

QUALITY ASSURANCE & QUALITY CONTROL

BRIDGE STRUCTURES

Project I.D. 5426-00-71
CTH C – STH 131
(Conway Valley Creek Bridge and Approaches)
CTH B
Crawford County

Structure B-12-0155

August 1, 2016



560 SUNRISE DRIVE
SPRING GREEN, WI 53588

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FINAL PLAN

GENERAL PLAN

- Same requirements as specified for preliminary plan except:
1. Verify the latest approved DOT boarder is being used.
 2. Verify title sheet information is correct on first drawing sheet.

Elevation View

- Same requirements as specified for preliminary plan except:
1. Show elevation at bottom of all substructure units.
 2. Give estimated pile lengths where used.

Cross-Section View

- Same requirements as specified for preliminary plan except:
1. For railroad bridges show a railroad cross-section.
 2. View of pier if the bridge has a pier(s), if not, view of abutment.

Grade Line

Same requirements as specified for preliminary plan.

Design and Traffic Data

Same requirements as specified for preliminary plan plus

1. Show Design Specifications as: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
2. Hydraulic Information, if Applicable
3. Foundations

- a. Give soil/rock bearing capacity or pile capacity (see table 11.3-5 for typical maximum driving resistance values).
- b. *The factored axial resistance of piles in compression used for design is the required driving resistance multiplied by a resistance factor of 0.5 using modified Gates to determine driven pile capacity.
- c. Repeat the note above on each substructure sheet, except the asterisk (*) and subsequent explanation of factored design resistance need not appear on individual substructure sheets.

Estimated Quantities

1. Enter bid items and quantities as they appear, and in the order in which they appear in the "Schedule of Bid Items" of the Standard Specifications. Put items not provided for at the bottom of the list. Enter quantities for each part of the structure, (superstructure, each abutment, each pier) under a separate column with a grand total.
2. Quantities are to be bid under items for the Structure Type and not by the "B" or "C" numbers. For example, concrete for a multi-cell box culvert exceeding a total length of 20 feet is to be bid under item Concrete Masonry Culverts and a bridge having a length less than 20 feet would be given a "C" number; however, the concrete bid item is Concrete Masonry Bridges.
3. For incidental items to be furnished for which there is no bid item, and compensation is not covered by the Standard Specs or Special Provisions, note on the plans the most closely related bid item that is to include the cost in the price bid per unit of item. As an example, the cost of concrete inserts is to be included in the price bid per cubic yard of concrete masonry.

DESIGNER CHECKER ENGINEER OF RECORD

JZ	P13	P13
JZ	P13	P13

JZ	P13	P13
JZ	P13	P13

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

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| 11 | Slope the bearing area utilizing non-laminated elastomeric bearings if the slope of the bottom of girder exceeds 1%. |
| 12 | Slope the bridge seat between bearings 1" from front face of backwall to front face of abutment. |
| 13 | Give all beam seat elevations. |
| 14 | Bar Steel Listing and Detail |
| 15 | Pile Plan & Splice Detail |
| 16 | <u>View Showing Limits of Excavation and Backfill</u> |
| 17 | Special Details for Utilities |
| 18 | Drainage Details |

Plan View

- 1 Place a keyed construction joint near the center of the abutment if the length of the body wall exceeds 50 feet. Make the keyway as large as feasible and extend the horizontal bar steel through the joint.
- 2 Dimension wings in a direction parallel and perpendicular to the wing centerline.
- 3 Dimension angle between wing and body if that angle is different from the skew angle of the abutment.

Elevation

- 1 Give beam seat, wing (front face and wing tip), and footing elevations to the nearest .01 of a foot.
- 2 Give vertical dimension of wing.

Wing Elevation

Wing Sections

Body Section

- 1 Place an optional keyed construction joint in the parapet at the bridge seat elevation if there is a parapet.

Piers

- 1 Use as many sheets as necessary to show all details clearly.
- 2 One steel may show several piers if only the height, elevations and other minor details are different.
- 3 Give dimensions for a skewed pier to a reference line which passes through the intersection of the longitudinal structural reference line and the pier centerline.
- 4 Show the skew angle.
- 5 Dimension the centerline spacing of superstructure girders.
- 6 Bar Steel Listing and Details
- 7 Pile Splice Detail (If different from abutment only)
- 8 Cross Section thru Column and Pier Cap
- 9 Detail anchor bolts between reinforcing bars to provide clearance. Long steel bridges may require more clearance. This allows an erection tolerance for the structural steel so that the bar steel is not pierced by the anchor bolts if the bearing is shifted.

Plan View

- 1 Show dimensions
- 2 Show footings
- 3 Show cap steps
- 4 Show beam spacings
- 5 Show skew angle

Elevation

- 1 Show dimensions
- 2 Show elevations
- 3 Show lengths of all columns for clarity
- 4 Give the elevation of the bottom of footings and beam seats
- 5 Refer to abutments for detailing bridge seats
- 6 Dimension all bar steel and stirrups

DESIGNER	CHECKER	ENGINEER OF RECORD
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NA	P13	P23
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Footling Plan

- 1 Show dimensions for pile spacing
- 2 Show pile numbers
- 3 Show reinforcing steel in footing

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Superstructure

- 1 Use as many sheets as are necessary to show all details clearly.
- 2 Standard insert sheets are available to show many standard details.
- 3 The title, project number, and a few basic dimensions are added to these standard sheets.

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All Structures

- 1 Show the cross-section of roadway, plan view and related details, elevation of typical girder or girders, details of girders, and other details not shown on standard insert sheets. All drawings are to be fully dimensioned and show such sections and views as needed to detail the superstructure completely.
- 2 For girder bridges: Show the total dead load deflections, including composite dead load (without future wearing surface loads) acting on the composite section, at tenth points of each span.
- 3 For standard bridges without raised sidewalks, the parapet/railing and median weights should be distributed equally to all girders and one deflection value given for all girders. Raised sidewalk weights, along with corresponding parapet/railing weights, should be applied to the supporting girders, only, and separate deflection values given for interior and exterior girders. When raised sidewalks are utilized, median weight should be distributed to interior girders. See Chapter 17
- 4 Superstructure – General for proper dead load distribution. For prestressed concrete girders, the dead load deflection reported does not include the weight of the girder.
- 5 See Chapter 24 – Steel Girder Structures for camber and blocking, top of steel elevation and deflection reporting criteria.
- 6 For slab bridges:
Provide camber values at the tenth points of all spans. The camber is based on 3 times the deflection of the slab, only. For multi-span bridges, the deflection calculations are based on a continuous span structure since the falsework supports the bridge until the concrete slab has cured. Deflection and camber values are to be reported to the nearest 1/8 inch.
- 8 For girder structures, provide finished grade top of deck elevations for each girder line at the tenth points of all spans. Show the top of deck elevations at the outside edge of deck at tenth points. If staged construction, include tenth point elevations along the construction joint. For slab structures, provide the finished grade elevations at the centerline and/or crown and edge of slab at tenth points.
- 9 Decks of uniform thickness are used on all girders. Variations in thickness are achieved by haunching the deck over each girder. Haunches are formed off the top of the top flange. See the standards for details. In general the minimum haunch depth along the edge of girder is to be 1 1/4" although 2" is recommended to allow for construction tolerances. Haunch depth is the distance from the bottom of the concrete deck to the top of the top flange.
- 10 Provide a paving notch at each end of all structures for rigid approach pavements. See standard for details.
- 11 If the structure contains conduit for a deck lighting system, place the conduit in the concrete parapet. Place expansion devices on conduit which passes through structure expansion joints.
- 12 Show the bar steel reinforcement in the slab, curb, and sidewalk with the transverse spacing and all bars labeled. Show the direction and amount of roadway crown.
- 13 On bridges with a median curb and left turn lane, water may be trapped at the curb due to the grade slope and crown slope. If this is the case, make the cross slope flat to minimize the problem. Existing pavers cannot adjust to a variable crown line.
- 14 On structures with modular joints consider cover plates for the back of parapets when aesthetics are a consideration.

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Steel Structures

- 1 Show the diaphragm connections on steel girders. Show the spacing of rail posts on the plan view.
- 2 Show a steel framing plan for all steel girders. Show the spacing of diaphragms.
- 3 On the elevation view of steel girders show dimension, material required, field and shop splice locations, stiffener spacing, shear connector spacing, and any other information necessary to construct the girder. In additional views show the field splice details and any other detail that is necessary.

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- 4 Show the size and location of all weld types with the proper symbols except for butt welds. Requirements for butt welds are covered by A.W.S. Specifications.
- 5 See Chapter 24 – Steel Girder Structures for camber and blocking, top of steel elevation and deflection reporting criteria.
- 6 Existing flange and web sizes should be shown to facilitate the sizing of bolts on Rehabilitation Plans.

Box Culverts

Detail plans for box culverts are to be fully dimensioned and have sectional drawings needed to detail the structure completely. The following items are to be shown when necessary:

- 1 Plan View
- 2 Longitudinal section
- 3 Section through box (If panels not identical, section through each panel)
- 4 Wing elevations
- 5 Section through wings (Include wingwall heel if wall height is 6' or over).
- 6 Section through cutoff wall (Include alternate sheeppile cutoff wall section).
- 7 Vertical construction joint
- 8 Bar steel clearance details
- 9 Header details
- 10 North point, Bench mark, Quantities
- 11 Bill of bars, Bar details
- 12 General notes, List of drawings, Rip rap layout
- 13 Inlet nose detail on multiple cell boxes
- 14 Corner details
- 15 Show name plate location on plan view and on wing detail.

See the standard details for box culverts for the requirements on vertical construction joints, apron and cutoff walls, longitudinal construction joints, and optional construction joints.

Utilities

Coordination with any utilities show on the preliminary plans and verify conflict or accommodations have been made.

Bench Marks

- 1 Bench mark caps are shown on all bridges and larger culverts.
- 2 Locate the caps on a horizontal surface flush with the concrete.
- 3 Show the location in close proximity to the Name Plate.

DESIGNER	CHECKER	ENGINEER OF RECORD
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N/A	N/A	N/A
N/A	N/A	N/A

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**Review of Quality Control by Project Director
Stating Checklist Items Conform to Project Plan.**

Date: 7/26/16