**Experiment No. 04**

**Determination of Unconfined Compressive**

**Strength of soil**

**Designation:**

* ASTM: D 2166-00

**Apparatus:**

* Unconfined Compression Test Apparatus
* Sample Trimming equipment
* Weighing balance
* Springs of different spring rates
* Containers for moisture content determination
* Timer
* Oven

**Procedure:**

* Extrude the soil sample from Shelby Tube Sampler.
* Cut a soil sample such that the ratio “L/D” lies in between 2 and 2.5.
* Measure the exact diameter of top of the specimen at three different locations (120o apart), both at top and bottom of the sample and take the average diameter from the above measurements.
* Measure the exact length of the specimen at three different locations and take its average value.
* Weigh the sample on a weighing balance.
* Carefully place the specimen in the compression testing device and centre it on the bottom plate.
* Adjust the apparatus such that the upper plate just makes contact with the specimen and set the spring in the apparatus.
* Adjust graph on front of the apparatus and apply loading by rotating the liver at a constant rate (strain is applied at a rate of 0.5 to 2.0% per minute).
* After failure remove the sample from the compression testing machine and find out its moisture content for further calculations.
* The largest value of load per unit area or load per unit area at 15% strain, whichever occurs first, is known as Unconfined Compression Strength, qu..
* Internal cohesion “C” is taken as one half of the Unconfined Compression Strength, qu.i.e.;

 C = qu / 2

**Limitation:**

* In an unconfined compression test, since there is no lateral support, the soil sample must be able to stand alone in the shape of a cylinder. A cohesion less soil (such as sand) cannot generally stand alone in this manner; hence this test procedure is usually limited to cohesive soils.

**Observations:**

Initial diameter of sample, do = ----------------- mm

Initial height of sample, ho = ----------------- mm

Weight of sample, w = ----------------- kg

Spring Rate = ---------------- N/mm

Spring Extension

(Reading of graph on y-axis) = ------------------ mm