

FOR CONTRACT NO: 08-0Q9204

INFORMATION HANDOUT

GEOTECHNICAL DESIGN REPORT

ROUTE: 08-Riv-10, PM 34.2/35.2
ROUTE: 08-Riv-62, PM 1.2/2.2
ROUTE: 08-Riv-111, PM 59.0/60.0

M e m o r a n d u m*Flex your power!
Be energy efficient!***To:** SERGIO AVILA, D08
Design E**Date:** September 13, 2012
File: 08-RIV-10-PM 34.74
08-RIV-62-PM 1.64
08-RIV-111-PM 59.33
0Q9201-0800020572
CMS Installation**From:** DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Geotechnical Design – South 2. MS #5**Subject:** Geotechnical Design Report.

Per your request, our Office of Geotechnical Design – South 2 has completed a Geotechnical Design Report (GDR) for construction of the three (3) proposed Changeable Message Signs (CMS) at I-10, SR62 and SR111 near the Palm Springs in Riverside County.

The scope of this report includes the following tasks:

- Literature search and review of available geologic reference materials.
- Conducting site investigation and subsurface exploration.
- Performing engineering analysis and providing our recommendations.

The purpose of this report is to document subsurface geotechnical conditions, provide analyses of anticipated site conditions as they pertain to the project described herein, and to recommend design and construction criteria for the subject area of the project. This report is in compliance of our currently Caltrans GDR Guidelines.

Existing Facilities and Proposed Improvements

The District proposes the installation of three CMS structures, each at one of the three different locations on SR 62, I-10 and SR111. Type and dimension of three CMS and other information are summarized in the following table:

| CMS Nos. | Route (PM) | Width Across | Max Post Height | Foundation Depth(CIDH) | Remarks |
|-----------------|--------------------|---------------------|------------------------|-------------------------------|-------------------|
| 1 | I-10 WB(PM 34.74) | 26.0 feet | 24.0 feet | Min. 22.0 feet | M 500-Single Post |
| 2 | SR62 WB(PM 1.64) | 26.0 feet | 24.0 feet | Min. 22.0 feet | M 500-Single Post |
| 3 | SR111 NB(PM 59.33) | 26.0 feet | 24.0 feet | Min. 22.0 feet | M 500-Single Post |

In general, the three proposed CMS are located approximately 5 to 10 feet from edge of shoulder (ES) offset to the travel way, in mostly flat area with light traffic, as shown below:



There is no existing structure observed within the 20-foot of the three proposed CMS locations, except that at location CMS #1, where the existing Mission Creek Bridge is located approximately between 10 - 20 feet away.

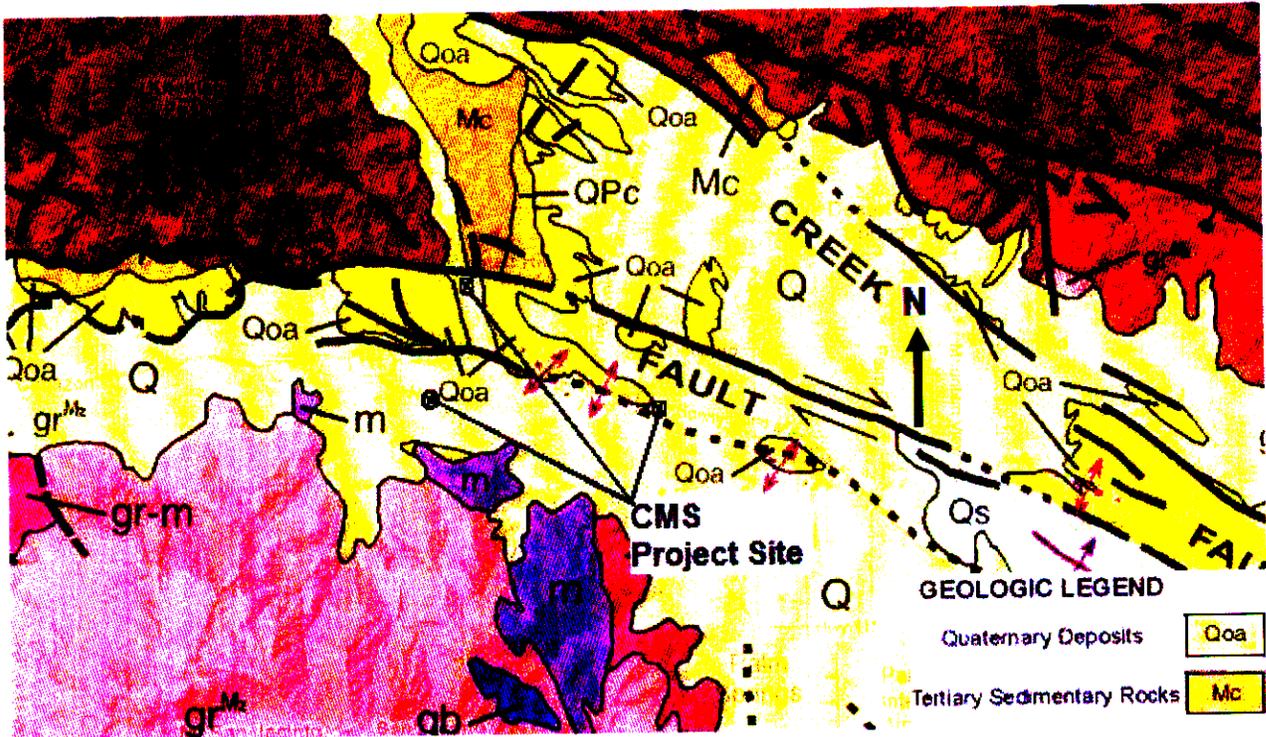
Field and Subsurface Investigation

A total of two (2) boreholes near the proposed locations for CMS#2 and CMS#3 were conducted on the dirt shoulder of SR 62 and SR111. One was for each of proposed CMS. Each hole was situated within 50 feet of the proposed CMS location. Hollow-stem auger with dry method was used for this subsurface exploration. The boring holes were down to about 40-foot and 25-foot depth at SR62 and SR111, respectively. Standard Penetration Tests (SPT) was taken at 5 feet interval. Bulk samples were retrieved from the SPT tubes and collected for corrosion and other primary laboratory tests. Log of Test Borings (LOTB) will be prepared when official plan and correct stationing of the proposed plan is completed and furnished by your Office.

There is no new drilling for the CMS #1 on I-10. An existing LOTB in 1964 is available for building the Mission Creek Bridge (Br 56-165, reference 2) within 100 ft distance.

Site Geology

Based on the 2010 Geologic Map of California, Department of Conservation, as shown below, the project site is mainly comprised of Quaternary Deposits and Tertiary Sedimentary Rocks. In general, the proposed CMS are situated in an area which is predominately consisted of medium dense to very dense, fine to coarse sand with some sub-angular gravel and small boulders; Underlain by slightly decomposed, sedimentary rock (Reference 1, 2&3).



Extracted From California 2010 Geologic Map

Subsurface conditions

Location CMS #1(I-10 WB, PM 34.74):

Based on the LOTB at the Mission Creek Bridge (Br 56-165,) which is located within 100 feet from the proposed CMS #1 location, the subsurface area comprises of a top 10 feet of medium dense to dense gravelly sandy soil with a few small to medium-size boulders. Underlain the top sandy soil layer is hard rock formation including Quaternary Deposits and Sedimentary Rocks.

No underground water was encountered in these referred LOTBs.

Location CMS #2(SR-62 SB, PM 1.64):

Our LOTB A-12-001 at this site shows a top 10 feet of medium dense to dense, fine to coarse, gravelly Sand with little Silt. Underlain the top soil layer is rock formation including Quaternary Deposits with moderately decomposed Sedimentary Rocks.

No underground water was encountered at this boring hole.

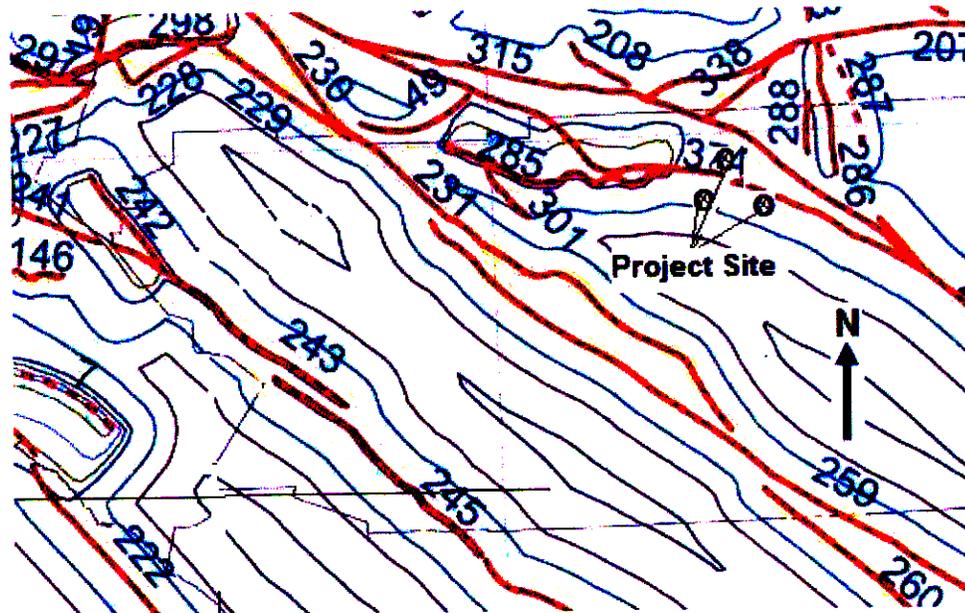
Location CMS #3(SR-111 NB, PM 59.33):

Our LOTB A-12-001 at this site shows a top 25 feet of medium dense to very dense, gravelly, Sand with little silt and few cobbles and boulders. Underlain the top gravelly soil layer is rock formation including Quaternary Deposits with moderately decomposed Sedimentary Rocks.

No underground water was encountered at this boring hole.

Seismic recommendations

The three CMS Nos. 1, 2 and 3 are located about 2, 3 and 8 miles, respectively near the San Andreas fault zone (San Bernardino Mountain section - southern - Nos.374,) that can produce a maximum credible earthquake of magnitude M 7.8. Maximum Peak Ground Acceleration (PGA) is also estimated 0.5g at this site, based on the Caltrans 2007 Deterministic PGA Map.



Excerpt From The 2007 Caltrans Deterministic PGA Map

In addition, based on the dense and very dense soil conditions and no underground water at the three proposed locations encountered, liquefaction at these sites should be considered insignificant to none.

Corrosion Potential

Corrosion tests have been processed and conducted by our laboratory, and unavailable at this time. However, based on our general information obtained from other construction projects in the Riverside County, most soils in these areas are not corrosive. Results of the corrosion tests will be forwarded to your office later.

Foundation Recommendations

Based on our visual observation and review of the LOTB, the native soils in these areas for three CMS have been very competent that would satisfactorily support any proposed CMS type and model that is shown in Caltrans 2010 Standard Plans. In addition, for practical design purpose, soil properties are estimated as follows: Unit weight = 125 pcf; Friction angle = 34 degrees; Cohesion = 100 psf.

Drilling for CIDH pile foundation may encounter some difficulty due to presence of medium to large size gravels or cobbles as discussed in the previous "Subsurface conditions" section.

Our office should be notified in advance, should any change be made later in the project planning or geometry so that we may revise our previous recommendations accordingly.

If you have any question, please call Cuong Nguyen at (916) 227-4513 or CalNet 8-498-4513.

Prepared by:



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Project File – South

References

1. "Log of Test Borings for Mission Creek Bridge, Br 56-165," California Division of Highways, July 22, 1968.
2. "Log of Test Borings for E 10/62 Connectors, Br 56-474 G/F," California Division of Highways, August 31, 1960.
3. "Log of Test Borings for Snow Creek Bridge, Br 56-194 R," California Division of Highways, December 28, 1964.