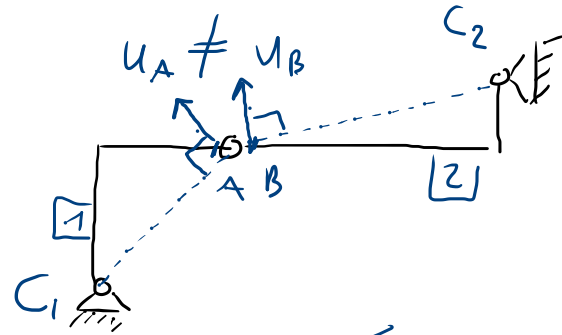
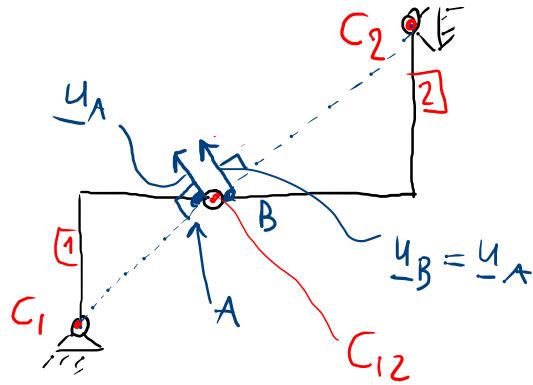


... ANCORA SULL' ALLINEAM. DI TRE CERNIERE

22/4/22



1) Assegnamo ROT. a [1]

2) Impoigo $\underline{u}_A = \underline{u}_B$

3) Verifico che \underline{u}_B soddisfi la cinematica del corpo [2]

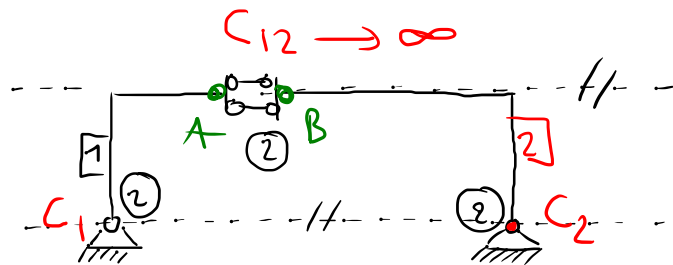
i punti 1), 2), 3) sono soddisfatti se

$$C_1 \Leftrightarrow C_{12} \Leftrightarrow C_2$$

~~$C_1 \Leftrightarrow C_{12} \Leftrightarrow C_2$~~ \Rightarrow LA STRUTTURA
RIMANE
BLOCCATA

VINCOLI BEN DISPOSTI.

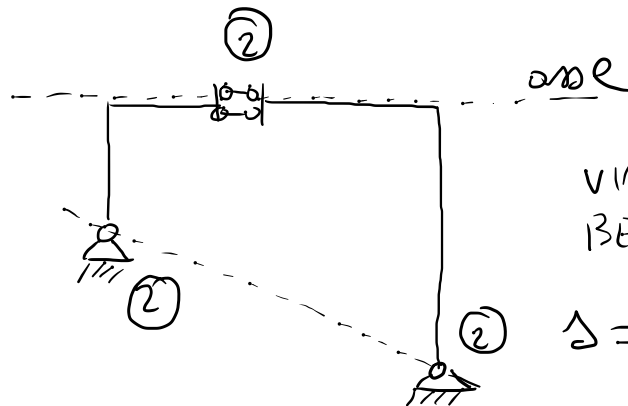
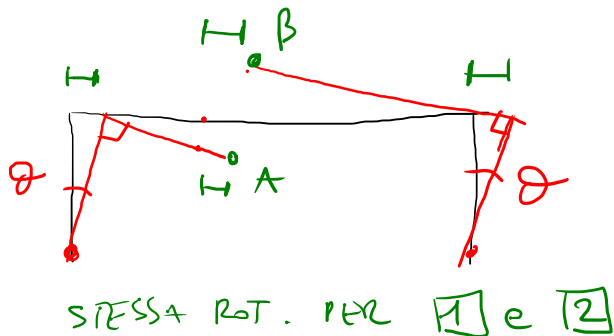
UN ESEMPIO NOTEVOLLE: CERNIERA - CERNIERA - DOPPIO PENDOLO



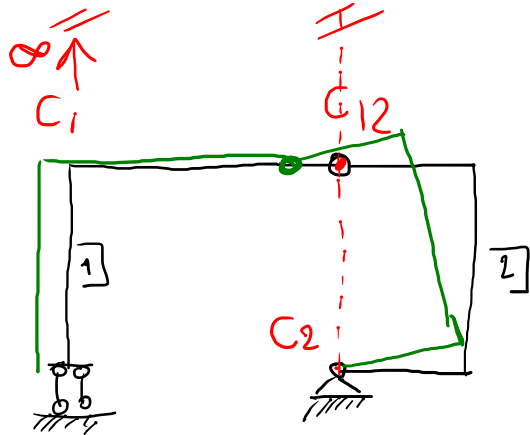
$C_1 \leftrightarrow C_{12} \leftrightarrow C_2$ ALLINEAMENTO
VERIFICATA

VINCOLI MAL DISPOSTI

$v=6, \Delta=5$

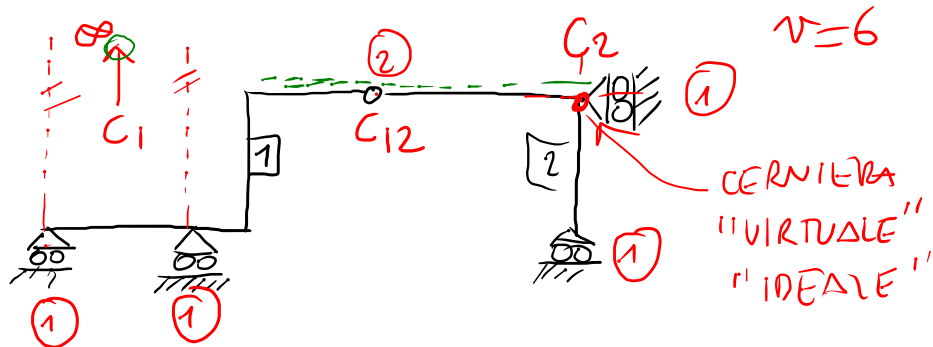
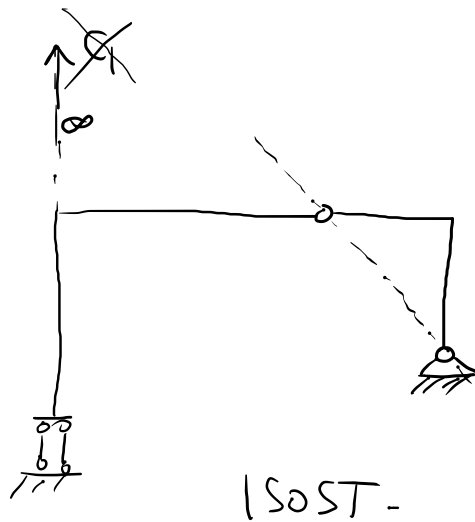


LES: STR ISO o LABILE? $g=6, v=6$



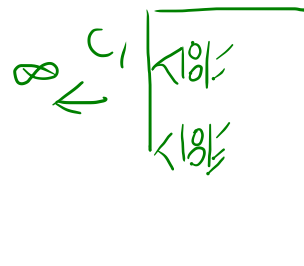
LABILE

$C_1 \leftrightarrow C_{12} \leftrightarrow C_2$?
 \swarrow SI \searrow NO



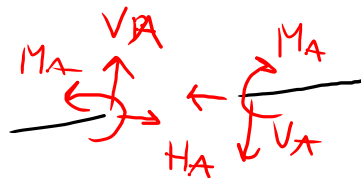
CERNIERA
 "VIRTUALE"
 "IDEALE"

~~$C_1 \leftrightarrow C_{12} \leftrightarrow C_2$~~
 ISO STATICA

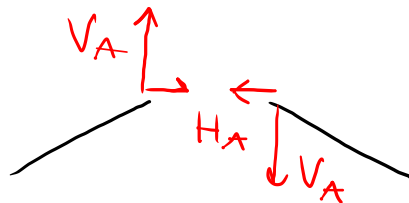
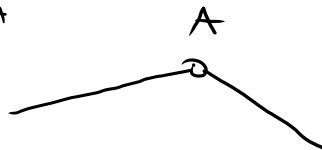


PRESTAZIONI STATICHE VINCOLI INTERNI

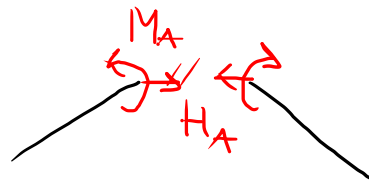
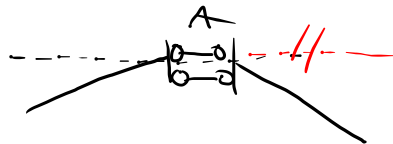
$v=3$: INCASTRO INTERNO



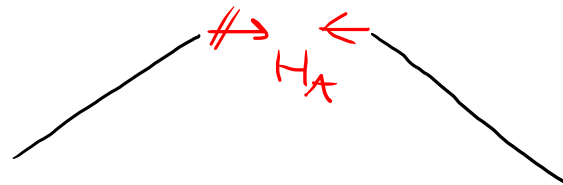
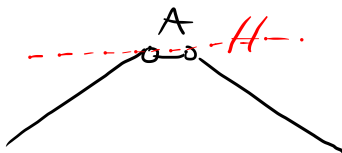
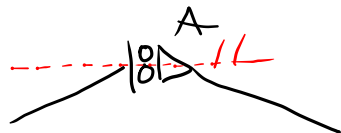
$v=2$: CERNIERA INTERNA



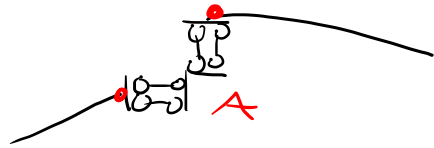
$v=2$: DOPIO PENDOLO INTERNO



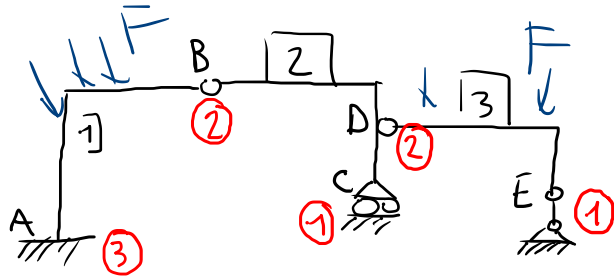
$v=1$: CARRELLA / PENDOLO / BIELLA



$\nu=1$: DOPPIO-DOPPIO PENDOLO INTERNO

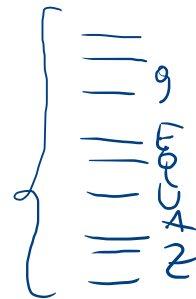
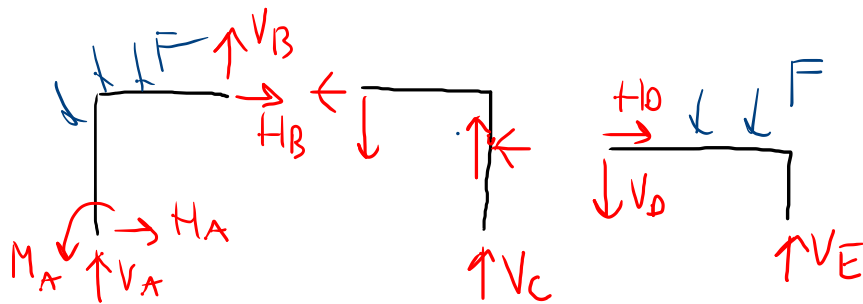


ANALISI STATICA DELLE STRUTTURE ARTICOLATE (METODO GENERALE)



$$\left. \begin{aligned} g &= 3 \cdot 3 = 9 \\ \nu &= 9 \\ \lambda &= 9 \end{aligned} \right\} \text{ISOSTATICA}$$

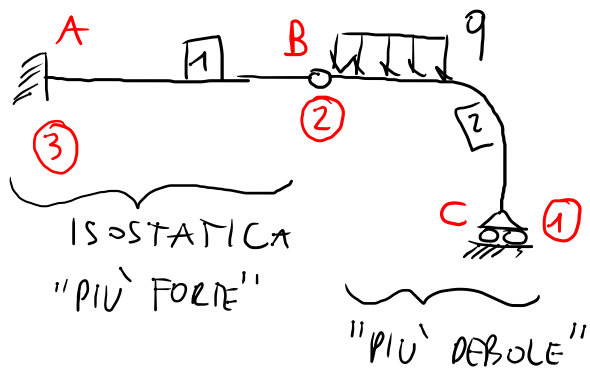
PER OGNI C.R. POSSO SCRIVERE 3 EQ. DI EQUILIBRIO \Rightarrow 9 EQ. TOTALI



RICOGNIRE (9)
 $M_A, V_A, H_A, V_B, H_B, V_C, H_D, V_D, V_E$

STUDIO DI STR. ISOSTATICHE DISTINGUENDO LA TIPOLOGIA CORRETTA.

LES



$$g = 3 \cdot 2 = 6$$

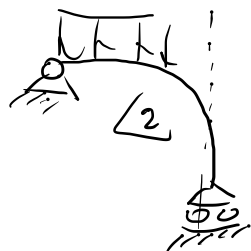
$$v = 6$$

$$s = 6$$

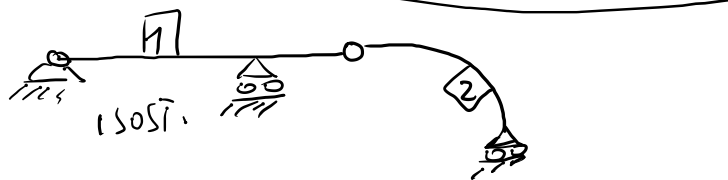
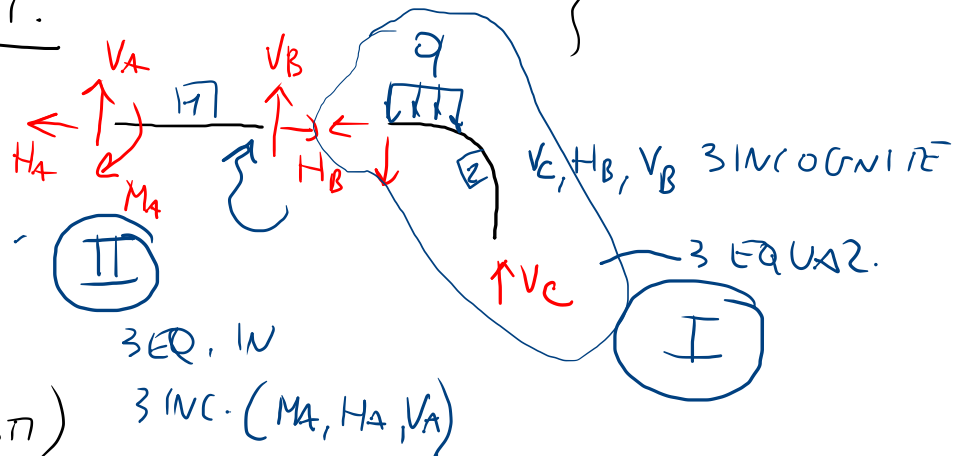
ISOST.

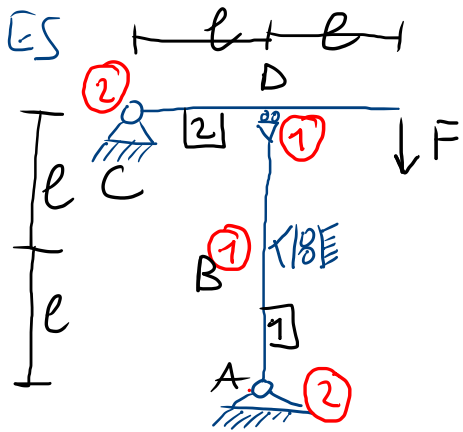
STRUTTURE
CON
GERARCHIA

1 è ISOSTATICA (NON SI MUOVE)



ISOSTATICA
(VINCOLI
BEN DISPOSTI)





$g = 6$
 $v = 6$



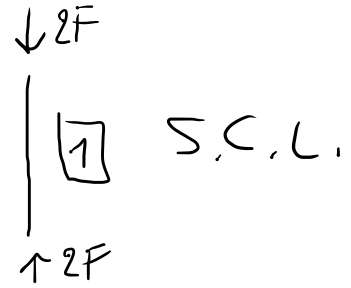
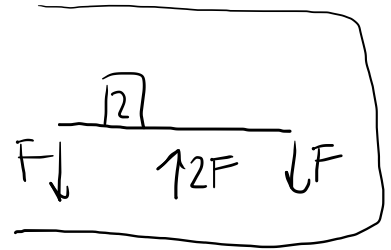
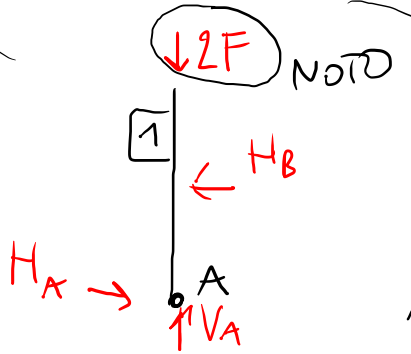
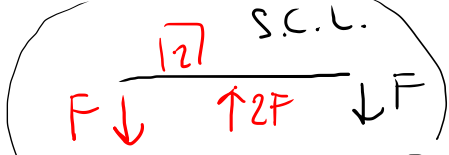
$$\begin{cases}
 \rightarrow : H_c = 0 \\
 +\uparrow : V_c + V_d - F = 0 \\
 +\uparrow : V_d e - F 2e = 0
 \end{cases}
 \left. \begin{array}{l}
 H_c = 0 \\
 V_c = -F \\
 V_d = 2F
 \end{array} \right\}$$

$\boxed{2} \in OK$

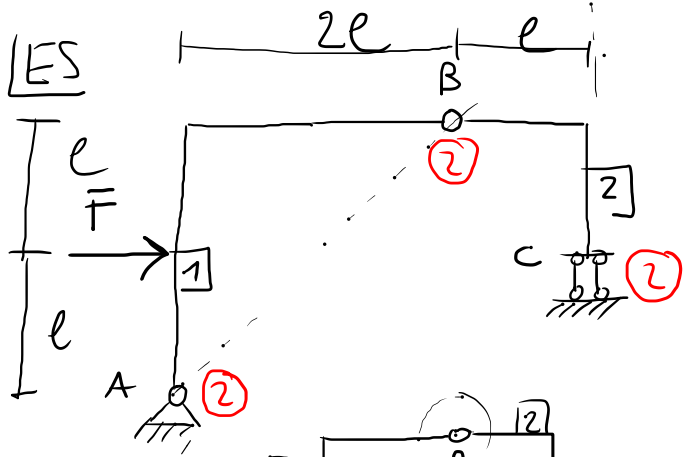
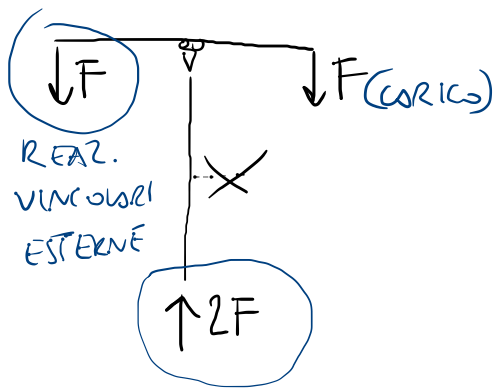


$$\begin{cases}
 \rightarrow : H_A - H_B = 0 \\
 \uparrow : V_A - 2F = 0 \\
 \odot_A : H_B e = 0
 \end{cases}
 \left. \begin{array}{l}
 H_A = 0 \\
 V_A = +2F \\
 H_B = 0
 \end{array} \right\}$$

$\boxed{1}$: STR. ISOSTATICA "FORTE"
 $\boxed{2}$: STR. "DEBOLE"

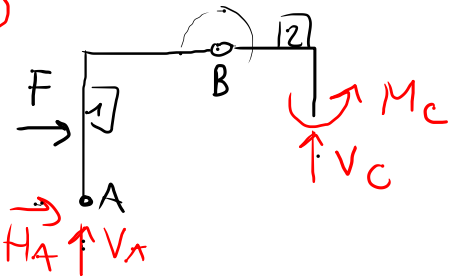


VERIFICA EQ. GLOBALE



$g=6$
 $r=6$
 $s=6$

STR CON
 2 C.R.
 SENZA
 GERARCHIA
 (ARCO TRE
 CERNIERE)



(I) : SCRIVO 4 EQUAZ.
 IN 4 INCOGNITE
 (QUELLE ESTERNE)

$$\begin{cases}
 \rightarrow : +F + H_A = 0 \\
 +\uparrow : +V_A + V_C = 0 \\
 (A) : -F \cdot l + V_C \cdot 3l + M_C = 0
 \end{cases}$$

4 EQ IN 4 INCOGNITE

\Rightarrow SOLUZ.
 (DA DETERMINARE)

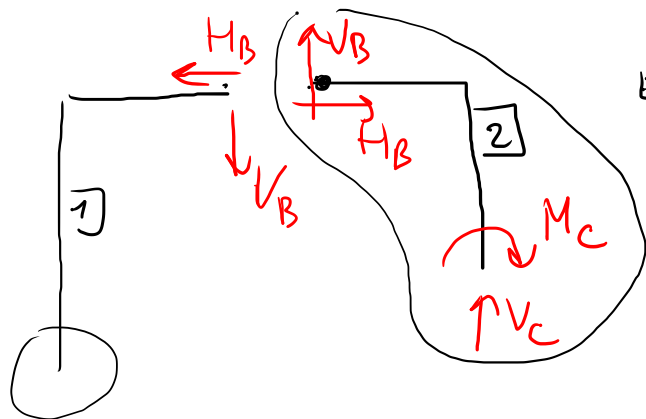
EQ. AUSILIARIA

$$(B) : +V_C \cdot l + M_C = 0$$

(II) STUDIO IL CORPO (1) (O IL C.R. (2)) E

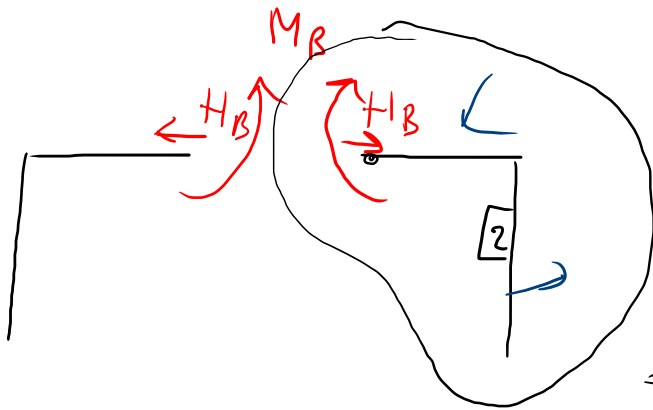
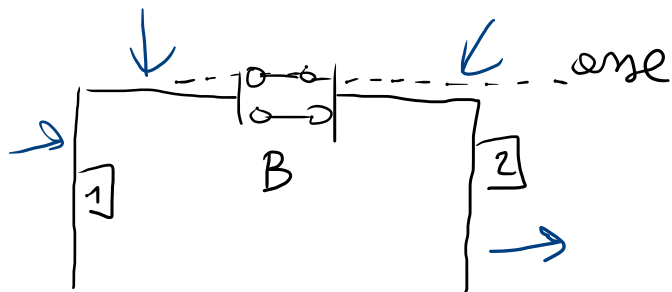
DETERMINO M_B, V_B

EQ. AUSILIARIA



QUANDO C'È UNA CERNIERA INTERNA, L'EQ. AUSILIARIA È $(B)^+$. PERCHÉ?

IN QUESTO MODO H_B E V_B NON ENTRANO NEL SIST. DI EQUAZ. CHE DETERMINANO LE INCOGNITE ESTERNE.



$\uparrow^+ [2]$: EQ. AUSILIARIA PER IL DOPPIO PENDOLO.

\Rightarrow EQ. ORTOGONALE

ALL'ASSE DEL DOPPIO PENDOLO.