

Abstract

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Efficiency of corrugated sheets in resisting membrane forces

In steel construction, the covering sheets can play an important role in insuring the stability of structural system through membrane forces and diaphragm action. When adequately connected to the supporting beams and columns, the covering sheets contributes in resisting in plane shear force and reduce the need for large bracing elements. This paper aims to quantify the efficiency of corrugated sheets in supporting the horizontal force due to wind load earthquake. For a specific arrangement of framed system, different forms of steel sheets are analyzed and the behavior under lateral load is explained. In each case, the efficiency of the steel sheet is quantified by comparing the horizontal displacement of the loading point with the reference basic case of truss system. Parametric studies are carried to identify the effect of sheet thickness and number fasteners on the global stability of the structural system.