INFORMATION HANDOUT

For Contract No. 06-0Q4204
At 06-Ker-5713

Identified by
Project ID 0613000095

MATERIALS INFORMATION

Foundation Report

M e m o r a n d u m

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To: MR. STEPHEN WINZENREAD
Senior Engineer
D06 Deputy Region Project Development

Date: June 24, 2013

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EA: 06-0Q420
ID: 0613000095
Mojave HMS, 50L5713

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

Subject: Foundation Report

Introduction

This report has been prepared to provide foundation recommendations for the proposed improvements at the Caltrans highway maintenance station (HMS) referenced above. It is proposed to construct a new mechanics building (Phase 1) at the southwest corner of the existing HMS lot.

Pertinent Data

The following information was used to complete these foundation recommendations:

1) The preliminary site plan for the new proposed facility.

2) As-built structural plans for existing facilities at the Mojave HMS.

3) A test boring log (LOTB) for two exploratory borings completed in 1994 at the Mojave HMS (formerly Lost Hills MS) to characterize soil parameters for the site.

4) An LOTB completed in 1996 for the Oak Creek Road OH bridge (50-0490) to determine possible groundwater.

5) The California Building Code (2010 edition).

Site Subsurface Conditions

Based on the exploratory borings completed in 1994 the site is underlain by alluvium (soil) consisting dense to very dense silty sand. This material becomes hard at 10 feet below the existing ground surface.

Corrosion

The site soils are categorized as granular. The site soils should be considered to be non-corrosive to foundation elements.

Groundwater

Groundwater was not encountered in any of the referenced exploratory borings and ground water is known to be far below the existing ground surface in the region. Groundwater will not be a factor during construction of the new facility.

Frost Depth

The frost depth is estimated to be 18 inches below finished grade at the project site.

Seismic Information

As determined from Table 1613.5.2 of the 2010 California Building Code, the soil class at the is type D.

Based on the Caltrans ARS Online Tool (Version 2.2.06), the nearest active fault for the site is the Garlock (West) fault (ID No. 231) with a Mmax of 7.7. The fault is a strike-slip fault with a dip angle of 90 degrees (vertical dip). The distance from the HMS site to the top of the fault rupture plane is approximately 6 miles to the northwest.

The 2010 CBC coefficients and mapped spectral accelerations recommended for the project site are presented in **Table 1**.

Table 1. Seismic Ground Motion Values

Period (s)	Spectral Response Acceleration Parameter	Site Coefficient for Class "D"
0.2	$S_s = 1.355$	$F_a = 1.01$
0.1	$S_1 = 0.551$	$F_v = 1.52$

As there are no known faults crossing beneath or extending toward the site, the potential for surface rupture is considered low.

Liquefaction Potential

The site is not located in an area shown as potentially liquefiable on the State Seismic Hazard Map. The soils underlying the site are dense to hard and groundwater is more than 80 feet below the surface. The potential for liquefaction is considered low. The potential for seismically induced settlement and lateral spreading is also considered low.

Foundation Recommendations

Spread Footings

Foundations may be sized for maximum allowable soil pressures of 2000 psf for dead plus live load, with an allowable one-third increase for total load to evaluate the short term effects of seismic or wind forces. Footings should be founded a minimum of 18 inches below the lowest adjacent compacted soil grade and be a minimum of 12 inches wide.

Resistance to lateral displacement of foundations may be computed using an allowable friction factor of 0.3 multiplied by the effective vertical load on each foundation. Additional lateral resistance can be achieved by considering passive soil resistance against the vertical projection of the foundation equal to an equivalent fluid pressure of 340 psf per foot of depth. These two modes of resistance (friction and passive pressure) should not be added unless the frictional component is reduced by 50 percent due to the mobilizations of the resistive force occurring at different degrees of horizontal movement

Slab On Grade

The soil supported slab should be designed using a subgrade reaction modulus, k, of 90 psi per inch.

Moisture Barrier

There is no potential for groundwater intrusion beneath the proposed structure. Where upward capillary moisture from other sources such as leach fields is not desired, 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.

Slope Instability

There are no slopes greater than 5:1, proposed or existing, at the project site. There is no potential for slope instability.

Differential Settlement

It is estimated that post-construction total and differential settlement of the spread footings designed in accordance with the recommendations of this memo will not exceed 0.5 inches.

Construction Considerations

1) Groundwater is not expected to be encountered during excavation of the footings.

2) Spread footings shall be placed on firm soil. If non-suitable materials are encountered during excavation, the non-suitable materials should be removed and the footing bottom elevation should be lowered to a firm base.

3) If any different or unforeseen geotechnical conditions are encountered during excavation of the footings, this office should be contacted for additional recommendations.

Project Information

This section discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is information originating from Geotechnical Services.

Data and information attached with the project plans are:
None.

Data and Information included in the Information Handout provided to the bidders and Contractors are:
None.

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 conceptual changes to the structure are proposed during final project design, the Office of Geotechnical Design – North should review those changes to determine if the foundation recommendations contained herein are still applicable.

If you have any questions, please contact Christopher Koepke at (916) 227-1040.

Report by:

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Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Frank Momen (D06 PM)
Shira Rajendra (Corporate)
Doug Lambert (D06 DME)
GS Archive

Attachments: LOTB, Mojave MS, 1994
LOTB, Oak Creek Road OH, 50-0490