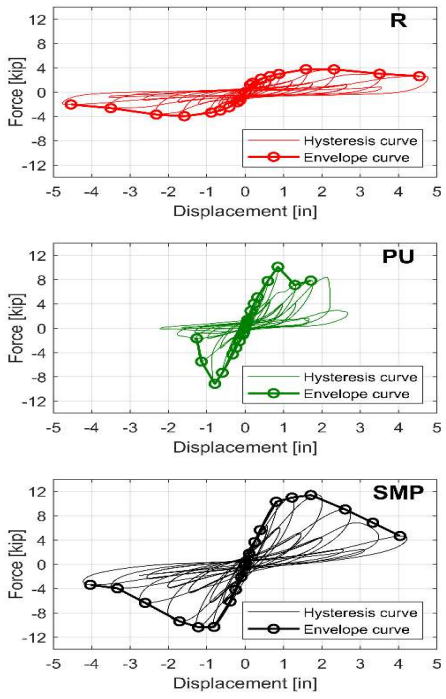
Results of Wall Test Expressed as Force Displacement--Hysteresis

The study looks at three ways to construct light-frame walls using common nails, polyurethane adhesive (PU), and polyether adhesive (SMP - Climate®) at sheathing-framing connections. The study conducted cyclic loading tests to evaluate the structural response by drawing a relationship between strength in (Thousand Pounds) versus movement in (inches), called Hysteresis Loops. The walls built with nails showed changes in performance over time due to the nails bending and slipping. The PU adhesive wall had a consistent performance but was more brittle. The Climate adhesive wall performed well and showed no signs of damage even when pushed further than the PU adhesive walls.

The research found that the Climate adhesive is better than using nails or PU adhesive. It can handle more weight, is more flexible, and absorbs more energy. This is because the Climate adhesive allows the wall materials to move and adjust freely without breaking apart. In comparison, the PU adhesive is strong but not very flexible, which can lead to early failures and less energy absorption.



Hysteresis Loops of cyclic tests

Alhawamdeh, B. & Shao, X. (2023, August) Enhancing light-frame shear wall performance with elastomeric adhesives. A test program study. Structural Adhesives. *Structure Magazine*, 50-52. https://www.structuremag.org/?page_id=24674