IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 4, March 2025

Comparative Study of Effect of Compaction Delay on Stabilized Black Cotton Soil

N. P. Mujumdar[1], D. S. Kekan[2], S. R. Joshi[3], A. R. Joshi[4]
Sr Lecture, Guru Gobind Singh Polytechnic, Nashik, India[1]
Lecture, KVN Naik Polytechnic, Nashik, Maharashtra, India[2]
Assistant Professor, Matoshri College of Engineering and Research Centre, Nashik, India[3]
Lecture, Government Polytechnic, Samangan, India[4]

Abstract: *Urbanization and growth in the economy of India have led to the steep increase in the building construction activities and has necessitated the implementation of infrastructure projects such as highways, railways, air strips, water tanks, reclamation etc. These projects invariably require quality earth in massive quantity. In urban areas, borrow earth is not easily available which has to be hauled from a long distance. Quite often, large areas are covered with highly plastic and expansive soil, which is not suitable for such purpose. The wide spread of the black cotton soil has posed challenges and problems to the construction activities. At the same time pond ash is the most abundant of all residue and its disposal not only needs enormous land, water and power resources, but it also causes serious environmental hazards. In India there are 87 working thermal power plants producing more than 100 million tons of pond ash every year and the figure is likely to soar. Hence disposal of pond ash in ecologically in suitable manners has lately become global concern. A task was therefore undertaken to investigate and improve the engineering properties of the black cotton soils of Nashik (North West region of Maharashtra) using pond ash and pond ash-lime as a stabilizer. Some unavoidable reasons like sudden rainfall, machine failure and labour problems etc. cause delay between mixing the stabilizers and soil compaction which cause changes in soil properties. Hence effect of compaction delay on stabilized black cotton soil was investigated.*
Modified Proctor tests, UCS tests, CBR tests were conducted on the pond ash soil mixture (10%,20%,30% pond ash by weight of soil), soil- pond ash-lime mixture(10%,20%,30% pond ash and 3%,5%,8% Lime) and prepared samples were tested with time delay (time delay between mixing the contents with water and compaction) of 04 hours, 08hours, 12hours and it was observed that with increase in compaction delay MDD,UCS and CBR decreases of all mixture. However 77%Black cotton soil+ 20% pond ash+3% Lime shows better results of stabilization and has less effect of compaction delay and can be used as an admixture to improve the properties of subgrade soil.

Keywords: Cotton Soil