1 Scope

This test method covers the determination of the unconfined compressive strength of cohesive soil in the undisturbed, remolded, or compacted condition, using strain-controlled application of the axial load.

2 Significance and Use

The purpose of this test is to quickly obtain the approximate compressive strength of soils that possess sufficient cohesion to permit testing in the unconfined state. The test represents short-term conditions including rapid loading, construction, and undrained conditions.

3 Apparatus

- Soil sample
- Sample form and manual rammer for compaction
- Sample extruder
- Knife
- Sample holder
- Calipers
- Pressure chamber
- Porous stones
- Transducers - force, displacement, and pressure
- Shearing apparatus
- Computer - Geotech Data Logger program
- Digital voltmeter

3.1 Procedure

1. Obtain your soil sample. Determine the appropriate amount of water to add to your soil in order to achieve the desired water content.

2. Add the appropriate amount of water to your soil and mix thoroughly. You need to have the same water content throughout your sample.
3. Compact the clay using the sample form and manual rammer just like we did in a previous lab.

4. After compaction, extrude the sample from the mold.

5. Cut the sample in half, lengthwise. Each lab group should take half of the original sample.

6. Place the sample in the holder.

7. Carefully shave the sample so that you end up with a cylindrical clay sample. Start off shaving on the side of the sample holder where the knife is against the edge but does not cut all the way to the core of the sample. Once the sample gets close to being done, turn the sample holder so that the knife can cut up against the side of the sample.

8. Take the cylindrical sample and lay it horizontally on the sample holder. Using the edge of the holder, cut the ends off of the sample so that they are square. You want to end up with a sample about 3.75in. long.

9. Disassemble the compression chamber.

10. Place a porous stone on top of the base and the cylindrical sample on top. Place the other porous stone on top of the sample.

11. Place the compression chamber case onto the base. Hold the plunger at the top while you do this so that it doesn’t disturb the sample.

12. Place the three vertical bars on the chamber to lock it in place. Drop the bars in place, putting the circular end first into the bottom.

13. Place the compression chamber onto the loading frame and set it up as instructed.

14. Start the computer and the machine.

15. Allow the computer to take readings. Stop the program once the readings level out.

3.2 Results

The following things need to be included in the results for your lab report:

- Force versus time plot.
- Displacement versus time plot.
- $\sigma$ versus $\epsilon$ plot.
- $\sigma$ versus $\tau$ plot including Mohr’s circle.
- Values for $S_u$ and $q_u$. 