



نام درس: اصول مکانیک خاک و پی و آزمایشگاه
 کد درس:
 رشته تحصیلی: گرایش:
 مقطع:

صفحه: — از —

سال تحصیلی: نیمسال: اول دوم تابستان بارم:

سؤالات تشریحی
 سوال اول: (نمره ۲)

الف-

$$q = kh \frac{N_f}{N_d} = 2.5 \times 10^{-5} \times 4.00 \times \frac{4.7}{15}$$

$$= 3.1 \times 10^{-5} \text{ m}^3/\text{s} \quad (\text{per m})$$

ب-

point	$h_{(m)}$	$z_{(m)}$	$h - z(m)$	$u = \gamma_w (h - z)$ (kN/m^2)
4	1.07	-2.10	3.17	31.1
7	1.87	-2.40	4.27	41.9

سوال ۲- (نمره ۲)
 راه حل اول:

$$\sigma_1 - u = (\sigma_3 - u) \tan^2(45 + \phi/2) + 2c \tan(45 + \phi/2)$$

$$270 - u = (100 - u) \tan^2(45 + 29/2) + 2 \times 15 \times \tan(45 + 29/2)$$

$$u \cong 36 \text{ kN} / \text{m}^2$$



راه حل دوم:

The modified shear strength parameters are

$$\alpha' = \tan^{-1}(\sin \phi') = \tan^{-1}(\sin 29^\circ) = 26^\circ$$

$$c' = c \cos \phi' = 15 \cos 29^\circ = 13 \text{ kN/m}^2$$

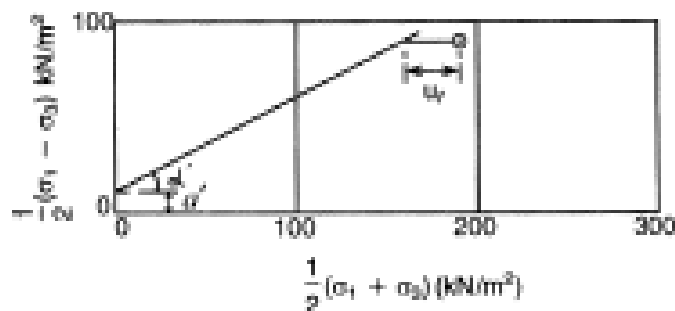
The coordinates of the stress point representing failure conditions in the test are

$$\frac{1}{2}(\sigma_1 - \sigma_2) = \frac{1}{2} \times 170 = 85 \text{ kN/m}^2$$

$$\frac{1}{2}(\sigma_1 + \sigma_3) = \frac{1}{2}(270 + 100) = 185 \text{ kN/m}^2$$

The pore water pressure at failure is given by the horizontal distance between this stress point and the modified failure envelope. Thus from Figure Q4.4

$$u_f = 36 \text{ kN/m}^2$$



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