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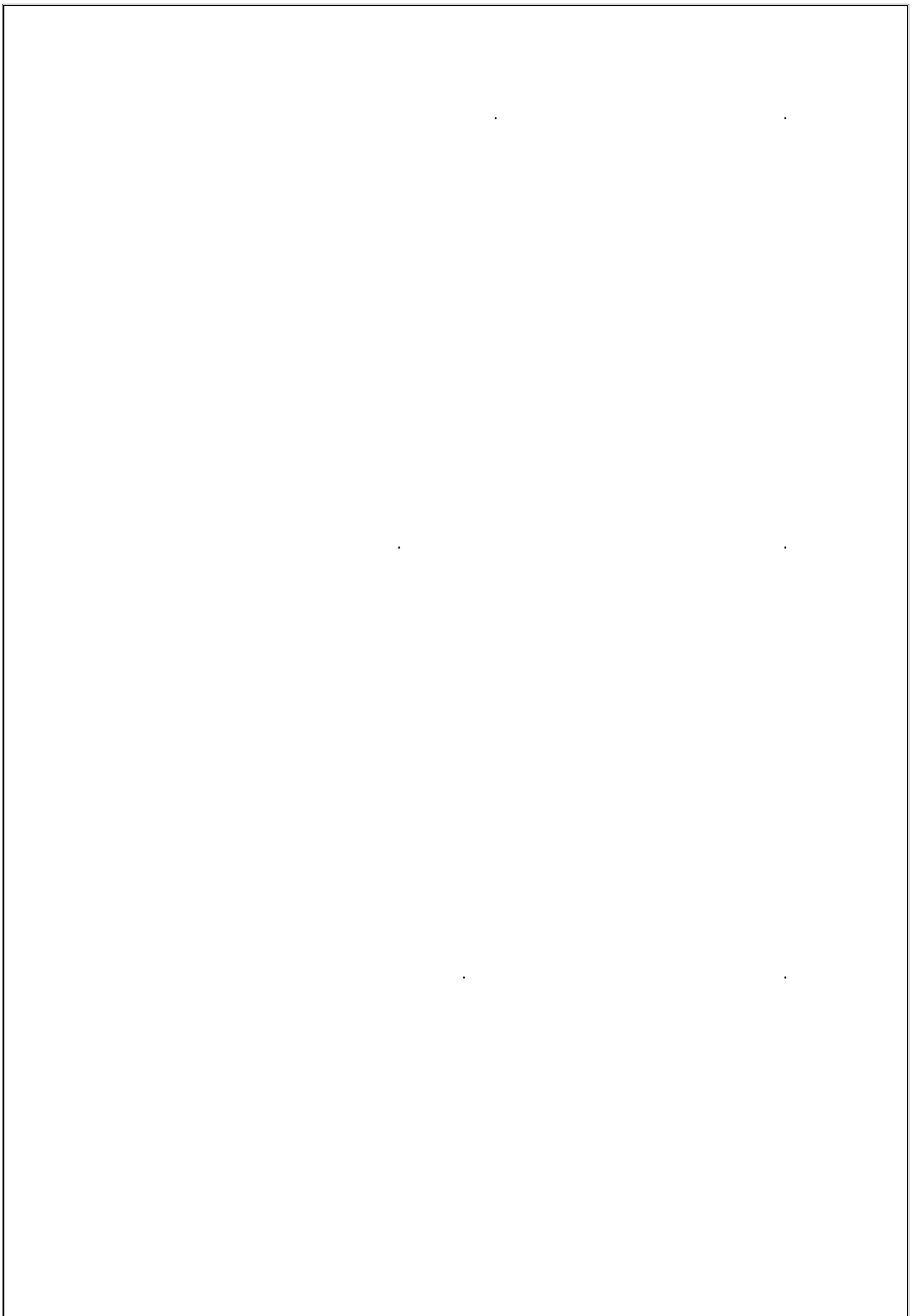
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(CHW=140)

$$H_{sp} = \frac{P_{sp}}{\gamma} = \frac{294}{9.81} = 30 \text{ m}$$

$$Q_{sp} = C_d \times \frac{\pi}{4} d^2 \times \sqrt{2gH_{sp}}$$

$$= 0.60 \times \frac{\pi}{4} (0.004)^2 \sqrt{2 \times 9.81 \times 30}$$

$$= 1.83 \times 10^{-4} \text{ m}^3/\text{s}$$

$$= 0.658 \text{ m}^3/\text{hr} = 0.183 \text{ L/s}$$

$$Q_L = Q_{sp} \times N_{sp} = 0.183 \times 15 = 2.744 \text{ L/s}$$

$$L = (15-1) \times 12 + 6 = 174 \text{ m}$$

$$N_{sp} = 15 \rightarrow F = 0.363$$

$$H_f = 1.22 \times 10^{-10} \times 174 \left(\frac{2.744}{140} \right)^{1.852} \times (2 \times 25.4)^{-4.87} \times 0.363$$

$$= 2.61 \text{ m}$$

$$H_L = H_{sp} + 0.75 H_f + \frac{1}{2} \times \frac{1}{100} \times 174 + 1.5$$

$$= 30 + (0.75 \times 2.61) + \frac{1}{2} \times \frac{1}{100} \times 174 + 1.5$$

$$= 34.33 \text{ m}$$

$$P_L = 34.33 \times 9.81 = 336.75 \text{ KPa}$$

$$P_{av} = 0.377 L = 0.377 \times 174 = 65.6 \text{ m}$$

$$r_{min} = \frac{S_s}{Q_{sp}} \left(Q_L - CHW \left(\frac{S \cdot d}{K} \right)^{4.87} \right)^{1.852}$$

$$= \frac{12}{0.183} \left(2.744 - 140 \left(\frac{0.01 \times 50.8}{1.22 \times 10^{-10}} \right)^{4.87} \right)^{1.852}$$

$$= 98 \text{ m}$$

$$x_{min} = \frac{98}{174} = 0.56$$

$$\therefore x^3 = 0.1756$$

$$\frac{5}{x} = 0.55$$

$$H_{f_{ox}} = 1.875 \times H_f \left(x - \frac{x}{3} \times \frac{5}{x} \right)$$

$$= 1.875 \times 2.61 \left(0.56 - \frac{0.1756}{3} + \frac{0.55}{5} \right)$$

$$= 1.81 \text{ m}$$

$$H_{min} = H_L - S_p r_{min} - H_{f_{ox}}$$

$$= 34.33 - \frac{1}{100} \times 98 - 1.81$$

$$= 31.55 \text{ m}$$

$$P_{min} = 31.55 \times 9.81 = 309.5 \text{ KPa}$$

$$R_L = N_t \times S_t = 6 \times 48 = 288 \text{ m} \quad L = R_L = 288 \text{ m}$$

$$R = L = 288 \text{ m}$$

مساحة الدائرة

$$A_i = \pi (288)^2 = 260576.26 \text{ m}^2$$

$$R_g = R + r_{ag} = 288 + 22 = 310 \text{ m}$$

$$A_t = \pi (310)^2 = 301907.05 \text{ m}^2$$

$$D_g = \frac{D_m}{E_a} = \frac{60}{0.75} = 80 \text{ mm}$$

$$T_i = \frac{D_m}{E_{Tc}} = \frac{60}{15} = 4 \text{ day}$$

$$N_d = 4 - 1 = 3 \text{ day}$$

$$T_j = 3 \times 18 = 54 \text{ hr}$$

$$Q_s = \frac{D_g \cdot A_i}{T_j} = \frac{0.080 \times 260576.26}{54} = 386 \text{ m}^3/\text{hr} = 107.23 \text{ L/S}$$

$$Q_t = \frac{D_g \cdot A_t}{T_j} = \frac{0.080 \times 301907.05}{54} = 447.27 \text{ m}^3/\text{hr} = 124.24 \text{ L/S}$$

$$Q_g = 124.24 - 107.23 = 17 \text{ L/S}$$

$$V = \frac{2\pi R L}{T_j} = \frac{2 \times \pi \times 288}{54} = 33.5 \text{ m/hr}$$

$$\cos \alpha = \frac{R}{R_g} = \frac{288}{310} = 0.929$$

$$\therefore \alpha = 21.7^\circ$$

$$\theta = 90 - 2\alpha$$

$$\therefore \theta = 46.57^\circ$$

$$A_g = \frac{\theta}{90} \times \frac{\pi}{4} (R_g^2 - R^2) = \frac{46.57}{90} \times \frac{\pi}{4} (310^2 - 288^2) = 5346.6 \text{ m}^2$$

$$A_t = 260576.26 + 4(5346.6) = 281962.8 \text{ m}^2$$

$$\% \Delta A = \frac{4 \times 5346.6}{260576.26} \times 100 = 8.2\%$$

$$r_{25} = 24 \times 6 + 12 = 156 \text{ m}$$

$$Q_{r25} = \frac{107.23}{(288)^2} (2 \times 6 \times 156) = 2.42 \text{ L/S}$$

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 (Q_{sp}) - (Q_s) - (V_r) -
 \end{array}$$

$$TAW = 110 \times \frac{80}{100} = 88 \text{ mm}$$

$$D_n = \frac{50}{100} \times 88 = 44 \text{ mm}$$

~~$$T_i = \frac{88}{8} = 11 \text{ day}$$~~

$$Q_s = \frac{L \cdot L_f \cdot D_g}{T_i}$$

~~$$= \frac{2 \times 1500 \times 57.62}{84.37 \times 3600}$$~~

$$D_g = \frac{44}{0.83 \times 0.92} = 57.62 \text{ mm}$$

$$= 85.37 \text{ L/s}$$

$$(Ra)_{\text{max.sp}} = \frac{80}{0.92} = 86.96 \text{ mm/hr}$$

$$NSP = \frac{300}{10} = 30$$

$$Q_{sp} = \frac{85.37}{30} = 2.84 \text{ L/s}$$

$$Ra = \frac{\pi}{4} \times 80 = 62.83 \text{ mm/hr}$$

$$62.83 = \frac{1500 \times 57.62 \times 0.92}{15 \times T_i}$$

$$\therefore T_i = 84.37 \text{ hr}$$

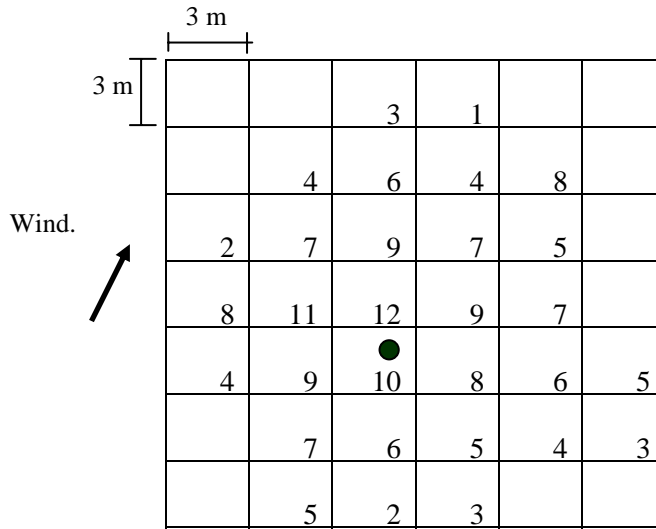
$$V_i = \frac{L_f}{T_i} = \frac{1500}{84.37} = 17.78 \text{ m/hr}$$

$$= 0.3 \text{ m/min}$$

$$T_a = \frac{W}{V_i} = \frac{15}{0.3} = 50 \text{ min}$$

$$1500 = \frac{5.5 \times 20 \times 60 - (2 \times 40)}{\left(\frac{1}{0.3} + \frac{1}{V_r} + \frac{12}{100} \right)}$$

$$\therefore V_r = 1.12 \text{ m/min}$$



بعد تجميع المار الناتج من الدراسات =
 تكون اعمار الحياة المتجمعة

$$\sum x_i = 13 + 13 + 15 + 12 + \dots = 162 \text{ mm}$$

$$\bar{x} = \frac{\sum x_i}{n} = \frac{162}{12} = 13.5 \text{ mm}$$

$$\sum |x_i - \bar{x}| = 0.5 + 0.5 + 1.5 + \dots = 38 \text{ mm}$$

$$d = \frac{9 + 9 + 10}{3} = 9.33 \text{ mm}$$

$$Cu = \left(1 - \frac{38}{162}\right) \times 100 = 76.5 \%$$

$$Du = \frac{9.33}{13.5} \times 100 = 69.1 \%$$

x_i		
13	13	15
12	9	23
11	10	17
12	9	18
$x_i - \bar{x}$		
0.5	0.5	1.5
1.5	4.5	9.5
2.5	3.5	3.5
1.5	4.5	4.5