

Workflow MS 4 - Working with Model Files and Sheet Files

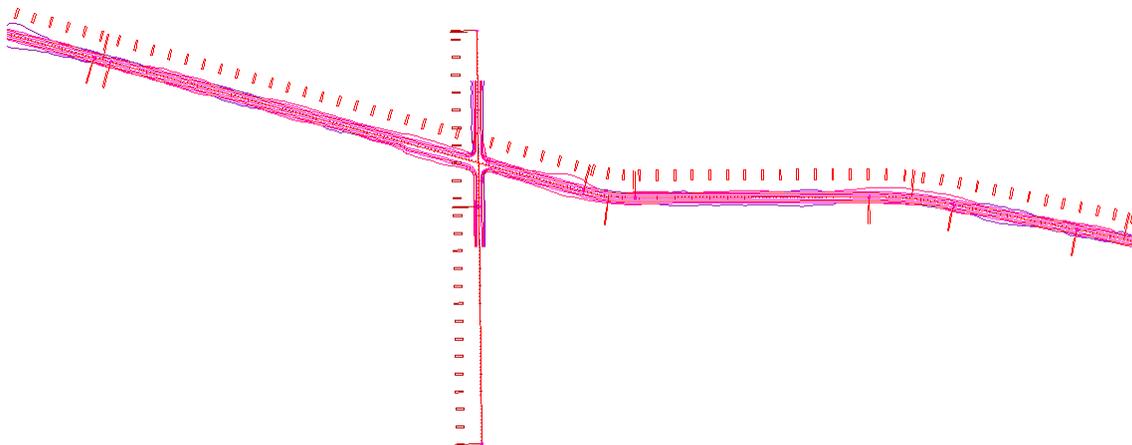
This document defines how to use and manage model and sheet files in a typical CDOT workflow. The document begins by describing the data that each type of file should contain along with typical examples to illustrate the differences. The locations for storing these files are identified. The steps to create a new model and sheet files and how to change the file settings to work with different plotting scales are explained. Finally, the process for referencing model files for review or printing is covered.

File Types

Model Files

Model files usually contain *design graphics* that are placed at the correct real world coordinates or *detail graphics* that are not dependant on real world coordinates. Model files are files that are ready to be used as a reference file to other model files for further design or to be referenced by sheet files for the purpose of plotting. Typical data included in a model file that is drawn at the correct real world coordinates would include planometrics for alignments, contours, utility lines, building outlines, structures, and any other DTM features. Model file data that is not dependent on real world coordinates would include typical sections, profiles, detail drawings, and tabulation sheets.

A model file will usually contain only one type of data. For example, one model file would contain only existing topography data, while another would contain only geometry data. Separate model files should be used for cross-sections and profiles. Dividing the data types into separate model files will allow for the most flexibility in how the data is utilized both by the specialty group team members and the secondary users that need to reference the data. This method of managing model files also minimizes level management by not having unrelated data in the file.



Another characteristic of the design file is that the graphics in the file usually represent the entire project. These graphics will later be referenced into a sheet file and clipped to fit the boundaries of the sheet.

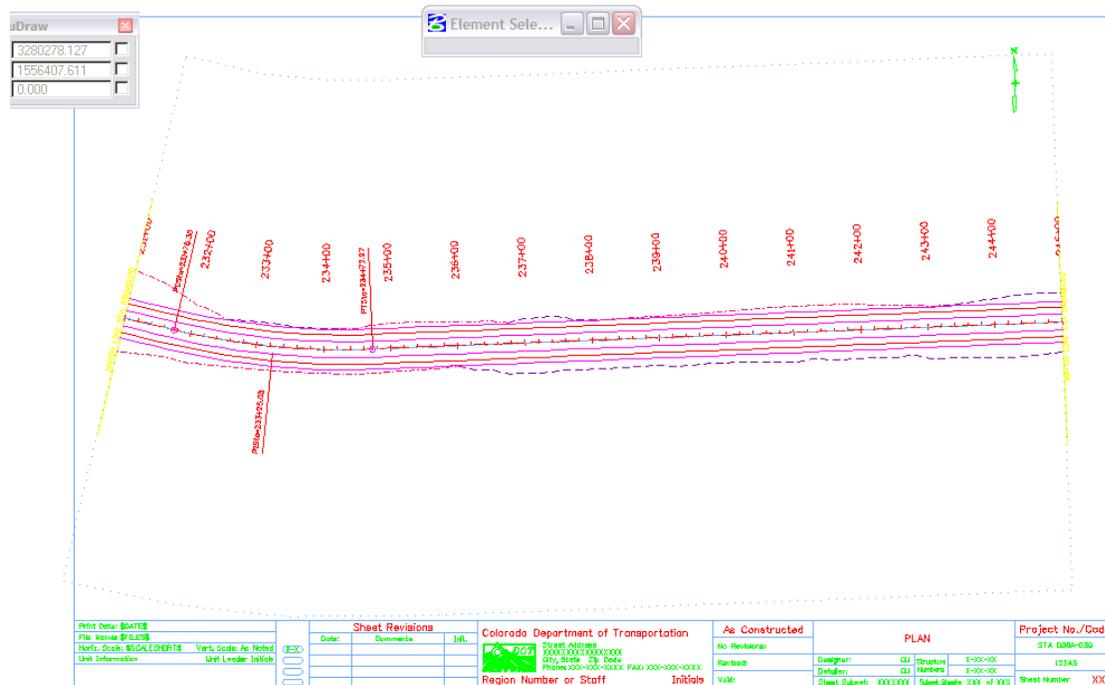
A distinct type of model file is the *working file*.

Working Files

Working files are model files that are being developed and/or revised and are not ready for use by other specialty groups or team members. These files usually have the owners' initials included in the filename as a way to distinguish the file from the ready-to-use model file. The differences between a model file and a working file is the completeness of the file and its availability to others.

Sheet Files

Sheet files are MicroStation DGN files that contain the data required for printing. They are created by referencing in various model files that either represent directly or add clarification to the features that will be constructed from the printed sheet and include a border file. In addition to containing reference files, typical data that would be included in a sheet would be informational text, such as callouts and dimensions, a directional arrow if appropriate, and other non-engineering information such as logos or stamps.



The graphics in a sheet file represent only a portion of the entire design and are usually included within a standard border. The image above is a portion of the graphic representing the design file shown on the previous page.

File Management

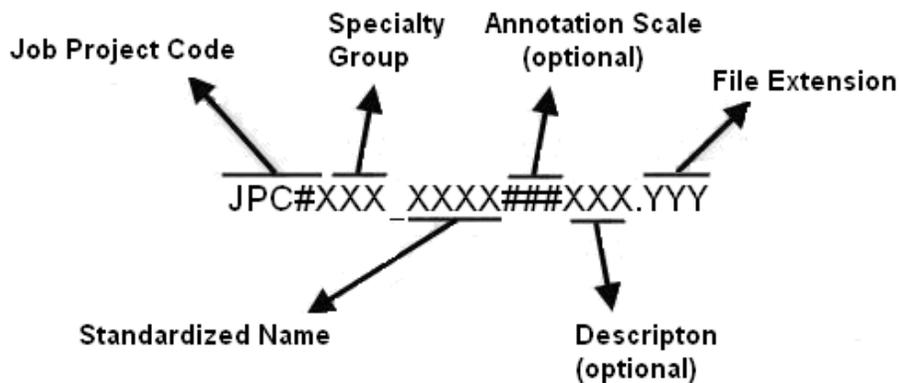
Each of these files is owned by the Project Manager of the specialty group whose data is contained in the file and updated by the assigned team member. A team member from one specialty group should not update the file(s) of a team member from another specialty group.

File Naming Conventions

The CDOT naming standard uses a formula that restricts the character placement, ensures unique file names, and identifies the information contained in the file.

All CDOT projects must follow these file naming conventions. Standardizing file names is necessary for effective management of the large numbers of files needed to produce a set of design plans.

CDOT files are named in a standard format that identifies the file's project, the data contained within it, and the product used for its creation. The naming convention is illustrated as follows:



- ◆ **Job Project Code (JPC)** is the CDOT project code, formerly known as the project subaccount number.
- ◆ **Specialty Group** is the standardized abbreviation for the specialty group that the owner of the file is with.
- ◆ **Standardized Name** denotes the type of data that is contained in the file.
- ◆ **Annotation Scale** including the annotation scale in the file name is optional. However, it should be included in file names for projects that use multiple annotation scales.
- ◆ **Description** A brief description can be used to further identify a model file. For sheet files, this field is used as a counter to differentiate between multiple files of a specific type.
- ◆ **File Extensions** define the product used for its creation. Examples would be DGN for MicroStation, DTM for an InRoads surface, etc.

An example file name for a MicroStation design file would look like the following,
12345DES_Model100US285.dgn

12345 indicating the CDOT Project Number, DES indicates it is Roadway Design's model file and 100 indicating it uses a 1"=100' annotation scale, US285 is a description identifying the highway this model depicts. DGN is the default extension for MicroStation design files.

Note: A seventh segment is used on Working Files. This segment should be the initials of the designer or engineer who is working on the file.

Example: CU12345DES_Model100.dgn where CU, are the initials of the designer or engineer (in this example, CU stands for "CDOT User").

Storing Model Files and Sheet Files

Model File Location

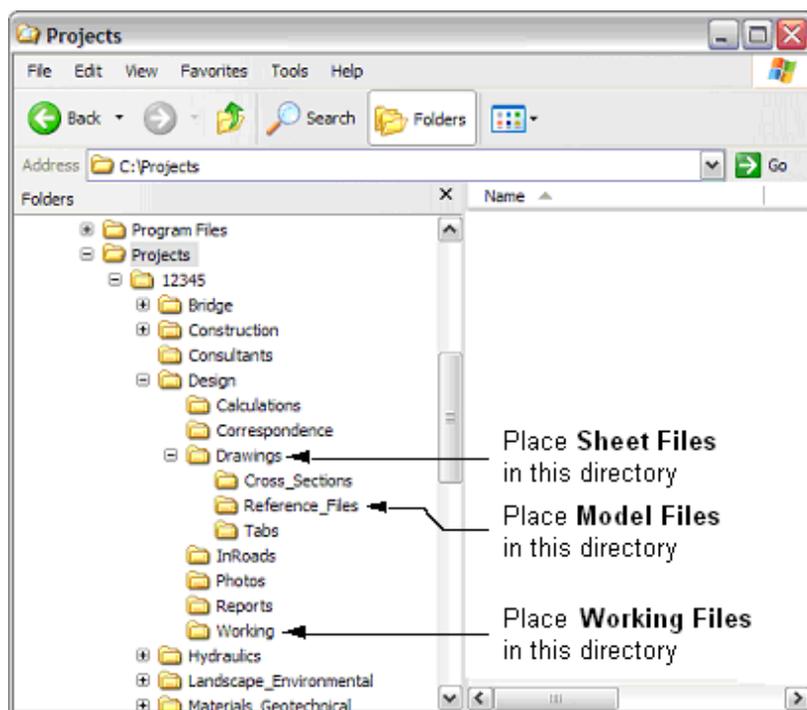
Model files should be stored in the `JPC#\SpecialtyGroup\Drawings\Reference_Files` folder. The exception to this is for cross-sections (design or construction) which have their own sub-directory under `\Drawings` sub-directory. Cross sections are separated from the rest of the model files at the request of the Reproduction department to simplify the process of assembling plan sets.

Working File Location

Working files should be stored in the `\JPC#\Specialty Group\Working` folder.

Sheet File Location

Sheet files should be stored in the `\JPC#\Specialty Group\Drawings` folder.



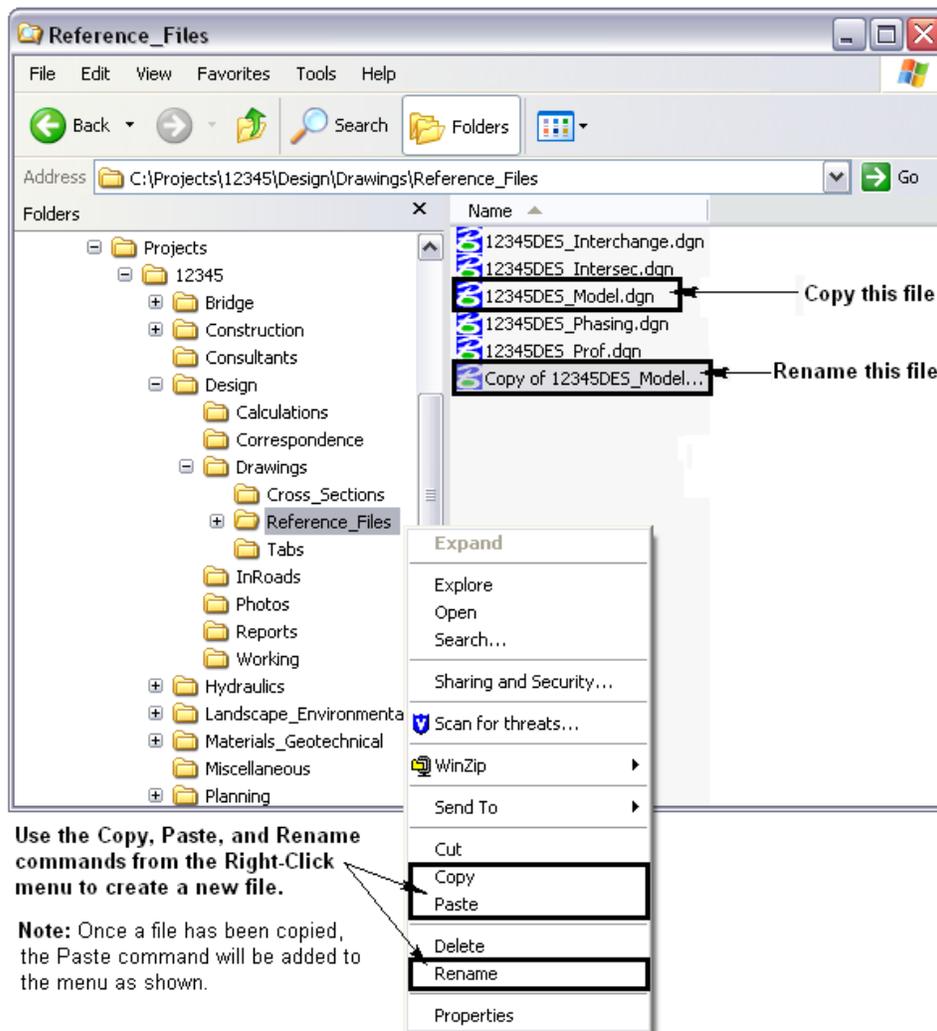
Creating a Model and Sheet Files

During the setup of a project, several model and sheet files are auto-populated into the `\JPC#\SpecialtyGroup\Drawings\Reference_Files` and `\JPC#\Specialty Group\Drawings` directories of each of the specialty group folders and have the CDOT standard file names already assigned. (Construction and Planning are exceptions and do not have any auto-populated files.) These auto-populated files can be modified to include project specific information before being used to create new drawings. In addition to the auto-populated files, standard 2D and 3D seed files are available from the `C:\Program Files\Workspace-CDOT\Standards-Global\MicroStation\Seed` directory. These files are global standards and are write protected so that no changes can be made.

Several of methods can be used to begin a new drawing; 1) Use the Windows Explorer to copy, paste, and rename a file, or 2) use the MicroStation Manager window to create a new file using a seed file or to open a drawing and then use the “save-as” command to create the new file. If a new file with project specific data is required, use the Windows Explorer method. Otherwise, the MicroStation Manager method should be used.

Using Windows Explorer

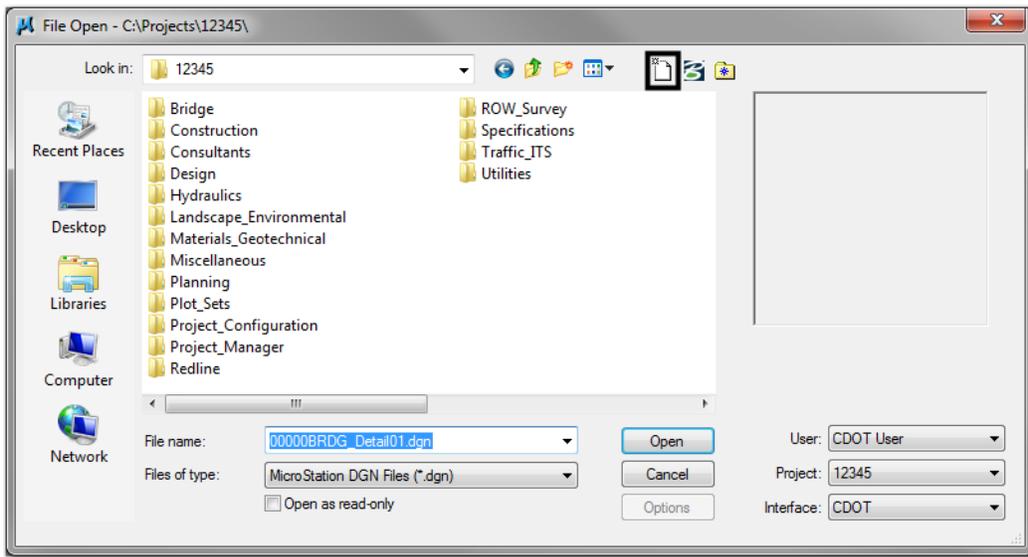
1. Open the Windows Explorer window and navigate to the desired `\Projects\JPC#\Specialty Group\` folder. **<R>** on the desired file and select **Copy** from the menu.



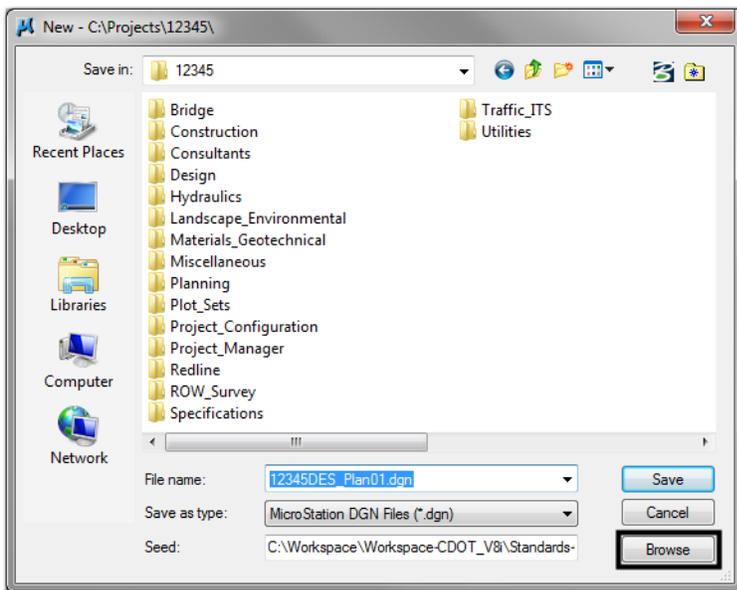
2. In the blank area below the file list, right click and select **Paste** from the menu.
3. A copy of the selected file is placed in the folder. Rename the new file according to the file naming conventions. To rename the file **<R>** on the file name and select
4. **Rename** from the menu. Type in the new name and press the **Enter** key to finish.

Using a Seed File

1. Open MicroStation from the Start menu (or desktop icon if available). From the **File Open** dialog box select the **New** file icon. If MicroStation is already open, select **File > New** from the menu. Both operations will display the **New** window.



2. From the **New** window, click on the **Browse** button to display the **Select Seed File** window.



3. From the **Select Seed File** window, highlight the desired seed file.

Note: All disciplines use the *2D-Seed_CDOT.dgn* and the *3D-Seed_CDOT.dgn*. The *Bridge-2D-Seed_CDOT.dgn* and *Bridge-3D-Seed_CDOT.dgn* have specific settings for Bridge.

4. Click the **Open** button to accept the selection. This will dismiss the **Select Seed File** window.

5. In the **New** window, type the desired file name (refer to the naming conventions above). Click the **Save** button to accept the file name. MicroStation will open with the newly created file.

Annotation and Line Style Scale

While the elements themselves are drawn at a 1' = 1' scale, a scale factor is set for line styles and text so that its size will be appropriate when printed.

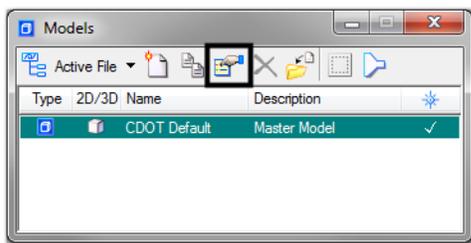
Setting the Annotation Scale

Annotation Scale controls text, dimension, and linestyle sizes. It is set in the model properties dialog box or in the drawing scale toolbox docked at the bottom of the application screen.

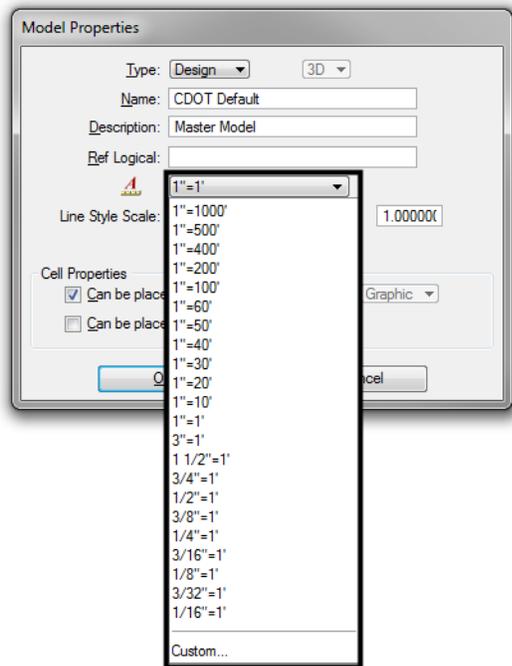
1. Select the **Models** icon from the **Primary Tools** toolbar.



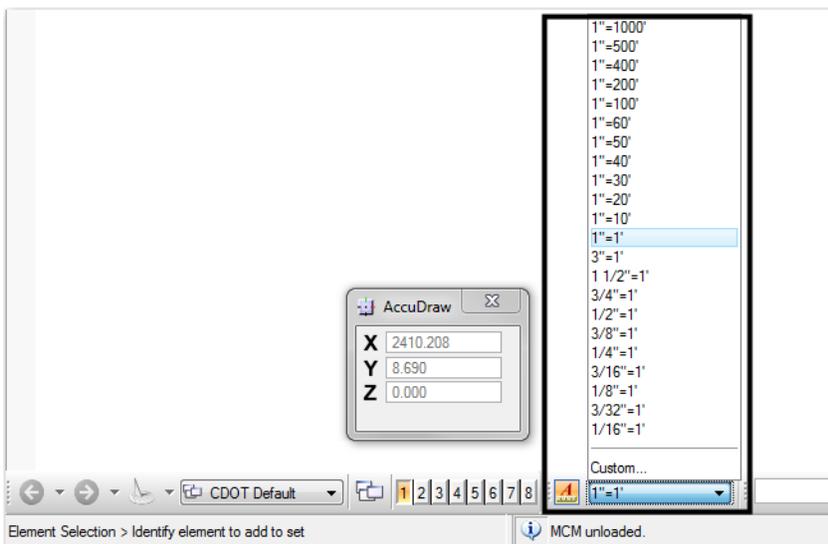
2. This displays the **Models** dialog box. From here, select the **Edit Model Properties** icon.



- In the **Model Properties** dialog box, select the desired **Annotation Scale**.



- <D> the **OK** icon to accept the selection. This will close the **Model Properties** dialog box. The **Models** dialog box can also be closed.
- Changing the Annotation Scale from the Drawing Scale toolbox is the faster way to make this change since it doesn't require any dialog boxes to be opened.

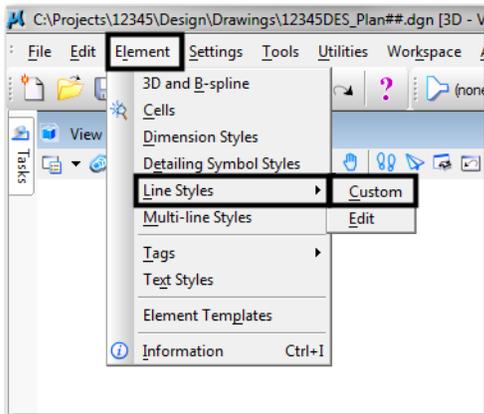


Line Style Scale Settings

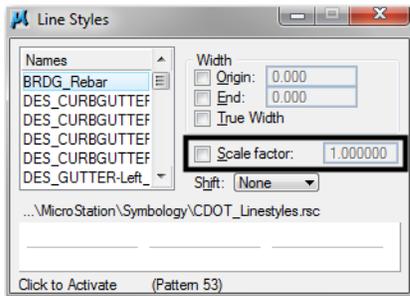
The Line Style Scale settings are set based on the type of data that is in the model or sheet file. Graphics that are generated in MicroStation will behave differently than data that is generated from InRoads. Applying the wrong setting will display the linestyle symbology incorrectly in the model and when referenced into other drawings.

MicroStation graphics are drawn at a scale of 1 and utilize the annotation scale setting to view the linework in the appropriate print scale. InRoads hard codes the line style scale to the graphics based on the **Project Options Factors**.

1. Open the **Line Styles** dialog box by selecting, **Element > Line Styles > Custom**.

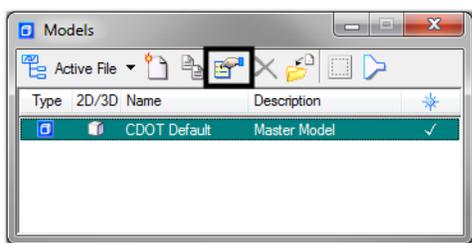


2. Verify the **Scale factor**: setting is toggled off.

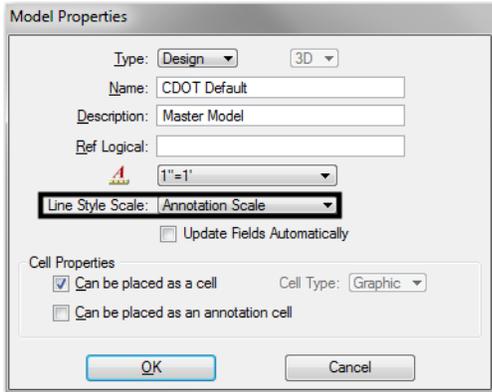


MicroStation graphics

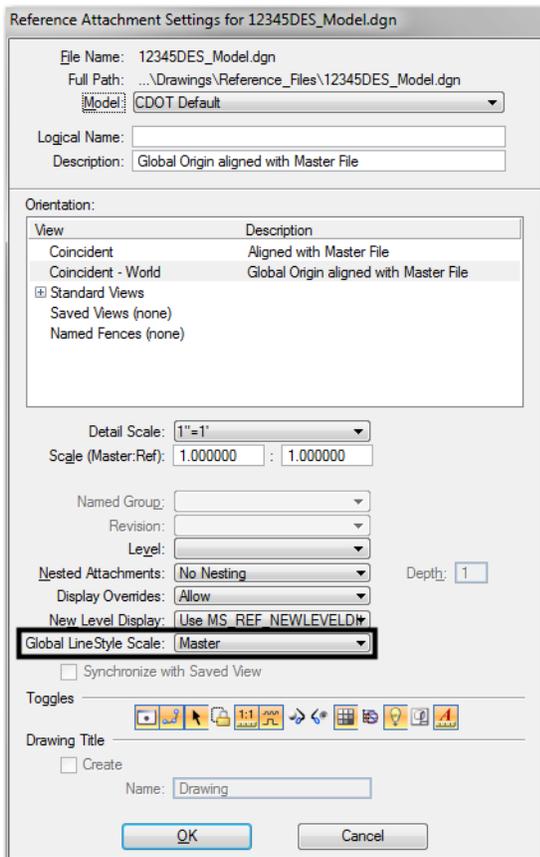
1. Open the **Model Properties**.



- Verify the **Line Style Scale** setting is set to **Annotation Scale**.



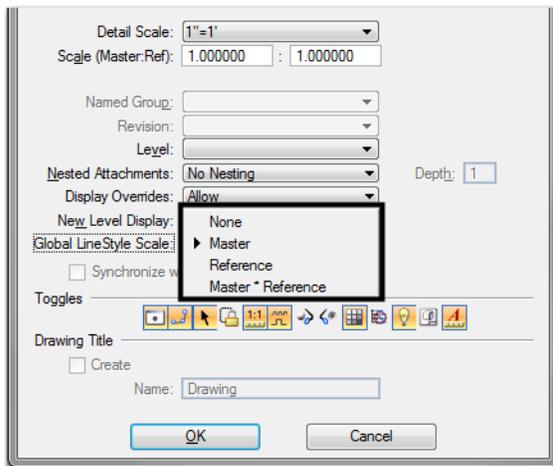
- Close the **Model Properties** dialog box by selecting the **OK** button.
- Changing the **Annotation Scale** will now modify the **Line Style** scales in the models
- When referencing models that contain MicroStation generated graphics, set the **Global LineStyle Scale:** to **Master**



Note: This will force the reference line styles to read the sheet file annotation scale and apply it to the reference line styles.

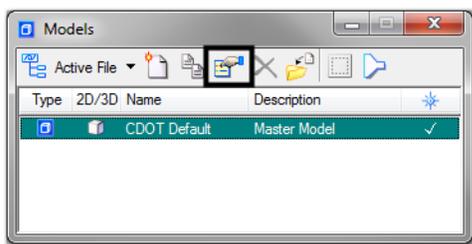
6. Settings for the Global LineStyle Scale are as follows:

- ◆ None - no scaling is applied, line styles will be viewed at a 1 to 1 scale
- ◆ Master - the reference line styles will be scaled to the annotation scale setting in the open file
- ◆ Reference - the reference line styles will be scaled to the annotation scale setting in the referenced file
- ◆ Master*Reference - the line styles will be scaled to both annotation scales together

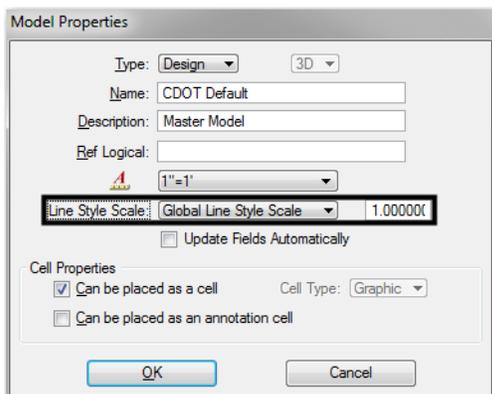


InRoads Graphics

1. Open the **Model Properties**.

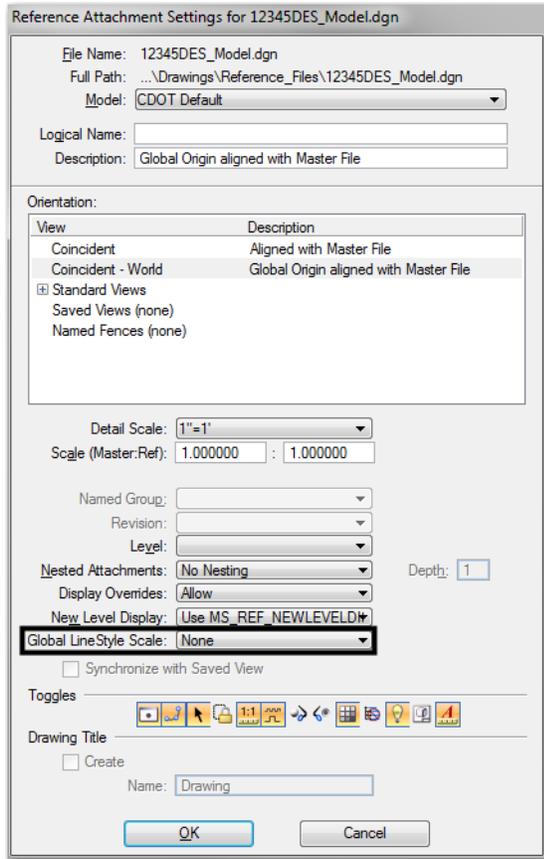


2. Verify the **Line Style Scale** setting is set to **Global Line Style Scale** and set to a value of 1.



3. Close the **Model Properties** dialog box by selecting the **OK** button.

4. If the print scale of the sheet file changes, the InRoads graphics will have to be re-displayed with the new print scale set in the **Factors** tab in InRoads. The annotation scale settings will not affect this file.
5. When referencing models that contain InRoads generated graphics, set the **Global LineStyle Scale:** to **None**



Using Model Files From Other Users As References

A reference is a model that is attached to and displayed within the active model or sheet file for design or printing purposes. Elements in a reference display as though they were in the active model. Although you cannot manipulate the elements in a reference, you can snap to them and even copy them into the active model.

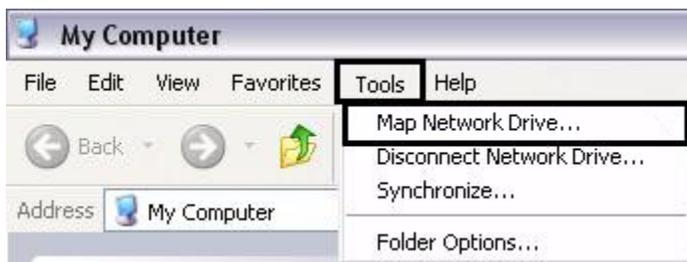
Model files created by other users can be used as references even if the file resides on a different computer. This is done by mapping the remote computer (the one containing the file to be referenced) to a drive letter on the local computer.

Mapping a Remote Computer

1. Open the **My Computer** window from the **Start** menu or desktop icon (if available).

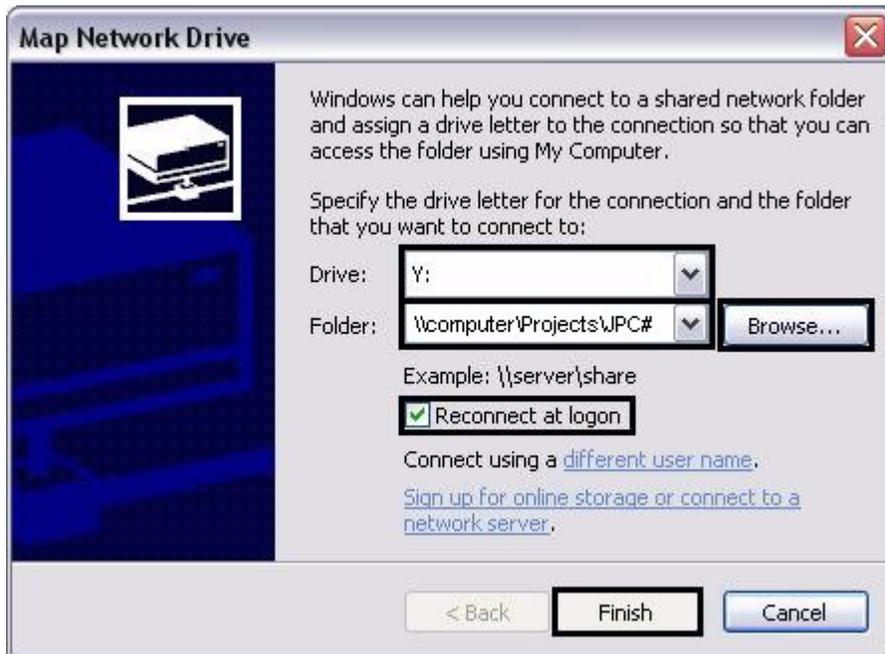


2. From the **My Computer** window, select **Tools > Map Network Drive**.



3. In the **Map Network Drive** dialog box, select the desired **Drive** letter.
4. In the **Folder** field, enter the desired computer name and directory. The **Browse** icon can also be used to locate and select this information. The following format is used when keying in the computer information:
\\computer_name\Projects\JPC#\.
5. If the information on the remote computer will be required over a period of many days, check on the **Reconnect at Login** option.

6. <D> the **Finish** icon to complete the process.



7. Files from the remote computer can now be referenced into local drawings. The procedures for referencing files are covered in the following workflows: [CDOT Sheet File Creation](#), [CDOT Sheet File Creation Multiple Scales](#).

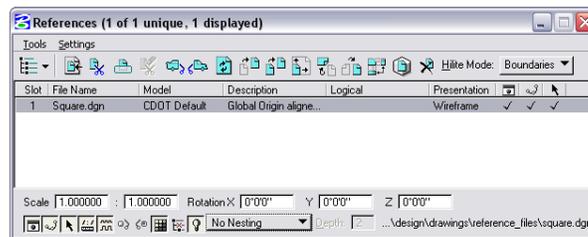
Nested Attachments

Reference attachment nesting determines what happens when a file containing attachments is attached to the active dgn file. The following examples are used to illustrate the different nesting options.

Four files are used in the examples. **Blank.dgn** is the active file. **Square.dgn**, **Triangle.dgn**, and **Circle.dgn** will be used as attachments. For the purposes of the examples, **Circle.dgn** has been previously attached to **Square.dgn** and **Triangle.dgn** has been previously attached to **Circle.dgn**.

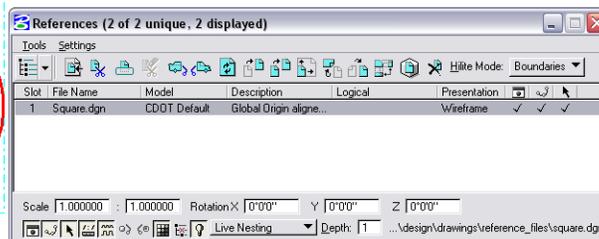
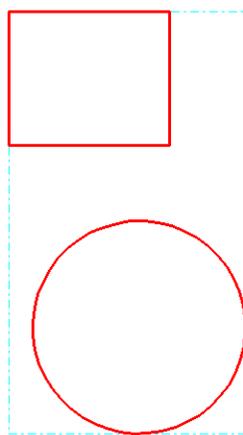
No Nesting

1. With this option, only the selected file will visible in the active file.

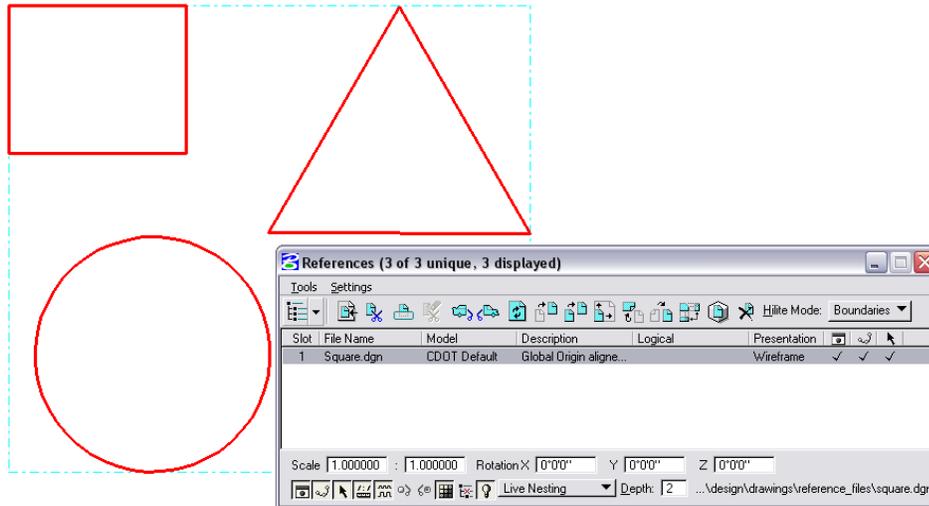


Live Nesting

1. This option allows files that are attached to the selected file to be viewed.



- The number of levels of attachments that can be viewed in this manner is controlled by the **Depth** setting. In the above illustration, **Circle.dgn** is attached directly to **Square.dgn** and is visible with a **Depth** setting of **1**. By changing the **Depth** setting to **2**, files attached to **Circle.dgn** (in this case **Triangle.dgn**) become visible.

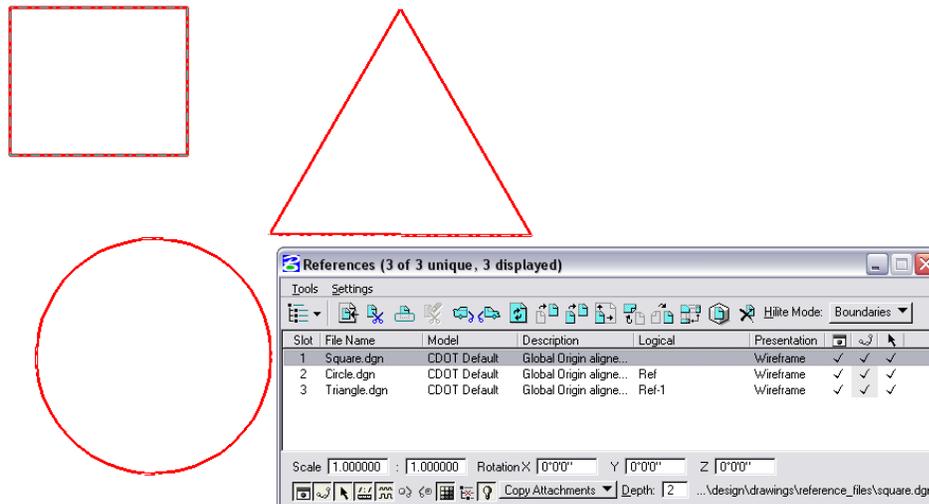


- With live nesting, any reference file settings changes affect all of the visible files. So, for example, if the **Display** is turned off for **Square.dgn**, **Circle.dgn** and **Triangle.dgn** are turned off also.

Note: Level display of nested attachments is discussed below.)

Copy Attachments

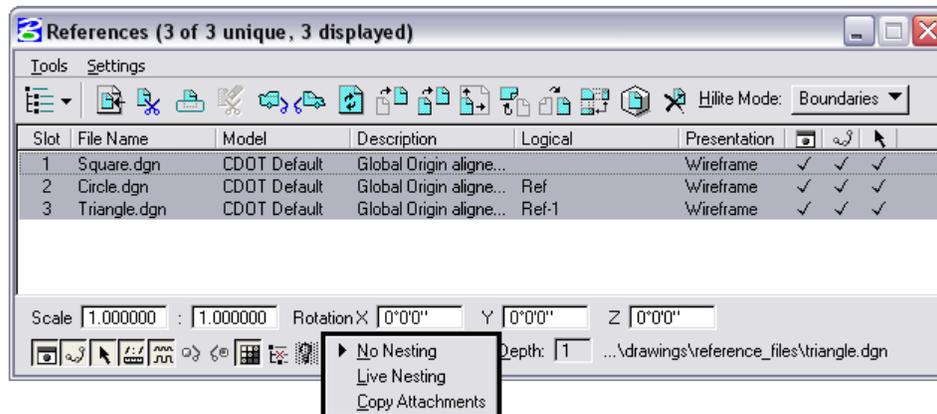
- This option also allows multiple levels of attachments to be viewed, however, it also allows independent control of each attachment. Compare the illustration below with those for **Live Nesting**. Here, each attached file is listed in the **References** dialog box and its settings can be adjusted independently.



Changing the Nesting Mode

The **Nesting Mode** for a single file or a group of attachments can be changed from the **References** dialog box. To change the nesting mode:

1. Highlight the desired files from the list.
2. Use the pull-down at the bottom of the dialog box to select the desired nesting mode.



Attachment Level Display

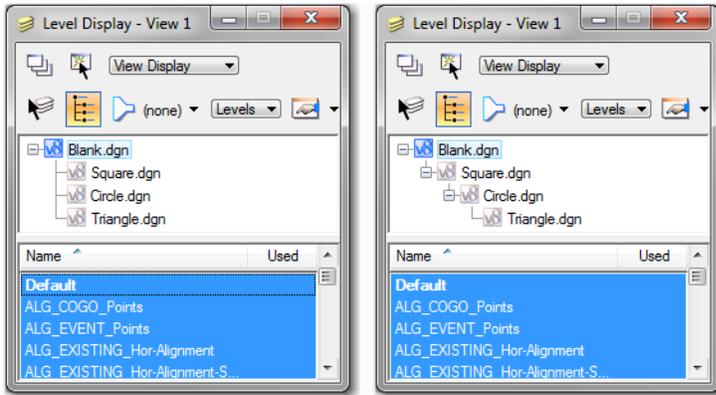
It is probable that elements in attachments will occupy levels that have the same name as levels in the active file or other attachments. This is possible because the level display operates independently on the active file and each attachment regardless of the nesting mode.

Turning Levels On and Off in Attachments

1. Select the **Level Display** icon from the MicroStation **Primary Tools** tool bar.

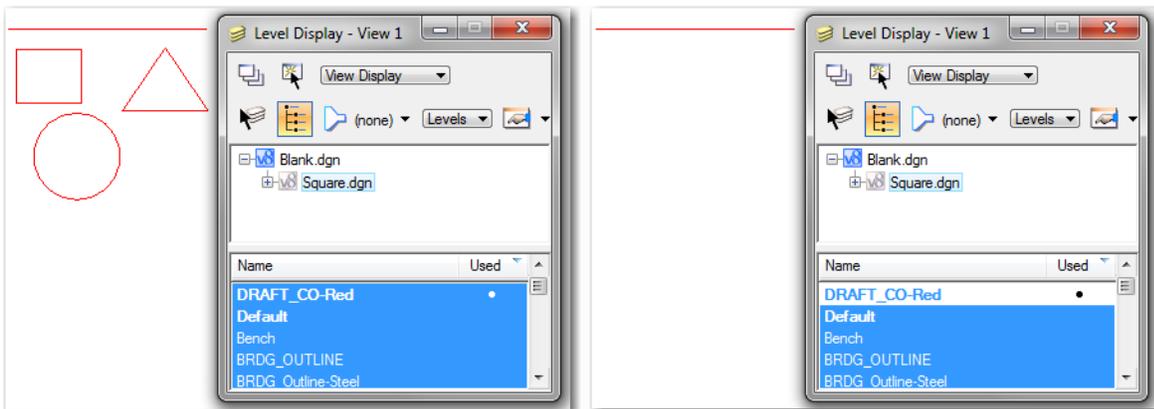


- Select the file whose levels will be turned on or off. The file display within the Level Display dialog box will be different depending on the nesting mode.

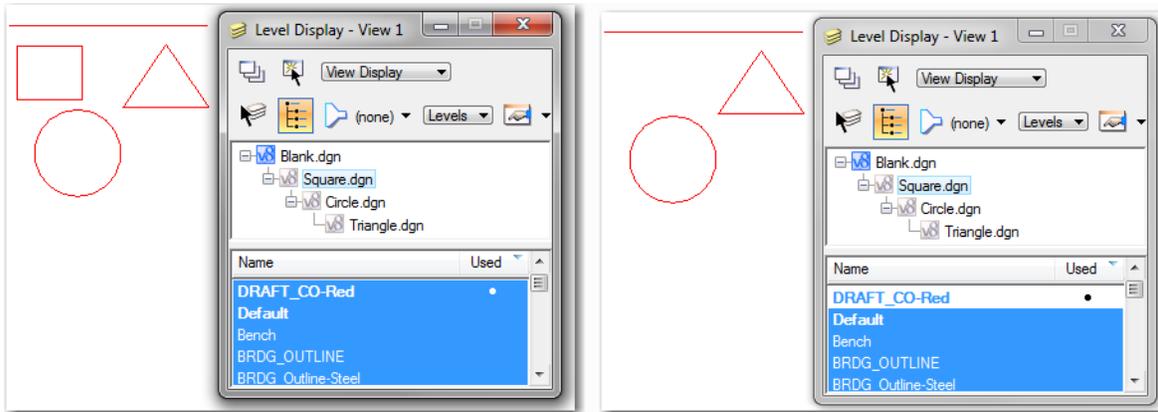


Note: On the left the files were attached separately or with the **Copy Attachment** nesting mode. On the right, the files were attached using live nesting.

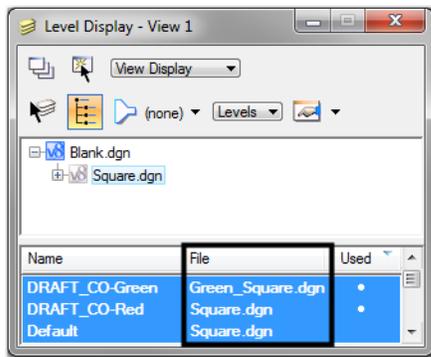
- Click on the desired level to change its view status. When using live nesting, if the file tree is not expanded, level display changes to a particular file will affect all the files collapsed underneath it.
- Continuing the examples above, the attachments were made using **Live Nesting** with a Depth of **2**. All of the elements shown were drawn on the DRAFT_CO-Red level (the line is in the active file, **Blank.dgn**). In the illustration below, the DRAFT_CO-Red level is turned off in **Square.dgn** with the file tree collapsed. This causes the elements in the files collapsed under **Square.dgn** to be turned off also.



- In this illustration, the file tree has been expanded so that when the DRAFT_CO-Red level in *Square.dgn* is turned off the other files are unaffected and only the square disappears.

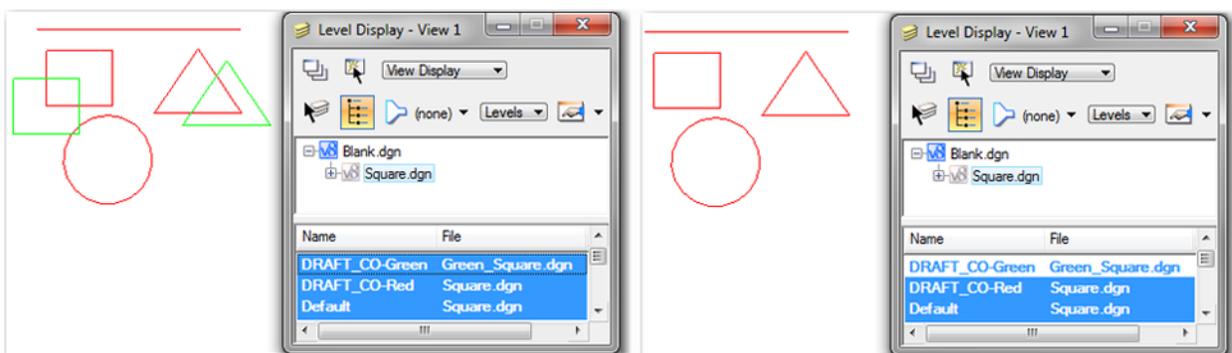


- Levels that are used in nested attachments which are not used in the main attachment will be displayed in the **Level Display** dialog box. The name of the first attachment containing the level is displayed.



Note: With the tree view collapsed, turning on or off a level in a collapsed file will affect all collapsed files using that level.

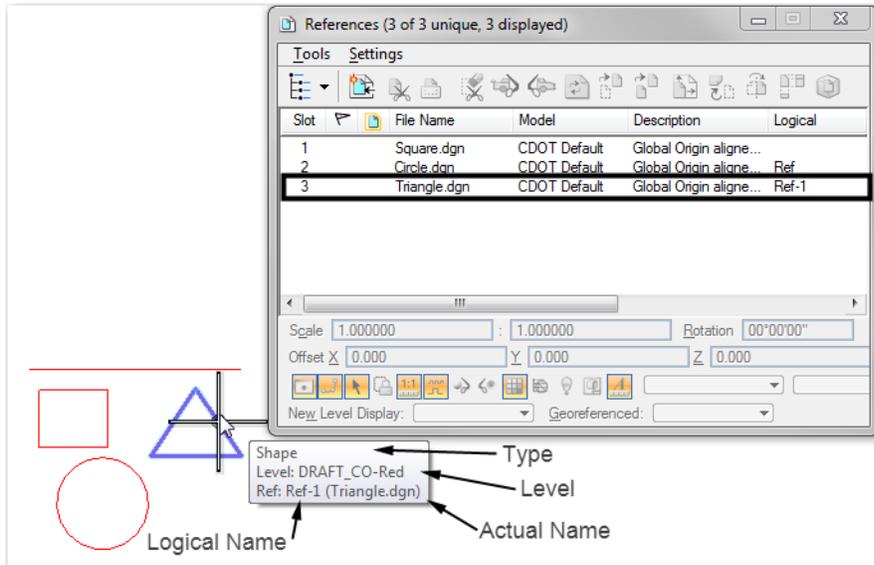
- Two more files have been added to the example, *Green_Triangle.dgn* and *Green_Square.dgn*. Each of the new files use the DRAFT_CO-Green level. These are attached to *Square.dgn* and are displayed by **Live Nesting**. With the file tree collapsed, turning off the DRAFT_CO-Green level turns off the display in both files.



- With the file tree expanded, the levels for the individual files can be manipulated without affecting the same named levels in other attachments.

Determining an Element's File

- Just by looking, there is no way to determine which file an element belongs to. However, a <T> snap on the element will display a tool tip listing the element's **Type**, **Level**, the **Logical Name** of the attachment, and its actual file name.

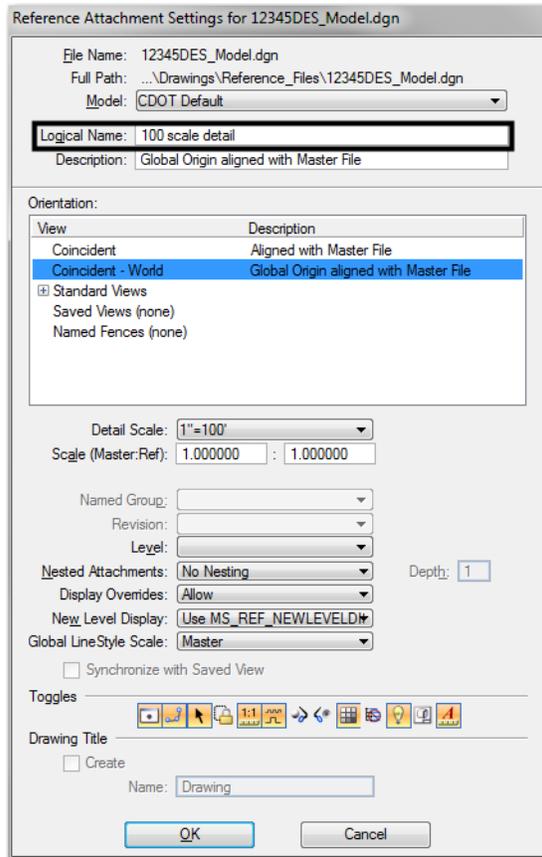


Logical Names and Slot Numbers for Reference Attachments

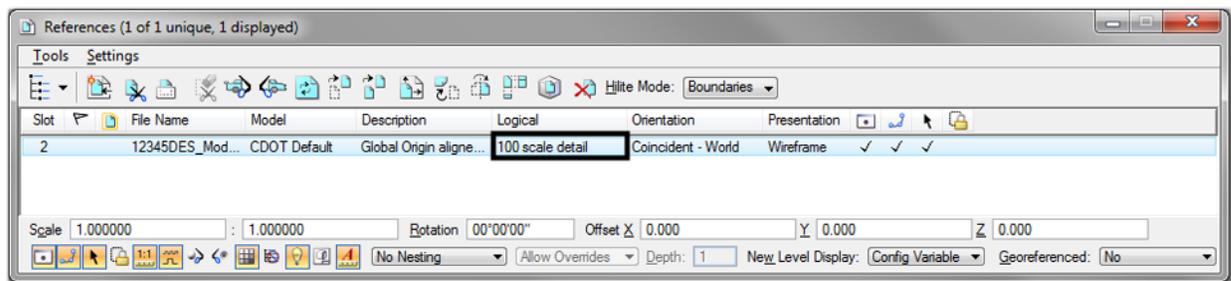
Logical Names

- In MicroStation, a file can be used as an attachment within a single file numerous times. **Logical Names** are used to distinguish one version of the attachment from another. A logical name can be given to any attachment, but must be given to the second and subsequent attachments of a file.

- To give a logical name to an attachment, begin the attachment procedure as normal. When the **Reference Attachment Settings** dialog box displays, **key in** the desired logical name in the field provided. Finish the attachment process as normal.



- The logical name is displayed in the **References** dialog box as illustrated below:



Slot Numbers

- Slot numbers are assigned to attachments to provide another method of grouping the files. They are used to assign the processing order when making shaded color or grayscale prints. For more information on using slot numbers in this process, see the workflow [CDOT Shaded Color And Grayscale Printing](#).

