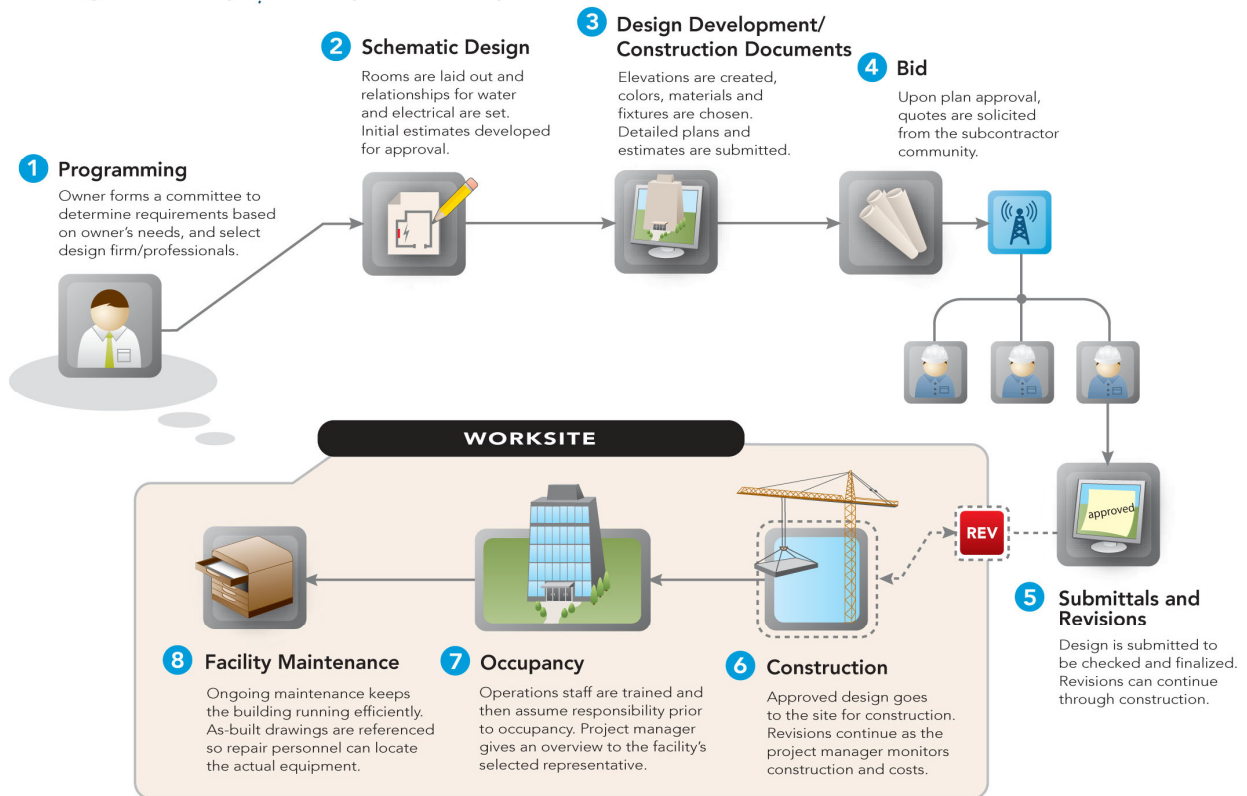


Revit and Civil 3D Interoperability

BIM in Architecture and Engineering

Autodesk defines Building Information Modeling (BIM) as “the creation and use of coordinated, consistent, computable information about a building project in design and construction.” To successfully implement BIM, a company must consider not only the technology, but also people and processes. As BIM becomes more prevalent in the AEC industry, processes are changing to encompass a cross-disciplinary design workflow including civil engineering, mechanical systems and construction.

Building Industry / Project Lifecycle



From conceptualization through the final turnover of the project to the owners and tenants, Autodesk has software programs for all phases. The interoperability of these applications is continuously maturing. Autodesk has responded to industry demand for greater compatibility between applications by focusing on development in the vertical products. An immediate need is the ability to allow civil engineers and architects to work concurrently with Civil 3D and Revit Architecture.

Whether in schematic design or design development, architects require the definition of the site topography. Using surface elevations imported from Civil 3D, the architect can begin his project with an accurate representation of the proposed site. Civil 3D and Revit are both parametric platforms, therefore enhancing each other when used in tandem.

Changes in design are inevitable. Adding a reference to corresponding intelligent models improves the designers' ability to react to changes throughout the project lifecycle. Civil engineers and architects can exchange their respective designs using the Import/Export tools.

This white paper explains some of the basic interoperability between Civil 3D 2009 and Revit Architecture 2009. This paper assumes the user has a solid understanding of manipulating AutoCAD Civil 3D objects and AutoCAD functions, as well as a basic understanding of the Revit platform.

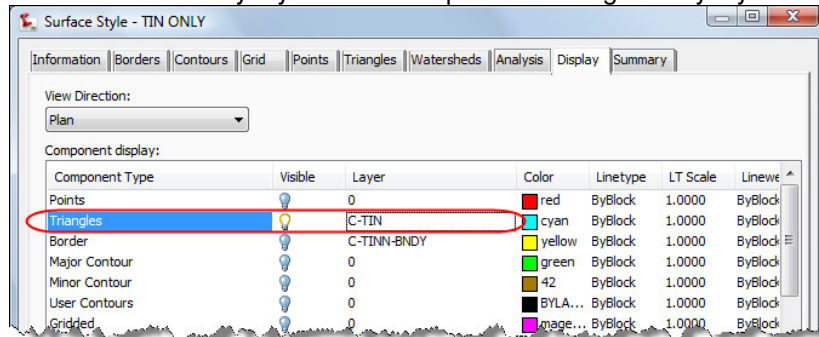
Civil 3D 2009 and Revit Architecture 2009 Compatibility: Part 1

Exporting a Civil 3D Surface to Revit

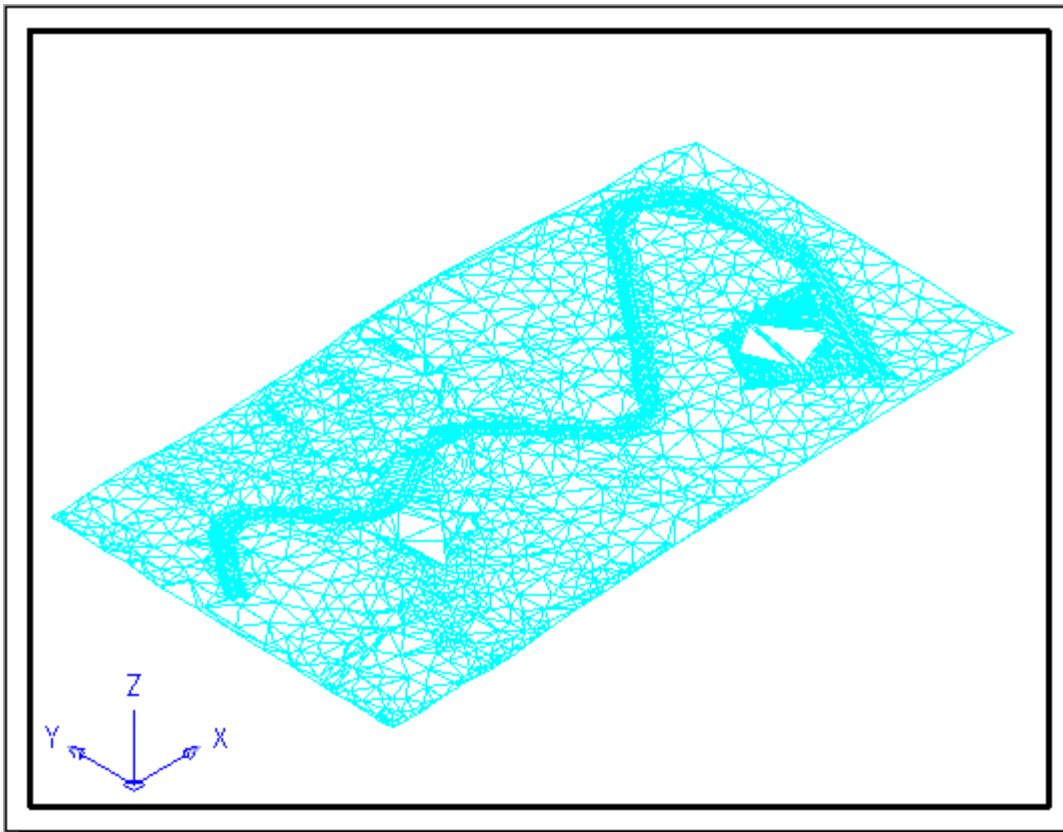
You are an architect using Revit Architecture 2009. Your civil department has a surface they created in Civil 3D 2009. You need their grading plan to locate a building. The following instructions will guide you through creating a Revit Toposurface from a Civil 3D TIN Surface.

In Civil 3D 2009:

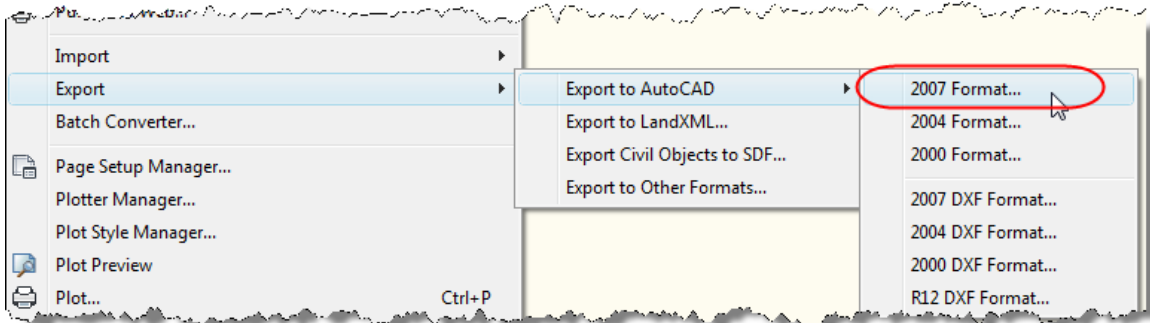
1. Set the surface's style you wish to export to a triangles only style.



The layer on which your triangles appear in the Civil 3D surface style, will be the layer that they will be on when importing into Revit.



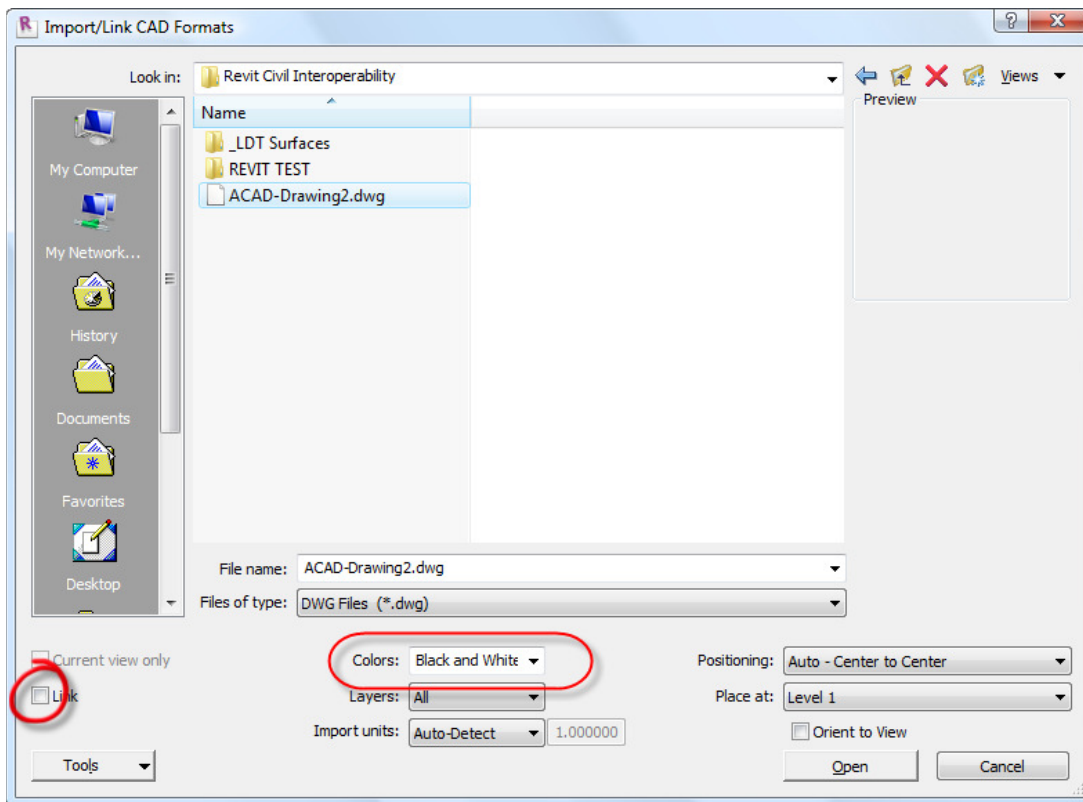
2. Next, create a Layout with a viewport showing the surface in isometric view.



3. Export the file as an AutoCAD 2007 format using **File > Export > Export to AutoCAD > 2007 Format...**


4. *In Revit 2009:*

Open a 3D View, create, if not already in the Project Browser:



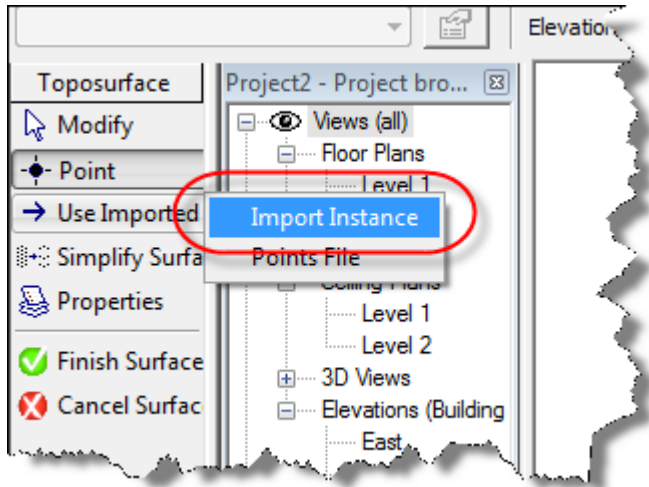
5. Go to **File > Import/Link > CAD Formats**. Browse to the exported file. Make sure Link is *not* checked. Set the import colors to **Black and White**. Click **Open**

6. Type ZE to zoom the entire surface into view

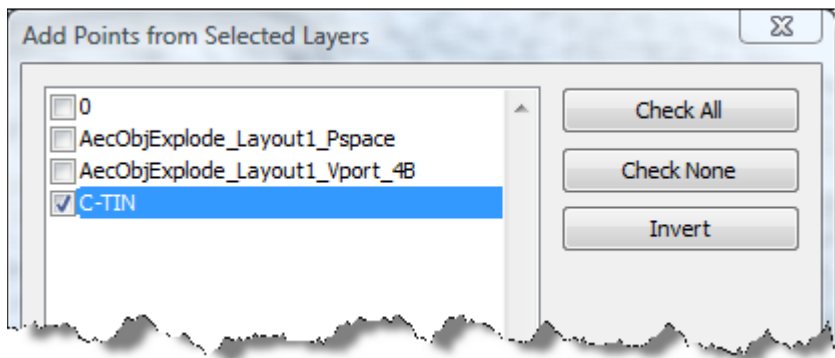
7. In the **Site Design Bar > Toposurface**  Toposurface

You will now be directed to the **Sketch Mode**.

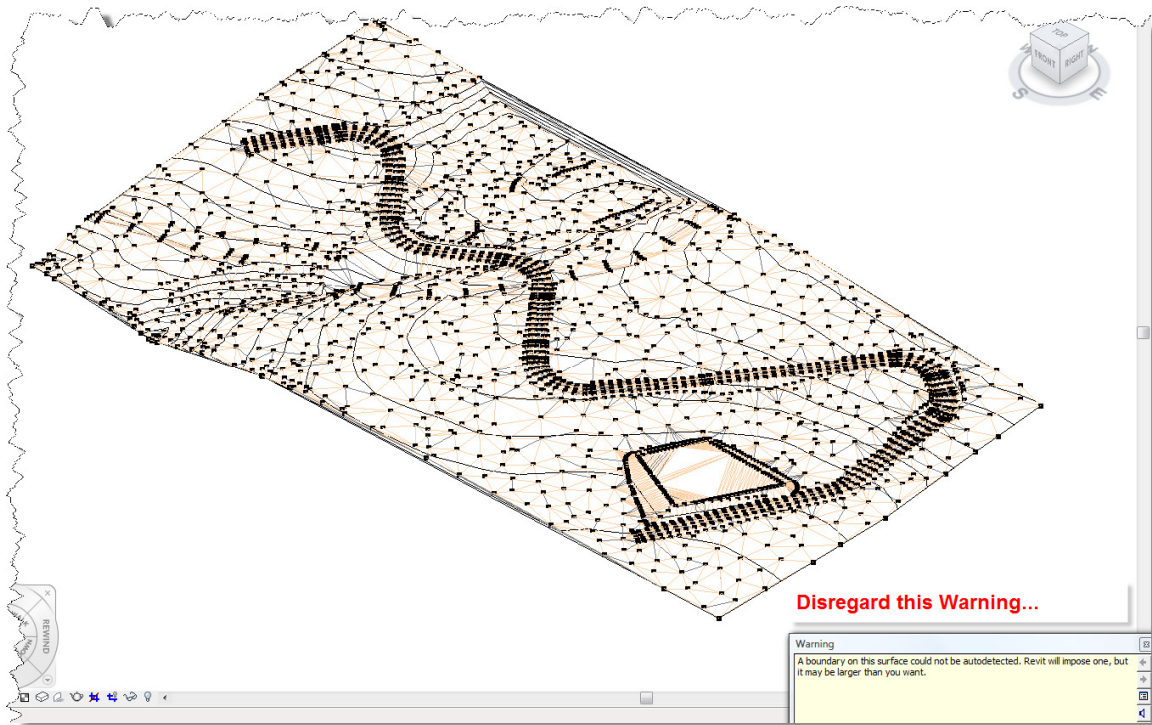
8. Click on **Use Imported > Import Instance**



9. Select the imported dwg file. A dialog will pop up asking you to select the correct layers. (The selection will be different for each client, depending on the Layers of the civil engineer.)

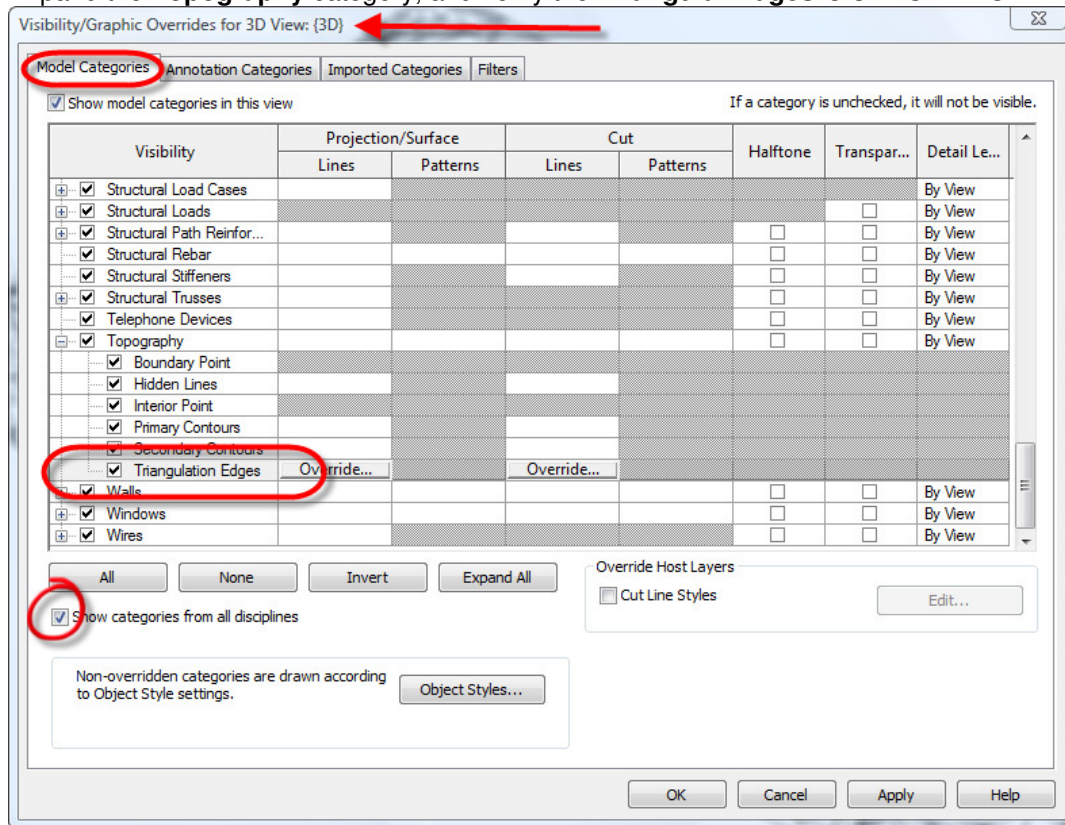


10. Click **OK**. If it looks correct, click **Finish Surface**.



Note: If you cannot see the Toposurface, and can only see the imported dwg file, open the Visibility/Graphics Dialog Box:

In the **Model categories** tab, make sure **Show categories from all disciplines** is selected. Expand the **Topography** category, and verify the **Triangular Edges** is CHECKED ON!



Civil 3D 2009 and Revit Architecture 2009 Compatibility: Part 2

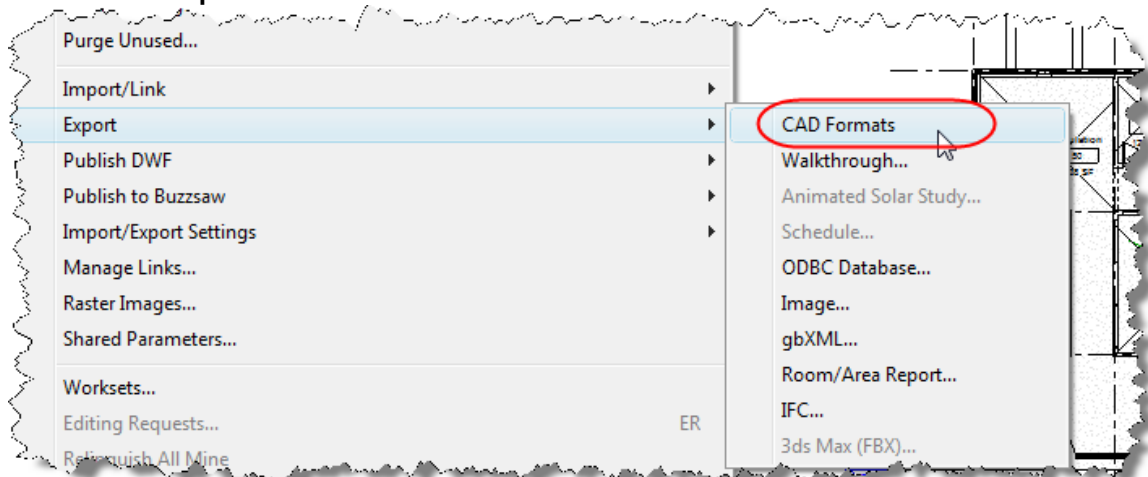
Revit Design to Civil 3D 2009

You are a civil designer working with an AEC firm and you want to make sure the building pad you designed will work with the building the architects designed in Revit Architecture 2009.

Note: It's important to get a simplified version of the project. A complex Revit structure can be a large file size. Minimizing the file size will increase performance when manipulating the building in Civil 3D. Try to obtain an exterior only version for use in Civil 3D.

1. From Revit, export the building to DWG format.

Select **File > Export > CAD Formats**.



You are then prompted to save the file.

2. Open the exported building in Autocad. Delete any unnecessary objects such as interior fixtures or furniture. Simplify it as much as possible.
3. If possible, figure out where this drawing lies in space. We will ultimately be inserting this as a block, so figure out where 0,0,0 is located. If it does not correlate to your coordinate system (and it probably won't) use a combination of the INSBASE command and/or MOVE to get this where you want it. In this example, the insertion base point was set to 0,0,0 and then the drawing elements were moved so that the lower left building corner was also at 0,0,0.

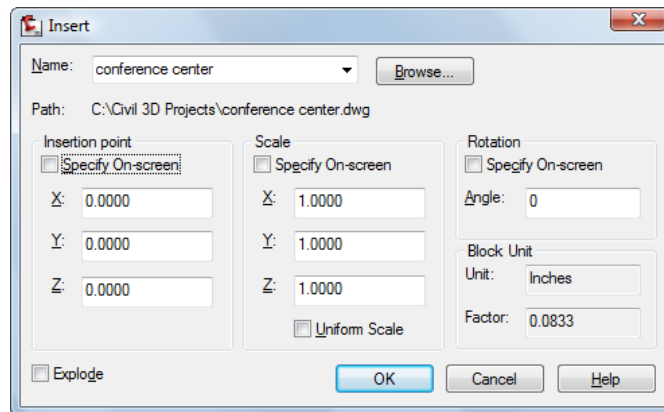
Now we're ready to save and close the architectural DWG and open up the civil project where this will sit.

In Civil 3D –

4. Insert the drawing as a block.

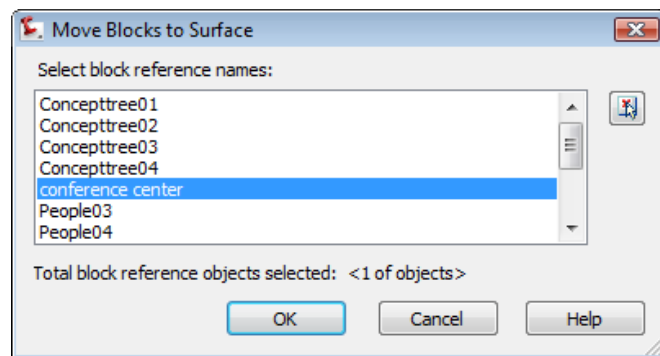
Do not explode the object at this time.

5. After the block is inserted you will likely have to move it to the correct location in the XY plane.



Once the Revit building is in the site we can use some new Surface utilities to lift it in the Z direction.

6. Go to **Surfaces > Utilities > Move Blocks to Surface...**
7. Select the Revit block.
8. Click **OK**.



Once the building is in the correct location it is appropriate to explode the block. The building can now be manipulated as a native AutoCAD object.

