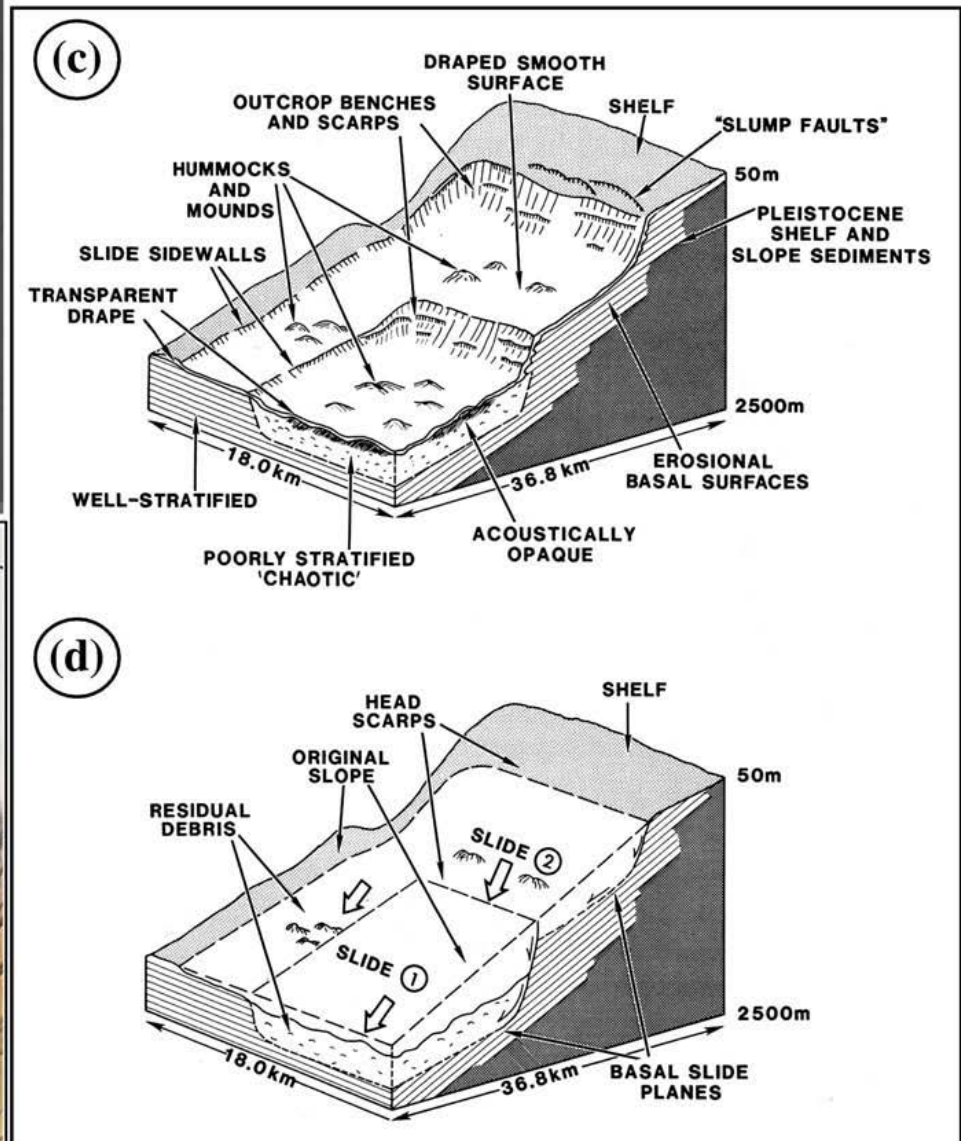
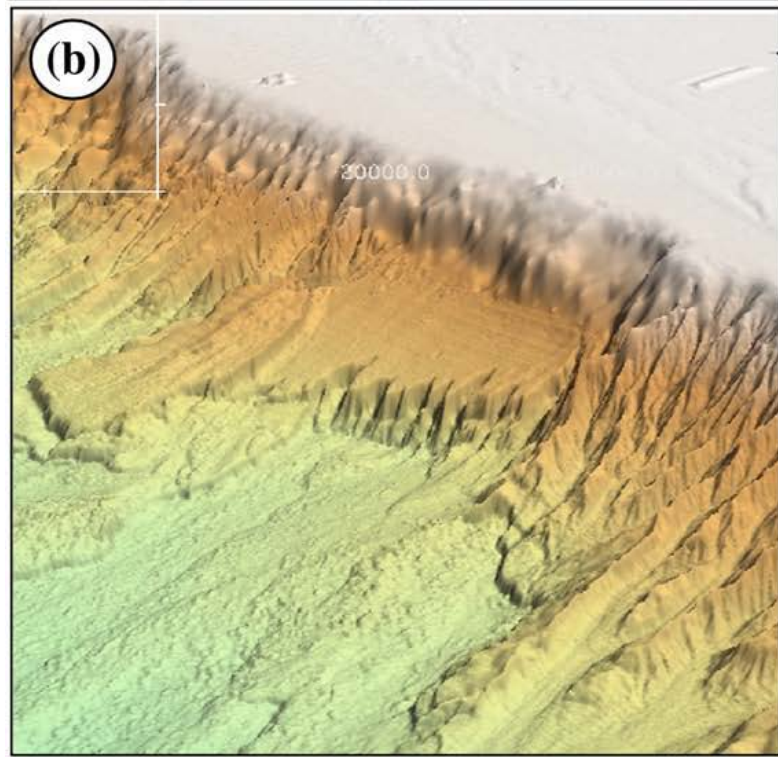
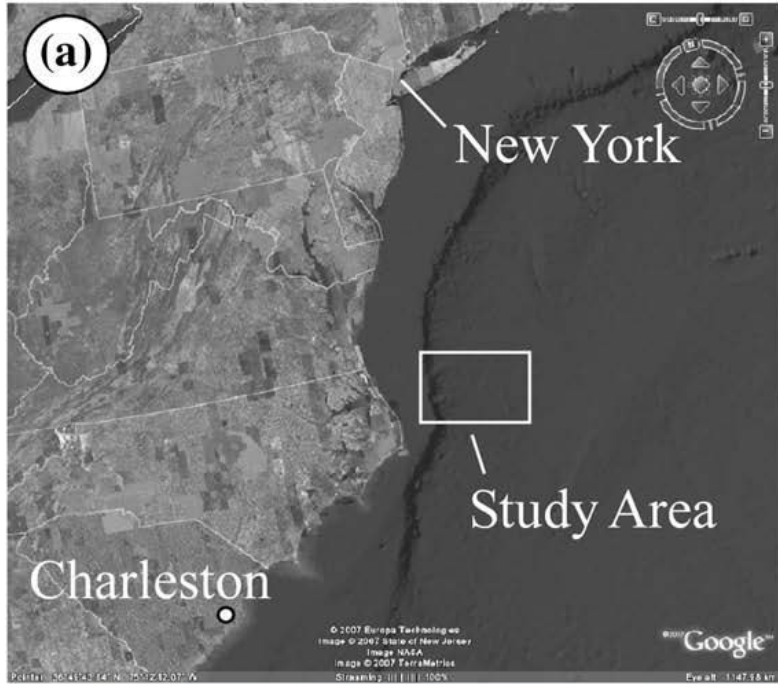


Slope Failures

AdOc 4060 Spring 2013



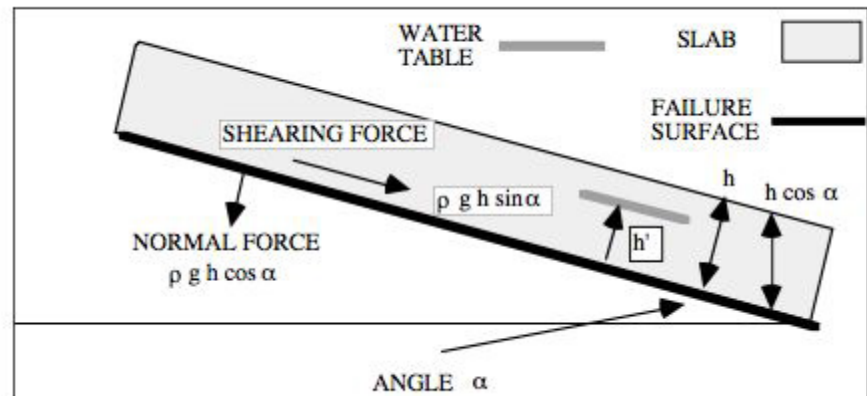
Stability Analysis

s , Shear strength

$$s = c' + \sigma' \tan \theta'$$

where c' Effective cohesion, σ' Effective normal strength, θ' Effective internal friction angle

Undrained and drained cases !



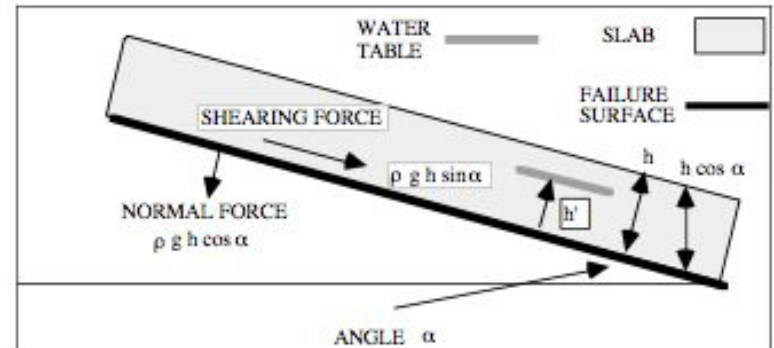
$$F = \frac{\text{RESISTING}}{\text{DRIVING}} = \frac{c + (\sigma - u) \tan \phi}{\rho_{slab} gh \sin \alpha}$$

substituting from the diagram above.....

$$F = \frac{c + (\rho_{slab} gh \cos \alpha - u) \tan \phi}{\rho_{slab} gh \sin \alpha}$$

substituting for u

$$F = \frac{c + (\rho_{slab} gh \cos \alpha - \rho_{water} gh') \tan \phi}{\rho_{slab} gh \sin \alpha}$$



Factor of Safety
Calculating Formula
 Includes pore pressure

Refinements:

- Circular failure surface, what depth ?
- Earthquake ground motions
- Wave cyclic loading (hurricanes, shallow water)
- Liquefaction (earthquakes and waves)

- Run-out
- Halting slope angle