Investigation of Lattice Structure for Cold Formed Steel (CFS) Shear Walls

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Abstract

Excellent candidates for lightweight, energy-absorbing applications include lattice structures. Lattice structures' mechanical characteristics and deformation behavior are influenced by several design factors. Recent times have seen a rise in strut-based cellular topologies because of the accessibility of 3d printing. The use of faces in conjunction with the struts has also been investigated. We do a simulation, based study to investigate the possibility of replacing conventional construction material with Lattice structures.

Here we take shear wall as the subject of a study. Shear wall is a structural member in a reinforced concrete framed structure to resist lateral forces such as wind forces. Shear walls are generally used in high-rise buildings subject to lateral wind and seismic forces. In reinforced concrete framed structures, the effects of wind forces increase in significance as the structure increases in height. We replace wooden board (OSB) with Lattice structure to reduce the induced forces on the CFS members to increase the longevity of the entire assembly.

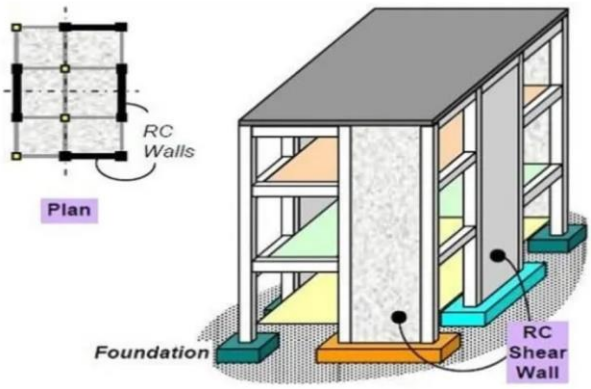

Figure 1. Shear Wall in Building Construction

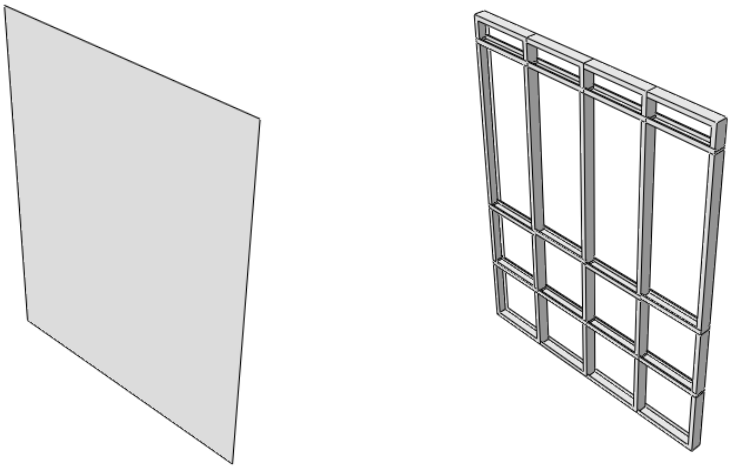

Figure 2. a) Sheathing Board b) Cold Formed Steel

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