PRELIMINARY DESIGN CHECKLIST – BRIDGE (CONNECT)

Date: July 2026

County:_____ **Design No.:**_____ **Check By:**_____ **Date:**_____

Project Location:_____ **Consultant:**_____

GENERAL

Abbreviations

___ Use as needed. Reference [BDM 13.1.4]

Title Block

___ "Design for (xx Skew) (RA)(LA)"

___ Structure Type and Size and Beam Type (e.g. "304'-0 x 40'-0 Pretensioned Prestressed Concrete Beam Bridge")

___ For bridge with multi-project staging, the structure width listed should be the width of the current stage plus all previously completed stages. (e.g. if stage 1 construction is 20 ft. and stage 2 construction is 30 ft., the first project title block should show 20 ft. and the second project title block should show 50 ft.) Show text: Stage 1, Stage 2 as-needed

___ Span Description (e.g. "101'-0 End Spans", "102'-0 Center Span")

___ For bridge on horizontal curve, show 'Radius = xxxx'

___ Station of bridge at center of bridge (offset needed for duals). Include roadway (e.g. "US 30 – Ramp D")

___ Current TSL Date (e.g. "July 2023")

___ County

___ "Iowa Department of Transportation"

___ "Design No.", "Design Sheet. No. x of x", "FHWA No."

___ Sheet Title (Ex. Situation Plan, Situation Plan-Site, or Situation Plan-Misc.)

Location

___ Location: Road over road/stream
Township/Range (e.g. "T-86/87N", "R-2/3W")
Section (e.g. "35/36")
Township Name
County
City of _____ (if needed)
Railroad Crossing: For replacement RR bridges use existing Federal Railroad Administration No. (FRA).
For new bridges FRA will be assigned later. The Iowa Crossing Number is no longer being used.
Bridge Maintenance Number – Show if known
FHWA No.: New number shall be provided and shown
Latitude/Longitude (6 decimal) at station of bridge at center of bridge (e.g. "12.345678/-12.345678")

Traffic Estimate

___ Traffic Data as shown in Road Plans – see CADD cell

Vertical Profile Data

___ Proposed profile grade detail - Vertical curve data include sta/elev of VPC, VPT, or g1/g2 end points as needed. Show slope digits to the thousandths (e.g. 2.484% vs. 2.48% See GEO file report).

Horizontal Curve Data

___ Horizontal curve data. Submit data if on super elevation.

Vertical Clearance Table

___ Include station/offsets/elevation (overhead/underpass), deck thickness, haunch, beam depth, vertical clearance. If needed, provide separate Staging Vertical Clearance Table.

Utilities

___ General Utility Symbols and Utilities Note Cell. Place a label on the plan view to identify areas that may be of potential conflict.

Recoverable Berm Location Table

___ Recoverable berm location table

Berm Slope Location Table

___ Berm slope location table

Hydrology & Hydraulic Data

___ Hydraulic data table – see data cell for appropriate application

___ For drainage areas greater than 10 sq.mi. a Riverine Infrastructure Database (RIDB) dataset is to be developed. Stream ID and river mile verified. [LRFD BDM 3.2.2.8]

Berm Slope Armoring for Stream Projects

___ Provide typical section showing embedded vs. non-embedded grading surface (e.g. "2'-0 Class E Revetment (Embedded)"). Show and label grading surface (e.g. "Grading Surface").

___ Use 9-inch thickness for erosion stone, typical 2' lining thickness for Class E and typical 3' lining thickness for Class B or C. Stone Toe lining may be thicker.

___ Note/label armoring station/offset limits

___ Show Revetment Quantities Table for bridge over waterway– see CADD cell for details.

Signature Block

__ State of Iowa Professional Engineering Seal covering Hydraulic Design – bridge over waterway/ or bridge sized RCB (includes Precast options and CIP options).

Staging

___ Staging sequence details if required

Railroad Bridges

___ Show macadam stone slope protection

___ Minimum horizontal clearance dimension to pier

___ For RR overpass provide heavy construction pier if center of track to face of column is less than 25'

___ Show fence if required

___ Add note stating fence type (curved - sidewalk/trail or straight – shoulder only)

___ UP/BNSF/CN/CP RR bridge - use 3'-8 barrier rail above RR ROW which may transition to 3'-2 outside of RR ROW when applicable

___ UP/BNSF/CN/CP RR bridges - do not add fence on bridge barrier rail unless required

___ UP/BNSF/CN/CP RR bridge - include standard sheet 1067

Temporary Bridges

___ If the bridge will be temporary, complete this checklist along with the Preliminary Design – Temporary Bridge checklist.

General Notes

General Notes shown on the TS&L are to be incorporated into the General Notes of the final plan set. The final designer shall delete these notes from the final TS&L. Example notes:

___ This design is for the replacement of the existing 240' x 26' Continuous I-Beam Bridge, Monona Design No. 1654, FHWA No. 037080, Maint. No. 6727.6S175.

___ Work under this design shall include removal of remnants of Monona Design No. 1530. Includes removal of substructure units and the removal of the 42' x 20' I-Beam approach span from the downstream channel.

___ The project will impact United States Geological Survey (USGS) stream gage 06607200, Maple River at Mapleton IA. Contact the USGS 30 days prior to construction that will impact the gage. USGS Contact: ?

___ The project will impact an Iowa Flood Center (IFC) stream sensor ID No. ENISH02, East Nishnabotna River (US 59) at Shenandoah. Contact the IFC 30 days prior to construction that will impact the sensor. IFC Contact: ?

Design Notes

Design Notes shown on the TS&L are intended to inform the final bridge designer of design decisions and other requirements. The final designer shall delete these notes from the final TS&L. Example notes:

___ Non-Standard Abutment Wing Wall

___ Standard Bridge Index No. ??? (e.g. J40, J44 etc.)

___ TL-? single slope Bridge Railing Proposed

___ Pier Type – (Frame, T, Pile Bent, Diaphragm, etc.) and assumed width. Note if pile bent is to be individually or fully encased. If needed, Pier Type can be changed by final design.

___ For grade separation bridges with width 30 feet or less, include a note stating that the pier type may be changed in final design

___ Provide vent hole in beam

___ As this project requires a sovereign lands permit, bid item reference notes shall restrict broken concrete as a substitute for revetment. [BDM 3.7.3.5]

___ Bridge aesthetics to be incorporated during final design

___ An Iowa DNR Flood Plain Permit (and/or Sovereign Lands Permit) is required. Preliminary Design will submit the joint application and place the permit(s) in the PW Regulatory_Permits subdirectory folder upon receipt.

___ The project is located within a levee critical zone. Section 408 approval is required. (Ref: BSB Attachment)

___ The bridge does not meet Iowa DOT's desired (operational or channel) freeboard per BDM 3.2.2.4 (list rationale). Final design aspects in the BDM related to inundation required.

___ The proposed bridge will be constructed using Accelerated Bridge Construction (ABC) methods. The ?? method has been chosen as the preferred method with a selected closure duration of ?? days.

___ Requirements for a state water trail or paddling route are applicable. Signage, plan notes, and bid items shall be addressed by the Design Bureau and included in the road plans. [BDM 3.2.2.11]

___ There is a potential for conflicts with existing foundations. (specify type and location(s))

___ Vehicle Collision Force [BDM 3.7.4] – use appropriate note: Pier #? is located within the acceptable clear zone of ?? feet.

- Collision requirements shall be evaluated during final design.
- The pier is exempt from Collision Force requirements due to site conditions as approved by the bridge project development engineer. (Ex. urban low speed between traffic signals)
- The pier is exempt from collision force requirements due to redirection or absorption of the collision load (verify during final design).
- The pier shall be designed for structural resistance to vehicular collision forces (ex. directly behind a roadway median barrier that is not structurally independent)

___ Final Design shall consider the need for temporary shoring to accommodate staging of bridge

construction and include in the final plans as necessary. (Conceptual temporary shoring may be shown, but it will be a final design task to consider any extent and plan needs.)

___ Final Design shall submit the U.S. Coast Guard permit application 6 months prior to letting [BDM 3.10.1]. (bridge projects over a navigable waterway)

___ Density used for Class ?? quantity calculations is ?? T/cy (e.g. 1.5 for Class E, 1.6 for Class B and C, 1.6 for Erosion Stone)

___ Debris and ice are not a concern at this site. The final designer may consider the use of individually encased pile bents rather than fully encased pile bents. Check with the BSB Preliminary Design Unit Leader before proceeding [see BDM 3.7.4]

___ Final design shall verify the number of beams and spacing.___ The site is in the proximity of an airport. The final designer shall coordinate with the Aviation Director of the Modal Transportation Bureau relative to potential requirements or restrictions.

Plan Notes

Plan Notes should remain on the final TS&L. Example notes:

___ 2-Span Grading Shown (see EW 203/204 - 5' offset)

___ Top of bridge deck (or slab for CCS) at centerline roadway is '?' above (or below) the profile grade to account for (if applicable, deck cross slope and) parabolic crown. See [LRFD BDM 1.7.1]

___ Class (C, E, etc.) revetment stone is (embedded or non-embedded)

___ The bridge will be designed to withstand the applicable effects of ice and the horizontal stream loads and uplift forces associated with the Q100 [BDM 3.2.2.4] (Use when a Flood Plain permit is required and Q50 operational freeboard is less than 3')

Miscellaneous

___ North arrow

___ Scale bar

___ Survey Control Point – Use coordinates/description per plan set

___ Border: "County", "Project No.", "File No.", "Sht. No. x of x"

___ Project (Phase) number in the border for all sheets. For routes and paren numbers that are not three digits, include the leading zero(s) before the route and paren numbers (eg. BRF-063-3(046)--38-62).

___ Situation Plan Sheets – See Guideline details for Situation, Site and Misc. Plan. For dual bridges, Site and Misc. Plan for each bridge to reflect unique information, notes and leveling. See [BDM C3.9]

___ Show bridge cross section – fully dimension, show lanes, shoulders, beams, deck cross slopes and rails. Check the standards for number of beams and spacing.

___ Bridge deck cross slopes to match through lane cross slopes. Shoulder slope to match adjacent lane slope.

___ Zone of Intrusion – verify dimensions/details when this situation applies

PLAN VIEW

___ Bridge Dimensions

- Show 'Face to Face of Paving Notches' dimension
- Show 'Centerline to Centerline Abutment Bearings' dimension
- Show 'Span #' and each span dimension
- Show proposed stations along centerline of approach roadway or baseline approach roadway at piers/abutments

___ Dimensions adjusted for horizontal and grade length within spans differing greater than 1/2 inch for PPCB bridges.

- Horizontal length stationing is measured from centerline to centerline abutment bearings and centerline to centerline spans. Label 'Horizontal Dimensions'.
- Grade length is measured for individual spans and bridge length along the grade from centerline to centerline abutment bearings and face to face paving notch (normal to grade). Label 'Along Grade Dimensions'. [LRFD BDM 1.7.2 and Figures]

___ Roadway designation(s)

___ Typical Approach Roadway Section - dimension lane/shoulder widths and show cross slopes

___ Trail/Sidewalk on Bridge Deck:

- To control water runoff on the bridge, verify whether a raised grade or on-grade trail/sidewalk is required based on an urban vs rural approach section and roadway vs stream crossing.
- The separation barrier and rail determination is indicated and is shown with correct width.
- Show clear opening dimension on bridge and ensure that rail attached to barrier does not encroach on required width
- Show appropriate parapet/fencing

___ Slope protection shown and labeled as to type.

___ POT stationing of mainline roadway construction centerline and side-road intersection

___ Skew angle – show actual in plan view and design skew in Title Block to nearest degree

___ Minimum vertical clearance location

___ Minimum horizontal clearance dimension to pier

___ Show assumed pier width(s), as applicable

___ Label guardrail – “Guardrail”

___ Arrows for direction of traffic

___ Dimension variable width bridges at abutments

___ Bridge abutment wing wall dimension shown if non-standard length used

___ Structures with no side piers – dimension berm toe offset

___ Show and label existing contours

___ Existing utilities shown, referenced line styles are at an appropriate scale for readability (include survey for fence-lines, tiles)

___ Existing and older remants of structures (bridge, culverts); label - type/size/station and design number

___ Other proposed structures (bridge, culverts) shown on TSL sheets; label - type/size/station and design number

- If structure not part of project (paren) or a tied project, also add ‘Not Part Of This Contract’ (Use this option for dual bridges, staged bridges unless let together or tied)
- If structure part of project (paren) or a tied project with different design number, also add ‘See Design ????’

___ Dimension side road lane and shoulder widths

___ Show proposed roadway embankment contours and ditch grading, if available.

___ Show proposed berm and any proposed channel or special grading contours

___ Label all centerlines and profile grade lines

___ Label stationing on at least two “tic” marks in the plan view

___ Stream name and direction of flow

___ Check text/dimensioning legible and not placed on top of other details

___ Proposed foundations do not conflict with existing foundations. (Unit leader approval required for exceptions-conflicts shall be noted).

___ Show existing ROW lines, if they are available in the project directory for referencing.

LONGITUDINAL SECTION

___ Bottom of footing elevation (Bott., Ftg., Elev.)

___ Slope protection: label type

___ Existing ground line and proposed grade line shown/labeled

___ Existing structure – substructure, piling (from as-built plans) when applicable, include previous structure remnants

___ Actual Berm slope labeled (e.g. 2.5:1 max, Normal)

___ Show Proposed and Staging (if needed) Vertical Clearance – show actual locations and dimensions

___ Top of berm elevation at abutments

___ Design streambed elevation

___ Q ‘Design’ water surface elevation as per H&H Data information

___ Abutment/pier deck (or slab for CCS) elevations along the centerline of approach roadway

___ Channel and Operational Low Beam – see BDM definitions. CADD - Point to elevation locations and label ‘Channel Low Beam’ and ‘Operational Low Beam’ but do not include elevations in the section.

___ Prebore Holes - Integral Abutments: show prebore holes 10’-0 deep from bottom of footing and 1’-4 diameter along centerline of abutment footing for bridge lengths greater than 130 feet. Dimension diameter and bottom of prebore hole elevation. Stub Abutments: not required.

___ Potential footing/piling conflicts noted. (Unit leader approval required).

___ Pile Bent Piers have been reviewed for unsupported height [BDM 3.7.4]

CADD Checklist

Refer to: CONNECT Applications

___ Verify Iowa Regional Coordinate System is correct for the project site.

___ Correct CONNECT ProjectWise folder structure is being used.

___ Correct seed files are being used.

___ Correct File naming conventions are being followed.

___ Correct Model naming conventions are being followed.

___ The correct levels, element templates, or features are used (this will ensure the correct font style is being applied).

___ Combine multisheet designs into one pdf file named TSL_CC_DDDD.pdf

___ Review the Iowa DOT Environmental Resource Survey Area (ERSA) design file to ensure the bridge and channel related work limits are included.