

Memorandum

To: MR. MICHAEL KEEVER
Office of Structure Design
Bridge Design Branch South
Design Section 15

Date: June 18, 2001

File: 11-SD-15-KP M 21.14
11-232600

Attention: Ms. Traci Holden



Carroll Canyon Road OC
Type L Walls
Bridge No. 57-0933

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services - MS 5
Structure Foundations - South

Subject: Final Foundation Recommendations

A foundation study for the proposed Type L Walls at the Carroll Canyon Road OC Bridge, Bridge No. 57-0933, was completed in May 2001. The study consisted of a site review and the review of "As-Built" data. The "As-Built" review included the evaluation of "As-Built" Log of Test Borings (LOTB) from March 1977 and "As-Built" drawings of the structure. Information from the mud-rotary test borings W24-B2 and B2, completed during March of 2000 for the nearby Type 1 Retaining Walls was also reviewed. All elevations referred to below and shown on the current LOTB sheets (including W24-B1 and B2) are based on the NAVD of 1988. The elevations shown on the 1977 "As-Built" LOTB sheets are based on the NGVD of 1929.

Project and Site Description

The existing Carroll Canyon Road OC bridge carries Carroll Canyon Road over State Route 15 in northern San Diego, California. The site location is an area of gently sloping hills being extensively graded for development. The proposed improvements are part of the Interstate Route 15 widening at the structure location and include widening both the north and southbound exterior lanes. The proposed Type L walls will accommodate the southbound exterior widening of approximately 3.5m, and the northbound widening of approximately 6.5m. The freeway at the bridge location consists of a cut section of roadway. The proposed wall footings will be located below the traveled way in native material consisting of dense sand or sandy and silty gravel.

Geologic Data

Based on the 1977 "As-Built" LOTB information, the structure site is underlain by Quaternary alluvium consisting of very dense sand, sandy gravel, silt and cobble-gravel. The cobbles are found in very dense layers throughout the soil column investigated, and include very hard and fresh dacite, granite and quartzite. Groundwater was not encountered by the 1977 borings that extended to elevation 139.6m.

Seismic Data and Liquefaction

According to the Office of Geotechnical Earthquake Engineering (OGEE) Final Seismic Design Recommendations memorandum dated May 31, 2001, the controlling fault for the site is the Newport - Inglewood- Rose Canyon Fault (NIE, style strike slip). This fault is located approximately 13.7 km west of the site, and may generate a maximum credible earthquake of moment magnitude $M_w=7$. The Memo indicates that the horizontal peak bedrock acceleration at the site is estimated to be 0.3 g, and the horizontal peak ground acceleration is approximately 0.35g. Based on the available information, the potential for soil liquefaction appears remote and there is no potential for lateral spreading.

Foundation Recommendations

The following recommendations are for the proposed Type L walls at Abutment 1 and Abutment 4 of the Carroll Canyon Road OC, Bridge 57-0933 as shown on the General Plan dated May 23, 2001. Spread footings are recommended for the support of the proposed Type L Wall at both wall locations.

Table No. 1
Type L Wall Spread Footing Data

Support Location	Bottom of footing Elevation	Minimum Footing Width	Recommended Soil Bearing Pressures	
			ASD ¹	LFD ²
			Gross Allowable Soil Bearing Pressure (q_{all})	Ultimate Soil Bearing Pressure (q_{ult})
Abut 1 36m Lt. sta. 252+87- 36m Lt. sta. 253+19 "LO Line"	147.76m	2.9 m	240 kPa (2.5 tsf)	N/A
Abut 4 36m Lt. sta. 252+87- 36m Lt. sta. 253+19 "LO Line"	147.90m	2.9 m	240 kPa (2.5 tsf)	N/A

Notes: 1) Allowable Stress Design, (ASD). The Maximum Contact Pressure, (q_{max}), is not to exceed the recommended Gross Allowable Soil Bearing Pressure, (q_{all}). The Ultimate Soil Bearing Capacity, (q_{ult}), will equal or exceed 3 times the recommended Gross Allowable Soil Bearing Pressure, (q_{all}).
2) Load Factor Design, (LFD). The Maximum Contact Pressure, (q_{max}), divided by the Strength Reduction Factor, (ϕ), is not to exceed the recommended Ultimate Soil Bearing Pressure, (q_{ult}). The Ultimate Soil Bearing Capacity, (q_{ult}), will equal or exceed the recommended Ultimate Soil Bearing Pressure, (q_{ult}).

General Notes

- Should there be any reduction in the spread footing dimensions, or increase in the bottom of footing elevation, the Structure Foundations South Section must be notified to reevaluate the recommended gross allowable soil bearing pressures to be used for design.

Construction Considerations

- The footing concrete shall be placed neat against undisturbed soil at the bottom of the footing excavation. If the soils at the bottom of the excavation are disturbed or loosened, they shall be re-compacted to 95% relative density prior to placing any concrete or steel.

The recommendations contained in this report are based on specific project information regarding the proposed structure locations, loading conditions and foundation dimensions

Mr. Michael Keever
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provided by Office of Structure Design. If any conceptual changes are made during final project design, or if there are any questions regarding the above recommendations, please contact Mark A. Richards at (916) 227-7193 (CALNET 498-7193) or Mark DeSalvatore (916) 227-7056 (CALNET 498-7056), of the Office of Geotechnical Design - South, Structure Foundation South Branch.

Report by: *Mark A. Richards* Date: *6/18/01*

Supervised by: *[Signature]* Date: *6/18/01*

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- c: R.E. Pending File
- DBarlow - Specs & Estimates
- TRuckman - Specs & Estimates
- OAlcantara - Proj Mgmt
- A. Padilla - Materials & Investigation (D11)
- LCarr - Proj Mgr (D11)
- YDeng - Structure PCE
- Geology Bridge File (LA)
- Geology Bridge File (Sac)
- MWilliam
- RGES.30

