

Bridge Standards Manual Revision History

- Typically excludes history of minor corrections, minor layout changes, broken link fixes, etc.
- Note that many sub-section numbers specified herein become inaccurate over time as BSM sub-sections are subsequently added, deleted or moved.

Date	Section/ Sub-section	Revision description
July 2, 2024	1.4, 2.5.1 & 2.5.4	Expanded definition and explanation of “Structural Design Engineer (SDE)” to include “structural engineering responsibility for the use and application of Ministry Standard Drawings or previously used components for a specific project.” Added the requirement that “A specific bridge project must have at least one SDE that is actively involved in the project.”
July 2, 2024	2.5.1	Added: “Where possible, projects shall be coordinated so that the General Arrangement Engineer is also the Construction Assurance Engineer.”
July 2, 2024	6	Added the requirement that when caps are required on top of steel pipe columns or steel piles, the caps must be concrete (i.e. not steel).
July 2, 2024	8.3.2.3	Made concrete slab girder to abutment connection minimum one 25 mm dia. steel dowel per slab per abutment for all types of slab girders (previously min. for shear connected slab girders was 2 dowels per abutment). Specified requirement for dowels to be isolated from blockout fill material to ensure no vertical load transfer.
July 2, 2024	10.2.3 to 10.3.5	Minor clarifications and additions to various steel material specifications, including increased listings of approved alternative steel grades.
July 2, 2024	Appendices to Section 19	Revised the standard bridge material requisition templates for steel girder concrete deck bridges and steel girder timber deck bridges so they will work with the revised concrete ballast wall drawings in the Substructures Standard Bridge Drawing Set (STD-EC-050 Series.) Eliminated the option to choose PCP-A (Penta) for timber treatment in the steel girder timber deck template because it is now banned.
July 2, 2024	Appendices to Section 20	Revised sheets 01 to 03 in the Steel Girder Concrete Deck Standard Bridge Drawing Set (STD-EC-030 Series.) Significant revisions are on sheet 03, as follows: <ul style="list-style-type: none"> • Moved steel girder end plate detailing from the Substructures Standard Bridge Drawing Set (STD-EC-050 Series) to this sheet, and included the following revisions:

		<ul style="list-style-type: none"> ○ Added requirement for Supplier to confirm matching of holes between end plates and ballast walls prior to delivery for bolted ballast wall connection option 1; ○ Added minimum dimensions for end plates and girder webs; ○ Added a standard horiz. distance of 525 mm between the steel girder end plate and centreline of bearing; ○ Increased/revised standard details for welding end plates to girders; ○ Increased details for shackle holes in end plates and girder webs; and ○ Increased standard requirements for SDEs to specify lifting, launching and handling procedures and limitations for steel girders.
July 2, 2024	Appendices to Section 20	<p>Revised sheets 01, 02, 03, 04, 09 and 10 in the Substructures Standard Bridge Drawing Set (STD-EC-050 Series.) Some revisions are:</p> <p>General Notes</p> <ul style="list-style-type: none"> ● Sheet 01: Replaced outdated lengthy General Notes with the more concise new typical MOF format of Standard Bridge Drawing Set General Notes which rely on BSM. <p>Concrete Ballast Walls</p> <ul style="list-style-type: none"> ● Sheet 02: noted to be “Currently Not In Use”; ● Sheets 03 and 04: Significant changes to Concrete Ballast Wall drawings, including: <ul style="list-style-type: none"> ○ Eliminated standard ballast walls with 2.4m < height < 2.8m; ○ Decreased standard rear face horizontal rebar spacing by 25 mm; ○ Decreased standard front face horizontal rebar spacing so it is 200 mm c/c for all standard wall sizes; ○ Decreased standard vertical rebar spacing (from 250 mm c/c to 150 mm c/c) for both front and rear faces; ○ Changed horizontal top edge (beside deck) from 750 mm to 1000 mm to allow wider level approach fill which can better support approach barriers; ○ Eliminated “deck beside ballast wall” as an option for concrete decked bridges; ○ Simplified standard geometry, including: <ul style="list-style-type: none"> ▪ Making the projection of the ballast wall below the girder soffit a standard distance of 300 mm; ▪ Providing standard locations for the ballast wall to girder connections; ○ Added a standard horiz. distance of 525 mm between the steel girder end plate and centreline of bearing;

		<ul style="list-style-type: none"> ○ Added a min. horiz. distance of 150 mm between conc. ballast wall front face and nearest bearing or abutment component; ○ For the original bolted ballast wall to steel girder connection option (now option 1): <ul style="list-style-type: none"> ▪ Decreased the I.D. of the holes through the ballast walls from 32 mm to 27 mm to provide a better connection; ▪ Added requirement for supplier to confirm matching of hole locations (between the ballast walls and the girder end plates) prior to delivery to preclude installation problems; ○ Added a 2nd option for a bolted ballast wall to steel girder connection (which may make it easier to ensure bolt hole matching); ○ Allowed for A307 bolts for bolted connections if SDE confirms adequacy; ○ Provided new embedded plate details, including: <ul style="list-style-type: none"> ▪ increasing number of studs from 4 to 6; ▪ widening the plate; ▪ terminating welds before the plate edge; and ▪ adding a trough around the plate; to: <ul style="list-style-type: none"> ▪ reduce likelihood of concrete spalling caused by field-welded ballast wall to girder connection; and ▪ work with girder end plates of various widths. <p>Steel HP Abutment and Pier Caps</p> <ul style="list-style-type: none"> ● Revised sheets 09 and 10 to indicate that standard HP steel abutment caps and standard HP steel pier caps have been made obsolete.
July 2, 2024	Appendix to Section 21	Updated the Sample Bridge General Arrangement Drawings.
March 28, 2024	Appendix to Section 19	<p>Revised standard bridge material requisition template for reinforced concrete slab girder bridges. Some revisions are:</p> <ul style="list-style-type: none"> ● Modifications to work with the reinforced concrete slab girder bridge standard drawing set which was updated in 2023. ● After it is filled out, the completed template becomes a “Bridge Supply Special Provisions” contract document rather than a “Requirements and Specifications” contract document. ● Template language improved for situations where the Ministry may be providing bidders with completed Structural Design Drawings;

		<ul style="list-style-type: none"> • Template language improved for situations where bridge supply and bridge installation are part of the same contract. • Selection of Box A or Box B Supplier qualification requirements simplified. <p>Layout improved so that template areas requiring user input are less spread-out through the document.</p>
December 12, 2023	1.4 & 7.1	Added definition for “minor culvert” and stated that the Ministry’s Engineering Manual is the primary reference for these structures.
December 12, 2023	1.7	Revised guidance relating to the clarification of possible discrepancies between various types of Ministry provided information relevant to a specific Ministry contract.
December 12, 2023	1.18.4	Provided additional standards and commentary relating to bridge deck width and deck flares.
December 12, 2023	1.18.5	Provided revised standards relating to bridge skews.
December 12, 2023	1.18.6	Limited the longitudinal grade on bridges to 4% for all standard bridges.
December 12, 2023	1.18.8	Added requirement to, where possible, specify steel girders with out-to-out lengths in increments of 3.048 m (10”) for economic reasons.
December 12, 2023	1.18.9	Provided more detailed camber standards for various types of girders.
December 12, 2023	1.19 & Steel Girder Conc. Deck Std. Dwg.	Added requirement for hazard markers on guardrails at narrowest bridge deck locations (i.e.; where a deck flare ends and the regular bridge width begins).
December 12, 2023	2.4.2 and Appendix to Section 2	Updated requirements to be followed when bridge projects on FSRs are not managed directly by the Ministry. The new authorization process relates to “Significant Works” on FSRs.
December 12, 2023	2.5.7.3	Made minor revisions to the standard disclaimer for Ministry Engineers to use when accepting drawings prepared by others, in consideration of the new EGBC Practice Advisory: Professional conduct between Submitting Professionals and Authorities having Jurisdiction.
December 12, 2023	2.6	Added qualification requirements for engineers performing work related to FSR bridges.
December 12, 2023	3.7	Minor updates to standards and provision of new commentary relating to designing for debris flows.
December 12, 2023	3.12.2 & 3.12.3	Minor updates to construction loads for bridge design. Clarified that all bridges with deck panels shall be designed for construction loads that

		<p>were previously written more specifically for bridges with composite deck panels.</p> <p>Moved requirement for design of slab girders for cantilevered installation from Section 8 to this section.</p>
December 12, 2023	5.2	Added a link in the <i>commentary</i> for this section to two guidance documents (dated 2004) which are located in the Bridge Standards Library. The documents provide guidance for determining load distribution between shear-connected concrete slab girders.
December 12, 2023	6.5	Required composite bridges to have concrete ballast walls welded to the girders.
December 12, 2023	6.6	Provided updated standards relating to caps.
December 12, 2023	8.2.10	Situations requiring waterproofing membranes described and standard waterproofing membrane details provided.
December 12, 2023	8.2.3.1	Specified rebar as 400R <u>or</u> 400W rather than only specifying 400W.
December 12, 2023	8.3.1.1	Standard concrete deck panel edge thicknesses removed for 5486 mm wide decks.
December 12, 2023	8.3.1.3 to 8.3.1.6	<p>Updated design requirements for concrete deck panels with various types of joints between panels, and various types of joints between panels and ballast walls.</p> <p>Provided standards addressing concrete deck panels that have gaps between deck panel soffits and girder top flanges when the panels are placed on the flanges.</p> <p>Specified that CHBDC empirical design method shall not be used for FSR concrete bridge decks.</p>
December 12, 2023	8.3.3.2	Expanded design possibilities relating to lifting anchors in the top of precast ballast walls.
December 12, 2023	9.2.3	Added details to fastener standards for timber connections.
December 12, 2023	9.3.2	Added table “Standard Dimensions for Steel Girder Bridges with Timber Decks” relevant to the STD-EC-020 Standard Drawing Series.
December 12, 2023	10.4.2.1	Standard steel I-girder spacing of 4200 mm for 5486 mm deck width eliminated as a standard.
December 12, 2023	10.4.2.7	Added standards relating to detailed design of short span composite bridges.
December 12, 2023	10.6.4 & 10.6.5	Clarified standards relating to bridges in naturally corrosive environments and where corrosive road surface treatments are used.

December 12, 2023	Appendix to Section 19	<p>Revised standard bridge material requisition template for steel girder concrete deck bridges. Some revisions are:</p> <ul style="list-style-type: none"> • Modifications to work with the newly created/updated steel girder concrete deck standard drawing set. • After it is filled out, the completed template becomes a “Bridge Supply Special Provisions” contract document rather than a “Requirements and Specifications” contract document. • Template language improved for situations where the Ministry may be providing bidders with completed Structural Design Drawings; • Template language improved for situations where bridge supply and bridge installation are part of the same contract. • Selection of Box A or Box B Supplier qualification requirements simplified. • Layout improved so that template areas requiring user input are less spread-out through the document.
December 12, 2023	20 and Appendices to Section 20	Updated General Notes on Steel Girder Timber Deck Standard Drawing set, deleting obsolete references and moving some information into the BSM pdf.
December 12, 2023	20 and Appendices to Section 20	<p>Combined Composite and Non-Composite Steel Girder Concrete Deck Standard Drawing sets to create one Steel Girder Concrete Deck Standard Drawing set (also moved the previously independent Steel Armour for Deck Ends standard drawing into this combined set.)</p> <p>General changes from the previous drawings include:</p> <ul style="list-style-type: none"> • Transverse top mat reinforcement for deck panels always req’d to be crowned. • Drip groove on deck soffit specifically required to be continuous through transverse grouted deck joints. • Deck end joint gap specified to be 25 mm prior to being filled with evazote. <p>Changes specific to non-composite bridges include:</p> <ul style="list-style-type: none"> • Updated obsolete references; • Reduced length of General Notes by providing reference to the Bridge Standards Manual; • Added note that indicates non-composite bridges are intended to be used at multiple sites over their design life; • Elimination of single shear stud deck panel to girder connection option; • Added minor details to bolted deck panel to girder connection; • Elimination of options to use skewed panels or flared panels; • Maximum internal longitudinal distance between deck panel blockouts changed from 2400 to 1200;

		<ul style="list-style-type: none"> • Changed typical applicable girder length range from: <ul style="list-style-type: none"> ○ 15.24m (50’) to 48.632m (160’); to ○ 6.1m (20’) to 39.624m (130’); • Deck panel chamfers above transverse joint compression seals changed from 20x20 to 10x10; • Requirement for some non-comp. bridges to have the deck end joint waterproofed and waterproofing protected. <p>Changes specific to composite bridges include:</p> <ul style="list-style-type: none"> • Waterproofing of the deck end joint referenced in above bullet is now required to be protected by asphalt impregnated fibreboard or equivalent. • Added two transverse deck angular shear key grouted joint options between deck panels. Eliminated the round shear key grouted joint option. • Changed typical applicable girder length range from: <ul style="list-style-type: none"> ○ 15.24m (50’) to 48.632m (160’); to ○ 9.14m (30’) to 39.624m (130’). <p>Changes specific to steel armour for deck ends include:</p> <ul style="list-style-type: none"> • Elimination of option to use a 90 degree steel angle for armour (a custom-bent steel plate is now the only option if steel armour is required). The thickness of the custom-bent steel plate has been changed from 8 mm to 6.4 mm min.
Aug. 29, 2023	1.18.3	Moved “Vehicle Horizontal Tracking Requirements” information from Section 3: Loads, to this new sub-section in Section 1: General.
Aug. 29, 2023	1.19	Added new sub-section “Signs at Bridge Sites”. Removed information about signs from Section 3: Loads.
Aug. 29, 2023	3.5.2.1 Commentary	Added commentary about BC TRAN CL-800 traffic loading scenario and theoretical design traffic loading scenarios LOH and HOH. None of these scenarios are allowed for FSR bridge design.
Aug. 29, 2023	14.5 and Appendices to Section 14	Changed name of “Post-fire Bridge Assessment Procedures” to “Post-Fire Bridge Assessment Guidelines & Procedures”. Made minor updates to the document, including eliminating its identification as a “Working Draft”.
Aug. 29, 2023	14.9	Modified standards for bridge load posting and provided commentary relating to the derivation of appropriate load limits to be shown on load posting signs.
July 5 to 12, 2023	1.4	Added new definitions and modified some existing definitions (especially relating to the various engineers involved with specific projects and generic Ministry Standard Drawings)

July 5 to 12, 2023	1.6.1	Expanded the section describing the mandatory and appropriate use of bridge standards (including Bridge Standard Drawings) emphasizing that engineers involved with specific projects are fully responsible for engineering of their projects.
July 5 to 12, 2023	1.8.2	Added clarifying details about applicability of CHBDC to FSR projects.
July 5 to 12, 2023	1.18.7	Added information to previous camber requirements, including a warning regarding excessive camber.
July 5 to 12, 2023	1.19.4	Added requirement for designers to confirm availability of materials prior to finalizing designs.
July 5 to 12, 2023	2	Re-organization of some sub-sections within this section.
July 5 to 12, 2023	2.2	Added clarifying information relating to Durable Bridges and Prime Stationary Bridges.
July 5 to 12, 2023	2.4.2 & Appendix to Section 2	Clarified current (interim) requirements for bridge construction projects that are managed by proponents such as Road Use Permit holders. Moved the appendix: “FS1229: Building of FSR Bridges by a Road Permit Holder (DOCX, 63KB)” from the Bridge Standards Manual website to the Bridge Standards Library website because it is not current.
July 5 to 12, 2023	2.5	Expanded and clarified a section describing roles and responsibilities of various engineers involved in projects. Emphasized that Standard Drawing Engineers are not to be considered responsible for the engineering of specific projects.
July 5 to 12, 2023	2.5.4	Added requirement for Structural Design Engineers to review Shop Fabrication Drawings and provide documentation of the review to the Ministry Engineer prior to the Ministry Engineer accepting the Shop Fabrication Drawings.
July 5 to 12, 2023	2.5.7.3	Added a sub-section describing standards for Ministry Engineers to follow (including use of a standard disclaimer) when they routinely accept drawings prepared by others.
July 5 to 12, 2023	2.7.1	Changed In-plant steel fabricator CSA W47.1 welding qualification requirements for miscellaneous steel components from Div. 3 or better to Div. 2 or better.
July 5 to 12, 2023	2.9.2 and Appendices to Section 2	Revisions to the “Heads-up Notice of Impending Bridge Fabrication Project Requiring QA Inspections” form which is to be completed by Ministry Engineers for all projects that involve in-plant fabrication. Revisions to the sub-section discussing this form.

July 5 to 12, 2023	2.9.5 and Appendices to Section 2.	Added new section to describe the In-plant QA Fabrication Assurance Statement which is to be completed by the In-plant QA Inspection Engineer after completion of in-plant fabrication. Added a revised version of this form to the BSM Appendices.
July 5 to 12, 2023	6.7	Added bridge endfill specifications.
July 5 to 12, 2023	8.1	Expanded general information describing where to find specific concrete related standards.
July 5 to 12, 2023	8.2.3.1	<ul style="list-style-type: none"> • Specified rebar as 400W rather than 400R <u>or</u> 400W; • Specified CHBDC requirements to generally apply for reinforcement in concrete.
July 5 to 12, 2023	10	Expanded and refined Steel Structures Section.
July 5 to 12, 2023	10.4.2.6; 14.6; & Appendices to Chapter 14	Provided additional information regarding design and (especially) evaluation of steel I-girder shear capacity relating to end panel tension field analysis.
July 5 to 12, 2023	15.1	Clarified that rehabilitation and repairs need to be done in accordance with Ministry Engineer direction or be approved by a Ministry Engineer.
July 5 to 12, 2023	20.1	Updated general description of the Standard Drawings. Clarified that Standard Drawings are not to be used directly for construction (i.e.; fabrication and/or installation.) Project specific drawings are to be created for construction of specific projects.
July 5 to 12, 2023	Various sections of BSM and Appendices to Section 20	Simplified heading/title of a category of standard drawings from “Bridge Guardrails, pedestrian railings and approach barriers” to “Barriers”.
July 5 to 12, 2023	Appendices to Section 20	Minor updates to the Steel Girder Concrete Composite Deck Standard Bridge Drawing Set, including: <ul style="list-style-type: none"> • Updated obsolete references; • Revised General Notes; • Removed deck beside ballast wall option; • Added requirement for waterproofing the joint between end deck panels and ballast walls.
July 5 to 12, 2023	Appendices to Section 20	Minor updates to the Standard Precast Concrete Reinforced Slab Girder Standard Bridge Drawing Set, including: <ul style="list-style-type: none"> • Updated obsolete references; • Reduced length of General Notes by providing reference to the Bridge Standards Manual;

		<ul style="list-style-type: none"> • Added requirement for waterproofing the joint between slab girders and cap beam/wing walls for shear connected slab girder bridges; • For drafting clarity, removed illustrations of: gravel decks on slab girders, and interlocking concrete blocks as wing walls.
March 7, 2023	8.3.3	Provided additional standards for design of precast components for lifting.
March 7, 2023	Definitions; 2.2.2; 6.1 and 6.2	<ul style="list-style-type: none"> • Refined sections listing standard stationary and portable superstructure and substructure types; • Created definition for <i>Semi-Portable Bridge</i> and described standard superstructure and substructure types for semi-portable bridges.
March 7, 2023	6.3 to 6.6.3	Refinements to substructure requirements.
March 7, 2023	21.2.1.1 and Appendix to Section 21	Reduced number of Sample Standard General Arrangement Drawing sets included in the BSM from 2 sets to 1 set.
February 28, 2023	All	<p>Published publicly available online Bridge Standards Manual (BSM) within the online, publicly available Bridge Guidelines, Standards and Specifications (BGSS).</p> <p>This included many minor changes from the previous BGSS website. Some notable changes included:</p> <ul style="list-style-type: none"> • Organized mandatory current standards into the Bridge Standards Manual; • Organized BSM information in sections that generally align with Canadian Highway Bridge Design Code (CHBDC) sections; • Modified standard bridge material requisition templates in the BSM to align with the changes above; • Eliminated a partially complete document entitled Ministry of Forests Supplement to CHBDC and moved the information into the Bridge Standards Manual Section 3: Loads • Eliminated the Bridge Component Concrete Standard and moved its contents into the BSM Section 8: Concrete Structures; • Provided many new and updated definitions in the BSM; • Revised and updated various technical standards and specifications in the BSM.