

Physical Properties of Crushed Aggregates in Some Selected Quarries in Kwara State, Nigeria

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Abstract : This study examines rock properties of crushed aggregate in some selected quarries in Kwara state, Nigeria. Some physical properties (chemical composition, mineral composition, particle size distribution) of gneiss sample were determined using ISRM standards. The physicomechanical properties (specific gravity, dry density, porosity, water absorption, point load index, tensile, and compressive strength) of the gneiss rock were evaluated. The analysis on the gneiss samples revealed the mean dry density and the unit weight are 2.52 g/m³, 2.63 g/m³, 2.38 g/m³; and 24.1 kN/m³, 25.78 kN/m³, 23.33 kN/m³, respectively (for locations A,B,C). The water absorption level of the gneiss rock sample ranged from 0.38 % - 0.57 % for the three locations. The mean Schmidt hammer rebound value ranged from 51.0 - 52.4 for the three locations and mean point load index values ranged from 9.89 - 10.56 MPa classified as very high strength while the uniaxial compressive strength of the rock samples revealed that its strength ranged from 120 - 139 MPa (for location A, B, and C) classified as strong rock. The aggregate impact value test and aggregate crushing value test conducted on the gneiss aggregates from the three locations in accordance with British Standard. The gneiss sample from the three locations (A, B, and C) is a good material for the production of construction works such as concrete, bricks, pavement, embankment among others, the compressive strength of the material is within the accepted limit.

Keywords : gneiss, aggregate impact, aggregate crushing, physic-mechanical properties, rock hardness

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