Drawing Creation Tutorial

Placing Labels and Dimensions

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SESSION 10

Placing Labels and Dimensions

Objective

By the end of this session, you will be able to:

- 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
- Place smart dimensions
- Place ‘distance between’ dimensions

Overivew

An essential part of the drawing process is adding text, graphics, and annotations that allow you to easily identify the objects in a drawing. Annotations are text and graphics that provide information about a drawing and emphasize certain objects in the drawing view. Labels and dimensions can be placed automatically by label and dimension rules in the view style. You can modify the position of these automatically placed labels and dimensions or place additional labels and dimensions manually. Smart 3D treats automatic (unmodified) annotations differently than modified and manual annotations during subsequent updates of the view. Automatic annotations have the positioning rules re-applied while manual and modified annotations are kept where the user moved or placed them.

Labels

Labels are associated with an object in a drawing, and they allow you to easily identify objects. When you place a label, it appears near the object, as shown. If you move the object, the label moves with it.

You can place labels on drawings either by label rules included in the view style during update or manually after the views have been updated. The command to place labels is available when you edit a drawing in SmartSketch Drawing Editor. You place labels by choosing one of the label templates available. You can use label templates that are delivered with the software, or by creating your own label templates. Label rules control the appearance of labels, as well as their automatic placement on drawings. For example, you can create label rules that place labels with or without borders and leader lines. Examples of rules that are available within Smart 3D are grid line labels, name labels, piping line number labels and structural member section size labels.

It should also be noted the label rules are saved in the SharedContent directory located in the \Drawings\Catalog\Rules\LabelRules folder. Rules have corresponding templates and symbols under \Drawings\Catalog\Labels\Templates.

Dimensions

Dimensions supply information about the size, location, and orientation of objects in a drawing, such as the length of a line, the distance between points, or the angle of a line. Dimensions are associated with the objects to which they refer, as shown in Figure 2.

To place dimensions, select a command from the Dimension toolbar shown in Figure 3, and then select the elements or key points to be dimensioned. The commands on the Dimension toolbar from left to right are as follows:

- Smart Dimension - Places several different dimensions, such as length and angle of a line, radius and diameter of a circle, and length, angle, radius, and diameter of an arc.
- Distance Between - Places a linear dimension that measures the distance between elements or key points.
- Angle Between - Places a dimension that measures the angle between elements or key points.
- Axis - Sets a dimension axis for a drawing. A dimension axis allows you to place dimensions that are perpendicular to or parallel to an element.
- Coordinate Dimension - Places a dimension that measures the distance from a common origin to one or more key points or elements.
- Symmetric Diameter - Places a dimension that measures the distance between a center line and another element or key point.
- Measure Distance - Measures the distance between points in free space or between key points.
- Measure Distance Along - Measures the distance along an object based on two points.
- Measure Area - Displays the most recently selected area of the boundary in the current units. It also displays the total area of all selected boundaries in the current document units.
- Character Map - Inserts a character in a text box by using a different font. You can also insert special characters that do not appear on your keyboard.
- Leader - Adds a leader to an annotation or to another leader.
- Balloon - Places a balloon containing text. You can use balloons to refer to an element or a point in free space.
- Dimension Text - Overrides a driven dimensional value with a text string. A driven dimension is a dimension that is placed as you draw in 2D Drawing Editor. To place this dimension, click Tools > Options. Under the General tab of the Options dialog box, check the "Dimension key-in values automatically" tab.

There are two methods you can use to place dimensions in drawings: automatic dimensioning and manual dimensioning. In automatic dimensioning, dimension rules within a view style control whether or not dimensions are placed in the drawing. When you use manual dimensioning, you edit an existing drawing and place dimensions manually. On the next pages, you will learn how to place manual dimensions.

Change Undo Steps

1. Select **File > Define Workspace**.

   *The **Define Workspace** dialog box displays.*

2. Select **More** from the **Filter** list, and then select **Drawings Creation Filters\10\U01 Workspace**.

3. Right-click on the drawing **Drawings Creation Labs\10\Equipment Plan01,** and select **Edit**.

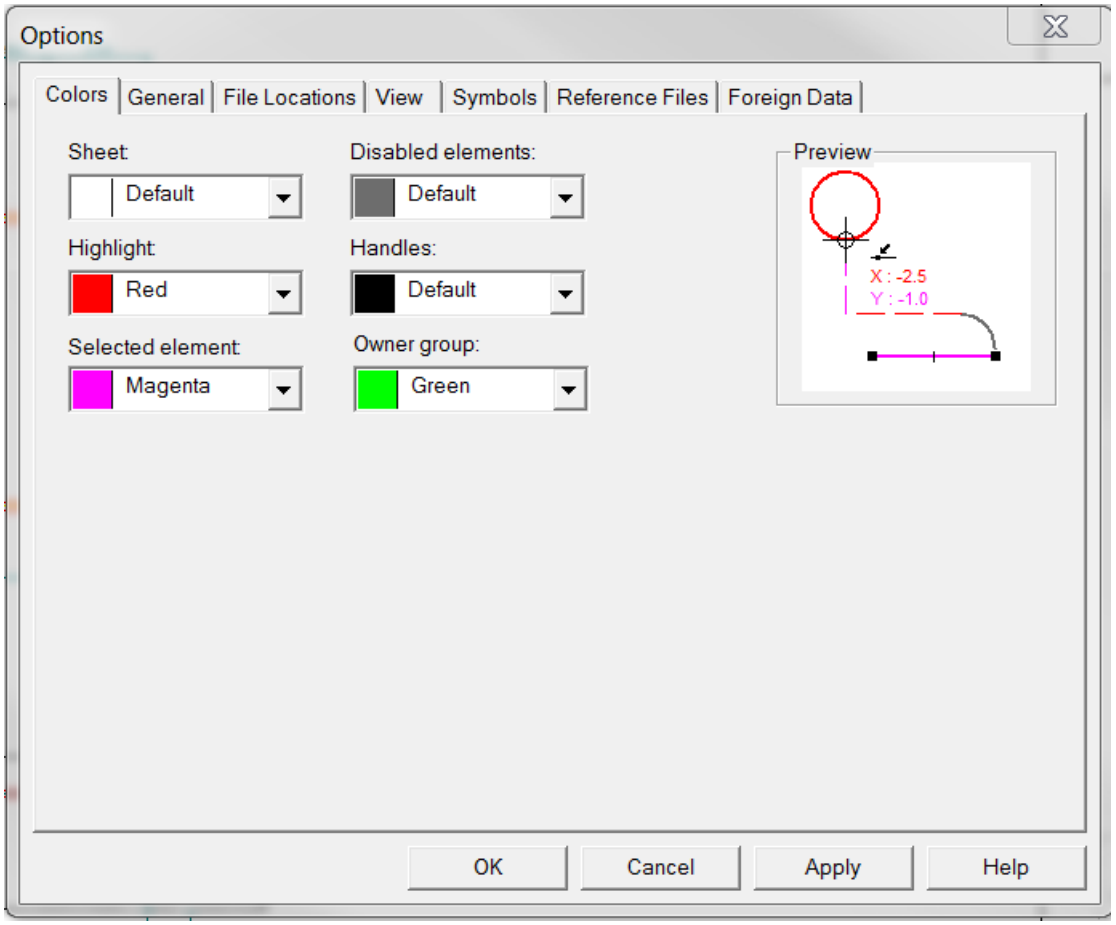
   *The **SmartSketch Drawing Editor** window displays.*

4. Maximize the drawing window in **SmartSketch Drawing Editor**.

5. Click **Fit** .

6. Click **Tools > Options**.

   *The **Options** dialog box displays.*



7. Select **Green** from the **Highlight** list.

8. Click on the **General** tab. Verify that the **Undo steps** field is set to **10**. If not, type **10** in the field to increase the number of undo steps to ten for this session of Smart 3D.

TIP Here is some information regarding how settings from the **Options** dialog box are stored:

- The values for the various **Options** settings are stored in the registry for each user, not in the document. Because it is saved by user, different users can log on to the same machine and open the same document and see different **Options** values.
- When Smart 3D is launched, it stores in memory the values of the **Options** settings in the registry at *HKEY_CURRENT_USER\Software\Intergraph\Applications\Shape2DServer.Application \PrefSets\Options-General*. When Smart 3D is exited, it takes the values stored in memory and writes them back to the registry, overwriting any changes made while the Smart 3D session was active.
- All of the various 2D environments in Smart 3D write to this same location in the registry. So during a session of Smart 3D, changes made to the **Options** settings while in Structure's Sketch 2D environment are seen when editing a drawing inside of Smart 3D or outside of Smart 3D. However, after Smart 3D is exited, the values saved into memory at the beginning of the Smart 3D session overwrite any **Options** changes made while the session was active.

In short, if the **Option** settings are made while outside of Smart 3D, then these settings are seen inside of Smart 3D.

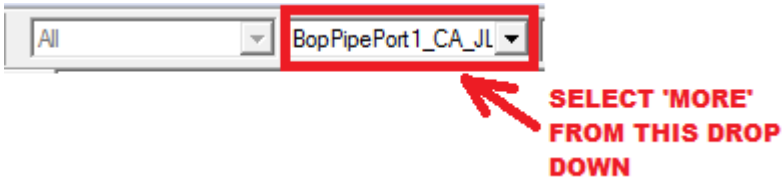
9. Click **OK** on the **Options** dialog box.

Place View Labels

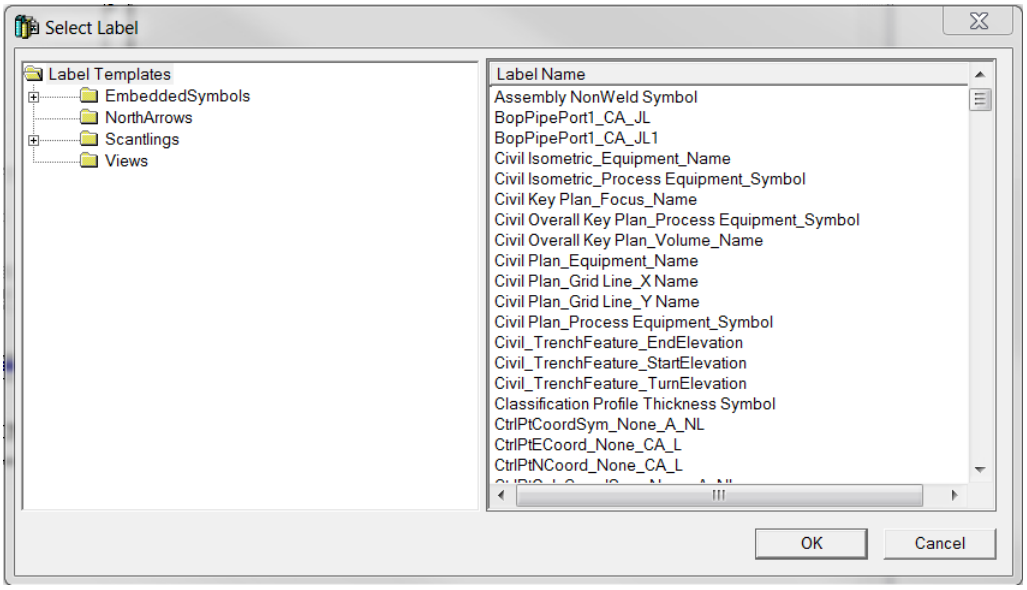
1. Click **Place a Label** .

   *The **Place a Label** ribbon displays.*

2. Select **More** from thelabel name list on the **Place a Label** ribbon.



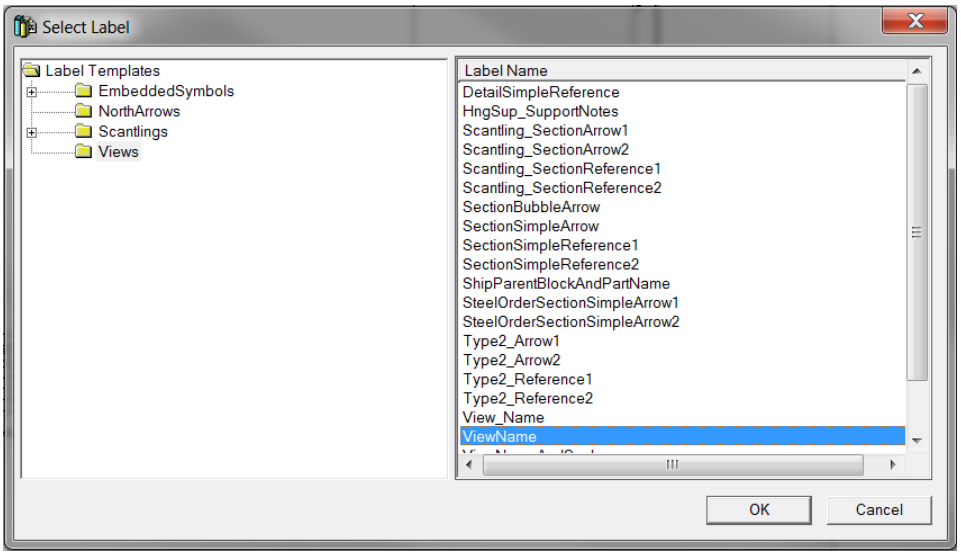
*The **Select Label** dialog box displays.*



3. Select the **Views** folder in the tree view.

   The available labels in that folder display in the list view.

4. Select the label **ViewName**.



5. Click **OK** on the **Select Label** dialog box.

   *The software returns control to **SmartSketch Drawing Editor**.*
   *The status bar displays **Select object to attach label**.*

   TIP The labels in the **View** folder are designed to be associated with graphic views.

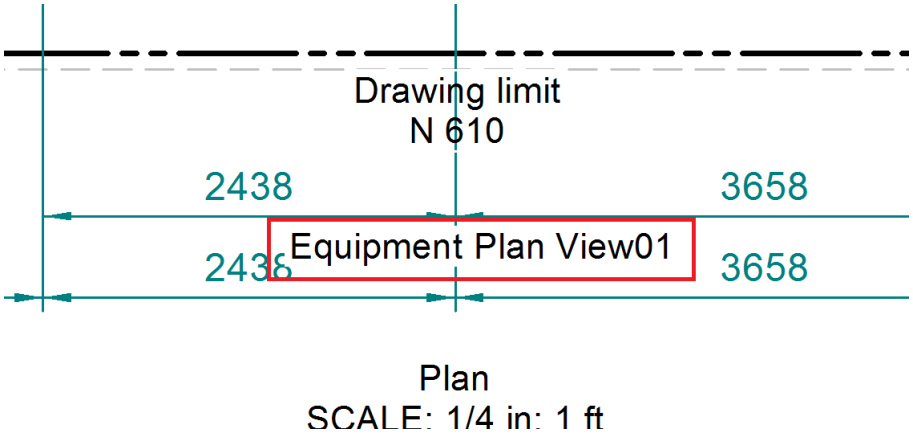
6. Select the boundary of the main graphic view.

   The label evaluates the property values of the view and displays the label contents at the

end of the cursor.

*The status bar displays **Click to place the label**.*

7. Click **Zoom Area** .
8. Drag a rectangle around the lower left quadrant of the drawing to get a closer look at the contents.
9. Right-click to exit **Zoom Area**.
10. Click at a position below the bottom edge of the main view, near its center, to place the label.



*The status bar displays **Select object to attach label**. The **Place a Label** command is still active.*

Place Object Labels

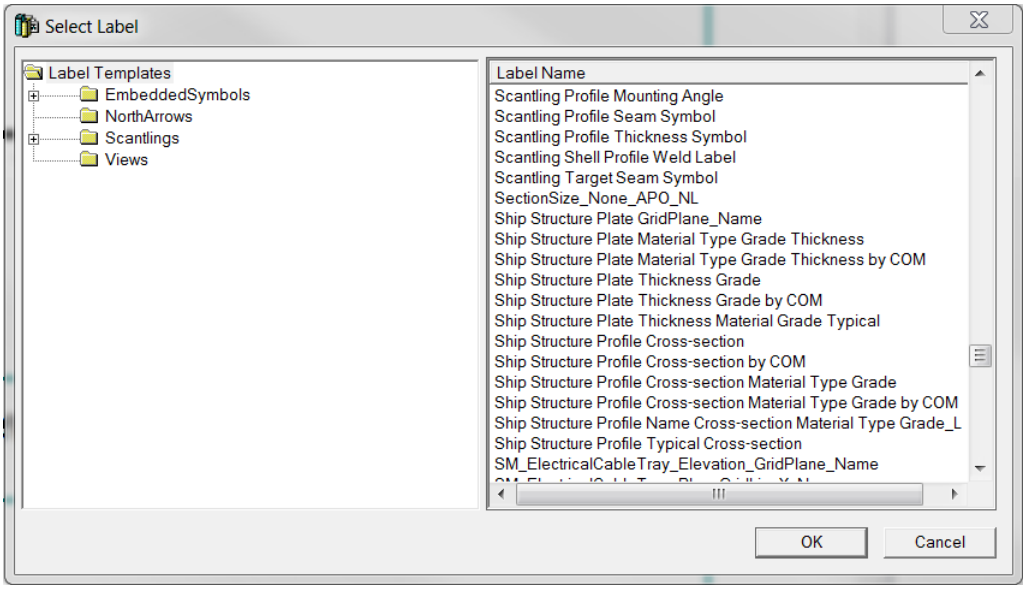
1. Select **More** from the label name list on the **Place a Label** ribbon.

   *The **Select Label** dialog box displays.*

2. Select the **Label Templates** folder in the tree view.

   The software displays the available labels in that folder in the list view.

3. Select the label **SectionSize_None_APO_NL**.



TIP Based on the naming convention of this label, it displays the **Section Size** property with no text box and no leader. The **APO** term refers to its automatic placement behavior: absolute X and Y location, parallel, and offset relative to an object.

4. Click **OK** on the **Select Label** dialog box.

   *The software returns control to **SmartSketch Drawing Editor**.*

5. Click **Text Color** on the **Place a Label** ribbon.

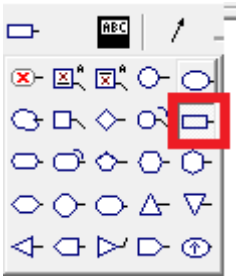
   A color palette displays.

6. Select blue from the palette.

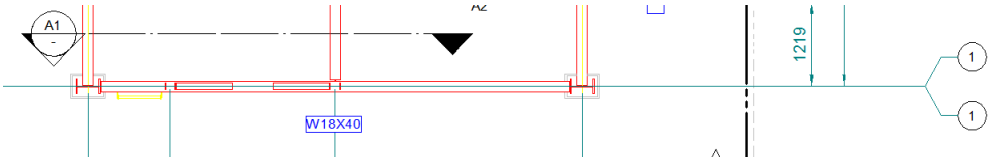
7. Click **Shape** on the **Place a Label** ribbon.

   A shape palette displays.

8. Select **Rectangle** from the palette.



9. Select the horizontal beam aligned with grid line **1**.
10. Click at a position below the bottom edge of the beam, near its center, to place the label.



Use As-Drawn

1. Select **More** from the label name list on the **Place a Label** ribbon.

   *The **Select Label** dialog box displays.*

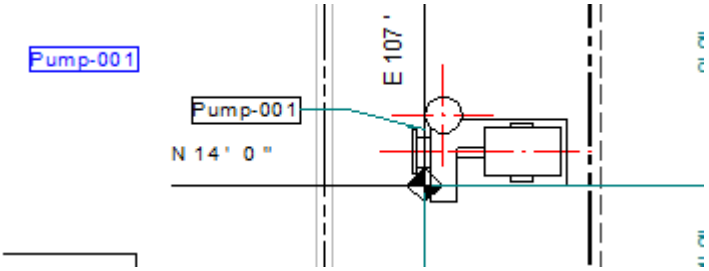
2. Select the label **Name_Capsule_CA_L** in the **Label Templates** folder.

   TIP Based on the naming convention of this label, it displays the **Name** property with a capsule-shaped text box and a leader. The **CA** term refers to its automatic placement behavior. The label attempts clear-space positioning. If no clear space is found, it falls back to an absolute position relative to an object.

3. Click **OK** on the **Select Label** dialog box.

   *The software returns control to **SmartSketch Drawing Editor**.*

4. Select **Pump-001** in the main view.



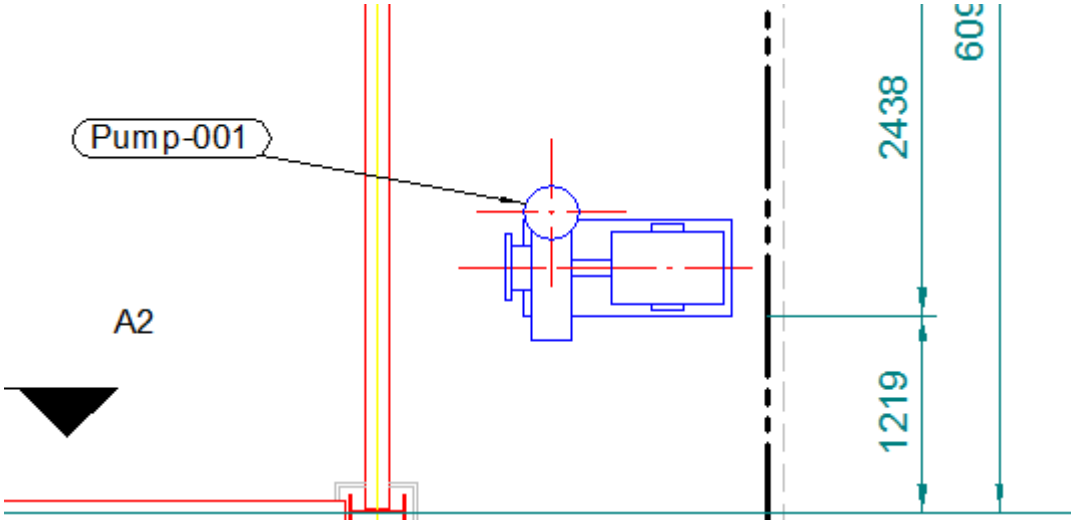
   *The appearance of the label at the end of the cursor uses the properties from the **Place a Label** toolbar, overriding the label's definition.*

5. Click **As Drawn** on the **Place a Label** ribbon.

   The software uses the label definition during placement.

   The appearance of the label at the end of the cursor uses the properties from its definition

*rather than the **Place a Label** toolbar.*



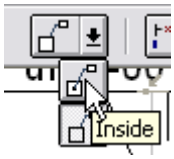
6. Click at a position to the left of the pump to place the label.

Use Leader Boundary Option

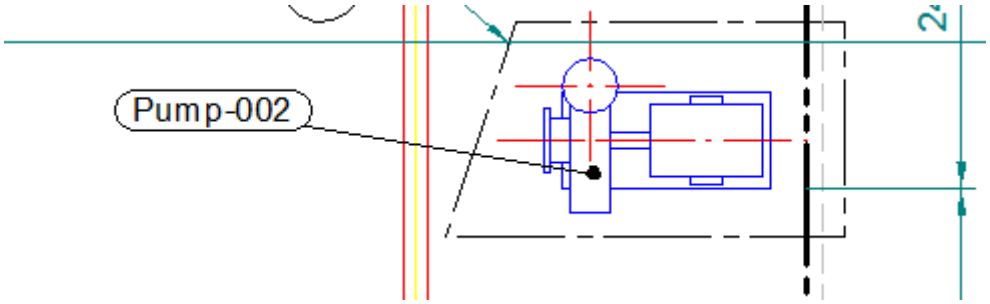
1. Select **Pump-002** in the main view.

   The leader attachment point is on the boundary of the pump.

2. Select **Inside** from the **Boundary list** on the **Place a Label** toolbar.



The leader attachment point moves to the inside of the pump from the boundary.

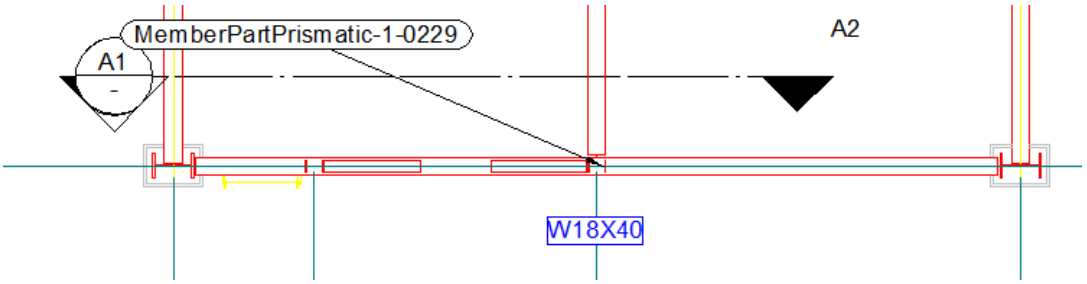


3. Click at a position to the left of the pump to place the label.

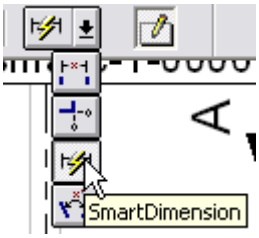
Place a Dimension Style Label

1. Select the horizontal beam aligned with grid line **1**.

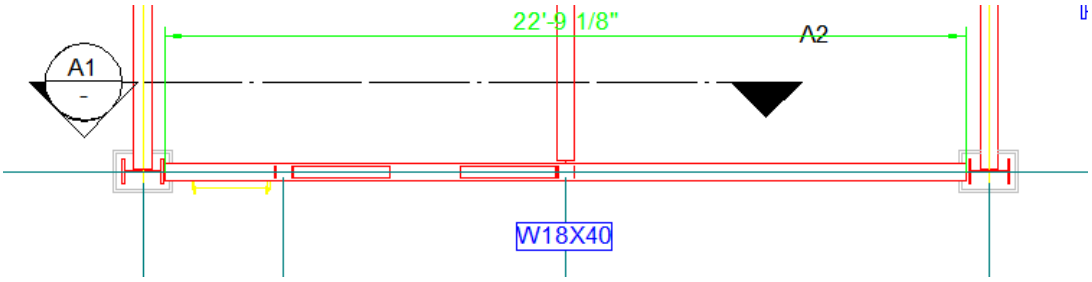
   The appearance of the label at the end of the cursor uses the properties as the previous label.



2. Select **SmartDimension** from the **Dimension** list on the **Place a Label** toolbar.

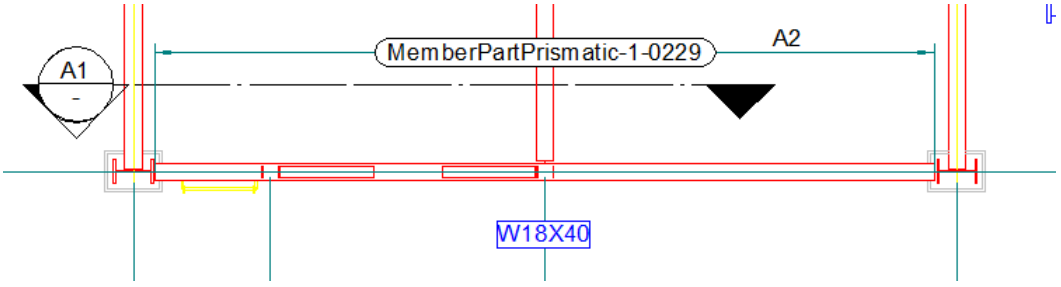


3. Select the beam again to display a dimension at the end of the cursor.



4. Click to position the dimension.

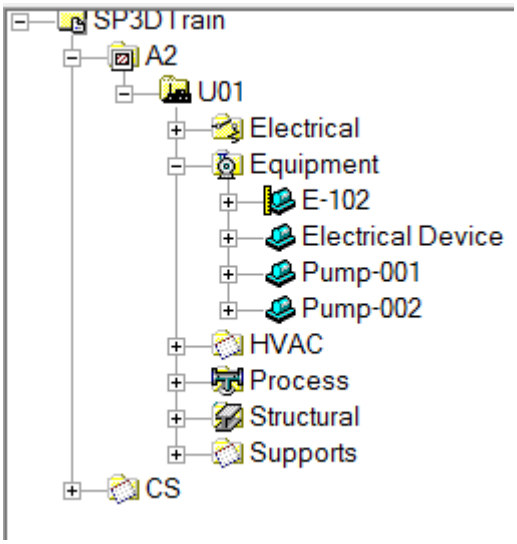
   The dimension is placed and is immediately replaced by the label contents.



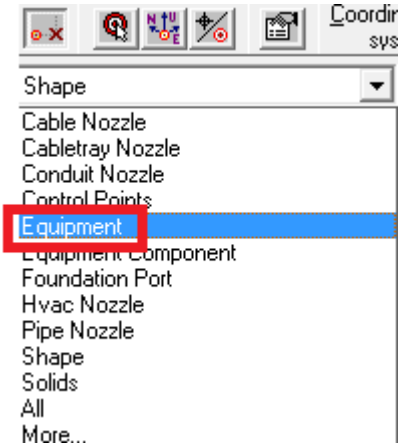
5. Click **File > Exit** to exit **SmartSketch Drawing Editor**. Click **Yes** to save the drawing.

Modify the 3D Model

1. Click **Tasks > Equipment and Furnishings** to enter the task to modify the position of an equipment object.
2. Select the face that changes the look direction to **Looking Plan** on the **Common Views** dialog box.
3. Click **Fit** .
4. Select the **System** tab of the **Workspace Explorer**.
5. Expand the **A2**, **U01**, and **Equipment** nodes.



6. Select **Equipment** from the **Locate Filter** list in the upper left area of the **Smart 3D** window.



7. Select **Pump-002** on the **System** tab of the **Workspace Explorer** to select the object in the graphic window.
8. Click **Edit > Copy**.
9. Use the **PinPoint** ribbon to define the reference point of the copy:

10. Type **0** in the **E** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **0 ft 0.00 in** and is locked.*

11. Type **0** in the **N** field on the **PinPoint** ribbon. Press TAB.

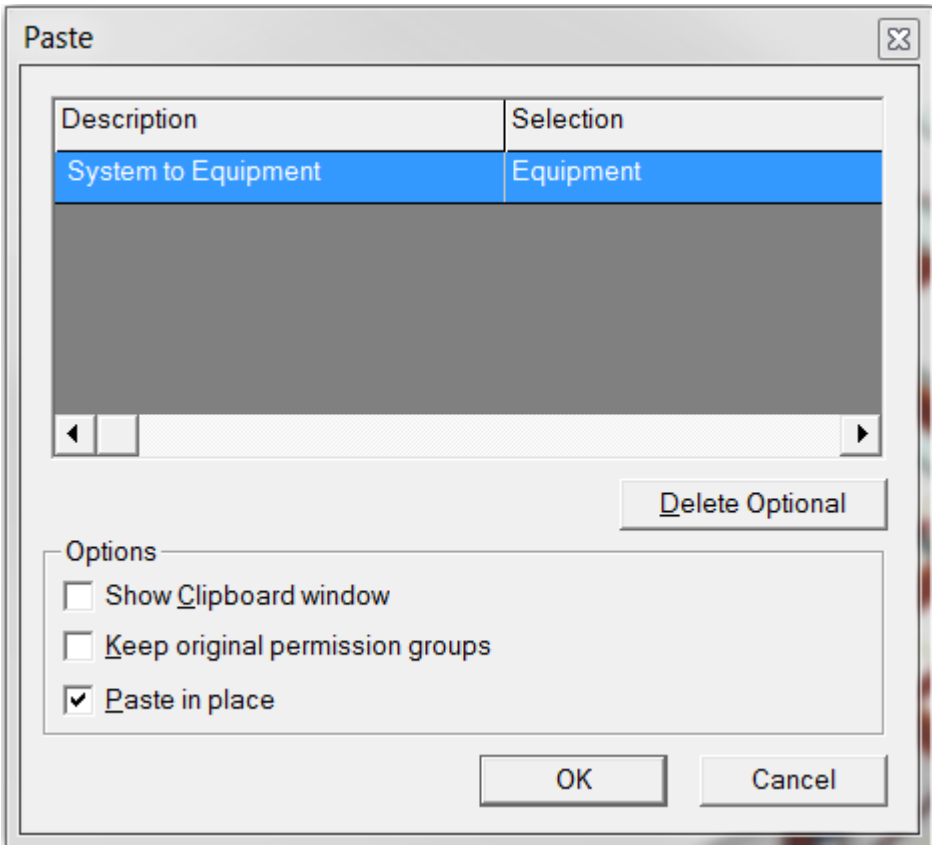
    *The field displays **0 ft 0.00 in** and is locked.*

12. Type **0** in the **El** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **0 ft 0.00 in** and is locked.*

13. Click anywhere in the graphic view to complete the definition of the origin point of the copy.
14. Click **Edit > Paste.**

    *The **Paste** dialog box displays.*



15. Clear **Paste in place**.
16. Click **OK** on the **Paste** dialog box.
17. Use the **PinPoint** ribbon to define the destination point of the pasted object:
18. Type **-10** In the **E** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **-10 ft 0.00 in** and is locked.*

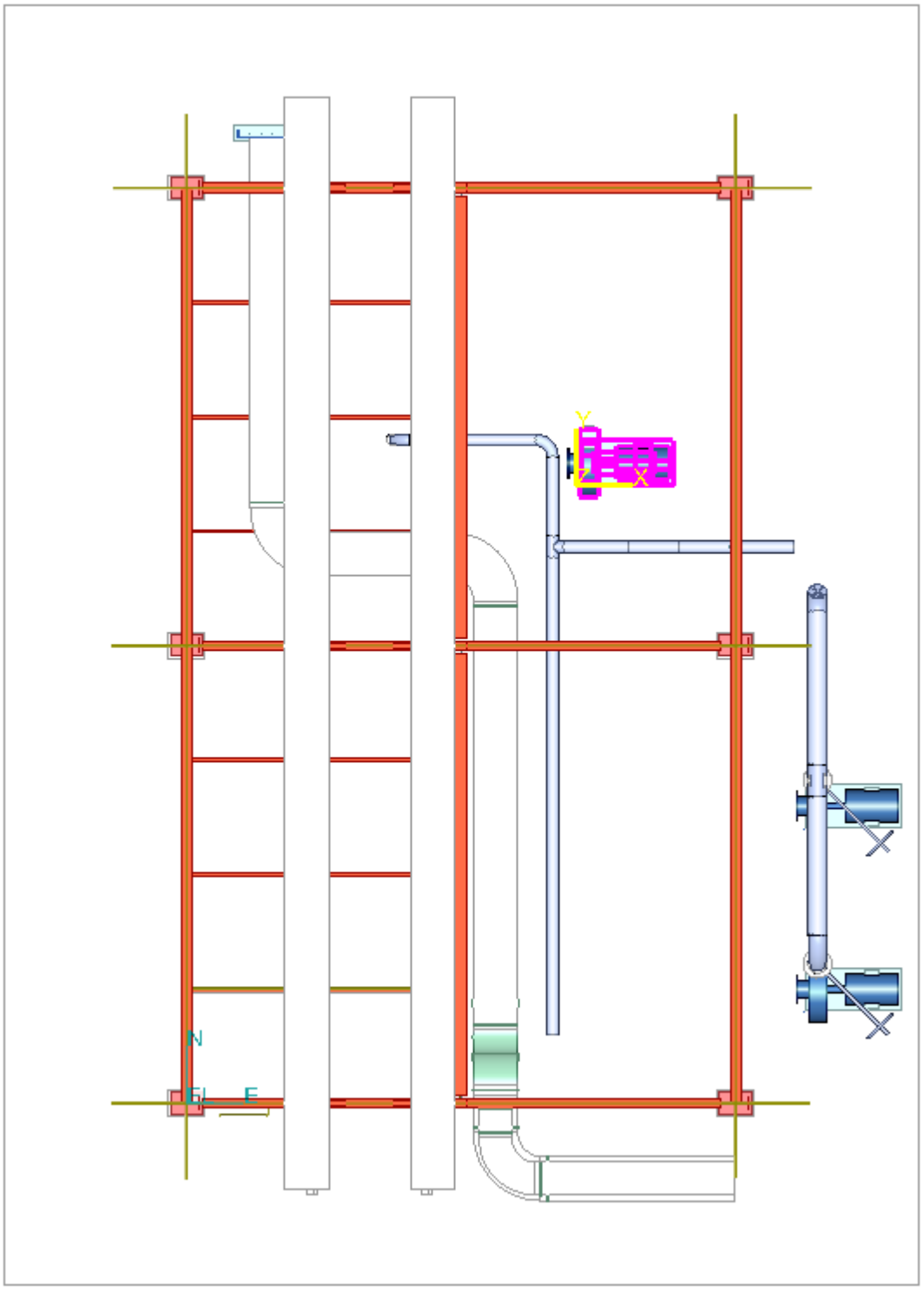
19. Type 15 in the **N** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **15 ft 0.00 in** and is locked.*

20. Type **0** in the **El** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **0 ft 0.00 in** and is locked.*

21. Click anywhere in the graphic view to complete placement of the pasted object.

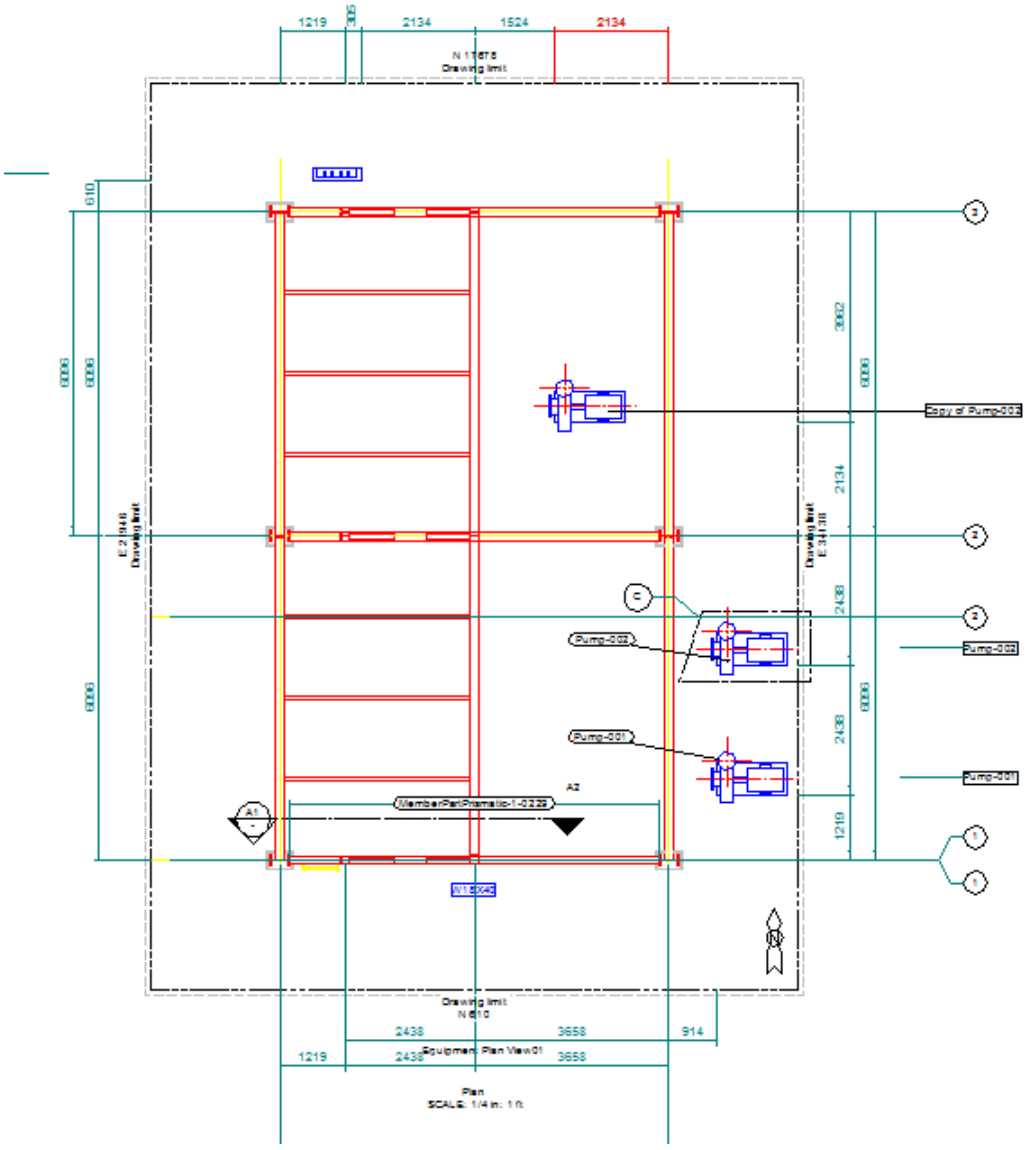


22. Right-click in the graphic window to clear the selection from the pasted object.
23. Switch to the **Drawing Console** window.
24. Right-click **Drawings Creation Labs\10\Equipment Plan01,** and select **Update Now.**

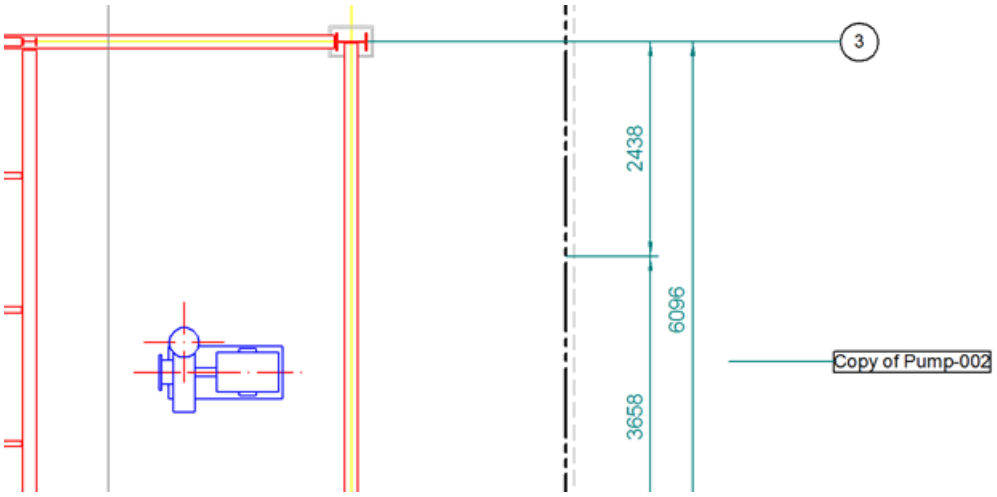
    The software generates the contents of the drawing.
25. When the update completes (as shown by the status barmessage in the lower left corner of the Smart 3D window), right-click **Equipment Plan01***,* and select **Edit**.

    *The **SmartSketch Drawing Editor** window displays.*
26. Maximize the drawing window in **SmartSketch Drawing Editor**.
27. Click **Fit** .

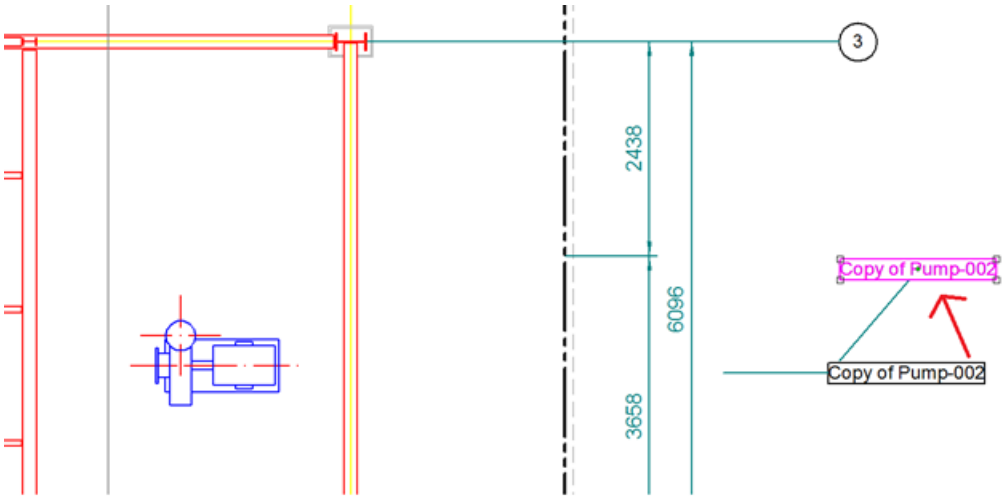
    The results in the main view should look similar to the picture below:



28. Click **Zoom Area** .
29. Drag a rectangle around the top half of the view to get a closer look at the contents.



30. Right-click to exit **Zoom Area**.
31. Select the label that displays **Copy of Pump-002**.
32. Drag the label to a position slightly up and to the left of its original position.



33. Click **File > Exit** to exit **SmartSketch Drawing Editor**. Click **Yes** to save the drawing.
34. Select **Copy of Pump-002** on the **System** tab of the **Workspace Explorer.**

    The object highlights in the graphic window.
35. Click **Move** on the **Common** toolbar.

    *The **Move** ribbon displays.*

*The selected object is attached to the cursor and the **Move To** button on the ribbon is*

enabled.

36. On the **Move** ribbon, select the **Move From** button.

37. Use the **PinPoint** ribbon to define the origin point of the move:
38. Type **0** in the **E** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **0 ft 0.00 in** and is locked.*
39. Type **0** In the **N** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **0 ft 0.00 in** and is locked.*
40. Type **0** in the **El** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **0 ft 0.00 in** and is locked.*
41. Click anywhere in the graphic view to complete the definition of the origin of the move.
42. Use the **PinPoint** ribbon to define the destination point of the move:
43. Type **0** In the **E** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **0 ft 0.00 in** and is locked.*
44. Type **5** In the **N** field on the **PinPoint** ribbon. Press TAB.

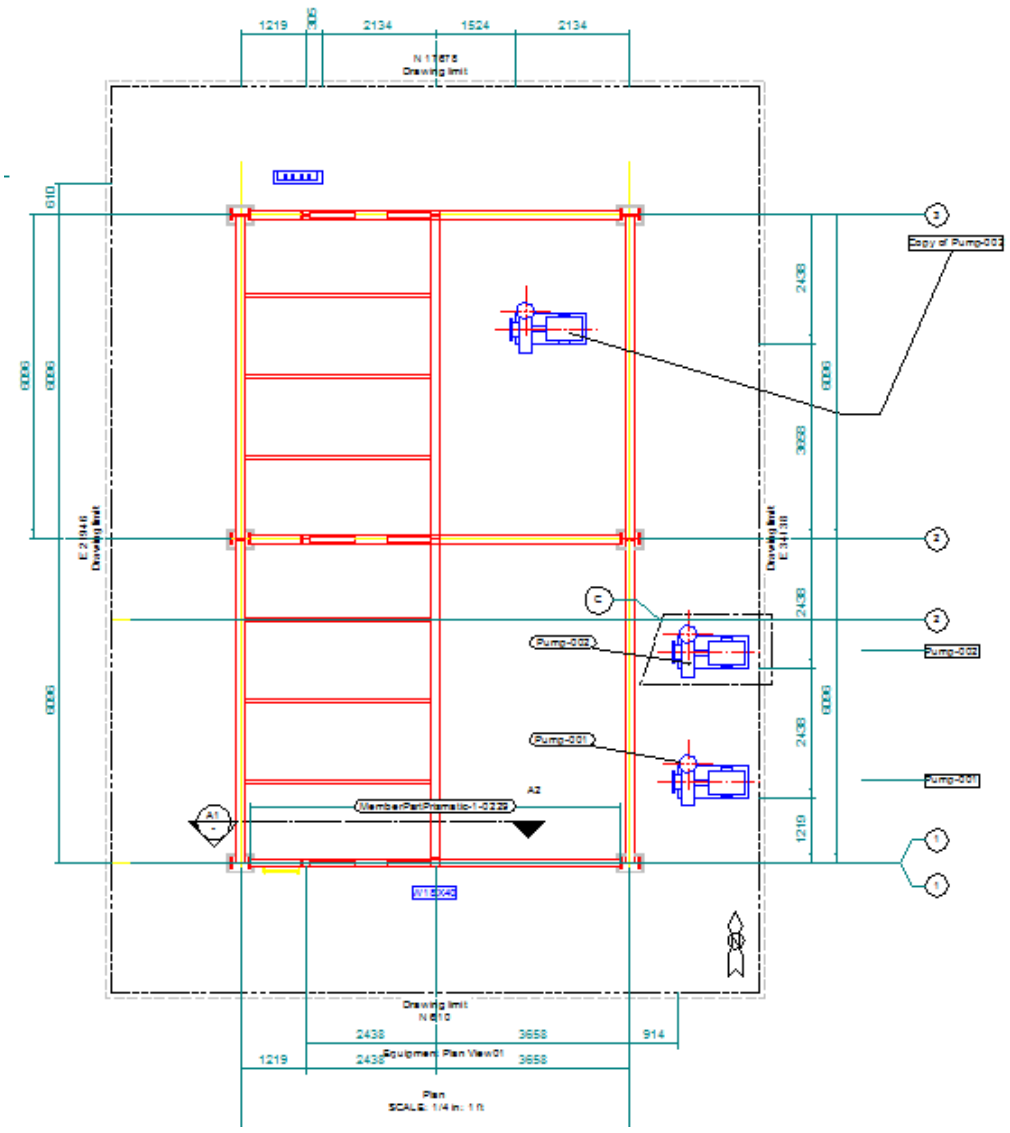
    *The field displays **5 ft 0.00 in** and is locked.*
45. Type **0** in the **El** field on the **PinPoint** ribbon. Press TAB.

    *The field displays **0 ft 0.00 in** and is locked.*
46. Click anywhere in the graphic view to complete the move of the object.
47. Right-click in the graphic window to clear the selection from the moved object.
48. Switch to the **Drawing Console** window.
49. Right-click **Equipment Plan01,** and select **Update Now**.

    The software generates the contents of the drawing.
50. When the update completes, right-click **Equipment Plan01,** and select **Edit**.

    *The **SmartSketch Drawing Editor** window displays.*
51. Maximize the drawing window in **SmartSketch Drawing Editor**.
52. Click **Fit** .

The results in the main view should look similar to the picture below:



The equipment reflects the new position in the model, but the modified label stays where it was moved.

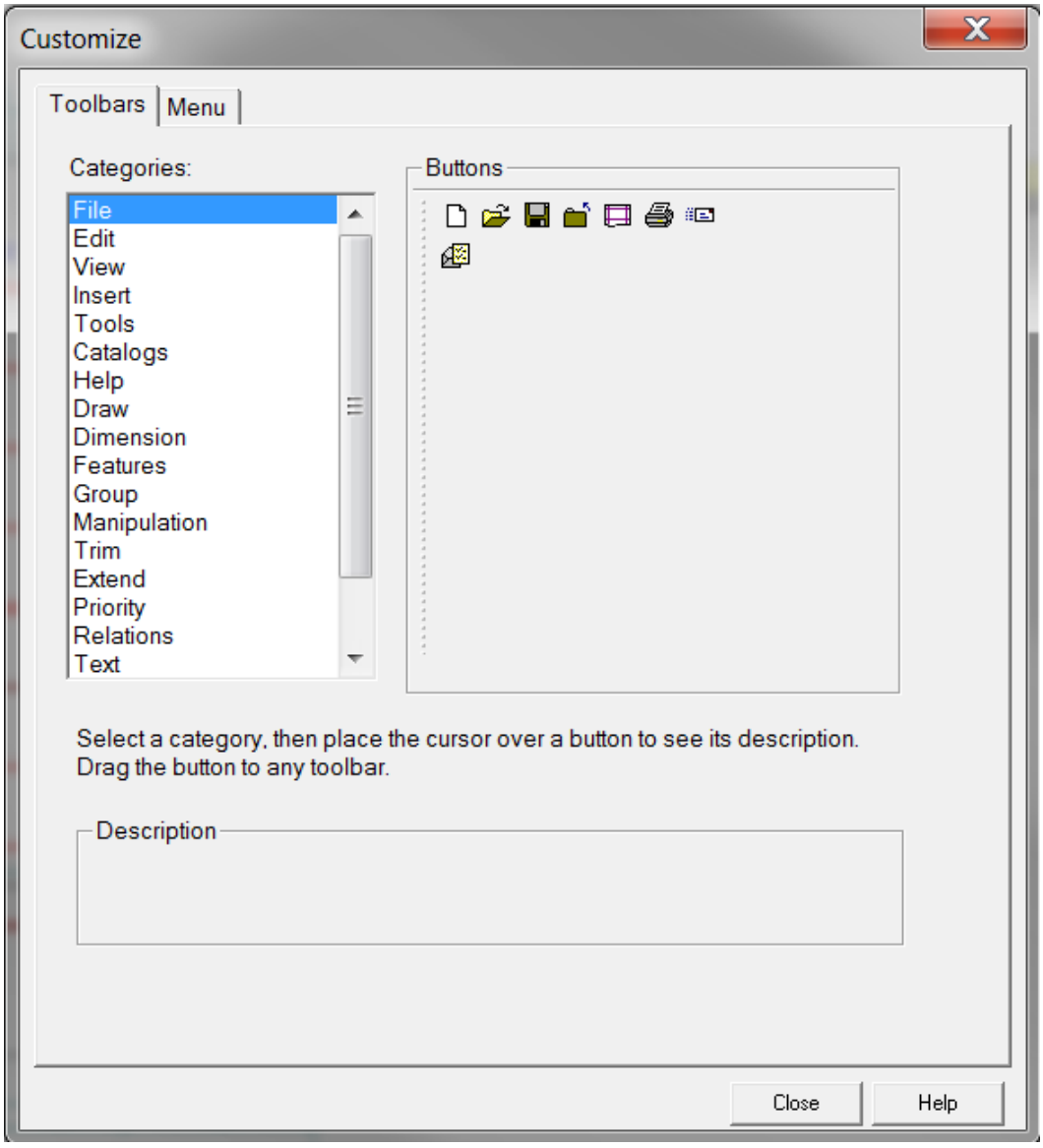
The leader extends to connect to the new position of the equipment.

TIP Labels that have been *manually* placed with the **Place a Label** command maintain their position after update. In addition, automatically-place labels that have been moved or modified also maintain their position after update. Only labels that are automatically-placed and never modified or moved will move with the labeled object on update.

Add Drawings Custom Commands

1. Click **Tools > Customize** in **SmartSketch Drawing Editor**.

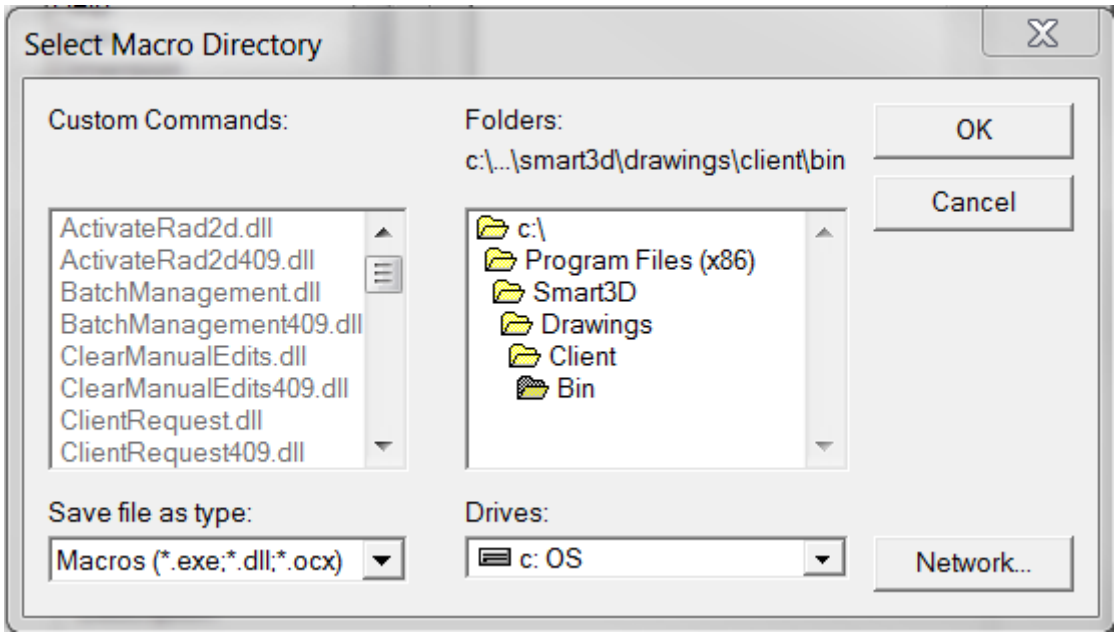
   *The **Customize** dialog box displays.*



2. Scroll to the bottom of the **Categories** list, and select **Custom Commands**.
3. Click **Browse** on the **Customize** dialog box.

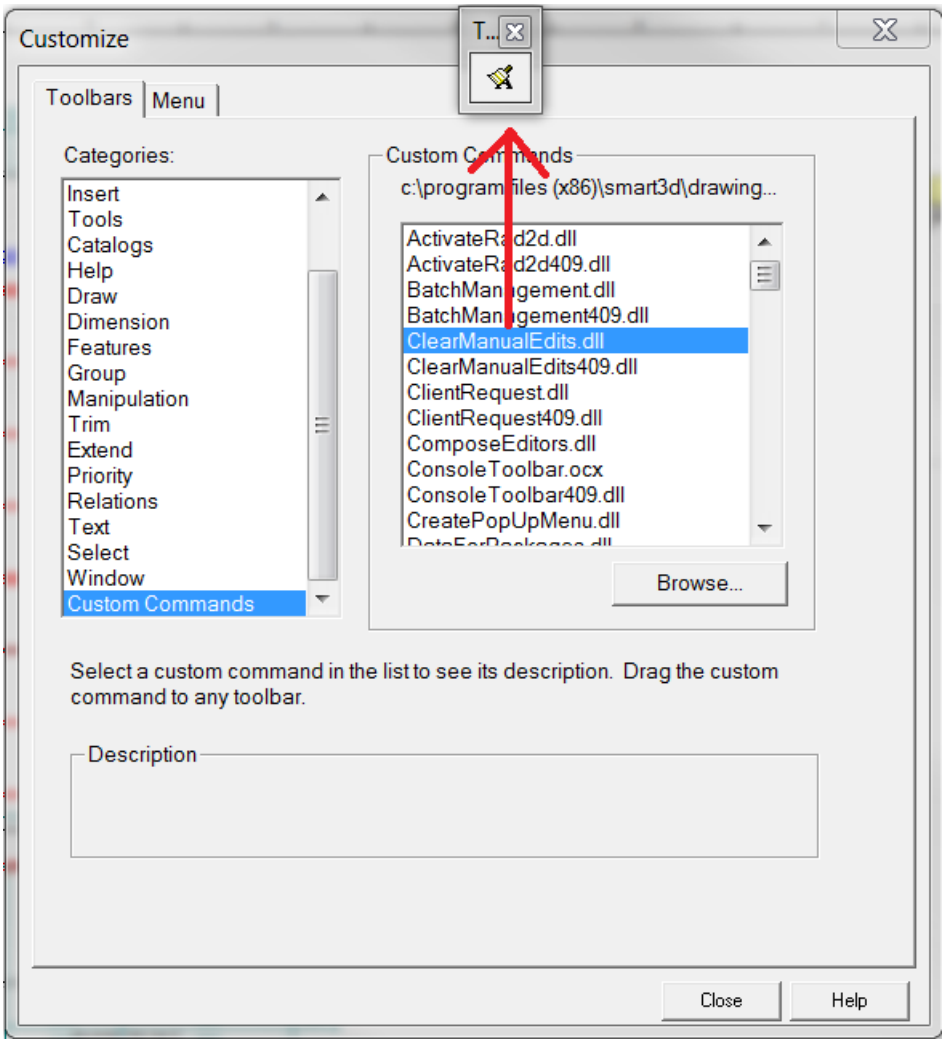
   *The **Select Macro Directory** dialog box displays.*

4. Browse to the folder *[Smart 3D Installation Directory]\Drawings\Client\Bin* in the **Select Macro Directory** dialog box .



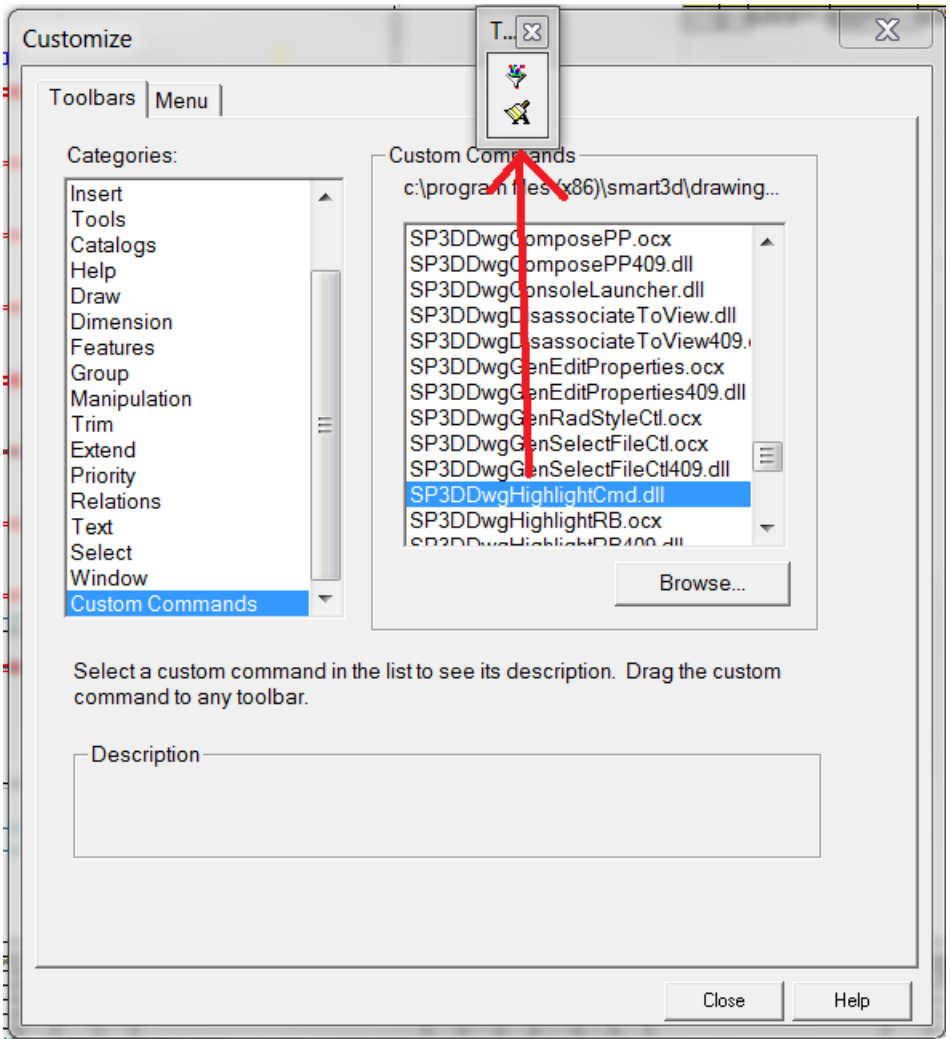
5. Click **OK** on theSelect Macro Directory dialog box to return control to the **Customize** dialog box.
6. Crag **ClearManualEdits.dll** from the **Custom Commands** area to the toolbar area of **SmartSketch Drawing Editor** on the **Customize** dialog box.

The software creates a new toolbar and adds an icon to it.



7. Scroll through the **Custom Commands** list, and drag **SP3DDwgHighlightCmd.dll** from the **Custom Commands** area to the **Clear Manual Edits** toolbar.

*The software adds the **Highlight** button to the toolbar.*

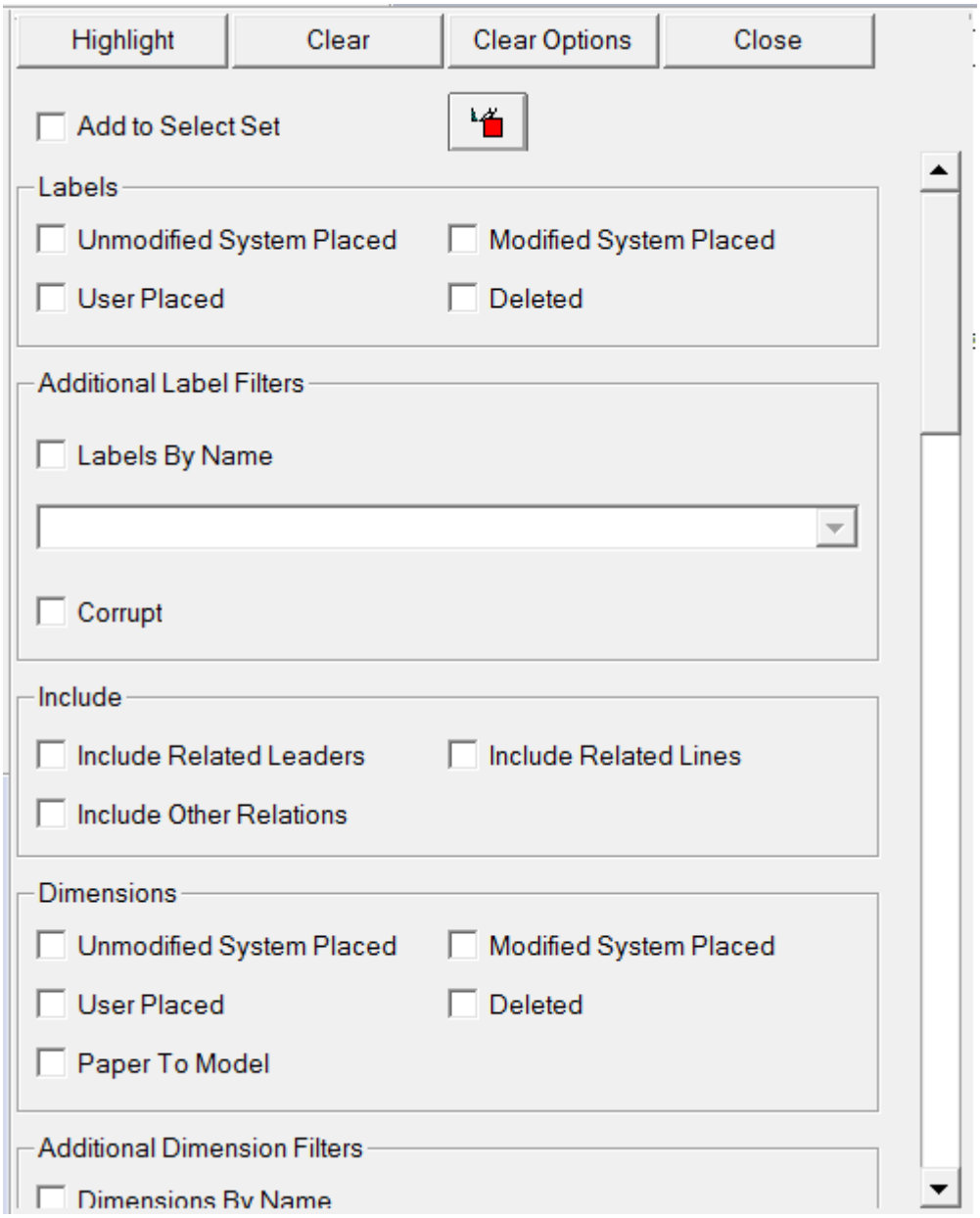


8. Click **Close** on the **Customize** dialog box.

Use the Highlight Command

1. Click **Highlight** .

*The **Highlight** dialog box displays docked to the left of the graphic window.*

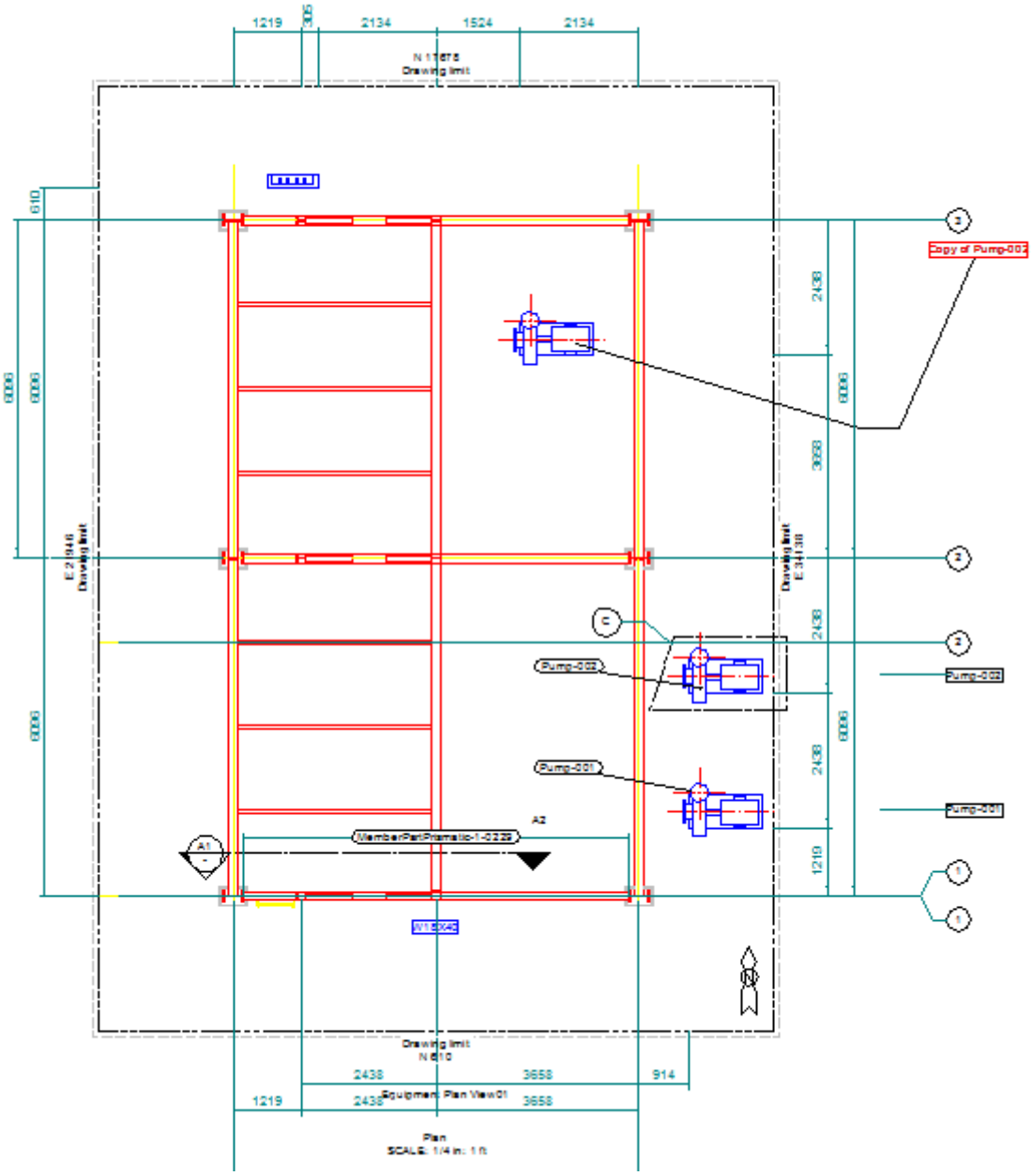


TIP The **Highlight** dialog box highlights or selects labels and dimensions based on their state or source.

This can be useful for troubleshooting when it is necessary to determine the source of the annotation.

2. Select **Modified System Placed,** and click **Highlight** on the **Highlight** dialog box to highlight automatically-placed labels that have been moved or modified.

*The only label that highlight is the one that says **Copy 0f Pump-001**, which was moved in a previous section of this lab.*

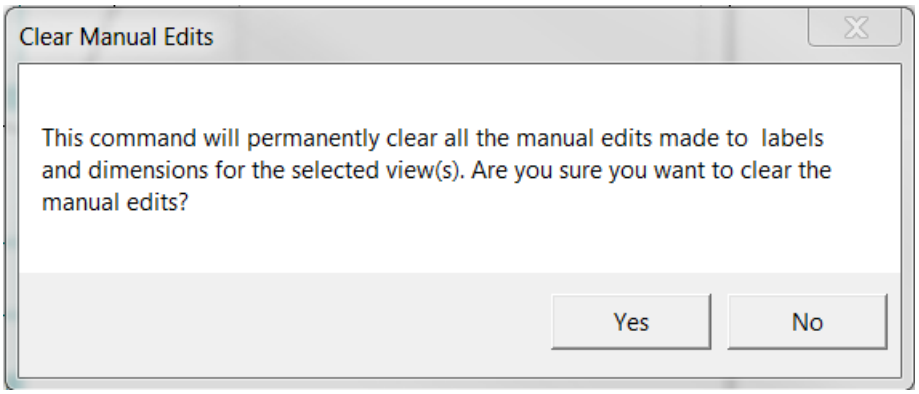


3. Click **Close** on the **Highlight** dialog box.

Clear Manual Edits

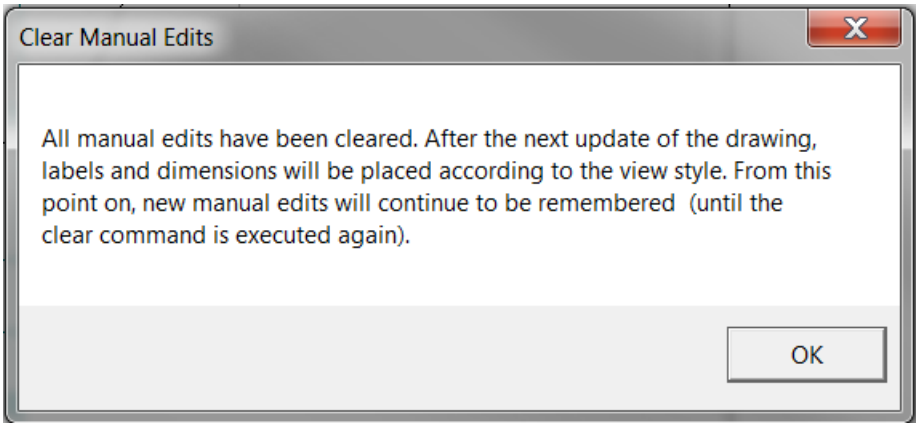
1. Select the main graphic view.
2. Click **Clear Manual Edits** .

   A message displays indicating that the software will remove any manual edits made to automatically-placed labels and dimensions as well as manually-placed labels and dimensions.



3. Click **Yes** on the message box.

   A message displays explaining that the software will remove the edits after the next update.



TIP The message does not mention that it is necessary to save the drawing before performing the update to remove the manual edits.

4. Click **OK** on the message box.
5. Click **File > Exit** to exit **SmartSketch Drawing Editor**. Click **Yes** to save the drawing.
6. Switch to the **Drawing Console** window.
7. Right-click on the drawing **Equipment Plan01,** and select **Update Now.**

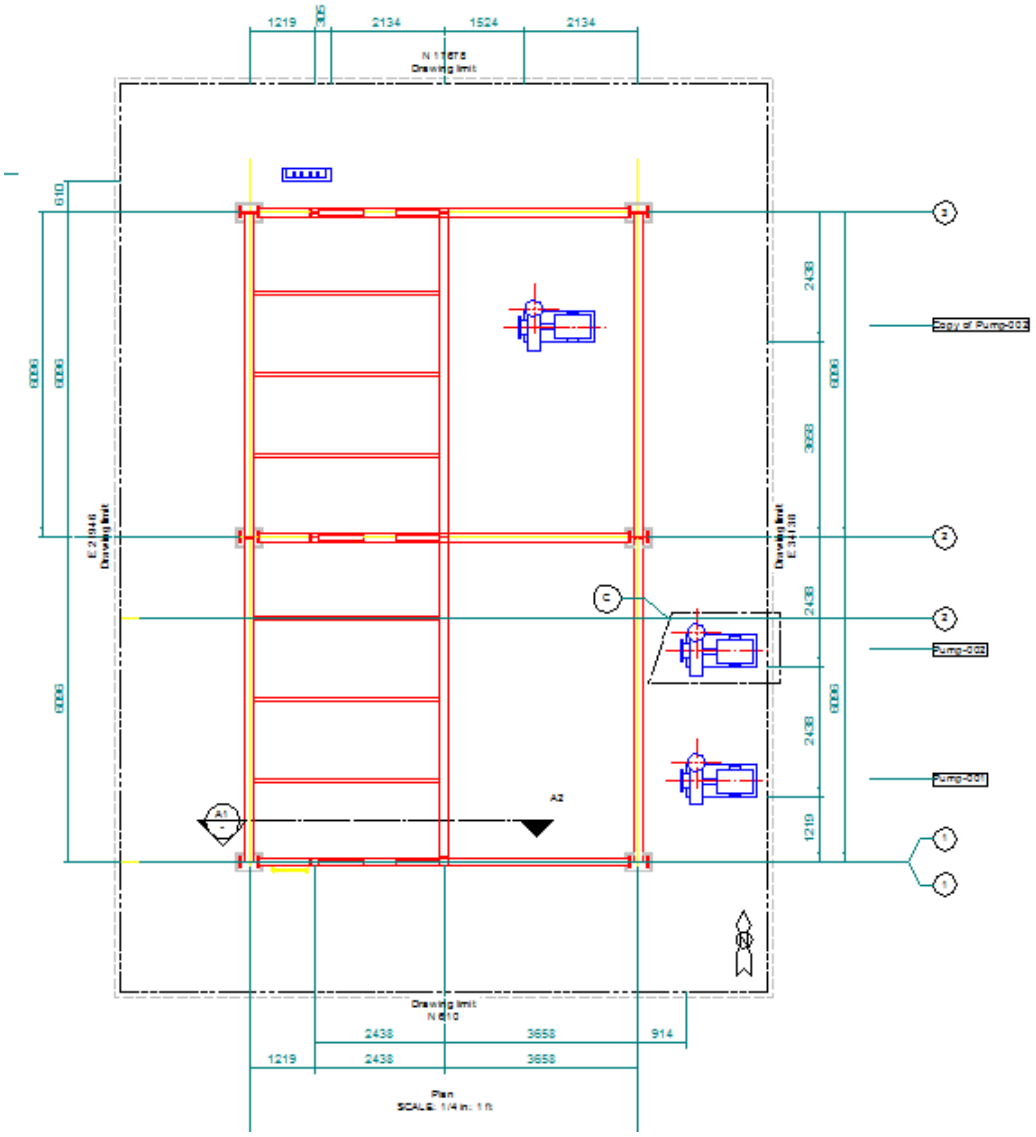
   The software generates the contents of the drawing.

8. When the update completes, right-click on the drawing **Equipment Plan01,** and select **Edit**.

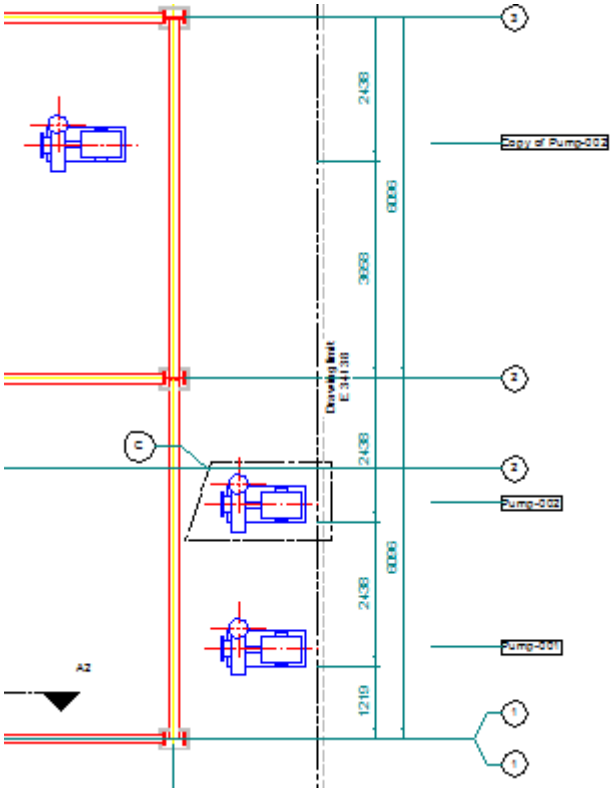
   *The **SmartSketch Drawing Editor** window displays.*

9. Maximize the drawing window in **SmartSketch Drawing Editor**.
10. Click **Fit** .

    The results in the main view should look similar to the picture below:



The manually-placed labels are removed and the label for the new pump has moved.



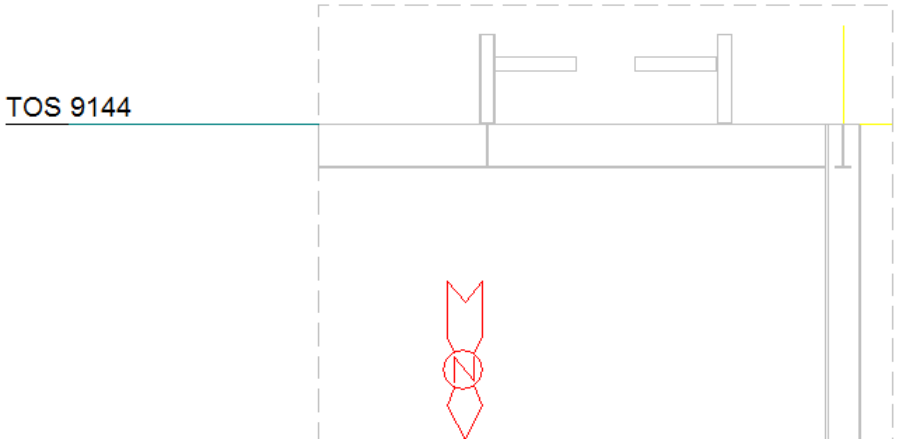
11. Click **File > Exit** to exit **SmartSketch Drawing Editor**. You do not need to save the drawing because you did not change it.

Use the Smart Dimension Command

1. Switch to the **Drawing Console** window.
2. Right-click **Drawings Creation Labs\10\Section and Detail Views,** and select **Edit**.

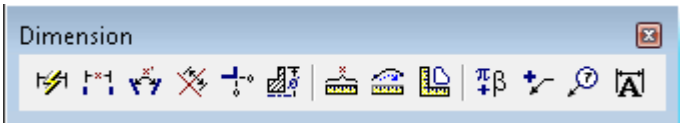
   *The **SmartSketch Drawing Editor** window displays.*
3. Maximize the drawing window in **SmartSketch Drawing Editor**.
4. Click **Fit** .
5. Click **Zoom Area** .

6. Drag a rectangle around the top half of the section view to get a closer look at the contents.



7. Right-click to exit **Zoom Area**.
8. Click **Dimension** .

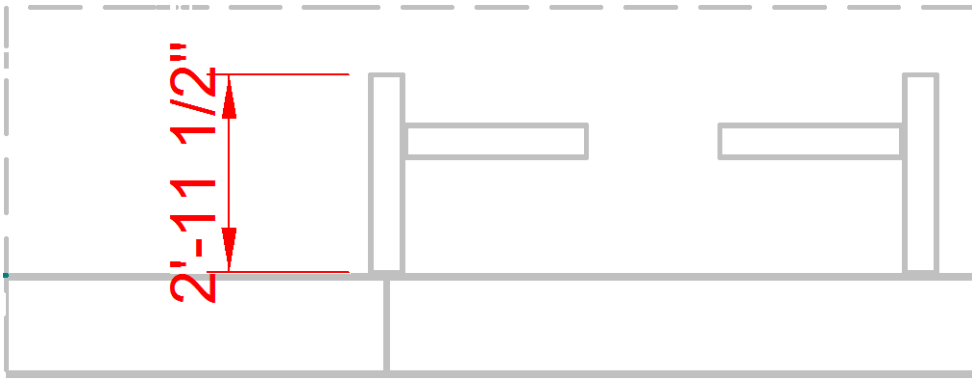
   *The **Dimension** toolbar displays.*



9. Drag the **Dimension** toolbar to the toolbar area to dock it.
10. Click **SmartDimension** on the **Dimension** toolbar.

    *The status bar displays **Click on an element to dimension**.*

11. Select the left edge of the column as shown in the picture below to display the dimension attached to the cursor.



TIP The value of the dimension is in *model space*. Dimensioning elements that exist within the view (that is, embedded within the SmartFrame element) applies the scale of the view to the dimension.

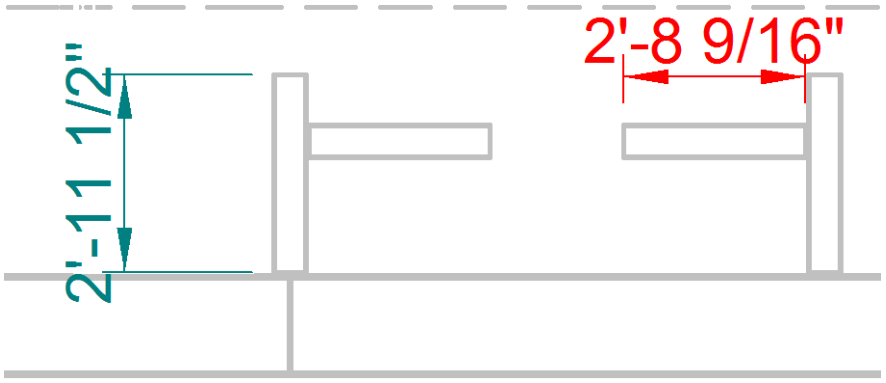
*The status bar displays **Click to create the dimension**.*

12. Click to the left of the column to place the dimension.

*The status bar displays **Click on an element to dimension**.*

*The **SmartDimension** command is still active.*

13. Select the top edge of the beam at the right as shown in the picture below to display the dimension attached to the cursor.



14. Click above the beam to place the dimension.

Use the Distance Between Dimension Command

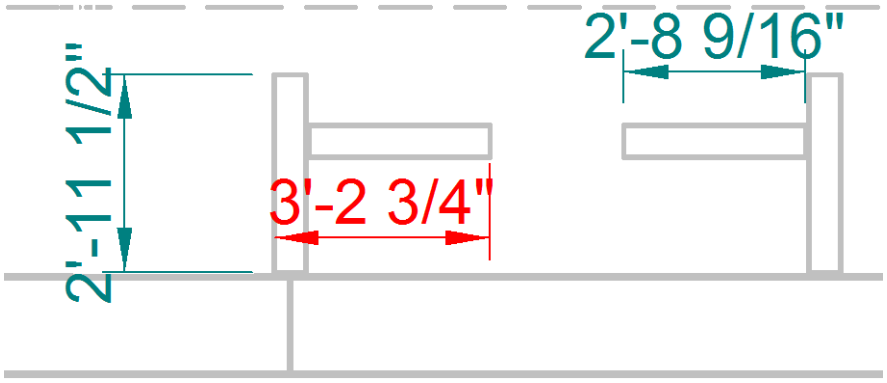
1. Click **Distance Between** on the **Dimension** toolbar.

   *The status bar displays **Click on the dimension origin element**.*

2. Select the same left edge of the column as before to define the start point of the dimension.

   *The status bar displays **Click on the dimension measurement element**.*

3. Select the right edge of the left beam as shown in the picture below to display the dimension attached to the cursor.



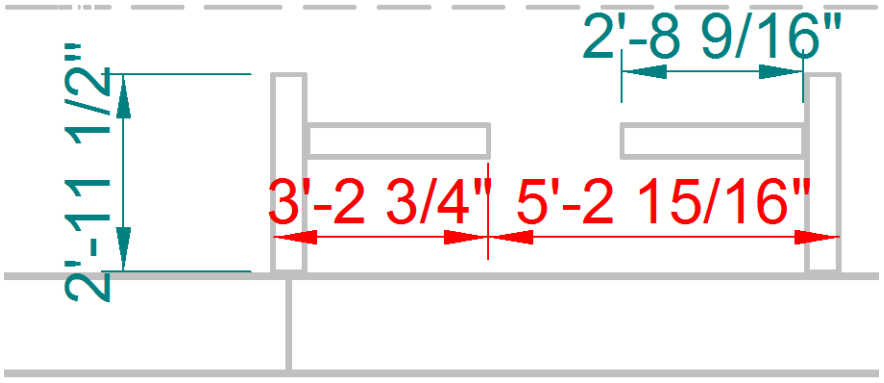
   *The status bar displays **Click to create the dimension**.*

4. Click below the beam to place the dimension.

   *The status bar displays **Click on the dimension measurement element**.*

   *The **Dimension Between** command is still active.*

5. Select the right edge of the right column as shown in the picture below to display the dimension attached to the cursor.

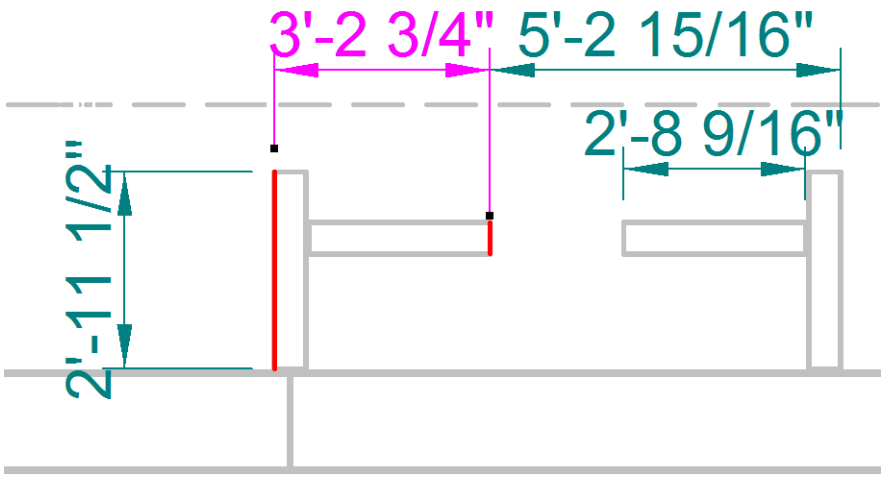


If you move the cursor to the right of the first dimension, the second dimension is automatically aligned with the first dimension placed. If you move the cursor below the first dimension, the second dimension is stacked with the first dimension.

*The status bar displays **Click to create the dimension**.*

6. Click alongside the first dimension so that the second is aligned with it.
7. Press ESC to exit **Dimension Between**.
8. Drag the first dimension line that you placed (not the dimension text but the dimension line) above the beams.

The second dimension is still aligned with the first dimension when the move is complete.



TIP Dimensions placed with **Dimension Between** are grouped. However, it depends on which dimension in the group is moved that determines whether the group moves as one element. If the first dimension (the *master* dimension) is moved, the other dimensions move with it. If another dimension is moved, it moves independently; no other dimension moves.

9. Click **File > Exit** to exit **SmartSketch Drawing Editor**. Click **Yes** to save the drawing.