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Spotlight on *Structures*



Editor's Featured Article

The Featured Article for Volume 68 of *Structures* is now available. Lei Wang, Associate Editor, has chosen a paper studying the bearing capacity of steel tubes reinforced with high-ductility concrete. This article is available to read free of charge.

Experimental study on ultimate bearing capacity of short thin-walled steel tubes reinforced with high-ductility concrete

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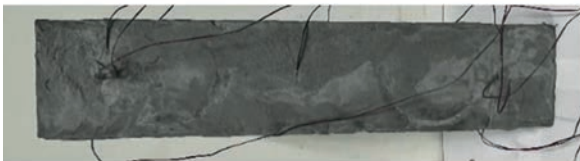
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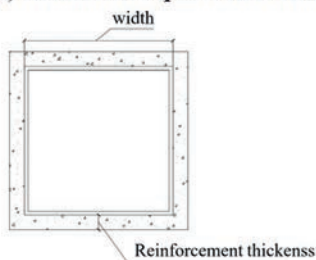
Thin-walled steel short columns often suffer from local buckling and limited load-carrying capacity. To address this issue, this study uses high-ductility concrete to reinforce thin-walled steel tubes, aiming to enhance both their load-carrying capacity and ductility. However, the challenge lies in the low bond strength between steel and high-ductility concrete. Therefore, the paper aims to propose an appropriate bond interface treatment to ensure a reliable bond between these two materials. Subsequently, axial compression tests were conducted for twelve short thin-walled steel tubes, comprising three unreinforced steel tube columns and nine columns reinforced with high-ductility concrete. The effect of the

following parameters on both unreinforced and reinforced thin-walled steel tubes was investigated: length-to-slenderness ratio, width-to-thickness ratio and the thickness of reinforced high-ductility concrete. The ultimate load-carrying capacity, failure modes and local buckling behaviour of steel tubes are evaluated and high-ductility concrete can enhance the mechanical performance of thin-walled steel tubes. A design equation is proposed to predict the ultimate strength of short thin-walled steel tubes reinforced with high-ductility concrete, which provides design guidelines for the application of high-ductility concrete strengthening existing steel tube structures.

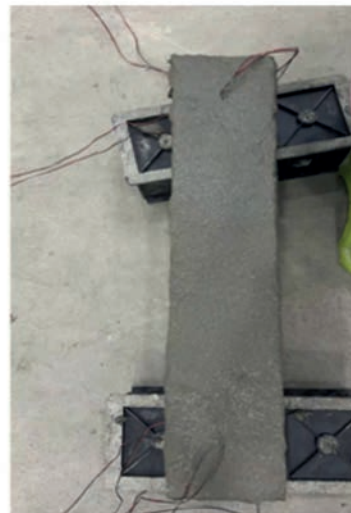
→ Read the full paper at <https://doi.org/10.1016/j.istruc.2024.107109>



(a) Reinforced square steel tube



(b) cross-section



(c) smearing HDC on steel tube



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