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## Microstructural analysis of recycled aggregate concrete produced from two-stage mixing approach

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### Abstract

Owing to the shortage of space for land reclamation in Hong Kong, it is difficult to dispose of tons of masonry waste generated daily from construction activities. Adoption of recycled aggregate from concrete waste thus becomes a burning issue. The Hong Kong SAR Government has set-up a recycling plant in Tuen Mun Area 38 aiming at turning concrete waste into recycled aggregate with a practice note and specifications issued for controlling the quality of recycled aggregate. However, the use of recycled aggregate concrete to high-grade applications is rarely reported because of its poorer compressive strength and high variability in mechanical behavior. This paper proposes a new approach in mixing concrete, namely, "two-stage mixing approach (TSMA)," intended to improve the compressive strength for recycled aggregate concrete and hence lower its strength variability. Based upon experimental works, improvements in

strength to recycled aggregate concrete were achieved. The effect can be attributable to the porous nature of the recycled aggregate, and hence, the premix process can fill up some pores and cracks, resulting in a denser concrete, an improved interfacial zone around recycled aggregate and thus a higher strength when compared with the traditional mixing approach.



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## Keywords

Compressive strength; Two-stage mixing approach; Recycled aggregate concrete; Waste management; Construction

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