BRIDGE PLAN REVIEW CHECKLIST

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

Project Name: _____

1. GENERAL - ALL PROJECTS

1.1 Title Block

___ "Design For (xx Skew) (RA)(LA)" "Design For Repair To (xx Skew) (RA)(LA)." For bridge on horizontal curve, show 'Radius = xxxx'.

___ Structure Type and Size (Ex.: "188'-0 x 40'-0 Continuous Concrete Slab Bridge" or "300'-0 x 36'-0 Continuous Welded Girder Bridge").

___ For bridges with multi-project staging, the structure width listed should be the width of the current stage plus all previously completed stages. (Ex.: 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.) Add to the bridge title the stage (Ex.: Concrete Beam Bridge – Stage 1).

___ Span Description (Ex.: "41'-0 End Spans" or "71-0, 137'-0, 51'-0 Spans").

___ Sheet Title (Ex.: "General Notes & Bridge Quantities").

___ Station of bridge (mainline). Mainline bridge station should agree with T.S. & L. for new structure or previous plans for repair. Verify that Masterworks (PPMS) matches.

___ Turn In to Contracts Date (Ex.: "December 2013")

___ County

___ For design numbers located in a county different from the project number county, enclose the project number county in () after the design number county in the title block and sheet border (e.g. Johnson (Washington) County).

___ "Iowa Department of Transportation"

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

1.2 General

___ Check plan constructability. Sufficient details included to guide contractor. Staging sequence provided if required. Additional construction and staging considerations for substructures shall be considered. [See LRFD BDM 6.1.7]

___ Scale not shown on situation plan or any details.

___ Details consistent with Bridge standard sheets.

___ Non-standard details reviewed with appropriate personnel.

___ Soils sheets (as provided by Design Bureau) included in plan set (new design).

___ Cadd files drawn with the correct levels for printing color plans.

___ Lists of proprietary products specified in plans must have at least 3 products listed. Do not use "or approved equivalent" instead of designating a third product.

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

___ Standard abbreviations used. See [LRFD BDM 13.1.4].

___ Asbestos clearance has been verified for bridge removals. Include note E485 and appropriate bid item if Asbestos present.

___ Bent bar details include the note, "Note: All dimensions are out to out. D = pin diameter."

___ Paint color specified by SAE AMS-STD-595 color number.

___ For bridges over roadways check with Traffic and Safety Bureau if bridge-mounted signs will be required.

___ Staged bridges or structure (foundations) built adjacent to roadways reviewed for temporary shoring needs. Provide necessary details, plans notes, and bid items if temporary shoring is required to support earth below adjacent roadways.

___ Iowa DOT requirements for sheet callouts is to use Design Sheet Numbers (Ex. Refer to Design Sheet No. ?? for barrier rail details).

___ Validate any "By Others" notes referenced in plan set. Only work items in a separate contract are considered "By Others". Tied projects are not considered separate contracts.

___ Use the term "Slab" for Continuous Concrete Slab (CCS) bridges and "Deck" for all other types of bridges.

2. TITLE & LOCATION MAP SHEETS- ALL PROJECTS

2.1 Title Sheet

___ Title sheet conforms to current DOT format in the Bridge Plan Production Seed file.

___ "Sheet No. A.1" bottom right border.

___ Correct Project (Phase) Number (upper right side, right lower border and top left border of sheet).

___ Correct File Number (lower left border).

___ Correct PIN Number, and Project Directory Number (upper right side of sheet)

___ "Letting Date" filled in with the letting date (upper left border).

___ Table of applicable Bridge Standards included if necessary.

___ Boxed note referencing Road Standards on road sheets. Include the roadway and roadside sheet number(s).

___ Index of Seals (sheet number seal is located on, name and expertise). Add consultant firm information below this by asterix when needed.

___ County Name (center of sheet, lower border and bottom left border).

___ Proper sheet heading ("Primary", "Interstate", etc.)

___ Proper 'Work Type'. See Masterworks (PPMS) (Ex.: "Bridge New-Steel Girder") (center of sheet, top left border). Use the work type which represents the majority of the work in the project.

___ Verbal location at the center of the sheet should follow format "Route over feature crossed" and "Distance from major feature or intersection" (US 69 over Iowa River, 0.25 Mi. S. of S. Jct of C20).

___ FRA Crossing Number(s) agrees with Masterworks (PPMS).

___ Traffic data shown on title sheet unless more than one structure is included in the plans. For multi-structure plans show the traffic data on each individual situation plan and use the traffic data note on the seed title sheet that refers to individual situation plans for traffic data information. See [LRFD BDM 1.8.1.2].

___ Traffic data for both roadways shall be included for a separation grade crossing (overhead bridges).

___ Traffic data includes % trucks.

___ ROW project # - leave blank

___ Iowa One Call logo on title sheet.

___ Value Engineering Note

___ Iowa map in lower left-hand corner with county highlighted.

2.1.1 Index of Sheets

___ List Title Sheet and Map Sheet separately in the table (if needed).

____ List Revision Sheet (if needed).

___ List sheet containing 'Estimated Bridge Quantities' tabulation referenced (e.g. Estimated Quantities – Design No. XXX).

___ List remaining detailing sheets. Do not itemize bridge details sheets for standard projects; Indicate "Design No. xxx".

___ List soil profile sheets with "SPS" convention (e.g. SPS.xx – SPS.xx).

___ List overall sheet range for "Road Plans" (A.?? – X.??).

___ List separately sheet containing 'Estimated Roadway Quantities' in table (e.g. "C.1 Estimated Quantities – Road").

___ List standard "Road Plans" table (e.g. "C.2 Standard Plans – Road").

___ List separately summarizing pay quantities not included in the bridge and road tabulations referenced above (e.g., Roadside sheets, R sheets).

___ Separate "Index of Sheets" included for larger projects on Estimate Sheet or General notes sheet. (generally bridge plans in excess of 50 detail sheets).

2.2 Location Map Sheet

___ Location map has its own page.

___ "Sheet No. A.2" bottom right border.

___ Overall Iowa map in lower left-hand corner with county highlighted.

___ Remove references to scales.

___ North arrow, North is up.

___ Map Township/Range (Ex.: "T-87N", "R-2W").

___ For larger scale urban map, "Part of City of xx".

___ Leader to bridge location with text "Design No. xx", and "FHWA No. xx" (arrowhead should be larger than normal).

___ Standard Legend associated with county or city map as appropriate.

___ Ensure county or city map is properly scaled for legibility of the map on a printed page. Labels around the structure are visible. Location of structure needs to be obvious within a display region.

___ Region shown on the map includes at least one major feature nearby, such as a town/city, two primary roads intersecting, a county or state park, or a major body of water (lake or river).

3. ESTIMATE SHEET AND GENERAL NOTES – ALL PROJECTS

3.1 Estimate Sheet

3.1.1 Estimated Quantity Tabulation

___ Quantity tabulation for design provided on this first V-sheet for each structure.

___ Additional tabulated "Total Estimated Bridge Quantities" table for multi-design projects not required.

___ Tabulation title "Estimated Bridge Quantities". For repairs, include a title representing the repair project (Ex; "Estimated Bridge Repair Quantities").

___ In reinforcing bar lists, for variable length bars, the "varies" designation should be provided in the length column in lieu of an average length.

___ All Item Codes and Descriptions agree with Masterworks (PPMS)

___ Divisions in Masterworks (PPMS) are in proper order. For B03 plans, the Bridge Item Division(s) should be first followed by the Roadway Division(s). For B04 plans, the Roadway Item Division(s) should be first followed by the Bridge Item Division(s).

___ Estimated quantities reflect addition of itemized tables in plans.

___ Modified standard PPC Beam description/mark correct. See [LRFD BDM 5.4.1.4.2]. Reference on framing plan when required.

___ Include Construction Survey for all new bridges, deck replacements and widenings.

___ Include bid items "Fiber Reinforcement for Structural Concrete" and "Trial Batch and Test Placement" for all new bridges, deck replacements, widenings and overlays.

___ Mobilization bid item located with Estimated Bridge Quantities and not Roadway Quantities if the plans are to be turned in by the Bridges and Structures Bureau.

___ For widenings and major repairs, Construction Survey should include a general note E101 to field verify existing dimensions, etc.

___ RR Liability Insurance Bid Item included (if needed).

___ Include bid item "Containment" when preforming paint removal. See [LRFD BDM 12.1.9.5.2].

___ Roadway quantities note, in box.

___ When necessary for Streambank Protection, include bid items and quantities for rip-rap as shown on the Site Plan (e.g. Engineering fabric, Erosion Stone, Class 10 Excavation, Revetment, etc).

___ Ensure that roadway sheets do not duplicate quantities for rip-rap. Coordinate with Roadway design on these quantities when more extensive waterway protection measures are provided (i.e. wing dike protection).

___ Include bid item for HPC if applicable. Check map for HPC applicability [LRFD BDM 5.2.4.1.1.2].

___ Include bid item for Structural Concrete 4,500 psi or greater for non-standard deck concrete strength (f'c) as needed per PPCB Design Data Sheets [LRFD BDM 5.4.1.4.1.2].

___ When both HPC concrete and 4,500psi or greater concrete are needed for the deck, use the Structural Concrete 4,500psi or greater bid item and reference the Development Specification for HPC in the Estimate Reference Notes of this bid item.

3.1.2 Estimate Reference Information Notes

___ Estimate reference notes listing includes all applicable bridge related default notes stored in Masterworks (PPMS).

___ Removal of Existing Bridge item should include Inspection Information regarding Asbestos for all removals on replacement projects.

____ For bridge repairs, Removals As Per Plan note should include Inspection Information when only asbestos is present.

___ Include the note "Federal-Aid Non-Participating" for bid item "Deliver and Stockpile Salvaged Materials" and include the bid

item in a separate bid item division unless the project funding is Federal-aid non-participating (“N” prefix in project number)

___ Delete default estimate reference notes that are specific to roadway work or not applicable to design.

___ Include Developmental Specification for HPC if applicable in appropriate bid item. [LRFD BDM 5.2.4.1.1.2].

___ Include Developmental Specification Structural Concrete 4,500 psi or greater as specified by PPCB Data Sheets for the deck in this bid item. [LRFD BDM 5.4.1.4.1.2].

3.2 Summary Quantities Sheet

___ Included for all new bridge designs or bridge replacement projects. See [CADD M0349]

___ Indicate concrete quantities that include fiber reinforcement with an (F) after the quantity (e.g. 250 CY (F)).

3.3 General Notes Sheet

3.3.1 General

___ Traffic Control Note, in box.

___ Pollution prevention plan note. See [LRFD BDM 13.2.2] note E40, E40B, or E40C.

___ Repair, extension, and replacement projects: Include structure design history at this site” tabulation (see standard sheet 1038). New projects should not include a “Design history at this site” tab.

3.3.2 Specifications ‘Note’

___ Correct ‘Specifications’ note. Replace “????” with “2023” specification series year. See [LRFD BDM 13.2.2] note E50_.

___ Supplemental specifications, developmental specifications and special provisions listed by name. Do not include the specification number.

___ Electronic copy of supplemental specifications, developmental specifications and special provisions shall be uploaded into Masterworks (PPMS) prior to turn-in date (if necessary).

___ For fiber reinforcement in concrete mixes, include the appropriate Developmental Specification.

___ Include Developmental Specification for HPC if applicable. Check map for HPC applicability. [LRFD BDM 5.2.4.1.1.2]

___ Include Developmental Specification when using 4,500 psi or greater deck concrete as specified by PPCB Data Sheets. [LRFD BDM 5.4.1.4.1.2].

___ Include Developmental Specification for Mass Concrete – Control of Heat of Hydration, when applicable per BDM. [LRFD BDM 6.4.4.1, 6.5.4.1., 6.5.4.2, and 6.6.4.1.].

3.3.3 Design Stresses ‘Note’

___ Correct ‘Design Stresses’ note’. See [LRFD BDM 13.2.2] note E50_.

___ Include Fatigue Design for Structural Steel. See [LRFD BDM 13.2.2] note E50E.

3.3.4 General Notes

3.3.4.1 All Projects

___ All applicable ‘standard’ general notes (per design manual) provided. ‘Non-standard’ notes checked for need and do not conflict with standard specifications and standard plan details.

___ Scrape test note provided if painted steel is to be cleaned (and/or painted) or removed. See [LRFD BDM 13.5.2] notes E480. Include note E481 when scrape test sample indicates hazardous material.

___ Keyway dimension note included. See [LRFD BDM 13.5.2] notes E443.

___ Deformed reinforcing dowel note included. See [LRFD BDM 13.2.2] notes E48.

___ Working drawing and Calculation submittals item list note included. See [LRFD BDM 13.2.2] notes E65.

___ Include temporary bracing note for all new bridges and projects involving deck replacement. See [LRFD BDM 5.5.2.2.6] and [LRFD BDM 13.3.2] notes E202 and E204.

___ For widenings and major repairs, note E101 included to field verify existing dimensions, etc.

3.3.4.2 Repair Projects

___ Concrete sealer is to be applied to the vertical face and the top of the existing barrier rails. See [LRFD BDM 13.5.2] note E463.

___ Concrete sealer is to be applied to any abutment and pier beam seats below deck expansion joint [LRFD BDM 13.5.2] note E438.

___ ‘Removals, As Per Plan’ [LRFD BDM 13.5.2] note E440 provides complete listing of work included in item.

___ ‘Surface Raise’ [LRFD BDM 13.5.2] note E433 not used on projects with existing overlay.

___ A scrape test will not be required on the plans for expansion device repair situations. When removing bridge rails or steel beams that have paint on them, a scrape test is still required. See [LRFD BDM 13.5.2] notes E480 and E481.

___ For deck replacement projects over railroad crossings, include note E417.

3.3.4.3 New Designs

___ Bridge plan deck (slab) dimension table included for new bridges or bridge replacements. See [LRFD BDM 5.2.1.1] and [LRFD BDM 13.5.2] note E110.

___ Transparent stay-in-place deck forms are a Contractor’s option in certain conditions. See [LRFD BDM 5.2.4.5] and add note E235 if criteria are met.

___ Do not include concrete sealer note (in general notes listing). Cover under abutment and pier notes as required.

___ If footing will be below water table consider need for ‘Excavation and Dewatering’ note and companion bid item. Applicable when seal coat required. Alternative is Class 21 Excavation with cofferdam and footing constructed in the dry. See [LRFD BDM 6.6.4.1.4].

___ If “Excavation and Dewatering” is needed or crossing a meandered stream [LRFD BDM C3.10.1], consider need for “Working Day Water Elevation” note E836 [LRFD BDM 13.8.1].

___ Ensure any geotechnical report requirements, such as waiting period between embankment construction and pile driving and/or pile points, are addressed in general notes. See [LRFD BDM 13.3.2] notes E175.

___ A girder erection plan needs to be submitted when a steel bridge meets one of the conditions found in [LRFD BDM 5.5.2.4.4]. See [LRFD BDM 13.2.2] note E70 and [LRFD BDM 13.9.2] note E905.

4. SITUATION PLAN

4.1 New Construction

4.1.1 General

___ Review and verify Preliminary Design Checklist for TSL.

___ Hydraulic seal included on all design numbers including alternates.

___ UP RR bridges, show macadam stone protection on TS&L and assume same during plan development. If UP RR asks us to change to concrete slope protection we will do so, retroactively.

___ Profile data. Verify profile information with roadway design.

___ Include Bridge Staking Coordinates Table. See [LRFD BDM 1.8.4].

___ Remove "Design Notes" from Preliminary TSL for final Situation Plan.

4.1.2 Plan

___ Shoulder and approach pavement widths and slopes (include foreslope) shown for main and crossing roadway. Verify information with roadway design.

___ Horizontal curve data. Verify information with roadway design.

___ Alignments and stationing along CL of approach roadway (and equations as applicable). Verify information with roadway design. Label profile grade line.

___ Proposed ditches and pipes shown. Verify information with roadway design.

___ Any removals to be performed by Bridge Contractor designated.

___ Drains called out if not shown in plan view elsewhere. See [LRFD BDM 5.8.4].

___ Guardrail shown (if not installed under contract check for appropriate general note).

___ Stream or crossing highway name.

___ Utilities information cell references Roadway plans (or correct roadway project number).

4.1.3 Longitudinal Section

___ Pier Class 20 and 21 excavation classification lines, when required.

___ Modify the following elevations:
CL abutment and CL pier along CL of approach roadway
Bottom of footing
Bottom of predrilled hole for pile
Top of berm
Low Beam elevation ("OPERATIONAL" and "REGULATORY") as shown on TSL

___ Piling description (length and type).

___ For structures with piers, label pier type as fixed or expansion as appropriate.

4.2 Repair/Overlay Projects

4.2.1 General

___ Location information near title block. Example:
US 151 Over Maquoketa River
T-87N R-2W
Section 36
Cascade Twp.
Dubuque County
Railroad X-ing: Federal Railroad Administration Identification No. (FRA) .
Bridge Maint. No. 3609.9S137
FHWA # _____
Latitude XX.123456°
Longitude XX.123456°

4.2.2 Plan

___ Alignments and stationing.

___ 'Face to Face of Paving Notches' dimension shown.

___ Bridge and curb/rail width.

___ Highway name shown.

___ Legend of work to be performed.

5. STAKING DIAGRAM- NEW CONSTRUCTION

___ Provide for curved alignments, alignments that do not coincide with CL bridge (dual roadways), bridges with special widths (climbing lanes, tapers, etc.).

___ Dimension gutterline at abutment. Note skew of gutterline at abutment relative to structure baseline (or other logical control line) if appropriate.

___ C.L. of approach roadway shown as the primary staking control line. For curved bridges a chord baseline is the control line. The chord is defined by the intersection of the C.L. of the abutments and C.L. of approach roadway.

___ Provide dimension of substructure units but do not show pile locations. This includes pile bent piers where only the pile cap should be dimensioned. Piles can be shown if potential conflicts with existing piles are a concern.

6. SUBSTRUCTURE – GENERAL – NEW CONSTRUCTION

___ Pile information for each substructure unit noted adjacent to piling layout. To include type.

___ Unsupported length of pile checked for pile encased with CMP behind MSE walls. (e.g., Maximum depth of bentonite is 15 ft. for HP10x42. Fill CMP with sand below bentonite).

___ Prestressed concrete pile: Tip-out soil layer blow count 25 to 40 and no boulders.

___ Steel and wood pile lengths rounded to 5' intervals.

___ Battered and vertical pile for a substructure unit specified same length (typically).

___ Drilled shaft CSL tube layout shown.

___ Column tie substitution note for drilled shafts (circ. ties for spiral) and bar detail included (Spacing consistent with pitch of spiral).

___ Anchor bolts set in drilled holes (per standard specifications - 2405.03, H, 2) if at all possible. When placing anchor bolts, avoid longitudinal bars in the cap.

___ Anchor bolts are not preset on two adjacent fixed piers.

___ Welding restrictions note included when preset anchor bolts are specified. See [LRFD BDM 13.9.2] note E924.

___ Anchor bolt layout detailed appropriately. See [LRFD BDM 5.7.4.4.2].

___ Check concrete least dimension of substructure units to see if the developmental specification for mass concrete – control of heat of hydration is applicable. See [LRFD BDM 6.4.4; 6.5.4; 6.6.4]

___ Show the "Low Step" elevation for all substructure units.

___ If HP10 piling are used only one of the sizes is used.

___ Abutment backfill details included.

7. PIER DETAILS - NEW CONSTRUCTION

7.1 General

___ Only one 'set' of pier notes provided in design to avoid inconsistencies.

___ Include pier pile notes E718 for LRFD contract length and resistance and E719 for LRFD driving and construction control. See [LRFD BDM 13.8.2].

___ For piers with expansion device include note regarding concrete sealer. See [LRFD BDM 13.3.2] note E181.

___ On pier plan view and footing plan view dimensions are tied into the bridge construction baseline and the baseline is labeled

appropriately. Coordinate with 'Staking Diagram' or 'Foundation Layout.'

___ Pier reinforcing marks conform to The Bridges and Structures Bureau pier detailing practice [LRFD BDM Table 6.6.4.1.1.2].

___ For the piers, if the top of cap keyway is not shown in the pier cap plan, place a note in the pier notes to refer to the design sheet where the keyway is shown (generally standard sheet 4500, superstructure details).

7.2 Cap

___ Pier steps normal to face of pier for expansion pier and parallel to center of roadway (with skew) for fixed pier. See [LRFD BDM 6.6.4.1.1.2].

___ Pier step reinforcement provided when required. See [LRFD BDM 6.6.4.1.1.2].

___ Cap reinforcement epoxy coated if under expansion device.

___ Minimum of 5" clear space between rebar provided for tremie.

7.3 Column

___ Column reinforcement epoxy coated if within 25' clear distance from edge of travel lane or under expansion device [LRFD BDM 6.6.4.1.2.2].

___ Heavy Construction or crash wall for RR overpass (check T.S.L., generally provided if center track to face column is less than 25')

___ Spiral ties shown for typical circular column (non-spirally reinforced, 12" spacing).

___ Column tie substitution note (circ. ties for spiral) and bar detail included (12" spacing).

___ Spacing of vertical bars in round column provided.

___ Keyway shown at top and bottom of column and labeled as to size and type. A 3 x 10 dressed and beveled strip is used for T-piers [LRFD BDM 13.8.2] note E701]

___ d1, column bars and d2, column to footing bars, should be same size.

___ Space in the column reinforcing provided to accommodate tremie. See [LRFD BDM 6.6.4.1.2.2].

___ If hooked bars are used projecting from columns provide 12" opening for the tremie. See [LRFD BDM 6.6.4.1.2.2].

7.4 Footing

___ Perimeter pile battered. See [LRFD BDM 6.6.4.1.3.1].

___ Note if battered pile used: "Pile dimensions shown are at bottom of footing. Batter piles X:1 in the direction shown".

___ Pile cutoff for battered piling horizontal. See [LRFD BDM 6.2.5].

___ Include bearing resistance note E835 for spread footings. See [LRFD BDM 13.8.2].

7.5 Pile Bent

___ Appropriate pile type provided based on blow count. See [LRFD BDM 6.2].

___ Pile size appropriate for unsupported length, which includes scour depth. See [Standard sheet P10L].

___ If P10L standard applicable, include P10L sheet in the bridge plans and list the sheet in the Standards Plan Box.

8. ABUTMENT DETAILS - NEW CONSTRUCTION

8.1 General

___ Only one 'set' of abutment notes required in design to avoid inconsistencies.

___ Include abutment pile notes E818 for LRFD contract length and resistance and E819 for LRFD driving and construction control. See [LRFD BDM 13.8.2].

___ On 'Part plan at abutment' and 'Abutment pile plan' beam and pile spacing (as appropriate) is tied into the bridge construction baseline and the baseline is labeled appropriately.

___ Paving block detail included if the approach is not to be placed by bridge contractor. See [LRFD BDM 6.5.1.1.1; 6.5.1.1.2].

8.2 Stub Abutments

___ Stagger pile between front and back rows to maximize clearance between piles. Behind MSE walls piling may need to be aligned to clear MSE wall straps.

___ Pile batter indicated (typically 4:1).

___ Abutment step reinforcement provided. See [LRFD BDM 6.5.4.2.2].

___ For stub abutments include note regarding concrete sealer. See [LRFD BDM 13.3.2] note E181.

___ For stub abutments behind MSE wall note E55 is included. See [LRFD BDM 13.2.2].

8.3 Integral Abutments

___ Is pile pre-bore required and if so is it noted in the appropriate place in the plans (bid-item included on estimated bridge quantities sheet, and on long. section of situation plan).

___ Constraints for use of integral abutments within bridge parameters. See [LRFD BDM Table 6.5.1.1.1].

___ Abutment step reinforcement not required (m and n bars).

___ CWPG Superstructure: Beam end reinforcing bars per design manual shown. See [LRFD BDM Figure 6.5.1.1.1].

9. SUPERSTRUCTURE DETAILS - GENERAL - NEW CONSTRUCTION

9.1 General

___ All new bridges, bridge replacements, deck replacements, and bridge widenings shall include polypropylene fibers in the deck pours. See [LRFD BDM 5.2.4.1.2]

9.2 Typical Section

___ Drain details included.

___ Drain note specifies cost in 'Structural Concrete', 'Structural Steel' or 'Deck Drains' bid item, as appropriate.

___ Beam spacing is tied into the bridge construction baseline and the baseline is labeled appropriately.

___ Permissible longitudinal construction joint provided for roadway width >80' or if the roadway is tapered. Label "Permissible". See [LRFD BDM 5.2.4.1.2].

___ If anticipated dead load deflection greater than 2", closure pour required with longitudinal joint.

___ Tributary deck width shall be considered when determining haunch thickness and beam line haunch elevations particularly for bridges involving staged construction and closure pours. See [LRFD BDM 5.2.4.1.2]. Beam lines adjacent to a closure pour with reduced tributary weight shall specifically state in a plan note that deflections are based on tributary deck width without any closure pour weight included so that field personnel are aware that no adjustment to the deflections is required.

___ Minimum closure pour width shall be the greater of 3 ft or the splice length plus 4". Closure pours should be placed in areas with constant cross slope in the bridge deck. Closure pours over beams and in vehicle wheel path should be avoided.

___ Closure pour to be placed continuously from end to end of the deck.

___ If longitudinal construction joint provided (either permissible or mandatory), transverse reinforcing bars are spliced at joint and weight of splice included in quantity.

___ If construction is staged over multiple construction seasons, exposed transverse deck (slab) reinforcing shall be stainless steel lapped with epoxy coated reinforcing on each side of the construction joint. See [LRFD BDM 5.2.4.1.2; LRFD BDM 5.8.5.1.1]

___ For variable width bridge deck (slab) placements, the sections should be uniform width. Use permissible longitudinal joints to separate the tapered sections.

___ If transverse reinforcing bars will be > 40' and no longitudinal construction joint is shown on plans, transverse reinforcement splice note included. See Standard Sheet 4310.

___ Table of 'b2' bars (PPCB) from standard drawing not shown (this is for designer information only).

___ For both standard and non-standard, non-varying bridge widths, show the cross-sectional area of the bridge deck (slab) listed on the plans within a box. See Standard Sheet 4560.

___ For bridges with sidewalks, liquid curing compound finishing note included for sidewalk surface.

___ For bridges with sidewalks, cover plates are detailed at expansion joints to be ADA compliant if necessary.

___ Trench type drains in sidewalks use ADA compliant grates.

9.3 Typical Section

___ Deck (slab) placement sequence shown (if required) with applicable notes. Note shall address whether end to end deck (slab) pours are permitted. Include 48 hour wait and minimum strength note E926 between pours. See [LRFD BDM 5.2.4.1.2].

___ Deck (slab) placement sequence consistent with IA/DOT practice - address uplift concerns if they exist. Pour positive moment sections first, then negative.

___ For widenings and staged construction, include note E1036 to the deck (slab) placement notes.

___ Proper transverse joint type shown. Skewed 'Alternate Transverse Construction Joint' shown with stepped joint. See [LRFD BDM Table 5.2.4.1.2 and Table 5.6.2.4.2].

___ Both longitudinal and transverse construction joint details provided if a stepped transverse construction joint is shown.

___ Longitudinal dimensions labeled as 'Out to Out of Deck (Slab)'.

___ Longitudinal construction joint shown (if applicable)

___ Transverse and longitudinal deck (slab) reinforcing layout details adequate.

___ For variable width bridges, vary lap splice for transverse bars rather than vary length of transverse bars. However, minimize number of different bar lengths.

9.4 Deck (Slab) Elevation Layout

___ Format of diagram consistent with IA/DOT practice.

___ Spacing provided for deck elevations along C.L. of beam (8' to 10' range preferred). See [LRFD BDM 5.2.4.1.2].

___ For CCS bridges using 'J' standard superstructure sheets, slab elevation spacing matches the spacing on form camber diagram.

___ Steel bridge deck elevations correspond with the deflection information provided.

___ Transverse elevations provided at the centerline of bearings but not the centerline of pier, (unless the centerline of the bearings corresponds with the centerline of the pier).

___ Deck elevations provided along the centerline of approach roadway, all beam lines, each gutter line and longitudinal construction joint if required.

___ Included beam line haunch elevation sheet for both PPCB and steel girder bridges.

___ Include "Crown Template" detail and define the dimension 'X' on the deck (slab) elevation sheet when the profile grade line is at the centerline of approach roadway. See [LRFD BDM 1.7.1].

10. SUPERSTRUCTURE DETAILS - CWPG - NEW CONSTRUCTION

10.1 Girder Details

___ Shear stud diameter 7/8".

___ Part plan view of stiffener details (section thru girder) provided.

___ Weld for flange to web noted as "Submerged Arc Welding".

___ Shear stud height varies with top flange thickness. See [LRFD BDM 5.5.2.4.1.8].

___ Intermediate girder termination crossbeam has shear studs (dropping girder line).

___ Weathering steel notes included for weathering steel bridges. See [LRFD BDM 13.9.2] note E930.

___ Painting of weathering steel on exterior girders fascia on median side required if opening between two bridges is less than 30 ft. See [LRFD BDM 5.5.2.4.2].

___ Painting of weathering steel for "tunnel-like" conditions. See [LRFD BDM 5.5.2.4.1.2].

___ Flange width increase clipped 2.5:1 at bolted splice. If the difference between top or bottom flange widths on either side of a field splice exceeds 2 inches, then the wider flange should be clipped at a 1:1 transition.

___ If flange plate size is increased exclusive of a bolted connection, request that analysis be made using larger plate between bolted connections and add appropriate note regarding substitution. See [LRFD BDM 5.5.2.4.1.6].

___ Label tension and compression zones. Based on net tensile stress under Strength Load Combination 1. See [LRFD BDM 5.5.2.4.2].

___ ASTM F3125 Grade A325 7/8" diameter bolts are typical.

___ Preferred maximum girder length between splice points 120'.

___ Note E904 included for most steel girders. See [LRFD BDM 5.5.2.1.1].

___ Note E204 included for temporary bracing of steel girders.

10.2 Superstructure Details

___ Flange deflector detail provided if necessary. See [LRFD BDM 5.5.2.4.2].

___ Correct bearing specified based on reaction.

___ Table of rocker and expansion joint settings included.

___ For bridges with closure pours the bracing in the bay to have the closure pour is to be installed after the second stage has been poured and prior to placing the closure pour. The bolt holes shall be field drilled in the cross-bracing members to provide allowances for fit up of the diaphragms. See [LRFD BDM 5.2.4.1.2].

___ Shop welded splice note included. See [LRFD BDM 5.5.2.4.2].

___ Detail included for Flange Butt Weld Splice. See [LRFD BDM 5.5.2.4.1.13].

___ Temporary deck overhang detail included. See [CADD M0144], and [LRFD BDM 5.4.1.2.5]. 9 kip live load.

10.3 Deflection Diagram

___ Format of camber, haunch and dead load deflection diagrams consistent with Design Manual. Typically, interior girder only shown unless unusual circumstances.

___ For 'Camber and Blocking' diagram 'Keep' dimensions (measured from 'chord between abut. bearings' or horizontal line) provided at all bearings (including '0 Keep' noted at abutment(s)).

___ Dimension from 'chord between abutment bearings' or horizontal line to 'top of web' shown as an individual value at the midpoint and ends of each girder segment (segment is considered end to splice or splice to splice). See [LRFD BDM 5.3.3.2] and [LRFD BDM C.5.3.3.2].

___ Dimension from both 'chords' to 'xx of web' shown at midpoint of parabolic camber.

___ Moment and reaction table, consistent with IA/DOT practice, included in plans.

___ Locations of the dead load deflection values should correspond to the deck elevation locations.

11. SUPERSTRUCTURE DETAILS - PPCB - NEW CONSTRUCTION

11.1 Framing Plan (If Provided)

___ Dimensions adjusted for slope - element lengths only - not horizontal lengths.

11.2 Superstructure Details

___ Appropriate intermediate diaphragm type used (concrete for road overpass, steel all others); steel for bulb tee beams.

___ Intermediate diaphragm details, do not use the note from standard sheet 1036 ("At locations under longitudinal bridge floor . . . ") when a longitudinal joint is not permitted.

___ Intermediate diaphragms placed at the correct locations when using a beam span greater than 120 ft. See [LRFD BDM 5.4.1.4.2].

___ Deck thickness of 8" (200 mm). See [LRFD BDM 5.2.1.1].

___ For bridges including a precast deck panel option check the use of precast deck panels is allowed and include the precast note below the Total Estimated Quantities Tabulation. See [LRFD BDM 5.2.4.3].

___ For prestressed concrete beam bridges with intermediate concrete diaphragms, the diaphragm shall not be placed in the bay where the closure pour is to be placed.

___ For prestressed concrete beam bridges with steel intermediate diaphragms, the diaphragm bolts used in connecting the channel to the bent plate shall remain loose until the second stage has been poured then tightened before the closure pour.

___ Appropriate bearing used. See [LRFD BDM 5.7].

___ Appropriate deck placement note. Note shall address whether end to end deck pours are permitted. See [LRFD BDM 13.9.2] note E926.

11.3 Beam Details

___ Current 'Strand Projection at Beam Ends' detail used, with strands upward.

___ Non-Standard beam details/notes reviewed with appropriate staff for need and adequacy.

___ Shear reinforcing modifications provided for haunch >2".

___ Required vent holes provided (stream crossings, per T.S.L.)

___ General notes from the beam standard sheets starting with 'If . .' reviewed for applicability. If applicable, delete the 'implied option' portion of the note (Ex. "If the steel diaphragm option is allowed and used"). If not applicable, note is not used.

___ General note from the beam standard sheet "The portions of the prestress beams that are to be embedded . . ." reviewed for applicability (abutment?, pier?)

___ Modified standard beam mark is consistent with bid item description. See [LRFD BDM 5.4.1.4.2].

___ Concrete sealer details included for the ends of PPC beams under bridge joints (typically for stub abutments), see IM 570 and standard sheets 1036.

12. DETAILS - REPAIR/OVERLAY PROJECTS

12.1 General

___ Existing conduit shown and labeled on typical section.

___ Typical section indicates cross slope of deck (slab).

___ Adequate details provided to define location and scope of concrete repair work.

___ Overlay: Correct number of drains noted for 'Floor repair detail at drains.'

___ Re-Overlay: Classification line shown correctly for bridges with existing overlay. Classification line will be 1/4" below the original classification line.

___ Ready mix trucks are not allowed on the deck (slab) for overlay or re-overlay projects. Add updated note E447. See [LRFD BDM 12.1.8.1].

___ All new HPC-O overlays shall include polypropylene fibers in the concrete pour. See [LRFD BDM 12.1.9.1.2]

12.2 Temporary Barrier Rail

___ Reduced width signing plan provided if lane width less than 14'-6. See [LRFD BDM 12.1.8.2].

___ 'F-Shape' used for minimum lane 12'-5 interstate mainline, 10'-6 primary. H-Pile section used when these minimums cannot be provided.

___ Traffic lane and work area shall be correctly shown on the staging cross sections of the bridge sheets for each construction stage with location of the TBR shown. The staging widths shall be coordinated with the traffic control details of the roadway plan. Traffic lane width should be noted as "minimum" on the bridge sheets.

___ For bridges with sidewalks, coordinate traffic control with Design Bureau to maintain pedestrian access during construction. See [LRFD BDM 12.1.8.2].

___ Typical layout of the rail for one-way and two-way traffic is shown on Road Design Details 8210 and 8212. See [LRFD BDM 12.1.8.3] for details of the placement policy.

12.3 Backwall Repair/Barrier Rail Footings

___ Detail specifying limits of Class 20 excavation and backfill materials provided.

___ Backwall: Note specifying that subdrain and backfill included in Class 20 excavation: The cost of furnishing and placing subdrain (including excavation), floodable backfill, porous backfill, and subdrain outlet is to be included in the price bid for "Excavation, Class 20". No extra payment will be made.

___ Backwall reconstruction consolidation note included. See [LRFD BDM 13.5.2] note E461.

13. BARRIER RAIL

13.1 New Construction

___ Electric conduit shown. See [LRFD BDM 5.8.1.2.1].

___ Use 2" or 3" conduit as appropriate. See [LRFD BDM 5.8.1.2.1].

___ Check that Road Standard LI-104 for junction boxes is included if applicable (typical when conduit in barrier rail).

___ Remember special 3'-8 rail for UP RR bridges.

___ UP RR bridges, assume 10:1 transition for barrier rail, as taller rail is required.

___ UP RR bridges, do not add fence (splashboard) unless UP RR says that we must.

___ For bridges with super elevations >2%, level the low side of the rail and keep high side of the rail perpendicular to the deck (slab) (i.e. on same superelevation) for "Jersey and F type" rails only. Details should be drawn accordingly.

___ For aesthetic barrier rail, check details with BSB Methods Unit and see [LRFD BDM 5.8.1.2.5].

___ Class D concrete is not allowed – appropriate barrier rail notes are included. See [LRFD BDM 5.8.1.2.6].

___ Interstate mainline bridges detail TL-5 railing. See [LRFD BDM 5.8.1.2.1].

___ Stainless steel reinforcing barrier rail dowel bars. See [LRFD BDM 5.2.1.1; 5.8.1.1.1; 5.8.1.2.1.1]; Standard sheets 1017S, 1018S, 1018SA-D2, 1019SA-B2, 1020SA-F, 1028SA, [CADD M0356].

14. EXPANSION DEVICE

14.1 General

___ "Or approved equivalent" indicated in table of approved devices.

___ Latest designation for glands and extrusions shown.

___ Non-weathering steel galvanized finger joints are preferred.

14.2 Repair/Retrofit

___ Extrusion field splice detail included.

15. SUBDRAIN/SLOPE PROTECTION DETAILS

15.1 Subdrain Details

___ Show subdrain bent around wingwall footings.

___ Standard 1007, 1007A, or 1007B as appropriate for overhead bridges. Include the subdrain outlet detail.

___ Standard 1007C as appropriate for stream/river crossings. Include the subdrain outlet detail specific to type of channel protection (embedded or non-embedded)

___ Show and dimension deck drain locations on plan view.

___ Include splash basin details under deck drains where appropriate (unprotected groundline)

___ Estimate and show lenths of perforated subdrains and outlet elevations)

15.2 Slope Protection Details

___ As determined by Preliminary Design, show for overhead bridges with standard berms 2.5:1 or flatter. Steeper berm slopes or abutments constructed behind walls require non-standard details by special design.

___ Slope protection appropriate for site (Macadam Stone preferred over Concrete Erosion Stone). See standard sheets 1006-1006E.

___ Perforated Subdrain must be shown at the toe of slope. Coordinate installation with Roadway (Bridge plan versus roadway plan).

15.3 Channel Protection Details

___ As determined by Preliminary Design, show for bridges with standard berms 2.5:1 or flatter. Steeper berm slopes or abutments constructed behind walls require non-standard details by special design.

___ Include slope protection detail sheet appropriate for site as detailed on the Site Plan (e.x. Revetment and Erosion Stone for stream/river crossing). See standard sheets 1007-1007C.

15.4 Wing Armoring Protection Details

___ Include wing armoring to match type of slope or channel protection of the berm (See standard sheet 1005 or 1005A)

___ Include wing armoring to match type of slope or rip rap protection of the berm.

___ Show subdrain placement around wing footing. Show true wing geometry.

16. LIGHTING DETAILS

___ Standard sheet modified to reflect the work to be performed to include:
- Elimination of details for conduits not provided (underdeck, sign, etc.)
- Modification of elevation and plan views to reflect abutment type
- Elimination of light pole bases and expansion fitting details if not used.

___ Sheet to show elevation view of conduit along bridge.

___ When installing light pole conduit to multiple bases along the bridge, 1" conduit is shown coming into pole base from both directions along bridge in plan view of pole base.

___ For bridges in urban areas or interchanges lighting requirements coordinated with Traffic and Safety Bureau and District.

17. AESTHETICS

___ Deck drain standard detail sheets 1054 used for bridges including aesthetic details.

___ Use of flush pier end diaphragm confirmed with BSB Methods Unit.

___ Concrete coating type confirmed with BSB Methods Unit and appropriate Developmental Specifications/Special Provisions included in references.

18. APPROACH SIDEWALK

___ For bridges with sidewalks the sidewalk approach slabdetail sheet is included.

19. ROADWAY PLANS

____ Check that approach roadway plans are either in the bridge project plans (preferred) or a tied roadway plans associated with the bridge.

___ Road sheets include necessary PE seals for roadway and geotechnical design. (Typically, a CS sheet requires a geotechnical seal).

___ R sheets with site maps (RC, RR and RU) are included. Landscape design seal included. (For projects with tied roadway plans, the R sheets will be included in the tied project.)

___ Erosion Control, including seeding, fertilizing, and mulching, bid items (ALL projects) - do not include as incidental items. Items should be on R sheets.

___ Verify abutment type (fixed or movable) and BR roadway standard (i.e. BR-203, BR-204, or BR-205) in roadway sheets are appropriately identified for bridge abutment type. For non-standard designs, ensure approach pavement design matches up with paving notch details.

___ Traffic control bid items (all projects where required by traffic control plan). If project is tied to a larger roadway plan, check that bid items are included in the tied project.

___ Traffic control plan current and acceptable to Design Bureau and District (For projects with tied roadway plans, the J sheets will be included in the tied project.)

___ PPP current, consistent with grading plan and acceptable to Design Bureau. PPP should be in the R sheets.

___ Longitudinal grooving quantitiy and tabulation includes area from bridge deck. Appropriate plan note placed in General Notes in bridge plans. See [LRFD BDM 5.2.4.1.2]. Longitudinal grooving typically belongs with the approach pavement sheets (preferred). Quantity for bridge and approach grooving shall all be bid under the same bid item “Longitudinal Grooving in Concrete, Bridge Deck”.

____ Verify guardrail bid items and standard road plans (BA-200 series) listed in the road sheets. If project is tied to a larger roadway plan, check that Design Bureau has included the guardrail in either the tied road sheets or the bridge project. Urban bridges on reduced speed roadways may have a tapered concrete end section.

____ If project is on a paddling route as shown on the Iowa DNR map, verify restricted padding signage included in the roadway (J) sheets. (map: https://www.iowadnr.gov/things-do/paddling-and-river-recreation/where-paddle)

____ When junction boxes are required in the bridge rail, request/verify the Road sheets contain the road standard LI-104.

REFERENCE ABBREVIATIONS

BA – BArriers (standards)
BR – BRidge approach (standards)
BDM – Bridge Design Manual
CADD – Computer Aided Drafting and Design
CCS – Continuous Concrete Slab
FHWA # – Federal Highway Administration Number
FRA – Federal Railroad Administration
HPC – High Performance Concrete
LA – Left Ahead
LI – LIghting (standards)
LRFD- Load and Resistance Factor Design
PE - Professional Engineering
PPCB – Pretensioned Prestressed Concrete Beam
PPMS – Program and Project Management System
PPP – Pollution Prevention Plan