Oedometer labs test - lab report example

Engineering

Oedometer Labs Test

Set-up of the Oedometer test

The set-up involves first weighing the consolidation ring with the glass plate (Wesley, 2010).

The height (h) of the ring is measured together with its inside diameter (d). The soil sample from the sampler is ejected. The initial specific gravity and moisture content of the soil is determined.

A length of about three-inch sample is cut and placed on the consolidation ring. The ring is rotated to pare off the excess soil by cutting such that the sample is reduced to the same that is inside the diameter of the ring. The cutting tool is held horizontally while cutting the excess soil.

The ring turned carefully to remove the soil portion that is protruding from the ring. A straight metal edge is used to cut the surface flush of the soil with the ring surface. The final portion is removed with a lot of carefulness.

The weighed glass plate covered with Saran is placed on the freshly cut surface, and Saran is peeled off the surface and the ring is turned and the other end is cut on the opposite side. The specimen is weighed together with ring and the glass plate.

The ring is removed carefully from the sample and filter papers are placed between the porous stone and the specimen. The specimen is lightly lowered to the base of the water reservoir where the water tank is filled with water to saturate the sample.

The dial gauge is adjusted to read zero. With the switch of toggle down the pressure, gauze is set to dial to give a pressure of 0. 5tsf. At the same time, the valve is opened, and the clock is timed.

The consolidation dial are recorded at the elapsed times provided. The steps are repeated with different preselected pressures.

The specimen and ring are again placed on the glass plate and weighed together. The empty moisture can is weighed.

The specimen is carefully removed from the consolidation ring and the placed on the moisture can. The moisture can is put in an oven to dry the sample for over 15 hours.

The dry specimen in the moisture can is weighed.

Retrieved from < https://www. google. com/search? q= Set-up+of+the+Oedometer+test≠wwindow= 1&source= lnms&tbm= isch&sa= X&ei= OCiJVcaMKYLmywOA5JqIAg&ved= 0CAcQ_AUoAQ&biw= 1280&bih= 891> Purpose and limitation of the test

The test aims at determining the consolidation characteristics of low permeability soils. The test finds two imperative parameters that are, the coefficient of consolidation, cv and the coefficient of compressibility volume, mv.

The test can be limited due to the outlier brought by the incorrect experimental process, sampling, calculation or observed value (Smith, 2013). The outliers can be noted by the scatter plot of the residual versus the predictor.

Determination of the coefficient of consolidation of the soil

Table 1: Data obtained

time in min

stress in mmHg x 0. 002

0. 0

2632

0. 5

2608

1. 0

2601

1. 5

2596

2. 0

2591

2. 5

2587

3. 0

2582

3. 5

2678

4. 0

2574

4. 5

2570

5. 0

2566

5. 5

2563

6. 0

2560

6. 5

2557

7. 0

2554

8. 0

2548

9. 0

2544

10

2540

11

2537

Chart 1: The plot of the stress against time.

Coefficient of the consolidation is given by the formula below.

Cv = = = 140/7 = 20Hgmm/min x 0. 002

Converting the Hgmm to Pascals

Cv = 27200 Pa x 0. 002 min-1

Cv= 0. 90667 m2sec-1

References

Smith, I. (2013). Smith's Elements of Soil Mechanics. Oxford: Wiley.

Wesley, L. (2010). Fundamentals of soil mechanics for sedimentary and residual soils. Hoboken, N. J.: Wiley.