Preparation Of Soil Analysis For Construction Of Commercial Complex

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Abstract : Sampling of soil is the most important work done for completing a project in good manner. It give the knowledge about the bearing capacity of soil, type of soil etc. It gives us the knowledge that the soil is good for construction project or not. The unsuitability of soil may cause for cancelling or delaying of the project. So it is very important to check a construction project. Some of the test such as consolidation test, specific gravity test, shear test, particle size analysis, moisture content are done for testing the fitness of soil for construction project.

Keywords: Soil sampling, testing, building construction

I. INTRODUCTION

The testing of soil is one of the most important steps for construction as we know there are some limits, we should know about the soil where we are planning the project because the strength of the building depends upon the quality of soil. We should check the different qualities of soil before construction such as sand content, contamination, strength, density, specific gravity etc. All these results should be checked properly by the experts and get a license that the land is good for project or not. It is important for us to know that the soil can sustain the construction project or not. If the soil is not good for construction, we should terminate the project.

It plays important role and is basic requirement for construction. The building's strength depends on the soil and its characteristics. The testing is used for determining the suitability of the soil and check whether it is good for construction or not and check the strength, density and sand content in that area.

II. OBJECTIVE

- The basic objective is to give proper information about the soil and the area.
- It is used to determine the type of soil.
- It is also useful in determining the input required for efficient and economic production.
- It is also used to determine the requirements of lime that can be used to diagnose the problem areas.
- It is also helpful in the farming areas.

III. METHODOLOGY

Soil samples obtained in their disturbed and undisturbed types from trial pits were subjected to various laboratory investigations such as Indices Test, Physical Experimentation Free Swell Index Test.

3.1- Field Dry Density & Natural Moisture Content

This method is used to determine the density, weight, volume and length of the undistributed soil sample with sampler (Shelby tube).

3.2- Particle Size Analysis

In this method the sieve analysis is carried out in accordance with IS: 2720 (part4, 1985).

3.3- Soil fraction Retained

In this method the soil fraction retained on 4.75 ISS is weighed.

3.4- Soil Fraction Passing 4.75 ISS

The portion of the soil passing 4.75mm ISS is oven dried at 105 to 110 centigrade. The portion is coned & quartered to obtain required representative quantity of the material.

3.5- Specific Gravity

This method is used to determine the specific gravity of the soils by using 50ml density bottle.

3.6- Shear Test

This test is done to find the shear parameter of the soil with respect to IS: 2720 on saturated samples.

3.7- Consolidation Test

This test is done on soil specimen in order to find the settlement quality of soil at different depth according to IS: 2720.

3.8- Differential Free Swell Test

This test is carried out to find the swelling quality on oven dried soil sample.
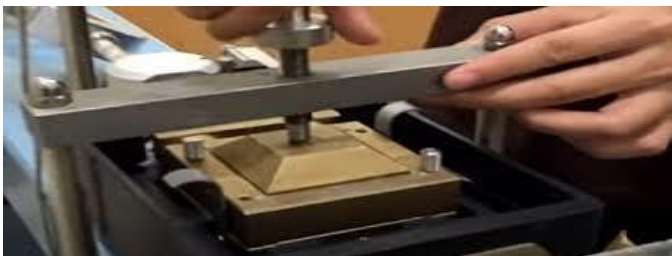
IV. RESULTS AND DISCUSSION

Sample details	Sample type	Sample depth(m)	IS soil classification	NMC(%)	Dry density (kN/m3)	Recorded N value		Corrected N value		Su(KN/M2)	DST		SBC(KN/M2)
											C (KN/M2)	φ(degree)	
UDS	UDS	2-3.45	MH-CH	20.75	12.14	-	-	86	43	0	111.50		
UDS	SPT	4-5.45	MH-CH	21.45	13.02	19	21	-	-	-	148.29		
UDS	UDS	6-6.45	MH-CH	22.35	13.50	-	-	171	84	0	173.40		
UDS	SPT	8-9.45	MH-CH	14.80	14.75	23	24	-	-	-	215.25		
UDS	UDS	10-10.45	MI-CL	16.75	15.25	-	-	223	113	10	273.50		
UDS	SPT	12-13.45	SM-SC	17.95	16.09	31	26	-	-	-	324.50		
UDS	UDS	14-15.45	SM-SC	18.48	16.49	-	-	251	126	10	381.80		
UDS	SPT	16-16.45	MI-CL	19.56	16.84	23	19	-	-	-	337.50		
UDS	UDS	18-18.45	MI-CL	20.55	16.93	-	-	299	147	0	328.15		
UDS	SPT	20-21.45	MI-CL	25.55	16.72	22	15	-	-	-	306.5		
UDS	SPT	22-23.45	MH-CH	26.15	17.49	11	9	-	-	-	164.50		

Table - Soil Sample Analysis

V. CONCLUSION

We have done the different tests related to the suitability of soil that our plot is suitable for construction or not. We have done test like specific gravity, strength, shear test, sieve analysis, moisture content etc. Here are some of the points that we have concluded:

- Quality of soil depends on the climate and weather of that place.
- The length and depth of the column determine during the foundation depends on the quality of the soil.
- Soil testing is very important before construction starts. If it is not done then the building will prone to dangerous accident.
- It is important to analyze the data and it should be done carefully.
- It is important to determine the ground water level.
- To determine the extent and properties of the construction material to be used is also important.

REFERENCES

[1] Ali, A. 2001.Macroeconomic variables as common pervasive risk factors and the empirical content of the Arbitrage Pricing Theory. Journal of Empirical finance, 5(3): 221–240.

[2] Basu, S. 1997. The Investment Performance of Common Stocks in Relation to their Price to Earnings Ratio: A Test of the Efficient Markets Hypothesis. Journal of Finance, 33(3): 663-682.

[3] Bhatti, U. and Hanif. M. 2010. Validity of Capital Assets Pricing Model. Evidence from KSE-Pakistan. European Journal of Economics, Finance and Administrative Science, 3 (20).

[4] All India Soil and Land Use Survey (AISLUS) (1990). Watershed Atlas of India. Department of Agriculture and Cooperation. IARI Campus, New Delhi.

[5] State Soil Survey, Department of Agriculture, Hyderabad 1988, Soils of Andhra Pradesh, Legend. pp:1:30.

[6] Eswaran, H., Beinroth, F.H., Reich, P.F., and Qunadt, L.A. 1999. Soils: their properties, classification profiles, SSSA, proc 36,686-89.

[7] K.A.Kelling and EE. Schulte., Soil and applied calcium and magnesium, understanding plant nutrients. A-2523, 2524.

[8] Herric, J.E.,(200); soil quality; an indication for sustainable land management. Applied soil ecology. 15:75-83.

[9] Larson, W. E.,and pierce, F.J., Construction and enhancement of soil quality, SSSA,1992, 7, 48-55.

[10] NyleC. Brady, The nature and properties of soils, 12th edition, EEE, Prentic-Hall, 2002.