

公式结果

第一章

$$\bar{\sigma} = \frac{P}{A}$$

$$\bar{\epsilon} = \ln \frac{l}{l_0} = \ln(1 + \epsilon)$$

$$\frac{A_0}{A} = \frac{l}{l_0}$$

$$\frac{d\bar{\sigma}}{d\bar{\epsilon}} = 0$$

$$\frac{d\bar{\sigma}}{d\bar{\epsilon}} = \bar{\sigma}$$

$$\frac{d\bar{\sigma}}{d\bar{\epsilon}} = \sigma(1 + \epsilon)$$

平衡方程

$$\begin{cases} \sigma_2 + \frac{\sqrt{2}}{2}(\sigma_1 + \sigma_3) = \frac{P}{A} \\ \frac{\sqrt{2}}{2}(\sigma_1 - \sigma_3) = \frac{Q}{A} \end{cases}$$

几何关系

$$\begin{cases} \epsilon_1 = \frac{\frac{\sqrt{2}}{2}(\delta_x + \delta_y)}{\sqrt{2}l} \\ \epsilon_2 = \frac{\delta_y}{l} \\ \epsilon_3 = \frac{\frac{\sqrt{2}}{2}(\delta_y - \delta_x)}{\sqrt{2}l} \end{cases}$$

本构关系

$$\begin{cases} \sigma = E\epsilon, & |\epsilon| \leq \epsilon_s \\ \sigma = \sigma_s \cdot \text{sgn}(\epsilon), & |\epsilon| > \epsilon_s \end{cases}$$

$\bar{\sigma}_s, \bar{\rho}_e, \delta_e, \rho_{s0}$

ρ_{e0}

$$\sigma_1^r = \sigma_2^r = \sigma_3^r \quad \gamma^*$$

弹性极限曲线

$$\begin{cases} \left| \frac{1}{2} \left(\frac{P}{A} \right) \pm \left(\frac{Q}{A} \right) - \gamma^* \right| \leq 1 \\ \left| \left(\frac{P}{A} \right) + \sqrt{2} \gamma^* \right| \leq 1 \end{cases}$$

$\bar{\sigma}_s$

$$M = -(L-x)P$$

$$\rho_e = \frac{M_e}{L}$$

$$-(L-x)P = -M_e$$

第二章

$$y \downarrow \rightarrow x \uparrow M$$

$$\epsilon = ky \quad (\text{纯弯})$$

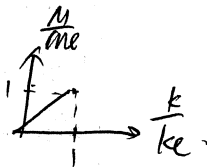
$$k = -\frac{\partial^2 w}{\partial x^2}$$

$$M = EJK \quad (J = \frac{1}{2}bh^3)$$

$$M_e = J \frac{\sigma_s}{\epsilon_s}$$

k_e

$$\left(\frac{M}{M_e} \right) = \left(\frac{k}{k_e} \right)$$



$$\zeta = \frac{y_0}{\frac{1}{2}h}$$

$$\sigma = \begin{cases} Eky, & |y| \leq y_0 \\ \sigma_s \cdot \text{sgn}(y), & y_0 < |y| \leq \frac{1}{2}h \end{cases}$$

$$M = \frac{M_e}{2} (3 - \zeta^2)$$

$$\zeta = \frac{k_e}{k} \text{sgn}(M)$$

$$\left| \frac{M}{M_e} \right| = \frac{1}{2} \left[3 - \left(\frac{k}{k_e} \right)^2 \right]$$

$$M_s = \frac{3}{2} M_e$$

$$\left(\frac{M}{M_e} \right) = \left(\frac{k}{k_e} \right)$$