

دراسة الانتظام المتناوب

$$M_{bmax} = 45 \cdot 10^6 (N \cdot mm), M_{bmin} = -15 \cdot 10^6 (N \cdot mm)$$

$$M_{bm} = 15 \cdot 10^6 (N \cdot mm), M_{ba} = 30 \cdot 10^6 (N \cdot mm)$$

$$\tau = \frac{1269,87}{0,707w}, \tau_a = \frac{2539,7}{0,707w}, \tau_{eq2} = \tau_m + \frac{\tau_a \cdot \tau_y}{A \cdot \sin^2}, A=1$$

$$\tau_{eq2} = \frac{2158,77}{0,707w}, \tau_{eqTOT} = \sqrt{\tau_{eq1}^2 + \tau_{eq2}^2}$$

$$\tau_{TOT} = \frac{2180,8}{w} \leq \tau_{all} \Rightarrow w = 60 \text{ mm}$$

$$P_0 = \frac{F}{n} \Rightarrow P_0 = 36 \text{ KN} \quad : (15) \text{ : "WLD"}$$

$$\tau = \frac{F}{A}, \tau = \frac{4F}{\pi d^2} \Rightarrow \tau = \frac{45836,6}{d^2}$$

$$l_1 = l_2 = l_3 = 200 \text{ (mm)}, l_4 = l_5 = 50 \text{ (mm)}$$

$$M_b = 45 \cdot 10^6 (N \cdot mm) \quad P_i = \frac{M_b \cdot l_i}{l_1^2 + l_2^2 + l_3^2 + l_4^2 + l_5^2}$$

$$P_1 = 72000 (N)$$

$$\sigma = \frac{P}{A} \Rightarrow \sigma = \frac{91673,2}{d^2}$$

$$\tau_{TOT} = \sqrt{\left(\frac{\sigma}{2}\right)^2 + \tau^2} \leq \tau_{all} \Rightarrow d = 18 \text{ mm}$$

$$\delta_B = \frac{P_B \cdot l^3}{3E \cdot I} \Rightarrow \delta_B = 0,00013 P_B \quad : (15) \text{ : "ابا"}$$

$$\delta_S = \frac{8 \cdot P_S \cdot N_e \cdot C^3}{G \cdot d} \Rightarrow \delta_S = 0,0625 P_S$$

$$\delta_B = \delta_S \Rightarrow 0,00013 P_B = 0,0625 P_S$$

$$P_B + P_S = 180 \Rightarrow P_S = 0,37 (KN), P_B = 179,63 (KN)$$

د. محمد العبدالله
د. طارق العبدالله [2]