

**DETERMINATION OF PHYSICAL AND MECHANICAL PROPERTIES OF
AGGREGATES FOR CONCRETE DESIGN MIXES
IN NEGROS OCCIDENTAL**

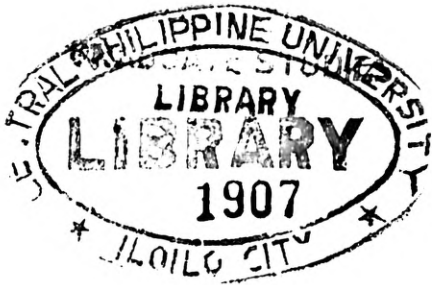
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by:

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ABSTRACT

This research is intended to show a profile of the physical and mechanical properties of fine and coarse aggregates used in concrete design mixes for building construction in Negros Occidental. It addresses the lack of information of practicing civil engineers about the sources of suitable aggregates in the province as well as the properties of the aggregates that are necessary for the computation of the design mix proportions. In order to provide data for source-specific design, testing aggregate samples from different quarry sites in Negros Occidental was conducted based on the American Society for Testing and Materials (ASTM) specifications. The river sources involved in this study are Bago, Buhangin, Camang-camang, Tongo, Hilabangan and Ilog rivers. The basic physical and mechanical properties of aggregates evaluated were specific gravity (bulk dry, bulk saturated surface dry and apparent) and absorption, bulk dry-rodded density and percent voids, gradation, shape, surface texture, abrasion resistance, fineness modulus and organic impurities. Coarse aggregates from Bago River are more likely to have greater voids and lesser bulk dry-rodded density. Camang-camang and Tongo river coarse aggregates displayed larger sizes. Buhangin and Ilog river have well graded coarse aggregates. Fine aggregates sourced at Camang-camang river have coarser particles while

those that were sourced at Buhangin and Hilabangan rivers have finer particles. Bago river sourced fine aggregates have uniformly distributed particle sizes that the amount of voids are lesser and the corresponding dry-rodded density is large. The results of the aggregate properties were used to formulate the proportions for concrete cylinder specimens to be tested for compressive strength. Findings showed that fine aggregates having higher bulk specific gravity and bulk saturated surface dry (SSD) specific gravity are more likely to produce stronger concrete. The diversity of properties of aggregates and the importance of testing in every concrete design mix activity is presented and highlighted in this paper. Moreover, among the six river sources included in this research, Bago river has displayed the most suitable quality of concrete aggregates in the province.