ABSTRACT

This study explores the stabilization of expansive soils using industrial waste materials, specifically dental stone waste (DSW) and sugarcane bagasse ash (SCBA). Expansive soil poses significant challenges in construction due to its high swell-shrink behaviour, leading to infrastructure damage. The addition of DSW and SCBA aims to improve the soil's engineering properties, reducing its swelling potential and enhancing its strength. Laboratory tests, such as unconfined compressive strength test (UCC) and California bearing ratio (CBR), are conducted to evaluate the effects of DSW and SCBA on the plasticity, compaction and strength characteristics of expansive soils. The results show that the combined use of DSW and SCBA significantly improves the mechanical and geotechnical properties of expansive soil, making it suitable for construction purposes. This research highlights the potential of utilizing industrial waste materials for soil stabilization, offering a sustainable and cost-effective solution for geotechnical engineering applications.