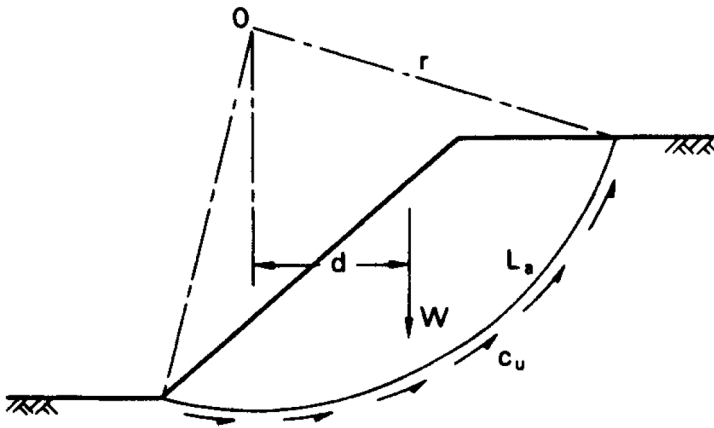




O = origin of slip
 W = weight of sliding mass
 L_a = Length of arc
 r = radius of slip
 d = distance from origin to centroid of sliding mass
 c_u =

$$F_o S = \frac{c_u L_a r}{W d}$$

Question 1

$$c_u = 60 \text{ kN/m}^2$$

$$L_a = 20.5 \text{ m}$$

$$d = 4.8 \text{ m}$$

$$\gamma_{\text{sat}} = 18.5 \text{ kN/m}^3$$

$$\text{Area of Mass} = 75 \text{ m}^2$$

$$r = 13.2 \text{ m}$$

$$\text{Weight} = \gamma_{\text{sat}} \times \text{Area} = 18.5 \times 75 = \underline{\underline{1387.5 \text{ kN/m}}}$$

$$F_o S = \frac{c_u L_a r}{W d} = \frac{60 \times 20.5 \times 13.2}{1387.5 \times 4.8}$$

$$= \frac{16236}{6660} = \underline{\underline{2.44}}$$

STABLE

Question 2

$$c_u = 50 \text{ kN/m}^2$$

$$L_a = 22.3 \text{ m}$$

$$d = 5.2 \text{ m}$$

$$\gamma_{\text{sat}} = 19.2 \text{ kN/m}^3$$

$$\text{Area of Mass} = 80 \text{ m}^2$$

$$r = 14.5 \text{ m}$$

$$\text{Weight} = 19.2 \times 80 = \underline{\underline{1536 \text{ kN/m}}}$$

$$FoS = \frac{C_u L_a r}{W d} = \frac{50 \times 22.3 \times 14.5}{1536 \times 5.2}$$

$$= \frac{16167.5}{8448} = \underline{\underline{1.91}}$$

STABLE

Question 3

$$C_u = 35 \text{ kN/m}^2$$

$$L_a = 25 \text{ m}$$

$$d = 6.0 \text{ m}$$

$$\gamma_{\text{sat}} = 20 \text{ kN/m}^3$$

$$\text{Area of mass} = 85 \text{ m}^2$$

$$r = 15.0 \text{ m}$$

$$\text{Weight} = 20 \times 85 = \underline{\underline{1700 \text{ kN/m}}}$$

$$FoS = \frac{C_u L_a r}{W d} = \frac{35 \times 25 \times 15}{1700 \times 6.0}$$

$$= \frac{13125}{10200} = \underline{\underline{1.28}}$$

STABLE
but close to
failure