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BEHAVIOUR OF GEOGRID (HDPE) CONFINED WITH REINFORCED CLAY SOIL

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ABSTRACT
Soft clay is normally avoided during construction due to it slow bearing capacity and high. Susceptibility of consolidation. These for bearing capacity of soft clay are considerably increased. With insertion of geo-grid at suitable depth from the foundation. Present research is intended to. Study of tri-axial test sand UCS to understand the effect of geo-grid on modification of strength. Parameters of soft clay. It is also observed that maximum improvement in axial stress is achieved when the geo-grid are Place data depth of one fourth of the loading diameter. Soil stabilization is a mechanical or chemical alteration of one or more soil properties to create an improved soil material possessing the desired engineering properties. Cost-effective soil stabilization technology has been a fundamental part of any construction and is very important for economic growth in any country. In some cases, construction has been challenged due to the high cost of soil stabilization processes. Besides, methods of stabilizations using common stabilizing agents are getting costly. Currently, there is a growing interest to identify new and green technology to improve construction techniques and to expand the road network. Currently, the use and production of HDPE geo-grid is becoming the most promising key for the advancement of a country by saving time, energy, and finance. It also reduces environmental pollution due to carbon emission by the conventional stabilizers.

Keyword: - *Geo-grid , liquid limit , plastic limit, UCS.*

1.INTRODUCTION

During the last three decades geo-synthetics are being extensively used to improve the Properties of poor soil, like to increase the drainage property, to reduce the compressibility, to Improve the shear strength, etc. In order to increase the bearing capacity of soft clay, use of Geo-Grid is also being extensively used and so on. Dash et al. (2003) reported that provision of Geo-cell reinforcement improves the load carrying capacity of foundation soil. Normally a geo-cell Is a three-dimensional, honey-comb like structure made of geo-synthetics interconnected by Joints. Geo-grids are normally used to make the cage and geotextiles or geo-membranes are put Inside the cage for retaining the Filling material like sand, gravel or boulder. The geo-Grid may be triangular, square, rectangular or hexagonal in plan depending upon the nature of utility. Geo-Grid have been found to be useful for base reinforcement of embankments and Subgrade soil, reinforcement below shallow foundations and steep slopes and in other Applications where the soil should withstand the high tensile stresses. Flexural rigidity of the Geo-cells plays an important role in increasing the strength of soil against bending. In the Present study, effects of Geo-cell in modifying the shear strength of soft clay under static and dynamic loading have been under taken. A series of Triaxial compression tests have been carried Out on 75 mm diameter clayey soil samples reinforced with four interconnected Geo- Grid placed At different depths from the top of the sample.

1.1 objectives of the present study

To carry out literature review for detail understanding of Geo-cell reinforcement. The behavior of Geo-grid can be understood better, when a relative study is made. To facilitate this, Geo-cell specimens were tested under the same

conditions of original soil specimens. To study the influence of shear strength parameters of different Geo-grid layer reinforced soil.

2. Material and methods of preparation

Different materials are used to experiments this projects

- geogrid
- expansive soil
- water

2.1 Geo-grid

Geo-grid of 18mm x 20mm Aperture size is used as geocell block. The aperture opening shape is rectangle.

Fig1 : geogrid

2.2 Experimental design

[1] In this project we want to design & experiment about the Geo-cell insert at different height, in previous research we found that addition of Geo-cell provides increase the strength.
[2] Different Height of Geo-cell insert at UCS Soil Sample and Triaxial Soil Sample such as L/2, L/3, L/4 etc. distance

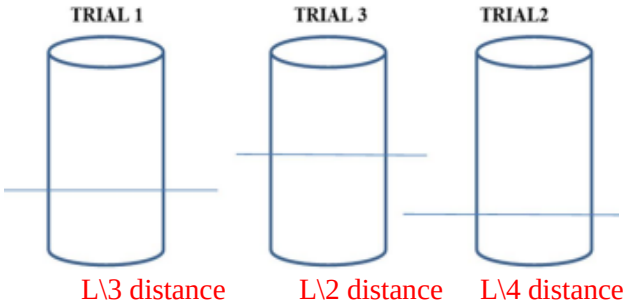

Fig2 : Geogrid insert design

3. Result analysis

UCS Test

We achieve the maximum UCS Strength by applying the Geo-grid at L/2 distance confined with reinforced soft clay soil.

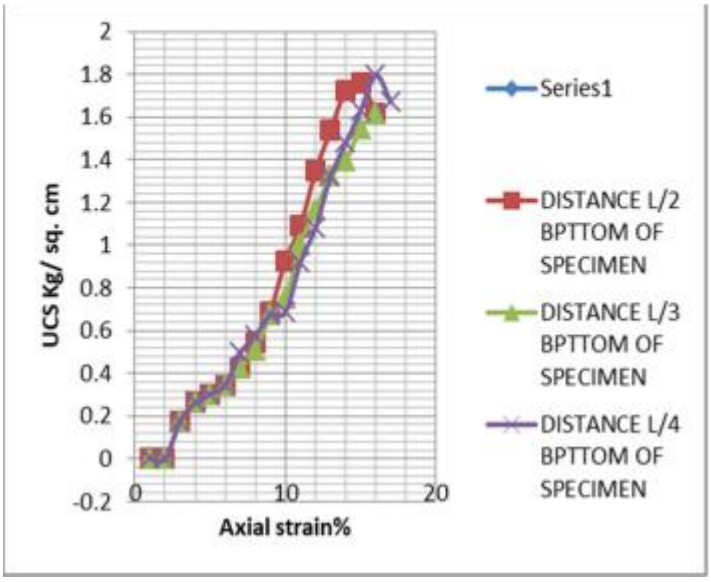

Chart -1: UCS test result of different height of geo-grid insertion

3.1 Triaxial test

Disp. Dial gauge	shear Disp cm	corrected area	proving ring	shear (kg)	shear stress (kg/sq cm)	Axial strain (%)
0	0	11.3411	0	0	0	0
50	0.05	11.4163	2	2	0.1752	0.658
100	0.1	11.4924	3	3	0.261	1.316
150	0.15	11.5695	3.5	3.5	0.3025	1.974
200	0.2	11.6477	4	4	0.3434	2.632
250	0.25	11.7269	5	5	0.4264	3.289
300	0.3	11.8072	6.4	6.4	0.542	3.947
350	0.35	11.8887	8.2	8.2	0.6897	4.605
400	0.4	11.9712	11	11.11	0.9281	5.263
450	0.45	12.0549	13	13.13	1.0892	5.921
500	0.5	12.1398	16.2	16.362	1.3478	6.579
550	0.55	12.2259	18.6	18.786	1.5366	7.237
600	0.60	12.3132	20.8	21.216	1.7230	7.895
650	0.65	12.4018	21.4	21.828	1.7601	8.553
700	0.70	12.4917	20.0	20.200	1.6171	9.211

Table-1: Triaxial test value

4. CONCLUSIONS

In this present study an effort has been taken to enlighten the use of Geogrid as a reinforcing material and physical properties with original clay soil. Based on the experimental observation in current study following conclusions can be made.

[1] The induced apparent excessive strength depends on the position of the Geogrid from the top of the sample. It is observed that when the Geogrid are placed at half of the diameter /width of the loading area, maximum benefit in strength is achieved.

[2] Geogrid l reinforced soil does not show any failure stress under unconfined condition.

[3] There is a degradation of strength of soil after some loading cycles, however, the degradation is marginally less once Geogrid are inserted into the soil.

[4] Lesser damping ratio and higher secant shear modulus are obtained if the soil is reinforced with Geogrid.

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