



## Chapter 2

# Beam Bottom Truss

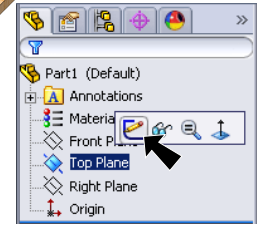
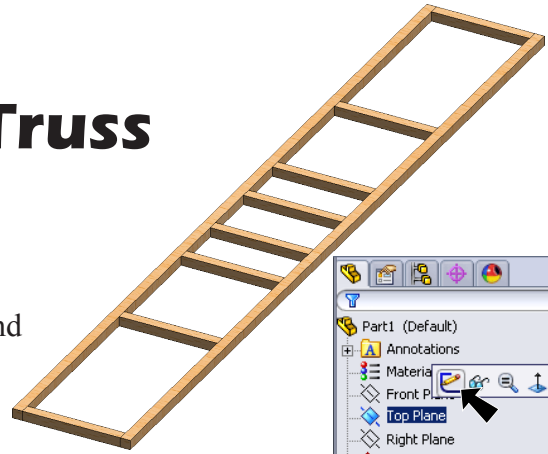




Fig. 1

### A. Sketch for Weldments.

Step 1. Click File Menu > New, click **Part** and OK.

Step 2. Click **Top Plane**  in the Feature Manager and click **Sketch**  from the Content toolbar, **Fig. 1**.

Step 3. Click **Center Rectangle**  (S) in the **Rectangle** flyout  on the Sketch toolbar.

Step 4. Draw a rectangle starting at Origin , **Fig. 2**.

Step 5. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 6. Add dimensions as shown in **Fig. 2**. 10 x 1.5

Step 7. Click Zoom to Fit  (F) on the View toolbar.

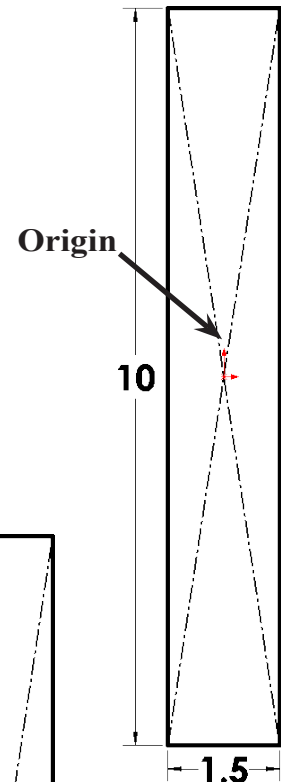


Fig. 2

### B. Save as "BEAM1".

Step 1. Click File Menu > Save As.

Step 2. Key-in **BEAM1** for the filename and press ENTER.

### C. Circle Tester Rod.

Step 1. Click **Circle**  (S) on the Sketch toolbar.

Step 2. Draw a circle starting at the Origin , **Fig. 3**.

Step 3. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 4. Dimension circle **diameter .5**, **Fig. 3**. The circle will represent the 1/2 inch rod of beam "tester".

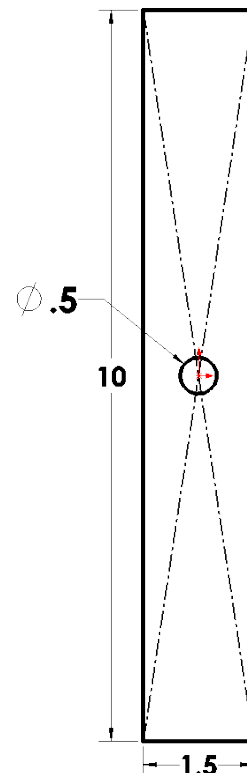


Fig. 3

## D. Offset Entities.

Step 1. Click **Offset Entities**  on the Sketch toolbar.

Step 2. In the Offset Entities Property Manager set:

**Distance**  **.1** **Fig. 4**

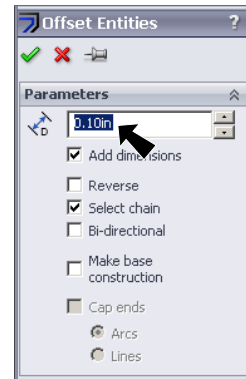
click **circle**, **Fig. 5**

The yellow offset should be outside original circle, **Fig. 5**.

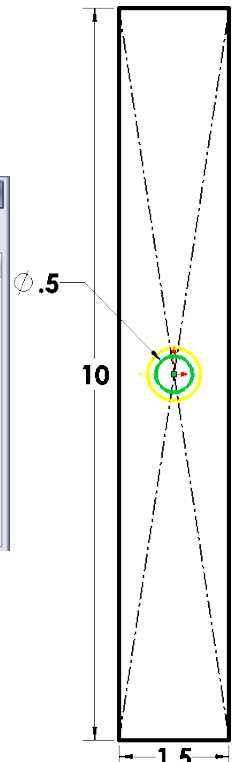
If it is not, check Reverse.

Click OK .

This offset circle is a reminder to keep cross members outside this area, otherwise the rod of the "tester" will not fit thru our beam.



**Fig. 4**



**Fig. 5**

## E. Lines.

Step 1. Click **Line**  (L) on the Sketch toolbar.

Step 2. Draw **4 horizontal lines** across sketch, **Fig. 6**.

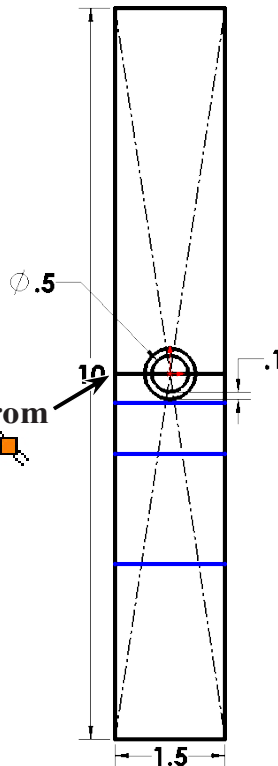
Start with line at Midpoint  of vertical line.

To terminate chain, double click back on the horizontal line you have just drawn. Later, we will convert the line thru Origin to construction line.

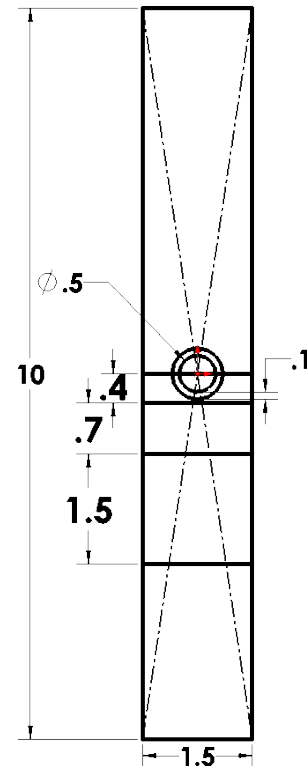
Step 3. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 4. Add the dimensions, **Fig. 7**.

**Draw line from Midpoint** 



**Fig. 6**




**Fig. 7**

## F. Construction Entities.

Step 1. Right click graphics area and click Select from menu to unselect Smart Dimension.

Step 2. Ctrl click both circles and line thru Origin (centerline) to select all three and click

Construction Geometry  on the Content toolbar, Fig. 8.

Ctrl click circles and centerline

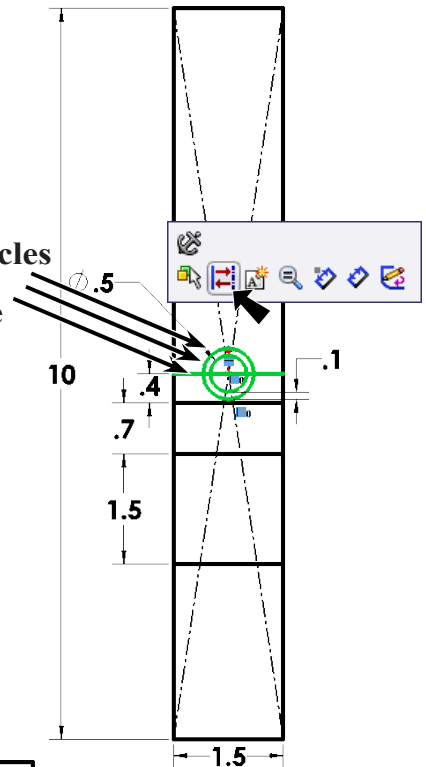



Fig. 8

## G. Mirror Entities.

Step 1. Ctrl click the 4 horizontal lines which will include the construction line, Fig. 9.

Step 2. Click Mirror Entities  on the Sketch toolbar, Fig. 10.

Step 3. Click Exit Sketch  on the Sketch toolbar.

Step 4. Save. Use Ctrl-S.

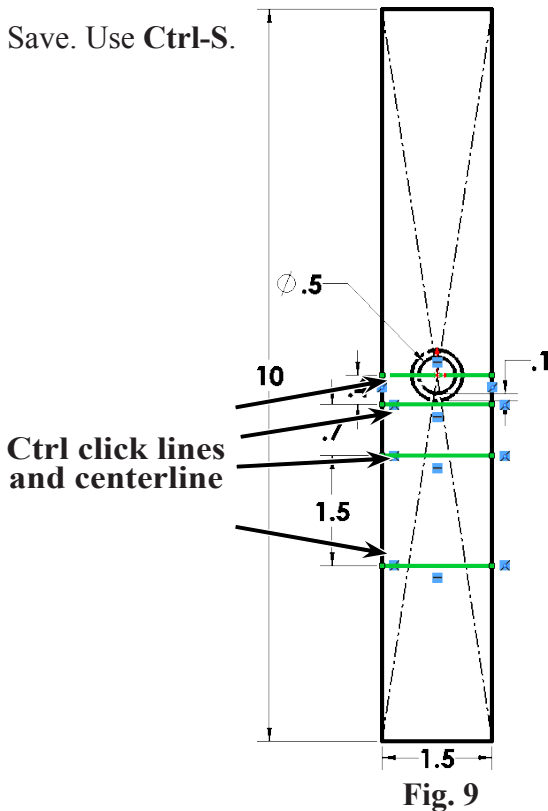


Fig. 9

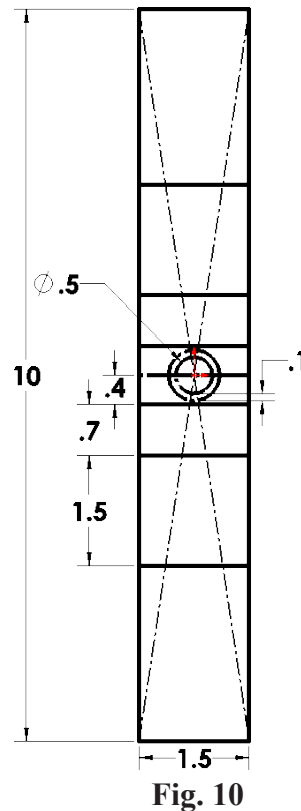


Fig. 10

## H. Structural Members.

Step 1. Right click Sketch  on the Command Manager toolbar and select **Weldments**, Fig. 11.

Step 2. Click **Weldments**  on the Command Manager toolbar.

Step 3. Click **Structural Member**  on the Weldments toolbar.

Step 4. In the Structural Member Property Manager set:  
 under Standard:  
     **My Profiles**, Fig. 12  
 under Type:  
     **Balsa**  
 under Size:  
     **.125 x .125**

starting at the top of rectangle, click the 4 lines of rectangle, Fig. 13

click End Butt1 , Fig. 12

confirm all 4 members on **inside of rectangle**.

Step 5. Click **Trimetric**  on the Standard Views toolbar.

Step 6. Zoom in around **right end of beam**, Fig. 14. To **zoom**, hold down **Shift** key and drag with middle mouse button (wheel). To **pan**, hold down **Ctrl** key and drag with middle mouse button (wheel).

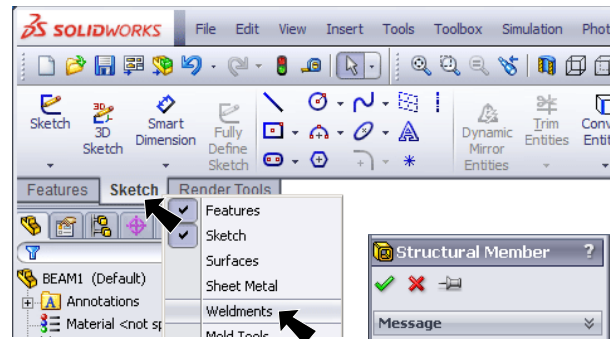


Fig. 11

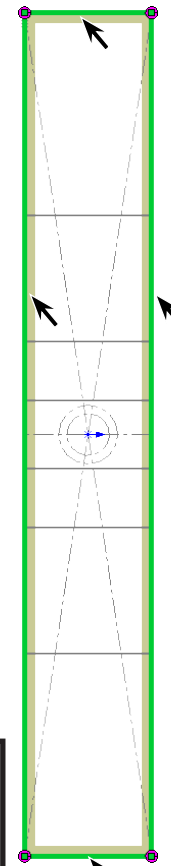


Fig. 13



Fig. 12

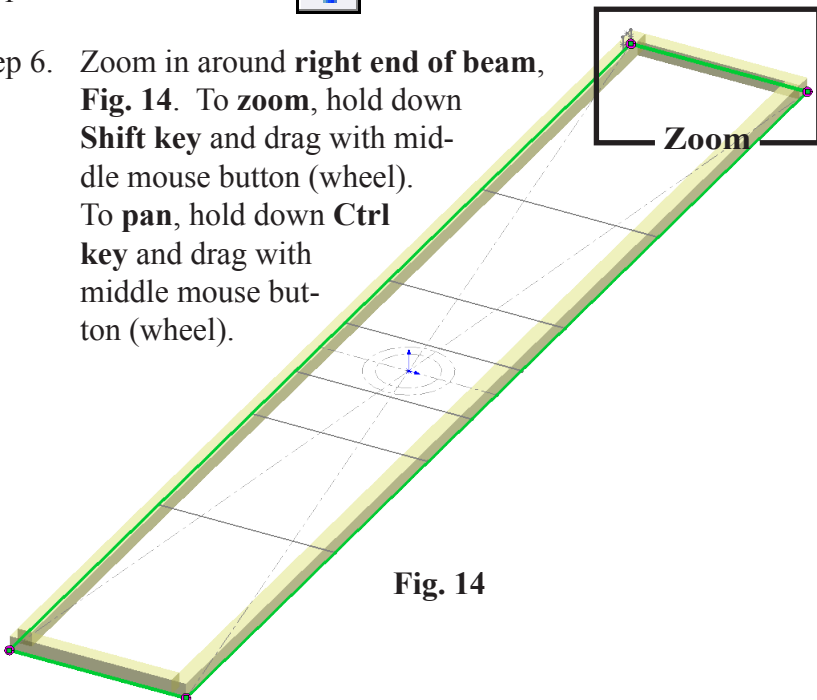


Fig. 14

Step 7. Click the right corner , Fig. 15.

Step 8. In the Corner Treatment dialog box:

click End Butt2 ,  
Fig. 16.

click OK , Fig. 17.

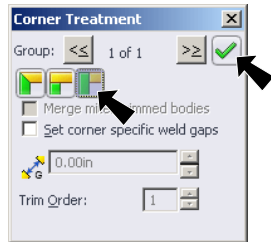


Fig. 16

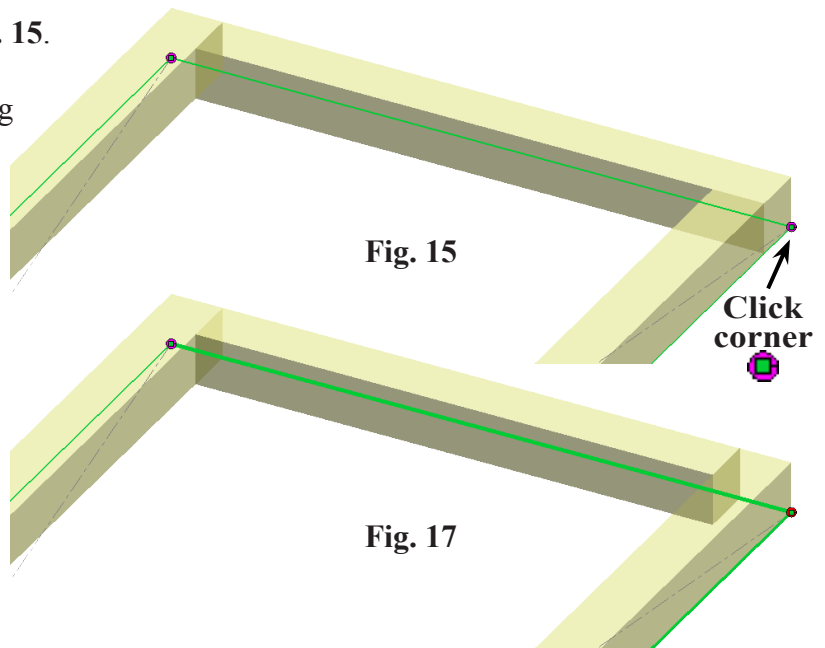


Fig. 15

Fig. 17

Step 9. Click Zoom to Fit  (F) on the View toolbar.

Step 10. If necessary, Zoom in around left end of beam, Fig. 18.

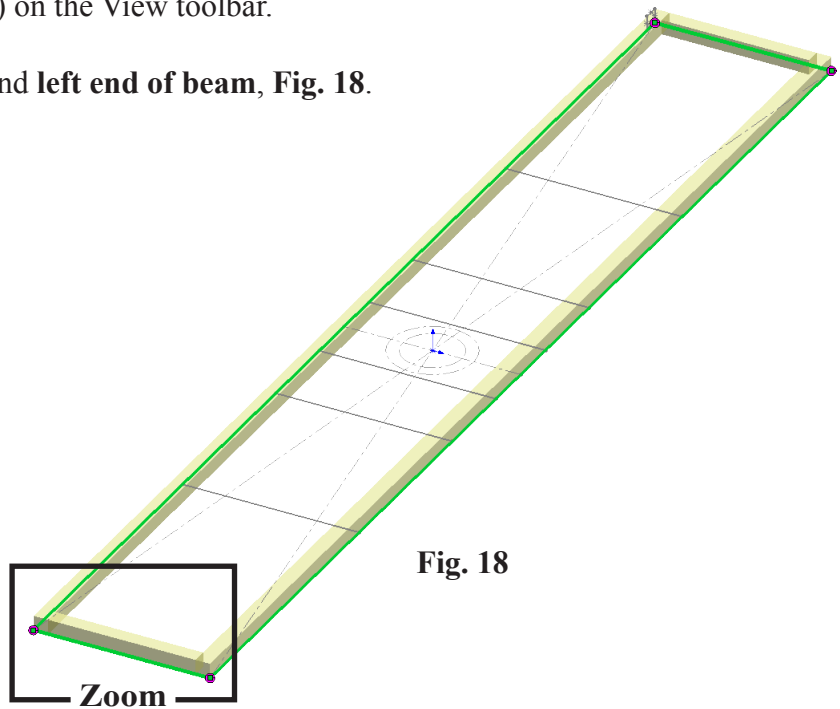


Fig. 18

Step 11. Click the left corner , Fig. 19.

Step 12. In the Corner Treatment dialog box:

click **End Butt2** ,  
Fig. 20.

click **OK** , Fig. 21.

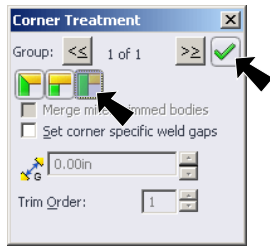


Fig. 20

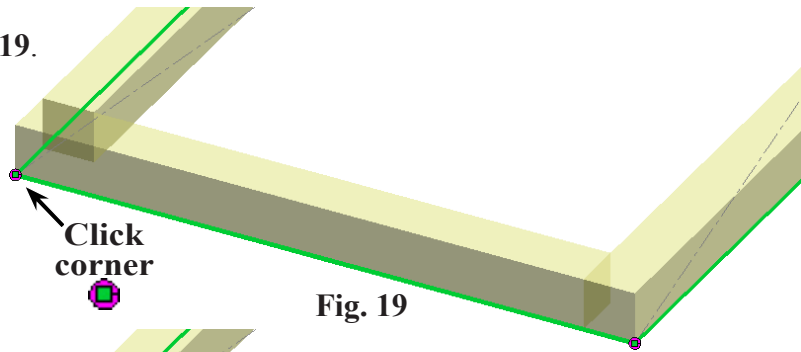


Fig. 19

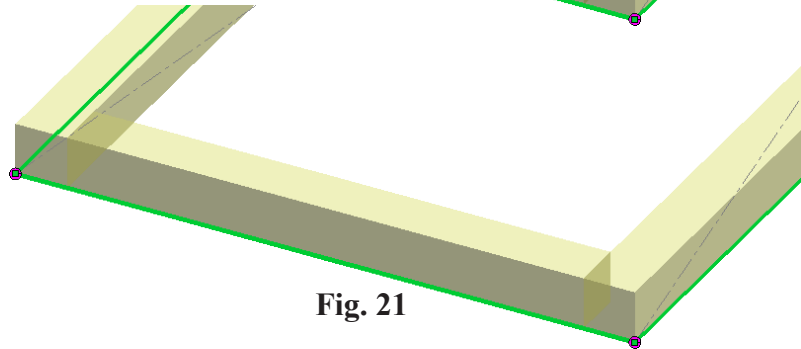


Fig. 21

Step 13. Click **Zoom to Fit**  (F) on the View toolbar.

Step 14. Click **New Group (2)** button, Fig. 22

click all **6 cross members** lines, Fig. 23.

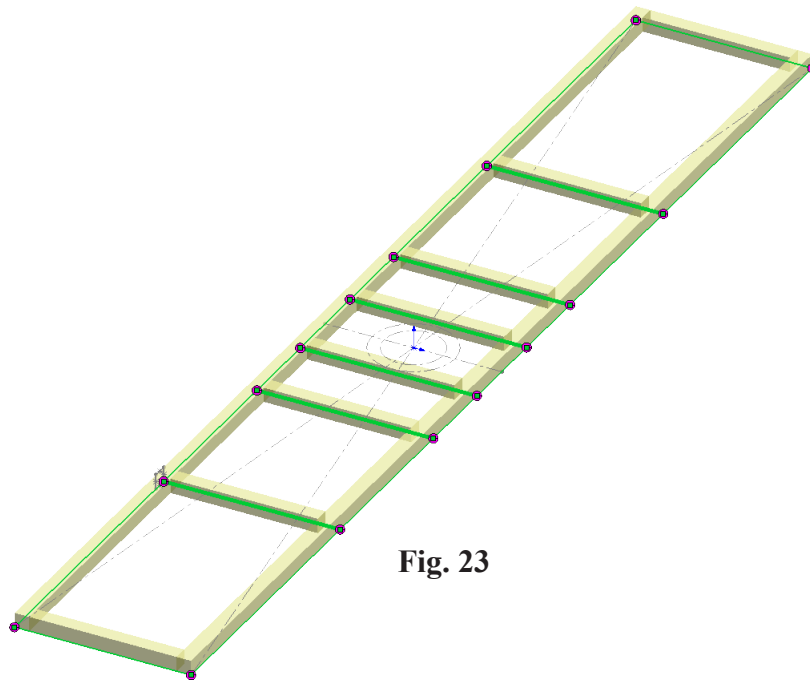


Fig. 23

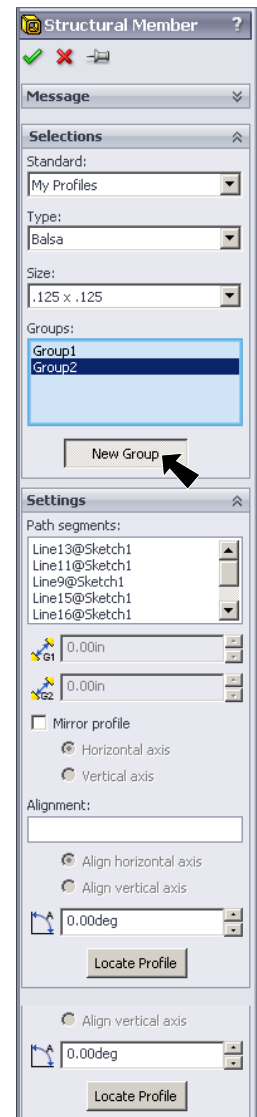
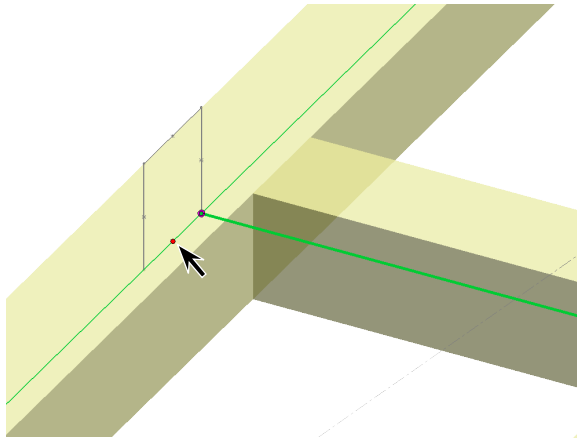


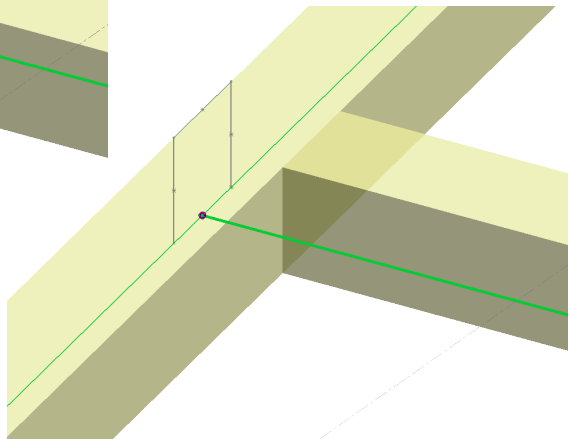
Fig. 22

Step 15. Click **Locate Profile** button, **Fig. 24**.

Step 16. Click **BOTTOM MIDDLE POINT** of profile sketch, **Fig. 25**.




**Fig. 25**



**Fig. 26**


Step 17. Click **Top**  on the Standard Views toolbar. (**Ctrl-5**)

Step 18. Confirm all cross members centered on lines, **Fig. 27** and click OK .

Step 19. Save. Use **Ctrl-S**.

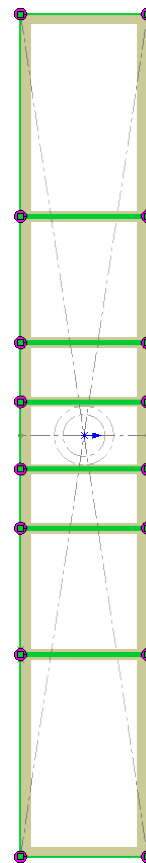
## I. Hide Sketch.

Step 1. Click **Trimetric**  on the Standard Views toolbar.

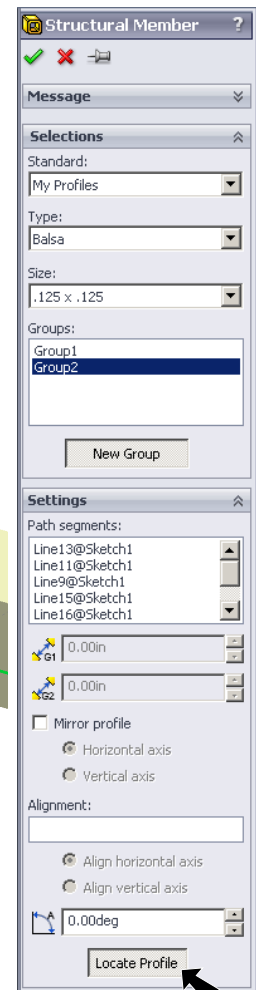
Step 2. Click **Sketch1** in the Feature Manager and click **Hide**  on the Content menu, **Fig. 28**.



**Fig. 28**



**Fig. 27**



**Fig. 24**

## J. Add to New Folder.

Step 1. **Ctrl** click **Sketch1** and **Structural Member1** feature in the Feature Manager to select both. Release **Ctrl** key and **right click** and select **Add to New Folder** on the Content menu, **Fig. 29**.

Step 2. Key-in **BOTTOM TRUSS** for folder name, **Fig. 30**.

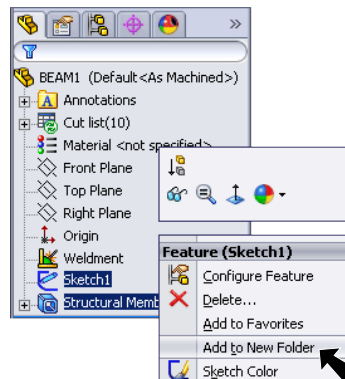


Fig. 29

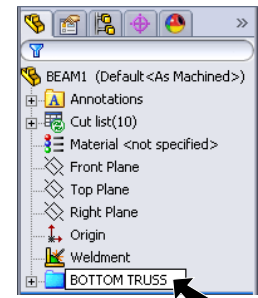


Fig. 30

## K. Material Balsa.

Step 1. **Right click** **Material**  in the Feature Manager and click **Edit Material**, **Fig. 31**.

Step 2. **Expand Woods** (click the +) in the material tree and select **Balsa**, **Fig. 32**. Click **Apply** and **Close**, **Fig. 33**.

Step 3. Save. Use **Ctrl-S**.

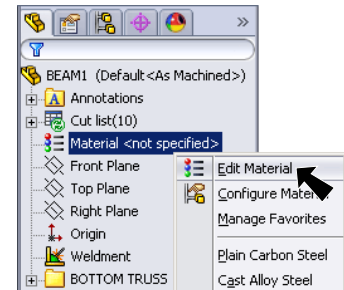


Fig. 31

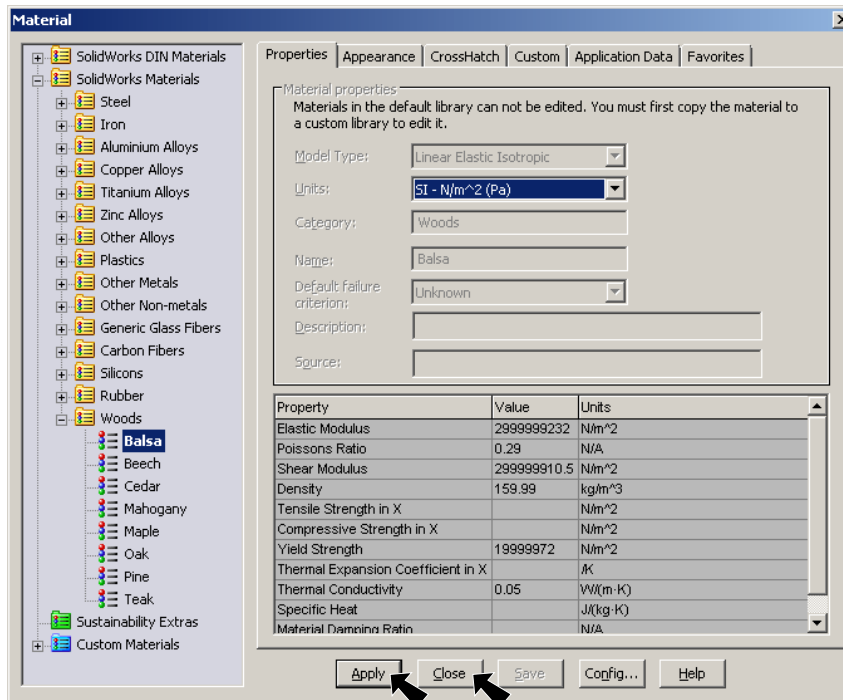


Fig. 32

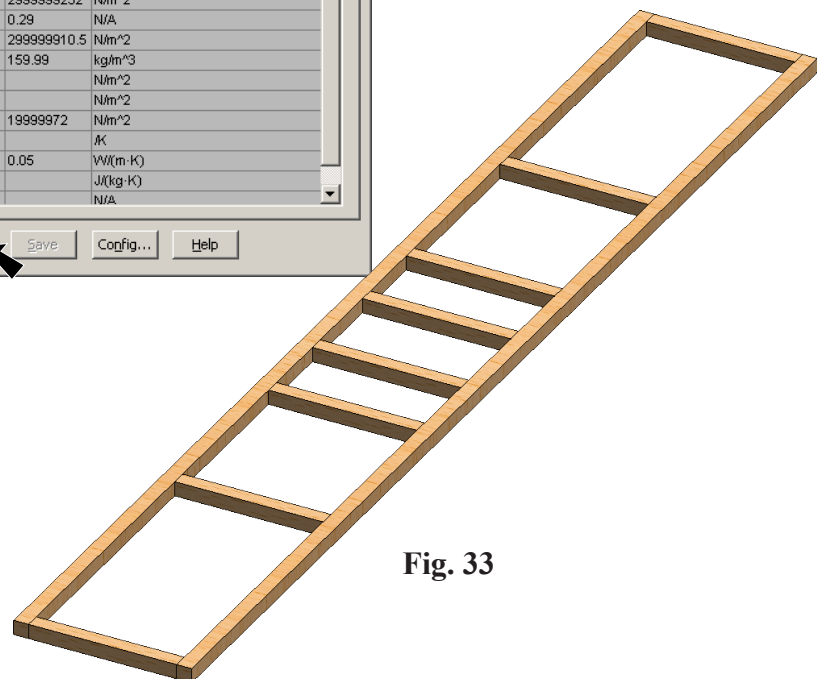


Fig. 33