GG 455 Laboratory

Experiment 2: Specific Yield

Total porosity is a measure of the volume of the total pore space relative to the total soil volume. However, not all pore space is available for water transport. The porosity available for replenishable storage and transport is called effective porosity. A measure of effective porosity is the specific yield, which is the quantity of water yielded by gravity drainage from a saturated sample of water-bearing material. It is expressed as a percentage of the total volume of the material drained. Theoretically an infinite time is required for drainage; however, in practice, most of the water drains in less than 24 hours. The values measured in this experiment will be considerably less than the specific yield. The term coefficient of drainage (CD) has been used to denote approximate values of specific yield based on a short drainage time. The coefficient of drainage will be determined by draining a measured volume of water ($V_w$) from a column of saturated sand and then observing the rise in the water table with time. The value of CD is given by:

$$CD = \frac{V_w}{V_s}$$

in which $V_s$ is the apparent volume of sand drained at a given time.

**Procedure:**
1. Measure the internal diameter of the tube containing the sand and also of the manometer tube.
2. Record the manometer reading prior to drainage of water from the sand column.
3. Drain about 30 ml of water from the sand column (make sure that the water level in the manometer does not drop below the manometer’s bottom.) Record the exact volume drained ($V_w$).
4. Record the manometer reading immediately after draining, and one reading every 2 seconds for the first 30 seconds, then after 1, 10, 20, and 30 minutes.

**Report will include:**
2. Graph of coefficient of drainage as a function of time.
3. Discussion of errors. Is the volume of water contributed by the manometer tube significant?

Due in one week