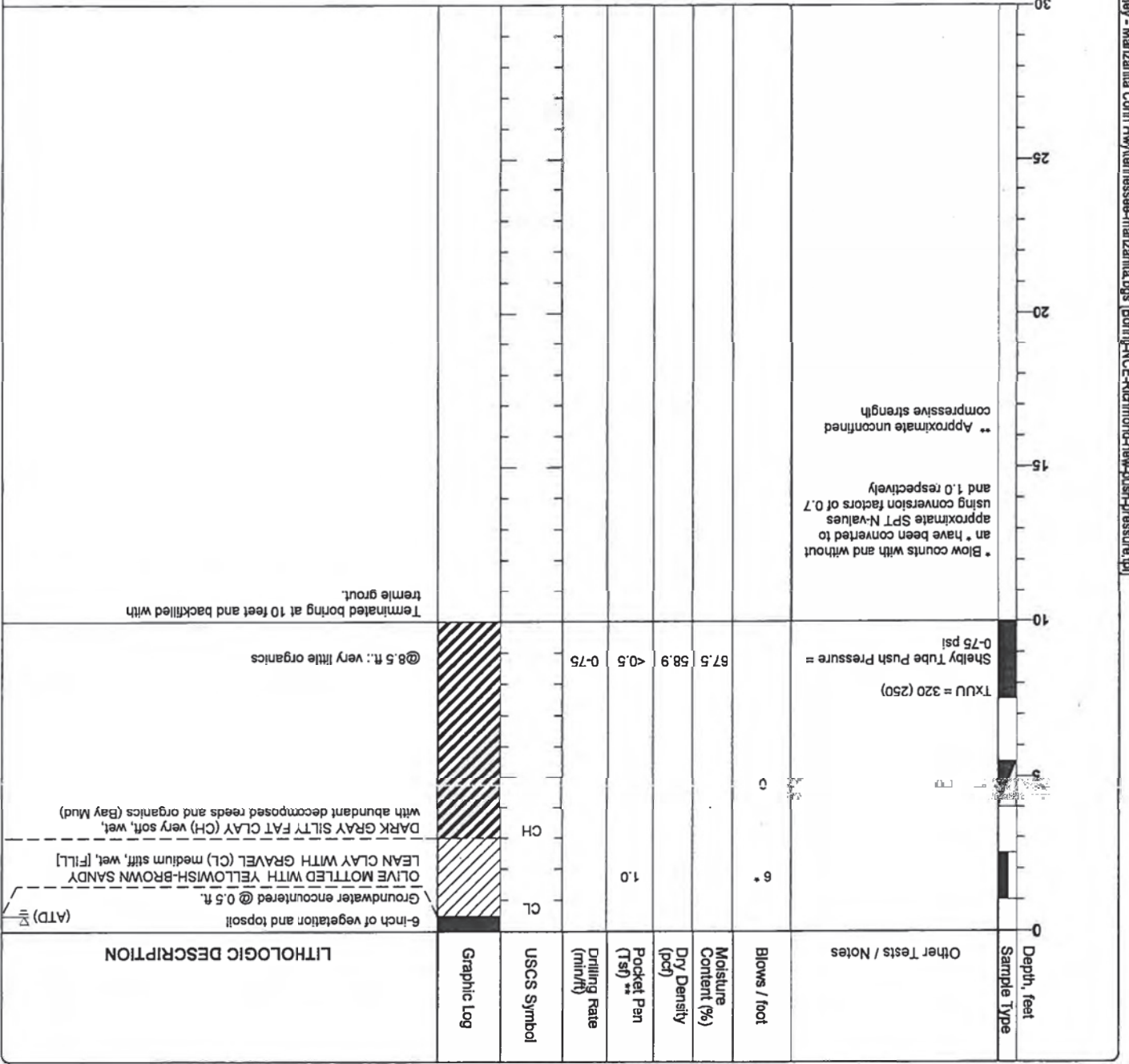
Log of Boring B-1
 Sheet 2 of 2

Depth, feet	Sample Type	Other Tests / Notes	Blows / foot	Moisture Content (%)	Dry Density (pcf)	Pocket Pen (lbf) **	Drilling Rate (min/ft)	USCS Symbol	Graphic Log	LITHOLOGIC DESCRIPTION
30								CH		DARK GRAY SILTY FAT CLAY (CH) soft, wet, with some peat and decomposed reeds (Bay Mud) (cont.)
40		Shelby Tube Push Pressure = 0-75 psi Consol	86.5	50.4	0.75					@40 ft.: now medium-stiff, with little to no organics
50		Shelby Tube Push Pressure = 75 psi	71.3	57.5	<0.5					@50 ft.: soft
55		* Blow counts with and without an * have been converted to approximate SPT N-values using conversion factors of 0.7 and 1.0 respectively								
65		** Approximate unconfined compressive strength								Terminated boring at 52.5 feet and backfilled with tremie grout.

N
 Nichols Consulting Engineers, Child
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 PE Richmond, California 94804

Figure A-4

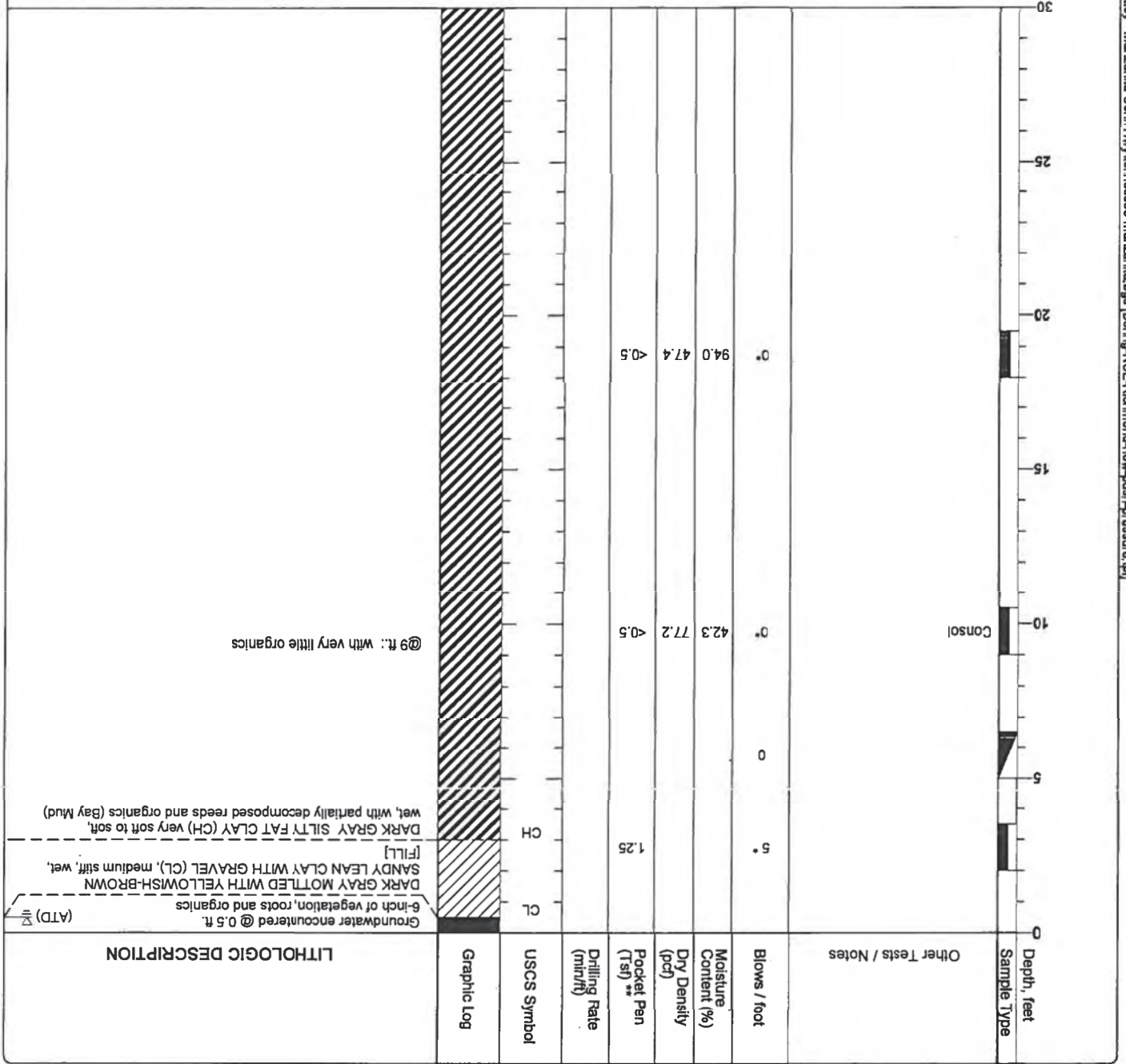
Date(s) Drilled	1/9/08	Logged By	Ryan Blunck	Checked By	Ryan Shafer
Drilling Method	Rotary Wash	Drill Bit Size/Type	6-inch Solid Flight Auger	Total Depth of Borehole	10 feet bgs
Drill Rig Type	Falling 1500	Drilling Contractor	Pitcher Drilling	Approximate Surface Elevation	Ground Surface
Groundwater Level and Date Measured	0.5 feet ATD	Sampling Method(s)	SPT, Mod. Cal, Shelby Tube	Hammer	140lb Rope + Cathed, 30-inch Drop
Borehole Backfill	Tremie Grout	Location	(See Site Plan)	Data	



Nichols Consulting Engineers, Chd
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 PL Richmond, California 94804

Figure A-5

Drilled Date(s) 1/9/08	Logged By Ryan Blunck	Checked By Ryan Shafer
Drilling Method Rotary Wash	Drill Bit 6-inch Solid Flight Auger and 4 7/8-inch drag bit	Total Depth 51.5 feet bgs of Borehole
Drill Rig Falling 1500	Drilling Contractor Pitcher Drilling	Approximate Surface Elevation Ground Surface
Groundwater Level and Date Measured 0.5 feet ATD	Sampling Method(s) SPT, Mod. Cal. Shelby Tube	Hammer 140lb Rope + Cathead, 30-inch Drop
Borehole Backfill Tremie Grout	Location (See Site Plan)	



N
 Nichols Consulting Engineers, Chd
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 PL Richmond, California 94804

Figure A-6

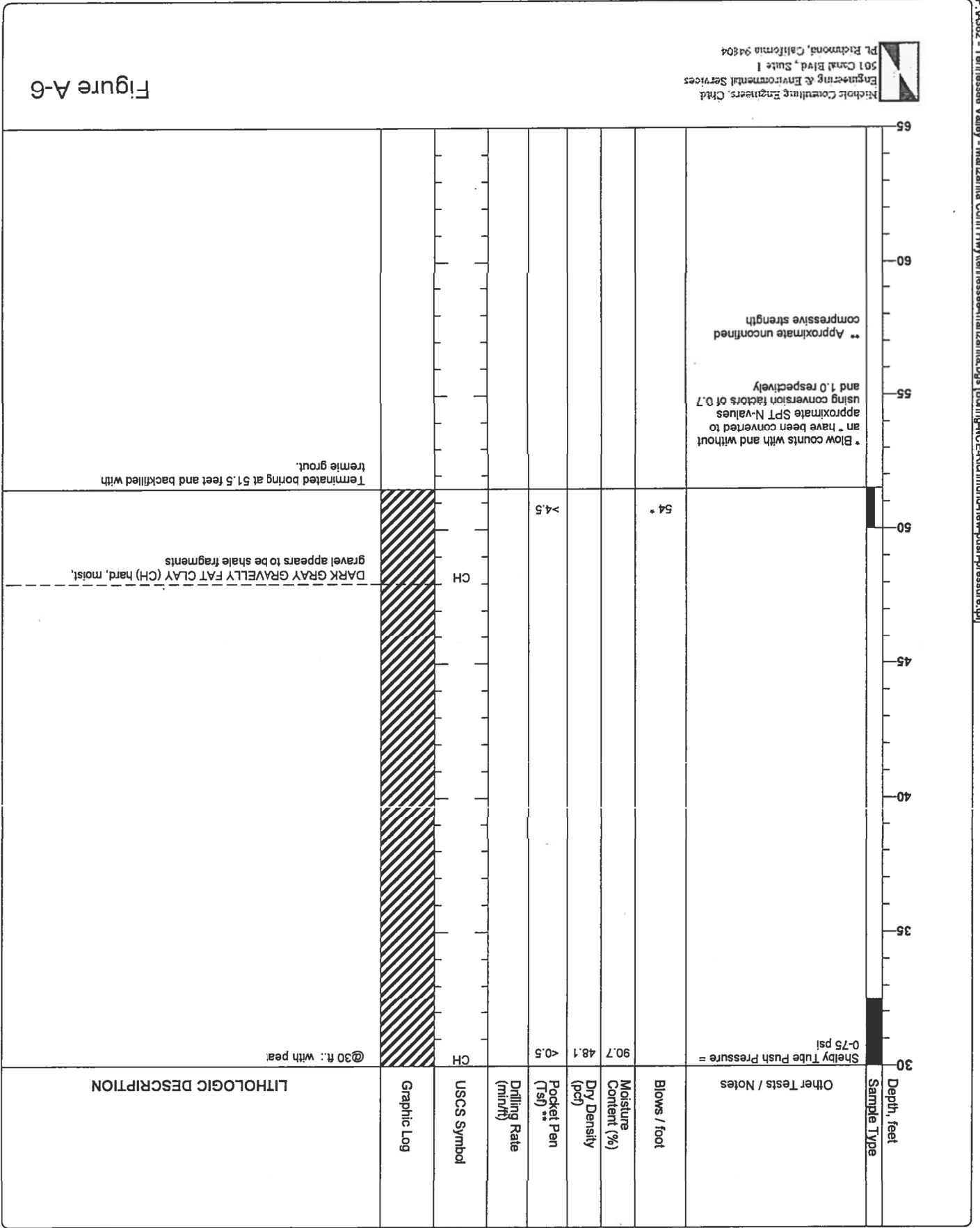


Figure A-6

Nichols Consulting Engineers, Child
 Engineering & Environmental Services
 501 Canal Blvd., Suite 1
 PL Richmond, California 94804

Dated 1/10/08		Logged By Ryan Blunck		Checked By Ryan Shafer	
Drilling Method	Rotary Wash	Drill Bit Size/Type	6-inch Solid Flight Auger	Total Depth of Borehole	9.5 feet bgs
Drill Rig Type	Falling 1500	Drilling Contractor	Pitcher Drilling	Approximate Surface Elevation	Ground Surface
Groundwater Level and Date Measured	1 feet ATD	Sampling Method(s)	Mod. Cal, Shelby Tube	Hammer	140lb Rope + Cathead, 30-inch Drop
Borehole	Tremie Grout	Location (See Site Plan)			
Backfill					


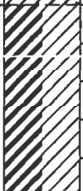

Depth, feet	Sample Type	Other Tests / Notes	Blows / foot	Moisture Content (%)	Dry Density (pcf)	Pocket Pen (Tsp) **	Drilling Rate (min/ft)	USCS Symbol	Graphic Log	LITHOLOGIC DESCRIPTION
0								CL-CH		6-inch grass and marsh, roots and organics encountered @ 1 ft. (ATD) $\frac{1}{2}$
0 - 2.0			6 *			2.0		CL-CH		GRAY-BROWN MOTTLED WITH BROWN LEAN TO FAT CLAY WITH GRAVEL AND SAND (CL-CH) medium stiff to stiff, wet, with peat, organics, and some shells
2.0 - 9.5		Shelby Tube Push Pressure = -200 = 22.0 0.75 psf				>0.5		SC		GRAY-BROWN CLAYEY SAND (SC) loose to medium dense, wet, with pockets of sandy clay
9.5 - 30		* Blow counts with and without an * have been converted to approximate SPT N-values using conversion factors of 0.7 and 1.0 respectively ** Approximate unconfined compressive strength								Terminated boring at 9.5 feet and backfilled with tremie grout.

Figure A-7

Date(s) Drilled	1/10/08	Logged By	Ryan Blunck	Checked By	Ryan Shafer
Drilling Method	Rotary Wash	Drill Bit	6-inch Solid Flight Auger and 4 7/8-inch drag bit	Total Depth of Borehole	42.5 feet bgs
Drill Rig	Falling 1500	Drilling Contractor	Pitcher Drilling	Approximate Surface Elevation	Ground Surface
Groundwater Level and Date Measured	2 feet ATD	Sampling Method(s)	SPT, Mod. Cal, Shelby Tube, Hammer 140lb Rope + Cathead, 30-inch Drop	Data	
Borehole	Tremie Grout Backfill	Location	(See Site Plan)		

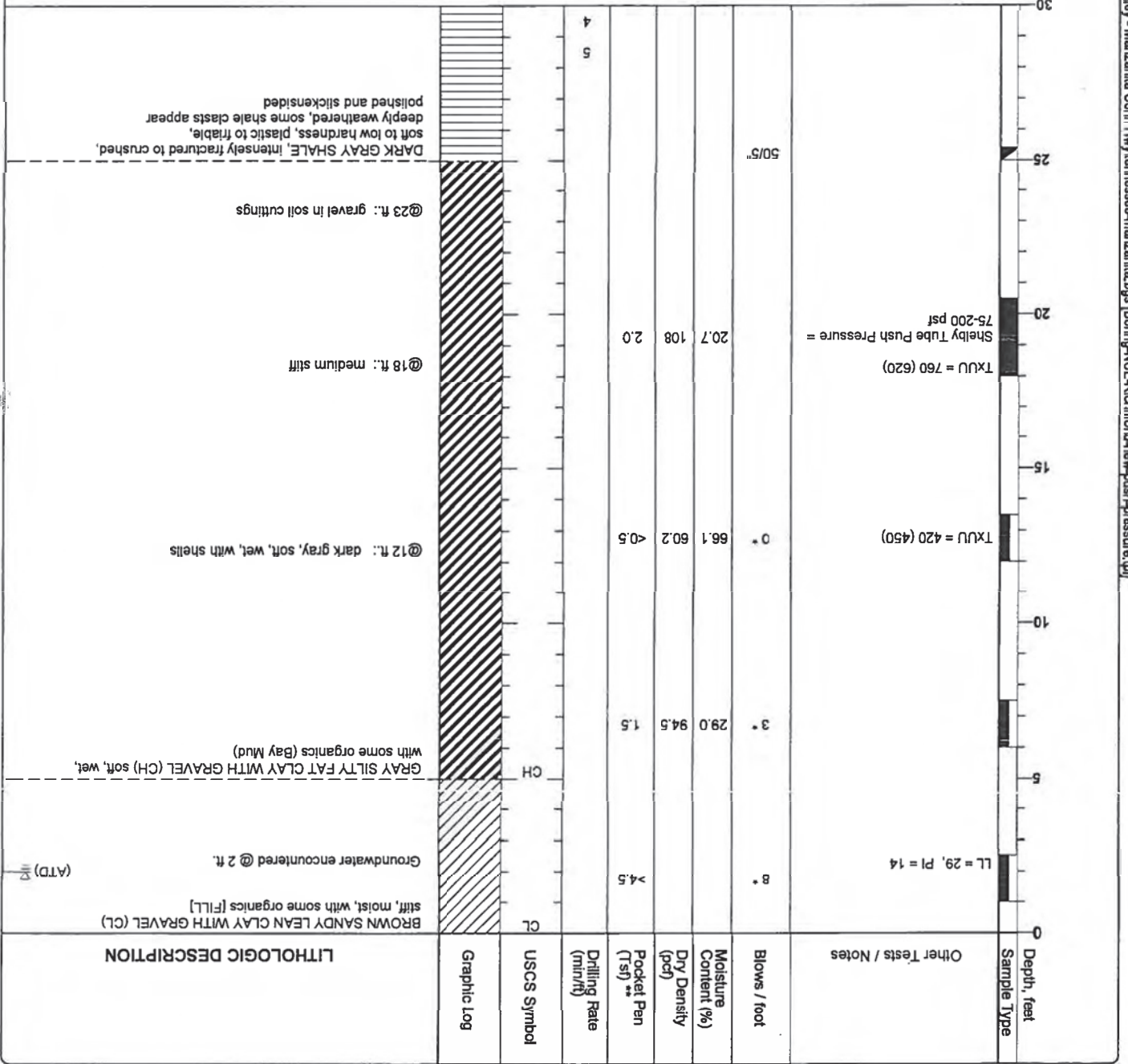


Figure A-8



Richards Consulting Engineers, Chd
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 PL Richmond, California 94804

Figure A-8

Depth, feet	Sample Type	Other Tests / Notes	Blows / foot	Moisture Content (%)	Dry Density (pcf)	Pocket Pen (tsf) **	Drilling Rate (min/ft)	USCS Symbol	Graphic Log	LITHOLOGIC DESCRIPTION
30		TXUU = 2960 (1000) Pitcher Barrel Push Pressure = 250-400 psf	4.1	4.1	143	>4.5	6			
30-40		TXUU = 3590 (1300)	5.0	5.0	140		7			@40 ft.: weak zones of rocks
40-42.5							7			Terminated boring at 42.5 feet and backfilled with remie grout.
45		* Blow counts with and without approximate SPT N-values an * have been converted to using conversion factors of 0.7 and 1.0 respectively								
50		** Approximate unconfined compressive strength								
55										
60										
65										

Date(s) Drilled	1/30/08	Logged By	Ryan Blunck	Checked By	Ryan Shafter
Drilling Method	Rotary Wash	Drill Bit	6-inch Solid Flight Auger and 4 7/8-inch drag bit	Total Depth of Borehole	73.5 feet bgs
Drill Rig	Falling 1500	Drilling Contractor	Pitcher Drilling	Approximate Surface Elevation	Ground Surface
Groundwater Level and Date Measured	5 feet ATD	Sampling Method	Mod. Cal. Shelby Tube, Pitcher	Hammer	140lb Rope + Cathead, 30-inch Drop
Borehole	Tremie Groat	Location	(See Site Plan)		

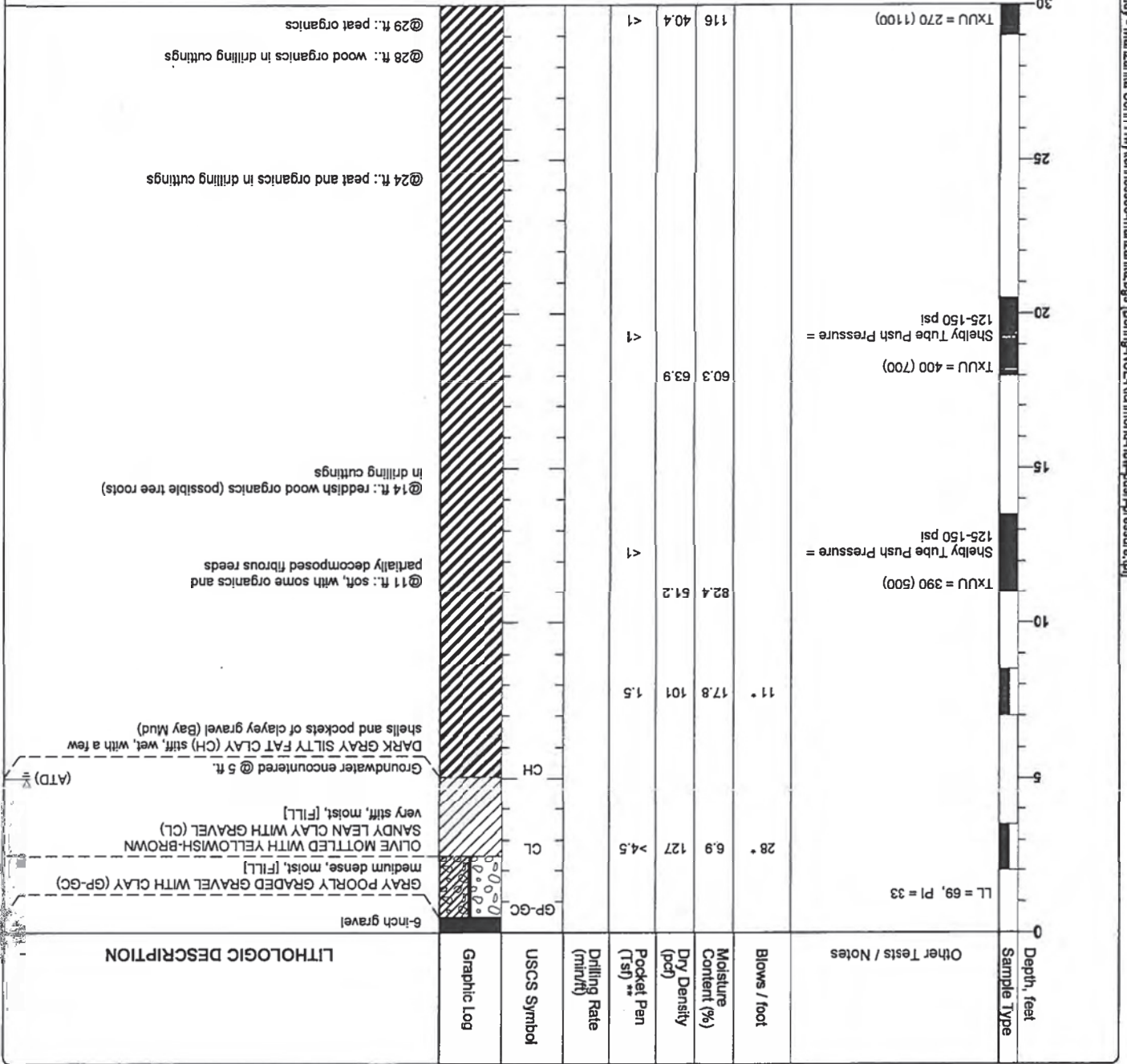


Figure A-9

Nichols Consulting Engineers, Chd
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 Pt Richmond, California 94804

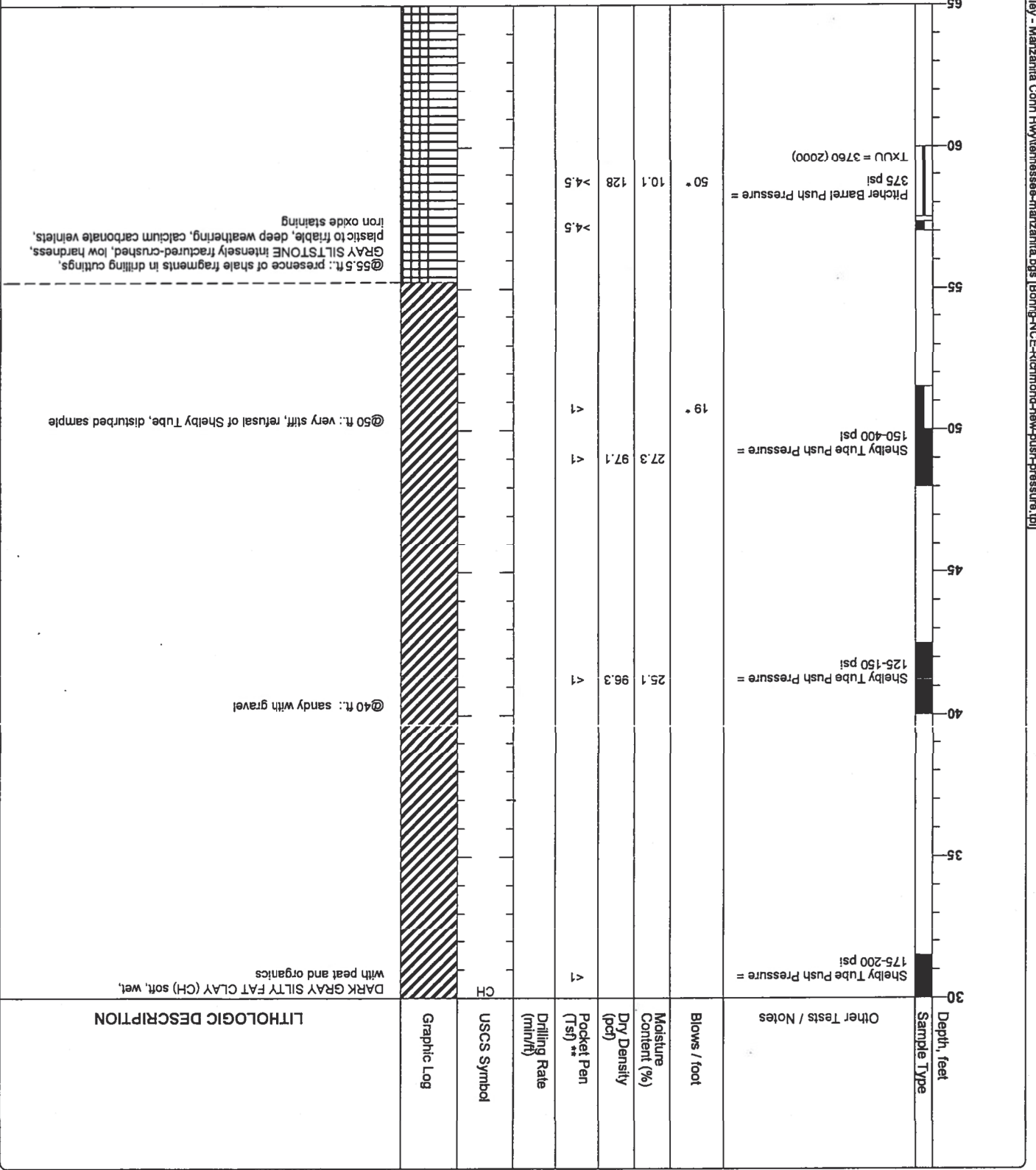
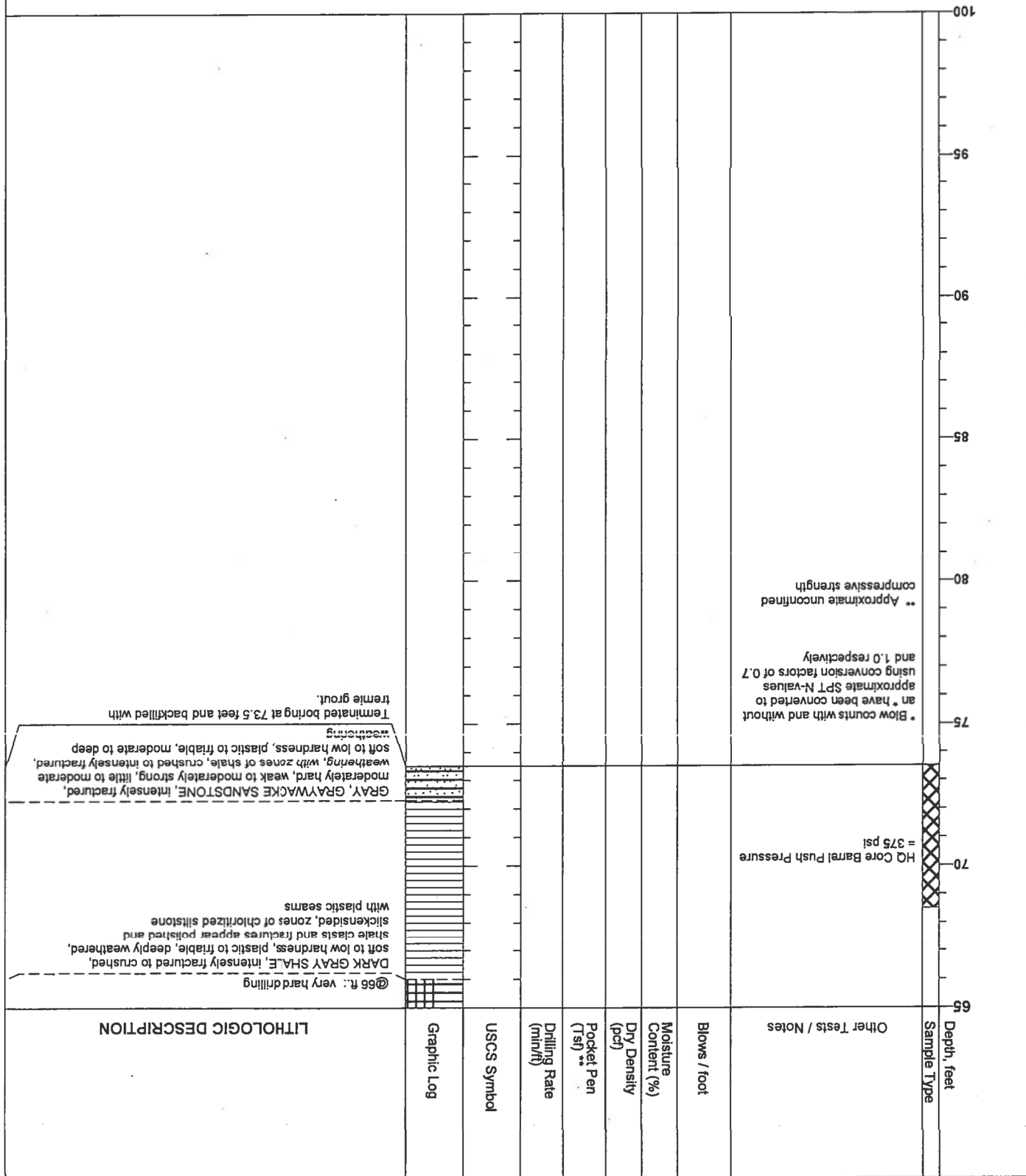


Figure A-9

Nichols Consulting Engineers, Chd.
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 PL Richmond, California 94804

Figure A-9

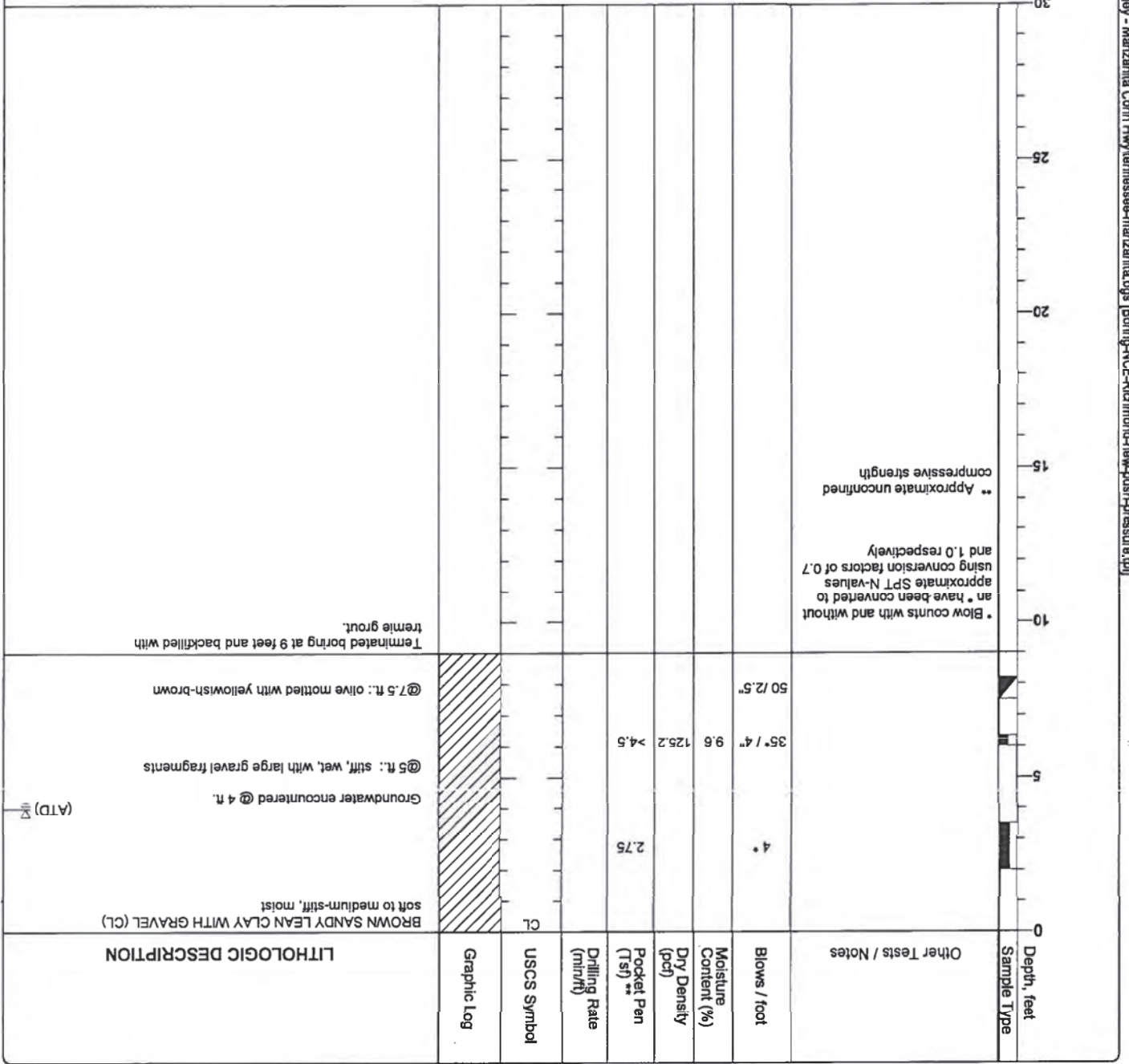


Project: Tennessee Valley / Manzanita Connector Pathway -
 Project Location: Marin County, California
 Project Number: 382.03.20

Log of Boring B-10

Sheet 1 of 1

Date(s) Drilled	1/10/08	Logged By	Ryan Blunck	Checked By	Ryan Shafer
Drilling Method	Rotary Wash	Drill Bit Size/Type	6-inch Solid Flight Auger	Total Depth of Borehole	9 feet bgs
Drill Rig	Falling 1500	Drilling Contractor	Pitcher Drilling	Approximate Surface Elevation	Ground Surface
Groundwater Level and Date Measured	4 feet ATD	Sampling Method(s)	Mod. Cal, SPT	Hammer	140lb Rope + Cathed, 30-inch Data Drop
Borehole	Tremie Grout	Location	(See Site Plan)		



Nichols Consulting Engineers, Chd
 Engineering & Environmental Services
 301 Canal Blvd., Suite 1
 PL Richmond, California 94804

Figure A-10

Date(s) 1/31/08	Logged By Ryan Blunck	Checked By Ryan Shafer
Drilled Method Rotary Wash	Drill Bit 6-inch Solid Flight Auger and 4 7/8-inch drag bit	Total Depth of Borehole 32 feet bgs
Drill Rig Type Falling 1500	Drilling Contractor Pitcher Drilling	Approximate Surface Elevation Ground Surface
Groundwater Level and Date Measured 3.5 feet ATD	Sampling Method(s) Mod. Cal, Shelby Tube, HQ Core Barrel	Hammer 140lb Rope + Cathed, 30-inch Drop
Borehole Backfill Tremie Grout	Location (See Site Plan)	

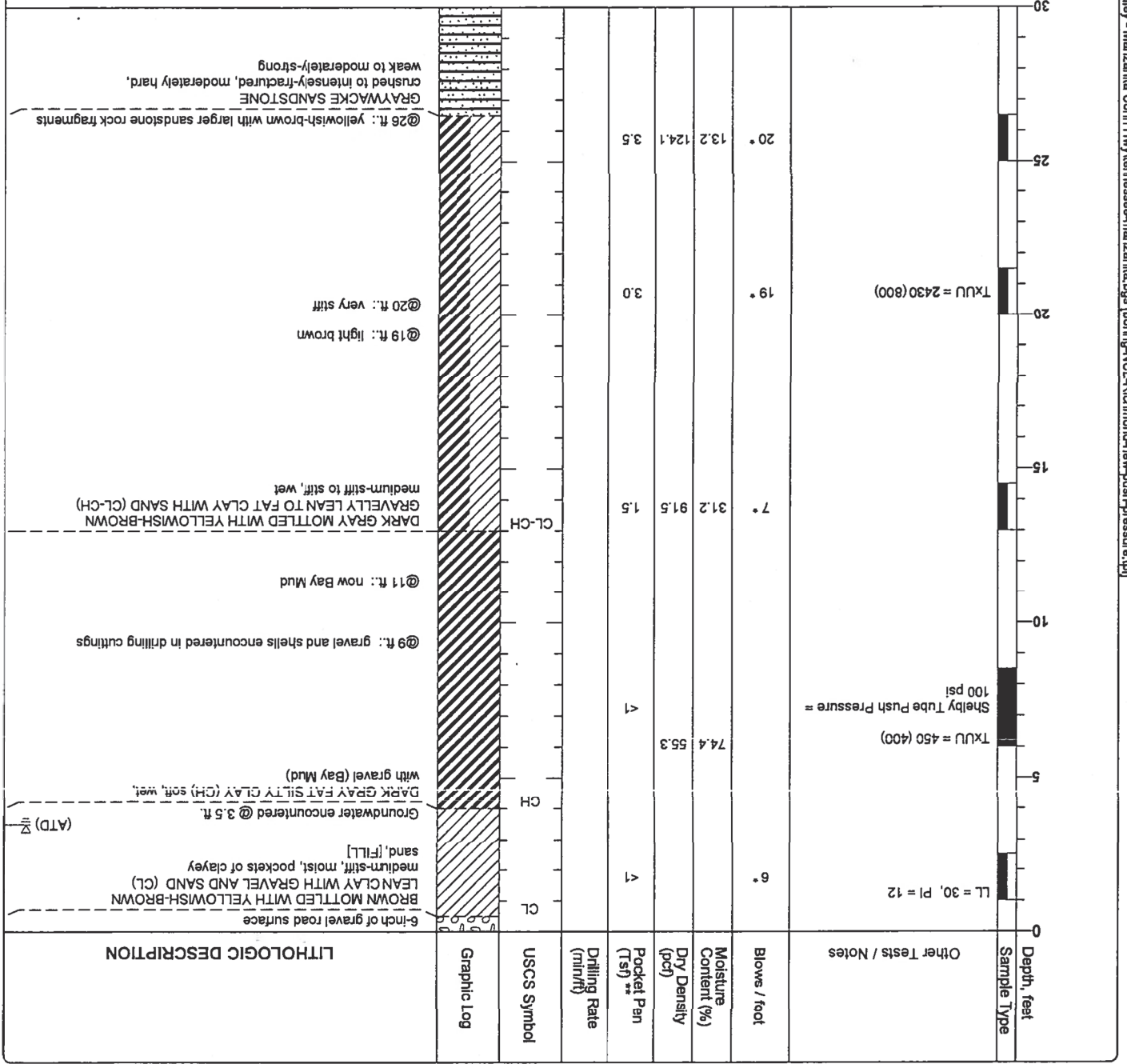



Figure A-11

Nichols Consulting Engineers, Ctrd
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 Pt Richmond, California 94804

Depth, feet	Sample Type	Blows / foot	Moisture Content (%)	Dry Density (pcf)	Pocket Pen (Tsf) **	Drilling Rate (min/ft)	USCS Symbol	Graphic Log	LITHOLOGIC DESCRIPTION
30	Other Tests / Notes HQ Core Barrel Push Pressure = 300-375 psf					10			Terminated boring at 32 feet and backfilled with tremie grout.
65	* Blow counts with and without an * have been converted to approximate SPT N-values using conversion factors of 0.7 and 1.0 respectively ** Approximate unconfined compressive strength								



Nichols Consulting Engineers, Clark
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 Ft. Richmond, California 94804

Figure A-11

Date(s) 1/11/08	Logged By Ryan Blunck	Checked By Ryan Shafter
Drilled	6-inch Solid Flight Auger	Total Depth 24.5 feet bgs
Rotary Wash	Drill Bit and 4 7/8-inch drag bit	of Borehole
Drill Rig Falling 1500	Drilling Contractor	Approximate Surface Elevation
Groundwater Level and Date Measured 3 feet ATD	Sampling Method(s) Mod. Cal, SPT, HQ Core	Hammer 140lb Rope + Cathead, 30-inch Drop
Borehole Tremie Grout	Location (See Site Plan)	Data

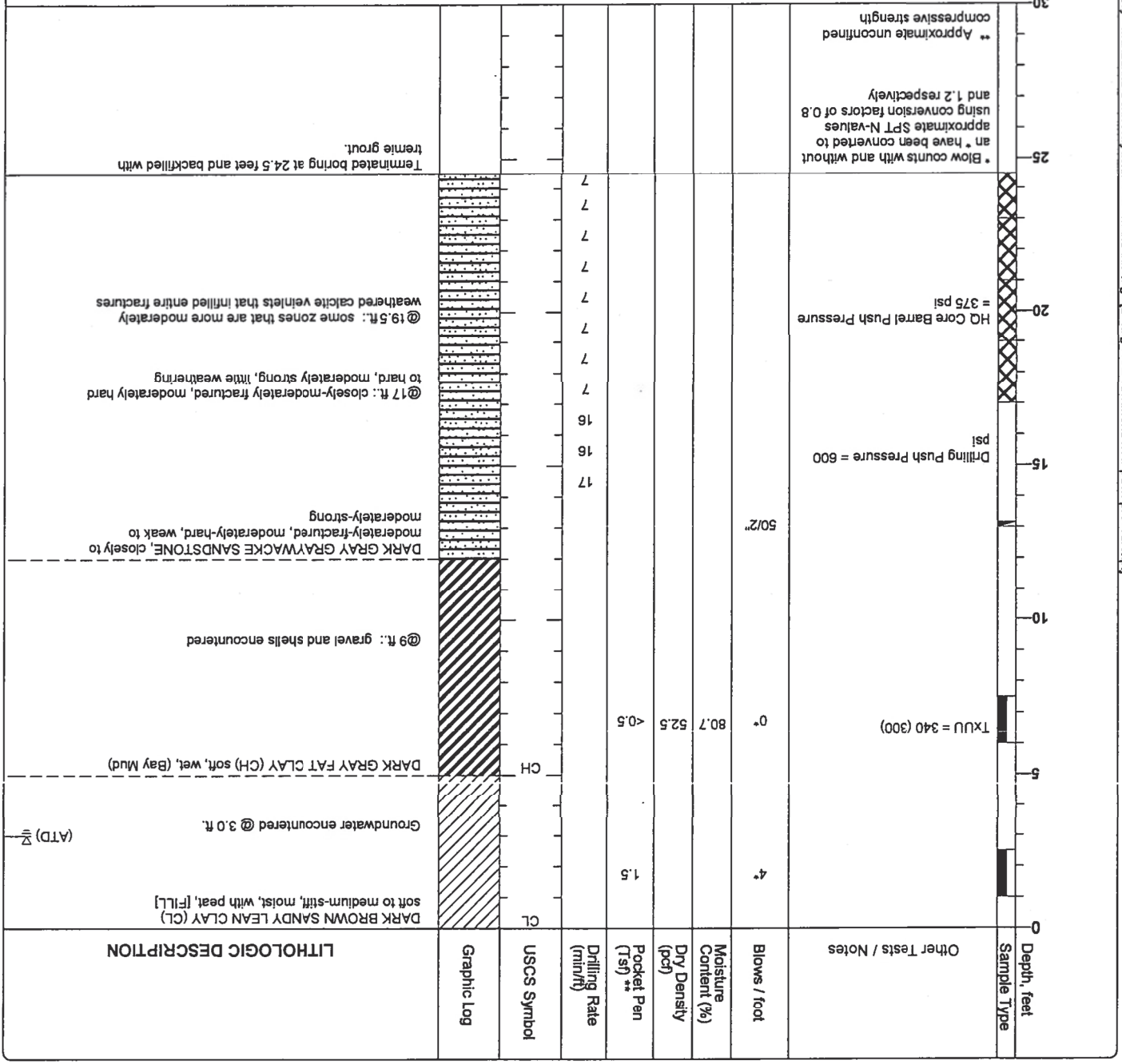


Figure A-12

Nichols Consulting Engineers, CRed
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 PL Richmond, California 94804

Date(s) Drilled	1/11/08	Logged By	Ryan Blunck	Checked By	Ryan Shafer
Drilling Method	Rotary Wash	Drill Bit Size/Type	6-inch Solid Flight Auger and 4 7/8-inch drag bit	Total Depth of Borehole	21.5 feet bgs
Drill Rig Type	Falling 1500	Drilling Contractor	Pitcher Drilling	Approximate Surface Elevation	Ground Surface
Groundwater Level and Date Measured	1 feet ATD	Sampling Method(s)	Mod. Cal, SPT, Shelby Tube	Hammer	140lb Rope + Cathed, 30-inch Data Drop
Borehole Backfill	Tremie Grout	Location (See Site Plan)			

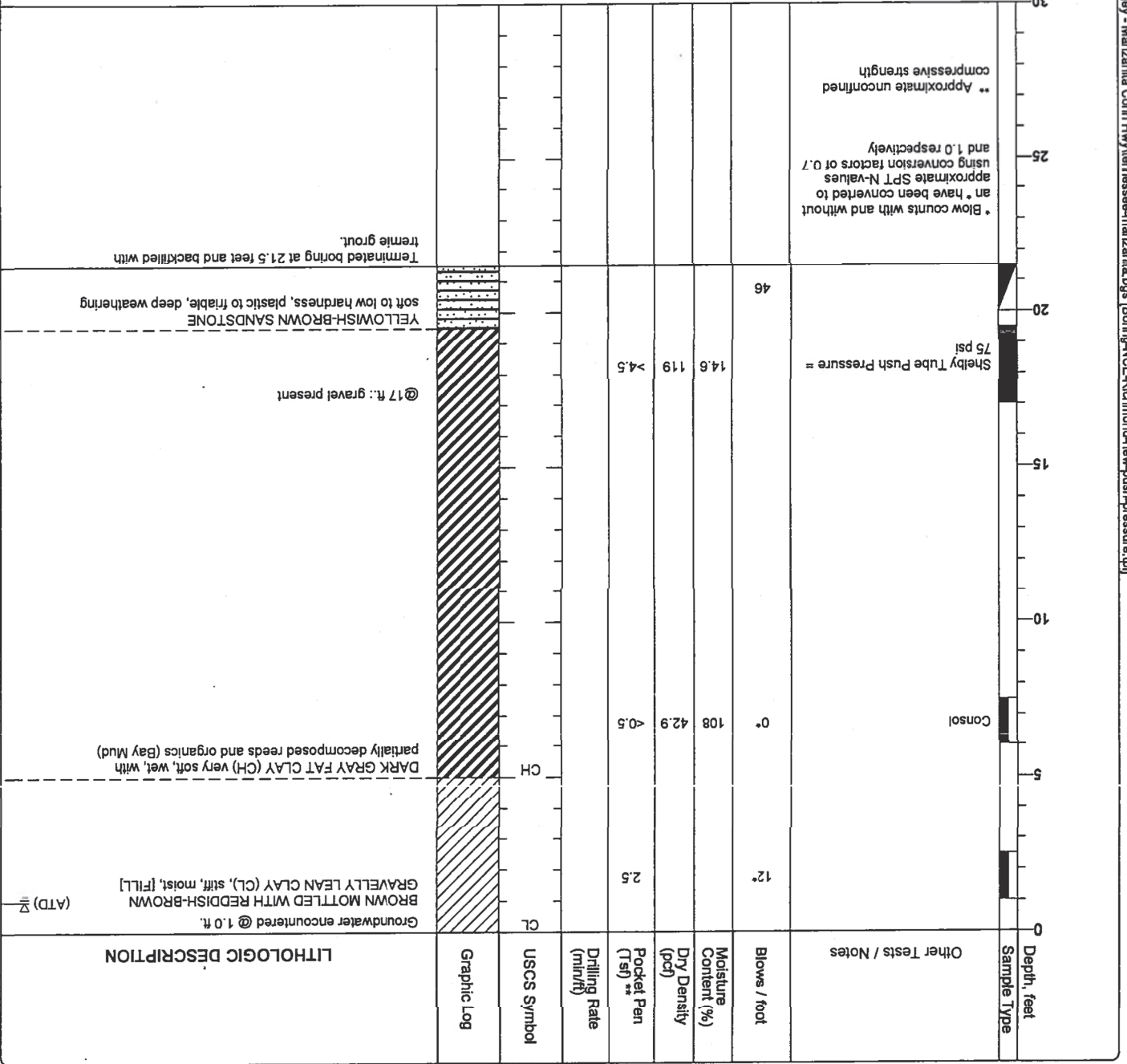


Figure A-13

Nichols Consulting Engineers, CRed
 Engineering & Environmental Services
 501 Canal Blvd, Suite 1
 PL Richmond, California 94804