

TO: All Design Section Staff
FROM: Bijan Khaleghi
DATE: August 20, 2022
SUBJECT: Revisions to Bridge Design Manual M 23-50.21, June 2022 Publication

This design memorandum summarizes the editorial revisions and clarifications to WSDOT Bridge Design Manual M 23-50.21, June 2022 Publication as described in Items A through G.

A. Revise Section 1.2.2.B.4 Floating Bridge & Special Structures Design Unit Manager as follows:

Mechanical, Electrical, and Operation of Moveable Bridges and Special Structures are managed by the Bridge Preservation Office staff.

This position serves two main roles in the Bridge Office:

1. Serves as a statewide technical expert on floating bridges
 - Determines and manages statewide design policy for floating bridges, movable bridges and special structures.
 - Maintains close ties and communication with Region ~~operations~~ staff and Bridge Preservation staff to continuously evaluate the condition of the WSDOT floating bridges, movable bridges and special structures and their ~~structural~~ ~~operational~~ needs.
2. Serves as the Design Unit Manager of the Floating Bridge & Special Structures design unit
 - Manages floating bridges, movable bridges and special structures design activities performed by the Bridge & Structures Office design staff and consultants.
 - Submits final design documents and budget proposals for floating bridges, movable bridges and special structures to the State Bridge Design Engineer for approval.
 - Once construction of floating bridges, movable bridges and special structures commence, the Floating Bridge & Special Structures unit provides technical support, reviews and approves construction submittals required by the contract.
 - Responsible for the design of bridges and other structures including preparation of contract plans.

B. Revise Section 1.2.3 Unit Responsibilities and Expertise as follows:

Richard Brice Bridge Design Technology Unit Supervisor

C. Revise Section 2.4.1.E Prestressed Concrete Girder Sections as follows:

2.4.1.E.1 Application

3. W65DG, W53DG, W41DG, and W35DG precast, prestressed concrete decked bulb tee girders requiring a 1-1/2-inch minimum modified concrete overlay or a 3-inch minimum Hot Mix Asphalt (HMA) overlay wearing surface used for span less than 150-feet, with the Average

Daily Traffic (ADT) limitation of 30,000 or less. The 30,000 ADT limitation may be waived if precast decked bulb tee girders are longitudinally connected using cast-in-place (CIP) ultra high performance concrete (UHPC) instead of welded ties and grouted key connections.

8. WF39DG, WF45DG, WF53DG, WF61DG, WF69DG, WF77DG, WF86DG, WF98DG, and WF103DG precast, prestressed concrete wide flange girders requiring a 1-1/2-inch minimum modified concrete or 3-inch minimum HMA overlay wearing surface used for spans less than 195-feet, with the Average Daily Traffic (ADT) limitation of 30,000 or less. The 30,000 ADT limitation may be waived if precast wide flange decked bulb tee girders are longitudinally connected using CIP UHPC instead of welded ties and grouted key connections.

D. Revise Table of Content of Section 5 Concrete Structures as follows:

~~Prestressing~~ Post-Tensioned Concrete Anchorage Systems.....5-25

E. Revise Section 5.1.1.L.2. Concrete Exposed to Salt/Seawater as follows:

Designers shall provide the minimum cover specified in AASHTO LRFD ~~Table 5.12.3-1~~ Table 5.10.1-1 to concrete structures with direct exposure to salt/sea water such as the Pacific Ocean and the Puget Sound. However, use of other corrosion mitigation strategies described in ACI 201.2R 7.2.3 and ACI 357.3R could be used to reduce this cover or provide additional protection such as minimizing concrete permeability, using corrosion resistant reinforcement, cathodic protection, treatments that penetrate or are applied on the surface of the concrete to slow the entry of chloride ions, etc. Sites shall be classified as Coastal if they conform to the requirements of a marine site in accordance with Section 6.7.1.

F. Revise the title of Section 5.1.5 as follows:

~~Prestressing~~ Post-Tensioned Concrete Anchorage Systems

G. Revise Section 15.9.2.E.7 as follows

Seismic Isolation Bearings Seismic isolation bearings may be used, subject to the restrictions outlined in Sections 4.2.2 and 9.3. ~~A cost-benefit analysis comparing Type 1 (ductile substructure) design vs. Type 3 (seismic isolation) design shall be performed and submitted for approval to the Bridge Design Engineer. This analysis shall, as a minimum, address the life cycle costs and other impacts identified in Section 9.3.2~~

Background:

Some editorial revisions, clarifications, and inconsistencies encountered since the release of June 2022 Bridge Design Manual M 23-50.21 are addressed in this memorandum.

<https://www.wsdot.wa.gov/publications/manuals/fulltext/M23-50/BDM.pdf>

Please contact Bijan Khaleghi at (360) 705-7181 or Bijan.Khaleghi@wsdot.wa.gov If you have any questions regarding this memorandum.

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