A PROPOSAL OF A METHOD FOR IN SITU CHARACTERIZATION OF GEOTECHNICAL PROPERTIES OF TROPICAL SOILS FOR ROAD CONSTRUCTION

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The paper presents an adaptation of a laboratory method for in situ identification of tropical soils as a preliminary study of relevant geotechnical characteristics for road construction. Lateritic tropical soils have been used as a successful and low-cost solution for pavement and landfill construction, protection of slopes against erosion and remediation of abandoned borrow pits, among other applications. In the State of São Paulo, over 8,000 km of highways have been constructed using these soils.The proposed method is based on the results of a study comprising over 100 samples representative of tropical soils in the State of São Paulo, Brazil. The characterization of tropical soils is made through the direct measurement of properties of interest to road construction: (i) shrinkage of soil paste disks, molded in rings of 35mm of diameter and 10mm of height; (ii) water re-absorption by capillarity by the dried soil disks; and (iii) penetration resistance after water re-absorption. These properties can substitute the index properties traditionally used in Soil Mechanics for classification, such as grain size distribution and Atterberg limits, which have proved to be inadequate to differentiate and hierarchize tropical soils. The proposed system has a great potential for use in road, pavement and landfill construction and environmental protection, due to its simplicity and expeditiousness to differentiate tropical soils, which occur extensively in regions of hot and humid climate.