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Spotlight on *Structures*



Editor's Featured Article

The Featured Article for Volume 66 of *Structures* is now available. Ana Espinós, Associate Editor, has selected a paper studying the lateral behaviour of a composite concrete-filled steel tubes truss column.

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Experimental and theoretical studies on lateral behavior of prefabricated composite concrete-filled steel tubes truss column

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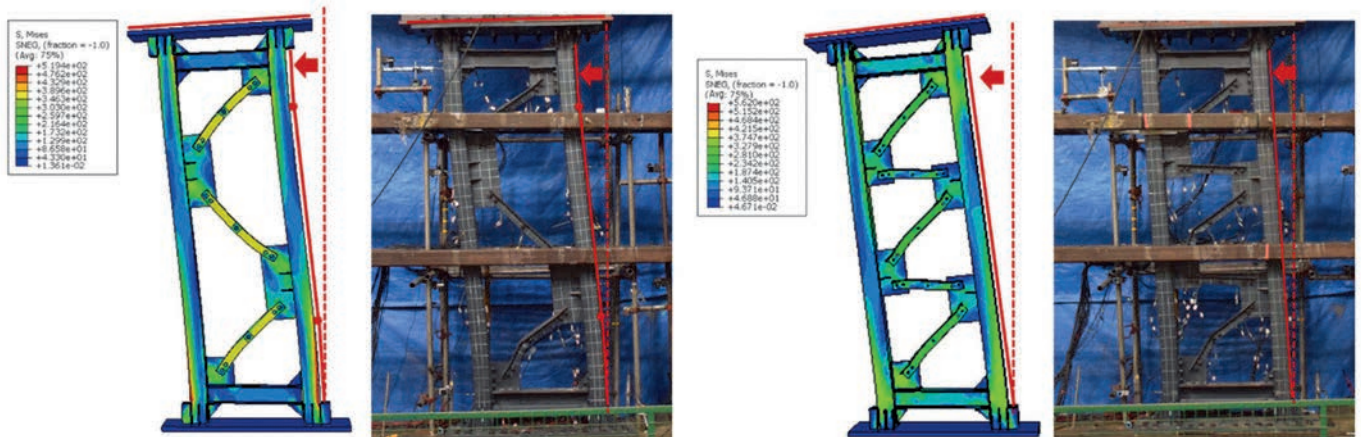
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Enhancing the lateral force resistance of residential structures through innovative prefabricated designs is crucial for

improving structural resilience and safety. This study presents an innovative design for prefabricated concrete-filled steel tube (CFT) column trusses with V-shaped or Z-shaped configurations to enhance the lateral displacement and ductility of residential buildings under lateral forces. The CFT-column truss is a prefabricated system featuring two square CFT columns connected to H-section beams using fish plates. Additionally, the beams and columns are linked to a web truss component made of double-angle sections. To assess their failure patterns and characteristic capacities, two large-scale specimens were subjected to lateral monotonic loads. The test results indicated that both V-shaped and Z-shaped trusses exhibited exceptional performance.

The V-shaped trusses demonstrated significant improvements in yield stiffness and ductility, increasing by approximately 22% and 31%, respectively. However, the yield and peak bearing capacities of these trusses were reduced by about 10% and 6.75%, respectively. Furthermore, a theoretical model was developed based on the observed test failure modes and verified through finite element (FE) analyses. The predictive results of the theoretical model were compared to a group of FE models, demonstrating their suitability for accurately estimating bearing capacities and yield stiffness with a high level of agreement.

→| Read the full paper at <https://doi.org/10.1016/j.istruc.2024.106920>



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