

1 Festigkeitsberechnung - Vorgehensweise

$$F_{R2} = 0,57 \text{ kN}$$

$$F_{R3} = 1,76 \text{ kN}$$

$$F_{t2} = 1,48 \text{ kN}$$

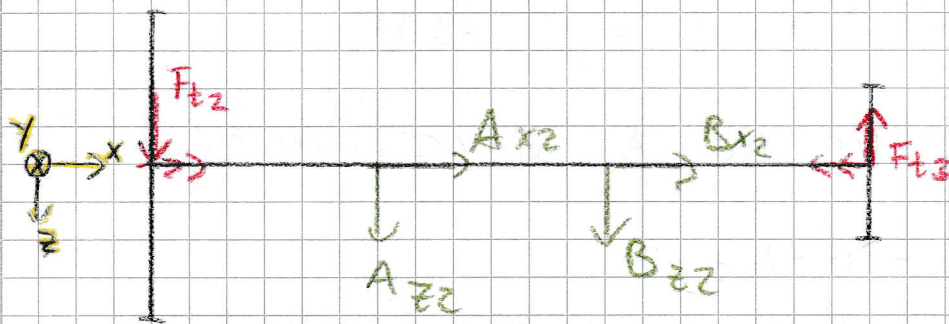
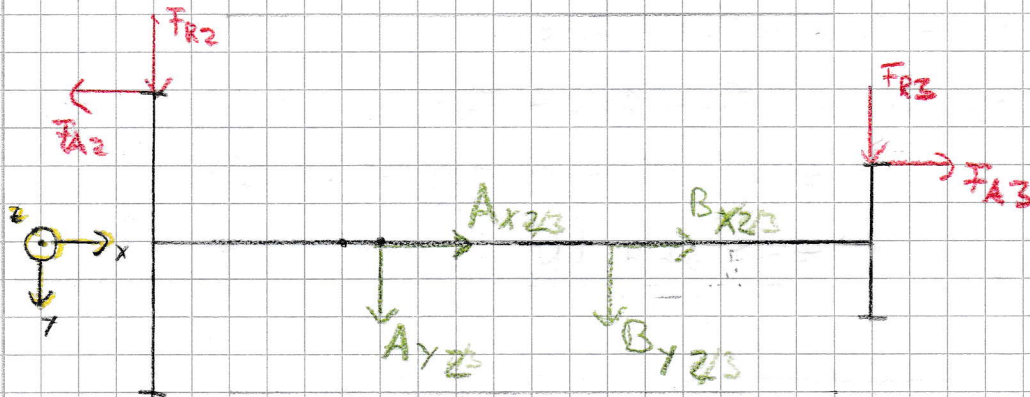
$$F_{t3} = 4,54 \text{ kN}$$

$$F_{A2} = 0,54 \text{ kN}$$

$$F_{A3} = 1,65 \text{ kN}$$

$$d_2 = 226,67 \text{ mm}$$

$$d_3 = 74,42 \text{ mm}$$



$$\sum M_z: B_{y2} \cdot 34 - F_{R2} \cdot 25,5 - F_{A2} \cdot \frac{d_2}{2} + F_{R3} \cdot 72 + F_{A3} \cdot \frac{d_3}{2} = 0$$

$$\Rightarrow B_{y2} = \frac{F_{R2} \cdot 25,5 + F_{A2} \cdot \frac{d_2}{2} - F_{R3} \cdot 72 - F_{A3} \cdot \frac{d_3}{2}}{34}$$

$$= \frac{0,54 \text{ kN} \cdot 25,5 + 0,5 \text{ kN} \cdot \frac{226,67}{2} - 1,76 \text{ kN} \cdot 72 - 1,65 \text{ kN} \cdot \frac{74,42}{2}}{34}$$

$$= \underline{\underline{-3,463 \text{ kN}}}$$

$$\uparrow: F_{R2} + A_{y2} + B_{y2} + F_{t3}$$

$$\Rightarrow A_{y2} = -F_{R2} - B_{y2} - F_{t3}$$

$$= -0,57 \text{ kN} - 3,463 \text{ kN} - 1,76 \text{ kN} = \underline{\underline{1,135 \text{ kN}}}$$

$$\sum \mathcal{M}_y: B_{z2} \cdot 34 - F_{t2} \cdot 25,5 - F_{t3} \cdot 72 = 0$$

$$\Rightarrow B_{z2} = \frac{F_{t2} \cdot 25,5 + F_{t3} \cdot 72}{34}$$

$$= \frac{1,48 \text{ kN} \cdot 25,5 + 4,54 \text{ kN} \cdot 72}{34} = \underline{\underline{10,724 \text{ kN}}}$$

$$\uparrow: F_{t2} + A_{z2} + B_{z2} + F_{t3}$$

$$\Rightarrow A_{z2} = -F_{t2} - B_{z2} + F_{t3}$$

$$= -1,48 \text{ kN} - 10,724 \text{ kN} + 4,54 \text{ kN}$$

$$= \underline{\underline{-7,664 \text{ kN}}}$$

$$A_{r2} = \sqrt{A_{x2}^2 + A_{z2}^2} = \underline{\underline{7,75 \text{ kN}}}$$

$$B_{r2} = \sqrt{B_{y2}^2 + A_{z2}^2} = \underline{\underline{11,269 \text{ kN}}}$$

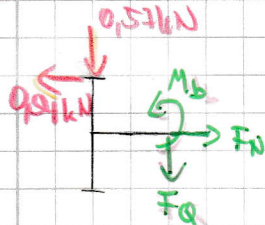
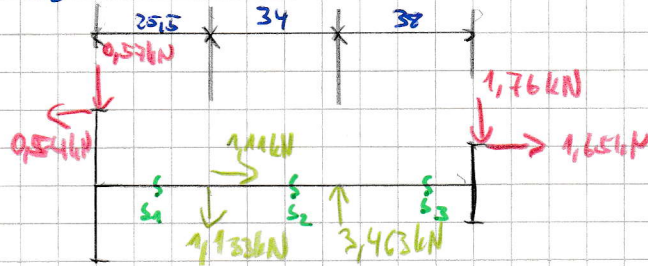
\Rightarrow Festlager bei A (kleinere radiale Belastung)

$$\rightarrow: F_{x2} - F_{x3} - A_{x2} = 0$$

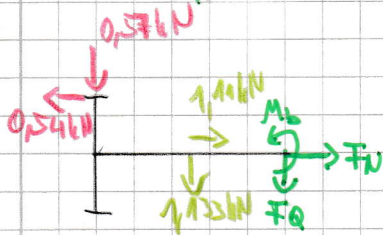
$$\Rightarrow A_{x2} = F_{x3} - F_{x2} = 1,65 \text{ kN} - 0,54 \text{ kN} = \underline{\underline{1,11 \text{ kN}}}$$

2 Festigkeitsberechnung - Vorjolgewelle

M_{b2} - Verläufe



$$\begin{aligned} \rightarrow: F_N &= 0,54 \text{ kN} \\ \uparrow: F_Q &= -0,57 \text{ kN} \\ \odot: M_{b2}(s_1) &= -0,57 \text{ kN} \cdot s_1 - 0,54 \cdot \frac{226,67}{2} \end{aligned}$$

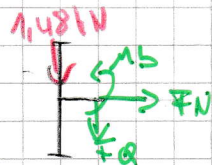
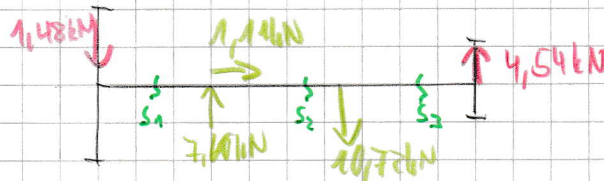


$$\begin{aligned} \rightarrow: F_N &= 0,54 \text{ kN} - 1,11 \text{ kN} = -0,57 \text{ kN} \\ \uparrow: F_Q &= -0,57 \text{ kN} - 1,13 \text{ kN} = -1,70 \text{ kN} \\ \odot: M_{b2}(s_2) &= 0,57 \text{ kN} \cdot (s_2 + 25,5) - 1,13 \text{ kN} \cdot s_2 - 0,54 \text{ kN} \cdot \frac{226,67}{2} \end{aligned}$$

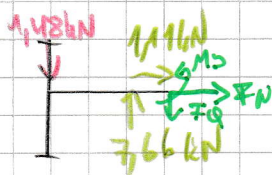


$$\begin{aligned} \rightarrow: F_N &= 1,65 \text{ kN} \\ \uparrow: F_Q &= 1,76 \text{ kN} \\ \odot: -1,76 \cdot s_3 + 1,65 \text{ kN} \cdot \frac{74,45}{2} \end{aligned}$$

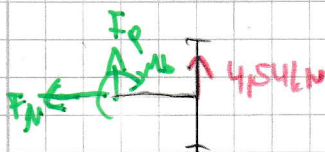
M_{by} - Verläufe



$$\begin{aligned} \uparrow: F_Q &= -1,48 \text{ kN} \\ \rightarrow: F_N &= 0 \\ \odot: M_{by}(s_1) &= -1,48 \cdot s_1 \end{aligned}$$



$$\begin{aligned} \uparrow: F_Q &= 7,66 \text{ kN} \\ \rightarrow: F_N &= -1,11 \text{ kN} \\ \odot: M_{by}(s_2) &= 1,48 (25,5 + s_2) + 7,66 \cdot s_2 \end{aligned}$$



$$\begin{aligned} \uparrow: F_Q &= 4,54 \text{ kN} \\ \rightarrow: F_N &= 0 \\ \odot: M_{by}(s_3) &= 4,54 \cdot s_3 \end{aligned}$$