

Soil Stabilization with Rice Husk Ash

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ABSTRACT: Civil engineering projects located in areas with soft or weak soils have traditionally incorporated improvement of soil properties by using various methods. Soil Stabilization is being used for a variety of engineering works, the most common application being in the construction of road and pavements, where the main objective is to increase the strength or stability of soil and to reduce the construction cost by making best use of the locally available materials. Over the times, rice husk ash is the materials used for stabilizing soils. Thus the use of Agricultural waste (such as rice husk ash -RHA) will considerably reduce the cost of Construction and as well reducing the environmental hazards they cause. Rice husk is an agricultural waste obtained from milling of rice. About 108 tons of rice husk is Generated annually in the world. Hence, use of RHA for upgrading of soil should be encouraged. The present investigation has therefore been carried out with agricultural waste materials like Rice Husk Ash (RHA) which was mixed with soil to study improvement of weak sub grade in terms of compaction and strength characteristics. Silica produced from rice husk ashes have investigated successfully as a pozzolanic material in soil stabilization. Due to various construction development projects undertaken all over the world there is a substantial increase in the production of waste materials rice husk. Which create disposal problems. Rice husk waste is produced in large quantity in rice husk mills and is disposed in open land. Therefore use of rice husk in foundation of buildings and in road constructions to improve bearing capacity of soil and to reduce the area of open land needed for its disposal and to preserve environment through resource conservation. Results show strength improvements for all RHA and lime contents and time periods studied, and all materials produced can be defined as modified rather than stabilized. Improvement of sandy soils with RHA is an alternative to the final disposition with environmental, social and economic benefits. The focus of this research paper is to study the feasibility of stabilizing soil by using rice husk ash, thus re-using waste materials and providing an economical and ecofriendly method of soil stabilization.

KEYWORDS: Rice Husk Ash, Soil Stabilization, Silica, Pozzolanic Material, Waste Material, Sandy Soils

I. INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Soil is a significant component in the construction scenario. The longevity of a structure is directly dependent on the soil upon which it rests, therefore, it is necessary to ensure that the soil over which any structure is constructed, is firm or stable enough. Soil stabilization is a set of methods devised to improve the stability of soil. Various stabilization techniques prevail in the construction field utilizing diverse materials of varying properties.

Soil stability is an important criteria in the field of construction. For soil which lacks sufficient stability, various stabilization techniques can be adopted. Stabilization can increase the shear strength of soil and control the shrink-swell properties of soil, thus improving the load bearing capacity of the sub-grade to support pavements and foundations. A vast diversity of stabilization techniques exist. The focus of this research paper is to study the feasibility of stabilizing soil by using rice husk ash, thus re-using waste materials and providing an economical and ecofriendly method of soil stabilization. Rice husk ash (RHA) is a by-product of rice milling. Its use as a soil stabilizer is an alternative to the final disposition with environmental benefit. Because RHA is not self-cementitious, a hydraulic binder such as lime must be added to form cements to improve the soil strength.