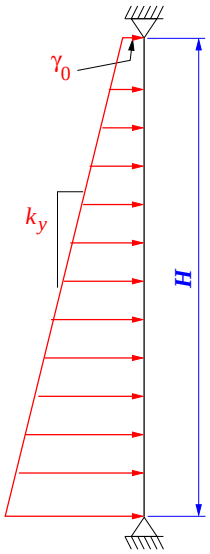
Section 6.2.3. Bending of principal side beam - Analytical intro



bending moment M_b :

$$(\quad A = \gamma_0 + k_y H \quad)$$

$$M_b(y) = k_y \frac{H^3 - y^3}{3} - (k_y y + A)\frac{H^2 - y^2}{2} + A\,y(H-y) + H\left(\frac{\gamma_0}{2} + \frac{k_y H}{6}\right)(H-y) \qquad \ldots \hat{M}_b \propto \boldsymbol{H^3}$$

deflections u from :

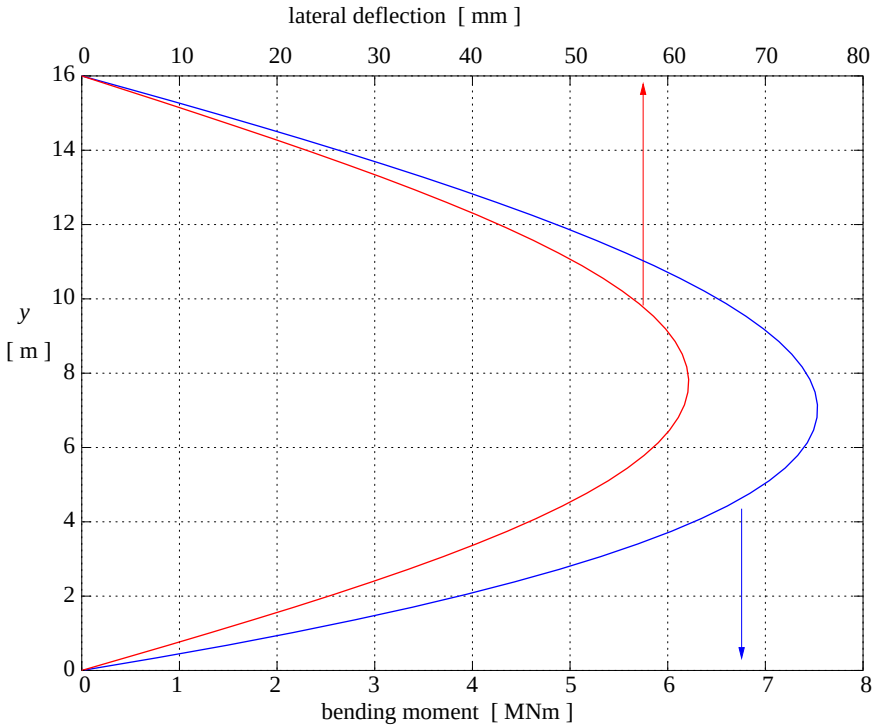
$$\frac{d^2u}{dy^2} \approx \text{curvature} = \frac{M_b(y)}{EI} \qquad \ldots \hat{u} \propto \boldsymbol{H^5}$$

H = 16.0 m , Z_{cell} = 1.6 m

p_0 =350 mbar , ρ = 1400 $\frac{\text{kg}}{\text{m}^3}$

$\Rightarrow$ γ_0 = 5.6 10^4 $\frac{\text{N}}{\text{m}}$, k_y = 2.1974 10^4 $\frac{\text{N}}{\text{m}^2}$

E = 200 GPa , I = 1.613 10^{-2} m^4
(HL 1100 x 607)



Pressure not everywhere : numerical work :

H = 16.958 m , H_n = 14 m , H_i = 1.479 m