Modeling Pressure Pipe Within Civil 3D: How to Coordinate Piping Runs Using BIM 360

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AUTODESK. UNIVERSITY

About the speaker

SALASO'BRIEN

Senior Civil Designer for Salas O'Brien

I am senior designer within the civil engineering group of Salas O'Brien. I have been using Civ3d/LDD software for 20+ years. I enjoy learning all the utilities Civ3d has to offer, including pressure pipe and gravity piping. Our office is a multi-discipline firm where I get to use multiple products, such as Plant 3D, Revit, Infraworks. Teaching others how to enhance their workflows and manage budgets with new tools.

Why do Civil Designers make smaller mistakes?

Why do Civil Designers make smaller mistakes?

Everything we do is 1/12 the size of other disciplines!

Learning Objectives:

OBJECTIVE 1:

Learn how to create a 3D model using pressure pipe within Civil 3D. Starting with setting up the material catalog to the creating a long parts list for pipes, fittings and appurtenances.

OBJECTIVE 2:

How to modify your 3D model. Profile views, breaking the pipes to add fittings, Grips, and of course design checks.

OBJECTIVE 3:

Collaboration with BIM360, Desktop Connector – within a Civil3D environment. How current changes have made this quite a tool for office to office interaction.

OBJECTIVE 4:

Done with your design, now its on to the submittal. Sheet Sets! Sheet Set Manager

Preliminary work: Your workspace

One of the things I encounter are drawings that are done in feet/inches. One way to make sure you are in the using the correct units is to bring in aerial imagery.

You can easily bring in imagery if you are logged into your Autodesk account, and set your geographic location.

Something I use everyday are the tools shown on the longer status bar shown below.

Mapstatusbar

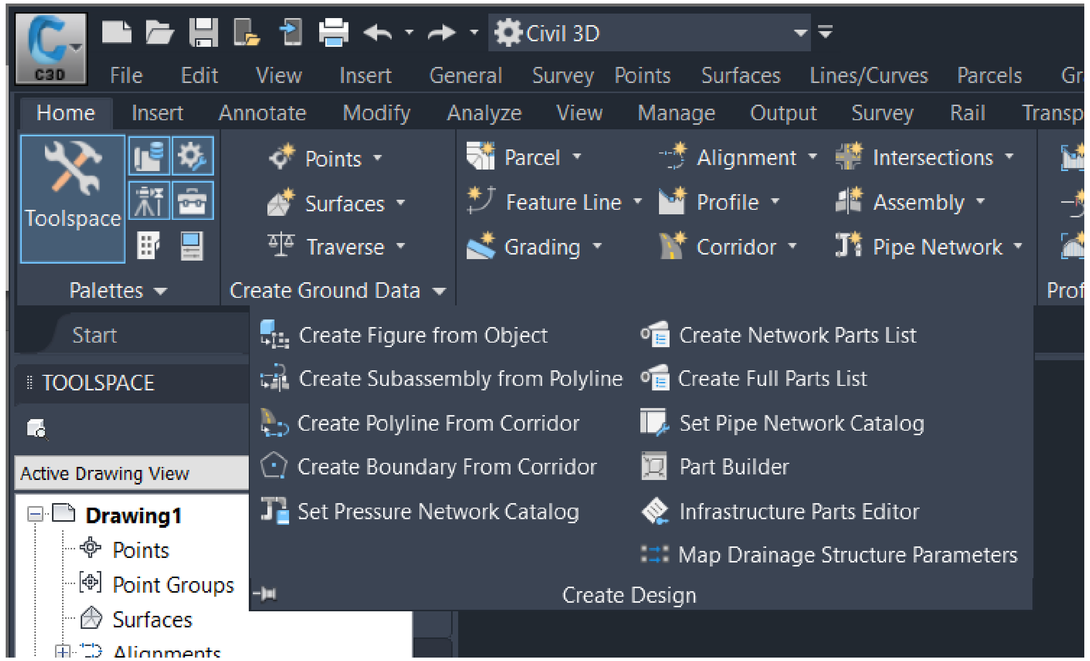
Mapstatusbar brings in the tools from map down to your status bar. One of the tools allows for the setting of your geographic location.

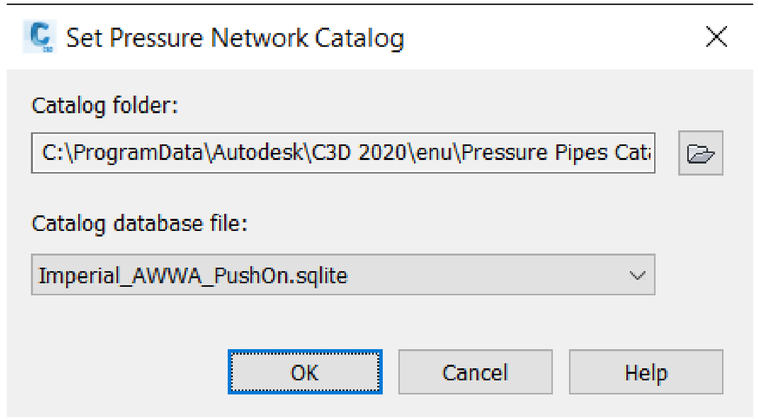
With your aerial now on, you can check your units and location are correct.

First Steps:

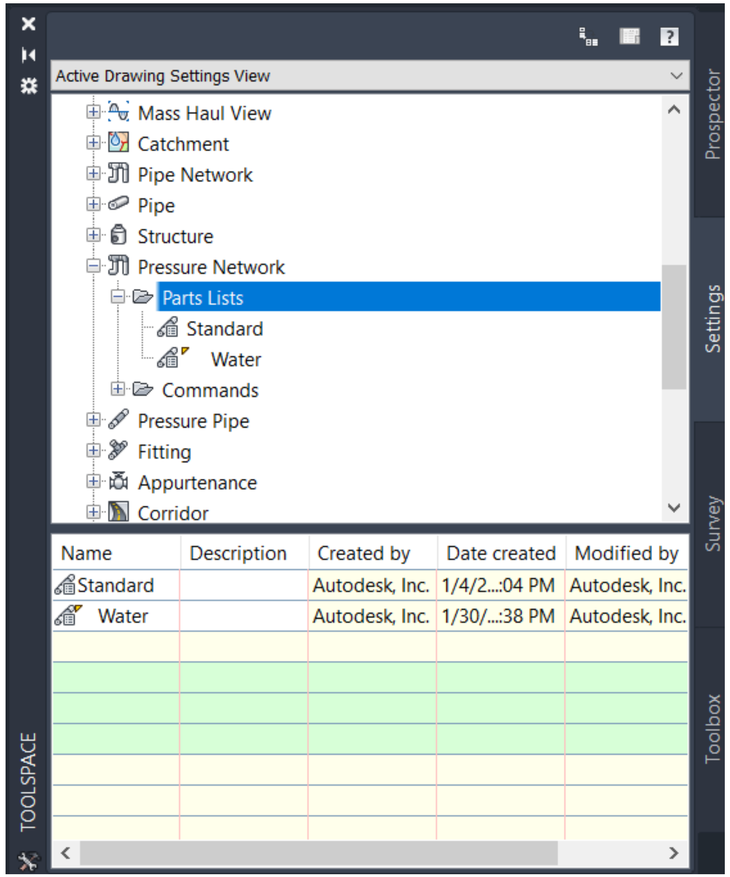
First Steps to starting your Pressure Pipe Model:

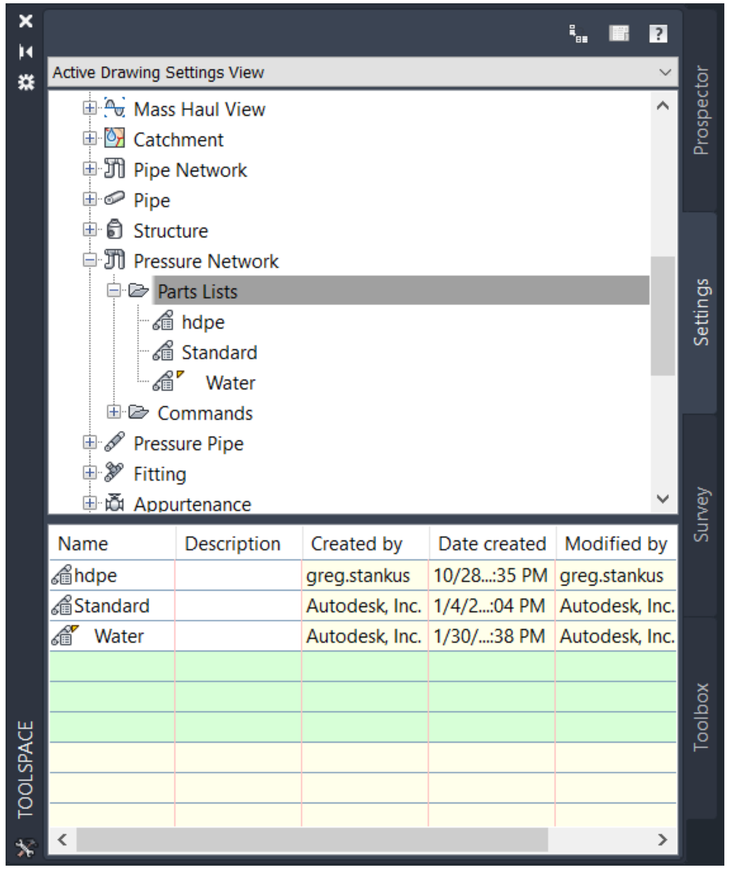
Setting up your Network Pipe Catalog:





Creating a parts list:





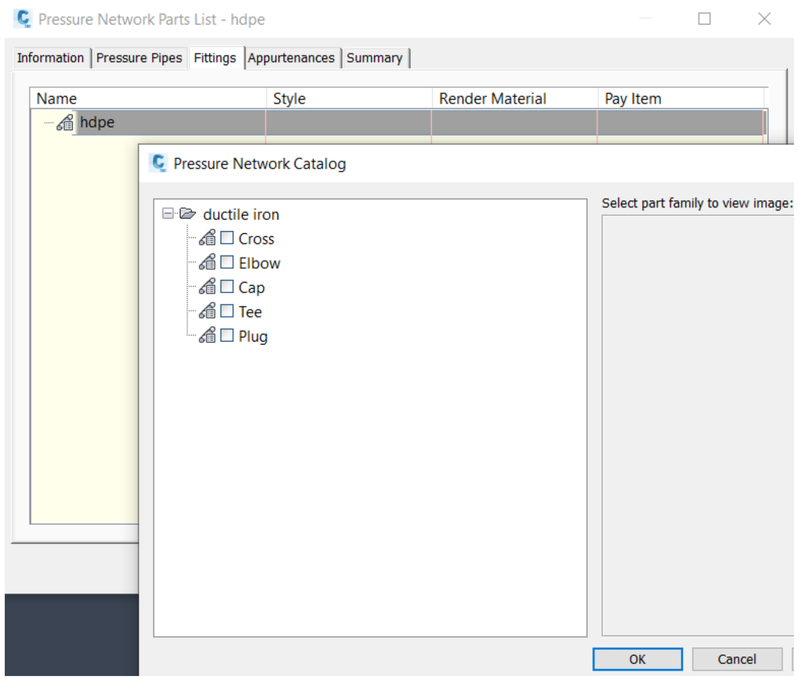
Many different types and materials are now available – metric and imperial.

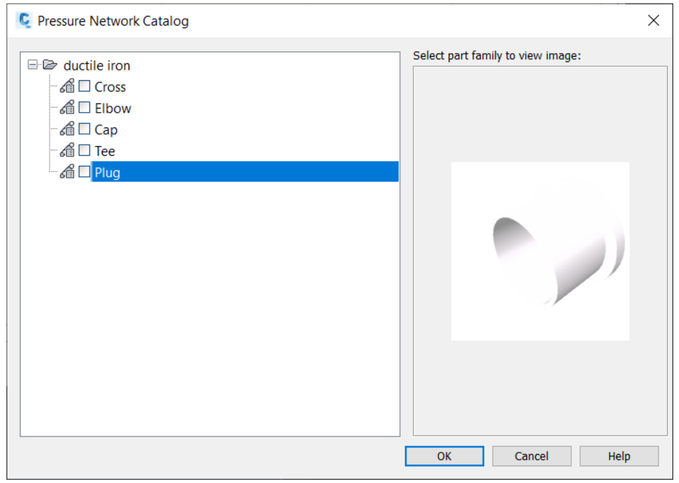
Types that are open to you: (Imperial)	Flanged	(Metric)	Push ON
	HDPE		Ductile Iron
	Mechanical		PE
	Push On		PVC
	PVC		Steel
	Steel		

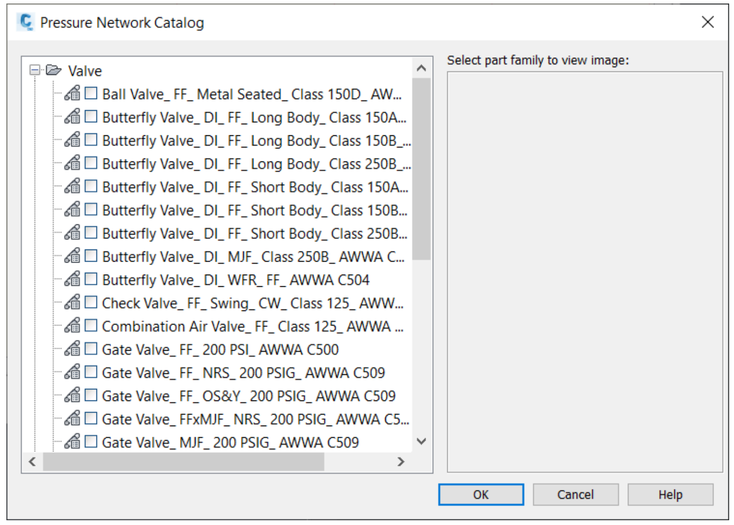
TIP:

CreatePressurePartListFull

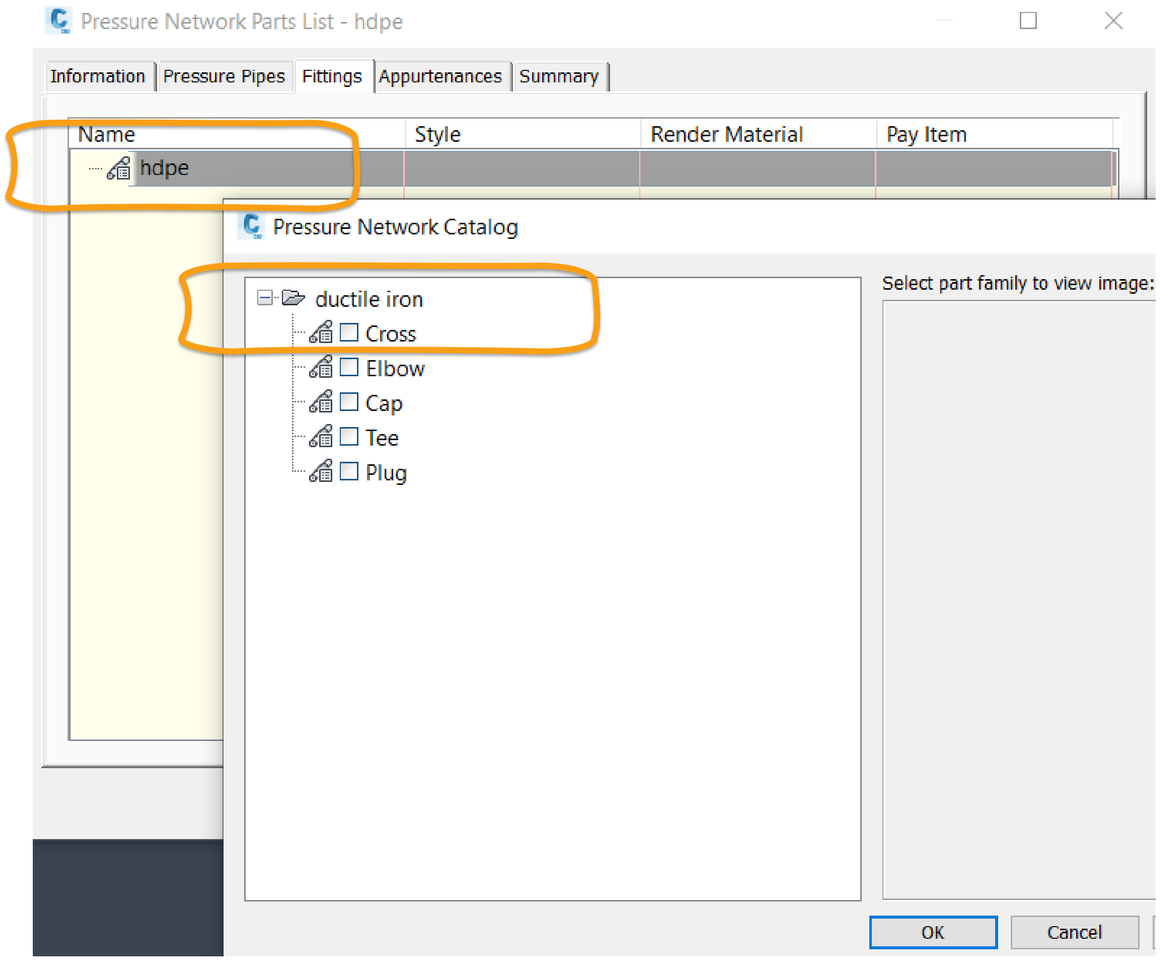
Click through the tabs of the available pipes, fittings and appurtenances:







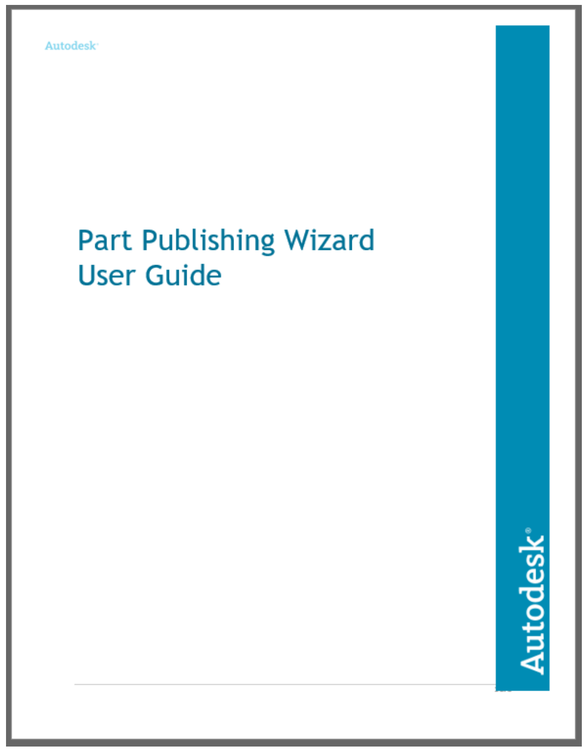
One note: even though the material you might have imported is something other than DI, your fittings will be labelled as DI..



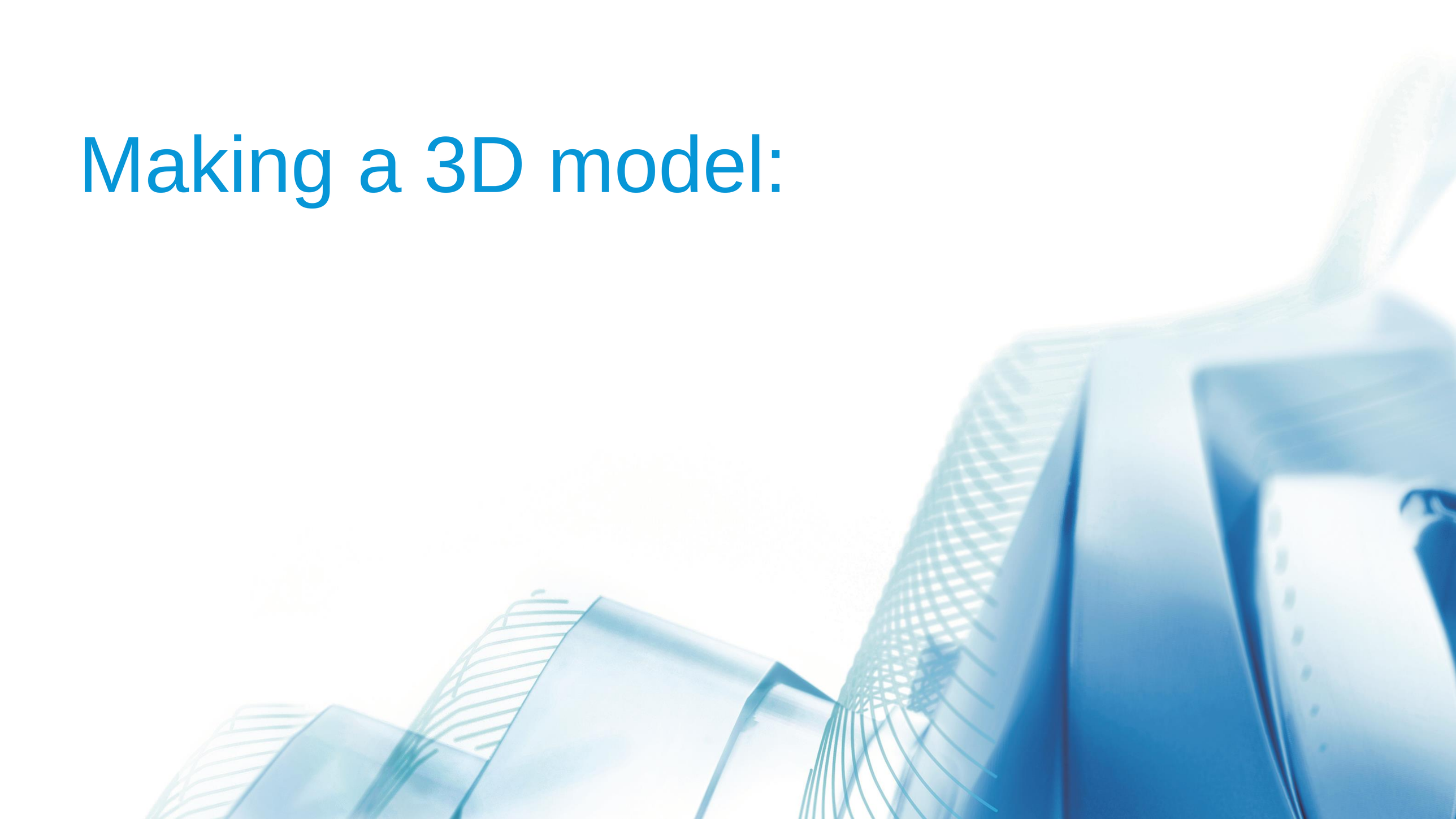
Can you make your own parts????

Parts Publishing Wizard found:

C:\Program Files\Autodesk\AutoCAD 2020\C3D\Sample\Civil 3D API\Part Publishing Wizard

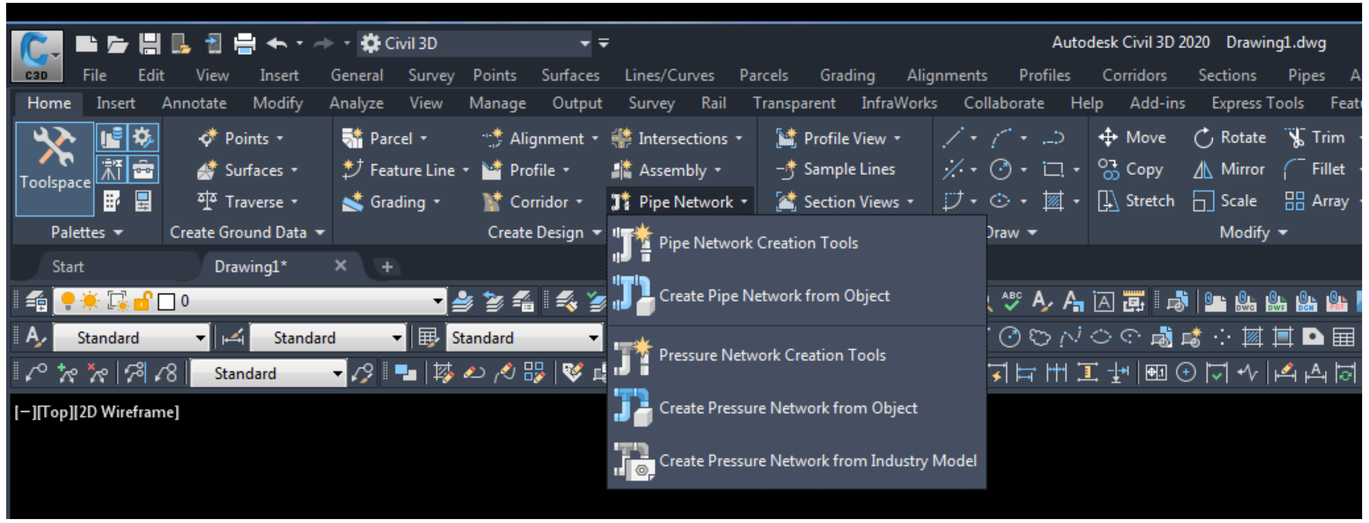


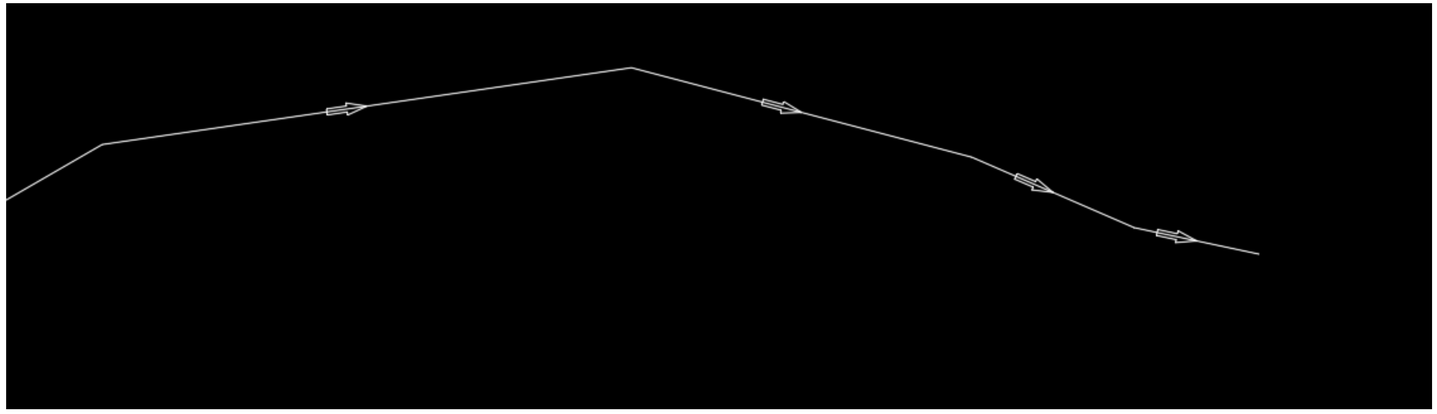
Making a 3D model:

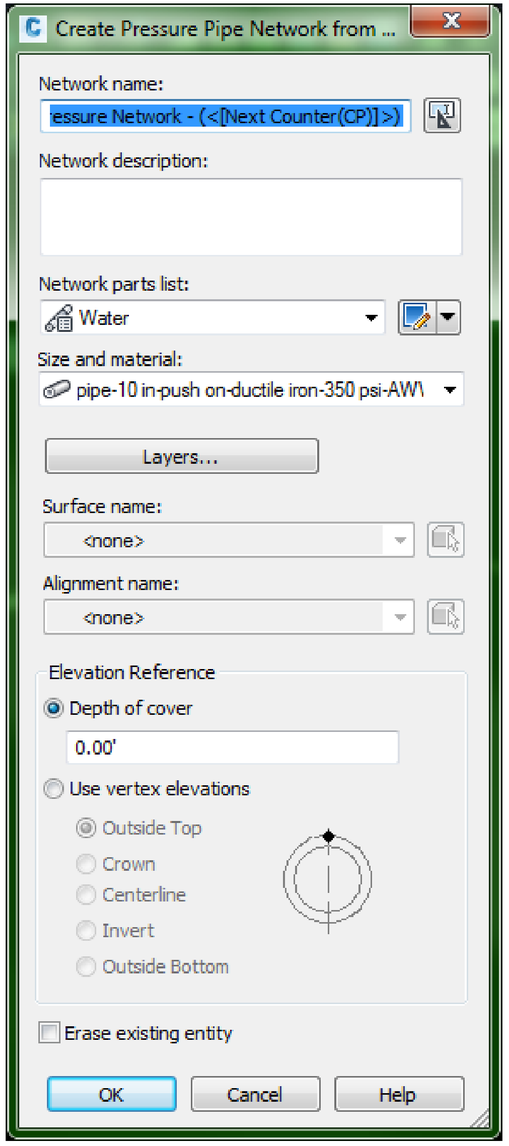


Making and Modifying your 3D model:

Creating your 3D model:

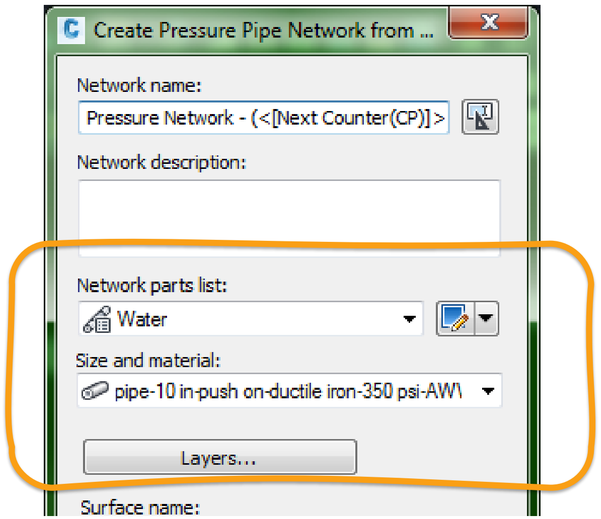


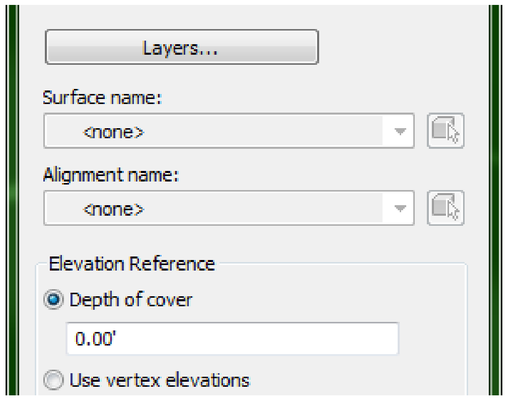


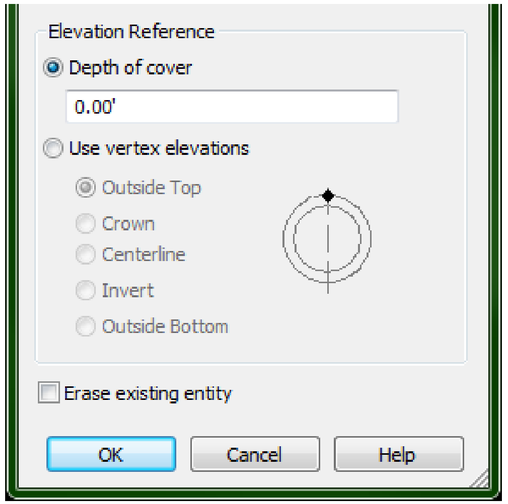


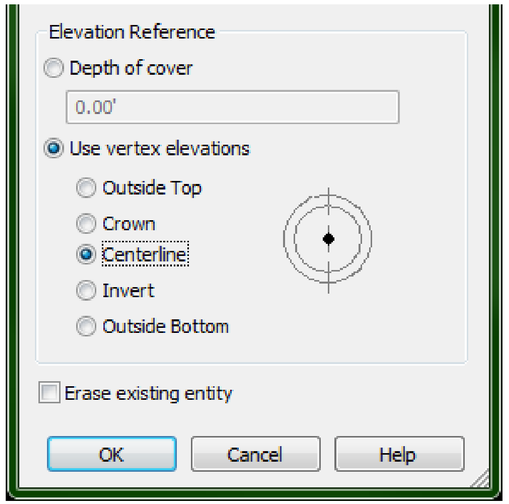
Making and Modifying your 3D model:

Important parts to remember when creating a network from an Object









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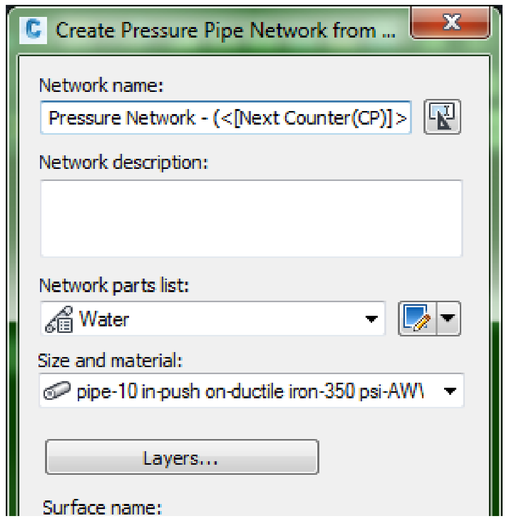

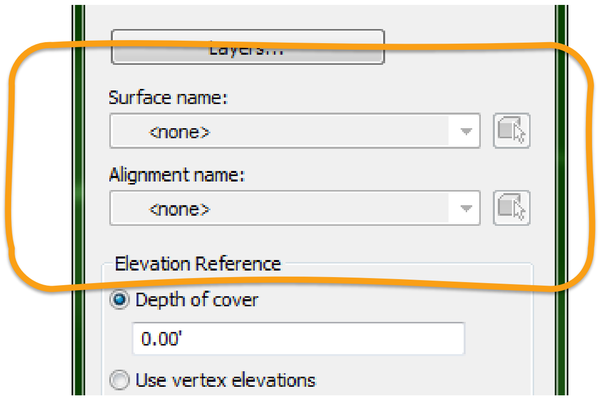

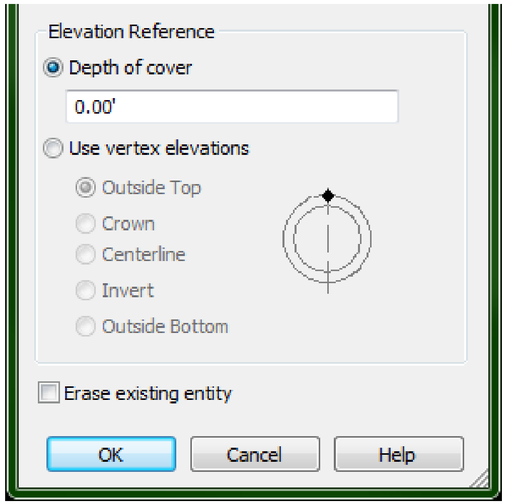

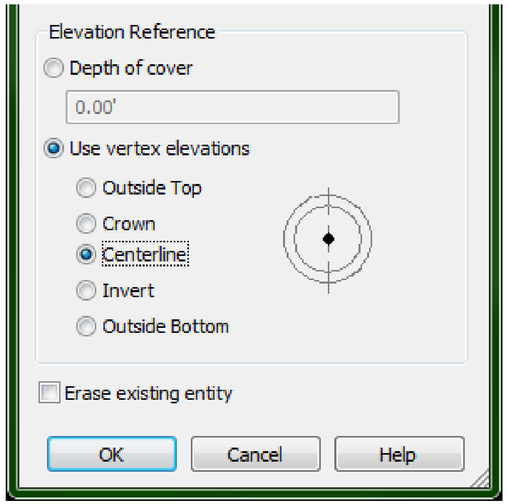

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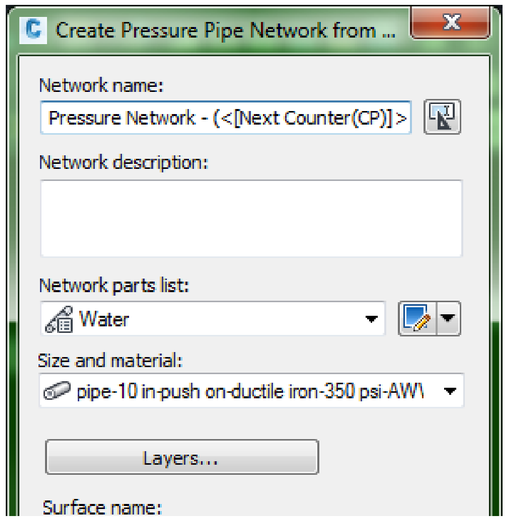

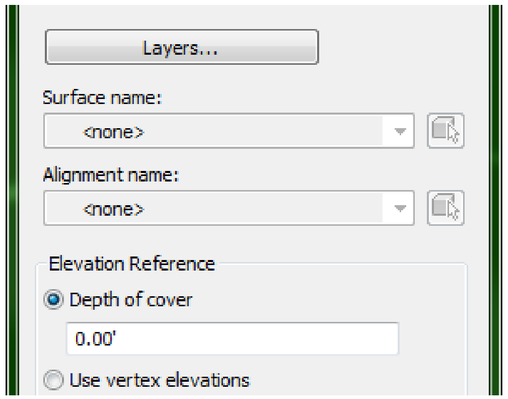

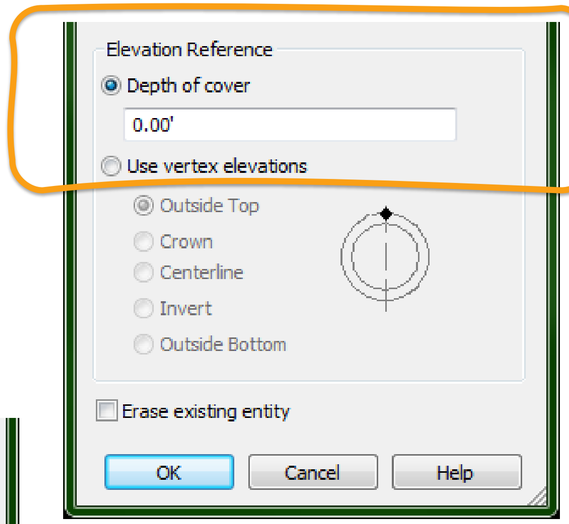

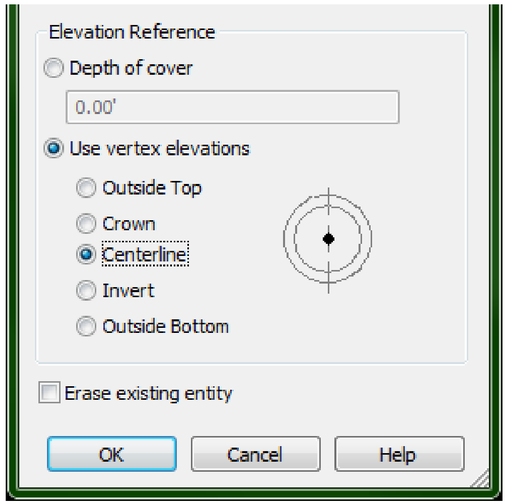

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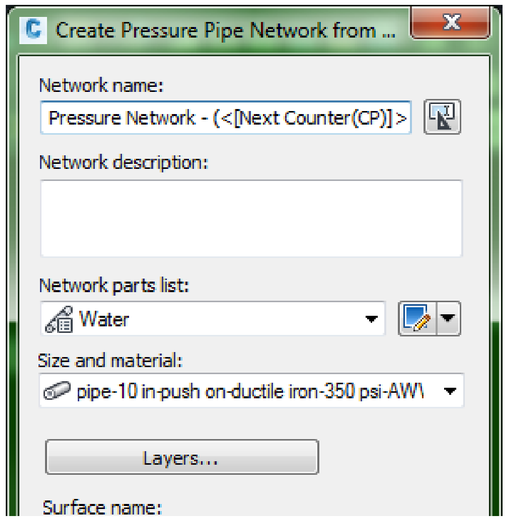

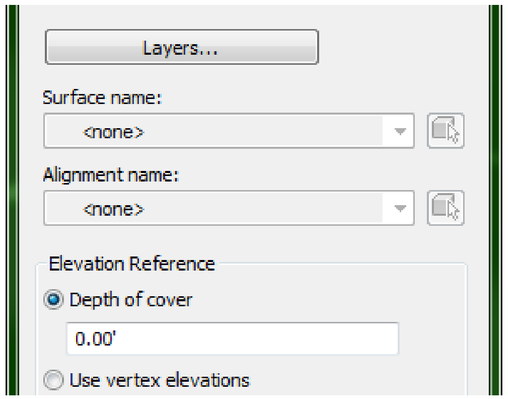

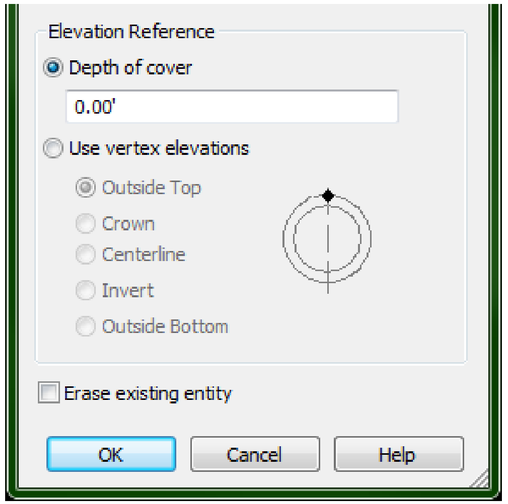

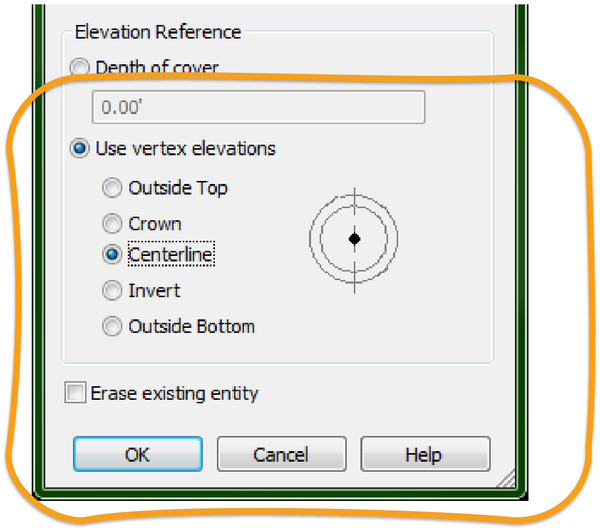

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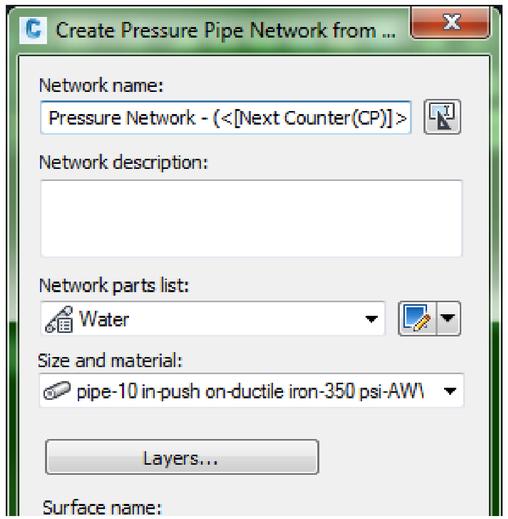
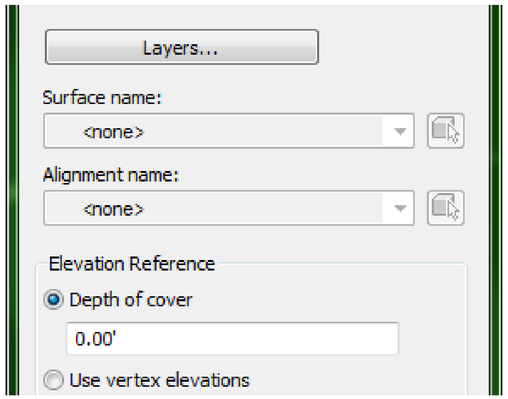
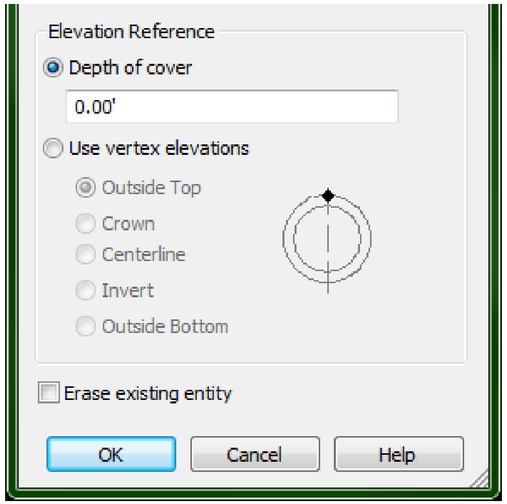
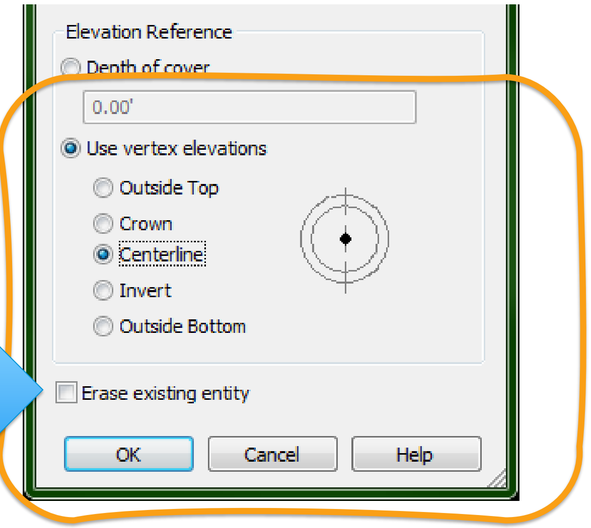






TIP!

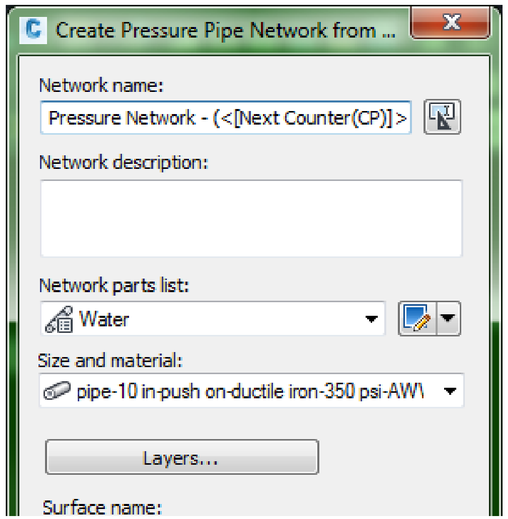


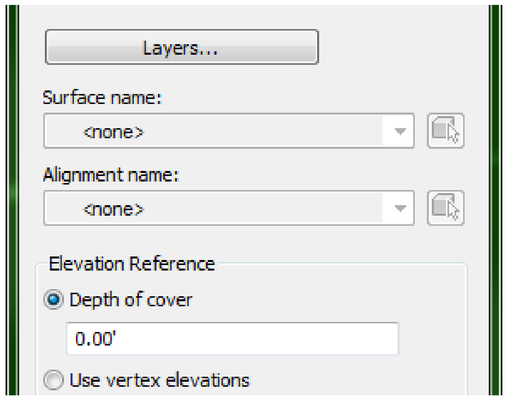
TIP:

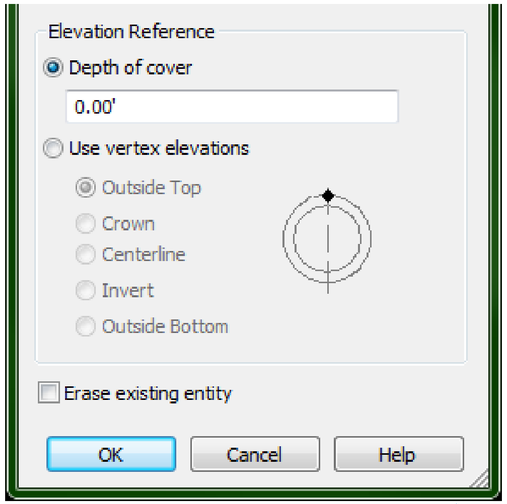
Do NOT delete the Polyline

Making and Modifying your 3D model:

Important parts to remember when creating a network from an Object







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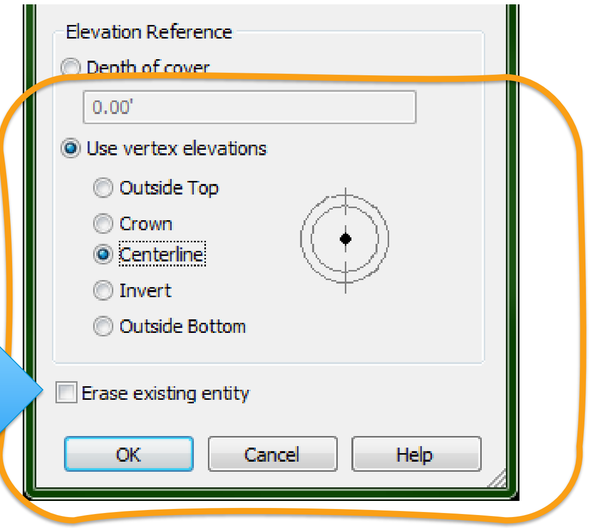


Revisions and Interferences:

Modifying your 3D Polyline:

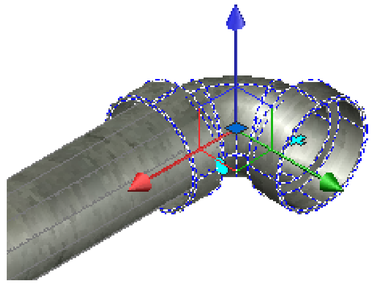
Toolbar: UCS

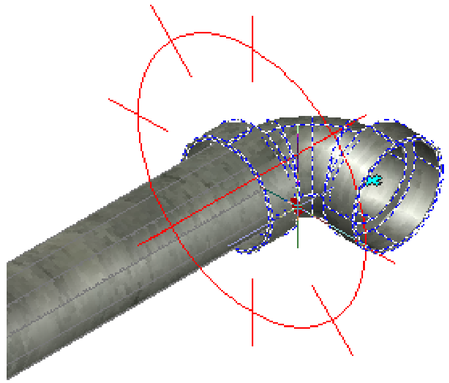
Toolbar: 3D Navigation

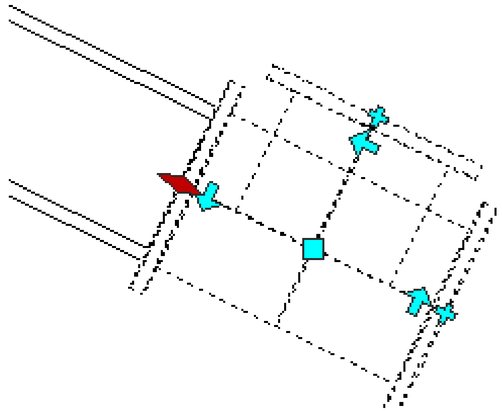
Toolbar: UCS II

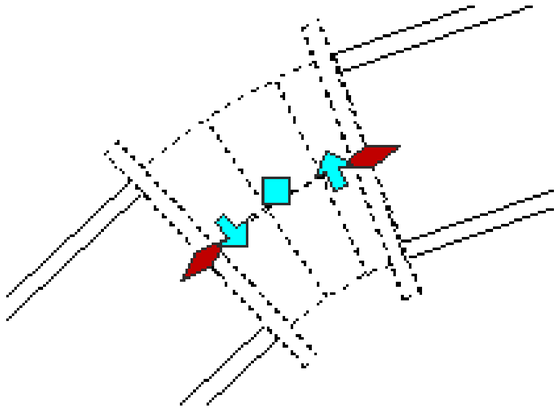
Making and Modifying your 3D model:

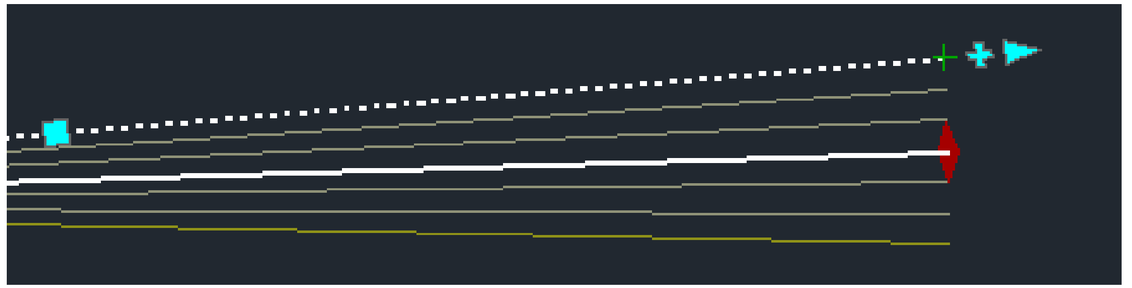
Grips are an important part of modifying your model once it has been created.











Adding a tee:

- Break the pipe at the intersection you want to add the tee
- Second – move the pipes to make room for the tee
- Use the UCS to rotate to where the z-axis is pointing towards one of the directions for the tee
- With the UCS rotated, insert a tee, and it will come in at the angle you just set with the UCS.
- Move the other ends of the pipes to re-connect with the newly inserted tee.

- If you have more than one that is parallel:
- Break your lines where they need to be
- Copy the one tee to the new locations since it is already at the correct rotation.

TIP:

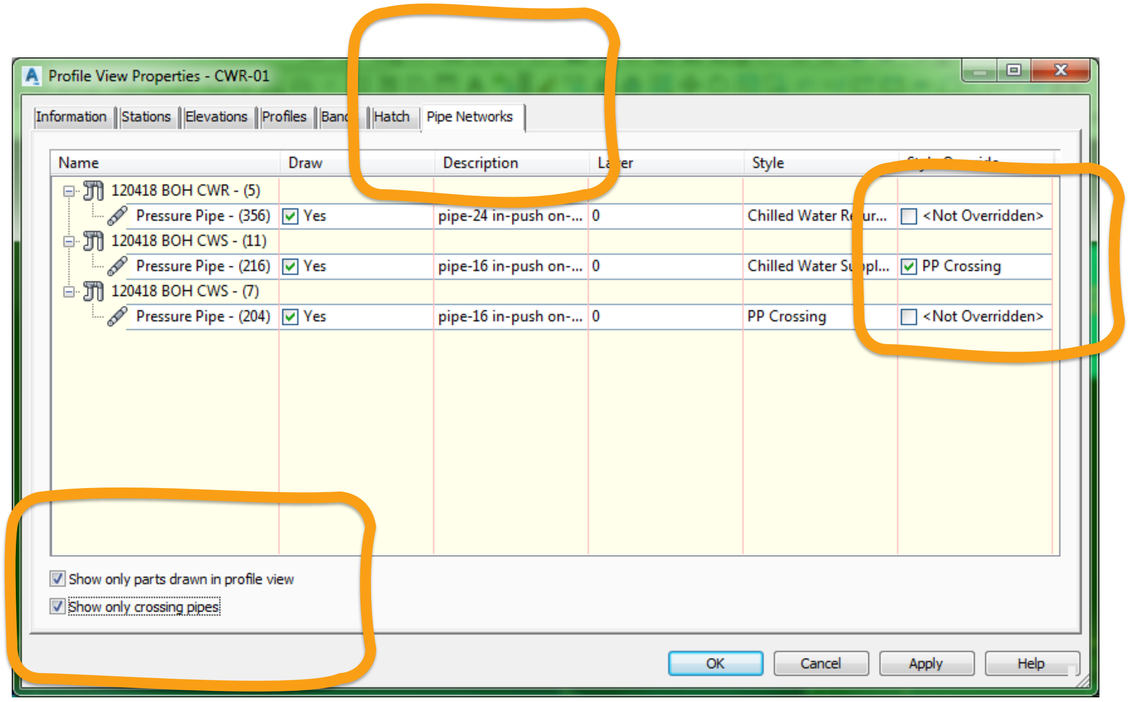
To modify an elevation, modify the 3D poly and snap to the new elevations.

Profile Views:

Profiles: Another reason to keep your Polyline

Copy your 3D poly, and convert to 2D poly.

Create an alignment from your (2D) Polyline, and then make a profile.



- Select the Pipe Network tab on the Profile Properties.
- Select the options at the bottom to reduce clutter
- Crossing Pipes Style Overrides

Profiles: Another reason to keep your Polyline

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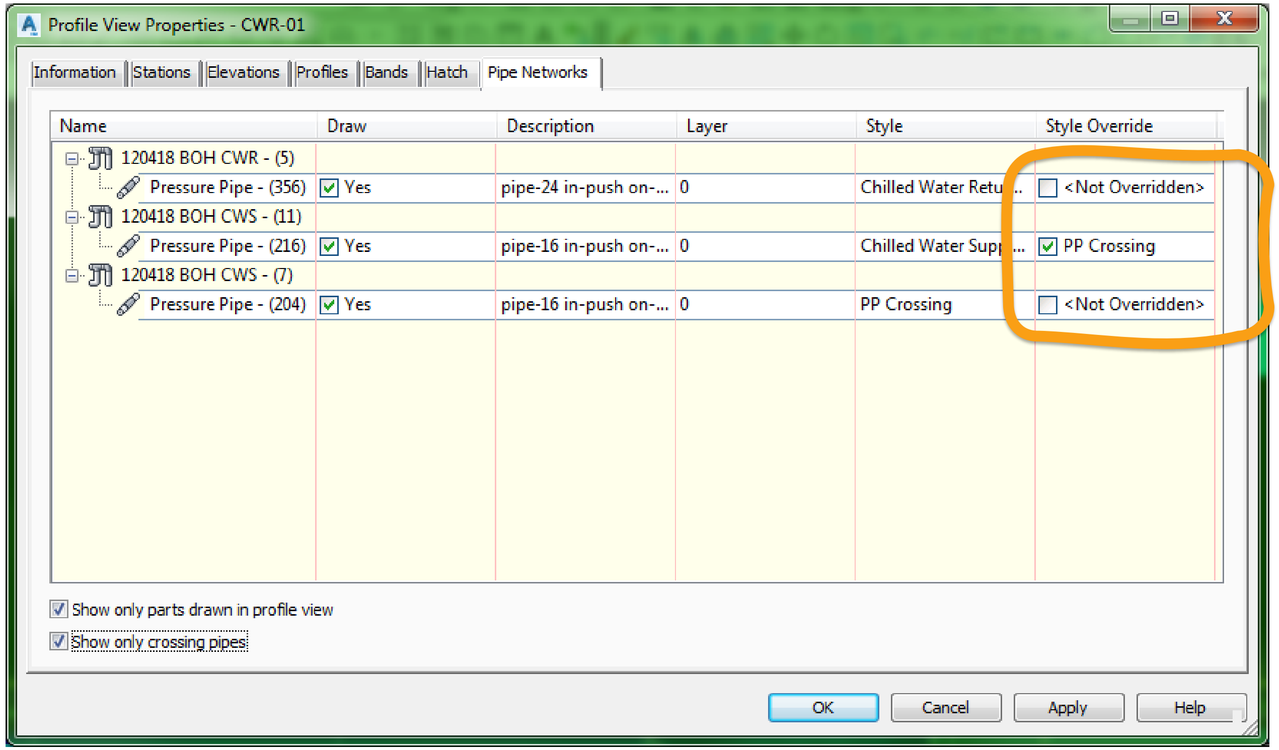

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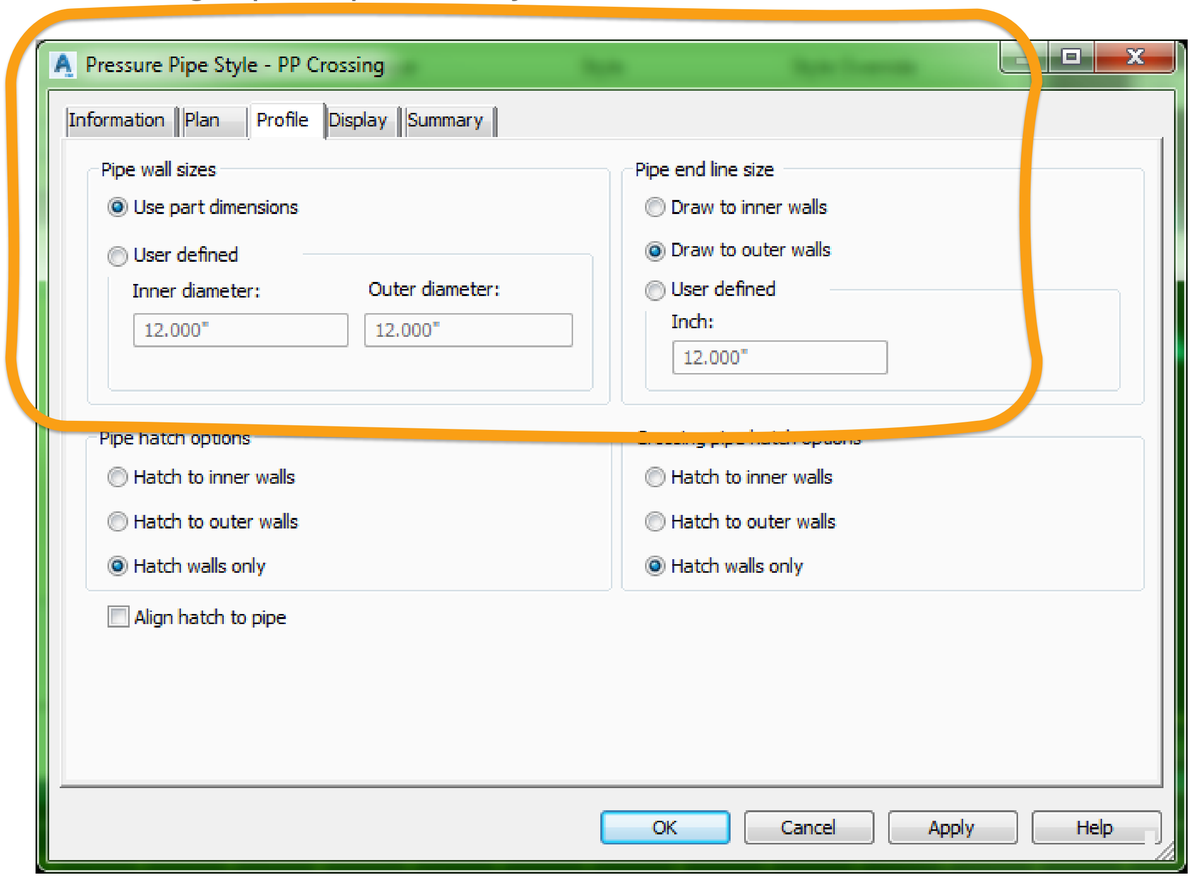
Profiles:

Crossing Pipe requires a style all its own:



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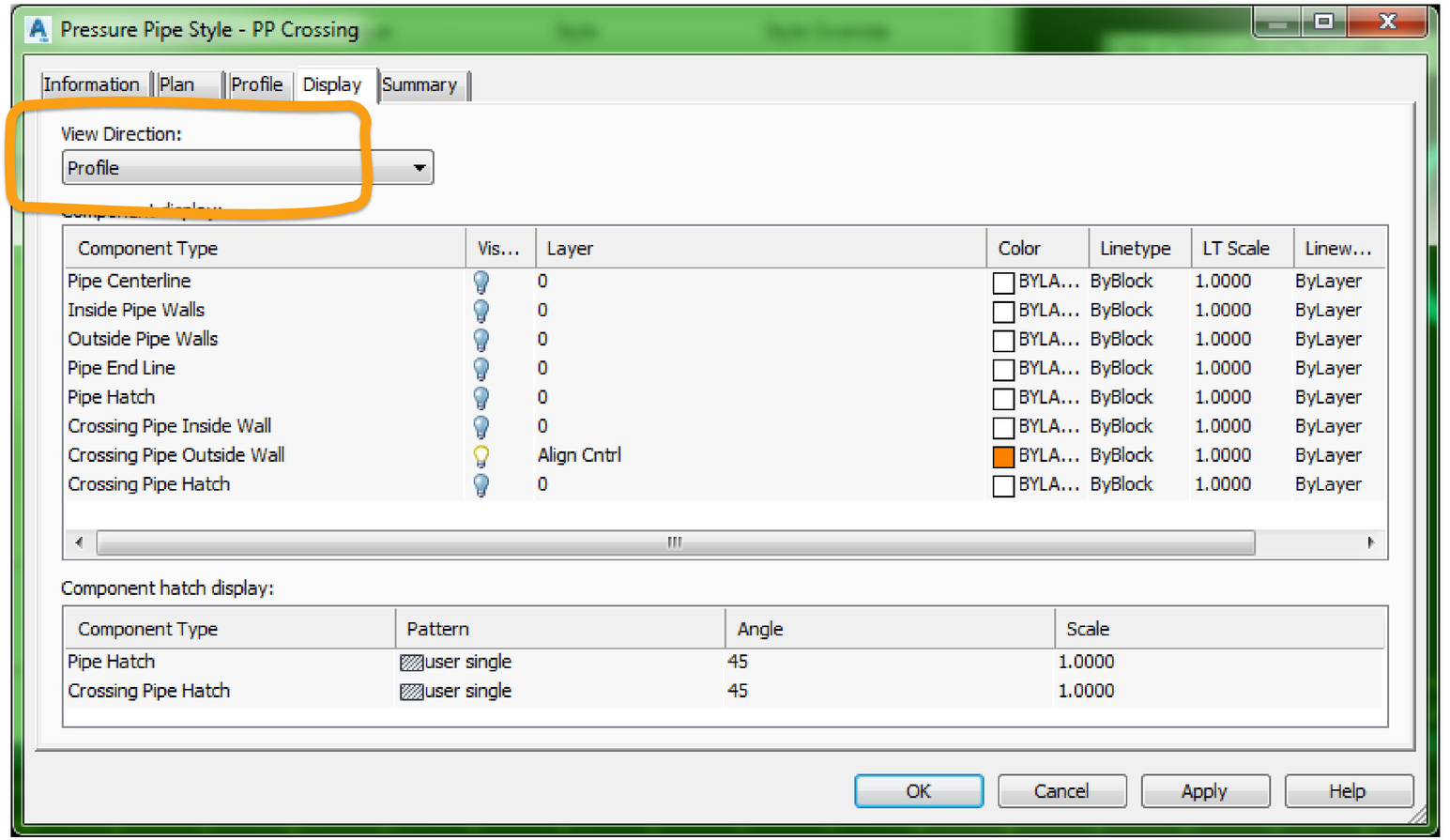

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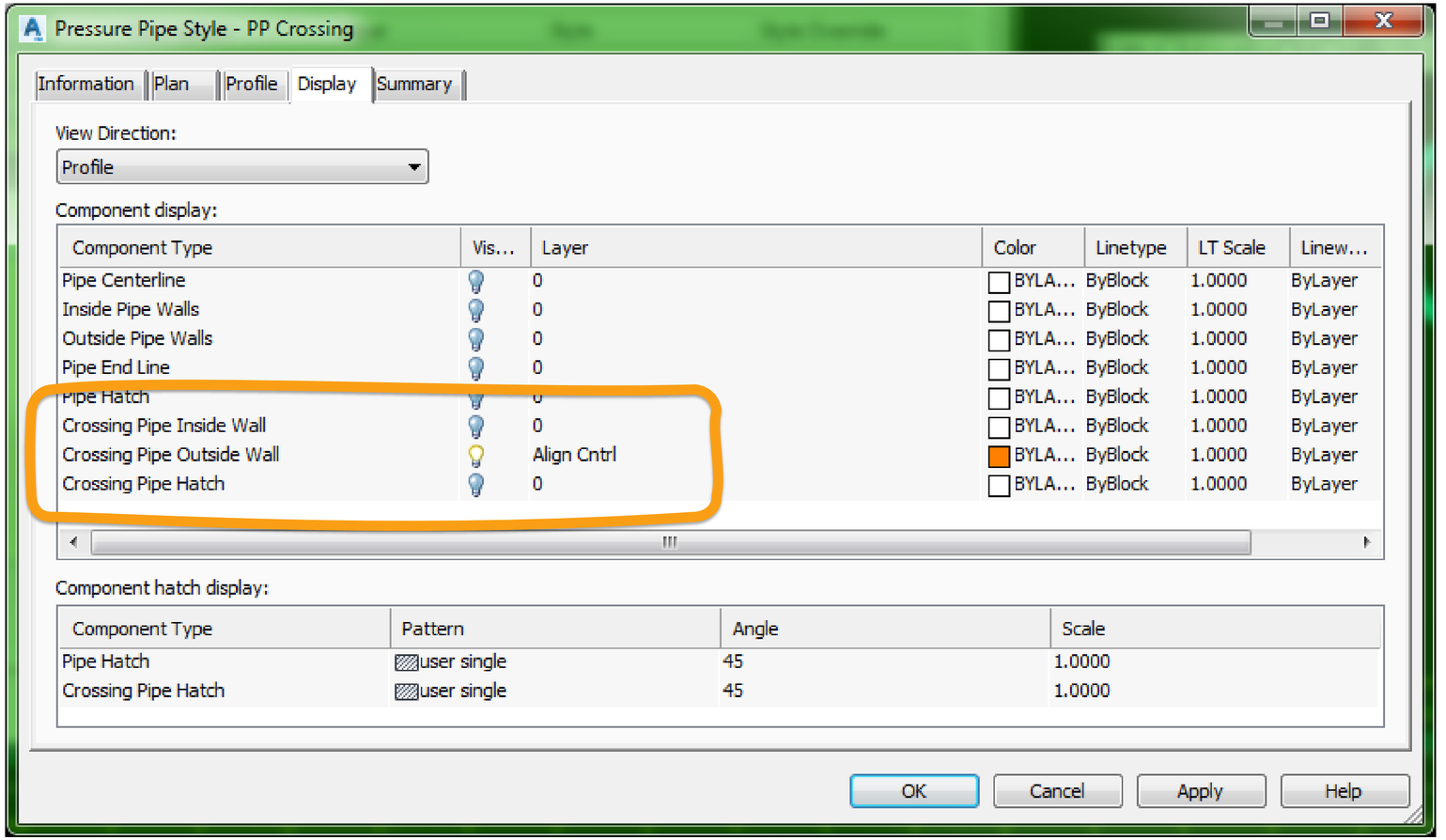
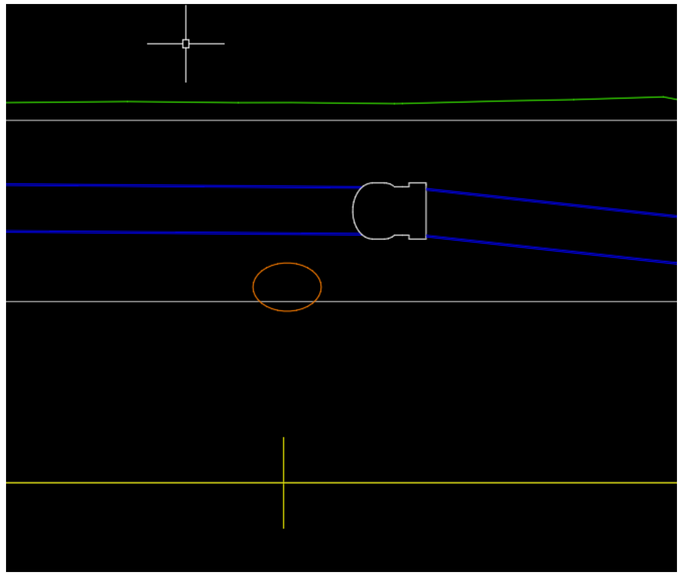
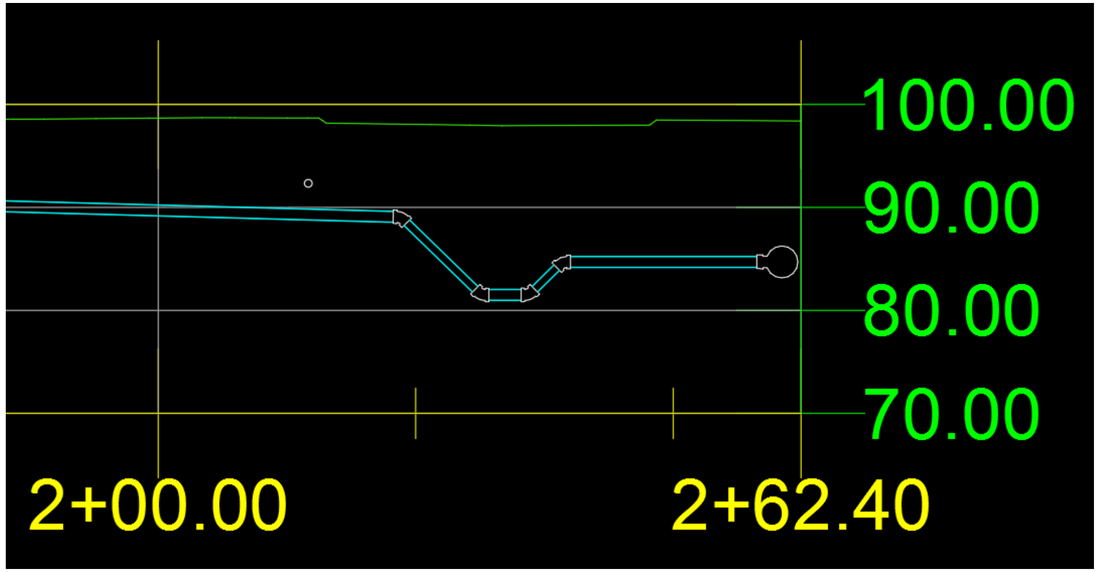


Profiles:

Keep Vertical Exaggeration to 1:

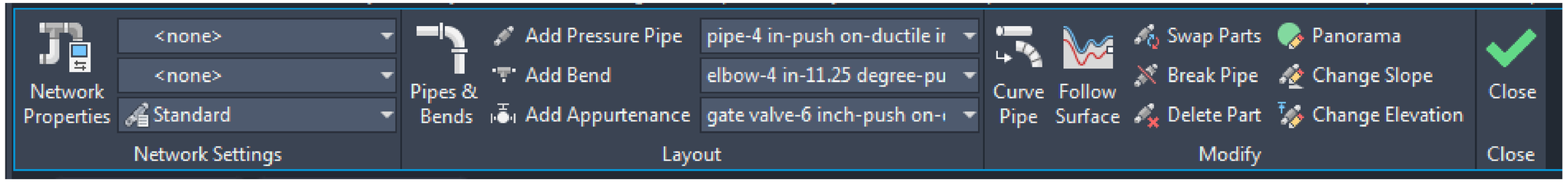
This helps you draw a line to aid in the design. 45 degree bends are easy when they aren’t exaggerated.

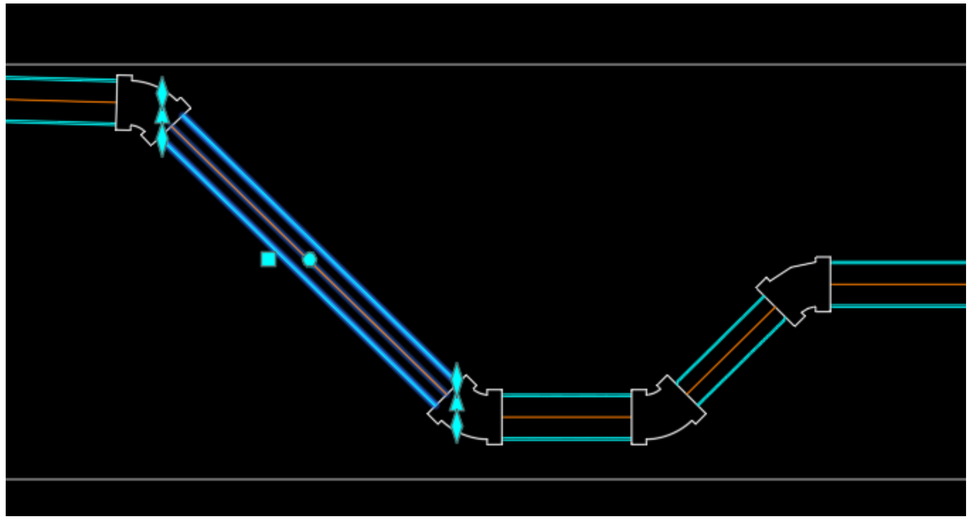


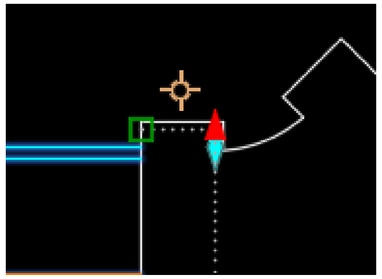


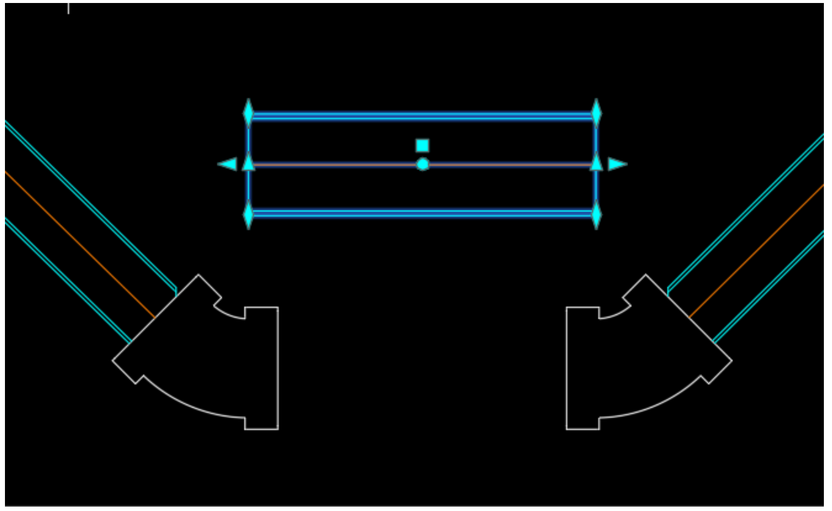
Profiles:

Use the grips on the pipes to help raise or lower the pipe. Be sure to re-connect the pipe!









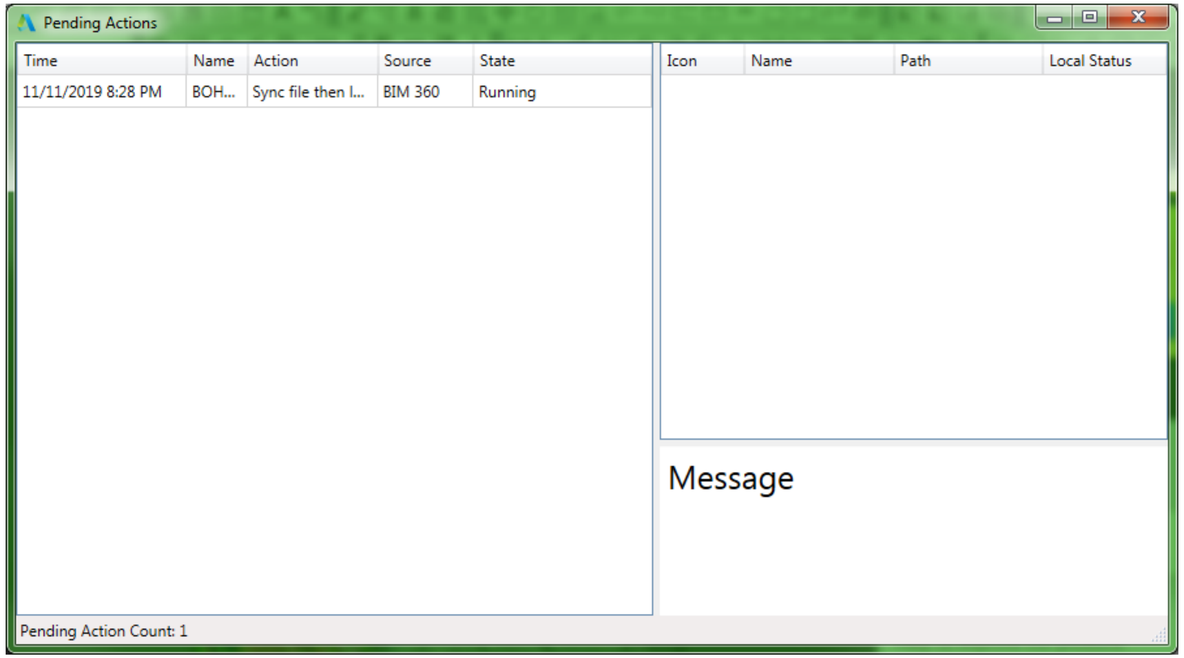
BIM 360 Docs & Desktop Connector

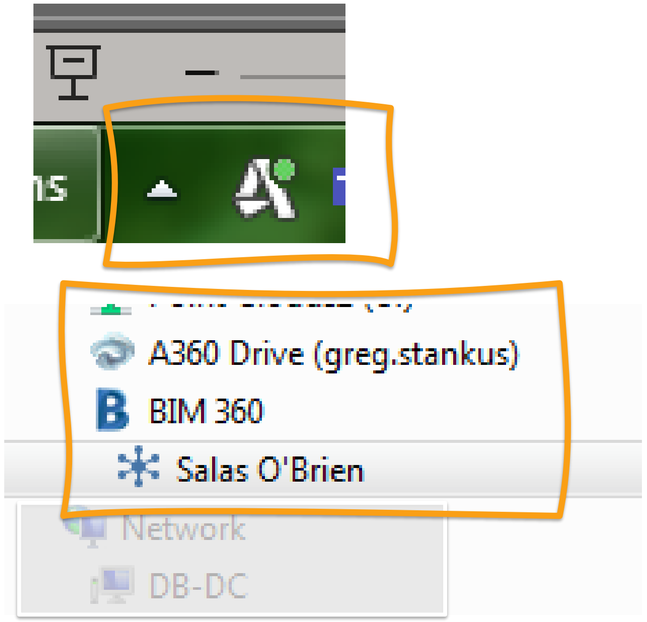
TIP:

Communication is STILL the best method!

Collaboration 101: BIM360 and Communication

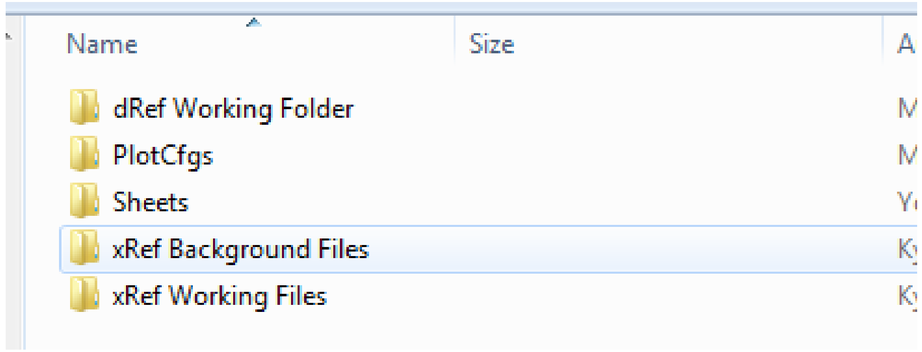
Desktop Connector

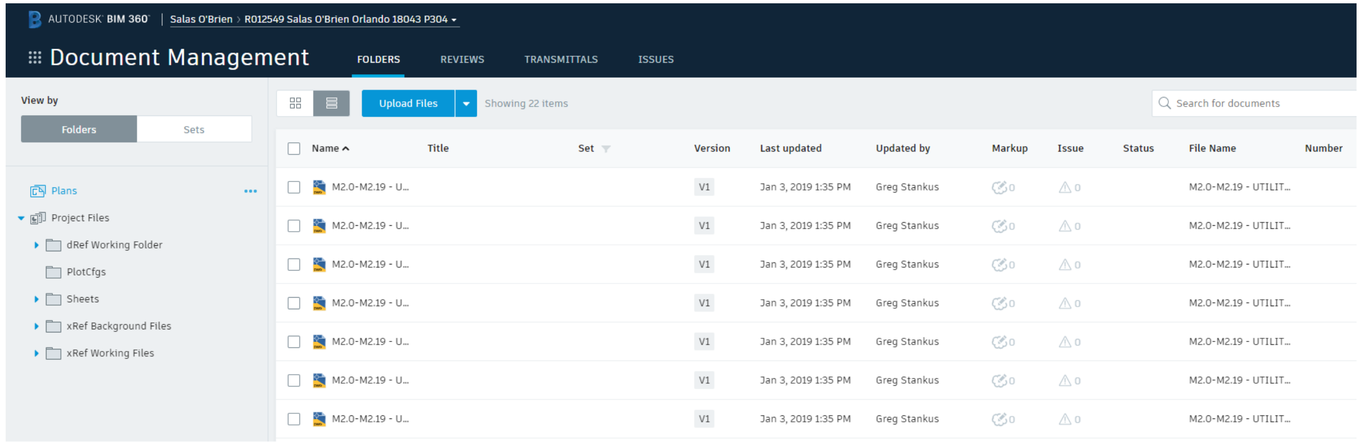




Collaboration 101

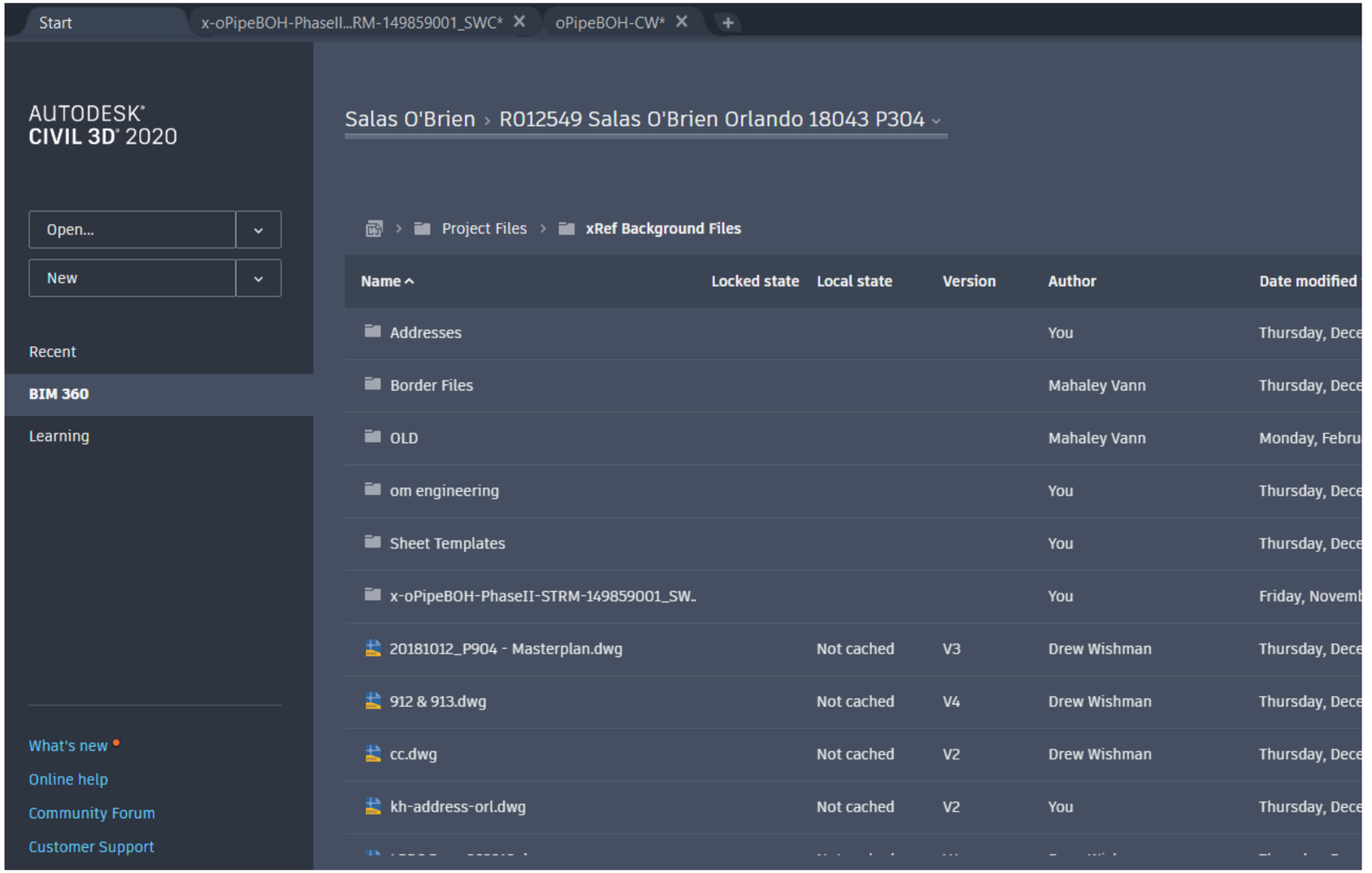
Desktop Connector & BIM 360 DOCs





Collaboration 101

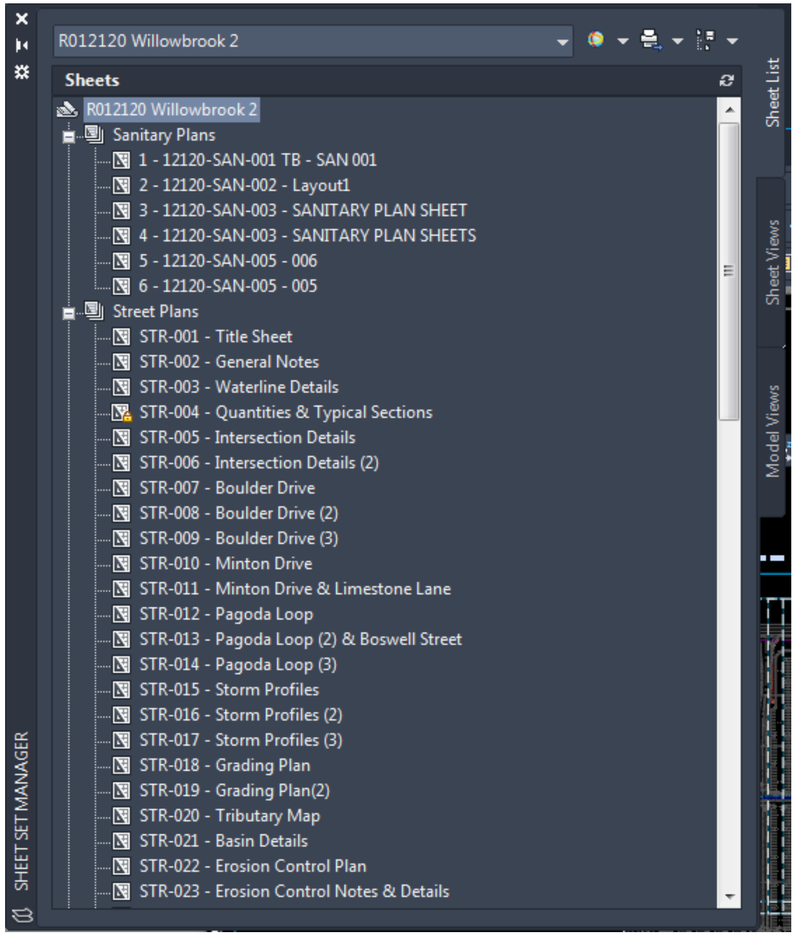
NEW BIM 360 DOCs… on the start tab of Civil3d.



Delivery…

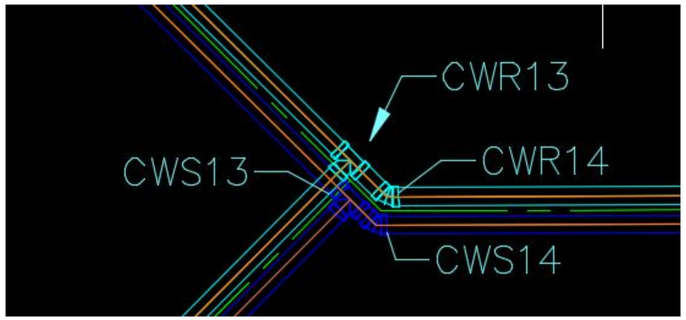
SSM: Sheet Set Manager

One of the most underutilized AutoCad tools.



Labels:

Adding labels and sorting them, all done with styles.



~~CWR1~~ GATE VALVE–12 INCH N: 1495844.0887' E: 511134.9425' C/L PIPE ELEV: 97.50	~~CWS1~~ GATE VALVE–12 INCH N: 1495840.9403' E: 511137.7224' C/L PIPE ELEV: 97.50
~~CWR2~~ ELBOW–12 IN–45° N: 1495936.4264' E: 511239.5244' C/L PIPE ELEV: 96.50	~~CWS2~~ ELBOW–12 IN–45° N: 1495932.2334' E: 511241.1212' C/L PIPE ELEV: 96.50
~~CWR3~~ TEE–18 IN X 16 IN N: 1495938.5879' E: 511724.7990' C/L PIPE ELEV: 89.80	~~CWS3~~ TEE–18 IN X 16 IN N: 1495934.3724' E: 511721.3177' C/L PIPE ELEV: 93.00

By Heidi Hewett
July 24, 2017

Learning

Learn the Process of AutoCAD Sheet Sets

Welcome to the second in a series of posts to lead you through the powerful Sheet Set functionality available in AutoCAD. In the first post, R.K. McSwain introduced you to the Sheet Set manager (SSM) and offered an overview of some of the advantages to using sheet sets. In this post, I provide an overview of the general process from getting started with the most basic steps to implementing sheet sets for maximum efficiency.

Learn the Process of AutoCAD Sheet Sets

https://blogs.autodesk.com/autocad/process-sheet-sets/

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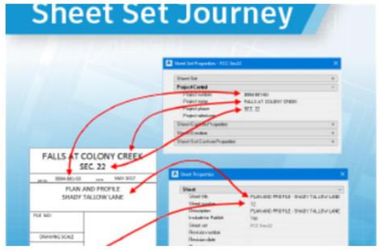
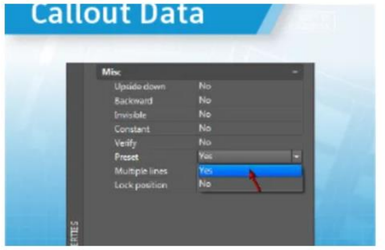
Mastering AutoCAD Sheet Sets



Learning
Congratulations! You're an AutoCAD Sheet Set Master

What a journey it's been! Last year, we started our series to help you master AutoCAD sheet sets. Hopefully you've followed ...



Learning
Implementing Sheet Sets for Maximum Efficiency: Automate Callout ...

We're getting close to the finish line in our extended series of articles designed to set you up for success with ...

Learning
Implementing Sheets for Maximum Efficiency: Automate View Label ...

As you learned in the previous article of the series, you can assign the Label Block for Views property in your ...

Mastering AutoCAD Sheet Sets

https://blogs.autodesk.com/autocad/tag/mastering-autocad-sheet-sets/

Summary…

Pressure Pipe 101:

STEP 1

LIST OF MATERIALS

Get your list if materials set up prior to starting, including sizes and pressures.

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It’s the easiest and fastest way to create/modify a complex network of pipes.

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Constantly updating, including a great new update.

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STEP 4

SSM

Sheet Sets save time, help organize a project and can reduce errors when revisions come around.

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- Create vertical profiles to check for depth allowances.
- Desktop Connector and BIM 360 are continually changing.
- Use the sheet set manager to manage and plot your projects.

Questions:

THANK YOU!

Greg.Stankus@salasobrien.com

SALASO'BRIEN

Senior Civil Designer for Salas O'Brien

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