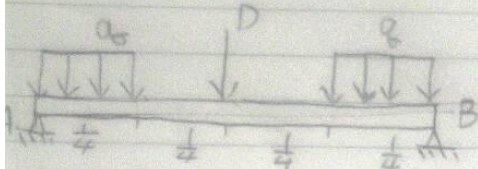


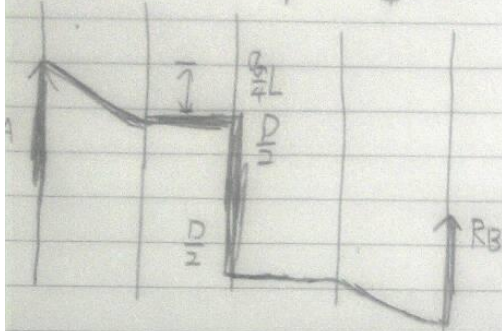
4A3/2023 吳鴻智

5-6-2



$L = 9.75 \text{ m}$ $q = 66 \text{ kN/m}$
 $P = 13 \text{ kN}$ $\sigma_{allow} = 124 \text{ MPa} = 0.124 \text{ GPa}$

$R_A = \frac{qL}{2} + \frac{P}{2}$
 $W_{max} = \frac{1}{2} \times \frac{P}{2} + \frac{qL}{4} \times \frac{1}{2} \times \frac{L}{4} = \frac{PL}{4} + \frac{qL^2}{32}$



$S = \frac{W_{max}}{\sigma_{allow}} = \frac{PL}{4 \cdot \sigma_{allow}} + \frac{qL^2}{32 \cdot \sigma_{allow}}$
 $= \frac{51.29 \times 10^3 \text{ N}}{124} = 413.629 \text{ cm}^3$

IPN 260 $S = 442 \text{ cm}^3$
 $W = 41.9 \text{ kg/m} \times 9.8 = 410.62 \text{ N/m}$
 $= 0.41062 \text{ kN/m}$

$M_{max} = \frac{WL^2}{8} = \frac{41.9 \times (9.75)^2}{8} = 4.884 \text{ kN-m}$

$S = \frac{(51.29 + 4.884)}{124} = 0.453016 \times 1000 = 453.016 \text{ cm}^3 > 442 \text{ (X)}$

IPN 280 $S = 542 \text{ cm}^3$ $W = 47.9 \text{ kg/m} \times 9.8 = 469.42 \text{ N/m}$
 $= 0.46942 \text{ kN/m}$

$M_{max} = \frac{WL^2}{8} = \frac{47.9 \times (9.75)^2}{8} = 5.578 \text{ kN-m}$

$S = \frac{51.29 + 5.578}{124} = 0.4586 \times 1000 = 458.6 \text{ cm}^3 < 542 \text{ cm}^3$
 (V)

A: ① 413.629 cm³
 A: ② IPN 280