Short Answer Questions

1. What is soil compaction and how does it differ from soil consolidation?

2. What factors affect the compaction characteristics of a soil?

3. What are the assumptions of Terzaghi's consolidation theory?

Calculation Problems

In an oedometer test, the $e - p$ compression curve is as Figure 2 shows. Determine: 1) The coefficient of compressibility according to two loading stages indicated by point A and B; 2) The coefficient of volume compressibility.
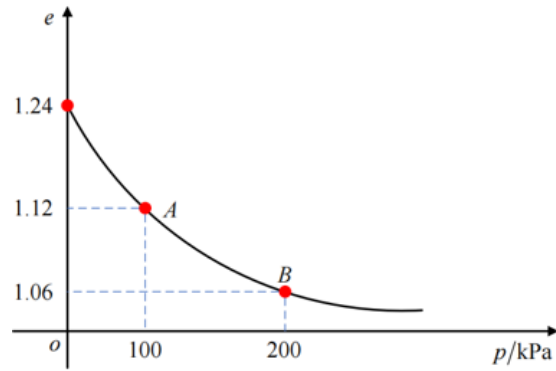

Figure 1: Compression curve of an oedometer test

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A 3 m thick clay layer is sandwiched between dry sand on the top and saturated gravel on the bottom. On top of the sand layer, 1000 kN of a point load is applied.

1. Estimate settlement of the clay layer directly under the loading point. Handle the clay layer as a single layer and assume that it is normally consolidated ($C_c = 0.216, \gamma = 10$ kN/m^3).

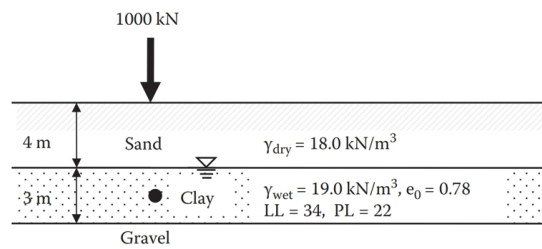2. If it is the distributed load with same magnitude, estimate the settlement of the clay layer

Figure 2: Profile of the ground