

## ABSTRACT

The majority of the geotechnical studies on laterites was carried out from the viewpoint of soil characterization and was not particularly meant for indurated laterites. With due need, in this research, physico-mechanical properties of indurated laterites from different parts of India (i.e. Kharagpur, West Bengal; Haripur and Tengara, Odisha; and Kanhwara, Madhya Pradesh) were investigated with regard to *in situ* characterization of lateritic profiles. Based on texture, appearance and relative strength of the lateritic materials, the characterized zones in each laterite profile were identified. The indurated laterites were collected from each zone and were used to determine uniaxial compressive, point load and Brazilian tensile strengths; effective porosity; dry density; vug volumetric percentage (a newly introduced index); and slake durability indices. The physico-mechanical properties of the indurated laterites from each profile were found to conform well to the corresponding field observations (i.e. characterized zones).

In order to evaluate the influence of parent lithology on field appearances and engineering properties of indurated laterites under same geographical conditions, two nearby laterite profiles (in Haripur and Tengara) were investigated. In the laboratory, along with the determination of physico-mechanical properties; petrographic study and XRD analysis were also carried out. It was found that the difference in engineering properties between the indurated laterites of Haripur and Tengara is very much dependent on mineralogy such as sesquioxides, clay content and other minerals altered from the parent lithologies.

Based on the analysis of the mechanical strength properties, it became apparent that point load strength is the most useful/practical strength parameter in characterizing indurated laterites. With due need, a guideline based on the point load strength values was proposed to mark the quality of indurated laterites for construction purposes. Vug volumetric percentage was found to be the most efficient index in predicting point load strength. Subsequently, it was concluded that this index can also be utilized as a useful engineering property of indurated laterites.

**Keywords:** *Characterization of laterite profiles; Indurated laterites; Physico-mechanical properties; Parent lithology; Engineering implications*