COMPRESSIONE

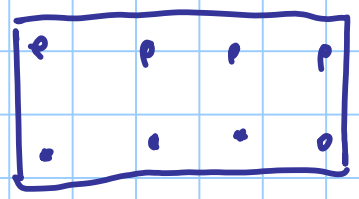
Titolo nota 25/03/2014

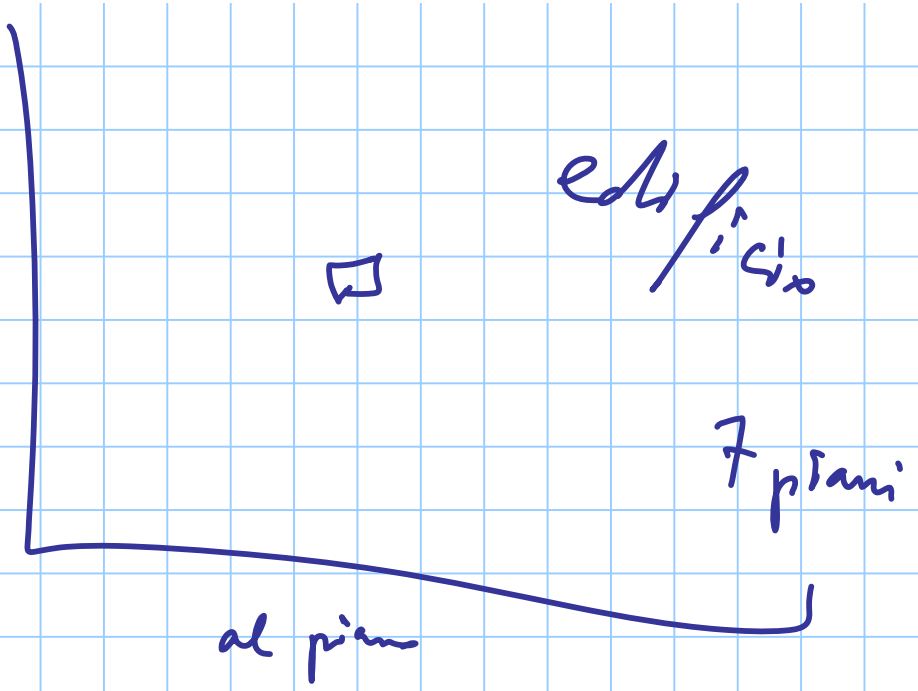
$$A_{ci} > A_s + n A_s$$

$$\sigma_c = \frac{N}{A_{ci}} \qquad \sigma_s = n \sigma_c$$

a Tempo infinito, per tener conto degli effetti viscosi

$$n \simeq 15$$





N

$g_k = 170$ kN

$q_k = 50$ kN $\quad \psi_2 = 0.3$

quasi permanente

$g_k + \psi_2 q_k$

al piano $170 + 0{,}3 \times 50 =$

$= 185$ kN

$N = 7 \times 185 = 1295$ kN

1. vuoi dire
-1295
prodotto comp

stato tensionale q. perm. $t = \infty$ $n = 15$

$$A_{ci} = A_c + n A_s = 30 \times 60 + 15 \times 8 \times 1.54 = 1985 \text{ cm}^2$$

$$\sigma_c = \frac{1295 \times 10^3}{1985 \times 10^2} = 6.52 \text{ MPa}$$

-6.52

$\sigma_s = 15 \times 6.52 = 97.9$ MPa

-97.9 ng. Fivi

rara al piano $170 + 50 = 220$ kN

$g_k + q_k$ alla base $N \simeq 7 \times 220 = 1540$ kN

$$\sigma_c = \frac{1540 \times 10^3}{1985 \times 10^2} = 7.76 \text{ MPa} \qquad \sigma_s = 116.4 \text{ MPa}$$

C25/30 $\bar{\sigma}_c$ 9.75 MPa FeB44k $\bar{\sigma}_s = 255$ MPa

Tensioni Ammissibili

acciai $Fe\ B\ 44\ K$ $\quad \bar{\sigma}_s = 255\ MPa$

calcestruzzo

$R_{ck} = 25\ MPa \quad \bar{\sigma}_c = 8{,}5\ MPa$

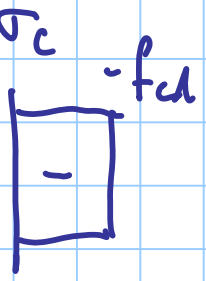
$$\bar{\sigma}_c = 6 + \frac{R_{ck} - 15}{4}$$

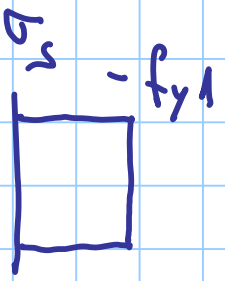
$R_{ck} = 30\ MPa \quad \bar{\sigma}_c = 9{,}75\ MPa$

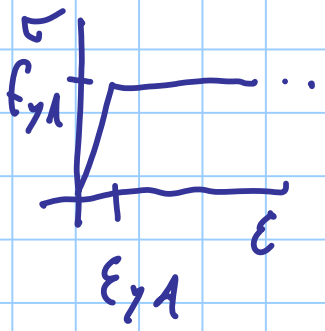
per sol N il limite è $0{,}7\ \bar{\sigma}_c$

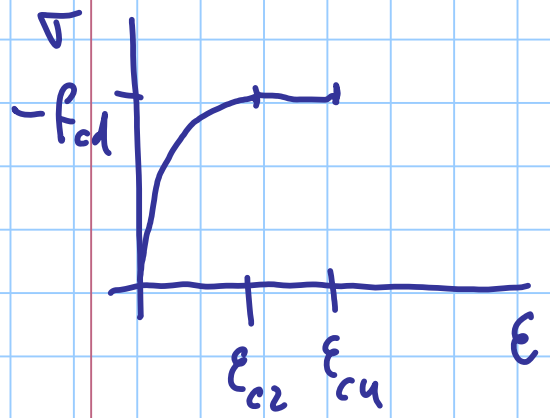
oggi SLU

tre modelli di comportam.









sezione parzializzata $|\varepsilon| \leq |\varepsilon_{cu}|$

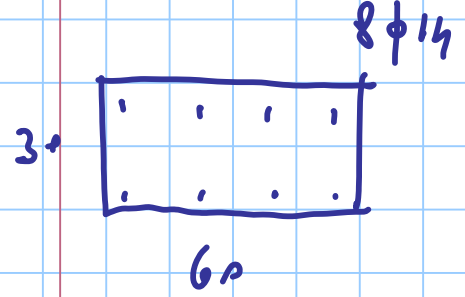
sezione mif. compress $|\varepsilon| \leq |\varepsilon_{c2}|$

$$N = \int \sigma \, dA = \int_{cls} \sigma_c \, dA_c + \int_{acc} \sigma_s \, dA_s = -A_c f_{cd} - A_s f_{yd}$$

$$N_{Rd} = A_c f_{cd} + A_{s,tot} f_{yd} \qquad \text{(negativo perché compr.)}$$

C25/30 $\qquad f_{cd} = \alpha_{cc} \frac{f_{ck}}{\gamma_c} = 0.85 \frac{25}{1.5} = 14.2 \text{ MPa}$

B450C $\qquad f_{yd} = \frac{f_{yk}}{\gamma_s} = \frac{450}{1.15} = 391.3 \text{ MPa}$



$g_k = 170$ kN
$q_k = 50$ kN al piano

SLU

$g_d = \gamma_g \, g_k = 1.3 \times 170 = 221$ kN

$q_d = \gamma_q \cdot q_k = 1.5 \times 50 = 75$ kN

alla base $N_{Ed} = 7 \times (221 + 75) = 2072$ kN

$$N_{Rd} = \frac{1800 \times 10^2 \times 14.2 + 8 \times 1.54 \times 10^2 \times 391.3}{10^3} = 3038 \text{ kN}$$

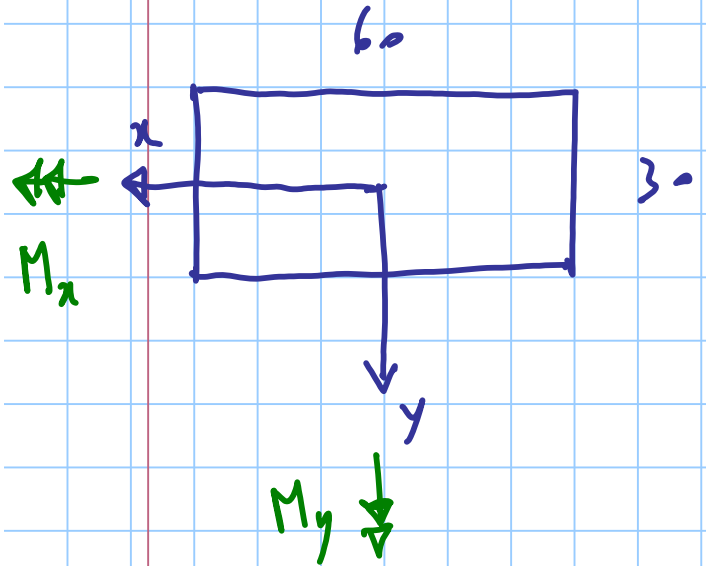
NTC 08 , EC2

c'è sempre M

anche se non c'è (o è piccolo) usare

$$M_{Ed} = N_{Ed} \cdot e$$

$$e = 0{,}05\, h \geq 20\ mm$$



$$e = MAX\left(0{,}05\,h \;;\; 2\ cm\right)$$

per M_x $\quad h = 30\ cm \quad 0{,}05\,h = 1{,}5\ cm$

$\Rightarrow e = 2\ cm$

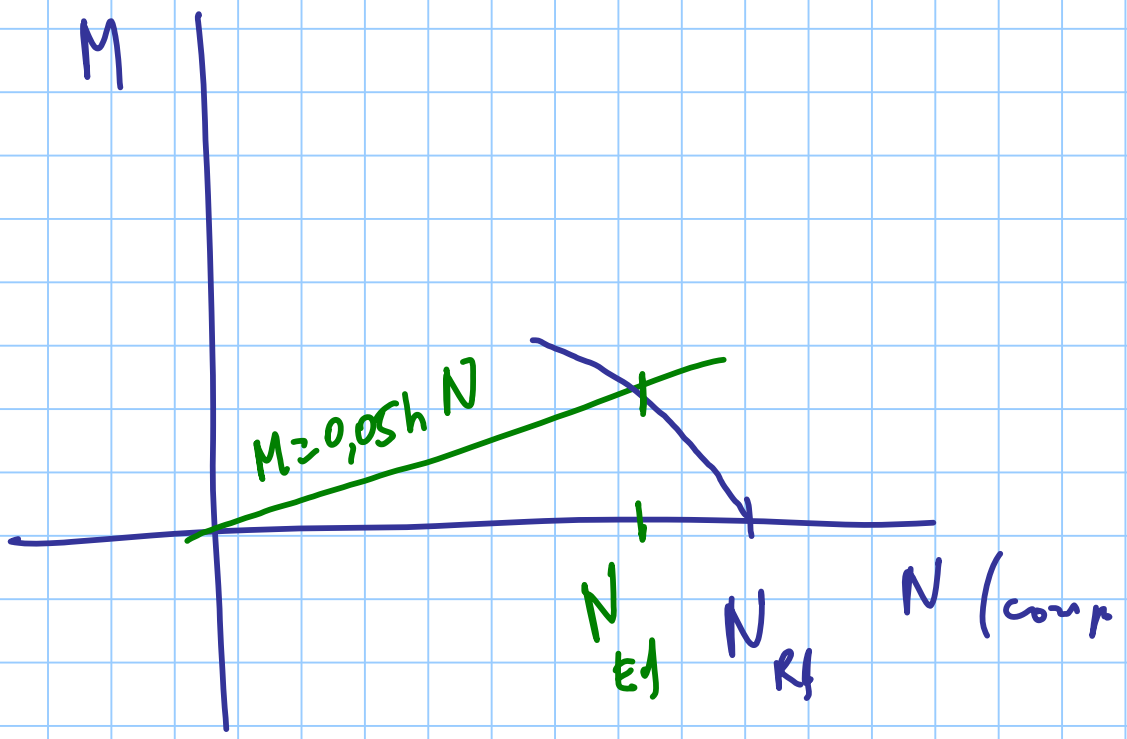
per M_y $\quad h = 60\ cm \quad 0.05\,h = 3{,}0\ cm$

$\Rightarrow e = 3\ cm$

$$N_{Ed} = 2072\ kN$$

$$M_{x,Ed} = 2072 \times 0{,}02 = 41{,}4\ kN\,m$$

$$M_{y,Ed} = 2072 \times 0.03 = 62{,}1\ kN\,m$$



suggerimento progettuale:

$$N_{RA} \geq 1{,}20\ N_{Ed}$$