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Experimental study on reusing ornamental rock waste for the production of structural concrete

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The gneiss rock industry is an important Local Productive Arrangement (LPA) in the Northeastern Region of Rio de Janeiro state. However, the companies in this LPA use rudimentary techniques in their productive processes resulting in an excess of waste, high production costs and low competitiveness. The high rate of discarded raw material generates a significant amount of polluting waste. The objective of this research study is to evaluate the technical viability of reusing this waste as raw material in the production of structural concrete. The concrete would be produced by first crushing the rocks and then using the crushed rocks as a coarse aggregate. In order to attain this objective, this research study developed an experimental case study to evaluate a rock sample from a company of the Local Productive Arrangement. The goal was to compare the resistance of concrete produced with the gneiss aggregate with the resistance of concrete produced with conventional aggregate. The results indicate that the resistance to compression of the concrete produced with the rock waste is very similar to that of concrete produced with conventional aggregate thereby making the production of structural concrete with coarse gneiss aggregate technically viable. The reuse of this material may generate the following benefits: Minimize environmental impacts caused by the inappropriate disposal of waste and generate complementary income for producers by transforming residues into a commercially viable product.

Biography

Romeu E Silva Neto has completed his Doctorate in Production Engineering from the Catholic University of Rio de Janeiro (2002) and Post-Doctorate in Industrial Economics from the Economics Institute of the Federal University of Rio de Janeiro (2008). He is Currently Professor of Graduate Program in Environmental Engineering (Fluminense Federal Institute) and Professor and Coordinator of the Production Engineering course Technological Institute of Applied Social Sciences and Health (ISECENSA).

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