LECTURE 25

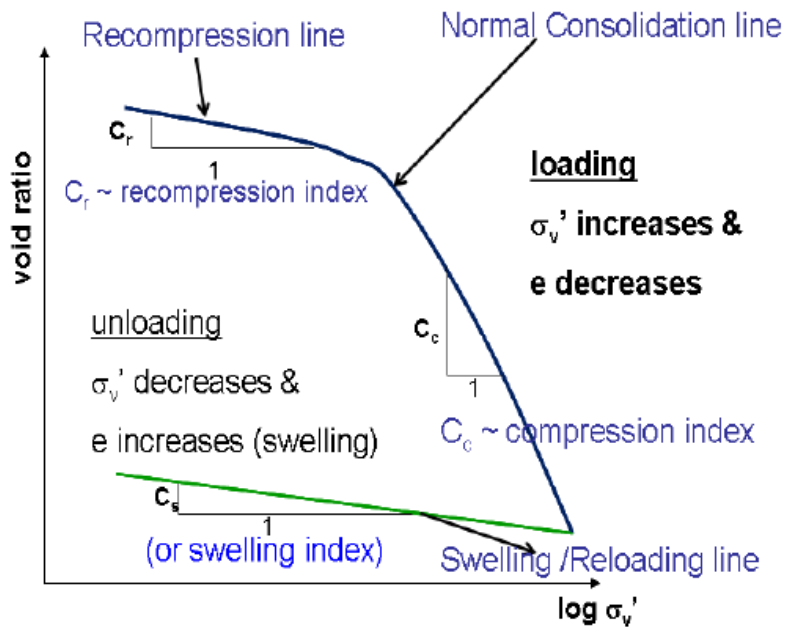**Compressibility Properties-**

Fig.   e – log σ_v' plot

Coefficient of compression/compression index (C_c)
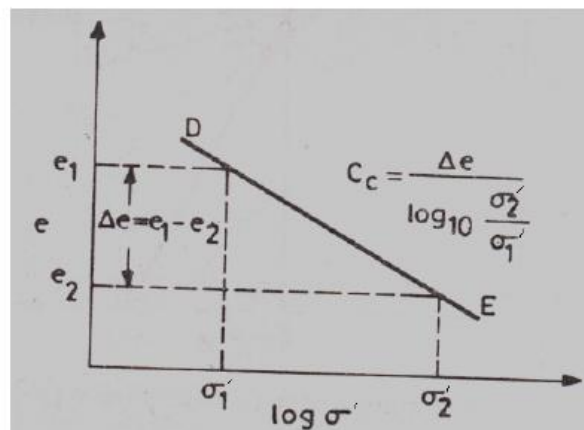

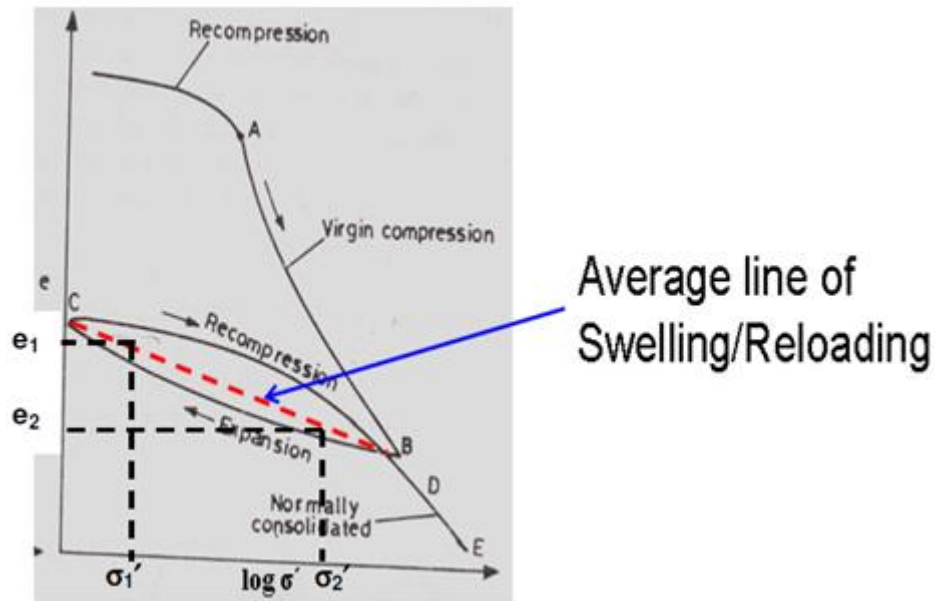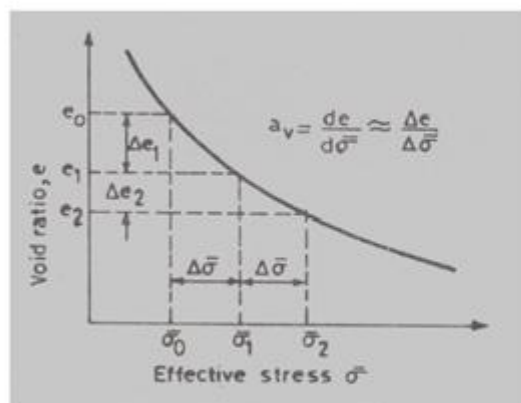Fig.   : e – log σ' plot

Figure: e – log $\sigma_v{}'$ plot

Swelling Index(C_s)

It is the average slope of the unloading/reloading curves in e – logσ' plot given by

$$C_s = \frac{e_1 - e_2}{\log 10 \frac{\sigma'_2}{\sigma'_1}}$$

Co-efficient of compressibility (a_v)

Void ratio versus effective stress plot

It is the slope of the void ratio versus effective stress for a given stress increase $\Delta\sigma'$ in void ratio versus effective stress plot as shown

$$a_v = \frac{\Delta e}{\Delta\sigma'} = \frac{e_1 - e_2}{\sigma'_2 - \sigma'_0}$$

a_v decrease with increase in effective stress

Co-efficient of volume compressibility (m_v)

It is the ratio of change in volume of a soil per unit initial volume due to unit increase in effective stress and is given by

$$m_v = \frac{\Delta e}{(1+e_0)} \frac{1}{\Delta\sigma'}$$

Δe = Change in void ratio
e_0 = Initial void ratio
$\Delta\sigma'$ = increase in effective stress