

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

*These instructions are intended to be used by the specialty groups to assign the project Geographic Coordinate System (GCS), created by Survey and assigned to the JPC##SURV\_Top01Scale###.dgn file, to MicroStation design files so that files with non-project specific GCS can be properly projected and aligned with project design data.*

## Introduction

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 file. Without knowing the GCS, there is no guarantee the design files and imagery will line up with the project data.

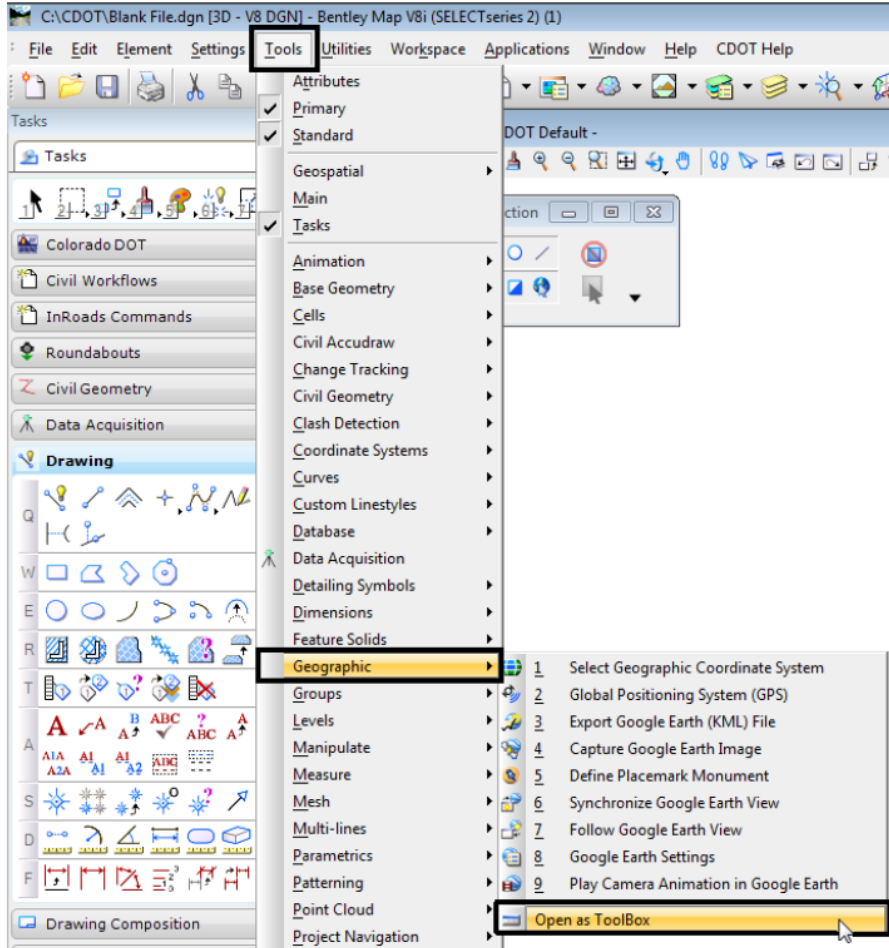
This workflow guides you through the steps required to assign a project Geographic Coordinate System to a project design file. This will facilitate the integration of images, GIS data, and design files that use different coordinate systems or no coordinate system.

CDOT Survey creates a project specific, local datum plane (project coordinate system). The project GCS is then assigned to Survey's MicroStation *JPC##SURV\_Top01Scale###.dgn* file. Once assigned, other specialty groups can reference this survey file to assign the project GCS to their own design files.

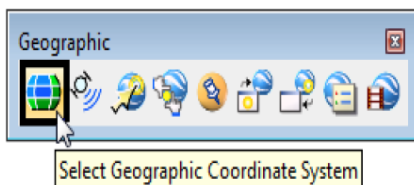
## Assigning the Project GCS To A Design DGN File from Survey's project DGN file

The Survey project specific Geographic Coordinate System can be assigned to design DGN files using the **From File** tool in the Geographic Tool Box.

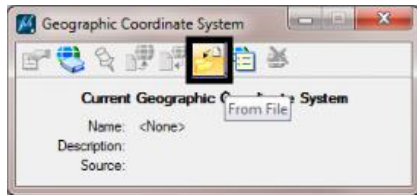
1. Select **Tools > Geographic> Open as Toolbox** from the menu bar.



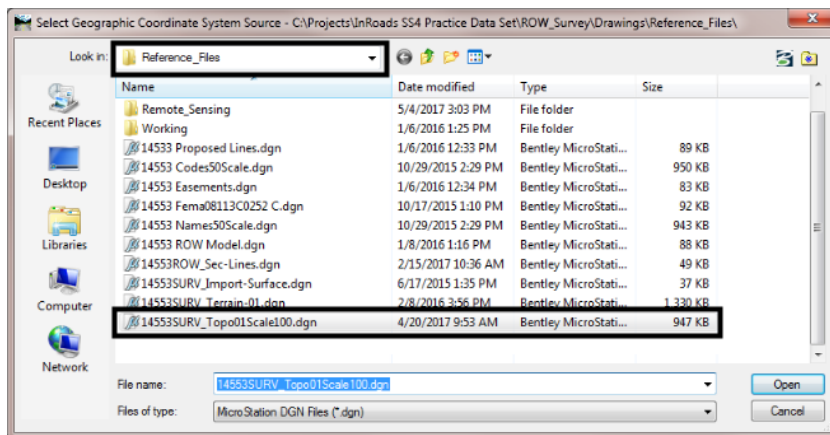
2. This will open the **Geographic** toolbox. Click the **Select Geographic Coordinate System** icon from the toolbox.



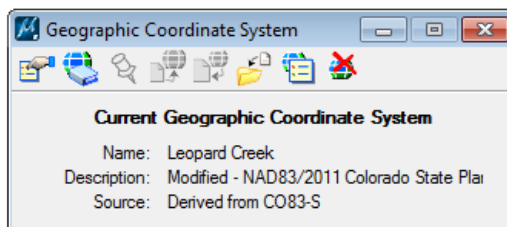
3. This opens the **Geographic Coordinate System** dialog box. Click the **From File** icon (the sixth icon from the left) to open the **Select Geographic Coordinate System Source** dialog box.



4. In the **Select Geographic Coordinate System Source** dialog box, navigate to the projects **ROW\_Survey/Drawings/Reference\_Files** folder.
5. Select the **#####SURV\_Topo01Scale100.dgn** file (##### representing the project code). In this example the 14553SURV\_Topo01Scale100.dgn is used.



6. Click **Open** to assign the GCS from this drawing.  
The GCS is now assigned to the drawing.

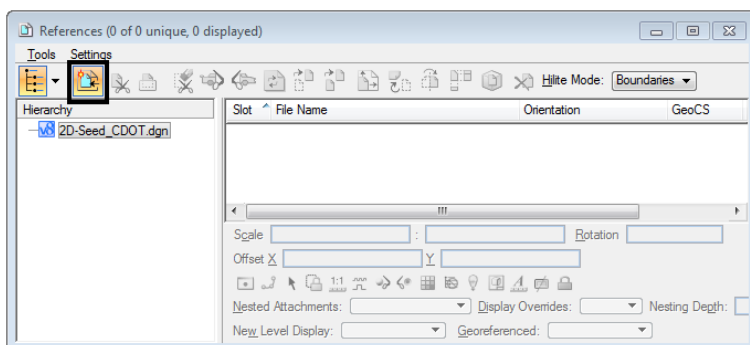


**Note:** Repeat this process on all design files prior to working in the file. This will ensure that all data files are coordinately correct.

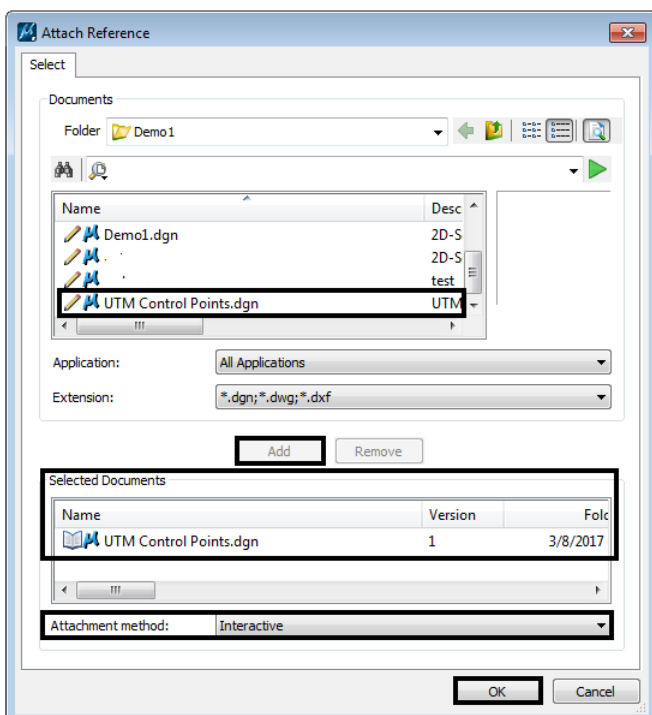
## Adding Reference Files To An Assigned Project GCS DGN File

Once the project GCS has been assigned to the design file, other files with non-project specific coordinate systems can be referenced. Using the same steps to reference a dgn file, with a non-project specific GCS file can be correctly oriented to the active project specific GCS DGN file.

1. Begin by selecting the **Attach Reference** icon in the **References** dialog box.

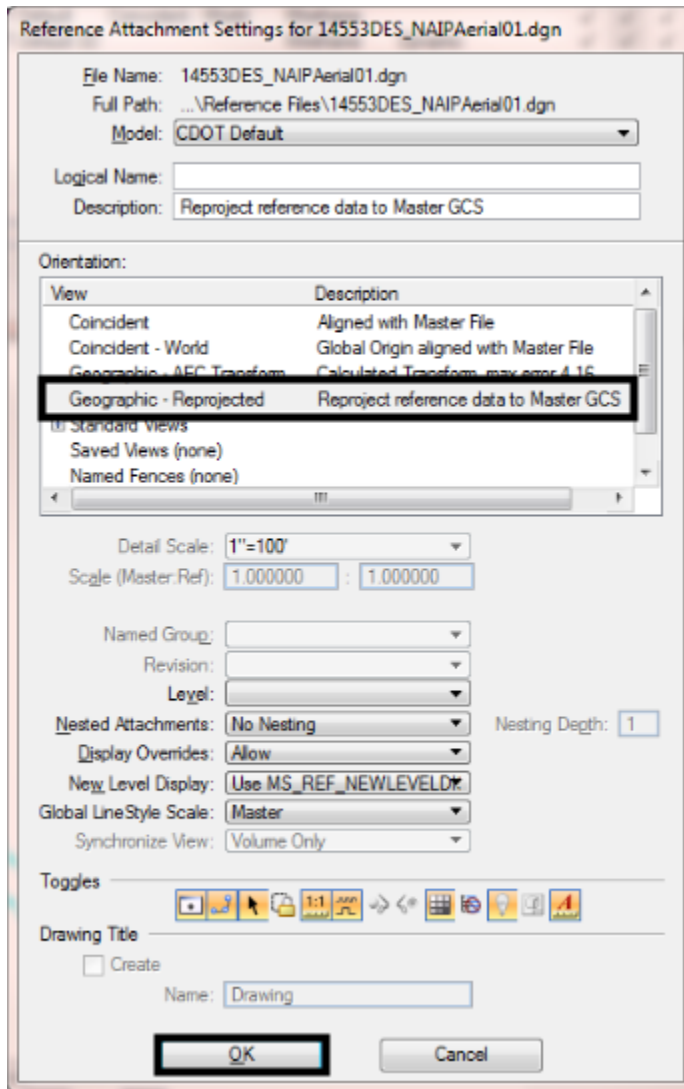


2. In the **Attach Reference** dialog box, navigate to the design file (it MUST have a GCS assignment in order to be reprojected).
3. **Add** the file to the **Selected Documents**.
4. Change the **Attachment method** to **Interactive**.
5. Click **OK**.



This will open the **Reference Attachment Settings** dialog box.

6. In the **Orientation** section, select **Geographic – Reprojection**.
7. Set your nesting and global line style scale settings as you normally would.
8. Click the **OK** button to attach the file.

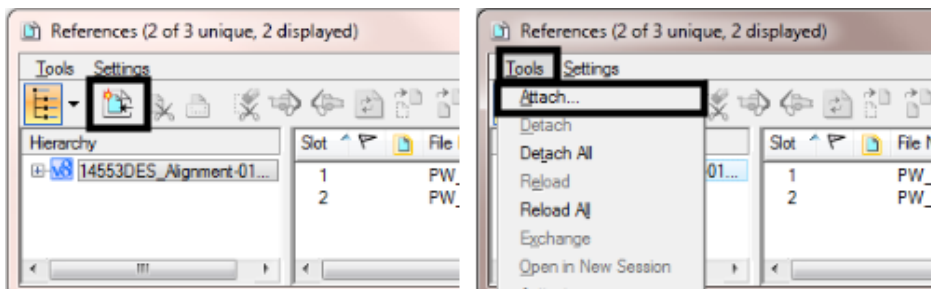


The attach reference file has been reprojected so that data in the referenced file is in the correct location in relation to the active file.

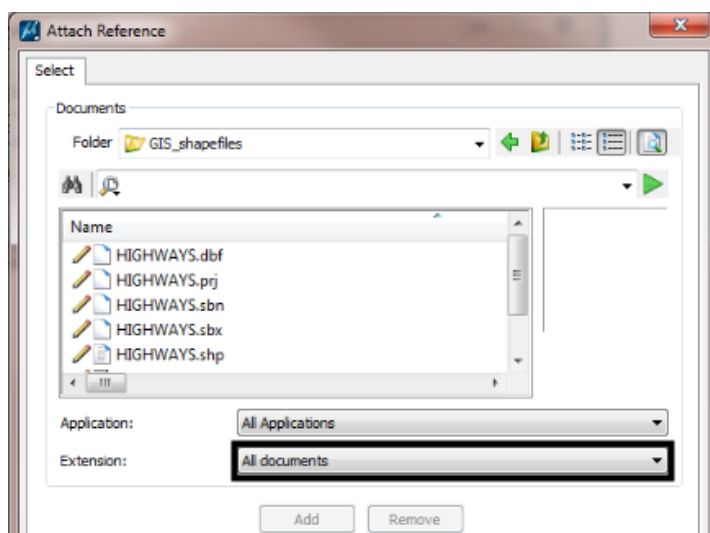
## Referencing GIS Shapefiles

MicroStation allows you to reference Shapefiles with a GCS. When referencing a shapefile you will need the associated files located in the same folder. Shape (SHP) files with a defined GCS can be referenced into the design file by using the same steps to reference a dgn file.

9. From the References dialog box, Left Click the **Attach Reference** icon or select **Tools > Attach** from the References menu bar. This displays the **Attach References** dialog box.

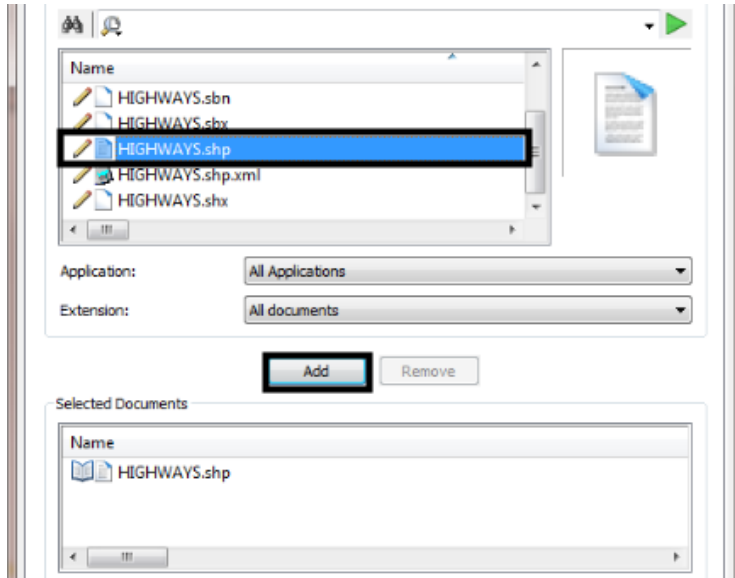


10. In the **Attach References** dialog box, navigate to the folder containing the SHP file.
11. Set the **Extention** to **All Documents**.

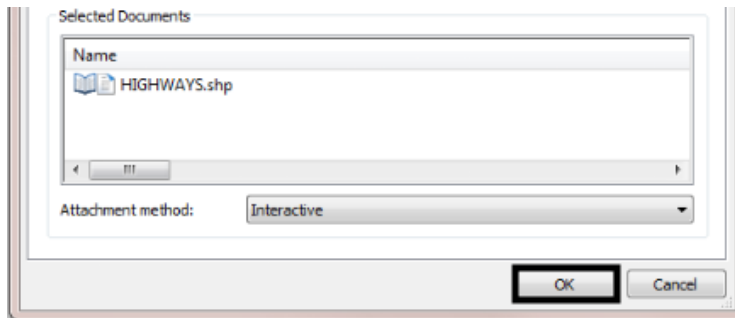


12. In the file list, select the desired **SHP** file(s). Only the file with the **.shp** extension should be selected.

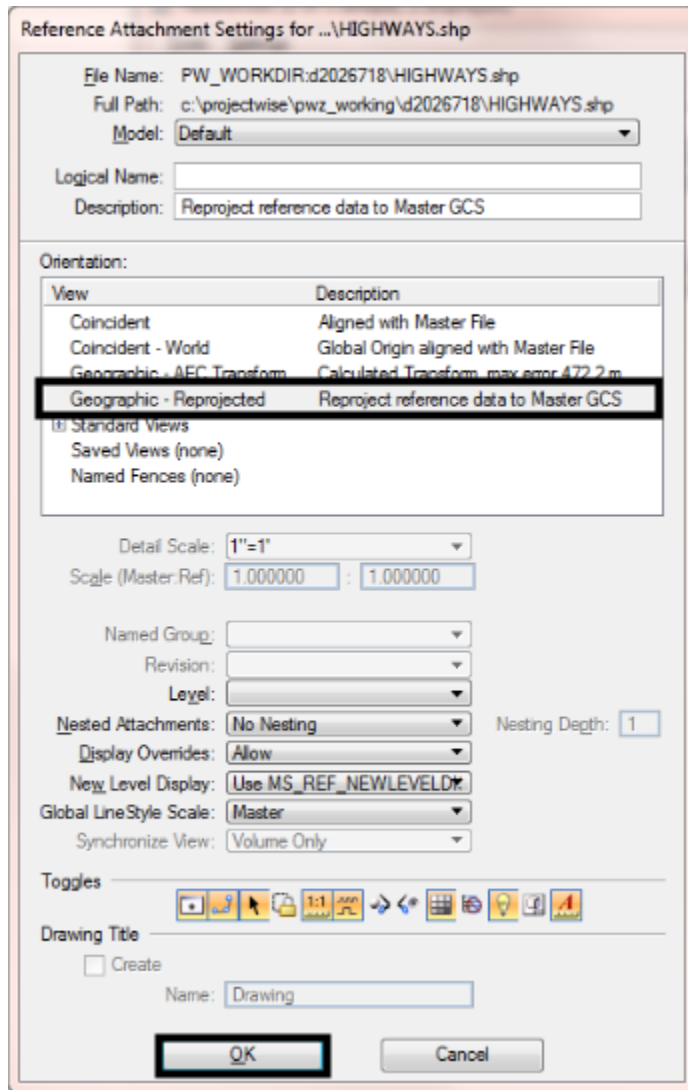
13. If multiple **SHP** file are to be attached, Left Click the **Add** button to place the selected files into the **Selected Documents** area. This allows SHP files in different folders to be selected at the same time.



14. Left Click the **OK** button to attach the SHP files. This will open the **Reference Attachment Settings** dialog box.



15. In the **Orientation** area, select **Geographic – Reprojection**.
16. Click the **OK** button to attach the file. The SHP files are automatically reprojected and placed in the correct location, as long as the MicroStation file has a project coordinate system assigned to it.



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





## Referencing Image Files

CDOT has imagery covering the state of Colorado. This imagery is in two different coordinate systems. The greater Denver area is in NAD83 Colorado State Plane coordinates and the rest of Colorado is in UTM coordinates. Images in either system can be referenced into a design file. The process below attaches and reprojects the image 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.

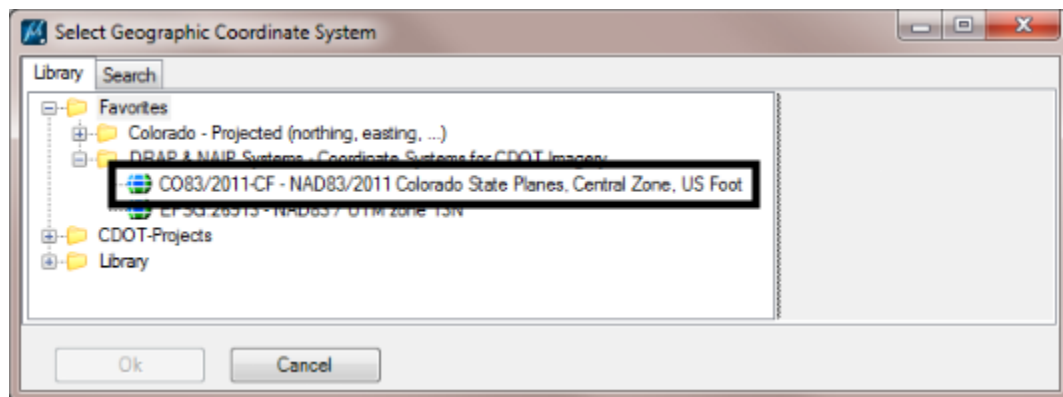
**Note:** it is recommended that an individual 2D design file be created for each set of images.

Using the **From Library** command allows you to select a GCS system from a library of know systems and a list of common systems used in Colorado.

1. From the **Geographic Coordinate System** toolbar, Left Click the **From Library** icon. This displays the **Select Geographic Coordinate System** dialog box.

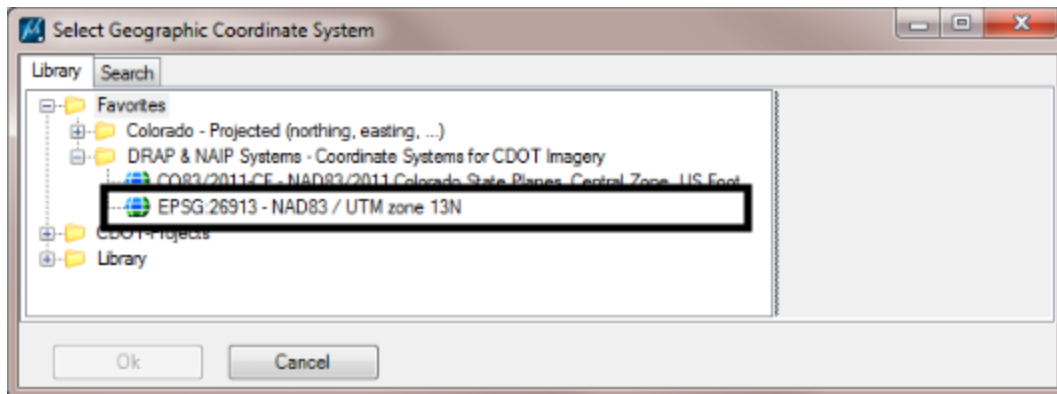
For images from the **DRAPP** database:

2. In the **Select Geographic Coordinate System** dialog box, expand the **Favorites** folder will reveal a Colorado favorites list.
3. Select the **CO83/2011-CF** from the list.



For images from the **NAIP** database:

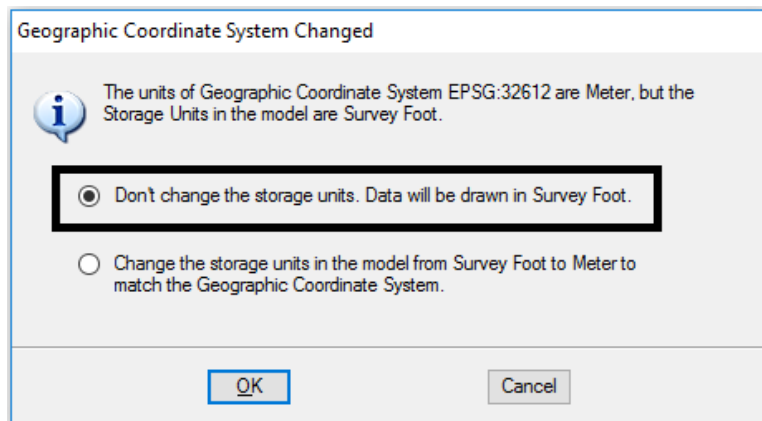
2. In the **Select Geographic Coordinate System** dialog box, expand the **Favorites** folder will reveal a Colorado favorites list.
3. Select the **EPSG 26913** from the list.



For images from either database, continue with step 4

4. Click **OK** after selecting the correct system.

It is possible a message dialog box will appear with a warning message.

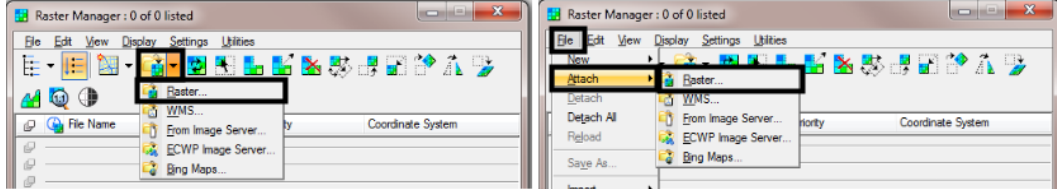


5. Select **Don't change the storage units. Data will be drawn in Survey Foot.** Click **OK** to continue.

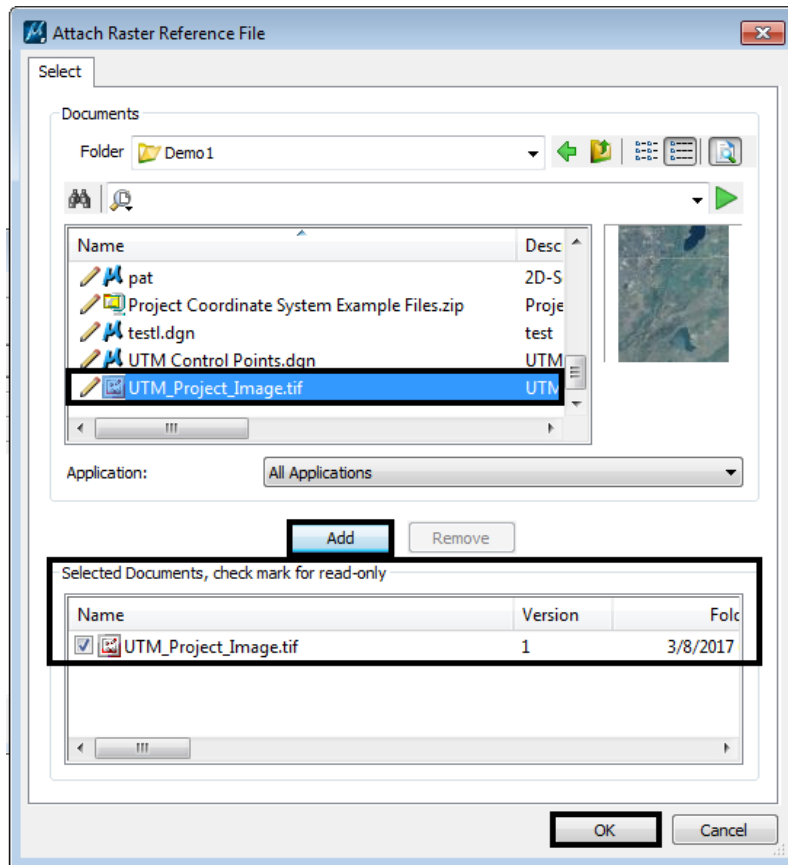
The selected GCS is now attached to the DGN file.

Once the Library GCS has been attached to the DGN file, the raster images can be attached.

- Using Raster Manager, select the **Attach Raster** icon. From the menu bar, **File > Attach > Raster** can also be used.



- In the **Attach Raster Reference File** dialog box, navigate to the image file to be referenced and add it to the selection set.



- Click **OK** to continue.

Next the **Raster Attachment Options** dialog box will appear, here you must set the level the image should be assigned to and a Geometry Priority setting.

- Set **Draft\_Image** for the level.
- Depending on the type of image that is being referenced, the Geo Priority options could be **Raster Header** (NAIP) or **Sister File** (DRAP). Select the appropriate option.

11. Click **Attach** to continue. The image is automatically reprojected and placed in the correct location, as long as the MicroStation file has a project coordinate system assigned to it.

