

# Microstation Connect: Creating 2D Custom Line Styles

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## **IMPORTANT**

These instructions assume you will be using the ORD WorkSpace located on CADD Services' website.

### **CONFIG FILE**

As of 5/25/2022, the zip file published by CADD Services does not have the config file for the "None" role. Having this file is a necessity for creating line styles. Until CADD Services zip includes this file, in the interim, you can easily add the config file yourself to the workspace.

The reason for having the "None" role is when creating a new line style (this applies to creating new cells as well) if you open an existing cell or line style library file you will only be able to use the cells or styles existing or embedded in the file (the line style or cell is already drawn in the file). Choosing "None" allows you to import from any library to use in creating a new one.

Do this by following these steps:

1. Create a blank text file using a simple text editor such as Notepad or UltraEdit. Name the file **None.cfg** and place one line in it which states, "DoNothing=0" and place one extra blank line after it, see below.



2. Save this config file into this location:  
[C:\NCDOT\\_CONNECT\\_WORKSPACE\Configuration\\_10\\_10\WorkSpaces\DOT-US North Carolina\Roles](C:\NCDOT_CONNECT_WORKSPACE\Configuration_10_10\WorkSpaces\DOT-US North Carolina\Roles)
3. This will allow the "None" role to be available.

### **TOOL NAVIGATION**

Navigating to specific tools may require you to go to a specific Workflow, Tab, Tool Group, and Tool or Tool Dropdown. These are identified this way:

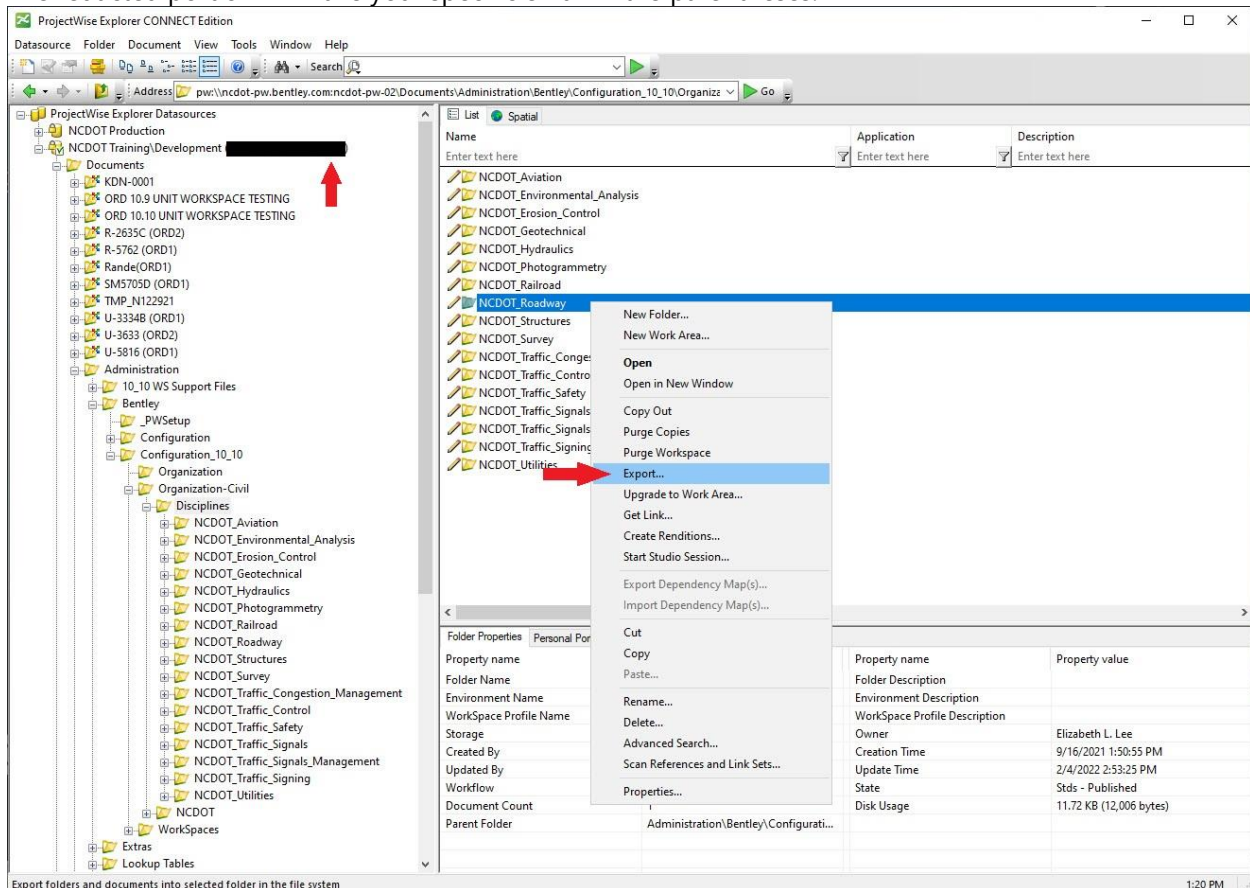
**Workflow** > *Tab* > *Tool Group* > **Tool/Tool Dropdown**

## IMPORTING A CUSTOM LINE STYLE FROM ANOTHER SOURCE

Following these steps will allow you to import a line style into your library from another source such as a unit or discipline. This example will show copying the HPB line style from the Roadway WorkSpace into the EAU WorkSpace.

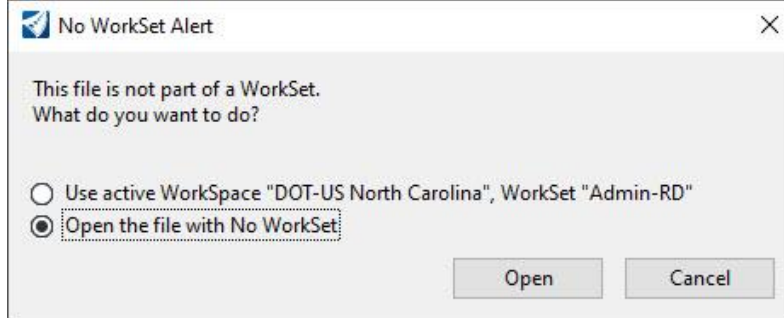
The "NCDOT\_Roadway" workspace is located under [NCDOT Training\Development](#) in PW.  
[\Documents\Administration\Bentley\Configuration\\_10\\_10\Organization-Civil\Disciplines](#)

1. Export the "NCDOT\_Roadway" workspace to your Disciplines folder on your C: drive  
The redacted portion will have your specific email in the parentheses.



2. Open Microstation Connect edition
3. Set the WorkSpace to DOT-US North Carolina and the WorkSet to Admin-XX (where "XX" is whatever letters designate your discipline i.e., RD=Roadway). Every discipline has an Admin WorkSet. The Admin WorkSet allows you to create levels while loading your Workspace, the regular WorkSets will not.
4. Open the DGNLIB file [cls\\_heu.dgnlib](#) located here:  
[C:\NCDOT\\_CONNECT\\_WORKSPACE\Configuration\\_10\\_10\Organization-Civil\Disciplines\NCDOT\\_Environmental\\_Analysis\Standards\Dgnlib\Line Styles](#)

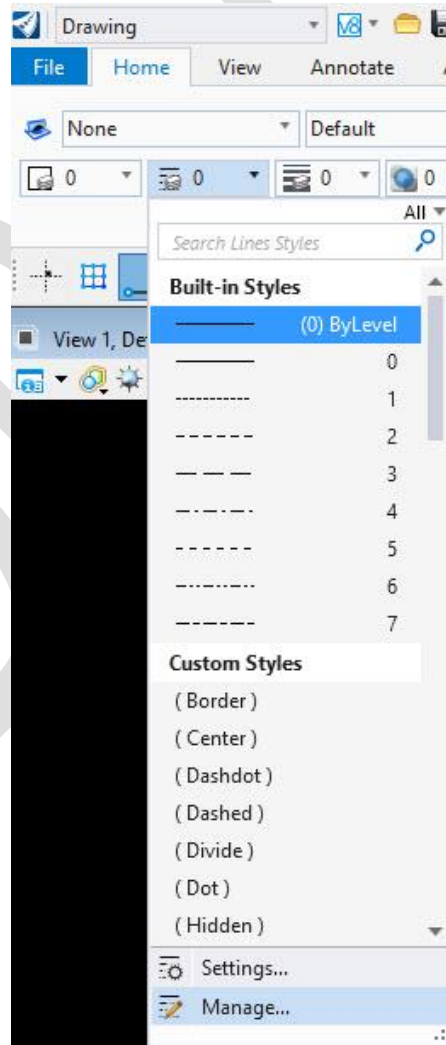
5. As the file is opening, you may have a window pop that asks you to confirm whether you want to open the file with no WorkSet or use the last one used. Be sure to select "Open the file with No WorkSet".



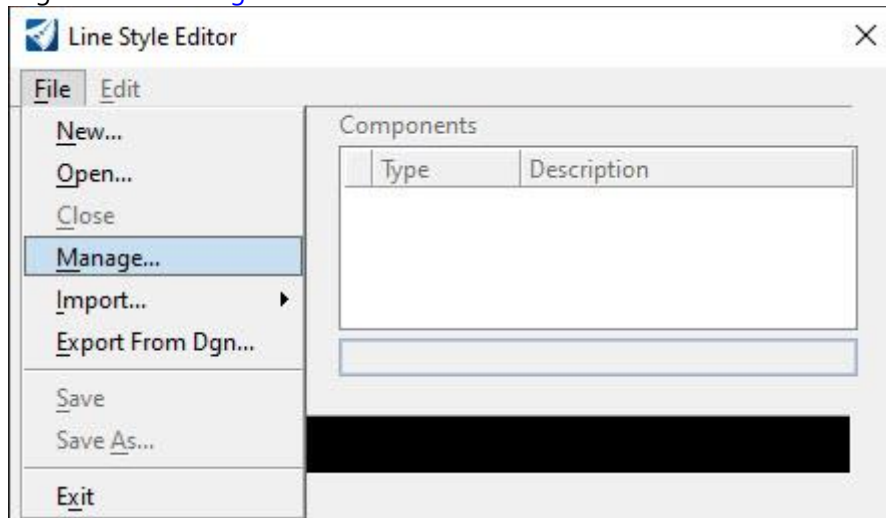
You can check to confirm there is no WorkSet by mousing over the WorkSet icon in the lower right of the Microstation window and it should indicate "There is no active WorkSet"



6. Open the Line Style Editor. Go to the Attributes tool group, click the drop-down for line styles and select "Manage..." at the bottom.



7. Go to the Attribute tool group, the line style drop-down, then click "Manage..." which will open the [Line Style Editor](#), then go to [File>Manage...](#)

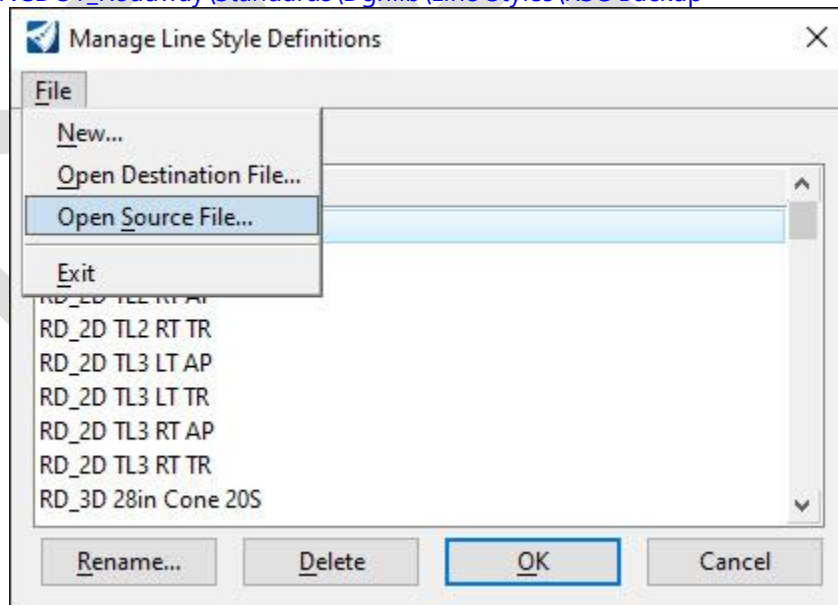


8. Select your destination library first. This will be your unit's new ORD resource file ([eau\\_cls.rsc](#)) located here:

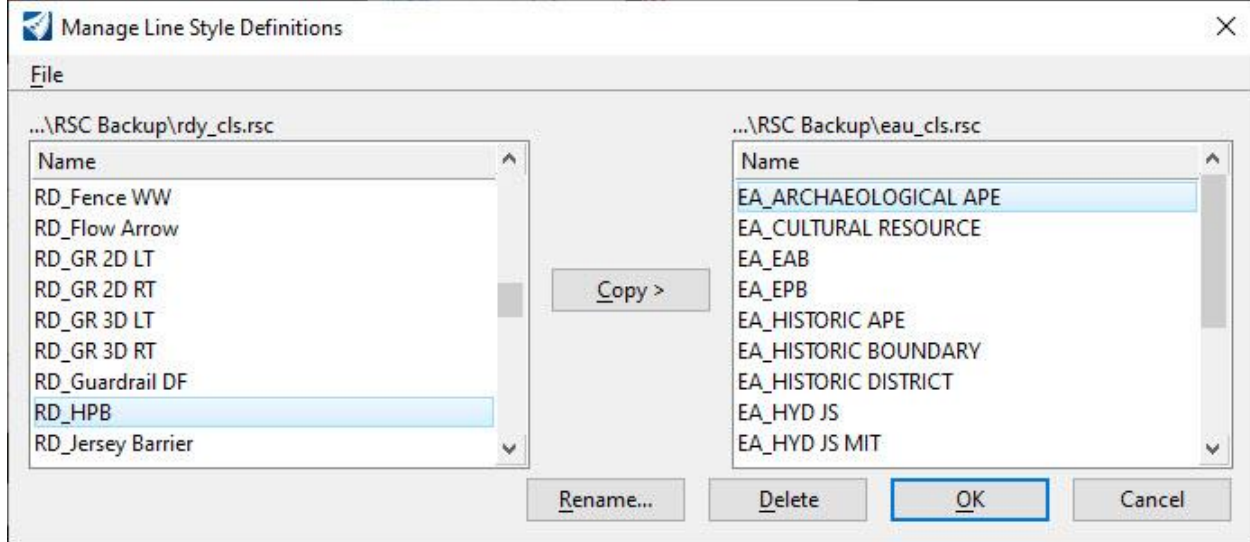
[C:\NCDOT\\_CONNECT\\_WORKSPACE\Configuration\\_10\\_10\Organization-Civil\Disciplines\NCDOT\\_Environmental\\_Analysis\Standards\Dgnlib\Line Styles\RSC Backup\](#)

9. At the [Manage Line Style Definitions](#) window go to File → Open Source File... then select resource file where you want to import the new line style from. In this case, to import the HPB line style FROM Roadway's resource library you will select the [rdy\\_cls.rsc](#) file from here:

[C:\NCDOT\\_CONNECT\\_WORKSPACE\Configuration\\_10\\_10\Organization-Civil\Disciplines\NCDOT\\_Roadway\Standards\Dgnlib\Line Styles\RSC Backup](#)



10. Select the line style(s) you want to import (in this case **RD\_HPB**). Use the **[Shift]** key to select a continuous range or the **[Ctrl]** key to highlight multiple files not in the same range.



11. Rename the new style with your unit's initials. In this case it would be named **EA\_HPB**.

12. Exit the file

13. In the WorkSets.inp file change the NCDOT WorkSet to L2 and the unit WorkSet to your unit (listed in the paragraph above the setting).

```

20 #-----
21 # Edit the below NCDOT_USE_LOCAL_WORKSETS variable to load the desired WorkSet
22 # levels stored on the server and local C:\ drive.
23 #
24 # L0 - Does not use local C:\ drive WorkSets.
25 # L1 - Use local NCDOT STIP Project Worksets store on "C:\Projects\NCDOT" folder. (Default)
26 # L2 - Use local NCDOT Unit training and workspace admin WorkSets.
27 # L3 - Use local or server WorkSets stored under the WorkSpaces\WorkSets folder (Bentley Default).
28 #
29 # <<<< Make Changes Here >>>>
30
31 NCDOT_USE_LOCAL_WORKSETS = L2
32
33 #-----
34 # If NCDOT_USE_LOCAL_WORKSETS = L2, edit the below NCDOT_UNIT_TRAINING_WORKSETS
35 # variable to able to select the desired Training and Admin WorkSets from the NCDOT Unit Discipline Workspace.
36 # Valid values are:
37 #
38 # Roadway (default), Aviation, Environmental_Analysis, Erosion_Control, Geotechnical, Hydraulics, Photogrammetry,
39 # Railroad, Structures, Survey, Traffic_Congestion_Management, Traffic_Control, Traffic_Safety, Traffic_Signals,
40 # Traffic_Signals_Management, Traffic_Signing, Utilities
41 #
42 # <<<< Make Changes Here >>>>
43
44 NCDOT_UNIT_TRAINING_WORKSETS = Environmental_Analysis
45
46 #-----

```

## CONVERSION OF V8i LINE STYLES TO NEW ORD LINE STYLES

This first step will convert old V8i line styles so that the scale is corrected for the new annotations scale. If you ever need a specific level from a Workspace you load the Workspace with that level. However, when creating a \*.dgnlib, like the "cls\_rdy.dgnlib", where line styles will actually be drawn in the design file, or a Workspace file that does not depend on loading any workspace.

### 1. FILE CREATION

A. Open Microstation Connect edition

B. Set the WorkSpace to DOT-US North Carolina and the WorkSet to Admin-XX (where "XX" is the letters designating your discipline e.g., RD=Roadway). Every discipline has an Admin WorkSet. The Admin WorkSet allows you to create levels while loading your WorkSpace, the regular WorkSets will not.

C. Create a new blank CADD file. Use a standard 2D seed file, give it the normal "dgn" file extension, and save the file in your unit's folder, the highlighted portion below:

C:\NCDOT\_CONNECT\_WORKSPACE\Configuration\_10\_10\Organization-Civil\Disciplines\  
NCDOT\_Environmental\_Analysis\Standards\Dgnlib\Line Styles

D. Go to **OpenRoads Modeling** > *Drawing* > *Primary* > **Key-in** tool which looks like a cluster of three keyboard keys



E. Type in "file disassociateworkset" and hit **[Enter]**.

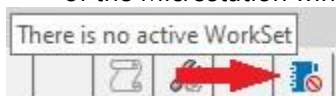


F. Go to File → Close or you can completely exit Microstation, but **DO NOT do a save settings** on this file before closing/exiting, or it will go back to the active Workspace and WorkSet used when initially opening the file

G. Reopen Microstation (**DO NOT open the file yet**) and first choose "None" for the Role, then choose "No Workspace". The WorkSet should automatically set to "No WorkSet", select your file again and open it.

H. Close the file and reopen it, making sure the "No WorkSet" & "None" Role are selected again. Reopening the file this way ensures any previous WorkSets or Roles are cleared out of the Microstation cache.

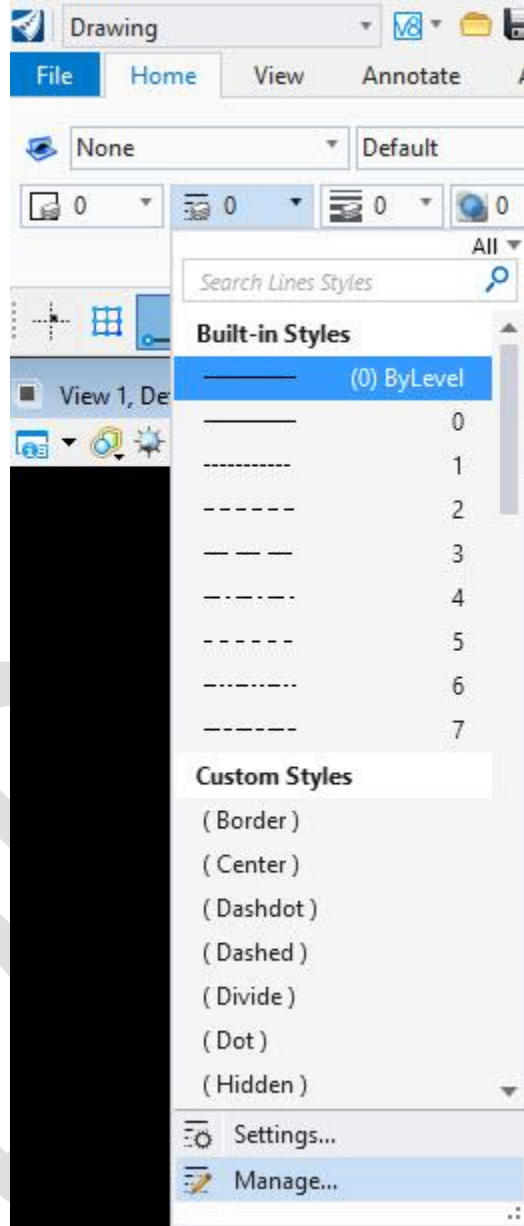
I. You can check to confirm there is no WorkSet by mousing over the WorkSet icon in the lower right of the Microstation window and it should indicate "There is no active WorkSet"



## 2. RESET THE SCALE

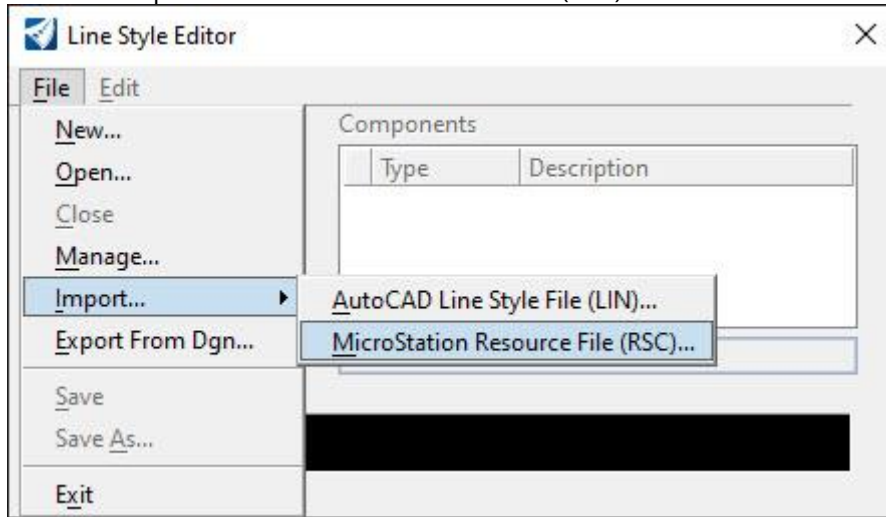
**NOTE:** This is only used to import and revise the scale on an older V8i resource line style library into an ORD resource file

- A. Go to the Attributes tool group, click the drop-down for line styles and select "Manage..." at the bottom.

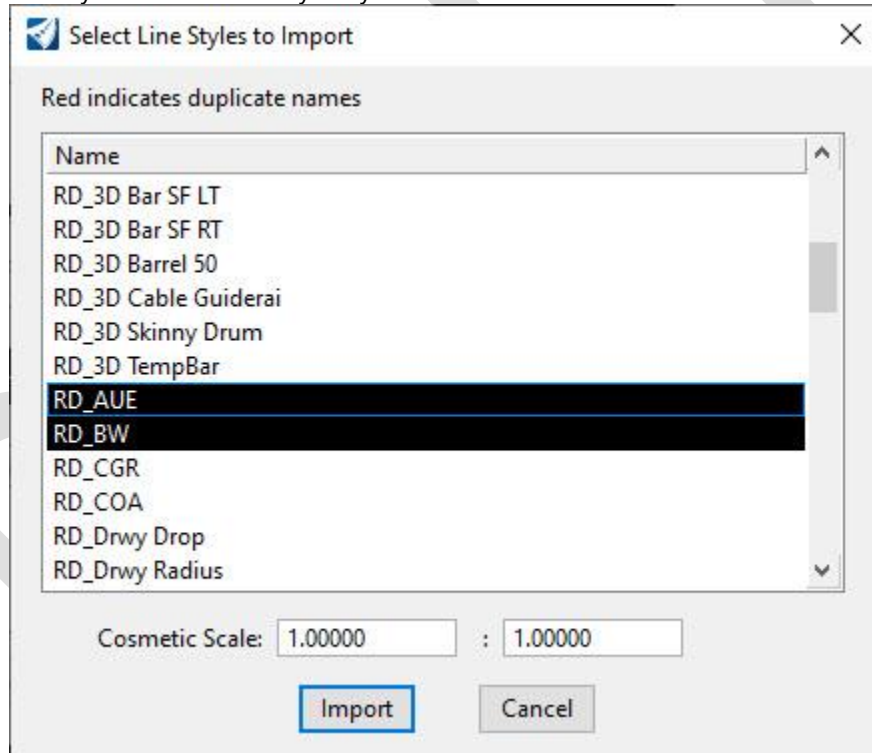




B. The select File → Import → Microstation Resource File (RSC)...

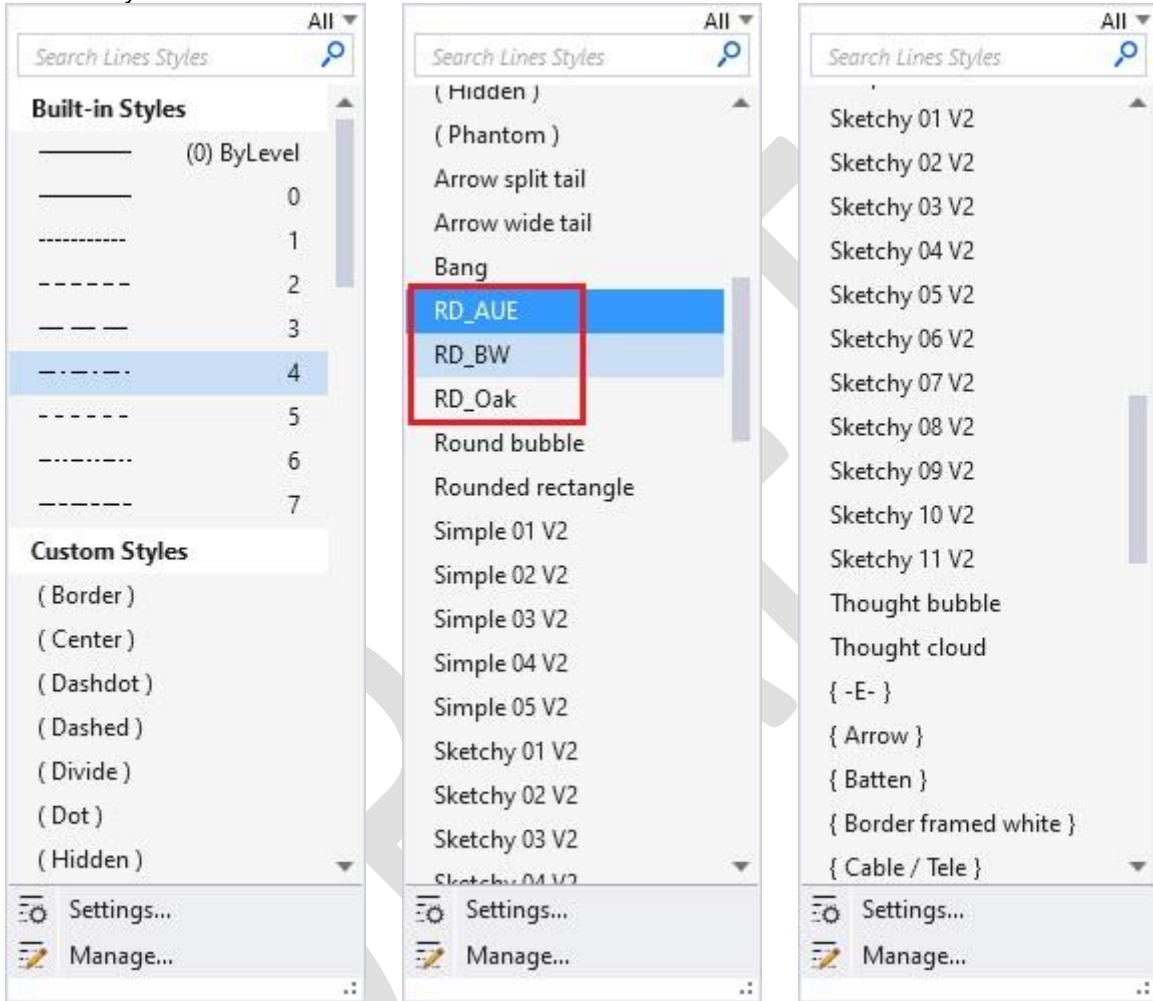


C. Then path to [C:\NCDOT\\_V8\\_WORKSPACE\Ncdot\\_Stds\English\symb](C:\NCDOT_V8_WORKSPACE\Ncdot_Stds\English\symb) and select the [rdy\\_cls.rsc](#) file, or whichever file you need to modify for your unit.



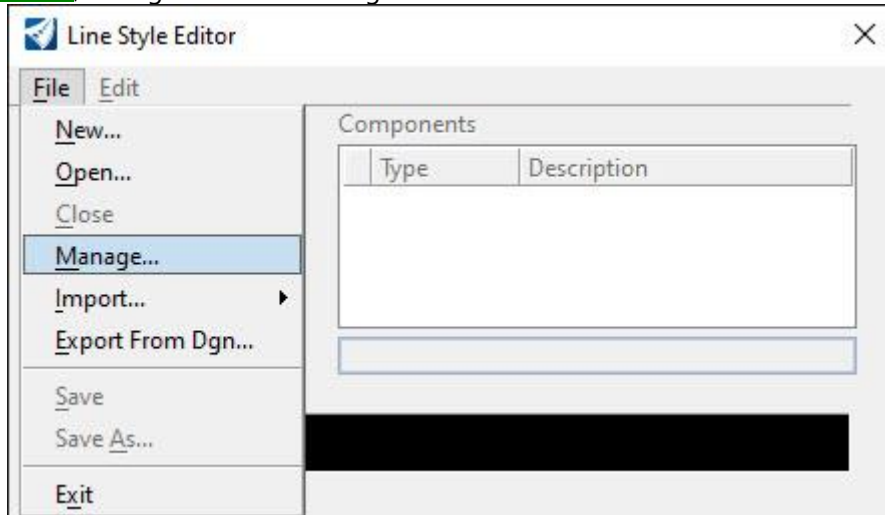
D. Select the line styles you want to modify the scale to 1.00000:12.00000 and click on [Import]. This will import the selected custom line styles into the \*.dgn file at the scale chosen.

E. It may appear that nothing happened. To check they were imported, go to the Attribute tool group, click the drop-down for the line styles. You should see only the Bentley default line styles (because the file was disassociated) and your imported line style(s), in the red box in the middle image below. Notice the two styles that were selected to be imported **RD\_AUE**, **RD\_BW**, and the custom one **RD\_Oak** is already shown in this example because it was previously created. The rest are default styles for Microstation.

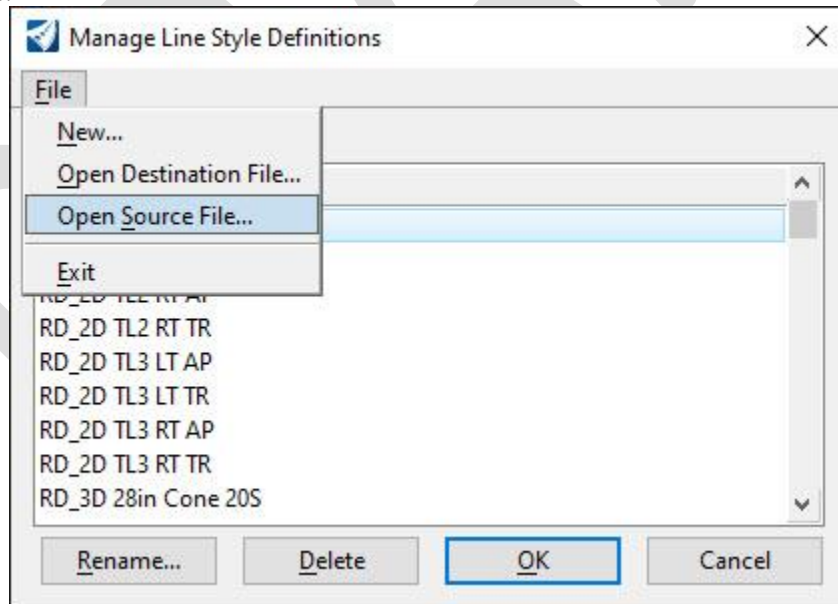


Something else to consider is if you desire to revise the names of all the old levels. This method is recommended as it makes it easier to determine if you are choosing the new line style that's been redesigned/rescaled for ORD vs. the old one, because it will have a new name. However, the [Line Style Editor](#) does not allow you to rename styles. The renaming must be done through the [Manage Line Style Definitions](#).

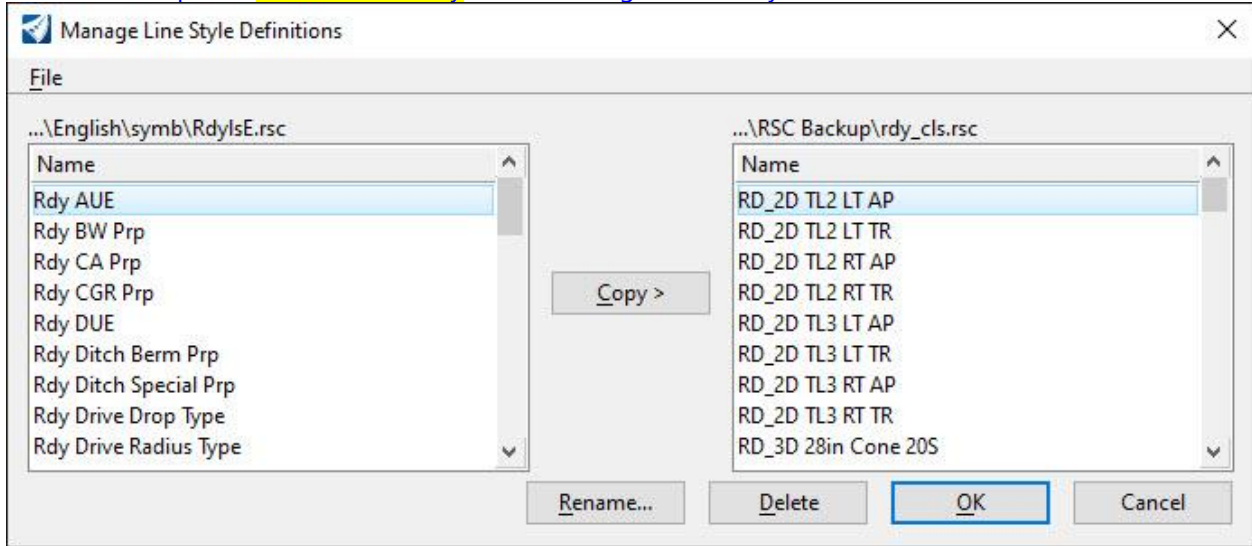
**F.** Go to the Attribute tool group, the line style drop-down, then click Manage... which will open the [Line Style Editor](#), then go to File → Manage...



**G.** At the [Manage Line Style Definitions](#) window go to File → Manage... and it will have you select your Destination library first, from there you go to File → Open Source File... then select your new resource file.



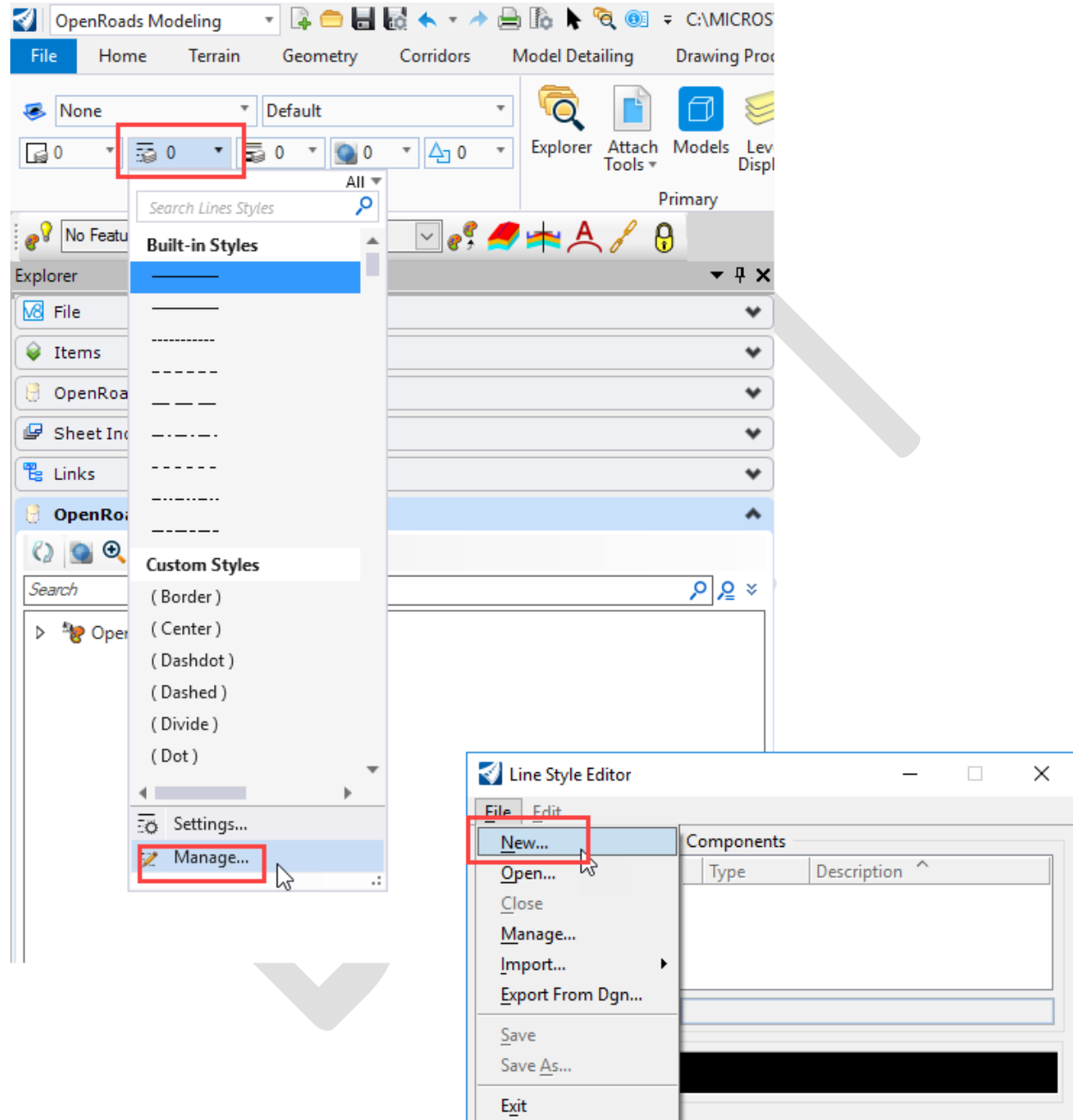
**H.** Source (old "rsc" file in V8i) is on the left and Destination (new "rsc" file) is on the right.  
**OLD** = path to [C:\NCDOT\\_V8\\_WORKSPACE\Ncdot\\_Stds\English\symb](C:\NCDOT_V8_WORKSPACE\Ncdot_Stds\English\symb) and select your unit's resource file (i.e., Roadway=**Rdyls.rsc**)  
**NEW** = path to your unit's (highlighted folder below) new resource file (or the one being made for this exercise, Roadway=**rdy\_cls.rsc**)  
[C:\NCDOT\\_CONNECT\\_WORKSPACE\Configuration\\_10\\_10\Organization-Civil\Disciplines\NCDOT\\_Roadway\Standards\Dgnlib\Line Styles](C:\NCDOT_CONNECT_WORKSPACE\Configuration_10_10\Organization-Civil\Disciplines\NCDOT_Roadway\Standards\Dgnlib\Line Styles)



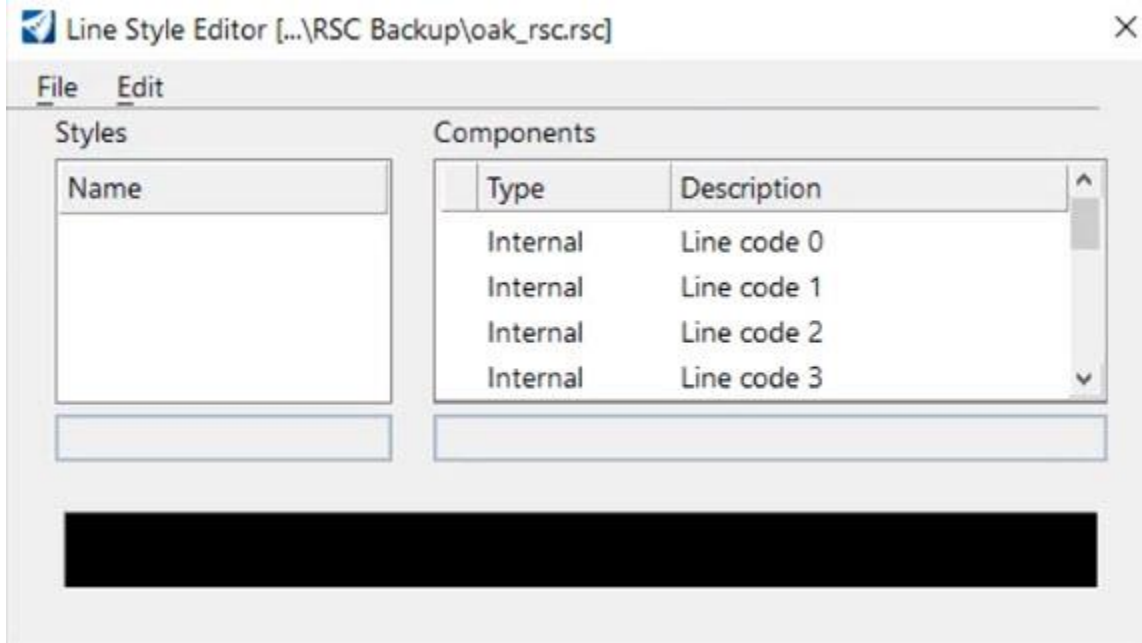
- I.** When you rename the custom line style, then you can import it into the dgn library. The one renamed is the destination.
- J.** Once you are done with renaming/re-scaling/importing your edited line styles you can exit the file and rename it with a "dgnlib" extension.
- K.** Save the new/revised library here:  
[C:\NCDOT\\_CONNECT\\_WORKSPACE\Configuration\\_10\\_10\Organization-Civil\Disciplines\NCDOT\\_Roadway\Standards\Dgnlib\Line Styles](C:\NCDOT_CONNECT_WORKSPACE\Configuration_10_10\Organization-Civil\Disciplines\NCDOT_Roadway\Standards\Dgnlib\Line Styles)
- L.** Line styles need to be edited through the "rsc" file. The "dgnlib" is the product of the line style "rsc" file that makes the line styles portable. Portable in this context means when a line style from a "dgnlib" is placed by a user in a "dgn" file, it is saved as a part of that file. If you only used a style from an "rsc" file, you would need to send the workspace along with the file to anyone.

## CREATING A CUSTOM LINE STYLE FROM SCRATCH

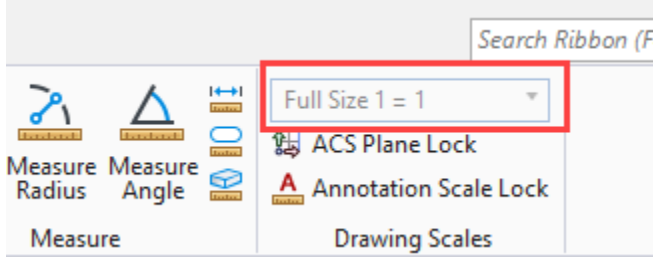
1. Open an existing custom line style resource file (\*.rsc) or create a new one, like the existing Roadway one named "rdy\_cls.rsc". Open this resource file by going to the element attributes tool group and use the drop-down in the line styles to select "Manage...". This will open the Line Style Editor window, then choose "New...".



For this example we are creating an "rsc" file named "oak\_rsc.rsc"



2. The file annotation scale is in the "OpenRoads Modeling" Workflow on the "Drawing Production Ribbon" in the "Drawing Scales" section and should be set to "Full Size 1 = 1".



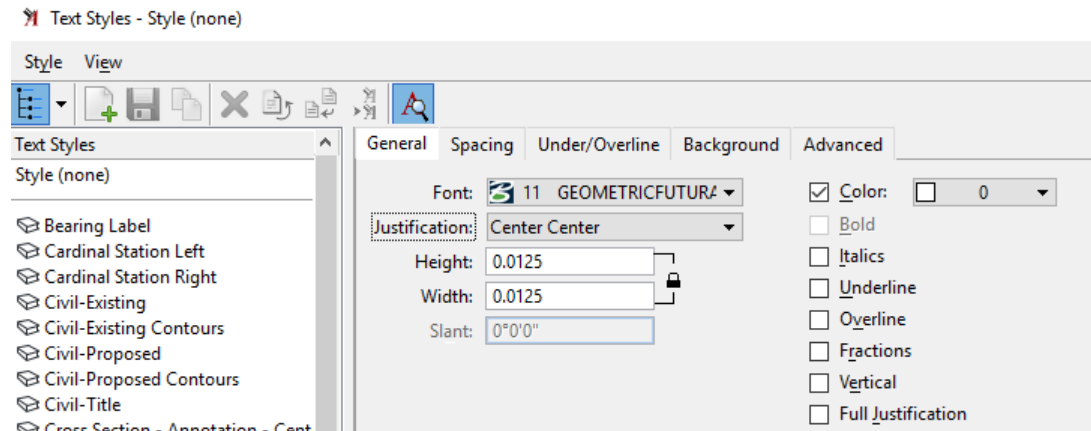
#### Annotation Scale Ready

For storing text as part of the custom line style, set the active text height and width (text size) to this full size 1:1 base scale. If the text size is 7.5 at 1"=50', then the base scale text size should be set to 0.0125 (7.5/600).

#### Legacy Project Scale Consideration

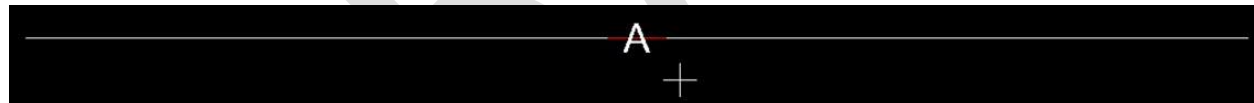
For storing text as part of the custom line style, set the active text height and width (text size) to the 1:12 ratio (1"=1'). If the text size is 7.5 at 1:50, then the base scale text size should be set to 0.1500 (7.5/50). **DO NOT DO THIS FOR THE CONNECT WORKSPACE.**

For this cell we are using font style 11 "GEOMETRICFUTURA" but any font can be used.



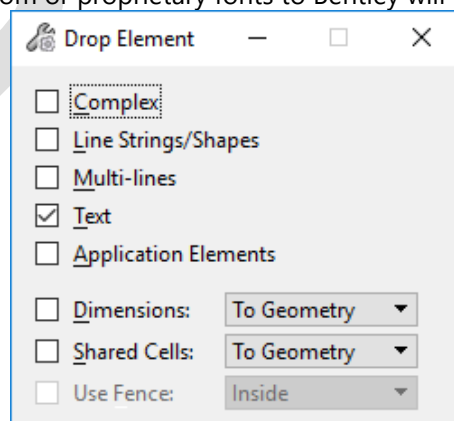
3. Draw the line style graphically in the dgnlib file. This is helpful to visualize what you will use as your pattern. It is also necessary to draw it if the symbol or text being utilized as part of the pattern is not already part of the library as a point component of the line style. Draw this new line style graphically at a scale that looks good on a 1"=50' plan sheet then scale it down 1:600. This is called your base scale and is the real 1:1 scale you will draw so that applying annotation scale to the style will scale it correctly for your drawing.

A line style is made up of two different elements; stroke pattern (lines & gaps) and sometimes a symbol or point cell. These point cells are only shown in the rsc file. Once a point is in the rsc file it cannot be edited, it can only be created or deleted, but only deleted using V8i, this may be a bug in the Connect edition. In the example below, the red line the "A" is centered on is only used for centering the text and will not be part of the line style. The point symbol cell or text component of the custom line style can be placed on any level. However, it is recommended that the Default level with color, weight, and line code of zero be used.



#### 4. Place Point Symbol Cell (text or drawing symbol)

**A.** For the text point symbol cell only, drop the complex status of the text. This is to ensure the text retains its shape if the font or dgnlib is not available. Microstation will eventually only utilize Windows fonts and the custom or proprietary fonts to Bentley will no longer be available.



These point symbols could be text or a graphic design or shape and are a special kind of point cell only seen within the resource file library.

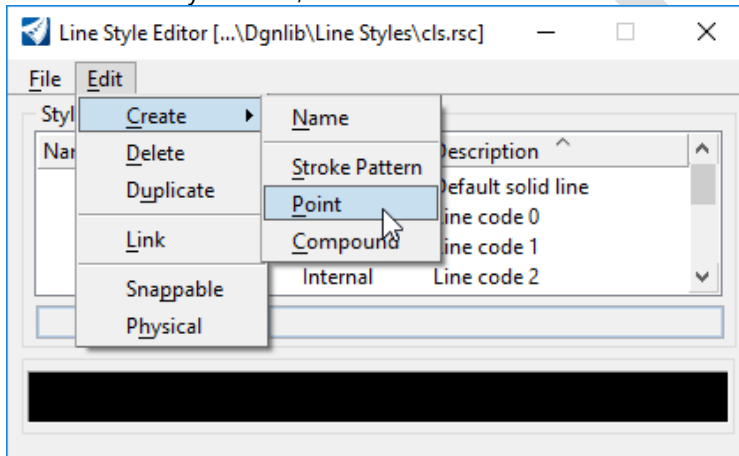
**B.** Place a fence around the text or you can use the selection tool to select just the text.



**C.** Define Cell Origin. In this case we snapped to the center of the red line.

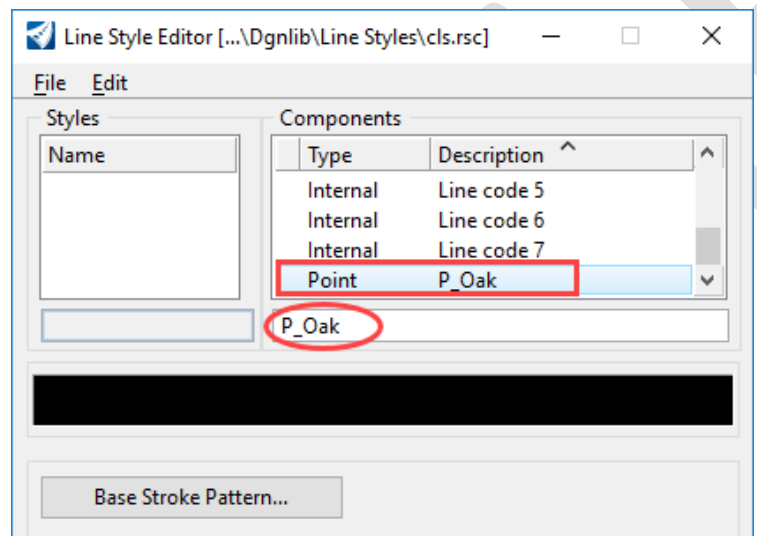
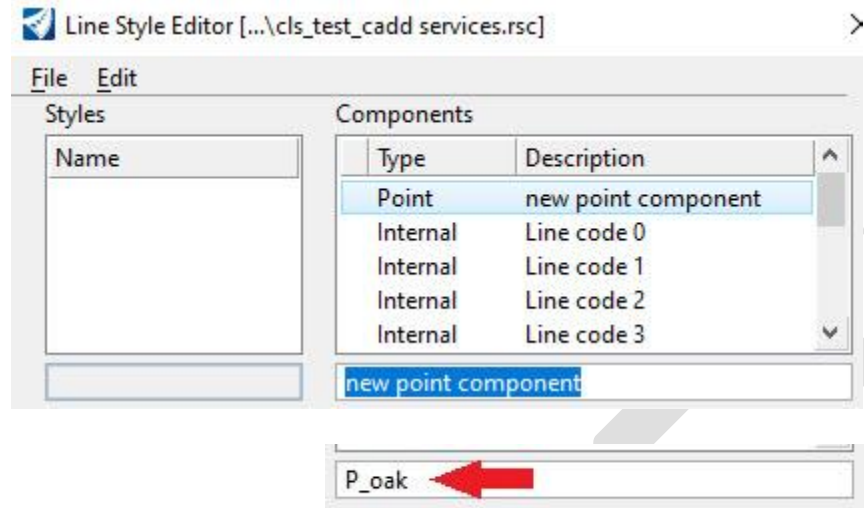


**5.** In the Line Style Editor, select Edit → Create → Point.



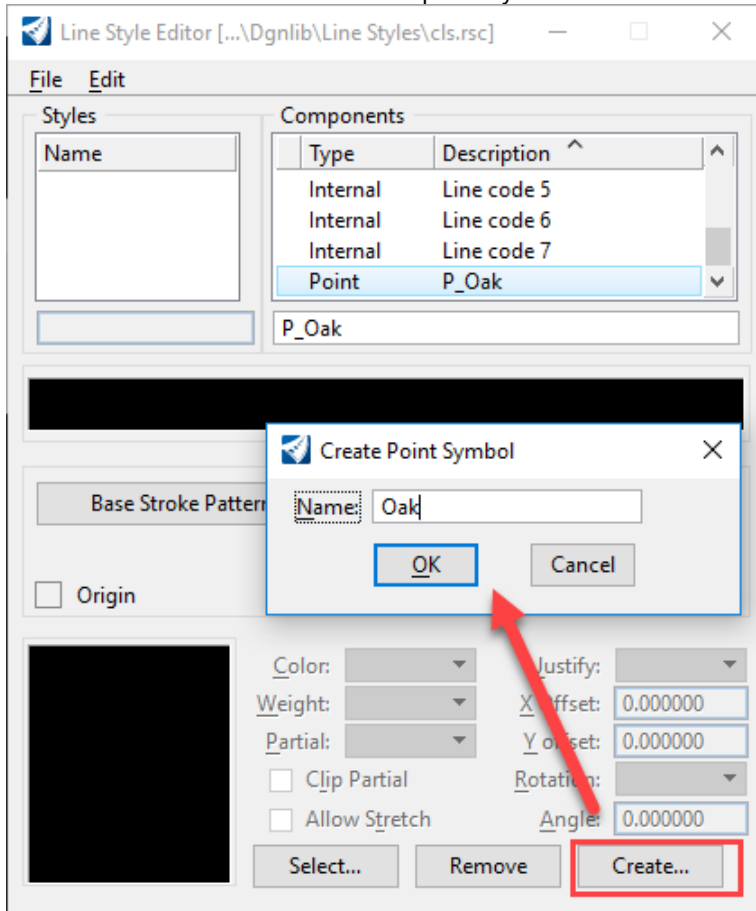


6. In the Components list sort the list by clicking on the "Type" column. Scroll through and locate the list of "Point" symbol then in the "Description" column it should show "new point component" then select the point you just created. In the field below the Component list rename this point cell with a "P\_" prefix to indicate it is a point component. Hit the Enter key to make the change.



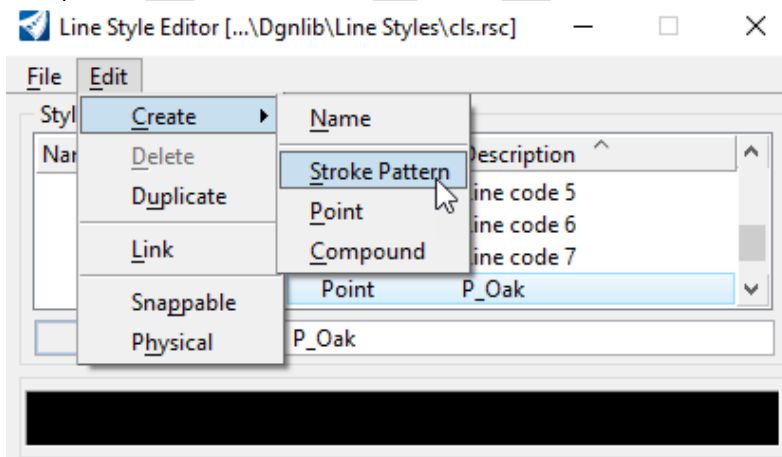
**NOTE: It is good practice to save your work after each step.**

7. Select Create and name the new point symbol cell.

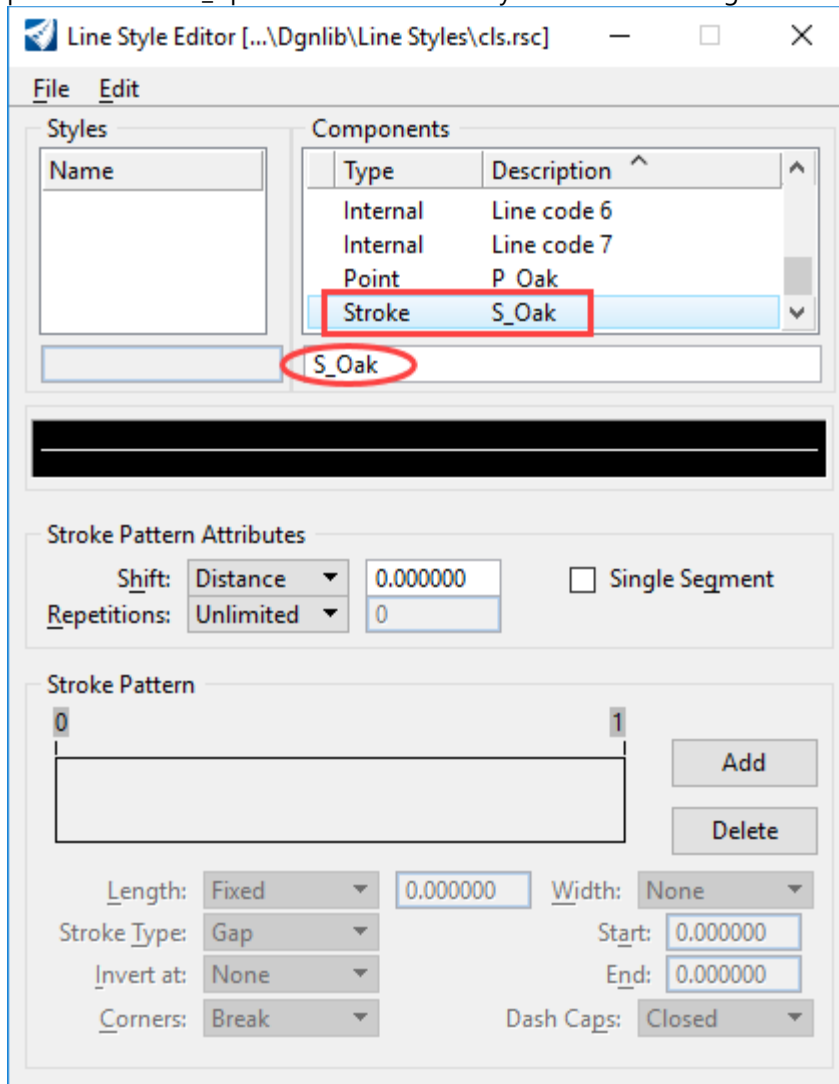


8. Since the point cell is created, remove the fence or de-select the text. The cell origin command can also be de-activated by depressing the Define Cell Origin button.

9. In the Line Style Editor, select Edit → Create → Stroke Pattern. This will create a "Stroke" Type in the Components list.

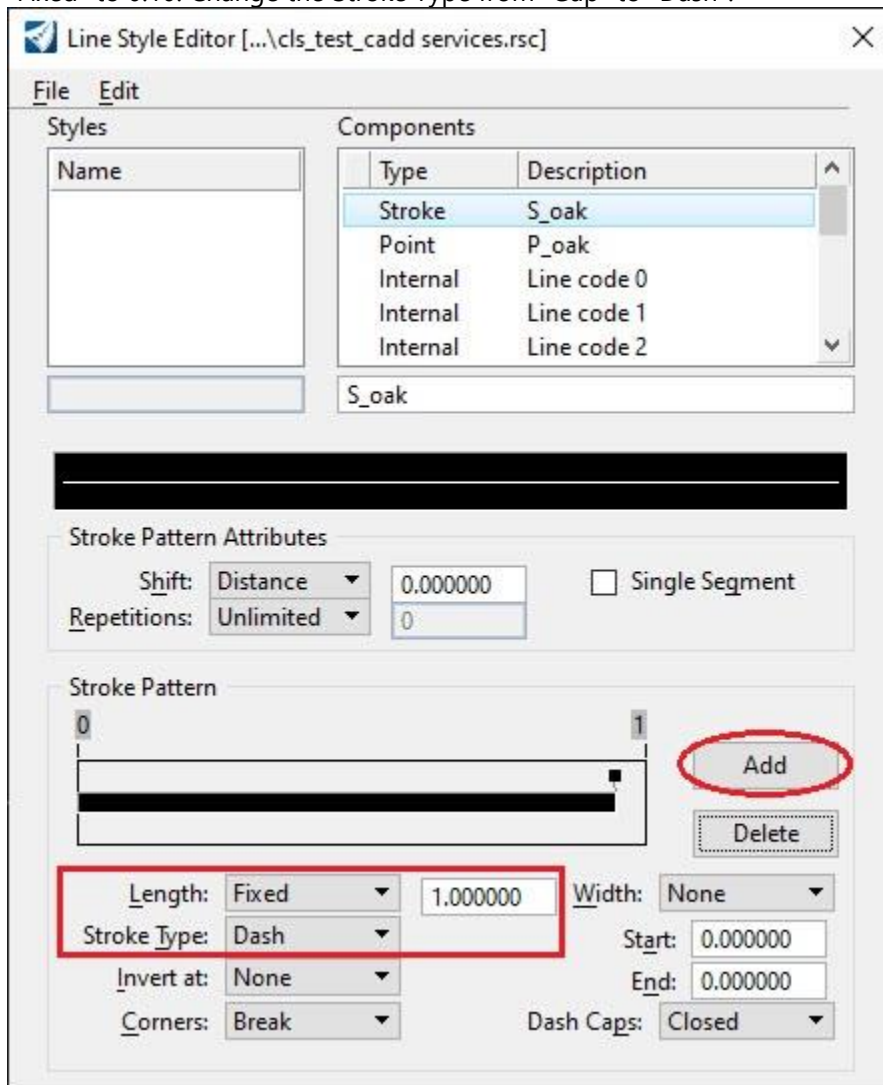


10. Scroll through the Component list and select the new stroke pattern component. Rename this stroke pattern with a "S\_" prefix. Hit the Enter key to make the change.



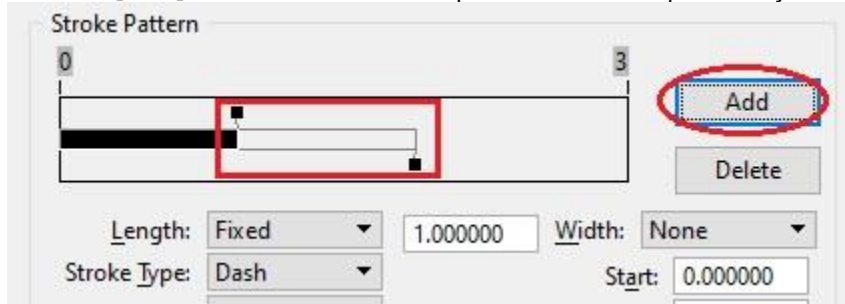
In this step we are defining the stroke pattern distance (or line) between the point symbol cells.

**11.** Define the stroke pattern Gap (open) and Dash (solid) lengths. Click **[Add]** and change the Length "Fixed" to 0.10. Change the Stroke Type from "Gap" to "Dash".

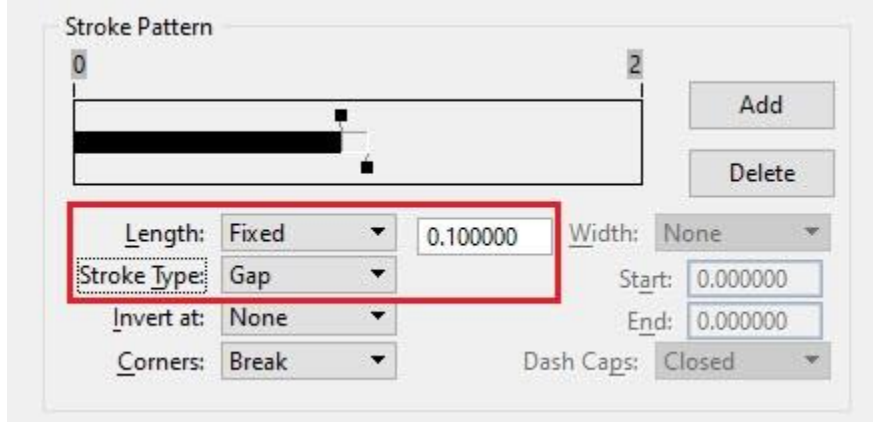


In this step we are defining the stroke pattern distance (or an open gap) to place the point symbol cell in. This distance should be just slightly longer than the width of the point symbol cell. For example, if the character "A" is 0.05 (text width), then two times that is 0.10, resulting in a gap distance of 0.10. For patterns that have more than one letter in it, half a letter width extra on each side is a good distance i.e., a 4-letter pattern would need a gap of 0.25:  $0.05 \times 4 + 0.025 \times 2$ .

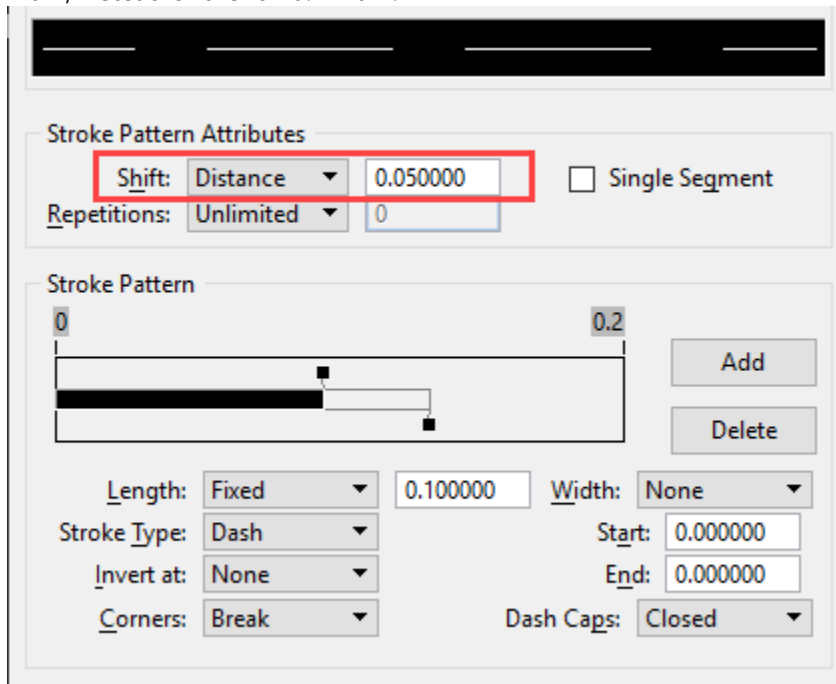
12. Click **[Add]** and select the second part of the stroke pattern by clicking on it.



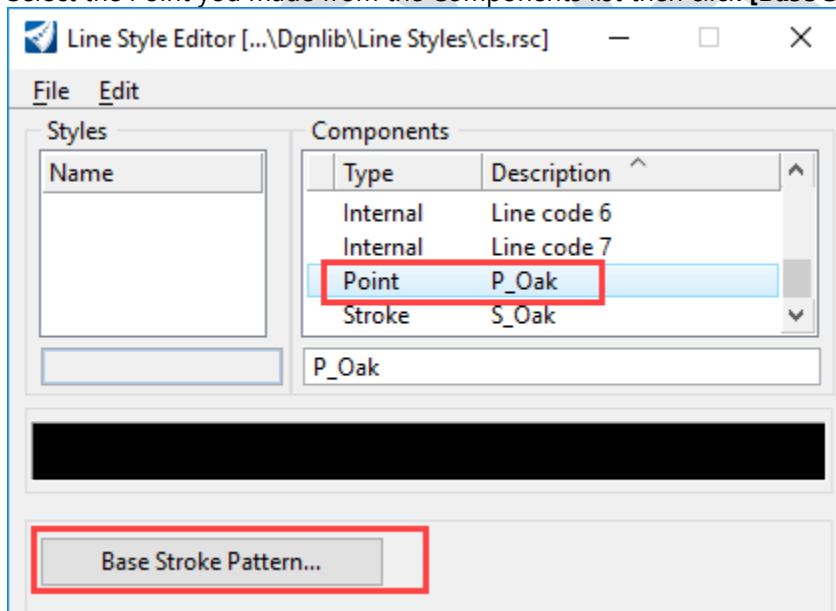
13. Change the Length (Fixed) to 0.100000. Stroke Type should be set to "Gap".



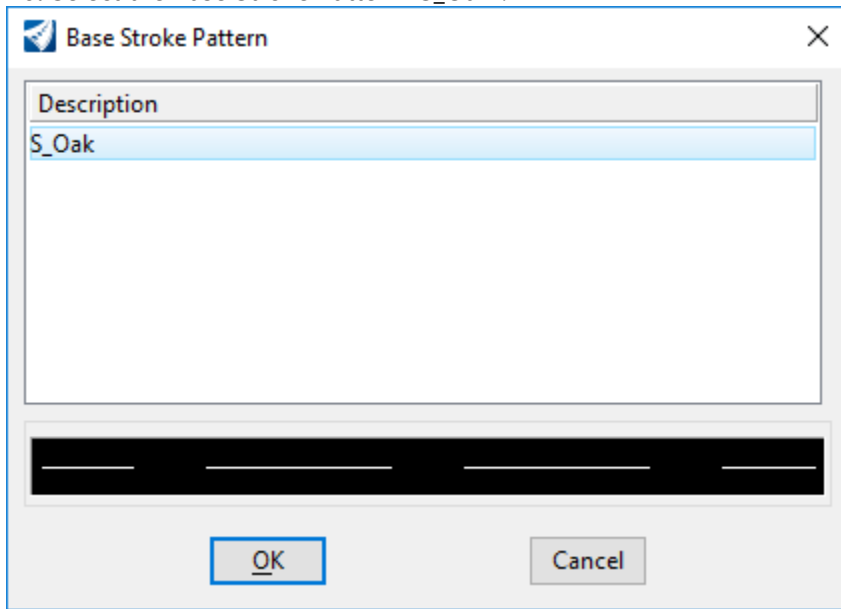
14. Optional: In the Stroke Pattern Attributes, set the Shift (Distance) to 0.50. This is taking half the distance of the solid dash line (1.00) and shifting the first point symbol cell (gap) location at the half 0.05 mark, instead of the full 0.1 mark.



15. To create a custom style you choose the component elements you want to make up that pattern. Select the Point you made from the Components list then click **[Base Stroke Pattern]** button.



16. Select the Base Stroke Pattern "S\_Oak".

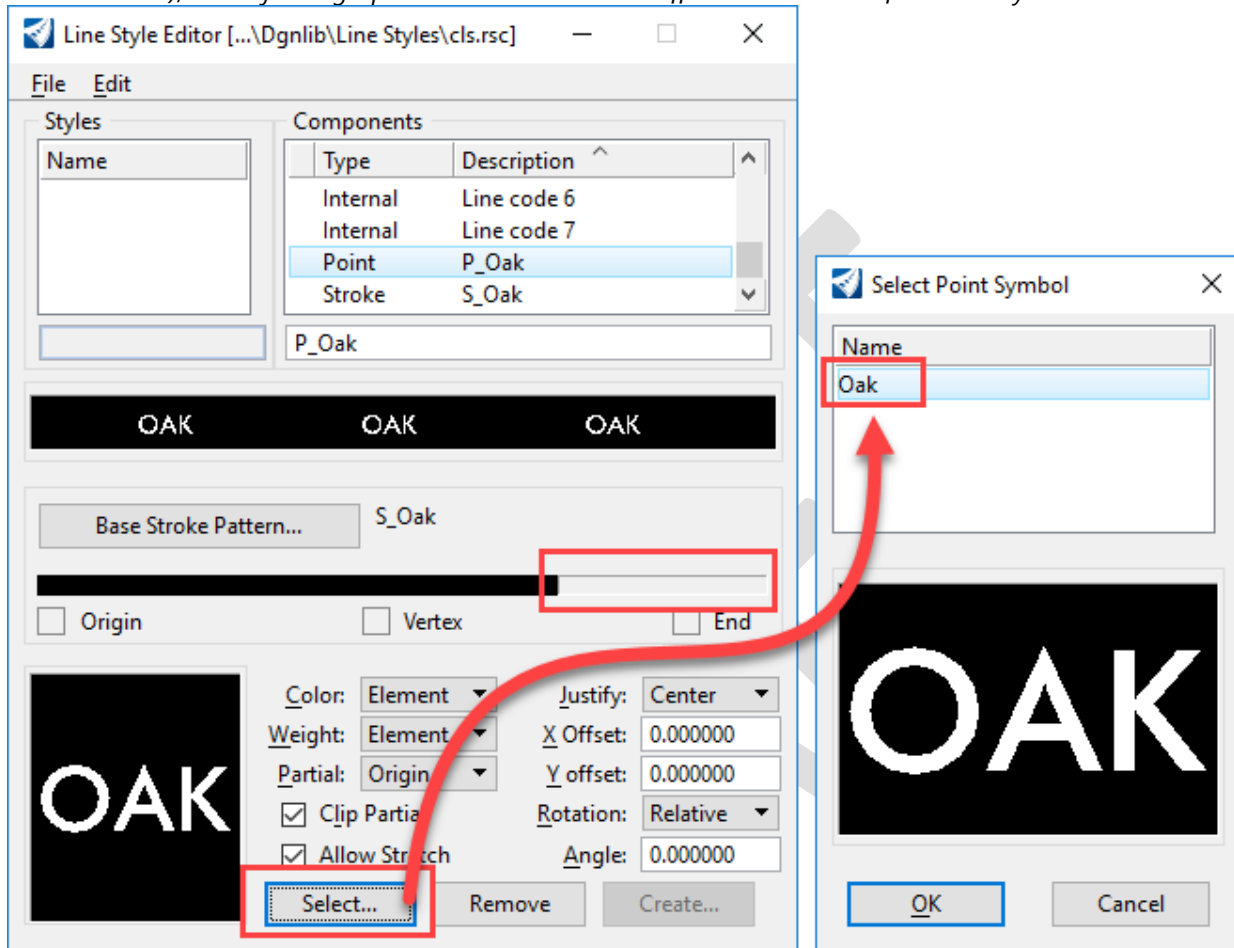


A sample of the pattern will be displayed.



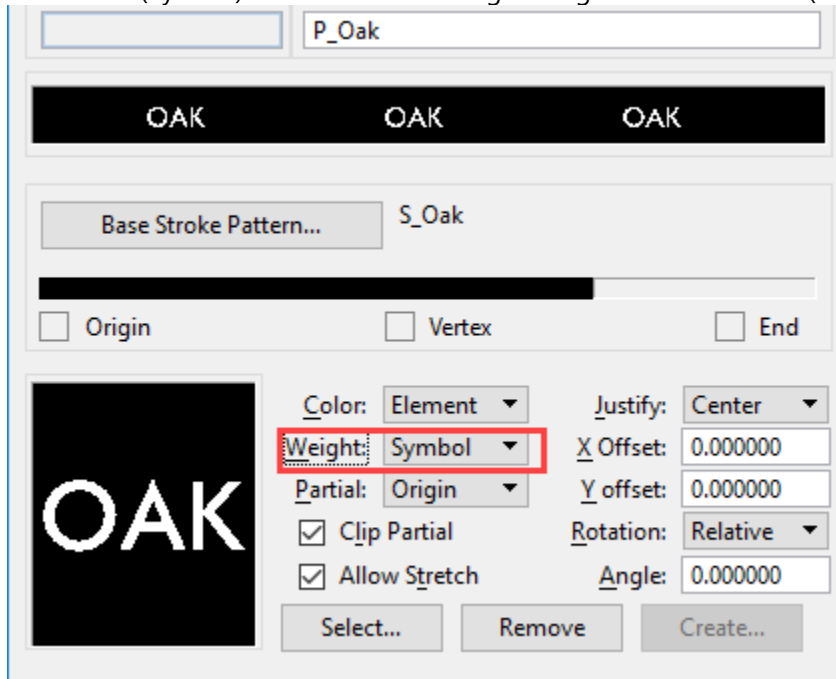
17. Click on the Gap portion of the stroke pattern and then [Select...] to choose the point symbol cell "Oak" you made in step 6.

*NOTE: Sometimes the line will not display in the preview (the ling black bar in the middle of the Line Style Editor window), this is just a graphics issue and does not affect the creation of the line style.*



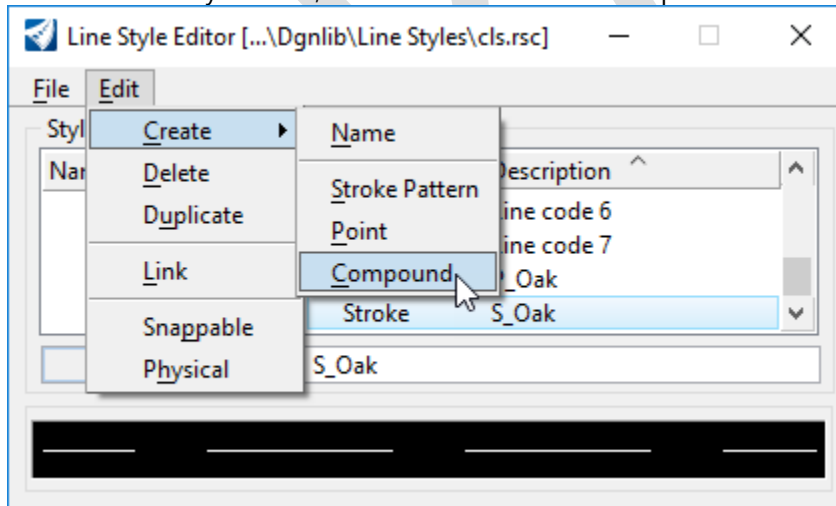


**18.** Recommended: For point symbol cell text only, change the point symbol Weight to "Symbol". This is done because when we drop the text complex status into a shape, having a weight higher than zero causes jagged edges. The point symbol cells can always use the color and weight they were originally created on (Symbol) or the color and weight assigned with the level (Element).

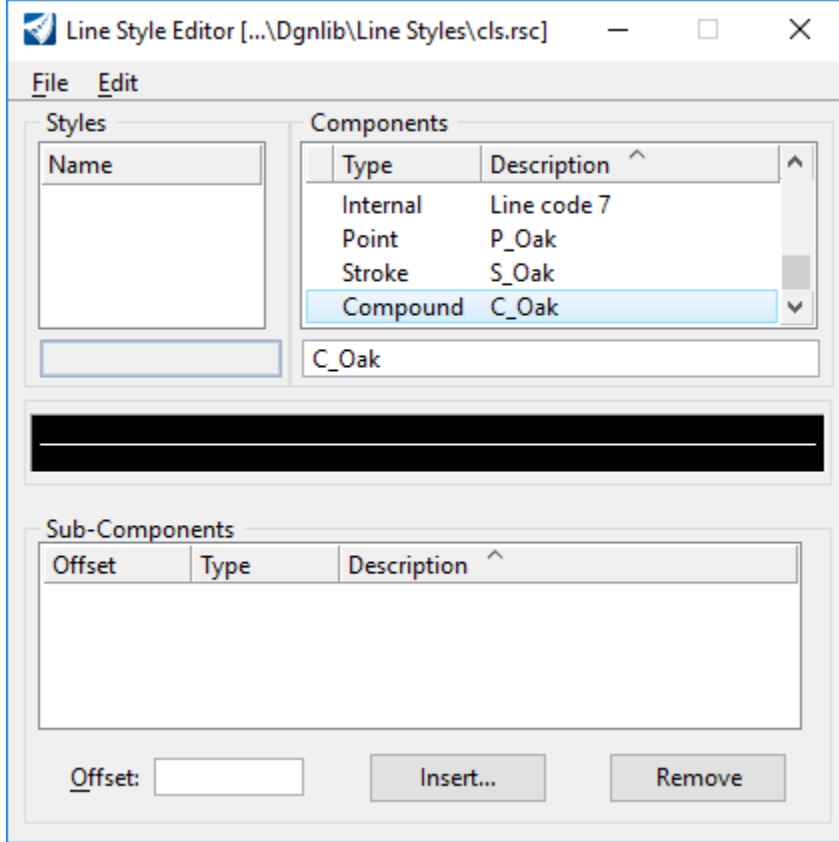


Now you have a stroke pattern and a symbol cell you can use to create a Compound.

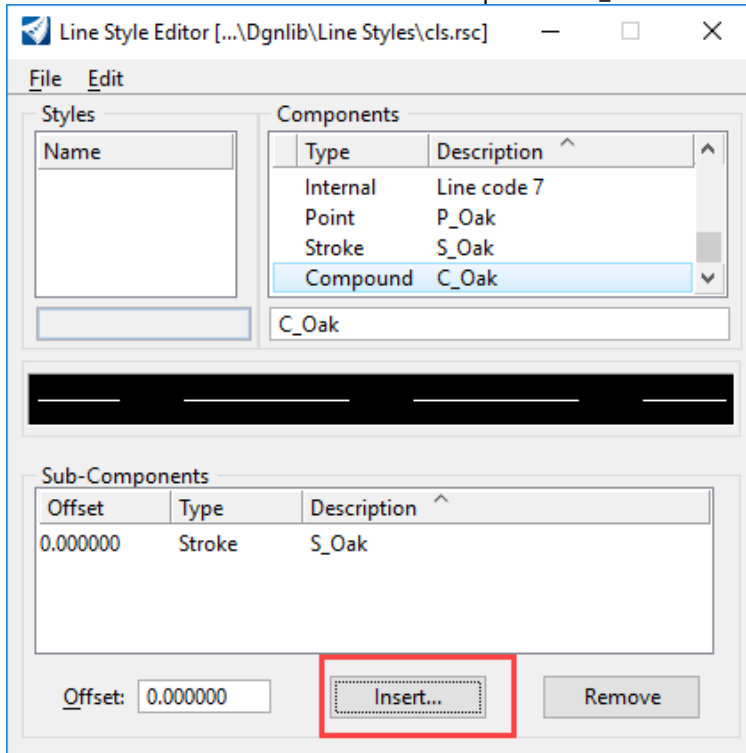
**19.** In the Line Style Editor, select Edit → Create → Compound.



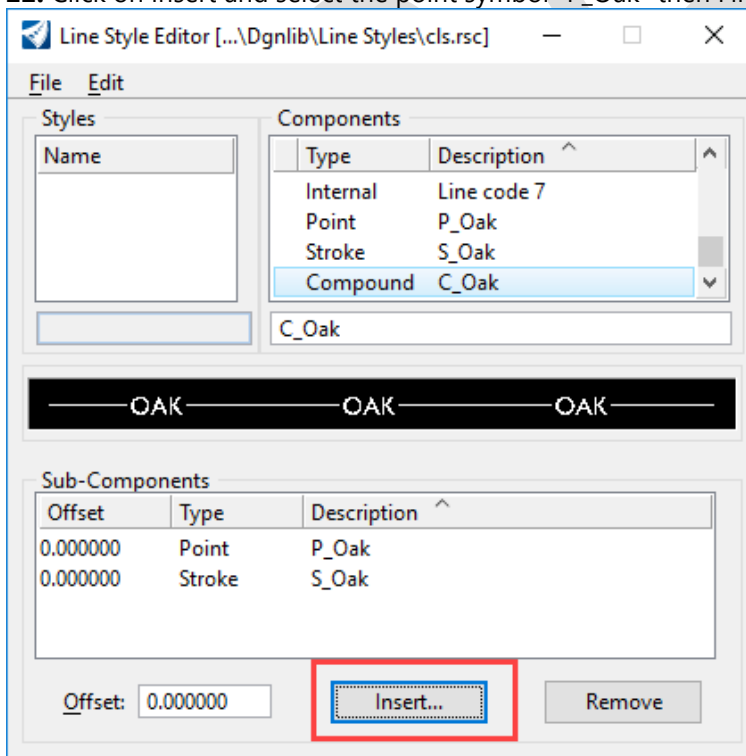
20. Scroll to the bottom (or top) of the Component list and select the new compound component. Rename this stroke pattern with a "C\_" prefix. Hit the Enter key to make the change.



21. Click on Insert and select the stroke pattern "S\_Oak".

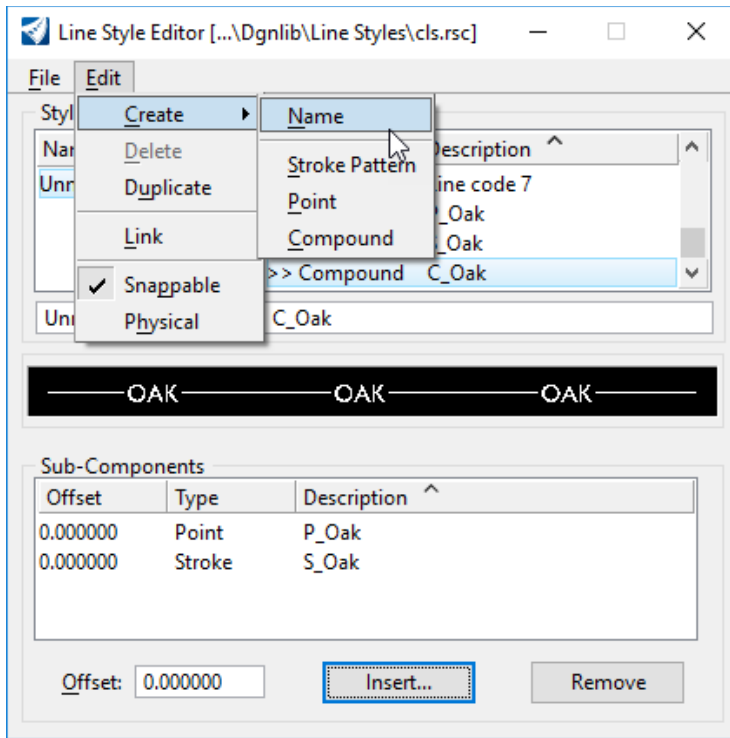


22. Click on Insert and select the point symbol "P\_Oak" then File → Save.

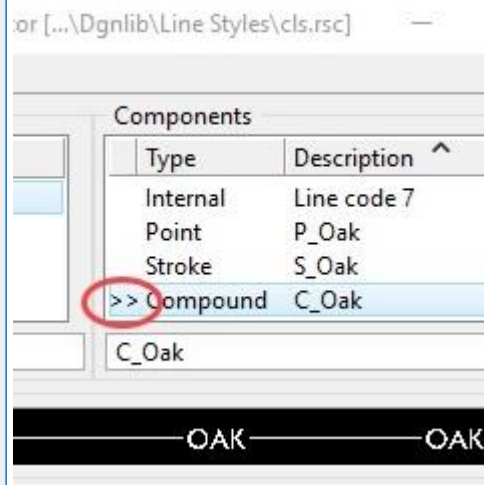
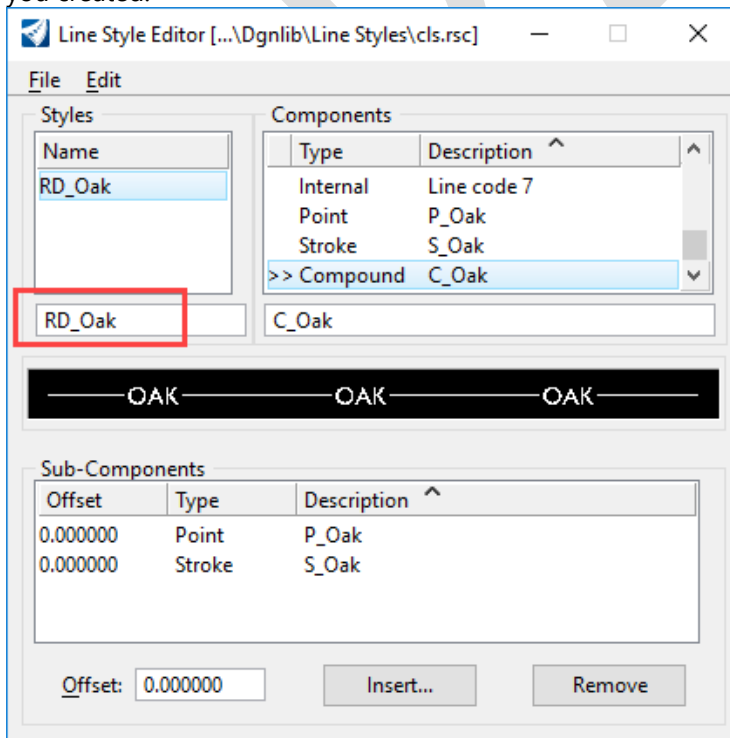


Depending on what scale you drew your stroke and point symbol, the pattern may or may not show in the preview pane,

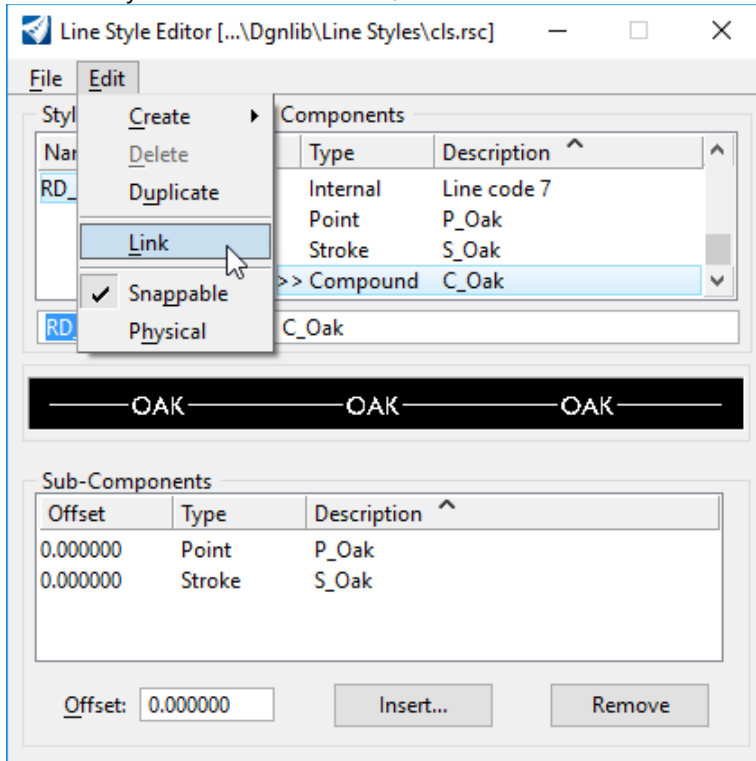
23. Next you want to create the actual line style name. In the Line Style Editor, select Edit → Create → Name.



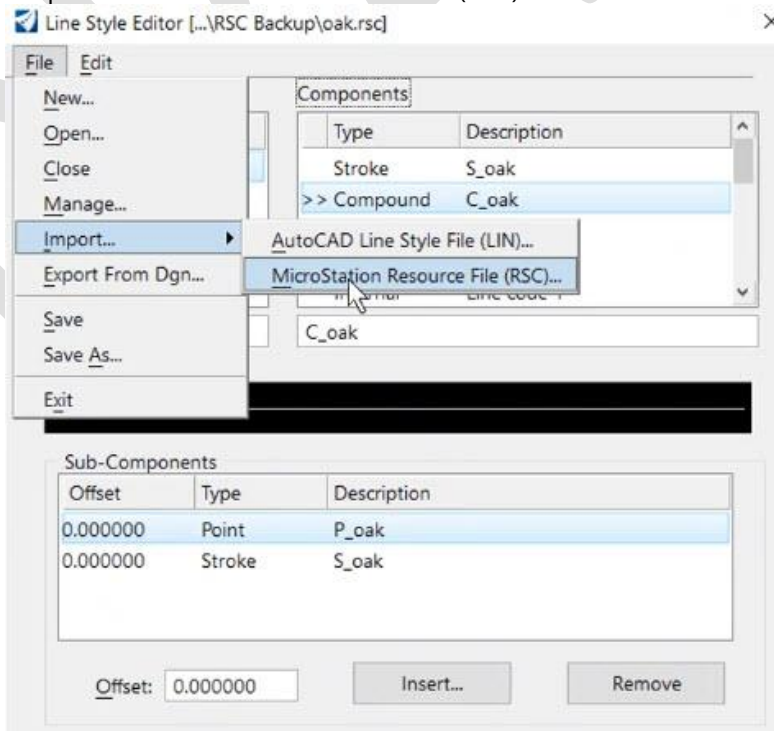
24. Key in the name of the custom line style and hit the Enter key to make the change. The double arrows ">>" by the Type indicates you are about to link the name of your custom line style with the Compound you created.



If this is not the case, then while highlighting the custom line style name and the compound select Edit → Link. Lastly save the resource file, File → Save.

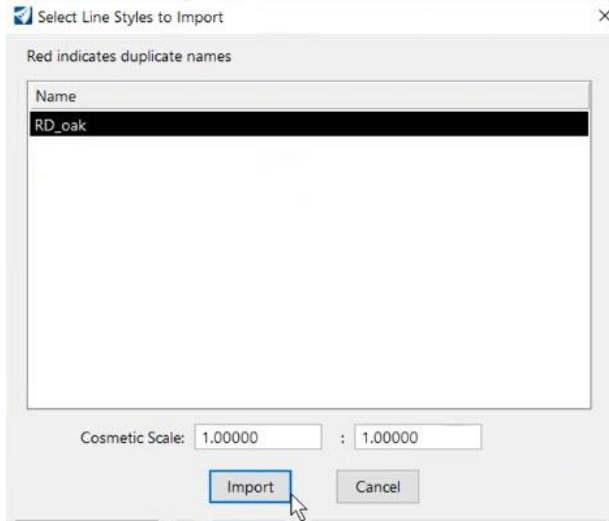


25. To test the new custom line style, simply Import it from the resource file to the active dgnlib file.  
A. Go to File → Import → MicroStation Resource File (RSC).

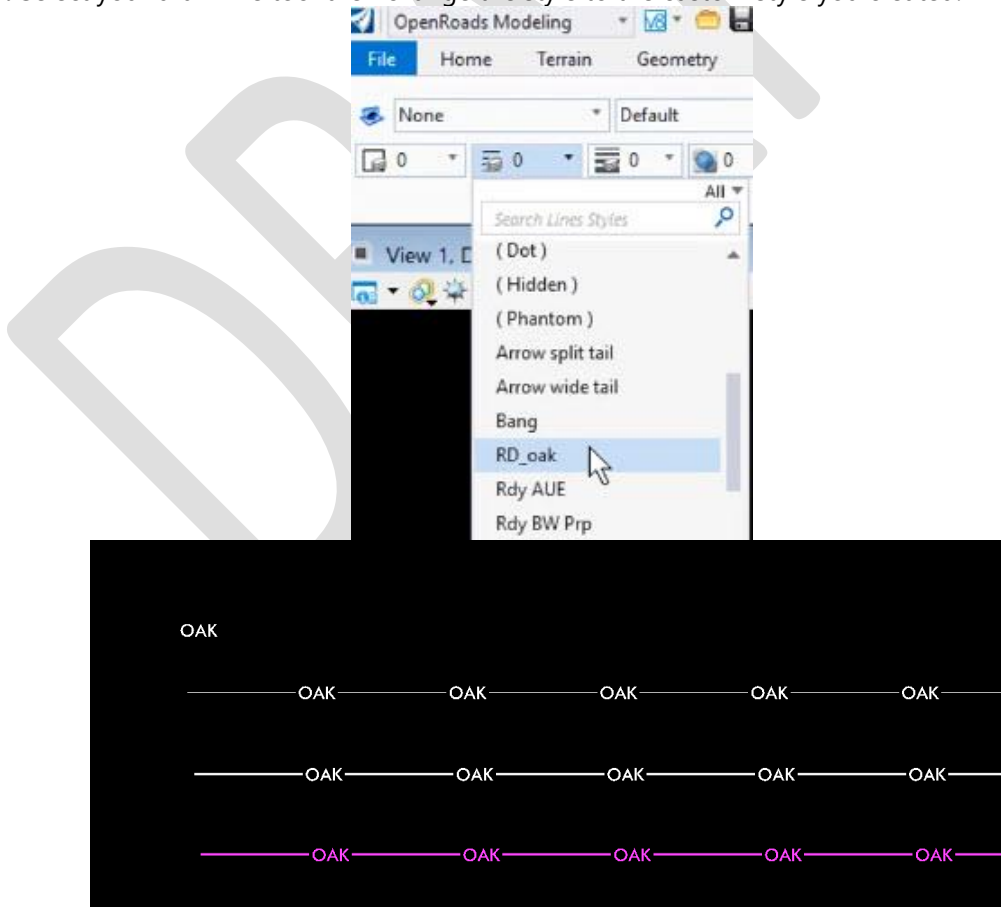


**B.** At the next window path to and select the RSC file you want to import from. This is typically: [C:\NCDOT\\_CONNECT\\_WORKSPACE\Configuration\\_10\\_10\Organization-Civil\Disciplines\NCDOT\\_Roadway\Standards\Dgnlib\Line Styles\RSC Backup](C:\NCDOT_CONNECT_WORKSPACE\Configuration_10_10\Organization-Civil\Disciplines\NCDOT_Roadway\Standards\Dgnlib\Line Styles\RSC Backup)

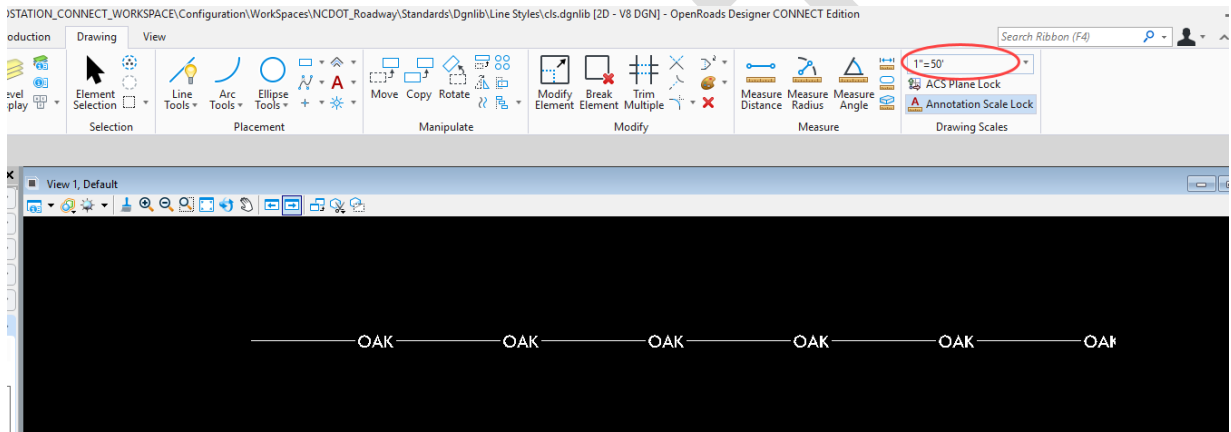
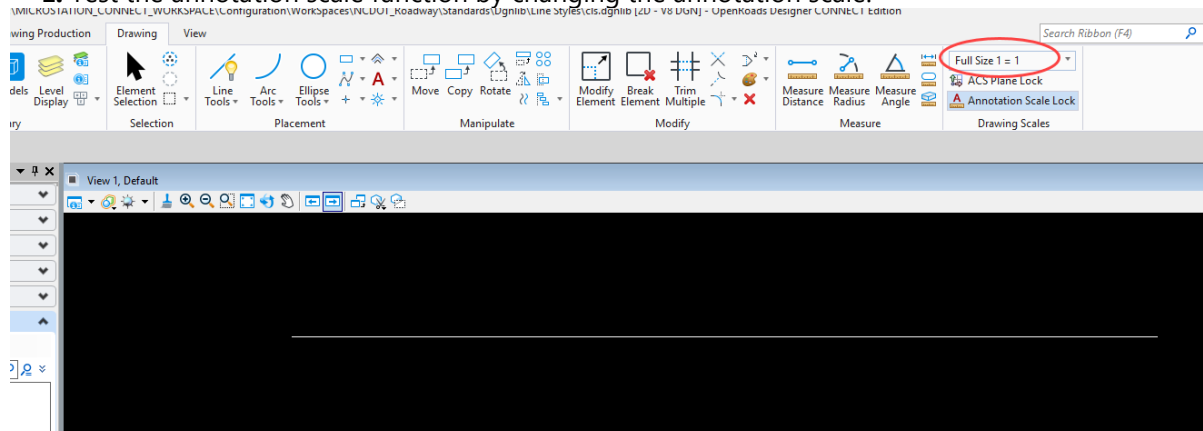
**C.** Select the new line style(s) you want to import.



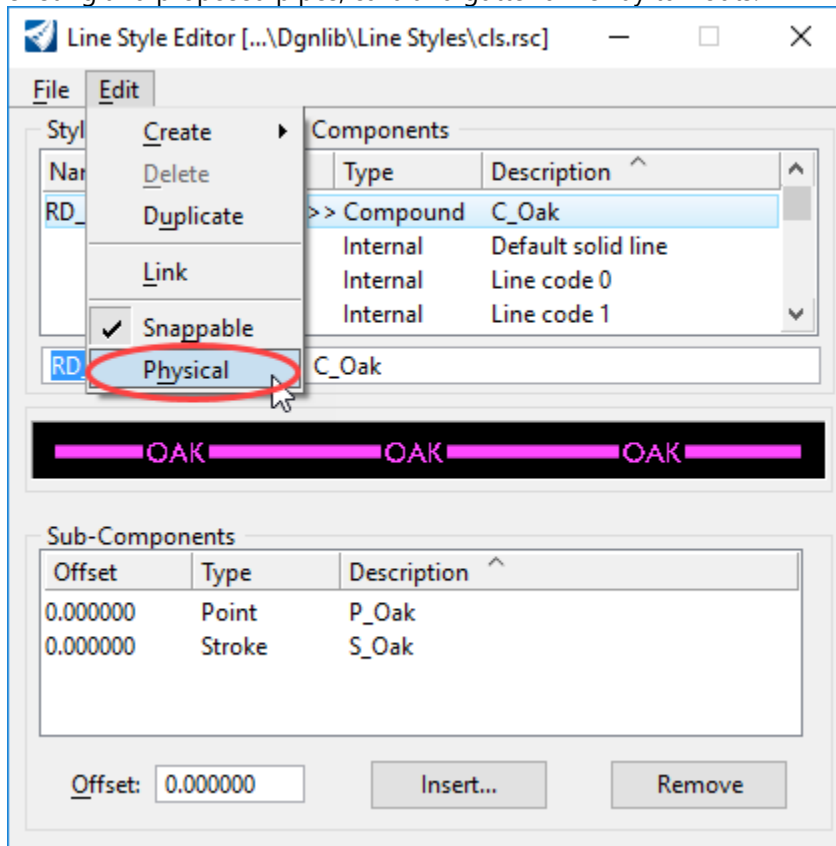
**D.** Select your draw line tool then change the style to the custom style you created.



E. Test the annotation scale function by changing the annotation scale.



25. There is a "Physical" setting in the Line style Editor that can be checked on if you do not want the annotation scale to take effect. This is done for true real world dimension line styles, such as some existing and proposed pipes, curb and gutter driveway turnouts.



26. Saving the ".dgnlib"

Rename the file to have a ".dgnlib" extension. Otherwise known as "when a design file is not a design file". This allows the revised or new dgnlib to be loaded into the WorkSpace once it is updated on a user's computer. As you can see, this ".dgnlib" is simply a regular design file saved with a ".dgnlib" extension. Coincidentally, this is the same way used to create a ".cel" file for cell library files. It is also important to verify the correct 2D or 3D design seed file is used to create the new file.

27. Remember that you can always shift a line style for clarity and readability using the "Modify Line Style Attributes" tool located **Drawing** → **Home** → **Modify** → **Change Element Attributes** tool.



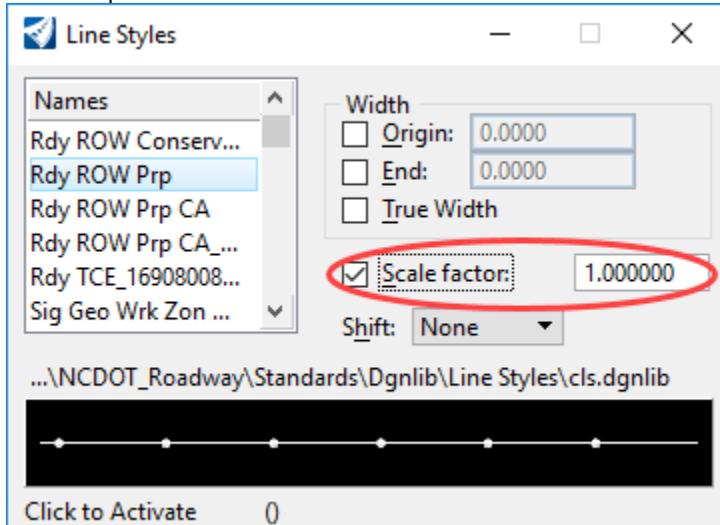


## RETROFITTING EXISTING CUSTOM LINE STYLES

1. draw the custom line style in the active dgnlib.

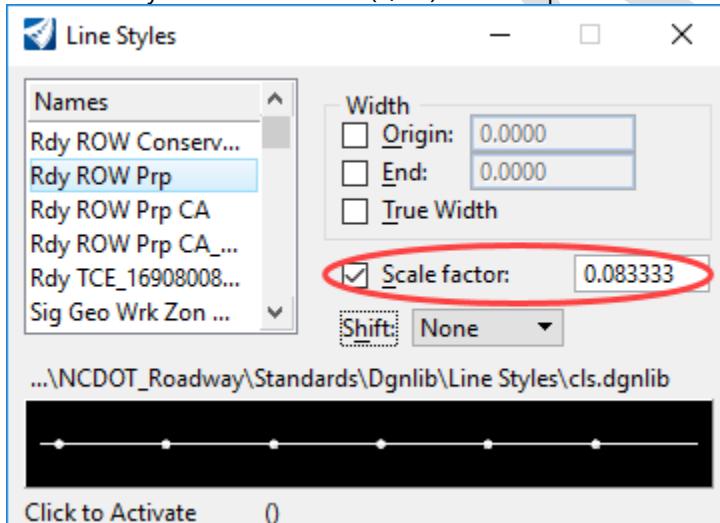
### Legacy Project Scale Consideration

Since the original custom line styles were created with Project Scale in mind, use the line style scale of 1 for their placement.

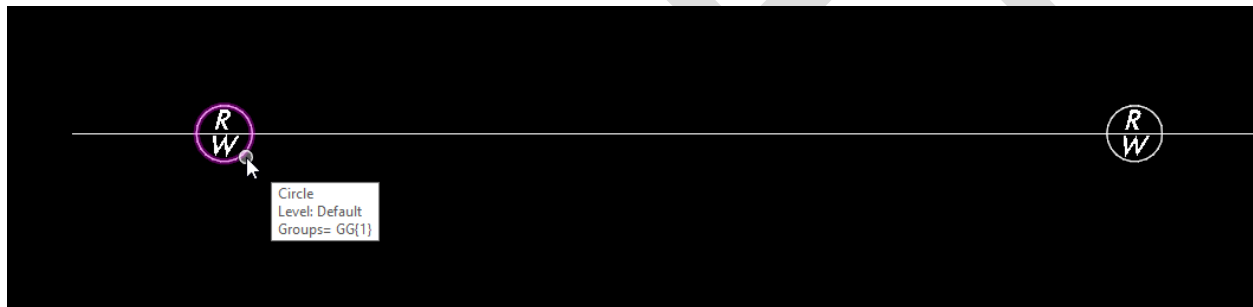
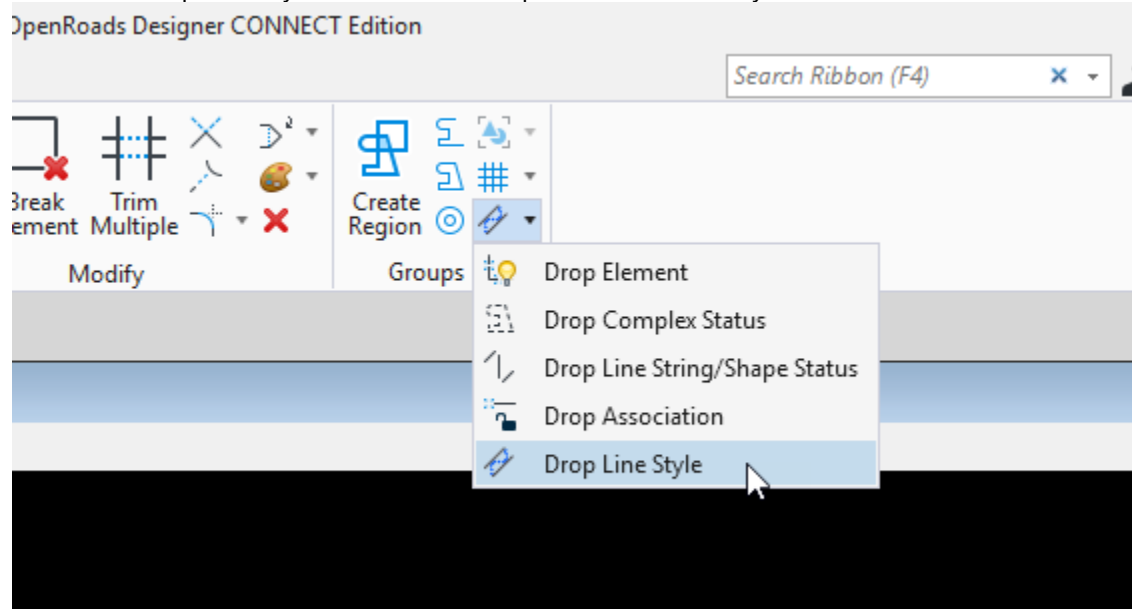


### Annotation Scale Ready

Use a line style scale of 0.0833 (1/12) for their placement.



2. Use the Drop Line Style command to drop the custom line style to leave the individual elements.

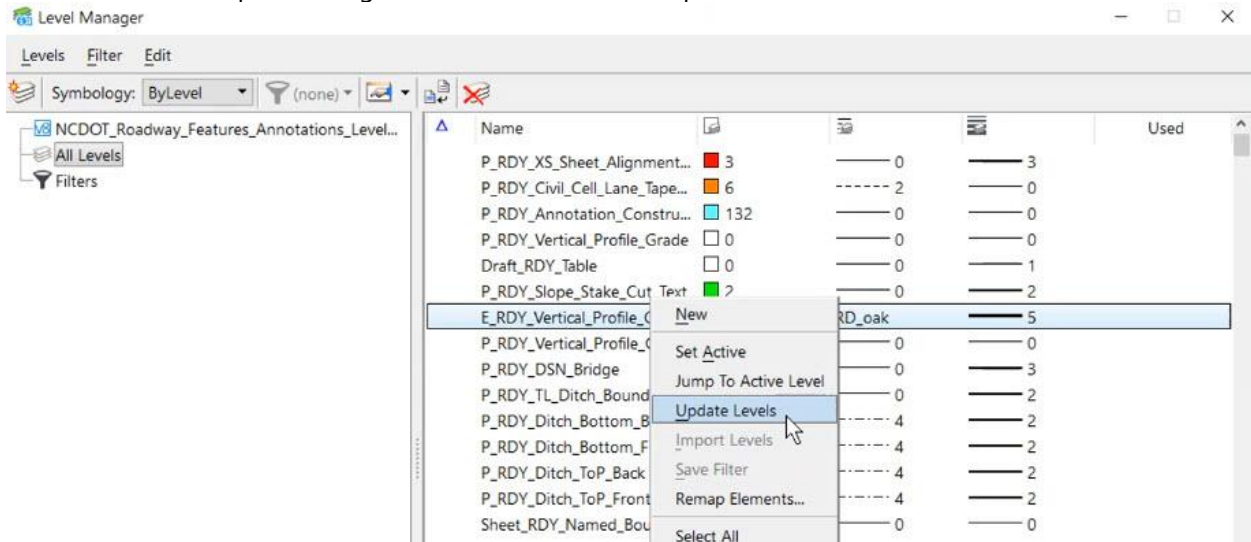


Repeat the steps above for creating custom line styles from scratch starting from step 2D (define cell origin).

## UPDATING LINES STYLES ALREADY BEING USED IN AN EXISTING FILE

If an existing line style is used and a revision is made to the line style, the user will need to update their design file.

1. Open the file
2. Open the Level Manager
3. Find the level in question, right-click on it and select "Update Levels".



This will sync whatever is in the WorkSpace with what's in the design file.