

Betongegnekaper:

$$f_{ck} := 30 \text{ MPa}$$

$$\gamma_c := 1.5$$

$$f_{cd} := 0.85 \frac{f_{ck}}{\gamma_c} = 17 \text{ MPa}$$

$$E_{cm} := 33000 \text{ MPa}$$

Stålegnekaper:

$$f_{yk} := 500 \text{ MPa}$$

$$\gamma_s := 1.15$$

$$f_{yd} := \frac{f_{yk}}{\gamma_s} = 435 \text{ MPa}$$

$$\phi := 10 \text{ mm}$$

Geometri:

$$d := 200 \text{ mm}$$

$$L_s := 2750 \text{ mm}$$

$$A_c := \pi \cdot \left(\frac{d}{2}\right)^2$$

Laster:

$$L := 7.4 \text{ m}$$

$$\gamma_g := 1.2$$

$$\gamma_q := 1.5$$

$$g_{k.dekke} := 6.25 \frac{\text{kN}}{\text{m}}$$

$$g_{d.dekke} := g_{k.dekke} \cdot \gamma_g \cdot 2 = 15 \frac{\text{kN}}{\text{m}}$$

$$q_{k.dekke} := 4 \frac{\text{kN}}{\text{m}}$$

$$q_{d.dekke} := q_{k.dekke} \cdot \gamma_q \cdot 2 = 12 \frac{\text{kN}}{\text{m}}$$

$$S_k := 3.16 \frac{\text{kN}}{\text{m}}$$

$$S_d := S_k \cdot \gamma_q = 4.74 \frac{\text{kN}}{\text{m}}$$

$$G_{k.søyle} := 2.16 \text{ kN}$$

$$G_{d.søyle} := G_{k.søyle} \cdot \gamma_g \cdot 2 = 5.184 \text{ kN}$$

$$N_{Ed} := \frac{(g_{d.dekke} + q_{d.dekke} + S_d) \cdot L}{2} + G_{d.søyle} = 122.6 \text{ kN}$$

Lengdearmeing:

$$A_{s.min} := \max \left(0.2 \cdot A_c \cdot \frac{f_{cd}}{f_{yd}}, 0.01 A_c \right) = 314 \text{ mm}^2 \quad (\text{EC2, NA.9.5.2})$$

$$n := \frac{A_{s.min}}{\pi \cdot \left(\frac{\phi}{2} \right)^2} = 4 \quad \text{Velger: 4}\phi 10$$

$$A'_s := 4 \pi \cdot \left(\frac{\phi}{2} \right)^2 = 314 \text{ mm}^2$$

$$N_{Rd} := f_{cd} \cdot (A_c - A'_s) + f_{yd} \cdot A'_s = 665 \text{ kN} \quad (\text{Sørensen (4.5)})$$

$$N_{Rd} > N_{Ed} \quad \text{Gir tilstrekkelig kapasitet}$$

Tverrarmeing:

$$S_{cl.tmax} := 200 \text{ mm}$$

$$n := \frac{L_s}{S_{cl.tmax}} = 13.8 \quad \text{Velger 14}\phi 6c200$$

Kontroll mot knekking:

$$L_k := L_s = 2750 \text{ mm}$$

$$I := \frac{\pi \cdot \left(\frac{d}{2} \right)^4}{12} = (2.618 \cdot 10^7) \text{ mm}^4$$

$$N_{kr} := \frac{\pi^2 \cdot E_{cm} \cdot I}{L_k^2} = 1128 \text{ kN} \quad (\text{Sørensen (6.3)})$$

$$N_{kr} > N_{Ed} \quad \text{Gir tilstrekkelig kapasitet}$$