|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **RD. / RTE. NO:** |  | **RD. / RTE. NAME:** |  | | **PROJECT ID:** | |  |
| **COUNTY:** |  | **PROJECT DESCRIPTION:** |  | | | | |
| **SUBMITTAL TYPE:** |  | **SUBMITTED BY:** |  | **RPG/DISTRICT/**  **CONSULTANT:** | |  | |
| **QC PERFORMED BY:** |  | **DATE:** |  | | | | |
| **QA PERFORMED BY:** |  | **PROJECT TYPE:** |  | | | | |
|  | | | | | | | |

Preliminary Bridge Plans shall be submitted to and reviewed by the Structural Des Support Quality Assurance Office prior to the designer proceeding with preparation of 95% Bridge Plans. The Preliminary Bridge Plans shall be subjected to a thorough Quality Control (QC) / Quality Assurance (QA) review by the designer prior to submittal to the SCDOT Structural Design Support Office. Failure to provide proper level of review by the designer or the Engineer of Record (EOR) will be cause for rejection of the plans and submittal will be returned for proper plans preparation. Design review comments made by SCDOT on the Preliminary Bridge Plans shall be addressed and responses from EOR returned to SCDOT together with 95% Bridge Plans.

This checklist is organized by Plan sheet sequence as referenced in SCDOT Bridge Design Manual (BDM) Section 3.3.

Is a design variance required for any part of the project that does not meet the requirements of the SCDOT Design References? - See BDM Section 11.2.3 /11.2.3.2  Yes  No  N/A

A comprehensive list of SCDOT Design References is now available on the SCDOT website:

[**https://www.scdot.org/business/design-quality.aspx**](https://www.scdot.org/business/design-quality.aspx)

**Title Sheet Drawing no. 700-01, 700-02 BDM Section 6.3.1**

Project Layout Map - BDM Section 6.3.1.1

* + County Name – Use both county names when bridge crosses over county line
  + Project ID (verify correctness with SCDOT Project Manager)
  + Route Number followed by Local Road Name in parentheses
  + Crossing Description – Replace Bridge Over …, Construct Bridge Over … (for new location), and Widen Bridge Over… Rehabilitate Bridge Over …, etc.

Project Layout Map and an arrow(s) indicating stationing direction(s), including Longitude and Latitude - BDM Section 6.3.1.5

* + Add Project Location Map using SCDOT County or City Maps. Maps are scaled to provide legible detail and provide adequate level of information for locating project site
  + Orientation of Project Layout Map matches direction of North Arrow
  + Site Location label added with line terminator ending with a circle enclosing bridge site
  + Direction of Stationing noted

Index of Sheets provided - BDM Figure 6.1-1 & BDM Section 6.3.1.2

* + Sheet number indicated matches sheet number of each individual plan sheet
  + Name of each sheet matches titles located in title blocks of individual plan sheets

Utility Location Note included – BDWG 700-01 & BDWG 700-02

Correct Asset ID number entered in plans -LRGD and MEMO DM0420

Traffic Data provided (current year, design year, % trucks) - BDM Section 6.3.1.4

Correct Project Length - BDM Section 6.3.1.3. All numbers truncated to a thousandth of a mile

* + Approach slabs not included in the Net Length of Bridge
  + Net Length of Roadway is zero, unless all Road Plans and Road Quantities are included within Bridge Plans

Shop Plans Submittal Box - proper contact information is provided - BDWG 700-01 & BDWG 700-02

Location Box - BDM Section 6.3.1.6

* + Latitude provided
  + Longitude provided

Signature Blocks (label level of submittal) - BDM Section 6.3.1.8

Date of Plan Set, CADD Information, and plot stamp - BDM Section 6.3.1.9

Low Volume Bridge Note added, if applicable. Verify all Selection Characteristics are met per SCDOT PCDM-11

Date of Plan Set, CADD Information, and plot stamp BDM Section 6.3.1.9

**General Notes Sheet Drawing no. 700-03, 700-04 BDM Section 6.3.3**

Updated revision block with project name, initials, date per BDWG 700-03, 700-04

Updated Seismic Design Category (SDC), Analysis Method, and seismic Operational Classification (OC) based on SDS Table 3.1

* + Seismic Design Category (SDC) provided – SDS Table 3.5, BDWG 700-03.01
  + Analysis Method provided – BDWG 700-03.01
  + Operational Classification provided –Table 3.1 SDS, BDWG 700-03.01
  + PGA (FEE & SEE) provided
  + SDS (FEE & SEE) provided
  + SD1 (FEE & SEE) provided
  + Acceleration Design Response Spectrum Data Tables (FEE & SEE) completed
  + Identify how values are determined - BDWG 700-03.01

Verify Seismic data included follows the Preliminary Geotechnical Engineering Report for the project

Low Volume Bridge - Seismic data from BDWG 700-03.01 & Seismic design acceleration coefficient SD1 (SEE) is based on project location relative to US Route 1

Verify project design per correct version of LRFD specifications – MEMO DM0220, BDWG 700-03

Ensure Design Data includes appropriate Design Live Load

Ensure minimum requirements for reinforcing bars are listed as per AASHTO M31, Type W (ASTM A706 Grade 60) see BDM Section 15.2.2

Ensure minimum grades and types of structural steel are met per BDM Section 16.2

Ensure all bolts are minimum ASTM F3125 (Type 1) galvanized or ASTM F3125 (Type 3) weathering steel

Final Surface Finish selected

**Roadway Typical Section Sheet BDM Section 6.3.5**

Ensure Roadway approaches on both sides of the bridge shown on Bridge Plan and Profile sheet match Typical Roadway Section - BDM Section 6.3.5

Ensure total travelway width and shoulders match approaches on both sides of the bridge - see BDMFigure12.6-1

Uniform cross-slope for normal crown is 2%

If the proposed bridge is over a roadway, include a typical section of the lower roadway

Roadway Typical Section Sheet labeled “For Information Only”

**Roadway Plan and Profile Sheet BDM Section 6.3.6**

Ensure Roadway sheets included in the Bridge Plans match the most current revision of the roadway plans

Roadway Plan and Profile Sheet labeled “For Information Only”

Bridge end drainage shown

Applicable thrie-beam connector note(s)

New bridge construction drawing and note included

Grades, elevations, end drainage, riprap, MSE wall, concrete slope protection at end bents, lengths and guardrail/ barrier transition type match the bridge plans

**Stages of Construction Sheet** Yes No N/A **BDM Section 6.3.7**

Show existing conditions along with existing structures to be impacted

Areas of the existing structure that will be removed during each stage

New portions of the structure that will be constructed during each stage

Show where traffic will be accommodated

Locations of traffic control devices, including temporary concrete barriers

* + Reference appropriate roadway standard drawings for installation
  + Note that traffic control devices are roadway items

Verify if additional deck design is needed in order to support temporary barriers placed on deck overhangs

Note if traffic control items are roadway pay items

Show dimensions necessary for construction

* + Stage widths
  + Traffic direction
  + Lane widths
  + Shoulder/median widths
  + Distance from edge of stage to centerline (CL) new structure/roadway
  + Distance from edge of new structure to edge of existing structure
  + Distance from CL new structure/roadway to CL existing structure/roadway
  + Clear distance between structures
  + Distance from temporary barrier to edge of construction
  + Roadway widths
  + Slab out-to-out width
  + Lane, shoulder, median widths

Notes describing each stage of construction

**Bridge Plan and Profile Sheet Drawing no. 700-06 BDM Section 6.3.8**

Plan View BDM Section 6.3.8.1

Show the largest engineering scale practical to fit on the sheet. Use multiple sheets if necessary

Show existing bridge with light dashed line. Include a note on its size, material, removal and disposition per Standard Specifications

Show new bridge and approach slabs using solid lines

Label beginning & end of bridge

Show centerlines for roadway construction, survey centerline across the structure including centerlines of roadways or railroads underneath the structure

Tangent centerlines should be labeled with their bearings in the style of Northing - Easting, and degree of curve

Where the roadway is on a horizontal curve show clear horizontal curve data. Label the applicable PC and PT for the roadway. Ensure horizontal curve data matches the roadway sheets

Station marks increasing left to right, at 100-ft increments at top of sheet

Show tie equality stationing at the intersection of design centerline and crossroad and/or railroad centerlines

Show matchline stationing where the structure is drawn on two or more sheets

Dimension the overall roadway width across the structure. Ensure it is consistent with the Roadway Typical Section

Dimension the width from the construction centerline to each edge of the roadway

Dimension the railing wall widths and slab extension behind the railing wall

Dimension the travel lane, shoulder, and median widths prior to and beyond the structure

Dimension the sidewalk widths

Dimension the minimum horizontal clearances for roadways and railroads crossed over - BDM Section 12.6

Dimension the horizontal distance between construction centerlines for dual structures

Dimension the offset width between the roadway construction centerline and the structure centerline

Dimension the width of each stage, for staged projects. Ensure it matches the Stage of Construction sheets

Drains:

* + Show spacing of deck drains and to which side(s) they apply. If not required, indicate this in a note. Deck drains are recommended if there are no environmental restrictions
  + A drainage inlet must always be located at the low point of a sag vertical curve - BDM Section 18.2.4
  + Flanking inlets placed 5 feet on either side of the low point of a sag vertical curve - BDM Section 18.2.4
  + Drains should not be located within 5’ from edge of substructure - BDM Section 18.2.5.4.1
  + Scupper outlets are not allowed over railroad right-of-way - BDM Section 18.2.5.4

Show end drainage or reference roadway plans

Show skew angle between the construction centerline, or long chord on curved bridges, and the centerline at one or more of the bents even when 90 degrees

If the roadway is superelevated across the structure, provide a detail showing the cross section view of the superelevated section

If the superelevation transitions on the structure, provide a detail showing the method of superelevation

Route number, Railroad (R.R.) name, traffic direction to nearest town if applicable

Stream crossing name and direction of flow if applicable

Traffic directions for crossing highway

North arrow

Curb and gutter

Show and label Guard rail

Offset to detour bridge

Benchmark data and elevations show minimum two benchmarks, indicate location by station, and distance left or right from construction center line, note the type of benchmarks, including the elevation of the benchmarks rounded up to the nearest hundredth of a foot –BDM 6.3.8.3

Specify location of expansion or deflection joints

Toe of fills and/or top of cuts

Limits of slope protection or riprap

Temporary shoring location if applicable

Show retaining walls if applicable

Structure-mounted signs or luminaires

Show boring locations and verify consistency with boring log sheets

All utilities, pipes, power lines, etc. and label owners

For bridge widening comply with BDM Chapter 23

Label point of minimum vertical clearance (“PMVC”)

Show legend list used on the sheet

Railroads (R.R.) - BDM Section 22

Show horizontal alignment of the railroad crossed over

Distance between track centers = 15 ft. minimum

Minimum horizontal clearance from the centerline of the track = 25 ft. - BDM Section 22.2.3.2

Edges of the footing should not be closer than 15.0 ft. from the centerline of the track - BDM Section 22.2.3.2

For lateral clearance on curved and superelevated tracks see BDM Chapter 22 and Figure 22.2-4

Existing horizontal and vertical clearances should be maintained for widening projects. Clearances for reconstruction work or for alteration of existing tracks are dependent on existing physical conditions and, where reasonably practical, should be improved to meet the requirements for new construction - BDM Section 22.2.3.7

If bents supporting bridges over railways are within a clear distance of 25.0 ft. or less from the centerline of a railroad track, bents shall be of heavy construction or shall be protected by a 2.5ft thick reinforced concrete crash wall to limit damage by the redirection and deflection of railroad equipment - BDM Section 22.2.3.5

Construction casing shall be specified for drilled shafts that are located within 30 ft. of the centerline of an existing railroad track. For drilled shaft locations greater than 30 ft. from the centerline of a track, consideration shall be given to requiring construction casing - BDM Section 22.2.7

Concrete slope protection pavement should be provided where practical- BDM Section 22.2.3.6

Dimension ROW limits for railroads

Include table with the elevation for each rail at each railroad station along with date of the survey

Stations and Elevations of R.R. rails, distances center to center tracks, label present and future track

Show the distance to the nearest railroad milepost from the intersection of the centerline track and centerline of the bridge

Note to contractor in regards of verifying top-of-rail and existing alignment

Comply with BDM Chapter 22 and MEMO DM0307 for design and construction criteria

Temporary horizontal construction clearances shall be noted on the plans as a minimum of 13.0 ft. for tangent tracks and 14.0 ft. for curved tracks measured from the centerline of track. Temporary vertical construction clearance shall be noted as 22.0 ft. above the top of high rail. The railroad company may request increased temporary clearances after review of the preliminary plans - BDM Section 22.2.3.2

A protective fence will be provided if requested by the railroad company - BDM Section 22.2.6

For CSX overhead bridges, refer to "CSX Criteria for Overhead Bridges"

Profile View BDM Section 6.3.8.2

Avoid locating a sag vertical curve low point on the bridge or approach slab see BDM Section 18.2.1.2

Label the Profile view with the appropriate name according to what is representing “SECTION ALONG …”

Note the stationing rounded up to the second decimal place

Note finish grade elevations rounded up to one thousandth of a foot at Begin/End Bridge, CL Bents, Begin /End Approach slab

All stations shown at 100-ft increments, along the bottom of the profile view (e.g., 807 + 00, 808 + 00) and the appropriate in-between stations (e.g., +10, +20, +30 or +20, +40, +60), depending on the scale

Show superstructure type, deck, piles, shafts, footings, bent caps, approach slabs at beginning /end bridge

Consecutively number each bent by increasing stations matching the plan view. Also, provide a label to indicate that these are the bent numbers (i.e., BENT NO. →).

Note the stationing of PVI, PVC, and/or PVT if applicable

Show vertical curve data, including, length of vertical curve, forward and back tangent grades in percent, PVI station and elevation. Verify vertical curve data match the roadway plans

If open drainage is used, minimum longitudinal deck gradient = 0.3% per BDM Section 18.2.1

Show the existing ground line and finished grade line profile at the construction centerline. Include left and right of the centerline profiles with dashed lines

Dimension minimum vertical clearance for roadways per BDM Section 12.6 and railroads passing under the structure.

Minimum vertical clearance shall be 23.0 ft. - BDM Section 22.2.3.2

Show 100-year and 500-year scour lines

Water surface elevation at the time of survey

Show the 100-year, 50-year, 25-year, and highest recorded high-water elevations as applicable for the project

Hydraulic data, drainage area, design year flow, elevation, overtopping, backwater elevation and water fluctuation note if applicable

Ensure Hydraulic data matches the most current data roadway plans

Ensure hydraulic freeboard requirements for the project are met

Label each bent and show stationing of each bent rounded up to the second decimal place

Show elevations at centerline of each bent rounded up to a one thousandth of a foot

Low chord elevation

Dimension out-to-out horizontal distance of the overall bridge length

Dimension approach slabs

Dimension continuous spans and each span length

Bent numbers if multiple span structure

Label the superstructure type in the overall bridge length dimension line

Label type of bearing at each bent (fixed, integral, etc.)

Add construction notes applicable to the drawing

Label slope rate and slope protection type

If roadway crosses underneath the bridge: If bents within 30 feet from edge of travel lane comply with MEMO DM0213 and BDM Section 20.2.3.1 and BDM Figure 20.2-2

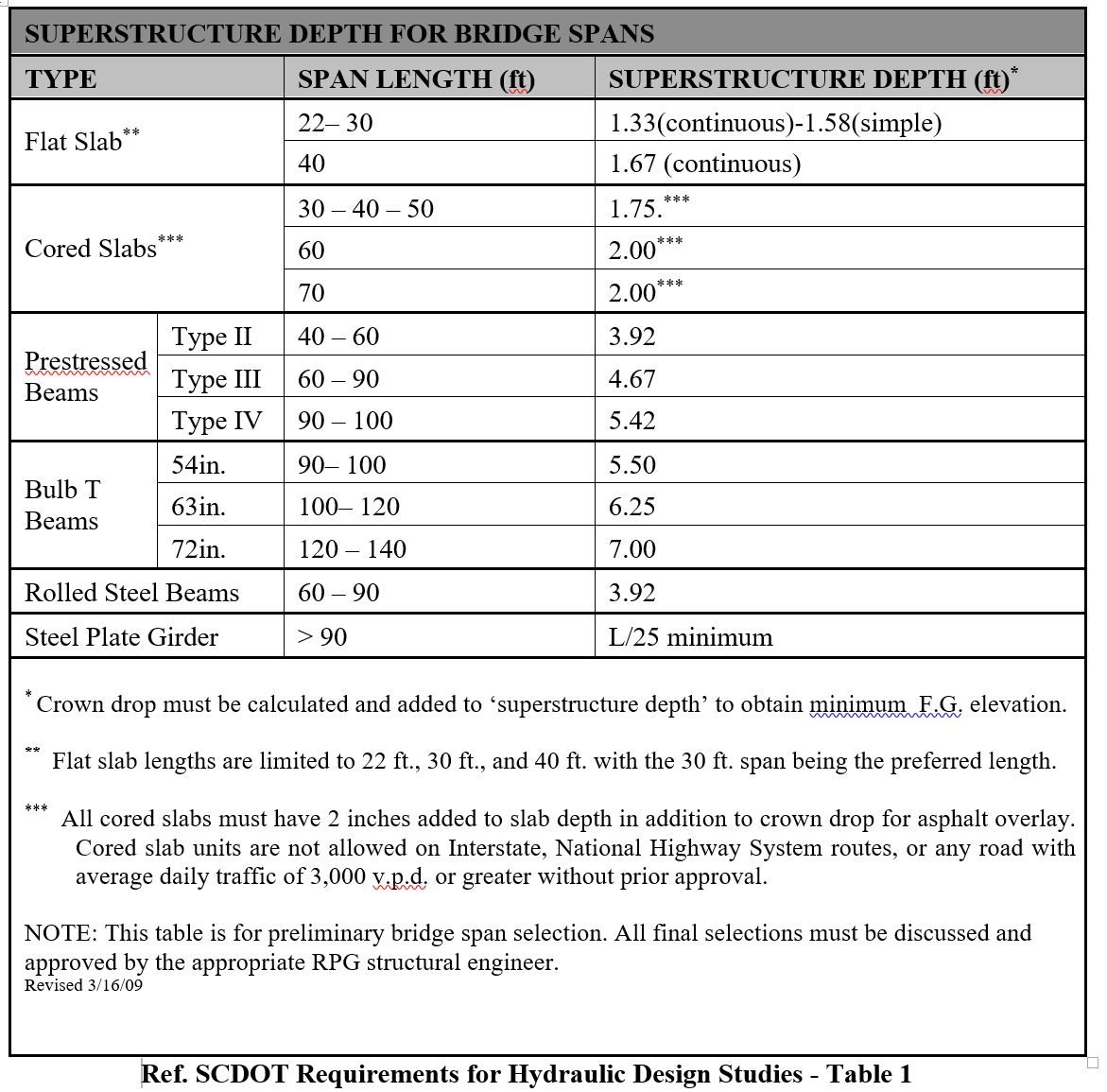
Show embankment at least 1 ft. above the bottom of the end bent cap

Detail the wing walls to allow for a minimum berm width of 2 ft. measured perpendicular to the bent cap

Show toe of riprap embedded 1 ft. below existing ground

Show all utilities that may interfere with bridge construction (or note if identified on Roadway plans)

Ensure bridge span selection meet the criteria of Table 1 below or per design variance approved by SCDOT.



All spans shall meet AASHTO LRFD Table 2.5.2.6.3-1 -- Traditional Minimum Depths for Constant Depth Superstructures

For bridge widening comply with BDM Chapter 23

Excavation cross-hatched & label “See Road Plans”

Railroads (R.R.):

Railroad cross sections should be shown at 25-ft intervals for 100-ft on each side of the centerline of the bridge – BDM 3.3.2.10

The new end fill slopes should be plotted on the cross sections

Clearances between the toe of slope and railroad tracks shown if applicable

Reference MEMO DM0213 for interior bents within 25 feet to 50 feet of CL of railroad tracks

Vertical clearance shall be set between a minimum of 23 ft. and a maximum of 23.4 ft. Reference BDM 22.2.3.2.3

Comply with SCDOT BDM Chapter 22 and DM0307 for design and construction criteria

**Boring Logs Sheet BDM Section 6.3.9**

Show Boring Logs

Note “For Information Only” included

Boring log locations presented in a format of "station and offset"

**Foundation Layout Sheet BDM Section 6.3.10**

Show stationing marks increasing left to right, at 100-ft increments at top of sheet

Dimension overall structure’s length

Label bent number

Call out center line of piles or shafts

Note the size of the piles or diameters of drilled shafts

Stationing rounded up to the second decimal place shown where construction centerline intersects the centerline of each bent and begin/end bridge

Show construction centerline, bridge center line, alignment data and work points

Location of existing foundations drawn in light dashed lines

Note and dimension any existing substructure

Show north arrow

Show skew angle of all bents

Show Long Chord Layout including skew angles and offsets for curves at critical points - BDM Section 6.3.10

Dimension length of span and label it

Show stages of construction if applicable

Add geotechnical notes if not included on other sheets

Show location of temporary shoring wall

Label index piles

Show legend if applicable

**Bent Sheets (End Bent / Interior Bent) BDM Section 6.3.11**

Plan view (typical bents)\* BDM Section 6.3.11.2

End/Interior\*

Select scale that allows both the plan and elevation view of a bent to fit on one sheet and clearly show the reinforcing details

Note direction of stationing

Centerline of construction, survey or bridge centerline noted

Dimension overall length of the bent

Dimension distances between the outside edges of the bent to centerline of construction, survey or bridge centerline

Dimension bent width

Dimension bearing and bent centerline

Dimension distances to centerlines dowels, bearings etc.

Dimension girder/beam spacing including distance to and from first/last girder to end of bent

Show distances from centerline to staged construction joint if applicable

Skew angle shown

Show beam numbers if applicable

Show beam seat location, size and anchor bolt information

Wing Walls length and width shown

Show shear keys if applicable

Type and thickness of expansion joint material if applicable

Elevation View (typical bents) or Bridge Typical Section BDM Section 3.3.2.7 & 6.3.11.3 & 6.3.13.4.1

Centerline of construction, survey or bridge centerline noted

Dimension overall length of the bent

Dimension distances between the outside edges of the bent to centerline of construction, survey or bridge centerline

and to wing walls

Dimension out-to-out superstructure width

Dimension overall superstructure thickness

Show pile/shafts/column type, size and spacing

Dimension centerline (CL) of first/last pile to end of bent and from CL of pile to construction CL

Label superstructure type

Number the Piles/Drilled Shaft or Columns and show their size

Dimension widths between the construction centerline to the gutter line

Barrier width and distance between the barrier and the edge of the deck

Sidewalk width if applicable

Median width if applicable

Direction of cross slope in percent

Finished grade

Drip groove shown

Deck drains shown if applicable

Lane and shoulder width shown. Ensure they match the latest Roadway sheets

Dimension the thickness of the slab

Dimension overall superstructure depth

Height of barrier/ parapet wall

Girders/beams type and cross bracing if applicable

Miscellaneous

Location of utilities attached to the structure

Dimension widths of stages of construction if applicable

High and low sides of superelevated sections

Construction joints/ closure pour shown

Gutter line

Special notes

Legend if applicable

Label location of construction Joints, widths, and type of expansion material

Construction notes Span length guidelines per SCDOT BDM Figure 12.3-1

|  |  |  |  |
| --- | --- | --- | --- |
| Structure Type | Span Length Ranges (feet) | | |
| ≤ 40 | > 40 to 100 | > 100 |
| Prestressed Concrete Girders |  | X |  |
| Flat Slabs | X |  |  |
| Steel Welded Plate Girders |  | X | X |
| Steel Rolled Beams |  | X |  |
| Cored Slabs | X | X |  |

Ensure minimum depth for single superstructure spans is met per AASHTO LRFD Table 2.5.2.6.3-1

Deck overhang should be less than 50% of the average girder spacing or meet the limitations of BDM Figure 12.2-1 below, whichever is less governs. Structural steel plate girders - the web depth shall be used as the depth of beam.

For chorded girders, the overhang at any point shall not exceed 50% of the average girder spacing. See BDM Section 12.2.5.5

|  |  |  |
| --- | --- | --- |
| Type of Beam | Depth of Beam1 | Maximum Deck Overhang |
| Prestressed Concrete | < 54” | 42” |
| 54” – 63” | 48” |
| > 63” | 54” |
| Structural  Steel | < 36” | Depth of Beam |
| 36” – 48” | 42” |
| > 48” | 45” |

1 - structural steel girders, depth of beam = depth of web

* + - Minimum overhang = greater of 12” beyond edge of top flange and 2’-3” beyond centerline of girder - BDM Section 12.2.5.5

Section through bent cap (typical bents) BDM Section 3.3.2.6

Show all anticipated cap dimensions

Show Begin/End Bridge, CL Bents, Begin/End Approach slab, joints

Dimension CL of beam seat to the outside edge of bent cap

Label superstructure type

Dimension typical length of pile embedment into the bent cap

Show top of embankment fill as per BDM Fig. 20.2-2 and location of riprap if applicable

The top of the bent cap - minimum of 12 in above the surrounding grade (including any rip rap placed on earth berm).

The bottom of the bent cap detailed a minimum of 12 in below the earthen berm -BDM Section 20.2.3. Account for rip-rap thickness resting on top of earthen berm when determining cap depth – RDWG 804-105-00

Maintain a minimum berm width of 2 ft. measured perpendicular to the bent cap

**Existing Bridge Plans Sheets** Ref: Online Plans Library & **BDM Section 6.3.19**

Existing Bridge Plans included

Note “For Information Only” included on each sheet

New sheet numbers and Project ID added at tops of sheets