

## Geotechnical Competition

### Overview

This competition centers on Swedish soil scientist Albert Atterberg's attempt to classify fine grained soils by using their liquid and plastic limits. The Atterberg experiment is based on moisture content in the soil. In his studies, Atterberg defined the plastic, liquid, and shrinkage limits in the soil. The plastic limit defines where the soil changes from semi-solid to a flexible (plastic) state. The liquid limit is the moisture content that defines where the soil changes from a plastic state to a viscous fluid state. The shrinkage limit is the moisture content that defines where the soil volume will not reduce further if the moisture content is reduced. These properties are used to classify a fine grained soil according to the Unified Soil Classification system or AASHTO system.

### Objective

The Geotechnical Competition provides an opportunity to apply concepts learned in the classroom in a real world application. Soil moisture content, which is tested on most large scale construction projects, is a vital aspect in the design of soil foundations. The participants will conduct an Atterberg experiment to determine the liquid and plastic limits of a given soil sample.

### Eligibility

Each team may consist of two (2) maximum members, one (1) of which may be a graduate student.

### Materials and Limitations

Materials required for this competition are:

- FE approved Calculator
- Pen/Pencil
- Measuring Scale
- Liquid and Plastic Limits Determination Form (provided below)  
<http://www.vulcanhammer.net/geotechnical/courses/soil-mechanics-laboratory/dd1209.pdf>



## Execution

Follow Atterberg experiment procedures.

## Judging

Judging will be performed by the head judges. Additional judges may be selected to ensure that all judging is fair and consistent throughout the competition. There will be a minimum of three (3) judges for the competition, and at least two (2) judges will preside over the competition at all times.

It will be the judges' duty and responsibility to evaluate the teams fairly and consistently. The teams will be evaluated on the completed Liquid- and Plastic Limits Determination Form (located in the Materials and Limitations Section) at the end of the Atterberg experiment. The judges' ruling will be final for all competitors.

## Scoring

The winner will be determined by the university that has the closest plasticity index to that of the reference sample. The Plasticity Index is the difference between the Liquid Limit and the Plastic Limit ( $PI = LL - PL$ ).

During the competition, only the provided procedures, equations, clipboard, and FE approved calculator are allowed. Participants may use the form provided for scratch paper

## Disqualifications

Any university that does not abide by the regulations presented above or performs unethically will be disqualified.

