

FOR CONTRACT NO: 08-384344
PROJECT ID: 080000640

INFORMATION HANDOUT

MATERIALS INFORMATION

GEOTECH REPORT

ROUTE: 08-SBd-10-9.9/R24.5

Memorandum

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To: DOUGLAS DUNRUD
Bridge Design Branch 14

Date: January 20, 2011
File: 08-384341
08-SBd-10-PM 15
Soldier Pile Wall #62

Attn: Lihua Han

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

Subject: Geotechnical Design Report for Soldier Pile Retaining Wall #62

As requested on November 17, 2010, our Office of Geotechnical Design – South 2 (OGDS2) has prepared this Geotechnical Design Report (GDR), which provides geotechnical information and foundation recommendations for the proposed, Soldier Pile Retaining Wall #62. As referenced, this Office prepared a GDR dated May 28, 2009 for five retaining wall in the vicinity for the same project. This GDR is prepared for the 6th wall, Wall #62, which is a soldier pile wall due to the very limited space between the existing commercial building and the Lay Out Line (LOL) of the proposed wall. Wall #62 will provide needed space for widening along Mt. Vernon Avenue onramp to the westbound I-10 freeway in San Bernardino County.

General Site Description

From the information received by this office, the subject wall will be constructed between the existing onramps and the Caltrans Right of Way, and the soldier piles will be founded in the existing original ground below an existing parking lot and existing commercial structure.

Subsurface Investigation

Our subsurface investigation for this project utilized a B-47 trailer mounted drill rig, which advanced 3 exploratory borings at the site as close to the proposed retaining wall LOL as possible. In-situ testing, including Standard Penetration Tests (SPT), were performed every 5 feet and extended to a maximum depth of 35 ft below the surface of the existing paved shoulder. Blow counts from the SPT were recorded and are presented in the Log of Test Boring sheets (LOTBs) for retaining wall #62 dated 10-28-10. Bulk bag samples were collected from auger cuttings and were delivered to the Sacramento Laboratory for testing.

Site Geology and Seismicity Information

The nearest fault to the project is the Railto-Colton-C Claremont (RCC) fault, which is approximately 5 miles away from the proposed retaining wall site. As shown on the California

Seismic Hazard Map, 1996, the RCC fault has a Maximum Credible Earthquake (MCE) rating of 6.75 and could produce up to 0.5 g Peak Rock Acceleration.

This Office has calculated the seismic earth pressure acting on the wall due to the design earthquake ground motion using the same limit equilibrium methodology as the static pressure case. For the seismic earth pressure calculation, the Mononabe-Okabe relationship was used (Seed and Whiteman, 1970). During an earthquake, an additional seismic earth pressure load of 22 psf per feet of wall height may be developed for this wall where it retains a horizontal backfill. Note that the active and seismic pressures have a triangular distribution with the largest load occurring at the bottom of the wall and should be added to the permanent loading if structural analysis of the piles or wall is needed.

Subsurface Soil Information

The following geotechnical information is based on our investigation and knowledge of the area. As noted on the LOTB dated 10-28-10, the subsurface soils consisted of native original ground. The native original material encountered consisted of medium dense to very dense silty SAND with blow counts ranging from 12 to 52 blows per foot. Groundwater was not encountered during our investigation on October 10, 2010, although groundwater elevation may fluctuate.

Soil Design Parameters

Our design assumed that the existing foundation material shall provide the following soil parameters; 32° for the angle of internal friction, zero (0) cohesion and a moist unit weight of 120 lb/ft³. Our analysis assumed proper drainage facilities would be installed to insure no hydrostatic pressure building up behind the wall.

Pile and Pile Loading Parameters

The following is the pile and loading information our Office received from your Office:

Pile Type	W14 x 120 steel H pile centered inside a 24" diameter CIDH pile.
Pile length	33 ft.
Pile spacing	6 ft.
Wall height, max.	11 ft.
Pile diameter	2 ft.
Mom. Of inertia	1370 in ⁴
Area	35 in. ²
Shear	33 kips
Moment	116 kips-ft
Axial Load	1 kip.

Wall Design and Analysis

The above Pile Parameters, Soil Parameters and the Loading Parameters were input into the LPILE computer program and analyzed for lateral displacement at the top of the CIDH pile. The LPIIE output for the Pile-Head Deflection was 0.476 inches, which is less than the maximum allowable deflection of 0.50 inches.

Foundation Recommendations

This office concurs with your foundation design for Solider Pile Wall #62 as described above. The W14 x 120 steel H piles centered in a 24" diameter CIDH piles should be embedded a minimum of 22 feet below finished grade.

Construction Considerations

It is not anticipated that groundwater will be encountered during construction, although if water seepage into the drilled hole is encountered and persists during construction, wet CIDH pile construction may be required. Caving should not be expected during construction, although the Contractor will be required to control any caving per Section 49-4.03 Drilled Holes, of the Standard Specifications. The contractor will be responsible for the identification of any and all utilities, above ground and/or underground, prior to any construction work. The soil was determined to be non-corrosive by Caltrans standards, and standard concrete may be used.

If you require further information, please contact Brian Gutierrez at (916) 227-1222 or Shawn Wei at (916) 227-5252.

Prepared by:

Date:

Brian Gutierrez 1-20-11

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