

Memorandum

TO: All Design Section Staff
 FROM: Bijan Khaleghi
 DATE: August 4, 2008
 SUBJECT: Wall Type Design and Stamping/Signing Responsibilities for Special Design Retaining Walls

This design memorandum is to provide guidance on the design specification requirements, stamping and signing responsibilities for retaining walls, noise walls and moment slabs. This design memorandum supersedes the design memorandum issued on February 28, 2007.

The Design Manual has a flow chart for Retaining Wall Design Process (see Figures 1130-4a and 1130-4b). This flow chart applies to all wall types for determining if the Bridge and Structures Office prepares the PS&E. In situations where it will be more efficient for the Bridge and Structures Office to prepare the PS&E, such as standard retaining walls adjacent to either special design walls or bridges, a request can be submitted from the Region Design Office to the Bridge and Structures Office. All PS&E prepared by the Bridge and Structures Office shall be stamped and signed in accordance with the Memorandum dated June 4th, 2008.

Structural details designed by the HQ Geotechnical Division shall be included in the wall plan set as a self contained sheet(s). These sheets will include all information provided by the geotechnical engineer, the names of the engineers who provided this information and the name of the detailer from the Bridge & Structures Office (who prepared the sheet) in the title block, and the stamps of the geotechnical engineers or supervisors involved. These sheets will be numbered and included with the other wall plan sheets provided by the Bridge & Structures Office.

All retaining walls shall include seismic design load combinations. The design acceleration for retaining walls shall be determined in accordance with the AASHTO Guide Specifications for LRFD Seismic Bridge Design. Once the design acceleration is determined, the designer shall follow the applicable design specification requirements listed below:

Wall Types	Design Specifications
Soldier Pile Walls With & Without Tie-Backs	<p>Cantilever soldier pile walls shall be designed to the AASHTO LRFD Bridge Design Specification 4th Edition 2007 & Interims.</p> <p>Soldier Piles with Tie-backs shall be designed to the AASHTO LRFD Bridge Design Specification 4th Edition 2007 & Interims along with the FHWA Geotechnical Engineering Circular No. 4, "Ground Anchors and</p>

	<p>Anchored Systems” – 1999.</p> <p>Fascia shall be designed to the AASHTO LRFD Bridge Design Specification - 2007 & Interims.</p> <p>Lagging shall be designed per the WSDOT Bridge Memorandum 5/16/07.</p>
<p>Pre-Approved Proprietary Walls including: (Structural Earth Walls, Crib Walls, Bin Walls, Precast Cantilever Walls, Etc.)</p>	<p>These walls are designed per Appendix 15-A of the GDM which is based on the AASHTO Standard Specifications - 17th Edition.</p> <p>Current pre-approval for wall systems will expire on June 30, 2009. After this date, all proprietary walls will be designed to the AASHTO LRFD Bridge Design Specification 4th Edition 2007 & Interims</p>
<p>Special Design Proprietary Walls</p>	<p>These walls shall be designed to the AASHTO LRFD Bridge Design Specifications 4th Edition 2007 & Interims and Appendix 15 of the GDM.</p>
<p>Standard Plan Geosynthetic Walls (Geosynthetic Wrapped Face Walls)</p>	<p>This wall system has Standard Plans that are based on AASHTO Standard Specifications - 17th Edition (ASD/LFD Design Methodology).</p> <p>These standards are being redesigned; by the HQ Geotechnical Branch for internal and structural components and by the Bridge and Structures Office for the non-structural fascia, too meet the requirements of the AASHTO LRFD Bridge Design Specifications 4th Edition 2007 & Interims.</p>
<p>Non-Standard Geosynthetic Walls</p>	<p>These walls shall be designed to AASHTO LRFD Bridge Design Specifications 4th Edition 2007 & Interims. Wall components designed by the HQ Geotechnical Division shall be included on a separate plan sheet.</p>
<p>Standard Plan Reinforced Concrete Cantilever Walls</p>	<p>This wall system has Standard Plans that are based on AASHTO LRFD Bridge Design Specification 4th Edition 2007 & Interims.</p>
<p>Non-Standard Reinforced Concrete Cantilever Walls</p>	<p>These walls shall be designed per AASHTO LRFD Bridge Design Specification 4th Edition 2007 & Interims.</p>
<p>Soil Nail Walls</p>	<p>All soil nail walls and their components shall be designed using the publication "Geotechnical Engineering Circular No. 7" FHWA-IF-03-017.</p> <p>The HQ Geotechnical Division completes the internal design of the soil nail wall and shall layout the nail pattern. The nail pattern, soil nail information, etc. shall be included on a separate plan sheet that is detailed in the Bridge and Structures office.</p> <p>The Bridge and Structures Office shall design the temporary shotcrete facing as well as the permanent structural facing, including the nail</p>

	<p>head, bearing plates, and shear studs.</p> <p>The upper cantilever of the facing that is located above the top row of nails shall be designed per AASHTO LRFD Bridge Design Specification 4th Edition 2007 & Interims.</p>
Standard Plan Noise Barrier Walls	This wall system has Standard Plans that are based on the AASHTO Guide Specifications for Structural Design of Sound Barriers – 1992 & Interims. This is a LFD design method that corresponds with the AASHTO 17th Edition design methodologies.
Non-Standard Noise Barrier Walls	<p>These walls shall be designed per the AASHTO LRFD Bridge Design Specification 4th Edition 2007 & Interims.</p> <p>Wind load shall be per WSDOT BDM chapter 3 and foundation design shall be per GDM chapter 15.</p>
Pre-Approved and Standard Plan Moment Slabs for Geosynthetic Walls	<p>Appendix 15-A gives the Venders for Pre-Approved Proprietary Walls the ability to design to the AASHTO Standard Specifications - 17th Edition.</p> <p>There is a Standard Plan for moment slabs on geosynthetic walls and it is designed for the AASHTO LRFD Bridge Design Specifications 4th Edition 2007 & Interims.</p>
Non-Pre-Approved and Non-Standard Moment Slabs for Walls	These moment slabs shall be designed to the AASHTO LRFD Bridge Design Specifications 4 th Edition 2007 & Interims.

Exceptions to the cases described above may occur with approval from the Bridge Design Engineer and/or the State Geotechnical Engineer.

Background

While the Bridge and Structures Office has adopted the AASHTO LRFD Bridge Design Specifications – 2007 & Interims, several wall types either have not yet been brought up to that standard or those wall types are not covered by that standard. To assist designers with knowing what design specification they are responsible to meet and to track the process of moving all wall designs to the current specifications, this document is created.

Additional confusion and concern has arisen about responsibility for plan sheets. Components designed by the HQ Geotechnical Division were being included on Bridge Plan Sheets with supervisors' stamps that did not oversee the work. To avoid these conditions, the work performed by each office will be separated onto different plan sheets with the names of the engineers involved and the stamps of the correct supervisors included for signatures.

If you have any questions regarding this issue, please contact Monique Pawelka at 705-7754, Stuart Bennion at 705-7168, or Bijan Khaleghi at 705-7181.

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