241_Experimental Investigation of Clayey Soil mixed with Rubber Flash

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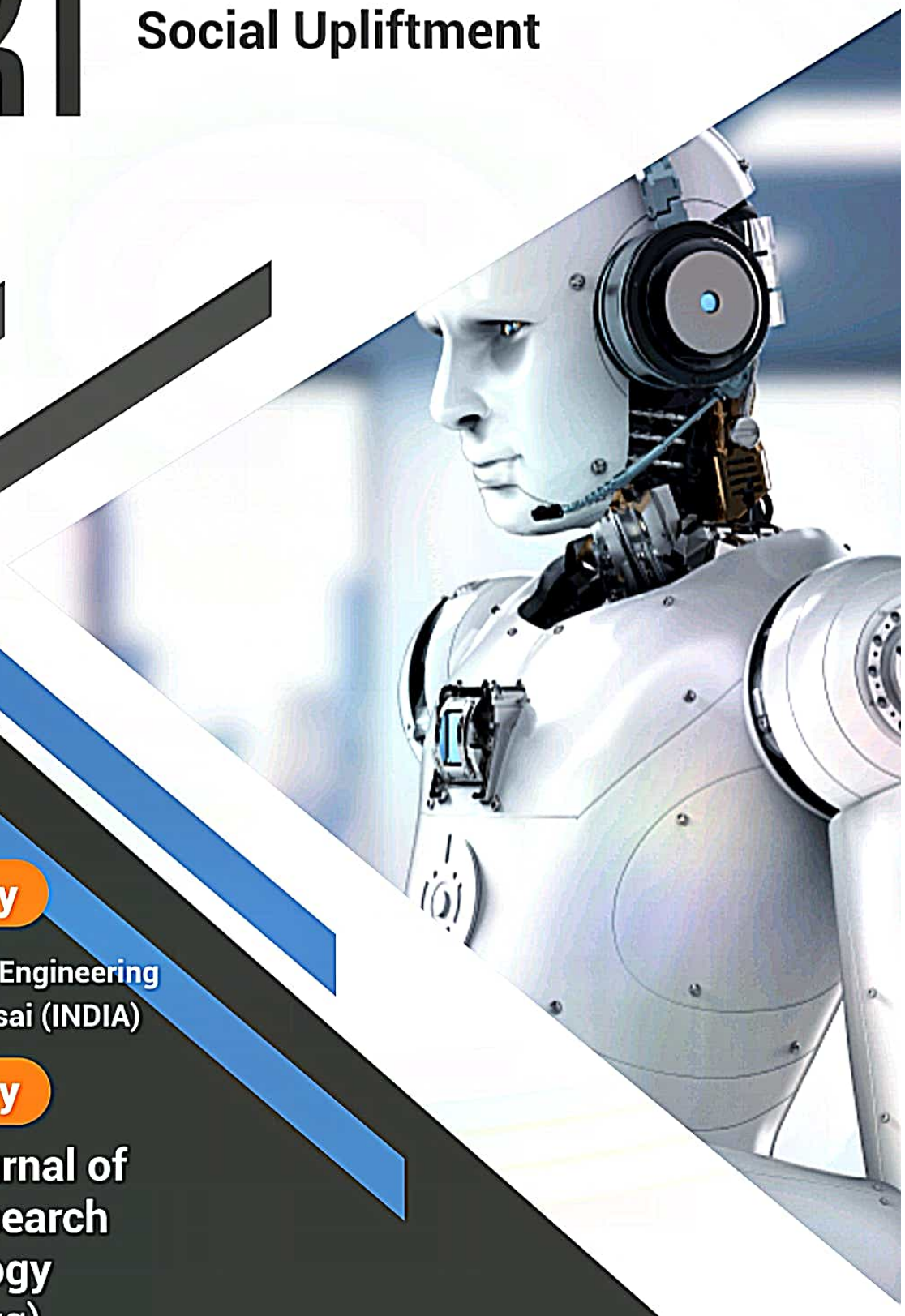

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Experimental Investigation of Clayey Soil mixed with Rubber Flash

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Abstract Over the years, the expanse of solid waste generated has been increasing at an alarming rate every year and the disposal of the same has become a serious problem. Particularly, recycling ratio of rubber waste is low and most of which has to be reclaimed because of the incongruity for incineration. This study presents a modest approach of utilizing rubber waste in the field of civil engineering as reinforcing material. Clayey soil sample is mixed with rubber strips randomly distributed to anticipate its reinforcing effects with respect to change of percentage of strip content and aspect ratio on the engineering properties of compacted soil. California Bearing Ratio Test (CBR) is performed to evaluate the mechanical response of fiber reinforced clay in terms of compaction characteristics and penetration resistance.

Keywords Rubber waste, Reinforced soil, Aspect ratio, Compaction. Penetration Resistance.

1. INTRODUCTION

Natural soil is both a complex and highly variable material; yet because of its universal availability and low cost, it offers a great opportunity for skillful use as an engineering material/foundation material. Soil according to a geotechnical engineer can be fine grained or coarse grained based on size; out of which fine grained soil is usually weak in taking higher amount of stresses for which stabilization is essential. Soil stabilization refers to the procedure in which a special soil, a cementing material, or other chemical or non-chemical materials are added to a natural soil or a technique use on a natural soil to improve one or more of its properties. One may achieve stabilization by physically mixing the natural soil and stabilizing materials together so as to achieve a homogeneous mixture or by adding stabilizing material to an undisturbed soil deposits and obtaining interaction by letting it permeate through soil voids (Abood, Kasa, & Z.B., 2007). Soil stabilizing additives are used to improve the properties of less desirable road soils. When used these stabilizing agents can improve and

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II. STATE OF THE ART

For any structure, a strong foundation is very important to support the superstructure and thereby safely transfer the loads to the soil. Hence the properties of the soil on which any structure is placed should be strong and stable. However, Expansive soils when come in contact with water exhibit swelling and swelling pressure characteristics. These soils are considered to be problematic and cause damages to the structures due to alternate swelling and shrinking as a result of seasonal moisture changes (Katti, 1979). Indian soils comprised of expansive soils, a large portion of these structures pass through expanses of such soils. Among various methods for the solutions to the problems posed by expansive soils, especially for large area coverage, the stabilization of such soils would be a natural choice (Kate, 2005). The process of soil stabilization helps to achieve the required properties in a soil needed for the construction work (Harshita., 2018). In India, the modern era of soil stabilization began when there occurred a general shortage of petroleum and aggregates, it became necessary for the engineers to look at means to improve soil other than replacing the poor soil at the building site (S.P.Kanniyappan, 2019). Many areas of India consist of soils with high silt contents, low strengths and minimal bearing capacity (Ganesha, 2009). Soil stabilisation was used, but due to the use of obsolete methods and also due to the absence of proper technique, soil stabilization lost favor. In recent times, with the growth in the demand for infrastructure, sensitive materials and fuel, soil stabilization has begun to call for a fresh form (Bandna Kumari, 2016). The stabilization process