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Departmental Seminar

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| Seminar Title | : Conference Return Seminar: INFLUENCE OF EICP ON THE STRENGTH PROPERTIES OF COMPACTED POND ASH  |
| Speaker       | : Panchadarla Sri Prathimayadav  |
| Supervisor    | : Dr. M. Gattu   |
| Venue         | : CE Seminar Hall  |
| Date and Time | : 06 Jan 2025 (04:55 PM)   |
| Abstract      | : Pond ash is a combination of fly ash and bottom ash that accumulated in ash ponds. It is conventionally stabilized with cement/lime and used as a geo-material. In recent times, the use of these stabilizers are discouraged due to their higher energy consumption and emission of greenhouse gases, leading to unsustainable geotechnical applications. Hence, in this study, the pond ash is stabilized with enzyme induced calcium carbonate precipitation (EICP) using urea ( $\text{CO}(\text{NH}_2)_2$ ), calcium chloride dihydrate ( $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ ) and soybean flour as a source of urease enzyme. The strength characteristics of pond ash at different CaCl <sub>2</sub> to urea (CU) ratios (1.5:1, 1.5:2, and 1.5:3), soybean flour (SF) concentrations (20, 30, and 40 g/L), and curing durations (0, 7, 28, and 60 days) are explored. The results show an improvement in the unconfined compressive strength (UCS) and split tensile strength (STS) of stabilized pond ash with increased CU ratios and curing durations. However, strength properties reduce with an increase in the SF concentrations. The 28-day UCS of stabilized material enhanced from 273 kPa to 1332 kPa when CU ratio increased from 1.5:1 to 1.5:3, respectively at a constant SF concentration (20 g/L), and 28-day STS increased from 17 kPa to 26 kPa, respectively. The mineralogical studies shows the precipitation of calcium carbonate in the compacted material, contributing for strength gain. |