

Corso di laurea in Ingegneria civile strutturale e geotecnica

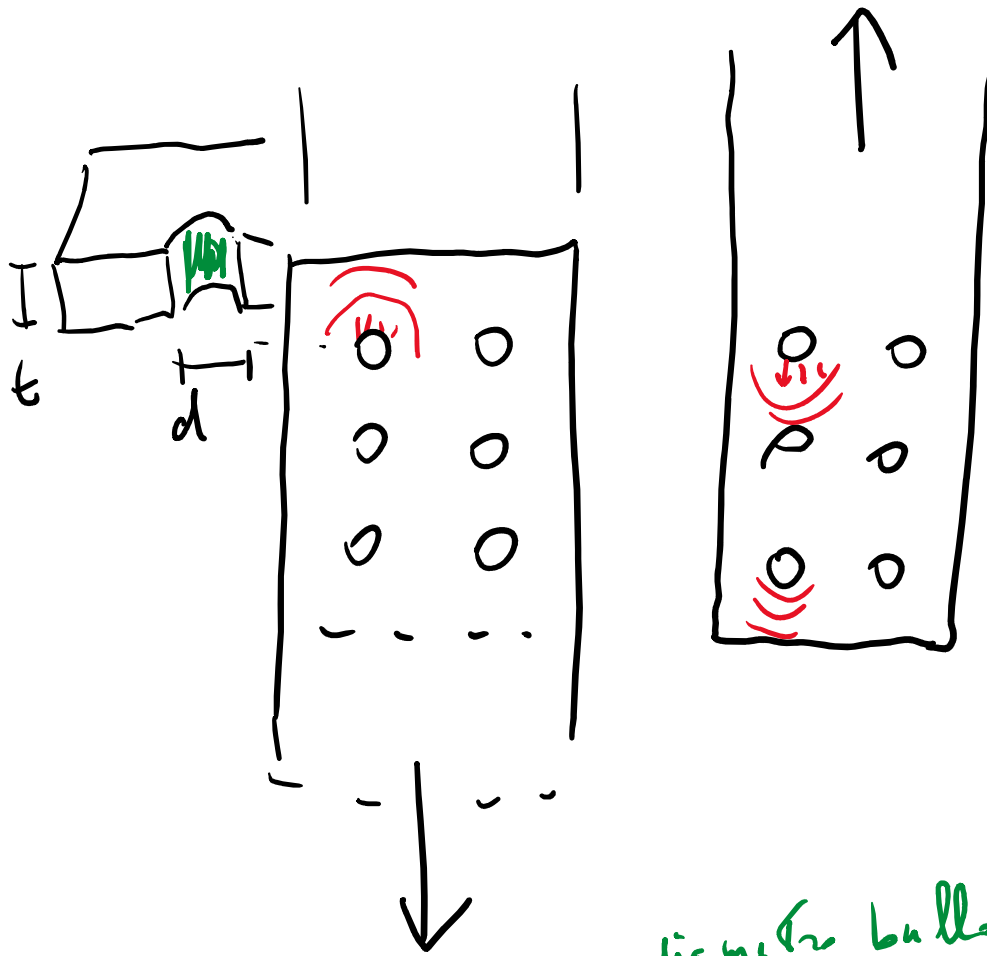
Tecnica delle costruzioni

modulo A

30 – Esempi di collegamento

Aurelio Gheresi

22/12/2020



$$F_{b,R1} = K \alpha \underset{\substack{\uparrow \\ \text{spec. v} \\ \text{pitch.}}}{t} d \underset{\substack{\uparrow \\ \text{dia. of bolt}}}{\frac{f_u}{\gamma_{m2}}}$$

$$\alpha \leq 1$$

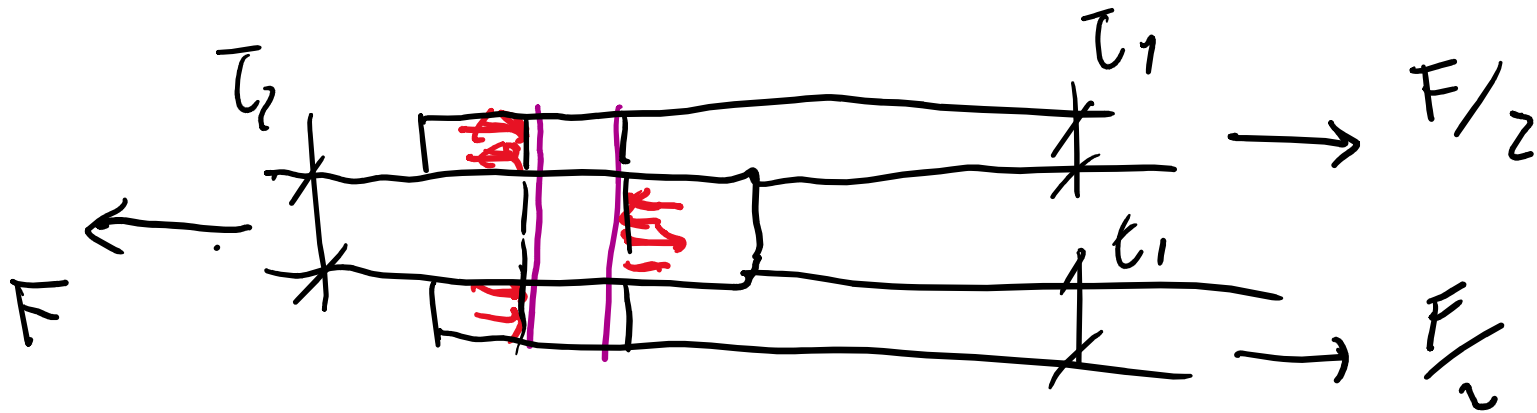
$$\frac{e_1}{3d}$$

$$\frac{p_1}{3d} = 0.25$$

$$K \leq 2.5$$

$$2.8 \frac{e_2}{d_o} = 1.7$$

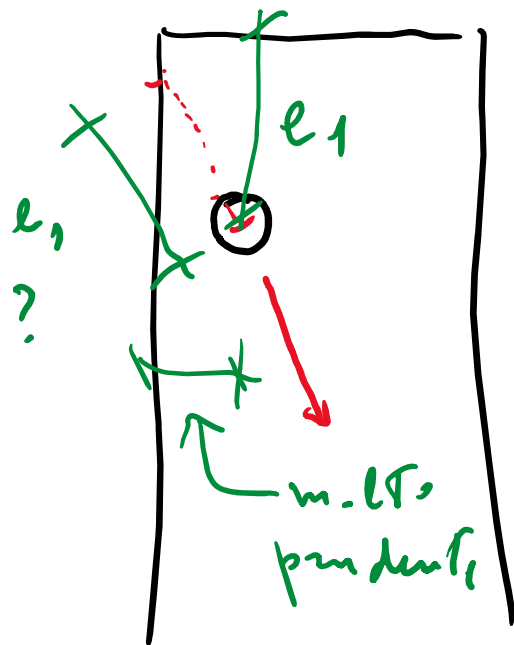
$$1.4 \frac{p_2}{l_o} = 1.7$$



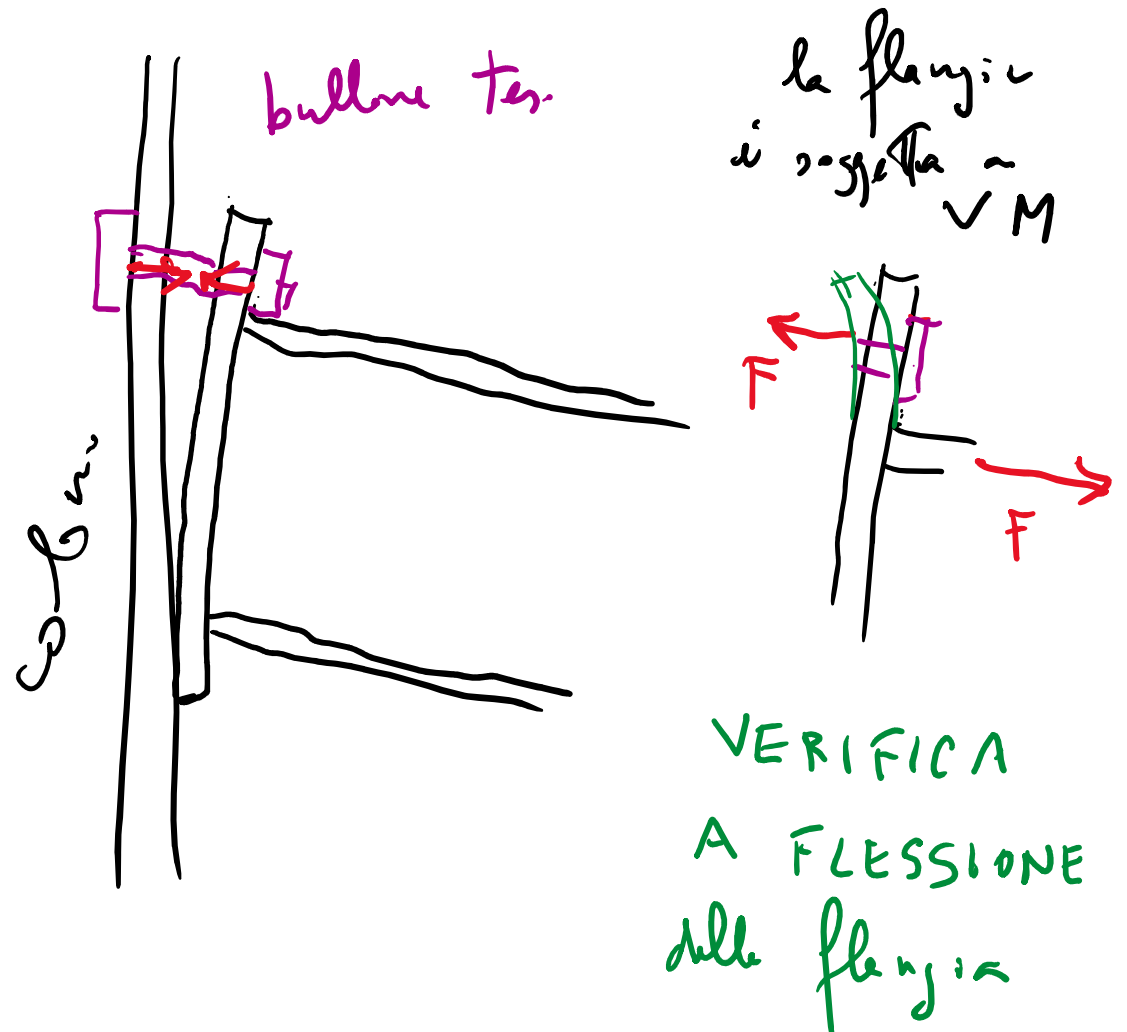
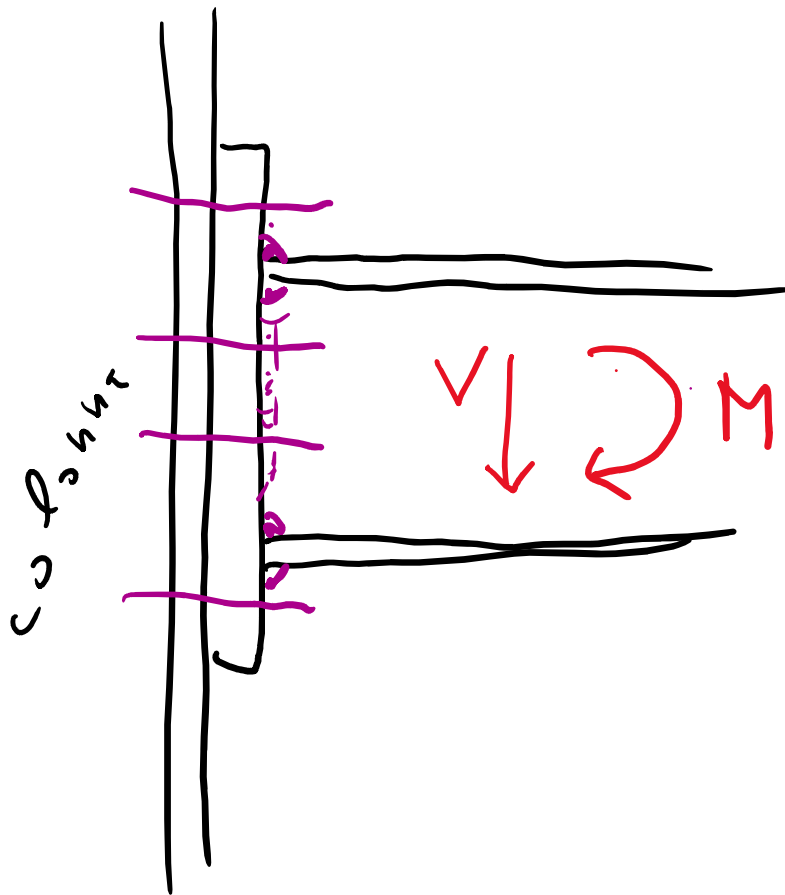
$$F_{b, R_2, 2} = K \propto d t_2 \frac{f_u}{\gamma_{M_2}} \times n_{\text{bolt}} \leq F$$

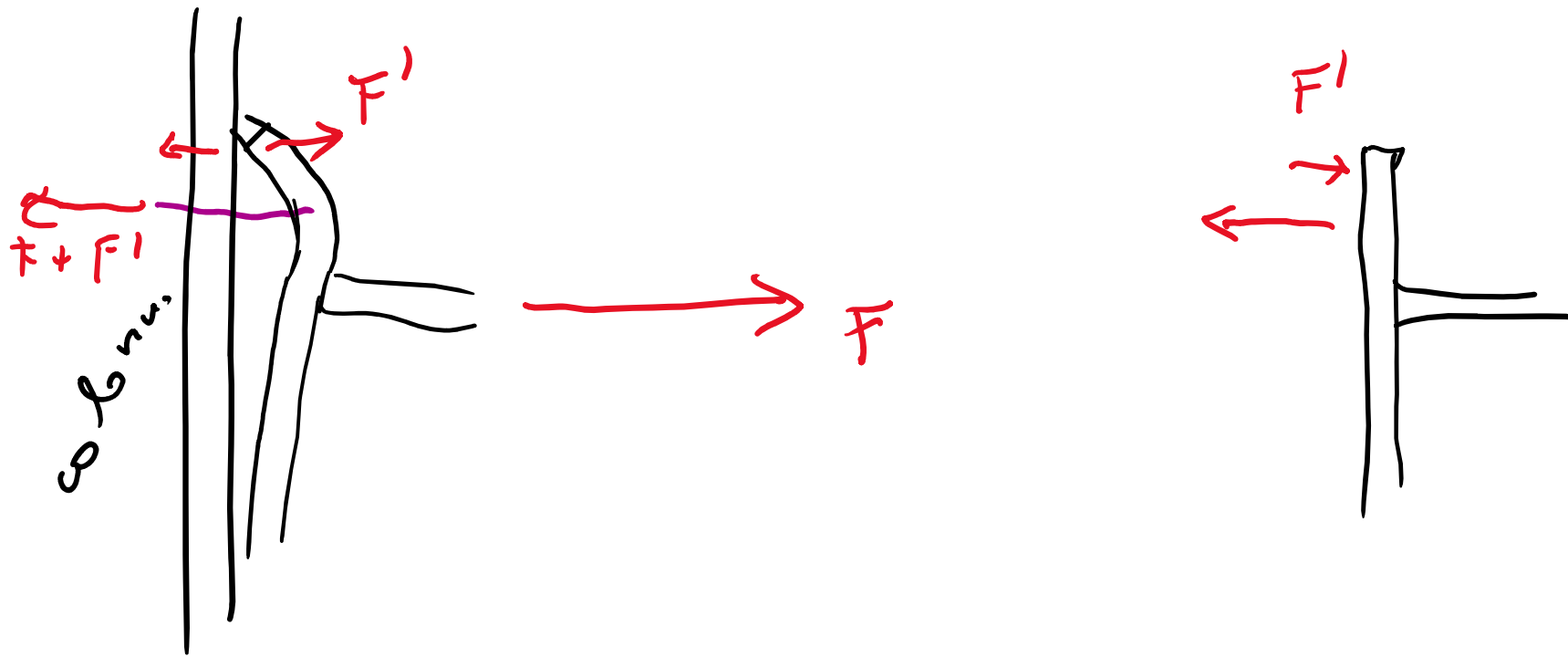
$$F_{b, R_1, 1} = K \propto d t_1 \frac{f_u}{\gamma_{M_1}} \times n_{\text{bolt}} \leq \frac{F}{2}$$

CONSIDER $t_2 \geq 2 t_1$



GIUNTO FLANGIATO

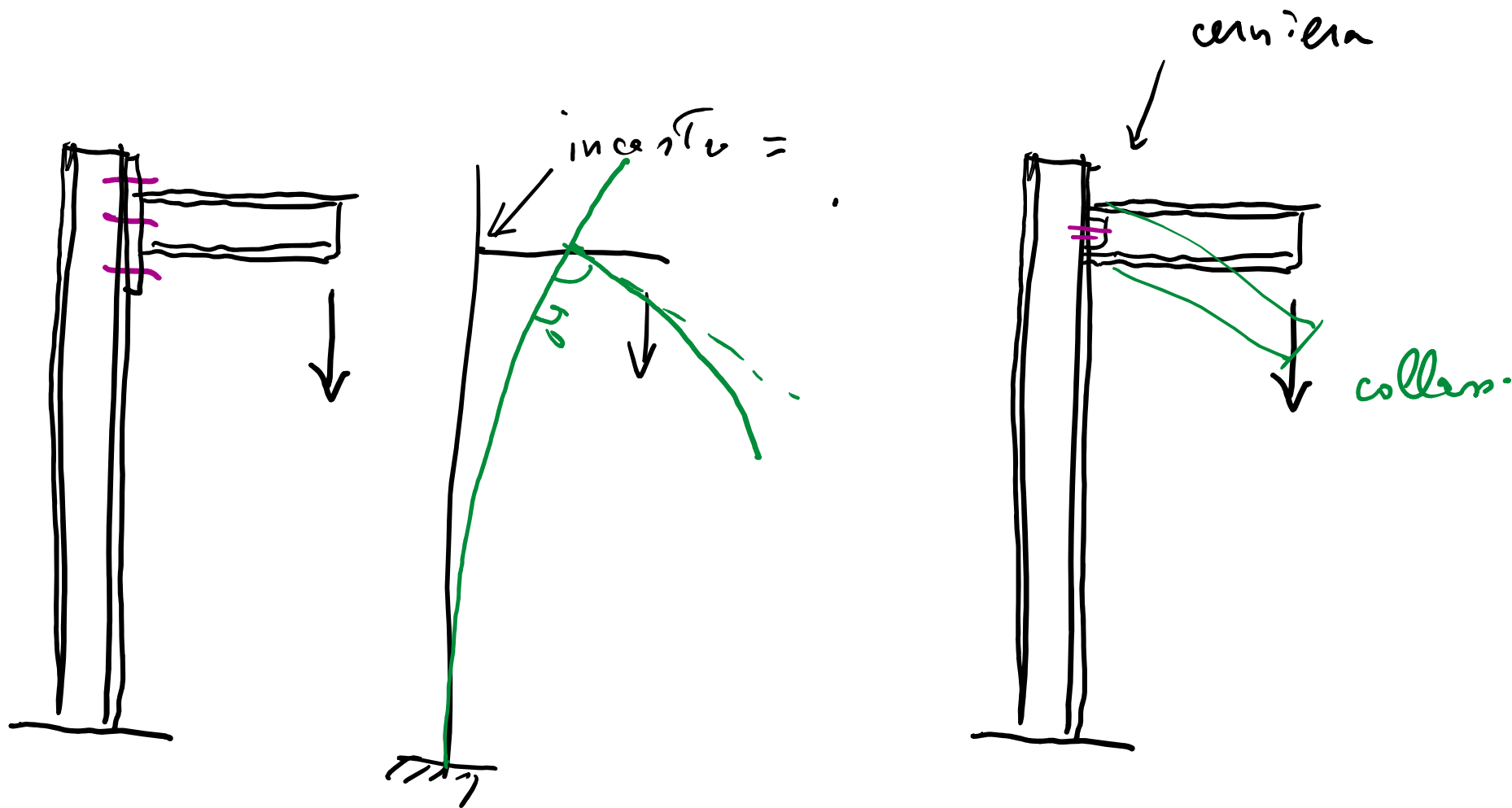




eff. tt. leva : azione nel bullone è maggiore di F



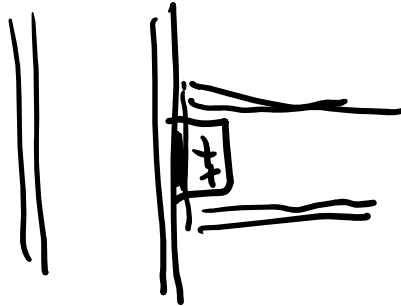
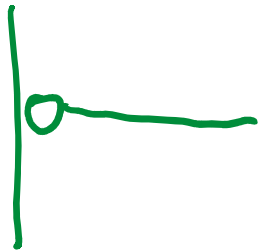
ma contemporaneamente si riduce M
nelle flangia



incastro = niente spostamenti relativi e
rotazioni relative tra gli elementi
mutuo.

COLLEGAMENTI

a cerniere



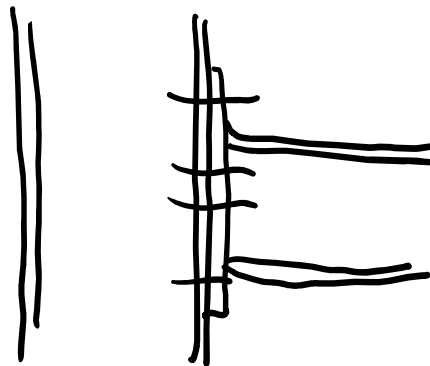
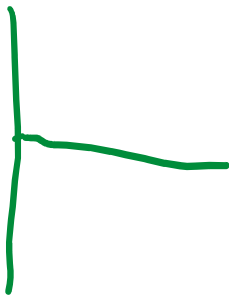
in realtà -

cerniere non perfette

può trasmettere

M (piccolo)

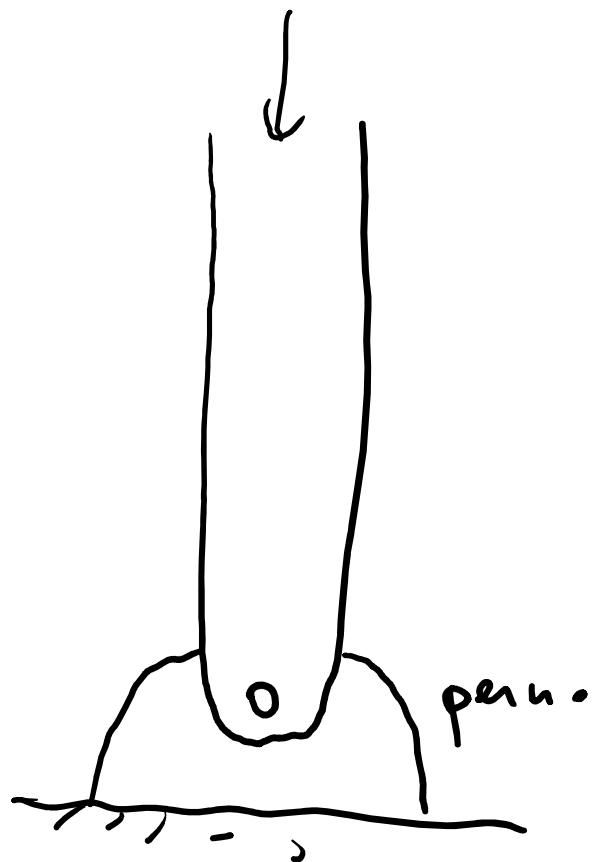
a incastro (mutuo)



incastro non perfetto

può esserci $\Delta\varphi$

(piccolo)



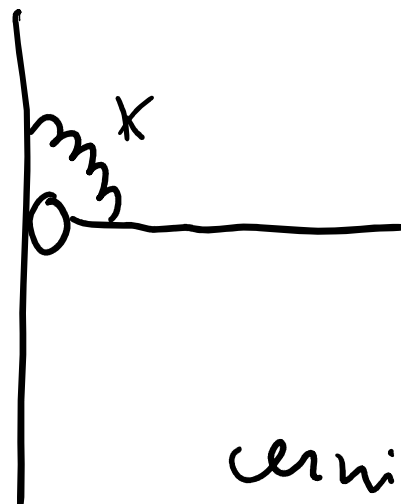
cerniera

(haz') ideale

attorno tre i punti

in generale

$$M = K \cdot \Delta\varphi$$



$$\Delta\varphi = \frac{M}{K}$$

cerniera

con molla

— cerniera

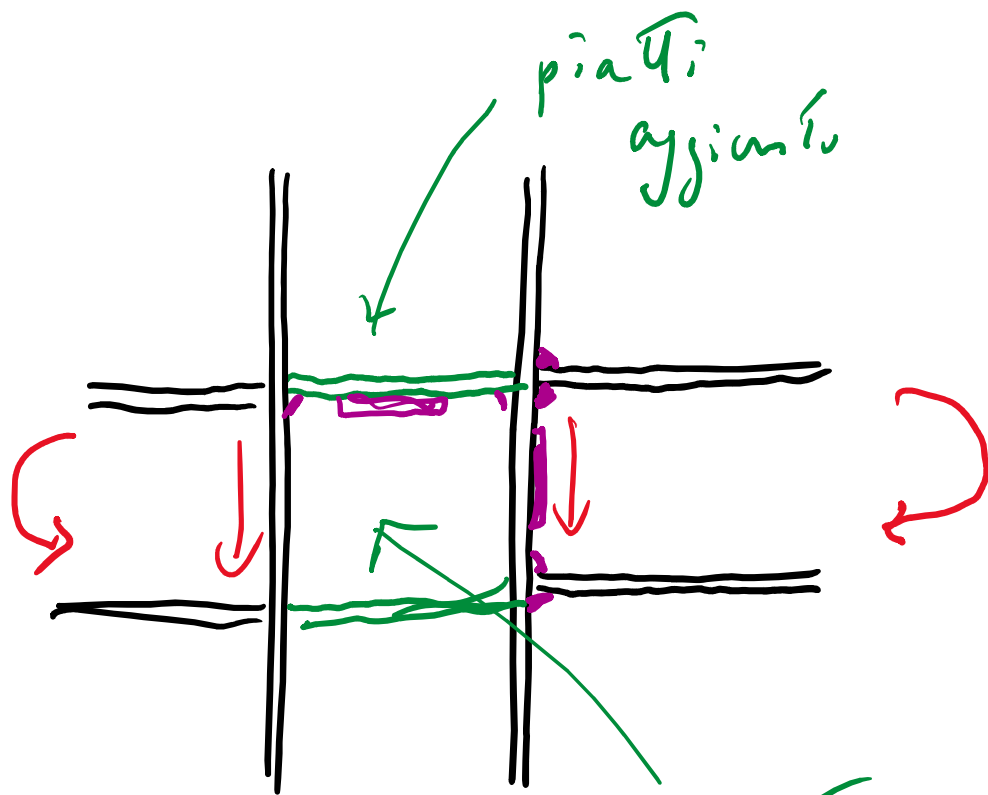
$$K \approx 0$$

— incastrò

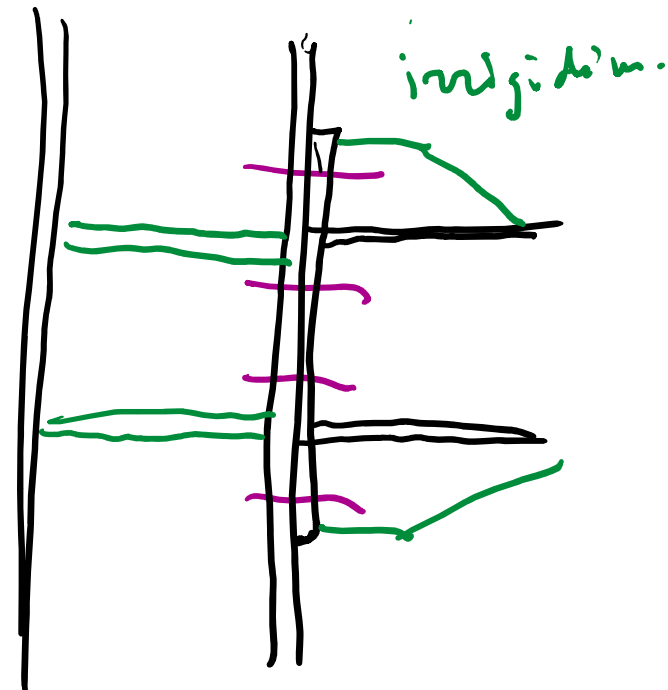
$$K \rightarrow \infty$$

— semi rigidi

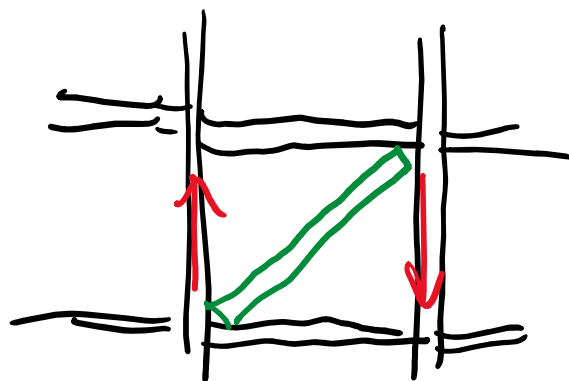
$$K = \frac{M}{\Delta\varphi}$$



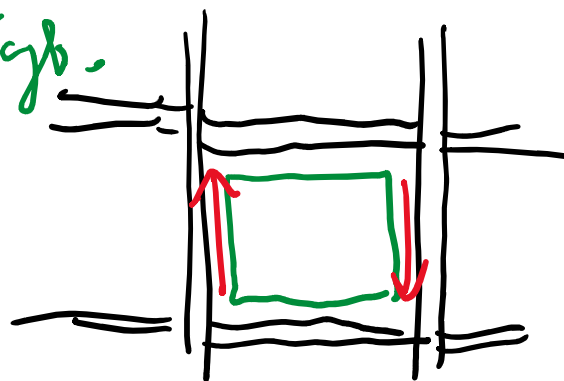
eventuale
irrigidimento anis.
per Tgb.



deformazioni dovute
ad allungamento
bulloni



1



2