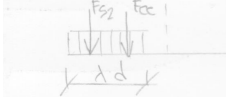
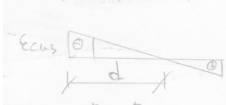
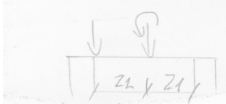
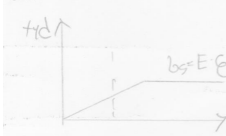
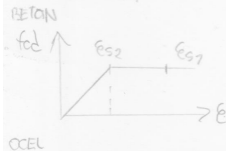
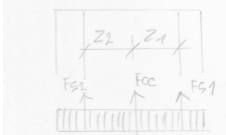
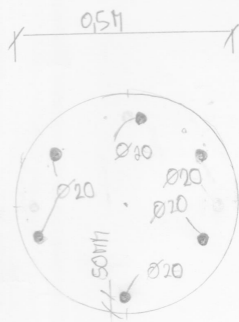


# POSOUZENÍ SLOUPU



$$N_{ed} = 1250,78 \text{ kN}$$

$$M_{ed} = 63 \text{ kNm}$$

$$d_o = 3,55 \text{ m}$$

BETON C15/30

OCEL B550B

$$A_{s1} = A_{s2} = 8 \times \pi \cdot 20^2 = 9,42 \cdot 10^{-4} \text{ m}^2$$

## 1) GEOMETRIE

$$h = 0,5 \text{ m}$$

$$A_c = 0,1963 \text{ m}^2$$

$$d = 0,5 - 0,05 = 0,45 \text{ m}$$

$$z_1 = z_2 = \frac{h}{2} - d_1 = \frac{0,5}{2} - 0,05 = 0,2 \text{ m}$$

$$A_{s1} = A_{s2} = 9,42 \cdot 10^{-4} \text{ m}^2$$

## 2) MATERIÁL

BETON C25/30

OCEL B550B

$$f_{ck} = 25 \text{ MPa} \quad \epsilon_{cr} = 2,10 \%$$

$$f_{yk} = 550 \text{ MPa}$$

$$f_{cd} = 16,67 \text{ MPa}$$

$$f_{yd} = 478,26 \text{ MPa}$$

$$f_{ctm} = 2,6 \text{ MPa}$$

$$E_s = 200 \text{ GPa}$$

$$\epsilon_{uk3} = 3,5 \%$$

$$\epsilon_{yd} = 0,24 \%$$

## VÝPOČET INTERAKČNÍHO DIAGRAMU

BOD "0"

$$b_w = \epsilon_{uk3} \cdot E_s = 0,002 \cdot 200 \cdot 10^9 = 400 < f_{yd} = 478,26 \text{ MPa}$$

$$F_{s1} = F_{s2} = A_{s1} \cdot b_w = 9,42 \cdot 10^{-4} \cdot 400 \cdot 10^3 = 376,8 \text{ kN}$$

$$F_{cc} = A_c \cdot f_{cd} = 0,1963 \cdot 16,67 \cdot 10^3 = 3272,32 \text{ kN}$$

$$N_{rd0} = -F_{cc} - F_{s1} - F_{s2} = -3272,32 - 2 \cdot 376,8 = -4025,92 \text{ kN}$$

$$M_{rd0} = F_{s1} \cdot z_1 - F_{s2} \cdot z_2 = 9,42 \cdot 10^{-4} \cdot 0,12 - 9,42 \cdot 10^{-4} \cdot 0,12 = 0 \text{ kNm}$$

BOD "1"

$$N_{rd1} = -(\lambda \cdot b \cdot d \cdot \eta \cdot f_{cd} + F_{s2}) = -(0,8 \cdot 0,5 \cdot 0,45 \cdot 1 \cdot 16,67 \cdot 10^3 + 469,65) = -3470,25 \text{ kN}$$

$$F_{s1} = F_{s2} = 9,42 \cdot 10^{-4} \cdot 478,26 \cdot 10^3 = 449,65 \text{ kN}$$

$$M_{rd1} = \lambda \cdot b \cdot d \cdot \eta \cdot f_{cd} \left( \frac{h}{2} - \frac{\lambda \cdot d}{2} \right) = 0,8 \cdot 0,5 \cdot 0,45 \cdot 1 \cdot 16,67 \cdot 10^3 \left( \frac{0,5 - 0,8 \cdot 0,45}{2} \right) = 210,042 \text{ kNm}$$



# INTERAKČNÍ DIAGRAM

