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Suitability of Quarry Dust as Replacement of Sand in Medium Grade Concrete

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Abstract : Concrete plays the important role and a huge percentage of concrete is being utilized in every construction practices. Natural river sand is one of the major ingredients of concrete, is becoming expensive due to excessive cost of accessibility from sources. Also large scale depletion of sources creates environmental problems. Therefore, there is a need of economic alternative materials. Quarry dust is a waste obtained during quarrying process. It has been rampantly used in different construction practices and could be used as an effective fine aggregate instead of river sand. Partial and total replacement of fine aggregate in conventional concrete with quarry dust has been empirically conducted with the view to examining primarily the compressive strength of the resulting composite and possible total utilization of quarry dust as fine aggregate in the production of medium grade concrete. The results of the study showed that its specific gravity, porosity and water absorption showed satisfactory performance. The percentage replacement of natural river sand with quarry dust for a designed strength of 25N/mm2 varied at intervals of 10% up to a maximum value of 100%. A total of 132 cubes of 150 x 150 x 150mm were cast and tested at 7, 14 and 28 days of hydration. Compressive strength increases with curing age in all the mixes. Compressive strength decreases with increase in percentage of quarry dust. Generally the compressive strength of concrete incorporating quarry dust attained strength of 22.47 N/mm2 after 28 days which makes it a suitable aggregate for the production medium grade concrete.

Keywords : quarry dust, concrete, aggregates, compressive strength
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