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Spotlight on Structures



Editor's Featured Article

Associate Editor, Man-Tai Chen, has chosen a paper investigating the axial stress-strain behaviour of carbon fibre-reinforced polymer-confined recycled fine aggregate concrete as the Featured Article for Volume 87 of *Structures*.

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Stress-strain behaviour of CFRP-confined recycled fine aggregate concrete: A packing-coupling approach

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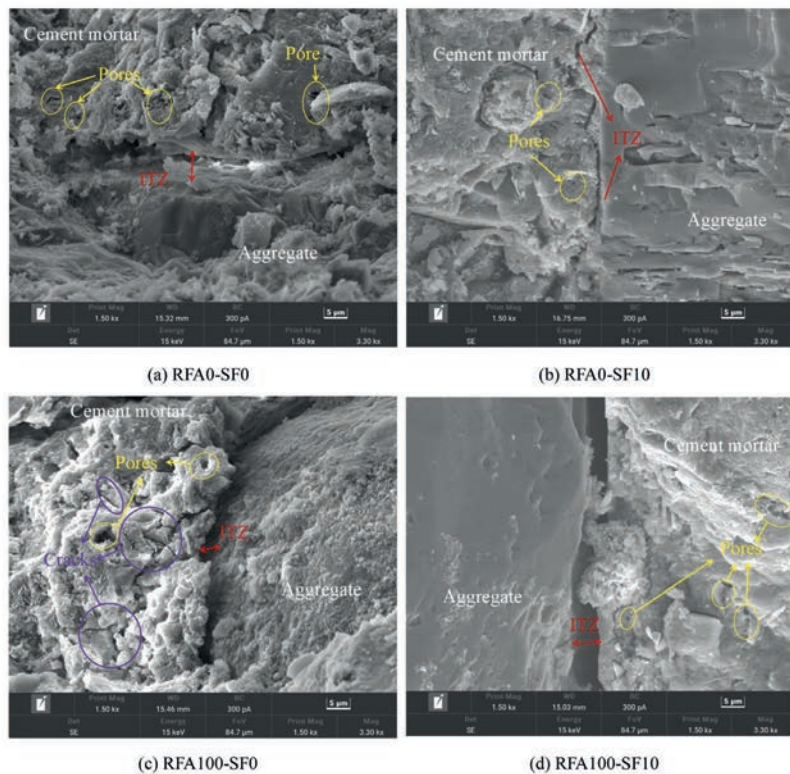
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SF incorporation improved WPD and ITZ integrity, effectively mitigating RFA-induced deterioration and enhancing confinement efficiency. CFRP-confined RFAC exhibited a characteristic bilinear stress-strain response governed by the interaction between packing-controlled lateral dilation and confinement stiffness. A packing-coupled, path-dependent constitutive model accurately predicted

the stress-strain behaviour across all test parameters, providing mechanistic insights into the confined response of RFAC and supporting its application in low-carbon, sustainable structural systems.

→ Read the full paper at <https://doi.org/10.1016/j.istruc.2026.111734>

With increasingly stringent restrictions on river sand extraction and the growing accumulation of construction waste, recycled fine aggregate (RFA) has attracted attention as a sustainable alternative for structural concrete. However, the porous adhered mortar and defect-rich interfacial transition zones (ITZ) associated with RFA fundamentally alter the particle-packing structure, thereby weakening mechanical performance and limiting structural applications. This study investigates the axial stress-strain behaviour of carbon fibre-reinforced polymer (CFRP)-confined recycled fine aggregate concrete (RFAC) from a packing-coupling framework. A total of 36 cylindrical specimens with varying RFA replacement ratios, silica fume (SF) contents, and CFRP layer numbers were tested under uni-axial compression. Results show that increasing RFA replacement reduced wet packing density (WPD), leading to a more compliant load-bearing skeleton characterised by reduced strength and stiffness but enhanced deformation capacity.



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