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SECTION 6 – PLAN FORMAT AND CONTENT

The following is intended to be a guide for structure plans preparation of typical structures. It was derived by summarizing format and content from typical plans previously prepared by the Office of Bridge Design and does not represent an all-encompassing specification for plans preparation of structures. However, the format outlined in this section and Appendix F will be followed as close as practical.

6.1. Cast-In-Place Box Culvert Plans

See Appendix F for example plan sheets – Cast In Place Box Culvert

6.1.1. Sequence of Sheets

General Drawing and Quantities
Notes and Undercut Details
Inlet Details
Outlet Details
Barrel Details
Details of Standard Plate No's 460.02 & 460.10
Details of Standard Plate No. 620.16

6.1.2. GENERAL DRAWING AND QUANTITIES

1. Title Block in lower right corner
 - 1.1. Title (name) of sheet (with site and alternate if applicable)
 - 1.2. Description of structure type, size, location, orientation and design loading
 - 1.3. Structure No., Project No., PCN., County, Owner, Date, and structure plans sheet number
 - 1.4. Bridge Code Number (X___ reference no.) for bridge length culverts (top width greater than 20 ft. along centerline of roadway)
 - 1.5. Block at bottom showing initials of those who the plans were Designed By, Checked By, Drawn By and Approved By
 - 1.6. For Topeka Shiner Habitat, an asterisk by the stream name with a note to the left of the title block indicating "Topeka Shiner Habitat"

2. Block in upper right corner of sheet including the State, Project No., Sheet No. and Total No. of Sheets in Section E (section method plans) or in full set of plans (non-section method plans) (common to all sheets)
3. Index of Culvert Sheets in upper right corner (preferred location: if room does not allow, place elsewhere on sheet) with Bridge Code No. (if applicable)
4. Estimated Quantities Box below Index of Culvert Sheets
 - 4.1. Listing of all contract bid items, their units, and total quantities for the structure.
 - 4.2. Standard notes below quantity box
5. Plan View of proposed box culvert oriented such that the longitudinal centerline of the box is parallel to the top margin of the sheet and the left & right ends of the box are left & right, respectively, of the centerline of roadway when looking ahead stationing.
 - 5.1. Horizontal dimensioning: overall culvert length; length left & right of centerline roadway; length of inlet & outlet; barrel section lengths; wing & heel dimensions; barrel span length; wall thicknesses; erosion protection limits, working point locations
 - 5.2. Roadway template including centerline of roadway, subgrade shoulders, and slope break points with distances and slopes shown normal to the centerline of roadway
 - 5.3. Inlet/Outlet sections and barrel sections labeled numerically from left to right
 - 5.4. Other items: centerline station; skew angle; flowline elevations along box centerline; construction joints; working points; wing flares; direction of flow; erosion protection; north arrow
6. Elevation View of box culvert projected down from the Plan View
 - 6.1. Dimensions: barrel rise; slab thicknesses; inlet & outlet vertical dimensions; depth of erosion protection
 - 6.2. Roadway template along the centerline of culvert with elevations shown at the centerline of roadway, subgrade shoulders and slope break points along with horizontal dimensions

- 6.3. Inlet/Outlet sections and barrel sections labeled numerically from left to right
- 6.4. Other items: flow line elevations along centerline of box; flow line gradient; construction joints; erosion protection, Design High Water Elevations at the inlet
7. Horizontal and Vertical Curve Data (with diagrams)
8. Table of Working Points with Station and Offset to each W.P.
9. Hydraulic Data
10. Survey Datum Note
11. Identification of firm or office that prepared plans

6.1.3. NOTES AND UNDERCUT DETAILS

1. Title Block in lower right corner (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Standard plan notes along left margin
3. Undercut and Backfill details
 - 3.1. Undercut Layout (Plan of undercut bottom dimensions) corresponding to the orientation of the General Drawing with centerline rdwy, direction of flow, North arrow and critical dimensioning
 - 3.2. Typical Section (Cross section of undercut and backfill showing dimensions and limits with respect to the bottom slab of box)
4. Estimated Quantities Box

Listing of all contract bid items, their units, and quantities for the undercut and backfill

6.1.4. INLET DETAILS

1. Title Block in lower right corner (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner

- 2.1. Listing of all reinforcing bars for the inlet by Mark, Number, Size, Length and Type
- 2.2. Bending Details showing bar bend lengths for Types other than straight.
- 2.3. Cutting Diagrams for linearly varying length bars with the same designation
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box

Listing of all contract bid items, their units, and quantities for the Inlet and Inlet Apron (if used) separately
4. Legend for Placing Re Steel Box in the right margin under the Estimated Quantities Box

Descriptions of abbreviations used in the detailing of reinforcing steel in the Elevation Views of the Inlet
5. Plan View of Inlet and Inlet Apron (if used)
 - 5.1. Details of reinforcing steel in Apron (#4 bars @ 12" cntrs.), wing heels (footings), and parapet
 - 5.2. Dimensions: wing, heel, and toe (fillet) lengths; wing and cut off wall thicknesses
 - 5.3. Other items: wing flare angles; working points; locations of Section A-A, Section E-E, and Detail "X"
6. Elevation View of Inlet projected from the Plan View
 - 6.1. Details of reinforcing steel in heel, cut off wall, and each face of wing wall
 - 6.2. Dimensions: wing length; wing height at end; depth of cut off wall; slab thickness; height of Inlet
 - 6.3. Location of Section C-C
7. Detail of the junction of the wing to the barrel at the bottom slab (Detail "X")
 - 7.1. Details of reinforcing steel tying wing slab to barrel slab, and barrel cut off wall reinforcement
 - 7.2. Working point and location of Section B-B

8. X Section of parapet at top slab (Section A-A)
 - 8.1. Dimensions and reinforcing details for parapet and 45 deg. bevel (Inlet end only)
 - 8.2. Location of View D-D (Inlet end only)
9. X Section of barrel cut off wall at bottom slab taken normal to face of cut off wall (Section B-B) with cut off wall dimensions and reinforcing details
10. X Section of wing near junction with barrel taken normal to face of wing (Section C-C)
 - 10.1 Dimensions and reinforcing details for wing, wing slab, and cut off walls
 - 10.2 Optional Construction Joint and 2"x 3" Keyway Joint locations
11. View D-D showing detail of parapet bevel and fillet at wall locations (Inlet only)
12. X Section of Inlet Apron (if used) and apron cut off wall (Section E-E) with Dimensions and reinforcing details for Inlet Apron and apron cut off wall
13. Standard Notes

6.1.5. OUTLET DETAILS

(Same format and content as Inlet Details sheet except for Outlet instead of Inlet)

6.1.6. BARREL SECTION DETAILS

1. Title Block in lower right corner (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for the S1 Barrel Section by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for Types other than straight.
 - 2.3. Cutting Diagrams for linearly varying length bars with the same designation
3. Estimated Quantities Box in the right margin below the Reinforcing Schedule Box

Listing of all contract bid items, their units, and quantities for the Barrel Section(s)

4. Legend for Placing Re-Steel Box in the right margin below the Estimated Quantities Box with description of abbreviations used in the detailing of reinforcing steel
5. Plan View of Barrel Section(s) showing barrel length, and details of reinforcement in slab faces and wall X sections

Barrel length shown from construction joint to inside of parapet, or to adjacent construction joint for interior barrel sections

6. Elevation View of Barrel Section showing details of reinforcement in wall faces and slab X sections
7. X Section of Barrel Section showing barrel dimensions and reinforcing details with design fill height in parentheses below section reference
8. Standard Optional Fillet Detail
9. Standard Notes

6.1.7. DETAILS OF STANDARD PLATES No's 460.02 & 460.10

1. Year Plate Details (No. 460.02)
2. Box Culvert Barrel Tie Reinforcement (No. 460.10)
3. Title Block (Abbreviated Version)

6.1.8. DETAILS OF STANDARD PLATE NO. 620.16

1. Fence Anchors for Box Culvert Wing Walls (No. 620.16)
2. Title Block (Abbreviated Version)

6.2. Precast Box Culvert Plans

See Appendix F for example plan sheets – Precast Box Culvert

6.2.1. Sequence of Sheets

General Drawing and Quantities

Notes and Undercut Details

Details of Standard Plate No's 460.02 & 560.01

Details of Standard Plate No's 560.20 & 620.16

6.2.2. GENERAL DRAWING AND QUANTITIES

1. Title Block in lower right corner
 - 1.1. Title (name) of sheet (with site and alternate if applicable)
 - 1.2. Description of structure type, size, location, orientation and design loading
 - 1.3. Structure No., Project No., PCN., County, Owner, Date, and structure plans sheet number
 - 1.4. Bridge Code Number (X____ reference no.) for bridge length culverts (top width greater than 20 ft. along centerline of roadway)
 - 1.5. Block at bottom showing initials of those who the plans were Designed By, Checked By, Drawn By and Approved By
 - 1.6. For Topeka Shiner Habitat, an asterisk by the stream name with a note to the left of the title block indicating "Topeka Shiner Habitat"
2. Block in upper right corner of sheet including the State, Project No., Sheet No. and Total No. of Sheets in Section E (section method plans) or in full set of plans (non-section method plans) (common to all sheets)
3. Index of Culvert Sheets in upper right corner (preferred location: if room does not allow, place elsewhere on sheet) with Bridge Code No. (if applicable)
4. Estimated Quantities Box below Index of Culvert Sheets
 - 4.1. Listing of all contract bid items, their units, and total quantities for the structure.
 - 4.2. Standard notes below quantity box

5. Plan View of proposed box culvert oriented such that the longitudinal centerline of the box is parallel to the top margin of the sheet and the left & right ends of the box are left & right, respectively, of the centerline of roadway when looking ahead stationing.
 - 5.1. Horizontal dimensioning: overall culvert length; length left & right of centerline roadway; length of inlet & outlet; barrel section lengths; barrel span length; wall thicknesses; erosion protection limits
 - 5.2. Roadway template including centerline of roadway, subgrade shoulders, and slope break points with distances and slopes shown normal to the centerline of roadway
 - 5.3. Other items: centerline station; skew angle; flowline elevations along box centerline; direction of flow; erosion protection; north arrow
6. Elevation View of box culvert projected down from the Plan View
 - 6.1. Dimensions: barrel rise; slab thicknesses; depth of erosion protection
 - 6.2. Roadway template along the centerline of culvert with elevations shown at the centerline of roadway, subgrade shoulders and slope break points along with horizontal dimensions
 - 6.3. Other items: flow line elevations along centerline of box; flow line gradient; construction joints; erosion protection, Design High Water Elevations at the inlet
7. Recessed Flowline note (if applicable)
8. Horizontal and Vertical Curve Data (with diagrams)
9. Hydraulic Data
10. Legend with symbols and definitions
11. Identification of firm or office that prepared plans

6.2.3. NOTES AND UNDERCUT DETAILS

1. Title Block in lower right corner (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Standard plan notes along left margin

3. Undercut and Backfill details
 - 3.1. Undercut Layout (Plan of undercut bottom dimensions) corresponding to the orientation of the General Drawing with centerline roadway, direction of flow, North arrow and critical dimensioning
 - 3.2. Typical Section (Cross section of undercut and backfill showing dimensions and limits with respect to the bottom slab of box)
4. Estimated Quantities Box with listing of all contract bid items, their units, and quantities for the undercut and backfill

6.2.4. DETAILS OF STANDARD PLATES No's 460.02 & 560.01

1. Year Plate Details (No. 460.02)
2. Precast Box Culvert Tie Bolt Assembly Details (No. 560.01)
3. Title Block (Abbreviated Version)

6.2.5. DETAILS OF STD PLATES for INLET/OUTLET & FENCE ANCHORS

1. Standard Plate No. 560.10, 560.11, 560.20 or 560.21 as appropriate for inlet/outlet used
2. Fence Anchors for Box Culvert Wing Walls (No. 620.16)
3. Title Block (Abbreviated Version)

6.3. Continuous Concrete Bridge Plans

See Appendix F for example plan sheets – Continuous Concrete Bridge

6.3.1. Sequence of Sheets

General Drawing

Estimate of Structure Quantities and Notes

Notes (Continued)

Subsurface Investigation and Piling (and Drilled Shaft or spread footing, if used) Layout

Abutment Details

Bent (or other intermediate substructure unit) Details

Superstructure Details

End Block, Barrier Curb & Drain Details

Details of Bridge End Backfill

Details of Approach Slab Adjacent to Bridge

Approach Slab Joint Details

Riprap Details (if required)

Details of Standard Plate No's 460.02 & 460.05

Details of Standard Plate No's 510.40 & 620.18

Details of Standard Plate No. 630.92

6.3.2. GENERAL DRAWING

1. Title Block in lower right corner
 - 1.1. Title (name) of sheet
 - 1.2. Description of structure type, size, location, orientation and design loading
 - 1.3. Structure No., Project No., PCN, County, Owner, Date, and structure plans sheet number
 - 1.4. Bridge Code Number (X___ reference no.)
 - 1.5. Block at bottom showing initials of those who the plans were Designed By, Checked By, Drawn By and Approved By
 - 1.6. For Topeka Shiner Habitat, an asterisk by the stream name with a note to the left of the title block indicating "Topeka Shiner Habitat"
2. Block in upper right corner of sheet including the State, Project No., Sheet No. and Total No. of Sheets in Section E (section method plans) or in full set of plans (non-section method plans) (common to all sheets)

3. Index of Bridge Sheets in upper right corner (preferred location: if room does not allow, place elsewhere on sheet) with Bridge Code Number
4. Plan View of proposed bridge oriented such that the centerline of roadway is parallel to the top border of the sheet and stationing increases from left to right
 - 4.1. Horizontal dimensioning: overall bridge length; span lengths; overall superstructure width; roadway width; curb width; left & right. distances to curb line from centerline roadway; approach slab length & width; deck drain spacing; berm top width; erosion protection limits
 - 4.2. Centerline of roadway stations & elevations and left & right curb elevations at Begin & End Bridge and centerline of Abutments & Bents
 - 4.3. Other items: bridge centerline station; skew angle; flow direction; stream name; roadway template for overpass structures; centerlines of roadway and survey; centerlines of bridge & channel; centerlines of Abutments & Bents; existing structure limits; berms and berm slopes; piles; erosion protection; north arrow
5. Elevation View of bridge projected down from the Plan View along lines parallel to the centerlines of the substructure units
 - 5.1. Elevations: bottom of substructure units; top of berms; channel flow line; roadway typical section points (if overpass structure), limits of erosion protection; Design High Water levels
 - 5.2. Dimensions: column length; bent cap and footing thickness; channel bottom width; erosion protection thickness; horizontal and vertical clearances (if overpass structure)
 - 5.3. Profile of existing ground line, new berms and channel along the centerline of roadway
 - 5.4. Substructure units labeled numerically from left to right
 - 5.5. Other items: structure excavation reference line; berm slopes, piles: erosion protection
6. Horizontal and Vertical Curve Data (with diagrams)
7. Hydraulic Data
8. Curb and Centerline Elevation detail showing curb and centerline elevations, with camber included, at span 1/4 points

9. Identification of firm of office that prepared plans

6.3.3. ESTIMATE OF STRUCTURE QUANTITIES & NOTES

1. Title Block (abbreviated from General Drawing)
2. Estimate of Structure Quantities table along left margin with listing of all structure contract bid items, their units, and total quantities for structure
3. Structure Plan Notes

6.3.4. NOTES (CONTINUED)

1. Title Block (abbreviated from General Drawing)
2. Structure Plan Notes (continued from sheet no. 2)

6.3.5. SUBSURFACE INVESTIGATION AND PILING LAYOUT

1. Title Block (similar to General Drawing except the Bridge Code No, PCN and Topeka Shiner Habitat information not present)
2. Subsurface investigation information (prepared by the Geotechnical Engineering Activity)
3. Plan view of footing and pile layout for new substructure
 - 3.1. Centerline of roadway and survey line; centerlines of substructure units; locations of existing substructure (when interference is anticipated); spacing of new piles or shafts; centerline stations of abutments & bents; skew angle; flow direction of stream; north arrow
 - 3.2. Heavy border line separating Piling Layout from plan of subsurface investigation if drawn separately

6.3.6. ABUTMENT DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner

- 2.1. Listing of all reinforcing bars for the abutment by Mark, Number, Size, Length and Type
- 2.2. Bending Details showing bar bend lengths for types other than straight
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
4. Listing of all contract bid items, their units' and quantities for each Abutment
5. Plan View of Abutment oriented such that the back face of the Abutment is toward and parallel to the top border
 - 5.1. Horizontal Dimensions: overall abutment length; wing lengths; distance left & right of centerline roadway, along the back face of abutment, to outside of curbs; abutment thickness; wing thickness
 - 5.2. Details of reinforcing steel in Abutment
6. Other items: Begin & End Bridge stations; arrow indicating direction of increasing stations for each abutment; centerline of abutment; centerline of roadway; skew angle; faces of abutment; piles; X Section location references
7. Elevation View of Abutment projected down from the Plan View
 - 7.1. Dimensions: wing heights; height from bottom of Abutment to construction joint at centerline of roadway & outside of curbs and to top of slab at centerline of roadway; height from construction joint to top of wing at outside of curbs and to top of slab at centerline of roadway; pile embedment; and pile spacing
 - 7.2. Details of reinforcing steel in Abutment
 - 7.3. Other items: elevations at bottom of Abutments; construction joints; crown slope; piles; centerline of roadway; slab and curbs (phantom lines)
8. X Section of Abutment taken near centerline of roadway (Section A-A)
 - 8.1. Abutment reinforcing details
 - 8.2. Other items: pavement rest (notch) dimensions; construction joint; pile embedment
9. X Section of Abutment at curb (Section B-B)

10. Abutment reinforcing details
11. X Section of wing near curb (Section C-C)
12. Wing reinforcing details

6.3.7. BENT DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for each Bent by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for types other than straight
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of all contract bid items, their units, and quantities for each Bent
 - 3.2. Notes explaining quantity breakdown below Estimated Quantity Box
4. Plan View of Bent oriented such that the centerline of Bent is parallel to the top border of sheet
 - 4.1. Dimensions overall length of bent cap along centerline of Bent; length left and right of centerline of roadway; width of bent cap; distance from end of cap to outside of curb (normally 4" normal to curb)
 - 4.2. Details of reinforcing steel in top and bottom of Bent cap
 - 4.3. Other items: centerlines of Bent, roadway, and columns; skew angle; arrow indicating direction of increasing stations; columns, footings, and piles (hatched lines)
5. Elevation View of Bent projected down from Plan View
 - 5.1. Dimensions: column spacing; cantilever lengths; column diameter; footing thickness; column height; cap thickness at end; pile embedment; cap and slab thickness at centerline of roadway; overall width of slab and distance left & right of centerline roadway, along centerline of bent

- 5.2. Details of reinforcing steel in cap, columns, and footings
- 5.3. Elevation reference points along centerline of bent: top of cap construction joint at centerline roadway, left & right ends (labeled El. "A", "B" & "C" respectively); bottom of cap ("D"); bottom of footing ("E")
- 5.4. Other items: X Section locations; centerlines of roadway and columns; piles; construction joints; slab and curbs (phantom lines)
6. X Section thru footing showing footing dimensions, reinforcing steel details in top & bottom of footing and pile orientation & spacing
7. X Section thru cap between columns showing cap reinforcing details and dimensions
8. X Section thru cap cantilever showing reinforcing details and dimensions
9. X Section thru column showing column diameter and reinforcing details
10. Table of Elevations Box listing elevation reference points and corresponding elevations for each bent
11. Notes
12. Substructure shoring note

6.3.8. SUPERSTRUCTURE DETAILS

(Superstructure Details base sheet with specific structure data filled in)

6.3.9. END BLOCK, BARRIER CURB, AND DRAIN DETAILS

(End Block, Barrier Curb, and Drain Details base sheet with specific structure data filled in)

6.3.10. DETAILS OF BRIDGE END BACKFILL

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Estimated Quantities Box near the right margin
 - 2.1. Listing of all contract bid items, their units, and quantities

- 2.2. Notes explaining quantity breakdown below Estimated Quantity Box
3. Plan View of Bridge End Backfill at Abutment oriented such that the centerline of roadway is parallel to the top margin of sheet
 - 3.1. Dimensions: width of Backfill limits; distance of limits left and right of centerline roadway; underdrain pipe lengths
 - 3.2. Other items: centerlines of roadway and abutment; Bridge and Backfill limits; station and elevation reference points; 4" underdrain pipes; underdrain trench: underdrain slopes; location of X Sections
4. X Section of Bridge End Backfill along the centerline of roadway (Section A-A)
 - 4.1. Dimensions: approach slab dimensions; thickness of surfacing; depth of backfill at end of approach slab or sleeper slab
 - 4.2. Other items: approach slabs and abutment (phantom lines); limits of bridge end backfill and bridge end backfill excavation; drainage fabric and polyethylene sheeting limits; top of subgrade; location of Detail "X"
5. X Section of Bridge End Backfill normal to centerline of roadway (Section B-B)

Approach slab (phantom lines); limits of bridge end backfill and bridge end backfill excavation; drainage fabric and polyethylene sheeting limits; centerline of roadway; crown slope; excavation side slope
6. X Section of backfill trench in wing areas taken normal to abutment (Section C-C)
 - 6.1. Dimensions: Underdrain trench width; distance to centerline of underdrain pipe; depth of trench and backfill wedge
 - 6.2. Other items: wing wall (phantom lines); limits of bridge end backfill and non pervious backfill, drainage fabric and polyethylene sheeting limits; backfill slope; 4" under drain pipe
7. X Section of limits of work to be done prior to excavating for Bridge End Backfill taken normal to abutment (Section D-D)

Items: profile of work limits; abutment (phantom lines); slope; distance from back of abutment to slope break point

8. Detail showing trench immediately adjacent to abutment at centerline of roadway (Detail "X")
 - 8.1. Dimensions: underdrain trench width; distance to centerline of underdrain pipe; trench depth; polyethylene sheeting dimensions
 - 8.2. Other items: abutment (phantom lines); limits of work done prior to excavating for bridge end backfill; limits of bridge end backfill, MSE geotextile and drainage fabric and polyethylene sheeting; 4" underdrain pipe; non-pervious backfill

6.3.11. DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE

1. Title block (similar to General Drawing except the Bridge Code No, PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for Approach Slabs by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for types other than straight
 - 2.3. Cutting Diagrams for linearly varying length bars with the same designation
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of Approach Slab bid items, their units, and quantities
 - 3.2. Listing of informational quantities contained in the Approach Slab items placed directly below the Estimated Quantity Box
4. Plan View of Approach Slabs oriented such that the centerline of roadway is parallel to the top border of sheet
 - 4.1. Dimensions: overall width of approach slabs; length of approach slab along centerline of roadway; curb transition lengths
 - 4.2. Details of reinforcing steel in top and bottom of approach slabs
 - 4.3. Other items: drop inlet locations; centerline of roadway; crown slope; X Section and Detail reference locations; stations, offsets, and elevations for corners of approach or sleeper slabs

5. X Section thru Approach Slabs at centerline of roadway (Section A-A)

Details of reinforcement in Approach Slab and Sleeper Slab; sawed joint details for junction of approach slab to bridge slab; detail reference location, polyethylene sheeting location; sliding surface of sleeper slab note

6. X Section thru curb, normal to centerline roadway, showing details of reinforcement in curb area and curb dimensions (Section B-B)

7. X Section thru curb at end of approach slab, normal to centerline of roadway, showing reinforcing details and location of elevation reference (Section C-C)

8. X Section at approach slab end, parallel to centerline of roadway near curb, illustrating curb transition details (Section D-D)

9. Detail of junction of approach slab with bridge at curb locations showing joint details (Detail "X")

10. Plan view and X Section (Section E-E) showing 1/2" preformed expansion joint filler limits and hot poured elastic joint sealer details.

11. X Section thru Sleeper Slab parallel to the centerline of roadway (Section F-F)

11.1. Dimensions: bottom and top width of sleeper slab; sleeper slab bottom and overall thicknesses; approach slab thickness and step bevel dimensions

11.2. Details of reinforcing steel in sleeper slab

11.3. Other items: centerline of joint and sheet no. reference for approach slab joint details, armor angle; approach slab step bevel slope; Detail "Y" reference location; stations

12. Detail of drop inlet location showing reinforcing steel alteration details required to accommodate drop inlets (Detail "Z")

6.3.12. APPROACH SLAB JOINT DETAILS

(Membrane Sealant Expansion Joint base sheet with specific structure data filled in)

6.3.13. RIPRAP DETAILS

(This sheet is required only if there is not sufficient room on the General Drawing sheet to detail the erosion protection adequately)

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Estimated Quantities Box in the right margin above the Title Block
 - 2.1. Listing of erosion protection bid items, their units, and quantities
 - 2.2. Conversion factor used to convert cu. yds. to tons under the Estimated Quantities Box
3. Plan View similar to that on General Drawing except concentrating on erosion protection details and limits
4. All dimensions (horizontal), slopes and elevations required to establish erosion protection limits and ties to structure location
5. Elevation View similar to that on the General Drawing except concentrating on erosion protection details and limits
6. Standard Notes with specific structure information filled in

6.3.14. DETAILS OF STANDARD PLATE NO's 460.02 & 460.05

1. Year Plate Details (No. 460.02)
2. Bridge Survey Marker (No. 460.05)
3. Title Block (Abbreviated Version)

6.3.15. DETAILS OF STANDARD PLATE NO's 510.40 & 620.18

1. Steel Pile Splice Details (No. 510.40)
2. Fence Anchors for Bridge Abutment Wings (No. 620.18)
3. Title Block (Abbreviated Version)

6.3.16. DETAILS OF STANDARD PLATE NO. 630.92

1. 5-Bolt Insert Plate Assembly Details (No. 630.92)
2. Title Block (abbreviated Version)

6.4. Prestressed Girder Bridge Plans

See Appendix F for example plan sheets – Prestressed Girder Bridge

6.4.1. Sequence of Sheets

General Drawing

Estimate of Structure Quantities and Notes

Notes (Continued)

Subsurface Investigation and Piling (and Drilled Shaft or spread footing, if used) Layout

Abutment Details

Bent Details

Superstructure Details

End Block, Barrier Curb & Drain Details

Girder Details

Erection Data

Diaphragm Details

Details of Bridge End Backfill

Details of Approach Slab Adjacent to Bridge

Approach Slab Joint Details

Riprap Details

Details of Standard Plate No's 460.02 & 460.05

Details of Standard Plate No's 510.40 & 620.19

Details of Standard Plate No. 630.92

6.4.2. GENERAL DRAWING

1. Title Block in lower right corner
 - 1.1. Title (name) of sheet
 - 1.2. Description of structure type, size, location, orientation and design loading
 - 1.3. Structure No., Project No., PCN., County, Owner, Date, and structure plans sheet number
 - 1.4. Bridge Code Number (X__ reference no.)
 - 1.5. Block at bottom showing initials of those who the plans were Designed By, Checked By, Drawn By and Approved By
 - 1.6. For Topeka Shiner Habitat, an asterisk by the stream name with a note to the left of the title block indicating "Topeka Shiner Habitat"

2. Block in upper right corner of sheet including the State, Project No., Sheet No. and Total No. of Sheets in Section E (section method plans) or in full set of plans (non-section method plans) (common to all sheets)
3. Index of Bridge Sheets in upper right corner (preferred location: if room does not allow, place elsewhere on sheet)
4. Plan View of proposed bridge oriented such that the centerline of roadway is parallel to the top border of the sheet and stationing increases from left to right
 - 4.1. Horizontal dimensioning: overall bridge length; span lengths; overall superstructure width; roadway width; curb width; left & right distances to curb line from centerline roadway; approach slab length & width; deck drain spacing; berm top width
 - 4.2. Centerline of roadway stations & elevations and left & right curb elevations at Begin & End Bridge and centerline of Abutments & Bents
 - 4.3. Other items: bridge centerline station; skew angle; flow direction; stream name; roadway template for overpass structures; centerlines of roadway & survey; centerlines of bridge & channel; centerlines of Abutments & Bents; existing structure limits; berms and berm slopes; piles; erosion protection; north arrow
5. Elevation View of bridge projected down from the Plan View along lines parallel to the centerlines of the substructure units
 - 5.1. Elevations: bottom of substructure units; top of berms; channel flow line; roadway typical section points (if overpass structure); limits of erosion protection; Design High Water levels
 - 5.2. Dimensions: column length; bent cap and footing thickness; channel bottom width; erosion protection thickness; horizontal and vertical clearances (if overpass structure)
 - 5.3. Profile of existing ground line, new berms and channel along the centerline of roadway
 - 5.4. Substructure units labeled numerically from left to right
 - 5.5. Other items: structure excavation reference line; berm slopes; piles; erosion protection
6. Horizontal and Vertical Curve Data (with diagrams)

7. Hydraulic Data
8. Identification of firm or office that prepared plans

6.4.3. ESTIMATE OF STRUCTURE QUANTITIES & NOTES

1. Title Block (abbreviated from General Drawing)
2. Estimate of Structure Quantities table along left margin with listing of all structure contract bid items, their units, and total quantities for structure
3. Structure Plan Notes

6.4.4. NOTES (CONTINUED)

1. Title Block (abbreviated from General Drawing)
2. Structure Plan Notes (continued from sheet no. 2)

6.4.5. SUBSURFACE INVESTIGATION AND PILING LAYOUT

1. Title Block (similar to General Drawing except the Bridge-Code No, PCN and Topeka Shiner Habitat information not present)
2. Subsurface investigation information (prepared by the Foundation and Geology Activity)
3. Plan view of footing and pile layout for new substructure
 - 3.1. Centerline of roadway and survey line; centerlines of substructure units; locations of existing substructure (when interference is anticipated); spacing of new piles or shafts; centerline stations of abutments & bents; skew angle; flow direction of stream; north arrow
 - 3.2. Heavy border line separating Piling Layout from plan of subsurface investigation if drawn separately

6.4.6. ABUTMENT DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No, PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner

- 2.1. Listing of all reinforcing bars for the abutment by Mark, Number, Size, Length and Type
- 2.2. Bending Details showing bar bend lengths for types other than straight
- 2.3. Cutting diagrams for linearly varying length bars with the same designation
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of all contract bid items, their units, and quantities for each Abutment
 - 3.2. Notes explaining quantity breakdown below Estimated Quantity Box
4. Plan View of Abutment oriented such that the back face of the Abutment is toward and parallel to the top border
 - 4.1. Horizontal Dimensions: overall abutment length; wing lengths; distance left & right of centerline roadway along the back face of abutment, to outside of curbs; abutment thickness; wing thickness; girder spacing
 - 4.2. Details of reinforcing steel in Abutment
 - 4.3. Other items: Begin & End Bridge stations; arrow indicating direction of increasing stations for each abutment; centerline of abutment; centerline of roadway skew angle; faces of abutment; piles; locations of Detail "X" and X Section references; girder centerlines numbered left to right on ahead stationing
5. Elevation View of Abutment projected down from the Plan View
 - 5.1. Dimensions: wing heights; height from bottom of Abutment to construction joint and to top of slab at centerline of roadway; height from bottom of slab to top of wing at outside of curbs; slab thickness; depth of slab plus haunch over centerline of girder at centerline of abutment; pile embedment; and pile spacing
 - 5.2. Details of reinforcing steel in Abutment
 - 5.3. Elevation reference points along centerline of abutment: top of slab at centerline roadway, left right curb lines (labeled "A", "B" & "C" respectively); top of grout pad at centerlines of girders (labeled left to right, on ahead stationing, "G1" "G2", "G3", "G4", "G5" etc.)

- 5.4. Other items: construction joint; crown slope; piles; centerline of Roadway; curbs (phantom lines); girders; X Section reference locations
6. X Section of Abutment near centerline of roadway
 - 6.1. Abutment reinforcing details
 - 6.2. Other items: pavement rest (notch) dimensions; construction joint; pile embedment
7. Section C-C showing X Section of wing near curb
8. Wing reinforcing details
9. Plan view detail of elastomeric bearing pad and grout pad showing dimensions with respect to centerlines of girder and abutment (Detail "X")
10. Detail of girder ends at abutment showing limits of preformed expansion joint filler (Detail "Y")
11. Abutment Backwall Coating Details with note explaining area to place coating
12. Table of Elevations Box listing elevation reference points and corresponding elevations for each abutment

6.4.7. BENT DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No, PCN and Topeka Shiner Habitat information. not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for each Bent by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for types other than straight
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of all contract bid items, their units, and quantities for each Bent
 - 3.2. Notes explaining quantity breakdown below Estimated Quantity Box

4. Plan View of bent cap oriented such that the centerline of Bent is parallel to the top border of sheet and the left & right ends of cap are left & right, respectively, of the centerline of roadway when looking ahead stationing
 - 4.1. Dimensions: overall length of bent cap along centerline of Bent; girder spacing along centerline of Bent; grout pad & elastomeric pad dimensions; radius of rounded ends of cap; width of bent cap
 - 4.2. Other items: centerlines of Bent, roadway, and columns; centerlines of girders numbered from left to right; skew angle; elastomeric and grout pads, N1 dowel bars; columns (hatched lines)
5. Plan X Section of bent cap showing reinforcing details in top and bottom of cap (Section A-A)
6. Elevation View of Bent projected down from Plan View
 - 6.1. Dimensions: column spacing; cantilever lengths; column diameter; footing thickness; column lengths; cap thickness; pile embedment; grout pad recess depth
 - 6.2. Details of reinforcing steel in cap, columns, and footings
 - 6.3. Elevation reference points: top of cap ("A"); bottom of footing ("B"); top of grout pad at centerline of Bent (labeled left to right "G1", "G2", "G3", "G4", "G5" etc.)
 - 6.4. Other items: X Section location references; centerlines of roadway and columns; piles; construction joints; rustication; grout pads
7. X Section thru cap between columns showing cap reinforcing details and dimensions (Section B-B)
8. X Section thru column showing column diameter and reinforcing details (Section C-C)
9. Section thru footing showing footing dimensions, reinforcing steel details in top & bottom of footing, and pile orientation & spacing with respect to centerline of Bent
10. Detail showing rustication dimensions (Detail "X")
11. Table of Elevations Box listing elevation reference points and corresponding elevations for each Bent

6.4.8. SUPERSTRUCTURE DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for superstructure by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for types other than straight
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of all contract bid items, their units, and quantities for the superstructure
 - 3.2. Notes explaining quantity breakdown below Estimated Quantity Box
 - 3.3. Jersey Barrier concrete quantities below Estimated Quantity Box
4. Plan or Half Plan View of Superstructure oriented such that the centerline of roadway is parallel to the top border of sheet and stationing increases from left to right
 - 4.1. Dimensions: span lengths; overall superstructure length; distances from centerlines of abutment bents to centerlines of diaphragms; overall superstructure width; curb width; distance to left & right curb lines from centerline of roadway; girder spacing; slab cantilever lengths
 - 4.2. Details of reinforcing steel in top and bottom of slab
 - 4.3. Other items: X Section location references; centerlines of roadway, abutment, bents, and diaphragms; centerlines of girders numbered from left to right; skew angle; Begin Bridge
5. X Section of superstructure taken normal to centerline of roadway, with half of section at midspan and half at centerline of Bent. (Section A-A)
 - 5.1. Dimensions: overall superstructure width; roadway width; distance to left & right curb lines from centerline of roadway; curb widths; girder spacing; slab cantilever lengths; slab thickness; clear cover on reinforcing steel to top and bottom of slab; depth of slab plus haunch over centerline of girder at centerline of Bent

- 5.2. Details of reinforcing steel in curbs, slab, and diaphragms
- 5.3. Other items: Detail location references; construction joints; crown slope; centerlines of roadway and girders; diaphragms; girders
6. X Section of Bent Diaphragm showing extended and bent strands (Section C-C)
7. X-Section of Bent Diaphragm showing reinforcing details (Section B-B)
8. Plan Detail of Bent Diaphragm
 - 8.1. Dimensions: girder spacing; diaphragm thickness, distance between beam ends; diaphragm end cap dimensions
 - 8.2. Details of reinforcing steel in diaphragms
 - 8.3. Other items: X Section and View location references; centerlines of diaphragm and girders
9. View showing Bent Diaphragm end cap reinforcing details (View D-D)
10. Standard General Notes with specific structure data filled in

6.4.9. END BLOCK, BARRIER CURB, AND DRAIN DETAILS

(End Block, Barrier Curb, and Drain Details base sheet with specific structure data filled in)

6.4.10. GIRDER DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars per girder, for each girder length, by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for types other than straight
3. Standard Notes, with specific structure data filled in, placed at right margin between Title Block and Reinforcing Schedule Box
4. Elevation View of each length of girder

- 4.1. Dimensions: length of girder; distance from bottom of beam to centroid of prestressing steel at beam ends and drape points; threaded insert and holes in web locations; gap between beam ends; flat drape lengths
- 4.2. Details of mild reinforcing steel in beams
- 4.3. Other items: centerline of girder, abutment, and bent; center of gravity of prestressing steel; Detail location references; threaded inserts and holes in web
5. Centerline Section and End View of each length of girder

Items: strand pattern details; location of centroid for prestressing steel & concrete section; eccentricity of prestressing force; top longitudinal mild steel details; centerline of girder; location of strands to be extended and bent at beam ends
6. Stirrup Details showing stirrup reinforcing steel configuration within girder cross section
7. X Section of girder type showing beam dimensions
8. Detail of extended and bent strands at beam ends (Detail "X")

Items: length of strand extension; radius of bend and distance to bend from beam end; threaded insert locations; centerline of bent; abutment and bent ends of beams labeled
9. Detail of Girder Lifting Device showing number of strands required, minimum embedment of strands, distance to lift loop from beam end, and limiting lift angle
10. X-Section showing pipe insert details (Section M-M)

6.4.11. ERECTION DATA

(Standard Erection Data Sheet with specific structure data filled in)

6.4.12. DIAPHRAGM DETAILS

(Diaphragm base sheet with specific structure data filled in)

6.4.13. DETAILS OF BRIDGE END BACKFILL

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)

2. Estimated Quantities Box near the right margin
 - 2.1. Listing of all contract bid items, their units, and quantities for each Bent
 - 2.2. Notes explaining quantity breakdown below Estimated Quantity Box
3. Plan View of Bridge End Backfill at Abutment oriented such that the centerline of roadway is parallel to the top margin of sheet
 - 3.1. Dimensions: width of Backfill limits; distance of limits left and right of centerline roadway; underdrain pipe lengths
 - 3.2. Other items: centerlines of roadway and abutment; Bridge and Backfill limits; station and elevation reference points; 4" underdrain pipes; underdrain trench: underdrain slopes; location of X Sections
4. X Section of Bridge End Backfill along the centerline of roadway (Section A-A)
 - 4.1. Dimensions: approach slab dimensions; thickness of surfacing; depth of backfill at end of approach slab or sleeper slab
 - 4.2. Other items: approach slabs and abutment (phantom lines); limits of bridge end backfill and bridge end backfill excavation; drainage fabric and polyethylene sheeting limits; top of subgrade; location of Detail "X"
5. X Section of Bridge End Backfill normal to centerline of roadway (Section B-B)

Approach slab (phantom lines); limits of bridge end backfill and bridge end backfill excavation; drainage fabric and polyethylene sheeting limits; centerline of roadway; crown slope; excavation side slope
6. X Section of backfill trench in wing areas taken normal to abutment (Section C-C)
 - 6.1. Dimensions: Underdrain trench width; distance to centerline of underdrain pipe; depth of trench and backfill wedge
 - 6.2. Other items: wing wall (phantom lines); limits of bridge end backfill and non pervious backfill, drainage fabric and polyethylene sheeting limits; backfill slope; 4" under drain pipe
7. X Section of limits of work to be done prior to excavating for Bridge End Backfill taken normal to abutment (Section D-D)

Items: profile of work limits; abutment (phantom lines); slope; distance from back of abutment to slope break point

8. Detail showing trench immediately adjacent to abutment at centerline of roadway (Detail "X")
 - 8.1. Dimensions: underdrain trench width; distance to centerline of underdrain pipe; trench depth; polyethylene sheeting dimensions
 - 8.2. Other items: abutment (phantom lines); limits of work done prior to excavating for bridge end backfill; limits of bridge end backfill, MSE geotextile and drainage fabric and polyethylene sheeting ; 4" underdrain pipe; non-pervious backfill

6.4.14. DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE

1. Title block (similar to General Drawing except the Bridge Code No, PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for Approach Slabs by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for types other than straight
 - 2.3. Cutting Diagrams for linearly varying length bars with the same designation
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of Approach Slab bid items, their units, and quantities
 - 3.2. Listing of informational quantities contained in the Approach Slab items placed directly below the Estimated Quantity Box
4. Plan View of Approach Slabs oriented such that the centerline of roadway is parallel to the top border of sheet
 - 4.1. Dimensions: overall width of approach slabs; length of approach slab along centerline of roadway; curb transition lengths
 - 4.2. Details of reinforcing steel in top and bottom of approach slabs

- 4.3. Other items: drop inlet locations; centerline of roadway; crown slope; X Section and Detail reference locations; stations, offsets, and elevations for corners of approach or sleeper slabs
5. X Section thru Approach Slabs at centerline of roadway (Section A-A)

Details of reinforcement in Approach Slab and Sleeper Slab; sawed joint details for junction of approach slab to bridge slab; detail reference location, polyethylene sheeting location; sliding surface of sleeper slab note
6. X Section thru curb, normal to centerline roadway, showing details of reinforcement in curb area and curb dimensions (Section B-B)
7. X Section thru curb at end of approach slab, normal to centerline of roadway, showing reinforcing details and location of elevation reference (Section C-C)
8. X Section at approach slab end, parallel to centerline of roadway near curb, illustrating curb transition details (Section D-D)
9. Detail of junction of approach slab with bridge at curb locations showing joint details (Detail "X")
10. Plan view and X Section (Section E-E) showing 3/4" preformed expansion joint filler limits and hot poured elastic joint sealer details.
11. X Section thru Sleeper Slab parallel to the centerline of roadway (Section F-F)
 - 11.1. Dimensions: bottom and top width of sleeper slab; sleeper slab bottom and overall thicknesses; approach slab thickness and step bevel dimensions
 - 11.2. Details of reinforcing steel in sleeper slab
 - 11.3. Other items: centerline of joint and sheet no. reference for approach slab joint details, armor angle; approach slab step bevel slope; Detail "Y" reference location; stations
12. Detail of drop inlet location showing reinforcing steel alteration details required to accommodate drop inlets (Detail "Z")

6.4.15. APPROACH SLAB JOINT DETAILS

(Membrane Sealant Expansion Joint base sheet with specific structure data filled in)

6.4.16. RIPRAP DETAILS

(This sheet is required only if there is not sufficient room on the General Drawing sheet to detail the erosion protection adequately)

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Estimated Quantities Box in the right margin above the Title Block
 - 2.1. Listing of erosion protection bid items, their units, and quantities
 - 2.2. Conversion factor used to convert cu. yds. to tons under the Estimated Quantity box
3. Plan View similar to that on General Drawing except concentrating on erosion protection details and limits
4. All dimensions (horizontal), slopes and elevations required to establish erosion protection limits and ties to structure location
5. Elevation View similar to that on the General Drawing except concentrating on erosion protection details and limits
6. Standard Notes with specific structure information filled in

6.4.17. AS-BUILT ELEVATION SURVEY

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Plan View
3. Estimated Quantities
4. Survey Datum
5. Table of Elevations – Bridge Survey Markers
6. Table of As-Built Elevations – Bridge Deck
7. Table of As-Built Elevations – Approach Roadway
8. Standard Notes

6.4.18. DETAILS OF PRECAST CONCRETE HEADWALL FOR DRAIN

6.4.19. DETAILS OF STANDARD PLATE NO's 460.02 & 460.05

1. Year Plate Details (No. 460.02)
2. Bridge Survey Marker (No. 460.05)
3. Title Block (Abbreviated Version)

6.4.20. DETAILS OF STANDARD PLATE NO's 510.40 & 620.19

1. Steel Pile Splice Details (No. 510.40)
2. Fence Anchors for Bridge Abutment Wings (620.19)
3. Title Block (Abbreviated Version)

6.4.21. DETAILS OF STANDARD PLATE NO. 630.92

1. 5-Bolt Insert Plate Assembly Details (No. 630.92)
2. Title Block (Abbreviated Version)

6.5. Steel Girder Bridge Plans

See Appendix F for example plan sheets – Steel Girder Bridge

6.5.1. Sequence of Sheets

General Drawing

Estimate of Structure Quantities and Notes

Notes (Cont.)

Subsurface Investigation and Piling (and Drilled Shaft or spread footing, if used) Layout

Abutment Details

Bent Details

Superstructure Details

End Block, Barrier Curb & Drain Details

Diaphragm Details

Girder Layout and Details

Framing Diagram and Erection Details

Details of Bolted Field Splices and Bearings

Details of Approach Slab Adjacent to Bridge

Approach Slab Joint Details

Riprap Details

Details of Standard Plate No's 460.02 & 460.05

Details of Standard Plate No's 510.40 & 460.19

Details of Standard Plate No. 630.92

6.5.2. GENERAL DRAWING

1. Title Block in lower right corner
 - 1.1. Title (name) of sheet
 - 1.2. Description of structure type, size, location, orientation and design loading
 - 1.3. Structure No., Project No., PCN, County, Owner, Date, and structure plans sheet number
 - 1.4. Bridge Code Number (X___ reference no.)
 - 1.5. Block at bottom showing initials of those who the plans were Designed By, Checked By, Drawn By and Approved By
 - 1.6. For Topeka Shiner Habitat, an asterisk by the stream name with a note to the left of the title block indicating "Topeka Shiner Habitat"

2. Block in upper right corner of sheet including the State, Project No., Sheet No. and Total No. of Sheets in Section E (section method plans) or in full set of plans (non-section method plans) (common to all sheets)
3. Index of Bridge Sheets in upper right corner (preferred location: if room does not allow, place elsewhere on sheet) with Bridge Code Number
4. Plan View of proposed bridge oriented such that the centerline of roadway is parallel to the top border of the sheet and stationing increases from left to right
 - 4.1. Horizontal dimensioning: overall bridge length; span lengths; overall superstructure width; roadway width; curb width; left & right distances to curb line from centerline roadway; approach slab length & width; deck drain spacing; berm top width; erosion protection limits
 - 4.2. Centerline of roadway stations & elevations and left & right curb elevations at Begin & End Bridge and centerline of Abutments & Bents
 - 4.3. Other items: bridge centerline station; skew angle; flow direction; stream name; roadway template for overpass structures; centerlines of roadway & survey; centerlines of bridge & channel; centerlines of Abutments & Bents; existing structure limits; berms and berm slopes; piles; erosion protection; north arrow
5. Elevation View of bridge projected down from the Plan View along lines parallel to the centerlines of the substructure units
 - 5.1. Elevations: bottom of substructure units; top of berms; channel flow line; roadway typical section points (if overpass structure); limits of erosion protection; Design High Water levels
 - 5.2. Dimensions: column length; bent cap and footing thickness; channel bottom width; erosion protection thickness; horizontal and vertical clearances (if overpass structure)
 - 5.3. Profile of existing ground line, new berms and channel along the centerline of roadway
 - 5.4. Substructure units labeled numerically from left to right
 - 5.5. Other items: structure excavation reference line; berm slopes; piles; erosion protection
6. Horizontal and Vertical Curve Data (with diagrams)

7. Hydraulic Data
8. Identification of firm or office that prepared plans

6.5.3. ESTIMATE OF STRUCTURE QUANTITIES & NOTES

1. Title Block (abbreviated from General Drawing)
2. Estimate of Structure Quantities table along left margin with listing of all structure contract bid items, their units, and total quantities for structure
3. Structure Plan Notes

6.5.4. NOTES (CONTINUED)

1. Title Block (abbreviated from General Drawing)
2. Structure Plan Notes (continued from sheet no 2)

6.5.5. SUBSURFACE INVESTIGATION AND PILING LAYOUT

1. Title Block (similar to General Drawing except the Bridge Code No, PCN and Topeka Shiner Habitat information not present)
2. Subsurface investigation information (prepared by the Geotechnical Engineering Activity)
3. Plan view of footing and pile layout for new substructure
 - 3.1. Centerline of roadway and survey line; centerlines of substructure units; locations of existing substructure (when interference is anticipated); spacing of new piles or shafts; centerline stations of abutments & bents; skew angle; flow direction of stream; north arrow
 - 3.2. Heavy border line separating Piling Layout from plan of subsurface investigation if drawn separately

6.5.6. ABUTMENT DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No, PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner

- 2.1. Listing of all reinforcing bars for the abutment by Mark, Number, Size, Length and Type
- 2.2. Bending Details showing bar bend lengths for types other than straight
- 2.3. Cutting diagrams for linearly varying length bars with the same designation
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of all contract bid items, their units, and quantities for each Abutment
 - 3.2. Notes explaining quantity breakdown below Estimated Quantity Box
4. Plan View of Abutment oriented such that the back face of the Abutment is toward and parallel to the top border
 - 4.1. Horizontal Dimensions overall abutment length; wing lengths; distance left & right of centerline roadway, along the back face of abutment, to face of curbs; curb width; abutment thickness; wing thickness; girder spacing
 - 4.2. Details of reinforcing steel in Abutment
 - 4.3. Other items: Begin & End Bridge stations; arrow indicating direction of increasing stations for each abutment; centerline of abutment; centerline of roadway; skew angle; faces of abutment; piles; locations of Detail "X" and X Section location references; girder centerlines numbered left to right on ahead stationing; elevation of bottom of slab on centerline of abutment at outside of curbs
5. Elevation View of Abutment projected down from the Plan View
 - 5.1. Dimensions: wing heights; height from bottom of Abutment to top of slab at centerline of roadway; slab thickness; depth of slab plus haunch over centerline of girder at centerline of abutment; pile spacing
 - 5.2. Details of reinforcing steel in Abutment
 - 5.3. Pile cut off elevation reference point (Elev. "A")
 - 5.4. Dimension location references: pile embedment ("B"); distance from top of pile cut off to top of girder ("C"); distance from bottom of abutment to top of girder ("D")

- 5.5. Other items: crown slope; piles; centerline of roadway; curbs (phantom lines); girders; X Section reference locations; elevation at bottom of abutments; pile centerlines numbered left to right on ahead stationing; top & bottom of slab; construction joint
6. X Section of Abutment between girders (Section A-A)
 - 6.1. Abutment reinforcing details
 - 6.2. Other items: pavement rest (notch) dimensions; construction joint; girder end; pile
7. X Section of wing near curb showing wing reinforcing . details (Section B-B)
8. Plan view X Section, thru girder web, of abutment at girder ends showing reinforcing details (Section C-C)
9. Detail of girder to pile attachment showing details of field welding and connection plate in plan and elevation views (View D-D and Detail "X")
10. Table of Elevations & Dimensions Box Listing elevation and dimension reference points with corresponding elevations and dimensions for each pile location in each abutment

6.5.7. BENT DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for each Bent by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for types other than straight
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of all contract bid items, their units, and quantities for each Bent
 - 3.2. Notes explaining quantity breakdown below Estimated Quantity Box

4. Plan View of bent cap oriented such that the centerline of Bent is parallel to the top border of sheet and the left & right ends of cap are left & right, respectively, of the centerline of roadway when looking ahead stationing
 - 4.1. Dimensions: overall length of bent cap along centerline of Bent; girder spacing along centerline of Bent; grout pad dimensions; swedge bolt locations; radius of rounded ends of cap; width of bent cap
 - 4.2. Other items: centerlines of Bent, roadway, and columns; centerlines of girders numbered from left to right; skew angle: grout pads: columns
5. Plan X Section of bent cap showing reinforcing details in top and bottom of cap (Section A-A)
6. Elevation View of Bent projected down from Plan View
 - 6.1. Dimensions: column spacing; cantilever lengths; column diameter; footing thickness; column lengths; cap thickness; pile embedment; grout pad recess depth; swedge bolt projection
 - 6.2. Details of reinforcing steel in cap, columns, and footings
 - 6.3. Elevation reference points: top: of cap ("A"); bottom of footing ("B"); top of grout pad at . centerline of Bent (labeled left to right "G1", "G2", "G3", "G4", "G5" etc.)
 - 6.4. Other items X Section location references; centerlines of roadway and columns; piles; construction joints rustication: grout pads
7. X Section thru cap between columns showing cap reinforcing details and dimensions (Section B-B)
8. X Section thru column showing column diameter and reinforcing details (Section C-C)
9. Section thru footing showing footing dimensions, reinforcing steel details in top & bottom of footing, and pile orientation & spacing with respect to centerline of Bent
10. Detail showing rustication dimensions (Detail "X")
11. Table of Elevations Box listing elevation reference points and corresponding elevations for each Bent

6.5.8. SUPERSTRUCTURE DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for superstructure by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths types other than straight
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of all contract bid items, their units, and quantities for the superstructure
 - 3.2. Informational Structural Steel weight and Jersey Barrier concrete quantities below Estimated Quantity Box
4. Plan or Half Plan View of Superstructure oriented such that the centerline of roadway is parallel to the top border of sheet and stationing increases from left to right
 - 4.1. Dimensions: span lengths; overall superstructure length; overall superstructure width; curb width; distance to left & right curb lines from centerline of roadway; girder spacing; slab cantilever lengths
 - 4.2. Details of reinforcing steel in top and bottom of slab
 - 4.3. Other items: X Section location references; centerlines of roadway, abutment, and bents; centerlines of girders numbered from left to right; skew angle; Begin Bridge
5. X Section of Superstructure taken normal to centerline of roadway (Section A-A)
 - 5.1. Dimensions: overall superstructure width; roadway width; distance to left & right curb lines from centerline of roadway; curb widths; girder spacing; slab cantilever lengths; slab thickness; clear cover on reinforcing steel to top and bottom of slab; depth of slab plus haunch over centerline of girder at centerline of Bents & Abutments
 - 5.2. Details of reinforcing steel in curbs and slab
 - 5.3. Other items: construction joints; crown slope; centerlines of roadway and girders

6. X Section of slab and abutment showing pavement rest (notch) dimensions and slab reinforcing details in abutment area (Section B-B)

6.5.9. END BLOCK. BARRIER CURB. & DRAIN DETAILS

(End Block, Barrier Curb, and Drain Details base sheet with specific structure data filled in)

6.5.10. GIRDER LAYOUT AND DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Standard Notes, with specific structure data filled in, placed at upper right margin
3. Elevation View of girder (Girder Layout)
 - 3.1. Horizontal dimensions: span lengths; distance from centerline of abutments and bents to centerline of field splices; shear connector spacing; dimensions defining tension and stress reversal areas; no paint length at abutment end
 - 3.2. Plate sizes and steel types designated for top flange, web, and bottom flange along girder length
 - 3.3. Other items: centerline of girder, abutment, bents and field splices; shear connections
4. Typical Section at Abutments taken parallel to girder showing elevation view of girder at abutment
 - 4.1. Dimensions: stiffener splicing; distance from center line of abutment to centerline of holes in girder web; web hole spacing, distance from top of pile to top of slab at centerline of abutment girder chamfer dimensions
 - 4.2. Other items: stiffener sizes and weld details; web hole diameters; pile and pile connection plate; centerline of abutment; Detail location reference
5. End View of girder showing stiffener sizes, clips and weld details (with weld termination note) for stiffeners to be embedded in abutment
6. Detail of web hole reinforcing plate showing dimensions and weld details (Detail "X")

7. Typical Section at Bents taken parallel to girder showing elevation view of girder at bents

Items: distance from top of grout pad to top of slab at centerline of girder; bearing stiffener size and weld details; fabric pad between bearing plate and Grout pad
8. Typical Section at intermediate point taken parallel to girder showing elevation view of girder at an intermediate stiffener location

Items: intermediate stiffener size and weld details; web depth; Detail location reference
9. Detail of intermediate stiffener to flange weld in compression areas, showing stiffener clip dimensions and weld details (Detail “Y”)

Standard note explaining where this detail is to be used and what to do in other zones
10. Details of Diaphragm Stiffeners at Centerline Bearings showing bearing stiffener size, clips and weld details (with weld termination note)
11. Details of Stiffeners at Intermediate Diaphragms showing diaphragm stiffener size, clips and weld details
12. Shear Connector Details showing stud size and spacing across width of top flange
13. Payment note and informational quantity below Detail
14. Camber Cutting Diagrams for web sections between field splice locations showing camber cut ordinates at span 1/10 points (or intervals not greater than 6'-0”)
 - 14.1. Dimensions: web section lengths; spacing of camber cut ordinates; web depth
 - 14.2. Items: centerline of abutments, bents, and field splices
15. Flange to Web Weld Box listing flange thicknesses with corresponding fillet weld size required

6.5.11. FRAMING DIAGRAM AND ERECTION DETAILS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)

2. Framing Diagram showing line diagram plan view of girders, stiffeners and diaphragms
 - 2.1. Dimensions: span lengths; distances from centerline of abutment and bent to centerline of field splices; diaphragm spacing; stiffener spacing; girder spacing
 - 2.2. Items: centerline of abutments, bents, field splices and roadway; centerlines of girders numbered from left to right on ahead stationing
3. Table of Slab Form Elevations & Computations Box listing theoretical top of slab elevations prior to concrete placement (Elev. "M"), along with blanks to carry out haunch calculations in the field, at span 1/10 points for each girder
4. Girder Erection Diagram showing line diagram elevation view of top flange
 - 4.1. Dimensions: overall length between centerlines of abutments span lengths; distance from centerline of abutment to field splice and field splice to field splice; spacing of span 1/10 points
 - 4.2. Elevation location reference points at span 1/10 points numbered from left to right (0, 1, 2, 3, 4, etc. corresponding to Table of Slab Form Elevations & Computations Box)
 - 4.3. Elevation location reference points on top of girder at centerlines of abutments bents and field splices, labeled from left to right ("A", "B" "C", "D", etc.)
 - 4.4. Slope location reference lengths labeled from left to right (a, b, c, d, etc.)
 - 4.5. Dead load deflection ordinates (due to slab and curbs) at span 1/10 points
5. Girder Erection Elevations and Slopes Box listing elevation reference points and slope references with corresponding elevations and slopes for each girder (with explanation note below)
6. Standard note and detail with specific structure data filled in (detail has slab thickness dimensions and elevation location references needed for Table of Elevations & Computations)

6.5.12. DIAPHRAGM DETAILS

(Standard Diaphragm Details sheet with specific structure data filled in)

6.5.13. DETAILS OF BOLTED FIELD SPLICES & BEARINGS

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Field Bolted Splice Detail showing elevation view of at field splice location with details of flange and web splices

Items; sizes of all splice plates, flanges and web at field splice location; web splice bolt hole spacing; View location references; centerline of splice; maximum gap between girder ends at splice

3. View of Top Flange showing top flange splice details (View A-A)

Items: flange widths; centerlines of girder and splice; maximum gap; top flange splice bolt hole spacing; flange taper slope; splice plate plan dimensions

4. View of Bottom flange showing bottom flange splice details (View B-B)

Items: flange widths; centerlines of girder and splice; maximum gap; bottom flange splice bolt hole spacing; flange taper slope; splice plate plan dimension

5. Bearing Details showing Plan and Elevation views of bearings for substructure units
 - 5.1. Plan View of bearing showing: centerlines of girder and bent or abutment; skew; plate dimensions and anchor bolt spacing
 - 5.2. Elevation View of bearing projected down from Plan View, along lines parallel to centerline of girder, showing: centerline of girder bearing plate dimensions; anchor bolt and bolt hole details; weld details; View location reference
 - 5.3. Elevation View of bearing, at 90 degrees to the axis of girder, showing: bearing plate dimensions; weld details; fabric pad note
6. Standard bolt note indicating bolt diameter

6.5.14. DETAILS OF BRIDGE END BACKFILL

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Estimated Quantities Box near the right margin

- 2.1. Listing of all contract bid items, their units, and quantities for each Bent
- 2.2. Notes explaining quantity breakdown below Estimated Quantity Box
3. Plan View of Bridge End Backfill at Abutment oriented such that the centerline of roadway is parallel to the top margin of sheet
 - 3.1. Dimensions: width of Backfill limits; distance of limits left and right of centerline roadway; underdrain pipe lengths
 - 3.2. Other items: centerlines of roadway and abutment; Bridge and Backfill limits; station and elevation reference points; 4" underdrain pipes; underdrain trench: underdrain slopes; location of X Sections
4. X Section of Bridge End Backfill along the centerline of roadway (Section A-A)
 - 4.1. Dimensions: approach slab dimensions; thickness of surfacing; depth of backfill at end of approach slab or sleeper slab
 - 4.2. Other items: approach slabs and abutment (phantom lines); limits of bridge end backfill and bridge end backfill excavation; drainage fabric and polyethylene sheeting limits; top of subgrade; location of Detail "X"
5. X Section of Bridge End Backfill normal to centerline of roadway (Section B-B)

Approach slab (phantom lines); limits of bridge end backfill and bridge end backfill excavation; drainage fabric and polyethylene sheeting limits; centerline of roadway; crown slope; excavation side slope
6. X Section of backfill trench in wing areas taken normal to abutment (Section C-C)
 - 6.1. Dimensions: Underdrain trench width; distance to centerline of underdrain pipe; depth of trench and backfill wedge
 - 6.2. Other items: wing wall (phantom lines); limits of bridge end backfill and non pervious backfill, drainage fabric and polyethylene sheeting limits; backfill slope; 4" under drain pipe
7. X Section of limits of work to be done prior to excavating for Bridge End Backfill taken normal to abutment (Section D-D)

Items: profile of work limits; abutment (phantom lines); slope; distance from back of abutment to slope break point

8. Detail showing trench immediately adjacent to abutment at centerline of roadway (Detail "X")
 - 8.1. Dimensions: underdrain trench width; distance to centerline of underdrain pipe; trench depth; polyethylene sheeting dimensions
 - 8.2. Other items: abutment (phantom lines); limits of work done prior to excavating for bridge end backfill; limits of bridge end backfill, MSE geotextile and drainage fabric and polyethylene sheeting ; 4" underdrain pipe; non-pervious backfill

6.5.15. DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE

1. Title block (similar to General Drawing except the Bridge Code No, PCN and Topeka Shiner Habitat information not present)
2. Reinforcing Schedule Box in upper right corner
 - 2.1. Listing of all reinforcing bars for Approach Slabs by Mark, Number, Size, Length and Type
 - 2.2. Bending Details showing bar bend lengths for types other than straight
 - 2.3. Cutting Diagrams for linearly varying length bars with the same designation
3. Estimated Quantities Box in the right margin between Title Block and Reinforcing Schedule Box
 - 3.1. Listing of Approach Slab bid items, their units, and quantities
 - 3.2. Listing of informational quantities contained in the Approach Slab items placed directly below the Estimated Quantity Box
4. Plan View of Approach Slabs oriented such that the centerline of roadway is parallel to the top border of sheet
 - 4.1. Dimensions: overall width of approach slabs; length of approach slab along centerline of roadway; curb transition lengths
 - 4.2. Details of reinforcing steel in top and bottom of approach slabs
 - 4.3. Other items: drop inlet locations; centerline of roadway; crown slope; X Section and Detail reference locations; stations, offsets, and elevations for corners of approach or sleeper slabs

5. X Section thru Approach Slabs at centerline of roadway Section A-A)
Details of reinforcement in Approach Slab and Sleeper Slab; sawed joint details for junction of approach slab to bridge slab; detail reference location, polyethylene sheeting location; sliding surface of sleeper slab note
6. X Section thru curb, normal to centerline roadway, showing details of reinforcement in curb area and curb dimensions (Section B-B)
7. X Section thru curb at end of approach slab, normal to centerline of roadway, showing reinforcing details and location of elevation reference (Section C-C)
8. X Section at approach slab end, parallel to centerline of roadway near curb, illustrating curb transition details (Section D-D)
9. Detail of junction of approach slab with bridge at curb locations showing joint details (Detail "X")
10. Plan view and X Section (Section E-E) showing 3/4" preformed expansion joint filler limits and hot poured elastic joint sealer details.
11. X Section thru Sleeper Slab parallel to the centerline of roadway (Section F-F)
 - 11.1. Dimensions: bottom and top width of sleeper slab; sleeper slab bottom and overall thicknesses; approach slab thickness and step bevel dimensions
 - 11.2. Details of reinforcing steel in sleeper slab
 - 11.3. Other items: centerline of joint and sheet no. reference for approach slab joint details, armor angle; approach slab step bevel slope; Detail "Y" reference location; stations
12. Detail of drop inlet location showing reinforcing steel alteration details required to accommodate drop inlets (Detail "Z")

6.5.16. APPROACH SLAB JOINT DETAILS

(Membrane Sealant Expansion Joint base sheet with specific structure data filled in)

6.5.17. RIPRAP DETAILS

(This sheet is required only if there is not sufficient room on the General Drawing sheet to detail the erosion protection adequately)

1. Title Block (similar to General Drawing except the Bridge Code No., PCN and Topeka Shiner Habitat information not present)
2. Estimated Quantities Box in the right margin above the Title Block
 - 2.1. Listing of erosion protection bid items, their units, and quantities
 - 2.2. Conversion factor used to convert cu. yds. to tons under the Estimated Quantities Box
3. Plan View similar to that on General Drawing except concentrating on erosion protection details and limits
4. All dimensions (horizontal), slopes and elevations required to establish erosion protection limits and ties to structure location
5. Elevation View similar to that on the General Drawing except concentrating on erosion protection details and limits :
6. Standard Notes with specific structure information filled in

6.5.18. DETAILS OF STANDARD PLATE NO's 460.02 & 460.05

1. Year Plate Details (No. 460.02)
2. Bridge Survey Marker (No. 460.05)
3. Title Block (Abbreviated Version)

6.5.19. DETAILS OF STANDARD PLATE NO's 510.40 & 620.19

1. Steel Pile Splice Details (No. 510.40)
2. Fence Anchors for Bridge Abutments (No. 620.19)
3. Title Block (Abbreviated Version)

6.5.20. DETAILS OF STANDARD PLATE NO 630.92

1. 5-Bolt Insert Plate Assembly Details (No. 630.92)
2. Title Block (Abbreviated Version)

6.6. Section Method Sheets

(see appendix 7.5 for example plan sheets – Section Method Sheets)

The following is a guide for structure plans preparation of typical Section E Title and Quantity pages, used when plans assembly is done using the Section Method as outlined in the SDDOT Road Design Manual. They were derived by summarizing format and content from typical plans previously prepared by the Office of Bridge Design and do not represent an all encompassing specification for plans preparation.

6.6.1. SECTION E TITLE SHEET

1. Section E Title
2. Project Block upper right corner of sheet including State, Project No. and Total No. of Sheets in Section E.
3. Index of Sheets in upper right corner (preferred location: if room does not allow, place elsewhere on sheet)
4. North Arrow
5. Project Map showing the full project from Beginning to End. Use abbreviated data at beginning and ending of project listing project number and station data.
6. Note each structure location on the map. Include structure site and option data (if applicable), station, structure number and a description of the structure.

6.6.2. SECTION E QUANTITIES SHEET

1. Section E Estimate of Quantities Title
2. Block in upper right corner of sheet including the State, Project No., Sheet No. and Total No. of Sheets in Section E.
3. INCIDENTAL WORK, STRUCTURE notes, if applicable.
4. Provide a table of quantities for each structure in Section E. When multiple structures are being constructed, provide station, structure number and structure description for each quantity table.