
Departmental Seminar

Seminar Title	: Conference Return Seminar : Analysis of Interparticle Interactions and Stress Deformation Behaviour of Stone Columns in Clayey Soils: A Dem Study
Speaker	: Dr. Soukat Kumar Das
Supervisor	: Dr. M. Gattu
Venue	: CE Seminar Hall
Date and Time	: 24 Dec 2024 (1030 am)
Abstract	: In the last five decades, there has been a growing trend in employing compacted stone columns as a method to reinforce weak cohesive soils. This approach aims to improve bearing capacity, increase the rate of consolidation, and enhance the settlement response of foundation soils. The key factor influencing the bearing capacity of the stone column is the lateral confining pressure exerted by the native soft soil which prevents the stone columns from bulging and collapsing. However, stone columns are not useful in soft, compressible clayey soils lacking sufficient lateral confinement, specifically with undrained shear strength below 15 kPa. The use of cemented stone columns can be a sustainable solution to this problem. The present study compiles numerical analyses conducted on stone column samples subjected to triaxial loading by discrete element method (DEM). The cemented stone column shows reduced bulging and enhanced strength under confinement. It is seen that the stress-strain response varies significantly with cementation specifically affecting the peak strength which is manifested in terms of the contact force distribution and particle displacement. Additionally, the applied strain rate is also found to affect the macroscopic response of the cemented stone column.