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Spotlight on *Structures*

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Volume 39 of *Structures* (May 2022) is now available to read at www.sciencedirect.com/journal/structures/vol/39.

Associate Editor, Lin-Hai Han, has selected an article on seismic fragility analysis of braced frames constructed from concrete-filled tubes as the 'Featured Article' from this issue. The article will be available free of charge for six months.

Editor's Featured Article

Seismic fragility analysis of CFT frames with buckling-restrained braces and steel braces under long- and short-duration ground motions

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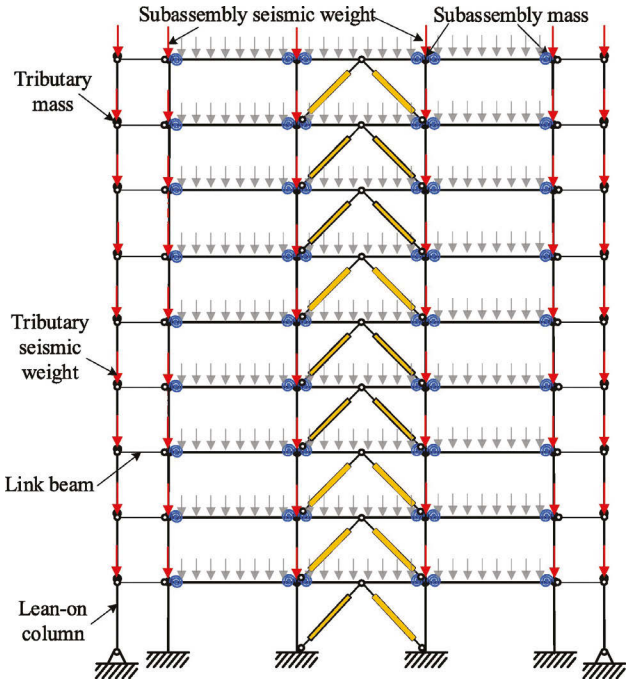

This study presents the seismic behaviour and the effect of ground motion duration on the probabilistic seismic fragility for the concrete-filled steel tube (CFT) frames with buckling-restrained braces (BRB-CFTF) and conventional steel braces (SB-CFTF). The nine-storey BRB-CFTF and SB-CFTF prototype structures were designed based on the performance-based plastic design method. One scaled single-storey single-bay BRB-CFTF and one buckling-restrained brace (BRB) extracted from the prototype structure were cyclically tested and analyzed. Finite element (FE) models of the two braced frame structures were developed and validated by available test results. The results obtained from nonlinear dynamic analyses showed that the designed two structures achieved expected performance objectives in terms of the inter-storey drift and member energy-dissipating demand. The selection of engineering demand parameter (*EDP*) quantifying structural response and intensity measure (*IM*) representing ground motion hazard level was performed to determine optimal indicators for identifying duration effect prior to establishment of fragility curves. The results indicated that the overall damage index (*ODI*) as the *EDP* can clearly distinguish the influence of duration effect on structural cumulative damage. The optimal *IM* relative to *ODI* was believed to be the combined duration- and spectrum-related $I_{NP\text{-}D}$, because of desirable balance among the efficiency, sufficiency and scaling robustness. The BRB-CFTF and SB-CFTF structures were more vulnerable to all limit states under long-duration ground motions than those under short-duration ones at the same seismic hazard level, and the probability of exceedance for a given $I_{NP\text{-}D}$ of the SB-CFTF was generally larger than that of the BRB-CFTF. The influence of ground motion duration on the cumulative damage for the BRB-CFTF and SB-CFTF structures is suggested to be considered in structural seismic design and analysis.

→| Read the full paper at **https://doi.org/10.1016/j.istruc.2022.03.078**

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