

Memorandum

To: Bethnay Des Jardins
Traffic Project Development
District 11 MS 230

Date: February 1, 2010

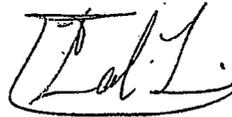
File: 11-SD-8-(PM) L1.2
EA 11-286601

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design – South 2

Subject: Foundation Report for the Overhead Sign and Traffic Light on West Mission Bay Drive

Pursuant to your request, the Office of Geotechnical Design-South 2 (OGDS2) has prepared this foundation report for the proposed overhead sign and traffic light on West Mission Bay Drive North of I-8 in San Diego. This report defines the geotechnical conditions as evaluated from field and laboratory test data and used in the development of the geotechnical excavation. This report also provides recommendations for project design and construction.

OGDS2 staff will be available for further assistance. Should you have any questions or comments regarding this report, please contact Ali Lari at (858) 467-6922.



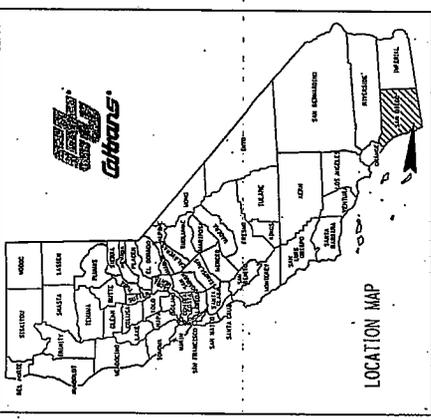
Ali Lari
Transportation Engineer (Civil)
Office of Geotechnical Design - South 2



Attachments

cc: Abbas Abghari
Brian Hinman *BH*
Richard Estrada
Levy Le (Project Engineer/RE pending file)
Mark Willian
Art Padilla
Leon Edmonds
GS File room
File

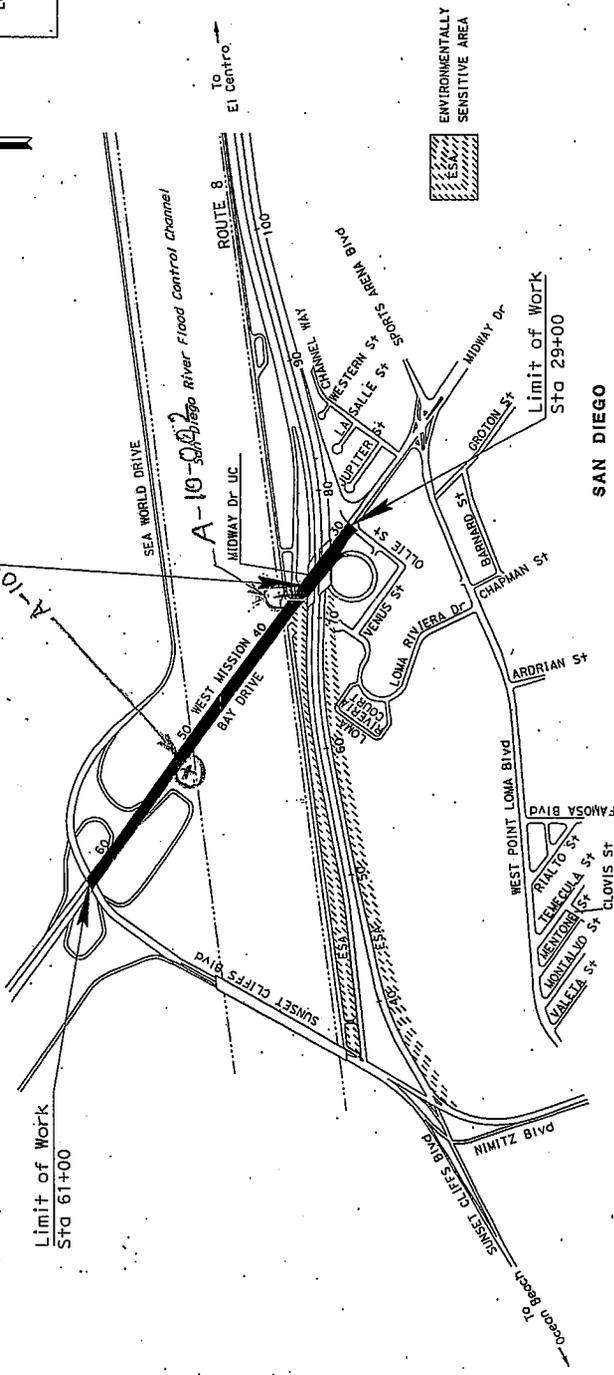
| | | | | | | | | | |
|-------|----|--------|----|-------|---|---------|------|-------|----|
| Sheet | 11 | County | SD | Route | 8 | Project | L1.2 | Sheet | 11 |
|-------|----|--------|----|-------|---|---------|------|-------|----|



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY
AND CITY STREET
IN SAN DIEGO COUNTY IN SAN DIEGO
AT MIDWAY DRIVE UNDERCROSSING

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006

LOCATION OF CONSTRUCTION
Sta 74+00 PM L1.2



REGISTERED CIVIL ENGINEER
 LEVY Q. LE
 No. 65788
 Exp. 09-30-11

PROJECT ENGINEER DATE
 REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE
 THE STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
 CONTRACT NO. 11-286604

INDEX OF PLANS
 NO SCALE
 RELATIVE BORDER SCALE
 TO IN INCHES
 CALTRANS WEB SITE IS: [HTTP://WWW.DOT.CA.GOV/](http://www.dot.ca.gov/)
 BORDER LAST REVISED 4/11/2008
 THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."
 BORDER LAST REVISED 4/11/2008

| | |
|-----------------|-----------------|
| DESIGN ENGINEER | LEVY Q. LE |
| PROJECT MANAGER | RICHARD ESTRADA |

| | |
|--------------|-----------|
| CONTRACT NO. | 11-286604 |
| CU 11233 | EA 286601 |

| | | | | | | |
|---|------------------------|-----------------------------|--|------------------------------------|-----------------------------|----------------------------------|
| LOGGED BY J. Tesar | BEGIN DATE 01/14/10 | COMPLETION DATE 01/14/10 | BOREHOLE LOCATION (Lat/Long or North/East and Datum) | | | HOLE ID: A-10-001 |
| DRILLING CONTRACTOR Drilling Services | | | BOREHOLE LOCATION (Station, Offset, and Line) 52+20, 45 feet Left, M line | | | SURFACE ELEVATION 20.7 ft |
| DRILLING METHOD Auger | | | DRILL RIG CS 2000 | | | BOREHOLE DAIMETER 8" |
| SAMPLER TYPE(S) AND SIZE(S) (ID) | | | SPT HAMMER TYPE Automatic | | | HAMMER EFFICIENCY (ER) 84 % |
| BOREHOLE BACKFILL AND COMPLETION Hole Cuttings | | | GROUNDWATER READINGS | DURING DRILLING Not Encountered | AFTER DRILLING (DATE) NA | TOTAL DEPTH OF BORING 28.5 ft |

| ELEVATION (ft) | DEPTH (ft) | Material Graphics | DESCRIPTION | Sample Location | Sample Number | Blows Per 6 in | Blows Per 1.0 ft | Recovery (%) | RQD (%) | Moisture Content (%) | Dry Unit Weight (pcf) | Shear Strength (tsf) | Drilling Method | Casing Depth | REMARKS | |
|----------------|------------|-------------------|--|-----------------|---------------|----------------|------------------|--------------|---------|----------------------|-----------------------|----------------------|-----------------|--------------|-------------------------------------|---------------------------|
| 20.7 | 1 | | Poorly graded Sand (SP), estimated medium dense, gray, moist, fine SAND, (FILL) | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | 1 | | | | | | | | | | Sample for corrosion test |
| | 4 | | | | | | | | | | | | | | | |
| | 5 | | | | | | 10 | | | | | | | | | |
| | 6 | | | | | | 7 | | | | | | | | | |
| 14.2 | 7 | 6.5 | Poorly graded SAND/SILTY SAND (SP/SM), loose to medium dense, brown, moist, fine SAND, few micaceous | | | 10 | 17 | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | | |
| | 10 | | | | | | 3 | | | | | | | | | |
| | 11 | | | | | | 5 | | | | | | | | | |
| | 12 | | | | | | 6 | 11 | | | | | | | | |
| 7.7 | 13 | 13.0 | Elastic SILT interlayered with fat CLAY (MH/CH), very soft, brown, moist, few micaceous, highly plastic dark gray, wet, strong odor | | | | | | | | | | | | | |
| | 14 | | | | | | | | | | | | | | | |
| | 15 | | | | | | 2 | | | | | | | | | p.p < 0.25 tsf |
| | 16 | | | | | | 3 | | | | | | | | | |
| | 17 | | | | | | 4 | 7 | | | | | | | | |
| | 18 | | | | | | | | | | | | | | | p.p < 0.25 tsf |
| | 19 | | | | | | | | | | | | | | At 18.5 feet the hole was caved in. | |
| | 20 | | | | | | | | | | | | | | | |

(continued)



DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN-SOUTH 2

REPORT TITLE
Foundation Report
DISTRICT COUNTY
11 SD
PROJECT OR BRIDGE NAME
Overhead sign at West Mission Bay Drive
BRIDGE NUMBER PREPARED BY
NA A. Larl
DATE
01/21/10

HOLE ID: A-10-001
POSTMILE(KP) EA
L.12 286601

SHEET
1 of 2

| | | | | |
|---|---|-----------------------------|--|---------------------------------|
| LOGGED BY J. Tesar | BEGIN DATE 01/14/10 | COMPLETION DATE 01/14/10 | BOREHOLE LOCATION (Lat/Long or North/East and Datum) | HOLE ID: A-10-002 |
| DRILLING CONTRACTOR Drilling Services | BOREHOLE LOCATION (Station, Offset, and Line) | | SURFACE ELEVATION 19.7 ft | |
| DRILLING METHOD Auger | DRILL RIG CS 2000 | | BOREHOLE DAIMETER 8" | |
| SAMPLER TYPE(S) AND SIZE(S) (ID) | SPT HAMMER TYPE Automatic | | HAMMER EFFICIENCY (ER) 84 % | |
| BOREHOLE BACKFILL AND COMPLETION Hole Cuttings | | | GROUNDWATER READINGS | DURING DRILLING Not Encountered |
| | | | AFTER DRILLING (DATE) NA | |
| | | | TOTAL DEPTH OF BORING 21.5 ft | |

| ELEVATION (ft) | DEPTH (ft) | Material Graphics | DESCRIPTION | Sample Location | Sample Number | Blows Per 6 in | Blows Per 1.0 ft | Recovery (%) | ROD (%) | Moisture Content (%) | Dry Unit Weight (pcf) | Shear Strength (tsf) | Drilling Method | Casing Depth | REMARKS |
|----------------|------------|-------------------|--|-----------------|---------------|----------------|------------------|--------------|---------|----------------------|-----------------------|----------------------|-----------------|--------------|----------------------------|
| 19.7 | | | Asphalt concrete over aggregate base | | | | | | | | | | | | |
| | 1 | | Poorly graded SAND with GRAVEL (SP), estimated medium dense, brown, moist, mostly fine to medium SAND, little GRAVEL | | 1 | | | | | | | | | | Sample for corrosion test |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | GRAVELLY zone | | | | | | | | | | | | |
| | 5 | | | | | 30 | | | | | | | | | |
| | 6 | | | | | 50 | | | | | | | | | Refusal by a piece of rock |
| | 7 | | | | | | | | | | | | | | |
| 11.7 | 8 | 8.0 | Elastic SILT (MH), very soft, dark gray, moist, micaceous, organic odor | | | | | | | | | | | | p.p < 0.25 tsf |
| | 9 | | | | | | | | | | | | | | |
| | 10 | | | | | 6 | | | | | | | | | |
| | 11 | | GRAVELLY zone or rock | | | 7 | | | | | | | | | |
| | 12 | | | | | 6 | 13 | | | | | | | | |
| 7.7 | 12 | 12.0 | SILTY SAND (SM), loose, dark gray, moist, fine SAND, few micaceous | | | | | | | | | | | | |
| | 13 | | | | | | | | | | | | | | |
| | 14 | | | | | | | | | | | | | | |
| | 15 | | | | | 3 | | | | | | | | | |
| | 16 | | | | | 4 | | | | | | | | | |
| | 17 | | | | | 5 | 9 | | | | | | | | |
| 2.7 | 17 | 17.0 | Fal CLAY (CH), very soft, dark gray, micaceous, strong organic odor, highly plastic | | | | | | | | | | | | |
| | 18 | | | | | | | | | | | | | | |
| | 19 | | | | | | | | | | | | | | |
| | 20 | | | | | | | | | | | | | | |

(continued)



DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN-SOUTH 2

REPORT TITLE
Foundation Report
DISTRICT COUNTY
11 SD
PROJECT OR BRIDGE NAME
Overhead sign at West Mission Bay Drive
BRIDGE NUMBER
NA
PREPARED BY
A. Lari
DATE
01/25/10

HOLE ID: A-10-002
POSTMILE(KP) EA
288601

SHEET
1 of 2

| ELEVATION (ft) | DEPTH (ft) | Material Graphics | DESCRIPTION | Sample Location | Sample Number | Blows Per 6 in | Blows Per 1.0 ft | Recovery (%) | RQD (%) | Moisture Content (%) | Dry Unit Weight (pcf) | Shear Strength (ksf) | Drilling Method | Casing Depth | REMARKS |
|----------------|------------|-------------------|---------------------------------|-----------------|---------------|----------------|------------------|--------------|---------|----------------------|-----------------------|----------------------|-----------------|--------------|---------|
| -1.8 | 21 | | | | | 1 | | | | | | | | | |
| | 21.5 | | | | | 1 | | | | | | | | | |
| | 22 | | Bottom of the hole at 21.5 feet | | | 1 | 2 | | | | | | | | |
| | 23 | | | | | | | | | | | | | | |
| | 24 | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | |
| | 26 | | | | | | | | | | | | | | |
| | 27 | | | | | | | | | | | | | | |
| | 28 | | | | | | | | | | | | | | |
| | 29 | | | | | | | | | | | | | | |
| | 30 | | | | | | | | | | | | | | |
| | 31 | | | | | | | | | | | | | | |
| | 32 | | | | | | | | | | | | | | |
| | 33 | | | | | | | | | | | | | | |
| | 34 | | | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | | | |
| | 36 | | | | | | | | | | | | | | |
| | 37 | | | | | | | | | | | | | | |
| | 38 | | | | | | | | | | | | | | |
| | 39 | | | | | | | | | | | | | | |
| | 40 | | | | | | | | | | | | | | |



DEPARTMENT OF TRANSPORTATION
 DIVISION OF ENGINEERING SERVICES
 GEOTECHNICAL SERVICES
 OFFICE OF GEOTECHNICAL DESIGN-SOUTH 2

REPORT TITLE
 Overhead sign at West Mission Bay Drive
 DISTRICT COUNTY
 11 SD
 PROJECT OR BRIDGE NAME
 #REF!
 BRIDGE NUMBER PREPARED BY
 NA A. Lari

ROUTE
 8
 DATE
 01/25/10

HOLE ID: A-10-002
 POSTMILE(KP) EA
 L1.2 286601

SHEET
 2 of 2

1.0 INTRODUCTION

Pursuant to your request, Caltrans OGDS has conducted a foundation investigation for the proposed overhead sign and traffic signal at West Mission Bay Drive in the City of San Diego, San Diego County, California. The investigation included examination of the project plans, review of archived geologic maps and relevant data, review of Caltrans Standard Plans, site reconnaissance, two exploratory soil borings, corrosion testing of collected soil samples, and preparation of this report. Based on the project plans the project will include a lightweight, two post type A-2 overhead sign to be located at S/B West Mission Bay Drive just North of the San Diego River and a traffic signal to be located next to the existing concrete barrier at the intersection of the N/B West Mission Bay Drive and W/B off-ramp from I-8 to West Mission Bay Drive.

2.0 SUBSURFACE INVESTIGATION AND LABORATORY TESTING

On January 14 2010 two 8-inch diameter hollow stem auger borings were drilled. Boring number A-10-001 was drilled at the proposed overhead sign to a depth of 26.5 feet. Boring number A-10-002 was drilled at the proposed location of the traffic signal to a depth of 21.5 feet. The boring locations are shown on the attached plan. Standard Penetration Tests (SPT) were performed at 5-foot intervals. Soil samples were visually classified in the field. Laboratory testing of soil for corrosion potential was conducted. Descriptions of the subsurface soils encountered and the boring locations are presented in the attached boring records.

3.0 SITE GEOLOGY AND SUBSURFACE CONDITIONS

The site is underlain by artificial fill, which is underlain by alluvium deposited by the San Diego River. The fill appears to be engineered. The alluvium appears to be composed primarily of loose to medium dense sands and very soft to soft clays. No ground water was encountered in the exploratory borings; however, based on the existing ground elevation at the location of the overhead sign and traffic signal, ground water should be expected at a depth of approximately 20 feet below existing ground at or slightly above mean sea level.

4.0 CORROSION EVALUATION

Testing of the corrosion potential of collected soil samples was conducted in the Division of Engineering Services, Corrosion Technology branch. A total of two minimum resistivity tests and two PH tests were performed. The laboratory test result indicates no corrosion potential for these two samples. However, the tested samples were gathered at boring depths less than six feet and are not judged to be representative of soil that will contact the full depth of the piles. Based on the geology of the area and proximity of the site to the San Diego River, Mission Bay, and associated marine environment, the project site soils should be considered to be corrosive.

5.0 FOUNDATION RECOMMENDATIONS

Based on the results of our study the following recommendations are presented:

5.1- The Caltrans Standard Plans may be used for the Cast In Drilled Hole (CIDH) pile foundation for the overhead sign and traffic signal.

5.2- Potentially corrosive site conditions should be factored into design of the CIDH pile foundations.

5.3- Standard augering equipment may be used for drilling CIDH pile foundations.

5.4- Ground water was not encountered in the exploratory borings, however based on the elevation of top of the borings it is likely that ground water will be present at a depth of 20 feet below existing ground at or slightly above mean sea level.

5.5- Zones of loose sand were encountered in the exploratory borings. Caving may occur within zones of loose sand during CIDH pile excavation.

6.0 ACTUAL VERSUS REPORTED SITE CONDITIONS

The recommendations contained in this report are based on specific project information regarding structure type and location. If any conceptual changes are made during final project design, OGDS2 should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Ali Lari, (858) 467-6922 or Brian Hinman, (858) 467-4051 at OGDS2.



<Rudy_C_Lopez@dot.ca.gov
>
01/29/2010 08:10 AM

To <ali_lari@dot.ca.gov>
cc
bcc

Subject Corrosion Test Summary Report - Soil, EA: 11-286601
(Corr. #s CR100115 & CR100115)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion Technology Branch
Report Date: 1/29/2010
Reported By: Lopez, Rudy

CORROSION TEST SUMMARY REPORT - Soil/Water

Bridge Name:
Bridge Number:
EA No.: 11-286601
Dist/Co/Rte/PM or KP: 11 / SD / 8 / L 1.21

| SIC Number (TL101) | Sample Location | Sample Type | Sample Depth | Minimum Resistivity (ohm-cm) | pH | Chloride Content (ppm) | Sulfate Content (ppm) |
|--------------------|------------------------|-------------|----------------------------|------------------------------|------|------------------------|-----------------------|
| C585386A | WEST MISSION BAY DRIVE | SOIL | 1.0-5.0 FT/BORING A-10-001 | 4283 | 6.38 | | |
| C585386B | WEST MISSION BAY DRIVE | SOIL | 1.0-6.0 FT/BORING A-10-002 | 2030 | 7.25 | | |

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resistivity must be 2000 ohm-cm or greater, 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.

^{1,2}CTM 643, ³CTM 422, ⁴CTM 417