Version 1

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State of Connecticut Department of Transportation, AEC Applications – Division of Facilities & Transit

Attaching 2016 Orthophotography using MicroStation V8i

The SELECTSeries Digital Design Environment

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Section 1 Introduction

1.1 Required Versions

MicroStation V8i (SELECTseries 4) - Version 08.11.09.832
InRoads V8i (SELECTseries 2) - Version 8.11.07.615

1.2 Workflow Description

This Workflow was developed for use with network drives (X-Drive) projects to bring **2016 Orthophotography** from UCONN's CT ECO webite into a MicroStation V8i design file. This workflow offers two methods to bring in the aerial images: Aerial Imagery WMS and Ortho Downloads. There are advantages and disadvantages to either method. It is up to the user to determine which one they would like to use.

1. Aerial Imagery from UCONN'S CT ECO Web Map Server (WMS) connecting directly from MicroStation
   Disadvantage – Slower to create PDF
   Disadvantage – Slower to update a MicroStation View
   Advantage – One Step to bring in image
2. Ortho downloads from UCONN'S CT ECO website
   Disadvantage – Multiple Steps to bring in image(s)
   Advantage – Quick to create PDF

Prerequisites for using this workflow include basic MicroStation knowledge including understanding the Raster Manager and Referencing.

Please Note: If you are using MicroStation through ProjectWise please use the Earth Exploration Toolset Workflow found on The ProjectWise Digital Design Environment website.

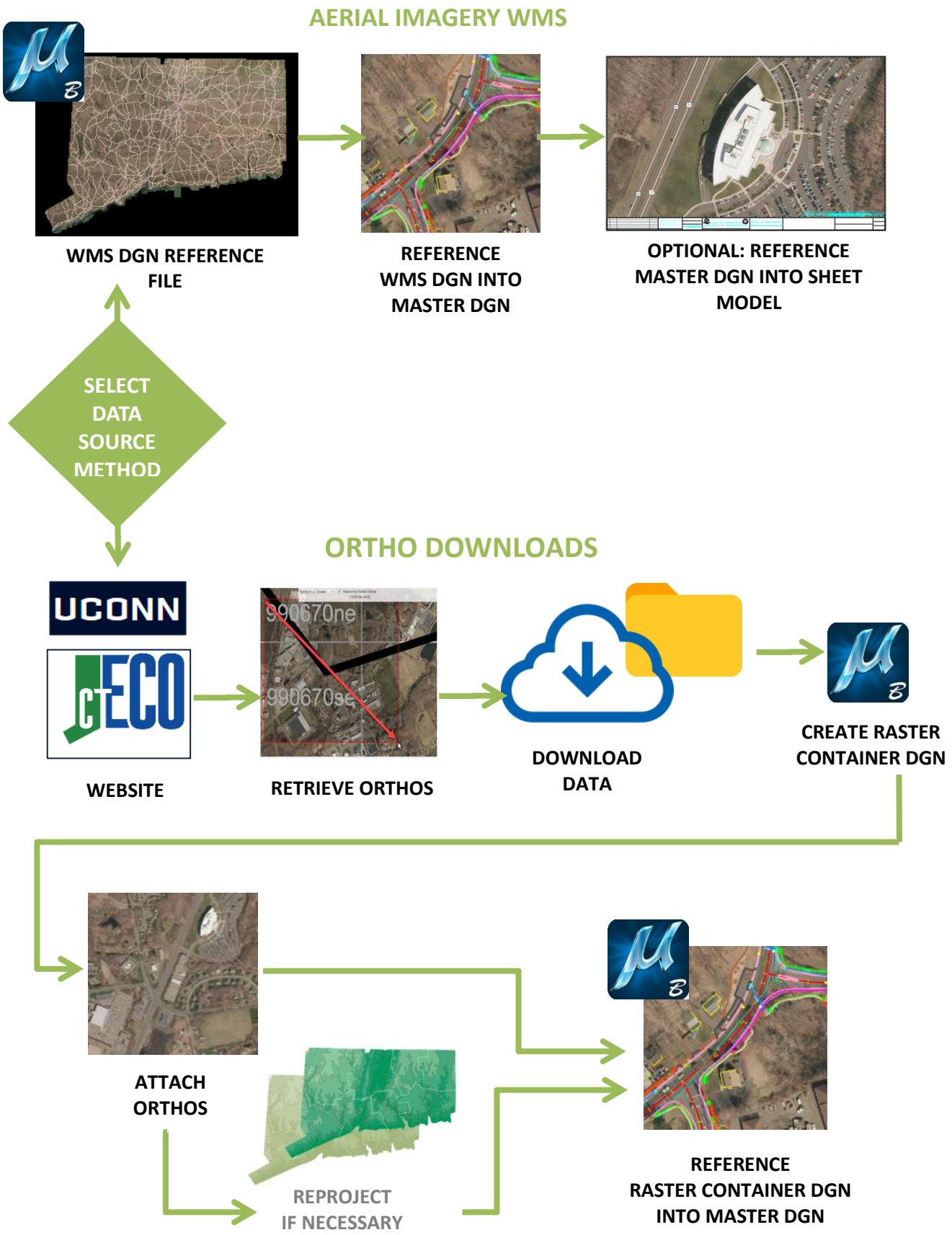
1.3 Ortho Imagery File Formats

Statewide Arial Photos can be found in several locations. Keep in mind that all file formats found on websites may **not** be compatible with MicroStation V8i. The NOAA Website and the UCONN/CT ECO Website recently published 4 band orthoimagery (MrSID4) for the Statewide 2016 Orthophotograhy flight. This format is **not** compatible with MicroStation V8i; however, the Statewide 2016 Orthophotograhy flight also produced 3 band orthoimagery (MrSID3) which **is** compatible with MicroStation V8i.

MicroStation V8i Orthoimagery Compatibility:

File Format	Compatible with MicroStation V8i
4 band orthoimagery (MrSID4)	**NO** ✗
3 band orthoimagery (MrSID3)	**YES** ✓

1.4 Raster Attachment Workflow



Section 2 MicroStation & WMS Aerial Imagery

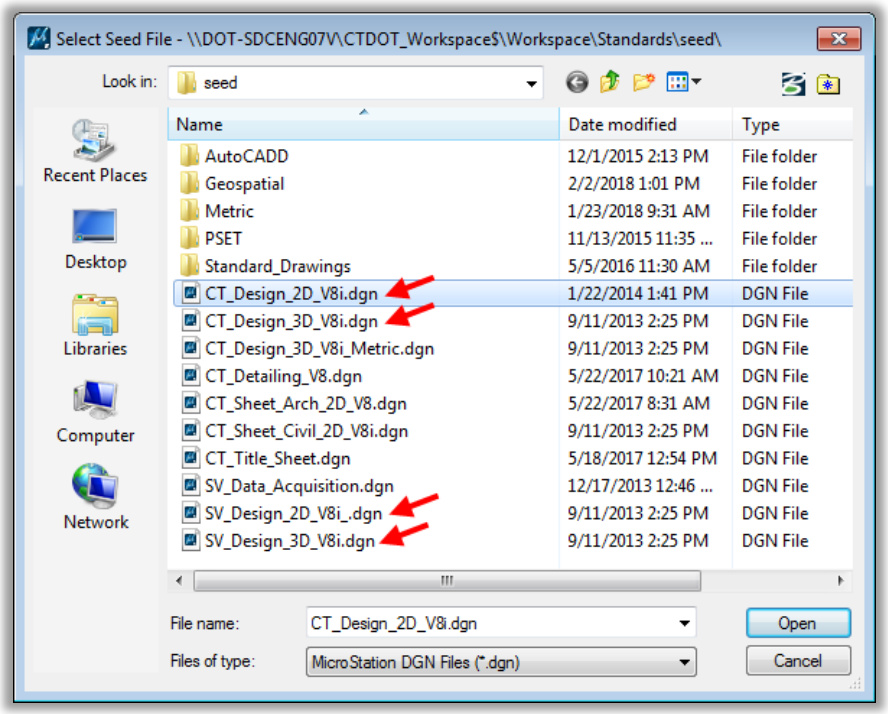
MicroStation V8i has the functionality of connecting to a live Web Map Server (WMS.) WMS is a standard format for georeferenced map images that are generated from GIS databases and then served over the internet.

Rather than using MicroStation Raster Manager to directly attach the WMS, we will reference a blank design file with the WMS files already attached for your convenience. Two MicroStation dgn files are provided in the workspace to reference into your projects: one for NAD 83 - *2D_Ortho_2016_83FT.dgn* and another for NAD 27 - *2D_Ortho_2016_27FT.dgn*. [If you have a metric project, please contact AEC Applications staff for additional steps.] Each DGN references WMS images which are provided by The University Of Connecticut's (UCONN) Connecticut Environmental Conditions Online (CT ECO.)

2.1 Active Design File

1. Start MicroStation through the CTDOT Accounting Menu.
2. Open or create a new MicroStation design file using one of the design seed files listed below:

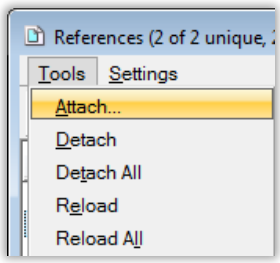
Designer Users:
W:\Workspace\Standards\seed\CT_Design_3D_V8i.dgn
W:\Workspace\Standards\seed\CT_Design_2D_V8i.dgn
Survey Users:
W:\Workspace\Standards\seed\CT_Survey_3D_V8i.dgn
W:\Workspace\Standards\seed\CT_Survey_2D_V8i.dgn



2.2 Reference WMS Design File

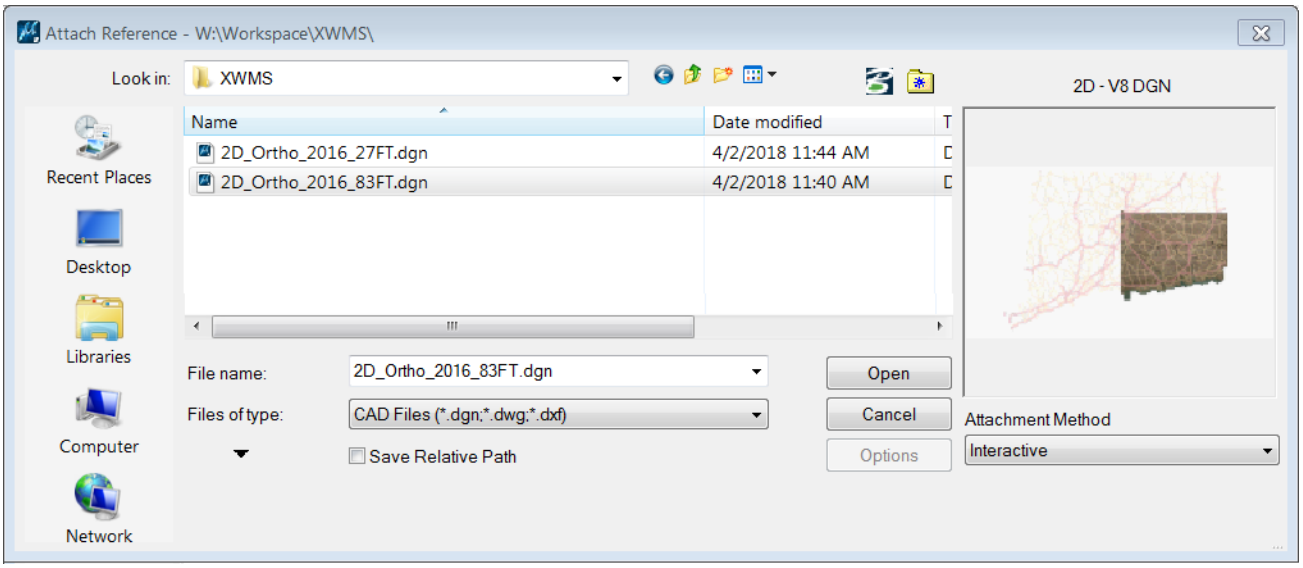
1 . Select **References** from the primary tool bar:

2 . From the References dialog box, navigate to *Tools> Attach…*

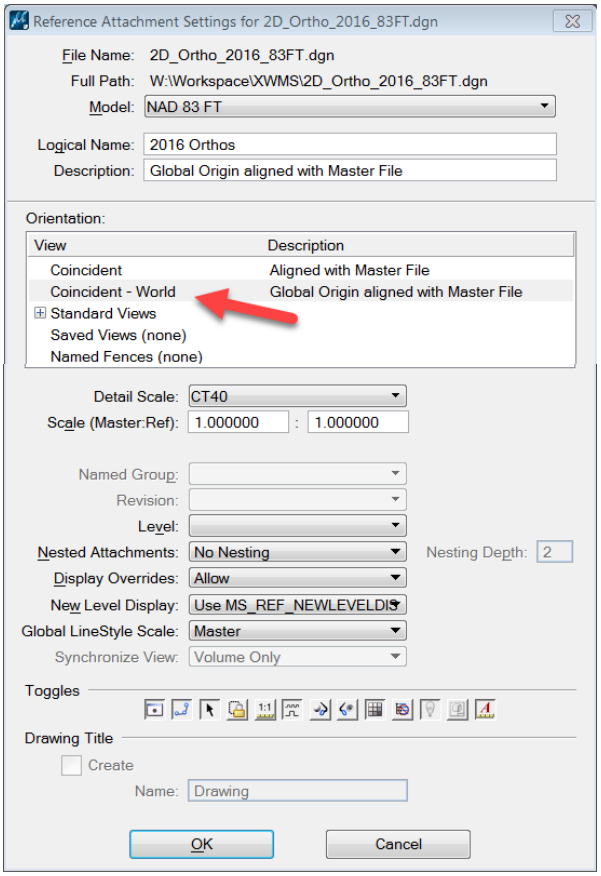


3 . From the Attach Reference dialog, browse to *W:\Workspace\XWMS* and select the 2D Ortho file that corresponds to your project Datum:
2D_Ortho_2016_27FT.dgn
2D_Ortho_2016_83FT.dgn

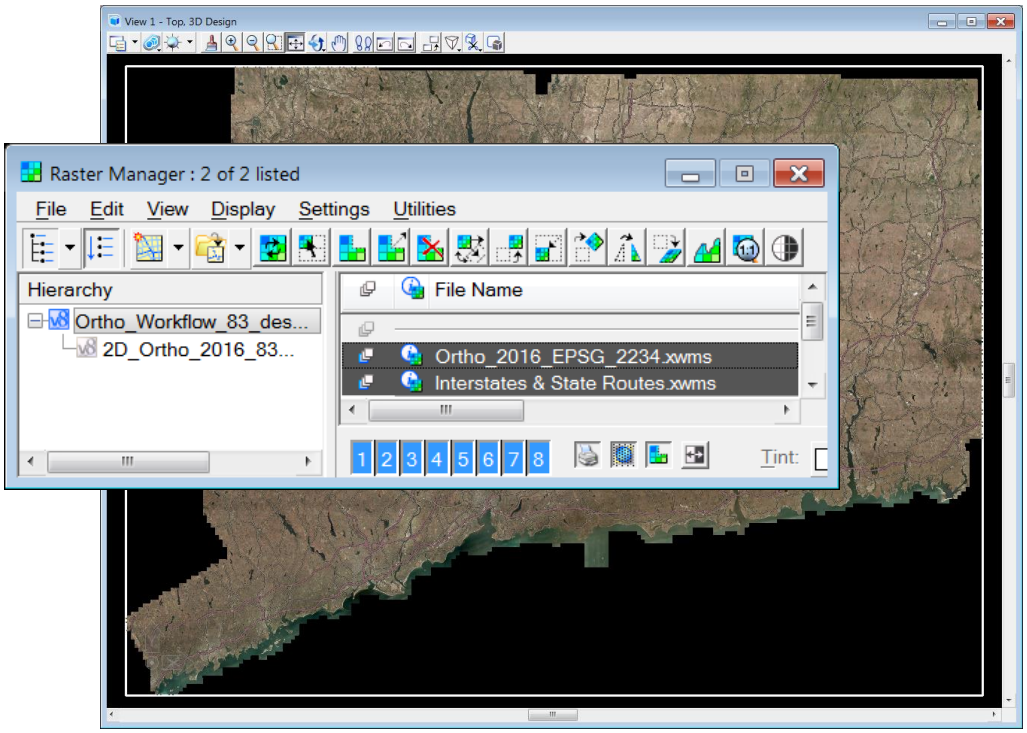
4 . Select **Open**:



5 . The Reference Attachment Settings dialog will appear. Enter a *Logical Name*, set the fields as shown below, and click **OK**.

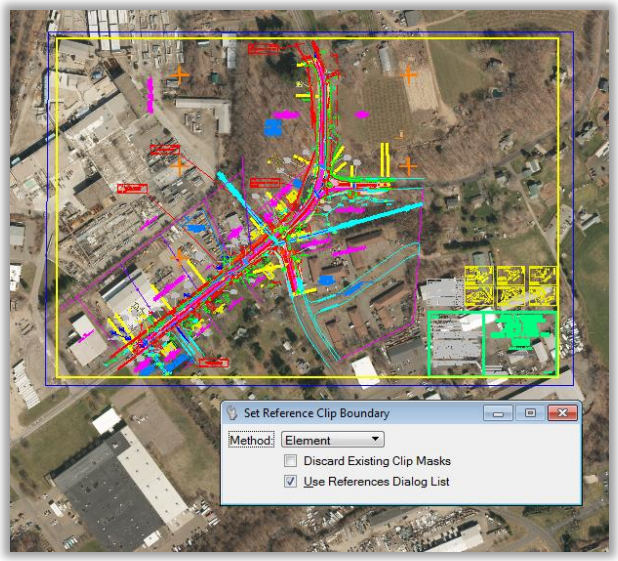


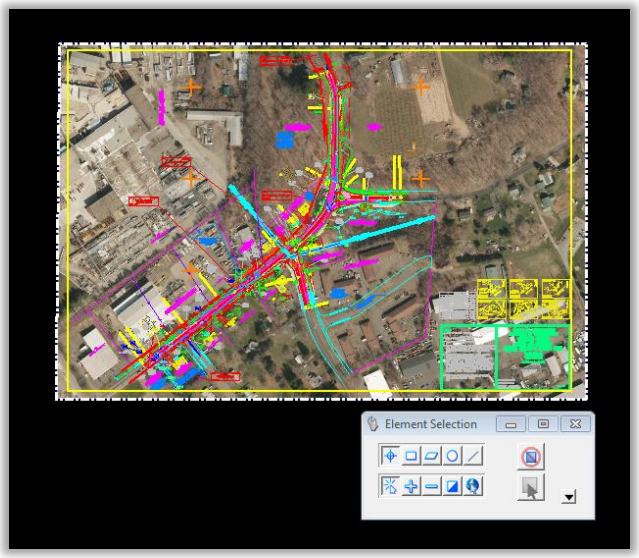
6 . Fit the View. This may take 10 or more seconds to load and display the two attached images: the 2016 Orthophotos, and the Interstate and State Routes.



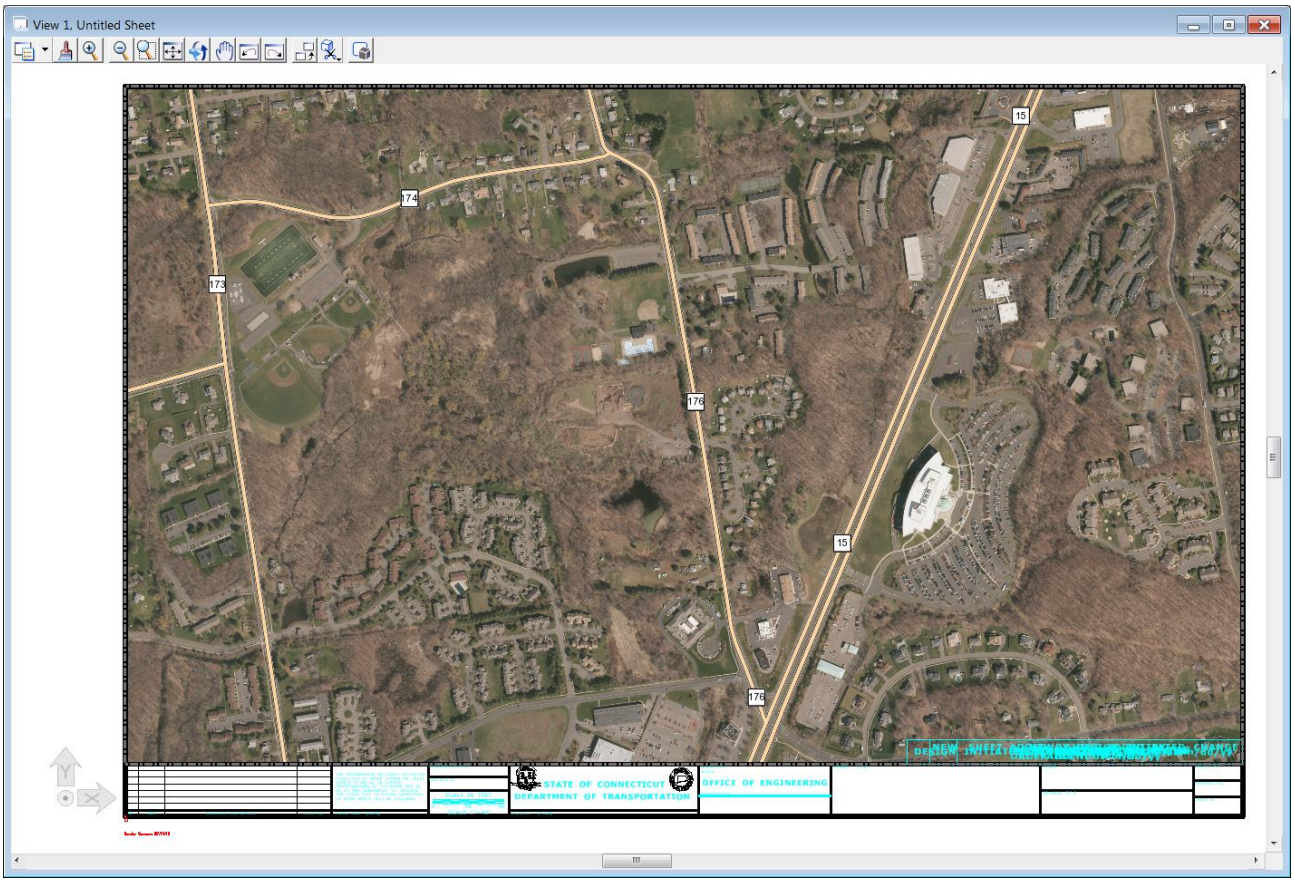
2.3 Clip WMS Reference File

1 . Attach a ground survey file to reference if you wish. Zoom to your project location and clip the Ortho Reference as needed.





2 . You may also wish to create a sheet model to reference your design, and place a border at a desired scale for the ease of publishing a PDF (see Section 4 Sheet Model Publishing.)

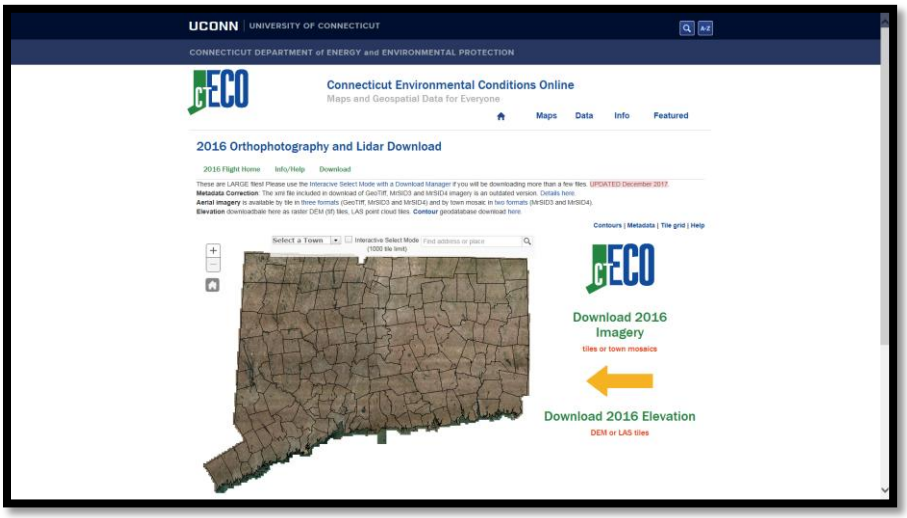


Section 3 Download selected CT ECO Orthophotography

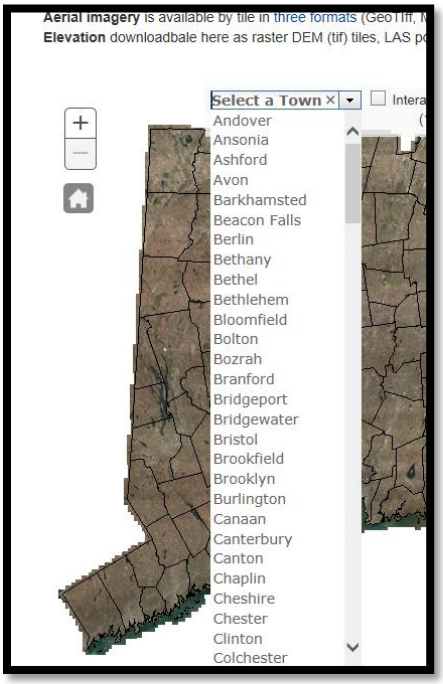
The imagery on the UCONN CT ECO website uses the State Plane 1983 projection. The 2016 Ortho imagery will come in lined up with projects using Horizontal NAD83 Datum ground survey. If the ground survey uses a Horizontal NAD27 Datum the 2016 Orthos will need to be reprojected after they are brought into MicroStation.

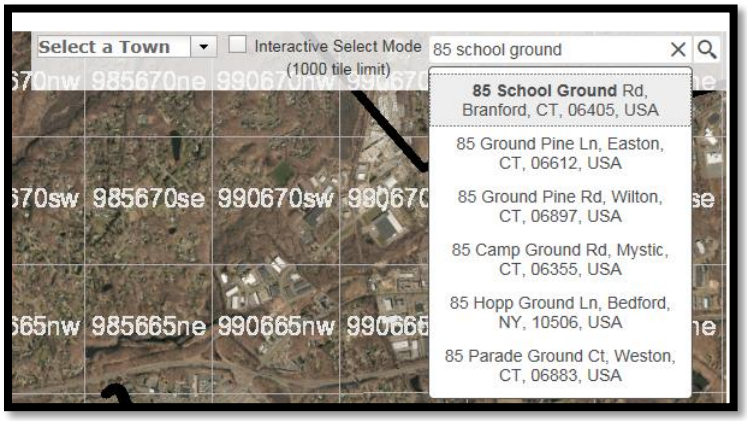
3.1 Retrieve 3 band Orthoimagery (MrSID3)

1. Browse to the UCONN ECO site http://cteco.uconn.edu/data/download/flight2016/index.htm.



2. Select a town from the drop down or type in an address and search for the project location.

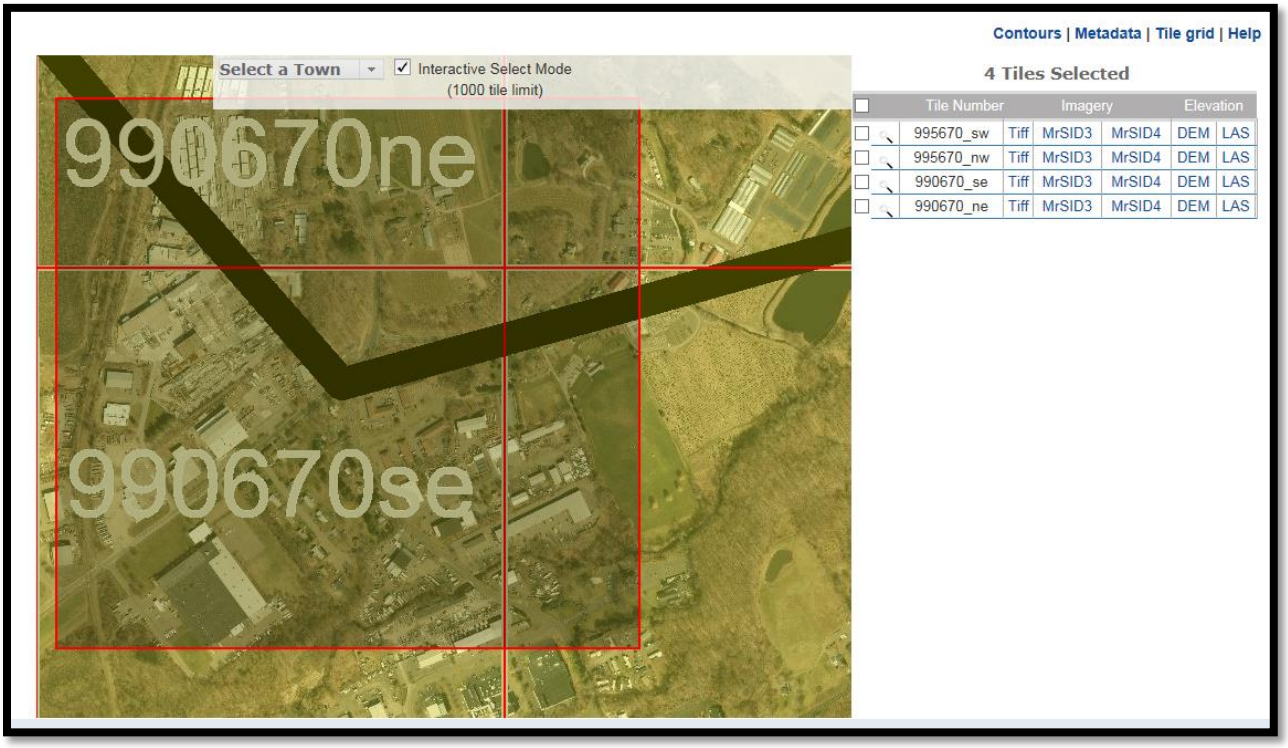




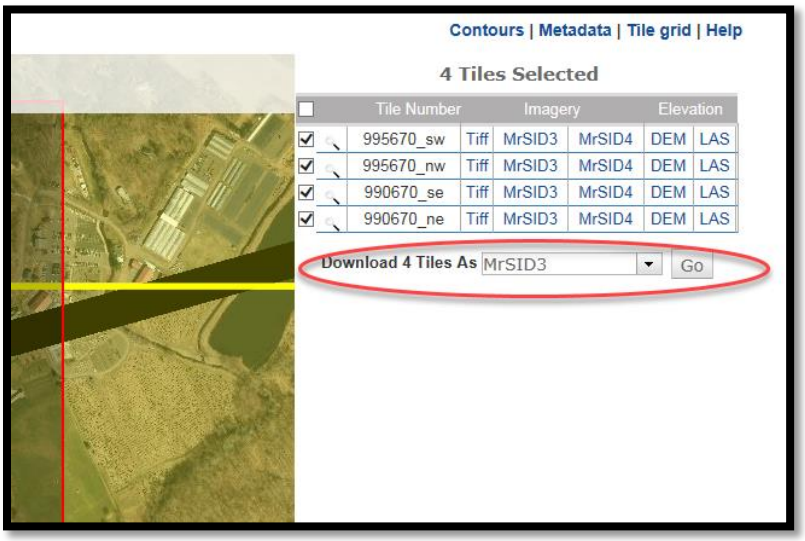
3. Once the location is found, check the ***Interactive Select Mode*** box.

4. Click and drag from left to right in the map section to draw a selection rectangle.

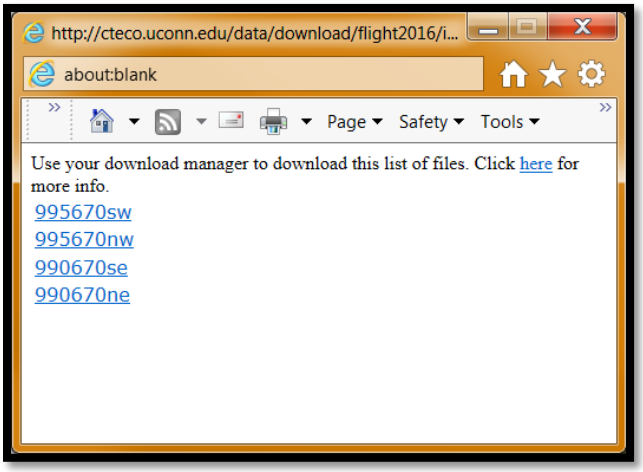
5. The tiles touching the selection rectangle should highlight yellow and a list of the tiles should appear to the right of the map.



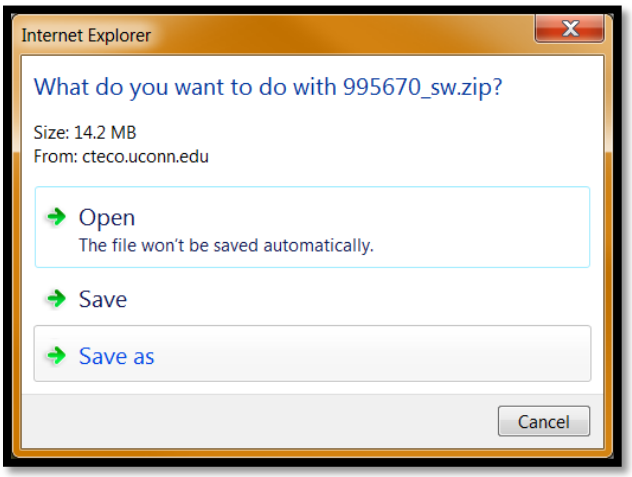
6. Check the boxes next to each tile number, set the *Download Tiles As* field to *MrSID3* and click the ***Go*** button.



7. A popup window should appear with links to each tile. Click the tile number listed.



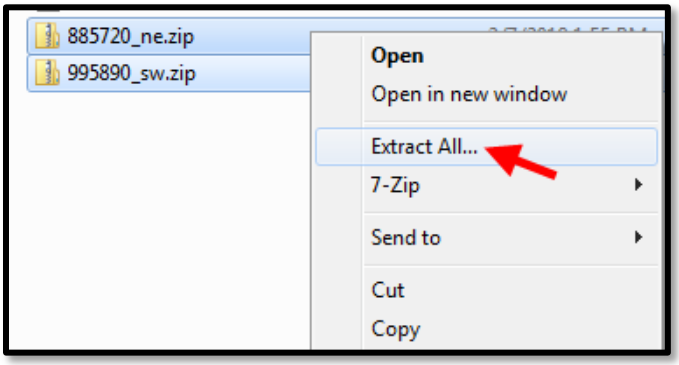
8. The save dialog will appear, click **Save as** and save the zip file in the *Raster_Reference_Files* folder located in your project container (repeat steps 7 & 8 for each tile listed in the pop-up window.



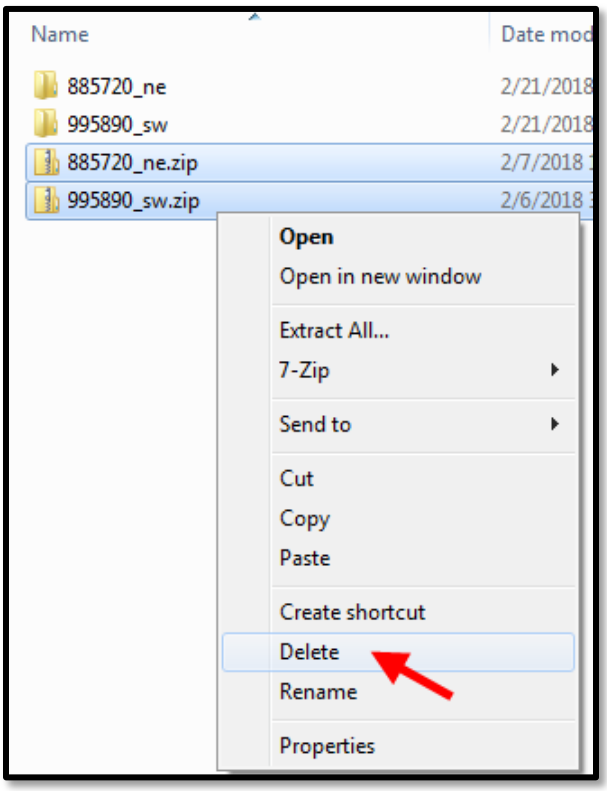
9. Close the CT ECO 2016 imagery webpage.

3.2 Extract Zip Files

1. Navigate to where the zip files were saved, right click on each zip file and select **Extract All…** and extract into your project folder.

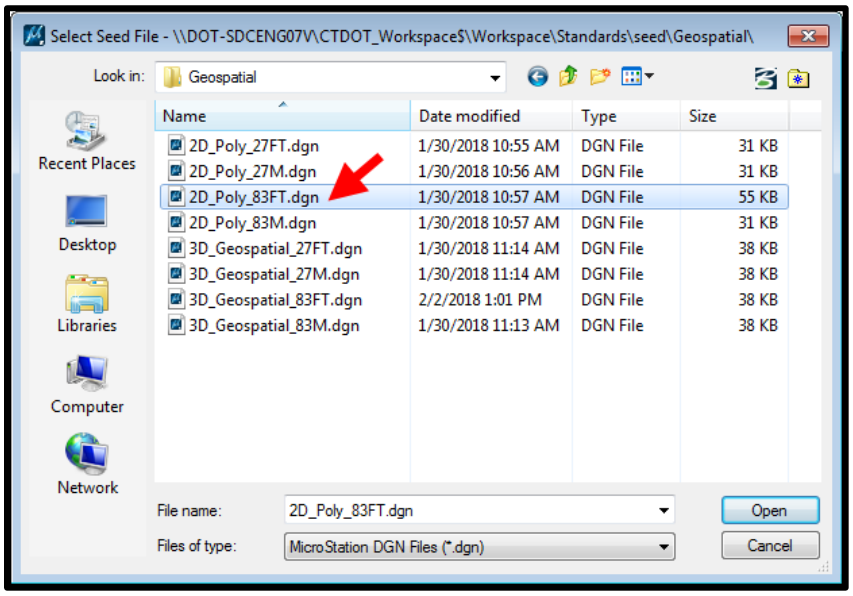


2. Delete the zip files from the folder if they were saved to the x-drive to save space, once the files are unzipped the zip version is not needed.

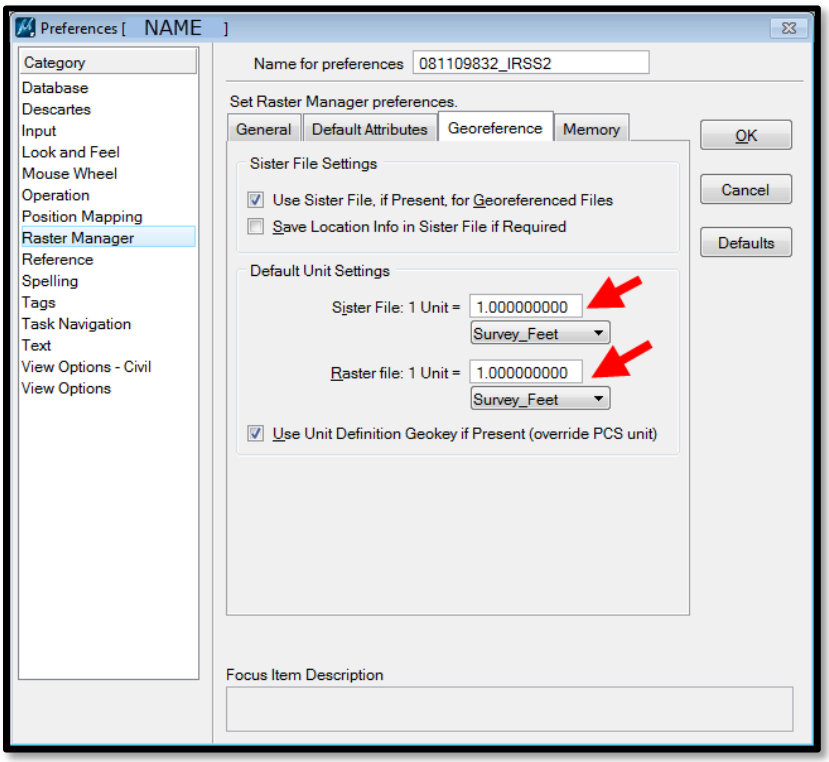


3.3 Create Raster Container Design File

1. Open MicroStation through the CTDOT Accounting Menu.
2. Create the MicroStation file that will be used as a container for the MrSID3 Orthophotography raster attachments. Use the seed file: *W:\Workspace\Standards\seed\Geospatial\2D_Poly_83FT.dgn*.



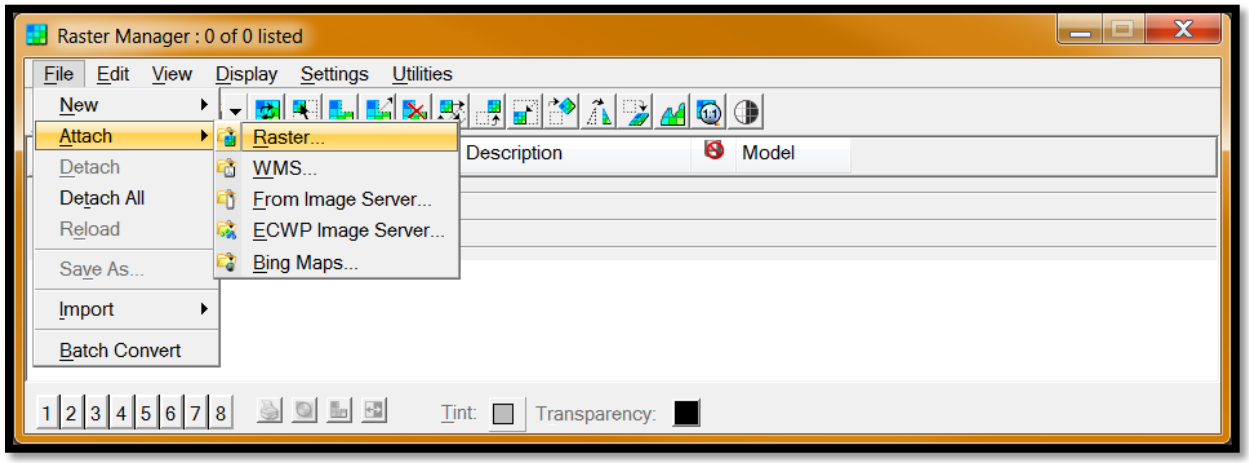
3. Open the new file, on the MicroStation main menu bar navigate to *Workspace > Preferences…*
4. The Preferences dialog box will appear go to the *Raster Manager* category and click the *Georeference* tab. In the Default Unit Settings area set the Sister file units and Raster file units to *1*, and unit type to *Survey_Feet*, click **OK**.



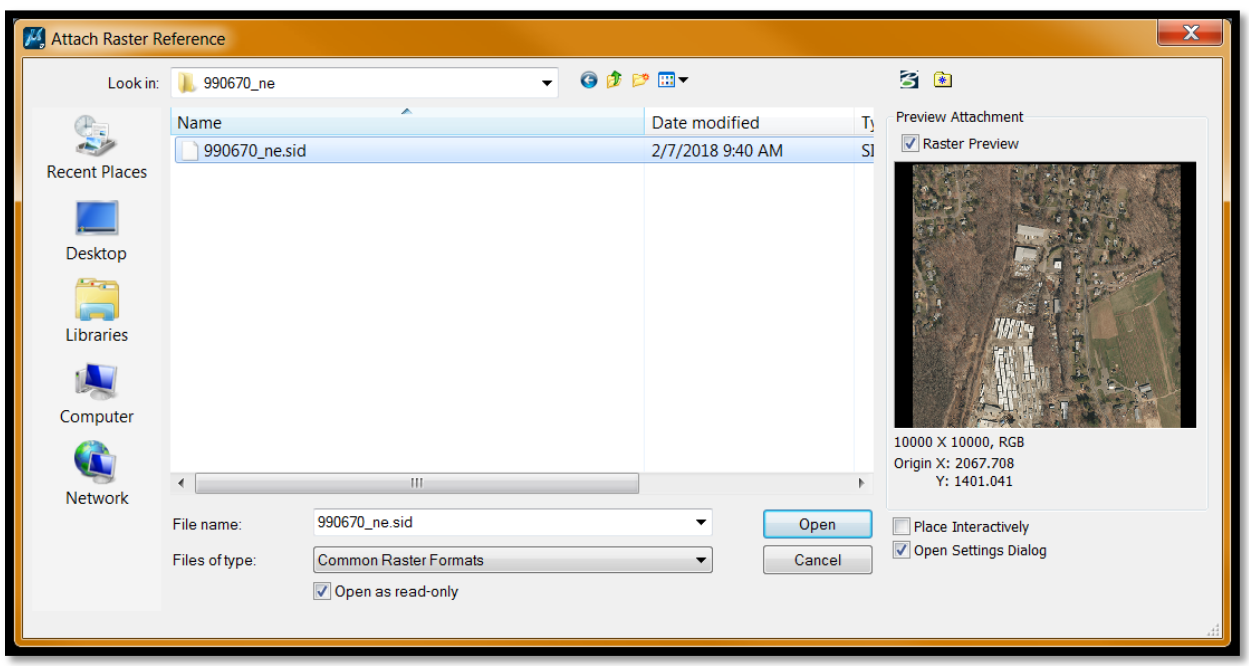
3.4 Attach Orthoimagery (Raster Manager)

1. From the primary tool bar, select **Raster Manager**.

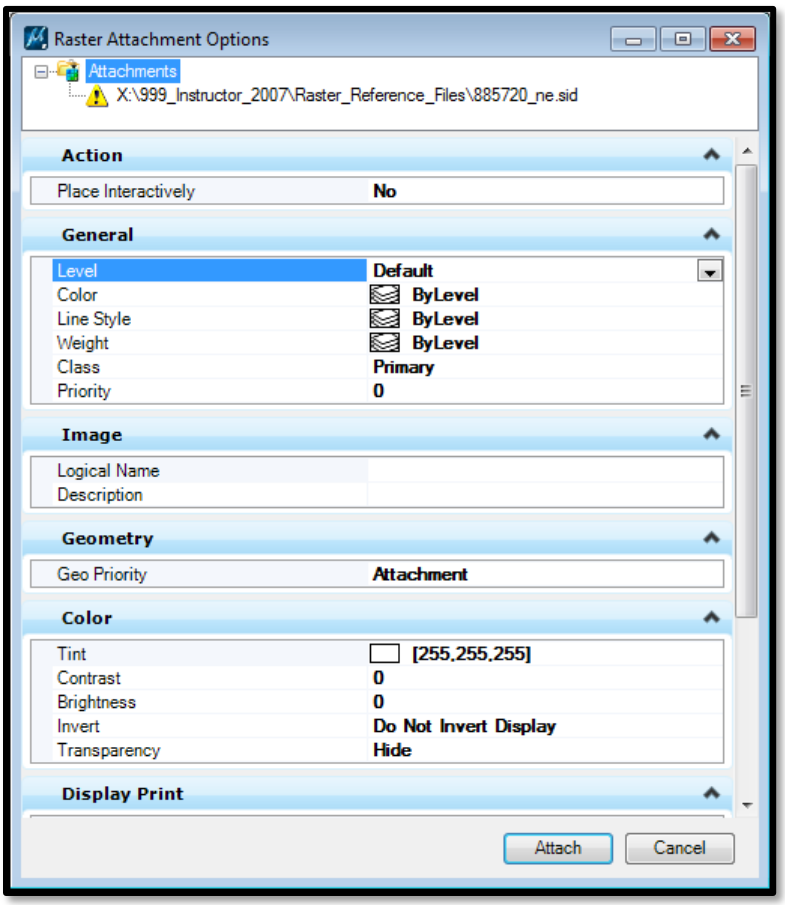
2. From the Raster Manager dialog box, navigate to *File> Attach> Raster*.



3. Browse to the SID files that were saved, click **Open**.



4. The Raster Attachment Options dialog box will appear. Click **Attach**.

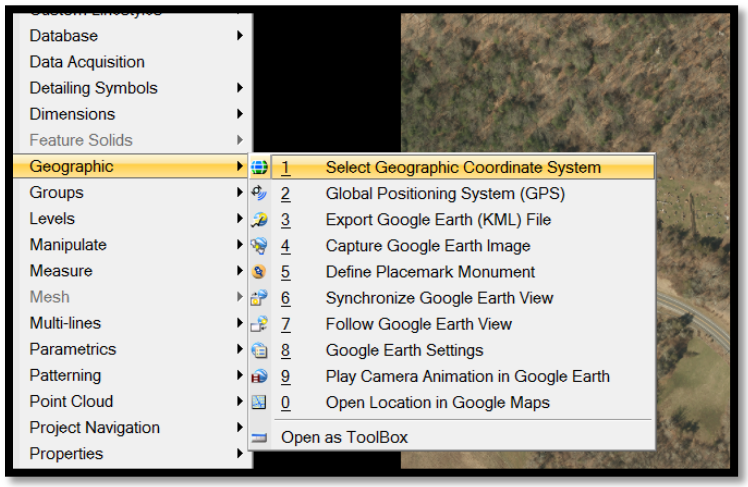


5. From the MicroStation main menu bar, navigate to *File > Save Settings*. Close this file if you do not need to reproject to NAD27 and move on to Section 3.7.

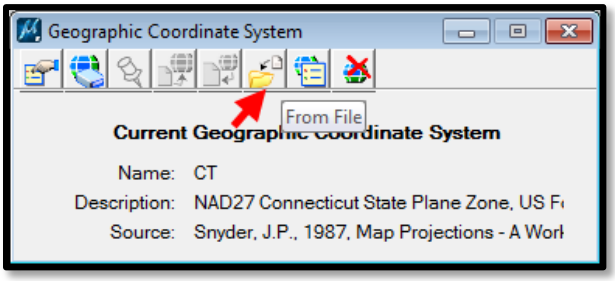
   If it is necessary to reproject to NAD27, continue onto Section 3.5.

3.5 Reproject Orthoimagery

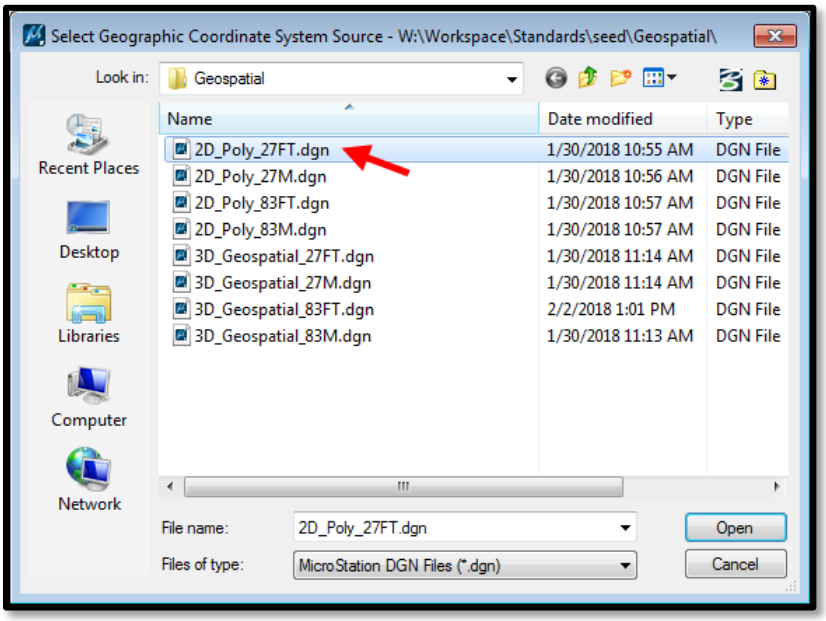
1. Remain in the file that was created in Section 3.1. From the MicroStation main menu bar navigate to *Tools> Geographic> Select Geographic Coordinate System*.



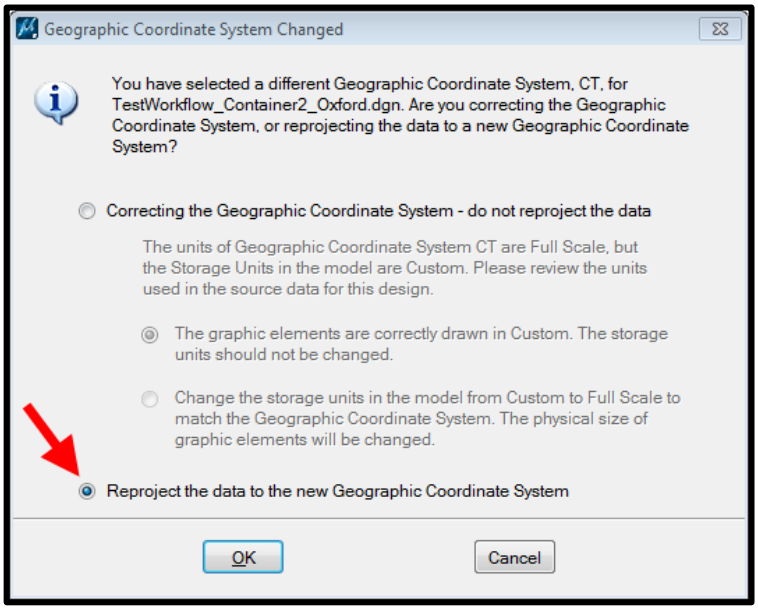
2. The Geographic Coordinate System toolbox will appear, click the **From File** button



3. Browse to the folder *W:\Workspace\Standards\seed\Geospatial* and select the seed file *2D_Poly_27FT.dgn*. Click **Open**.



4. A dialog box will appear, toggle on *Reproject the data to the new Geograghic Coordinate System* and click **OK**.



5. From the MicroStation main menu bar navigate to *File > Save Settings*.

3.6 Attach Raster Container to the Design File

In this section users will open or create a new design file and attach the MicroStation file created in Section 3.

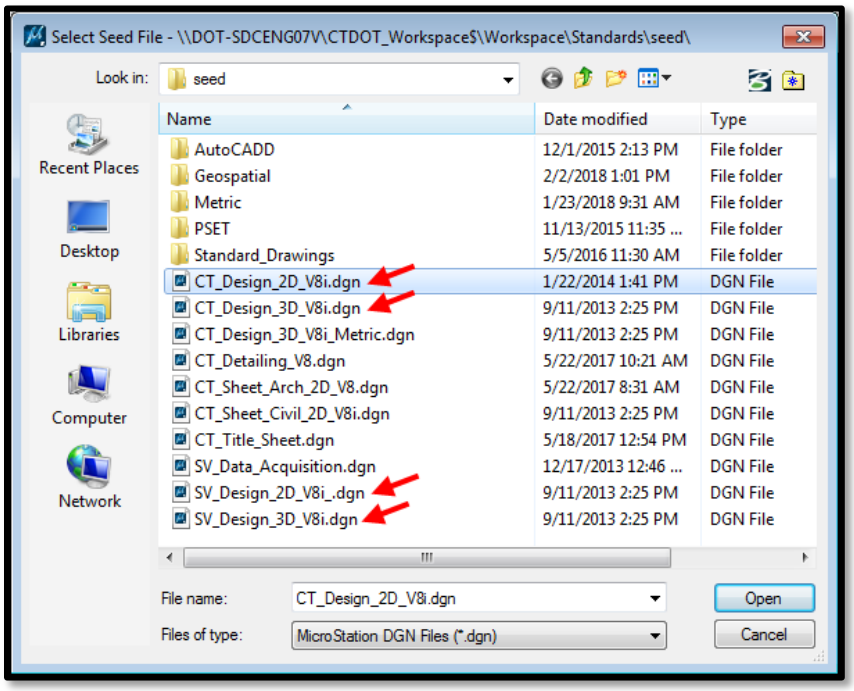
1 . Use one of the seed files listed below to create the MicroStation file.

Designer Users:

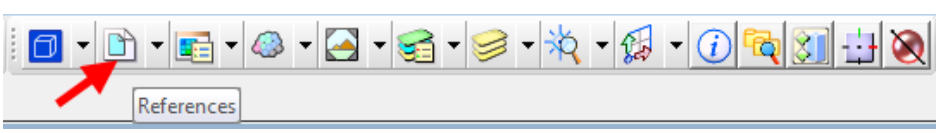
W:\Workspace\Standards\seed\CT_Design_3D_V8i.dgn
W:\Workspace\Standards\seed\CT_Design_2D_V8i.dgn

Survey Users:

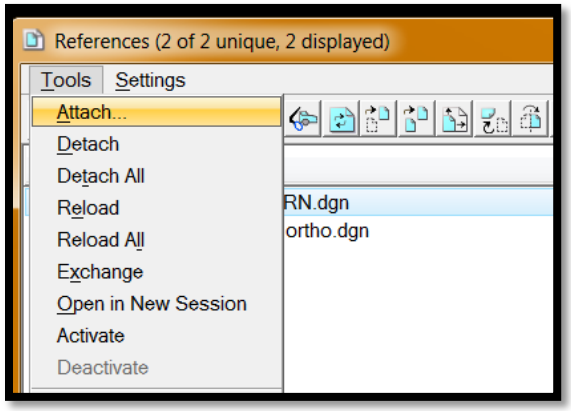
W:\Workspace\Standards\seed\SV_Survey_3D_V8i.dgn
W:\Workspace\Standards\seed\SV_Survey_2D_V8i.dgn



2 . Select **References** from the primary tool bar:

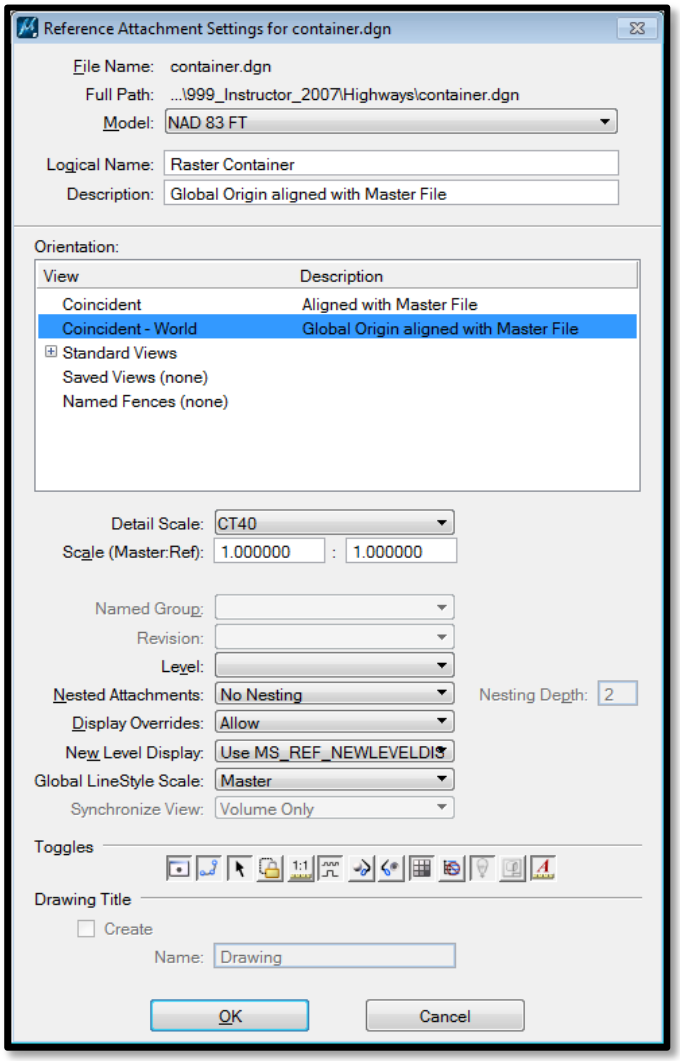


3 . From the References dialog box, navigate to *Tools> Attach…* to open the Attach Reference dialog.

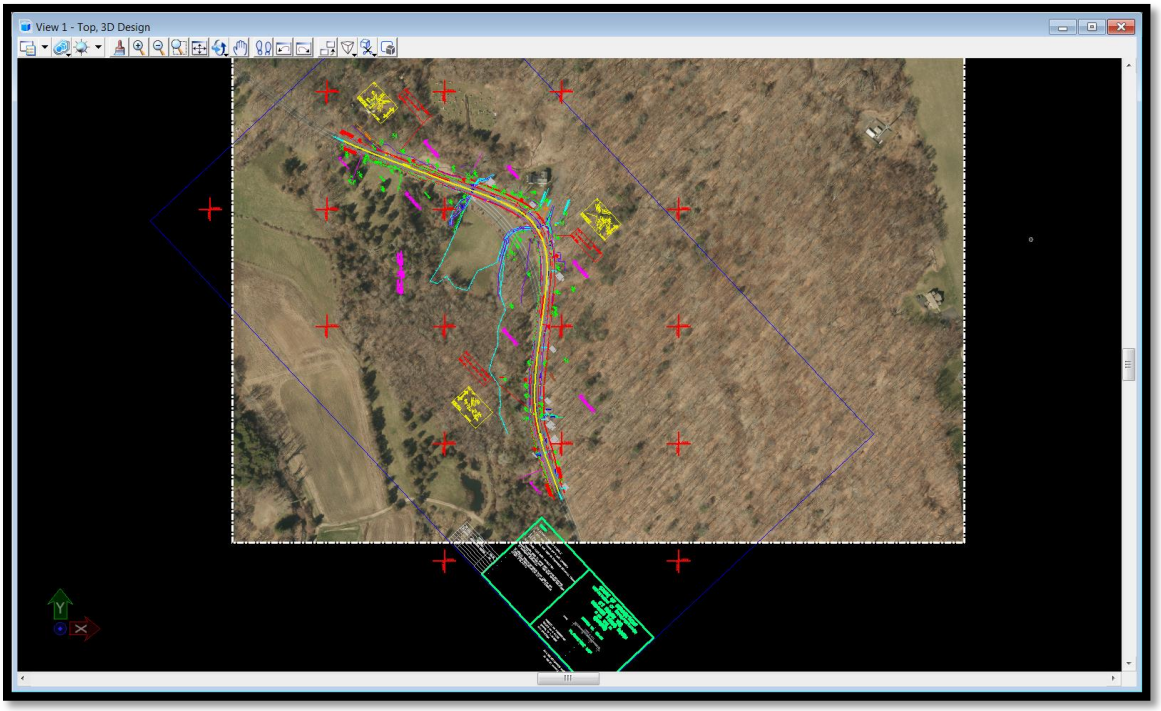


4 . Browse to the raster container file and **Open**.

5 . The Reference Attachment Settings dialog will appear. Give the reference a *Logical Name*. Click **OK**.

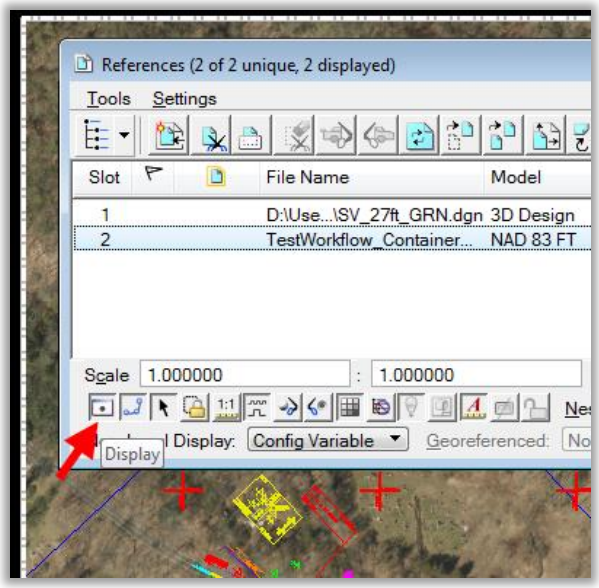


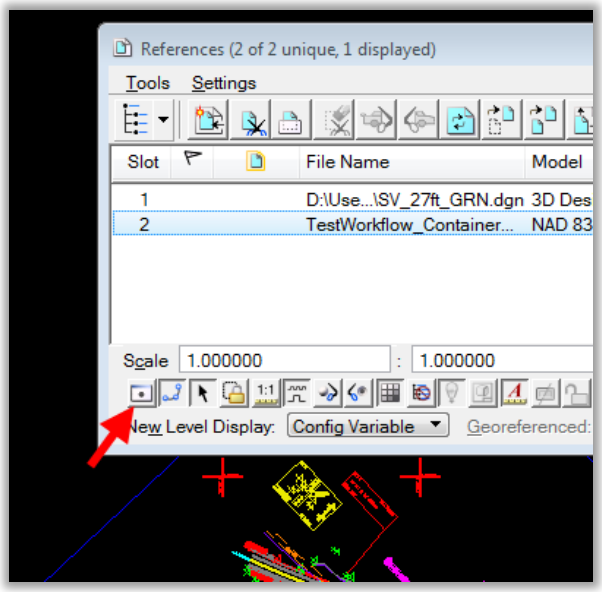
6 . The raster images should appear in the correct location.



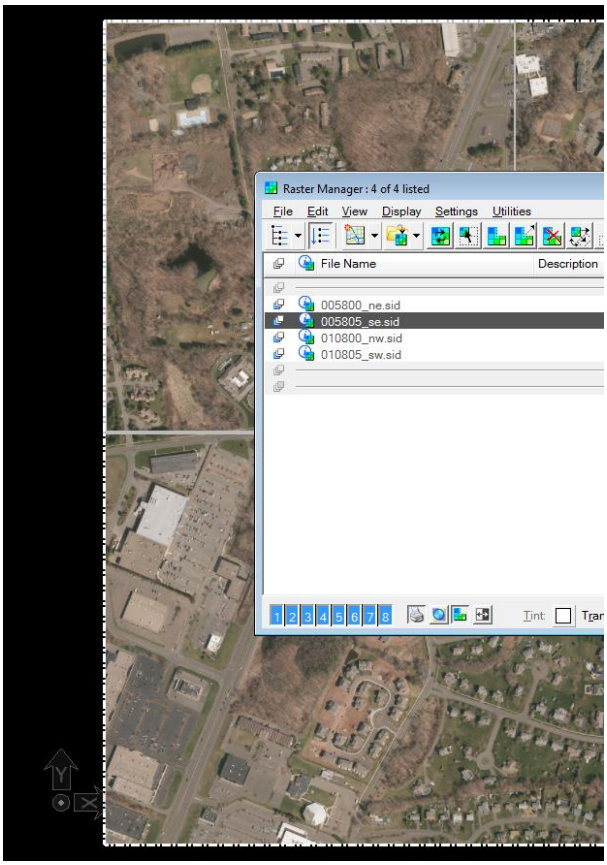
3.7 Raster Display

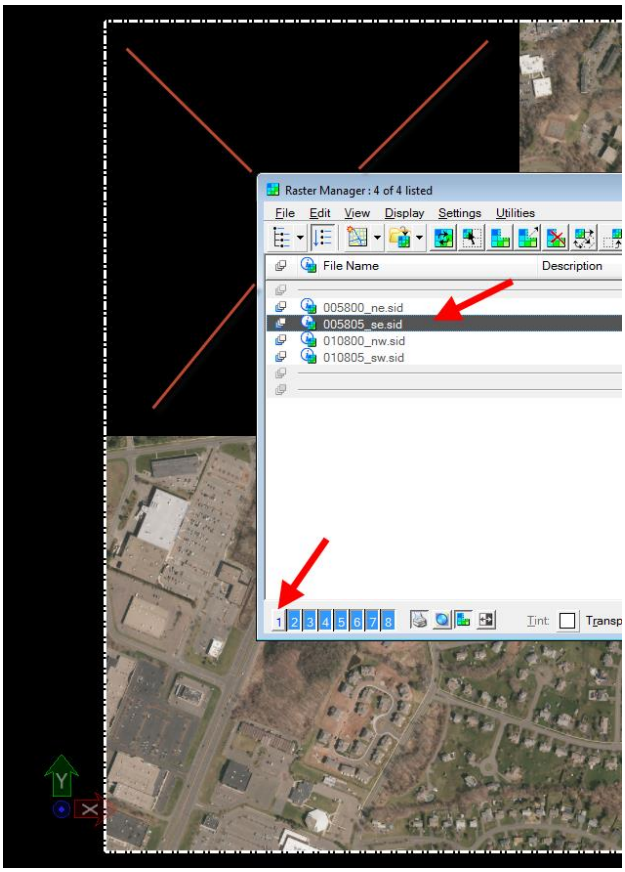
1 . All the raster files can be turned off with one click on the References dialog box by clicking off the display of the reference file that contains all the rasters.





2 . Raster files can be individually turned on and off in the Raster Manager. On the Raster Manager dialog box select the Raster and choose the View you would like to set the display off.



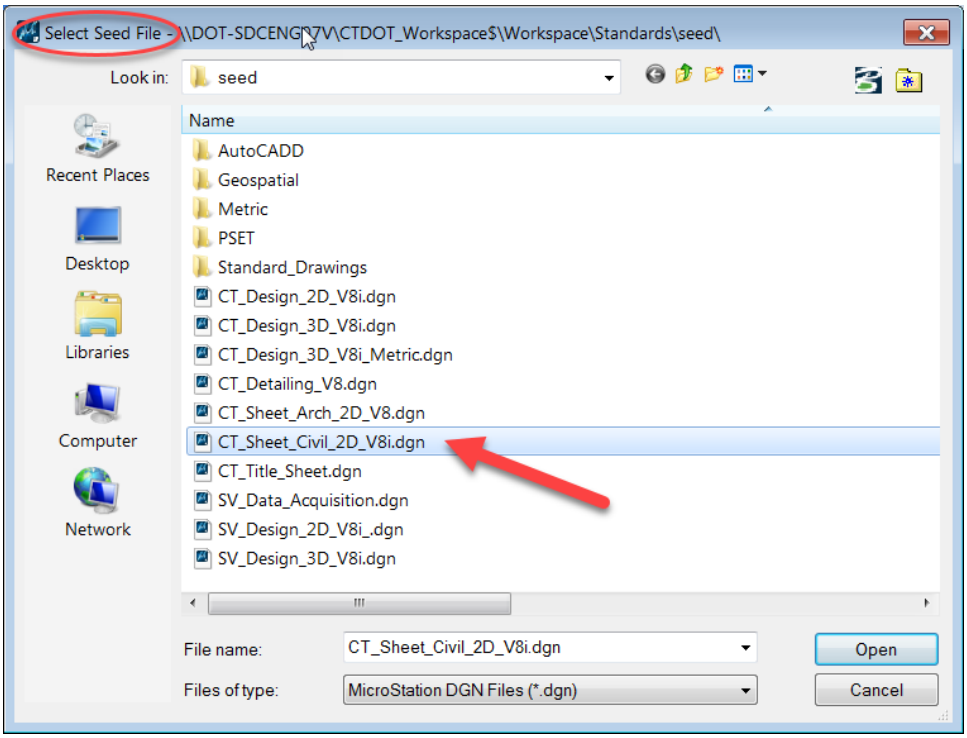


Section 4 Sheet Model Publishing

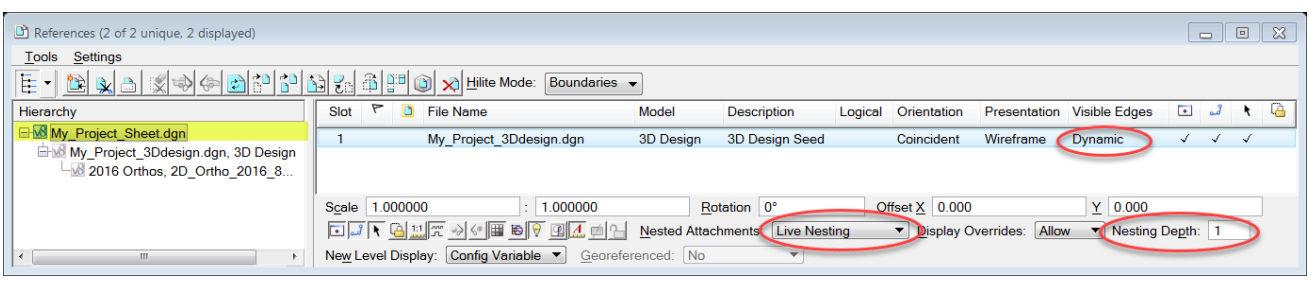
Sheet models, not design models, are to be used for publishing PDFs. Borders shall be placed in sheet models only. Plot drivers have been customized to accommodate WMS rasters. By using a standard border, the publishing task becomes simplified.

4.1 Create a Sheet Model

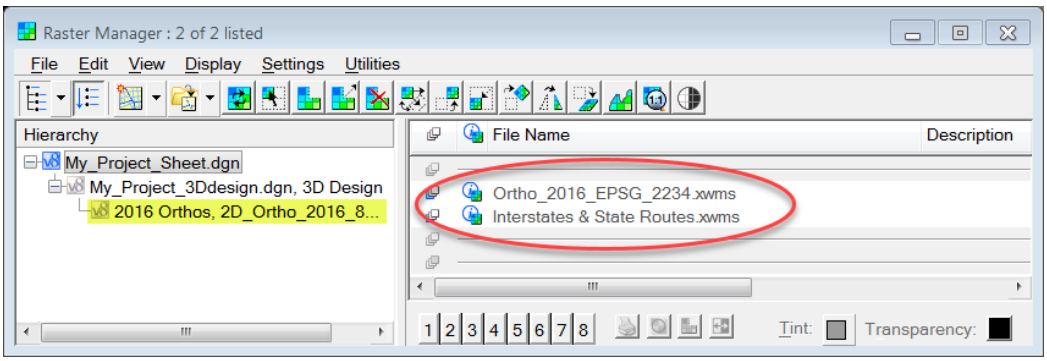
1. Create a new MicroStation design file using the Civil sheet seed file:



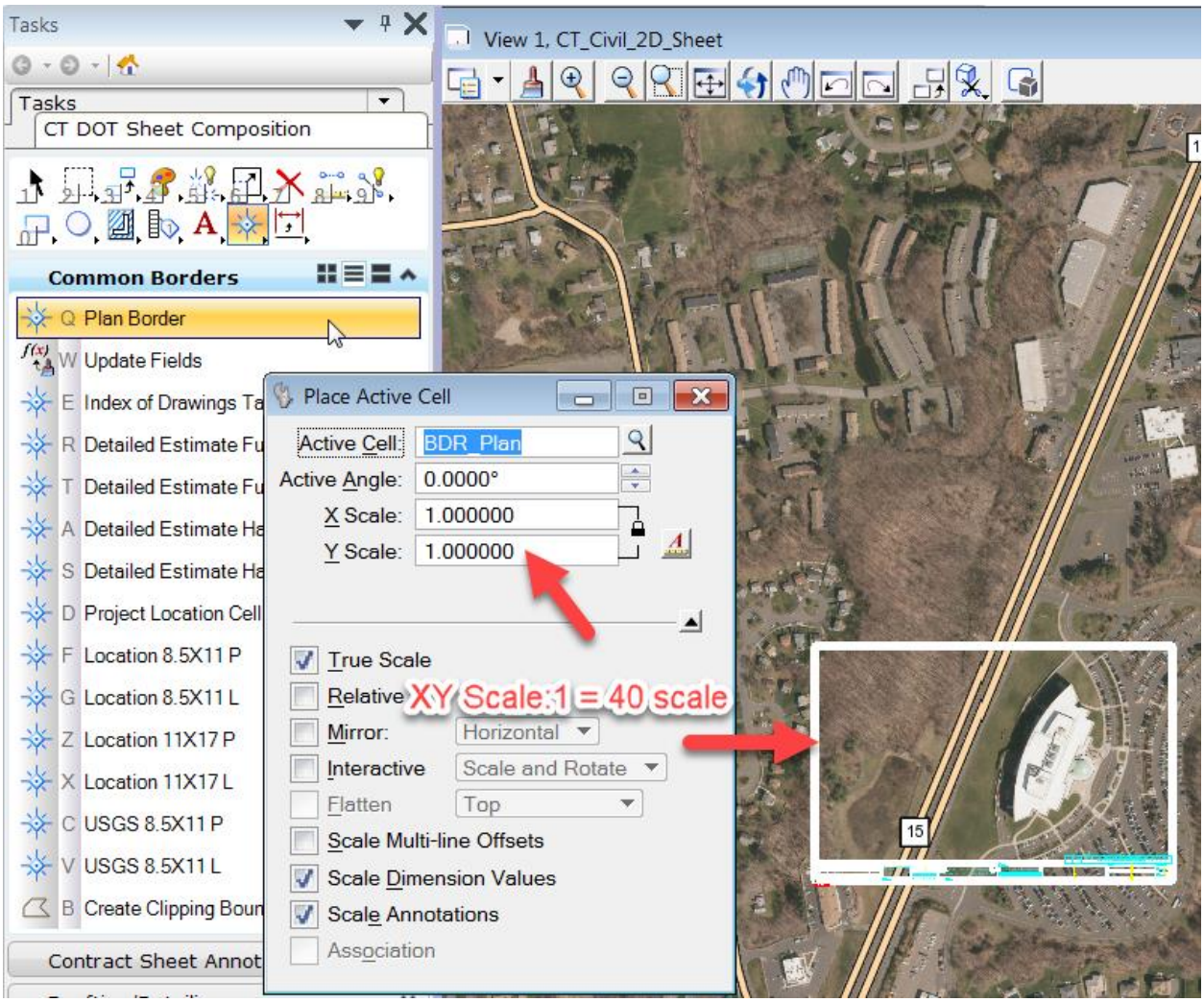
2. Reference the 3D Design file (which you created from Section 2) using Live Nesting and a Nesting Depth of 1 to include the referenced design file which contains the WMS files. Ensure that Visible Edges is set to Dynamic.



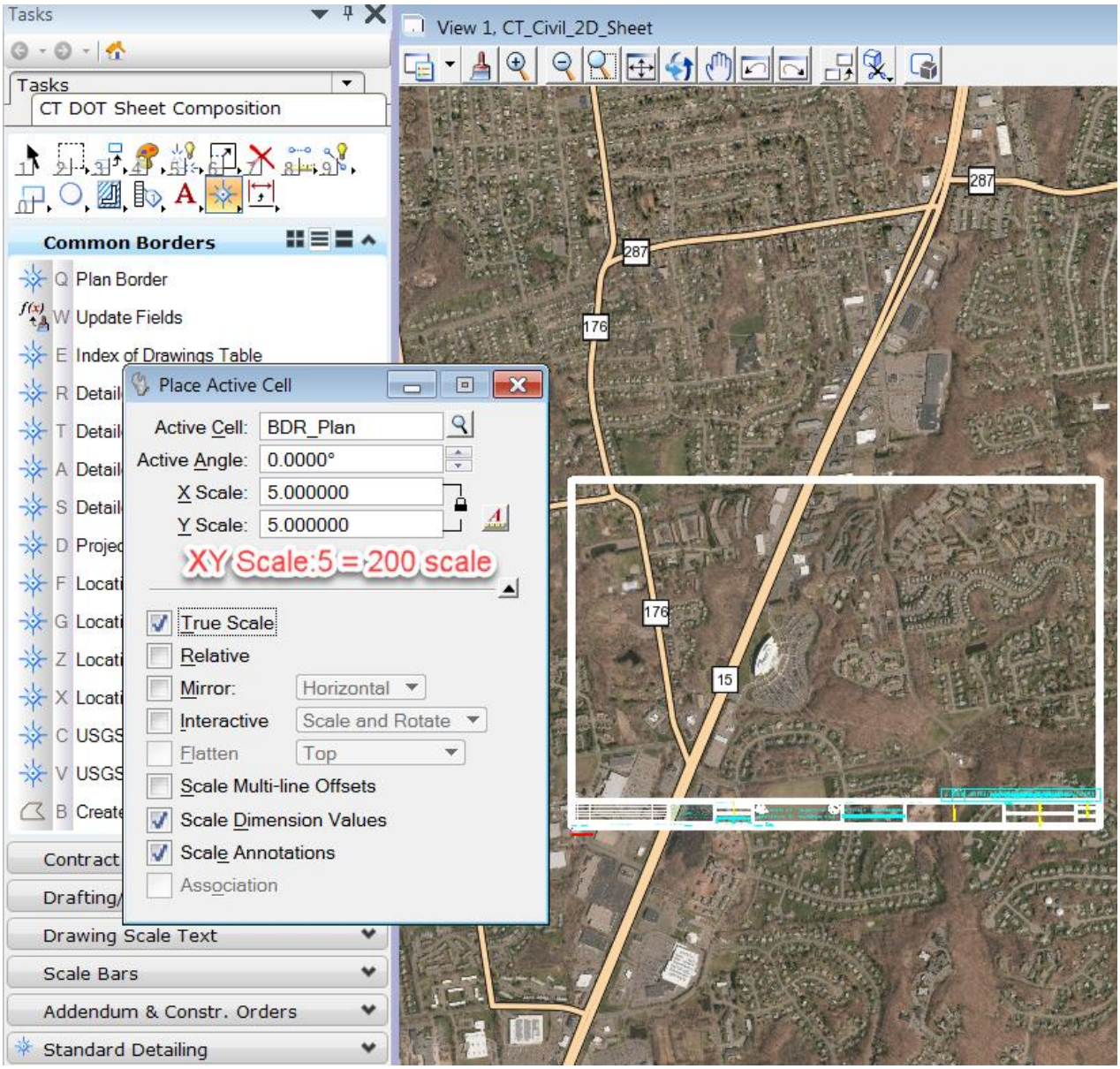
[Note the hierarchy in the following image: the active sheet file references a 3D design file which references the Ortho design file with attached WMS files]



3. Using the CT DOT Sheet Composition tasks, place a Plan Border cell. Use an active X&Y scale of 1 if your desired scale is 40. [Note: Network environment cells are based upon 40 scale or 480:1]



4. In the example below, an active scale of 5 will yield a 200 scale plot border (5x40 scale=200 scale).



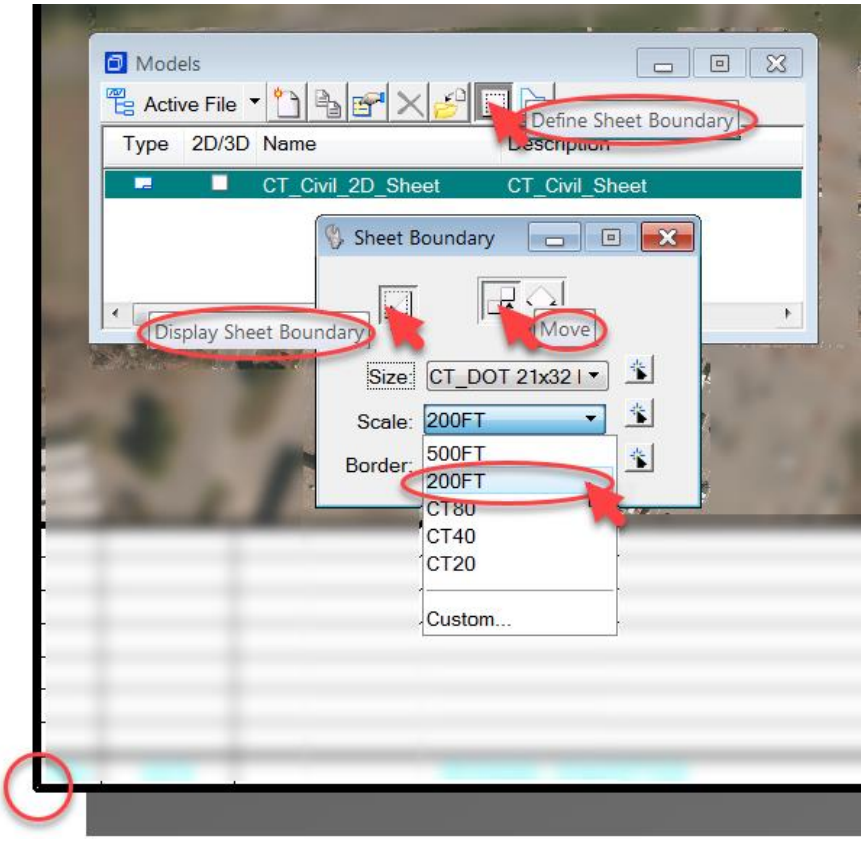
5. Set up the Sheet Boundary (transient shape) for the sheet model as shown:

    a. Define Sheet Boundary

    b. Display Sheet Boundary

    c. Move the Sheet Boundary to the lower left border corner

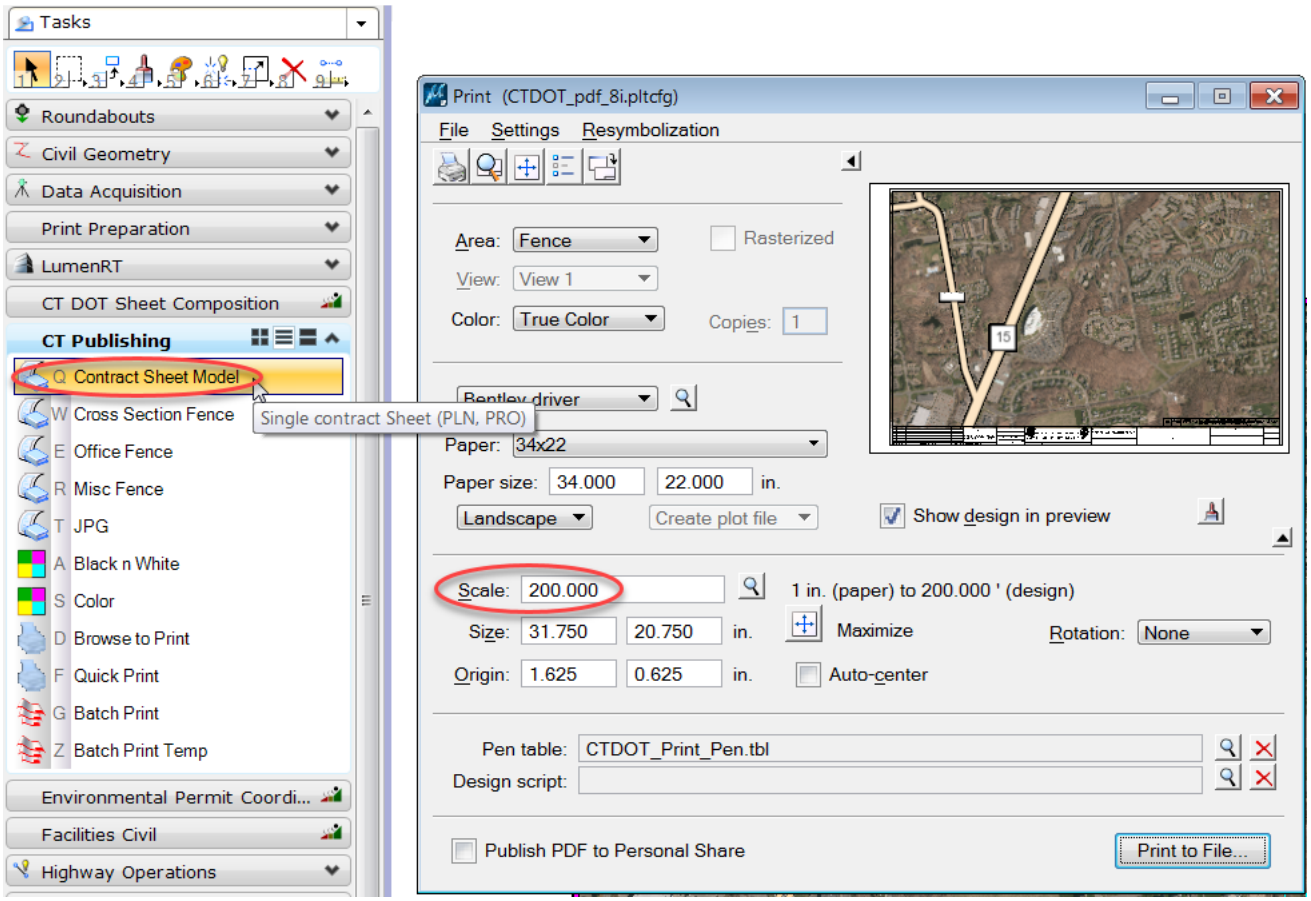
    d. Choose the proper Sheet Boundary Scale if applicable



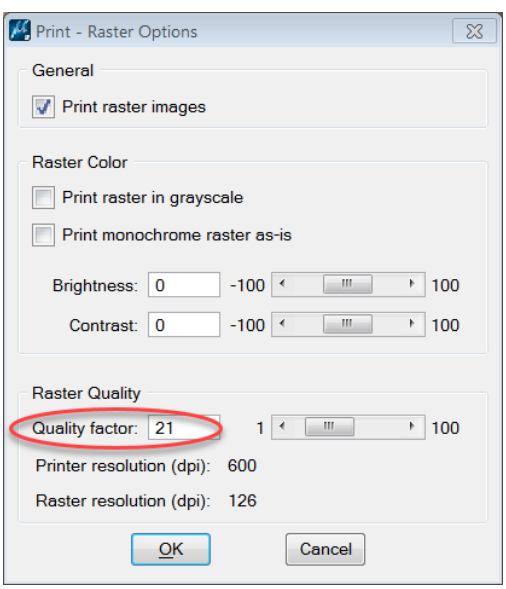
6. See also Section 2.3 Clip WMS Reference File

4.2 PDF Publishing

1. Use the CT Publishing task to select the Contract Sheet Model. The Print dialog will appear:



2. Published Raster Quality has been preset to 21% to accommodate WMS. This can be adjusted using the Print dialog Settings menu. This quality is a good balance between PDF/plot resolution and the time it takes to create the PDF. NOTE: current processing time is approximately one minute per sheet.



Section 5 Appendix

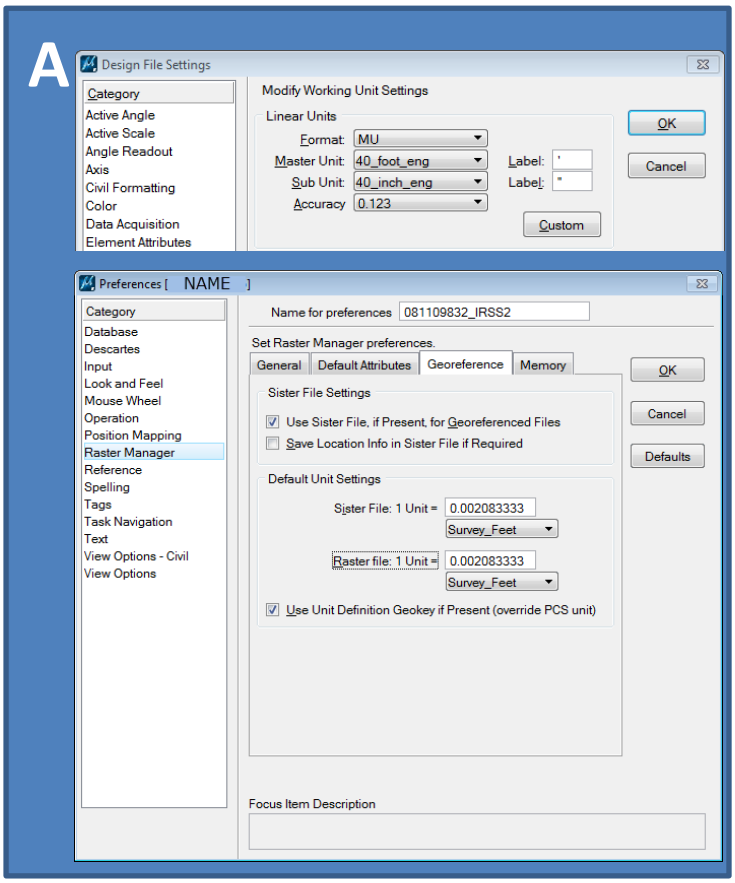
5.1 Adjust Raster Manager Unit Settings

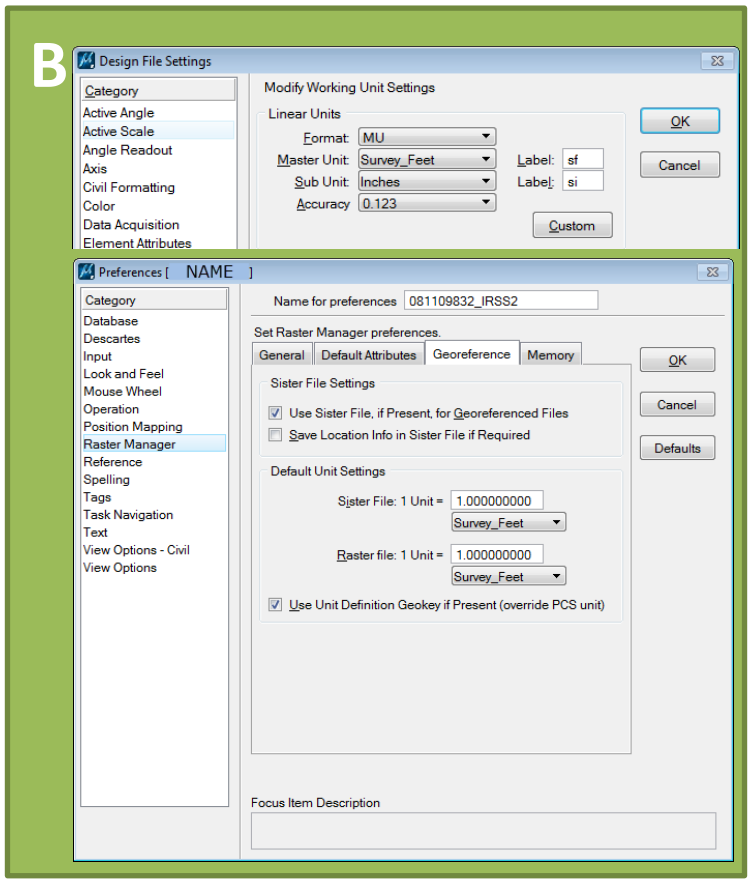
Your User Preference, Raster Manager default Unit Settings will need to be adjusted at times to account for the type of file being used when attaching geospatial raster images. This needs to be adjusted only if you are attaching raster files directly into a dgn file using the Raster Manager. In this workflow we only attach raster's directly to Geospatial files, so the setting should follow row B in the table below.

1. Navigate to *Settings > Design File* and make note of your settings.

		Design File Working Units	User Preference Raster Manager Georeference Sister File: 1 Unit	User Preference Raster Manager Georeference Raster File 1 Unit
A	Custom Unit File	40_foot_eng	.002083333	.002083333
B	Geospatial File	Survey Feet	1	1

2. Navigate to *Workspace> Preferences…*
3. The Preferences window will appear. Select the *Raster Manager* category and click the *Georeference* tab. Set the Sister file and raster file units. After entering the Unit values, click **OK** on the Preferences Dialog box, and select and *File > Save Settings* from the MicroStation main menu.





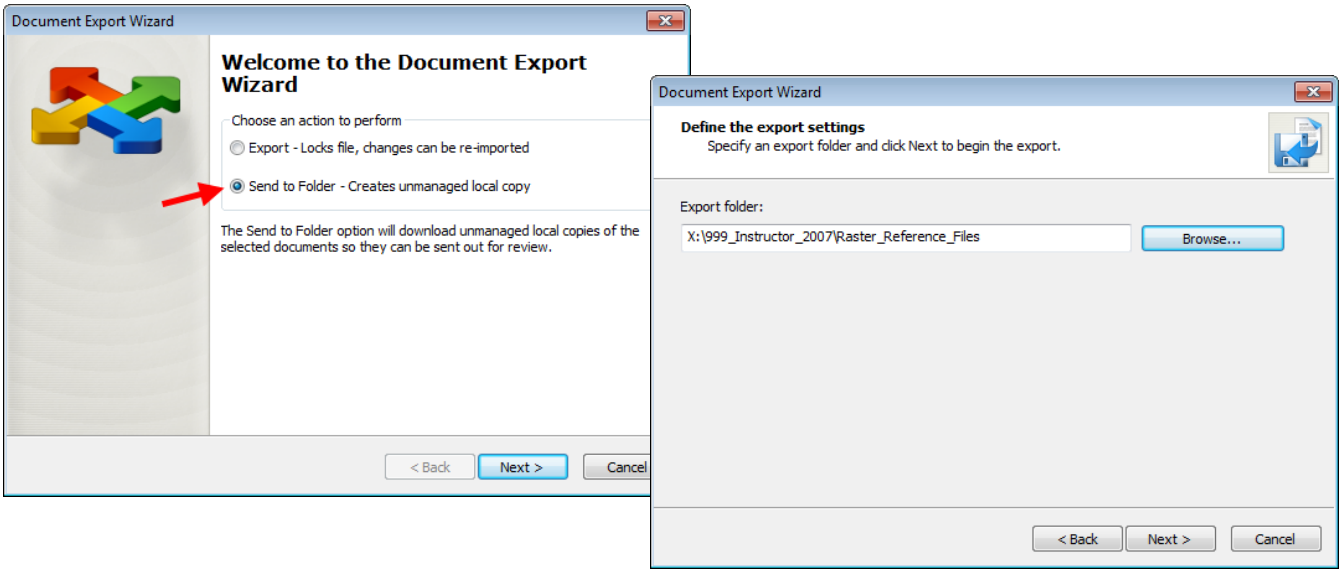
5.2 Reference Exported ProjectWise MicroStation Files

User may have MicroStation files with aerial photos or USGS maps attached that are housed in ProjectWise that need to referenced into a file on the network. Users will need to extract these files out of ProjectWise and copy them to the needed network location.

3. In ProjectWise Explorer right click on the MicroStation Dgn file(s) that you would like to export and select **Export**.

4. On the Welcome Dialog box make sure **Send to Folder** is toggled on and click the **Next >** button.

5. On the Define export settings dialog box click **Browse**. Browse to the needed external network location and select **OK** on the Browse to Folder dialog box. Click **Next>** and **Finish**. This will export the MicroStation file along with all rasters and reference files that are attached.



6. **DO NOT ATTEMPT TO OPEN THE EXPORTED PROJECTWISE DGN FILE THROUGH ACCOUNTING.** Access MicroStation through Accounting and open an existing native network DGN file or create a file from the W drive seed files:

   Designer Users:
   W:\Workspace\Standards\seed\CT_Design_3D_V8i.dgn
   W:\Workspace\Standards\seed\CT_Design_2D_V8i.dgn
   Survey Users:
   W:\Workspace\Standards\seed\SV_Survey_3D_V8i.dgn
   W:\Workspace\Standards\seed\SV_Survey_2D_V8i.dgn

7. Reference the exported ProjectWise DGN file using a scale of 1 to 1.