

Pseudo-dynamic testing of a fabricated composite frame with steel plate shear walls

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Fabricated composite frame with steel plate shear walls



Composite beam

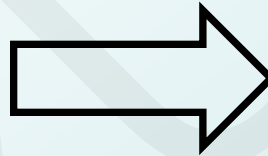


BHA connection



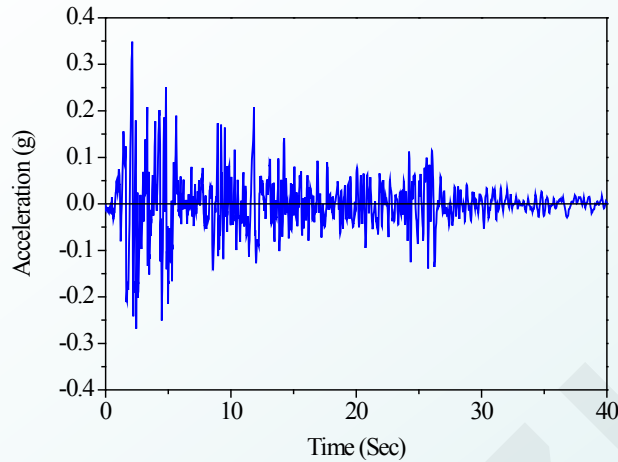
Infill panel

Fabricated construction
technology



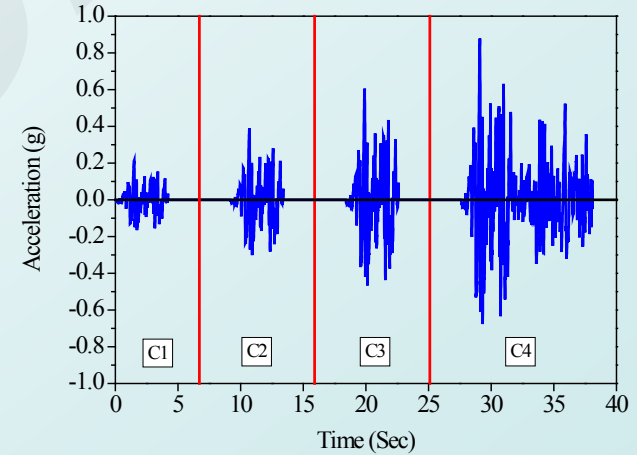
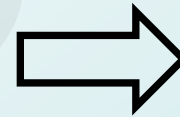
**Fabricated composite frame
with steel plate shear walls**

Loading Cases



Original ground acceleration (EL Centro, 1940)

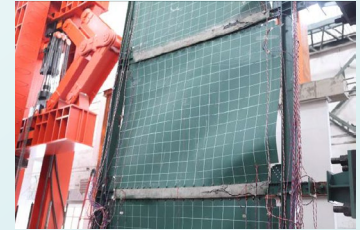
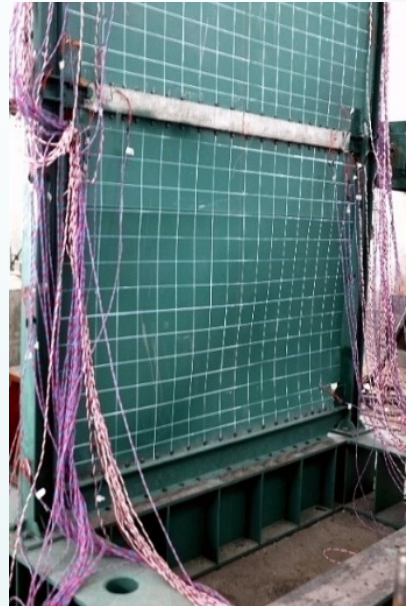
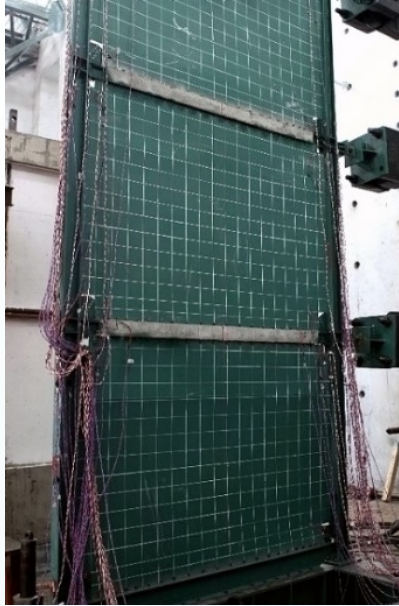
PGA and duration of four loading cases



Continued scaled ground acceleration

Case	C1	C2	C3	C4
PGA	0.22g	0.4g	0.62g	0.9g
Duration (s)	4.2	4.2	4.2	10.5

Experimental phenomena

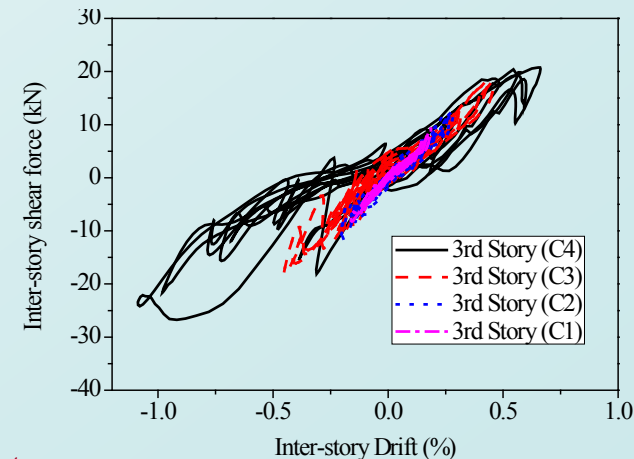
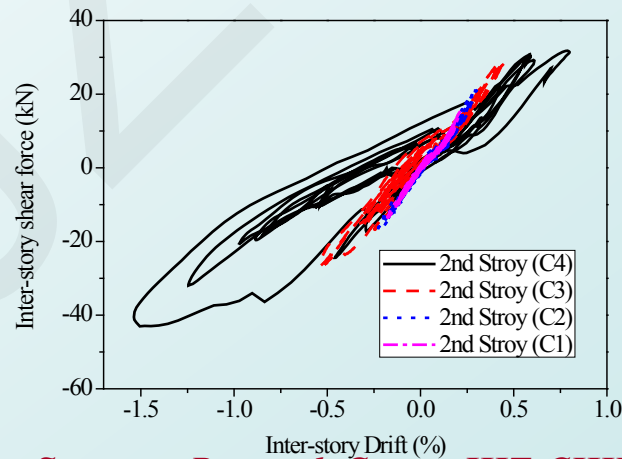
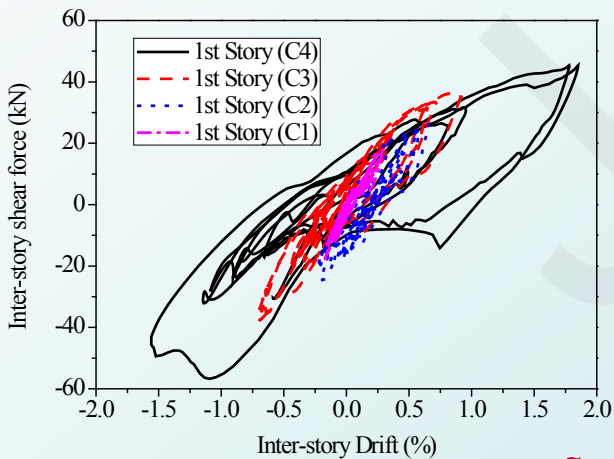


Case C1

Case C2

Case C3

Case C4





Conclusions

- ❑ Beam-only-connected SPSWs buckled at a relatively small inter-story drift, and post-buckling tension fields were formed and yielded to resist lateral loads and dissipate earthquake energy.
- ❑ No damage or obvious connector slippage was observed in BHA connections, which was in accordance with the strong connection design principle.
- ❑ An undesirable failure mode of the fabricated composite frame in huge earthquakes was the horizontal cracks progressed in composite beams and the block shear failure in SPSWs' connections.
- ❑ The first story was the critical position of the prototype building and needed to be well designed to avoid the formation of soft-stories.