

# Memorandum

To: MR. RAMIN RASHEDI  
Division of Structure Design  
Office of Bridge Design C  
  
Attention Mr. Gary Blakesley

Date: July 19, 2000  
  
File: 11-SD-5-KP 49.8/49.9  
11-0301U1

Retaining Wall No. 531

From: **DEPARTMENT OF TRANSPORTATION**  
ENGINEERING SERVICE CENTER  
Division Structural Foundations - MS 5  
Office of Structure Foundations

Subject: Foundation Recommendations

A Request for Foundation Recommendations (dated March 4, 1999) for the retaining wall was submitted to the Office of Structure Foundations (OSF) by Mr. Earl Seaberg. Retaining Wall No. 531 will be located between the S5/S805 Truck Connector approach embankment (Br. No. 57-1069F, near Abutment 21) and southbound Rte. I-5 according to the above Caltrans Memorandum and Wall Layout Plans.

A subsequent foundation investigation at the site of the proposed wall was completed in December 1999. Subsurface information was obtained by four variable diameter mud rotary borings. Results from the field study will be shown on the Log of Test Borings (LOTB).

## Site Description

Underlying sediments beneath the proposed wall footprint at the site consist of artificial fill which ranges between approximately 0.3 to 2.44 m (1.0 to 8.0 ft) thick. Underlying native alluvium (Holocene and possible older Quaternary alluvium and Pleistocene Bay Point Formation, undifferentiated) ranges from approximately 10.06 to 3.05 m (33.0 to 10.0 ft) thick. Underlying claystones/siltstones (probable Ardath Shale thin tongues) and gravelly formational sands of the probable Torrey Sandstone occur below elevations ranging from +9.39 to +17.25 m (+30.8 to +56.6 ft).

Artificial fill consists dominantly of medium dense to dense/minor very stiff, silty sand and sandy silt with intermittent scattered gravel and minor cobbles (up to 5%) interlayered with minor sandy lean clay. Native alluvium or Bay Point Formation sediments (undifferentiated) consist of dominantly medium dense to very dense/minor very stiff, sand interbedded with silty sand, sandy silt, clayey sand, cobble/gravel lenses with sand matrix, and minor lean clay. Cobbles within the alluvial or Bay Point Formation unit are up to 150 mm (6 in) diameter and are composed dominantly of hard metavolcanic rock fragments. The underlying probable Eocene Ardath Shale and/or Torrey Sandstone generally consist of interbedded soft to hard, claystone/siltstone interbeds (probable Ardath Shale) intertonguing and partially underlain by the Torrey Sandstone composed of very dense to dense, fine to medium formational sand with intermittent scattered gravel/cobbles (dominantly uncemented, soil-like sand). The probable Ardath Shale is dominantly slightly weathered to fresh and unfractured to slightly fractured. These fractures are dominantly infilled with calcite cement. The deepest borings penetrated down 17.53 to 18.44 m (57.5 to 60.5 ft) below the surface, down to elevations ranging between +4.21 to +6.22 m (+13.8 to +20.4 ft). The LOTB should be reviewed for more specific details.

### Ground Water

Static ground water is estimated at approximate elevation +10.36 m (+34 ft) within Boring 99-4 (near Begin Wall) although perched water layers may be encountered somewhat shallower.

### Liquefaction

Liquefaction potential is considered very low. Artificial fill and alluvium and/or Bay Point Formation sediments (undifferentiated) at the site are dominantly composed of medium dense to dense/very stiff, sand interbedded with silty sand, clayey sand, and sandy clay lenses. Ground water is also estimated at least 11.37 m (37.3 ft) below the surface. Final liquefaction potential will be determined by the Office of Geotechnical Earthquake Engineering (OGEE).

### **Foundation Recommendations**

The following recommendations are based on District 11 Layout Sheets L-14 and L-16 with retaining wall (highlighted), the General Plan for Retaining Wall No. 531 (received January 24, 2000), the Foundation Plan for the adjacent S5/S805 Truck Connector (Br. No. 57-1069F, sheet 6 of 6, checked by S. Wang, October 1, 1998) and District 11 Wall Layout Plans which show existing topography, and sporadic discussions with Messrs Ramin Rashedi and Gary Blakesley (Structure Design Engineers) from March 1999 to May 2000.

Retaining Wall No. 531 (a Type I retaining wall) is approximately 93.70 m (307.4 ft) in length and varies from 3.6 to 1.8 m (11.8 to 5.9 ft) in height with an additional Type 25 Barrier (concrete) to be placed on top of the wall.

Retaining Wall No. 531 can be supported by Standard Type 1 wall spread footings placed within existing embankment material or alluvial and/or Bay Point Formation sediments at elevations shown on the General Plan. Following footing excavation, exposed material should be compacted to 95% R.C. (relative compaction) at footing grade. The maximum allowable bearing for the retaining wall and barrier should not exceed 145 kPa (1.5 TSF).

All elevations shown in the Plans and on the LOTB are based on the current metric NAVD 88 datum.

### **Constructability**

Spread footing foundations will be well above static ground water level.

Settlement magnitude from additional fill should be minor and settlement should be relatively rapid within dominantly granular soils. OSF suggests (Pratt, Foundation Recommendations, June 26, 2000, S5/S805 Truck Connector, Br. No. 57-1069F) a settlement waiting period of up to 60 days in this area. The actual waiting period shall be determined by the Project Engineer on the basis of settlement data in the field. The purpose of the proposed retaining wall is to keep added approach embankment for the S5/S805 Truck Connector from encroaching on the proposed widening of adjacent southbound Route I-5. At the completion of the settlement period, when settlement has essentially ceased to tolerable levels, the wall and bridge abutment can then be constructed.

### **Corrosiveness**

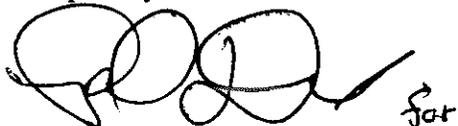
Soil samples for corrosion testing were not specifically taken for Retaining Wall No. 531. Corrosion tests taken for the adjacent proposed S5/S805 Truck Connector (Br. No. 57-

1069F) and the similar hillside and formational setting at the Carmel Mountain Road Undercrossing (Widen and Outer Right, Br. No. 57-0314R/L/S) indicate that fill and native material can be corrosive.

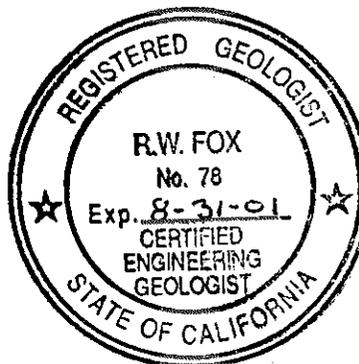
OSF feels that the Corrosion Technology Branch should comment on nearby corrosion test results and provide final recommendations regarding concrete cover requirements for footings in contact with fill and native soils within this area.

If you have any questions, please call Joe Pratt at (562) 864-5740 or Richard Fox at (916) 227-7085.

Report by:



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Associate Engineering Geologist



- c: R.E. Pending File
- DBarlow - Specs & Estimates
- OAlcantara - Proj Mgmt
- Dist. 11 (2)
- ELeivas - OSF
- RFox - OSF
- AAbghari - OGEE
- DParks - Corrosion Technology
- MTolin - Corrosion Technology
- LA File