
Answers to Selected Problems

CHAPTER 2

- 2-2. A-2-4 (0)
SC
- 2-4. $w = 15.3\%$
 $e = 0.56$
 $n = 36.0\%$
 $S = 72.6\%$
 $\gamma = 122.6 \text{ lb/ft}^3$
 $\gamma_d = 106.3 \text{ lb/ft}^3$
- 2-6. $\gamma = 121.2 \text{ lb/ft}^3$
 $\gamma_d = 105.4 \text{ lb/ft}^3$
 $n = 36.0\%$
 $S = 70.3\%$
- 2-9. $\gamma = 109.8 \text{ lb/ft}^3$
 $G_s = 2.77$
- 2-11. $w = 13.04\%$
 $\gamma = 104.4 \text{ lb/ft}^3$
- 2-13. $\gamma_d = 16.52 \text{ kN/m}^3$
 $e = 0.62$
 $S = 54.3\%$
- 2-17. $e = 0.61$
 $\gamma = 111.2 \text{ lb/ft}^3$
- 2-19. 6.1%
- 2-21. 19.9 lb

CHAPTER 3

- 3-2. 30, 34
- 3-4. 19, 18
- 3-6. 382 lb/ft²
- 3-8. 63 ft; upper layer: moist to dry silty and sandy soils; lower layer: well-fractured to slightly fractured bedrock with moist soil-filled cracks

CHAPTER 4

- 4-1. $\gamma = 116.7 \text{ lb/ft}^3$
 $\gamma_d = 107.0 \text{ lb/ft}^3$
- 4-3. 9 to 19%
- 4-5. $\gamma = 124.2 \text{ lb/ft}^3$
 $\gamma_d = 107.1 \text{ lb/ft}^3$
- 4-7. 2897 m³

CHAPTER 5

- 5-1. $6.56 \times 10^{-4} \text{ ft}^3/\text{s}$
- 5-3. 0.103 cm/s
- 5-5. 0.0342 cm/s
- 5-7. 0.0405 cm/s
- 5-9. 0.485 ft, or 5.8 in.
- 5-11. $1.57 \times 10^{-6} \text{ cm/s}$
- 5-13. 0.00328 ft³/s per ft

CHAPTER 6

- 6-2. 169 lb/ft²
- 6-4. a. $p_{(1\text{m})} = 97.50 \text{ kN/m}^2$
b. $p_{(3\text{m})} = 39.00 \text{ kN/m}^2$
c. $p_{(5\text{m})} = 20.89 \text{ kN/m}^2$
- 6-6. a. 48.50 kN/m²
b. 97.64 kN/m²
- 6-8. 520 lb/ft²
- 6-10. a. 628 lb/ft²
b. 350 lb/ft²
- 6-12. a. 109.5 kN/m of wall
b. 197.9 kN/m of wall
- 6-14. 2.87 kips/ft²

CHAPTER 7

- 7-1. 2.63×10^{-8} cm/s
 7-3. 0.79
 7-5. 0.062 m
 7-7. **b.** 3.66 in.
 7-11. **1.** 37 yr
 2. 0.69 in.
 3. 1.75 yr
 7-13. 0.89 in.
 7-15. 3.06 tons/ft²
 7-17. 13.5 mm

CHAPTER 8

- 8-2. $c = 380$ lb/ft²
 $\phi = 19.5^\circ$
 8-4. 34°
 8-5. 35.4°
 8-8. 1925 lb/ft²
 8-10. 96.0 kN/m²

CHAPTER 9

- 9-2. 12,100 lb/ft²
 9-4. 691 tons
 9-6. 38°
 9-8. 243 kN/m²
 9-10. 5.5 ft by 5.5 ft
 9-12. 91 kN/m²
 9-15. **1a.** 2.50
 1b. 3.40
 2a. 3.58
 2b. 4.87
 9-17. **1.** $q_R = 3.5$ kip/ft²
 $q_L = 0.5$ kip/ft²
 2. 69.6 kips
 3. 148.8 ft-kips
 4. 4.0
 5. 7.2
 6. 3.1

CHAPTER 10

- 10-2. 22.4 kips
 10-4. 83.6 kips

- 10-6. 265 kN
 10-8. 28 ft
 10-10. 20 blows/ft
 10-12. 37.5 tons
 10-14. 382 kips
 10-16. **a.** 557 kips
 b. 444 kips
 c. 444 kips
 10-18. 675 kN
 10-20. $Q_{\max} = 70$ kips
 $Q_{\min} = 10$ kips

CHAPTER 11

- 11-1. 556 kips

CHAPTER 12

- 12-1. 39.58 kN/m of wall
 12-4. 6900 lb/ft of wall
 12-6. 9190 lb/ft of wall
 12-8. 89.0 kN/m²
 12-9. 16,150 lb/ft of wall acting at
 9.41 ft above the base
 12-11. 16,100 lb/ft of wall

CHAPTER 13

- 13-1. **a.** 3.31
 b. 1.96
 c. $q_L = 4.66$ kips/ft²
 $q_R = 0.10$ kip/ft²
 (Notes: $q_L > q_a$ of 4 kips/ft²)
 13-4. $L_{\text{total}} = 6.40$ m
 $s = 0.669$ m
 13-6. 2.20 m

CHAPTER 14

- 14-2. 8.7 ft
 14-4. 1.38
 14-6. 38°
 14-8. 1.86