Homework Assignment No. 11

Due: November 16, 2017

1. What is the shear strength in terms of effective stress on a plane within a saturated soil mass at a point where the total normal stress is 295 kN/m$^2$ and the pore water pressure is 120 kN/m$^2$? The effective stress parameters for the soil are $c'$ =12 kN/m$^2$ and $\phi'$ =30°.

2. A series of drained triaxial tests was carried out on specimens of a sand prepared at the same porosity and the following results were obtained at failure. Determine the value of the angle of shearing resistance $\phi'$.

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|---|---|---|---|---|
| All-round pressure (kN/m$^2$) | 100 | 200 | 400 | 800 |
| Principal stress difference (kN/m$^2$) | 452 | 908 | 1810 | 3624 |

3. The effective stress parameters for a fully saturated clay are known to be $c'$ =15 kN/m$^2$ and $\phi'$ =29°. In an unconsolidated-undrained triaxial test on a specimen of the same clay the all-round pressure was 250 kN/m$^2$ and the principal stress difference at failure 134 kN/m$^2$. What was the value of pore water pressure in this specimen at failure?