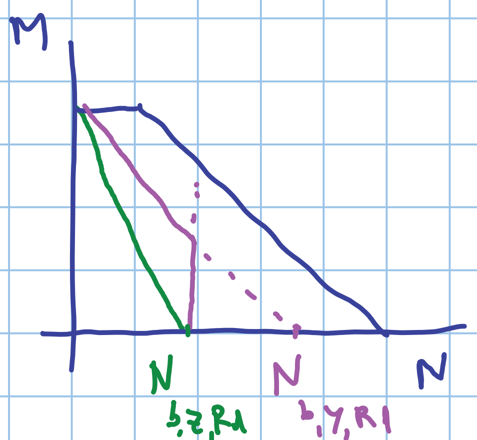
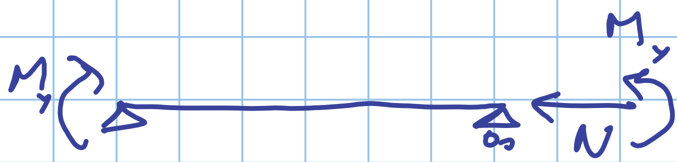
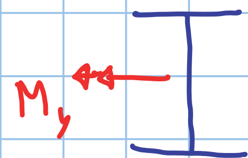
FLESSIONE COMPOSTA – ASTA COMPRESSA

Titolo nota 11/12/2018





momento costante



N < 0 compr

si instabilizza nel piano x y

rotazioni intorno a z

metodo A

$$\frac{N_{Ed}}{N_{b,Rd}} + \frac{M_{y,Ed}}{M_{y,Rd}\left(1 - \frac{N_{Ed}}{N_{cr,y}}\right)} \leq 1$$

$N_{b,y,Rd}$

$N_{b,z,Rd} < N_{b,y,Rd}$

metodo B

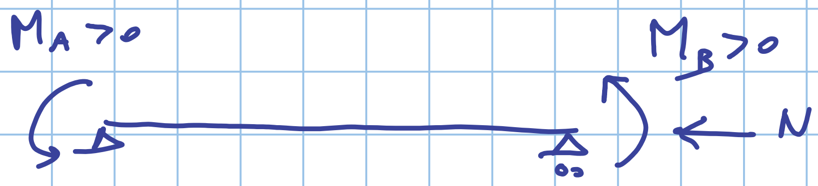
$$\begin{cases} \dfrac{N_{Ed}}{N_{b,y,Rd}} + k_{yy} \dfrac{M_{y,Ed}}{M_{y,Rd}} \leq 1 \\[2ex] \dfrac{N_{Ed}}{N_{b,z,Rd}} \leq 1 \end{cases}$$

$$k_{yy} = 1 + \min\left(\bar{\lambda}_y - 0.2 ; 0.8\right) \frac{N_{Ed}}{N_{b,y,Rd}}$$

Momento equivalente

diagramma lineare

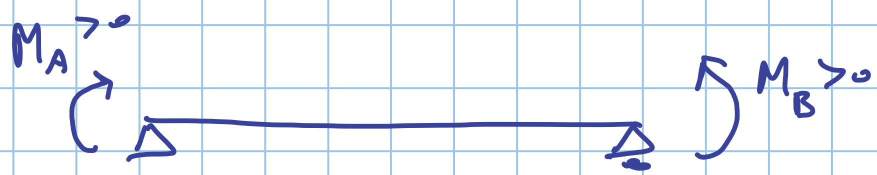
metodo A



$$M_{eq} = 0.6\, M_A - 0.4\, M_B$$
$$\geq 0.4\, M_A$$

$M_A \geq M_B$

metodo B



come convenz. delle sollecit.

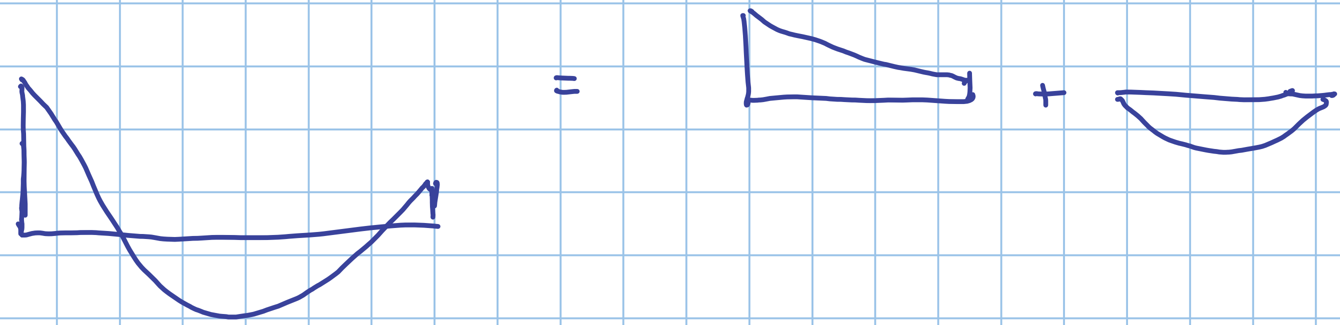
$$M_{eq} = \alpha_m\, M_A \qquad \alpha_m = 0.6 + 0.4\, \psi$$
$$\geq 0.4$$

$M_A \geq M_B$

$$\psi = \frac{M_B}{M_A}$$

Momento equivalente — carico distribuito

Metodo A

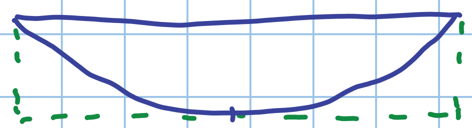


calcolo M_m

$\downarrow$

valore medio

$$\frac{\int M \, dx}{L}$$



M^+_{max}

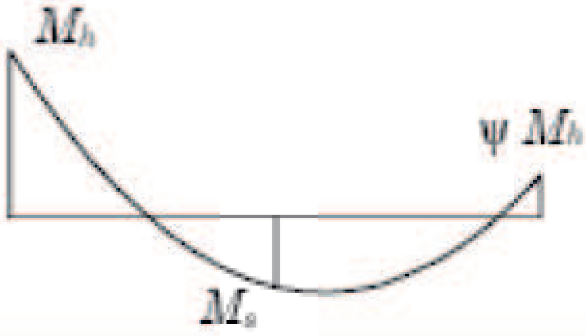
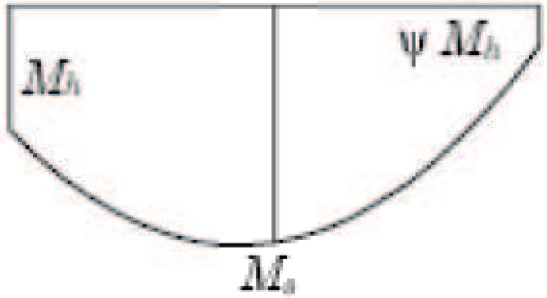
$$M_{eq} = 1.3 \, M_m$$

$$\geq 0.75 \, M_{max}$$

$$M_m = \frac{2}{3} M_{max}$$

$$M_{eq} = 1.3 \times \frac{2}{3} M_{max} = 0.87 \, M_{max}$$

Tab. 1. Valori di α_m nel caso di carico uniforme

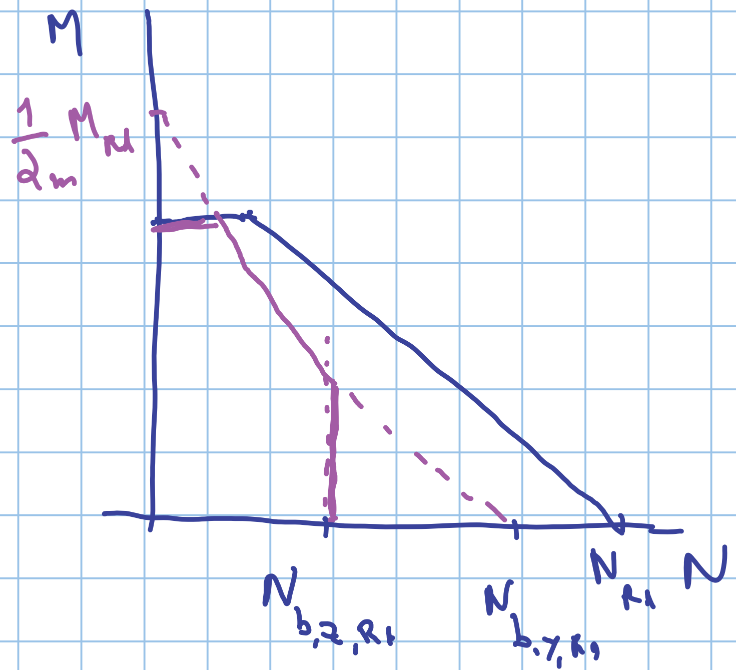
<table>
<tr><th>Diagramma del momento</th><th colspan="2">Intervallo</th><th>α_m</th></tr>
<tr><td rowspan="3">$|M_h| > |M_s|$ $\alpha_s = M_s / M_h$

</td><td>$0 \le \alpha_s \le 1$</td><td>$-1 \le \psi \le 1$</td><td>$0.2 + 0.8\,\alpha_s \ge 0.4$</td></tr>
<tr><td rowspan="2">$-1 \le \alpha_s < 0$</td><td>$0 \le \psi \le 1$</td><td>$0.1 - 0.8\,\alpha_s \ge 0.4$</td></tr>
<tr><td>$-1 \le \psi < 0$</td><td>$0.1(1-\psi) - 0.8\,\alpha_s \ge 0.4$</td></tr>
<tr><td rowspan="3">$|M_s| > |M_h|$ $\alpha_h = M_h / M_s$

</td><td>$0 \le \alpha_h \le 1$</td><td>$-1 \le \psi \le 1$</td><td>$0.95 + 0.05\,\alpha_h$</td></tr>
<tr><td rowspan="2">$-1 \le \alpha_h < 0$</td><td>$0 \le \psi \le 1$</td><td>$0.95 + 0.05\,\alpha_h$</td></tr>
<tr><td>$-1 \le \psi < 0$</td><td>$0.95 + 0.05\,\alpha_h (1 + 2\psi)$</td></tr>
</table>

metod B

$\alpha_m(\quad)$

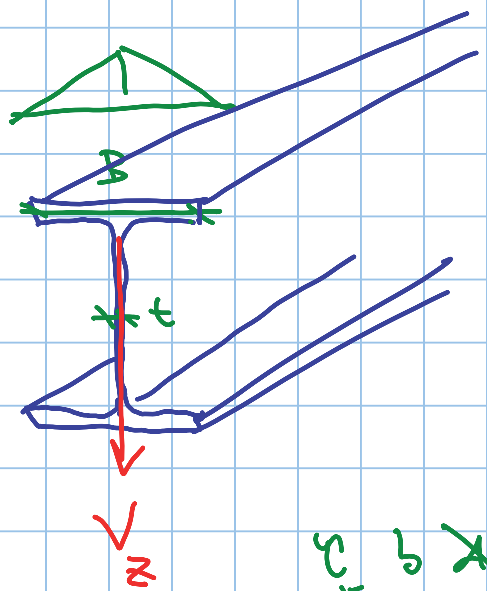
$$\begin{cases} \dfrac{N_{Ed}}{N_{b,y,Rd}} + k_{yy}\dfrac{M_{y,Ed}}{M_{y,Rd}} \le 1 \\[2ex] \dfrac{N_{Ed}}{N_{b,z,Rd}} \le 1 \end{cases}$$

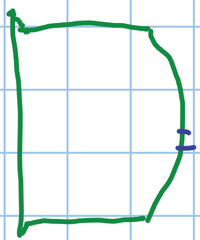
$\alpha_m = 0.8$

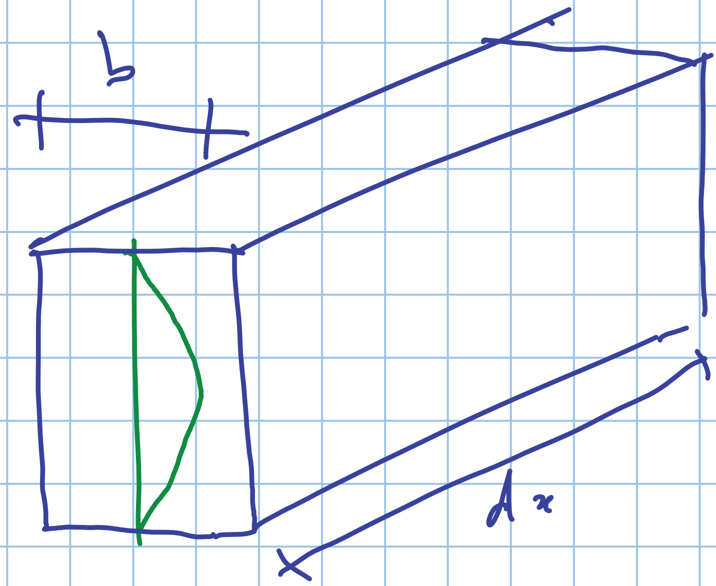


TAGLIO

$$V = \int_{anima} \tau_{zx} \, dA$$







$$\sigma = \frac{M_y}{I_y} z$$

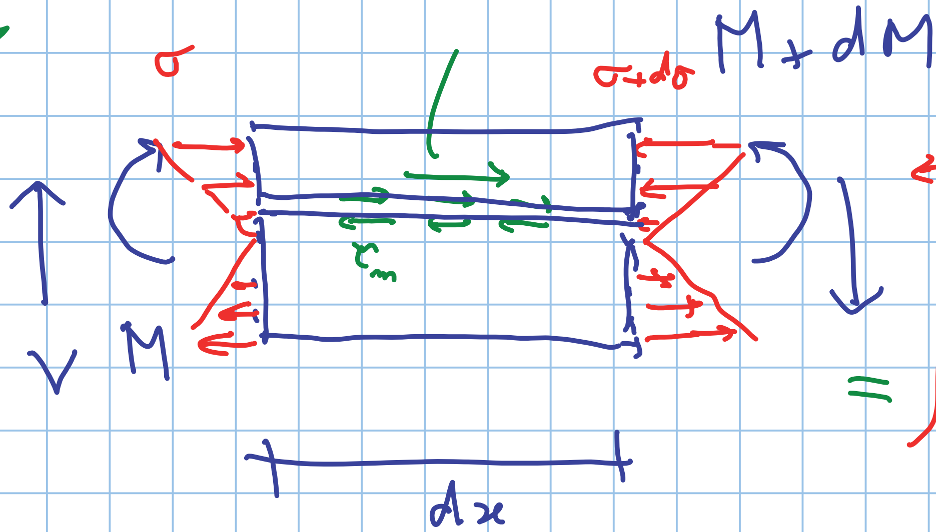
$$d\sigma = \frac{dM_y}{I_y} z = \frac{V\,dx}{I_y} z$$

$$\tau_m \, b \, \cancel{dx} = \frac{V \cancel{dx}}{I_y} S$$

$$\tau_m \, b \, dx =$$

$$\tau_m = \frac{V S}{I_y b}$$

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



$$\leftarrow \int d\sigma \, dA$$

$$= \int \underbrace{\frac{V\,dx}{I_y} z \, dA}_{S}$$

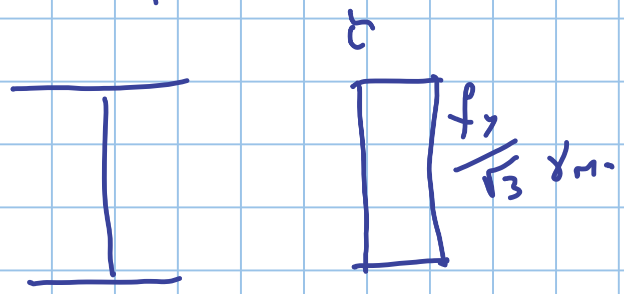
valore max della τ per verifica ?

CRITERIO DI RESISTENZA

Mises $$\sigma_{eq} = \sqrt{\sigma^2 + 3\tau^2}$$

x $\sigma = 0$ $$\sigma_{eq} = \sqrt{3}\,\tau \leq \frac{f_y}{\gamma_{M0}}$$

piena plasticizzazione $$\tau \leq \frac{f_y/\gamma_{M0}}{\sqrt{3}}$$



$$V_{Rd} = A_v \frac{f_y/\sqrt{3}}{\gamma_{M0}}$$