
Departmental Seminar

Seminar Title	: Conference Return Seminar: Strength Characteristics of Low-Plastic Clay Treated with Alkali-Activated Fly Ash.
Speaker	: Govind Kumar Bharti
Supervisor	: Dr. M. Gattu
Venue	: CE Seminar Hall
Date and Time	: 08 Jan 2025 (05:15 pm)
Abstract	: Clayey soils often pose several challenges in road or embankment construction due to their poor strength and sensitivity to water, which in turn cause settlement and cracks. The use of alkali-activated material to stabilize problematic soil has gained popularity due to its advantages over cement/lime in terms of economy and ecology. Hence, in this study, low-plastic clay is treated with different fly ash (FA) contents (4%, 8%, 12%, and 16%) and activated with different concentrations of sodium hydroxide (NaOH) solution (4 M, 6 M, 8 M, and 10 M). Laboratory experiments were conducted to assess the compaction characteristics (light and heavy compactive efforts), unconfined compressive strength (UCS), split tensile strength (STS), and unconsolidated-undrained shear strength parameters. As the FA content rises, the maximum dry density (MDD) and optimum moisture content (OMC) decrease. The UCS and STS values of clay improved continuously with increased FA content and compactive effort. These strength properties further increase with an increase in the NaOH concentration up to 8 M. A higher 28-day UCS of 5.13 MPa and STS of 390.3 kPa were observed at 16% FA and 8 M NaOH concentration. Further, cohesion increases, and the angle of internal friction decreases with the addition of binder. These alterations in the strength properties of stabilized soil are due to the development of the N-A-S-H, N-A-S, and Mg-A-C-H phases.