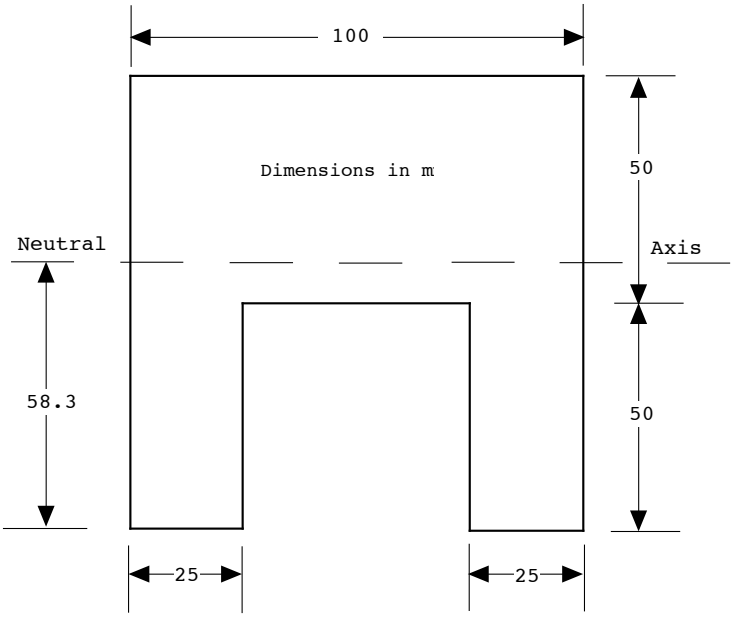
Example 1 Draw the shear stress distribution. Take F = 400kN

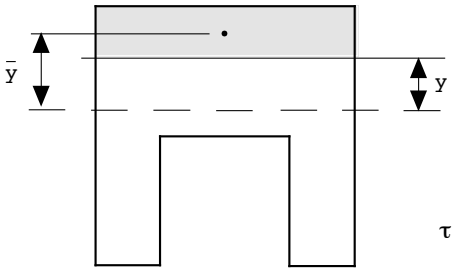


Calculate the following:

1. $A = 7500\ mm^2$
2. $\bar{y} = 58.3\ mm$
3. $I_{NA} = 5.729 \times 10^6\ mm^4$

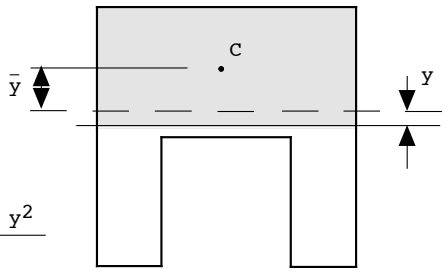
Use $\tau = \dfrac{FA\bar{y}}{It}$

Case 1

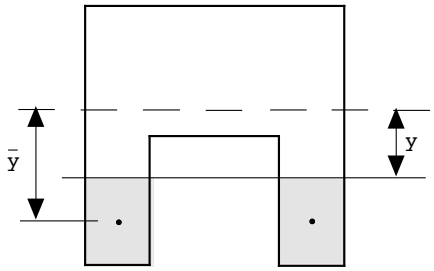


$$\tau = \frac{1738.9 - y^2}{28.645}$$

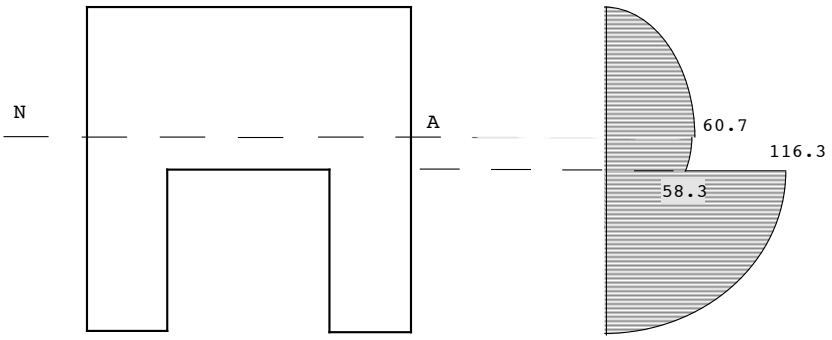
Case 2



Case 3

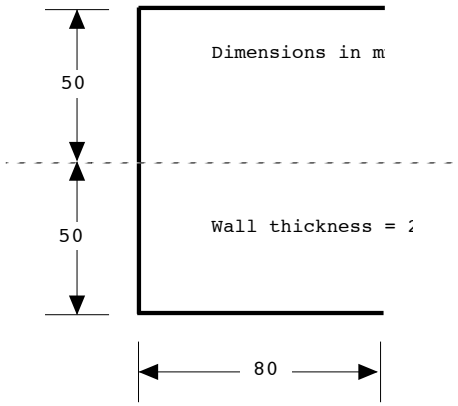


$$\tau = \frac{3398.9 - y^2}{28.645}$$



Shear stress distribution in N/mm^2

Example 2 Draw the shear flow distribution. Take F = 10kN. Also find th location of the shear centre of the thin-walled channel.



Calculate the following:

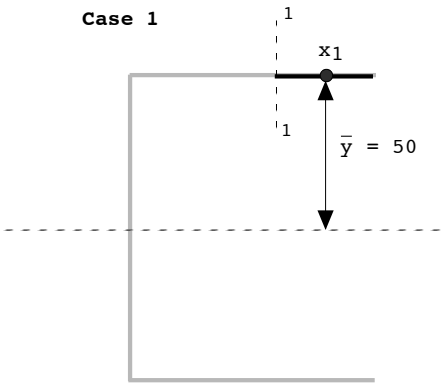
1. $A = 520\ mm^2$

2. $y = 50\ mm$

3. $I_{NA} = 966.7 \times 10^3\ mm^4$

Use $f = \dfrac{FA\bar{y}}{I}$

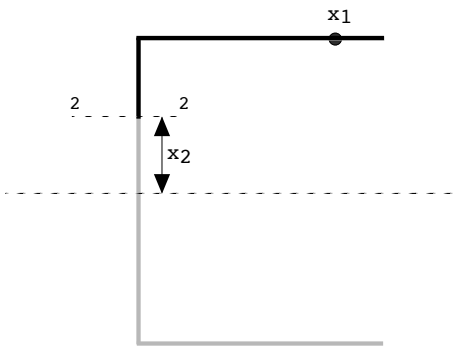
Case 1



$A_1 = 2\ x_1$

$f_1 = 1.034\ x_1\ N/mm$

Case 2

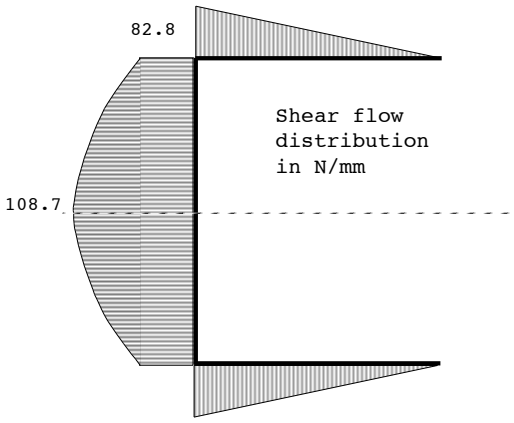


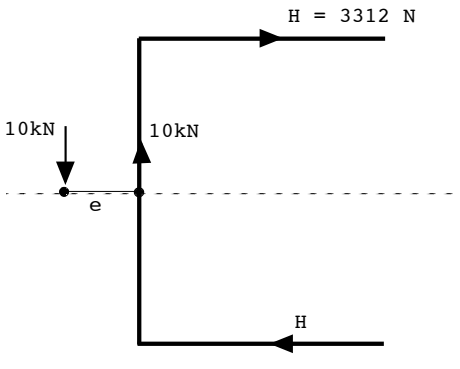
$A_2 = 160 + 2\ (50 - x_2)$

$y = 50 \qquad y = (50 + x_2)/2$

$$f_2 = \frac{10000\ (8000 + 50^2 - x_2^2)}{966.7 \times 10^3}$$

$$= 82.8 + 1.034\ (50^2 - x_2^2)/100$$





$10000\ e = H \times 100$

$e = 33.1mm$