

DTU Beton Konstruktionen

2/2



$\varnothing 20$

$$f_{cd} = 24,1 \text{ MPa}$$

$$f_{yd} = 417 \text{ MPa}$$

$$\lambda = 40$$

Varmere 6

$$N_{crd} = A_c \sigma_{crd} = \frac{\pi}{4} \cdot 400^2 \cdot 29,0 = 2513 \text{ kN} < N_{Ed} = 2625 \text{ kN}$$

$$\sigma_{crd} = \frac{f_{cd}}{1 + \left(\frac{f_{cd}}{\pi^2 E_{ocrd}} \right) \cdot \lambda^2} = \frac{24,1}{1 + 1,3 \cdot 10^{-4} \cdot 40^2} = 29,0 \text{ MPa}$$

$$\frac{f_{cd}}{\pi^2 E_{ocrd}} = \frac{24,1}{\pi^2 \cdot (0,75 \cdot E_{ok} / \gamma_c)}$$

$$= \frac{24,1}{\pi^2 (0,75 \cdot 105 \cdot 22000 \cdot \frac{35+8}{10} / 1,45)} = 1,3 \cdot 10^{-4}$$

$$= \frac{24,1}{\pi^2 (0,75 \cdot 51000 \cdot \frac{35+13}{1,45})} = 1,3 \cdot 10^{-4}$$

Armering

$$\alpha = 19 \quad \rho = \frac{A_s}{A_c} = \frac{8 \pi (20/2)^2}{(\pi/4) \cdot 400^2} = 0,02$$

$$N_{crd,1} = N_{crd} (1 + \alpha \rho) = 2513 (1 + 19 \cdot 0,02) = 3266 \text{ kN}$$

$$N_{crd,2} = N_{crd} + A_s f_{yd} = 2513 + 8 \pi (20/2)^2 \cdot 417 = 3558 \text{ kN}$$

$$N_{crd,3} = N_{crd} (1 + \alpha \cdot 0,04) = 2513 (1 + 19 \cdot 0,04) = 4021 \text{ kN}$$

$$N_{crd} = 3266 \text{ kN} > N_{Ed} = 2625 \text{ kN} \quad \text{OK!}$$