CULVERT 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)”.

___ Structure Type and Size (Ex.: “Twin 12’ x 12’ x 240’-0 RCB Culvert” “10’ x 10’ x 320’-0 RCB Culvert”).

___ Sheet Title (Ex.: “General Notes & Culvert Quantities”).

___ Station of culvert (mainline). Mainline culvert station should agree with T.S. & L. for new structure or previous plans for repair. Verify that Project Scheduling System (PSS) matches.

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

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

___ “Iowa Department of Transportation - Highway Division.”

___ “Design Sht. No. x of x”, “File No.”, “Design No.”

___ Box around title block.

1.2 General

___ Check plan constructability. Sufficient details included to guide contractor. Staging sequence provided if required.

___ Scale not shown on situation plan or any details.

___ Details consistent with culvert standard sheets.

___ Non-standard details reviewed with appropriate personnel.

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

___ Project number in the border all sheets for each design. For routes that are not three digits include the leading zero(s) before the route number (e.g. BRF-063-3(46)—38-62).

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

___ Precast culvert alternate is included for culverts meeting the alternate criteria. See [LRFD BDM 7.3].

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

2. TITLE SHEET - ALL PROJECTS

2.1 General

___ Title sheet conforms to current DOT format posted on Bridges and Structures Bureau web site. Bottom border should state “Bridges and Stuctures Bureau”.

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

___ Correct PIN Number (upper right side of sheet).

___ Correct File Number and Project Directory Name (lower border).

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

___ Culvert Standard Plan Box.

___ Boxed note referencing Road Standards on road sheets.

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

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 sheet.

___ Tabulation title “Estimated Culvert Quantities”

___ Column in tabulation for ‘As-Built’ quantities.

___ All Item Codes and Descriptions agree with Project Scheduling (in-house projects) or Bid Items Application (consultant projects). - OK to use ‘short’ description.

___ Estimated quantities reflect addition of itemized tables in plans.

___ Roadway quantities note, in box.
3.1.2 Estimate Reference Information Notes

3.1.2.1 All Projects
___ Estimate reference notes listing includes all applicable default notes stored in Project Scheduling (in-house projects) or Bid Items Application (consultant projects).

3.2 General Notes Sheet

3.2.1 General
___ Traffic Control Note, in box.
___ Pollution prevention plan note. See [LRFD BDM 13.2.2] note E40__.
___ Repair/Extension Project: Design history tabulation (see standard sheet 1038/M1038). New projects should not include a "design history at this site" tab.

3.2.2 Specifications ‘Note’
___ Correct ‘Specifications’ note. See [LRFD BDM 13.7.2] note E601__.
___ Supplemental specifications, developmental specifications and special provisions listed by name.
___ Electronic copy of special provisions (if necessary) placed in the special provision turn in folder.
___ If Standard ‘G1’ applies, do not duplicate.

3.2.3 Design Stresses ‘Note’
___ Correct ‘Design Stresses’ note. See [LRFD BDM 13.2.2] note E50__.
___ If Standard ‘G1’ applies, do not duplicate.

3.2.4 General Notes

3.2.4.1 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.
___ If Standard ‘G1’ applies, do not duplicate General Notes.

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

4. SITUATION PLAN (Placed after Estimated Quantities sheet and General Notes sheet)

4.1 New Construction

4.1.1 General
___ Location information near title block. Example: (Relocated) US 151 Over Maquoketa River T-87N R-2W Section 36 Cascade Twp. Dubuque County
City of _______ - on all RCB culverts > 20’ along roadway
Latitude XX.123456° Longitude XX.123456°
Bridge Maintenance No. (if replacing existing bridge)
___ Traffic estimate shown.
___ Hydraulic data
___ Profile data, check for coordination with roadway design.
___ 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, check for coordination with roadway design.
___ Horizontal curve data, check for coordination with roadway design.
___ Alignments and stationing along CL of approach roadway (and equations), check for coordination with roadway design. Label profile grade line.
___ Proposed ditches and pipes shown, check for coordination with roadway design.
___ Any removals to be performed by culvert contractor designated.
___ ‘Back to back of parapets’ dimension shown.
___ Length from centerline roadway left to back of parapet dimension shown.
___ Length from centerline of roadway right to back of parapet dimension shown.
___ Lengths of individual sections dimension shown.
___ Angle of skew tangent from centerline of roadway dimension shown.
___ Label headwall size and skew angle. Indicate “Inlet” and “Outlet”.
___ Existing structure(s) shown.
___ Highway name.
___ Pertinent structures and features close enough to influence construction shown (utilities, old structures, etc.).

4.1.3 Longitudinal Section
___ Channel excavation limits with slopes, dimensions and elevations.
___ Following elevations labeled and shown:
___ Foreslopes labeled (6:1, etc.) (additional slopes when applicable (e.g. flumes and drop inlets)).
___ Benchmark
___ Dimension fill height (Use 1’ increments). See Culvert Design Manual for metric conversion.
___ “Anticipated settlement = ___ ” below view title.
___ Bell joints standard note, if necessary.
4.2 Repair/Extensions Projects

4.2.1 General

___ Location information near title block. Example:
US 151 Over Maquoketa River
T87N R2W
Section 36
Cascade Twp.
Dubuque County
City of __________
Bridge Maint. No. 3609.9S137 - on all RCB culverts > 20’ along roadway
FHWA # _______ - on all RCB culverts > 20’ along roadway
Latitude XX.123456°
Longitude XX.123456°

___ Traffic counts for current year.

4.2.2 Plan

___ Alignments and stationing.
___ 'Back to Back of Parapets' dimension shown.
___ Highway name shown.
___ Legend of work to be performed.

5. DETAILS - REPAIR/EXTENSION PROJECTS

5.1 General

___ For an existing culvert that is being extended and the headwall is
at a skew to the culvert (not perpendicular) the culvert is "not" to
be squared up. The headwall is to be removed but the proposed
culvert is to be attached along the skew line.

___ If an existing culvert is being extended at a different skew, for
spans less than 8’, a minimum 3’ section (on the shortest wall) is
to be attached to the existing culvert prior to the proposed bend.
For spans 8’ or longer, a minimum 5’ wall section is to be used.

___ If an existing culvert is non-standard, it is to be extended with the
same size non-standard culvert (assuming an RCP would not
work).

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

5.2 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 min. lane 12-5 interstate mainline, 10'-6" primary. H-Pile section used when these
minimums cannot be provided.

___ Traffic lane and work area widths shown on rail layout plan.
Correct lane width shown on standard sheet 1049 note. Traffic
lane width should be noted as 'minimum'.

6. RCB CULVERTS

___ If fill exceeds maximum used for standards, check that culvert
program has been run and output matches values on plan. If
metric culvert, check that program output has been converted
properly.

___ Check that fill height is included in general notes. Design
assumption is that floor of culvert is not placed on bedrock.

___ Prefer to use Special Backfill when a granular blanket is
necessary. Include default estimate reference note that prohibits
RAP/HMA.

___ Use of working blanket consistent with SPS sheets. Use granular
blanket to refer to required material and working blanket to refer
to optional material for the contractor.

___ Check if openings for pipes, or weepholes are necessary.

___ For culverts without fill current notes and details are used. See
[LRFD BDM 7.2.4.5.1].

7. CAST IN PLACE CULVERTS

___ When using a non-standard barrel, the bell joint sheet must also
be modified.

___ Check for appropriate use of bell joints. If flume, include bell
joints at junction of culvert end barrel section and flume. If
tapered inlet, include a bell joint at junction of tapered inlet and
culvert barrel section.

___ Bends located internal to section, not at joint locations.

___ End barrel section minimum/maximum lengths. See [LRFD BDM
7.2.4.5.2.1].

___ Avoid joints below centerline of roadway (especially for 5’ of fill or
less), if possible.

8. PRECAST CULVERTS

___ Dimension length of straight barrel sections on Situation Plan.

___ Dimension End Section length.

___ Dimension "G" length as indicated on precast culvert end section
standards on Situation Plan.

___ Multiple barrel culverts include Standard Sheet 1082P.

___ Include Installation Plan when using precast boxes under existing
bridges. See [LRFD BDM 13.7.2] note E685.

9. FLOWABLE MORTAR

___ Proposed flowable mortar RCB culverts for bridge replacement
should allow a minimum of 3'-0 vertical clearance for bridge
beam spacing less than 6'-0, minimum 1'-0 vertical clearance for
bridge beam spacing 6'-0 or greater and minimum 1'-6 horizontal
side clearance. See [LRFD BDM 7.2.4.10].

___ Provide a detail in an elevation view showing dimension of
vertical clearance from top of culvert to bottom of existing bridge
low beam or deck.

___ Provide a detail in an elevation view showing dimension of
horizontal clearance from sides of culvert to existing bridge
substructure.

___ Vent hole layout for flowable mortar placement. See [LRFD BDM
7.2.4.10].

___ Show removal limits if required. (Removal of railing, end sections,
curbs, etc.)
10. ROADWAY PLANS

___ Erosion control, including seeding and mulching, bid items (all projects) - do not include as incidental items.

___ Traffic control bid items (all projects where required by traffic control plan).

___ Traffic control plan current and acceptable to Design Bureau.

___ PPP current, consistent with grading plan and acceptable to Design Bureau.

REFERENCE ABBREVIATIONS

BDM – Bridge Design Manual
CADD M – CADD Memo