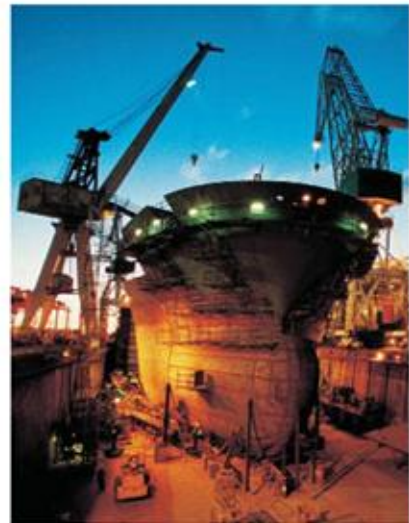


# SmartPlant 3D

## *Drawings Creation Practice Labs*

---

Process, Power & Marine



# Contents

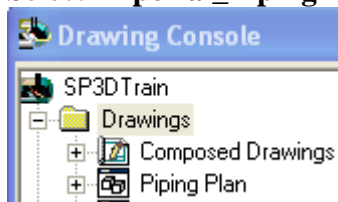
Lab 1 Creating Volume Drawings .....	3
Lab 2 : New Composed Drawing and Drawing Properties.....	6
Lab 3 : Volume by Two Points, Associate and Update View.....	8
Lab 4 : Place Composed View, Place Report View, Associate and Update Drawing .....	11
Lab 5 : Add Key Plan View.....	15
Lab 6 : Place Volume by Four Points, Associate Existing View to New Volume, Update View .....	16
Lab 7 : Volume by Selection and Volume by Path.....	17
Lab 8 : Create Snapshot View, Place Snapshot View with Preview, Update View .....	20
Lab 9 : Place cutting plane and place section view.....	23
Lab 10 : Place detail envelope and place detail view .....	24
Lab 11 : Placing Labels .....	26
Lab 12 : Placing Dimensions.....	30

# Lab 1 Creating Volume Drawings

Create volume drawings in Units **U01** and **U02** of your workspace by performing the following tasks

## 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.

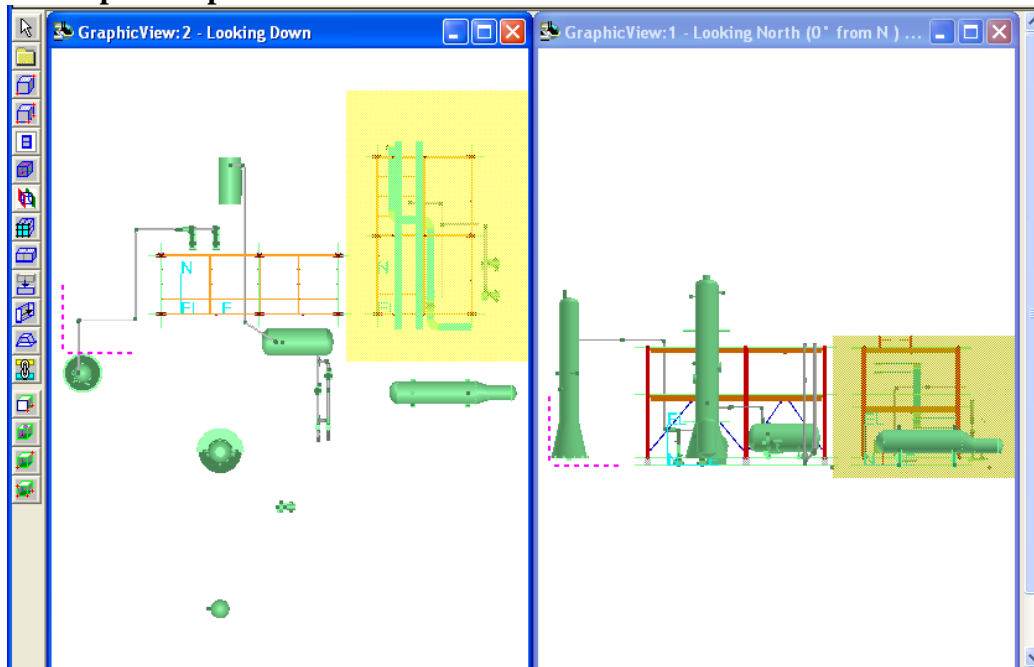
## Editing the Template

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

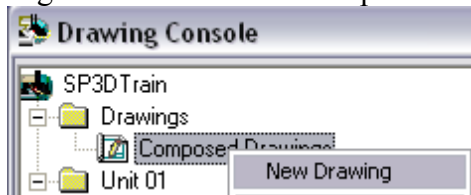
Update the drawings that you created in the previous procedures.

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.

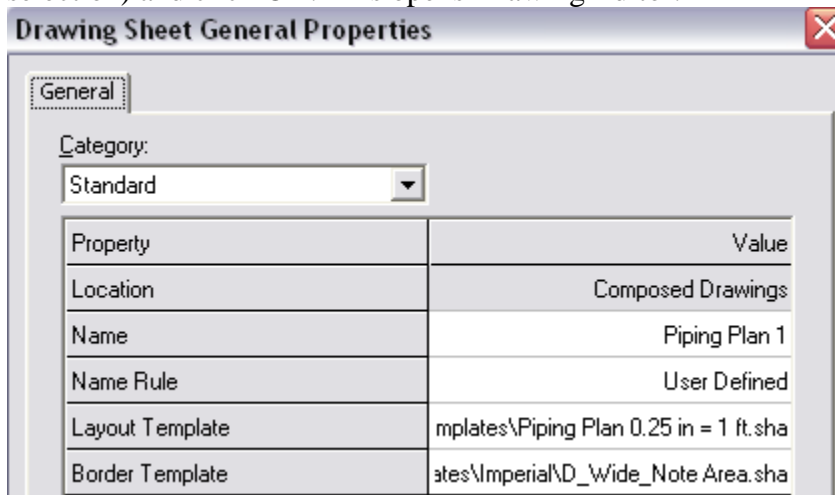
# Lab 2 : New Composed Drawing and Drawing Properties

## 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. 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 a '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. Below the tabs is a table with three columns: Name, Value, and Behavior. The 'Designed By' row is selected, and its 'Behavior' is set to 'Override'.

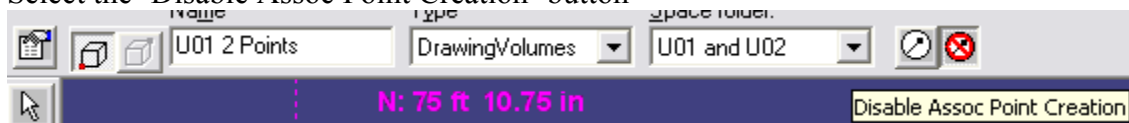
Name	Value	Behavior
Approval Date		Inherit
Approved By		Inherit
Checked By		Inherit
Checked Date		Inherit
Designed By	SND	Override

9. Click OK to close the properties dialog.

# Lab 3 : Volume by Two Points, Associate and Update View

## Place Volume by Two Points

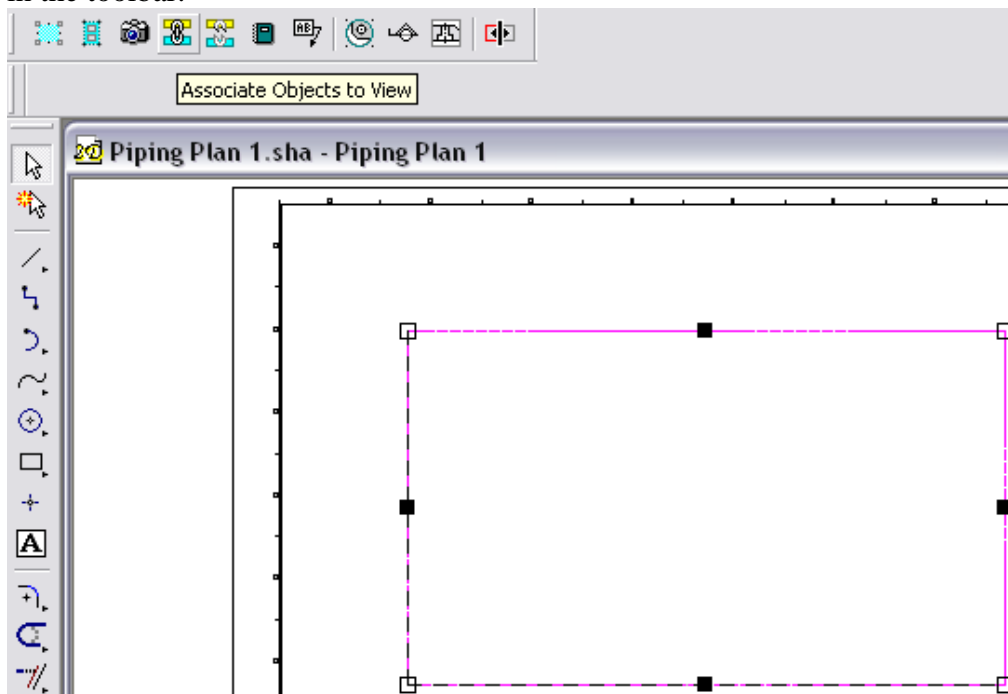
1. Start Pin Point toolbar
2. Start the 'Place Volume by Two Points' command in the vertical toolbar.
3. In the ribbon bar, enter 'U01 2 Points' in the Name field
4. Browse the Type field and select Definitions – Drawing Volumes – DrawingVolumes – DWGVOLUME1 and click OK
5. Browse the Space Folder field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

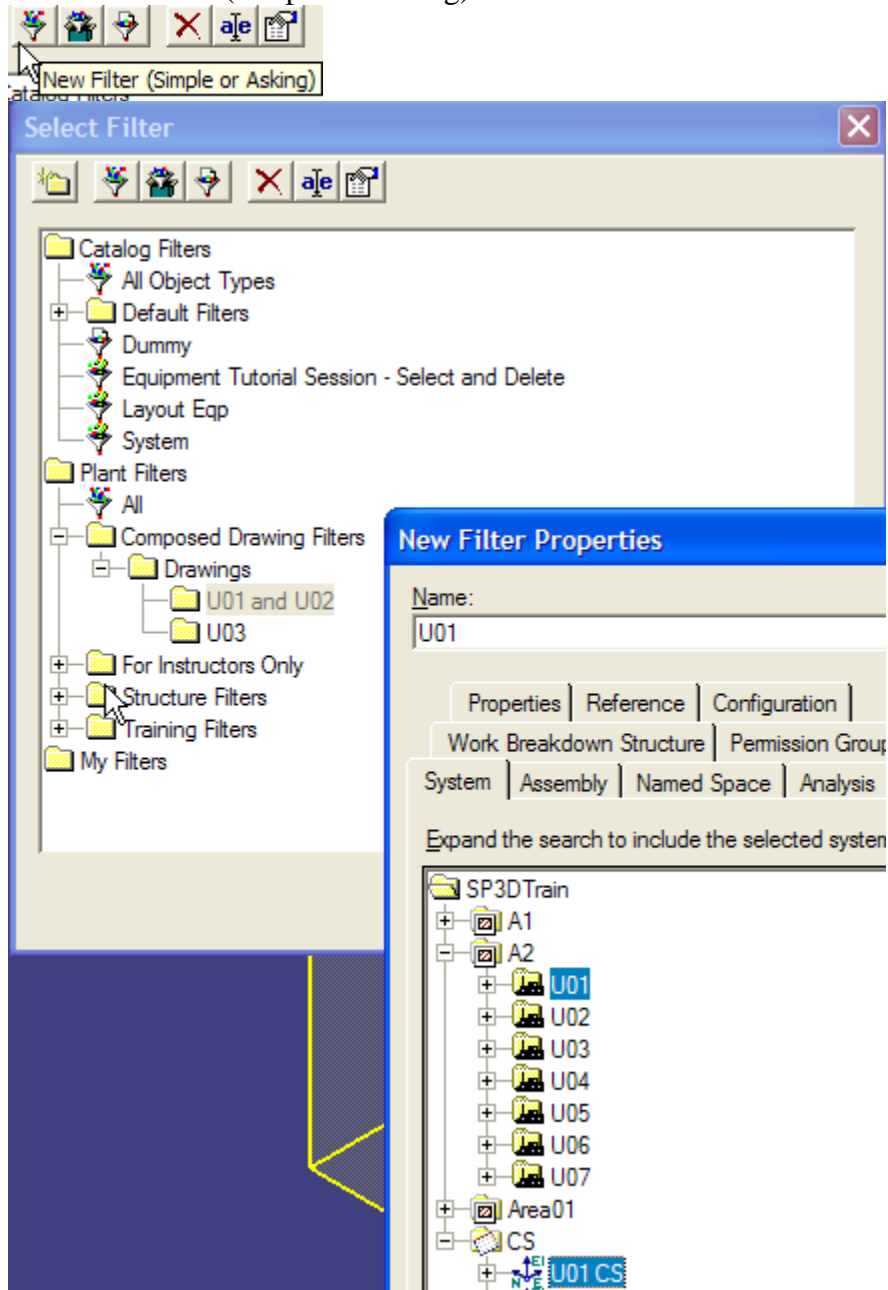
9. Open the Drawing Console
10. Right mouse click on 'Piping Plan 1' and Edit. This opens Drawing Editor.
11. Select the view in the opened drawing and select the 'Associate Objects to View' button in the toolbar.



12. Switch to the 3D window and select the volume placed

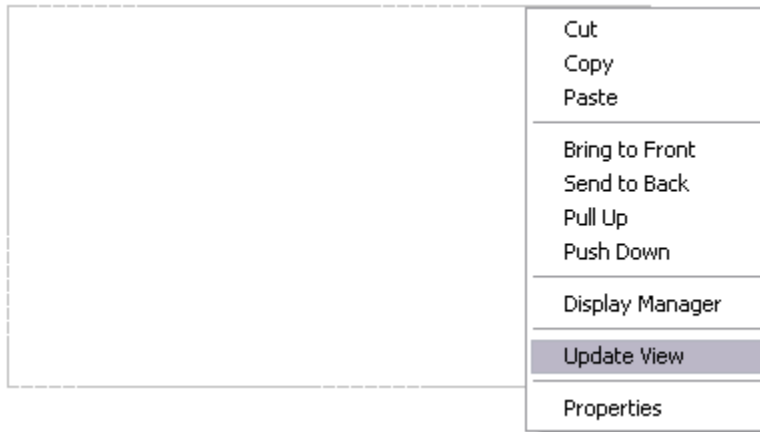


13. In the Filter field, select More...
14. Browse to Plant Filters – Composed Drawing Filters – Drawings – U01 and U02 and click New Filter (Simple or Asking)



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

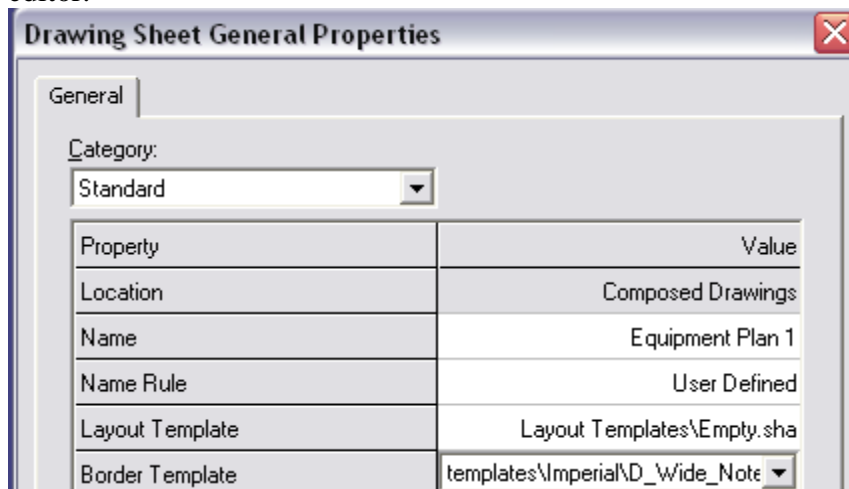
Updating view 'Piping Plan'. This may take some time...

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

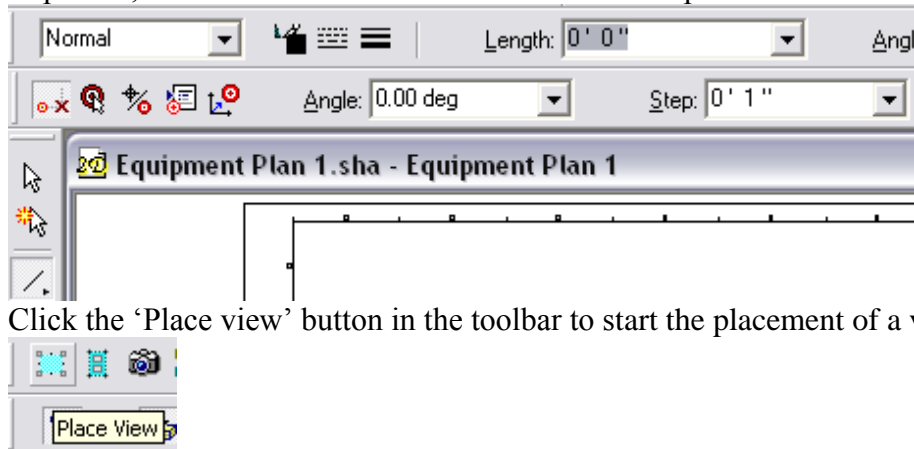
## Create New Drawing

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.



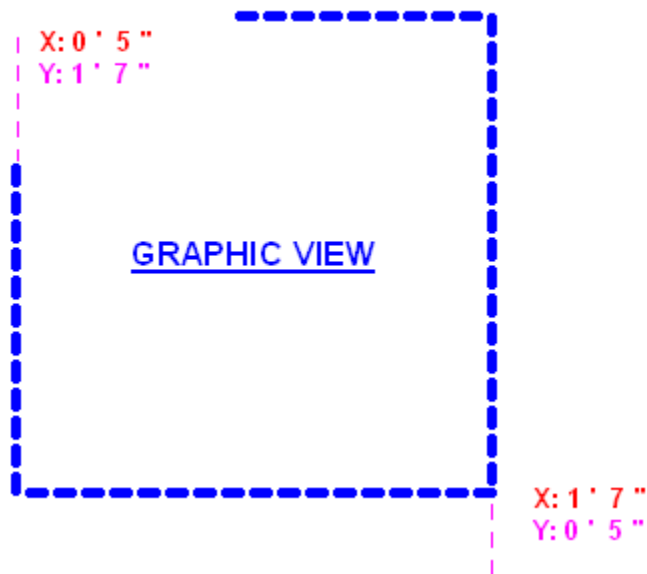
## Place Drawing View

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.

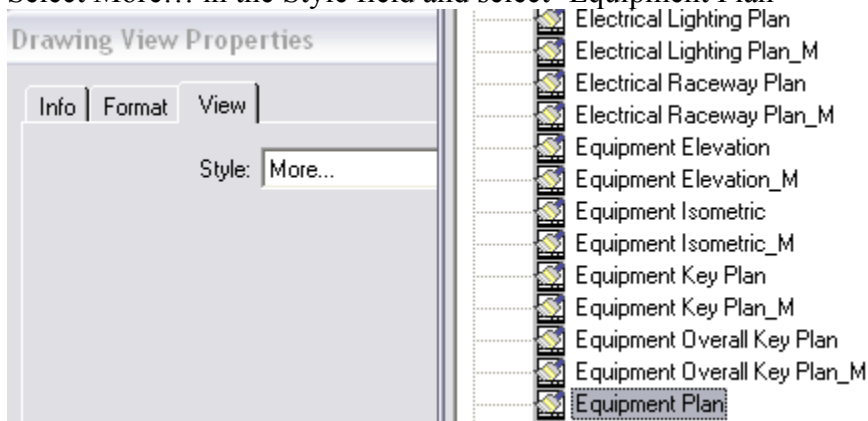


6. Click the 'Place view' button in the toolbar to start the placement of a view.

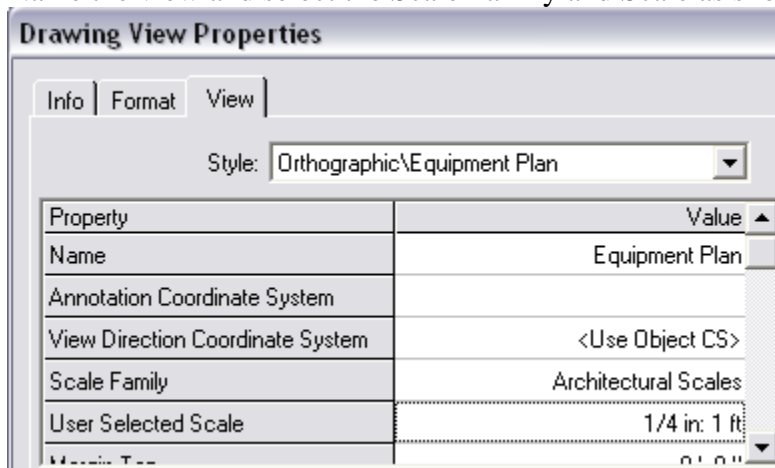
7. Click at X=0 '5", Y = 1'7" to start view placement, click at X = 1'7", Y = 0'5" to finish view placement. The drawing view properties dialog is shown



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

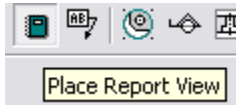


9. Name the view and select the Scale Family and Scale as shown and click OK.



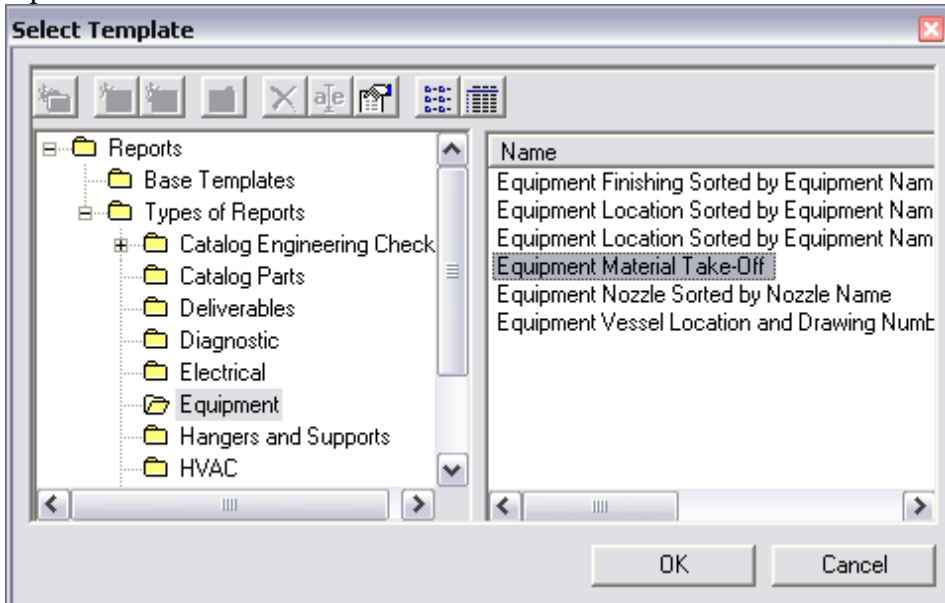
## Place Report view

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

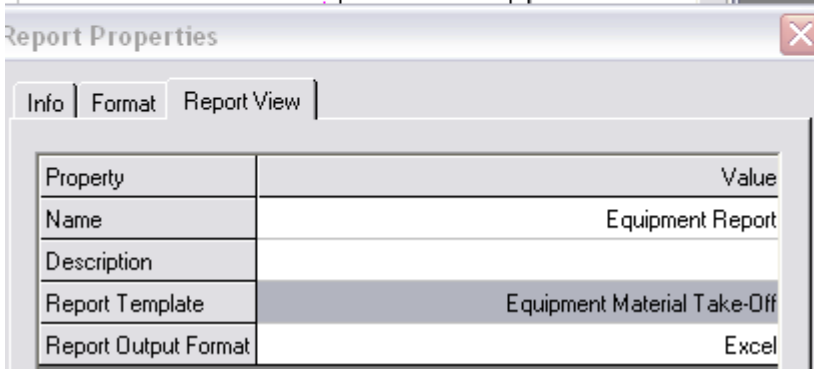
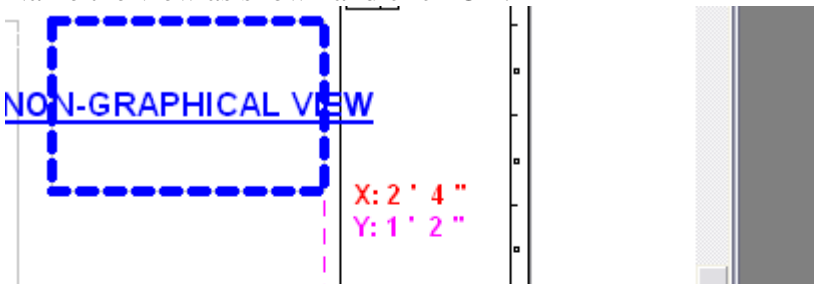


11. Place the report view from X = 1'8", Y=1'7" to X=2'4", Y = 1'2"

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.

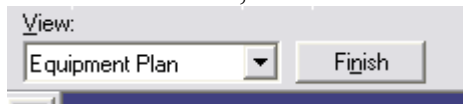


## Associate Drawing View to Volume

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

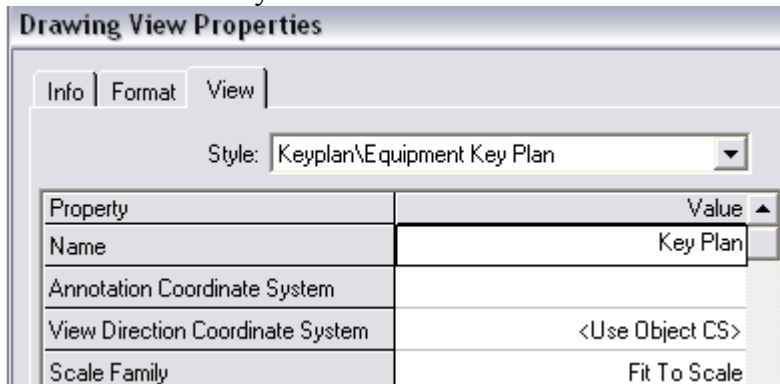
1. Right mouse click on 'Equipment Plan 1' and 'Edit'
2. Start the 'Place View' command from the toolbar.
3. Place the view in the bottom right hand corner of the drawing using the four points as a guide. The drawing view properties dialog is shown.



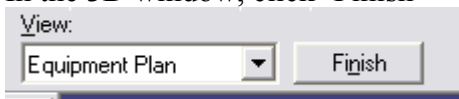
4. Select the 'Equipment Key Plan' style



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'

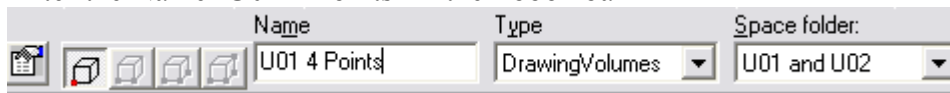


9. Right-mouse click on the key plan view and update view.
10. Close the drawing and save when prompted.

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

## Place Volume by Four Points

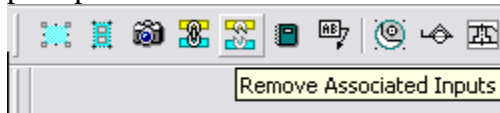
1. Activate Pinpoint
2. Start the 'Place Volume by Four Points' command
3. Enter the Name 'U01 4 Points' in the ribbon bar



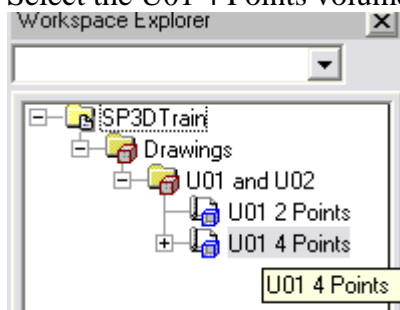
4. Place the four points around the existing volume 'U01 2 Points' in the order  
E 72' N 58' EL -2'  
E 72' N 2' EL -2'  
E 112' N 2' EL -2'  
E 112' N 2' EL 34'

## 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



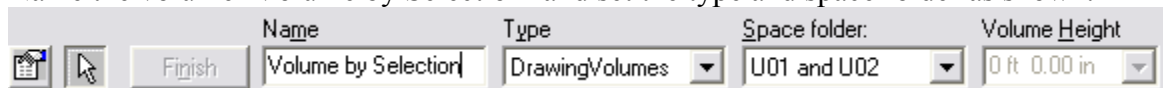
10. In the Filter field select the 'U01' filter
11. Right mouse click on the graphic view in drawing editor and update view.
12. Close the drawing and save when prompted.



# Lab 7 : Volume by Selection and Volume by Path

## Place Volume by Selection

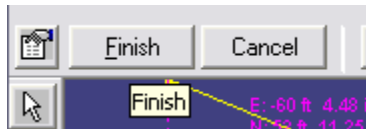
1. Define workspace using filter Plant Filters – Training Filters – U02
2. Start the 'Place Volume by Selection' command.
3. Name the volume 'Volume by Selection' and set the type and space folder as shown.



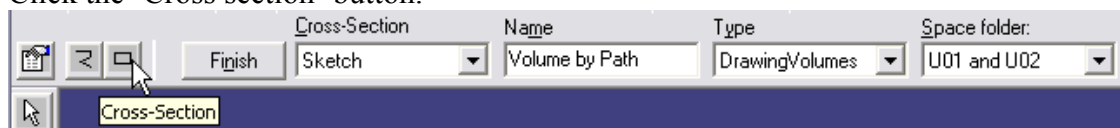
4. Select (graphically or through WSE) the following objects: VS-102, PU2-02, U02-6-P-0002-1C0031
5. Click Finish to complete volume placement.

## Place Non-Rectangular Volume

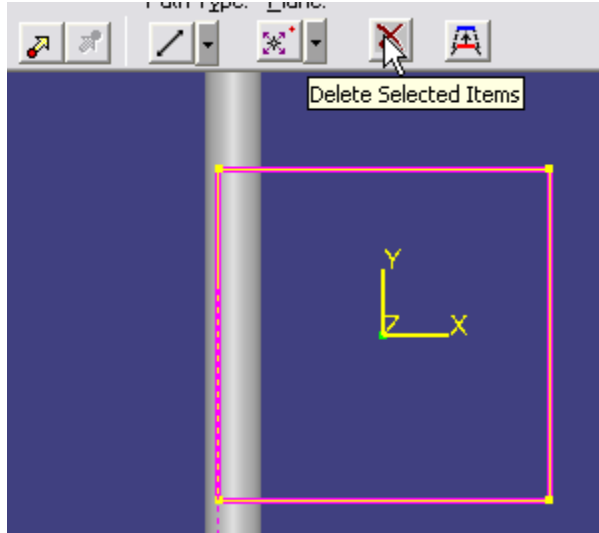
6. Activate pinpoint toolbar
7. Start the 'Place Volume Along Path' command from the vertical toolbar.
8. Enter values E=20', N=20', EL = 45' in pinpoint, click once in a graphic view
9. Enter values E=20', N=20', EL = 0' in pinpoint, click once in graphic view
10. Click 'Finish' in the ribbon bar.



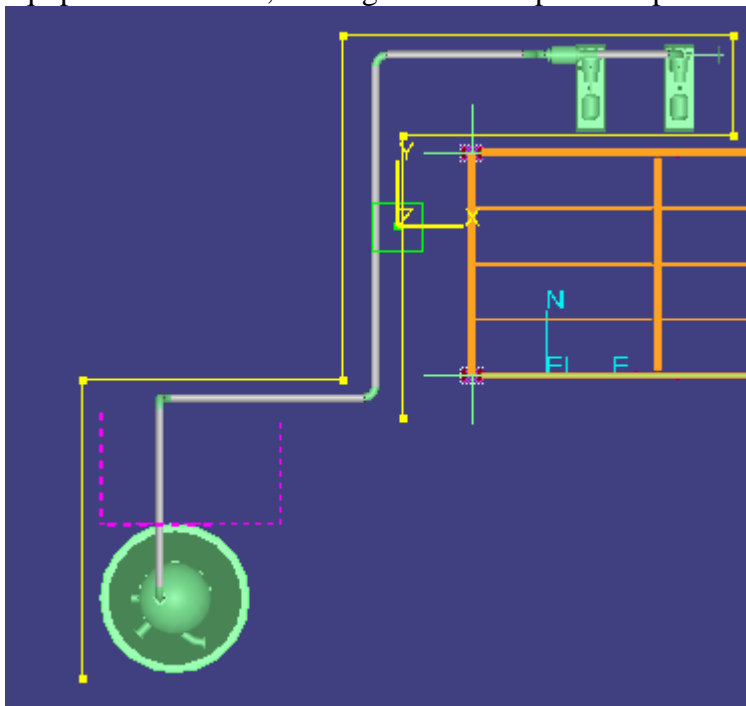
11. Name the volume 'Volume by Path' and set the type and space folder as shown.
12. In the Cross-section pick list, pick 'Sketch'
13. Click the 'Cross section' button.



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



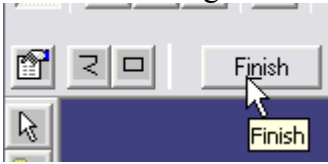
15. Sketch the desired cross section that follows the path of the pipeline and the connected equipment as shown, making sure to complete the path to be a closed curve.



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 the 'Drawing Sheet General Properties' dialog box. The 'General' tab is selected. The 'Category' dropdown is set to 'Standard'. Below this is a table with properties and their values.

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.

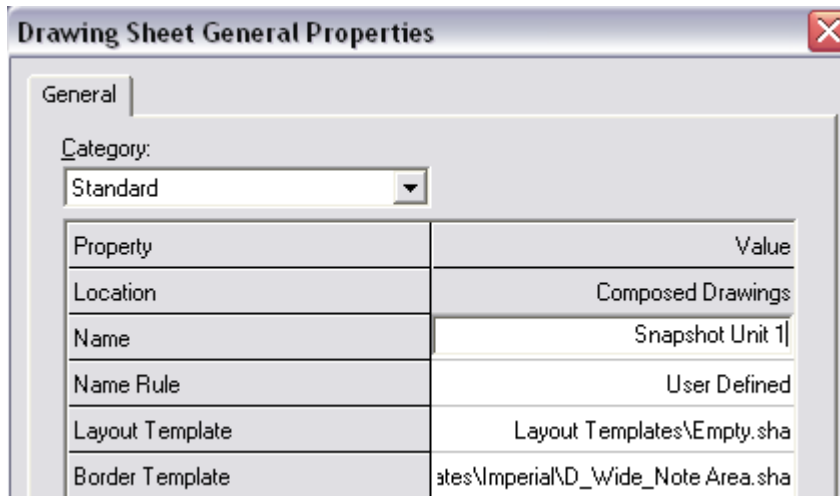
24. Select the right view and associate it to the volume by path and the same filter (U02) above.

25. Update both views by right mouse click update view command.

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

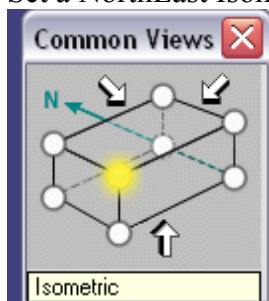
## Create New Drawing

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.



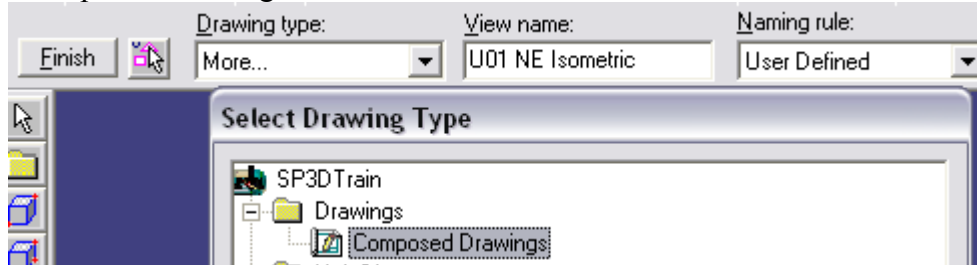
## Create Snapshot View

4. Refresh workspace to remove the drawing volumes from the workspace
5. Set a NorthEast Isometric view direction using the 'Common Views' dialog

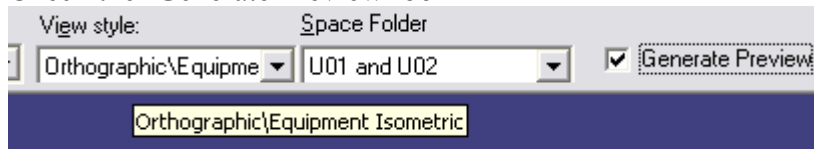


6. Tools → Snapshot View

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



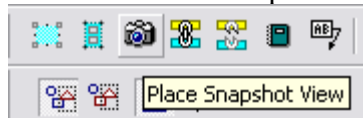
8. In the view style field pick 'Equipment Isometric'
9. In the space folder field, pick 'U01 and U02'
10. Check the 'Generate Preview' box



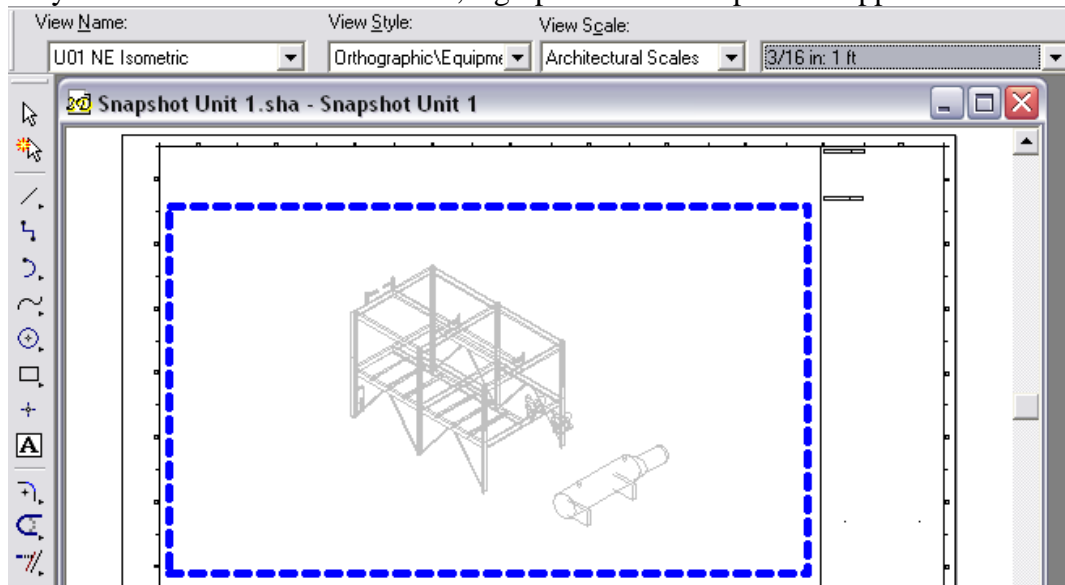
11. Click Finish to create the snapshot.

## Place Snapshot View

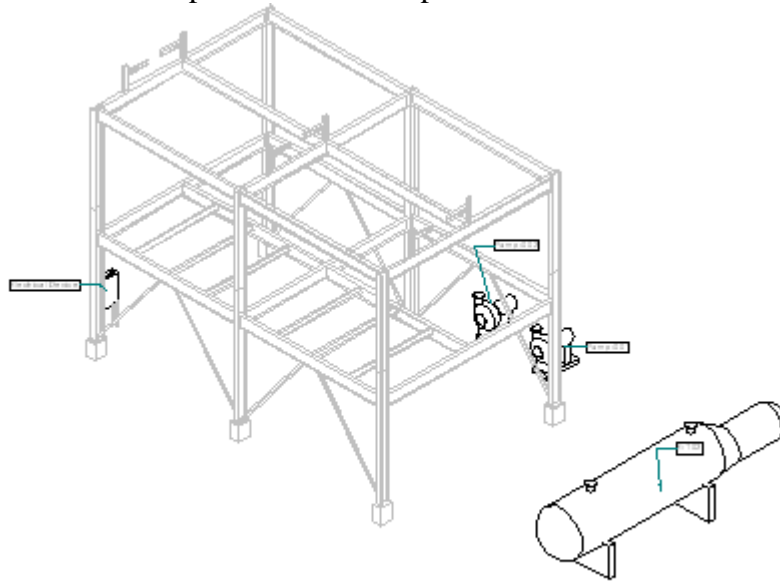
12. Switch to the Drawing Editor window
13. Click the 'Place Snapshot View' button



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

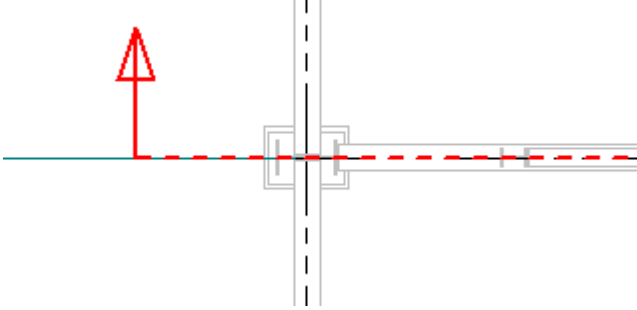
1. Open Drawing Console
2. Select 'Equipment Plan 1' and 'Edit '
3. Start the 'Cutting Plane' command



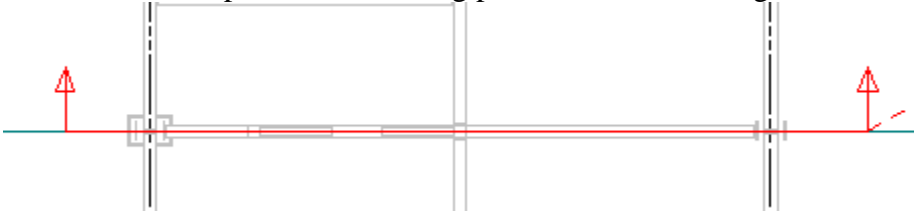
4. Enter value A for Reference 1 and 2



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

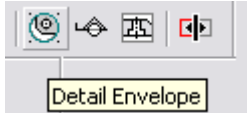


8. In the ribbon, enter a depth of 25'
9. Move the mouse towards the bottom of the screen to set the cutting plane look direction, then click to finish cutting plane placement.
10. A view appears on your cursor. In the ribbon bar, check the 'Update' box, select the 'Equipment Elevation' view style and 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.  

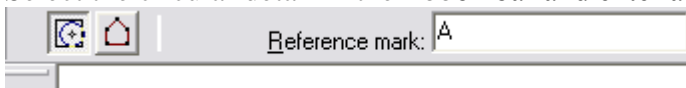
Updating view 'Section A-A'. This may take some time...
12. After view updates, close the drawing and save when prompted.
13. Notice that in 3D, a new volume named 'Section A-A' has been created under the same parent folder as the parent volume.

# Lab 10 : Place detail envelope and place detail view

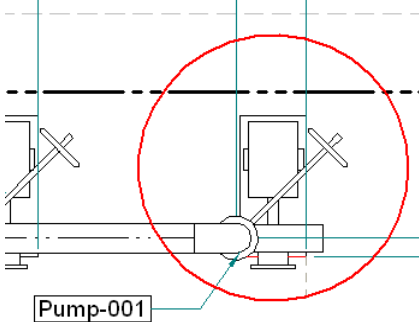
1. Open drawing console
2. Select 'Piping Plan 1' and 'Edit'
3. Start the 'Detail Envelope' command.



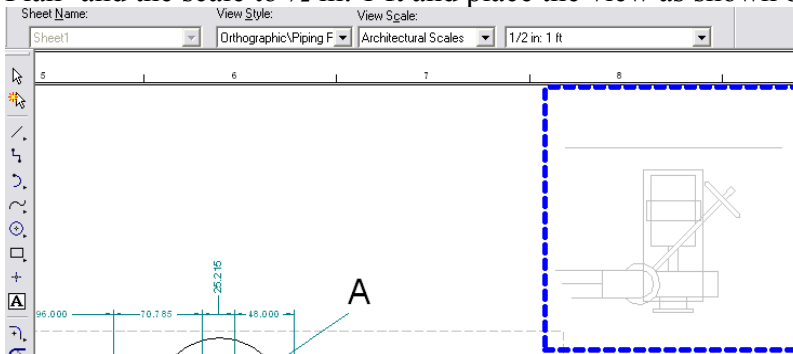
4. Select the graphic view which will contain the detail
5. Select the circular detail in the ribbon bar and enter a Reference Mark 'A'



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

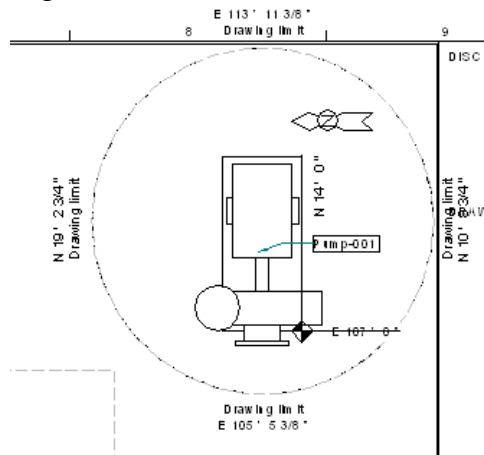


7. A view appears on your cursor. In the ribbon bar, change the view style to 'Equipment Plan' and the scale to 1/2 in: 1 ft and place the view as shown by clicking in the sheet.





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



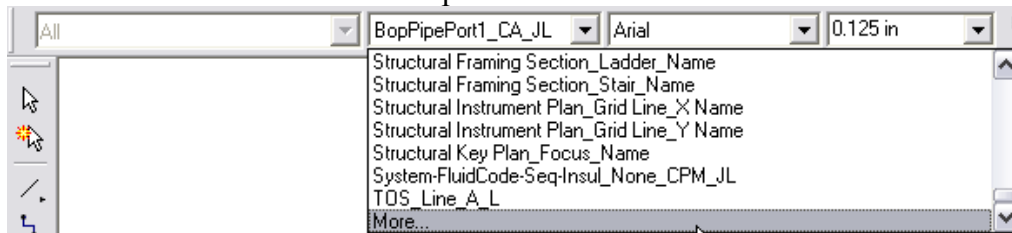
# Lab 11 : Placing Labels

## Placing View Labels

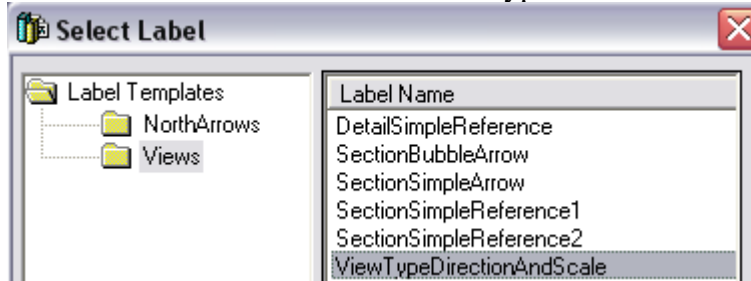
1. Open Drawing Console
2. Select the drawing 'Equipment Plan 1' and 'Edit'
3. Start the 'Place a label' command.



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.

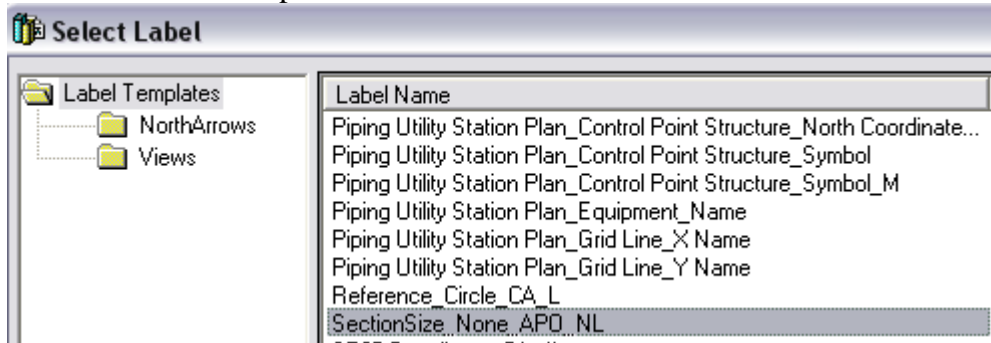
Section A - A  
Looking South  
SCALE: 3/16 in: 1 ft

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

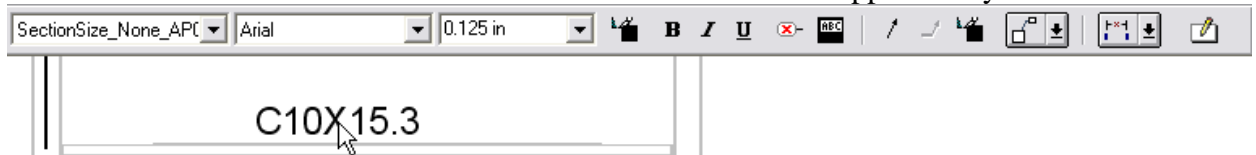
## Placing Object Labels

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

10. Select the Label Templates folder and the SectionSize\_None\_APO\_NL label

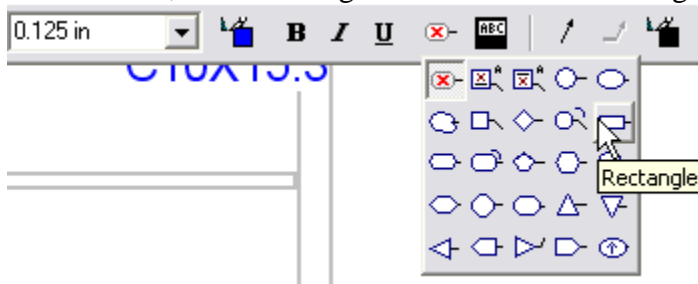


11. Select a steel member in the view and the label with section size appears on your cursor.



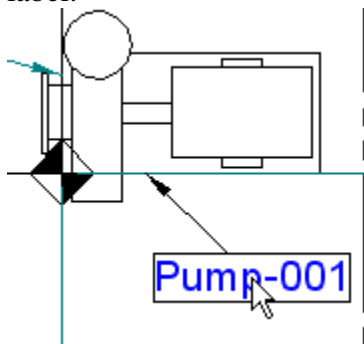
12. Click to place the label.

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.

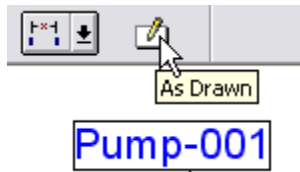


### Use As-Drawn

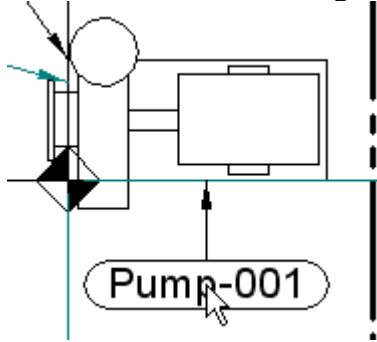
14. Select the Name\_Capsule\_CA\_L label from the pick list and click on a pump. Note that the previously made changes to properties of the previous label are retained for the new label.



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



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

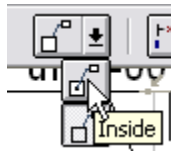


17. Click to place the label.

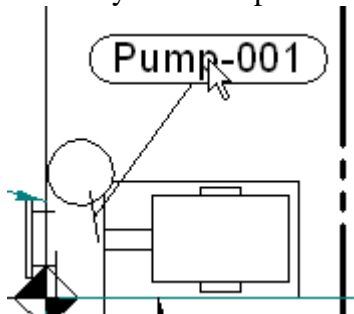
### ***Use Leader Boundary Option***

18. Select the pump again

19. Now click the 'Boundary' pulldown in the label ribbon and select the 'Inside' button.

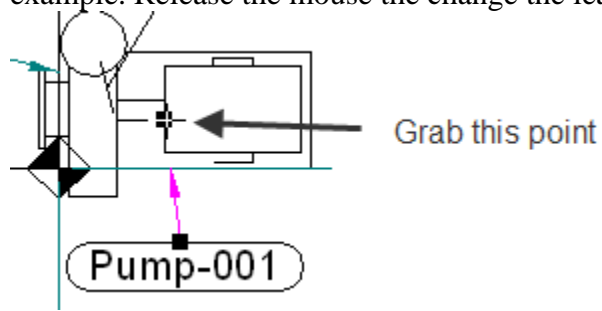


20. Notice that the leader attachment point has jumped to the inside of the pump from the boundary. Click to place the label.



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

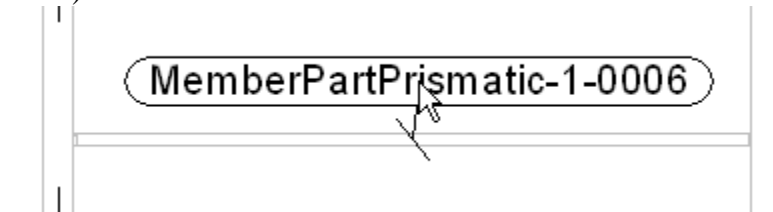
example. Release the mouse the change the leader arrow style.



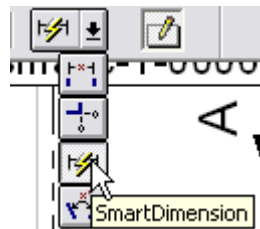
### ***Dimension Style Label***

22. Start the 'Place a Label' command

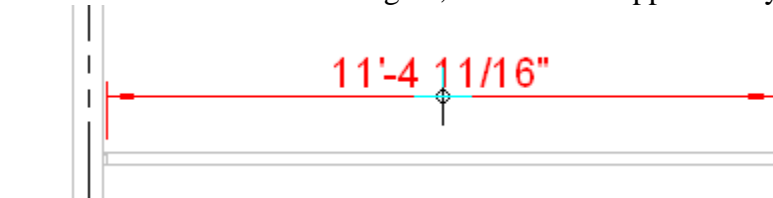
23. Select a steel member, the name appears in a capsule with a leader (like the previous label)



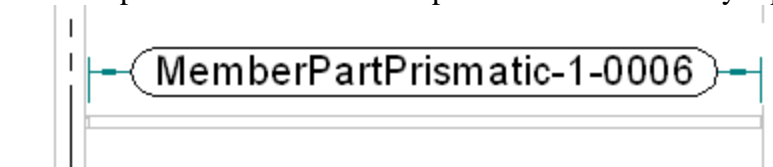
24. Activate the 'dimension' pulldown in the label ribbon bar and select 'SmartDimension'



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.



# Lab 12 : Placing 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.



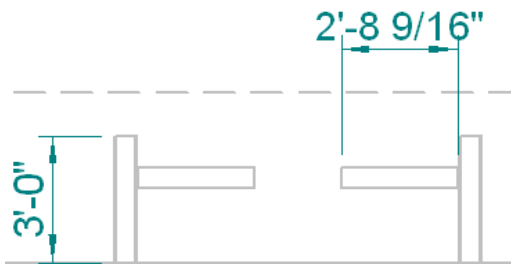
4. Start the 'SmartDimension' command from the 'Dimension' toolbar.



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

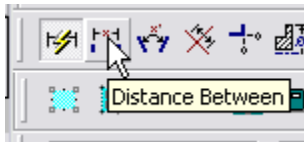


6. Select the top edge of the beam at the right and click to place dimension.



## 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.

