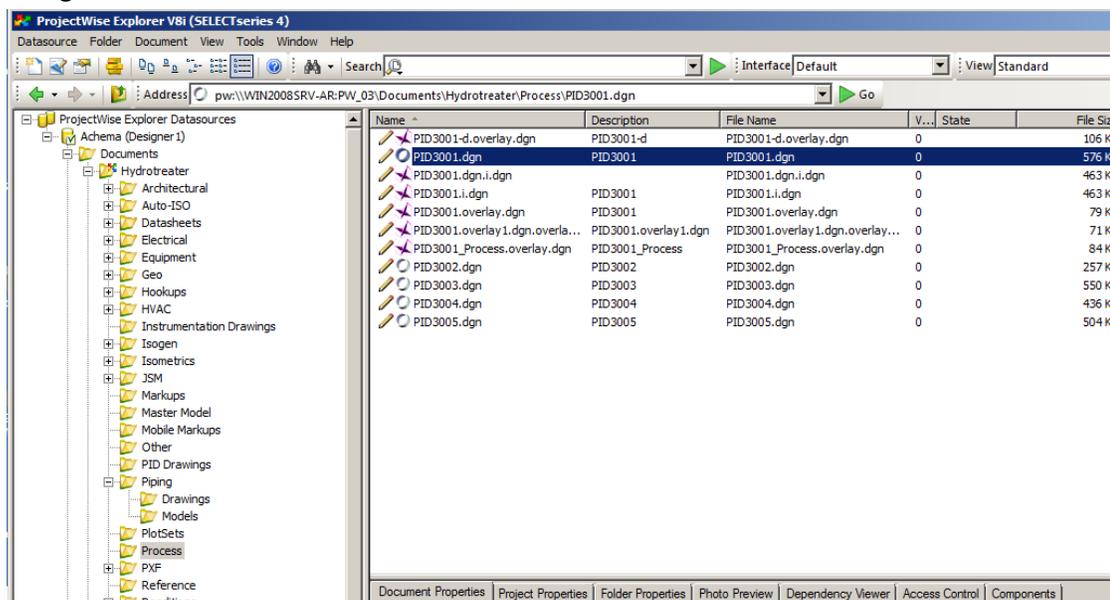


Instructions OpenPlant Power PID and Modeler workshop

We will simulate a workflow in a small project. Starting point is the P&ID where we just received an overlay file with some review notes. So we need to act on the instructions and change first the P&ID and later on the 3D model using modeler.

During the course of the workshop we will use ProjectWise, OpenPlant Power PID, OpenPlant Modeler, OpenPlant Isometrics Manager, Bentley Navigator, OpenPlant Reporting

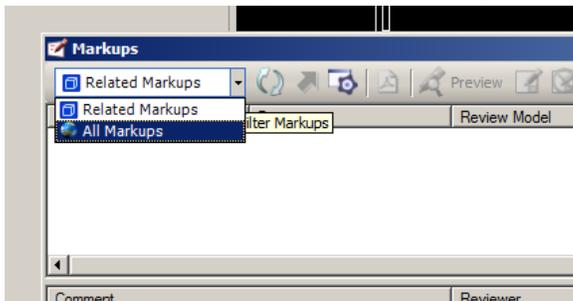
1. Launch ProjectWise explorer
2. Login as Designer1 password: designer1
3. Navigate to the folder: Process



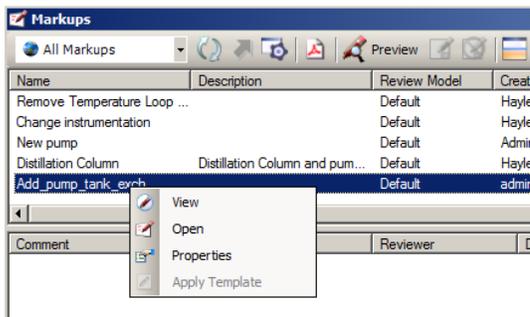
4. Open PID3001.dgn. This is an OpenPlantPowerPID drawing so it will launch the application.
5. When the drawing is open launch the markups dialog.



6. You will have to change to see all Markups.

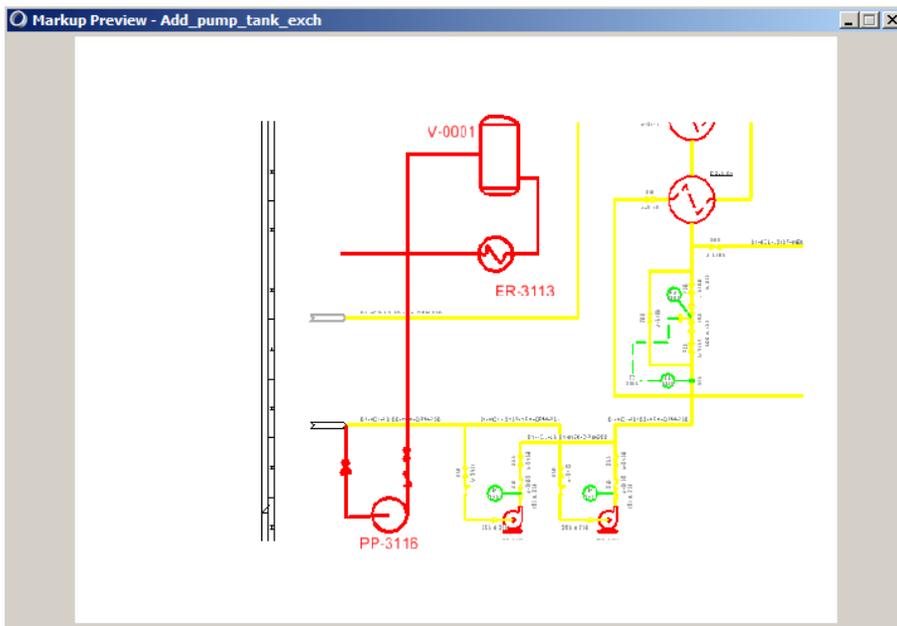


7. Go to the markup called "Add_pump_tank_exch" and right click.



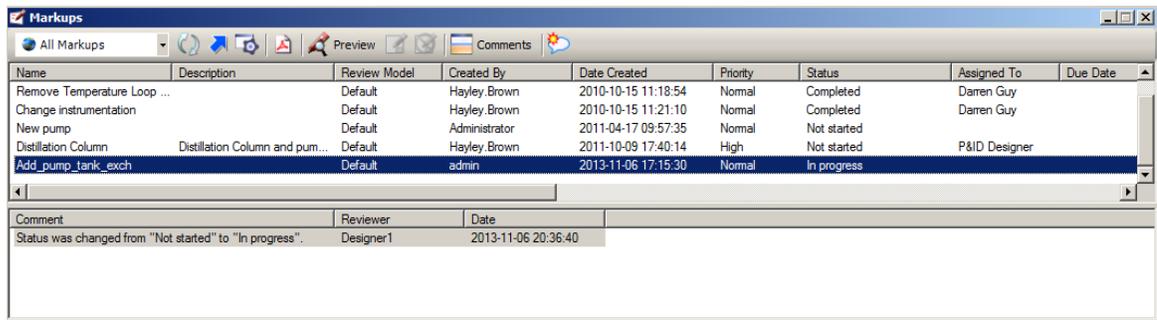
Choose "View" from the menu.

8. You will then see the markup preview of the ordered change.



So we need to add a pump, a tank and an exchanger. And some piping.

9. If you like you can change the status to “In progress”



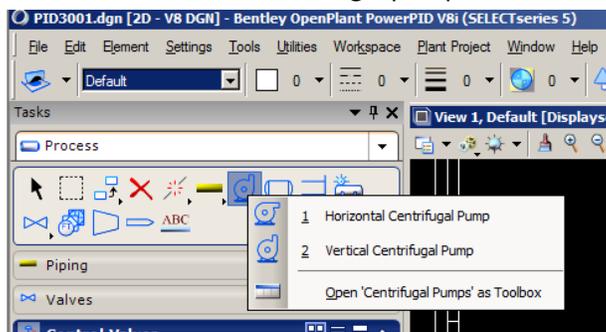
Name	Description	Review Model	Created By	Date Created	Priority	Status	Assigned To	Due Date
Remove Temperature Loop ...		Default	Hayley Brown	2010-10-15 11:18:54	Normal	Completed	Darren Guy	
Change instrumentation		Default	Hayley Brown	2010-10-15 11:21:10	Normal	Completed	Darren Guy	
New pump		Default	Administrator	2011-04-17 09:57:35	Normal	Not started		
Distillation Column	Distillation Column and pum...	Default	Hayley Brown	2011-10-09 17:40:14	High	Not started	P&ID Designer	
Add_pump_tank_exch		Default	admin	2013-11-06 17:15:30	Normal	In progress		

Comment	Reviewer	Date
Status was changed from "Not started" to "In progress".	Designer1	2013-11-06 20:36:40

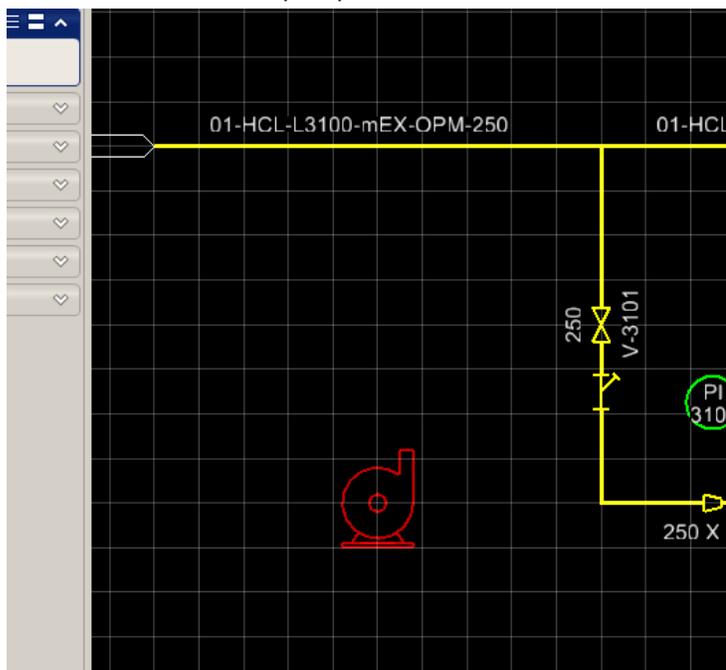
Notice the history is changed, with a comment stating the status change, by whom and when it occurred.

10. Close the markup dialog but keep the preview window so we can keep track of what is to be done.

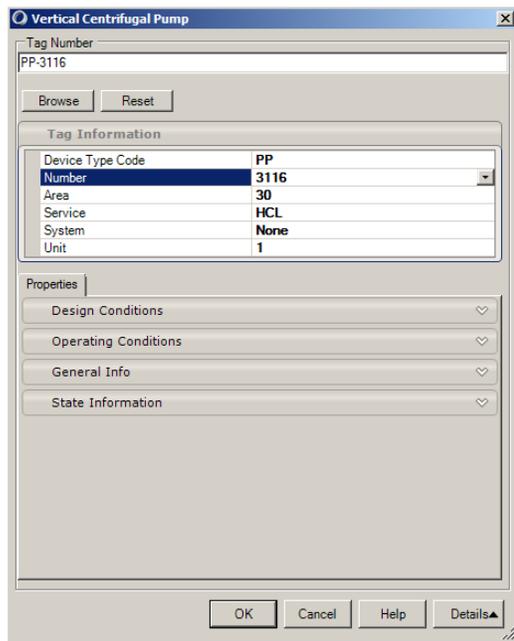
11. Choose the “Vertical centrifugal pump” from the menu on top.



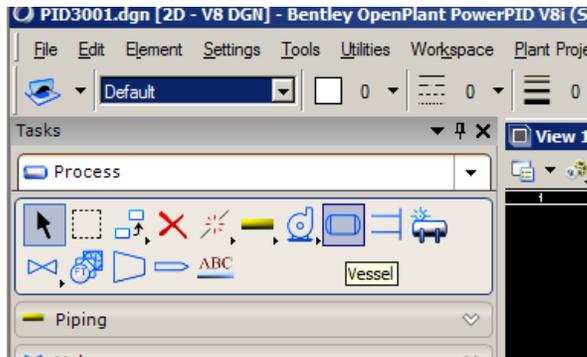
12. Place it next to the left pump PP-3101.



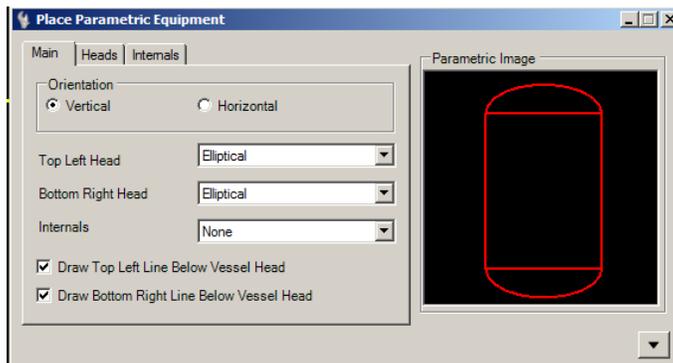
13. Name it PP-3116



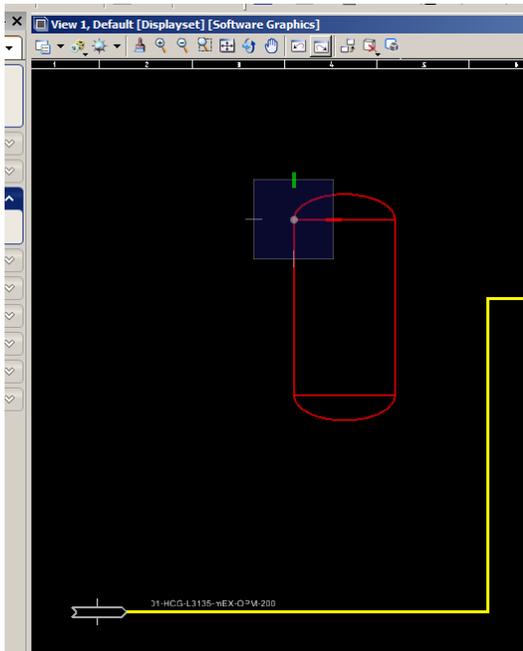
14. To place the tank select the Vessel tool:



15. In the next dialog check the “Vertical vessel” option:



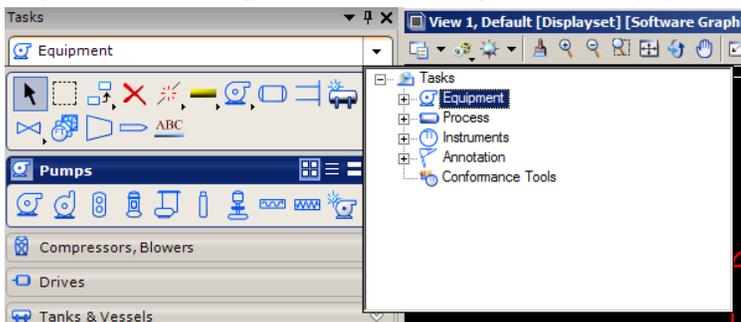
16. Place the tank where you want it just by clicking and dragging the pointer.



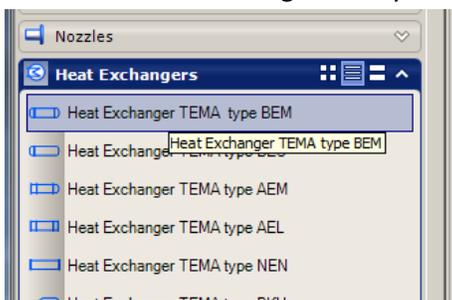
17. Name it V-0001

Service should be HCL

18. To place the exchanger we need to navigate to the Equipment section of the task menu.



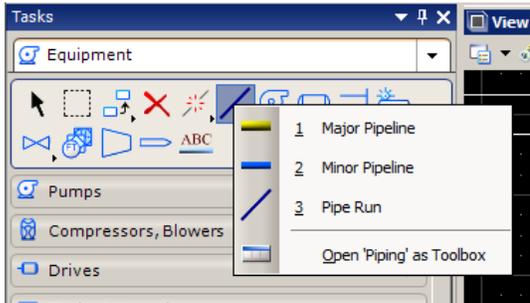
19. Select a suitable exchanger. Or if you want to have a round one, copy one of the existing ones.



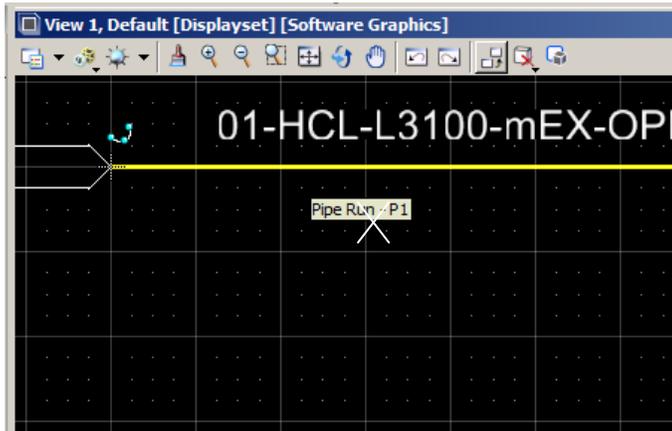
20. Name it ER-3113

21. Now we need to add the pipelines. Start with the pump suction line.

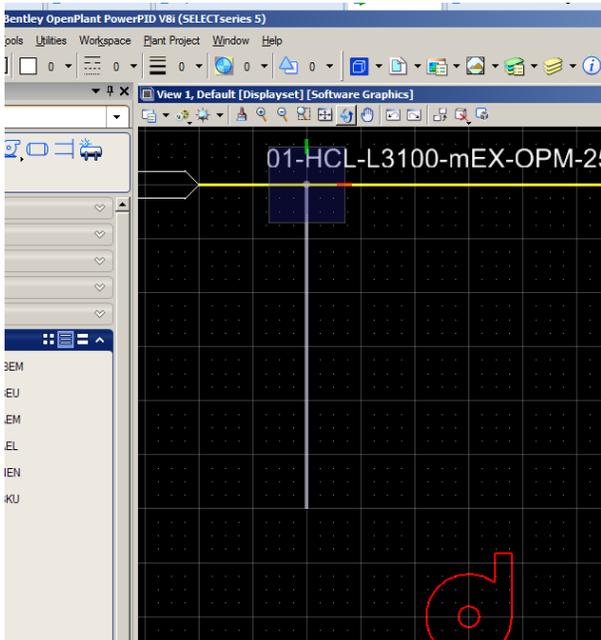
22. That line is to have the same line number as the existing suction line. So choose the “Pipe Run” option.



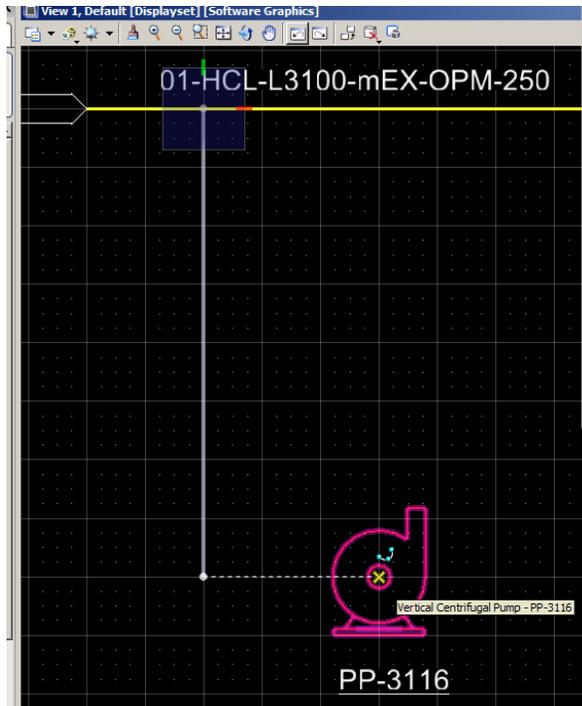
23. It asks for a start point so choose the line 01-HCL-L3100



24. Pull straight down and hit “Enter”. This locks it in the “Y” direction.

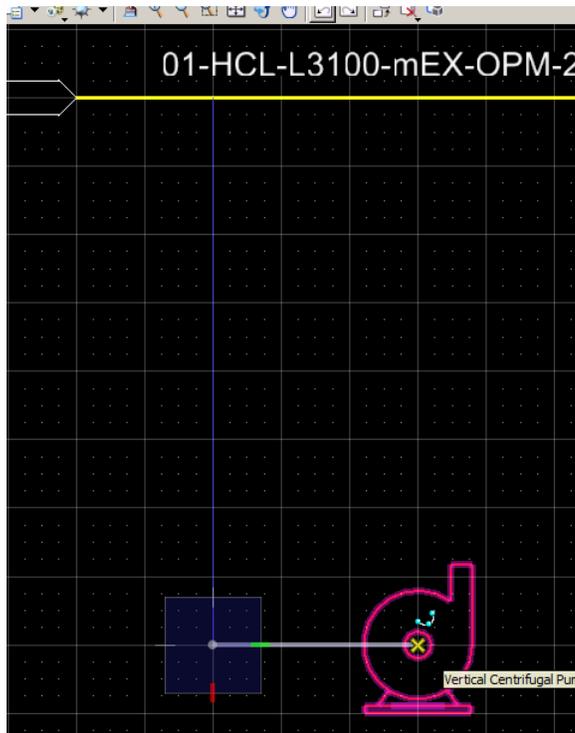


Next you just snap to the center of the pump.



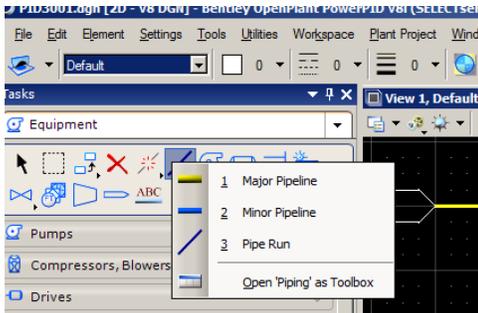
and hit the left mouse button.

25. Finish placement by once more clicking the center of the pump. End by hitting the right mouse button.

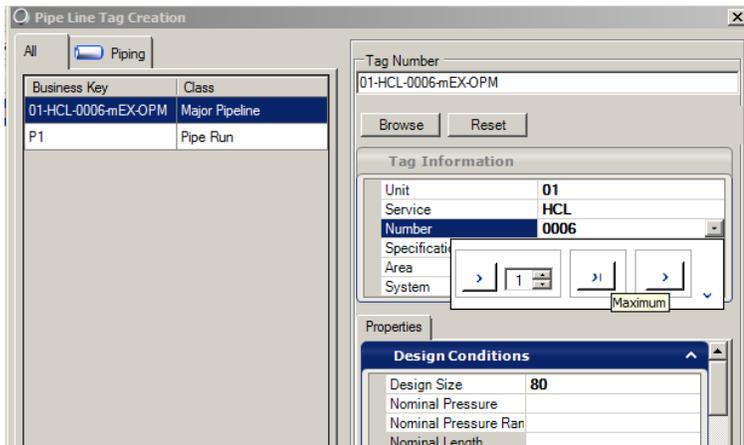


26. The “Pipe Run” dialog comes up. Hit “OK”.

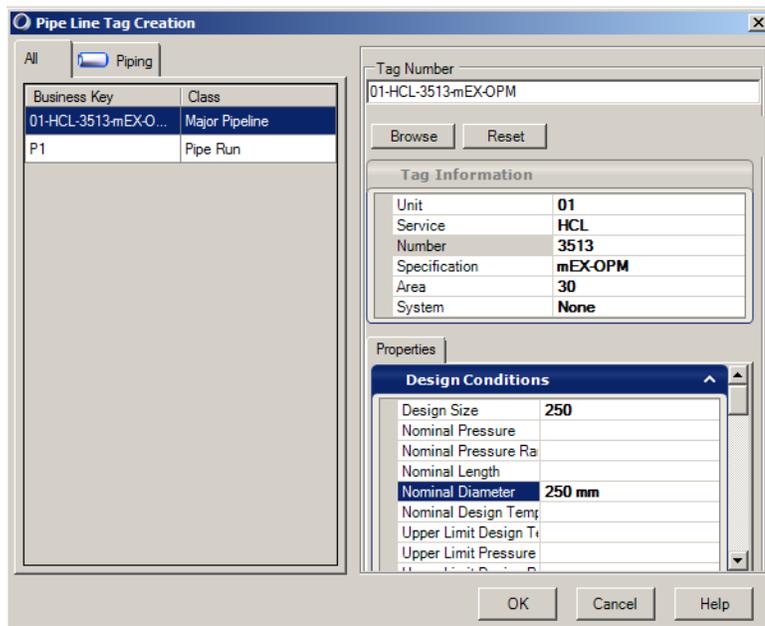
27. Power PID is sensitive to the direction you place the pipe. Default is that the pipe is drawn in the direction of the flow.
28. Now we need to place a new pipeline from the discharge side of the pump to the vessel
29. Select the “Major Pipeline” from the menu.



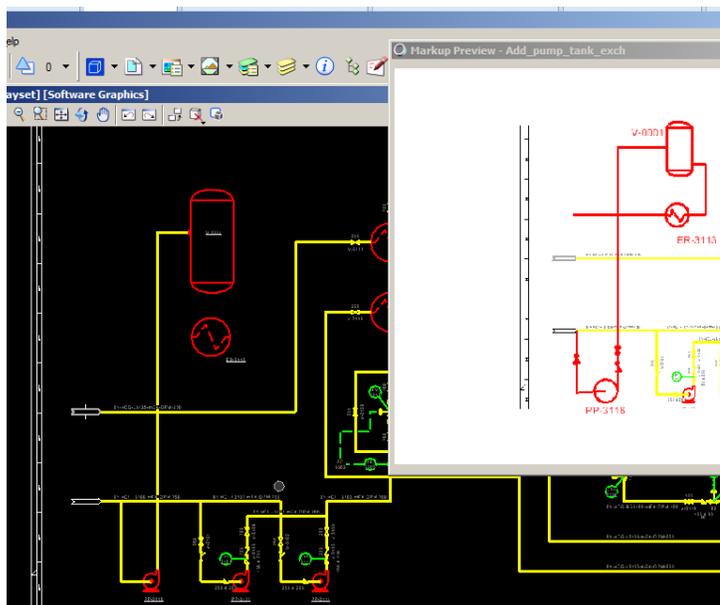
30. In the “Pipeline Tag Creation” dialog. Change the “Unit” to “01”, the “Service” to “HCL”. And when you come to the “Number” field, choose the arrow and then the middle button to find the maximum available number(3513).



31. Change the “Design Size” to 250 and also set the “Nominal Diameter” to 250.
Hit OK.



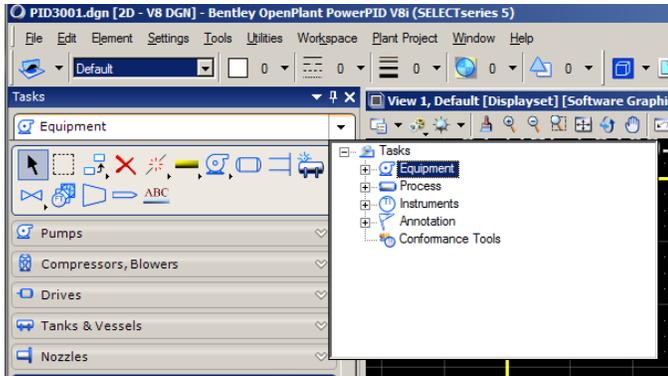
32. Place the line.



33. Now place the line going from the tank to the exchanger and from the exchanger to the edge of the P&ID using the same method.
- Unit = 01
 - Service = HCL
 - Number = Maximum
 - Design Size = 200
 - Nominal Diameter = 200

34. We need to add some valves and reducers around the pump.
Look at the lines for pump PP-3101. Do the same for PP-3116.
35. We start by adding the valve to the suction line.

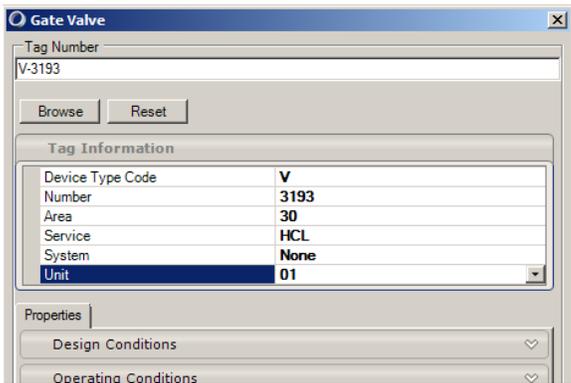
Activate the “Process” part of the Task menu.



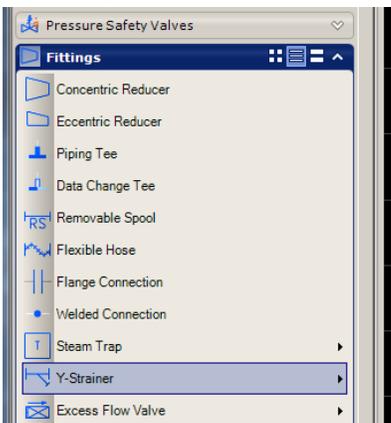
36. Go to the Valves section and select a “Gate Valve”.
37. Place it on the suction line.



38. Set the “Device Type Code to “V” and choose the same Unit and Service as the pipeline and hit maximum for the number.

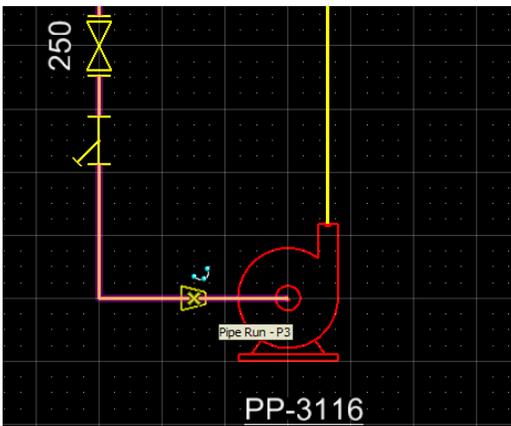


39. Next we place the strainer. You find it under the “Fittings” section.

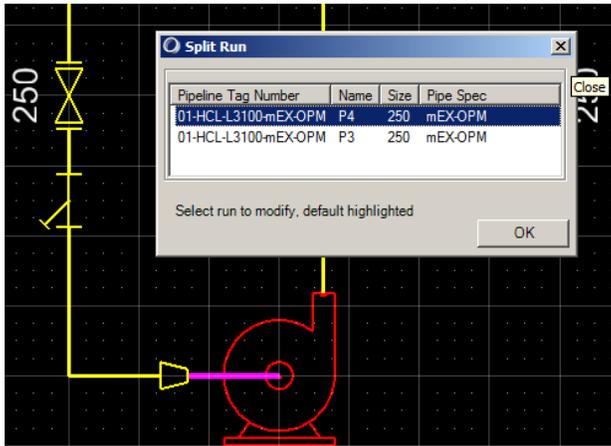


40. The reducer is also under Fittings.

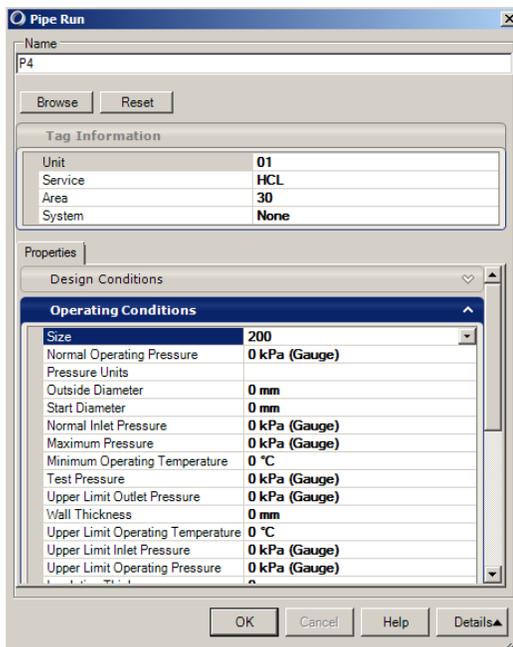
Choose the “Concentric Reducer” and place it on the suction line.



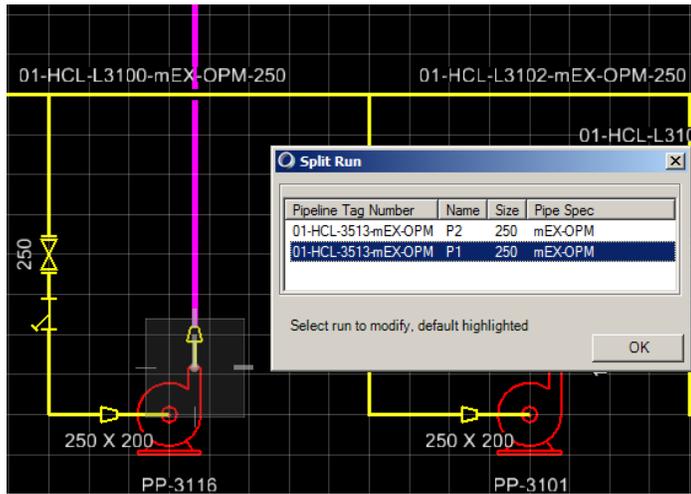
41. You get a question which line to modify. Accept the default by clicking OK.



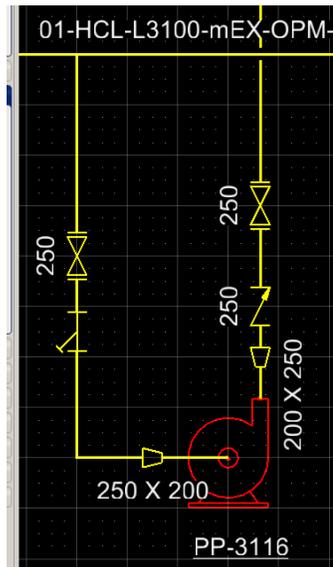
42. Under operating conditions select 200 as the new size.



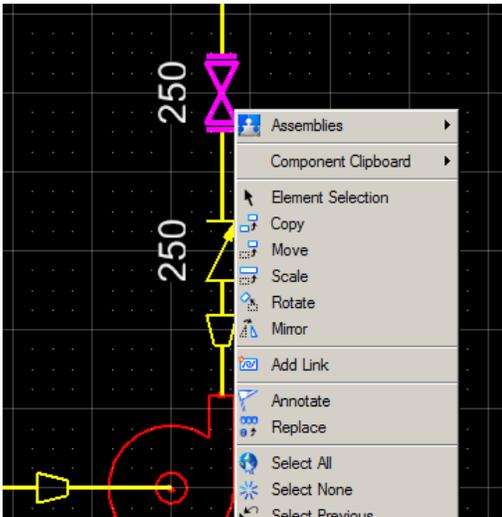
43. Place another reducer on the suction line. But this time we want to make the first part smaller so select the second line in the dialog.



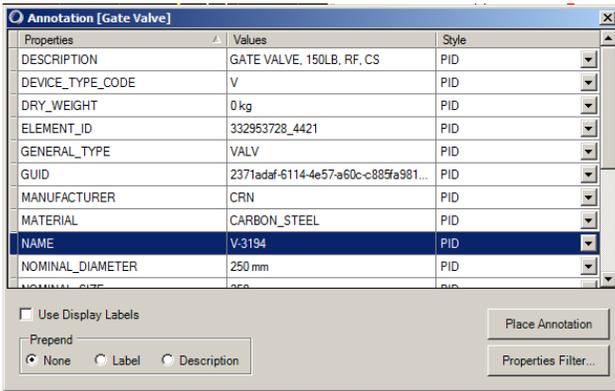
44. Place the check valve and the gate valve on the discharge line.



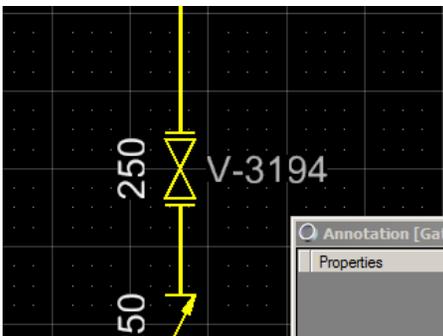
45. To place the tag number of the valves, right click a valve and choose “Annotate”



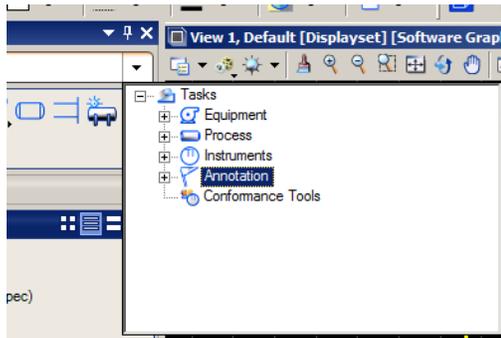
46. Highlight the Name and hit “Place Annotation”



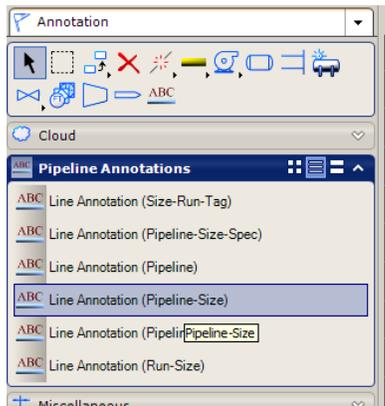
47. Place the text where you want it.



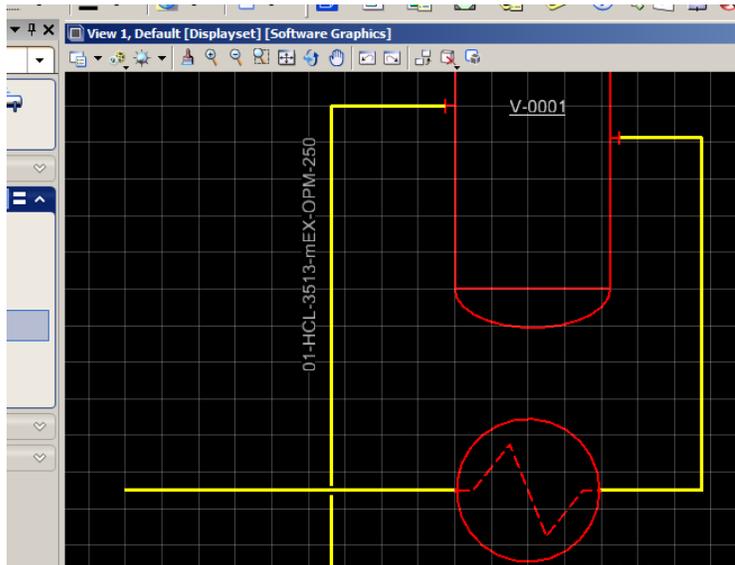
48. Last we need to place some line annotations.
Select the Annotation section of the task menu.



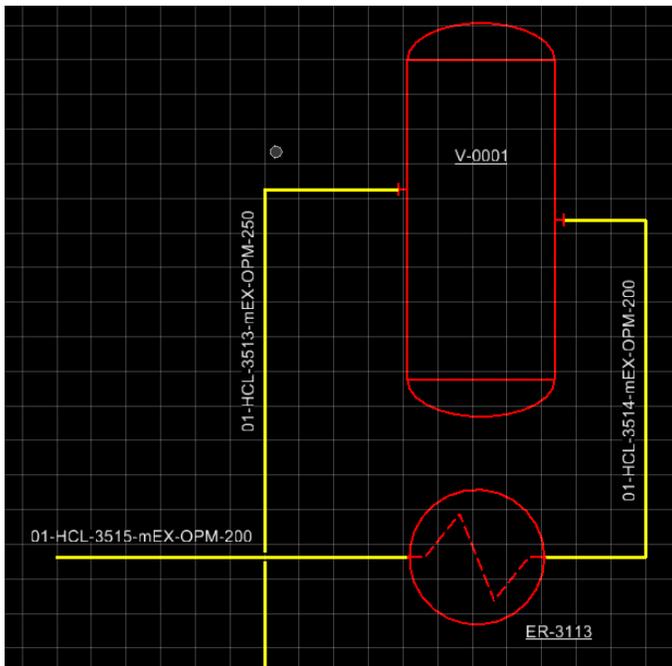
49. Choose the Pipeline-Size annotation.



50. Just pause the pointer for a second over the line you want to annotate, notice the values are retrieved and place the text.

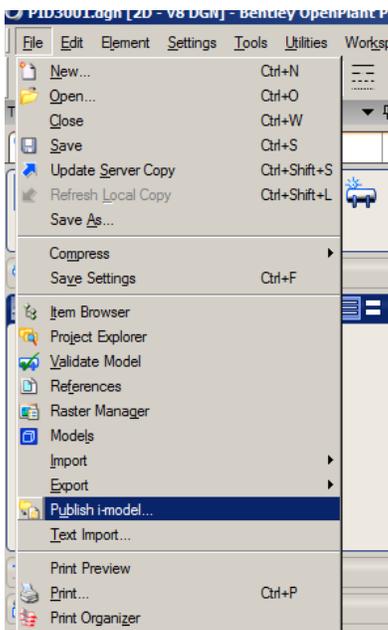


51. Do it for all three new lines.

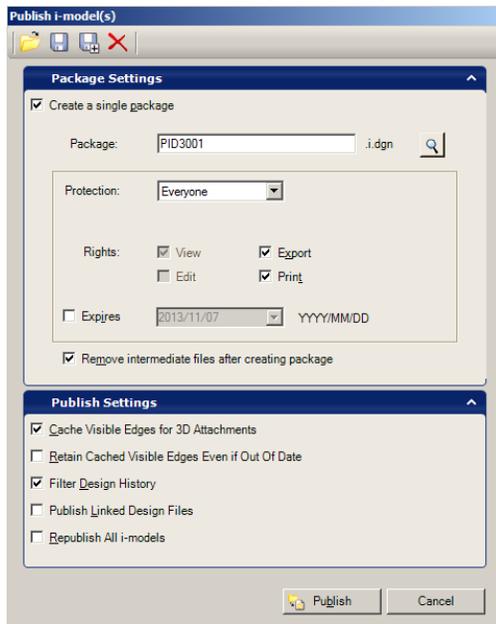


52. Now we are done with the changes in the P&ID so we just need to create a new i-model to use in Modeler to check consistency against the P&ID.

53. From the file menu choose “Publish i-model”



54. Check to “create a single package” and “Remove intermediate files”.



55. Click “Publish”.

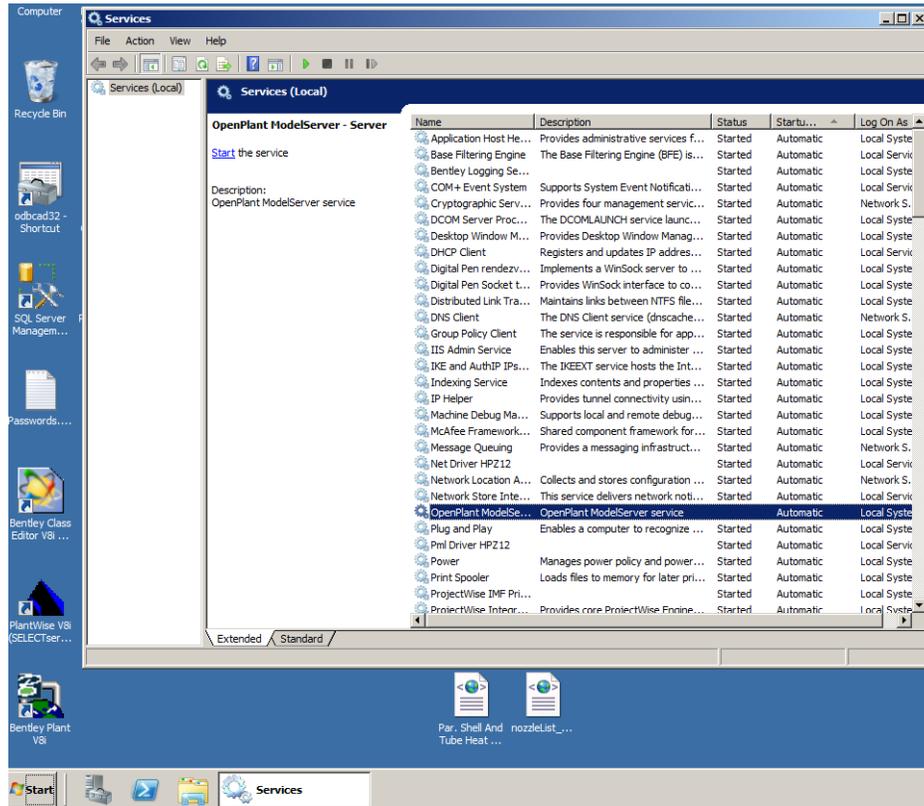
Overwrite the existing file.

56. Close the P&ID when the i-model is done.

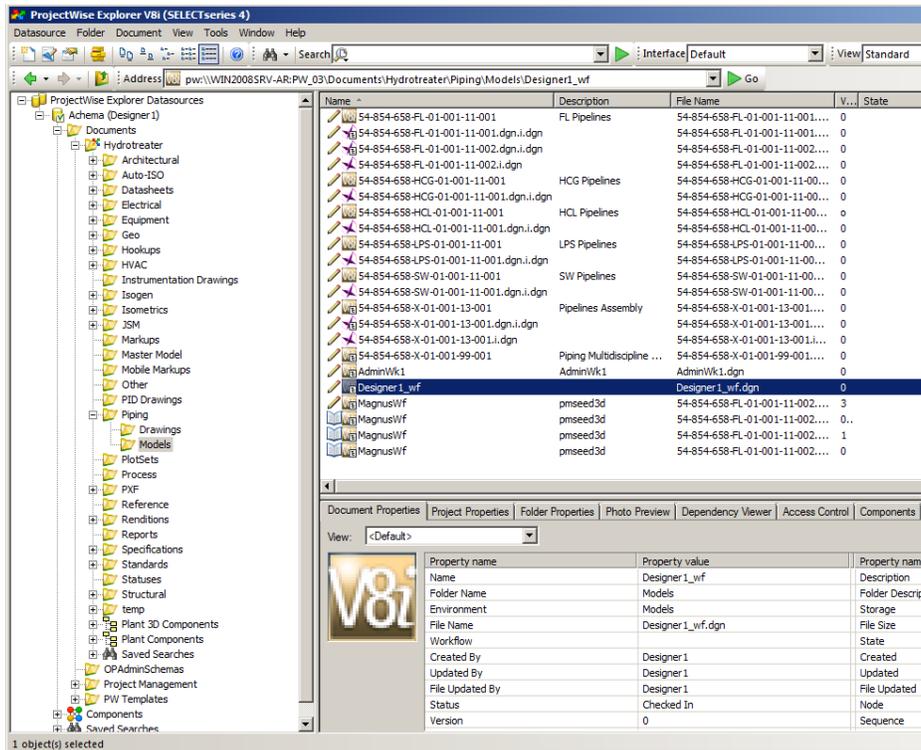
Choose to “Check-in” the drawing.

Modeler

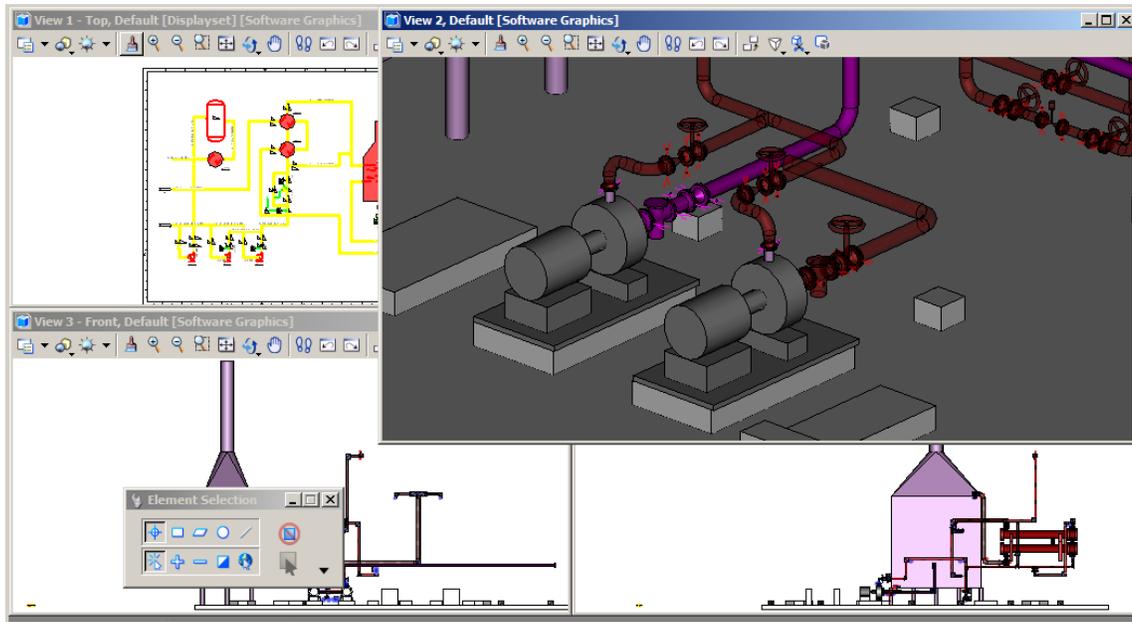
1. Make sure the OpenPlantModelserver is running.



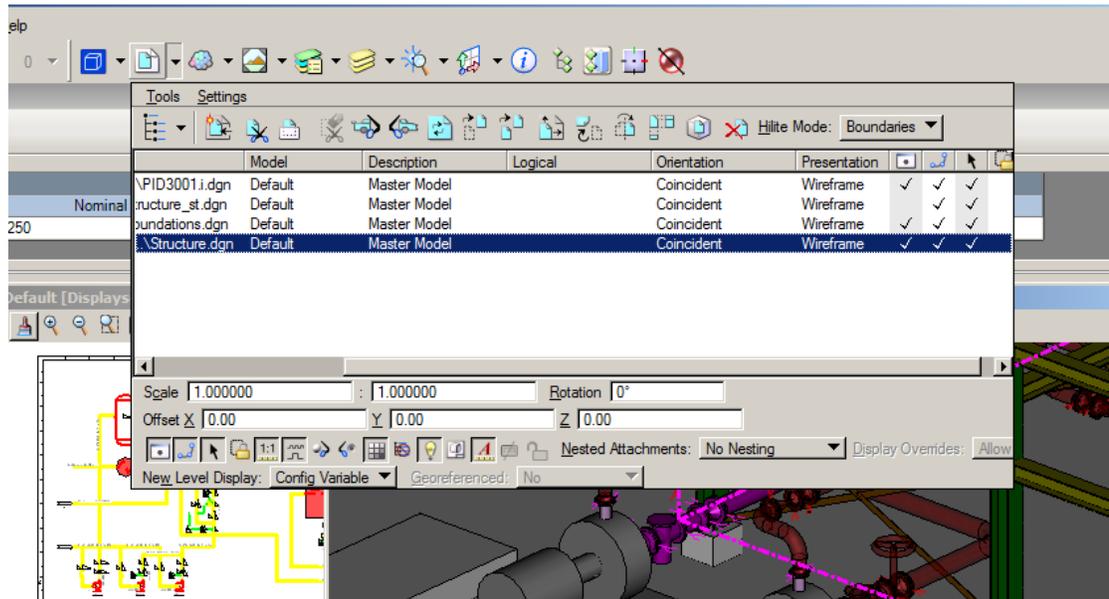
2. Go to the Piping\Models folder in ProjectWise



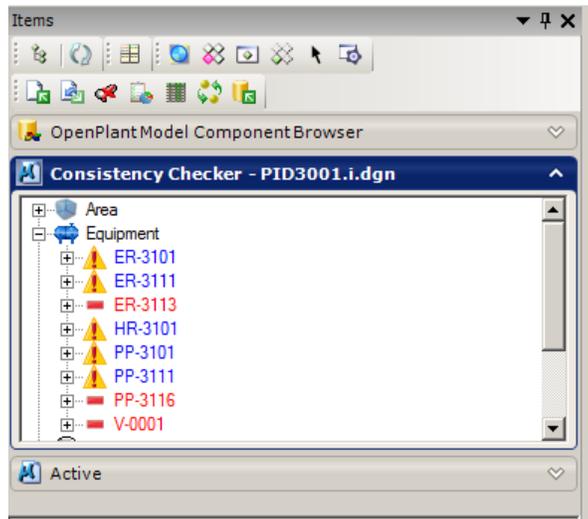
3. Open the model Designer1_wf.dgn.



- It is a hybrid with foundations and steel structure as file based xrefs. The structure is turned off. You can turn it on if you like.

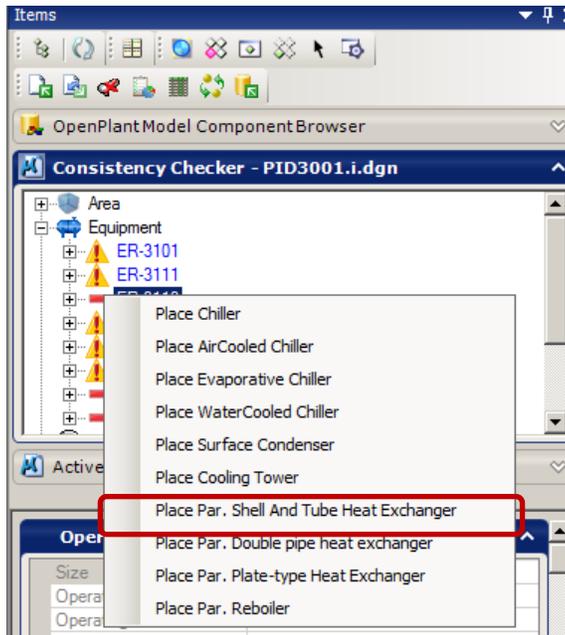


- Notice that the P&ID i-model is also already attached. You can zoom to it in the top view.
- Expand the Consistency checker tree. Click on the plus next to Equipment. Be patient and click only once. It is a little delay before it updates.



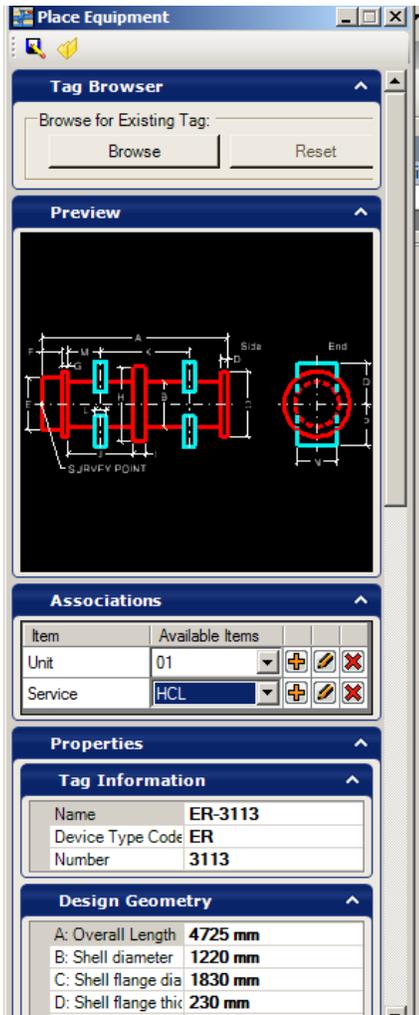
- Notice that some objects are blue. They are present in 3D but have some inconsistencies in the database. Red ones are missing. And if they are fine they will be green.

8. Right click exchanger and choose which shape to place.

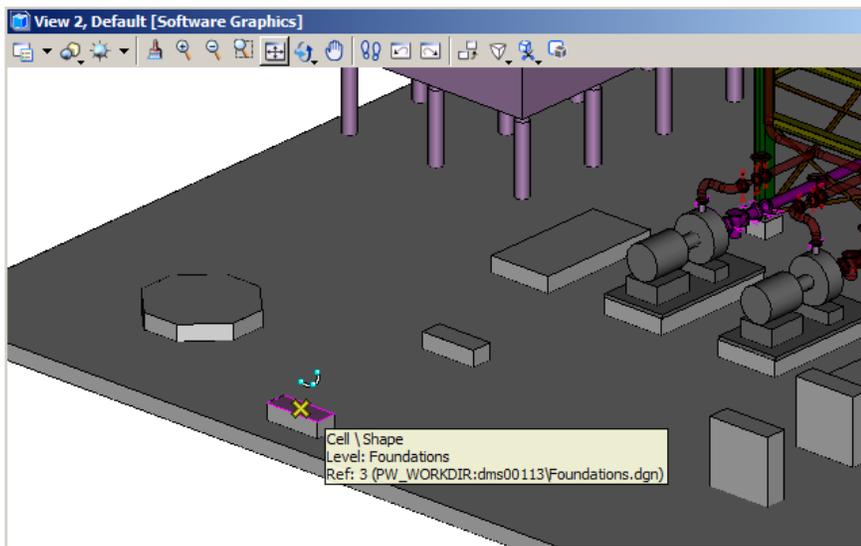


Use the "Place Par. Shell and Tube Heat Exchanger"

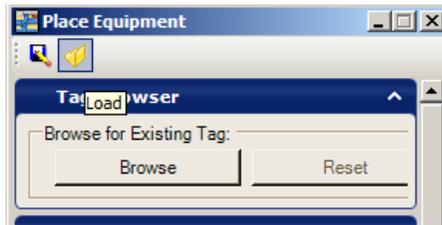
9. The “Place Equipment” dialog is shown. Make sure it says Unit=“01” and Service = “HCL”



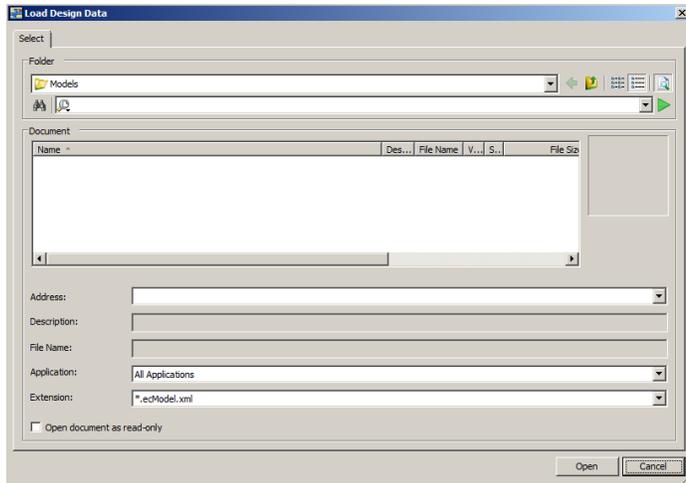
10. We are going to place it on these foundations. So zoom in the iso window like this:



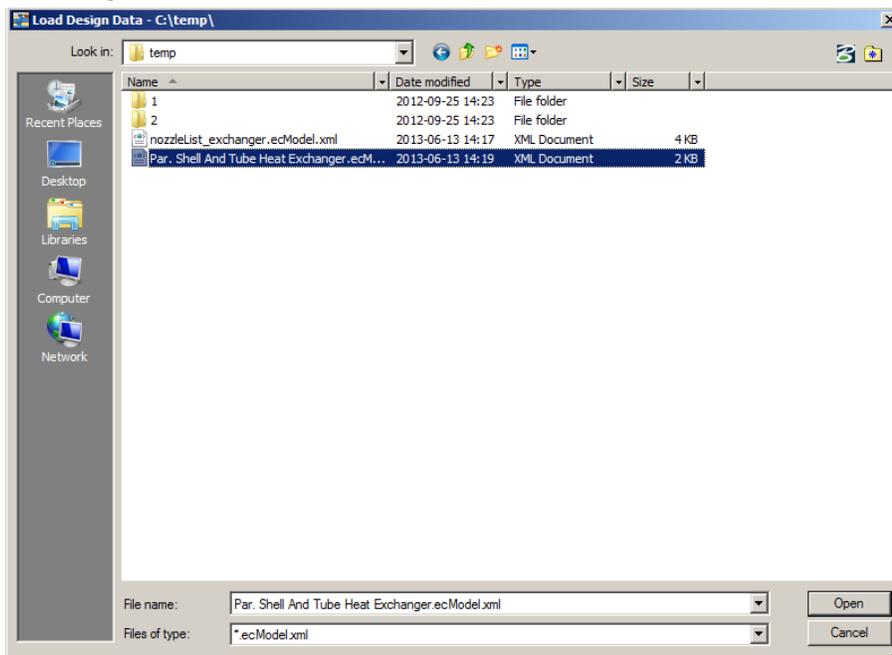
11. The dimensions are incorrect so we need to update. In this case we actually have saved the dimensions to a file. Select “Load” at the top.



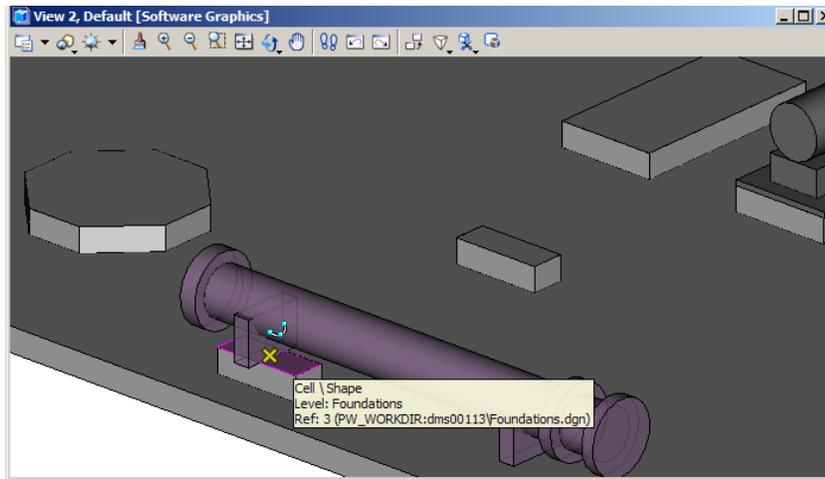
12. Cancel the first dialog.



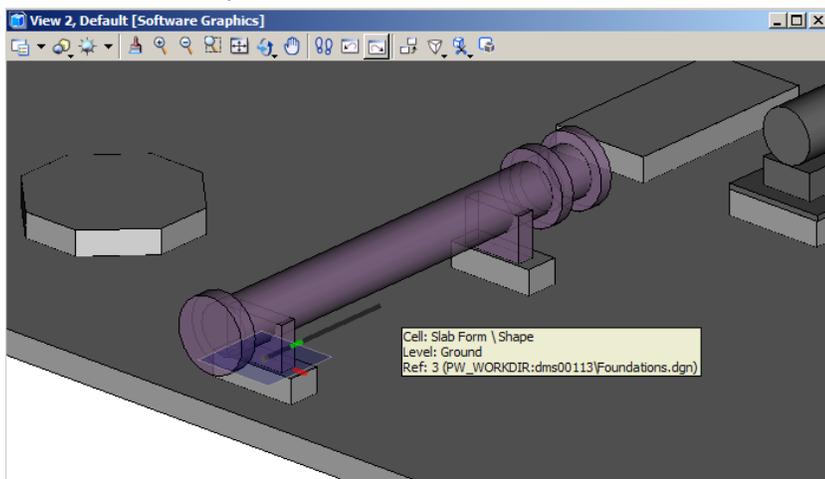
13. In the second dialog navigate to c:\temp\ and choose the Par.Shell and tube heat exchanger.ecModel.xml file.



14. Now notice that the size of the exchanger is changed. Place it on the foundation.

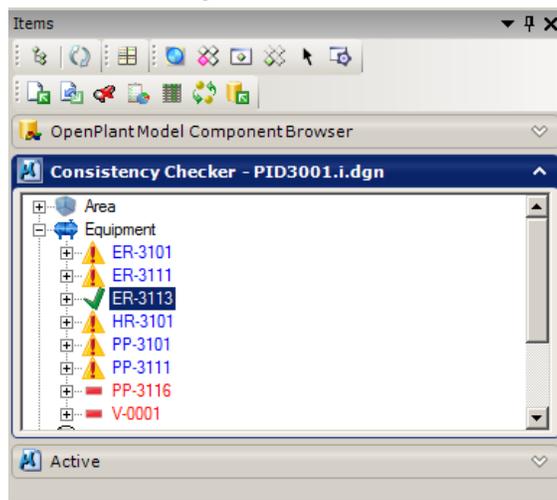


15. And rotate this way

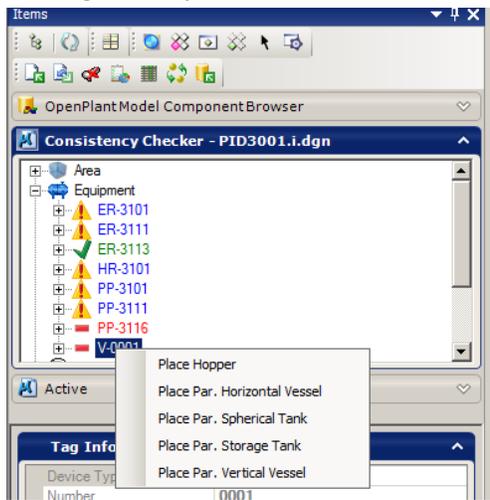


16. Right click to finish the command.

17. Notice it is now green



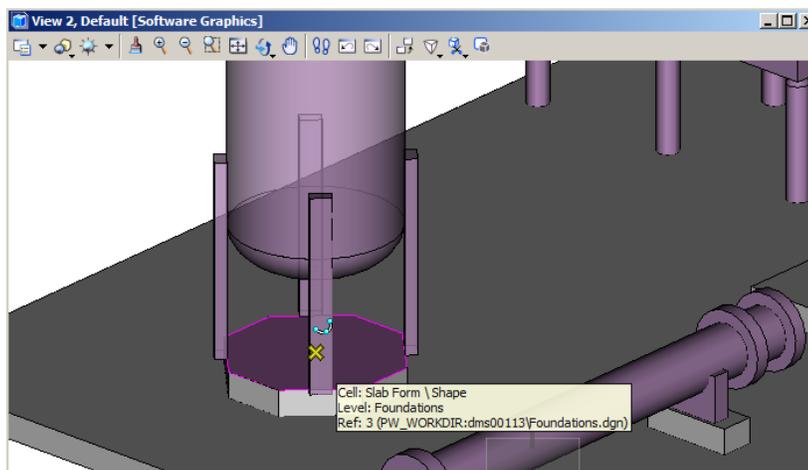
18. Also right click place the V-0001



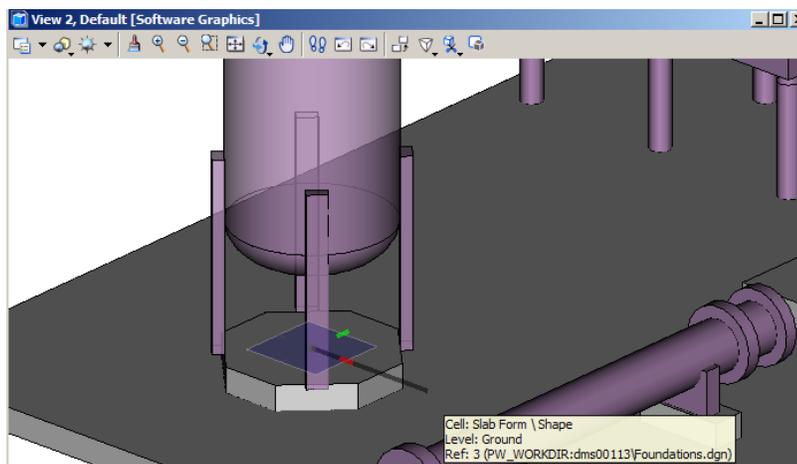
Choose "Place Par. Vertical Vessel"

19. Make sure Service = "HCL"

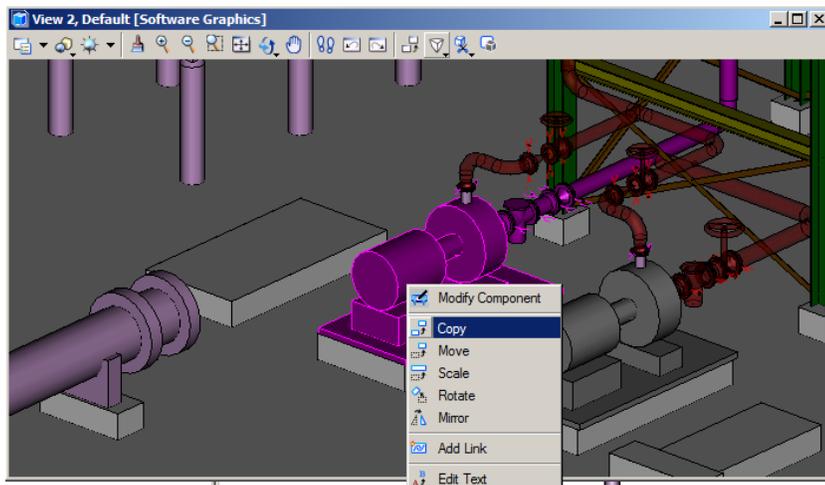
20. Place it on the foundation



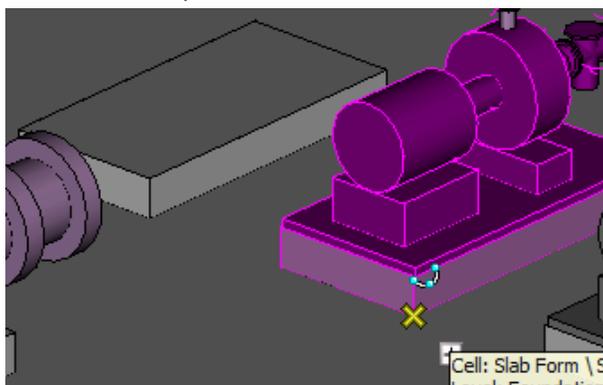
21. And rotate like this.



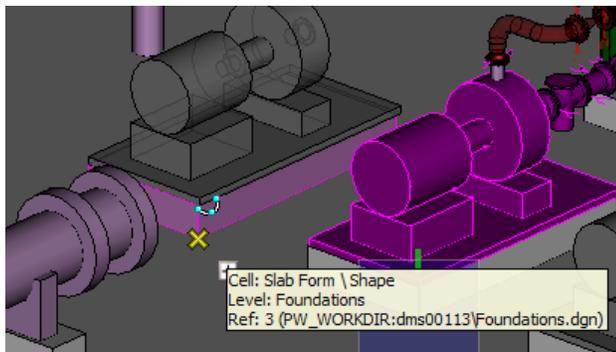
22. Right click to end the command. Now also the V-0001 should be green.
23. For the pump we do it differently. Since it is the same size as the one next to it lets copy it.
24. Right click the pump and choose "Copy"



25. Choose a base point

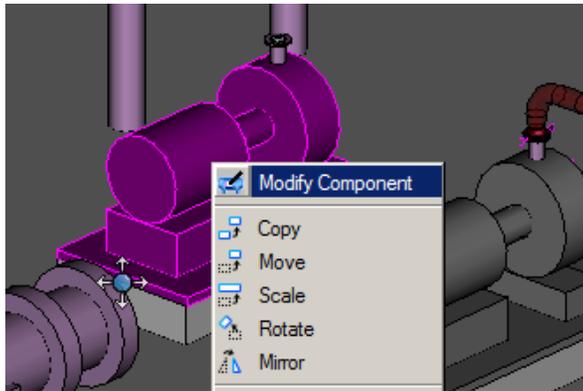


26. And a second point to copy to

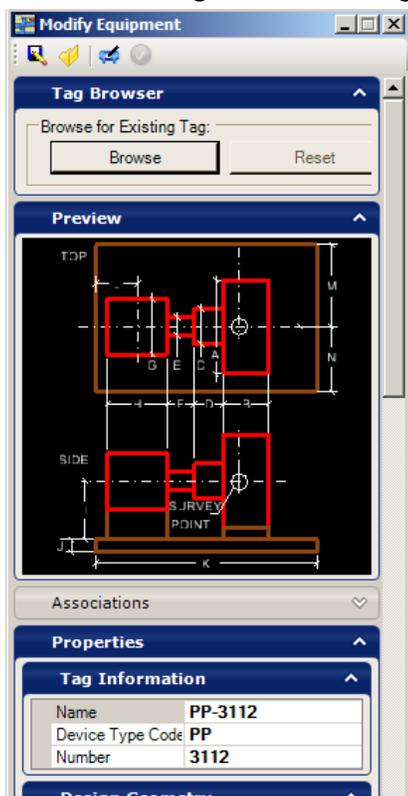


27. Right click to finish the copy command.

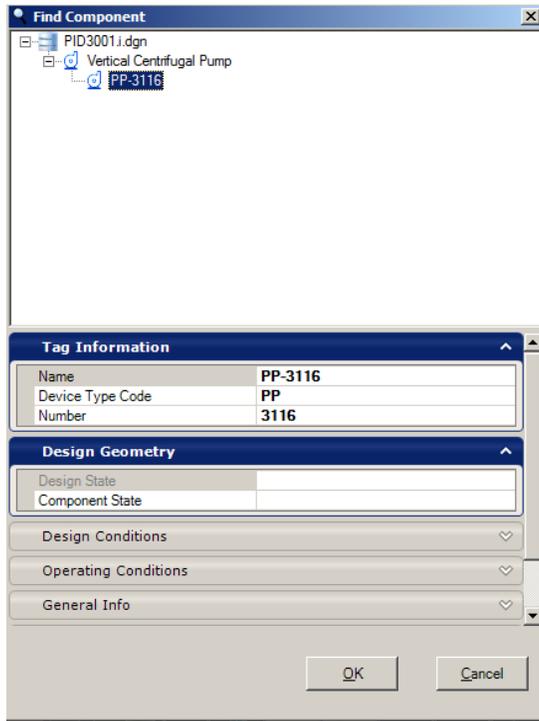
28. Right click the new pump and choose “Modify component”



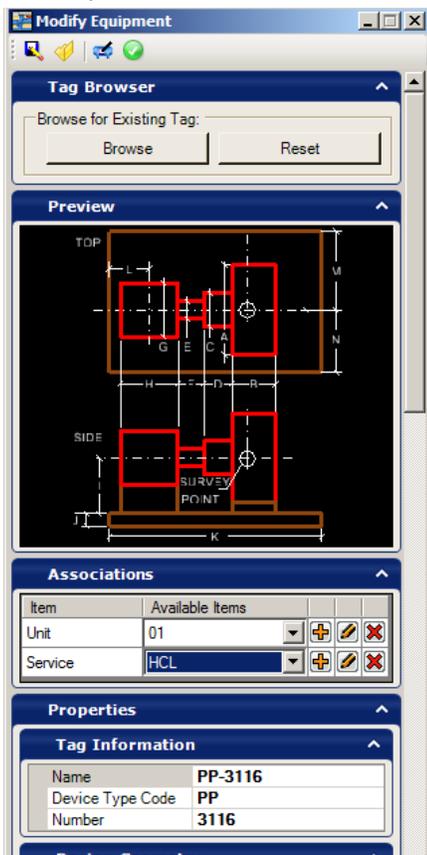
29. Notice that the pump automatically got a new tag-number. But it is not the correct one. Click Browse to get the correct tag number from the P&ID.



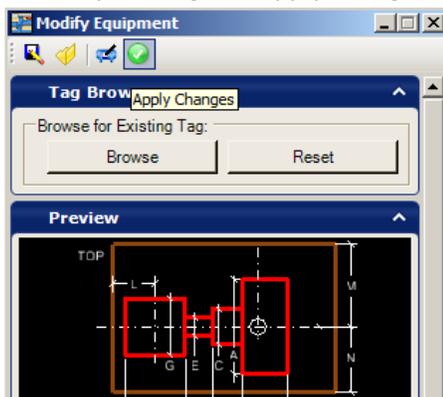
30. Expand until you find the pump. The view is automatically filtered to show the correct object type and to only show tags not yet inserted.



31. Also expand the “Associations” to make sure we have the correct Service.



32. Finish by clicking on “Apply changes”



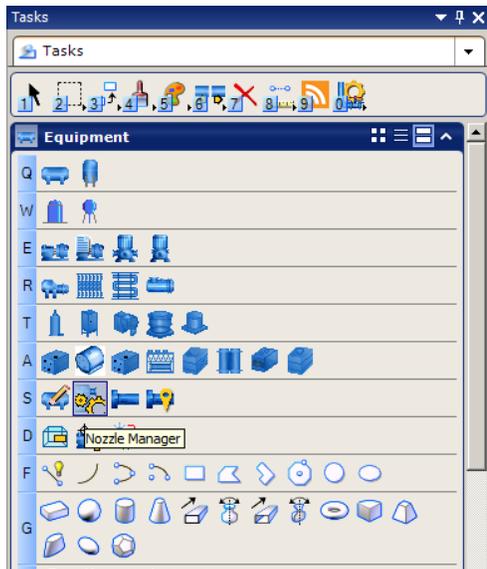
33. Close the dialog

34. Refresh the consistency checker to show the green checkmark on the pump.

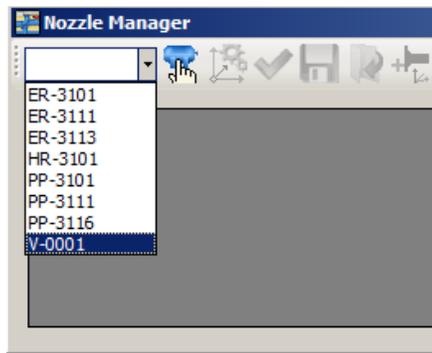
35. Now we need to place nozzles on the Vessel.

36. Switch to the Tasks menu

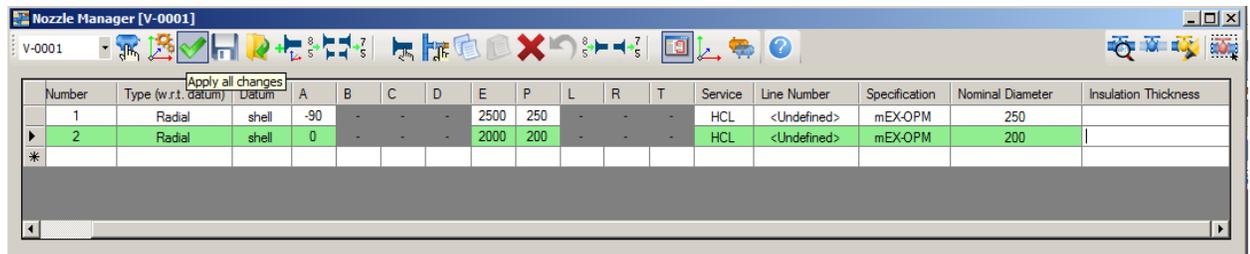
37. Expand the Equipment section and launch the Nozzle Manager.



38. Select V-0001 in the graphics window or from the dropdown list

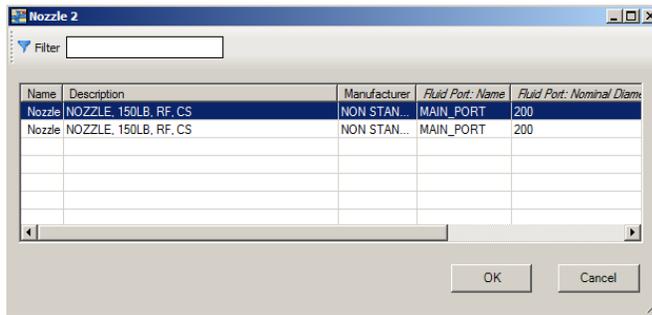


39. Place two radial nozzles on the pid.

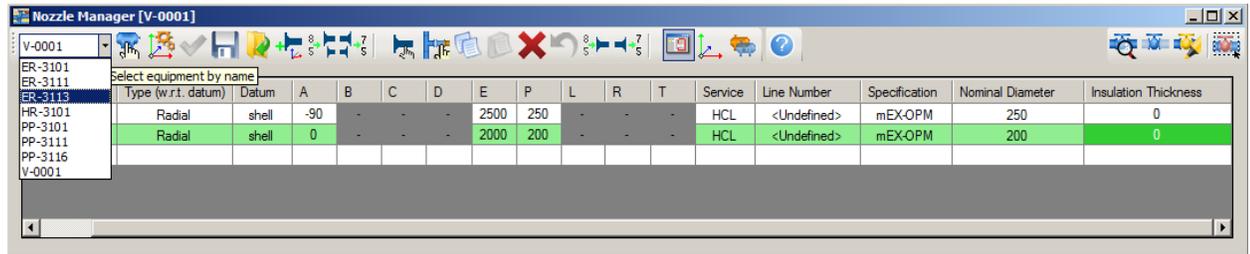


Use the values above. And then hit “Apply all changes”.

40. Choose one of the options



41. Now we change to the exchanger from the dropdown list

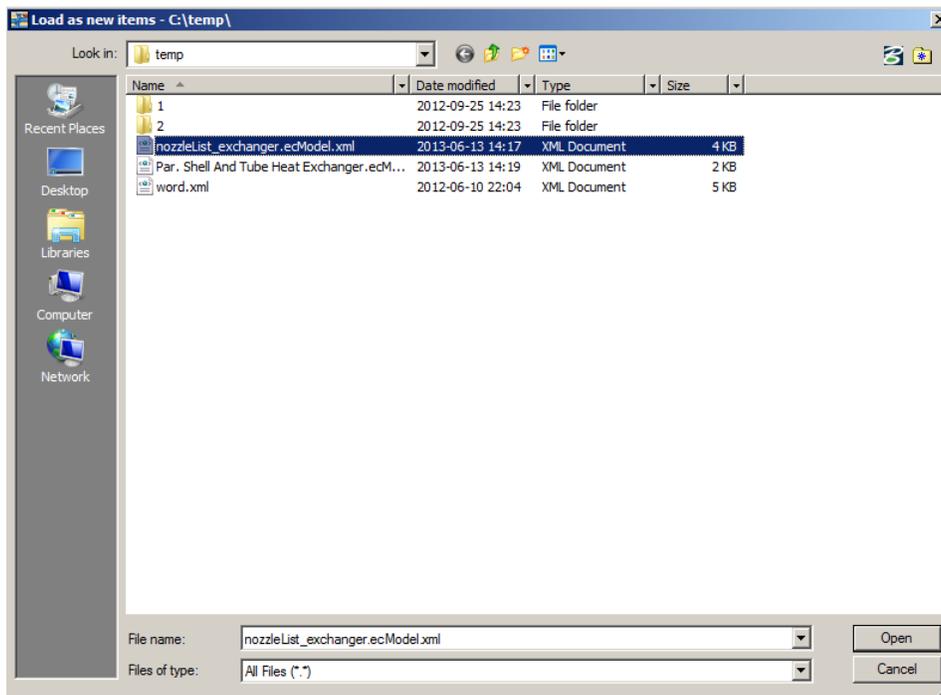


42. For the exchanger we have saved an xml file. So hit the "Load as new items"

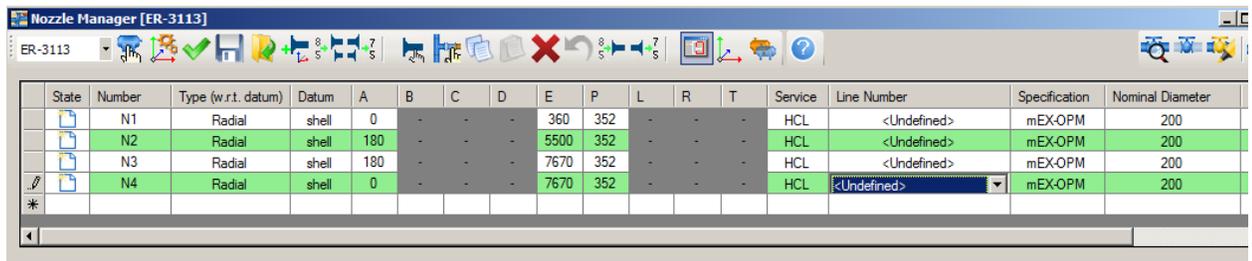


43. Cancel the first ProjectWise dialog.

44. In the second dialog chose this file:



45. Change so Service for all are “HCL” and the Line numbers are set to “<undefined>”



State	Number	Type (w.r.t. datum)	Datum	A	B	C	D	E	P	L	R	T	Service	Line Number	Specification	Nominal Diameter
	N1	Radial	shell	0	-	-	-	360	352	-	-	-	HCL	<Undefined>	mEX-OPM	200
	N2	Radial	shell	180	-	-	-	5500	352	-	-	-	HCL	<Undefined>	mEX-OPM	200
	N3	Radial	shell	180	-	-	-	7670	352	-	-	-	HCL	<Undefined>	mEX-OPM	200
*	N4	Radial	shell	0	-	-	-	7670	352	-	-	-	HCL	<Undefined>	mEX-OPM	200

46. Apply all changes

47. Now it is time to start piping placement

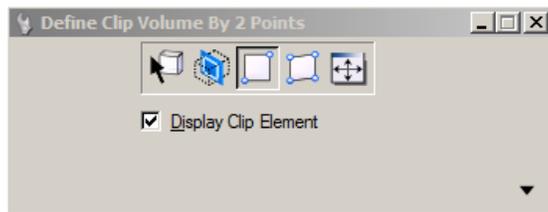
We will start with the suction line to the new pump.

48. Do a clip volume so you do not see the furnace.

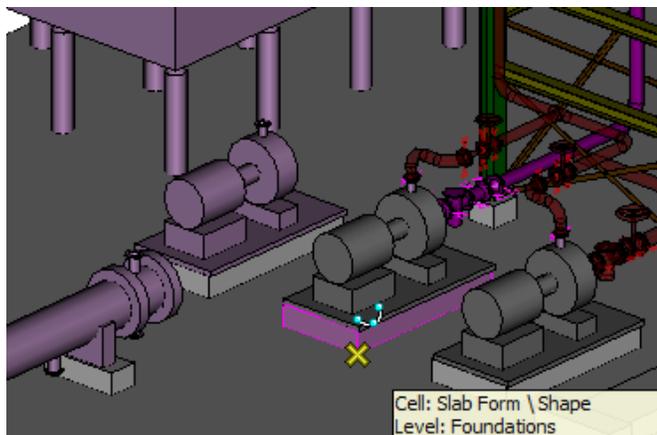
Use this tool:



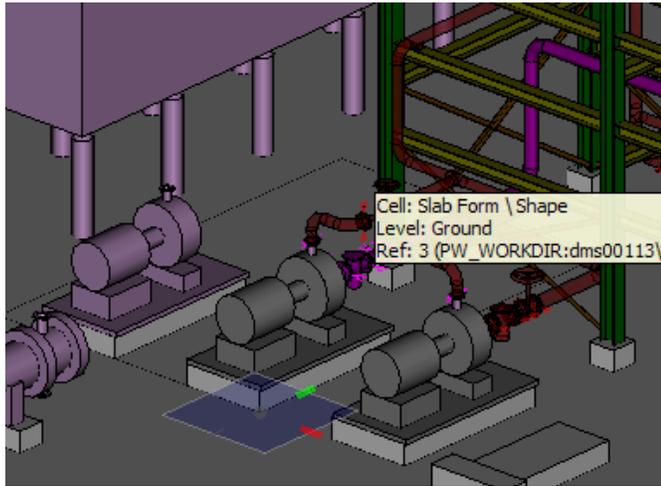
49. Set it to “Define Clip Volume By 2 Points”



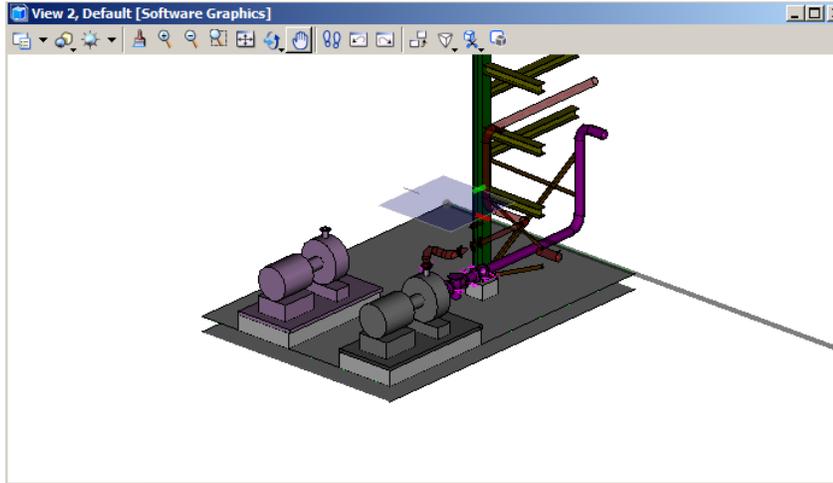
50. Select first point somewhere like this:



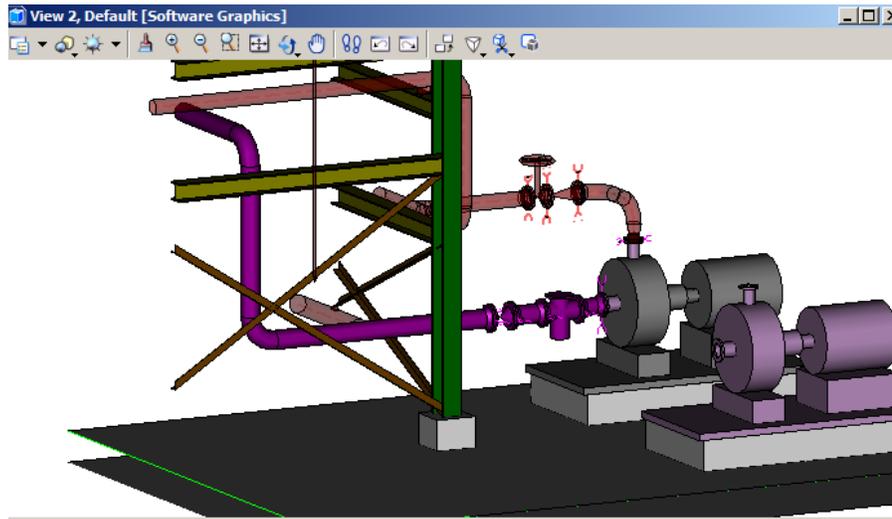
51. Hit the “T” key to rotate the “Accu draw compass” to a top rotation.
And second point here:



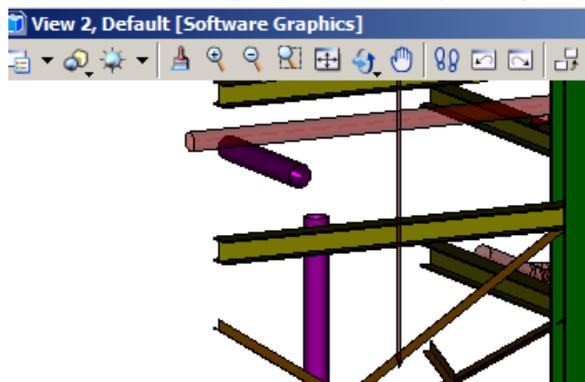
52. Click once in the iso view to verify that it is in that view we will use the clip.



53. Rotate and adjust the clip so you get a view like this. You need to see the pump and the suction line going from the piperack to the existing pump.

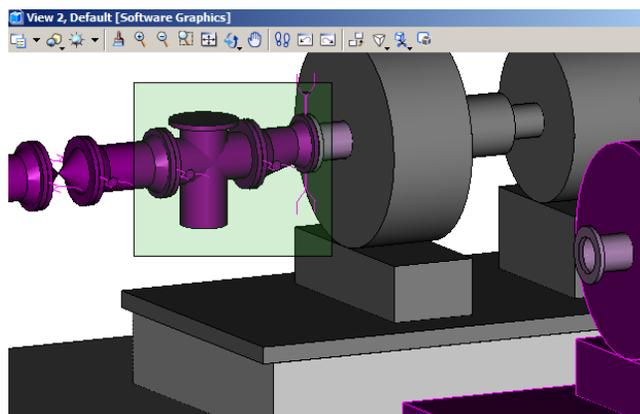


54. Start with removing the elbow on top facing down.



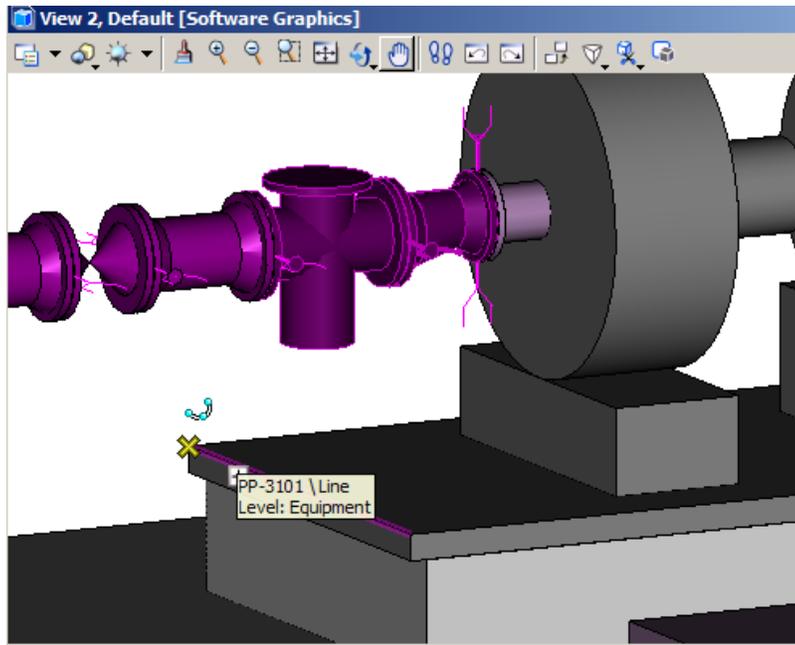
55. The components closest to the pump are the same as the existing line. The line number is that same as well so we copy those components.

Select these:

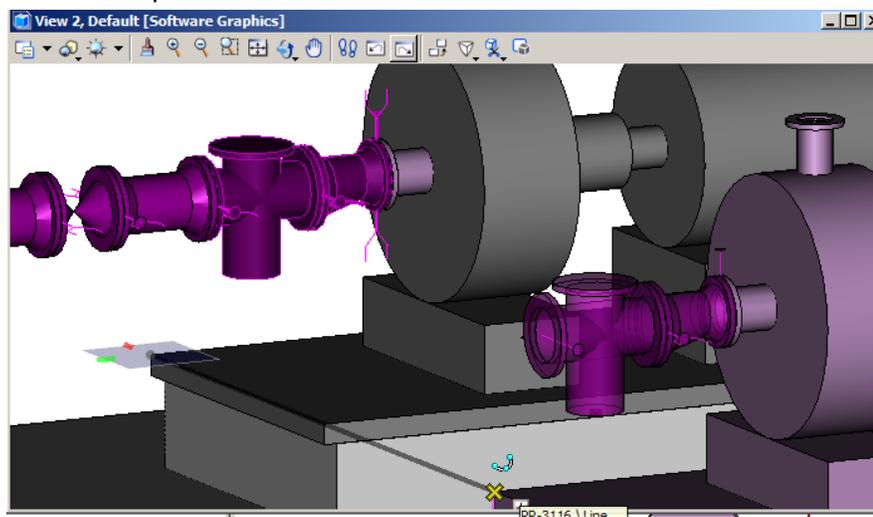


56. Right click one of the selected components and choose "Copy".

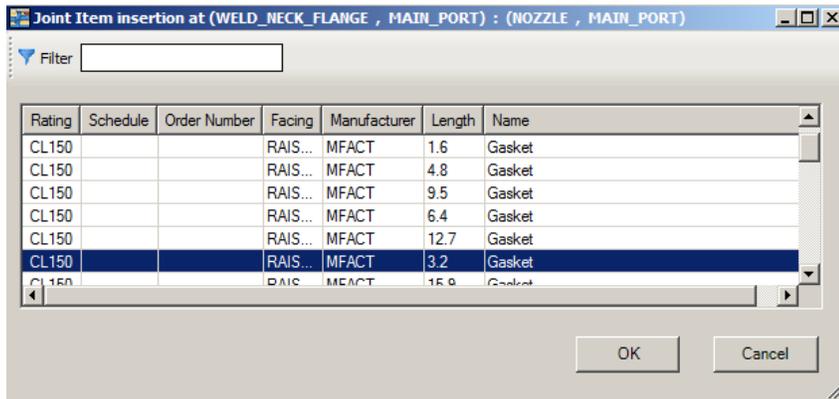
57. First point:



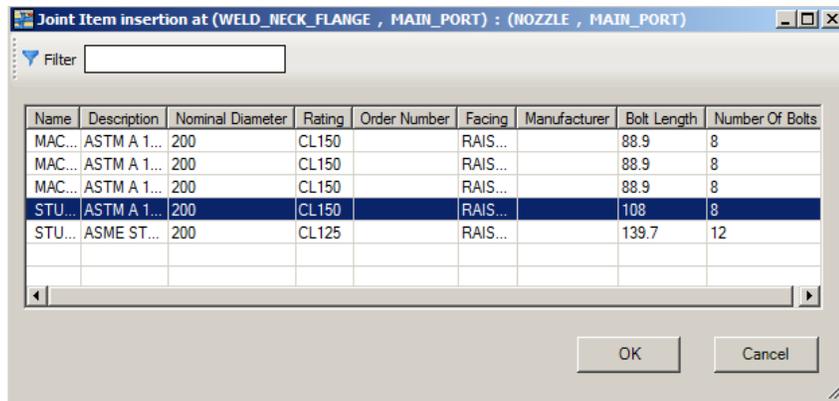
58. And second point:



59. It realizes that the flange will be connected to the new pumps nozzle. Therefore a new gasket is needed:

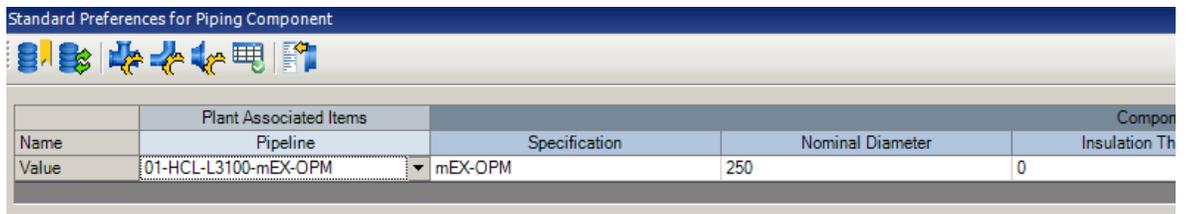


60. And a new set of bolts as well:



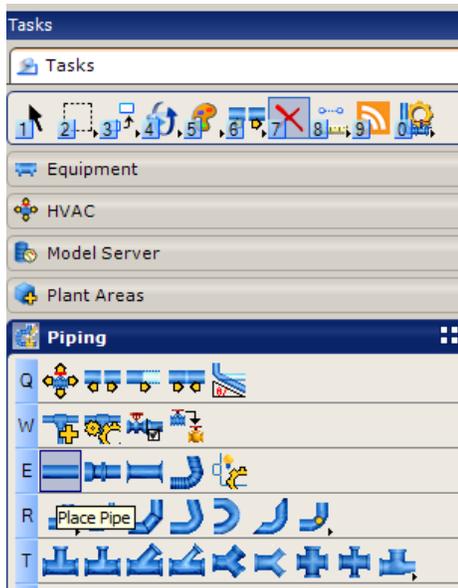
61. Right click to end the copy command.

62. In the “Standard preferences for Piping Components” dialog make sure the line 01-HCL-L3100 is selected:

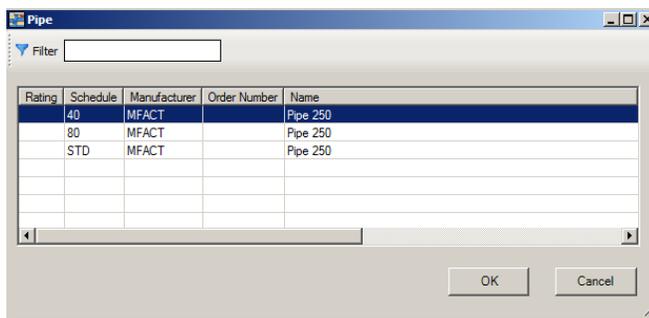


63. In the Tasks menu collapse the Equipment section and expand the Piping section.

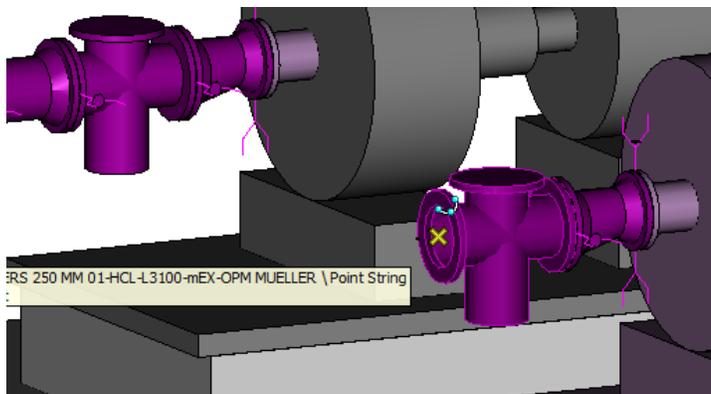
64. Select the “Place Pipe” tool:



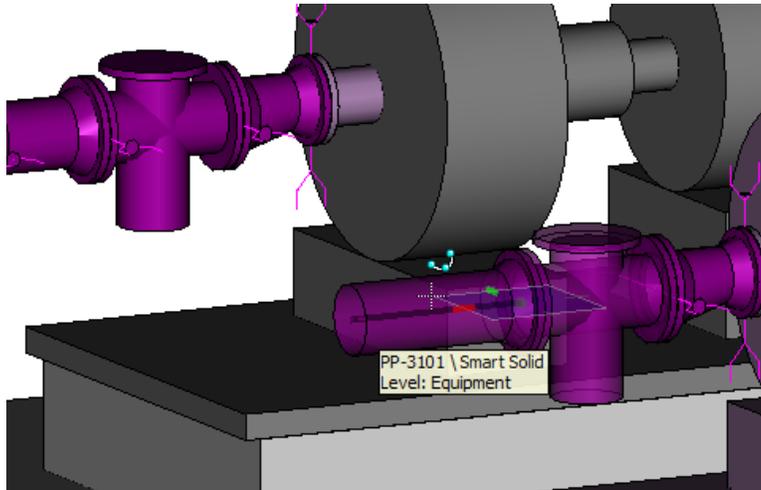
65. Select schedule 40:



66. Start placement by clicking on the strainer:

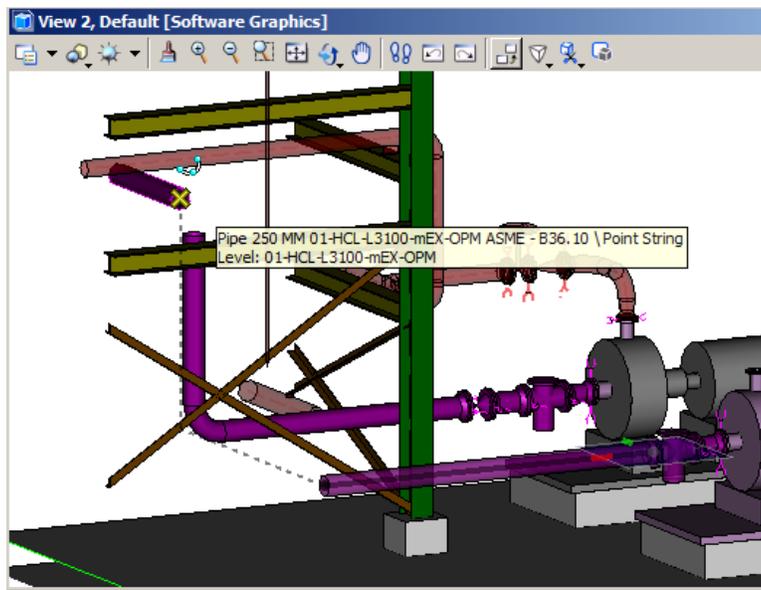


67. Notice that a flange is automatically placed in case you copied it without it.



68. Pull along the “Red direction” of the accu draw compass and notice you have a thick “rubber band” attached. Hit “Enter” when it looks like that and the direction is locked.

69. At that point snap on the existing line in the pipeway:



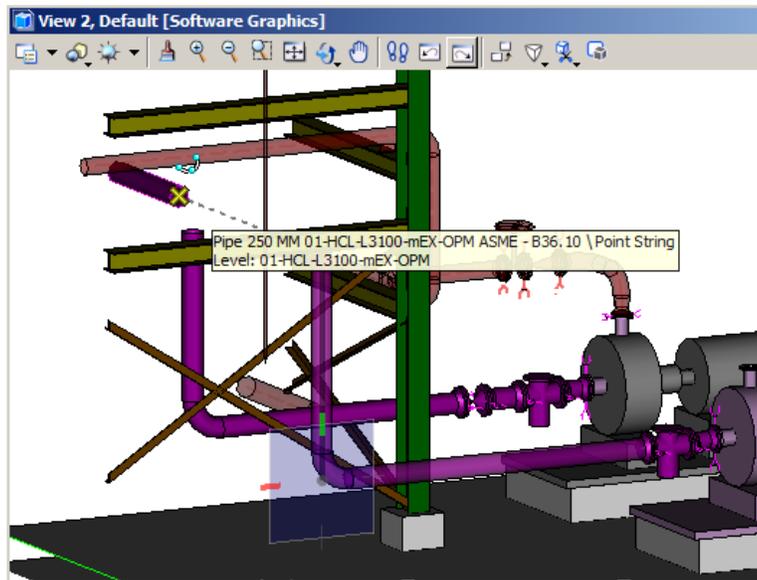
That way you find the correct location of the suction line.

70. Select gasket and bolt again

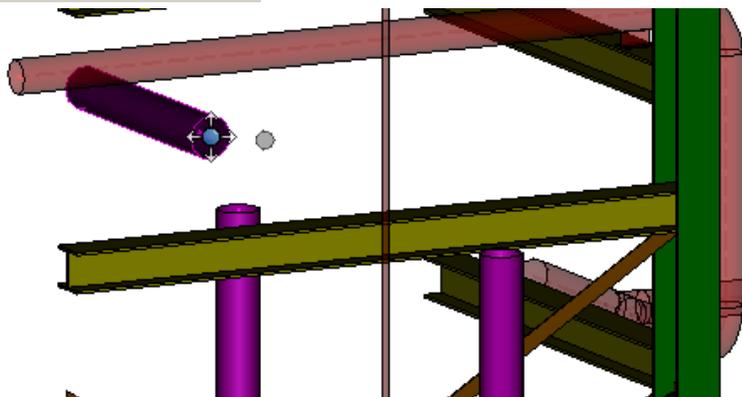
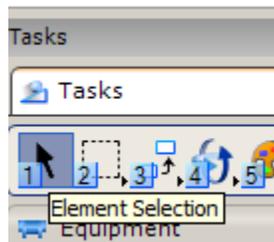
71. Now we need to go vertical. So hit “S” to rotate the compass to a “Side” orientation.

Pull up and hit “Enter” again to lock that direction. Snap on the existing pipe again to find

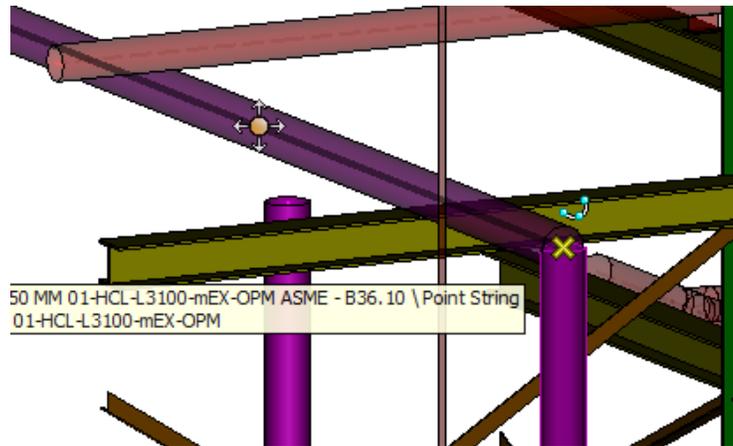
the correct elevation.



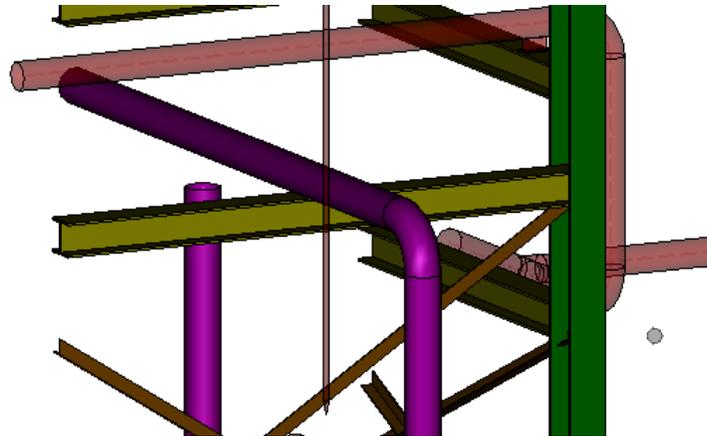
72. Right click to end pipe placement at that point.
73. To connect the existing horizontal pipe to the new vertical section, select the horizontal pipe with the select tool active.



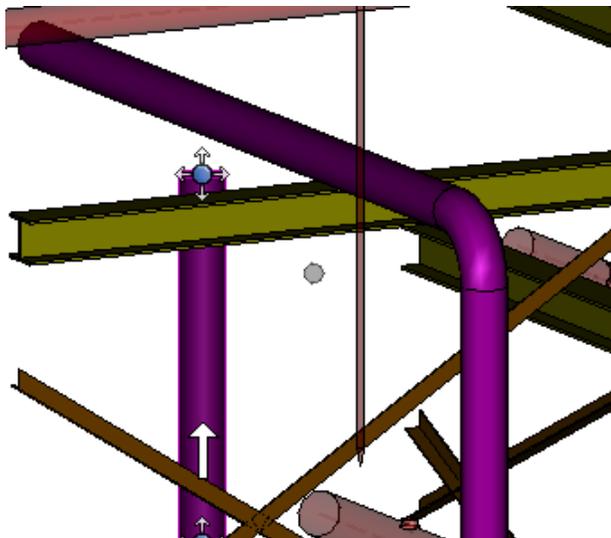
74. Then click on the blue dot and pull it to the end of the vertical pipe.



75. Notice it will connect and automatically add the elbow.



76. Select the existing old vertical suction line. Extend to line in pipe way. The tee will be automatically generated.

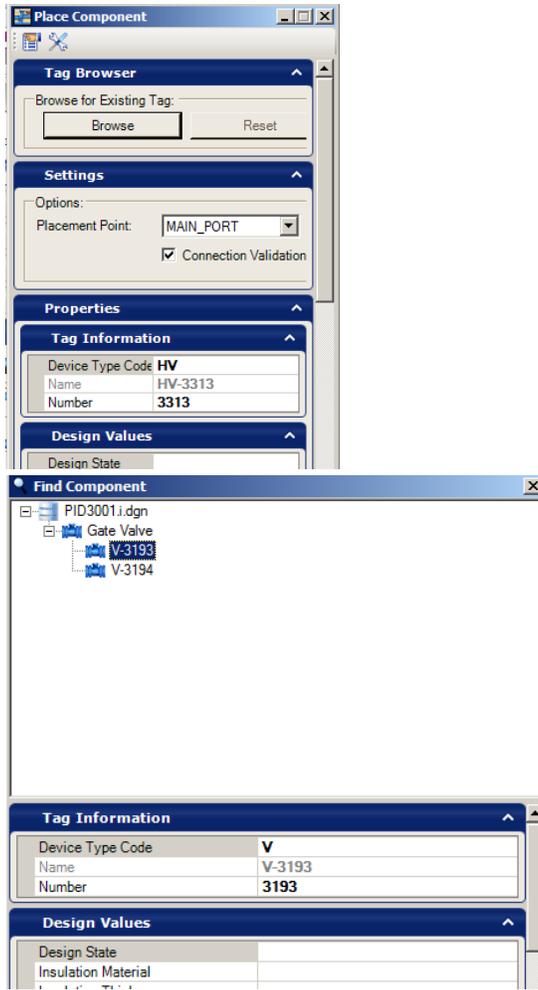




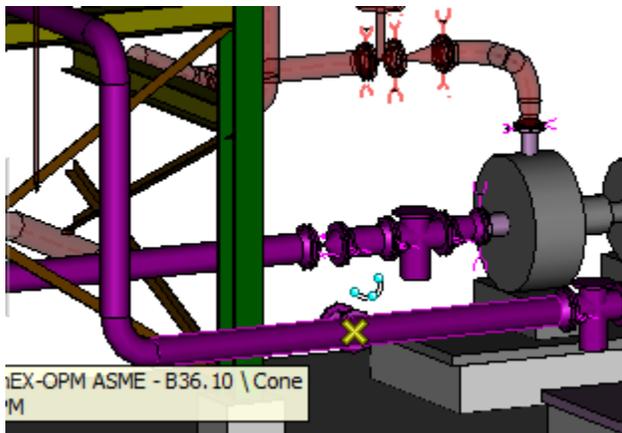
- 77. Place the gate valve on the suction line. V-3193.
Choose the gate valve from the tasks menu



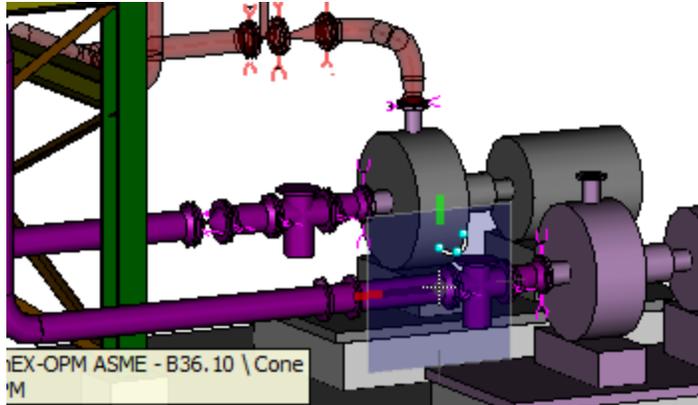
Before placement Browse the PID for the tag number:



Click on the line.



and place the valve

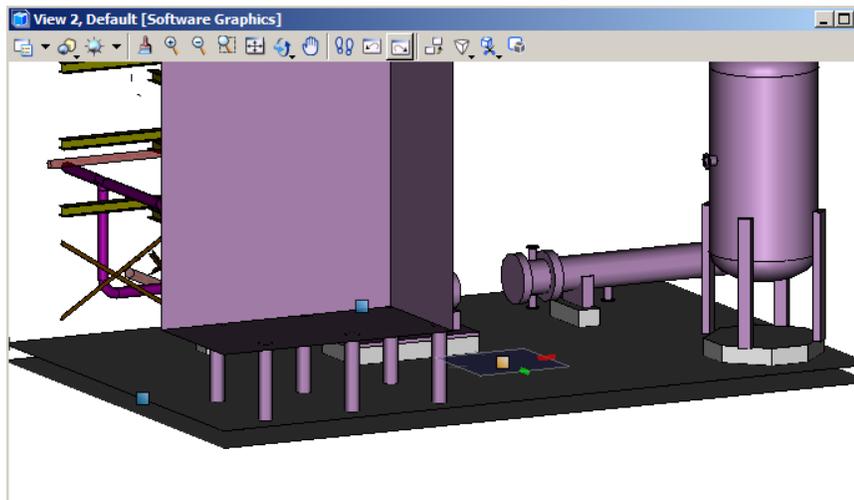


Select gasket and bolts.

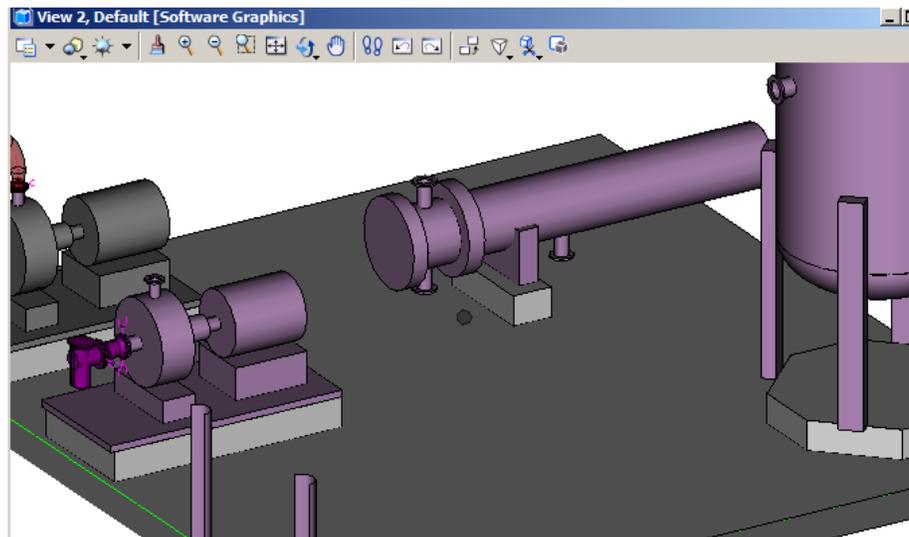
78. Now lets place the discharge line running to the vessel V-0001

79. First we need to modify the clip so we can see the pump and the tank.

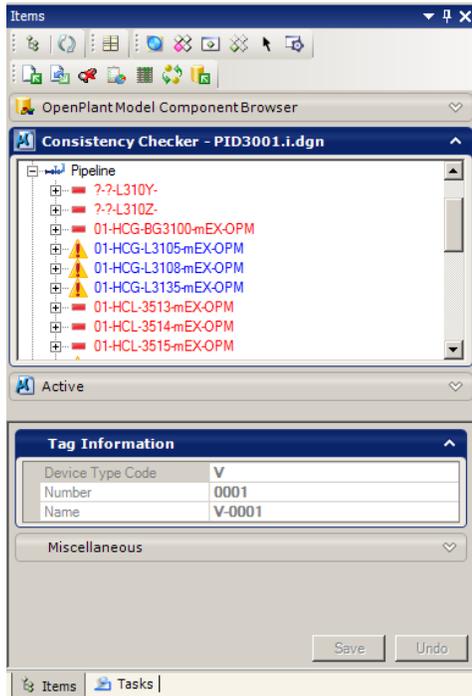
Select the clip volume with the select tool. Drag it until you see what you want.



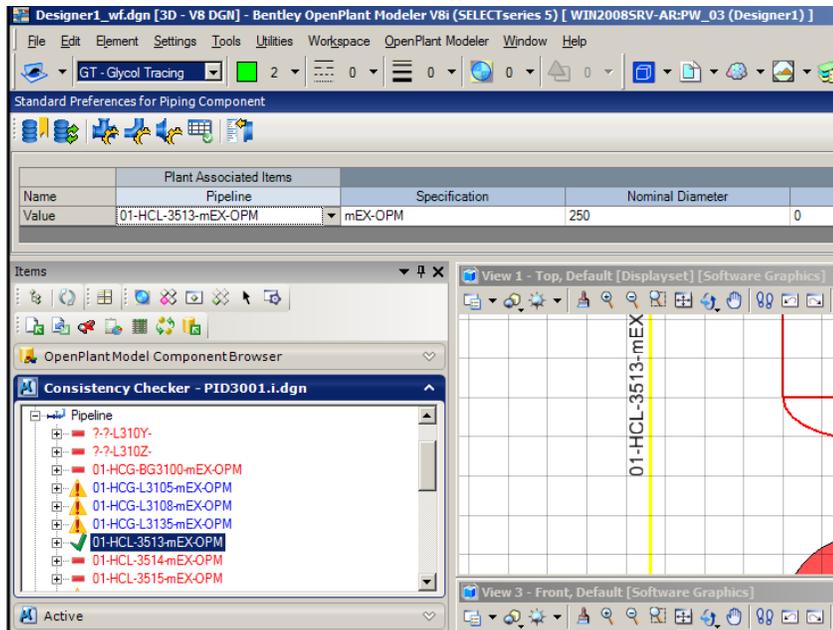
Pull the other side so we do not see the furnace.



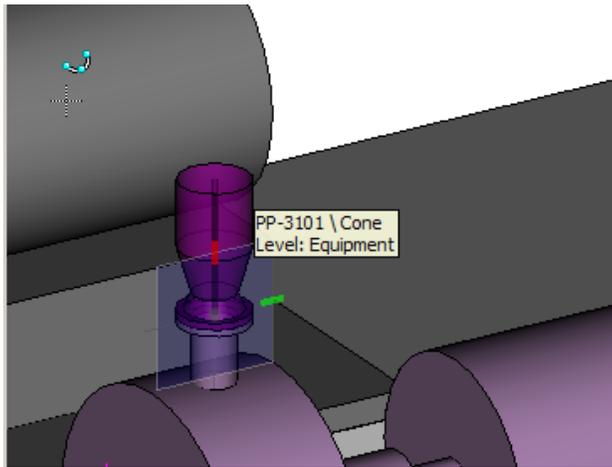
80. Go back to the Items menu and the consistency checker, expand pipelines and locate line L3513.



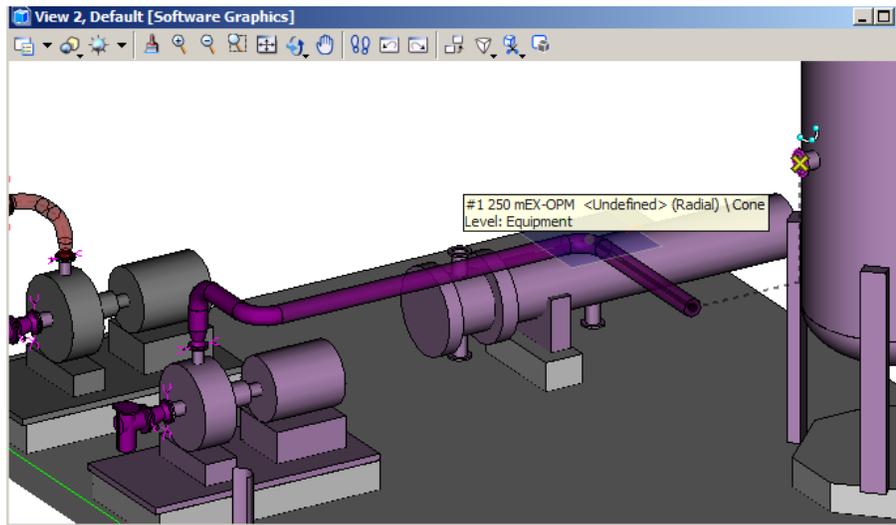
81. Right click it and create pipeline. When it is done the pipeline is green and is also selected in the Standard preferences toolbar.



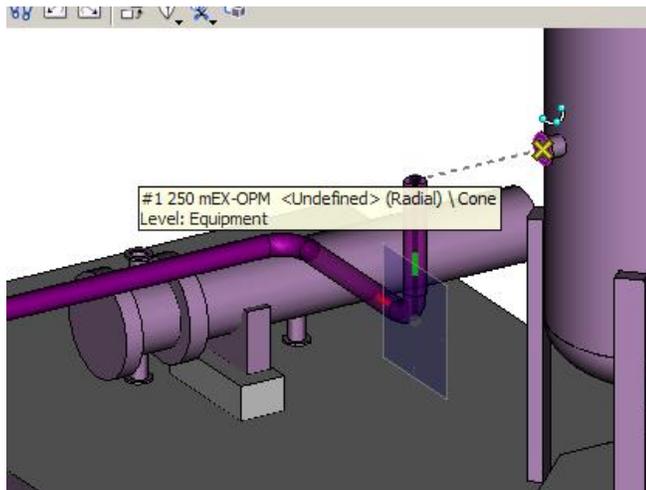
82. Start pipe placement from the discharge on the pump. Notice it places the reducer as required.



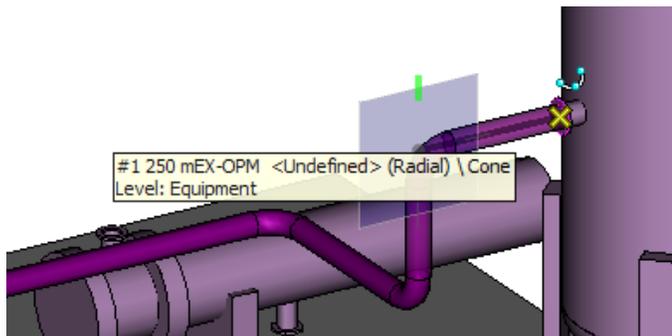
83. Place the pipe something like this. In the end you need to hit Enter to lock direction and snap to the nozzle to find the correct coordinates.



84. In this point I hit “F” on the keyboard to choose “Front orientation of the “Accudraw compass”

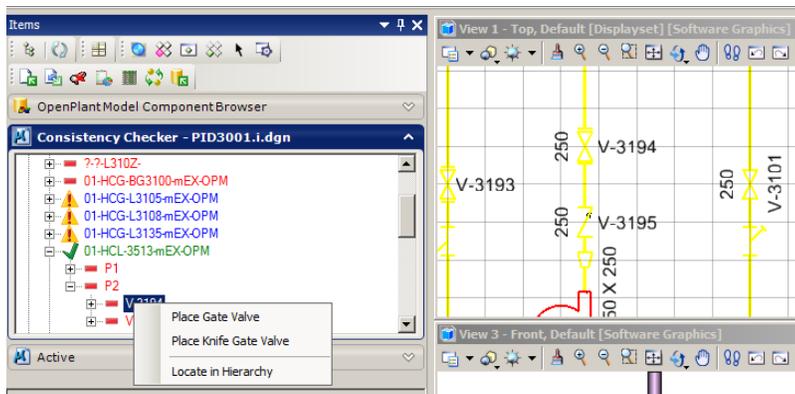


85. Finish with a Side orientation “S”

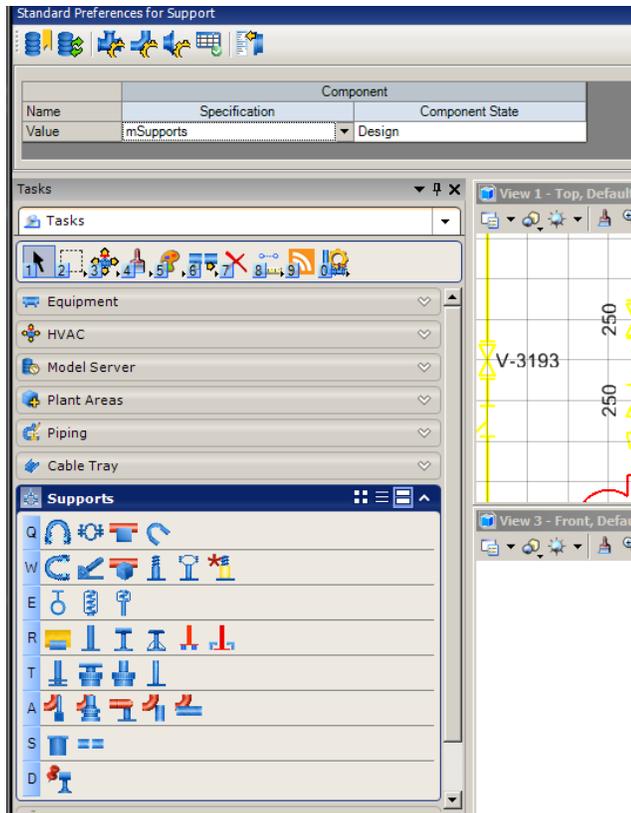


86. The finishing flange at the nozzle will be automatically placed.

87. From consistency checker right click the valves and place them on the pipe.

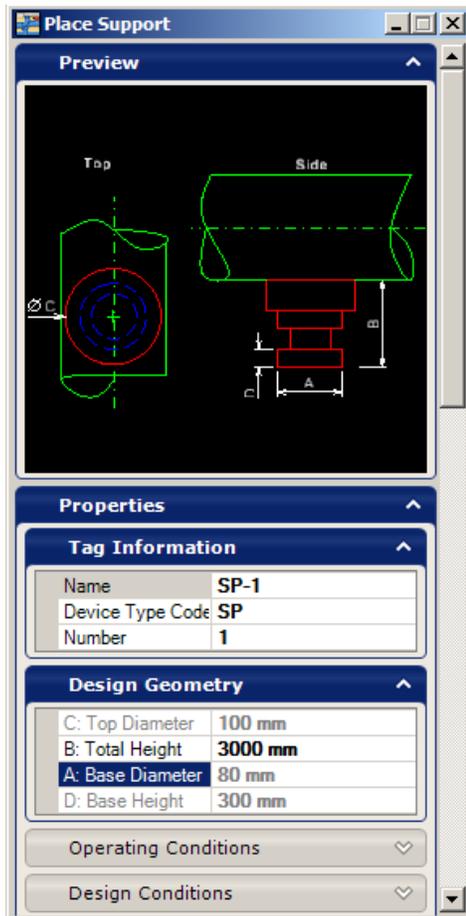


88. Place a support on the line. Collapse the piping section of the Tasks menu and expand the supports.



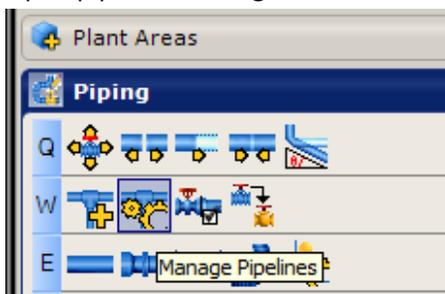
Notice the Standard preferences changed appearance and the mSupports spec is selected.

89. Choose a support to place. The Place support dialog is shown, and you can edit tag-information and dimension.

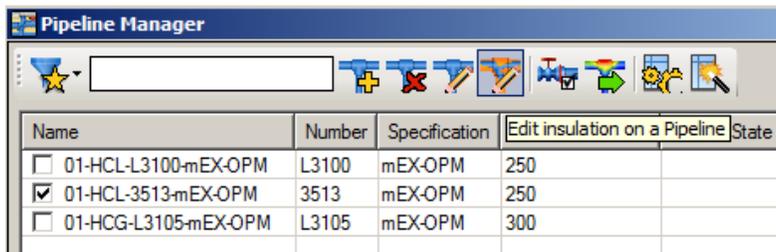


90. Finally we want to add insulation to the pipe and create an iso.

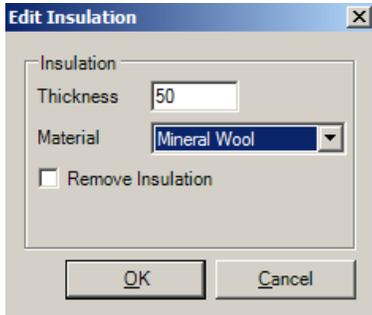
91. Open pipe line manager.



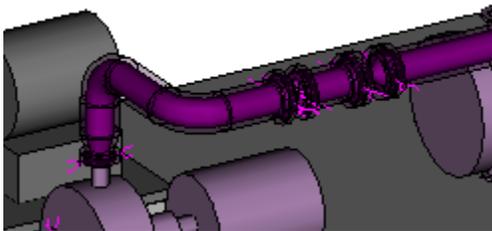
92. Select the line and choose “Edit insulation on a Pipeline”



93. Add insulation.

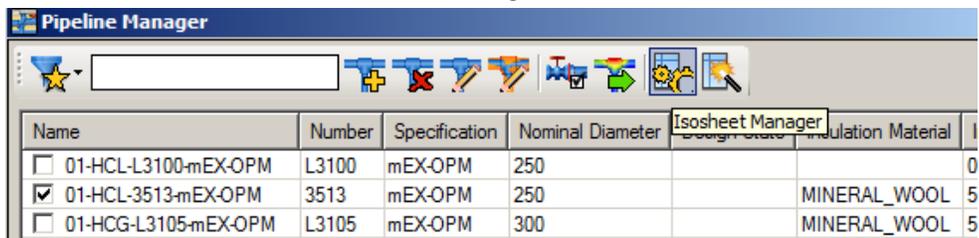


94. Notice the insulation is added. It is on a separate level which is transparent.

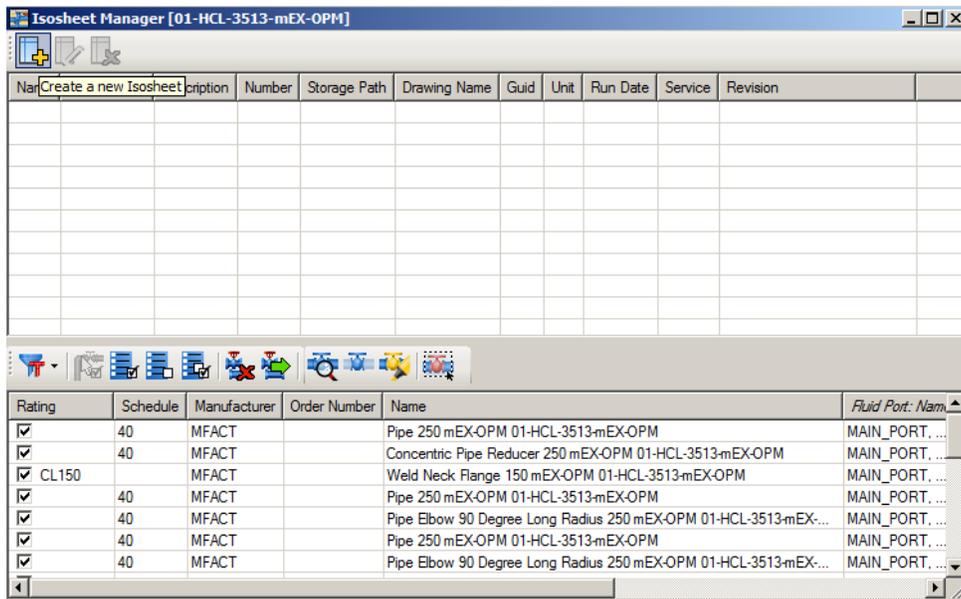


95. To create an iso we first have to create an iso sheet.

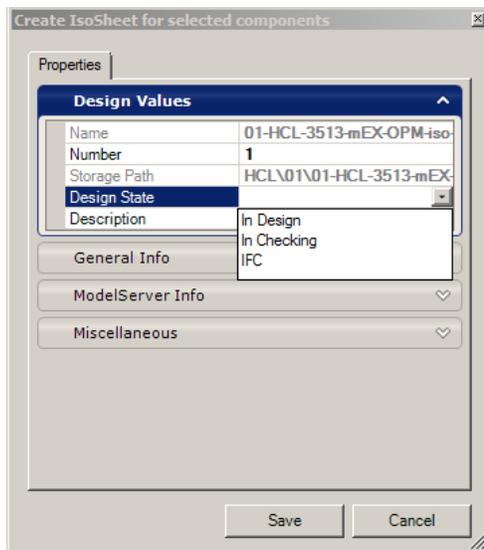
Select the line and choose “Isosheet manager”



96. Check all components and hit “Create new isosheet.”



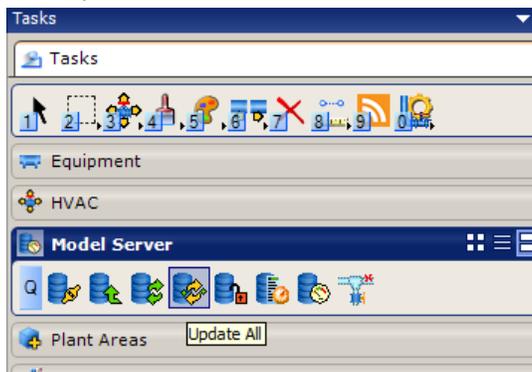
97. Give it a design state.



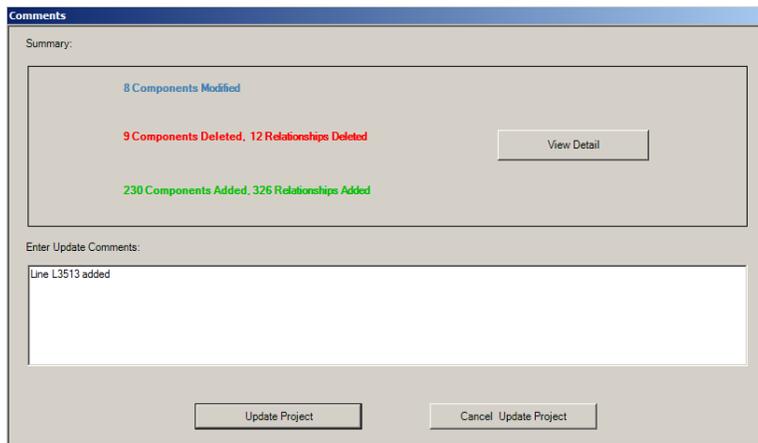
98. Close the dialog and exit the Pipeline manager.

99. Now we need to update the server with the changes.

100. Expand the “Model Server” section. Choose “Update all”.

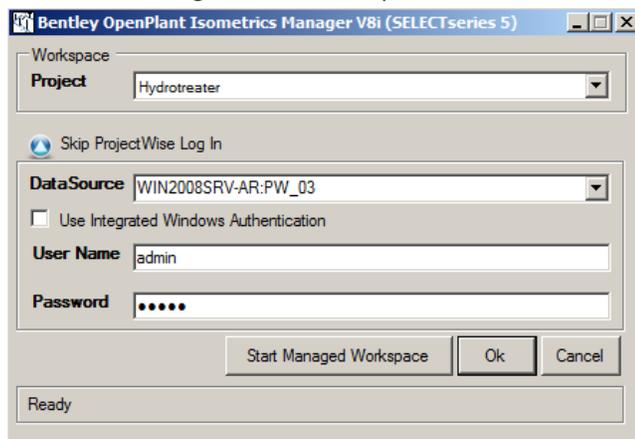


101. Add a comment and click “Update Project”

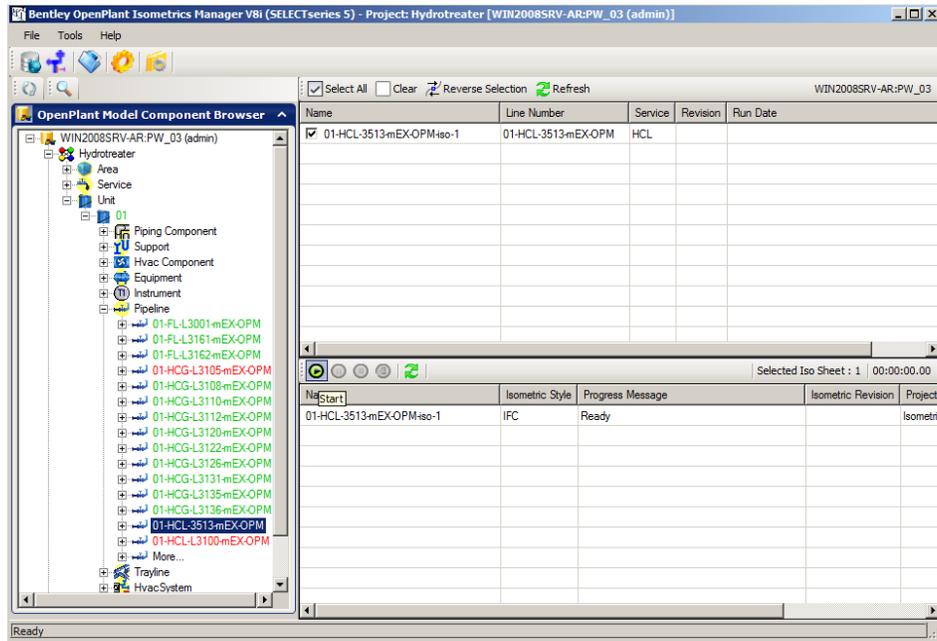


102. When it is done we launch OpenPlant Isometrics Manager to view the file.

103. This time log in as “Admin” password “Admin”



104. Navigate to the line number and click on it. On the right select the iso sheet and below click “Start”.



105. Once it is done. You can right click and “Show Isometric”