

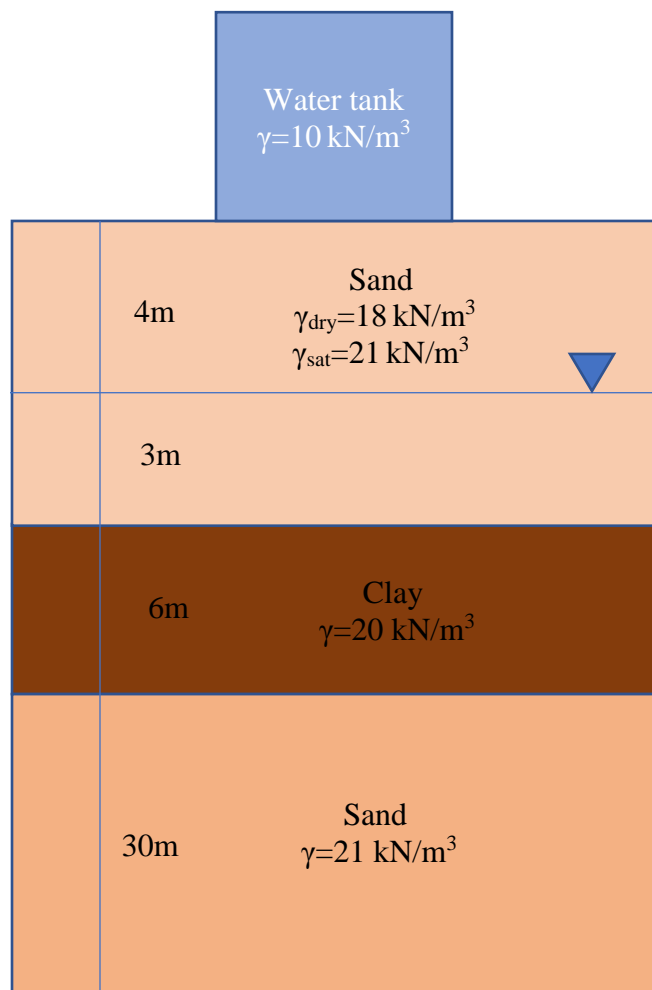
**Birzeit University**  
**Faculty of Engineering**  
**Department of Civil and Environmental Engineering**  
**ENCE 331, Soil Mechanics**  
**Second semester 2020-2021**  
**Final Exam**

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**Question 1: (20 Points)**

A circular water tank with a diameter of 10m is resting on soil profile as shown. the water height in the tank is 10m. Use Newmark's influence chart if necessary.

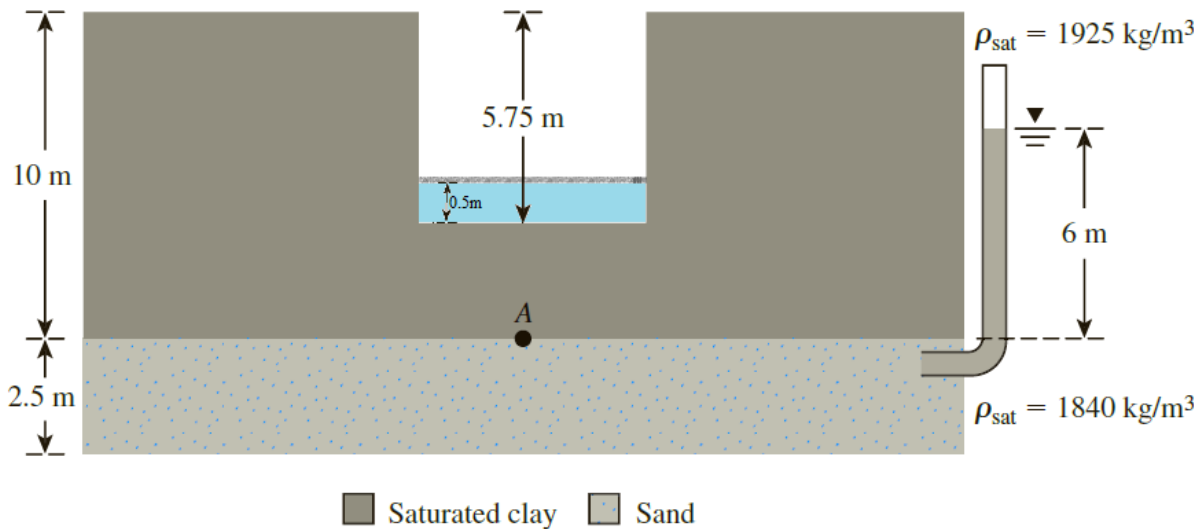
- Given:  $e_0=0.7$ ,  $\sigma_c' =140 \text{ kN/m}^2$ ,  $C_c =0.8$ ,  $C_s=0.07$ ,  $C_v=0.01 \text{ cm}^2/\text{sec}$ , Calculate the expected primary consolidation settlement.
- If the primary consolidation is 30 cm
  1. What is the time in (days) required for 5 cm consolidation settlement to occur?
  2. After 25 days, what is the amount of consolidation settlement?



### Question 2: (20 Points)

A 10-m-thick layer of stiff saturated clay is underlain by a layer of sand. Shown in the figure. The sand is under artesian pressure. A 5.75-m-deep cut is made in the clay. At a given time, the water level inside the cut reaches 0.5m.

- Determine the factor of safety against heaving at point A.



After a while, the water stops flowing into the cut as shown in the figure.

- Explain why did the flow stop?
- Determine the total stress, pore water pressure, and effective stress at point A.

