

Session 2: Creating a Volume Drawing

Objective:

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

- Create and update a volume drawing.

Prerequisite Sessions:

- SP3D Overview
- SP3D Common Sessions
- Drawings: An Overview

Overview:

Most general arrangement and construction drawings use a template that shows a large view of a small portion of a model. As a result, many of these drawings are needed to cover the entire model. Volume drawings enable you to document many areas of a model with the same drawing template, eliminating the need to create multiple drawings to cover different areas of the model.

A volume drawing component uses a template to create drawings. So, an SP3D administrator needs to create new view styles and templates for use with the drawings or edit the existing styles and templates, as appropriate. For example, the administrator can place title block labels and reports on templates to reflect your project or company standards.

Once the templates and view styles are created or edited, you can place a view on a template and associate the view with a view style to determine the appearance of the resulting drawing. You can then define the contents of the view by creating a drawing volume, which is associated to single or multiple views, in the template. You place a drawing volume in the **Space Management** task.

Before you can create drawings in the Drawings and Reports environment, Microsoft Excel must be configured on your system **Execution of embedded reports:** Many drawings and reports use Visual Basic macros. Without enabling Microsoft Excel to run embedded reports, you will not be able to run the drawings and reports. Therefore, you need to enable this setting on your system by performing the following steps

In Microsoft Excel 2003:

1. On the menu bar, click the **Tools > Macro > Security** command. The Security dialog box is displayed.
2. Click the **Trusted Sources** tab, select the **Trust access to Visual Basic Project** check box, and then click **OK**, as shown in Figure 1

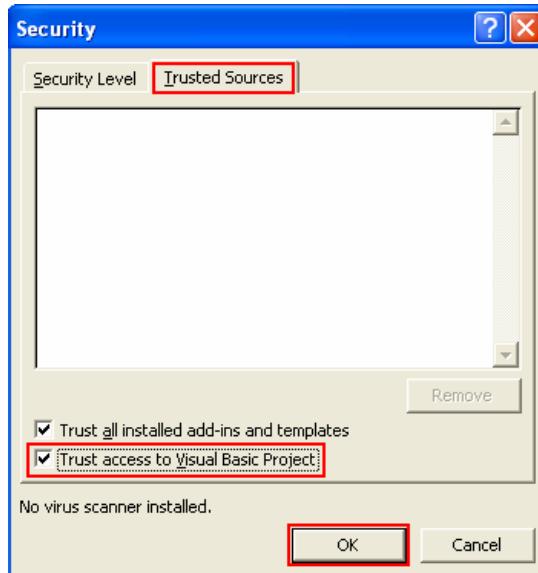


Figure 1: Security Dialog Box

In Microsoft Excel 2007

1. Click the Office Button in the top left corner of the Excel application. In the resulting form, click Excel Options as shown in Figure 2

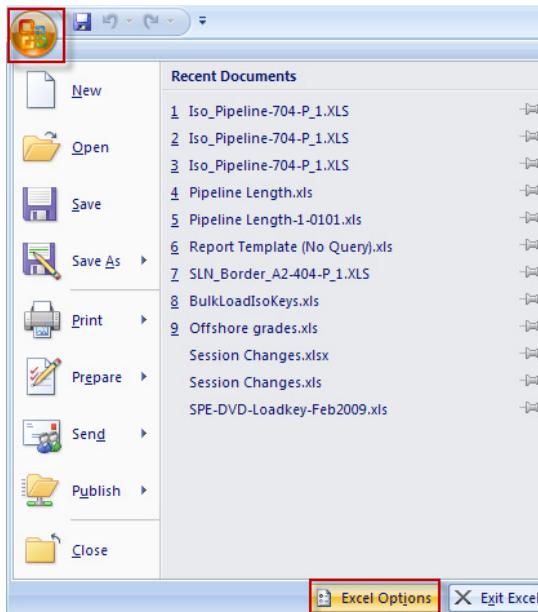


Figure 2: Accessing Excel Options in Excel 2007

2. Click Trust Center in the left column and click the Trust Center Settings... button as shown in Figure 3.

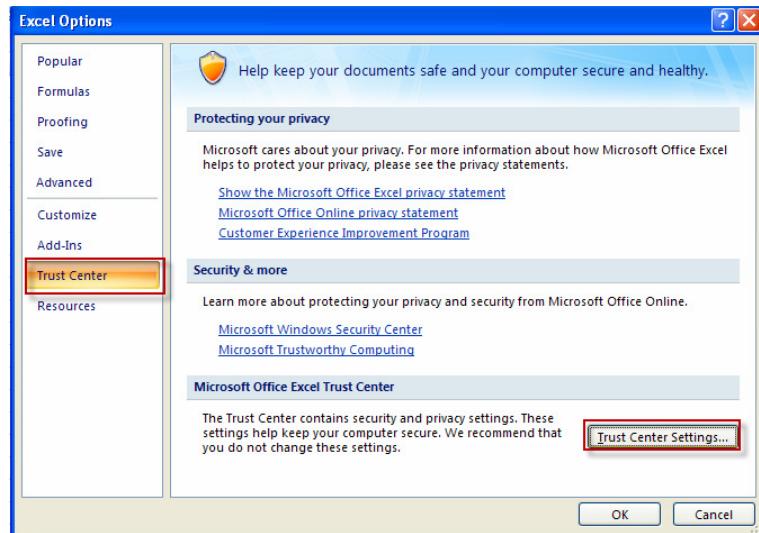


Figure 3: Accessing Trust Center Settings

3. Click Macro Settings in the left column, and check the box Trust access to the VBA project object model. Then click OK to accept the Trust Center Settings and click OK again to save Excel Options.

Creation of volume drawings involves the following tasks:

1. **Adding a volume drawing component:** The drawing components are organized into folders, which can be added to the root folder in the Management Console and other folders. Each component has a different icon and right-click menu.
2. **Placing a drawing volume:** Drawing volumes are a critical piece of the volume drawing creation process. Drawing volumes are different from the other drawing components in that they exist in the 3D model as objects. These volumes are placed and associated with the appropriate volume drawing component to create a volume drawing. You can define a drawing volume by using the **Place Drawing Volume** commands in the **Space Management** task. You can also specify the size of a volume based on the grid coordinates in the model. Volumes can be placed using the following commands:
 - o Place Drawing Volume by View
 - o Place Drawing Volume by Selection
 - o Place Drawing Volume by Two Points
 - o Place Drawing Volume by Four Points

Volumes are stored in the Plant database. The software automatically names a volume and places it in the space hierarchy. When a 3D task, such as Piping, is active, you can see the defined volumes on the **Space** tab of the **Workspace Explorer**, which makes it easy to locate and manipulate drawing volumes.

3. **Updating the drawing:** The drawings can be updated either individually or multiple drawings at a time. The drawings may be updated on your client workstation using

'Update Now' or sent to a batch server if one has been setup.

In this session, you will learn how to place drawing volumes by using all four commands.

Caution:

- If you delete a drawing volume in the model, the software deletes any associated drawings and views.

Steps For Creating Volume Drawings:

You will create volume drawings in Units **U01** and **U02** of your workspace by performing the following tasks. These steps are an overview, detailed steps follow in the next section:

Add a **Piping Plan** drawing component to the **Drawings** folder. The hierarchy in the **Drawing Console** after adding the component will resemble Figure 4.



Figure 4 Piping Plan Component in Drawing Console Hierarchy

- A. Place drawing volumes in Units **U01** and **U02** of your workspace.
 - i) Place two drawing volumes under the space folder **Drawing Volumes** in Unit **U01** of your workspace by using **Place Drawing Volume by View** command of following specifications:

First drawing volume: E: 72', N -2', El -3'

Second drawing volume: E: 72', N 32' 6". El -3'

The elevation for both the volumes should be **33'**. The view of the model after placing the volumes will resemble Figure 5.

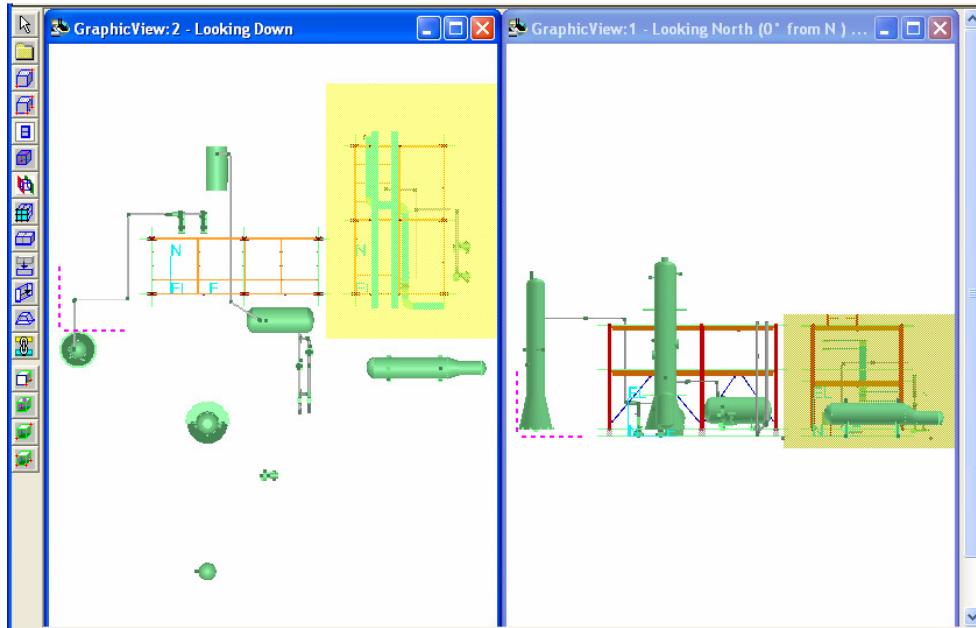


Figure 5 Final Output - After Placing the Volumes

- ii) Place a drawing volume under the space folder **Drawing Volumes** in Unit **U02** of your workspace by using the **Place Drawing Volume by Selection** command. The view of the model after placing the volume should resemble Figure 6.

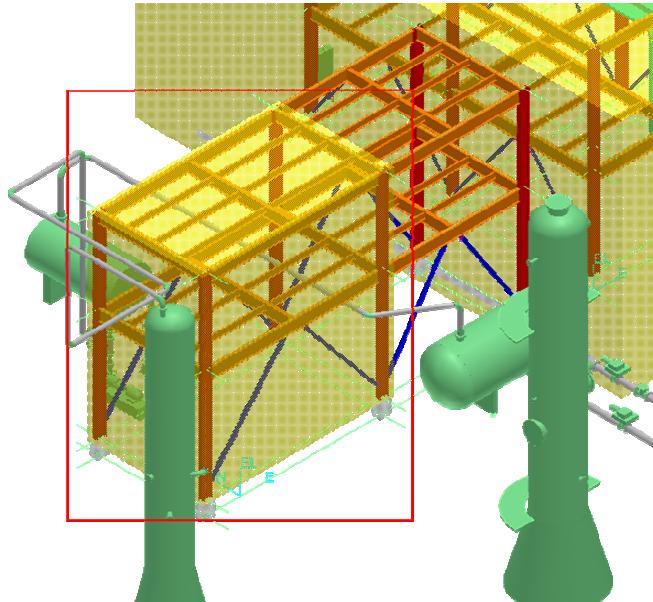


Figure 6 Final Output - After Placing the Volume

- iii) Place a drawing volume under the space folder **Drawing Volumes** in Unit **U02** of your workspace by using the **Place Drawing Volume by Two Points** command. The following are the specifications for the volume:

© Copyright 2007 Intergraph Corporation

First point: E: 50', N: 9', EL: 2'
Second point: E: 72', N: 26' EL: 30'

The view of the model after placing the volume should resemble the highlighted area in Figure 7.

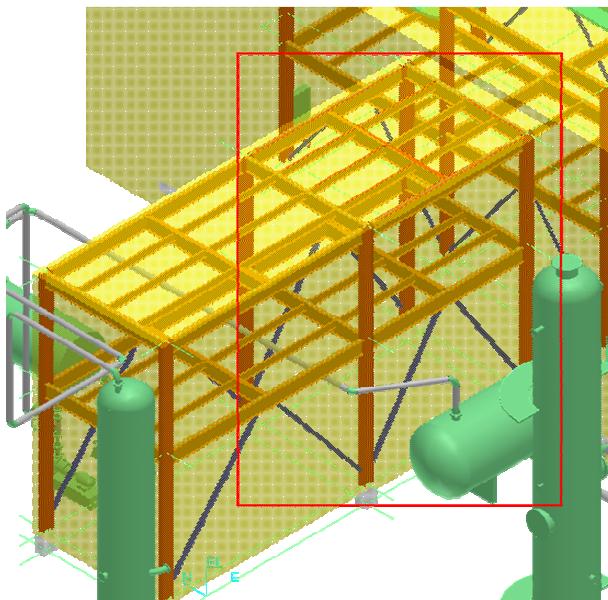


Figure 7 Final Output - After Placing the Volume

- iv) Place a drawing volume under space folder **Drawing Volumes** in Unit **U01** of your workspace by using **Place Drawing Volume by Four Points** command. Use the following specifications for the volume:

First point: E: 72', N: 58', EL: 0'
Second point: E: 72', N: 2', EL: 0'
Third point: E: 112', N: 2', EL: 0'
Fourth point: E: 112', N: 2', EL: 33'

The view of the model after placing the volume should resemble Figure 8.

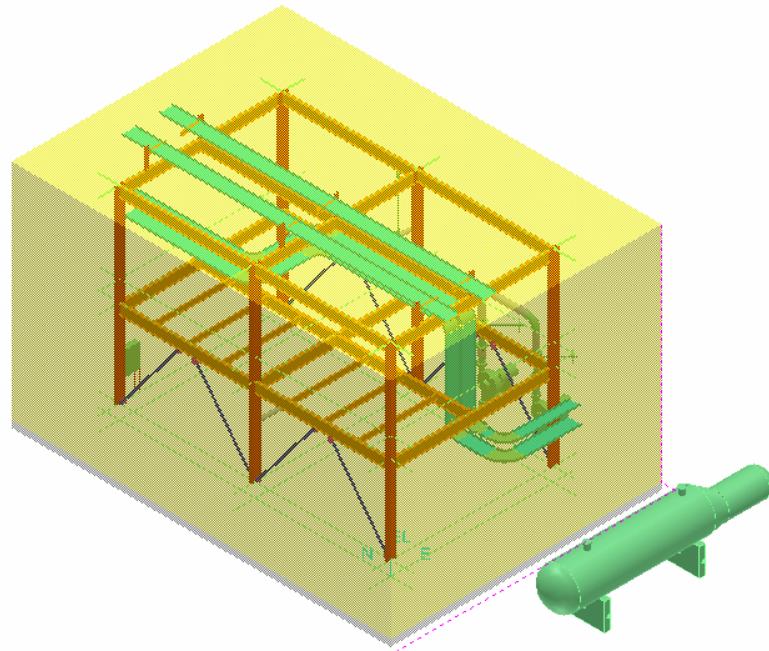


Figure 8 Final Output - After Placing the Drawing Volume

Adding a Volume Drawing Component:

Define your workspace to display U01 & U02, the units where the drawing volume component needs to be added, by using a system filter, as shown in Figure 9.

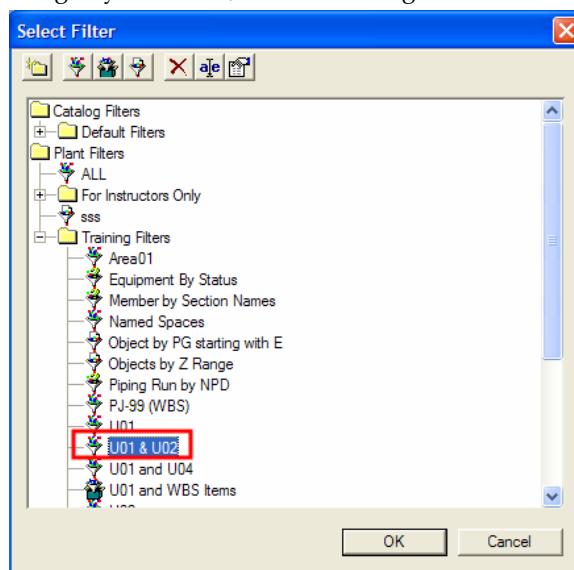


Figure 9: Select Filter Dialog Box

Click the Tools > Drawings Console command to open the Drawings Console as shown in Figure 10.

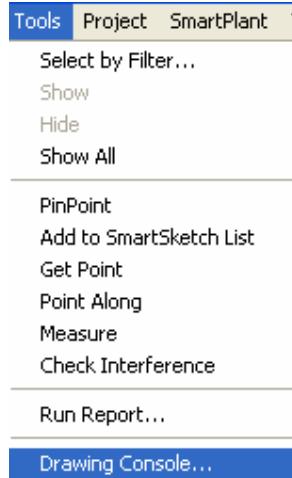


Figure 10: Tools > Drawing Console Command

1. In the Drawing Console, , right-click the **Drawings** folder and select **New...** to add the **Piping Plan** drawing component.
2. In the Add Component dialog box, click the **Piping** tab to view the components under it. Select **Imperial_Piping Plan**, and click **OK**, as shown in Figure 11.

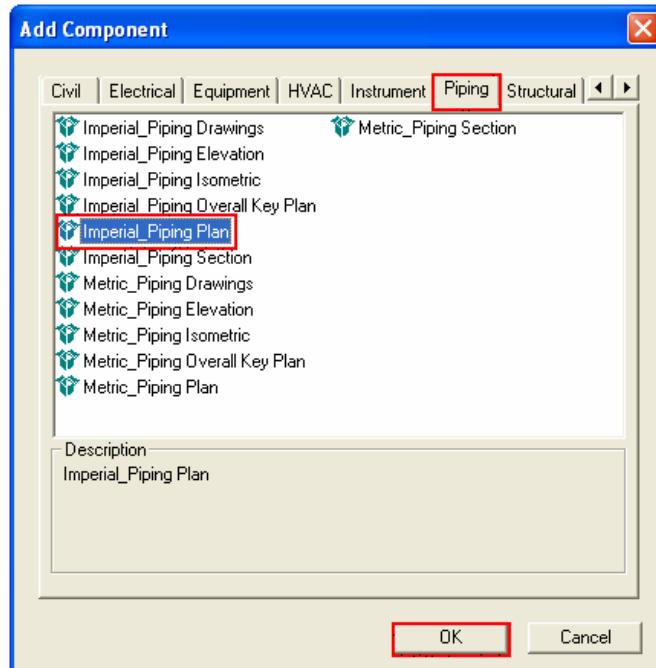


Figure 11: Piping Tab in the Add Component Dialog Box

This adds the **Imperial_Piping Plan** component to the **Drawings** folder. The folder is displayed in the **Drawing Console** hierarchy, as shown in Figure 12.



Figure 12: Piping Plan Component in Drawing Console Hierarchy

Placing the Drawing Volumes:

Now, you will place the drawing volumes by using the commands available in the Space Management task environment. Before placing the drawing volume by using the **Place Drawing Volume by View** command, you need to edit the **Scale** property of the template. You need to change the default scale to **1/2" = 1'0"** so that the volume you place includes all the objects of the unit. Perform the following steps to edit the properties of the template.

Steps for Editing the Template:

1. In the **Drawings and Reports** task, under the **Management Console**, right-click the **Piping Plan** component and select the **Edit Template** option, as shown in Figure 13.

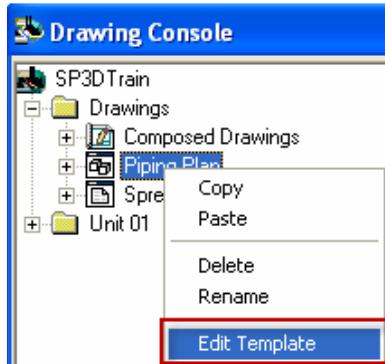


Figure 13: Editing the Template

2. The **2D Drawing Editor** window appears. The **2D Drawing Editor** window displays the template with the view drawn in it as shown in Figure 14. 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.

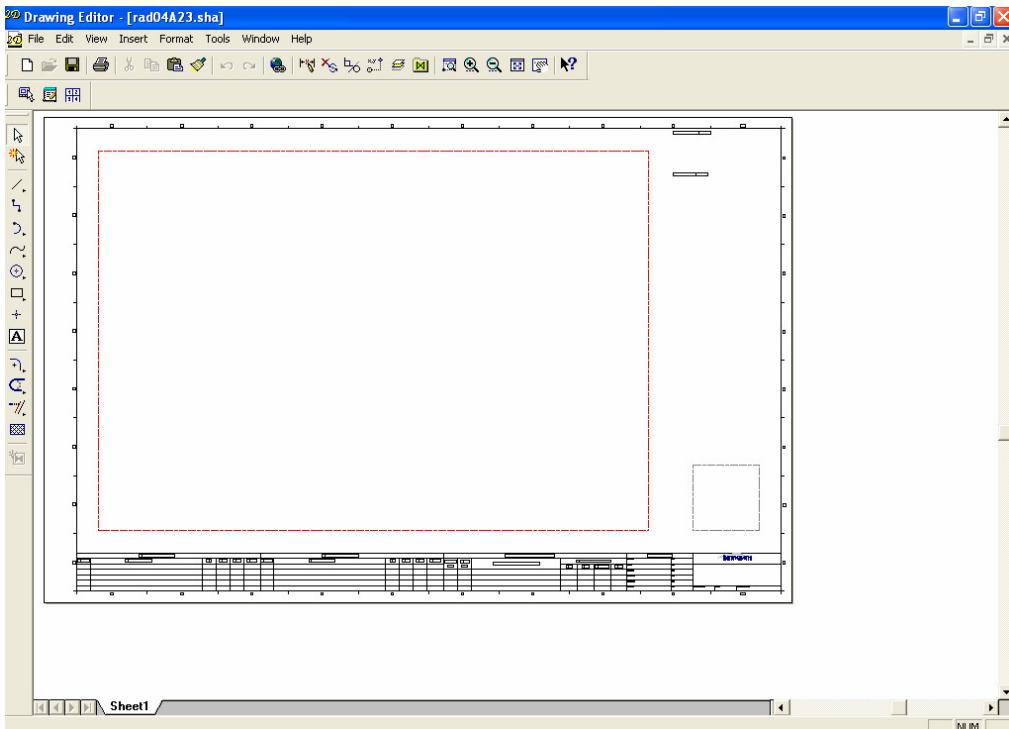


Figure 14: 2D Drawing Editor Window

3. In the **Drawing View Properties** dialog box, set the scale to $1/2" = 1'0"$ and then click **OK** as shown in Figure 15.

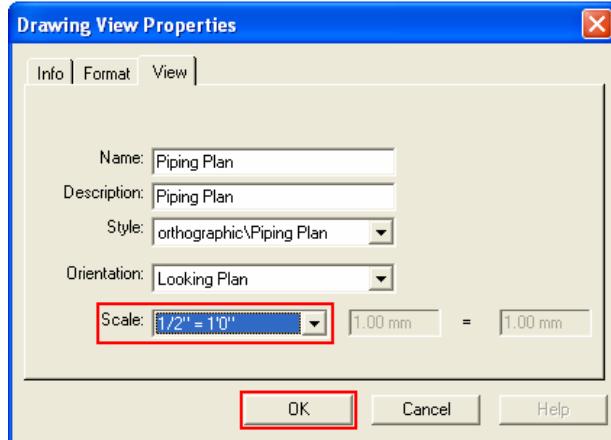


Figure 15: Drawing View Properties Dialog Box

4. Save the changes and exit the **2D Drawing Editor** window.

Steps for Placing Drawing Volume by Using Place Drawing Volume by View Command:

1. Click the **Tasks > Space Management** command to switch to the **Space Management** task again.
2. Open two graphics views and orient them **Looking Down** and **Looking North**, as shown in Figure 16.

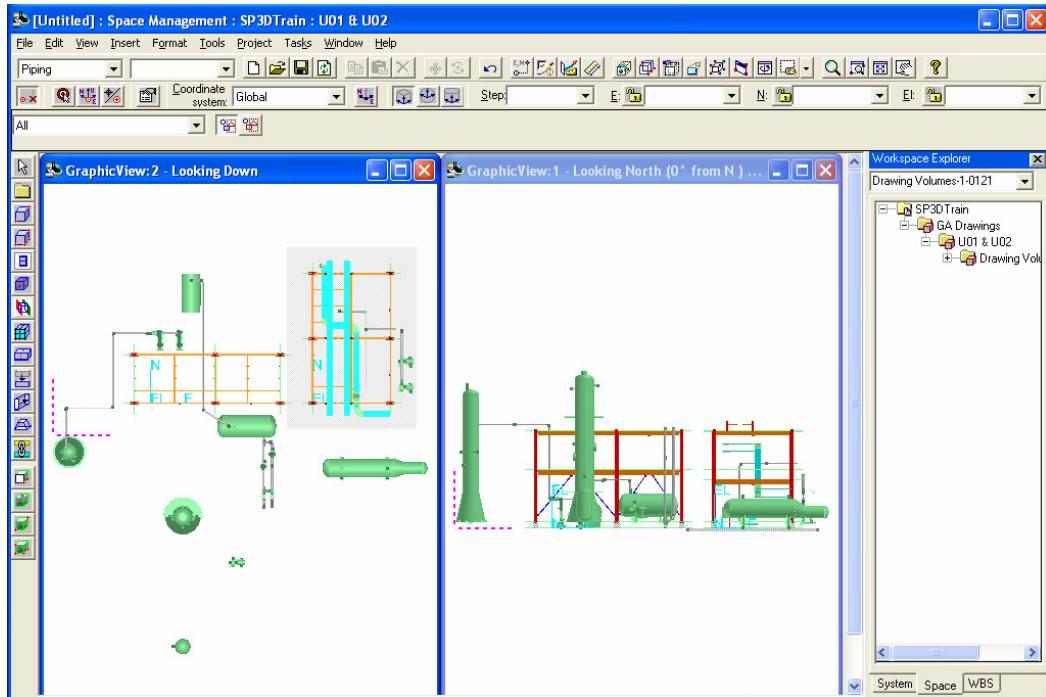


Figure 16: Two Graphic Views - Looking Down and Looking North

3. Click the **Place Drawing Volume by View** button on the vertical toolbar, as shown in Figure 17.



Figure 17: Place Drawing Volume by View Button on the Vertical Toolbar

Note:

- After activating the command, note the dotted square as the cursor is moved around in the modeling workspace. This square's dimensions are determined by the size of the view on the drawing template with respect to the predefined Scale setting in the view's properties. The objects that this square encloses, in conjunction with the depth (elevation) of the volume, will be the objects considered for the drawing.

4. 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, as shown in Figure 18.



Figure 18: Place Drawing Volume by View Ribbon

5. 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**, as shown in Figure 19.

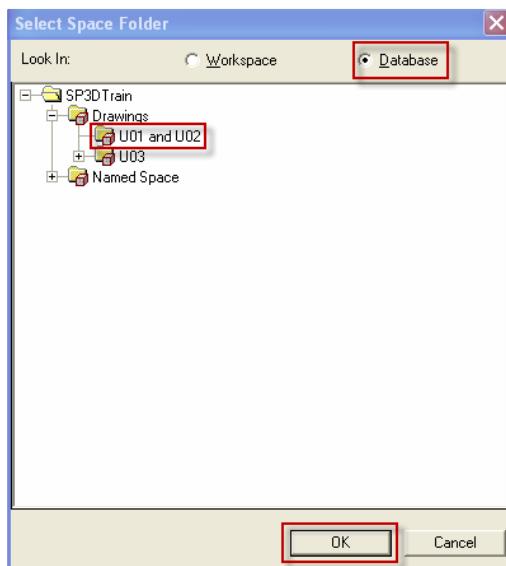


Figure 19: Select Space Folder Dialog Box

6. 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, as shown in Figure 20.



Figure 20: PinPoint Ribbon

7. Click the graphic view and then key in the elevation **EL 33'** on the **PinPoint** ribbon to accept the placement of the volume.
8. Click the graphic view to place the volume as highlighted in Figure 21.

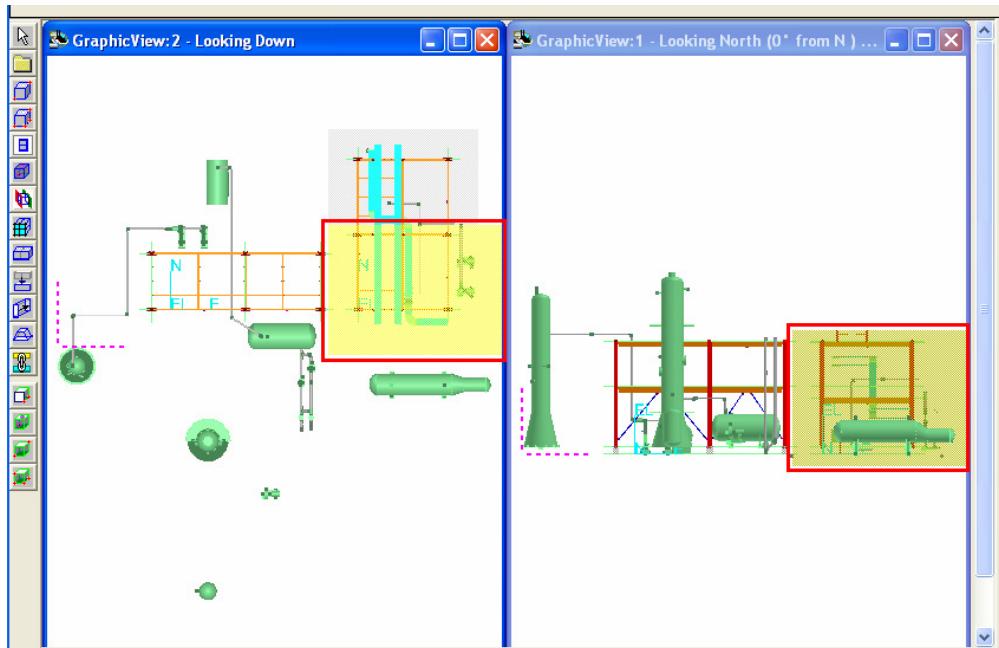


Figure 21: View of Model After Placing the First Volume

9. Place the second volume by entering the coordinates **E: 72', N 32' 6", El -3'** on the **PinPoint** ribbon.
10. Click the graphic view and then key in the elevation **EL 33'** on the **PinPoint** ribbon to accept the placement of the volume.
11. Click the graphic view to place the second volume adjacent to the first volume, as shown in Figure 22.

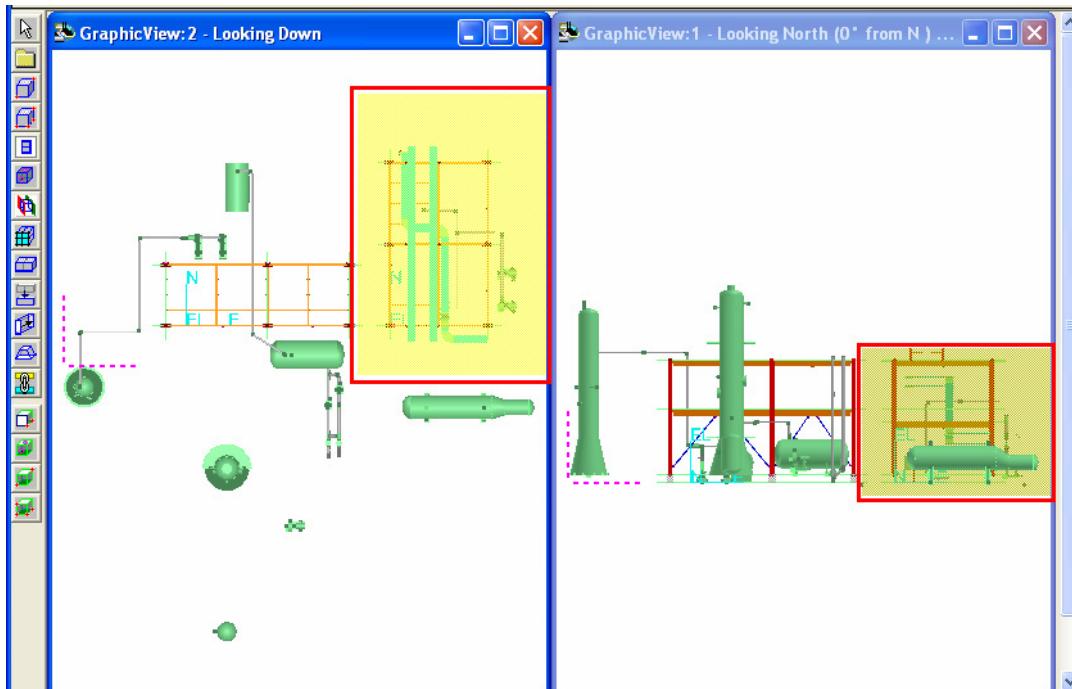


Figure 22: Output - After Placing the Two Drawing Volumes

12. Click the **Select** button on the vertical toolbar or right-click the graphic view to terminate the **Place Drawing Volume by View** command.

You can now verify that the two drawing volumes are created under the hierarchy of the drawing folders by switching to the **Space** tab of the **Workspace Explorer**, as shown in Figure 23.

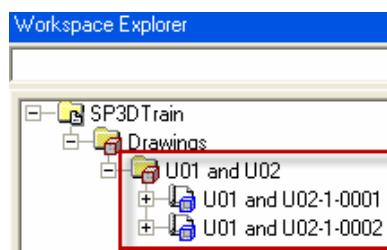


Figure 23: Drawing Volumes in the Workspace Explorer

Steps for Placing Drawing Volume by Using the Place Drawing Volume by Selection Command:

1. Click the **Place Drawing Volume by Selection** button on the vertical toolbar, as shown in Figure 24.



Figure 24: Place Drawing Volume by Selection Button on Vertical Toolbar

2. The **Place Drawing Volume by Selection** ribbon appears. On the ribbon, click the **More...** option in the **Drawing Type** drop-down list to select the drawing volume component.
3. In the **Select Volume Drawing Type** dialog box, select the **Piping Plan** component and click **OK**. Similarly, select the Space Folder with which you want to associate your drawing volume, as shown in Figure 25.

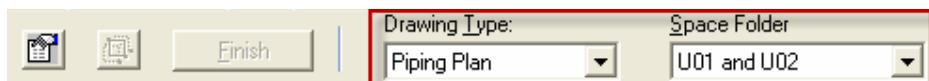


Figure 25: Place Drawing Volume by Selection Ribbon

4. Select the objects where you want to place the volume, as shown in Figure 26. Notice that as you click objects, the volume expands to include those objects.

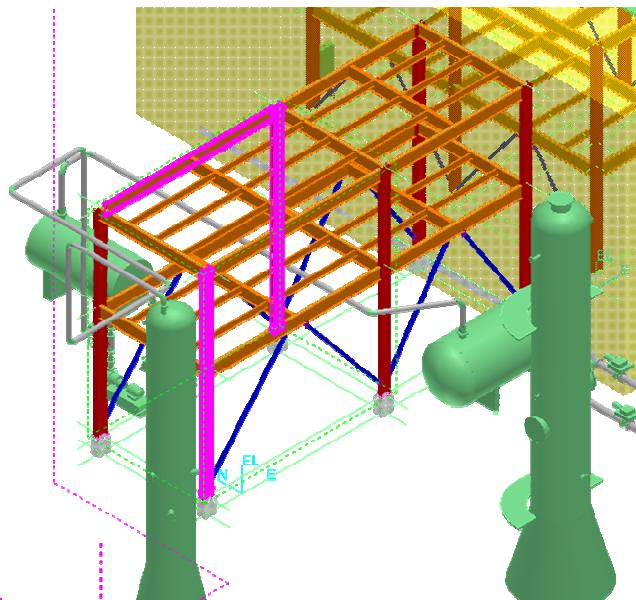


Figure 26: Selecting the Objects to Place the Volume

5. After you have created the area for the volume, click the **Finish** button on the ribbon. The created volume is highlighted in Figure 27.

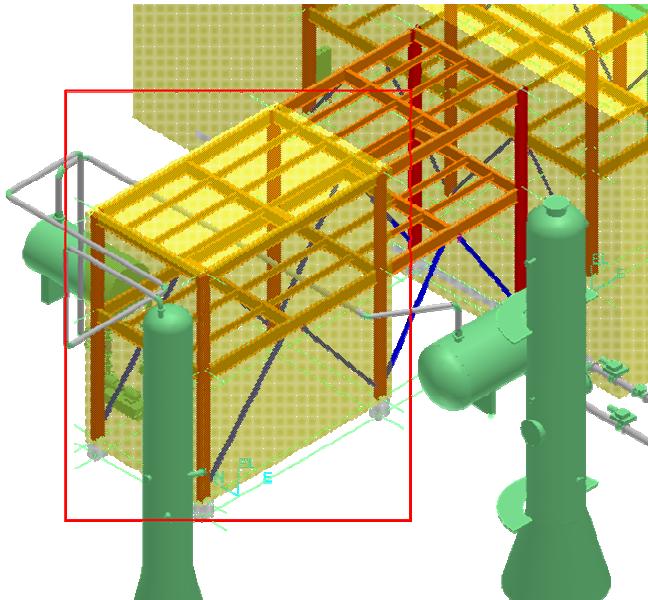


Figure 27: Final Output – After Placing the Volume

You can view the three drawing volumes that you created under the hierarchy of the drawing folders on the **Space** tab of the **Workspace Explorer**, as shown in Figure 28.

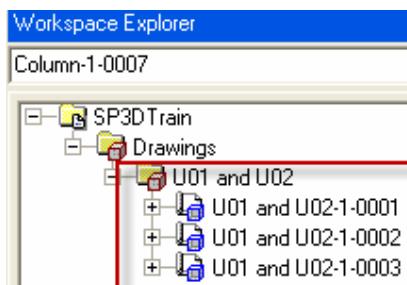


Figure 28: Drawing Volumes in the Workspace Explorer

Steps for Placing Drawing Volume by Using the Place Drawing Volume by Two Points Command:

1. Click the **Place Drawing Volume by Two Points** button on the vertical toolbar, as shown in Figure 29.



Figure 29: Place Drawing Volume by Two Points Button on the Vertical Toolbar

2. The **Place Drawing Volume by Two Points** ribbon appears. The software detects the ribbon settings automatically, as shown in Figure 30. You need not change the ribbon settings.

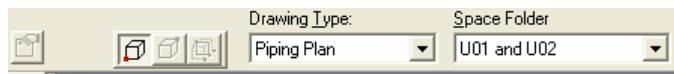


Figure 30: Place Drawing Volume by Two Points Ribbon

3. On the **PinPoint** ribbon, key in the coordinates E: 50', N: 9', EL: 2' to select the first point for the volume as shown in Figure 31.

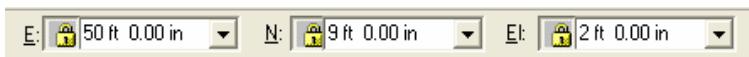


Figure 31: PinPoint Ribbon

4. Click the graphic view to place the first point for the volume.
5. To place the second point, key in the coordinates E: 72', N: 26' EL: 30' in the **PinPoint** ribbon and click the graphic view. The volume is created, and the software displays the outline as a dotted green line.

6. Click the graphic view and the volume is created, as shown in Figure 32.

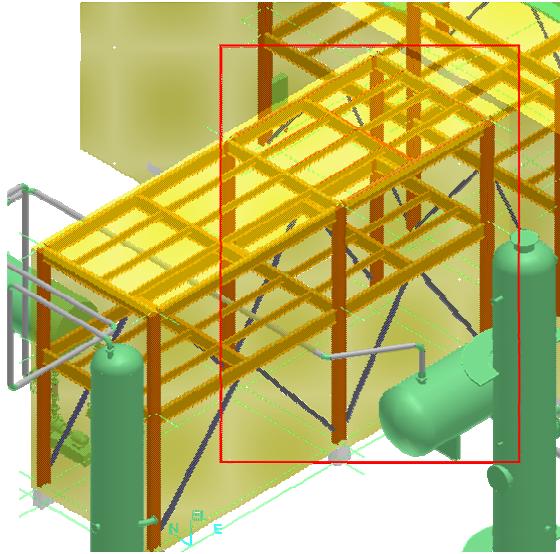


Figure 32: Final Output – After Placing the Volume

Switch to the **Space** tab of the **Workspace Explorer** to see that the four drawing volumes are created under the hierarchy of the drawing folders, as shown in Figure 33.

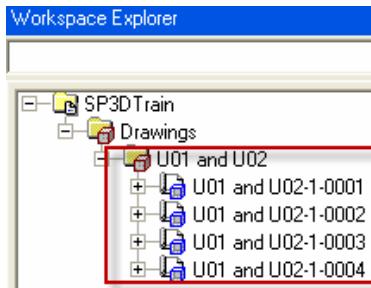


Figure 33: Drawing Volumes in the Workspace Explorer

Steps for Placing the Drawing Volume by Using the Place Drawing Volume by Four Points Command:

1. Redefine your workspace to display Unit **U01**.
2. Click the **Place Drawing Volume by Four Points** button on the vertical toolbar, as shown in Figure 34.



Figure 34: Place Drawing Volume by Four Points Button on the Vertical Toolbar

3. Select the following options on the **Place Drawing Volume by Four Points** ribbon as shown in Figure 35:

Drawing Type: Piping Plan

Space Folder: U01 and U02

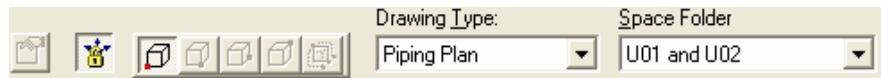


Figure 35: Place Drawing Volume by Four Points Ribbon

Note:

- The previous volumes that have been placed will all maintain the northing direction on the drawing as pointing up on the drawing sheet. However, the 4 point volume contains the flexibility to rotate the view by 90 degrees. This is accomplished by the order and location in which you place your points. The placement of Point 1 and Point 2 will define the X-Axis. If the line between Points 1 and 2 is along the Y-Axis in the model, the volume rotates by 90 degrees. The line that is determined between points 2 and 3 will define the Y-Axis of the volume and the line between Points 3 and 4 will determine the depth (elevation) of the volume. When the volume is positioned on the view in the drawing, the X-Axis will be along the bottom of the drawing, where the northing direction is now pointing to the left on the drawing sheet.

4. Select the first point of the volume by using the **Pinpoint** ribbon. Key in the coordinates **E: 72', N: 58', EL: 0'** on the **PinPoint** ribbon for the first point. This point will define the starting point of the volume as shown in Figure 36.

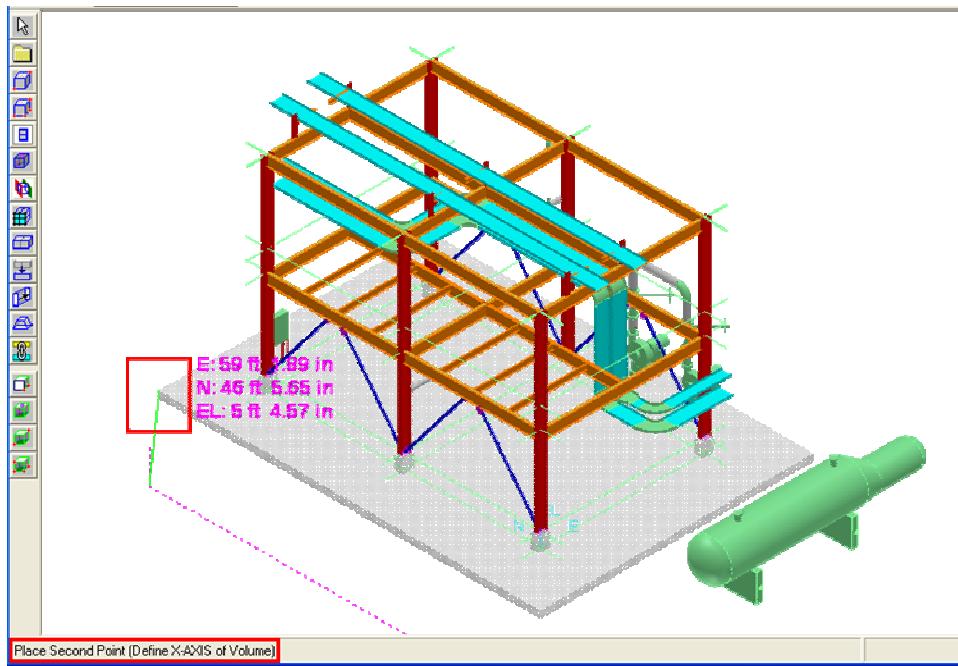


Figure 36: Selecting the First point to Place the Volume

- Click the graphic view to place the first point of the volume.

Tip:

- The bottom left corner of the SP3D window provides instructions to perform the required step - place the second point - as shown in the highlighted area in Figure 36.

- For the second point of the volume, key in the coordinates **E: 72', N: 2', EL: 0'** on the **PinPoint** ribbon. The second point will define your X-Axis, based on the starting point.
- Click the graphic view to place the second point of the volume.
- To place the third point of the volume, unlock the coordinates by clicking the lock buttons beside the coordinate values and key in the coordinates **E: 112', N: 2', EL: 0'**. This point will define the Y-Axis, based on the second point you placed to this point.
- Click in the graphic view to place the third point of the volume.
- To place the fourth point of the volume, unlock the elevation coordinate by clicking the lock button beside the coordinate value and key in **EL: 33'**. The view of the model will resemble the one displayed in Figure 37.

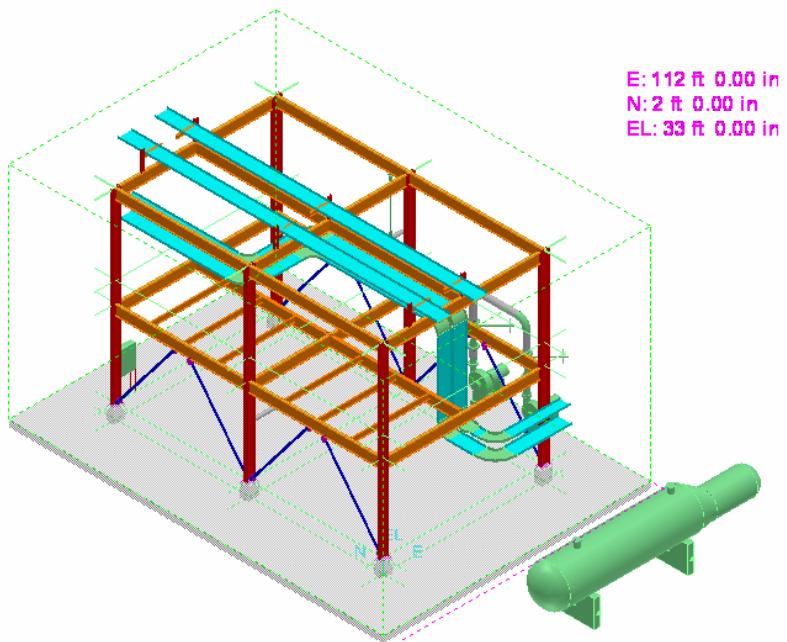


Figure 37: Outline of the Volume

11. Click the graphic view to place the fourth point. Notice that when you click the graphic view, the volume is created as shown in Figure 38.

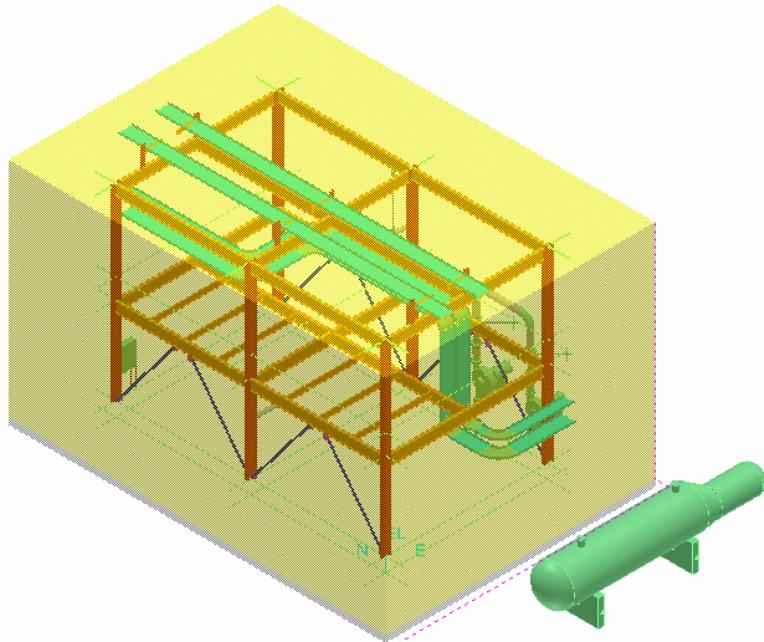


Figure 38: Output - After Placing the Drawing Volume

12. Click the **Select** button on the vertical toolbar or right-click the graphic view to terminate the **Place Drawing Volume by Four Points** command.

This completes the procedure to create the volume drawing. You can switch to the **Space** tab of the **Workspace Explorer** to verify that five drawing volumes are created under the hierarchy of the drawing folders.

After creating the volume drawing, you can update it to the Batch Server instantly to enhance the performance of SP3D, provided batch processing is configured for the selected Plant. To update the drawing, you use the **Update Now** command, which is accessed by right-clicking a parent node in the **Management Console**. You can update one or more drawings at a time. If you have edited the previous copy of a volume or composed drawing, the software recalls the changes and recreates them. When a drawing is created and updated, the software collects the 3D objects in the drawing and then passes them to the view style. View style creation is an administrative workflow and contains several rules for filtering, labeling, and creating the graphics in the output drawing. The view style also lists tests and actions that are performed on the objects. If the objects pass these tests, then single or multiple or all the rules are applied to the objects that provide the resultant drawing.

Steps for Updating the Drawings:

After the drawings are updated, they will appear in the Detail View, as shown in Figure 39.

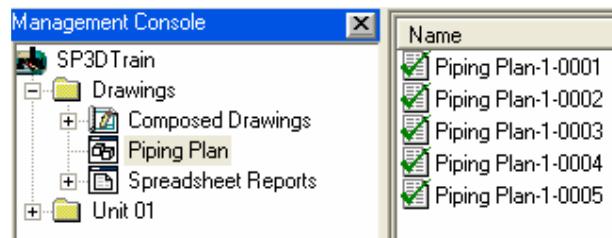


Figure 39: Detail View - After Updating the Drawings

1. Click the **Tasks > Drawings and Reports** command to switch to the **Drawings and Reports** task.
2. 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** as shown in Figure 40.

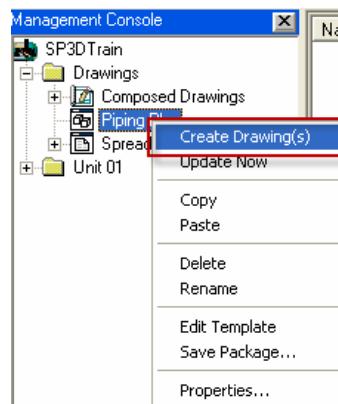


Figure 40: Management Console

3. 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, as shown in Figure 41.

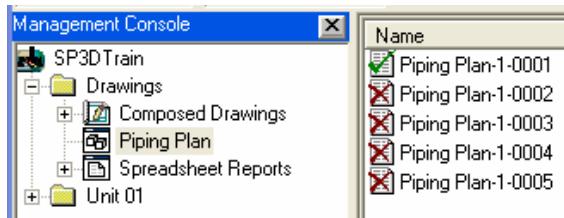


Figure 41: Updated Drawing in Detail View

4. Follow the same step as above to update the remaining drawings.

Note:

- It is possible to update drawings all drawings in a component or update drawings one by one using the Drawing Console in any 3D task. However it is required to switch to the 'Drawings and Reports' task to update multiple selected drawings.

For more information related to creating and updating volume drawings, refer to the following topics of the user guide *DrawingsandReportsUsersGuide.pdf*:

- *Volume Drawings: An Overview*
- *Updating Drawings: An Overview*