

A Review: Study of Improvement of Clayey Soil by Using RBI Grade-81 and Stone Dust in Sub grade and minimize the Thickness of Flexible Pavement

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Abstract— Soil stabilization methods are commonly used in highway projects where high strength of sub-soil is required. In physical and chemical stabilization, an optimum amount of RBI Grade-81 and Stone Dust is mixed with the soil to improve its quality. A practical and generally accepted approach is used to determine the optimum amount of additive to be added to the soil to get the maximum efficiency.

Keywords: CBR, Expensive Soil, RBI Grade-81, Reinforcement Soil, Stone Dust and Soil Stabilization

I. INTRODUCTION

A. General:

It is odorless; the pH value of saturated paste made by it is 12.5. It improves the engineering properties of several types of soils.

By the addition of low dosages of RBI Grade 81, the stability of poor soil will increase w.r.t its volume. Hence, swelling and shrinkage of poor soil can be minimized. That bind the soil by both chemical and frictional forces and hence particles together converted into a hard inflexible mass. This binding decreases the pore spaces without decrease in entire volume of soil mass. Strength of soil treated with RBI Grade 81 improves with age. It acquires strength as long as one year after application to soil.

As it diminishes pore spaces, the penetrability of soil diminishes with expansion of RBI Grade 81. The adjustment of soil having earth content won't cause age of far-reaching salts. RBI Grade 81 proselytes earth particles irreversibly into aluminum hydrates and cementations calcium silicate. They don't cause break of soil because of volume change

II. STABILISATION

The methods of stabilization are physical processes as well as chemical processes. Physical processes include compaction, blends with granular materials, etc. Chemical processes are mixing with various chemicals like cement, fly ash, lime, limes bi-products, RBI Grade-81, etc. Different types of materials are used to stabilize the soil depending upon the cost, type of structure to be conducted and also the climatic conditions.

III. LITERATURE REVIEW

For any research work, it is essential to study the past literature related to the topic. It helps to establish a proper planning and method which acts as a guiding force throughout the progress of the research. By this, new areas of research can be inferred.

The present research work is related to study on the changes of red mud stabilized with different percentages of

chemical stabilizer named RBI Grade-81. Literature is related to stabilization of red mud by using different types of stabilizers and also the stabilization of cohesive soils by using RBI Grade 81.

Mamta & Honna 2014, conducted a study to improve the engineering properties of black cotton soil by using cementitious stabilizer RB1 Grade-81. The result of CBR test on Black cotton Soil increasing from 5.7% to 7% on un-soaked condition and 7% to 10% on 3 days of soaking. For red soil it increases from 11.4% to 12.3% in un-soaked condition and 13% to 15% in 3 days of soaking. They concluded that the stabilizer RBI-81 is powerful stabilizer for enhancement of strength properties of black cotton and red soil.

Naseem & Damgir 2014, RB1 Grade-81 has been mix in with extensive soil from 0 to 6 %. They were directed light compaction test, Unconfined Compression Strength test, drenched CBR tests. They also indicated its suitability to improve performance of soft soil. It has been found that soil when treated with 4% RBI Grade-81, there is increase in Max Dry Density and Optimum Moisture Content of soil than untreated soil.

Lekha & Shankar 2014, conducted a study on stabilizer RBI Grade-81 to modify the strength characteristics of black cotton soil. They conclude that the strength of black cotton soil improved appreciably with RBI Grade 81 and they also suggested that 6% RBI Grade 81 provides best strength at 7- and 28-days curing.

Madurwar et al. 2013, They were conducted out Atterberg's limit, UCS and CBR tests were on the specimen of soil with RBI-81 in a mix proportion of 2% & 6% and period of curing 7 and 14 days. After getting test results, they concluded that the raw soil which was having 2.69% UCS value and 2.33% CBR values has been increased to 3.62% and 10.03% at 14 days curing by adding 2% of RBI Grade-81.

Patil & Patil 2013, investigated stabilization of sub grade soil by using natural soil stabilizer RBI Grade-81 and fly ash. The stabilization of soil by using fly ash and RBI Grade 81 by adding both in optimum dosage significantly enhances the structural properties of soil.

A. Problem facing due to construction work from literature: Conventional materials are limited in use as well as in applications.

- Conventional materials are not suitable for all types of soils
- There is no generalized relationship between % RBI and improvement in CBR.
- Most studies have been made on black cotton soil and some on red soil, kaolinite, lateritic and clayey soil.

- Effect of RBI grade 81 along with fly ash on silty & clayey soil has not been studied.
- Conventional materials are highly expensive.
- In situ soil is to be replaced.
- Soil exchange is require in conventional road construction
- It has got a negative impact on environment.
- Conventional methods of construction require maintenance for whole life.
- Expansive soils like lateritic soils black cotton soils are problematic soils.

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