

Review the information provided on the Office of Bridges and Structures website regarding MicroStation Documentation and Tools.

1. Legibility, ~~not scale,~~ on the print should be considered when detailing. ~~Although~~ Scale is important and should be used, ~~when possible,~~ maintaining legibility.
2. All text regarding dimensions, notes and labels is to be clearly visible on details. Text and dimensions should not be obstructed by linear elements. (Do not show lines through text. Break the lines so text is legible on the print for clarity.)
3. Text in small spaces may be compressed HORIZONTALLY, not vertically, and must be legible on the print.
4. Use the Bridge Office MicroStation Seed files. These include the Preliminary Design and Final Design tools which aid in the proper CADD settings for text, dimensions, levels and linear elements.
- ~~1-5.~~ For proper text font size use Bridge Office text settings, Normal, Header and Subheader text. With ByLevel on for color, style and weight.
- ~~2-6.~~ All elements should be on the Bridge Office levels (brg....) with ByLevel ON for color, weight and line style. Edit elements as needed for specific lines such as centerline. There are separate level libraries for Preliminary Design and Final Design.
- ~~3-7.~~ All Bridge Office levels that start with “brgRev.....” are Revision Levels and are only to be used when creating plan revisions.
- ~~4-8.~~ Named levels are to be used with their assigned ByLevel attributes (color, weight and line style). Line style ~~can~~ may be altered as needed to aid in the clarity of a detail.
- ~~5-9.~~ Use Bridge Office abbreviations as found in the “CADD Notes” section of the Bridge Office Design Manual.
- ~~6-10.~~ All border and vertical lines of tables or notes are to use brgTableBorder level with ByLevel on for color, line style and weight.
- ~~7-11.~~ All horizontal lines of tables or notes are to use brgTableLines level with ByLevel on for color, line style and weight.
- ~~8-12.~~ Show hidden lines on the same level. Use line style 2 or 3 (style size selected should be appropriate for the detail drawn). Line weight=ByLevel or less for clarity.
- ~~9-13.~~ Use Bridge Office dimension styles, separate styles are available for Preliminary Design and Final Design. The use of these styles ensures the proper dimension settings regarding text size and spacing, dimension terminators, extension line gap, leader lines and notes.
- ~~10-14.~~ Dimension extension lines should not touch the object. The gap should be enough to be seen on the print.
- ~~11-15.~~ Dimension extension lines should go past the dimension information line far enough to be visible on the print.
- ~~12-16.~~ When dimensioning a small space with the arrowheads on the outside, a continuous dimension line should be used though the dimensioned space.
- ~~13-17.~~ Put arrowheads on the outside when there is no room to put them on the inside of ~~a~~ a dimension.

- ~~14-18.~~ When several small spaces are dimensioned together, use the dot, not a slash, to represent the double arrowhead of a dimension.
- ~~15.~~ ~~Text in small spaces may be compressed HORIZONTALLY, not vertical and must be readable on the print.~~
- ~~16.~~ ~~Do not show lines through text. Break the lines so text is legible on the print for clarity.~~
- ~~19.~~ There should be a space between the text and the dimension line. Do not place text on the dimension line, text should typically be centered in the dimension.
- ~~17-20.~~ If dual dimensions or other information is needed then text should be above and below the dimension line.
- ~~18-21.~~ Extension lines should be broken when crossing Dimension lines and Text.
- ~~19-22.~~ Extension lines may cross Extension lines without being broken.
- ~~20-23.~~ Dimensioning reinforcing – The total distance does not have to be shown for less than 5 spaces. Example (4 SPA. @ 9; 5-4f2 BARS) and (5 SPA. @ 9 = 3'-9; 6-4f2 BARS).
- ~~21-24.~~ One inch (1") should have the inch mark shown to be understood as a numeric one.
- ~~22-25.~~ Longer spaced Centerline style (brgDimensionLines level, line style=4, ~~line weight=1~~) should be used for:
- Centerline of pier, pier cap, pier column.
 - Centerline of abutment, abutment bearing.
 - Culvert centerline.
 - Centerline of bridge roadway.
- ~~23-26.~~ Shorter spaced Centerline style (brgDimensionLines level, line style=7) should be used for:
- Centerline of bearings.
 - Abutment footings.
 - Centerline of beam lines.
- ~~24-27.~~ When showing pier bars in elevation or plan:
- Show the first three and last three bars when there are a number of them. These may be constant or variable length.
 - Show the first three and last three when the spacing changes.
 - Double hoop bars need to be spaced apart to show on the prints.
 - Solid circle bars represent a cut bar.
 - Open circle bars represent a viewed bar. These can be in a section if the bar is not cut or a view.
 - These bars do not have to be to scale.
 - Large bars open or filled bars distract from the detail.
 - Small bars open or filled bars disappear or appear to be closed on the print.
 - An end view should be shown on the pier detail sheet.
- ~~25-28.~~ Do not use the letters "i", "l" (L), "o" or "x" as Bar Mark labels.
- ~~26.~~a. Commas will be shown for numbers 10,000 and greater. Numbers 9,999 and less may be shown without the comma.
- ~~27-29.~~ Showing transverse and longitudinal (horizontal) bars together:

- a. These bars should be slightly gapped to not appear on top of each other on the print.
 - b. All the open or closed bars need to be shown in pier footings or similar details.
- ~~28-30.~~ Show all bars as single lines when scale is ½” or smaller.
- ~~31.~~ Double lining (**full scale**) of ~~reinforcing~~**transverse** steel is optional on scales of ¾” and larger. ~~The double lining does not have to be to scale. The lines need to be far enough apart to show on the print and not appear as a heavy solid line.~~ If there are numerous bars shown in a detail the double lining may cause clutter instead of clarity.
- ~~29-32.~~ All bent bars detailed in the BENT BAR DETAILS should have a Pin Diameter size defined.
- ~~30-33.~~ Showing break lines should be on the same level as what is being broken but use a weight of one (line weight=1).
- ~~31-34.~~ Hatching should be the same level as the element (concrete, steel, etc.) but use a weight of one (line weight=1). Break hatching for dimension text, arrowheads and dimension lines.
- ~~32-35.~~ Hatching is used to show existing cut/section through concrete.
- ~~33-36.~~ Speckling is used to show new cut/section through concrete.
- ~~34-37.~~ Speckle concrete enough to represent the area and any concrete section being cut. Do not speckle over reinforcing bars, dimension text, arrowheads and dimension line.
- ~~35-38.~~ On the Title Sheet location description, the word n~~Number~~ shows as No. 1, No. 2, etc. Do not use # on Title Sheet description or when calling out sheet numbers in plans. The # may be used when calling out rebar or steel wire size.
- ~~36-39.~~ Show “Expansion” and “Fixed” pier call outs on the Elevation View of the T.S.L. sheet (situation plan) and at least on the elevation view of the deck longitudinal cross section.
- ~~37-40.~~ When the situation requires multiple adjoining Township, Range and Section locations to be listed then show the information as in example format below:
- T-84/85 N R-22/21 W
- Sections 36/31
- Richland/Sherman Twp.
- ~~38-41.~~ When showing size of object or construction detail such as, 2x4x1” KEYWAY, always use a lower case “x”.
- ~~39-42.~~ When showing details within the design (one design number) –
- a. Detailed materials (components) should be shown with their normal level attributes (color & line weight).
 - b. All new construction should be shown with normal level attributes (color & line weight).
 - c. All visible lines should be a solid line style and the hidden lines should be a dashed hidden line style for all components except for the removals.
- ~~40-43.~~ When showing details with different design numbers –

- a. What is existing is **EXISTING** whether it is recently built or several years old.
- b. The existing structure (brgPreStructureExisting) should be shown with visible components shown as solid lines and hidden components shown as dashed hidden lines.

~~41.44.~~ 41.44. Removed portions of existing structures should be shown on the removal level (brgRemovals) with dashed lines except for the concrete removal line defining the break line between the existing and removed concrete. This removal (break) line should be a solid line style and preferably wavy or jagged to represent a cut line with a line weight of 8 and still shown on the removal level. Note: there is a cell that is sometimes used, the cell from the brgFinal.cel file named: BROKE.

~~42.45.~~ 42.45. Future structures should be shown as dashed (~~phantom~~) line style = 6, because the structure is not visible, it is proposed.