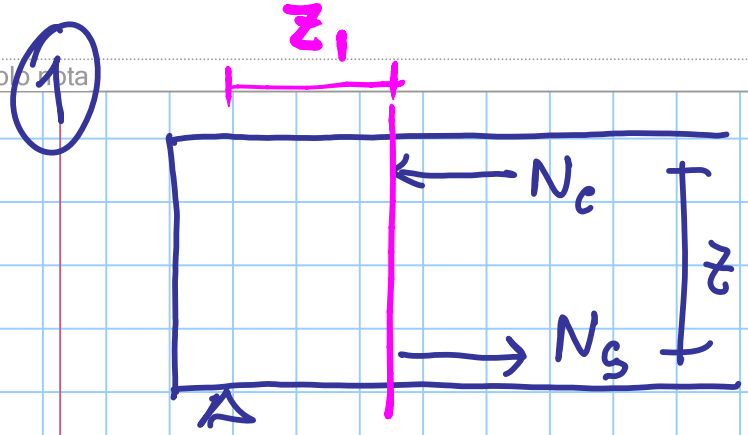
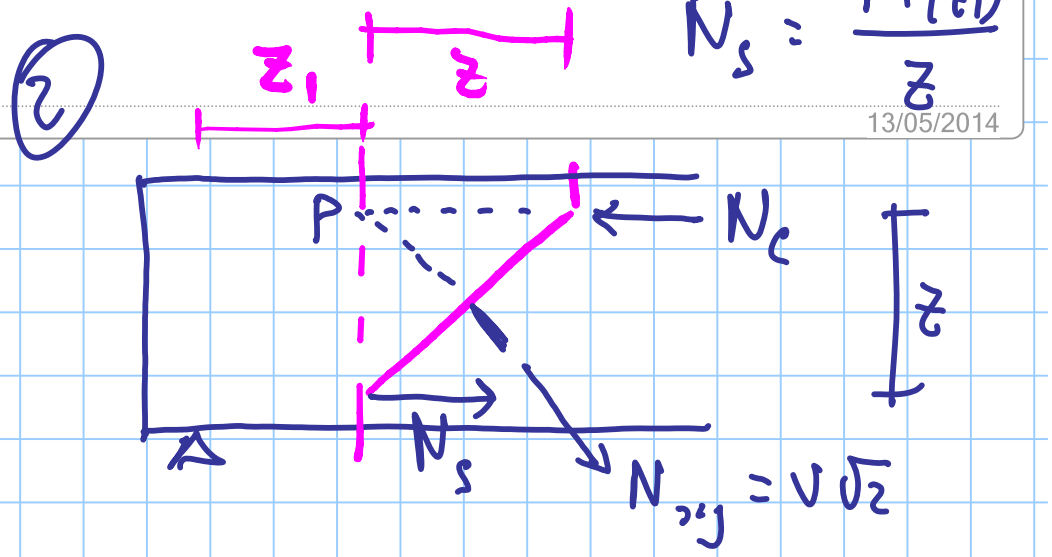
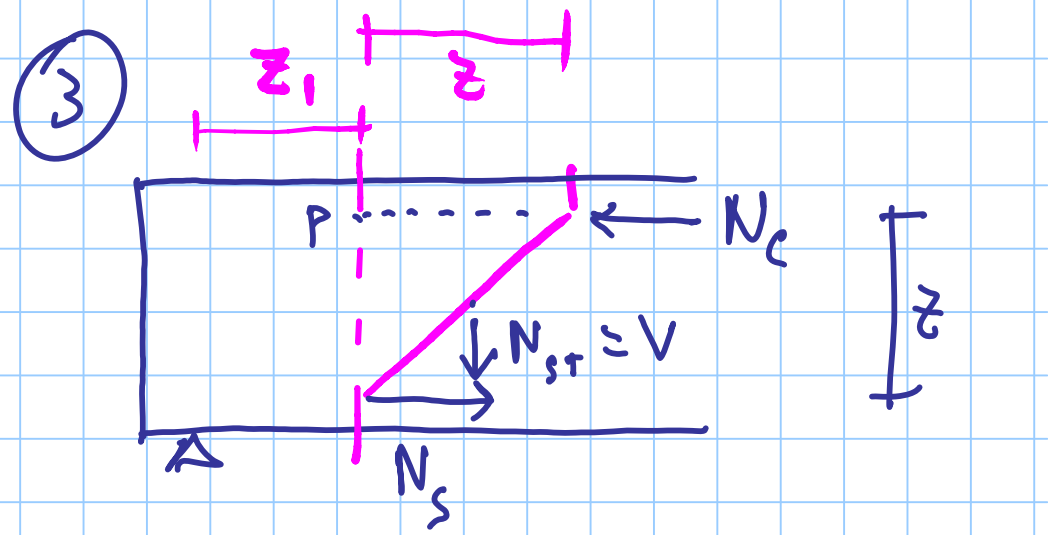
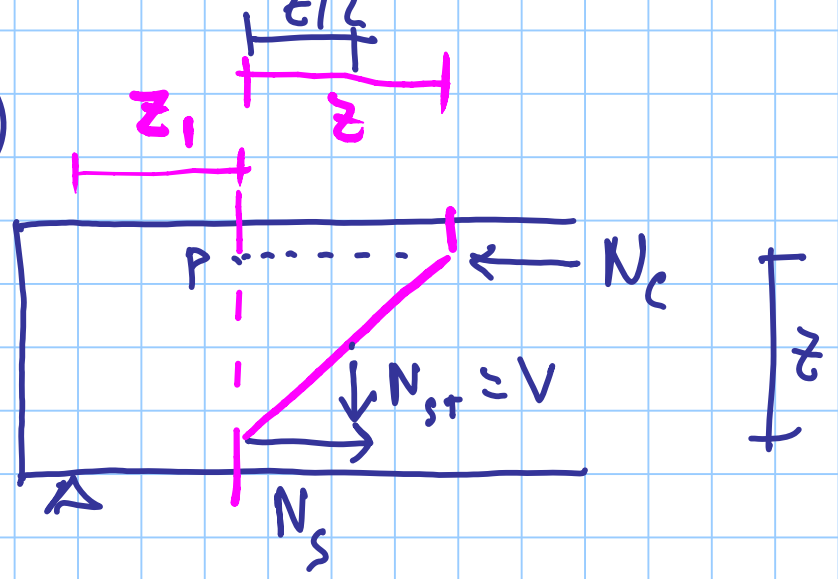


$$N_s = \frac{M(z_1)}{z}$$





(3)

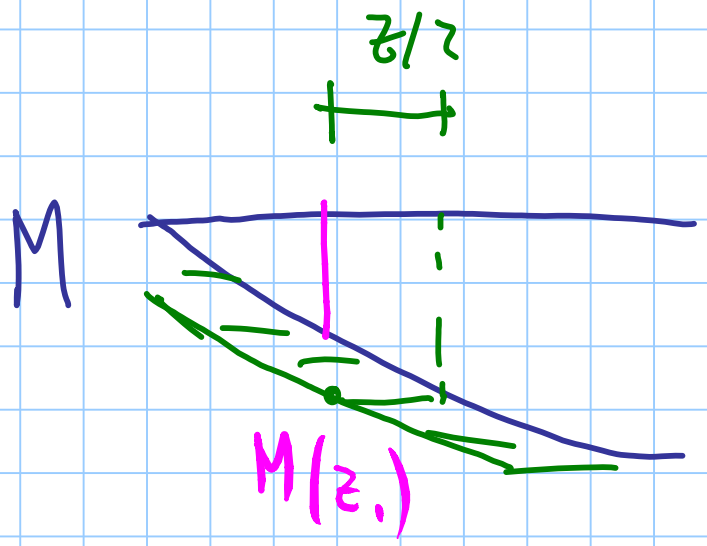


$$V = \frac{dM}{dz}$$

$$M(z_1) = N_s z - V \frac{z}{2}$$

$$N_s = \frac{M(z_1) + V\frac{z}{2}}{z} = \frac{M(z_1)}{z} + \frac{V}{2} = \frac{M\left(z_1 + \frac{z}{2}\right)}{z}$$

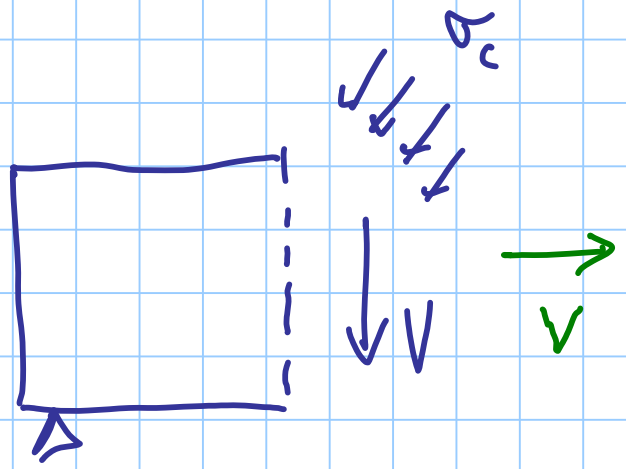
TRASLAZIONE DEL DIAGR. MOMENTO



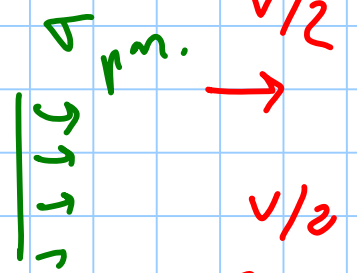
$$N_s = \frac{M(z_.)}{z}$$

dal modello di

campi di tensione



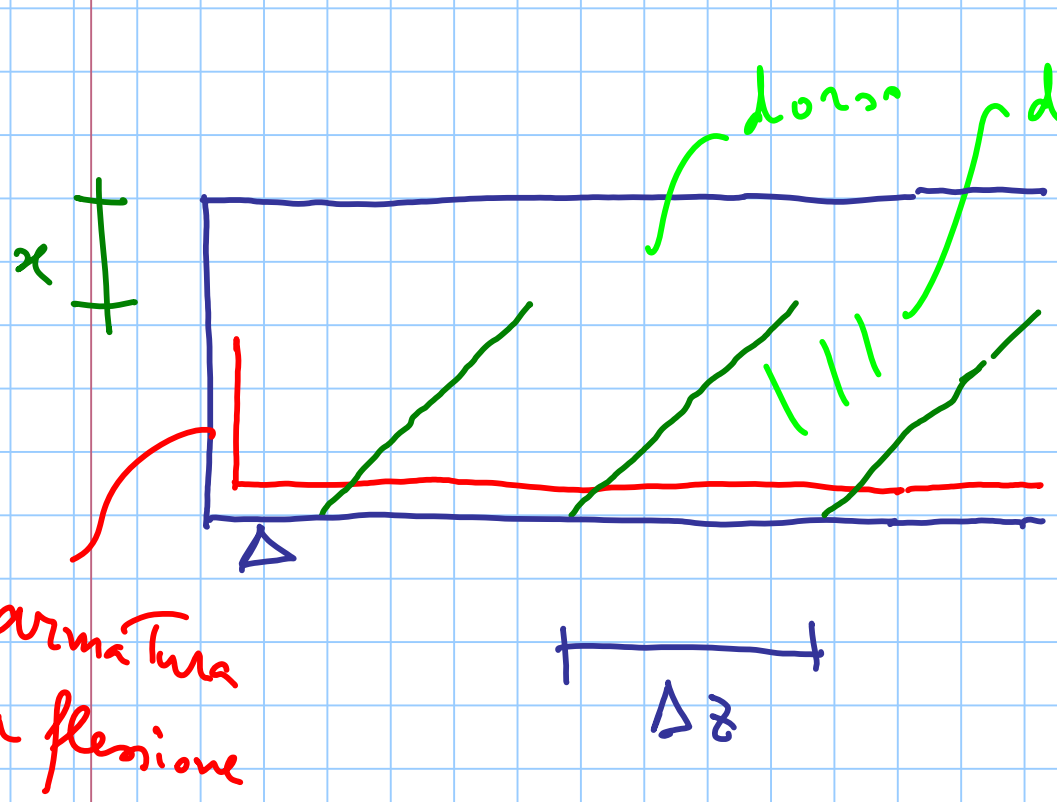
alternativo



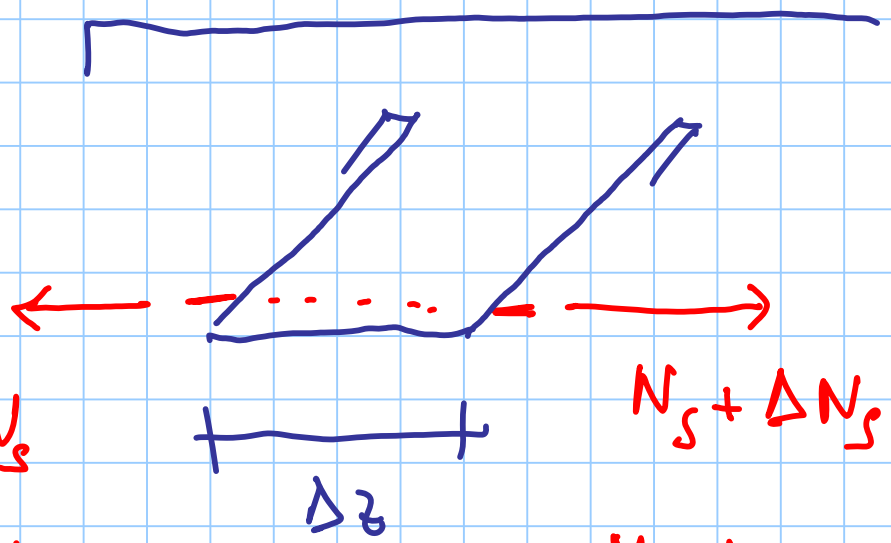
$$A_{pr} = \frac{V}{\sigma}$$

STATO LIMITE ULTIMO

— Resistenza a V in assenza di armatura a taglio

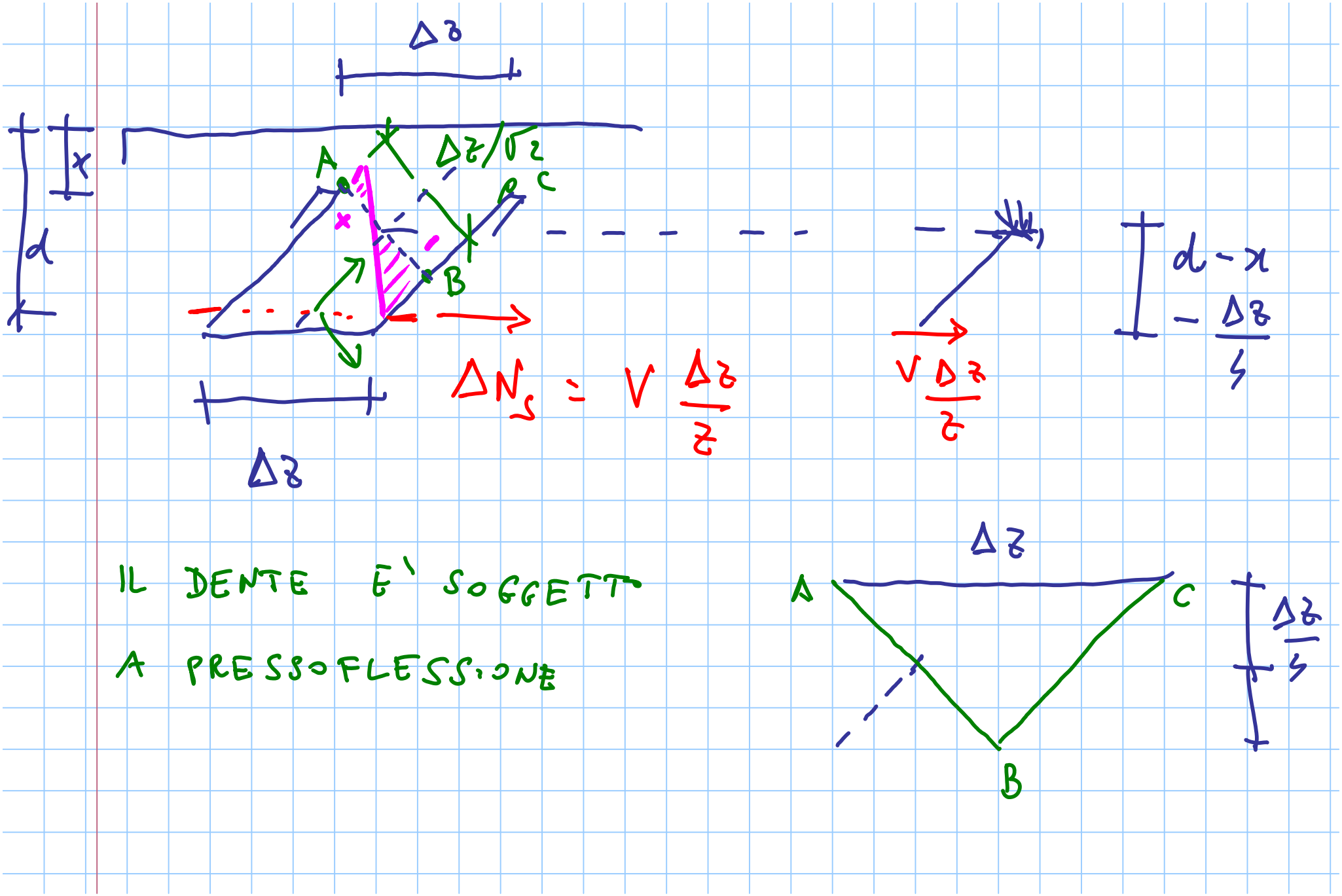


"MODELLO A PETTINÈ"



$$\frac{M}{z}$$

$$\frac{M + \Delta M}{z} = \frac{M + V \Delta z}{z}$$


Δz
x
d
A
Δz/√2
C
B
Δz
ΔN_S = V Δz / z
V Δz / z
d - x
- Δz/4
IL DENTE E' SOGGETTO
A PRESSOFLESSIONE
Δz
A
C
B
Δz/4

la sezione AB è soggetta a:

$$N = -\frac{N_2}{\sqrt{2}} = -\frac{V\,\Delta z}{2\sqrt{2}} \qquad \sigma = \frac{N}{A} + \frac{M}{W}$$

$$M = \frac{V\,\Delta z}{2}\left(d - x - \frac{\Delta z}{4}\right)$$

$$A = b\,\frac{\Delta z}{\sqrt{2}} \qquad W = b\left(\frac{\Delta z}{\sqrt{2}}\right)^2 \frac{1}{6} = \frac{b\,\Delta z^2}{12}$$

si assume $\Delta z = d$ $\quad x = 0.2\,d$ $\quad z = 0.9\,d$

$$N = -\frac{V}{0.9\sqrt{2}} = -0.786\ V$$

$$M = \frac{V}{0.9} \cdot 0.55\,d = 0.611\ V\,d$$

$$A = 0.707\ b\,d \qquad W = 0.0833\ b\,d^2$$

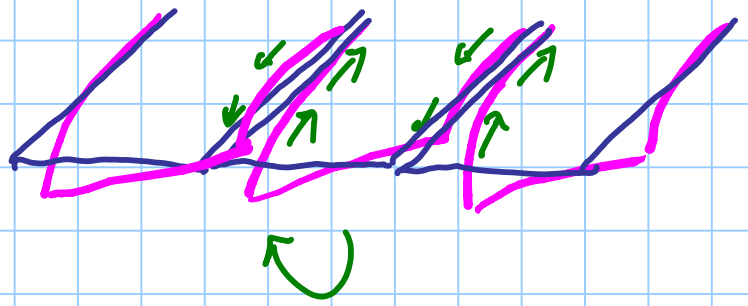
$$\sigma = \frac{-0.786\ V}{0.707\ b\,d} + \frac{0.611\ V\,d}{0.0833\ b\,d^2} \simeq 6.2\ \frac{V}{b\,d} \leq f_{cfd}$$

$$-1.112 \qquad 7.335$$

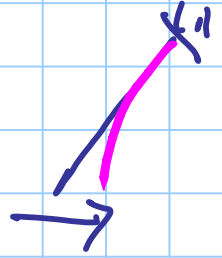
$$1.6\ f_{ctd}$$

$$V \leq \frac{1.6}{6.2} f_{ctd}\, b\, d \simeq 0.25\, b\, d\, f_{ctd}$$

ALTRI CONTRIBUTI ALLA RESISTENZA



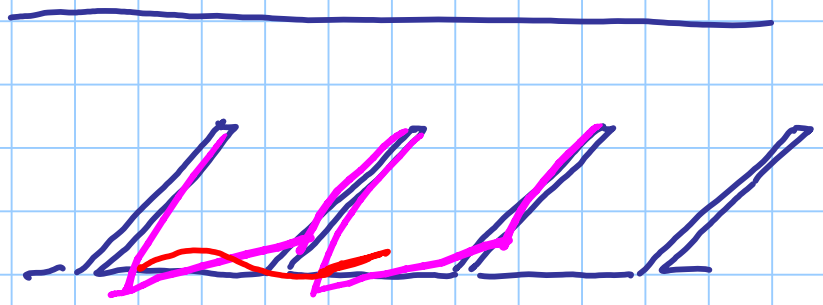
riduce M



dipende da h

INGRANAMENTO DEGLI INERTI

se ne tiene conto mediante un moltiplicatore K $1 \leq K \leq 2$



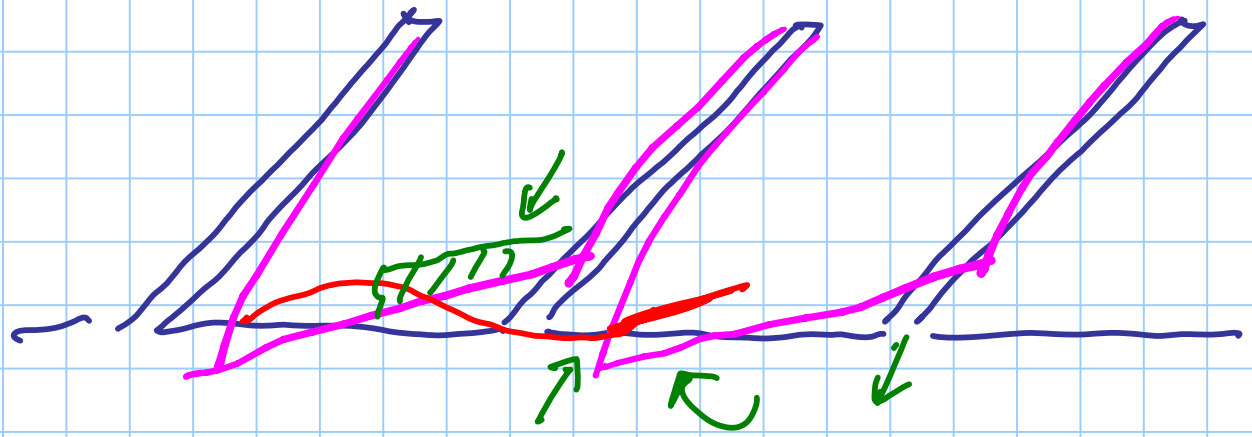
EFFETTO

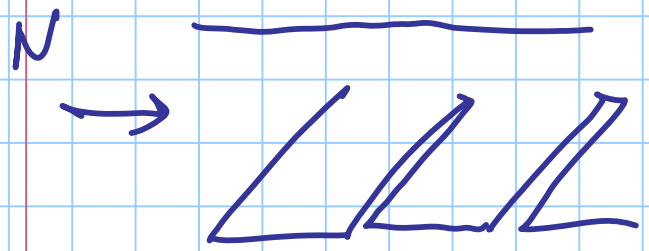
SPINOTTO

dipende da A_s

(e da f_{ct})

$$\rho = \frac{A_s}{b\,d}$$





EFFETTO DI N

compressione → aumenta x

dente più corto → vita meglio

Trazione → riduce x

dente più lungo → vita peggio
(si può rompere anche il dente)

$$V_{Rd,c} = \left[\underbrace{\frac{0.18}{\gamma_c} K \sqrt[3]{100 \rho_l f_{ck}}}_{0,035 \sqrt{K^3 f_{ck}}} + 0.15 \sigma_{cp} \right] b d$$

$$\rho_l = \frac{A_s}{bd} \leq 0.02$$

$$\rho_l = MIN\left(\frac{A_s}{bd} ; 0.02 \right)$$

$$K = 1 + \sqrt{\frac{200}{d}} \leq 2 \qquad d \text{ in mm}$$

$$\sigma_{cp} = \frac{-N}{A_c} \leq 0.2 f_{cd}$$