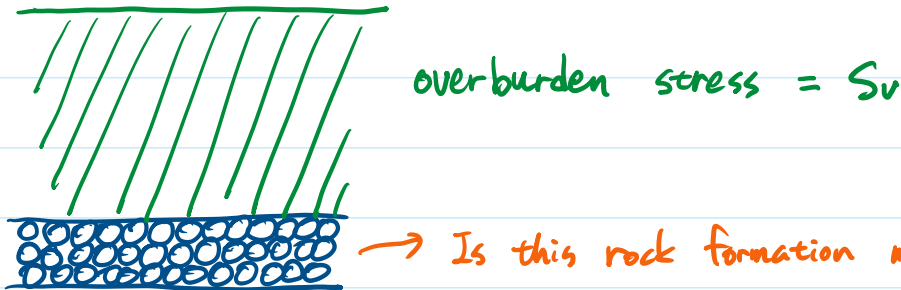


Relation between Total and Effective Stresses

2019년 7월 15일 월요일 오후 11:10



→ Is this rock formation moving?
No, equilibrium

In the rock formation, the grains and the fluid in the pore space support the overburden stress.

how to calculate?

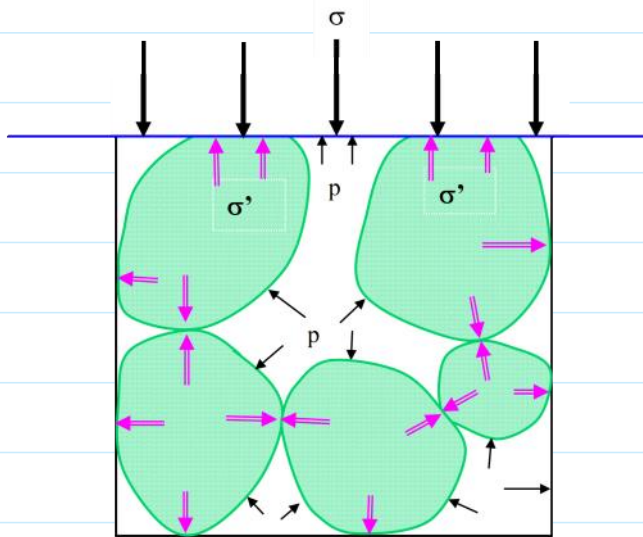
ex) $\rho_b = 2 \text{ g/cc}$, depth = 1 km

$$S_v = 2000 \cdot 9.8 \cdot 1000 = 19.6 \text{ MPa} = 2842 \text{ psi}$$

$$1 \text{ MPa} = 145 \text{ psi}$$

Overburden stress = Grain stress + Pore pressure

Total stress = Effective stress + Pore pressure



From Geomechanics in STARS and GEM 2017 - Presentation

However, because of compaction and cementation,

the whole pore pressure is not used to support S_v .



compacted



cemented



compacted

cemented

Total stress = Effective stress + α · Pore pressure

$$S = \sigma + \alpha p I$$