CARROPONTE

	[daN]
PORTATA NETTA	3000
PESO BOZZELLO	100
CARICO DI SERVIZIO	3100

PESO COMPLESSIVO CARRELLO	200
PESO PARANCO DI SOLLEVAMENTO	500
PESO COMPLESSIVO CARRELLO	1000

PESO SINGOLA TRAVE DEL PONTE	600
PESO SINGOLA CONTROVENTATURA	250
PESO SINGOLA TESTATA PONTEGGIO	120

DIMENSIONI	[mm]
SCANTAMENTO DEL PONTE	8730
PASSO RUOTE TESTATA	2100
SCANTAMENTO CARRELLO	700
PASSO RUOTE CARRELLO	800

1 - FORZE DI INERZIA VERTICALI

VERTICALI

$$\Psi = 1 + \beta v_s \qquad \text{con} \quad \beta = 0.6, \quad v_s = 2.5\ m/s$$

$$\Psi = 1.15$$

SCORRIMENTO PONTE

$$\frac{1}{30}$$

SCORRIMENTO CARRELLO

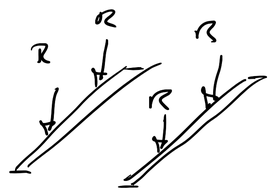
$$\frac{1}{30}$$

CONDIZIONE DI CARICO I

$S_Q = 3100$ daN — CARICO DI SERVIZIO

$P_C = 1000$ daN — PESO CARRELLO

$$R = \frac{M}{4} \cdot (P_C + \Psi \cdot S_Q)$$



CLASSE DI CARICO Q1, CONDI. DI IMPIEGO U2 } CLASSE $A_1 \Rightarrow M = 1$

$R = 1161.25$ daN

DISTANZA DI MASSIMA SOLLECITAZIONE

$$d = \frac{1}{2}\left(\ell - \frac{s_c}{2}\right) = 4165\ mm$$

TENSIONI

$$\sigma_{x,v} = \frac{M_v}{W_{x-x}} \qquad \sigma_y = \frac{F}{A}$$

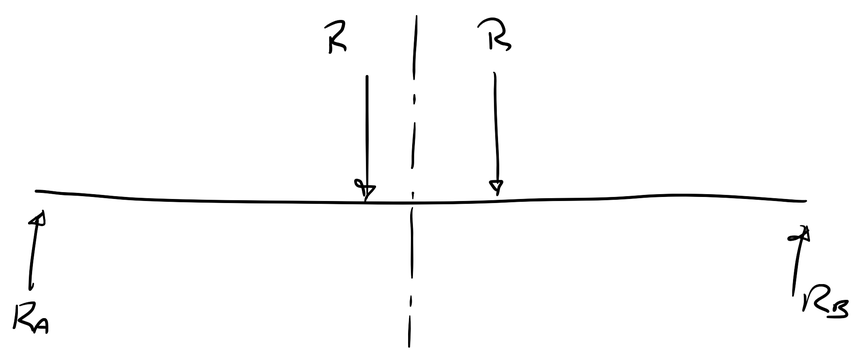
$$\sigma_{x,o} = \frac{M_o}{W_{y-y}} \qquad \tau' = \frac{T'}{A_{T'}}$$

$$\tau'' = \frac{T''}{(A_{T''} - 2t)}$$

s_p SCANTAMENTO CARROPONTE
s_c SCANTAMENTO CARRELLO

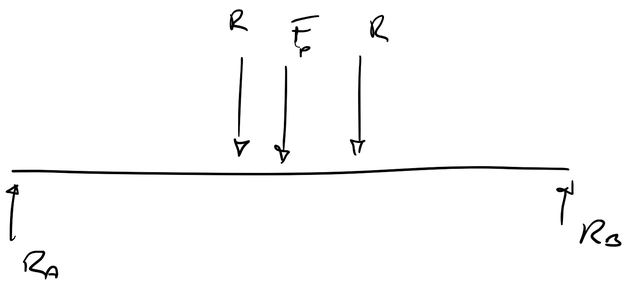
$$M_{MAX} = \frac{R}{2 \cdot SP}\left(SP - \frac{s_c}{2}\right)^2$$

REAZIONI VINCOLARI



CARICHI CONCENTRATI

CONSIDERO IL PESO DELLA TRAVE APPLICATO IN MEZZERIA



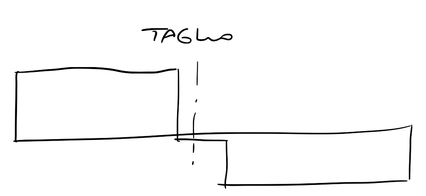
$$\begin{cases} R_A + R_B - 2R - F_p = 0 \\ R \cdot d + F_p \cdot \frac{SP}{2} + R \cdot (d + S_c) - R_B \cdot SP = 0 \end{cases}$$

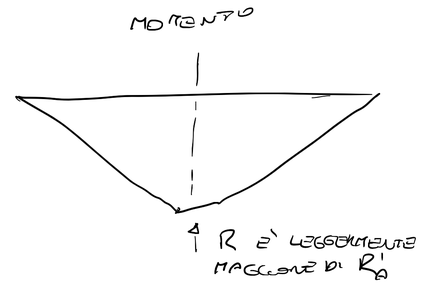
$$\begin{cases} R_B = \frac{1}{SP}\left[R \cdot d + F_p \cdot \frac{SP}{2} + R(d + S_c)\right] = 16785\ N \\ R_A = 2R + F_p - R_B = 15740\ N \end{cases}$$

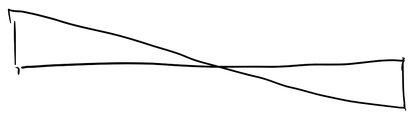
PER COSTRUIRE IL DIAGRAMMA DI TAGLIO E MOMENTO SEMPRE FORZA PESO E CARICHI CONCENTRATI

$$R_A' = R_A - \frac{F_p}{2} = 10890\ N$$

$$R_B' = R_B - \frac{F_p}{2} = 11935\ N$$



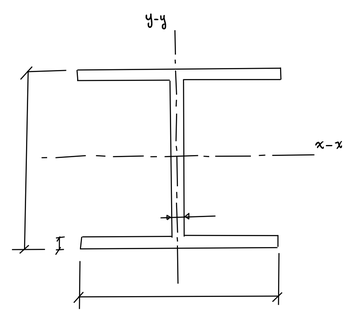




CONDIZIONE DI CARICO — I, II, III

I — SERVIZIO NORMALE SENZA VENTO
II — FORZE ACCIDENTALI E OCCASIONALI
III — CARICHI ECCEZIONALI

CARATTERISTICHE SEZIONE



$J_{x-x} = 9800\ cm^4$
$W_{x-x} = 653\ cm^3$
$J_{y-y} = 451\ cm^4$
$W_{y-y} = 72,2\ cm^3$

SOLLECITAZIONE MASSIMA - FLESSIONE IN MEZZERIA

$$\sigma_{MAX} = \frac{M_{MAX}}{W_{xx}} = 8.56\ \frac{daN}{mm}$$

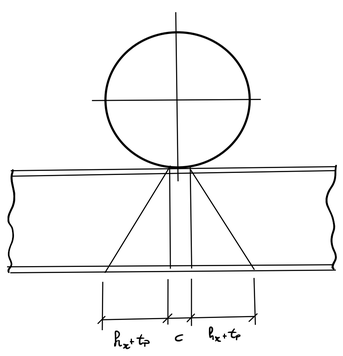
$$M_{MAX} = \frac{R}{2 \cdot SP}\left(SP - \frac{SC}{2}\right)^2 + \frac{1}{8} F_p\, S$$

↳ IPOTESI CONSERVATIVA

$$= 5,594,027\ daN \cdot mm$$

$$\tau_{MAX} = \frac{\sigma_{MAX}}{\sqrt{3}} = 4.95\ daN$$

SOLLECITAZIONI LOCALI



$$\sigma_y = \frac{R}{c + 2(h_z + t_p) \cdot t_a} < 1.15\, \sigma_{AMM}$$

VERIFICA CARICHI CONCENTRATI

$$\frac{F}{b_{eff} \cdot t_w} \leq \frac{230000}{\nu}\left[1 + 2\left(\frac{h_w}{a}\right)^2\right]\left(\frac{t_w}{h_w}\right) \frac{N}{mm^2}$$

h_w = ALTEZZA ANIMA; t_w = SPESSORE ANIMA; ν = COEFF. SICUREZZA 1.5

VERIFICA FRECCIA MASSIMA

$$f_p = \begin{cases} \frac{R(S_p - S_c)\left[3S_p^2 - (S_p - S_c)^2\right]}{48 E J_{x-x}} & a < 0.65\,l \\ \frac{R \cdot S_p^3}{48 E J_{x-x}} & a > 0.65\,l \end{cases}$$