International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES)
Impact Factor: 5.22 (SJIF-2017),e-ISSN:2455-2585
International Conference on
Recent Explorations in Science, Engineering And Technology (ICRESET'19)
Volume-5, Special Issue-March, 2019.

EXPERIMENTAL INVESTIGATION ON STABILIZATION ON PEAT SOIL

P. Aswin[1], J.Jasmin Ani[2],M. Karthi Keyan[3], P. Thennarasuvel Pandi[4] , E.Priyadharshini[5]

[1,2,3,4] UG student, Department of civil engineering, KGISL Institute of technology, Tamilnadu.
[5]Assistant professor, Department of civil engineering, KGISL Institute of technology, Tamilnadu.

ABSTRACT-Peat has considerable negative geotechnical properties such as high water content, low shear strength, high organic matter, and low bearing capacity and consequently a significant severing high compressibility takes place that makes as one of the most difficult soils for constructing structure over its natural state. Because of the geotechnical problems of the peat soil, improvement mechanism is so essential when the peat soil exits to deal with it as a soil foundation.

I. INTRODUCTION

Now a day the developing countries like India, the construction work is gaining huge demand. This forces the engineers to carry out the construction in unstable soils. The aim of the study is to make use of waste material for stabilization of soil. It is the basic component of any structure that effectively distributes the load. The stabilization of soil is important in various geotechnical engineering works such as building foundation, pavement structures, irrigation systems, etc., In our project plastics, rubber tyre, coconut shell and sea shell powder are added to check the stabilization of the soil.

II. OBJECTIVE

- To find the properties of soil
- To improve the properties and density of soil
- To improve the stability of the soil.

III. SCOPE

- To increase the strength of the soil by using plastic waste, rubber type waste, sea shell and coconut shell powder

IV. MATERIAL USED

A. **PEAT SOIL:** Soil made up of waterlogging partially decomposed plant material including sphagnum moss and other acid- loving plants.

B. **PLASTIC POWDER:** Adding 4%, 6%, 8% of plastic powder in to the soil

C. **RUBBER TYER POWDER** Adding 4%, 6%, 8% of rubber powder

D. **COCONUT SHELL POWDER:** Adding 4%, 6%, 8% of coconut shell powder

E. **SEA SHELL POWDER:** Adding 4%, 6%, 8% of sea shell powder

F. **WATER: P**ortable water is generally considered satisfactory for mixing concrete

V. PROPERTY OF MATERIAL

A. **PEAT SOIL:** Shrinkage limit, Porosity, Texture, Permeability

B. **PLASTIC POWDER:** Weather resistance, fire resistances , durability, thermal resistances, dimensional stability

C. **COCONUT SHELL POWDER:** Renewable, high specific strength, low density less abrasion to machine and environmental friendly

D. **SEA SHELL POWDER:** High splitting tensile strength, high flexural strength, modules of elasticity

VI. TESTING OF SPECIMENT:

A. PROCTOR COMPACTION TEST

1. PLASTIC POWDER :

On adding 6% ,8%,10%, 12% of plastic powder the Optimum water content is 14%,16% and the Maximum dry density of soil is 1.87,1.75,1.61,1.58,1.51 g/cm².

2. RUBBER TYRE POWDER:

On adding 4%,6%,8%,10%, of rubber tyre powder the optimum water content is 18%,16%,14%,16% and the maximum dry density is 1.78, 1.78, 1.79, 1.73 g/cm².

3. COCONUT SHELL POWDER:

On adding 6%, 8%, 10%, 12% of coconut shell powder the optimum water content is 16%, 12%, and the maximum dry density of soil is 1.78, 1.73, 1.67, 1.55 g/cm².

4. SEA SHELL POWDER

On adding 14%, 16%, 18%, 20% of sea shell powder the optimum water content is 14%, 18%, 16% and the maximum dry density is 1.76, 1.78, 1.8, 1.82 g/cm².

B. UNCONFINED COMPRESSIVE STRENGTH OF SOIL

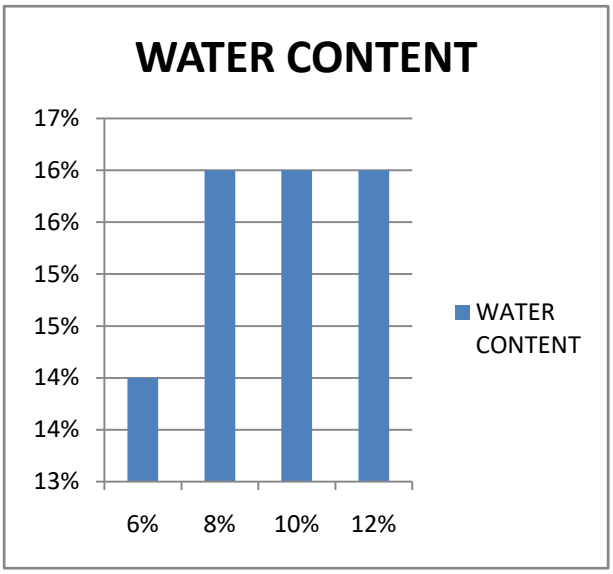
1. PLASTIC POWDER :

On adding 6%, 8%, 10%, 12% of plastic powder the unconfined compression strength 112.4 ,137.69, 112.4, 101.16 KN/m² and unconfined value 56.2,68.85, 56.2, 50.58 KN/m².

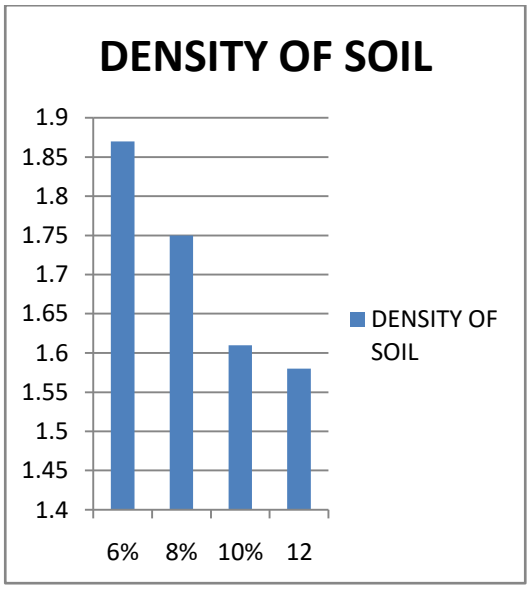
2. **RUBBER TYRE POWDER:** On adding 4%, 6%, 8%, 10% of plastic powder the unconfined compression strength 75.87 ,98.35, 67.44, 81.49 KN/m² and unconfined value 37.94,49.18, 33.72, 40.75 KN/m².

3. **COCONUT SHELL POWDER:** On adding 6%, 8%, 10%, 12% , of plastic powder the unconfined compression strength 92.73 ,165.79, 115.21, 81.49, KN/m² and unconfined value 46.37,82.9, 57.61, 40.75 KN/m².

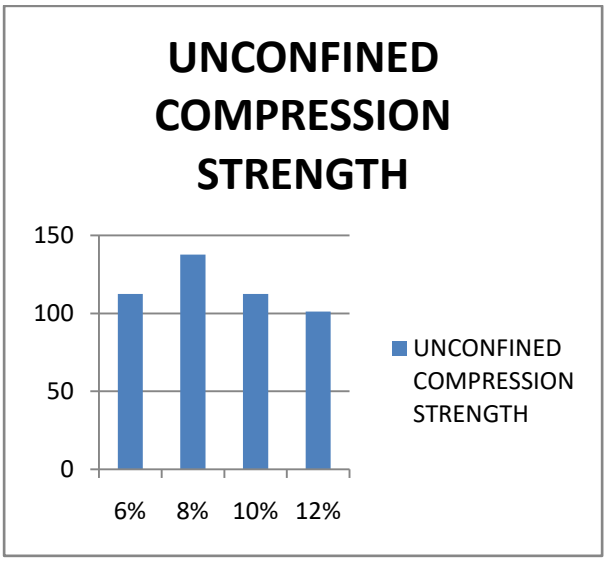
4. SEA SHELL POWDER On adding 14%, 16%, 18%, 12% of plastic powder the unconfined compression strength 162.98 , 118.02, 165.79 KN/m² and unconfined value 81.49, 59.01, 82.9 KN/m².



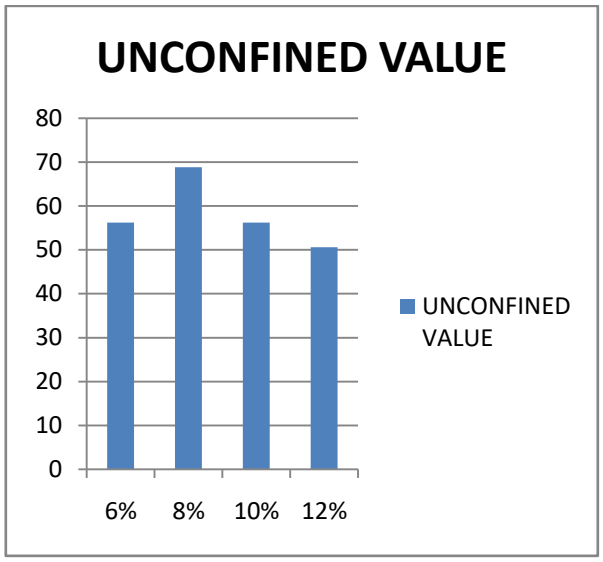
PERCENTAGE OF PLASTIC POWEDER POWDER



PERCENTAGE OF PLASTIC



PERCENTAGE OF PLASTIC POWDER



PERCENTAGE OF PLASTIC POWDER

VII. CONCLUTION

Thus we conclude that from our project for non-degradable materials the bearing strength of soil increases for 8% of rubber tyre powder and 12% of plastic powder. For degradable materials the bearing strength of soil increases for 12% of coconut shell powder and 16% of sea shell. The compressive strength for non-degradable materials is increased in 8% of plastic powder and 6% of rubber tyre powder. The compressive strength for degradable materials is increased in 8% of coconut shell powder and 20% of sea shell. Hence the soil attained required bearing strength and compressive strength when the admixtures are added, so the soil is suitable for pavement design.

VIII. REFERENCES

A. Athira,T. and Sowmya,V. (2017)'**Expansive Soil Stabilization using Coconut Shell Powder and Lime'** IJERTV Volume 6.
B. Gaby Ruiz,(2016)**'Use of crushed seashell by-products for sandy subgrade stabilization for pavement purpose'** LACCEI Volume 14.
C. Mallikarjuna,V. and Bindu Mani,T. (2016) **'Soil stabilization using plastic waste'** IJRET Volume 5.
D. Manikandan,A.T. Ibrahim,Y. Thiyaneswaran,M.P. Dheebikhaa,B. and Raja,K. (2017) **'A study on effect of Bottom ash and Coconut shell powder on the properties of Clay soil'** IRJET Volume 4.
E. Punmia,B.C. Ashok **'Soil Mechanics and Foundation Engineering'** Laxmi publications.
F. Ravikumar Badiger,(2015) **'Study on Stabilization of Soil Using Sea Shell and Bitumen Emulsion'** IJIRSET Volume 4.
G. Sathwik,A.(2016) **'Behavior of soil by using tyre powder'** IGC Volume 3.