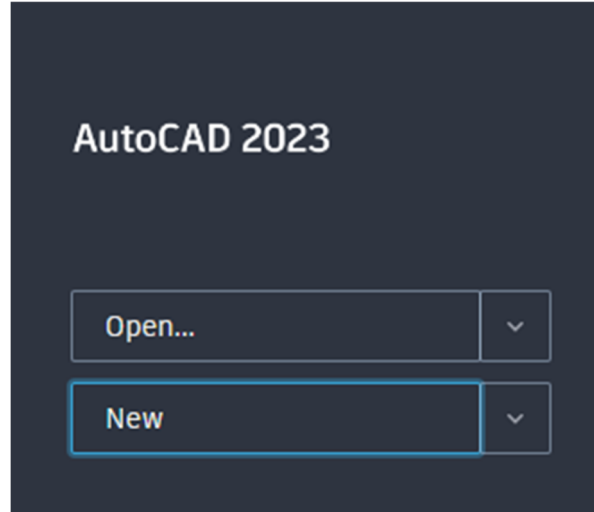


Autodesk AutoCAD Guide

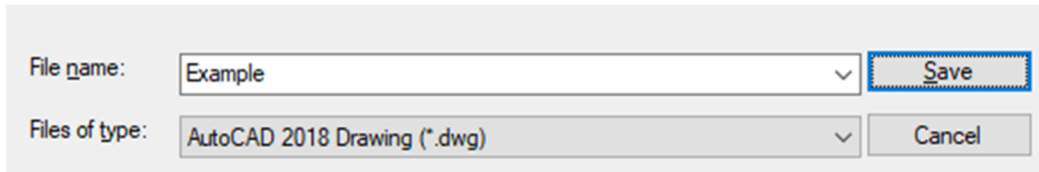
Please remember to save!

Creating a New File

Step 1: Select *New*.

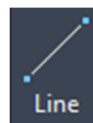


Step 2: Press Ctrl+S to save the file, name the file, and select *Save*.



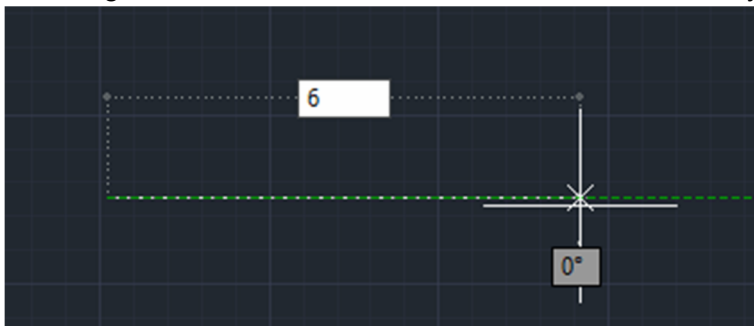
Autodesk AutoCAD Guide

Drawing the Elevation View

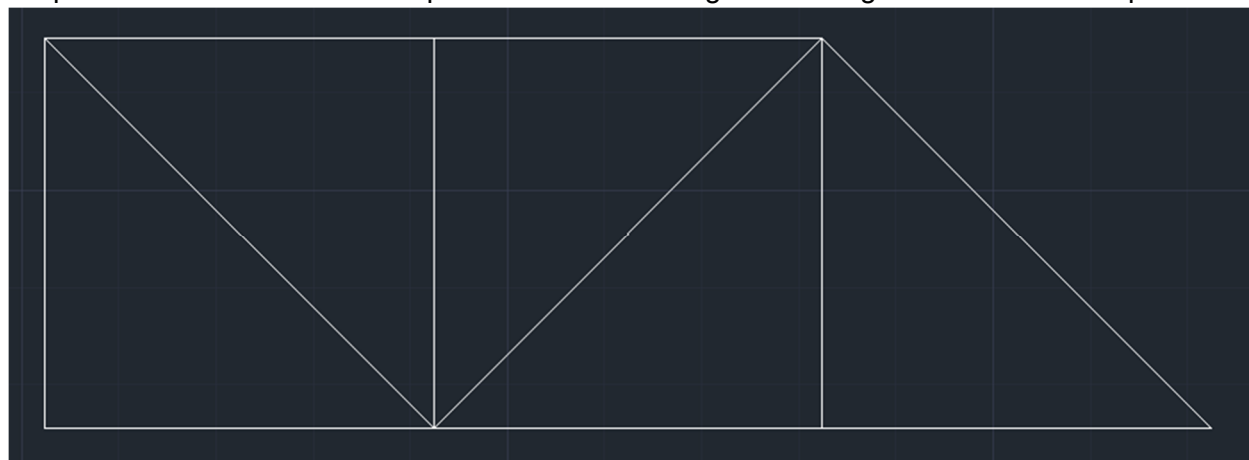


Step 1: From the *Home* tab, in the *Draw* toolbar, select the *Line* tool.

Step 2: Specify the first point by clicking anywhere on the screen and draw a horizontal line that is $\frac{1}{2}$ of the desired bridge length. The length can be entered using the keyboard. In this example, the $\frac{1}{2}$ length will be 6 in. This line will be the bottom line of your bridge.

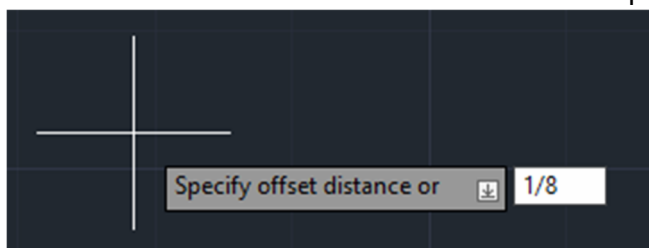


Step 3: Use the *Line* tool to complete the desired design. The image below is an example.



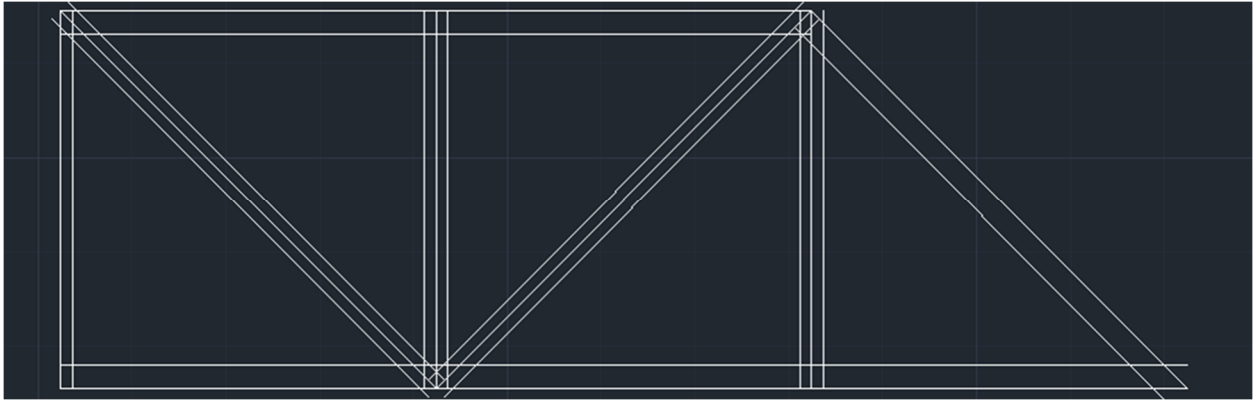
Step 4: From the *Home* tab, in the *Modify* toolbar, select the *Offset* tool.

Step 5: Specify the offset distance to the thickness of the member and press Enter. ($\frac{1}{8}$ in)



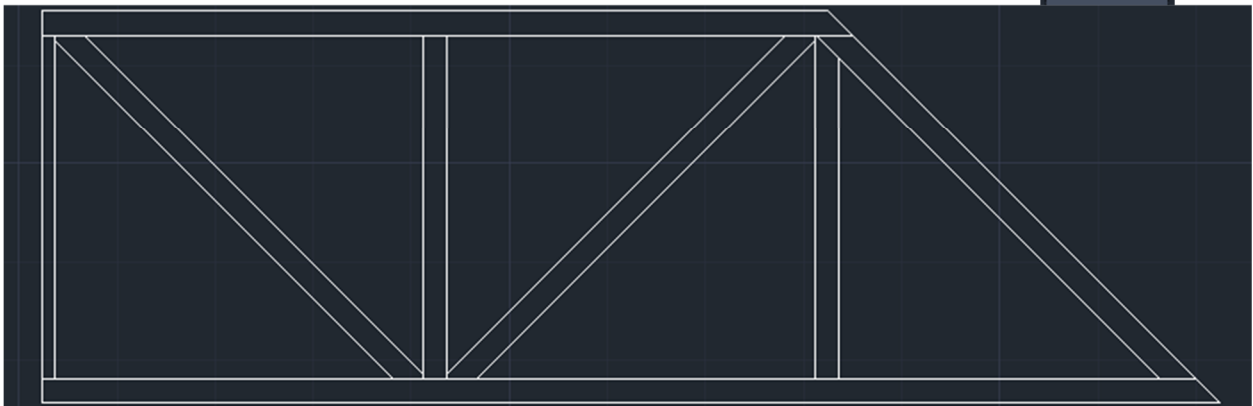
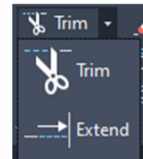
Autodesk AutoCAD Guide

Step 6: Select the members to offset and drag the cursor to the side that is desired.



Note: The line on the left should be offset to $\frac{1}{2}$ the offset distance ($\frac{1}{16}$ in) since it will be mirrored later. The other vertical lines were created with a ($\frac{1}{16}$ in) offset on both sides of the original line.

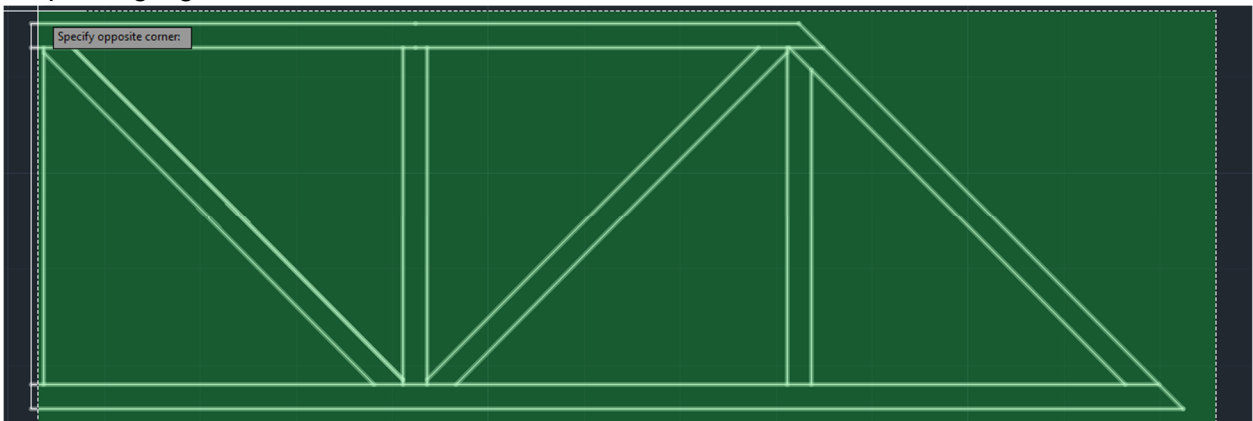
Step 7: From the *Home* tab, in the *Modify* toolbar, select the *Trim* tool or the *Extend* tool, and then select the line to trim or extend the lines to determine the connection of the members. The image below is an example.



Step 8: From the *Home* tab, in the *Modify* toolbar, select the *Mirror* tool.



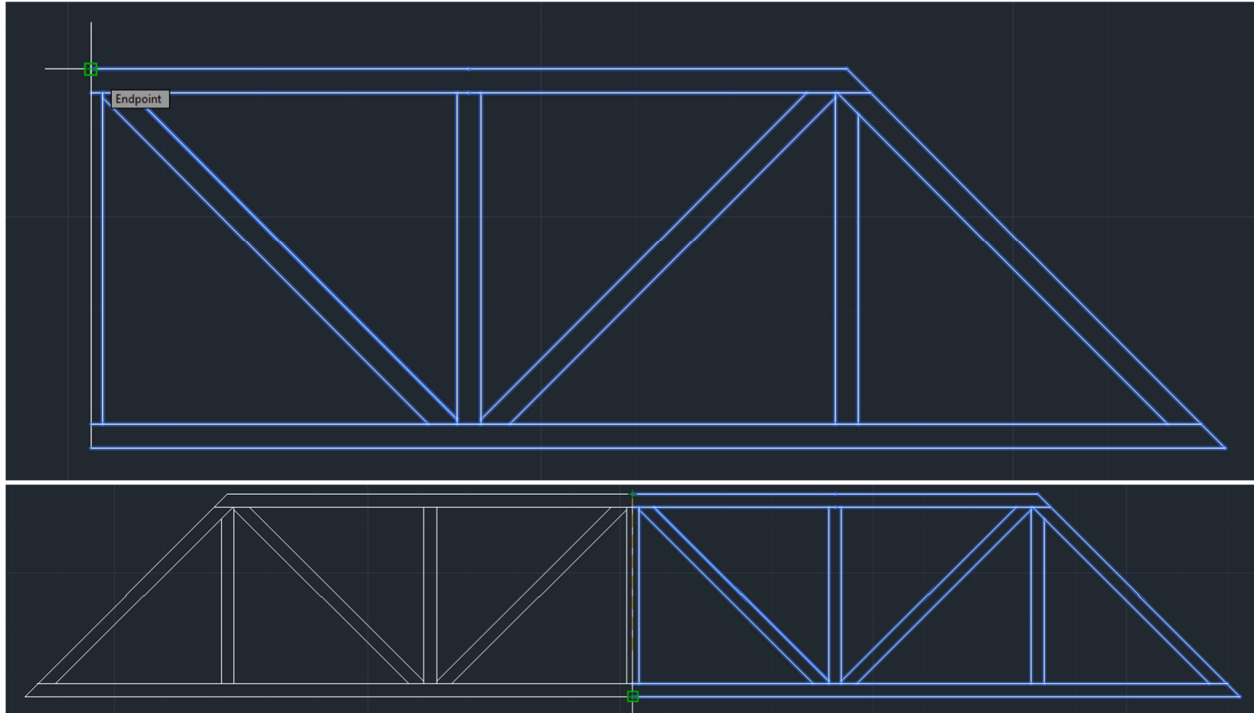
Step 9: Highlight or select the members that need to be mirrored.



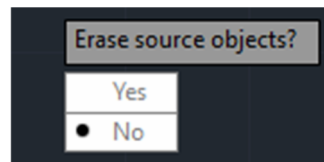
Autodesk AutoCAD Guide

Step 10: Click Enter or right-click in order to specify the first point of the mirror line.

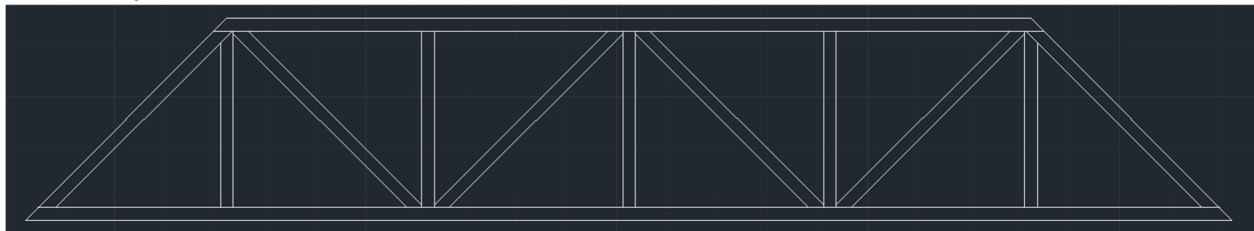
Step 11: Select to top of the left line and then the bottom of the left line.



Step 12: Select *No*.



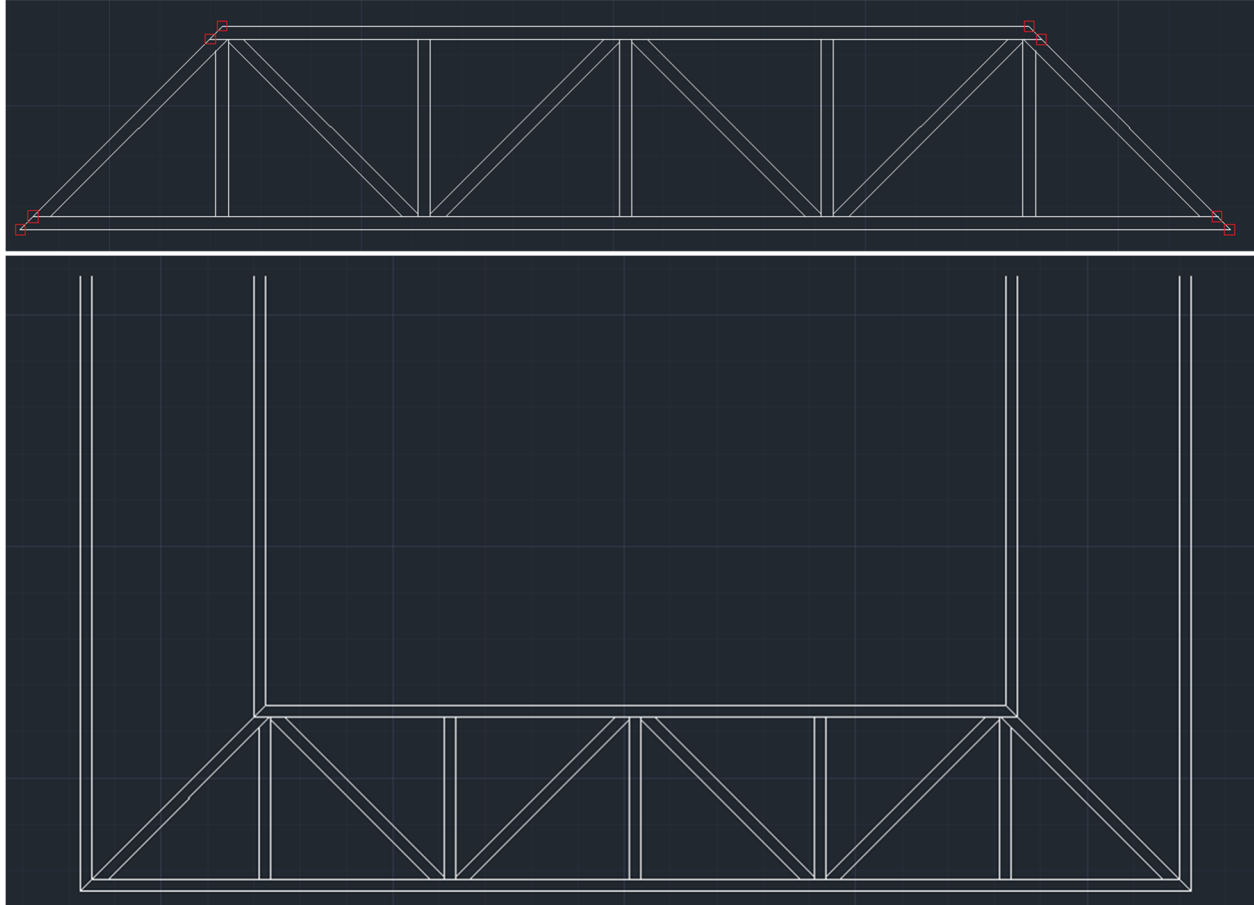
Step 13: Select the center line, the line that was used to mirror, and click Delete on the keyboard to delete. This will be the Elevation View.



Autodesk AutoCAD Guide

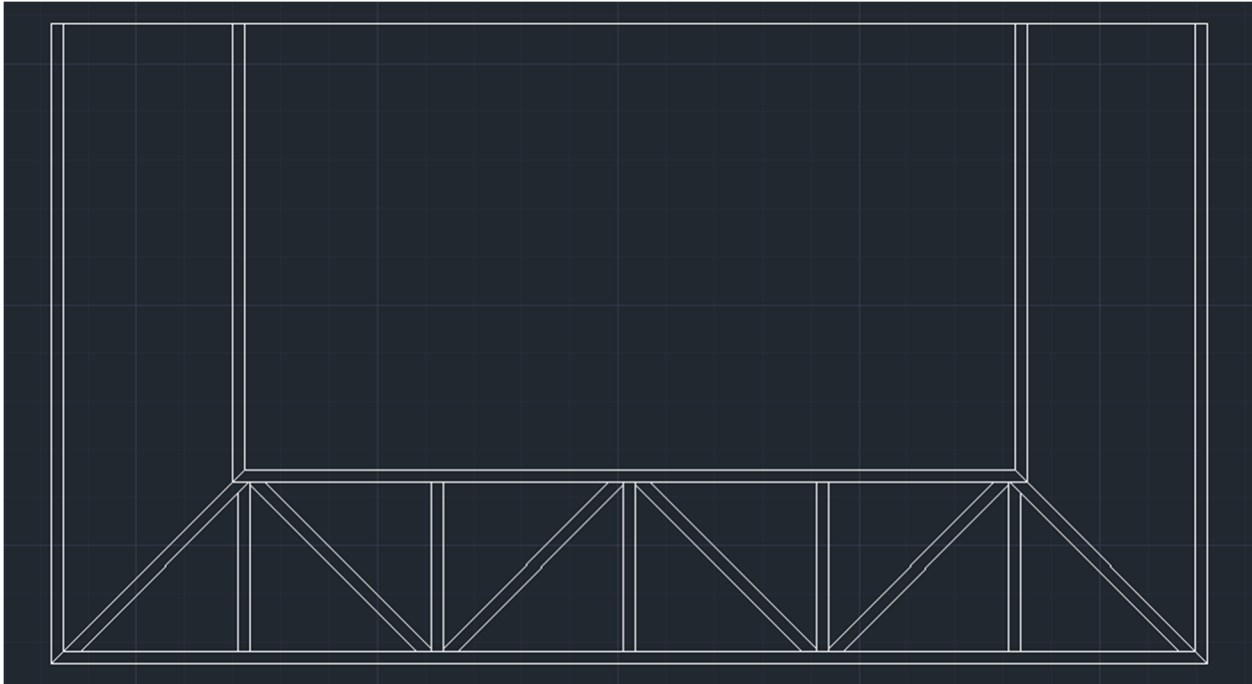
Creating the Plan View

Step 1: Use the *Line* tool to draw vertical lines from the top outer border of the Elevation View. Draw a vertical line everywhere where a horizontal line intersects the outer border. Please see the images below for examples.



Autodesk AutoCAD Guide

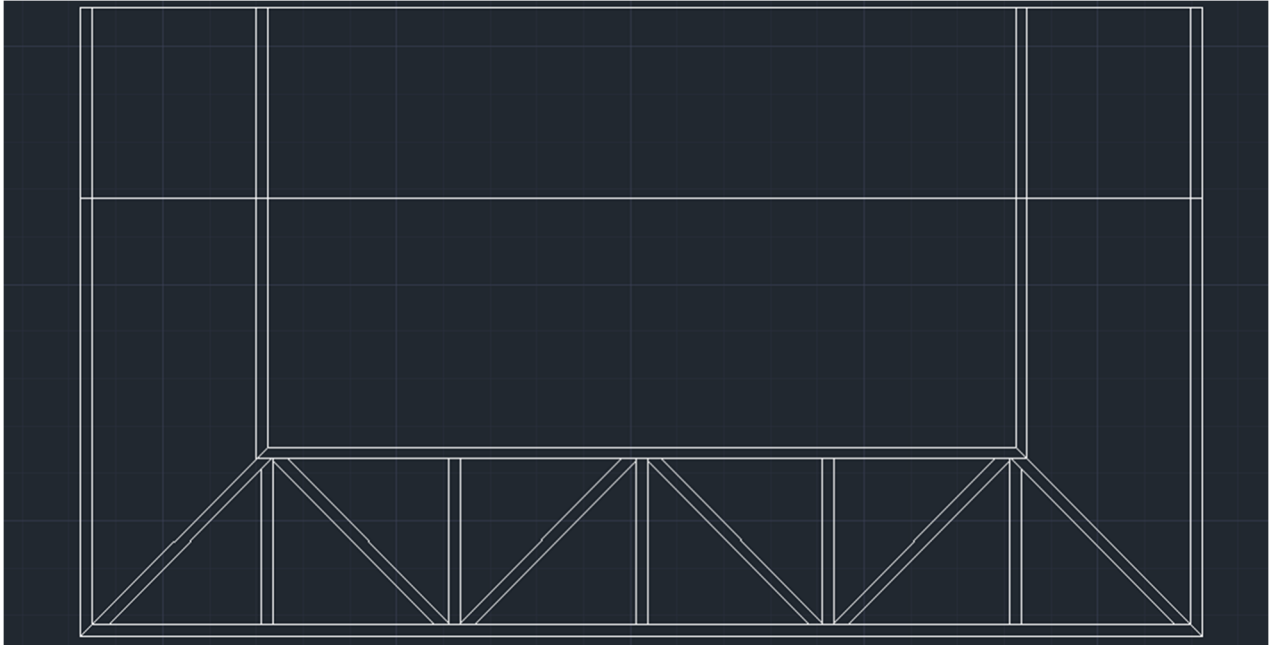
Step 2: Draw a horizontal line connecting the vertical lines.



Step 3: Select the *Line* tool, hover over the leftmost vertical line, drag the mouse down, enter the width of the bridge, press Enter, and draw a second horizontal line to the rightmost vertical line. In this example, the width will be 2 in.



Autodesk AutoCAD Guide



Step 4: Use the *Offset* tool and offset the two horizontal lines inward to the thickness of the member ($\frac{1}{8}$ in).



Step 5: Use the *Trim* tool to trim the unnecessary vertical lines.



Step 6: Determine the locations of the middle connection members and draw vertical lines. Use the Elevation View as a guide if needed (similar to step 3). Use other tools if necessary. This will be the Plan View.

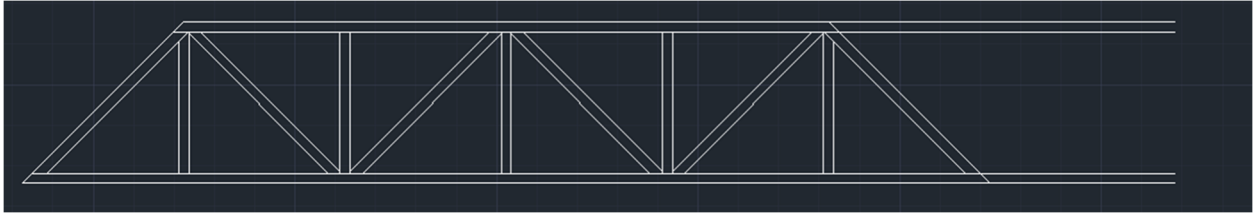


Note: Make sure to include any bracing members if the chosen design includes them.

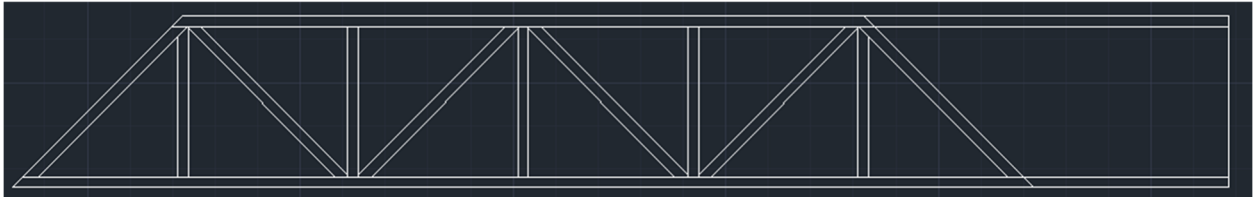
Autodesk AutoCAD Guide

Creating a Section View

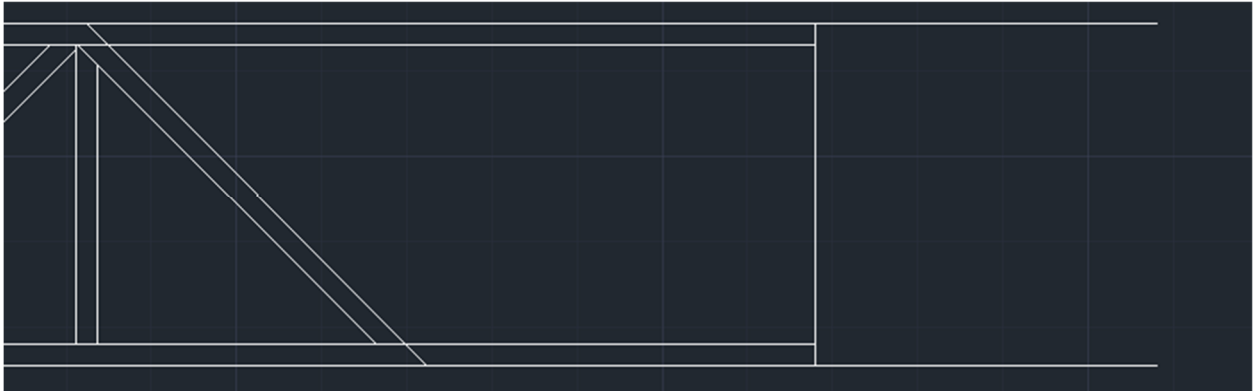
Step 1: Similar to Step 1 of the Plan View, draw horizontal lines from the right outer border.



Step 2: Draw a vertical line to connect the horizontal lines.



Step 3: Draw two horizontal lines with the distance of the width of the bridge and draw a vertical line connecting them.



Autodesk AutoCAD Guide

Step 4: Delete the horizontal lines drawn in Step 1.

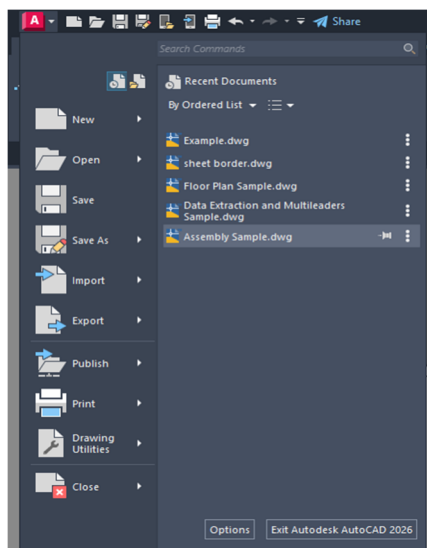
Step 5: Offset the lines to the thickness of the member ($\frac{1}{8}$ in). This will be the Section View.




Autodesk AutoCAD Guide

Creating a Sheet Border

Step 1: To close the previous file, select the drop-down arrow on the AutoCAD logo in the top left corner of the screen and then select *Close*.

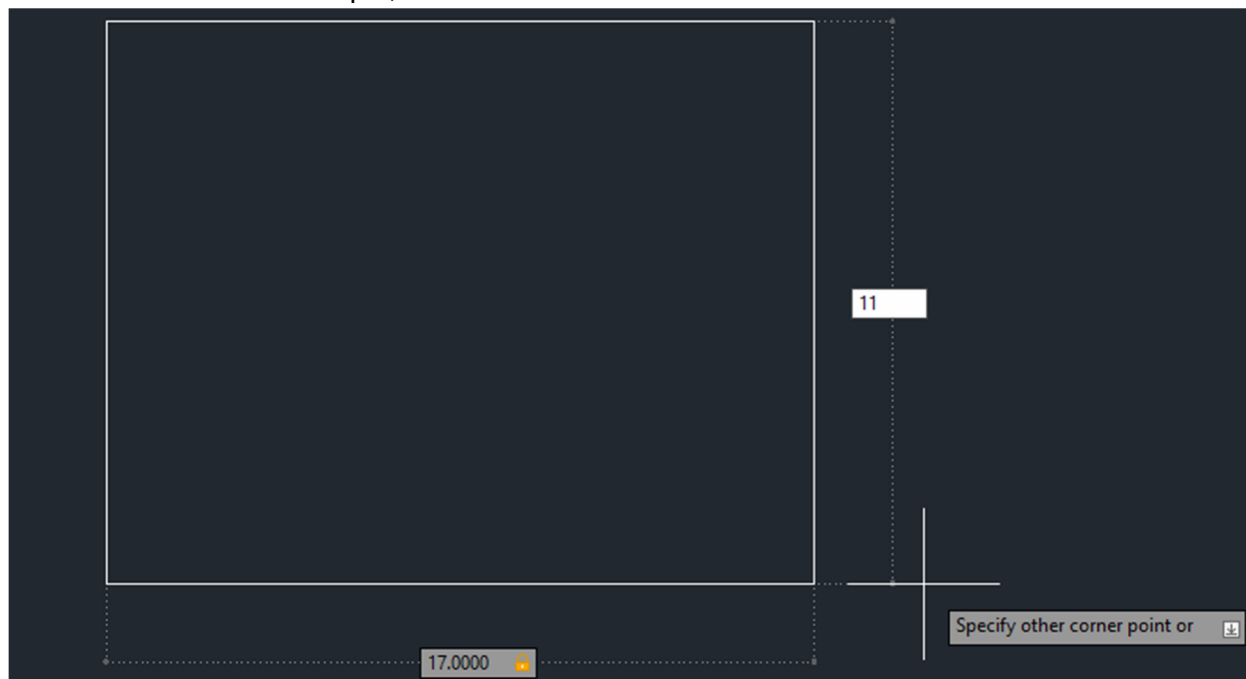


Step 2: Create a new file. Make sure to save the file!

Step 3: From the *Home* tab, in the *Draw* toolbox, select the *Rectangle* tool. 

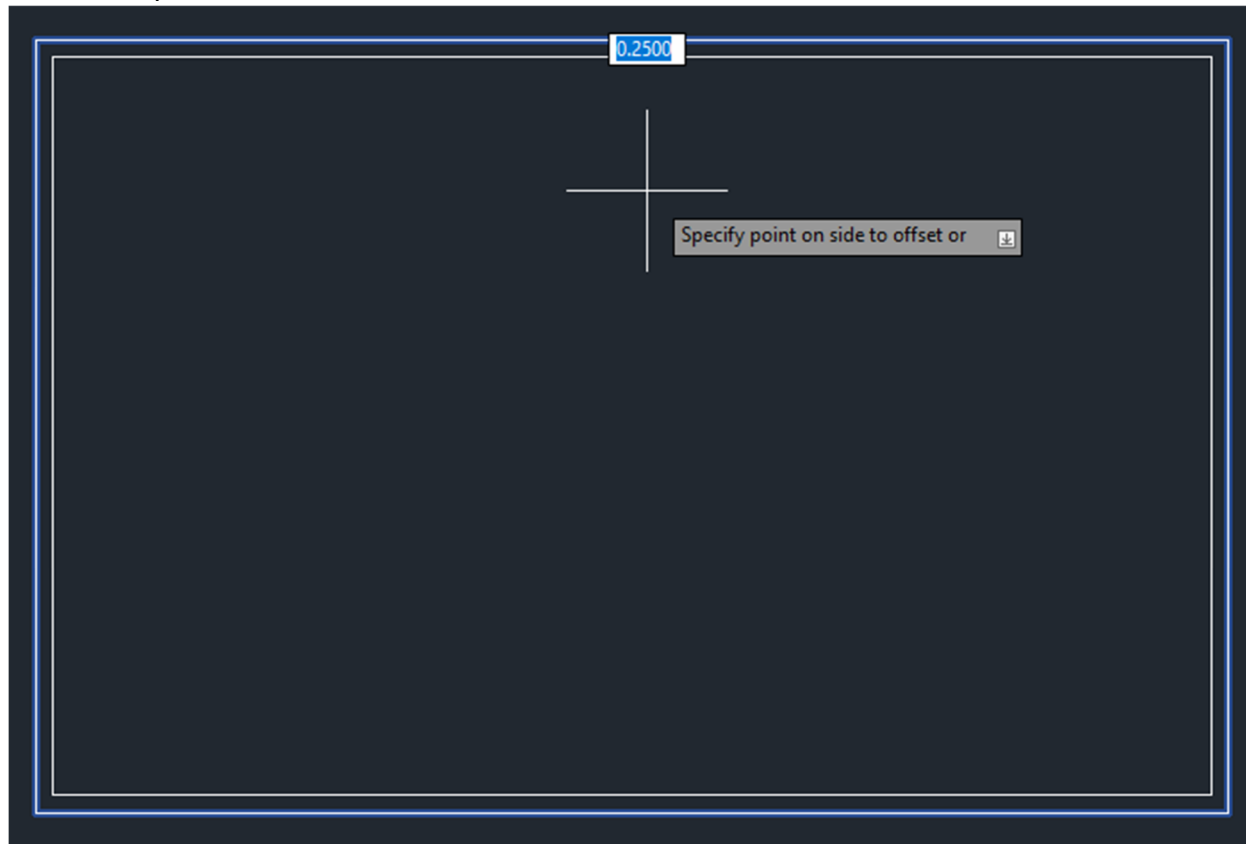
Step 4: Specify the first point at any location on the screen and drag the cursor away from the first point.

Step 5: Enter the sheet size used for plotting/printing. To switch between the input boxes press Tab. For this example, a sheet size of 11x17 is used.

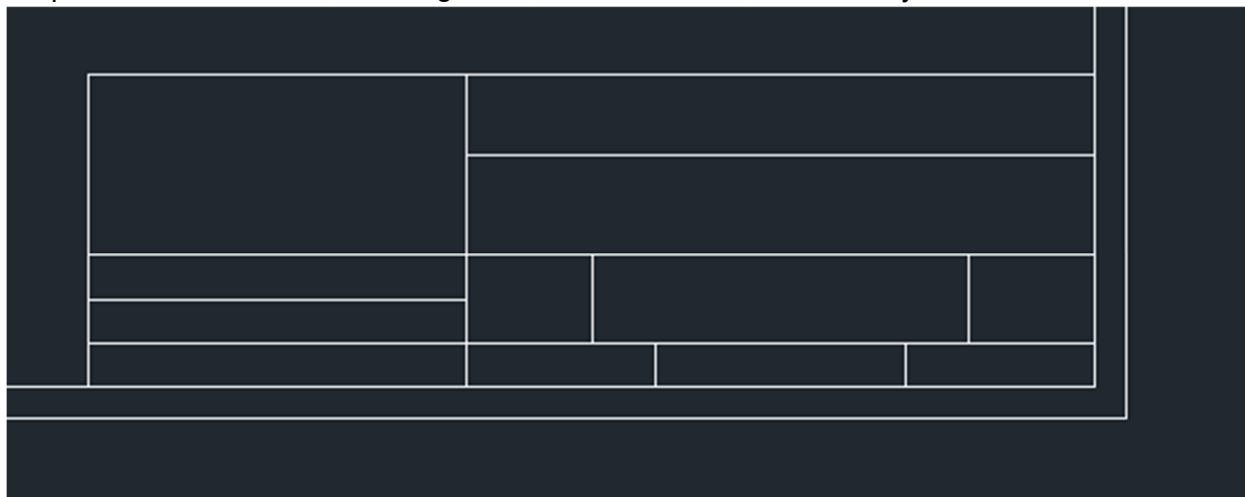


Autodesk AutoCAD Guide

Step 6: Use the *Offset* tool to offset the rectangle drawn earlier to $\frac{1}{4}$ in or the printable area of the printer.

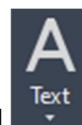


Step 7: Use the *Line* tool, *Rectangle* tool, and other tools, if necessary, to create a Title Box.



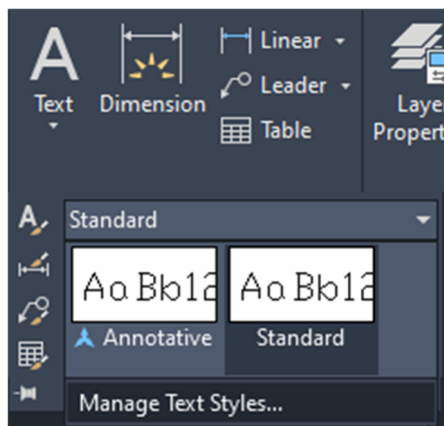
Note: The Title Box shown in this example used the Title Box from Fusion 360 as reference. Teams must create a Title Box that includes information required in the competition guidelines. Adjust the shape and location of the Title Box accordingly.

Autodesk AutoCAD Guide

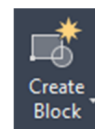


Step 8: From the *Home* tab, in the *Annotate* toolbar, select the *Text* tool to add information needed for the Title Box.

Note: To set/change the text style, select the *Annotation* dropdown, and select *Manage Text Styles*.



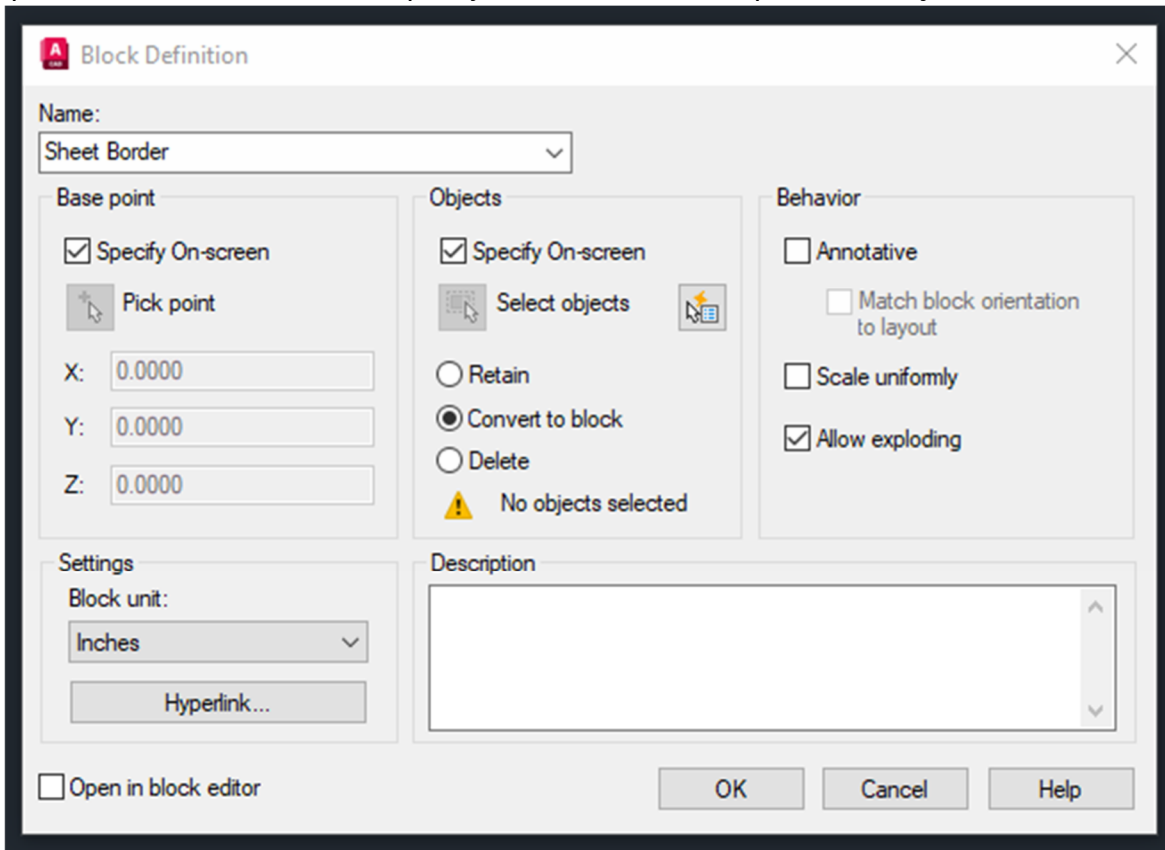
			PROJECT				
			BRIDGE DESIGN COMPETITION				
			TITLE				
			EXAMPLE TRUSS BRIDGE				
APPROVED		SIZE	CODE	DWG NO	REV		
CHECKED		B					
DRAWN	TEAM NAME	DATE	SCALE	1:1	WEIGHT	SHEET	1/1



Step 9: From the *Insert* tab, in the *Block Definition* toolbar, select the *Create Block* tool.

Autodesk AutoCAD Guide

Step 10: Name the block, check *Specify On-screen* for *Base point* and *Objects*, and select *OK*.

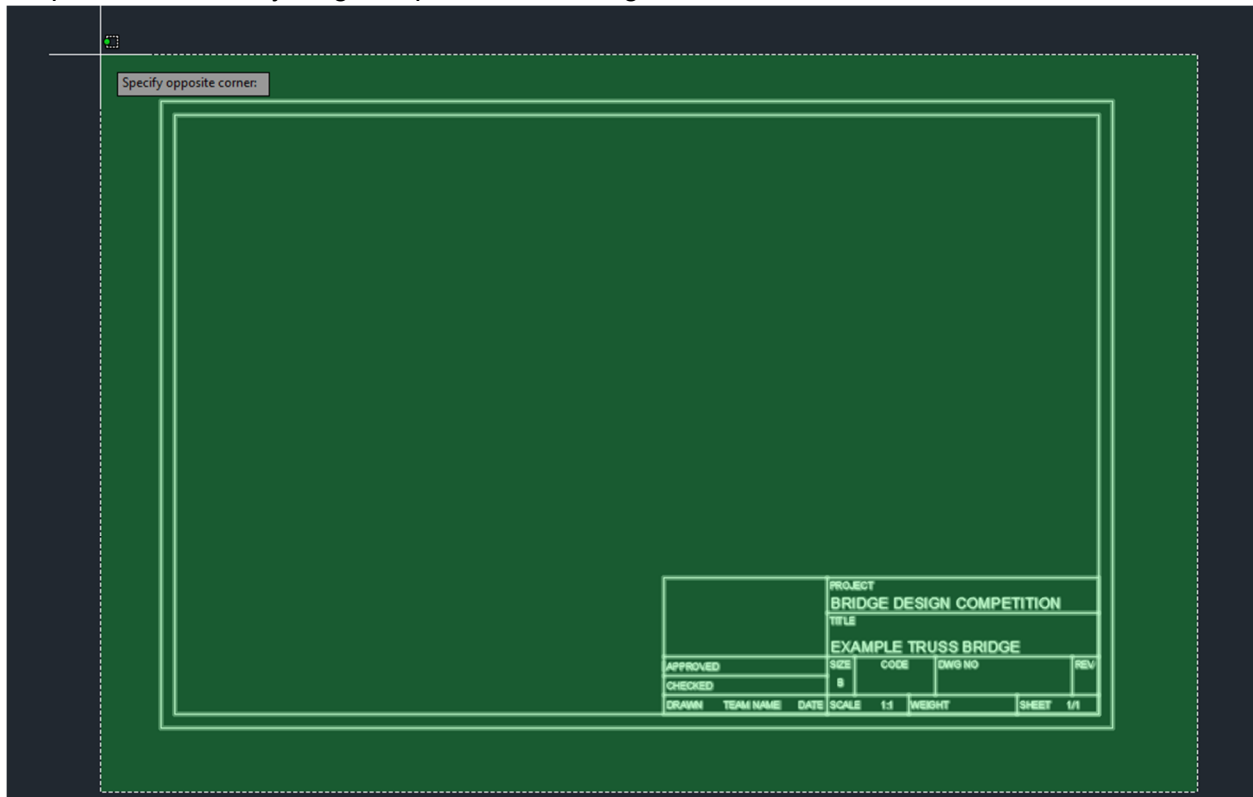


Step 11: Specify the base point at the bottom left corner.

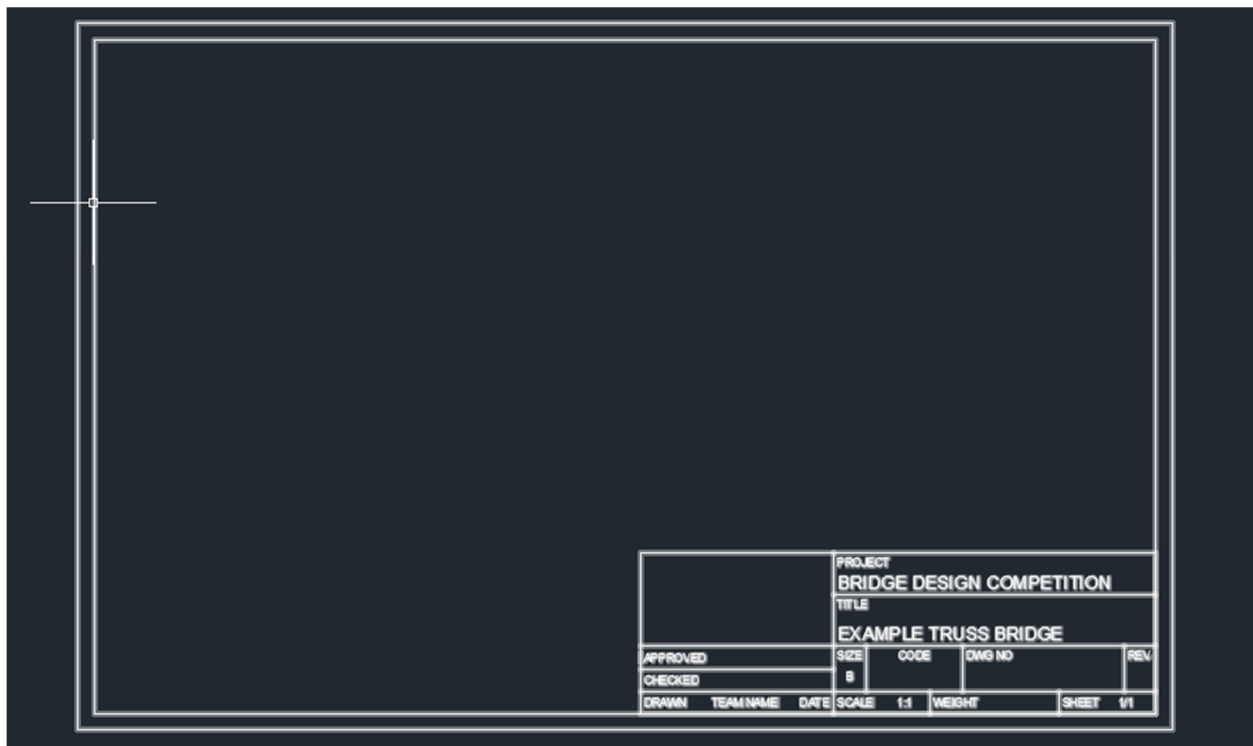


Autodesk AutoCAD Guide

Step 12: Select everything and press Enter or right-click.



Note: If a Block is successfully created, the Sheet Border will become one unit when hovered over.



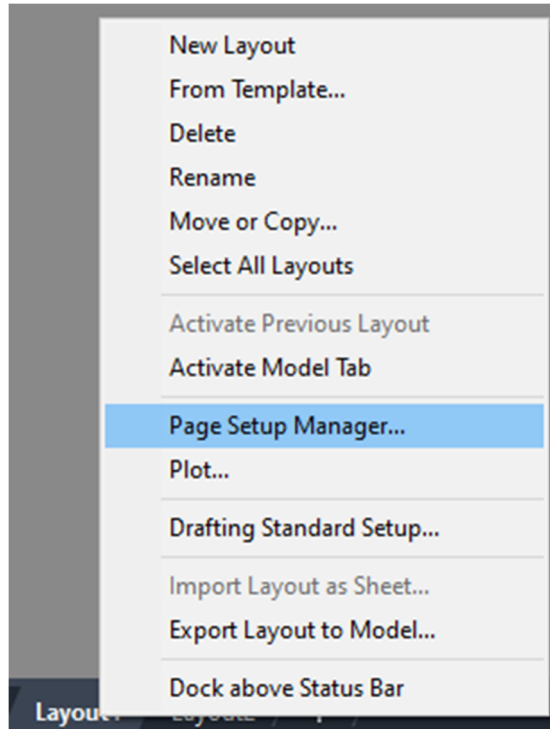
Don't forget to save!

Autodesk AutoCAD Guide

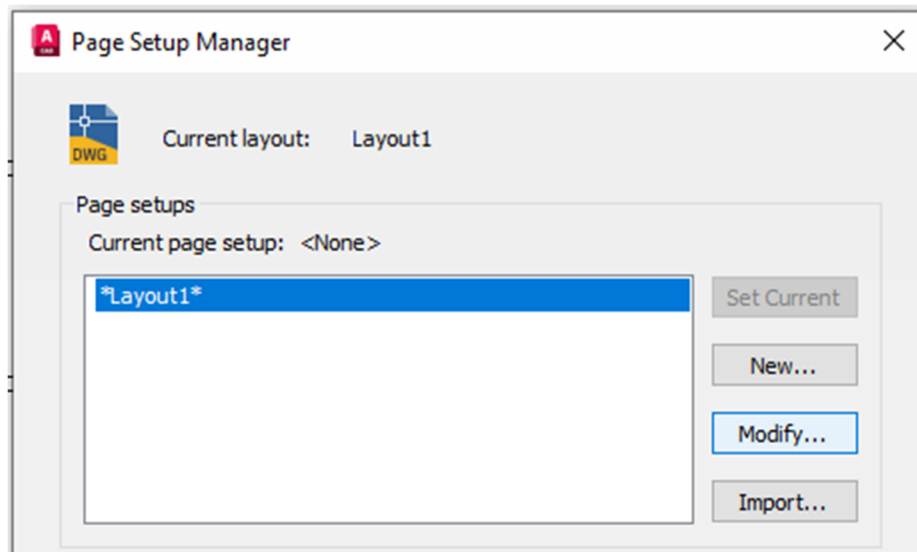
Combining Sheet Border and Bridge Drawing

Step 1: Open or go back to the file where the bridge details were drawn.

Step 2: Select *Layout1* at the bottom left corner of the screen. While hovering over the *Layout1* tab, right-click and select *Page Setup Manager*.

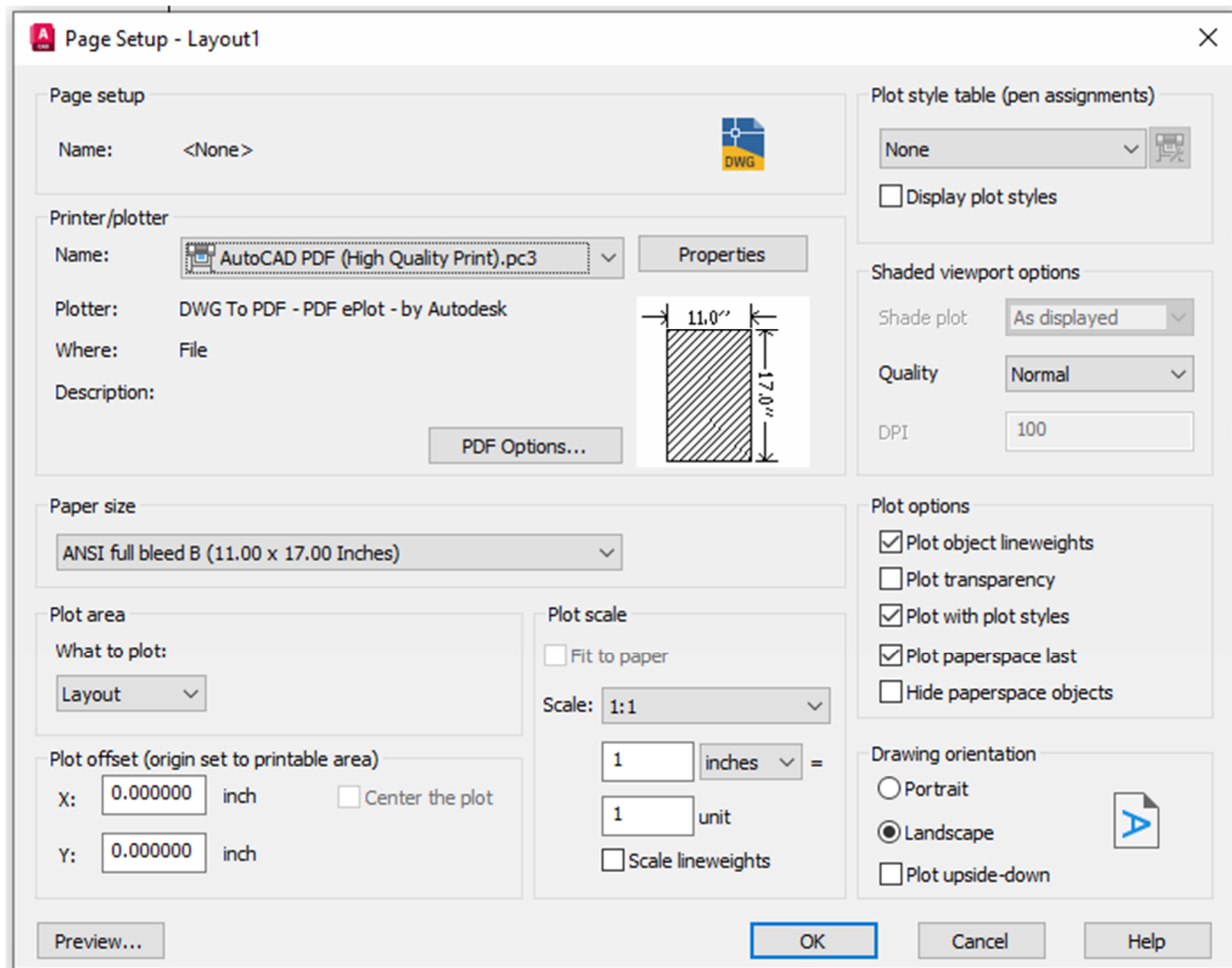


Step 3: Select *Modify*

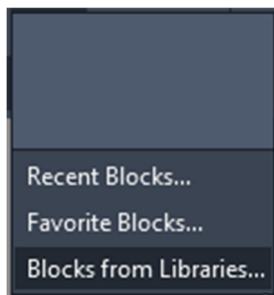


Autodesk AutoCAD Guide


Step 4: Select the appropriate *Printer/plotter Name* (PDF) and *Paper size* (11 x 17 in) and select **OK**.

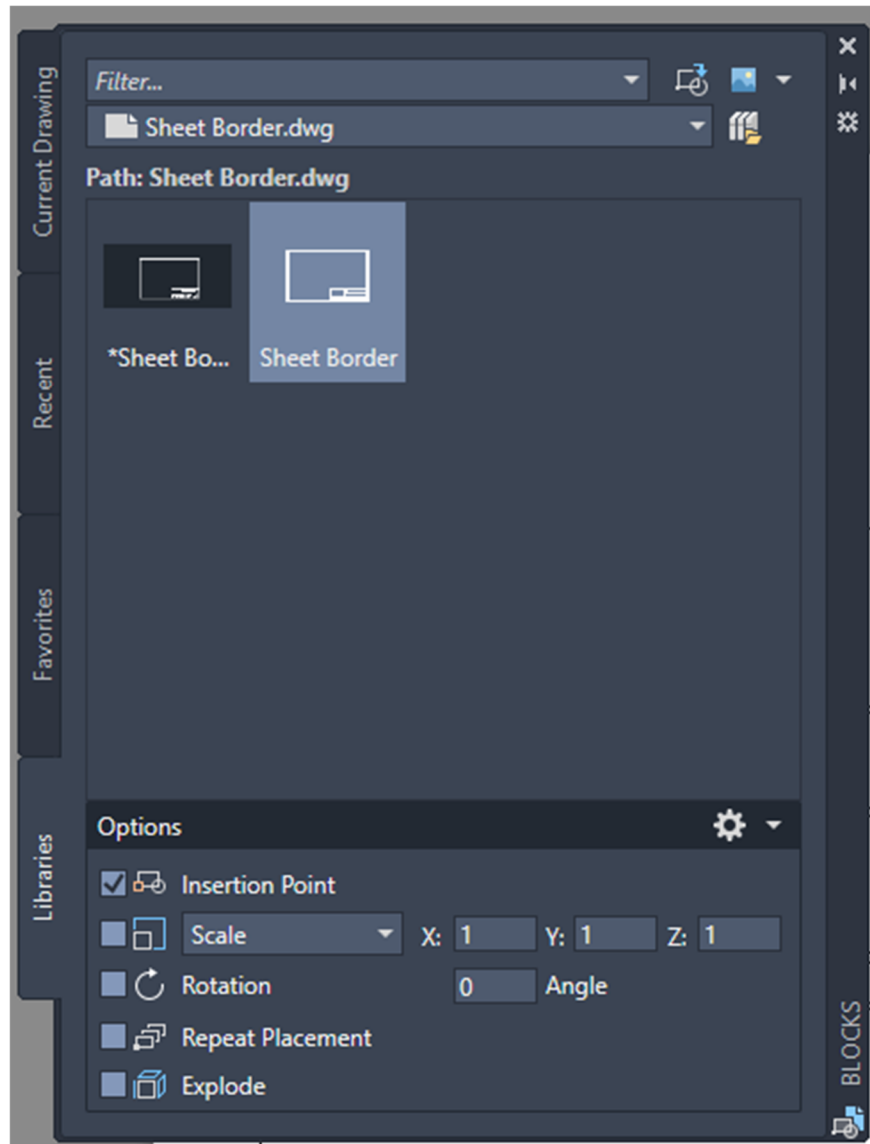


Step 5: From the *Insert* tab, in the *Block* toolbar, select the *Insert* tool (a dropdown should appear), and select *Blocks from Libraries*.



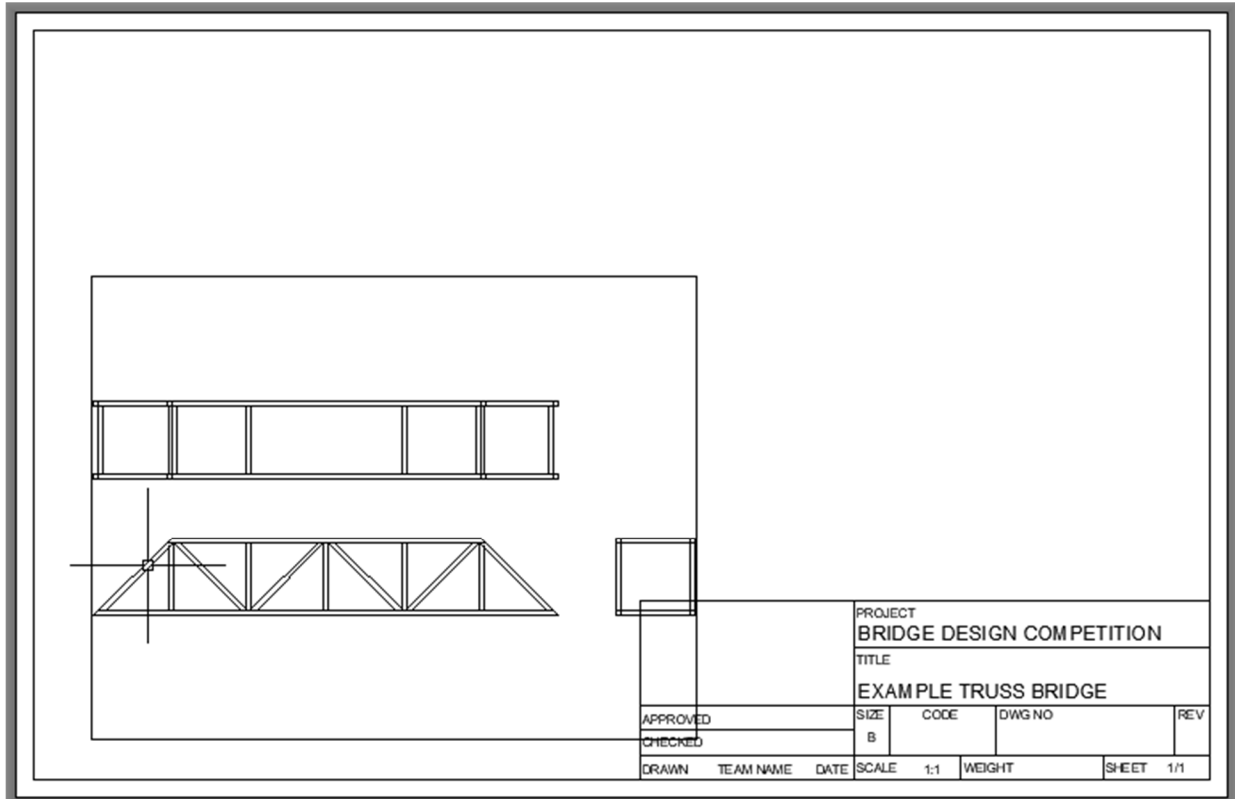
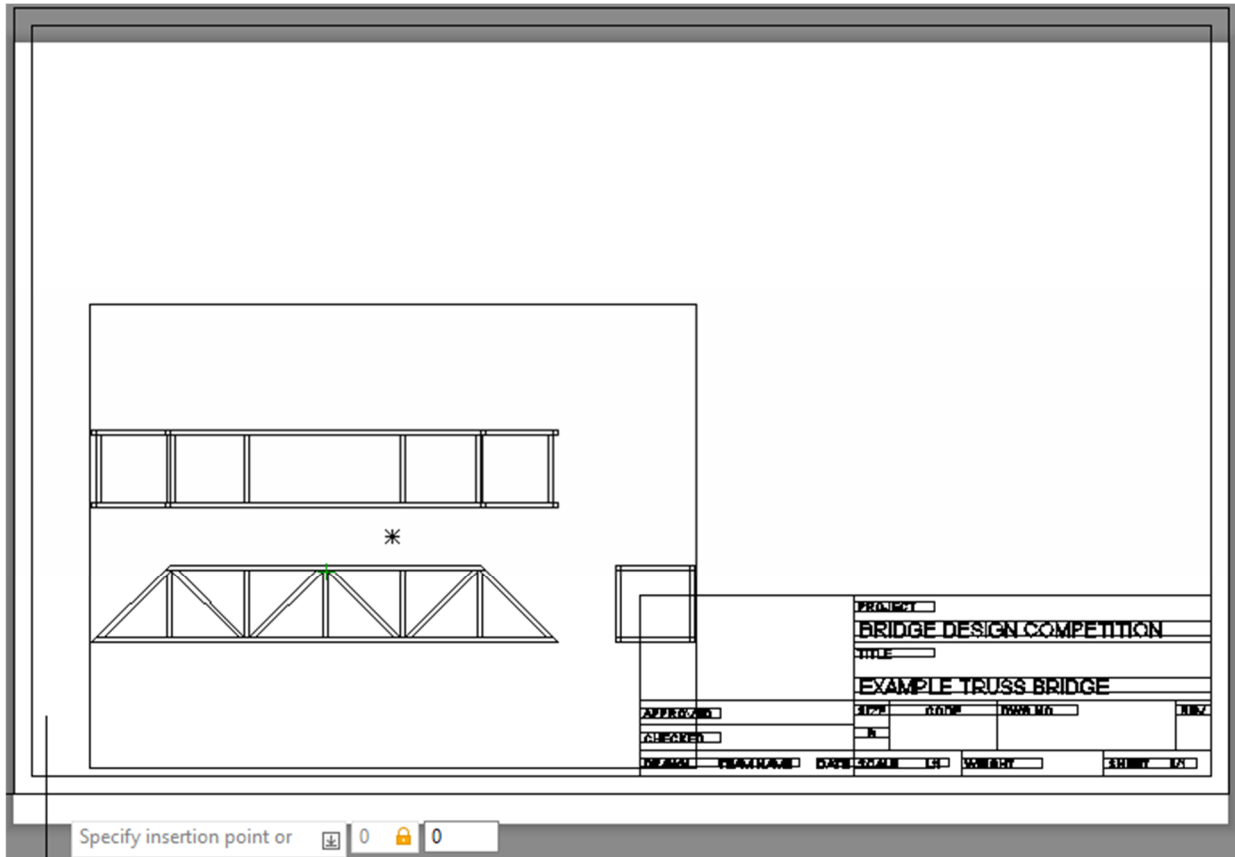
Autodesk AutoCAD Guide

Step 6: Select the file navigation icon , find the file where the Sheet Border Block was created, and select the Sheet Border.



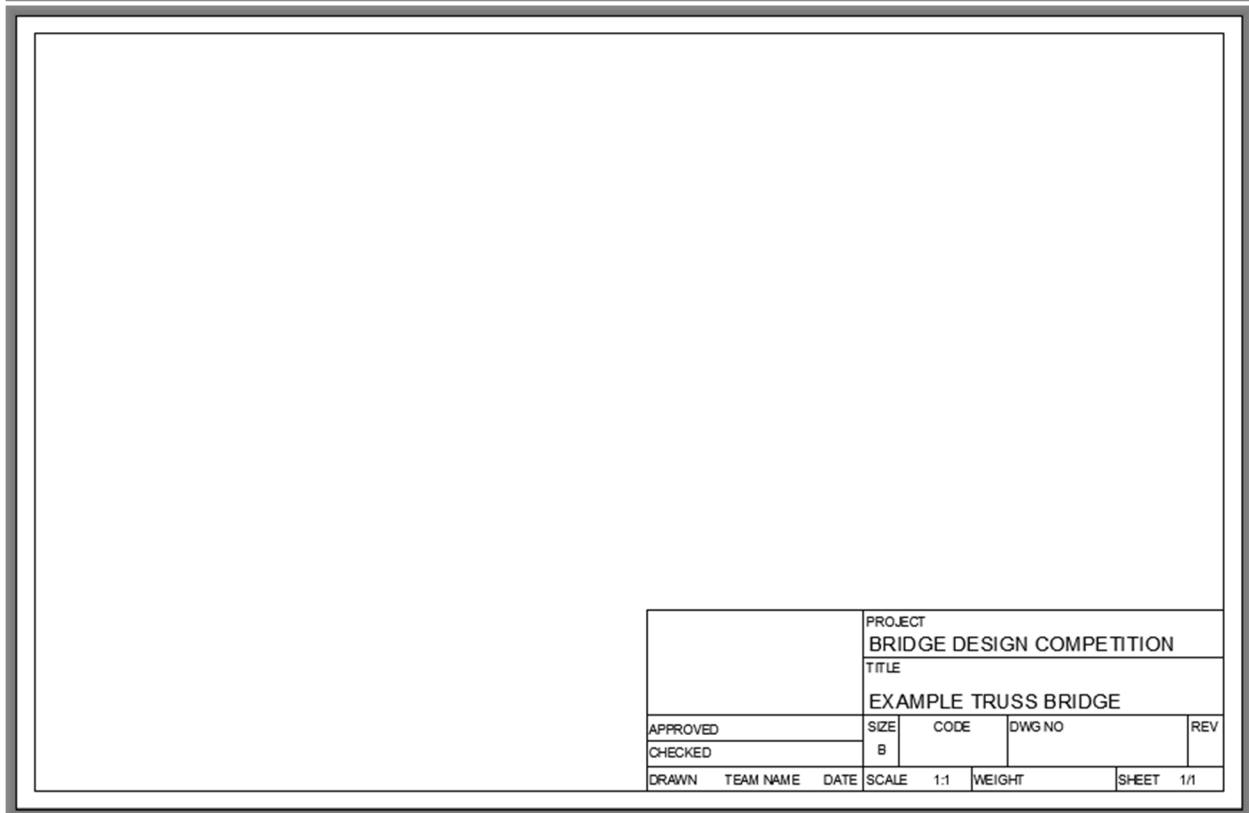
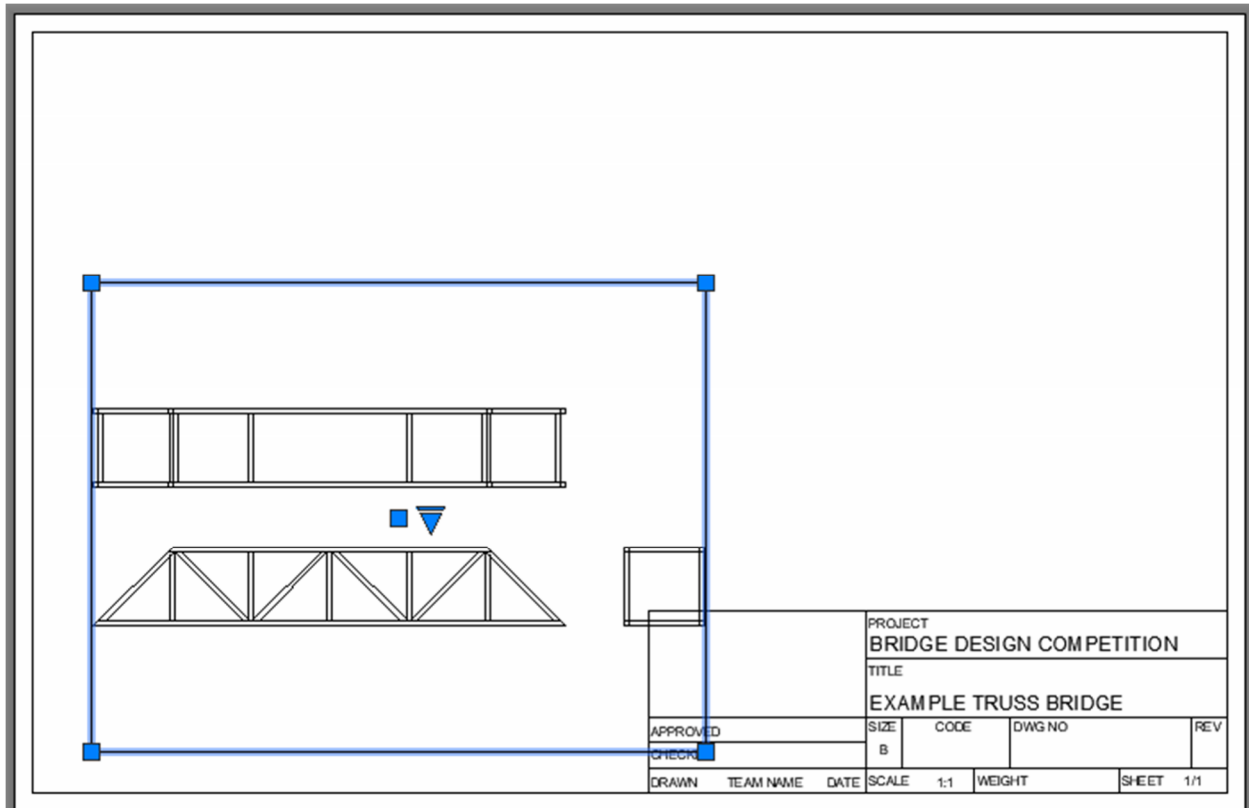
Autodesk AutoCAD Guide

Step 7: Enter 0, press Tab, enter 0, and press Enter to specify the insertion point.



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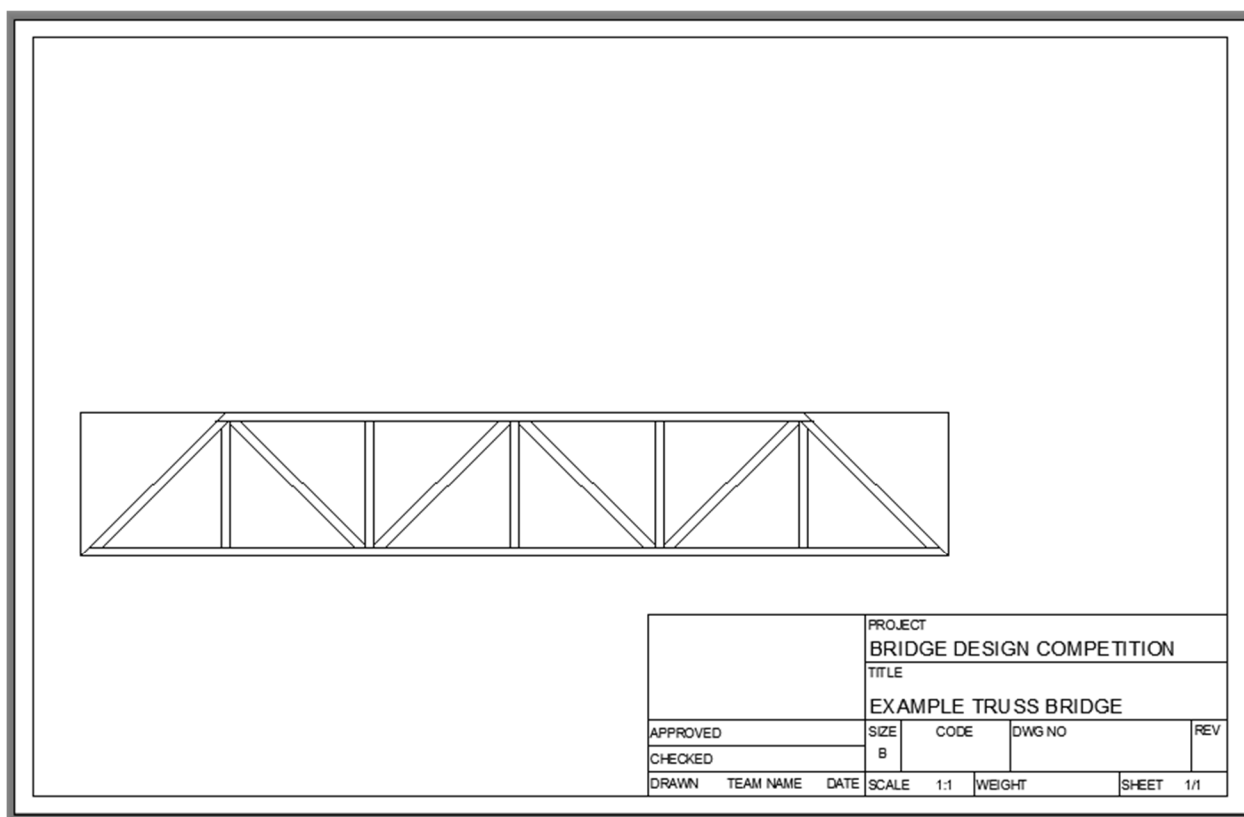
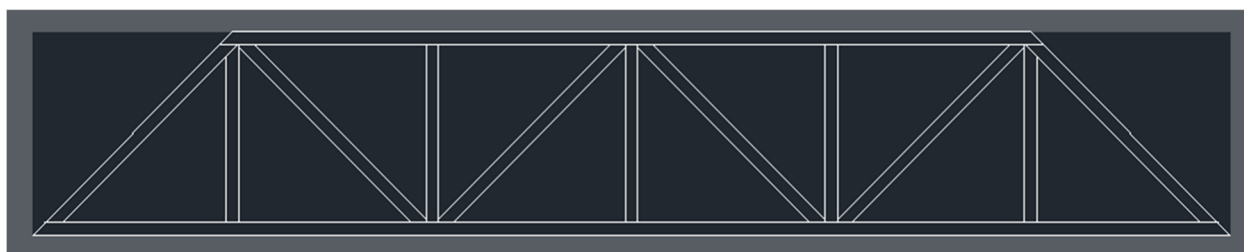
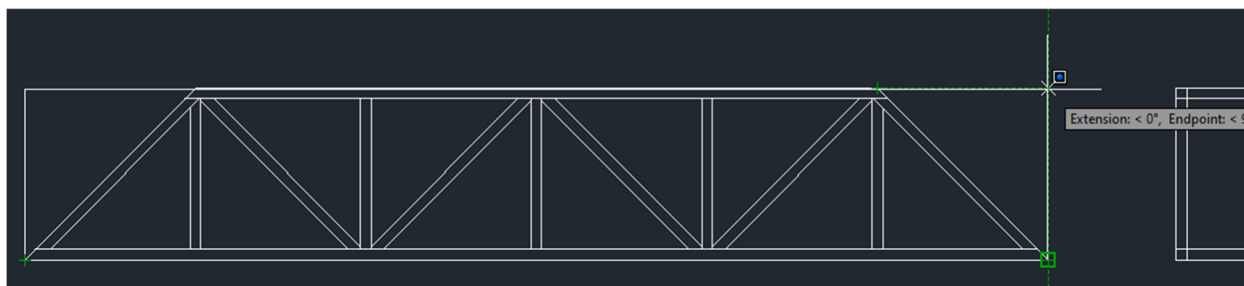
Step 8: Select and delete the Viewport currently on the screen.

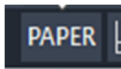



Step 9: From the *Layout* tab, in the *Layout Viewports*, select *Insert View*.

Autodesk AutoCAD Guide

Step 10: Select a view, from corner to corner, right-click, right-click again, select an appropriate scale, and place it at an appropriate location on the screen.

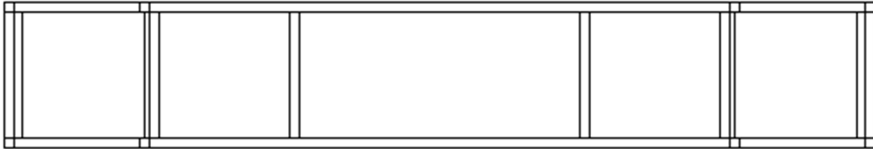
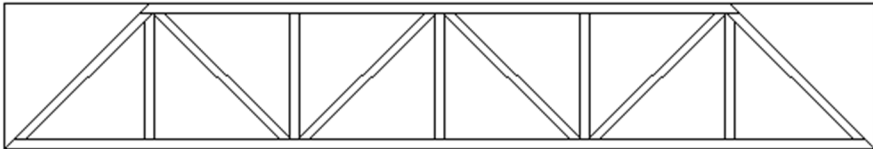
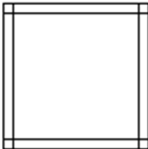


Note: If you see a grid behind your model turn it off by clicking the paper button  on the bottom right of your screen. Then hit this icon  on the tab that appears.

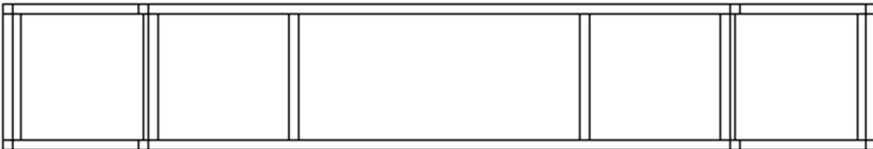
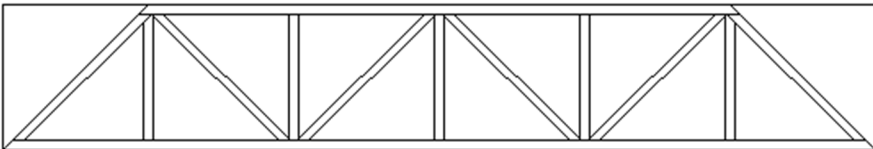
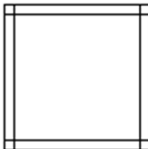
Autodesk AutoCAD Guide

Step 11: Repeat Steps 9 and 10 for other views and adjust views as needed.

Note: Don't forget to change the scale in the Title Box or wherever it is labeled.

																																			
																																			
		<table border="1"><tr><td colspan="4">PROJECT</td></tr><tr><td colspan="4">BRIDGE DESIGN COMPETITION</td></tr><tr><td colspan="4">TITLE</td></tr><tr><td colspan="4">EXAMPLE TRUSS BRIDGE</td></tr><tr><td>APPROVED</td><td>SIZE</td><td>CODE</td><td>DWG NO</td></tr><tr><td>CHECKED</td><td>B</td><td></td><td>REV</td></tr><tr><td>DRAWN</td><td>TEAM NAME</td><td>DATE</td><td>SCALE 1:1</td></tr><tr><td colspan="2">WEIGHT</td><td colspan="2">SHEET 1/1</td></tr></table>		PROJECT				BRIDGE DESIGN COMPETITION				TITLE				EXAMPLE TRUSS BRIDGE				APPROVED	SIZE	CODE	DWG NO	CHECKED	B		REV	DRAWN	TEAM NAME	DATE	SCALE 1:1	WEIGHT		SHEET 1/1	
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DRAWN	TEAM NAME	DATE	SCALE 1:1																																
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Step 12: Use the *Text* tool and label the views.

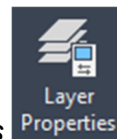
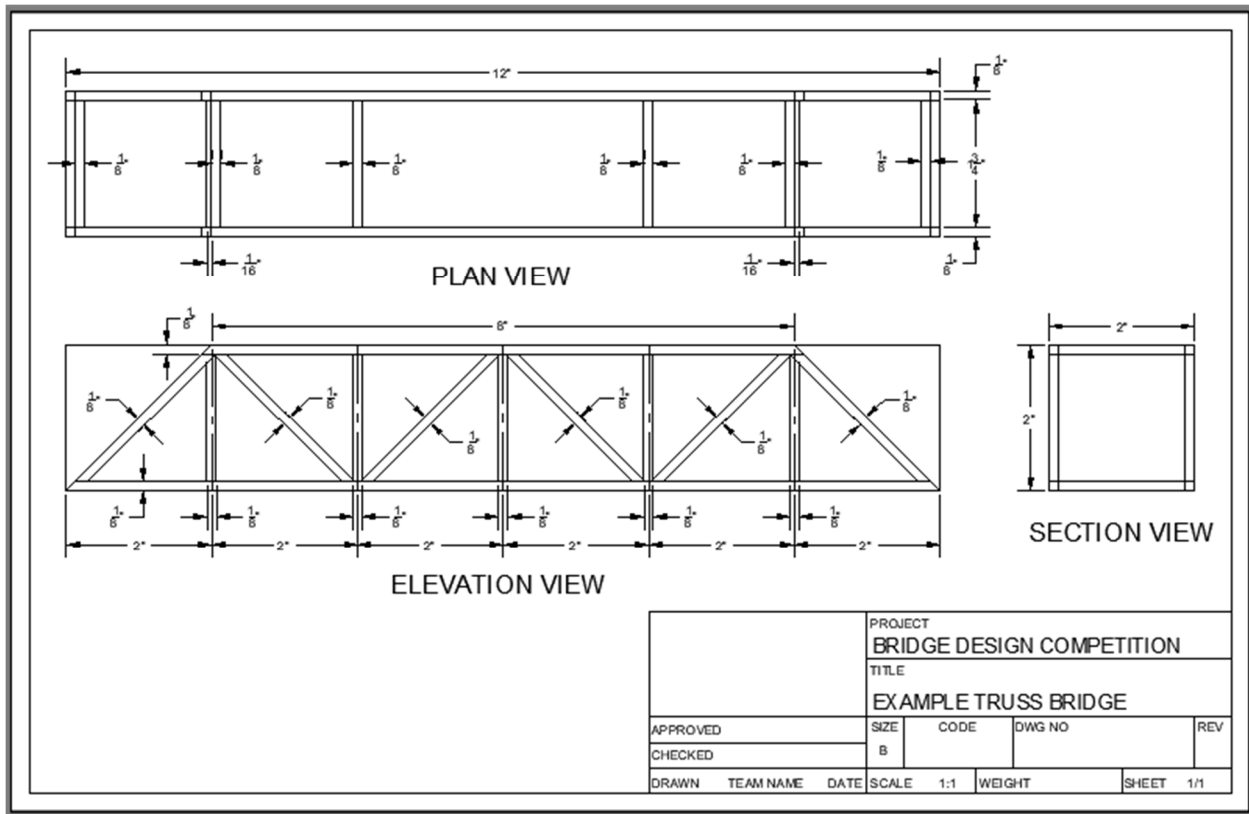
															
PLAN VIEW															
															
ELEVATION VIEW		SECTION VIEW													
		<table border="1"><tr><td colspan="4">PROJECT</td></tr><tr><td colspan="4">BRIDGE DESIGN COMPETITION</td></tr><tr><td colspan="4">TITLE</td></tr></table>		PROJECT				BRIDGE DESIGN COMPETITION				TITLE			
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Step 13: From the *Home* tab, in the *Annotation* toolbar, select the *Dimension* tool to dimension the views. (Also available from the *Annotate* tab, in the *Dimensions* toolbar.)

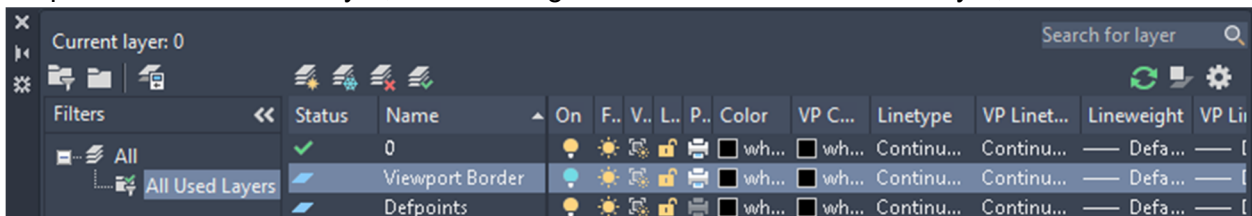
Note: To change the dimension style, select the *Annotation* dropdown and manage styles accordingly.



Step 14: To turn off the Viewport border, select *Layer Properties* in the *Layers* toolbox from the *Home* tab.

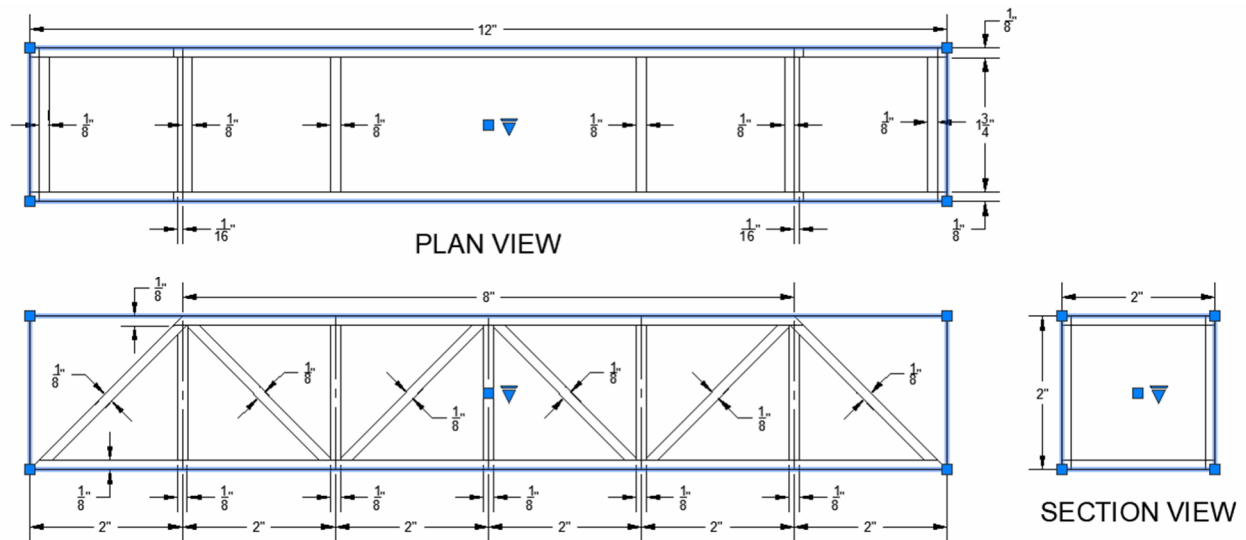
Step 15: Select the *New Layer* icon.

Step 16: Name the new layer, select the lightbulb icon to turn off the layer, and close it.

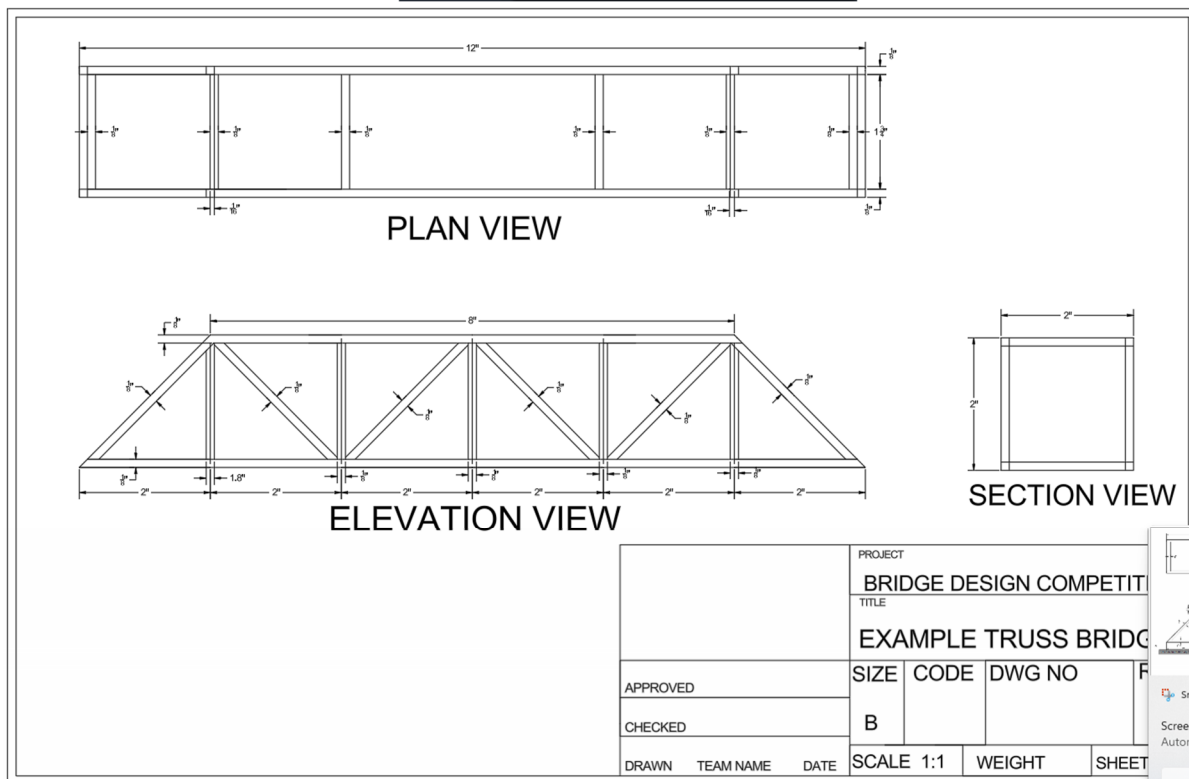
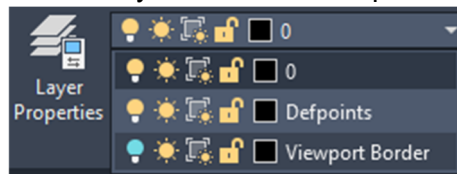


Autodesk AutoCAD Guide

Step 17: Select the Viewports.



Step 18: From the *Home* tab, in the *Layers* toolbox, select the dropdown next to *Layer Properties*, and select the new layer made for Viewport borders to turn them off.

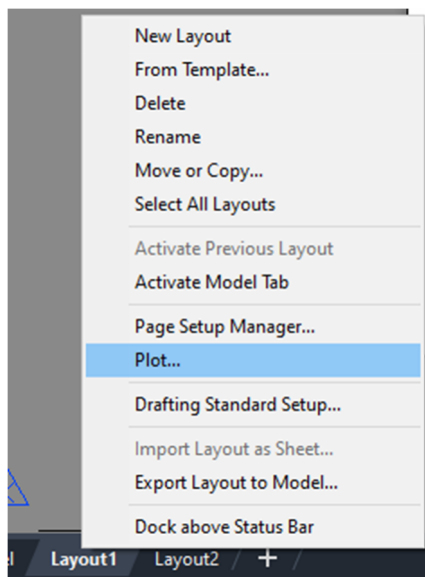


Don't forget to make changes to the Title Box if needed
!Don't forget to save!

Autodesk AutoCAD Guide

Plotting

Step 1: Right-click on *Layout1* at the bottom left corner of the screen and select *Plot*.



Step 2: Make sure the settings are correct, select *OK*, name the file, and select *Save*.

