## Setting general values of area and moment of inertia in SAP2000

**Define Frame Sections -** To define the cross-section properties of a structural element, click on the **Define** menu at the top of the SAP2000 interface window, then click on **Section Properties**, then **Frame Sections...**, and then the **Frame Properties** window is displayed.

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d this property EC1	Inport New Property .	
BIC!	Add New Property .	
	Add Copy of Property .	
	Wodify/Shaw Property .	
	in the second	

The default Frame Section label is **FSEC1**. To change the properties of the frame section, click on the **Modify/Show Property...** button. The **I/Wide Flange Section** window is displayed.

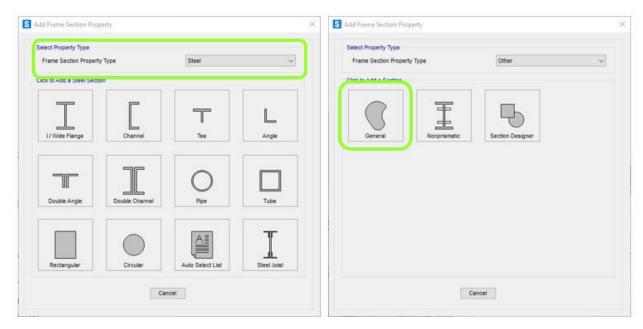
Section Name	FSEC1	Display Color
Section Notes	Modify/Show Notes	
Dimensions		Section
Outside height ( t3 )	12	
Top fange width (12)	5	
Top flange thickness ( tf )	0.38	
Web thickness ( tw )	0.25	3<
Bottom fiange width ( t2b )	5.	
Bottom flange thickness (tfb)	0.36	
Filet Radus	Q.	Properties
		Section Properties
Material	Property Modifiers	Time Dependent Properties
+ A992Fy50 ·	Set Modifiers	

To define the material of this frame section, click on the **Material** pull-down menu and select our weightless material **A992Fy50**. Click **OK** to return to the **Frame Properties** window, then click **OK** again.

In this example, the frame elements have a cross-sectional area of  $A = 10 \text{ in}^2$  and a moment of inertia value I = 600 in<sup>4</sup>. Click **Add New Property** on the **Frame Properties** menu to specify this value. The **Add New Property** menu is displayed. For this example, click the **Frame Section Property Type** dropdown menu, select **Other**, and then click on **General**.

Click Add New Property on the Frame Properties menu to specify this value. The **Add New** Property menu is displayed. For this example, click the **Frame Section Property Type** dropdown menu, select **Other**, and then click on **General**.

Click Add New Property on the Frame Properties menu to specify this value. The Add New Property menu is displayed. For this example, click the Frame Section Property Type dropdown menu, select Other, and then click on General.



The **Property Data** menu is displayed. In this example, the **Moment of inertia about the 3 axis** (the strong axis) is 600 in<sup>4</sup>. The value of the **Cross-sectional area** is 20 in<sup>2</sup>. The **Moment of inertia about the 2** should be a small value of 0.001 to minimize their effect on the results. Set all the other values in the left column to zero.

Section Name		500	
operties			
Cross-section (axial) area	10.	Section modulus about 3 axis (top)	1.
Moment of Inertia about 3 axis	600.	Section modulus about 3 axis (bottom)	1.
Moment of Inertia about 2 axis	1.000E-03	Section modulus about 2 axis (left)	1.
Product of Inertia about 2-3	0.	Section modulus about 2 axis (right)	1.
Torsional constant	0.	Warping Constant (Cw)	0.
Shear area in 2 direction	0.	Plastic modulus about 3 axis	1.
Shear area in 3 direction	0.	Plastic modulus about 2 axis	1.
CG offset in 3 direction	0.	Radius of Gyration about 3 axis	1.
CG offset in 2 direction	0.	Radius of Gyration about 2 axis	1.
Shear Center Offset (x3)	0.		
Shear Center Offset (x2)*	0.	* Value is not used in analysis	

Enter the value and click **OK**. Then click **OK** on the **General Shapes** menu, and the Frames Properties menu is displayed. Note that **FSEC2** has been added to the list of sections. Click **OK**.