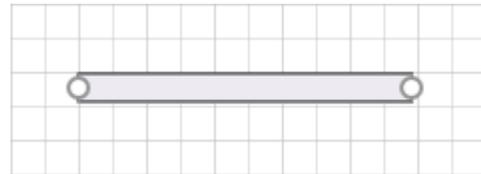
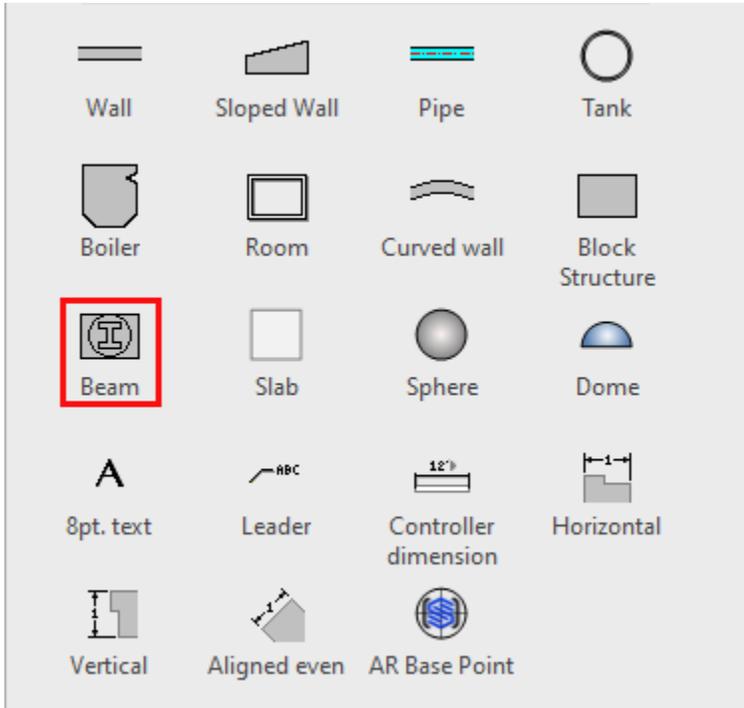


Working with Beams



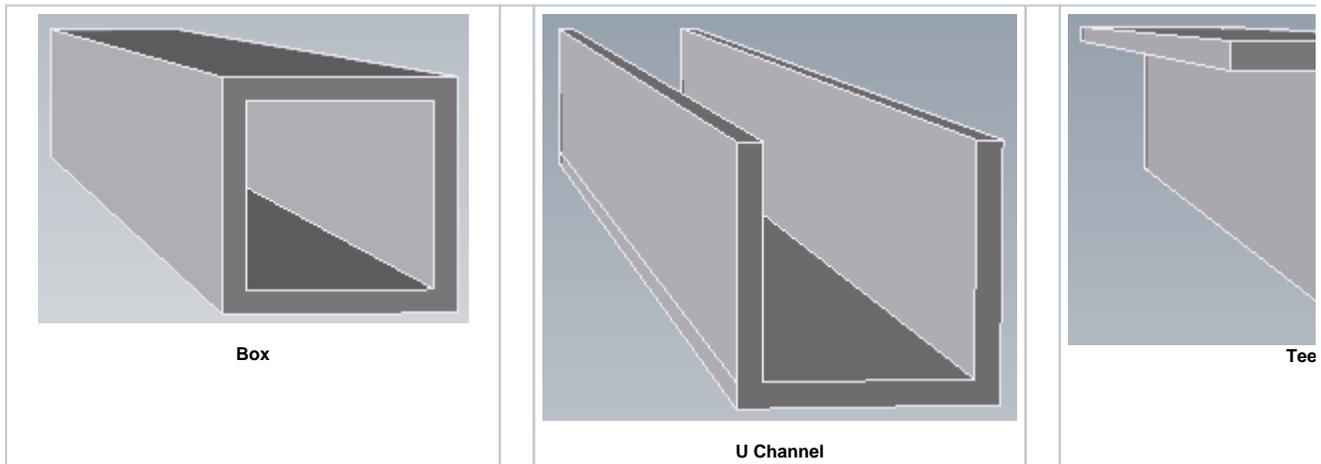
Beams are very versatile shapes that you can use for many purposes, as Beams and as other objects. Once added to a drawing, you can add a part number to any Beam, which adds that Beam to the Bill of Materials.

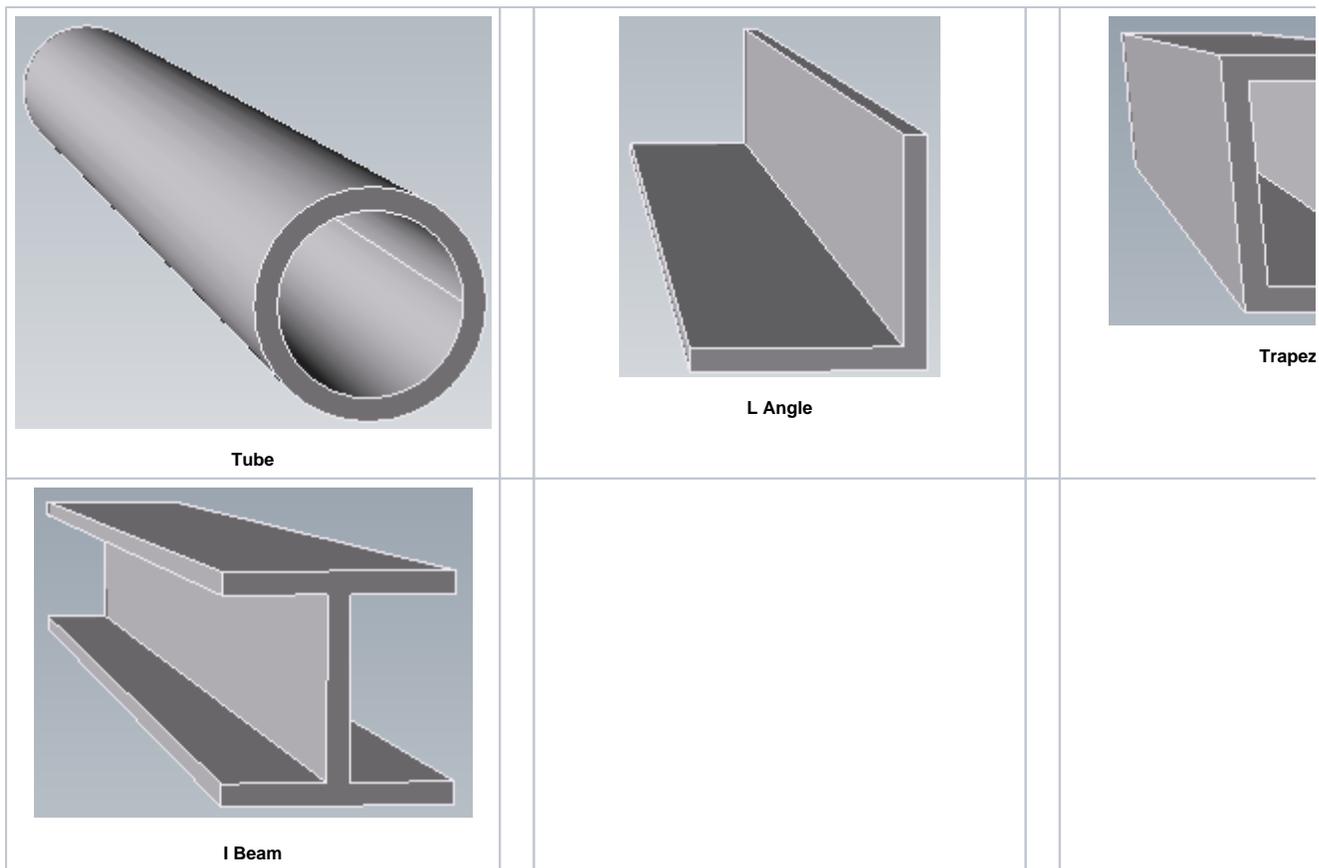
This page contains the following:

- [Beam Types](#)
- [Changing a Beam's Type](#)
- [Creating a Vertical Beam](#)
- [Adding a Beam to the Bill of Materials](#)
- [Using a Beam as a Ledger](#)
- [Creating a Cone from a Beam](#)

Beam Types

When you first drag and drop a Beam onto a drawing, it is a box Beam by default. You can use the *Shape Data* dialog to change it to the type of Beam you want. Your options are:





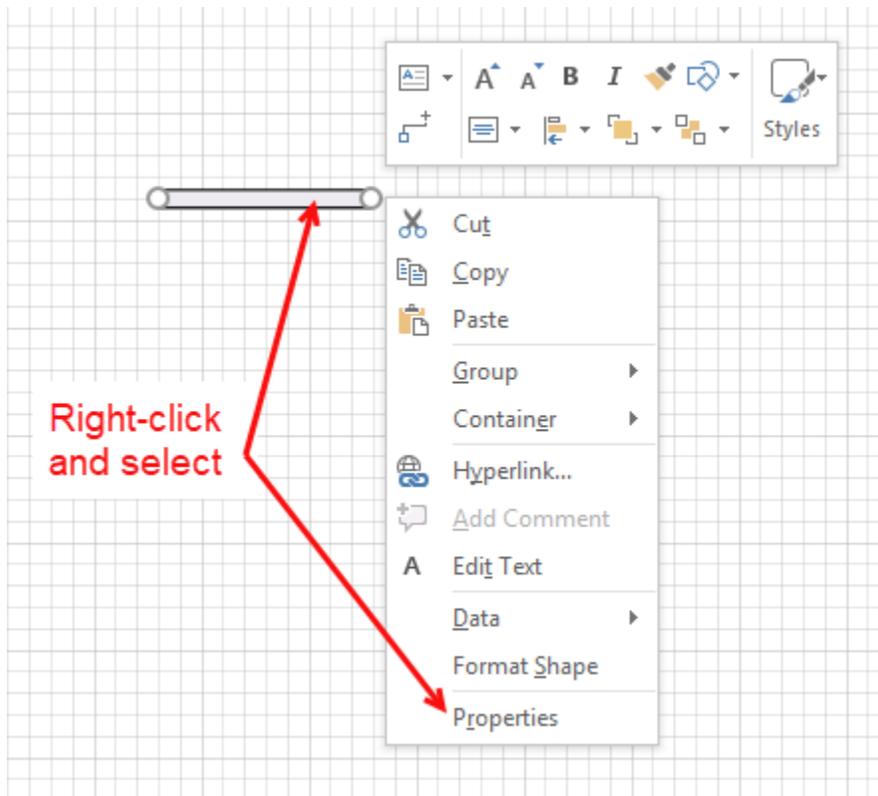
Changing a Beam's Type

Besides determining a Beam's length, width and height, Avontus Designer enables you to change a Beam's type.

To change a Beam's type.

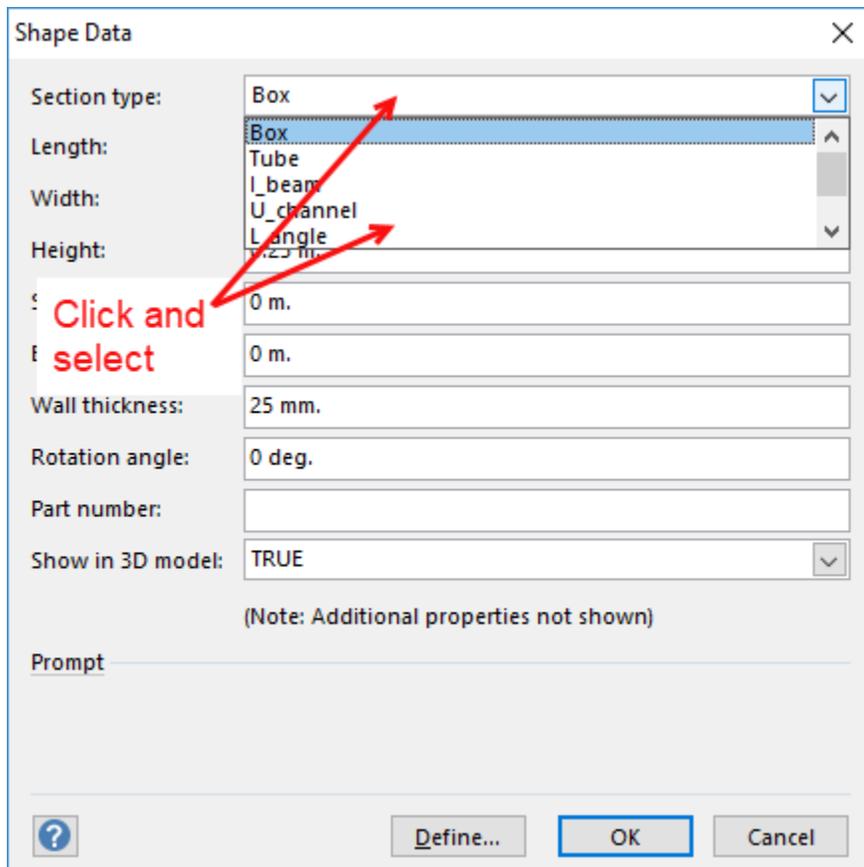
1. Right-click the appropriate Beam and select **Properties** from the menu that appears.

Note: You can also double-click the Beam.



The *Shape Data* popup appears.

2. Click the **Selection Type** dropdown and select the appropriate type of Beam.



3. Click **OK**.

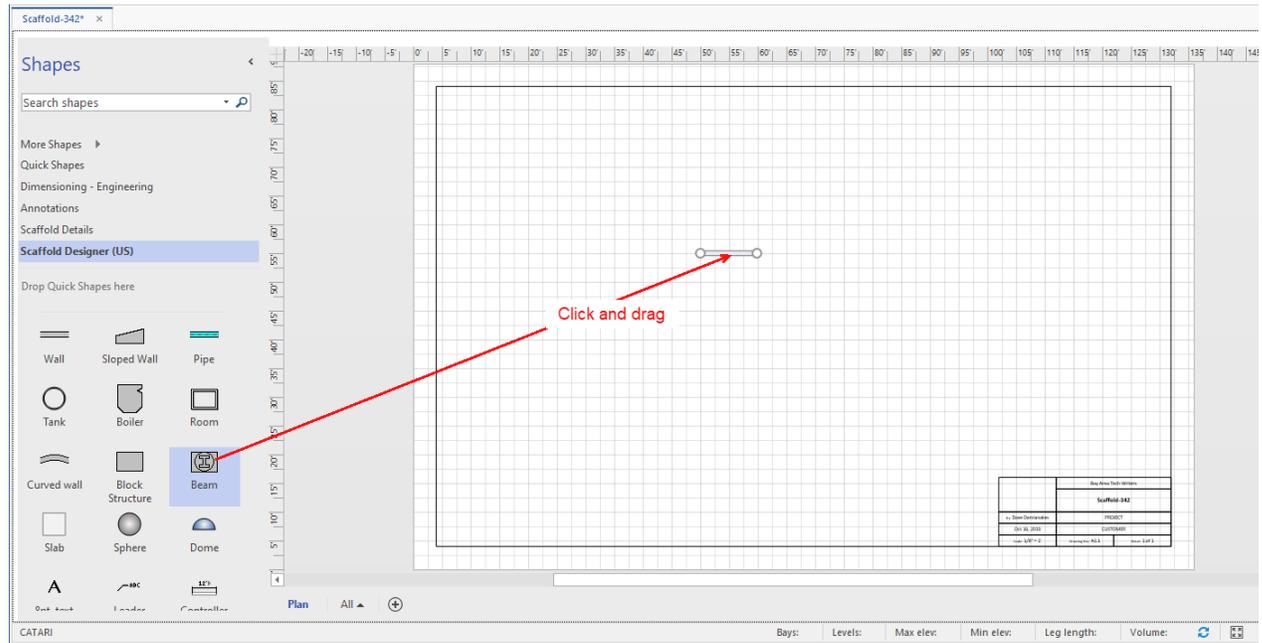
Creating a Vertical Beam

Avontus Designer makes it easy to create a vertical Beam for use in any drawing.

To create a vertical Beam:

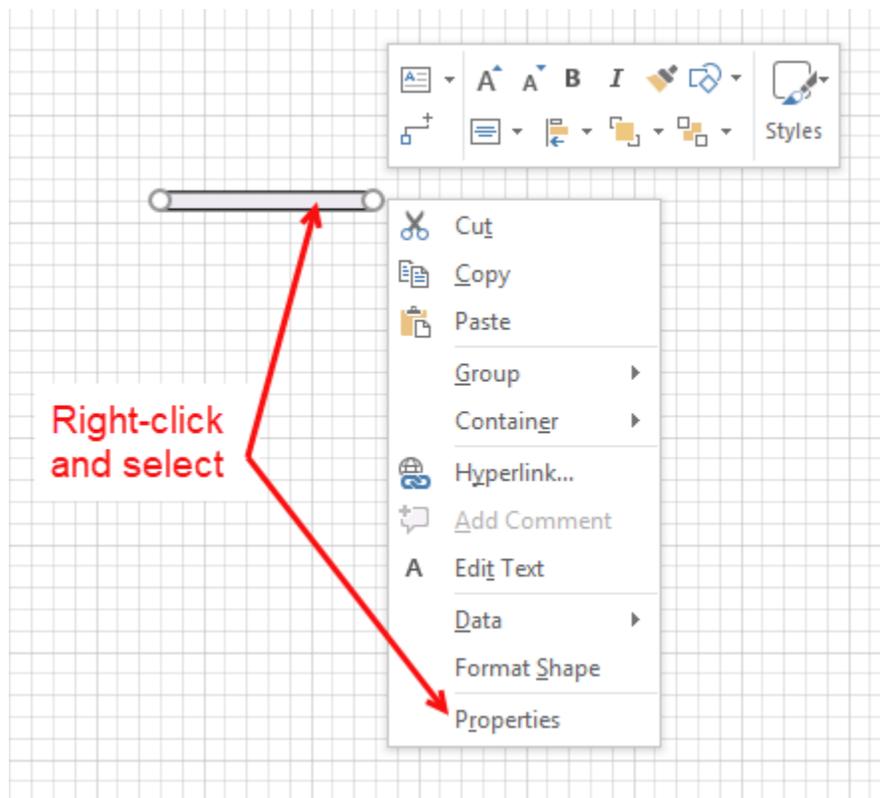
1. Click the **Beam** object in the **Shape** palette and drag it onto the Drawing Page.

If you already have a Beam that you want to make vertical, go to step 3.



2. Right-click the Beam and select **Properties** from the menu that appears.

Note: you can also double-click the Beam.



The *Shape Data* dialog appears.

3. Click the **Selection Type** dropdown and select the appropriate type of Beam.
4. Click in the **Length** text field and enter 11mm (this dialog will not accept zero).
5. Click in the **Start Elevation** text field and enter the elevation at which you want the Beam to start.
6. Click in the **End Elevation** text field and enter the elevation at which you want the Beam to end.
7. Click **OK**.

Shape Data

Section type: I_beam 3. Click and select

Length: 11 mm. 4. Click and enter

Width: 0.25 m.

Height: 0.25 m.

Start elevation: 10 m. 5. Click and enter

End elevation: 250 m. 6. Click and enter

Wall thickness: 25 mm.

Rotation angle: 0 deg.

Part number:

Show in 3D model: TRUE

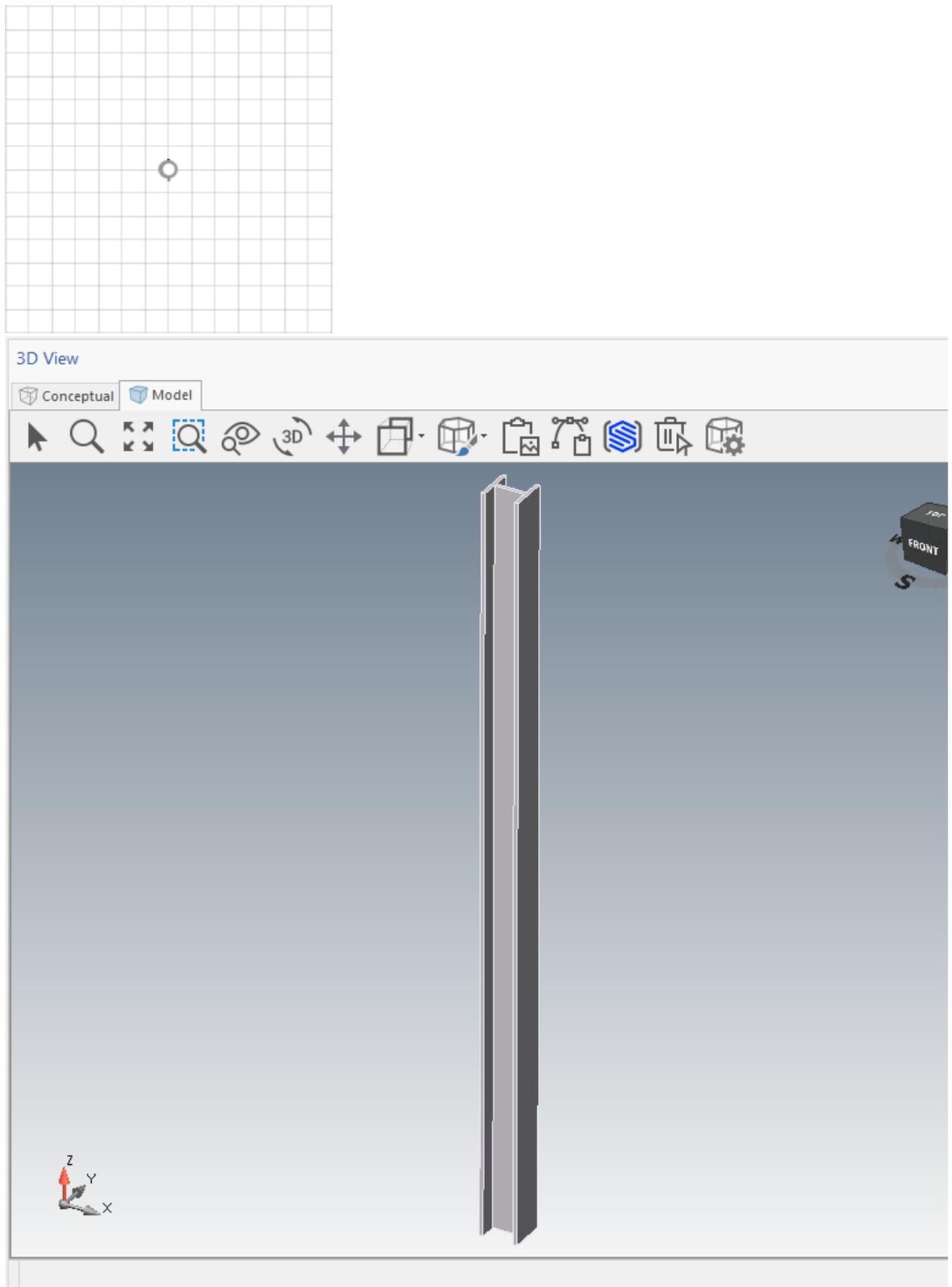
(Note: Additional properties not shown)

Prompt

7. Click here

Define... OK Cancel

Avontus Designer refreshes, showing the Beam as a square on the Drawing Page. The 3D View shows the vertical Beam.



Adding a Beam to the Bill of Materials

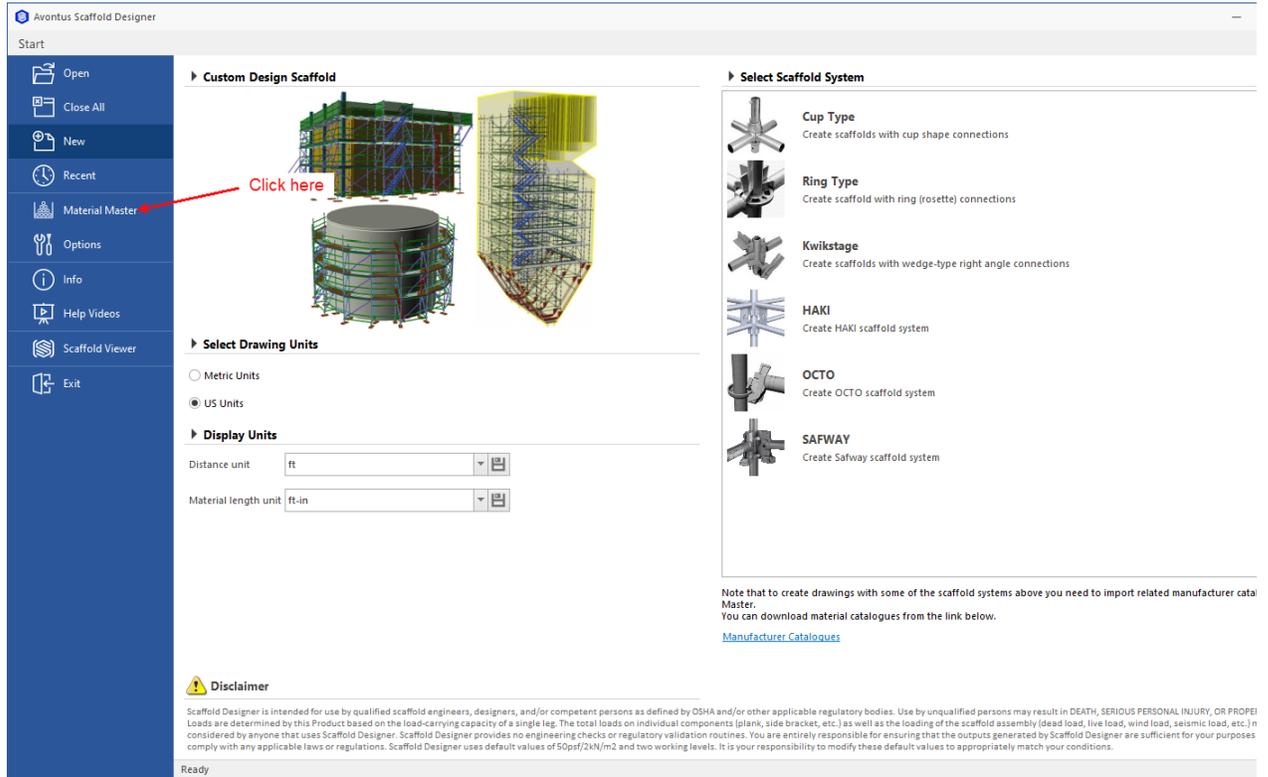
To add a Beam to the Bill of Materials, you first create an item in the Material Master, then create the item and assign the new part number to the new Beam. Before you begin, you will need a part number for the new part.

To add a Beam to the Bill of Materials:

1. Make sure that all drawings are closed.
2. Click the **Start** tab.

The *Backstage* appears.

3. Click **Material Master**.



The *Material Master* dialog appears.

4. Click **Add Material**.

Scaffold Designer - Material Master

Save Changes | Undo Changes | Print Preview | Backup | Restore | Add Material | Duplicate Selected | Remove Material | Reset to Default | Delete All | Export Materials | Import Materials | Additional Catalogs | Part Mods

File | Edit | Share | Parts

Drag a column header here to group by that column

Par...	Description	Weight	Effective L...	Actual Le...	Width	Height	Material...	Supporte...	Manufac...	Active	Custom Optio...	Color
Click here to add a new row												
WT16	Wood Toeboard 16'	52.91094...	16' 0"	16' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT14	Wood Toeboard 14'	46.29707...	14' 0"	14' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT12	Wood Toeboard 12'	39.68320...	12' 0"	12' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT11	Wood Toeboard 11'	36.37627...	11' 0"	11' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT10	Wood Toeboard 10'	33.06933...	10' 0"	10' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT09	Wood Toeboard 9'	29.76240...	9' 0"	9' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT08	Wood Toeboard 8'	26.45547...	8' 0"	8' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT07	Wood Toeboard 7'	23.14853...	7' 0"	7' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT06	Wood Toeboard 6'	19.84160...	6' 0"	6' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT05	Wood Toeboard 5'	16.53466...	5' 0"	5' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT04	Wood Toeboard 4'	13.22773...	4' 0"	4' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT03	Wood Toeboard 3'	9.920801...	3' 0"	3' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT02	Wood Toeboard 2'	6.613867...	2' 0"	2' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT01	Wood Toeboard 1'	3.306933...	1' 0"	1' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP20	Wood Plank 20'	80.24826...	18' 0"	20' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP18	Wood Plank 18'	72.22343...	16' 0"	18' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP16	Wood Plank 16'	64.19861...	14' 0"	16' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP14	Wood Plank 14'	56.17378...	12' 0"	14' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP12	Wood Plank 12'	48.14895...	10' 0"	12' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP11	Wood Plank 11'	44.13654...	9' 0"	11' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP10	Wood Plank 10'	40.12413...	8' 0"	10' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP09	Wood Plank 9'	36.11171...	7' 0"	9' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP08	Wood Plank 8'	32.09930...	6' 0"	8' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...
WP07	Wood Plank 7'	28.08689...	5' 0"	7' 0"	0' 9.2"		Wood Pla...	CUPT;RING		<input checked="" type="checkbox"/>		...

Record 1 of 1313

Distance unit: ft-in | Weight unit: lb

A new row appears in the Material Master.

5. Click in the **Part No.** cell of the new item and enter the number for the new part.

Scaffold Designer - Material Master*

Save Changes | Undo Changes | Print Preview | Backup | Restore | Add Material | Duplicate Selected | Remove Material | Reset to Default | Delete All | Export Materials | Import Materials | Additional Catalogs | Part Mods

File | Edit | Share | Parts

Drag a column header here to group by that column

Par...	Description	Weight	Effective L...	Actual Le...	Width	Height	Material...	Supporte...	Manufac...	Active	Custom Optio...	Color
		0	0' 0"				Others			<input checked="" type="checkbox"/>		...
WT16	Wood Toeboard 16'	52.91094...	16' 0"	16' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT14	Wood Toeboard 14'	46.29707...	14' 0"	14' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT12	Wood Toeboard 12'	39.68320...	12' 0"	12' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT11	Wood Toeboard 11'	36.37627...	11' 0"	11' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...
WT10	Wood Toeboard 10'	33.06933...	10' 0"	10' 0"	0' 1.5"	0' 3.5"	Toe-boar...	CUPT;RING		<input checked="" type="checkbox"/>		...

6. As necessary, add the remaining information for the new part. For more information about this procedure, refer to [Adding Material](#).

7. When you are done, click **Close Material Master**.

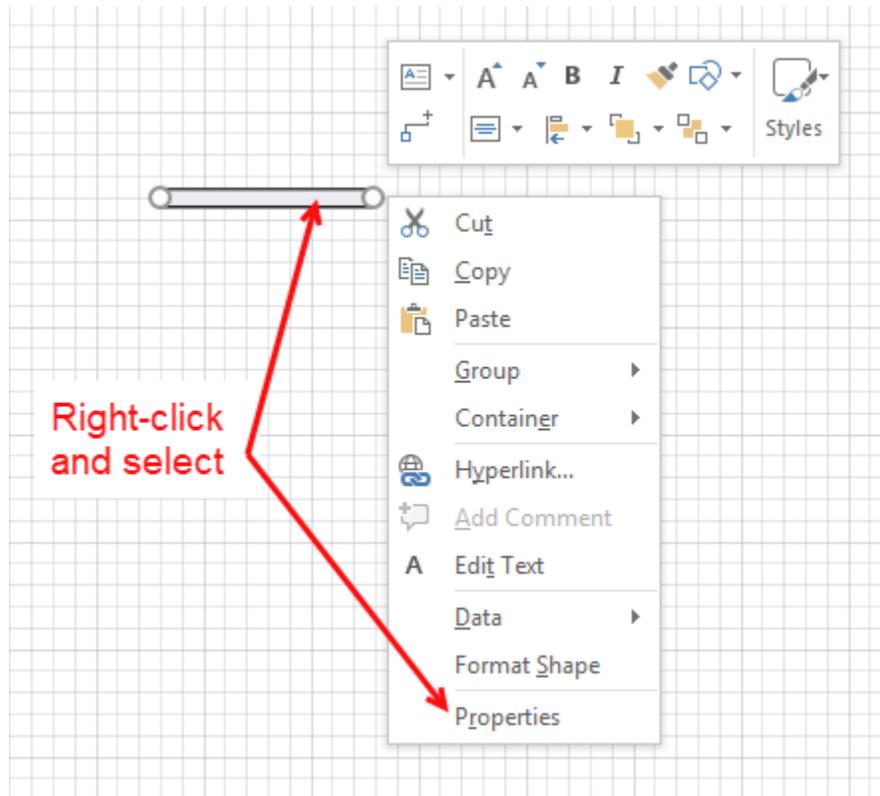
Scaffold Designer - Material Master*

Save Changes | Undo Changes | Print Preview | Backup | Restore | Add Material | Duplicate Selected | Remove Material | Reset to Default | Delete All | Export Materials | Import Materials | Additional Catalogs | Part Mods

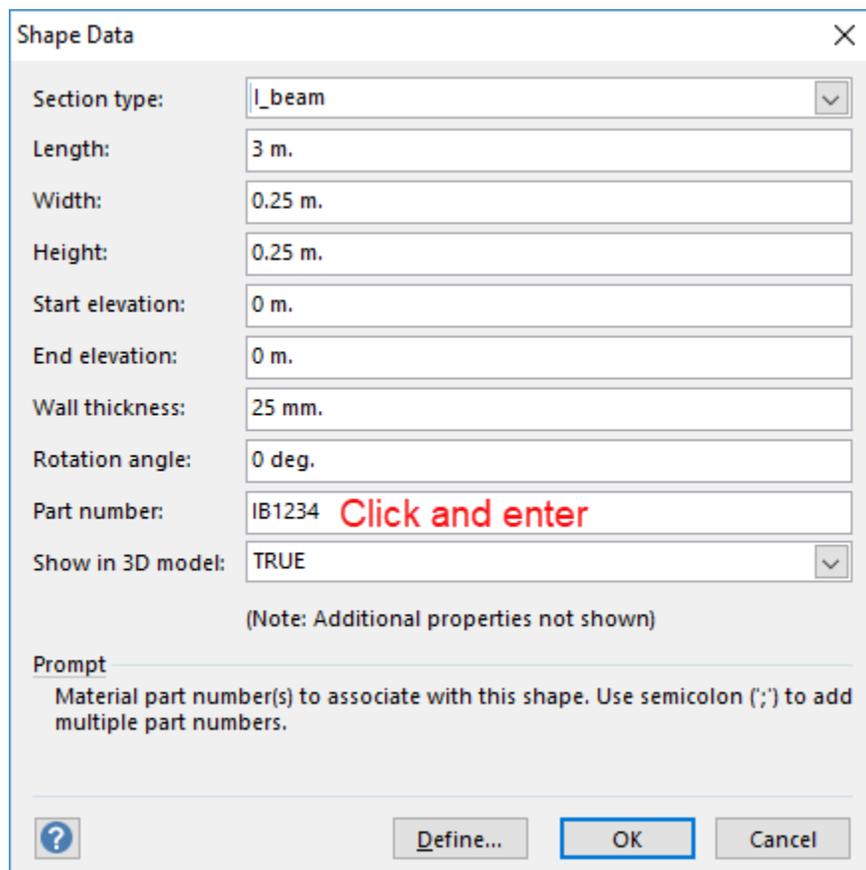
File | Edit | Share | Parts

Click here

8. Start a new drawing or open the appropriate existing drawing.
9. Either click and drag a Beam object onto the drawing or select an existing Beam on the Drawing Page.
10. Right-click the Beam and select **Properties** from the menu that appears.



11. Click in the **Part No.** text field and enter the new part number.



The image shows a 'Shape Data' dialog box with the following fields and values:

Section type:	I_beam
Length:	3 m.
Width:	0.25 m.
Height:	0.25 m.
Start elevation:	0 m.
End elevation:	0 m.
Wall thickness:	25 mm.
Rotation angle:	0 deg.
Part number:	IB1234 Click and enter
Show in 3D model:	TRUE

(Note: Additional properties not shown)

Prompt
Material part number(s) to associate with this shape. Use semicolon (;) to add multiple part numbers.

Buttons: Define..., OK, Cancel

12. Click **OK**.

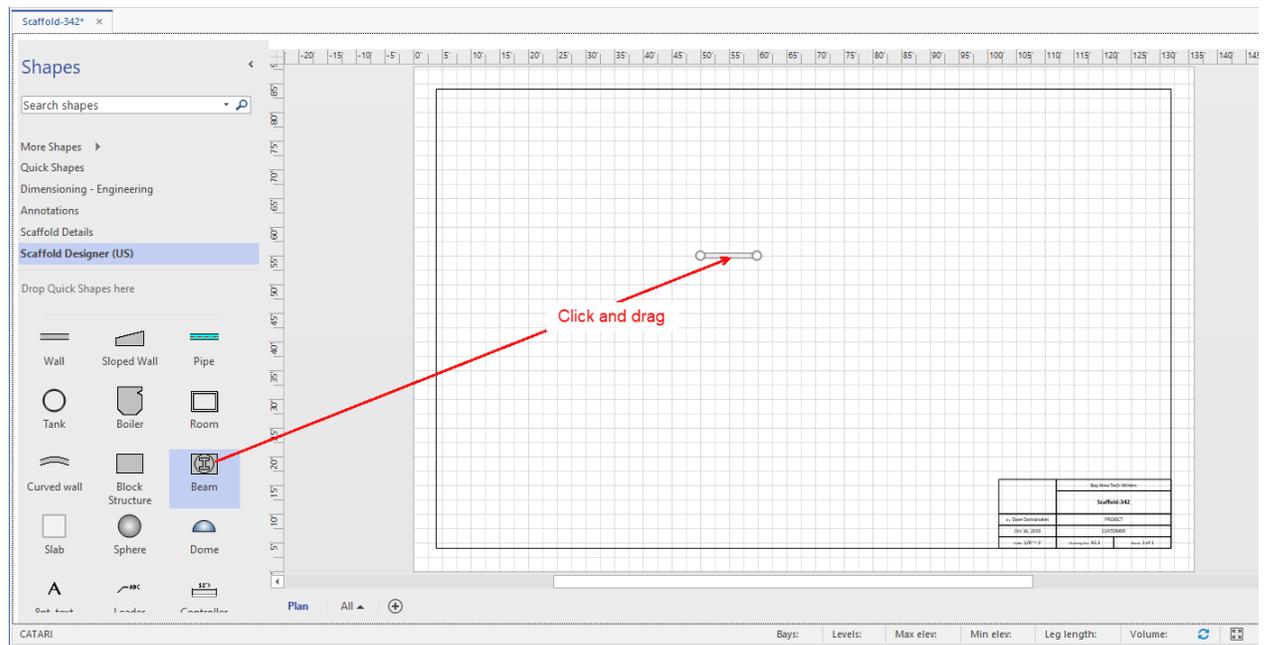
The BOM will now count every instance of this Beam in the drawing.

Using a Beam as a Ledger

When you are in a pinch and you need an extra ledger for a scaffold, use a Beam.

To use a Beam as a ledger:

1. Click and drag the Beam onto the Drawing Page, near the appropriate scaffold bay.



2. Double-click the Beam shape.

The *Shape Data* popup appears.

3. Click the **Selection Type** dropdown and select **Tube**.

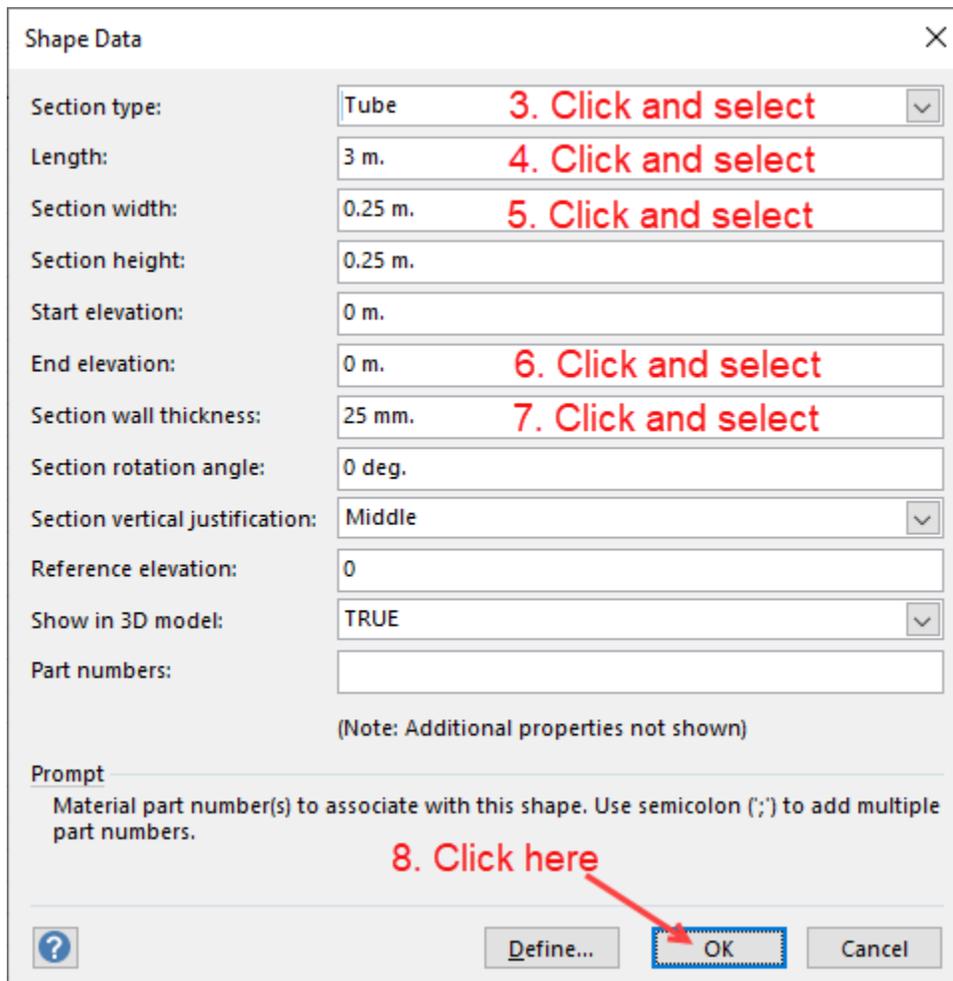
4. Click in the **Length** text field and enter the length of the ledger.

5. Click in the **Width** text field and enter the width of the ledger.

6. Click in the **Start Elevation** text field and enter the elevation at which you want the ledger to start.

7. Click in the **End Elevation** text field and enter the elevation at which you want the ledger to end.

8. Click **OK**.



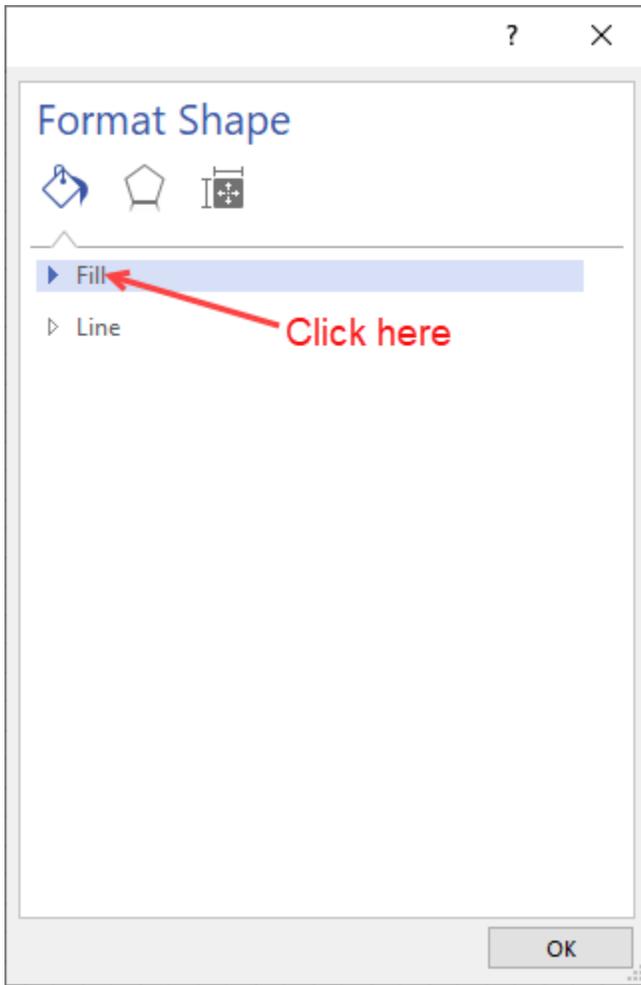
Avontus Designer makes the changes to the Beam.

9. Change the color to match the bay.

a. Right-click and select **Format Shape** from the menu that appears.

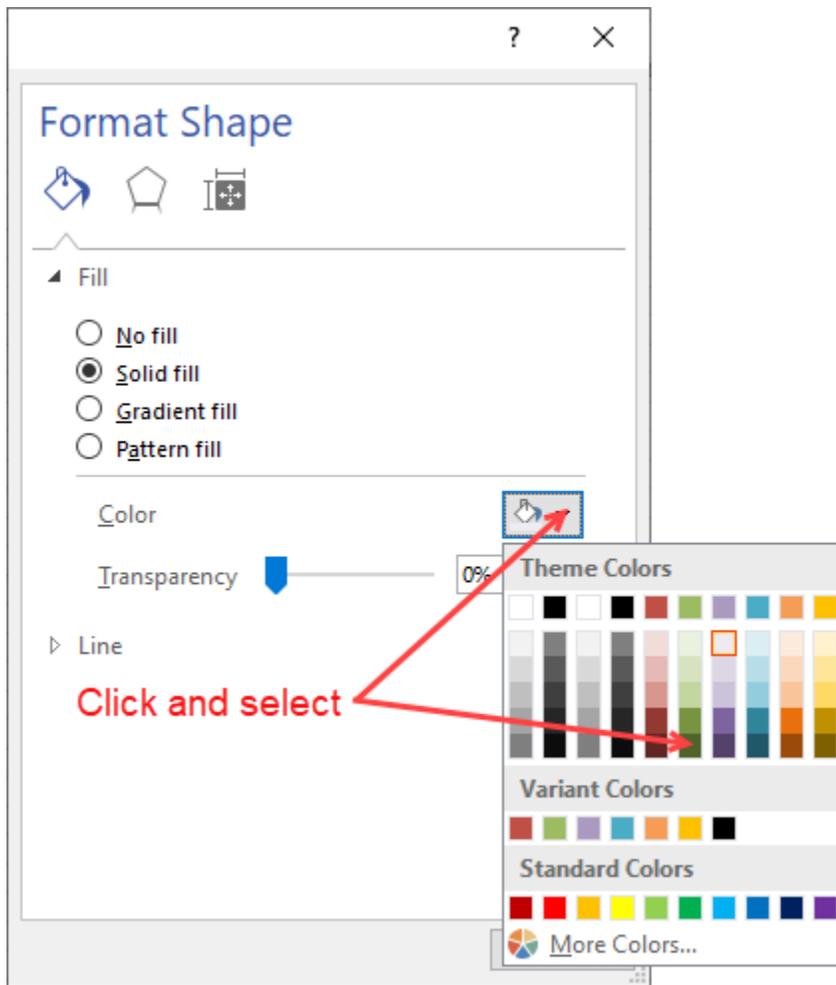
The Format Shape popup appears.

b. Click Fill.



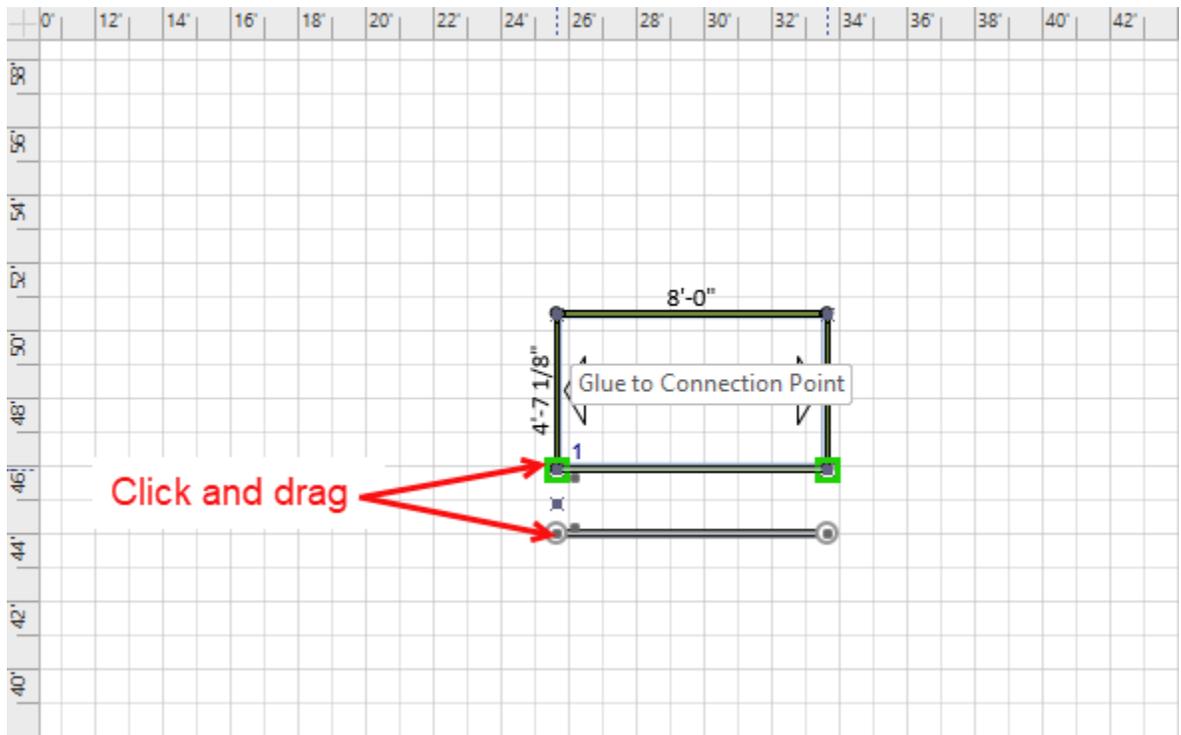
The Format Shape popup refreshes, displaying fill options.

- c. Click the Paint Bucket dropdown and select the appropriate color.

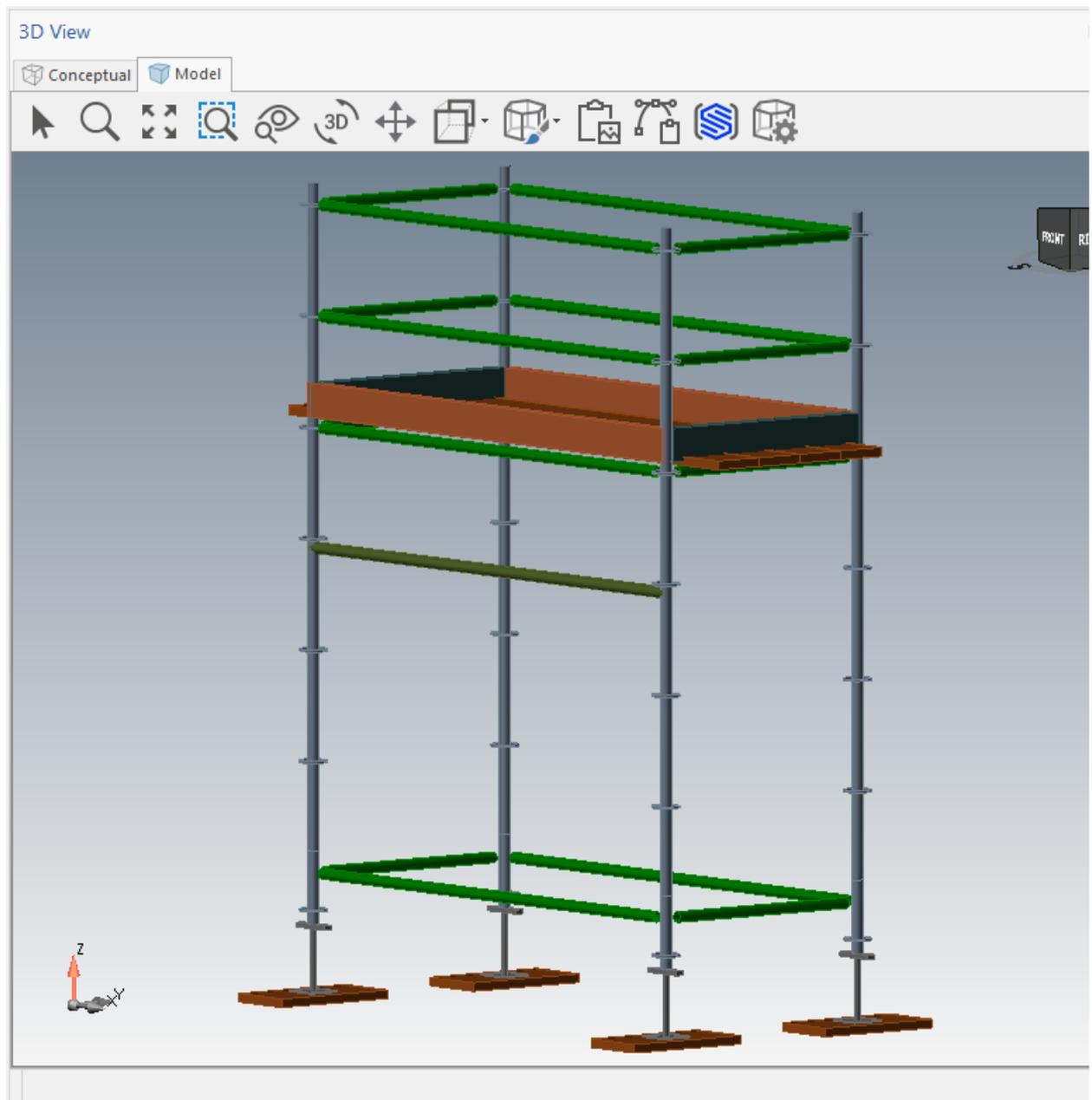


d. Click **OK**.

10. Click and drag the Beam onto the appropriate side of the scaffold bay, making sure that the two shapes glue together.



The result should look something like this:

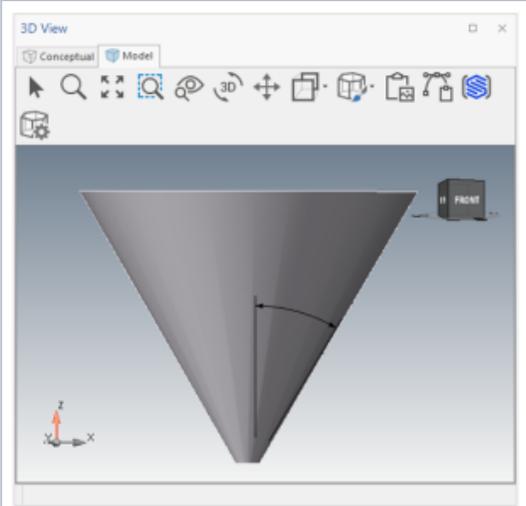


Creating a Cone from a Beam

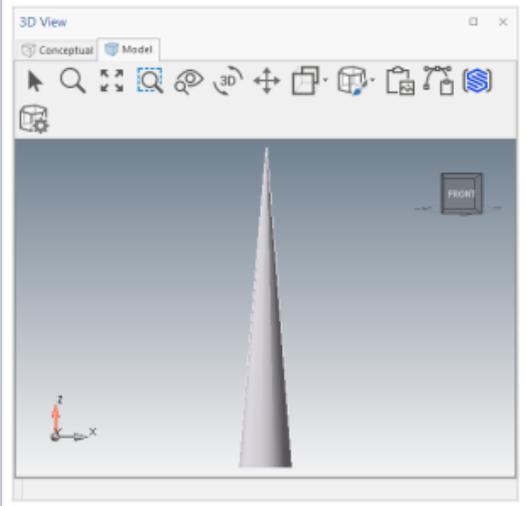
Avontus Designer enables you to use a Beam to create a cone. Part of this process is determining the angle of the cone (the Draft Angle). This angle is measured from the cone's center axis. Avontus Designer allows a maximum of 45 degrees for this angle.

A positive number for this angle results in a cone that expands out from the base.

The draft angle is measured from one side of the base of a cone created with a positive number (above), with a line drawn straight up and another along the side of the cone. The vertical cone in the image to the right has a base of .25 meters, a height of three meters, and an angle of 30 degrees. The draft angle is shown as that angle drawn from the vertical line and the side of the cone.



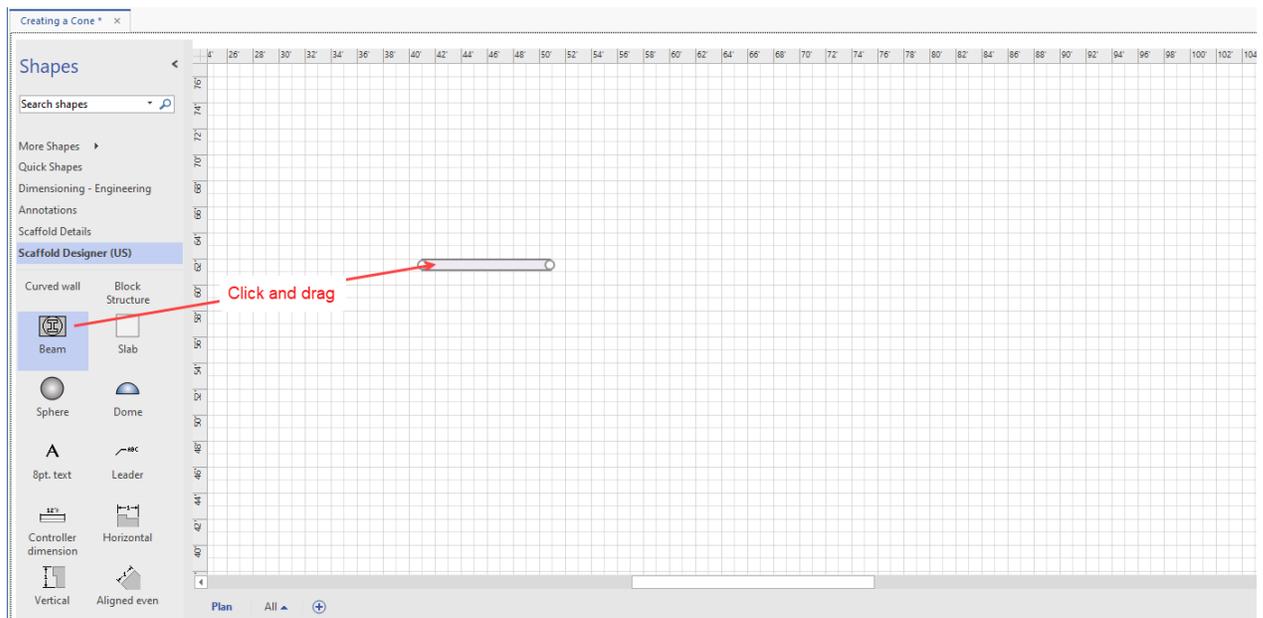
Cones with negative draft angles start with the base and simply taper up the length of the cone to a point. The vertical cone in the image to the right also has a base of .25 meters, a height of three meters. However, it has an angle of -30 degrees.



Note: If you want the cone to be vertical, start the procedures below by making a vertical Beam (as explained above). The procedures below result in a vertical cone.

To create a cone from a Beam:

1. Drag a Beam onto the drawing page.



2. Double-click the Beam.

The *Shape Data* dialog appears.

3. Click the **Section Type** dropdown and select **Tube**.

4. Click in the **Section Width** text field and enter the diameter of the base of the cone.

5. Click in the **Section Height** text field and enter the diameter of the base of the cone.

6. Click in the **Start Elevation** text field and enter the elevation of the base of the cone.

7. Click in the **End Elevation** text field and enter the end elevation of the cone.

Note: In a vertical cone, this will be the height of the cone.

8. Click in the **Section Wall Thickness** text field and enter **0 mm**.

The image shows a screenshot of the 'Shape Data' dialog box. The dialog has a title bar with a close button (X) in the top right corner. The main area contains several input fields and dropdown menus. Red arrows point to the following elements:

- An arrow points to the 'Section type' dropdown menu, which is currently set to 'Tube'. The text 'Click and sel' is written in red next to the arrow.
- An arrow points to the 'Section width' text field, which contains '0.25 m.'. The text 'Click and enter' is written in red next to the arrow.
- An arrow points to the 'Section height' text field, which contains '0.25 m.'. The text 'Click and enter' is written in red next to the arrow.
- An arrow points to the 'Section wall thickness' text field, which contains '0 mm.'. The text 'Click and enter' is written in red next to the arrow.

Other fields in the dialog include: Length (3 m.), Start elevation (0 m.), End elevation (0 m.), Section rotation angle (0 deg.), Section vertical justification (Middle), Reference elevation (0), Show in 3D model (TRUE), and Part numbers (empty). A note at the bottom states: '(Note: Additional properties not shown)'. Below the note is a 'Prompt' section with the text: 'For Box and Tube cross sections, input zero to get solid section and also get the option to specify draft angle (close and reopen dialog box)'. At the bottom of the dialog are three buttons: a help button (question mark in a circle), 'Define...', 'OK', and 'Cancel'.

9. Click **OK**.

10. Double-click the Beam again.

The *Shape Data* dialog returns, containing a new text field: **Draft Angle**.

11. Click in the **Draft Angle** text field and enter the appropriate angle (Avontus Designer allows up to 45 degrees max).

Note: A positive number for this angle results in a cone that expands out from the base. A negative number results in a cone that tapers from the base to the tip.

Shape Data [X]

Section type: Tube [v]

Length: 3 m.

Section width: 0.25 m.

Section height: 0.25 m.

Start elevation: 0 m.

End elevation: 0 m.

Section wall thickness: 0 mm.

Section rotation angle: 0 deg.

Section vertical justification: Middle [v]

Draft angle: 30 deg. ← Click and enter

Reference elevation: 0

Show in 3D model: TRUE [v]

Part numbers:

(Note: Additional properties not shown)

Prompt
 Draft angle from center axis. Use a positive angle to expanding and a negative angle to taper down toward the end point.

[?] [Define...] [OK] [Cancel]

12. Click **OK**.

