

# ASTE IDEALI → PERFETTE

Titolo nota

31/10/2012

## ASTE REALI → CON IMPERFEZIONI

— geometriche

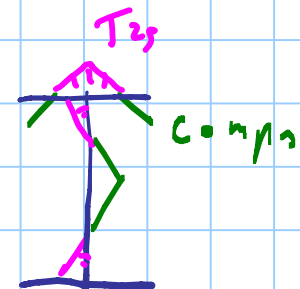
ASTA NON RETTILINEA



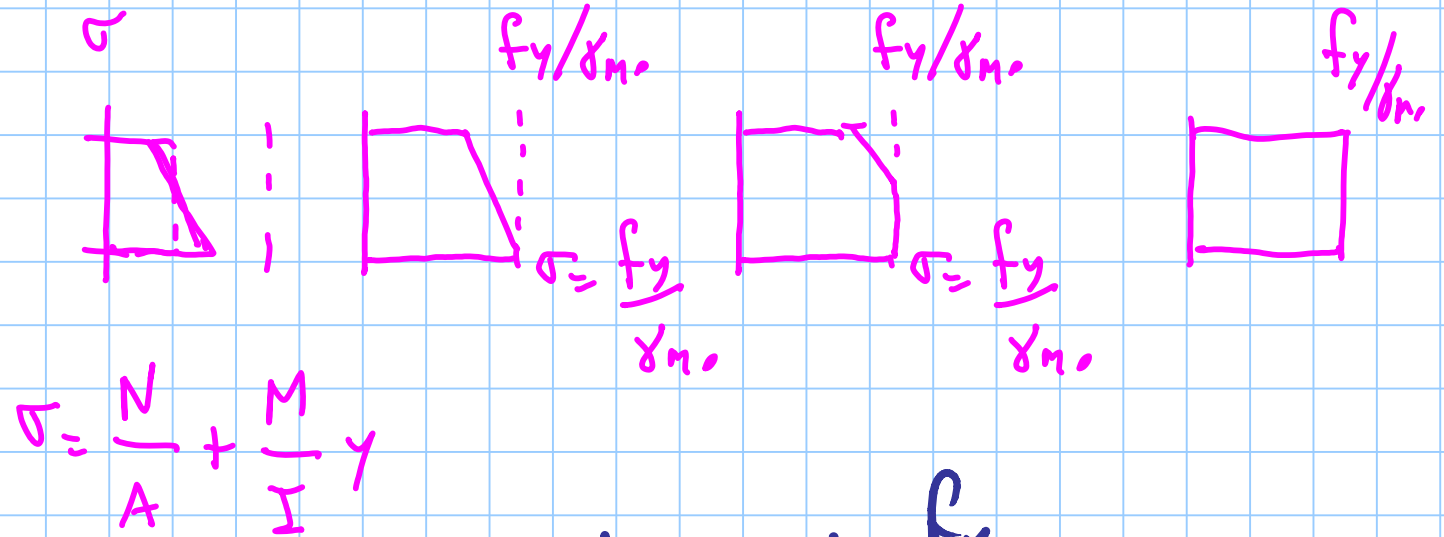
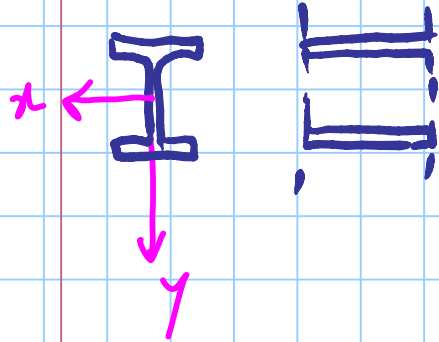
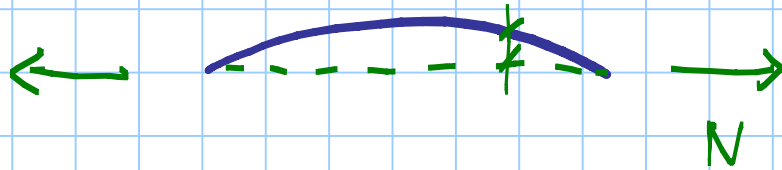
$$f \leq \frac{1}{1000} l$$

— meccaniche

TENSIONI RESIDUE



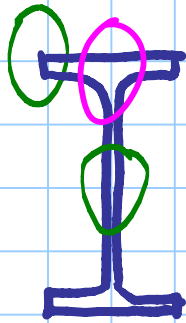
$$M = N e$$



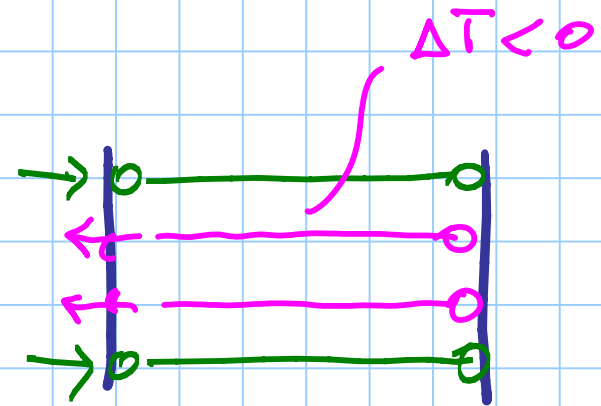
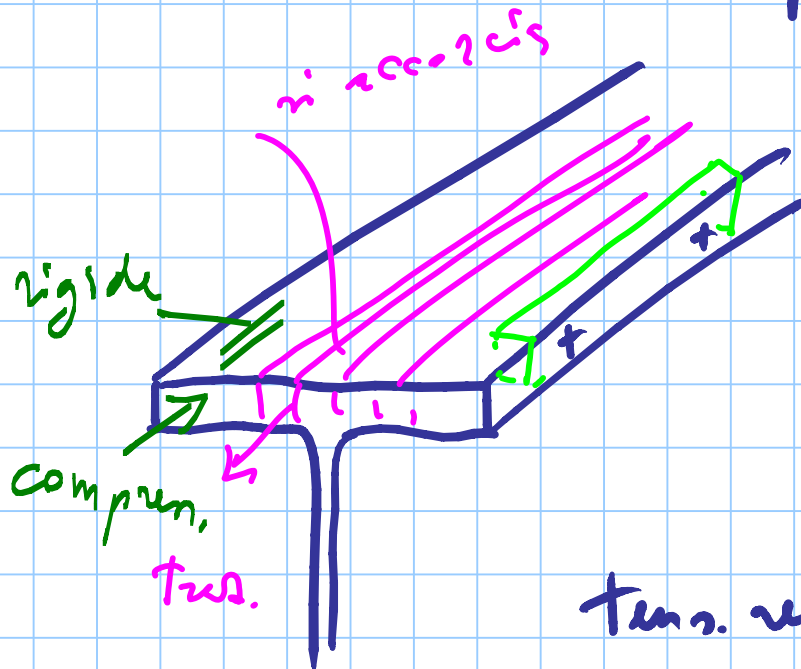
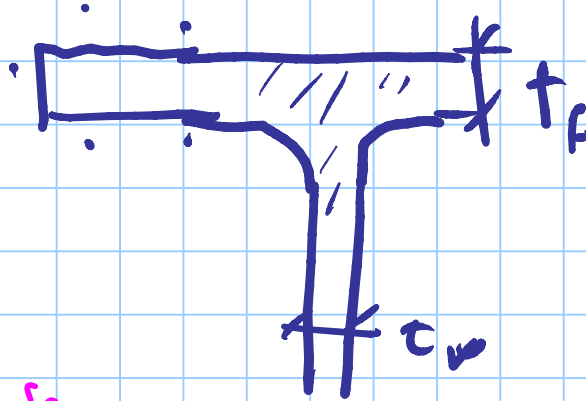
$$\sigma = \frac{N}{A} + \frac{M}{I} y$$

$$N_{Rd} = A \frac{f_y}{\gamma_{m0}}$$

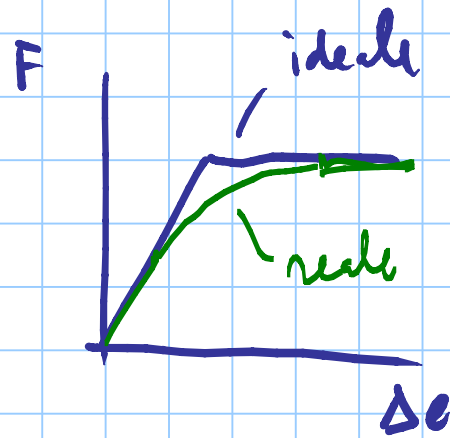
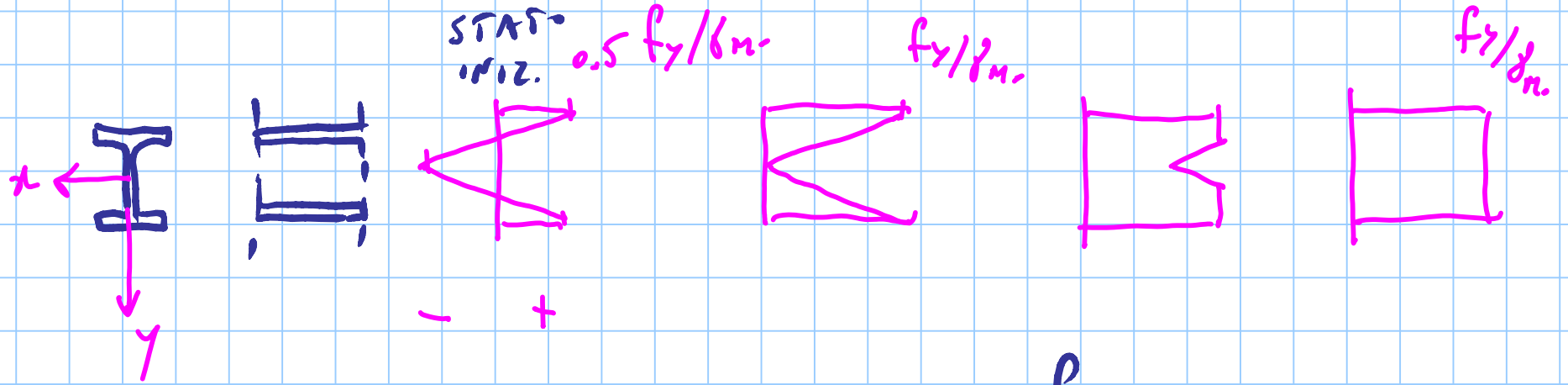
si raffredda  
primi



si raffredda  
dopo

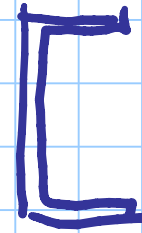
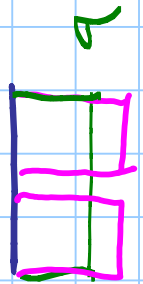
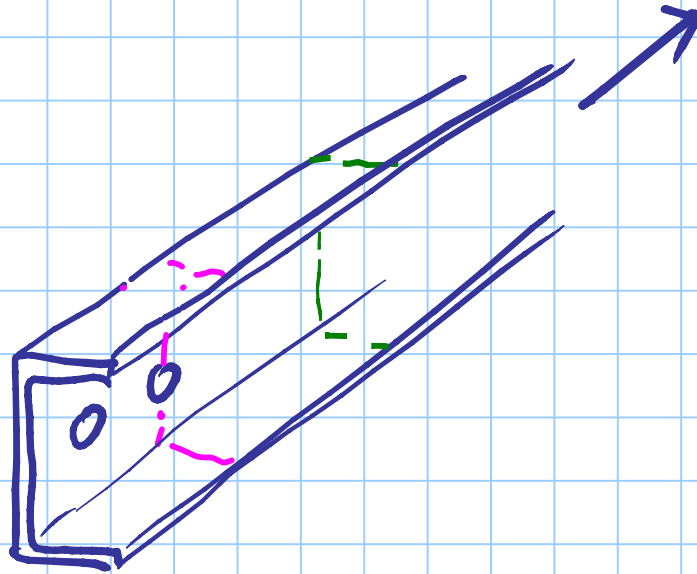


tens. residue fin.  $\sim 0.5 f_y$  o più



$$N_{Rd} = A \frac{f_y}{\gamma_m}$$

ASTA CON FORI

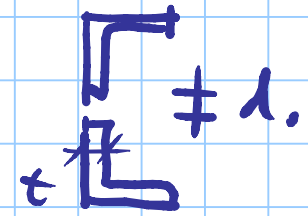
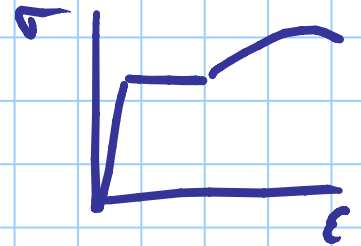


$A_g$



carico medio

$$\sigma = \frac{N}{A_g}$$



$$A_n = A_g - d_o \cdot t$$

$$\sigma = \frac{N}{A_n}$$

RESIST. SEZ. FORATA

$$N_{Rd, n} = 0.9 A_n \frac{f_u}{\gamma_{M2}}$$

SEZ. INTEGRA

$$N_{Rd, pl} = A_g \frac{f_y}{\gamma_{M0}}$$

ASTA:  $N_{Rd} = \min(N_{Rd, n} ; N_{Rd, pl})$

$$\text{se } N_{Rd, n} < N_{Rd, pl}$$

**FRAGILE**

SI ROMPE IN CORRISP. AL FORO

$$\text{se } N_{Rd, n} > N_{Rd, pl}$$

**DUTTILE**

SI SNERVA TUTTA L'ASTA PRIMA  
DI ROMPERSI IN CORRISP. FORO

$$0.9 A_n \frac{f_u}{\gamma_{m2}} > A_g \frac{f_y}{\gamma_{m0}}$$

$$\frac{A_n}{A_g} > \frac{f_y / \gamma_{m0}}{0.9 f_u / \gamma_{m2}} = \frac{f_y \gamma_{m2}}{0.9 f_u \gamma_{m0}}$$

S275

$$f_y = 275 \text{ MPa}$$

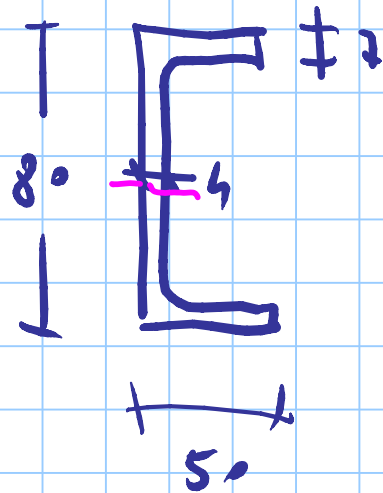
$$f_u = 430 \text{ MPa}$$

$$\downarrow$$

$$\frac{275 \times 1.25}{0.9 \times 430 \times 1.05} = 0.846$$

$$A_s = 10.1 \times 10^2 \text{ mm}^2$$

VPE 8.



motiv. geom.

$$d_o \leq \frac{1}{3} 80 = 26 \text{ mm}$$

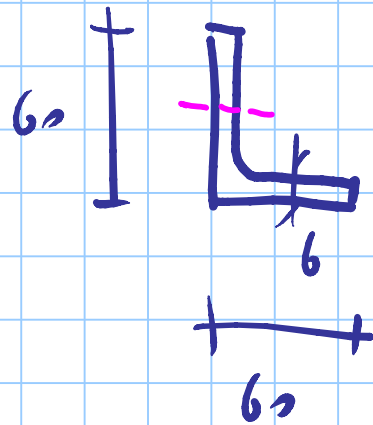
fora max per comp. da A. 4

max  $T_{0.4} \approx 15\% A_s$

$$152 \text{ mm}^2$$

$$d_o \leq \frac{152}{4} = 38 \text{ mm}$$





L 60x60x6

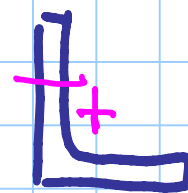
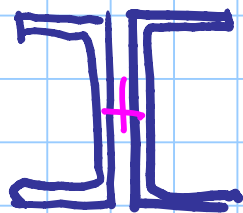
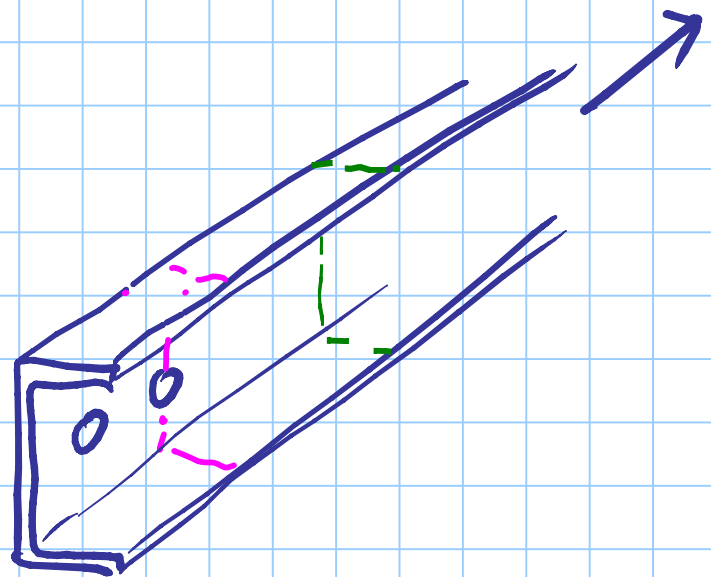
$$A_g = 6.91 \times 10^2 \text{ mm}^2$$

$$15\% \rightarrow 104 \text{ mm}^2$$

$$d_o \leq \frac{104}{6} = 17.3 \text{ mm}$$

per m.t.v. gen

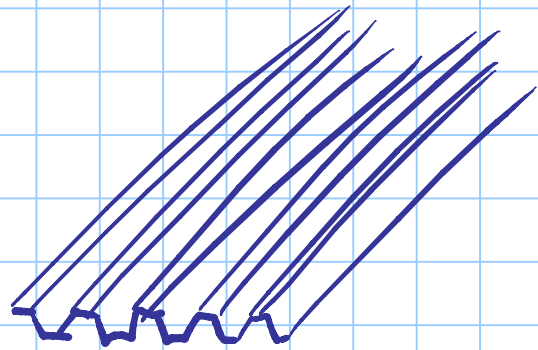
$$d_o \leq \frac{1}{3} 60 = 20 \text{ mm}$$



$$N_{Rd,u} = \underset{\substack{\downarrow \\ 0.9}}{k} A_n \frac{f_u}{\gamma_{M2}}$$

— . pier piero

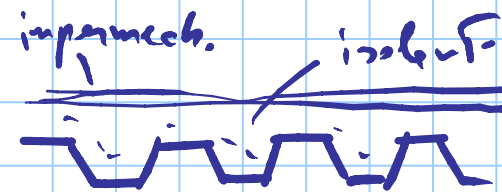
# EDIFICI, CAPANNONI, SCALE



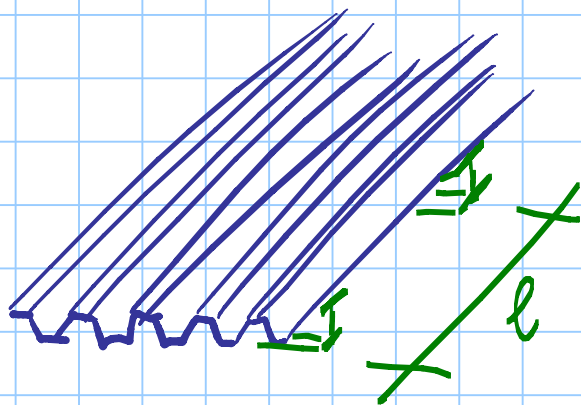
lamiera  
grate

COPERTURE  
non praticabili

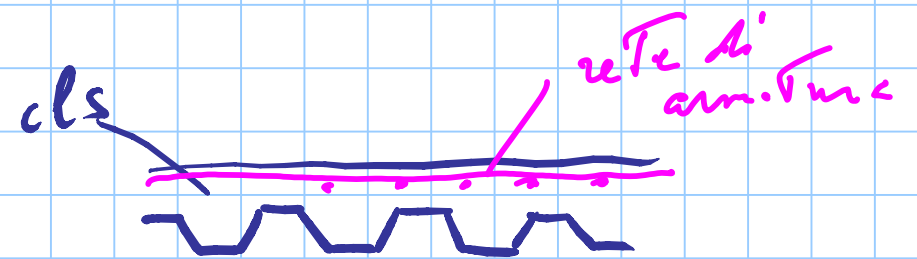
pannelli  
lamiera grate + isolanti



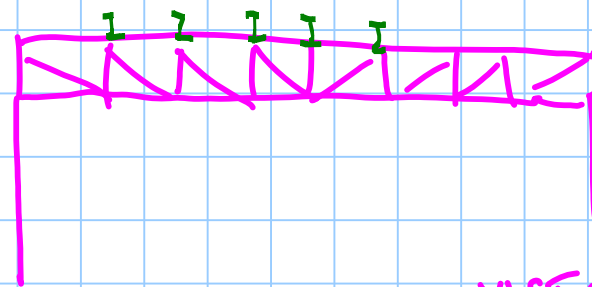
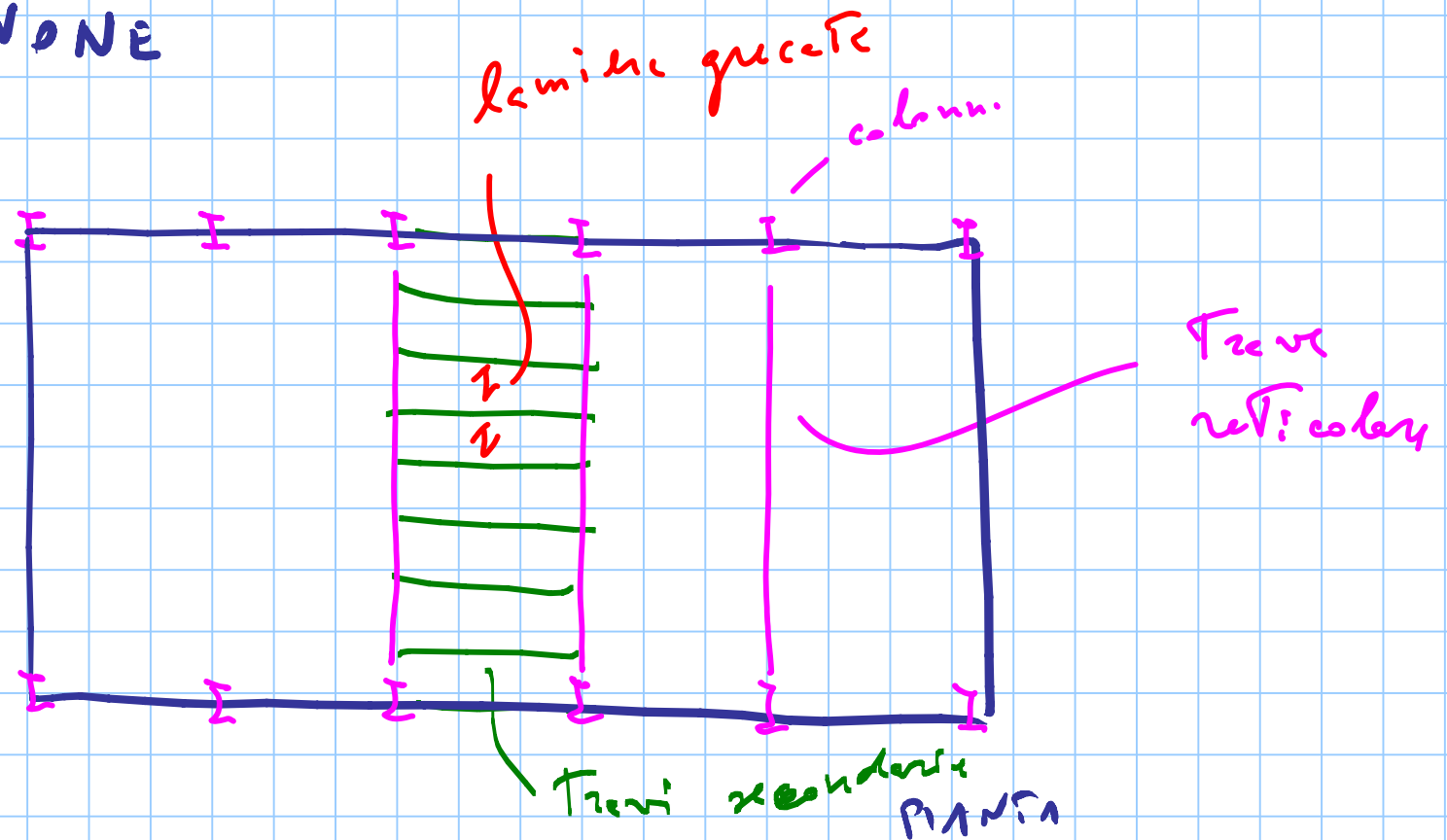
	lance		
	1.50	2.00	2.50
pannell 1	$\rho_{me} = \cup$	$\cup$	$\cup$
pan 2	$\cup$	$\cup$	$\cup$



# SOLAI PRATICABILI

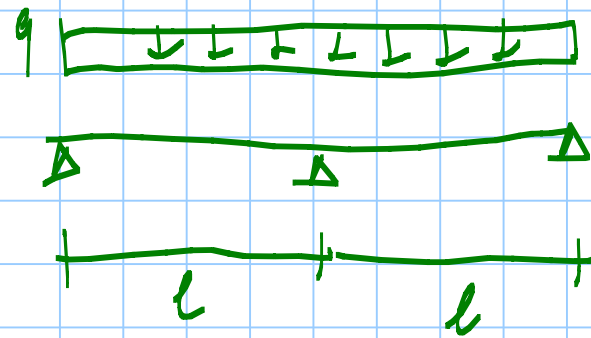
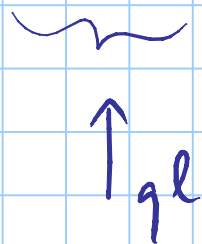
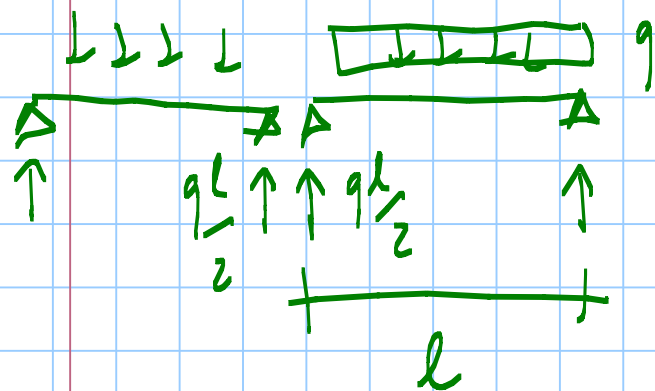


# CAPANNONE



VISTA LATERALE

# TRAVI SECONDARIE



M

