A STUDY ON SOIL STABILIZATION USING WASTE TEXTILE MATERIAL

Gohel Sagar P, Chotaliya Hardik K, Makwana Pratik p, Mangroliya Akshay A, Ambaliya Ankur R

Student, Student, Student
Student, Student
Civil Engineering Department,
Shree Swami Atmanand Saraswati Institute Of Technology, Surat, Gujarat, India

Abstract: The paper deals with stabilization of soil using industrial waste. Unsuitable highway sub grade soil requires stabilization to improve its properties. Industrial waste is used as raw materials. Ingredients are used as waste textile materials like a polyester, etc. In this paper various experiment like specific gravity, proctor compaction test, CBR test and direct shear test to increase strength properties and behavior of sub base. Then the results and its graph of various mixes are compared to see their effects in sub base stabilization. The stabilization technique has an additional benefit of providing an environment friendly way to deal with industrial textile waste.

I. INTRODUCTION
This paper aims to study on soil stabilization at where soil is some erodible and not good for sub base compare to other area. By adding some waste textile material like polyester clothes layers to increase soil strength and its capacity. In this paper we scrutinized from research paper to carry out aim and testing on soil. Soil stabilization may be defined as the alteration or preservation of one or more soil properties to improve the engineering characteristics and performance of a soil. Stabilization, in a broad sense, incorporates the various methods employed for modifying the properties of a soil to improve its engineering performance.

II. AIM
To perform Investigation on soil stabilization utilizing waste textile material

III. OBJECTIVES:
- To study soil property.
- To prepare sample of stabilized soil and determine the properties of soil with textile material.
- To compare normal soil sample and sample with waste textile material in laboratory.

IV. MATERIALS USED IN THIS WORK:
Generally, in market different types of materials are available for stabilization of soil but they may be extensive. So, we decided to use wastage materials from textile industry. Industry that we have selected was loom industry located at laskana area in Surat. Waste material includes yarn resins which were useless due to defects.

V. STUDY AREA:
In Surat city we have selected kosmada village area for this experiment. In this village we found black cotton soil. Hence, by use of yarn wastage we stabilize the soil by Random fiber reinforcement method.
1. RESEARCH METHODOLOGY:

1.1 WORK METHODOLOGY:
(a) Interaction With:
- Industry owner
- Industry’s manager
- Machine operators
- Village personnel

(b) Collection of Yarn Material
(c) Collection of Soil Sample
(d) Performed Different Tests on:

We have performed some tests on soil like particle size distribution, specific gravity of soil, Atterberg limit, California bearing ratio test (CBR).

2. RESULT AND GRAPHS:

Figure 1: Normal soil
2.1 CONCLUSION:

By performing C.B.R. experiment, we can conclude that, using polyester fibre in various layers the strength of soil increases as follows:

- C.B.R value of soil sample = 1.935 % @ 2.5mm penetration
• By using 2 fibres = 2.753 % @ 2.5mm penetration
• By using 3 fibres – 5.2% at 2.5 mm penetration which seems to be more effective
• By using 4 fibres = 4.09 % @ 2.5mm penetration

3. REFERENCES:

• Methods of soil stabilization, December 24, 2010.
• A study on soil stabilization through innovative material for construction of rural roads By Dr. N.C. Shah And R.G. Dhamsaniya, 4th August 2009.
• Soil stabilization using polypropylene as waste fibre material By Shish Pall And Vinod Kumar Sonthwal, November 2015.
• Stabilizing of soil using polyester fabrics By F. Changizi, Sep 23, 2015.
• Experimental Study On Soil Stabilization Using Waste Fibre Material By Ch. Vinodh Kumar , K. Bhanuji Rao And G. Himla Kumari, June 2017.
• A Review on Different Types of Soil Stabilization Techniques By Habiba Afrin, July 2017.
• Soil Stabilization Using Waste Clothes By Sachin kumar, Dr.Shubha Agrawal And Prof. Prabhat tiwari., June 2019.
• Soil stabilization by using waste material : A review” by Bandna Kumari, Vinod k. Sonthwal, Jasvir S Rattan. , July 2016.
• Soil Stabilization for Road Construction: Comparative Analysis of a Three-Prong Approach by Obianigwe Njideka1 and Ngene Ben U1, September 2018.
• IS 2720/XIID:(1986) Methods of Test for Soils, direct shear test.
• IS 2720(X): (199 1) Methods of Test for Soils, determination of unconfined compression test.