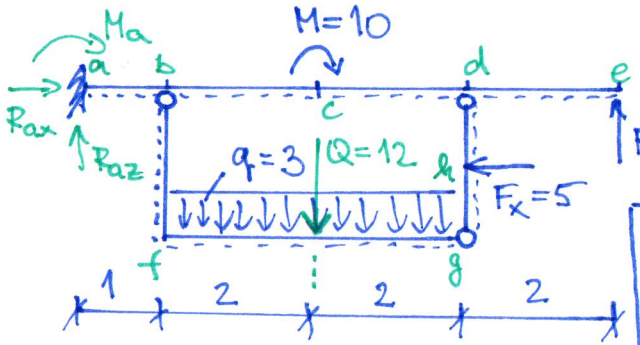
[m, kN, kNm, kN/m]



REAKCE:

$\Sigma F_{xi} = 0$

$R_{ax} - F_x = 0 \Rightarrow \underline{R_{ax} = 5\,kN}$

$\Sigma F_{zi} = 0$

$R_{az} + F_z - Q = 0 = \underline{R_{az} = 6\,kN}$

$\Sigma M_{ai} = 0$ ⊕↻

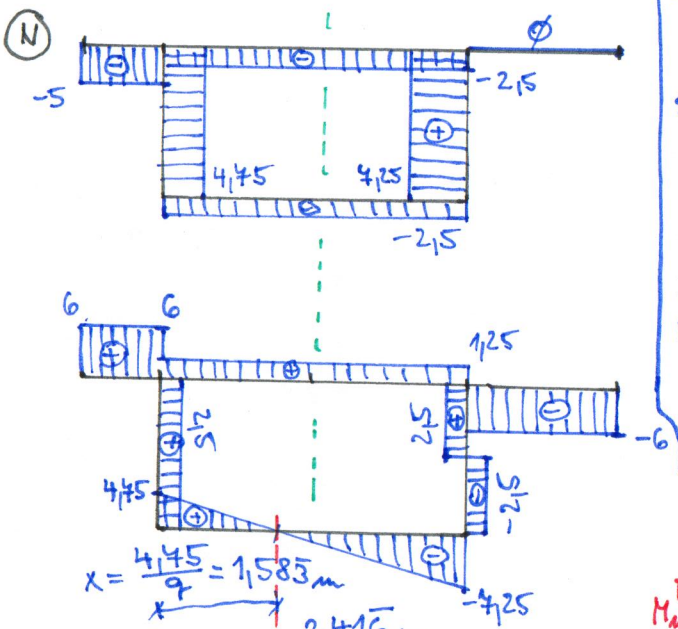
$M_a + M + Q\cdot 3 + F_x \cdot 1 - F_z \cdot 4 = 0$

$\underline{M_a = -9\,kNm}$

$\Sigma M_{gi} = 0$ ⊕↻

$M_a + R_{az}\cdot 5 + R_{ax}\cdot 2 + M - Q\cdot 2 - F_x\cdot 1 - F_z\cdot 2 = 0$

$0 = 0$ ✓



vodorovná tečna
lokální / globální extrém

$M^P_{max} = G_z \cdot 2{,}41\overline{6} - q \cdot \frac{2{,}41\overline{6}^2}{2} = \underline{8{,}7604\,kNm}$

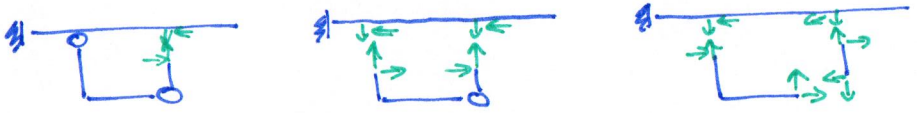
$M^P_{max} = M_g - \int v\,dx = 0 - \frac{1}{2}\cdot 2{,}41\overline{6}\cdot(-7{,}25) = \underline{8{,}7604\,kNm}$ ✓

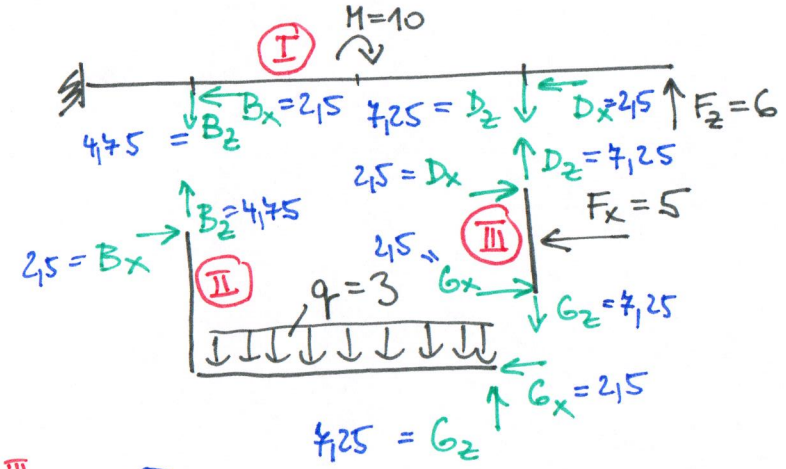
$M^{tečq}_Q = G_z \cdot 2 = 14{,}5\,kNm$

tečna pod Q $M^P_Q = G_z\cdot 2 - q\cdot 2\cdot 1 = 8{,}5\,kNm$

úhel tečnového polygonu

- rozříznu konstrukci, abych se zbavil uzavřené části (nejpohodlnější kloub)





$\Sigma M^{III}_{gi} = 0$ ⊕↻

$-D_x\cdot 2 + F_x\cdot 1 = 0 \Rightarrow D_x = \frac{5}{2} = \underline{2{,}5\,kN}$

$\Sigma M^{III}_{di} = 0$ ∨ $\Sigma F^{III}_{xi} = 0 \Rightarrow G_x = D_x = \underline{2{,}5\,kN}$

$\Sigma M^{II}_{bi} = 0$ ⊕↻

$-q\cdot 4\cdot 2 + G_z\cdot 4 - G_x\cdot 2 = 0 \Rightarrow \underline{G_z = 7{,}25\,kN}$

$\Sigma F^{II}_{xi} = 0$ $B_x - G_x = 0 \Rightarrow B_x = G_x = \underline{2{,}5\,kN}$

$\Sigma M^{II}_{gi} = 0$ ∨ $\Sigma F^{II}_{zi} = 0$ ⊕↓ $-B_z - G_z + q\cdot 4 = 0$

$\underline{B_z = 4{,}75\,kN}$

$\Sigma F^{III}_{zi} = 0 \Rightarrow D_z - G_z = 0$

$\underline{D_z = G_z = 7{,}25\,kN}$

NORMÁLOVÉ SÍLY

I $N^P_{ed} = 0 = N^P_{de}$

I $N^P_{db} = -D_x = -2{,}5\,kN$

I $N^P_{bd} = -D_x = -2{,}5\,kN$

I $N^P_{ba} = -D_x - B_x = -5\,kN$

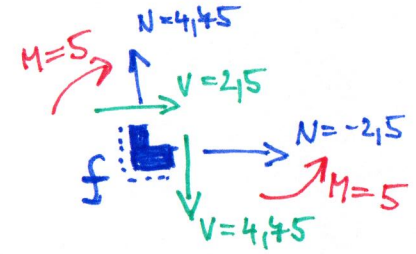
I $N^P_{ab} = -D_x - B_x = -5\,kN$

II $N^L_{bf} = N^L_{fb} = B_z = 4{,}75\,kN$

II $N^L_{fg} = N^L_{gf} = -B_x = -2{,}5\,kN$

III $N^L_{gd} = N^L_{dg} = G_z = 7{,}25\,kN$

STYČNÍK (f)



$\Sigma F_{x_i} = 0$ ✓

$\Sigma F_{z_i} = 0$ ✓

$\Sigma M_i = 0$ ✓

POSOUVAJÍCÍ SÍLY

I $V^P_{ed} = V^P_{de} = -F_z = -6\,kN$

I $V^P_{db} = V^P_{bd} = -F_z + D_z = +1{,}25\,kN$

I $V^P_{ba} = V^P_{ab} = -F_z + D_z + B_z = 6\,kN$

II $V^L_{bf} = V^L_{fb} = B_x = 2{,}5\,kN$

II $V^L_{f-g}(x) = B_z - q \cdot x = 4{,}75 - 3x$

II $V^L_{fg} = V^L_{f-g}(x=0) = 4{,}75\,kN$

II $V^L_{gf} = V^L_{f-g}(x=4) = 4{,}75 - 3\cdot 4 = -7{,}25\,kN$

III $V^L_{gh} = V^L_{hg} = -G_z = -2{,}5\,kN$

III $V^L_{hd} = V^L_{dh} = -G_z + F_x = 2{,}5\,kN$

MOMENTY

I $M_e = 0$

I $M^L_{e-d}(x) = F_z \cdot x = 6x \Rightarrow$ lineární fce

I $M^L_{de} = M^L_{e-d}(x=2) = 6\cdot 2 = 12\,kNm$

I $M^L_{cd} = F_z \cdot 4 - D_z \cdot 2 = 9{,}5\,kNm$

I $M^L_{cb} = F_z \cdot 4 - D_z \cdot 2 - M = -0{,}5\,kNm$

I $M^L_{bc} = F_z \cdot 6 - D_z \cdot 4 - M = -3\,kNm$

I $M^L_{ab} = F_z \cdot 7 - D_z \cdot 5 - M - B_z \cdot 1 = -9\,kNm$

III $M^L_g = 0$

III $M^L_h = -G_x \cdot 1 = -2{,}5\,kNm$

III $M^L_d = -G_x \cdot 2 + F_x \cdot 1 = 0$ kloub ✓

II $M^L_b = 0$

II $M^L_{fb} = B_x \cdot 2 = 5\,kNm = M^L_{fg}$

II $M^L_{f-g}(x) = B_x \cdot 2 + B_z \cdot x - q\frac{x^2}{2} =$

$= 5 + 4{,}75 \cdot x - 1{,}5 \cdot x^2$

II $M^L_{fg} = M^L_{f-g}(x=0) = 5\,kNm$ ✓

II $M^L_{gf} = M^L_{f-g}(x=4) = 5 + 4{,}75\cdot 4 - 1{,}5\cdot 4^2 = 0$ ✓ kloub

II $M_{max} = M_{f-g}(x = 1{,}583) = 5 + 4{,}75\cdot 1{,}583 - 1{,}5\cdot 1{,}583^2 =$

$= 8{,}7604\,kNm$