



Bridge Design Details 6.1 August 2022

Abutment

The ABUTMENT LAYOUT and ABUTMENT DETAIL sheets provide specific details for the bridge abutment. Additional details such as abutment drainage, bearing pad layout, utility locations, retaining wall connections, and other abutment-related details may be shown on these sheets.

Plan

1. Place at the top, left side of sheet, oriented with the front side facing down and the centerline of abutment horizontal. Alternatively, the PLAN view may be orientated the same direction as the PLAN view shown on the GENERAL PLAN sheet.
2. The minimum scale is $\frac{1}{4}'' = 1'-0''$. Use $\frac{1}{8}'' = 1'-0''$ on large structures but show less detail.
3. Show abutment, footing, pile spacing, bearing pad, and wingwall dimensions along the same layout lines used on the FOUNDATION PLAN (Note: Show the centerline of the abutment bearing for seat abutments and the centerline of the abutment for diaphragm abutments).
4. Do not repeat layout stations or bearings shown on the FOUNDATION PLAN.
5. Show wingwall or retaining wall lengths.
6. Show pile spacing (Do not dimension piles from edge of footing).
 - A FOOTING PLAN may be used to show pile spacing if it can't be shown clearly in the PLAN view. Additional DETAILS of footings should be shown in the same orientation as the PLAN view. Show the centerline of bearing.
7. Show North arrow.
8. Show bearing pads and limits of level bearing area. A portion of the expanded polystyrene or expansion joint filler material may be added.
9. Show the centerline of utility and future utility openings. Identify the size of opening and details for buried pipe for bridges with approach slabs, see *Standard Plan: B6-10 Utility Openings T-Beam* and *Standard Plan: B7-10 Utility Openings Box Girder*.
10. Avoid showing portions of approach slabs or reinforcement.



Elevation

1. Place below PLAN view, projected from face of abutment. If PLAN is orientated the same as the GENERAL PLAN, place ELEVATION in front of PLAN, looking normal to face of abutment.
2. Use solid lines for portions below grade. Rear elevations should be avoided. ELEVATION should be a depiction of abutment stem, backwall, and footing. Avoid showing the superstructure on seat type abutments, but if it is shown – use dashed lines.
3. Use the same scale as PLAN view.
4. Show location of weep holes if Structure Approach Drainage is not required. For typical drainage details, see *Standard Plan B0-3: Bridge Detail 3-1*.
5. Show the finished grade or slope paving in front of the abutment (FG should be parallel to the deck when the cross slope is constant and level for crowned slopes).
6. Do not attempt to show the entire skewed wingwalls.
7. Show bearing pads and utility opening information.
8. Do not show all piles (NOTE: All piles not shown).
9. Avoid showing barrier, approach slab, or other detail dimensions.

Wingwall Elevation

1. Projection of PLAN view, if possible; otherwise locate by VIEW letters or simply call out as WINGWALL ELEVATION.
2. Always show looking normal to the wall.
3. Use the same scale as PLAN view unless reinforcement is to be shown. Usually, reinforcement should not be shown at a scale less than $\frac{3}{8}'' = 1'-0''$.
4. Do not show wingwall layout dimensions given on PLAN view. Call out Standard Plan references instead of re-detailing standard reinforcement.
5. Show SECTION of top of wall details for railings, sidewalks, overhangs, and architectural treatment. Section should show Structure Approach Drainage Details if applicable.
6. Show finished grade or slope paving.
7. Show all piles.
8. Railing need not be shown (NOTE: Barrier railing not shown).



Retaining Wall or Return Wall Elevation

1. Do not show dimensions given on PLAN view or standard plan sheets. Call out Standard Plan references (e.g., footing steps, expansion joints, weakened planes, etc). Show all other layout information along the Retaining Wall Layout Line (RWLOL).
2. Long retaining walls adjacent to bridges may require separate sheets or plans showing PLAN and ELEVATION details.
3. Show SECTION of top of wall details for railings, sidewalks, overhangs, and architectural treatment. Section should show Structure Approach Drainage Details if applicable.
4. Do not show all piles (NOTE: All piles not shown).
5. Distance between footing steps should be in multiples of 8 feet. Maximum height of steps should be held to 4 feet. For typical step details, see *Standard Plan B3-5: Retaining Wall Details No. 1 - Footing Step*. Small steps less than 12 inches should be avoided unless distance between steps is 96 feet or more. If footing thickness changes between steps, the bottom of footing elevation should be adjusted so that the top of footing remains at the same elevation.
6. When sloping footings are used, form and joint lines are permitted to be perpendicular and parallel to the footing for ease of construction. Sloping footing grades shall be constant for the entire length of the wall. If breaks in footing grade (angle points) are deemed necessary, a level-stepped footing shall be used for the entire wall instead of a sloping footing (Maximum permissible slope for a reinforced concrete retaining wall footing is 3% and maximum permissible slope for masonry walls is 2%).
7. Weakened plane joints (*Standard Plan B0-3: Bridge Detail 3-2*) should be shown at nearly equal spaces between expansion joints.
8. Expansion Joints (*Standard Plan B0-3: Bridge Detail 3-4*) shall be shown at maximum intervals of 96 feet (shorter spaces should be in multiples of 8 feet). Expansion joints should not be placed at an angle point in the wall alignment. Waterstop in the expansion joint shall be shown to extend 1 foot below the finished grade. When concrete barriers or curbs are used on top of the retaining walls, the waterstop in the expansion joint shall be shown to extend 6 inches into the barrier or curb.



Sections and Details

1. For general requirements, see *Bridge Design Details*: 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. Do not repeat reinforcement shown in the Standard Plans.
4. Abutment SECTION should include the following:
 - a) Location of Beginning of Bridge (BB) and End of Bridge (EB), see *Bridge Design Details*: 6.8 BB and EB Locations.
 - b) Centerline Bearing for seat type abutment and Centerline Abutment for diaphragm type.
 - c) Stem and backwall reinforcement. For post tensioned girder bridges, backwall to be placed after bridge has been stressed.
 - d) Footing reinforcement and pile spacing.
 - e) Outline of end diaphragm or superstructure (Do not use drop out lines or include reinforcement details of superstructure beyond bars that extend from end diaphragm abutment into deck).
 - f) Joint seal type, movement range, and joint seal blackout details.
 - g) Waterstop or Structure Approach joint detail, see *Bridge Design Details*: 6.7 Sealed Joints.
 - h) Drainage details behind the abutment and "Weep Hole and Geocomposite Drain Detail" alternative when *Standard Plan B0-3*: Detail 3-1 is shown. For more information, see *Bridge Design Details*: 6.3 Abutment Drainage Details.
 - Edit the NOTES in the "Weep Hole and Geocomposite Drain Detail" to remove references to wall types or elements that are not specific to the project plans.
 - i) Dimension distance below the soffit and width of maintenance berm. For additional berm information, see *Bridge Design Details*: 2.1 Bridge Layout and *Bridge Design Details*: 6.2 Seat & End Diaphragm Abutments.
5. SHEAR KEY DETAIL should include the following:
 - a) Expanded polystyrene and expansion joint filler details.
 - b) Shear Key, stem, and wingwall reinforcement.