World Academy of Science, Engineering and Technology
International Journal of Structural and Construction Engineering
Vol:10, No:11, 2016

Effect of Baking Temperature on the Mechanical Properties of Reinforced Clayey Soil

Authors : Gul Muhammad, Amanullah Marri, Asif Abbas

Abstract : Thermal treatment changes the physical and mechanical properties of clayey soils. Thermally treated soils have been used since ancient times for making trails for access and bricks for residence. In this study, it has been focused to observe and analyze the effect of baking (burning) temperature on the mechanical properties of clayey soils usually used for the construction of adobe houses in the rural areas of many of the developing countries. In the first stage of experimental work, a series of tests on clayey soil moulds (100 mm height and 50 mm diameter in size) added different percentages of lime and wheat straw (typically 2%, 4%, 6%, 8%, and 10%) were conducted. In the second stage; samples were made of clayey soils and were subjected to six level of temperatures i.e., 25, 100, 200, 300, 400, and 500^{o}C. In the third stage, the moulds of clayey soil were submerged in water prior to testing in order to investigate the flood resilience of the moulds prepared with and without the addition of lime and wheat straw. The experimental results suggest that samples with 6% of lime content and on 2% of wheat straw contents have shown the maximum value of compressive strength. The effect of baking temperature on the clayey soils has shown that maximum UCS is obtained at 200^{o}C. The results also suggest reinforcement with 2% wheat straw, give 70.8% increase in the compressive strength compared to soil only, whereas the flooding resilience can be better resist by adding 6% lime and 2% wheat straw.

Keywords : baked temperature, submersion, lime, uniaxial, wheat straw
Conference Title : ICSAGBE 2016 : International Conference on Structural, Architectural, Geotechnical and Building Engineering
Conference Location : Venice, Italy
Conference Dates : November 07-08, 2016

Open Science Index, Structural and Construction Engineering Vol:10, No:11, 2016 publications.waset.org/abstracts/53605.pdf