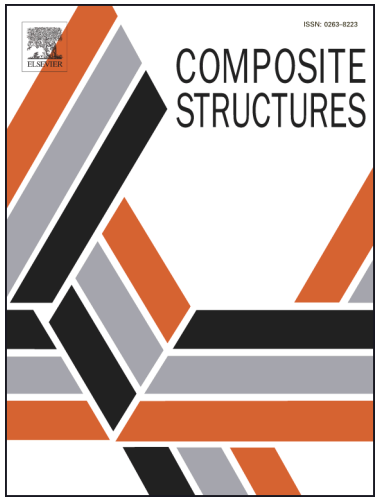

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Effect of Aggregate Size on Stress-strain Behavior of Concrete Confined by Fiber Composites

Cheng Jiang[1], Yu-Fei Wu[2]*, Jia-Fei Jiang[3]

Abstract

There is no consensus in extant literature on the size effect of fiber reinforced polymer (FRP) confined concrete columns. This work studies the size effect by studying the influence of aggregate size on the stress-strain behavior of FRP confined concrete. Experimental tests were conducted on concrete cylinders with different aggregate sizes and fixed specimen dimensions. Aggregate size shows no effect on the stress-strain behavior of unconfined concrete but has significant effect in the transitional region of the stress-strain curve of FRP confined concrete. However, no significant effect exists on the hardening slope of the stress-strain curve and the ultimate strength of FRP confined concrete. Based on the experimental results and Bazant's law of size effect, a new method is proposed for modeling the stress-strain relationship of FRP confined concrete allowing for size effect.

Keywords: Concrete; Size effect; Aggregate size; FRP; Confinement; Stress-strain relationship.

[1] Dept. of Architecture and Civil Engineering, City University of Hong Kong, Hong Kong Special Administrative Region, China.
[2] School of Engineering, RMIT University, Australia. Formerly Dept. of Architecture and Civil Engineering, City University of Hong Kong.
*Corresponding author, Tel. +61 399252493, Fax. +61 396390138, Email: yufei.wu@rmit.edu.au
[3] Research Institute of Structural Engineering and Disaster Reduction, Tongji University, 200092, Shanghai, China.