INFORMATION HANDOUT

For Contract No. 04-2J0704
At 04-Ala-880-2.9/27.3

Identified by
Project ID 0414000421

MATERIALS INFORMATION

Foundation Recommendations for New Overhead Sign Posts and Double Luminaire Masts for the Median Barrier Replacement Project on I-880, Dated June 23, 2015

Foundation Report, I-880 Median Barrier Replacement and Express Lane Project, Santa Clara and Alameda County, California, Dated June 22, 2015

Division of Occupational Safety and Health, Mining and Tunneling Unit, Route 880 Sign Posts, Underground Classification, dated January 5, 2015

Division of Occupational Safety and Health, Mining and Tunneling Unit, I-880 Median Barrier Replacement, Underground Classification, dated June 8, 2015

Non-Storm Water Information Handout, Contract No. 2J0700

Bay Area Recycled Water Commercial Truck Fill Facilities Location Guide, Dated January 2015

Recycle Water Information, East Bay Municipal Utility District:

1. Recycle Water Truck Program
2. Recycle Water for Construction & Other Uses
3. Recycle Water Truck Program Guidelines, May 2014
4. Recycle Water Uses Allowed in California
5. Recycle Water Truck Program, Recycled Water Use Permit
6. Certificate of Commercial Auto and Trucking Liability Insurance
7. Certificate of Workers' Compensation Insurance

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Serious drought.
Help Save Water!

To: MR. MORTEZA AZIMI
Alameda Design

Date: June 23, 2015

File: 04-ALA-880, PM 2.9/27.3
04-2J0700
Efis#: 0414000421
Median Barrier Replacement
Overhead Sign Posts & Double
Luminaire Masts

Attn: A. Zepeda
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Subject: Foundation Recommendations for new Overhead Sign Posts and Double Luminaire Masts for the Median Barrier Replacement Project on I-880

This memo provides foundation recommendations for twelve new overhead sign posts and six sections of new median lighting using double luminaires spaced approximately 200-feet apart in select areas within the project limits, to be built for the Median Barrier Replacement Project on I-880 between Fremont and Oakland in Alameda County, California.

During the initial writing of this memo, a request from the Metropolitan Transportation Commission was received by Caltrans to add additional median lighting segments to this project. Those additional segments are referred to in this memo as MTC No. 1, MTC No. 2, etc.

SCOPE OF WORK

Our understanding is that the overhead signs will be mounted to select various post types depending on sign type, and will be mounted to either, a single post or two post type, round pedestal pile foundation(s) depending upon application. In addition to the overhead signs, median lighting consisting of Double Luminaire Mast Arms will be installed.

The scope of work includes the following:

- Review of As-built plans along I-880 between Fremont and Oakland.
- Identification of borings closest to the proposed overhead sign post locations.
- Engineering analyses and preparation of the repair recommendations.

PROJECT DESCRIPTION

The project limits are located on I-880, between post miles 2.9 to 27.3, South Fremont to South Oakland, in Alameda County, California. Eleven overhead signs are proposed for installation; of which nine existing overhead median signs will be replaced. The existing concrete median barrier will also be replaced with a 56-inch high, Type 60G Concrete Barrier. Because the barrier is to be greater than the standard height of 36-inches, a special design is required, which needs geotechnical recommendations for median lighting foundations, supported on the barrier approximately every 200-feet center-to-center, in select locations within the project limits. Please refer to Figure 1 - Location Map, which is attached.

Please refer to Table 1–Overhead Sign Posts, below, indicating location information, sign type, and post type:

Table 1 – Overhead Sign Posts

No.	Post Mile	M-Line Station	Type	Direction Facing	Roadway Location	Cross-Section Location	Post Type
1	2.97	1303+35	Single Post	NB	Fremont Blvd. (South)/Cushing Pkwy off-ramp	NB Outside Shoulder	VIII
2	3.90	1352+50	Single Post	SB	Between Fremont Blvd. and Auto Mall Parkway	SB Outside Shoulder	VIII
3	8.40	1590+00	Single Post	NB	Between Central Ave. and Thorton Ave.	NB Outside Shoulder	VIII
4	9.90	1669+00	Single Post	SB	Between Thorton Ave. and Decoto Rd.	SB Outside Shoulder	VIII
5	10.61	1706+75	Single Post	NB	Between Decoto Road and Paseo Padre Parkway	NB Outside Shoulder	VIII
6	11.88	1774+00	Single Post	NB	Between Alvarado/Fremont Blvd. and Alvarado-Niles Rd.	NB Outside Shoulder	VIII
7	12.46	1803+08	Single Post	SB	Between Alvarado/Fremont Blvd. and Alvarado-Niles Rd.	SB Outside Shoulder	VIII
8	16.77	2032+00	Single Post	NB	Between Rte 880/92 Separation (Jackson St. OC) and W92 to S880 Connector I-880 Separation	NB Outside Shoulder	VII
9	18.3	2111+50	Single Post	SB	Between Winton Ave. and A St.	SB Outside Shoulder	VII
10	20.96	2253+00	Single Post	NB	Between Washington Ave. and Floresta Blvd.	NB Outside Shoulder	VIII
11	21.153	2261+75	Two Posts	SB	Between Washington Ave. and Floresta Blvd.	Median & SB Outside Shoulder	V-S

Please refer to Table 2 – Locations for Caltrans Median Barrier Lighting segments, indicating location information and Double Luminaire Type:

Table 2 – Caltrans Median Barrier Lighting Segments

No.	Post Mile	M-Line Stationing	Segment Length, ft.	Location Description	Double Luminaire Type
1	4.02-4.47	1358+45 - 1382+39	2376	Between Arroyo De La Laguna Creek Bridge and Auto Mall Parkway	21D
2	7.92-8.19	1564+75 - 1578+75	1426	Between Mowry Avenue and Central Avenue	21D
3	12.51-12.94	1807+11 - 1829+45	2270	Between Crandall Creek Bridge and Alvarado-Niles Road	21D
4	14.50-14.99	1912+04 - 1937+92	2587	Industrial Parkway and South of Tennyson Road	21D
5	18.01-19.44	2097+38 - 2172+57	7550	North of Winton Street and South of Paseo Grande Road	21D
6	22.00-22.79	2307+75 – 2349+75	4171	Between Floresta Blvd. and Marina OC	21D
7	22.85-23.07	2353+08 – 2364+70	1162	Between Marina OC and Williams Street OC	21D
8	23.11-23.61	2366+76 – 2393+15	2640	Between Williams Street OC and Davis Street OC	21D
9	23.67-24.13	2396+30 – 2420+42	2429	Between Davis Street OC and San Leandro Creek Bridge	21D
10	24.47-24.69	2438+45 – 2450+15	1162	Between San Leandro Creek Bridge and 98th Avenue OC	21D
11	24.74-24.86	2452+73 – 2458+73	637	Between 98th Avenue OC and Jones Avenue POC	21D
12	24.89–25.43	2460+73 – 2489+18	2851	Between 98th Avenue OC and Hegenberger Road OC	21D
13	25.50-25.93	2492+80 - 2515+25	2270	Between Hegenberger Road OC and Elmhurst Creek Bridge	21D
14	25.96-26.49	2517+23 - 2545+10	2798	Between Elmhurst Creek Bridge and Damon Slough Bridge	21D
15	26.57-27.20	2549+10 - 2582+60	3326	Between Damon Slough Bridge and East Creek Slough Bridge	21D
16	27.24-27.58	2584+60 - 2602+60	1795	East Creek Slough Bridge and High Street Viaduct	21D

Please refer to Table 3 – MTC Barrier Lighting Segments, indicating location information and Double Luminaire Type:

Table 3 MTC Median Barrier Lighting Segments

No.	Post Mile	M-Line Stationing	Segment Length, ft.	Location Description	Double Luminaire Type
MTC No. 1	3.30-3.94	1320+59 – 1354+59	3379	North of Fremont Blvd.	21D
MTC No. 2	4.59-4.97	1388+52 – 1408+52	2006	Auto Mall Parkway	21D
MTC No. 3	5.20-5.38	1420+82 – 1430+51	950	North of Auto Mall Parkway	21D
MTC No. 4	5.87-6.04	1456+45 – 1464+99	898	South of Stevenson Boulevard Overcrossing	21D
MTC No. 5	6.31-6.69	1479+39 – 1499+39	2006	Stevenson Boulevard Overcrossing	21D
MTC No. 6	7.26-7.64	1529+52 – 1549+52	2006	Mowry Avenue Overcrossing	21D
MTC No. 7	9.99-10.71	1673+64 – 1711+93	3802	Decoto Road Separation	21D
MTC No. 8	12.48	1805+08	N/A	South of Alvarado-Niles Road Overcrossing	21D
MTC No. 9	13.05-14.05	1835+48 – 1888+36	5280	Alvarado-Niles Road Overcrossing and Industrial Parkway	21D
MTC No. 10	15.20-15.57	1948+92 – 1968+20	1954	South of Tennyson Road Overcrossing	21D
MTC No. 11	15.79-16.17	1979+88 – 1999+88	2006	Between Tennyson Road Overcrossing and 92/I-880 Separation	21D
MTC No. 12	16.81-17.46	2034+07 – 2068+00	3432	92-I-880 Separation to Winton Avenue Overcrossing	21D
MTC No. 13	19.51-21.57	2176+69-2285+00	10,560	Between A Street and Floresta Blvd.	21D

SITE GEOLOGY

Because the footprint of the project is very large and the structural elements to be built could be considered small and spaced relatively far apart from one another; it is, from an economic and practicality standpoint, reasonable to present a macro view of the geologic and seismic parameters existing at the site. Tables 4, 5, and 6, respectively, present geologic and seismic parameters for the Overhead Sign Posts, Caltrans Median Barrier Segments, and MTC Median Barrier Segments. Please refer to Figures 2 and 3 – Geology which are attached.

Table 4 – Geologic and Seismic Parameters for Overhead Sign Posts

Planned Construction	PM	Station	State Route	Direction	Geologic Unit(s) Symbol	Geology on Figure	Nearby Faults	Fault Type	Peak Bedrock Acceleration[5]
Sign Post	2.97	1303+35	880	NB	Qha[1]	2	Hayward (South), Silver Creek	Strike Slip	0.77
Sign Post	3.90	1352+50	880	SB	Qha[1]	2	Hayward (South), Silver Creek	Strike Slip	0.77
Sign Post	8.40	1590+00	880	NB	Qha[1]	2	Hayward (South), Silver Creek	Strike Slip	0.77
Sign Post	9.90	1669+00	880	SB	Qha[1]	2	Hayward (South/North) San Andreas	Strike Slip	0.77
Sign Post	10.61	1706+75	880	NB	Qha[1]	2	Hayward (South/North) San Andreas	Strike Slip	0.77
Sign Post	11.88	1774+00	880	NB	Qha[1]	2	Hayward (South/North) San Andreas	Strike Slip	0.77
Sign Post	12.46	1803+08	880	SB	Qha[1]	2	Hayward (South/North) San Andreas	Strike Slip	0.77
Sign Post	16.77	2032+00	880	NB	Qha[1]	2	Hayward (South/North) San Andreas	Strike Slip	0.77
Sign Post	18.3	2111+50	880	SB	Qha[1]	3	Hayward (South/North) San Andreas	Strike Slip	0.80
Sign Post	20.96	2253+00	880	NB	Qha[1]	3	Hayward (South/North) San Andreas	Strike Slip	0.81
Sign Post (Two Posts)	21.153	2261+75	880	SB	Qha[1]	3	Hayward (South/North) San Andreas	Strike Slip	0.81

1 - Alluvium, undifferentiated (Holocene) -- Alluvium deposited in fan, terrace, or basin environments. The surface is generally planar and smooth with little to no dissection. This unit is mapped where separate types of alluvial deposits could not be delineated either due to complex interfingering of depositional environments or the small size of the area. Typically, undifferentiated alluvium is mapped in relatively flat, smooth valley bottoms of small- to medium-sized drainages. Deposits probably are intercalated sand, silt, and gravel that are poorly to moderately sorted.

2 - Alluvium, undifferentiated (Pleistocene) -- This unit is mapped on gently sloping to level alluvial fan or terrace surfaces where a late Pleistocene age is indicated by slight dissection, and lack of historical flooding.

3 - Artificial Fill - Artificial fill (Historic)--Loose to very well consolidated gravel, sand, silt, clay, rock fragments, organic matter, and man-made debris in various combinations. Thickness is variable and may exceed 30 m in places. Some is compacted and quite firm, but fill made before 1965 is nearly everywhere not compacted and consists simply of dumped materials.

4 - Bay mud (Holocene)--Water-saturated estuarine mud, predominantly gray, green and blue clay and silty clay underlying marshlands and tidal mud flats of San Francisco Bay.

5 - Shear wave velocity of 560m/s for Qpa and Qha and 270m/s for Qhym. Probabilistic Model USGS Seismic Hazard Map (2008) 975 Year Return Period.

Table 5 – Geologic and Seismic Parameters for Caltrans Median Barrier Segments

Planned Construction	PM	Station	State Route	Direction	Geologic Unit(s) Symbol	Geology on Figure	Nearby Faults	Fault Type	Peak Bedrock Acceleration[5]
Median	4.02-4.47	1358+45-1382+39	880	N/A	Qha[1]	2	Hayward (South), Silver Creek	Strike Slip	0.77
Median	7.92-8.19	1564+75-1578+75	880	N/A	Qha[1]/Qpa[2]	2	Hayward (South), Silver Creek	Strike Slip	0.77
Median	12.51-12.94	1807+11-1829+45	880	N/A	Qha[1]	2	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	14.50-14.99	1912+04-1937+92	880	N/A	Qha[1]	2	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.81
Median	18.01-19.44	2097+38-2172+57	880	N/A	Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.81
Median	22.00-22.79	2307+75–2349+75	880	N/A	af[3]/Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	22.85-23.07	2353+08–2364+70	880	N/A	af[3]/Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	23.11-23.61	2366+76–2393+15	880	N/A	af[3]/Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.76
Median	23.67-24.13	2396+30–2420+42	880	N/A	af[3]/Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.76
Median	24.47-24.69	2438+45–2450+15	880	N/A	af[3]/Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	24.74-24.86	2452+73–2458+73	880	N/A	af[3]/Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	24.89–25.43	2460+73–2489+18	880	N/A	Qha[1]/af[3]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	25.50-25.93	2492+80-2515+25	880	N/A	af[3]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	25.96-26.49	2517+23-2545+10	880	N/A	af[3]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	26.57-27.20	2549+10-2582+60	880	N/A	af[3]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
Median	27.24-27.58	2584+60-2602+60	880	N/A	af[3]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77

1 - Alluvium, undifferentiated (Holocene) -- Alluvium deposited in fan, terrace, or basin environments. The surface is generally planar and smooth with little to no dissection. This unit is mapped where separate types of alluvial deposits could not be delineated either due to complex interfingering of depositional environments or the small size of the area. Typically, undifferentiated alluvium is mapped in relatively flat, smooth valley bottoms of small- to medium-sized drainages. Deposits probably are intercalated sand, silt, and gravel that are poorly to moderately sorted.

2 - Alluvium, undifferentiated (Pleistocene) -- This unit is mapped on gently sloping to level alluvial fan or terrace surfaces where a late Pleistocene age is indicated by slight dissection, and lack of historical flooding.

3 - Artificial Fill - Artificial fill (Historic)--Loose to very well consolidated gravel, sand, silt, clay, rock fragments, organic matter, and man-made debris in various combinations. Thickness is variable and may exceed 30 m in places. Some is compacted and quite firm, but fill made before 1965 is nearly everywhere not compacted and consists simply of dumped materials.

4 - Bay mud (Holocene)--Water-saturated estuarine mud, predominantly gray, green and blue clay and silty clay underlying marshlands and tidal mud flats of San Francisco Bay.

5 - Shear wave velocity of 560m/s for Qpa and Qha and 270m/s for Qhym. Probabilistic Model USGS Seismic Hazard Map (2008) 975 Year Return Period.

Table 6 – Geologic and Seismic Parameters for MTC Median Barrier Segments

Planned Construction	PM	Station	State Route	Direction	Geologic Unit(s) Symbol	Geology on Figure	Nearby Faults	Fault Type	Peak Bedrock Acceleration[5]
MTC No. 1	3.30-3.94	1320+59 – 1354+59	880	NA	Qha[1]	2	Hayward (South), Silver Creek	Strike Slip	0.77
MTC No. 2	4.59-4.97	1388+52 – 1408+52	880	NA	Qha[1]	2	Hayward (South), Silver Creek	Strike Slip	0.77
MTC No. 3	5.20-5.38	1420+82 – 1430+51	880	NA	Qha[1]	2	Hayward (South), Silver Creek	Strike Slip	0.77
MTC No. 4	5.87-6.04	1456+45 – 1464+99	880	NA	Qha[1]	2	Hayward (South), Silver Creek	Strike Slip	0.77
MTC No. 5	6.31-6.69	1479+39 – 1499+39	880	NA	Qpa[2]	2	Hayward (South), Silver Creek	Strike Slip	0.77
MTC No. 6	7.26-7.64	1529+52 – 1549+52	880	NA	Qpa[2]	2	Hayward (South), Silver Creek	Strike Slip	0.77
MTC No. 7	9.99-10.71	1673+64 – 1711+93	880	NA	Qha[2]	2	Hayward (South), Silver Creek	Strike Slip	0.77
MTC No. 8	12.48	1805+08	880	NA	Qha[2]	2	Hayward (South), Silver Creek	Strike Slip	0.77
MTC No. 9	13.05-14.05	1835+48 – 1888+36	880	NA	Qha[2]	2	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
MTC No. 10	15.20-15.57	1948+92 – 1968+20	880	NA	Qpa[2]	2	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.77
MTC No. 11	15.79-16.17	1979+88 – 1999+88	880	NA	Qha[1]	2	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.81
MTC No. 12	16.81-17.46	2034+07 – 2068+00	880	NA	Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.81
MTC No. 13	19.51-21.57	2176+69-2285+00	880	NA	Qha[1]	3	Hayward (South/North) San Andreas (Peninsula)	Strike Slip	0.78

1 - Alluvium, undifferentiated (Holocene) -- Alluvium deposited in fan, terrace, or basin environments. The surface is generally planar and smooth with little to no dissection. This unit is mapped where separate types of alluvial deposits could not be delineated either due to complex interfingering of depositional environments or the small size of the area. Typically, undifferentiated alluvium is mapped in relatively flat, smooth valley bottoms of small- to medium-sized drainages. Deposits probably are intercalated sand, silt, and gravel that are poorly to moderately sorted.

2 - Alluvium, undifferentiated (Pleistocene) -- This unit is mapped on gently sloping to level alluvial fan or terrace surfaces where a late Pleistocene age is indicated by slight dissection, and lack of historical flooding.

3 - Artificial Fill - Artificial fill (Historic)--Loose to very well consolidated gravel, sand, silt, clay, rock fragments, organic matter, and man-made debris in various combinations. Thickness is variable and may exceed 30 m in places. Some is compacted and quite firm, but fill made before 1965 is nearly everywhere not compacted and consists simply of dumped materials.

4 - Bay mud (Holocene)--Water-saturated estuarine mud, predominantly gray, green and blue clay and silty clay underlying marshlands and tidal mud flats of San Francisco Bay.

5 - Shear wave velocity of 560m/s for Qpa and Qha and 270m/s for Qhym. Probabilistic Model USGS Seismic Hazard Map (2008) 975 Year Return Period.

FIELD INVESTIGATION AND SUBSURFACE CONDITIONS

Because the footprint of the project is very large and the structural elements to be built could be considered small and spaced relatively far apart from one another; it is, from an economic and practicality standpoint, reasonable to present a macro view of the subsurface conditions existing at the site. This macro view of the subsurface conditions is based on the review of nearby as-built logs-of-test-borings (LOTB's) for completed projects relatively close to the proposed structures. Tables 7, 8, and 9, respectively present subsurface conditions and groundwater elevations, if available, for the Overhead Sign Posts, Caltrans Median Barrier Segments, and MTC Median Barrier Segments. A subsurface investigation was ***not*** conducted in the field for this project.

Table 7, presented on the following page, consists of information compiled from as-built LOTB's, which are chosen based on their approximate distance from the proposed overhead sign posts. The generalized subsurface conditions presented for each location should be considered for foundation installation. Any site conditions differing from that which is presented in Table 7 should be documented and brought to the attention of the Office of Geotechnical Design – West. As-builts referenced by Table 7 are attached in Appendix A.

Table 7 – Generalized Subsurface Conditions for Overhead Sign Posts based on As-built Information

No.	Post Mile	M-Line Station	Type	Post Type	As-built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Approximate Distance from Proposed Structure (Post) (ft.)
1	2.97	1303+35	Single Post	VIII	B-11.7	17	0-5' **CL** 5-15' **SP** 15-25' **CL** 25-30' **SP** 30-35' **GW**	Ave. SPT Blow Count = 22	Not measured due to drilling method.	04-233104	650
					B-11.10*	21			8.4		2250
2	3.90	1352+50	Single Post	VIII	B-11.7	17	0-5' **CL** 5-15' **SP** 15-25' **CL** 25-30' **SP** 30-35' **GW**	Ave. SPT Blow Count = 22	Not measured due to drilling method.	04-233104	650
					B-11.10*	21			8.4		2250
3	8.40	1590+00	Single Post	VIII	B-4.2	36	0-16' **CL-ML** 16-26' **ML** 26-36' **SP** 36-46' **CL** 46-56' **GP-GW**	Ave. SPT Blow Count = 24	Not measured due to drilling method.	04-233144	600
4	9.90	1669+00	Single Post	VIII	B-1	14.9	0-19' **ML** (fill) 19-29' **ML** 29-79' **SP**	Ave. SPT Blow Count = 38** (Lens of Asphalt encountered at approx. 20 ft.)	Not measured due to drilling method.	04-033044	1950
5	10.61	1706+75	Single Post	VIII	B-6	21.6	0-5' **ML** 5-37'**CL** 37-50' **ML** 50-62' **CL** 62-90' **SP**	SPT Blow Count is up to 34	10.0.	04-408204	1500
6	11.88	1774+00	Single Post	VIII	BB-2	12.0	0-80' **CL** 80-90' **SM**	Ave. CAL MOD Blow Count = 24.	3.0	04-233164	4130
7	12.46	1803+08	Single Post	VIII	B-14.8	24	0-10' **CL** (fill) 10-15' **CL** 15-17' **SC** 17-25' **ML** 25-30 **SP** 30-35' **SM** 35-43' **ML**	Ave. SPT Blow Count = 9	Not measured due to drilling method.	04-233154	1840
8	16.77	2032+00	Single Post	VII	B-4	38.1	0-12' **ML** 12-19' **CL** 19-28' **SW** 28-40' **MH** 40-57' **SP**	Ave. SPT Blow Count = 39	30.2	04-016011	150
9	18.3	2111+50	Single Post	VII	B-1	50.5	0-32' **CL** 32-35' **SM** 35-47' **CL** 47-50' **SM** 50-80' **CL**	Ave. SPT Blow Count = 21	Not measured due to drilling method.	04-123144	100
					B-7*	50.8			28.7		100
10	20.96	2253+00	Single Post	VIII	No. 3	21	0-30' **CL**	Not applicable, non-standard hammer used.	14.4	51-4TC17	700
11	21.13	2261+75	Two Posts	V-S	No. 3	21	0-30' **CL**	Not applicable, non-standard hammer used.	14.4	51-4TC17	1600

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

***** - The borehole is referenced only for anticipated groundwater elevations. ****** - The actual SPT values are likely smaller in native soils.

Table 8, presented on the following page, consists of information compiled from as-built LOTB's, which are chosen based on their proximity to each proposed Caltrans median barrier segment. In order to bracket each segment, a minimum of two or more LOTB's are referenced to generalize the subsurface conditions for each segment. The generalized subsurface conditions presented for each segment should be considered for foundation installation. Any site conditions differing from that which is presented in Table 8 should be documented and brought to the attention of the Office of Geotechnical Design – West. As-builts referenced by Table 8 are attached in Appendix A.

Table 8 – Generalized Subsurface Soil Conditions for Caltrans' Median Barriers based on As-Built Information

No.	Post Mile	M-Line Station	Segment Length (ft.)	Post Type	As-built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
1	4.02-4.47	1358+45 - 1382+39	2376	21D	B-1	14.7	0-10' **CL** 10-30' **SM**	Ave. SPT Blow Count = 16	5.7	04-395774	3.3/4.5
					B-14	11.0	0-46' **CL** 46-51'**SC**	Ave. SPT Blow Count = 14	2.0	04-130604	2.8/3.7
					B-7	45.0	0-22' **ML** (fill) 22-25' **SC** (fill) 25-45' **SM** 45-70' **ML**	Ave. SPT Blow Count = 17	14	04-115404	4.3/5.4
2	7.92-8.19	1564+75 - 1578+75	1426	21D	B-8.8	35.0	0-17' **CL** 17-30' **SP** 30-50' **SW**	Ave. SPT Blow Count = 17	Not Measured due to drilling method.	04-233114	6.9/8.5
					B-2	34.8	0-3' **ML** 3-20' **SM** 20-45' **ML** 45-55' **SM** 55-80' **SW**	Ave. SPT Blow Count = 13	-16.2	56-4TC45-F	
					B-8.2	36	0-10' **CL** 10-25' **ML** 25-30' **SW** 30-37' **CL** 37-60' **ML** 60-95' **CL** 95-100' **SC** 100-110' **SW** 110-118' **GP**	Ave. SPT Blow Count = 22	Not Measured due to drilling method.	04-233114	
					B-1	145	0-20 **ML** (fill) 20-22 **AC** 22-37 **ML** 37-55 **SP** 55-70 **SW** 70-90 **SP**	Ave. SPT Blow Count = 48	Not Measured.	04-033174	6.0
					B-2	27.0	Penetrometer Test	N/A	1.2	57-4TC45-F	6.0
					B-1	23.6	0-5' **SM** 5-10' **ML** 10-25' **SM** 25-36' **ML** 36-46' **SP** 46-60' **ML**	Ave. SPT Blow Count = 17	Not Measured.	57-4TC45-F	10.66
3	12.51-12.94	1807+11 - 1829+45	2270	21D	B-2	21.7	0-2' **SM** 2-16' **CL** 16-37' **CL\OL** 37-40' **ML** 40-45' **ML\SM** 45-58' **SP\GP**	Ave. SPT Blow Count = 16	-21.3	56-4TC57	11.8
					B-2	19.8	0-10' **SP** 10-27' **SW** 27-47' **CL** 47-53' **SP** 53-65' **SW**	Ave. SPT Blow Count = 18	-9.2	56-4TC57-F	12.78

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

Table 8 (*Cont.*) – Generalized Subsurface Soil Conditions for Caltrans' Median Barriers based on As-Built Information

No.	Post Mile	M-Line Station	Segment Length (ft.)	Post Type	As-built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
4	14.50-14.99	1912+04 - 1937+92	2587	21D	B-4	10.4	0-10' **OL** 10-100' **CL**	Ave. SPT Blow Count = 15	2.4	04-234804	14.5
					BB-2	12.0	0-5 **ML** 5-70 **CL** 70-80 **SM**	Ave. CAL MOD Blow Count = 24	-3.0	04-233164	13.0
					B-3	7.5	0-42' **ML** 42-47' **CL** 47-55' **SW** 55-72' **CL**	Ave. SPT Blow Count = 24	-2.8; measured from Penetration Test B-2	56-4TC57-F	13.67
					B-4	25.0	0-25' **ML** 25-36' **SP** 36-75' **ML**	Ave. SPT Blow Count = 13	16.6	56-4TC57-F	15.65
					B-4	7.4	0-45' **CL** 45-50' **SP** 50-60' **SW**	Ave. SPT Blow Count = 25	-2.6	56-4TC57	13.81
					B-2	19.8	0-10' **SP** 10-27' **SW** 27-47' **CL** 47-53' **SP** 53-65' **SW**	Ave. SPT Blow Count = 18	-9.2	56-4TC57-F	12.78
					B-4	25.0	0-25' **ML** 25-36' **SP** 36-75' **ML**	Ave. SPT Blow Count = 13	16.6	56-4TC57-F	15.65
5	18.01-19.44	2097+38 - 2172+57	7550	21D	B-3	52.4	0-10' **GP** 10-20' **CL** 20-34' **ML** 34-43' **SP** 43-47' **ML** 47-53' **CL**	Ave. SPT Blow Count = 23	29.7	04-123144	18.4
					B-1	44.4	0-5' **ML** 5-10' **SP** 10-17' **ML** 17-27' **CL** 27-29' **ML** 29-38' **SP** 38-56' **ML** 56-58' **SP** 58-65' **CL** 65-67' **SP** 67-73' **CL**	Ave. SPT Blow Count = 17	23.4	04-123134	19.3
6	22.00-22.79	2307+75 - 2349+75	4171	21D	B-6	27.0	0-11' **SM** 11-39' **CL** 39-48' **SM** 48-51' **CL**	Ave. SPT Blow Count = 32	15	04-233500	22.4
					MR-2	30.0	0-23' **CL** 23-28' **GP-GC** 28-32' **SP-SM** 32-37' **CL** 37-42' **SM** 42-48' **SP-SC** 48-55' **CL** 55-62' **SW-SM** 62-66' **ML** 66-102' **CL**	Ave. SPT Blow Count = 26	16.5	04-3A9214	22.84

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

Table 8 (*Cont.*) – Generalized Subsurface Soil Conditions for Caltrans' Median Barriers based on As-Built Information

No.	Post Mile	M-Line Station	Segment Length (ft.)	Post Type	As-built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
7	22.85 – 23.07	2353+08 – 2364+70	1162	21D	MR-2	30.0	0-23' **CL** 23-28' **GP-GC** 28-32' **SP-SM** 32-37' **CL** 37-42' **SM** 42-48' **SP-SC** 48-55' **CL** 55-62' **SW-SM** 62-66' **ML** 66-102' **CL**	Ave. SPT Blow Count = 26	16.5	04-3A9214	22.84
					B-1	40.1	0-23' **SM** 23-47' **SC** 47-78' **ML** 78-85' **SM**	Ave. SPT Blow Count = 31	15.5	04-123174	23.1
8	23.11	2366+76 – 2393+15	2640	21D	B-1	40.1	0-23' **SM** 23-47' **SC** 47-78' **ML** 78-85' **SM**	Ave. SPT Blow Count = 31	15.5	04-123174	23.1
					DV-2	28.5	0-26' **CL** 26-32' **SM** 32-38' **SP** 38-46' **CL** 46-64' **SP-SM** 64-75' **CL** 75-83' **SP** 83-98' **CL**	Ave. SPT Blow Count = 19	18.5	04-3A9214	23.64
9	23.67-24.13	2396+30-2420+42	2429	21D	DV-2	28.5	0-26' **CL** 26-32' **SM** 32-38' **SP** 38-46' **CL** 46-64' **SP-SM** 64-75' **CL** 75-83' **SP** 83-98' **CL**	Ave. SPT Blow Count = 19	18.5	04-3A9214	23.64
					B-5	36.2	0-20' **SP** (fill) 20-65' **CL-ML** 65-67' **SC**	Ave. SPT Blow Count = 14	10.0 as stated from note in plans.	04-140201	24.2
10	24.47-24.69	2438+45-2450+15	1162	21D	B-5	36.2	0-20' **SP** (fill) 20-65' **CL-ML** 65-67' **SC**	Ave. SPT Blow Count = 14	10.0 as stated from note in plans.	04-140201	24.2
					B-16	13.5	0-5' **SM** 5-17' **CH** 17-25' **CL/CH** 25-43' **CL** 43-46 **GP** 46-50' **CL** 50-63' **CH** 63-67' **CL** 67-68' **SM** 68-81' **CH** 81-90' **CL** 90-103' **CL/CH**	Ave. CAL MOD Blow Count = 24	Not reported.	04-233281	24.74

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

Table 8 (*Cont.*) – Generalized Subsurface Soil Conditions for Caltrans' Median Barriers based on As-Built Information

No.	Post Mile	M-Line Station	Segment Length (ft.)	Post Type	As-built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
11	24.74-24.86	2452+73-2458+73	634	21D	B-16	13.5	0-5' **SM** 5-17' **CH** 17-25' **CL/CH** 25-43' **CL** 43-46 **GP** 46-50' **CL** 50-63' **CH** 63-67' **CL** 67-68' **SM** 68-81' **CH** 81-90' **CL** 90-103' **CL/CH**	Ave. CAL MOD Blow Count = 24	Not reported.	04-233281	24.74
					B-1	5.0	0-15' **OL** 15-24' **CL** 24-27' **SM** 27-52' **SM** 52-57' SP 57-67' **CL**	Ave. SPT Blow Count = 16	4.2 as stated from note in plans.	04-174384	25.5
12	24.89-25.43	2460+73-2489+18	2851	21D	B-16	13.5	0-5' **SM** 5-17' **CH** 17-25' **CL/CH** 25-43' **CL** 43-46 **GP** 46-50' **CL** 50-63' **CH** 63-67' **CL** 67-68' **SM** 68-81' **CH** 81-90' **CL** 90-103' **CL/CH**	Ave. CAL MOD Blow Count = 24	Not reported.	04-233281	24.74
					B-1	5.0	0-15' **OL** 15-24' **CL** 24-27' **SM** 27-52' **SM** 52-57' **SP** 57-67' **CL**	Ave. SPT Blow Count = 16	4.2 as stated from note in plans.	04-174384	25.5
13	25.50-25.93	2492+80-2515+25	2270	21D	B-1	5.0	0-15' **OL** 15-24' **CL** 24-27' **SM** 27-52' **SM** 52-57' **SP** 57-67' **CL**	Ave. SPT Blow Count = 16	4.2 as stated from note in plans.	04-174384	25.5
					B-12	6.50	0-5' **SM** 5-12' **CL** 12-32' **CH** 32-47' **SP** 47-51' **GM** 51-61' **SC** 61-65' **GP** 65-110' **CL**	Ave. CAL MOD Blow Count = 27	Not measured due to drilling method.	04-233191	25.97

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

Table 8 (*Cont.*) – Generalized Subsurface Soil Conditions for Caltrans' Median Barriers based on As-Built Information

No.	Post Mile	M-Line Station	Segment Length (ft.)	Post Type	As-built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
14	25.96-26.49	2517+23-2545+10	2798	21D	B-12	6.50	0-5' **SM** 5-12' **CL** 12-32' **CH** 32-47' **SP** 47-51' **GM** 51-61' **SC** 61-65' **GP** 65-110' **CL**	Ave. CAL MOD Blow Count = 27	Not measured due to drilling method.	04-233191	25.97
					B-3	7.9	0-7' **SP** (fill) 7-12' **CL** 12-17' **SP** 17-31' **CL** 31-57' **ML** 57-72' **SP/GP**	Ave. SPT Blow Count = 25	2.4	62-4T13619	26.0
15	26.57-27.20	2549+10-2582+60	3326	21D	B-3	8.1	0-5' **SP/GP** (fill) 5-10' **OL** (Bay Mud) 10-15' **SP** 15-20' **ML** 20-27' **SM** 27-30' **SP** 30-50' **CL** 50-52' **SP** 52-60' **SW**	Ave. SPT Blow Count = 16	Plan sheet note refers to Damon Slough, GWS = 2.4	04-265004	26.6
					B-1	8.0	0-5' **SP** (fill) 5-15' **OL** (Bay Mud) 15-19' **SM** 19-56' **ML** 56-81' **SM** 81-85' **SP**	Ave. SPT Blow Count = 20	0.7 based on Penetrometer test, B-3	62-4T13619	27.2
16	27.24-27.58	2584+60-2602+60	1795	21D	B-1	8.0	0-5' **SP** (fill) 5-15' **OL** (Bay Mud) 15-19' **SM** 19-56' **ML** 56-81' **SM** 81-85' **SP**	Ave. SPT Blow Count = 20	0.7 based on Penetrometer test, B-3	62-4T13619	27.2
					S'1	11.8	0-3.3' **GP** 3.3-6.5' **SC** 6.5-13' **CH** 13'-53.5' **CL** 53.5-61' **SC**	Ave. SPT Blow Count = 13	5.0	04-165421	27.5

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

Table 9, presented on the following page, consists of information compiled from as-built LOTB's, which are chosen based on their proximity to each proposed MTC median barrier segment. In order to bracket each segment, a minimum of two or more LOTB's are referenced to generalize the subsurface conditions for each segment. The generalized subsurface conditions presented for each segment should be considered for foundation installation. Any site conditions differing from that which is presented in Table 9 should be documented and brought to the attention of the Office of Geotechnical Design – West. As-builts referenced by Table 9 are attached in Appendix A.

Table 9 – Generalized Subsurface Soil Conditions for MTC Median Barriers based on As-Built information

No.	Post Mile	M-Line Stationing	Segment Length, ft.	Double Luminaire Type	As-Built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
MTC No. 1	3.30-3.94	1320+59 – 1354+59	3600	21D	B-1	14.7	0-10' **CL** 10-30' **SM**	Ave. SPT Blow Count =	5.7	04-395774	3.3/4.5
					B-14	11.0	0-46' **CL** 46-51'**SC**	Ave. SPT Blow Count =	2.0	04-130604	2.8/3.7
MTC No. 2	4.59-4.97	1388+52-1408+52	2000	21D	B-7	45.0	0-22' **ML** (fill) 22-25' **SC** (fill) 25-45' **SM** 45-70' **ML**	Ave. SPT Blow Count = 17	14	04-115404	4.3/5.4
MTC No. 3	5.20-5.38	1420+82-1430+51	969	21D	B-9.2	33.0	0-75' **CL** 75-100' **ML** 100-105' **SW** 105-120' **GP** 120-125' **SP** 125-160' **GP** 160-175' **CL**	Ave. SPT Blow Count = 37	Not Measured due to drilling method.	04-233101	2.5/6.9
					B-1	37.2	0-3' **CL** 3-10' **SP** 10-36' **CL** 36-55' **SW**	Ave. SPT Blow Count = 12	-8.9	57-4TC45	
MTC No. 4	5.87-6.04	1456+45-1464+99	805	21D	B-11.10	21.0	0-5' **GC** 5-16' **CL** 16-36' **SP** 36-55' **CL** 55-66' **SP**	Ave. SPT Blow Count = 16	8.4	04-233104	2.5/6.9
					B-9.2	33.0	0-75' **CL** 75-100' **ML** 100-105' **SW** 105-120' **GP** 120-125' **SP** 125-160' **GP**	Ave. SPT Blow Count = 37	Not Measured due to drilling method.	04-233101	2.5/6.9
MTC No. 5	6.31-6.69	1479+39-1499+39	2000	21D	B-9.2	33.0	0-75' **CL** 75-100' **ML** 100-105' **SW** 105-120' **GP** 120-125' **SP** 125-160' **GP** 160-175' **CL**	Ave. SPT Blow Count = 37	Not Measured due to drilling method.	04-233101	2.5/6.9
					B-1	37.2	0-3' **CL** 3-10' **SP** 10-36' **CL** 36-55' **SW**	Ave. SPT Blow Count = 12	-8.9	57-4TC45	

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

Table 9 (*continued*) – Generalized Subsurface Soil Conditions for MTC Median Barriers based on As-Built information

No.	Post Mile	M-Line Stationing	Segment Length, ft.	Double Luminaire Type	As-Built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
MTC No. 6	7.26-7.64	1529+52-1549+52	2000	21D	B-8.8	35.0	0-17' **CL** 17-30' **SP** 30-50' **SW**	Ave. SPT Blow Count = 17	Not Measured due to drilling method.	04-233114	6.9/8.5
					B-2	34.8	0-3' **ML** 3-20' **SM** 20-45' **ML** 45-55' **SM** 55-80' **SW**	Ave. SPT Blow Count = 13	-16.2	56-4TC45-F	
					B-8.2	36	0-10' **CL** 10-25' **ML** 25-30' **SW** 30-37' **CL** 37-60' **ML** 60-95' **CL** 95-100' **SC** 100-110' **SW** 110-118' **GP**	Ave. SPT Blow Count = 22	Not Measured due to drilling method.	04-233114	
MTC No. 7	9.99-10.71	1673+64-1711+93	4978	21D	B-1	145	0-20 **ML** (fill) 20-22 **AC** 22-37 **ML** 37-55 **SP** 55-70 **SW** 70-90 **SP**	Ave. SPT Blow Count = 48	Not Measured.	04-033174	6.0
					B-2	27.0	Penetrometer	N/A	1.2	57-4TC45-F	6.0
					B-1	23.6	0-5' **SM** 5-10' **ML** 10-25' **SM** 25-36' **ML** 36-46' **SP** 46-60' **ML**	Ave. SPT Blow Count = 17	Not Measured.	57-4TC45-F	10.66
MTC No. 8	12.48	1805+08	600	21D	B-2	21.7	0-2' **SM** 2-16' **CL** 16-37' **CL\OL** 37-40' **ML** 40-45' **ML\SM** 45-58' **SP\GP**	Ave. SPT Blow Count = 16	-21.3	56-4TC57	11.8
					B-2	19.8	0-10' **SP** 10-27' **SW** 27-47' **CL** 47-53' **SP** 53-65' **SW**	Ave. SPT Blow Count = 18	-9.2	56-4TC57-F	12.78

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

Table 9 (*continued*) – Generalized Subsurface Soil Conditions for MTC Median Barriers based on As-Built information

No.	Post Mile	M-Line Stationing	Segment Length, ft.	Double Luminaire Type	As-Built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
MTC No. 9	13.05-14.05	1835+48-1888+36	6566	21D	BB-2	12.0	0-5 **ML** 5-70 **CL** 70-80 **SM**	Ave. CAL MOD Blow Count = 24	-3.0	04-233164	13.0
					B-3	7.5	0-42' **ML** 42-47' **CL** 47-55' **SW** 55-72' **CL**	Ave. SPT Blow Count = 24	-2.8; measured from Penetration Test B-2	56-4TC57-F	13.67
					B-4	25.0	0-25' **ML** 25-36' **SP** 36-75' **ML**	Ave. SPT Blow Count = 13	16.6	56-4TC57-F	15.65
					B-4	7.4	0-45' **CL** 45-50' **SP** 50-60' **SW**	Ave. SPT Blow Count = 25	-2.6	56-4TC57	13.81
					B-2	19.8	0-10' **SP** 10-27' **SW** 27-47' **CL** 47-53' **SP** 53-65' **SW**	Ave. SPT Blow Count = 18	-9.2	56-4TC57-F	12.78
MTC No. 10	15.20-15.57	1948+92-1968+20	1928	21D	B-4	25.0	0-25' **ML** 25-36' **SP** 36-75' **ML**	Ave. SPT Blow Count = 13	16.6	56-4TC57-F	15.65
MTC No. 11	15.79-16.17	1979+88-1999+88	2000	21D	B-4	25.0	0-25' **ML** 25-36' **SP** 36-75' **ML**	Ave. SPT Blow Count = 13	16.6	56-4TC57-F	15.65
					B-1	33.2	0-22' **SC** 22-27' **CL** 27-40' **GW** 40-60' **ML** 60-62' **SP** 62-80' **ML** 80-95' **CL**	Ave. SPT Blow Count = 18	22.5; measured from Penetration Test B-3	59-14TC5	16.03
MTC No. 12	16.81-17.46	2034+07-2068+00	3431	21D	2W	57	0-25' **ML** 25-30' **CL** 30-35' **SM** 35-45' **GM** 45-52' **GC**	Ave. CAL MOD Blow Count = 32	45.5	04-016011	16.85

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

Table 9 (*continued*) – Generalized Subsurface Soil Conditions for MTC Median Barriers based on As-Built information

No.	Post Mile	M-Line Stationing	Segment Length, ft.	Double Luminaire Type	As-Built LOTB(s)	Boring Elevation (ft.)	Generalized Subsurface Soil Conditions by Depth (ft.)		Groundwater Elevation (ft.)	Contract Number	Post Mile
MTC No. 13	19.51-21.57	2176+69-2285+00	10,877	21D	B-1	32.8	0-5' **SP** 5-7' **CL** 7-10' **SC** 10-25' **CL** 25-30' **SW** 30-31' **ML** 31-35' **SC** 35-40' **CL** 40-50' **SC** 50-55' **GW** 55-70' **SC**	Ave. SPT Blow Count = 20	24.3	04-123134	19.8
					TH-4	37.5	0-15' **CL** 15-16' **SP** 16-18'**CL** 18-20' **SP** 20-30' **CL**	SPT's not performed.	23	52-4TC19	20.1
					B-1	37.2	0-15' **ML** 15-27' **CL** 27-38' **ML** 38-57' **CL** 57-77' **ML** 77-82' **CL**	Ave. SPT Blow Count = 16	LOTB's state that GWS is assumed to be 24.0	04-172384	20.2
					TH-1	25.3	0-5' **SM** 5-17' **CL** 17-19' **SM** 19-33' **CL**	SPT's not performed.	23.3	52-4TC19	20.3
					B-2	30.7	0-15' **ML** 15-26' **CL** 26-31' **ML** 31-58' **CL** 58-65' **GW** 65-71' **CL**	Ave. SPT Blow Count = 16	23.7	04-172384	20.5
					No. 6	20.5	0-8' **CL** 8-12' **ML** 12-38' **CL**	SPT's not performed.	14.7	51-4TC17	20.6
					No. 2	21.0	0-4' **CL** 4-10' **SC** 10-32' **CL**	SPT's not performed.	14.5	51-4TC17	20.8
					B-4	22.0	0-5' **CL** (fill) 5-9' **GP** (fill) 9-13' **SP** (fill) 13-60' **CL**	Ave. CAL MOD Blow Count = 20	15.0	04-288004	21.0
					B-1	26.7	0-5' **CL** 5-18' **SP** 18-48' **CL** 48-91' **SP**	Ave. SPT Blow Count = 40	10.6	04-123174	21.56

CL - Lean Clay, **ML** – Silt, **CH** - Fat Clay, **MH** - Elastic Silt, **OL/OH** – Organic Soil, **GW** – Well Graded Gravel, , **GP** - Poorly Graded Gravel, **GM** – Silty Gravel, **GC** – Clayey Gravel, **SW** - Well-graded Sand, **SP** – Poorly Graded Sand, **SM** – Silty Sand, **SC** – Clayey Sand

FOUNDATION RECOMMENDATIONS

Overhead Sign Post Foundations

Based on the generalized subsurface soil conditions listed above, we recommend using a Cast-In-Drilled-Hole (CIDH) Pile for each Overhead Sign Post foundation. Refer to Standard Plan Sheets; S8–Overhead Signs–Truss, Single Post Type, Round Pedestal Pile Foundation, and S15–Overhead Signs-Truss, Two Post Type, Round Pedestal Foundation, which are attached to this memo. Table 10-Foundation Recommendations for Overhead Sign Posts summarizes the CIDH pile diameter and foundation depth required for each sign.

Table 10 – Foundation Recommendations for Overhead Sign Posts

No.	Post Mile	M-Line Station	Type	Post Type	CIDH Pile		Standard Plan Reference Sheet
					Diameter	Foundation Depth	
1	2.97	1303+35	Single Post	VIII	**5'-0"**	**23'-0"**	S8
2	3.90	1352+50	Single Post	VIII	**5'-0"**	**25'-0"**	S8
3	8.40	1590+00	Single Post	VIII	**5'-0"**	**25'-0"**	S8
4	9.90	1669+00	Single Post	VIII	**5'-0"**	**25'-0"**	S8
5	10.61	1706+75	Single Post	VIII	**5'-0"**	**25'-0"**	S8
6	11.88	1774+00	Single Post	VIII	**5'-0"**	**25'-0"**	S8
7	12.46	1803+08	Single Post	VIII	**5'-0"**	**25'-0"**	S8
8	16.77	2032+00	Single Post	VII	**5'-0"**	**23'-0"**	S8
9	18.3	2111+50	Single Post	VII	**5'-0"**	**23'-0"**	S8
10	20.96	2253+00	Single Post	VIII	**5'-0"**	**25'-0"**	S8
11	21.153	2261+75	Two Posts	V-S	**5'-0"**	**26'-3"**	S15

Median Lighting (Double Luminaire Type 21D) Foundations for Caltrans Median Barrier

Our understanding is that the existing concrete median barrier will be replaced with a 56-inch high, Type 60G Concrete Barrier, which is 20-inches higher than the Type 21D Median Barrier Mounted, shown in Elevation B view of Standard Plan ES-6D (attached). The standard height of the Median Barrier is 36-inches. Based on the difference in heights and the subsurface soil conditions listed in Table 8, we recommend that the foundation depth be extended 24-inches, from 8'-0" to 10'-0". Table 11 - Foundation Recommendations for Median Barrier Lighting, summarize the CIDH pile diameter and foundation depths required for each luminaire.

Table 11 – Foundation Recommendations for Caltrans Median Barrier Lighting

No.	Post Mile	M-Line Stationing	Segment Length, ft.	Double Luminaire Type	CIDH Pile		Standard Plan Reference Sheet(s)
					Diameter	Foundation Depth	
1	4.02-4.47	1358+45 - 1382+39	2376	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
2	7.92-8.19	1564+75 - 1578+75	1426	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
3	12.51-12.94	1807+11 - 1829+45	2270	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
4	14.50-14.99	1912+04 - 1937+92	2587	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
5	18.01-19.44	2097+38 - 2172+57	7550	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
6	22.00-22.79	2307+75 – 2349+75	4171	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
7	22.85-23.07	2353+08 – 2364+70	1162	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
8	23.11-23.61	2366+76 – 2393+15	2640	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
9	23.67-24.13	2396+30 – 2420+42	2429	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
10	24.47-24.69	2438+45 – 2450+15	1162	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
11	24.74-24.86	2452+73 – 2458+73	637	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
12	24.89–25.43	2460+73 – 2489+18	2851	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
13	25.50-25.93	2492+80 - 2515+25	2270	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
14	25.96-26.49	2517+23 - 2545+10	2798	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
15	26.57-27.20	2549+10 - 2582+60	3326	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
16	27.24-27.58	2584+60 - 2602+60	1795	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N

Median Lighting (Double Luminaire Type 21D) Foundations for MTC Median Barrier

Our understanding is that the existing concrete median barrier will be replaced with a 56-inch high, Type 60G Concrete Barrier, which is 20-inches higher than the Type 21D Median Barrier Mounted, shown in Elevation B view of Standard Plan ES-6D (attached). The standard height of the Median Barrier is 36-inches. Based on the difference in heights and the subsurface soil conditions listed in Table 9, we recommend that the foundation depth be extended 24-inches, from 8'-0" to 10'-0". Table 12 - Foundation Recommendations for MTC Median Barrier Lighting, summarize the CIDH pile diameter and foundation depths required for each luminaire.

Table 12 - Foundation Recommendations for MTC Median Barrier Lighting

No.	Post Mile	M-Line Stationing	Segment Length, ft.	Double Luminaire Type	CIDH Pile		Standard Plan Reference Sheet(s)
					Diameter	Foundation Depth	
MTC No. 1	3.30-3.94	1320+59–1354+59	3379	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 2	4.59-4.97	1388+52-1408+52	2006	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 3	5.20-5.38	1420+82-1430+51	950	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 4	5.87-6.04	1456+45-1464+99	898	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 5	6.31-6.69	1479+39-1499+39	2006	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 6	7.26-7.64	1529+52-1549+52	2006	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 7	9.99-10.71	1673+64-1711+93	3802	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 8	12.48	1805+08	N/A	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 9	13.05-14.05	1835+48-1888+36	5280	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 10	15.20-15.57	1948+92-1968+20	1954	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 11	15.79-16.17	1979+88-1999+88	2006	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 12	16.81-17.46	2034+07-2068+00	3432	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N
MTC No. 13	19.51-21.57	2176+69-2285+00	10,560	21D	**2'-0"**	**10'-0"**	ES-6D ES-7N

CORROSION

We noted, during our review of the recent draft foundation report for the "I-880 Median Barrier Replacement and Express Lane Project in Santa Clara and Alameda Counties", dated March 30th, 2015, prepared by Pahrikh Consultants, Inc. of San Jose, CA, for Caltrans and the Metropolitan Transportation Commission, (EA 04-2J0702 and EA 04-3G911), that it was indicated that several borings tested for chloride concentrations greater than 500 ppm, which is one of three individual thresholds listed in Caltrans' Corrosion Guidelines (November 2012) for determining whether a site is corrosive to structural elements. Based on this information and because this project (Overhead Sign Posts and Double Luminaire Masts for the Median Barrier Replacement Project on I-880) overlaps the I-880 Median Barrier Replacement and Express Lane Project in Santa Clara and Alameda Counties, we recommend that the clear concrete cover for all CIDH piles in this project be increased as specified in Table 5.12.3.1 Cover for Unprotected main Reinforcing Steel (in.) of Section 5: Concrete Structures, California Amendments to AASHTO LRFD Bridge Design Specifications – Fourth Edition (December 2008). This recommendation is consistent with that of Pahrikh Consultants, Inc.

CONSTRUCTION CONSIDERATIONS AND REQUIREMENTS

The following construction considerations and requirements should be included in the design and construction specifications for the proposed foundations:

- The contractor may encounter difficulties during the drilling of the CIDH piles due to variable groundwater levels at each proposed site. During the drilling operation for the proposed CIDH piles, we believe that higher groundwater elevations may be encountered and that some caving of the drilled holes will likely occur. Use of slurry may be necessary.

- Please note that the actual soil conditions for each proposed foundation may be different than those soil conditions listed in Tables 7, 8, and 9, due to changing site conditions, such as fill thickness, hard material, buried man-made objects, lenses of caving soils, etc.

- Installation of CIDH piles should be performed in accordance with Section 49-3, CAST-IN-DRILLED-HOLE CONCRETE PILING, of the 2010 Caltrans Standard Specifications.

- Use of temporary casing is necessary where caving soil is encountered. Require Contractor to furnish temporary casings at the job site before drilling CIDH piles.

- Contact our office immediately, if there are any problems with the installation of the CIDH piles, so we can evaluate the need for additional measures.

- Known buried man-made objects, utilities, etc. must be shown on the plans.

If you have any questions, please contact me at (510) 622-8742 or Mahmood Momenzadeh at (510) 286-5732.

Attachments

c: TPokrywka (OGD-West); MMomenzadeh (OGD-West); ELandin-Lowe; RE_Pending_File@dot.ca.gov; GSetberg; RWoo; Geotechnical Archive

JMoore/jm

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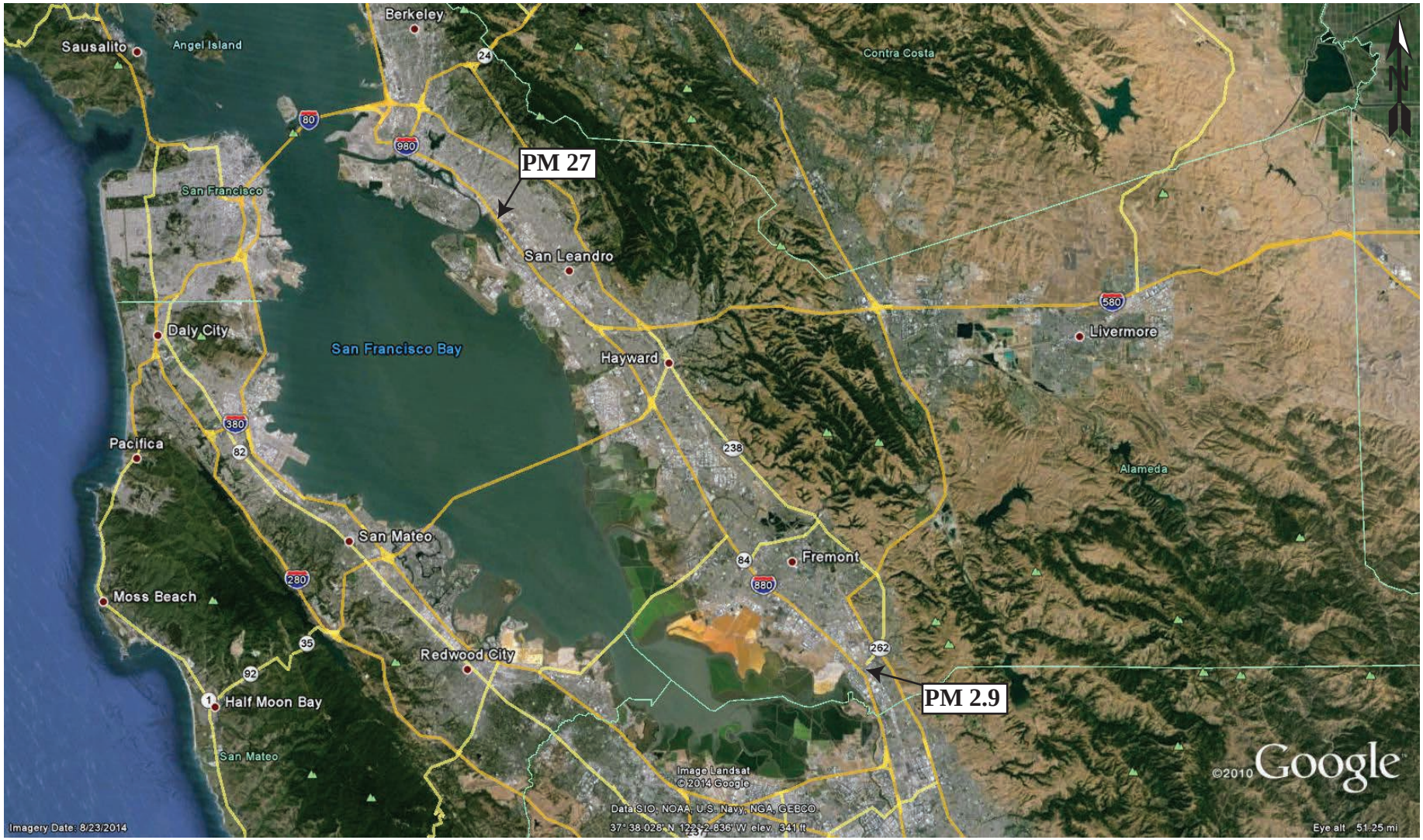
STATE OF CALIFORNIA



SCALE

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Caltrans

DIVISION OF
ENGINEERING SERVICES
GEOTECHNICAL SERVICES
GEOTECHNICAL DESIGN - WEST – BRANCH B

LOCATION MAP

04-ALA-880	**04140000421**
PM. 2.9-27.6	**MARCH 2015**

FIGURE 1

Sta. 1912+00-1938+00

Sta. 1806+00-1832+00

Sta. 1803+08

Sta. 1774+00

Sta. 1706+75

Sta. 1669+00

Sta. 1590+00

Sta. 1564+50-1579+50

Sta. 1357+00-1383+00

Sta. 1352+50

Sta. 1303+35

Qpa

Qha

Qhym

Carpenter

Union City

Fremont

Newark

Decoto Rd

Peralta Blvd

Thornton Ave

Mowry Ave

238

84

880

680

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37° 32.944' N 122° 1.233' W elev 39 ft

Eye alt 10.71 mi

Explanation

af	Artificial Fill
Qha	Alluvium (Pleistocene)
Qpa	Alluvium (Pleistocene)
Qhym	Sedimentary rocks (Miocene)
Tpms	Sedimentary rocks (Pliocene and early Miocene)
Ks	Franciscan Complex mélange (Eocene, Paleocene, and (or) Late Cretaceous)
KJs	Great Valley complex sedimentary rocks (Early Cretaceous and (or) Late Jurassic)
KJfc	Franciscan Complex chert (Early Cretaceous and (or) Late Jurassic)

Map Symbols

Sign Post Locations

Caltrans Median Barrier Locations

MTC Median Barrier Locations

Reference:
Geologic Map of Alameda_County, CA
From USGS Scientific Investigations
Map 2918

http://www.haas.berkeley.edu/map/

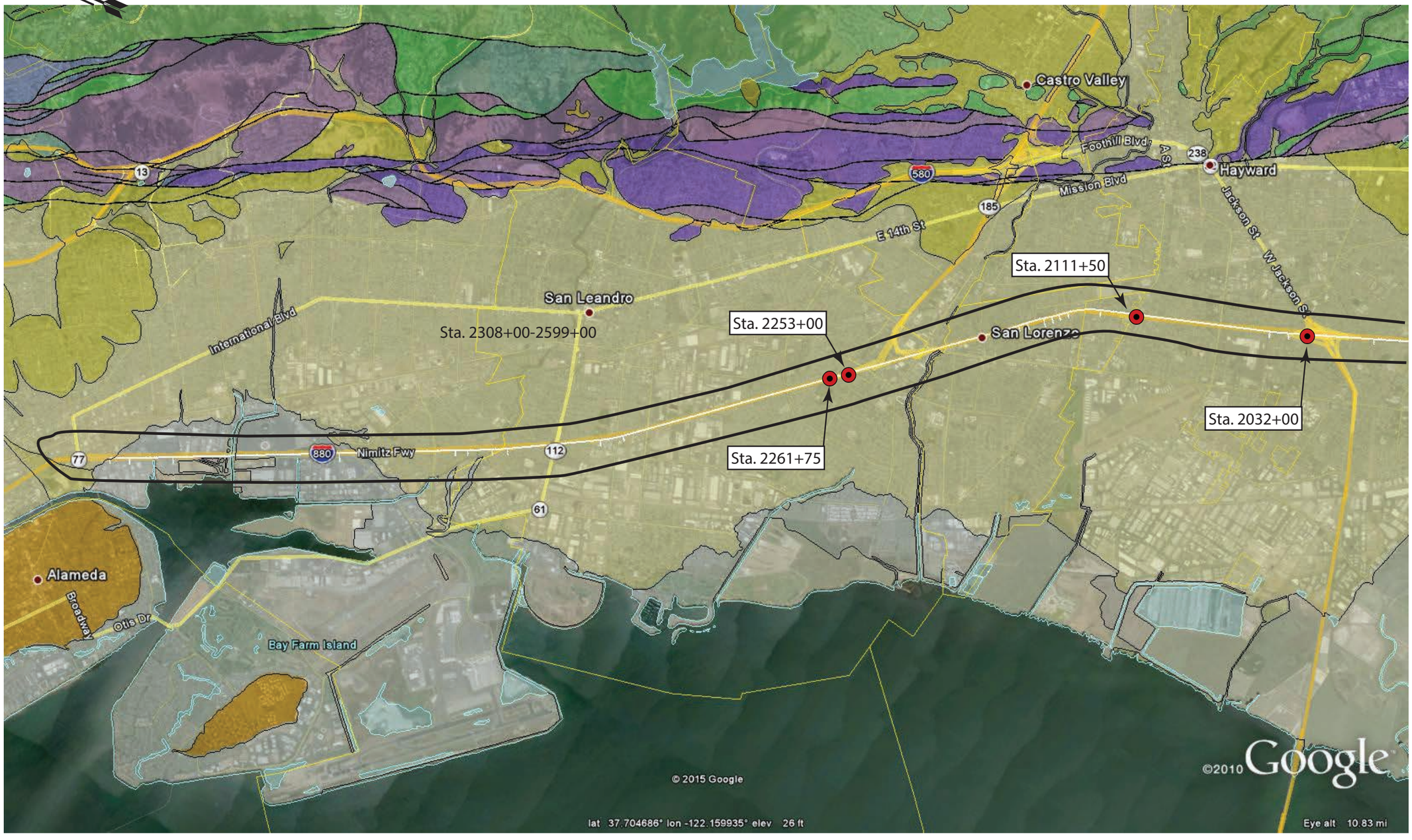
SCALE

0 1 mile

Caltrans

DIVISION OF
ENGINEERING SERVICES
GEOTECHNICAL SERVICES
GEOTECHNICAL DESIGN - WEST – BRANCH B

GEOLOGY	
04-ALA-880	04140000421
PM. 2.9-27.6	MARCH 2015
FIGURE 2	



Explanation

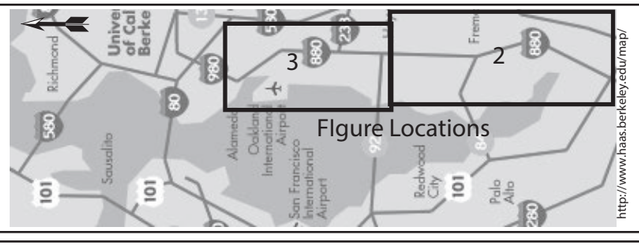
af	Artificial Fill
Qha	Alluvium (Holocene)
Qs	Beach and dune sand (Quaternary)
Qpa	Alluvium (Pleistocene)
Qhym	Sedimentary rocks (Miocene)
Tpms	Sedimentary rocks (Pliocene and early Miocene)
Ks	Franciscan Complex mélange (Eocene, Paleocene, and (or) Late Cretaceous)
KJs	Great Valley complex sedimentary rocks (Early Cretaceous and (or) Late Jurassic)
Ji	Great Valley complex volcanic rocks (Jurassic)
Jv	Great Valley complex plutonic rocks (Jurassic)

Map Symbols

Sign Post Locations

MTC Median Barrier Locations

Reference:
Geologic Map of Alameda_County, CA
From USGS Scientific Investigations
Map 2918



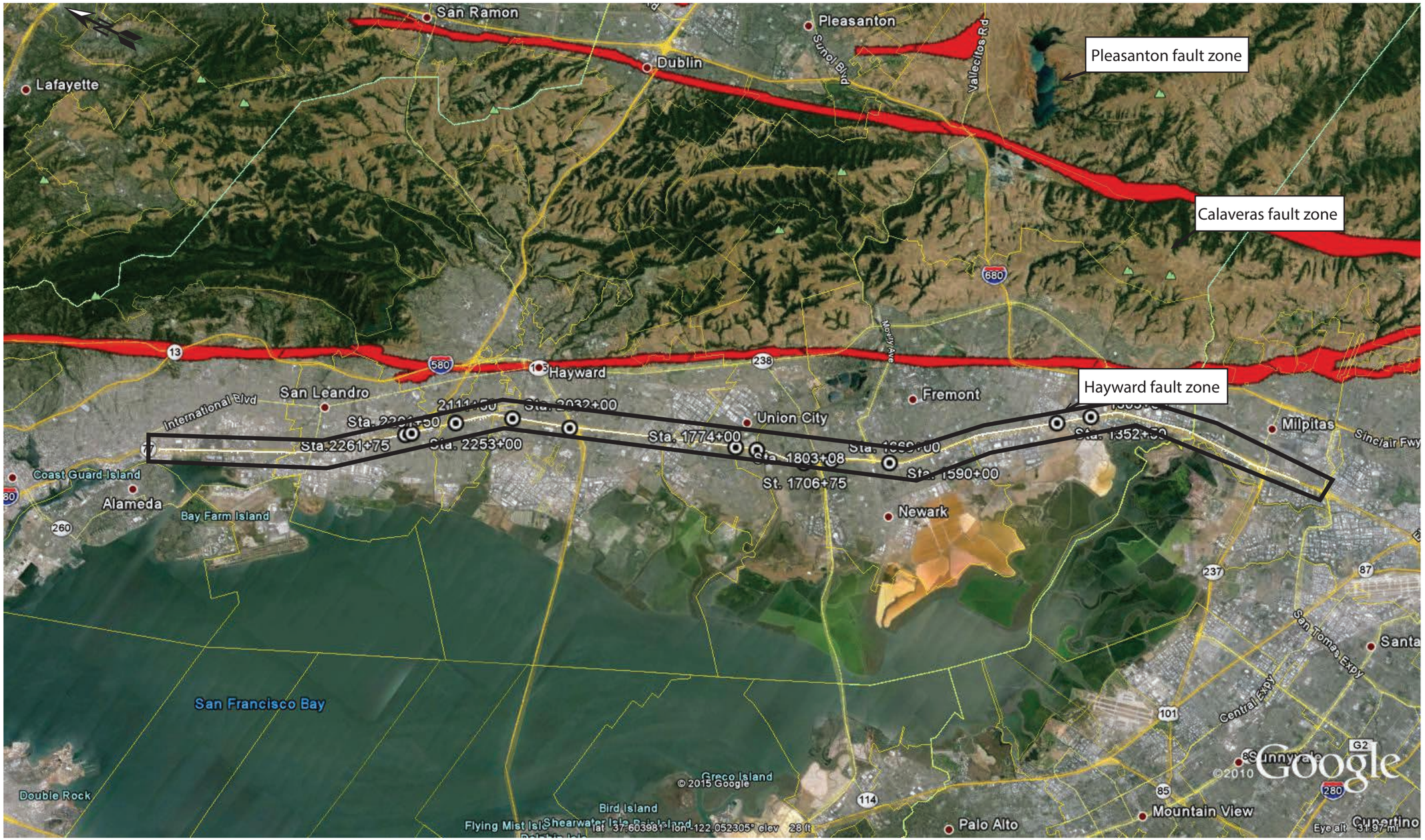
SCALE

0 1 mile

Caltrans

DIVISION OF
ENGINEERING SERVICES
GEOTECHNICAL SERVICES
GEOTECHNICAL DESIGN - WEST – BRANCH B

GEOLOGY	
04-ALA-880	04140000421
PM. 2.9-27.6	MARCH 2015
FIGURE 3	



Explanation

Map Alquist-Priolo Earthquake Fault Zone

Outline of Project Location

Reference:
Geologic Map of Alameda_County, CA
From USGS Scientific Investigations
Map 2918

http://www.haas.berkeley.edu/map/

SCALE

0 5 mile

Caltrans

DIVISION OF
ENGINEERING SERVICES
GEOTECHNICAL SERVICES
GEOTECHNICAL DESIGN - WEST – BRANCH B

REGIONAL FAULT MAP

04-ALA-880	04140000421
PM. 2.9-27.6	MARCH 2015

FIGURE 4

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 20, 2011
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Stanley P. Johnson No. C57793 Exp. 9-31-12 CIVIL STATE OF CALIFORNIA

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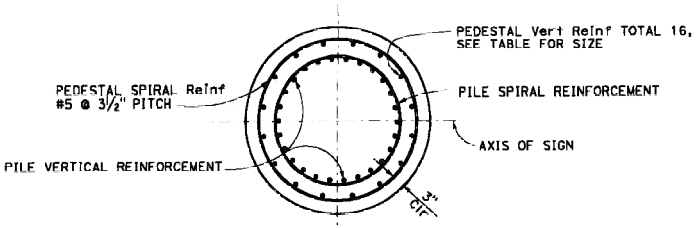
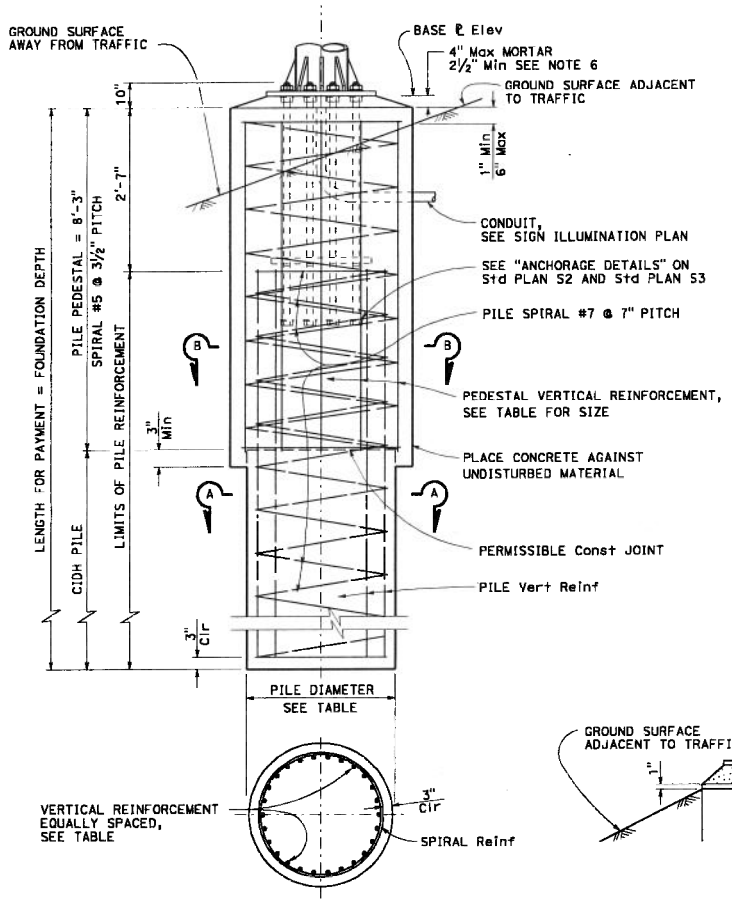


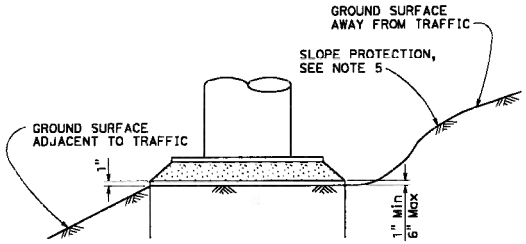
SECTION B-B



SECTION A-A

POST TYPE No.	ANCHOR BOLTS			ROUND PILE PEDESTAL					CIDH PILE					FOUNDATION DEPTH **
	BOLT CIRCLE	BOLT TOTAL AND Dia	TOTAL LENGTH	Dia	VERTICAL REINFORCING		SPIRAL		PILE Dia	VERTICAL REINFORCING		SPIRAL		
					TOTAL	BAR SIZE	BAR SIZE	PITCH		TOTAL	BAR SIZE	BAR SIZE	PITCH	
II	2'-0"	12-2"	4'-2"	5'-3"	16	#10	#5	3½"	4'-6"	26	#10	#5	3½"	14'-9"
III	2'-0"	12-2"	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	16'-0"
IV	2'-0"	12-2"	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	18'-0"
V	2'-10"	14-2"	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	19'-0"
VI	↓	16-2½"	5'-0"	5'-9"	↓	#11	↓	↓	5'-0"	28	#11	↓	↓	22'-0"
VII	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	23'-0"
VIII	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	25'-0"
IX	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	25'-0"

** Use Foundation Depth shown in table unless otherwise shown on the Project Plans.



DETAIL C

NOTES:

1. For anchor bolt layout, see Standard Plan S3.
2. For "Base ℄ elevation" see Project Plans.
3. Prior to erection of the post, backfill which is equivalent to the surrounding material shall be in place.
4. Pedestal shall be formed 6" minimum below ground surface. Remainder to be placed against undisturbed material.
5. Slope protection required when indicated on the Project Plans.
6. For drain holes and central void in mortar see Standard Plan ES-6B detail N.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS-TRUSS SINGLE POST TYPE ROUND PEDESTAL PILE FOUNDATION

NO SCALE

S8

2010 STANDARD PLAN S8

6-30-10

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 20, 2011
PLANS APPROVAL DATE

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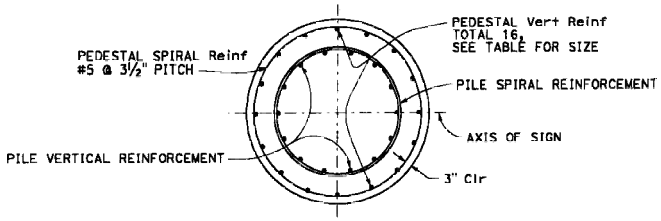
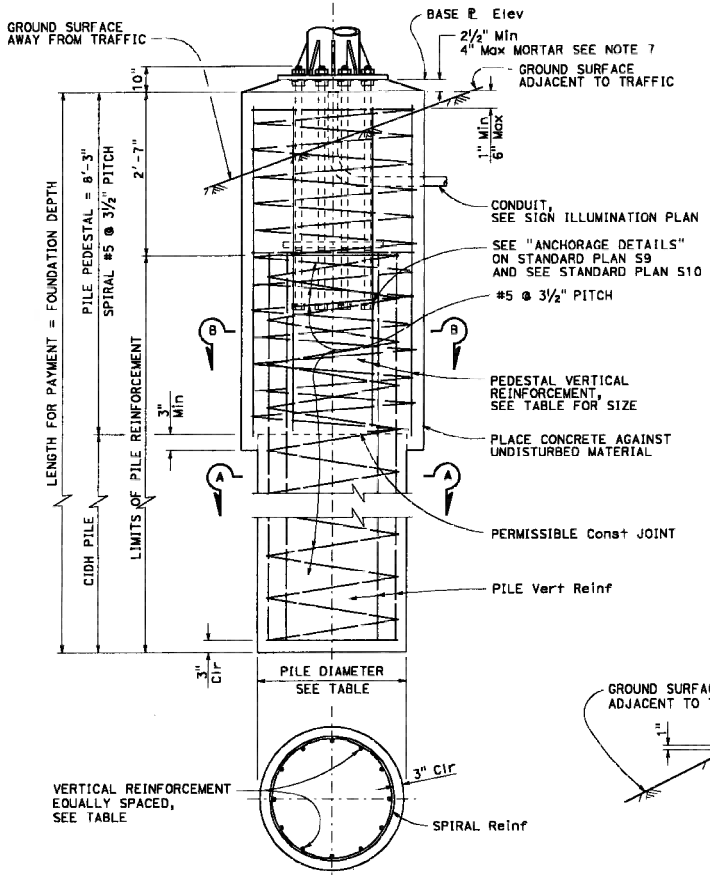
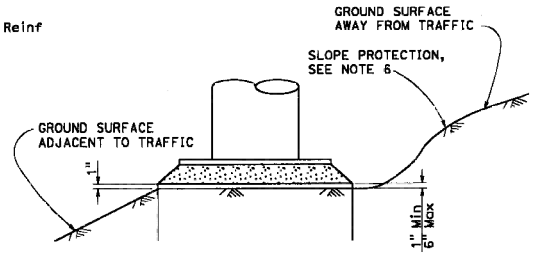


SECTION B-B



SECTION A-A



DETAIL C

POST TYPE	ANCHOR BOLTS TOTAL	ANCHOR BOLTS Dia	ANCHOR BOLTS BOLT CIRCLE	ANCHOR BOLTS TOTAL LENGTH	ROUND PILE PEDESTAL Dia	ROUND PILE PEDESTAL VERTICAL REINFORCING TOTAL	ROUND PILE PEDESTAL VERTICAL REINFORCING BAR SIZE	ROUND PILE PEDESTAL SPIRAL BAR SIZE	ROUND PILE PEDESTAL SPIRAL PITCH	CIDH PILE PILE Dia	CIDH PILE VERTICAL REINFORCING TOTAL	CIDH PILE VERTICAL REINFORCING BAR SIZE	CIDH PILE SPIRAL BAR SIZE	CIDH PILE SPIRAL PITCH	FOUNDATION DEPTH * *
I-S	12	2"	2'-4"	4'-2"	5'-3"	16	#10	#5	3½"	4'-6"	26	#10	#5	3½"	18'-0"
II-S	12		2'-4"												19'-8"
III-S	12		2'-7"												23'-0"
IV-S	14		2'-10"												23'-0"
V-S	16	2½"	3'-2"	5'-0"	5'-9"		#11			5'-0"	28	#11			26'-3"
VI-S	16	2½"	3'-5"	5'-0"	5'-9"		#11			5'-0"	28	#11			27'-10"
VII-S	16	2½"	3'-5"	5'-0"	5'-9"		#11			5'-0"	28	#11			27'-10"

* * Use Foundation Depth shown in table unless otherwise shown on the Project Plans.

NOTES:

1. For anchor bolt layout, see Standard Plan S10.
2. For "Base ℄ elevation" see Project Plans.
3. Longer side of post shall be normal to axis of sign.
4. Prior to erection of the post, backfill which is equivalent to the surrounding material, shall be in place.
5. Pedestal shall be formed 6" Min below ground surface. Remainder to be placed against undisturbed material.
6. Slope protection required when indicated on the Project Plans.
7. For drain holes and central void in mortar see Standard Plan ES-6B detail N.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS-TRUSS TWO POST TYPE ROUND PEDESTAL PILE FOUNDATION

NO SCALE

S15

2010 STANDARD PLAN S15

6-30-10

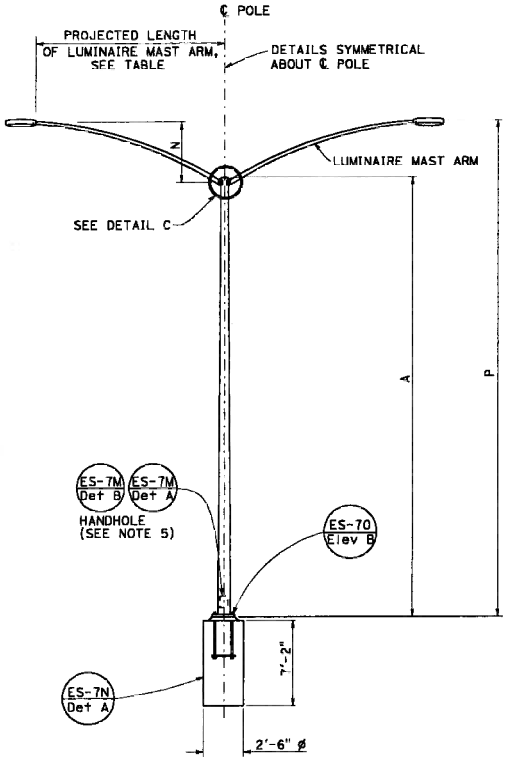
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

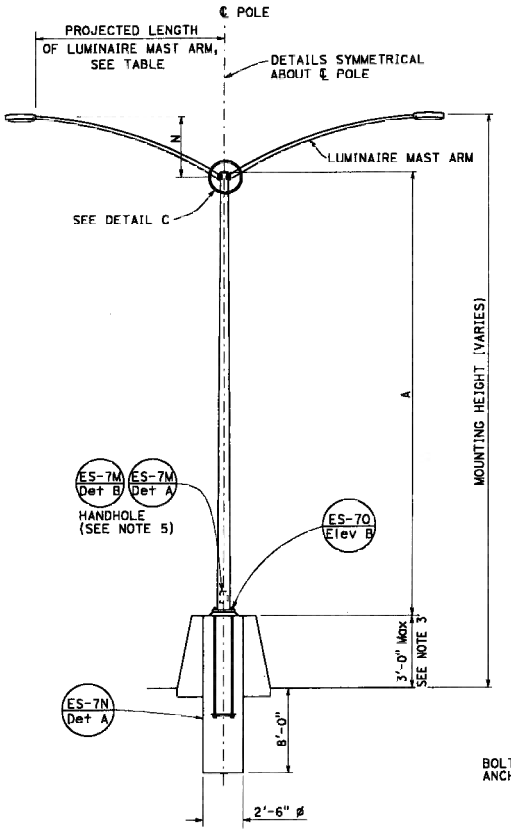
May 20, 2011
PLANS APPROVAL DATE

Stanley P. Johnson No. C57793 Exp. 3-31-12 CIVIL STATE OF CALIFORNIA REGISTERED PROFESSIONAL ENGINEER

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



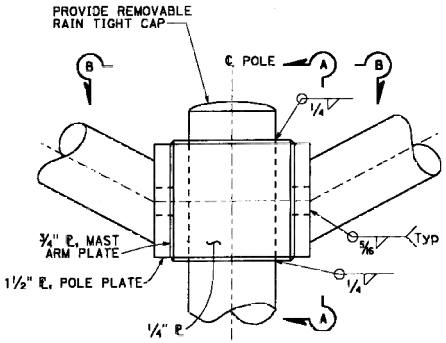
TYPE 15D AND TYPE 21D
ELEVATION A



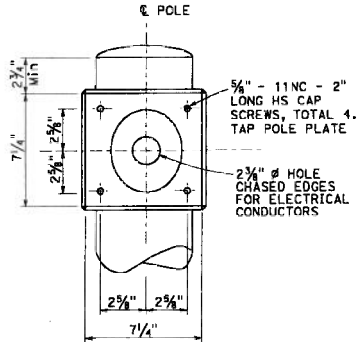
TYPE 15D AND TYPE 21D
MEDIAN BARRIER MOUNTED
ELEVATION B

NOTES:

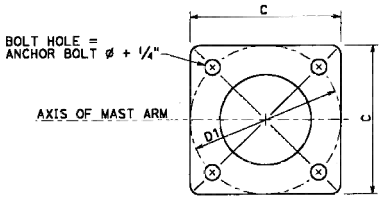
1. [ ] Indicates mast arm length to be used unless otherwise noted on the plans.
2. For additional notes and details, see Standard Plans ES-7M and ES-7N.
3. See Concrete Barrier Details Type 60E and 60SE.
4. For locations with one arm, plug unused cap screw holes and chased outlet with galvanized cap screws and knockout plug.
5. Handhole shall be located perpendicular to the luminaire mast arm and as directed by the Engineer.



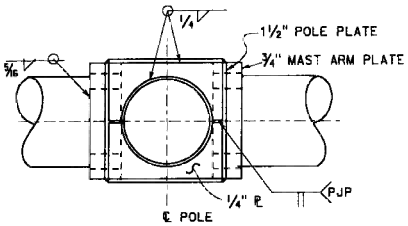
DETAIL C



SECTION A-A



BASE PLATE
DETAIL B



SECTION B-B

POLE TYPE	POLE DATA				BASE PLATE DATA			
	A HEIGHT	Min OD BASE	Min OD TOP	Min THICKNESS	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE
15D	30'-0"	8"	3 11/16"	0.1793"	1'-0"	1'-0"	2"	1 1/4" ø x 42"
21D	35'-0"	8 5/8"	3 3/16"					

LUMINAIRE MAST ARM DATA					
PROJECTED LENGTH	N RISE	Min OD AT POLE	NOMINAL THICKNESS	P	
				TYPE 15D	TYPE 21D
6'-0"	2'-0"±	3 1/4"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3 1/2"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3 7/8"		32'-9"±	37'-9"±
[12'-0"]	4'-3"±			33'-9"±	38'-9"±

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (LIGHTING STANDARD, TYPES 15D AND 21D, DOUBLE LUMINAIRE MAST ARM)

NO SCALE

ES-6D

8-9-10

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 20, 2011
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Stanley P. Johnson No. C57793 Exp. 3-31-12 CIVIL STATE OF CALIFORNIA

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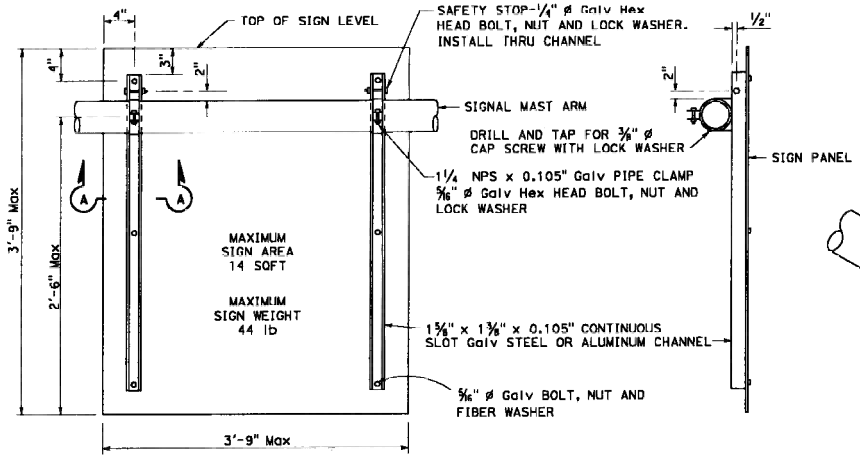
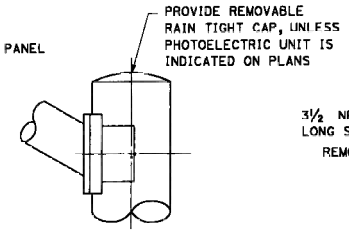


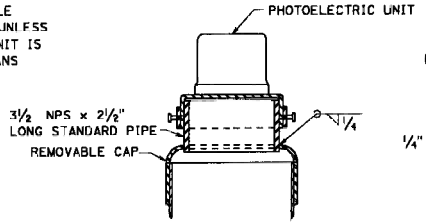
REAR VIEW

SIDE VIEW

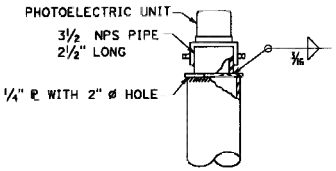
SIGN MOUNTING DETAILS
DETAIL U



STANDARD TOP
DETAIL B-1

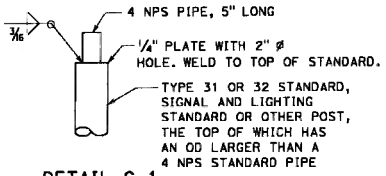


MOUNTING ADAPTER FOR PHOTOELECTRIC UNIT
DETAIL B-2

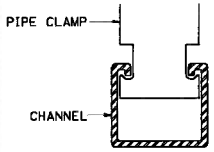


ALTERNATIVE MOUNTING ADAPTER
DETAIL B-3

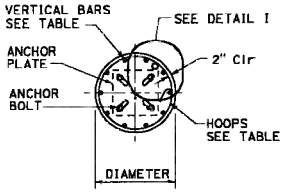
POLE TOP DETAILS
DETAIL B



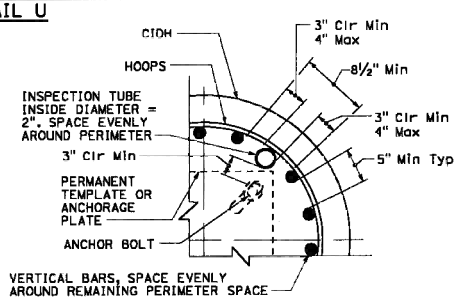
DETAIL C-1



SECTION A-A



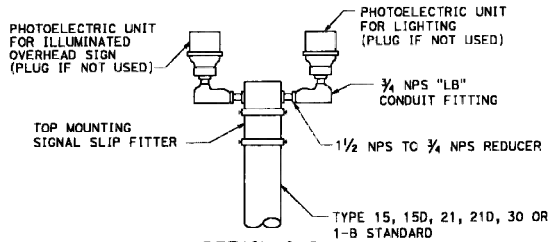
SECTION B-B



INSPECTION TUBE PLACEMENT
DETAIL I

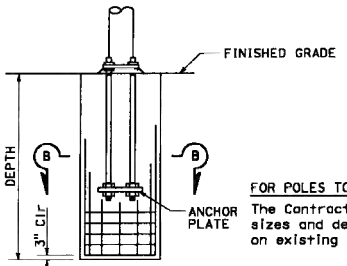
CIDH REINFORCING AND INSPECTION TUBE SCHEDULE			
CIDH DIAMETER	VERTICAL BARS	HOOPS (WELDED)	INSPECTION TUBE
2 ft	8-#5	#4 AT 6	2
2.5 ft	10-#6		4*
3 ft	12-#7	#5 AT 6	
3.5 ft	14-#8		4
4 ft	18-#9	2-#4 AT 7	5
5 ft	22-#10	2-#5 AT 7	6
6 ft	26-#11	2-#6 AT 7	7

* FOR SLIP BASE VERSIONS WITH 3 ANCHOR BOLTS USE 3 INSPECTION TUBES.



DETAIL C-2

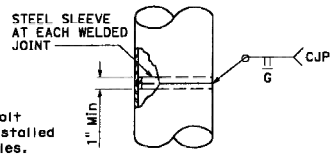
DUAL PHOTOELECTRIC UNIT MOUNTING DETAIL
DETAIL C



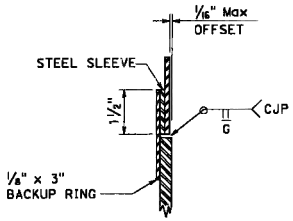
ELEVATION

CAST-IN-DRILLED HOLE PILE FOUNDATION, REINFORCED PILE
DETAIL A

FOR POLES TO BE INSTALLED ON EXISTING FOUNDATION:
The Contractor shall verify bolt circles, anchor bolt sizes and dependent dimensions for poles to be installed on existing foundations before fabricating the poles.



FOR UNIFORM TUBE THICKNESS
DETAIL T-1



AT TUBE THICKNESS CHANGE
DETAIL T-2

POLE SPLICES
DETAIL T

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, DETAIL No. 2)

NO SCALE

ES-7N

2010 STANDARD PLAN ES-7N

11-1-10

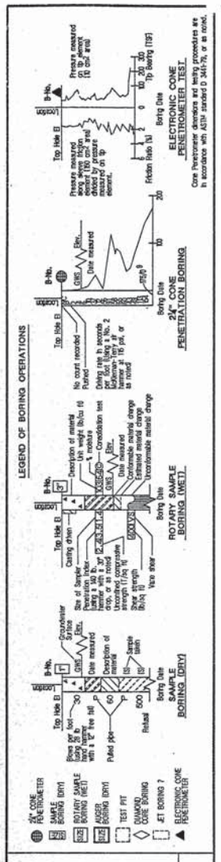
APPENDIX A

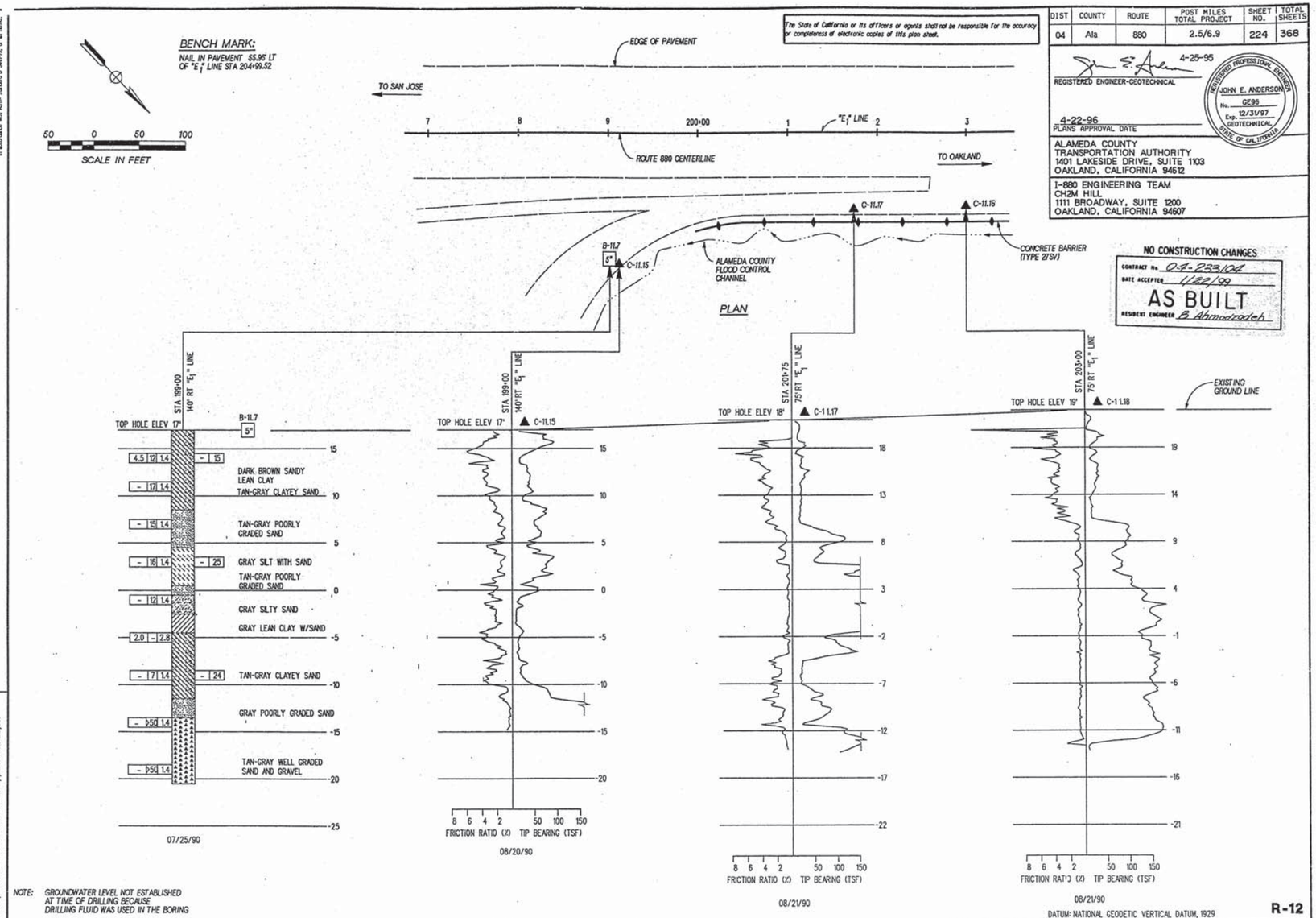
As-built LOTB's for Overhead Sign Posts

As-built LOTB's for Caltrans Median Barrier

As-built LOTB's for MTC Median Barrier

As-built LOTB’s for Overhead Sign Posts





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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	2.5/6.9	224	368

REGISTERED ENGINEER-GEOTECHNICAL 4-25-95

REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE96 Exp. 12/31/97 GEOTECHNICAL STATE OF CALIFORNIA

4-22-96
PLANS APPROVAL DATE

ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CALIFORNIA 94612

I-880 ENGINEERING TEAM
CH2M HILL
1111 BROADWAY, SUITE 1200
OAKLAND, CALIFORNIA 94607

NO CONSTRUCTION CHANGES
CONTRACT No. 04-233104
DATE ACCEPTED 11/22/99
AS BUILT
RESIDENT ENGINEER B. Ahmadzadeh

NOTE: GROUNDWATER LEVEL NOT ESTABLISHED AT TIME OF DRILLING BECAUSE DRILLING FLUID WAS USED IN THE BORING

DATUM: NATIONAL GEODETIC VERTICAL DATUM, 1929

R-12

DESIGN OVERSIGHT
SIGN OFF DATE 6/14/95

DRAWN BY AL CORTEZ
CHECKED BY D. ALLARD

S. TERENTIEFF
FIELD INVESTIGATOR
REGISTRATION NO. N/A

APPROVAL RECOMMENDED BY
REGISTRATION NO.

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

TOM DUMSCOMBE
PROJECT ENGINEER

BRIDGE NO.
POST MILE

ROUTE WIDENING
RETAINING WALL NO.1

LOG OF TEST BORINGS

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04183
EA 233101

DISREGARD PRINTS BEARING EARLIER REVISION DATES 10/15/92

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 15 OF 21

CAE file ->> ZF2:(201,003)08WD199.DGN:3
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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	2.5/6.9	227	368

REGISTERED ENGINEER-GEOTECHNICAL 4-25-95

REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE95 Exp. 12/31/97 GEOTECHNICAL STATE OF CALIFORNIA

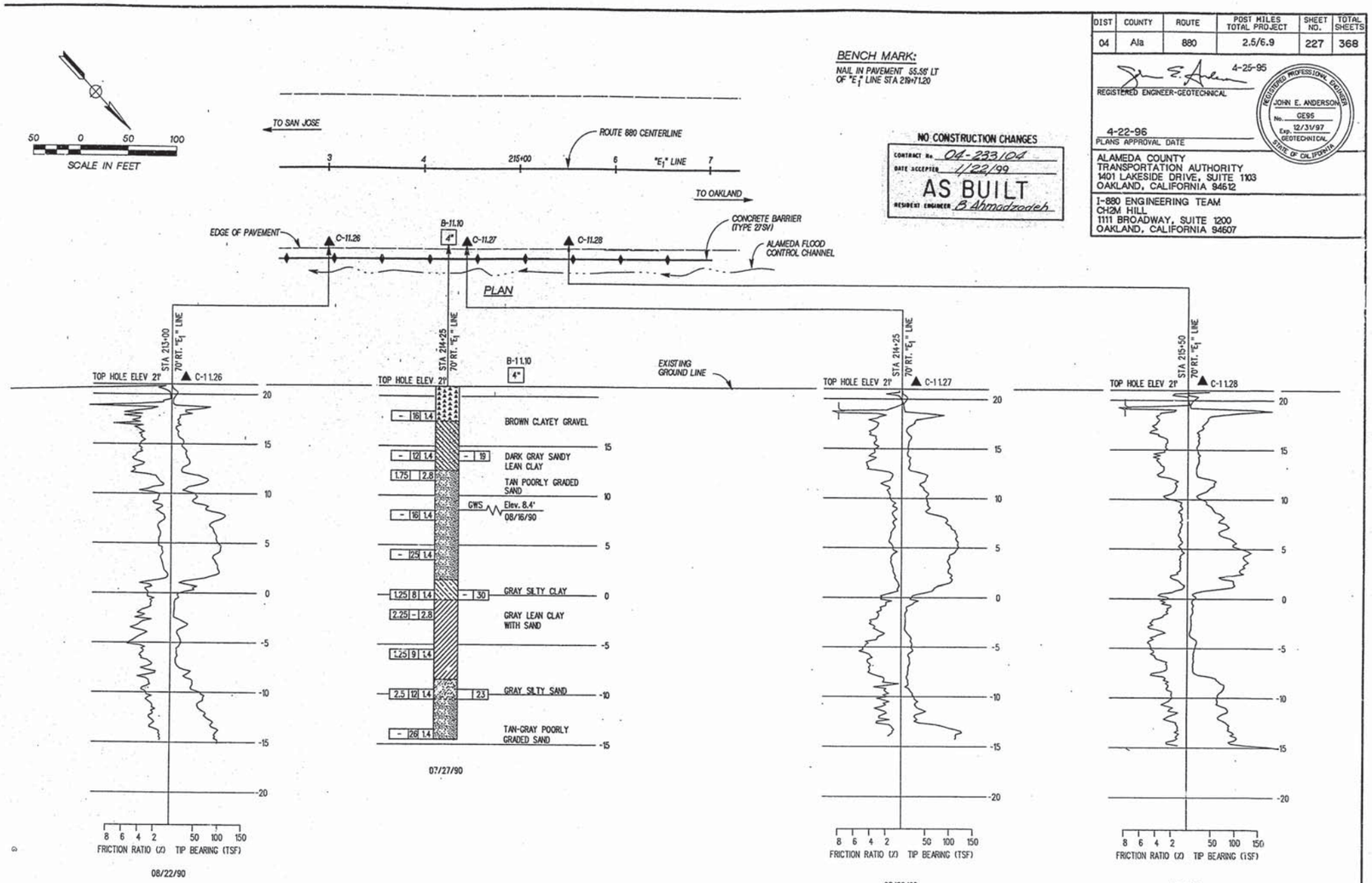
4-22-96
PLANS APPROVAL DATE

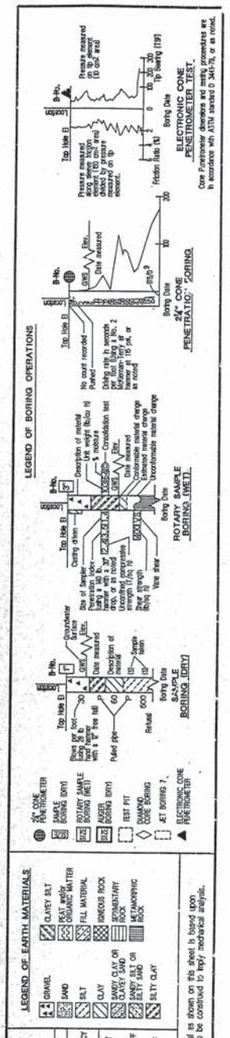
ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CALIFORNIA 94612

I-880 ENGINEERING TEAM
CH2M HILL
1111 BROADWAY, SUITE 1200
OAKLAND, CALIFORNIA 94607

BENCH MARK:
NAIL IN PAVEMENT 55.56' LT OF "E1" LINE STA 219+71.20

NO CONSTRUCTION CHANGES
CONTRACT No. 04-233104
DATE ACCEPTED 4/22/99
AS BUILT
RESIDENT ENGINEER B. Ahmadzadeh





DATUM: NATIONAL GEODETIC VERTICAL DATUM, 1929

R-15

DESIGN OVERSIGHT 6/14/95	DRAWN BY AL CORTEZ	S. TERENTIEFF FIELD INVESTIGATOR	APPROVAL RECOMMENDED BY J. ANDERSON	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	TOM DUMSCOMBE PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY D. ALLARD	REGISTRATION NO. N/A	REGISTRATION NO. GE96		

BRIDGE NO. / POST MILE

ROUTE WIDENING
RETAINING WALL NO.1

LOG OF TEST BORINGS

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04183
EA 233101

DISREGARD PRINTS BEARING EARLIER REVISION DATES 10/15/93

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 18 OF 21

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	2.5/6.9	227	368

REGISTERED ENGINEER-GEOTECHNICAL 4-25-95

REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE95 Exp. 12/31/97 GEOTECHNICAL STATE OF CALIFORNIA

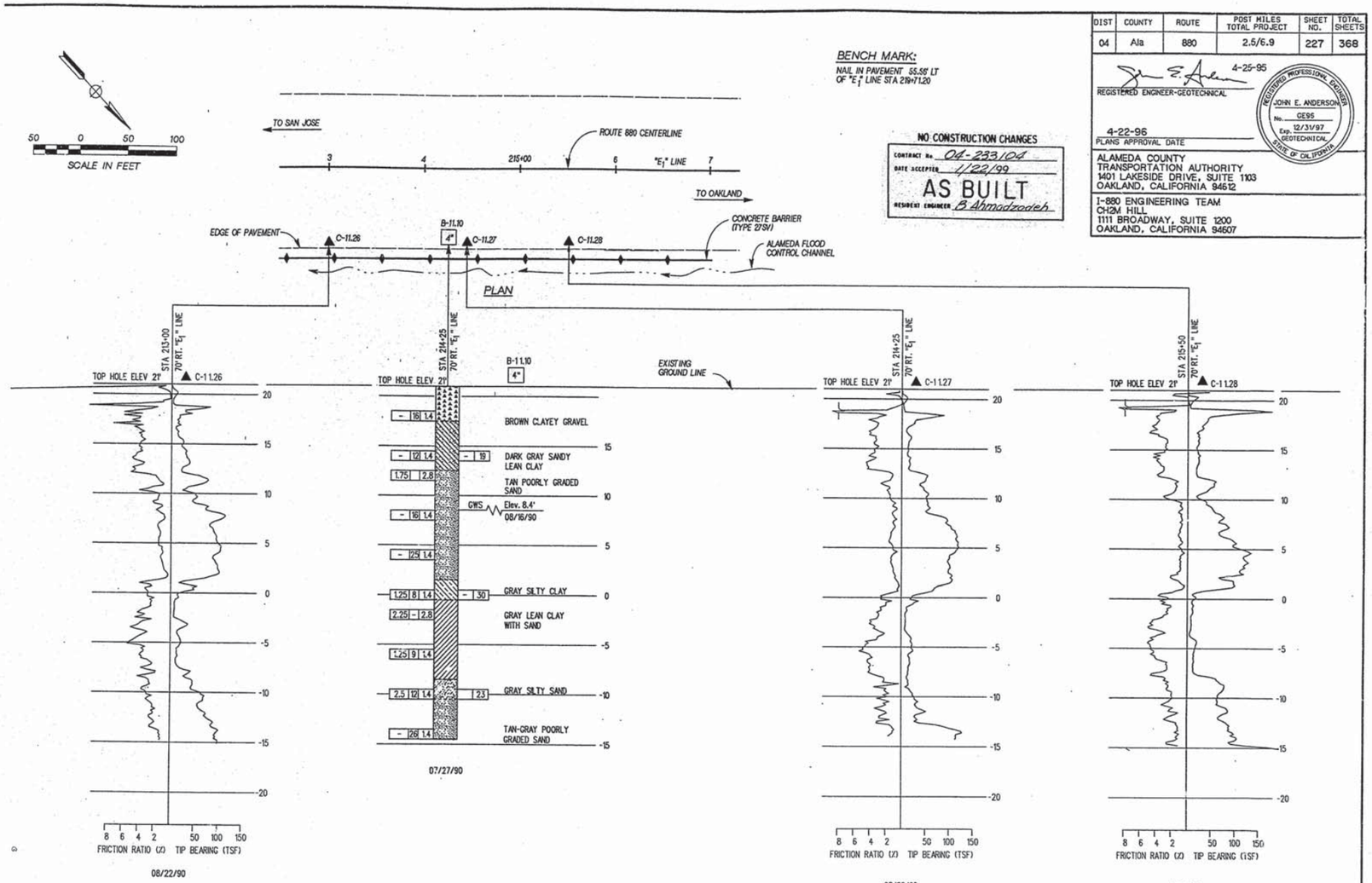
4-22-96
PLANS APPROVAL DATE

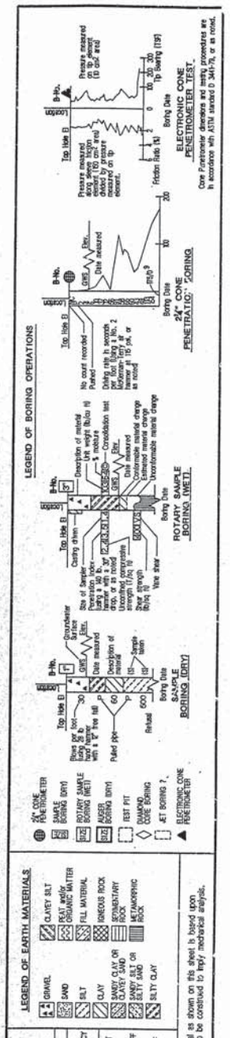
ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CALIFORNIA 94612

I-880 ENGINEERING TEAM
CH2M HILL
1111 BROADWAY, SUITE 1200
OAKLAND, CALIFORNIA 94607

BENCH MARK:
NAIL IN PAVEMENT 55.56' LT OF "E1" LINE STA 219+71.20

NO CONSTRUCTION CHANGES
CONTRACT No. 04-233104
DATE ACCEPTED 4/22/99
AS BUILT
RESIDENT ENGINEER B. Ahmadzadeh





DATUM: NATIONAL GEODETIC VERTICAL DATUM, 1929

R-15

DESIGN OVERSIGHT 6/14/95	DRAWN BY AL CORTEZ	S. TERENTIEFF FIELD INVESTIGATOR	APPROVAL RECOMMENDED BY J. ANDERSON	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	TOM DUMSCOMBE PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY D. ALLARD	REGISTRATION NO. N/A	REGISTRATION NO. GE96		

BRIDGE NO. / POST MILE

ROUTE WIDENING
RETAINING WALL NO.1

LOG OF TEST BORINGS

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04183
EA 233101

DISREGARD PRINTS BEARING EARLIER REVISION DATES 10/15/93

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 18 OF 21

CAE file ->> ZF2:[201,003]088WD214.DGN;3
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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Alameda	880	8.3/9.9	175	308

REGISTERED ENGINEER-GEOTECHNICAL

11-28-94
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — JOHN E. ANDERSON — Rep. GE16 — Exp. 12/31/97 — GEOTECHNICAL — STATE OF CALIFORNIA

ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CALIFORNIA 94612

I-880 ENGINEERING TEAM
CH2M HILL
1111 BROADWAY, SUITE 1200
OAKLAND, CALIFORNIA 94607

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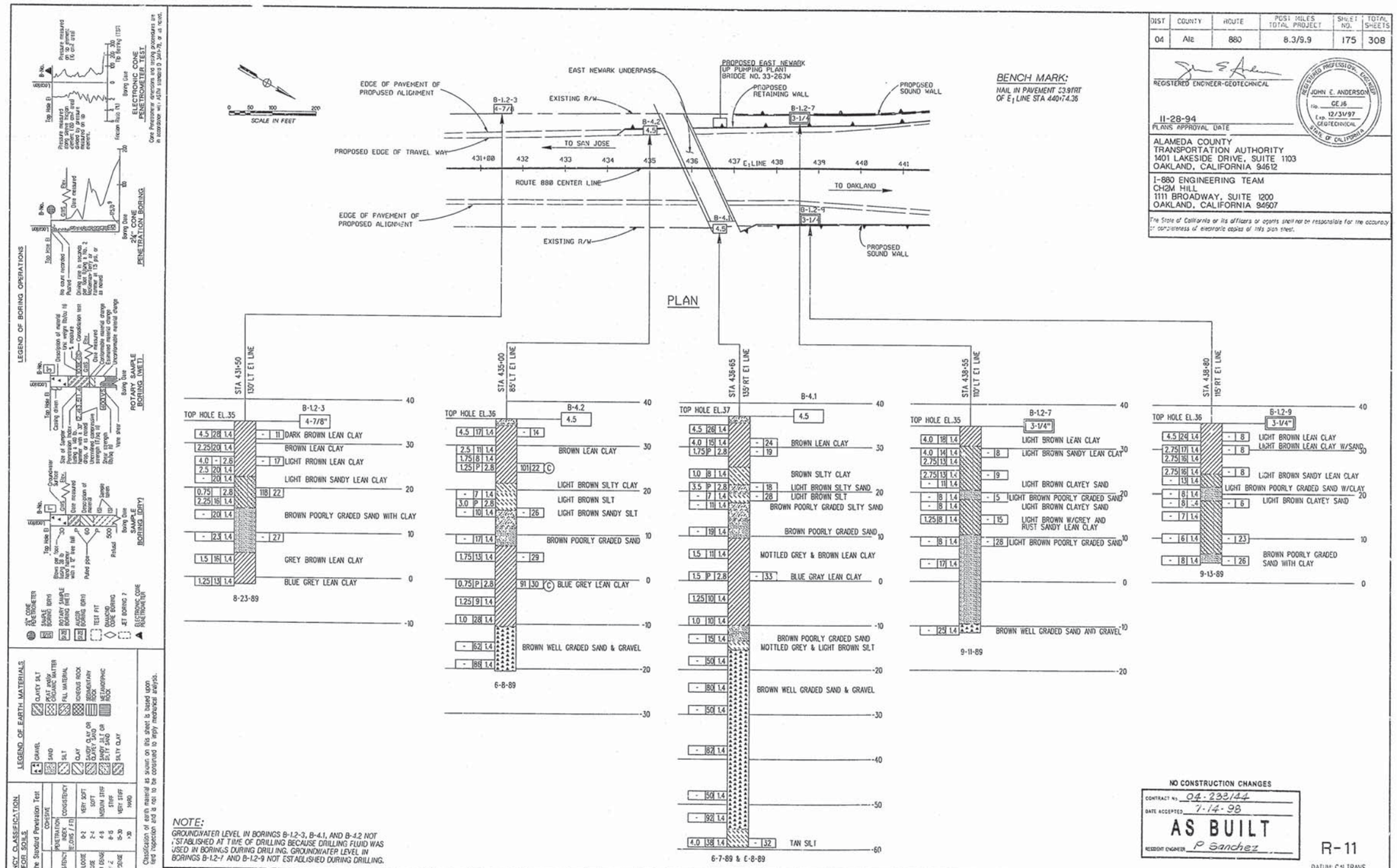


BENCH MARK:
NAIL IN PAVEMENT 53.91RT OF E1 LINE STA 440+74.36

NOTE:
GROUNDWATER LEVEL IN BORINGS B-1.2-3, B-4.1, AND B-4.2 NOT ESTABLISHED AT TIME OF DRILLING BECAUSE DRILLING FLUID WAS USED IN BORINGS DURING DRILLING. GROUNDWATER LEVEL IN BORINGS B-1.2-7 AND B-1.2-9 NOT ESTABLISHED DURING DRILLING.

NO CONSTRUCTION CHANGES
CONTRACT No. 04-233144
DATE ACCEPTED 7-14-98
AS BUILT
RESIDENT ENGINEER P. Sanchez

R-11

DATUM: CALTRANS

DESIGN OVERSIGHT 7-10-98 / SIGN OFF DATE	DRAWN BY CHI-NANG SOO	D. ALLARD FIELD INVESTIGATOR	APPROVAL RECOMMENDED BY	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY D. ALLARD	REGISTRATION NO. N/A	REGISTRATION NO.	J. MAHER PROJECT ENGINEER

BRIDGE NO. / POST MILE

THORNTON AVENUE INTERCHANGE

LOG OF TEST BORINGS

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04183
EA 233140

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 10/25/89

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET OF

CAE file ->> /sfo1/20100.3/0887HT431.DGN;1

LEGEND OF BORING OPERATIONS

LEGEND OF EARTH MATERIALS

CONSISTENCY CLASSIFICATION FOR SOILS

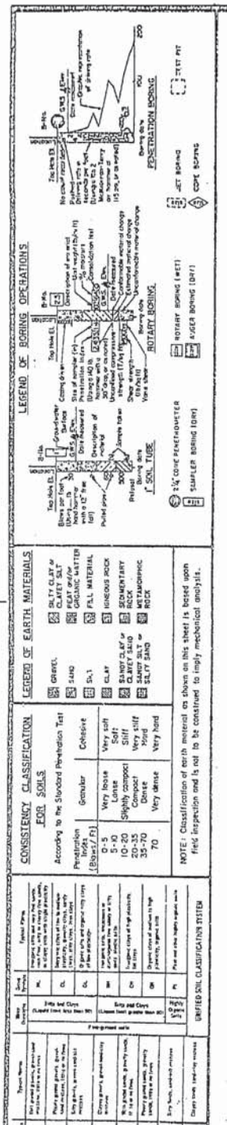
NOTE: Classification of earth material as shown on this sheet is based upon visual inspection and is not to be construed to imply mechanical analysis.

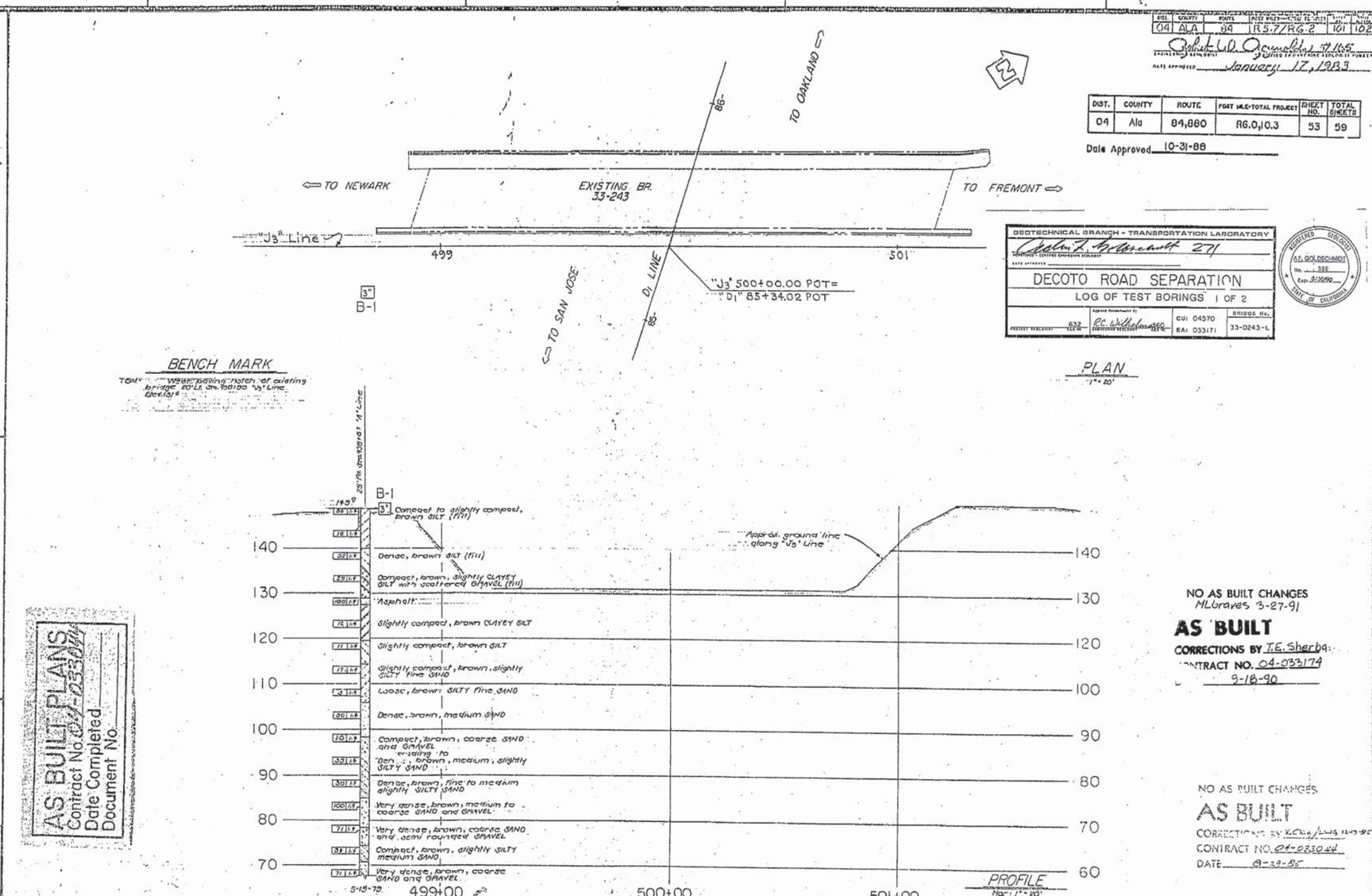
DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	84,880	R6.0,10.3	53	59

Date Approved 10-31-88

DIST.	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
04	ALA	84	R5.7/R6.2	101	102

Robert W. Oppenheimer 7165
ENGINEER GEOLOGIST — REGISTERED PROFESSIONAL ENGINEER
DATE APPROVED January 17, 1983





GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY
Charles L. Schwartz 271
REGISTERED CERTIFIED ENGINEERING GEOLOGIST
DATE APPROVED

REGISTERED GEOLOGIST A.S. GOLDSCHMIDT No. 556 Exp. 6/30/90 STATE OF CALIFORNIA

DECOTO ROAD SEPARATION
LOG OF TEST BORINGS 1 OF 2

DISTRICT	DIVISION	CU: 04570	BRIDGE No.
632	R.C. Williamson	EA: 033171	33-0243-L

NO AS BUILT CHANGES
MLbraves 3-27-91
AS BUILT
CORRECTIONS BY T.E. Sherba
CONTRACT NO. 04-033174
9-18-90

NO AS BUILT CHANGES
AS BUILT
CORRECTIONS BY LCNa/LWS 12-13-95
CONTRACT NO. 04-033044
DATE 8-29-95

AS BUILT PLANS
Contract No. 04-033174
Date Completed
Document No.

ENGINEERING GEOLOGY BRANCH
FIELD STUDY By R. Fox 5/79
DRAWN By ED PONO 6/79
CHECKED By R. Fox 7/79
Approved Recommended By R. Fox
ENGINEERING GEOLOGIST 70

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION
STRUCTURES - DESIGN 9
PROJECT ENGINEER Ex Powers CE 72015
BRIDGE NO. 33-243R
POST MILE 6.0
CU 04220
WO 033041
Disregard prints bearing earlier revision dates

DECOTO ROAD SEPARATION (84/14)
LOG OF TEST BORINGS 1 OF 2

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

REVISION DATES (PRELIMINARY ENGINEERING ONLY) 12/7/66 12/9/66 12/12/66
SHEET 12 OF 13

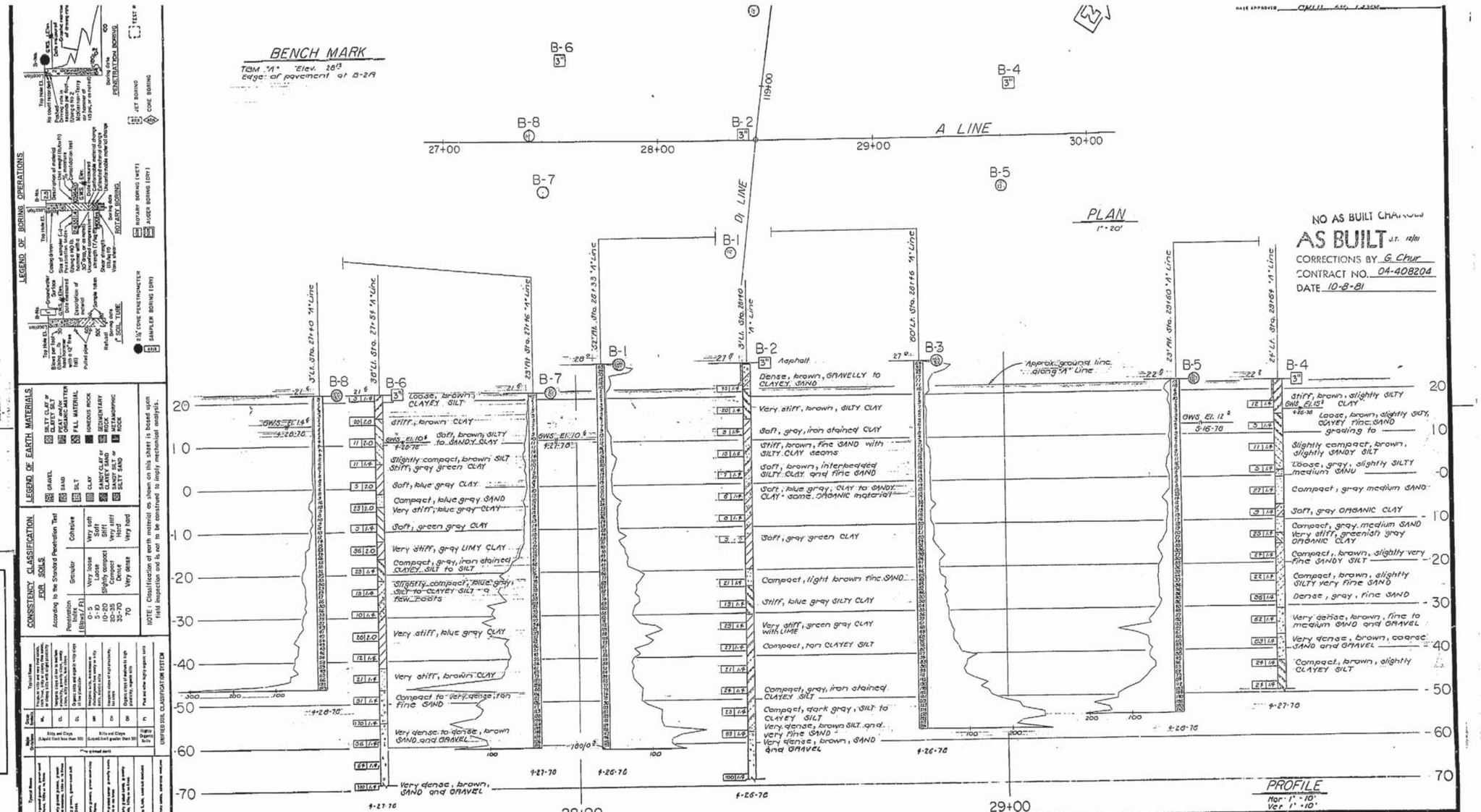
101

AS BUILT PLANS
Contract No. 04-033174
Date Completed 9-18-90
Document No.

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION

DATE 5-1-91 SIGNATURE Ronald Blackford TITLE

MICROFILM - STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - MICROFILM
SCALE 1" = 50' 0 100 200 300 400 500 600
SCALE 1" = 20' 0 50 100 200 300
ChipPDF - www.fastio.com



AS BUILT PLANS
Contract No. 04-408204
Date Completed
Document No.

39

ENGINEERING GEOLOGY BRANCH
FIELD STUDY By R. F. Hagen
DRAWN By ED FONG 10778
CHECKED By R. F. Hagen
Approved Recommended By Richard F. Hagen
CERTIFIED ENGINEERING GEOLOGIST NUMBER 777

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN 4
PROJECT ENGINEER C. H. Pomeroy 1-17-80 7845

BRIDGE NO. 33-515
POST MILE 10.9

CU 04217
WO 408201

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

Disregard prints bearing earlier revision dates

REVISION DATES (PRELIMINARY STAGE ONLY)

PASEO PADRE PARKWAY OVERCROSSING
LOG OF TEST BORINGS

SHEET 13 OF 13

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.

DATE 12-18-81 PERFORMED Donald Bluchford TITLE Senior Microfilm Tech

MICROFILM - STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - MICROFILM
SCALE 1" = 50' SCALE 1" = 60' SCALE 1" = 20' SCALE 1" = 40'
SCALE 1" = 10' or 1" = 100' SCALE 1" = 10' or 1" = 100' SCALE 1" = 40'

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	12.8/13.2	276	295

GEOTECHNICAL PROFESSIONAL 1/27/95

6-10-96
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/97 GEOTECHNICAL STATE OF CALIFORNIA

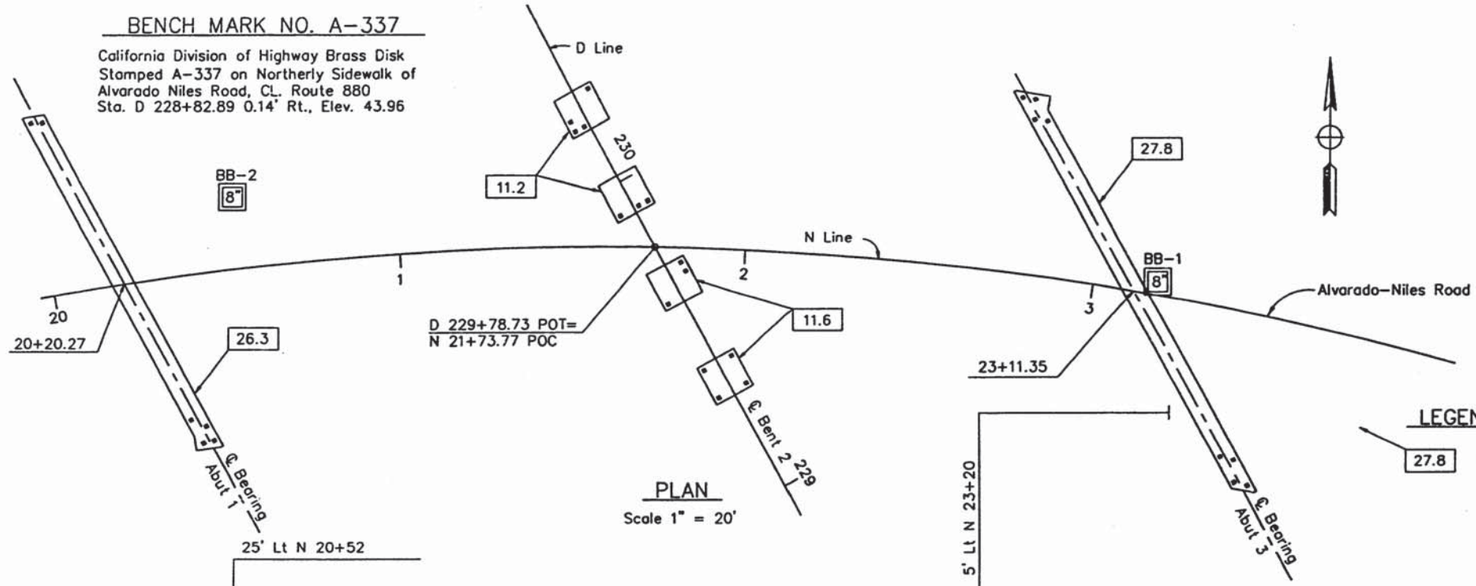
ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE SUITE 600
OAKLAND, CA 94612

PARIKH CONSULTANTS, INC.
481 VALLEY WAY
MILPITAS, CA 95035

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

BENCH MARK NO. A-337

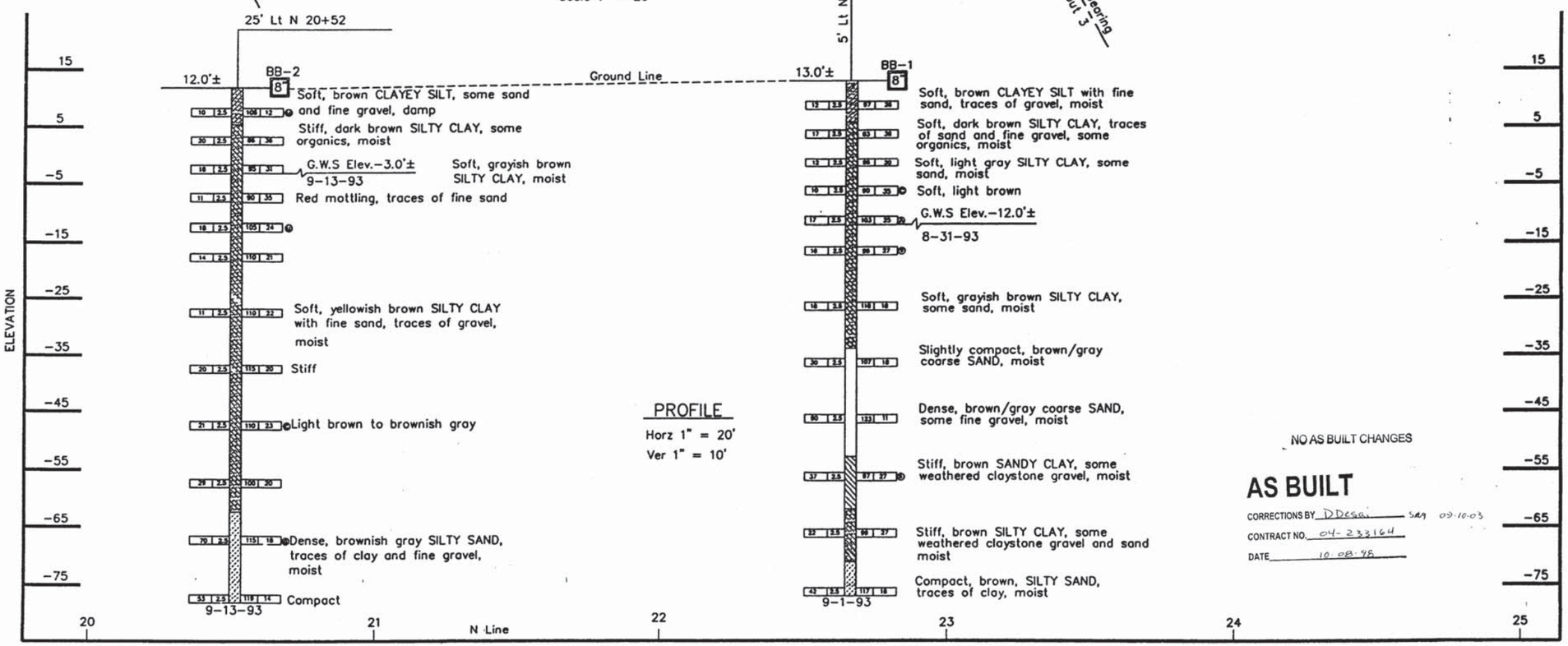
California Division of Highway Brass Disk Stamped A-337 on Northerly Sidewalk of Alvarado Niles Road, CL. Route 880 Sta. D 228+82.89 0.14' Rt., Elev. 43.96



PLAN
Scale 1" = 20'

LEGEND

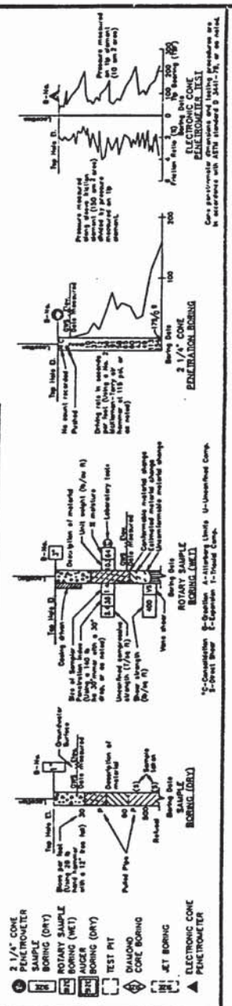
27.8 Denotes bottom of footing elevation



PROFILE
Horz 1" = 20'
Ver 1" = 10'

NO AS BUILT CHANGES

AS BUILT
CORRECTIONS BY D Degan 09-10-03
CONTRACT NO. 04-233164
DATE 10-08-98



LEGEND OF EARTH MATERIALS

GRAVEL, SAND, SILT, CLAY, CLAYEY SILT, PEAT and/or ORGANIC MATTER, FILL MATERIAL, IGNEOUS ROCK, SEDIMENTARY ROCK, METAMORPHIC ROCK, SANDY CLAY or CLAYEY SAND, SANDY SILT or SILTY SAND, SILTY CLAY

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Penetration Resistance (Blows/Ft)	Granular	Cohesive
0-4	Very loose	Very soft
5-9	Loose	Soft
10-19	Slightly compact	Stiff
20-34	Compact	Very stiff
35-69	Dense	Hard
> 70	Very dense	Very hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT 6/23/95	DRAWN BY P. QUACH	E. BHANGOO FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
SIGN OFF DATE	CHECKED BY Y.D. WANG	DATE SEPTEMBER 93	

Y.D. WANG
PROJECT ENGINEER

BRIDGE NO. 33-631
POST MILE 13.0

ALVARADO-NILES ROAD OVERCROSSING
LOG OF TEST BORINGS

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04183
EA 233161

DISREGARD PRINTS BEARING EARLIER REVISION DATES

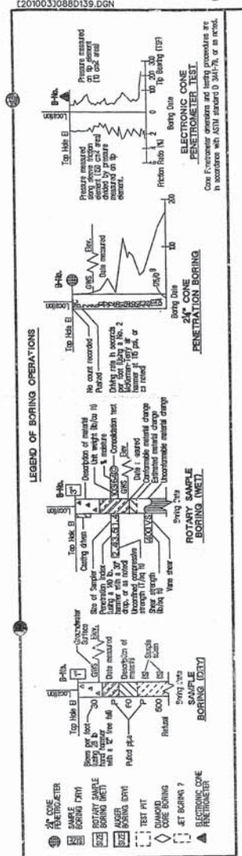
REVISION DATES (PRELIMINARY STAGE ONLY) 3/27/94 7/27/94 9/26/94 11/29/94 1/30/95

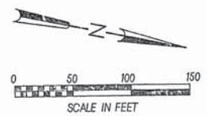
SHEET 22 OF 22

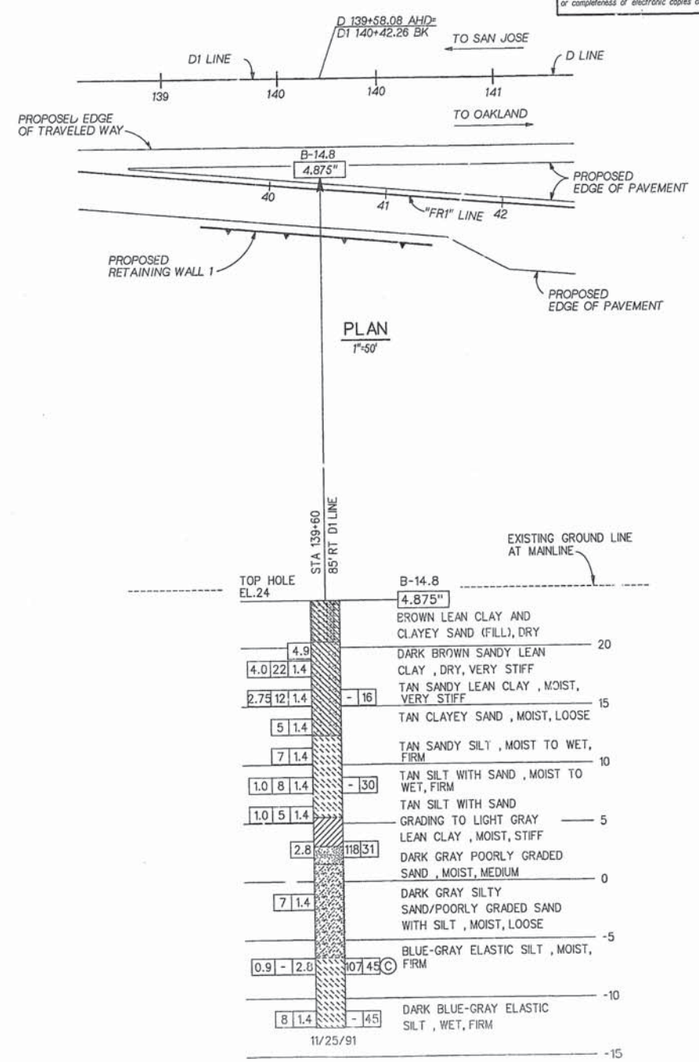
PCI Job No. 93102.12 Plate 2

ALVNLTB

[201003J088D139.DGN







PLAN
1"=50'

NOTE :
GROUNDWATER LEVEL NOT ESTABLISHED AT TIME OF BORING BECAUSE DRILLING FLUID WAS USED IN BORING

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	11.2/11.8	228	236

REGISTERED ENGINEER-GEOTECHNICAL 4/27/94
REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE96 Exp. 12/31/97 GEOTECHNICAL STATE OF CALIFORNIA

10-23-95
PLANS APPROVAL DATE

ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CALIFORNIA 94612

I-880 ENGINEERING TEAM
CH2M HILL
1111 BROADWAY, SUITE 1200
OAKLAND, CALIFORNIA 94607

BENCH MARK:
USC & GS BRASS DISK ON NORTH SIDE OF NORTHERLY FREMONT BLVD. OVERPASS, 178' LT OF D LINE STA 142+77.15 ELEV. 49.06

NO AS BUILT CHANGES
AS BUILT
CORRECTIONS BY B. Hughes
CONTRACT NO. 04-233151
DATE 8/5/03

RETAINING WALL 1
DATUM: CALTRANS

DESIGN OVERSIGHT 7/28/94
SIGN OFF DATE

DRAWN BY J. BRADY
CHECKED BY A. DEMOREST

A. DEMOREST
FIELD INVESTIGATOR
REGISTRATION NO. N/A

APPROVAL RECOMMENDED BY J. ANDERSON
REGISTRATION NO. GE96

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

JEFFERSON M. HILLIARD
PROJECT ENGINEER

BRIDGE NO.
POST MILE

ALVARADO/FREMONT BOULEVARD INTERCHANGE
LOG OF TEST BORINGS

CU 04183
EA 233150

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 3/30/93
REVISION DATES (PRELIMINARY STAGE ONLY)
SHEET 2 OF

DIST.	COUNTY	ROUTE	KILOMETER POST'S TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	92,880	7.8/10.9, 25.1/28.3	1176	1319

Caltrans Metric

08-31-04
REGISTERED ENGINEER - CIVIL

10-23-06
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
J.C. Moore
No. 61792
Exp. 6-30-05
CIVIL
STATE OF CALIFORNIA

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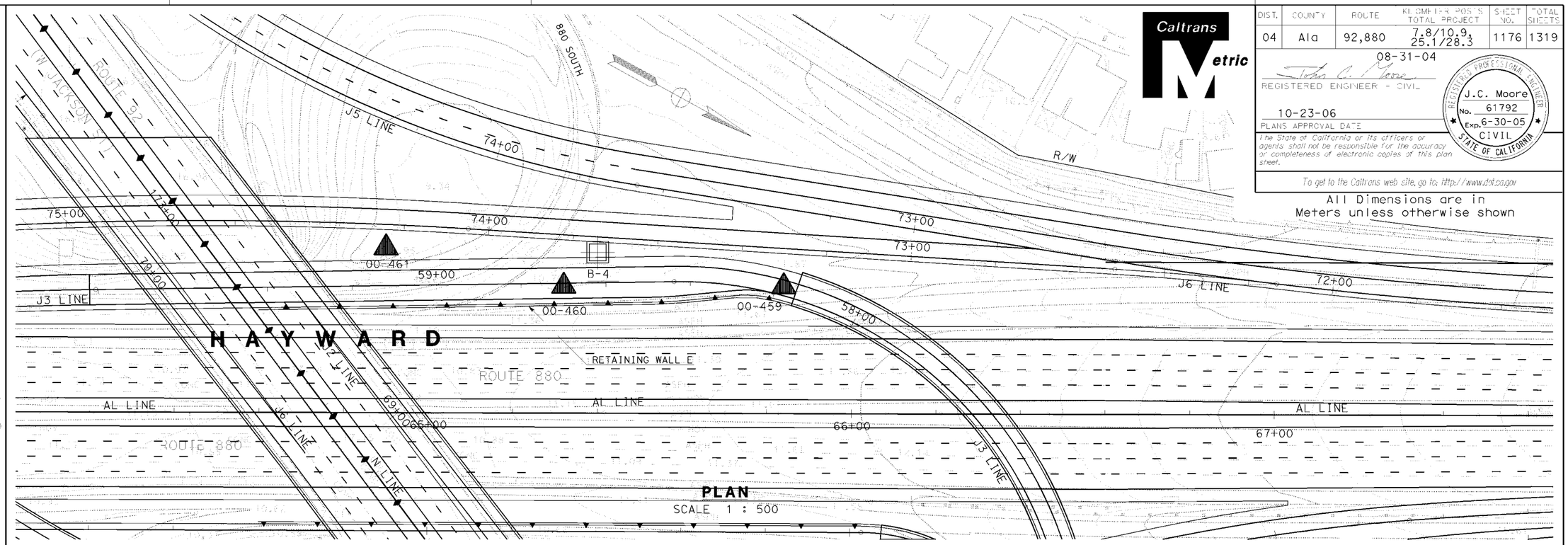
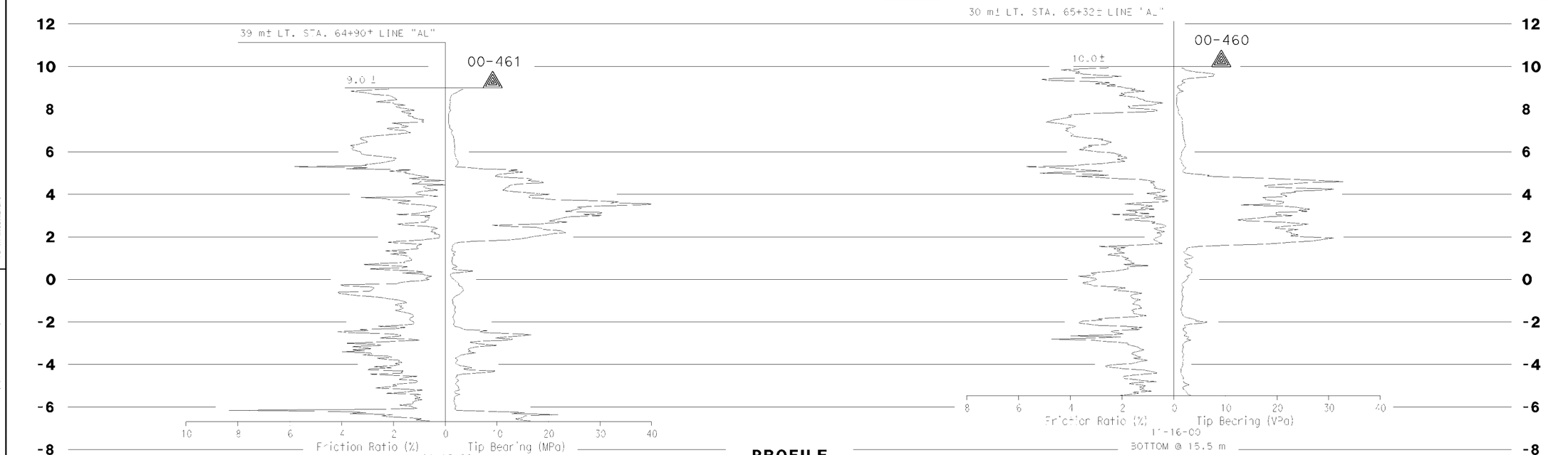
To get to the Caltrans web site, go to: http://www.dot.ca.gov

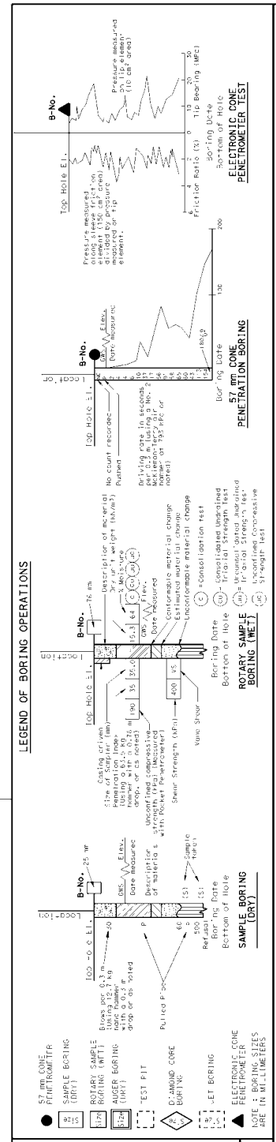
All Dimensions are in Meters unless otherwise shown



PLAN
SCALE 1 : 500



PROFILE
HORIZ. NO SCALE
VERT. 1 : 100



LEGEND OF EARTH MATERIALS

GRAVEL · CLAYEY SILT · SAND · PEAT AND/OR ORGANIC MATTER · SILT · FILL MATERIAL · CLAY · COHESIVE ROCK · SANDY CLAY OR CLAYEY SAND · SLIGHTLY CLAYEY OR SILTY SAND · SILTY CLAY · METAMORPHIC ROCK

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

SPT N-Value (Blows/ 0.3 m)	Granular	SPT N-Value (Blows/ 0.3 m)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		>31	Hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DIVISION OF ENGINEERING SERVICES		FIELD INVESTIGATION BY:	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	GEOTECHNICAL SERVICES OFFICE OF GEOTECHNICAL DESIGN - WEST	BRIDGE NO. 33E0018 / KILOMETER POST 26.98	RETAINING WALL E
DRAWN BY	GINT/ M. REYNOLDS 09/03	J. MOORE				LOG OF TEST BORINGS NO. 1
CHECKED BY	W. NYAZ			CU 04256 EA 233171	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY) / SHEET 5 OF 6

(Rev 01/02)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

USERNAME => trmariak
DGN FILE => 0160 0 7.0 001.dgn

DATE PLOTTED => 18 OCT 2006
TIME PLOTTED => 12:52

DIST.	COUNTY	ROUTE	KILOMETER POSTS TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	92,880	7.8/10.9, 25.1/28.3	1177	1319

Caltrans Metric

08-31-04
REGISTERED ENGINEER - CIVIL

10-23-06
PLANS APPROVAL DATE

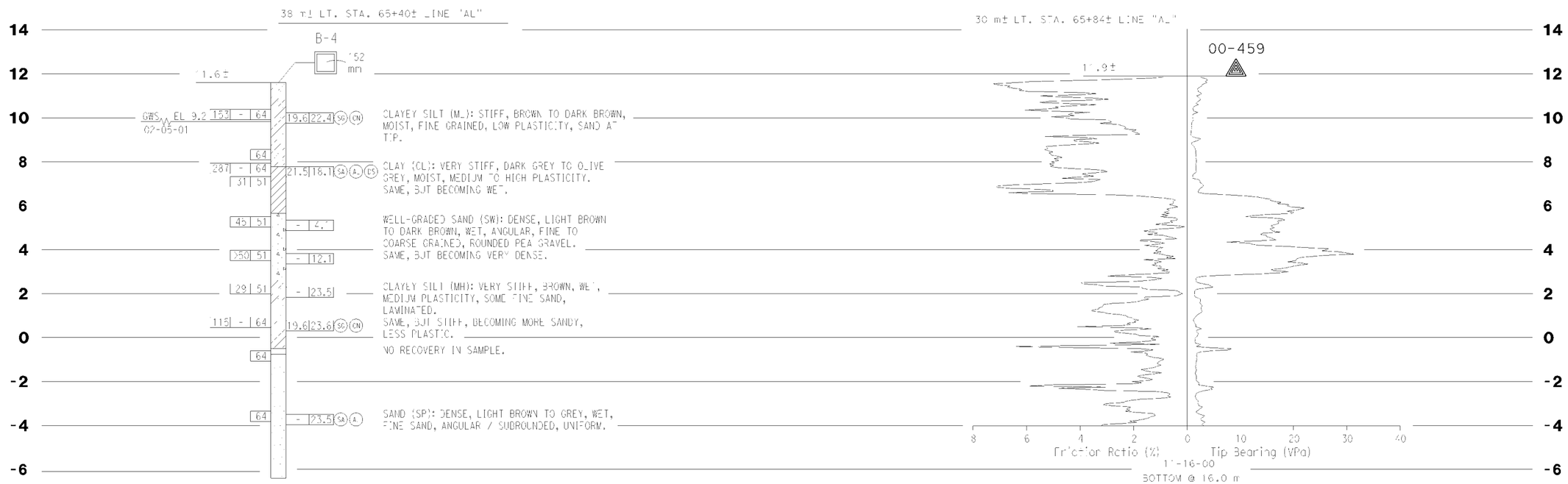
REGISTERED PROFESSIONAL ENGINEER
J.C. Moore
No. 61792
Exp. 6-30-05
CIVIL
STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

To get to the Caltrans web site, go to: http://www.dot.ca.gov

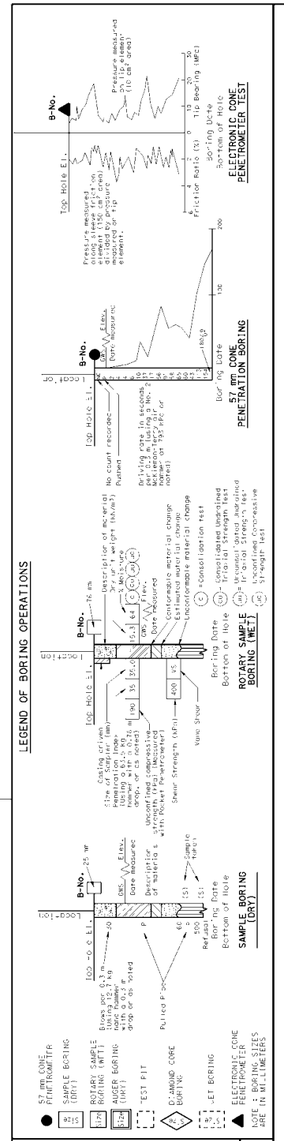
All Dimensions are in Meters unless otherwise shown

(For boring location see PLAN, LOTB sheet 1 of 2)

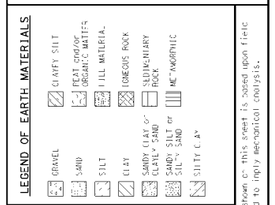


PROFILE
HORIZ. NO SCALE
VERT. 1 : 100

LEGEND OF BORING OPERATIONS



LEGEND OF EARTH MATERIALS



CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test

SPT N-Value (Blows/0.3 m)	Granular	SPT N-Value (Blows/0.3 m)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		>31	Hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DIVISION OF ENGINEERING SERVICES	
DRAWN BY	GINT/ M. REYNOLDS 09/03
CHECKED BY	W. NYAZ

FIELD INVESTIGATION BY: J. MOORE

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL SERVICES OFFICE OF GEOTECHNICAL DESIGN - WEST

CU 04256
EA 016011

BRIDGE NO.
KILOMETER POST

RETAINING WALL E

LOG OF TEST BORINGS NO. 2

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 6 OF 6

(Rev 01/02)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

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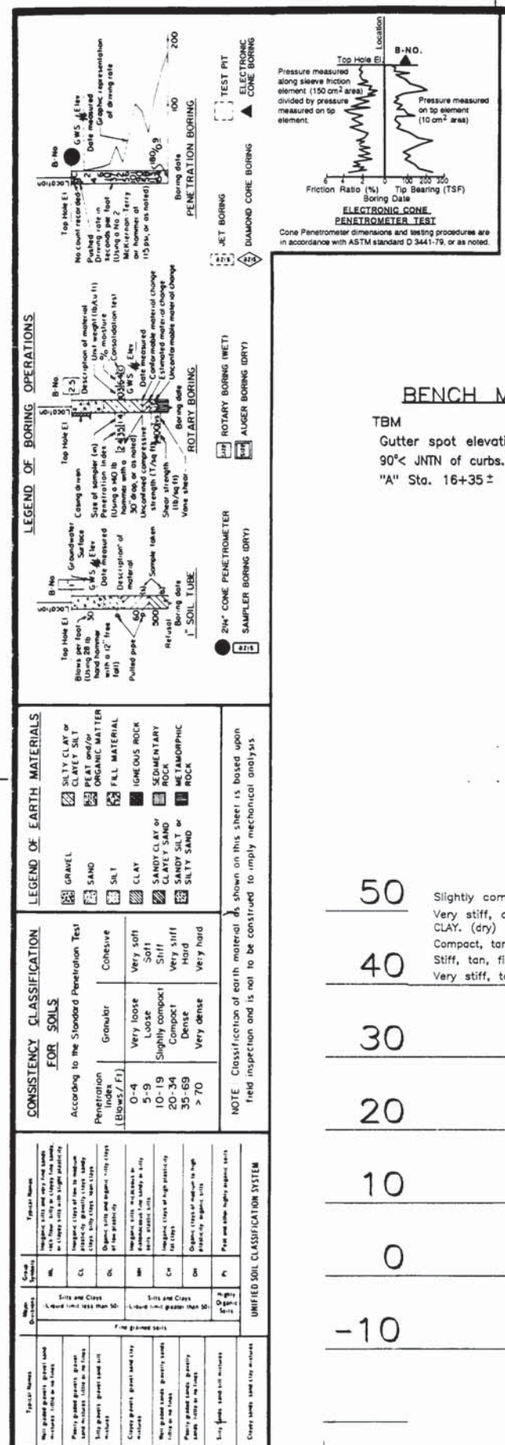
DGN FILE => 016011_o_7_0-002.dgn

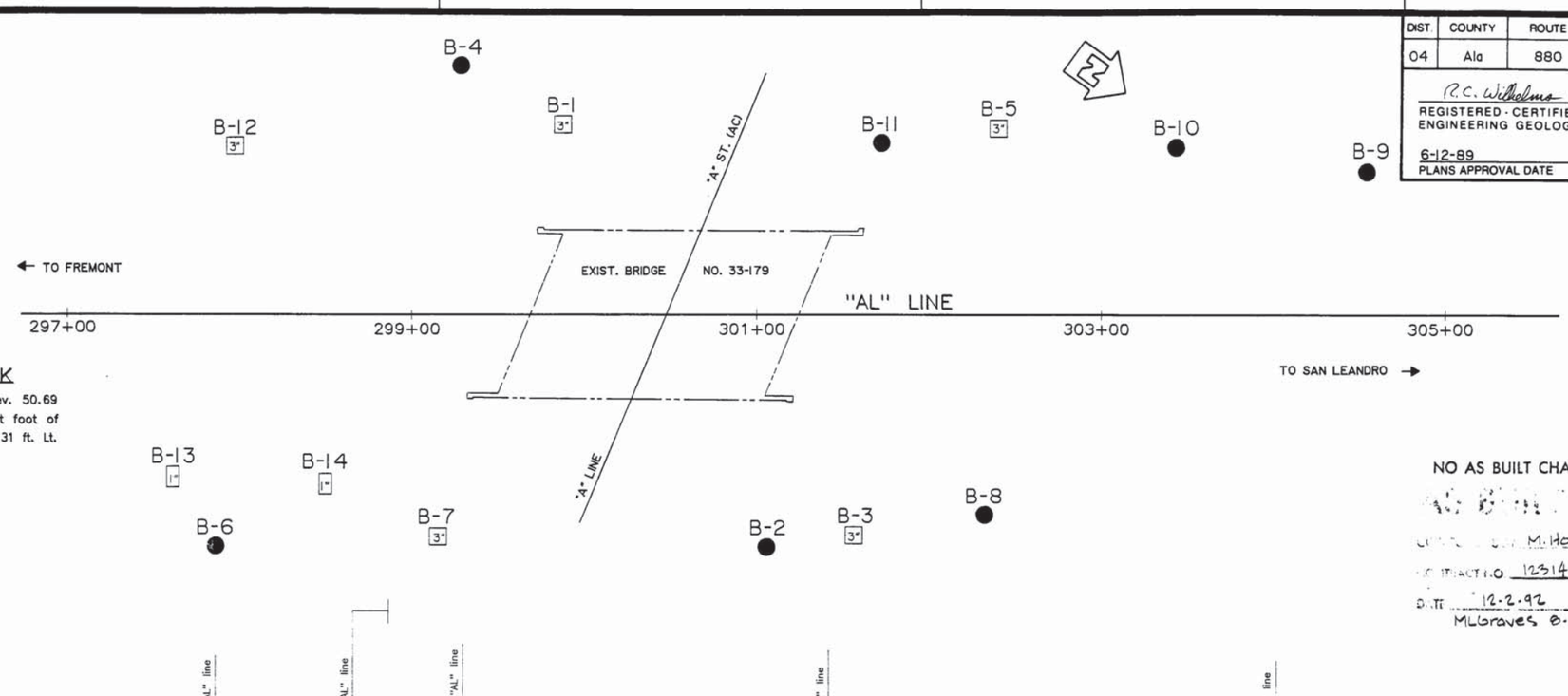
DATE PLOTTED => 18-OCT-2006
TIME PLOTTED => 2:52

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	16.2/18.5	280	290

R.C. Wilhelms E.G. No. 560
REGISTERED · CERTIFIED ENGINEERING GEOLOGIST
6-12-89
PLANS APPROVAL DATE

REGISTERED GEOLOGIST R.C. WILHELMS No. 1719 Exp. 6-30-90 STATE OF CALIFORNIA





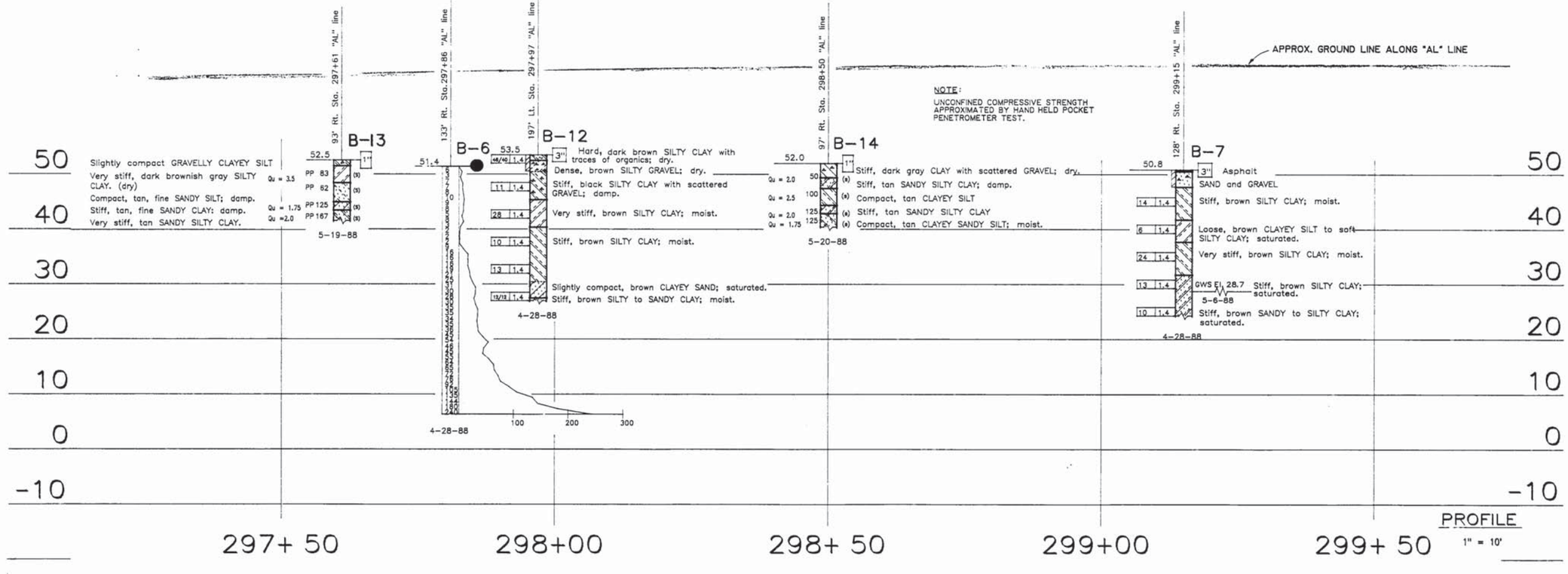
BENCH MARK

TBM Elev. 50.69
Gutter spot elevation at foot of 90°< JNTN of curbs. Loc 31 ft. Lt. "A" Sta. 16+35 ±

PLAN

1" = 40'

NO AS BUILT CHANGES
AS BUILT
M. HOLM
CONTRACT NO 123144
DATE 12-2-92
MLGraves 8-10-93



PROFILE
1" = 10'

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY			
DRAWN BY	IRMA GAMARRA 8/88	PROJECT GEOLOGIST	632 C.E.G. NO.
CHECKED BY			

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN 4
PROJECT ENGINEER — C042268 REGISTERED CIVIL ENGINEER NO.

BRIDGE NO. 33-179
POST MILE 18.4

"A" STREET UNDERCROSSING WIDENING
LOG OF TEST BORINGS 1 OF 3

TRIM LINE

TRIM LINE

TRIM LINE

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	16.2/18.5	281	290

R.C. Wilhelms E.G. No. 560
REGISTERED · CERTIFIED
ENGINEERING GEOLOGIST

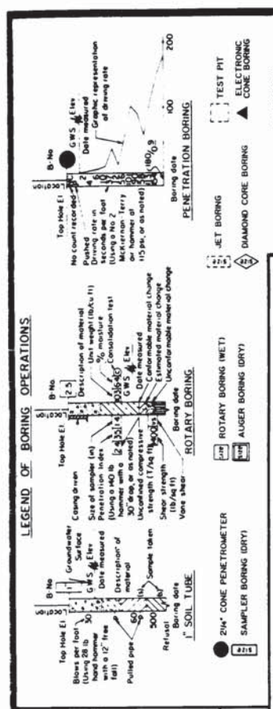
6-12-89
PLANS APPROVAL DATE

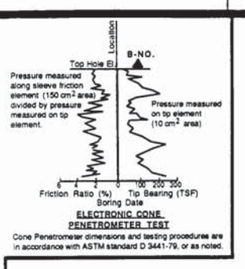
REGISTERED GEOLOGIST
R.C. WILHELMS
No. 1719
Exp. 6-30-90
STATE OF CALIFORNIA

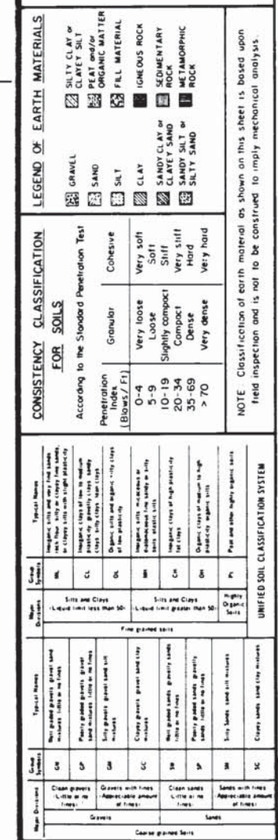
NO AS BUILT CHANGES

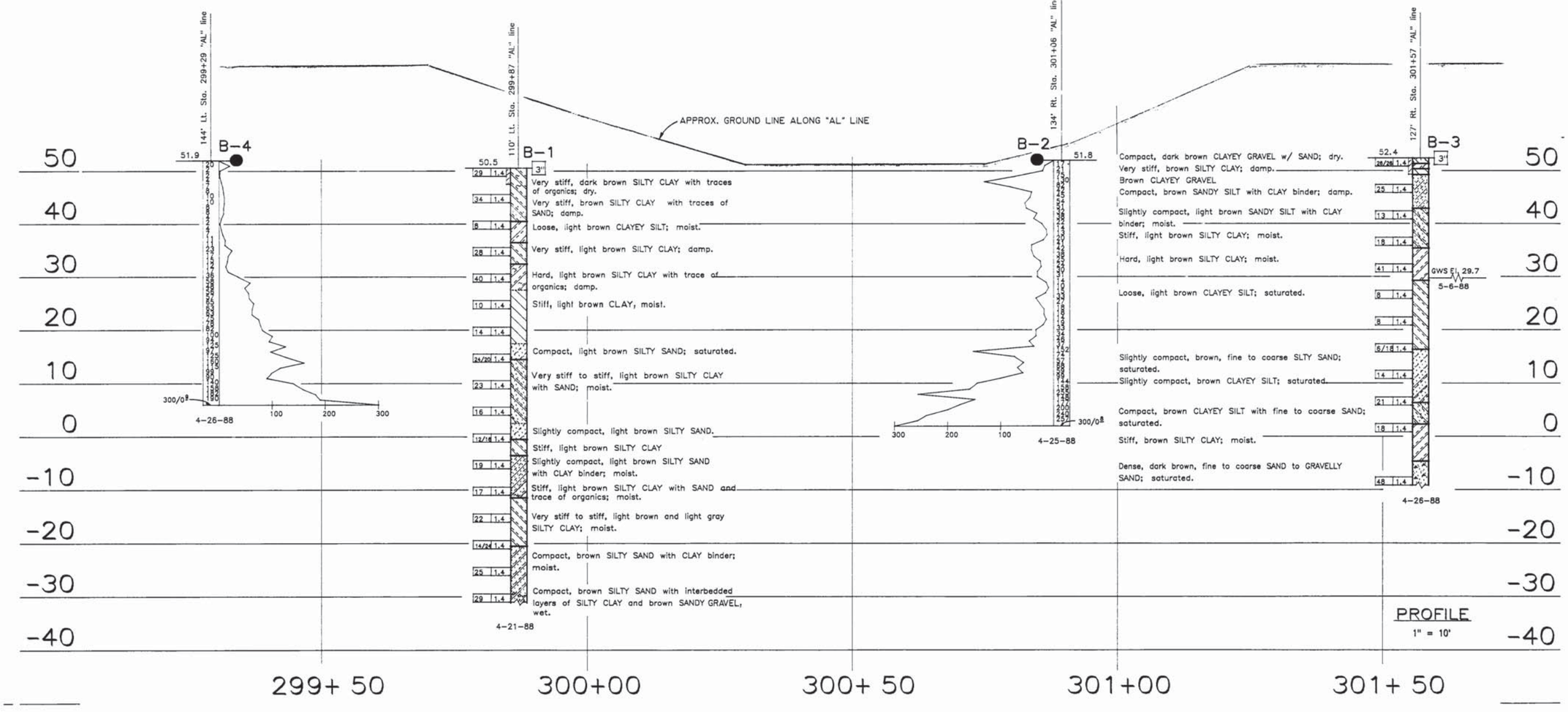
AS BUILT
CONTRACTOR M. HOLM
CONTRACT NO. 123144
DATE 12-2-92
M. Gomes 8-10-93

FOR PLAN VIEW SEE
"LOG OF TEST BORINGS 1 OF 3"









ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY			
DRAWN BY	IRMA GAMARRA	8/88	PROJECT GEOLOGIST 632 C.E.G. NO.
CHECKED BY			

State of
CALIFORNIA
DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN
PROJECT ENGINEER — REGISTERED CIVIL ENGINEER NO. C042268

BRIDGE NO. 33-179
POST MILE 18.4

"A" STREET UNDERCROSSING WIDENING
LOG OF TEST BORINGS 2OF3

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET | OF

ORIGINAL SCALE IN INCHES

CU 041173

ClipPDF www.ClipPDF.com

TRIM LINE

TRIM LINE

TRIM LINE

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	16.2/18.5	282	290

R.C. Wilhelms EG No. 560
REGISTERED - CERTIFIED
ENGINEERING GEOLOGIST

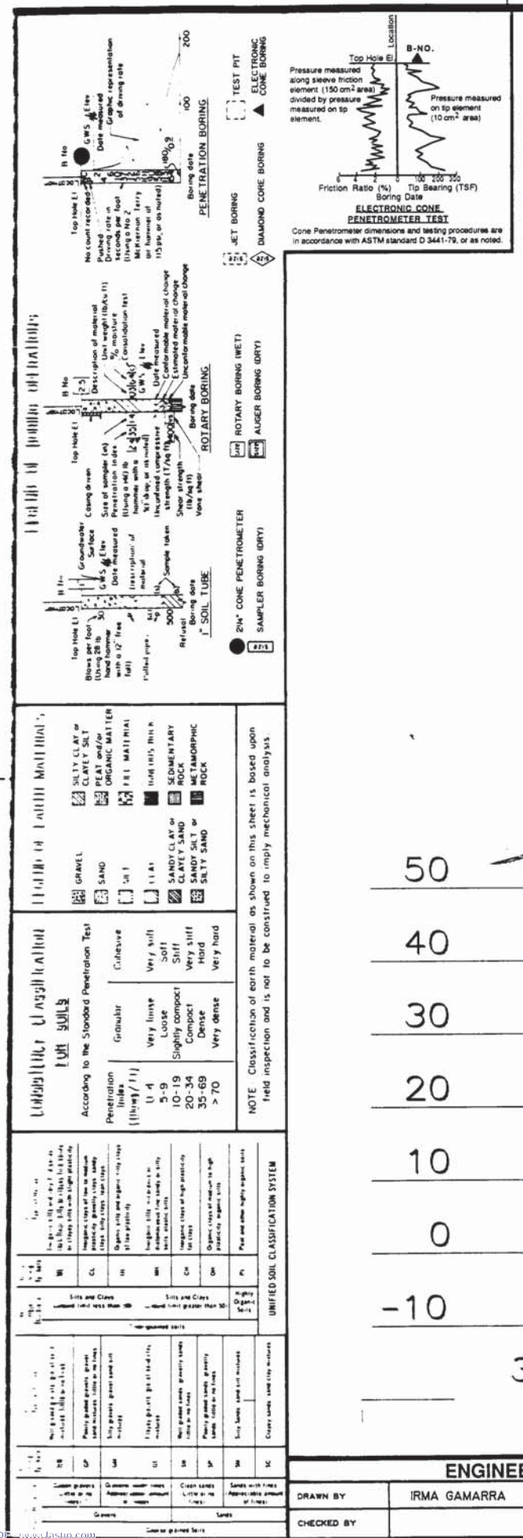
6-12-89
PLANS APPROVAL DATE

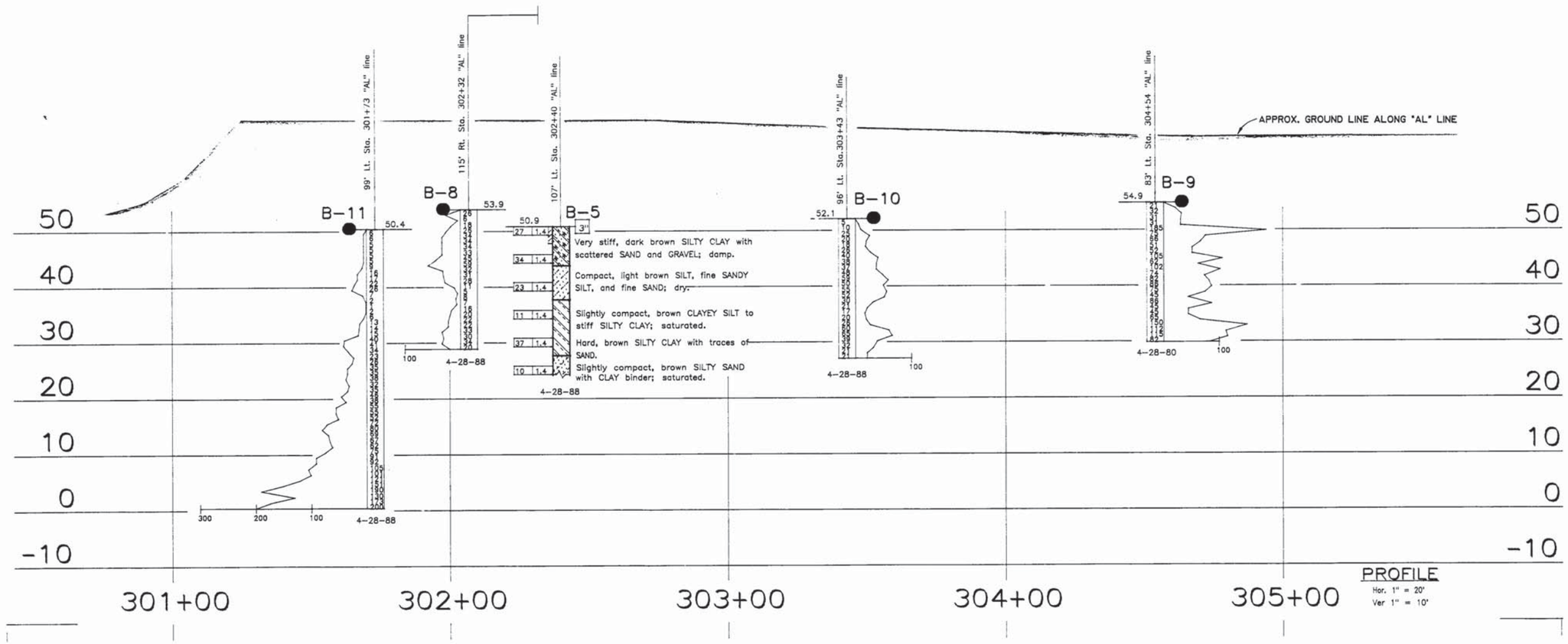
REGISTERED GEOLOGIST R.C. WILHELMS No. 1719 Exp. 6-30-90 STATE OF CALIFORNIA

NO AS BUILT CHANGES

M. Houm
CONTRACTOR 123144
DATE 12-2-92
M. Graves 8-10-93

FOR PLAN VIEW SEE
"LOG OF TEST BORINGS 1 OF 3"





ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY

DRAWN BY IRMA GAMARRA 8/88
CHECKED BY
PROJECT GEOLOGIST 632 C.E.G. NO.

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN 4
PROJECT ENGINEER C042263 REGISTERED CIVIL ENGINEER NO.

BRIDGE NO. 33-179
POST MILE 18.4

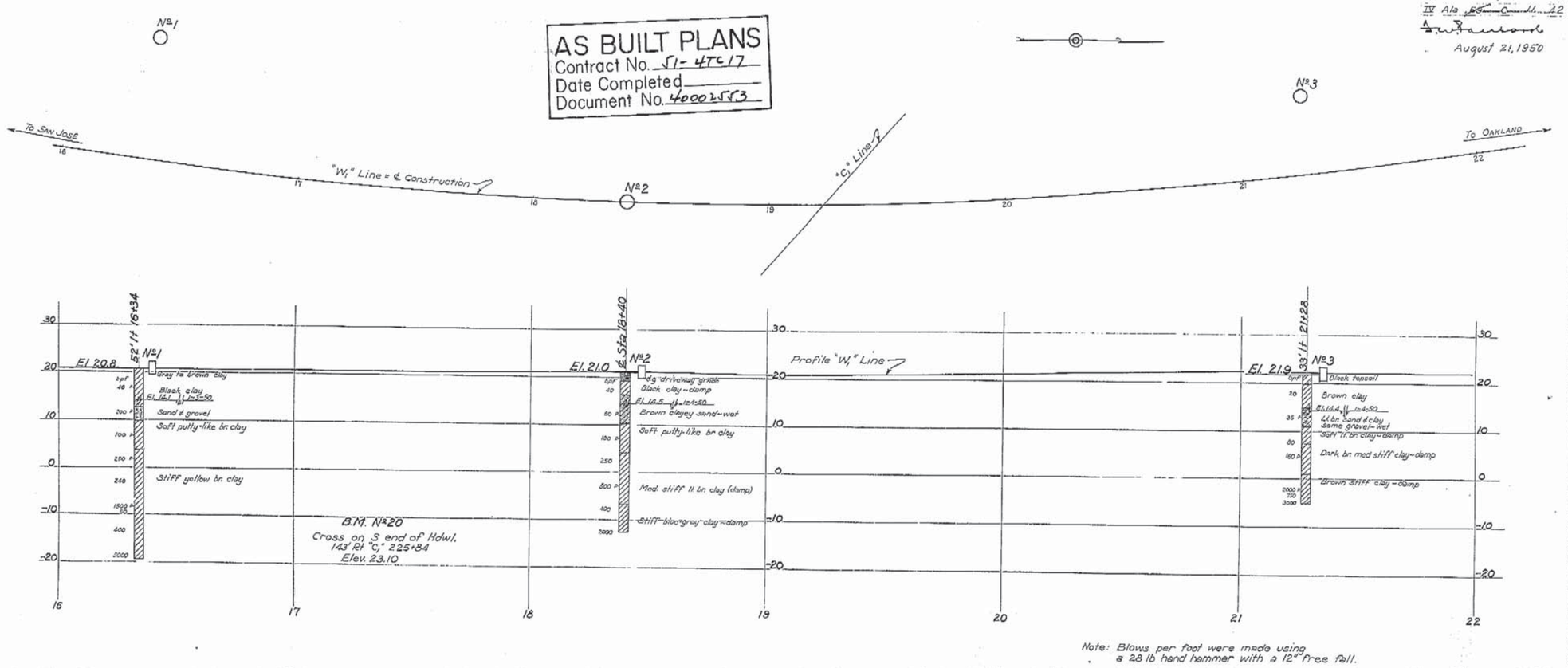
"A" STREET UNDERCROSSING WIDENING
LOG OF TEST BORINGS 3 OF 3

110 174

IV Ala ~~Sol~~ Contr. 12

August 21, 1950

AS BUILT PLANS
Contract No. 51-4TC17
Date Completed
Document No. 40002553



Note: Blows per foot were made using a 28 lb hand hammer with a 12" free fall.

Classification of Material Based on Standard Grade Size Limits

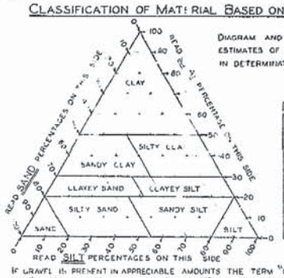


Diagram and table showing the basis for estimates of grade size distribution used in determination of class names.

Grouping Used in Triangular Classification			
Class Name	Percentage of Size Present		
	Sand	Silt	Clay
Sand	80-100	0-20	0-20
Silty Sand	45-80	0-55	0-20
Sandy Silt	0-45	35-80	0-20
Silt	0-20	80-100	0-20
Clayey Sand	30-80	0-42	20-30
Clayey Silt	0-35	32-80	20-30
Sandy Clay	30-70	0-40	30-50
Silty Clay	0-30	20-70	30-50
Clay	0-50	0-50	50-100

If gravel is present in appreciable amounts the term "Gravelly" may be added to the class name, viz "Gravelly sand". The terms "Coarse," "Medium" and "Fine" when used to describe Gravel, Sand and Silt refer to Standard Grade Size Limits.

Legend of Boring Operations

- Plan of any boring
- 1" Sampler boring
- Rotary wash boring
- 1" Closed sampler driven
- Core boring
- 2½" Penetrometer driven
- 2" Sampler boring
- 2" to 5" Auger boring
- 8" to 20" Auger boring
- Casing driven
- Jet boring
- (S) Sample taken

The appropriate boring symbols designating the method of operation are shown at the upper right-hand corner of the respective boring. Where tool changes were made during the boring operation symbols are shown at the point of change.

Legend of Earth Materials

- Gravel – G
- Sand – S
- Silt – Si
- Clay – C
- Silty Sand – Si S
- Clayey Sand – C S
- Sandy Silt – S Si
- Clayey Silt – C Si
- Sandy Clay – SC
- Silty Clay – Si C
- Peat and Organic Clay – O
- Sandstone – SS
- Shale – Sh
- Broken Rock (Fragments) – Br
- Rock – R

Abbreviations

El 69.4	Elevation of ground at test hole
bpf	Blows per foot – (see note above)
P	Pulled pipe
M	Moisture as % dry weight
El 9.3 ⊥ 8-12-49	Elevation of ground water and date

Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

MICROFILMED

WASHINGTON AVE OVERCROSSING
LOG OF TEST BORINGS
Horizontal: 1" = 20'
Vertical: 1" = 10'

33-166 Drawing No. C-2359-11

BR:DGF DEPARTMENT

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

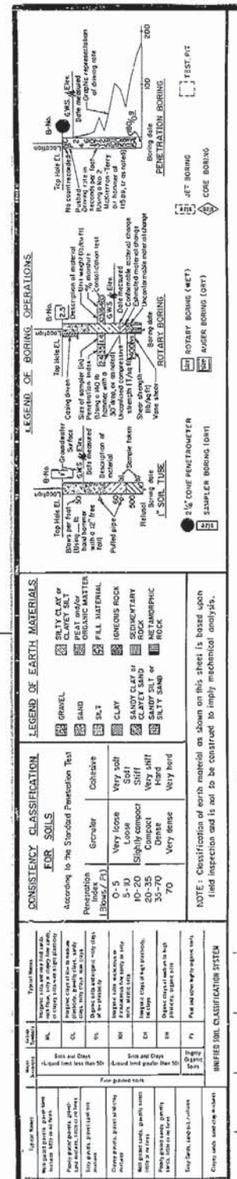
DATE 3/20/72 SIGNATURE Donald Grant TITLE SR. RMC

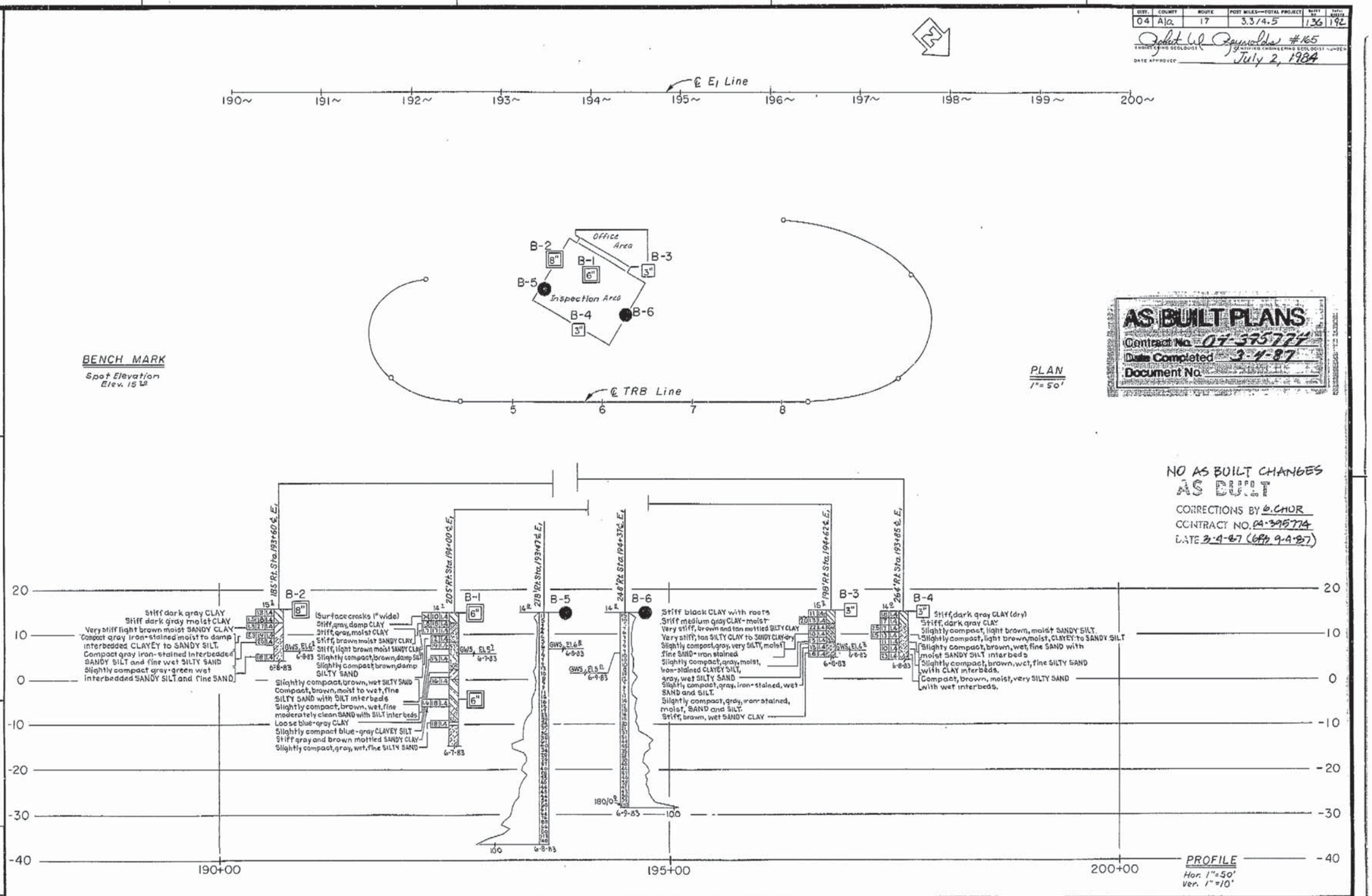
ClibPDF - www.fastio.com

As-built LOTB’s for Caltrans Median Barrier

DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET	TOTAL SHEETS
04	Alo.	17	3.3/4.5	136	192

Robert W. Reynolds #165
ENGINEERING GEOLOGIST — REGISTERED ENGINEERING GEOLOGIST NUMBER
DATE APPROVED July 2, 1984





ENGINEERING GEOLOGY AND TECHNICAL SERVICES BRANCH – TRANSPORTATION LABORATORY					
DRAWN BY WIGGINTON 6-83	Richard Wilfling 560	CHARGE UNIT	EXPEND. AUTHOR.	SPEC. DESIGN.
CHECKED BY	Sr. A.E. Goldsmith	04216	395771	

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN — PROJECT ENGINEER — REGISTERED CIVIL ENGINEER NO. C 16298 7/83

33-T026 — POST MILE 3.3/4.7

NIMITZ INSPECTION FACILITY

LOG OF TEST BORINGS

SHEET S 19

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04215
WO 395771

Disregard prints bearing earlier revision dates →

REVISION DATES (PRELIMINARY STAGE ONLY)

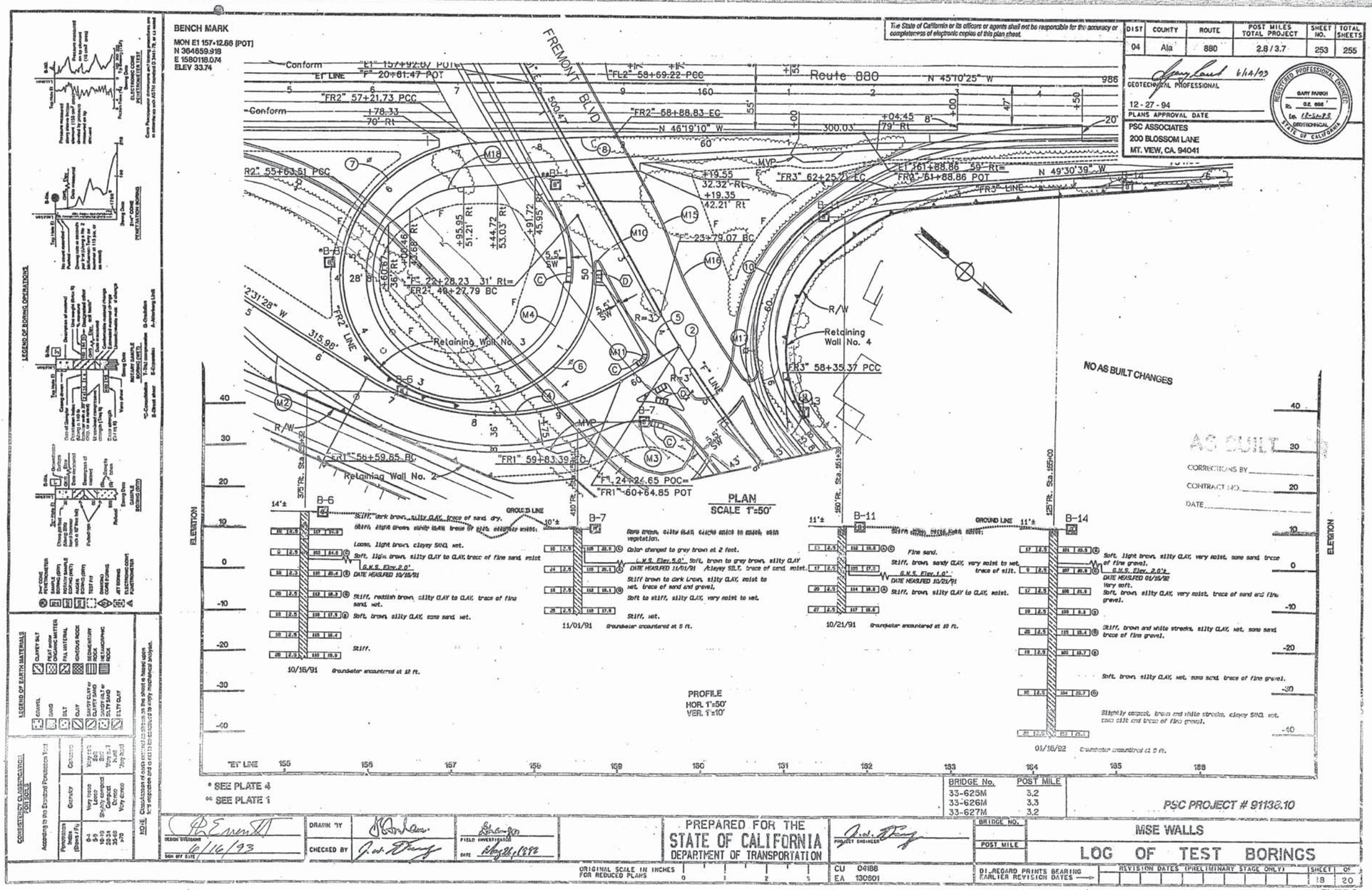
SHEET OF

136

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.

DATE 2-22-88 SIGNATURE Donald Blackford TITLE MICROFILM SERVICES

ClibPDF - www.fastio.com



The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	2.8 / 3.7	253	255

GEOTECHNICAL PROFESSIONAL 6/16/93
12 - 27 - 94
PLANS APPROVAL DATE
PSC ASSOCIATES
200 BLOSSOM LANE
MT. VIEW, CA. 94041

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	4.3 / 5.4	210	211

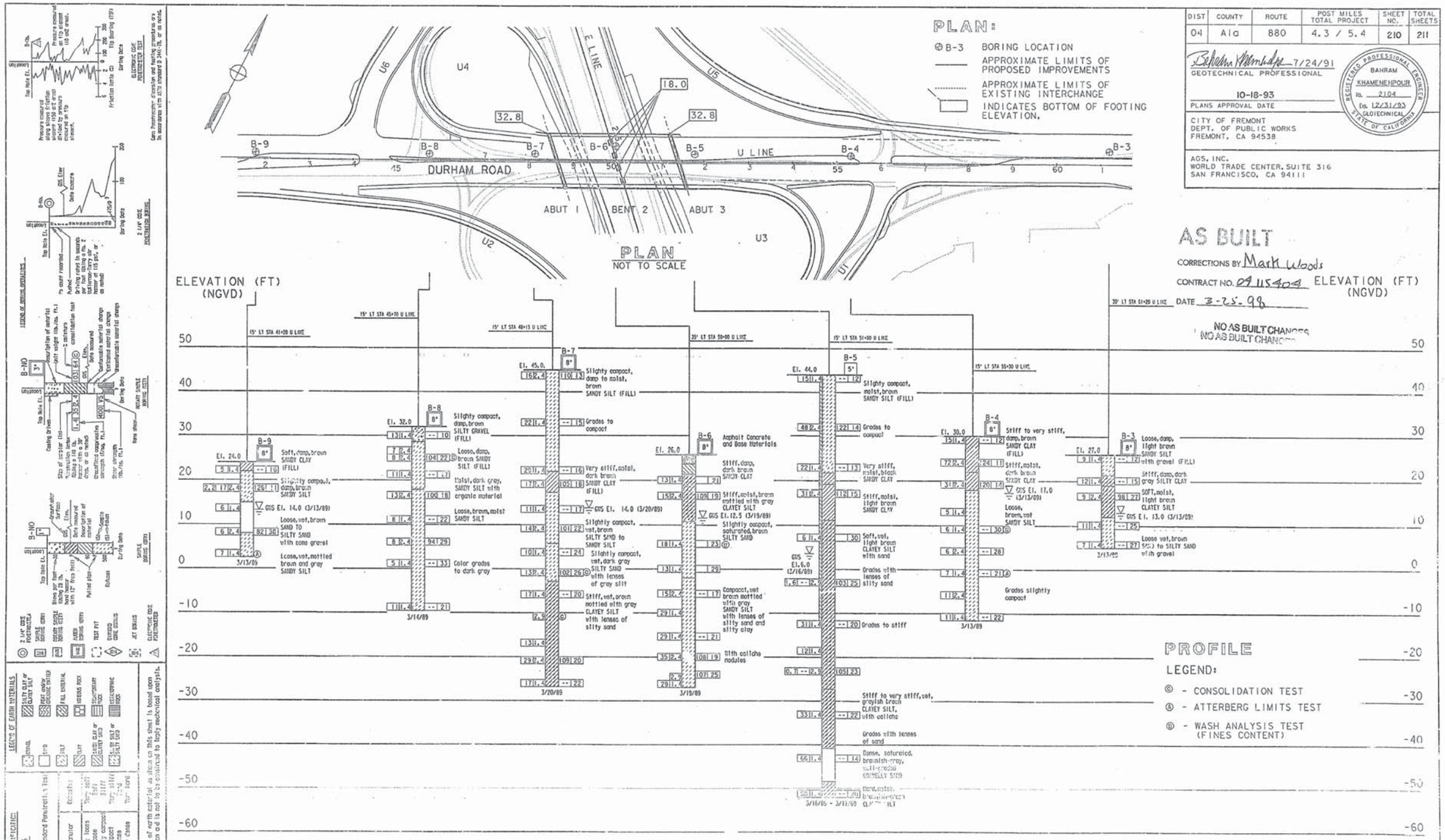
GEOTECHNICAL PROFESSIONAL 7/24/91

10-18-93
PLANS APPROVAL DATE

CITY OF FREMONT
DEPT. OF PUBLIC WORKS
FREMONT, CA 94538

AGS, INC.
WORLD TRADE CENTER, SUITE 316
SAN FRANCISCO, CA 94111

REGISTERED PROFESSIONAL ENGINEER — BAHRAM KHAMENEJPOUR — No. 2104 — Exp. 12/31/93 — GEOTECHNICAL — STATE OF CALIFORNIA



AS BUILT
CORRECTIONS BY Mark Woods
CONTRACT NO. 04 115404
DATE 3-25-98
NO AS BUILT CHANGES

DESIGN OVERSIGHT	DRAWN BY	D.A.C	R.F.S. FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	LUIS E. MOURA 39791 PROJECT ENGINEER REGISTERED C.E. NO.	BRIDGE NO. 33-268	DURHAM ROAD OVERCROSSING (REPLACE)	ST18
SIGN OFF DATE 10/16/91	CHECKED BY	L.E.M.	DATE 3/89			POST MILE 4.71	LOG OF TEST BORINGS	

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04183
EA 115401

DISREGARD PRINTS BEARING EARLIER REVISION DATES —<- 7/90

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 18 OF 19

PLOTTING DATE Sun Oct 13 15:36:13 1991
OS4: [111.KOJI]15405T18.DGN;1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	6.9 / 8.5	242	285

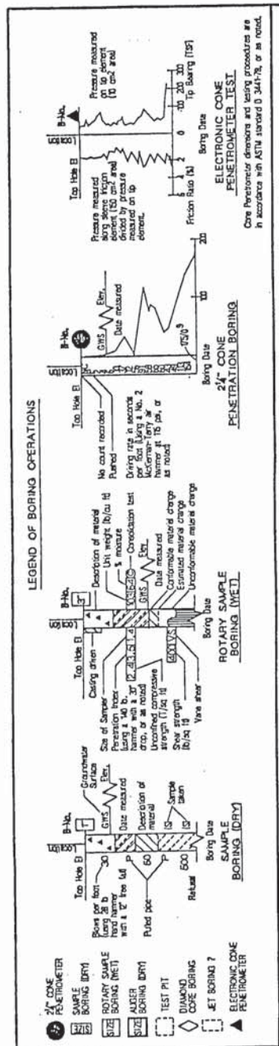
REGISTERED ENGINEER-GEOTECHNICAL 5/22/91

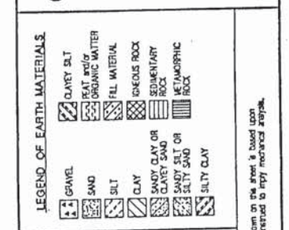
REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE96 Exp. 12/31/93 GEOTECHNICAL STATE OF CALIFORNIA

10-11-93
PLANS APPROVAL DATE

I-880 ENGINEERING TEAM
CH2M HILL
6425 CHRISTIE AVE, SUITE 500
EMERYVILLE, CALIFORNIA 94608

BENCH MARK:
NAIL IN PAVEMENT, 54.32' RT OF "E1" LINE STA 384+99.92

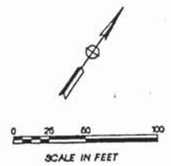


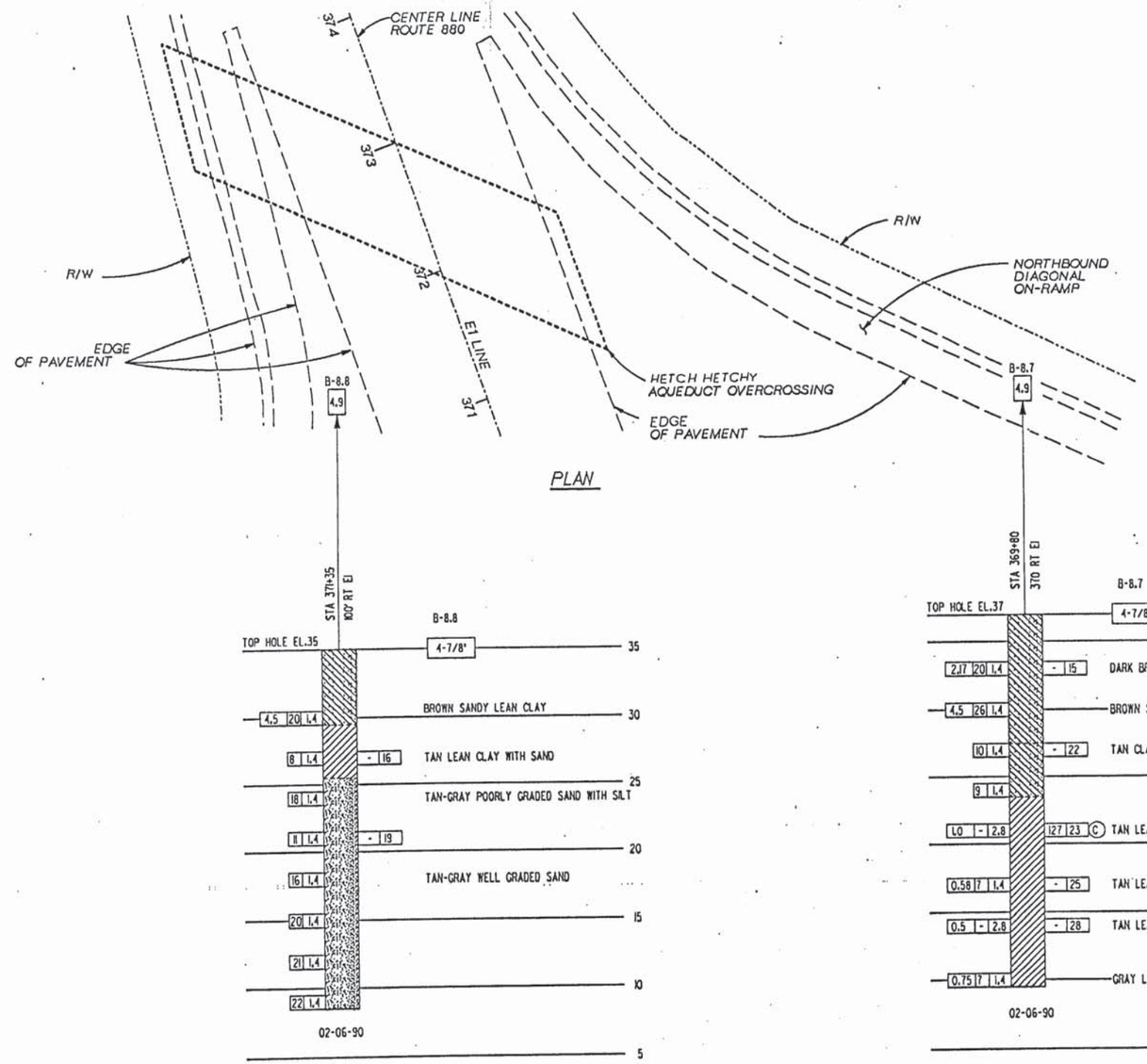


CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test

Penetration Blows / ft	Granular	Cohesive
0-4	Very loose	Very soft
5-9	Loose	Soft
10-19	Slightly compact	Stiff
20-34	Compact	Very stiff
35-69	Dense	Hard
>70	Very dense	Very hard

NOTE: Classification of earth material as shown on the sheet is based upon field inspection and is not to be construed to imply mechanical analysis.





NO AS BUILT CHANGES

CONTRACT No. 04-233114
DATE ACCEPTED AUG 96
AS BUILT
RESIDENT ENGINEER Scott Fabel
REVISIONS BY Mark Woods DATE JAN 20 1998
LA 12.4.98

NOTE:
GROUNDWATER LEVEL NOT MEASURED AT TIME OF DRILLING BECAUSE DRILLING FLUID WAS USED IN BORINGS.

DATUM: NGVD

DESIGN OVERSIGHT 5/7/93
SIGN OFF DATE

DRAWN BY D. HAECKER
CHECKED BY D. ALLARD

S. TERENTIEFF
FIELD INVESTIGATOR
REGISTRATION NO. N/A

APPROVAL RECOMMENDED BY
J. ANDERSON
REGISTRATION NO. GE96

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

D. GREB
PROJECT ENGINEER

CU 04-183
EA 233114

BRIDGE NO. 33-272
POST MILE 7.3

HETCH HETCHY ACQUEDUCT BRIDGE (WIDEN)

LOG OF TEST BORINGS

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 7 OF 8

CAE file =>> ZF2:[201,003]088STA369.DGN;1
USERNAME: $$$$$$$USER$$$$$$ PLOTDATE: $$$$$$$DATE$$$$$$

ClibPDF - www.fastio.com

FED. ROAD DIV. NO.	STATE	PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
7	CAL.			266	349

F-341(16)

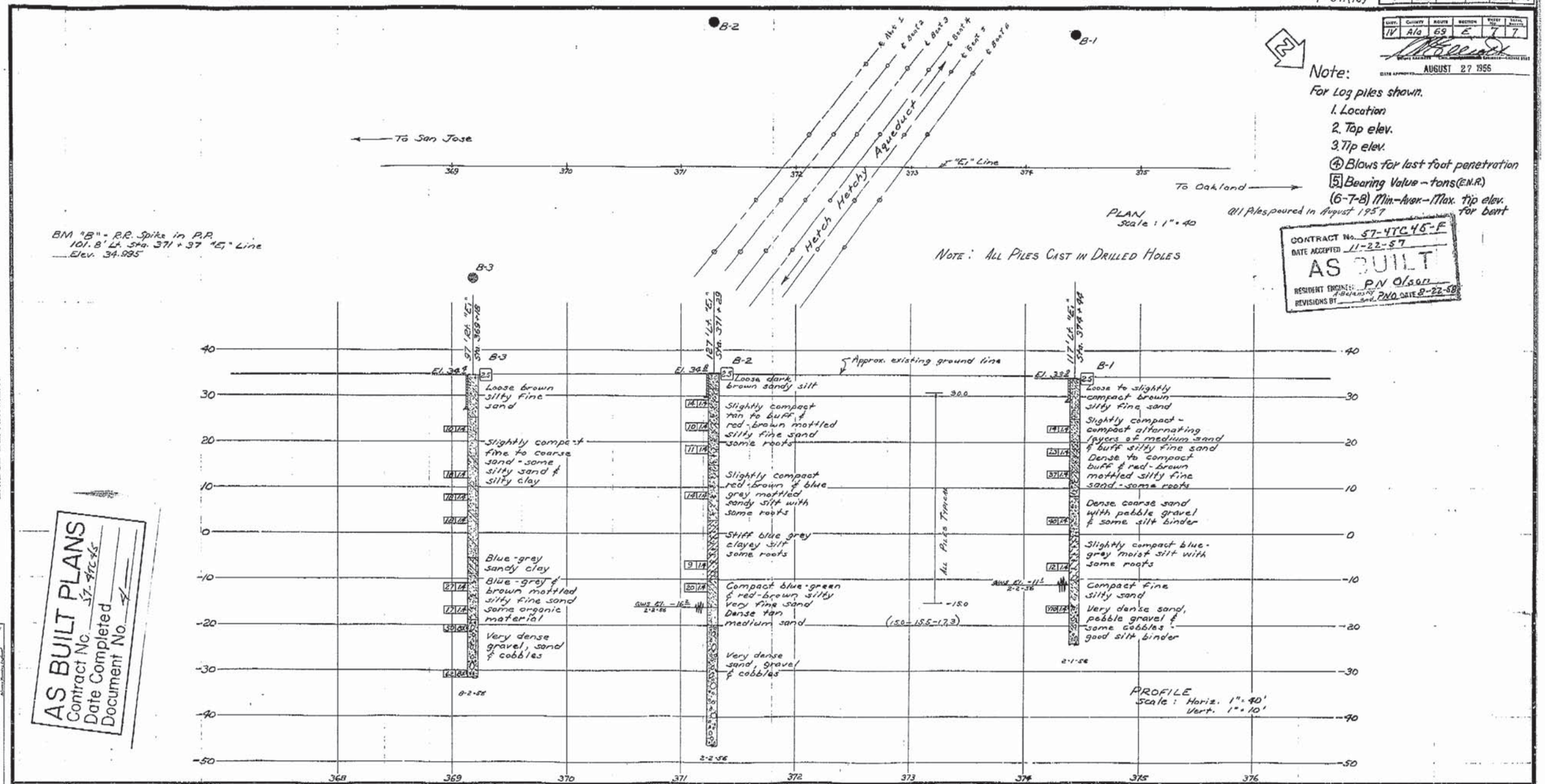
DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
IV	Ala	69	E	7	7

DATE APPROVED AUGUST 27 1956

Note:
For Log piles shown.
1. Location
2. Top elev.
3. Tip elev.
4. Blows for last foot penetration
5. Bearing Value – tons (E.N.R.)
(6-7-8) Min.–Aver.–Max. tip elev. for bent

All Piles poured in August 1957

CONTRACT No. 57-47C46-F
DATE ACCEPTED 11-22-57
AS BUILT
RESIDENT ENGINEER P.N. Olson
REVISIONS BY P.N.O. DATE 8-22-58



BRIDGE DEPARTMENT

AS BUILT PLANS
Contract No. 57-47C46
Date Completed
Document No. 4

PREPARED	A. Hughes 2-2-56
DRAWN	A. Hughes 2-2-56
CHECKED	E. Keyes 3-2-56
Approval Recommended	

268

Classification of Material Based on Standard Grade Size Limits

Diagram showing the basis for estimates of grade size distribution used in determination of class names.
If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand." The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

SILT PERCENTAGES

Legend of Earth Materials

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

Legend of Boring Operations

- Plan of any boring
- Penetrometer
- 2¼" Cone Penetrometer
- Sampler boring (DRY)
- Rotary boring (WET)
- Auger boring (DRY)
- Jet boring
- Core boring
- Test pit

1" Soil Tube — Rotary Boring — Penetration Boring

NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.
Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

HETCH HETCHY AQUEDUCT

LOG OF TEST BORINGS

SCALE As Noted | BRIDGE 33-272 | FILE | DRAWING C-4782-8

PKEL. DRAWING NO. P-4782 7

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE 5/7/73 SIGNATURE [illegible] TITLE [illegible]

ClibPDF - www.fastio.com

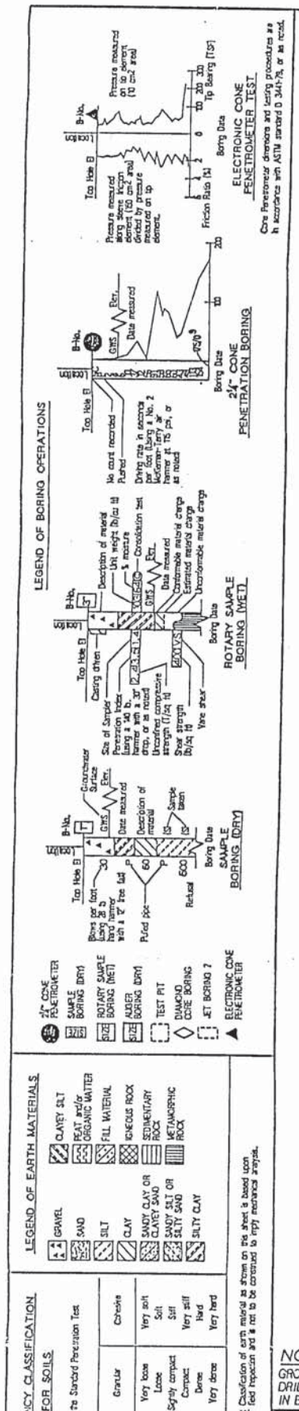
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	6.9/8.5	225	285

REGISTERED ENGINEER-GEOTECHNICAL 2/4/91

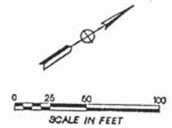
REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE96 Exp. 12/31/93 GEOTECHNICAL STATE OF CALIFORNIA

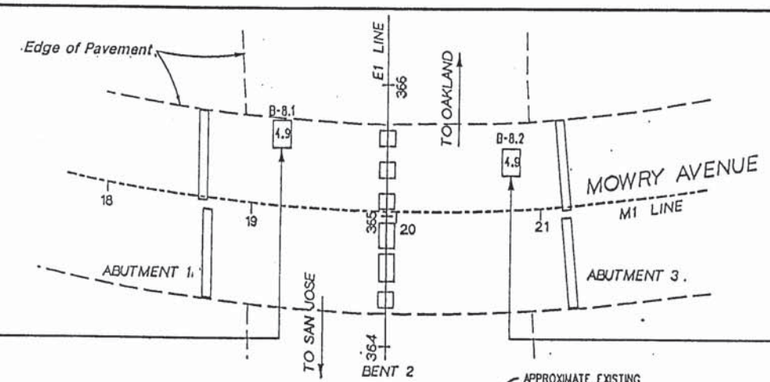
10-11-93
PLANS APPROVAL DATE

I-880 ENGINEERING TEAM
CH2M HILL
6425 CHRISTIE AVE, SUITE 500
EMERYVILLE, CALFORNIA 94608

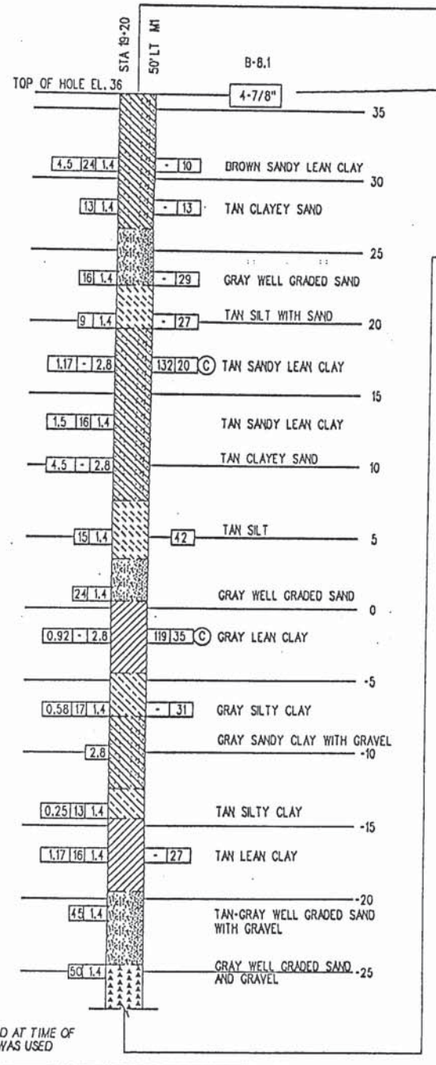


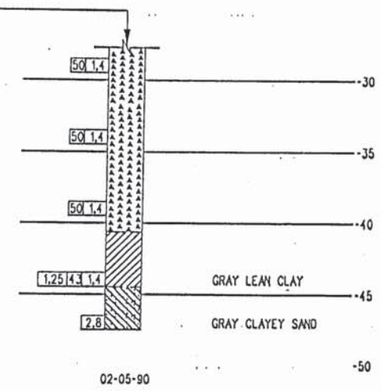
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply assurance of type.

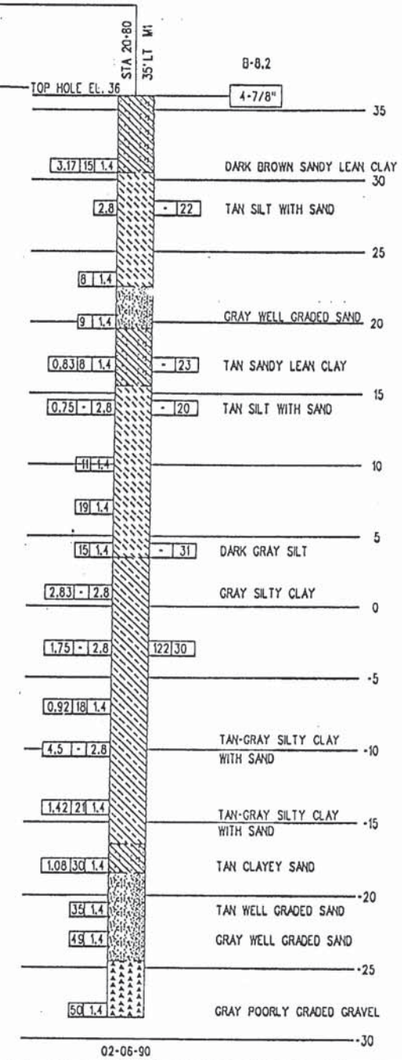




PLAN







BENCH MARK:
USC & GS BRASS DISK CHC ON OVERCROSSING @ STEVENSON BLVD. 0.73' RT. OF ℄ 'LINE STA 314+51.21. ELEV. 57.39'

LA 11.20.98
NO AS BUILT CHANGES

CONTRACT No. 04-233114
DATE ACCEPTED AUG 96
AS BUILT
RESIDENT ENGINEER Scott Fabel
REVISIONS BY Mark Woods DATE JAN 20 1998

NOTE:
GROUNDWATER LEVEL NOT MEASURED AT TIME OF DRILLING BECAUSE DRILLING FLUID WAS USED IN BORINGS.

DATUM: CALTRANS

DESIGN-OVERSIGHT
SIGN OFF DATE 5/7/93

DRAWN BY D. HAECKER
CHECKED BY D. ALLARD

S. TERENTIEFF
FIELD INVESTIGATOR
REGISTRATION NO. N/A

APPROVAL RECOMMENDED BY
J. ANDERSON
REGISTRATION NO. GE96

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

W. LAFRANCHI
PROJECT ENGINEER

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04-183
EA 233111

BRIDGE NO. 33-267 L/R
POST MILE 7.18

MOWRY AVENUE OVERCROSSING (REPLACE)

LOG OF TEST BORINGS

DISREGARD PRINTS BEARING EARLIER REVISION DATES 10/16/93 9/10/91

REVISION DATES (PRELIMINARY STAGE ONLY)

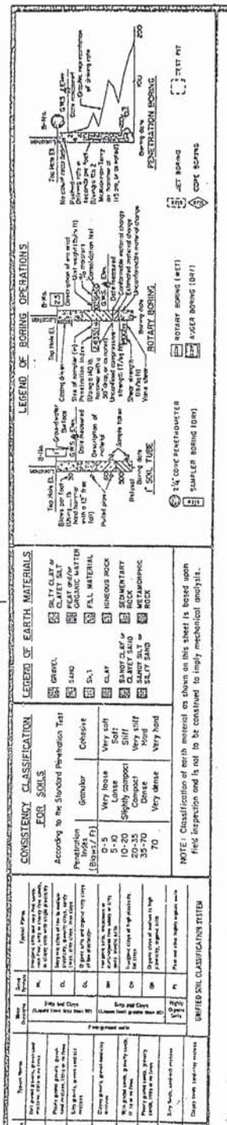
SHEET 19 OF 20

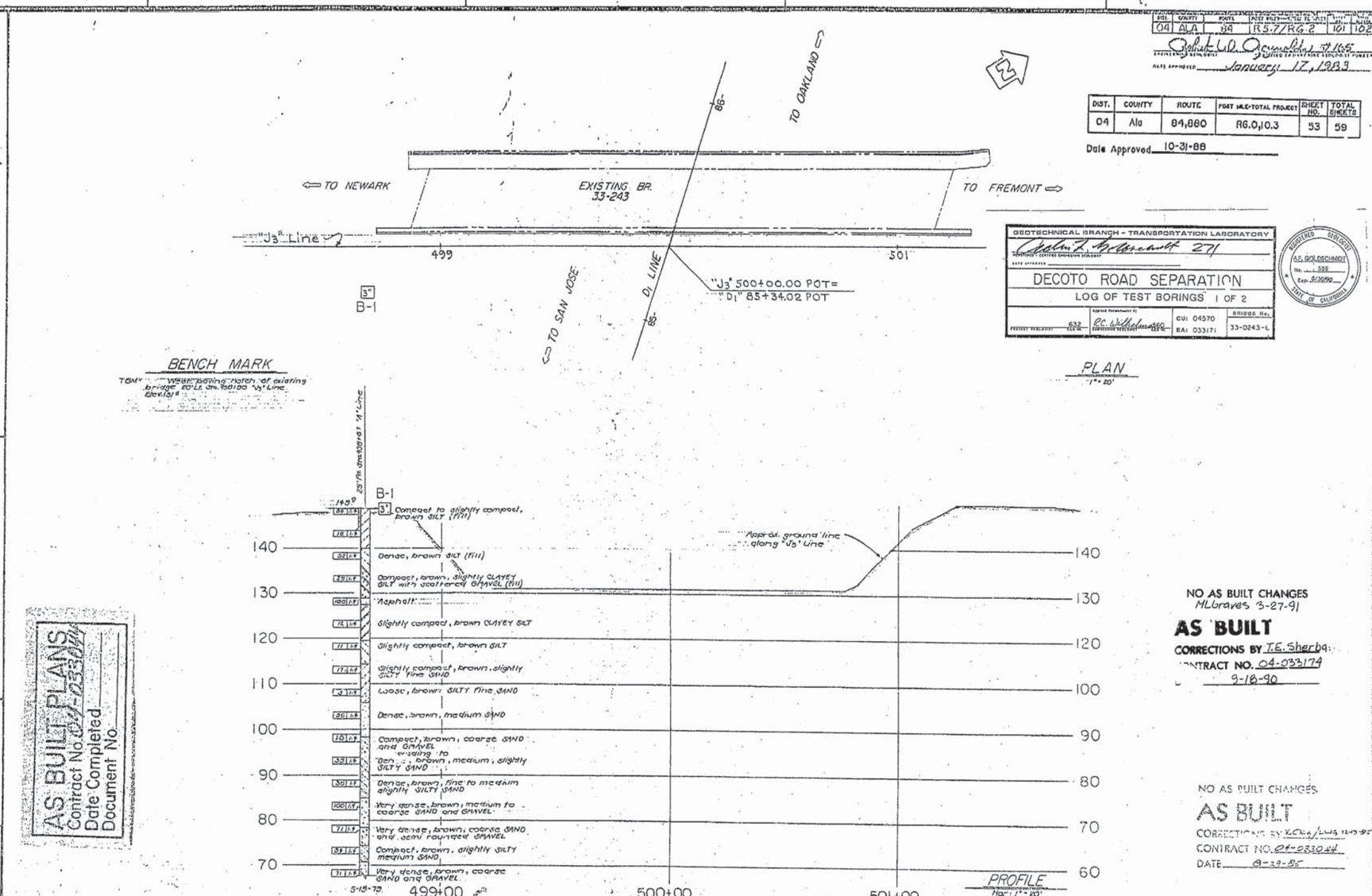
DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	84,880	R6.0,10.3	53	59

Date Approved 10-31-88

DIST.	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
04	ALA	84	R5.7/R6.2	101	102

Robert W. Oppenheimer 7165
ENGINEER GEOLOGIST — REGISTERED PROFESSIONAL ENGINEER
DATE APPROVED January 17, 1983





GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY
Charles L. Schwartz 271
REGISTERED CERTIFIED ENGINEERING GEOLOGIST
DATE APPROVED

REGISTERED GEOLOGIST A.S. GOLDSCHMIDT No. 556 Exp. 6/30/90 STATE OF CALIFORNIA

DECOTO ROAD SEPARATION
LOG OF TEST BORINGS 1 OF 2

DISTRICT	DIVISION	CU: 04570	BRIDGE No.
632	R.C. Williamson	EA: 033171	33-0243-L

NO AS BUILT CHANGES
MLbraves 3-27-91
AS BUILT
CORRECTIONS BY T.E. Sherba
CONTRACT NO. 04-033174
9-18-90

NO AS BUILT CHANGES
AS BUILT
CORRECTIONS BY LCNa/LWS 12-13-95
CONTRACT NO. 04-033044
DATE 8-29-95

AS BUILT PLANS
Contract No. 04-033174
Date Completed
Document No.

ENGINEERING GEOLOGY BRANCH
FIELD STUDY By R. Fox 5/79
DRAWN By ED PONO 6/79
CHECKED By R. Fox 7/79
Approved Recommended By R. Fox
ENGINEERING GEOLOGIST 70

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION
STRUCTURES - DESIGN 9
PROJECT ENGINEER Ex Powers CE 72015
BRIDGE NO. 33-243R
POST MILE 6.0
CU 04220
WO 033041
Disregard prints bearing earlier revision dates

DECOTO ROAD SEPARATION (84/14)
LOG OF TEST BORINGS 1 OF 2

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

REVISION DATES (PRELIMINARY ENGINEERING ONLY) 12/7/66 12/9/66 12/12/66
SHEET 12 OF 13

101

AS BUILT PLANS
Contract No. 04-033174
Date Completed 9-18-90
Document No.

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION

DATE 5-1-91 SIGNATURE Ronald Blackford TITLE

MICROFILM - STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - MICROFILM
SCALE 1" = 50' 0 100 200 300 400 500 600
SCALE 1" = 20' 0 50 100 200 300
ChipPDF - www.fastio.com

F-341(16)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET	TOTAL SHEETS
7	CAL.			327	349

DIST	COUNTY	ROUTE	POST MILES-TOTAL PROJECT	SHEET NO.	TOT. SHEETS
04	Ala	84,880	R6.0,10.3	54	59

DATE APPROVED: 10-31-88

DIST.	COUNTY	ROUTE	POSTMILES	SHEET	TOTAL SHEETS
IV	Ala	880			72

DATE APPROVED AUGUST 31, 1956

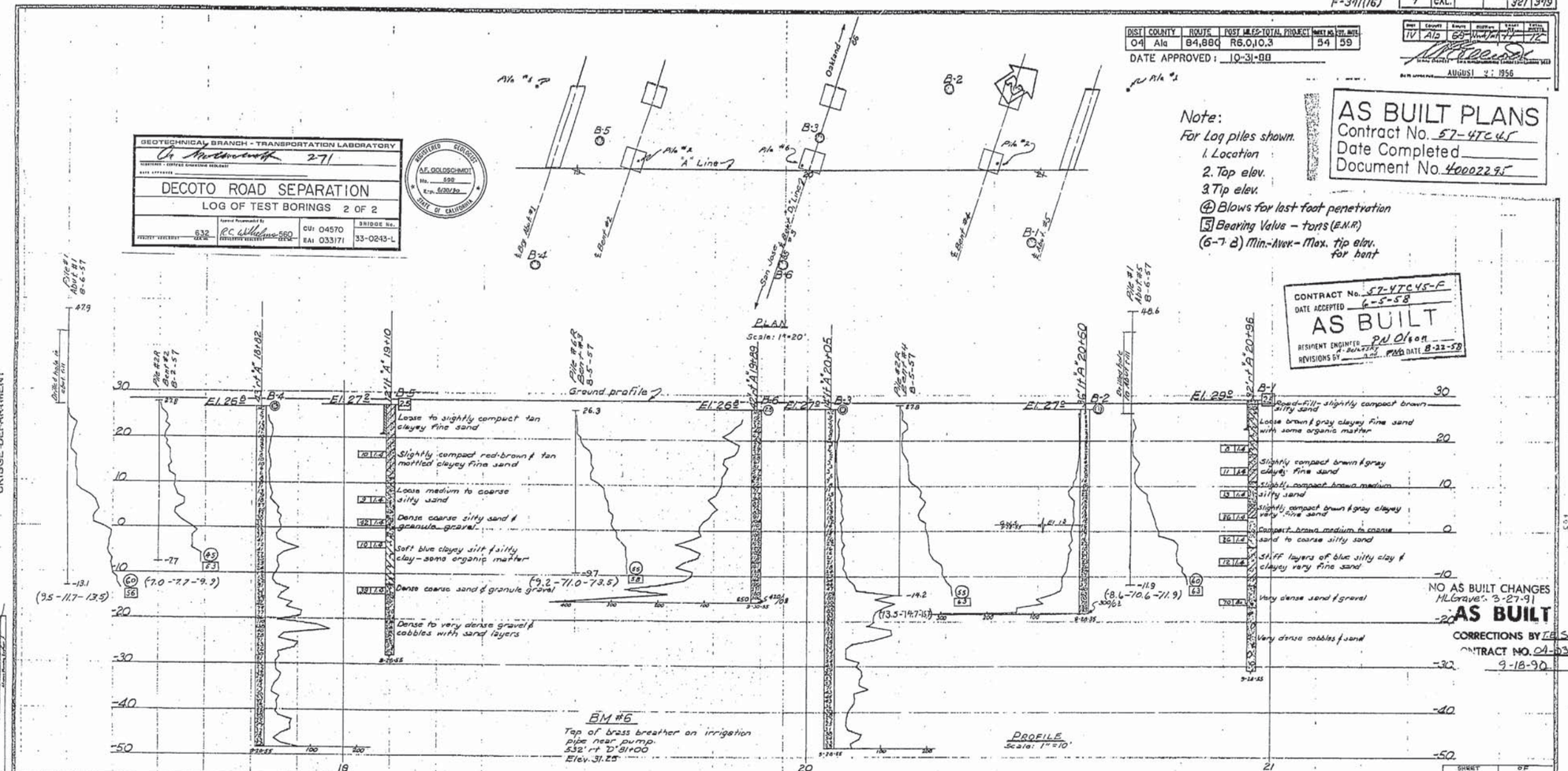
AS BUILT PLANS
Contract No. 57-47C45
Date Completed
Document No. 40002295

GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY
2-71
DECOTO ROAD SEPARATION
LOG OF TEST BORINGS 2 OF 2
632 | R.C. Wilshire 560 | CU: 04570 EA: 033171 | BRIDGE No. 33-0243-L

REGISTERED GEOLOGIST A.F. GOLDSCHMIDT No. 599 Exp. 6/30/56 STATE OF CALIFORNIA

Note:
For Log piles shown.
1. Location
2. Top elev.
3. Tip elev.
4. Blows for last foot penetration
5. Bearing Value – tons (E.N.R)
(6-7-8) Min.-Aver.-Max. tip elev. for bent

CONTRACT No. 57-47C45-F
DATE ACCEPTED 6-5-58
AS BUILT
RESIDENT ENGINEER P.N. Olson
REVISIONS BY DATE 8-22-58



NO AS BUILT CHANGES
H.L. Graves 3-27-91

AS BUILT
CORRECTIONS BY T.E. Sherba
CONTRACT NO. 04-033174
9-18-90

BRIDGE DEPARTMENT

FIELD BY: R. Hager 9-55
DRAWN: R. Dorr 10-55
CHECKED: R. Hager 10-55

Approval Recommended: R.C. Wilshire 11-4-55
Approved: C.A. Ramos 11-4-55

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

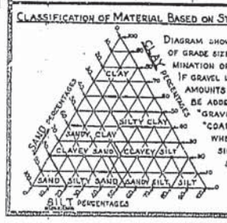


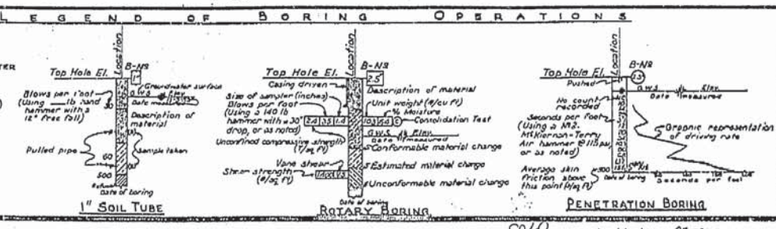
DIAGRAM SHOWING THE BASIS FOR ESTIMATING OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES. IF GRAVEL IS PRESENT IN APPRECIABLE AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ. "GRAVELLY SAND". THE TERMS "COARSE", "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE SAND, SILT AND GRAVEL REFER TO STANDARD GRADE SIZE LIMITS.

LEGEND OF EARTH MATERIALS

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

LEGEND OF BORING OPERATIONS

- Plan of any boring
- Penetrometer
- 2½" Cone Penetrometer
- Sampler boring (DRY)
- Rotary boring (WET)
- Auger boring (DRY)
- Jet boring
- Core boring
- Test pit



NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.
Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

DECOTO ROAD OVERCROSSING

LOG OF TEST BORINGS 2 OF 2

SCALE As shown | BRIDGE 33-243 | FILE | DRAWING C-4003-11

PREL. DRAWING NO. P-4003

Effomeny 1/12/66 CE 7845

329

AS BUILT PLANS
Contract No. 04-033174
Date Completed 9-18-90
Document No.

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION

DATE | SIGNATURE Ronald Blackford | TITLE

MICROFILM - STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - MICROFILM
SCALE 1" = 50'
SCALE 1" = 20'
ClibPDF - www.fastio.com

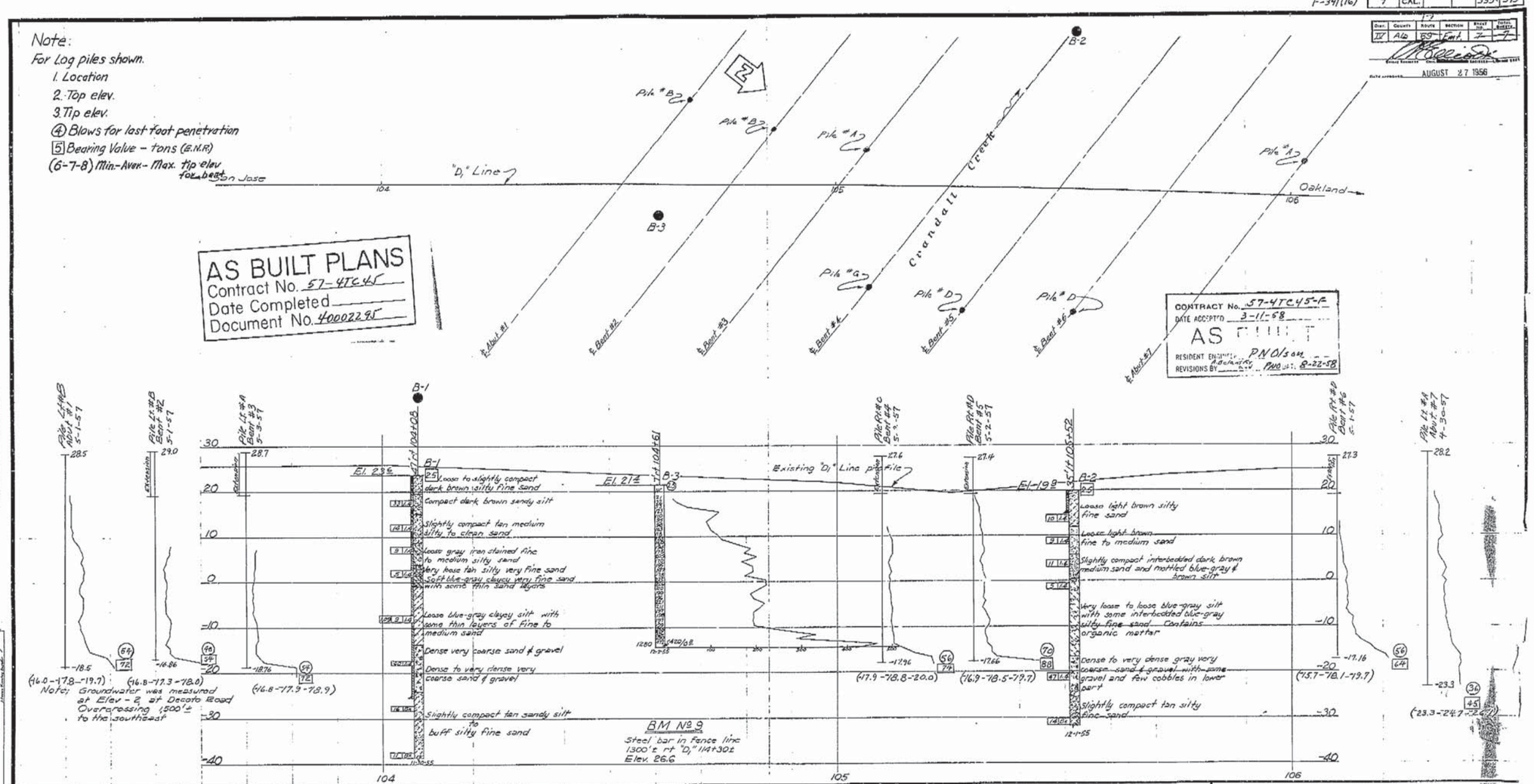
F-341(16)

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.			335	349

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
IV	Ala	69	Ent.	7	7

AUGUST 27 1956

Note:
For Log piles shown.
1. Location
2. Top elev.
3. Tip elev.
4. Blows for last foot penetration
5. Bearing Value – tons (E.N.R.)
(6-7-8) Min.-Aver.- Max. tip elev for abut.



AS BUILT PLANS
Contract No. 57-4TC45
Date Completed
Document No. 40002295

CONTRACT No. 57-4TC45-F
DATE ACCEPTED 3-11-68
AS BUILT
RESIDENT ENGINEER P.N. Olsen
REVISIONS BY Adamson Date 8-22-58

BRIDGE DEPARTMENT

FIELD STUDY	W. Hager	12-55
DRAWN	W. Hager	12-55
CHECKED	W. Hager	1-56

Approved for Submission by: [signature]

Classification of Material Based on Standard Grade Size Limits

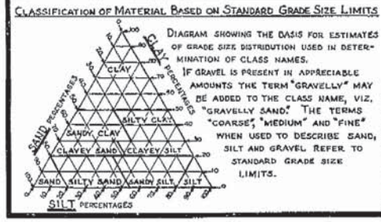


Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz, "gravelly sand." The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

Legend of Earth Materials

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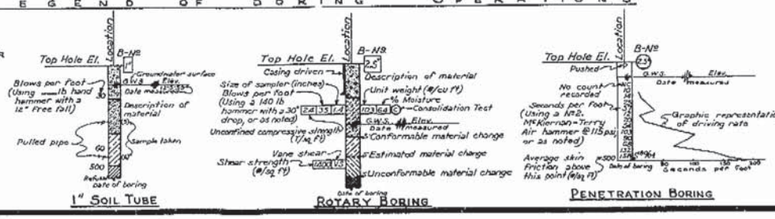
- Rotary Boring (Wet)
- Auger Boring (Dry)
- Jet Boring
- Core Boring
- Test Pit



Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

CRANDALL CREEK BRIDGES

LOG OF TEST BORINGS

SCALE 1" = 10' | BRIDGE 33-273 S/L | FILE E-2 | DRAWING B-4796

PRELIM. DRAWING NO. B-4796 7

337

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE June 21, 1971 SIGNATURE [signature] TITLE Records Officer

ClibPDF - www.fastio.com

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.			772	288

F-341(18)

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
IV	Ala	69	D	11	11

Date approved November 18, 1955

BRIDGE DEPARTMENT

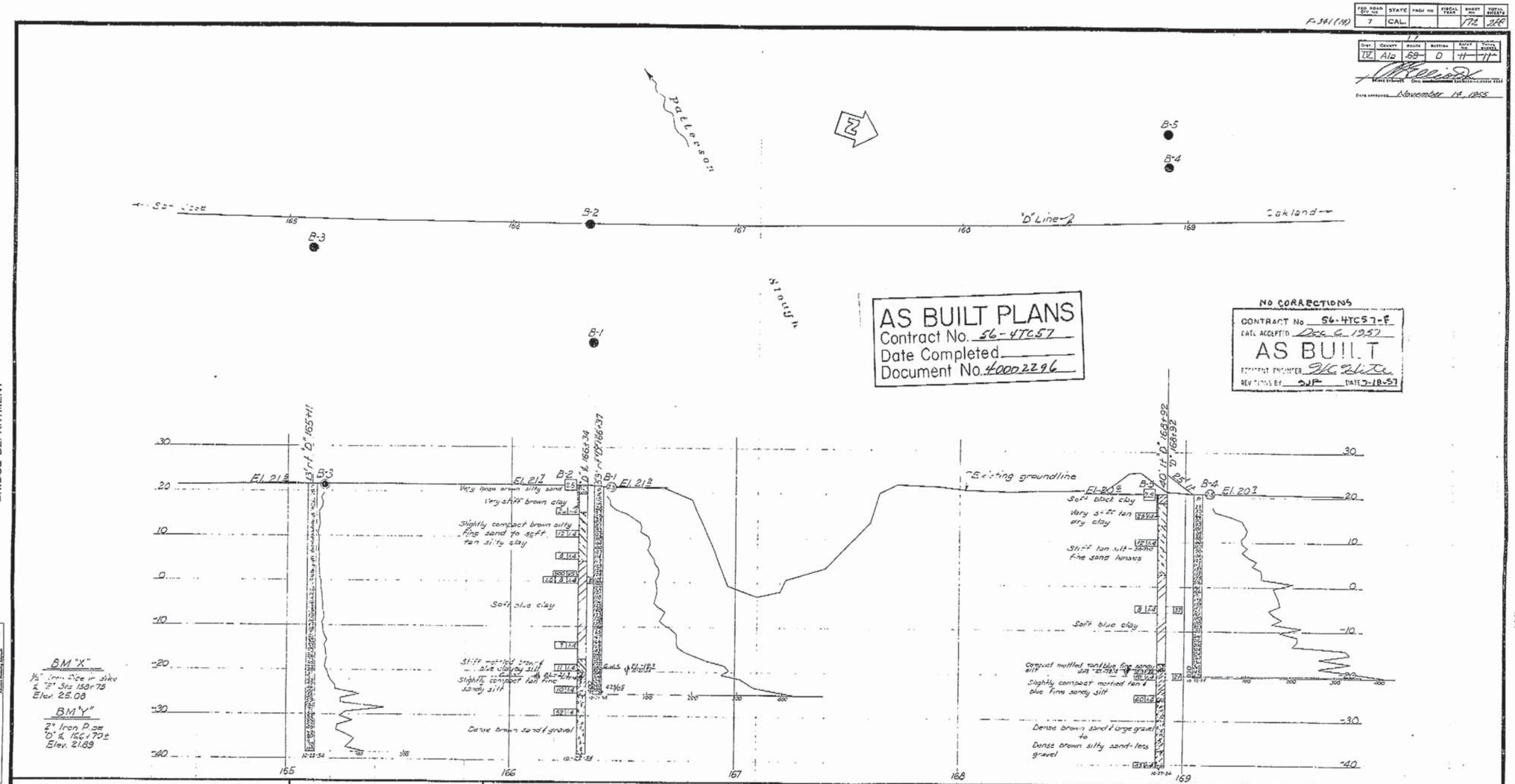

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Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand." The terms "coarse," "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

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- 2½" Cone Penetrometer
- Sampler boring (dry)
- Rotary boring (wet)
- Auger boring (dry)
- Jet boring
- Core boring
- Test pit

1" Soil Tube — Rotary Boring — Penetration Boring

Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

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State of California
Department of Public Works
Division of Highways

Bridge Across Patterson Slough

Log of Test Borings

Scale Horiz. 1"=20' Vert. 1"=10 | Bridge 33-250 ½ | File | Drawing C-4135-11

RR-4135-3

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE June 21, 1971 SIGNATURE [illegible] TITLE Highway Information Officer

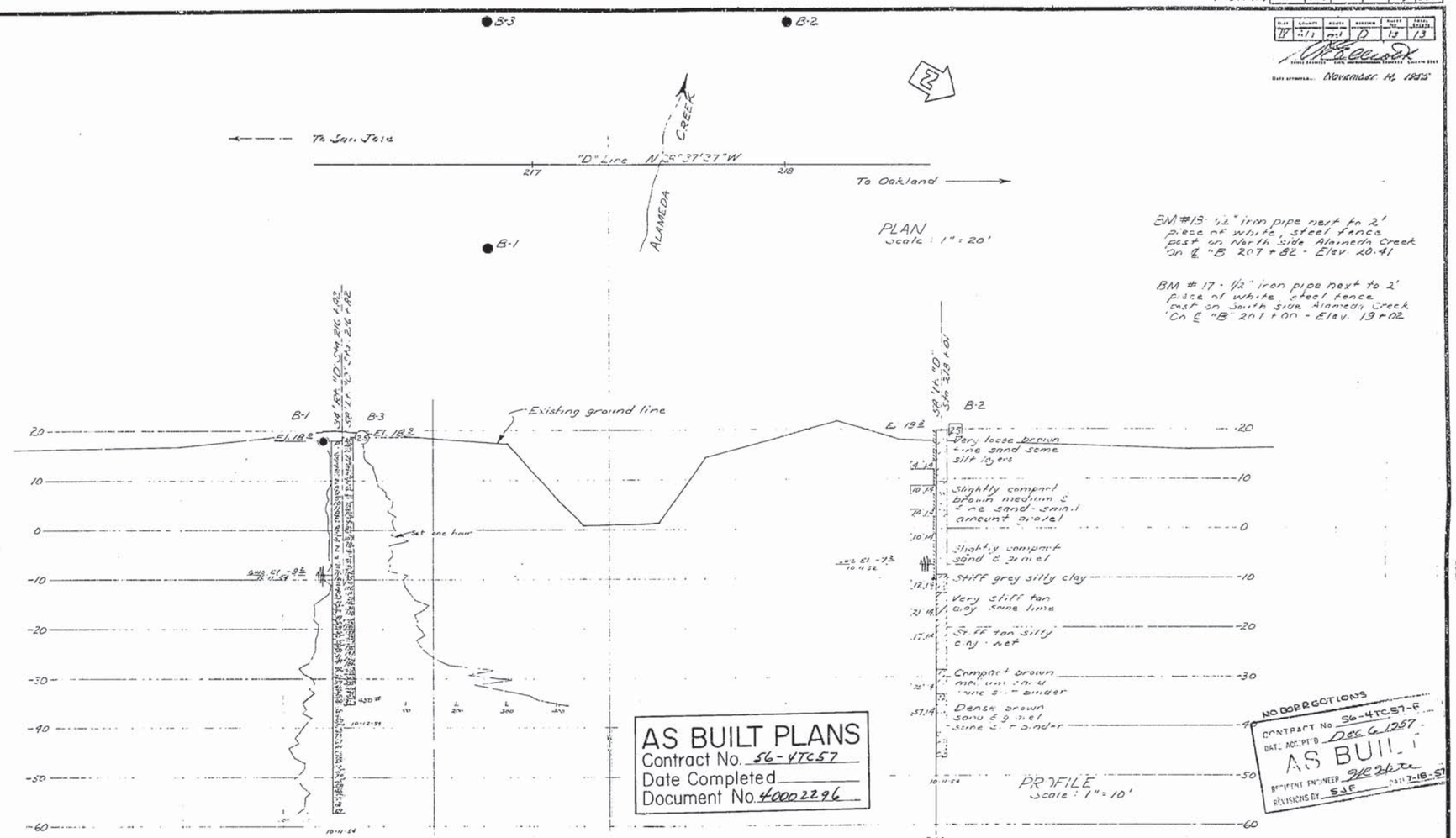
ClibPDF - www.fastio.com

F-341 (14)

DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
04	Alm	17	D	13	13

Date approved November 14, 1955

BRIDGE DEPARTMENT

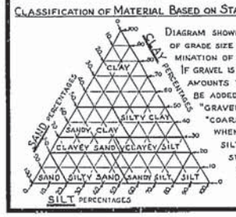


AS BUILT PLANS
Contract No. 56-4TC57
Date Completed
Document No. 40002296

NO CORRECTIONS
CONTRACT No. 56-4TC57-F
DATE ACCEPTED Dec. 6, 1957
AS BUILT
RESIDENT ENGINEER
REVISIONS BY SJF DATE 7-18-57

FIELD STUDY: H. A. Moreck 10-54
DESIGN: H. A. Moreck 12-54
CHECKED: H. A. Moreck 1-55
Approval Recommended by: T. H. Kirkwood, Chief Bridge Engineer

Classification of Material Based on Standard Grade Size Limits



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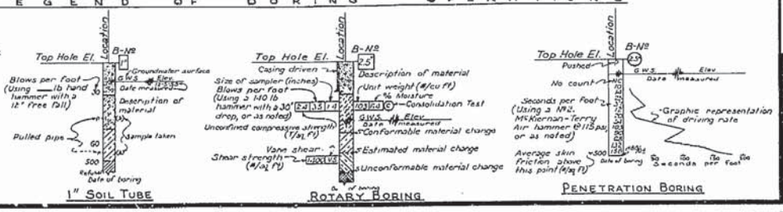
- 2¼" Cone Penetrometer
- Sampler Boring (Dry)
- Rotary Boring (Wet)
- Auger Boring (Dry)
- Jet Boring
- Core Boring
- Test Pit



Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

BRIDGE ACROSS ALAMEDA CREEK

LOG OF TEST BORINGS

Scale	Bridge	File	Drawing
A. [illegible]	33-2[illegible]		C-3958-13

Full Drawing 3958-39

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE: SIGNATURE: TITLE:

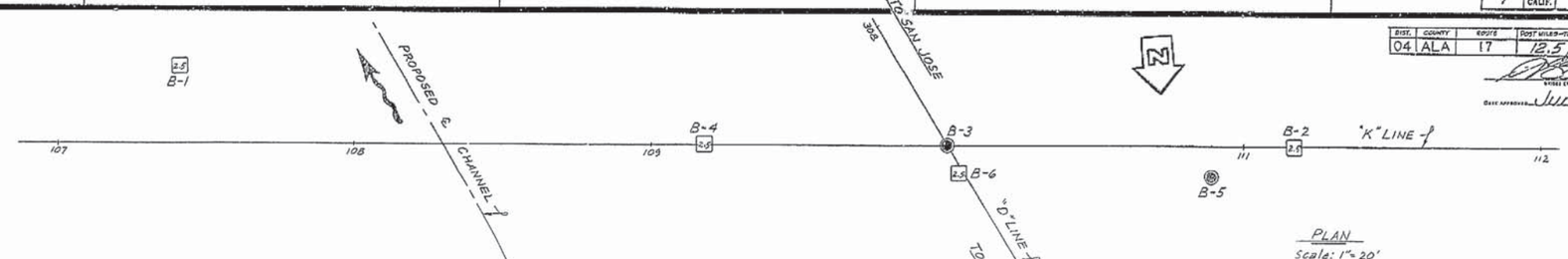
ChipPDF - www.fastro.com

FED. ROAD DIV. NO.	STATE	F. A. PROJECT No.	SHEET NO.	TOTAL SHEETS
7	CALIF.			

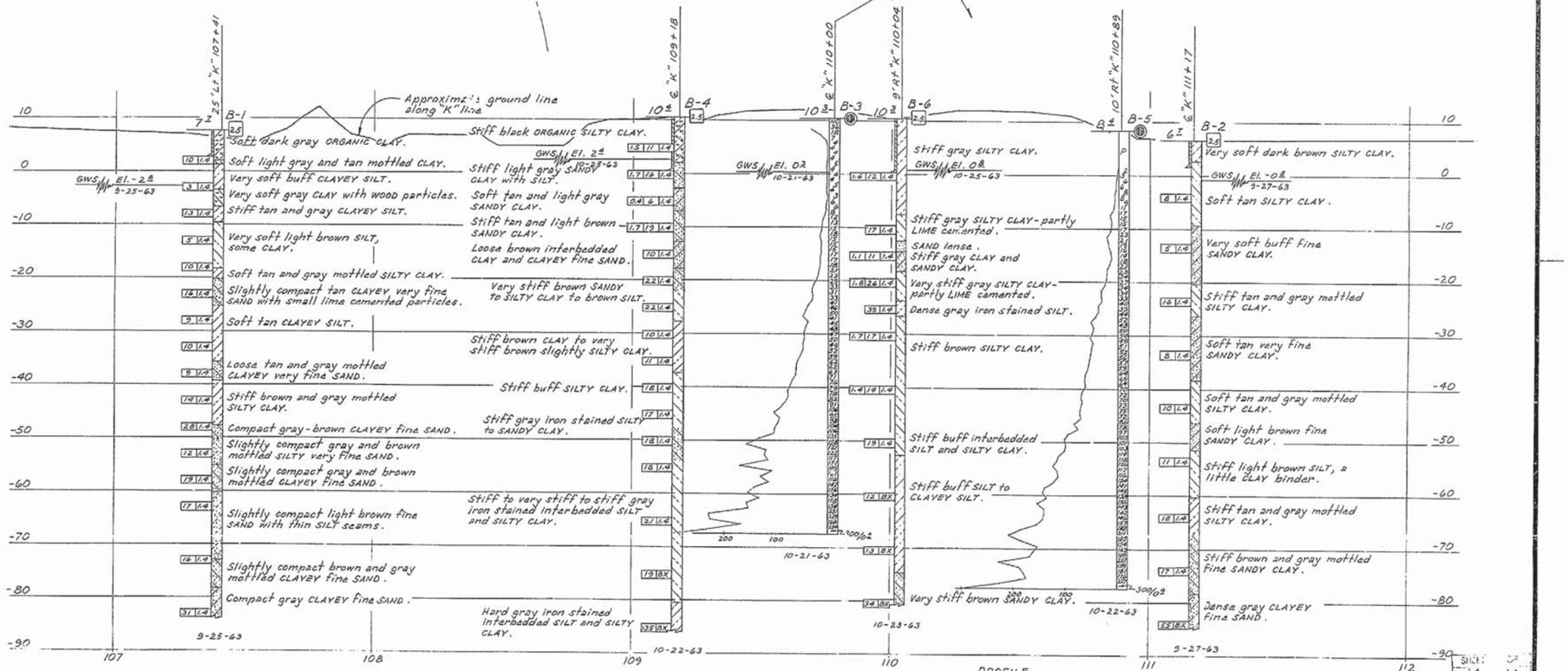
DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	ALA	17	12.5/15.2	126	137

BRIDGE ENGINEER — CIVIL ENGINEER—LICENSE EXPS.

DATE APPROVED June 19, 1967



PLAN
Scale: 1" = 20'



PROFILE
Scale: Horiz. 1" = 20'
Vert. 1" = 10'

BM
S. rim MH cover 13'± Rt "K" 107+28
Elev. 10.1±

BM
Brass cap in DI @ "D" 309+70
Elev. 9.95

AS BUILT PLANS
Contract No. 04-234804
Date Completed 6-19-67
Document No. 40006196

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

INDUSTRIAL PARKWAY OVERCROSSING

LOG OF TEST BORINGS

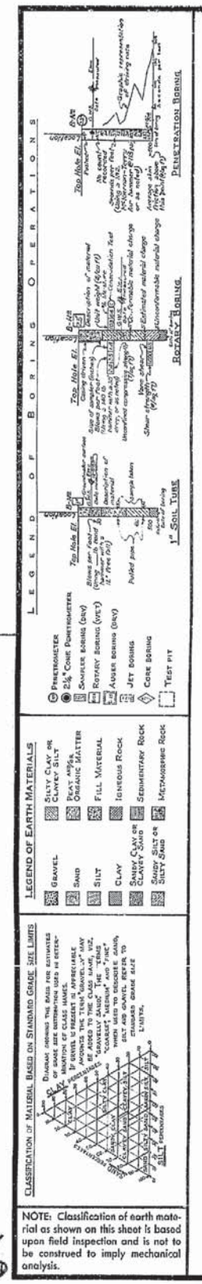
SCALE AS NOTED | BRIDGE 33-398 | POST MILE 14.5 | DRAWING 33398-12

SHEET 14 OF 14

Disregard prints bearing earlier numbers → PREL. DRAWING NO. PR-

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.

DATE 3/5/74 | SIGNATURE James E. Court | TITLE Microfilm Supervisor



NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

FIELD STUDY	by R. HABER	10-2-63
DRAWN	by R. HABER	10-24-63
CHECKED	by R. HABER	11-14-63

Approval Recommended: E. E. Gilgebach, Engineering Geologist

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

126

MICROFILM - STATE OF CALIFORNIA - DEPARTMENT OF PUBLIC WORKS - MICROFILM
SCALE 1" = 50'
SCALE 1" = 20'
ClibPDF - www.fastio.com

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	12.8/13.2	276	295

GEOTECHNICAL PROFESSIONAL 1/27/95

6-10-96
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/97 GEOTECHNICAL STATE OF CALIFORNIA

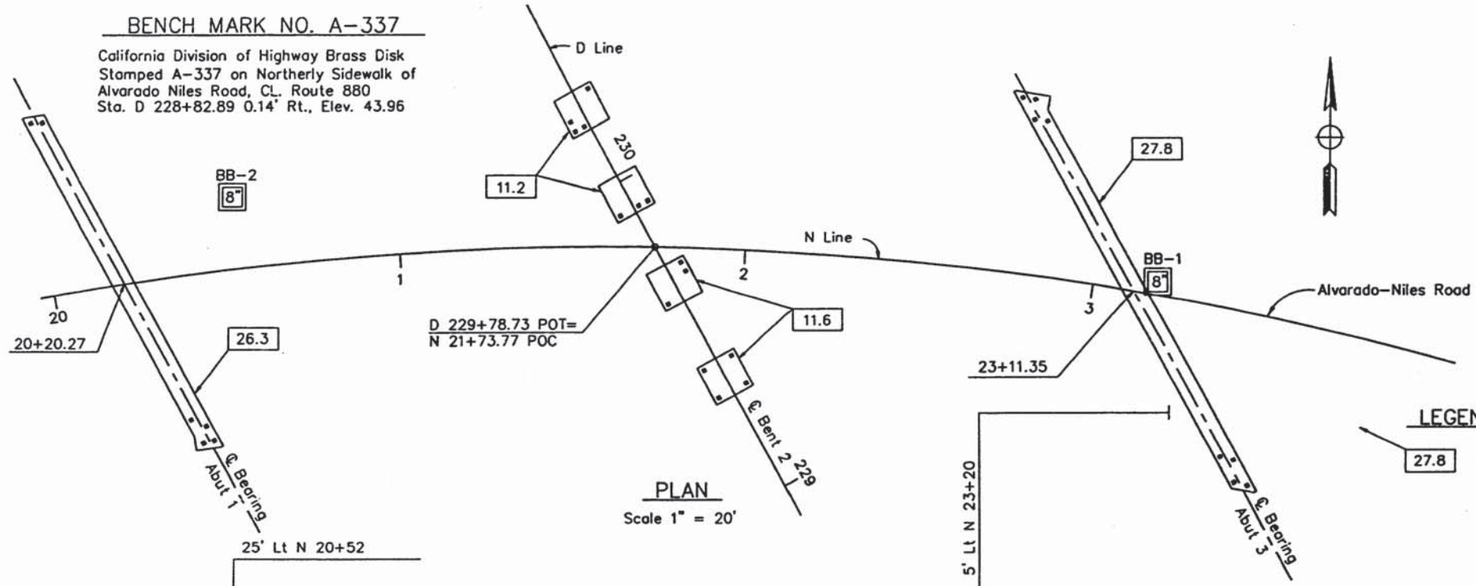
ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE SUITE 600
OAKLAND, CA 94612

PARIKH CONSULTANTS, INC.
481 VALLEY WAY
MILPITAS, CA 95035

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

BENCH MARK NO. A-337

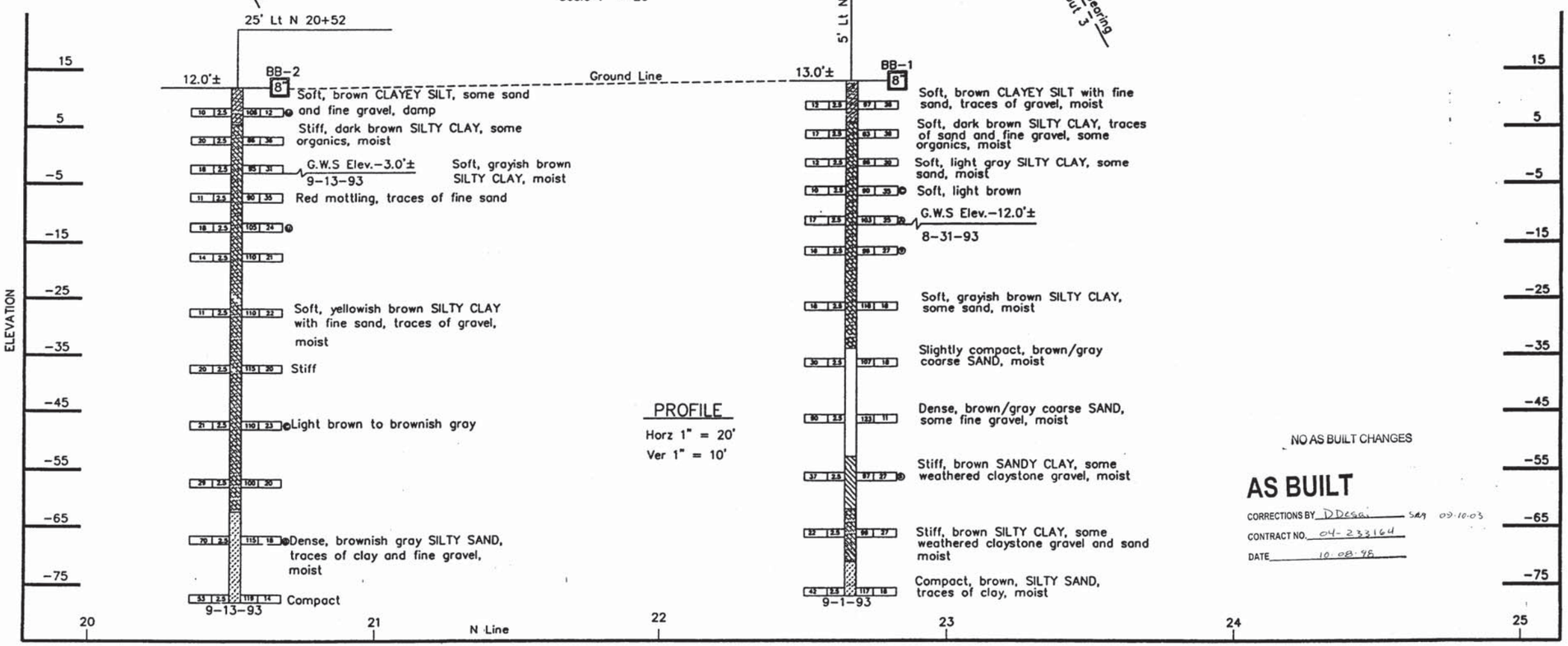
California Division of Highway Brass Disk Stamped A-337 on Northerly Sidewalk of Alvarado Niles Road, CL. Route 880 Sta. D 228+82.89 0.14' Rt., Elev. 43.96



PLAN
Scale 1" = 20'

LEGEND

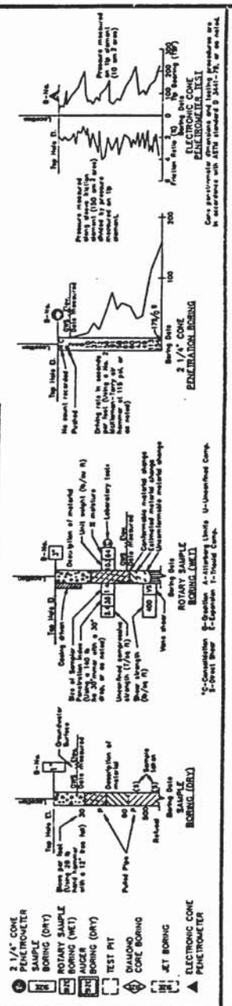
27.8 Denotes bottom of footing elevation



PROFILE
Horz 1" = 20'
Ver 1" = 10'

NO AS BUILT CHANGES

AS BUILT
CORRECTIONS BY D Degan 09-10-03
CONTRACT NO. 04-233164
DATE 10-08-98



LEGEND OF EARTH MATERIALS

GRAVEL, SAND, SILT, CLAY, CLAYEY SILT, PEAT and/or ORGANIC MATTER, FILL MATERIAL, IGNEOUS ROCK, SEDIMENTARY ROCK, METAMORPHIC ROCK, SANDY CLAY or CLAYEY SAND, SANDY SILT or SILTY SAND, SILTY CLAY

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Penetration Resistance (Blows/Ft)	Granular	Cohesive
0-4	Very loose	Very soft
5-9	Loose	Soft
10-19	Slightly compact	Stiff
20-34	Compact	Very stiff
35-69	Dense	Hard
> 70	Very dense	Very hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT 6/23/95	DRAWN BY P. QUACH	E. BHANGOO FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
SIGN OFF DATE	CHECKED BY Y.D. WANG	DATE SEPTEMBER 93	

Y.D. WANG
PROJECT ENGINEER

BRIDGE NO. 33-631
POST MILE 13.0

ALVARADO-NILES ROAD OVERCROSSING
LOG OF TEST BORINGS

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04183
EA 233161

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) 3/27/94 7/27/94 9/26/94 11/29/94 1/30/95

SHEET 22 OF 22

PCI Job No. 93102.12 Plate 2

ALVNLTB

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.
04	Ala	880	13.0/14.5	332

12-16-91
PLANS APPROVAL DATE

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY
CERTIFIED ENGINEERING GEOLOGIST
PROJECT GEOLOGIST

WHIPPLE ROAD U.C. (WIDEN)

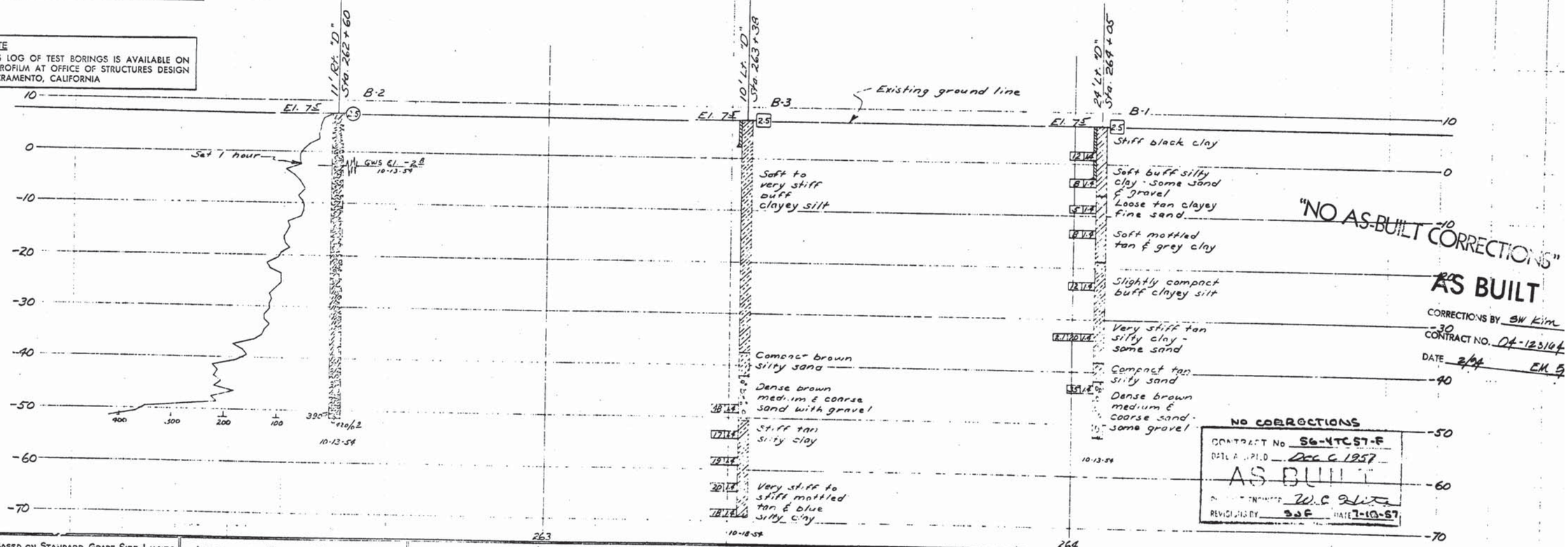
LOG OF TEST BORINGS

		CU: 04 EA: 123161	BRIDGE No. 33-245

REGISTERED GEOLOGIST — GOLDSCHMIDT No. 271 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

AS BUILT PLANS
Contract No. 56-4TC57
Date Completed
Document No. 40002296

NOTE
THIS LOG OF TEST BORINGS IS AVAILABLE ON MICROFILM AT OFFICE OF STRUCTURES DESIGN SACRAMENTO, CALIFORNIA



"NO AS-BUILT CORRECTIONS"

AS BUILT
CORRECTIONS BY SW Kim
CONTRACT NO. 04-123164
DATE 2/04 EM 5

NO CORRECTIONS
CONTRACT No 56-4TC57-F
DATE APPLIED Dec 6 1957
AS BUILT
RESIDENT ENGINEER W.C. White
REVISIONS BY SJF DATE 1-10-57

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

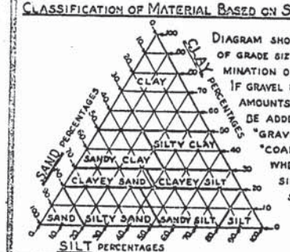


DIAGRAM SHOWING THE BASIS FOR ESTIMATES OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES.
IF GRAVEL IS PRESENT IN APPRECIABLE AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ. "GRAVELLY SAND." THE TERMS "COARSE", "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE SAND, SILT AND GRAVEL REFER TO STANDARD GRADE SIZE LIMITS.

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- SANDY SILT OR SILTY SAND
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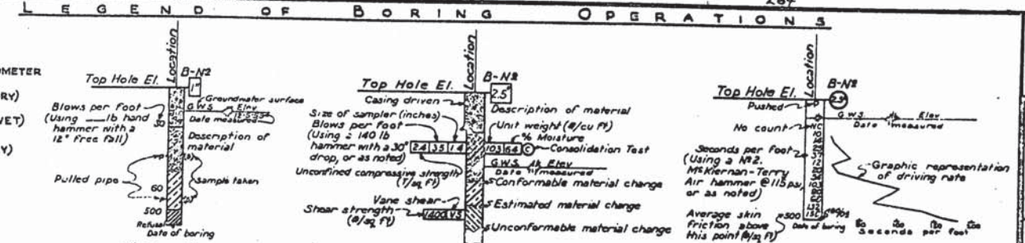
- FILL MATERIAL
- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

LEGEND OF BORING OPERATIONS

- PLAN OF ANY BORING
- PENETROMETER
- 2½" CONE PENETROMETER
- SAMPLER BORING (DRY)
- ROTARY BORING (WET)
- AUGER BORING (DRY)
- JET BORING
- CORE BORING
- TEST PIT



NOTES

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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

WHIPPLE ROAD UNDERCROSSI

LOG OF TEST BORINGS

SCALE 1" = 10'	BRIDGE 33-245 R/L	FILE	DRAWING 4035-

PREL. DRAWING No. F-4035 25 26 41 56

PR-4035

BRIDGE DEPARTMENT

ClibPDF - www.fastio.com

FED. ROAD DIST. NO.	STATE	FISCAL YR.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
7	CAL.			266	286

F-341 (14)

04 Ala 880 13.7 / 16.2 182 184

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
04	Ala	880	TT	12	

November 14 1958

AS BUILT PLANS
Contract No. 04-123154
Date Completed 10-31-91
Document No.

AS BUILT PLANS
Contract No. 56-476C7
Date Completed
Document No. 40002311

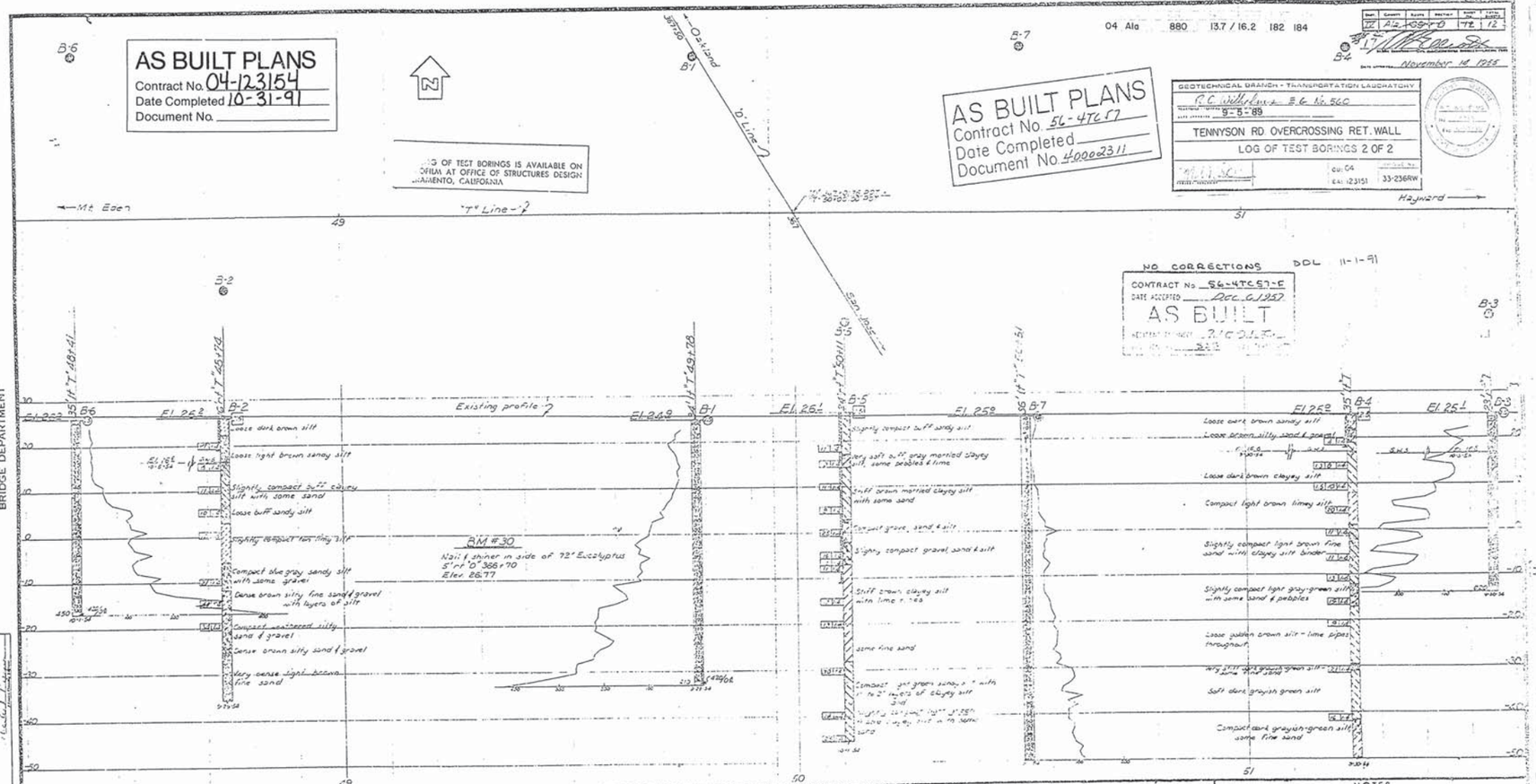
GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY
R.C. Wolfe Exp. E.G. No. 560
9-5-89
TENNYSON RD OVERCROSSING RET. WALL
LOG OF TEST BORINGS 2 OF 2
DIST. 04 EA. 123151 33-236RW

NO CORRECTIONS DDL 11-1-91

CONTRACT No. 56-476C7-E
DATE ACCEPTED Dec. 6, 1957
AS BUILT

...G OF TEST BORINGS IS AVAILABLE ON ...FILM AT OFFICE OF STRUCTURES DESIGN ...RAMENTO, CALIFORNIA

BRIDGE DEPARTMENT



Classification of Material Based on Standard Grade Size Limits

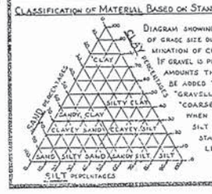


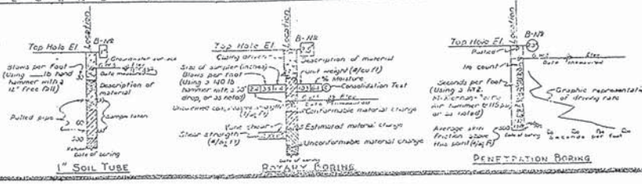
Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand". The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

Legend of Earth Materials

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

Legend of Boring Operations

- Plan of any boring
- Penetrometer
- 2½" Cone Penetrometer
- Sampler boring (CLY)
- Rotary boring (WET)
- Auger boring (DRY)
- Jet boring
- Core boring
- Test pit



Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.
Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

TENNYSON ROAD OVERCROSSING

LOG OF TEST BORINGS 2 OF 2

SCALE 1" = 10' | BRIDGE 33-236 | FILE | DRAWING G-3585-12

PREL. DRAWING NO. P-3582 | 13 | 1/91

Sheet 8 of 8

CERTIFICATE OF ACCURATE MICROFILM IMAGE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ADM 8042 (REV. 3-88)

I hereby certify that this is a true and accurate image of the above document taken under my direction and control on this date in Sacramento, California pursuant to authorization by the Director of Transportation.

SUPERVISOR OF MICROFILM SERVICES (Signature) | DATE 6/12/92

30X

FED. ROAD DIV. No	STATE	PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
7	CAL.			234	260

F-221 (12)

DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
04	Ala	880	0	72	78

DATE APPROVED November 14, 1990

DIST	COUNTY	RDUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	13.0/14.5	292	354

12-16-91
PLANS APPROVAL DATE

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY

CERTIFIED ENGINEERING GEOLOGIST
PROJECT GEOLOGIST

ALQUIRE ROAD U.C. (WIDEN)

LOG OF TEST BORINGS

		CU: 04 EA: 123161	BRIDGE No. 33-246

REGISTERED GEOLOGIST — GOLDSCHMIDT — No. 271 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

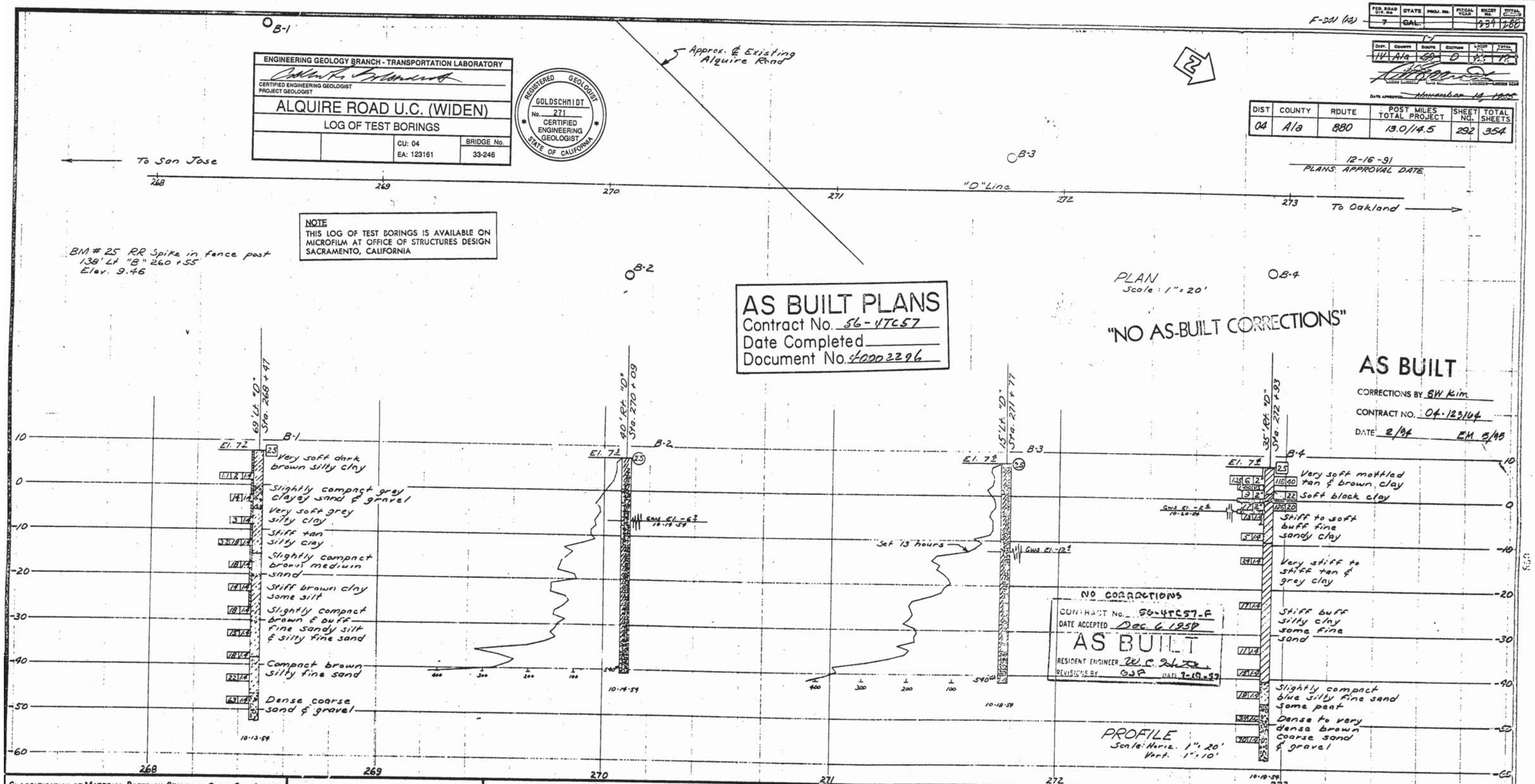
NOTE
THIS LOG OF TEST BORINGS IS AVAILABLE ON MICROFILM AT OFFICE OF STRUCTURES DESIGN SACRAMENTO, CALIFORNIA

AS BUILT PLANS
Contract No. 56-4TC57
Date Completed
Document No. 40002296

"NO AS-BUILT CORRECTIONS"

AS BUILT
CORRECTIONS BY SW Kim
CONTRACT NO. 04-123104
DATE 2/94 EM 5/95

NO CORRECTIONS
CONTRACT No. 56-4TC57-F
DATE ACCEPTED Dec. 6, 1959
AS BUILT
RESIDENT ENGINEER W. C. Schatz
REVISIONS BY OSP DATE 7-19-97



Classification of Material Based on Standard Grade Size Limits

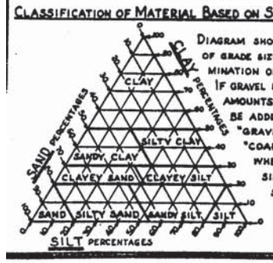


Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand." The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

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- Plan of any boring
- Penetrometer
- 2¼" Cone Penetrometer
- Sampler boring (DRY)
- Rotary boring (WET)
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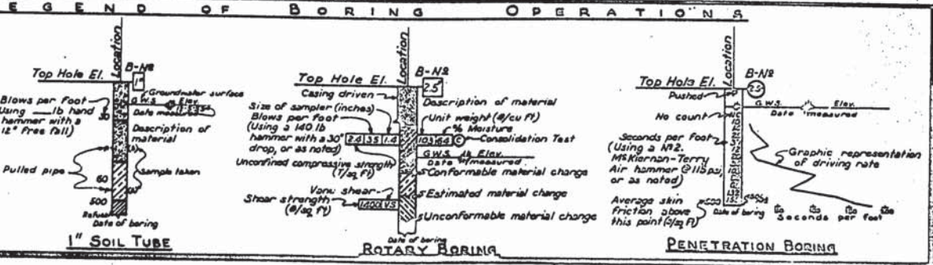
- Jet boring
- Core boring
- Test pit



NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

ALQUIRE ROAD OVERHEAD

LOG OF TEST BORINGS

SCALE As Noted	BRIDGE 33-246	FILE	DRAWING C-4036-12

PREL. DRAWING NO. P-4036 | 25

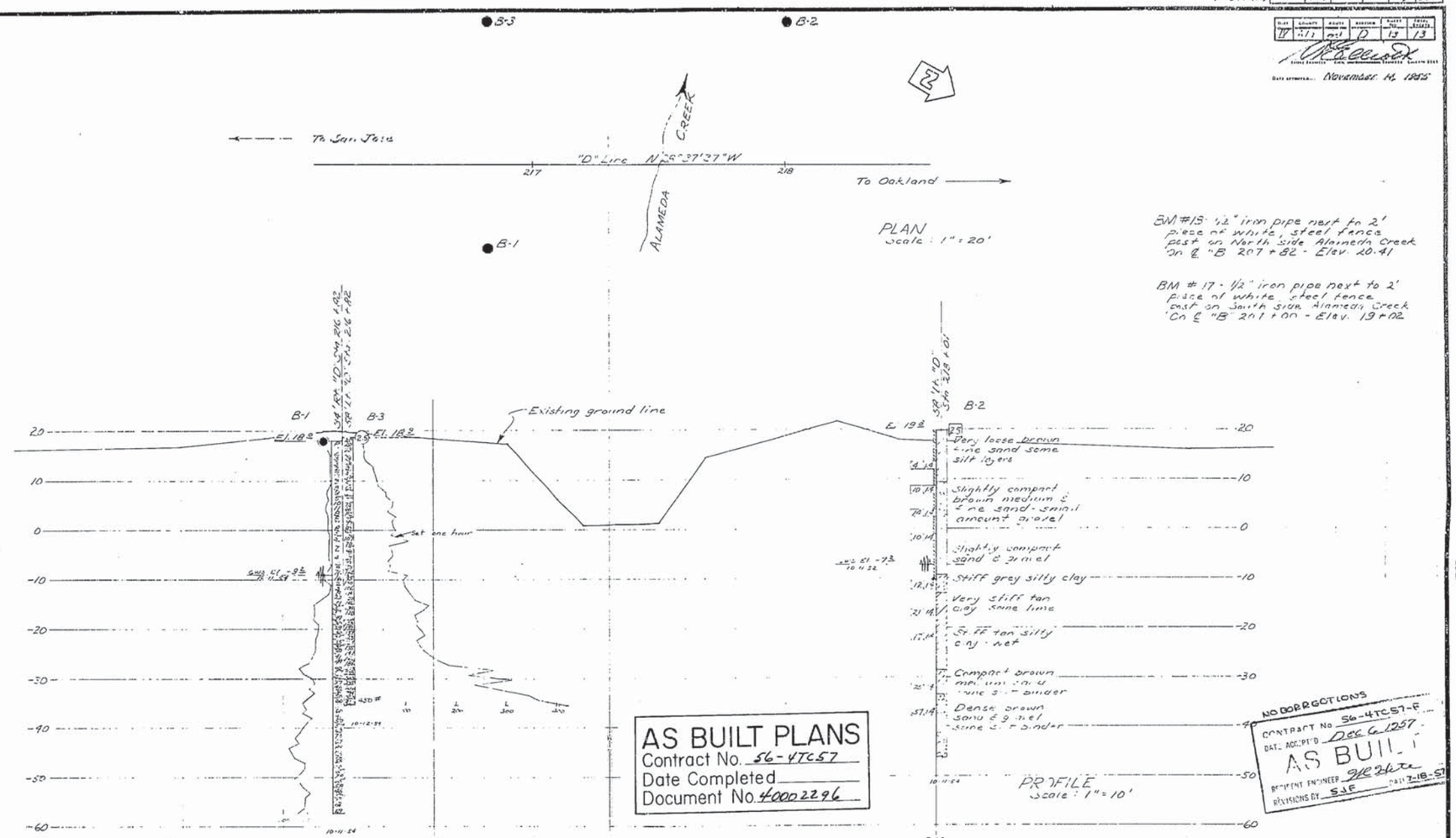
ChbPDF - www.fastio.com

F-341 (14)

DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
04	Alm	17	D	13	13

Date approved November 14, 1955

BRIDGE DEPARTMENT



AS BUILT PLANS
Contract No. 56-4TC57
Date Completed
Document No. 40002296

NO CORRECTIONS
CONTRACT No. 56-4TC57-F
DATE ACCEPTED Dec. 6, 1957
AS BUILT
RESIDENT ENGINEER
REVISIONS BY SJF DATE 7-18-57

FIELD STUDY: H. A. Moreck 10-54
DESIGN: H. A. Moreck 12-54
CHECKED: H. A. Moreck 1-55
Approval Recommended by: T. H. Kirkwood, Chief Bridge Engineer

Classification of Material Based on Standard Grade Size Limits

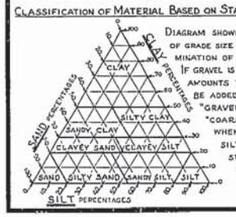


Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand". The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

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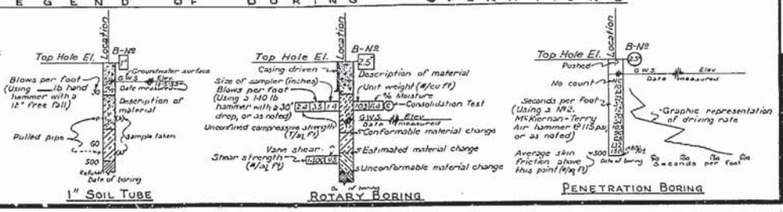
- Jet Boring
- Core Boring
- Test Pit



Notes

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Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

BRIDGE ACROSS ALAMEDA CREEK

LOG OF TEST BORINGS

Scale	Bridge	File	Drawing
A. [illegible]	33-2[illegible]		C-3958-13

Full Drawing 3958-39

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

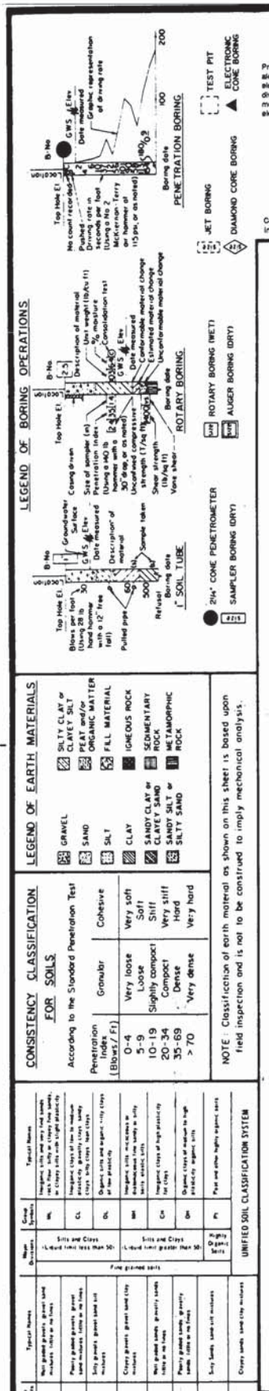
DATE: SIGNATURE: TITLE:

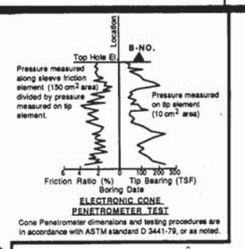
ChipPDF - www.fastro.com

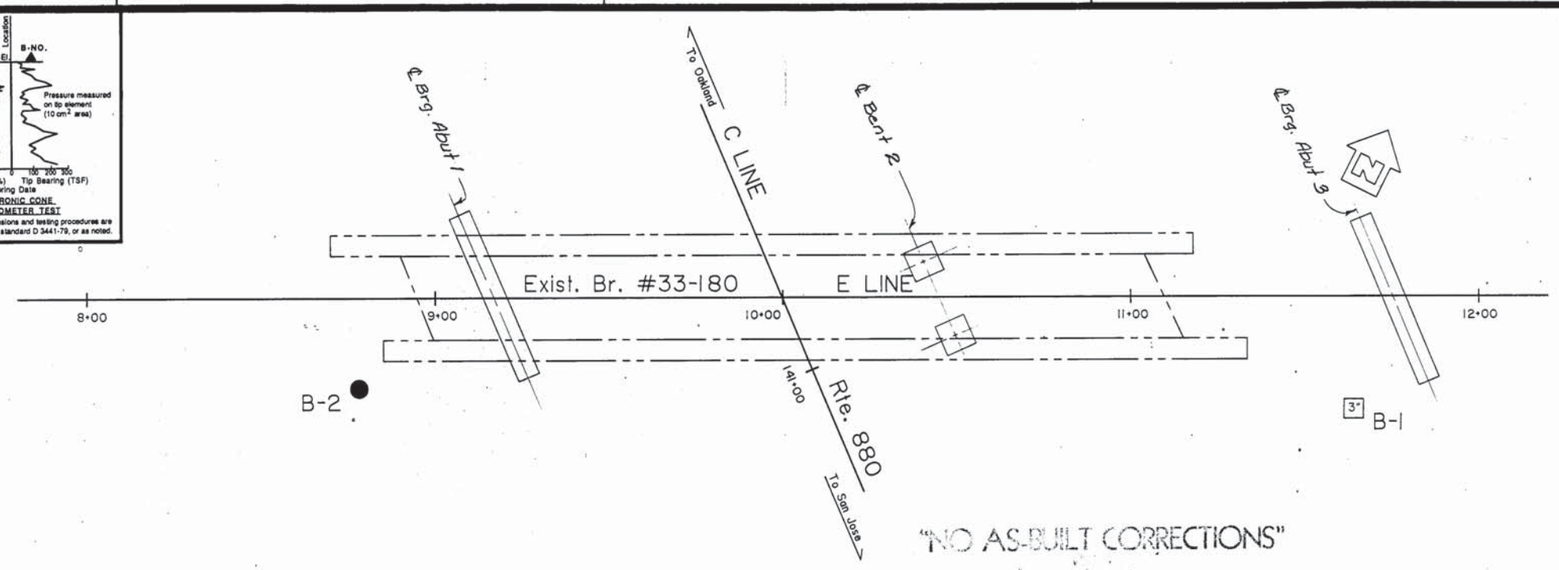
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	18.6/20.6	234	270

R.C. Wilhelms E.G. No. 560
REGISTERED - CERTIFIED ENGINEERING GEOLOGIST
5-30-89
PLANS APPROVAL DATE

REGISTERED GEOLOGIST R.C. WILHELMS No. 1719 Exp. 6-30-90 STATE OF CALIFORNIA

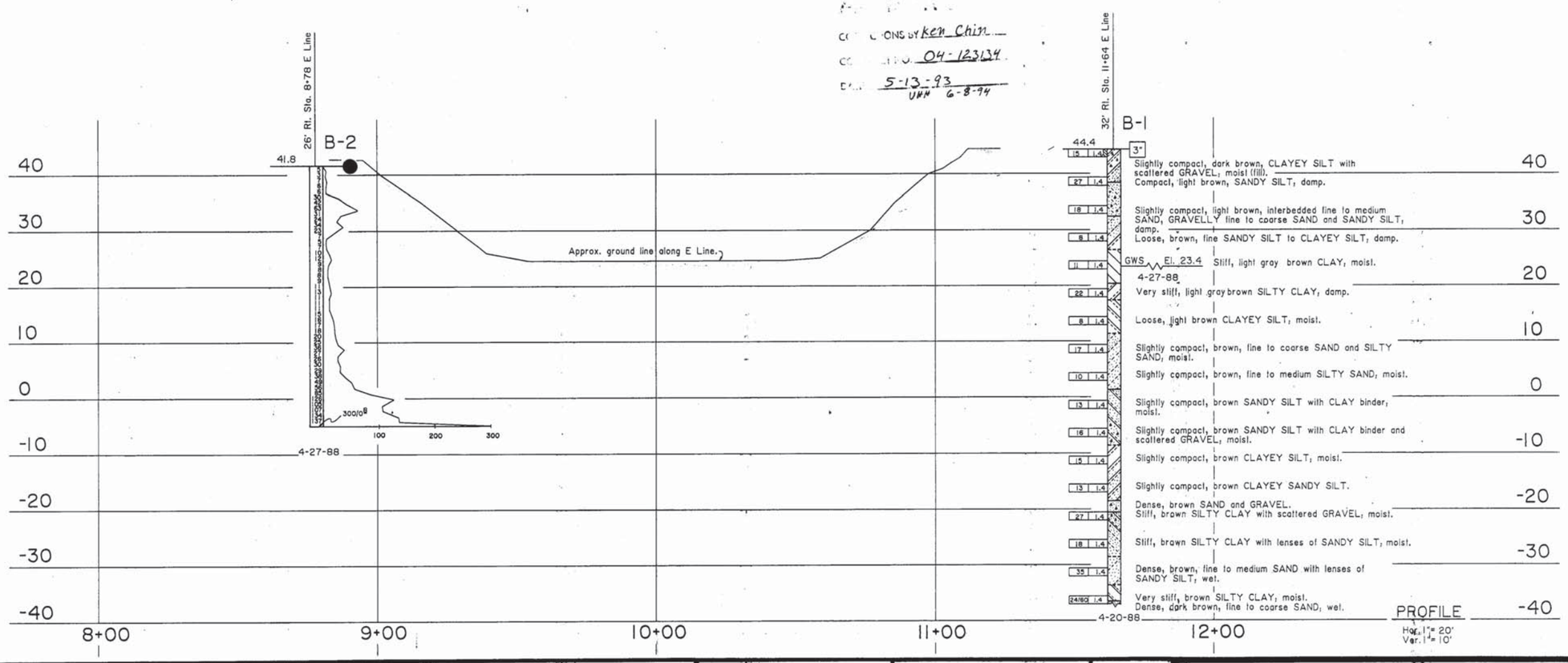






PLAN
1"=20'

"NO AS-BUILT CORRECTIONS"
CORRECTIONS BY Ken Chin
CONTRACT NO. 04-123134
DATE 5-13-93 UNM 6-8-94



PROFILE
Hor. 1"= 20'
Ver. 1"= 10'

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY

DRAWN BY	JOHN L. THORNE	6/88	George G. Miller, PROJECT GEOLOGIST — 632 C.E.G. NO.
CHECKED BY			

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN
John S Deeiny 41056
PROJECT ENGINEER — REGISTERED CIVIL ENGINEER NO.

BRIDGE NO. 33-180
POST MILE 19.3

HACIENDA AVENUE OC
LOG OF TEST BORINGS 1 OF 2

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04173
EA 123131

Disregard prints bearing earlier revision dates

REVISION DATES (PRELIMINARY STAGE ONLY) 10/31/88

SHEET 15 OF 16

BS 8146 REV. 3/88

TRIM LINE

TRIM LINE

TRIM LINE

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	16.2/18.5	281	290

R.C. Wilhelms E.G. No. 560
REGISTERED · CERTIFIED
ENGINEERING GEOLOGIST

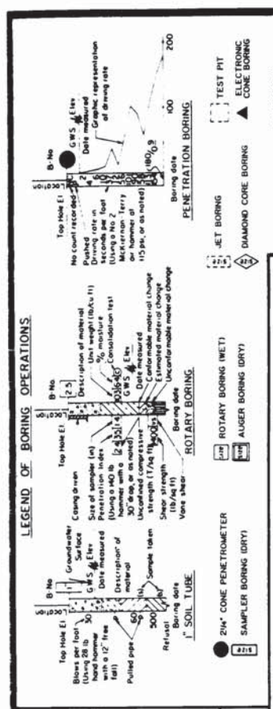
6-12-89
PLANS APPROVAL DATE

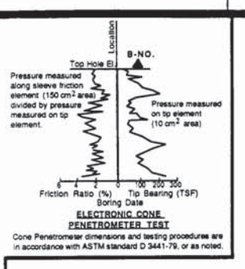
REGISTERED GEOLOGIST
R.C. WILHELMS
No. 1719
Exp. 6-30-90
STATE OF CALIFORNIA

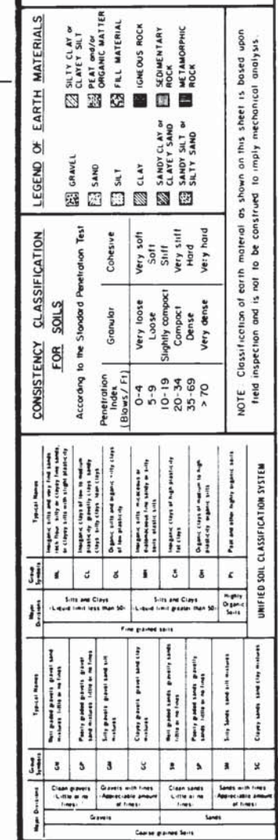
NO AS BUILT CHANGES

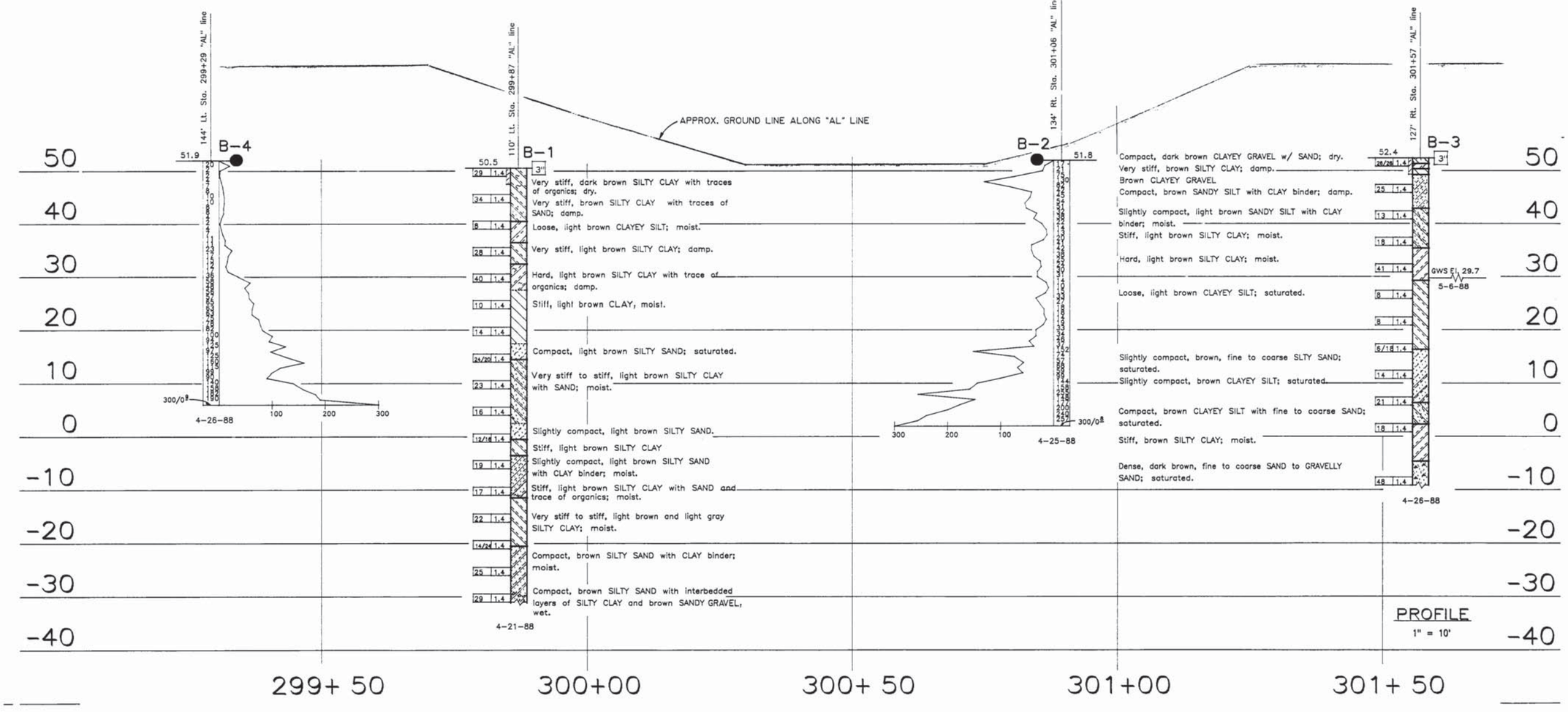
AS BUILT
CONTRACTOR M. HOLM
CONTRACT NO. 123144
DATE 12-2-92
M. Gomes 8-10-93

FOR PLAN VIEW SEE
"LOG OF TEST BORINGS 1 OF 3"









ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY			
DRAWN BY	IRMA GAMARRA	8/88	PROJECT GEOLOGIST 632 C.E.G. NO.
CHECKED BY			

State of
CALIFORNIA
DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN
PROJECT ENGINEER — REGISTERED CIVIL ENGINEER NO. C042268

BRIDGE NO. 33-179
POST MILE 18.4

"A" STREET UNDERCROSSING WIDENING
LOG OF TEST BORINGS 2OF3

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET | OF

ORIGINAL SCALE IN INCHES

CU 041173

ClipPDF www.ClipPDF.com

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Ala	880	22.6/24.0	727	760

GEOTECHNICAL PROFESSIONAL — DATE 12/1/11

4-16-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. G.E. 666 — Exp. 12/31/11 — GEOTECHNICAL — STATE OF CALIFORNIA

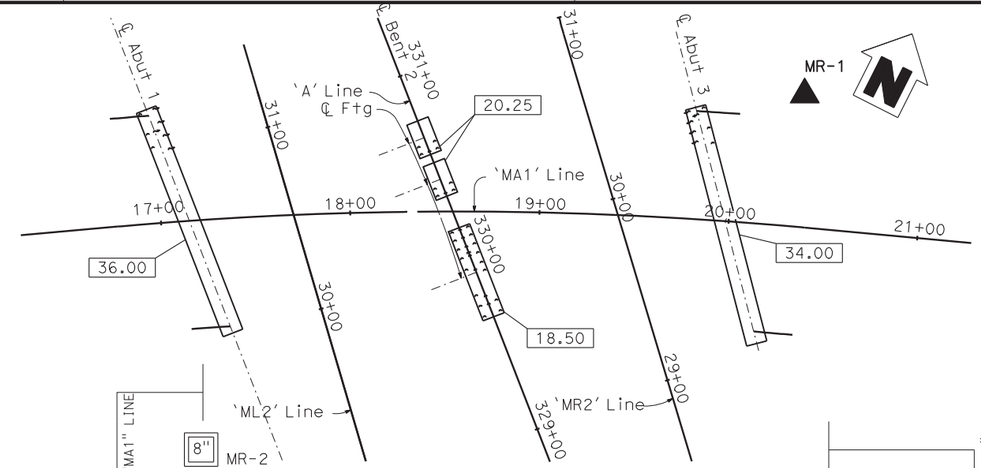
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

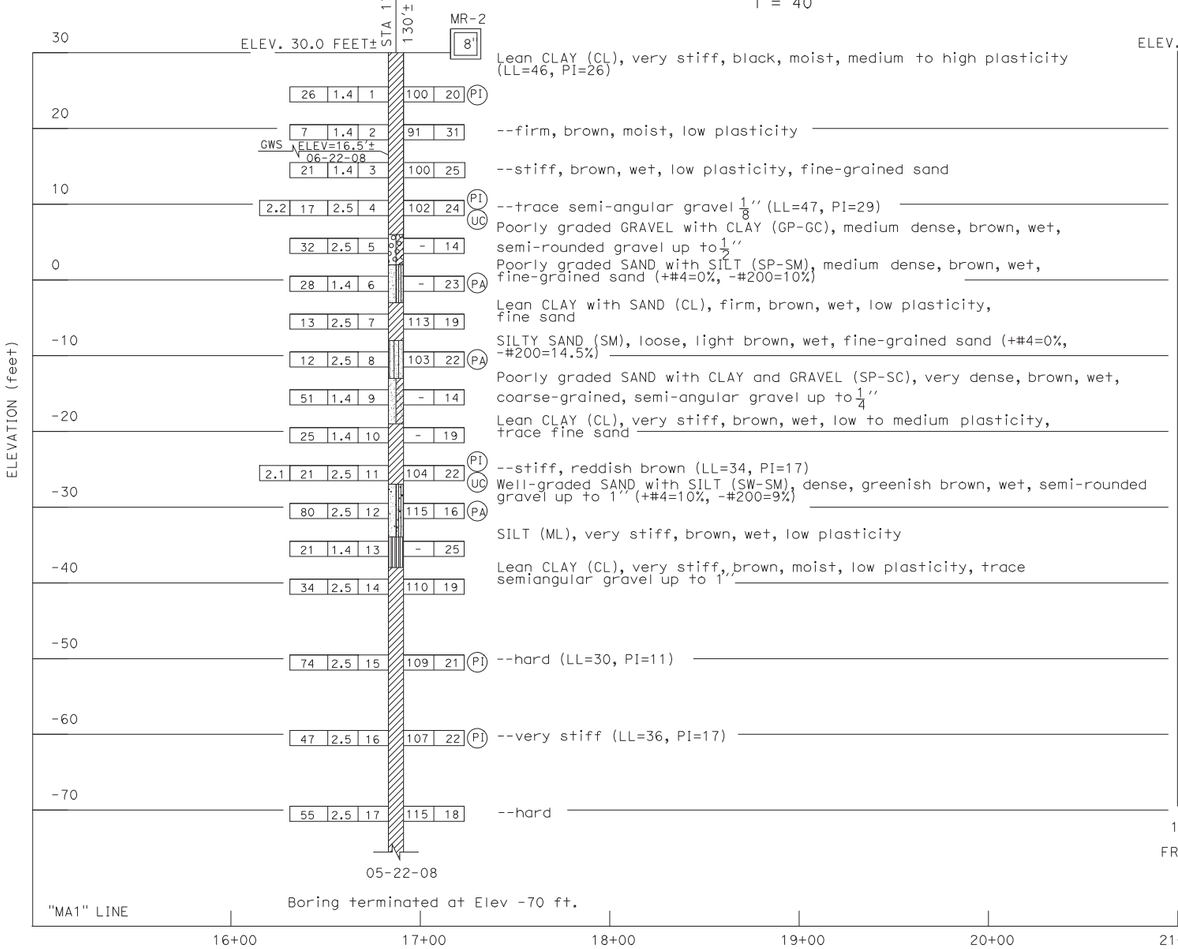
ACTC
1333 BROADWAY, SUITES 220 & 300
OAKLAND, CA 94612

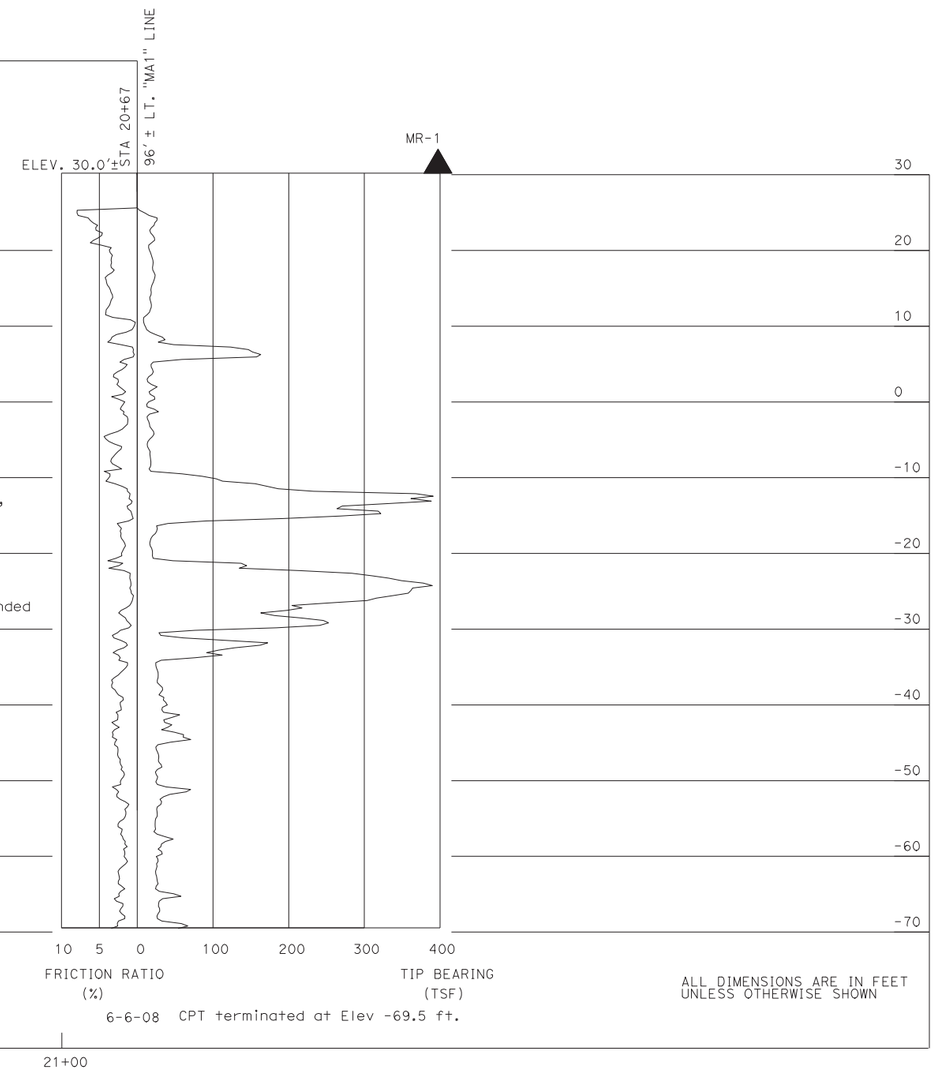
BENCHMARK:
3/4" IRON PIPE WITH PLUG ON NORTHBOUND ROUTE 880 ON-RAMP FROM WESTBOUND MARINA BLVD., ±17.4' SOUTH OF EDGE OF PAVEMENT.
NORTHING: 2,085,802.77; EASTING: 6,079,495.08;
ELEV. 30.97.

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



PLAN
1"= 40'





ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

DESIGN OVERSIGHT Yiwei Hu — 12/29/11 SIGN OFF DATE	DRAWN BY L. TRAN	L. BHANGOO / G. TRIPATHI FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY D. WANG	DATE: MAY & JUNE 2008	

D. WANG
PROJECT ENGINEER

BRIDGE NO. 33-0735
POST MILES 22.84

MARINA BLVD OC (REPLACE)
LOG OF TEST BORINGS 3 OF 5

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 7/16/10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT:
PROJECT NUMBER & PHASE:
CONTRACT NO.:

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: ~~11/16/09~~ ~~5/31/11~~ 10/17/11

SHEET 28 OF 30

FILE => 33-0735-z-ltb03.dgn

USERNAME => s124496 DATE PLOTTED => 19-APR-2012 TIME PLOTTED => 14:58

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	ALA	880	22.4		

GEOTECHNICAL PROFESSIONAL

09/04/91
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — LUIS MOURA — No. 2130 — Exp. 12/31/93 — GEOTECHNICAL — STATE OF CALIFORNIA

AGS, INC.
120 HOWARD STREET
SUITE 600
SAN FRANCISCO, CALIFORNIA 94105

Bench Marks

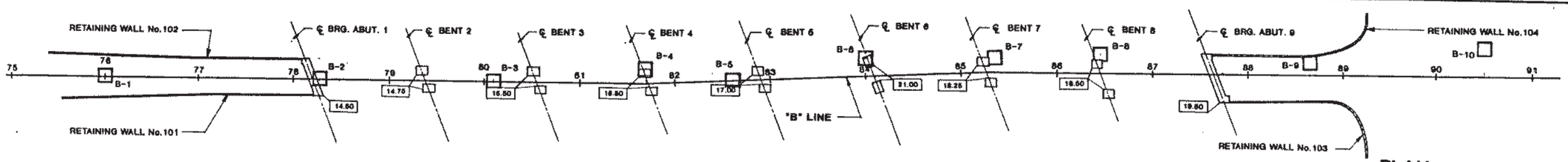
Top of punched Brass Disc in monument casting at Fairway Drive and Miller Street as shown on Parcel Map No.379 filed in Book 138 of Parcel Maps at page 80 Alameda County Records. Elev.18.19

Top of punched Brass Disc in monument casting in Cul-de-sac at Easterly end of Fairway Drive as shown on Parcel Map No.379 filed in Book 58 of Parcel Maps at page 80 Alameda County Records. Elev.22.60

Top of punched Brass Disc in monument casting at Aladdin Avenue and Teagarden Street as shown on Parcel Map No.2724 filed in Book 64 of Parcel Maps at page 80 Alameda County Records. Elev.26.39

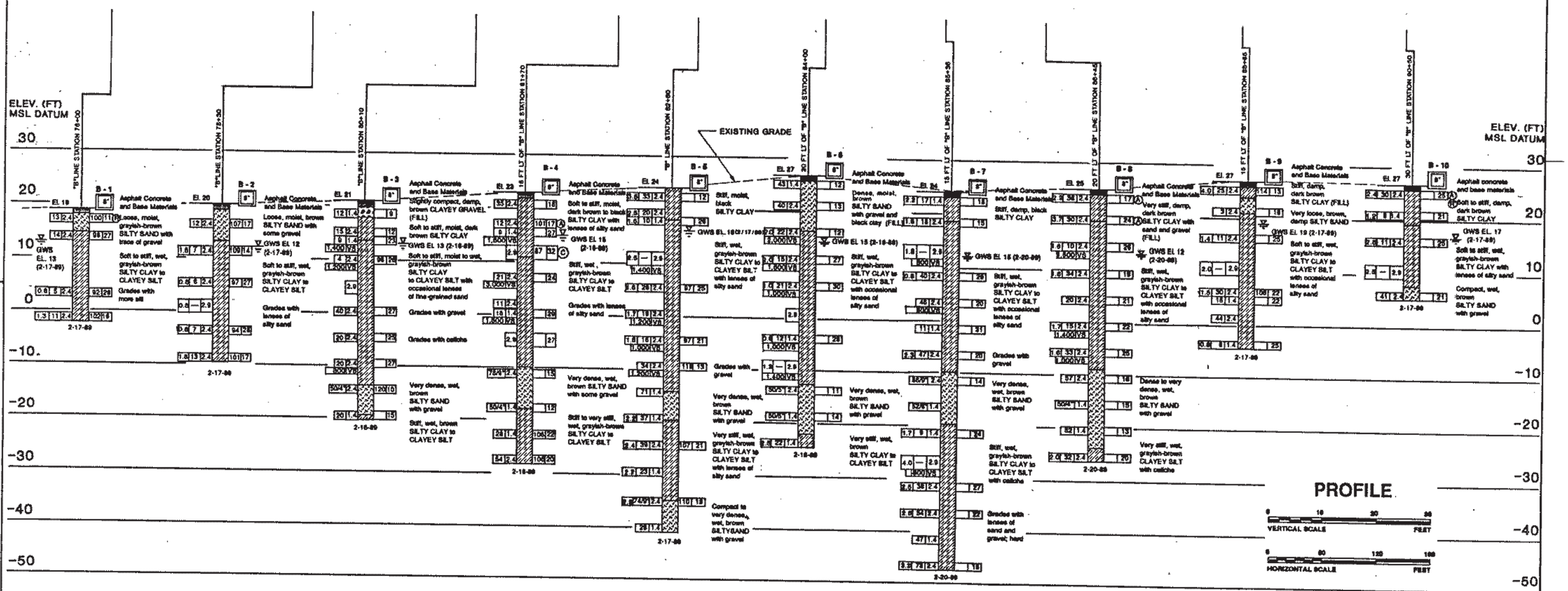
LEGEND:

- B-1 APPROXIMATE BORING LOCATION
- PROPOSED FOOTING, SHOWING PROPOSED BOTTOM ELEVATION IN FEET (18.25)
- PROPOSED RETAINING WALL



PLAN

SCALE 0 80 120 160 FEET



PROFILE

VERTICAL SCALE 0 10 20 30 FEET

HORIZONTAL SCALE 0 80 120 160 FEET

AS BUILT CHANGES UNKNOWN

LEGEND OF BORING OPERATIONS

LOCATION — TOP HOLE ELEV. — B-NO. — DESCRIPTION OF MATERIAL — DRY UNIT WEIGHT (LB/CU FT) — MOISTURE CONTENT (%) — LABORATORY TEST — CASING DRIVEN — SIZE OF SAMPLER — PENETRATION INDEX — BLOWS/FT USING A 140-LB HAMMER WITH 30-IN DROP, OR AS NOTED — UNCONFINED COMPRESSIVE STRENGTH (T/SQFT) AS MEASURED WITH POCKET PENETROMETER — SHEAR STRENGTH (LB/SQFT) — VANE SHEAR — DATE MEASURED — MATERIAL CHANGE — BORING DATE — SAMPLE BORING

LABORATORY TESTS

- COMPACTION
- CONSOLIDATION
- GRAIN SIZE ANALYSIS (WITH % FINES CONTENT)
- WASH ANALYSIS (WITH % FINES CONTENT)
- DIRECT SHEAR
- ATTERBERG LIMITS
- UNCONFINED COMPRESSION
- R-VALUE
- CORROSIVITY

PUSH SAMPLE — 2-1/4-IN. CONE PENETROMETER — ROTARY SAMPLE BORING (WET) — AUGER BORING (DRY) — TEST PIT — DIAMOND CORE BORING — ELECTRIC CONE PENETROMETER — 0-5" BULK SAMPLE LOCATION (ft/DEPTH)

LEGEND OF EARTH MATERIALS

GRAVEL — SAND — SILT — CLAY — SANDY CLAY OR CLAYEY SAND — SANDY SILT OR SILTY SAND — SILTY CLAY — CLAYEY SILT — PEAT AND/OR ORGANIC MATTER — FILL MATERIAL — IGNEOUS ROCK — SEDIMENTARY ROCK — METAMORPHIC ROCK

CONSISTENCY CLASSIFICATION FOR SOILS

ACCORDING TO THE STANDARD PENETRATION TEST

PENETRATION INDEX (BLOWS/FT)	GRANULAR	COHESIVE
0-4	VERY LOOSE	VERY SOFT
5-9	LOOSE	SOFT
10-19	SLIGHTLY COMPACT	STIFF
20-34	COMPACT	VERY STIFF
35-69	DENSE	HARD
> 70	VERY DENSE	VERY HARD

NOTE: CLASSIFICATION OF EARTH MATERIAL AS SHOWN ON THIS SHEET IS BASED UPON FIELD INSPECTION AND IS NOT TO BE CONSTRUED TO IMPLY MECHANICAL ANALYSIS.

DESIGN OVERSIGHT — SIGN OFF DATE 2/6/92

DRAWN BY	RFS / IP
CHECKED BY	LEM

RFS / NBF — FIELD INSPECTION — DATE 2/16 - 20/89

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

LUIS E. MOURA — PROJECT ENGINEER

CU 04
EA 233500

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

BRIDGE NO. 33-583
POST MILE 22.4

ALADDIN AVENUE / FAIRWAY DRIVE / INTERSTATE 880 OVERCROSSING

LOG OF TEST BORINGS

DISREGARD PRINTS BEARING EARLIER REVISION DATES 9/04/91 12/19/91

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 28 OF 28

ClibPDF - www.fastio.com

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	20.3/23.6	264	354

H. R. Taber
CERTIFIED ENGINEERING GEOLOGIST

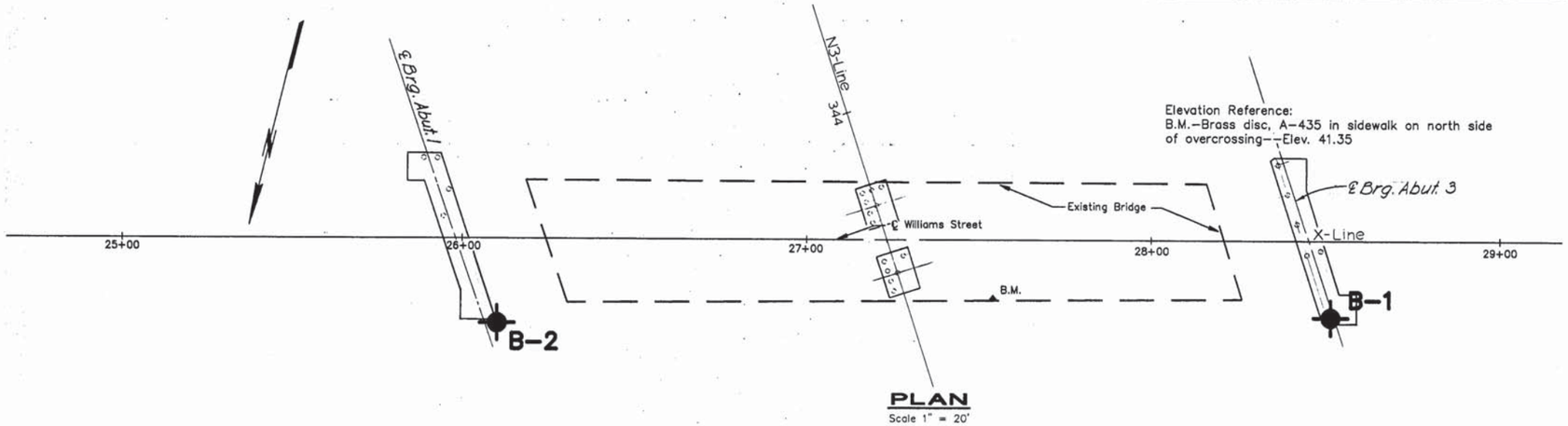
8-26-91
PLANS APPROVAL DATE

REGISTERED GEOLOGIST — H. R. TABER — No. 12 — Exp. 5-30-90 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

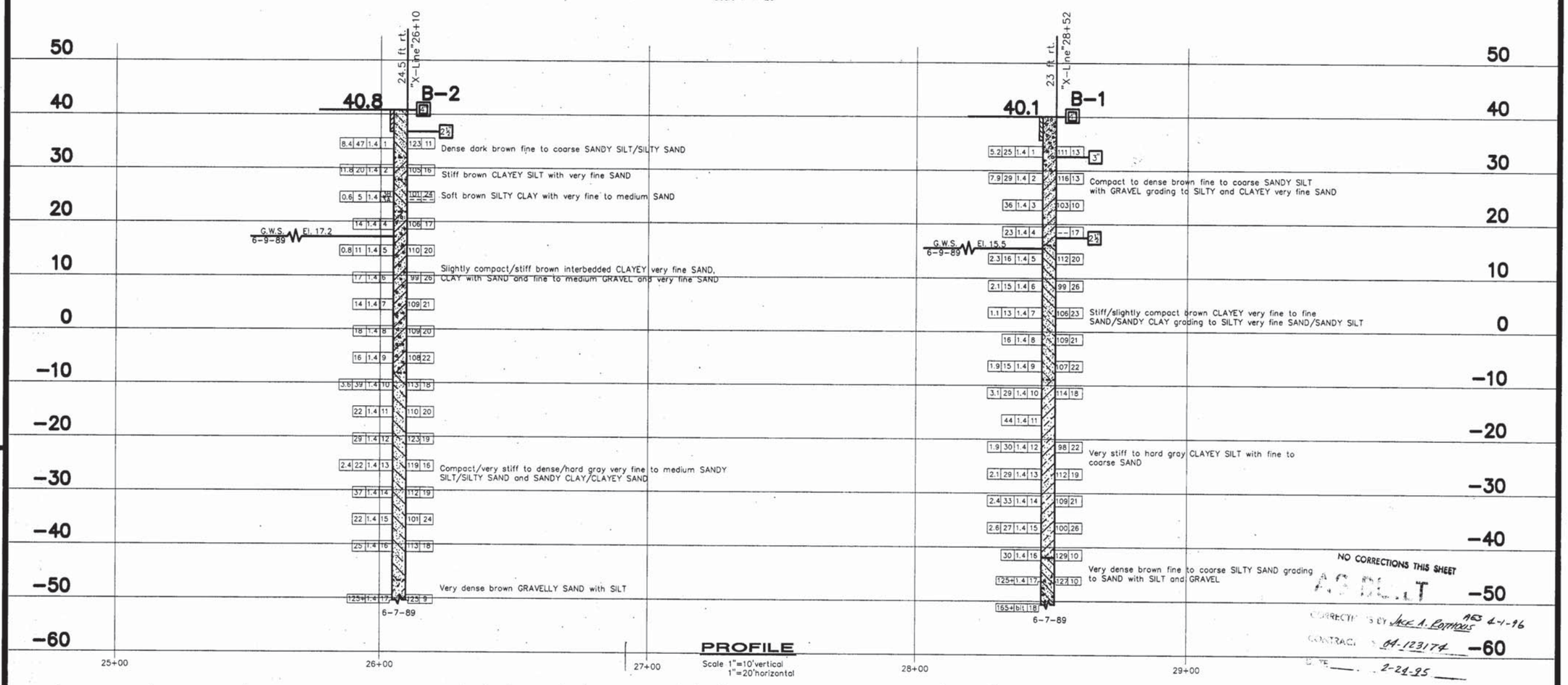
TABER CONSULTANTS
536 Galveston Street
West Sacramento, CA 95691

JOB No. 1P1/388/72-12

Field Study By: E. A. SHEDD



PLAN
Scale 1" = 20'

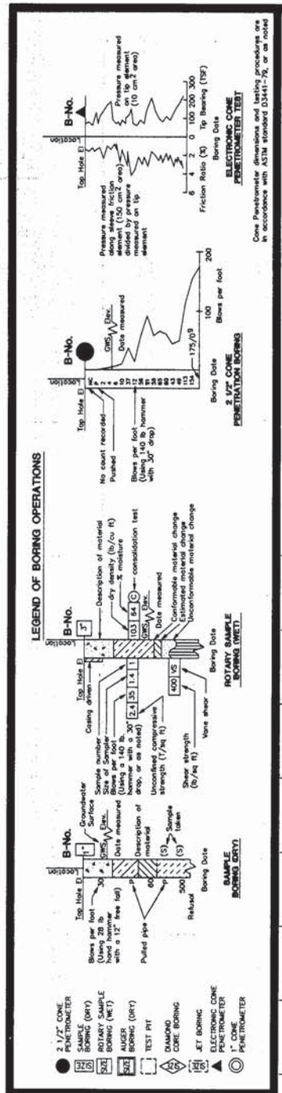


PROFILE
Scale 1"=10'vertical
1"=20'horizontal

NO CORRECTIONS THIS SHEET
AS BUILT
CORRECTIONS BY Jack A. Rothous AS 6-1-96
CONTRACT 04-123174
DATE 2-24-95

Scale: As shown

LEGEND OF BORING OPERATIONS



LEGEND OF EARTH MATERIALS

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Penetration Index (Blows / Ft)	Granular	Cohesive
0–4	Very loose	Very soft
5–9	Loose	Soft
10–19	Slightly compact	Stiff
20–34	Compact	Very stiff
35–69	Dense	Hard
>70	Very dense	Very hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY

DRAWN BY M.D.R. 7-89
CHECKED BY E.A.S. 7-89

, PROJECT ENGINEER

PREPARED FOR: State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES 2
STRUCTURE DESIGN

BRIDGE NO. 33-169
POST MILE 23.1

WILLIAMS STREET OVERCROSSING
LOG OF TEST BORINGS

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04173
EA 123171

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) 11/20/90

SHEET 15 OF 16

TL 6052 REV. 4/89

ClibPDF - www.fastio.com

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Ala	880	22.6/24.0	759	760

GEOTECHNICAL PROFESSIONAL — DATE 12/1/11

4-16-12
PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

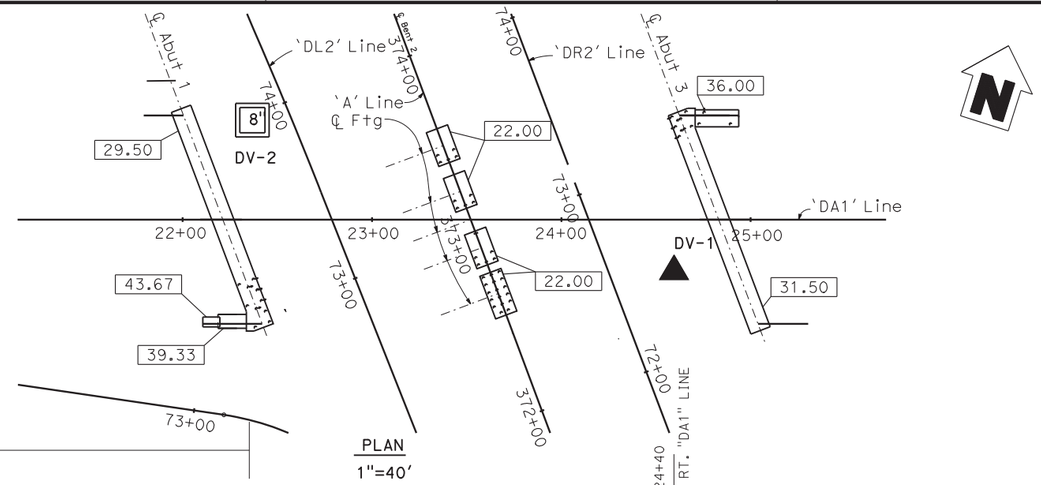
REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. G.E. 666 — Exp. 12/31/11 — GEOTECHNICAL — STATE OF CALIFORNIA

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

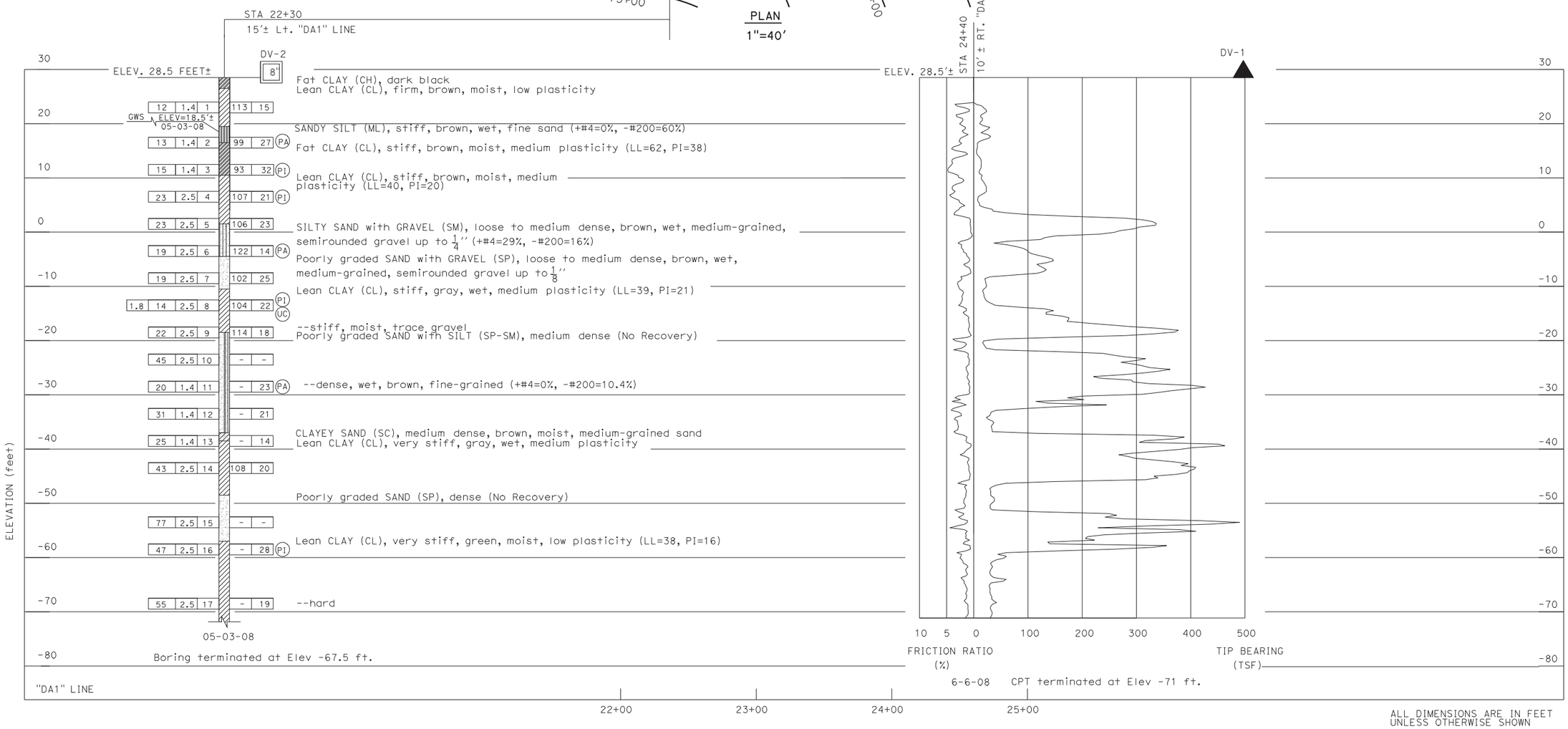
ACTC
1333 BROADWAY, SUITES 220 & 300
OAKLAND, CA 94612

BENCHMARK:
3/4" IRON PIPE WITH PLUG ON NORTHBOUND ROUTE 880 ON-RAMP FROM EASTBOUND DAVIS STREET, ±5' EAST OF EDGE OF PAVEMENT AND ±63' SOUTH OF METERING LIGHT (STA 374+10.5)
NORTHING: 2,088,799.01; EASTING: 6,076,699.29;
ELEV. 28.72.

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



PLAN
1"=40'



ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

DESIGN OVERSIGHT Yiwei Hu
12/29/11
SIGN OFF DATE

DRAWN BY L. TRAN
CHECKED BY D. WANG

L. BHANGOO / G. TRIPATHI
FIELD INVESTIGATION BY:
DATE: MAY & JUNE 2008

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

D. WANG
PROJECT ENGINEER

BRIDGE NO. 33-0736
POST MILES 23.64

ROUTE 112/880 SEPARATION (REPLACE)
LOG OF TEST BORINGS 3 OF 4

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 7/16/10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT:
PROJECT NUMBER & PHASE:
CONTRACT NO.:

DISREGARD PRINTS BEARING EARLIER REVISION DATES
REVISION DATES 11/16/09 5/31/11 10/17/11
SHEET 30 OF 31

FILE => 33-0736-z-1tb03.dgn

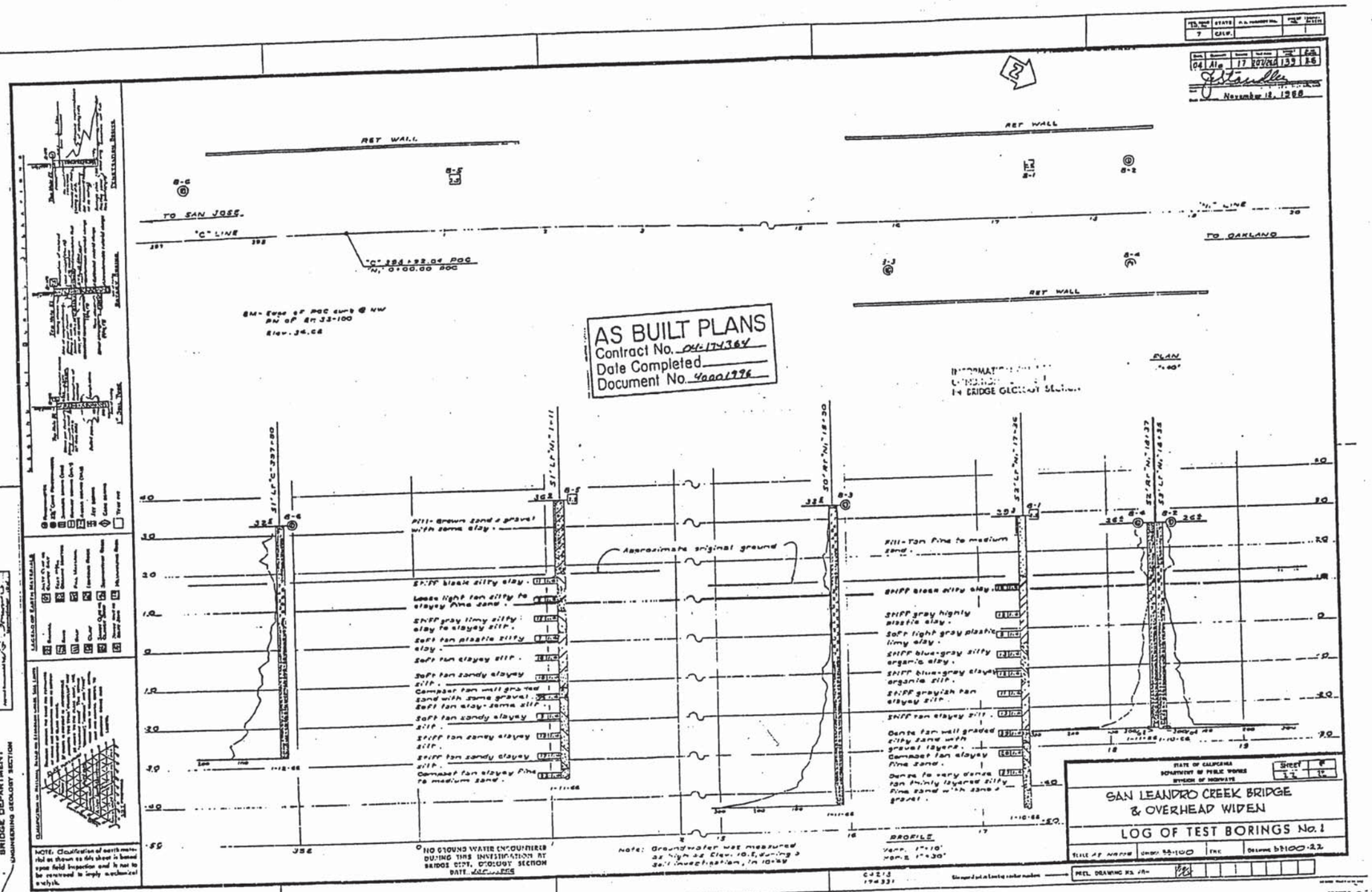
USERNAME => s124496 DATE PLOTTED => 19-APR-2012 TIME PLOTTED => 15:01

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880,61	24.2,18.6	32	51

TO ACCOMPANY PLANS DATED 6-20-94

REGISTERED PROFESSIONAL ENGINEER
RAMIN GOLESORKHI
No. C 48292
Exp. 6/30/96
CIVIL
STATE OF CALIFORNIA

NOTE:
THE AS BUILT LOG OF TEST BORING SHEETS WERE USED TO PREPARE THE GEOTECHINICAL REPORT.



NO AS BUILT CHANGES

AS BUILT
CORRECTIONS BY T. Hoekstra
CONTRACT NO. 04-140201
DATE 6-22-97 10-17-97

MIKE CULLEN DESIGN OVERSIGHT M J Cullen 5-12-94 SIGNOFF DATE	NOTE: ADDITIONAL AS-BUILAT FOUNDATION DATA MAY BE AVAILABLE AT THE DIVISION OF NEW TECHNOLOGY, MATERIALS AND RESEARCH 5900 FOLSON BOULEVARD, SACRAMENTO, CALIFORNIA 95819	DESIGN BY S. GEE DETAILS BY A. LEE QUANTITIES BY A. McCLENDON, JR	CHECKED D. JANG CHECKED D. JANG CHECKED D. JANG	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3	D. JANG PROJECT ENGINEER CU 04 EA 140201

BRIDGE NO. 33-100
POST MILE 24.2

EARTHQUAKE RETROFIT PROJECT SR-091
SAN LEANDRO CREEK BRIDGE AND OVERHEAD
AS-BUILT LOG TEST BORING NO.3

DISREGARD PRINTS BEARING EARLIER REVISION DATES 6-16-93 9-10-93 11-18-93 2-24-94 3-22-94 5-2-94

SHEET 20 OF 20

(PLOT 1=8) FILE = P:\PROJECT\66203-01\GEN\NISS2 10-14-1993 at 11:06 << BY : AL >>

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	24.4/25.2	335	367

REGISTERED CIVIL ENGINEER

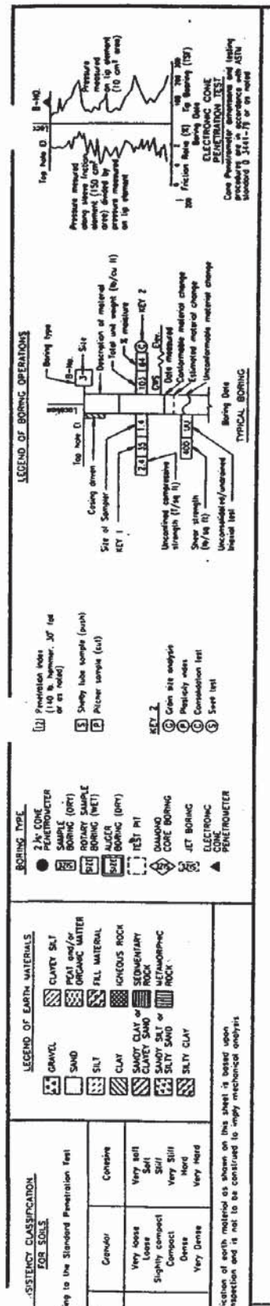
August 21, 1995

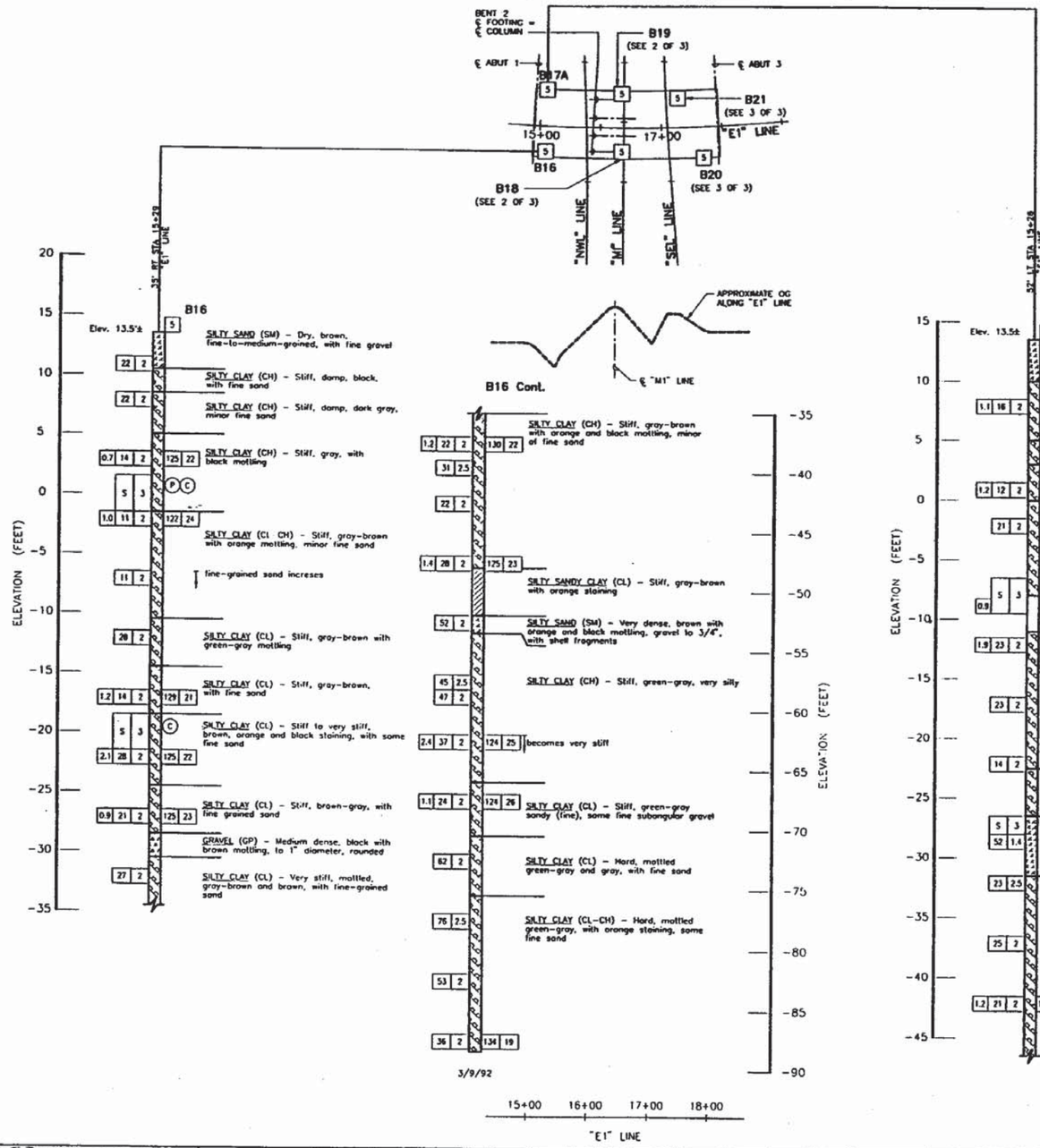
PLANS APPROVAL DATE

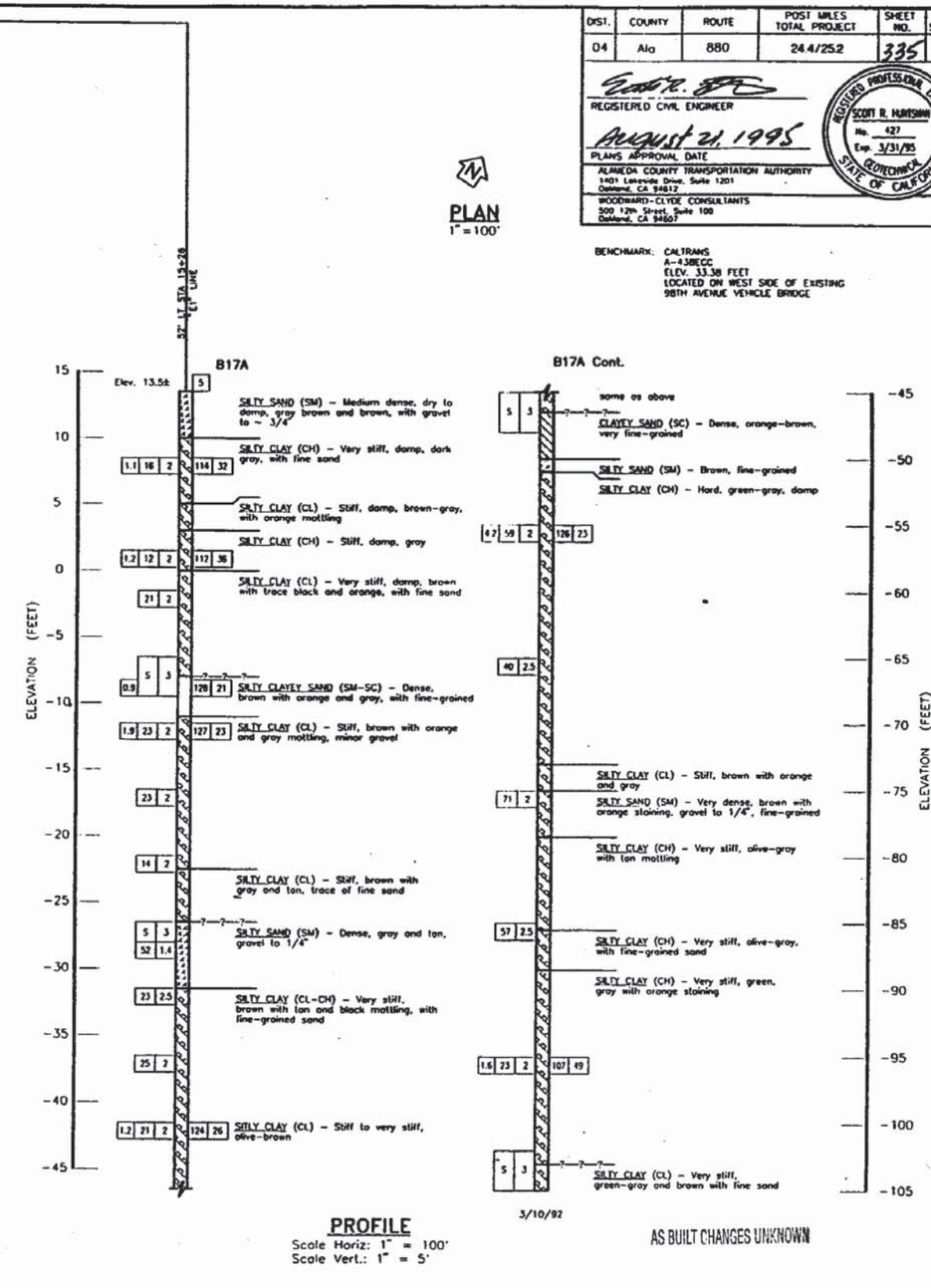
REGISTERED PROFESSIONAL ENGINEER SCOTT R. HUNTSMAN No. 427 Exp. 3/31/95 GEOTECHNICAL STATE OF CALIFORNIA

ALAMEDA COUNTY TRANSPORTATION AUTHORITY
1401 Lakeside Drive, Suite 1201
Oakland, CA 94612

WOODWARD-CLYDE CONSULTANTS
500 12th Street, Suite 100
Oakland, CA 94607







PROFILE
Scale Horiz: 1" = 100'
Scale Vert.: 1" = 5'

AS BUILT CHANGES UNKNOWN

DESIGN OVERSIGHT 7/14/94	DRAWN BY RA	PR, SC, MJ FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER	BRIDGE NO. 33-110 / POST MILE 24.74 — 98TH AVENUE OVERCROSSING (REPLACE)
SIGN OFF DATE	CHECKED BY JP	DATE			LOG OF TEST BORINGS 1 OF 3

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04184
EA 233781

DISREGARD PRINTS BEARING EARLIER REVISION DATE — —

REVISION DATES (PRELIMINARY STAGE ONLY)

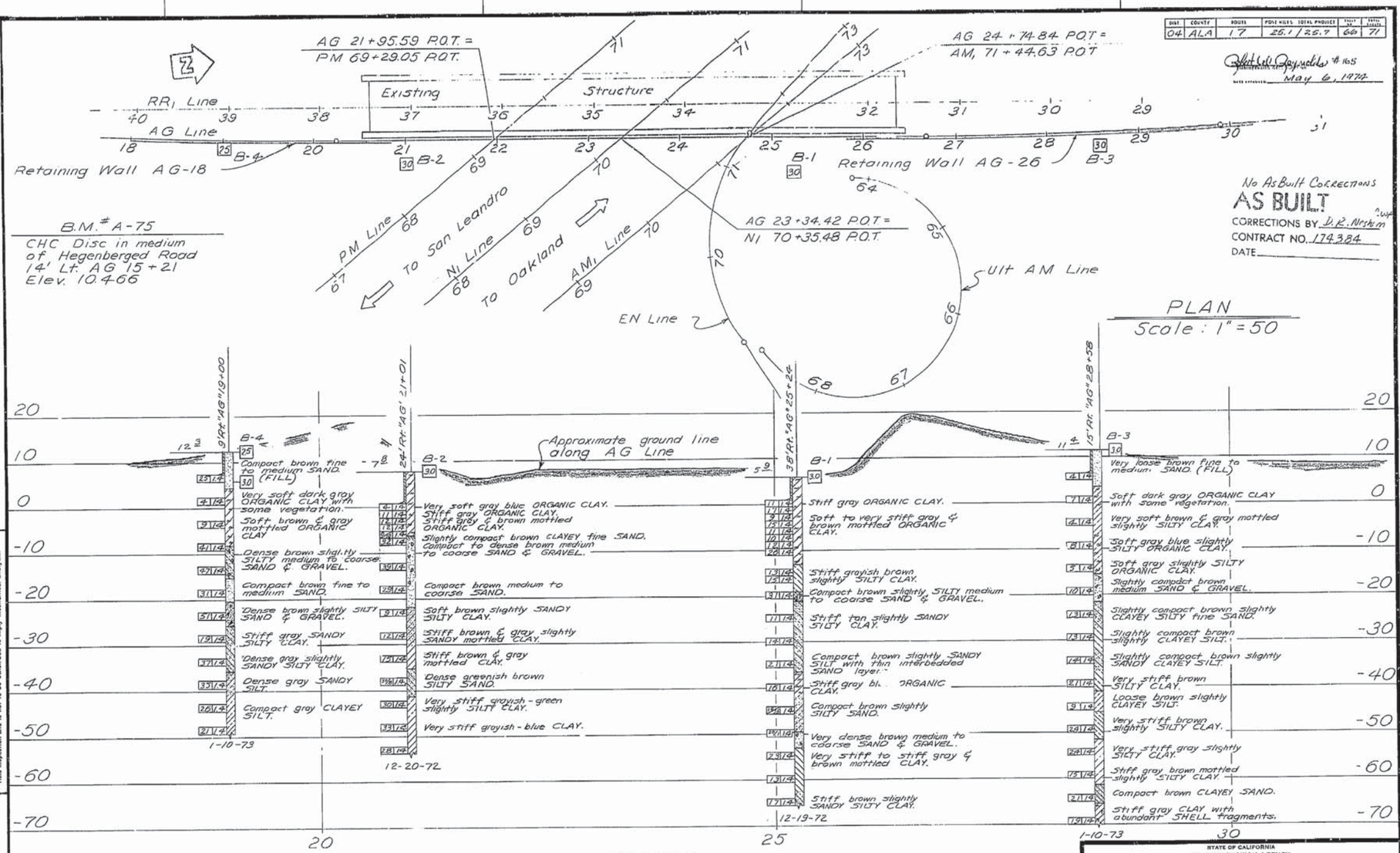
SHEET 20 OF 24

8804-13 02

ClibPDF - www.fastio.com

DIST.	COUNTY	ROUTE	POST MILES	TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	ALA	17	25.1 / 25.7		66	71

Gilbert Hill Daywalt #165
DATE APPROVED May 6, 1977



No As Built Corrections
AS BUILT
CORRECTIONS BY D.R. Nishim
CONTRACT NO. 174384
DATE

Note: The adjacent bridge structure borings ("33-88) encountered ground water at Elev. 4½

LEGEND OF BORING OPERATIONS

LEGEND OF EARTH MATERIALS

CONSISTENCY CLASSIFICATION FOR SOILS

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

HEGENBERGER ROAD OVERCROSSING

LOG OF TEST BORINGS

BRIDGE NO.	POST MILE	DRAWING NO.	SHEET	OF
33-502	25.5		10	10

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION
FIELD STUDY by R. Fox 1-73
DRAWN by S.T. Kawamura 1-22-73
CHECKED by W.T. Nelson 1-23-73
Approval Recommended by Gilbert H. Daywalt, Engineering Geologist
Certified Engineering Geologist No. 165

WO 174381
CU 04204

Disregard prints bearing earlier revision dates

REVISION DATES (PRELIMINARY STAGE ONLY)

AS BUILT PLANS
Contract No. 04-174384
Date Completed
Document No. 40008100

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.

DATE 9/28/86 SIGNATURE Joseph M. Loth TITLE Supervisor

ClibPDF - www.fastio.com

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	25.1/26.1	279	308

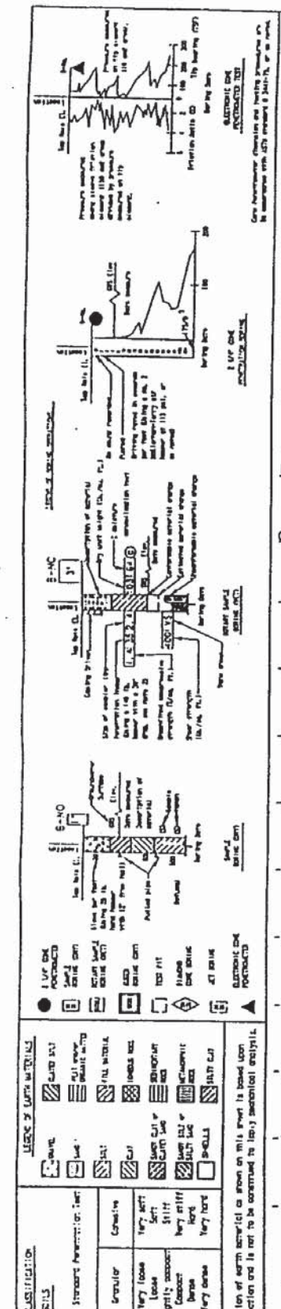
REGISTERED ENGINEER 1-31-95

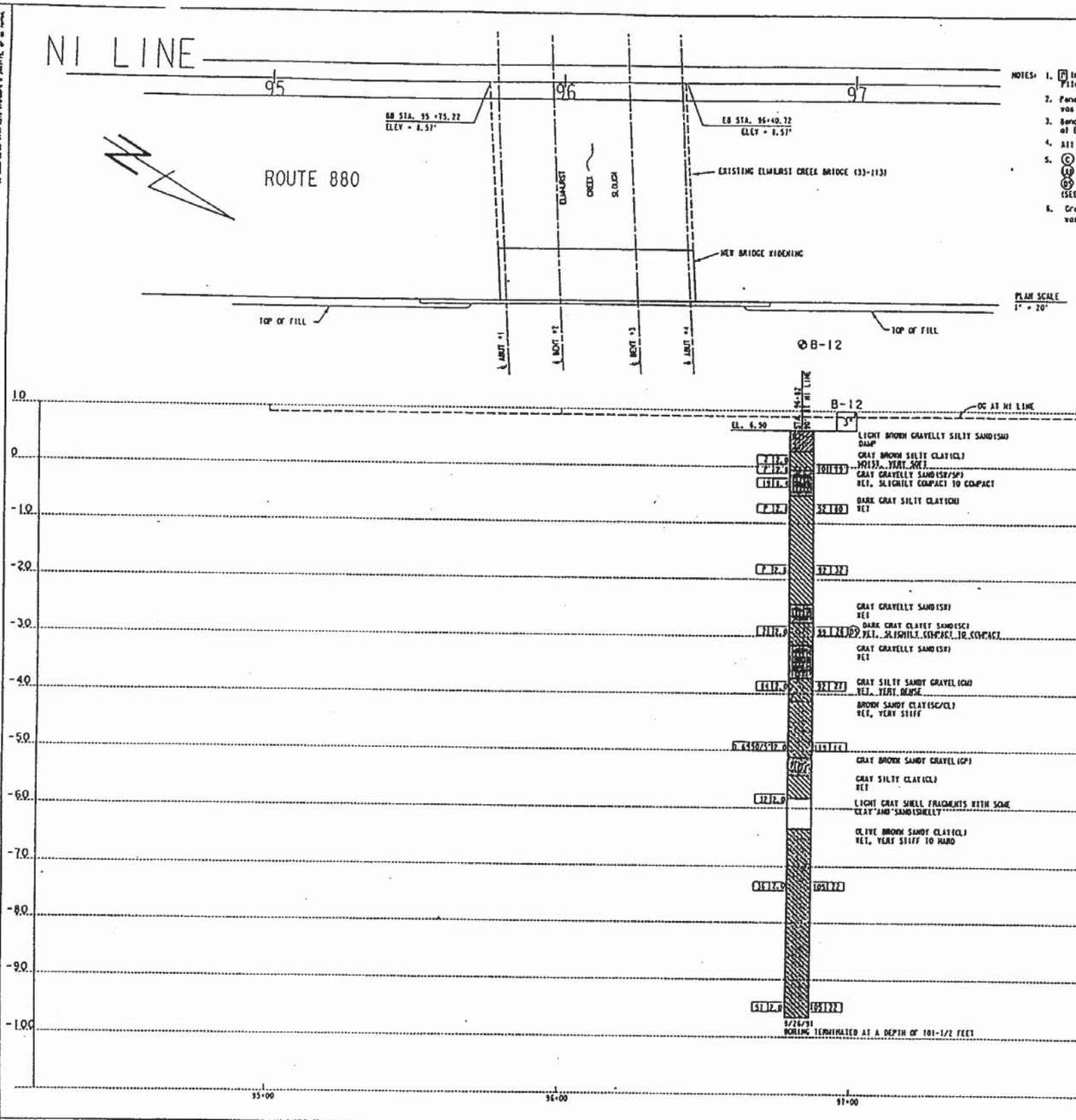
10 - 15 - 1995
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Michael Majdzich No. 555 Exp. 3-31-95 GEOTECHNICAL STATE OF CALIFORNIA

ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CA 94612

KLEINFELDER, INC.
7133 KOLL CENTER PARKWAY, SUITE 100
PLEASANTON, CA 94566





DESIGN OFFICE CHIEF 3/24/94	DRAWN BY	NN, RM	FIELD INVESTIGATOR Michael Majdzich
	CHECKED BY	MAK	DATE 12/28/92

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ROBIN LIM
PROJECT ENGINEER

CU 04184
EA 233191

BRIDGE NO. 33-113
POST MILE 25.97

ELMHURST CREEK BRIDGE WIDENING

LOG OF TEST BORINGS

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) 8/90 2/91 2/92

SHEET 7 OF 8

PLOTTING DATE ****DATE*********
FILE******************

ClibPDF - www.fastio.com

U-341(18)

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.			167	277

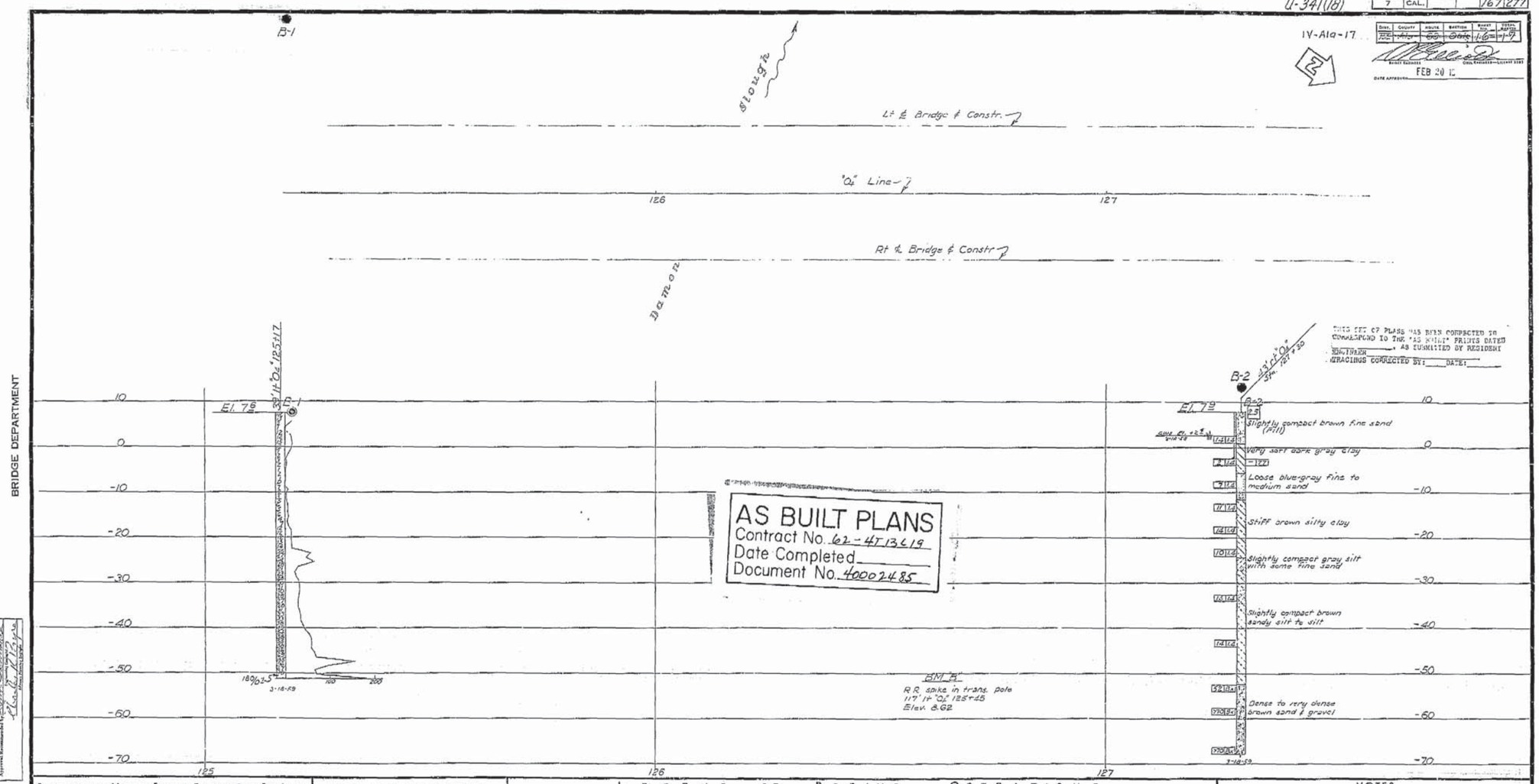
DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
07	Ala	80	Dam	16	17

RESIDENT ENGINEER — CHIEF ENGINEER—CLAIMS DIST.

DATE APPROVED FEB 20 1[illegible]

IV-Ala-17

BRIDGE DEPARTMENT



THIS SET OF PLANS HAS BEEN CORRECTED TO CORRESPOND TO THE "AS BUILT" PRINTS DATED _____, AS SUBMITTED BY RESIDENT ENGINEER _____
TRACINGS CORRECTED BY: _____ DATE: _____

FIELD STUDY: H. Hager 3-59
DRAWN: H. Darr 3-59
CHECKED: R. Blair 4-59

Approval Recommended by: [illegible]

Classification of Material Based on Standard Grade Size Limits

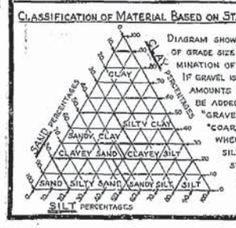


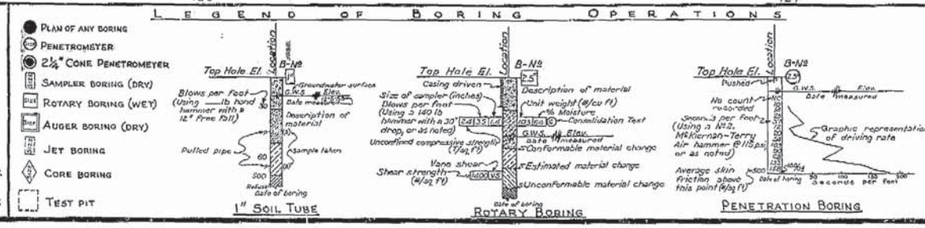
Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand." The terms "coarse," "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

Legend of Earth Materials

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

Legend of Boring Operations

- Plan of any boring
- Penetrometer
- 2¼" Cone Penetrometer
- Sampler boring (DRY)
- Rotary boring (WET)
- Auger boring (DRY)
- Jet boring
- Core boring
- Test pit



Notes

~~The contractor's attention is directed to Section 9, Article (c) of the Standard Specifications and the Special Provisions accompanying the set of plans.~~

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

DAMON SLOUGH BR. WIDENING

LOG OF TEST BORINGS

SCALE	BRIDGE	FILE	DRAWING
1" = 10'	33-142		C-1727-46

PREL. DRAWING NO. P-1727

167

421

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE _____ SIGNATURE _____ TITLE _____

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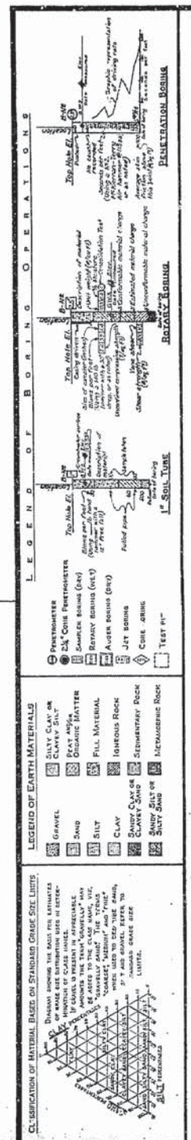
FED. ROAD DIV. No.	STATE	F.A. PROJECT No.	SHEET No.	TOTAL SHEETS
7	CALIF.			

DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
04	Ala	17	25.9/R.6	95	98

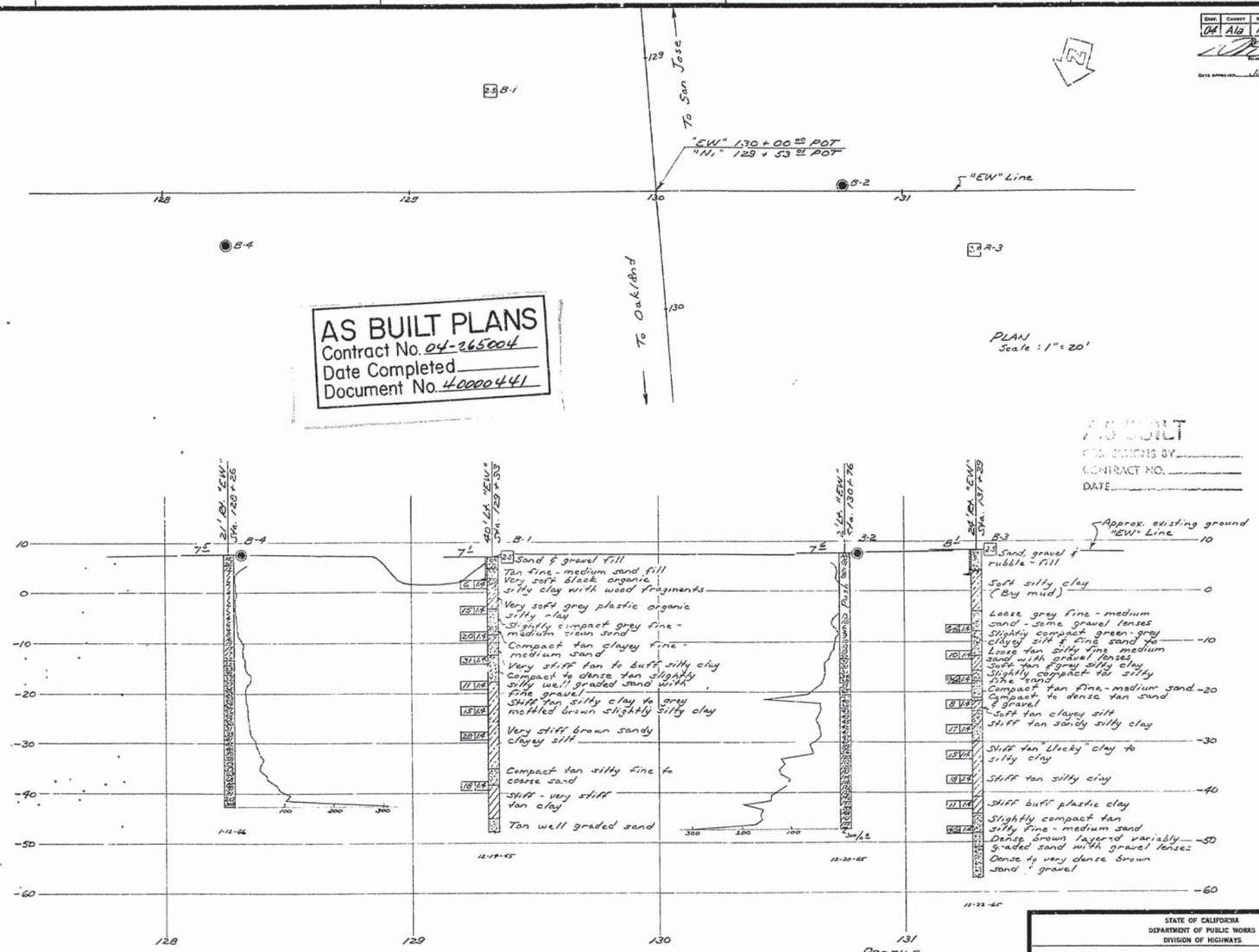
DATE APPROVED January 30, 1967



FIELD STUDY
DRAWN
CHECKED
Approval Recommended

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

95



AS BUILT PLANS
Contract No. 04-265004
Date Completed
Document No. 40000441

AS BUILT
PLAN CHANGES BY
CONTRACT NO.
DATE

BM CHC Mon. set in PCC SW W side Br # 33-142 Elev. 8.23

Note: Due to caving of borings, no ground water was measured. Ground water was measured in borings at Damon Slough Elev. + 2.4 3-18-59

PROFILE
Scale: Horiz. 1" = 20'
Vert. 1" = 10'

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

SHEET	OF
10	10

66TH AVENUE OVERCROSSING

LOG OF TEST BORINGS

SCALE As Noted | BRIDGE 33-435 | FILE | DRAWING 33435-10

04218
265001

Disregard prints bearing earlier numbers → PREL. DRAWING No. PR-33435-2

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Ala	880	43.8/45.4	280	592

Caltrans Metric

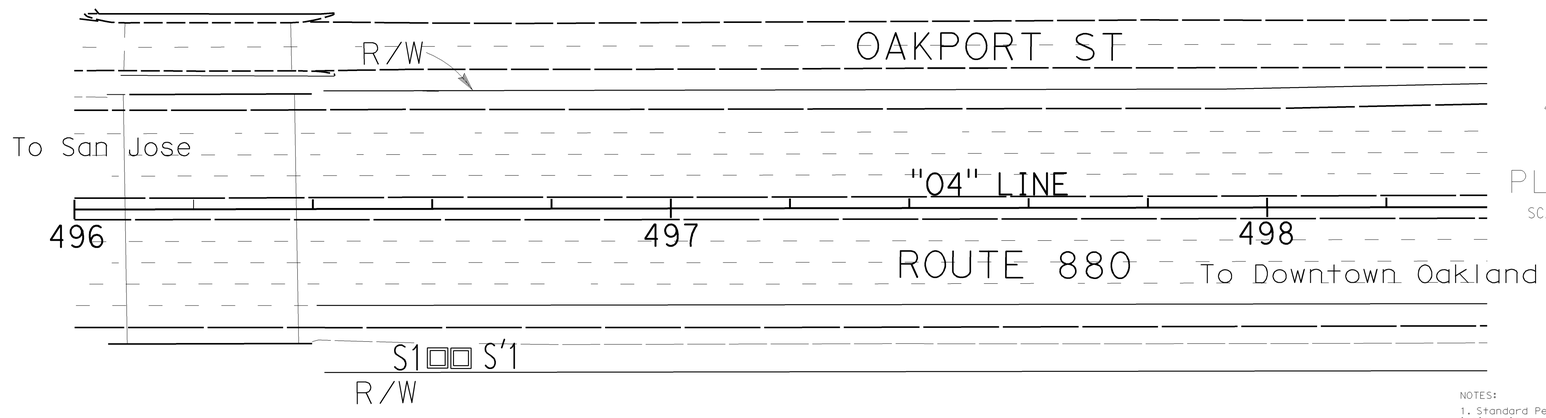
REGISTERED CIVIL ENGINEER 11-28-06

6-23-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — JEREMY JACOB ZORNE — No. C60936 — Exp. 12/31/08 — CIVIL — STATE OF CALIFORNIA

GEOCON
CONSULTANTS, INCORPORATED
11375 SUNRISE PARK DRIVE, SUITE 100
RANCHO CORDOVA, CA. 95742-7207
PHONE 916 852-9118 - FAX 916 852-9132

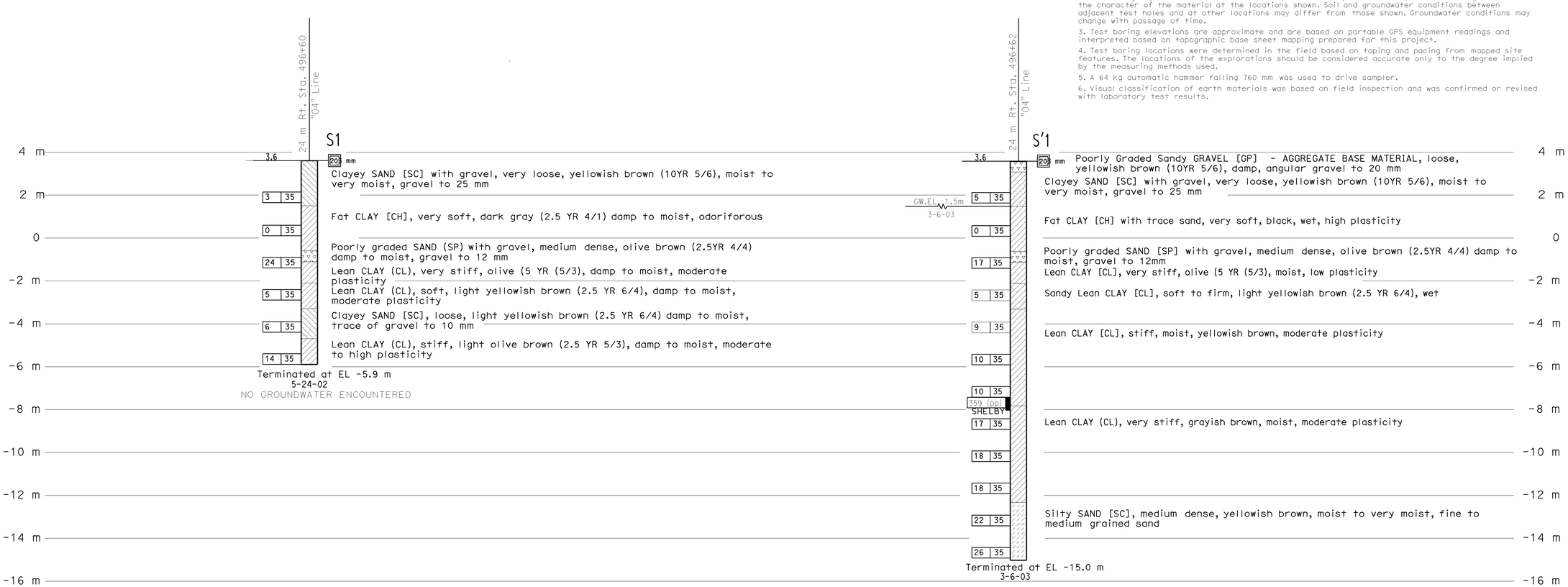
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



PLAN VIEW
SCALE : 1 : 500

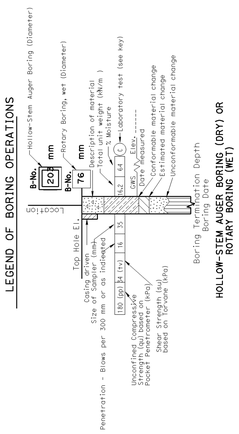
NOTES:

1. Standard Penetration Tests (SPT) were performed by driving a 51 mm outside diameter, 35 mm inside diameter split-spoon SPT sampler.
2. The boring logs and related information represent the opinion of the professional engineer as to the character of the material at the locations shown. Soil and groundwater conditions between adjacent test holes and at other locations may differ from those shown. Groundwater conditions may change with passage of time.
3. Test boring elevations are approximate and are based on portable GPS equipment readings and interpreted based on topographic base sheet mapping prepared for this project.
4. Test boring locations were determined in the field based on taping and pacing from mapped site features. The locations of the explorations should be considered accurate only to the degree implied by the measuring methods used.
5. A 64 kg automatic hammer falling 760 mm was used to drive sampler.
6. Visual classification of earth materials was based on field inspection and was confirmed or revised with laboratory test results.



PROFILE
VERT. SCALE. 1:100

LEGEND OF BORING OPERATIONS



SOIL TEST DESIGNATIONS

- (AL) ATTERBERG LIMITS
- (CH) CHLORIDE
- (CO) CORROSIVITY
- (DD) MAXIMUM DRY DENSITY
- (CU) CONSOLIDATED UNDRAINED TRIAXIAL
- (DS) DIRECT SHEAR
- (SS) SOLUBLE SULPHATES
- (R) R-VALUE
- (CN) CONSOLIDATION
- (GS) GRAIN SIZE ANALYSIS
- (UC) UNCONFINED COMPRESSION
- (UU) UNCONSOLIDATED UNDRAINED TRIAXIAL

TYPES OF BORING

- 57 mm CONE PENETRATION
- SAMPLE BORING (DRY)
- ROTARY SAMPLE BORING (WET)
- AUGER BORING (DRY)
- TEST PIT
- DIAMOND CORE BORING
- JET BORING
- ELECTRONIC CONE PENETROMETER

LEGEND OF EARTH MATERIALS

- GRAVEL
- SAND
- SILT
- CLAY
- SANDY CLAY or CLAYEY SAND
- SANDY SILT or SILTY SAND
- SILTY CLAY
- CLAYEY SILT
- PEAT and/or ORGANIC MATTER
- COBBLES and/or BOULDERS
- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC

Note: Visual classification of earth materials based on field inspection is confirmed or revised with laboratory test results as necessary.

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

SPT N-Value (Blows/0.3m)	Granular	SPT N-Value (Blows/0.3m)	Cohesive
0-4	Very Loose	Q	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very stiff
		>30	Hard

R-12

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CALTRANS DESIGN OVERSIGHT SIGN OFF DATE	DRAWN BY: A. M. LADRILLONO CHECKED BY: J. J. ZORNE	FIELD INVESTIGATION BY: LEANNE ROBERTS MAY 2002 JEREMY ZORNE MARCH 2003	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	B. LEE PROJECT ENGINEER	BRIDGE NO. 33-0040 L/R 33-0068 S KILOMETER POST 43.6 - 45.5

HIGH STREET SEISMIC RETROFIT PROJECT

LOG OF TEST BORINGS

CU 04250
EA 165421

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 04/01/03 | 09/23/03 | 01/29/04 | 03/04/04 | 05/18/04

SHEET 2 OF 10

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS: 0 10 20 30 40 50 60 70 80 90 100

OGS CIVIL LOG OF TEST BORINGS SHEET (METRIC) (REV. 3/01)

FILE => 416542qg002.dgn

USERNAME => trrichf DATE PLOTTED => 24-JUN-2008 TIME PLOTTED => 11:30

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Ala	880	43.8/45.4	281	592

Caltrans Metric

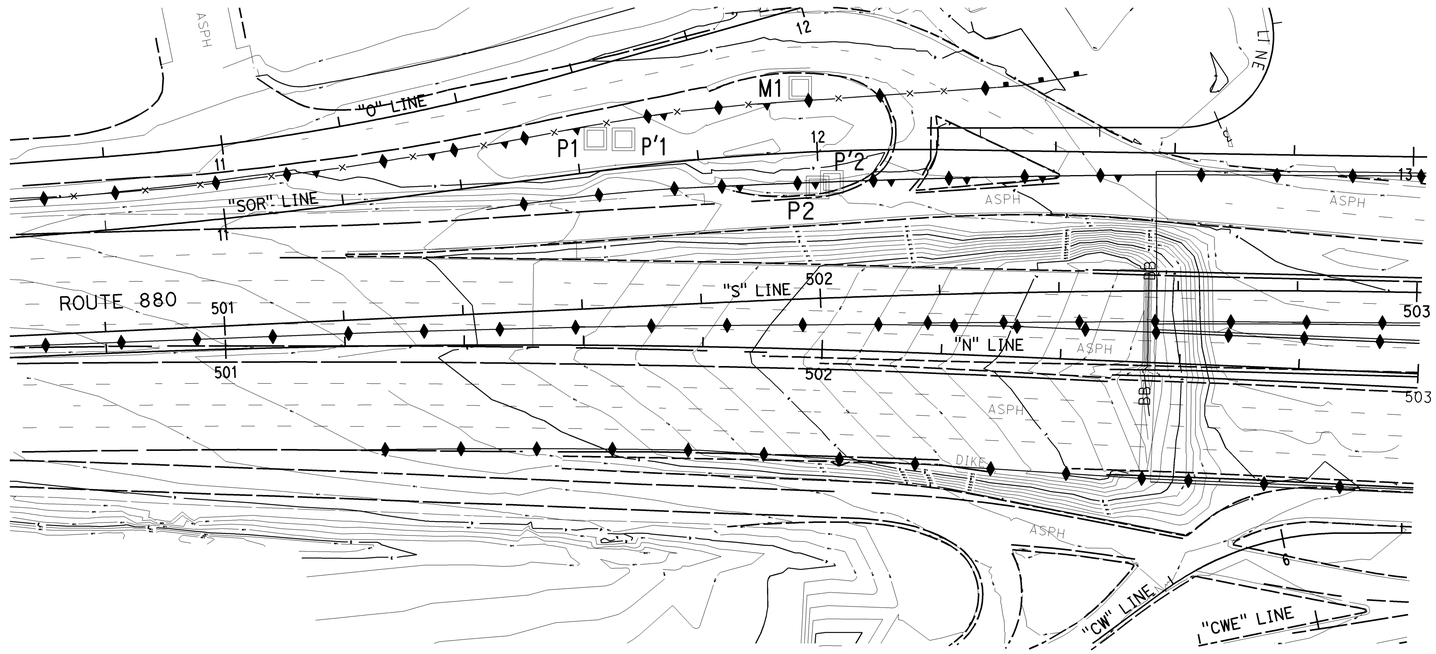
REGISTERED CIVIL ENGINEER 11-28-06

6-23-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER JEREMY JACOB ZORNE No. C60936 Exp. 12/31/08 CIVIL STATE OF CALIFORNIA

GEOCON
CONSULTANTS, INCORPORATED
11375 SUNRISE PARK DRIVE, SUITE 100
RANCHO CORDOVA, CA. 95742-7207
PHONE 916 852-9118 - FAX 916 852-9132

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

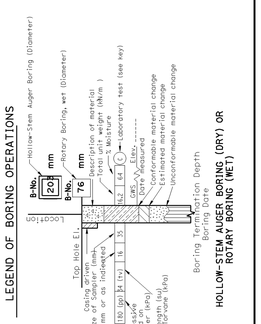


PLAN VIEW
SCALE : 1 : 500

NOTES:

1. 60 mm samples were taken using a modified California soil-barrel sampler with an inside diameter of 60 mm and outside diameter of 76 mm.
2. Standard Penetration Tests (SPT) were performed by driving a 51 mm outside diameter, 35 mm inside diameter split-spoon SPT sampler.
3. The boring logs and related information represent the opinion of the professional engineer as to the character of the material at the locations shown. Soil and groundwater conditions between adjacent test holes and at other locations may differ from those shown. Groundwater conditions may change with passage of time.
4. Test boring elevations are approximate and are based on portable GPS equipment readings and interpreted based on topographic base sheet mapping prepared for this project.
5. Test boring locations were determined in the field based on taping and pacing from mapped site features. The locations of the explorations should be considered accurate only to the degree implied by the measuring methods used.
6. A 64 kg automatic hammer falling 760 mm was used to drive the samplers.
7. Visual classification of earth materials was based on field inspection and was confirmed or revised with laboratory test results.

LEGEND OF BORING OPERATIONS



SOIL TEST DESIGNATIONS

(AL)	ATTERBERG LIMITS
(CH)	CHLORIDE
(CR)	CORROSIVITY
(RD)	MAXIMUM DRY DENSITY
(CU)	CONSOLIDATED UNDRAINED TRIAXIAL
(DS)	DIRECT SHEAR
(SO4)	SOLUBLE SULPHATES
(R)	R-VALUE
(CN)	CONSOLIDATION
(GS)	GRAIN SIZE ANALYSIS
(UC)	UNCONFINED COMPRESSION
(UU)	UNCONSOLIDATED UNDRAINED TRIAXIAL

TYPES OF BORING

57 mm CONE PENETRATION; SAMPLE BORING (DRY); ROTARY SAMPLE BORING (WET); ROTARY BORING (DRY); TEST PIT; DIAMOND CORE BORING; JET BORING; ELECTRONIC CONE PENETROMETER

LEGEND OF EARTH MATERIALS

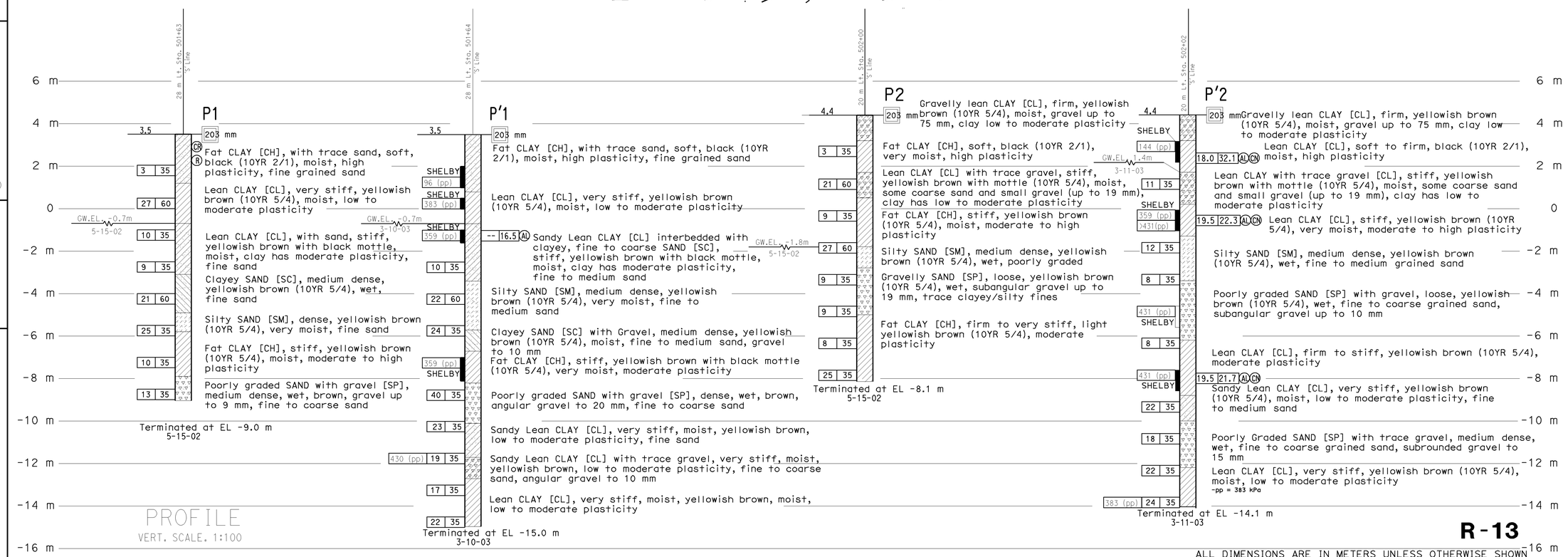
GRAVEL; SAND; SILT; CLAY; SANDY CLAY or CLAYEY SAND; SANDY SILT or SILTY SAND; SILTY CLAY; CLAYEY SILT; PEAT and/or ORGANIC MATTER; COBBLES and/or BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

SPT N-Value (Blows/0.3m)	Granular	SPT N-Value (Blows/0.3m)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very stiff
		>30	Hard

Note: Visual classification of earth materials based on field inspection is confirmed or revised with laboratory test results as necessary.



PROFILE
VERT. SCALE. 1:100

R-13

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CALTRANS DESIGN OVERSIGHT SIGN OFF DATE	DRAWN BY: A. M. LADRILLONO CHECKED BY: J. J. ZORNE	FIELD INVESTIGATION BY: LEANNE ROBERTS MAY 2002	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	B. LEE PROJECT ENGINEER	BRIDGE NO. 33-0040 L/R 33-0068 S KILOMETER POST 43.6 - 45.5

HIGH STREET SEISMIC RETROFIT PROJECT

LOG OF TEST BORINGS

CU 04250
EA 165421

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 01/07/03 01/17/03 03/28/03 07/18/03 03/29/04 03/04/04 05/18/04

SHEET 3 OF 10

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS: 0 10 20 30 40 50 60 70 80 90 100

OGS CIVIL LOG OF TEST BORINGS SHEET (METRIC) (REV. 3/01)

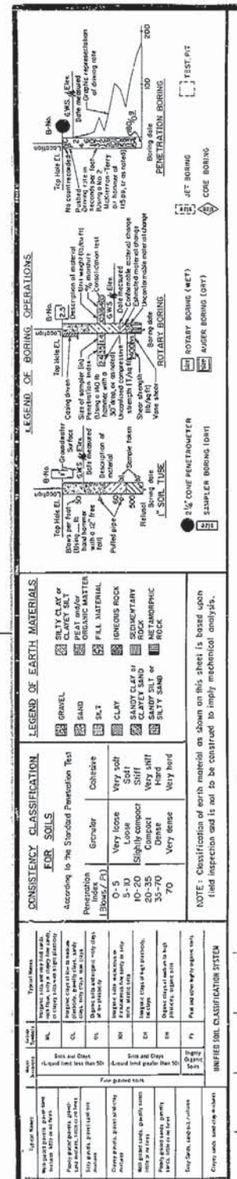
FILE => 416542qg003.dgn

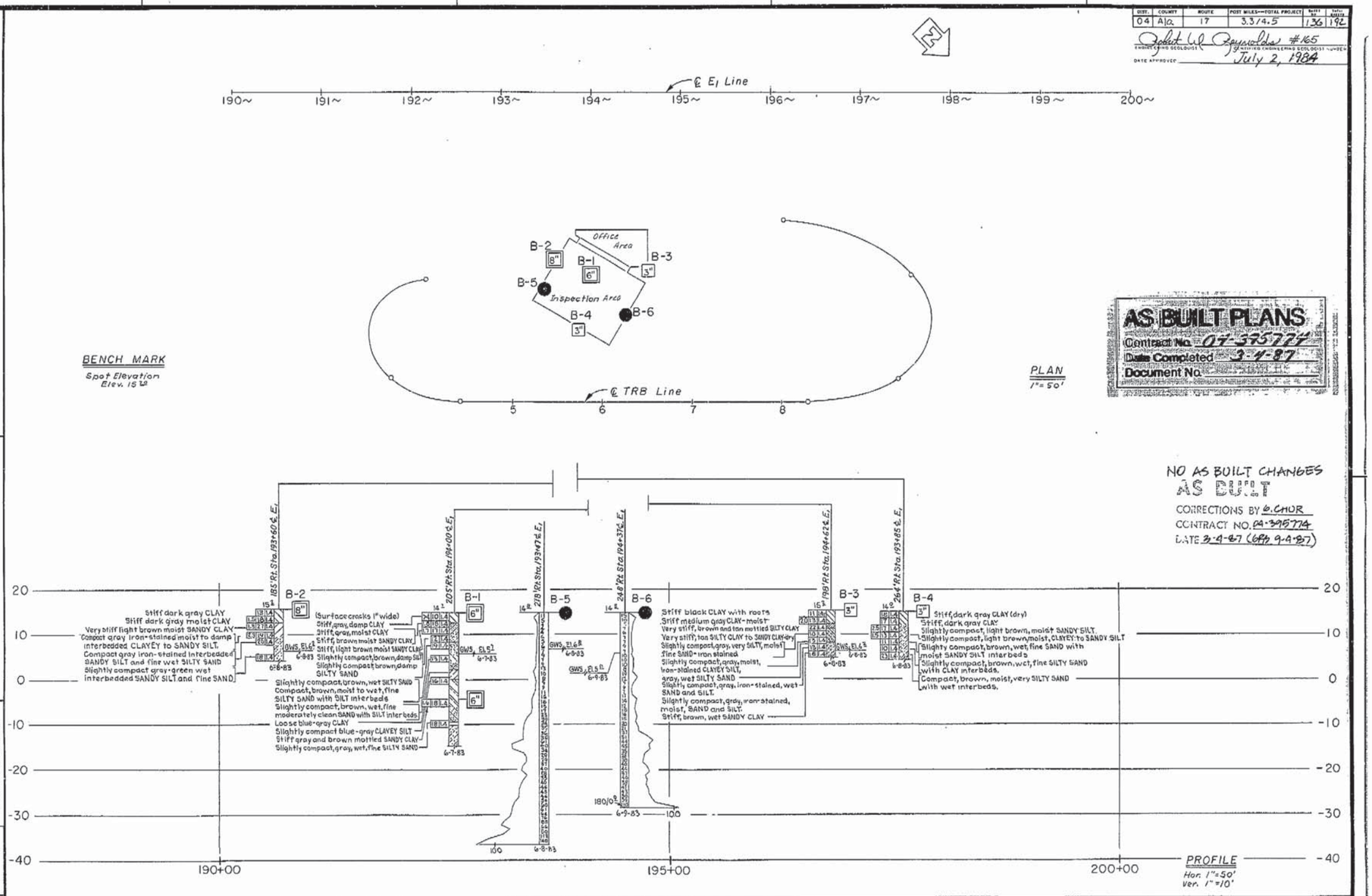
USERNAME => trrichf DATE PLOTTED => 24-JUN-2008 TIME PLOTTED => 11:30

As-built LOTB’s for MTC Median Barrier

DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET	TOTAL SHEETS
04	Alo.	17	3.3/4.5	136	192

Robert W. Reynolds #165
ENGINEERING GEOLOGIST — REGISTERED ENGINEERING GEOLOGIST NUMBER
DATE APPROVED July 2, 1984





ENGINEERING GEOLOGY AND TECHNICAL SERVICES BRANCH – TRANSPORTATION LABORATORY					
DRAWN BY WIGGINTON 6-83	Richard Wilfling 560	CHARGE UNIT	EXPEND. AUTHOR.	SPEC. DESIGN.
CHECKED BY	Sr. A.E. Goldsmith	04216	395771	

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN — PROJECT ENGINEER — REGISTERED CIVIL ENGINEER NO. C 16298 7/83

33-T026 — POST MILE 3.3/4.7

NIMITZ INSPECTION FACILITY

LOG OF TEST BORINGS

SHEET S 19

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04215
WO 395771

Disregard prints bearing earlier revision dates →

REVISION DATES (PRELIMINARY STAGE ONLY)

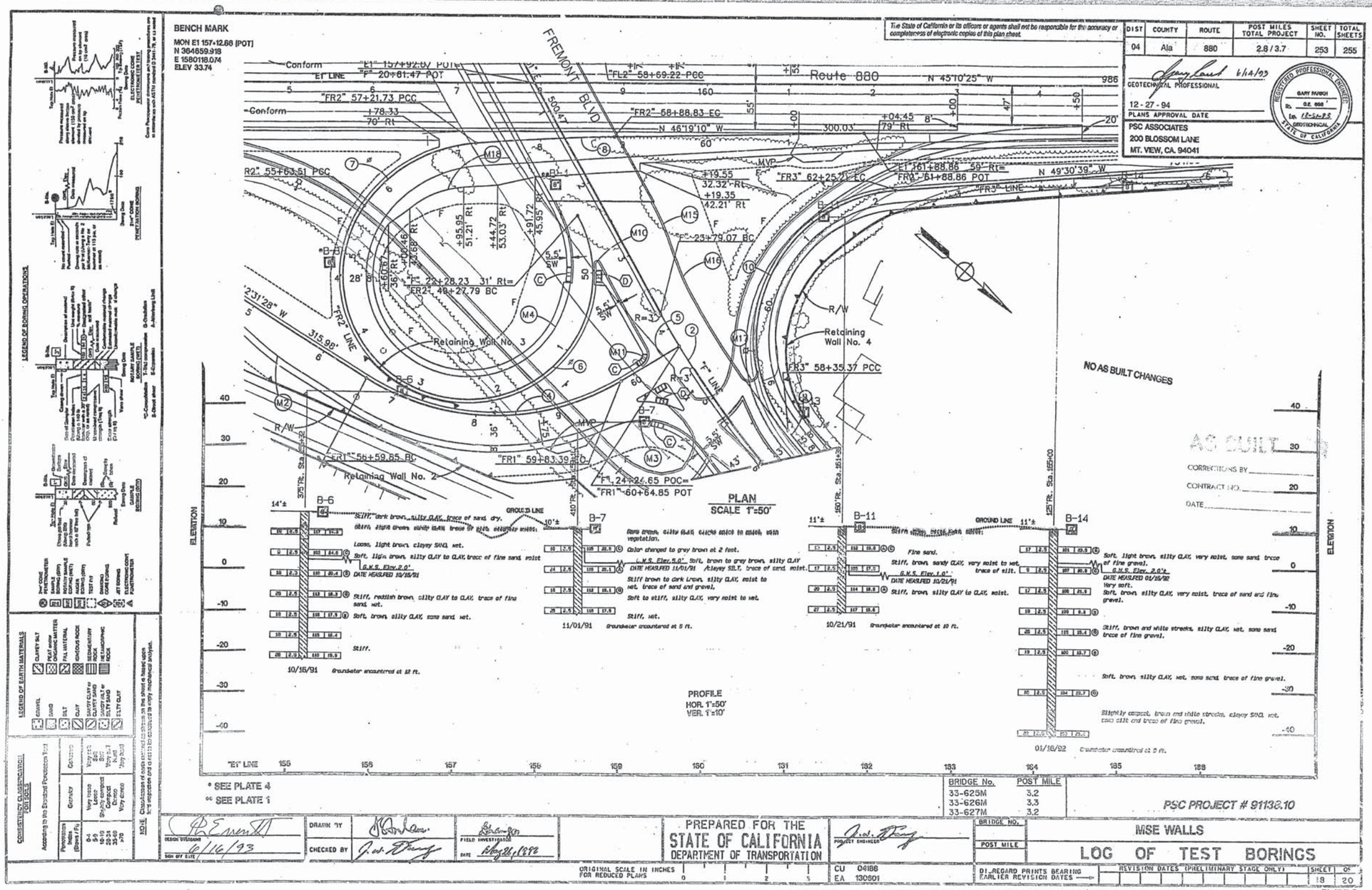
SHEET OF

136

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.

DATE 2-22-88 SIGNATURE Donald Blackford TITLE MICROFILM SERVICES

ClibPDF - www.fastio.com



The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	2.8 / 3.7	253	255

GEOTECHNICAL PROFESSIONAL 6/16/93
12 - 27 - 94
PLANS APPROVAL DATE
PSC ASSOCIATES
200 BLOSSOM LANE
MT. VIEW, CA. 94041

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	4.3 / 5.4	210	211

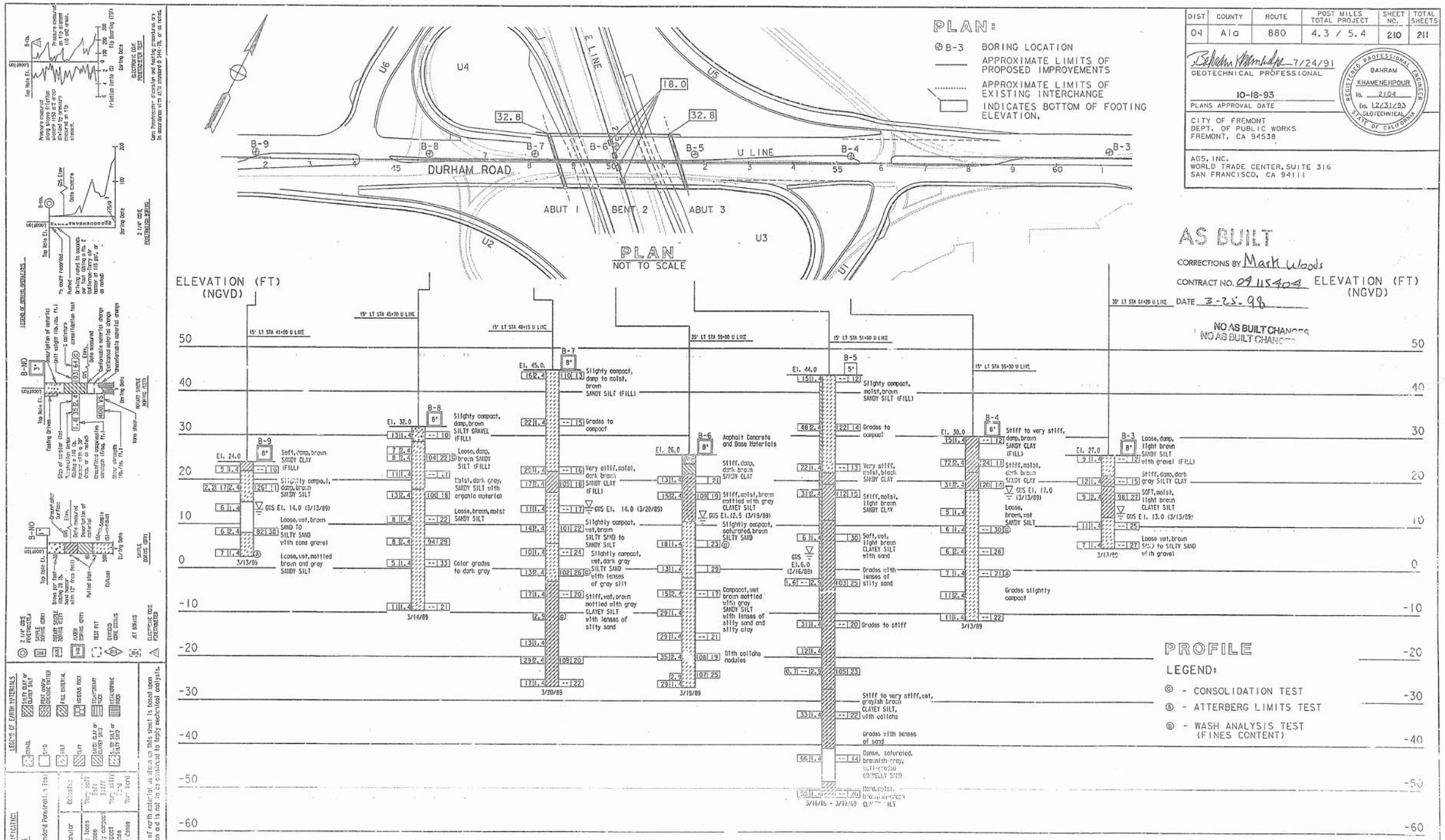
GEOTECHNICAL PROFESSIONAL 7/24/91

10-18-93
PLANS APPROVAL DATE

CITY OF FREMONT
DEPT. OF PUBLIC WORKS
FREMONT, CA 94538

AGS, INC.
WORLD TRADE CENTER, SUITE 316
SAN FRANCISCO, CA 94111

REGISTERED PROFESSIONAL ENGINEER — BAHRAM KHAMENEJPOUR — No. 2104 — Exp. 12/31/93 — GEOTECHNICAL — STATE OF CALIFORNIA



AS BUILT
CORRECTIONS BY Mark Woods
CONTRACT NO. 04 115404
DATE 3-25-98
NO AS BUILT CHANGES

DESIGN OVERSIGHT	DRAWN BY	D.A.C	R.F.S. FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	LUIS E. MOURA 39791 PROJECT ENGINEER REGISTERED C.E. NO.	BRIDGE NO. 33-268	DURHAM ROAD OVERCROSSING (REPLACE)	ST18
SIGN OFF DATE 10/16/91	CHECKED BY	L.E.M.	DATE 3/89			POST MILE 4.71	LOG OF TEST BORINGS	

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04183
EA 115401

DISREGARD PRINTS BEARING EARLIER REVISION DATES —<- 7/90

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 18 OF 19

PLOTTING DATE Sun Oct 13 15:36:13 1991
OS4: [111.KOJI]15405T18.DGN;1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	2.5/6.9	367	368

4-25-95
REGISTERED ENGINEER-GEOTECHNICAL

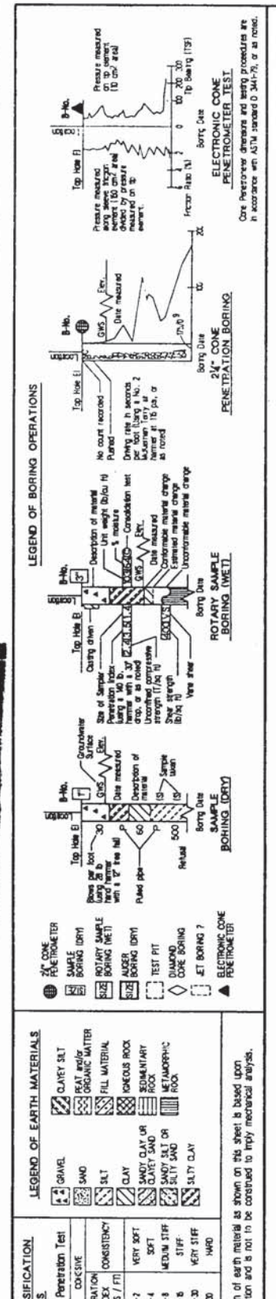
REGISTERED PROFESSIONAL ENGINEER
JOHN E. ANDERSON
No. CE96
Exp. 12/31/97
GEOTECHNICAL
STATE OF CALIFORNIA

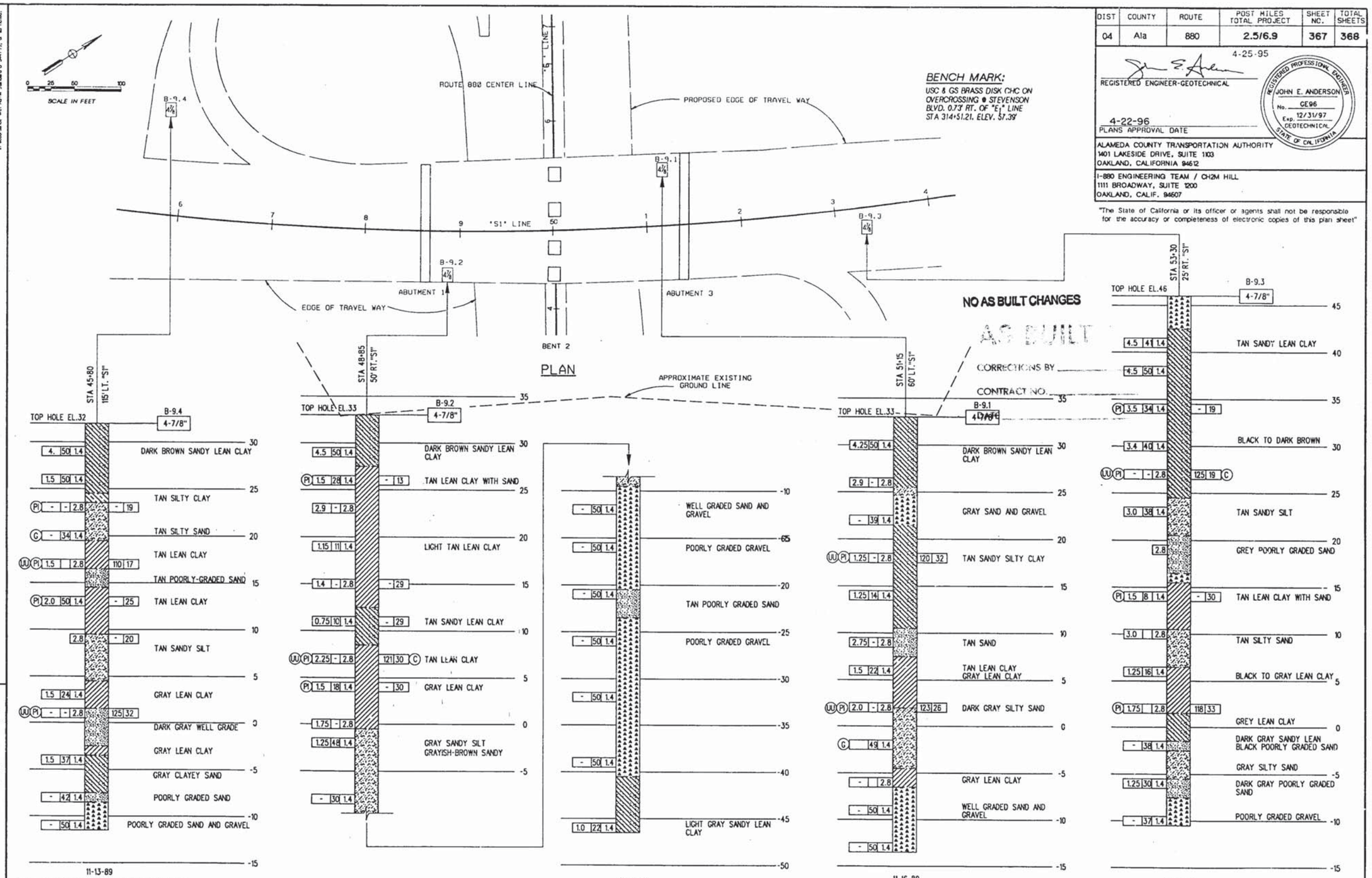
4-22-96
PLANS APPROVAL DATE

ALAMEDA COUNTY TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CALIFORNIA 94612

I-880 ENGINEERING TEAM / CH2M HILL
1111 BROADWAY, SUITE 1200
OAKLAND, CALIF. 94607

"The State of California or its officer or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet"





NOTE: GROUNDWATER LEVEL WAS NOT MEASURED AT TIME OF DRILLING BECAUSE DRILLING FLUID WAS USED IN THE BORINGS.

DESIGN OVERSIGHT / SIGN OFF DATE 6/14/95	DRAWN BY A.CORTEZ	S. TERENTIEFF FIELD INVESTIGATOR	APPROVAL RECOMMENDED BY	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	S.J.THOMAN PROJECT ENGINEER
	CHECKED BY D.ALLARD	REGISTRATION NO. N/A	REGISTRATION NO.		

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04183
EA 233101

BRIDGE NO. 33-591
POST MILE 6.24

STEVENSON BOULEVARD OVERCROSSING (REPLACE)

LOG OF TEST BORINGS

DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES (PRELIMINARY STAGE ONLY) 3/91 12/94 8/95 4/96

SHEET 19 OF 20

F-26839/STE 16.DGN

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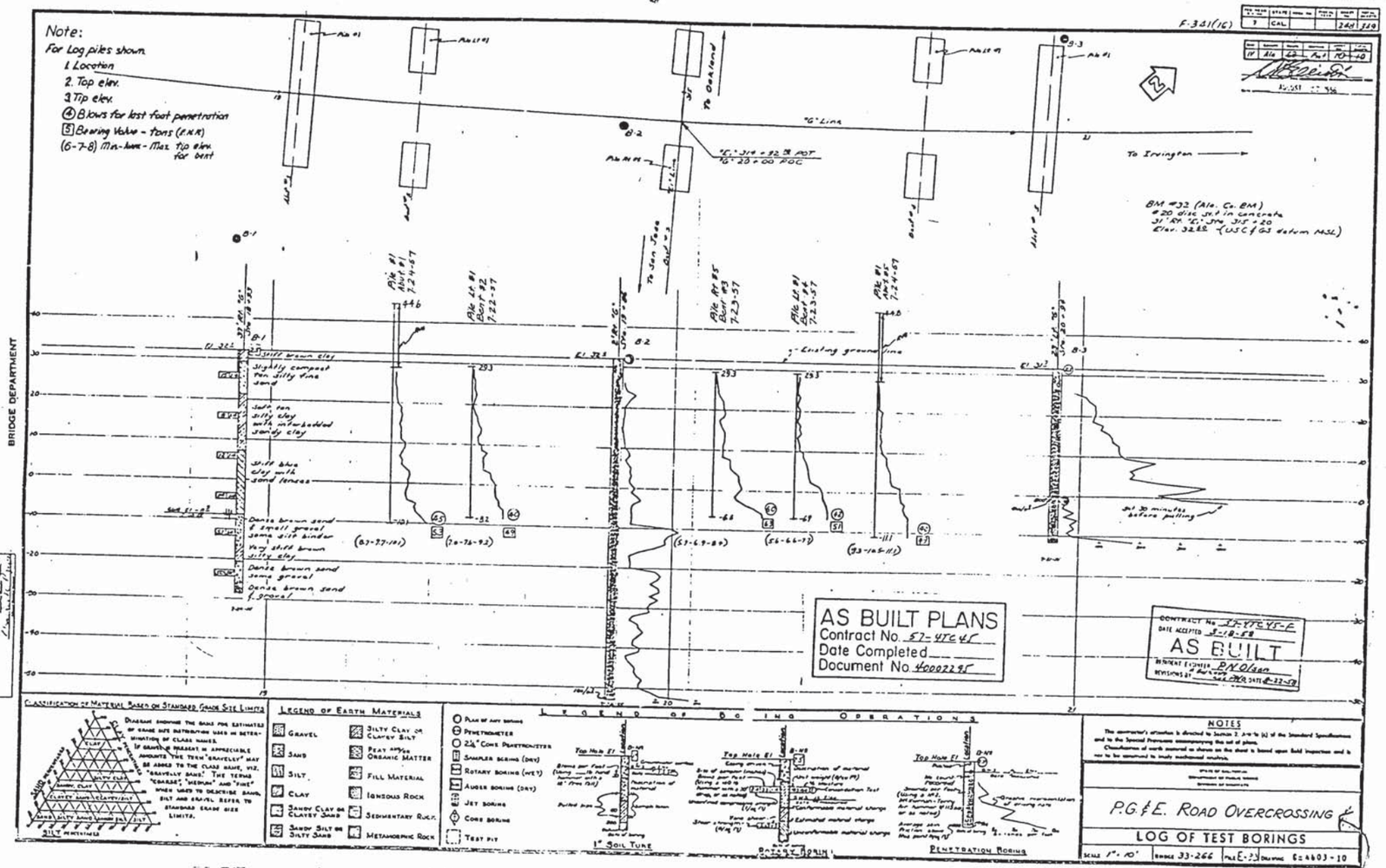
4-22-96 TO ACCOMPANY PLANS DATED	DIST	COUNTY	ROUTE	POST MILLS TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
	04	Ala	880	2.5/6.9	368	368.

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



NO AS BUILT CHANGES

STEVER AS BUILT

CORRECTIONS BY

CONTRACT NO.

DATE

DESIGN OVERSIGHT

SIGN OFF DATE

NOTE:
ADDITIONAL AS-BUILT FOUNDATION DATA MAY BE AVAILABLE AT THE OFFICE OF TRANSPORTATION MATERIALS AND RESEARCH 5900 FOLSOM BOULEVARD, SACRAMENTO, CALIFORNIA 95819

	BY	DATE
DESIGN		
DETAILS		
QUANTITIES		

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

PROJECT ENGINEER

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04183
EA 233101

BRIDGE NO. 33-591
POST MILE 6.24

STEVENSON BOULEVARD OC (REPLACE)

AS-BUILT LOG OF TEST BORINGS

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 20 OF 20

284

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	2.5/6.9	227	368

REGISTERED ENGINEER-GEOTECHNICAL 4-25-95

REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE95 Exp. 12/31/97 GEOTECHNICAL STATE OF CALIFORNIA

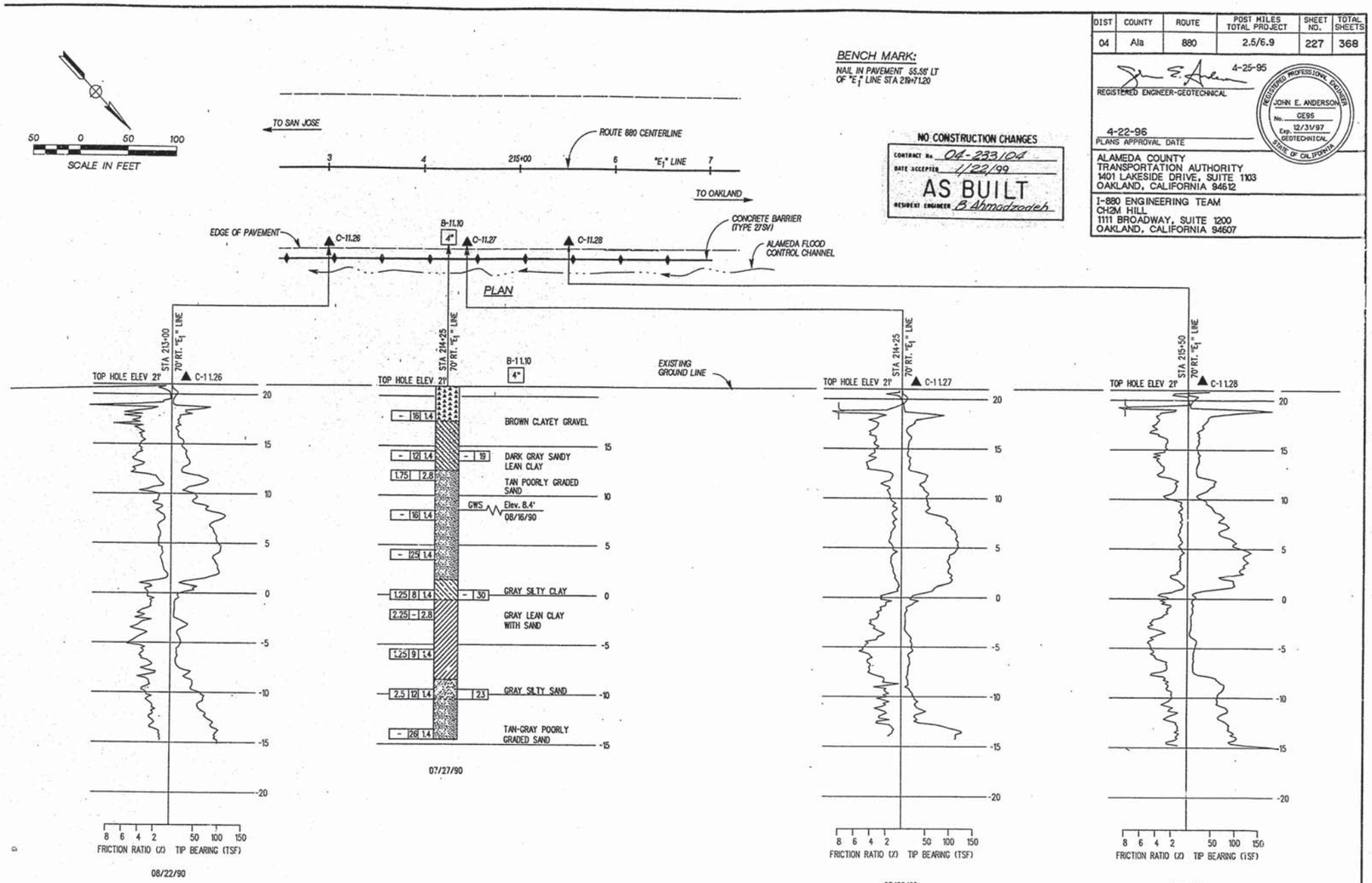
4-22-96
PLANS APPROVAL DATE

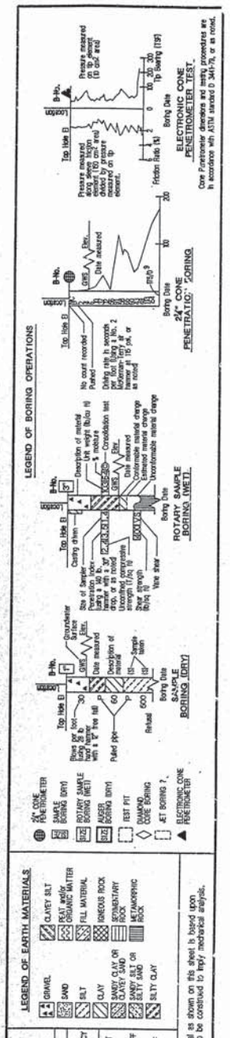
ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CALIFORNIA 94612

I-880 ENGINEERING TEAM
CH2M HILL
1111 BROADWAY, SUITE 1200
OAKLAND, CALIFORNIA 94607

BENCH MARK:
NAIL IN PAVEMENT 55.56' LT OF "E1" LINE STA 219+71.20

NO CONSTRUCTION CHANGES
CONTRACT No. 04-233104
DATE ACCEPTED 4/22/99
AS BUILT
RESIDENT ENGINEER B. Ahmadzadeh





DATUM: NATIONAL GEODETIC VERTICAL DATUM, 1929

R-15

DESIGN OVERSIGHT 6/14/95	DRAWN BY AL CORTEZ	S. TERENTIEFF FIELD INVESTIGATOR	APPROVAL RECOMMENDED BY J. ANDERSON	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	TOM DUMSCOMBE PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY D. ALLARD	REGISTRATION NO. N/A	REGISTRATION NO. GE96		

BRIDGE NO. / POST MILE

ROUTE WIDENING
RETAINING WALL NO.1

LOG OF TEST BORINGS

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04183
EA 233101

DISREGARD PRINTS BEARING EARLIER REVISION DATES 10/15/93

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 18 OF 21

CAE file ->> ZF2:[201,003]088WD214.DGN;3
USERNAME: $$$$$$$USER$$$$$ FLOTDATE: $$$$$$$DATE$$$$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	2.5/6.9	367	368

4-25-95
REGISTERED ENGINEER-GEOTECHNICAL

REGISTERED PROFESSIONAL ENGINEER
JOHN E. ANDERSON
No. CE96
Exp. 12/31/97
GEOTECHNICAL
STATE OF CALIFORNIA

4-22-96
PLANS APPROVAL DATE

ALAMEDA COUNTY TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE, SUITE 1103
OAKLAND, CALIFORNIA 94612

I-880 ENGINEERING TEAM / CH2M HILL
1111 BROADWAY, SUITE 1200
OAKLAND, CALIF. 94607

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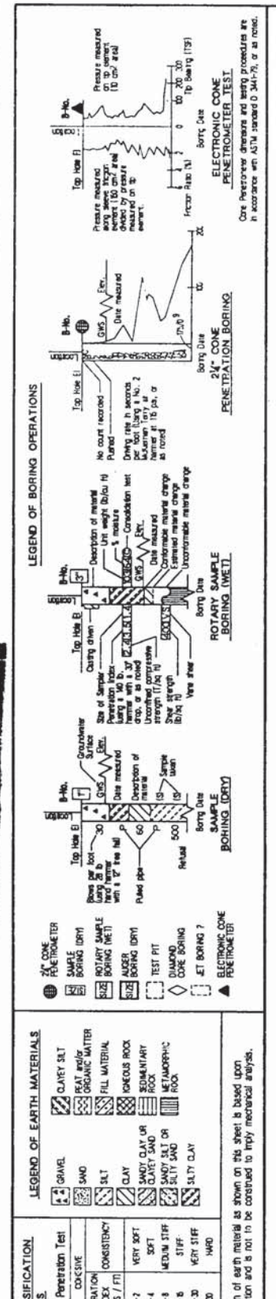

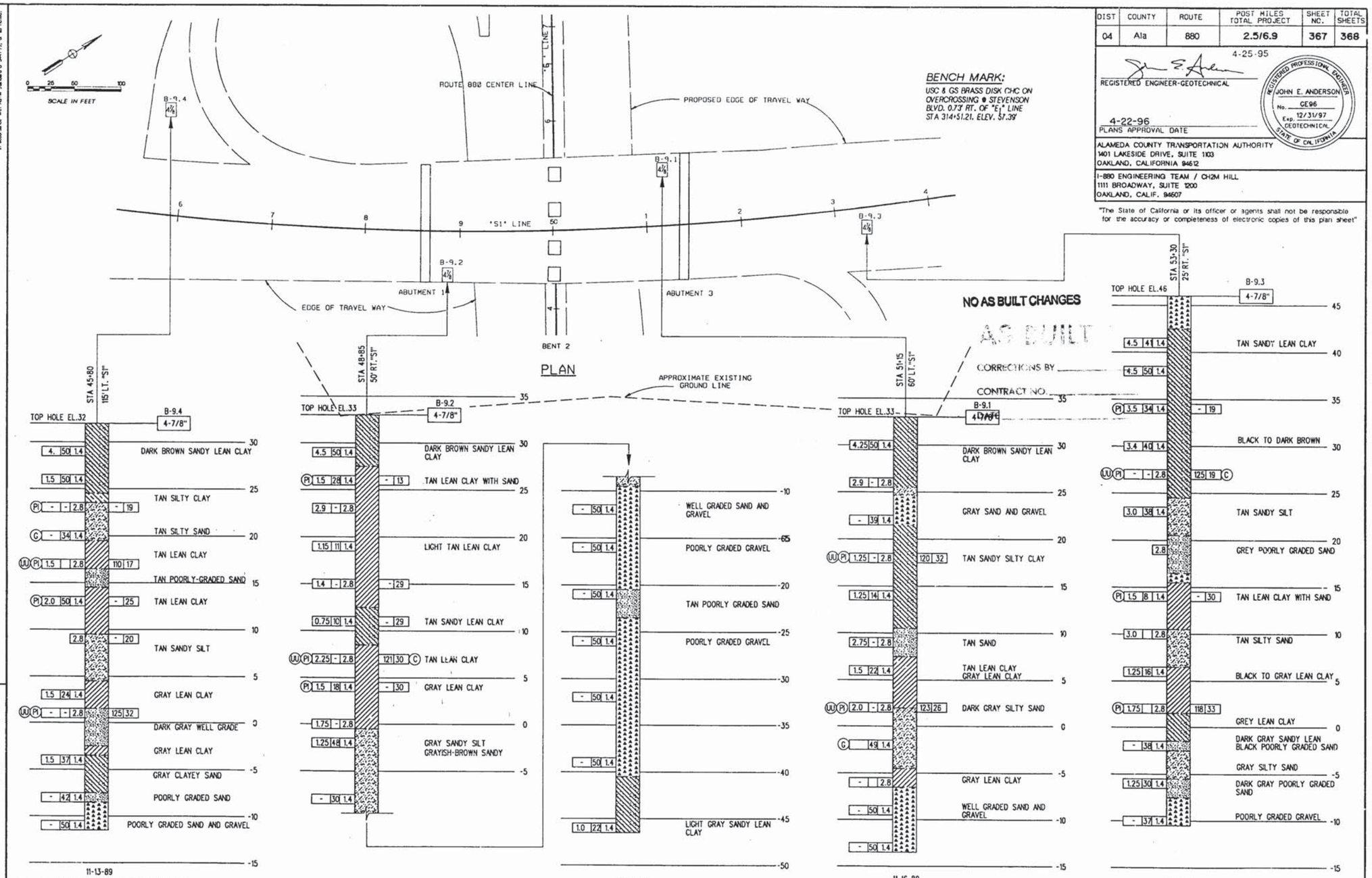

NOTE: GROUNDWATER LEVEL WAS NOT MEASURED AT TIME OF DRILLING BECAUSE DRILLING FLUID WAS USED IN THE BORINGS.

DESIGN OVERSIGHT / SIGN OFF DATE 6/14/95	DRAWN BY A.CORTEZ	S. TERENTIEFF FIELD INVESTIGATOR	APPROVAL RECOMMENDED BY	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	S.J.THOMAN PROJECT ENGINEER
	CHECKED BY D.ALLARD	REGISTRATION NO. N/A	REGISTRATION NO.		

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04183
EA 233101

BRIDGE NO. 33-591
POST MILE 6.24

STEVENSON BOULEVARD OVERCROSSING (REPLACE)

LOG OF TEST BORINGS

DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES (PRELIMINARY STAGE ONLY) 3/91 12/94 8/95 4/96

SHEET 19 OF 20

F-26839/STE 16.DGN

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	6.9 / 8.5	242	285

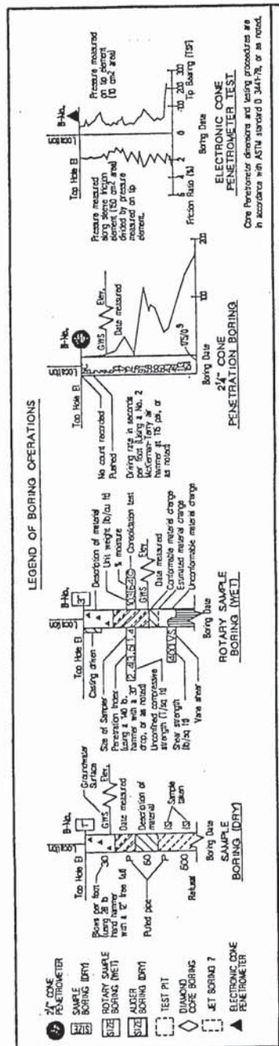
REGISTERED ENGINEER-GEOTECHNICAL 5/22/91

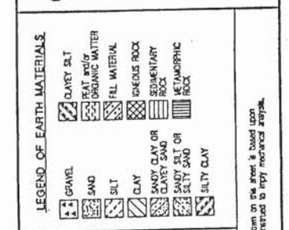
REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE96 Exp. 12/31/93 GEOTECHNICAL STATE OF CALIFORNIA

10-11-93
PLANS APPROVAL DATE

I-880 ENGINEERING TEAM
CH2M HILL
6425 CHRISTIE AVE, SUITE 500
EMERYVILLE, CALIFORNIA 94608

BENCH MARK:
NAIL IN PAVEMENT, 54.32' RT OF "E1" LINE STA 384+99.92

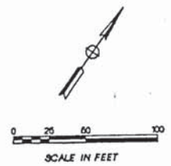


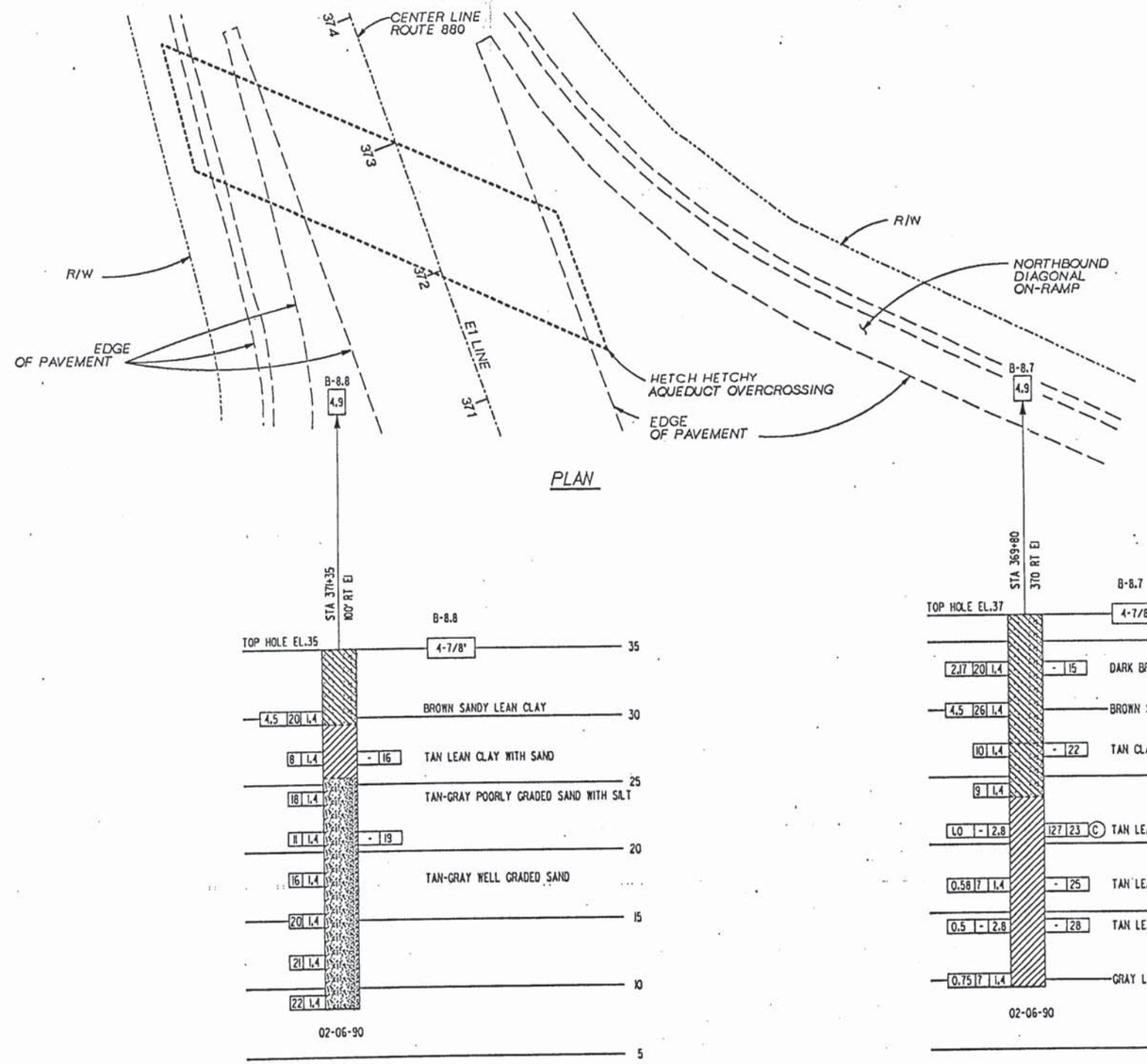


CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test

Penetration Blows / ft	Granular	Cohesive
0-4	Very loose	Very soft
5-9	Loose	Soft
10-19	Slightly compact	Stiff
20-34	Compact	Very stiff
35-69	Dense	Hard
>70	Very dense	Very hard

NOTE: Classification of earth material as shown on the sheet is based upon field inspection and is not to be construed to imply mechanical analysis.





NO AS BUILT CHANGES

CONTRACT No. 04-233114
DATE ACCEPTED AUG 96
AS BUILT
RESIDENT ENGINEER Scott Fabel
REVISIONS BY Mark Woods DATE JAN 20 1998
LA 12.4.98

NOTE:
GROUNDWATER LEVEL NOT MEASURED AT TIME OF DRILLING BECAUSE DRILLING FLUID WAS USED IN BORINGS.

DATUM: NGVD

DESIGN OVERSIGHT 5/7/93
SIGN OFF DATE

DRAWN BY D. HAECKER
CHECKED BY D. ALLARD

S. TERENTIEFF
FIELD INVESTIGATOR
REGISTRATION NO. N/A

APPROVAL RECOMMENDED BY
J. ANDERSON
REGISTRATION NO. GE96

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

D. GREB
PROJECT ENGINEER

CU 04-183
EA 233114

BRIDGE NO. 33-272
POST MILE 7.3

HETCH HETCHY ACQUEDUCT BRIDGE (WIDEN)

LOG OF TEST BORINGS

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 7 OF 8

CAE file =>> ZF2:[201,003]088STA369.DGN;1
USERNAME: $$$$$$$USER$$$$$$ PLOTDATE: $$$$$$$DATE$$$$$$

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FED. ROAD DIV. NO.	STATE	PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
7	CAL.			266	349

F-341(16)

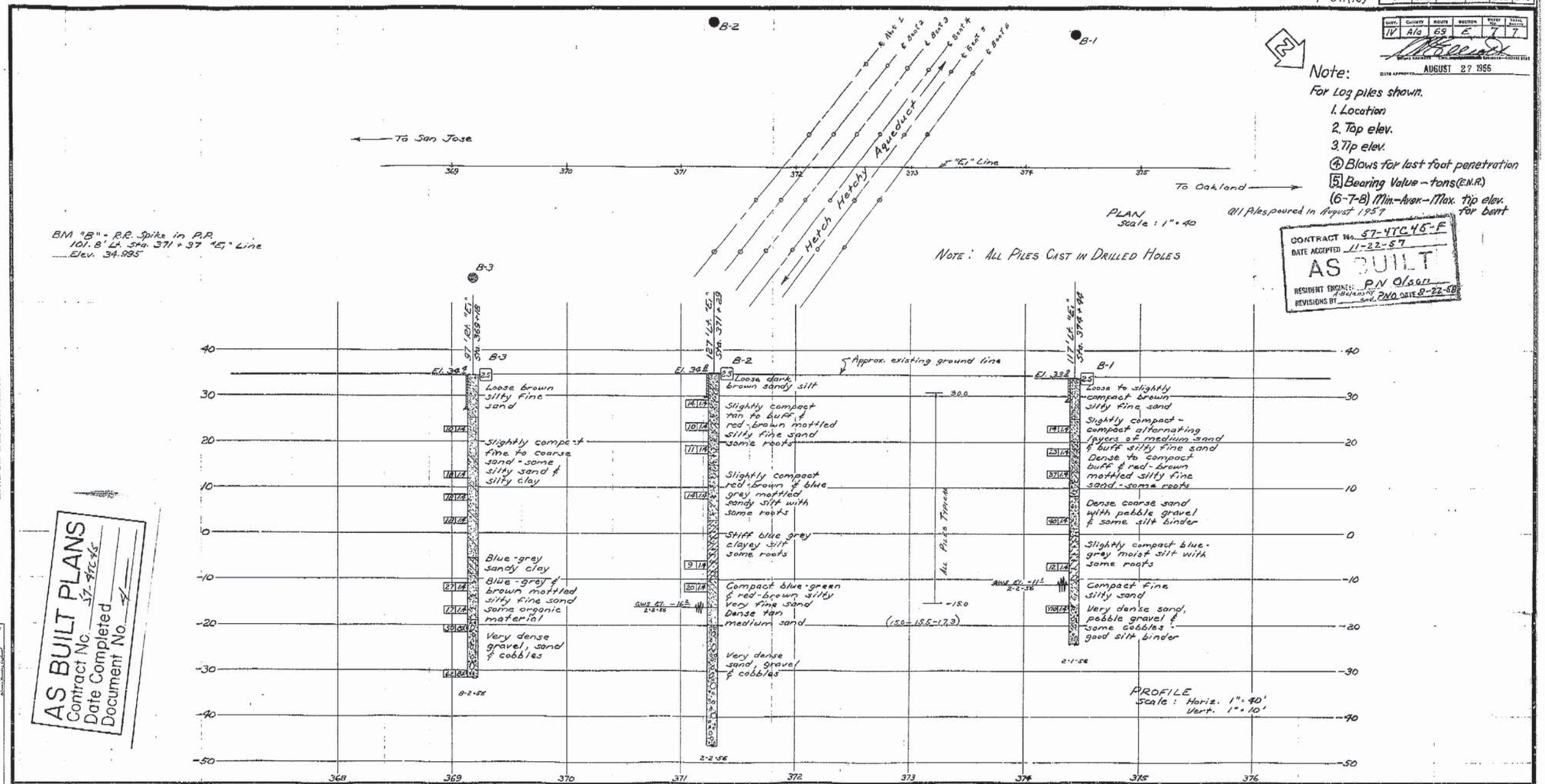
DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
IV	Ala	69	E	7	7

DATE APPROVED AUGUST 27 1956

Note:
For Log piles shown.
1. Location
2. Top elev.
3. Tip elev.
4. Blows for last foot penetration
5. Bearing Value – tons (E.N.R.)
(6-7-8) Min.–Aver.–Max. tip elev. for bent

All Piles poured in August 1957

CONTRACT No. 57-47C46-F
DATE ACCEPTED 11-22-57
AS BUILT
RESIDENT ENGINEER P.N. Olson
REVISIONS BY P.N.O. DATE 8-22-58



BRIDGE DEPARTMENT

AS BUILT PLANS
Contract No. 57-47C46
Date Completed
Document No. 4

PREPARED	A. Hughes 2-2-56
DRAWN	A. Hughes 2-2-56
CHECKED	E. Keyes 3-2-56
Approval Recommended	

268

Classification of Material Based on Standard Grade Size Limits

Diagram showing the basis for estimates of grade size distribution used in determination of class names.
If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand." The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

SILT PERCENTAGES

Legend of Earth Materials

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

Legend of Boring Operations

- Plan of any boring
- Penetrometer
- 2¼" Cone Penetrometer
- Sampler boring (DRY)
- Rotary boring (WET)
- Auger boring (DRY)
- Jet boring
- Core boring
- Test pit

1" Soil Tube — Rotary Boring — Penetration Boring

NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.
Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

HETCH HETCHY AQUEDUCT

LOG OF TEST BORINGS

SCALE As Noted | BRIDGE 33-272 | FILE | DRAWING C-4782-8

PKEL. DRAWING NO. P-4782 7

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE 5/7/73 SIGNATURE [illegible] TITLE [illegible]

ClibPDF - www.fastio.com

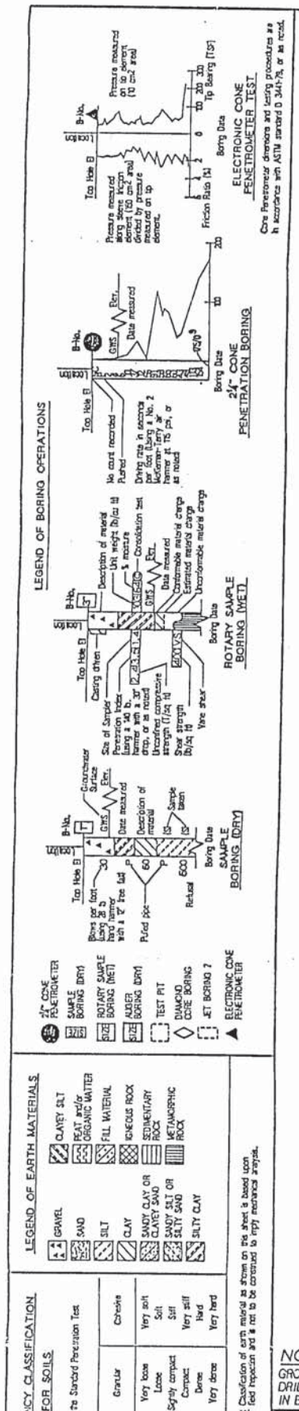
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	6.9/8.5	225	285

REGISTERED ENGINEER-GEOTECHNICAL 2/4/91

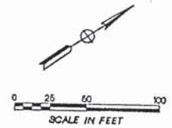
REGISTERED PROFESSIONAL ENGINEER JOHN E. ANDERSON No. GE96 Exp. 12/31/93 GEOTECHNICAL STATE OF CALIFORNIA

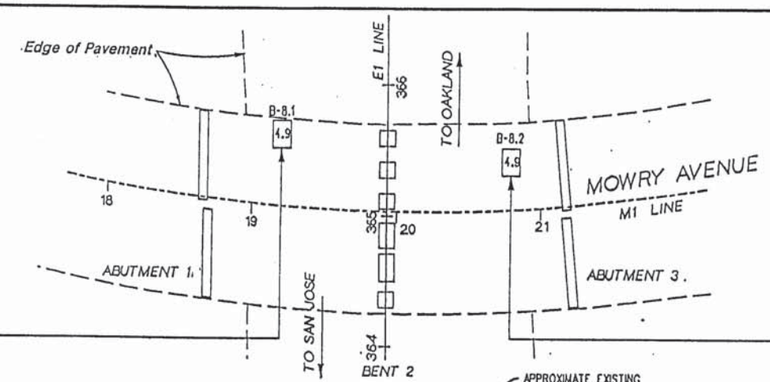
10-11-93
PLANS APPROVAL DATE

I-880 ENGINEERING TEAM
CH2M HILL
6425 CHRISTIE AVE, SUITE 500
EMERYVILLE, CALFORNIA 94608

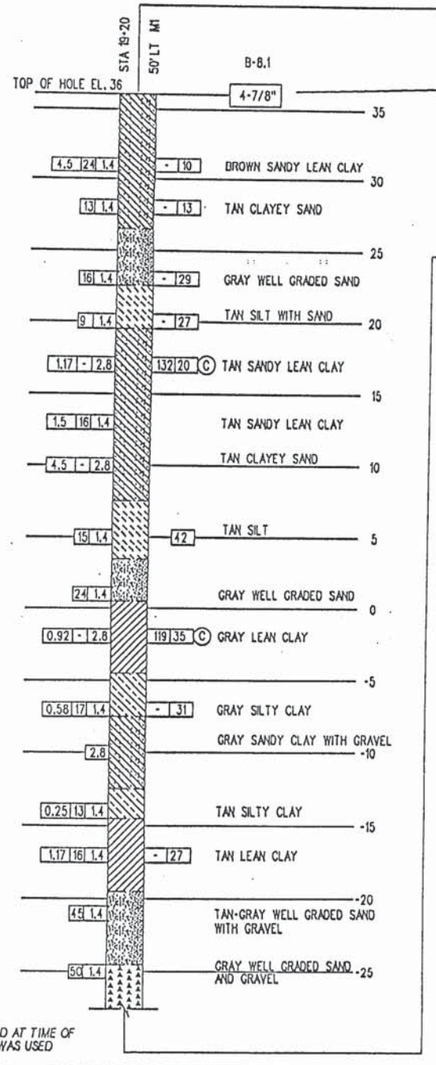


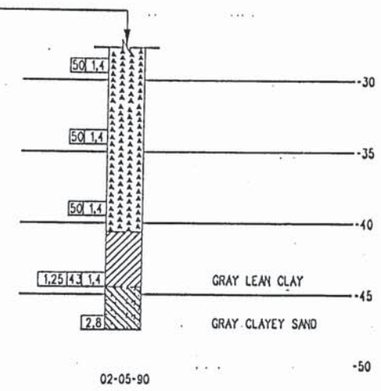
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply assurance of type.

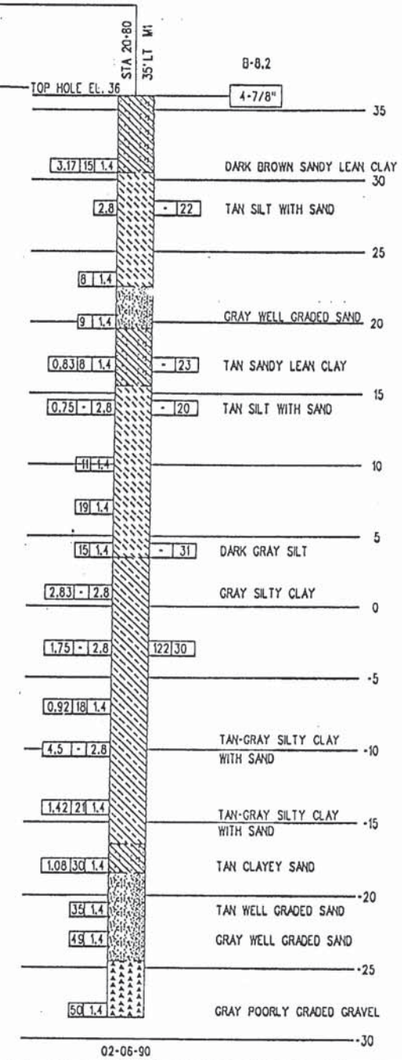




PLAN







BENCH MARK:
USC & GS BRASS DISK CHC ON OVERCROSSING @ STEVENSON BLVD. 0.73' RT. OF ℄ 'LINE STA 314+51.21. ELEV. 57.39'

LA 11.20.98
NO AS BUILT CHANGES

CONTRACT No. 04-233114
DATE ACCEPTED AUG 96
AS BUILT
RESIDENT ENGINEER Scott Fabel
REVISIONS BY Mark Woods DATE JAN 20 1998

NOTE:
GROUNDWATER LEVEL NOT MEASURED AT TIME OF DRILLING BECAUSE DRILLING FLUID WAS USED IN BORINGS.

DATUM: CALTRANS

DESIGN-OVERSIGHT
SIGN OFF DATE 5/7/93

DRAWN BY D. HAECKER
CHECKED BY D. ALLARD

S. TERENTIEFF
FIELD INVESTIGATOR
REGISTRATION NO. N/A

APPROVAL RECOMMENDED BY
J. ANDERSON
REGISTRATION NO. GE96

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

W. LAFRANCHI
PROJECT ENGINEER

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 04-183
EA 233111

BRIDGE NO. 33-267 L/R
POST MILE 7.18

MOWRY AVENUE OVERCROSSING (REPLACE)

LOG OF TEST BORINGS

DISREGARD PRINTS BEARING EARLIER REVISION DATES 10/16/93 9/10/91

REVISION DATES (PRELIMINARY STAGE ONLY)

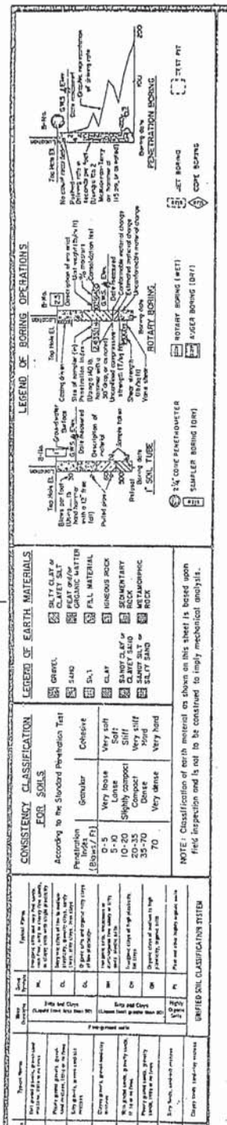
SHEET 19 OF 20

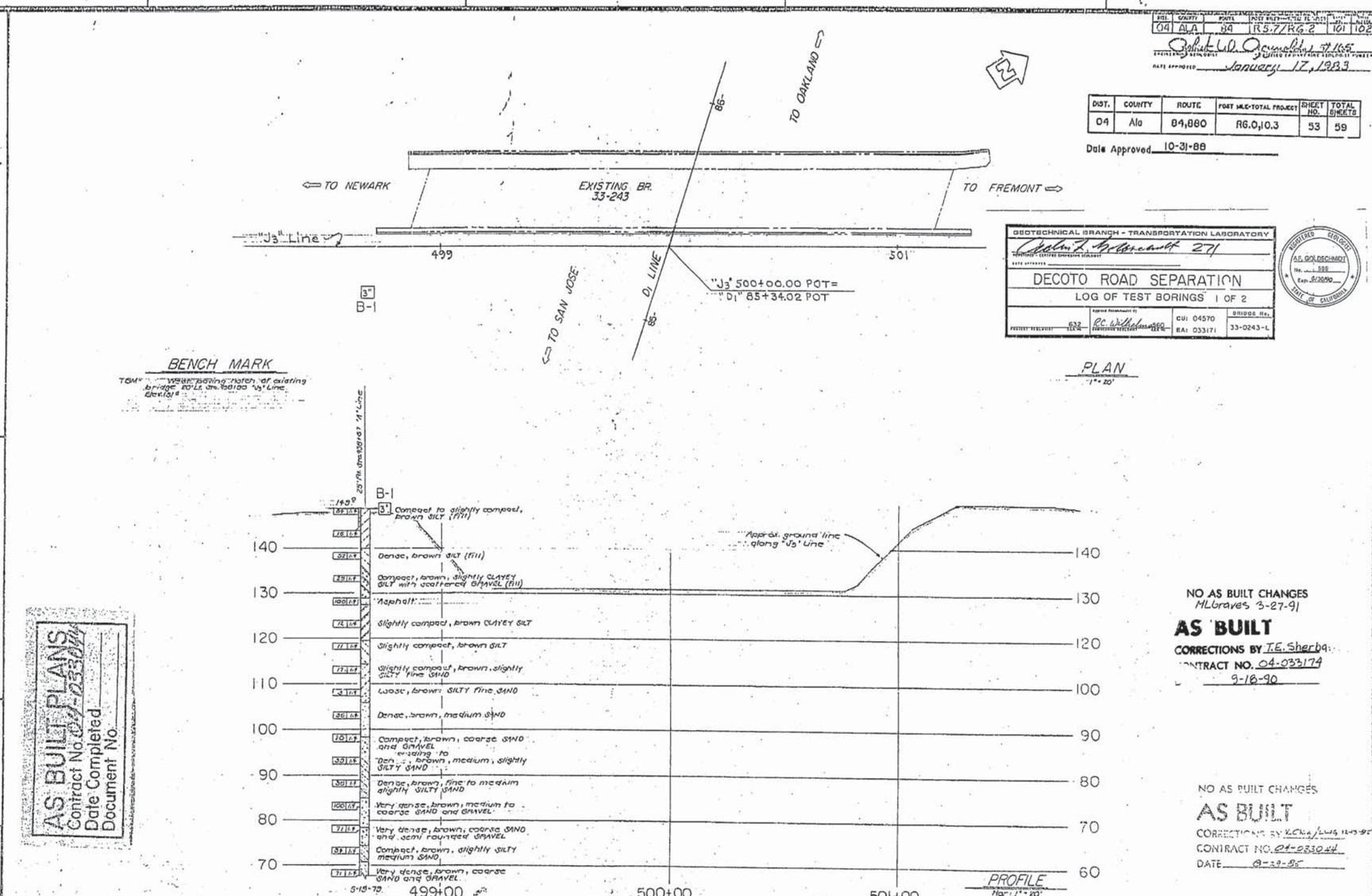
DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	84,880	R6.0,10.3	53	59

Date Approved 10-31-88

DIST.	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
04	ALA	84	R5.7/R6.2	101	102

Robert W. Oppenheimer 7165
ENGINEER GEOLOGIST — REGISTERED PROFESSIONAL ENGINEER
DATE APPROVED January 17, 1983





GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY
Charles L. Schwartz 271
REGISTERED CERTIFIED ENGINEERING GEOLOGIST
DATE APPROVED

REGISTERED GEOLOGIST A.S. GOLDSCHMIDT No. 556 Exp. 6/30/90 STATE OF CALIFORNIA

DECOTO ROAD SEPARATION
LOG OF TEST BORINGS 1 OF 2

DISTRICT	DIVISION	CU: 04570	BRIDGE No.
632	R.C. Williamson	EA: 033171	33-0243-L

NO AS BUILT CHANGES
MLbraves 3-27-91
AS BUILT
CORRECTIONS BY T.E. Sherba
CONTRACT NO. 04-033174
9-18-90

NO AS BUILT CHANGES
AS BUILT
CORRECTIONS BY LCNa/LWS 12-13-95
CONTRACT NO. 04-033044
DATE 8-29-95

AS BUILT PLANS
Contract No. 04-033174
Date Completed
Document No.

ENGINEERING GEOLOGY BRANCH
FIELD STUDY By R. Fox 5/79
DRAWN By ED PONO 6/79
CHECKED By R. Fox 7/79
Approved Recommended By R. Fox
ENGINEERING GEOLOGIST 70

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION
STRUCTURES - DESIGN 9
PROJECT ENGINEER Ex Powers CE 72015
BRIDGE NO. 33-243R
POST MILE 6.0
CU 04220
WO 033041
Disregard prints bearing earlier revision dates

DECOTO ROAD SEPARATION (84/14)
LOG OF TEST BORINGS 1 OF 2

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

REVISION DATES (PRELIMINARY ENGINEERING ONLY) 12/7/66 12/9/66 12/12/66
SHEET 12 OF 13

101

AS BUILT PLANS
Contract No. 04-033174
Date Completed 9-18-90
Document No.

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION

DATE 5-1-91 SIGNATURE Ronald Blackford TITLE

MICROFILM - STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - MICROFILM
SCALE 1" = 50' 0 100 200 300 400 500 600
SCALE 1" = 20' 0 50 100 200 300
ChipPDF - www.fastio.com

F-341(16)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET	TOTAL SHEETS
7	CAL.			327	349

DIST	COUNTY	ROUTE	POST MILES-TOTAL PROJECT	SHEET NO.	TOT. SHEETS
04	Ala	84,880	R6.0,10.3	54	59

DATE APPROVED: 10-31-88

DIST.	COUNTY	ROUTE	POSTMILES	SHEET	TOTAL SHEETS
IV	Ala	880			72

DATE APPROVED AUGUST 31, 1956

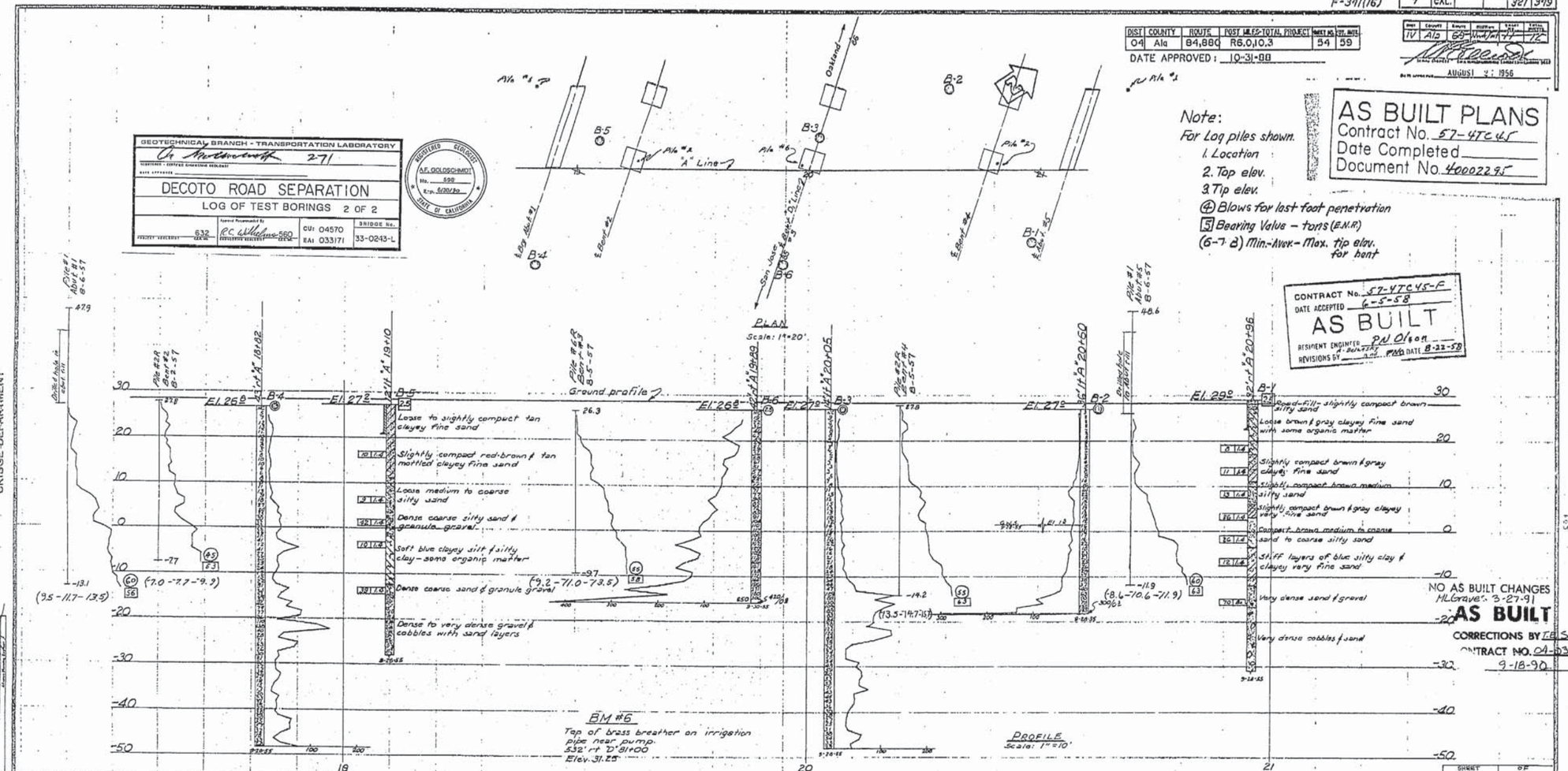
AS BUILT PLANS
Contract No. 57-47C45
Date Completed
Document No. 40002295

GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY
2-71
DECOTO ROAD SEPARATION
LOG OF TEST BORINGS 2 OF 2
632 | R.C. Wilshire 560 | CU: 04570 EA: 033171 | BRIDGE No. 33-0243-L

REGISTERED GEOLOGIST A.F. GOLDSCHMIDT No. 599 Exp. 6/30/56 STATE OF CALIFORNIA

Note:
For Log piles shown.
1. Location
2. Top elev.
3. Tip elev.
4. Blows for last foot penetration
5. Bearing Value – tons (E.N.R)
(6-7-8) Min.-Aver.-Max. tip elev. for bent

CONTRACT No. 57-47C45-F
DATE ACCEPTED 6-5-58
AS BUILT
RESIDENT ENGINEER P.N. Olson
REVISIONS BY DATE 8-22-58



NO AS BUILT CHANGES
H.L. Graves 3-27-91

AS BUILT
CORRECTIONS BY T.E. Sherba
CONTRACT NO. 04-033174
9-18-90

BRIDGE DEPARTMENT

FIELD BY: R. Hager 9-55
DRAWN: R. Dorr 10-55
CHECKED: R. Hager 10-55

Approval Recommended: R.C. Wilshire 11-4-55
Approved: C.A. Ramos 11-4-55

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

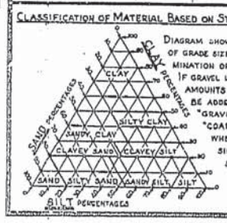


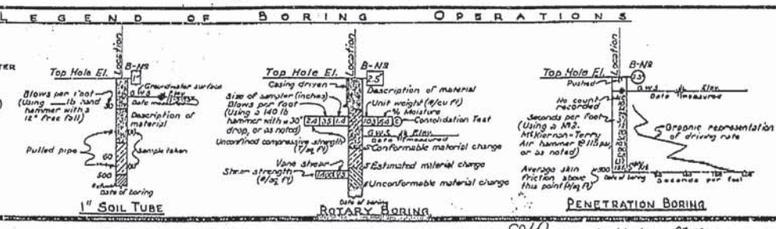
DIAGRAM SHOWING THE BASIS FOR ESTIMATING OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES. IF GRAVEL IS PRESENT IN APPRECIABLE AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ. "GRAVELLY SAND". THE TERMS "COARSE", "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE SAND, SILT AND GRAVEL REFER TO STANDARD GRADE SIZE LIMITS.

LEGEND OF EARTH MATERIALS

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

LEGEND OF BORING OPERATIONS

- Plan of any boring
- Penetrometer
- 2½" Cone Penetrometer
- Sampler boring (DRY)
- Rotary boring (WET)
- Auger boring (DRY)
- Jet boring
- Core boring
- Test pit



NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.
Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

DECOTO ROAD OVERCROSSING

LOG OF TEST BORINGS 2 OF 2

SCALE As shown | BRIDGE 33-243 | FILE | DRAWING C-4003-11

PREL. DRAWING NO. P-4003

Effomeny 1/12/66 CE 7845

329

AS BUILT PLANS
Contract No. 04-033174
Date Completed 9-18-90
Document No.

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION

DATE | SIGNATURE Ronald Blackford | TITLE

MICROFILM - STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - MICROFILM
SCALE 1" = 50'
SCALE 1" = 20'
ClibPDF - www.fastio.com

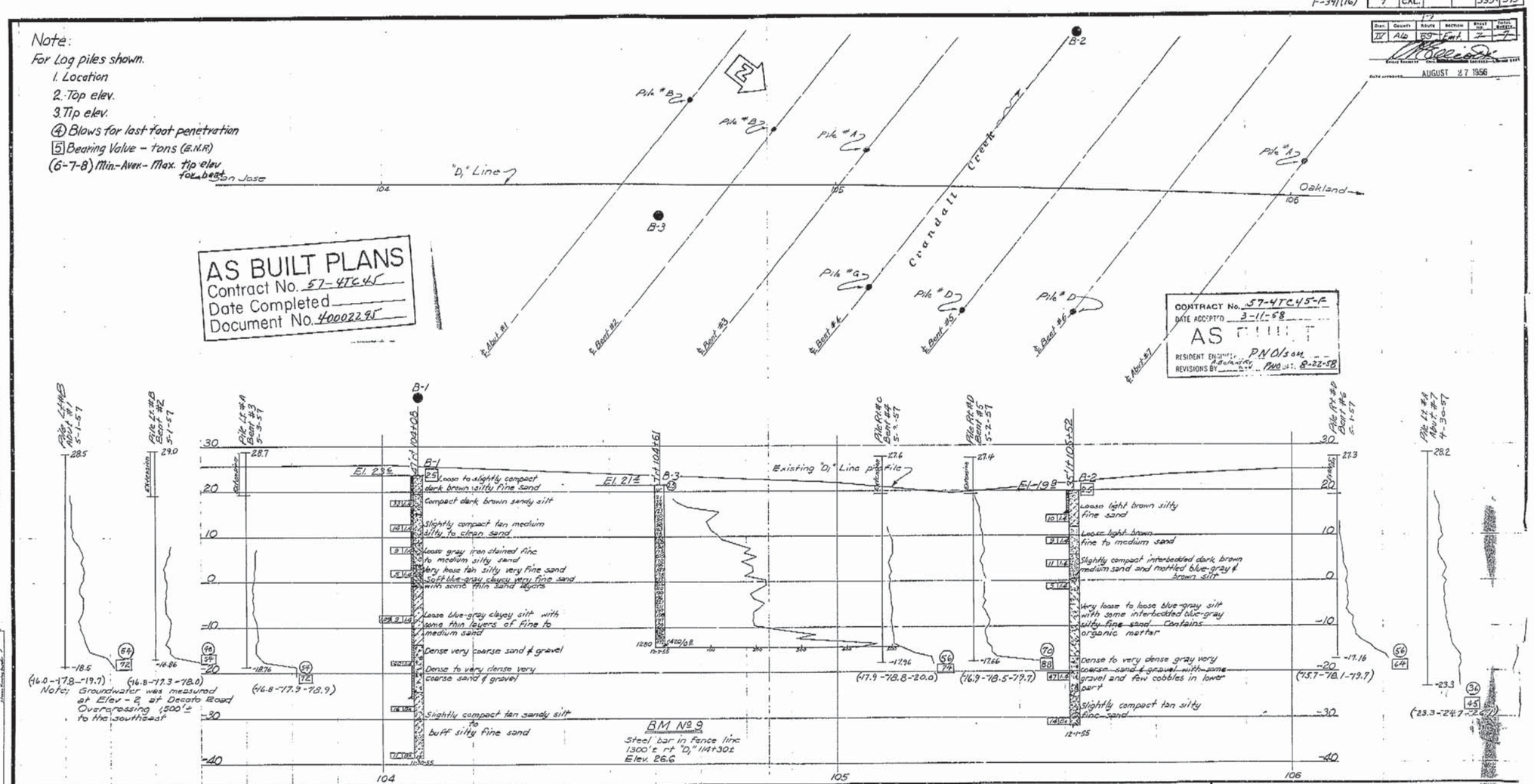
F-341(16)

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.			335	349

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
IV	Ala	69	Ent.	7	7

AUGUST 27 1956

Note:
For Log piles shown.
1. Location
2. Top elev.
3. Tip elev.
4. Blows for last foot penetration
5. Bearing Value – tons (E.N.R.)
(6-7-8) Min.-Aver.- Max. tip elev for abut.



AS BUILT PLANS
Contract No. 57-4TC45
Date Completed
Document No. 40002295

CONTRACT No. 57-4TC45-F
DATE ACCEPTED 3-11-68
AS BUILT
RESIDENT ENGINEER P.N. Olsen
REVISIONS BY Adamson Date 8-22-58

BRIDGE DEPARTMENT

FIELD STUDY	W. Hager	12-55
DRAWN	W. Hager	12-55
CHECKED	W. Hager	1-56

Approved for Submission by: [signature]

Classification of Material Based on Standard Grade Size Limits

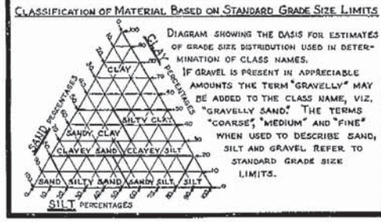


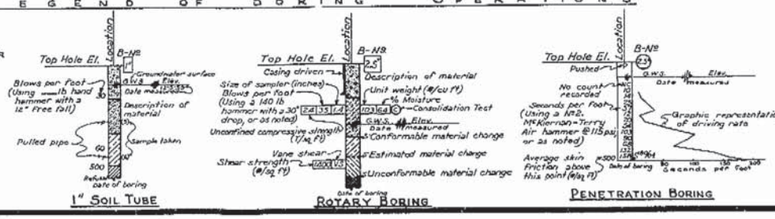
Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz, "gravelly sand." The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

Legend of Earth Materials

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

Legend of Boring Operations

- Plan of any boring
- Penetrometer
- 2½" Cone Penetrometer
- Sampler Boring (Dry)
- Rotary Boring (Wet)
- Auger Boring (Dry)
- Jet Boring
- Core Boring
- Test Pit



Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

CRANDALL CREEK BRIDGES

LOG OF TEST BORINGS

SCALE 1" = 10' | BRIDGE 33-273 S/L | FILE E-2 | DRAWING B-4796

PRELIM. DRAWING NO. B-4796 7

337

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE June 21, 1971 SIGNATURE [signature] TITLE Records Officer

ClibPDF - www.fastio.com

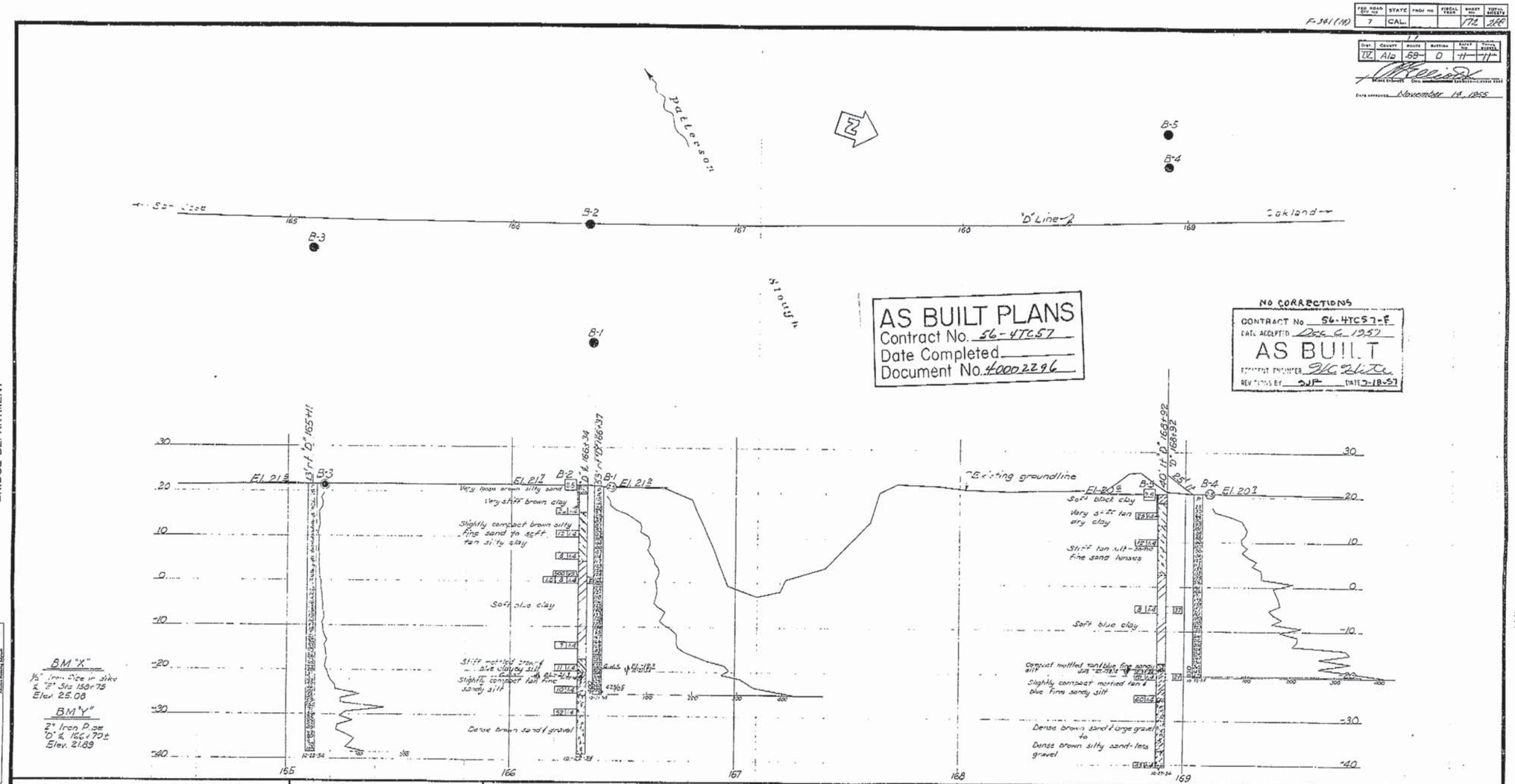
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.			772	288

F-341(18)

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
IV	Ala	69	D	11	11

Date approved November 18, 1955

BRIDGE DEPARTMENT



Classification of Material Based on Standard Grade Size Limits

Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand." The terms "coarse," "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

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- 2½" Cone Penetrometer
- Sampler boring (dry)
- Rotary boring (wet)
- Auger boring (dry)
- Jet boring
- Core boring
- Test pit

1" Soil Tube — Rotary Boring — Penetration Boring

Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

State of California
Department of Public Works
Division of Highways

Bridge Across Patterson Slough

Log of Test Borings

Scale Horiz. 1"=20' Vert. 1"=10 | Bridge 33-250 ½ | File | Drawing C-4135-11

RR-4135-3

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE June 21, 1971 SIGNATURE [illegible] TITLE Highway Information Officer

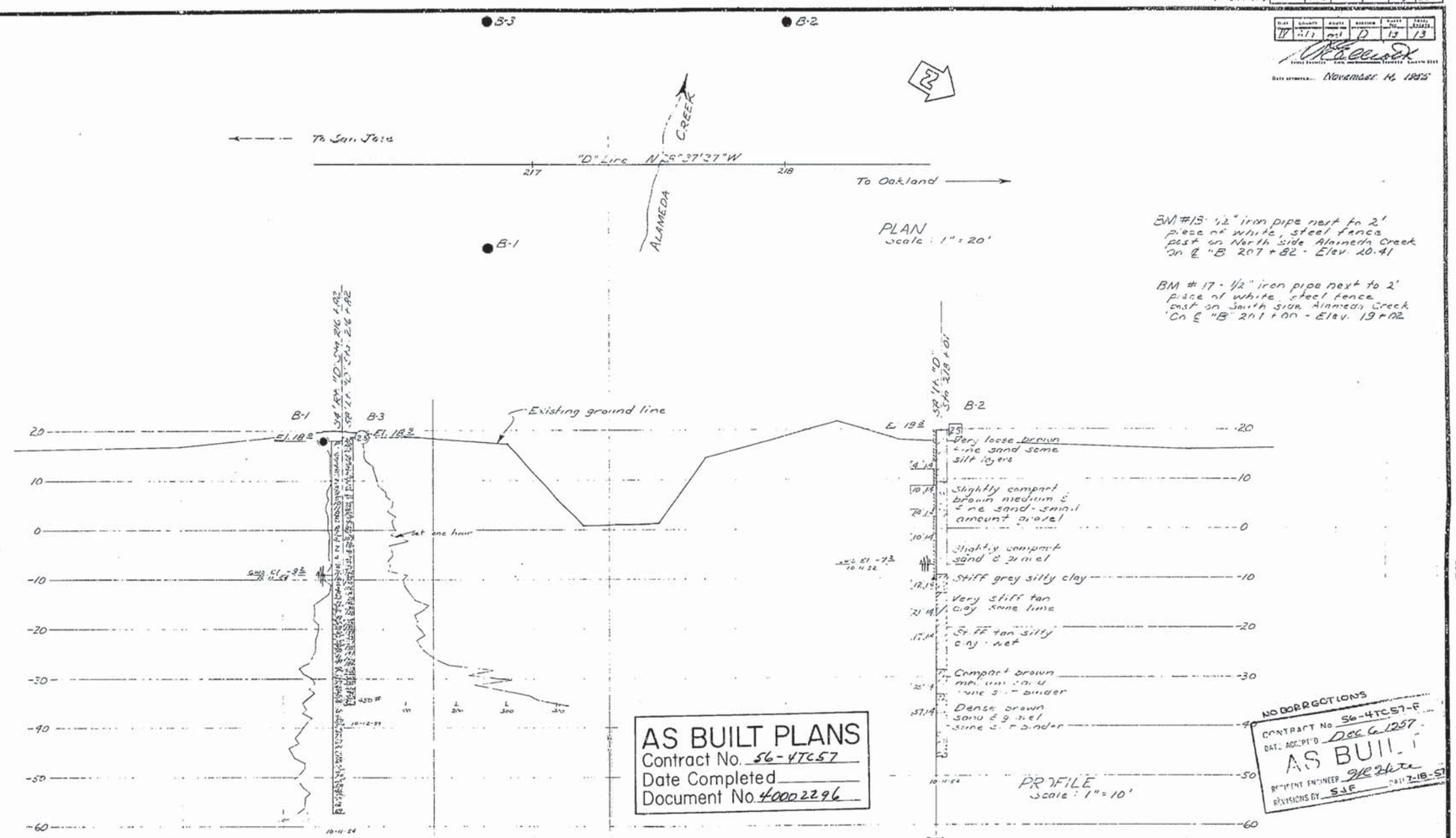
ClibPDF - www.fastio.com

F-341 (14)

DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
04	Alm	17	D	13	13

Date approved November 14, 1955

BRIDGE DEPARTMENT



AS BUILT PLANS
Contract No. 56-4TC57
Date Completed
Document No. 40002296

NO CORRECTIONS
CONTRACT No. 56-4TC57-F
DATE ACCEPTED Dec. 6, 1957
AS BUILT
RESIDENT ENGINEER
REVISIONS BY SJF DATE 7-18-57

FIELD STUDY: H. A. Moreck 10-54
DESIGN: H. A. Moreck 12-54
CHECKED: H. A. Moreck 1-55
Approval Recommended by: T. H. Kirkwood, Chief Bridge Engineer

Classification of Material Based on Standard Grade Size Limits

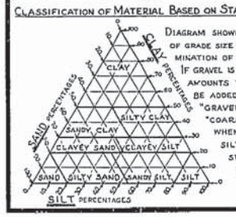


Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand". The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

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- Clay
- Sandy Clay or Clayey Sand
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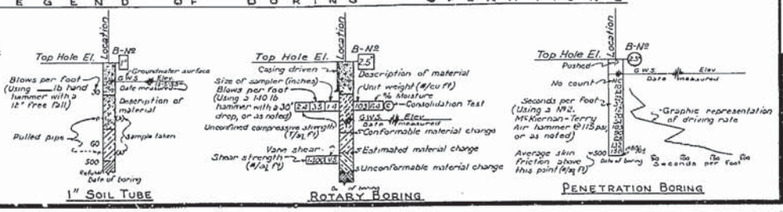
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

Legend of Boring Operations

- Plan of any boring
- Penetrometer
- 2¼" Cone Penetrometer
- Sampler Boring (Dry)
- Rotary Boring (Wet)
- Auger Boring (Dry)
- Jet Boring
- Core Boring
- Test Pit



Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

BRIDGE ACROSS ALAMEDA CREEK

LOG OF TEST BORINGS

Scale	Bridge	File	Drawing
A. [illegible]	33-2[illegible]		C-3958-13

Full Drawing 3958-39

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE: SIGNATURE: TITLE:

ChipPDF - www.fastro.com

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	12.8/13.2	276	295

GEOTECHNICAL PROFESSIONAL 1/27/95

6-10-96
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/97 GEOTECHNICAL STATE OF CALIFORNIA

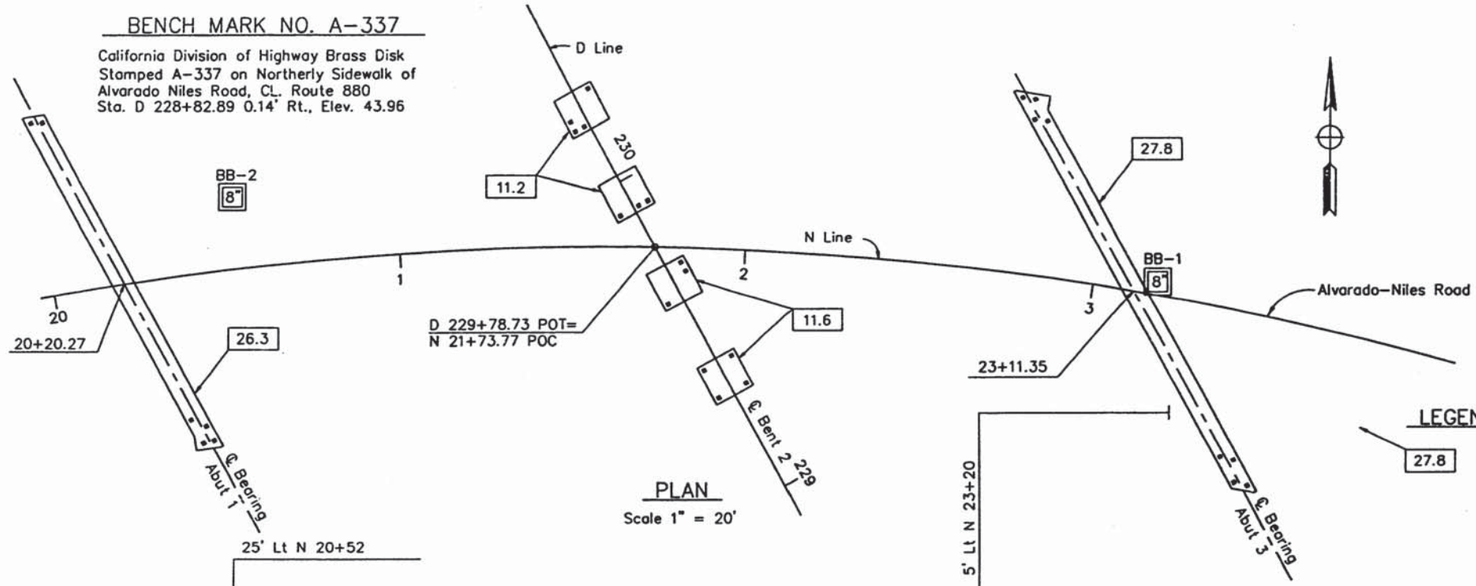
ALAMEDA COUNTY
TRANSPORTATION AUTHORITY
1401 LAKESIDE DRIVE SUITE 600
OAKLAND, CA 94612

PARIKH CONSULTANTS, INC.
481 VALLEY WAY
MILPITAS, CA 95035

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

BENCH MARK NO. A-337

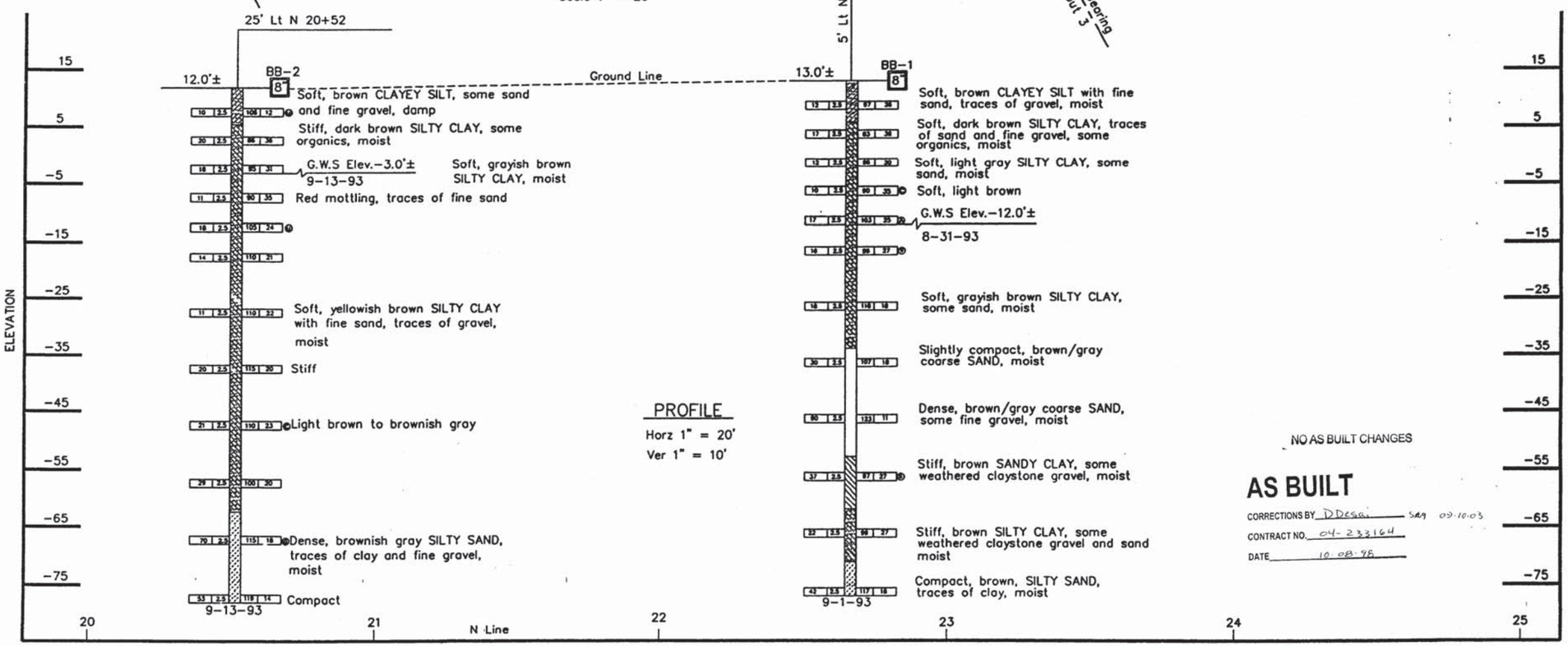
California Division of Highway Brass Disk Stamped A-337 on Northerly Sidewalk of Alvarado Niles Road, CL. Route 880 Sta. D 228+82.89 0.14' Rt., Elev. 43.96



PLAN
Scale 1" = 20'

LEGEND

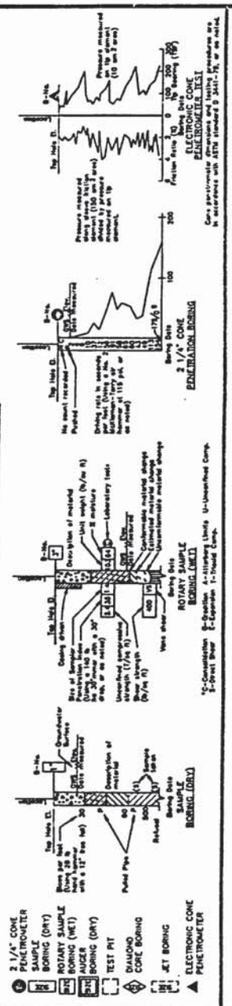
27.8 Denotes bottom of footing elevation



PROFILE
Horz 1" = 20'
Ver 1" = 10'

NO AS BUILT CHANGES

AS BUILT
CORRECTIONS BY D Degan 09-10-03
CONTRACT NO. 04-233164
DATE 10-08-98



LEGEND OF EARTH MATERIALS

GRAVEL, SAND, SILT, CLAY, CLAYEY SILT, PEAT and/or ORGANIC MATTER, FILL MATERIAL, IGNEOUS ROCK, SEDIMENTARY ROCK, METAMORPHIC ROCK, SANDY CLAY or CLAYEY SAND, SANDY SILT or SILTY SAND, SILTY CLAY

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Penetration Resistance (Blows/Ft)	Granular	Cohesive
0-4	Very loose	Very soft
5-9	Loose	Soft
10-19	Slightly compact	Stiff
20-34	Compact	Very stiff
35-69	Dense	Hard
> 70	Very dense	Very hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT 6/23/95	DRAWN BY P. QUACH	E. BHANGOO FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
SIGN OFF DATE	CHECKED BY Y.D. WANG	DATE SEPTEMBER 93	

Y.D. WANG
PROJECT ENGINEER

BRIDGE NO. 33-631
POST MILE 13.0

ALVARADO-NILES ROAD OVERCROSSING
LOG OF TEST BORINGS

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04183
EA 233161

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) 3/27/94 7/27/94 9/26/94 11/29/94 1/30/95

SHEET 22 OF 22

PCI Job No. 93102.12 Plate 2

ALVNLTB

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.
04	Ala	880	13.0/14.5	332

12-16-91
PLANS APPROVAL DATE

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY
CERTIFIED ENGINEERING GEOLOGIST
PROJECT GEOLOGIST

WHIPPLE ROAD U.C. (WIDEN)

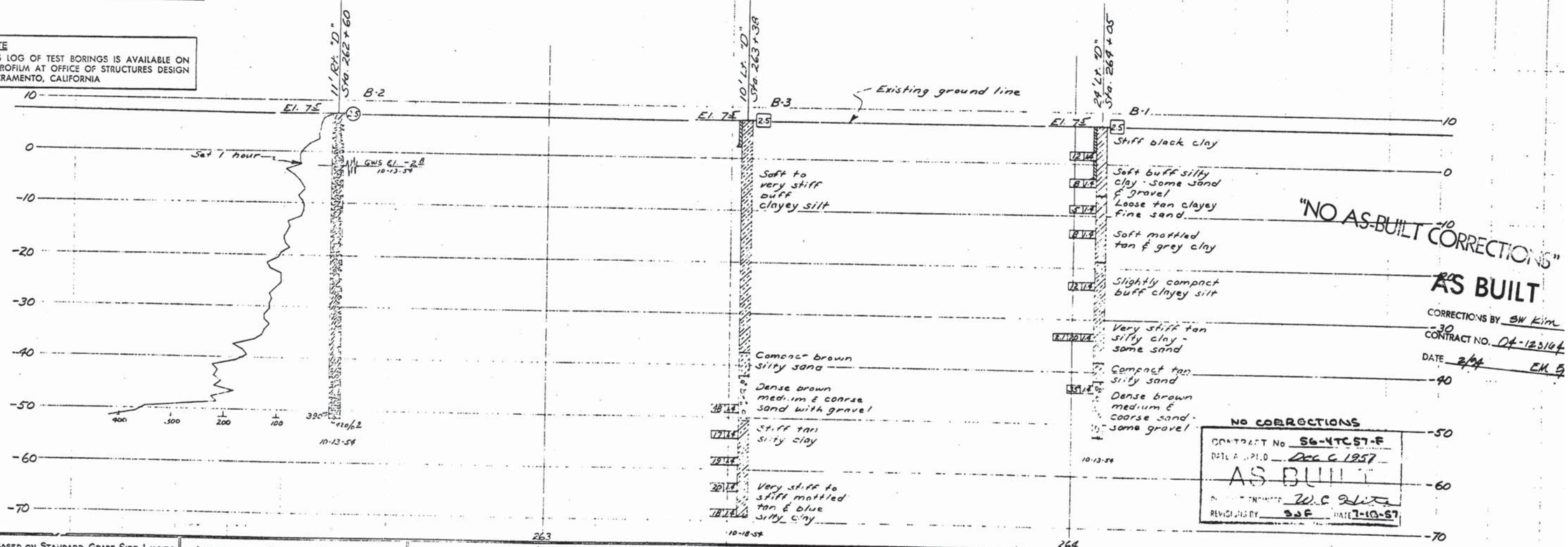
LOG OF TEST BORINGS

		CU: 04 EA: 123161	BRIDGE No. 33-245

REGISTERED GEOLOGIST — GOLDSCHMIDT No. 271 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

AS BUILT PLANS
Contract No. 56-4TC57
Date Completed
Document No. 40002296

NOTE
THIS LOG OF TEST BORINGS IS AVAILABLE ON MICROFILM AT OFFICE OF STRUCTURES DESIGN SACRAMENTO, CALIFORNIA



"NO AS-BUILT CORRECTIONS"

AS BUILT
CORRECTIONS BY SW Kim
CONTRACT NO. 04-123164
DATE 2/04 EM 5

NO CORRECTIONS
CONTRACT No 56-4TC57-F
DATE APPLIED Dec 6 1957
AS BUILT
RESIDENT ENGINEER W.C. White
REVISIONS BY SJF DATE 1-10-57

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

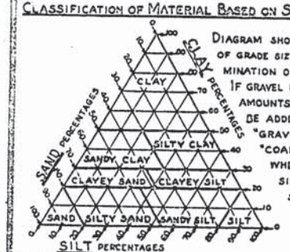


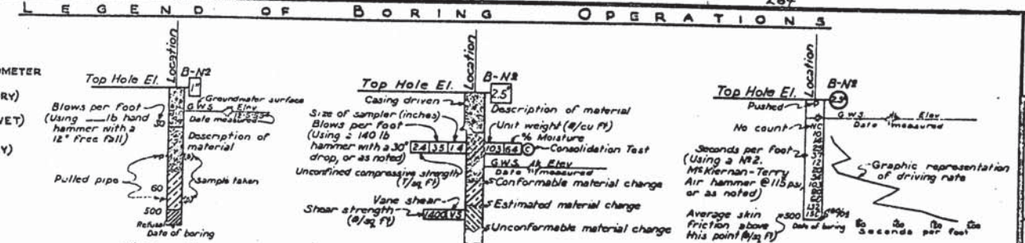
DIAGRAM SHOWING THE BASIS FOR ESTIMATES OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES.
IF GRAVEL IS PRESENT IN APPRECIABLE AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ. "GRAVELLY SAND." THE TERMS "COARSE", "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE SAND, SILT AND GRAVEL REFER TO STANDARD GRADE SIZE LIMITS.

LEGEND OF EARTH MATERIALS

- GRAVEL
- SAND
- SILT
- CLAY
- SANDY CLAY OR CLAYEY SAND
- SANDY SILT OR SILTY SAND
- SILTY CLAY OR CLAYEY SILT
- PEAT AND/OR ORGANIC MATTER
- FILL MATERIAL
- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

LEGEND OF BORING OPERATIONS

- PLAN OF ANY BORING
- PENETROMETER
- 2½" CONE PENETROMETER
- SAMPLER BORING (DRY)
- ROTARY BORING (WET)
- AUGER BORING (DRY)
- JET BORING
- CORE BORING
- TEST PIT



NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifi and to the Special Provisions accompanying this set of plans.
Classification of earth material as shown on this sheet is based upon field inspection not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

WHIPPLE ROAD UNDERCROSSI

LOG OF TEST BORINGS

SCALE 1" = 10'	BRIDGE 33-245 R/L	FILE	DRAWING 4035-

PREL. DRAWING No. F-4035 25 26 41 56

PR-4035

BRIDGE DEPARTMENT

ClibPDF - www.fastio.com

FED. ROAD DIST. NO.	STATE	FISCAL YR.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
7	CAL.			266	286

F-341 (14)

04 Ala 880 13.7 / 16.2 182 184

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
04	Ala	880	TT	12	

November 14 1958

AS BUILT PLANS
Contract No. 04-123154
Date Completed 10-31-91
Document No.

AS BUILT PLANS
Contract No. 56-476C7
Date Completed
Document No. 40002311

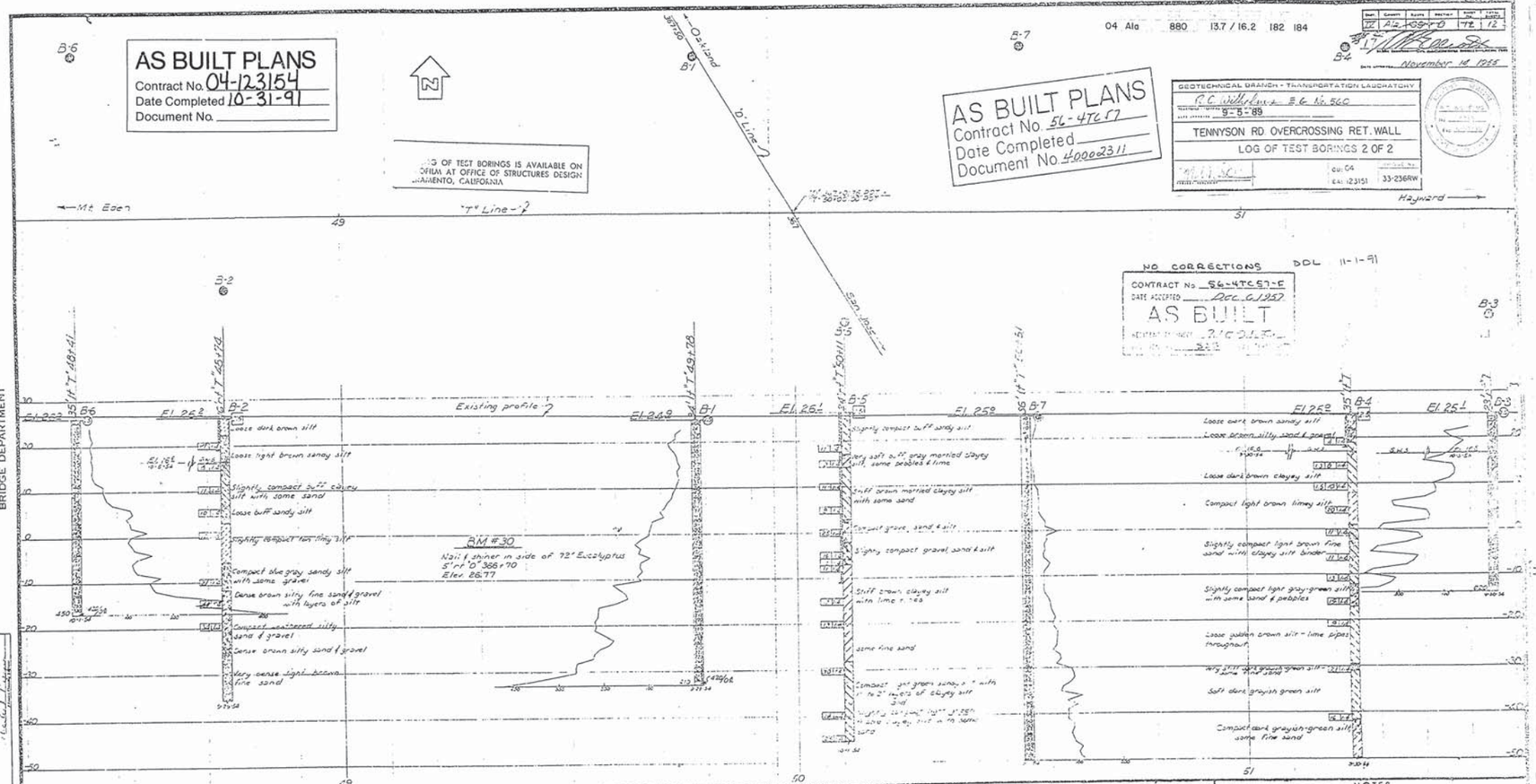
GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY
R.C. Wolfe Exp. E.G. No. 560
9-5-89
TENNYSON RD OVERCROSSING RET. WALL
LOG OF TEST BORINGS 2 OF 2
DIST. 04 EA. 123151 33-236RW

NO CORRECTIONS DDL 11-1-91

CONTRACT No. 56-476C7-E
DATE ACCEPTED Dec. 6, 1957
AS BUILT

...G OF TEST BORINGS IS AVAILABLE ON ...FILM AT OFFICE OF STRUCTURES DESIGN ...RAMENTO, CALIFORNIA

BRIDGE DEPARTMENT



Classification of Material Based on Standard Grade Size Limits

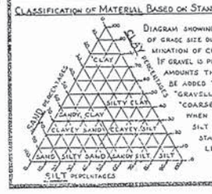


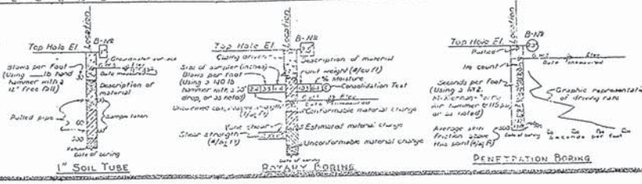
Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand". The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

Legend of Earth Materials

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

Legend of Boring Operations

- Plan of any boring
- Penetrometer
- 2½" Cone Penetrometer
- Sampler boring (CLY)
- Rotary boring (WET)
- Auger boring (DRY)
- Jet boring
- Core boring
- Test pit



Notes

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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

TENNYSON ROAD OVERCROSSING

LOG OF TEST BORINGS 2 OF 2

SCALE 1" = 10' | BRIDGE 33-236 | FILE | DRAWING G-3585-12

PREL. DRAWING NO. P-3582 | 13 | 1/91

Sheet 8 of 8

CERTIFICATE OF ACCURATE MICROFILM IMAGE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ADM 8042 (REV. 3-88)

I hereby certify that this is a true and accurate image of the above document taken under my direction and control on this date in Sacramento, California pursuant to authorization by the Director of Transportation.

SUPERVISOR OF MICROFILM SERVICES (Signature) | DATE 6/12/92

30X

FED. ROAD DIV. No	STATE	PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
7	CAL.			234	260

F-221 (12)

DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
04	Ala	880	0	72	78

DATE APPROVED November 14, 1990

DIST	COUNTY	RDUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	13.0/14.5	292	354

12-16-91
PLANS APPROVAL DATE

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY

CERTIFIED ENGINEERING GEOLOGIST
PROJECT GEOLOGIST

ALQUIRE ROAD U.C. (WIDEN)

LOG OF TEST BORINGS

		CU: 04 EA: 123161	BRIDGE No. 33-246

REGISTERED GEOLOGIST — GOLDSCHMIDT — No. 271 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

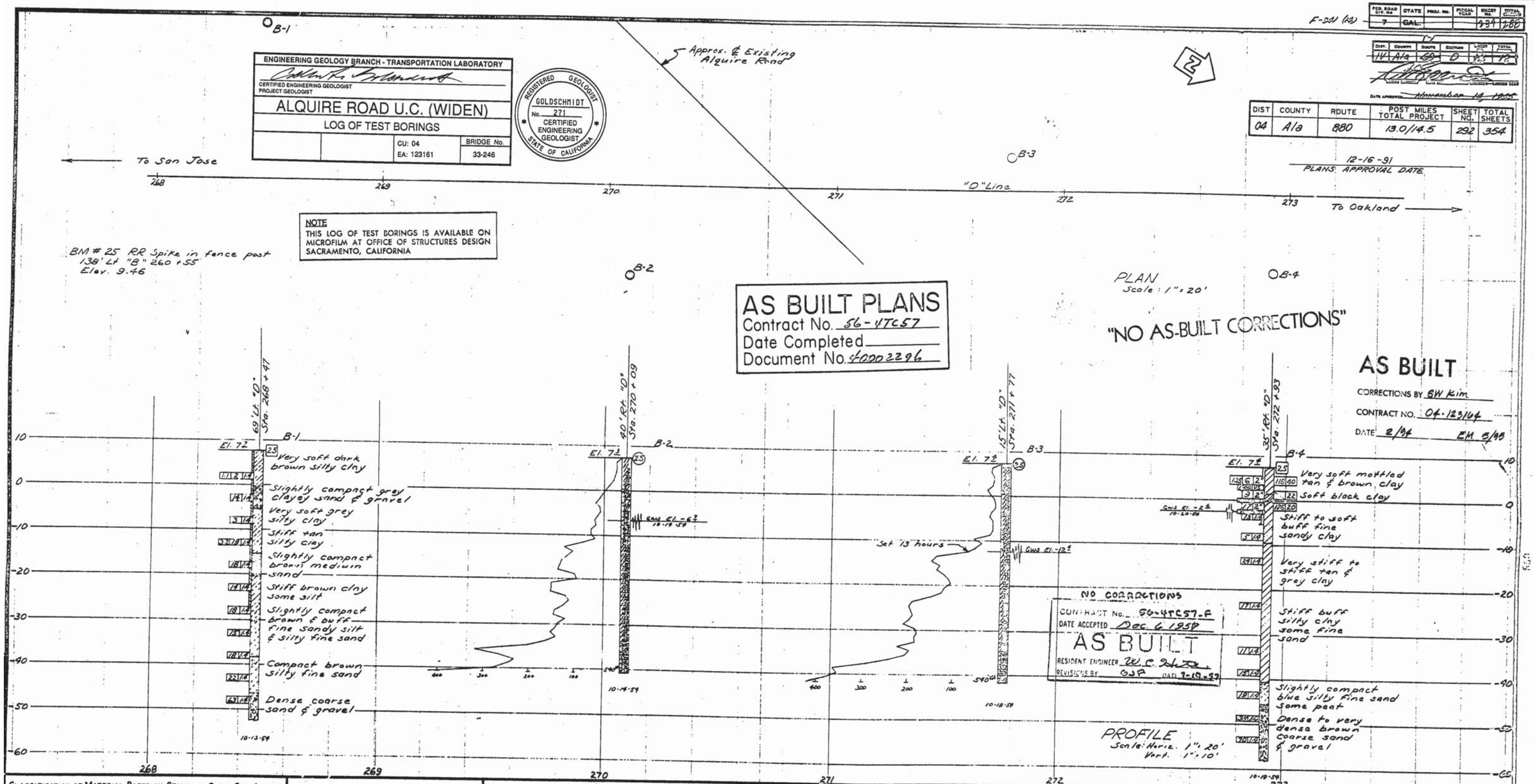
NOTE
THIS LOG OF TEST BORINGS IS AVAILABLE ON MICROFILM AT OFFICE OF STRUCTURES DESIGN SACRAMENTO, CALIFORNIA

AS BUILT PLANS
Contract No. 56-4TC57
Date Completed
Document No. 40002296

"NO AS-BUILT CORRECTIONS"

AS BUILT
CORRECTIONS BY SW Kim
CONTRACT NO. 04-123104
DATE 2/94 EM 5/95

NO CORRECTIONS
CONTRACT No. 56-4TC57-F
DATE ACCEPTED Dec. 6, 1959
AS BUILT
RESIDENT ENGINEER W. C. Schatz
REVISIONS BY OSP DATE 7-19-97



Classification of Material Based on Standard Grade Size Limits

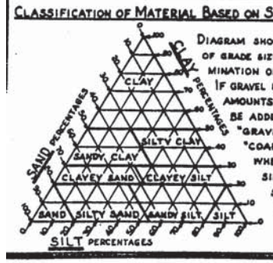


Diagram showing the basis for estimates of grade size distribution used in determination of class names. If gravel is present in appreciable amounts the term "gravelly" may be added to the class name, viz. "gravelly sand." The terms "coarse", "medium" and "fine" when used to describe sand, silt and gravel refer to standard grade size limits.

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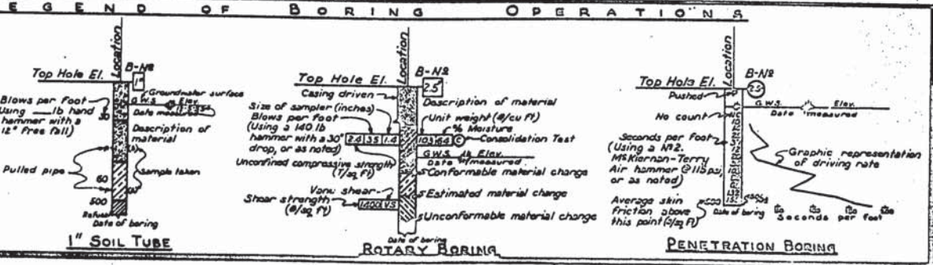
- Metamorphic Rock

Legend of Boring Operations

- Plan of any boring
- Penetrometer
- 2¼" Cone Penetrometer
- Sampler boring (DRY)
- Rotary boring (WET)
- Auger boring (DRY)
- Jet boring
- Core boring
- Test pit



NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

ALQUIRE ROAD OVERHEAD

LOG OF TEST BORINGS

SCALE As Noted	BRIDGE 33-246	FILE	DRAWING C-4036-12

PREL. DRAWING NO. P-4036 | 25

ChbPDF - www.fastio.com

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.				

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
12	Ala	59	1124	3	11

BRIDGE ENGINEER — CIVIL ENGINEER—LICENSE 5245

DATE APPROVED MARCH 10 1956

SINGLE COLUMN RETROFIT - PROJECT 41

DIST.	COUNTY	ROUTE	POST MILES - TOTAL PROJECT	Sheet No.	Total Sheets
04	Ala	580,880	31.7/35.0,16.0/22.8	46	49

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION MATERIALS & RESEARCH

R.C. Wilhelms — 10-7-91

CERTIFIED ENGINEERING GEOLOGIST - PROJECT GEOLOGIST — PLANS APPROVAL DATE

ELDRIDGE AVE POC
LOG OF TEST BORINGS

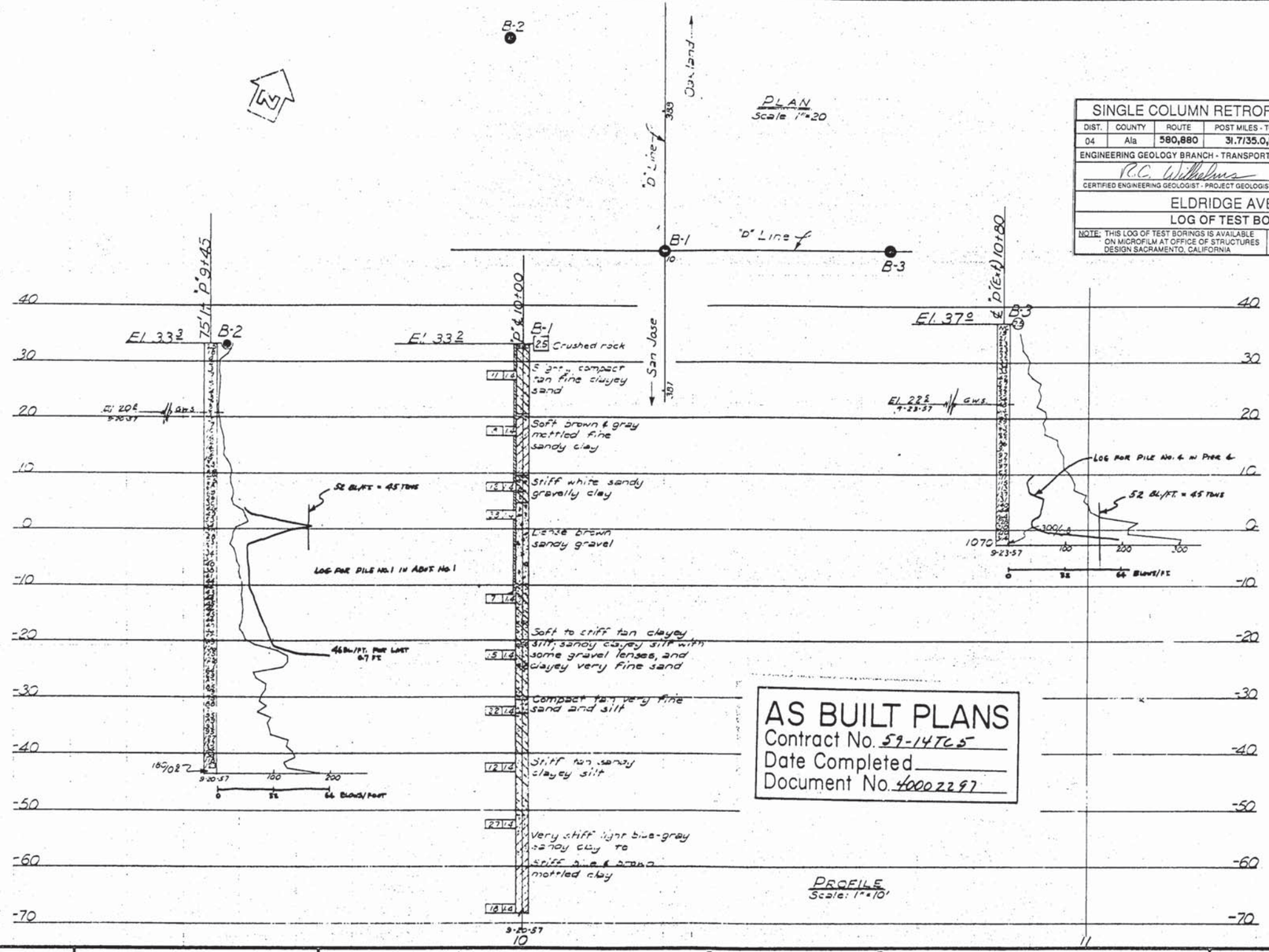
NOTE: THIS LOG OF TEST BORINGS IS AVAILABLE ON MICROFILM AT OFFICE OF STRUCTURES DESIGN SACRAMENTO, CALIFORNIA

CU:04336
EA:130971

BRIDGE No. 33-282

SHEET 11 OF 11

REGISTERED GEOLOGIST — R.C. WILHELMS — No. 560 — Exp. 6-30-92 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA



AS BUILT PLANS
Contract No. 59-14TC5
Date Completed
Document No. 40002297

AS BUILT
NO CORRECTIONS BY MATTHEW J. HARIZAL
CONTRACT NO. 04-130974
DATE 9/1/93
FRS 4/7/94

AS BUILT
CORRECTIONS BY G.A. Verpuleo
CONTRACT NO. 59-14TC5

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

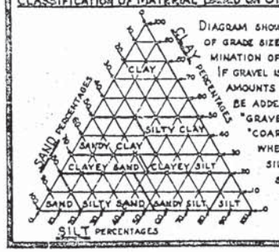


DIAGRAM SHOWING THE BASIS FOR ESTIMATES OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES.

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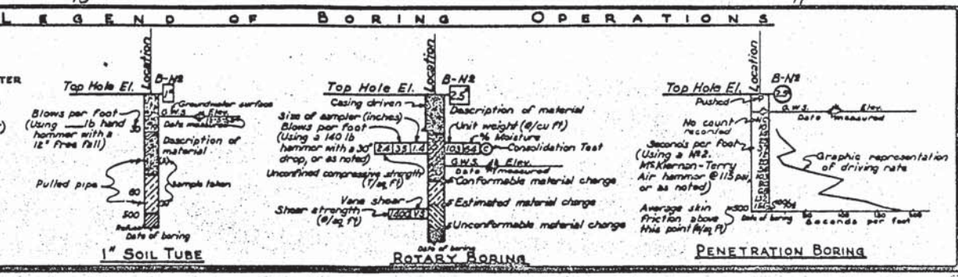
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

LEGEND OF BORING OPERATIONS

- Plan of any boring
- Penetrometer
- 2 1/4" Cone Penetrometer
- Sampler boring (dry)
- Rotary boring (wet)
- Auger boring (dry)
- Jet boring
- Core boring
- Test pit



NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

ELDRIDGE AVENUE PEDESTRIAN OVERCROSSING

LOG OF TEST BORINGS

SCALE As shown | BRIDGE 33-282 | FILE E-33 | DRAWING C-5727-9

PREL. DRAWING No. P-5727 | 3 | 12/24 | PR-5727-3

BRIDGE DEPARTMENT

1062

DIST.	COUNTY	ROUTE	KILOMETER POSTS TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	92,880	7.8/10.9, 25.1/28.3	1215	1319

08-31-04
REGISTERED ENGINEER - CIVIL

10-23-06
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
J.C. Moore
No. 61792
Exp. 6-30-05
CIVIL
STATE OF CALIFORNIA

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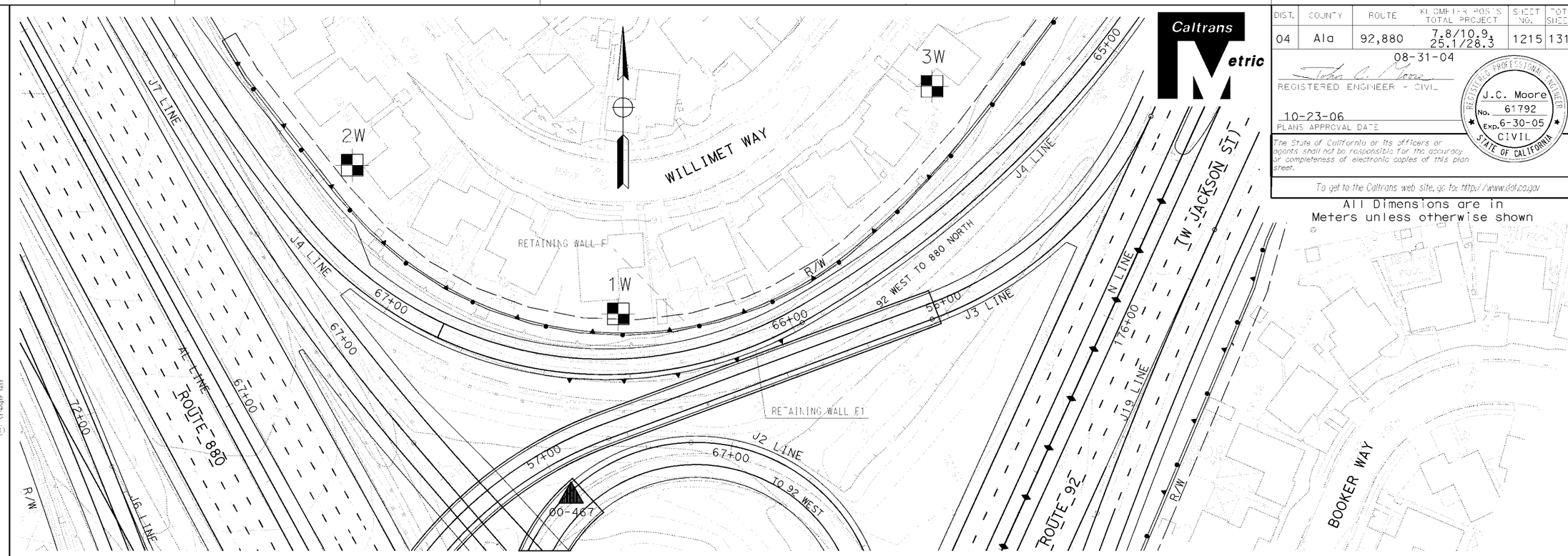
To get to the Caltrans web site, go to: http://www.dot.ca.gov

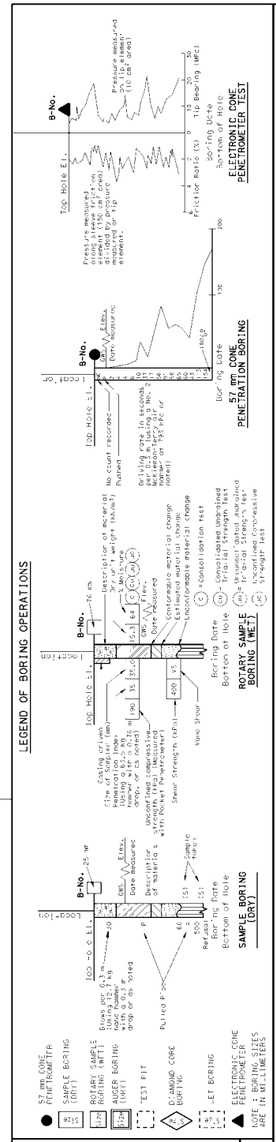
Caltrans Metric

All Dimensions are in Meters unless otherwise shown



PLAN
SCALE 1 : 500

PROFILE
HORIZ. NO SCALE
VERT. 1 : 100



CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test			
SPT N-Value (Blows/ 0.3 m)	Granular	SPT N-Value (Blows/ 0.3 m)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		>31	Hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DIVISION OF ENGINEERING SERVICES	
DRAWN BY	GINT/ M. REYNOLDS 09/03
CHECKED BY	W. NYAZ

FIELD INVESTIGATION BY: J. MOORE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN - WEST

BRIDGE NO. 33E0022
KILOMETER POST 10.9

RETAINING WAL/SOUNDWALL "F1"
LOG OF TEST BORINGS NO. 1

(Rev 01/02)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04256
EA 016011

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 23 OF 24

USERNAME => tracarol
DGN FILE => 016011_g_7_0_1001.dgn

DATE PLOTTED => 18 OCT 2006
TIME PLOTTED => 1:24

DIST.	COUNTY	ROUTE	KILOMETER POSTS TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	92,880	7.8/10.9, 25.1/28.3	1216	1319

Caltrans Metric

08-31-04
REGISTERED ENGINEER - CIVIL

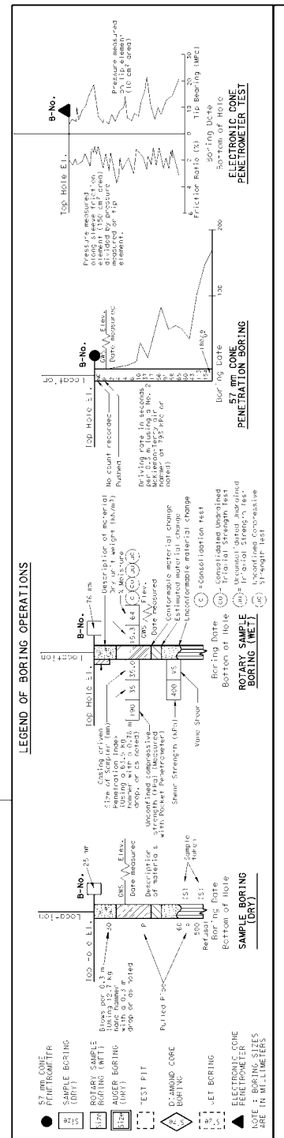
10-23-06
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
J.C. Moore
No. 61792
Exp. 6-30-05
CIVIL
STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

To get to the Caltrans web site, go to: http://www.dot.ca.gov

All Dimensions are in Meters unless otherwise shown



(For boring 2W location see PLAN, Retaining Wall D and D1 LOTB sheet 1 of 2)

(For boring 3W location see PLAN, Retaining Wall F and F1 LOTB sheet 1 of 2)

PROFILE
HORIZ. NO SCALE
VERT. 1 : 100

DIVISION OF ENGINEERING SERVICES		FIELD INVESTIGATION BY:	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	GEOTECHNICAL SERVICES OFFICE OF GEOTECHNICAL DESIGN - WEST	BRIDGE NO. 33E0022 / KILOMETER POST 10.9	RETAINING WALL/SOUNDWALL "F1"
DRAWN BY	GINT/ M. REYNOLDS 09/03					LOG OF TEST BORINGS NO. 2
CHECKED BY	W. NYAZ	J. MOORE		CU 04256 EA 016011	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 24 OF 24

(Rev 01/02)

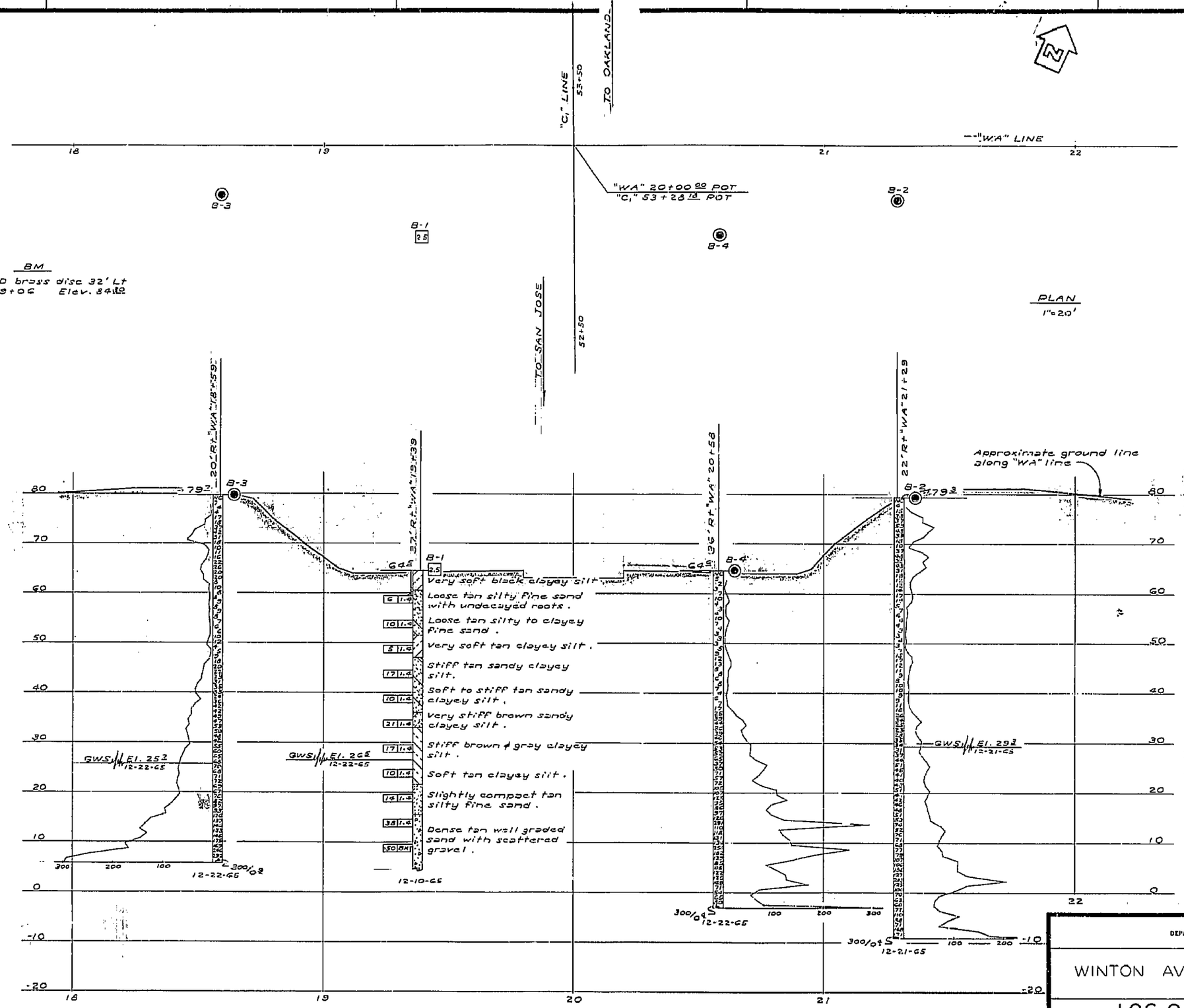
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

USERNAME => tmcarol
DGN FILE => 016011 g 7.0-002.dgn

DATE PLOTTED => 18 OCT 2006
TIME PLOTTED => 1:24

DIST.	COUNTY	ROUTE	P.M.	SHEET NO.	TOTAL SHEETS
04	ALA	17	17.3/17.9	80	80

DATE APPROVED August 15, 1966



AS BUILT PLANS
Contract No. 04-322404
Date Completed
Document No. 4000337

AS BUILT WEW
CORRECTIONS BY R.M. McCullough
CONTRACT NO. 04-322404
DATE 5-7-68 / 5-21-69

16 of 16

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

WINTON AVENUE OVERCROSSING

LOG OF TEST BORINGS

SCALE As Noted	UNIDOC 33-181	FILE	DRAWING 33181-15

LEGEND OF BORING OPERATIONS

Penetrometer; 2½" Cone Penetrometer; Sampler Boring (Dry); Rotary Boring (Wet); Auger Boring (Dry); Jet Boring; Core Boring; Test Pit

Penetrated Rock; Rotary Boring; 1" Soil Tube

LEGEND OF EARTH MATERIALS

Gravel; Sand; Silt; Clay; Sandy Clay or Clayey Sand; Sandy Silt or Silty Sand; Silty Clay or Clayey Silt; Peat and Organic Matter; Fill Material; Igneous Rock; Sedimentary Rock; Metamorphic Rock

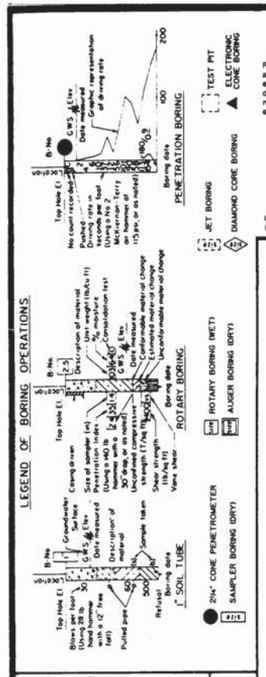
CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

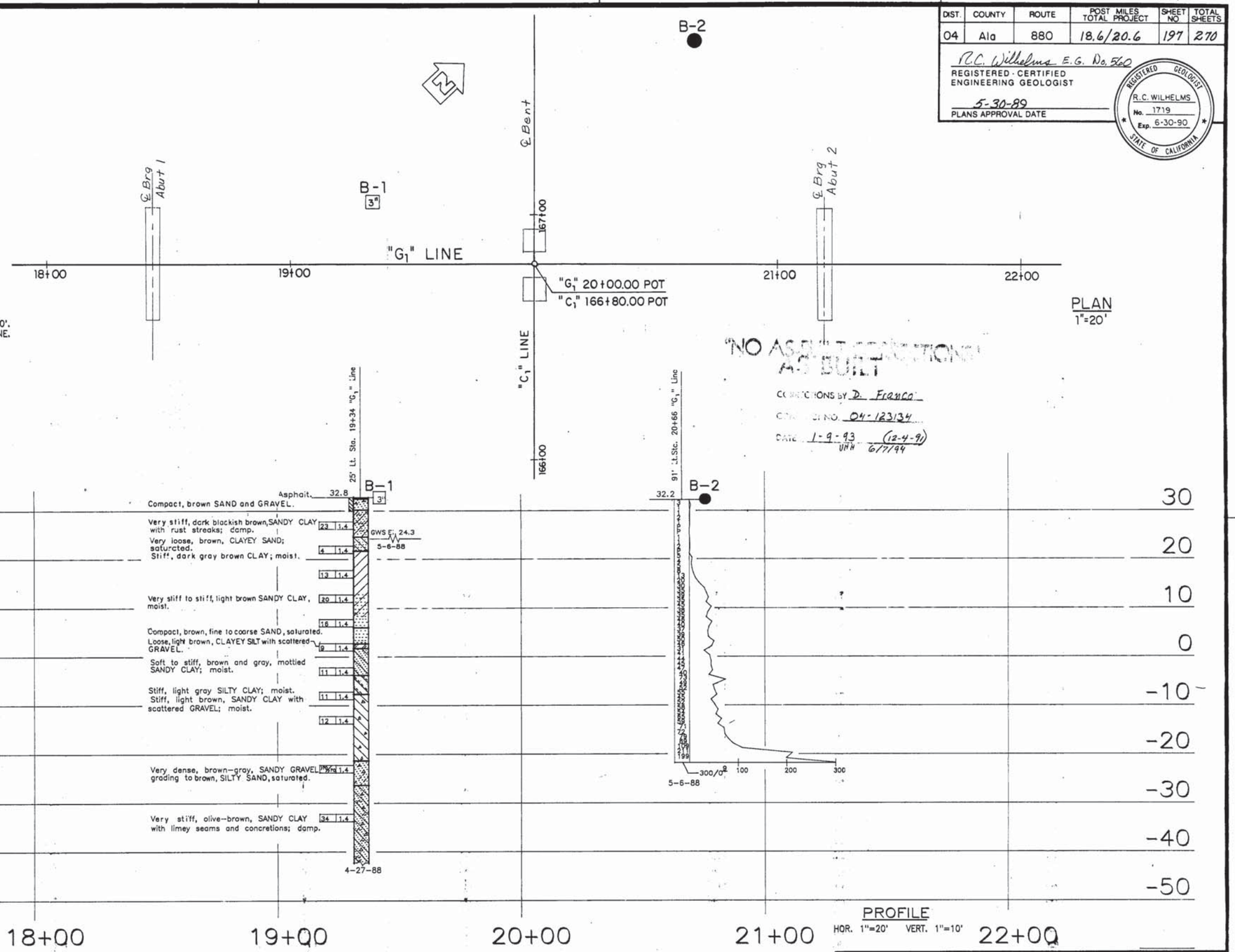
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	Ala	880	18.6/20.6	197	270

R.C. Wilhelms E.G. No. 560
REGISTERED · CERTIFIED ENGINEERING GEOLOGIST
5-30-89
PLANS APPROVAL DATE

REGISTERED GEOLOGIST R.C. WILHELMS No. 1719 Exp. 6-30-90 STATE OF CALIFORNIA





BENCH MARK
SPOT ELEV. FROM DIST. SITE MAP. ELEV. 32.50'.
LOCATED APPROX. 23' LT. STA. 19+28 "G " LINE.

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY

DRAWN BY	LEONY L. LOPEZ	6/88	PROJECT GEOLOGIST 632 C.E.A. NO.
CHECKED BY			

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN 2
John S Quincy 41056
PROJECT ENGINEER REGISTERED CIVIL ENGINEER NO.

BRIDGE NO. 33-174
POST MILE 19 8

PASEO GRANDE OVERCROSSING
LOG OF TEST BORINGS 1 OF 2

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04
EA 123131

Disregard prints bearing earlier revision dates

REVISION DATES (PRELIMINARY STAGE ONLY) 10/Rev 10/29 1/93

SHEET 15 OF 16

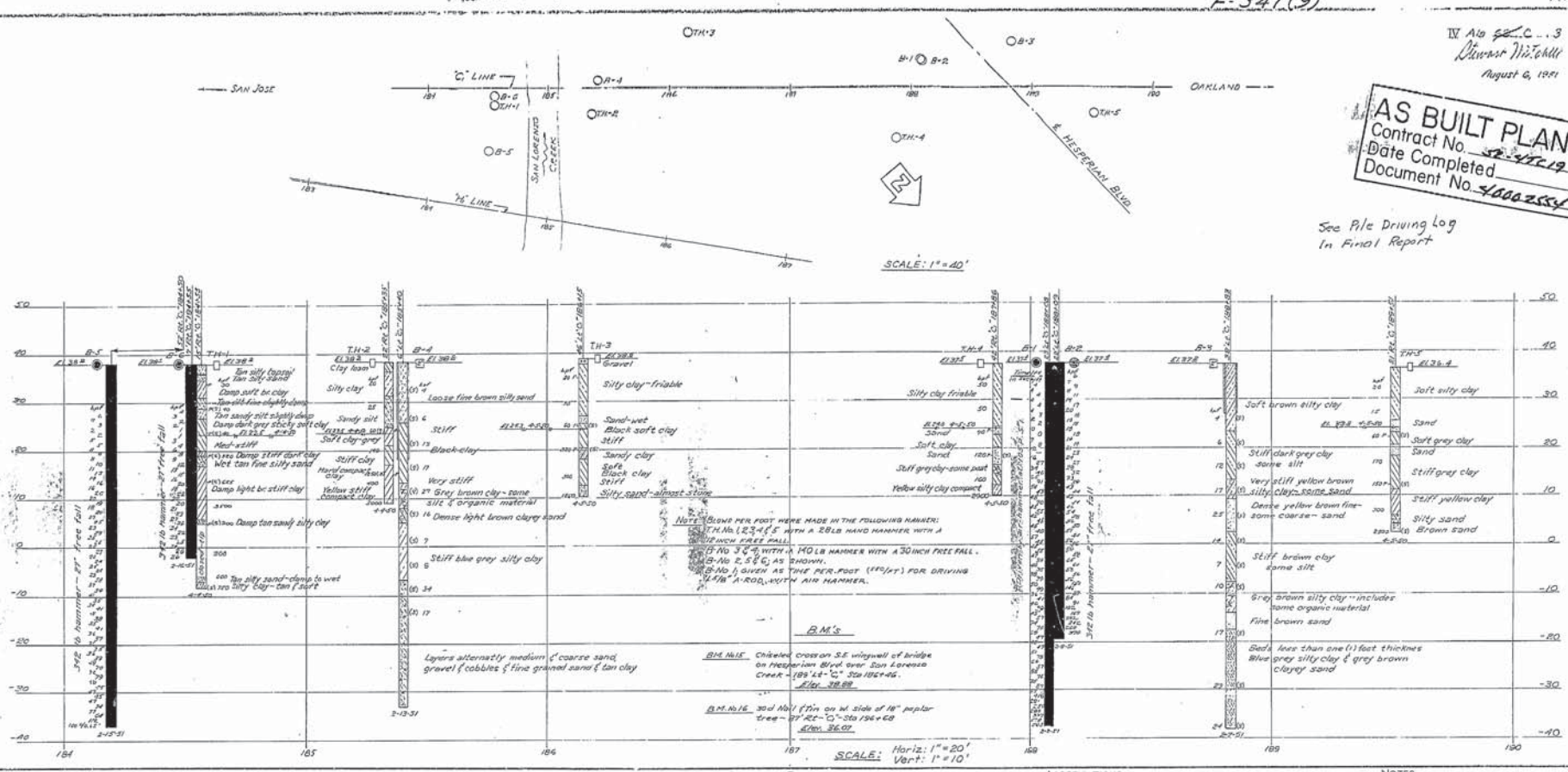
RE 8146 REV. 2/88

F-341(9) 145 166

IV No SR.C..3 R.L.
Dewar Mitchell
August 6, 1981

AS BUILT PLANS
Contract No. SR-4/TK19
Date Completed
Document No. 40002554

See Pile Driving Log In Final Report



Classification of Material Based on Standard Grade Size Limits

Diagram and table showing the basis for estimates of grade size distribution used in determination of C 155 names.

Class Name	Percentage of Sizes Present		
	Sand	Silt	Clay
Sand	80-100	0-20	0-20
Silty Sand	45-80	0-55	0-20
Sandy Silt	0-45	55-80	0-20
Silt	0-20	80-100	0-20
Clayey Sand	35-80	0-45	20-30
Clayey Silt	0-35	55-80	20-30
Sandy Clay	30-70	0-40	30-50
Silty Clay	0-30	50-70	30-50
Clay	0-50	0-50	50-100

Grouping Used in Trends, or Classification

If gravel is present in appreciable amounts the term "Gravelly" may be added to the class name, viz. "Gravelly sand". The terms "Coarse," "Medium" and "Fine" which used to describe Gravel, Sand and Silt refer to Standard Grade Size Limits.

Legend of Boring Operations

- Plan of any boring
- 1" Sampler boring
- Rotary wash boring
- 1" Closed sampler driven
- Core boring
- 2 1/2" Penetrometer driven
- 2" Sampler boring
- 2" to 5" Auger boring
- 6" to 20" Auger boring
- Casing driven
- Jet boring
- (a) Sample taken
- 1 5/8" A Rod

The appropriate boring symbols designating the method of operation are shown at the upper right-hand corner of the respective boring. Where tool changes were made during the boring operation symbols are shown at the point of change.

Legend of Earth Materials

- Gravel — G
- Sand — S
- Silty — Si
- Clay — C
- Silty Sand — Si S
- Clayey Sand — C S
- Sandy Silt — S Si
- Clayey Silt — C Si
- Sandy Clay — SC
- Silty Clay — Si C
- Peat and Organic Clay — O
- Sandstone — SS
- Shale — Sh
- Broken Rock (fragments) — Br
- Rock — R

Abbreviations

- El. 19.4 — Elevation of ground at test hole
- Blows per foot — (see note above)
- Pulled pipe
- Moisture as % dry weight
- El. 14.3 — Elevation of ground water as shown

Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

MICROFILMED

HESPERIAN BLVD UC #
SAN LORENZO CREEK BRIDGES
LOG OF TEST BORINGS
As shown
C-2445-3

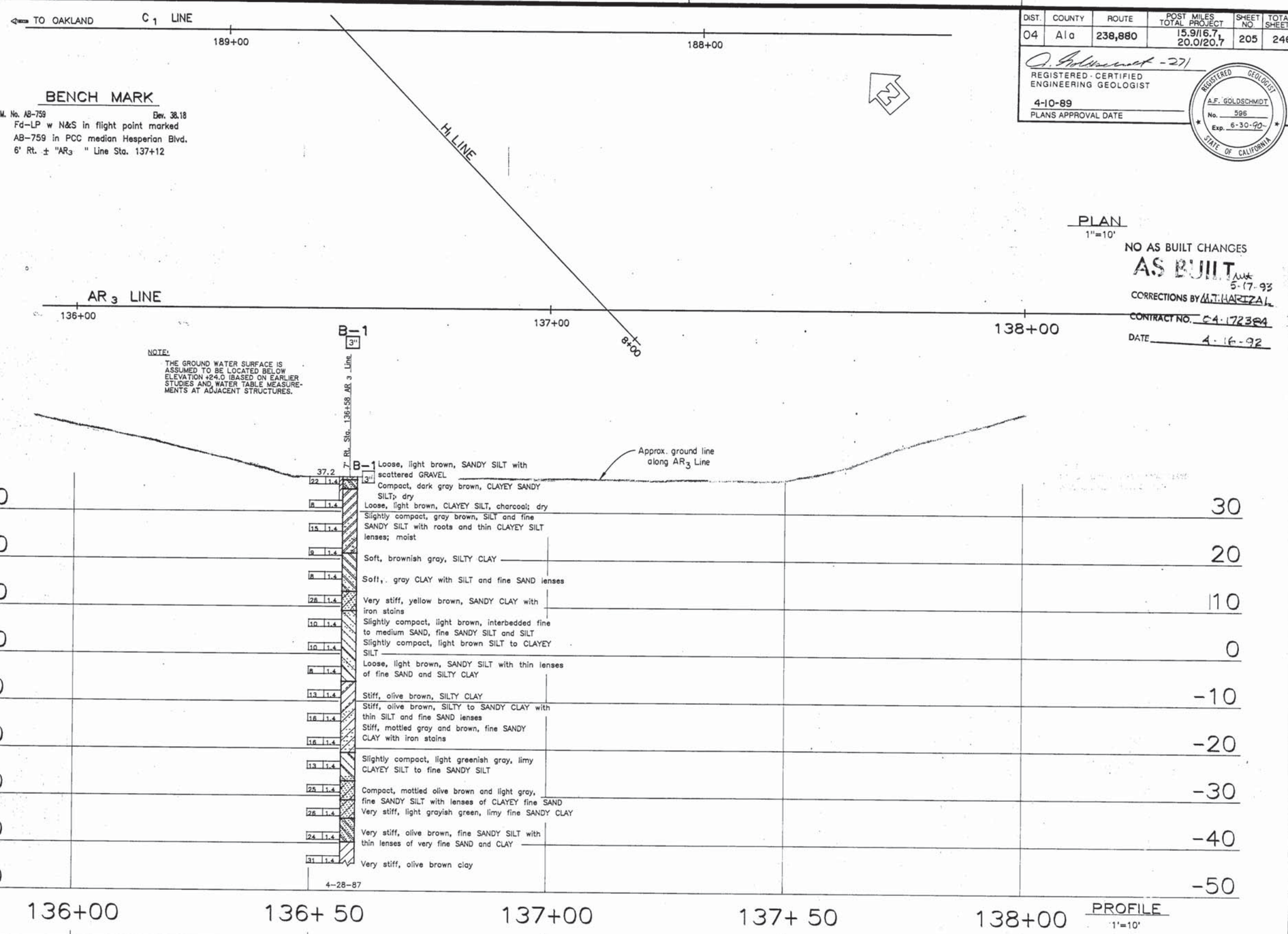
I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE 1/20/77 SIGNATURE [illegible] TITLE Sr. RMA

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	238,880	15.9/16.7, 20.0/20.7	205	246

A. Goldschmidt -271
REGISTERED - CERTIFIED ENGINEERING GEOLOGIST
4-10-89
PLANS APPROVAL DATE

REGISTERED GEOLOGIST A.F. GOLDSCHMIDT No. 596 Exp. 6-30-90 STATE OF CALIFORNIA



PLAN
1"=10'

NO AS BUILT CHANGES
AS BUILT
5-17-93
CORRECTIONS BY M.T. HARTZAL
CONTRACT NO. 04-172384
DATE 4-16-92

PROFILE
1'=10'

BENCH MARK
B.M. No. AB-759 Elev. 38.18
Fd-LP w N&S in flight point marked AB-759 in PCC median Hesperian Blvd. 6' Rt. ± "AR3 " Line Sta. 137+12

NOTE:
THE GROUND WATER SURFACE IS ASSUMED TO BE LOCATED BELOW ELEVATION +24.0 (BASED ON EARLIER STUDIES AND WATER TABLE MEASUREMENTS AT ADJACENT STRUCTURES.

PENETRATION BORING: TEST PIT; JET BORING; CORE BORING
ROTARY BORING: ROTARY BORING (WET); AUGER BORING (DRY)
1" SOIL TUBE; 2 1/4" CONE PENETROMETER; SAMPLER BORING (DRY)
FILL: CLAY; SANDY CLAY or CLAYEY SAND; SANDY SILT or SILTY SAND; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.
UNIFIED SOIL CLASSIFICATION SYSTEM

GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY

DRAWN BY	ED FONG 6/87	J.G. Miller 632	R.C. Wilhelms 560	CHARGE UNIT	EXPEND. AUTHOR / SPEC. DESIGN
CHECKED BY	GGM 10/87	PROJECT GEOLOGIST / CEG NO.	ENGINEERING GEOLOGIST / CEG NO.		

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN 1
PROJECT ENGINEER / REGISTERED CIVIL ENGINEER NO. 35636

BRIDGE NO. 33-170
POST MILE 20.2

HESPERIAN BLVD. U.C. (WIDEN)
LOG OF TEST BORINGS 2 OF 3

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04207
EA 172381

Disregard prints bearing earlier revision dates

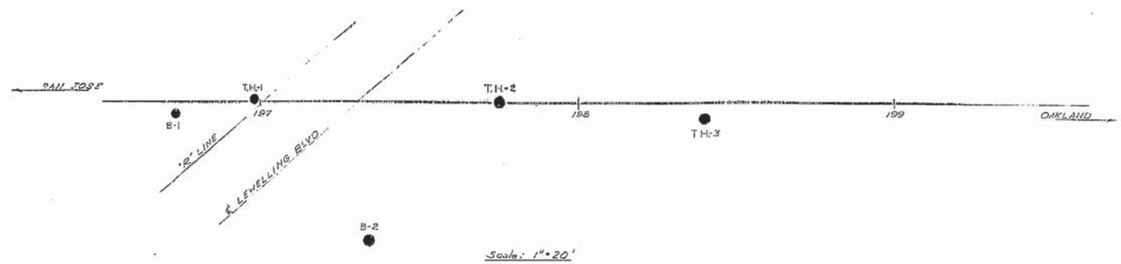
REVISION DATES (PRELIMINARY STAGE ONLY) 7/4/91 7/29/91

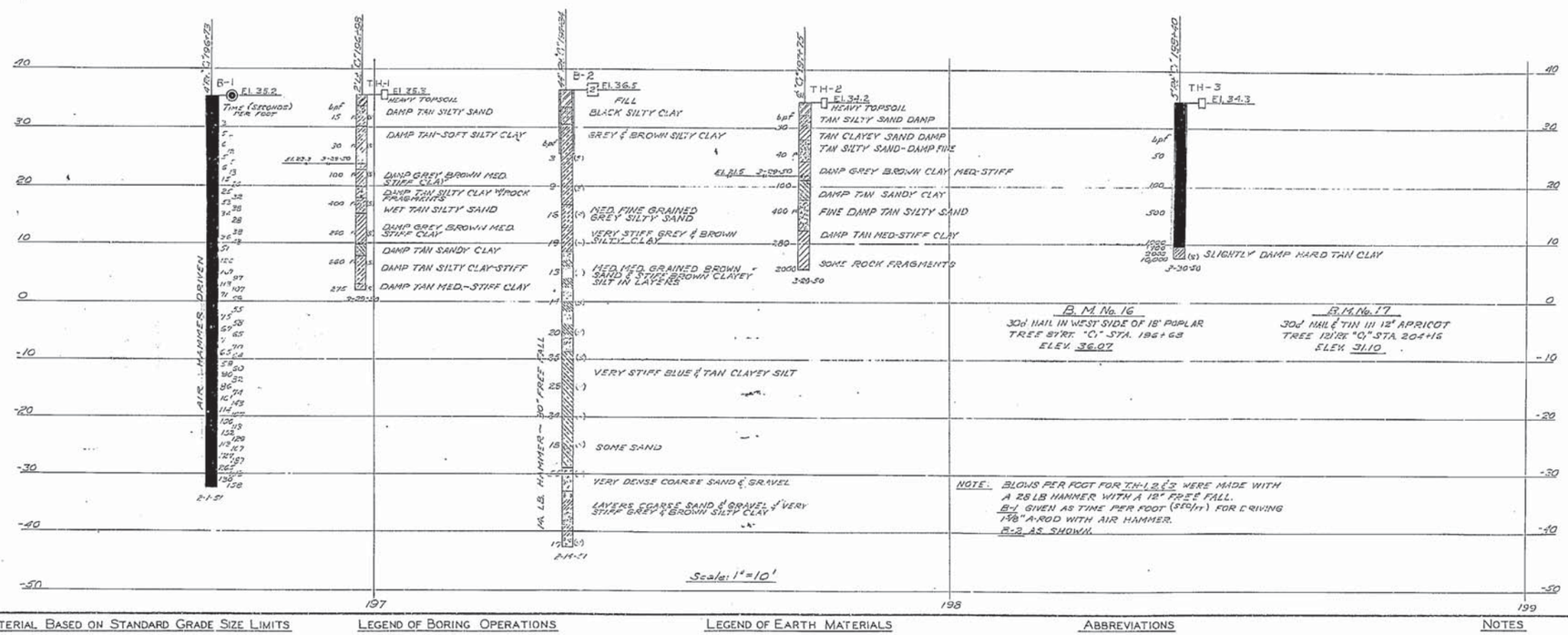
SHEET 22 OF 23

F-341(9)

141 166

August 3, 1951





AS BUILT PLANS
Contract No. 52-47E/F
Date Completed
Document No. 40002400

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
BRIDGE DEPARTMENT

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

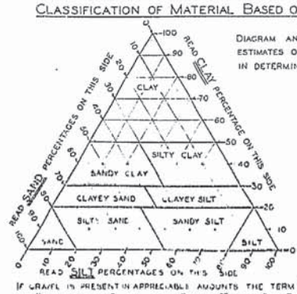


DIAGRAM AND TABLE SHOWING THE BASIS FOR ESTIMATES OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES.

GROUPING USED IN TRIANGULAR CLASSIFICATION			
CLASS NAME	PERCENTAGE SIZES PRESENT		
	SAND	SILT	CLAY
SAND	80-100	0-20	0-20
SILTY SAND	45-80	0-55	0-20
SANDY SILT	0-45	30-80	0-20
SILT	0-20	80-100	0-20
CLAYEY SAND	38-80	0-42	20-30
CLAYEY SILT	0-38	32-80	20-30
SANDY CLAY	30-70	0-40	30-50
SILTY CLAY	0-30	20-70	30-50
CLAY	0-30	0-30	50-100

IF GRAVEL IS PRESENT IN APPRECIABLE AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ "GRAVELLY SAND". THE TERMS "COARSE", "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE GRAVEL, SAND AND SILT REFER TO STANDARD GRADE SIZE LIMITS.

LEGEND OF BORING OPERATIONS

- PLAN OF ANY BORING
- 1" SAMPLER BORING
- ROTARY WASH BORING
- 1" CLOSED SAMPLER DRIVEN
- CORE BORING
- 2 1/2" PENETROMETER DRIVEN
- 2" SAMPLER BORING
- 2" 105° AUGER BORING
- 6" 1020° AUGER BORING
- CASIN DRIVEN
- JET BORING
- (S) SAMPLE TAKEN
- 1 5/8" A-ROD DRIVEN

THE APPROPRIATE BORING SYMBOLS DESIGNATING THE METHOD OF OPERATION ARE SHOWN AT THE UPPER RIGHT-HAND CORNER OF THE RESPECTIVE BORING. WHERE TOOL CHANGES WERE MADE DURING THE BORING OPERATION SYMBOLS ARE SHOWN AT THE POINT OF CHANGE.

LEGEND OF EARTH MATERIALS

- GRAVEL — G
- SAND — S
- SILT — SI
- CLAY — C
- SILTY SAND — SI S
- CLAYEY SAND — C S
- SANDY SILT — S SI
- CLAYEY SILT — C SI
- SANDY CLAY — SC
- SILTY CLAY — SI C
- PEAT and/or ORGANIC CLAY — O
- SANDSTONE — SS
- SHALE — SH
- BROKEN ROCK (FRAGMENTS) — BR
- ROCK — R

ABBREVIATIONS

EL. 69.4	ELEVATION OF GROUND AT TEST HOLE
bpf	BLOWS PER FOOT — (SEE NOTE ABOVE)
P	PULLED PIPE
M	MOISTURE AS % DRY WEIGHT
EL. 64.3 on 8-13-49	ELEVATION OF GROUND WATER AND DATE

NOTES

THE CONTRACTOR'S ATTENTION IS DIRECTED TO SECTION [illegible], ARTICLE [illegible], OF THE STANDARD SPECIFICATIONS AND TO THE SPECIAL PROVISION ALL HEREIN OF THIS SET OF PLANS.

CLASSIFICATION OF EARTH MATERIAL AS SHOWN ON THIS SHEET IS BASED UPON FIELD INSPECTION AND IS NOT TO BE CONSTRUED TO IMPLY MECHANICAL ANALYSIS.

MICROFILMED

LEWELLING BLVD UNDERCROSSING
LOG OF TEST BORINGS
As shown
33-176 R & L
C-2435-8

12B3

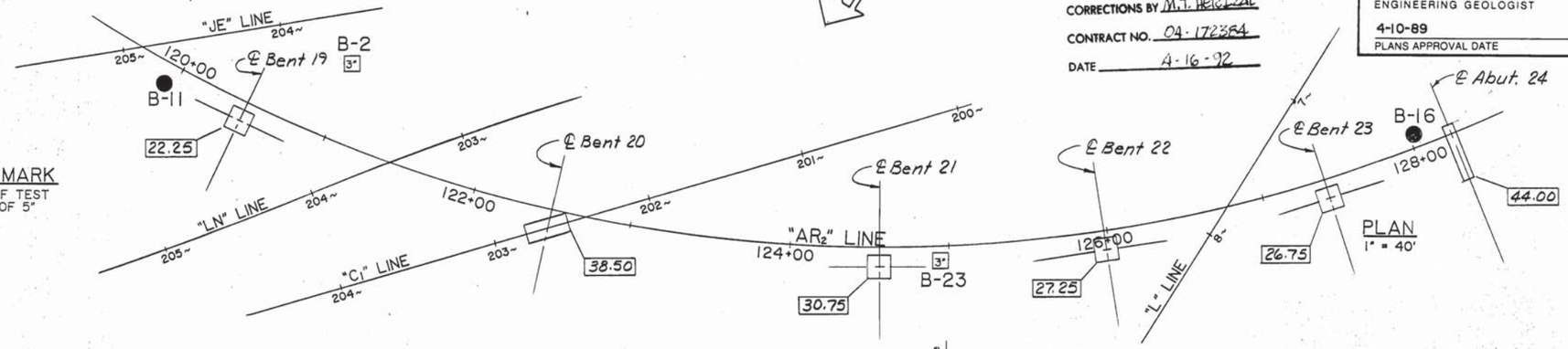
ClibPDF - www.fastio.com

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	238,880	15.9/16.7, 20.0/20.7	130	246

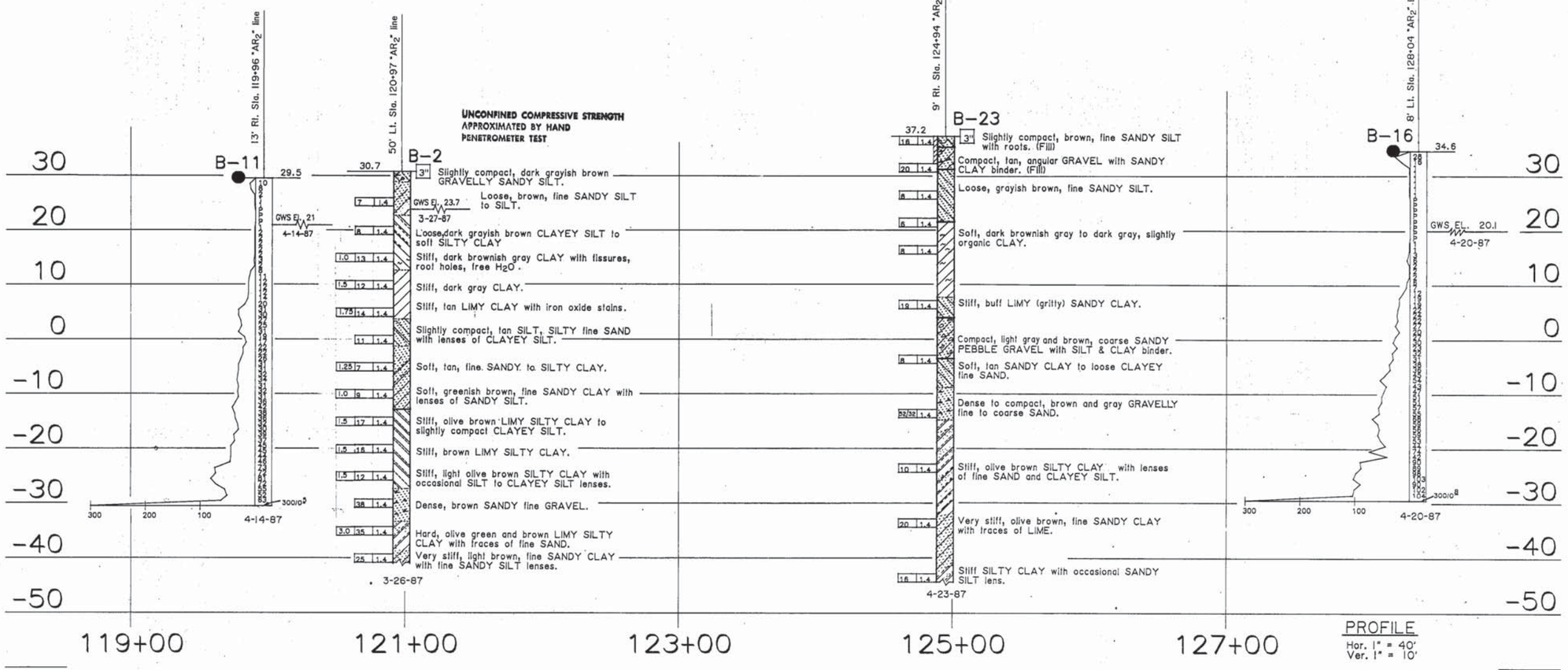
REGISTERED - CERTIFIED ENGINEERING GEOLOGIST
4-10-89
PLANS APPROVAL DATE

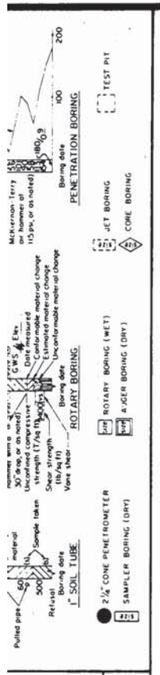
REGISTERED GEOLOGIST A.F. GOLDSCHMIDT No. 596 Exp. 6-30-90 STATE OF CALIFORNIA

NO AS BUILT CHANGES
AS BUILT MH 5-14-93
CORRECTIONS BY M.T. HERCZAL
CONTRACT NO. 04-172364
DATE 4-16-92



BENCH MARK
SEE "LOG OF TEST BORINGS 1 OF 5"





GEOTECHNICAL BRANCH - TRANSPORTATION LABORATORY

DRAWN BY	I. Howell 6/87	Approval Recommended By		CHARGE UNIT	EXPEND. AUTHOR	SPEC. DESIGN.
CHECKED BY	G. Miller 11/87	PROJECT GEOLOGIST A 632 CEG NO.	ENGINEERING GEOLOGIST R.C. Wilhelms 560 CEG NO.			

State of **CALIFORNIA** DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN
PROJECT ENGINEER Gwin Will REGISTERED CIVIL ENGINEER NO. 35636

BRIDGE NO. 33-0540G
POST MILE 16.0

ROUTE 238/880 CONNECTOR O.C.
LOG OF TEST BORINGS 5 OF 5

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04
EA 172381

Disregard prints bearing earlier revision dates

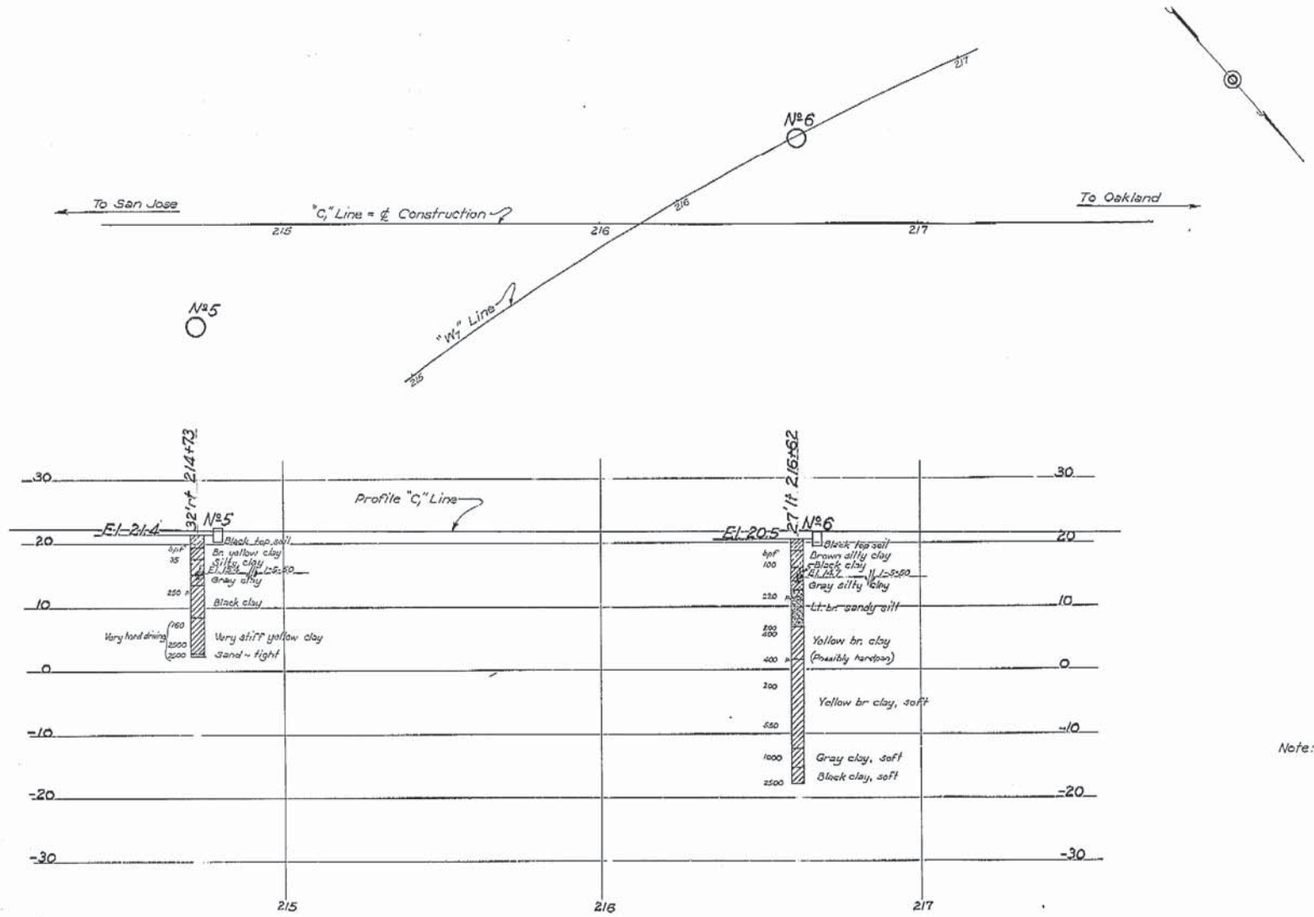
REVISION DATES (PRELIMINARY STAGE ONLY) 6/24/11

SHEET 50 OF 50

2 CAL 127 174

12 Ala 69-1 C 22 42

Stewart Mitchell
August 21, 1950



B M № 20
x on south end of headwall
143' rt C 225+84
Elev 23.10

Note: Blows per foot were made using a 28 lb hand hammer with a 12" free fall.

AS BUILT PLANS
Contract No. 51-4TC17
Date Completed
Document No. 40002563

BR:DGF DEPARTMENT

JOD 7-50

Classification of Material Based on Standard Grade Size Limits

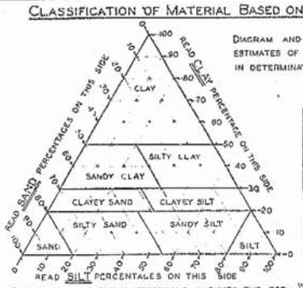


Diagram and table showing the basis for estimates of grade size distribution used in determination of class names.

Grouping Used in Triangular Classification			
Class Name	Percentage of Size Present		
	Sand	Silt	Clay
Sand	60-100	0-20	0-20
Silty Sand	45-[illegible]	0-55	0-20
Sandy Silt	0-45	35-80	0-20
Silt	0-20	80-100	0-20
Clayey Sand	35-80	0-42	20-30
Clayey Silt	0-38	32-80	20-30
Sandy Clay	30-70	0-40	30-50
Silty Clay	0-30	20-70	30-50
Clay	0-30	0-50	50-100

If gravel is present in appreciable amounts the term "Gravelly" may be added to the class name, viz. "Gravelly Sand". The terms "Coarse", "Medium" and "Fine" when used to describe Gravel, Sand and Silt refer to Standard Grade Size Limits.

Legend of Boring Operations

- Plan of any boring
- 1" Sampler boring
- Rotary wash boring
- 1" Closed sampler driven
- Core boring
- 2½" Penetrometer driven
- 2" Sampler boring
- 2" 105° Auger boring
- 6" to 20" Auger boring
- Casing driven
- Jet boring
- (S) Sample taken

The appropriate boring symbols designating the method of operation are shown at the upper right-hand corner of the respective boring. Where tool changes were made during the boring operation symbols are shown at the point of change.

Legend of Earth Materials

- Gravel – G
- Sand – S
- Silt – Si
- Clay – C
- Silty Sand – Si S
- Clayey Sand – C S
- Sandy Silt – S Si
- Clayey Silt – C Si
- Sandy Clay – SC
- Silty Clay – Si C
- Peat and Organic Clay – O
- Sandstone – SS
- Shale – Sh
- Broken Rock (Fragments) – Br
- Rock – R

Abbreviations

El. 69.4	Elevation of ground at test hole
bpf	Blows per foot – (See note above)
P	Pulled pipe
M	Moisture as % dry weight
El. 54.3 6-12-49	Elevation of ground water and date

Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

MICROFILMED

ROUTE 69-228 SEPARATION

LOG OF TEST BORINGS

Horizontal: 1" = 20'
Vertical: 1" = 10'

33-172 Drawing No. C-2588-22

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE 3/20/72 SIGNATURE James Cresit TITLE Sr. RMA

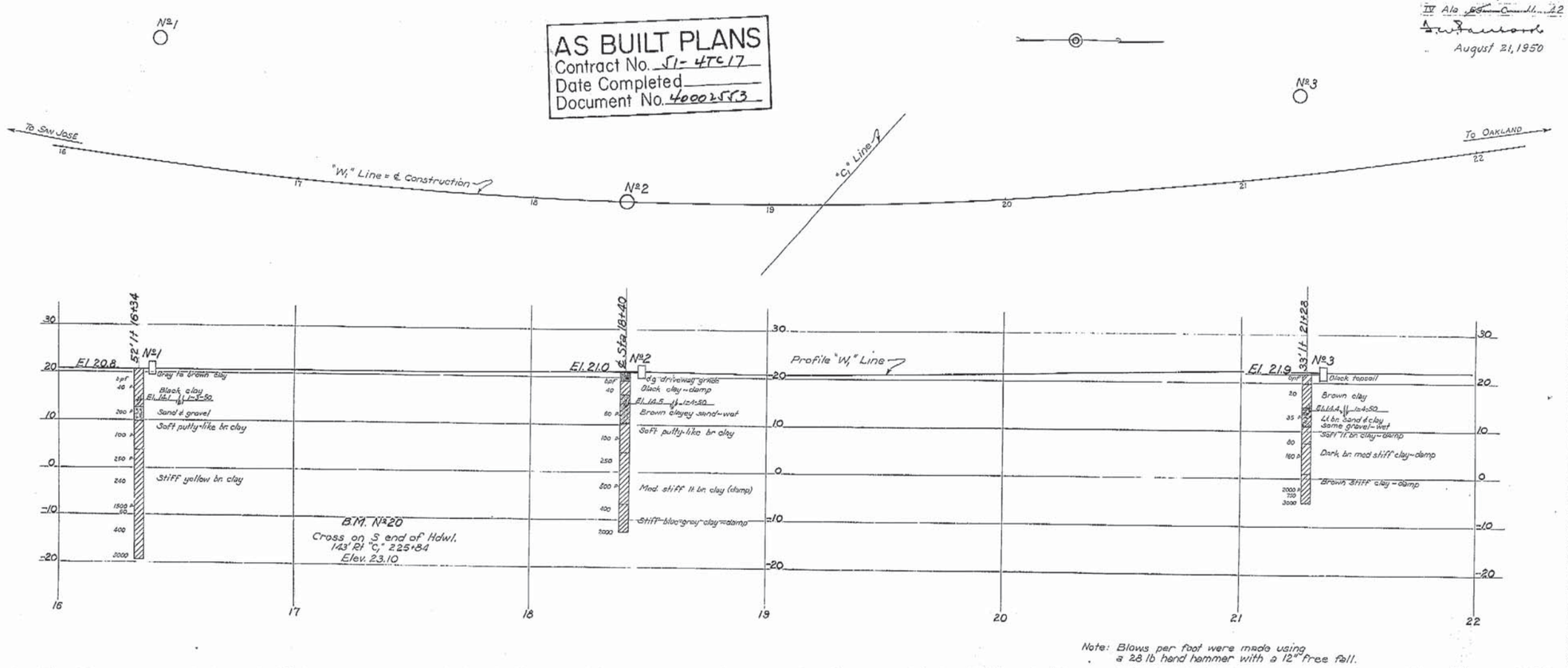
ClibPDF - www.fastio.com

110 174

IV Ala ~~Sol~~ Contr. 12

August 21, 1950

AS BUILT PLANS
Contract No. 51-4TC17
Date Completed
Document No. 40002553



Note: Blows per foot were made using a 28 lb hand hammer with a 12" free fall.

Classification of Material Based on Standard Grade Size Limits

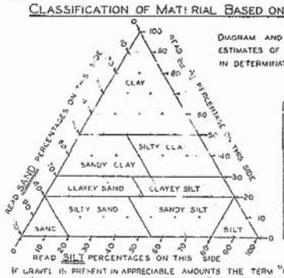


Diagram and table showing the basis for estimates of grade size distribution used in determination of class names.

Grouping Used in Triangular Classification			
Class Name	Percentage of Size Present		
	Sand	Silt	Clay
Sand	80-100	0-20	0-20
Silty Sand	45-80	0-55	0-20
Sandy Silt	0-45	35-80	0-20
Silt	0-20	80-100	0-20
Clayey Sand	30-80	0-42	20-30
Clayey Silt	0-35	32-80	20-30
Sandy Clay	30-70	0-40	30-50
Silty Clay	0-30	20-70	30-50
Clay	0-50	0-50	50-100

If gravel is present in appreciable amounts the term "Gravelly" may be added to the class name, viz "Gravelly sand". The terms "Coarse," "Medium" and "Fine" when used to describe Gravel, Sand and Silt refer to Standard Grade Size Limits.

Legend of Boring Operations

- Plan of any boring
- 1" Sampler boring
- Rotary wash boring
- 1" Closed sampler driven
- Core boring
- 2½" Penetrometer driven
- 2" Sampler boring
- 2" to 5" Auger boring
- 8" to 20" Auger boring
- Casing driven
- Jet boring
- (S) Sample taken

The appropriate boring symbols designating the method of operation are shown at the upper right-hand corner of the respective boring. Where tool changes were made during the boring operation symbols are shown at the point of change.

Legend of Earth Materials

- Gravel – G
- Sand – S
- Silt – Si
- Clay – C
- Silty Sand – Si S
- Clayey Sand – C S
- Sandy Silt – S Si
- Clayey Silt – C Si
- Sandy Clay – SC
- Silty Clay – Si C
- Peat and Organic Clay – O
- Sandstone – SS
- Shale – Sh
- Broken Rock (Fragments) – Br
- Rock – R

Abbreviations

El 69.4	Elevation of ground at test hole
bpf	Blows per foot – (see note above)
P	Pulled pipe
M	Moisture as % dry weight
El 9.3 ⊥ 8-12-49	Elevation of ground water and date

Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

MICROFILMED

WASHINGTON AVE OVERCROSSING
LOG OF TEST BORINGS
Horizontal: 1" = 20'
Vertical: 1" = 10'

33-166 Drawing No. C-2359-11

BR:DGF DEPARTMENT

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE 3/20/72 SIGNATURE Donald Grant TITLE SR. RMC

ClibPDF - www.fastio.com

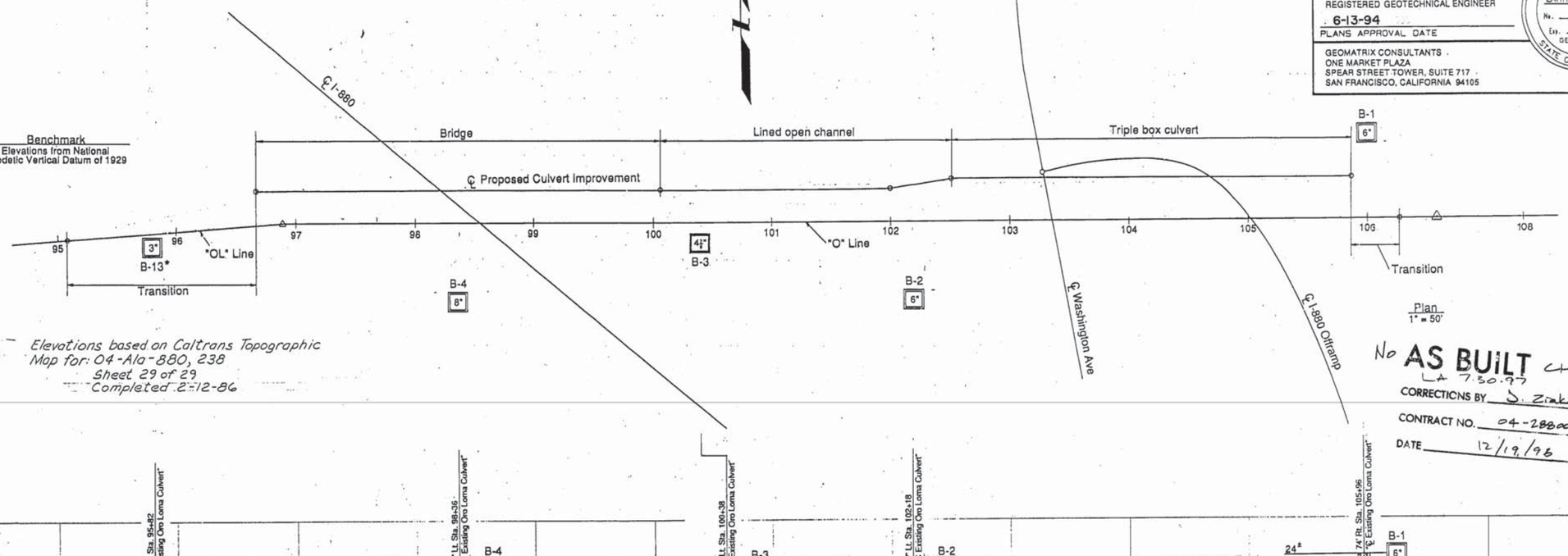
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	880	21.0	71	74

Larry Scheibel
SENIOR ENGINEER
REGISTERED GEOTECHNICAL ENGINEER
6-13-94
PLANS APPROVAL DATE

LARRY SCHEIBEL No. 752 Exp. 3/31/95 GEOTECHNICAL STATE OF CALIFORNIA

GEOMATRIX CONSULTANTS
ONE MARKET PLAZA
SPEAR STREET TOWER, SUITE 717
SAN FRANCISCO, CALIFORNIA 94105

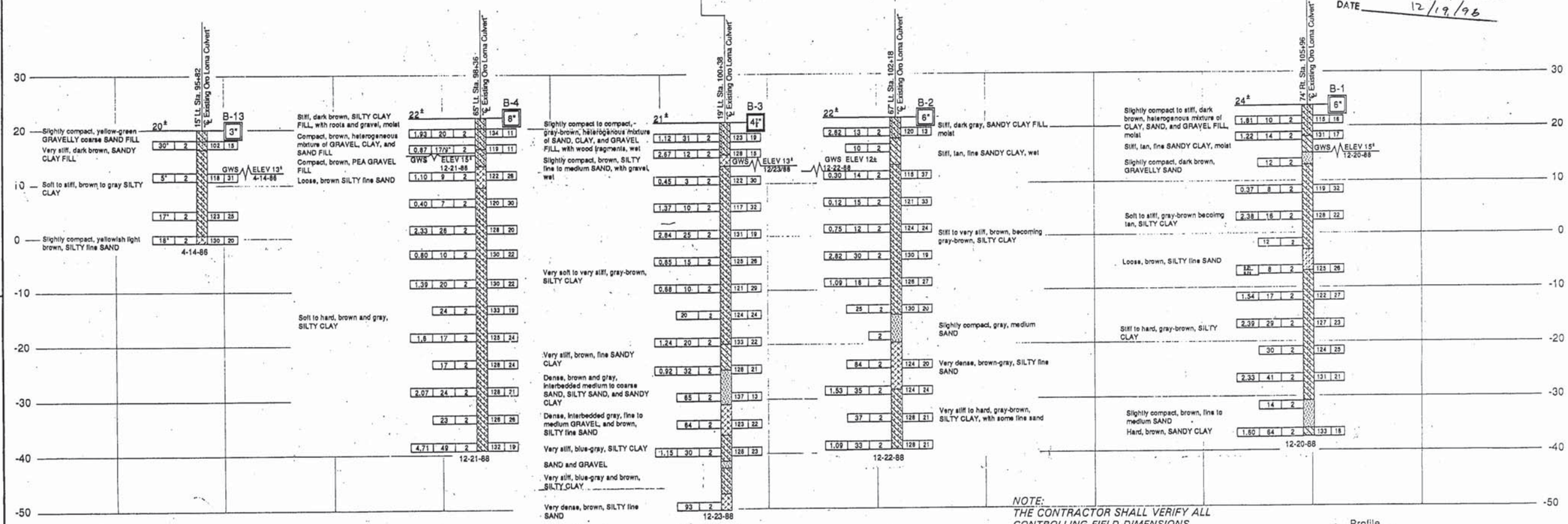
Benchmark
Elevations from National Geodetic Vertical Datum of 1929



Plan
1" = 50'

Elevations based on Caltrans Topographic Map for: 04-Ala-880, 238 Sheet 29 of 29 Completed 2-12-86

No AS BUILT CHANGES
LA 7.30.97
CORRECTIONS BY S. Zinkoff
CONTRACT NO. 04-288004
DATE 12/19/96

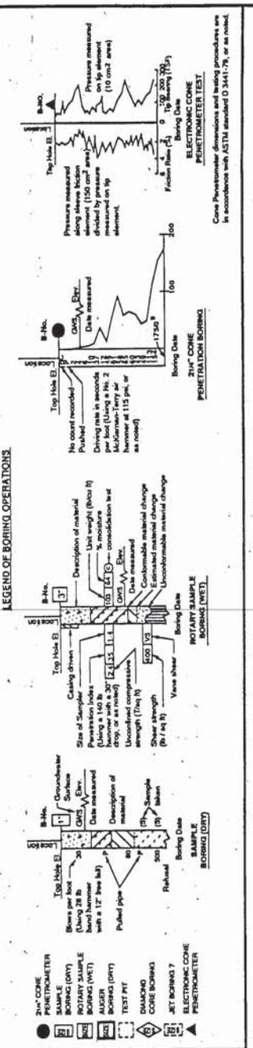


* Sampler driven with an 84 lb. hammer falling 30 inches for Boring B-13 only.

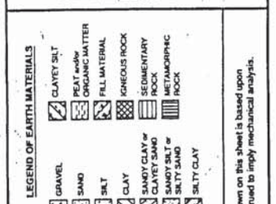
NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

Profile
Hor: 1" = 50'
Ver: 1" = 10'

LEGEND OF BORING OPERATIONS



LEGEND OF EARTH MATERIALS



CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Penetration Index (Blows / Ft)	Granular	Cohesive
0-4	Very loose	Very soft
5-9	Loose	Soft
10-19	Slightly compact	Stiff
20-34	Compact	Very stiff
35-69	Dense	Hard
>70	Very dense	Very hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT 7/21/92 SIGN-OFF DATE	DRAWN BY CAROLYN J. MOSHER 9-15-89 (REVISED 12-19-90)	FIELD INVESTIGATOR Larry Scheibel REGISTRATION NO. CE 29674	APPROVAL RECOMMENDED BY Carl Basore CIVIL ENGINEER REGISTRATION NO. C12239
	CHECKED BY LARRY SCHEIBEL 9-15-89 CARL BASORE 12-19-90		

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Raymond H. Mullen Jr. 6/91
PROJECT ENGINEER

BRIDGE NO. 33-239
POST MILE 20.95

ORO LOMA DITCH
LOG OF TEST BORINGS

CU 04173
EA 288001

Job# 8811024.10

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 5-15-89 7/24/91 5-13-92 12-19-92 7/20/92

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 22 OF 22

Plate 1

ClibPDF - www.fastio.com

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala.	880	20.3/23.6	279	354

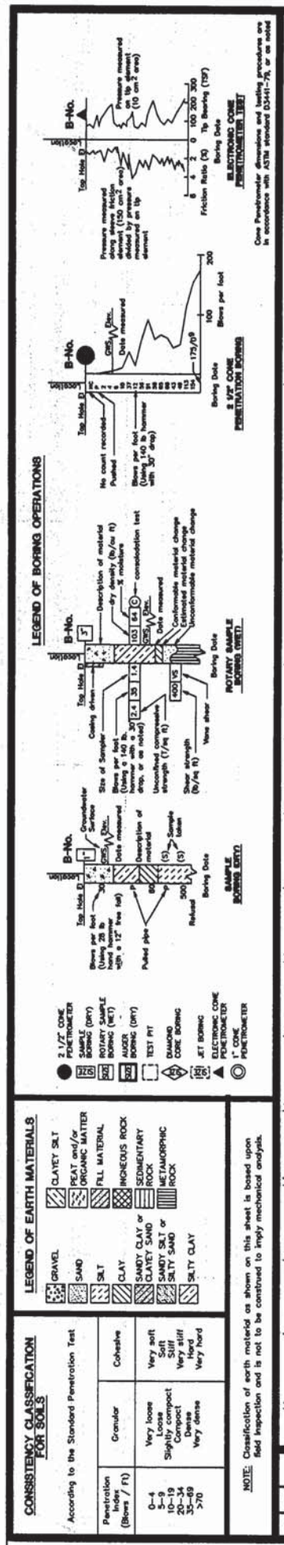
H. R. Taber
CERTIFIED ENGINEERING GEOLOGIST

REGISTERED GEOLOGIST — H. R. Taber — Exp. 6-30-90 — No. 172 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

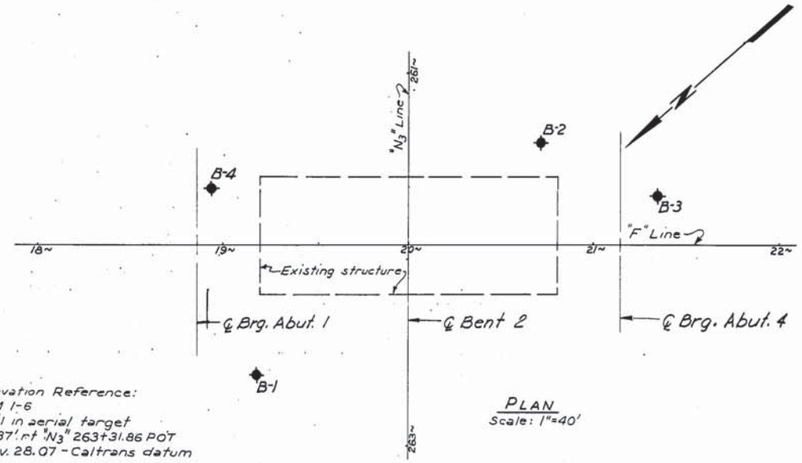
8-26-91
PLANS APPROVAL DATE

TABER CONSULTANTS
536 Galveston Street
West Sacramento, CA 95691

JOB No. IPI/388/72-13
Field Study By: E.A. Shedd

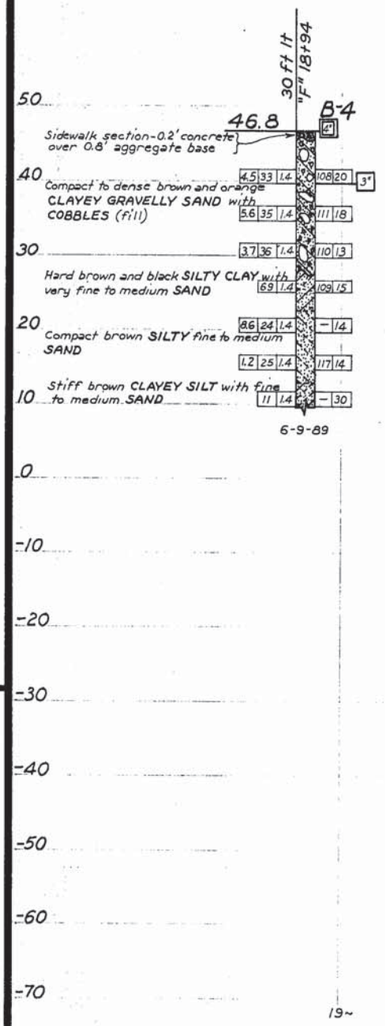


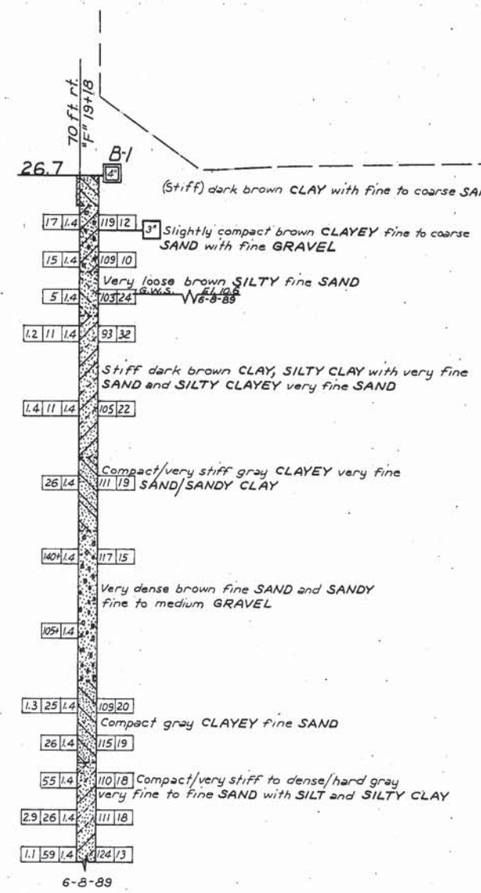
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.



Elevation Reference:
BM 1-6
Nail in aerial target
60.37' rt "N3" 263+31.86 POT
Elev. 28.07 - Caltrans datum

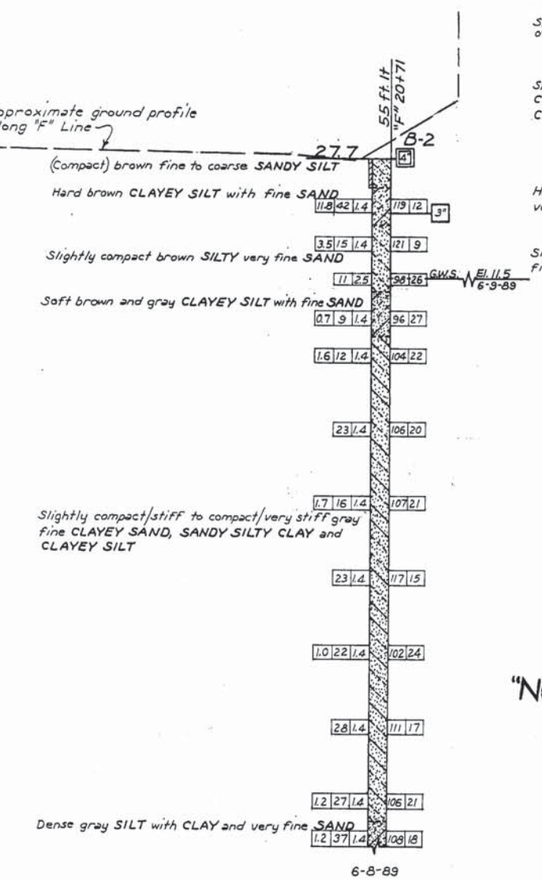
PLAN
Scale: 1"=40'

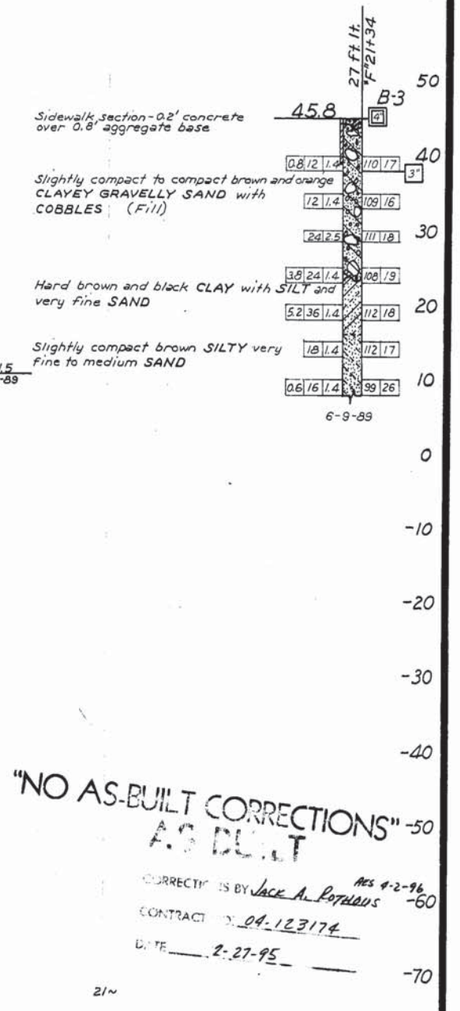




PROFILE
Scale: 1"=10'

20~





"NO AS-BUILT CORRECTIONS"
AS BUILT
CORRECTIONS BY Jack A. Rothaus ACS 4-2-96
CONTRACT NO. 04-123174
DATE 2-27-95

PREPARED FOR:

ENGINEERING GEOLOGY BRANCH - TRANSPORTATION LABORATORY		State of CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF STRUCTURES 2 STRUCTURE DESIGN	BRIDGE NO. 33-293	FLORESTA BOULEVARD OVERCROSSING
DRAWN BY J.O.D. 7-89	_____, PROJECT ENGINEER			POST MILE 2156	LOG OF TEST BORINGS
CHECKED BY E.A.S. 7-89					

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA 04-123171

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 5/10/95 5/13/97

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 14 OF 15

TL 6052 REV. 4/89

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FOUNDATION REPORT

I-880 MEDIAN BARRIER REPLACEMENT AND
EXPRESS LANE PROJECT
SANTA CLARA AND ALAMEDA COUNTY, CALIFORNIA
EA 04-2J0702 AND EA 04-3G911

Prepared For:

METROPOLITAN
TRANSPORTATION
COMMISSION

Prepared By:

PARIKH CONSULTANTS, INC.
2360 Qume Drive, Suite A, San Jose, CA 95131
(408) 452-9000

June 22nd 2015 PARIKH Project No. 2014-136-FDN

TABLE OF CONTENTS

Page No.

1.0 INTRODUCTION 1

2.0 SCOPE OF WORK 1

3.0 PROJECT DESCRIPTION 2

3.1 Existing Facilities 2

3.2 Proposed Project 4

4.0 PERTINENT INVESTIGATIONS, REPORTS AND PUBLISHED MAPS 6

5.0 EXCEPTIONS TO POLICY 8

6.0 FIELDINVESTIGATION AND TESTING PROGRAM 8

6.1 Field Exploration Performed 8

6.2 Field Testing 12

6.3 Details of Field Exploration 13

7.0 LABORATORY TESTING PROGRAM 13

8.0 SITE GEOLOGYAND SUBSURFACE SOIL CONDITIONS 14

8.1 Regional Geologic Setting 14

8.2 Site Geology 15

8.3 Subsurface Soil Conditions 18

8.4 Groundwater 23

9.0 SCOUR EVALUATION 26

10.0 CORROSION EVALUATION 26

11.0 SEISMIC RECOMMENDATIONS 29

11.1 Seismic Sources 29

11.2 Seismic Design Criteria 30

11.3 Seismic Hazard 31

11.3.1 Seismic Ground Shaking 31

11.3.2 Surface Fault Rupture 32

11.3.3 Liquefaction Susceptibility 32
11.3.4 Liquefaction Potential 37

12.0 FOUNDATION RECOMMENDATIONS 41
12.1 General 41
12.2 Foundations 41
12.2.1 Vertical Pile Capacity 42
12.2.2 Torsional Pile Capacity 43
12.2.3 Lateral Pile Capacity 43
12.3 Foundation for Each Overhead Sign Structures 44
12.4 Pile Data Table 96
13.0 NOTES TO DESIGNER 98
14.0 CONSTRUCTION CONSIDERATIONS 99
14.1 General Consideration 99
14.2 Cast-In-Drilled-Hole (CIDH) Concrete Pile 99
15.0 PLAN REVIEW 100
16.0 CONSTRUCTION OBSERVATION 101
17.0 INVESTIGATION LIMITATIONS 101

REFERENCES

PLATES

Project Location Map ..... Plates 1A - 1G
Site Plan ..... Plates 2A – 2M
General Geologic Map ..... Plates 3A - 3G
Caltrans ARS Online Map ..... Plate 4
ARS Design Curves ..... Plates5A and 5B
Historic Groundwater Depth Map ..... Plate 6
Quaternary Deposits Map ..... Plates 7A - 7I
Liquefaction Susceptibility Map ..... Plates 8A - 8I

APPENDICES

APPENDIX I: Site Map

APPENDIX II: Log of Test Borings

Log of Test Borings (Express Lane)
Log of Test Borings (Median Barrier Replacement)
As-built Log of Test Borings

APPENDIX III: Field Exploration and Testing

APPENDIX IV: Laboratory Test Results

Laboratory Test Summary Sheet
Laboratory Tests ..... Plate IV-1
Plasticity Chart ..... Plate IV-2
Particle Size Distribution Curve ..... Plate IV-3
Unconfined Compression Strength ..... Plate IV-4
Corrosion Test ..... Plate IV-5

APPENDIX V: Analyses and Calculations

Evaluation of Liquefaction Potential
Pile Capacity Analysis
Geotechnical Soil Parameters for LPILE Analysis

APPENDIX VI: Exceptions to Policy

APPENDIX VII: Responses to Caltrans Review Comments

FOUNDATION REPORT
I-880 MEDIAN BARRIER REPLACEMENT AND EXPRESS LANE PROJECT
SANTA CLARA COUNTY AND ALAMEDA COUNTY, CALIFORNIA
EA 04-2J0701 AND EA 04-3G911

1.0 INTRODUCTION

This "Foundation Report" presents the results of geotechnical engineering investigation for the proposed "I-880 Median Barrier Replacement Project (EA 04-2J0701) and subsequent I-880 Express Lane Project (EA 04-3G911)" in Santa Clara County and Alameda County, California, hereinafter referred to as "PROJECT". The report primarily addresses the overhead sign structure for the project. The work was performed in general accordance with the scope of work outlined in our proposal to HDR, Inc. (Designer).

The geotechnical recommendations presented in this report are intended for design input and are not intended to be used as specifications. In addition, the data provided in this report including these geotechnical recommendations should not be used for bidding purposes or for construction cost estimates. If the report is provided as a reference document, any interpretation of the data and recommendations should be the sole responsibility of the user and PARIKH Consultants, Inc. (PARIKH) shall not be liable for any consequences.

2.0 SCOPE OF WORK

The purpose of this report is to evaluate the general subsurface soil conditions at the project site, to evaluate their engineering properties, and to provide foundation design recommendations for the proposed project. The general location of the project corridor and its vicinity are shown on the "Project Location Map" presented on Plate 1.

This report addresses recommendations for the foundation design of sixty-one proposed Overhead Sign Structures. The scope of work performed for this investigation included a review of the readily available soils and geologic literature pertaining to the project site including as-built "Log of Test Borings" (LOTB) available within the project limits which is in the vicinity of the proposed overhead sign structures, site reconnaissance, obtaining representative samples and logging soil materials encountered in exploratory borings, laboratory testing of the representative soil samples, performing engineering analyses based on the field and laboratory data, and preparation of this foundation report.

3.0 PROJECT DESCRIPTION

The limits of the project are along Interstate 880 (I-880) corridor from north of Route 237 Interchange to north of Hegenberger Road Interchange. This segment is approximately 25 miles long and is located in Santa Clara and Alameda counties. The proposed improvement of the project will convert the existing High Occupancy Vehicle (HOV) lanes to express lanes in both northbound and southbound directions of I-880. The existing freeway will be widened in areas with proposed ingress and/or egress weave lanes. Install overhead signs and gantries in the median which will require power and telecommunications. The existing median concrete barriers will be modified at the proposed overhead sign locations and existing California Highway Patrol observation areas will be modified. The freeway lighting and fixtures will be installed and Maintenance Vehicle Pullouts (MVPs) will be constructed.

A map showing the project location and its vicinity is presented in Appendix I and Plates 1A through 1G.

3.1 Existing Facilities

Within the project limits, I-880 is an eight to twelve lane north/south facility passing through Santa Clara and Alameda counties and the cities of Milpitas, Fremont, Newark, Union City, Hayward, San Lorenzo, San Leandro, and Oakland. I-880 corridor serves as a vital transportation link in the San Francisco Bay Area connecting the Santa Clara County and Alameda County.

I-880 corridor is within an urbanized area with residential, industrial, and commercial development abutting the State right-of-way in both directions. The terrain on I-880 within the project limits is relatively flat, (3.0% maximum grade). Sound walls currently exist at the outside edges throughout the majority of the project area where residential properties are located. New landscaping has been installed along the project limits from several recently constructed highway improvement projects.

The following are the general descriptions of the existing facilities of I-880 within the project limits:

a) I-880 has three to five general purpose lanes and one HOV lane in each direction within the corridor.
b) The existing general purpose and HOV lanes vary from 11 feet wide to 12 feet wide.
c) The existing inside shoulder varies from one foot wide to 18 feet wide, and the outside shoulder varies from 2 feet wide to 25 feet wide.
d) The median width varies from 7 feet to 30 feet with paved inside shoulders and median concrete barrier.
e) There are twenty-five interchanges located on I-880 within the project limits. The following are the existing interchange locations (from south to north).

Post Mile	Interchange
10.42	Dixon Landing Road
2.29	I-880/SR-262 & Warren Avenue
3.25	Fremont Boulevard
4.71	Auto Mall Parkway
6.24	Stevenson Boulevard
7.18	Mowry Avenue
8.84	Thornton Avenue
10.30	Decoto Road (State Route 84)
11.50	Alvarado Boulevard
13.00	Alvarado-Niles Road
13.67	Whipple Road
14.54	Industrial Parkway
15.65	Tennyson Road
16.70	SR-92/I-880
17.60	Winton Avenue
18.35	A Street
20.16	Hesperian Boulevard
20.30	NB I-238/SB I-880
20.32	Lewelling Boulevard

20.68	SB I-880/SB I-238
20.82	Washington Avenue
22.84	Marina Boulevard
23.64	SR-112 (Davis Street)/I-880
24.74	98th Avenue
25.50	Hegenberger Road

3.2 Proposed Project

The Metropolitan Transportation Commission (MTC) and the California Department of Transportation (Caltrans) are pursuing development of an integrated Bay Area express lane network to enhance mobility and afford greater user flexibility of the transportation system within the San Francisco Bay Area. Express lanes will allow single occupancy vehicles to use high occupancy vehicle (HOV) lanes by paying a toll that is adjusted dynamically based on congestion.

Express lane conversions on I-880 would total approximately 45 directional lane miles. Express Lane signs and electronic tolling equipment would be installed to support this conversion. Table 1identifies the limits of associated improvements proposed under the project, as well as the location and length of existing HOV lanes that would be converted to express lanes.

TABLE 1 - I-880 EXISTING HOV LANES TO BECONVERTED TOEXPRESS LANES

Segment Limits (PM)	Limits of HOV Conversion (PM)	HOV Conversion Length (Directional Miles)	Conversion Description
SCL 880 7.5 – 10.5	NB: SCL 88010.0 – 10.5 SB: SCL 880 10.0 - 10.5	NB = 19.38 SB = 25.53	NB = Dixon Landing Rd to Hacienda Ave SB = Dixon Landing Rd to Hegenberger Rd
ALA 880 R0.0 – 26.4	ALA 880 R0.0 – 19.15 ALA 880 R0.0 – 25.3		

According to the designer, the fifty-nine proposed overhead signs will be under the "MTC Express Lane Project" and "Caltrans Median Barrier Replacement Project" with the following details:

Project Name	EA Number	Post Mile	Overhead Sign
MTC Express Lane	04-3G9101	SCL PM 7.5/10.5 & ALA PM R0.0/26.4	OS PM-9.70, OS PM-10.16, OS PM-R0.20, OS PM-R1.00 , OS PMR1.10, OS PM-2.50, OS PM-2.67
Caltrans Median Barrier	04-2J0701	ALA PM 2.9/27.3	Remaining overhead signs as listed in Table 2.

The project will install overhead and barrier-mounted static (non-changing) signs, variable (changing) message signs and card reader signal poles in the median with the following details:

Sign Types

The express lanes would include static (non-changing) and varibale (changing) message signs as described below:

1. Static Sign

    a) Roadside Sign – smaller signs with approximate dimensions of 3.5'x2.5' to 7'x10' displaying the express lane operating rules (e.g., hours of operation, person-per-vehicle requirements, etc.) and guidance information about access points (i.e. distance and directional arrow)would be located on the concrete median barrier at approximately ¼ to ½-mile intervals or on the outside shoulder mounted on two wood posts.

    b) Overhead Express Lane Signs – mid-size signs, varying from about 5.5'x9.5' to 7'x17', displaying the express lane operating rules and guidance information about the access points (i.e. distance and directional arrow) would be mounted on vertical single post. The installation of these signs would include the replacement of the existing concrete median barrier within the paved areas of the freeway right-of-way.

2. Variable Toll Message Signs – large overhead (approximately 10'x29' to about 13'x29') electronic message signs would display the toll pricing for the express lane system,

which would change depending on the level of congestion on the freeway. These signs would be mounted on vertical single post.

Sign Structures

a) The three types of sign structures expected to be usedalong the express lanes will include i) "Vertical Single Post Type"; ii) "Post Mounted"; and iii) "Median Mounted".

b) Some of the signs will be mounted along with electronic tolling equipment.

c) Signs that would extend directly over the freeway travel lanes would have a minimum clearance height of 19 feet.

d) The maximum height is approximately 34'-6" (max) from roadway surface to the top of the sign panel. It is expected that the sign structure will have a Cast-In-Drilled-Hole (CIDH) concrete pile foundation with an expected maximum pile length of 45 feet. The length of the CIDH concrete pile foundation is dependent on the vertical and lateral demands, and subsurface soil conditions.

e) When it is necessary to minimize the impact along the inside shoulder adjacent to the overhead sign, non-standard 4-foot diameter sign pile pedestal, CIDH pile and anchorage will be used.

Card Reader Signal Poles

The project will also install card reader signal poles. These poles will not be carrying any signs. It is expected that these structures will have a Cast-In-Drilled-Hole (CIDH) concrete pile foundation with an expected maximum pile length of 22 feet.

This foundation report is prepared for the proposed overhead and static (non-changing) signs, variable (changing) message signs and card reader signal poles to be mounted at the median barrier as described above.

4.0 PERTINENT INVESTIGATIONS, REPORTS AND PUBLISHED MAPS

Published reports and maps that include the project area vary in focus and scale.

As-Built Log of Test Borings (LOTB)

a) Caltrans (1990), LOTB for Fremont Blvd. Overcrossing (Br. No. 33-625M, 33-626M and 33-627M) MSE Wall (PM 2.8/3.7)
b) Caltrans (1990), LOTB for Route Widening Retaining Wall No. 1 (PM 2.5/6.9)
c) Caltrans (1998), LOTB for Durham Road Undercrossing (Replace) (Br. No. 33-268)
d) Caltrans (1999), LOTB for Route Widening Retaining Wall Nos. 2 and 3 (PM 2.5/6.9)
e) Caltrans (1999), LOTB for Stevenson Blvd. Interchange Soundwall No. 2 (PM 2.5/6.9)
f) Caltrans (1995), LOTB for William Street Overcrossing (Br. No. 33-169)
g) Caltrans (1994), LOTB for Soundwall No. 1 (PM 6.9/8.5)
h) Caltrans (1994), LOTB for Soundwall No. 2 (PM 6.9/8.5)
i) Caltrans (1998), LOTB for Mowry Avenue Overcrossing (Replace) (Br. No. 33-267 L/R)
j) Caltrans (1994), LOTB for Soundwall (PM 4.9/8.2)
k) Caltrans (1999), LOTB for Retaining Wall No 3 (PM 6.9/8.5)
l) Caltrans (1998), LOTB for Hatch Hatchie Aqueduct Bridge (Br. No. 33-272)
m) Caltrans (1998), LOTB for Retaining Wall No. 4 (PM 6.9/8.5)
n) Caltrans (1993), LOTB for Central Avenue Overcrossing (Replace) (Br. No. 33-261 L/R)
o) Caltrans (1998), LOTB for Thornton Avenue Interchange (PM 8.3/9.9)
p) Caltrans (1998), LOTB for Mainline Widening Post Mile 9.9 to 12.8 (PM 9.9/12.8)
q) Caltrans (2002), LOTB for Alvarado/Fremont Overcrossing (Replace) (Br. No. 33-0618)
r) Caltrans (1998), LOTB for Alvarado-Niles Road Overcrossing (Br. No. 33-631)
s) Caltrans (1998), LOTB for Alquire Road Overhead (Br. No. 33-246S)
t) Caltrans (1991), LOTB for Tennyson Road Overcrossing Ret. Wall (Bridge No. 33-236 RW)
u) Caltrans (1993), LOTB for “A” Street Undercrossing Widening (Br. No. 33-179)
v) Caltrans (1992), LOTB for Soundwalls 1, 2, 3 & 4 (PM 18.6/20.6)
w) Caltrans (1994), LOTB for Soundwall Nos. 1 and 2 (PM 23.6/24.3)
x) Caltrans (1999), LOTB for Retaining Walls/Soundwalls – “SW” Line (PM 24.4/25.2)
y) Caltrans (1996), LOTB for Soundwall No. 1 (PM 23.6/24.3)
z) Caltrans LOTB for Eldridge Ave. Pedestrian Overcrossing (Replace) (Bridge No. 33-0282)

Other reference documents are listed at the end of this report section.

5.0 EXCEPTIONS TO POLICY

Normal procedures were assumed for construction of the proposed overhead sign structures throughout our analysis and represent one of the bases of recommendations presented herein. The investigation for the proposed foundations has followed Caltrans policy. Exception to policy is not needed.

6.0 FIELDINVESTIGATION AND TESTING PROGRAM

6.1 Field Exploration Performed

Based on the plans, discussions with the design team, and readily available geotechnical data in the area, fifty-nine borings were drilled at selected locations to depths ranging from 40 ft to 46.5 ft below the existing ground surface from December 2014 through February 2015.Seven Cone Penetration Tests (CPT) were performed in the vicinity of the proposed overhead sign locations where potentially liquefiable soil layer(s) was/were encountered in the soil borings. The purpose was to obtain required extra depth of subsurface soil profile information for use in the pile foundation design. Approximate locations of these fifty-nine borings and seven CPTs are shown on the Site Plan (Plate 2).

The station, approximate ground elevation and depth of these borings are summarized in table below.

TABLE 2 - SUMMARY OF BORINGS

No.	Sign Designation	"M" Line Station (ft)	Reference Boring/CPT	"M" Line Station (ft)	Offset	Boring/ CPT Depth (ft)	Approx. Ground Elev. (ft)(3)
1	OS PM-9.70(1)	1117+25	A-14-880-001	1117+25	100' Rt.	41.5	14.5
2	-	1134+30	A-14-880-002	1134+30	70' Rt.	41.5	15.5
3	OS PM-10.16(1)	1141+40	R-15-880-003	1141+00	91' Rt.	46.5	14.5
4	OS PM-R0.20(1)	1170+16	R-15-880-004	1169+90	79' Rt.	41.5	13.5
5	Signal Pole(1), (2)	1178+00	No boring was drilled for this structure.				
6	Signal Pole(1), (2)	1178+25	No boring was drilled for this structure.				
7	OS PM-R1.00(1)	1212+47	R-14-880-005	1212+50	97' Rt.	41.5	15.5

No.	Sign Designation	"M" Line Station (ft)	Reference Boring/CPT	"M" Line Station (ft)	Offset	Boring/ CPT Depth (ft)	Approx. Ground Elev. (ft)(3)
8	OS PM-R1.10(1)	1217+68	R-15-880-059	1217+70	100' Rt.	41.5	15.5
9	OS PM-2.50(1)	1277+88	R-14-880-006	1277+90	87' Rt.	46.5	23.5
10	OS PM-2.67(1)	1286+00	R-15-880-007	1286+00	100' Rt.	41.5	20.0
11	OS1-1	1303+42	R-15-880-008	1303+40	53' Rt.	41.5	17.5
12	OS2-1	1312+00	R-15-880-009	1312+00	80' Rt.	41.5	16.5
13	OS3-1,2	1330+59	R-15-880-010	1329+80	82' Rt.	41.5	17.0
14	OS4-1	1346+50	R-15-880-011	1346+50	100' Lt.	41.5	18.5
15	OS5-1	1356+50	R-15-880-060	1356+50	78' Rt.	41.5	19.5
16	OS6-1 (2)	1364+83	R-15-880-012	1364+80	52' Lt.	40.9	23.0
17	OS7-1	1381+20	R-15-880-013	1382+00	66' Rt.	41.5	25.5
18	OS8-1	1398+52	R-15-880-014	1398+50	86' Lt.	41.5	27.0
19	OS10-1	1425+02	R-14-880-015	1426+00	81' Rt.	41.5	29.5
20	OS10-2	1426+51	R-14-880-015	1426+00	81' Rt.	41.5	29.5
21	OS12-1,2	1454+30	R-15-880-016	1454+30	82' Rt.	41.5	33.0
22	OS15-1	1489+39	R-15-880-017	1489+40	91' Rt.	41.5	37.5
23	OS17-1,2	1519+89	A-15-880-018	1519+90	78' Rt.	46.5	39.0
			CPT-15-880-018	1519+90	78' Rt.	60.0	39.0
24	OS19-1	1539+52	As-Built B-28	1540+90	71' Rt.	46.0	34.0
25	OS20-1	1560+00	As-Built B-17	1559+95	100' Rt.	49.0	32.0
26	OS22-1	1583+32	R-15-880-021	1583+30	92' Rt.	41.5	19.0
27	OS24-1	1598+85	R-15-880-022	1598+85	92' Rt.	30.2	25.0
28	OS25-1,2	1620+28	R-15-880-023	1620+30	79' Rt.	40.0	39.0
29	OS27-1,2	1648+25	R-15-880-024	1648+50	80' Lt.	41.0	36.5
30	OS29-1,2	1667+00	R-15-880-025	1667+00	81' Lt.	41.5	36.0
			CPT-15-880-025	1667+00	81' Lt	60.0	36.0
31	OS31-1	1683+64	R-15-880-026	1683+60	97' Rt.	41.5	31.0
			CPT-15-880-026	1683+60	97' Rt.	60.0	31.0
32	OS32-1,2	1701+68	R-15-880-027	1701+70	94' Rt.	41.5	31.5
33	OS35-1	1728+50	R-15-880-028	1728+50	96' Rt.	41.5	28.0
34	OS37-1,2	1748+89	R-15-880-029	1748+90	86' Rt.	41.5	27.0
35	OS41-1,2	1802+93	R-15-880-030	1802+90	90' Lt.	41.5	24.0
36	OS43-1(2)	1826+20	No boring was drilled for this structure.				
37	OS43-2	1831+48	R-15-880-031	1831+50	65' Rt.	41.5	20.5

No.	Sign Designation	"M" Line Station (ft)	Reference Boring/CPT	"M" Line Station (ft)	Offset	Boring/ CPT Depth (ft)	Approx. Ground Elev. (ft)(3)
38	OS45-1,2	1854+65	R-15-880-032	1855+20	82' Lt.	41.5	16.5
			CPT-15-880-032	1855+20	82' Lt.	60.0	16.5
39	OS47-1	1879+00	R-15-880-033	1879+00	62' Lt.	41.5	36.5
40	OS47-2,3	1884+36	R-15-880-034	1884+40	89' Rt.	41.5	19.0
41	OS51-1	1932+43	R-15-880-035	1932+40	89' Rt.	46.5	16.5
42	OS51-2	1933+92	A-15-880-061	1933+90	93' Rt.	41.5	17.0
43	OS53-1(2)	1952+92	No boring was drilled for this structure.				
44	OS53-2	1958+20	A-15-880-036	1958+20	89' Rt.	41.5	22.0
45	OS54-1	1966+00	R-15-880-037	1966+00	73' Lt.	41.5	25.0
46	OS55-1	1989+88	As-Built 01-01	1989+50	60' Rt.	103.0	33.0
47	OS57-1,2	2014+15	A-15-880-039	2014+15	76' Rt.	41.5	42.0
48	OS60-1	2058+00	A-15-880-040	2058+00	81' Rt.	41.5	63.0
			CPT-15-880-040	2058+00	81' Rt.	60.0	63.0
49	OS63-1,2	2089+88	R-15-880-041	2089+90	60' Lt.	41.5	64.0
50	OS64-1	2103+38	R-15-880-042	2103+40	80' Rt.	41.5	59.5
51	OS65-1	2111+70	R-15-880-062	2111+00	73' Rt.	41.5	65.0
52	OS66-1,2	2121+88	R-15-880-043	2121+90	72' Rt.	41.5	63.0
			CPT-15-880-043	2121+90	72' Rt.	60.0	63.0
53	OS68-1	2148+28	A-14-880-044	2148+30	83' Rt.	46.5	50.0
			CPT-15-880-044	2148+30	83' Rt.	60.0	50.0
54	OS68-2,3	2156+60	A-15-880-045	2156+60	98' Lt.	46.5	39.0
55	Signal Pole(1), (2)	2169+40	No boring was drilled for this structure.				
56	OS70-1	2174+68	R-15-880-046	2174+70	85' Rt.	41.5	39.0
57	OS75-1	2246+52	R-15-880-047	2246+50	55' Rt.	41.5	26.0
58	OS76-1	2253+88	R-15-880-048	2253+90	78' Rt.	46.5	26.0
59	OS77-1	2275+00	A-15-880-049	2275+00	83' Rt.	41.5	29.0
60	OS79-1	2301+40	A-14-880-050	2301+40	82' Rt.	45.0	30.0
61	OS82-1	2333+08	A-14-880-051	2333+10	83' Rt.	41.0	29.0
62	OS84-1	2361+24	A-15-880-052	2361+20	100' Lt.	41.5	25.0
63	OS87-1(1)	2411+23	R-15-880-053	2411+20	77' Rt.	40.4	26.0
64	OS89-1	2436+64	R-15-880-054	2436+50	78' Rt.	41.5	36.0
65	OS92-1(2)	2471+28	No boring was drilled for this structure.				
66	OS92-2	2480+93	R-15-880-055	2480+90	92' Rt.	41.5	11.0

No.	Sign Designation	"M" Line Station (ft)	Reference Boring/CPT	"M" Line Station (ft)	Offset	Boring/ CPT Depth (ft)	Approx. Ground Elev. (ft)(3)
67	OS94-1	2507+33	A-15-880-056	2507+30	83' Lt.	44.5	10.0
68	OS95-1	2523+17	A-15-880-057	2523+20	73' Lt.	46.5	10.0
69	OS96-1	2533+73	R-15-880-058	2533+70	74' Rt.	41.5	11.0

(1) This structure is a part of the future "express lanes" project phase. The current structure name is preliminary. Final sign designation will be assigned to this structure during that future phase.
(2) Card Reader Signal Pole.
(3) Elevations are based on NAVD88 datum.

The overall work program and the approach to the field exploration work was submitted to Caltrans which was reviewed and approved by them prior to our commencing the work. The following comment should be noted in reference to the field exploration program:

a) Some of the proposed overhead signs were relocated; however the location of the corresponding boring is still within 100 feet radial distance from the location of the proposed sign.

b) The proposed overhead signs with the reference borings Boring R-15-880-059 through R-15-880-062 were added subsequent to our starting the field exploration work.

c) The proposed overhead sign was deleted after Boring A-14-880-002 had been drilled. This boring is not used.

d) No field exploration was performed for Card Reader Signal Poles except Boring R-15-880-012 for OS6-1. The recently-drilled nearby borings were used for foundation analysis of these structures

e) Boring R-14-880-015 was drilled at the location approximately 95 feet and 50 feet from the proposed overhead sign OS10-1 and OS10-2.

f) Boring number with extension 019, 020 and 038 was cancelled and not used because as-built LOTBs are available for the proposed overhead signs OS19-1, OS20-1 and OS55-1 respectively.

g) The CPT was pushed at the same location as the corresponding boring that has been drilled.

h) Boring R-15-880-022 was terminated at shorter depth due to refusal due to possible cobbles was encountered at approximate depth of 31 feet below existing ground surface.

i) The field exploration of all the soil boring and the pushing of all the CPT were performed at the shoulder.

k) As-built Caltrans LOTBs as listed in Section 4.0 were used for the proposed overhead signs (as additional references) if the as-built boring are within 500 feet from the proposed overhead sign locations.

The descriptions of the soil materials encountered in the field exploration and relevant boring information are presented on the Log of Test Borings (LOTB) included in Appendix II.

6.2 Field Testing

a) Soil samples were obtained from the borings during drilling at various depths by driving a 2.5 inches Inside Diameter (I. D.) Modified California Sampler or a 1.375 inches I.D. Standard Penetration Sampler (ASTM Test Method No. 1586). The sampler was driven into the subsurface soils under the impact of a 140 pounds hammer having a free fall of 30 inches. The blow counts required to drive the sampler for the last 12 inches are presented on the LOTB, Appendix II. (When correlating standard penetration data in similar soils, the blow counts for the Modified California sampler can be converted to equivalent Standard Penetration Test sampler by multiplying a factor of 0.65).

b) Pocket penetration tests were also performed on clay samples to evaluate their consistency.

6.3 Details of Field Exploration

All the test borings were drilled with either a truck-mounted drill rig using 8-inch diameter hollow-stem auger or rotary-wash drilling method with 4-inch diameter drilling bit. The borings were drilled under the technical supervision of our engineers, who classified and continuously logged the soils encountered during drilling and supervised the collection of soil samples at various depths for visual examination and laboratory testing. The soil samples were visually classified in the field according to the Caltrans "Soil and Rock Logging, Classification and Presentation Manual" (2010 Edition) and then transported to our laboratory for further evaluation and testing. Upon completion of drilling, the boreholes were backfilled with cement grout. Grouting inspections were performed by Alameda County Water District, as necessary.

The logs presented in Appendix II were prepared from the field logs which were edited after visual re-examination of the soil samples in the laboratory and results of classification tests on selected soil samples as indicated on the logs.

7.0 LABORATORY TESTING PROGRAM

The following laboratory tests were performed on selected soil samples collected during field exploration to evaluate the physical and engineering properties of the subsurface soils at the project site to support the preliminary foundation recommendations:

a) Laboratory determination of Moisture-Density (California Test Method T-226).
b) Atterberg Limits (California Test Method T-204).
c) Grain Size Classifications (California Test Method T-202).
d) Unconfined Compression Test (California Test Method T-221).
e) Corrosion Test (California Test Method T-643).

The laboratory test methods and laboratory test results for moisture content, total unit weight, unconfined compression, Plasticity Index and grain size classification of the soil samples are summarized in the table in Appendix IV.

It should be noted that the descriptions of the soils encountered and relevant boring information presented on the LOTB depict subsurface conditions only at the locations indicated on the plan and on the particular date noted on the LOTB. Because of the variability from place to place within soil/rock in general, subsurface conditions at other locations may differ from conditions occurring at the boring locations explored. The abrupt stratum changes shown on the logs may be gradational and relatively minor changes in soil types within a stratum may not be noted on the logs due to field limitations. Also, the passage of time may result in a change in the soil conditions at these locations due to environmental changes.

8.0 SITE GEOLOGYAND SUBSURFACE SOIL CONDITIONS

8.1 Regional Geologic Setting

The project sites are located along the eastern side of the San Francisco Bay in the Coast Ranges geomorphic province of California. The axes of the mountain ranges and valleys trend in northwest direction. The crests of the Coast Ranges Mountains range from 2000 to 4000 feet, occasionally 6000 feet elevation above sea level. The valleys between the ridges range from sea level to several hundred feet above sea level. San Francisco Bay occupies a broad partially submerged valley between the San Francisco Peninsula and the East Bay.

Much of the geologic framework of the San Francisco Bay Region is the result of plate tectonics. The region is located at the boundary between two large crustal plates that are separated by the north-northwest trending San Andreas Fault (and related sub-parallel faults including the Hayward and Calaveras Faults). The Pacific Plate (located west of the San Andreas Fault) is slowly moving northwestward relative to the North American Plate (located east of the San Andreas Fault). The strain that accumulates in the rocks on either side of the fault is occasionally released in the form of earthquakes. Some earthquakes are accompanied by surface rupture where the active faults intersect the ground surface.

The ground surface slopes gently westward from the foot of the Diablo Range and the Hayward Fault toward the eastern shoreline of San Francisco Bay and the isolated Coyote Hills.

Witter, et al (2007) mapped various units of Quaternary-age deposits exposed at the ground surface in San Francisco Bay Region. Plates 7-A through 7-G show portions of that mapping along the project alignment. Descriptions of those units follow.

8.2 Site Geology

At the present time, the surface of the Franciscan bedrock is buried beneath 400 and 800 feet of alluvium where I-880 is located. I-880 was constructed on that ground surface and is underlain by different layers of fine- and coarse-grained alluvium.

Human development of the land around San Francisco Bay has resulted in the placement of artificial fill on top of alluvium in some places around the Bay's margins. I-880 was built upon such fill at the northern and southern ends of the project area. Bedrock should not be encountered in foundation excavation for the proposed overhead sing structures.

Dibblee's geologic maps (2005 and 2007) of the project area indicate that majority of the sites of the proposed overhead signs are underlain by undifferentiated Quaternary age alluvium ("Qa")

The listing of all the geologic maps for the proposed overhead signs is presented in the "References". Geologic maps along the project corridor are shown in Plates 3A through 3I. Based on these maps, the proposed overhead signs are located on the following geologic units:

The map of Quaternary deposits by Witter, et. al. (2006) differentiates the alluvium beneath the project sites into the following units, which are labeled and described as:

Qa - Surficial Sediments (Holocene) Alluvial gravel, sand and clay of valley areas.

af - Artificial fill (historical). Material deposited by humans. Most of the artificial fill shown forms large highway and railroad embankments, consisting of engineered fill up to approximately 100 feet thick.

Qhl - Holocene alluvial fan levee deposits. Natural levee deposits of alluvial fans consisting of loose, moderately to well sorted- sand, silt and clay; formed by streams that overtop their banks and deposit sediment adjacent to the channel.

Qhf - Holocene alluvial fan deposits, undifferentiated; Alluvial fan sediment includes sand, gravel, silt and clay, and it moderately to poorly sorted, and moderately to poorly-bedded.

Qhb-Holocene basin deposits, undifferentiated. Basin deposits consist of fine-grained alluvium with horizontal stratification, including clay, layers of sand and silt.

The geological units that underlie segments of project alignment are summarized in the table below.

TABLE 3-SUMMARY OF GEOLOGIC UNITS MAPPED UNDERLYING THE OVERHEAD SIGN

Sign Designation	"M" Line Station (ft)	Reference Boring/CPT	Geology
OS PM-9.70(1)	1117+25	A-14-880-001	Qa
-	1134+30	A-14-880-002	Qa
OS PM-10.16(1)	1141+40	R-15-880-003	Qa
OS PM-R0.20(1)	1170+16	R-15-880-004	Qa
OS PM-R1.00(1)	1212+47	R-14-880-005	Qa
OS PM-R1.10(1)	1217+68	R-15-880-059	Qa
OS PM-2.50(1)	1277+88	R-14-880-006	Qa
OS PM-2.67(1)	1286+00	R-15-880-007	Qa
OS1-1	1303+42	R-15-880-008	Qa
OS2-1	1312+00	R-15-880-009	Qa
OS3-1,2	1330+59	R-15-880-010	Qa
OS4-1	1346+50	R-15-880-011	Qa
OS5-1	1356+50	R-15-880-060	Qa
OS7-1	1381+20	R-15-880-013	Qa
OS8-1	1398+52	R-15-880-014	Qa

Sign Designation	"M" Line Station (ft)	Reference Boring/CPT	Geology
OS10-1	1425+02	R-14-880-015	Qa
OS10-2	1426+51	R-14-880-015	Qa
OS12-1,2	1454+30	R-15-880-016	Qa
OS15-1	1489+39	R-15-880-017	Qa
OS17-1,2	1519+89	A-15-880-018/CPT-15-880-018	Qa
OS19-1	1539+52	As-Built Boring B-28	Qa
OS20-1	1560+00	As-Built Boring B-17	Qa
OS22-1	1583+32	R-15-880-021	Qa
OS24-1	1598+85	R-15-880-022	Qa
OS25-1,2	1620+28	R-15-880-023	Qa
OS27-1,2	1648+25	R-15-880-024	Qa
OS29-1,2	1667+00	R-15-880-025/CPT-15-880-025	Qa
OS31-1	1683+64	R-15-880-026/CPT-15-880-026	Qa
OS32-1,2	1701+68	R-15-880-027	Qa
OS35-1	1728+50	R-15-880-028	Qa
OS37-1,2	1748+89	R-15-880-029	Qa
OS41-1,2	1802+93	R-15-880-030	Qa
OS43-2	1831+48	R-15-880-031	Qa
OS45-1,2	1854+65	R-15-880-032/CPT-15-880-032	Qa
OS47-1	1879+00	R-15-880-033	Qa
OS47-2,3	1884+36	R-15-880-034	Qa
OS51-1	1932+43	R-15-880-035	Qa
OS51-2	1933+92	A-15-880-061	Qa
OS53-2	1958+20	A-15-880-036	Qhfp
OS54-1	1966+00	R-15-880-037	Qhfp
OS55-1	1989+88	As-Built Boring 01-01	Qhfp
OS57-1,2	2014+15	A-15-880-039	Qhaf
OS60-1	2058+00	A-15-880-040/CPT-15-880-040	Qhaf
OS63-1,2	2089+88	R-15-880-041	Qhaf
OS64-1	2103+38	R-15-880-042	Qhaf
OS65-1	2111+70	R-15-880-062	Qhaf
OS66-1,2	2121+88	R-15-880-043/CPT-15-880-043	Qhaf
OS68-1	2148+28	A-14-880-044/CPT-15-880-044	Qhaf
OS68-2,3	2156+60	A-15-880-045	Qhaf

Sign Designation	"M" Line Station (ft)	Reference Boring/CPT	Geology
OS70-1	2174+68	R-15-880-046	Qhaf
OS75-1	2246+52	R-15-880-047	Qhb
OS76-1	2253+88	R-15-880-048	Qhl
OS77-1	2275+00	A-15-880-049	Qhl
OS79-1	2301+40	A-14-880-050	Qhb
OS82-1	2333+08	A-14-880-051	Qhb
OS84-1	2361+24	A-15-880-052	Qhl
OS87-1(1)	2411+23	R-15-880-053	Qhaf
OS89-1	2436+64	R-15-880-054	Qhb
OS92-2	2480+93	R-15-880-055	Qhb
OS94-1	2507+33	A-15-880-056	af
OS95-1	2523+17	A-15-880-057	af
OS96-1	2533+73	R-15-880-058	af

(1) This structure is a part of the future "express lanes" project phase. The current structure name is preliminary. Final sign designation will be assigned to this structure during that future phase.

The descriptions of the subsurface soils/rock encountered in the geotechnical explorations are consistent with the published geologic maps.

8.3 Subsurface Soil Conditions

Based on the boring data, the descriptions of the subsurface soil materials encountered in each of the exploratory boring are summarized in the table below.

TABLE 4- SUMMARY OF SUBSURFACE SOIL CONDITIONS

Sign Designation	Reference Boring	Subsurface Soil Conditions
OS PM-9.70(1)	A-14-880-001	Poorly graded gravel, underlain by **loose** clayey sand with gravel, underlain by medium stiff to very stiff lean/fat clay/silt.
-	A-14-880-002	Poorly graded gravel, underlain by medium dense silty sand with gravel, underlain by medium stiff to very stiff lean/fat clay/silt with a single layer of dense poorly-graded sand.
OS PM-10.16(1)	R-15-880-003	Medium stiff to very stiff lean clay/silt, with a single layer of very soft fat clay and medium dense to dense well-graded sand with silt. Silt caved in below the depth of 45 feet and there was about 8 feet of soil inside the auger at the depth of 50 feet.
OS PM-R0.20(1)	R-15-880-004	Medium stiff to stiff lean clay/silt with sand with a single layer of soft lean clay.
OS PM-1.00(1)	R-14-880-005	Stiff to very stiff fat/lean clay/sandy silt, with a single layer of medium dense silty sand.
OS PM-R1.10(1)	R-15-880-059	Medium stiff to very stiff lean clay, underlain by medium dense silty sand.
OS PM-2.50(1)	R-14-880-006	Medium stiff to very stiff clay.
OS PM-2.67(1)	R-15-880-007	Stiff to hard lean clay.
OS1-1	R-15-880-008	Stiff to hard lean clay.
OS2-1	R-15-880-009	***Loose*** silty sand, underlain by stiff to hard lean clay with sand with a single layer of medium dense silty sand.
	B-8	Very soft to stiff silty clay with interbedded layers of ***very loose*** silty sand.
OS3-1,2	R-15-880-010	Medium stiff to very stiff lean clay with interbedded layers of medium dense silty sand.
OS4-1	R-15-880-011	Soft to very stiff lean clay/sandy silt with interbedded layers of medium dense silty sand.
OS5-1	R-15-880-060	Stiff to very stiff sandy lean clay/sandy silt with interbedded layers of medium dense silty sand and medium dense to very dense poorly graded sand with silt.
OS6-1(1)	R-15-880-012	Interbedded layers of very stiff lean clay and medium dense silty sand to very dense silty sand with gravel/silty gravel with sand.
	B11.8	Interbedded layers of soft to very stiff lean clay/silt and dense poorly graded/well graded sand.
OS7-1	R-15-880-013	Interbedded layers of stiff to very stiff lean clay/silt and medium dense poorly graded sand/silty sand.
	B.11.11	Interbedded layers of medium stiff to stiff lean clay and medium dense to very dense clayey sand/poorly graded sand.
OS8-1	R-15-880-014	Soft to very stiff lean clay/silt with a single layer of medium dense silty sand.
	B-5	Soft to hard clay/silt, underlain by soft clayey silt with occasional pocket/lens/layer of dense well-graded sand.
	B-6	Stiff to hard sandy clay/sandy silt with interbedded layers of medium dense silty sand.
	B-7	Stiff to very stiff lean clay/silt with interbedded layers of medium dense silty sand.
OS10-1,2	R-14-880-015	Medium stiff to very stiff lean clay/silt, underlain by dense poorly graded sand with silt.
	B-1 (11A)	Medium stiff to very stiff lean/fat clay/silt.

Sign Designation	Reference Boring	Subsurface Soil Conditions
OS12-1,2	R-15-880-016	Hard lean clay, underlain by ***loose*** clayey sand, underlain by soft to stiff lean clay/silt, underlain by dense silty sand.
OS15-1	R-15-880-017	Soft to very stiff lean clay/silt with sand.
	B-23	Stiff to very stiff lean clay with occasional pocket/lens of clayey sand, underlain by very dense poorly graded sand.
	B-24	Medium stiff to very stiff lean clay/silty clay.
OS17-1,2	A-15-880-018	Soft to very stiff lean clay/sandy silt, with interbedded layers of medium dense clayey/silty sand.
	B-8.6	Stiff to hard sandy lean clay with a single layer of medium dense to dense well graded sand with gravel.
OS19-1	B-27	Medium stiff to very stiff lean clay with interbedded layers of median dense to dense clayey sand/poorly-graded sand and clayey sand.
OS19-1	B-28	Medium stiff to very stiff lean clay with a single layer of medium dense clayey sand.
OS20-1	B-17	Soft to very stiff lean clay with a single layer of medium dense sand.
	B-12A.7	Interbedded layers of medium dense silty sand with gravel/poorly graded sand and medium stiff to hard sandy lean clay/silty fat clay.
OS22-1	R-15-880-021	***Loose*** silty sand, underlain by medium stiff to stiff lean clay, underlain by dense to very dense poorly graded gravel with silt and sand.
	B-6.1	Medium stiff to very stiff lean clay, underlain by very dense poorly graded/well graded sand.
	B-6.2	Medium stiff to hard lean clay with interbedded layers of dense poorly-graded sand to very dense well-graded sand and gravel.
OS24-1	R-15-880-022	Medium dense to very dense silty sand with gravel/silty gravel with sand. Big cobbles were encountered at the depth of 30 feet which was the depth of boring.
OS25-1,2	R-15-880-023	Medium stiff to stiff lean clay with interbedded layer of medium dense clayey sand with gravel to dense poorly-graded sand with clay and gravel. Drilled hole caved in at the depth of 31 feet. The boring was drilled to the depth of 40 feet.
	B-7.7	Medium stiff to hard lean clay/sandy silt with interbedded layers of dense well-graded sand and gravel.
OS27-1,2	R-15-880-024	Medium stiff to very stiff lean clay/silt with interbedded layers of medium dense poorly graded sand with silt to very dense well graded sand with silt and gravel.
OS29-1,2	R-15-880-025	Medium stiff to hard lean clay/sandy silt, with interbedded layers of medium dense to dense silty sand.
OS31-1	R-15-880-026	Stiff to hard lean clay/sandy silt with a single layer of medium dense silty sand.
OS32-1,2	R-15-880-027	Medium stiff to stiff lean clay/silt with a single layer of ***loose*** silty sand.
OS35-1	R-15-880-028	Stiff to hard lean clay/sandy silt with a single layer of medium dense sand.
	B-13.13	Medium stiff to very stiff sandy lean clay/silt with a single layer of medium dense clayey gravel with sand,
OS37-1,2	R-15-880-029	Interbedded layers of soft to hard lean clay and ***loose*** to medium dense silty sand.
	B-14.5	Interbedded layers of medium stiff to stiff sandy lean clay/silt and medium dense silty sand and very dense well-graded sand with clay and gravel.

Sign Designation	Reference Boring	Subsurface Soil Conditions
	B-14.6	Interbedded layer of medium stiff to stiff sandy lean clay/silt and loose to medium dense silty/clayey sand, and very dense well-graded sand with clay and gravel.
	B-14.7	Interbedded layer of medium stiff to stiff sandy lean clay/silt and medium dense silty sand to very dense well-graded sand with clay and gravel
OS41-1,2	R-15-880-030	Very soft to hard lean clay with a single layer of medium stiff sandy silt.
OS43-2	R-15-880-031	Medium stiff to very stiff lean clay with interbedded layers of medium dense silty sand.
	BB-1	Interbedded layers of soft to stiff lean clay/silt and medium dense to dense silty sand.
	BB-2	Soft to stiff clayey silt or silty clay, underlain by dense silty sand.
OS45-1,2	R-15-880-032	Soft to very stiff lean clay, underlain by interbedded layers of ***loose*** clayey sand and stiff lean clay.
OS47-1	R-15-880-033	Soft to very stiff lean clay with a single layer of dense silty sand.
	B-2	***Very loose*** silty sand underlain by interbedded layer of soft to very stiff silt and medium dense to dense silty clayey sand.
	B-3	Soft to stiff lean clay/silt, underlain by medium dense sand with silt to very dense sand with silt.
OS47-2,3	R-15-880-034	Medium dense silty sand, underlain by medium stiff to very stiff lean clay.
OS51-1	R-15-880-035	Soft to very stiff lean clay.
OS51-2	R-15-880-061	Asphalt concrete, underlain by medium stiff to very stiff lean clay with interbedded layers of medium dense silty/poorly graded sand.
OS53-2	A-15-880-036	Medium stiff to very stiff lean clay, underlain by medium dense clayey sand.
OS54-1	R-15-880-037	Medium stiff to stiff lean clay with a single layer of medium dense silty sand.
	B-2	Interbedded layers of stiff sandy lean clay/silt and medium dense silty clayey sand.
OS55-1	01-01	Soft to very stiff lean clay/silt with interbedded layers of medium dense to dense sand.
OS55-1	02-02	***Loose*** well-graded sand, underlain by interbedded layers of soft to very stiff lean clay/silt and medium dense silty sand.
OS57-1,2	A-15-880-039	Medium stiff to very stiff lean clay with interbedded layers of medium dense silty sand.
OS60-1	A-15-880-040	Medium stiff lean clay/silt, underlain by dense silty sand.
OS63-1,2	R-15-880-041	Stiff to very stiff sandy silt, underlain by ***loose*** to dense silty sand/clayey sand.
OS64-1	R-15-880-042	Medium dense silty sand, underlain by interbedded layers of soft to very stiff lean clay.
OS65-1	R-15-880-062	Medium dense to dense silty sand/clayey sand with gravel, underlain by stiff to very stiff lean clay.
OS66-1,2	R-15-880-043	Interbedded layers of stiff to hard lean clay/silt with sand and medium dense silty sand/poorly graded sand with gravel.
	B-5	Stiff to hard silty clay/silt, underlain by medium dense silty sand with clay.

Sign Designation	Reference Boring	Subsurface Soil Conditions
OS68-1	A-14-880-044	Very soft to hard fat/lean clay/silt, underlain by ***loose*** to medium dense well graded sand and silt. Hollow-Stem Auger (HSA) filled with about 10 feet of soil at the depth of 40 feet. The boring was drilled to the depth of 46.5 feet.
OS68-2,3	A-15-880-045	Soft to very stiff lean clay with a single layer of medium dense silty sand to dense poorly graded gravel. Soil flowed back into the HSA, placed bentonite inside auger at 32.5 feet to stabilize. The boring was drilled to the depth of 46.5 feet.
OS70-1	R-15-880-046	Medium stiff to very stiff fat/lean clay with interbedded layers of medium dense silty sand.
	P-11	Medium stiff to stiff silty clay.
	P-14	Medium stiff to stiff silty clay.
OS75-1	R-15-880-047	Medium stiff to very stiff lean clay with a single layer of ***loose*** clayey sand.
OS76-1	R-15-880-048	Medium stiff to very stiff sandy lean clay.
OS77-1	A-15-880-049	Medium stiff to very stiff lean/fat clay/silt.
OS79-1	A-14-880-050	***Loose*** poorly graded sand, underlain by very soft to stiff lean clay with interbedded layers of medium dense well graded sand with silt.
OS82-1	A-14-880-051	***Loose*** poorly graded sand, underlain by interbedded layers of medium stiff to very stiff lean clay/silt and medium dense to very dense clayey gravel/silty sand.
OS84-1	A-15-880-052	Stiff to very stiff lean clay.
	B-1	Interbedded layers of stiff to hard lean clay/silt, and medium dense to dense silty/clayey sand, underlain by interbedded layers of medium dense to very dense clayey sand/silty sand.
	B-2	Interbedded layers of soft to hard lean clay/silt and medium dense to dense clayey sand/silty sand,
OS87-1(1)	R-15-880-053	Interbedded layers of stiff to very stiff lean clay, underlain by dense to very dense silty sand.
	P-1	Medium stiff to very stiff silty clay.
	P-2	Stiff to very stiff silty clay.
	P-6	Medium stiff to very stiff silty clay.
OS87-1	P-7	Medium dense silty sand, underlain by stiff to very stiff silty clay.
OS89-1	R-15-880-054	Asphalt concrete, underlain by aggregate base, underlain by interbedded layers of medium dense to dense silty sand and stiff to hard lean clay.
	B-1	***Loose*** clayey gravel, underlain by stiff to very stiff silty clay, underlain by medium dense poorly-graded sand.
OS92-2	R-15-880-055	Asphalt concrete, underlain by interbedded layers of stiff to very stiff lean clay and medium dense clayey sand/gravel.
OS94-1	A-15-880-056	***Loose*** poorly graded sand, underlain by interbedded layers of soft to very stiff fat/lean clay and ***loose*** to very dense sand. Using HSA – Sand layer heaved and stuck into the HSA to about 12 feet inside the auger. Switched to use Rotary-Wash using very thick bentonite slurry to control gravel from caving in. Could not sample at 40 feet due to gravel caving in. Boring drilled to the depth of 44.5 feet.
OS95-1	A-15-880-057	***Loose*** poorly graded sand with silt, underlain by interbedded layers of loose to medium dense silty sand/poorly graded sand and very soft to stiff fat/lean clay.

Sign Designation	Reference Boring	Subsurface Soil Conditions
OS96-1	R-15-880-058	Medium dense clayey sand, underlain by very soft to medium stiff sandy lean/fat clay.

(1) This structure is a part of the future "express lanes" project phase. The current structure name is preliminary. Final sign designation will be assigned to this structure during that future phase.

Due to limitations inherent in geotechnical investigations, it is neither uncommon to encounter unforeseen variations in the subsurface soil conditions during construction nor is it practical to determine all such variations during an acceptable program of drilling and sampling for a project of this scope. Such variations, when encountered, generally require additional engineering services to attain properly constructed project. We, therefore, recommend that a contingency fund be provided to accommodate any additional charges resulting from technical services that may be required during construction.

8.4 Groundwater

Hollow-Stem Auger drilling was used to measure groundwater. However, most of the location could not be left open due to traffic limitations and permit requirements. Also, the water table caused caving conditions in many of the borings. In the interest of getting good samples, the drilling was converted to Rotary Wash Drilling method. Therefore, we have also relied on other groundwater data from published documents.

Contours indicating historic depths to groundwater are included in the "State's Seismic Hazard Zonation Reports (2001 and 2003)" for individual quadrangles. The contours indicating the historic groundwater depth for all the relevant quadrangles within the project limits are presented on Plate 6.

Groundwater was measured during drilling in the soil borings using the Hollow-Stem auger. Groundwater level was also interpreted from the CPTs using the pore pressure dissipation method. The following Table 5 presents the depths below existing grade and the corresponding elevations of groundwater encountered in each of the borings.

TABLE 5 - SUMMARY OF GROUNDWATER

Sign Designation	Station	Boring No./As-Built LOTB	Measured Groundwater below Existing Grade (ft)		Historic Groundwater Depth (ft)	Groundwater Level Used for Design (ft)	
			Depth	Elev.		Depth	Elev.
OS PM-9.70(1)	1117+25	A-14-880-001	19.0	-4.5	<5	5.0	9.5
-	1134+30	A-14-880-002	25.0	-9.5	-	5.0	10.5
OS PM-10.16(1)	1141+40	R-15-880-003	Not measured	-	<5	5.0	9.5
OS PM-R0.20(1)	1170+16	R-15-880-004	Not measured	-	<5	5.0	8.5
OS PM-R1.00(1)	1212+47	R-14-880-005	Not measured	-	5	5.0	10.5
OS PM-R1.10(1)	1217+68	R-15-880-059	Not measured	-	5	5.0	10.5
OS PM-2.50(1)	1277+88	R-14-880-006	Not measured	-	9	5.0	18.5
OS PM-2.67(1)	1286+00	R-15-880-007	Not measured	-	8	5.0	15.0
OS1-1	1303+42	R-15-880-008	Not measured	-	6	5.0	12.5
OS2-1	1312+00	R-15-880-009	Not measured	-	5	5.0	11.5
OS3-1,2	1330+59	R-15-880-010	Not measured	-	<5	5.0	12.0
OS4-1	1346+50	R-15-880-011	Not measured	-	5	5.0	13.5
OS5-1	1356+50	R-15-880-060	Not measured	-	6	5.0	14.5
OS7-1	1381+20	R-15-880-013	Not measured	-	9	5.0	20.5
OS8-1	1398+52	R-15-880-014	Not measured	-	12	5.0	22.0
OS10-1	1425+02	R-14-880-015	Not measured	-	11	5.0	24.5
OS10-2	1426+51	R-14-880-015	Not measured	-	11	5.0	24.5
OS12-1,2	1454+30	R-15-880-016	Not measured	-	18	13.0	20.0
OS15-1	1489+39	R-15-880-017	Not measured	-	20	13.0	24.5
OS17-1,2	1519+89	A-15-880-018	25.0	14.0	13	5.0	34.0
	1519+89	CPT-15-880-018	21.0	18.0	13	5.0	34.0
OS19-1	1539+52	As-Built B-28	No information	-	13	5.0	29.0
OS20-1	1560+00	As-Built B-17	No Information	-	11	5.0	27.0
OS22-1	1583+32	R-15-880-021	Not measured	-	20	13.0	6.0
OS24-1	1598+85	R-15-880-022	Not measured	-	20	13.0	12.0
OS25-1,2	1620+28	R-15-880-023	Not measured	-	19	13.0	26.0
OS27-1,2	1648+25	R-15-880-024	Not measured	-	17	13.0	23.5
OS29-1,2	1667+00	R-15-880-025	Not measured	-	16	5.0	31.0
	1667+00	CPT-15-880-025	20.1	15.9	16	5.0	31.0
OS31-1	1683+64	R-15-880-026	Not measured	-	14	5.0	26.0
		CPT-15-880-026	19.1	11.9	14	5.0	26.0

Sign Designation	Station	Boring No./As-Built LOTB	Measured Groundwater below Existing Grade (ft)		Historic Groundwater Depth (ft)	Groundwater Level Used for Design (ft)	
			Depth	Elev.		Depth	Elev.
OS32-1,2	1701+68	R-15-880-027	Not measured	-	12	5.0	26.5
OS35-1	1728+50	R-15-880-028	Not measured	-	10	5.0	23.0
OS37-1,2	1748+89	R-15-880-029	Not measured	-	10	5.0	22.0
OS41-1,2	1802+93	R-15-880-030	Not measured	-	8	5.0	19.0
OS43-2	1831+48	R-15-880-031	Not measured	-	7	5.0	15.5
OS45-1,2	1854+65	R-15-880-032	Not measured	-	5	5.0	11.5
		CPT-15-880-032	8.3	8.2	5	5.0	11.5
OS47-1	1879+00	R-15-880-033	Not measured	-	<5	5.0	31.5
OS47-2,3	1884+36	R-15-880-034	Not measured	-	<5	5.0	14.0
OS51-1	1932+43	R-15-880-035	Not measured	-	6	5.0	11.5
OS51-2	1933+92	A-15-880-061	18.0	-1.0	6	5.0	12.0
OS53-2	1958+20	A-15-880-036	15.0	7.0	8	5.0	17.0
OS54-1	1966+00	R-15-880-037	Not measured	-	9	5.0	20.0
OS55-1	1989+88	As-Built 01-01	No information	-	12	5.0	28.0
OS57-1,2	2014+15	A-15-880-039	19.0	23.0	18	15.0	27.0
OS60-1	2058+00	A-15-880-040	18.0	45.0	23	15.0	48.0
		CPT-15-880-040	26.4	36.6	23	15.0	48.0
OS63-1,2	2089+88	R-15-880-041	Not measured	-	24	15.0	49.0
OS64-1	2103+38	R-15-880-042	Not measured	-	23	15.0	44.5
OS65-1	2111+70	R-15-880-062	Not measured	-	22	15.0	50.0
OS66-1,2	2121+88	R-15-880-043	17.0	46.0	22	15.0	48.0
		CPT-15-880-043	29.0	34.0	22	15.0	48.0
OS68-1	2148+28	A-14-880-044	25.0	25.0	19	15.0	35.0
		CPT-15-880-044	19.2	30.8	19	15.0	35.0
OS68-2,3	2156+60	A-15-880-045	20.0	19.0	17	15.0	24.0
OS70-1	2174+68	R-15-880-046	Not measured	-	14	5.0	34.0
OS75-1	2246+52	R-15-880-047	Not measured	-	9	5.0	21.0
OS76-1	2253+88	R-15-880-048	Not measured	-	8	5.0	21.0
OS77-1	2275+00	A-15-880-049	13.0	16.0	9	5.0	24.0
OS79-1	2301+40	A-14-880-050	5.0	25.0	9	5.0	25.0
OS82-1	2333+08	A-14-880-051	15.0	14.0	8	5.0	24.0
OS84-1	2361+24	A-15-880-052	20.0	5.0	20	15.0	20.0

Sign Designation	Station	Boring No./As-Built LOTB	Measured Groundwater below Existing Grade (ft)		Historic Groundwater Depth (ft)	Groundwater Level Used for Design (ft)	
			Depth	Elev.		Depth	Elev.
OS87-1(1)	2411+23	R-15-880-053	Not measured	-	9	5.0	21.0
OS89-1	2436+64	R-15-880-054	Not measured	-	7	5.0	31.0
OS92-2	2480+93	R-15-880-055	Not measured	-	6	5.0	6.0
OS94-1	2507+33	A-15-880-056	5.0	5.0	<5	5.0	5.0
OS95-1	2523+17	A-15-880-057	24.0	-14.0	<5	5.0	5.0
OS96-1	2533+73	R-15-880-058	Not measured	-	<5	5.0	6.0

(1) This structure is a part of the future "express lanes" project phase. The current structure name is preliminary. Final sign designation will be assigned to this structure during that future phase.

A groundwater depth of 5 feet, 13 feet and 15 feet below the existing grade are assumed for the design of various proposed overhead sign structures.

The groundwater level is anticipated to vary with the passage of time due to seasonal groundwater fluctuations, variations in yearly rainfall, water elevations in the nearby creeks, surface and subsurface flows, ground surface run-off, and other environmental factors that may not be present at the time of the investigation.

9.0 SCOUR EVALUATION

The "Scour Evaluation" is considered irrelevant for the proposed overhead sign structures since there is no water crossing in close proximity of these structures.

10.0 CORROSION EVALUATION

Chemical tests were performed on selected soil samples from the soil borings to evaluate the corrosion potential of the subsurface soil. The test results are as follows:

TABLE 6 -SUMMARY OF CORROSION TEST RESULTS

Boring No.	Sample Depth (ft)	Minimum Resistivity (ohms-cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
A-14-880-001	31	120	7.76	1478.7	209.6
R-15-880-003	16	170	8.31	2864.0	335.6
R-15-880-003	41	140	8.17	3919.6	391.8
R-15-880-004	16	290	9.08	421.0	417.6
R-15-880-004	31	110	8.28	4252.9	1202.9
R-14-880-005	11	700	8.14	51.0	72.6
R-15-880-059	26	2250	7.58	24.8	9.9
R-14-880-006	26	1470	7.74	22.9	7.9
R-15-880-007	21	1800	7.70	21.2	21.9
R-15-880-008	21	1310	8.48	27.6	28.8
R-15-880-009	21	1450	8.38	22.7	26.9
R-15-880-010	11	1450	8.18	19.2	29.6
R-15-880-011	26	560	8.05	315.2	166.2
R-15-880-060	16	720	7.58	154.1	241.7
R-15-880-012	21	880	7.84	35.7	110.3
R-15-880-013	31	1900	8.31	27.3	15.8
A-15-880-014	36	1230	8.21	34.1	34.5
R-14-880-015	26	560	7.39	166.6	391.4
R-15-880-016	36	1390	7.86	44.0	63.8
R-15-880-017	26	1740	7.51	32.8	15.0
A-15-880-018	6	1850	6.99	25.2	31.3
R-15-880-021	21	1020	7.87	70.1	57.3
R-15-880-022	21	2950	7.51	15.4	23.2
R-15-880-023	36	1260	7.36	21.7	117.7
R-15-880-024	6	2650	7.84	14.5	28.4
R-15-880-025	16	2550	7.12	17.6	40.2
R-15-880-026	11	4560	7.24	16.2	23.0
R-15-880-027	11	1420	7.56	26.1	68.3
R-15-880-028	16	1980	7.87	28.1	26.0
R-15-880-029	31	1260	7.65	28.6	99.4
R-15-880-030	11	1630	7.57	41.6	29.7
R-15-880-031	16	1390	7.58	37.4	56.7

Boring No.	Sample Depth (ft)	Minimum Resistivity (ohms-cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
R-15-880-032	21	1180	7.91	34.5	74.6
R-15-880-033	26	670	7.33	134.0	24.5
R-15-880-034	26	230	8.46	1087.1	521.1
R-15-880-035	16	1290	7.53	25.7	20.3
A-15-880-061	11	1180	7.76	23.2	20.3
A-15-880-036	16	1150	7.76	28.1	39.6
R-15-880-037	26	1070	8.15	36.8	22.1
A-15-880-039	31	1580	7.38	23.0	9.7
A-15-880-040	26	1230	6.93	22.0	41.8
R-15-880-041	11	2140	7.22	15.9	31.4
R-15-880-042	26	780	7.23	26.2	22.3
R-15-880-062	36	1130	6.94	19.9	17.5
R-15-880-043	26	780	7.15	24.7	48.8
A-14-880-044	26	1130	6.59	27.2	19.0
R-15-880-046	21	1230	7.70	26.3	19.2
R-15-880-047	21	1210	7.99	29.9	12.7
R-15-880-048	36	1530	8.28	20.9	29.1
A-15-880-049	21	880	7.15	26.0	28.3
A-14-880-050	36	1260	8.06	19.1	30.8
A-14-880-051	16	540	7.36	35.4	23.5
A-15-880-052	26	1820	7.74	15.6	6.1
R-15-880-053	31	1420	7.64	21.9	15.1
R-15-880-054	31	430	7.93	190.4	65.8
R-15-880-055	16	1450	7.31	28.8	10.8
A-15-880-056	11	400	8.31	354.7	44.3
A-15-880-057	21	80	7.91	8618.2	2175.0
R-15-880-058	16	160	8.12	3273.6	610.4

According to Caltrans Corrosion Guidelines, November 2012 (Version 2.0), Caltrans considers a site to be corrosive to foundation element if one of the following conditions exists for the representative soil samples taken at the site:

- Chloride concentration is greater than or equal to 500 ppm,

- Sulfate concentration is greater than or equal to 2000 ppm,
- pH is 5.5 or less.

Based on the corrosion test results, the native subsurface soils in majority of the borings as shown in Table 6 are considered non-corrosive per Caltrans Corrosion Guidelines November 2012 (Version 2.0) (Caltrans Corrosion Guidelines). The subsurface soil is considered corrosive at some of the proposed overhead sign locations due to the high chloride content. According to Caltrans corrosion guidelines, corrosion protection of reinforced concrete is required in accordance with Section 5 Concrete Structures of California Amendments (to the AASHTO LRFD Bridge Design Specifications – Fourth Edition). Table5.12.3-1 Minimum Concrete Cover (inches) for 75-year Design Life of the California Amendments specifies the use of increased clear concrete cover for the CIDH pile reinforcing steel for corrosion protection of reinforced concrete exposed to chloride environments.

11.0 SEISMIC RECOMMENDATIONS

11.1 Seismic Sources

The project is located in a seismically active part of northern California. Many faults exist in the regional area. These faults are capable of producing earthquakes and may cause strong ground shaking at the project site.

Maximum moment magnitudes (M_{max}) of some of the closest faults in the area are based on the 2012 ARS Online Report. These maximum moment magnitudes represent the largest earthquake a fault is capable of generating and is related to the seismic moment. Based on the “State of California Special Study Zone (Alquist-Priolo Fault Zone) Map”, the closest “Site-to-Fault Distance” along the project corridor from any major fault zone is approximately 5600 feet from the Hayward Fault Zone.

11.2 Seismic Design Criteria

The design spectrum was developed in accordance with the 2012 Caltrans Fault Database (Version 2b) and the Acceleration Response Spectrum (ARS) Online web tool (Version 2.3.06). The development of the design ARS curve is based on several input parameters, including site location (longitude/latitude), average shear wave velocity for the top 30m/100 feet (Vs_{30m}), and other site parameters, such as fault characteristics, site-to-fault distances.

The current design methods incorporate both "Deterministic and Probabilistic Seismic Hazards" to produce the "Design Response Spectrum". According to the recent Caltrans methodology, the Caltrans probabilistic response spectrum to be used for design of bridge structures is verified with the spectrum from "2008 USGS National Seismic Hazard Map" for the 5% in 50 years probability of exceedance (or 975 year return period) at periods of 0, 0.3, 1 and 3 seconds.

Average shear wave velocities (V_s) for the top 30m (100 feet) at the various locations of the proposed overhead sign structures were estimated by using established correlations and the procedure provided in the "Caltrans Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations (November 2012)".

Based on our understanding, ARS design curve is not used by Kimley-Horn (Structural Engineer) for the structural design of the proposed overhead sign structure. The most critical ARS design curve was developed to determine the peak ground acceleration based on the selected boring location at as-built Boring BB-1 (in the vicinity of Boring R-15-880-031). This boring was selected considering its location and the calculated peak ground acceleration is representative of the other locations. The average shear wave velocity is estimated to be 237 m/s for this location.

The site location and the relevant parameters of as-built Boring BB-1 are summarized as follows, and the recommended design curve is presented on Plate 4A. Comparison of deterministic and probabilistic ARS curves is presented on Plate 4B.

- Site Location: 37.5987ºN/122.061ºW
- Estimated V_{S30m}: 237 m/s
- Anticipated Peak Ground Acceleration (PGA): 0.698 g
- Maximum Moment Magnitude: 6.8 (Based on USGS 2008 Deaggregation Analysis)
- The recommended ARS curve is governed by Caltrans Online Probabilistic ARS.
- Special accelerations were increased by 20% for periods of equal to or above 1.0 second.
- No adjustment was needed for basin effect.

11.3 Seismic Hazard

The project is located in a seismically active part of northern California. Nearby active faults are capable of producing large earthquakes that may cause strong ground shaking at the location of each proposed overhead sign structure.

Primary seismic hazards include ground shaking and surface fault rupture. Secondary seismic effects resulting from soil responses to ground shaking includes liquefaction. These hazards may cause deformation of man-made structures. These hazards are discussed in the following paragraphs.

Primary Seismic Hazards

11.3.1 Seismic Ground Shaking

Based on available geological and seismic data, the possibility of the project site to experience strong ground shaking may be considered high. A peak ground acceleration of 0.70 g was calculated for the site.

11.3.2 Surface Fault Rupture

The project site is not within the "Alquist-Priolo Special Study Zone" and no known/mapped active fault passes through the project corridor. Therefore the potential for ground surface rupture due to faulting at each overhead sign location is considered low.

Secondary Seismic Hazards

11.3.3 Liquefaction Susceptibility

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary but essentially total loss of shear strength under the reversing, cyclical shear stresses associated with earthquake shaking. Saturated cohesionless sands and silts of low relative density are the type of soils that are usually susceptible to liquefaction. Clays are generally not susceptible to liquefaction. Gravels tend to drain well and are not usually susceptible to liquefaction.

The extent to which any of the subsurface soils underlying the proposed overhead sign structure may be prone to liquefy is a function of their grain-size distribution, density, and level of saturation. The alluvial deposits beneath majority of the proposed overhead sign structures appear to contain a mixture of fine-grained soil materials that would be less susceptible to liquefaction. However, pockets/lenses of loose to medium dense sand or non-plastic to low plasticity silt may exist at location for some of the proposed overhead sign structure that would be subject to liquefaction or shaking-induced settlement.

Both the "Quaternary Deposits Map" (Plate Nos. 7A through 7I) and "Liquefaction Susceptibility Map" (Plate Nos. 8A through 8I) were referred to in the evaluation of the liquefaction potential for the proposed overhead sign structures within the project limits. Both these maps are developed from

Witter, R.C.; Knudsen K.L.; Sowers, J.M.; Wentworth, C.M.; Koehler, R.D.; and Randolph, C.E.; 2006; "Map of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Region, California"; U.S. Geological Survey Open File Report 2006-1037. According to these maps, the liquefaction susceptibility is classified as "Very High" for the "Modern stream channel deposit (Qhc)", "Very Low" to "Low" for the "Early Quaternary deposits" and "Late Pleistocene deposits" and "Moderate" for the "Late Pleistocene deposits" and "Holocene deposits".

The "Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California (Witter et. al., 2006)" indicates the units' liquefaction susceptibilities vary from Very Low to Moderate. The categories are described as:

VERY LOW - An estimated PGA of greater than about 0.6 g is necessary to trigger liquefaction in deposits assigned VERY LOW susceptibility.

LOW - An estimated PGA of greater than about 0.5 g is necessary to trigger liquefaction, although a lower level of shaking may trigger liquefaction in latest Pleistocene to Holocene basin deposits.

MODERATE -PGAs of greater than 0.2 g to 0.3 g are necessary to trigger liquefaction of deposits assigned MODERATE susceptibility, although slightly lower and significantly higher shaking thresholds may control liquefaction in some deposits.

HIGH - PGAs of greater than about 0.1 g to 0.2 g are necessary to trigger liquefaction of deposits assigned HIGH susceptibility.

VERY HIGH - PGAs of about 0.1 g are necessary to trigger liquefaction in deposits assigned VERY HIGH susceptibility.

Based on Table 8 in "Witter et al.; Maps of Quaternary Deposits and

Liquefaction Susceptibility in the Central San Francisco Bay Region, California", the geologic units at the project site are categorized as shown in Table 7 below (Refers to Plate 7-A through 7-I for map).

TABLE 7 - LIQUEFACTION SUSCEPTIBILITY CATEGORIES

Geologic Unit	Description	Historical Liquefaction	Estimated PGA threshold	Typical depth to groundwater	Liquefaction Susceptibility Category Assigned to Geological Unit
af	Artificial fill	Yes	0.3 g	< 15 ft	Very High to Very Low
afem	Artificial fill over SF Bay Mud	Yes	0.1 g	< 15 ft	Very High
Qhf	Holocene alluvial fan deposits	Yes	>0.2 g	< 15 ft	Moderate
Qhfe	Holocene alluvial fan-estuarine complex deposits	Yes	0.1 to 0.2 g	< 15 ft	High
Qhff	Holocene alluvial fan deposits, fine faceies	Yes	>0.2 g	< 15 ft	Moderate
Qhfy	Latest Holocene alluvial fan deposits	Yes	0.1 to 0.2 g	< 15 ft	High
Qhl	Holocene alluvial fan levee deposits	Yes	0.1 to 0.2 g	< 15 ft	Moderate
Qhly	Younger Holocene alluvial fan levee deposits	Yes	>0.2 g	< 15 ft	Moderate

Based on 2006 "Map of Quaternary Deposits & Liquefaction Susceptibility in the Central San Francisco Region, California" by Robert C. Witter, et al, (Liquefaction Susceptibility Map), the liquefaction susceptibility at various locations for the proposed overhead signs is summarized in Table 8 below.

TABLE 8 - LIQUEFACTION SUSCEPTIBILITY AT SITES (per Witter, et. al.; 2006)

Sign Designation	Station	Quaternary Deposit Unit	Minimum Groundwater Depth (Based on Historic Groundwater Depth/as-built LOTB/2014-2015 Borings/2015 CPTs) (ft)	Liquefaction Susceptibility
OS PM-9.70(1)	1117+25	af/Qhfe	<5	High
OS PM-10.16(1)	1141+40	af/Qhfe	<5	High
OS PM-R0.20(1)	1170+16	Afem/Qhbm	<5	Moderate
OS PM-R1.00(1)	1212+47	af/Qhff	5	Moderate
OS PM-R1.10(1)	1217+68	af/Qhff	5	Moderate
OS PM-2.50(1)	1277+88	af/Qf	9	Moderate
OS PM-2.67(1)	1286+00	af/Qf+Qhff	8	Moderate
OS1-1	1303+42	af/Qhff	6	Moderate
OS2-1	1312+00	af/Qhff	5	Moderate
OS3-1,2	1330+59	af/Qhff	<5	Moderate
OS4-1	1346+50	Qhff	5	Moderate
OS5-1	1356+50	Qhff	6	Moderate
OS7-1	1381+20	Qhf3	9	Moderate
OS8-1	1398+52	Qhl3	12	Moderate
OS10-1	1425+02	Qhf3	11	Moderate
OS10-2	1426+51	Qhf3	11	Moderate
OS12-1,2	1454+30	Qhf3	18	Moderate
OS15-1	1489+39	Qhf3	20	Moderate
OS17-1,2	1519+89	Qhl3	11	Moderate
OS19-1	1539+52	Qhl3	13	Moderate
OS20-1	1560+00	Qhf3	11	Moderate
OS22-1	1583+32	Qhf3	20	Moderate
OS24-1	1598+85	Qhf3	20	Moderate
OS25-1,2	1620+28	Qhl1	19	Moderate
OS27-1,2	1648+25	Qhl1	17	Moderate
OS29-1,2	1667+00	Qhfy	16	High
OS31-1	1683+64	Qhfy	14	High
OS32-1,2	1701+68	Qhfy	12	High
OS35-1	1728+50	Qhfy	10	High
OS37-1,2	1748+89	Qhfy	10	High
OS41-1,2	1802+93	Qhfy	8	High

Sign Designation	Station	Quaternary Deposit Unit	Minimum Groundwater Depth (Based on Historic Groundwater Depth/as-built LOTB/2014-2015 Borings/2015 CPTs) (ft)	Liquefaction Susceptibility
OS43-2	1831+48	Qhly	7	Very High
OS45-1,2	1854+65	Qhff	5	Moderate
OS47-1	1879+00	Qhff	<5	Moderate
OS47-2,3	1884+36	Qhff	<5	Moderate
OS51-1	1932+43	Qhl + Qhf	6	Moderate
OS51-2	1933+92	Qhl + Qhf	6	Moderate
OS53-2	1958+20	Qhf	8	Moderate
OS54-1	1966+00	Qhf	9	Moderate
OS55-1	1989+88	Qhl	12	Moderate
OS57-1,2	2014+15	Qhl	18	Moderate
OS60-1	2058+00	af/Qhf	23	Moderate
OS63-1,2	2089+88	Qhl	24	Moderate
OS64-1	2103+38	af/Qhf	23	Moderate
OS65-1	2111+70	af/Qhf	22	Moderate
OS66-1,2	2121+88	af/Qhf	17	Moderate
OS68-1	2148+28	af/Qhf	19	Moderate
OS68-2,3	2156+60	Qhl	17	Moderate
OS70-1	2174+68	Qhf + Qhl	14	Moderate
OS75-1	2246+52	af/Qhf	9	Moderate
OS76-1	2253+88	af/Qhf	8	Moderate
OS77-1	2275+00	af/Qhl	9	Moderate
OS79-1	2301+40	af/Qhf + Qhl	5	Moderate
OS82-1	2333+08	af/Qhf	8	Moderate
OS84-1	2361+24	Qhf	20	Moderate
OS87-1(1)	2411+23	Qhf	9	Moderate
OS89-1	2436+64	af/Qhf+Qhff+Qhfy	7	High
OS92-2	2480+93	Qhff	6	Moderate
OS94-1	2507+33	Afem	<5	Very High
OS95-1	2523+17	Afem	<5	Very High
OS96-1	2533+73	afem	<5	Very High

(1) This structure is a part of the future "express lanes" project phase. The current structure name is preliminary. Final sign designation will be assigned to this structure during that future phase.

11.3.4 Liquefaction Potential

All of the project site locations for the proposed overhead signs are located within a "Sate Seismic Hazard Zone of Required Investigation of Potential Liquefaction". See reference list for "State Seismic Hazard Zones Maps" for the six quadrangles within which the project site location is located.

The liquefaction potential was evaluated in accordance with the methods proposed by Youd (Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCCER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al. ASCE Journal of Geotechnical and Geo-environmental Engineering, October 2001, Vol. 127 No. 10). We have reviewed and compared the available data from the boring at each location in the evaluation. The evaluation was primarily using the boring data in the vicinity of Hayward Fault with an Earthquake Magnitude 6.8 and a peak ground acceleration of about 0.7g (Caltrans Online Probabilistic ARS). This method compares the estimates of the earthquake-induced shear stress to the susceptibility of soil liquefaction. According to Bray (2006), liquefaction appears to occur in soils where these fines are either non-plastic or are low plasticity silts and/or silty clays (PI<12%, and LL<37%), and with high water content relative to their liquid limit (w>0.85 LL).

Based on Caltrans latest Guidelines on Foundation Loading and Deformation Due to Liquefaction Induced Lateral Spreading, residual shear strengths were estimated using the equation by Kramer and Wang (2007). The soil strengths in the liquefiable layer are modeled as soft clay with shear strength equal to the residual strength of the liquefied soil.

In general, liquefaction hazards are most severe in the upper 50 feet of the surface as mentioned in Special Publication 117A (CGS, 2008). In our opinion, the impact due to the potential liquefiable soils below 50 feet is

considered insignificant, especially when the layer is relatively thin and discontinuous.

Based on our analysis, the subsurface soil with liquefaction potential exists at various depths of some of the proposed overhead signs along the I-880 corridor. The results of our liquefaction analysis are summarized in the table below:

TABLE 9–SUMMARY OF LIQUEFACTION ANALYSIS RESULTS

Sign Designation	Boring No./As-Built LOTB	Average $(N_1)_{60,cs}$	Approx. Depth of Liquefiable Soils (ft)	Estimated Post-Liquefaction Settlement (inch)
OS PM-R0.20	R-15-880-004	11.4	23.5	1.28
		12.0	28.5	1.23
OS PM-R1.10	R-15-880-059	20.3	31.0	1.00
OS2-1	R-15-880-009	14.8	4.0	0.84
OS4-1	R-15-880-011	21.5	8.0	0.80
		16.9	26.0	0.57
OS7-1	R-15-880-013	9.5	13.0	1.47
		19.2	34.0	0.56
OS8-1	R-15-880-014	19.6	13.0	1.02
		12.8	19.0	1.41
OS10-1, 2	R-14-880-015	16.8	14.0	0.86
OS12-1,2	R-15-880-016	18.3	13.0	0.38
		14.1	15.0	0.88
OS15-1	R-15-880-017	16.3	30.0	0.59
OS17-1,2	A-15-880-018	16.5	8.0	1.07
		10.2	26.0	1.11
		18.9	30.0	0.70
		22.5	34.0	1.00
		17.3	40.5	0.28
OS20-1	As-Built B-17	19.7	17.0	0.85
OS27-1,2	R-15-880-024	16.8	13.0	0.96
OS29-1,2	R-15-880-025	11.6	16.0	1.01
		22.5	20.0	0.62
		18.4	24.0	1.81
		24.6	33.5	0.65
OS31-1	R-15-880-026	21.1	8.0	0.81
		22.9	29.0	1.06
OS32-1,2	R-15-880-027	15.4	23.0	1.02
OS35-1	R-15-880-028	13.5	11.0	0.90
		9.9	15.0	0.86
OS37-1,2	R-15-880-029	16.9	4.5	0.76
		18.7	8.5	0.88
OS41-1,2	R-15-880-030	11.6	18.0	1.27
OS43-2	R-15-880-031	21.7	36.0	0.39

Sign Designation	Boring No./As-Built LOTB	Average $(N_1)_{60,cs}$	Approx. Depth of Liquefiable Soils (ft)	Estimated Post-Liquefaction Settlement (inch)
OS45-1,2	R-15-880-032	7.7	24.0	1.71
		20.2	34.0	0.67
OS51-2	A-15-880-061	24.0	18.5	0.66
		19.4	23.0	0.86
OS55-1	As-Built 01-01	22.4	33.0	0.46
OS57-1,2	A-15-880-039	15.8	34.5	0.60
OS60-1	A-15-880-040	17.2	15.0	0.57
		24.2	33.0	0.66
OS66-1,2	R-15-880-043	11.7	18.5	1.01
		11.5	28.0	1.40
		22.7	33.5	0.69
		20.1	38.0	0.59
OS68-1	A-14-880-044	19.7	15.0	0.51
		12.6	28.0	1.90
		7.5	36.0	1.06
		7.5	39.0	1.40
		17.6	43.0	0.65
OS68-2,3	A-15-880-045	22.2	38.0	0.47
OS70-1	R-15-880-046	14.0	34.5	0.55
OS75-1	R-15-880-047	16.6	8.0	0.97
OS77-1	A-15-880-049	20.2	34.0	0.58
OS79-1	A-14-880-050	11.1	5.0	0.78
OS82-1	A-14-880-051	20.6	21.0	0.33
		22.9	23.0	0.76
OS89-1	R-15-880-054	18.3	8.0	0.90
OS92-2	R-15-880-055	24.9	34.0	0.64
OS94-1	A-15-880-056	15.3	18.0	1.23
		20.2	24.0	0.83
		23.3	29.0	0.90
OS95-1	A-15-880-057	17.2	4.0	0.75
		9.0	24.0	0.77
		7.5	32.0	2.10

The liquefaction analysis calculations are included in Appendix V.

The impact of the liquefaction potential on the foundation design of each overhead sign structure will be discussed in Section 12.3.

12.0 FOUNDATION RECOMMENDATIONS

12.1 General

This report was prepared specifically for the proposed project according to the plans provided to us. Normal construction procedures were assumed throughout our analysis and represent one of the bases of recommendations presented herein. Our design criteria have been based upon the materials and subsurface soil conditions encountered in the soil borings at the proposed sign location. Therefore, we should be notified in the event that these conditions are changed, so as to modify or amend our recommendations.

12.2 Foundations

Based on the information provided by the designer, sixty-one overhead sign structures and seven card reader signal poles are proposed to be constructed along both northbound and southbound I-880 within the project limits. The proposed overhead sign structures will be about 15.0 feet to 17.0 feet above grade.

The overhead sign structure foundations will be non-standard and will differ from the 2010 Caltrans Standard Plan S8 for "Overhead Signs-Truss Single Post Type Round Pedestal Pile Foundation" due to one or more of the following:

a) Non-standard structural loading
b) Non-standard pile diameter due to physical restrictions
c) Soft to medium stiff clays/silts
d) Loose to medium dense liquefiable sands/gravels/non-plastic silts

The card reader signal pole foundations will also be non-standard and will differ from Caltrans revised standard plan RSP ES-7E and Pole type 23-3-100 due to one or more of the following:

a) Soft to medium stiff clays/silts
b) Loose to medium dense liquefiable sands/gravels/non-plastic silts

12.2.1 Vertical Pile Capacity

The estimation of the capacity of CIDH concrete pile was based on "AASHTO LRFD Bridge Design Specifications, Sixth Edition and California Amendments Section 10, Foundation". The pile capacity of the CIDH pile was derived primarily from frictional resistance along the pile shafts, and end bearing capacity was not included when estimating the pile capacity. Caltrans "SHAFT" program was used in the vertical pile capacity analyses.

Overhead Sign Pile Foundation Selected for Axial Pile Capacity Analyses

Based on our understanding from the meeting with Caltrans, pile capacity analysis was not performed for the pile foundation with estimated Caltrans standard pile length. Vertical pile capacity analysis was performed for the pile foundation of the proposed overhead sign under the following conditions:

a) Four-foot pile diameter instead of the standard five-foot pile diameter.

b) Subsurface soil conditions anticipated with significant post-liquefaction settlement and relatively larger downdrag force. CPT was performed at this location to provide subsurface soil profile at greater depth for the pile foundation recommendation.

The pile lengths were calculated based on the axial load demands provided by the structural engineer and subsurface soil conditions.

Downdrag Due to Post-Liquefaction Settlement

Potential liquefaction-induced ground settlement (more than 0.6 inches) tends to cause downdrag load on the foundation piles at some of the overhead sign locations. The foundation design needs to consider the impact of liquefaction and additional downdrag load due to liquefaction. The evaluation of downdrag load due to liquefaction was performed in accordance with NAVFAC DM 7.2. The design and specified pile tip elevations presented in the "Pile Data Table" below have included these additional loads.

The compressive capacity calculations are included in Appendix V.

12.2.2 Torsional Pile Capacity

The Torsional pile capacity is not controlling the pile length based on the demand provided by the structural engineer. Only a conservative case (4-foot diameter CIDH with 30' pile length) was analyzed to check the Torsional pile capacity.

The torsional capacity calculation is included in Appendix V.

12.2.3 Lateral Pile Capacity

Under seismic loading conditions, lateral pile capacity analyses should be performed for the foundation piles of the proposed overhead sign structure using the LPILE program. The structural engineer performed lateral pile lateral capacity analyses based on the geotechnical soil parameters provided by PARIKH. The design tip elevation from the lateral pile capacity analyses is based on the pile tip reaching the second point of deflection counter-flexure.

The recommended geotechnical parameters for LPILE analyses are include in the tables in Appendix V.

Based on the pile capacity analyses, it appears that the pile length is generally controlled by either the lateral load demand or the vertical load demand under the following conditions:

Pile Diameter/Downdrag	**Pile Length Controlled by**
4-foot Diameter + No downdrag or small downdrag	Lateral load demand
4-foot Diameter + Extensive downdrag (with CPT(1))	Vertical load demand
5-foot Diameter + Extensive downdrag (with CPT(1))	Vertical load demand
5-foot Diameter + No downdrag or small downdrag	Lateral load demand

(1) CPT was performed to provide additional subsurface soil profile.

No pile capacity analysis was performed for the 5-foot pile diameter with no downdrag or small downdrag case, but it is believed that the lateral load should control the pile length based on the relatively small vertical load demand comparing with the lateral load demand.

12.3 Foundation for Each Overhead Sign Structures

The subsurface soil conditions, the sign structure details and the discussions for foundation recommendations of each proposed overhead sign structures are provided below.

– ***Overhead Sign Structure "OSPM-9.70", Sta. "M" 1117+25***

This overhead sign structure will be located south of the Dixon Landing Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OSPM-9.70" is based on the boring information of Boring A-14-880-001.

The boring data (Boring A-14-880-001) indicates that the foundation soil materials generally consist of poorly graded gravel, underlain by approximately 2 feet of loose clayey sand with gravel, underlain by approximately 4 feet of medium stiff silt underlain by very stiff fat clay, underlain by medium stiff to very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was measured at the depth of 19

feet (Elev. -4.5 feet) during field exploration on December 8, 2014. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH piles. The pile depth will be deeper than the Caltrans standard foundation depth based on the loading demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OSPM-10.16", Sta. "M" 1141+40***

This overhead sign structure will be located approximately 1400 feet south of the Dixon Landing Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OSPM-10.16" is based on the boring information of Boring R-14-880-003.

The boring data (Boring R-15-880-003) indicates that the foundation soil materials generally consist of approximately4 feet of medium stiff lean clay, underlain by approximately 2 feet of medium stiff silt, underlain by very stiff lean clay, underlain by approximately 6 feet of medium stiff lean clay, underlain by approximately 5 feet of very soft fat clay, underlain by dense well-graded sand with silt, underlain by approximately 6 feet of medium dense well-graded sand with silt and gravel, underlain by very stiff lean clay, underlain by approximately 4 feet of medium stiff lean clay to the maximum explored depth of 46.5 feet. Groundwater was not measured during field exploration on January 26, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the loading demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OSPM-R0.20", Sta. "M" 1170+16***

This overhead sign structure will be located approximately 1500 feet north of the Dixon Landing Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OSPM-R0.20" is based on the boring information of Boring R-14-880-004.

The boring data (Boring R-15-880-004) indicates that the foundation soil materials generally consist of stiff lean clay, underlain by approximately 16 feet of medium stiff clay, underlain by stiff silt with sand, underlain by approximately 4 feet of soft lean clay, underlain by stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 26, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 10 feet of non-plastic silt with sand encountered at approximate depth of 23.5 feet (Elev. -10 feet) exists and may result in post-liquefaction settlement on the order of 2.5 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.7'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the

Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OSPM-R1.00", Sta. "M" 1212+47***

This overhead sign structure will be located between the Dixon Landing Road Overcrossing and the Warren Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OSPM-R1.00" is based on the boring information of Boring R-14-880-005.

The boring data (Boring R-14-880-005) indicates that the foundation soil materials generally consist of stiff to very stiff fat clay, underlain by stiff lean clay, underlain by very stiff sandy silt, underlain by approximately 9 feet of medium dense silty sand, underlain by stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on December 17, 2014 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the loading demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OSPM-R1.10", Sta. "M" 1217+68***

This overhead sign structure will be located between the Dixon Landing Road Overcrossing and the Warren Avenue Overcrossing. The foundation recommendation

for Overhead Sign Structure "OSPM-R1.10" is based on the boring information of Boring R-15-880-059.

The boring data (Boring R-15-880-059) indicates that the foundation soil materials generally consist of stiff to very stiff lean clay, underlain by medium stiff sandy lean clay, underlain by medium dense silty sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 3, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 6 feet of medium dense silty sand encountered at approximate depth of 31 feet (Elev. -15.5 feet) exists and may result in post-liquefaction settlement on the order of 1.0 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type VII with the height of 15.0'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OSPM-2.50", Sta. "M" 1277+88***

This overhead sign structure will be located approximately 800 feet northwest of the Warren Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OSPM-2.50" is based on the boring information of Boring R-14-880-006.

The boring data (Boring R-14-880-006) indicates that the foundation soil materials generally consist of medium stiff to very stiff clay to the maximum explored depth of 46.5 feet. Groundwater was not measured during field exploration on December 18,

2014 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH piles with pile length of 35 feet per Caltrans Standard Plans Sheet S8, and the foundation depth will be determined according to Caltrans Standard Plans Sheet S8.

– ***Overhead Sign Structure "OSPM-2.67", Sta. "M" 1286+00***

This overhead sign structure will be located approximately 1600 feet northwest of the Warren Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OSPM-2.67" is based on the boring information of Boring R-15-880-007.

The boring data (Boring R-15-880-007) indicates that the foundation soil materials generally consist of stiff to very stiff lean clay, underlain by very stiff to hard lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 5, 2014 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.3'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the

Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS1-1", Sta. "M" 1303+42***

This overhead sign structure will be located approximately 1450 feet southeast of the Fremont Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structure "OS1-1" is based on the boring information of Boring R-15-880-008.

The boring data (Boring R-15-880-008) indicates that the foundation soil materials generally consist of stiff to hard lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 27, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.0'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS2-1", Sta. "M" 1312+00***

This overhead sign structure will be located approximately 600 feet southeast of the Fremont Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structure "OS2-1" is based on the boring information of Boring R-15-880-009.

The boring data (Boring R-15-880-009) indicates that the foundation soil materials generally consist of ***loose*** silty sand, underlain by stiff to very stiff lean clay, underlain by medium dense silty sand, underlain by very stiff to hard lean clay with

sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 12, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 4 feet of medium dense silty sand encountered at approximate depth of 4 feet (Elev. 12.5 feet) exists and may result in post-liquefaction settlement on the order of 0.9 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type VII with the height of 15.3'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS3-1,2", Sta. "M" 1329+80***

This overhead sign structure will be located approximately 1200 feet northwest of the Fremont Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structure "OS3-1, 2" is based on the boring information of Boring R-15-880-010.

The boring data (Boring R-15-880-010) indicates that the subsurface soils generally consist of very stiff lean clay, underlain by medium stiff lean clay, underlain by approximately 7.5 feet of medium dense silty sand, underlain by stiff to very stiff lean clay, underlain by medium dense silty sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 20, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign

location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS4-1", Sta. "M" 1346+50***

This overhead sign structure will be located approximately 450 feet southeast of the truck scales. The foundation recommendation for Overhead Sign Structure "OS4-1" is based on the boring information of Boring R-15-880-011.

The boring data (Boring R-15-880-011) indicates that the foundation soil materials generally consist of Stiff to very stiff lean clay, underlain by stiff sandy silt, underlain by medium dense silty sand, underlain by soft lean clay, underlain by medium dense silty sand, underlain by medium stiff to very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 22, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 4 feet of non-plastic sandy silt encountered at the depth of 8 feet (Elev. 10.5 feet) and the approximately3 feet of medium dense silty sand encountered at the depth of 26 feet (Elev. -7.5 feet) exists and may result in post-liquefaction settlement on the order of 1.4 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type VII with the height of 15.2'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS5-1", Sta. "M" 1356+50***

This overhead sign structure will be located in the vicinity of the truck scales. The foundation recommendation for Overhead Sign Structure "OS5-1" is based on the boring information of Boring R-15-880-060.

The boring data (Boring R-15-880-060) indicates that the foundation soil materials generally consist of very stiff sandy lean clay, underlain by stiff to very stiff sandy silt, underlain by very stiff lean clay, underlain by medium dense silty sand, underlain by very dense poorly graded sand with silt, underlain by medium dense poorly graded gravel with silt and sand, underlain by very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 27, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS7-1", Sta. "M" 1381+20***

This overhead sign structure will be located approximately 1200 feet southeast of the AutoMall Parkway Overcrossing. The foundation recommendation for Overhead Sign Structure "OS7-1" is based on the boring information of Boring R-15-880-013.

The boring data (Boring R-15-880-013) indicates that the foundation soil materials generally consist of very stiff lean clay, underlain by ***loose*** poorly graded sand with silt, underlain by stiff silt, underlain by medium dense silty sand, underlain by very stiff lean clay to the maximum explored depth of41.5 feet. Groundwater was not measured during field exploration on February 1, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of loose poorly graded sand with silt encountered at the approximate depth of 13feet (Elev. 12.5 feet) and the approximately 3.5 feet of medium dense silty sand encountered at the approximate depth of 34.0 feet (Elev. -8.5 feet) exists and may result in post-liquefaction settlement on the order of 2.0 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS8-1", Sta. "M" 1398+52***

This overhead sign structure will be located approximately 450 feet northwest of the AutoMall Parkway Overcrossing. The foundation recommendation for Overhead Sign Structure "OS8-1" is based on the boring information of Boring A-15-880-014.

The boring data (Boring R-15-880-014) indicates that the foundation soils generally consist of stiff lean clay, underlain by medium dense silty sand, underlain medium stiff silt, underlain by soft to very stiff lean clay to the maximum explored depth of41.5 feet. Groundwater was not measured during field exploration on February 3, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 6 feet of loose silty sand encountered at the approximate depth of 13 feet (Elev. 14 feet) and the approximately 6 feet of medium dense silty sand encountered at the approximate depth of 19 feet (Elev. 8 feet) exists and may result in post-liquefaction settlement on the order of 2.4 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.2'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS10-1", "M" 1425+02 and "OS10-2, Sta. "M" 1426+51***

This overhead sign structure will be located between the AutoMall Parkway Overcrossing and the Stevenson Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structures "OS10-1" and "OS10-2"is based on the boring information of Boring R-14-880-015.

The boring data (Boring R-14-880-015) indicates that the foundation soil materials generally consist of approximately stiff to very stiff lean clay, underlain by approximately 5 feet of medium stiff silt with sand, underlain by medium stiff to very stiff lean clay, underlain by dense poorly graded sand with silt to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on December 18, 2014 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 4.5 feet of non-plastic silt with sand encountered at the approximate depth of 14 feet (Elev. 15.5 feet) exists and may result in post-liquefaction settlement on the order of 0.9 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

For Sign "OS10-1", the sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

For Sign "OS10-2", the sign post type will be Type VI with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper

than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS12-1,2", Sta. "M" 1454+30***

This overhead sign structure will be located approximately 2050 feet southeast of the Stevenson Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structures"OS12-1, 2" is based on the boring information of Boring R-15-880-016.

The boring data (Boring R-15-880-016) indicates that the foundation soil materials generally consist of a very thin layer of hard lean clay, underlain by approximately 16 feet of ***loose*** clayey sand, underlain by stiff lean clay/silt, underlain by soft to stiff lean clay, underlain by dense silty sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 5, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 13 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 6 feet of loose clayey sand encountered at approximate depth of 13 feet (Elev. 20 feet) exist and may result in post-liquefaction settlement on the order of 1.3 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS15-1", Sta. "M" 1489+40***

This overhead sign structure will be located approximately 1450 feet northwest of the Stevenson Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structure "OS15-1" is based on the boring information of Boring R-15-880-017.

The boring data (Boring R-15-880-017) indicates that the foundation soil materials generally consist of soft to very stiff lean clay, underlain by stiff to very stiff silt with sand, underlain by very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 6, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 13 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 4.5 feet of non-plastic silt with sand encountered at approximate depths of 30.0 feet (Elev. 7.5 feet) exist and may result in post-liquefaction settlement on the order of 0.6 inches under the design earthquake loading.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS17-1,2", Sta. "M" 1519+89***

This overhead sign structure will be located approximately 500 feet southeast of the Mowry Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS17-1, 2" is based on the boring information of Boring A-15-880-018 and CPT information of CPT-15-880-018.

The boring data (Boring A-15-880-018) indicates that the foundation soil materials generally consist of very stiff lean clay/sandy silt, underlain by soft to stiff lean clay, underlain by approximately 4 feet and 6 feet of medium dense clayey/silty sand with interbedded layers of stiff sandy silt underlain by stiff lean clay to the maximum explored depth of 46.5 feet. Groundwater was measured at the depth of 25 feet during field exploration on January 6, 2015. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on the evaluation of liquefaction potential, the liquefaction potential of the approximately 5.5 feet of sandy silt encountered at approximate depth of 8 feet (Elev. 31 feet) and the approximately 16 feet of medium dense clayey/silty sand and sandy silt encountered at approximate depths of 28 feet (Elev. 11 feet) exist and may result in post-liquefaction settlement on the order of 4.1 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses. The estimated pile length, with the consideration of the downdrag, is deeper than the boring depth of Boring A-15-880-018.

CPT-15-880-018 was performed to provide additional subsurface profile for the pile foundation recommendation. The CPT data (CPT-15-880-018) indicates that the subsurface soil materials below the boring depth of 46.5 feet generally consist of very stiff clay/silt, underlain by dense sand. Groundwater was measured at the depth of 11 feet based on the dissipated pore pressure measured during the CPT performed in February 2015.

The sign post type will be Type IX with the height of 15.1’±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions consisting of sandy silt and medium dense clayey/silty sand with

relatively high liquefaction potential in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS19-1", Sta. "M" 1539+52***

This overhead sign structure will be located approximately 1450 feet northwest of the Mowry Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS19-1" is based on the boring information of as-built Boring B-28.

The boring data (as-built Boring B-28) indicates that the subsurface soils generally consist of very stiff lean clay, underlain by medium stiff lean clay, underlain by medium dense clayey sand, underlain by medium stiff lean clay to the maximum explored depth of 46 feet. There was no groundwater level record in this boring. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS20-1", Sta. "M" 1560+00***

This overhead sign structure will be located approximately 2100 feet southeast of Central Ave. The foundation recommendation for Overhead Sign Structure "OS20-1" is based on the boring information of as-built Boring B-17.

The boring data (as-built Boring B-17) indicates that the subsurface soils generally consist of approximately very stiff lean clay, underlain by medium stiff lean clay, underlain by medium dense sand, underlain by soft to medium stiff lean clay to the maximum explored depth of 51.5 feet. There was no groundwater level record in this

boring. Based on historic groundwater data, groundwater was assumed to be at 5 feet below existing grade for design purpose.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of medium dense sand encountered at approximate depth of 17 feet (Elev. 15 feet) exist and may result in post-liquefaction settlement on the order of 0.9 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.2'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS22-1", Sta. "M" 1583+32***

This overhead sign structure will be located approximately 200 feet northwest of the Central Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS33-1" is based on the boring information of Boring R-15-880-021.

The boring data (Boring R-15-880-021) indicates that the subsurface soils generally consist of ***loose*** silty sand, underlain by medium stiff to stiff lean clay, underlain by dense to very dense poorly graded gravel with silt and sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 2, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 13 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS24-1", Sta. "M" 1598+85***

This overhead sign structure will be located approximately 1350 feet southeast of the Thornton Avenue Separation. The foundation recommendation for Overhead Sign Structure "OS24-1" is based on the boring information of Boring R-15-880-022.

The boring data (Boring R-15-880-022) indicates that the subsurface soils generally consist of very stiff lean clay, underlain by very stiff silt, underlain by medium dense poorly graded sand with silt, underlain by medium stiff lean clay, underlain by stiff silt, underlain by very stiff silty clay, underlain by very dense well graded sand with silt and gravel to the maximum explored depth of 30.2 feet because of the hard drilling. Groundwater was not measured during field exploration on February 4, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 13 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS25-1,2", Sta. "M" 1620+28***

This overhead sign structure will be located approximately 800 feet northwest of the Thornton Avenue Separation. The foundation recommendation for Overhead Sign Structure "OS25-1, 2" is based on the boring information of Boring R-15-880-023.

The boring data (Boring R-15-880-023) indicates that the foundation soil materials generally consist of approximately 19 feet of medium stiff to stiff lean clay, underlain by dense poorly-graded sand with clay and gravel, underlain by approximately 3 feet of medium dense clayey sand with gravel, underlain by medium stiff lean clay to the maximum explored depth of 40.0 feet. Groundwater was not measured during field exploration on January7, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 13 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.5'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS27-1,2", Sta. "M" 1648+25***

This overhead sign structure will be located between the Thornton Avenue Separation and the Decoto Road Separation. The foundation recommendation for Overhead Sign Structure "OS27-1, 2" is based on the boring information of Boring R-15-880-024.

The boring data (Boring R-15-880-024) indicates that the foundation soil materials generally consist of very stiff lean clay, underlain by very stiff silt, underlain by

approximately 10 feet of medium dense poorly graded sand with silt, underlain by approximately 6 feet of medium stiff lean clay, underlain by approximately 5 feet of stiff silt, underlain by very stiff silty clay, underlain by very dense well graded sand with silt to the maximum explored depth of 41.0 feet. Groundwater was not measured during field exploration on January 15, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 13 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of medium dense poorly graded sand encountered at approximate depth of 13 feet (Elev. 23.5 feet) exists and may result in post-liquefaction settlement on the order of 1.0 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.9'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS29-1,2", Sta. "M" 1667+00***

This overhead sign structure will be located approximately 2200 feet southeast of the Decoto Road Separation. The foundation recommendation for Overhead Sign Structure "OS29-1, 2" is based on the boring information of Boring R-15-880-025 and CPT information of CPT-15-880-025.

The boring data (Boring R-15-880-025) indicates that the foundation soil materials generally consist of approximately stiff to hard lean clay, underlain by approximately 2 feet of medium stiff sandy lean clay with a single layer of stiff sandy silt, underlain by approximately 18 feet of medium dense silty sand, underlain by very stiff sandy

silt, underlain by dense silty sand with gravel to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 15, 2015 because of the rotary-wash drilling method. Based on historic groundwater dater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 12.5 feet of medium dense silty sand encountered at approximate depth of 16feet (Elev. 20 feet) and the approximately 4.5 feet of non-plastic sandy silt encountered at approximate depths of 33.5 feet (Elev. 2.5 feet) exists and may result in post-liquefaction settlement on the order of 3.1 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses. The estimated pile length, with the consideration of the downdrag, is deeper than the boring depth.

CPT-15-880-025 was performed to provide additional subsurface profile for the pile foundation recommendation. The CPT data (CPT-15-880-025) indicates that the subsurface soil materials below the boring depth of 41.5 feet generally consist of dense sand. Groundwater was measured at the depth of 20.1 feet based on the dissipated pore pressure measured during the CPT performed in February 2015

The sign post type will be Type IX with the height of 15.3’±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions consisting of medium dense silty sand and non-plastic sandy silt with relatively high liquefaction potential in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS31-1", Sta. "M" 1683+64***

This overhead sign structure will be located approximately 550 feet southeast of the Decoto Road Separation. The foundation recommendation for Overhead Sign Structure "OS31-1" is based on the boring information of Boring R-15-880-026 and CPT information of CPT-15-880-026.

The boring data (Boring R-15-880-026) indicates that the foundation soil materials generally consist of stiff lean clay, underlain by hard sandy silt, underlain by approximately 23 feet of medium dense silty sand, underlain by stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 15, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of sandy silt encountered at approximate depth of 8feet (Elev. 23 feet) and the approximately 7 feet of medium dense silty sand with gravel encountered at approximate depth of 29 feet (Elev. 2 feet) exists and may result in post-liquefaction settlement on the order of 1.9 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses. The estimated pile length, with the consideration of the downdrag, is deeper than the boring depth of Boring R-15-880-026.

CPT-15-880-026 was performed to provide additional subsurface profile for the pile foundation recommendation. The CPT data (CPT-15-880-026) indicates that the subsurface soil materials below the boring depth of 46.5 feet generally consist of medium dense sand, underlain by dense sand. Groundwater was measured at the depth of 19.1 feet based on the dissipated pore pressure measured during the CPT performed in February 2015.

The sign post type will be Type IX with the height of 15.2'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions consisting of sandy silt and medium dense silty sand with gravel with relatively high liquefaction potential in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS32-1,2", Sta. "M" 1701+68***

This overhead sign structure will be located approximately 1300 feet northwest of the Decoto Road Separation. The foundation recommendation for Overhead Sign Structure "OS32-1, 2" is based on the boring information of Boring R-15-880-027.

The boring data (Boring R-15-880-027) indicates that the subsurface soils generally consist of medium stiff to stiff lean clay, underlain by stiff silt, underlain by ***loose*** silty sand, underlain by medium stiff to very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 11, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of loose silty sand encountered at approximate depth of 23feet (Elev. 8.5 feet) exists and may result in post-liquefaction settlement on the order of 1.0 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.3'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS35-1", Sta. "M" 1728+50***

This overhead sign structure will be located approximately 600 feet northwest of the Paseo Padre Parkway Overcrossing. The foundation recommendation for Overhead Sign Structure "OS35-1" is based on the boring information of Boring R-15-880-028.

The boring data (Boring R-15-880-028) indicates that the foundation soil materials generally consist of Stiff to very stiff lean clay, underlain by stiff sandy silt, underlain by approximately 5 feet of medium dense sand, underlain by medium stiff to stiff lean clay, underlain by hard silt with sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 12, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 7 feet of sandy silt encountered at approximate depth of 11feet (Elev. 17 feet) exists and may result in post-liquefaction settlement on the order of 1.8 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS37-1,2", Sta. "M" 1748+89***

This overhead sign structure will be located approximately 300 feet south of the Alvarado Boulevard Overcrossing. The foundation recommendation for Overhead

Sign Structure "OS37-1, 2" is based on the boring information of Boring R-15-880-029.

The boring data (Boring R-15-880-029) indicates that the foundation soil materials generally consist of hard lean clay, underlain by approximately 9 feet of ***loose*** silty sand, underlain by approximately 27 feet of soft to medium stiff lean clay, underlain by approximately a foot of medium dense silty sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 12, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 9 feet of loose silty sand encountered at approximate depth of 4.5 feet (Elev. 22.5 feet) exists and may result in post-liquefaction settlement on the order of 1.7 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS41-1,2", Sta. "M" 1802+93***

This overhead sign structure will be located between the Alvarado Boulevard Overcrossing and Alvarado-Niles Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS41-1, 2" is based on the boring information of Boring R-15-880-030.

The boring data (Boring R-15-880-030) indicates that the foundation soil materials generally consist of very stiff to hard lean clay, underlain by approximately 9 feet of very soft to stiff lean clay, underlain by approximately 5 feet of medium stiff sandy silt, underlain by approximately 18 feet of medium stiff to stiff lean clay, underlain by less than a foot of very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 21, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of non-plastic sandy silt encountered at approximate depth of 18 feet (Elev. 6 feet) exists and may result in post-liquefaction settlement on the order of1.3 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.2'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS43-2", Sta. "M" 1831+48***

This overhead sign structure will be located approximately 250 feet southeast of the Alvarado-Niles Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS43-2" is based on the boring information of Boring R-15-880-031.

The boring data (Boring R-15-880-031) indicates that the foundation soil materials generally consist of approximately4 feet of medium dense silty sand with gravel, underlain by stiff silty clay, underlain by medium stiff to very stiff lean clay with interbedded pocket/lens of medium dense silty sand to the maximum explored depth

of 41.5 feet. Groundwater was not measured during field exploration on January 13, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 2.5 feet of medium dense silty sand encountered at approximate depth of 36 feet (Elev. -15.5 feet) exists and may result in post-liquefaction settlement on the order of 0.4 inches under the design earthquake loading.

The sign post type will be Type VII with the height of 15.2'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS45-1,2", Sta. "M" 1854+65***

This overhead sign structure will be located approximately 1250 feet southeast of the Whipple Road Undercrossing. The foundation recommendation for Overhead Sign Structure "OS45-1, 2" is based on the boring information of Boring R-15-880-032 and CPT information of CPT-15-880-032.

The boring data (Boring R-15-880-032) indicates that the subsurface soils generally consist of very stiff lean clay with gravel, underlain by soft to very stiff lean clay, underlain by interbedded layers of ***loose*** clayey sand and stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 2, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the

approximately 5 feet of loose clayey sand encountered at approximate depth of 24 feet (Elev. -7.5 feet) and the approximately 4 feet of loose clayey sand encountered at approximate depth of 34 feet (Elev. -17.5 feet) exists and may result in post-liquefaction settlement on the order of 2.4 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses. The estimated pile length, with the consideration of the downdrag, is deeper than the boring depth of Boring R-15-880-032.

CPT-15-880-032 was performed to provide additional subsurface profile for the pile foundation recommendation. The CPT data (CPT-15-880-032) indicates that the subsurface soil materials below the boring depth of 46.5 feet generally consist of stiff lean clay, underlain by hard clay/silt. Groundwater was measured at the depth of 8.3 feet based on the dissipated pore pressure measured during the CPT performed in February 2015.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions consisting of loose clayey sand with relatively high liquefaction potential in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS47-1", Sta. "M" 1879+00***

This overhead sign structure will be located approximately 1100 feet northwest of the Whipple Road Undercrossing. The foundation recommendation for Overhead Sign Structure "OS47-1" is based on the boring information of Boring R-15-880-033.

The boring data (Boring R-15-880-033) indicates that the foundation soil materials generally consist stiff to very stiff lean clay, underlain by dense silty sand, underlain by stiff lean clay, underlain by soft to stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 14, 2015 because of the rotary-wash drilling method. Based on historic groundwater

data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.3'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS47-2.3", Sta. "M" 1884+36***

This overhead sign structure will be located approximately 1650 feet northwest of the Whipple Road Undercrossing. The foundation recommendation for Overhead Sign Structure "OS47-2, 3" is based on the boring information of Boring R-15-880-034.

The boring data (Boring R-15-880-034) indicates that the subsurface soils generally consists of medium dense silty sand, underlain by medium stiff to very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 3, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.4'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS51-1", Sta. "M" 1932+43***

This overhead sign structure will be located between the Industrial Park Overcrossing and the Tennyson Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS51-1" is based on the boring information of Boring R-15-880-035.

The boring data (Boring R-15-880-035) indicates that the subsurface soils generally consist of very stiff lean clay, underlain by stiff lean clay with interbedded layers of soft and medium stiff lean clay, underlain by approximately 8 feet of medium stiff lean clay to the maximum explored depth of 46.5 feet. Groundwater was not measured during field exploration on January 19, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS51-2", Sta. "M" 1933+92***

This overhead sign structure will be located between the Industrial Park Overcrossing and the Tennyson Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS51-2" is based on the boring information of Boring A-15-880-061.

The boring data (Boring A-15-880-061) indicates that the subsurface soils generally consist of asphalt concrete, underlain by medium stiff to stiff lean clay, underlain by medium dense silty/poorly graded sand, underlain by stiff to very stiff lean clay. to the maximum explored depth of 41.5 feet. Groundwater was measured at the depth of

18 feet during field exploration on January 28, 2015. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5.5 feet of medium dense silty sand encountered at approximate depth of 18.5 feet (Elev. -1.5 feet) and the approximately 4 feet of medium dense poorly graded sand with silt encountered at approximate depth of 23 feet (Elev. -6 feet) exists and may result in post-liquefaction settlement on the order of 1.5 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS53-2", Sta. "M" 1958+20***

This overhead sign structure will be located approximately 1300 feet southeast of the Tennyson Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS53-2" is based on the boring information of Boring A-15-880-036.

The boring data (Boring A-15-880-036) indicates that the subsurface soils generally consist of medium stiff to very stiff lean clay, underlain by medium dense clayey sand to the maximum explored depth of 41.5 feet. Groundwater was measured at the depth of 15 feet during field exploration on January 28, 2015because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VIII with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS54-1", Sta. "M" 1966+00***

This overhead sign structure will be located approximately 550 feet southeast of the Tennyson Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS54-1" is based on the boring information of Boring R-15-880-037.

The boring data (Boring R-15-880-037) indicates that the subsurface soils generally consist of medium stiff to stiff lean clay, underlain by medium dense silty sand, underlain by medium stiff sandy lean clay, underlain by medium stiff to stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 2, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VI with the height of 15.0'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS55-1", Sta. "M" 1989+88***

This overhead sign structure will be located approximately 1900 feet northwest of the Tennyson Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS55-1" is based on the boring information of as-built Boring 01-01.

The boring data (as-built Boring 01-01) indicates that the subsurface soils generally consist of soft to very stiff lean clay/silt with interbedded layers of medium dense to dense sand, underlain by very stiff lean to the maximum explored depth of 103 feet. There was no groundwater level record in this boring. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 3 feet of medium dense sand encountered at approximate depth of 33 feet (Elev. 0 feet) exist and may result in post-liquefaction settlement on the order of 0.5 inches under the design earthquake loading.

The sign post type will be Type IX with the height of 15.3'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS57-1,2", Sta. "M" 2014+15***

This overhead sign structure will be located approximately 1300 feet southeast of the W. Jackson St. The foundation recommendation for Overhead Sign Structure "OS57-1, 2" is based on the boring information of Boring A-15-880-039.

The boring data (Boring A-15-880-039) indicates that the subsurface soils generally consist of medium stiff to very stiff lean clay, underlain by medium dense silty sand, underlain by very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was measured at the depth of 19 feet during field exploration on January 29, 2015. Based on historic groundwater data, groundwater was assumed to

be 15 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 3 feet of medium dense silty sand encountered at approximate depth of 34.5 feet (Elev. 7.5 feet) exists and may result in post-liquefaction settlement on the order of 0.6 inches under the design earthquake loading.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS60-1", Sta. "M"2058+00***

This overhead sign structure will be located approximately 1700 feet southeast of the Winton Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS60-1" is based on the boring information of Boring A-15-880-040 and CPT information of CPT-15-880-040.

The boring data (Boring A-15-880-040) indicates that the subsurface soils generally consist of stiff lean clay, underlain by stiff silt, underlain by medium stiff lean clay, underlain by medium stiff silt, underlain by dense silty sand. to the maximum explored depth of 41.5 feet. Groundwater was measured at the depth of 18 feet during field exploration on January 29, 2015. Based on historic groundwater data, groundwater was assumed to be 15 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of non-plastic silt encountered at approximate depth of 15 feet (Elev. 50 feet) and the approximately 4.5 feet of silt encountered at approximate depth of 33 feet (Elev. 30 feet) exists and may result in post-liquefaction settlement

on the order of 1.3 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses. The estimated pile length, with the consideration of the downdrag, is deeper than the boring depth of Boring A-15-880-040.

CPT-15-880-040 was performed to provide additional subsurface profile for the pile foundation recommendation. The CPT data (CPT-15-880-040) indicates that the subsurface soil materials generally similar to that encountered in Boring A-15-880-040 except below the depth of 37.5 feet at which consist of medium stiff silt, underlain by very stiff clay/silt. Groundwater was measured at the depth of 24.4 feet based on the dissipated pore pressure measured during the CPT performed in February 2015.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions consisting of silt with relatively high liquefaction potential in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS63-1,2", Sta. "M" 2089+88***

This overhead sign structure will be located approximately 1500 feet northwest of the Winton Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS63-1, 2" is based on the boring information of Boring R-15-880-041.

The boring data (Boring R-15-880-041) indicates that the foundation soil materials generally consist of stiff to very stiff sandy silt, underlain by approximately 14 feet of ***loose*** to medium dense silty sand, underlain by dense silty clayey sand/silty sand with gravel to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 21, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 15 feet

below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.2'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS64-1", Sta. "M" 2103+38***

This overhead sign structure will be located approximately 1150 feet southeast of the A Street Undercrossing. The foundation recommendation for Overhead Sign Structure "OS64-1" is based on the boring information of Boring R-15-880-042.

The boring data (Boring R-15-880-042) indicates that the subsurface soils generally consist of medium dense silty sand, underlain by interbedded layers of soft to medium stiff lean clay and very stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 25, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 15 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.0'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS65-1", Sta. "M" 2111+70***

This overhead sign structure will be located approximately 400 feet southeast of the A Street Undercrossing. The foundation recommendation for Overhead Sign Structure "OS65-1" is based on the boring information of Boring R-15-880-062.

The boring data (Boring R-15-880-062) indicates that the foundation soil materials generally consist of dense silty sand with gravel, underlain by approximately 7 feet of medium dense clayey sand with gravel, underlain by very stiff lean clay with a single layer of stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 25, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 15 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS66-1,2", Sta. "M" 2121+88***

This overhead sign structure will be located approximately 700 feet northwest of the A Street Undercrossing. The foundation recommendation for Overhead Sign Structure "OS66-1, 2" is based on the boring information of Boring R-15-880-043 and the CPT information of CPT-15-880-043.

The boring data (Boring R-15-880-043) indicates that the subsurface soils generally consist of stiff to very stiff lean clay, underlain by medium dense silty sand, underlain by hard lean clay, underlain by medium stiff silt with sand, underlain by

medium dense poorly graded sand with gravel, underlain by very stiff silt to the maximum explored depth of 41.5 feet. Groundwater was measured at the depth of 17 feet during field exploration on January 26, 2015. Based on historic groundwater data, groundwater was assumed to be 15 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 4 feet of medium dense silty sand encountered at approximate depth of 18.5 feet (Elev. 44.5 feet) and the approximately 13.5 feet of silt and medium dense poorly graded sand with gravel encountered at approximate depth of 28 feet (Elev. 35 feet) exists and may result in post-liquefaction settlement on the order of 3.7 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses. The estimated pile length, with the consideration of the downdrag, is deeper than the boring depth of Boring R-15-880-043.

CPT-15-880-043 was performed to provide additional subsurface profile for the pile foundation recommendation. The CPT data (CPT-15-880-043) indicates that the subsurface soil materials below the boring depth of 41.5 feet generally consist of hard lean clay, underlain by medium dense sand, underlain by very stiff silt/clay. Groundwater was measured at the depth of 29 feet based on the dissipated pore pressure measured during the CPT performed in February 2015.

The sign post type will be Type IX with the height of 15.1’±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions consisting of medium dense silty sand, silt and medium dense poorly graded sand with gravel with relatively high liquefaction potential in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS68-1", Sta. "M" 2148+28***

This overhead sign structure will be located approximately 1400 feet southeast of the Hacienda Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS68-1" is based on the boring information of Boring A-14-880-044 and CPT information of CPT-15-880-044.

The boring data (Boring A-14-880-044) indicates that the foundation soil materials generally consist of very stiff fat clay, underlain by hard lean clay, underlain by very stiff silt, underlain by approximately 10 feet of medium stiff lean clay, underlain by approximately 8 feet of very soft sandy silt, underlain by ***loose*** to medium dense well-graded sand with silt to the maximum explored depth of 46.5 feet. Groundwater was measured at the depth of 25 feet during field exploration on December 10, 2014. Based on historic groundwater data, groundwater was assumed to be 15 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of non-plastic silt encountered at approximate depth of 15 feet (Elev. 35 feet) and the approximately 18.5 feet of sandy silt and loose to medium dense well graded sand with silt encountered at approximate depth of 28 feet (Elev. 22 feet) exists and may result in post-liquefaction settlement on the order of 5.6 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses. The estimated pile length, with the consideration of the downdrag, is deeper than the boring depth of Boring A-14-880-044.

CPT-15-880-044 was performed to provide additional subsurface profile for the pile foundation recommendation. The CPT data (CPT-15-880-044) indicates that the subsurface soil materials below the boring depth of 46.5 feet generally consist of very

stiff silt/clay. Groundwater was measured at the depth of 19.2 feet based on the dissipated pore pressure measured during the CPT performed in February 2015.

The sign post type will be Type IX with the height of 15.5'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions consisting of silt, sandy silt and loose to medium dense well graded sand with silt with relatively high liquefaction potential in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS68-2,3", Sta. "M" 2156*+60**

This overhead sign structure will be located approximately 600 feet southeast of the Hacienda Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS68-2, 3" is based on the boring information of Boring A-15-880-045.

The boring data (Boring A-15-880-045) indicates that the foundation soil materials generally consist of interbedded layers of stiff and very stiff lean clay, underlain by approximately 9 feet of soft to medium stiff lean clay, underlain by dense poorly graded gravel, underlain by approximately 3 feet of medium dense silty sand, underlain by very stiff lean clay to the maximum explored depth of 46.5 feet. Groundwater was measured at the depth of 20 feet during field exploration on January 21, 2015. Based on historic groundwater data, groundwater was assumed to be 15 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 3 feet of medium dense silty sand encountered at approximate depth of 38 feet (Elev. 1 feet) exists and may result in post-liquefaction settlement on the order of 0.5 inches under the design earthquake loading.

The sign post type will be Type IX with the height of 15.3'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the

Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS70-1", Sta. "M" 2174+68***

This overhead sign structure will be located approximately 1250 feet northwest of the Hacienda Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS70-1" is based on the boring information of Boring R-15-880-046.

The boring data (Boring R-15-880-046) indicates that the foundation soil materials generally consist of very stiff fat clay, underlain by interbedded layers of medium stiff to very stiff lean clay, underlain by approximately 4 feet of medium dense silty sand, underlain by stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on January 21, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 2.5 feet of medium dense silty sand encountered at approximate depth of 34.5 feet (Elev. 4.5 feet) exists and may result in post-liquefaction settlement on the order of 0.6 inches under the design earthquake loading.

The sign post type will be Type VII with the height of 15.3'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS75-1", Sta. "M" 2246+52***

This overhead sign structure will be located approximately 200 feet northwest of the Washington Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS75-1" is based on the boring information of Boring R-15-880-047.

The boring data (Boring R-15-880-047) indicates that the subsurface soils generally consist of stiff lean clay, underlain by ***loose*** clayey sand, underlain by very stiff lean clay with a single layer of medium stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 2, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of loose clayey sand encountered at approximate depth of 8 feet (Elev. 18 feet) exists and may result in post-liquefaction settlement on the order of 1.0 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type VI with the height of 15.2'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS76-1", Sta. "M" 2253+88***

This overhead sign structure will be located approximately 950 feet northwest of the Washington Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS76-1" is based on the boring information of Boring R-15-880-048.

The boring data (Boring R-15-880-048) indicates that the subsurface soils generally consist of very stiff sandy lean clay, underlain by medium stiff to very stiff lean clay to the maximum explored depth of 46.5 feet. Groundwater was not measured during field exploration on February 11, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.3'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS77-1", Sta. "M" 2275+00***

This overhead sign structure will be located approximately 850 feet southeast of the Floresta Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structure "OS77-1" is based on the boring information of Boring A-15-880-049.

The boring data (Boring A-15-880-049) indicates that the subsurface soils generally consist of medium stiff to very stiff lean clay, underlain by stiff fat clay, underlain by very stiff lean clay, underlain by very stiff silt, underlain by stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was measured at the depth of 13 feet during field exploration on January 29, 2015. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 3.5 feet of silt encountered at approximate depth of 34 feet (Elev. -5

feet) exists and may result in post-liquefaction settlement on the order of 0.6 inches under the design earthquake loading.

The sign post type will be Type IX with the height of 15.3'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS79-1", Sta. "M" 2301+40***

This overhead sign structure will be located between the Floresta Boulevard Overcrossing and the Marina Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structure "OS79-1" is based on the boring information of Boring A-14-880-050.

The boring data (Boring A-14-880-050) indicates that the foundation soil materials generally consist of approximately 6 feet of ***loose*** poorly graded sand, underlain by stiff lean clay, underlain by approximately 10 feet of very soft to medium stiff lean clay, underlain by approximately 4 feet of medium dense well graded sand with silt, underlain by medium stiff to stiff lean clay to the maximum explored depth of 45.0feet. Groundwater was measured at the depth of 5 feet during field exploration on December 10, 2014. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 3 feet of loose poorly graded sand encountered at approximate depth of 5 feet (Elev. 25 feet) exists and may result in post-liquefaction settlement on the order of 0.8 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.2'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS82-1", Sta. "M" 2333+08***

This overhead sign structure will be located approximately 1700 feet southeast of the Marina Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structure "OS82-1" is based on the boring information of Boring A-14-880-051.

The boring data (Boring A-14-880-051) indicates that the subsurface soils generally consist of approximately 2 feet of loose poorly graded sand, underlain by very stiff silt, underlain by medium stiff to stiff lean clay, underlain by approximately 7 feet of medium dense clayey gravel/silty sand, underlain by stiff to very stiff lean clay, underlain by very dense silty sand to the maximum explored depth of 41.0 feet. Groundwater was measured at the depth of 15 feet during field exploration on December 10, 2014. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 7 feet of medium dense clayey gravel/silty sand encountered at approximate depth of 21 feet (Elev. 8 feet) exists and may result in post-liquefaction settlement on the order of 1.1 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.4'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS84-1", Sta. "M" 2361+24***

This overhead sign structure will be located approximately 100 feet northwest of the Marina Boulevard Overcrossing. The foundation recommendation for Overhead Sign Structure "OS84-1" is based on the boring information of Boring A-15-880-052.

The boring data (Boring A-15-880-052) indicates that the subsurface soils generally consist of stiff to very stiff lean clay, underlain by very stiff lean clay with sand, underlain by stiff lean clay to the maximum explored depth of 41.5 feet. Groundwater was measured at the depth of 20 feet during field exploration on January 29, 2015. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type IX with the height of 15.7'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS87-1", Sta. "M" 2411+23***

This overhead sign structure will be located approximately 1700 feet northwest of the David S. Karp Overcrossing. The foundation recommendation for Overhead Sign Structure "OS87-1" is based on the boring information of Boring R-15-880-053.

The boring data (Boring R-15-880-053) indicates that the foundation soil materials generally consist of interbedded layers of stiff to very stiff lean clay, underlain by dense to very dense silty sand to the maximum explored depth of 40.4 feet. Groundwater was not measured during field exploration on January 22, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater

was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VI with the height of 15.2'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS89-1", Sta. "M" 2436+64***

This overhead sign structure will be located approximately 1500 feet southeast of the 98th Avenue Overcrossing. The foundation recommendation for Overhead Sign Structure "OS89-1" is based on the boring information of Boring R-15-880-054.

The boring data (Boring R-15-880-054) indicates that the subsurface soils generally consist of asphalt concrete, underlain by aggregate base, underlain by medium dense to dense silty sand with gravel, underlain by stiff to hard lean clay with interbedded pocket/lens of dense silty sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 3, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 5 feet of medium dense silty sand with gravel encountered at approximate depth of 8 feet (Elev. 28 feet) exists and may result in post-liquefaction settlement on the order of 0.9 inches under the design earthquake loading. We have

considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS92-2", Sta. "M" 2480+93***

This overhead sign structure will be located approximately 1000 feet southeast of the Hegenberger Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS92-2" is based on the boring information of Boring R-15-880-055.

The boring data (Boring R-15-880-055) indicates that the subsurface soils generally consist of asphalt concrete, underlain by interbedded layers of stiff to very stiff lean clay and medium dense clayey gravel with sand to the maximum explored depth of 41.5 feet. Groundwater was not measured during field exploration on February 4, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 4.5 feet of medium dense clayey gravel with sand encountered at approximate depth of 34 feet (Elev. -23 feet) exists and may result in post-liquefaction settlement on the order of 0.6 inches under the design earthquake loading.

The sign post type will be Type VII with the height of 15.4'±. The sign will be supported on 5 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS94-1", Sta. "M" 2507+33***

This overhead sign structure will be located approximately 1650 feet northwest of the Hegenberger Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS94-1" is based on the boring information of Boring A-15-880-056.

The boring data (Boring A-15-880-056) indicates that the foundation soil materials generally consist of approximately 4 feet of loose poorly graded sand, underlain by approximately 10 feet of soft fat clay, underlain by approximately 4 feet of medium stiff to stiff lean clay, underlain by approximately 15 feet of ***loose*** to medium dense silty sand, underlain by medium dense poorly graded gravel with silt and sand, underlain by very dense poorly graded sand, underlain by very stiff lean clay to the maximum explored depth of 44.5 feet. Groundwater was measured at the depth of 5 feet during field exploration on January 28, 2015. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is not corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 17 feet of loose silty sand and medium dense poorly graded gravel with silt and sand encountered at approximate depth of 18 feet (Elev. -8 feet) exists and may result in post-liquefaction settlement on the order of 3.0 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type VII with the height of 15.3'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS95-1", Sta. "M" 2523+17***

This overhead sign structure will be located between the Hegenberger Road Overcrossing. The foundation recommendation for Overhead Sign Structure "OS95-1" is based on the boring information of Boring A-15-880-057.

The boring data (Boring A-15-880-057) indicates that the foundation soil materials generally consist of approximately4 feet of loose poorly graded sand with silt, underlain by approximately 4 feet of medium dense silty sand, underlain by approximately 16 feet of very soft to soft fat clay, underlain by approximately 3 feet of medium dense silty sand, underlain by approximately 7 feet of medium stiff fat/lean clay, underlain by approximately 6 feet of ***loose*** silty sand, underlain by approximately 5 feet of medium dense poorly graded sand, underlain by stiff lean clay to the maximum explored depth of 46.5 feet. Groundwater was measured at the depth of 24 feet during field exploration on January 27, 2015. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential of the approximately 4 feet of medium dense silty sand encountered at approximate depth of 4 feet (Elev. 6 feet), approximately 2.5 feet of medium dense silty sand encountered at approximate depth of 24 feet (Elev. -14 feet) and the approximately 6 feet of loose silty sand encountered at approximate depth of 32 feet (Elev. -22feet) exists and may result in post-liquefaction settlement on the order of 3.6 inches under the design earthquake loading. We have considered liquefaction in foundation design by considering downdrag forces for vertical demand and residual shear strength for lateral pile analyses.

The sign post type will be Type IX with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the

Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Overhead Sign Structure "OS96-1", Sta. "M" 2533+73***

This overhead sign structure will be located approximately 1650 feet southeast of 66th Avenue. The foundation recommendation for Overhead Sign Structure "OS96-1" is based on the boring information of Boring R-15-880-058.

The boring data (Boring R-15-880-058) indicates that the subsurface soils generally consist of medium dense clayey sand, underlain by soft to medium stiff sandy lean clay, underlain by very soft lean clay, underlain by soft to medium stiff fat clay with sand to the maximum explored depth of 51.5 feet. Groundwater was not measured during field exploration on January 27, 2015 because of the rotary-wash drilling method. Based on historic groundwater data, groundwater was assumed to be 5 feet below existing grade for design purpose. Corrosion test indicates that the subsurface soil at the proposed overhead sign location is corrosive.

Based on our evaluation of liquefaction potential, the liquefaction potential for the subsurface soil conditions at the proposed overhead sign location does not exist.

The sign post type will be Type VII with the height of 15.1'±. The sign will be supported on 4 feet diameter CIDH pile. The pile depth will be deeper than the Caltrans standard foundation depth based on the load demand and subsurface soil conditions in the vicinity of the proposed overhead sign location.

– ***Card Reader Signal Pole Structures***

No borings were planned/drilled at the "card reader signal pole" structure locations. Design of CIDH pile foundations for the card reader signal pole structures was based on the soils encountered at the nearby borings that were drilled in the vicinity of the proposed overhead sign structures locations. The vertical and torsion loads for these structures were considered relatively small and the pile lengths were determined

based on lateral load analysis only. The pile diameters, lengths, tip elevations as well as reference borings used for the analysis of these structures are shown in Table 11.

12.4 Pile Data Table

Based on the design load provided by the designer, the pile type, calculated pile lengths, design pile tip elevations and specified pile tip elevations are summarized in the pile data tables for overhead sign structures and card reader signal pole structures below.

TABLE 10 – PILE DATA TABLE FOR OVERHEAD SIGN STRUCTURES

Sign Designation	Station	Pile Dia. (ft)	CIDH Pile Length (ft) Due to		Design Pile Tip Elev. (ft)		Specified Tip Elev. (ft)
			Lateral Load	Vertical Load	Lateral Load	Vertical Load	
OS PM-9.70(1)	1117+25	5'-0"	40.0	-	-27.10	-	-27.10
OS PM-10.16(1)	1141+40	4'-0"	40.0	9.0	-26.80	4.20	-26.80
OS PM-R0.20(1)	1170+16	5'-0"	40.0	43.0	-31.80	-34.80	-34.80
OS PM-R1.00(1)	1212+47	5'-0"	40.0	-	-26.60	-	-26.60
OS PM-R1.10(1)	1217+68	5'-0"	35.0	43.5	-20.40	-28.90	-28.90
OS PM-2.50(1)	1277+88	5'-0"	40.0	-	-19.70	-	-19.70
OS PM-2.67(1)	1286+00	5'-0"	35.0	-	-16.80	-	-16.80
OS1-1	1303+42	5'-0"	35.0	-	-20.10	-	-20.10
OS2-1	1312+00	5'-0"	40.0	12.0	-26.50	1.50	-26.50
OS3-1,2	1330+59	5'-0"	40.0	-	-25.80	-	-25.80
OS4-1	1346+50	5'-0"	40.0	17.0	-23.40	-0.40	-23.40
OS5-1	1356+50	5'-0"	40.0	-	-21.70	-	-21.70
OS7-1	1381+20	5'-0"	40.0	23.0	-17.30	-0.30	-17.30
OS8-1	1398+52	5'-0"	40.0	36.0	-13.70	-9.70	-13.70
OS10-1	1425+02	4'-0"	35.0	31.0	-7.20	-3.20	-7.20
OS10-2	1426+51	4'-0"	35.0	31.0	-7.10	-3.10	-7.10
OS12-1,2	1454+30	5'-0"	40.0	32.0	-9.60	-1.60	-9.60
OS15-1	1489+39	5'-0"	40.0	4.0	-5.00	31.00	-5.00
OS17-1,2	1519+89	5'-0"	45.0	54.0	-7.10	-16.10	-16.10
OS19-1	1539+52	5'-0"	45.0	-	-10.80	-	-10.80
OS20-1	1560+00	5'-0"	45.0	41.0	-11.00	-7.00	-11.00
OS22-1	1583+32	5'-0"	50.0	6.0	-33.60	10.40	-33.60
OS24-1	1598+85	5'-0"	45.0	-	-31.60	-	-31.60

Sign Designation	Station	Pile Dia. (ft)	CIDH Pile Length (ft) Due to		Design Pile Tip Elev. (ft)		Specified Tip Elev. (ft)
			Lateral Load	Vertical Load	Lateral Load	Vertical Load	
OS25-1,2	1620+28	5'-0"	40.0	-	-4.30	-	-4.30
OS27-1,2	1648+25	5'-0"	40.0	28.0	-4.90	7.10	-4.90
OS29-1,2	1667+00	5'-0"	42.0	35.0	-9.20	-2.20	-9.20
OS31-1	1683+64	5'-0"	40.0	44.0	-7.90	-11.90	-11.90
OS32-1,2	1701+68	5'-0"	40.0	41.5	-10.10	-11.60	-11.60
OS35-1	1728+50	5'-0"	40.0	22.0	-12.80	5.20	-12.80
OS37-1,2	1748+89	5'-0"	45.0	29.0	-20.60	-4.60	-20.60
OS41-1,2	1802+93	5'-0"	45.0	41.0	-22.30	-18.30	-22.30
OS43-2	1831+48	5'-0"	40.0	7.0	-22.00	11.00	-22.00
OS45-1,2	1854+65	5'-0"	40.0	56.0	-25.50	-41.50	-41.50
OS47-1	1879+00	5'-0"	35.0	-	-2.10	-	-2.10
OS47-2,3	1884+36	5'-0"	40.0	-	-21.90	-	-21.90
OS51-1	1932+43	4'-0"	35.0	3.0	-21.30	10.70	-21.30
OS51-2	1933+92	4'-0"	35.0	34.0	-20.80	-19.80	-20.80
OS53-2	1958+20	5'-0"	40.0	-	-20.50	-	-20.50
OS54-1	1966+00	4'-0"	40.0	4.0	-17.80	18.20	-17.80
OS55-1	1989+88	4'-0"	40.0	10.0	-6.70	23.30	-6.70
OS57-1,2	2014+15	5'-0"	40.0	7.0	-0.40	32.60	-0.40
OS60-1	2058+00	4'-0"	35.0	60.0	25.00	0	0
OS63-1,2	2089+88	4'-0"	40.0	17.0	21.20	44.20	21.20
OS64-1	2103+38	4'-0"	35.0	7.0	22.20	50.20	22.20
OS65-1	2111+70	4'-0"	35.0	7.0	33.00	61.00	33.00
OS66-1,2	2121+88	5'-0"	40.0	54.0	21.10	7.10	7.10
OS68-1	2148+28	5'-0"	40.0	63.0	6.70	-16.30	-16.30
OS68-2,3	2156+60	5'-0"	35.0	4.0	-0.20	30.80	-0.20
OS70-1	2174+68	4'-0"	25.0	2.5	5.70	28.20	5.70
OS75-1	2246+52	4'-0"	30.0	17.0	-5.60	7.40	-5.60
OS76-1	2253+88	4'-0"	40.0	4.0	-16.60	19.40	-16.60
OS77-1	2275+00	4'-0"	40.0	5.0	-13.30	21.70	-13.30
OS79-1	2301+40	4'-0"	40.0	16.0	-12.50	11.50	-12.50
OS82-1	2333+08	4'-0"	40.0	38.0	-13.20	-11.20	-13.20
OS84-1	2361+24	4'-0"	30.0	4.0	-8.10	17.90	-8.10
OS87-1	2411+23	4'-0"	30.0	5.0	-6.50	18.50	-6.50

Sign Designation	Station	Pile Dia. (ft)	CIDH Pile Length (ft) Due to		Design Pile Tip Elev. (ft)		Specified Tip Elev. (ft)
			Lateral Load	Vertical Load	Lateral Load	Vertical Load	
OS89-1	2436+64	4'-0"	30.0	18.0	1.70	13.70	1.70
OS92-2	2480+93	5'-0"	40.0	-	-31.80	-	-31.80
OS94-1	2507+33	4'-0"	40.0	41.0	-32.20	-33.20	-33.20
OS95-1	2523+17	4'-0"	40.0	47.5	-31.90	-39.40	-39.40
OS96-1	2533+73	4'-0"	40.0	7.0	-31.80	1.20	-31.80

(1) The sign designation for this structure is preliminary and it is used in the foundation report only. A final sign designation will be provided during the future "express lanes" project phase.

TABLE 11 – PILE DATA TABLE FOR CARD READER SIGNAL POLE STRUCTURES

Sign Designation	Station	Pile Dia. (ft)	Reference Boring	CIDH Pile Length (ft)	Design Pile Tip Elev. (ft)	Specified Tip Elev. (ft)
				For Lateral Load		
-(1)	1178+00	3'-0"	R-15-880-004	18	-7.62	-7.62
-(1)	1178+15	3'-0"	R-15-880-004	18	-7.62	-7.62
OS6-1	1364+83	3'-0"	R-15-880-012	22	1.68	1.68
OS43-1	1826+20	3'-0"	R-15-880-031	22	3.08	3.08
OS53-1	1952+92	3'-0"	A-15-880-036	22	1.48	1.48
-(1)	2169+40	3'-0"	R-15-880-046	18	20.88	20.88
OS92-1	2471+28	3'-0"	R-15-880-055	18	-3.82	-3.82

(1) The sign designation for this structure is preliminary and it is used in the foundation report only. A final sign designation will be provided during the future "express lanes" project phase.

13.0 NOTES TO DESIGNER

It is our understanding that the lateral pile analysis will be conducted by the structural engineer. It is recommended that the structural engineer verify the pile tip elevations when finalizing the pile data table. Should the specified pile tip elevation required to meet lateral load demands exceed the specified pile tip elevation given within this report, the Geotechnical Engineer must be contacted for further recommendations.

14.0 CONSTRUCTION CONSIDERATIONS

14.1 General Consideration

A safe working distance from underground and overhead utilities should be provided during construction work. If this is not possible, the utility lines may need to be cleared from the site before the start of construction work.

14.2 Cast-In-Drilled-Hole (CIDH) Concrete Pile

a) Caltrans standard specifications and standard special provisions (SSP) for "Cast-in-Place Concrete Piling" should be used for the construction of CIDH concrete piles. Access tubes for acceptance testing should be provided in all CIDH concrete piles that are 24 inches in diameter or larger for construction quality control, except when the holes are dry or when the holes are dewatered without the use of temporary casing to control groundwater. The acceptance test should include Gamma- Gamma Logging and may also include cross-hole sonic logging. Gamma-Gamma Logging should be performed in accordance with California Test Method 233 Standard (CT-233) to check the homogeneity of CIDH concrete piles.

b) Due to the presence of granular material and groundwater, raveling or caving is anticipated, which may require additional drilling and cleaning effort and may increase the concrete volume for the piles. It is prudent to make the contractor aware of these conditions so that appropriate steps can be taken to comply with the standards and maintain the integrity of the CIDH concrete pile.

c) The use of temporary steel casing and/or slurry displacement method of construction is anticipated during pile foundation construction. This should be consistent with any other special conditions required by the Regulatory Agency. Caltrans Standard Specifications and SSPs should be used for construction and quality assurance procedures.

d) In several of the borings, the granular material flowed into the auger. This could be due to the fine material and the flowing water under pressure (artesian conditions). These conditions may present challenge in keeping the hole intact and often special measures such as tremie seal may be required to maintain integrity of the pile excavation and to allow concreting under a controlled condition.

e) Near some of the proposed sign locations, cobbles and gravel material were encountered and presenting a refusal condition. However, if the design requires the pile to be extended into these layers, slurry method or casing should be used to attain the required tip elevation. Additional efforts such as oscillating casing may be required to penetrate the gravel and cobble material.

f) The proposed sign locations are within the median of the busy highway. Contractor should study the available data including the challenging subsurface soil conditions and groundwater conditions before starting the construction at these locations to avoid long-term closure and traffic impacts.

g) It is recommended that the specifications set certain criteria for qualifications and previous work experience requirements to pre-qualify the potential contractors. The intent is to help select qualified contractors to reduce construction issues.

h) All pile excavations should be observed by the geotechnical engineer or regulatory agency prior to the placement of reinforcement and concrete so that if conditions differ from those anticipated, appropriate recommendations can be made.

15.0 PLAN REVIEW

This report is prepared for the proposed “I-880 Median Barrier Replacement and Express Lane Project”. We recommend that final foundation plans for the proposed project to be reviewed by PARIKH prior to construction so that the intent of our recommendations is

included in the project plans and specifications and to further see that no misunderstandings or misinterpretations have occurred. However, design-build elements should be reviewed only from overall compliance standpoint.

16.0 CONSTRUCTION OBSERVATION

To a degree, the performance of any structure is dependent upon construction procedures and quality control measures. Hence, geotechnical observation and testing of grading operations, foundation excavations, and observation of pile installations should be carried out by the Geotechnical Engineer. If the subsurface conditions different from those forming the basis of our recommendations are encountered, this office should be informed in order to assess the need for design changes. Therefore, the recommendations presented in this report are contingent upon good quality control and these geotechnical observations during construction.

17.0 INVESTIGATION LIMITATIONS

Our services consist of professional opinions and recommendations made in accordance with generally accepted geotechnical engineering principles and practices and are based on our site reconnaissance and the assumption that the subsurface conditions do not deviate from observed conditions. All work done is in accordance with generally accepted geotechnical engineering principles and practices. No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work or by the furnishing of oral or written reports or findings.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in structures, soil, surface water, groundwater or air, below or around this site. Unanticipated soil conditions are commonly encountered and cannot be fully determined by taking soil samples and excavating test borings; different soil conditions may require that additional expenditures be made during construction to attain a properly constructed project. Some contingency fund is thus recommended to accommodate these possible extra costs.

This report has been prepared for the proposed project as described earlier, to assist the engineer in the design of this project. In the event any changes in the design or location of the facilities are planned, or if any variations or undesirable conditions are encountered during construction, our conclusions and recommendations shall not be considered valid unless the changes or variations are reviewed and our recommendations modified or approved by us in writing.

This report is issued with the understanding that it is the designer's responsibility to ensure that the information and recommendations contained herein are incorporated into the project and that necessary steps are also taken to see that the recommendations are carried out in the field.

The findings in this report are valid as of the present date. However, changes in the subsurface conditions can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control.

Respectfully submitted,
PARIKH CONSULTANTS, INC.

Alston Lam, P.E., G.E. 2605
Project Engineer

Y. David Wang, Ph.D., P.E. 52911
Senior Project Engineer

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REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

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STATE OF CALIFORNIA EDMUND G. BROWN, JR., Governor

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT
2424 Arden Way, Suite 125
Sacramento, California 95825
doshM&Tsac@dir.ca.gov

Telephone (916) 574-2540
FAX (916) 574-2542

January 5, 2015

Calif. Dept. of Transportation
111 Grand Avenue
Oakland, CA 94612

Attention: Chris Risden, Branch Chief

Subject: Project: 15051 – Route 880 Sign Posts, Alameda County
Classification: Potentially Gassy With Special Conditions
Number Attached: 8 (A-H)

The information provided to this office relative to the above project has been reviewed. On the basis of this analysis, Underground Classifications of "Potentially Gassy With Special Conditions" have been assigned to the tunnels identified on your submittal. Please retain the original Classifications for your records and deliver a true and correct copy of each Classification to the tunnel contractor for posting at the job site.

When the contractor who will be performing the work is selected, please advise them to notify this office to schedule the mandated Pre-Job Conference with the Division prior to commencing any activity associated with boring of the tunnels. A Pre-Job Request Form is enclosed.

Should you have another bore under construction that is not required to have an Underground Classification (i.e.: less than 30 inches in diameter), please contact the Mining and Tunneling Unit prior to any employee entry of such a space.

If you have any questions on this subject, please contact this office at your earliest convenience.

Sincerely,

Douglas Patterson
Senior Engineer

enc: Classifications
Pre-Job Request Form

cc: christopher.risden@dot.ca.gov
rifaat.nashed@dot.ca.gov
rbrockman@dir.ca.gov

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

15051A001CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

of 111 GRAND AVENUE; OAKLAND, CA 94612

at ROUTE 880 SIGN POSTS

has been classified as *** POTENTIALLY GASSY WITH SPECIAL CONDITIONS ***

as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The two 60-inch-diameter 23-to-25-foot-deep drilled vertical shafts alongside Route 880 located between Fremont Boulevard & Auto Mall Parkway in Fremont, Alameda County

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

January 5, 2015

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

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4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 60-inch-diameter 25-foot-deep drilled vertical shaft alongside Route 880 located between Stevenson Boulevard & Mowry Avenue in Fremont, Alameda County

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

January 5, 2015

State of California

Department of Industrial Relations

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The 60-inch-diameter 25-foot-deep drilled vertical shaft alongside Route 880 located between Central & Thorton Avenue in Fremont, Alameda County

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

January 5, 2015

State of California

Department of Industrial Relations

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This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

January 5, 2015

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The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 60-inch-diameter 25-foot-deep drilled vertical shaft alongside Route 880 located between Decoto Road & Paseo Padre Parkway in Fremont, Alameda County

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

January 5, 2015

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

15051F001CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

of 111 GRAND AVENUE; OAKLAND, CA 94612

at ROUTE 880 SIGN POSTS

has been classified as *** POTENTIALLY GASSY WITH SPECIAL CONDITIONS ***

as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
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3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The two 60-inch-diameter 25-foot-deep drilled vertical shafts alongside Route 880 located between Alvarado/Fremont Boulevard & Alvarado-Niles Road in Union City, Alameda County

This classification shall be conspicuously posted at the place of employment.

January 5, 2015

Douglas Patterson, Senior Engineer

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

15051G001CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

of 111 GRAND AVENUE; OAKLAND, CA 94612

at ROUTE 880 SIGN POSTS

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as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

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2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The two 60-inch-diameter 23-foot-deep drilled vertical shafts alongside Route 880 located between Winton Avenue & A Street in San Lorenzo, Alameda County

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

January 5, 2015

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

15051H001CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

of 111 GRAND AVENUE; OAKLAND, CA 94612

at ROUTE 880 SIGN POSTS

has been classified as *** POTENTIALLY GASSY WITH SPECIAL CONDITIONS ***

as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

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2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The three 60-inch-diameter 25-to-26-foot-deep drilled vertical shafts alongside Route 880 located between Washington Avenue & Floresta Boulevard in San Lorenzo, Alameda County

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

January 5, 2015

State of California
Department of Industrial Relations
Division of Occupational Safety & Health

REQUEST FOR PRE-JOB (TUNNEL)

ATTACH COPY OF CLASSIFICATION AND DIESEL PERMIT

Company Name: _____

Phone _____ FAX: _____

DATE FAXED: _____

PLEASE NOTE: THE BORING CONTRACTOR SHOULD SCHEDULE THE PREJOB AS FAR IN ADVANCE AS POSSIBLE – AT LEAST 3-4 DAYS IN ADVANCE. THE DIVISION REQUIRES THE JOB TO BE SET UP WHEN THE FIELD ENGINEER ARRIVES FOR THE PREJOB. THIS MEANS THAT THE BORE PIT HAS BEEN DUG AND PROPERLY GUARDED, THE CRANE IS IN PLACE AND READY TO LIFT, THE BORING MACHINE IS IN THE PIT AND READY TO GO, AND THE CREW IS READY TO BEGIN BORING THE TUNNEL. IF THERE IS A DELAY IN SETTING UP THE JOB, THE BORING CONTRACTOR SHOULD CONTACT THE DIVISION IMMEDIATELY.

PRE-JOB REQUEST DATE & TIME: _____

ON-SITE SUPERVISOR & CELL NO.: _____

CLASSIFICATION #: _____ **DIESEL PERMIT #:** _____

BORE DIAMETER AND LENGTH: _____ (Diameter) _____ (Length)

IS BORE ENTRY ANTICIPATED? **YES** **NO**
(Circle One)

You MUST contact the Division if entry is planned, REGARDLESS of the bore diameter.

MANNER OF EXCAVATION: _____

_____

JOB-SITE LOCATION AND DIRECTIONS: _____

_____

_____

GENERAL CONTRACTOR: _____

SUBMITTED BY: _____

REVIEWED BY: _____ **DATE:** _____

☐ *Mining & Tunneling Unit, District 1*
2424 Arden Way, Suite 125
Sacramento, California 95825-2400
(916) 574-2540; ***FAX: (916) 574-2542***

☐ *Mining & Tunneling Unit, District 2*
6150 Van Nuys Blvd., Suite 310
Van Nuys, California 91401-3333
(818) 901-5420; ***FAX: (818) 901-5579***

☐ *Mining & Tunneling Unit, District 3*
464 West Fourth Street, Suite 354
San Bernardino, California 92401-1442
(909) 383-6782; ***FAX: (909) 388-7132***

STATE OF CALIFORNIA EDMUND G. BROWN, JR., Governor

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT
2424 Arden Way, Suite 125
Sacramento, California 95825
doshM&Tsac@dir.ca.gov

Telephone (916) 574-2540
FAX (916) 574-2542

June 8, 2015

State of California Department of Transportation
c/o Parikh
2360 Qume Dr, Ste A
San Jose, CA 95131

Attention: Alston Lam, Project Engineer

Subject: Project: 15082 – I-880 Median Barrier Replacement County
Classification: Potentially Gassy With Special Conditions
Number Attached: 1(A)

The information provided to this office relative to the above project has been reviewed. On the basis of this analysis, an Underground Classification of "Potentially Gassy With Special Conditions" has been assigned to the tunnel identified on your submittal. Please retain the original Classification for your records and deliver a true and correct copy of the Classification to the tunnel contractor for posting at the job site.

When the contractor who will be performing the work is selected, please advise them to notify this office to schedule the mandated Pre-Job Conference with the Division prior to commencing any activity associated with boring of the tunnel. A Pre-Job Request Form is enclosed.

Should you have another bore under construction that is not required to have an Underground Classification (i.e.: less than 30 inches in diameter), please contact the Mining and Tunneling Unit prior to any employee entry of such a space.

If you have any questions on this subject, please contact this office at your earliest convenience.

Sincerely,

Douglas Patterson
Senior Engineer

enc: Classification(s)
Pre-Job Request Form

cc: DoshM&TSac@dir.ca.gov, Mining & Tunneling Unit

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

15082A001CT **STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**

of **111 GRAND AVENUE, 8TH FLOOR; OAKLAND, CA 94612**

at **I-880 MEDIAN BARRIER REPLACEMENT**

has been classified as ***** POTENTIALLY GASSY WITH SPECIAL CONDITIONS *****

as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

*****SPECIAL CONDITIONS*****

1. **A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.**
2. **Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.**
3. **The Division shall be notified immediately if any Flammable Gas or Petroleum Vapor exceeds 5% of the Lower Explosive Limit.**
4. **All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.**

The fifty-eight 36-to-60-inch diameter drilled holes in the median of I-880 located between Cushing Parkway in Fremont and 66th Avenue in Oakland, Alameda County

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

June 8, 2015

State of California
Department of Industrial Relations
Division of Occupational Safety & Health

REQUEST FOR PRE-JOB (TUNNEL)

ATTACH COPY OF CLASSIFICATION AND DIESEL PERMIT

Company Name:_____

Phone_____FAX:_____

DATE FAXED: _____

PLEASE NOTE: THE BORING CONTRACTOR SHOULD SCHEDULE THE PREJOB AS FAR IN ADVANCE AS POSSIBLE - AT LEAST 3-4 DAYS IN ADVANCE. THE DIVISION REQUIRES THE JOB TO BE SET UP WHEN THE FIELD ENGINEER ARRIVES FOR THE PREJOB. THIS MEANS THAT THE BORE PIT HAS BEEN DUG AND PROPERLY GUARDED, THE CRANE IS IN PLACE AND READY TO LIFT, THE BORING MACHINE IS IN THE PIT AND READY TO GO, AND THE CREW IS READY TO BEGIN BORING THE TUNNEL. IF THERE IS A DELAY IN SETTING UP THE JOB, THE BORING CONTRACTOR SHOULD CONTACT THE DIVISION IMMEDIATELY.

PRE-JOB REQUEST DATE & TIME: _____

ON-SITE SUPERVISOR & CELL NO.: _____

CLASSIFICATION #: _____ **DIESEL PERMIT #:** _____

BORE DIAMETER AND LENGTH: _____ _____
(Diameter) (Length)

IS BORE ENTRY ANTICIPATED? YES NO
(Circle One)

You MUST contact the Division if entry is planned, REGARDLESS of the bore diameter.

MANNER OF EXCAVATION: _____

_____

JOB-SITE LOCATION AND DIRECTIONS: _____

_____

_____

GENERAL CONTRACTOR: _____

SUBMITTED BY: _____

REVIEWED BY: _____ **DATE:** _____

☐ *Mining & Tunneling Unit, District 1*
2424 Arden Way, Suite 125
Sacramento, California 95825-2400
(916) 574-2540; ***FAX: (916) 574-2542***

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Van Nuys, California 91401-3333
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☐ *Mining & Tunneling Unit, District 3*
464 West Fourth Street, Suite 354
San Bernardino, California 92401-1442
(909) 383-6782; ***FAX: (909) 388-7132***

NON-STORM WATER INFORMATION HANDOUT
CONTRACT NO. 2J0700

Replace Concrete Median Barrier and Overhead Signs and Install Freeway Lighting on Route 880
04-SM-880-PM 2.9/27.58
Alameda County on Route 880

California Department of Transportation
District 4, 111 Grand Avenue
Oakland, CA 94612

1. Project Description

The project proposes to replace concrete median barrier over about 24 miles of Route 880 in Alameda County between Landing Parkway in Fremont and High Street Viaduct in Oakland. In addition to the barrier, the project will replace a number of overhead signs and install about 8.5 miles of lighting in the median. To coordinate with a later project that will create express lanes for the Metropolitan Transportation Commission (MTC), additional sign and lighting foundations will be constructed in the median within the limits of this project. Sign and light foundations will be CIDH piles that will require excavation from 10 to 49 ft. deep.

Due to the extended length of the project area (24.68 miles), the project area is divided to 11 segments for Caltrans and MTC Sign and Lighting Posts (see attached table); and 7 segments for 51 culverts replacement/removal within the project limit. The division is based on the clustering of overhead signs, lighting locations, culvert locations, and similar subsurface conditions. A total of 57 CIDH pile foundations for new overhead signs will be constructed in the median and 10 more on the outside shoulders of the freeway. About 320 CIDH Pile foundations (mostly 2 ft. diameter x 10 ft. deep) for new overhead lights will be constructed in the median. Excavation for the MTC sign foundations, all in the median will vary from 20 to 48.6 ft. deep. Excavations for the OH signs on the outside shoulders (all Caltrans-owned) will be 23 to 28 ft. deep. The signs on the outside shoulder will be excavated in unpaved soil with no protection from aerially deposited lead contamination.

2. Construction Activities triggering Dewatering

Dewatering is anticipated due to the construction of Caltrans and MTC Overhead Sign and Lighting Posts at various locations. The groundwater elevation through the project area varies between -2.8 m (-9.2 ft) at Boring No.B-2 Contract #56-4TC45-Fand 9.2 m (30.3 ft) at Boring No. B-4 Contract #04-016011. For calculation, the shallowest groundwater elevation in each segment and the deepest hole excavation will be used. The average seepage rate (flow rate) for the project area ranges approximately between 145 Gallons/day/hole (segment 5) and 27,800 Gallons/day/hole (segment 3). The dewatering cost estimate for culvert replacement/removal is not included in the estimate because the average seepage rate (flow rate) for the project area is almost 0.0 Gallon/day/hole (Segment 7).

DEWATERING LOCATION MAP

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	880	2.9/27.3	1	

INDEX OF PLANS

SHEET No.	DESCRIPTION
1	TITLE SHEET AND LOCATION MAP
2	TYPICAL CROSS SECTIONS
3 - 102	LAYOUT

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

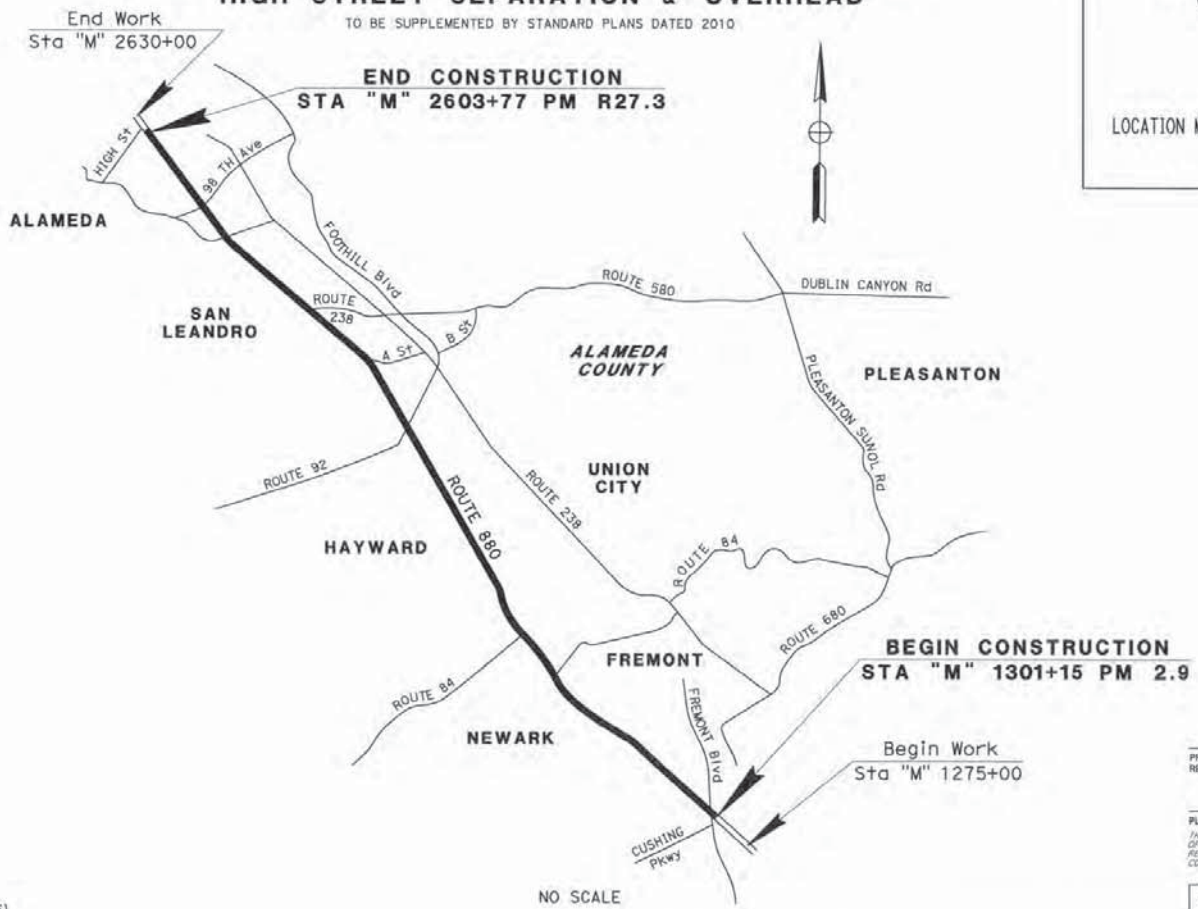
PROJECT PLANS FOR CONSTRUCTION ON

STATE HIGHWAY

IN ALAMEDA COUNTY

IN FREMONT, UNION CITY, HAYWARD, SAN LORENZO SAN LEANDRO, AND OAKLAND, FROM 0.4 MILES SOUTH OF FREMONT BLVD. OVERCROSSING TO HIGH STREET SEPARATION & OVERHEAD

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010



PROJECT ENGINEER REGISTERED CIVIL ENGINEER DATE

Paul Alan Snyder No. 41128 Exp. 3-31-17 CIVIL STATE OF CALIFORNIA

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

CONTRACT No.	04-2J0701
PROJECT ID	0414000421

PROJECT MANAGER: EMILY LANDIN LOWE

DESIGN MANAGER: ALBERT ZEPEDA

LAST REVISION 08-05-14 | DATE PLOTTED => 28-JAN-2015 | TIME PLOTTED => 09:21

GROUNDWATER SEEPAGE RATE

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

M e m o r a n d u m

serious drought.
Help Save Water!

To: MR. ALBERT ZEPEDA
Senior Transportation Engineer
District 4- Design East, Alameda County

Date: May 5, 2015

Attention: P.Snyder

File: 04- ALA- 880 PM 2.9/27.58
04-2J0700
E-FIS # 0414000421
Median Barrier replacement
(Seepage Rate)

From: RIFAAT NASHED
Engineering Geologist
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

CHRIS RISDEN
Chief, Branch B
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

PROFESSIONAL GEOLOGIST
CHRIS RISDEN
CERTIFIED ENGINEERING GEOLOGIST
No. 2011
Exp. 4/30/15
STATE OF CALIFORNIA

Subject : SEEPAGE RATE (FLOW RATE) ESTIMATE AT CIDH PILES EXCAVATION THAT WILL BE INCLUDED IN THE PROJECT AREA.

This memo is in response to your request to provide the approximate groundwater seepage rate for replacing concrete median barrier and overhead signs and install freeway lighting in the median of Route 880 between Landing Parkway in Fremont and the High Street Viaduct in Oakland. It is our understanding that this information will be used in estimating dewatering quantities.

It should be noted that our estimates are based on the following:

1- Due to the extended length of the project area (24.68 miles) and for simplicity, the project area is divided to 11 sections (segments). The division is based on the clustering of overhead signs and lighting locations, and similar subsurface conditions. The segments are as follows:

Segment No.	Post mile	M-Line Stationing	No. of Caltrans Overhead signs Posts included	No. of MTC Overhead signs Posts included	No. of Caltrans Lighting Posts included	No. of Caltrans Lighting Posts included
1	2.97/4.47	1303+35-1382+39	2	7	13	16
2	4.59/7.83	1388+52-1560+00	–	8	_	37
3	7.92/8.28	1564+75-1583+32	–	1	8	
4	8.4/11.03	1590+00-1728+50	3	7	_	18
5	11.41/12.48	1748+28-1805+08	2	2	_	1
6	12.51/12.94	1807+11-1829+45	–	1	12	_
7	12.98/14.05	1831+48-1937+92	–	6	12	22
8	14.5/14.99	1948+92-22285+00	4	15	26	48
9	21.88/23.61	2301+40-2393+15	–	3	40	_
10	24.43/26.08	2436+50-2523+17	–	5	39	_
11	26.11/27.58	2525+10-2602+60	–	1	31	_

2- The groundwater elevation through the project area varies between -2.8 m (-9.2 ft) (at Boring NO. B-2 Contract # 56-4TC45-F)) and 9.2 m (30.2 ft) (at Boring No. B-4, Contract # 04-016011). Accordingly we considered the groundwater elevation in each segment separate. We used the shallowest groundwater elevation in each segment as the most conservative estimate. The following table shows the groundwater elevation used in each segment and the borehole used to determine it:

Segment No.	Post mile	M-Line Stationing	Groundwater elevation (m)	Borehole No.	Contract No.
1	2.97/4.47	1303+35-1382+39	4.3	B-7	04-115404
2	4.59/7.83	1388+52-1560+00	-2.7	B-1	57-4TC45
3	7.92/8.28	1564+75-1583+32	0.4	B-2	57-4TC45F
4	8.4/11.03	1590+00-1728+50	3.0	B-6	04-40824
5	11.41/12.48	1748+28-1805+08	0.9	BB-2	04-2333164
6	12.51/12.94	1807+11-1829+45	-2.8	B-2	57-4TC45-F
7	12.98/14.05	1831+48-1937+92	5.1	B-4	57-4TC45-F
8	14.5/14.99	1948+92-22285+00	9.2	B-4	04-016011
9	21.88/23.61	2301+40-2393+15	5.6	DV-2	04-3A9214
10	24.43/26.08	2436+50-2523+17	3.0	B-5	04-140201
11	26.11/27.58	2525+10-2602+60	1.5	S-1	04-165421

3- In our calculation we considered the deepest hole excavation (the most conservative scenario) which is the pile tip of the overhead sign, since lighting piles in general are 3 m (10 ft) only. The pile tips considered in each segment are as follows:

Segment No.	Post mile	M-Line Stationing	CIDH pile length (m)	Borehole Diameter (m)	Pile tip elevation (m)
1	2.97/4.47	1303+35-1382+39	14.8	1.52	-7.86
2	4.59/7.83	1388+52-1560+00	14.8	1.52	- 4.18
3	7.92/8.28	1564+75-1583+32	16.3	1.52	-7.2

4	8.4/11.03	1590+00-1728+50	14.8	1.52	-9.6
5	11.41/12.48	1748+28-1805+08	14.8	1.52	- 6.27
6	12.51/12.94	1807+11-1829+45	6.1	0.91	1.6
7	12.98/14.05	1831+48-1937+92	13.28	1.52	8.0
8	14.5/14.99	1948+92-22285+00	13.28	1.52	- 5.0
9	21.88/23.61	2301+40-2393+15	13.28	1.22	- 4.0
10	24.43/26.08	2436+50-2523+17	13.28	1.22	- 9.8
11	26.11/27.58	2525+10-2602+60	11.77	1.22	- 9.7

We used the Coefficient of Permeability, K value $4.83429e^{-05}$ m/s (13.7ft/day) poorly graded gravel (GP), $4.94015e^{-06}$ m/s (1.4 ft/day) for well, poorly graded sand (SW &SP) and silty sand (SM) and silt (ML), $9.52744e^{-09}$ m/s ($2.7x\ 10^{-3}$ ft/day) for lean clay (CL), $9.52744e^{-10}$ m/s ($2.7x\ 10^{-4}$ ft/day) for elastic silt (MH), and $9.52744e^{-11}$ m/s ($2.7x\ 10^{-5}$ ft/day) for fat clay (CH).

According to "The Federal Highway Report NO. FHWA-TS-80-224, Page 48-49" the Coefficient of Permeability K (ft/day) for the soils encountered are as follows:

Unified Soil Classification	Coefficient of Permeability K (ft./day)	Coefficient of Permeability K (m/s)
Poorly graded gravel (GP)	13.7 to 24,400	$4.83429e-^{5}$ to 0.000966859
Well graded sand (SW)	1.4 to 137	$4.94015e-^{6}$ to 0.00048429
Poorly graded sand (SP)	0.14 to 1.4	$4.94015e-^{7}$ to $4.94015e-^{6}$
Silty sand (SM)	$2.7x10^{-4}$ to 1.4	$9.52744e-^{10}$ to $4.94015e-^{6}$
Calyey sand (SC)	$2.7x10^{-5}$ to 0.14	$9.52744e-^{11}$ to $4.94015e-^{7}$
Silt (ML)	$2.7x10^{-5}$ to 0.14	$9.52744e-^{11}$ to $4.94015e-^{7}$
Lean clay (CL)	$2.7x10^{-5}$ to $2.7x\ 10^{-3}$	$9.52744e-^{11}$ to $9.52744e-^{09}$
Elastic silt (MH)	$2.7x10^{-6}$ to $2.7x\ 10^{-4}$	$9.52744e-^{12}$ to $9.52744e-^{10}$
Fat clay (CH)	$2.7x10^{-7}$ to $2.7x\ 10^{-5}$	$9.52744e-^{13}$ to $9.52744e-^{11}$

Our estimate of the average seepage rate (flow rate) for the project area ranges approximately between 145 Gallons /day/ hole (segment 5) and 27,800 Gallons /day/ hole (segment 3). This seepage rate (flow rate) estimate is provided for cost estimate purposes only.

If you have any questions or need additional information, please call Rifaat Nashed at (510) 622-1773 or Cris Risden at (510) 622-8757.

c: TPokrywka, CRisden, J. Moore, J.Chen, Daily File

RNashed/

ALA 880 PM 2.9/27.58 Median Barrier Replacement Project - SEEPAGE RATE (sheet 1)

Segment NO.	Soil Type	Bed thickness (m)	K m/s	√K	GW ELEV. (m)	Pile Tip elev. (m)	H	H^2	hw^2	R_0	Tw (m)	Q m^3/s	Q ft^3/sec	Q ft^3/day	Q Gallon/day
	Silt fill (ML)	6.70	4.94015E-07	0.000702862	4.3	-7.86	1.2	1.44	0	2.530303	1.52	4.38307E-06	0.000154787	13.3735652	99.8
Segment 1	Clayey sand fill (SC)	0.90	4.94015E-07	0.000702862	4.3	-7.86	2.1	4.41	0	4.428031	1.52	6.39781E-06	0.000225937	19.5209165	145.7
	Silty sand (SM)	5.77	4.94015E-06	0.002222645	4.3	-7.86	7.9	61.9369	0	52.47664	1.52	0.000271277	0.00958005	827.716359	6177.0
Average															**6422.5**
	lean clay (CL)	0.9	9.52744E-09	9.76086E-05	-2.7	-4.18	0.9	0.81	0	0.263543	1.52	-1.3829E-08	-4.8837E-07	-0.04219531	0.0
	Poorly graded sand (SP)	2.13	4.94015E-06	0.002222645	-2.7	-4.18	3.03	9.1809	0	20.20384	1.52	5.50467E-05	0.001943956	167.957825	1253.4
Segment 2	lean clay (CL)	7.90	9.52744E-09	9.76086E-05	-2.7	-4.18	10.93	119.4649	0	3.200586	1.52	4.79965E-06	0.000169498	14.6446254	109.3
	well graded sand (SW)	3.84	4.94015E-06	0.002222645	-2.7	-4.18	14.77	218.1529	0	98.48539	1.52	0.000811279	0.028650033	2475.36288	18472.9
Average															**19835.6**
	Silty sand (SM)	1.52	4.94015E-06	0.002222645	0.4	-7.2	1.52	2.3104	0	10.13526	1.52	1.88894E-05	0.000667074	57.6351633	430.1
Segment 3	Silt (ML)	1.52	4.94015E-07	0.000702862	0.4	-7.2	3.04	9.2416	0	6.410101	1.52	9.96108E-06	0.000351772	30.3931229	226.8
	Silty sand (SM)	4.57	4.94015E-06	0.002222645	0.4	-7.2	7.61	57.9121	0	50.74298	1.52	0.000256078	0.009043299	781.340995	5830.9
	Silt (ML)	3.35	4.94015E-07	0.000702862	0.4	-7.2	10.96	120.1216	0	23.1101	1.52	6.84657E-05	0.002417844	208.901687	1559.0
Average	poorly graded sand (SP)	3.00	4.94015E-06	0.002222645	0.4	-7.2	13.96	194.8816	0	93.08437	1.52	0.00073467	0.02594463	2241.616	16728.5
	Silt (ML)	2.3	4.94015E-07	0.000702862	0.4	-7.2	16.26	264.3876	0	34.28561	1.52	0.000131617	0.004648003	401.587486	2996.9
Average															**27772.2**
	Silt (ML)	1.52	4.94015E-07	0.000702862	3.0	-9.6	1.52	2.3104	0	3.205051	1.52	4.80405E-06	0.000169654	14.6580699	109.4
Segment 4	lean clay (CL)	9.7	9.52744E-09	9.76086E-05	3.0	-9.6	11.22	125.8884	0	3.285506	1.52	4.88589E-06	0.000172544	14.9077809	111.3
	Silt (ML)	3.54	4.94015E-07	0.000702862	3.0	-9.6	14.76	217.8576	0	31.12273	1.52	0.00011193	0.003952772	341.519474	2548.7
															2769.3
Segment 5	lean clay (CL)	14.81	9.52744E-09	9.76086E-05	0.9	-6.27	14.8	219.04	0	4.333822	1.52	6.25426E-06	0.000220867	19.0829217	**142.4**
Segment 6	poorly graded sand (SP)	3.0	4.94015E-06	0.002222645	-2.8	1.6	3.0	9	0	20.0038	0.91	4.51774E-05	0.001595424	137.84466	1028.7
	well graded sand (SW)	3.0	4.94015E-06	0.002222645	-2.8	1.6	6.0	36	0	40.00761	0.91	0.000147602	0.005212516	450.361423	3360.9
Average															**4389.6**
Segment 7	Silt (ML)	7.6	4.94015E-07	0.000702862	5.1	8.0	7.6	57.76	0	16.02525	1.52	3.80384E-05	0.001343313	116.062243	866.1
	poorly graded sand (SP)	3.4	4.94015E-06	0.002222645	5.1	8.0	11.0	119.9025	0	73.01388	1.52	0.000480363	0.016963858	1465.67737	10937.9
	Silt (ML)	2.3	4.94015E-07	0.000702862	5.1	8.0	13.3	175.5625	0	27.93876	1.52	9.35436E-05	0.00330346	285.418919	2130.0
Average															**13934.0**

***Q = π K (H^2 - hw^2) / Ln (R_0 /T_w)……** Dupuit Forcheimer Equation

Notes

Length = bed thickness

k = Soil permeability (from Hwy Subdrainage Design Report No. FHWA - TS-80-224- Page 48-49)

H = Hydraulic head of the original table

h_w = the pile tip (bottom of the hole)

R_0= radius of influnce of hole or point source

= 3000(H-hw) √ K for radial flow

= 1500 (H-hw) √ K for trench / linear flow

T_w = hole diameter

= √ length of excavation area X width of excavation area / π

Q = pumping rate

* Equation obtained from powers, J.P., A.B. Corwin, P.C. Schmall, and W.E. Kaeck, 2007. Construction Dewatering and Groundwater Control, New methods and applications. John Wiley & Sons, Inc., 3rd Edition.

ALA 880 PM 2.9/27.58 Median Barrier Replacement Project - SEEPAGE RATE (Sheet 2)

Segment NO.	Soil Type	Bed thickness (m)	K m/s	√K	GW ELEV. (m)	Pile Tip elev. (m)	H	H^2	hw^2	R_0	Tw (m)	Q m^3/s	Q ft^3/sec	Q ft^3/day	Q Gallon/day
	Silt (ML)	3.65	4.94015E-07	0.000702862	9.2	-5.0	3.7	13.3225	0	7.696339	1.52	1.27408E-05	0.000449936	38.8744575	290.1
Segment 8	lean clay (CL)	2.13	9.52744E-09	9.76086E-05	9.2	-5.0	5.8	33.4084	0	1.692533	1.52	9.29583E-06	0.000328279	28.3633316	211.7
	well graded sand (SW)	2.74	4.94015E-06	0.002222645	9.2	-5.0	8.5	72.5904	0	56.8108	1.52	0.00031097	0.010981803	948.827814	7080.8
	elastic silt with sand (MH)	3.65	9.52744E-10	3.08666E-05	9.2	-5.0	12.2	148.1089	0	1.126938	1.52	-1.4809E-06	-5.2296E-05	-4.51840538	0.0
	poorly graded sand (SP)	1.10	4.94015E-06	0.002222645	9.2	-5.0	13.3	176.0929	0	88.48349	1.52	0.00067212	0.023735686	2050.76329	15304.2
Average															**22886.8**
	lean clay (CL)	7.9	9.52744E-09	9.76086E-05	5.6	-4.0	7.9	62.41	0	2.313324	1.22	2.91805E-06	0.00010305	8.90350981	0.0
	Silt (ML)	1.80	4.94015E-07	0.000702862	5.6	-4.0	9.7	94.09	0	20.45328	1.22	5.17694E-05	0.001828219	157.958133	1178.8
Segment 9	poorly graded sand (SP)	1.80	4.94015E-06	0.002222645	5.6	-4.0	11.5	132.25	0	76.68125	1.22	0.000495428	0.017495876	1511.64371	11280.9
	lean clay (CL)	1.70	9.52744E-09	9.76086E-05	5.6	-4.0	13.2	174.24	0	3.865301	1.22	4.52016E-06	0.000159628	13.7918419	102.9
Average															**12562.6**
Segment 10	poorly graded sand (SP)	6.10	4.94015E-06	0.002222645	3.0	-9.8	6.1	37.21	0	40.6744	1.22	0.000164598	0.005812729	502.219747	3747.9
	lean clay &Silt (CL-ML)	7.20	9.52744E-09	9.76086E-05	3.0	-9.8	13.3	176.89	0	3.894583	1.22	4.55906E-06	0.000161002	13.9105611	103.8
Average															**3851.7**
	poorly graded gravel (GP)	1.00	4.83429E-05	0.006952906	3.0	-9.6	1	1	0	20.85872	1.52	5.79584E-05	0.002046783	176.842043	1319.7
Segment 11	Clayey sand (SC)	0.97	4.94015E-07	0.000702862	3.0	-9.6	1.97	3.8809	0	4.153914	1.52	5.9881E-06	0.000211468	18.270811	136.3
	Fat clay (CH)	1.06	9.52744E-11	9.76086E-06	3.0	-9.6	3.03	9.1809	0	0.088726	1.52	-9.6679E-10	-3.4142E-08	-0.00294987	0.0
															1456.0

***Q = π K (H^2 - hw^2) / Ln (R_0 /T_w)……** Dupuit Forcheimer Equation

Notes

Length = bed thickness

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= √ length of excavation area X width of excavation area / π

Q = pumping rate

* Equation obtained from powers, J.P., A.B. Corwin, P.C. Schmall, and W.E. Kaeck, 2007. Construction Dewatering and Groundwater Control, New methods and applications. John Wiley & Sons, Inc., 3rd Edition.

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

M e m o r a n d u m

Serious drought.
Help Save Water!

To: MR. ALBERT ZEPEDA
Senior Transportation Engineer
District 4- Design East, Alameda County

Date: July 6, 2015

Attention: P.Snyder

File: 04- ALA- 880 PM 2.9/27.58
04-2J0700
E-FIS # 0414000421
Culvert in Median Barrier
Replacement (Seepage Rate)

From: RIFAAT NASHED
Engineering Geologist
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

CHRIS RISDEN
Chief, Branch B
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject: SEEPAGE RATE (FLOW RATE) ESTIMATE AT CULVERTS EXCAVATION THAT WILL BE INCLUDED IN THE PROJECT AREA

This memo is in response to your request to provide the approximate groundwater seepage rate for all culvert work (removal/installation) within the limits of the median barrier replacement project of Route 880 between Landing Parkway in Fremont and the High Street Viaduct in Oakland. It is our understanding that this information will be used in estimating dewatering quantities.

It should be noted that our estimates are based on the following:

1- Due to the extended length of the project area (24.68 miles) and for simplicity, the project area is divided into 9 sections (Segments). The division depends on the clustering of culvert locations, and the subsurface conditions. The segments are as follows:

Segment No.	M-Line Stationing	No. of culverts (Drainage system) included	Culvert Numbers included
1	1374+60 - 1380+25	3	1,2,3 &4
2	1462+09 - 1468+49	4	5,6,7 &8
3	1564+60 - 1584+10	7	9,10,11,1213, 14 &15
4	1640+15 - 1729+28	5	16, 17, 18, 19 &20
5	1933+27- 1937+28	1	21
6	2067+72- 2279+30	19	22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39 & 40
7	2352+93 - 2374+93	11	41, 42, 43, 44,45, 46, 47, 48, 49 , 50 &51

2- The groundwater elevation through the project area ranges between -2.8 m (-9.2 ft) (at Boring NO. B-2 Contract # 56-4TC45-F)) and 9.2 m (30.2 ft) (at Boring No. B-4, Contract # 04-016011). Accordingly, we considered the groundwater elevation in each segment separate. We used the shallowest groundwater elevation in each segment as the most conservative estimate. The following table show the groundwater elevation used in each segment and the borehole used to determine it:

Segment No.	M-Line Stationing	Culvert Numbers included	Groundwater elevation (m)	Borehole No.	Contract No.
1	1374+60 - 1380+25	1,2,3 &4	4.3	B-7	04-115404
2	1462+09 - 1468+49	5,6,7 &8	-2.7	B-1	57-4TC45
3	1564+60 - 1584+10	9,10,11,12 13, 14 &15	0.4	B-2	57-4TC45F
4	1640+15 - 1729+28	16, 17, 18, 19 &20	3.0	B-6	04-40824
5	1933+27- 1937+28	21	5.1	B-4	57-4TC45-F

6	2067+72-2279+30	22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39 & 40	9.2	B-4	04-016011
7	2352+93 - 2374+93	41, 42, 43, 44,45, 46, 47, 48, 49, 50 &51	5.6	DV-2	04-3A9214

3- In our calculation, we considered the deepest hole excavation (as the most conservative case) which is the flow line elevation of each culvert. The flow line elevation that considered in each segment is as follows:

Segment No.	M-Line Stationing	M-Line Stationing	Flow Line elevation range (m)	Ground water elevation (m)
1	1374+60 - 1380+25	1,2,3 &4	6.4 – 7.4	4.3
2	1462+09 - 1468+49	5,6,7 &8	10.7 – 11.1	-2.7
3	1564+60 - 1584+10	9,10,11,1213, 14 &15	3.5 – 11.4	0.4
4	1640+15 - 1729+28	16, 17, 18, 19 &20	8.8 – 10.9	3.0
5	1933+27-1937+28	21	Adjusted inlet	5.1
6	2067+72-2279+30	22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39 & 40	**7.5** – 18.3	9.2
7	2352+93 - 2374+93	41, 42, 43, 44,45, 46, 47, 48, 49 , 50 &51	6.4 – 7.6	5.6

The above table shows that all the culvert elevations are higher than the groundwater and dry, except segment 6 which includes 4 culverts (Culverts No. 37, 38, 39 & 40) located below the groundwater level. The flow line elevation of these 4 culverts ranges between 7.5 m (24.7 ft) and 8.1 m (26.7 ft), below the groundwater elevation of 9.2m (30.1 ft).

4- In our estimate, we used Borehole No. 01-1 (Contract No. 04-016011) as a representative to Segment 6 (Culverts No. 37, 38, 39 & 40) and the lowest elevation 7.5 m (24.4 ft) as the conservative case scenario.

We used the Coefficient of Permeability, K value $9.52744e^{-09}$ m/s ($2.7x\ 10^{-3}$ ft/day) for lean clay (CL)

According to "The Federal Highway Report NO. FHWA-TS-80-224, Page 48-49" the Coefficient of Permeability K (ft/day) for the soil encountered is as follows:

Unified Soil Classification	Coefficient of Permeability K (ft./day)	Coefficient of Permeability K (m/s)
Lean clay (CL)	$2.7x10^{-5}$ to $2.7x\ 10^{-3}$	$9.52744e-^{11}$ to $9.52744e-^{09}$

Our estimate of the average seepage rate (flow rate) for the project area is almost 0.0 Gallon /day/ hole (Segment 7). This seepage rate (flow rate) estimate is provided for cost estimate purposes only.

If you have any questions or need additional information, please call Rifaat Nashed at (510) 622-1773 or Cris Risden at (510) 622-8757.

c: TPokrywka, CRisden, JMoore, CChen, Daily File

RNashed/mm

PROFESSIONAL GEOLOGIST
CHRIS RISDEN
CERTIFIED ENGINEERING GEOLOGIST
No. 2541
Exp 9/30/15
STATE OF CALIFORNIA

ALA 880 PM 2.9/27.58 Median Barrier Replacement Project (Culverts) - SEEPAGE RATE

Segment NO.	Soil Type	Bed thickness (m)	K m/s	√K	GW ELEV. (m)	Flow line elev. (m)	H	H^2	hw^2	R_0	Tw (m)	Q m^3/s	Q ft^3/sec	Q ft^3/day	Q Gallon/day
Segment 7	lean clay (CL)	1.84	9.52744E-09	9.76086E-05	9.34	7.5	1.84	3.3856	0	0.2694	1.9	-5.185E-08	-1.8311E-06	-0.15820361	-1.2
Average															0.0

$*Q = \pi K (H^2 - hw^2) / Ln (R_0/T_w)$..... Dupuit Forcheimer Equation

Notes

Length = bed thickness

k = Soil permeability (from Hwy Subdrainage Design Report No. FHWA - TS-80-224- Page 48-49)

H = Hydraulic head of the original table

h_w = the pile tip (bottom of the hole)

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= 3000(H-hw) √ K for radial flow

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T_w = hole diameter

= √ length of excavation area X width of excavation area / π

Q = pumping rate

* Equation obtained from powers, J.P., A.B. Corwin, P.C. Schmall, and W.E. Kaeck, 2007. Construction Dewatering and Groundwater Control, New methods and applications. John Wiley & Sons, Inc., 3rd Edition.

CONSISTENCY CLASSIFICATION FOR SOILS			
According to the Standard Penetration Test			
SPT N-Value (Blows/ 0.3m)	Granular	SPT N-Value (Blows/ 0.3 m)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very stiff
		>30	Hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

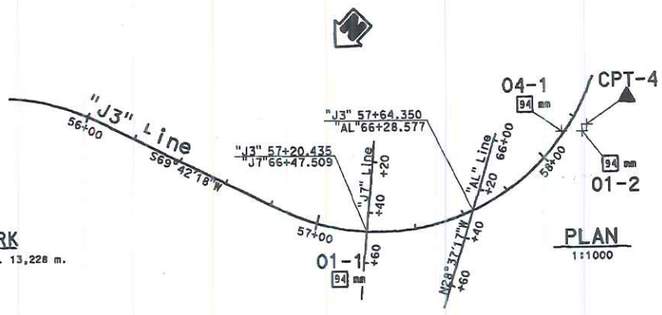
LEGEND OF EARTH MATERIALS

GRAVEL, SAND, SILT, CLAY, SANDY CLAY or CLAYEY SAND, SANDY SILT or SILTY SAND, SILTY CLAY, CLAYEY SILT, PEAT and/or ORGANIC MATTER, COBBLES and/or BOULDERS, IGNEOUS ROCK, SEDIMENTARY ROCK, METAMORPHIC

LEGEND OF BORING OPERATIONS

57 mm CONE PENETRATION; SAMPLE BORING (DRY); ROTARY SAMPLE BORING (WET); AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; JET BORING; ELECTRONIC CONE PENETROMETER

SAMPLE BORING (DRY) — ROTARY SAMPLE BORING (WET) — 57 mm CONE PENETRATION BORING — ELECTRONIC CONE PENETROMETER TEST

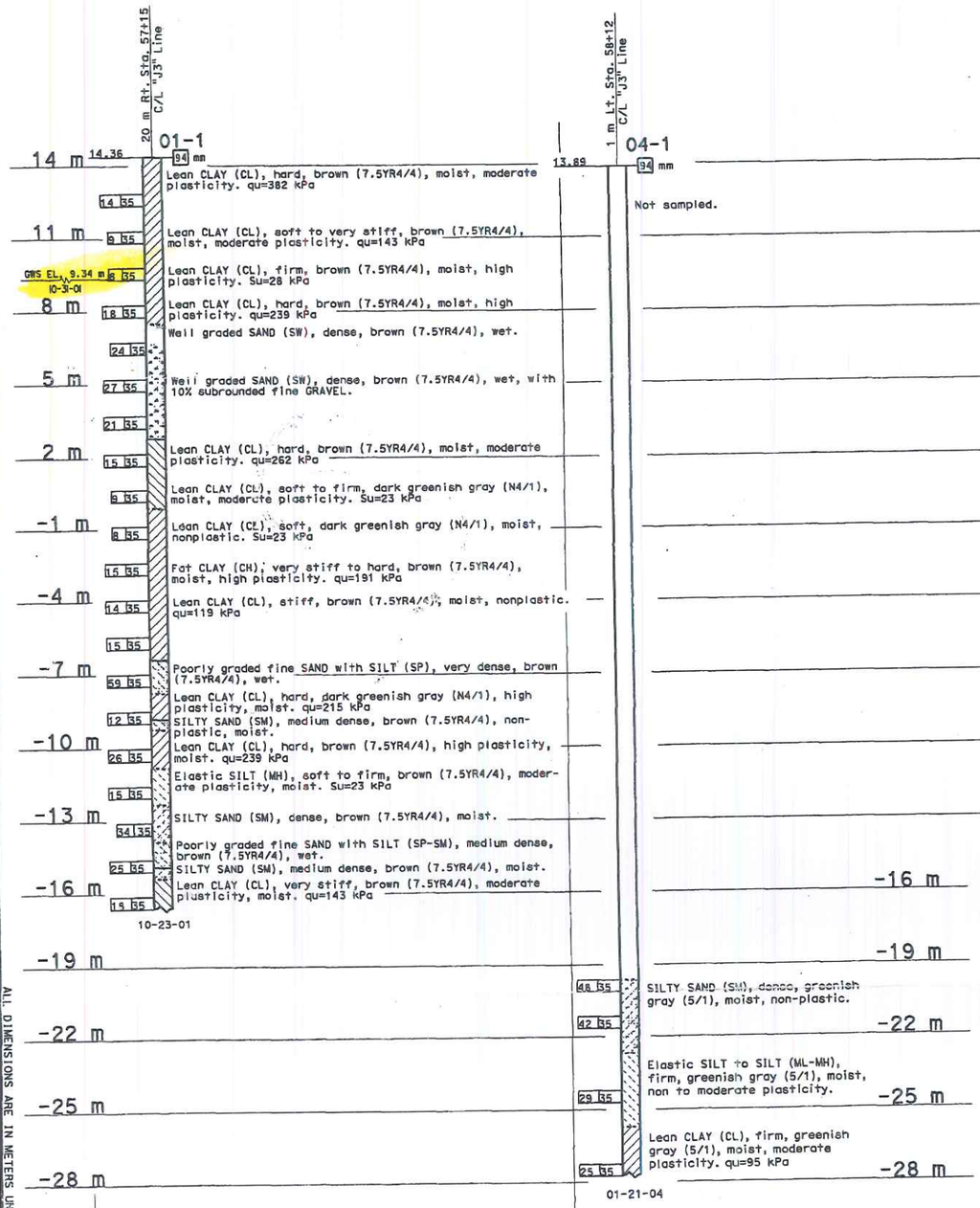


BENCH MARK

BM WP 103 SPIKE Elev. 13,228 m.

PLAN

1:1000



PROFILE

HOR. 1:500
VER. 1:100

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ENGINEERING SERVICES — GEOTECHNICAL SERVICES

DRAWN BY Lily Wang 03/02
CHECKED BY B. Levine 03/02
FIELD INVESTIGATION BY B. Levine

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF STRUCTURES
STRUCTURE DESIGN

CU 04
EA 016011
FILE => wb92sb880_lot2.dgn

BRIDGE NO. 33-0678F
KILOMETER POST

DIRECTIONS PRINTS REGARDING DATE/TIME/REVISION DATES

WB RTE 92/SB RTE 880 CONNECTOR

LOG OF TEST BORINGS 1 OF 2

SHEET 1 OF

Caltrans District 4

Bill Levine
CERTIFIED ENGINEERING GEOLOGIST 3-25-04

PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the correctness or completeness of electronic copies of this plan sheet.

REGISTERED GEOLOGIST — WILLIAM J. LEVINE — No. 2108 — Exp. 1/31/05 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

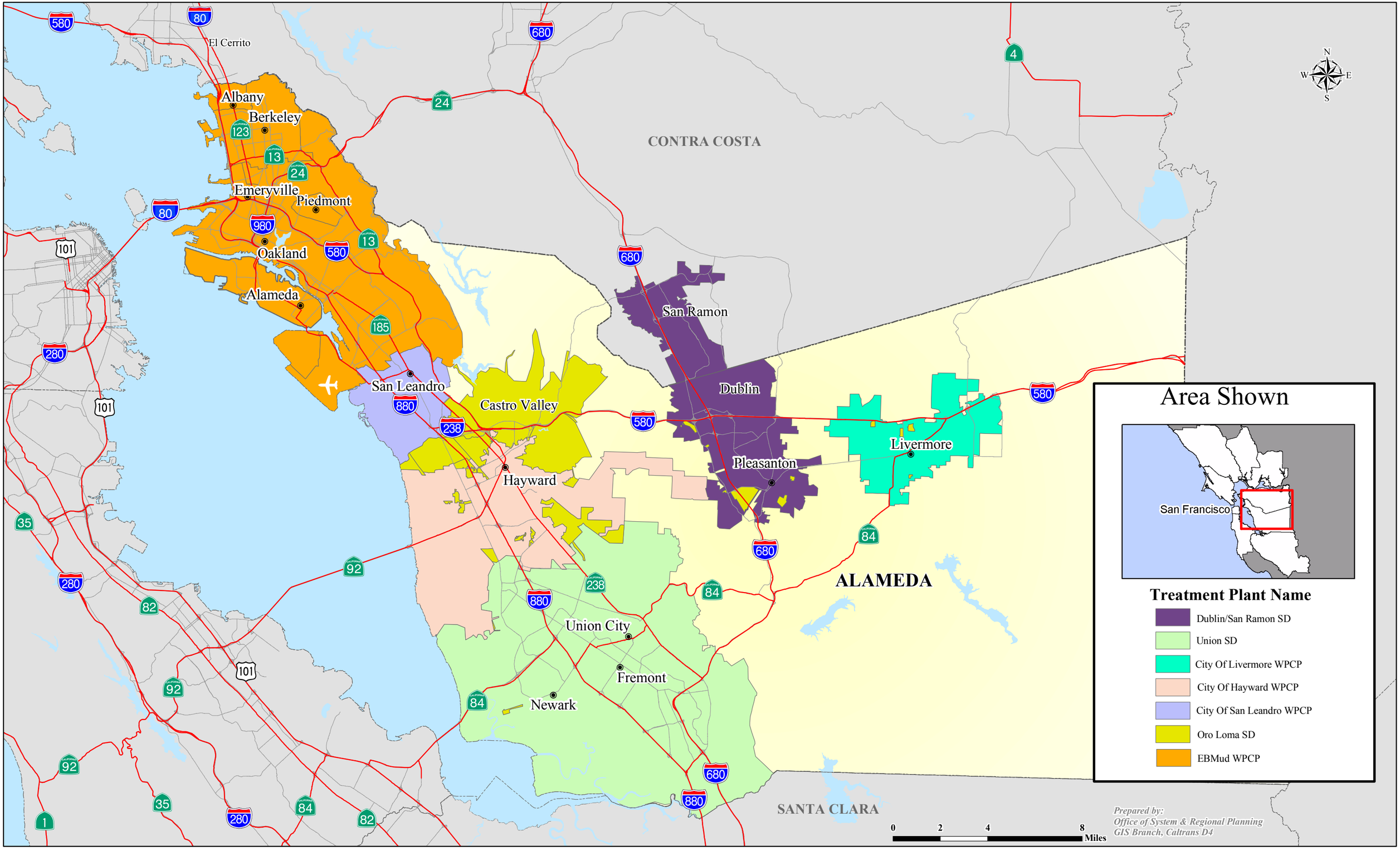
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO. TOTAL SHEETS
04	Ala	92/880		

USERNAME => fnguyen DATE PLOTTED => 25-MAR-2004 TIME PLOTTED => 14:18

GDS GEOLOGIST LOG OF TEST BORINGS SHEET (METRIC) (REV. 3/01)

LOCAL PUBLIC OWNED TREATMENT SYSTEM (POTWs)

Alameda County - POTW Service Areas



Alameda POTW

	City Discharger	Treatment Plant Name	WDR Discharger Name	Discharger Contact Name	Contact Phone No.	Contact Email	Mail Address	Ct Contact for Groundwater & De-Watering Discharges	Service Area of the POTW
6	Dublin	Dublin San Ramon Service District	Dublin San Ramon SD	Bob Anderson/ Levi Fuller	925-875-2360, cell 925-570-8757; 925-846-0568, ext. 119	anderson@dsrsd.com; fuller@dsrsd.com	DSRSD, 7051 Dublin Blvd., Dublin, CA 94568	Call Env. Compliance Officer Eric Kuefner @ 925-875-2335 "case-by-case situation -prefer not during storms" Testing required,$385 for annual permit, per million gal fee, etc.	Dublin, San Ramon, & Pleasanton
7	Pleasanton		City of Pleasanton	Richard Lagomarsino; Daniel Smith	925-931-5538; 925-931-5509	rlagomarsino@ci.pleasanton.ca.us; dsmith@ci.pleasanton.ca.us	Richard Lagomarsino, Lead Utility Operator and Daniel Smith, Utility Superintendent, 3333 Busch Road, Pleasanton, CA 94588	Same as Dublin-San Ramon SD - see line #A- 7	Same as Dublin-San Ramon SD - see line #A- 7
8	Union City	Union SD	Union SD	Roger Ham	510-477-7540	roger_ham@unionsanitary.com	Roger Ham, Collection Service Manager, Uniion Sanitary District, 5072 Benson Road, Union City, CA 94587	Best contact is Von Henry @ 510-477-7637. UCSD would consider if there are no other options available, ie. If non-contaminated using the storm drain is "ok"	Services: Fremont (including Niles), Union City, & Newark
9	Livermore	City of Livermore WPCP	City of Livermore	Darren Greenwood	925-960-8100	dggreenwood@ci.livermore.ca.us	Darren Greenwood, Water Resources Manager, 101 West Jacklondon Blv., Livermore, CA 94551	Call Env. Source Control's - Alex Paredes 925-960-8144 : "requires testing, then annual G.W discharge Permit of $250, and $6,750 PMG's of discharge" - Will mail packet	City of Livermore, the Ruby Hills Development of Pleasanton, and the Veteran's Hospital of unincorporated Alameda County.
10	Hayward	City of Hayward WPCP	City of Hayward	Alex Ameri	510-583-4720	alexa@ci.hayward.ca.us	Alex Ameri, Deputy Director/Utilities, Dept. of Public Works, 777 B Street, Hayward, CA 94541-5007	Call Ms. Dije Ndreu @ 510-881-7960 They will accept discharge with test results. Permit fee is $470 plus per gallon fee. See email of 6/22/04 has all info	Per Alex Ameri: 90% of the city of Hayward is served by this sewer system - the other 10% (the North end, north of "A" St.) is serviced by Ora Loma Sanitation
11	San Leandro	San Leandro WPCP	City of San Leandro	Dean Wilson	510-577-6030	dwilson@ci.san-leandro.ca.us	Dean Wilson, Water Pollution Control Plant Manager, 3000 David St., San Leandro, CA 94577	Contact: John Camp in Env.Services @ 510-577-6029. "Haven't accepted in the past…prefers Baker tanks for sediment, then discharge to storm drain" There is a special Discharge Permit, includes $2.40 per 100 cu.ft. Would consider proposals.	Plant phone # is 510-577-3434 - they only do "the city boundaries of San Leandro - not the unincorporated areas - its sort of a Zig-Zag kind of thing..." They do have their boundaries on GIS - call Mike Hamer at 577-3339
12	San Lorenzo	Oro Loma SD	Oro Loma S.D.	Michael C. Cameron	510-481-6969	mcameron@oroloma.org	Michael Cameron, General Manager, Oro Loma Sanitary District, 2600 Grant Avenue, San Lorenzo, CA 94580	Best contact: Jeff Carson 510-481-6971. Fee, permit, plan, testing, possible treatment required. Potential problems are large sediments and amounts. May only allow discharge between 2 and 4 A.M. Service area is 40% of both Hayward and San Leandro, San Lorenzo, and some unincorporated Alameda County	Call Bill Halstead @ 510-481-6963 - he has base maps and shape files which he will make available on CD or pdf. Service area is all of San Lorenzo, parts of San Leandro, Hayward, and Castro Valley, and parts of unincorporated Alameda County. "Ora Loma is a 'district' and not subject to city boundaries..."
13	Castro Valley		Castro Valley S.D.	Roland Williams	510-537-0757	roland@cvsan.org	Roland William, General Manager, Castro Valley Sanitary District, 21040 Marshall Street, Castro Valley, CA 94546-6098	Same as Oro Loma SD - see line # A-12	Same as Oro Loma SD - see line # A-12
14	Oakland	EBMUD WPCP	EBMUD	Maura A. Bonnarens; Jannifer Smith	510-287-1141; 510-287-0509	mbonnare@ebmud.com; jsmith@ebmud.com	David R. Williams, P.O. Box 2055 (MS#702), Oakland, CA 94623-1055	Web site: www.ebmud.com or call 510-287-1651 "for determination of your permitting needs" Best contact Gail Tupper at 510-287-1608 Permit is 13 pages long (costs $650) - "every situation is different/special…"	Cities of: Alameda, Albany, Berkeley, El Cerrito, Emeryville, Kensington, Oakland, and the Stege Sanitary section of Richmond.
15	Alameda		City of Alameda	Wali Waziri	510-749-5853	wwaziri@ci.alameda.ca.us	Mat Naclerio, Director of Public Works, City of Alameda, Alameda Point, Building 1, 950 West Mall Square, Room 110, Alameda, CA 94501	Same as EBMUD WPCP - see line # A-14	Part of EBMUD see # A -14
16	Albany		City of Albany	Ann Chaney	510-528-5768	achaney@albanyca.org	Ann Chaney, Director of Community Development and Environmental Resources, City of Albany-City Hall, 1000 San Pablo Ave, Albany, CA 94706	Same as EBMUD WPCP - see line # A-14	Part of EBMUD see # A -14
17	Berkeley		City of Berkeley	Henry Yee	510-981-6303	hyee@ci.berkeley.ca.us	Rene Cardinaux, Public Works Director, City of Berkeley, 2180 Milvia St., Berkeley, CA 94704	Same as EBMUD WPCP - see line # A-14	Part of EBMUD see # A -14
18	Emeryville		City of Emeryville	Maurice Kaufman	510-596-4334	mkaufman@ci.emeryville.ca.us	Hank Van Dyke, City Engineer, City of Emeryville, 1333 Park Ave., Emeryville, CA 94608	Same as EBMUD WPCP - see line # A -14	Part of EBMUD see # A -14
19	Oakland		City of Oakland	Fuad Sweiss; Allen Law	510-238-6607 (LR); 238-6939(AL)	fssweiss@oaklandnet.com; atlaw@oaklandnet.com	Michael Neary, Engineering Divisiion Manager, Cit of Oakland, 250 Frank Ogawa Plaza, Suite 4314, Oakland, CA 94612	Same as EBMUD WPCP - see line #A -14	Part of EBMUD see # A -14
20	Piedmont		City of Piedmont	Larry Rosenberg	510-420-3050	lrosenberg@ci.piedmont.ca.us	Larry Rosenberg, Director of Public Works, City of Piedmont, 120 Vista Ave., Piedmont, CA 94611	Same as EBMUD WPCP - see line # A -14	Part of EBMUD see # A -14

BACWA
BAY AREA
CLEAN WATER
AGENCIES

Bay Area Recycled Water Commercial Truck Fill Facilities Location Guide

January 2015

WHITLEY BURCHETT *& Associates*

Background

This Guide was prepared by Whitley Burchett & Associates under contract with Bay Area Clean Water Agencies and under the direction of the BACWA Recycled Water Committee. The Guide was prepared in response to inquiries of commercial recycled water truck fill facilities in the Bay Area. It is the Recycled Water Committee's intention to update this Guide annually. If you see any information that should be updated, have a facility to add to this Guide, or have any questions please email Info@bacwa.org.

Disclaimer

The intent of this Guide is to provide prospective water haulers with general information regarding the location of Bay Area Recycled Water Commercial Truck Fill Facilities, permit requirements, and associated fees for recycled water. Information in this Guide represents data collected in the fall of 2014. Please contact agencies directly for current information.

Cover Photos

Top row from left to right:	San Francisco Public Utilities Commission, Dublin San Ramon Services District
Bottom row:	East Bay Municipal Utility District

Acknowledgements

This Guide was prepared in conjunction with the BACWA agencies. The time spent by agencies providing program information and review of this document is greatly appreciated.

Electronic Version

The BACWA Truck Fill Guide is available on the BACWA website at http://bacwa.org.

TABLE OF CONTENTS

Bay Area Commercial Recycled Water Truck Fill Facilities Location Map…… ii
List of Agencies with Commercial Fill Facilities Sorted by County/City……iii

SECTION 1 - RECYCLED WATER COMMERCIAL TRUCK FILL FACILITIES INFORMATION

Calistoga, City of…… 1
Central Contra Costa Sanitary District……2
Dublin San Ramon Services District……..……3
East Bay Municipal Utility District…… 4
Livermore, City of…… 5
Marin Municipal Water District……6
Milpitas, City of…… 7
Napa Sanitation District…… 8
North Marin Water District…… 9
Oro Loma/East Bay Dischargers Authority…… 10
Palo Alto, City of……11
Petaluma, City of……12
Redwood City, City of……13
San Francisco International Airport……14
San Francisco Public Utilities Commission……15
Santa Rosa, City of……16
Sonoma County Water Agency……17
South Bay Water Recycling and City of San Jose……18
Sunnyvale, City of……19
Yountville, Town of……..20

SECTION 2 - ADDITIONAL COMMERCIAL TRUCK FILL FACILITIES IN 2015

Commercial Fill Facilities Planned to be Operational in 2015…… 21

SECTION 3 - POTENTIAL FUTURE COMMERCIAL TRUCK FILL FACILITIES

Agencies That May Consider Fill Facilities in the Future…… 22

SECTION 4 - Recycled Water Uses Allowed in California

Recycled Water Uses Allowed in California…… 23

Bay Area Commercial Recycled Water Truck Fill Facilities Location Map

* Indicates the general location of a truck fill facility.

List of Agencies with Recycled Water Commercial Truck Fill Facilities Sorted by County/City

COUNTY/CITY	AGENCY	PAGE NO.
ALAMEDA COUNTY		
Dublin	Dublin San Ramon Services District	3
Livermore	City of Livermore	5
Oakland	East Bay Municipal Utility District	4
San Lorenzo	Oro Loma/East Bay Dischargers Authority	10
CONTRA COSTA COUNTY		
Concord	Central Contra Costa Sanitary District	2
Martinez	Central Contra Costa Sanitary District	2
Richmond	East Bay Municipal Utility District	4
MARIN COUNTY		
Novato	North Marin Water District	9
San Rafael	Marin Municipal Water District	6
NAPA COUNTY		
Calistoga	City of Calistoga	1
Napa	Napa Sanitation District	8
Yountville	Town of Yountville	20
SAN FRANCISCO		
San Francisco	San Francisco Public Utilities Commission	15
SAN MATEO COUNTY		
San Francisco	San Francisco International Airport	14
Redwood City	City of Redwood City	13
SANTA CLARA COUNTY		
Milpitas	City of Milpitas	7
Palo Alto	City of Palo Alto	11
San Jose	South Bay Water Recycling and City of San Jose	18
Sunnyvale	City of Sunnyvale	19
SONOMA COUNTY		
Petaluma	City of Petaluma	12
Santa Rosa	City of Santa Rosa	16
Sonoma	Sonoma County Water Agency	17

SECTION 1

Recycled Water Commercial Truck Fill Facilities Information

CITY OF CALISTOGA

707.942.2782

www.ci.calistoga.ca.us

Recycled Water Fill Facilities:

Treatment Plant: Yes

Distribution System: No

Can water be used outside of this agency's service area? No

Hydrant Fill Facilities

Location: None

Number of Fill Facilities:

Connection Device:

Quality:

Truck Size Limits:

Quantity Limitations per Trip:

Truck Weight Limits:

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: Dunaweal Wastewater Treatment Plant (call for address)

Quality: Disinfected Tertiary

Type of Connection: Side

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Hours: Mon-Fri 7 a.m. - 3:30 p.m.

Appointment Required: No

Quantity Limitations per Day: No Minimum
Maximum 50,000 gal

Truck Size Limits: None

Truck Weight Limits: None

Additional Access Information:

Training

Required: No

Duration:

Who:

Frequency:

Schedule:

Location:

Length of time to become authorized truck hauler: 1 business day

Signage

Area Use Signage Required: No

Vehicle Signage Required: Yes

Signs Provided by Water Agency: N/A

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: No

Inspection Location:

Duration:

Re-inspection Required:

How to schedule:

Fees

Water: No Charge

Training: No Charge

Connection Device: No Charge

Permit: No Charge

Vehicle Signage: No Charge

Use Area Signage: N/A

Other:

CENTRAL CONTRA COSTA SANITARY DISTRICT

925.228.9500

www.centralsan.org

Recycled Water Fill Facilities:

Treatment Plant: No

Distribution System: Yes

Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: Locations in Concord (Willow Way) and Martinez (Marsh Drive)

Number of Fill Facilities: 3

Connection Device: Hydrant key and Construction meter

Quality: Disinfected Tertiary

Truck Size Limits: Max. truck length 18 ft.

Quantity Limitations per Trip: No Minimum
Maximum 6,000 gal

Truck Weight Limits: No limit

Other Restrictions:

Additional Access Information: Fill times: Mon.-Fri. 7 a.m. - 5 p.m. (can be negotiated)

Fill Facilities at Treatment Plant

Location: None

Quality:

Type of Connection:

Quantity Limitations per Trip:

Hours:

Appointment Required:

Quantity Limitations per Day:

Truck Size Limits:

Truck Weight Limits:

Additional Access Information:

Training

Required: Yes

Duration: 15 minutes

Who: Either Truck Owner, Truck Driver, or Customer using water

Frequency: Only Once

Schedule: By Appointment

Location: Recycled Water Treatment Plant

Length of time to become authorized truck hauler: 1 business day

Signage

Area Use Signage Required: No

Vehicle Signage Required: Yes

Signs Provided by Water Agency: N/A

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: No

Inspection Location:

Duration:

Re-inspection Required:

How to schedule:

Fees

Water: $3.28 per 1,000 gal

Training: No Charge

Connection Device: $750 (refundable deposit)

Permit: No Charge

Vehicle Signage: No Charge

Use Area Signage: N/A

Other:

DUBLIN SAN RAMON SERVICES DISTRICT

925.875.2334

www.dsrsd.com

Recycled Water Fill Facilities:

Treatment Plant: Yes
Distribution System: Yes
Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: Dublin, CA - see website for locations
Number of Fill Facilities: 10+
Connection Device: Construction Meter
Quality: Disinfected Tertiary
Truck Size Limits: None
Quantity Limitations per Trip: No Minimum
Maximum up to truck limit
Truck Weight Limits: None
Other Restrictions: Permit plus $1,000 refundable deposit for meter required.
Additional Access Information: Obtain permit and meter at 7051 Dublin Blvd, Dublin.

Fill Facilities at Treatment Plant

Location: DSRSD Wastewater Treatment Plant
7399 Johnson Drive, Pleasanton
Quality: Disinfected Tertiary
Type of Connection: Overhead and Large Hose Bib
Quantity Limitations per Trip: No Minimum
Maximum up to truck limit
Hours: 24 hrs/day, 7 days/wk*
Appointment Required: No
Quantity Limitations per Day: No Minimum
No Maximum
Truck Size Limits: None
Truck Weight Limits: None
Additional Access Information: *After business hours truck drivers must use special gate access code to enter the plant. The access code is valid only during hours specified in the permit.

Training

Required: Yes
Duration: 15 min
Who: Truck Owner and Driver
Frequency: Once
Schedule: By Appointment
Location: Recycled Water Plant
Length of time to become authorized truck hauler: 1 business day

Signage

Area Use Signage Required: No
Vehicle Signage Required: Yes
Signs Provided by Water Agency: N/A
Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: No
Inspection Location:
Duration:
Re-inspection Required:
How to schedule:

Fees

Water: Hydrant- check with DSRSD for current fee; Plant- $10/truck load
Training: No Charge
Permit: Hydrant- No permit fee; Treatment Plant- $73/year
Connection Device: Hydrant access- $1,000 deposit for construction meter; Treatment Plant- No connection device charge
Use Area Signage: N/A
Vehicle Signage: No Charge
Other:

EAST BAY MUNICIPAL UTILITY DISTRICT
510.287.1346
www.ebmud.com

Recycled Water Fill Facilities:
Treatment Plant: Yes
Distribution System: No
Can water be used outside of this agency's service area? Check with EBMUD

Hydrant Fill Facilities

Location: None
Number of Fill Facilities:
Connection Device:
Quality:
Truck Size Limits:
Quantity Limitations per Trip:
Truck Weight Limits:
Other Restrictions:
Additional Access Information: www.ebmud.com, search "Recycled Water Truck Program"

Fill Facilities at Treatment Plant

Locations: 1) EBMUD Wastewater Treatment Plant, Oakland
2) North Richmond Water Recycling Plant, Richmond
Quality: Disinfected Tertiary
Type of Connection: Hydrant
Quantity Limitations per Trip: No Minimum
Maximum up to truck limit
Hours: 24 hrs/day, 7 days/wk
Appointment Required: Only for first visit
Quantity Limitations per Day: No Minimum
No Maximum
Truck Size Limits: None
Truck Weight Limits: None
Additional Access Information: 1) EBMUD Wastewater Treatment Plant - enter through the main security gate at the plant to obtain access to the fill hydrant. 2) North Richmond Plant - hydrant is located outside of the plant gate and is accessible with a hydrant key.

Training

Required: Yes
Duration: 15 minutes
Who: Truck Driver
Frequency: Once
Schedule: By Appointment
Location: Recycled Water Plant
Length of time to become authorized truck hauler: 5 business days

Signage

Area Use Signage Required: No
Vehicle Signage Required: Yes
Signs Provided by Water Agency: N/A
Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: Yes
Inspection Location: Recycled Water Plant
Duration: Less than 1 hour
Re-inspection Required: No
How to schedule: To be conducted at time of training

Fees

Water: No Charge
Training: No Charge
Connection Device: No Charge
Permit: No Charge
Vehicle Signage: No Charge
Use Area Signage: N/A
Other:

CITY OF LIVERMORE

925.960.8138

Recycled Water Fill Facilities:

Treatment Plant: No

Distribution System: Yes

Can water be used outside of this agency's service area? No

Hydrant Fill Facilities

Location: Call for address

Number of Fill Facilities: 10+

Connection Device: Construction meter and Hydrant Key

Quality: Disinfected Tertiary

Truck Size Limits: No limit

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Truck Weight Limits: No limit

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: None

Quality:

Type of Connection:

Quantity Limitations per Trip:

Hours:

Appointment Required:

Quantity Limitations per Day:

Truck Size Limits:

Truck Weight Limits:

Additional Access Information:

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Driver

Frequency: Once

Schedule: At time of hydrant meter deposit

Location: Administration Building

Length of time to become authorized truck hauler: 1 business day

Signage

Area Use Signage Required: Yes

Vehicle Signage Required: Yes

Signs Provided by Water Agency: Yes

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: No

Inspection Location:

Duration:

Re-inspection Required:

How to schedule:

Fees

Water: $2.37 per CCF

Training: No Charge

Connection Device: $1,000

Permit: No Charge

Vehicle Signage: Varies

Use Area Signage: No Charge

Other: Monthly service charge of $195.30

MARIN MUNICIPAL WATER DISTRICT

415.945.1557

Recycled Water Fill Facilities:

Treatment Plant: No

Distribution System: Yes

Can water be used outside of this agency's service area? No

Hydrant Fill Facilities

Location: Call for location

Number of Fill Facilities: 1

Connection Device: Hose Bib

Quality: Disinfected Tertiary

Truck Size Limits: No limit

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Truck Weight Limits: No limit

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: None

Quality:

Type of Connection:

Quantity Limitations per Trip:

Hours:

Appointment Required:

Quantity Limitations per Day:

Truck Size Limits:

Truck Weight Limits:

Additional Access Information:

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Driver

Frequency: Once

Schedule: By Appointment

Location: Administration Building or Hydrant Fill Facility

Length of time to become authorized truck hauler: 6 business days

Signage

Area Use Signage Required: Yes

Vehicle Signage Required: Yes

Signs Provided by Water Agency: Yes

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: Yes

Inspection Location: Administration Building

Duration: 1 hour or less

Re-inspection Required: Annually

How to schedule: Appointment

Fees

Water: Tier 1: 0-100 CCF @ $2.57 per CCF; Tier 2: 101-150 CCF @ $7.48 per CCF Tier 3: over 150 CCF @ $14.97 per CCF

Training: No Charge

Connection Device: No Charge

Permit: No Charge

Vehicle Signage: No Charge

Use Area Signage: No Charge

Other:

CITY OF MILPITAS

408.586.3355

www.ci.milpitas.ca.gov

Recycled Water Fill Facilities:

Treatment Plant: No

Distribution System: Yes

Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: Call for locations

Number of Fill Facilities: 5

Connection Device: Hydrant key and Construction meter

Quality: Disinfected Tertiary

Truck Size Limits: check with City

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Truck Weight Limits: check with City

Other Restrictions: M-F: 7 a.m. to 7 p.m.

Additional Access Information: Secure access. Gate key to be provided at training.

Fill Facilities at Treatment Plant

Location: None

Quality:

Type of Connection:

Quantity Limitations per Trip:

Hours:

Appointment Required:

Quantity Limitations per Day:

Truck Size Limits:

Truck Weight Limits:

Additional Access Information:

Training

Required: Yes

Duration: 1 hour

Who: Truck Owner, Truck Driver, and Customer

Frequency: Once

Schedule: By Appointment and Semi-Annually

Location: Administration Building or Hydrant fill facility

Length of time to become authorized truck hauler: 2 business days

Signage

Area Use Signage Required: Yes

Vehicle Signage Required: Yes

Signs Provided by Water Agency: No

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: Yes

Inspection Location: Administration Building or Hydrant fill facility

Duration: 1 hour or less

How to schedule: Appointment

Re-inspection Required: Annually

Fees

Water: $2.65 per HCF

Training: No Charge

Connection Device: $2,000

Permit: No Charge

Vehicle Signage: No charge

Use Area Signage: No charge

Other: Monthly fee of $75

NAPA SANITATION DISTRICT

707.258.6029

www.napasan.com

Recycled Water Fill Facilities:

Treatment Plant: Yes

Distribution System: No

Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: None

Number of Fill Facilities:

Connection Device:

Quality:

Truck Size Limits:

Quantity Limitations per Trip:

Truck Weight Limits:

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: Soscol Water Recycling Facility (call for address)

Quality: Disinfected Tertiary

Type of Connection: Side

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Hours: 7:30 a.m. - 4:30 p.m. Daily

Appointment Required: No

Quantity Limitations per Day: No Minimum
No Maximum

Truck Size Limits: None

Truck Weight Limits: None

Additional Access Information:

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Owner, Truck Driver, and Customer

Frequency: Once, plus Annual Refresher

Schedule: By Appointment

Location: Recycled Water Plant

Length of time to become authorized truck hauler: 2 business days

Signage

Area Use Signage Required: Yes

Vehicle Signage Required: Yes

Signs Provided by Water Agency: Yes

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: Yes

Inspection Location: Recycled Water Plant

Duration: 15 min

Re-inspection Required:

How to schedule: By Appointment

Fees

Water: $0.98 per 1,000 gal

Training: No Charge

Connection Device: No Charge

Permit: $50

Vehicle Signage: $6 per sticker and $10.50 per plastic sign

Use Area Signage: $6 per sticker and $10.50 per plastic sign

Other:

NORTH MARIN WATER DISTRICT

415.761.8912

www.nmwd.com

Recycled Water Fill Facilities:

Treatment Plant: No

Distribution System: Yes

Can water be used outside of this agency's service area? No

Hydrant Fill Facilities

Location: Call for address

Number of Fill Facilities: 10+

Connection Device: Hydrant key

Quality: Disinfected Tertiary

Truck Size Limits: No limit

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Truck Weight Limits: No limit

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: None

Quality:

Type of Connection:

Quantity Limitations per Trip:

Hours:

Appointment Required:

Quantity Limitations per Day:

Truck Size Limits:

Truck Weight Limits:

Additional Access Information:

Training

Required: No

Duration:

Who:

Frequency:

Schedule:

Location:

Length of time to become authorized truck hauler: 1 business day

Signage

Area Use Signage Required: No

Vehicle Signage Required: Yes

Signs Provided by Water Agency: N/A

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: No

Inspection Location:

Duration:

Re-inspection Required:

How to schedule:

Fees

Water: $5.00 per load; no max.

Training: N/A

Connection Device: No Charge

Permit: No Charge

Vehicle Signage: No Charge

Use Area Signage: N/A

Other:

ORO LOMA

510.276.4700

Recycled Water Fill Facilities:

Treatment Plant: Yes
Distribution System: No
Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: None
Number of Fill Facilities:
Connection Device:
Quality:
Truck Size Limits:
Quantity Limitations per Trip:
Truck Weight Limits:
Other Restrictions:
Additional Access Information:

Fill Facilities at Treatment Plant

Location: Oro Loma Treatment Facility (call for address)
Quality: Disinfected Secondary-2.2
Type of Connection: Overhead
Quantity Limitations per Trip: No Minimum
Maximum up to truck limit
Hours: M-F: 6 a.m. - 5 p.m.
Appointment Required: No
Quantity Limitations per Day: No Minimum
No Maximum
Truck Size Limits: None
Truck Weight Limits: None
Additional Access Information:

Training

Required: Yes
Duration: 15 min
Who: Truck Driver
Frequency: Once
Schedule: By Appointment
Location: Recycled Water Plant
Length of time to become authorized truck hauler: 1 business day

Signage

Area Use Signage Required: No
Vehicle Signage Required: No
Signs Provided by Water Agency: N/A
Signs Provided by Water Agency: N/A

Vehicle Inspection

Required: No
Inspection Location:
Duration:
Re-inspection Required:
How to schedule:

Fees

Water: No Charge
Training: No Charge
Connection Device: No Charge
Permit: No Charge
Vehicle Signage: N/A
Use Area Signage: N/A
Other:

CITY OF PALO ALTO

650.329.2598

Recycled Water Fill Facilities:

Treatment Plant: Yes

Distribution System: No

Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: None

Number of Fill Facilities:

Connection Device:

Quality:

Truck Size Limits:

Quantity Limitations per Trip:

Truck Weight Limits:

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: Palo Alto Regional Water Quality Control Plant (call for address)

Quality: Disinfected Tertiary

Type of Connection: Overhead and Side

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Hours: Mon-Fri 6:30 a.m. - 5 p.m.

Appointment Required: No

Quantity Limitations per Day: No Minimum
No Maximum

Truck Size Limits: None

Truck Weight Limits: None

Additional Access Information:

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Driver

Frequency: Once

Schedule: By Appointment

Location: Recycled Water Plant

Length of time to become authorized truck hauler: 1 business day

Signage

Area Use Signage Required: Yes

Vehicle Signage Required: Yes

Signs Provided by Water Agency: No

Signs Provided by Water Agency: No

Vehicle Inspection

Required: No

Inspection Location:

Duration:

Re-inspection Required:

How to schedule:

Fees

Water: No Charge

Training: No Charge

Connection Device: No Charge

Permit: $50 per year

Vehicle Signage: User provides

Use Area Signage: User provides

Other:

CITY OF PETALUMA

707.776.3726

Recycled Water Fill Facilities:

Treatment Plant: Yes

Distribution System: No

Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: None

Number of Fill Facilities:

Connection Device:

Quality:

Truck Size Limits:

Quantity Limitations per Trip:

Truck Weight Limits:

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: Ellis Creek Water Recycling Facility (call for address)

Quality: Disinfected Tertiary

Type of Connection: Overhead

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Hours: Mon-Fri 7 a.m. - 4:30 p.m.

Appointment Required: No

Quantity Limitations per Day: No Minimum
No Maximum

Truck Size Limits: None

Truck Weight Limits: None

Additional Access Information:

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Driver and
Customer using water

Frequency: Once

Location: Recycled Water Plant

Schedule: By Appointment

Additional Permit Requirement: City inspects all recycled water use sites, and performs cross connection checks. City issues permit to recycled water user. Recycled water user must contact City to initiate water hauling. Time to issue permit varies.

Length of time to become authorized truck hauler: Varies. Contact City.

Signage

Area Use Signage Required: Yes

Vehicle Signage Required: Yes

Signs Provided by Water Agency: Yes

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: No

Inspection Location:

Duration:

Re-inspection Required:

How to schedule:

Fees

Water: $1.88 per HCF

Training: No Charge

Connection Device: No Charge

Permit: No Charge

Vehicle Signage: No Charge

Use Area Signage: No Charge

Other:

CITY OF REDWOOD CITY

650.780.7470

Recycled Water Fill Facilities:

Treatment Plant: No

Distribution System: Yes

Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: Call for address

Number of Fill Facilities: 4

Connection Device: Construction Meter

Quality: Disinfected Tertiary

Truck Size Limits: No limit

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Truck Weight Limits: No limit

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location:

Quality:

Type of Connection:

Quantity Limitations per Trip:

Hours:

Appointment Required:

Quantity Limitations per Day:

Truck Size Limits:

Truck Weight Limits:

Additional Access Information:

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Owner, Truck Driver, and Customer using water

Frequency: Once

Location: Administration Building

Schedule: By Appointment

Length of time to become authorized truck hauler: 5 business days

Signage

Area Use Signage Required: Yes

Vehicle Signage Required: Yes

Signs Provided by Water Agency: Yes

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: No

Inspection Location:

Duration:

Re-inspection Required:

How to schedule:

Fees

Water: Contact City

Training: Contact City

Connection Device: Contact City

Permit: Contact City

Vehicle Signage: No Charge

Use Area Signage: No Charge

Other:

SAN FRANCISCO INTERNATIONAL AIRPORT

650.821.8380

Recycled Water Fill Facilities:

Treatment Plant: Yes

Distribution System: No

Can water be used outside of this agency's service area? No

Hydrant Fill Facilities

Location: None

Number of Fill Facilities:

Connection Device:

Quality:

Truck Size Limits:

Quantity Limitations per Trip:

Truck Weight Limits:

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: Mel Leong Treatment Plant

Quality: Disinfected Secondary-23

Type of Connection: Hydrant

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Hours: 24 hrs/day, 7 days/wk

Appointment Required: No

Quantity Limitations per Day: No Minimum
No Maximum

Truck Size Limits: None

Truck Weight Limits: None

Additional Access Information:

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Driver

Frequency: Once

Schedule: By Appointment

Location: Treatment Plant

Length of time to become authorized truck hauler: 5 business days

Signage

Area Use Signage Required: No

Vehicle Signage Required: Yes

Signs Provided by Water Agency: N/A

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: Yes

Inspection Location: Recycled Water Plant

Duration: 1 hour or less

Re-inspection Required: One random audit per year

How to schedule: Appointment

Fees

Water: No Charge

Training: No Charge

Connection Device: No Charge

Permit: No Charge

Vehicle Signage: No Charge

Use Area Signage: N/A

Other:

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

415.695.7378

Recycled Water Fill Facilities:

Treatment Plant: Yes
Distribution System: No
Can water be used outside of this agency's service area? No

Hydrant Fill Facilities

Location: None
Number of Fill Facilities:
Connection Device:
Quality:
Truck Size Limits:
Quantity Limitations per Trip:
Truck Weight Limits:
Other Restrictions:
Additional Access Information:

Fill Facilities at Treatment Plant

Location: South East Treatment Plant
750 Phelps Street, San Francisco
Quality: Disinfected Secondary-23
Type of Connection: Overhead and Side
Quantity Limitations per Trip: No Minimum
Hours: 24 hrs/day, 7 days/week
Maximum up to truck limit
Appointment Required:
Quantity Limitations per Day: No Minimum
Truck Size Limits: None
No Maximum
Truck Weight Limits: None
Additional Access Information: Access code and PIN provided at permit issuance

Training

Required: Yes
Duration: 2 hours or less
Who: Truck Driver
Frequency: Once
Schedule: By Appointment
Location: Treatment Plant
Length of time to become authorized truck hauler: 3 business days

Signage

Area Use Signage Required: Yes
Vehicle Signage Required: Yes
Signs Provided by Water Agency: No
Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: Yes
Inspection Location: Truck Fill Facility
Duration: 1 hour or less
Re-inspection Required: Not required
How to schedule: Appointment

Fees

Water: No Charge
Training: No Charge
Connection Device: No Charge
Permit: No Charge
Vehicle Signage: No Charge
Use Area Signage: No Charge
Other:

CITY OF SANTA ROSA

707.543.3938

Recycled Water Fill Facilities:			
Treatment Plant	Yes	Distribution System	No
Can water be used outside of this agency's service area?			Yes

Hydrant Fill Facilities

Location:	None		
Number of Fill Facilities:		Connection Device:	
Quality:		Truck Size Limits:	
Quantity Limitations per Trip:		Truck Weight Limits:	
Other Restrictions:			
Additional Access Information:			

Fill Facilities at Treatment Plant

Location:	Santa Rosa Subregional Water Reuse Plant		
Quality:	Disinfected Tertiary	Type of Connection:	Hydrant
Quantity Limitations per Trip:	No Minimum	Hours:	Mon-Fri 8 a.m. - 5:30 p.m.
	Maximum up to truck limit	Appointment Required:	No
Quantity Limitations per Day:	No Minimum	Truck Size Limits:	None
	No Maximum	Truck Weight Limits:	None
Additional Access Information:			

Training

Required:	No	Duration:	
Who:		Frequency:	
Schedule:		Location:	
Length of time to become authorized truck hauler:			1 business day

Signage

Area Use Signage Required:	No	Vehicle Signage Required:	Yes
Signs Provided by Water Agency:	N/A	Signs Provided by Water Agency:	No

Vehicle Inspection

Required:	No	Inspection Location:	
Duration:		Re-inspection Required:	
How to schedule:			

Fees

Water:	$5.09 per 1,000 gal	Training:	No Charge
Connection Device:	No Charge	Permit:	$15.00 per year
Vehicle Signage:	N/A	Use Area Signage:	No Charge
Other:			

SONOMA COUNTY WATER AGENCY

707.521.1865

www.scwa.ca.gov

Recycled Water Fill Facilities:

Treatment Plant: Yes

Distribution System: No

Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: None

Number of Fill Facilities:

Connection Device:

Quality:

Truck Size Limits:

Quantity Limitations per Trip:

Truck Weight Limits:

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Locations: Sonoma Valley County Sanitation District (call for address)

Quality: Disinfected Tertiary

Type of Connection: Side

Quantity Limitations per Trip: No Minimum
Maximum up to truck limit

Hours: Mon-Fri 8 a.m. - 4 p.m.; with permission could be 24/7

Quantity Limitations per Day: No Minimum
No Maximum

Appointment Required: No

Truck Size Limits: None

Truck Weight Limits: None

Additional Access Information: Contact treatment plant for site access outside of business hours

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Driver

Frequency: With each new application

Schedule: By Appointment

Location: Recycled Water Plant

Length of time to become authorized truck hauler: 5 business days

Signage

Area Use Signage Required: No

Vehicle Signage Required: Yes

Signs Provided by Water Agency: N/A

Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: Yes

Inspection Location: Recycled Water Plant

Duration: 1 hour or less

Re-inspection Required: With each new application

How to schedule: Appointment

Fees

Water: $5.00 per 1,000 gal

Training: No Charge

Connection Device: $100 deposit

Permit: $300

Vehicle Signage: First set free

Use Area Signage: N/A

Other:

SOUTH BAY WATER RECYCLING

408.277.3671

Recycled Water Fill Facilities:

Treatment Plant: Yes
Distribution System: Yes
Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: Call for location
Number of Fill Facilities: 10+
Connection Device: Hydrant Key and Construction Meter
Quality: Disinfected Tertiary
Truck Size Limits: TBD during inspection
Quantity Limitations per Trip: No Minimum
Maximum up to truck limit
Truck Weight Limits: TBD during inspection
Other Restrictions:
Additional Access Information: Secured access. Gate access code or gate key to be provided at training.

Fill Facilities at Treatment Plant

Location: San Jose/Santa Clara Regional Wastewater Facility
700 Los Esteros Rd., San Jose
Quality: Disinfected Tertiary
Type of Connection: Hydrant
Quantity Limitations per Trip: No Minimum
Maximum up to truck limit
Hours: Mon-Fri 7 a.m. - 4 p.m.
Appointment Required: No
Quantity Limitations per Day: No Minimum
No Maximum
Truck Size Limits: None
Truck Weight Limits: None
Additional Access Information:

Training

Required: Yes
Duration: 2 hours or less
Who: Truck Owner, Truck Driver, and Customer using water
Frequency: Annually
Location: At Water Retailer Office
Schedule: By Appointment
Length of time to become authorized truck hauler: 1 business day

Signage

Area Use Signage Required: Yes
Vehicle Signage Required: Yes
Signs Provided by Water Agency: Yes
Signs Provided by Water Agency: Yes

Vehicle Inspection

Required: Yes
Inspection Location: Corp Yard
Duration: 1 hour or less
Re-inspection Required: Annually
How to schedule: Appointment

Fees

Water: Contact City
Training: Contact City
Connection Device: Contact City
Permit: Contact City
Vehicle Signage: Contact City
Use Area Signage: Contact City
Other:

CITY OF SUNNYVALE

408.760.7560

Recycled Water Fill Facilities:

Treatment Plant: Yes
Distribution System: No
Can water be used outside of this agency's service area? Yes

Hydrant Fill Facilities

Location: None

Number of Fill Facilities:
Connection Device:
Quality:
Truck Size Limits:
Quantity Limitations per Trip:
Truck Weight Limits:
Other Restrictions:
Additional Access Information:

Fill Facilities at Treatment Plant

Location: Sunnyvale Water Pollution Control Plant (call for address)

Quality: Disinfected Tertiary
Type of Connection: Hydrant
Quantity Limitations per Trip: No Minimum
Maximum up to truck limit
Hours: Mon-Fri 7 a.m. - 4 p.m.
Appointment Required: No
Quantity Limitations per Day: No Minimum
No Maximum
Truck Size Limits: None
Truck Weight Limits: None
Additional Access Information:

Training

Required: Yes
Duration: 2 hours or less
Who: Truck Owner, Truck Driver, and Customer using water
Frequency: Annually
Schedule: By Appointment
Location: Agency Corp Yard
Length of time to become authorized truck hauler: 8+ business days

Signage

Area Use Signage Required: Yes
Vehicle Signage Required: Yes
Signs Provided by Water Agency: No
Signs Provided by Water Agency: No

Vehicle Inspection

Required: Yes
Inspection Location: Corp Yard
Duration: 1 hour or less
Re-inspection Required: Annually
How to schedule: Appointment

Fees

Water: No Charge
Training: No Charge
Connection Device: No Charge
Permit: No Charge
Vehicle Signage: User provides
Use Area Signage: User provides
Other:

TOWN OF YOUNTVILLE

707.944.2988

townofyounvtille.com

Recycled Water Fill Facilities:

Treatment Plant: Yes

Distribution System: No

Can water be used outside of this agency's service area? No, not without authorization

Hydrant Fill Facilities

Location: None

Number of Fill Facilities: 0

Connection Device:

Quality:

Truck Size Limits:

Quantity Limitations per Trip:

Truck Weight Limits:

Other Restrictions:

Additional Access Information:

Fill Facilities at Treatment Plant

Location: Town of Yountville Wastewater Reclamation Facility
7501 Solano Avenue, Yountville, CA 94599

Quality: Disinfected Tertiary and Disinfected Secondary-2.2

Type of Connection: Hydrant and Side

Quantity Limitations per Trip: No Minimum
Maximum 5,000 gal

Hours: Mon-Fri 8 a.m. - 3:30 p.m.

Appointment Required: Yes, for initial fill-up and training

Quantity Limitations per Day: No Minimum
Maximum 25,000 gal per day

Truck Size Limits: None

Truck Weight Limits: None

Additional Access Information:

Training

Required: Yes

Duration: 2 hours or less

Who: Truck Owner, Truck Driver, and Customer using water

Frequency: Annually

Location: Wastewater Reclamation Facility

Schedule: By Appointment

Length of time to become authorized truck hauler: 3 business days

Signage

Area Use Signage Required: Yes

Vehicle Signage Required: No

Signs Provided by Water Agency: No

Signs Provided by Water Agency: N/A

Vehicle Inspection

Required: No

Inspection Location:

Duration:

Re-inspection Required:

How to schedule:

Fees

Water: $992 for first 100,000 gal

Training: No Charge

Connection Device: No Charge

Permit: $350

Vehicle Signage: N/A

Use Area Signage: User provides

Other:

SECTION 2

Additional Commercial Truck Fill Facilities in 2015

Commercial Fill Facilities Planned to be Operational in 2015

COUNTY/CITY	AGENCY
SAN MATEO COUNTY	
Pacifica	North Coast County Water District (contact for availability) Contact: www.nccwd.com
SONOMA COUNTY	
Windsor	Town of Windsor (operational Spring 2015) Contact: (707) 838-5343

SECTION 3

Potential Future Commercial Truck Fill Facilities

Agencies That May Consider Commerical Fill Facilities in the Future

At the time this Guide was prepared, the agencies below indicated they may consider development of commercial fill facilities, in particular if the drought continues.

COUNTY/CITY	AGENCY
ALAMEDA COUNTY	
Piedmont	City of Piedmont
Union City	Union Sanitary District
CONTRA COSTA COUNTY	
Antioch	Delta Diablo Sanitation District
Brentwood	City of Brentwood
Richmond	West County Wastewater District
MARIN COUNTY	
San Rafael	Ross Valley Sanitary District
SAN FRANCISCO	
South San Francisco	South San Francisco
SAN MATEO COUNTY	
Menlo Park	West Bay Sanitary District
San Mateo	City of San Mateo
SOLANO COUNTY	
Benicia	City of Benicia
SONOMA COUNTY	
Guerneville	Sonoma County Water Agency
Petaluma	City of Petaluma
Santa Rosa	City of Santa Rosa
Santa Rosa	Sonoma County Water Agency
Sonoma	Sonoma County Water Agency

SECTION 4

Recycled Water Uses Allowed in California

Recycled Water Uses Allowed[1] in California

Use of Recycled Water	Treatment Level			
	Disinfected Tertiary Recycled Water	Disinfected Secondary – 2.2 Recycled Water	Disinfected Secondary – 23 Recycled Water	Undisinfected Secondary Recycled Water
Irrigation of:				
Food crops where recycled water contacts the edible portion of the crop, including all root crops	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Parks and playgrounds	**Allowed**	Not Allowed	Not Allowed	Not Allowed
School yards	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Residential landscaping	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Unrestricted-access golf courses	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Any other irrigation uses not prohibited by other provisions of the California Code of Regulations	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Food crops, surface-irrigated, above-ground edible portion, and not contacted by recycled water	**Allowed**	**Allowed**	Not Allowed	Not Allowed
Cemeteries	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Freeway landscaping	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Restricted-access golf courses	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Ornamental nursery stock and sod farms with unrestricted public access	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Pasture for milk animals for human consumption	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Non-edible vegetation with access control to prevent use as a park, playground or school yard	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Orchards with no contact between edible portion and recycled water	**Allowed**	**Allowed**	Not Allowed[2]	Not Allowed[2]
Vineyards with no contact between edible portion and recycled water	**Allowed**	**Allowed**	Not Allowed[2]	Not Allowed[2]
Non food-bearing trees, including Christmas trees not irrigated less than 14 days before harvest	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Fodder and fiber crops and pasture for animals not producing milk for human consumption	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Seed crops not eaten by humans	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Food crops undergoing commercial pathogen-destroying processing before consumption by humans	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Ornamental nursery stock, sod farms not irrigated less than 14 day before harvest	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Supply for impoundment:				
Non-restricted recreational impoundments, with supplemental monitoring for pathogenic organisms	**Allowed[3]**	Not Allowed	Not Allowed	Not Allowed
Restricted recreational impoundments and publicly-accessible fish hatcheries	**Allowed**	**Allowed**	Not Allowed	Not Allowed
Landscape impoundments without decorative fountains	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Supply for cooling or air conditioning:				
Industrial or commercial cooling or air conditioning involving cooling tower, evaporative condenser, or spraying that creates a mist	**Allowed[4]**	Not Allowed	Not Allowed	Not Allowed
Industrial or commercial cooling or air conditioning not involving cooling tower, evaporative condenser, or spraying that creates a mist	**Allowed**	**Allowed**	**Allowed**	Not Allowed

Recycled Water Uses Allowed[1] in California
(continued)

Use of Recycled Water	Treatment Level			
	Disinfected Tertiary Recycled Water	Disinfected Secondary – 2.2 Recycled Water	Disinfected Secondary – 23 Recycled Water	Undisinfected Secondary Recycled Water
Other uses:				
Groundwater recharge	**Allowed** under special case-by-case permits by RWQCBs[5]			
Flushing toilets and urinals	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Priming drain traps	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Industrial process water that may contact workers	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Structural fire fighting	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Decorative fountains	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Commercial laundries	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Consolidation of backfill material around potable water pipelines	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Artificial snow making for commercial outdoor uses	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Commercial car washes, not heating the water, excluding the general public from washing process	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Industrial process water that will not come into contact with workers	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Industrial boiler feedwater	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Non-structural fire fighting	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Backfill consolidation around non-potable piping	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Soil compaction	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Mixing concrete	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Dust control on roads and streets	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Cleaning roads, sidewalks, and outdoor work areas	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Flushing sanitary sewers	**Allowed**	**Allowed**	**Allowed**	**Allowed**

This summary is prepared from the December 2, 2000-adopted Title 22 Water Recycling Criteria and supersedes all earlier versions. Prepared by Bahman Sheikh and edited by EBMUD Office of Water Recycling, who acknowledge this is a summary and not the formal version of the regulations referenced above.

[1] Refer to the full text of the December 2, 2000 version of Title 22: California Code of Regulations, Chapter 3 Water Recycling Criteria. This chart is only an informal summary of the uses allowed in this version, with the exception of orchards and vineyards noted as "Not Allowed[2]" on page 1 and explained below.

[2] Per California Department of Public Health letter of January 8, 2003 to California Regional Water Quality Control Boards.

[3] Allowed with "conventional tertiary treatment." Additional monitoring for two years or more is necessary with direct filtration.

[4] Drift eliminators and/or biocides are required if public or employees can be exposed to mist.

[5] Refer to Groundwater Recharge Guidelines, available from the California Department of Public Health.

2013

Recycled Water Truck Program

To help save limited potable water supplies, EBMUD provides recycled water at no charge to trucks for construction and other non-potable purposes. The Recycled Water Truck Program supplies clean, safe, disinfected recycled water for allowed uses like dust control, soil compaction, power washing, decorative fountains, landscape irrigation and ponds, street washing, and sewer flushing. To learn about other allowable uses of recycled water please see "Recycled Water Uses Allowed in CA" below.

Recycled water for trucks is available at EBMUD's main wastewater treatment plant in West Oakland and in North Richmond. Recycled water from this program may be used ***only*** in EBMUD's service area. Customers interested in participating must apply for a Recycled Water Use Permit. Please:

- Apply in person, at EBMUD's New Business Office on the 1st Floor of the Administration Building, 375 11th Street, Oakland, or
- Download the form below from EBMUD's website, or
- Call the Recycled Water Truck Program Manager at (510) 287-1346 or call (510) 287-7011 to request an application form be sent to you.

Completed applications should be returned to EBMUD. You may mail, email or fax the form as noted below:

EBMUD, Recycled Water Truck Program
P.O. Box 24055, MS 407, Oakland, CA 94623-1055
Email: mblueste@ebmud.com or mwest@ebmud.com
Fax: (510) 287-1295, Attention: Mark Bluestein

The documents below are PDF files that can be viewed and printed through Adobe Acrobat Reader, a free software.

Get ADOBE® READER®

Recycled Water Uses Allowed in CA	47.14 KB
Recycled Water Truck Program Use Permit	48.38 KB
RWTP-Certificate of Liability Insurance	26.47 KB
RWTP-Worker's Comp Certificate	21.11 KB

Requirements

- Tank trucks must be equipped with an air gap.
- Truck owners must show proof of valid truck registration (copy for each truck must be attached to permit application).
- Truck owners must show proof of vehicle liability insurance and workers' compensation insurance. Copies of the Certificate of Liability Insurance or an ACCORD form, and the Certificate of Workers' Compensation Insurance must be attached to permit application. Photocopies, PDFs, and scanned documents are acceptable.
- Before EBMUD can fill their trucks for the first time, customers/drivers are required to attend a brief on-site training in order to learn about using the filling station and the proper handling and use of recycled water. EBMUD's Recycled Water Truck Program Manager schedules the training and informs customers of the date, time, and location.
- If a company has more than one truck driver who will use this program, all drivers must attend an on-site training, and read and sign the Recycled Water Truck Program Guidelines below.
- Once the customer/driver completes the on-site orientation and training, EBMUD will issue a signed Recycled Water Use Permit along with magnetic recycled water signs to affix to each of the customer's trucks.
- Other requirements and details about the filling stations will be reviewed at the on-site training.

Recycled Water Truck Program Guidelines	47.88 KB

Popular Pages in Recycled Water

Current Recycled Water Users

Long-Term Recycled Water Planning

Water Recycling Projects Under Construction

About Recycled Water

Recycled Water Customer Service Corner

News

Recycled Water FAQs for Construction & Other Workers

See below for our Recycled Water Frequently Asked Questions for Construction & Other Workers.

Recycled Water Truck Programs in the East Bay

Several agencies offer recycled water through a truck/purple hydrant program in the East Bay. View list of East Bay recycled water truck programs below.

TRUCK CUSTOMER FILLS HIS TANKER TRUCK WITH RECYCLED WATER.

Regulatory Approval

The California Department of Public Health has approved this program which operates under EBMUD's existing master recycled water permit shown below. Customers must certify in the Recycled Water Truck Program permit that they have read the applicable rules and regulations in the master recycled water permit (Order 96-011) and agree to abide by them.

Recycled Water FAQs for Construction and Other Workers	31.05 KB
Recycled Water Truck Programs in the East Bay	26.2 KB
Order 96-011	152.96 KB

Recycled Water for Construction & Other Uses

Truck Program/Recycled Water Hydrant Sources in the East Bay Area

(Updated July 2014)

As a service to EBMUD customers, the list below includes summary information about various utilities, including EBMUD, within the EBMUD service area or relatively close to it that produce and supply recycled water. **Please contact agencies directly for more details about their recycled water truck programs.**

All customers who plan to use recycled water must first obtain permits from the appropriate recycled water supplier.

The recycled water suppliers on this list offer tertiary-treated recycled water. For information about allowed uses of tertiary-treated recycled water, please go to: www.ebmud.com > Water Supply > Recycling > About Recycled Water > Recycled Water Uses Allowed in CA (PDF document).

Disinfected Tertiary Treated:

Central Contra Costa Sanitary District
Program Description: Central San, with treatment facilities near the Interstate 680 and Highway 4 interchange, has a recycled water hydrant program (purple hydrants). To learn more about Central San's truck and purple hydrant program:
Contact: Melody LaBella
Phone Number: (925) 229-7370
Web Page: http://www.centralsan.org/index.cfm?navId=159

Dublin San Ramon Services District
Program Description: There are currently seven purple hydrants in Dublin and four in San Ramon (including Dougherty Valley). Additionally, customers can pick up recycled water at DSRSD's Regional Wastewater Treatment Facility in Pleasanton near the Interstates 580 and 680 interchange. To learn more about DSRSD's truck and purple hydrant program:
Contact: Ann Cigliuti
Phone Number: (925) 875-2334
Web Page: http://www.dsrsd.com/do-business-with-us/recycled-water-use/recycled-water-hydrants-and-fill-station

East Bay Municipal Utility District
Program Description: The Recycled Water Truck Program (RWTP) includes two truck filling stations located as follows:

- Wastewater Treatment Plant in West Oakland.
- Driveway entrance to North Richmond Water Reclamation Plant, two blocks from the Richmond Parkway.

Contact: Mark Bluestein
Phone Number: (510) 287-1346
Web Page: http://www.ebmud.com/environment/conservation-and-recycling/recycling/recycled-water-truck-program

City of Livermore
Program Description: Numerous purple hydrants on recycled water distribution system. To learn more about Livermore's purple hydrant program:
Contact: Dean Atkins
Phone Number: (925) 960-8125

Recycled Water Truck Program Guidelines

(May 2014)

Recycled Water Quality: EBMUD's Recycled Water Truck Program (RWTP) supplies clean, safe tertiary-treated recycled water that has been through a treatment process that includes either microfiltration or sand filtration and extra disinfection. Recycled water treated to this high level meets the rigorous and protective standards set by the California Department of Public Health and qualifies for unrestricted uses.

General Program Requirements

1. Customers with trucks interested in getting recycled water must apply for a Recycled Water Use Permit. The application may be obtained as follows:
   - In person, at EBMUD's New Business Office on the 1st Floor of the Administration Building, 375 11th Street, Oakland.
   - By downloading the form from EBMUD's website (www.ebmud.com): Home Page > Water Supply > Recycling > Recycled Water Truck Program > Recycled Water Truck Program Use Permit.
   - By calling the Recycled Water Truck Program Manager at (510) 287-1346 and requesting that the application form be mailed to the customer.

2. Application forms must be completed and returned, with copies of required documents attached (photocopies, PDFs, scanned documents acceptable), to EBMUD's Recycled Water Truck Program. Options for submitting completed applications include:
   - Mail to EBMUD, P.O. Box 24055, Recycled Water Truck Program, MS 407, Oakland, CA 94623-1055.
   - Email to mblueste@ebmud.com.
   - Fax to (510) 287-1295, Attention: Mark Bluestein.

3. EBMUD's recycled water may be used ***only*** within EBMUD's service area.

4. Tank trucks must be equipped with an air gap.

5. Truck owners must show proof of valid truck registration (a copy for each truck must be attached to permit application).

6. Truck owners must show proof of vehicle liability insurance (see permit form for coverage and documentation requirements) and worker's compensation insurance (unless owner-operated with no employees).

7. Before trucks can be filled for the first time, all truck owners and/or drivers are required to attend a brief on-site orientation/training in order to learn about using the filling station and the proper handling and use of recycled water. EBMUD's Recycled Water Truck Program Manager schedules the on-site orientation/training and informs customers of the date, time, and location.

8. Once the customer completes the on-site orientation/training and an EBMUD inspector verifies the required air gap, EBMUD will issue a signed Recycled Water Use Permit along with three magnetic recycled water signs to affix to the customer's truck (both sides and rear). EBMUD provides the first set of signs at no charge; the customer will have to pay (at cost) for any replacement signs. Customers who use EBMUD's Wastewater Treatment Plant filling station also will be issued a decal for truck tracking purposes.

9. The Recycled Water Use Permit must be available for inspection at all times. The recycled water user/user's agent must carry at least two copies in the truck.

Wastewater Treatment Plant Requirements

1. Recycled water is available at EBMUD's Wastewater Treatment Plant, located at 2020 Wake Avenue in West Oakland. (EBMUD provides maps and directions to the plant and to the recycled water filling station within the plant.)

2. In order to enter EBMUD's Wastewater Treatment Plant to access the recycled water filling station, the truck driver must leave one copy of the Recycled Water Use Permit at the plant's Security Gate for each water pickup.

3. Trucks must have an affixed EBMUD-issued decal and appropriately-placed recycled water signage to enter the Wastewater Treatment Plant.

4. Trucks must cross a live railroad line to access EBMUD's Wastewater Treatment Plant. Do not wait or park on the tracks at any time.

5. ***NO IDLING***. Please turn off your truck engine while filling or waiting at the filling station.

6. ***NO SMOKING*** is permitted in the plant at any time (smoking is a safety hazard as there are flammable gases, oxygen, and methane present).

7. The speed limit is ***10 miles per hour*** within the plant.

8. In the event an emergency alarm sounds (six long tones), the truck driver needs to call (510) 287-1522 for further instructions.

9. Please do ***not*** leave any trash or debris in the filling station area.

North Richmond Filling Station Requirements

1. Access to the North Richmond RWTP filling station is restricted to those truck customers ***only*** who have an EBMUD-issued permit. (EBMUD provides a map and directions to the location of the North Richmond recycled water filling station.)

2. EBMUD will issue a hydrant meter access key following the completion of site orientation/ training and the issuance of a permit. For truck customers who lose or misplace their key, EBMUD will charge a $50 replacement fee.

3. Trucks must have appropriately-placed recycled water signage to use the North Richmond recycled water filling station.

4. Please do not block any turnaround areas or nearby driveway entrances/exits when waiting or filling.

5. ***NO IDLING***. Please turn off your truck engine while filling or waiting at the filling station.

6. ***NO SMOKING*** is permitted at North Richmond recycled water filling station at any time (smoking is a potential safety hazard).

7. Please do ***not*** leave any trash or debris in the filling station area.

8. *PLEASE SECURELY RE-LOCK THE METER BEFORE LEAVING THE FILLING STATION AND MAKE SURE THAT NO WATER IS LEAKING FROM THE METER OR HYDRANT.*

9. In the event of an emergency concerning the recycled water hydrant, meter, fill pipe or hose (spillage, leaks, etc.), the truck driver needs to call the emergency contact number listed on the filling station sign for further instructions.

Recycled Water Handling and Use Requirements/Precautions

1. Do ***not*** drink recycled water or use it for food preparation. Additionally, the truck driver must notify workers and/or the public when recycled water is used at a site and tell them that they are not to drink recycled water or use it for food preparation.

2. Recycled water users should apply hand sanitizer or wash their hands with soap and potable water after working with recycled water and especially before eating or smoking.

3. Precautions should be taken to avoid food coming contact with recycled water while the use site is still wet.

4. Truck drivers should be equipped with an adequate first aid kit. Cuts or abrasions should be promptly washed, disinfected, and bandaged.

5. Recycled water shall not be allowed to spray onto external drinking water fountains.

6. Recycled water shall not be applied where it could contact or enter passing vehicles, buildings, areas where food is handled or eaten, or storm drains.

7. Recycled water users shall take adequate measures to prevent overspray, ponding, or run off of recycled water from the authorized recycled water use area unless it is specifically

allowed by the Regional Water Quality Control Board or by an attachment to the Recycled Water Use Permit issued by EBMUD.

8. There shall be no irrigation or impoundment of recycled water within a minimum of 50 feet of any domestic (drinking water) well.

9. Vehicles used for transportation and distribution of recycled water must have water-tight valves and fittings, must not leak, and tanks must be cleaned of contaminants prior to use. A truck or tank that has contained material from a septic tank or cesspool shall not be used to convey recycled water.

10. Recycled water must not be introduced into any permanent piping system and no connection shall be made between the tank truck and any part of a potable water system.

11. Tank trucks used to transport recycled water should not be used to carry potable water unless a thorough cleaning and disinfection process has been completed. Contact EBMUD at (510) 287-1346 for details.

I certify that I have read, understand, and agree to abide by the above guidelines.

Signature _____ Date _____

Print Name _____

Company _____

California Driver License Number: _____

Recycled Water Uses Allowed[1] in California

Use of Recycled Water	Treatment Level			
	Disinfected Tertiary Recycled Water	Disinfected Secondary – 2.2 Recycled Water	Disinfected Secondary – 23 Recycled Water	Undisinfected Secondary Recycled Water
Irrigation of:				
Food crops where recycled water contacts the edible portion of the crop, including all root crops	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Parks and playgrounds	**Allowed**	Not Allowed	Not Allowed	Not Allowed
School yards	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Residential landscaping	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Unrestricted-access golf courses	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Any other irrigation uses not prohibited by other provisions of the California Code of Regulations	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Food crops, surface-irrigated, above-ground edible portion, and not contacted by recycled water	**Allowed**	**Allowed**	Not Allowed	Not Allowed
Cemeteries	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Freeway landscaping	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Restricted-access golf courses	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Ornamental nursery stock and sod farms with unrestricted public access	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Pasture for milk animals for human consumption	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Non-edible vegetation with access control to prevent use as a park, playground or school yard	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Orchards with no contact between edible portion and recycled water	**Allowed**	**Allowed**	Not Allowed[2]	Not Allowed[2]
Vineyards with no contact between edible portion and recycled water	**Allowed**	**Allowed**	Not Allowed[2]	Not Allowed[2]
Non food-bearing trees, including Christmas trees not irrigated less than 14 days before harvest	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Fodder and fiber crops and pasture for animals not producing milk for human consumption	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Seed crops not eaten by humans	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Food crops undergoing commercial pathogen-destroying processing before consumption by humans	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Ornamental nursery stock, sod farms not irrigated less than 14 day before harvest	**Allowed**	**Allowed**	**Allowed**	**Allowed**
Supply for impoundment:				
Non-restricted recreational impoundments, with supplemental monitoring for pathogenic organisms	**Allowed[3]**	Not Allowed	Not Allowed	Not Allowed
Restricted recreational impoundments and publicly-accessible fish hatcheries	**Allowed**	**Allowed**	Not Allowed	Not Allowed
Landscape impoundments without decorative fountains	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Supply for cooling or air conditioning:				
Industrial or commercial cooling or air conditioning involving cooling tower, evaporative condenser, or spraying that creates a mist	**Allowed[4]**	Not Allowed	Not Allowed	Not Allowed
Industrial or commercial cooling or air conditioning not involving cooling tower, evaporative condenser, or spraying that creates a mist	**Allowed**	**Allowed**	**Allowed**	Not Allowed

Recycled Water Uses Allowed[1] in California
(continued)

Use of Recycled Water	Treatment Level			
	Disinfected Tertiary Recycled Water	Disinfected Secondary – 2.2 Recycled Water	Disinfected Secondary – 23 Recycled Water	Undisinfected Secondary Recycled Water
Other uses:				
Groundwater recharge	**Allowed** under special case-by-case permits by RWQCBs[5]			
Flushing toilets and urinals	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Priming drain traps	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Industrial process water that may contact workers	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Structural fire fighting	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Decorative fountains	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Commercial laundries	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Consolidation of backfill material around potable water pipelines	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Artificial snow making for commercial outdoor uses	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Commercial car washes, not heating the water, excluding the general public from washing process	**Allowed**	Not Allowed	Not Allowed	Not Allowed
Industrial process water that will not come into contact with workers	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Industrial boiler feedwater	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Non-structural fire fighting	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Backfill consolidation around non-potable piping	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Soil compaction	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Mixing concrete	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Dust control on roads and streets	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Cleaning roads, sidewalks, and outdoor work areas	**Allowed**	**Allowed**	**Allowed**	Not Allowed
Flushing sanitary sewers	**Allowed**	**Allowed**	**Allowed**	**Allowed**

This summary is prepared from the December 2, 2000-adopted Title 22 Water Recycling Criteria and supersedes all earlier versions. Prepared by Bahman Sheikh and edited by EBMUD Office of Water Recycling, who acknowledge this is a summary and not the formal version of the regulations referenced above.

[1] Refer to the full text of the December 2, 2000 version of Title 22: California Code of Regulations, Chapter 3 Water Recycling Criteria. This chart is only an informal summary of the uses allowed in this version, with the exception of orchards and vineyards noted as "Not Allowed[2]" on page 1 and explained below.

[2] Per California Department of Public Health letter of January 8, 2003 to California Regional Water Quality Control Boards.

[3] Allowed with "conventional tertiary treatment." Additional monitoring for two years or more is necessary with direct filtration.

[4] Drift eliminators and/or biocides are required if public or employees can be exposed to mist.

[5] Refer to Groundwater Recharge Guidelines, available from the California Department of Public Health.

2013

This Recycled Water Use Permit must be available for inspection at all times. The recycled water user/user's agent must carry two copies in the truck and present one copy at EBMUD's Wastewater Treatment Plant Security Gate for water pickups at that location only. Permit is subject to RWQCB Order 96-011.

Recycled Water Truck Program
Recycled Water Use Permit

East Bay Municipal Utility District
Recycled Water Truck Program, MS 407
P.O. Box 24055
Oakland, CA 94623-1055

(For EBMUD use)
Permit Number: _____ **Effective Date of Permit:** _____

Hydrant meter key issued by EBMUD? ☐ Yes ☐ No

1. Customer Information

User's Name: _____

Name of Company: _____

Mailing Address: _____

City/State/ZIP Code: _____

Office Phone #: _____ Fax #: _____

Primary Contact: _____ Title: _____

Cell Phone or Other Phone #: _____

2. Truck Information

Provide the following information for the truck(s) for which a permit is requested. An EBMUD inspector must inspect each truck to determine that it is equipped with the necessary air gap before decal issuance.

Truck Trailer # (if applicable)	**License Plate Number**	**Capacity of Tank or Storage Containers**	(For EBMUD use)	
			Vehicle Equipped with Air Gap?	**Decal #s**

3. Recycled Water Use Information (Check all that apply)

Use of Recycled Water: ☐ Soil Compaction ☐ Dust Control ☐ Irrigation ☐ Power Washing

☐ Sewer Flushing ☐ Street Cleaning ☐ Other: _____

RECYCLED WATER MUST NOT TO BE USED FOR STORM DRAIN FLUSHING

Application Method: ☐ Tank Truck ☐ Spray ☐ Wash Water

☐ Other: _____

RECYCLED WATER FROM EBMUD MAY BE USED ONLY WITHIN EBMUD's SERVICE AREA

Where you expect to apply recycled water within EBMUD's service area:

City: _____ Address: _____

City: _____ Address: _____

(Attach separate sheet if necessary)

4. Recycled Water Use Information

User agrees to install, maintain, and keep in place while using recycled water three magnetic signs (on both sides and the rear of each truck) identifying that recycled water is in use. EBMUD provides the first set of signs at no charge; replacement signs to be paid for at cost by user. ***User must initial here to acknowledge these requirements***: _____ (initials)

In cases where EBMUD issues a hydrant meter key, the customer must pay EBMUD $50 to replace any lost key. ***User must initial here to acknowledge this requirement:*** _____ (initials)

Customer must identify the person responsible for implementing worker/public protection at each site (i.e., that humans are not to drink recycled water or use it for preparing food).
Name of Responsible Person:_____

5. Vehicle Registration and Insurance Requirements

Permit holder must provide and attach copies of current vehicle registration (for each truck) and the following insurance requirements: 1) Proof of auto and trucking liability insurance with $1 million in policy limits that include liability coverage for bodily injury, property and auto damage. It must also provide coverage for the use of owned, non-owned and hired automobiles and trucks. 2) Proof of Workers Compensation coverage that provides up to the state statutory limits. (For single owner/operators with no employees Worker's Compensation coverage can be waived).

CERTIFICATION & INDEMNIFICATION

I certify that I am an authorized agent for the company cited in this application and that I have authority to bind the company to the requirements of this permit and program. I hereby certify under penalty of perjury that the information provided in this permit application and in any attachment is true and accurate to the best of my knowledge. I also certify that I have read the applicable rules and regulations of the Regional Water Quality Control Board Order 96-011 and the EBMUD Recycled Water Truck Program Guidelines and agree to abide by them.

My company agrees to defend, indemnify, and hold harmless EBMUD and its Directors, officers, agents and employees from and against any and all loss, liability, expense, claims, suits, and damages, including attorneys' fees, arising out of or resulting from Permit Holder's, its associates', employees', subconsultants', or other agents' negligent acts, errors or omissions, or willful misconduct, in the operation and/or performance under this Recycled Water Use Permit.

Signature of User _____ Print Name _____
Title _____
Company _____ Date _____

AUTHORIZATION

Customer is authorized to use recycled water from EBMUD's Recycled Water Truck Program in accordance with EBMUD's Recycled Water Truck Program Guidelines and RWQCB Order 96-011.

Authorized Signature: _____

Filling Station Representative Signature: _____ Date _____

CERTIFICATE OF COMMERCIAL AUTO AND TRUCKING LIABILITY INSURANCE

THIS IS TO CERTIFY TO:

East Bay Municipal Utility District (EBMUD)
Department: Water and Natural Resources
Recycled Water Truck Program, MS 407
Street Address: 375 11th St.
Mailing Address: P.O. Box 24055
City, State, Zip: Oakland, CA 94623-1055

THE FOLLOWING DESCRIBED POLICY HAS BEEN ISSUED TO:

District Contract/Permit Number: _____

Insured: _____

Address: _____

LOCATION AND DESCRIPTION OF PROJECT/AGREEMENT:

_____

TYPE OF INSURANCE: Automobile/Trucking Liability: Coverage/Endorsements as required by agreement.
LIMITS OF LIABILITY: (MINIMUM) $1,000,000/Occurrence, Bodily Injury, Property Damage- Auto Liability

SELF INSURED RETENTION ($): (Auto/Trucking)
Aggregate Limits (Auto/Trucking)

INSURANCE COMPANY(IES): (Auto/Trucking)

POLICY NUMBER(S): (Auto/Trucking)

POLICY TERM: From: (Auto/Trucking) To: (Auto/Trucking)

THE FOLLOWING COVERAGES OR ENDORSEMENTS ARE INCLUDED IN THE POLICY(IES):

1. ☒ The coverage is *Primary and non-contributory* to any other applicable insurance carried by the District;
2. ☒ The policy(ies) covers *contractual liability*;
3. ☒ The policy(ies) covers the use of *owned, non-owned, and hired* trucks;
4. ☒ The policy(ies) covers the use of *owned, non-owned, and hired automobiles;*
5. ☒ The policy(ies) will not be canceled nor the above coverages/endorsements reduced without 30 days written notice to East Bay Municipal Utility District at the address above.

IT IS HEREBY CERTIFIED that the above policies provide liability insurance as required by the agreement between the East Bay Municipal Utility District and the insured.

Signed _____ Firm _____
Address _____ Date _____
_____ Phone _____

_____ _____
Signature Date

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

THIS IS TO CERTIFY TO:

East Bay Municipal Utility District (EBMUD)
Department: Water and Natural Resources – RW Truck Program
Street Address: 375 Eleventh Street, MS 407
Mailing Address: P.O. Box 24055
City, State, Zip: Oakland, CA 94623

THE FOLLOWING DESCRIBED POLICY HAS BEEN ISSUED TO:

District Permit Number:
(completed by EBMUD) _____

Insured: _____

Address: _____

_____

LOCATION AND DESCRIPTION OF PROJECT/AGREEMENT:

Procure recycled water at designated EBMUD Recycled Water Truck Program filling station (West Oakland or North Richmond).

TYPE OF INSURANCE: Workers' Compensation Insurance as required by California State Law.

INSURANCE COMPANY: _____

POLICY NUMBER: _____

POLICY TERM: From: _____ To: _____

The policy will not be canceled nor the above coverage reduced without 30 days written notice to East Bay Municipal Utility District at the address above.

IT IS HEREBY CERTIFIED the above policy provides insurance as required by the agreement between East Bay Municipal Utility District at the Insured.

Signed: _____
Authorized Signature of Broker, Agent, or Underwriter

Date: _____ Firm: _____

Address: _____

_____

Phone: _____

"This certificate or verification of insurance is not an insurance policy and does not amend, extend, or alter the coverage afforded by the policies listed herein. Notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate or verification of insurance may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions, and conditions of the policies."