Remarks: See §5.4.3 pages 345 till 355
See §6.3.1, pages 427 till 437
See §6.4, example 5, pages 458 till 460

Answers:

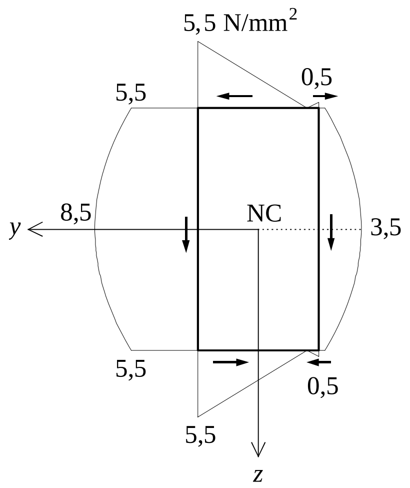
a. $V_z = 60$ kN
$M_t = 6$ kNm

b. $\tau_{\text{max;flange}} = 3\ \text{N/mm}^2$
$\tau_{\text{max;}web} = 6\ \text{N/mm}^2$

c. $\tau = 2,5\ \text{N/mm}^2$

d. See the figure here:

e. $\tau_{\text{max}} = 8,5\ \text{N/mm}^2$



Explanation:

$I_{zz} = 400\times10^6\,\text{mm}^4$; $A_m = 80\times10^3\ \text{mm}^2$ (Bredt)

b. The shear stress in the flanges varies linearly. Maximum in the corners:

$$\tau_{\text{max}} = \frac{(60\times10^3\ \text{N})(600\times10^3\ \text{mm}^3)}{(2\times15\ \text{mm})(400\times10^6\ \text{mm}^4)} = 3\ \text{N/mm}^2$$

The shear stress distribution in the web is parabolic; maximum at $z = 0$:

$$\tau_{\text{max}} = \frac{(60\times10^3\ \text{N})(1200\times10^3\ \text{mm}^3)}{(2\times15\ \text{mm})(400\times10^6\ \text{mm}^4)} = 6\ \text{N/mm}^2$$

c. The shear stress is constant and the same for the webs and flanges (Bredt):

$$\tau = \frac{60\times10^6\ \text{Nmm}}{2\times(80\times10^3\ \text{mm}^2)(15\ \text{mm})} = 2,5\ \text{N/mm}^2$$

e. $\tau_{\text{max}} = 8,5\ \text{N/mm}^2$; At the height of the normal centre, in the left web