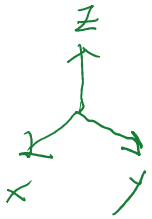
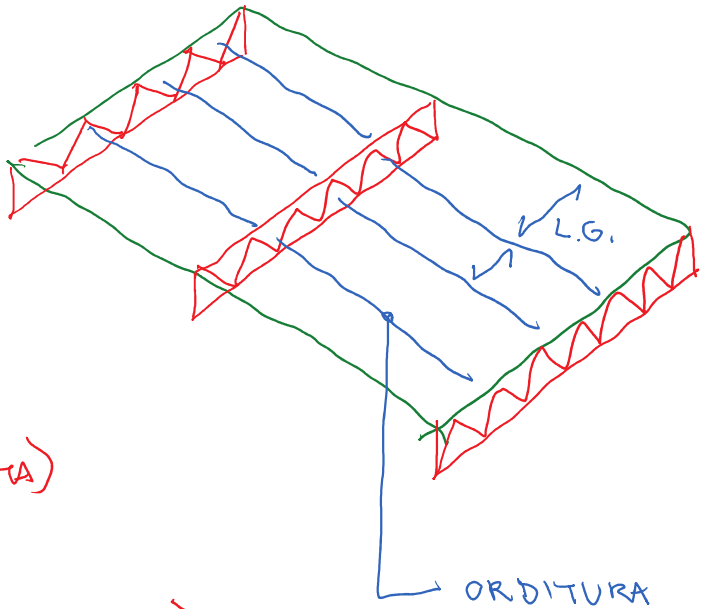
SOLUZIONI OTTIMIZZATE PER LA STRUTTURA DI IMPALCATO

NUOVA TIPOLOGIA STRUTTURALE :

STRUTTURA RETICOLARE SPAZIALE (3d)

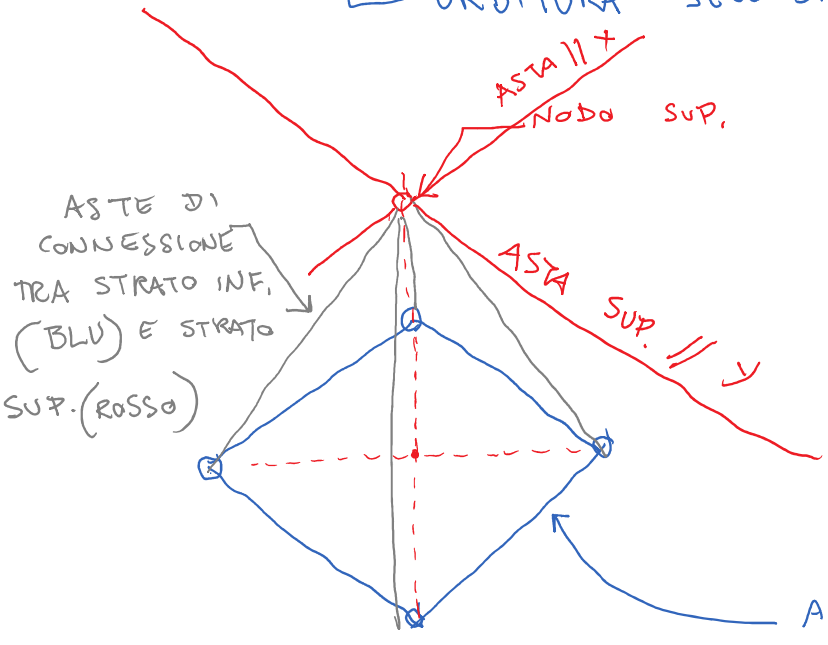
SPACE TRUSS

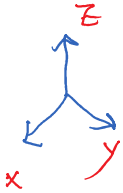




STRUTTURA
RET. PIANA (CONTENUTA)
IN UN PIANO XZ

SPACE TRUSS

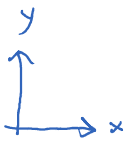


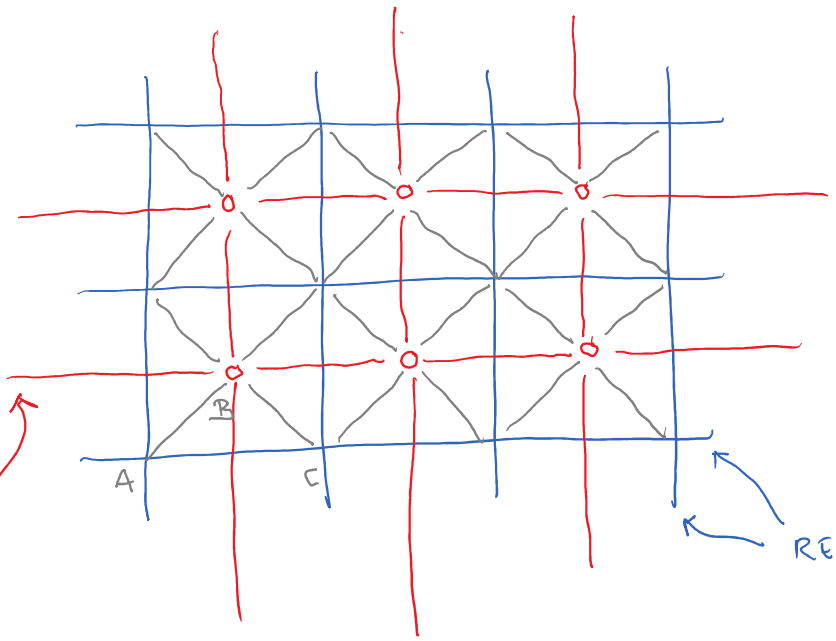


MODULO
3d

INTERIORE

NISTA PLANIMETRICA :





SCHEMA PIRAMIDALE

RET. SUP.

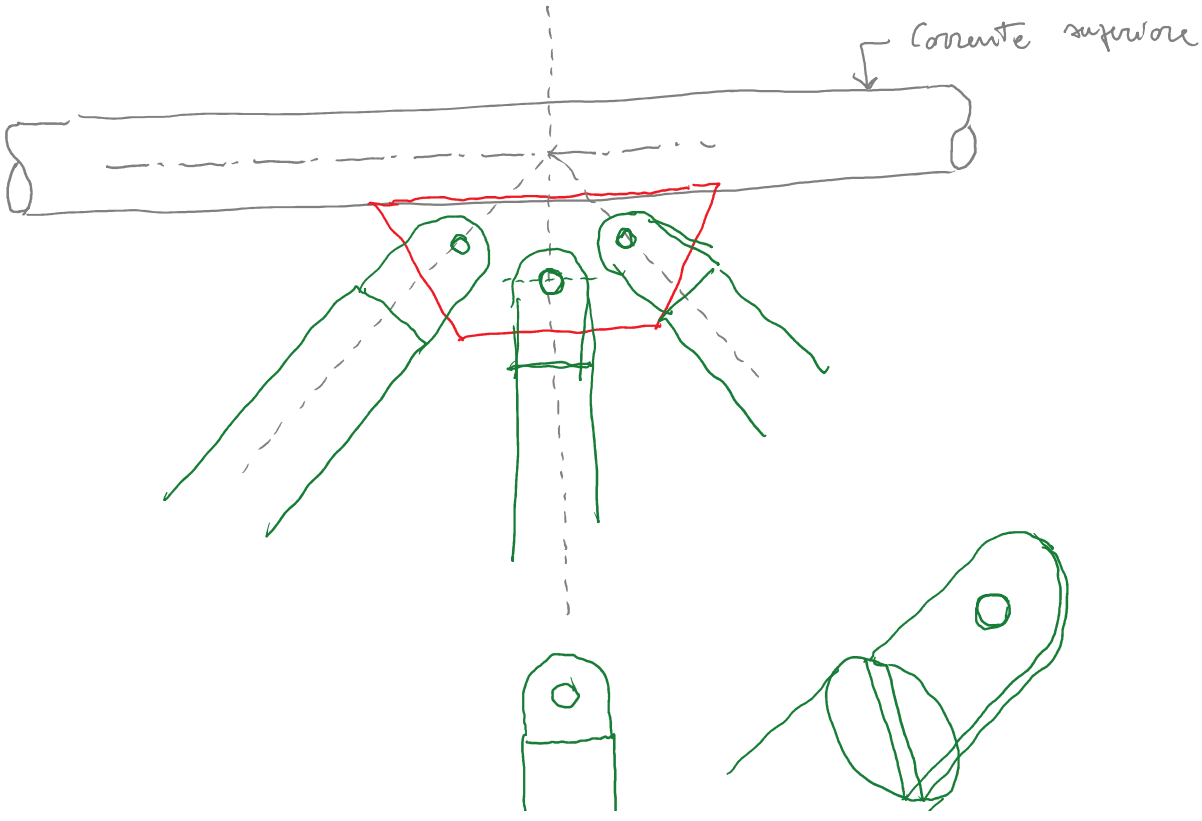
RET. INF.

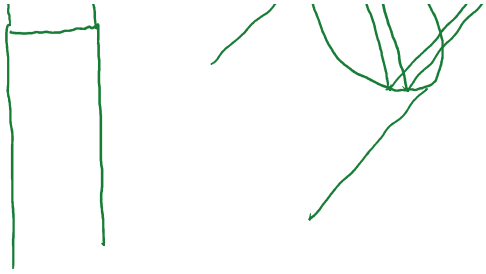
$\overline{AB} = \overline{AC}$ (SPESSO, NON SEMPRE)

aste di conn. strato sup & inf

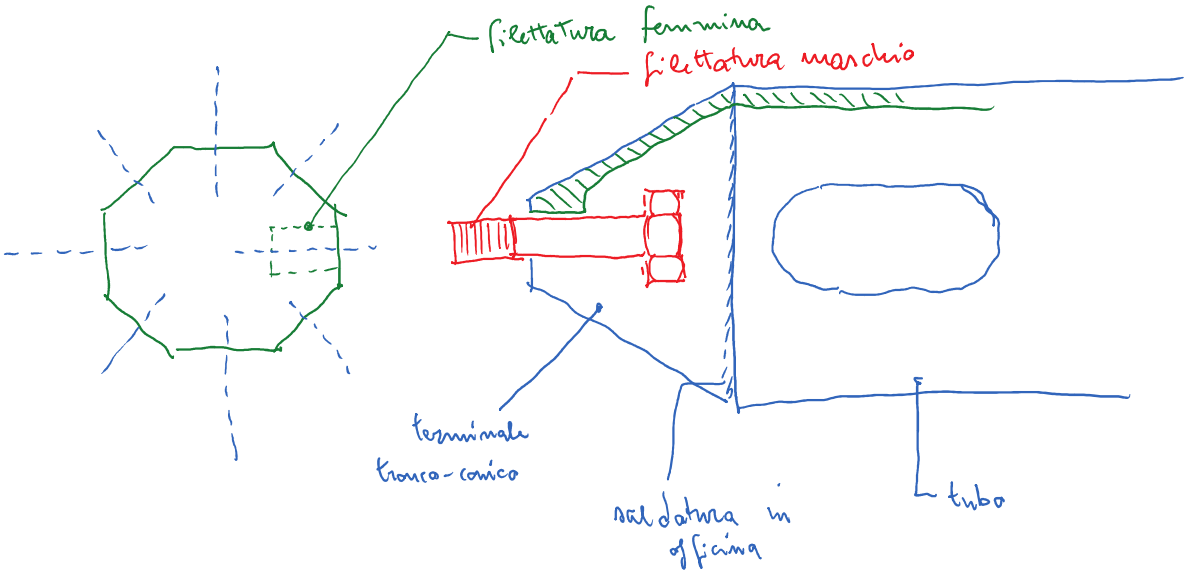
LATO DI BASE DELLA PIRAMIDE

NODO A FAZZOLETTO (STRUTT. RET. PIANA)





NODO TIPO MERO

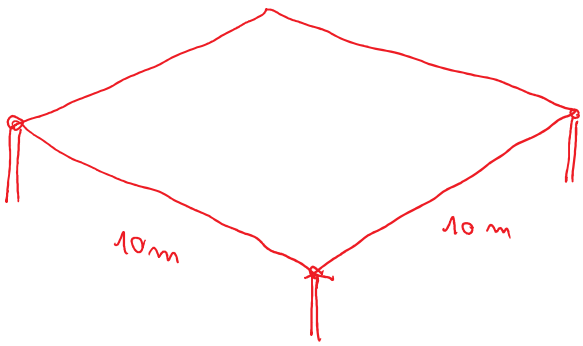


Space truss piramidale

Analisi dei carichi

750 daN/m^2

(carichi perm. + acc. valori caratteristici)



In SAP2000 :

n. of bays 1

Lato di base 1000 cm

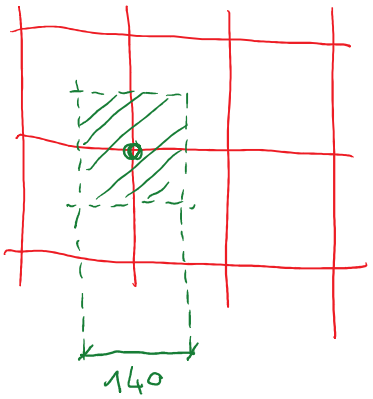
h = 150

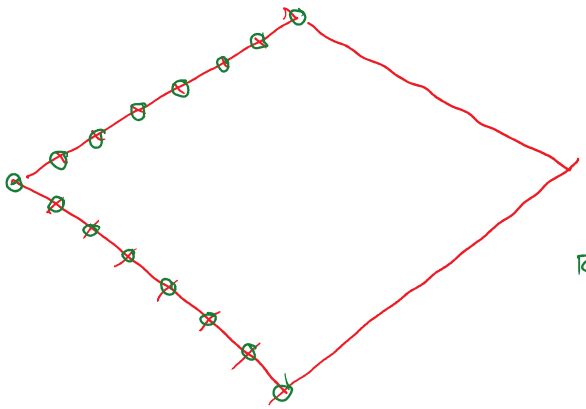
mesh lato 1000/7 ≅ 143

CARICO NODALE

$P = 750\ daN m^{-2} \times 1.4^2\ m^2 =$

$= 1470\ daN$





IN TOT. I NODI DEL PIANO RAFFIGURATO SONO 64

DEFINIAMO LA SEZIONE TIPO FSEC1 $\varnothing$ 152.4/6

Max sollecitaz. 13201 daN (compressione)

Verifica di resistenza $\sigma_{MAX} = \frac{2750\ daN cm^{-2}}{2} = \frac{f_{yk}}{S} = 1375$

area $29.1357\ cm^2$

$\sigma_{MAX} = \frac{13\,201}{29.13} = 453\ daN cm^{-2} \ll 1375$

Verifica di agibilità $f \ll \frac{L}{250}$ (target)

$f_{MAX} = 0.3156$ $\quad f = \frac{L}{K}$ si desidera $K \geq 250$

$K = \frac{L}{f} = \frac{1000}{0.32} \cong 3000$ $\quad f \cong \frac{L}{3000}$

Verifica di INSTABILITÀ EULERIANA DELL'ASTA

Verifica di INSTABILITÀ EULERIANA DELL'ASTA COMPRESSA

$$N \leq \frac{\pi^2 E I}{L^2 S} = 218\,000 = \frac{[F]}{21}$$

$\frac{P_{crit}}{S}$

$\pi = 3.14159265$

$E = 2\,080\,000 \ daN cm^{-2}$

$I = 778 \ cm^4$

$S =$ coeff. di sicurezza $= 2$

$L = 191 \ cm$

$N_{max} = 13\,200 \ll 218\,000$ Verifica soddisfatta