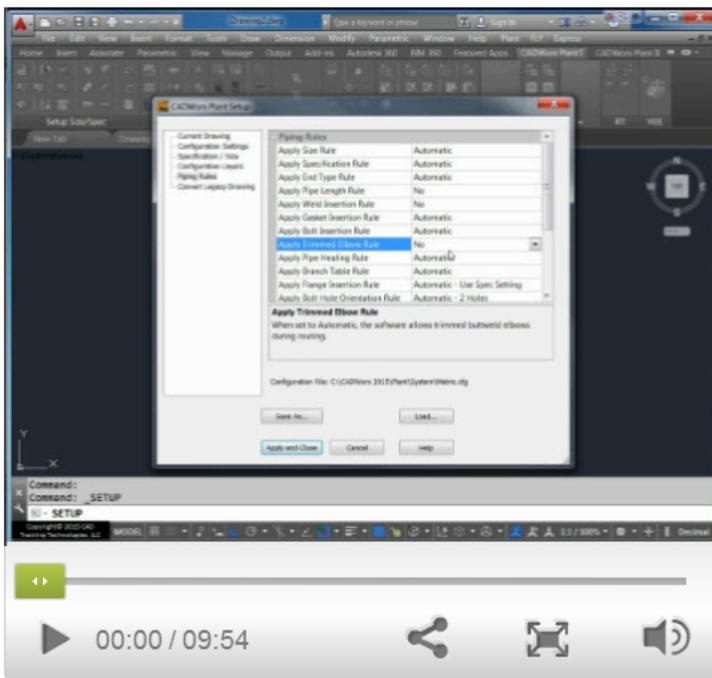


# CADWorx® 2016 Quick Start Video Training

## Get Started with CADWorx!

Now you can be up and running with this powerful 3D modeling software in minutes!



### Video One

The Ribbon, Selecting a Configuration, Project, and Specifications  
Setting Main and Reduced Sizes and the Piping Rules

### Video Two

The Specview Tool Palette  
Displaying Reducing and Threaded/Socketweld Fittings  
Real Time Routing, Entering Distances  
The Branch Table in Action  
The End Type Rule

### Video Three

How Size and End Type Affect Components  
The Component Distance Option  
Moving In-Line Components Using Grips  
Using the Stretch Command in CADWorx  
Using Plus Grips  
Using the Component List Option  
Viewing and Routing in 3D



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# CADWorx 2016 Quick Start Guide

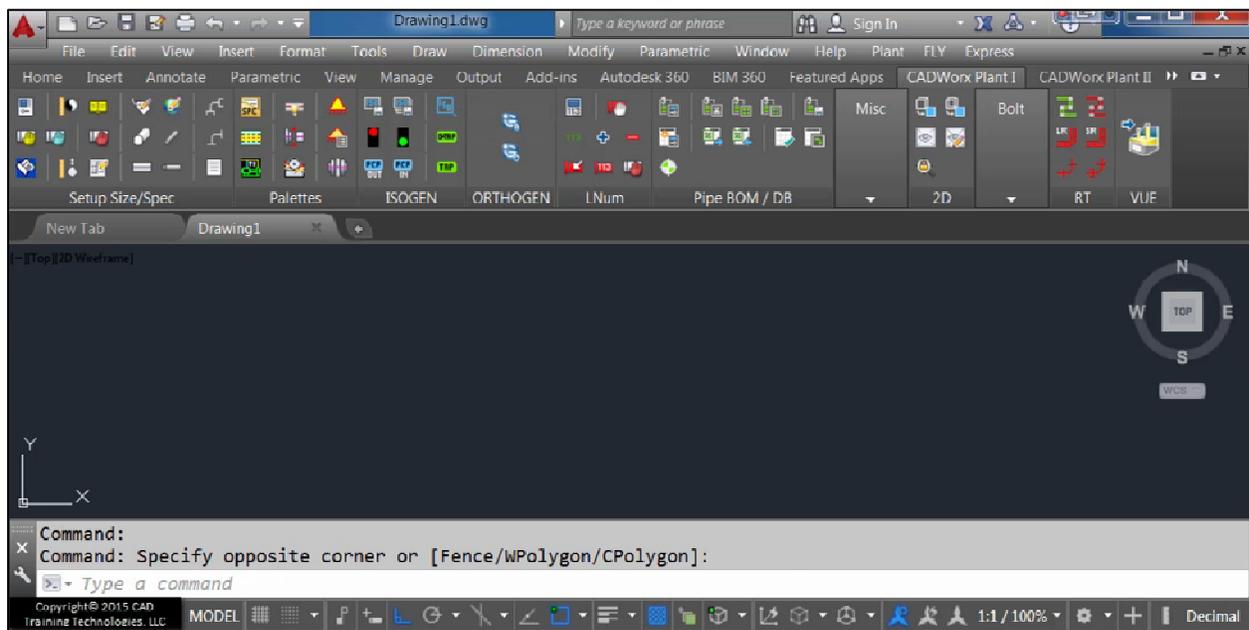
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## CADWorx 2016 Quick Start Guide - Video One

(Reference Video: Quick\_Start\_V1\_2016)

1. Welcome to the set of quick start videos for the CADWorx Plant Professional software. In the newest releases of CADWorx, the features and techniques for using the software have changed and improved significantly. For example, in the newer versions of CADWorx, we now have extensive rules available within the system. With these rules we can check the size, the spec, and end condition compatibility as we place components. We can change the size or spec of a group of piping components. Also, we can place a flanged valve into a line, and the system automatically places the connecting flanges, gaskets, and bolts, as needed.
2. Another big change is in the specifications. CADWorx stores the specifications in XML databases, and we have the ability to generate automatic part numbers. We can use features in the Specification Editor to automate how long descriptions appear in the material list. These kinds of features can improve consistency as new specs get added into or edited in a project environment, and how they show up in the material reports.
3. The purpose of these quick start videos is to get you running in the new version of CADWorx within minutes. As we work through this material you'll see we are just scratching the surface in this new version. However, after you are able to start running the new CADWorx, you can begin to explore the many new features in the system. If you want additional training, you can receive that from the last video in this set, which shows some of the training resources that are available to you. Let's get started.
4. **Double-click the CADWorx icon on your desktop to launch the program, and you see a screen like the image below:**



- Depending on the version of AutoCAD you're running and the version of CADWorx you're running, it could look different. The layout for CADWorx looks the same.

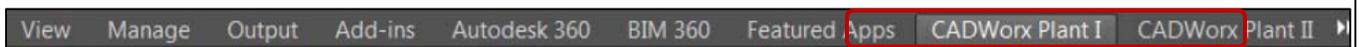
We have a ribbon along the top:



- We have our typical AutoCAD tabs along above the ribbon for Home, View, and so forth.



- We have a CADWorx Plant I and a Plant II.



- Click the arrow to the right of CADWorx Plant II. 

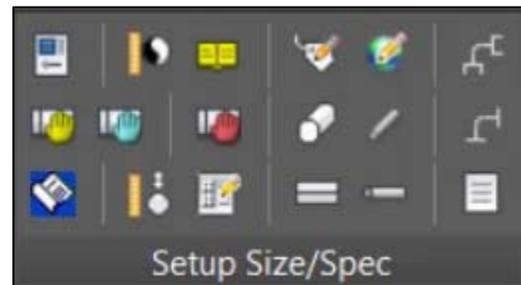
You can see we have CADWorx Steel and CADWorx HVAC as well.



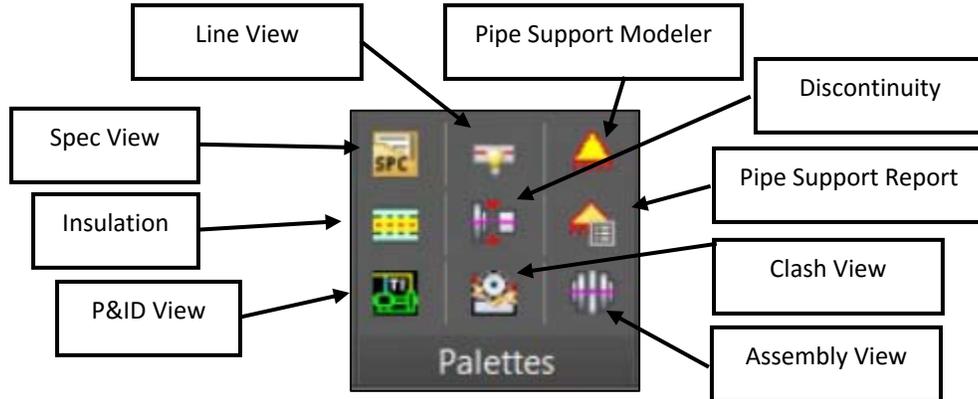
- I'm running this video in a slightly lower resolution so that it can be seen on mobile devices pretty easily. If you have a higher resolution monitor, this will all be expanded.

- In the CADWorx Plant I tab we have panels. These panels allow easy access for many of the features in CADWorx.

We have an area for setting up the size and the specification.



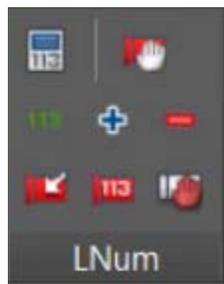
We have an area for palettes, so we use some of these. We have a spec view tool palette, an insulation view palette, and line number views palette, as well as a few others. We have a variety of things we can view here in the Palettes panel.



We have an area where we can produce isometrics automatically using the IsoGen system.

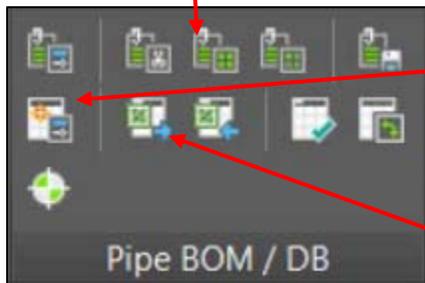


The ribbon also contains an OrthoGen palette. It is possible you do not have that on your ribbon, but the system I am using is set up for that. This great add on annotates and dimensions orthographic views in paper space for you. If you do a lot of that type of work, this can really pay off for itself.



We have a line number area.

We can do bill of material space on a single drawing



We can run with a live database or with a database that we have data intermittently

We have a bill of material and a database setup area.

We can export out and combine them into a spreadsheet

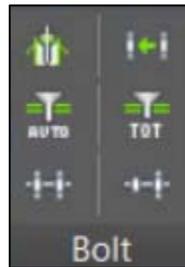
CADWorx is really flexible software. You have a lot of options to work the way that best works for you.

You can also see an area called the Miscellaneous panel.



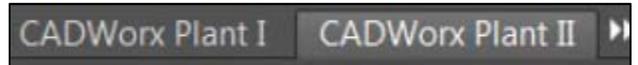
We have an area to do some 2D graphics if we want to do that.

We have bolting.

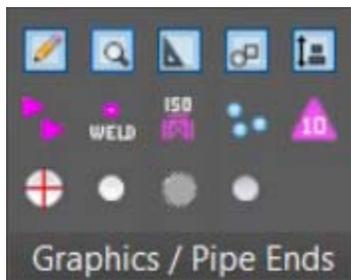
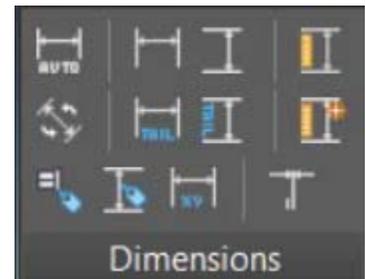


We also have various kinds of routing on the CADWorx Plant I ribbon.

11. Click the CADWorx Plant II tab on the ribbon.



On this new tab, you start to see things like Dimensioning tools.



Moving on to the next one we have graphic symbols that we can bring into a drawing. If you have a collection of graphics that you've stored or used through the years, that's all still able to you.

We have Layering options and we also have Restraints. If we place restraints in a model, we can click a button and produce a CAESAR II input file. CAESAR II is a pipe stress analysis system.

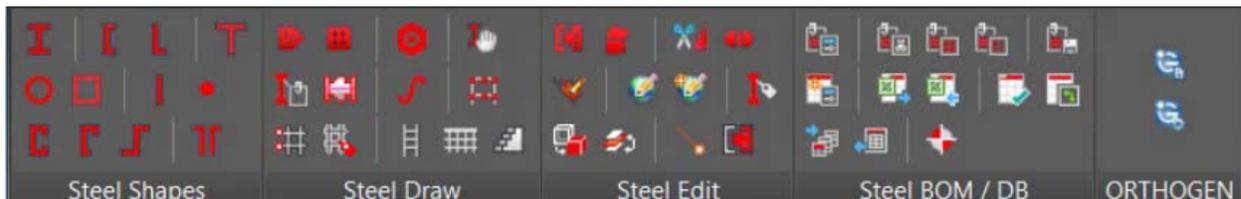


You can take the CAESAR II input file and give it to the pipe stress engineers, who can import it right into their system where they can quickly view the model. They do not have to reproduce all the geometry, which becomes a huge time saver for them. They can then run pipe stress analysis on the line, and then send it back to CADWorx with changes if we'd like to implement that.

- 12. Click the arrow to the right of CADWorx Plant II to expand and then click CADWorx Steel.



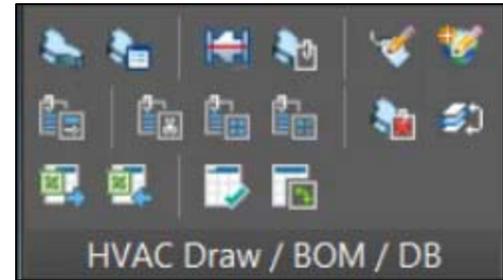
You can now see the CADWorx Steel area, where we have collections of all the various shapes and the AISC library. We also have an extensive number of international steel libraries and commands for steel copping, stairs, ladders, and hand rails. There are a lot of time saving features for modeling of steel in here. We can also pull material list and send to databases. Notice, we also have an OrthoGen tab on this ribbon as well to save time.



- 13. Click the arrow to the right of CADWorx Plant II to expand and then click CADWorx Steel.



You should now see the HVAC area for heating, ventilation, and air conditioning type duct work. You also have the option here to leave the top assembly shapes open so that you could use these very easily for cable trays in your modeling.



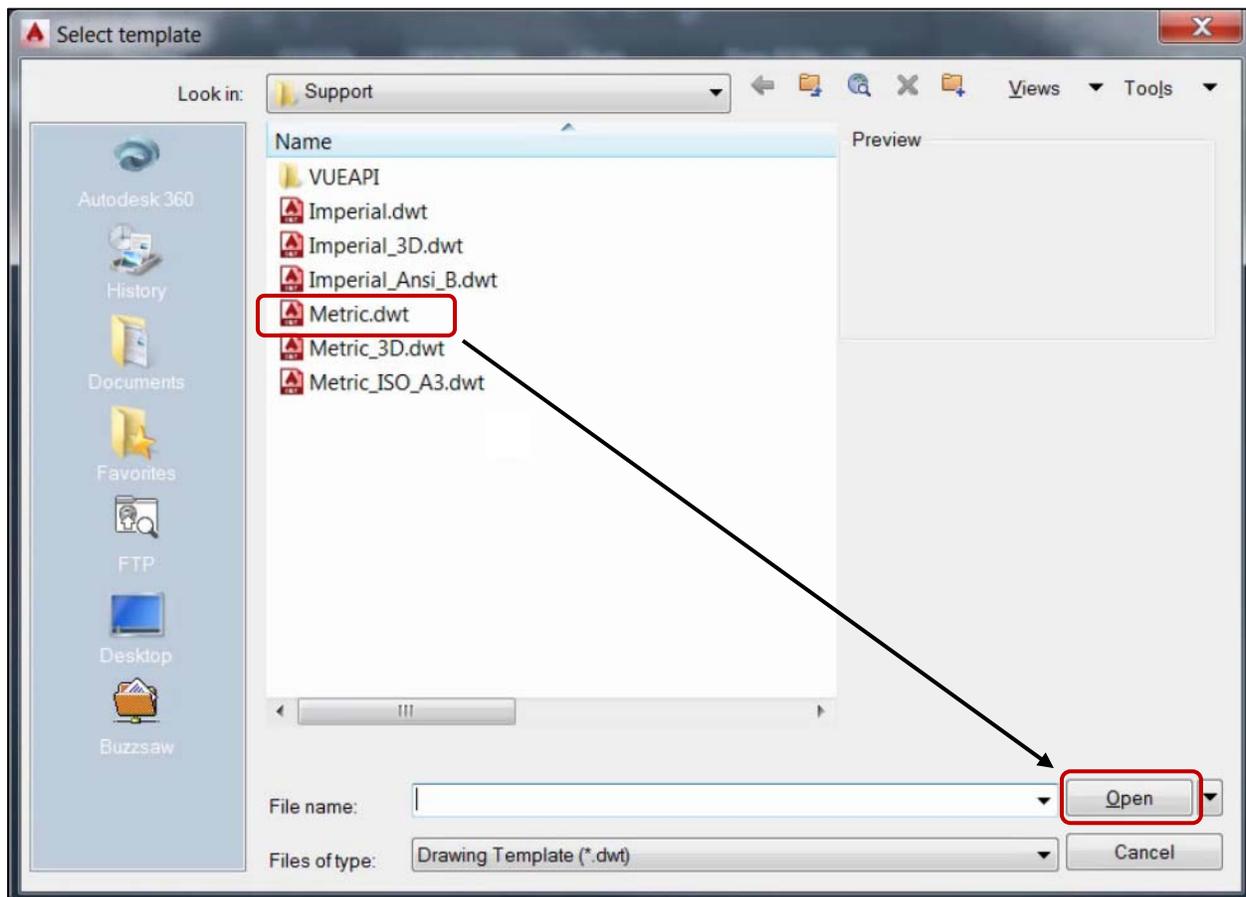
14. Let's going ahead and get this started.

Click the **CADWorx Plant I** tab on the ribbon.



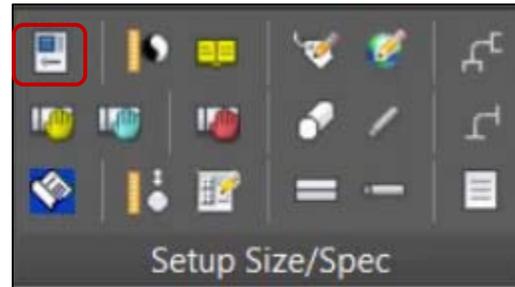
15. Click **New**  to start a new drawing.

16. When you start a drawing in CADWorx, you want to make sure you use a template. For this example, we are going to use the Metric template. **Select Metric.dwt, and then click Open.**

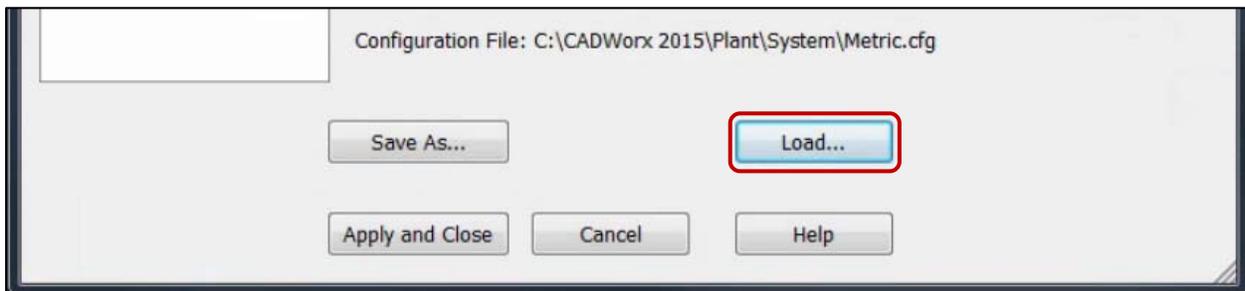


17. You can run CADWorx in feet and inches, millimeters, or metric/inch. Metric/Inch runs the software with the pipe bore diameters in inches and the lengths in millimeters. That's how we are going to do this example. Later, you can run in any units version you would like.

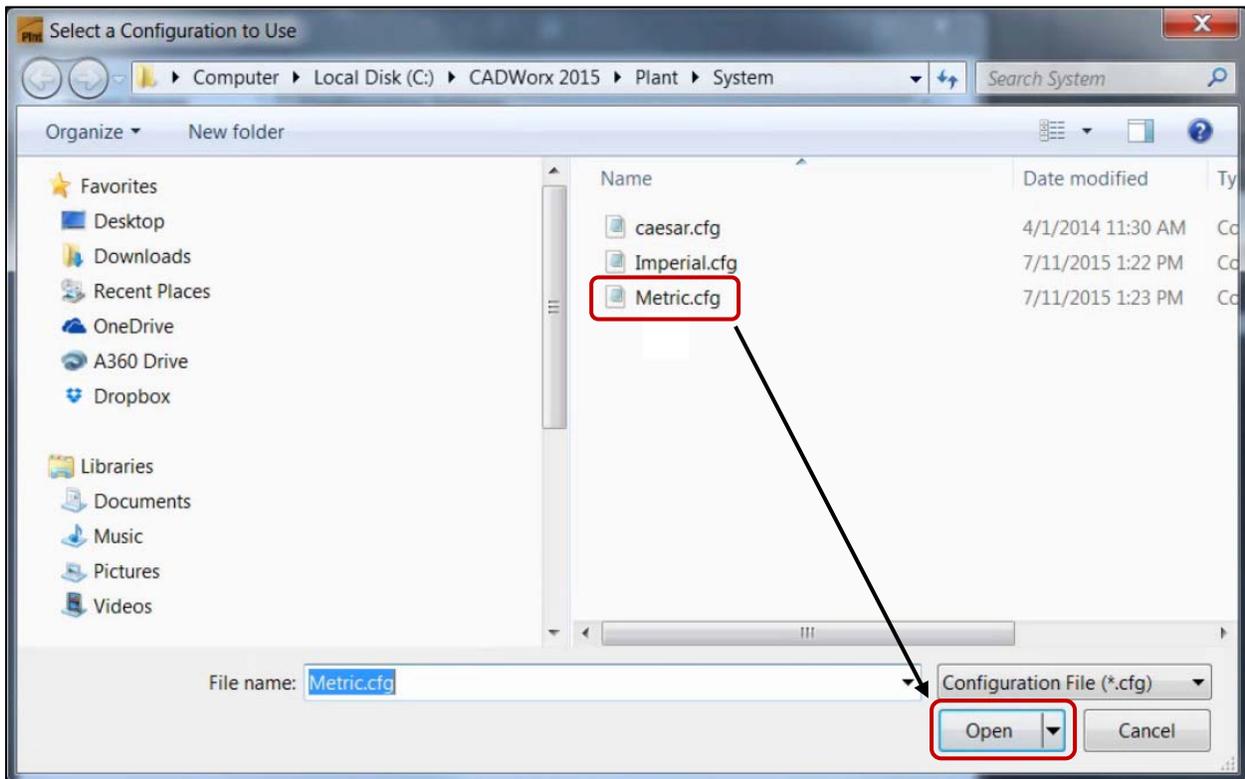
18. Click Setup on the Setup Size/Spec panel.



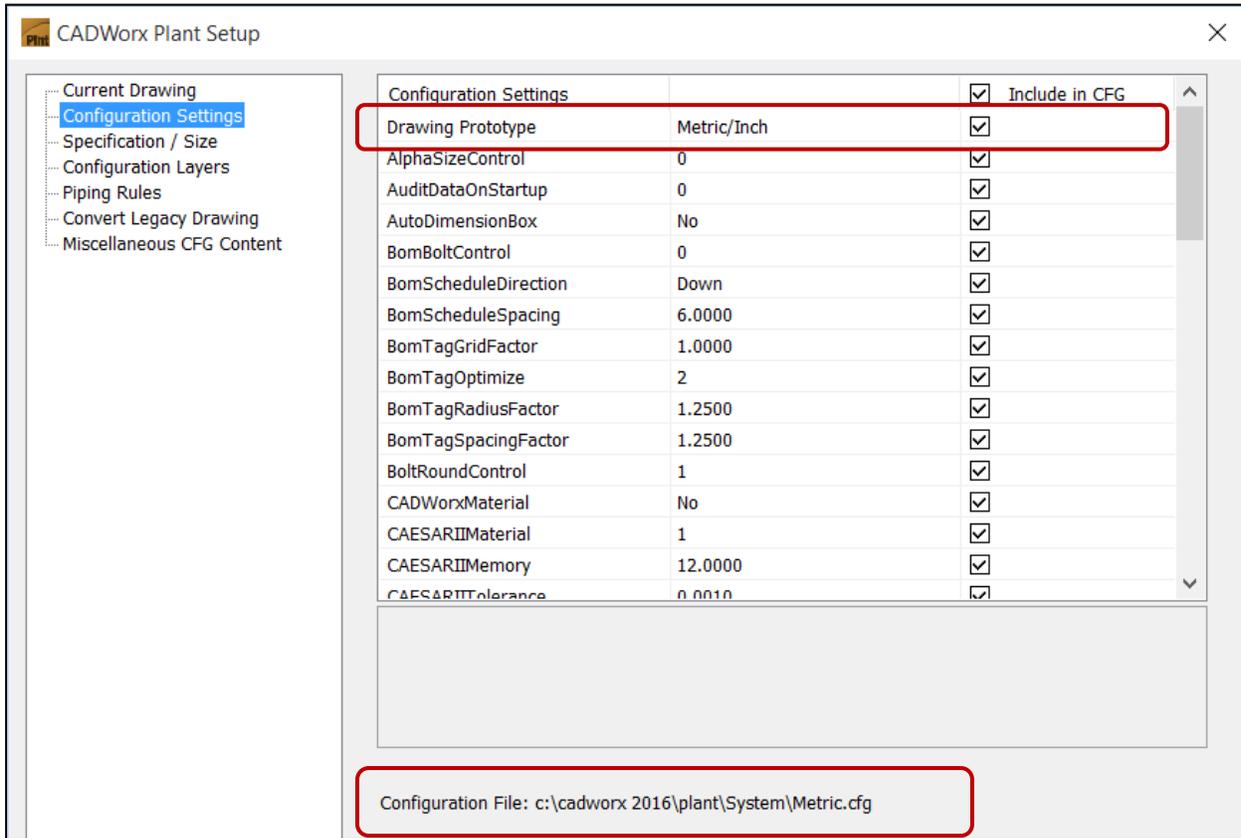
19. In the CADWorx Plant Setup dialog box, click Load.



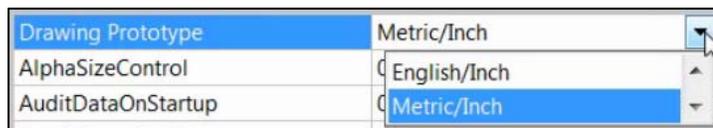
20. Select Metric.cfg. You can see that you can set it to imperial or metric. Click Open.



21. After the configuration file loads, you can see the Drawing Prototype set to Metric/Inch.



22. So that's how we want to have it set. If it's not set that way for your system, just go ahead and set it. **You can click the drop-down to set it how you like.** You can run in Inches, Metric/Inch, or Metric. Set it to Metric/Inch and notice you should have a metric config file set as indicated above.

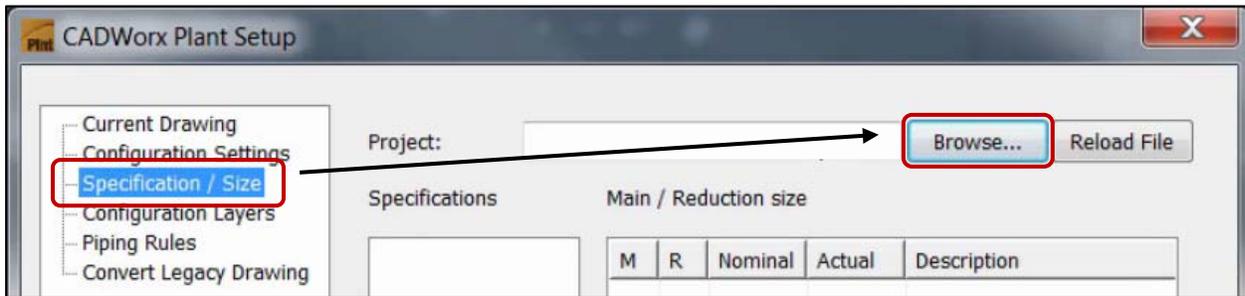


23. **Scroll down and check the SpecificationDirectory**

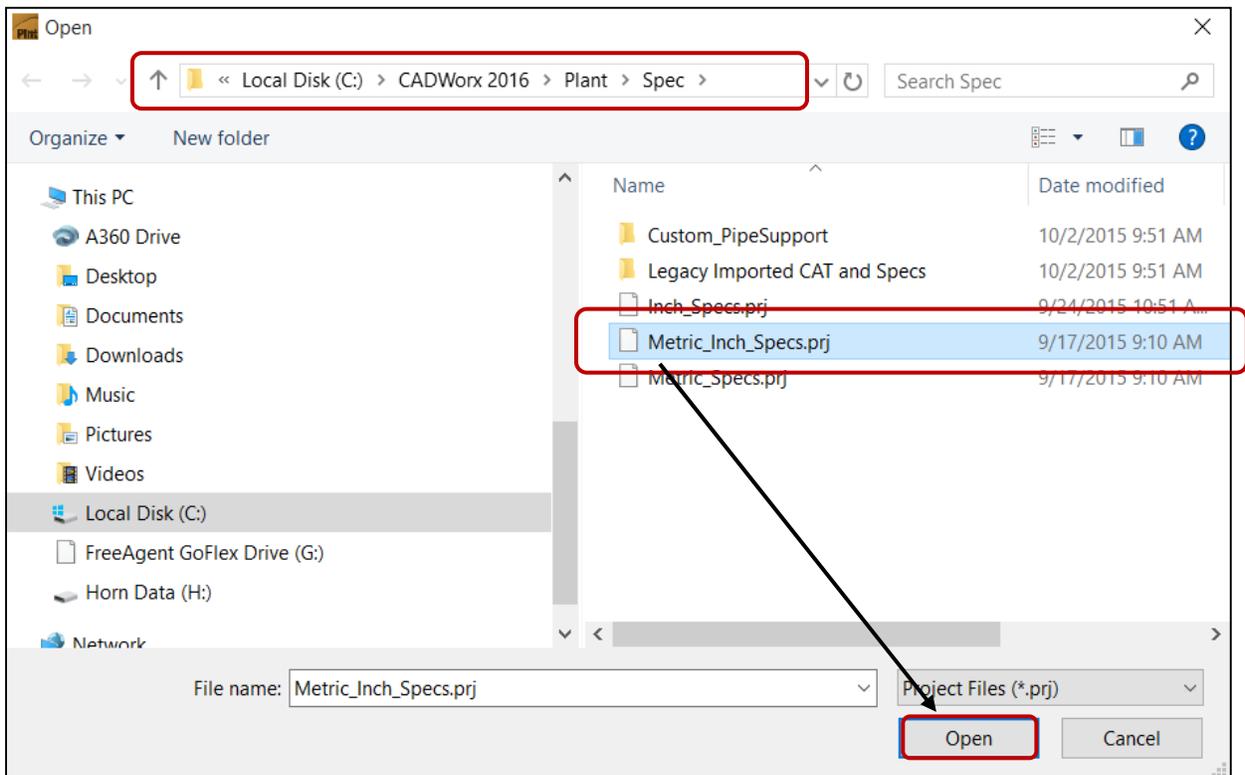
This configuration setting should point to C:\CADWorx 2016\Plant\Spec. That's how we want that set, so leave it like it is for now.



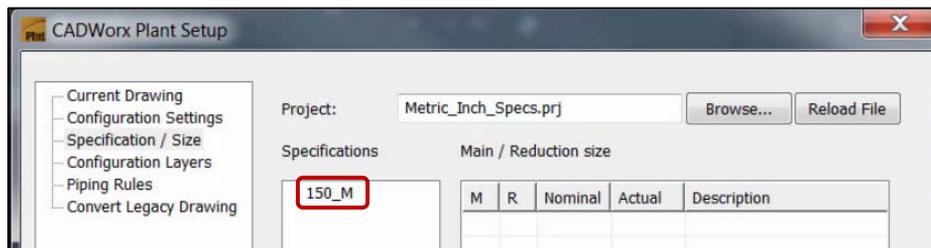
24. Click Specification / Size, and then click Browse.



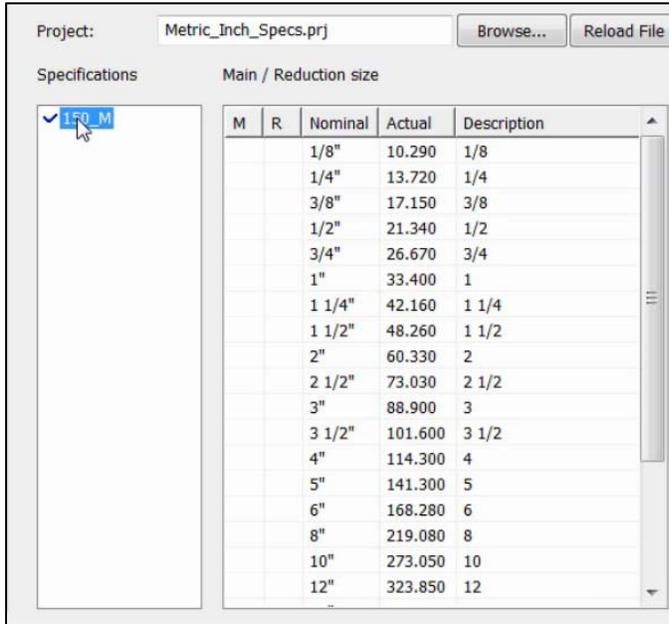
The system looks in the folder that you set SpecificationDirectory to. **Select Metric\_Inch\_Specs.prj, and then click Open.**



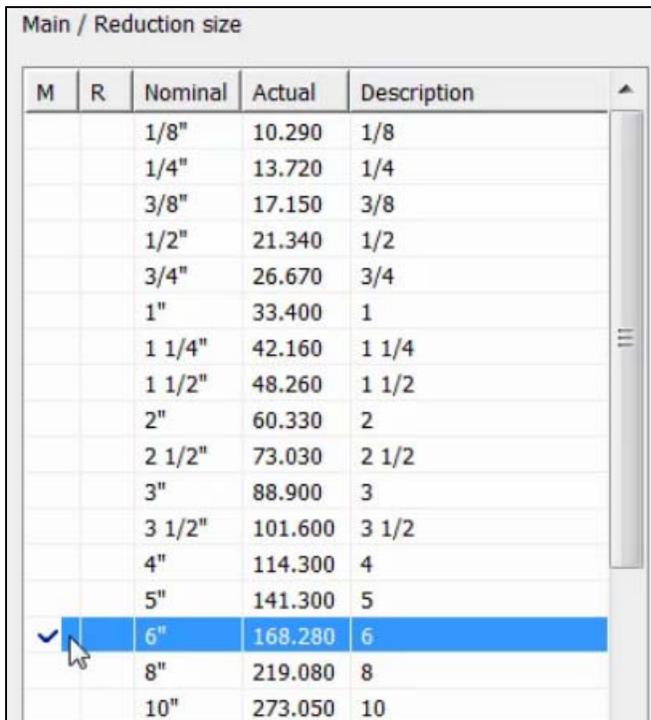
25. The software looks in this project to see what specifications it contains. A project is a collection of specifications and in this particular project, there's just one spec. It's called 150\_M. Select it.



26. You can now select the main size and the reduced sizes. Listed you see the Nominal pipe size in inches and the Actual size in MM.

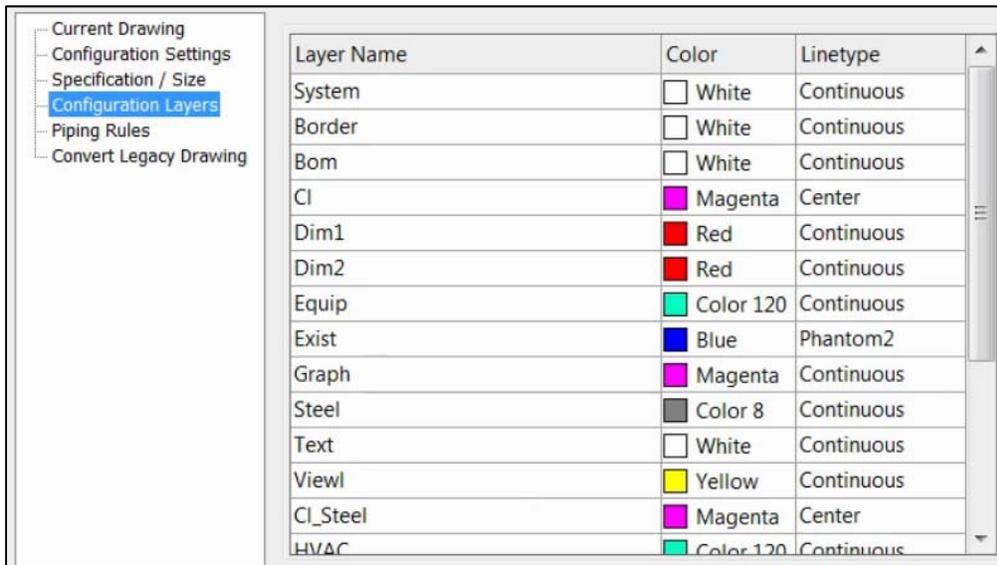


27. Double-click 6" underneath the Main column.



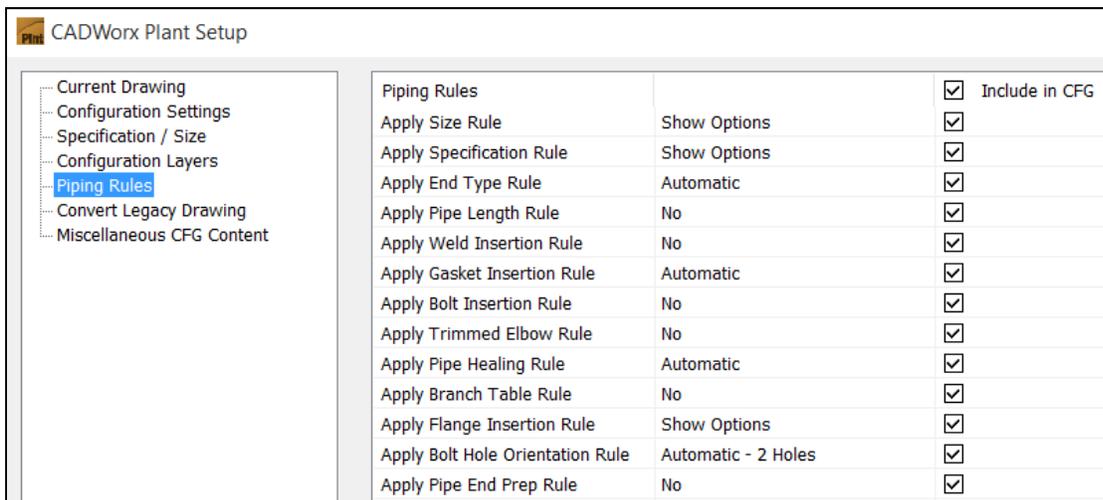
28. Leave it set like that, and let's look at some of these other settings for a minute.

29. **Click Configuration Layer.** These are standard settings that are in the system for layers which you can modify. You can edit these if you like. You can set up your own system if you like. Most people just leave this like it is because it works fine for just about all of us.



Layer Name	Color	Linetype
System	<input type="checkbox"/> White	Continuous
Border	<input type="checkbox"/> White	Continuous
Bom	<input type="checkbox"/> White	Continuous
Cl	<input checked="" type="checkbox"/> Magenta	Center
Dim1	<input checked="" type="checkbox"/> Red	Continuous
Dim2	<input checked="" type="checkbox"/> Red	Continuous
Equip	<input checked="" type="checkbox"/> Color 120	Continuous
Exist	<input checked="" type="checkbox"/> Blue	Phantom2
Graph	<input checked="" type="checkbox"/> Magenta	Continuous
Steel	<input checked="" type="checkbox"/> Color 8	Continuous
Text	<input type="checkbox"/> White	Continuous
View1	<input checked="" type="checkbox"/> Yellow	Continuous
Cl_Steel	<input checked="" type="checkbox"/> Magenta	Center
HVAC	<input checked="" type="checkbox"/> Color 120	Continuous

30. We have another section to look at, called Piping Rules. **Click Piping Rules.** These automatic rules built into the system help prevent errors and make things connect up properly.



Piping Rules	Options	Include in CFG
Apply Size Rule	Show Options	<input checked="" type="checkbox"/>
Apply Specification Rule	Show Options	<input checked="" type="checkbox"/>
Apply End Type Rule	Automatic	<input checked="" type="checkbox"/>
Apply Pipe Length Rule	No	<input checked="" type="checkbox"/>
Apply Weld Insertion Rule	No	<input checked="" type="checkbox"/>
Apply Gasket Insertion Rule	Automatic	<input checked="" type="checkbox"/>
Apply Bolt Insertion Rule	No	<input checked="" type="checkbox"/>
Apply Trimmed Elbow Rule	No	<input checked="" type="checkbox"/>
Apply Pipe Healing Rule	Automatic	<input checked="" type="checkbox"/>
Apply Branch Table Rule	No	<input checked="" type="checkbox"/>
Apply Flange Insertion Rule	Show Options	<input checked="" type="checkbox"/>
Apply Bolt Hole Orientation Rule	Automatic - 2 Holes	<input checked="" type="checkbox"/>
Apply Pipe End Prep Rule	No	<input checked="" type="checkbox"/>

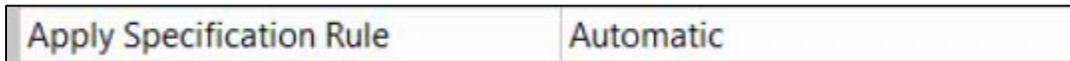
The column on the right (Include in CFG) lets the CAD Administrator customize these settings based on project and corporate preferences.

31. Let's take a look at some of the rules we have.

The Size Rule is set to Automatic, so when you put something into the system, it checks to see if the size matches. If the size doesn't match, it puts in the proper size component into the line.



The Specification Rule checks the spec to see if there's compatibility. You can do a different spec and it creates a spec break for you there if you like.



The software also checks the End Type compatibility, as well.



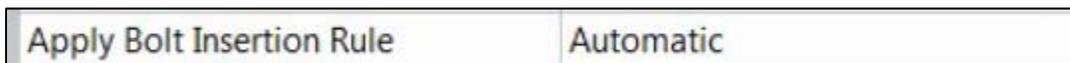
You have settings on these that you can set to No, Automatic, or Show Options, which shows you the different prompts based on your actions in the software. Those are some of the choices you have.

Apply Size Rule	Automatic
Apply Specification Rule	Automatic
Apply End Type Rule	Automatic
Apply Pipe Length Rule	No
Apply Weld Insertion Rule	Automatic
	Show Options

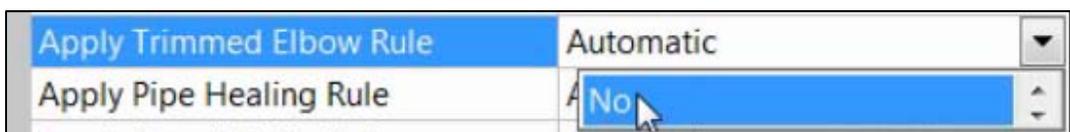
32. Some of the other rules we have are the Gasket Insertion rule. This rule puts a gasket in automatically when needed, such as with a flange set.



33. CADWorx also has the same thing for bolts. This rule puts a set of bolts on flange sets or other components requiring bolts, when it puts a gasket in.

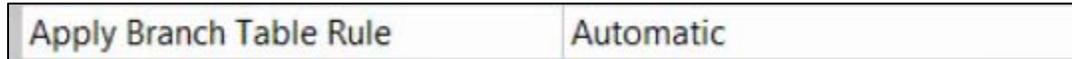


34. If you have the Trimmed Elbow rule set to Automatic-- for this example **click the drop-down and set it to No**, which it probably is by default.



However, if you set it to automatic, then you can key in on XYZ to do a rolled offset, and it automatically inserts trimmed elbows. The trimmed elbows go into the model, into the material list, and through Isogen.

35. We also have a Branch Table rule that you can use, which is controlled by the specification.



36. There are a variety of rules in Piping Rules shown below.

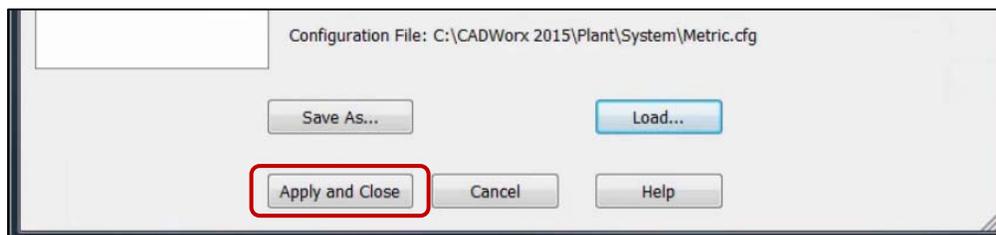


Apply Trimmed Elbow Rule	No
Apply Pipe Healing Rule	Automatic
Apply Branch Table Rule	Automatic
Apply Flange Insertion Rule	Automatic - Use Spec Setting
Apply Bolt Hole Orientation Rule	Automatic - 2 Holes
Apply Pipe End Prep Rule	No
Apply Auto Coupling Rule	No
Apply Line Number Rule	Show Options
Apply Change Data Rule	Custom Data
Apply O-Let Minimum Spacing Rule	6.3500
Center Line	On
Apply Skew Pipe Maximum Angle	15.0000

37. We have the Center Line rule that ensures a center line draws with the components.



38. So this is how we want to have our settings. Click Apply and Close.

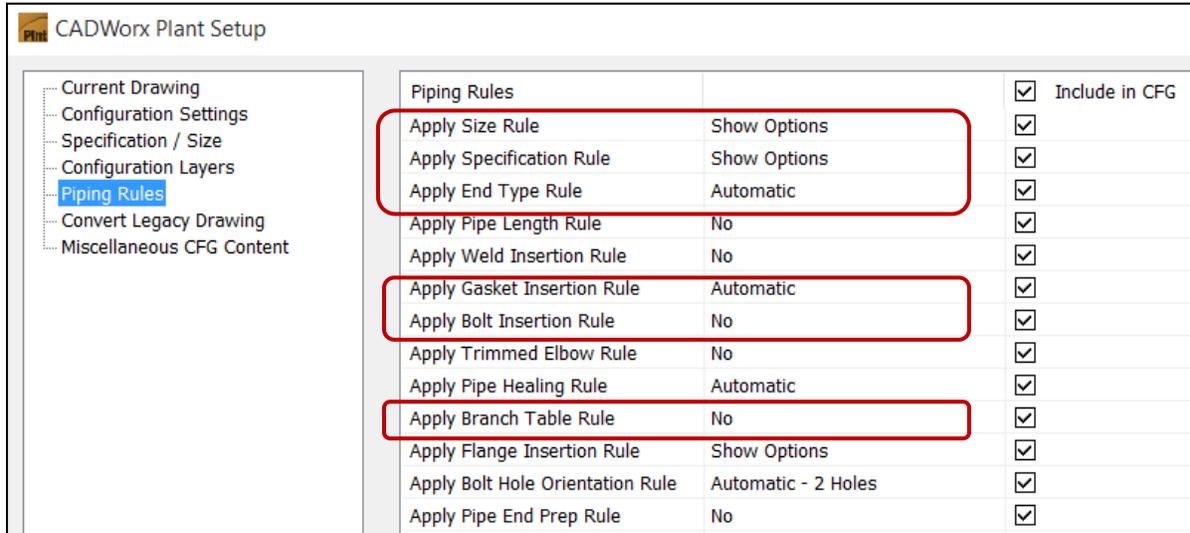
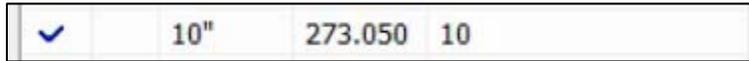


39. Get your drawing set up to this point, and then in the next video we start placing some components.

## CADWorx 2016 Quick Start Guide - Video Two

(Reference Video: Quick\_Start\_V2\_2016)

1. We have now setup our session, so let's give some of this a try. Before we used Setup, set our specs, set up with a 10 inch size, and we had our piping rules set up. You can see we have the first three set to Automatic. We also have Gaskets, Bolts, and Branch Table set to Automatic.



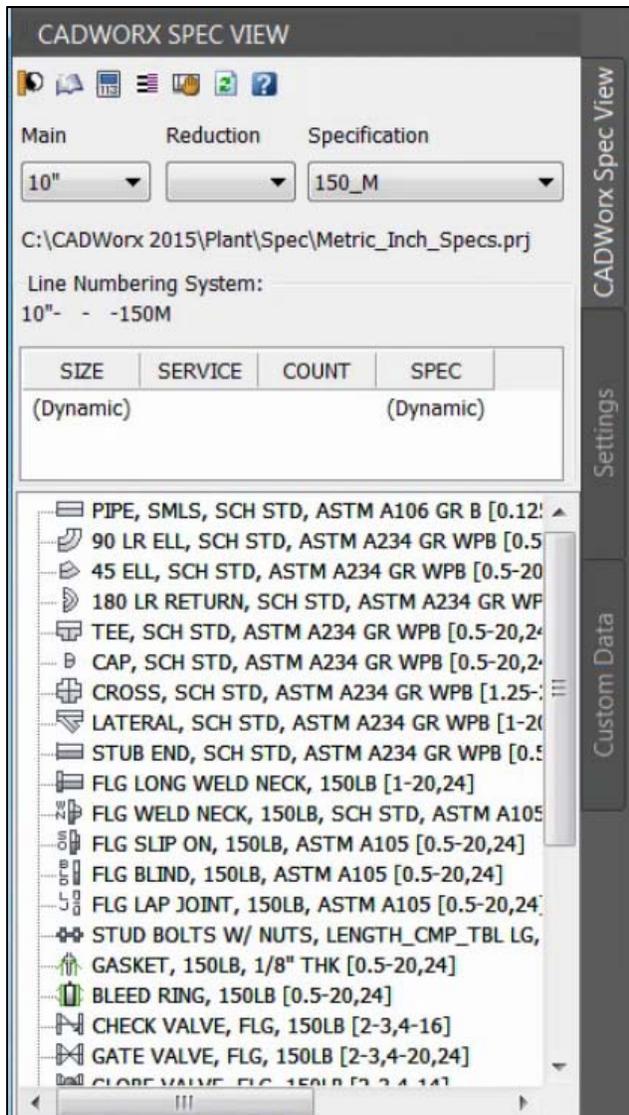
Click Apply and Close.



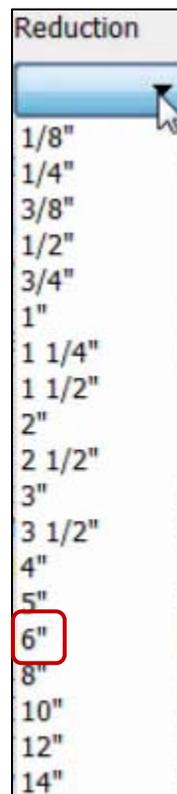
2. On the Palettes panel, we have some different buttons. **Hover over the icon indicated below and you see that it's the Spec View tool pallet. Click Spec View.**



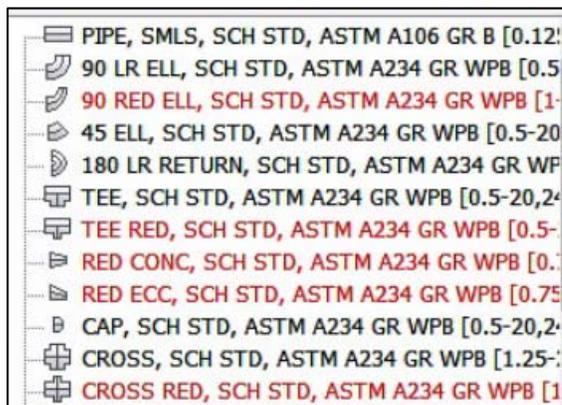
- The Spec View palette displays. You can see it is set for a 10-inch size, and our spec is 150\_M. When you see the \_M, it means you are in a metric/inch spec. If you just have an MM, that's going to be all metric. If you just have 150, it's going to be an imperial spec. So that's how they designate these.



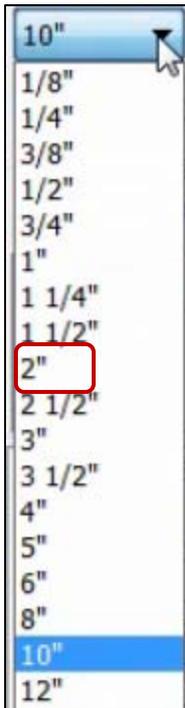
Also, you can see we just see black fittings listed in here. There are no colors down in the component list. If we set our reduction size—**click the Reduction drop-down arrow, and select 6"**. If we do that, then we start seeing some red in the component list.



Red fittings are the reducing fittings.



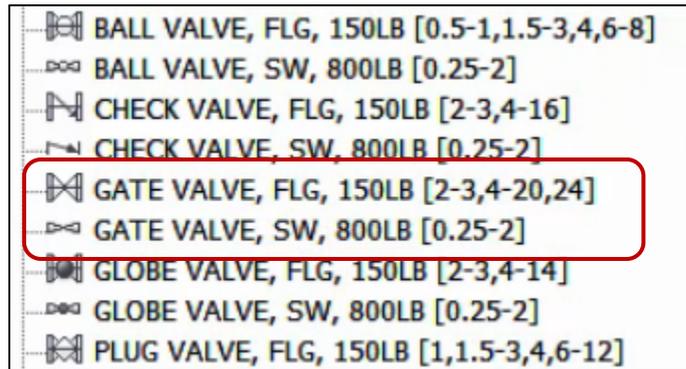
- Let's check something. Instead of a 10 inch, let's just set it down smaller.
- Click the Main drop-down arrow, and select 2”.**



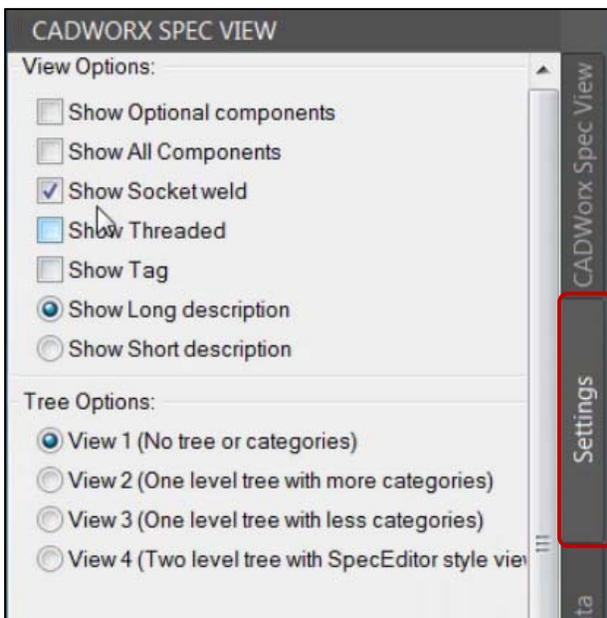
Whatever two inch size components we have available in the spec, they'll be listed in the component list.

- Scroll down and take a closer look at some of these. **Click the scroll bar and drag down to see the valves.**

If we look at our list now, we have a gate valve flanged, and we have a gate valve socket weld.



- Well, let's say that we wanted to see threaded. Our spec might have buttweld, flange, threaded, socket weld. To show more fittings in the Spec View pallet is we go to Settings. **Click the Settings tab.**

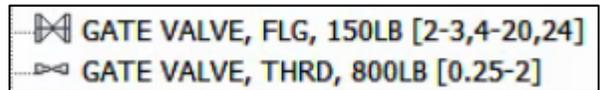


Then, we can use Show Threaded. For clarity, let's turn off the Show Socket weld check box. **Click Show Threaded and clear Show Socket Weld.**



- Click the CADWorx Spec View tab, and then I drag the scroll bar down and look and to see what's displaying now.**

We now see under Gate Valve, we have Flanged and Threaded. So, that's how you show the other fittings.

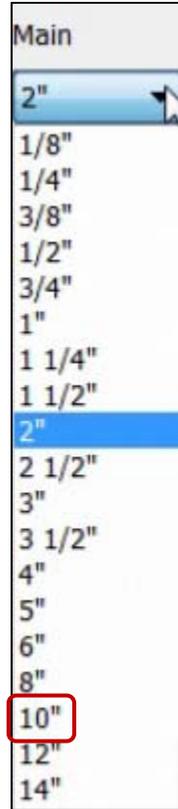
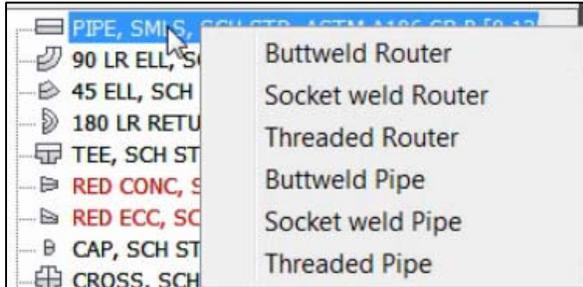


9. One other thing to say here on the piping. If you click Pipe, this inserts a buttweld two inch pipe.

10. However, if you right-click the Pipe entry, you receive some choices.

**Right-click Pipe.**

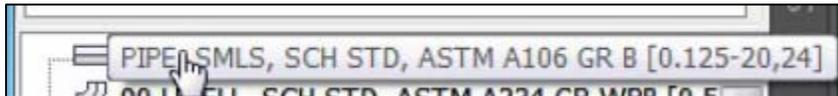
This shows you could bring in Buttweld Pipe, Socket Weld, or Threaded.



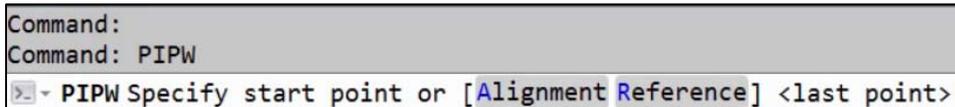
11. Let's go back up here now to the Main Size, and let's set it to 10 inches.

**Click the Main drop-down, and select 10”.**

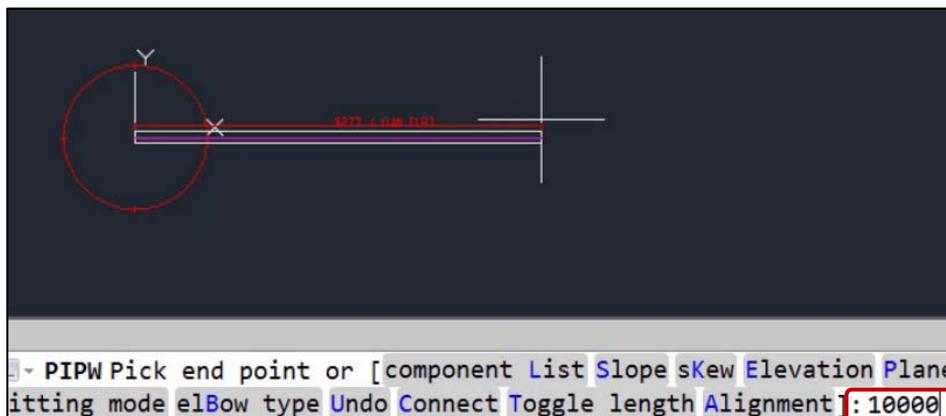
12. Click Pipe.



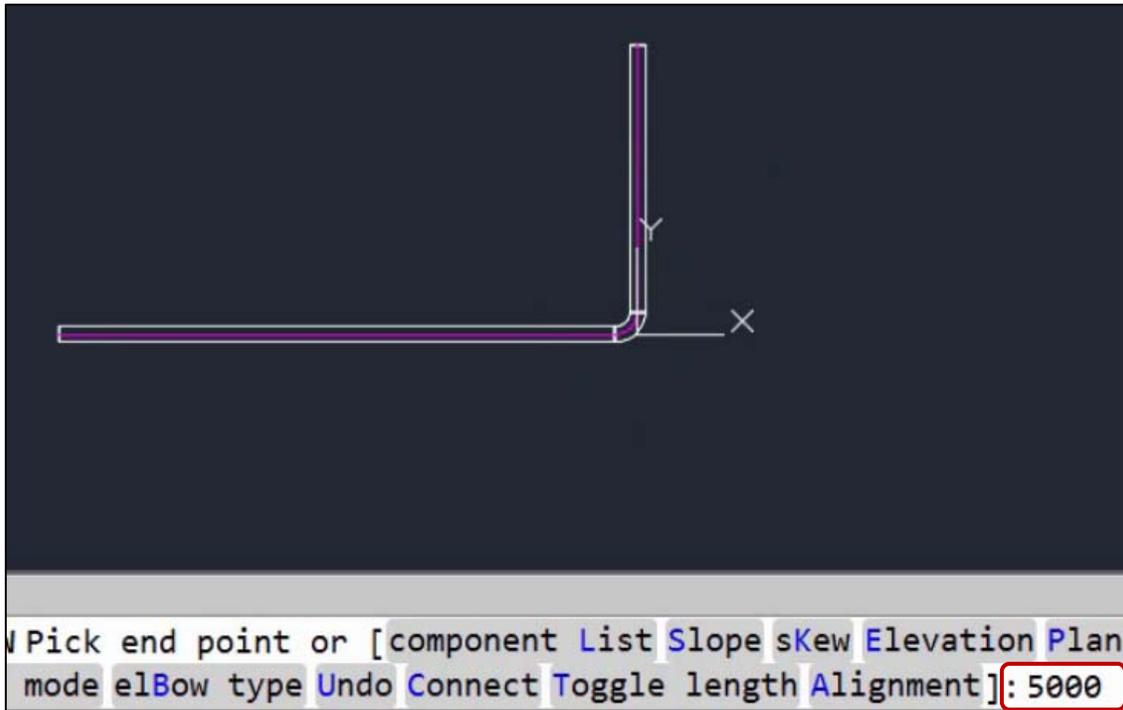
The software prompts you to Specify Start Point.



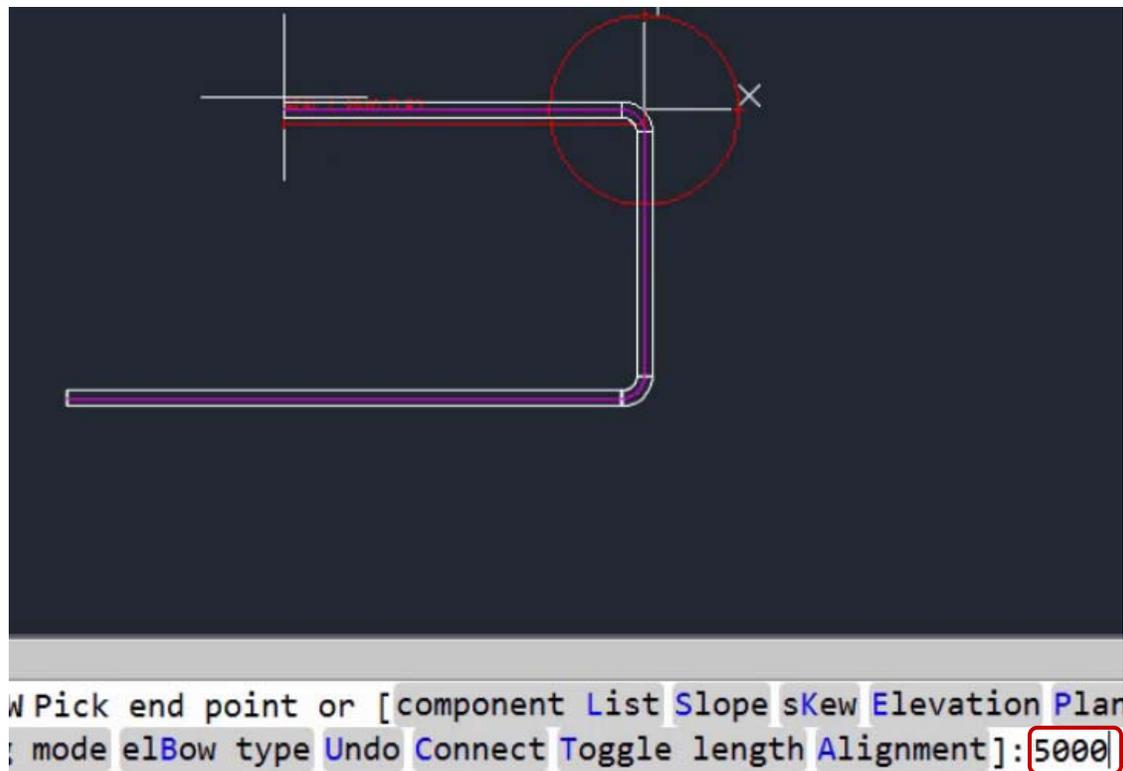
13. Click a point on the screen, drag out to the right, type 10,000, and then press Enter.



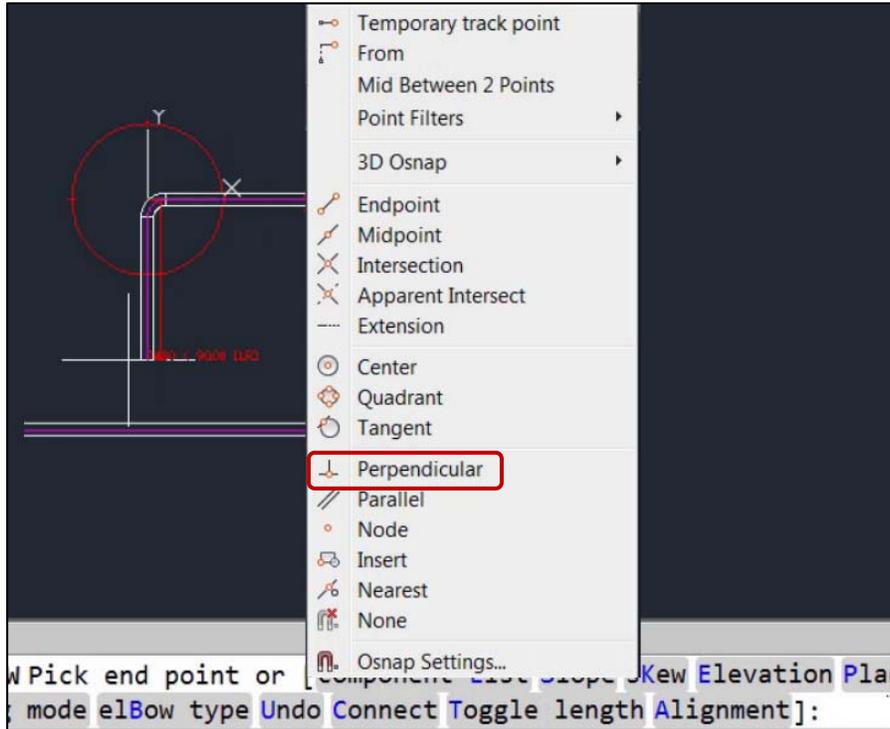
14. Drag straight up, and type 5,000.



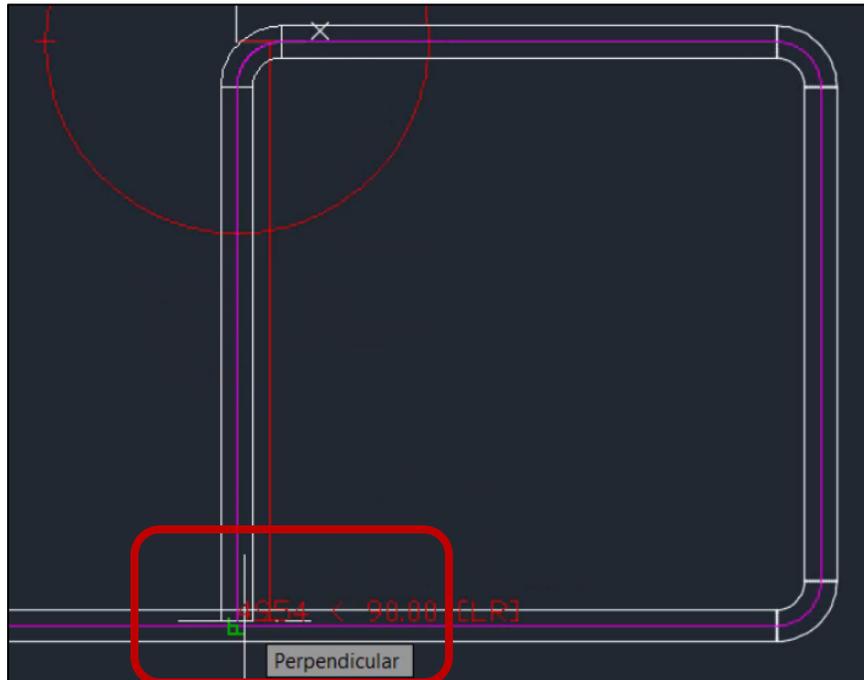
15. Drag straight over to the left, and type 5000.



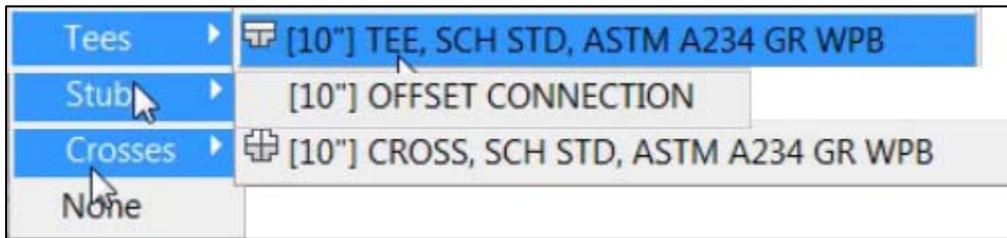
16. Then, what we want to do is drag down, press Shift + right-click, and then select Perpendicular.



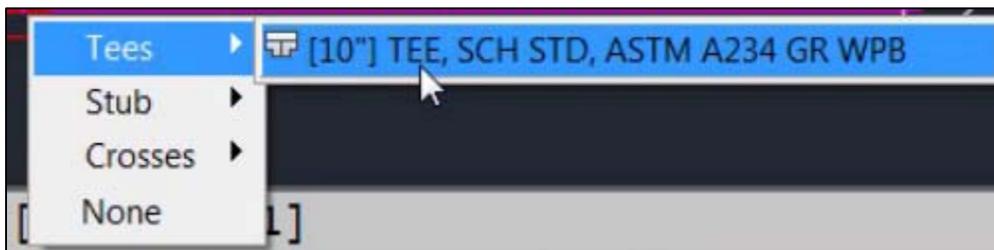
17. Roll the mouse wheel forward to zoom in, and hover right on the center line of the pipe coming across from left to right, and then click.



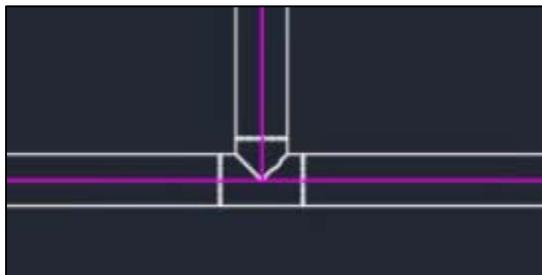
18. Since we have our roles set to User Branch Table, we have a choice of how we want the system to put in a connection on this line. We can select Tees to put in a 10 inch tee. However, we also have options for an offset stub, a cross, or none.



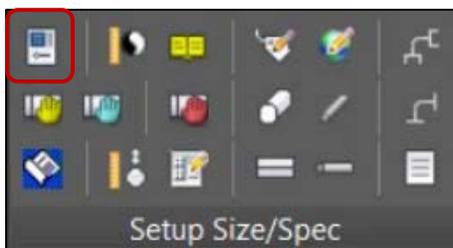
19. Click the 10" tee to use that straight tee.



The tee places on the piping, and it breaks the pipe into two pieces.

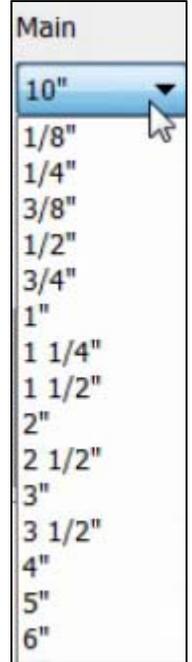


20. Let's try a few things now. **Click Setup, and then select Piping Rules, and set the Size Rule to No.** We turn it off to see what happens.

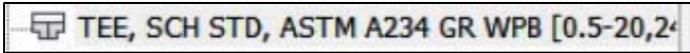


21. Click Apply and Close.

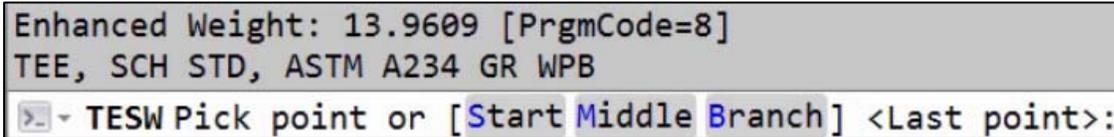
22. Let's reset our main size. **Click the Main drop-down arrow, and set it to be 6 inches.** So we're 6 on the main, and 6 on the reduced.



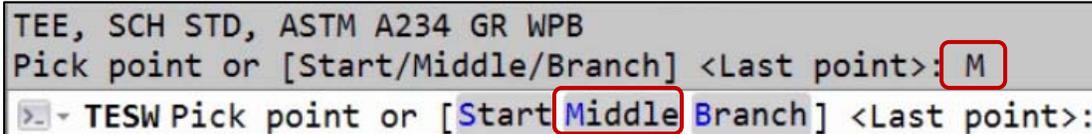
23. **Scroll down, and click a Tee.**



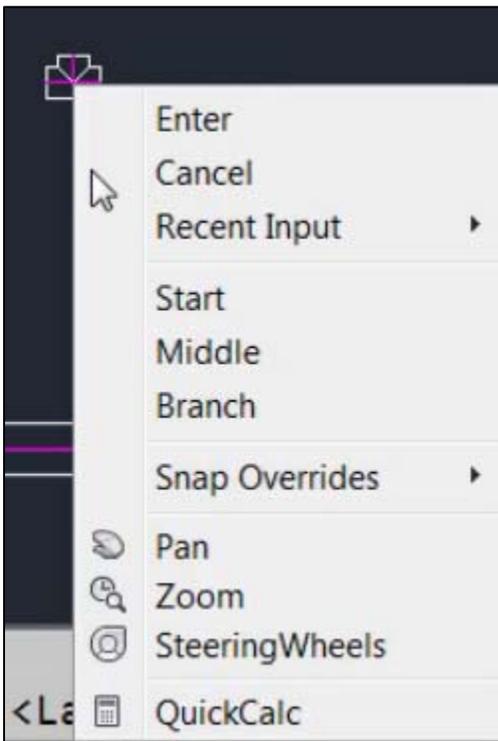
The software prompts you to Pick point.



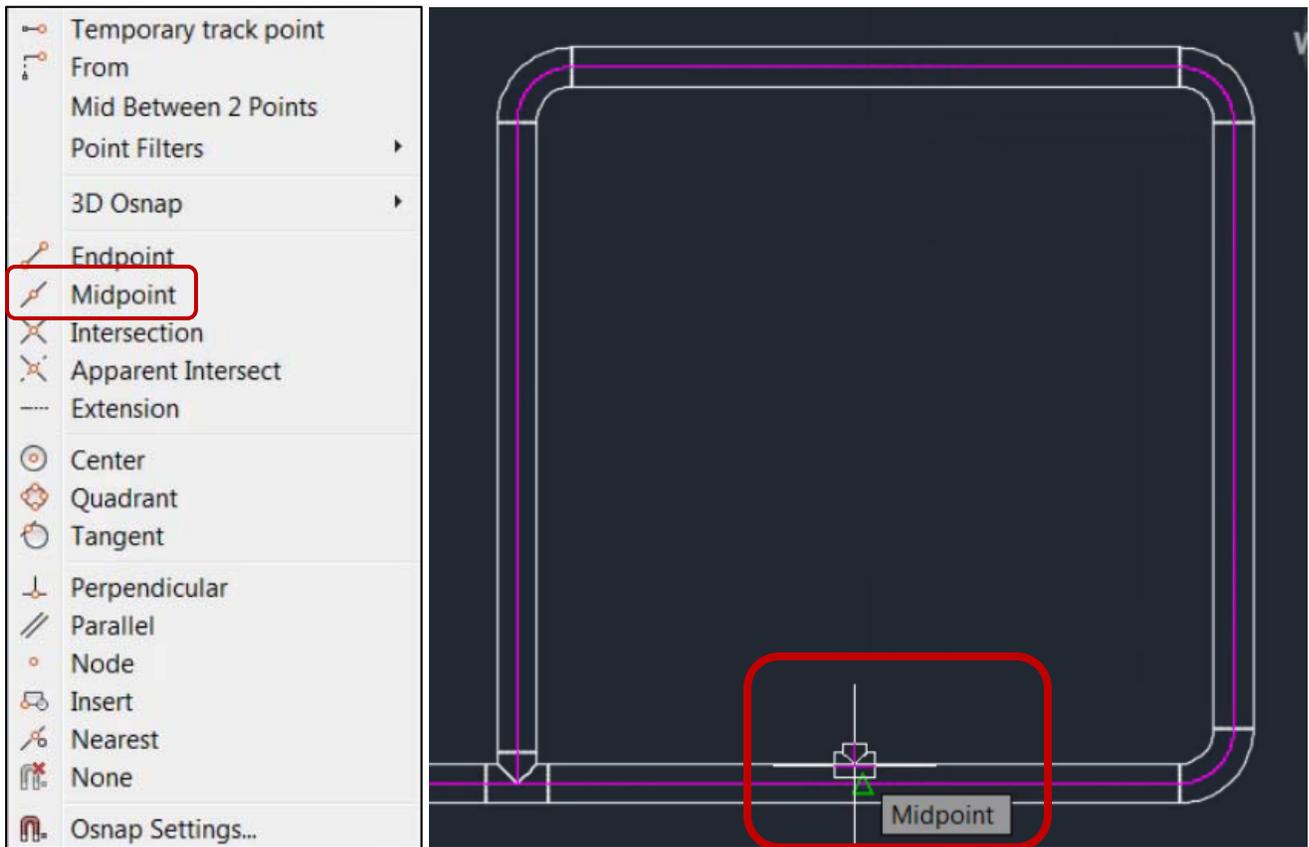
24. **Click Middle to set it to be middle justified when it comes in.** You can also type M on the command line, and then press Enter.



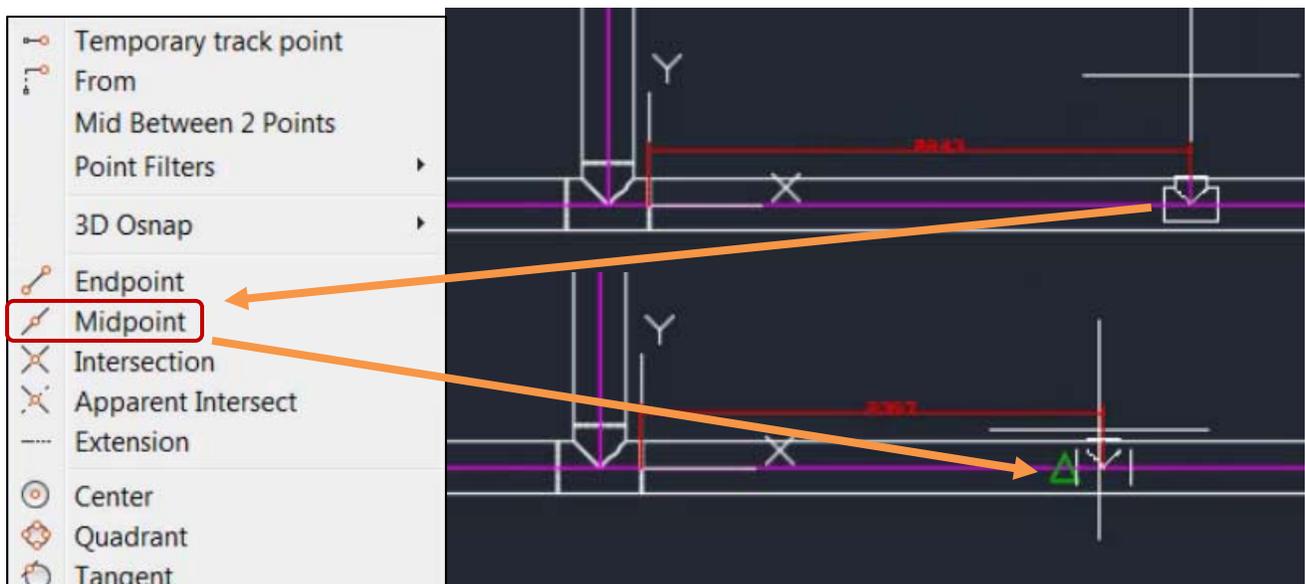
25. In some of the earlier versions of CADWorx, you couldn't just click Middle on the command prompt; you had to right-click, and then select Middle. So either way you get there.



26. **Next, Shift + right-click.** So you just hold down the Shift key, and then right-clicking on the mouse. **Select Midpoint, and then click the midpoint of the line as indicated in the image below.**



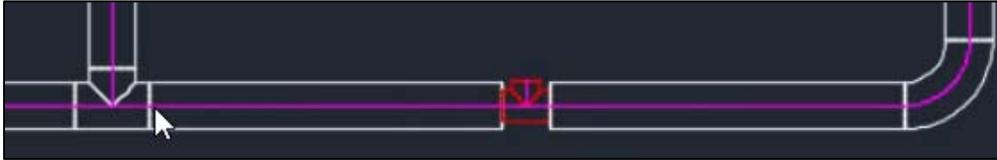
27. When the system starts dragging back and forth from that line, it'll let me enter a number. **Shift + right-click, select Midpoint, and then click again on that line at the midpoint.**



The software prompts for the orientation of the branch.

```
Specify insertion point or [point distance/Component distance/Pipe end point distance/insertion Justification]: _mid of
TESW Pick branch end direction:
```

28. Click straight up, and the software inserts the tee on that line.



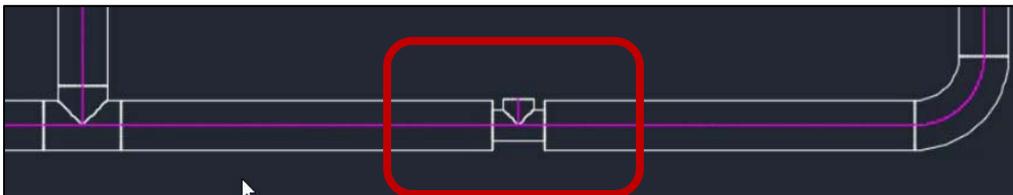
The tee displays in red and the software prompts you for the line number.

```
TESW Enter an option [Exact copy of parent line number: 10" - -150_M
Dynamic parent line number: 6" - -150_M
Current line number setup: 6" - -150_M] <Exact>:
```

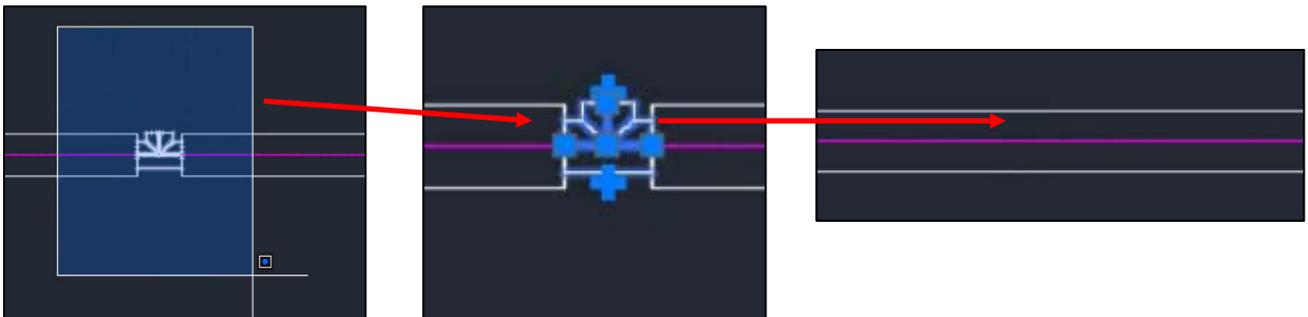
29. Click Current line number setup: 6" - -150\_M.

```
TESW Enter an option [Exact copy of parent line number: 10" - -150_M
Dynamic parent line number: 6" - -150_M
Current line number setup: 6" - -150_M] <Exact>:
```

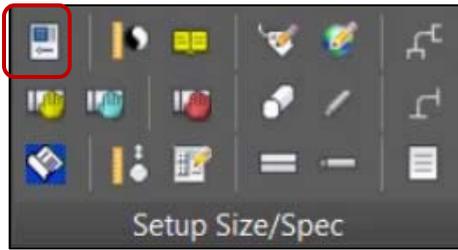
30. What I wanted you to see was that it came out at 6 inches. The pipe size rule had no effect on it. We do not really want that.



31. Click the screen to the upper left-hand side, and then drag down to the lower right-hand side, to window the tee. Press Delete, and it removes. We could use an erase on it as well.

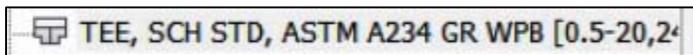


32. So now, let's go back to Setup and to Piping Rules again.  
**Click Setup, and then select Piping Rules, and set the Size Rule to Automatic.**

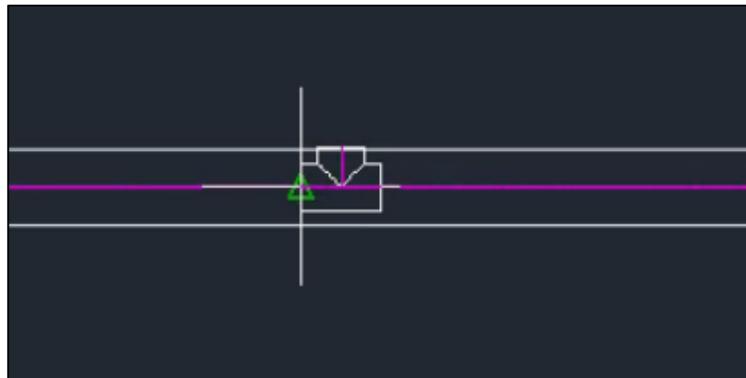
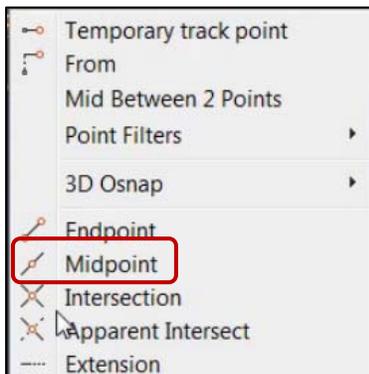


33. Click Apply and Close.

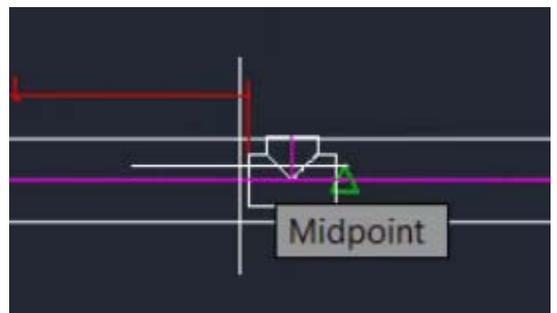
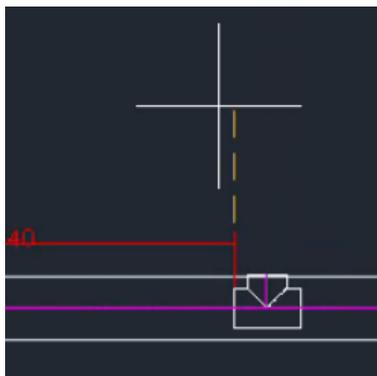
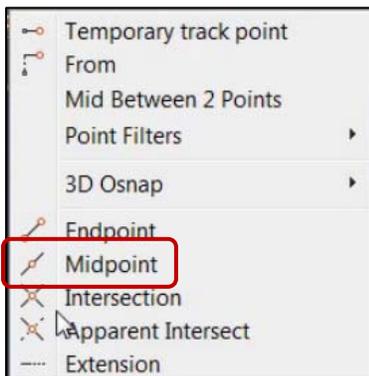
34. Scroll down, and click that Tee again.



35. Do the same thing we did earlier. Shift + right-click, select Midpoint, and then click on the midpoint of that line.



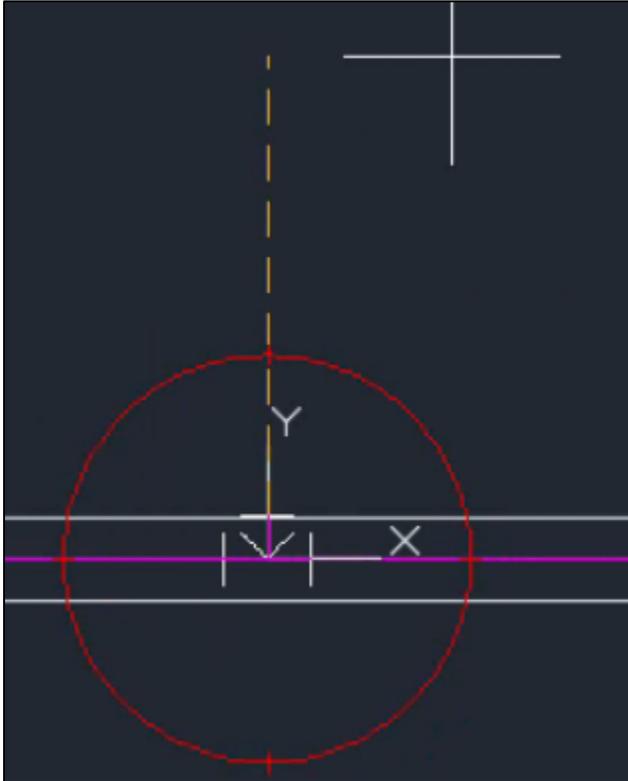
36. **Shift + right-click, and then Midpoint again.** I didn't set it to be Middle Justified, but for our example, it doesn't matter. The main thing you can see is that it's coming in smaller than the pipe. **Click the midpoint again.**



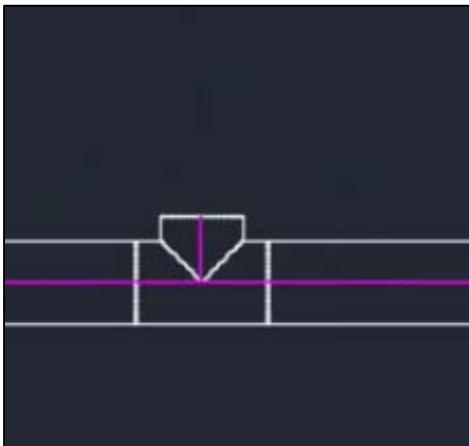
The software prompts for the orientation.

```
Specify insertion point or [point distance/Component distance/Pipe end point distance/insertion Justification]: _mid of  
> TESW Pick branch end direction:
```

37. Click straight up above the pipe.



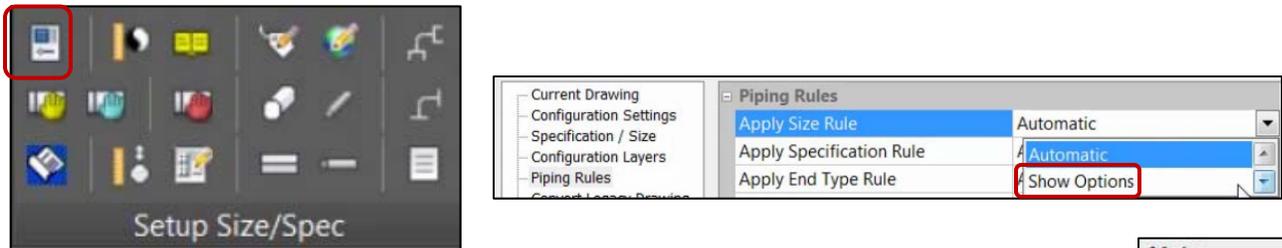
The software switches the tee to the proper size and puts it in. So it automatically set it to match the size of the line that it was going into. So that was good.



38. Click the screen to the upper left-hand side, and then drag down to the lower right-hand side, to window the tee. Press Delete, and it removes.



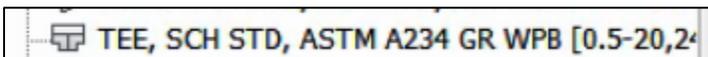
39. Click Setup, and then select Piping Rules, and set the Size Rule to Show Options.



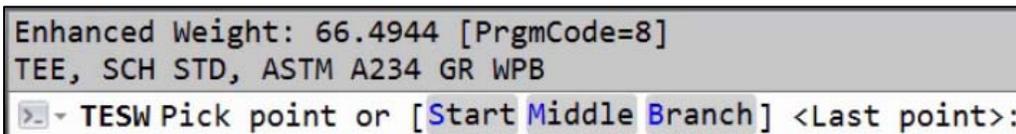
40. Click Apply and Close.

41. Let's change our Main size again. Let's go with something else, like a 14 inch size, to really get something big in the line.  
Click the Main drop-down, and select 14”.

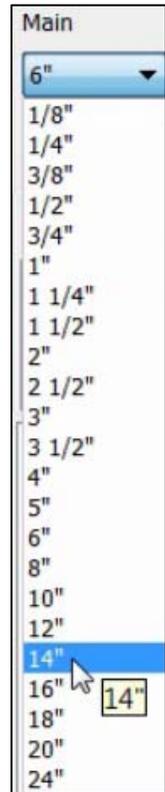
42. Click that Tee again.



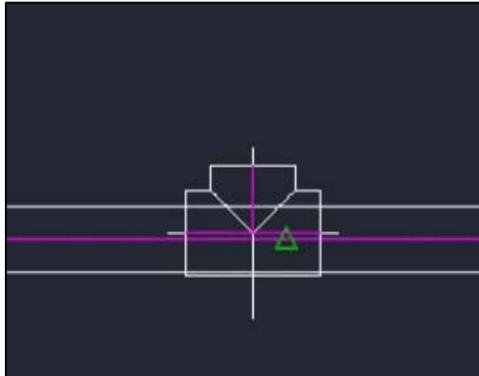
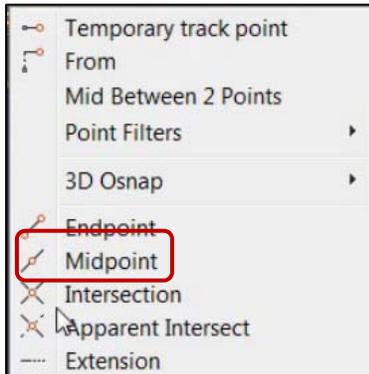
The software again prompts for the start point.



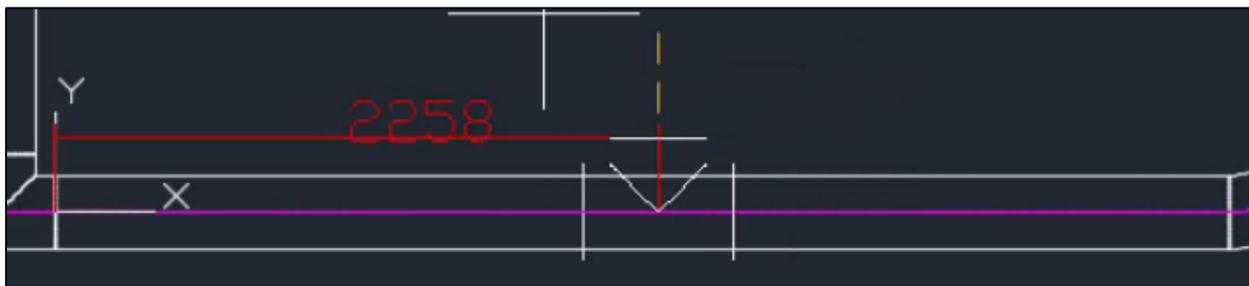
43. Right-click this time, and then select Middle.



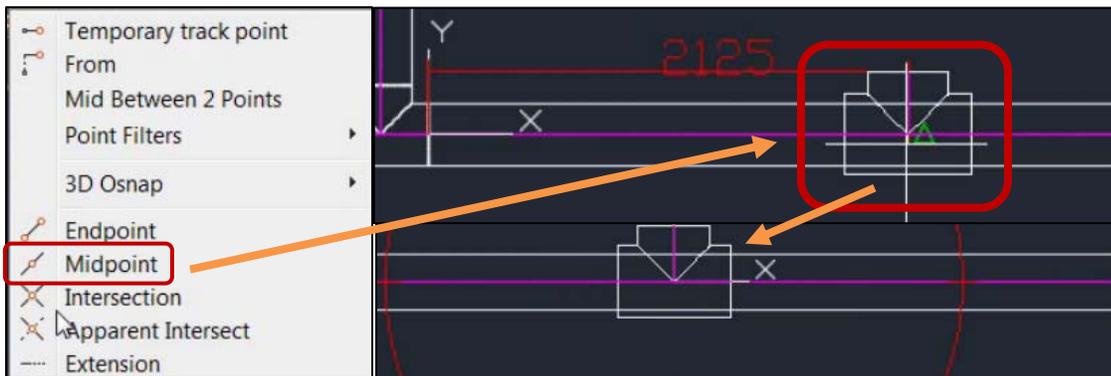
44. **Shift + right-click, select Midpoint, and then click the midpoint of that line.**



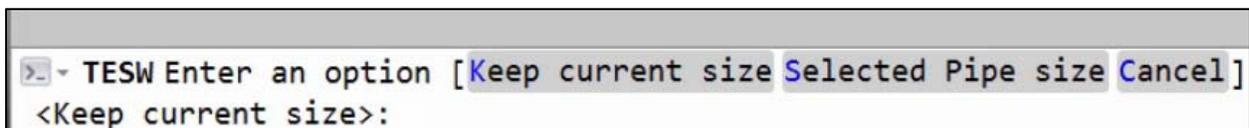
The software lets me drag it around.



45. **Shift + right-click, Midpoint again, click on that line, and then orient it up.**



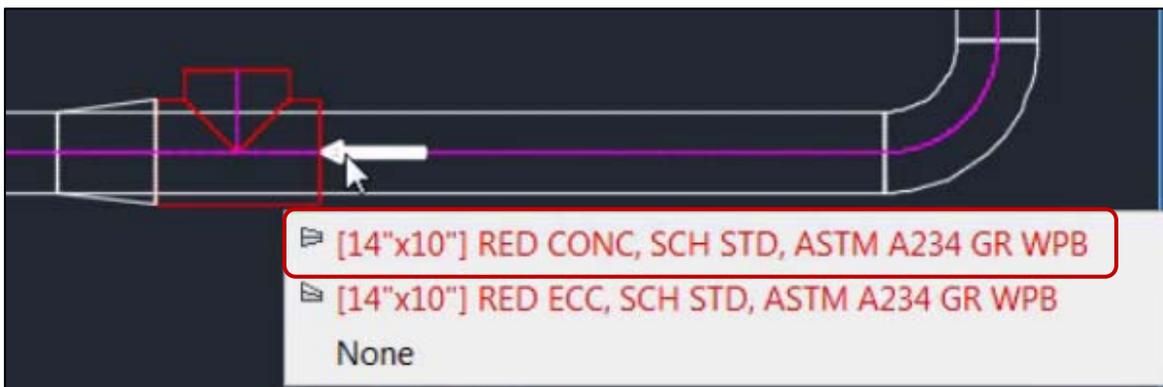
46. The software prompts with messages asking: Do you want to keep the current size, or the pipe size you selected? **By default, it sets to Keep Current Size, so press Enter to take that.**



47. An arrow displays on the left side asking how you want to merge or connect this. We can use a concentric reducer or an eccentric. **Select the concentric reducer.**

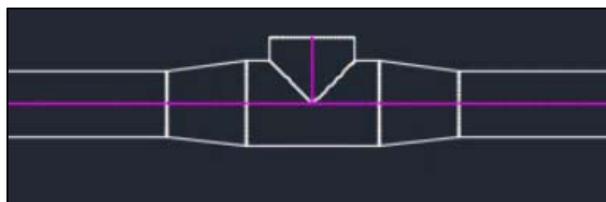


48. Now it does the same thing on the other size. What do you want to do here? **Select the concentric reducer.**



49. The software now asks: What do you want to do about the line number? I'm just going to use this current line number. **Click Current line number setup: 14"- - -150\_M.**

```
TESW Enter an option [Exact copy of parent line number: 10"- - -150_M  
Dynamic parent line number: 14"- - -150_M  
Current line number setup: 14"- - -150_M] <Exact>:
```

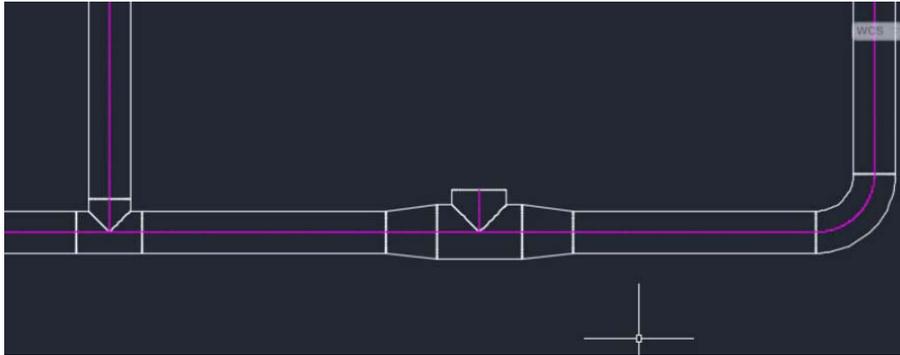


50. You can see how this can really save you some time, because you won't have to figure out so many things and change your size so often. Go ahead and get your line to this point, and then we'll take a look at some more features in CADWorx.

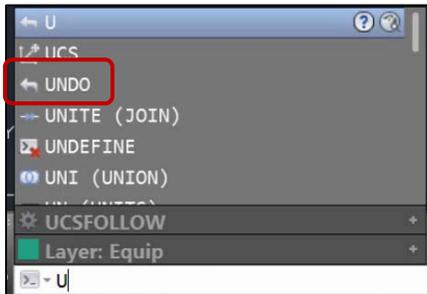
## CADWorx 2016 Quick Start Guide - Video Three

(Reference Video: Quick\_Start\_V3\_2016)

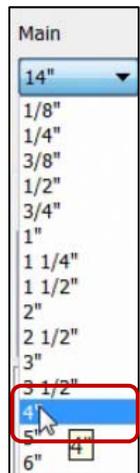
1. Let's go ahead and continue looking at placing components in the new CADWorx.



2. What I'm going to do, I'm just going to type U+Enter for undo, and we'll just take the tee and reducers out. **Type U on the command line, and then press ENTER.**



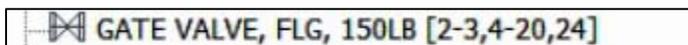
3. Now, we have a single pipe running across the bottom as shown above. Let's go ahead and set a smaller size. Right now we are at 6" on reduced. Let's set our main size to be 4", so that we have four on the main, and six on the reduced. **Click Main and select 4".**



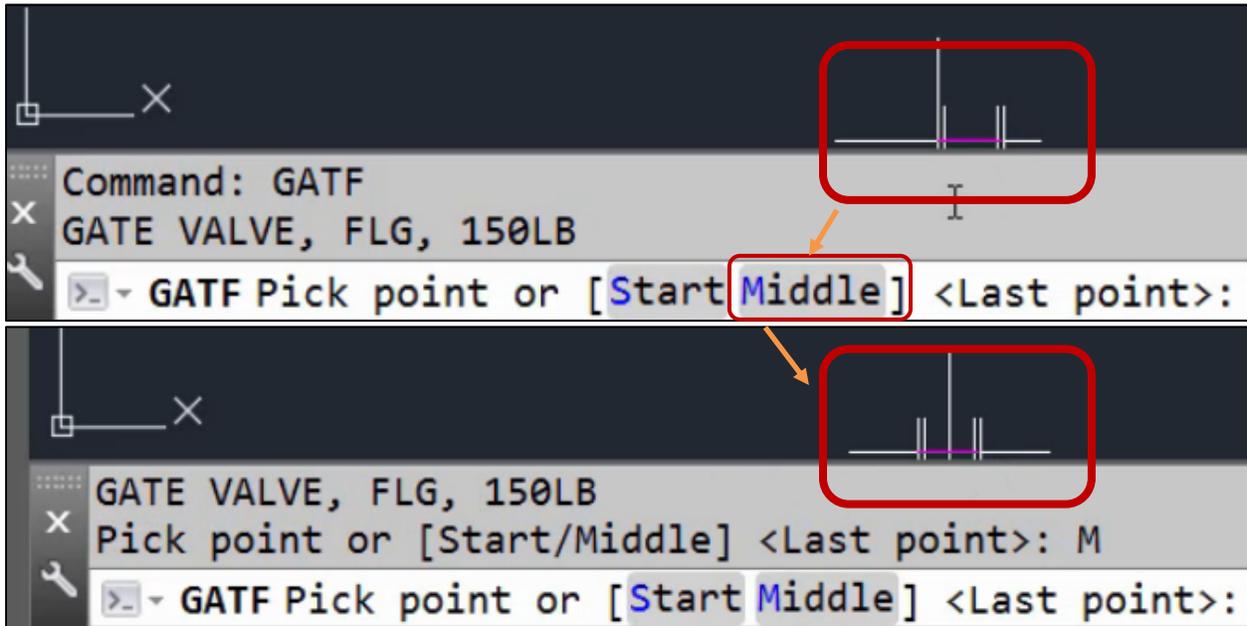
4. **Scroll down to find a gate valve.**



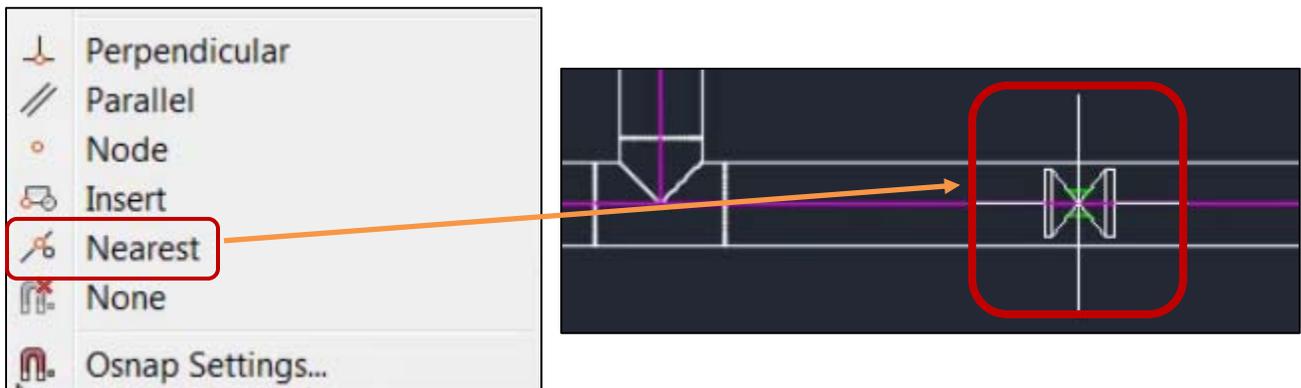
5. **Click the flanged gate valve.**



- Click **Middle** to change the insertion point of the component from the start point to the middle point.



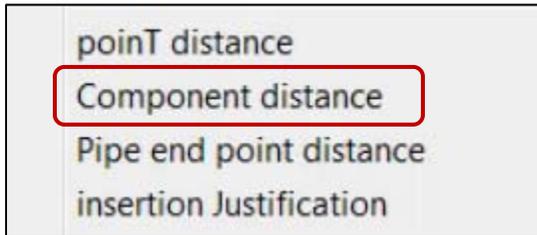
- Shift + right-click**, select **Nearest**, and then click a point along this line.



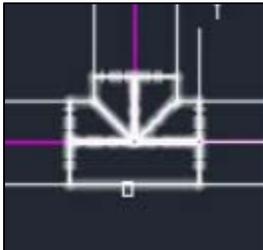
Notice that it drags down off the end of that tee.



8. What we can do, CADWorx gives us some options. If we right-click, we can see those options. **Right-click to see the options provided by the software, and click Component distance.**



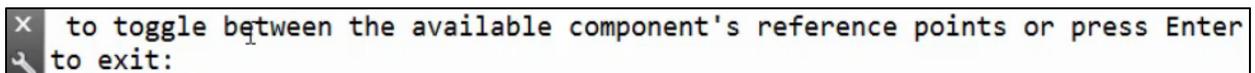
9. Click on the tee.



10. Now, instead of it dragging off the end of the tee, it's dragging off the center.



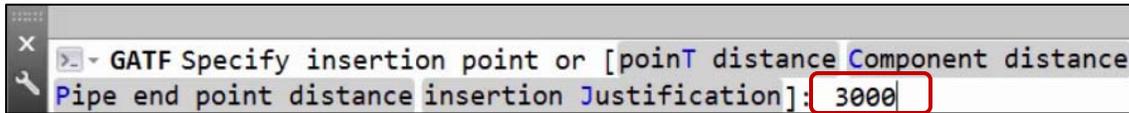
The software prompts you to press Enter to exit. **Press Enter.**



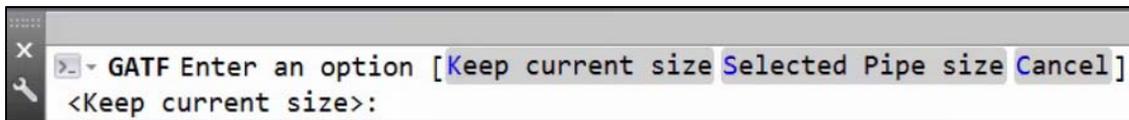
So, now the valve drags based on the center of the tee.



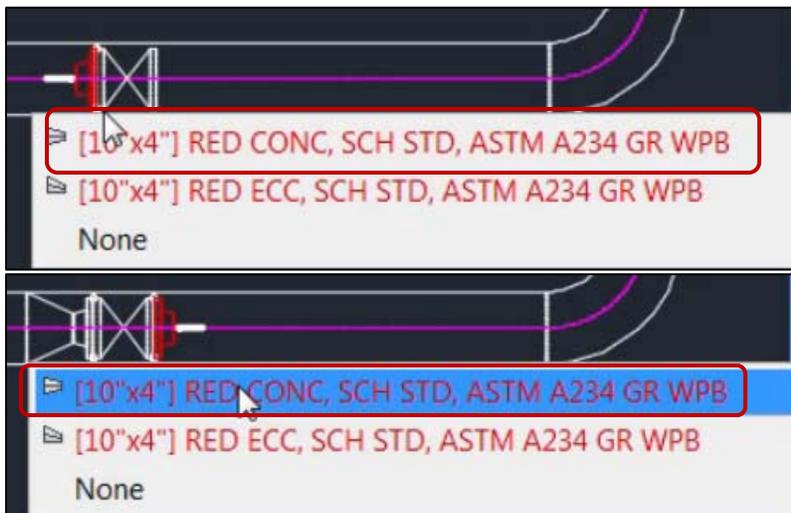
11. Type 3,000, and press Enter.



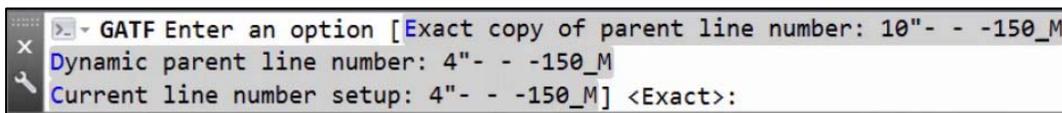
12. The software asks what you want to do: Keep the current size or fit it to match the selected pipe size. Press Enter to keep the current size.



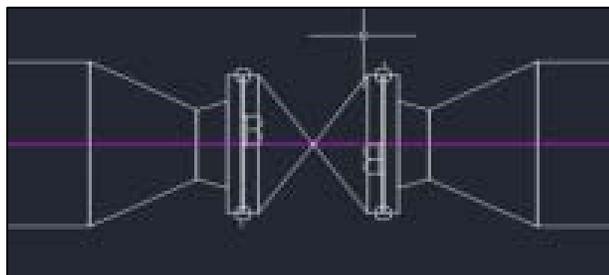
13. Now, the software asks about reducers again. Let's take the concentric reducer on both sides. Select the concentric reducer twice.



14. Also we'll take the same line number. Press Enter for Exact.



15. Notice that CADWorx not only inserts the valve and the reducers, but also inserts the flanges, the gaskets, and the bolts.

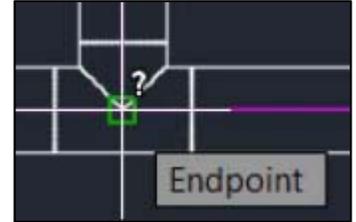


16. You can see this is really doing some automation for us.

17. Let's check the distance, type **DIST**, on the command line, and then press Enter.



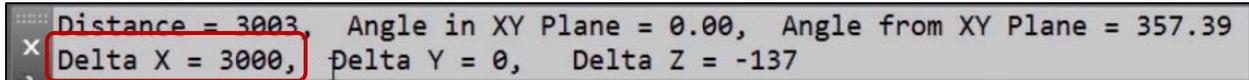
18. Click the center of the tee, the O snap endpoint, and it's going to pick up that point.



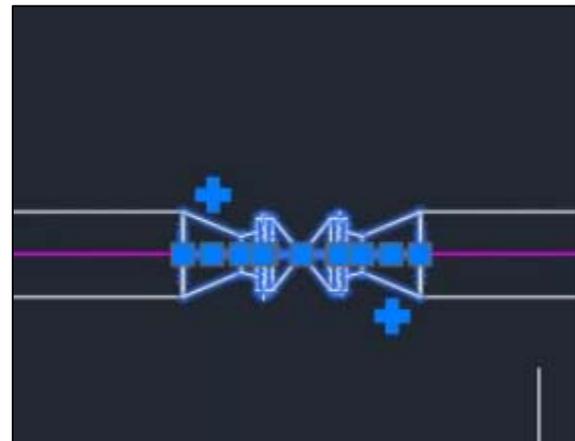
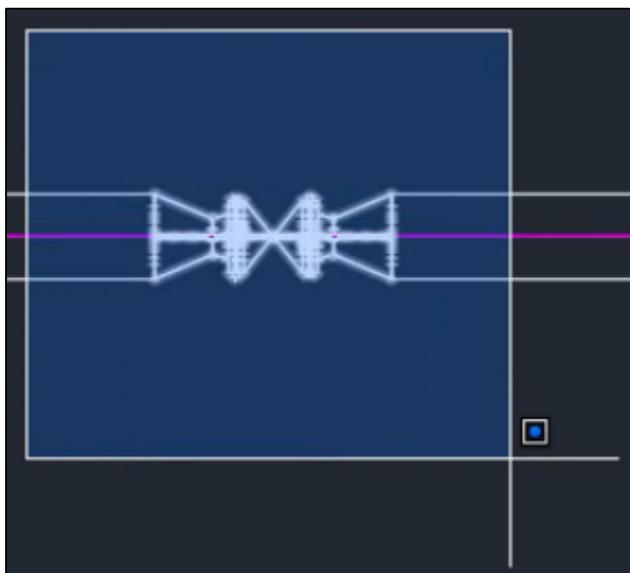
19. For the center of the valve, **Shift + right-click**, select Midpoint, and click the midpoint of the center line of the valve.



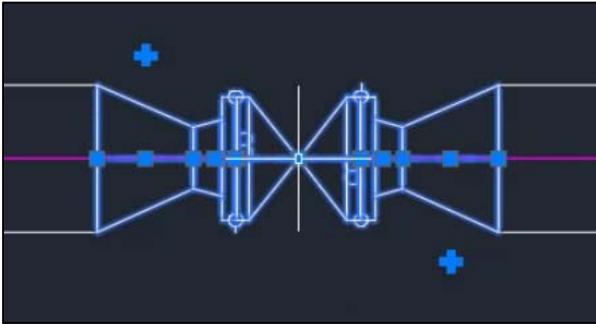
The software echoes back the delta x dimension of 3,000, so it's done like we would expect.



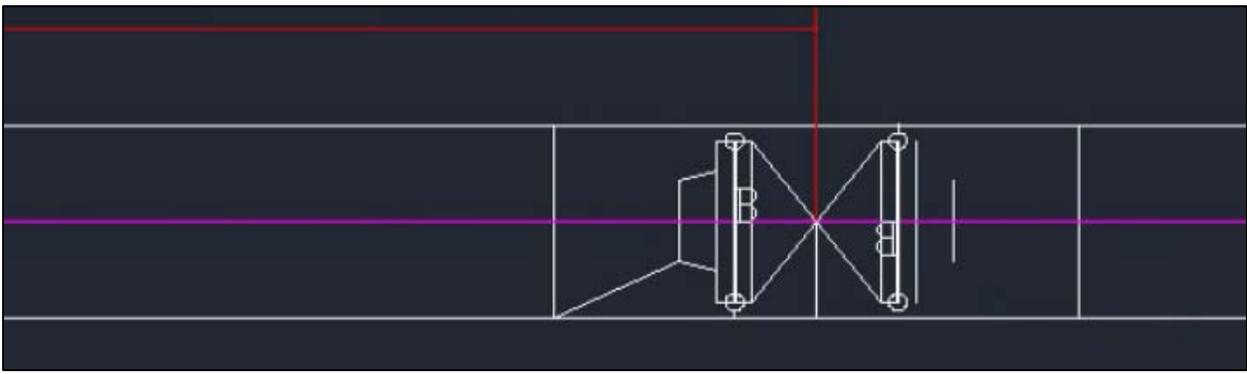
20. Let's go ahead and just window this valve and flanges. **Click the upper left hand corner, drag a window around the valve, flanges, and reducers, and click the lower right hand corner.** You see some plus grips, and a series of grips in the middle.



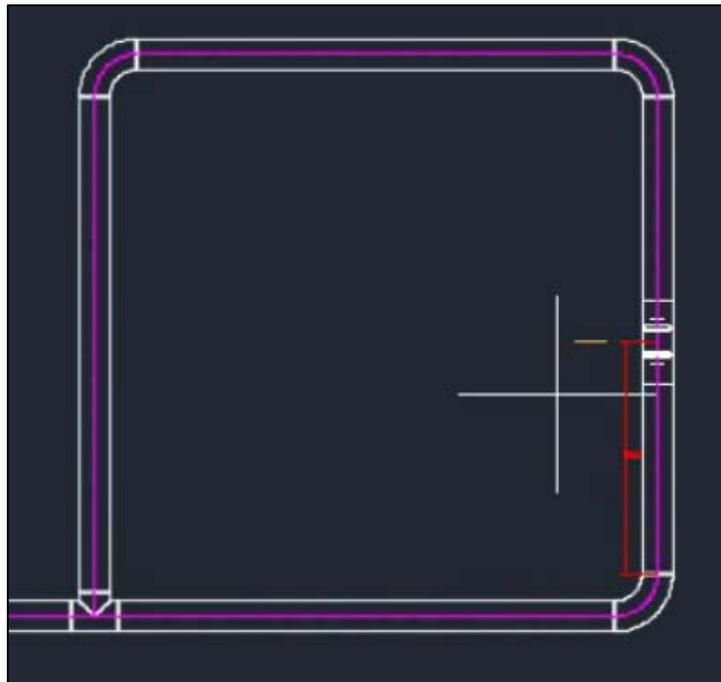
21. Click on the grip in the center of the valve.



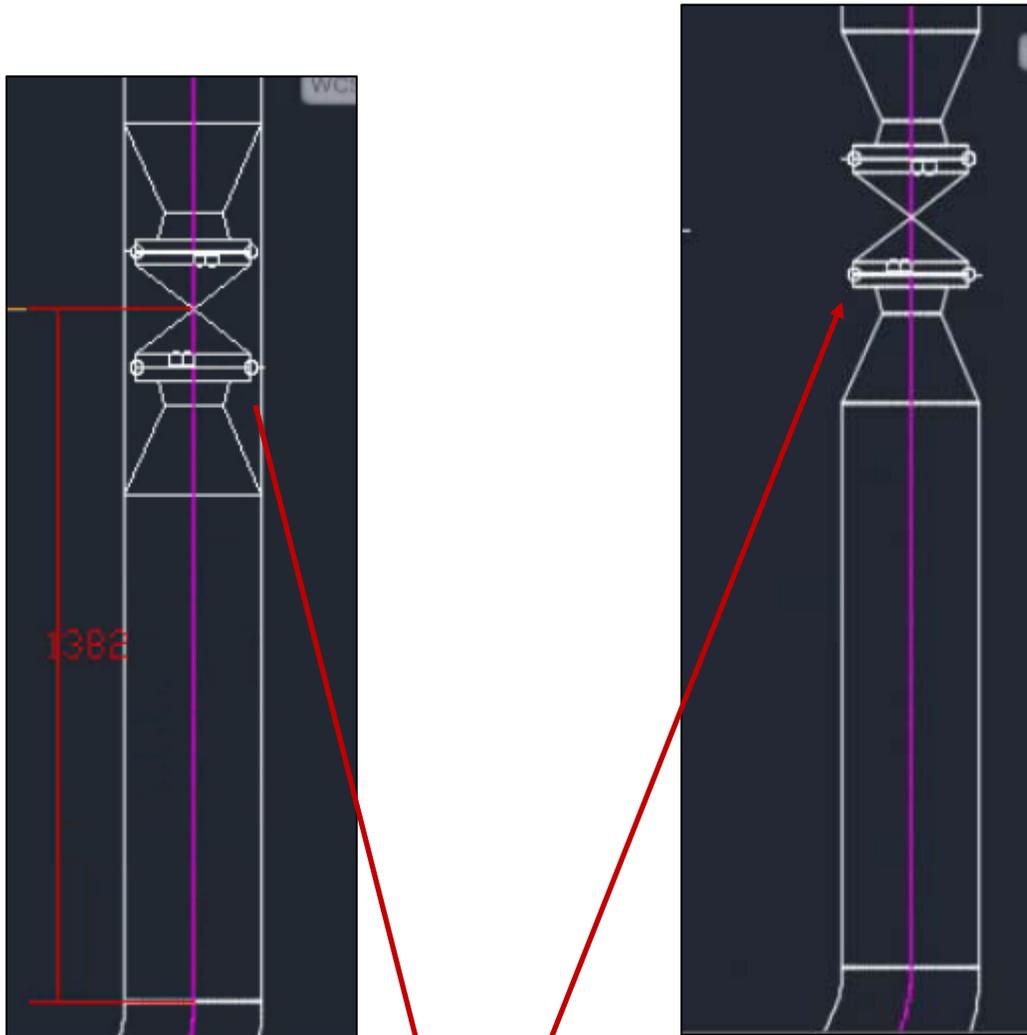
You can see now that the whole assembly moves.



22. Zoom out, take it up the line to the right, and it's tracking off the end of that.



23. So that's just pretty amazing to me. Zooming in we see some numbers listed on the dimensions. **Type 1,500 and the assembly places in that line.**



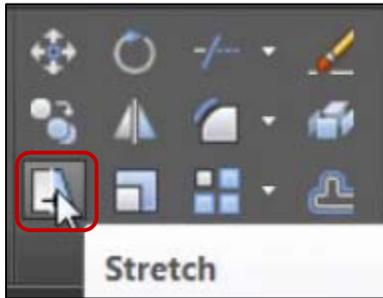
```
MOVECOMPONENT Specify point reference insertion or [TAB key  
point reference Component reference Pipe end point reference  
insertion Justification]: 1500
```

24. You can now see how nice this is, when it comes to editing and modifying CADWorx. All the other AutoCAD options work in the drawing as well.

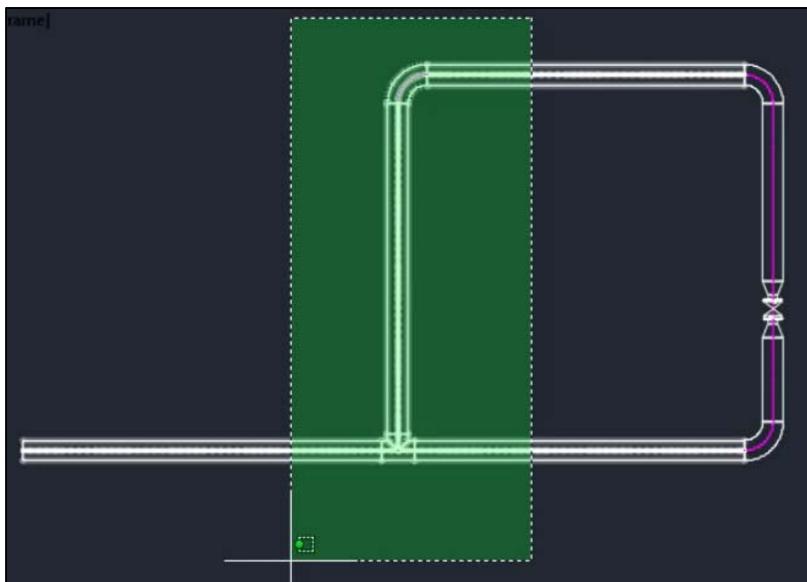
25. Click the Home tab.



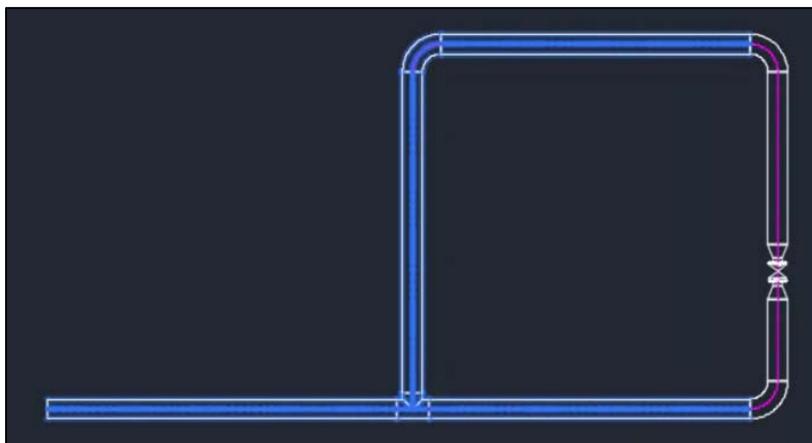
26. Click an edit command on the Modify panel, let's go with Stretch.



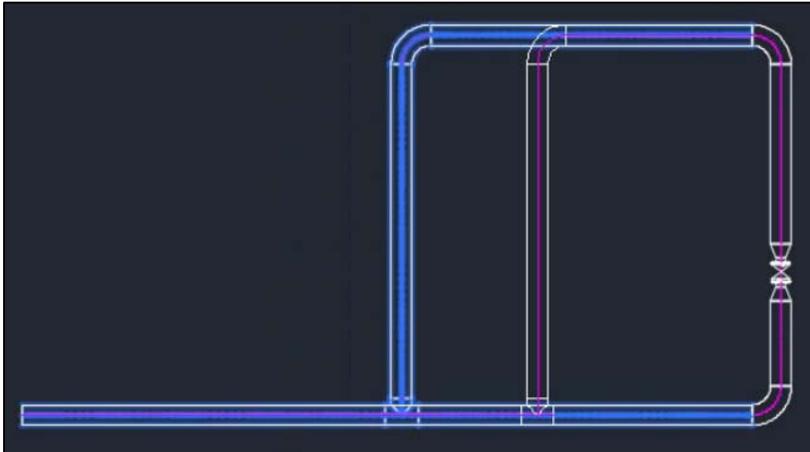
27. Click the upper right-hand corner, then drag and click the lower left hand corner as indicated in the image below to cross through the lines.



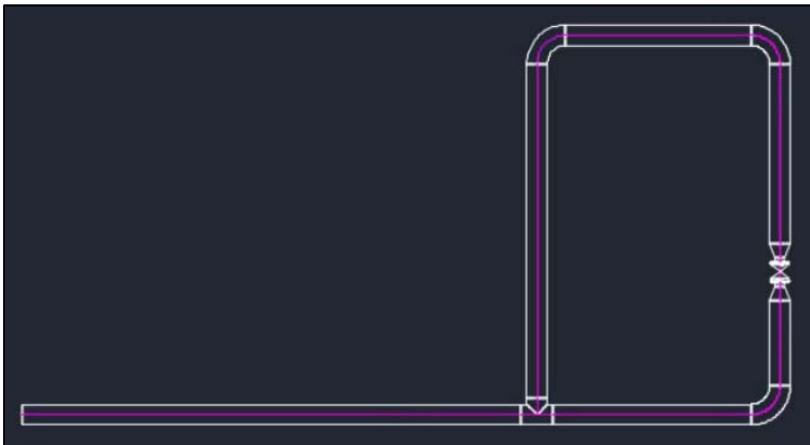
28. In stretch, you have to do a right to left, for the window select not a left to right. Press Enter.



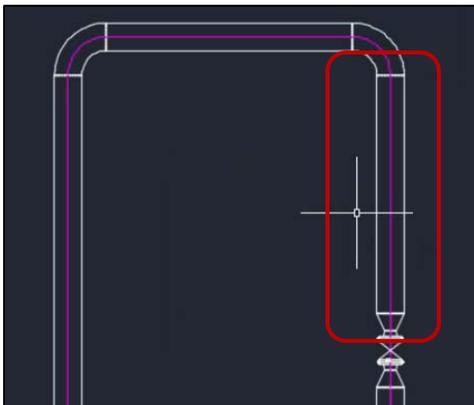
29. Then, click a point, and stretch these over to the right.



You can see everything stays connected, and it's just very easy to modify geometry in this system.

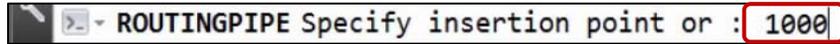


30. Let's talk about the grips on these objects. **Zoom in for a moment, and click on the pipe on the right.** We see that we have grips on the end, plus we have a plus grip in the middle.

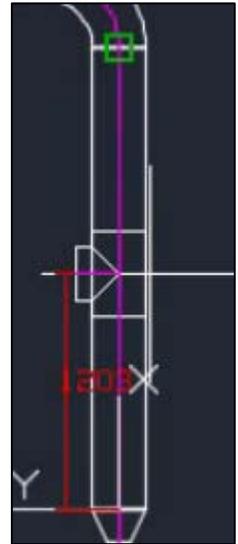
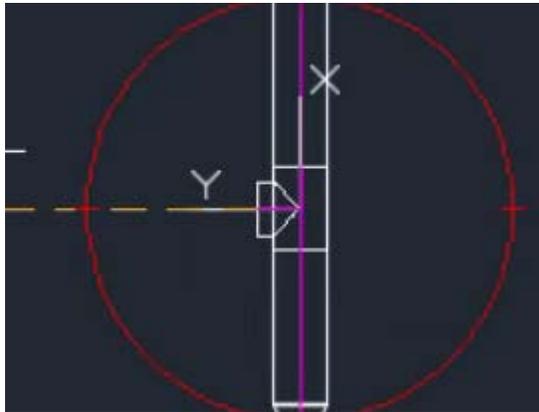


31. Click the plus grip, and the software immediately tries to place a center justified tee coming off the end of the pipe.

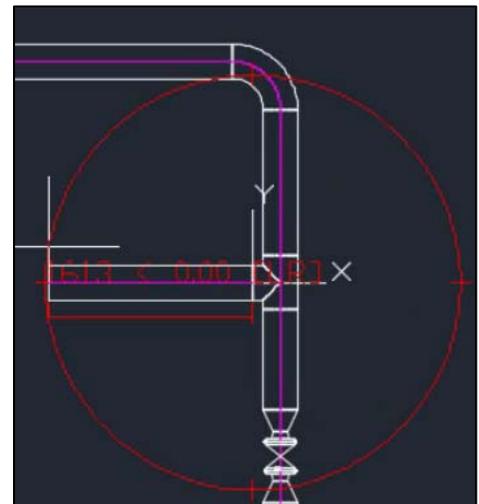
32. Type 1,000 on the command line, and then press Enter. We got it located.



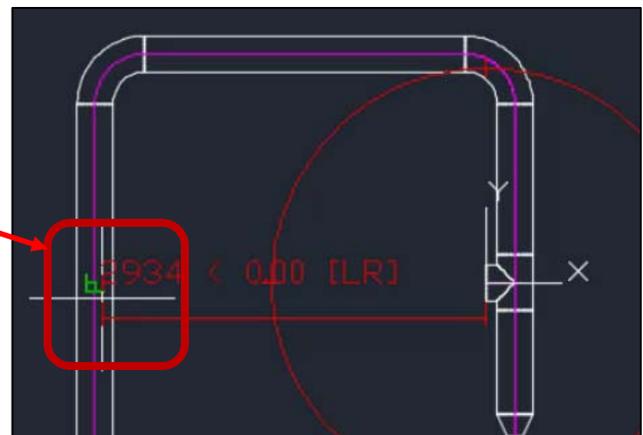
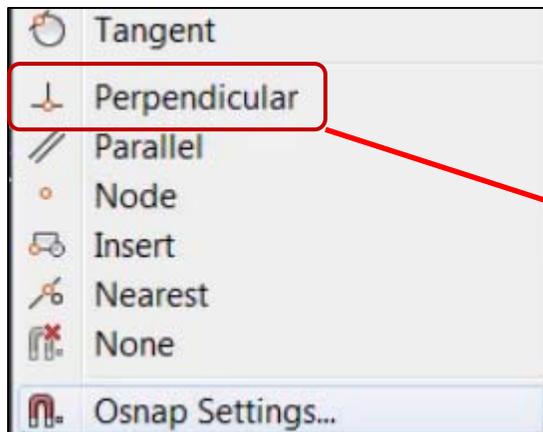
33. Drag to the left for the orientation of that tee.



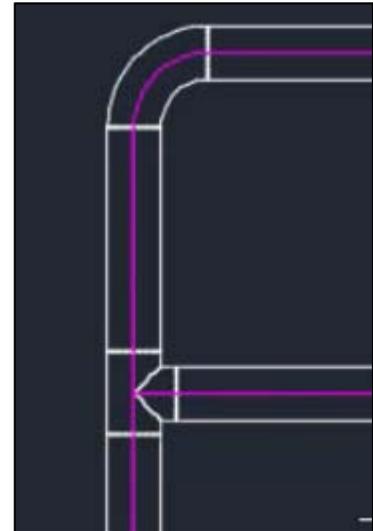
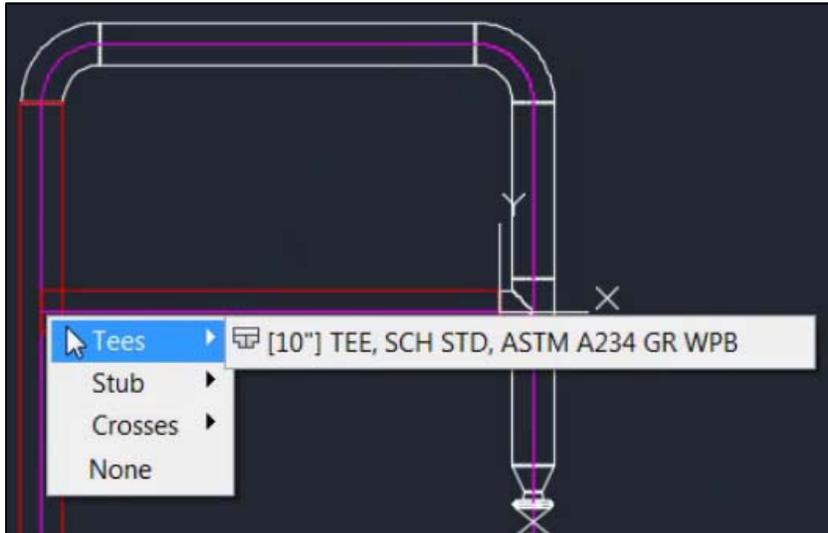
34. Then click and it starts routing right off of that tee.



35. Shift + right-click, select Perpendicular, and then click on the center of the line as indicated below.

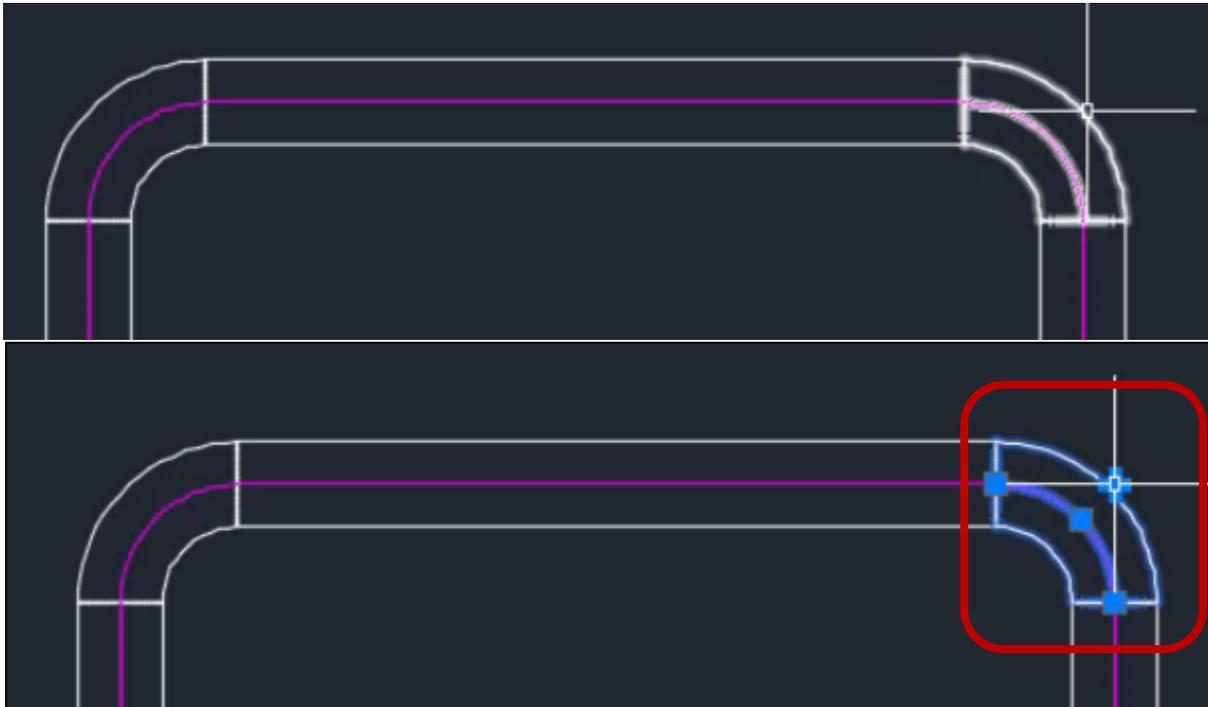


36. The software asks “How do you want to connect this?” Again, CADWorx reads the branch table, and it's looking at the size of the line that we're working with.  
**Select Tee, and then select the tee from the spec, and it places right in the line.**



So, really fast in getting components in it.

37. Let's look at what happens when you do this with an elbow.  
**Click the elbow indicated below, and then click on the plus grip.**



38. The software asks: How do you want to attach this?



39. Select Elbow-O-Let Threaded, and then select the 10" x 1 1/2" elbow lead.



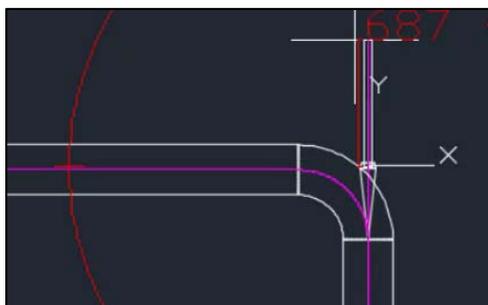
The software places it on that elbow and asks: What about the line number?



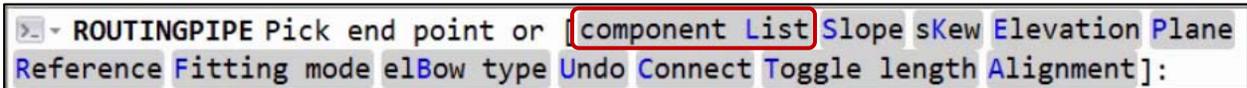
40. Press Enter to take the default.

The software then asks: What is the direction here?

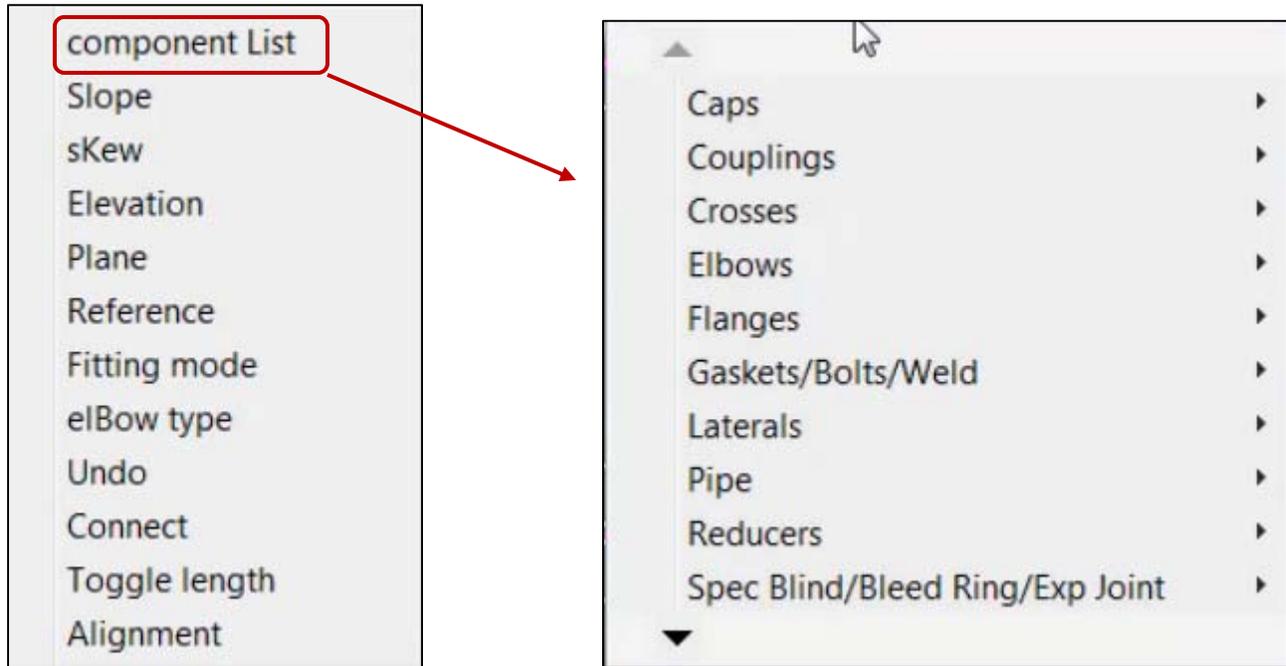
41. Click straight up. Now, the o-let routes off of this elbow.



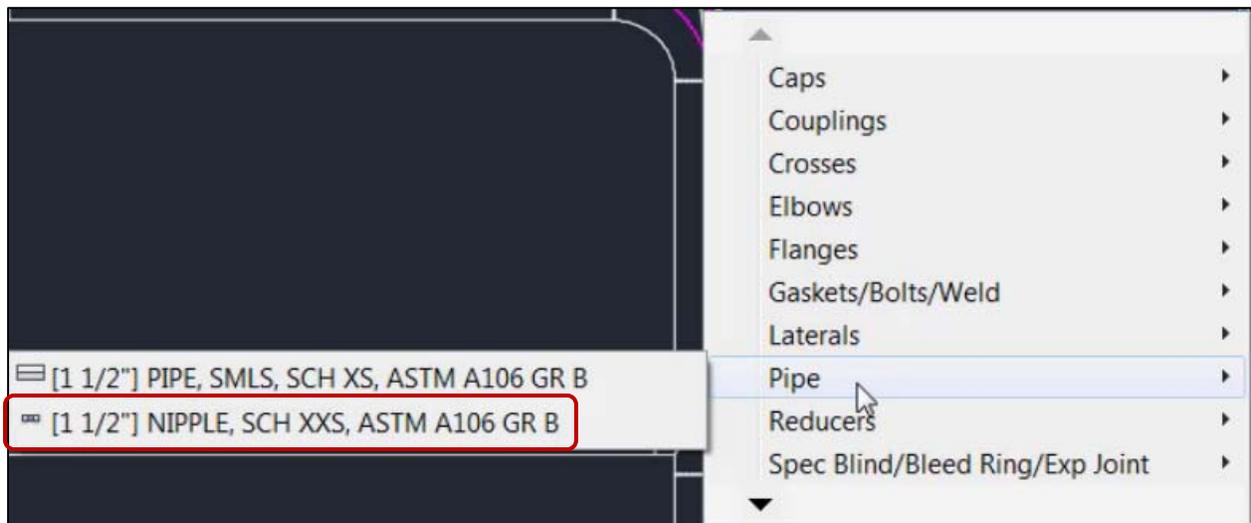
42. This is really quite interesting. We have an option called Component List.



43. Right-click, and then select component List. This option gives us a list of components that we can then connect to this elbow lead.



44. Hover over pipe, let it do a flyout, and then select Nipple.



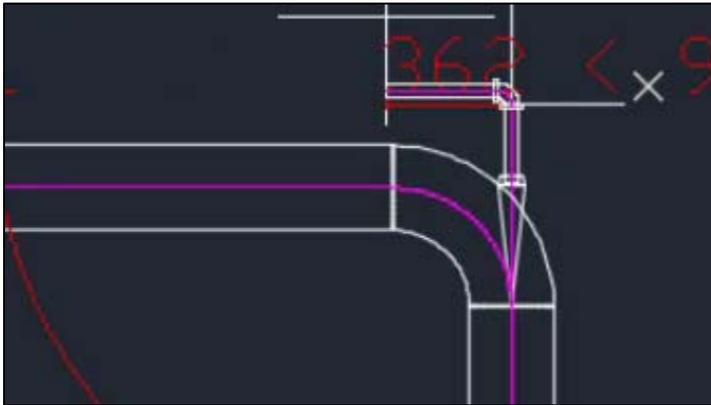
CADWorx prompts for us to enter the length of nipple, if you want to do that. You can also just use a close nipple.

```
> - ROUTINGPIPE Enter length of Nipple or [Close] <Close>:
```

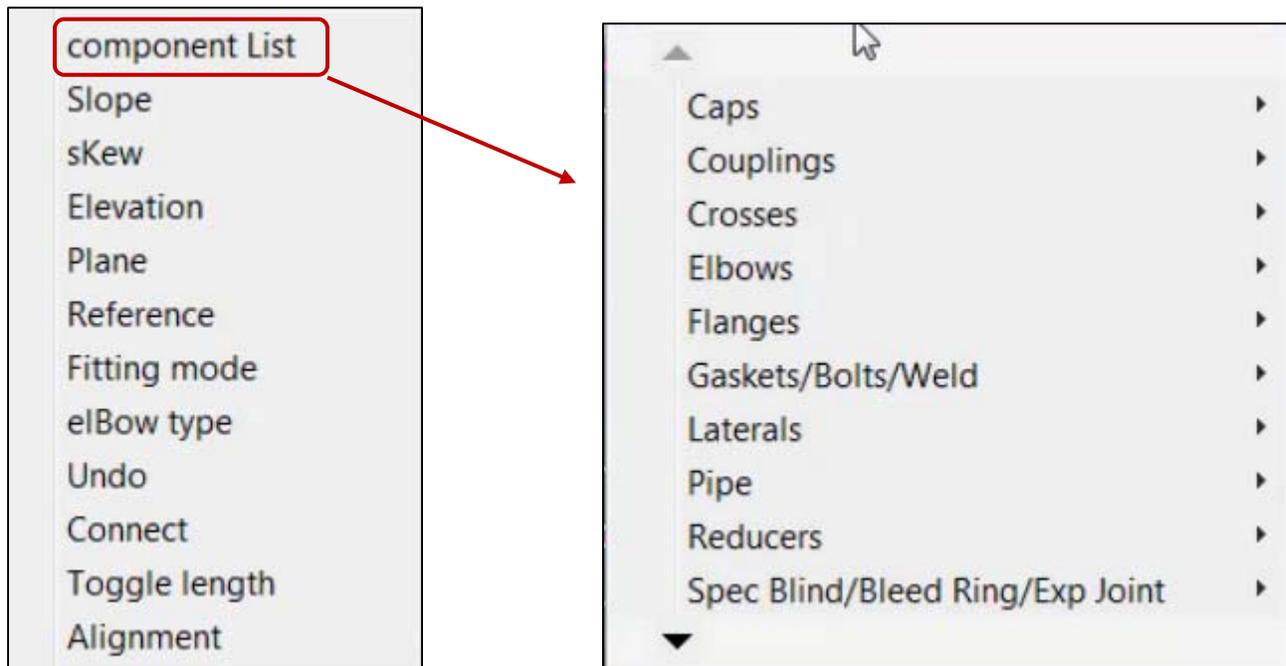
45. Type 250, and then press Enter.

```
> - ROUTINGPIPE Enter length of Nipple or [Close] <Close>: 250|
```

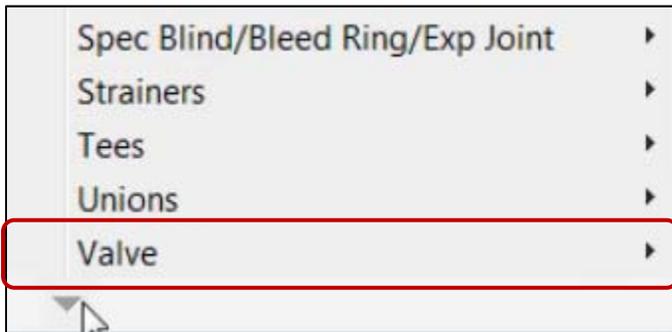
CADWorx places the nipple. Then, CADWorx places us routing off the pipe nipple.



46. Right-click, and then select component List.

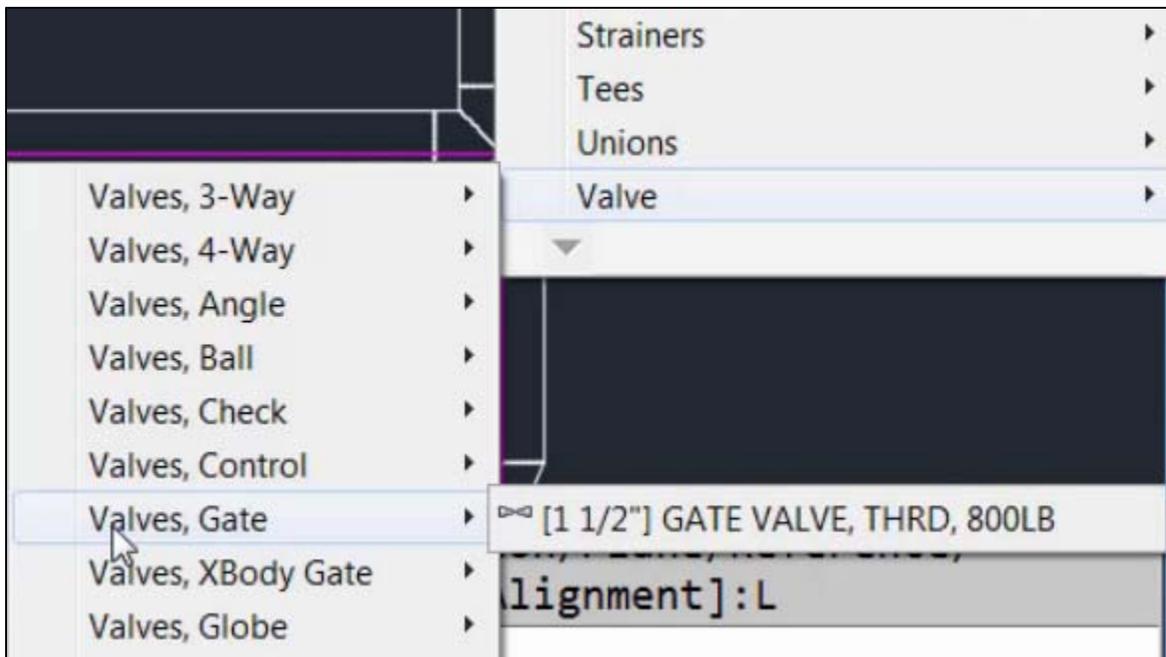


47. Scroll down, and find valves.

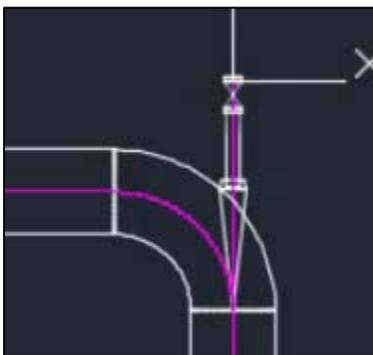


48. Hover over Valve, and select Gate Valve.

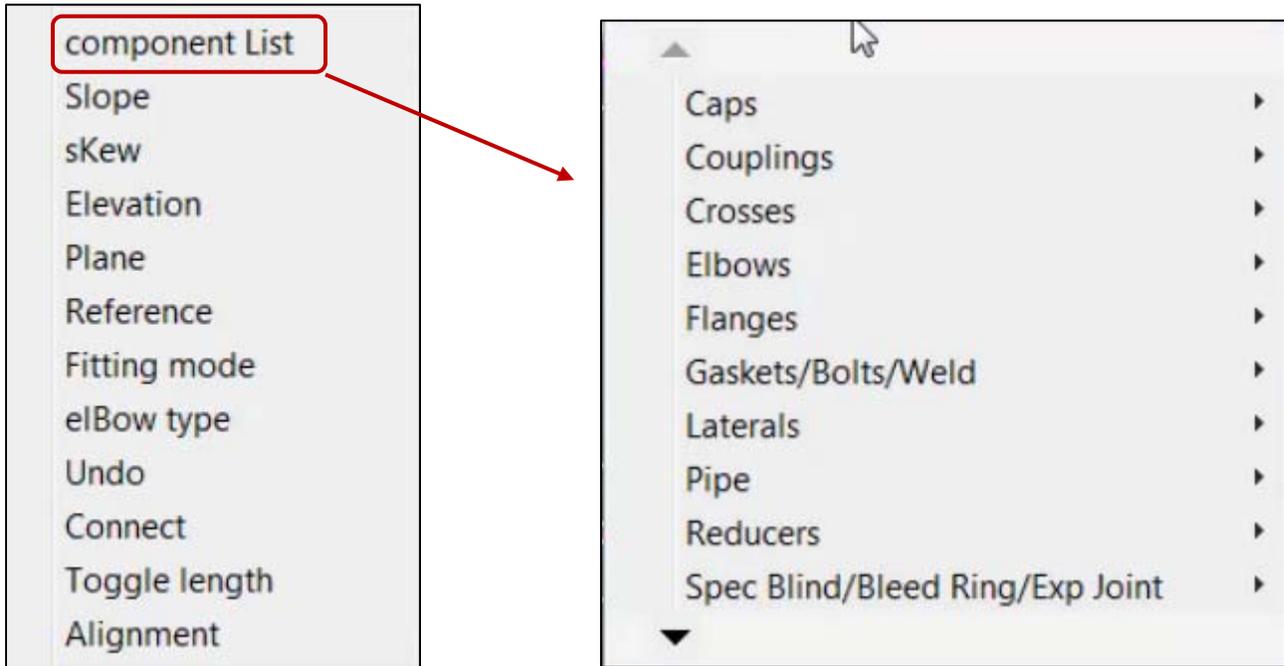
Notice we get a choice here for the size, which is in the specs.



CADWorx places the valve and now we route off of that.



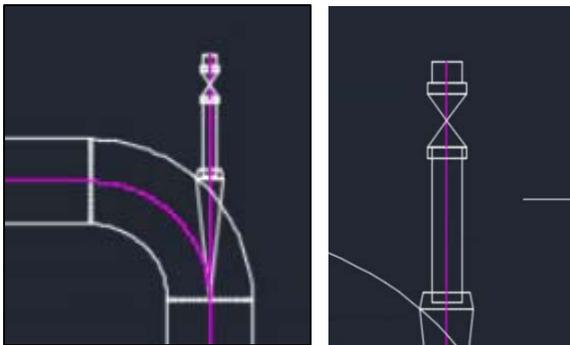
49. Right-click, and then select component List again.



Let's scroll on up a moment and hover on Caps. Under Caps, we have a Plug. Select the Plug.



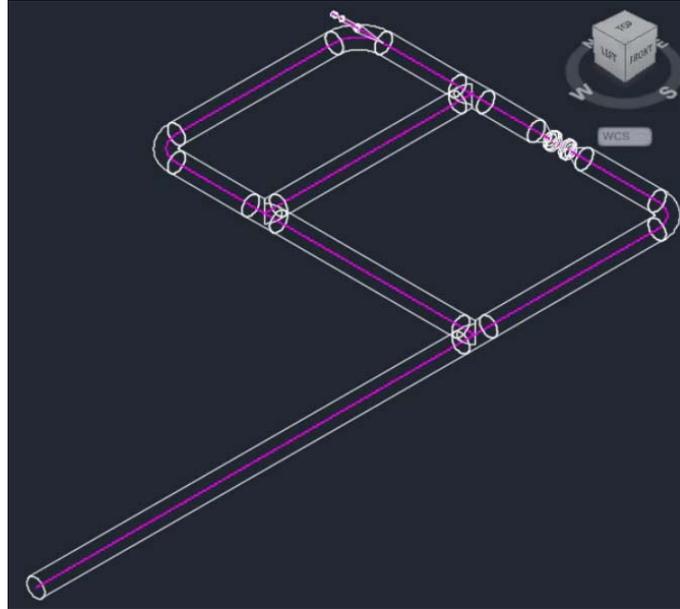
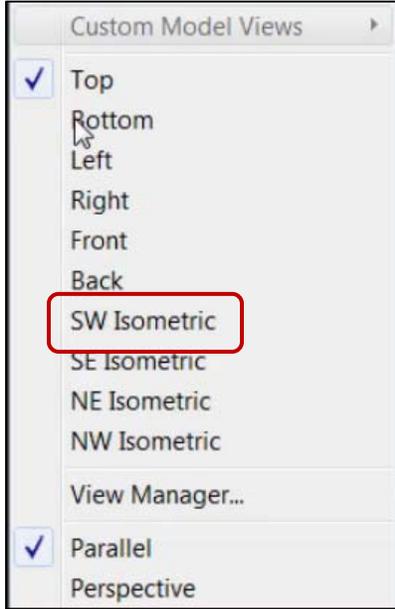
The plug adds and CADWorx terminates the command, because the software knows that's typically the end of a line like this.



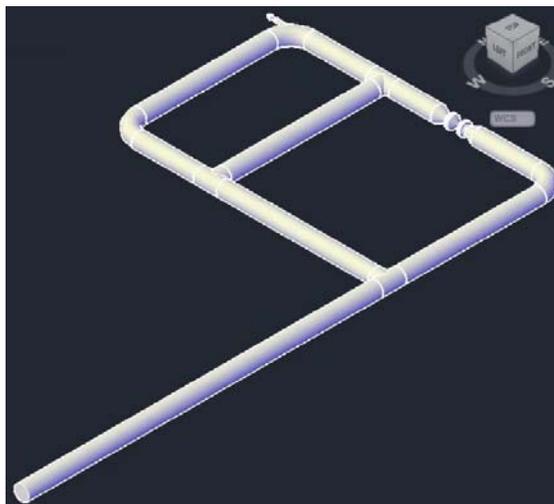
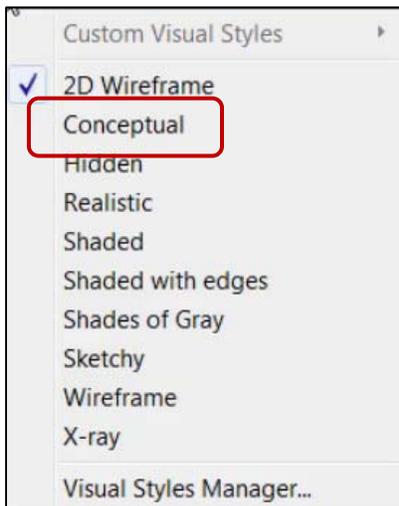
50. You can see how quick this is, when it comes to adding new components. When you get good at using this Right Click option, it just goes really fast for you.

51. It looks like it's in 2D, but actually we're in 3D in this model.

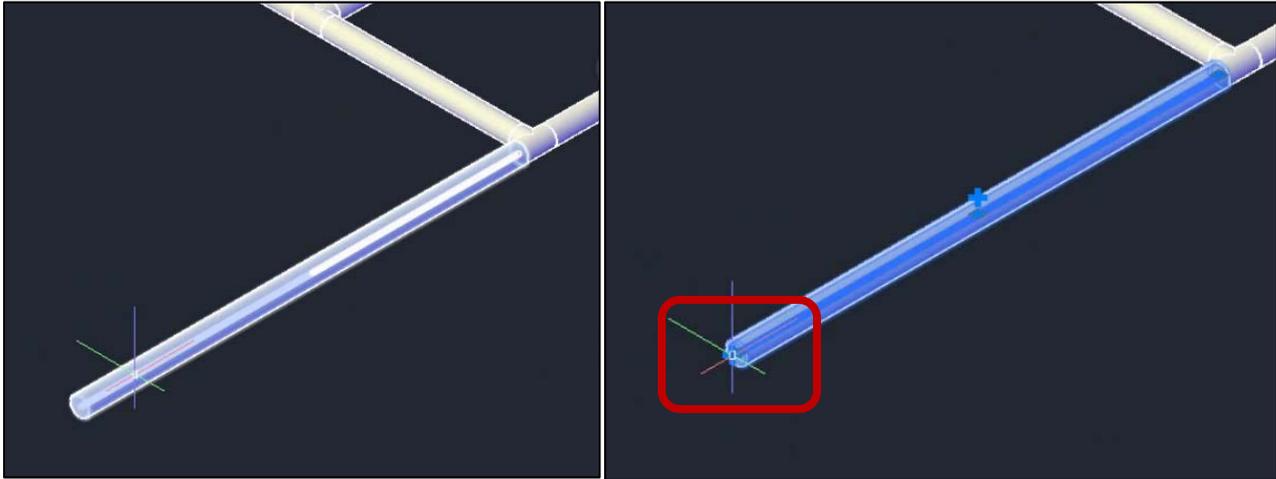
52. Click **Top** in the **View Options** in the up left corner, and then select **Southwest (SW) Isometric**. So, you can see we're building all this in 3D.



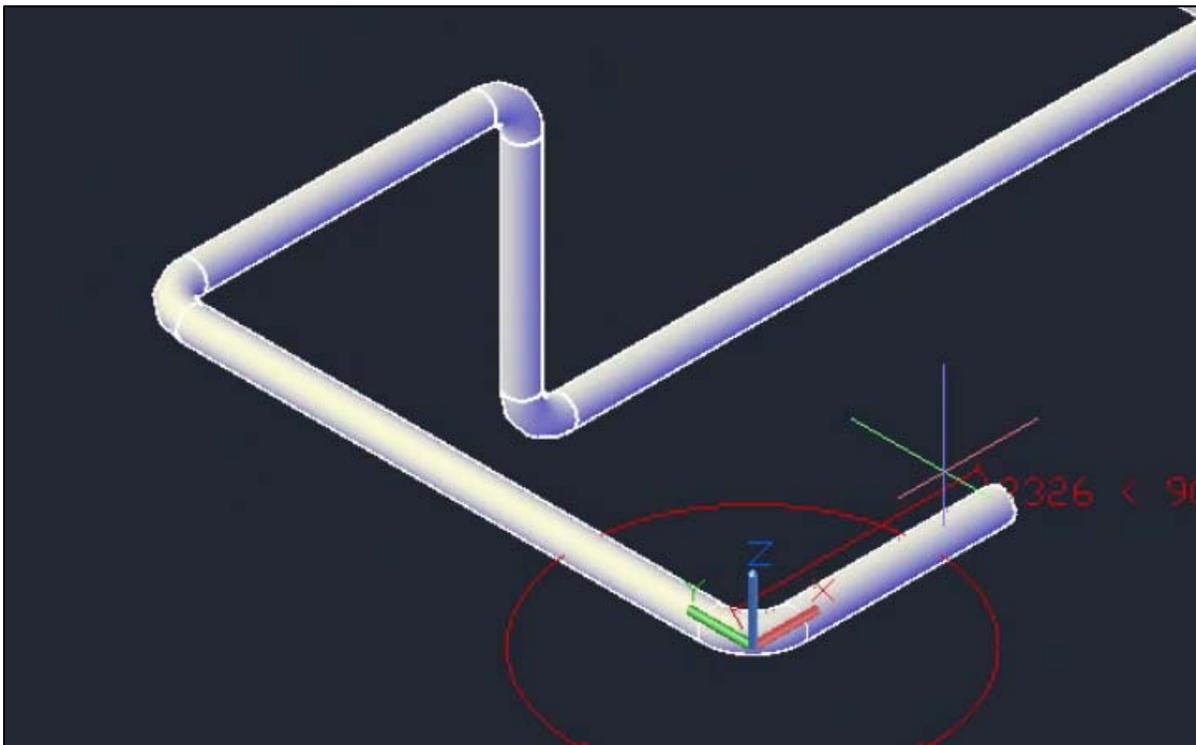
53. Click **2D Wireframe**, and then select **Conceptual**, and we can see how this model looks.



54. Click on the line indicated below, and then click on the plus grid.



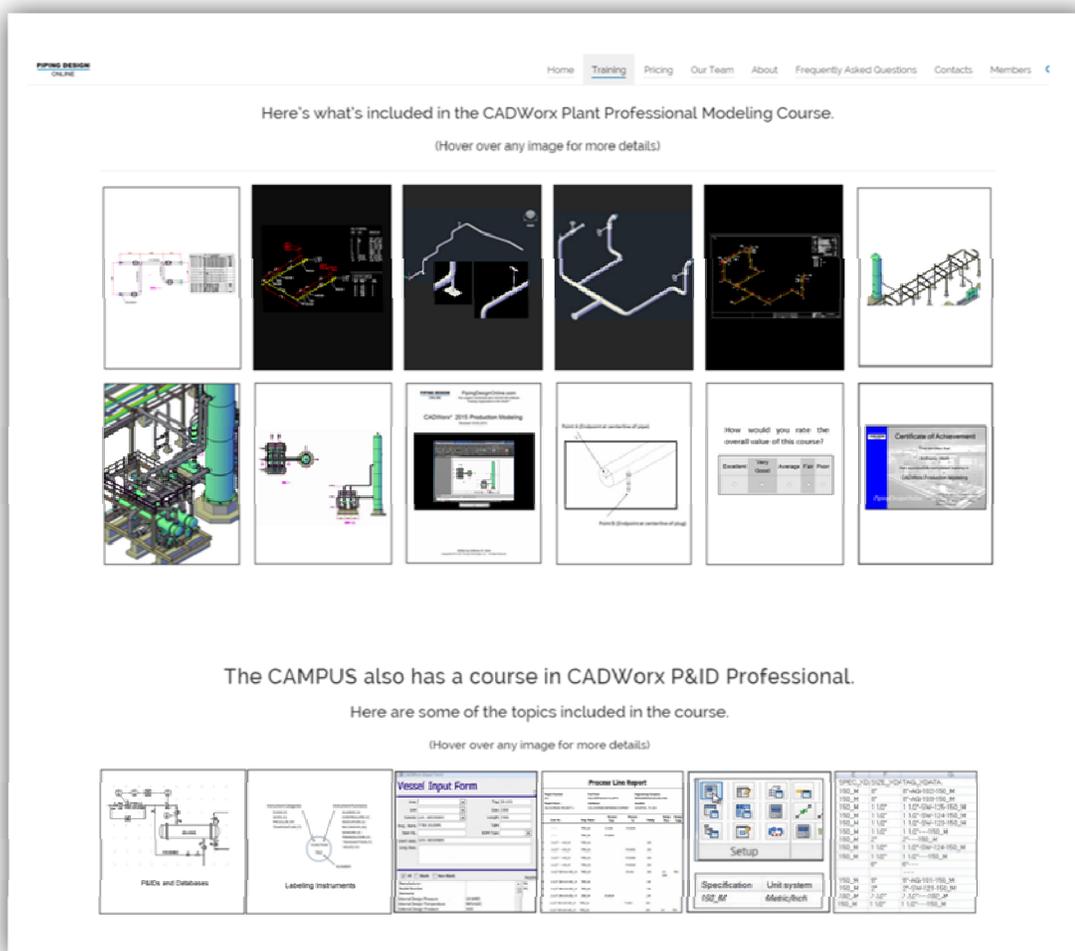
55. **We can take it straight up.** So we can now begin to route this thing in 3D very easily. We only need to key in numbers, clicking points, or typing values. So a really fast system.



56. As you are going through the model, using 3D like we are doing here, you have options for things like Elevation.

Pick end point or [component List/Slope/sKew/**Elevation**/Plane/Reference/  
Fitting mode/elBow type/Undo/Connect/Toggle length/Alignment]:

57. You can Right-click and key in a specific number for a world elevation, or a bottom of pipe justification. There are just so many things that you can do very fast with CADWorx.
58. So, we've got you using the spec, placing components, getting some really good shortcuts, and you are off and running. You can now begin to explore the system and just look at all the different toolbars, panels, and options that you have in CADWorx. If you're interested in additional training, we'd love for you to visit our website. It's called pipingdesignonline.com.
59. If you visit the website, you can click on CADWorx training to see what we have available. There are very affordable subscriptions for both individuals and companies. We have corporate account information on the website as well as information on our new offerings in Intergraph's CAESAR II and PV Elite software.



60. Thank you a lot for taking a look at these videos. I hope you enjoyed them, and I really think you'll find CADWorx is just a tremendous system, so easy to use, and so productive.

## About the Author



Anthony W. Horn is the owner and creator of PipingDesignOnline.com. Launched in 2011, PipingDesignOnline.com has issued over 1800 certificates in CADWorx in more than 40 countries, and is the largest Intergraph CADWorx and Analysis Solutions software training organization in the world.

Anthony holds degrees in both engineering and architecture, and continues to write and produce new training content in CADWorx, CAESAR II, and PV Elite software for PipingDesignOnline.com.