Polymeric Mortar of Brick and Block Laying: A Study of Marble Waste Incorporation

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Currently, the search for lower costs cause companies to adopt new processing techniques, concerned with the recovery of their waste or with the attempt to use waste from other processes as raw material. The objective of this study was to evaluate the technical performance of polymer mortar for brick and blocks laying for civil construction, using marbled residues as a small aggregate. A reference mortar was prepared with the ratio 1: 7 (polymer resin: calcium carbonate, medium natural sand) and test formulations were used under three different conditions: 100% replacing conventional building sand (CS) and 50% and 100% CaCO3 (CC) by the marble waste (MW). The water/ polymer resin ratio was 0.48. The prepared formulations were submitted to the Tear and Tensile Strength tests. In addition, microstructural tests of SEM, FTIR and X-rays and environmental leaching and solubilization tests were performed. The performance tests showed higher mechanical strength than the commercial sample, whose results ranged from 1,572 MPa to 2,694 MPa. From the environmental perspective, iron, sodium and zinc metals were not detected in the leached and solubilized extracts. At the economic level, the total substitution of CS and CC for the marble waste (MW) provided a 25.12% reduction in material costs, and it was concluded that the polymer mortar with the use of marble waste has a technical, economic to be used in brick and block settlement in building construction.

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