

Opmerkingen: Zie §4.4, blz. 150 t/m 153

Zie §4.6, blz. 165 t/m 166

Antwoorden:

- a. $W = 58 \times 10^3 \text{ mm}^3$
- b. $N = -112,5 \text{ kN}$
- c. $M = 2,175 \text{ kNm} (\cup)$

Toelichting:

$$\text{a. } I = \frac{1}{12}(60 \text{ mm})(80 \text{ mm})^3 - \frac{1}{12}(45 \text{ mm})(40 \text{ mm})^3 = 2,32 \times 10^6 \text{ mm}^4$$

$$W = \frac{2,32 \times 10^6 \text{ mm}^4}{40 \text{ mm}} = 58 \times 10^3 \text{ mm}^3$$

$$\text{b. } A = 3000 \text{ mm}^2$$

$$\sigma_{\text{NC}} = -37,5 \text{ N/mm}^2$$

$$N = (-37,5 \text{ N/mm}^2)(3000 \text{ mm}^2) = 112,5 \times 10^3 \text{ N}$$

$$\text{c. } \sigma_o^{(M)} = \sigma_o - \sigma_{\text{NC}} = 37,5 \text{ N/mm}^2 \quad (\text{trek onder})$$

$$\sigma_b^{(M)} = \sigma_b - \sigma_{\text{NC}} = -37,5 \text{ N/mm}^2 \quad (\text{druk boven})$$

$$\text{Dus: } \sigma_{\text{max}}^{(M)} = 37,5 \text{ N/mm}^2$$

$$M = \sigma_{\text{max}}^{(M)} \times W = (37,5 \text{ N/mm}^2)(58 \times 10^3 \text{ mm}^3) = 2,175 \times 10^6 \text{ Nmm} (\cup)$$

(want trek onder en druk boven)