

# **FRP-CONFINED CONCRETE-ENCASED CROSS-SHAPED STEEL COLUMNS: STUB COLUMN TESTS**

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## **ABSTRACT**

FRP-confined concrete-encased cross-shaped steel columns (FCCSCs) are a new form of hybrid columns recently developed at the University of Wollongong. An FCCSC consists of a square FRP outer tube, a cross-shaped steel section and concrete filled in between. This sectional configuration ensures that the concrete is very effectively confined despite the square shape of the column, and that the steel section is well protected and constrained by the FRP tube from corrosion and buckling, leading to a column that is highly ductile and corrosion-resistant. This presentation provides a summary on an experimental study designed to demonstrate the concept of the new column form. The experimental program involved the testing of FCCSC specimens as well as two types of similar column forms, namely, square FRP-confined plain concrete columns (SFCPCs) and circular FRP-confined plain concrete columns (CFCPCs). The test results confirmed the excellent performance of FCCSCs. The test results also showed that compared with the concrete in SFCPCs and that in CFCPCs, the concrete in FCCSCs has a much larger ultimate axial strain and a larger compressive strength, when the same FRP tube is used.

**KEYWORDS:** FRP, steel section, concrete, tubular column, confinement.