

Lateritic Soils from Ceara, Brazil: Sustainable Use in Constructive Blocks for Social Housing

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Abstract : The state of Ceara, located in the northeast region of Brazil, is abundant in lateritic soil which has been usually discarded due to its lack of agricultural potential while materials of similar nature have been used as constituents of housing constructive elements in many parts of the world, such as India and Portugal, for decades. Since many of the semi-arid housing conditions in the state of Ceara fail to meet the minimum criteria regarding comfort and safety requirements, this research proposed to study the Ceara lateritic soil and the possibility of its use as a sustainable building block constituent for social housings, collaborating to the improvement of the region living conditions. In order to achieve this objective, soil samples were collected from five different locations within the specific region, three of which presented lateritic nature, being characterized according to the Unified Soil Classification System and the MCT methodology, which is a Brazilian methodology developed during the 80's that aimed to better describe and approach tropical soils, its characterization and behavior. Two of these samples were used to build two different miniature block prototypes, which were manually molded, heated at low temperatures ($< 300\text{ }^{\circ}\text{C}$) in order to save energy and lessen the CO_2 high emission rate common in traditional burning methods- and then submitted to load tests. Among the soils tested, the one with the highest degree of laterization and greater presence of fines constituted the block with the best performance in terms of flexural strength tensions, presenting resistance gains when heated at increasing temperatures, which can indicate that this type of soil has potential towards being used as constructing material.

Keywords : constructive blocks, lateritic soil, MCT methodology, sustainability

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