World Academy of Science, Engineering and Technology
International Journal of Civil and Environmental Engineering
Vol:16, No:02, 2022

Use of Benin Laterites for the Mix Design of Structural Concrete

Authors : Yemalin D. Agossou, Andre Lecomte, Remi Boissiere, Edmond C. Adjovi, Abdelouahab Khelil

Abstract : This paper presents a mixed design trial of structural concretes with laterites from Benin. These materials are often the only granular resources readily available in many tropical regions. In the first step, concretes were designed with raw laterites, but the performances obtained were rather disappointing in spite of high cement dosages. A detailed physical characterization of these materials then showed that they contained a significant proportion of fine clays and that the coarsest fraction (gravel) contained a variety of facies, some of which were not very dense or indurated. Washing these laterites, and even the elimination of the most friable grains of the gravel fraction, made it possible to obtain concretes with satisfactory properties in terms of workability, density and mechanical strength. However, they were found to be slightly less stiff than concretes made with more traditional aggregates. It is, therefore, possible to obtain structural concretes with only laterites and cement but at the cost of eliminating some of their granular constituents.

Keywords : laterites, aggregates, concretes, mix design, mechanical properties
Conference Title : ICCC 2022 : International Conference on Cement and Concrete
Conference Location : London, United Kingdom
Conference Dates : February 15-16, 2022