



组合钢板剪力墙的简化模型

A Simplified Model for Composite Steel Plate Shear Walls

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英文关键词: [Composite steel plate wall](#) [Simplified model](#) [Cross-strip model](#) [Hysteretic model](#)

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中文摘要

新型钢-混凝土组合钢板剪力墙在混凝土板与边缘构件之间留有缝隙, 避免混凝土板参与抵抗剪力, 从而可以避免其对钢板的约束作用发生退化。观察这种组合钢板剪力墙的受力机理和破坏模式发现, 缝隙的设置使得无约束区域的钢板产生与钢板墙相类似的斜拉场效应。据此在钢板墙的斜拉杆模型中引入斜压杆, 提出了双向多斜杆简化分析模型。通过理论分析, 给出了该模型中斜杆元件的截面特性、滞回模型。经试验验证, 表明该模型准确地模拟组合钢板剪力墙在单调加载和反复加载下的非线性性能。

英文摘要

A new-type Composite Steel Plate Shear Wall (CSPSW) is set with gaps between its concrete panel and its boundary members in order to prevent the concrete panel from resisting shear force and to protect the restraining action of the concrete panel on the steel plate from deterioration. Observing the mechanism and failure mode of CSPSW shows that the gaps make the unrestrained region of the steel plate produce diagonal tensile action of steel plate shear walls. A simplified model - Cross-Strip Model was proposed by introducing diagonal compressive bars into the strip model for steel plate shear walls. The cross sectional properties and hysteretic model for the cross strips in the model were determined with theoretical analysis. Comparison with experimental results showed that the proposed model was able to capture accurately nonlinear behavior of CSPSW under monotonic and cyclic loading.

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