Příloha TP1 – Výpočet reakcí

Vyjádření reakcí pro vodorovné zatížení

$$R_{CY} = \frac{F_V * e * \sin(\beta_1) + F_V * d * \sin(\beta_1)}{d * \cos(\beta_1) - \frac{c * \cos(\alpha_1) * d * \sin(\beta_1)}{c * \sin(\alpha_1)}}$$
$$= \frac{5 * 0{,}8 * \sin(26{,}1) + 5 * 0{,}5 * \sin(26{,}1)}{0{,}5 * \cos(26{,}1) - \frac{1{,}3 * \cos(69{,}8) * 0{,}5 * \sin(26{,}1)}{1{,}3 * \sin(69{,}8)}} = 7{,}77\ N \quad (7.16)$$

$$R_{DX} = -\frac{R_{CY} * c * \cos(\alpha_1)}{c * \sin(\alpha_1)} = -\frac{7{,}77 * 1{,}3 * \cos(69{,}8)}{1{,}3 * \sin(69{,}8)} = -2{,}86\ N \quad (7.17)$$

$$R_{BY} = R_{CY} = 7{,}77\ N \quad (7.18)$$

$$R_{DY} = R_{CY} = 7{,}77\ N \quad (7.19)$$

$$R_{CX} = R_{DX} - F_V = -2{,}86 - 5 = -7{,}86\ N \quad (7.20)$$

$$R_{BX} = -\frac{R_{BY} * c * \cos(\alpha_1)}{c * \sin(\alpha_1)} = -\frac{7{,}77 * 1{,}3 * \cos(69{,}8)}{1{,}3 * \sin(69{,}8)} = -2{,}86\ N \quad (7.21)$$

$$M_A = -F_V * a + R_{DX} * b - F_V * b = -5 * 1{,}6 + (-2{,}86) * 1 - 5 * 1 = -15{,}86\ N * m \quad (7.22)$$

$$R_{AX} = F_V = 5\ N \quad (7.23)$$

$$R_{AY} = 0 = 0\ N \quad (7.24)$$

Vyjádření reakcí pro svislé zatížení

$$R_{CY} = \frac{-F_S * e * \cos(\beta_1) - \frac{F_S * c * \cos(\alpha_1) * d * \sin(\beta_1)}{c * \sin(\alpha_1)}}{d * \cos(\beta_1) - \frac{c * \cos(\alpha_1) * d * \sin(\beta_1)}{c * \sin(\alpha_1)}}$$
$$= \frac{-5 * 0{,}8 * \cos(26{,}1) - \frac{5 * 1{,}3 * \cos(69{,}8) * 0{,}5 * \sin(26{,}1)}{1{,}3 * \sin(69{,}8)}}{0{,}5 * \cos(26{,}1) - \frac{1{,}3 * \cos(69{,}8) * 0{,}5 * \sin(26{,}1)}{1{,}3 * \sin(69{,}8)}} \quad (7.25)$$
$$= -10{,}86\ N$$

$$R_{DX} = -\frac{(R_{CY} - F_S) * c * \cos(\alpha_1)}{c * \sin(\alpha_1)} = -\frac{(-10{,}86 - 5) * 1{,}3 * \cos(69{,}8)}{1{,}3 * \sin(69{,}8)} \quad (7.26)$$
$$= 5{,}84\ N$$

$$R_{BY} = R_{CY} - F_S = -10{,}86 - 5 = -15{,}86\ N \quad (7.27)$$

$$R_{DY} = R_{CY} - F_S = -10{,}86 - 5 = -15{,}86\ N \quad (7.28)$$

$$R_{CX} = R_{DX} = 5{,}84\ N \quad (7.29)$$

$$R_{BX} = -\frac{R_{BY} * c * \cos(\alpha_1)}{c * \sin(\alpha_1)} = -\frac{-15{,}86 * 1{,}3 * \cos(69{,}8)}{1{,}3 * \sin(69{,}8)} = 5{,}84\ N \quad (7.30)$$

$$M_A = R_{DX} * b = 5{,}84 * 1 = 5{,}84\ N * m \quad (7.31)$$

$$R_{AX} = 0 = 0\ N \quad (7.32)$$

$$R_{AY} = F_S = 5\ N \quad (7.33)$$