Workflow MS-24 – Assigning a Project Geographic Coordinate System (GCS)

The following workflow has been created to guide users on how to assign the project GCS created by the Survey group to a MicroStation design file. This workflow will include the steps for reprojection of design files, GIS data, and images that use different coordinate systems. Additional steps in the workflow cover how to reference MicroStation, Image, and Shape files with GCS assignments.

CDOT Survey Project Files

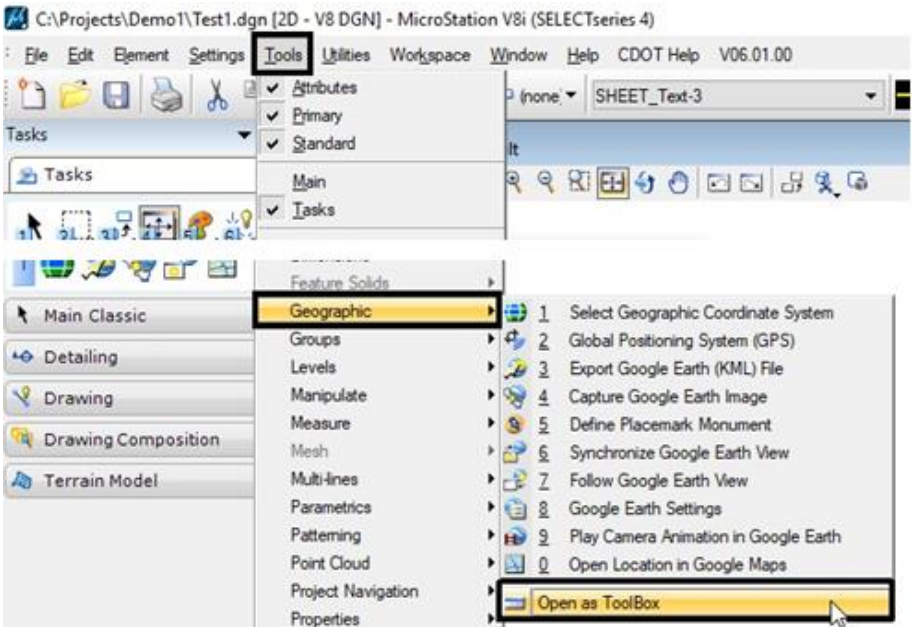
Survey model DGN files have a project specific, local datum plane project geographic coordinate system (project GCS) that is created for that project, by the survey group. Other (design) specialty groups can use this Survey model DGN file to assign the project GCS to their design DGN files.

Accessing The Geographic Toolset

There are two different ways to access the Geographic Coordinate System dialog box commands.

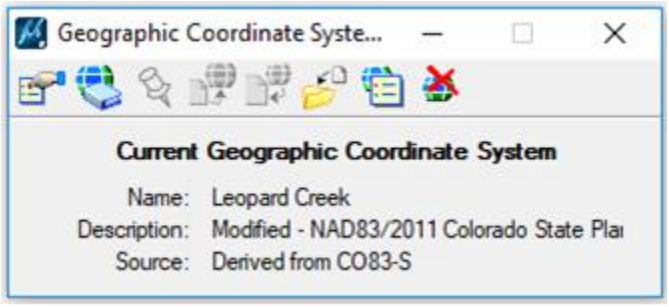
Method 1

1. Select **Tools > Geographic** from the menu bar.
2. Select **Geographic** from the drop-down menu.
3. Select **Open as Toolbox**. This opens the ***Geographic*** toolbox,



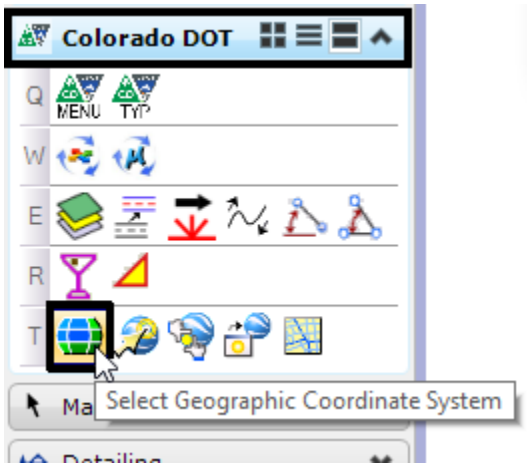
4. In the ***Geographic*** toolbox, click the **Select Geographic Coordinate System** icon from the toolbox.

This displays the ***Geographic Coordinate System*** dialog box.

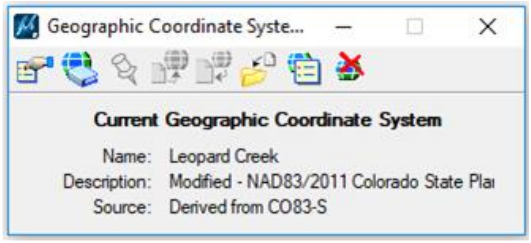


Method 2

5. Expand the **Colorado DOT** task menu.
6. Click the **Select Geographic Coordinate System** button.



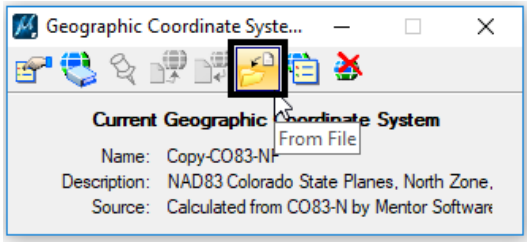
This opens the ***Geographic Coordinate System*** dialog box.



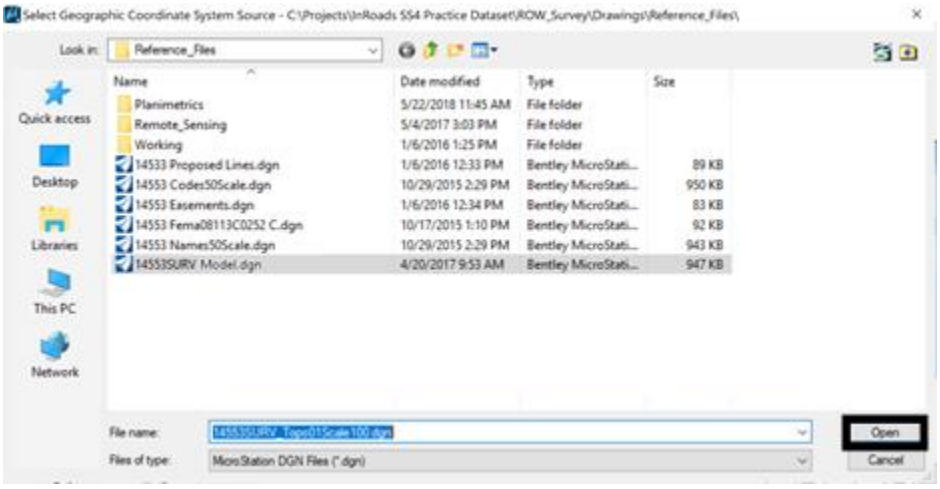
Assigning a Project GCS to Your Design DGN File

The following steps are used to assign the project GCS from the Survey DGN file to a Design DGN file that does not have a GCS assigned.

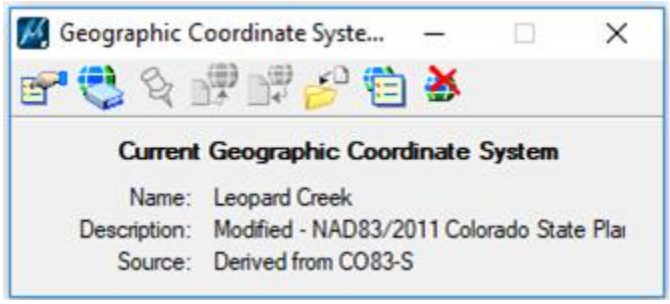
1. In the ***Geographic Coordinate System*** dialog box, Click the **From File** icon (the sixth icon from the left) to open the ***Select Geographic Coordinate System Source*** dialog box.



2. In the ***Select Geographic Coordinate System Source*** dialog box, navigate to the project's **ROW_Survey/Drawings/Reference_Files** folder.
3. Select the **#####SURV_Model.dgn** file (##### representing the project code).
4. Click **Open** to assign the GCS from this drawing.



The GCS has been copied from the survey file to your design file.

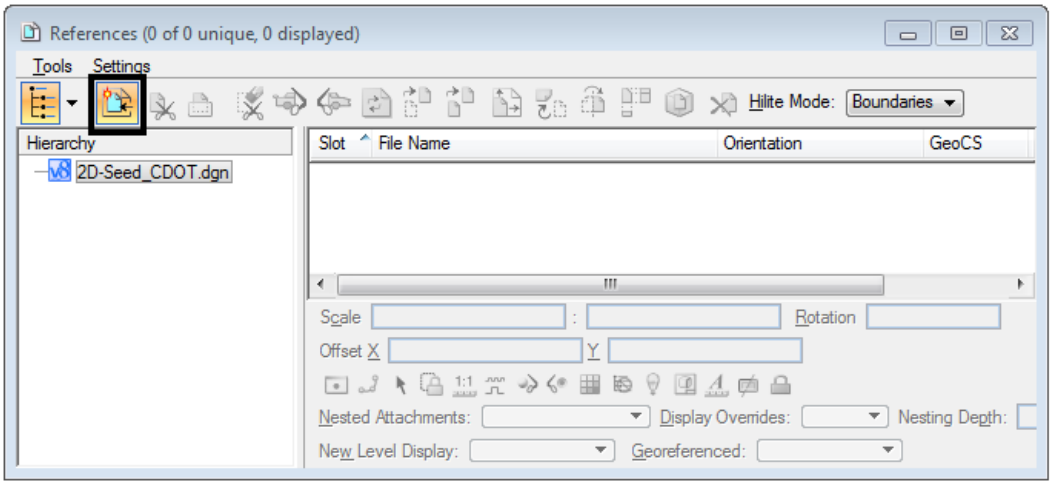


5. **Close** the Geographic dialog boxes and tool boxes. This completes the process of attaching a project GCS.

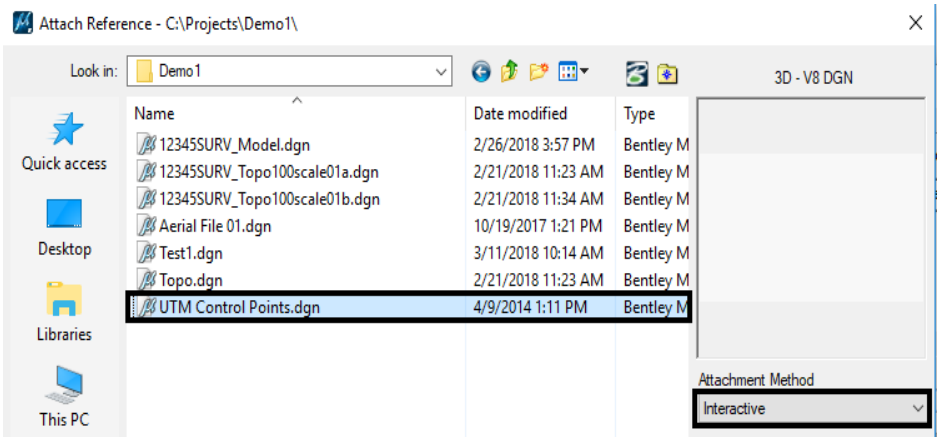
Referencing Non-Project GCS MicroStation Files

Once the project GCS has been assigned to the design file, other files with different coordinate systems can be referenced and reprojected.

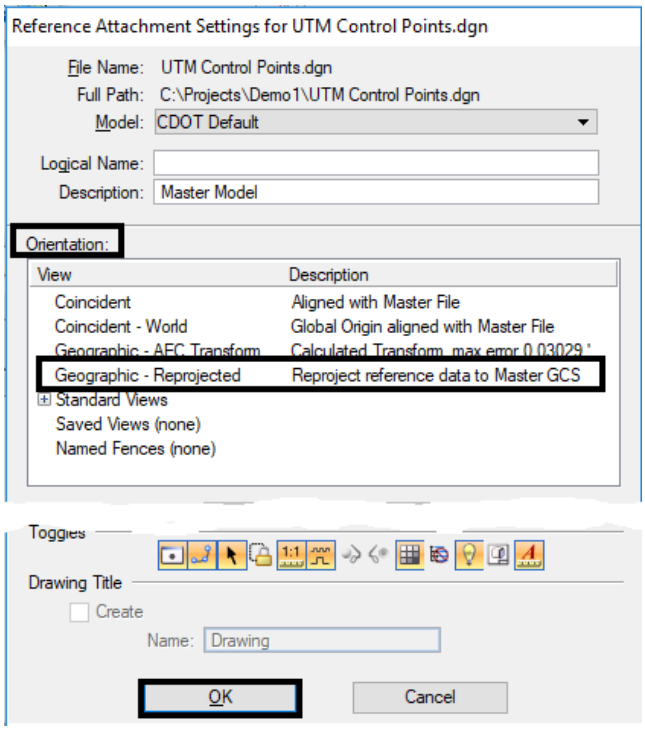
1. Begin by selecting the **Attach Reference** icon in the ***Reference Manager***.



2. In the ***Attach Reference*** dialog box, navigate to the design file's location.
3. Select the file to be referenced.
4. Change the ***Attachment method*** to **Interactive**.



5. Click **Open**. This will open the ***Reference Attachment Settings*** dialog box.
6. In the ***Orientation*** section, select **Geographic – Reprojection**.
7. Set the ***Global Line Style Scale*** (typically, **Master** is used) and ***Nested Attachments*** settings. This depends on how many files attached to the one being referenced need to be seen. To view one level of files attached to the file being referenced, for example, set ***Nested Attachments*** to **Live Nesting** and ***Nesting Depth*** to **1**.
8. Click the **OK** button to attach the file.



The attached reference file has been reprojected so that data in the referenced file is in the correct location in relation to the active file.

Referencing GIS Shapefiles

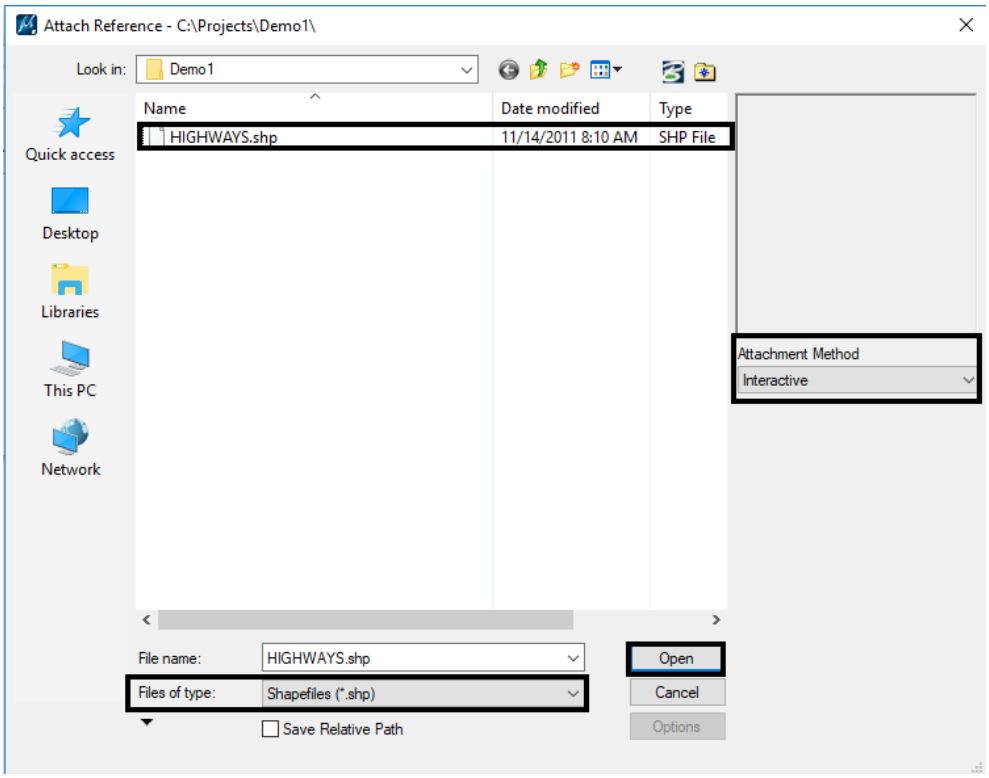
MicroStation allows you to reference Shapefiles with a GCS. When referencing a shapefile three files with the following extensions are required:

- **SHP** – this shape file defines the data geometry such as points, lines, and polygons
- **SHX** – this is a shape index file which contains positional data
- **DBF** – this is the attribute format which contains attributes for each shape in dBase III format

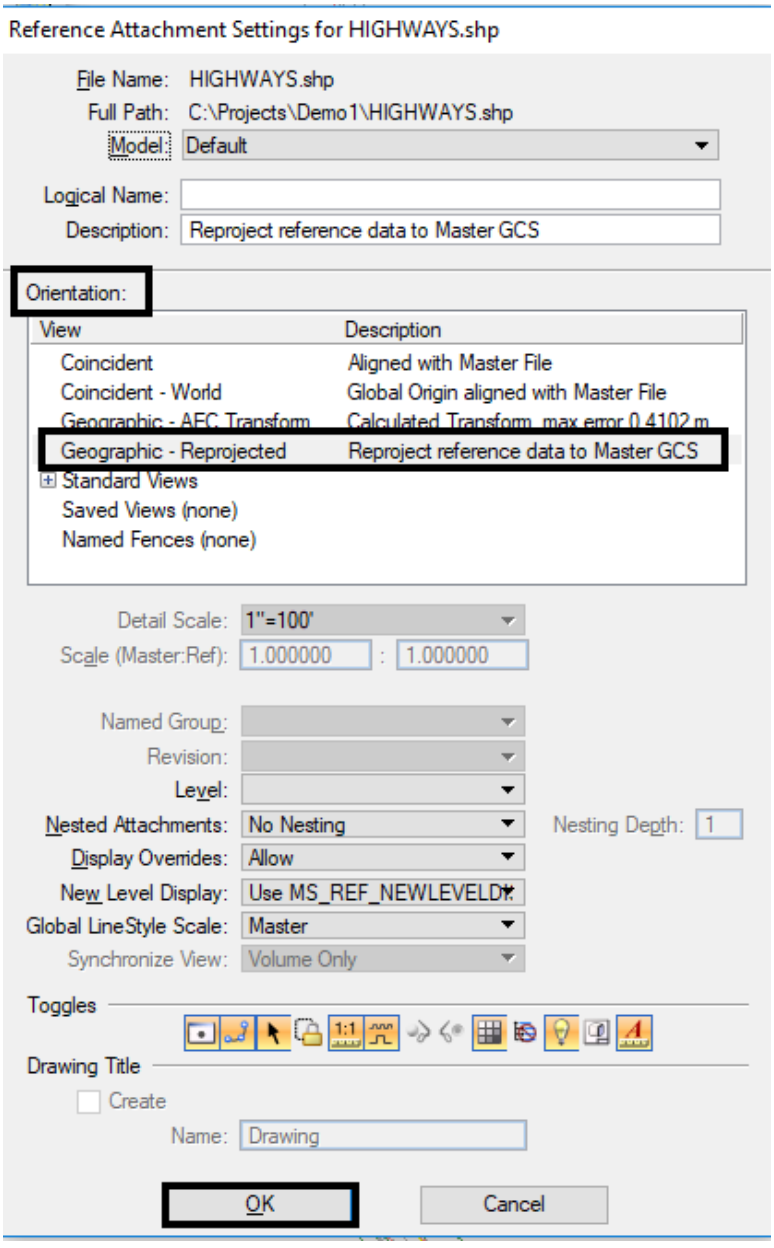
These three files must all be located in the same folder and have the same name.

Shape (SHP) files with a defined GCS can be referenced into the design file by using the same steps to reference a dgn file. The only difference is the setting for the extension.

1. When referencing a GIS shapefile, select the extension **Shapefiles (*.shp)** in the ***Files of type*** drop down menu.

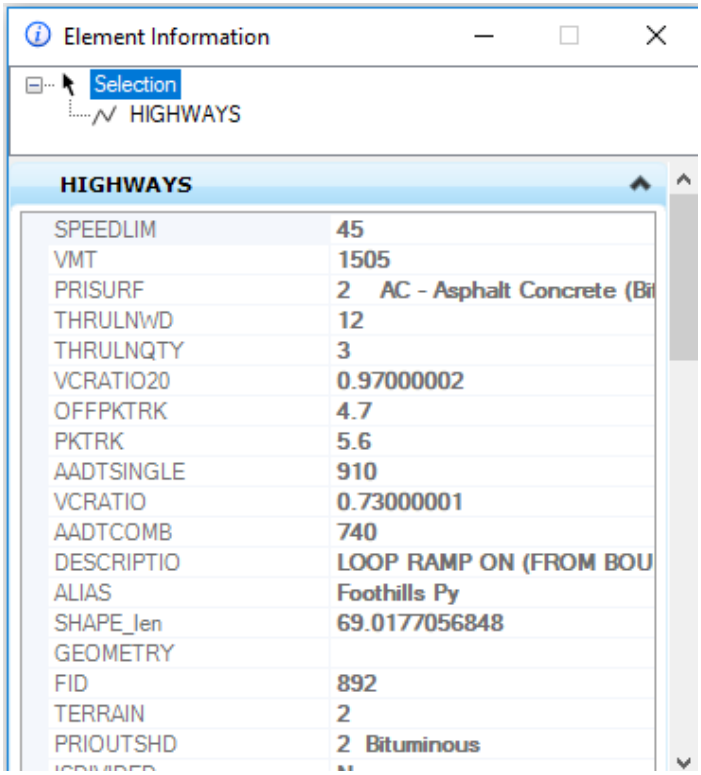


2. Select the shape file.
3. Set the ***Attachment Method*** to **Interactive**.
4. Click **Open**. This will open the ***Reference Attachment Settings*** dialog box.
5. In the ***Orientation*** section, select **Geographic – Reprojection**.
6. Set your nesting and global line style scale settings as you normally would.
7. Click the **OK** button to attach the file.



The attached reference file has been reprojected so that data in the referenced file is in the correct location in relation to the active file.

8. Once the shapefile has been referenced, you can use the ***Element Information*** tool to see the attribute information.

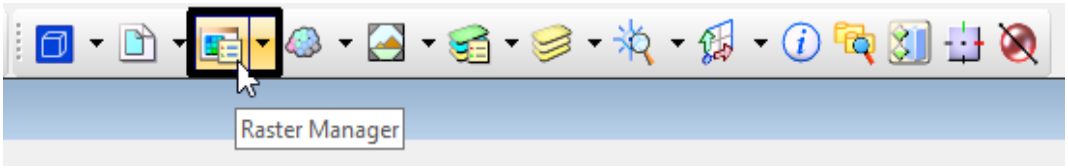


Referencing Image Files

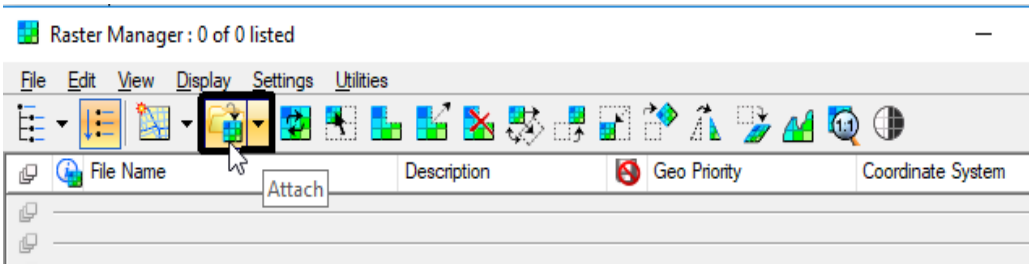
The key to having design files and imagery properly line up with one another is in the GCS assignments. When referencing imagery, it is important to know the GCS of the image file. Without knowing the GCS, there is no guarantee the design files and imagery will line up with the project data.

CDOT has two different sets of imagery covering the state of Colorado. Each set uses a different coordinate system. The greater Denver area is in NAD83 Colorado State Plane coordinates and the rest of Colorado is in UTM coordinates. Either system can be referenced into a design file and reprojected to the project coordinate system of a MicroStation design file.
Refer to the workflow CDOT Workflow MS 12 - Accessing Imagery Files to learn more on how to find images within the state of Colorado.

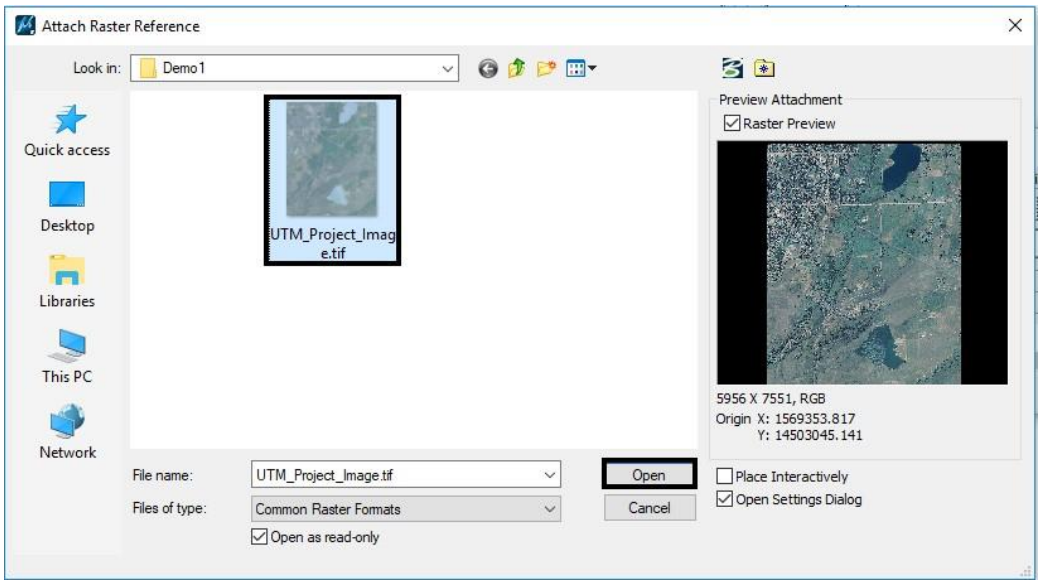
1. From MicroStation, open **Raster Manager**.



2. In the ***Raster Manager*** dialog box, select the **Attach Raster** icon or select **File>Attach>Raster**.



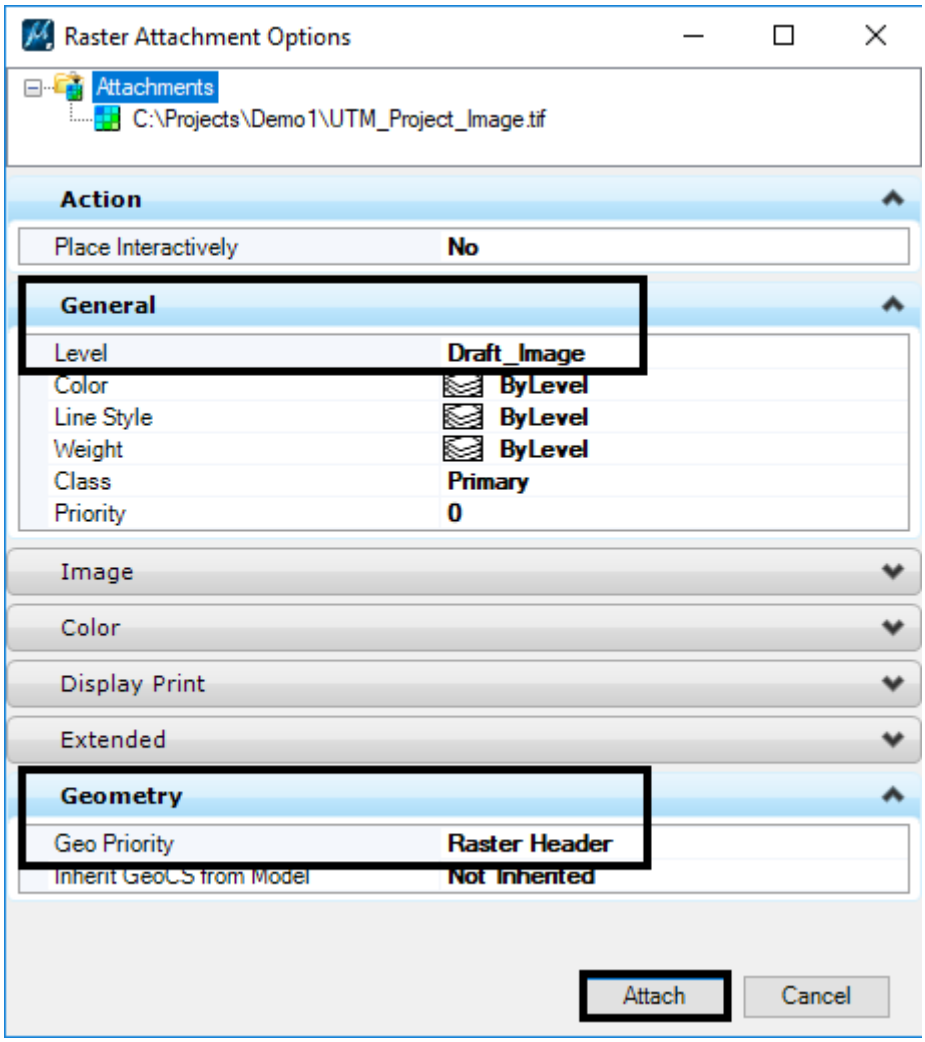
3. In the ***Attach Raster Reference File*** dialog box, navigate to the image file to be referenced.



4. Click **Open** to continue.

This displays the ***Raster Attachment Options*** dialog box. The following settings are made in the dialog box.

5. Under the ***General*** section, set **Draft_Image** for the level.
6. Under the ***Geometry*** section, set ***Geo Priority*** option to **Raster Header** for NAIP images or **Sister File** for DRAP images.



7. Click **Attach** to complete the process.