



Bridge Design Details 7.1 October 2025

Bent

The BENT (PIER) LAYOUT and BENT (PIER) DETAIL sheets provide specific details for the bridge bents and piers. By definition, bridge supports can only be labeled as PIERS if a span crosses a waterway. By default, it is assumed that if any span of a bridge crosses a waterway, all supports except the abutments will be called piers.

Plan

1. Place at top, left side of sheet, oriented looking ahead on stationing or ahead on bent numbering; with the front side facing down and the centerline of bent horizontal.
2. The minimum scale is $\frac{1}{4}" = 1'-0"$. Reinforcement may be shown in this view at this scale.
3. Show the same District layout line used on FOUNDATION PLAN. Do not repeat layout stations, bearings, skews, or dimensions shown elsewhere.
4. Show North arrow.
5. Show bearing pads, limits of level bearing area, expanded polystyrene, and expansion joint filler details.
6. Show reference lines (usually Centerline of Column or Centerline of Bridge) that are parallel to girders for bar cutoffs and placement.
7. Show a few stirrups at ends of bent caps on skews, including partial or split stirrups at round or octagonal columns and at corners of bent caps, see 7-11 Bent Cap Stirrup Reinforcement (Vertical Exterior Girders) and 7-12 Bent Cap Stirrup Reinforcement (Sloping Exterior Girders).
8. Show deck drains and details of reinforcement around drains.
9. Show centerline and outline of edges of utility and future utility openings, see Standard Plan: B6-10 Utility Openings T-Beam and Standard Plan: B7-10 Utility Openings Box Girder.
10. Avoid showing outline of girders and deck reinforcement.

Elevation

1. Place below PLAN view, projected from face of bent cap for skewed bents. Length of ELEVATION should match the length along the layout line at centerline of bent (NOTE: For skewed structures, the skewed length is longer than the width of the bridge normal to the bridge layout line).
2. Show finished grade and use solid lines for portions of structure below grade.



3. Use the same scale as PLAN view. Reinforcement may be shown in this view at this scale.
4. Show all footings and a few footing reinforcing bars to identify locations of column pins or bars in footing mats, see 7-2 Footing Reinforcement. Give footing elevations only if they are not shown on FOUNDATION PLAN.
5. Do not show all piles (NOTE: All piles not shown). Give pile cut-off elevations only if they are not shown on PILE DATA TABLE.
6. Show seal course, see 7-4 Structure Excavation (Type A) with Seal Course.
7. Show column geometries in ELEVATION or in a separate detail for "ARCHITECTURAL COLUMNS" or "COLUMN GEOMETRICS" detail.
8. Show deck overhang reinforcement and some column and flare reinforcement. Column and flare reinforcement include vertical bars and hoops.
9. Show cap stirrup spacing taken along centerline of bent with special stirrup details and spacing at columns or corners of skewed bents.
10. Show locations of all columns and bent cap SECTIONS.
11. Show new and future utilities; detail reinforcement around openings, see Standard Plan: B6-10 Utility Openings T-Beam and Standard Plan: B7-10 Utility Openings Box Girder.
12. Show locations deck drains, and pipes in bent cap and columns.
13. Show locations and details for bearing pads.
14. Do not show girders.

Footing Plan

1. Preferred scale $\frac{1}{4}" = 1'-0"$. Reinforcement may be shown in this view at this scale.
2. Show all footings. Typically, one FOOTING PLAN provides pile layouts and another provides reinforcement details. Do not re-detail similar footings (NOTE: Details symmetric about centerline of footing. For details not shown, see "...").
3. Show complete pile layouts. Locate piles from centerline of column, which typically should equal centerline footing. Show centerline bent and footing.
4. Do not show layout information and dimensions that are shown on FOUNDATION PLAN from District layout line.

Sections and Details

1. For general requirements, see 1.1 General Detailing - Detail Layout, Sections, and Views.



2. SECTIONS and DETAILS showing reinforcement should not be less than $\frac{3}{8}" = 1'-0"$ scale; the preferred scale is $\frac{1}{2}" = 1'-0"$ minimum.
3. If main reinforcement cannot be shown in PLAN, show a PART PLAN of bent cap.
4. If non-standard concrete piles are used, include PILE DETAIL and SECTION that shows limits of payment and typical reinforcement. Otherwise, reference Standard Plans for details.

Bent Cap Section

1. Multiple sections may be needed for sections between and at columns.
2. Show main reinforcement, stirrups, and construction bars.
3. Show clearance to main cap reinforcing. Use outside deformation diameter to assure that deck clearance can be maintained, see 13 Reinforcement, for rebar dimensions.

Column Section

1. Use the same scale as BENT CAP SECTION.
2. Several sections may be needed for architectural columns, pinned column base, and variable bar patterns.