Mechanics of Materials

Project 3 - 3

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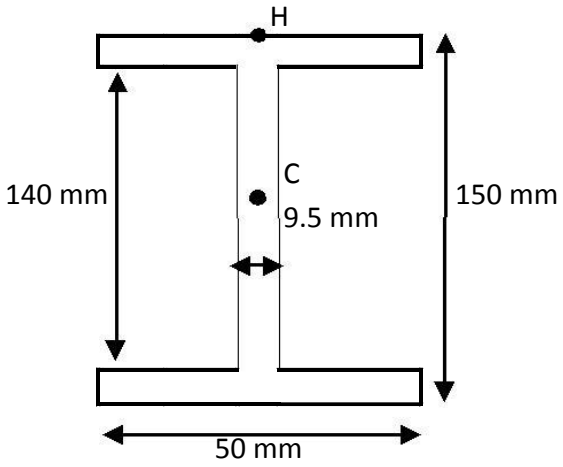
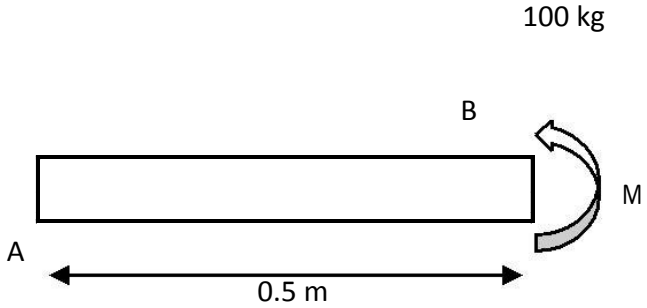
4.0 CALCULATION OF STRESS





*length has been dived by 2
*load has been divided by 2

No.	Area, mm^2	$\bar{y}$ m,mm	$\bar{y}$ mA, mm^3
1	(50)(5) = 250	145	36.25×10^3
2	(140)(9.5) = 1330	75	99.75×10^3
3	(50)(5) = 250	2.5	0.63×10^3
	$\sum A$ = 1830		$\sum \bar{y}mA = 136.63 \times 10^3$

- **Centroid** - The I-shaped cross section are divided into the three rectangles.
- **Moment at Point B** - The load are distributed along the beam is 100 kg (981 N). The length of the beam is 1 m. Use the total summation of moment at point A.
- **Centroidal Moment of Inertia** - To determine the moment of inertia of each rectangle with respect to the axis x' that passes through the centroid of the composite section is by using the parallel-axis theorem and adding moments of inertia of the rectangle.
- **Maximum Tensile Stress** - The center of curvature is located below the cross section, since the applied force bend the beam is downward. The maximum tensile stress occurs at point H, which is the farthest from the center of curvature.