Washington State Department of Transportation
Bridge and Structures Office

Design Memorandum

TO: All Design Section Staff

FROM: Amy Leland

DATE: April 3, 2025

SUBJECT: Bridges with Fill Over the Superstructure

NUMBER: 2025-01

This design memorandum provides revisions to the Bridge Design Manual M 23-50.23 and shall be considered active after the date of this memorandum. This memorandum updates WSDOT's design policy to distinguish bridges with fill from Buried Structures as a structure type. This memorandum introduces revisions to Chapters 2, 8, 10 and 15.

Bridge Design Manual Revisions

Section 2.4 Selection of Structure Type of the Bridge Design Manual is revised as follows:

Section 2.4.1 shall be appended with the following:

The maximum depth of fill over the bridge deck to the finished grade shall not exceed 5 ft, including soil and roadway depth. All loads shall be evaluated for vertical and horizontal effects. Fill depths exceeding this limit shall be approved by the Bridge Design Engineer and include design procedures for evaluating soil structure interaction. The placement of fill over the superstructure shall not eliminate the requirement for bridge decks or CIP toppings as required for bridges in Chapter 5.

Section 8.3 Buried Structures of the Bridge Design Manual is revised as follows:

Section 8.3 shall be appended with the following:

Any structure not defined herein and supporting earth or roadway fill shall not be classified as a Buried Structure, but shall be considered a bridge, meeting all requirements for a bridge.

Section 10.6 Bridge Approach Slabs of the Bridge Design Manual is revised as follows:

The second paragraph of Section 10.6 shall be revised to the following:

Bridge approach slabs may be omitted for Buried Structures with Structural Clear Spans up to 30 ft and for bridges with 2 ft or more of fill over the superstructure when concurrence is reached between the Geotechnical Office, the Region Design Project Engineer Office, and the Bridge and Structures Office. Allowances for deleting bridge approach slabs are described in GDM Section 8.6.5.3.

Section 15.8.3 Buried Structures of the Bridge Design Manual is revised as follows:

Section 15.8.3.A shall be appended with the following:

Buried structures shall conform to the requirement in Section 8.3. Any structure not defined herein and supporting earth or roadway fill shall not be classified as a Buried Structure, but shall be considered a bridge, meeting all requirements for a bridge.

Background

Through the delivery of the Fish Passage Program, the State has seen an increase in solutions to fish barrier correction projects. On projects with site complexities that challenge a Buried Structure as a viable solution, yet alignment and/or channel profiles dictate a structural solution supporting overburden, bridges with fill over the superstructure (often called a buried bridges) have increasingly been employed. This structure type has often been misidentified as a Buried Structure as defined in BDM Section 8.3. Bridges that are buried display a structural behavior and expected dynamic response that differs from that of Buried Structures. Additionally, bridges with traditionally longer span are more susceptible to reflective cracking in the roadway without shear transfer between precast superstructure elements.

Contact Information

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