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Section

B

Semister

6th

Assignment

#1

Subject

Geo tech Lab

Question 1

What is the difference between standard Proctor test and standard penetration Test?

Ans Standard Proctor test :-

The Proctor Compaction test is a laboratory method of experimentally determining the optimal moisture content at which a given soil type will become most dense and achieve its maximum dry density.

The test is named in honor of Ralph Roscoe Proctor, who in 1933 showed that the dry density of a soil for a given compactive effort depends on the amount of water the soil contains during soil compaction. His original test is most commonly referred to as the standard Proctor compaction test, his test was

later updated to create the modified Proctor Compaction test.

These laboratory tests generally consist of compacting soil at known moisture content into a cylindrical mold with a collar of standard dimensions of height and diameter using a compactive effort of controlled magnitude. The soil is usually compacted into the mold to a certain amount of equal layers, each receiving a number of blows from a standard weighted hammer at a specified height. This process is then repeated for various moisture contents and the dry densities are determined for each. The

graphical relationship of the dry density to moisture content is then plotted to establish the compaction curve. The maximum dry density is finally obtained from the peak point of the compaction curve and its corresponding moisture content, also known as the optimal moisture content.

The testing described is generally consistent with the American Society for Testing and Materials (ASTM) standards, and are similar to the American Association of State Highway and Transportation Officials (AASHTO) standards. Currently, the procedures and equipment details for the standard proctor compaction test is designated by ASTM D698 and

AASHTO T99. Also, the modified Proctor Compaction test is designated by ASTM D1557 and AASHTO T180-D

Standard Penetration test :-

The Standard Penetration test is an in-situ dynamic Penetration test designed to provide information on the geotechnical engineering properties of soil. This test is the most frequently used subsurface exploration drilling test performed worldwide. The test procedure is described in ISO 22476-3, ASTM D1586 and Australian Standards AS 1289.6.3.1. The test provides samples for identification

Purposes and provides a measure of Penetration resistance which can be used for geotechnical design purposes. Many local and widely published international correlations which relate blow count, or N-value, to the engineering properties of soil are available for geotechnical engineering purposes.

Q102 What is the classification of soil based on free swell index?

Free Swell Index	Degree of Expensiveness	LL	PL	SL
< 20	Low	0-50	0-35%	> 17%
20-35	Moderate	40-60%	25-50%	8-18%
35-50	High	50-75%	35-65%	6-12%
> 50	Very high	> 60%	> 45%	< 10%

Q No 3 Why is Permeability test for soil important?

Ans:- Importance of Permeability test

The following applications illustrate the importance of permeability in geotechnical design:

- Permeability influences the rate of settlement of a saturated soil under load.
- The design of earth dam is very much based upon the permeability of soil used.
- The stability of slopes and retaining structures can be greatly effected by the permeability of

Soils involved .

- Filters made of soil are designed based upon their permeability.