

Final Exam: Shallow Foundations – CEN 325

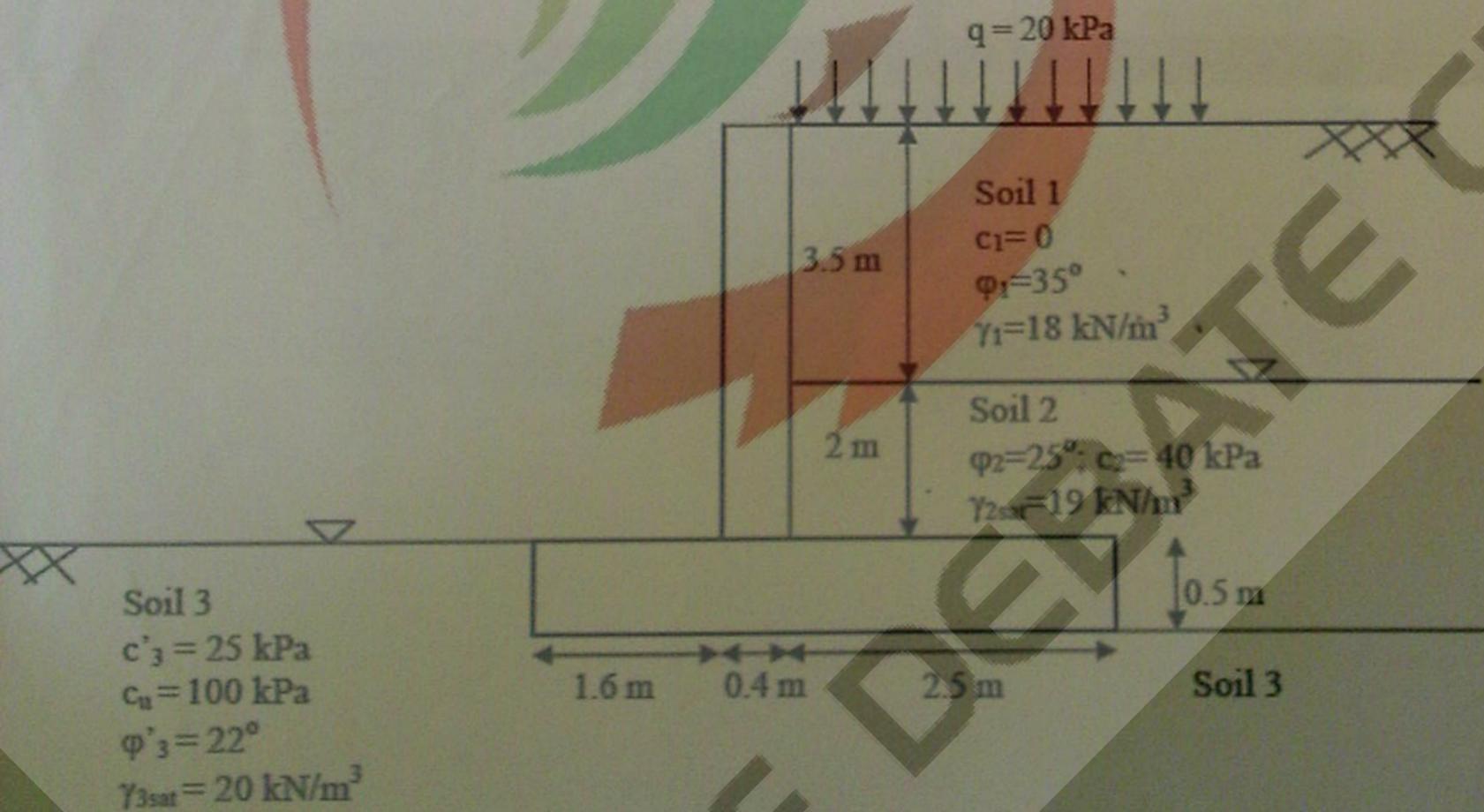
Problem 1

Using Rankine's theory,

- 1- Draw the active and passive earth pressures applied to the following cantilevered retaining wall.
- 2- Determine the safety factor of the following wall with respect to:
 - a- Overturning
 - b- Sliding
 - c- Drained and undrained bearing capacity

N.B: Don't neglect P_p .

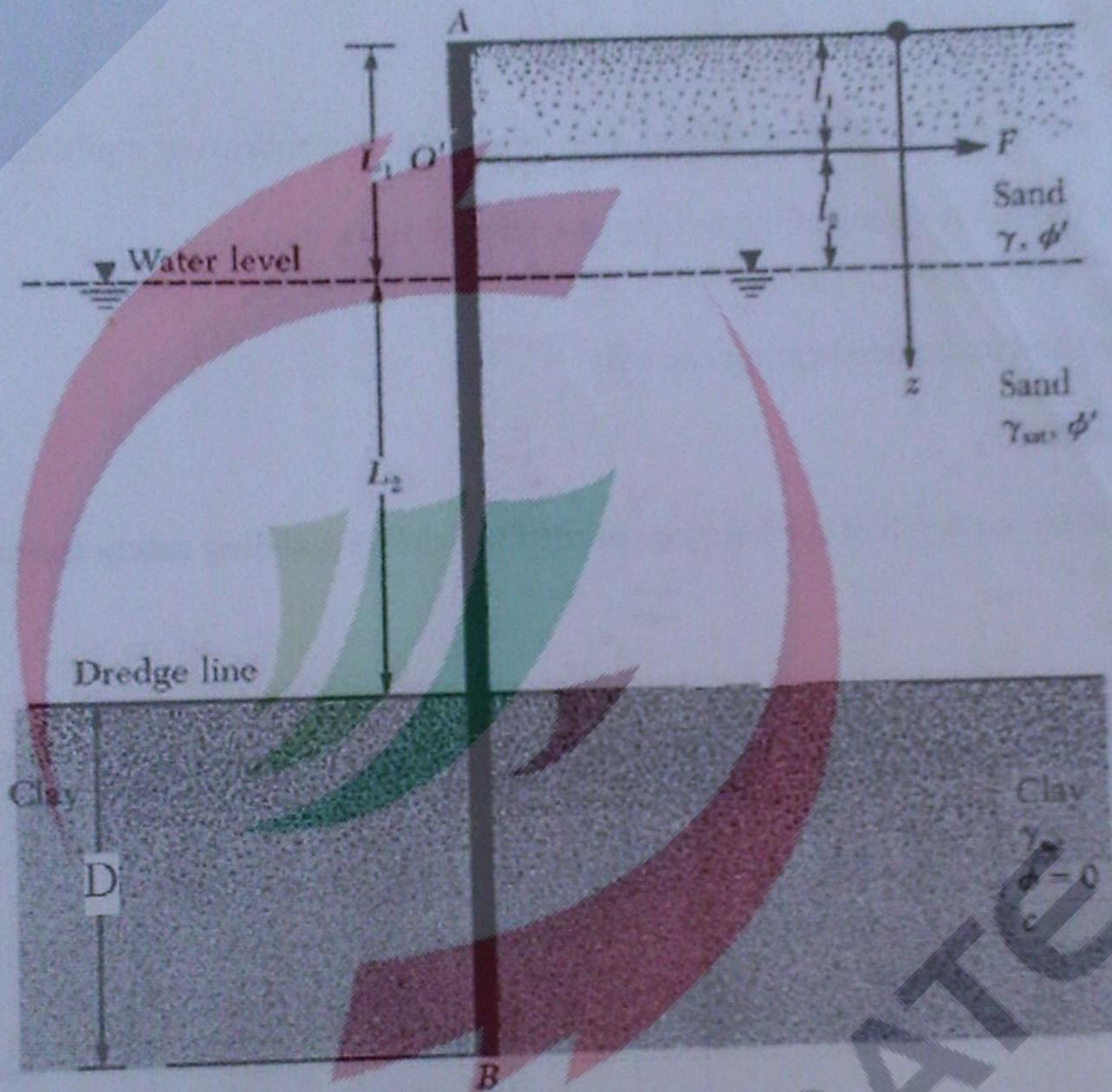
- 3- What would be the depth of the base key needed to achieve a sliding safety factor of 2.5?



Problem 2

Based on the figure below of an anchored sheet pile wall penetrating a clay layer, where $L_1 = 3\text{m}$, $L_2 = 5\text{m}$, $\phi' = 32^\circ$, $c_u = 100\text{kPa}$, $\gamma_{\text{sat, sand}} = \gamma_{\text{sat, clay}} = 22\text{kN/m}^3$, $l_1 = l_2 = 1.5\text{m}$. Find

- 1- The required anchor force.
- 2- The embedment depth D
- 3- The maximum theoretical bending moment developed in the sheet pile wall.



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