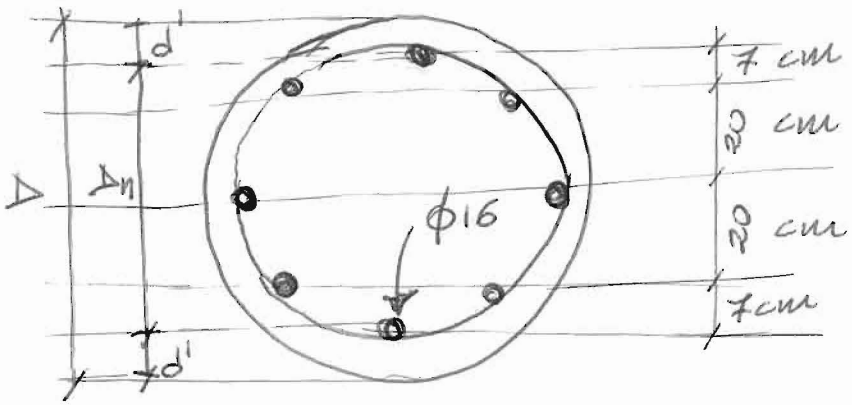
Esercitazione - Verifica di Stabilità

Effettuare la verifica di stabilità del pilastro in figura:

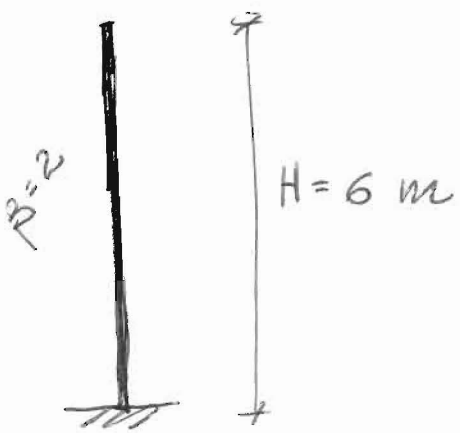


$D = 60\ cm$

$D_n = 54\ cm$

$d' = 3\ cm$

$N = 400\ kN$



$R_{ck}\ 25\ MPa$

$Fe\ B\ 38\ k \Rightarrow \bar{\sigma}_s = 220\ MPa$

$$\bar{\sigma}_c = 6 + \frac{R_{ck} - 15}{4} = 8{,}5\ MPa$$

$$\bar{\bar{\sigma}}_c = 0{,}7\,\bar{\sigma}_c = 5{,}95\ MPa$$

- Calcolo Snellezza

$$A_{id} = \frac{\pi D^2}{4} + 15 \cdot 8 \cdot 2{,}01 = 3068{,}63\ cm^2$$

$$I_x = I_y = \frac{\pi D^4}{64} + 15 \cdot \left(2 \cdot 2{,}01 \cdot 27^2\right) + 15 \cdot \left(4 \cdot 2{,}01 \cdot 20^2\right) = 728371{,}21\ cm^4$$

$$\rho_x = \rho_x = \sqrt{\frac{I}{A_{id}}} = \sqrt{\frac{728371{,}21}{3068{,}63}} = 15{,}41\ cm$$

$$\lambda = \frac{\beta H}{\rho} = \frac{2 \cdot 600\ cm}{15{,}41\ cm} = 77{,}87 \quad > \lambda_{cr}(50)$$

$$\omega = 1 + \frac{(\lambda - 50)^2}{4000} = 1{,}19$$

- Verifica $\quad \sigma_c = \dfrac{\omega N}{A_{id}} = \dfrac{1{,}19 \cdot 400 \cdot 10^3 N}{306863\ mm^2} = 1{,}55\ MPa < \bar{\bar{\sigma}}_c$ OK!

- Verifica minimi Normativi di Armatura

$$A_{s,eff} = 8\,\phi 16 = 16{,}08\ cm^2$$

$A_s > 0{,}3\%\ A_c = 8{,}48\ cm^2$ OK!

$A_s > 0{,}8\%\ \frac{N}{\sigma_c} = 5{,}37\ cm^2$ OK!

$A_s < 6\%\ A_c = 169\ cm^2$ OK!