

A Study of Soft Soil Improvement by Using Lime Grit

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Abstract : This paper presents an idea to improve the soft soil by using lime grits which are normally produced as waste product in the paper manufacturing industries. This waste material cannot be used as a construction material because of its light weight, uniform size and poor compaction control. With scarcity in land, effective disposal of lime grit is a major concern of all paper manufacturing industries. Considering its non-plasticity and high permeability characteristics the lime grit may suitably be used as a drainage material for speedy consolidation of cohesive soil. It can also be used to improve the bearing capacity of soft clay. An attempt has been made in this paper to show the usefulness of lime grit in improving the bearing capacity of shallow foundation resting on soft clayey soil. A series of undrained unconsolidated cyclic triaxial tests performed at different area ratios and at three different water contents shows that dynamic shear modulus and damping ratio can be substantially improved with lime grit. Improvement is observed to be more in case of higher area ratio and higher water content. Static triaxial tests were also conducted on lime grit reinforced clayey soil after application of 50 load cycles to determine the effect of lime grit columns on cyclically loaded clayey soils. It is observed that the degradation is less for lime grit stabilized soil. A study of model test with different area ratio of lime column installation is also included to see the field behaviour of lime grit reinforced soil.

Keywords : lime grit column, area ratio, shear modulus, damping ratio, strength ratio, improvement factor, degradation factor

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