Contribution ID: **410** Type: **Oral 20 Minutes**

A Terzaghi-Like Principle for Swelling Porous Materials

Wednesday, 16 May 2018 14:37 (15 minutes)

Terzaghi's Principle states that the total stress acting on a porous material can be decomposed linearly into a part that acts on the solid porous structure and the fluid pressure. The result of the Terzaghi's Principle is that the stress-strain relationship for porous media does not have to be re-constructed for every possible fluid pressure –increasing the fluid pressure linearly effects the total stress. This Principle assumes there is only one fluid phase, the solid component and liquid are incompressible, the material is homogeneous, and the drained compressibility coefficient is constant throughout the range of strains (typically small strains). How should this be extended for swelling porous materials, where the liquid pressure is not directly measurable? Here we give a simple derivation, using total differentials and an appropriate choice of independent variables, and derive a Terzaghi-like principle for swelling porous materials.

References

Acceptance of Terms and Conditions

Click here to agree

Primary author: SCHREYER, Lynn (Washington State University)

Presenter: SCHREYER, Lynn (Washington State University)

Session Classification: Parallel 8-F

Track Classification: MS 1.25: Upscaling Porous Materials with Strong Solid-Fluid Interactions