

The Deal with Geo-referenced Images

Ok, so you have Civil 3D 2010 (or Map 3D 2010) and you've got an aerial photo you'd like to slide into your drawing at the correct spot on Earth.

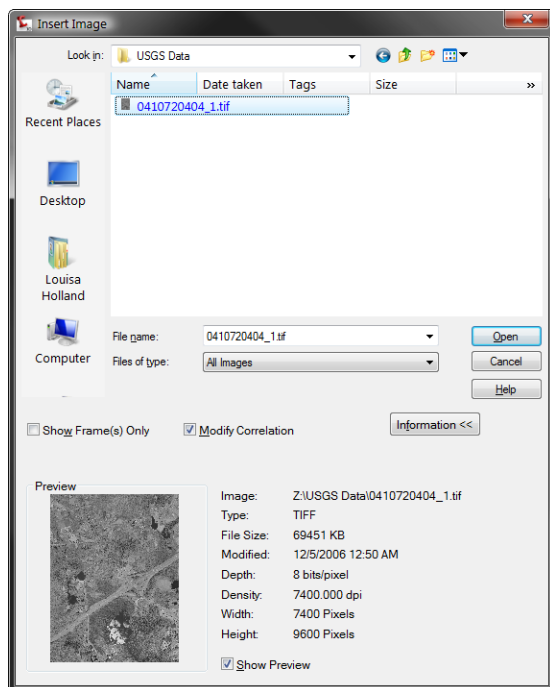
How you proceed depends on your situation.

Situation 1 (The easiest scenario): *Your drawing and the image are in the same coordinate system and have the same units.*

For example, your drawing is in state plane NAD83 feet and so is your tiff image! Woohoo!

Use **MAPIINSERT**.

Note: the Map Image Insert command will **NOT** transform the coordinates or units of an image if they differ from the drawing coordinate system or units. Be aware of the difference between US feet and International feet.



1. Type **MAPIINSERT** at the command line.
2. Browse to the location of your image file.
3. Click **OPEN**.

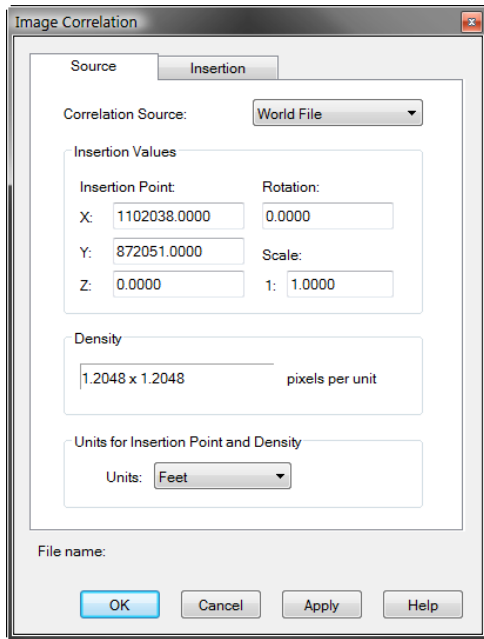


Figure 1

The tiff image I use in this example came with a TFW file. The TFW is called a World file and tells the software the correct units and insertion point for the image.

Some files such as GeoTiffs or SID files have this information imbedded in them and therefore do not need a separate World file.

4. Verify the insertion point is correct, and then click **OK**.

The image is now in your drawing and can be manipulated in CAD as any other raster image.

Situation 2: Your drawing and image are in different coordinate systems or have differing units.

For instance, your DWG is in a local coordinate system, such as NAD83 Connecticut State Plane, US Foot, but the image you are importing is in UTM-meters!

The next question you need to ask yourself is, “Am I going to end up plotting this image?”

If your answer is, “No, I’m just attaching it for reference” proceed to the instructions 2-a.

If the answer is, “Yes!”, proceed to instructions 2-b.

Situation 2-a: You are connecting to an image with a different coordinate system from your drawing and you don't need to plot with the image showing.

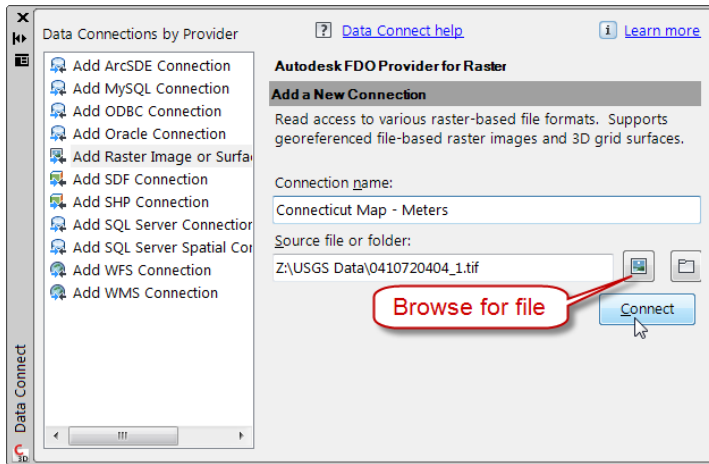


Figure 2

1. At the command line type **MAPCONNECT**.
2. Highlight the **Add Raster Image or Surface** on the left side of the dialog box.
3. Give the connection a name (if desired).
4. Click the blue Browse button to find the file.
5. Click **Connect**.

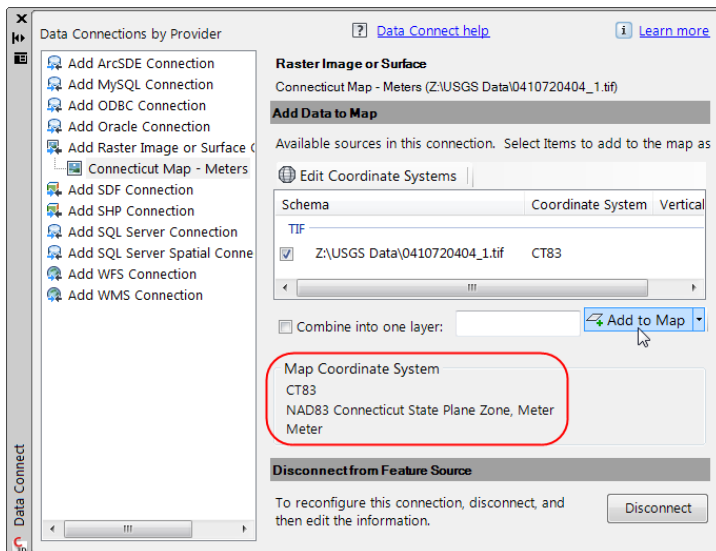


Figure 3

6. Civil 3D (well, really, the Map underpinnings...) will have picked up the coordinate system, units and report them in the data connect window.
7. Click **Add to Map**.

The image is now in your drawing. However, it will not behave like a traditional raster image in many ways. You can't add an image clips, adjust the transparency or adjust contrast and brightness on the image. Aerial photos connected in this manner may not plot as expected. If you are plotting, you'll need to proceed to 2-b.

Situation 2-b: Coordinate systems or units differ, and you need to plot the image.

This method requires the most steps, but yields the best results for attaching a geo-referenced image into Civil 3D. Once these steps are complete, the image will be in the correct location, you will be able to use image clip, transparency and adjust brightness and contrast. You will also get the best results when plotting a file attached in this manner.

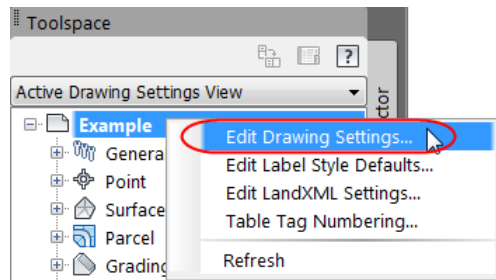


Figure 4

1. Start a “dummy” DWG and set the drawing coordinate system to the same coordinate system as the image file. To set this go to **Settings > Right-click the drawing name > Edit Drawing Settings**
2. Set the coordinate system on the **Units and Zone** tab by setting the category first, and the Available coordinate systems second. Click **OK** to dismiss the Drawing Settings Dialog box.
3. Use **MAPIINSERT** to insert the raster image into the drawing as described in Situation 1.
4. Save the “dummy” drawing and close it.
5. In your project drawing, verify that your coordinate system is correct (follow steps similar to 1 and 2 to set the project drawing’s coordinate system).

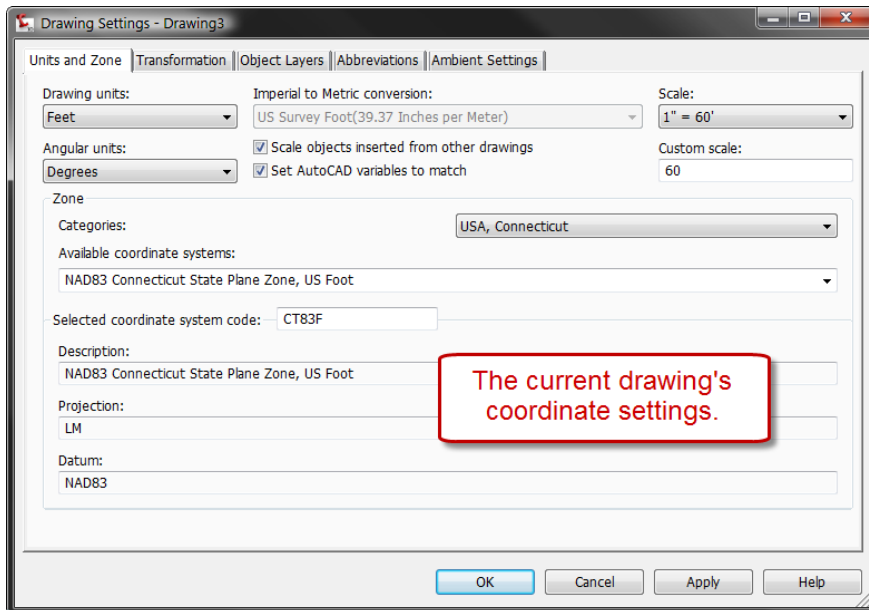



Figure 5

6. Switch to the  workspace.

(Civil 3D 2009 or earlier users can switch to the Map Classic workspace or type **MAPWSPACE** to access the tools we will need to continue.)



7. From the Home tab, click **Attach**.

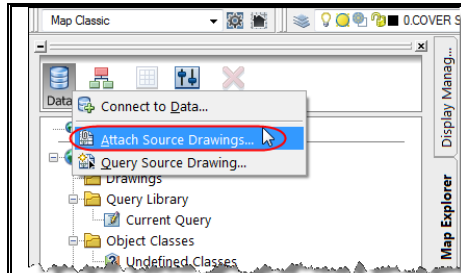


Figure 6

Note: If you are in Civil 3D 2009 or earlier, click **Data > Attach Source drawings** from the Map Task pane.

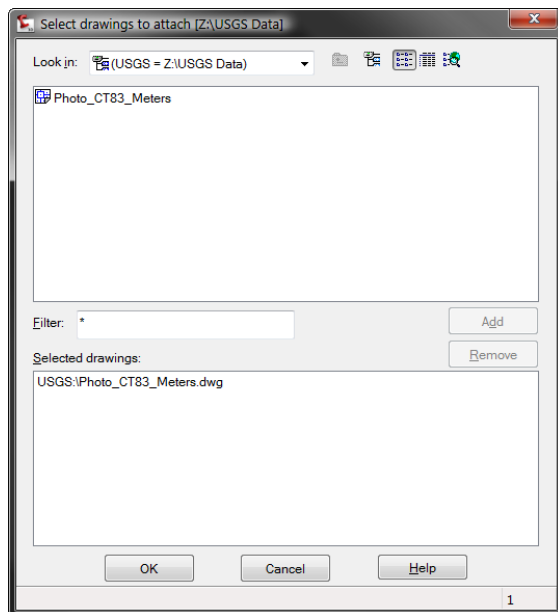



Figure 7

The next screen you will see is where you will browse to attach the “dummy” drawing.

By default, your C drive is the only drive the program can see.

8. In this example, my file is on a different drive, so I'll need to hit the **Create Drive Alias** button. 

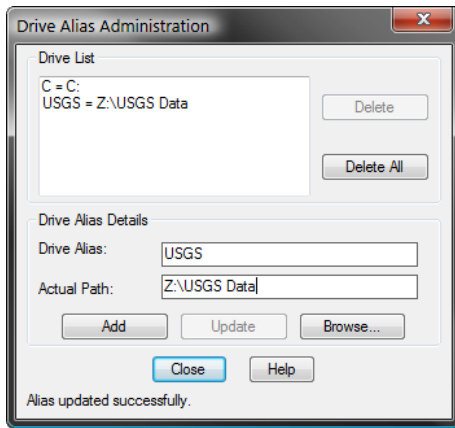


Figure 8

9. After Hitting the **Create alias** button I will type in the name I wish to call the drive.

In this example I called it USGS.


10. For the Actual Path, click **Browse**, and then select the path to the drive where your images are stored.

11. Click **Add**.

12. Click **Close**.

13. Back in the Select Drawing to Attach dialog box (Figure 7), browse to select the drawing and click **Add**.

14. Click **OK**.

15. From the Home tab click **query**.  (In Civil 3D 2009 or earlier, type **ADEQUERY**)

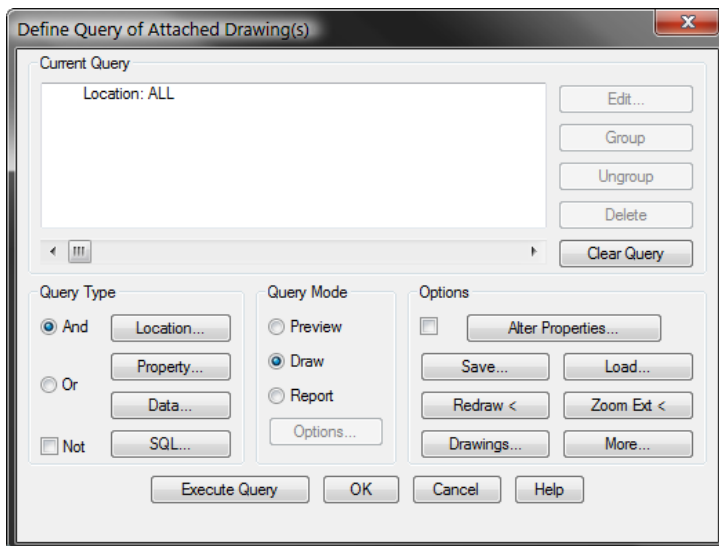
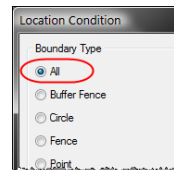


Figure 9

16. Click the location button.



17. Set the boundary type to **All** and click **OK**.

18. Back in the Define Query of Attached Drawings dialog box (Figure 9) set the query mode to **Draw**.

19. Click **Execute Query**.

20. Zoom extents in your drawing and you should see the image.

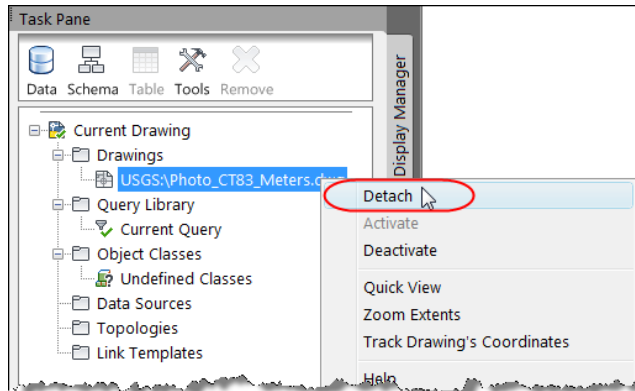


Figure 10

The last step in this process is to detach the “dummy” from your main project. You will need to bring up the Map task pane to do this.

21. Right-click on the name of the drawing from the Map Explorer tab.
22. Select **Detach**.
23. Save the drawing and proceed as normal.

Other Tidbits Related to Geo-referenced Images and Drawings:

- **Set your coordinate system in your main project drawing right away.** Make sure this is set before you import survey data or images.
- **Never, ever change coordinate systems partway through a project.** Civil 3D will not transform objects that are already placed in the drawing.
- **Never, ever change drawing units partway through a project.** If you need to convert a drawing from meters to feet, start a new drawing in feet and insert the metric drawing as a block into the new drawing. AutoCAD will recognize the difference in drawing units and automatically scale objects for you.
- **In order to insert SID image files, you will need to install the Raster Design Object Enabler.** This will activate a whole horde of file formats that do not come with Civil 3D “out of the box.” Go to www.autodesk.com to search for the free object enabler.