

Physical and mechanical properties of Lightweight Expanded Clay Aggregate (LECA)

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ABSTRACT

Lightweight aggregate is the generic name of a group of aggregates having a relative density lower than normal aggregates (natural sand, gravel, and crushed stone), sometimes is referred to as low density aggregate. Depending on the source and the method of production, lightweight aggregates exhibit considerable differences in particle shape, texture and properties. Lightweight expanded clay aggregate (LECA) is among the common lightweight materials that have been applied successfully in civil engineering works. Many studies have been conducted to investigate the performances of LECA used in structural and geotechnical applications. They are favourable materials used in projects where weight is an issue because the materials can help reduce dead loads and lateral forces by more than half in installations over structures and those with soft soils. LECA is an eco-friendly nature-based waste product that combines the same benefits as brick tiles. LECA is indestructible, non-combustible, and impervious to attack by dry-rot, wet-rot and insects. This paper focused on the properties of LECA aggregates supplied by LEXCA Sdn. Bhd. through laboratory tests in accordance to the standard specifications. The properties of several LECA produced from different country and production plants are also reviewed for comparative purpose. In addition, the material properties evaluated from previously conducted research also was discussed. It was found that, even though LECA was produced from the same raw materials, it has certain range of property values. The properties of LECA shows their suitability and potential for replacing natural aggregates in many civil engineering works. It is hoped that, the properties presented in this paper could help others who conduct study especially numerical analysis using LECA as geotechnical materials.

KEYWORDS:

Physical and mechanical properties; Lightweight expanded clay aggregate (LECA)