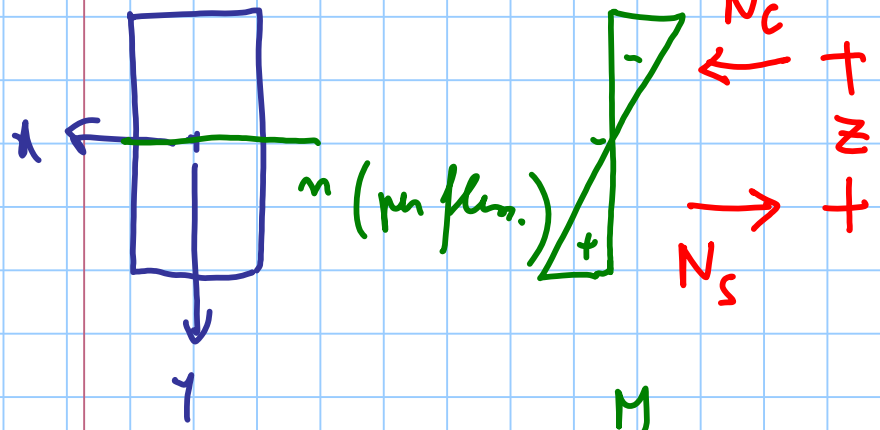
TAGLIO

Titolo nota 07/05/2015

$$\tau = \frac{V S}{I b}$$

S è max in corrisp. del baricentro



ris. omog. inter.

$$\sigma = \frac{M}{I} y$$

risultante delle compressioni

$$N_c = \int_{comp} \sigma \, dA = \int_{comp} \frac{M}{I} y \, dA =$$

$$= \frac{M}{I} \int_{comp} y \, dA = \frac{M}{I} S_{max}$$

$$\tau_c = \frac{V S_{max}}{I b}$$

$$N_c = \frac{M}{I} S_{max}$$

$$\frac{S_{max}}{I} = \frac{N_c}{M} = \frac{1}{z} \Rightarrow \tau_f = \frac{V}{z\,b}$$

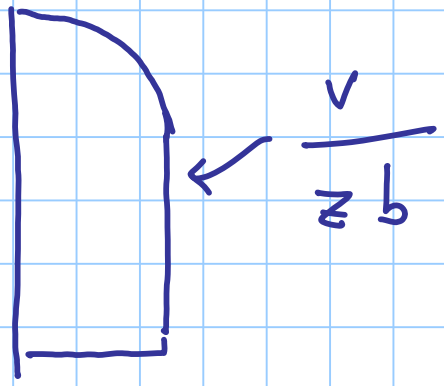
caso particolare

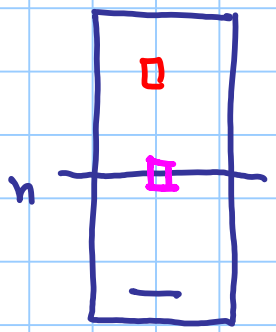
sezione rettangolare

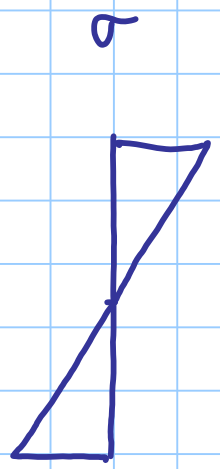
II stadio

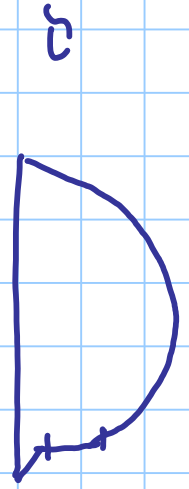
soggetta a flessione

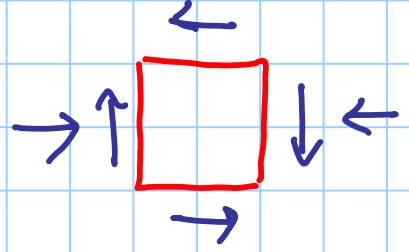
$$z \simeq 0.9\,d \Rightarrow \tau_{max} = \frac{V}{0.9\,b\,d}$$

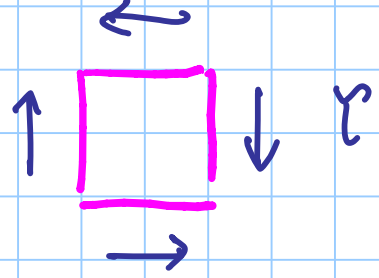








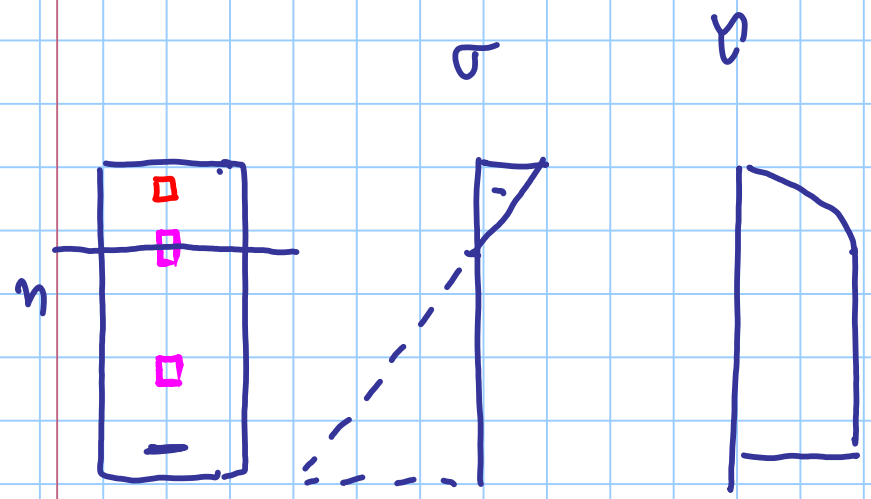


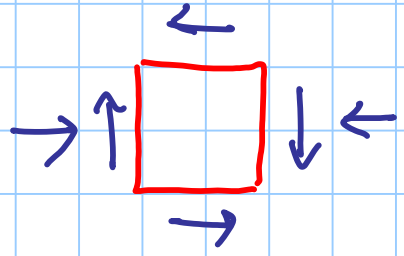


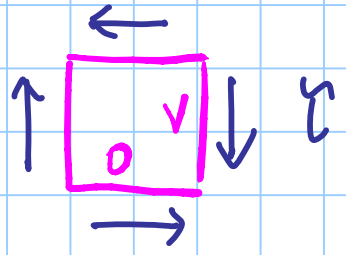
1° m.f.c...

$M > 0$

$N = 0$



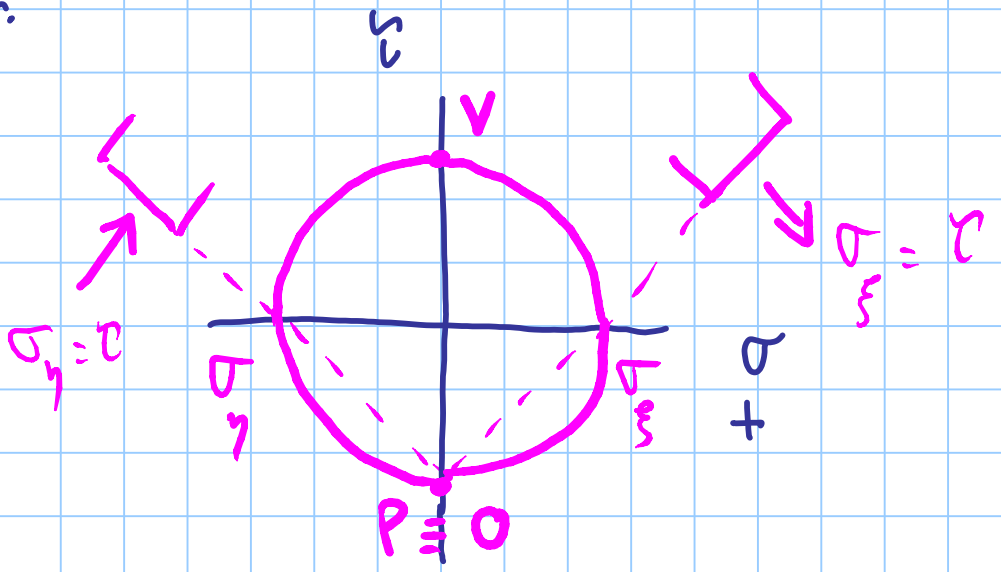


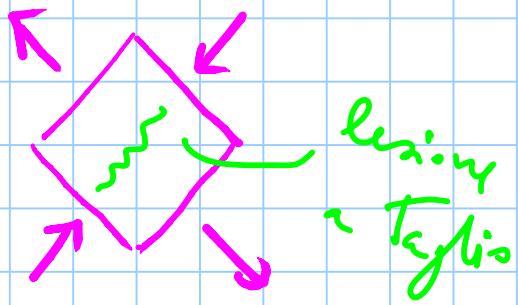


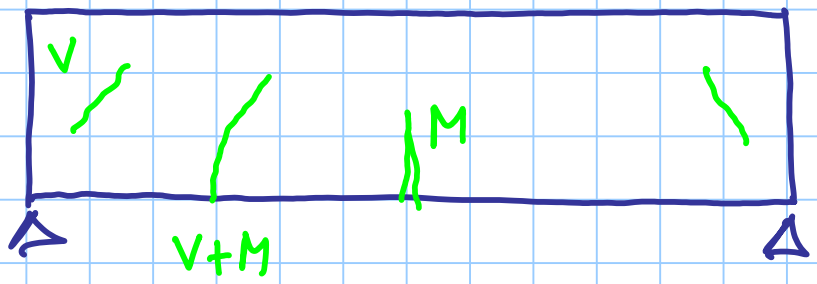
2° mod. comp.

$M > 0$

$N = 0$







NEL PASSATO

$\tau_{max} \leq \tau_{c0}$ il cls supporta le σ_s di taglio

non occorre armatura per taglio

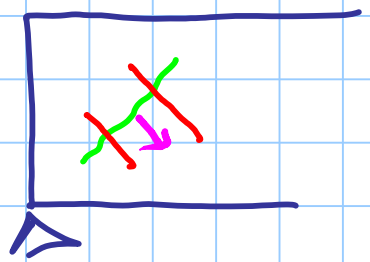
(nei solai non si mette

nelle Travi si mette, ma senza calcolo)

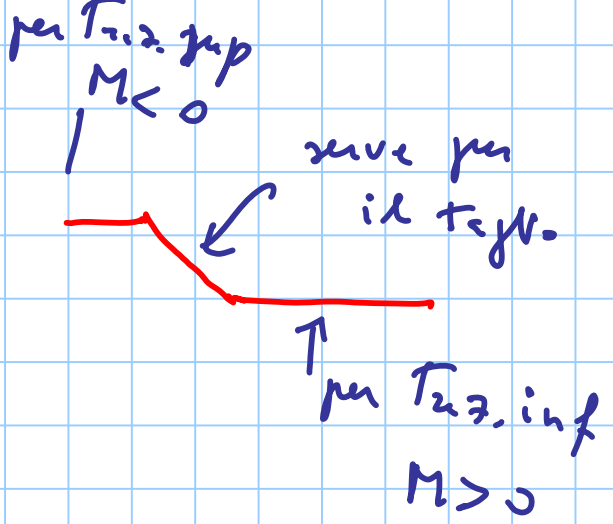
$\tau > \tau_{c0}$ si deve calcolare e disporre armatura per il Taglio

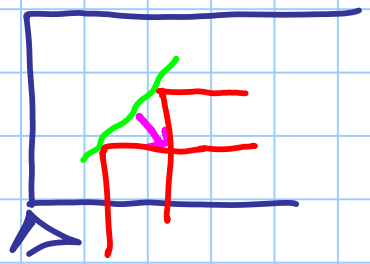
$\tau > \tau_{c1}$ la sezione (in cls) non va bene

ARMATURA A TAGLIO



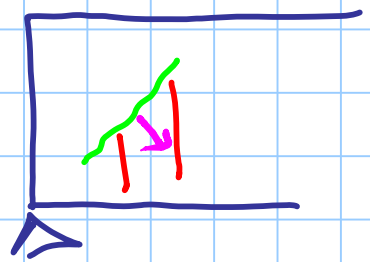
SAGOMATI





STAFFE

FERRI DI PARETE



SOLO STAFFE

e le componente τ_c → che fine fa?

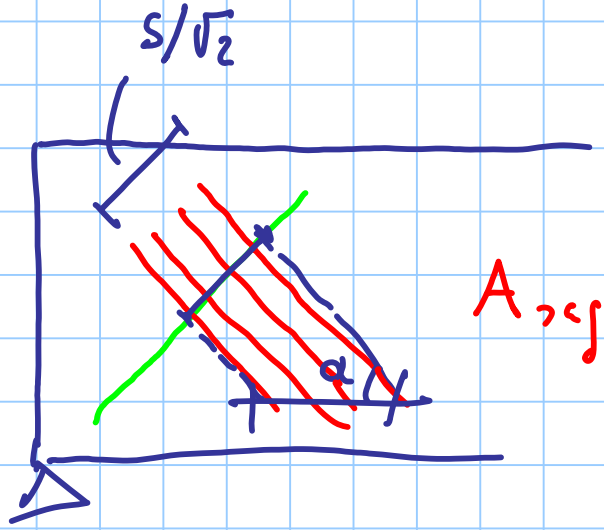
COME CALCOLARE L'ARMATURA A TAGLIO ?

1) dallo stato tensionale ...

2) Traliccio di MÖRSCH

3) modello dei campi di tensione

1

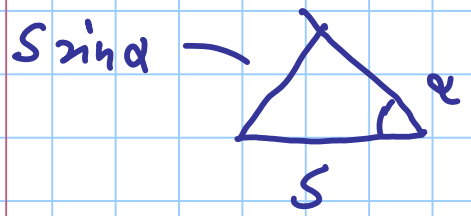


$$\sigma_s = \frac{V}{b z}$$

rez. za A_{rej}

$b = const$

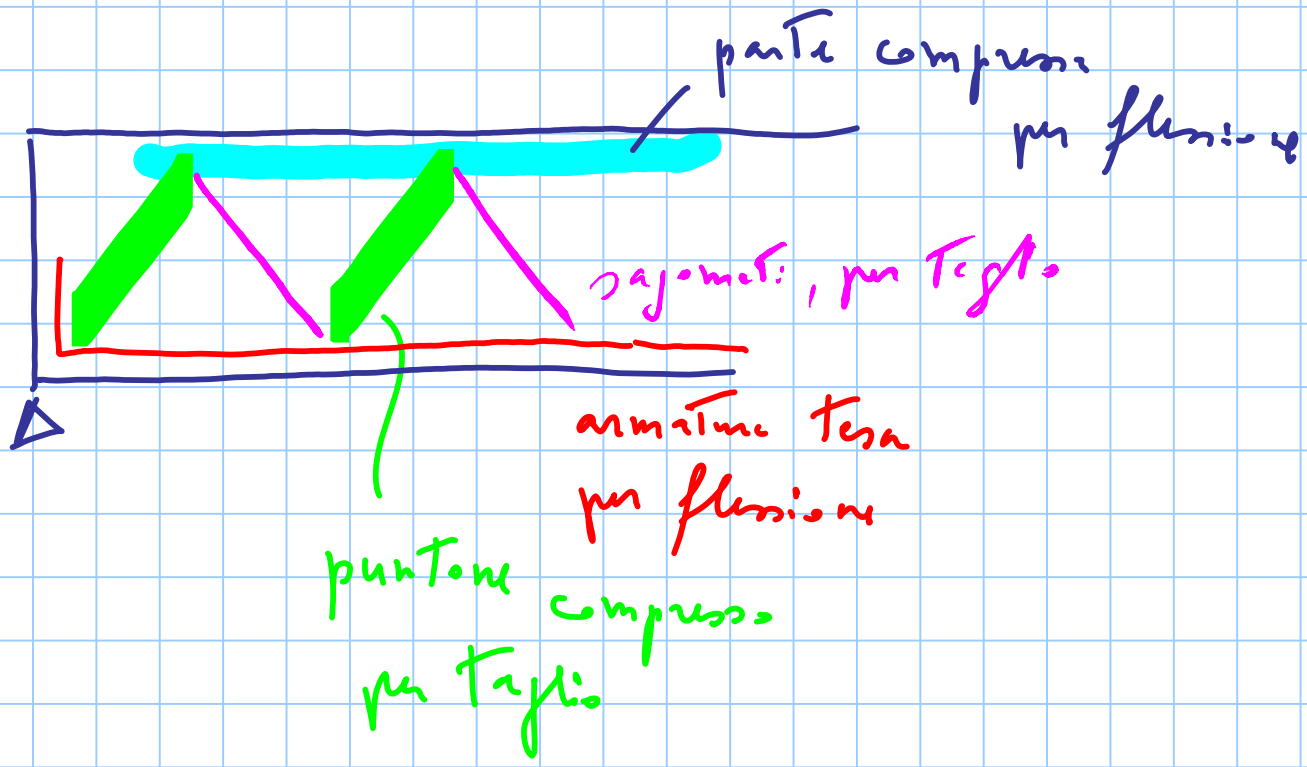
$$N_{\tau_{xz}} = \sigma_s \, b \, \frac{s}{\sqrt{2}} = \frac{V s}{\sqrt{2} z}$$

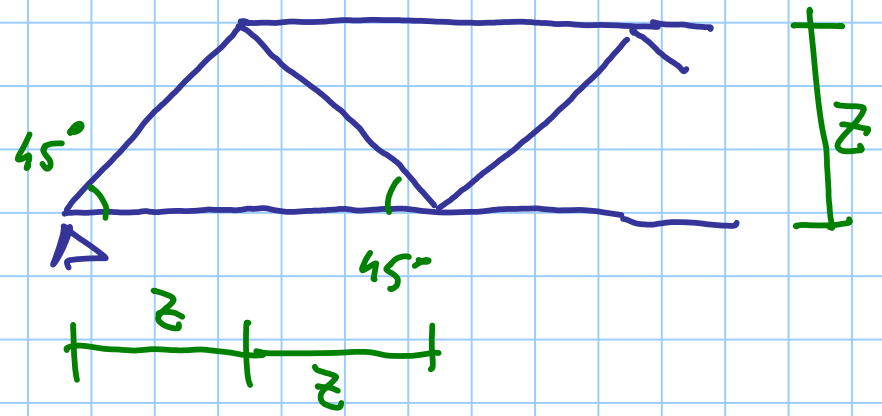


$$\sigma_s = \frac{N_{\tau_{xz}}}{A_{rej}} = \frac{V s}{\sqrt{2} z A_{rej}}$$

$$A_{rej} = \frac{V s}{\sqrt{2} z \bar{\sigma}_s}$$

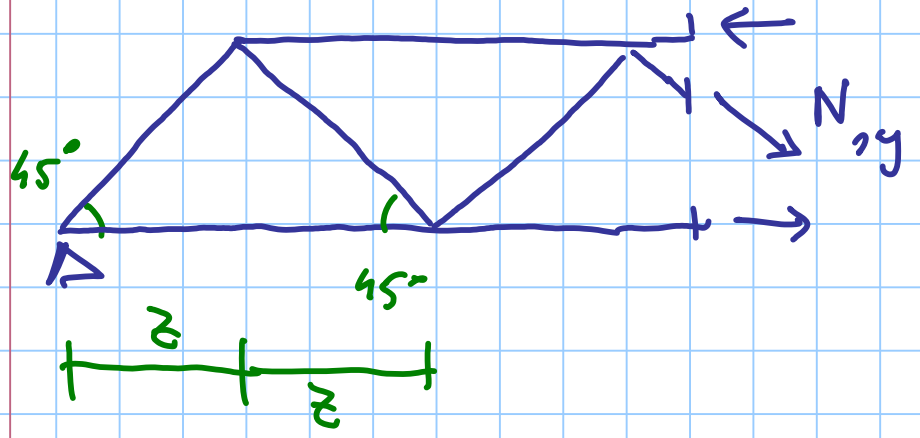
2

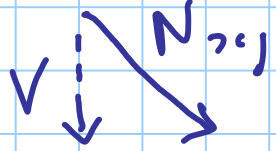




modello di Traliccio

MÖRSCH





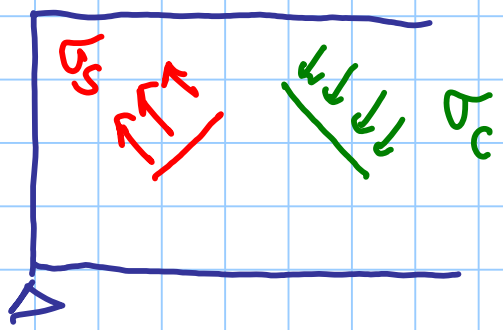
$$N_{sy} = V\sqrt{2}$$

$$\sigma_s = \frac{N_{sy}}{\frac{A_{sy}\,2z}{s}} = \frac{V\sqrt{2}\,s}{\sqrt{2}\,z\,A_{sy}}$$

$$\sigma_s = \frac{V\,s}{\sqrt{2}\,z\,A_{sy}}$$

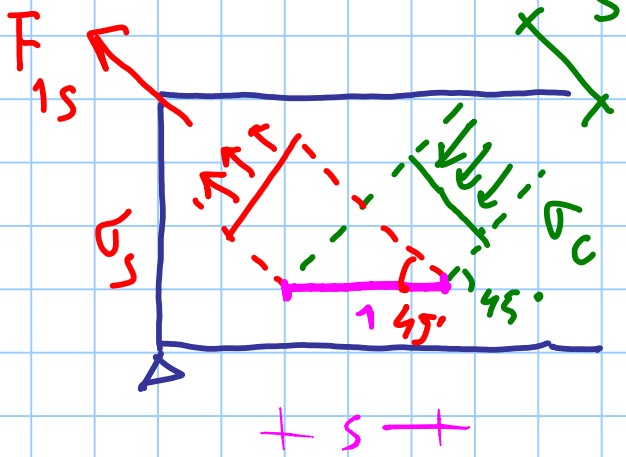
come modello (1)

(3)



$$F_{1c} = b \frac{s}{\sqrt{2}} \sigma_c$$

$$s \sin 45° = \frac{s}{\sqrt{2}}$$

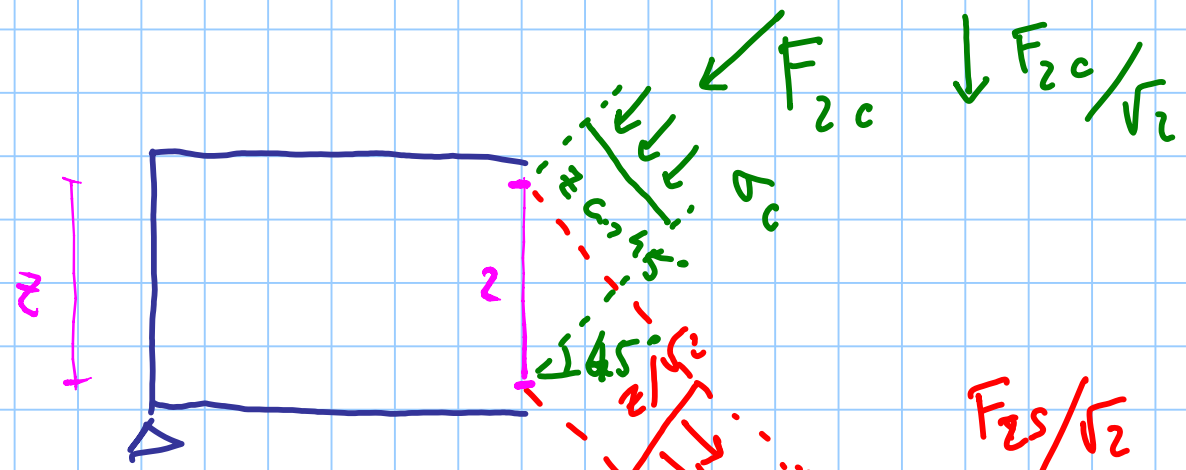


$$F_{1s} = A_{s,j} \sigma_s$$

$$\sigma_c = \frac{A_{s,j} \sigma_s \sqrt{2}}{b s}$$

$$F_{1c} \cos 45° - F_{1s} \sin 45° = 0$$

$$\frac{b s}{\sqrt{2}} \sigma_c = A_{s,j} \sigma_s$$



$$F_{2s} = \frac{A_{sw}}{s} z \, \sigma_s$$

$$F_{2c} = b \frac{z}{\sqrt{2}} \sigma_c$$

$$\sigma_c = \frac{A_{sw} \sigma_s \sqrt{2}}{b s}$$

$$\frac{F_{2c}}{\sqrt{2}} + \frac{F_{2s}}{\sqrt{2}} = V$$

$$\frac{b z}{2} \sigma_c + \frac{A_{sw}}{s} \frac{z}{\sqrt{2}} \sigma_s = V$$

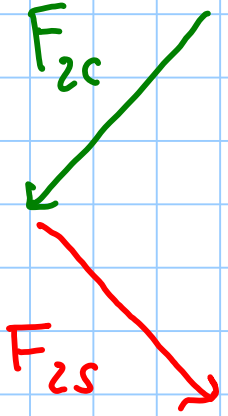
$$\frac{b z}{\sqrt{2} 2} \frac{A_{sw} \sigma_s \sqrt{2}}{b s} + \frac{A_{sw}}{s \sqrt{2}} z \, \sigma_s = V$$

$\sqrt{2}$

$$2 \cdot \frac{A_{sy} \cdot z}{s \sqrt{2}} \cdot \sigma_s = V$$

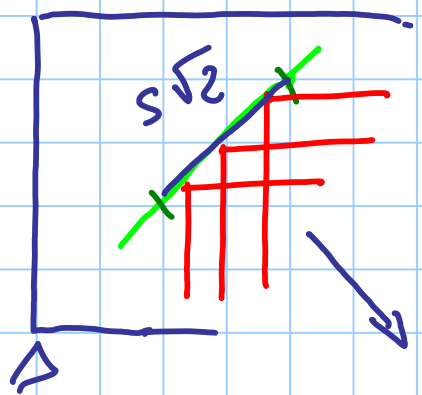
$$\sigma_s = \frac{V \cdot s}{\sqrt{2} \cdot z \cdot A_{sy}}$$

come per (1) e (2)



l'equilibrio alla traslazione orizzontale è verificato

STAFFE + FERRI DI PARETE



A_{pm} l'armatura totale (nel tronco z)

$$N_{Trazt} = b\, s\sqrt{2}\, \sigma_s = b\, s\sqrt{2}\, \frac{V}{z\, b} = \frac{V s\sqrt{2}}{z}$$

s

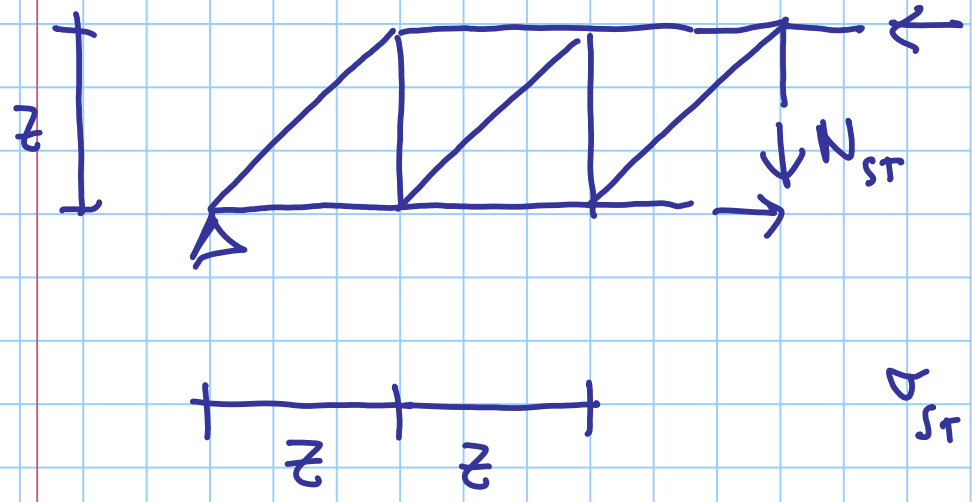
$$\frac{V s \sqrt{2}}{\sqrt{2}\, z} = \frac{V s}{z}$$

$$\sigma_{St} = \frac{V s}{z\, A_{St}} \qquad A_{St} = \frac{V s}{z\, \sigma_s}$$

$$\frac{V s}{z}$$

$$\sigma_{pm} = \frac{V s}{z\, A_{pm} \frac{s}{z}} = \frac{V}{A_{pm}} \qquad A_{pm} = \frac{V}{\sigma_s}$$

SOLO STAFFE



$$N_{St} = V$$

$$\sigma_{St} = \frac{N_{St}}{\frac{A_{st}}{s} z} = \frac{V s}{z A_{St}}$$

come per staffe + ferri para T_t