

A note on units

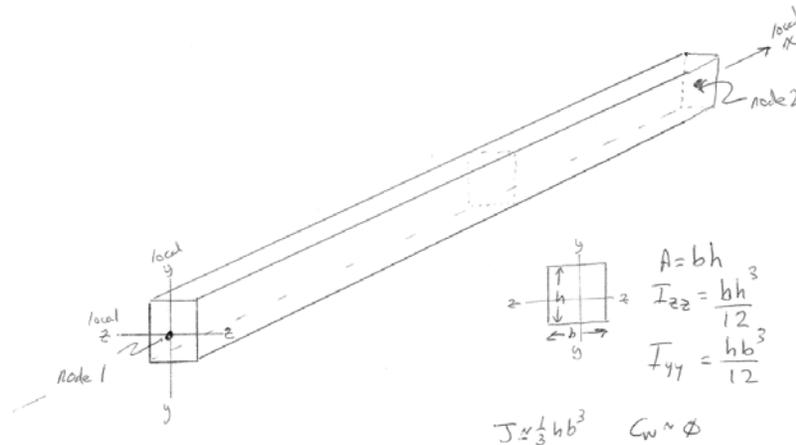
You need to use consistent units for length and force throughout your modeling. So, if you want to see displacement in millimeters, and forces in Newtons, then you use millimeters for all the dimensioning in your model and Newtons for all applied loads. (For better or worse in civil engineering in the U.S. imperial units are still typically used, with inches for length and kilo-pounds=1000 pounds also called a kip for force).

Properties of cross-sections

MASTAN asks you to tell it a lot about a member so that it may calculate the member's contribution to the structure accurately. Specifically, for each member type you must tell MASTAN:

Please enter section properties		Section 1	Name:	Database	Status:				
Area =	0	Izz =	0	Iyy =	0	J =	0	Cw =	0
Zzz =	inf	Zyy =	inf	Ayy =	inf	Azz =	inf	Apply	Cancel

For a member you define the two nodes that connect the member together. So, you define node 1 and node 2, for example (as shown below). Now your member which connects node 1 and node 2 has a certain size, here is how you define it:



where A is the cross-sectional area, I is the second moment of area about the local zz and local yy axis, J is the St. Venant Torsion Constant, and Cw is the warping constant – do not worry about the other constants (they are for including the possibility of yielding of your member).

You may find more on these A, I, and J constants on the web, for example

A: http://en.wikipedia.org/wiki/Area#Areas_of_2-dimensional_figures

I: http://en.wikipedia.org/wiki/Second_moment_of_area

J: http://en.wikipedia.org/wiki/Torsion_constant

Material

Material, you also have to tell MASTAN what material your structure is made out of

Please enter material properties		Material 1	Name:	Status:	Gravity assumed in -Y direction				
E =	0	v =	0.3	Fy =	inf	WT Dens. =	0	Apply	Cancel

$E_{\text{steel}}=30,000,000 \text{ pounds/in}^2=200,000\text{N/mm}^2$,

$E_{\text{concrete}}=(1/7)E_{\text{Steel}}$, $E_{\text{Aluminum}}=(1/3)E_{\text{Steel}}$, $E_{\text{wood}}=(1/100)E_{\text{Steel}}$

For sure you can find more about these quantities on the web too.