$M_0(0) = 0 \Rightarrow C_2 = 0$

$M_0(70) = 0 \Rightarrow \frac{0,05}{12} \cdot 70^4 - 0,5 \cdot 70^3 - 40 \cdot 70^2 + C_1 \cdot 70 = 0 \qquad C_1 = 3820,83$

$M_0(\bar{x}) = \frac{0,05}{12} \cdot \bar{x}^4 - 0,5 \cdot \bar{x}^3 - 40 \cdot \bar{x}^2 + 3820,83 \cdot \bar{x}$

$M_{g10} = M_0(40)$

$= \frac{0,05}{12} \cdot 40^4 - 0,5 \cdot 40^3 - 40 \cdot 40^2 + 3820,83 \cdot 40 = 67500 \text{ kNm}$

$M_g = M_{g10} - H \cdot f = 0 \Rightarrow H = \frac{M_{g10}}{f} = \frac{94500}{13}$

УСЛОВ ЗА РАЦИОНАЛНА ОСА:

$M = M_0 - H \cdot y = 0 \Rightarrow y = \frac{1}{H} \cdot M_0$

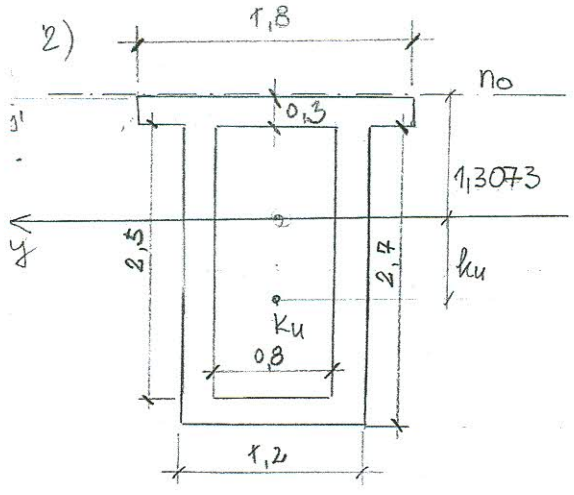
$$\boxed{y = \frac{13}{94500} \cdot \left(\frac{0,05}{12} \cdot \bar{x}^4 - 0,5 \cdot \bar{x}^3 - 40\bar{x}^2 + 3820,83\,\bar{x} \right)}$$

$\bar{y} = y + \bar{x} \cdot tg\,\delta_0$

$= \frac{13}{94500} \cdot \left(\frac{0,05}{12} \cdot \bar{x}^4 - 0,5\,\bar{x}^3 - 40 \cdot \bar{x}^2 + 3820,83\,\bar{x} \right) + \frac{1}{7}\,\bar{x}$

$= \frac{1}{94500} \cdot \left(\frac{0,65}{12} \cdot \bar{x}^4 - 6,5 \cdot \bar{x}^3 - 520\bar{x}^2 + 63170,83\,\bar{x} \right)$

2)



$z_1' = 0,15\ m \qquad F_1 = 1,8 \cdot 0,3 = 0,54 m^2$

$z_2' = 1,65\ m \qquad F_2 = 1,2 \cdot 2,7 = 3,24 m^2$

$z_3' = 1,55\ m \qquad F_3 = 0,8 \cdot 2,5 = 2 m^2$

$F = F_1 + F_2 - F_3 = 1,78 m^2$

$z_T' = \frac{\sum z_i' \cdot F_i'}{F} = 1,3073 m$

$z_1 = -1,1573 m$

$z_2 = 0,3427 m$

$z_3 = 0,1427 m$

$I = \left(\frac{1}{12} \cdot 1,8 \cdot 0,3^3 + 1,1573^2 \cdot 0,54 \right) + \left(\frac{1}{12} \cdot 1,2 \cdot 2,7^3 + 0,3427^2 \cdot 3,24 \right) - \left(\frac{1}{12} \cdot 0,8 \cdot 2,5^3 + 0,1427^2 \cdot 2 \right)$

$= 1,91664 m^4$

$W_0 = \frac{I}{|z_0|} = 1,4661 m^3$

$k_u = \frac{W_0}{F} = 0,824 m$