Accepted Manuscript

Ultra-high Strength Concrete on Eccentrically Loaded Slender Circular Concrete-filled Dual Steel Columns

C. Ibañez, M.L. Romero, A. Espinos, J.M. Portolés, V. Albero

PII: S2352-0124(17)30047-4
DOI: doi: 10.1016/j.istruc.2017.07.005
Reference: ISTRUC 209

To appear in: *Structures*

Received date: 16 November 2016
Revised date: 28 June 2017
Accepted date: 26 July 2017

Please cite this article as: C. Ibañez, M.L. Romero, A. Espinos, J.M. Portolés, V. Albero , Ultra-high Strength Concrete on Eccentrically Loaded Slender Circular Concrete-filled Dual Steel Columns, *Structures* (2017), doi: 10.1016/j.istruc.2017.07.005

Ultra-high strength concrete on eccentrically loaded slender circular concrete-filled dual steel columns

C. Ibañez [a], M. L. Romero [b]*, A. Espinos [b], J.M. Portolés [a] and V. Albero [b]

[a] *Department of Mechanical Engineering and Construction, Universitat Jaume I, Castellón, Spain*
[b] *Instituto de Ciencia y Tecnología del Hormigón (ICITECH), Universitat Politècnica de València, Valencia, Spain*
** Corresponding author. e-mail address: mromero@mes.upv.es*

ABSTRACT

This paper presents an experimental study which was undertaken to investigate the effect of ultra-high strength concrete (UHSC) on the mechanical response of concrete-filled dual steel tubular columns (CFDST) subjected to eccentric loads. This campaign is a continuation of a previous program on axially loaded members and consists in testing 12 CFDST specimens and two concrete-filled tubular (CFST) columns which serve as references. The location of the dual-grade concretes (outer ring and inner core) and the steel thicknesses configuration were the parameters analysed. Therefore, in this program, two series can be distinguished: 6 columns with normal strength concrete in their outer rings and, conversely, 6 with ultra-high strength concrete. In addition, two different steel tube thicknesses configurations were considered: columns with thin outer steel tube and thick steel tube (thin-thick); and the opposite pattern (thick-thin). Moreover, the experiments on the CFST columns of reference served to investigate the effect of the extra inner steel tube and its filling in CFDST columns. Since the number of campaigns on eccentrically loaded slender CFDST columns is scarce, the results presented in this work become particularly relevant. The analysis of the results revealed that, for both series, the response of the specimens showed similar trend but the effect of UHSC differed from that observed for axially loaded