

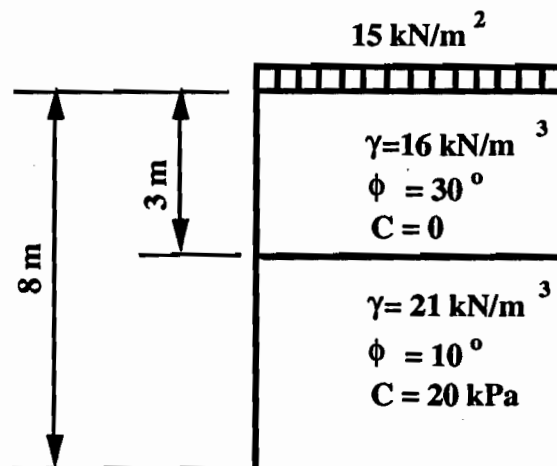
**Problem # 1**

A wall 8 m high retains sand weighing  $15 \text{ kN/m}^3$  dry and  $19 \text{ kN/m}^3$  saturated. The water table is permanently 3 m below the top of the wall. Assume  $\phi = 36^\circ$ .

- Plot the active pressure distribution on the back of the wall, and determine the active thrust,  $P_a$ , and its location (use Rankine's theory).
- Compute the percent change in the overturning moment about the base of the wall if the water table is lowered to the bottom of the wall (does it increase or decrease).

**Problem # 2**

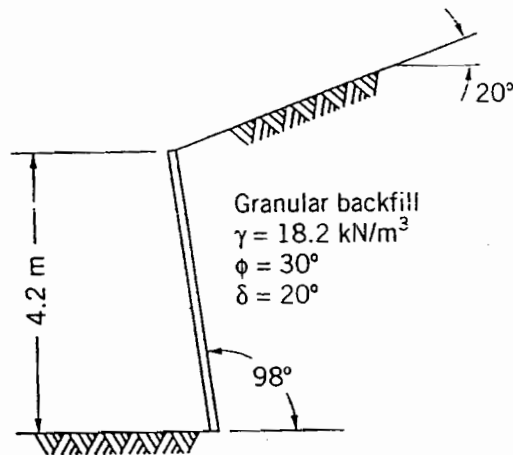
A retaining wall supporting the backfill soils shown in the figure below. Plot the active pressure distribution on the back of the wall, and determine the active thrust,  $P_a$ , and its location (use Rankine's theory).



### **Problem # 3**

For the retaining wall shown below. Using Coulomb's theory:

- plot the distribution of the active pressure and compute the active thrust and its location.
- plot the distribution of the passive pressure and compute the passive thrust and its location.



### **Problem # 4**

A retaining wall supporting a 5 m high backfill is shown below. Determine the active thrust and its location using:

- Rankine's theory.
- Coulomb's theory [assume  $\delta = 2/3 (\phi)$ ].

