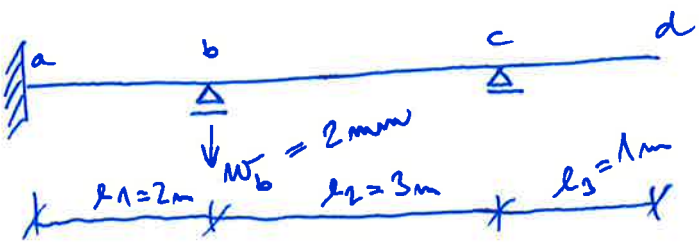
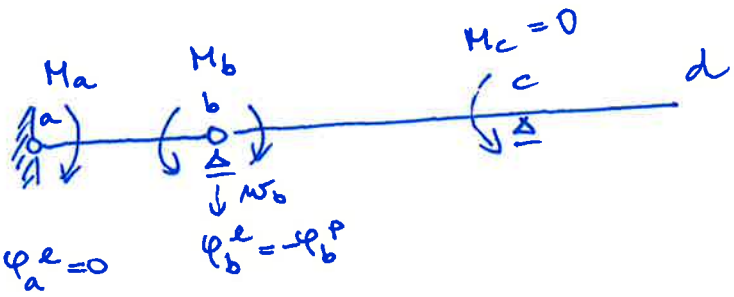


$E = 2\,GPa$

$I = \frac{1}{12} \cdot 0{,}1 \cdot 0{,}15^3$

$= 2{,}81 \cdot 10^{-5}\,m^4$

(2S)



$EI = 56\,250\,Nm^2$

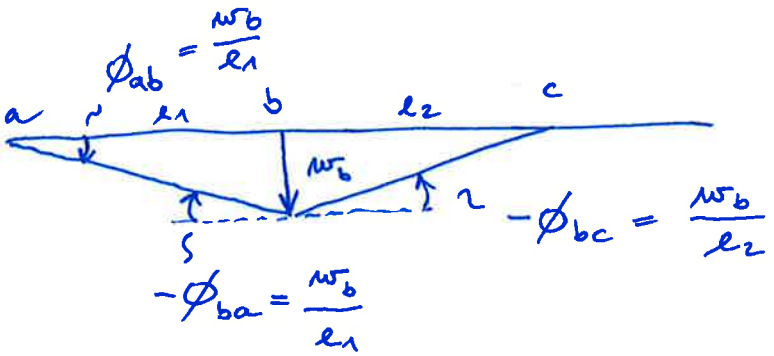
$\varphi_a^e = 0 : \quad \alpha_{ab} M_a + \beta_{ab} M_b + \phi_{ab} = 0$

$\varphi_b^e + \varphi_b^p = 0 : \quad \beta_{ba} M_a + (\alpha_{ba} + \alpha_{bc}) M_b + \beta_{bc} M_c + \phi_{ba} + \phi_{bc} = 0$

$\frac{l_1}{3EI} M_a + \frac{l_1}{6EI} M_b + \phi_{ab} = 0$

$\frac{l_1}{6EI} M_a + \frac{l_1 + l_2}{3EI} M_b + \phi_{ba} + \phi_{bc} = 0$

STANOVENÍ POOTOČENÍ VLIVEM POPUŠTĚNÍ w_b



SOUSTAVA

$$\begin{bmatrix} \frac{l_1}{3EI} & \frac{l_1}{6EI} \\ \frac{l_1}{6EI} & \frac{l_1 + l_2}{3EI} \end{bmatrix} \begin{Bmatrix} M_a \\ M_b \end{Bmatrix} = \begin{Bmatrix} -\frac{w_b}{l_1} \\ \frac{w_b}{l_1} + \frac{w_b}{l_2} \end{Bmatrix}$$

$$\frac{1}{6EI}\begin{bmatrix} 2l_1 & l_1 \\ l_1 & 2(l_1+l_2) \end{bmatrix}\begin{Bmatrix} M_a \\ M_b \end{Bmatrix} = \omega_b \begin{Bmatrix} -\frac{1}{l_1} \\ \frac{l_1+l_2}{l_1 l_2} \end{Bmatrix}$$

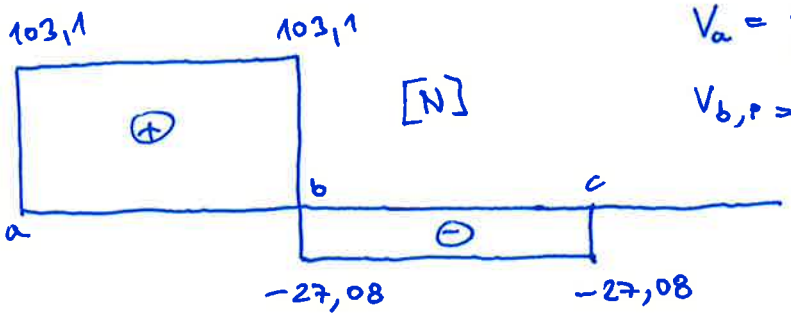
$$\begin{bmatrix} 2l_1 & l_1 \\ l_1 & 2(l_1+l_2) \end{bmatrix}\begin{Bmatrix} M_a \\ M_b \end{Bmatrix} = 6EI\,\omega_b \begin{Bmatrix} -\frac{1}{l_1} \\ \frac{l_1+l_2}{l_1 l_2} \end{Bmatrix}$$

$$\begin{bmatrix} 4 & 2 \\ 2 & 10 \end{bmatrix}\begin{Bmatrix} M_a \\ M_b \end{Bmatrix} = 6EI \cdot \omega_b \begin{Bmatrix} -\frac{1}{2} \\ \frac{2+3}{6} \end{Bmatrix}$$

$$M_a = -125 \text{ Nm}$$

$$M_b = 81{,}25 \text{ Nm}$$

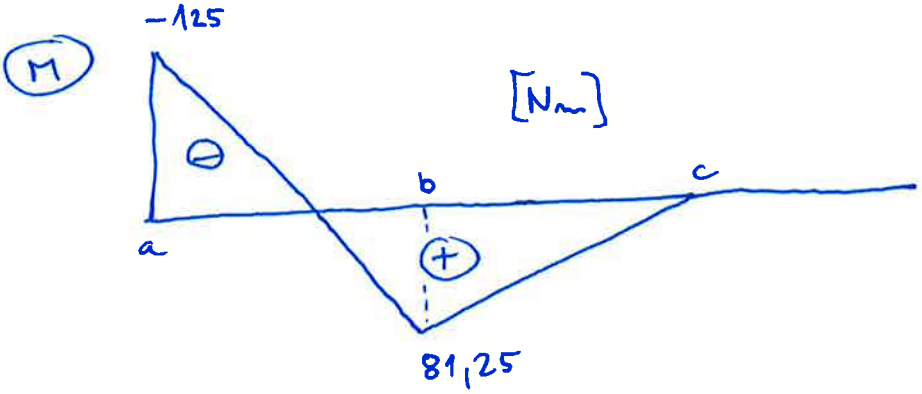
(V)

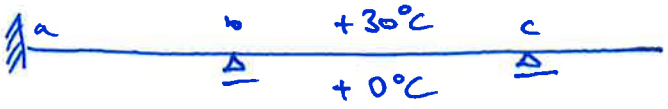


$$V_a = \frac{1}{l_1}(M_b - M_a) = 103{,}125 \text{N}$$

$$V_{b,p} = \frac{1}{l_2}(M_c - M_b) = -27{,}08\overline{3} \text{ N}$$

(M)

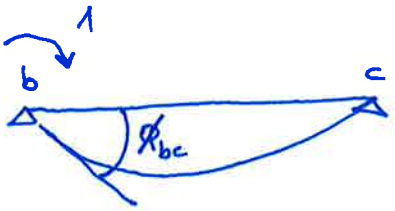


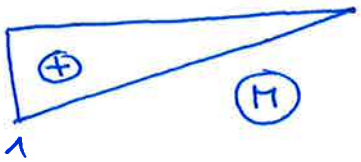


$\alpha_T = 1 \cdot 10^{-5}\ K^{-1}$

VIZ PŘÍKLAD S POPUŠTĚNÍM

$\phi_{ab} = 0$; $\phi_{ba} = 0$; ϕ_{bc} :





$$\phi_{bc} = \int_0^{l_2} M \cdot \alpha_T \frac{\Delta t_1}{h}\, dx = \alpha_T \frac{\Delta t_1}{h} \cdot \underbrace{\frac{1}{2} l_2 \cdot 1}_{A} =$$

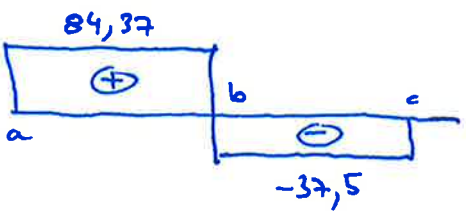
$$= \alpha_T \frac{\Delta t_1}{h} \cdot \frac{l_2}{2}$$

$$\frac{1}{6EI} \begin{bmatrix} 2l_1 & l_1 \\ l_1 & 2(l_1+l_2) \end{bmatrix} \begin{Bmatrix} M_a \\ M_b \end{Bmatrix} = \begin{Bmatrix} 0 \\ -\alpha_T \frac{\Delta t_1}{h} \cdot \frac{l_2}{2} \end{Bmatrix}$$

$M_a = -56{,}25$ Nm

$M_b = 112{,}5$ Nm

V



M