Strength of precast concrete shear joints reinforced with high-strength wire ropes

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This paper concerns the in-plane shear strength of connections between precast concrete wall elements reinforced with looped high-strength wire ropes. The looped wire ropes are pre-installed in so-called ‘wire boxes’ which function as shear keys. Although only a small amount of research on the shear strength of such connections can be found in the literature, this type of connection is increasingly being used because wire ropes are much more construction-friendly than traditional U-bars. A rigid plastic upper bound model for the shear strength of wall connections reinforced with looped wire ropes that are pre-installed in wire boxes is presented along with test results on the shear strength of connections with double-wire boxes. It is shown that the plastic solution agrees well with both the obtained test results and results from previously conducted tests.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Structural Engineering, University of Southern Denmark,
Aarhus University
Contributors: Joergensen, H. B., Hoang, L. C., Hagsten, L. G.
Number of pages: 12
Pages: 168-179
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Institution of Civil Engineers. Proceedings. Structures and Buildings
Volume: 170
Issue number: 3
ISSN (Print): 0965-0911
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 0.69 SJR 0.41 SNIP 0.616
Web of Science (2017): Impact factor 0.674
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.57 SJR 0.364 SNIP 0.499
Web of Science (2016): Impact factor 0.424
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 0.38 SJR 0.339 SNIP 0.711
Web of Science (2015): Impact factor 0.429
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 0.44 SJR 0.342 SNIP 0.469
Web of Science (2014): Impact factor 0.494
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 0.58 SJR 0.573 SNIP 1.202
Web of Science (2013): Impact factor 0.282
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 0.67 SJR 0.787 SNIP 0.994
Web of Science (2012): Impact factor 0.609
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 0.58 SJR 0.651 SNIP 0.784
Web of Science (2011): Impact factor 0.573
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.522 SNIP 0.517
Web of Science (2010): Impact factor 0.373