

3) UU behavior

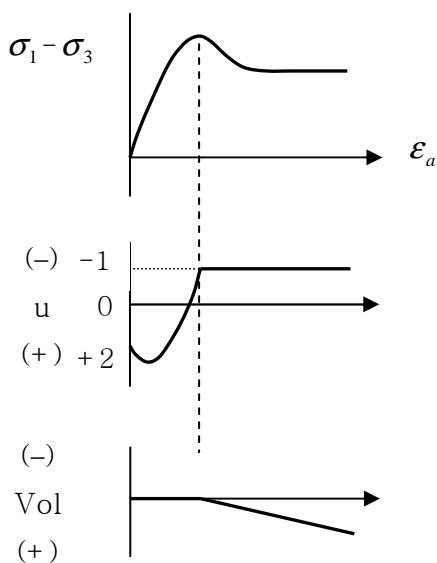
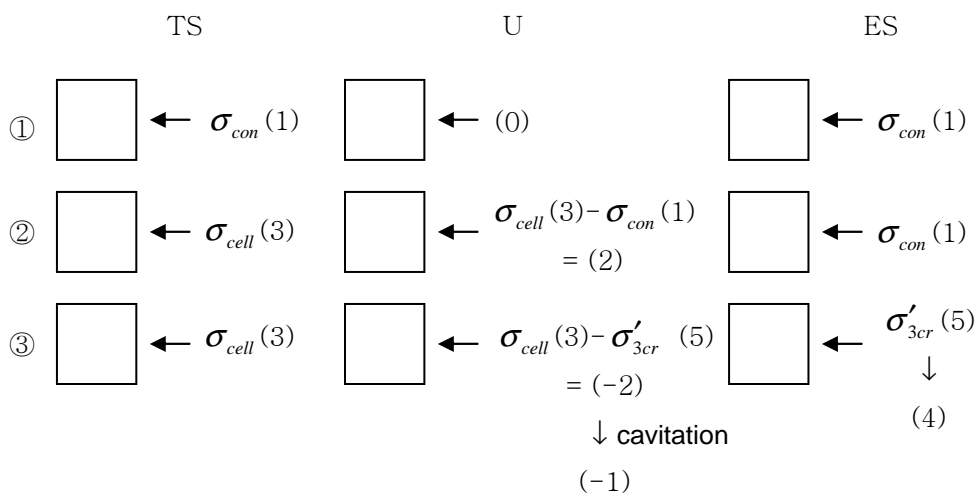
To run test

- ① Apply a pressure to sample, σ_{con} (For example, 1 atmosphere pressure), so that sample can stand “self-supported” in TX cell.
- ② Close drainage lines and apply cell pressure, σ_{cell} .
- ③ Load sample to failure by increasing vertical stress.

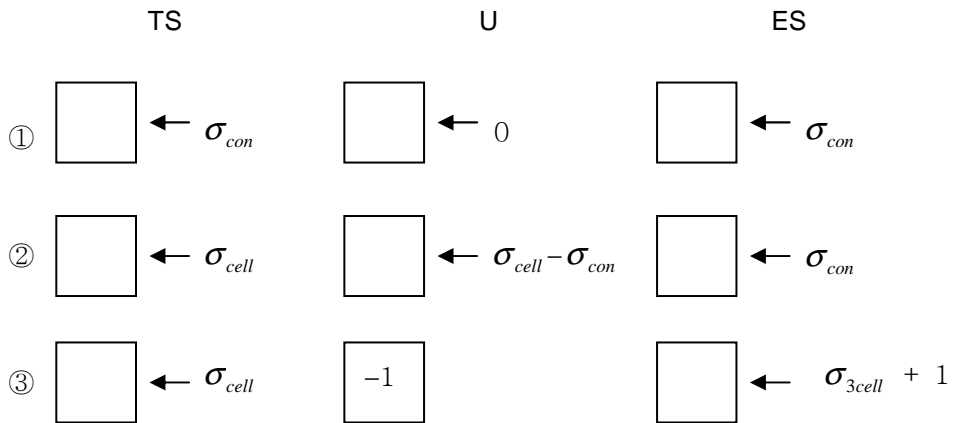
Example

In case of $\sigma'_{3cr} = 5$ atmosphere pressure, $\sigma_{con} = 1$, $\sigma_{cell} = 3$.

* look at lateral stresses

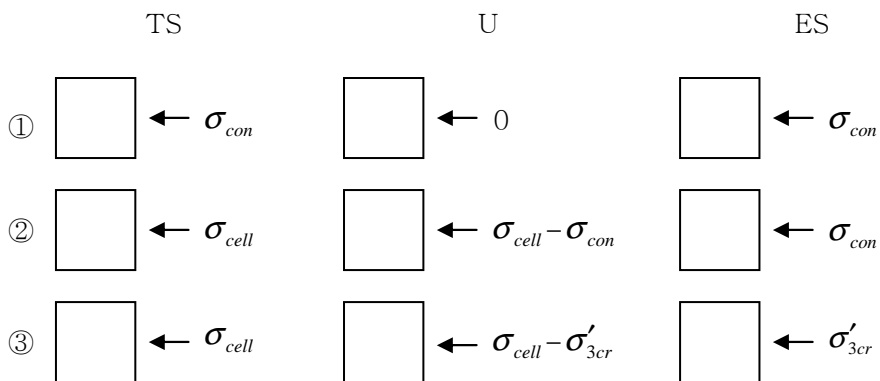


A) $\sigma_{cell} \leq \sigma'_{3cr} - 1$

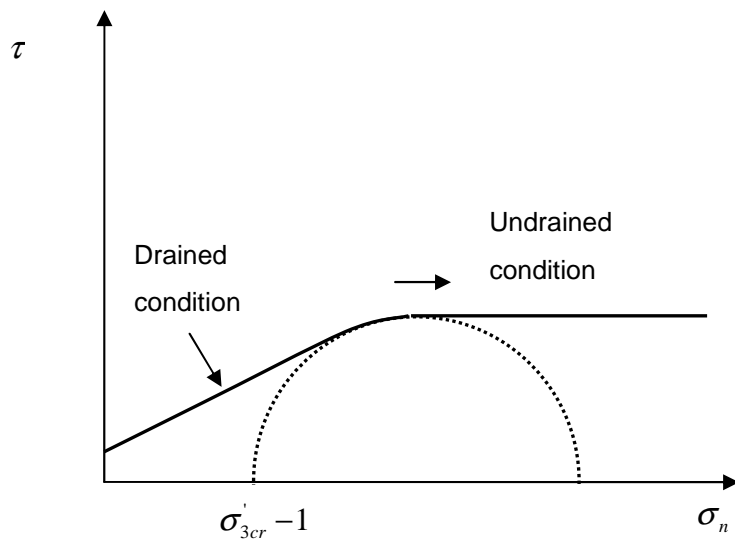
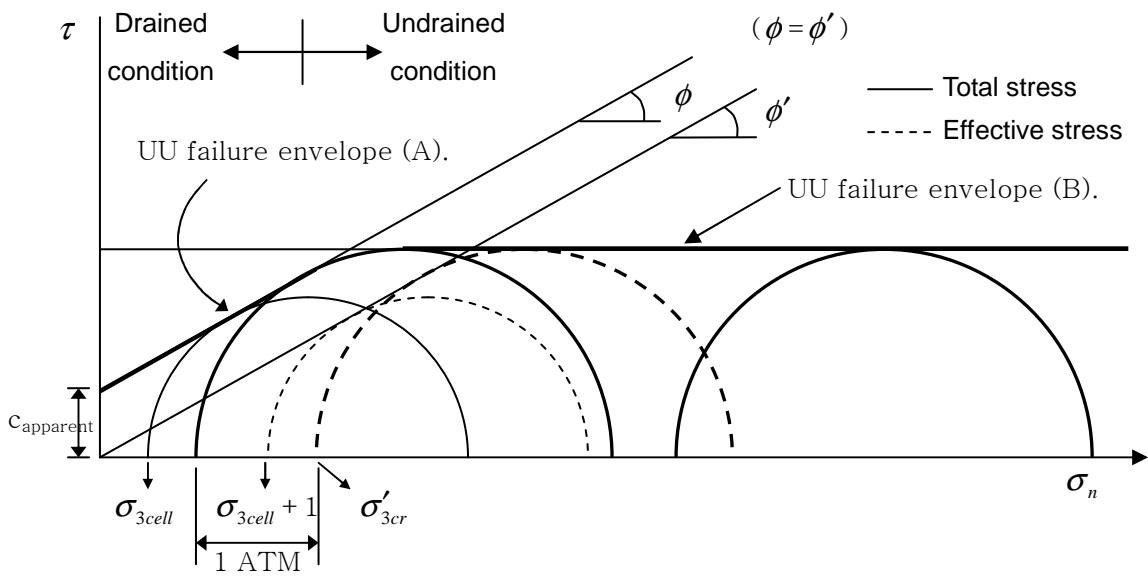


And compression occurs (+ ΔV)

B) $\sigma_{cell} > \sigma'_{3cr} - 1$



No volume change

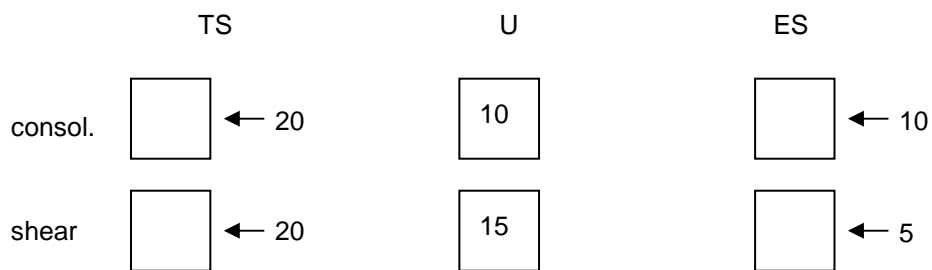


4) Comparison between Drained & Undrained Behavior → Clay
 (To evaluate critical condition for design).

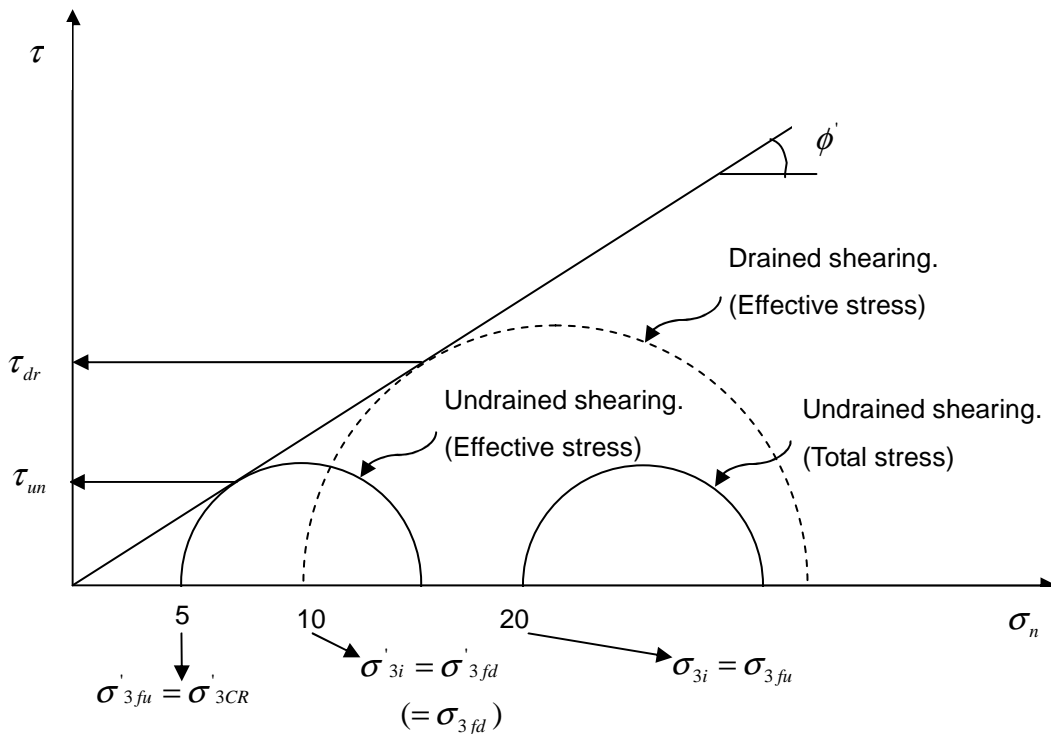
Run CIU Test. (Say $\sigma'_{CR} = 5$).

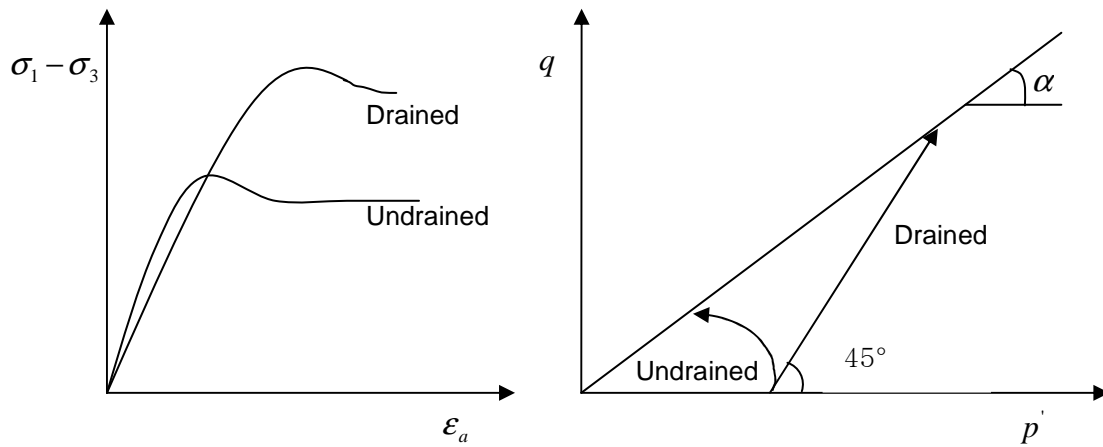
⊙ Test (a)

$$\sigma'_{3cell} = 10, u_b = 10 \Rightarrow \sigma_{3cell} = 20.$$



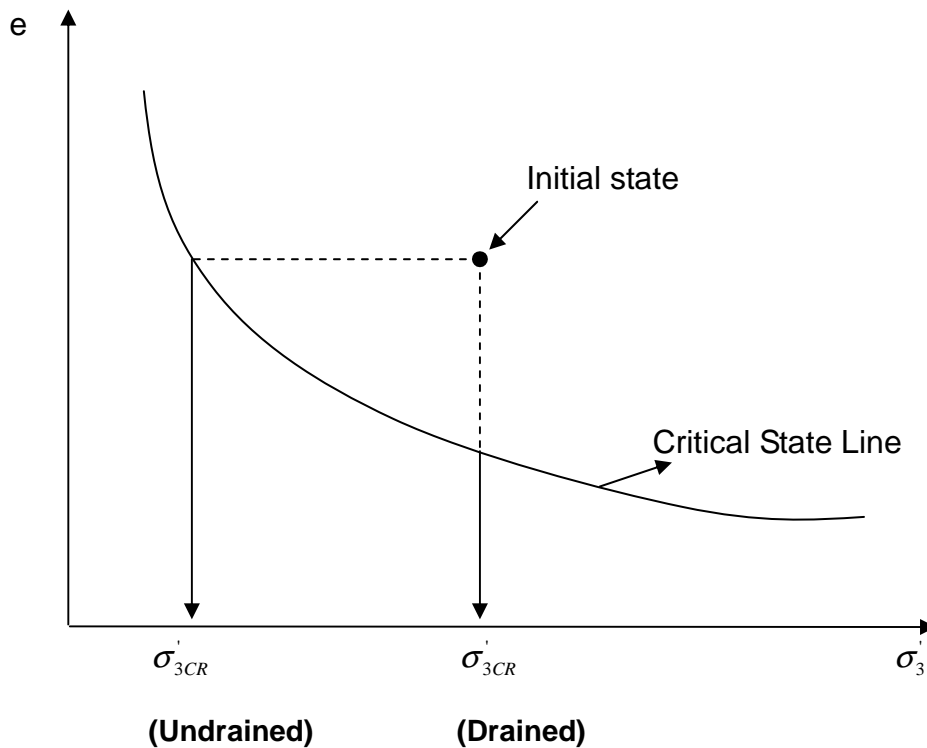
● Mohr's Circle





$\sigma'_{3initial} (= \sigma'_{3cell}) > \sigma'_{3CR}$ (i.e. Loose sand or NC).

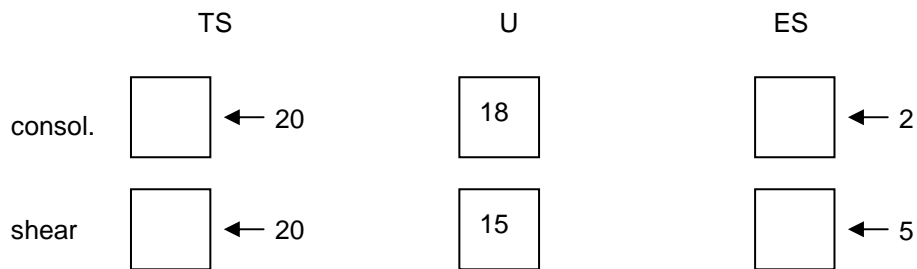
\Rightarrow Undrained strength should be used for loading (TXC) conditions.



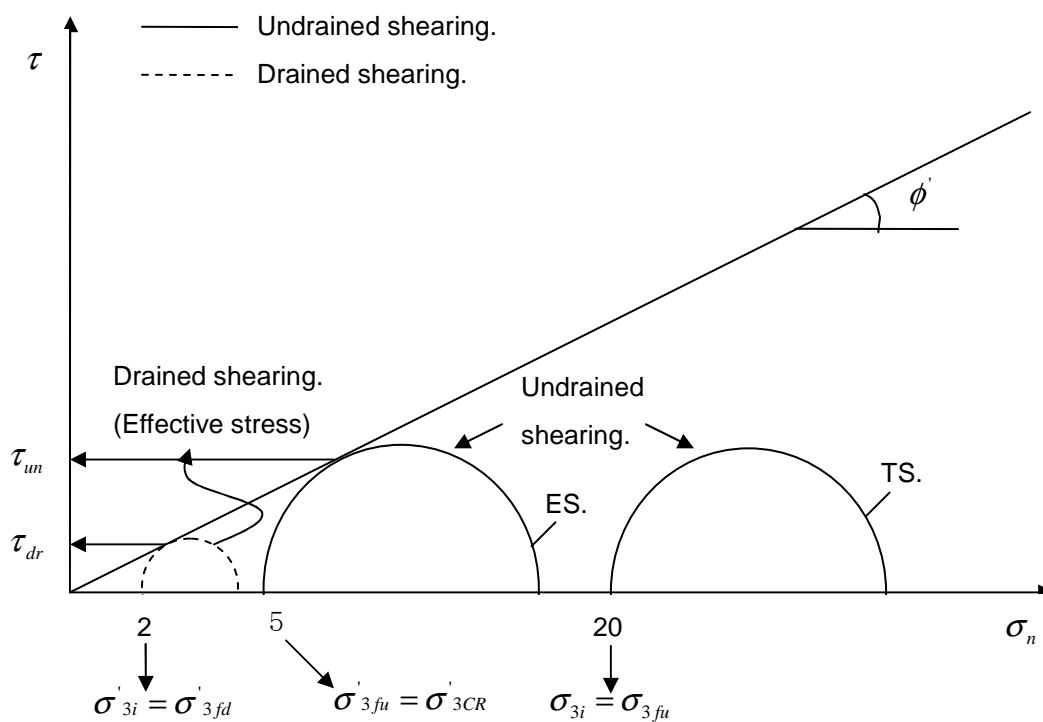
⊙ Test ⊙

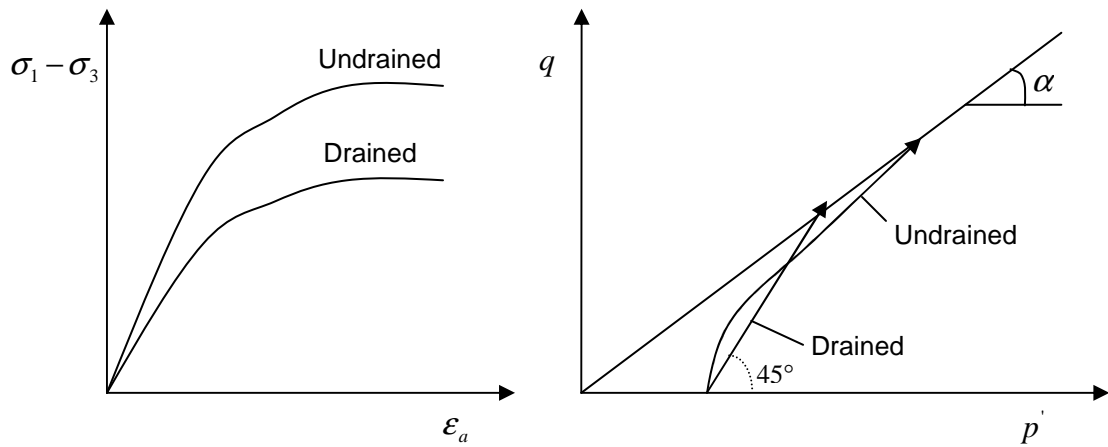
$$\sigma'_{3cell} = 2, u_b = 18 \Rightarrow \sigma_{3cell} = 20 (\sigma'_{3CR} = 5).$$

$$\Rightarrow \sigma'_{3cell} < \sigma'_{3CR}$$



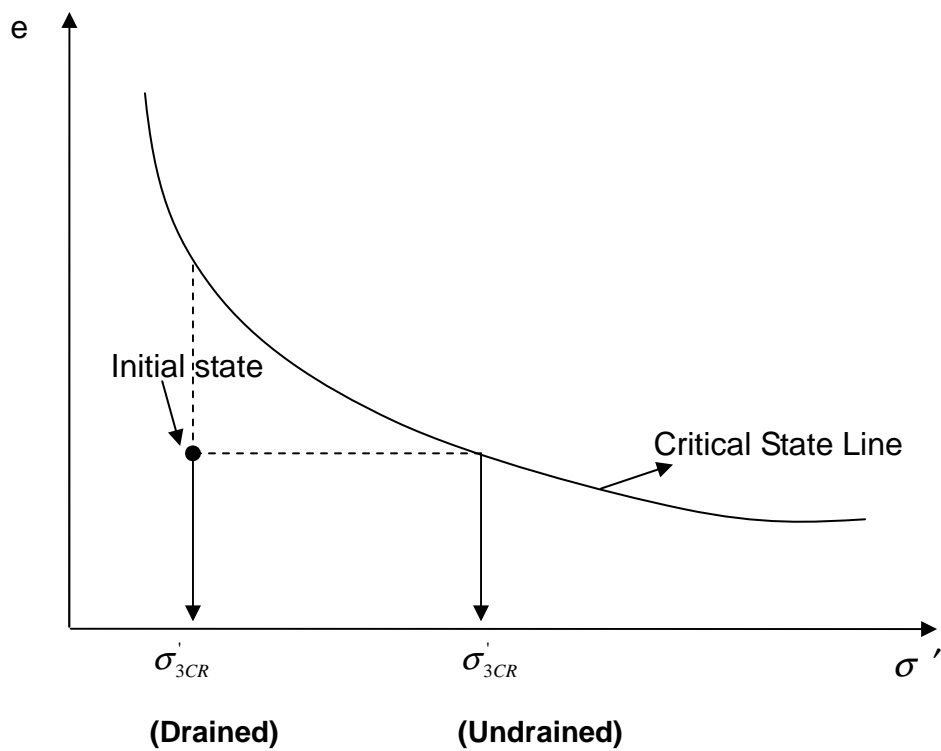
● Mohr's Circle





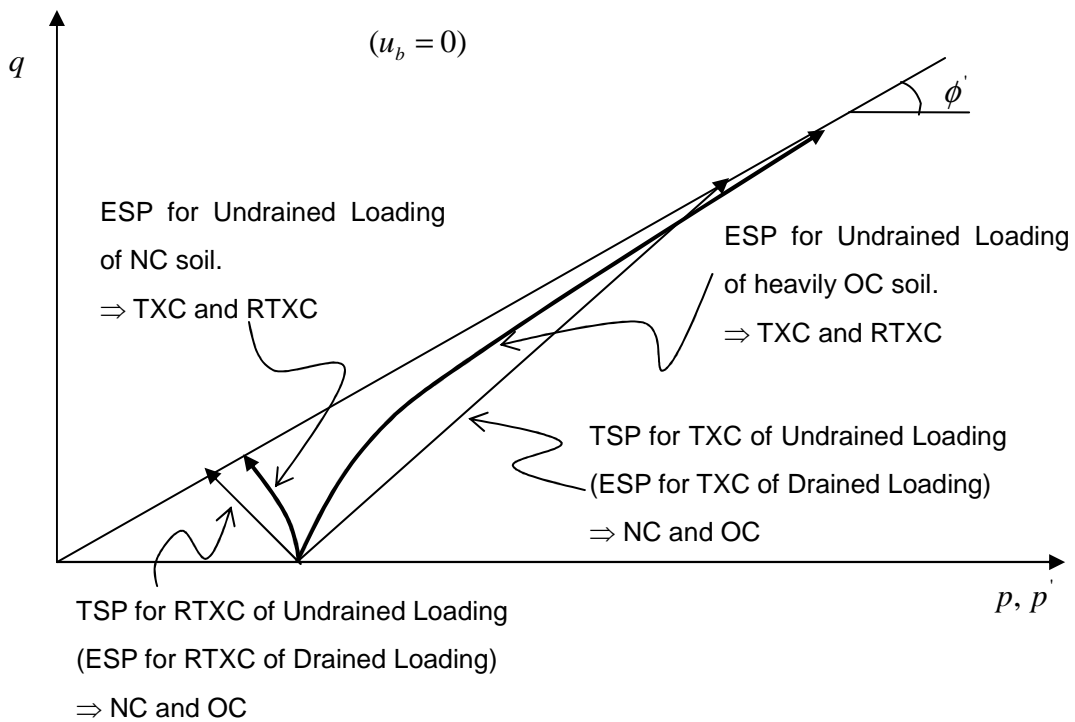
$\sigma'_{3initial} < \sigma'_{3CR}$ (i.e. Dense sand or OC clay)

⇒ Drained strength should be used for loading (TXC) conditions.



● **Comparison of Drained and Undrained Strength for Stress Paths in Compression Loading**

(Loading and Unloading for Triaxial Compression).



	NC Soil.	Heavily OC soil.
TXC	$CD > CU$	$CD < CU$
RTXC	$CD \approx CU$	$CD \ll CU$