

SmartPlant 3D

Drawing Creation Practice Labs



Process, Power & Marine



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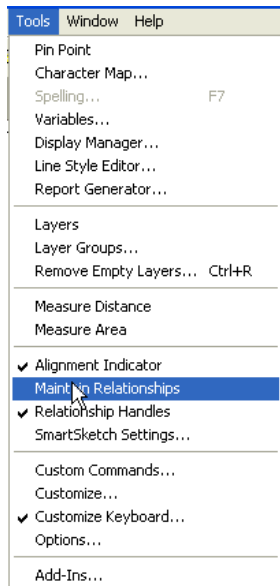
Lab 1 Creating a Parametric 2D Symbol

Objective

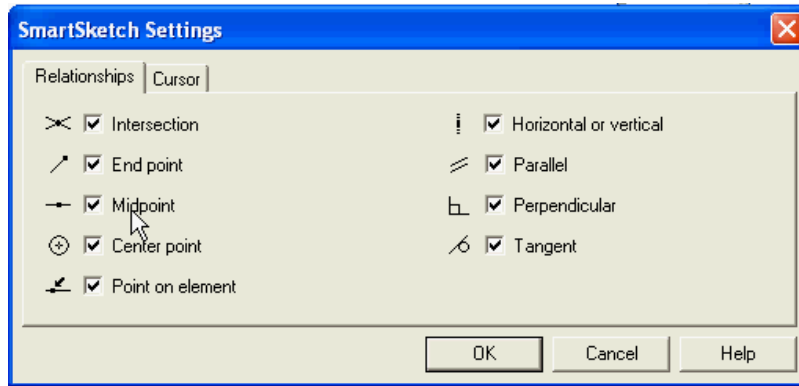
- Learn SmartSketch 2D concepts:
 - Drafting
 - Relationships
 - Fill
 - Dimensioning
 - Variable Table
 - Symbol Creation and Parameterization
- Create a parametric 2D Symbol for a pipe end

Draw the Graphics

1. Start Drawing Editor.
2. Make sure that Tools – Maintain Relationships is turned on.



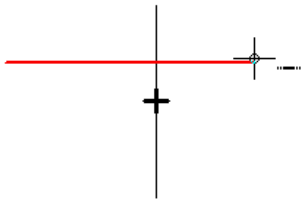
3. Select Tools – SmartSketch Settings and make sure that Mid Point is checked.



4. Select the line command and place a vertical line on the sheet.



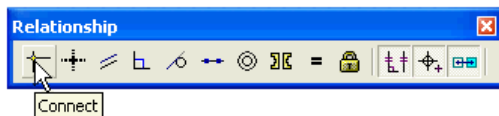
5. Reset (right mouse click) and place a horizontal line on the sheet.



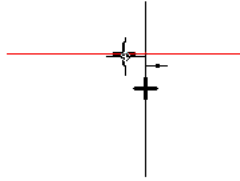
6. Display the relationship toolbar by clicking on the Main toolbar Relationship button.



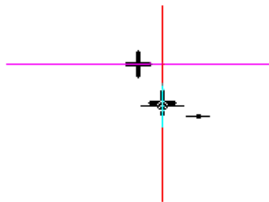
7. Select the Connect relationship command.



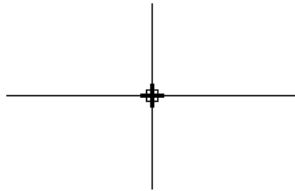
8. Move your mouse over the horizontal line until you see the midpoint glyph displayed and click the left mouse button.



9. Move your mouse over the vertical line until you see the midpoint glyph display and click the left mouse button.



10. The horizontal line should move so that its midpoint is coincident with the vertical lines midpoint.

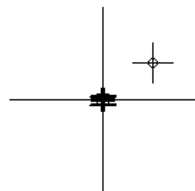


11. Select the Equal relationship command.



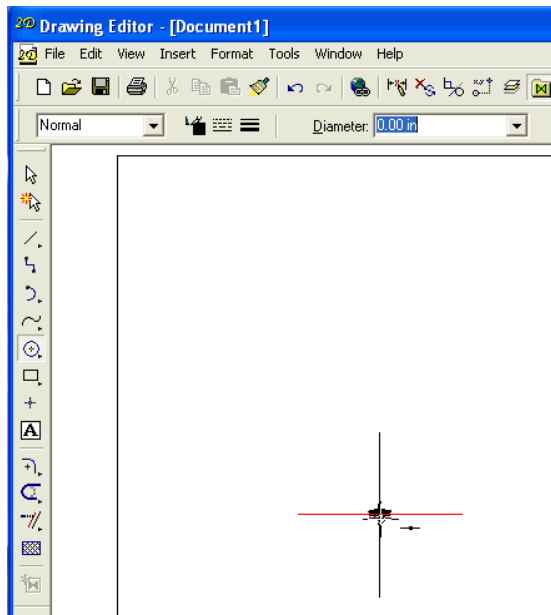
12. Click on the vertical line and then the horizontal line.

13. The vertical line and the horizontal line should become the same length.

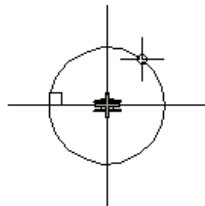


14. Turn off the Relationship toolbar by clicking the red X in the titlebar of the toolbar.

15. Select the circle command on the Draw toolbar and move over the intersection of the two lines. Click the left mouse button when the midpoint glyph is displayed to begin the circle.



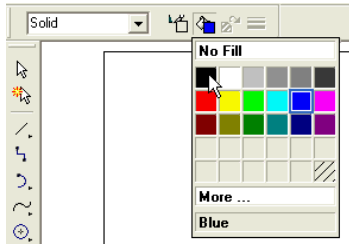
16. Move the mouse some distance and click again to place the circle.



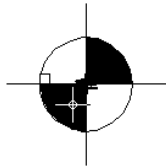
17. Select the Fill command on the Draw toolbar.



18. On the ribbon bar for the Fill command, select a Solid style and select black as the color.

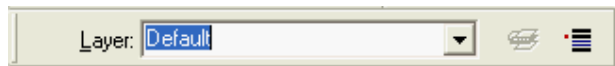


19. Click in the upper right and lower left quadrants of the circle to fill them.



Add the Dimensions

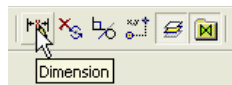
20. Select Tools – Layers to display the Layers ribbon bar.



21. Type in Dimensions to create a layer for the dimensions.



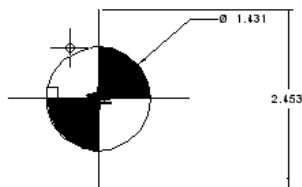
22. Display the Dimension toolbar by clicking the Dimension button on the Main toolbar.



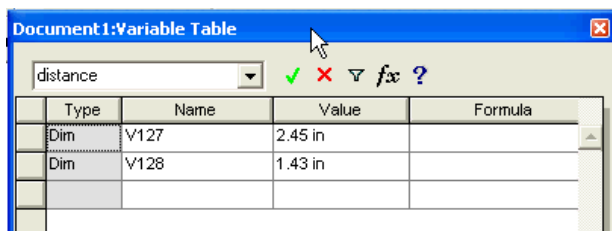
23. Select the SmartDimension command.



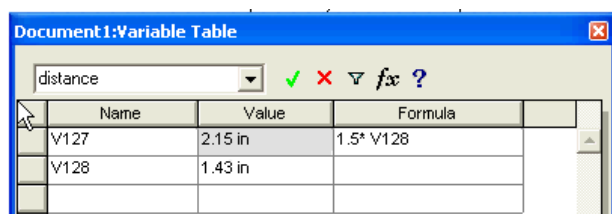
24. Dimension the diameter of the circle and the horizontal line. Both dimensions should be black (driving dimensions).



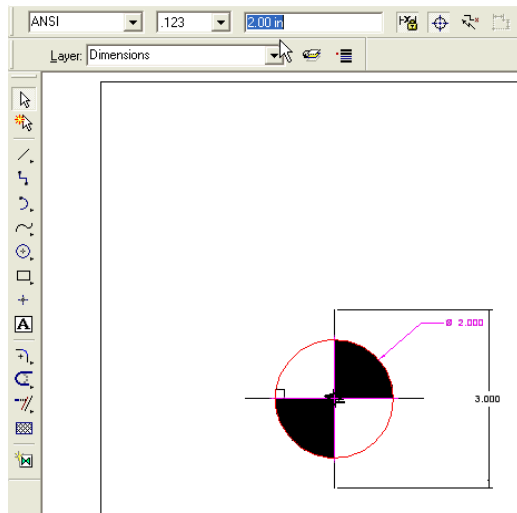
25. Select Tools – Variables to display the Variable Table. There should be two entries, one for the diameter of the circle and one for the length of the lines.



26. In the Formula field for the dimension for the length of the lines, enter '1.5*V128' (note – Replace V128 with the actual name of the circle dimension displayed in your Variable Table) and close the dialog. The two lines should resize with respect to the circle.

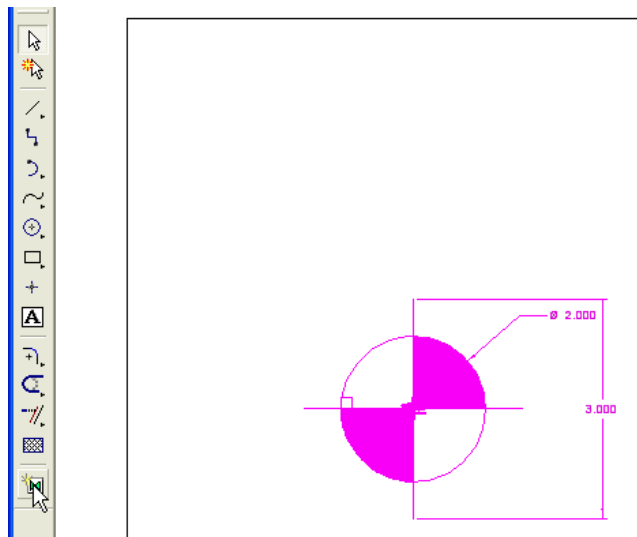


27. Select the dimension for the circle diameter and change its value in the dimension ribbonbar to verify that the formula is being correctly applied.

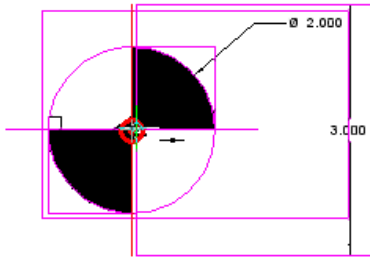


Create the Symbol

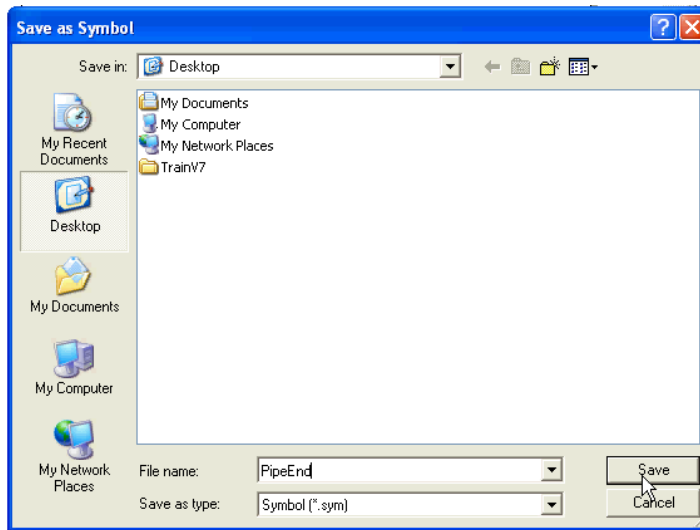
28. Select all of the objects using Edit – Select All or by using the Select Tool.
29. Click the Create Symbol command on the Draw toolbar.



30. Click at the center point of the circle (the intersection of the two lines) to set the symbol origin.

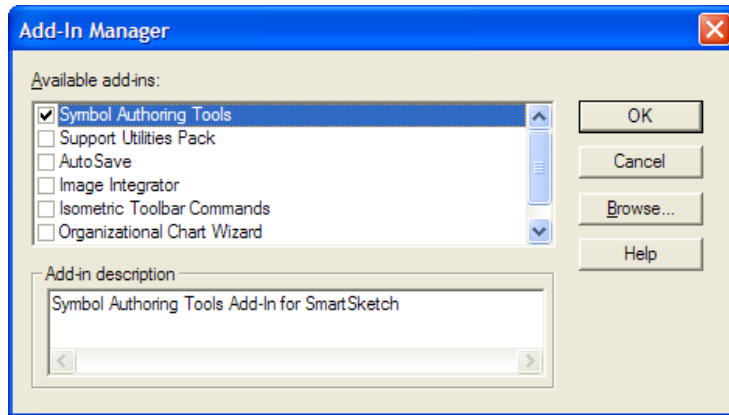


31. Enter a name and select the location in the File – SaveAs dialog.

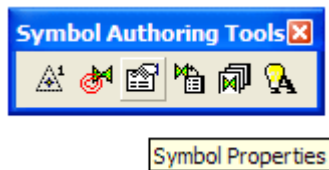


Set the symbol parameters and behaviors

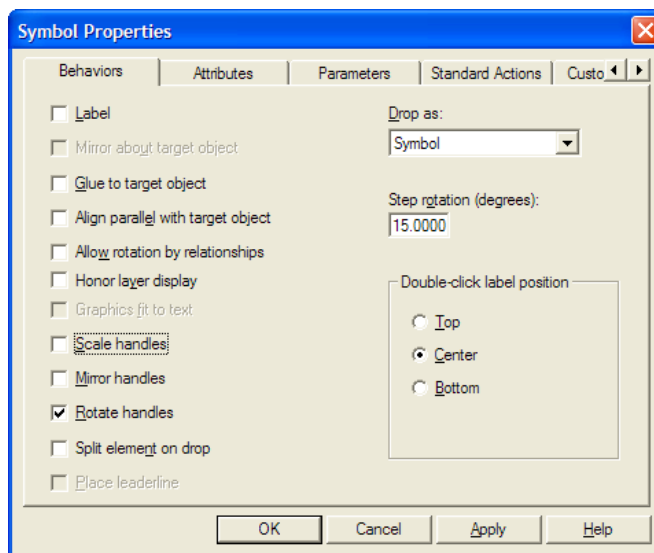
- 32. Open the symbol by selecting File – Open and browse to the symbol file you just created.
- 33. Select Tools – Add-Ins to display the Add-In Manager dialog and turn on the Symbol Authoring Tools add-in.



34. On the Symbol Authoring toolbar, select Symbol Properties.

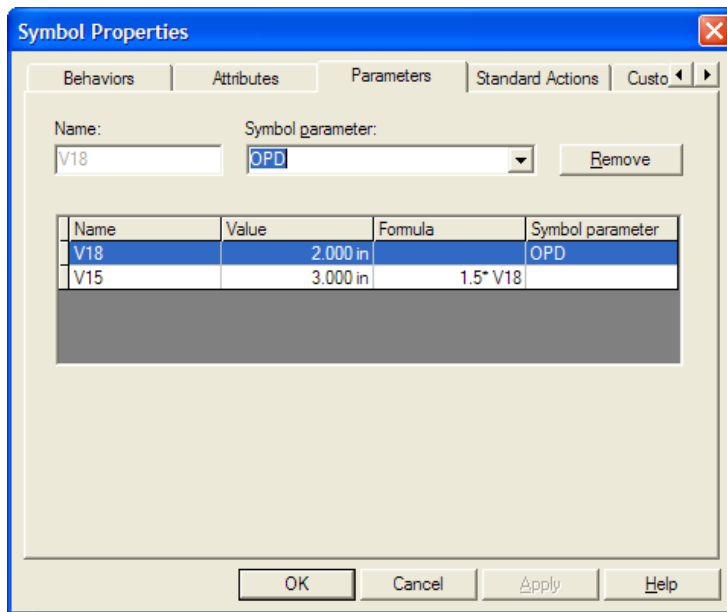


35. On the General tab, turn off Scale handles and Mirror handles.



36. Click on the Parameters tab.

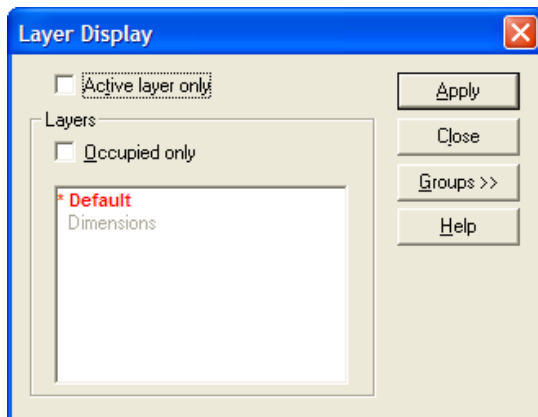
37. Make sure that the dimension for the Circle is selected and in the parameter name field enter OPD. Click Apply and OK.



38. On the Layers ribbon bar (if not displayed, use tools – Layers to display it), select the Default layer in the combo box; then click the Display layers button.



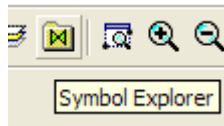
39. Turn off the display of the dimensions layer and click OK.



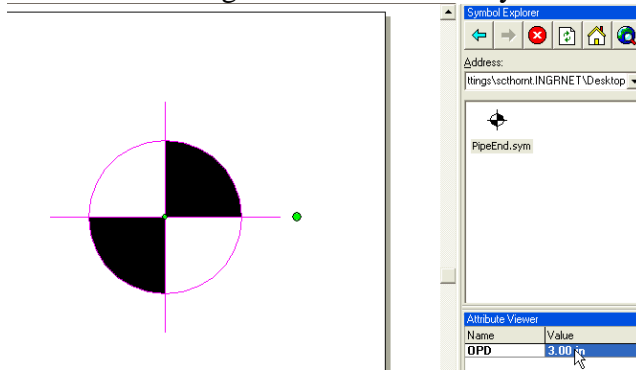
40. Save and Close the symbol file.

Place and Test the symbol

41. Display the Symbol Explorer by clicking on the Symbol Explorer button on the Main toolbar.



42. Use the Symbol Explorer to locate and drag in your symbol.
43. In the Attribute Viewer, set the value of OPD to 3 in and verify that the symbol resizes. Change the value and verify that the symbol resizes again.



Lab 2 New Composed Drawing and Drawing Properties

Objective

- Create a new composed drawing
- Set drawing properties

Create New Drawing

1. Define a workspace using the filter Plant Filters - Training Filters – U01
2. Switch to Space Management task using Tasks → Space Management
3. Open the Drawing Console using Tools → Drawing Console...
4. Right mouse click on 'Composed Drawings' and select New Drawing



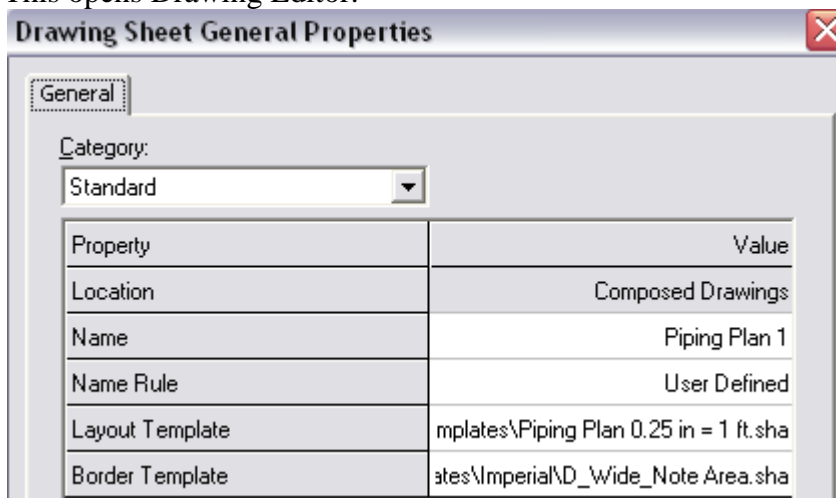
5. In the Drawing Sheet General Properties dialog, fill in values as below (by key-in or selection) and click OK.

Name: Piping Plan 1

Layout Template: Piping Plan 0.25 in = 1 ft.sha

Border Template: Imperial\D_Wide_Note_Area.sha

This opens Drawing Editor.



6. Close the drawing editor and save when prompted.

Drawing Properties

7. Reopen the Drawing Console, right mouse click on the Piping Plan 1 drawing and select Properties. The properties window for the specific drawing opens.
8. In the 'Signature Area' tab, select the 'Designed By' field and enter your initials, e.g. SND, then click in any other field. Notice that Behavior changes to 'Override'

The screenshot shows the 'Properties' dialog box with the 'Signature Area' tab selected. The dialog has several tabs: General, Title Area, Signature Area, Style, Custom, Notes, WBS, and Configuration. The 'Signature Area' tab contains a table with the following data:

Name	Value	Behavior
Approval Date		Inherit
Approved By		Inherit
Checked By		Inherit
Checked Date		Inherit
Designed By	SND	Override

9. Click OK to close the properties dialog.

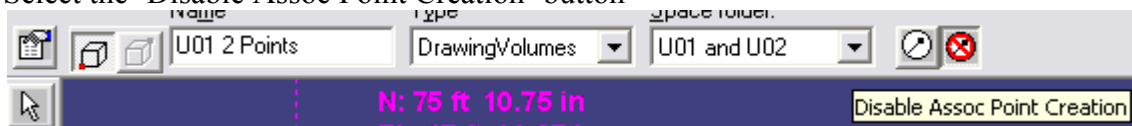
Lab 3 Volume by Two Points, Associate and Update View

Objective

- Place volume by two points using 3D pin point
- Associate view to volume and filter
- Update view

Place Volume by Two Points

1. Start Pin Point toolbar
2. Start the 'Place Volume by Two Points' command in the vertical toolbar.
3. In the ribbon bar, enter 'U01 2 Points' in the Name field
4. Browse the Type field and select Definitions – Drawing Volumes – DrawingVolumes – DWGVOLUME1 and click OK
5. Browse the Space Folder field and select the 'U01 and U02' folder
6. Select the 'Disable Assoc Point Creation' button

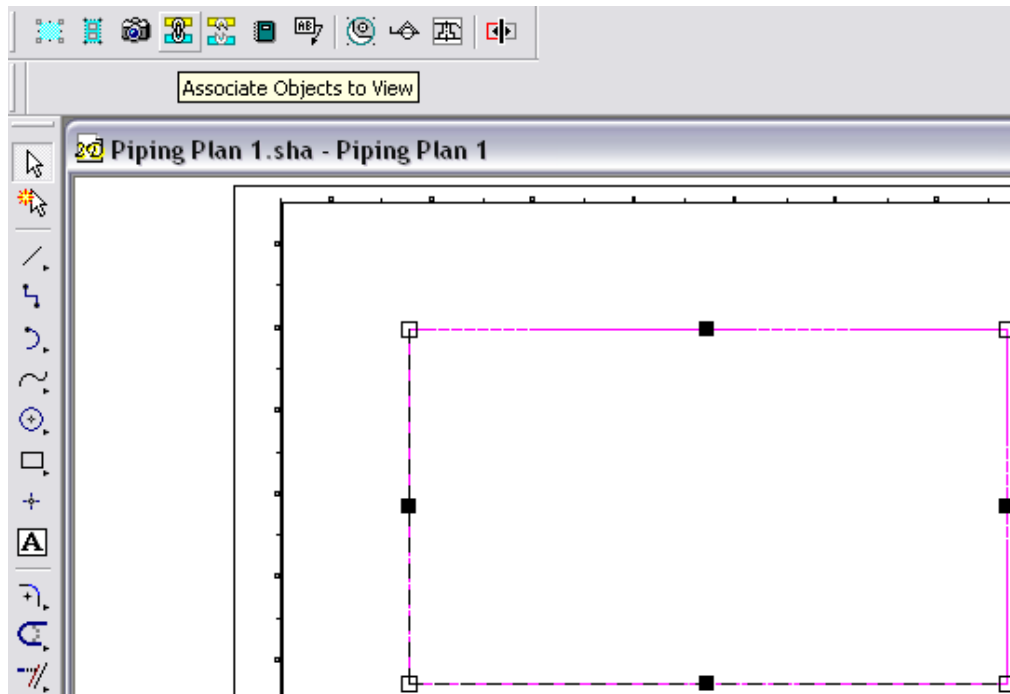


7. In the pin point toolbar, enter E = 72', N = 2', EL = -2' and click in the graphic view
8. In the pin point toolbar, enter E = 112', N = 58', EL = 34' and click in the graphic view

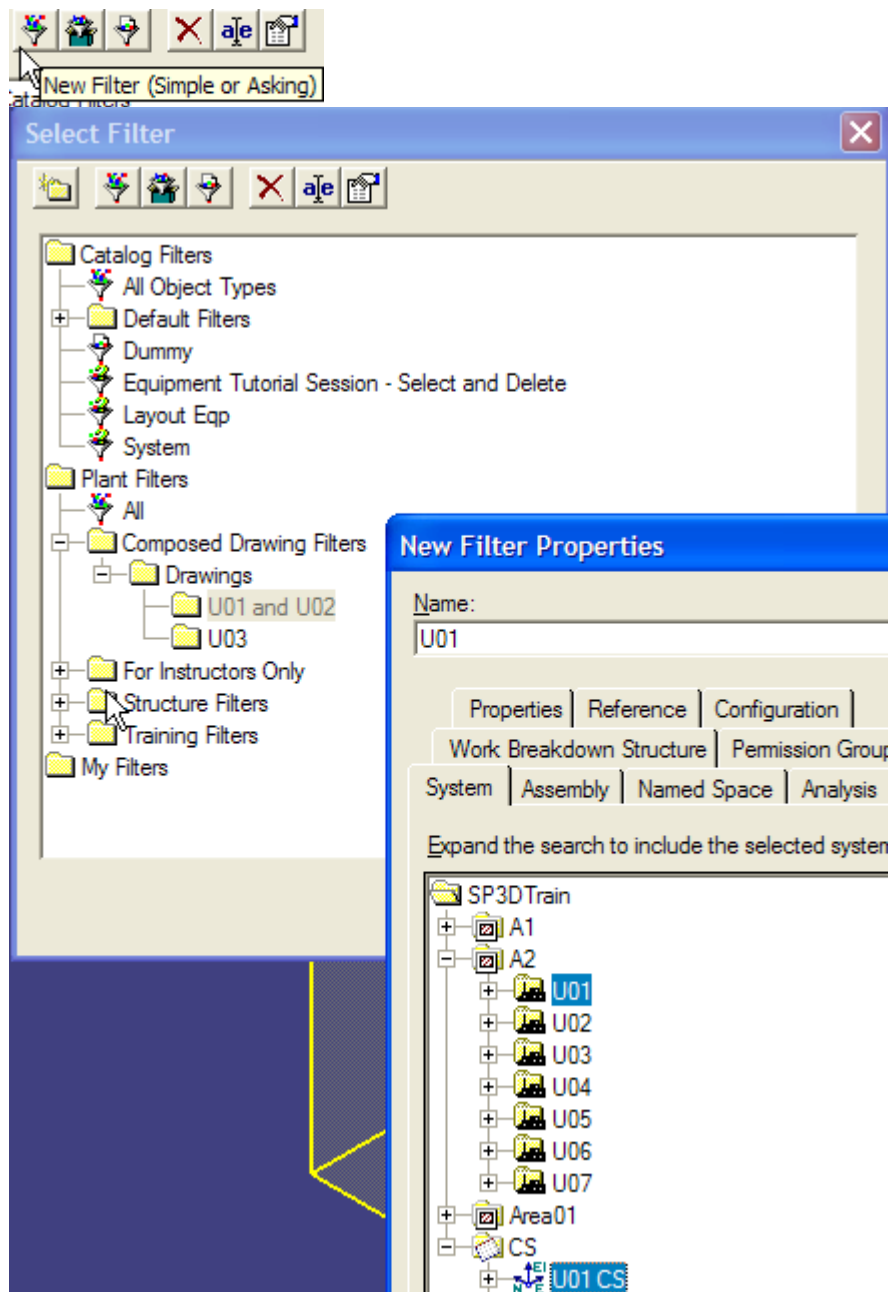
Associate View to Volume and Update View

9. Open the Drawing Console
10. Right mouse click on 'Piping Plan 1' and Edit. This opens Drawing Editor.

11. Select the view in the opened drawing and select the 'Associate Objects to View' button in the toolbar.

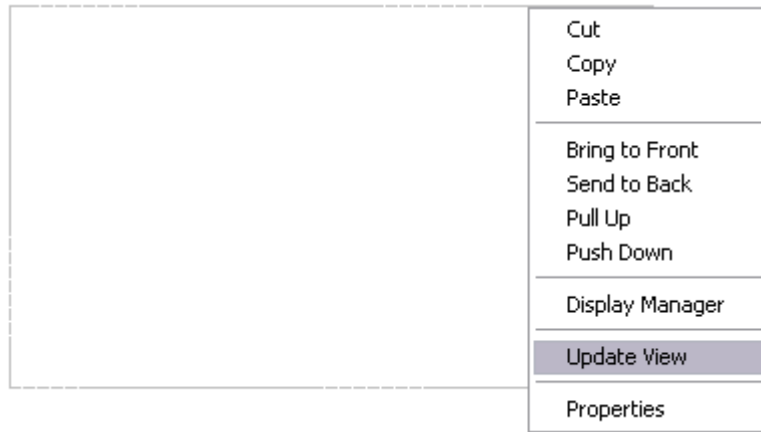


12. Switch to the 3D window and select the volume placed
13. In the Filter field, select More...
14. Browse to Plant Filters – Composed Drawing Filters – Drawings – U01 and U02 and click New Filter (Simple or Asking)



15. Name the filter 'U01' and select the systems 'U01' and 'U01 CS' as shown.
16. Click OK to define the filter.
17. Select the filter just defined and click OK to associate it with the view.

18. Switch back to the Drawing Editor window and right mouse click on the view and select 'Update View'



19. The status bar indicates that a view update is in progress
- Updating view 'Piping Plan'. This may take some time...
20. After update completes zoom into the drawing and observe the output. Then close the drawing, saying yes to save changes.

Lab 4 Place Composed View, Place Report View, Associate and Update Drawing

Objective

- Place drawing view using 2D pin point
- Place a non-graphical (report) view
- Associate report view to drawing view

Create New Drawing

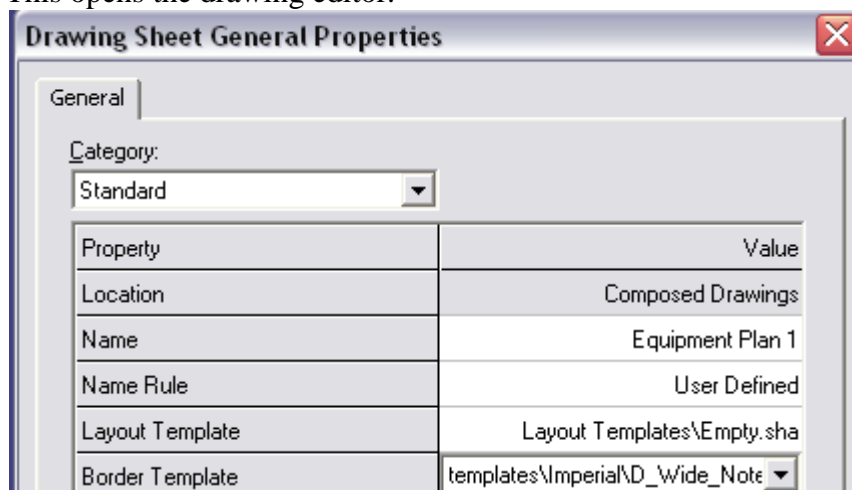
1. Open Drawing Console
2. Right mouse click on 'Composed Drawings' and select New Drawing
3. Enter values as shown and click OK to create a new drawing.

Name: Equipment Plan 1

Layout Template: Empty.sha

Border Template: Imperial\D_Wide_Note_Area.sha

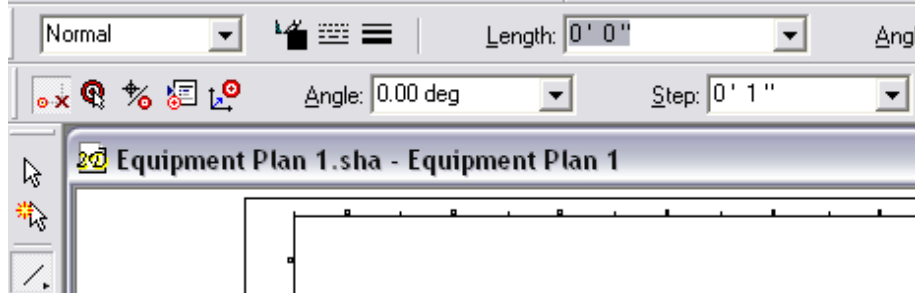
This opens the drawing editor.



Place Drawing View

4. In Drawing Editor, click PinPoint to start the 2D pinpoint, then click the 'Select' command to dismiss the target.

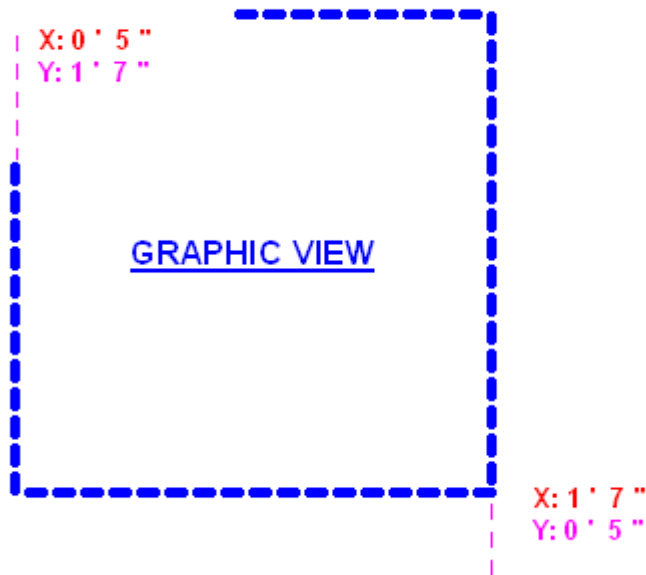
5. Start the place line command and click in the drawing sheet to activate pinpoint, then set step to 1", then run select command to terminate the place line command.



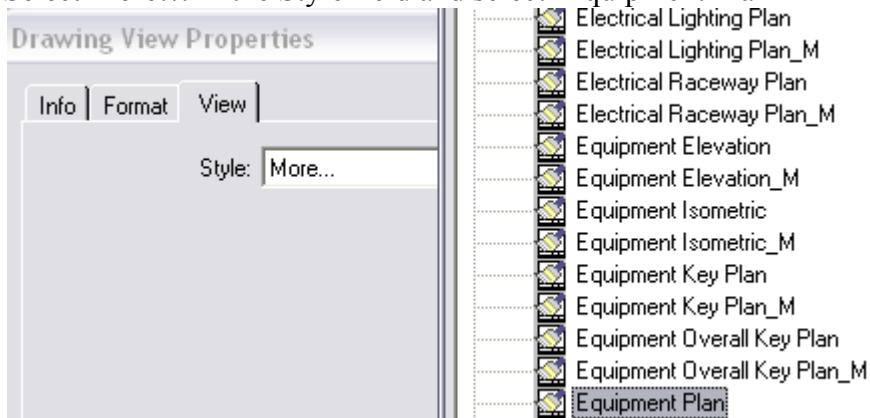
6. Click the 'Place view' button in the toolbar to start the placement of a view.



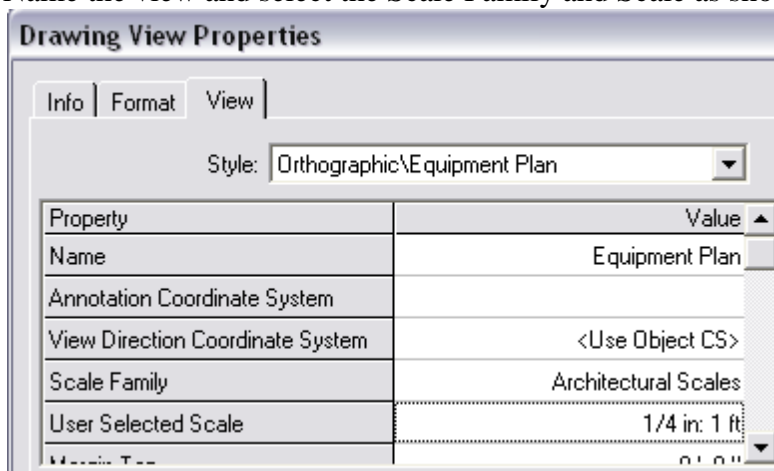
7. Click at X=0'5", Y=1'7" to start view placement, click at X=1'7", Y=0'5" to finish view placement. The drawing view properties dialog is shown



8. Select More... in the Style field and select 'Equipment Plan'

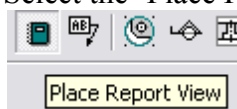


9. Name the view and select the Scale Family and Scale as shown and click OK.



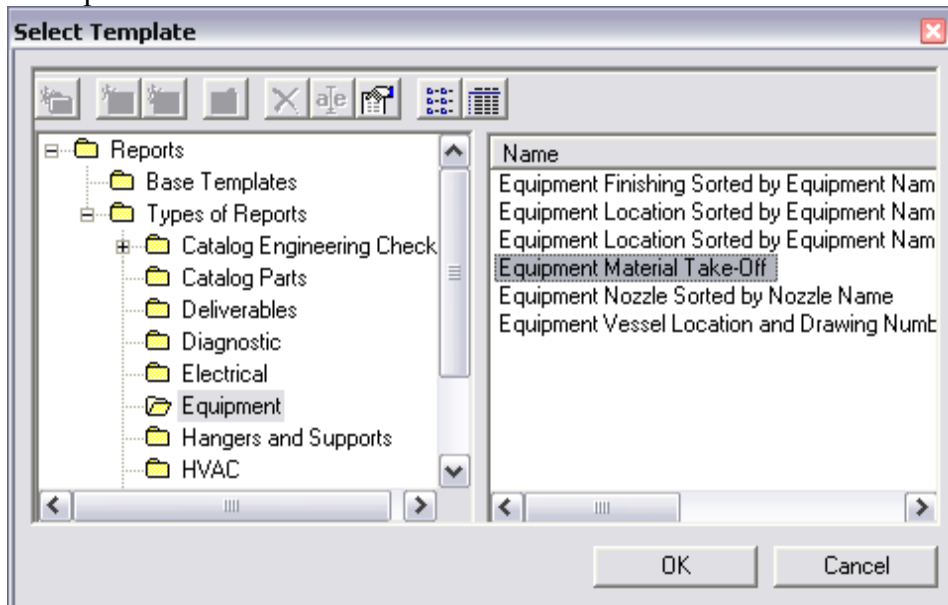
Place Report view

10. Select the 'Place Report View' button in the toolbar.

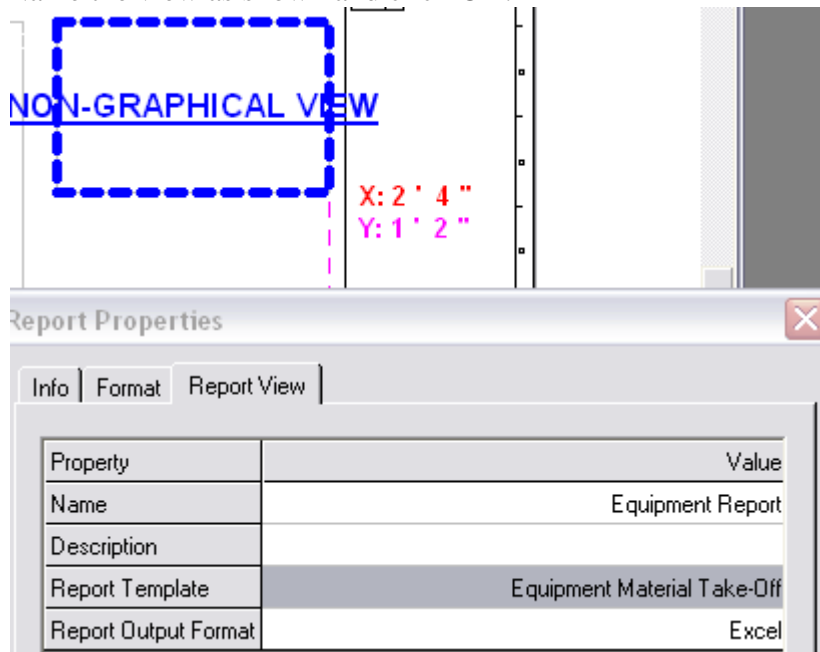


11. Place the report view from X = 1'8", Y=1'7" to X=2'4", Y = 1'2"

12. In the Report Template, field, select More.. and select the 'Equipment Material Take-off' report



13. Name the view as shown and click OK.

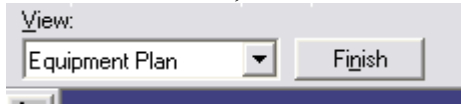


Associate Drawing View to Volume

14. Select the drawing view and click the 'Associate View to Objects' button.
15. Select the U01 2 Points volume in 3D
16. Select the U01 filter defined earlier (Plant Filters – Composed Drawing Filters – Drawings – U01 and U02 – U01)

Associate Report View to Drawing View

17. Select the report view and click the 'Associate View to Objects' button
18. In the 3D window, click 'Finish'



19. Close the drawing and save when prompted

Update the Drawing

20. Open Drawing Console
21. Right mouse click on 'Equipment Plan 1' and select 'Update Now'

Lab 5 Add Key Plan View

Objective

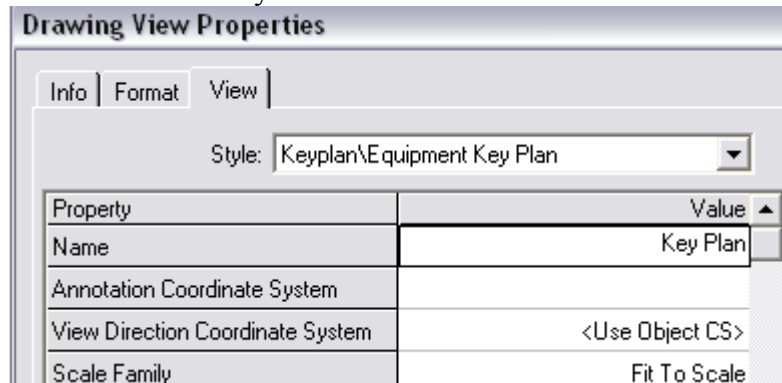
- Place drawing view and use a key-plan view style
 - Associate key plan view to orthographic view
1. Right mouse click on 'Equipment Plan 1' and 'Edit'
 2. Start the 'Place View' command from the toolbar.
 3. Place the view in the bottom right hand corner of the drawing using the four points as a guide. The drawing view properties dialog is shown.



4. Select the 'Equipment Key Plan' style

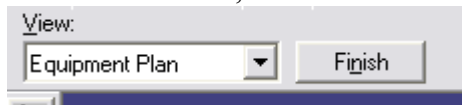


5. Name the view 'Key Plan' and select the scale as 'Fit to Scale'



6. Click OK
7. Select the key plan view and click the 'Associate View to Objects' button

8. In the 3D window, click 'Finish'



9. Right-mouse click on the key plan view and update view.
10. Close the drawing and save when prompted.

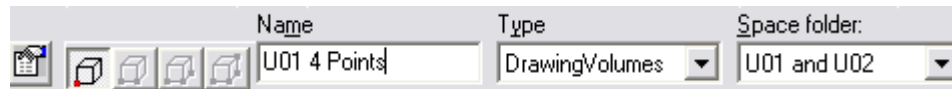
Lab 6 Place Volume by Four Points, Associate Existing View to New Volume, Update View

Objective

- Place 3D volume by 4 points for rotated views on drawings
- Dissociate view from inputs

Place Volume by Four Points

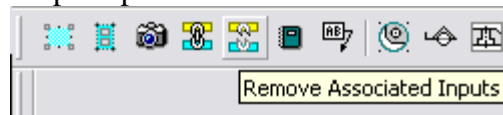
1. Activate Pinpoint
2. Start the 'Place Volume by Four Points' command
3. Enter the Name 'U01 4 Points' in the ribbon bar



4. Place the four points around the existing volume 'U01 2 Points' in the order
E 72' N 58' EL -2'
E 72' N 2' EL -2'
E 112' N 2' EL -2'
E 112' N 2' EL 34'

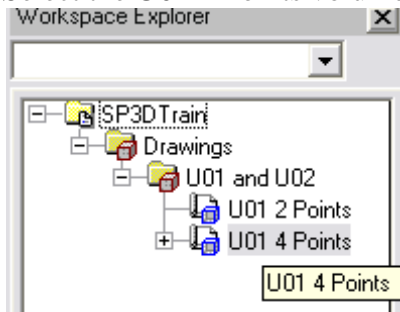
Associate Existing View to New Volume

5. Open Drawing Console
6. Right mouse click on 'Piping Plan 1' and 'Edit'
7. Select the graphic view and click the 'Remove Associated Inputs' button and accept the prompts



8. Select the graphic view and click the 'Associate Objects to View' button

9. Select the U01 4 Points volume in the workspace explorer



10. In the Filter field select the 'U01' filter
11. Right mouse click on the graphic view in drawing editor and update view.
12. Close the drawing and save when prompted.

Lab 7 Volume by Selection and Volume by Path

Objective

- Place drawing volume by selection (growing to include newly selected objects)
- Place a drawing volume along a single segment path (for non-rectangular volume)

Place Volume by Selection

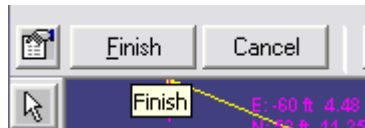
1. Define workspace using filter Plant Filters – Training Filters – U02
2. Start the 'Place Volume by Selection' command.
3. Name the volume 'Volume by Selection' and set the type and space folder as shown.



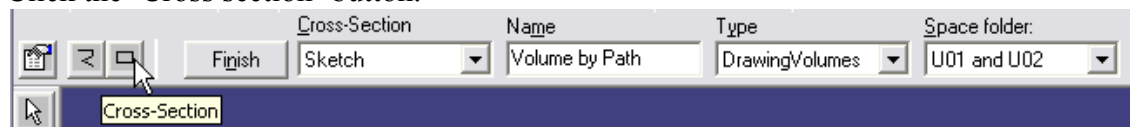
4. Select (graphically or through WSE) the following objects: VS-102, PU2-02, U02-6-P-0002-1C0031
5. Click Finish to complete volume placement.

Place Non-Rectangular Volume

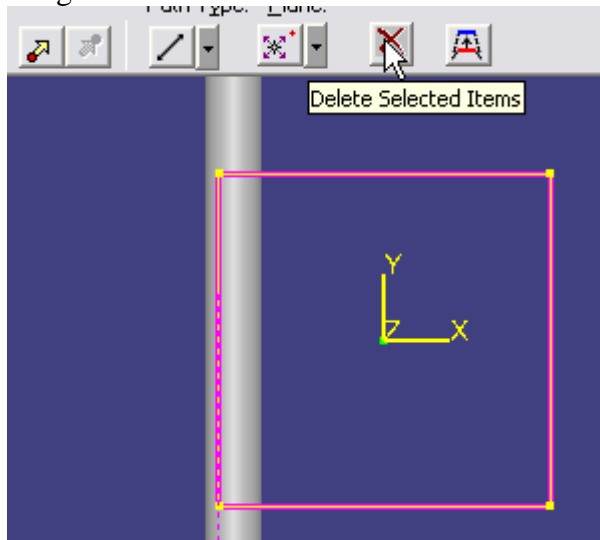
6. Activate pinpoint toolbar
7. Start the 'Place Volume Along Path' command from the vertical toolbar.
8. Enter values E=20', N=20', EL = 45' in pinpoint, click once in a graphic view
9. Enter values E=20', N=20', EL = 0' in pinpoint, click once in graphic view
10. Click 'Finish' in the ribbon bar.



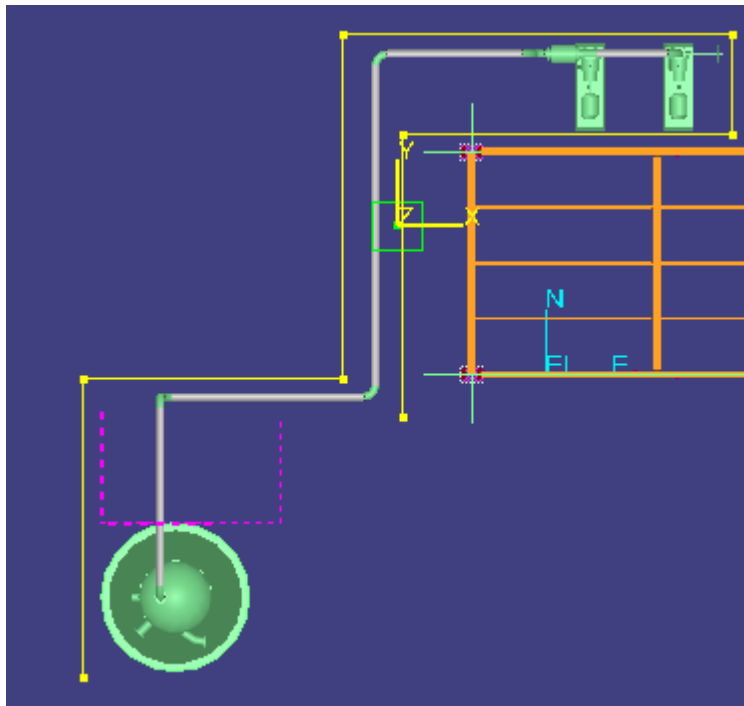
11. Name the volume 'Volume by Path' and set the type and space folder as shown.
12. In the Cross-section pick list, pick 'Sketch'
13. Click the 'Cross section' button.



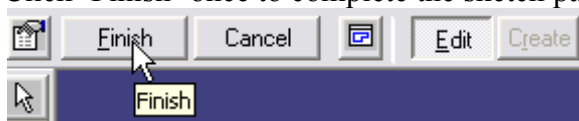
14. With the CTRL key pressed, select the four segments in the view and delete them using the delete button in the sketch ribbon.



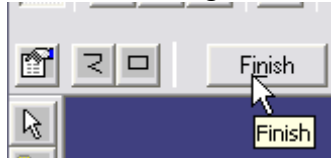
15. Sketch the desired cross section that follows the path of the pipeline and the connected equipment as shown, making sure to complete the path to be a closed curve.



16. Click 'Finish' once to complete the sketch path.



17. Click 'Finish' again to finish the volume placement.



Create New Drawing

18. Open Drawing Console
19. Right mouse click on 'Composed Drawings' and select New Drawing
20. Enter values as shown and click OK to create a new drawing. This opens the drawing editor.

 A screenshot of a dialog box titled 'Drawing Sheet General Properties'. It has a 'General' tab selected. Below the tab is a 'Category:' dropdown menu set to 'Standard'. Below that is a table with two columns: 'Property' and 'Value'.

Property	Value
Location	Composed Drawings
Name	Piping Plan 2
Name Rule	User Defined
Layout Template	emplates\Piping Plan Two Views.sha
Border Template	ates\Imperial\D_Wide_Note Area.sha

Associate Views to Volumes

21. In Drawing Editor, select the left view and associate it to the volume by selection
22. In the filter field select More...
23. Browse to Plant Filters – Composed Drawing Filters – Drawings – U01 and U02 and create a new filter named 'U02' that selects the 'U02' and 'U02 CS' systems.
24. Select the right view and associate it to the volume by path and the same filter (U02) above.
25. Update both views by right mouse click update view command.

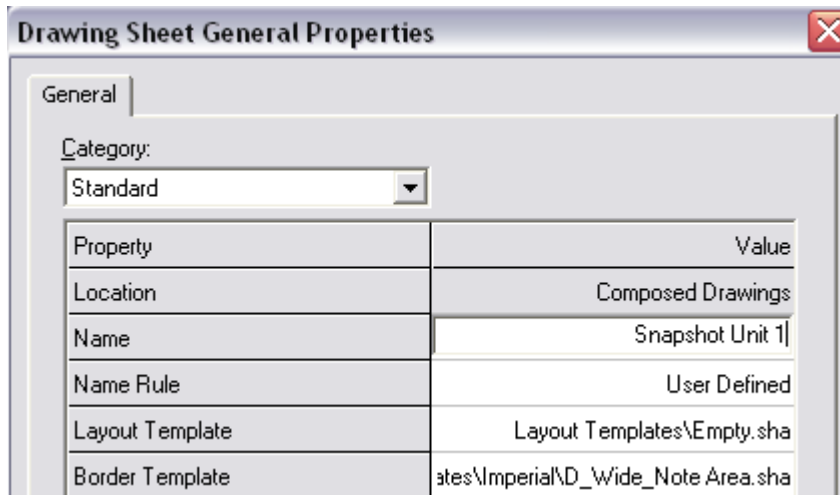
Lab 8 Create Snapshot View, Place Snapshot View with Preview, Update View

Objective

- Snapshot a view in 3D model and use the preview option

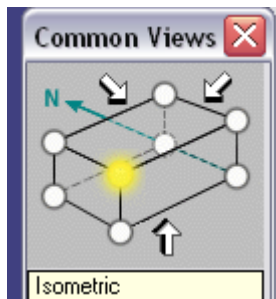
Create New Drawing

1. Open Drawing Console
2. Right mouse click on 'Composed Drawings' and select New Drawing
3. Enter values as shown and click OK to create a new drawing. This opens the drawing editor.



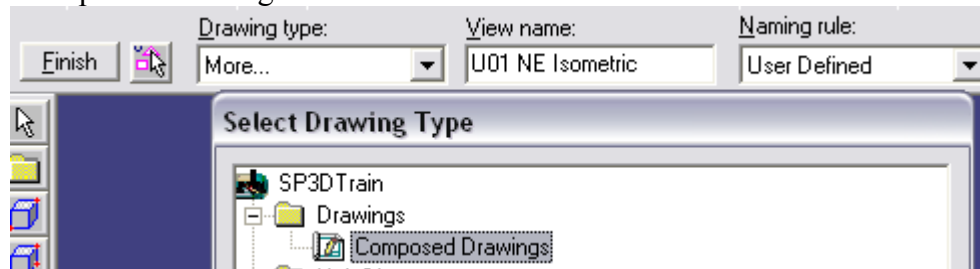
Create Snapshot View

4. Define workspace using the filter Plant Filters – Training Filters – U01
5. Set a NorthEast Isometric view direction using the 'Common Views' dialog

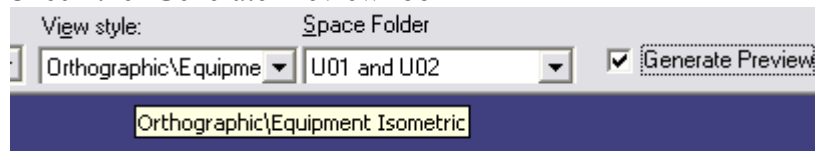


6. Tools → Snapshot View

7. Enter name 'U01 NE Isometric' in the ribbon bar and in the drawing type field, pick 'Composed Drawings'



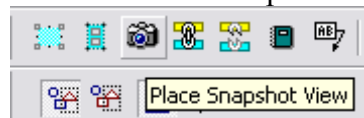
8. In the view style field pick 'Equipment Isometric'
9. In the space folder field, pick 'U01 and U02'
10. Check the 'Generate Preview' box



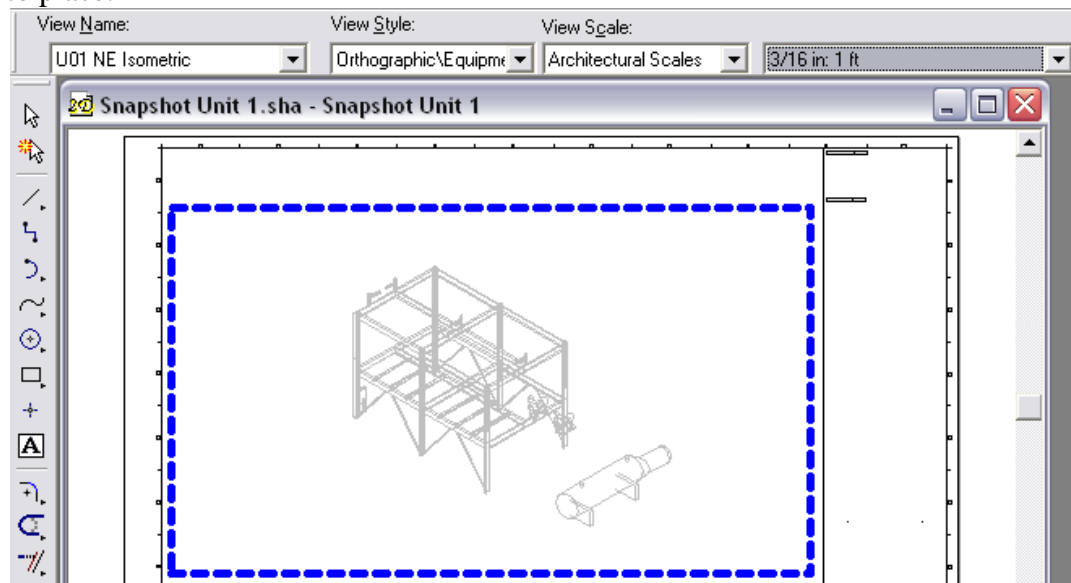
11. Click Finish to create the snapshot.

Place Snapshot View

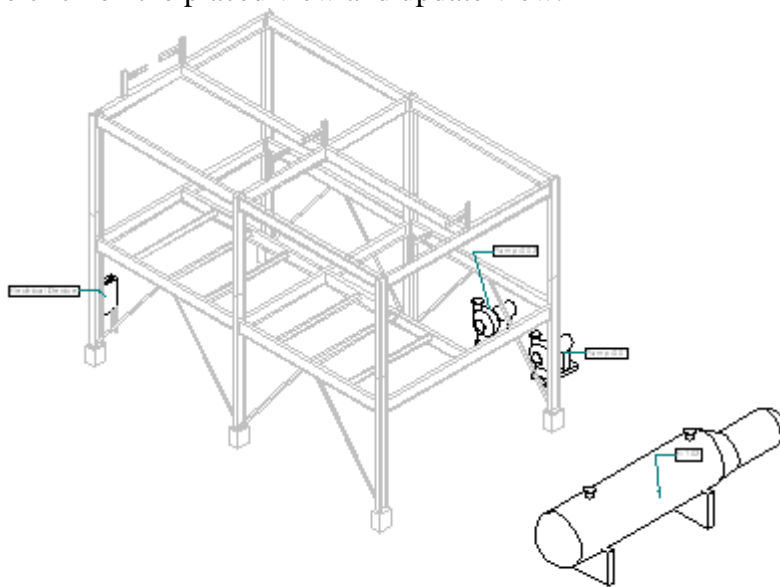
12. Switch to the Drawing Editor window
13. Click the 'Place Snapshot View' button



14. Select 'Architectural Scales' in the view scale picklist and select 3/16 in:1 ft as the scale. As you move mouse over the sheet, a graphic view with preview appears. Click to place.



15. Right mouse click on the placed view and update view.



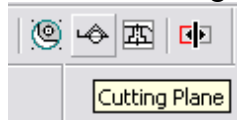
16. Close the drawing and save if prompted.

Lab 9 Place cutting plane and place section view

Objective

- Place a cutting plane on a 2D graphical view to create a section view

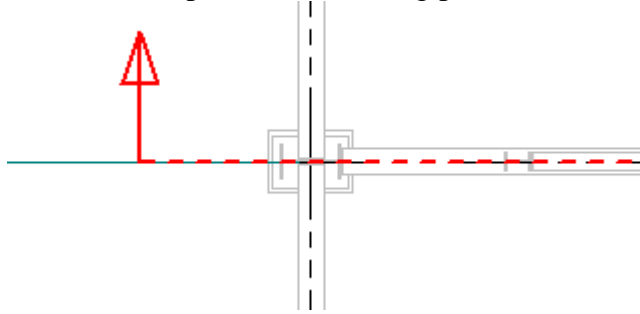
1. Open Drawing Console
2. Select 'Equipment Plan 1' and 'Edit '
3. Start the 'Cutting Plane' command



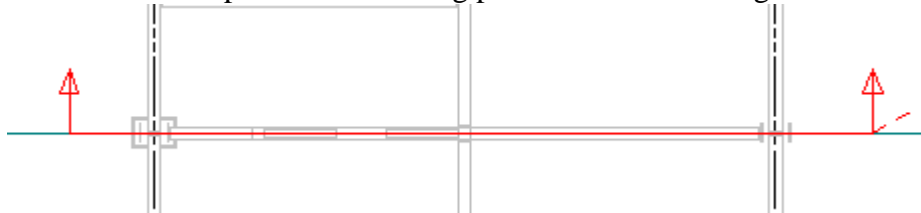
4. Enter value A for Reference 1 and 2



5. Select the graphic view which will contain the cutting plane
6. Place the first point of the cutting plane as shown along grid line 2



7. Place the second point of the cutting plane as shown and right-click once



8. In the ribbon, enter a depth of 25'
9. Move the mouse towards the bottom of the screen to set the cutting plane look direction, then click to finish cutting plane placement.
10. A view appears on your cursor. In the ribbon bar, check the 'Update' box, select the 'Equipment Elevation' view style and select a scale of 3/16 in:1 ft, then click to place the view in an empty area on the sheet.
11. The status bar shows that the section view is being updated.
Updating view 'Section A-A'. This may take some time...
12. After view updates, close the drawing and save when prompted.

13. Notice that in 3D, a new volume named 'Section A-A' has been created under the same parent folder as the parent volume.

Lab 10 Place detail envelope and place detail view

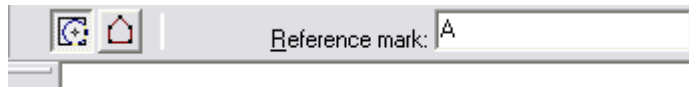
Objective

- Place a detail envelope on a 2D graphical view to create a detail view

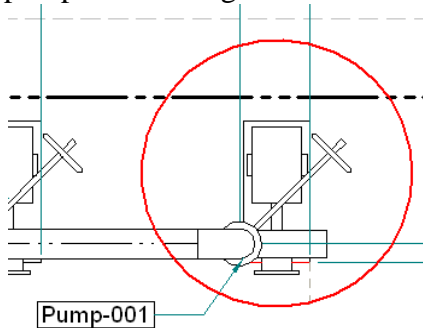
1. Open Drawing Console
2. Select 'Piping Plan 1' and 'Edit'
3. Start the 'Detail Envelope' command.



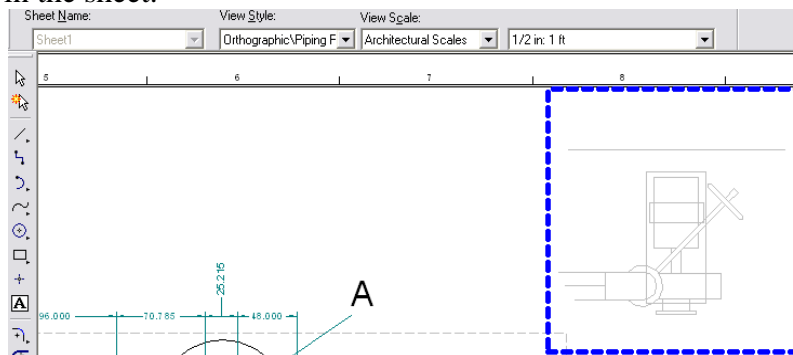
4. Select the graphic view which will contain the detail
5. Select the circular detail in the ribbon bar and enter a Reference Mark 'A'



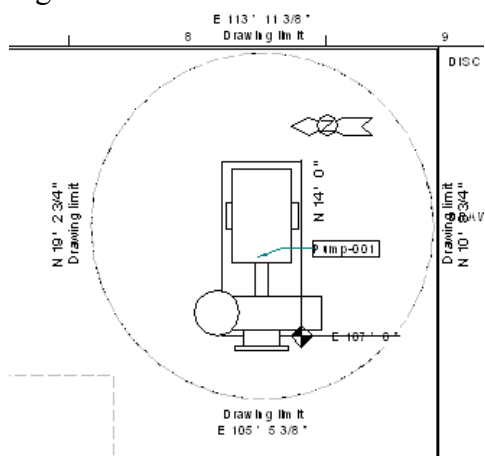
6. Draw a circle detail around Pump-001 by clicking somewhere near the center of the pump and moving mouse out till the circle is sized as shown



7. A view appears on your cursor. In the ribbon bar, change the view style to 'Equipment Plan' and the scale to 1/2 in: 1 ft and place the view as shown by clicking in the sheet.



8. Right mouse click the detail view and 'Update View'



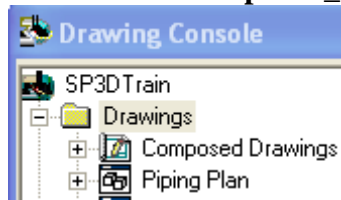
Lab 11 Creating Volume Drawings

Objective

- Add a volume drawing component and adjust the scale in the template
- Create drawing volumes using the drawing volume by two points command and 3D pinpoint.

Adding a Volume Drawing Component:

1. Define your workspace to display **U01 & U02**, the units where the drawing volume component needs to be added, by using a system filter.
2. Click the **Tools > Drawings Console** command to open the **Drawings Console**.
3. In the Drawing Console, right-click the Drawings folder and select New... to add the Piping Plan drawing component.
4. In the **Add Component** dialog box, click the **Piping** tab to view the components under it. Select **Imperial_Piping Plan**, and click **OK**.



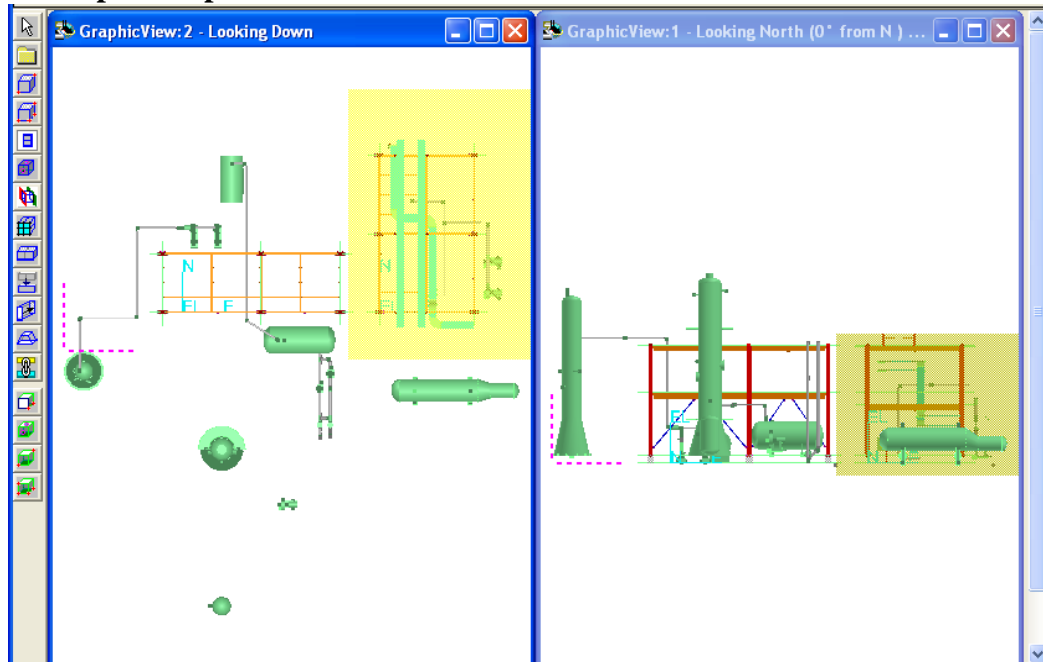
This adds the **Imperial_Piping Plan** component to the **Drawings** folder. The folder is displayed in the **Drawing Console** hierarchy.

Editing the Template

5. In the **Drawings and Reports** task, under the **Management Console**, right-click the **Piping Plan** component and select the **Edit Template** option.
6. The **2D Drawing Editor** window appears. The **2D Drawing Editor** window displays the template with the view drawn in it. The view in the template has a property set that causes the view to be hidden on the template. To locate the view on this template, move the mouse pointer around the perimeter of the rulers on the template until the view is visible. Right-click the view and click the **Properties** command.
7. In the **Drawing View Properties** dialog box, set the scale to **1/2" = 1'0"** and then click **OK**.
8. Save the changes and exit the **2D Drawing Editor** window.

Placing Drawing Volumes

9. Click the **Tasks > Space Management** command to switch to the **Space Management** task.
10. Open two graphic views and orient them **Looking Down** and **Looking North**.
11. Click the **Place Drawing Volume by View** button on the vertical toolbar.
12. On the **Place Drawing Volume by View** ribbon, the software automatically detects the **Piping Plan** component that you added in the previous section in the **Drawing Type** option. You need not change the setting as you want to associate the volume to **Piping Plan** drawing component. Click the **More...** option in the **Space Folder** drop-down list to select the folder where you need to save the drawing volumes.
13. In the **Select Space Folder** dialog box, click the **Database** option, browse to the folder **SP3D Train > Drawings > U01 and U02** and then click **OK**.
14. On the **Common** toolbar, click the **PinPoint** button to activate the **PinPoint** ribbon. Then, key in the coordinates: **E: 72', N: -2', El: -3'** on the **PinPoint** ribbon to select the first point for the drawing volume.
15. Click the graphic view and then type the elevation **El 33'** on the **PinPoint** ribbon to accept the placement of the volume.
16. Click the graphic view to place the volume.
17. Place the second volume by entering the coordinates **E: 72', N 32' 6", El -3'** on the **PinPoint** ribbon.
18. Click the graphic view and then key in the elevation **EL 33'** on the **PinPoint** ribbon to accept the placement of the volume.
19. Click the graphic view to place the second volume adjacent to the first volume.
20. The two drawing volumes are created as in the below picture and you can verify them under the hierarchy of the drawing folders by switching to the **Space** tab of the

Workspace Explorer.***Updating the Drawings***

Update the drawings that you created in the previous procedures.

21. Click the **Tasks > Drawings and Reports** command to switch to the **Drawings and Reports** task.
22. In the **Management Console**, expand the tree to **Drawings**, right-click the **Piping Plan** component, and click **Create Drawing(s)** to list the drawings in the **Detail View**.
23. Right-click the first drawing, and click **Update Now** to update the drawing. Without a Batch Server configured to update drawings, this process could take 10 seconds to 3 minutes on the client machine and displays the drawing in the **Detail View**.
24. Follow the same step as above to update the remaining drawings.

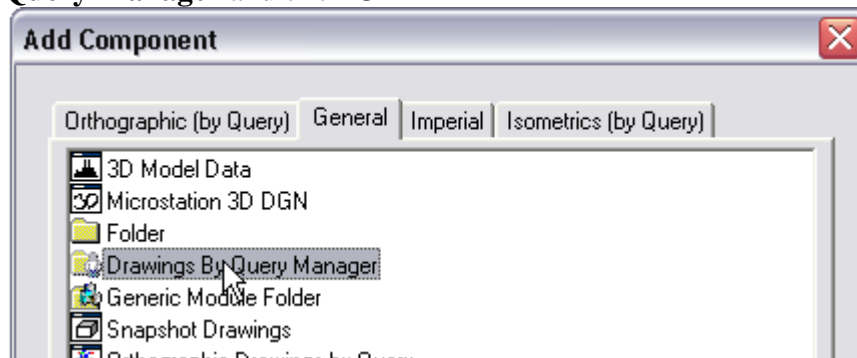
Lab 12 Drawings by Query

Objective

- Specify the “where” filter to create drawing volumes by query for hanger supports
- Edit the Coordinate System property of a drawing to create location plans

Create Drawings by Query

1. Right-click on Drawings and select **New...**
2. In the “Add Component” dialog, on the General tab, select **Drawings by Query Manager** and click **OK**

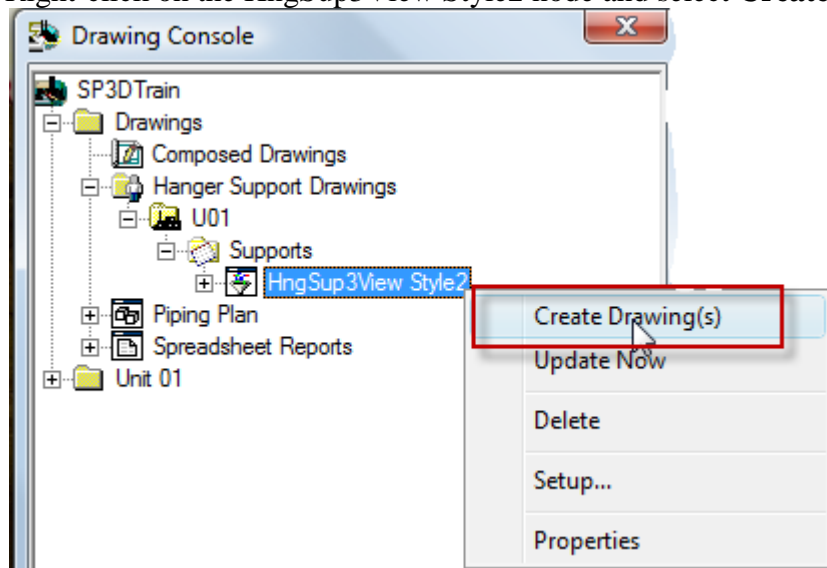


3. Right click on the Drawings By Query Manager component that was just added to the Management Console and select “Rename”. Rename this component to **Hanger Support Drawings**
4. Right click on **Hanger Support Drawings** and select Setup...
5. For the “Filter” property, drop down the select list and choose **More...** In the “Select Filter” dialog select the U01 filter from Plant Filters > Training Filters > U01.

6. For the “Package” property, drop down the select list and choose **More...** In the “Select Package” dialog, select **HngSup3View Style 2** and click OK.

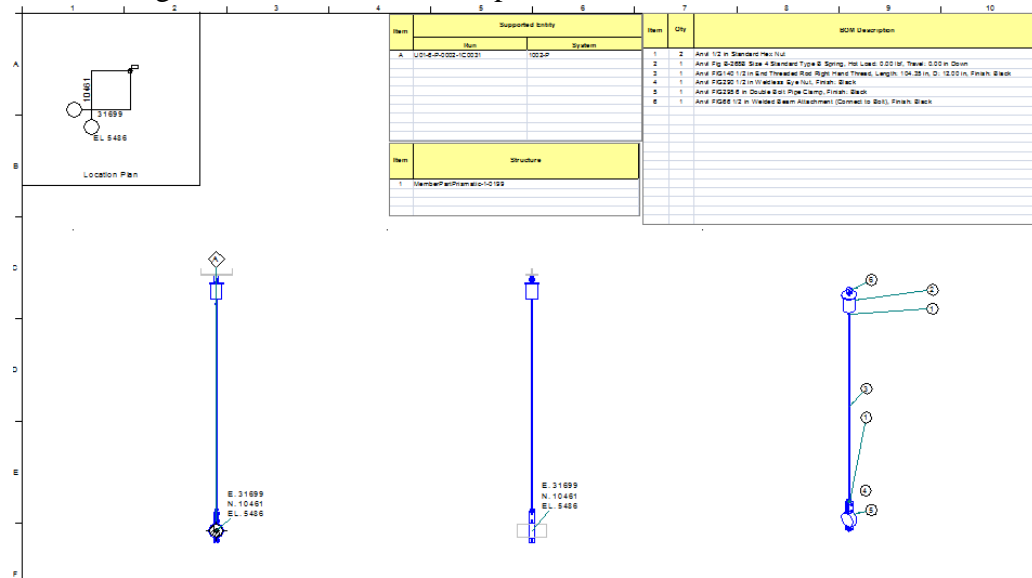


7. On the “Setup” dialog, click **OK** to save and exit the setup.
8. Right-click on the **Hanger Support Drawings** component and select **Run Query** Wait till the tree is automatically created.
9. Right-click on the HngSup3View Style2 node and select **Create Drawings**

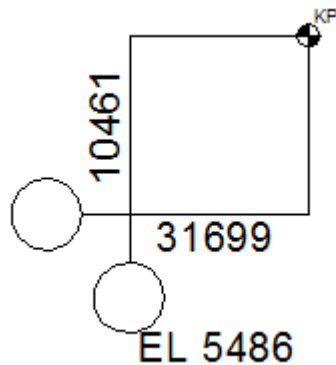


10. Right click on the drawing created in the Detailed View and select **Update Now**.

11. After the update completes, right click the drawing created and click **Edit**.
The drawing will resemble the below picture.



12. Zoom into the location plan on the top left corner of the drawing. Notice that the grid bubbles are empty and the distances shown are global distances.

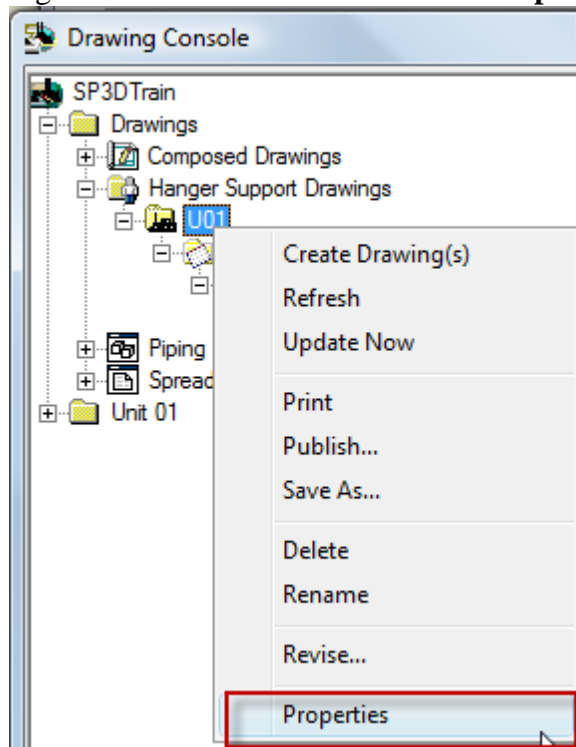


13. Close the drawing editor.

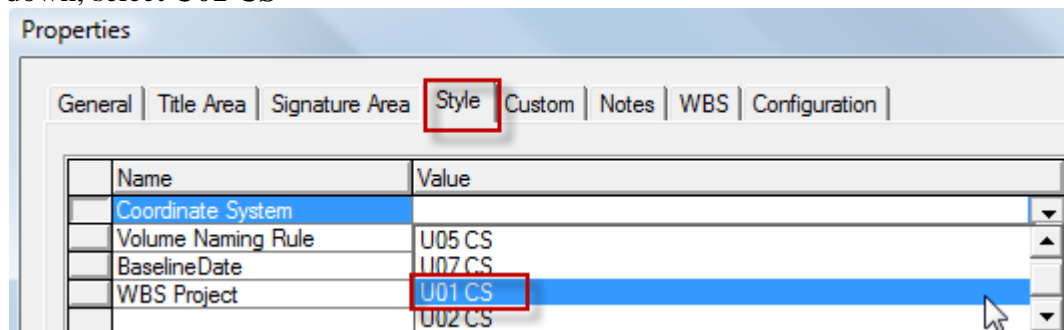
Edit Drawing Property

14. Select **Tools** → **Drawing Console** to reopen the drawing console.

15. Right mouse click on **U01** and select **Properties**.



16. Click the **Style** tab of the properties page and in the **Coordinate System** pull down, select **U01 CS**

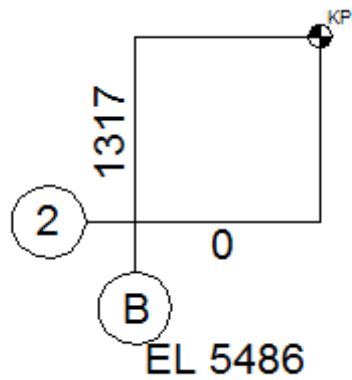


17. Click **OK** to save the properties.

18. Right mouse click on the drawing and click **Update Now**. This update will update the border properties only.

19. Right mouse click on the drawing one more time and click **Update Now**. This update will take longer and update the entire drawing.

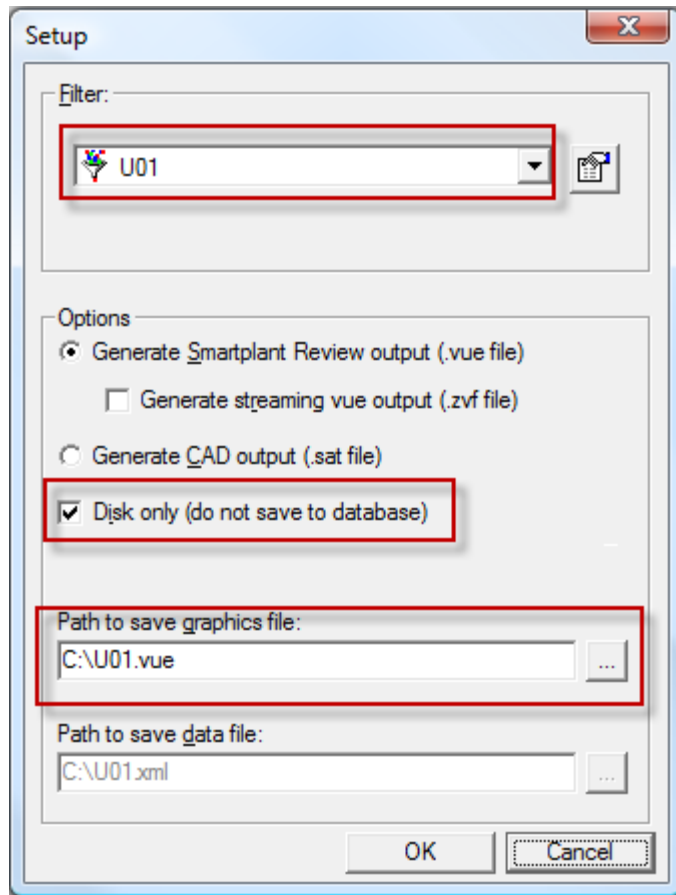
20. Edit the drawing and zoom into the location plan. Now the key plan shows the closest gridlines from U01 and the distances from them.



Lab 13 3D Model Data (SmartPlant Review) Workflow

Objective

- Create a vue file for viewing in SmartPlant Review
 1. Right-click on Drawings, select New... and add a New 3D Model Data component from the General tab
 2. Right-click on 3D Model Data and Setup...
 3. Pick the Plant Filters – Training Filters - U01 filter and check the ‘Disk only’ box. Designate a location on your disk (say C:\) to save the xml and vue files that. Name the files U01.xml and U01.vue.



4. Create Drawing, a drawing named '3D Model Data-1-0001' is created.
5. Right mouse click on this drawing and select "Update Now"

6. Double-click the U01.vue file to open and review it in SmartPlant Review.

Lab 14 Placing Labels

Objective

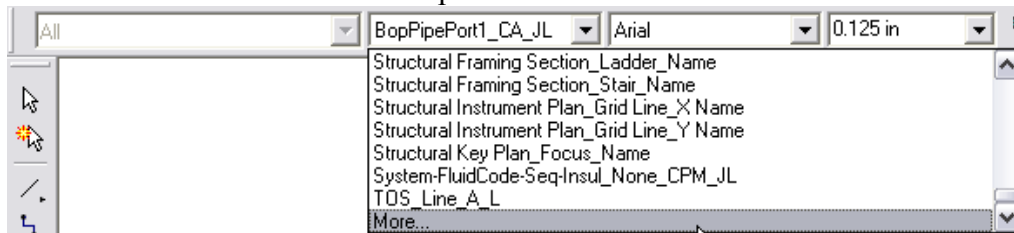
- Place view labels
- Place object labels using ribbon options and 'As Drawn'
- Place dimension style label
- Learn how modification of labels works
- Use custom command to highlight label status
- Use custom command to clear all manual edits to labels

Placing View Labels

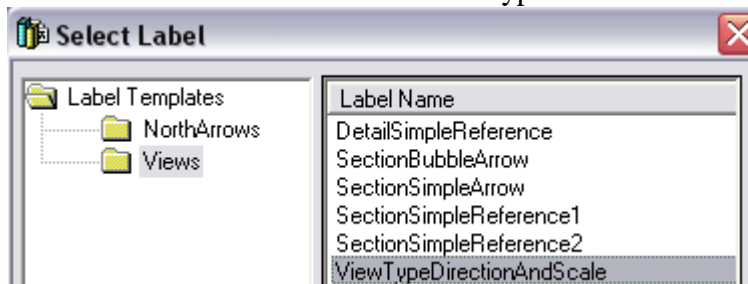
1. Open Drawing Console
2. Select the drawing 'Equipment Plan 1' and 'Edit'
3. Start the 'Place a label' command.



4. Select More... in the label names pick list.



5. Select the Views folder and the ViewTypeDirectionandScale label and click OK.



6. Select the graphic view (plan view) and click to place the label below the view.

Plan
SCALE: 1/4 in: 1 ft

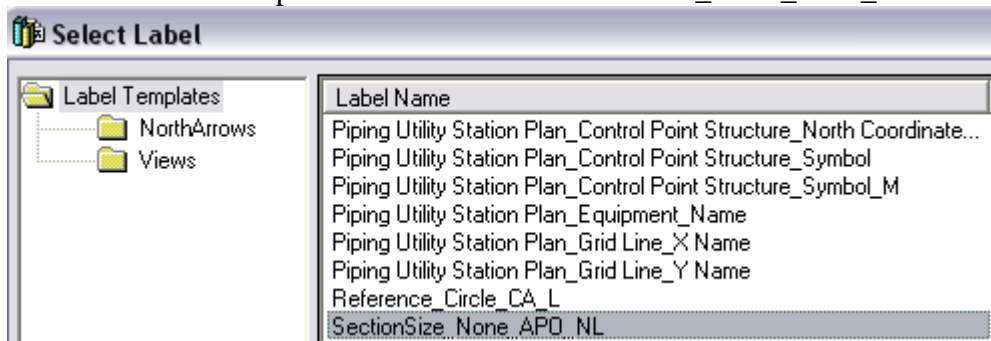
7. Select the section view and click to place the label below the view.

Section A - A
Looking South
SCALE: 3/16 in: 1 ft

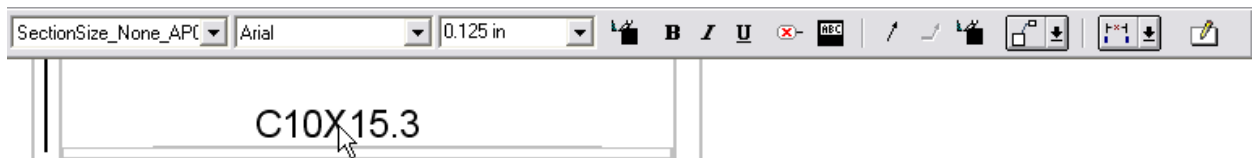
8. You may use the align command to align the label and the view to each other.

Placing Object Labels

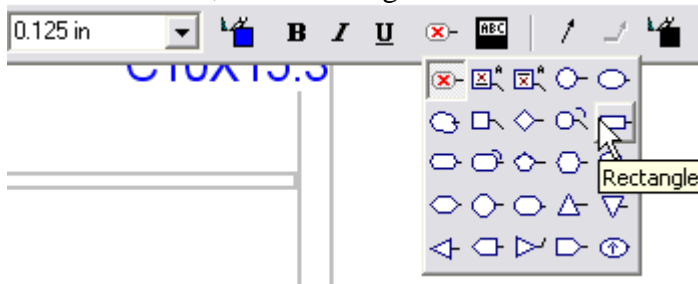
9. Select More... in the label names pick list
10. Select the Label Templates folder and the SectionSize_None_APO_NL label



11. Select a steel member in the view and the label with section size appears on your cursor.

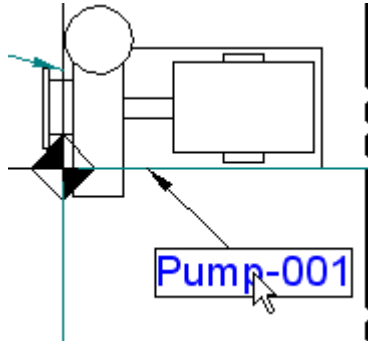


12. Click to place the label.
13. Select another member. The label placement ribbon allows you to change the graphic attributes or the label (color, font, size, border, orientation) or add a leader. Change the color to blue, add a rectangular border and add a single leader. Click to place.

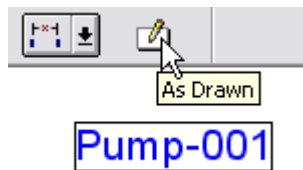


Use As-Drawn

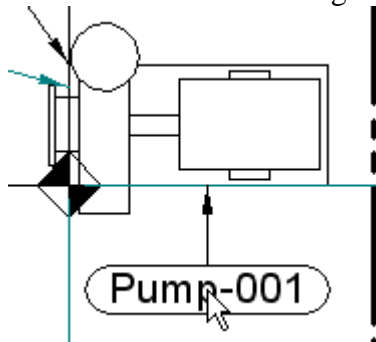
14. Select the Name_Capsule_CA_L label from the pick list and click on a pump. Note that the previously made changes to properties of the previous label are retained for the new label.



15. Click the 'As Drawn' button on the ribbon.



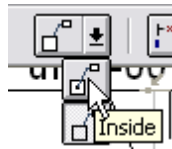
16. Notice that the label changes to the properties as defined in the label definition.



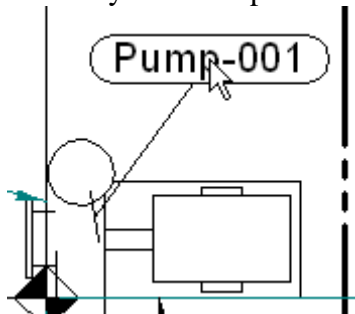
17. Click to place the label.

Use Leader Boundary Option

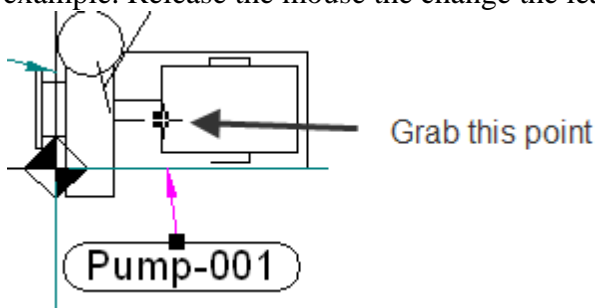
18. Select the pump again
19. Now click the 'Boundary' pulldown in the label ribbon and select the 'Inside' button.



20. Notice that the leader attachment point has jumped to the inside of the pump from the boundary. Click to place the label.

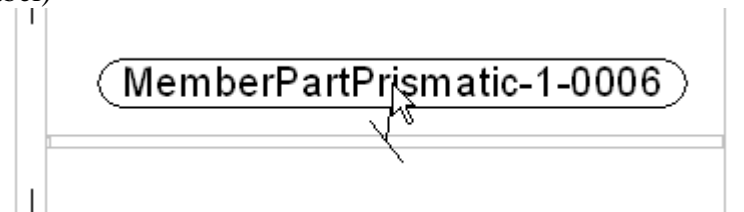


21. Select the attachment point (arrow) of a previously placed label and drag the point to elsewhere inside the pump. The attachment point changes to a line similar to above example. Release the mouse the change the leader arrow style.

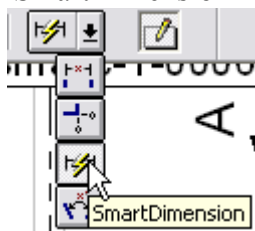


Dimension Style Label

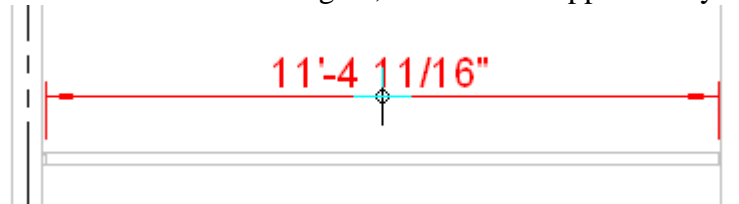
22. Start the 'Place a Label' command
23. Select a steel member, the name appears in a capsule with a leader (like the previous label)



24. Activate the 'dimension' pulldown in the label ribbon bar and select 'SmartDimension'



25. Pick the steel member once again, a dimension appears on your mouse.



26. Click to place. The dimension is placed and immediately replaced by the label contents.



27. Close the drawing and save when prompted

Modify 3D Model

28. Switch to the Equipment task

29. Select the Pump-002 and select Edit → Copy

30. Locate the Discharge nozzle of the pump and click to select that as the point to copy by.

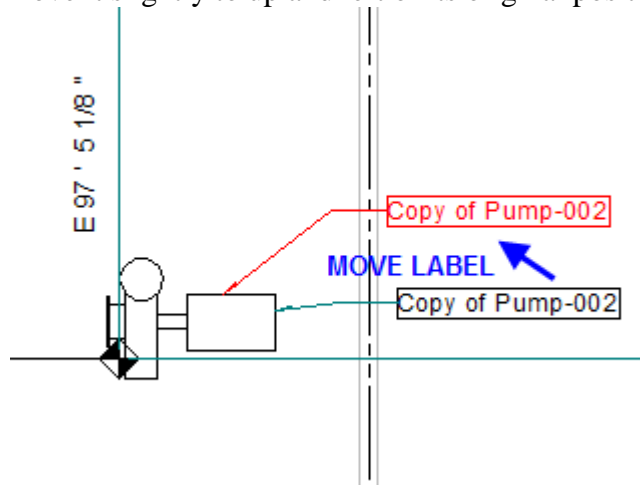
31. Select Edit → Paste

32. Uncheck all boxes on the paste form and click OK.

33. Enter coordinates in pinpoint E 98' N 38' E 0' and click in the graphic view.

34. Edit the Equipment Plan 1 drawing and update the view.

35. Notice that the new pump has a label placed to the right of it. Select the label and move it slightly to up and left of its original position.



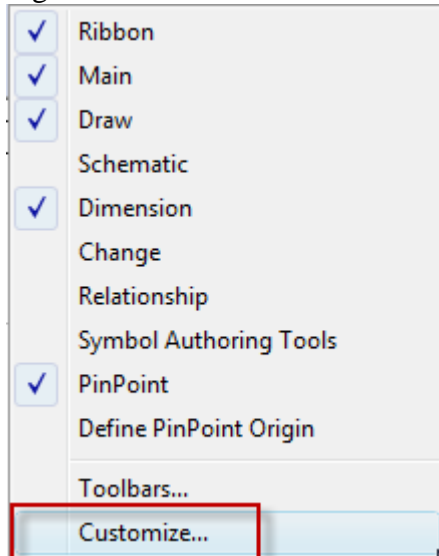
36. Close the drawing and save it.

37. Select the newly pasted pump and move it 5' south of its current location.

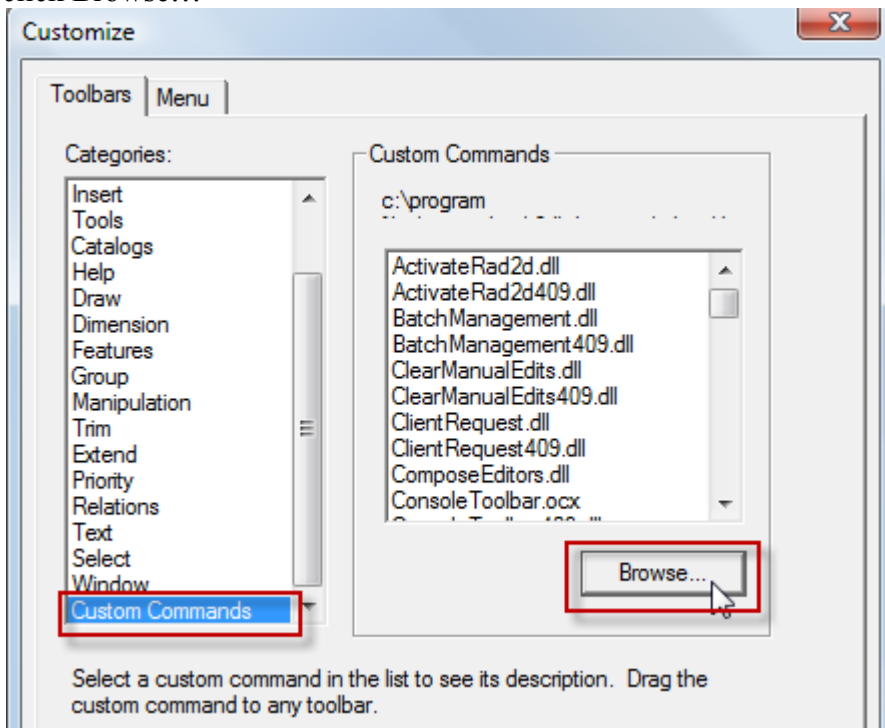
38. Edit the Equipment Plan 1 drawing and update the view. Notice that the equipment moves but modified label stays where you manually moved it and the leader extends to connect to the new position of the equipment.

Add custom commands to the drawing toolbar.

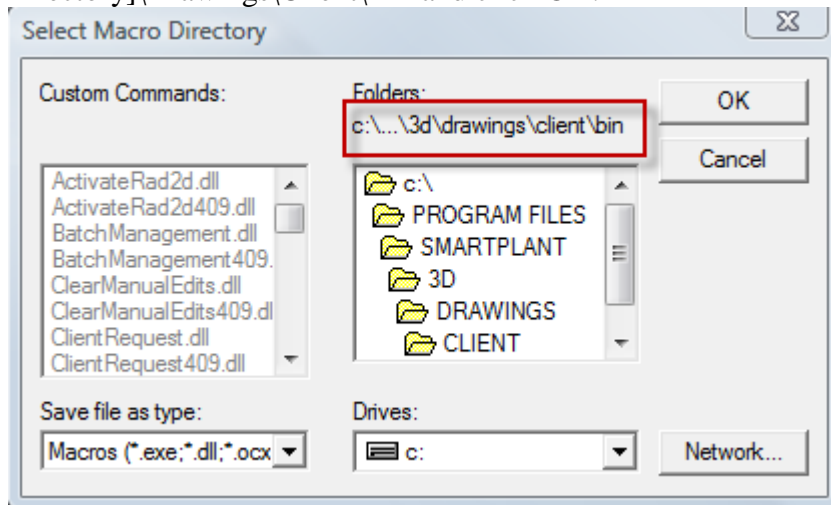
39. Right mouse click on the toolbar area and click 'Customize'



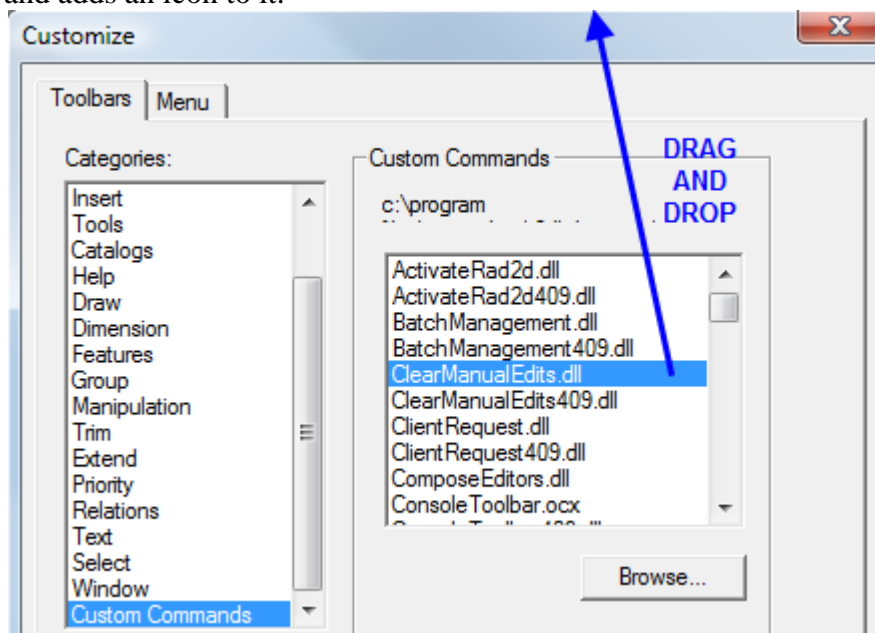
40. In the 'Customize' dialog, select Custom Commands in the Categories list and the click Browse...



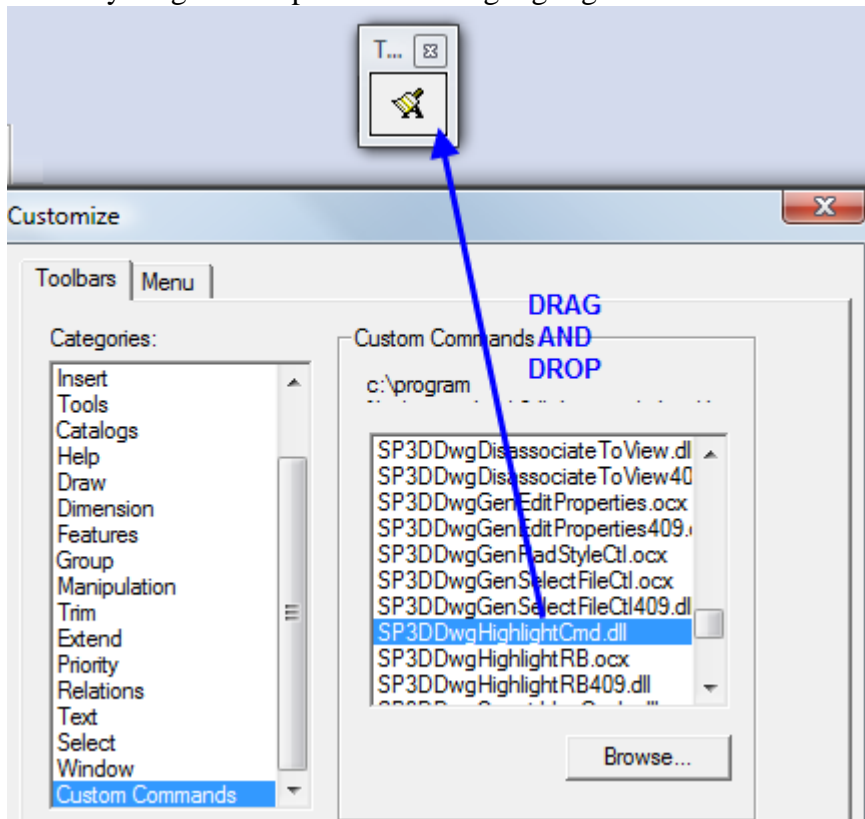
41. In the Select Macro Directory dialog, browse to [SP3D Installation Directory]\Drawings\Client\Bin and click OK.



42. Select ClearManualEdits.dll and drag it to the toolbar area. This creates a new toolbar and adds an icon to it.

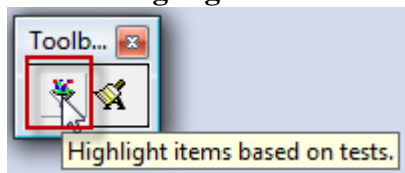


43. Similarly drag and drop the SP3DDwgHighlightCmd.dll into the toolbar.

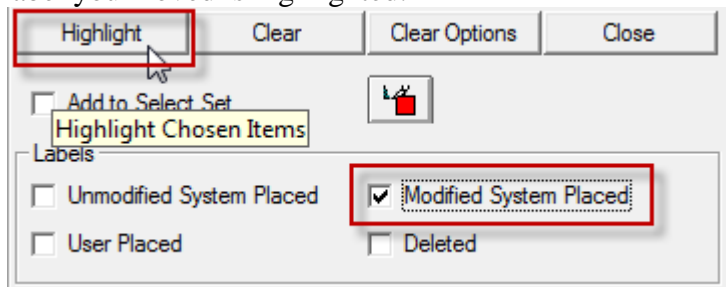


Highlight command

44. Start the **Highlight items based on tests** command



45. Check the 'Modified System Placed' checkbox and click the Highlight button. The label you moved is highlighted.



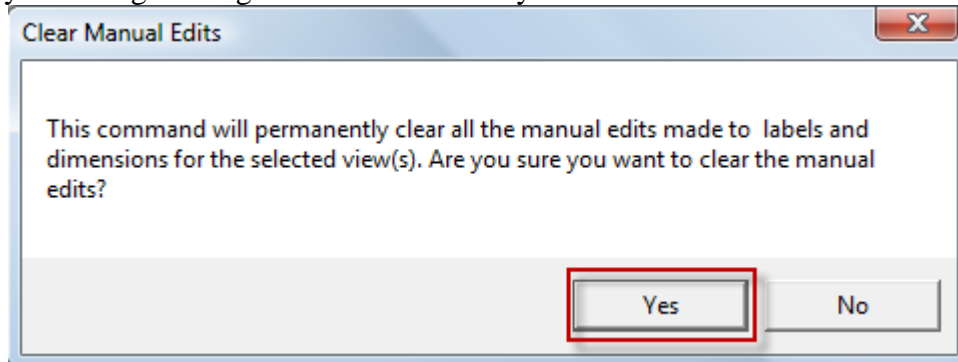
46. Click the Close button to dismiss the command.

Clear Manual Edits

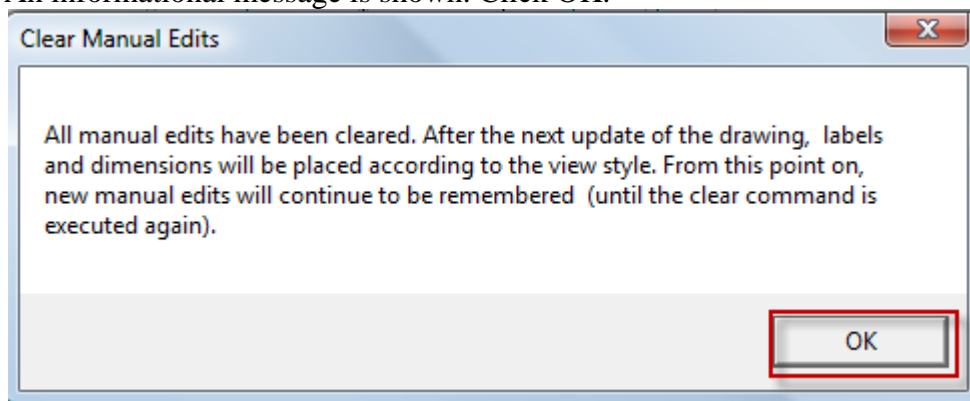
47. Select the view and click the Clear Manual Edits command.



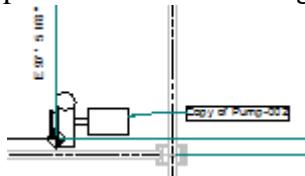
48. A message is shown indicating that all your changed will be lost. Click Yes to lose your changes and go back to the view style behavior.



49. An informational message is shown. Click OK.



50. Update the view. After the update completes, notice that all your manually placed labels and deleted and the label for the new pump has moved closer to the pump as per the label rule settings.



Lab 15 Placing Dimensions

Objective

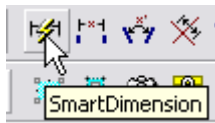
- Place smart dimensions
- Place 'distance between' dimensions

Placing 'Smart Dimensions'

1. Open Drawing Console
2. Select the drawing 'Equipment Plan 1' and 'Edit'
3. Zoom into the top of the section view.



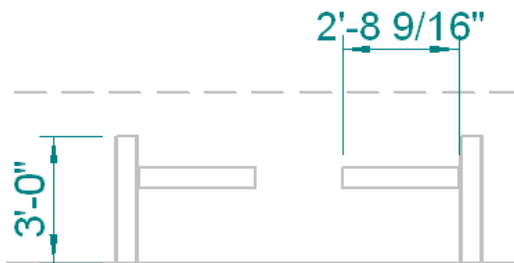
4. Start the 'SmartDimension' command from the 'Dimension' toolbar.



5. Select the left edge of the column at the left and click to place dimension.

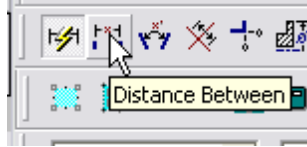


6. Select the top edge of the beam at the right and click to place dimension.

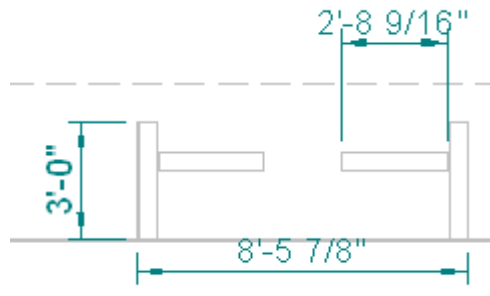


Placing 'Distance Between' Dimensions

7. Select the 'Distance Between' command on the dimension toolbar.



8. Place and out-to-out dimension between the two columns.



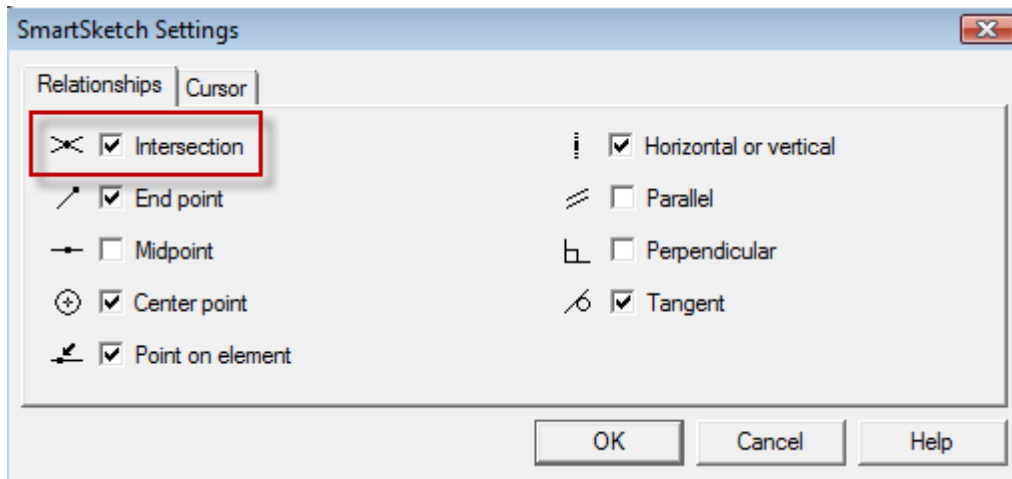
Lab 16 Scaled Sketching

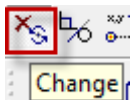
Objective

- Sketch and dimension at scale
- Move view with all associated annotations

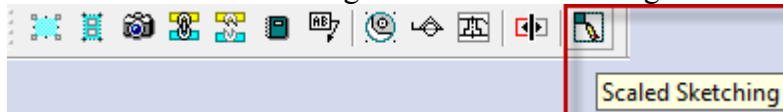
Drawing at scale

1. Open Drawing Console
2. Select the drawing 'Equipment Plan 1' and 'Edit'
3. Zoom into the portion with the two pumps
4. Select Tools → SmartSketch Settings and check the Intersection check box, then click OK.

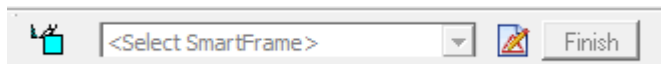


5. Click the 'Change' button  to turn on the 'Change' toolbar.

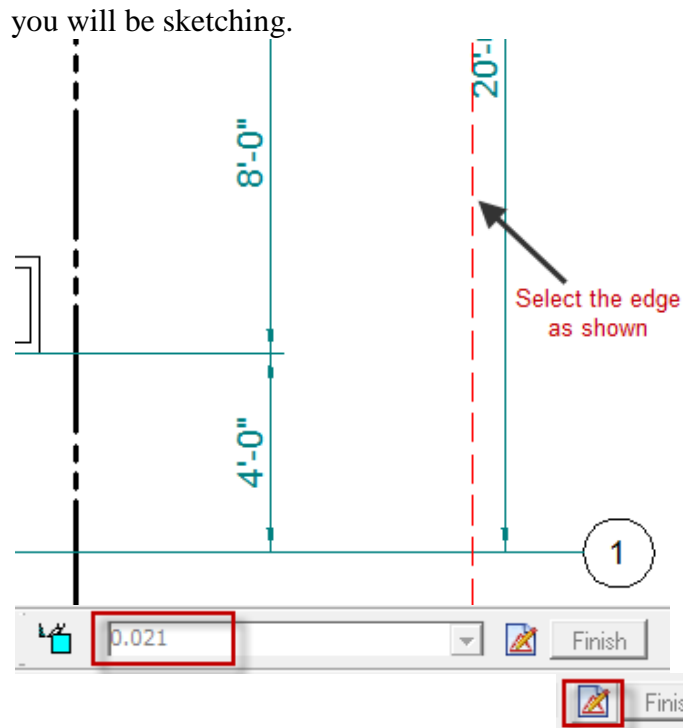
6. Click the 'Scaled Sketching' button on the drawing toolbar.




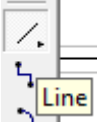
7. This opens the scaled sketching toolbar as shown.

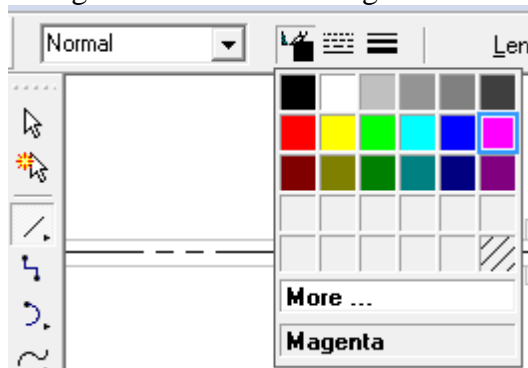


8. Select the edge of the smartframe as shown, this activates the smartframe and puts you in scaled sketching mode. The scaled sketch ribbon now shows the scale at which

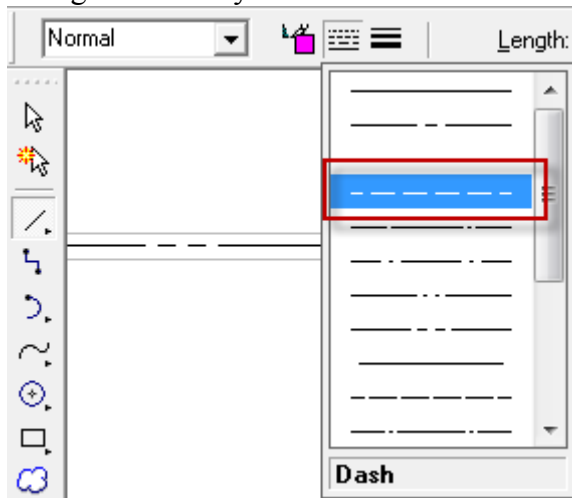


9. Click the 'Start Scaled Sketching' button. The icon changes to  to indicate the scaled sketching mode is active.

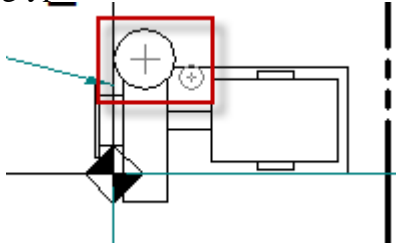
10. Start the 'Line' command  from the vertical toolbar.
11. Change the line color to Magenta.



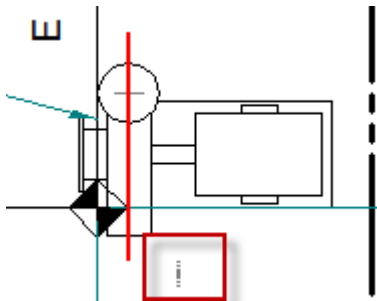
12. Change the line style to 'Dash'



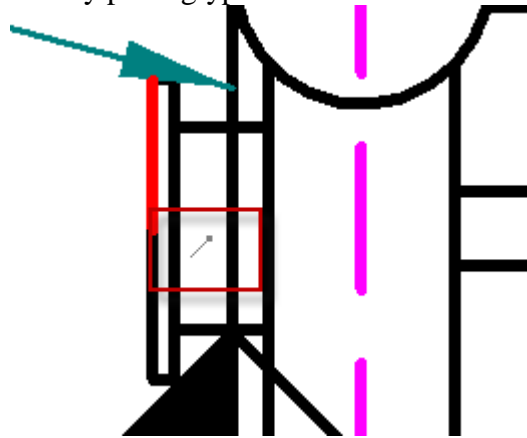
13. Hover your mouse over the discharge nozzle of the lower pump, till you see a center glyph.



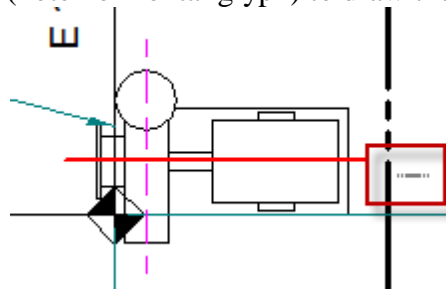
14. Click slightly above the nozzle and then click below the pump (note vertical glyph) to draw the centerline



15. Now hover mouse close to the midpoint of the suction nozzle as shown till you see the key point glyph.



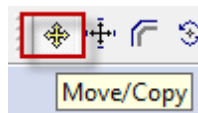
16. Click slightly to the left of the nozzle and then click to the right side of the pump (note horizontal glyph) to draw the centerline.



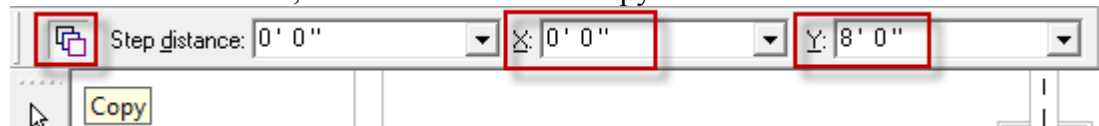
17. Right click once to terminate the line command.

Copying scaled sketch objects

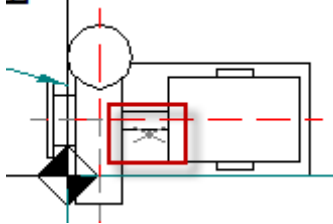
18. Select the two lines you just drew.
19. Click the Move/Copy button on the Change toolbar.



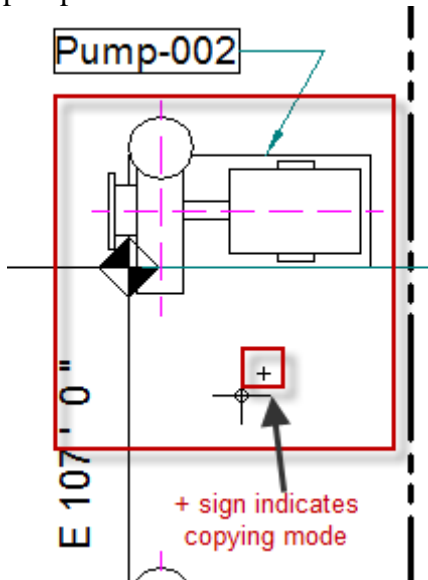
20. Enter distances X = 0', Y = 8' and click the 'Copy' button on the ribbon bar.



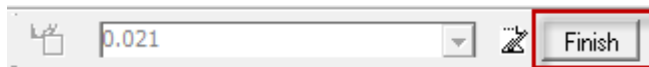
21. Hover over the intersection point of the two lines you drew till you see the 'Intersection' glyph and then click.



22. Move your mouse off, notice that the copy of the gridlines appears over the second pump.

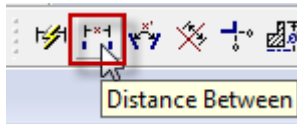


23. Click to complete the copy.
24. Right click to terminate the move/copy command.
25. Click the Finish button in the scaled sketch ribbon to complete scaled sketching.

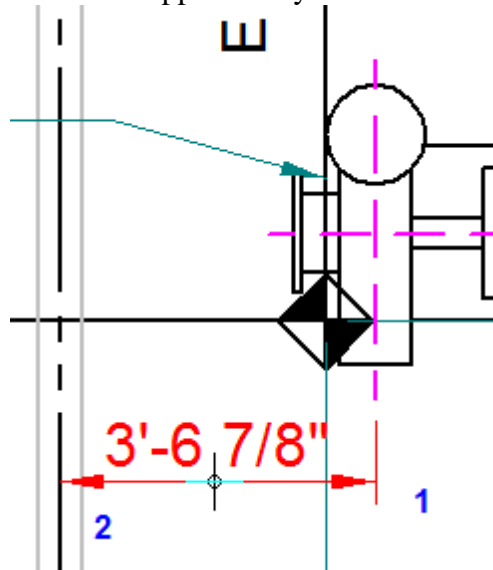


Dimensioning in scaled sketch mode

26. Select the smartframe and select the start scaled sketching button.
27. Start the 'Distance between' command from the dimension toolbar.



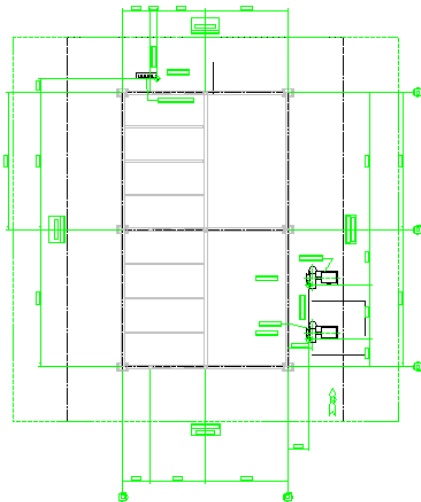
28. Click the vertical centerline you drew and the gridline drawn by VHL process. A dimension appears on your cursor. Click to place the dimension.



29. Notice that the dimension is in model scale.
 30. Click Finish on the scaled sketch ribbon to complete scaled sketching.
 31. Click the 'Scaled sketch' button on the drawings toolbar to dismiss the scaled sketch toolbar.

Moving a view with scaled sketch graphics.

32. Click the smartframe of the view with the 'Alt' key pressed. Notice that the view, all scaled sketch graphics and all labels and dimension are selected and shown in the selection color.



Use the move command or drag and drop the view to the desired location.