Short Answer Questions

1. Brief the principle of effective stress?

2. Brief why the settlement of ground occurs after a drop in water table?

3. Why is it important to calculate the stress increment under a foundation during design?

Calculation Problems

The profile of the ground is shown in Figure 1. The steady ground water table is at a depth of 6 m below the ground surface. 1) Compute the total geostatic stress σ_{cz}, pore pressure u, and then the effective geostatic stress σ'_{cz} at Points A, B, C, D; 2) Plot the total geostatic stress, pore pressure, as well as effective geostatic stress with the depth z.
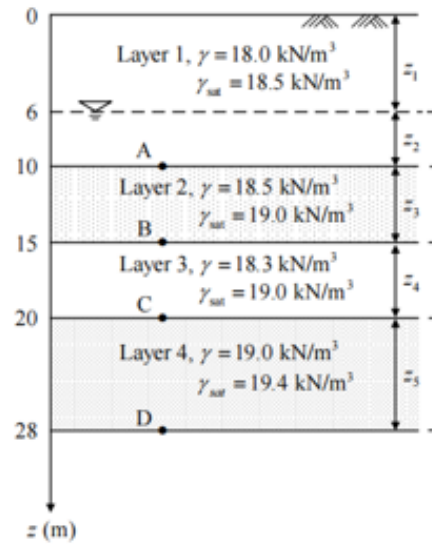

Figure 1: Schematic diagram of the problem

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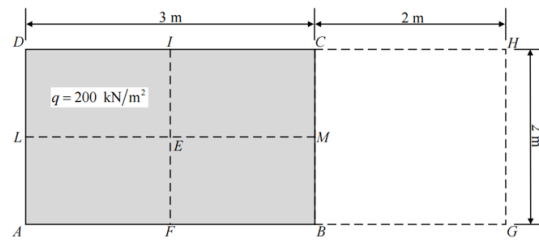A rectangular footing $ABCD$ with net pressure $q = 200$ kPa on the ground is shown in Figure 2. Compute σ_z under Points E, F, B, and G at a depth of 5 m.

Figure 2: Rectangular footing diagram