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| **Course Name** : CE 363 | **Date of Testing**: 10.05.2010 |
| **No. and Title of Test** : SML 22 Consolidation Test on An Undisturbed Clay | |
| **Year and Section**: 3rd Year, Section 1 | **Lab. Group** : 4 |
| **SURNAME, Other names of student**: | |

# OBJECT

The object of this experiment is to determine, for an undisturbed saturated, cohesive soil, the relationship between the effective pressure and void ratio and the time-settlement characteristics.

# APPARATUS

Specimen

Loading Cap

Porous stone

Porous stone

Standpipe

Force

# THEORY

Consolidation is the reduction of a fully saturated soil of low permeability due to the drainage of pore water, until the excess pore pressure set up by an increase in total stress has dissipated. The void ratio vs. pressure graph gives us the coefficients and characteristics of the consolidation. To find CV the following expression is used:



# TEST PROCEDURE

1. Weigh the consolidometer ring and measure its depth and internal diameter. Then extract a specimen by driving a special, thin-walled ring into the undisturbed soil sample, and trim the ends.
2. Take samples for the determination of the specific gravity of the soil.
3. Place the specimen with its ring in an evaporating dish and weigh.
4. With filter paper discs placed on top and bottom.
5. Adjust the deflection dial to give sufficient travel under the proposed increment of load, and to record a small amount of swelling.
6. The sequence of loading was selected as 25, 50, 100 kPa. After recording the initial dial reading, the pressure was applied and the stopwatch was started. And, compression readings were taken.

# CALCULATIONS and GRAPHS

Data obtained during experiment and results of the calculations are presented in attached data sheet.

Mass of water: Initial : 651.69-636.13=15.56g



Final : 654.64-639.08=15.56



2H0=MS/(A\*GS)cm

ρd=100\*ρ/(100+m1) g/ml

Cv=0.848\*(H^2)/t90

mv=-de/(100\*(1+e0))



# DISCUSSION

At the end, the degree of saturation increased and void ratio decreased. Also, while the applied pressure was getting bigger, the t90 decreased and Cv increased. Moreover, Cv increased while void ratio decreased.

# REFERENCES

* Mirata, Türker (2001). Laboratory Instructions for Soil Mechanics Students. Middle East Technical University.