

# INFORMATION HANDOUT

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  - C3. FOUNDATION REVIEW FOR SUN VALLEY OH (WIDENING) (BR. NO. 53-1134), DATED APRIL 15, 2008

# Memorandum

*Original*  
*FCH*  
Flex your power!  
Be energy efficient!

To: MR. FRITZ HOFFMAN, CHIEF  
Bridge Design Branch 6  
Office of Bridge Design West  
Structure Design  
Division of Engineering Services MS 9 3/3G

Date: July 27, 2006

Attention: Ms. Xiaodong Chen

File: 07-LA-05-KP 51.27  
07-121801  
I-5 HOV Lane Widening Project  
Cohasset Street UC (Widening)  
Bridge No. 53- 1111 (R/L)

From: WILLIAM BERTUCCI *WB*  
Associate Engineering Geologist  
Office of Geotechnical Design – West  
Geotechnical Services  
Division of Engineering Services

HOSSAIN SALIMI  
Senior Materials and Research Engineer  
Office of Geotechnical Design - West  
Geotechnical Services  
Division of Engineering Services

Subject: Final Foundation Design Recommendations

## INTRODUCTION

This final foundation recommendation memorandum is provided in response to your request (January 27, 2006) for the proposed widening of Route 5 (I-5) Cohasset Street Under-Crossing (UC) Bridge located west of the City of Burbank in Los Angeles County. According to the request, Cohasset St. UC is one in a series of 13 planned bridge widening and/or replacement projects along I-5 between KP 43.0 and KP 58.0. The project scope for this bridge includes median barrier upgrade, as well as north and south bound lanes widening. The existing bridge was completed in 1961.

Caltrans Office of Geotechnical Design-West and URS Corporation performed a combined foundation investigation that included 47 borings for the 13-bridge project, which commenced in July 2005, and was completed in November 2005. At the Cohasset Street (UC), four new borings were drilled. In addition, the Logs of Test Boring (LOTB) from the 1957 original foundation investigation, and the 1961 As-Built Plans were also reviewed.

MR. F. HOFFMAN

Attn: X. Chen

July 27, 2006

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## **GEOLOGY**

The bridge site, located in the eastern San Fernando Valley is situated on a relatively gentle west sloping alluvial fan, which was formed from the coalescing deposition of several streams, which originated in the nearby Verdugo Mountains. The valley outlines an east trending sediment filled structural basin within the Transverse Ranges. Generally, the sediments within the basin consist of unconsolidated poorly stratified flood plain, streambed, and alluvial fan deposits. At depth, these deposits become more consolidated and interbedded with marine deposits.

The geology at the bridge includes an approximately six-meter high existing embankment fill underlain by alluvium to the maximum explored depth of 23.5 m (Elevation 192.7 m). The fill appears to be composed of relatively dense mixture of sand with gravel and although not directly investigated, the embankment was constructed at about the same time as the Sun Valley embankment fill that was investigated. The materials at both bridges seem to compare with respect to composition and support performance. The fill soils supports existing abutment wing walls, and will support the wing walls of the proposed abutment extensions.

Based on the current LOTBs, the proposed abutment extensions from elevations 211 m to 214 m are underlain by native cohesionless loose to medium dense sand that includes some gravel. Below that, the soils are similar above and become dense to very dense with the increased depth. See LOTBs Attachment for detailed soil descriptions.

## **GROUNDWATER**

Historically, groundwater measurements, (Liquefaction Zones in the Burbank 7.5 Quadrangle, LA County, California, OFR88-07) indicate groundwater has reached to about 27 meters of the ground surface at the bridges. Groundwater was not encountered during our soils investigation.

## **SCOUR**

The bridge does not cross over a body of water. Therefore scour potential is not a design issue.

MR. F. HOFFMAN

Attn: X. Chen

July 27, 2006

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## **CORROSIVITY**

The site is considered non-corrosive based on soil corrosion tests conducted from samples taken during the field investigation.

## **SEISMICITY/LIQUEFACTION POTENTIAL**

Hossain Salimi from the Office of Geotechnical Design-West submitted the Final Seismic Design Recommendation in a report dated May 22, 2006.

## **FOUNDATION RECOMMENDATIONS**

According to the General Plan (March 14, 2006), provided by Xiaodong Chen, the existing abutment and wing walls are supported on spread footings. To maintain uniformity in design and performance, spread footings are recommended for the proposed abutment extensions and the new wing walls. These plans also indicate the existing and proposed footing grades will be the same. Spread footings for the wing walls will be founded in embankment fill while the abutments will be founded in native soils.

Based on our field investigation and engineering analysis, we recommend that a presumptive value of 144 kPa (1.5 tsf) allowable bearing capacity be used for the footings at the wing walls, and a value of 239 kPa (2.5 tsf) allowable bearing capacity be used at the abutment foundations. A factor of safety of 3 was used to determine the allowable bearing capacity.

5 tsf

Settlement under design load is anticipated to be less than 25 mm (1 inch) and differential settlement less than 12.5 mm (0.5 inch).

To insure adequate performance of the foundations, the underlying soils should have a relative compaction of 95 percent. If the soils do not meet this criterion, then reworking the material including moisture conditioning and compaction in accordance to Standard Specifications Earthwork Section 19-3.06 shall be required. The depth and lateral extent of the soil rework shall be determined during construction by the Engineer of Record or his/her representative.

MR. F. HOFFMAN

Attn: X. Chen

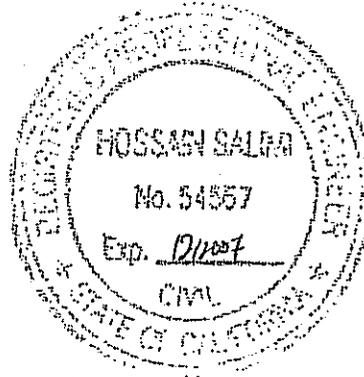
July 27, 2006

Page 4

If you have any questions or need additional information, please call Bill Bertucci at 510-622-8744 or Hossain Salimi at 916-227-7147.

c: TPokrywka, WBertucci, HSalimi, GWilcox, JStayton (4), R.E. Pending File, Route File, Daily File, Translab File

WBertucci/HSalimi/mmm



# FOUNDATION REVIEW

## DIVISION OF ENGINEERING SERVICES GEOTECHNICAL SERVICES

To: Structure Design

Date: 4/15/08

1. Preliminary Report
2. R.E. Pending File
3. Specifications & Estimates
4. File

Schasset St. UC  
Structure Name

**Geotechnical Services**

1. GS (Sacramento)
2. GS

07-2A-005-51.27  
District County Route Post Km

District Project Development  
District Project Engineer

07-121811 53-1111  
E.A. Number Structure Number

Foundation Report By: W. Bertucci

Dated: 7/27/08

Reviewed By: X Chen (OSD)

R. Price (GS)

General Plan Dated: 3/11/08

Foundation Plan Dated: 9/2/07

No changes.  The following changes are necessary.

### FOUNDATION CHECKLIST

- |   |   |  |
|---|---|--|
| <input checked="" type="checkbox"/> Pile Types and Design Loads   | <input checked="" type="checkbox"/> Footing Elevations, Design Loads, and Locations | <input checked="" type="checkbox"/> LOTB's                         |
| <input checked="" type="checkbox"/> Pile Lengths  | <input checked="" type="checkbox"/> Seismic Data                                    | <input checked="" type="checkbox"/> Fill Surcharge                 |
| <input checked="" type="checkbox"/> Predrilling   | <input checked="" type="checkbox"/> Location of Adjacent Structures and Utilities   | <input checked="" type="checkbox"/> Approach Paving Slabs          |
| <input checked="" type="checkbox"/> Pile Load Test  | <input checked="" type="checkbox"/> Stability of Cuts or Fills                      | <input checked="" type="checkbox"/> Scour                          |
| <input checked="" type="checkbox"/> Substitution of H Piles For   | <input checked="" type="checkbox"/> Fill Time Delay                                 | <input checked="" type="checkbox"/> Ground Water                   |
| <input checked="" type="checkbox"/> Concrete Piles <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> Effect of Fills on Abutments and Bents          | <input checked="" type="checkbox"/> Tremie Seals/Type D Excavation |

[Signature]  
Office of Structure Design

Branch 6  
Branch No.

[Signature]  
Geotechnical Services

*Original File*

## Memorandum

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To: MR. FRITZ HOFFMAN, CHIEF  
Bridge Design Branch 6  
Office of Bridge Design West  
Structure Design  
Division of Engineering Services MS 9 3/3G

Date: July 27, 2006

Attention: Ms. Xiaodong Chen

File: 07-LA-05-KP 52.06  
07-121801  
I-5 HOV Lane Widening Project  
Hollywood Way UC (Widening)  
Bridge No. 53- 1112 L

From: WILLIAM BERTUCCI *WB*  
Associate Engineering Geologist  
Office of Geotechnical Design – West  
Geotechnical Services  
Division of Engineering Services

HOSSAIN SALIMI  
Senior Materials and Research Engineer  
Office of Geotechnical Design - West  
Geotechnical Services  
Division of Engineering Services

Subject: Final Foundation Design Recommendations

### INTRODUCTION

This final foundation recommendation memorandum is provided in response to your request (January 27, 2005) for the proposed widening of Route 5 (I-5) Hollywood Way Under-Crossing (UC) Bridge located west of the city of Burbank in Los Angeles County.

According to the request, Hollywood Way UC is one in a series of 13 planned bridge widening and/or replacement projects along I-5 between KP 43.0 and KP 58.0. The project scope for this bridge includes median barrier upgrade and southbound lanes widening. The existing bridge was completed in 1961.

Caltrans Office of Geotechnical Design-West, and URS Corporation performed a combined foundation investigation that included 47 borings for the 13-bridge project, which commenced in July 2005 and was completed in November 2005. At the Hollywood Way UC, three borings were drilled to a maximum depth of 26.4m (elevation 200.4 m). The Logs of Test Boring (LOTB) from the 1958 original foundation investigation, and the 1961 As-Built Plans were reviewed.

MR. F. HOFFMAN

Attn: X. Chen

July 27, 2006

Page 2

## **GEOLOGY**

The bridge site, located at the eastern San Fernando Valley is situated on a relatively gentle west sloping alluvial fan, which was formed from the coalescing deposition of several streams that originated in the nearby Verdugo Mountains. The valley outlines an east trending sediment filled structural basin within the Transverse Ranges. Generally, the sediments within the basin consist of unconsolidated poorly stratified flood plain, streambed, and alluvial fan deposits. At depth, these deposits become more consolidated and interbedded with marine deposits.

The geology at the bridge includes an approximately seven-meter high existing embankment fill underlain by alluvium to the maximum explored depth of 39.4 m (Elevation 187.2 m). The fill appears to be composed of relatively dense mixture of sand with gravel. Although not directly investigated, the embankment was constructed at about the same time as the Sun Valley overhead (Bridge No. 53-1134L) embankment fill, which was investigated. The soils at both bridges seem to compare with respect to composition and support performance. The fill material supports existing abutment wing walls, and will support the wing walls of the proposed abutment extensions.

Based on the latest LOTBs, the proposed Abutment 1 extension pile cap will be underlain by native cohesionless medium dense sand that includes some gravel. At proposed Bent 2 and Abutment 3 extension, the soils are compositionally similar to Abutment 1, but are generally denser. See the LOTB Attachment for detailed soil descriptions.

## **GROUNDWATER**

Historically, groundwater measurements, (Liquefaction zones in the Burbank 7.5 Quadrangle, LA County, California, OFR88-07) indicate groundwater has reached to about 27 meters of the ground surface at the bridge site. Groundwater was not encountered during our soils investigation.

## **SCOUR**

The bridge does not cross over a body of water. Therefore, scour potential is not a design issue.

MR. F. HOFFMAN

Attn: X. Chen

July 27, 2006

Page 3

## **CORROSIVITY**

The site is considered non-corrosive based on soil corrosion tests conducted from samples taken during the field investigation.

## **SEISMICITY/LIQUEFACTION POTENTIAL**

Hossain Salimi from the Office of Geotechnical Design-West submitted the Final Seismic Design Recommendations to you in a report dated May 23, 2006.

## **FOUNDATION RECOMMENDATIONS**

The final foundation recommendations are based on the General Plan (May 9, 2005), the foundation loads provided by Xiaodong Chen and observed subsurface soil conditions. Open-ended Class 400 Alt. "W" piles are recommended to support the left bridge exterior widening at the abutments 1 & 3, and open-ended Class 625 piles at Bent 2. Cast-in-Drilled-Hole piles are not recommended because the soils underlying the site are predominantly granular and caving during drilling may occur. Displacement type driven pre-cast concrete piles are also not recommended because of the potential for vibration-induced damage to the existing bridge. The pile specifications including pile tip elevations are presented in Table 1.

The calculations for pile tip elevations utilized the Federal Highway Administration's Manual on Design and Construction and Driven pile software program (U.S. Department of Transportation, 1998). The designer shall determine the design tip elevations for lateral load demands.

Table 1  
 Pile Data Table

Location	Pile Type	Design Loading (kN)	Nominal Resistance		Bottom of Footing Elev. (m)	Design Tip Elev. (m)	Specified Tip Elev. (m)
			Compression (kN)	Tension (kN)			
Abutment 1	360mm Class 400, Alt "W"	350	700	N.A.	225.6	213.7 (a)	213.7
Bent 2	406mm Class 625, Alt "W"	N.A.	1800	N.A.	225.5	213.0 (a)	213.0
Abutment 3	360mm Class 400, Alt "W"	350	700	N.A.	225.6	213.7 (a)	213.7

Notes: Pile tip elevations are controlled by (a) Compression

### CONSTRUCTION CONSIDERATIONS

1. Shoring may be necessary to facilitate safe pile cap construction.
2. Due to the proximity of the adjacent existing bridge structure, vibration monitoring during pile driving is recommended.
3. Hard driving or refusal is not anticipated at this site. Should this happen, the Office of Geotechnical Design West shall be contacted before employing any assistance in installation techniques or cutting off of piles.

MR. F. HOFFMAN

Attn: X. Chen

July 27, 2006

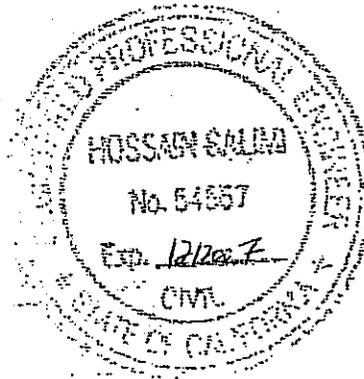
Page 5

4. The Contractor shall provide a driving system submittal including drivability analysis for approval prior to the installation of piles.

If you have any questions or need additional information, please call Bill Bertucci at 510-622-8744 or Hossain Salimi at 916-227-7147.

c: TPokrywka, WBertucci, HSalimi, GWilcox, JStayton (4), R.E. Pending File, Route File, Daily File, Translab File

WBertucci/HSalimi/mm



# Memorandum

*Flex your power!  
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To: MR. FRITZ HOFFMAN, CHIEF  
Bridge Design Branch 6  
Office of Bridge Design West  
Structure Design  
Division of Engineering Services MS 9 3/3G

Date: November 30, 2007

Attention: Ms. Xiaodong Chen

File: 07-LA-05-KP 52.06 (PM 32.3)  
07-121801  
I-5 HOV Lane Widening Project  
Hollywood Way UC (Widening)  
Bridge No. 53- 1112 L

From:

  
WILLIAM BERTUCCI  
Associate Engineering Geologist  
Office of Geotechnical Design – North  
Geotechnical Services  
Division of Engineering Services

  
JOHN HUANG  
Senior Materials and Research Engineer  
Office of Geotechnical Design - North  
Geotechnical Services  
Division of Engineering Services

Subject: Revised Final Foundation Recommendations (Revises the FFR dated July 27, 2006)

## INTRODUCTION

This revised final foundation recommendation memorandum is provided in response to a change in pile load at Bent 2 for the proposed widening of Route 5 (I-5) Hollywood Way Under-Crossing (UC) Bridge located west of Burbank in Los Angeles County. The load revision was provided by Marc Friedman (E-mail dated November 29, 2007). According to the original request, Hollywood Way UC is one in a series of 13 planned bridge widening and/or replacement projects along I-5 between KP 43.0 and KP 58.0. The project scope of work of this bridge includes median barrier upgrade and southbound lanes widening. The existing bridge was completed in 1961.

Caltrans Office of Geotechnical Design West and URS Corporation performed a combined foundation design investigation that included 47 borings for the 13-bridge project commencing in July 2005 completed in November 2005. At the Hollywood Way UC three borings were drilled. The maximum depth of these borings was 26.4m (elevation 200.4m). The Log of Test Boring logs from the 1958 original foundation

MR. HOFFMAN  
Attn: X. Chen  
November 30, 2007  
Page 2

investigation, and the 1961 As-Built Plans were reviewed.

## **GEOLOGY**

The bridge site, located in the eastern San Fernando Valley is situated on a relatively gentle west sloping alluvium apron that formed from the coalescing deposition of several streams that originated in the nearby Verdugo Mountains. The valley outlines an east trending sediment filled structural basin within the Transverse Ranges. Generally, the sediments within the basin consist of unconsolidated poorly stratified flood plain, streambed and alluvial fan deposits, at depth they become more consolidated and interbedded with marine deposits.

Soils at the bridge include an approximately seven-meter high existing embankment fill underlain by alluvium to the maximum depth explored 39.4 m (Elevation 187.2 m). The fill soils appear to be composed of relatively dense mixture of sand with gravel and although not directly investigated the embankment was constructed at about the same time as the Sun Valley embankment fill that was investigated. The soils at both bridges seem to compare with respect to composition and support performance. The fill soils supports existing abutment wing walls and will support the wing walls of the proposed abutment extensions.

Based on the current Log of Test Borings, the proposed abutment 1 extension pile cap will be underlain by native cohesionless medium dense sand that includes some gravel. At proposed Bent 2 and Abutment 3 extension the soils are compositionally similar to abutment 1 but they are generally denser. See Log of Test Borings (LOTB) Attachment for detailed soil descriptions.

## **GROUNDWATER**

Historically, high groundwater depths reported at the bridge site, (Liquefaction Zones in the Burbank 7.5 Quadrangle, LA County, California, OFR88-07) indicates groundwater has reached to within about 27 meters of the ground surface at the bridge site.

Groundwater was not encountered during our soils investigation.

MR. HOFFMAN  
Attn: X. Chen  
November 30, 2007  
Page 3

## **SCOUR**

The bridge does not cross over a body of water; therefore scour potential is not a design issue.

## **CORROSIVITY**

The site is considered non-corrosive based on soil corrosion tests conducted for the proposed bridge.

## **SEISMICITY/LIQUEFACTION POTENTIAL**

Hossain Salimi provided the seismic Design Recommendations.

## **FOUNDATION RECOMMENDATIONS**

The final foundation recommendations are based on the General Plan (May 9, 2005), revised load provided November 29, 2007 and the foundation loads provided by Xiaodong Chen and observed subsurface soil conditions. Open-ended Class 400 Alt. "W" piles are recommended to support the left bridge exterior widening at the abutments 1 & 3, and open-ended Class 625 Alt. "W" piles (Revised) at Bent 2. Cast-in-drilled-hole piles are not recommended because the soils underlying the site are predominantly granular and caving during drilling may occur. Displacement type driven pre-cast concrete piles are also not recommended because of the potential for vibration-induced damage to the existing bridge. The pile specifications including pile tip elevations are presented in Table 1.

Calculations for pile tip elevations utilized the Federal Highway Administration's Manual on Design and Construction and Driven pile software program (U.S. Department of Transportation, 1998). The designer determines the design tip elevations for lateral load demand.

Table 1 Pile Data Table

Location	Pile Type	Design Loading (kN)	Nominal Resistance		Bottom of Footing Elev. (m)	Design Tip Elev. (m)	Specified Tip Elev. (m)
			Compression (kN)	Tension (kN)			
Abutment 1	360mm Class 400, Alt "W"	350	700	0	225.6	213.7 (a)	213.7
Bent 2	360mm Class 625, Alt "W"	N/A	1040	590	225.5	213.2 (a) 214.9 (b)	213.2
Abutment 3	360mm Class 400, Alt "W"	350	700	0	225.6	213.7 (a)	213.7

Notes: Pile tip elevations are controlled by (a) Compression (b) Tension

### CONSTRUCTION CONSIDERATIONS

1. Shoring may be necessary to facilitate safe pile cap construction.
2. Due to the proximity of an adjacent existing bridge structure, vibration monitoring during pile driving is recommended even though vibration is less concerned for pipe piles.
3. Hard driving or refusal is not anticipated at this site. Should this happen, Office of Geotechnical Design West should be contacted before employing any assisting installation techniques or cutting off.

MR. HOFFMAN

Attn: X. Chen

November 30, 2007

Page 5

4. The Contractor shall provide a driving system submittal including drivability analysis for approval prior to installing the piles.

If you have any questions or need additional information, please call Bill Bertucci at 916-203-9772 or John Huang at 916-227-1037.

c: RBibbens, TPokrywka, HSalimi, JStayton, R.E. Pending, GDN File, GS File Room

WBertucci/JHuang/HSalimi/mm



# Memorandum

*Flex your power!  
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To: MR. FRITZ HOFFMAN, CHIEF  
Bridge Design Branch 6  
Office of Bridge Design West  
Structure Design  
Division of Engineering Services MS 9 3/3G

Date: April 5, 2008

Attention: Ms. Xiaodong Chen

File: 07-LA-05-KP 52.06 (PM 32.3)  
07-121801  
I-5 HOV Lane Widening Project  
Hollywood Way UC (Widening)  
Bridge No. 53- 1112 L

Subject: Update to Revised Final Foundation Recommendations dated November 30, 2008<sup>7</sup>

## INTRODUCTION

This updated revised final foundation recommendation memorandum is provided in response to your request (E-mail dated February 26, 2008) to include the allowance for other foundations alternatives at Bent 2. The referenced report recommended Class 400 Alt. "W" piles, however, because of the recognition of low-head room pile driving conditions at some proposed pile locations the Contractor should have some viable foundation options. Driven piles are still feasible although for the affected piles the number of welded pile sections would increase. Foundation recommendations for the bridge abutments remain unchanged. For completeness the abutment foundation recommendations are included herein.

## FOUNDATION RECOMMENDATIONS

The final foundation recommendations are based on the General Plan (May 9, 2005), revised load provided November 29, 2007 and the foundation loads provided by Xiaodong Chen and observed subsurface soil conditions.

### Pipe Pile Alternative

Open-ended Class 400 Alt. "W" piles are recommended to support the left bridge exterior widening at the abutments 1 & 3, and open-ended Class 625 Alt. "W" piles (Revised) at

MR. HOFFMAN

Attn: X. Chen

April 5, 2008

Page 2

Bent 2. Cast-in-drilled-hole piles are not recommended because the soils underlying the site are predominantly granular and caving during drilling may occur. Displacement type driven pre-cast concrete piles are also not recommended because of the potential for vibration-induced damage to the existing bridge. The pile specifications including pile tip elevations are presented in Table 1.

Calculations for pile tip elevations utilized the Federal Highway Administration's Manual on Design and Construction and Driven pile software program (U.S. Department of Transportation, 1998). The designer determines the design tip elevations for lateral load demand.

Table 1 Pile Data Table

Location	Pile Type	Design Loading (kN)	Nominal Resistance		Bottom of Footing Elev. (m)	Design Tip Elev. (m)	Specified Tip Elev. (m)
			Compression (kN)	Tension (kN)			
Abutment 1	360mm Class 400, Alt "W"	350	700	0	225.6	213.7 (a)	213.7
Bent 2	360mm Class 625, Alt "W"	N/A	1040	590	225.5	213.2 (a) 214.9 (b)	213.2
Abutment 3	360mm Class 400, Alt "W"	350	700	0	225.6	213.7 (a)	213.7

Notes: Pile tip elevations are controlled by (a) Compression (b) Tension

MR. HOFFMAN

Attn: X. Chen

April 5, 2008

Page 3

Other Foundation Alternatives

At the Contractor's option, the Contractor may propose to substitute alternative piling at Bent 2 for the State designed piling indicated in this report and shown on the plans. In that case the Contractor shall design and construct the alternative piling in compliance with the specifications as presented in Part 10-1 (Alternative Piling) of the Contract Standard Special Provisions.

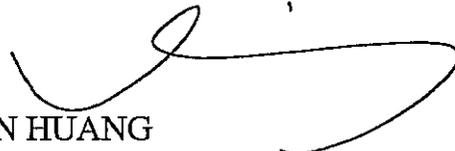
**CONSTRUCTION CONSIDERATIONS**

1. Shoring may be necessary to facilitate safe pile cap construction.
2. Due to the proximity of an adjacent existing bridge structure, vibration monitoring during pile driving is recommended even though vibration is less concerned for pipe piles.
3. Hard driving or refusal is not anticipated at this site. Should this happen, Office of Geotechnical Design West should be contacted before employing any assisting installation techniques or cutting off.
4. The Contractor shall provide a driving system submittal including drivability analysis for approval prior to installing the piles.

If you have any questions or need additional information, please call Bill Bertucci at 916-203-9772 or John Huang at 916-227-1037.

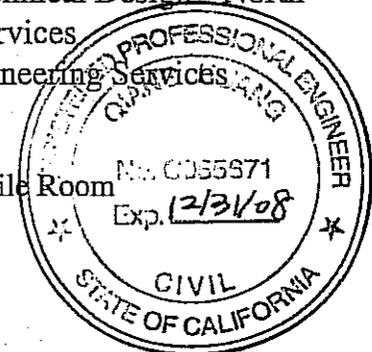


WILLIAM BERTUCCI  
Associate Engineering Geologist  
Office of Geotechnical Design – North  
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JOHN HUANG  
Senior Materials and Research Engineer  
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Geotechnical Services  
Division of Engineering Services

c: RBibbens, TPokrywka, HSalimi, JStayton, R.E. Pending, GDN File, GS File Room



## Memorandum

*Flex your power!  
Be energy efficient!*

To: MR. FRITZ HOFFMAN, CHIEF  
Bridge Design Branch 6  
Office of Bridge Design West  
Structure Design  
Division of Engineering Services MS 9 3/3G

Date: July 30, 2008

Attention: Ms. Xiaodong Chen

File: 07-LA-05-KP 52.06 (PM 32.3)  
07-121801  
I-5 HOV Lane Widening Project  
Hollywood Way UC (Widening)  
Bridge No. 53- 1112 L/R

Subject: Addendum to April 5, 2008 Update to Revised Final Foundation  
Recommendations dated November 30, 200~~8~~7

This Addendum provides adjusted pile tip elevations for Hollywood Way abutments 1 & 3 and Bent 2 (Left and Right Bridges). Changes in pile loads and minor discrepancies in bottom of footing elevations prompted a reevaluation of the foundation design.

The adjusted pile tip elevations are presented in Table 1. All other recommendations in the April 5, 2008 Memorandum remain applicable.

MR. HOFFMAN

Attn: X. Chen

July 30, 2008

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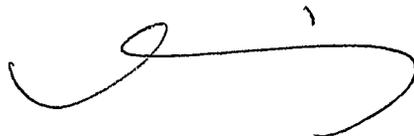
Table 1 Pile Data Table

Location	Pile Type	Design Loading (kN)	Nominal Resistance		Bottom of Footing Elev. (m)	Design Tip Elev. (m)	Specified Tip Elev. (m)
			Compression (kN)	Tension (kN)			
Abutment 1 L/R Bridge	360mm Class 400, Alt "W"	400	800	0	225.5	212.7 (a)	212.7
Bent 2 L/R Bridge	360mm Class 625, Alt "W"	N/A	1250	590	225.2	212.8 (a) 214.0 (b)	212.8
Abutment 3 L/R Bridge	360mm Class 400, Alt "W"	400	800	0	225.5	212.7 (a)	212.7

Notes: Pile tip elevations are controlled by (a) Compression (b) Tension

If you have any questions or need additional information, please call Bill Bertucci at 916-203-9772 or John Huang at 916-227-1037.

  
WILLIAM BERTUCCI  
Associate Engineering Geologist  
Office of Geotechnical Design – North  
Geotechnical Services  
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JOHN HUANG  
Senior Materials and Research Engineer  
Office of Geotechnical Design - North  
Geotechnical Services  
Division of Engineering Services

c: RBibbens, TPokrywka, HSalimi, JStayton, R.E. Pending, GDN File, GS File Room

SOE



# FOUNDATION REVIEW

## DIVISION OF ENGINEERING SERVICES GEOTECHNICAL SERVICES

To: Structure Design

1. Preliminary Report
2. R.E. Pending File
3. Specifications & Estimates
4. File

### Geotechnical Services

1. GS (Sacramento)
2. GS

District Project Development

District Project Engineer

Foundation Report By: W. Bertucci

Reviewed By: X. Chen (OSD)

General Plan Dated: 2/28/08

Date: 4/15/08

Hollywood Way UE  
Structure Name

07-44-005-52.5  
District County Route Post Km

07-121811 53-1112  
E.A. Number Structure Number

Dated: 11/30/07; 4/15/08  
R. Price (GS)

Foundation Plan Dated: 2/28/08

No changes.  The following changes are necessary.

### FOUNDATION CHECKLIST

- |  |   |  |
|--|---|--|
| <input checked="" type="checkbox"/> Pile Types and Design Loads  | <input checked="" type="checkbox"/> Footing Elevations, Design Loads, and Locations | <input checked="" type="checkbox"/> LOTB's                         |
| <input checked="" type="checkbox"/> Pile Lengths   | <input checked="" type="checkbox"/> Seismic Data                                    | <input checked="" type="checkbox"/> Fill Surcharge                 |
| <input checked="" type="checkbox"/> Predrilling  | <input checked="" type="checkbox"/> Location of Adjacent Structures and Utilities   | <input checked="" type="checkbox"/> Approach Paving Slabs          |
| <input checked="" type="checkbox"/> Pile Load Test   | <input checked="" type="checkbox"/> Stability of Cuts or Fills                      | <input checked="" type="checkbox"/> Scour                          |
| <input checked="" type="checkbox"/> Substitution of H Piles For  | <input checked="" type="checkbox"/> Fill Time Delay                                 | <input checked="" type="checkbox"/> Ground Water                   |
| <input checked="" type="checkbox"/> Concrete Piles <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | <input checked="" type="checkbox"/> Effect of Fills on Abutments and Bents          | <input checked="" type="checkbox"/> Tremie Seals/Type D Excavation |

Xiaodong Chen Branch 6  
Office of Structure Design Branch No.

R. Price  
Geotechnical Services

# Memorandum

Original JFB

*Flex your power!  
Be energy efficient!*

To: MR. FRITZ HOFFMAN, CHIEF  
Bridge Design Branch 6  
Office of Bridge Design West  
Structure Design  
Division of Engineering Services MS 9 3/3G

Date: July 27, 2006

Attention: Ms. Xiaodong Chen

File: 07-LA-05-KP 55.65  
07-121801  
I-5 HOV Lane Widening Project  
Sun Valley OH (Widening)  
Bridge No. 53-1134(L)

From: WILLIAM BERTUCCI *WB*  
Associate Engineering Geologist  
Office of Geotechnical Design – West  
Geotechnical Services  
Division of Engineering Services

HOSSAIN SALIMI  
Senior Materials and Research Engineer  
Office of Geotechnical Design - West  
Geotechnical Services  
Division of Engineering Services

Subject: Final Foundation Design Recommendations

## INTRODUCTION

This final foundation recommendation memorandum is provided in response to your request (January 27, 2005) for the proposed widening of Route 5 (I-5) Sun Valley Over Head (OH) Bridge located west of the city of Burbank in Los Angeles County. According to the request, Sun Valley OH is one in a series of 13 planned bridge widening and/or replacement projects along I-5 between KP 43.0 and KP 58.0. The project scope of work of this bridge includes median barrier upgrade and left bridge (southbound lanes) widening. The existing bridge was completed in 1961.

Caltrans Office of Geotechnical Design-West, and URS Corporation performed a combined foundation design investigation that included 47 borings for the 13-bridge project, which commenced in July 2005, and was completed in November 2005. Four new borings were drilled at the site. The original Caltrans foundation Investigation report (1958) and Bridge foundations – Seismic Retrofit, (SR 650) Memorandums by Taber (1995 and 1996) were also reviewed.

MR. F. HOFFMAN

Attn: X. Chen

July 27, 2006

Page 2

## **GEOLOGY**

The bridge site, located in the eastern San Fernando Valley is situated on a relatively gentle west sloping alluvial fan, which was formed from the coalescing deposition of several streams that originated in the nearby Verdugo Mountains. The valley outlines an east trending sediment filled structural basin within the Transverse Ranges. Generally, the sediments within the basin consist of unconsolidated poorly stratified flood plain, streambed, and alluvial fan deposits. At depth, these deposits become more consolidated and interbedded with marine deposits.

The geology at the bridge includes an approximately six-meter high existing embankment fill underlain by alluvium to the maximum explored depth of 23.5 m (Elevation 192.7 m). The fill appears to be composed of relatively dense mixture of sand with gravel. The fill deposits supports existing abutment wing walls, and will support the wing walls of the proposed abutment extensions

Based on the current Log of Test Borings (LOTB), the proposed abutment extensions from elevations 211 m to 214 m are underlain by native cohesionless loose to medium dense sand that includes some gravel. Below that, the soils are similar to above and become dense to very dense with the increased depth. See LOTB Attachment for detailed soil descriptions.

## **GROUNDWATER**

Historically, groundwater measurements, (Liquefaction Zones in the Burbank 7.5 Quadrangle, LA County, California, OFR88-07) indicate groundwater has reached to about 27 meters of the ground surface at the bridge site. Groundwater was not encountered during our soils investigation.

## **SCOUR**

The bridge does not cross over a body of water. Therefore, scour potential is not a design issue.

MR. F. HOFFMAN

Attn: X. Chen

July 27, 2006

Page 3

## **CORROSIVITY**

The site is considered non-corrosive based on soil corrosion tests conducted from samples taken during the field investigation.

## **SEISMICITY/LIQUEFACTION POTENTIAL**

Hossain Salimi from the Office of Geotechnical Design – West submitted the Final Seismic Design Recommendation in a report dated May 23, 2006.

## **FOUNDATION RECOMMENDATIONS**

According to the General Plan (March 14, 2006), provided by Xiaodong Chen, the existing abutment and wing walls are supported on spread footings. To maintain uniformity in design and performance, spread footings are recommended for the proposed abutment extensions and the new wing walls. These plans also indicate the existing and proposed footing grades will be the same. Spread footings for the wing walls will be founded in embankment fill while the abutments will be founded in native soils.

Based on our field investigation and engineering analysis, we recommend that a presumptive value of 144 kPa (1.5 tsf) allowable bearing capacity be used for the footings at the wing walls, and a value of 239 kPa (2.5 tsf) allowable bearing capacity be used at the abutment foundations. A factor of safety of 3 was used to determine the allowable bearing capacity.

Settlement under design load is anticipated to be less than 25 mm (1 inch) and differential settlement less than 12.5 mm (0.5 inch).

To insure adequate performance of the foundations, the underlying soils should have a relative compaction of 95 percent. If the soils do not meet this criterion, then reworking the material including moisture conditioning and compaction in accordance to Standard Specifications Earthwork Section 19-2.06 shall be required. The depth and lateral extent of the soil rework shall be determined during construction by the Engineer of Record or his/her representative.

1 tsf = 95.76 kPa

MR. F. HOFFMAN

Attn: X. Chen

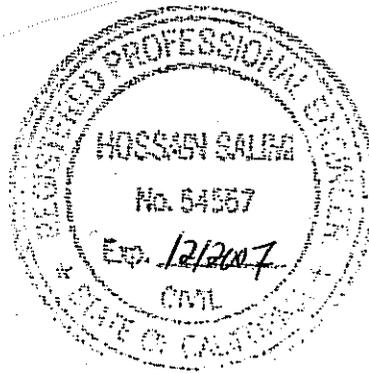
July 27, 2006

Page 4

If you have any questions or need additional information, please call Bill Bertucci at 510-622-8744 or Hossain Salimi at 916-227-7147.

c: TPokrywka, WBertucci, HSalimi, GWilcox, JStayton (4), R.E. Pending File, Route File, Translab File

WBertucci/HSalimi/mm



## Memorandum

*Flex your power!  
Be energy efficient!*

**To:** MR. FRITZ HOFFMAN, CHIEF  
Bridge Design Branch 6  
Office of Bridge Design West  
Structure Design  
Division of Engineering Services MS 9 3/3G

**Date:** April 1, 2008

**Attention:** Ms. Xiaodong Chen

**File:** 07-LA-05-KP 55.65  
07-121801  
I-5 HOV Lane  
Widening Project  
Sun Valley OH  
(Widening)  
Bridge No. 53- 1134

**Subject:** Revised Additional Final Foundation Design Recommendations – Bents 2 and 5  
(Revises Final Foundation Design Recommendations, dated July 27, 2006)

### INTRODUCTION

The revised additional foundation recommendation memorandum is provided in response to your request for the proposed widening of Route 5 (I-5) Sun Valley Over Head (OH) Bridge located north of the city of Burbank in Los Angeles County. The additional recommendations include Pile foundations at Bents 2 and 5, and the allowance for use of other foundation alternative types that will be covered in the Contract Standard Special Provisions. All other recommendations provided in the July 27, 2006 foundation remain applicable.

**FOUNDATION RECOMMENDATIONS**

The revised additional foundation recommendations provided below are based on the General Plan 1 (dated January 17, 2007), Foundation Plan(s) 1 & 2 (dated June 29 & September 19, 2006).

Pile foundation Alternative

Open-ended Class 900 Alt. "W" piles to support the left bridge widening at Bents 2 and 5 are considered feasible from a Geotechnical point of view. The pile specifications are presented in Table 1 below.

Table 1 – Pile Data

Location	Pile Type	Design Loading (kN)	Nominal Resistance		Bottom of Footing Elev. (m)	(1) Design Tip Elev. (m)	Specified Tip Elev. (m)
			Compression (kN)	Tension (kN)			
Bent 2	406 mm Class 900, Alt "W"	N/A	1500	0	256.8	246.3	246.3
Bent 5	406 mm Class 900, Alt "W"	N/A	1500	0	257.1	246.9	246.9

Notes: Pile tip elevations are controlled by (1) Compression

MR. F. HOFFMAN

Attn: X. Chen

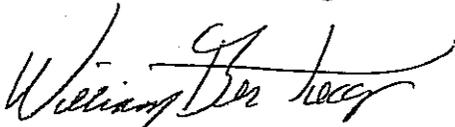
April 1, 2008

Page 3

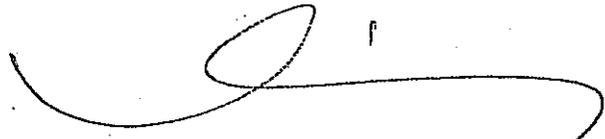
Other Foundation Alternatives

At the Contractor's option, the Contractor may propose to substitute alternative piling for the State designed piling indicated in this report and shown on the plans. In that case the Contractor shall design and construct the alternative piling in compliance with the specifications as presented in Part 10-1 (Alternative Piling) of the Contract Standard Special Provisions.

If you have any questions or need additional information, please call Bill Bertucci at 916-227-1045 or John Huang at 916-227-1037.



WILLIAM BERTUCCI  
Associate Engineering Geologist  
Office of Geotechnical Design – North  
Geotechnical Services  
Division of Engineering Services



JOHN HUANG  
Senior Materials and Research Engineer  
Office of Geotechnical Design - North  
Geotechnical Services  
Division of Engineering Services

c: JStayton (4), R.E. Pending File,



## Memorandum

*Flex your power!  
Be energy efficient!*

To: MR. FRITZ HOFFMAN, CHIEF  
Bridge Design Branch 6  
Office of Bridge Design West  
Structure Design  
Division of Engineering Services MS 9 3/3G

Date: August 11, 2008

Attention: Ms. Xiaodong Chen

File: 07-LA-05-KP 52.06 (PM 32.3)  
07-121801  
I-5 HOV Lane Widening Project  
Sun Valley OH  
Bridge No. 53- 1134

Subject: Addendum to April 1, 2008 Revised Additional Final Foundation –Bent 2 and Bent 5

This Addendum provides new pile tip elevations for Sun Valley OH Bents 2 & 5. Changes in pile loads provided by Xiaodong Chen on July 30, 2008 by e-mail prompted a reevaluation of the foundation design.

The new pile tip elevations are presented in the Table below. All other recommendations in the April 1, 2008 Memorandum remain applicable.

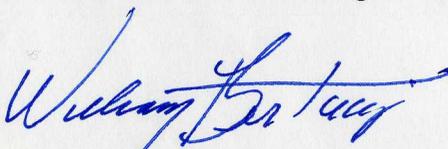
MR. HOFFMAN  
 Attn: X. Chen  
 August 11, 2008  
 Page 2

Table - Pile Data Table

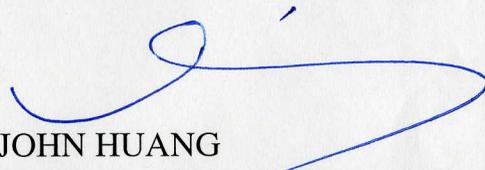
Location	Pile Type	Design Loading (kN)	Nominal Resistance		Bottom of Footing Elev. (m)	Design Tip Elev. (m)	Specified Tip Elev. (m)
			Compression (kN)	Tension (kN)			
Bent 2 Left	406 mm Class 900, Alt "W"	N/A	1700	200	256.8	245.7 (a) 247.6 (b)	<b>245.7</b>
Bent 5 Left	406 mm Class 900, Alt "W"	N/A	1700	200	257.1	246.3 (a) 247.2 (b)	<b>246.3</b>

Notes: Pile tip elevations are controlled by (a) Compression (b) Tension

If you have any questions or need additional information, please call Bill Bertucci at 916-203-9772 or John Huang at 916-227-1037.



WILLIAM BERTUCCI  
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JOHN HUANG  
 Senior Materials and Research Engineer  
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 Geotechnical Services  
 Division of Engineering Services

c: RBibbens, TPokrywka, HSalimi, JStayton, R.E. Pending, GDN File, GS File Room



# FOUNDATION REVIEW

## DIVISION OF ENGINEERING SERVICES GEOTECHNICAL SERVICES

To: Structure Design

Date: 4/15/08

1. Preliminary Report
2. R.E. Pending File
3. Specifications & Estimates
4. File

Sun Valley Off  
Structure Name

**Geotechnical Services**

1. GS (Sacramento)
2. GS

07 - LA - 005 - 55.6  
District County Route Post Km

District Project Development  
District Project Engineer

07-12/841 53-1134  
E.A. Number Structure Number

Foundation Report By: W. Bertucci

Dated: 7/27/06 4/1/08

Reviewed By: X. Chen (OSD)

R. Price (GS)

General Plan Dated: 2/26/08

Foundation Plan Dated: 9/19/07

No changes.  The following changes are necessary.

It is anticipated that hard driving will be encountered. If drilling to assist driving (Standard Spec 49 - 1.05) is used, it should be limited to 3m above specified tip.

### FOUNDATION CHECKLIST

- |   |   |  |
|---|---|--|
| <input checked="" type="checkbox"/> Pile Types and Design Loads<br><input checked="" type="checkbox"/> Pile Lengths<br><input checked="" type="checkbox"/> Predrilling<br><input checked="" type="checkbox"/> Pile Load Test<br><input checked="" type="checkbox"/> Substitution of H Piles For<br><input checked="" type="checkbox"/> Concrete Piles <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> Footing Elevations, Design Loads, and Locations<br><input checked="" type="checkbox"/> Seismic Data<br><input checked="" type="checkbox"/> Location of Adjacent Structures and Utilities<br><input checked="" type="checkbox"/> Stability of Cuts or Fills<br><input checked="" type="checkbox"/> Fill Time Delay<br><input checked="" type="checkbox"/> Effect of Fills on Abutments and Bents | <input checked="" type="checkbox"/> LOTB's<br><input checked="" type="checkbox"/> Fill Surcharge<br><input checked="" type="checkbox"/> Approach Paving Slabs<br><input checked="" type="checkbox"/> Scour<br><input checked="" type="checkbox"/> Ground Water<br><input checked="" type="checkbox"/> Tremie Seals/Type D Excavation |
|---|---|--|

X. Chen Branch 6  
Office of Structure Design Branch No.

R. Price  
Geotechnical Services