

$$\begin{array}{|c|c|c|} \hline I_x = \frac{bh^3}{12} & I_y = \frac{b^3h}{12} & I_{xy} = 0 \\ \hline W_x = \frac{bh^2}{6} & W_y = \frac{b^2h}{6} & \\ \hline \end{array} \quad \begin{array}{|c|c|c|} \hline I_x = I_y = \frac{\pi d^4}{64} & I_{xy} = 0 & I_p = \frac{\pi d^4}{32} \\ \hline W_x = \frac{\pi d^3}{32} & W_p = \frac{\pi d^3}{16} & \\ \hline \end{array}$$

$$\begin{array}{|c|c|c|} \hline I_x = I_y = \frac{\pi(d_{isor}^4 - d_{vid}^4)}{64} & I_{xy} = 0 & I_p = \frac{\pi(d_{isor}^4 - d_{vid}^4)}{32} \\ \hline W_x = W_y = \frac{\pi(d_{isor}^4 - d_{vid}^4)}{32d_{isor}} & W_p = \frac{\pi(d_{isor}^4 - d_{vid}^4)}{16d_{isor}} & \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline I_{x1} = I_x + a^2 A \\ \hline I_{y1} = I_y + b^2 A \\ \hline I_{xy} = I_{xy} + abA \\ \hline \end{array} \quad \begin{array}{|c|} \hline W_x = \frac{I_x}{|y_{\max}|} \\ \hline \end{array} \quad \begin{array}{|c|} \hline W_y = \frac{I_y}{|x_{\max}|} \\ \hline \end{array} \quad \begin{array}{|c|} \hline W_p = \frac{I_p}{\rho_{\max}} \\ \hline \end{array}$$

$$\sigma_{\theta} = \frac{F_n}{A_{\theta}} \quad \tau_{\theta} = \frac{F_t}{A_{\theta}}$$

$$A = A_{\theta} \cos \theta$$

$$\sigma_{\theta} = \sigma \cos^2 \theta$$

$$\tau_{\theta} = \frac{\sigma}{2} \sin 2\theta$$

$$\varepsilon = \frac{\sigma}{E} = \frac{N}{EA} \quad \varepsilon_s = -\nu \cdot \varepsilon \quad \varepsilon = \frac{N}{EA} + \alpha_t \cdot \Delta T$$

$$W = \frac{1}{2} F \Delta L \quad U = \frac{N^2 L}{2EA}$$

$$w_k = \sum_{i=1}^n \Delta L_i = \sum_{i=1}^n \varepsilon_i L_i = \sum_{i=1}^n \frac{\sigma_i L_i}{E_i} = \sum_{i=1}^n \frac{N_i L_i}{E_i A_i}$$

$$y = \frac{q \cdot L^2}{8H} \quad H = \frac{q \cdot L^2}{8y}$$

$$\sigma = \frac{qL^2}{8yA} \leq \sigma_{all} \quad q_g = \rho A g$$

$$\begin{array}{l} \varepsilon_1 = \frac{1}{E} (\sigma_1 - \nu(\sigma_2 + \sigma_3)) \\ \varepsilon_2 = \frac{1}{E} (\sigma_2 - \nu(\sigma_1 + \sigma_3)) \\ \varepsilon_3 = \frac{1}{E} (\sigma_3 - \nu(\sigma_1 + \sigma_2)) \end{array}$$

$$F_{cr} = \frac{\pi^2 EI_{\min}}{(\mu L)^2}$$

$$\sigma_{cr} = \frac{\pi^2 E}{\lambda^2} \quad \lambda = \frac{\mu L}{i_{\min}}$$

$$T = \frac{P}{\omega} = \frac{30P}{\pi \cdot n} \quad T = G \theta I_p \quad \tau_k = \frac{T \rho_k}{I_p}$$

$$\varphi = \theta L = \frac{T}{GI_p} L \quad \theta = \frac{T}{GI_p}$$

$$\sigma = \frac{M_x}{I_x} y \quad \tau_k = \frac{Q |S_k|}{I b_k}$$