

Transmittal Notice 2024-01

Date: 08/13/2024

Distribution: MnDOT Bridge Office Web Site

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Subject: MnDOT LRFD Bridge Design Manual Update

The MnDOT Bridge Office LRFD Bridge Design Manual (BDM) is available for download in Adobe PDF at:

<http://www.dot.state.mn.us/bridge/>

Check this Web site regularly for updates or to sign up for email update alerts.

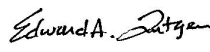
Instructions (for two-sided printing):

1. Remove from the BDM:
 - Title Page
 - Table of Contents pages xi and xii
2. Print and insert in the BDM:
 - Title Page
 - Table of Contents pages xi and xii
 - Memo to Designers #2024-01

BDM Update Summary

Revisions in the "AUGUST 2024" update consist of the addition of new Memo to Designers #2024-01 regarding use of bridge plan concrete reinforcement color.

For **technical questions** regarding this transmittal contact Karl Johnson, Bridge Design Manual Engineer, at karl.johnson@state.mn.us.


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State Bridge Engineer

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MINNESOTA DEPARTMENT OF TRANSPORTATION

Bridge Office

**LRFD Bridge
Design Manual**

MnDOT BRIDGE OFFICE

LRFD Bridge Design Manual

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APPENDIX A. Memos to Designers

#2005-01 REMOVED

#2005-02 REMOVED

#2005-03 REMOVED

#2006-01 REMOVED

#2007-01 REMOVED

#2007-02 REMOVED

#2007-03 REMOVED

#2008-01 REMOVED

#2008-02 REMOVED

#2011-01 REMOVED

#2011-02 REMOVED

#2011-03 REMOVED

#2012-01 Discontinued Usage of Plain Elastomeric Bearing Pads and
Substitution with Cotton-Duck Bearing Pads(dated April 12, 2012)

#2012-02 Transition to New
MnDOT Pile Formula 2012 (MPF12).....(dated November 21, 2012)

#2013-01 REMOVED

#2014-01 AASHTO LRFD Article 5.7.3.4 Concrete Crack Control Check
(dated August 6, 2014)

#2014-02 REMOVED

#2015-01 Concrete Mix Design Designations (dated August 10, 2015)

#2016-01 REMOVED

#2017-01 REMOVED

#2017-02 Post-Installed Anchorages for Reinforcing Bars ... (dated October 19, 2017)

#2018-01 REMOVED

#2019-01 Temporary Portable Precast Concrete Barriers on Bridges
(dated January 30, 2019)

#2020-01 MASH Implementation and Barrier Design (dated February 3, 2020)

#2021-01 Use of 300 ksi Prestressing Strand in Precast Pretensioned Concrete
Beams.....(dated January 21, 2021)

#2022-01 MnDOT Service Life Design Guide for Bridges (dated February 4, 2022)

#2023-01 Debonded Strands in Prestressed Concrete Beams.....
(dated November 3, 2023)

#2024-01 Bridge Plan Concrete Reinforcement Color (dated August 13, 2024)

Memo

Date: 08/13/2024

To: Bridge Design Engineers

From: Arielle Ehrlich 
State Bridge Design Engineer

RE: Memo to Designers #2024-01: Bridge Plan Concrete Reinforcement Color

Introduction

This memo provides guidance on the use of color in bridge plans for deformed bars (rebar) and welded wire fabric for concrete reinforcement. For the entirety of this Memo to Designers, the term “rebar” can be assumed to include welded wire reinforcement.

The primary purpose of developing a bridge plan is to create clear, accurate, and comprehensible instructions to build a bridge. MnDOT field staff requested the Bridge Office investigate showing reinforcement in color to help clarify concrete details and forming. Plan color helps the reader identify linework for concrete reinforcement versus object and dimension lines. This should help both the contractor and MnDOT field staff read bridge plans faster and reduce errors due to misinterpreting plan details.

The Bridge Office implemented several pilot projects testing rebar color in bridge plans. Post-project surveys indicated using a single color for rebar provided benefits in the field and was a manageable increase in effort for plan development. As a result, the Bridge Office decided to implement colored rebar for all bridge plans moving forward.

Effective immediately, show rebar in color when producing all bridge and box culvert plans. All other object linework, text, and figures depicted in bridge plans will remain black. Bridge and box culvert plans already started using black to depict reinforcement do not need to be redrafted and may continue to use black to depict reinforcement through plan signature.

Bridge Plan Production Requirements

General

When producing MnDOT bridge plans, use the color blue for all rebar contained within the plan. Refer to the “Drafting Requirements” section of this memo for specific requirements to obtain the correct shade of blue. This blue color was selected based on accessibility guidelines and to create an appropriate visual contrast for the reader. This color also prints black if the color plans are printed or copied in black and white. Depict all rebar in bridge plans using a single color, regardless of location, size, orientation, pour sequence, protective coating,

material composition, or functionality. Use rebar color for all bridge plans (both new construction and repair plans). Use color for both new and existing rebar contained in bridge repair plans. Color should also be used for bar bend details and the bar shape symbol within the Bill of Reinforcement. Refer to Figure 1 for an example bridge plan sheet using rebar color.

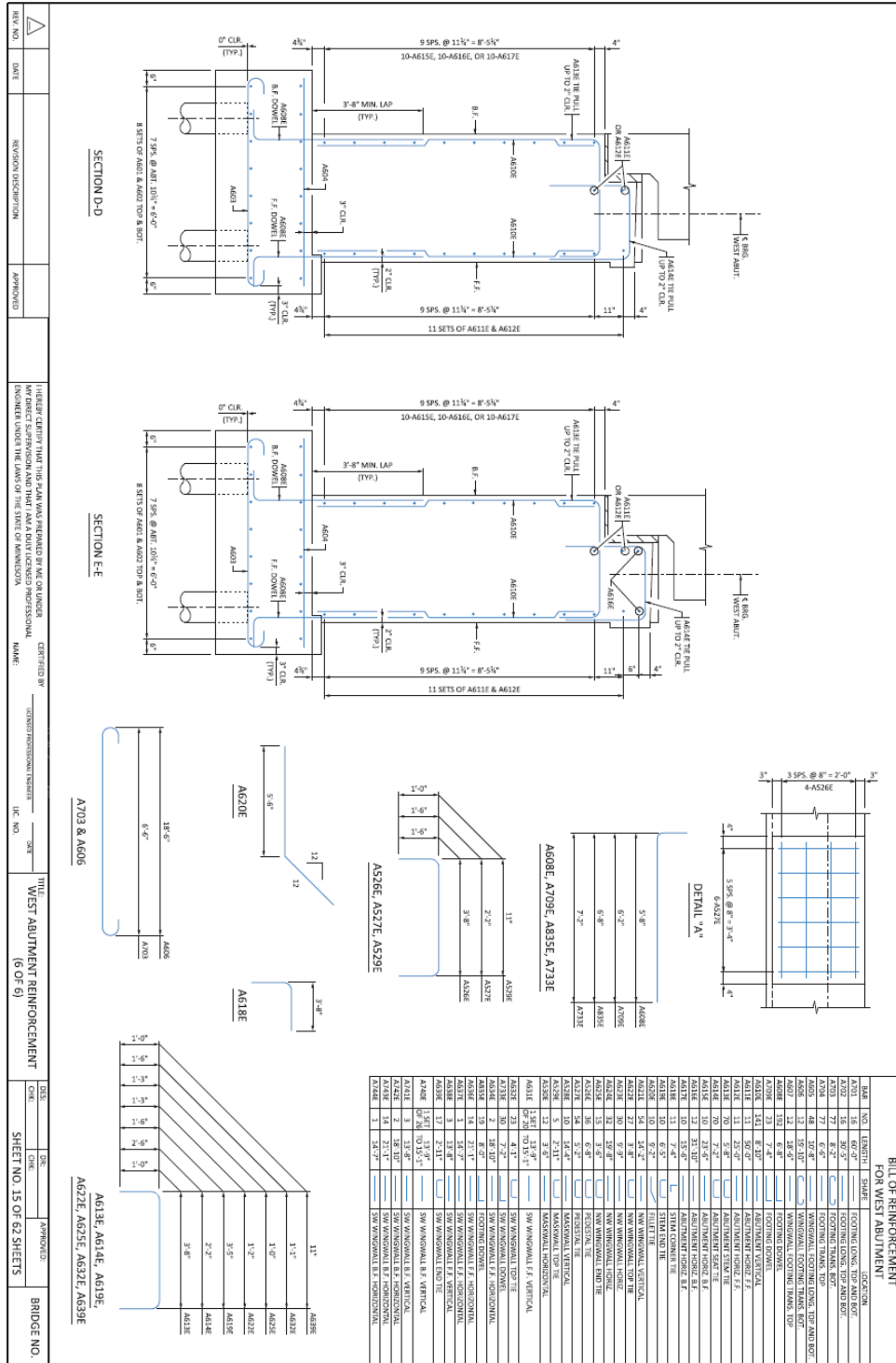


Figure 1

Depict all other embedded and non-embedded elements that are not rebar as black, even if their primary intention is to reinforce or strengthen the concrete. For example, all other forms of reinforcement (e.g.,

pretensioned strands, post-tensioned strands, threaded rods, etc.), hardware (e.g., shear studs, anchor rods, cork and dowel bar assemblies, adhesive anchors not using rebar, concrete inserts, expansion joint devices, bolts, nuts, washers, etc.), and miscellaneous elements (e.g., ground wires, conduits, junction boxes, rigid plastic joint extrusions, catch basins and other drainage elements, etc.) should be depicted in black.

Bridge plan color is a helpful tool intended for information only, with the goal to aid field staff during construction and reduce errors when interpreting plan details. Errors in bridge plan color cannot be claimed by contractors for monetary compensation; however, errors not pertaining to plan color (e.g., rebar callouts, dimensions, or quantity errors) remain subject to the typical claims process. To ensure this is understood by all parties, include the new standard note provided in the “Drafting Requirements” section of this memo in all bridge plans containing color.

Drafting Requirements

As previously mentioned, blue should be used to depict rebar in bridge plans. The correct shade of blue can be obtained within the MnDOT workspace of Open Bridge Modeler (OBM) by selecting color number 123 from the Bridge Office color table. This shade of blue has the following RGB color model designation: RGB (0, 145, 255). This color is automatically integrated into reinforcement levels when using the Bridge Office standard levels in the OBM workspace. Consequently, no additional effort should be required to produce plans in color when using standard Bridge Office levels and the drafting process specified in the MnDOT Bridge Office *Summary of Drafting Standards*. To print color bridge plans in OBM, simply ensure the reinforcement elements are on their appropriate level and all symbology is set to “by level” prior to printing. Upon special request, a traditional black and white plan can be produced from the same drafting file by manipulating the OBM printer settings. The MnDOT Bridge Office *Summary of Drafting Standards*, which contains a comprehensive list of Bridge Office standard levels, can be found at the following location: <https://dot.state.mn.us/bridge/drafting-aids.html>.

Include the following standard note in all bridge plans containing color along with the standard “Construction Notes” (typically located on the “General Plan and Elevation” or “Schedule of Quantities and Transverse Section” sheet):

THIS PLAN USES COLOR (BLUE) TO DEPICT REINFORCEMENT BARS AND/OR WELDED WIRE FOR CONCRETE REINFORCEMENT. THE COLOR IS FOR INFORMATIONAL PURPOSES ONLY TO AID PLAN READABILITY DURING CONSTRUCTION. ANY CONSTRUCTION PLAN ERRORS REGARDING DEPICTED COLOR ONLY ARE NOT SUBJECT TO MONETARY CLAIMS.

Do not modify the reinforcement color on Bridge Office standard plan sheets or B-Details. The Bridge Office will update the reinforcement color on all standards and release them when complete. Designers should use the current standard, even if the reinforcement is not in color.

For questions about this memo, please contact Karl Johnson (karl.johnson@state.mn.us) or Arielle Ehrlich (arielle.ehrlich@state.mn.us or 651-366-4506).

cc: E. Lutgen
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