

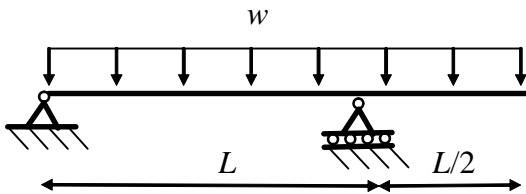


CIVL3206 Steel Structures 1

Assumed Knowledge

Name: _____ SID: _____

- 1) Draw the bending moment diagram (BMD) and shear force diagram (SFD).



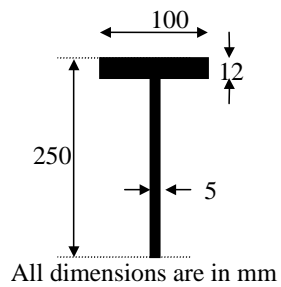
2) Consider the following:

- Solid square section – 100×100 mm
- Rectangular section – 12.5 mm wide \times 200 mm deep.
- Rectangular section – 25 mm wide \times 200 mm deep.

Calculate

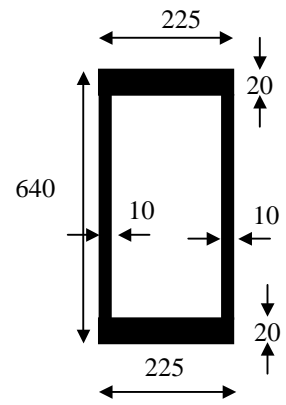
- Second moment of area, I_x
- Bending moment that will induce first yield, assuming if $f_y = 300$ MPa.
- Explain the difference between stiffness & strength.

3) Calculate the location of the centroid and show this location on a diagram. Calculate the second moment of area (I_x) of the section about the horizontal centroidal axis. The section is symmetric about the stem of the T.



4) Consider the box section which is shown below. The second moment of area about the major (horizontal) centroidal axis is $I_x = 1.225 \times 10^9 \text{ mm}^4$. The steel has a yield stress of 340 MPa.

Calculate the bending moment (about the x - axis) that will cause first yield of the section and draw the associated stress distribution.



All dimensions are in mm