

FOR CONTRACT NO.: 10-0A8724

INFORMATION HANDOUT

MATERIALS INFORMATION

**INSTALLATION DETAILS FOR
BATTERY BACKUP SYSTEM
(BBS Cabinet mounting details and wiring details)**

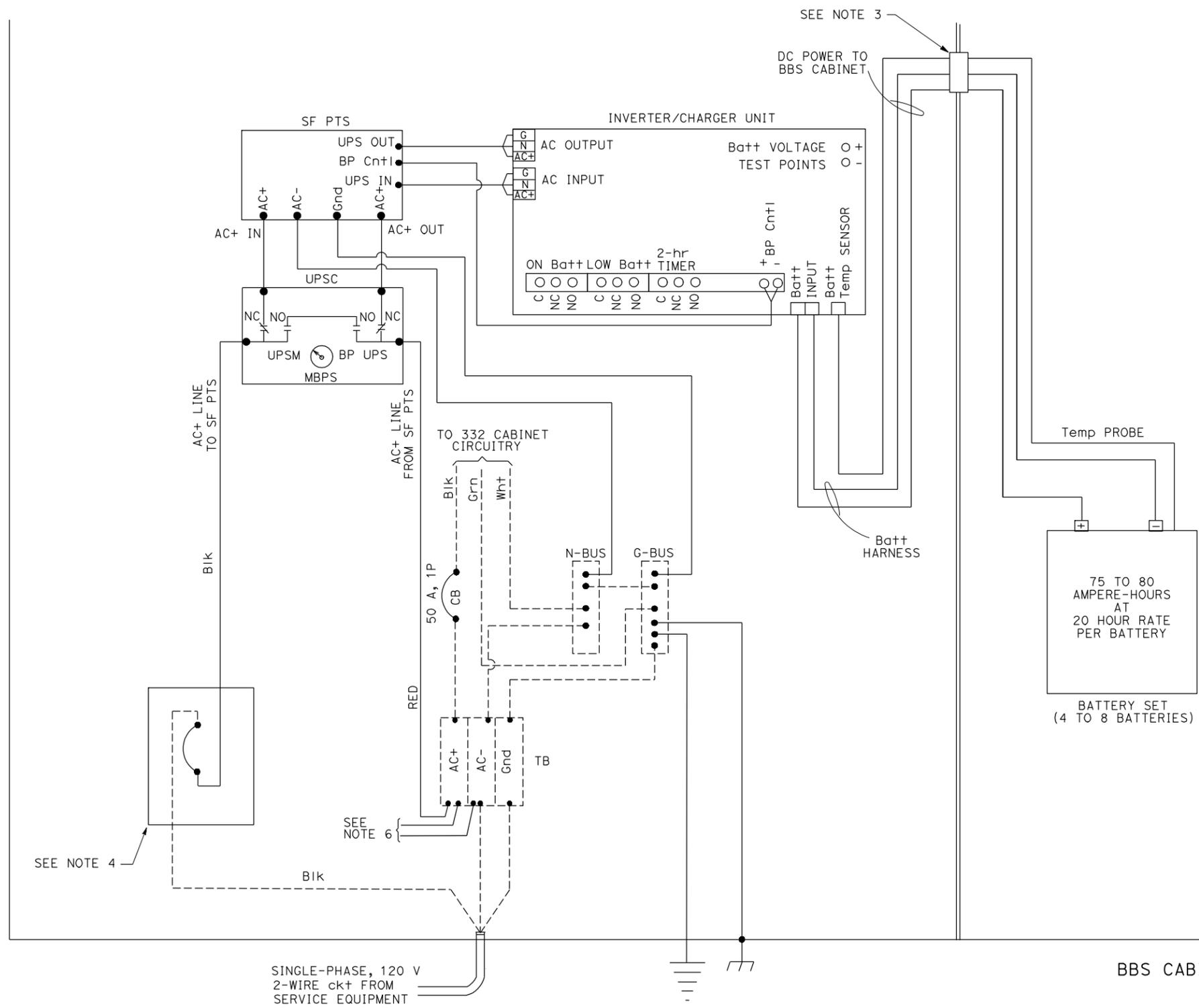
GEOTECHNICAL REPORT AND ADDENDUM

ROUTE: 10-STA-219, 108-3.4/7.9, 44.3/44.9



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

Theresa Gabriel 12-20-07
 REGISTERED ELECTRICIAN DATE
 Theresa A. Gabriel
 No. E15129
 Exp. 6-30-10
 ELECT
 STATE OF CALIFORNIA
 REGISTERED PROFESSIONAL ENGINEER
 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.



LEGEND: (THIS SHEET ONLY)

- PTS = POWER TRANSFER SWITCH
- UPS = UNINTERRUPTIBLE POWER SUPPLY
- UPSC = UNINTERRUPTIBLE POWER SUPPLY CONTROLLER
- UPSM = UPS MODE
- BP = BYPASS
- MBPS = MANUAL BYPASS SWITCH
- AC+ = UNGROUNDED CONDUCTOR
- AC- = GROUNDED CONDUCTOR
- C = COMMON
- Grn = GREEN
- Blk = BLACK
- Wht = WHITE
- SF = STATE-FURNISHED
- Batt = BATTERY
- Temp = TEMPERATURE
- TB = TERMINAL BOARD
- Cntl = CONTROL
- Gnd = GROUND

NOTES: (THIS SHEET ONLY)

1. TYPE B REFERS TO THE BBS EQUIPMENT FROM MANUFACTURER B.
2. CASE-2 REFERS TO THE SITUATION WHEN ONLY THE BATTERIES ARE INSTALLED IN THE BBS CABINET. THE REMAINING EQUIPMENT IS PLACED IN THE 332 CONTROLLER CABINET.
3. THE LOCATION OF THE 53C NIPPLE WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEMA-1 ENCLOSURE WITH 30 A, 1P, 120/240 VOLTS RATED CIRCUIT BREAKER MANUFACTURED PER UL STANDARD 489.
5. A TEMPERATURE PROBE SHALL BE ATTACHED TO THE BATTERY BY TAPE OR ATTACHED TO THE NEGATIVE TERMINAL OF THE BATTERY.
6. THE ELECTRICAL POWER FOR THE COOLING FAN FOR THE BBS CABINET SHALL BE TAPPED FROM THE BOTTOM OF THE TB IN THE 332 CABINET.
7. THE CONTRACTOR SHALL PROVIDE A 9-WIRE WIRING HARNESS OR BUNDLED 9 MULTICOLOR CONDUCTORS, #18 AWG WIRES FROM THE RELAY ON THE INVERTER/CHARGER UNIT TO THE CONTROLLER. THE ENDS OF THE CONDUCTORS SHALL BE INSULATED WITH TAPE AND A 1.828 m COIL ON EACH END.

**ELECTRICAL SYSTEMS
 (BBS POWER CONNECTION DIAGRAM,
 TYPE A, CASE-2)**

NO SCALE



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

Theresa Gabriel 12-20-07
 REGISTERED ELECTRICIAN DATE
 Theresa A. Gabriel
 No. E15129
 Exp. 6-30-10
 ELECT
 STATE OF CALIFORNIA

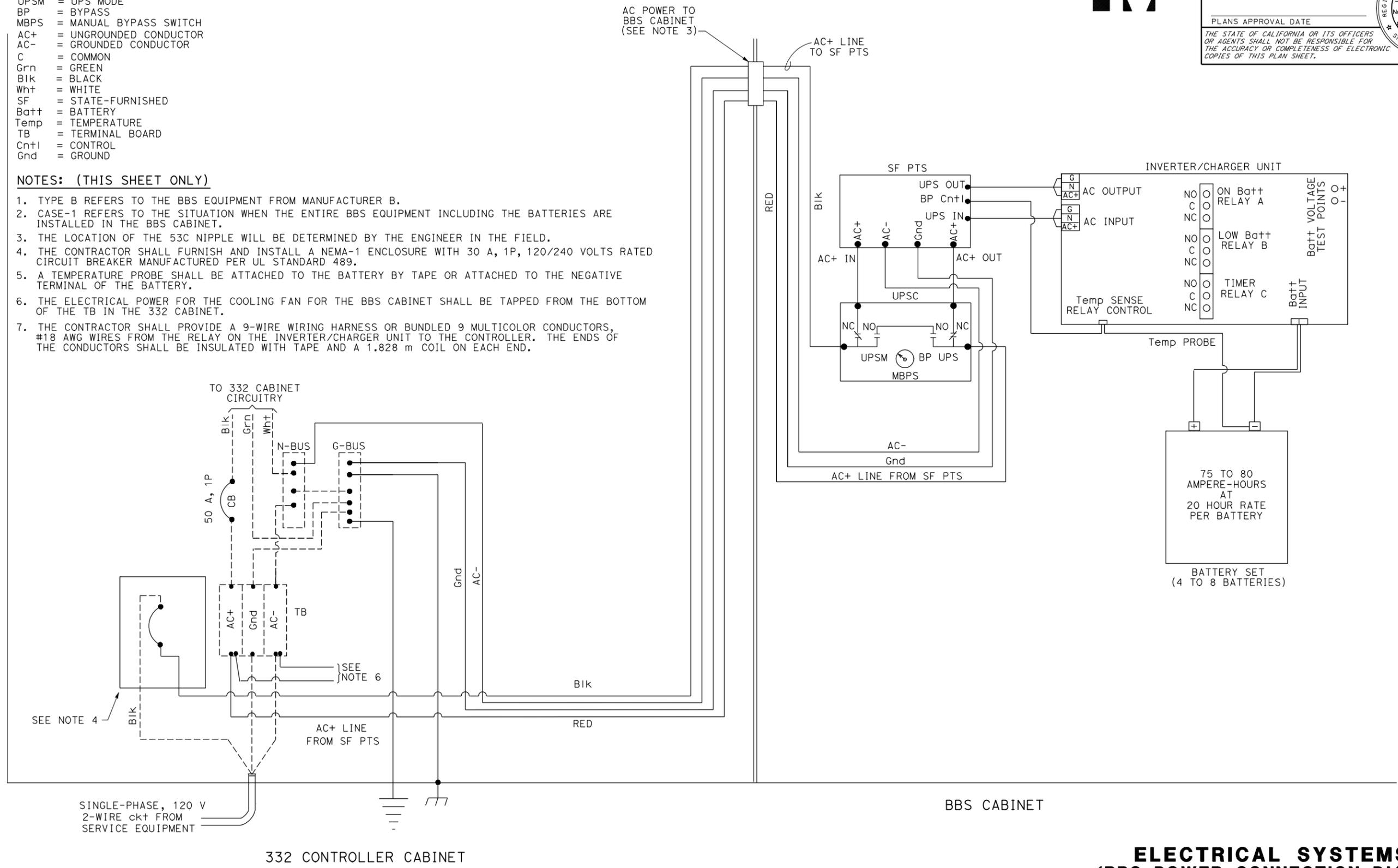
PLANS APPROVAL DATE
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

LEGEND: (THIS SHEET ONLY)

- PTS = POWER TRANSFER SWITCH
- UPS = UNINTERRUPTIBLE POWER SUPPLY
- UPSC = UNINTERRUPTIBLE POWER SUPPLY CONTROLLER
- UPSM = UPS MODE
- BP = BYPASS
- MBPS = MANUAL BYPASS SWITCH
- AC+ = UNGROUNDED CONDUCTOR
- AC- = GROUNDED CONDUCTOR
- C = COMMON
- Grn = GREEN
- Blk = BLACK
- Wh+ = WHITE
- SF = STATE-FURNISHED
- Batt+ = BATTERY
- Temp = TEMPERATURE
- TB = TERMINAL BOARD
- Cntl = CONTROL
- Gnd = GROUND

NOTES: (THIS SHEET ONLY)

1. TYPE B REFERS TO THE BBS EQUIPMENT FROM MANUFACTURER B.
2. CASE-1 REFERS TO THE SITUATION WHEN THE ENTIRE BBS EQUIPMENT INCLUDING THE BATTERIES ARE INSTALLED IN THE BBS CABINET.
3. THE LOCATION OF THE 53C NIPPLE WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEMA-1 ENCLOSURE WITH 30 A, 1P, 120/240 VOLTS RATED CIRCUIT BREAKER MANUFACTURED PER UL STANDARD 489.
5. A TEMPERATURE PROBE SHALL BE ATTACHED TO THE BATTERY BY TAPE OR ATTACHED TO THE NEGATIVE TERMINAL OF THE BATTERY.
6. THE ELECTRICAL POWER FOR THE COOLING FAN FOR THE BBS CABINET SHALL BE TAPPED FROM THE BOTTOM OF THE TB IN THE 332 CABINET.
7. THE CONTRACTOR SHALL PROVIDE A 9-WIRE WIRING HARNESS OR BUNDLED 9 MULTICOLOR CONDUCTORS, #18 AWG WIRES FROM THE RELAY ON THE INVERTER/CHARGER UNIT TO THE CONTROLLER. THE ENDS OF THE CONDUCTORS SHALL BE INSULATED WITH TAPE AND A 1.828 m COIL ON EACH END.



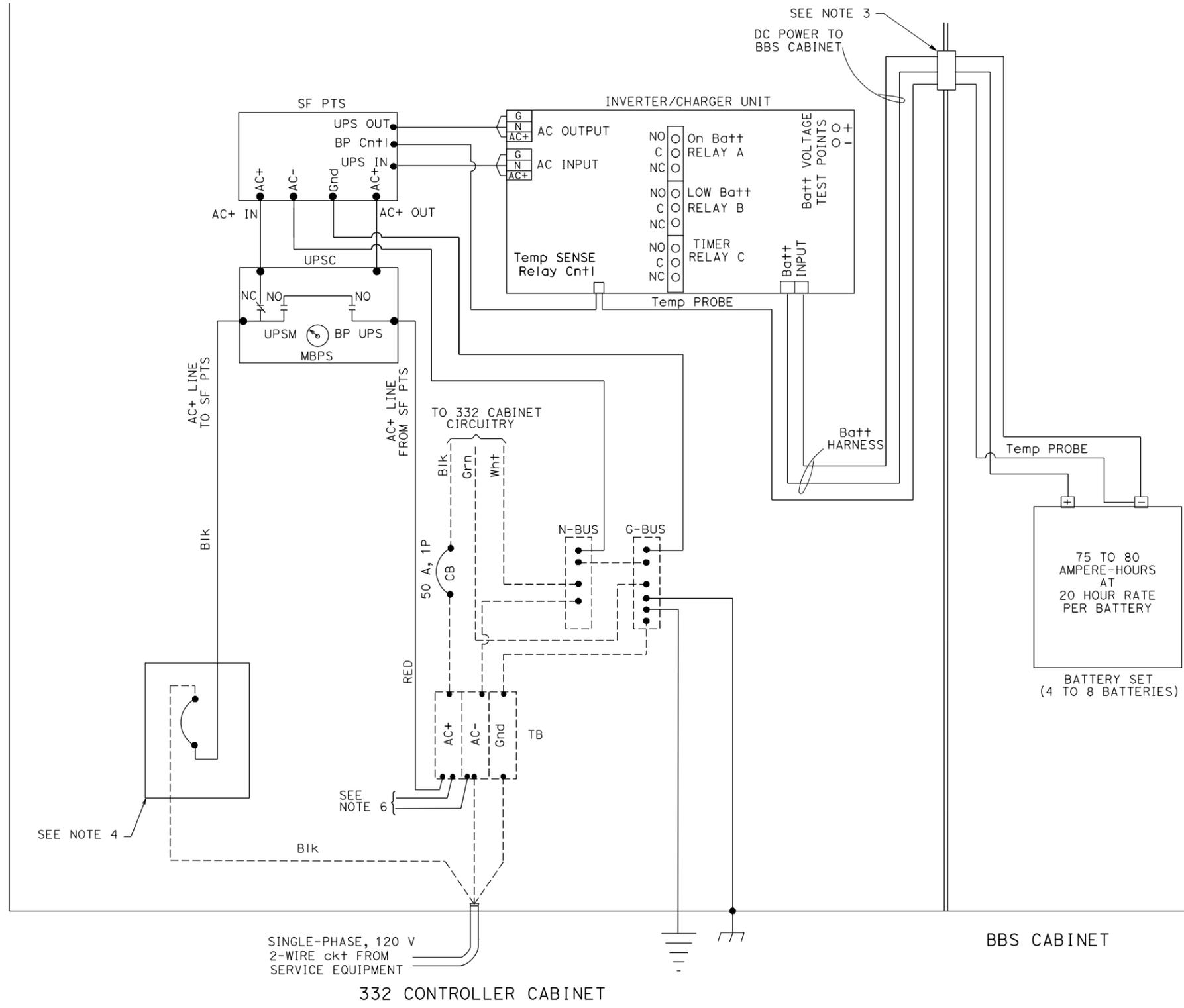
**ELECTRICAL SYSTEMS
(BBS POWER CONNECTION DIAGRAM,
TYPE B, CASE-1)
NO SCALE**

REVISIONS: REVISED BY DATE REVISED
 CALCULATED BY DESIGNED BY CHECKED BY
 FUNCTIONAL SUPERVISOR
 DEPARTMENT OF TRANSPORTATION
 STATE OF CALIFORNIA
 Caltrans



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

Theresa Gabriel 12-20-07
 REGISTERED ELECTRICIAN DATE
 Theresa A. Gabriel
 No. E15129
 Exp. 6-30-10
 ELECT
 STATE OF CALIFORNIA
 REGISTERED PROFESSIONAL ENGINEER
 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.



LEGEND: (THIS SHEET ONLY)

- PTS = POWER TRANSFER SWITCH
- UPS = UNINTERRUPTIBLE POWER SUPPLY
- UPSC = UNINTERRUPTIBLE POWER SUPPLY CONTROLLER
- UPSM = UPS MODE
- BP = BYPASS
- MBPS = MANUAL BYPASS SWITCH
- AC+ = UNGROUNDED CONDUCTOR
- AC- = GROUNDED CONDUCTOR
- C = COMMON
- Grn = GREEN
- Blk = BLACK
- Wht = WHITE
- SF = STATE-FURNISHED
- Batt+ = BATTERY
- Temp = TEMPERATURE
- TB = TERMINAL BOARD
- Cntl = CONTROL
- Gnd = GROUND

NOTES: (THIS SHEET ONLY)

1. TYPE B REFERS TO THE BBS EQUIPMENT FROM MANUFACTURER B.
2. CASE-2 REFERS TO THE SITUATION WHEN ONLY THE BATTERIES ARE INSTALLED IN THE BBS CABINET. THE REMAINING EQUIPMENT IS PLACED IN THE 332 CONTROLLER CABINET.
3. THE LOCATION OF THE 53C NIPPLE WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEMA-1 ENCLOSURE WITH 30 A, 1P, 120/240 VOLTS RATED CIRCUIT BREAKER MANUFACTURED PER UL STANDARD 489.
5. A TEMPERATURE PROBE SHALL BE ATTACHED TO THE BATTERY BY TAPE OR ATTACHED TO THE NEGATIVE TERMINAL OF THE BATTERY.
6. THE ELECTRICAL POWER FOR THE COOLING FAN FOR THE BBS CABINET SHALL BE TAPPED FROM THE BOTTOM OF THE TB IN THE 332 CABINET.
7. THE CONTRACTOR SHALL PROVIDE A 9-WIRE WIRING HARNESS OR BUNDLED 9 MULTICOLOR CONDUCTORS, #18 AWG WIRES FROM THE RELAY ON THE INVERTER/CHARGER UNIT TO THE CONTROLLER. THE ENDS OF THE CONDUCTORS SHALL BE INSULATED WITH TAPE AND A 1.828 m COIL ON EACH END.

**ELECTRICAL SYSTEMS
 (BBS POWER CONNECTION DIAGRAM,
 TYPE B, CASE-2)**

NO SCALE

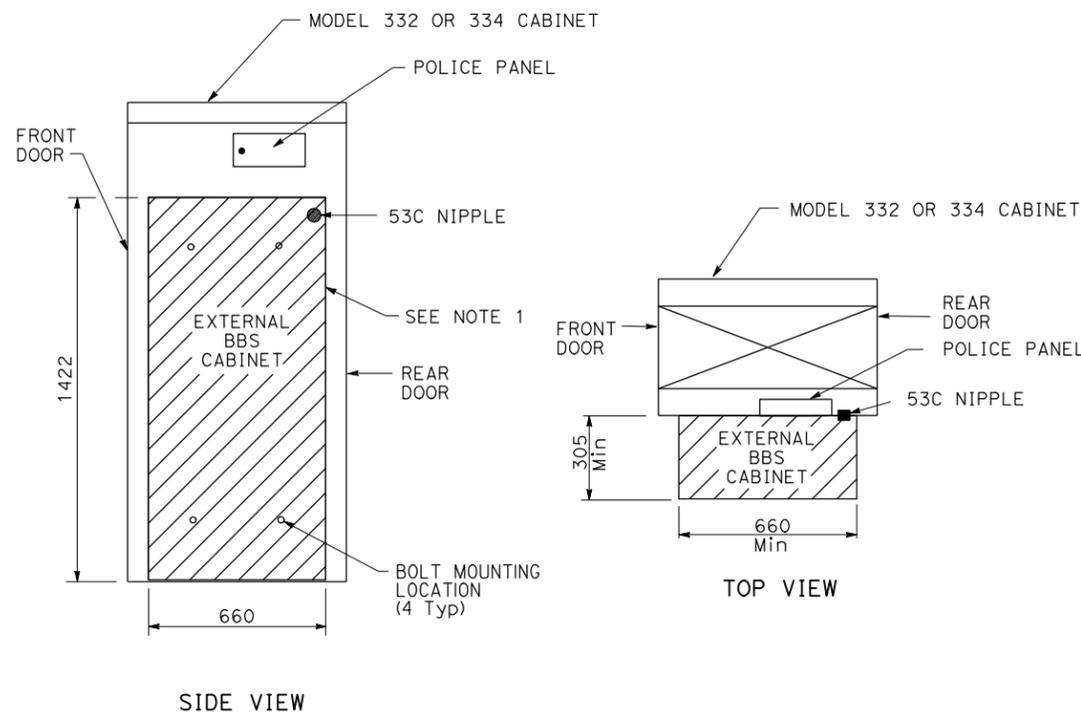


Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Theresa Gabriel 12-20-07
 REGISTERED ELECTRICIAN DATE
 Theresa A. Gabriel
 No. E15129
 Exp. 6-30-10
 ELECT
 STATE OF CALIFORNIA

PLANS APPROVAL DATE _____

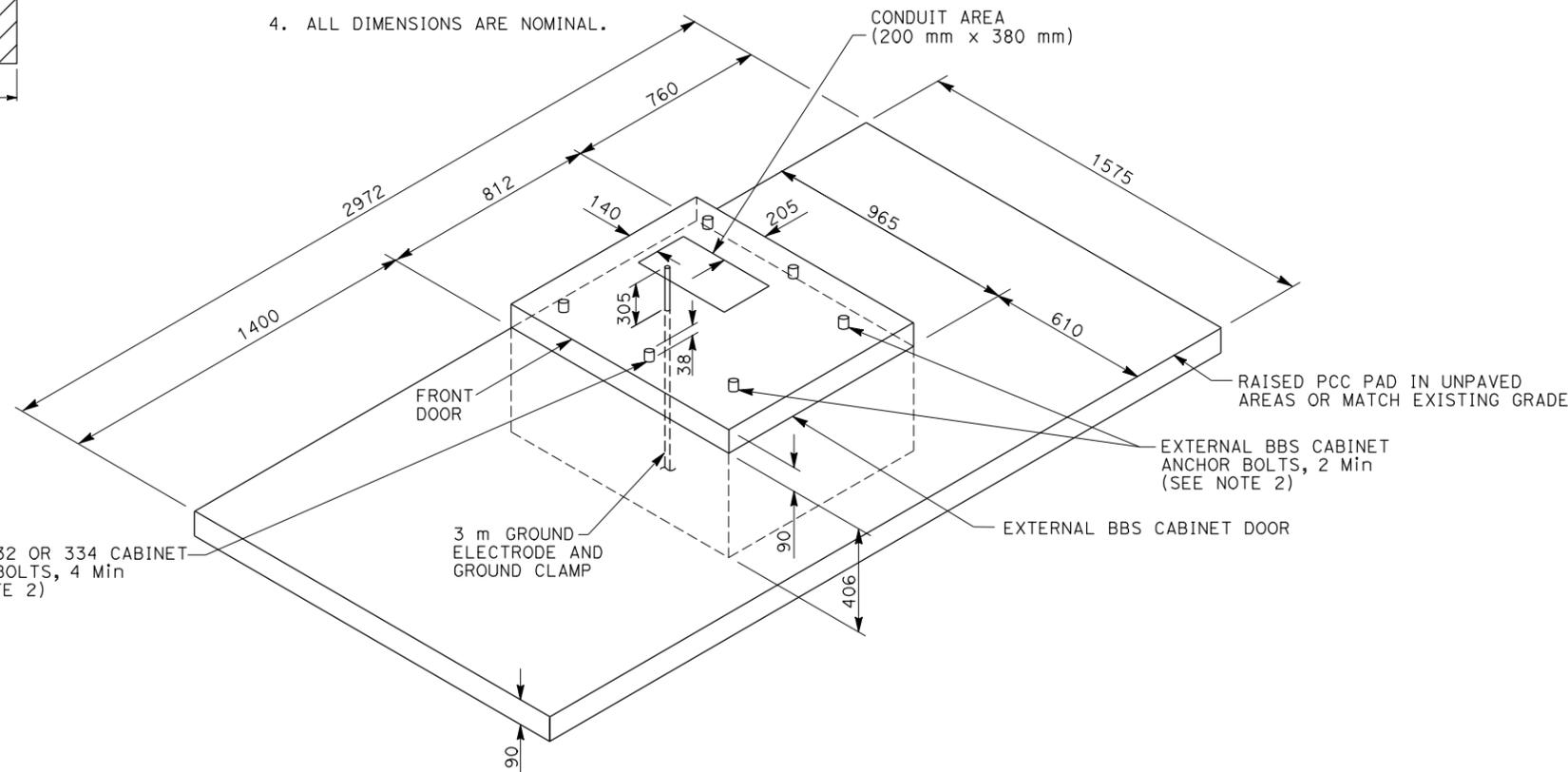
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



EXTERNAL BBS CABINET MOUNTED TO THE MODEL 332 OR 334 CABINET

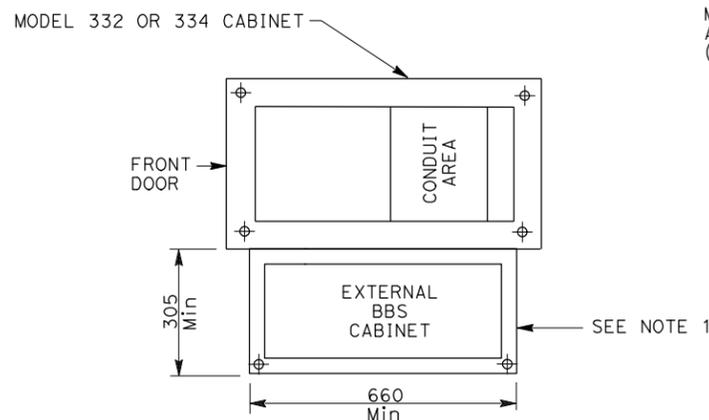
NOTE: (THIS SHEET ONLY)

1. THE EXTERNAL BBS CABINET SHALL BE MOUNTED TO THE MODEL 332 OR 334 CABINET WITH FOUR 18-8 STAINLESS STEEL HEX HEAD, FULLY-THREADED, 9.5 mm-16 X 25.4 mm BOLTS; TWO WASHERS PER BOLT, DESIGNED FOR 9.5 mm BOLTS AND ARE 18-8 STAINLESS STEEL, 25.4 mm OUTSIDE DIAMETER, ROUND, AND FLAT; AND ONE K-LOCK NUT PER BOLT, THAT IS 18-8 STAINLESS STEEL AND A HEX-NUT. THE ENGINEER WILL HAVE TO APPROVE THE BOLT MOUNTING LOCATION PRIOR TO INSTALLATION.
2. THE ANCHOR BOLTS SHALL BE 19 mm Dia X 380 mm WITH A 50 mm-90° BEND. THE CABINET MANUFACTURER'S SPECIFICATION SHALL DETERMINE THE LOCATION OF THE ANCHOR BOLTS IN THE FOUNDATION. THE ENGINEER WILL HAVE TO APPROVE ANCHOR BOLTS AND ITS LOCATION IN THE FOUNDATION PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS OF THE BBS CABINET PRIOR TO CONSTRUCTING THE FOUNDATION OF THE MODIFIED PORTION OF THE Std MODEL 332 AND 334 CABINET FOUNDATION. THE ENGINEER WILL HAVE TO APPROVE ANY NECESSARY DEVIATIONS PRIOR TO CONSTRUCTION.
4. ALL DIMENSIONS ARE NOMINAL.



MODIFIED MODEL 332 AND 334 CABINET FOUNDATION DETAIL FOR BATTERY BACKUP SYSTEM (BBS)

(FOR DIMENSIONS AND DETAILS NOT SHOWN AND ADDITIONAL NOTES, SEE SHEET ES-3C OF THE STANDARDS PLANS FOR MODEL 332 AND 334 CABINETS)



BASE PLAN FOR BBS MOUNTED TO THE MODEL 332 OR 334 CABINET

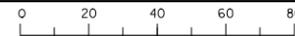
(FOR DIMENSIONS AND DETAILS NOT SHOWN, SEE SHEET A6-1 TO A6-4, CABINET HOUSING DETAILS OF THE TRANSPORTATION ELECTRICAL EQUIPMENT SPECIFICATION (TEES))

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN
ELECTRICAL SYSTEMS (BBS FOUNDATION DETAILS)

NO SCALE

THIS PLAN IS ACCURATE FOR ELECTRICAL WORK ONLY.

RELATIVE BORDER SCALE IS IN MILLIMETERS



USERNAME => trcarol
 DGN FILE => BBS Foundation metric.dgn

CU 00000

EA 00000

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



FUNCTIONAL SUPERVISOR

DESIGNED BY
 CHECKED BY

REVISOR
 DATE REVISION

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. JOSE HUERTA
Senior Transportation Engineer
District 10 Design IV, Branch L

Date: October 8, 2008

Attention: Wuthy Seng, Project Engineer

File: 10-STA-219
KP 3.4/7.9 (PM 2.1/4.9)
10-0A8721
Sound Walls & CMS's

**From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5**

Subject: Geotechnical Design Report

2008 OCT 11 AM 8:53

Introduction

Per your request, dated December 12, 2007, a Geotechnical Design Report (GDR) is provided for the widening project on Highway 219. This project is located within the northern portion of the City of Modesto in Stanislaus County from KP 3.4 to KP 7.9 (PM 2.1/4.9). See Plate No. 1, Vicinity Map.

This project is proposed to widen Route 219 from a two-lane conventional highway to a four-lane conventional highway to reduce congestion. As part of this improvement project, three sound walls are proposed within Stanislaus County Union School, one Changeable Message Sign (CMS) is proposed at Station 40+40 near Morrow Road, and another CMS is also proposed at Station 73+05 near Pentecost Drive. This memo documents the geotechnical recommendation for the sound walls and CMS's.

This report includes a review of published data, site visits, subsurface exploration, and laboratory analyses.

Pertinent Reports and Investigations

In preparing this report, we have reviewed the following documents:

1. Western Regional Climate Center for 1931-1990
2. "California Seismic Hazard Map", prepared by Caltrans, dated 1996.

3. Geologic Map of California: San Jose sheet: California Division of Mines and Geology, dated 1966.

Existing Facilities and Proposed Improvements

The proposed project starts from KP 3.4 to KP 7.9 on Highway 219. Along this stretch of the roadway, Highway 219 currently consists of a 2-lane undivided roadway paved with asphalt concrete aligned in a general east-west direction. The roadway is built on level terrain on mostly original ground. There minor slope of 1:2 (V:H) or flatter on either side of the roadway. There are local streets and driveways that are directly connected to residential area and businesses along this section of roadway. Utility lines parallel the roadway on the both sides.

The proposed project includes adding one lane on each direction by widening on the outside of the existing roadway. All intersections will be improved to meet current design standard. Outside shoulder is proposed to be widened to 3.0 m whereas inside shoulder is proposed to be widened to 1.5 m. As part of the project, three standard sound walls are proposed within the property of the Stanislaus County Union School around Station 49+00, two Model 510 CMS's are proposed at Stations 40+40 and 73+05.

Physical Setting

The physical setting of the project site and the surrounding area was reviewed to provide climate, topography and drainage, man-made and natural features, geology and seismicity characteristics to aid in preliminary project design and construction planning. The following is a discussion of our review:

Climate

Information regarding the climate in the project area is provided by the Western Regional Climate Center period of record from 1906 to 2007. There is one station located in Modesto (#045738). The average annual precipitation is 314 mm (12.26 in). The majority of this precipitation falls between November and April. The average daily minimum temperature ranges from 3.1° C (37.6° F) in January to 15.4 ° C (59.8° F) in

Mr. Jose Huerta
October 8, 2004
Page 3

July, and the average daily maximum temperature ranges from 12.1° C (53.7° F) in January to 34.6° C (94.2° F) in July. Freezing temperatures and snowfall are not common at the project site. Yearly updates are available at the Western Regional Climate Center web site.

Topography & Drainage

The site is located in the Great Valley geomorphic province of California on the western side of the Sierra Nevada Mountain Range and eastern side of the Coast Mountain Range. The flat terrain is typical for the valley region with an elevation of 25 meters on the West end of the project and an elevation of 31 meters on the east end of the project, with lower elevations of 25 meters on the west end and elevation increases westward. Most of the localized drainage is generally trending to the west.

Man-made and Natural Features of Engineering and Construction Significance

The terrain along the stretch of the project is relatively flat. Most of the highway is on original ground; however, the fill side slopes that do exist are performing well and are approximately 1:2 (V:H) or flatter. There are overhead power lines that run along both sides of the highway. These overhead power lines are fairly close to the existing roadway, since the widening is going to be outside of the existing roadway, these power lines are likely to be relocated. Tidewater Southern Railroad crosses the project at Station 70+55. There is no bridge located within this stretch of the highway.

Regional Geology and Seismicity

The California Department of Conservation, Division of Mines and Geology Geologic Map of California, San Jose Sheet, 1966 was used to determine the geologic formations in the project location. A section from these maps showing the project location is attached as Plate No. 2. The project location is mapped as being in an area of Recent Alluvial Fan Deposits in the Great Valley (Qf) and Recent Dune Sand (Qs) formed during the Quaternary Period of the Cenozoic Era, between 10 thousand and 1.6 million years ago.

Geotechnical Conditions

In general, the soil characteristics within the project area, according to findings from drilling, consist of fine to coarse grained, no to low plasticity, loose to very dense silt, sand, and mixtures thereof. See Plate 4 for Boring Location and attached Boring Record for more detailed information.

Groundwater

Groundwater was encountered during drilling on June 25 and June 26 of 2008 from all five borings. See Attached Boring Record. Groundwater depth was measured from 8.2 m to 9.6 m. Table 1 below shows the groundwater condition at different locations.

Table 1 - Groundwater Level

Boring ID	Location	Surface Elevation (m)	Groundwater Depth (m)	Groundwater Elevation (m)
08-1	Stanislaus Co. Union School	28.04	8.99	19.05
08-2	Stanislaus Co. Union School	28.04	9.57	18.47
08-3	Stanislaus Co. Union School	27.43	8.23	19.20
08-4	CMS 2 at Sta 73+07	31.00	9.60	21.40
08-5	CMS 1 at Sta 40+40	27.13	9.45	17.68

Project Site Seismicity

The Department's California Seismic Hazard Map, dated 1996, was reviewed to determine the seismicity of the project. The map indicates that the controlling fault is the Midway-San Joaquin Fault (MSJ). See Plate No. 3 for Seismic Hazard Map. This fault is an unknown-style fault, and it is located approximately 29.7 km west of the project area.

This fault is capable of generating a Maximum Credible Earthquake (MCE) of moment magnitude $M_w = 6.75$. The MCE from this source is expected to produce peak bedrock acceleration on the order of 0.2g at the project site where “g” represents the acceleration due to gravity.

Geotechnical Testing

Laboratory tests such as gradation analysis and corrosion test, were performed on representative soil samples. See Plate 4 for boring location.

Gradation Analysis

See Plates 5 and 6 for the results of mechanical analyses. Plate 5 shows the grain size distribution of three soil samples obtained from Stanislaus County Union School. Plate 6 shows grain size distribution of one sample obtained from Boring 08-4 (near CMS 2), and one sample obtained from Boring 08-5 (near CMS 1).

Corrosion

Corrosion test was performed on three samples obtained from Borings 08-1, 08-4, and 08-5 at a depth of 0 to 1.5 m below ground. See Table 2 below for corrosion test results.

Table 2 - Corrosion Test Result

Boring ID	Location	Sample Depth (m)	Minimum Resistivity (ohm-cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
08-1	Stanislaus Co. Union School	0-1.5	3132	7.12	0	0
08-4	CMS 2 at Sta 73+05	0-1.5	4338	7.56	0	0
08-5	CMS 1 at Sta 40+40	0-1.5	2956	5.11	0	0

In order for the site to be non-corrosive, the minimum resistivity must be 2000 ohm-cm or greater, the pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm. The pH at Boring 08-5 is 5.11 which indicates slightly acidic condition. For this reason, the site is classified as corrosive.

Geotechnical Recommendations

Sound Walls

Three sound walls are proposed in this project, and they are all located within the area of the Stanislaus County Union School. The proposed sound walls are Caltrans standard masonry block type with wall height of 4265 mm founded on trench footing. It is the recommendation of this office that the proposed sound walls can be constructed as planned. Case 1 design parameters should be utilized. The depth of the trench footing, D, should not be less than 2200 mm. If the wall height is changed, the following Table 3 shows the corresponding recommended trench footing depth, D.

Table 3 – Mim. Trench Footing
Depth

Maximum Wall Height, H (mm)	Recommended Trench Footing Depth, D (mm)
1829	1300
2438	1500
3048	1800
3658	2000
4267	2200
4877	2400

Changeable Message Sign (CMS)

There are two Model 510 CMS signs proposed for the project. CMS 1 is located near the intersection of Rte 219 and Morrow Road at Station 40+40, and CMS 2 is near the intersection of Rte 219 and Pentecost Drive at Station 73+05. The foundation of these CMS's should consist of a single cast-in-drilled-hole (CIDH) pile of 5488 mm in length and 1220 mm diameter.

Construction Considerations

All earthworks shall follow Section 19 of Caltrans Standard Specifications. Temporary casing may be used for CIDH piles construction if caving occurs. Since the site is corrosive, bridge reference specification 90CORR may be utilized for the construction of the CMS foundation. Settlement resulting from the placement of fills is expected to be minimal and to occur during construction. No waiting period is necessary.

Mr. Jose Huerta
October 8, 2004
Page 8

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:
LOTB for Rte 219 Sound Walls and CMS's

Data and information included in the Information Handout provided to the bidders and contractors are:
Geotechnical Design Report for EA 10-0A8721, dated Oct 8, 2008.

Data and information available for inspection at the District Office:
None.

Data and information available for inspection at the Transportation Laboratory are:
None.

A full-sized Log of Test Boring (LOTB) which is to be incorporated in the project plans has been prepared by Geotechnical Services, Office of Geotechnical Support Branch D – Contracts, Graphics & Records, and was forwarded to District 10 Project Development. Mrs. Irma Gamarra-Remmen of the Contracts, Graphic & Records branch may be contacted directly for information on the LOTB.

If any changes to the structure are proposed during the final project design, the Office of Geotechnical Design – North should review those changes to determine if the foundation recommendation herein still applies.

If you have any questions or comments, please call Carolyn Zhen at (916) 227-1055 or John Huang at (916) 227-1037.

cell
(916) 215-3482
Carolyn Zhen

Mr. Jose Huerta
October 8, 2004
Page 9



Report by:
CAROLYN ZHEN
Transportation Engineer, Civil
Office of Geotechnical Design – North
Branch E



Sign by:
JOHN HUANG, P.E.
Senior Materials and Research Engineer
Office of Geotechnical Design – North
Branch E

c: JHuang
GDN File



Mr. Jose Huerta
October 8, 2004
Page 10

LIST OF ATTACHMENTS

Plate 1 Vicinity Map

Plate 2 Geology Map

Plate 3 Seismic Hazard Map

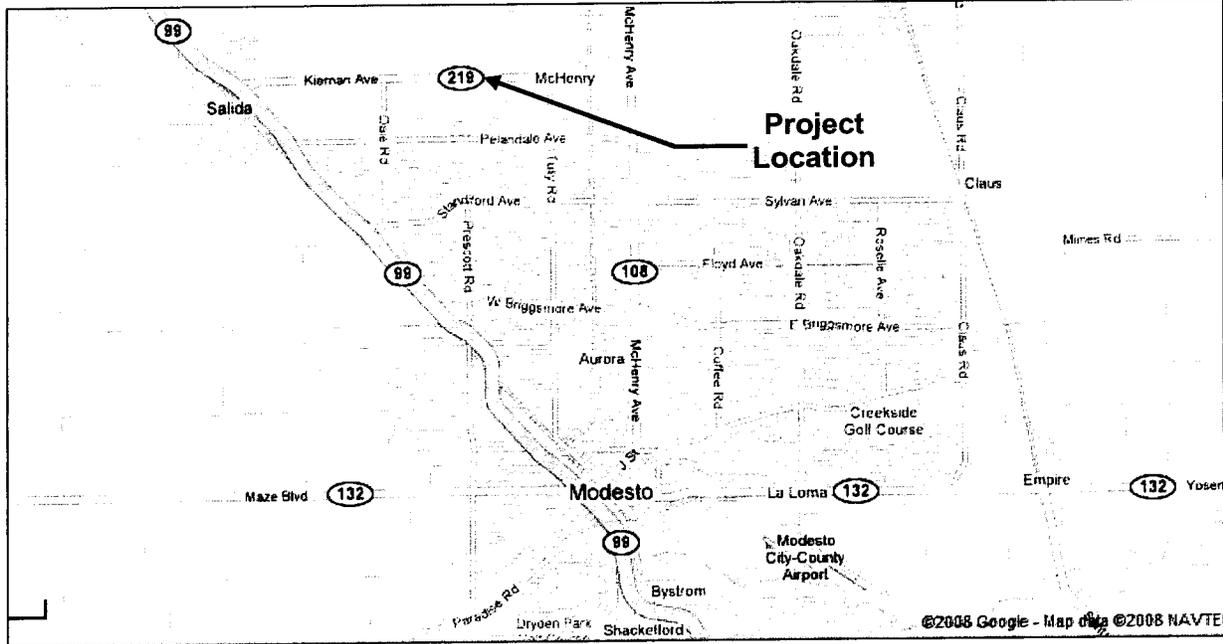
Plate 4 Boring Location

Plate 5 Gradation Analysis Test Results (Sound Walls)

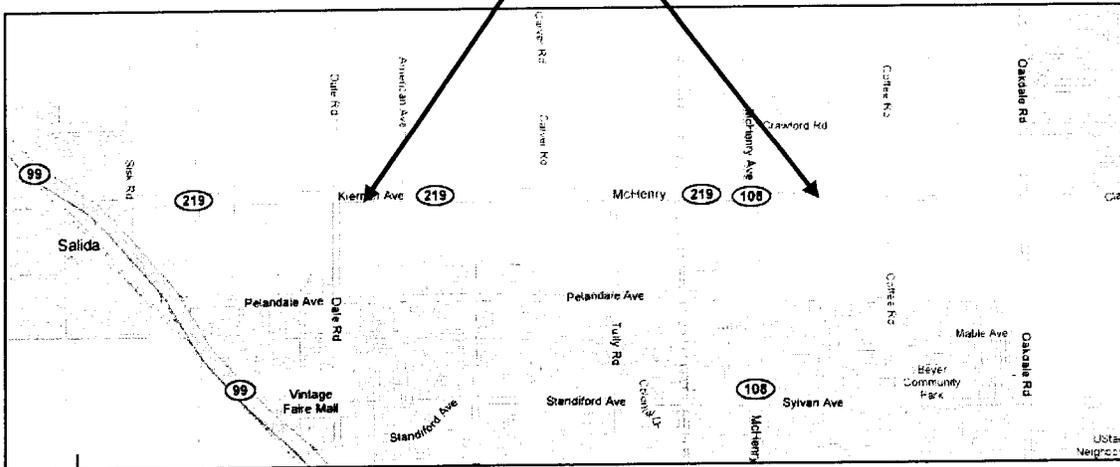
Plate 6 Gradation Analysis Test Results (CMS's)

Boring Record

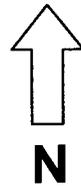
Boring Record Legend



Project Limits

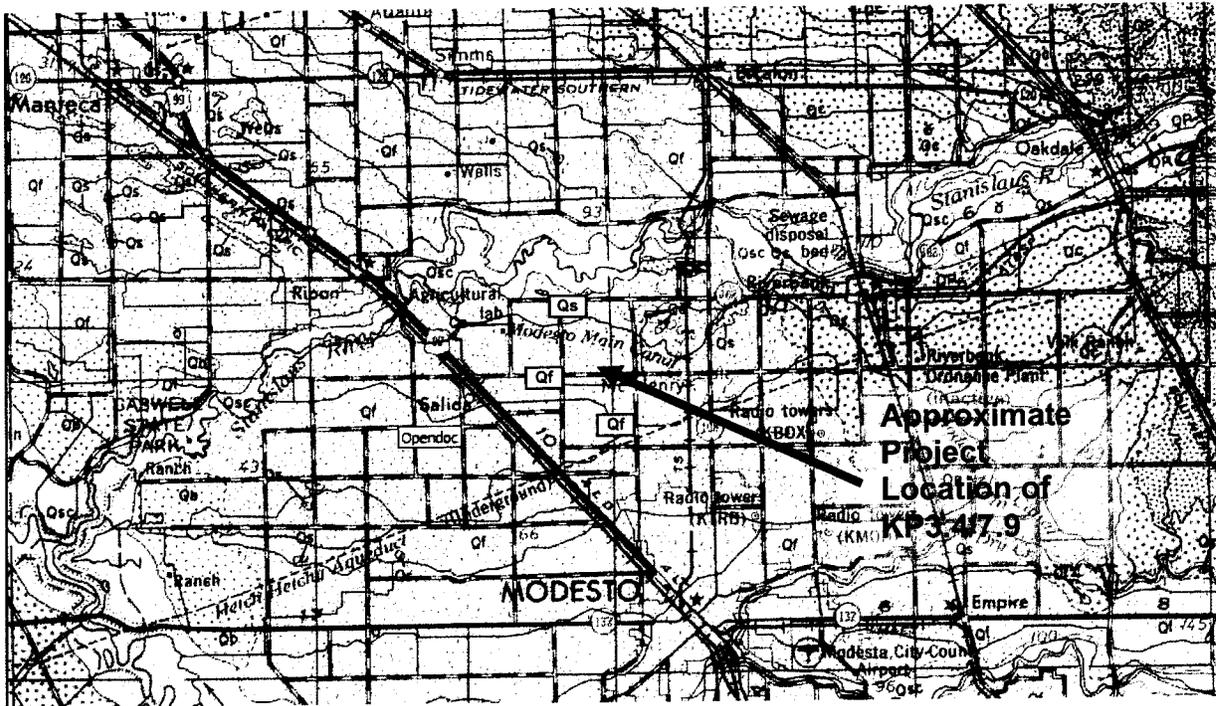


No scale



CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

EA: 10-0A8721	VICINITY MAP
Date: July 2008	
10-STA-219-KP 3.4/7.9 GEOTECHNICAL DESIGN REPORT	
	Plate No. 1



Geologic Map of California : San Jose sheet: California Division of Mines and Geology, 1966

Explanation of Relevant Formations:

Qf – Recent Alluvial Fan Deposits in the Great Valley – Sediments deposited from streams emerging from highlands surrounding the Great Valley.

Qs – Recent Dune Sand – Loose sand deposits very low in organic matter.



CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

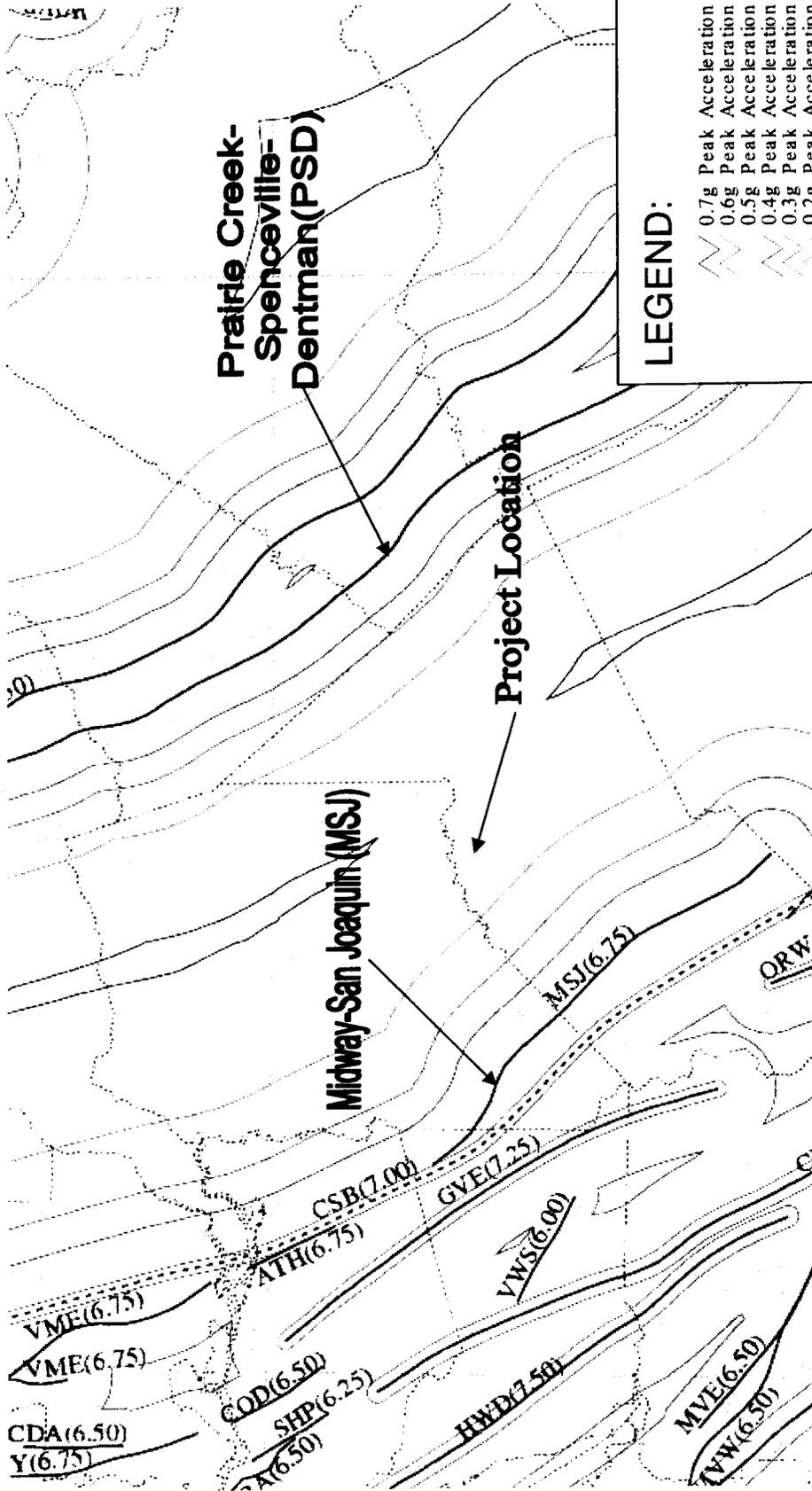
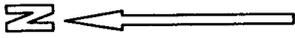
EA:10-0A8721

Date: July 2008

GEOLOGY MAP

10-STA-219 KP 3.4/7.9
GEOTECHNICAL DESIGN REPORT

Plate
 No. 2



Prairie Creek-Spenceville-Dentman(PSD)

Midway-San Joaquin (MSJ)

Project Location

LEGEND:

- 0.7g Peak Acceleration Contour
- 0.6g Peak Acceleration Contour
- 0.5g Peak Acceleration Contour
- 0.4g Peak Acceleration Contour
- 0.3g Peak Acceleration Contour
- 0.2g Peak Acceleration Contour
- 0.1g Peak Acceleration Contour
- Special Seismic Source (SSS)
- Faults with Fault Codes (MCE)
- State Highways
- County Boundary
- Latitude & Longitude

California Seismic Hazard Map, 1996, by Lalliana Mualchin

EA: 10-0A8721

July 2008

SEISMIC HAZARD MAP

Plate No. 3

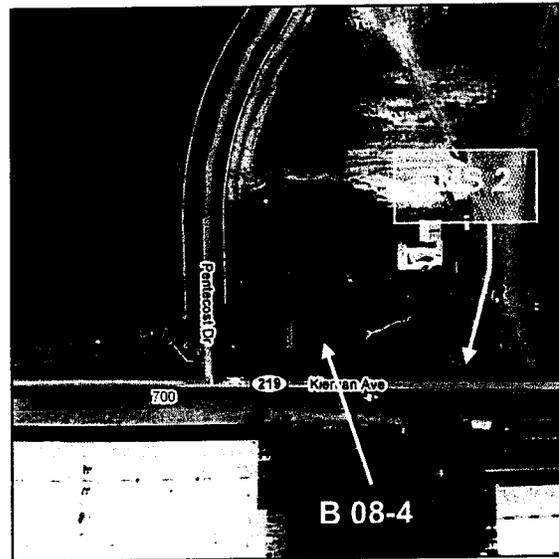
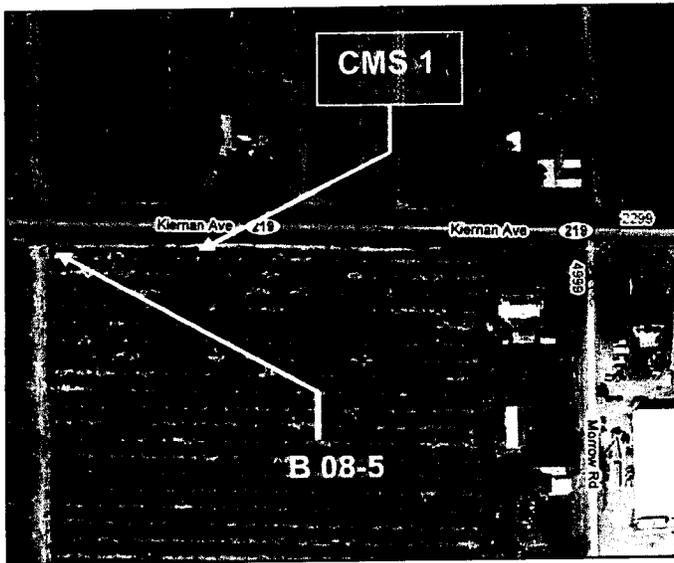
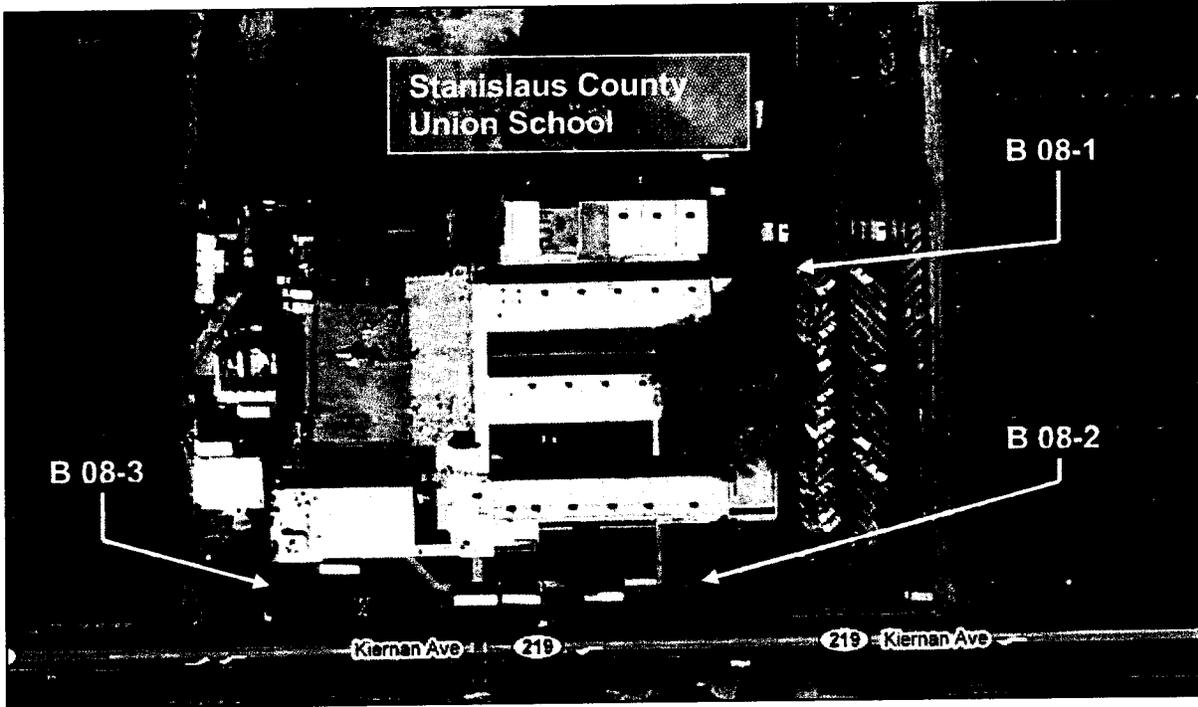
10-STA-219-KP 3.4/7.9

GEOTECHNICAL DESIGN REPORT



CALTRANS

Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design North



No scale



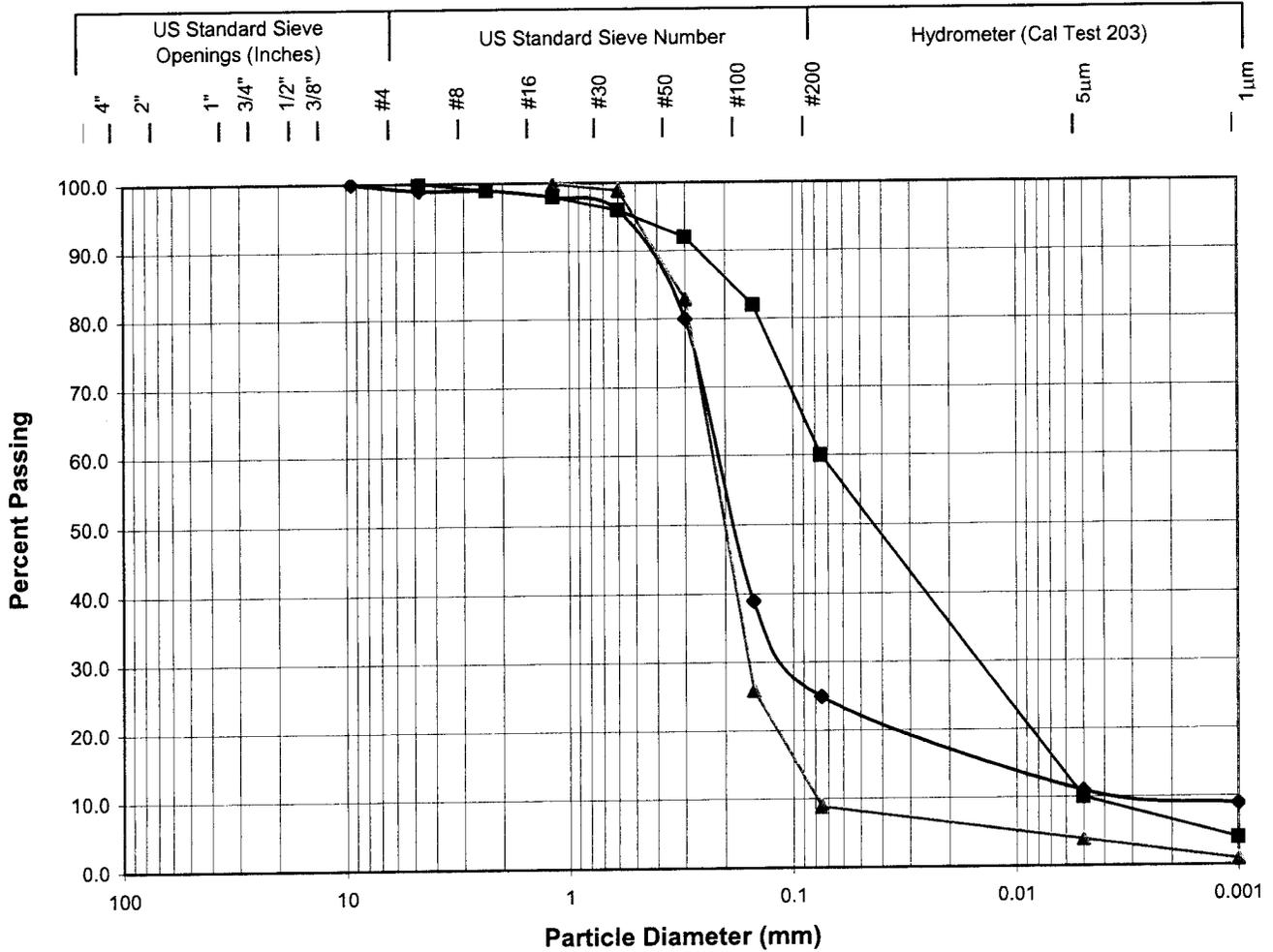
CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

EA: 10-0A8721	Boring Location
Date: Oct 2008	

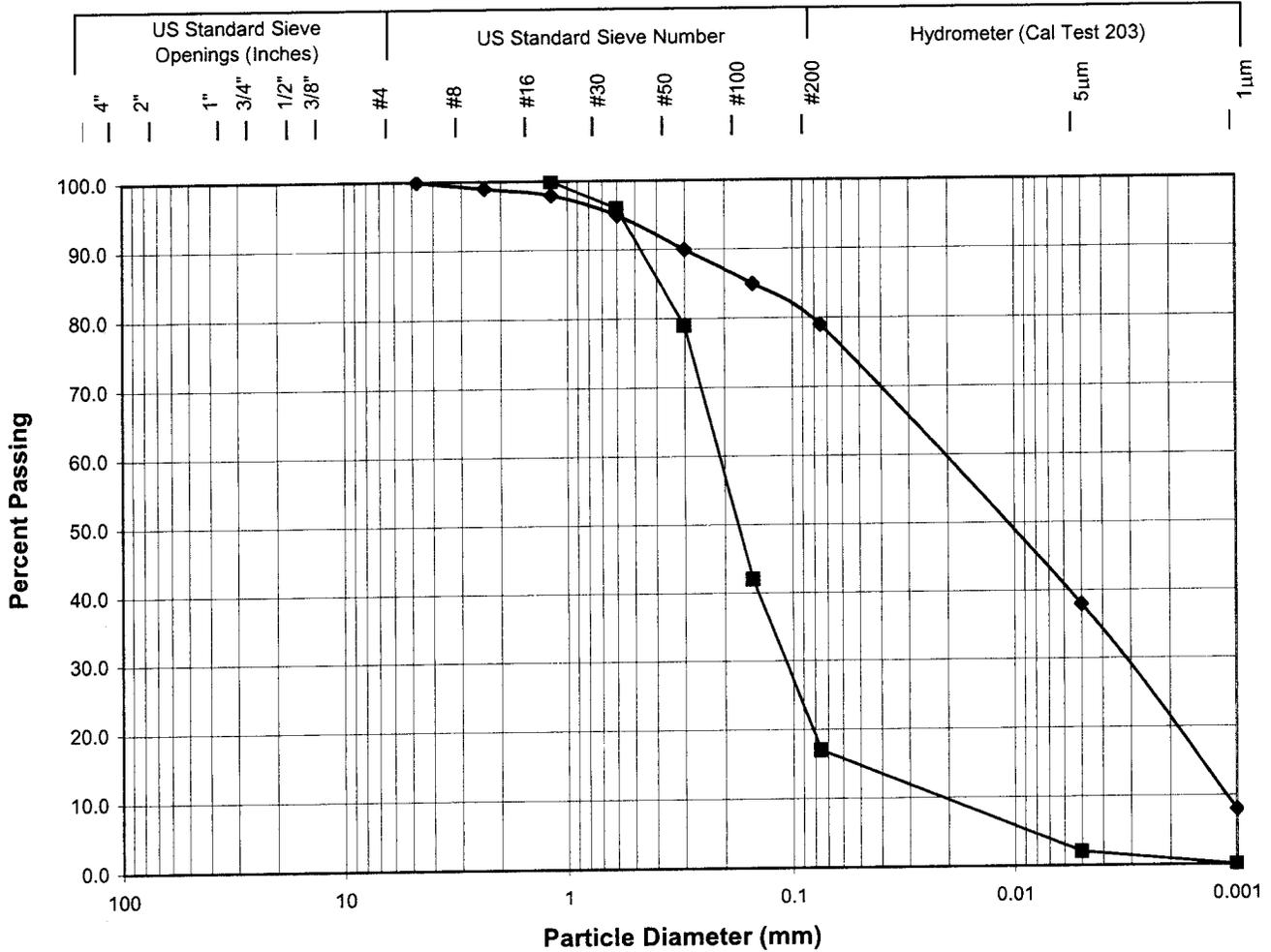
**10-STA-219-KP 3.4/7.9
 GEOTECHNICAL DESIGN REPORT**

Plate
 No. 4

Gradation Analysis Test Results (Sound Walls)



Gradation Analysis Test Results (CMS's)



Sample ID:

◆ B 08-4-2 CMS 2

■ B 08-5-2 CMS 1



Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design North

Project: Rte 219 Sound Walls & CMS's

EA: 10-0A8721

D.-Co.-Rt.-: 10-STA-219-KP3.4/7.9

Test Date: 9/30/2008

Plate 6

LOGGED BY C Zhen	BEGIN DATE 6-25-08	COMPLETION DATE 6-25-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID 08-1
DRILLING CONTRACTOR Caltrans			BOREHOLE LOCATION (Offset, Station, Line) 380' Lt Sta 49+90 "A" LINE	SURFACE ELEVATION 92 ft
DRILLING METHOD Hollow-Stem Auger			DRILL RIG CME 750	BOREHOLE DIAMETER 6 in.
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT			SPT HAMMER TYPE Automatic 140 lbs	HAMMER EFFICIENCY, ERI 82%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) 29.5 ft on 6-25-08	TOTAL DEPTH OF BORING 32.0 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
90.00	1		SILTY SAND (SM); medium dense; brown yellowish brown; moist; fine SAND; low plasticity fines.											
88.00	2													
86.00	3													
86.00	4													
86.00	5		SILT with SAND (ML); medium dense; light gray; moist; fine SAND; low plasticity fines; Scattered iron oxide staining (mottled).	1	7	26	94							
86.00	6				10									
86.00	7				16									
84.00	8		Poorly graded SAND (SP); loose; yellowish brown; moist; fine SAND; low plasticity fines; micaeous.											
84.00	9													
82.00	10													
82.00	11		CLAYEY SAND (SC); loose; light brown; moist; fine SAND; low plasticity fines.	2	5	10	67				PP = 2.7			
82.00	12		Well-graded SAND (SW); medium dense; yellowish brown; moist; fine SAND; no to low plasticity fines; micaeous.		5									
82.00	13													
80.00	14													
80.00	15													
80.00	16													
80.00	17		SILTY SAND (SM); medium dense; greenish gray; moist; fine SAND; low plasticity fines; weak cementation; micaeous.	3	4	15	94							
80.00	18				7									
80.00	19				8									
80.00	20													
80.00	21			4	1	24	94							a wood hair in sampler
80.00	22				7									
80.00	23				17									
80.00	24		Well-graded SAND (SW); medium dense; yellow; moist; medium SAND; no to low plasticity fines.											
80.00	25													

(continued)

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08



Department of Transportation
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-1
DIST. 10	COUNTY Stanilus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 1 of 2	

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
66.00	25		Well-graded SAND (SW) (continued).		5	9 15 15	30	83							
64.00	27		Well-graded SAND (SW); medium dense; light brownish gray; wet; medium to coarse SAND; no to low plasticity fines; slightly micaeous.												
62.00	29														Hit groundwater
60.00	31				6	6 13 13	26								
	32		Bottom of Borehole at 32.0 ft.												
	33														
58.00	34														
	35														
56.00	36														
	37														
54.00	38														
	39														
52.00	40														
	41														
50.00	42														
	43														
48.00	44														
	45														
46.00	46														
	47														
44.00	48														
	49														
42.00	50														
	51														
40.00	52														
	53														
38.00	54														
	55														



Department of Transportation
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-1
DIST. 10	COUNTY Stanilaus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 2 of 2	

LOGGED BY C Zhen	BEGIN DATE 6-25-08	COMPLETION DATE 6-25-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID 08-2
DRILLING CONTRACTOR Caltrans			BOREHOLE LOCATION (Offset, Station, Line) 110' Lt Sta 49+68 "A" LINE	SURFACE ELEVATION 92 ft
DRILLING METHOD Hollow-Stem Auger			DRILL RIG CME 750	BOREHOLE DIAMETER 6 in.
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT			SPT HAMMER TYPE Automatic 140 lbs	HAMMER EFFICIENCY, ERI 82%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) 31.4 ft on 6-25-08	TOTAL DEPTH OF BORING 31.5 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
90.00	1		SILTY SAND (SM); very loose; dark brown; moist; fine SAND; low plasticity fines; slightly micaeous.											
86.00	5			1	2	4	94							
86.00	6				2									
86.00	6				2									
84.00	7		Poorly graded SAND (SP); medium dense; greenish gray; moist; fine SAND; no to low plasticity fines; Iron oxide staining.											
82.00	10			2	2	12	100				PP = 1.5			
80.00	11		CLAYEY SAND (SC); fine SAND; Thin layer of clayey sand.											Small layer of clayey sand
80.00	12		Poorly graded SAND (SP); loose; gray; moist; fine to medium SAND; low plasticity fines; slightly micaeous.											
78.00	14													
76.00	15			3	3	10	83							
76.00	16				5									
76.00	16				5									
74.00	17		SILTY, CLAYEY SAND (SC-SM); very dense; yellowish brown; moist; fine to medium SAND; low plasticity fines; slightly micaeous.											
72.00	20			4	13	73	100							Blow count exceeds 100 per foot Ball shape cutting appears
70.00	21				40									
70.00	21				33									
68.00	22		Well-graded SAND (SW); medium dense; yellowish brown; moist; medium to coarse SAND; no to low plasticity fines.											Cutting becomes more moist
68.00	23													
68.00	24													
	25													

(continued)

CALTRANS BORING RECORD 052007 BORING 6-25-08 GPJ CT SACTO 053107.GDT 7/7/08



Department of Transportation
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-2
DIST. 10	COUNTY Stanilus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 1 of 2	

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
66.00	25	[Symbol]	Well-graded SAND (SW) (continued).	X	5	8 10 10	20	94							Cutting becomes wet
64.00	27	[Symbol]	SILTY SAND (SM); medium dense; wet; fine to medium SAND; no to low plasticity fines.												
62.00	30	[Symbol]	Well-graded SAND (SW); medium dense; yellowish brown; wet; medium SAND; no to low plasticity fines.	X	6	5 11 12	23	94							
60.00	31	[Symbol]	Bottom of Borehole at 31.5 ft.												Hit groundwater
58.00	32	[Symbol]													
56.00	33	[Symbol]													
54.00	34	[Symbol]													
52.00	35	[Symbol]													
50.00	36	[Symbol]													
48.00	37	[Symbol]													
46.00	38	[Symbol]													
44.00	39	[Symbol]													
42.00	40	[Symbol]													
40.00	41	[Symbol]													
38.00	42	[Symbol]													
	43	[Symbol]													
	44	[Symbol]													
	45	[Symbol]													
	46	[Symbol]													
	47	[Symbol]													
	48	[Symbol]													
	49	[Symbol]													
	50	[Symbol]													
	51	[Symbol]													
	52	[Symbol]													
	53	[Symbol]													
	54	[Symbol]													
	55	[Symbol]													



Department of Transportation
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-2
DIST. 10	COUNTY Stanilaus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 2 of 2	

LOGGED BY C Zhen	BEGIN DATE 6-26-08	COMPLETION DATE 6-26-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID 08-3
DRILLING CONTRACTOR Caltrans			BOREHOLE LOCATION (Offset, Station, Line) 118' Lt Sta 48+51 "A" LINE	SURFACE ELEVATION 90 ft
DRILLING METHOD Hollow-Stem Auger			DRILL RIG CME 750	BOREHOLE DIAMETER 6 in.
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT			SPT HAMMER TYPE Automatic 140 lbs	HAMMER EFFICIENCY, ERI 82%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) READINGS 27 ft on 6-26-08	TOTAL DEPTH OF BORING 31.5 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
88.00	1		SILTY SAND (SM); very loose; yellowish brown; moist; fine SAND; low plasticity fines.											
84.00	5			1	2	4	100							
84.00	6				2									
84.00	7				2									
82.00	7		SILTY SAND (SM); loose; yellow; moist; fine SAND; low plasticity fines; slightly micaceous.											
80.00	10			2	2	5	100							
80.00	11				2									
80.00	12				3									
78.00	12		Poorly graded SAND (SP); loose; yellowish brown; moist; fine SAND; low plasticity fines; slightly micaceous.											
74.00	15			3	4	10	100							@15.5'-16.5' cutting turns clayey
74.00	16				4									
74.00	17				6									
72.00	17		SILTY SAND (SM); very dense; yellowish brown w/ dark spots; moist; fine to medium SAND; low plasticity fines.											
70.00	20			4	24	95	94				PP = 3			Blow count exceeds 100 per foot
70.00	21				35									
70.00	22				60									
68.00	22		Well-graded SAND (SW); dense; yellowish red; moist; fine to medium SAND; no to low plasticity fines.											
66.00	24													
	25													

(continued)

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08



Department of Transportation
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-3
DIST. 10	COUNTY Stanilus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 1 of 2	

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
64.00	25	[Material Graphic: Well-graded SAND (SW)]	Well-graded SAND (SW) (continued).	X	5	8 12 13	25	100					[Material Graphic: Casing]		Hit groundwater
62.00	27		Well-graded SAND (SW); medium dense; olive gray; wet; medium SAND; no to low plasticity fines.												
60.00	30			X	6	5 10 10	20	94							
58.00	32		Bottom of Borehole at 31.5 ft.												
56.00	34														
54.00	36														
52.00	38														
50.00	40														
48.00	42														
46.00	44														
44.00	46														
42.00	48														
40.00	50														
38.00	52														
36.00	54														
	55														



Department of Transportation
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-3
DIST. 10	COUNTY Stanilus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 2 of 2	

LOGGED BY C Zhen	BEGIN DATE 6-26-08	COMPLETION DATE 6-26-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID 08-4
DRILLING CONTRACTOR Caltrans			BOREHOLE LOCATION (Offset, Station, Line) 72' Lt Sta 72+46 "A" LINE	SURFACE ELEVATION 102 ft
DRILLING METHOD Hollow-Stem Auger			DRILL RIG CME 750	BOREHOLE DIAMETER 6 in.
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT			SPT HAMMER TYPE Automatic 140 lbs	HAMMER EFFICIENCY, ERI 82%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) READINGS 31.5 ft on 6-26-08	TOTAL DEPTH OF BORING 31.5 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
100.00	1		SILTY SAND (SM); medium dense; yellowish red; moist; fine SAND; low plasticity fines; weak cementation [RECENT ALLUVIUM].												
96.00	5			X	1	7	19	78							
96.00	6					11									
96.00	6					8									
94.00	7		CLAYEY SILT with SAND (ML); medium dense; yellowish red; moist; fine SAND; low to medium plasticity fines; Iron oxide staining.												
92.00	10			X	2	6	19	83							
92.00	11					7									
92.00	11					12									
90.00	12		SILTY SAND (SM); medium dense; yellowish red; moist; fine to medium SAND; low plasticity fines.												
86.00	15			X	3	12	45	94							
86.00	16					27									
86.00	16					18									
84.00	17		CLAYEY SILT with SAND (ML); very dense; light brownish gray; moist; fine SAND; low plasticity fines.												
82.00	20			X	4	15	115	89							
82.00	21					40									
82.00	21					75									Blow count exceeds 100 per foot
80.00	22		Poorly graded SAND (SP); medium dense; light brownish gray; dry to moist; medium SAND; no to low plasticity fines; Iron oxide staining.												
78.00	24														
	25														

(continued)

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08



Department of Transportation
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-4
DIST. 10	COUNTY Stanilaus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 1 of 2	

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
76.00	25	[Dotted pattern]	Poorly graded SAND (SP) <i>(continued)</i> .	X	5	7	22	83					[Wavy line]		
74.00	26		Poorly graded SAND (SP); medium dense; light brownish gray; moist to wet; medium SAND; no to low plasticity fines.			11									
72.00	27	[Dotted pattern]		X	6	5	22	89					[Wavy line]		
70.00	28														
	29														
	30														
	31														
	31.5		Bottom of Borehole at 31.5 ft.												Hit groundwater
	32														
	33														
	34														
	35														
	36														
	37														
	38														
	39														
	40														
	41														
	42														
	43														
	44														
	45														
	46														
	47														
	48														
	49														
	50														
	51														
	52														
	53														
	54														
	55														



Department of Transportation
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-4
DIST. 10	COUNTY Stanilaus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 2 of 2	

LOGGED BY C Zhen	BEGIN DATE 6-26-08	COMPLETION DATE 6-26-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID 08-5
DRILLING CONTRACTOR Caltrans			BOREHOLE LOCATION (Offset, Station, Line) 131' Rt Sta 39+90 "A" LINE	SURFACE ELEVATION 89 ft
DRILLING METHOD Hollow-Stem Auger			DRILL RIG CME 750	BOREHOLE DIAMETER 6 in.
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT			SPT HAMMER TYPE Automatic 140 lbs	HAMMER EFFICIENCY, ERI 82%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER DURING DRILLING READINGS	AFTER DRILLING (DATE) 31 ft on 6-26-08
				TOTAL DEPTH OF BORING 31.5 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
87.00	1		SANDY SILT (ML); medium dense; olive gray; moist; fine SAND; low plasticity fines; iron oxide staining.												
83.00	5				1	5	19	94							
	6					8									
	7					11									
81.00	7		SILTY SAND (SM); loose; yellowish red; moist; fine SAND; no to low plasticity fines; micaceous.												
79.00	10				2	3	8	83							
	11					3									
	12					5									
77.00	12		Poorly graded SAND (SP); medium dense; light brownish gray; moist; medium SAND; no to low plasticity fines; micaceous; iron oxide staining.												
75.00	15				3	4	11	83							
	16					5									
	17					6									
71.00	17		SILTY SAND with GRAVEL (SM); very dense; yellowish brown; moist; fine to coarse SAND; low plasticity fines; iron oxide staining.												
69.00	20				4	14	119	100							Blow count exceeds 100 per foot
	21					19									
	22					100									
67.00	22		SILTY SAND (SM); medium dense; reddish gray; moist; fine to medium SAND; low plasticity fines.												
65.00	24														
	25														

(continued)

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08



Department of Transportation
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-5
DIST. 10	COUNTY Stanilus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 1 of 2	

CALTRANS BORING RECORD 052007 BORING 6-25-08.GPJ CT SACTO 053107.GDT 7/7/08

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
63.00	25		SILTY SAND (SM) (continued).		5	9	16	100							
	26					9									Small chip of red gravel in sampler
	27		SILTY SAND (SM); medium dense; olive gray; moist to wet; fine SAND; no to low plasticity fines.			7									
61.00	28														
	29														
59.00	30														
	31		Poorly graded SAND (SP); yellowish brown; wet; medium SAND.		6	5	23	100							Hit groundwater
	31.5		Bottom of Borehole at 31.5 ft.			8									
	32					15									
57.00	32														
	33														
	34														
55.00	34														
	35														
	36														
53.00	36														
	37														
	38														
51.00	38														
	39														
	40														
49.00	40														
	41														
	42														
47.00	42														
	43														
	44														
45.00	44														
	45														
	46														
43.00	46														
	47														
	48														
41.00	48														
	49														
	50														
39.00	50														
	51														
	52														
37.00	52														
	53														
	54														
35.00	54														
	55														



Department of Transportation
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

REPORT TITLE BORING RECORD				HOLE ID 08-5
DIST. 10	COUNTY Stanilaus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
PROJECT OR BRIDGE NAME Rte 219 Sound Walls and CMS's				
BRIDGE NUMBER	PREPARED BY C Zhen	DATE	SHEET 2 of 2	

GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names	Graphic / Symbol	Group Names
	GW Well-graded GRAVEL		CL Lean CLAY
	Well-graded GRAVEL with SAND		CL Lean CLAY with SAND
	GP Poorly graded GRAVEL		CL Lean CLAY with GRAVEL
	GP Poorly graded GRAVEL with SAND		SANDY lean CLAY
	GW-GM Well-graded GRAVEL with SILT		CL SANDY lean CLAY
	Well-graded GRAVEL with SILT and SAND		CL SANDY lean CLAY with GRAVEL
	GW-GC Well-graded GRAVEL with CLAY (or SILTY CLAY)		CL GRAVELLY lean CLAY
	Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		CL GRAVELLY lean CLAY with SAND
	GP-GM Poorly graded GRAVEL with SILT		ML SILTY CLAY
	GP Poorly graded GRAVEL with SILT and SAND		ML SILTY CLAY with SAND
	GP-GC Poorly graded GRAVEL with CLAY (or SILTY CLAY)		ML SILTY CLAY with GRAVEL
	GP Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		SANDY SILTY CLAY
	GM SILTY GRAVEL		ML SANDY SILTY CLAY
	GM SILTY GRAVEL with SAND		ML SANDY SILTY CLAY with GRAVEL
	GC CLAYEY GRAVEL		ML GRAVELLY SILTY CLAY
	GC CLAYEY GRAVEL with SAND		ML GRAVELLY SILTY CLAY with SAND
	GC-GM SILTY, CLAYEY GRAVEL		OL ORGANIC lean CLAY
	SILTY, CLAYEY GRAVEL with SAND		OL ORGANIC lean CLAY with SAND
	SW Well-graded SAND		OL ORGANIC lean CLAY with GRAVEL
	SW Well-graded SAND with GRAVEL		SANDY ORGANIC lean CLAY
	SP Poorly graded SAND		OL SANDY ORGANIC lean CLAY
	SP Poorly graded SAND with GRAVEL		OL SANDY ORGANIC lean CLAY with GRAVEL
	SW-SM Well-graded SAND with SILT		OL GRAVELLY ORGANIC lean CLAY
	SW-SM Well-graded SAND with SILT and GRAVEL		OL GRAVELLY ORGANIC lean CLAY with SAND
	SW-SC Well-graded SAND with CLAY (or SILTY CLAY)		CH Fat CLAY
	SW-SC Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)		CH Fat CLAY with SAND
	SP-SM Poorly graded SAND with SILT		CH Fat CLAY with GRAVEL
	SP-SM Poorly graded SAND with SILT and GRAVEL		SANDY fat CLAY
	SP-SC Poorly graded SAND with CLAY (or SILTY CLAY)		CH SANDY fat CLAY
	SP-SC Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)		CH SANDY fat CLAY with GRAVEL
	SM SILTY SAND		CH GRAVELLY fat CLAY
	SM SILTY SAND with GRAVEL		CH GRAVELLY fat CLAY with SAND
	SC CLAYEY SAND		MH Elastic SILT
	SC CLAYEY SAND with GRAVEL		MH Elastic SILT with SAND
	SC-SM SILTY, CLAYEY SAND		MH Elastic SILT with GRAVEL
	SC-SM SILTY, CLAYEY SAND with GRAVEL		SANDY elastic SILT
	PT PEAT		OH SANDY ORGANIC elastic SILT
			OH SANDY ORGANIC elastic SILT with GRAVEL
	COBBLES		OH GRAVELLY ORGANIC elastic SILT
	COBBLES and BOULDERS		OH GRAVELLY ORGANIC elastic SILT with SAND
	BOULDERS		OL/OH ORGANIC SOIL
			OL/OH ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTS

- C Consolidation (ASTM D 2435-04)
- CL Collapse Potential (ASTM D 5333-03)
- CP Compaction Curve (CTM 216 - 06)
- CR Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
- CU Consolidated Undrained Triaxial (ASTM D 4767-02)
- DS Direct Shear (ASTM D 3080-04)
- EI Expansion Index (ASTM D 4829-03)
- M Moisture Content (ASTM D 2216-05)
- OC Organic Content (ASTM D 2974-07)
- P Permeability (CTM 220 - 05)
- PA Particle Size Analysis (ASTM D 422-63 [2002])
- PI Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
- PL Point Load Index (ASTM D 5731-05)
- PM Pressure Meter
- PP Pocket Penetrometer
- R R-Value (CTM 301 - 00)
- SE Sand Equivalent (CTM 217 - 99)
- SG Specific Gravity (AASHTO T 100-06)
- SL Shrinkage Limit (ASTM D 427-04)
- SW Swell Potential (ASTM D 4546-03)
- TV Pocket Torvane
- UC Unconfined Compression - Soil (ASTM D 2166-06)
- Unconfined Compression - Rock (ASTM D 2938-95)
- UU Unconsolidated Undrained Triaxial (ASTM D 2850-03)
- UW Unit Weight (ASTM D 4767-04)
- VS Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- Standard California Sampler
- Modified California Sampler
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- First Water Level Reading (during drilling)
- Static Water Level Reading (short-term)
- Static Water Level Reading (long-term)



Department of Transportation
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

REPORT TITLE

BORING RECORD LEGEND

DIST. 10	COUNTY Stanilus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
----------	-----------------	-----------	--------------------	--------------

PROJECT OR BRIDGE NAME
Rte 219 Sound Walls and CMS's

BRIDGE NUMBER	PREPARED BY	DATE	SHEET 1 of 2
---------------	-------------	------	--------------

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	Pocket Penetrometer (tsf)	Torvane (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N ₆₀ - Value (blows / foot)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

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

PERCENT OR PROPORTION OF SOILS

Descriptor	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE

Descriptor	Size	
Boulder	> 12 inches	
Cobble	3 to 12 inches	
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay	Passing No. 200 Sieve	

PLASTICITY OF FINE-GRAINED SOILS

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

CEMENTATION

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

NOTE: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (July 2007), Section 2, for tables of additional soil description components and discussion of soil description and identification.



Department of Transportation
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

REPORT TITLE

BORING RECORD LEGEND

DIST. 10	COUNTY Stanilus	ROUTE 219	POSTMILE R2.1/R4.9	EA 10-0A8721
--------------------	---------------------------	---------------------	------------------------------	------------------------

PROJECT OR BRIDGE NAME
Rte 219 Sound Walls and CMS's

BRIDGE NUMBER	PREPARED BY	DATE	SHEET 2 of 2
---------------	-------------	------	------------------------

Memorandum

*Flex your power!
Be energy efficient!*

To: **MR. JOSE HUERTA**
Senior Transportation Engineer
District 10 Design IV, Branch L

Attention: Wuthy Seng, Project Engineer

Date: October 22, 2008

File: 10-STA-219
KP 3.4/7.9 (PM 2.1/4.9)
10-0A8721
Sound Walls & CMS's

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Addendum to Geotechnical Design Report

Introduction

Per your request via email, dated October 20, 2008, an addendum to Geotechnical Design Report (GDR), dated October 8, 2008, is provided for the recommendation on the alternative foundation design for the sound walls of the widening project on Highway 219. This project is located within the northern portion of the City of Modesto in Stanislaus County from KP 3.4 to KP 7.9 (PM 2.1/4.9).

This project is proposed to widen Route 219 from a two-lane conventional highway to a four-lane conventional highway to reduce congestion. As part of this improvement project, three sound walls are proposed within Stanislaus County Union School, one Changeable Message Sign (CMS) is proposed at Station 40+40 near Morrow Road, and another CMS is also proposed at Station 73+05 near Pentecost Drive.

This memo documents the additional recommendation for an alternative foundation design of CIDH piles for the sound walls.

Existing Facilities and Proposed Improvements

The proposed project starts from KP 3.4 to KP 7.9 on Highway 219. Along this stretch of the roadway, Highway 219 currently consists of a 2-lane undivided roadway paved with asphalt concrete aligned in a general east-west direction. The roadway is built on level terrain on mostly original ground. There are minor slopes of 1:2 (V:H) or flatter on either

Mr. Jose Huerta
October 22, 2008
Page 2

side of the roadway. There are local streets and driveways that are directly connected to residential area and businesses along this section of roadway. Utility lines parallel the roadway on both sides.

The proposed project includes adding one lane on each direction by widening on the outside of the existing roadway. All intersections will be improved to meet current design standard. Outside shoulder is proposed to be widened to 3.0 m whereas inside shoulder is proposed to be widened to 1.5 m. As part of the project, three standard sound walls are proposed within the property of the Stanislaus County Union School around Station 49+00, two Model 510 CMS's are proposed at Stations 40+40 and 73+05.

Geotechnical Conditions

In general, the soil characteristics within the project area, according to findings from drilling, consist of fine to coarse grained, no to low plasticity, loose to very dense silt, sand, and mixtures thereof. See GDR for Boring Location and Boring Record for more detailed information.

Groundwater was encountered during drilling on June 25 and June 26 of 2008 from all five borings. Groundwater depth was measured from 8.2 m to 9.6 m below existing ground surface during field investigation, which is deeper than the proposed bottom of piles. Table 1 below shows the groundwater condition at different locations.

Table 1 - Groundwater Level

Boring ID	Location	Surface Elevation (m)	Groundwater Depth (m)	Groundwater Elevation (m)
08-1	Stanislaus Co. Union School	28.04	8.99	19.05
08-2	Stanislaus Co. Union School	28.04	9.57	18.47
08-3	Stanislaus Co. Union School	27.43	8.23	19.20
08-4	CMS 2 at Sta 73+05	31.00	9.60	21.40
08-5	CMS 1 at Sta 40+40	27.13	9.45	17.68

Geotechnical Recommendations

Sound Walls

Three sound walls are proposed in this project, and they are all located within the area of the Stanislaus County Union School. The proposed sound walls are Caltrans standard masonry block type with wall height of 4265 mm founded on trench footing. It is the recommendation of this office that the proposed sound walls can be constructed as planned. Case 1 design parameters should be utilized. The depth of the trench footing, D, should be 2200 mm. If the wall height is changed, the following Table 2 shows the corresponding recommended trench footing depth, D.

Mr. Jose Huerta
October 22, 2008
Page 5

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

LOTB for Rte 219 Sound Walls and CMS's

Data and information included in the Information Handout provided to the bidders and contractors are:

Geotechnical Design Report for EA 10-0A8721, dated Oct 8, 2008.

Addendum to Geotechnical Design Report for EA 10-0A8721, dated Oct 22, 2008.

Data and information available for inspection at the District Office:

None.

Data and information available for inspection at the Transportation Laboratory are:

None.

If any changes to the structure are proposed during the final project design, the Office of Geotechnical Design – North should review those changes to determine if the foundation recommendation herein still applies.

If you have any questions or comments, please call Carolyn Zhen at (916) 227-1055 or John Huang at (916) 227-1037.