

TO: All Design Section Staff  
FROM: Bijan Khaleghi  
DATE: December 10, 2020  
SUBJECT: Removal of bridge design guidance from WSDOT web site

This design memorandum formally removes bridge design requirements and guidance from the WSDOT web site, [www.wsdot.wa.gov/bridge/structures](http://www.wsdot.wa.gov/bridge/structures), and incorporates it to the WSDOT Bridge Design Manual.

The following are revisions to the WSDOT Bridge Design Manual (BDM) M 23-50, September 2020.

## **Bridge Design Manual Revisions**

Revision Section 2.5.1 by adding reference to the AASHTO Bridge Aesthetics Sourcebook

### ***2.5.1 General Visual Impact***

Bridge, retaining walls and noise walls have a strong visual impact in any landscape. Steps must be taken to assure that even the most basic structure will complement rather than detract from its surroundings. The EIS and bridge site data submitted by the Region should each contain a discussion on the aesthetic importance of the project site. This commentary, together with submitted video and photographs, will help the designer determine the appropriate structure type.

The State Bridge and Structures Architect should be contacted early in the preliminary bridge plan process for input on aesthetics. Normally, a visit to the bridge site with the State Bridge and Structures Architect and Region design personnel should be made.

Aesthetics is a very subjective element that must be factored into the design process in the otherwise very quantitative field of structural engineering. Bridges that are structurally efficient using the least material possible are generally visually well proportioned. However, the details such as pier walls, columns, and crossbeams require special attention to ensure a structure that will enhance the general vicinity.

For large projects incorporating several to many bridges and retaining walls, an architectural theme is frequently developed to bring consistency in structure type, details, and architectural appointments. The preliminary plan designer shall work with the State Bridge and Structures Architect to implement the theme.

[AASHTO Bridge Aesthetics Sourcebook](#) provides practical ideas for short and medium span bridges.

Add new sections 2.5.6, 2.5.7, and 2.5.8

### **2.5.6 Fish Passage Project Aesthetics**

Three levels of design are assigned to fish passage projects; basic designs, enhanced designs, and refined designs. The design used depends on context. The guidance herein is used to facilitate collaboration between the Bridge and Structures Office, region staff, and stakeholders, in applying context sensitive design principles.

Design follows the Federal Highway Administration's Context Sensitive Design (CSS) principles. CSS is a model for transportation project development that has received broad acceptance. Its essence is that a proposed transportation project must be planned not only for its physical aspects as a facility serving specific transportation objectives, it must also be designed for its effect on the aesthetic, social, economic, and environmental values, needs, constraints, and opportunities in a larger community setting.

#### **A. Aesthetic Design**

The goal of these recommendations is to influence the production of the aesthetic design. These will guide future designers as fish passage designs are built out.

The recommendations are developed to aide in design. They are conceptual and outline typical situations. Throughout each phase of design and construction exceptional situations may arise in which a standard solution is not applicable. Specific situations must be assessed individually so that alternatives harmonize with the project as a whole.

#### **B. Basic Designs**

Basic designs utilize class two smooth concrete that is seen by almost no one. Class two finish is described in Standard Specifications 6-02.3(14)B. The use of pigmented sealer is dependent on the risk of graffiti.



Figure 2.5.6B-1 Basic Design Example

#### **C. Enhanced Designs**

Enhanced designs are used in highly visible settings. Surface treatments are accomplished with standard form liners from the Standard Specifications and Qualified Products List.



Figure 2.5.6C-1 Enhanced Design Example

## D. Refined Designs

Refined designs are used in high profile settings requiring community input and may serve as public art. These designs are accomplished with common construction methods and materials.



Figure 2.5.6B-3 Refined Design Example

### 2.5.7 Typical Project Colors

AMS Standard 595 Colors and four custom colors are used on WSDOT projects. Colored finishes are used to obscure visual differences between concrete mixes, aid in maintenance control of graffiti and provide a more 'finished look'. The warm taupe browns are neutral hues that blend with the pre-existing built infrastructure.

**WSDOT's custom colors are:**

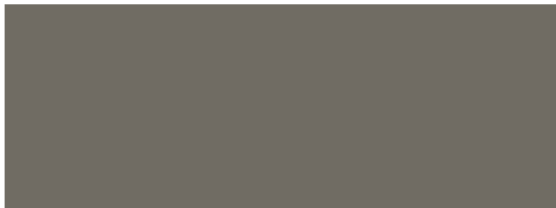
- Washington Gray: used in the majority of applications.



- Mt. St. Helens Gray: used for noise walls well off the roadway and in landscaped or forested areas.



- Mt. Baker Gray: I-405 CSS color used for dark gray accents.



- Cascade Green: I-405 CSS color for superstructures, railing and miscellaneous steel structures.



These samples are approximations of the actual paint color and are not to be used for construction. See WSDOT Standard specifications Section 9-08.2(1) for Pigmented Sealer applications. Contact the Bridge & Structures Architect for the steel top coat color verification process.

### **A. Sign Bridge Colors**

Typical colors for sign bridges are:

- AMS Standard 595 Color 35237: Blue gray for standard installations
- AMS Standard 595 Color 30045: Dark brown on US 2, US 12, US 97, SR 20, SR 410, Eastern portions of I-90 and in the National Forests
- AMS Standard 595 Color 30040: Very dark brown/bronze updated from 37056 in I-90 Architectural Design Standards December 1986.
- Cascade Green: Evergreen color used on I-405 CSS corridor

### **B. Fence Colors**

AMS Standard 595 Color 20045 dark brown is used for right of way fences, and accents requiring a brown hue.

In rare cases, such as urban areas tying into existing municipality fences, AMS Standard 595 Color 27038 black may be used.

### **C. Steel Bridge Colors**

A limited palette is used for repainting steel bridges. Existing steel bridges are repainted in original contract colors found in the Bridge Preservation data base. The AMS Standard 595 Color series is used.

New steel bridges are typically painted Washington Gray to blend with adjacent concrete bridges and match state corridors. Where required for inspection the interiors of cells of steel box girders may be painted AMS Standard 595 Color 17925 white.

## ***2.5.8 Standard Concrete Surface Treatments***

Standard concrete surface treatments are accomplished with manufactured form liners. The standard concrete surface treatments have been selected based on their successful use in WSDOT construction projects. Context sensitive design is used to select concrete surface treatments for a particular project. Aesthetic features are for the community and corridor roadway sides, depending on the project. The State Bridge and Structures Architect is required to approve concrete surface treatments. Concrete surface treatments are typically chosen in collaboration with the Region or WSDOT Landscape Architects.

Consult Standard Specifications 6-02.3(14)D and Qualified Products List 6-02.3(14)D for approved products and procedures.

Add the following reference to Section 2.99

13. *Bridge Aesthetics Sourcebook, Practical Ideas for Short- and Medium Span Bridges*, American Association of State Highway and Transportation Officials (AASHTO), 1<sup>st</sup> Edition, November 2010, ISBN 978-1-16051-485-5, <https://store.transportation.org/Item/PublicationDetail?ID=1622>

Revise Section 14.7 as follows

#### **14.7 Examples of Accelerated and Innovative Bridge Construction**

~~A document with examples of WSDOT projects where ABC has been utilized is on the Bridge and Structures' ABC website. This document includes a brief description of the benefits and reasons for using ABC in the project and the lessons learned. Below is a list of the types of construction and the projects that used each type.~~

A wide variety of ABC techniques have been used on projects throughout Washington State. The following list identifies projects where different ABC techniques have been used.

### **Background**

WSDOT is updating its web site by removing redundant, outdated, and trivial information while improving usability through user centered design principles. With this memorandum, relevant design guidance and requirements are moved from the WSDOT web site into the Bridge Design Manual.

The content related to bridge architecture and aesthetics is, in part, duplicated in BDM Sections 1.2.2B.2, 1.3.2A.1, and 1.4.3A.4. The "Bridge & Structures Typical Project Colors", "Fish Passage Aesthetics Guidance", and "Standard Concrete Finishes" documents contain design guidance and are best included in an official WSDOT design guidance document. The information in these documents have been updated to current standards.

The accelerated bridge construction examples on the WSDOT web site are viewed infrequently. They are published in PDF documents that do not meet WSDOT publishing standards, WSDOT communications standards, or ADA requirements. Documents and presentations on ABC topics not meeting WSDOT publishing and communication standards will be removed from the web site and stored by the Bridge and Structures Office for archival purposes.

For questions regarding the bridge and structures architectural and aesthetic requirements, contact [Matthew.Rochon@wsdot.wa.gov](mailto:Matthew.Rochon@wsdot.wa.gov) (360) 705-6856. For questions regarding accelerated bridge construction, contact [Eric.Schultz@wsdot.wa.gov](mailto:Eric.Schultz@wsdot.wa.gov) (360)705-7227. Questions may also be address to [Bijan.Khaleghi@wsdot.wa.gov](mailto:Bijan.Khaleghi@wsdot.wa.gov) (360) 705-7181.

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