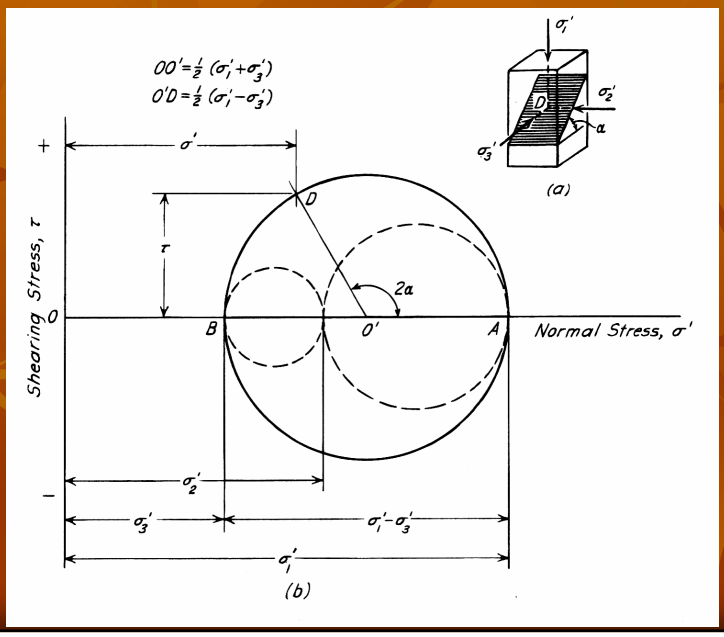
Clase N° 4

Prof: Ricardo Moffat

Círculo de Mohr en 3 dimensiones



Diagramas p-q

- Existen 2 definiciones de p-q
  - Definición del MIT (que utilizaremos en nuestro curso)
  - Definición de Cambridge

p-q (Cambridge)

$$p = \frac{\sigma_1 + \sigma_2 + \sigma_3}{3}$$

$$q = \sigma 1 - \sigma 3$$

p-q (MIT)

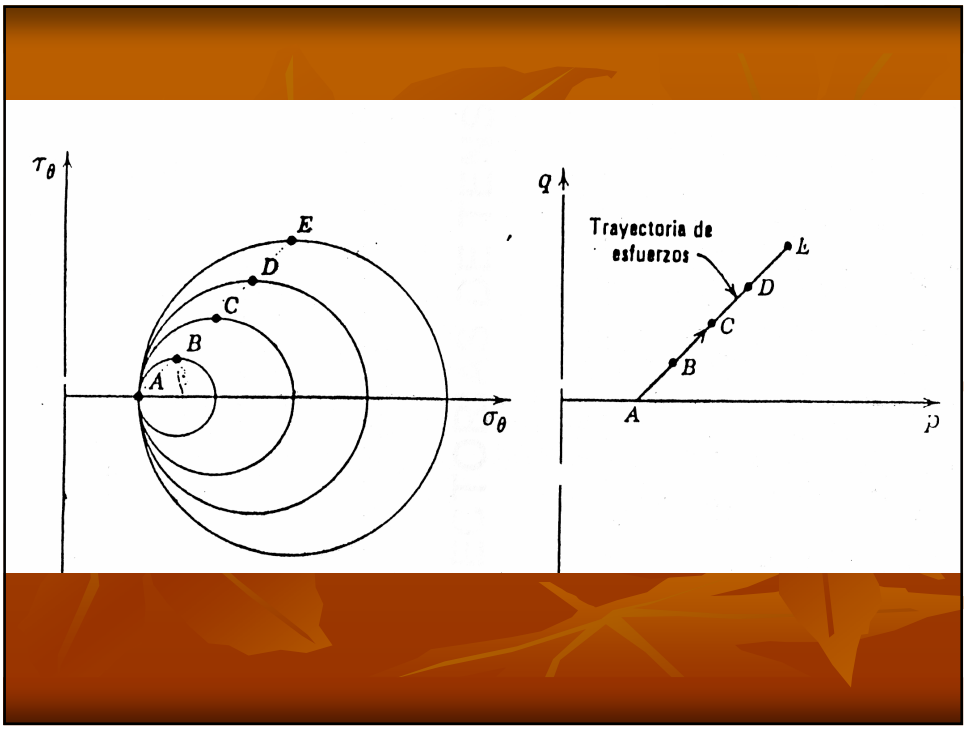
$$p = \frac{\sigma_1 + \sigma_3}{2}$$

en 2 dimensiones

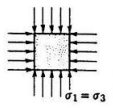
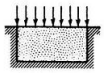
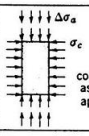
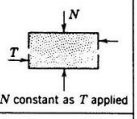
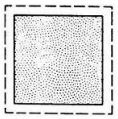
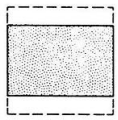
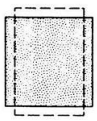
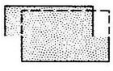
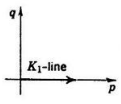
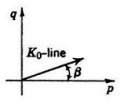
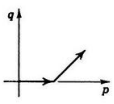
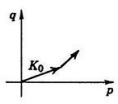
$$p = \frac{\sigma_1 + \sigma_2 + \sigma_3}{3}$$

en 3 dimensiones

$$q = \frac{\sigma_1 - \sigma_3}{2}$$



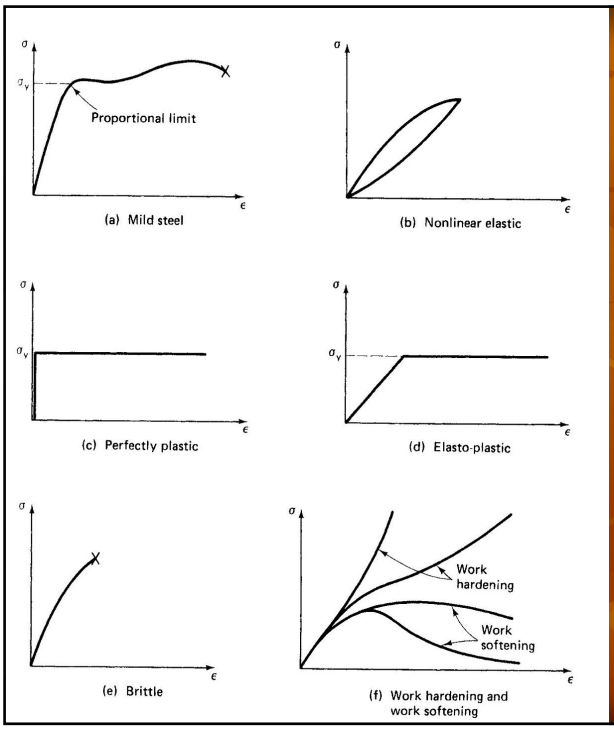
Trayectoria de tensiones

Test	Isotropic compression	Confined compression (oedometer)	Triaxial compression	Direct shear
Basic conditions		 No horizontal movement		
Type of deformation	Volumetric 	Primarily volumetric but some distortion 	Distortion and volumetric 	Primarily distortion, but some volumetric 
Stress path				
Uses	For study of purely volumetric strains	Very simple; approximates certain field conditions	Most common test for studying stress–strain and strength properties	Simple test for measuring strength

Common types of stress-strain tests.

Criterio de falla Mohr-Coulomb

- Círculo de Mohr
- Relaciones de esfuerzo deformación
- Criterio de falla Mohr-Coulumb



Esfuerzo - Deformación

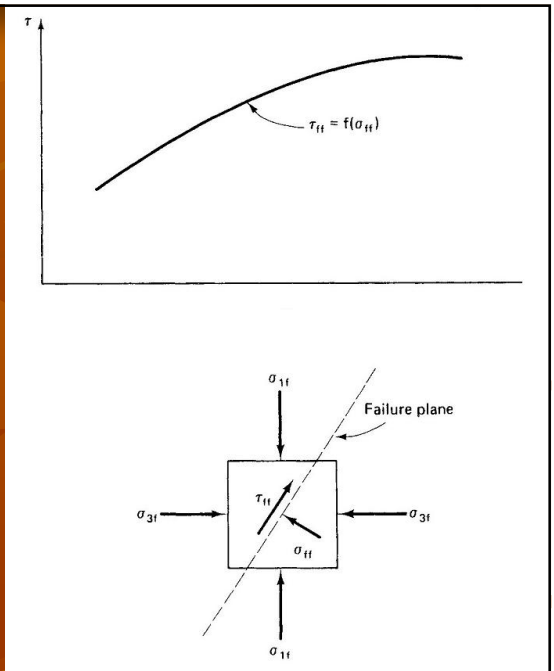
¿Cómo definir falla?

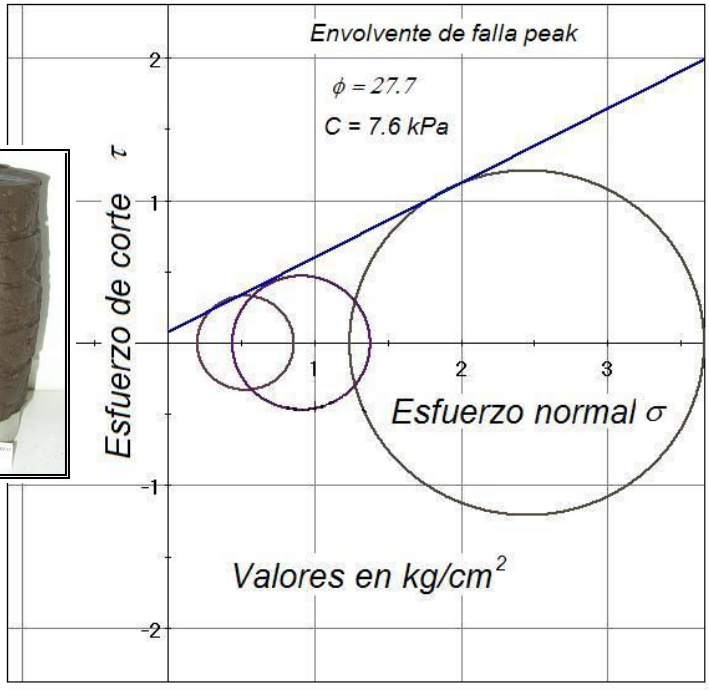
En suelos

- Comportamiento no lineal
- Comportamiento inelástico
- Dependiente del estado de esfuerzos
- Dependiente de la historia de esfuerzos
- Anisotrópico
- Dependiente del tiempo

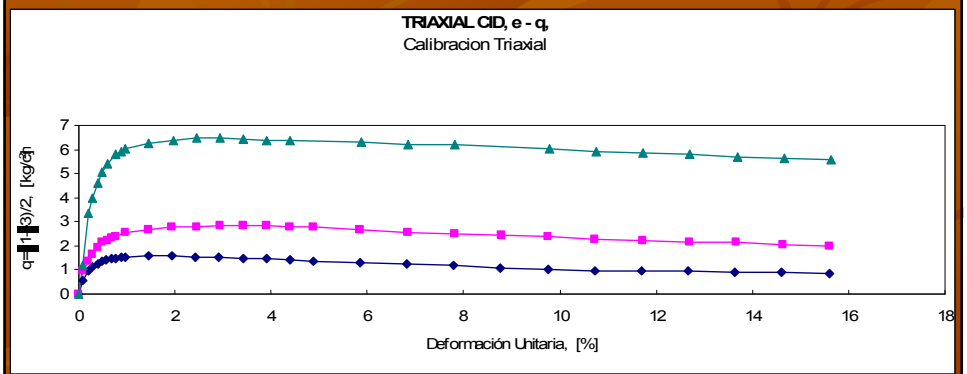
El criterio de falla más común en suelos es el de Mohr-Coulomb

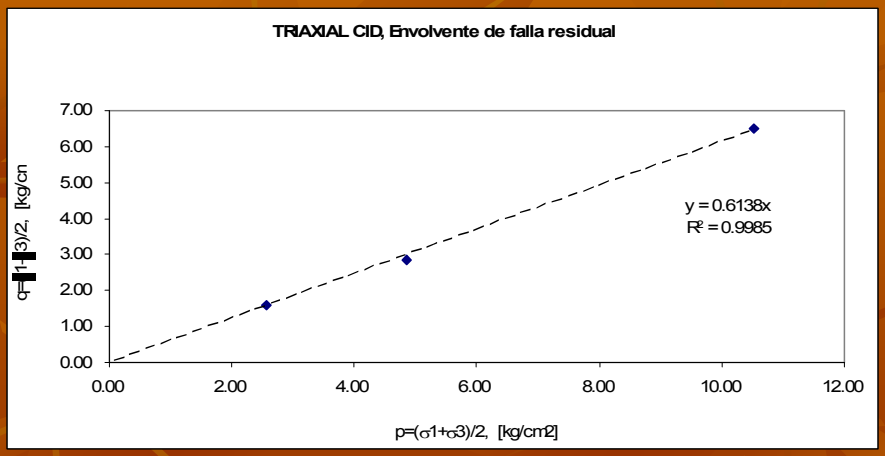
Mohr (~1900) dijo que un material falla en un plano, cuando ese plano alcanza un valor único en función de la tensión normal en tal plano





Ensayos triaxiales arena normalizada





$\phi = 38°$
$C = 0$

- Observaciones:
  - Factor de seguridad a la falla
  - Segunda mitad de la envolvente de falla
  - ¿Por qué no falla en ángulo de 45°?
  - Distintas envolventes (sólo fricción, sólo cohesión, ambas)

Probeta cilíndrica de hormigón

?