

# **MANUAL OF THE STRUCTURE AND BRIDGE DIVISION**

## **PART 2**

### **DESIGN AIDS AND TYPICAL DETAILS**



**VIRGINIA DEPARTMENT OF  
TRANSPORTATION**

**VDOT GOVERNANCE DOCUMENT**

**VDOT Manual of the Structure and Bridge Division: Part 02: Design Aids  
and Typical Details**

**OWNING DIVISION: Structure and Bridge**

**DATE OF ISSUANCE: 10/31/2018**



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF TRANSPORTATION

1401 EAST BROAD STREET  
RICHMOND, 23219-2000

**Stephen Brich**  
COMMISSIONER

October 31, 2018

**SUBJECT:** Manual of the Structure and Bridge Division – Part 2  
Design Aids – Typical Details

### MEMORANDUM

**TO:** Holders of Manual

### VOIDED:

Chapter 8 – Concrete Design Aids

Chapter 16 – Geometry

Chapter 21 – Slope Protection

### NEW ISSUES:

Chapter 8 – Bridge Layout (includes voided and updated Chapter 16 and Chapter 21 content)

### REVISIONS:

#### CHAPTER 2:

<u>File Number</u>	<u>Description of change(s)</u>
02.TOC-1	Revised dates.
02.00	Updated list of major changes.
02.01-1 thru -6	Revised bridge layout points to line thru center of bearings/piles. Updated AASHTO LRFD Bridge Design Specifications in General Notes to 8th Edition.
02.01-3	Removed expansion callouts at full integral abutment locations.
02.01-7	Revised Checklist Item 8.
02.01-8	Revised Checklist Items 24 and 25 to label line thru centers of bearings/piles. Inserted Checklist Item 27, renumbered remaining checklist items and updated current Checklist Item 28 content.
02.01-9 and -10	Updated all checklist numbers per insertion on File No. 02.01-8.
02.02-6	Added SS405 and SS413 to the list.

**REVISIONS:(cont'd)**

CHAPTER 2 (continued):

<u>File Number</u>	<u>Description of change(s)</u>
02.02-7	Revised name and use for SP Shear Keys and Blockouts Between Adjacent Members.
02.03-2	Updated AASHTO LRFD Bridge Design Specifications editions in General Notes.
02.03-7	Updated designer instructions for Type B structure.

CHAPTER 7:

<u>File Number</u>	<u>Description of change(s)</u>
All files	Removed "Vol. V" from all footer File No. blocks. Changed last revised dates only on sheets where other content was changed.
7.TOC-1 and -2	Revised dates and file numbers per section changes.
7.00	Added statement explicitly stating VDOT's Reinforcing Steel Schedule requirements. Updated list of major changes.
7.01-1	Revised table headers and column order. Added reinforcing steel bar length information previously provided in IIM-S&B-80.
7.01-2	Replaced Area of Rebars Per Foot of Section with ASTM Bar Marking Sequence.
7.02-1 thru -21	Revised and reorganized content of previous 14 sheets based on AASHTO LRFD specifications, 8 <sup>th</sup> Edition.

CHAPTER 10:

<u>File Number</u>	<u>Description of change(s)</u>
All files	Removed "Vol. V" from all footer File No. blocks. Changed last revised dates only on sheets where other content was changed.
10.TOC-1 and -2	Revised date, sheet name and section content.
10.00-1	Updated list of major changes.
10.01-1	Modified Note B.
10.01-6	Added cantilever design values for CPSR railing, revised second paragraph under table and added Cantilever Layout content.
10.02-1	Updated dimension in Concrete Bolster (Haunch) Detail.
10.02-2	Removed continuous slab retrofit content and sheet.
10.05-2 thru - 4	Revised bridge layout points to line thru center of bearings/piles and made miscellaneous changes.
10.05-5	Revised bridge layout points to line thru center of bearings/piles.

**REVISIONS:(cont'd)**

CHAPTER 11:

<u>File Number</u>	<u>Description of change(s)</u>
11.TOC-1, -2 and -4	Revised dates.
11.00-1	Updated list of major changes.
11.02-2	Added content on abrupt or unaesthetic transitions to Beam/Girder Spacing including reference.
11.03-3 thru -5	Revised bridge layout points to line thru center of bearings/piles and updated checklist numbers.
11.03-6 and -7	Removed previous Checklist Items 3 and 12 and renumbered subsequent items.
11.09-4	Revised bridge layout points to line thru center of bearings/piles.

CHAPTER 12:

<u>File Number</u>	<u>Description of change(s)</u>
12.TOC-1 thru -5	Revised dates and file numbers per section changes.
12.00-1 and -2	Updated list of major changes.
12.01-1	Permitted debonded strand use only for PSC bulb-T beams.
12.01-3 thru -6	Updated AASHTO LRFD article references.
12.02-2	Revised nomenclature for Eci and units for w. Added variable descriptions for L and a.
12.03-1 thru -11	Updated number of sheets.
12.03-1	Updated File No. references. Revised deck overhang content under Beam Spacing. Moved some content to next sheet.
12.03-2 and -3	Updated header and content nomenclature from stirrup requirements to interface shear reinforcement. Moved some content to sheet 3.
12.03-4	Revised top flange sleeve details for deck drains to specify fiberglass reinforced epoxy pipe sleeves in place of galvanized steel. Reduced content to one sheet and moved in front of preliminary design parameters and charts.
12.03-5 thru -10	Renumbered sheets due to insertion of top flange sleeve details.
12.03-6	Revised third bullet.
12.03-9 and -10	Revised File No. references.
12.05-2	Updated AASHTO LRFD article reference.
12.05-12 and -13	Revised bridge layout points to line thru center of bearings.
12.06-3	Updated AASHTO LRFD article reference.
12.06-12 and -13	Revised bridge layout points to line thru center of bearings.
12.07-7 and -11	Updated AASHTO LRFD article reference(s).
12.10-1 and 12.11-1 and -3	Updated AASHTO LRFD article reference(s).
12.11-3	Revised first sentence to indicate “nonprestressed reinforcement” approach instead of “simplified.”
12.12-1	Updated AASHTO LRFD article reference.
12.13-2 thru -7	Revised bridge layout points to line thru center of bearings/piles.

**REVISIONS:(cont'd)**

CHAPTER 12 (continued):

<u>File Number</u>	<u>Description of change(s)</u>
12.13-8 and -9	Removed Checklist Items 3 and 4 and renumbered. Inserted new Checklist Item 15 and revised current 11 and 12 content.
12.14-2	Revised bridge layout points to line thru center of bearings.
12.14-3 thru -6	Updated sample sheet per current standard sheet.
12.14-7	Updated sample sheet to have consistent dates with sample set.
12.15-1, -2 and -4	Updated AASHTO LRFD article reference.

CHAPTER 15:

<u>File Number</u>	<u>Description of change(s)</u>
15.TOC-1	Revised dates and sheet name.
15.00	Updated list of major changes.
15.01-7 and -8	Revised Spread Footing Data Table content and moved some Geotechnical Design Data Table content to next sheet.
15.02-13	Added embedment for prestressed concrete pile with CFRP strand.
15.03-2	Updated Spread Footing Data Table.

CHAPTER 17:

<u>File Number</u>	<u>Description of change(s)</u>
17.TOC-1, -2 and -4 thru -7	Revised dates.
17.00-1	Updated list of major changes.
17.02-3 and -4	Revised Spread Footing Data Table content, added Notes on Spread Footing Data Table and moved Pile Data Table content to next sheet.
17.03-12 and -15	Revised minimum bar size in footing corners and updated notes for footing dowel bars and lap requirements.
17.03-13 and -17	Revised bridge layout points to line thru center of bearings/piles. Revised bar size in footing corners and renumbered footing bars.
17.03-14	Added embedment for prestressed concrete pile with CFRP strand.
17.03-18	Revised bridge layout points to line thru center of bearings/piles and added last note.
17.05-3 and -4	Revised bridge layout points to line thru center of piles.
17.05-5 and -6	Revised Checklist Items 4 and 19 and File No. references in Checklist Items 11, 26 and 29.
17.05-7 and -8	Revised bridge layout points to line thru center of piles.
17.05-9 and -10	Revised Checklist Item 4 and File No. references in Checklist Items 11, 25 and 28.
17.07-3 thru -10	Revised bridge layout points to line thru center of bearings.
17.07-3, -4, -7 and -8	Revised bar size in footing corners and renumbered footing bars.

**REVISIONS:(cont'd)**

CHAPTER 17 (continued):

<u>File Number</u>	<u>Description of change(s)</u>
17.07-11 and -12	Revised Checklist Item 11 and File No. references in Checklist Items 28 and 31.
17.09-3 and -5	Revised bridge layout points to line thru center of bearings.
17.09-3	Revised bar size in footing corners and renumbered footing bars.
17.09-4	Updated sample sheet date.
17.09-6 and -7	Revised Checklist Item 9 and File No. references in Checklist Items 15 and 18.
17.10-3, -5, -6 and -8	Revised bridge layout points to line thru center of bearings.
17.10-4 and -7	Updated sample sheet date.
17.10-9 and -10	Revised Checklist Items 7 and 17. Revised File No. references in Checklist Items 21 and 24.
17.11-3, -4, -6 and -7	Revised bridge layout points to line thru center of bearings. Revised bar size in footing corners and renumbered footing bars.
17.11-5 and -8	Revised bar size in footing corners and renumbered footing bars.
17.11-9 and -10	Revised Checklist Item 6, removed 14 and renumbered the remaining items. Updated File No. reference in current 19.

**RETAIN THIS MEMO IN FRONT OF INDEX TO PART 2**

/original signed/  
Junyi Meng, P.E.  
Assistant State Structure and Bridge Engineer

For: Kendal R. Walus, P.E.  
State Structure and Bridge Engineer



# COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION  
1401 EAST BROAD STREET  
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**Stephen Brich**  
COMMISSIONER

October 5, 2018

**SUBJECT:** Manual of the Structure and Bridge Division – Part 2  
Design Aids – Typical Details

## MEMORANDUM

**TO:** Holders of Manual

### VOIDED:

None

### NEW ISSUES:

None

### REVISIONS:

#### CHAPTER 32:

#### File Number

#### Description of change(s)

32.TOC-1 and -4

Revised dates. Added Section 32.11.

32.00-1

Updated list of major changes to past practices.

32.011-1 thru -11

Added section on guidelines for the restorative maintenance and structural rehabilitation of culverts.

**RETAIN THIS MEMO IN FRONT OF INDEX TO PART 2**

/original signed/

Junyi Meng, P.E.

Assistant State Structure and Bridge Engineer

For: Kendal R. Walus, P.E.

State Structure and Bridge Engineer



**RELEASE LETTERS**

**PART 2**

**DESIGN AIDS AND TYPICAL DETAILS**

A complete set of all release (revision) letters is located at the following link:

[http://www.virginiadot.org/business/bridge\\_archives.asp](http://www.virginiadot.org/business/bridge_archives.asp)

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