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Marble waste and recycled concrete aggregates in self compacting concrete (SSC): an evaluation of fresh and hardened properties

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ABSTRACT

Abundant waste is being generated in the demolition or renovation in the construction industry. Improper disposal of this waste creates environmental concern as they form huge landfills without proper use. This study examined the fresh, hardened, durability,

and microstructural analysis of self-compacting concrete made with recycled aggregates (RA) and marble waste as a 10–30% granite substitute. Slump flow test, T50cm test, V-funnel test, and L-box test were conducted on the fresh concrete. Compressive strength, split tensile strength, flexural strength, microstructural properties, and carbonation of the hardened concrete were determined. The physical tests revealed that though the recycled aggregates and marble waste do not have properties as good as the natural coarse aggregates, recycled aggregates were observed to exhibit a better strength than marble waste. SCC with marble waste had better fresh state properties than those with recycled aggregates. SCC with recycled aggregates had better-hardened state properties than those with marble waste. It can be inferred from the microstructural analysis that the utilisation of partial granite replacement improved the interaction between the concrete constituents. However, the sample with recycled aggregate was still better than that with marble waste in this regard.

KEYWORDS:

- Recycled aggregate
- self-compacting concrete
- marble waste
- properties

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Compliance with Ethical Standards

This article does not contain any studies involving human or animal subjects.

Additional information

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