

Colorado Department of Transportation Staff Bridge Bridge Detail Manual	Chapter: Table of Contents Effective: June 30, 2024 Supersedes: January 31, 2014
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Appendix B – Microstation Configuration Details

B.1 Configuration

Training materials, manuals, workflows, video tutorials and other resources can be accessed online at:

<https://www.codot.gov/business/designsupport/cadd/>

The training videos cover assorted subjects. There are also a number of CDOT workflows in pdf format for the MicroStation user that address specific drafting issues such as Print Organizer, Linking Word / Excel Documents to MicroStation, Useful MicroStation Key-ins, Raster Manager, etc. and several InRoads related workflows.

The Bridge Detailer should become familiar with all the available information posted online at the above mentioned web locations. In addition, this information is available through MicroStation Help and CDOT Help links available on the MicroStation menu bar.

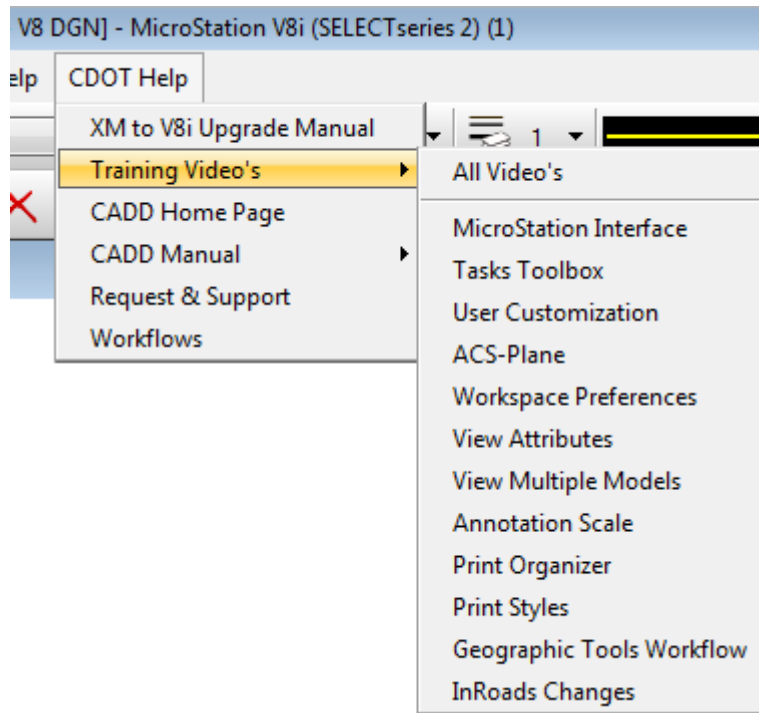


Fig. B.1-1 Help and CDOT Help

B.2 Seed Files

When working in MicroStation, the Bridge Detailer has the option of opening an existing drawing or starting a new one based on the existing bridge templates. Drawing templates used in MicroStation are called “seed files” and are included in the configuration files.

Two seed files are available for the preparation of bridge drawings. They are named *Bridge-3D-Seed_CDOT.dgn* and *Bridge-2D-Seed_CDOT.dgn*.

These seed files are located on *C:\Workspace\Workspace-CDOT_V8i\Standards-Global\MicroStation\Seed*.

The bridge 2D seed file contains two models named Linework and Border.

In the Linework model the detailer will create all line work for details at full scale (1:1). Linework model is the default model that cannot be deleted.

By default, the Border model contains the cell SHEET_Design-Sheet representing the CDOT border (ANSI-B size 11”x17”). The insertion point for the cell is at coordinates (0,0). This is a non-ProjectWise border.

In order to avoid display depth, global origin and other 3D issues, it is recommended that the 2D seed file be used for all drawings that do not require 3D presentation.

It is also recommended that a 2D model be used for the Border.

The Border model will contain the information from the Linework model referenced at the appropriate scale to be displayed in a readable manner on the plan sheet.

There are 3 model types available in MicroStation: design models, drawing models, and sheet models (see MicroStation Help for definition). By default, in the bridge seed files both Linework model and Border model are design models. The border model is set up so the detailer can switch to sheet type if so preferred. One of the benefits of sheet models is they can be selected specifically by the Print Organizer utility.

You can open the Model Properties dialog box by selecting File > Models and then click on the Edit Model properties icon. (see Fig. B.2-1)

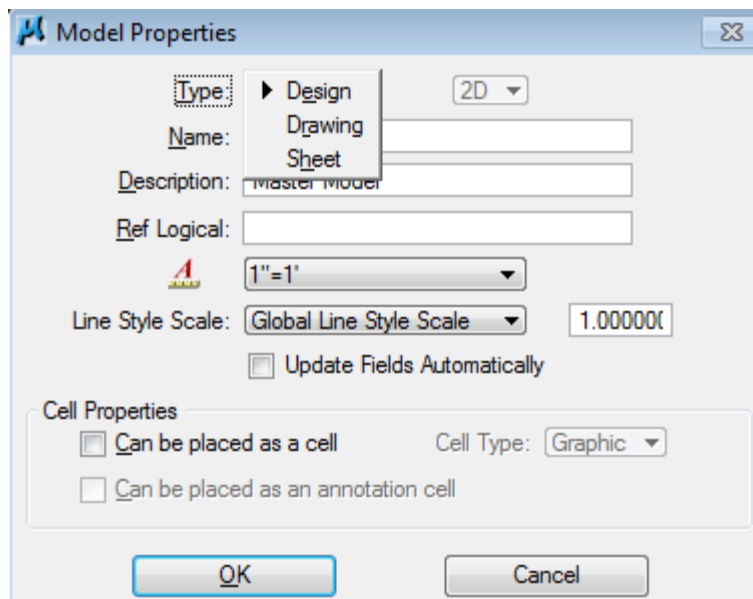
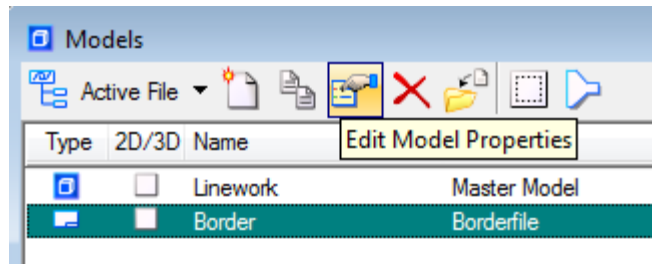


Fig. B.2-1 Models and Model Properties Dialog

B.3 Borders

There are two types of plan sheet border: ProjectWise and non ProjectWise. For ProjectWise border functionality, refer to the documentation available online at <http://www.coloradodot.info/business/designsupport/cadd>. Both border types are available in the CDOT Menu.

The CDOT border is typically plotted on 11" x 17" paper at scale 1"=1' and it is a cell named SHEET_Design-Sheet located in General.cel library file. It can be inserted into the Border model from the CDOT Menu, under Drafting.

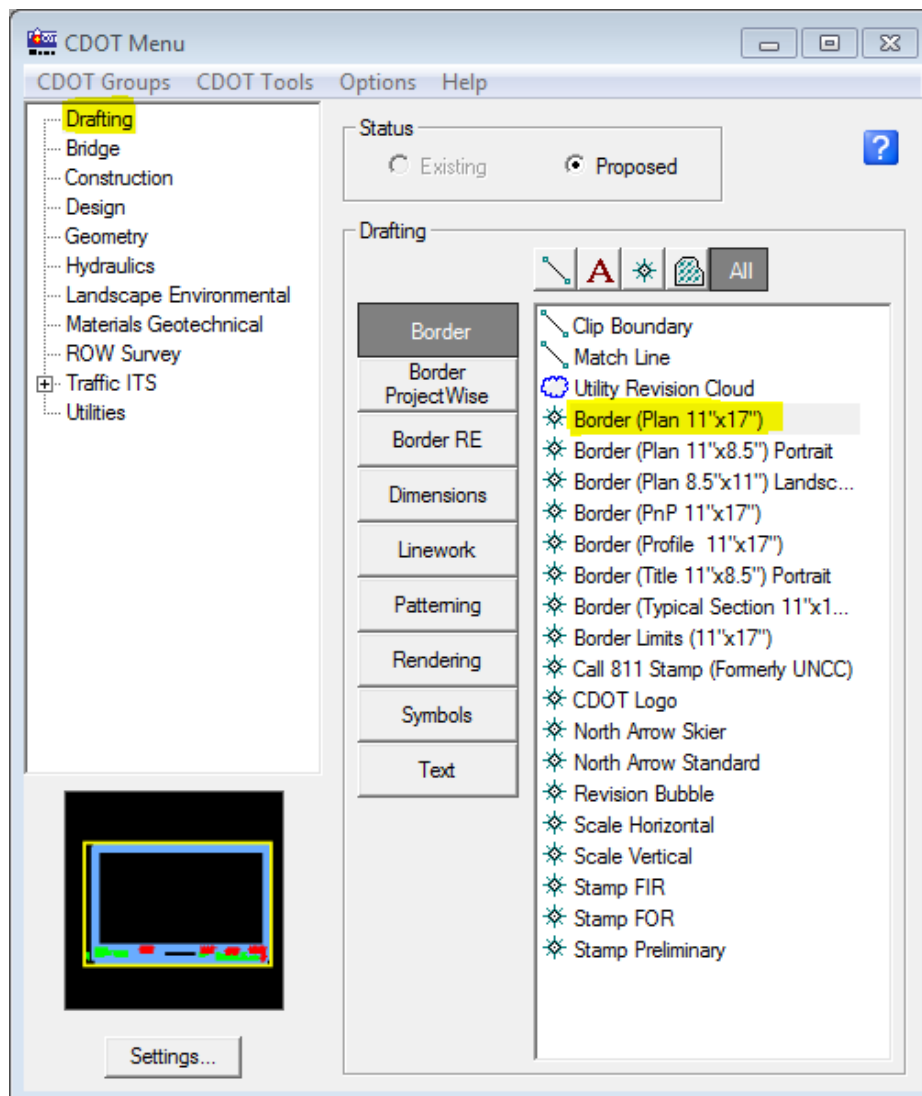


Fig. B.3-1 Border Selection from Drafting Group

The ProjectWise border is available from the CDOT Menu, as shown below.

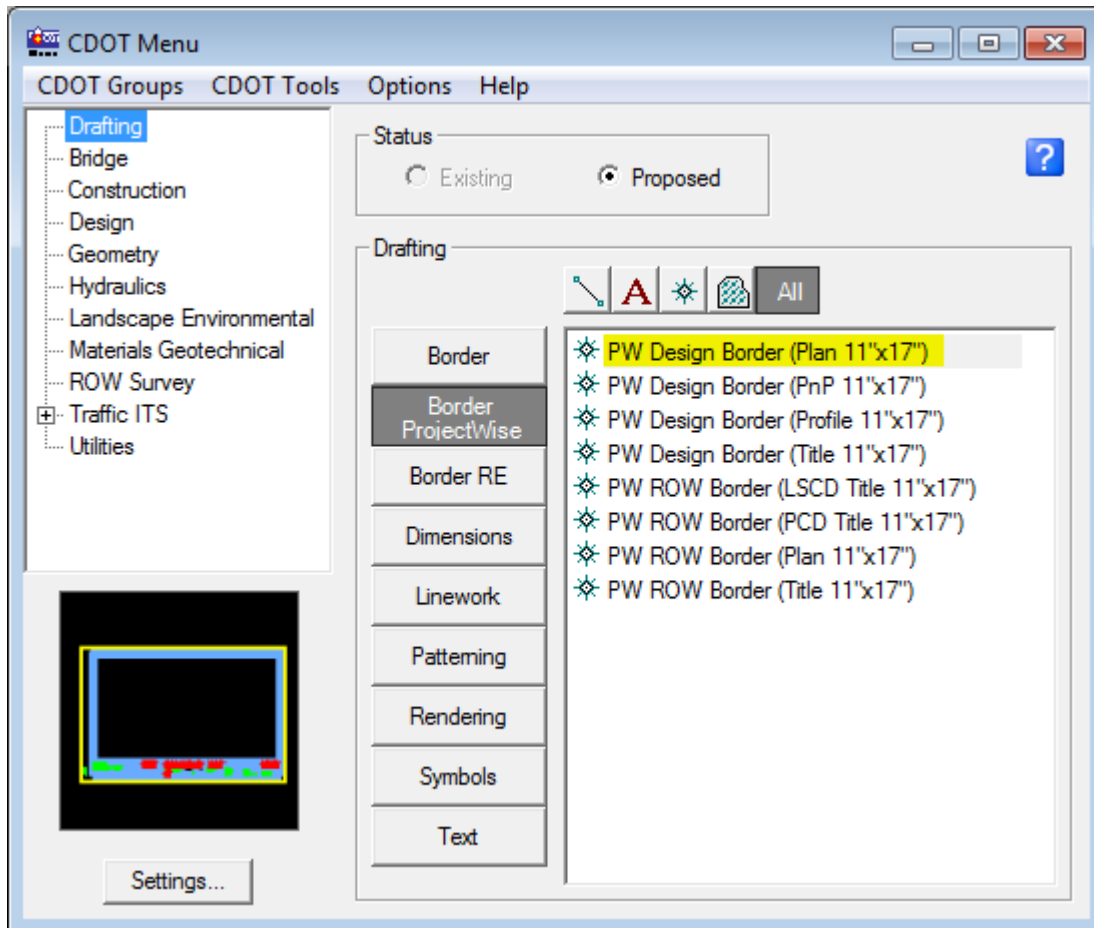


Fig. B.3-2 - ProjectWise Border

The middle part of the border requires the insertion of a cell for the Resident Engineer/Bridge Unit information. This can be inserted from CDOT Menu > Drafting > Border RE or CDOT Menu > Bridge > Border.

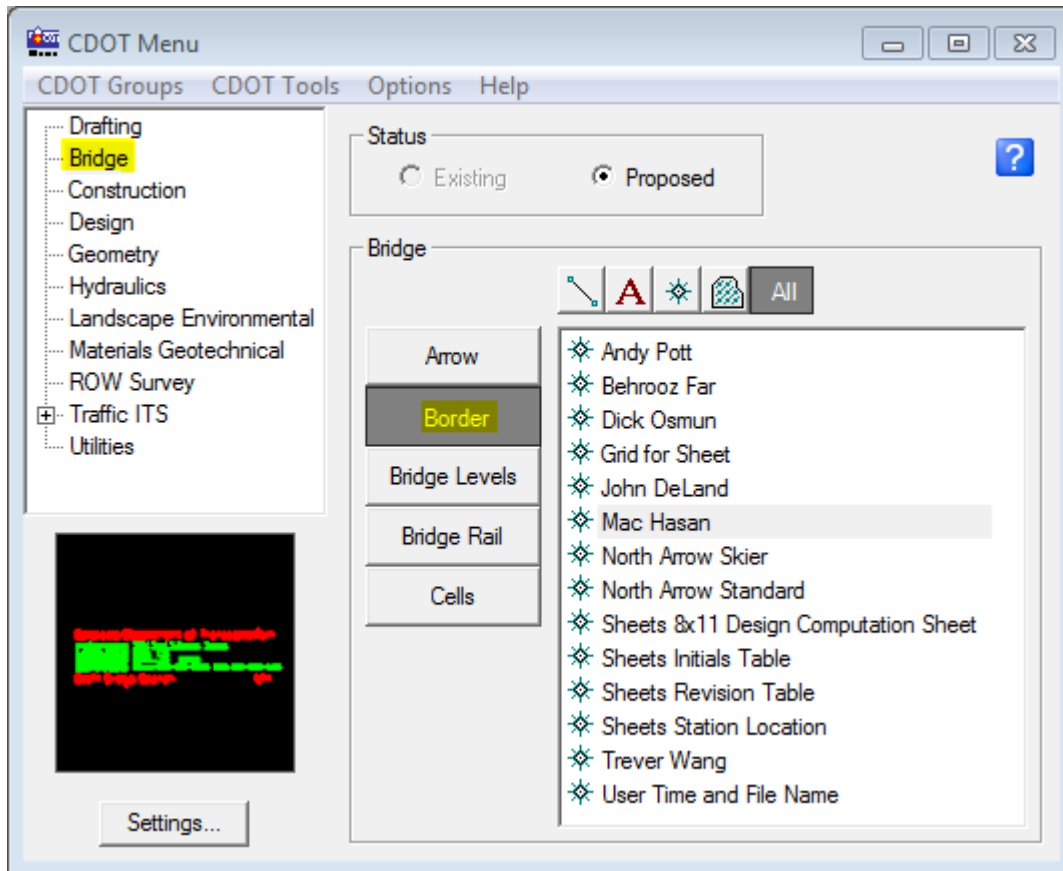


Fig. B.3-3 Border Selection from Bridge Group

B.4 Reference Files

A Reference is a model that is attached to and displayed with the active model for printing or construction purposes. You can reference/attach a model from a different dgn file or a model from the same dgn file (like attaching Linework model into the Border Model of the same dgn file). For that, go to File > References and then select Tools > Attach... and browse for the dgn file that you want to reference.

In order for the objects in a reference to be printed with the appropriate line weights, make sure to check the Line Weights box in the Reference Presentation dialog box (References > Settings > Presentation). Check the Use View Flags box, click on Line Weights, then de-select the View Flags check box and select OK.

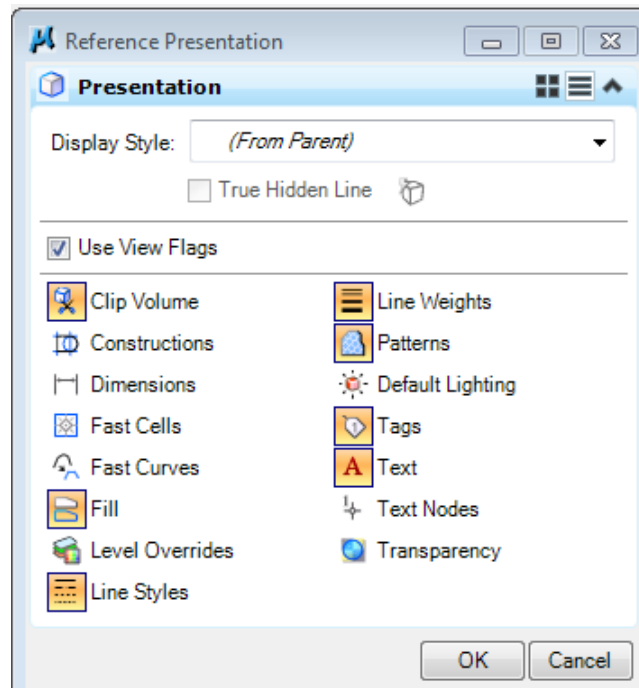


Fig. B.4-1 Reference Presentation Dialog Box














B.5 Levels

Levels in MicroStation are defined in the CDOT configuration by Color, Style, and Weight.

Currently, there are 13 general bridge levels (see table below) and over 150 specific bridge levels defined in the CDOT configuration.

The specific bridge levels mimic the general bridge levels, that is, all Outline levels print the same as the general Outline level, having the same line style and lineweight, but a different color. The purpose for the additional levels is to help in turning the levels off/on in different views and provide additional information for the detailer when developing linework.

The following table indicates the MicroStation general levels to be used to comply with the requirements described in Chapter 2 of the Bridge Detail Manual:

Level Name	Color	Linetype	Lineweight	How it looks in MicroStation
BRDG_BREAK	7	0	0	
BRDG_CENTER	7	4	0	
BRDG_CONSTRUCT	4	0	1	
BRDG_CONTROL	3	0	3	
BRDG_DASHED	2	3	1	
BRDG_DIMENSION	2	0	1	
BRDG_FROZEN	2	0	0	
BRDG_HIDDEN	5	5	1	
BRDG_OUTLINE	3	0	2	
BRDG_PATTERN	6	0	1	
BRDG_REBAR	1	BRDG_Rebar	3	
BRDG_TEXT	4	0	1	
BRDG_TITLE	1	0	3	

The addition or modification of bridge levels requires concurrence within the BUG (Bridge Users Group) committee at CDOT. The detailer is advised to use the levels defined in the configuration.

There are various ways to view and select an active level, as follows:

1. Select the level from the Attributes tool box, as shown in Fig. B.5-1.

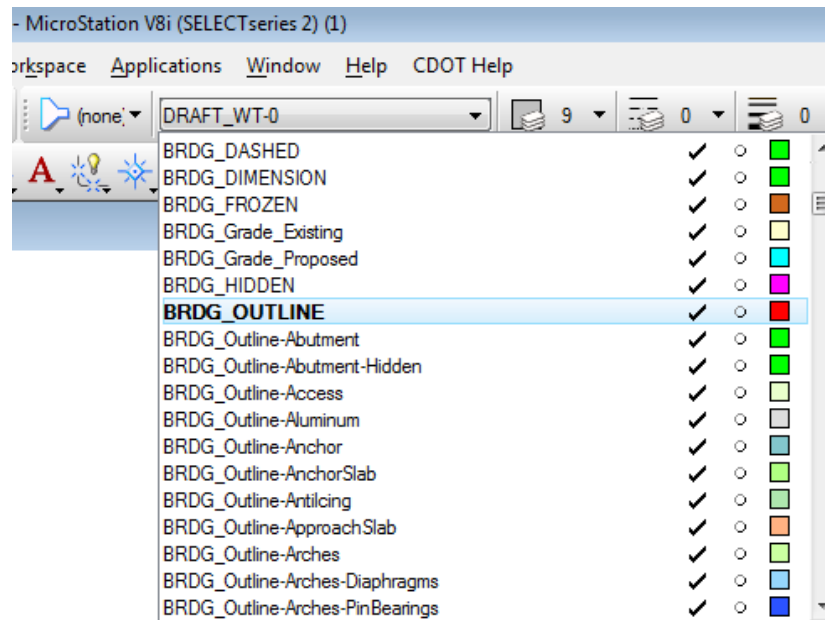


Fig. B.5-1 Active Level Selection

2. Use the CDOT menu by selecting the "Bridge" CDOT group> Bridge Levels> and using the pulldown "Type" menu to narrow the search. (Fig. B.5-2)

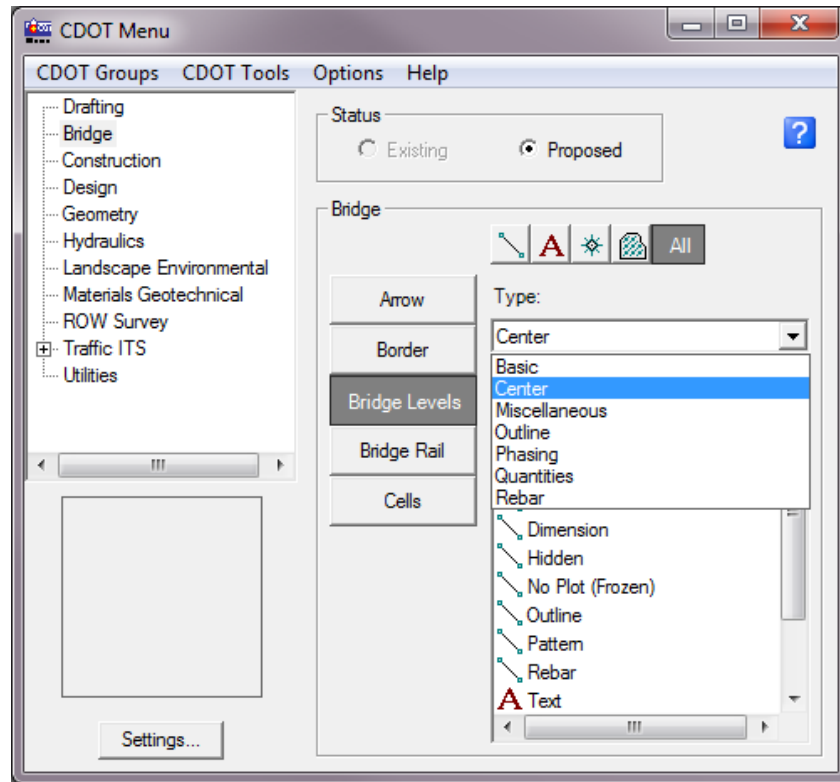


Fig. B.5-2- Bridge Level Selection from CDOT Menu

3. Double click on a level in the level display window. (Fig. B.5-3)

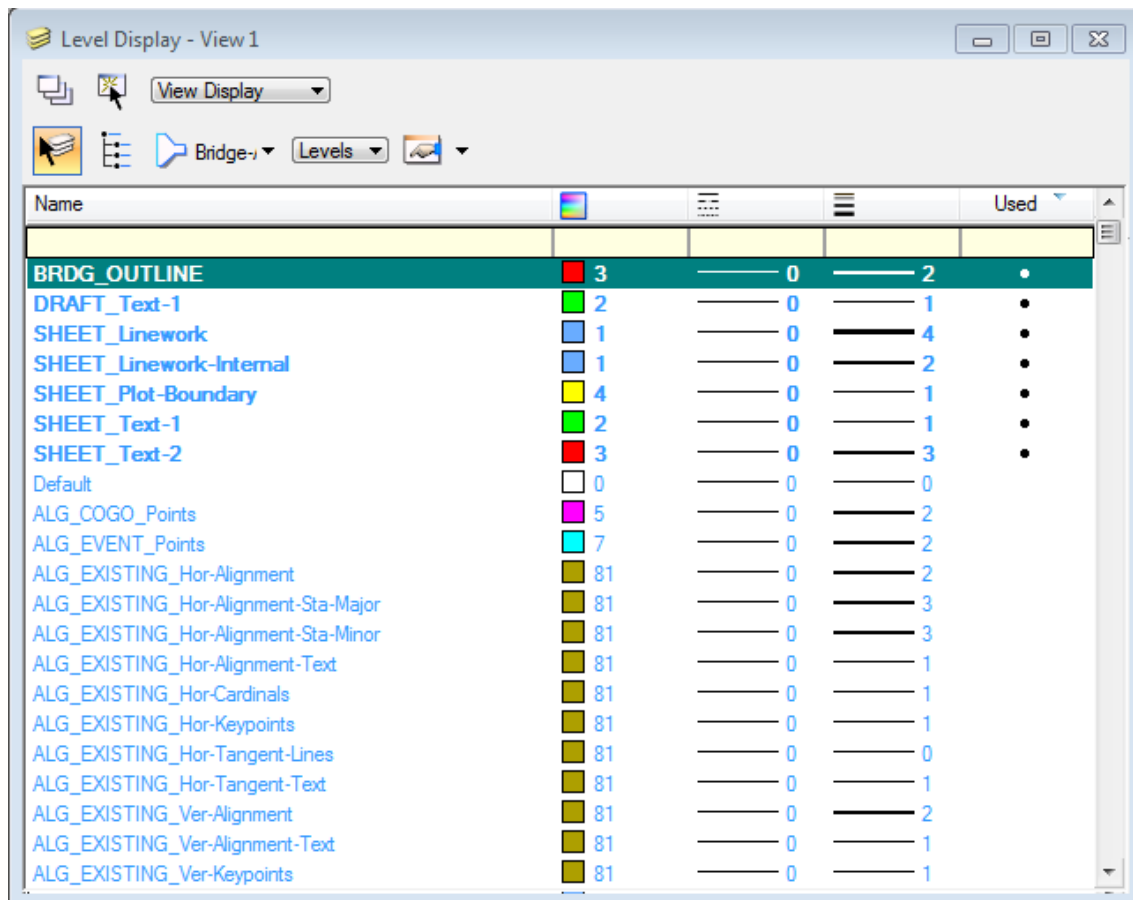


Fig. B.5-3 - Bridge Level Selection from the Level Display

Level filters are a useful way to group associated levels for the purposes of viewing or removing unneeded levels from view. Filters can be used in both the Attributes tool box and the Level Display window. There are several predefined filters available that cannot be modified by the user. (see Fig. B.5-4)

“On the fly” filters can be created in the Level Display window. To do that, first click on the Level Display icon on the Primary Tools tool box, then click the List Filter icon and select Untitled, then enter the desired filter criteria in the appropriate categories (Name, Color, Line Style etc.) in the top row. The example in Fig. B.5-5 shows a filter created “on the fly” with “brdg” in the name, a line style value of “0” and a line weight value of “3”. This filter can be toggled on/off by clicking the List Filter icon and selecting None. The filter remains until you exit MicroStation.

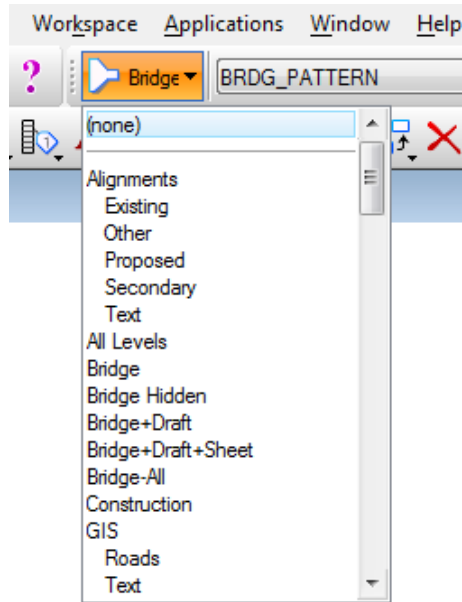


Fig. B.5-4 – Some of the CDOT Predefined filters

Level Display - View 1

View Display

*Untitled Levels

Name	Color	Count	Filter	Used
brdg		0	3	
BRDG_CONTOURS_Major	Orange	6	0	3
BRDG_CONTROL	Red	3	0	3
BRDG_Grade_Proposed	Cyan	7	0	3
BRDG_Outline-FRP	Yellow	82	0	3
BRDG_REBAR-4	Red	3	0	3
BRDG_Rebar-Spiral	Purple	249	0	3
BRDG_Rebar-Ties-Horizontal	Yellow	93	0	3
BRDG_Rebar-Ties-Vertical	Pink	234	0	3
BRDG_Rebar-WWF	Cyan	15	0	3
BRDG_TITLE	Blue	1	0	3

Fig. B.5-5 – Example of filters “on the fly”

All the configuration levels have an assigned color associated with the level. Although the color number of the level can't be changed, its appearance to individual user can. The user can personalize the color table without affecting the plot styles: Settings > Color Table...> Select the color you want to change, click on Change, pick the color you want to replace with and click OK, then select Attach.

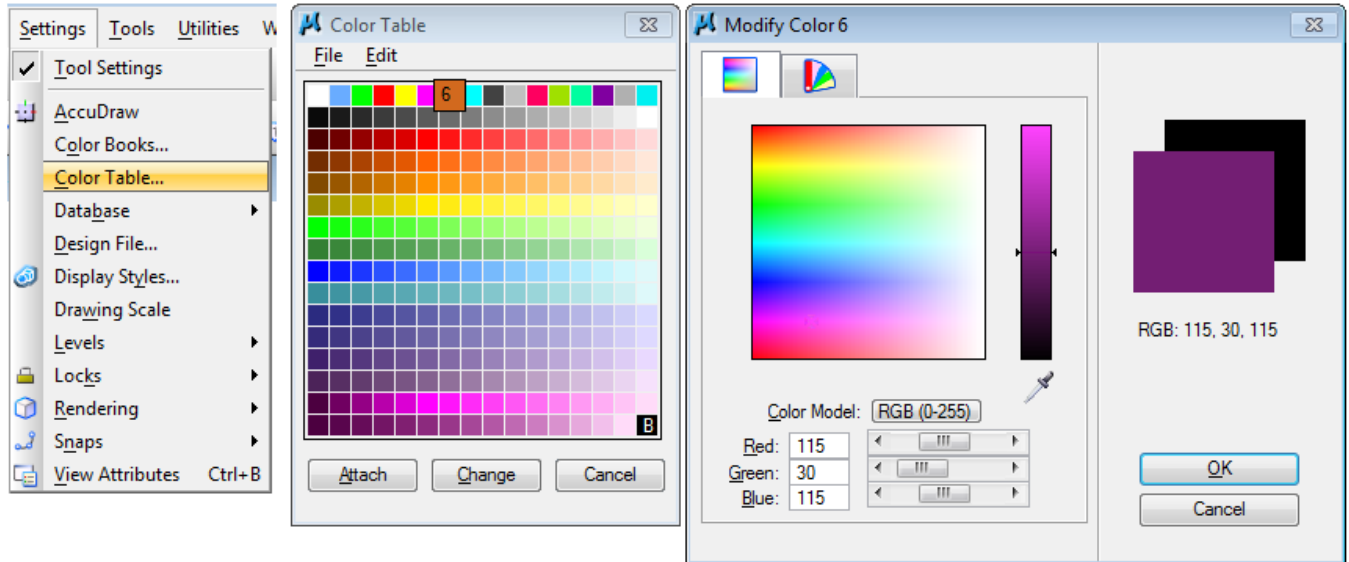


Fig. B.5-6 - Personalizing the Color Table

B.6 Cell Libraries

Cell libraries are ordinary MicroStation design files that have a .cel extension, with multiple models, one for each cell.

Staff Bridge has created cell libraries containing useful details for use in detailing CDOT bridge projects. Those library files are named Bridge.cel, Bridge_Repair.cel and BridgePiping.cel. There are also local developmental cell libraries for testing new cells prior to incorporating them into the configuration.

To view all cells contained in a library, open the Cell Library dialog box by selecting Element > Cells and then File > Attach File. As an alternative, the CDOT Menu can be used by selecting >Bridge > Cells and then selecting the appropriate cell type.

MicroStation provides other methods of accessing the cell libraries, including customized toolboxes, cell selector tools, etc.

The detailer may choose to create his or her own cells and cell libraries. It is important to place the cell origin in a useful location and to place each element of the cell in the appropriate level. The cell can then be saved in one of the existing developmental libraries (located on \\public\Bridge Common\MicroStation\CELLS) so everyone has access to it.

For more information on how to create a cell library and cells, see the MicroStation Help.

B.7 Annotation / Text Styles

The following table describes the text styles used on bridge drawings:

Text Style	Use
07_ENG-100	General notes and detailing text
07_ENG-80	Reduced width font for use in conserving space on plan sheet
10_ENG-100	Title Text
05_ENG-100	Rebar dimensioning normal
05_ENG-80	Rebar dimensioning – conserving space

Unfortunately, outdated text styles that should no longer be used can still be found in archived drawings and they should be replaced with the new styles from the table. For that, the methodology is: *Element* > *Text Styles* > Select style to change and right click > *Remap Elements...* > Pick the new style in the Destination box, then click *OK*. Once replaced, the old text styles can and should be purged (deleted). A note of caution: remapping might cause unwanted changes in the text appearance that need to be addressed.

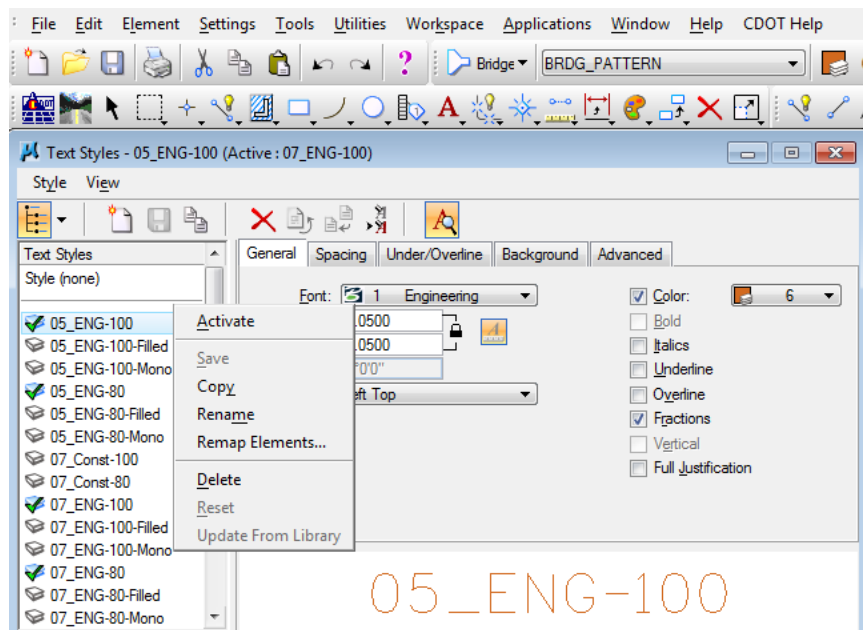


Fig. B.7-1 - Replacing old text styles

Text notes are controlled by the dimension styles and they should be put in the level Text.

B.8 Dimension Styles

The MicroStation Dimension Style for most details should be CDOT 3. This style is a normal architectural style (feet and inches).

Dimension style CDOT 5 should be used for the footing & piling layout plan. It shows dimensions in decimal feet, which is more appropriate for the surveying required to locate the piles and footings.

The dimension style dialog box can be accessed from Element – Dimension Styles.

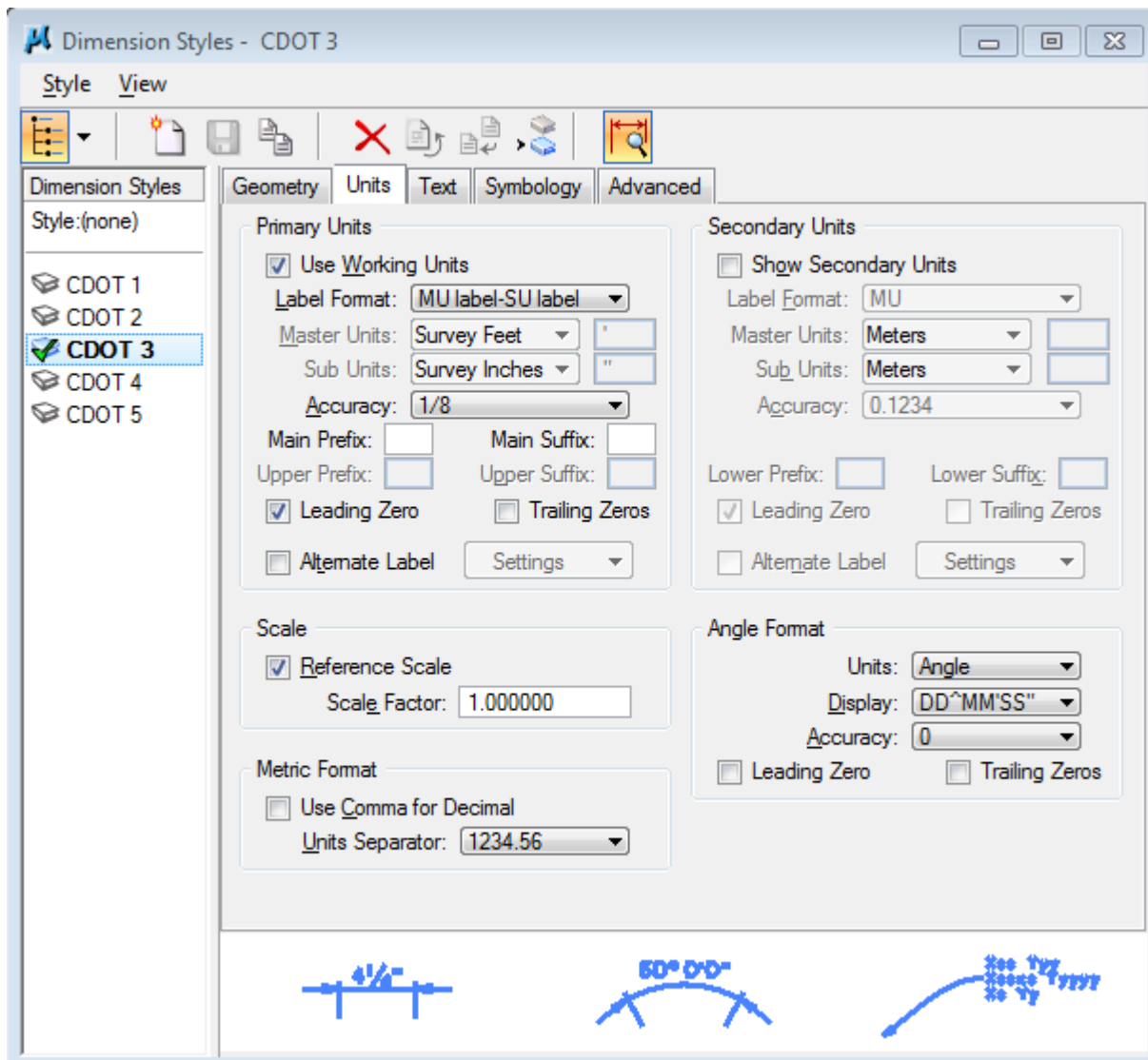


Fig. B.8-1 Dimension Style Dialog Box - Units

The orientation of the dimension text can be modified from Dimension Styles settings – Text – Orientation – Horizontal/Aligned.

Changes can be made to the dimension style as the need arises during detailing, i.e., when using angular dimensioning, angle format can be changed from units “Angle” to units “Length” to show arc size length in feet and inches instead of the angle value in degrees/ minutes/ seconds.

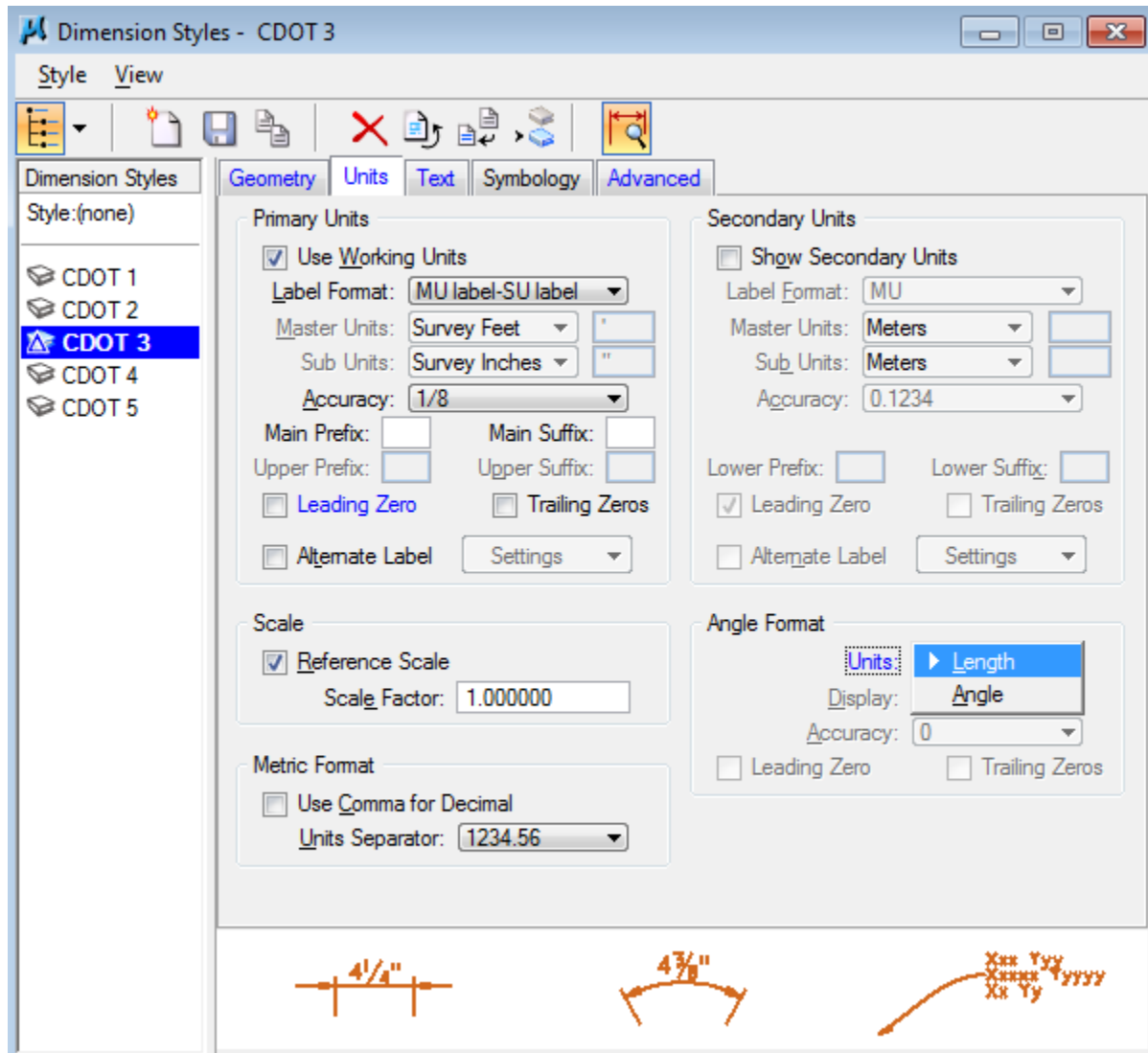



Fig. B.8-2 Dimension Style Dialog Box – Changing Angle Format

Text notes are drawn by default with just an arrow. You can change the terminator by selecting a cell or symbol (Element > Dimension Styles > Geometry > Terminators > Symbols > Note: select Cell or Symbol). The symbols are not set up currently. The default cell is set up to be the  Place Note integral arrow cell that looks like this (see Fig. B.8-3).

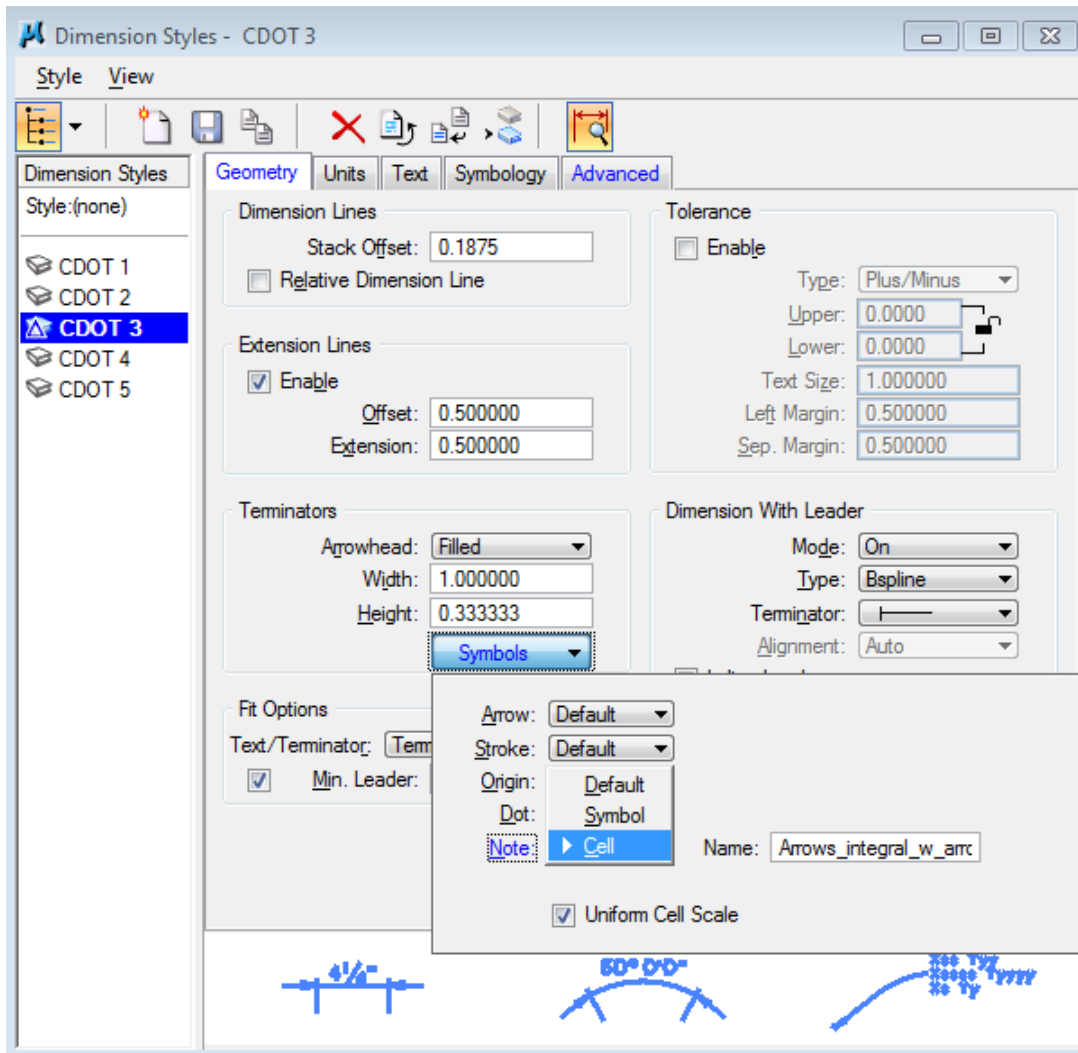


Fig. B.8-3 Dimension Style Dialog Box - Geometry

B.9 Printing

Before printing the drawing it is important to apply the print style, whether it is a hard print or a pdf print. In order to do that, from the Print menu > Settings > Apply Print Style select the printer/plotter desired. By default, the CDOT Default Printer is the one that is used for the hard print.

CDOT PDF (Draft Quality) is of sufficient quality for creating the majority of drawings. CDOT PDF (High Quality) may be required for some rendering.

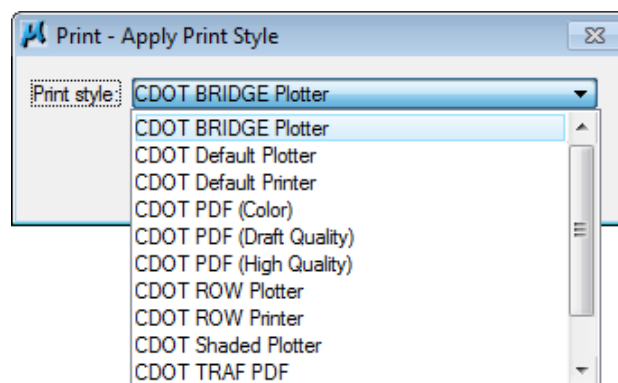
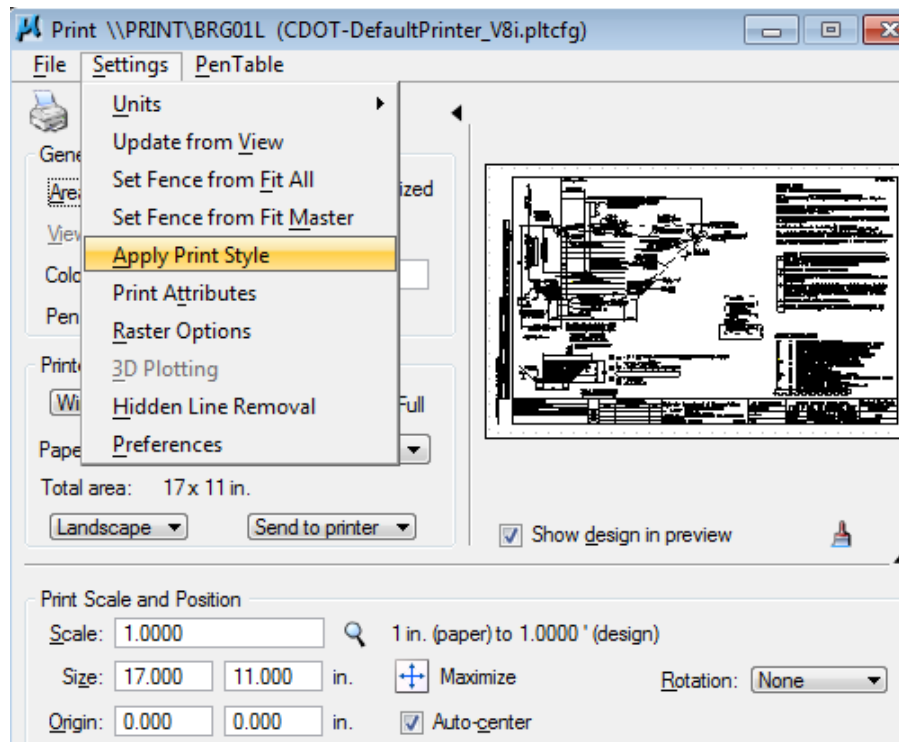


Fig. B.9-1 Print Style Selection

Currently, there are several CDOT printer drivers available. The printer drivers control plotting devices, plot sizes, pen tables etc. The standard plot size for all bridge drawings is 11x17. The default pen table (CDOT-PenTable.tbl) prints all bridge levels in black/white. If a color print is desired, the detailer will go to Print > PenTable > Attach and select one of the color pen tables available. (see Fig. B.9-2)

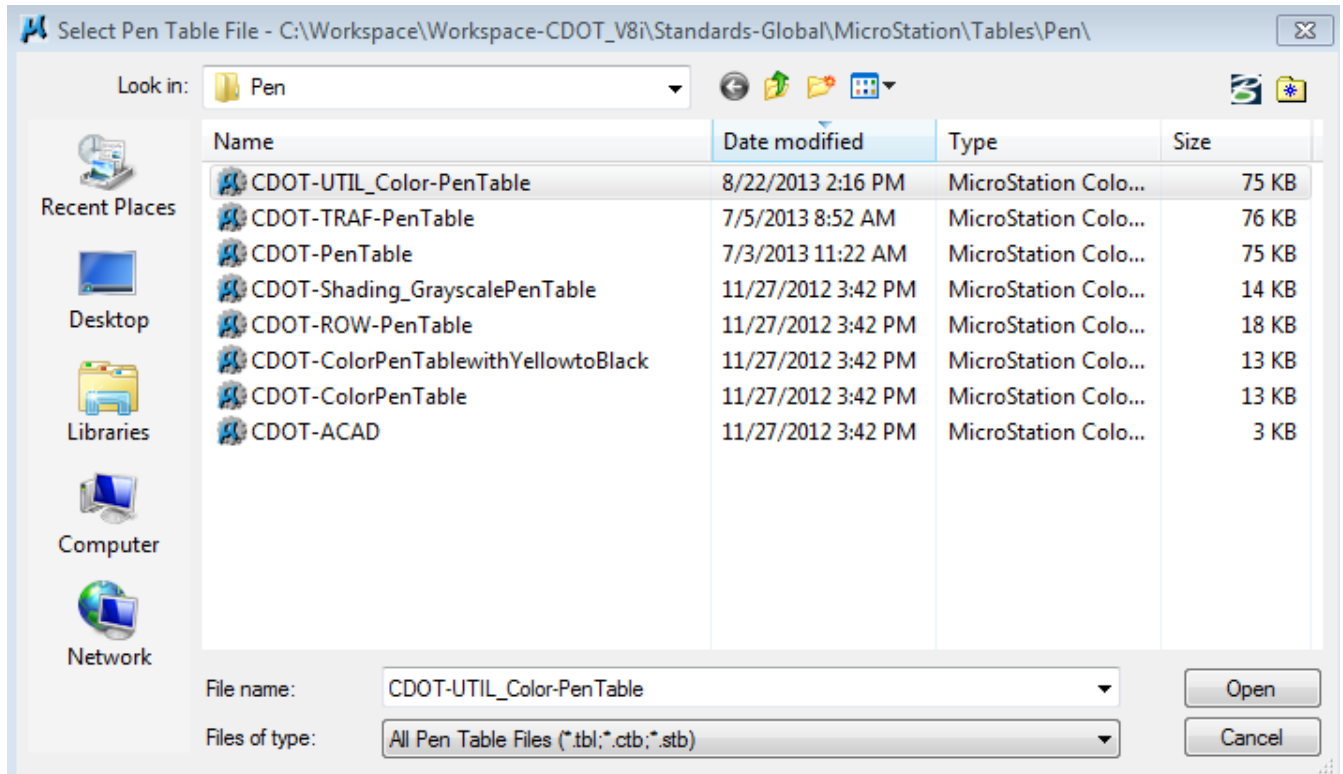


Fig. B.9-2 Pen Table Selection

B.10 Minimum Electronic Standards for Microstation Drawings

- 1) Final view for plotting hardcopy shall be View 1, a Top View. This view shall be located in the "Border" model.
- 2) Unless creating 3D elements at elevation, all linework should be at elevation zero.
- 3) Default symbology should be used for configuration levels.
- 4) Linework should be drawn at full scale.
- 5) Sheet models should generally use 1" = 1'.

B.11 Microstation Things that are Good to Know

- 1) A practice that seems to work well for copying from one file to another: Reference in the item to be copied, select and copy the element of interest. You can detach the reference when you're finished with it.
- 2) The drawing border should be placed at 0,0,0. A trick for finding this location is to take the following steps:
 - select the "Place SmartLine" tool,
 - data on the beginning point,
 - type p,
 - type "0,0,0" (zero, zero, zero, including commas), click enter,
 - data end point.

You will have created an arrow (of sorts) that points to the 0,0,0 coordinate. Consistently placing line work at this location will help preclude the loss of drawings in the vast expanses of MicroStation.

- 3) When adding dimensions it is helpful to open the Dimension Styles window (Element\Dimension Styles) so that you can make changes on the fly in placement and symbols.
- 4) Draw line work in "default" model and change the model name to "linework". The default model is the Master model, that can't be deleted by mistake. If the Bridge seed file is used, the linework model is already set up as the default.
- 5) If menus/windows disappear off your screen or are halfway off, making them unusable, change your screen resolution to a different setting, reposition the menu/window and then go back to default screen resolution. To get to the screen resolution, right-click the mouse in your desktop screen.
- 6) When the Sheet Border is created using 1" = 1', and the Annotation Scale is locked ON and is 1"=1', life is good and text is always the right size for the drawing.