



April 6, 2006

TO: Rosario Revilla/Adam Brown
Northwest Region, MS NB 82-75

FROM: T. M. Allen/M. A. Frye
E&EP Geotechnical Division, 47365

SUBJECT: SR-90, MP 6.22 to 7.24, XL2862
Two Way Transit & HOV Operations, Stage 1
Retaining Wall 14
Supplemental Geotechnical Recommendations

Introduction

This memorandum presents supplemental geotechnical recommendations for the design of Retaining Wall 14. Our January 18, 2006 memorandum provided recommendations for using Standard Plan concrete cantilever or structural earth walls for Wall 14. Construction of a Standard Plan concrete cantilever wall or a structural earth wall would require structural shoring to maintain traffic on eastbound I90. We understand use of a soldier pile wall will eliminate the need for structural shoring. The recommendations below supplement our January 18, 2006 memorandum titled, *SR90, MP 6.22 to 7.24, XL2423, Two Way Transit & HOV Operations, Stage 1, Retaining Walls 14, 27, 28, 29, and 31, Geotechnical Recommendations*.

Geotechnical Recommendations

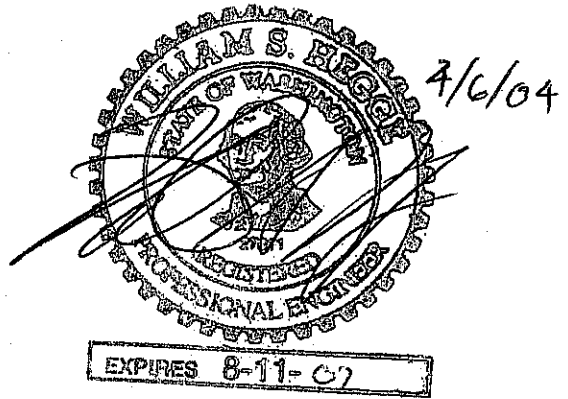
Earth pressure diagrams for design of Wall 14 are provided on Figures 1 and 2. We recommend a resistance factor of 0.75 be used for the passive earth pressure. The traffic surcharge load should be applied where the vehicular load is within a distance equal to one-half the wall height behind the back of the wall in accordance with Section 3.11.6.4 of the 2005 *AASHTO LRFD Bridge Design Specifications*.

Construction Considerations

Groundwater may be encountered during shaft excavation for the soldier piles. The Contractor may need to use temporary casing or slurry to maintain sidewall stability. In the very dense, glacially consolidated soils, difficult drilling should be expected.

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If you have questions or require further information, please contact Tony Allen at (360)
709-5450 or Mark Frye at (360) 709-5469.



Prepared By:
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Geotechnical Designer

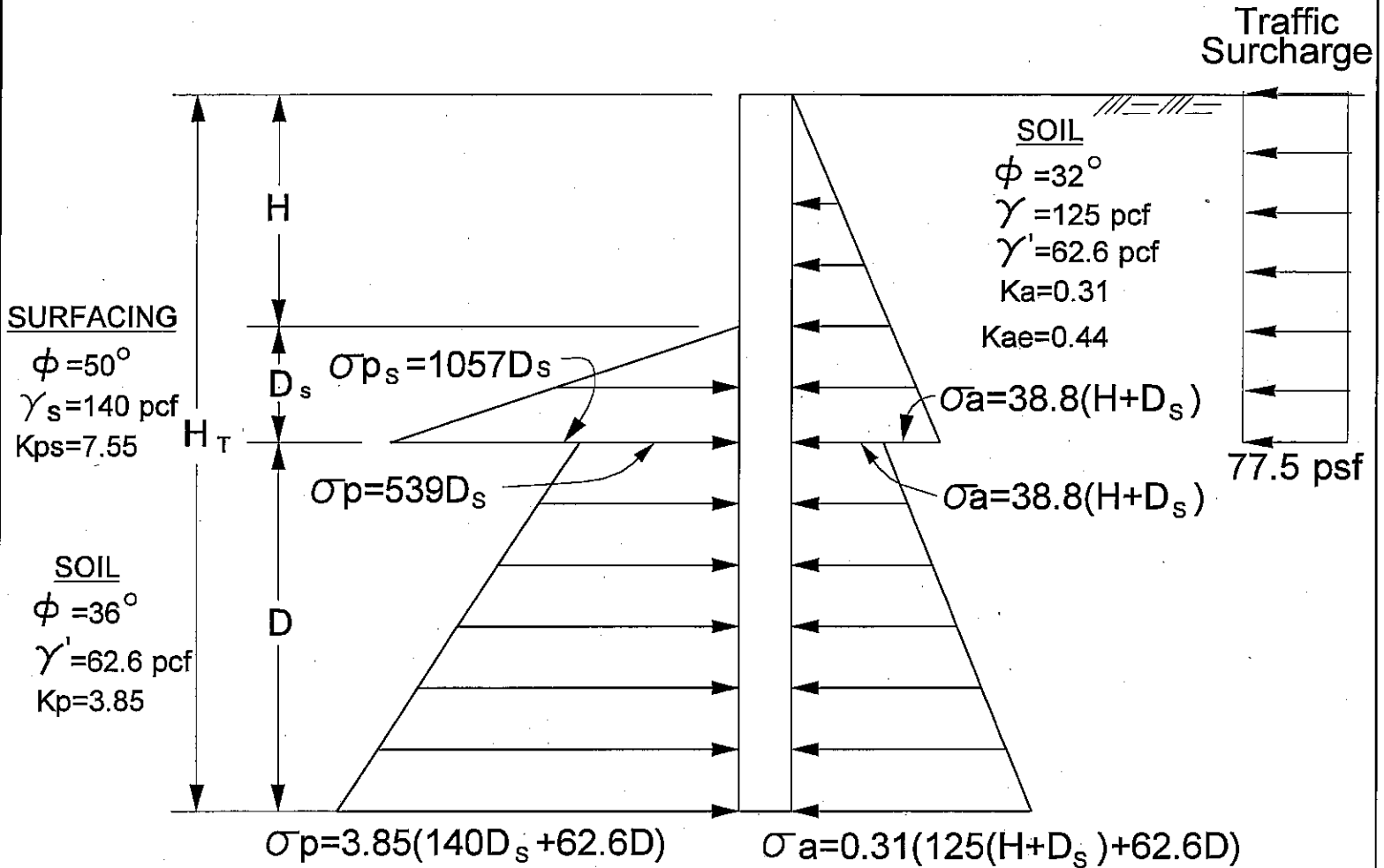
Reviewed By:
William S. Hegge
Senior Foundation Engineer

Agency Approval Authority:
Tony M. Allen
State Geotechnical Engineer

TMA/maf
Attachment: Figures

cc: Chris Johnson, Northwest Region Materials Engineer, MS NB 82-29
Munindra Talukdar, Bridge and Structures Office, MS 47340
Theresa D. McAuliffe, HNTB Corporation

Strength Limit State




NOTES

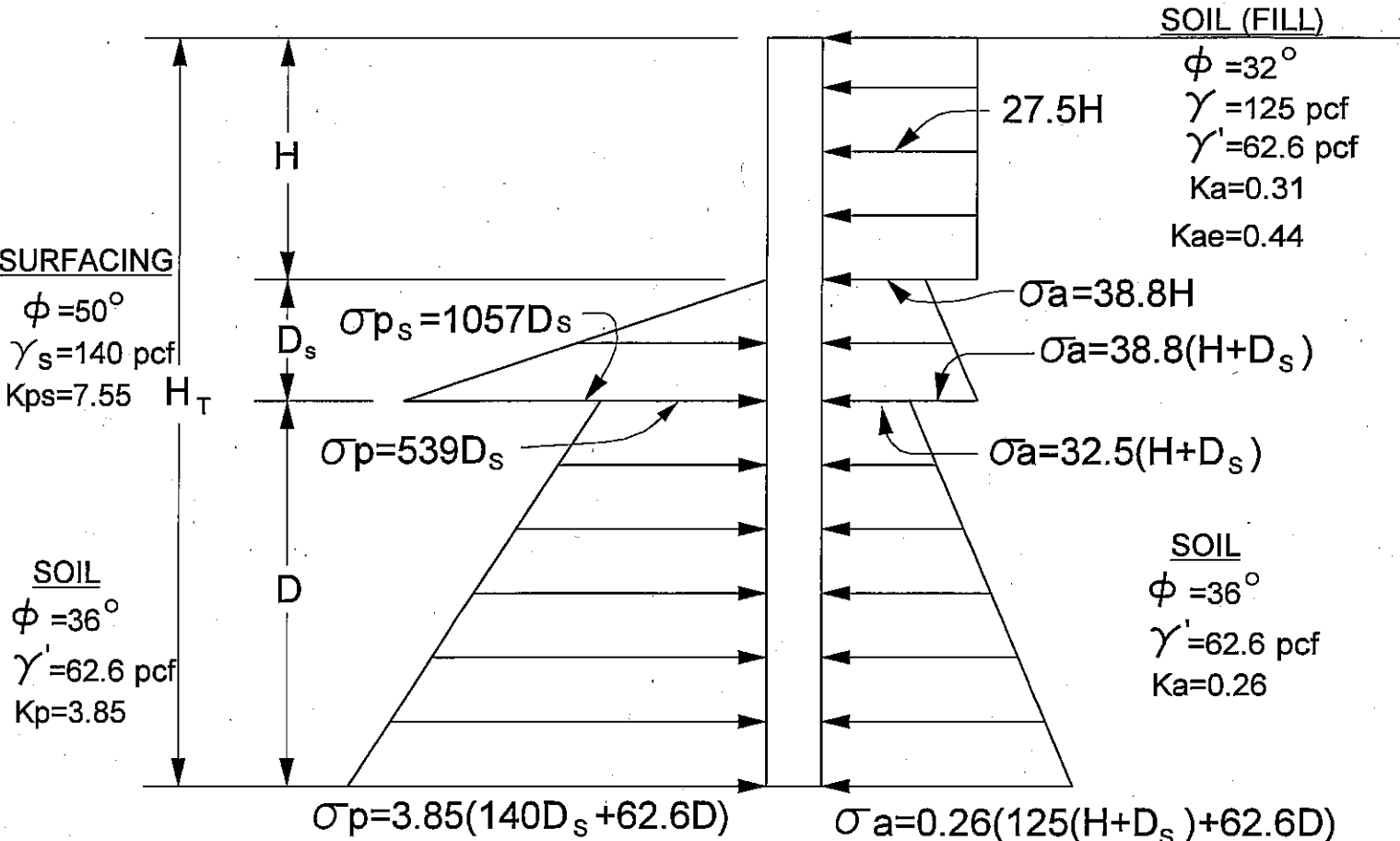
- ① If the wall is backfilled prior to construction of the roadway surfacing, the temporary construction stage where $D_s = 0$ should be evaluated.
- ② All pressures in psf.
- ③ D_s is the total depth of roadway surfacing including Portland Cement Concrete Pavement, Hot mix Asphalt Pavement, and Crushed Surfacing Base Course.
- ④ Passive pressures shown are unfactored.
- ⑤ Passive pressures should be applied over 3 pile diameters below the lagging.
- ⑥ Active pressures shown should be applied over 1 pile diameter below the lagging.

Figure 1: Earth Pressure Diagram

Wall 14

JOB XL-2862 S.R. 90 C.S. LAYOUT	
I-90 Two Way Transit & HOV Operations	
 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION MATERIALS BRANCH T. E. BAKER MATERIALS ENGINEER	DATE 10/2005 SCALE NOT VERT. TO HORIZ. SCALE SHEET OF DRAWN BY DWG


Extreme Limit State



NOTES

- ① The temporary construction stage where $D_s = 0$ should be evaluated.
- ② All pressures in psf.
- ③ D_s is the total depth of roadway surfacing including Portland Cement Concrete Pavement, Hot mix Asphalt Pavement, and Crushed Surfacing Base Course.
- ④ Passive pressures shown are unfactored.
- ⑤ Passive pressures should be applied over 3 pile diameters below the lagging.
- ⑥ Active pressures shown should be applied over 1 pile diameter below the lagging.

Figure 2: Earth Pressure Diagram
Wall 14

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