



Bridge Design Details 5.1 September 2019

Foundation Plan

A FOUNDATION PLAN sheet is a detailed map showing the existing features, utilities, and topographic information critical to a project. FOUNDATION PLAN sheets are prepared by the Structure Design Preliminary Investigations Branch (PI). When PI receives bridge site data from the district, it triggers the creation of the FOUNDATION PLAN sheets. The structure design branch should contact PI to confirm receipt of bridge site data.

FOUNDATION PLAN sheets may not be created by PI for:

- Emergency Projects
- Projects with no foundation modifications (e.g., retrofit, strengthening, etc.)
- Urban areas that do not have contours lines or existing utilities. In this case, a FOOTING PLAN shall be detailed on the ABUTMENT LAYOUT or BENT LAYOUT sheets with the same layout information that would be on a typical FOUNDATION PLAN sheet.

Once a structure design branch receives the FOUNDATION PLAN sheet from PI, the FOUNDATION PLAN sheet is modified to show all the foundation elements and the bottom of footing elevations.

The following instructions provide general guidelines and standards for modifying FOUNDATION PLANS for most structure projects.

1. Do not use "drop out" line style to show existing contours. Grade changes and final grading information is typically shown in ROADWAY PLANS.
2. Clip or mask contour lines that interfere with footing outlines, dimensions, stations, or bearings.
3. Relocate any pertinent information and text provided by PI that describes existing features that interfere with footing outline. The only exception is for existing and relocated utilities, which shall be fully shown.
4. Show North arrow.
5. Show names of nearest towns or cities.
6. Show PILE DATA TABLE (see *Memo to Designers: 3-1 Deep Foundations* for more information); alternative location for this information is the INDEX TO PLANS sheet.



7. Draw footings to scale, but do NOT dimension sizes of footings. The bottom of footing elevations shall be shown to the nearest 0.1 foot (e.g., 120.0)
 - The bottom of footing or bottom of abutment elevation for end diaphragm type abutments is not required if it is a constant depth and detailed on the ABUTMENT LAYOUT sheet.
8. Do NOT show all piles in a footing; instead show a few piles to indicate footings have piles, see *Bridge Design Details: 5A Footing Layout Information* (Exception: Column pile extension layouts shall be shown).
9. Show all bearings of abutment, bent, and pier centerlines. If supports are parallel, the bearing may be noted as such. Identify the stations where the support centerlines and bridge layout line intersect.
10. Only the GENERAL PLAN and FOUNDATION PLAN sheets should contain layout information such as bearings, stations, and curve data.
11. The layout line on the FOUNDATION PLAN sheet shall be the same line used on them GENERAL PLAN and other detail sheets.
12. Layout information shall be sufficient for the survey crews to stake out hubs for the contractor's use during construction.
 - Show adjacent retaining wall or wingwall retaining wall layout lines and footings. When adjacent wall details are provided in separate set of structure plans, the FOUNDATION PLAN sheets shall be similar between structures.
13. If stripping excavation is required, show the limits of stripping and the necessary sections needed to show limits of payment for the stripping excavation.
14. Other items such as HYDROLOGIC SUMMARY table (Figure 5.1.2) or SCOUR DATA TABLE (Figure 5.1.3) shall be added for structures over water.

HYDROLOGIC SUMMARY			
Drainage Area: X mi ²			
	Design Flood	Base Flood	Overtopping Flood/ Flood of Record
Frequency	50-yr	100-yr	X-yr/X-yr
Discharge	X cfs	X cfs	X cfs
Water Surface Elevation at Bridge	X ft	X ft	X ft
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

Figure 5.1.2 Hydrologic Summary Table



SCOUR DATA TABLE		
Support Location	Long Term (Degradation and Contraction) Scour Elevation (ft)	Short Term (Local) Scour Depth (ft)
Abut 1	-	-
Pier 2	-	-
Pier 3	-	-
Abut 4	-	-

Figure 5.1.3 Scour Data Table

Before adding or changing any of the details provided by PI on a FOUNDATION PLAN sheet, a copy should be made. Before working on a FOUNDATION PLAN sheet, consider the following:

- FOUNDATION PLAN sheets are drawn using master units (feet) and sub-units (tenths); structure plan detail sheets are drawn using master units (feet) and sub-units (inches).
- The FOUNDATION PLAN sheet is based on a "real-world" coordinate system and shall NOT be manipulated in any way that would change the coordinate value of any element on the map. The graphical elements, lines, points, and curves are located by their Northing and Easting coordinates.
- The features of the project and display of its alignment across the sheet shall be shown from left to right. If necessary, rotate the FOUNDATION PLAN sheet.

Confirm the FOUNDATION SHEET provided by PI has the following:

- Survey data block in the lower left-hand corner.
 - The vertical datum shown shall be NGVD 29 or NAVD 88.
 - The horizontal datum shall be NAD 27 or NAD 83.
- A minimum of two benchmark points shown; for survey control, the two monuments closest to the limits of the project shall be given.
 - The description of these monuments shall include the name, description, station, northing and easting coordinates, elevation, and relative offset location from the structure layout line.
- The locations and elevations of the existing bridge or structure.
 - A table of elevations and offset locations where the paving notch and curb intersect is typically provided.
- For overhead structures, the soffit elevation shall also be provided to ensure minimum vertical clearance is provided from the bottom of the structure to the top of rail (railroads) or to the top of pavement (roadway) below.