

FOR CONTRACT NO.: 07-3X3004

INFORMATION HANDOUT

MATERIALS INFORMATION

FOUNDATION RECOMMENDATION, FOUNDATION REVIEW, AND
RETAINING WALL LOG OF TEST BORING

ROUTE: 07-LA-5-25.4/27.2

Memorandum

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To: MR. MATT HOLM, CHIEF
Design Branch 12
Office of Structure Design

Date: January 2, 2012

File: 07-LA-10-PM 0.4
07-3X3001
Proj. No. 0700021169
Retaining Wall No. 53-E0205

Attention: Mr. Jinrong Wang

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design South-1
Branch D

Subject: Foundation Report for Retaining Wall No. 53-E0205 at Eastbound Interstate 10 Slope

References: 1) "Initial Site Assessment (ISA), Interstate 10 Slope Review and Repair", prepared by Office of Geotechnical Design South-1, dated January 27, 2011.
2) "Slope/Slide Investigation_LA-10 P.M.0.4", prepared by Office of Geotechnical Design South-1, dated April 29, 2005 (Revised 07/28/2005).
3) "Geotechnical Design Report for I-10 PM 0.0 to 0.6 Slope Slides", prepared by Office of Geotechnical Design South-1, dated May 27, 2005.

INTRODUCTION

Based on the request from the Office of Structure Design, and Draft Retaining Wall No. 53-E0205 General Plan (dated 12/01/11), Office of Geotechnical Design South-1 (OGDS1) has prepared a Foundation Report for the proposed Retaining Wall No. 53-E0205 at the existing cut slope along the southeast shoulder of eastbound Interstate 10 (¼ mile west of Soto Street Off-Ramp) at Post mile 0.4.

Retaining Wall No. 53-E0205 will be a soldier pile wall with timber lagging and will be constructed along the mid slope bench of the existing cut slope to accommodate the bench reconstruction within the Los Angeles County, California.

SCOPE OF WORK

The purpose of OGDS1's investigation was to evaluate site soil conditions and to provide seismic evaluations and recommendations for foundation design and construction of the proposed retaining wall. The scope of work for the current study included performing the following tasks:

- a. Review of the pertinent literature and current plans;
- b. Field reconnaissance by an engineer to observe the existing conditions at the proposed wall site;
- c. Interpretation of subsurface soils and groundwater conditions at the site of the proposed wall; and
- d. Engineering analyses and preparation of this report to present geotechnical recommendations for foundation design of the proposed wall.

PROJECT DESCRIPTION

Retaining Wall No. 53-E0205 will be a steel soldier pile (in drilled holes) wall with wood lagging and will be constructed along the mid slope bench of the existing cut slope, to accommodate the bench reconstruction, from Station 21+65 to Station 22+13 RW LOL (118.9' Rt. Station 21+65 to 118.2' Rt. Station 22+17.05 Centerline Route 10).

The existing cut slope at the location of the proposed wall is approximately 70 feet high above Interstate 10 with an approximate overall slope ratio of 1H:1V and with a 17 foot wide bench (access road) at mid slope height. The slope is covered with trees and vegetation. The area immediately west of the proposed soldier pile wall was reconstructed in 2005 under project EA: 07-250800 (Location No. 5) with existing crib wall.

Elevations provided on current plans and recommendations are based on NAVD88 datum.

The location and geometric layout data for the wall is shown on the General Plan and is summarized in Table 1, below.

Table 1 – Summary of Wall Information

RW LOL Station (ft)		Wall Type	Soldier Pile with Lagging Embedment Depth (ft)	Total Soldier Pile Wall Embedment Depth (ft)
From	To			
21+65	22+13	Steel Soldier Pile (HP 12x53) in 2 feet Diameter Drilled Hole with 6"x8" Treated Timber Lagging	8	25

FIELD INVESTIGATION AND TESTING PROGRAM

Field exploration was performed on April 19, 2005. The field investigation included drilling one 3-inch diameter mud rotary boring on top of the slope (near existing tieback wall). Standard Penetration Tests (SPT's) were performed within the boring. The SPT's were performed in accordance with ASTM Test Method D1586 using a standard 1.4 inch I.D. sampler with a 140 lb hammer dropped 30 inches. Caltrans Drilling Services operated drill rig model B80 was used at the boring location. Caltrans engineers performed the logging of the borings.

The location and elevation of the boring was estimated based on the survey plans provided by D07 Surveys. Boring number, estimated offset and stationing, estimated ground surface elevation, boring depth, and date drilled are summarized in Table 2.

Table 2 – Summary of Boring Information

Boring No.	Estimated C/L Rte 10 Stationing	Estimated Offset from I-5 (ft)	Estimated Top of Boring Elevation (ft)	Depth (ft)	Date Drilled
B-1	13+65 (38+10 metric)	126 (38.5 m)	377 (115 m)	100	04/19/2005

SITE GEOLOGY AND SUBSURFACE CONDITION

Site Description and Subsurface Condition

The subject site is located within the Boyle Heights Hills portion of Los Angeles Basin approximately 1.3 miles east of downtown Los Angeles. Outcrops of the Upper Miocene Puente Formation are exposed along freeway slopes. This formation consists of thin bedded, silty clay shale striking mostly on an east-west direction dipping into the slope. Overlying this formation is Quaternary alluvial deposits of gravel, sand and silt, weakly consolidated. For more information, refer to Log of Test Boring (B-1) presented in Attachment 1.

Based on OGDS1 observations of the temporary back cut during adjacent crib wall construction (Location No. 5) and 2011 site visits, the thickness of overlying alluvial deposits at the proposed wall location is estimated to be less than 5 feet.

Groundwater

Perched water was encountered during field reviews in 2005 and occurs within the upper part of Puente Formation probably along the contact with the alluvial deposits. Groundwater table was not encountered to approximate elevation of +277 feet drilled.

CORROSION

A representative soil sample was tested for corrosion potential at Caltrans Laboratory. Results presented in Table 3 show that subsurface soils are corrosive to metal and reinforced concrete (Reference 2).

Table 3 – Corrosion Test Summary for Retaining Wall No. 23-E0205

Boring No.	Sample Depth (ft)	Minimum Resistivity (ohm – cm)	PH	Chloride Content (PPM)	Sulfate Content (PPM)
B-1	30	520	4.62	265	1774
Corrosive Guidelines		<1000	≤5.5	≥500	≥2000

ND=Not detectable

Note: It is the practice of Caltrans Corrosion Technology Section (with the exception of MSE Walls) if the minimum resistivity of the sample is greater than 1000 ohm-cm and the pH is greater than 5.5, the sample is considered to be non-corrosive. Caltrans currently considers a site to be corrosive to foundation elements if one or more of the following conditions exist: Chloride concentration is greater than or equal to 500 ppm, sulfate concentration is greater than or equal to 2000 ppm; or the PH is 5.5 or less.

SEISMIC EVALUATION

Based on the Caltrans ARS on line procedure, Puente Hills Blind Trust Fault is the nearest active seismic source to the site. The Puente Hills Fault is located 2.6 miles from the site and is capable of

generating Maximum Moment Magnitude (M_{max}) of 7.3. Peak Ground Acceleration (PGA) for the ARS is about 0.67g.

LIQUEFACTION POTENTIAL

Liquefaction potential is considered low at the site. Groundwater was not encountered to approximate elevation of +277 feet in boring B-1. The potential for other secondary seismic hazards including significant seismically induced settlement and lateral spreading are also considered low.

SURFACE FAULT RUPTURE HAZARD EVALUATION

The project site is not located within any CGS designated Earthquake Fault Zone (EFZ) or directly underlain by any active fault considered for wall design. The possibility of surface fault rupture hazard at the wall site is considered low.

FOUNDATION RECOMMENDATIONS

The following recommendations are based on 1) Retaining Wall No. 53-E0205 Draft General Plan, (dated 12/01/11) provided by Mr. Jinrong Wang of Office of Structure Design, Branch 12, and 2) Results of field investigation completed on April 19, 2005 by OGDS1, and general knowledge of the subject area's geology.

For the purpose of proposed soldier pile wall analysis, idealized soil strength parameters shown in Table 4 are recommended.

Table 4 – Idealized Soil Parameters for Soldier Pile Analysis

Materials (Soil)	Friction Angle (Degree)	In situ Density (lbs/ft³)	Cohesion (psf)
Puente Formation	28	120 to 127	400

After installing soldier piles and lagging, OGDS1 recommends that the slip-out area behind the wall be constructed to road grade in accordance with Section 19 of Standard Specifications.

The slope below and outside of the wall should be cleaned/smoothed down to competent material (then in-filled as needed) to match adjacent slope surfaces. After slope smoothing and/or infilling is completed, an anchored mat system with hydro seeding of surface material should be placed over the repaired slope area beneath the wall. The mat should be laid on the slope and secured to the competent ground using anchors as per manufacture's recommendations. Contractor should submit his/her proposed mat system installation procedure at least 2 weeks prior to construction for OGDS1 review and approval. As an alternative, procedures provided in Attachment 2 for MacMatR8P may be used by contractor.

SLOPE STABILTIY ANALYSIS

The global stability of the cut slope was evaluated using Modified Bishop Method utilizing computer program XSTABL version 5.2 under both static and pseudo-static conditions. The stability analysis using soil parameters presented in Table 4 above, yields a factor of safety greater than the minimum acceptable values of 1.5 and 1.1 for static and seismic condition, respectively.

CONSTRUCTION CONSIDERATIONS

- 1) Appropriate drainage system should be designed to direct the surface/seepage water away from the existing bench and slope surface.
- 2) No ground water is anticipated at the pile boring excavations.
- 3) Minor caving is anticipated during pile hole excavations. Prior to placement of concrete, the interior surface of the shaft including the bottom should be cleaned of residue from drilling operations.
- 4) The drilling of the pile holes, the placement of the H pile, and concrete pour shall be completed at the same day.

If you have any questions or need further information, please contact Akbar Mehrazar at (949) 440-3415 or Shiva Karimi at (213) 620-2134.

Prepared by:

Date: 1/2/2012

Reviewed by:

Date: 1/2/2012

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Attachments:

- 1) Log of Test Borings (dated 06/09/2005)
- 2) Alternative Mat Installation Procedures

cc:

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