

INFORMATION HANDOUT

MATERIALS INFORMATION

FOUNDATION REPORT
(DATED 3-6-2009)

ADDENDUM TO FOUNDATION REPORT
(DATED 6-10-2009)

Memorandum

*Flex your power!
Be energy efficient!*

Received by 9/15/09

To: SEAN SAMUEL
Branch Chief
Structural Design Section 2
Office of Transportation Architecture
Structure Design Services &
Earthquake Engineering
Division of Engineering Services

Date: March 6, 2009

File: 09-MNO-47M5717
09-315201
Sonora Junction M.S.
Mechanics Facility

Attention: Andrew Corker

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

Subject: Foundation Investigation Report

Introduction

Per your request, the Office of Geotechnical Design – North (OGDN) has prepared this Foundation Investigation Report for the proposed Mechanics Facility to be added to Caltrans Sonora Junction Maintenance Station located on Highway 395 in Mono County. Figure 1, Vicinity Map, is provided in the Appendix.

Based on the plans and details provided, we understand that the proposed Mechanics Facility building will be a single story pre-engineered metal-framed structure with pre-finished metal walls and a soil-supported floor slab. The plan dimension of the building is approximately 52 by 56 square feet. The height of the building is approximately 28 feet.

Pertinent Report and Investigation

In preparation of this report, the following documents have been reviewed:

- Geology Map of California, Walker Lake Sheet, Scale 1:250,000, CDMG, 1963,
- Caltrans California Seismic Hazard Map 1996;
- A Technical Report to Accompany the Caltrans-California Seismic Hazard Map, CalTrans, 1996;
- A General Location Guide for Ultramafic Rocks in California - Areas More Likely

- to Contain Naturally Occurring Asbestos, CDMG, 2000;
- 2007 California Building Code (2007 CBC) January 2008 Revision, CBSC, 2008;
 - As-Built, Sonora Jct. MTCE Station, Foundation Plan, cottage, Caltrans, 1962;
 - As-Built, Sonora Jct. MTCE Station, Gas & Oil House, Caltrans, 1962;
 - As-Built, Sonora Jct. MTCE Station, Foundation Plan and Details, Caltrans, 1975;
 - As-Built, Sonora Junction Maintenance Station Building Addition and Alterations, Floor Plan, Section, Door & Finish Schedule, Caltrans, 1986;
 - As-Built, Sonora Junction Maintenance Station Building Addition and Alterations, Foundation Plan and Details, Caltrans, 1986; and
 - As-Built, Sonora Junction Maintenance Station Building Addition and Alterations, Concrete Standard, Caltrans, 1986

Physical Setting

The physical setting of the project site and surrounding area was reviewed to provide climate, topography and drainage, geology, and seismicity characteristics to aid in project design and construction planning. The information gathered during this review is discussed below.

Climate

Climate information of the proposed project site is obtained based on the data produced by the Western Regional Climate Center (WRCC) over a period between 1961 and 1990. The data collected in two monitoring stations were reviewed. These stations are Bishop, California (Latitude 37°22', Longitude 118°22', Elevation 4110 feet) and Reno, Nevada (Latitude 39°30', Longitude 119°47', Elevation 4404 feet).

Based on the data, the average annual precipitations in the project area are between 5.37 to 7.53 inches, with a majority of the precipitations occur between (include) November and March. The average daily minimum temperatures range from 19.9° Fahrenheit (F) in December to 56.1° F in July. The average daily maximum temperatures range from 45.1° F in January to 97.2° F in July.

Topography and Drainage

The site is located in the Sierra Nevada Mountain Range. The general terrain is mountainous with an elevation of approximately 6915 feet above mean sea level (MSL) at the project site. The immediate project area is essentially flat with gentle downward slope toward west. Figure 2, Topographic Map, is provided in the Appendix.

No drainage feature is observed in the immediate project area.

Geology

The regional geologic features pertaining to the site were evaluated by referencing the *Geologic Map of California, Walker Lake Sheet*. The site lies within the northeastern part of the Sierra Nevada geomorphic province of California. According to the map, the project area is underlain by Quaternary Glacial Deposits consisting predominantly of sands and gravels with varying silt contents. Figure 3, Geology Map, is provided in the Appendix.

Seismicity and Seismic Hazards

Based on the CalTrans' *California Seismic Hazard Map 1996*, the controlling fault for the site is the West Walker River (WWR). This fault possesses a Maximum Credible Earthquake (MCE) with a moment magnitude, M_w , of 6.0. The WWR is a normal fault and is located approximately 1 mile (1½ kilometers) west of the project site. Based on the referenced map, the peak bedrock acceleration (PBA) is estimated to be 0.5g at the site.

There is no known fault projecting toward or passing through the project site. Therefore, the potential for subsurface rupture due to fault movement at the site is considered negligible.

Liquefaction potential is considered to be low at the site due to absence of or low groundwater.

The project site and its immediate vicinity are essentially flat. Therefore, lateral spreading potential is considered limited at the site.

Site Classification

Based on Table 1613.5.2 of 2007 CBC, the site is judged to be *Class D*.

The following mapped spectral response accelerations at the project site were interpreted based on Figures 1613.5(3) and 1613.5(4) of 2007 CBC.

Mapped 0.2 second spectral acceleration, S_s , 1.50g
Mapped 1.0 second spectral acceleration, S_1 , 0.75g

Subsurface Conditions

The proposed project site was explored with two hand auger borings HA-09-001 and HA-09-002. The borings were extended to a depth of 5 feet below the existing ground surface. The borings encountered primarily of medium dense sands with varying silt and gravel contents.

The full sized LOTB of the two hand auger borings which is to be incorporated in the project plans is being prepared by Geotechnical Services, Office of Geotechnical Support Branch D – Contracts, Graphics & Records, and will be forwarded when completed. Mrs. Irma Gamarra-Remmen of the Contracts, Graphics, & Records branch may be contacted directly for information on the LOTB.

Groundwater

Groundwater was not encountered in the hand auger borings at the time of our field exploration. No Department of Water Resources (DWR) record of groundwater is available at the site. Groundwater is not anticipated to affect the proposed construction at the site.

Corrosivity

Based on previous projects done in the vicinity of the proposed project site, soils are considered as non-corrosive at the site.

Recommendations

Footing Foundation

The proposed Mechanics Facility building should be supported on conventional spread and strip footing foundations using an allowable soil bearing pressure of 2,500 pounds per square foot (psf).

The footing should have a minimum width of 12 inches and should be founded at least 18 inches below the adjacent finish grade to prevent frost.

Total and differential settlements of the footing under the aforementioned bearing pressure are estimated to be on the order of 1 and ½ inch, respectively.

Lateral Earth Pressure and Resistance

An active earth pressure equal to an equivalent fluid pressure of 36 pounds per square foot per foot (psf/ft) and a passive earth pressure equal to an equivalent fluid pressure of 360 (psf/ft) should be used for design. A friction coefficient of 0.4 can be used for sliding resistance between foundation bottom and subgrade soil.

Slab-on-Grade

Soil supported slab should be designed using a subgrade reaction modulus, k, of 120 pounds per square inch per inch (pci).

Frost Depth

According to Mono County Building Code, the frost depth should be 18 inches below finish grade at the site.

Moisture Barrier

Due to the moisture elevated by snow in winter season, moisture barrier should be implemented. A vinyl membrane with a minimum thickness of 6 mils should be placed over 4 inches of clean sand. The membrane should be covered by 3 inches of sand to aid

in a uniform concrete cure.

Construction Considerations

1. The bottoms of the footing excavations shall be level, smooth, and cleaned of loose materials, water, and other debris prior to placement of concrete.
2. All footing excavation shall be inspected and approved by the Engineer prior to the placement of concrete.
3. All underground utilities should be properly removed or abandoned prior to foundation construction at the site. Excavation resulted from utility removal should be properly backfilled according to Caltrans Standard Specification.

Project Information

Standard Special Provisions 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:

- A. *Log of Test Boring for Sonora Junction Maintenance Station, Mechanics Facility Building, 09-MNO-47M5717, EA 09-315201.*

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

- A. *Foundation Investigation Report for Sonora Junction M.S., Mechanics Facility Building, dated March 6, 2009.*

Data and Information available for inspection at the district Office:

- A. *None*

Data and information available for inspection at the Transportation Laboratory:

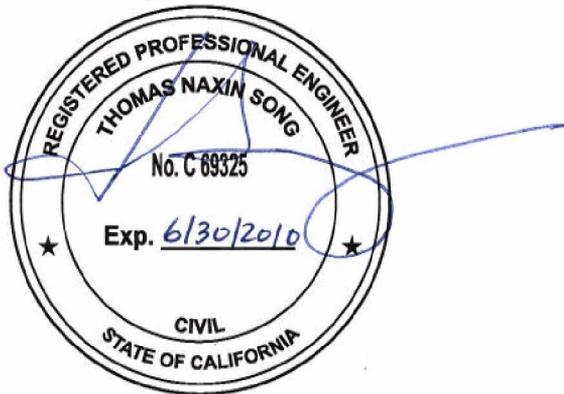
- A. *None*

Mr. Sean Samuel
March 6, 2009
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Foundation Report
Sonora Junction M.S.

The recommendations contained in this memorandum are based on specific project information regarding structure type, location, and design loads that have been provided. If any changes to the structure are proposed during final project design, OGDN should review those changes to determine if the recommendations contained herein are still applicable.

If you have any questions or comments, please contact Thomas Song at (916) 227-1054 or Qiang Huang at (916) 227-1037.



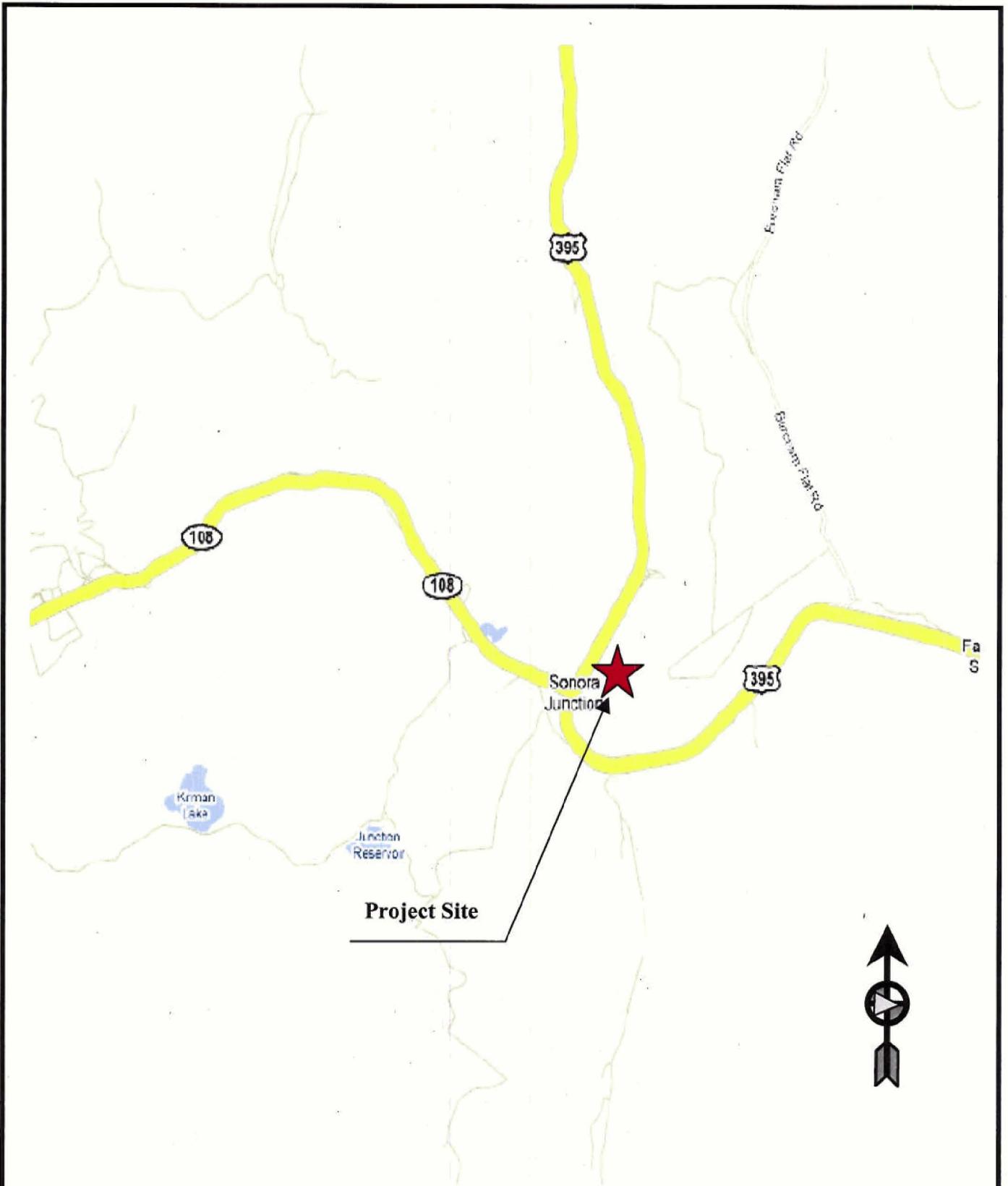
THOMAS NAXIN SONG, PE
Transportation Engineer, Civil
Office of Geotechnical Design – North
Branch E

Attachments

c: R.E. Pending
Structure OE
PCE (E-copy)
DME (E-copy)
GDN File
GS File Room

List of Attachments

Figure 1	Vicinity Map
Figure 2	Topographic Map
Figure 3	Geology Map



Base map provided by Google.



DEPARTMENT OF TRANSPORTATION
 Division of Engineering Services
 Geotechnical Services
 Geotechnical Design Branch - North

EA: 09-315201

Date: March 6, 2009

VICINITY MAP

Sonora Junction Maintenance Station
 Mechanics Building

Figure
 No. 1



NOT TO SCALE

Base map provided by Microsoft Streets & Trips.

 <p>CALTRANS Engineering Service Center Division of Structural Foundations Office of Roadway Geotechnical Engineering - North</p>	EA: 09-315201	<p>TOPOGRAPHIC MAP</p> <p>Sonora Junction Maintenance Station Mechanics Building</p>	Figure No. 2
	Date: March 6, 2009		



Base map provided by Google.



DEPARTMENT OF TRANSPORTATION
 Division of Engineering Services
 Geotechnical Services
 Geotechnical Design Branch - North

EA: 09-315201

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GEOLOGY MAP

Sonora Junction Maintenance Station
 Mechanics Building

Figure
 No. 3

Memorandum

*Flex your power!
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To: SEAN SAMUEL
Branch Chief
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Subject: Addendum to Foundation Report

Per your request, the Office of Geotechnical Design – North (OGDN) has prepared this Addendum to the Foundation Report (FR) titled “Foundation Report, 09-MNO-47M5717, 09-315201, Sonora Junction M.S., Mechanics Facility” dated March 6, 2009.

The following seismic design criteria are recommended for the site in accordance with California Building Code (CBC) 2007, Chapter 16.

Site Class	D
Mapped Spectral Acceleration for Short (0.2-Sec) Period, S_s ,	1.16g
Mapped Spectral Acceleration for 1-Second Period, S_1 ,	0.42g
Site Coefficient, F_a ,	1.04
Site Coefficient, F_v ,	1.58
Design Spectral Response Acceleration at Short (0.2-Sec) Period*, S_{DS} ,	0.80g
Design Spectral Response Acceleration at 1-Second Period*, S_{D1} ,	0.44g

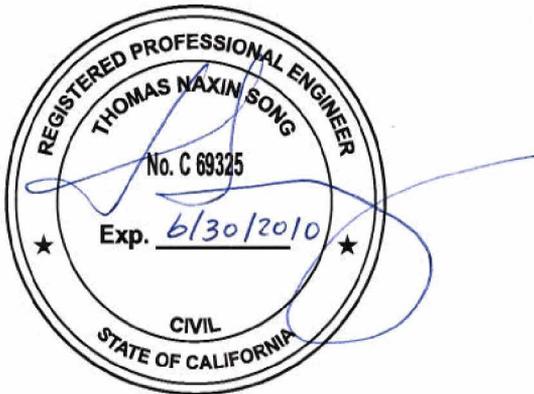
* The design spectral response acceleration parameters are 5% damped.

These recommendations shall supersede seismic design recommendations provided in the previous FR. All other discussions, conclusions, and recommendations contained in the previous FR shall still apply.

Mr. Sean Samuel
June 10, 2009
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Addendum to Foundation Report
Sonora Junction M.S.

If you have any questions or comments, please contact Thomas Song at (916) 227-1054.



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