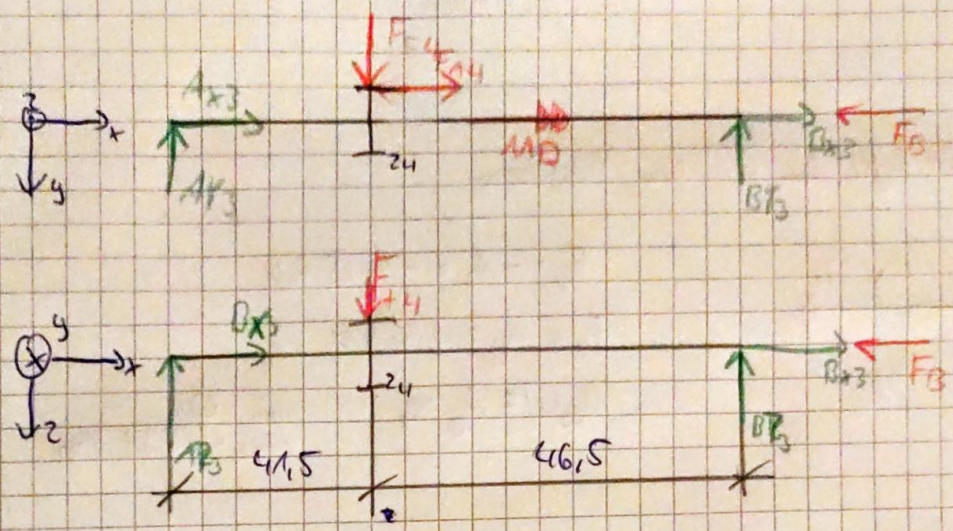
Abtriebswelle



$\circlearrowleft_{A_{y3}}$: $-F_{A4} \cdot 110{,}41\,mm - F_{R4} \cdot 41{,}5\,mm + B_{y3} \cdot 88\,mm$

$$\Rightarrow B_{y3} = \frac{+F_{A4} \cdot 110{,}41 + F_{R4} \cdot 41{,}5\,mm}{88\,mm} = -2{,}99\,kN$$

$\uparrow$: $B_{y3} - F_{R4} + A_{y3} = 0$

$$\Rightarrow A_{y3} = F_{R4} - B_{y3} = -1{,}76\,kN - (-2{,}99\,kN) = 1{,}14\,kN$$

$\circlearrowleft_{A_{z3}}$: $-F_{T4} \cdot 41{,}5\,mm + B_{z3} \cdot 88\,mm$

$$\Rightarrow B_{z3} = \frac{F_{T4} \cdot 41{,}5\,mm}{88\,mm} = -2{,}14\,kN$$

$\uparrow$: $A_{z3} + B_{z3} - F_{T4} = 0$

$$\Rightarrow A_{z3} = F_{T4} - B_{z3} = -4{,}54\,kN - (-2{,}14\,kN) = -2{,}4\,kN$$

$$A_{R3} = \sqrt{A_{z3}^2 + B_{y3}^2} = 2{,}66\,kN$$

$$B_{R3} = \sqrt{B_{z3}^2 + B_{y3}^2} = 3{,}6\,kN$$

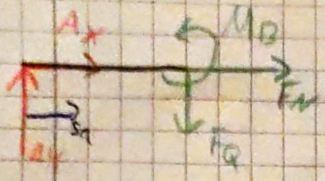
A über Festlager, da keine radiale Belastung

$$A_x = -F_{A4} + F_B = -(-1{,}65\,kN) + 3\,kN = 4{,}65\,kN$$

Schnittgrößenverläufe

$M_y(x)$:

1. positives Schnittufer $s_{min} = 0$; $s_{max} = 41{,}5$ mm

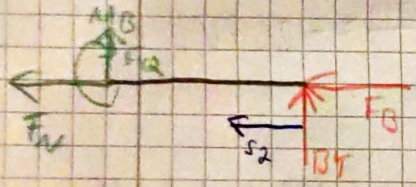


$F_N = -A_x = -4{,}65$ kN

$F_Q = A_y = 1{,}14$ kN

$M_{By}(x) = A_y \cdot s_1$ $\quad s_{min} = 0$, $s_{max} = 47{,}31$ Nm

2. negatives Schnittufer $s_{2\,min} = 0$; $s_{max} = 46{,}5$ mm



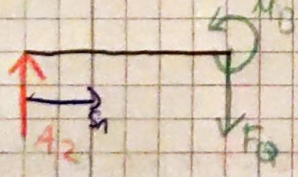
$F_N = -F_B = -3$ kN

$F_Q = -B_y = 2{,}9$ kN

$M_B = +B_y \cdot s_2 \Rightarrow s_{min} = 0$, $s_{max} = -134{,}85$ Nm

$M_z(x)$

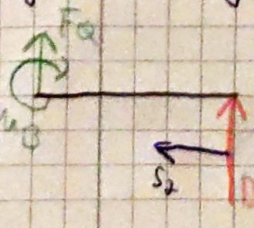
1. positives Schnittufer s von oben



$F_Q = A_z = -2{,}4$ kN

$M_B = A_z \cdot s_1 \Rightarrow s_{min} = 0$, $s_{max} = 99{,}6$ kN

2. negatives Schnittufer s_2 von oben



$F_Q = -B_z = 2{,}14$ kN

$M_B = B_z \cdot s_2 = s_{min} = 0$, $s_{max} = -99{,}51$

$M_{B\,gesamt} = \sqrt{M_y^2 + M_z^2} = 167{,}64$ Nm