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J40-25 Bridge Standards - General Notes

The J40-25 Bridge Standards, if properly used, provide the structural plans necessary to construct 3-span 40'-0" roadway continuous concrete slab bridges with lengths of 70, 80, 90, 100, 110, 120, 130, 140 and 150ft.

These bridges may be built on a 0°, 15°, 30° or 45° skew. These plans show the bridges skewed in one direction, but all dimensions and details would be the same for the opposite skew.

These standards give most of the information necessary to build these bridges. However, the following additional information is required for use on primary routes. For secondary routes the Engineer may not require all sheets to be provided:

1. Title Sheet With Engineer's Seal
2. Estimated Quantities Totals Including Bld Item "Class 20 Excavation" for Bridge
3. Situation Plan Layout of Bridge
4. Top of Slab Elevations Layout
5. Bottom of Abutment Footing Elevations
6. Bottom of Pier Cap Elevations
7. Piling Design Information
8. Slope Protection Layout (if needed)
9. Conduit Layout
10. Lighting Layout (if needed)

For clarity, most sections shown on the following sheets are drawn with single slope barrier rail only. These sections will be identical for open rail barriers with any modifications shown on Open Rail Barrier Details Sheet J40-52-25 and Open Rail Barrier Quantities Sheet J40-53-25.

Note, that when approach pavement is to be placed, the temporary paving blocks shall be removed. The abutments for these bridges are built integral with the superstructure.

Therefore, it is important that a proper joint for expansion be provided. The BR-205 double reinforced 12-inch approach standard road plan shall be used with the J40 Standards. This standard ties the approaches to the Integral (movable) abutment and provides expansion movement (BE joint) at the end of the first approach slab panel.

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

The floor slab as shown includes 3/4-inch integral wearing surface.

All laps and development lengths are conservatively based on epoxy coated reinforcement regardless of reinforcement type.

The abutment design utilized on these bridges restricts their use in the following manner:

(1) These bridges are not to be used when point bearing for the abutment steel piling would be obtained on rock at a distance less than 27 ft. from the bottom of the abutment footing without any prebore and at a distance of less than 34 ft. from the bottom of the abutment footing when there is 10 ft. of prebore. A special analysis is required to use steel piling at the abutment, if point bearing occurs at a shallower depth.

(2) For the 140 ft. and 150 ft. long bridges the abutment piling are to be driven through oversized holes prebored to a minimum of 10 ft. below the bottom of footing. The prebored holes shall be in accordance with Section 2501.03.Q of the Standard Specifications. The elevation of the bottom of the prebored hole shall be shown on the plans.

The piers and abutments for these standards have been designed for the use of both friction and point bearing piles. It is necessary that the type and length for both the abutment and pier piles be designated on the front sheet of the plans.

The integral abutments and pile bents for these J40 Standards have been designed for the use of various types of pile footings as follows.

• Integral abutments: Timber piles or HP 10x42 piles at Bridge Design Manual (BDM) Article 6.2.6.1 Structural Resistance Level-1 (SRL-1)

• Pile Bents: Standard concrete-filled steel pipe piles (P10L), Standard prestressed concrete piles (P10L), or Standard H-piles (P10L and SRL-1)

For pile foundations the Designer will need to determine the construction control method, contract length, and driving target and give that information on the front sheet of the plans. Bridge Design Manual CADD notes E718, E719, E818, and E819 are appropriate for that purpose. The notes, as well as the Bridge Design Manual and design examples, are available on the Bridges and Structures Bureau web site.

For more information on SRL-1, see the Bridge Design Manual, located on the Iowa Department of Transportation, Bridges and Structures Bureau web site. For piers subject to scour the design bearing shall be obtained below scour elevation. Scour elevation shall be shown on the front sheet.

Keyway dimensions shown on the plans are based on nominal dimensions unless stated otherwise. In addition, the bevel used on the keyway shall be limited to a maximum of 10 degrees from vertical.

These bridge plans label all reinforcing steel with english notation (5a1 is 5/8 inch diameter bar). English reinforcing steel received in the field may display the following "Bar Designation". The "Bar Designation" is the stamped impression on the reinforcing bars, and is equivalent to the bar diameter in millimeters.

English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

Specifications:

Design: AASHTO LRFD Bridge Design Specifications, 10th Ed., Series of 2024.
Construction: Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2023, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions shall apply to construction work on this project.

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 10th Ed., Series of 2024.

Reinforcing steel in accordance with LRFD AASHTO Section 5, Grade 60, for epoxy and non-coated bars, and Grade 60 or 75 for stainless steel reinforcing
Concrete in accordance with LRFD AASHTO Section 5, $f'_c = 4,000$ psi,
Structural steel in accordance with LRFD AASHTO Section 6. ASTM A709 Grade 36 or Grade 50 (AASHTO M270 Grade 36 or Grade 50).

$n = 8$ for tension steel

$2n = 16$ for compression steel

HL-93 live load plus 20 lbs. per sq. ft. for future wearing surface.

End span length is used to calculate equivalent width in live load distribution.

Six foot of approach slab dead & live load included in abutment loads.

Control of cracking by distribution of reinforcement for slab design based on the AASHTO LRFD Bridge Design Specifications, 10th Ed., Series of 2024.

Latest Revision Date

Approved by Bridge Engineer

IOWA | DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

General Information, Notes &
Sheet Index

J40-01-25