From: Debra M. Butchart
To: BR
Subject: Bridge Advertisement (DSI 13-021) LRFD Seismic Bridge Design & LRFD Retaining Wall
Date: Monday, July 29, 2024 8:17:31 AM

The EPG, Bridge Standard Drawings, and Missouri Standard Specifications have been updated as described below:

Implementation Statement: Effective immediately for design process not started.

(The Implementation Statement is a recommendation by the Development Section. The SPM is responsible for the level of implementation for any particular job.)

Revision Date	Items Revised	Description of Change
July 2024	EPG: **751.9**, 751.1, 751.24, 751.34, 751.35, 751.40, 751.50, 321.2, 720.1, 747.2, 756, 1052 Bridge Standard Drawings: MSEW MicroStation Cells: NA Std. Specifications: 720 & 1052 Standard Plans: NA Bridge Special Provisions: NA	All new and replacement bridges, culverts, retaining walls and other structures on which states initiate preliminary engineering shall be designed LRFD and in accordance with latest specifications as per implementation date in EPG 751.50. For additional information, See "Bridge Seismic Planning Flowchart", "Bridge Seismic Design Flowchart", "Bridge Seismic Retrofit Flowchart", SEG 24-01 and SEG 24-02. For modifications to existing structures, states have the option of using LRFD BDS and SGS specifications or the specifications that were used for the original design. Generally, modifications to bridge projects on the state system include but are not limited to rehabs, redecks, superstructure replacements and widenings . If widening require additional substructure or modification to existing substructure than whole structure shall be analyzed in accordance with LRFD BDS and SGS specification. For additional information, See "Bridge Seismic Retrofit Flowchart". • SEG 24-01, New LRFD Seismic Design Procedure and SEG 24-02, Seismic Design Procedure for Mass Inertial Forces at Integral Abutments added on MoDOT website. ◦ For preliminary planning and cost estimate use the SDC values shown on preliminary seismic design map. SDC boundaries are shown on preliminary seismic design map for soil site class D. Geotech will verify site class and seismic design category for SDC B, C and D. ◦ If multi span bridge receives a final SDC

B, C or D and carries a major route or 1st or 2nd priority earthquake emergency route then bridge will receive seismic details or seismic details plus abutment seismic design or complete seismic analysis per SEG 24-01 and Bridge seismic design flowchart. If bridge receives a final SDC A2 and carries a 1st or 2nd priority earthquake emergency route, then bridge will receive seismic details.

- If multi span bridge receives a final SDC B, C or D and is not carrying a major or 1^{st} or 2^{nd} priority earthquake emergency route, it will only receive seismic details.
- If single span bridge receives a final SDC B, C or D and carries a major route or 1st or 2nd priority earthquake emergency route then abutments will be designed for mass inertial forces per SEG 24-02 and Bridge seismic design flowchart.

- Request for Final Soundings for Structures Form and the Guidance for Request for Final Soundings for Structures Form are updated for LRFD seismic.
- Example 1 SDC Response Spectra provided to determine seismic design category and response spectra based on USGS 2018 National Seismic Hazard Model.
- On design layout:
  - Provide Site Class, Seismic Design Category, A_S and S_{D1} for SDC B, C and D bridge/wall, and Liquefaction Potential information for SDC C and D (All available information from Geotechnical report). When A_s is greater than 0.75 then show A_s = 0.75.
  - Indicate either “Nonseismic”, “Seismic Details”, “Abutment Seismic Design”, “Seismic Details plus Abutment Seismic Design” or “Complete Seismic Analysis” for a bridge structure based on Geotechnical Section provided SDC and

			Bridge Seismic Design Flowchart. ◦ Seismic analysis provisions shall not be ignored for walls that support another structure (i.e., support abutment fill or building) in SDC B or C (seismic zone 2 or 3). No-seismic-analysis provisions may be considered for walls that do not support another structure (i.e., most of District walls) in SDC B or C (seismic zone 2 or 3) in accordance with LRFD 11.5.4.2 and Geotech report. SDC D (seismic zone 4) retaining walls shall be designed for seismic load. ◦ For open ended CIP piles: For scour condition, minimum cleanout elevation shall be at least 3 feet below maximum estimated scour depth. For non-scour condition, minimum cleanout elevation shall be at least 10 feet below natural ground line. • Abutment: If the lengths of the wings exceed 22 ft. for seismic design category A or 17 ft. for seismic design category B, C or D, they will have to be broken into a stub wing and a detached wing wall. For seismic forces wings shall be designed assuming there is no lateral restraint at the bottom of the wing. • For conventional retaining wall design follow the EPG 751.40.8.15 Cast-In-Place Concrete Retaining Walls and modify guidance of ASD as necessary to meet LRFD requirements until EPG 751.24 is modified for LRFD. • MSE retaining walls: Bridge standard drawings MSEW_01 to MSEW_04 are added for LRFD specifications. Bridge standard drawings for ASD (MSEW_05 to MSEW_08) will be archived. MSE walls are divided in three categories as shown below and Sec 720 and Sec 1052 are updated. ◦ Drycast modular block wall systems are limited to a maximum height of 10 feet. ◦ Wetcast modular block wall systems are limited to a maximum height of 15 feet.

		◦ Precast modular panel wall systems are vertical walls with heights that may exceed 10 feet.

Follow links above for more information, or to view more details about this (or any) revision, use the Revision Index Database, located under Completed Revisions on Development's Sharepoint page.

Instructions:

Under Tables (left-hand side) double-click on RevisionRecords.

Click on the link under the Effective Date to access documentation for the completed revision.

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