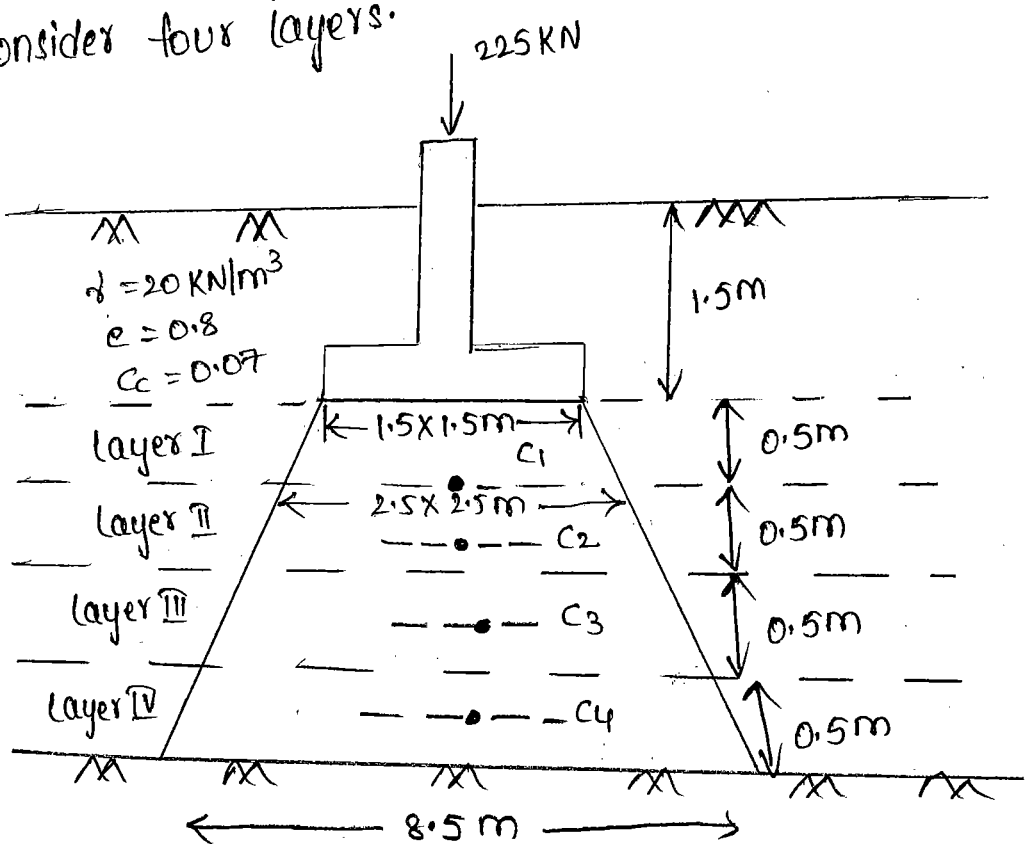
Ex: 9.23 A footing 1.5 m Square is located 1.5 m below the Surface a uniform soil deposit of density 20 KN/m^3. The void ratio of the soil is 0.8 and its compression index is 0.07. If the total thickness of the deposit, which is underlain by rock strata is 3.5 m, compute the primary consolidation settlement of the footing when it carries a load of 225 KN. Use trapezoidal stress distribution (2:1 Horizontal to vertical) and consider four layers.



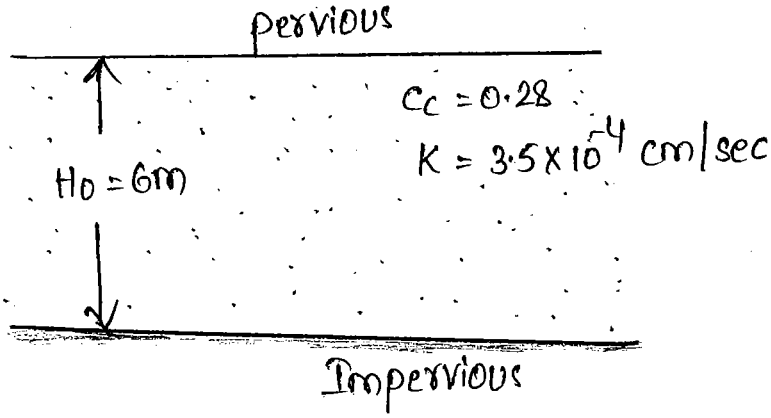
Ex 9.24 A saturated soil stratum 6 metres thick lies above an impervious stratum and below a pervious stratum. It has a compression index of 0.28 and a coefficient of permeability of 3.5×10^{-4} cm/sec. Its void ratio at a stress of 150 KN/m^2 is 1.95. Determine

(i) the change in void ratio due to an increase in stress to 210 KN/m^2

(ii) Settlement of the soil stratum due to the above increase in stress.

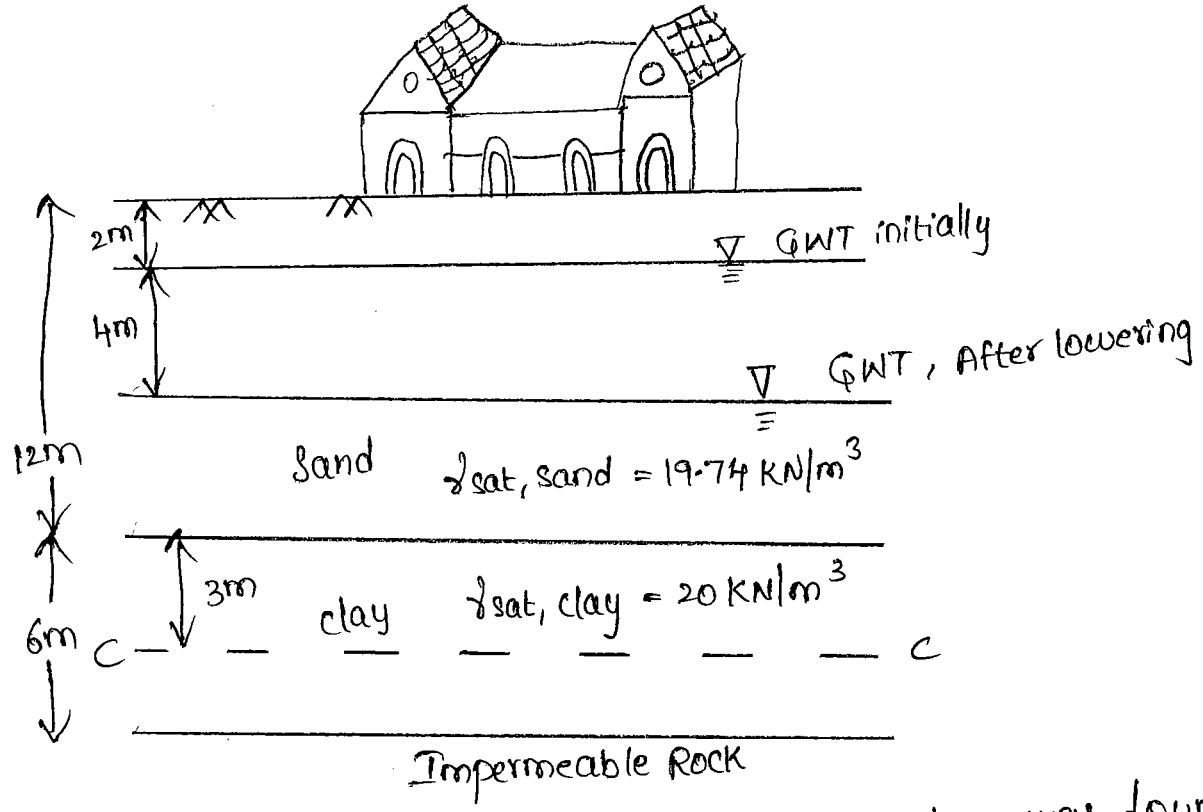
(iii) Time required for 50 percent consolidation. Assume time factor T for 50 percent consolidation as 0.20.

(iv) The amount of settlement which will take place in one hour. The ultimate Settlement of Stratum was found 72 cm. Assume time factor T for 50% consolidation as 0.20.



Ex: 9.25 A building is stands over soil profile shown in figure. Initially the GWT lies at a depth of 2m below Ground surface, above the water table Sand is 65% Saturated. For improving the site conditions, water is pumped from the Sand Strata and GWT falls down to 6m below the Ground Surface. Calculate possible Settlement of building as a result of pumping. The oedometer Analysis of clay Sample gave following results. (Assume linear variation)

pressure (σ) in KN/m^2	150	180	210
void ratio (e)	0.792	0.763	0.750



Ex: 9.26 The coefficient of consolidation (c_v) of a clay was found to be 0.955 mm^2/min. The final consolidation settlement for a 5m thick layer of this clay was calculated as 280 mm. Assuming and below the clay layer, compute the settlement time for

(i) 90 percent primary consolidation (Take $T_v = 0.848$ for $U = 90\%$)

(ii) Settlement of 100 mm.