ESERCIZIO 4

Calcolo di T

$$F \cdot d = T \cdot \frac{D}{2} \rightarrow T = \frac{2 \cdot F \cdot d}{D} = 680N$$

Calcolo delle Reazioni

Piano x-y (z uscente)

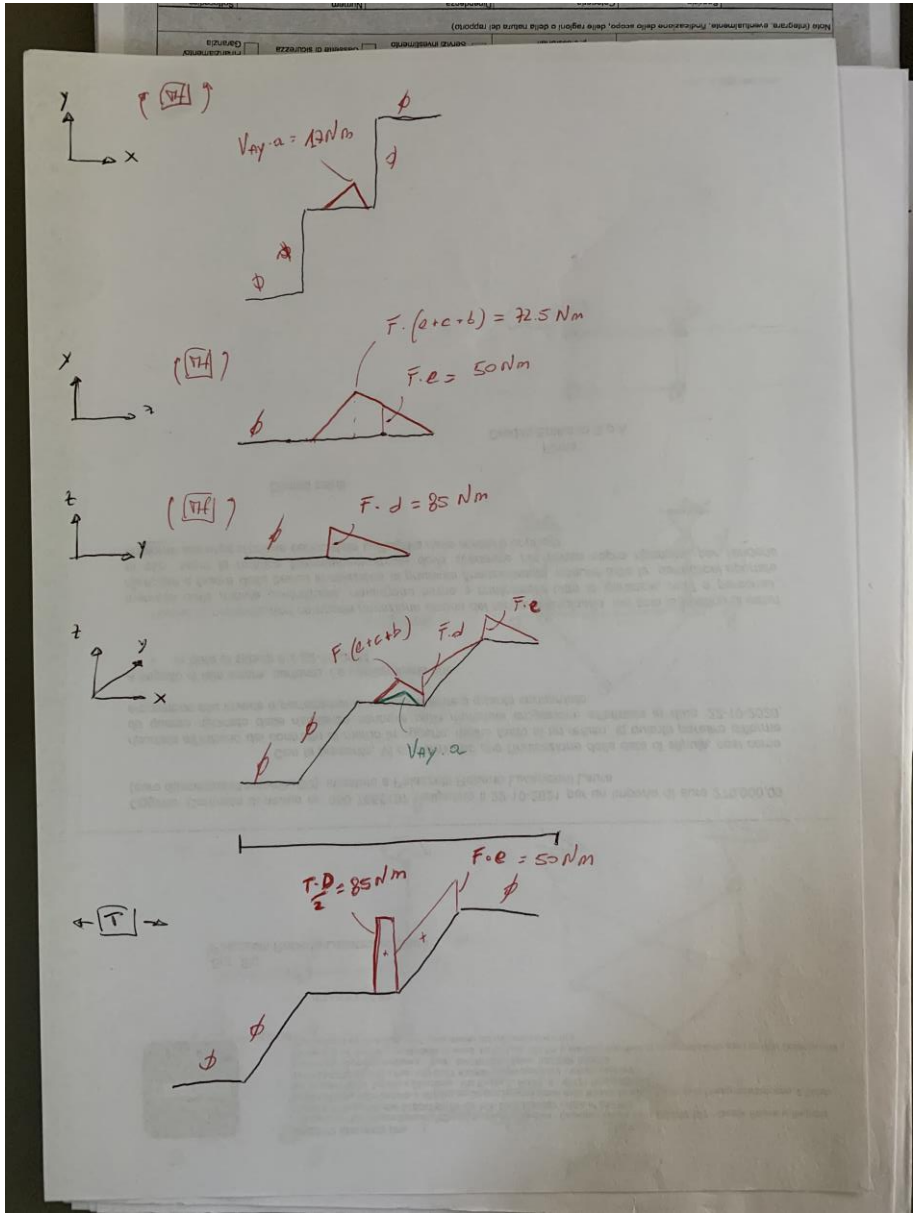
$$\begin{cases} H_{AY} = 0 \\ V_{AY} + V_{BY} = T \\ V_{BY} \cdot a - T \cdot (a + b) = 0 \end{cases} \rightarrow \begin{cases} H_{AY} = 0 \\ V_{AY} = -\dfrac{2 \cdot F \cdot b \cdot d}{a \cdot D} = -212.5N \\ V_{BY} = \dfrac{2 \cdot (a + b) \cdot d \cdot F}{a \cdot D} = 892.5N \end{cases}$$

Piano x-z (y entrante)

$$\begin{cases} H_{AX} = 0 \\ V_{AZ} + V_{BZ} = F \\ V_{BZ} \cdot a - F \cdot (a + b + c + e) = 0 \end{cases} \rightarrow \begin{cases} H_{AX} = 0 \\ V_{Az} = -\dfrac{F \cdot (b + c + e)}{a} = -906.25N \\ V_{Bz} = \dfrac{F \cdot (a + b + c + e)}{a} = 1406.25N \end{cases}$$

ESERCIZIO 4

Diagrammi delle sollecitazioni



ESERCIZIO 4 - carico $F \cdot \sin(\omega \cdot t)$

Dimensionamento a fatica con carico $F \cdot \sin(\omega \cdot t)$

Nella sezione H-H:

$$\begin{cases} M_f = F \cdot \sin(\omega \cdot t) \cdot d \\ M_t = F \cdot \sin(\omega \cdot t) \cdot e \end{cases} \rightarrow \begin{cases} \sigma_M = 0 \\ \sigma_A = \dfrac{F \cdot d \cdot \dfrac{diam}{2}}{\dfrac{\pi \cdot diam^4}{64}} = \dfrac{865803}{diam^3} \end{cases} \quad \begin{cases} \tau_M = 0 \\ \tau_A = \dfrac{F \cdot d \cdot \dfrac{diam}{2}}{\dfrac{\pi \cdot diam^4}{32}} = \dfrac{254648}{diam^3} \end{cases}$$

$$\sigma^*_{GP} = \sqrt{{\sigma_A}^2 + \left(\frac{\sigma'_{fa,F}}{\tau'_{fa}}\right)^2 \cdot {\tau_A}^2} = \frac{929998}{diam^3}$$

$$\sigma'_{fa,f} = \frac{0.4 \cdot R_m \cdot b_2 \cdot b_3}{1} = 259.2MPa$$

$$\tau'_{fa} = \frac{0.3 \cdot R_m \cdot b_2 \cdot b_3}{1} = 194.4MPa$$

$$\sigma^*_{GP} \leq \sigma'_{fa,F} \rightarrow diam \geq 15.3\ mm$$