

Compressive behavior of concrete cylinder fully and partially confined by carbon fibre-reinforced polymer (CFRP)

ABSTRACT

Partial CFRP-confinement has been used as an option beside full CFRP-confinement for strengthening structural elements. However, the sufficiency of partial CFRP-confinement has always been uncertain. Therefore, this paper presents 24 specimen cylinders ($300\text{ mm} \times 150\text{ mm}$) strengthened with partial CFRP-confinement horizontal and helicoidal strip. The results from both modes of partial CFRP confinement with strip spacing of 60, 40, and 20 mm were compared with full confinement and unconfined specimens. Partial horizontal CFRP strip confinement at 20 mm strip spacing yielded a reasonable load capacity (80.56 MPa) at 71% strength enhancement. Therefore, partial CFRP confinement with a horizontal strip is proven sufficient. Theoretical predictions and the test results are being compared as well in evaluating the accuracy of existing FRP-confined concrete model.

Keyword: Fibre-reinforced polymer; Partial confined; CFRP confinement; Stress-strain model