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Spotlight on *Structures*



Read the latest issue

The latest issue of *Structures* (Volume 28, December 2020) is available at www.sciencedirect.com/journal/structures/vol/28.

Editor-in-Chief, Leroy Gardner, has selected a paper entitled 'Study on the cyclic bending behaviour of CFRP strengthened full-scale CHS members' as his 'Featured Article' from this issue. The article will be available free of charge for six months.

Editor-in-Chief's Featured Article

Study on the cyclic bending behaviour of CFRP strengthened full-scale CHS members

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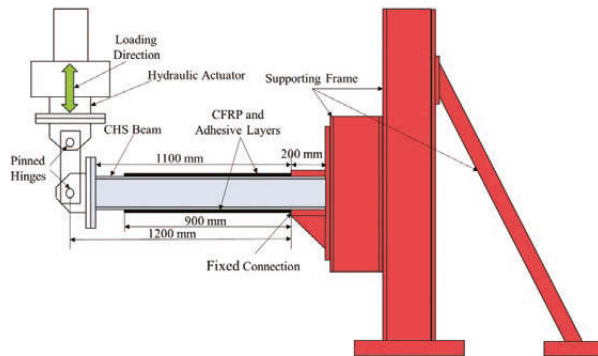
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Abstract

Circular hollow steel (CHS) members have been regarded as structural elements of choice for use in civil infrastructure. Despite the risk of seismic damage of steel structures during an earthquake due to its cyclic characteristics, studies on the cyclic strengthening of CHSs have been minimal. In the present study, a new finite element (FE) modelling approach is developed and applied to study the cyclic performance of carbon fibre reinforced polymer (CFRP) strengthened CHS specimens. The modelling techniques are first validated using results from the authors' previous

experimental work. A detailed parametric study is then carried out to evaluate the effects of CFRP bond length, CFRP layer numbers, ratio of thickness of CFRP to thickness of CHS, CHS member diameter-to-thickness ratio and steel grade on the cyclic performance of the CFRP strengthened CHS members. Results confirm the significant effects of these parameters on the cyclic performance of CFRP strengthened CHS members. The efficiency of CFRP strengthening increases with an increase in the ratio of the thickness of CFRP to the thickness of CHS and also with an increase in the diameter-to-thickness ratio of CHS specimens. Conversely, the efficiency of CFRP strengthening reduces with an increase in the steel grade. Moreover, the ultimate moment capacities obtained from the FE analyses of the bare and CFRP strengthened CHS specimens agree reasonably well with the theoretically predicted values.

→ Read the full paper at <https://doi.org/10.1016/j.istruc.2020.09.015>



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