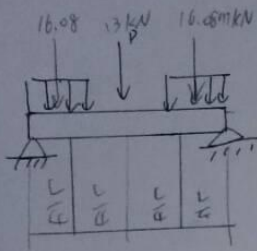


習題 5.6-2

自檢 = 甲 郭俊廷

一簡支梁 AB 受載重作用如圖

若  $\sigma_{allow} = 124 \text{ MPa}$ ,  $L = 9.75 \text{ m}$ ,  $P = 13 \text{ kN}$  及  $q = 6.6 \text{ kN/m}$ , 計算所需的截面模數  $S$ 。然後, 由附表 B 的表 B-2 中挑選合適的標準梁, 接著將的自重列入計算重新求  $S$  必要時, 挑一新的梁尺寸



$$\sum M_A = 0$$

$$13 \times \frac{L}{2} + (6.6 \times \frac{L}{2}) \times (\frac{3L}{4} + \frac{L}{20}) - (6.6 \times \frac{L}{2}) \times \frac{L}{20} = R_B \times L$$

$$R_B = 22.5875 \text{ kN}$$

$$\sum F_y = 0$$

$$13 + 2 \times 6.6 \times \frac{L}{2} - R_B = R_A$$

$$R_A = 22.5875 \text{ kN}$$

$$M = \frac{(6.6 \times 22.5875) \times \frac{9.75}{4}}{2} + 6.6 \times \frac{9.75}{4} = 51.929 \text{ kN}$$

$$S = \frac{51.929}{124} = 417.629 \text{ cm}^3 \text{ (IPN 260)}$$

$$w = 41.9 \frac{\text{kg}}{\text{m}} = 410.9 \frac{\text{N}}{\text{m}} \quad g = 9.8067 \text{ m/s}^2$$

$$\text{IPN 260} \quad \sum M_A = 0$$

$$13 \times \frac{L}{2} + 6.6 \times \frac{L}{4} \times \frac{L}{8} + 6.6 \times \frac{L}{4} \times (\frac{3L}{8} + \frac{L}{8}) + w \times L \times \frac{L}{2} = R_B \times L$$

$$R_B = 24.6 \text{ kN}$$

$$\sum F_y = 0$$

$$R_A = 13 + 2 \times 6.6 \times \frac{L}{4} + w \times L - R_B$$

$$R_A = 24.0 \text{ kN}$$

$$M_{\max} = 56.5 \text{ kN}\cdot\text{m} \quad S = \frac{56.5}{124} = 454.96 \text{ cm}^3 \text{ (IPN 280)}$$

$$\text{IPN 280} \quad \sum M_A = 0 \quad w = 469.7 \frac{\text{N}}{\text{m}}$$

$$R_B = 25 \text{ kN} \quad R_A = 22.5 \text{ kN}$$

$$M = 56.5 \text{ kN}\cdot\text{m}$$

$$S = \frac{56.5}{124} = 454.96 \text{ cm}^3$$

IPN 280