

SECUROCK® EXOAIR® 430 SYSTEM WOOD FRAME DESIGN GUIDE

Buildings are subjected to numerous stresses over their lifespan. Some of these stresses are wind loads, seismic loads, thermal expansion and thermal contraction. When designing a structure, one should consider if the structure and its materials can handle the stresses over the intended life of the building. This document specifically discusses wind loading and shear forces that are imposed on a building when using a gypsum panel installed over wood framing.

Shear can have several different meanings in the construction industry. This document focuses on shear being defined as the lateral force that is applied to walls during wind events. A common approach to accommodate shear forces on a building would be to sheath the exterior walls with a plywood or oriented strand board (OSB). Plywood and OSB accommodate high shear values over wood framing well.

Combustibility is the major disadvantage to using plywood or OSB sheathing. Wood is an excellent fuel source for fire propagation, which must be avoided in occupied structures. Gypsum sheathing is an ideal material to combat fire in the building envelope and accommodate high shear values over wood framing.

The following bracing methods are industry recommendations for meeting code requirements for shear values of wall systems. Ultimately, the engineer of record must validate these design configurations for use with a specific project and reference the American Society of Civil Engineers Design Guide 7.



The first method is to install plywood or OSB sheathing directly to the framing. During installation, the installer covers the wood components with gypsum sheathing. While this method is easy to implement, it can be cost prohibitive as it requires two layers of sheathing on the building exterior.

The second method is to install a diagonal piece of wood in a notch created in the framing. The International Residential Code dictates that the bracing shall be placed at an angle between 45 to 60 degrees. This method is economical because it requires only one additional piece of lumber, a circular saw, and chalk line, materials typically found on a job site.

The third method can be used in wood framed walls with 2" x 6" studs or greater. A box is constructed of 2" x 4" lumber sheathed with OSB and recessed in the empty stud cavity. The recessed box creates a smooth uninterrupted surface for interior drywall and exterior gypsum sheathing. It is incumbent on the engineer to design the inset shear wall panels, specify the amount required, and dictate their placement. When designed correctly, inset shear panels will provide enough lateral load resistance to accommodate all wind and seismic zones.

The fourth method utilizes diagonal metal strapping. A variety of manufacturers produce products for this methodology. There are three types of metal strapping: Flat, T-Profile, and L-Profile. All three types can be installed from top plate to sole plate across vertical framing members. In addition, Flat strapping can be installed over the top of the framing. T-Profile and L-Profile strapping must be installed in a diagonal notch in the framing. A benefit to a diagonal notch, created with one pass of a circular saw, is its small area widthwise.

Wood Framing and the Securock ExoAir 430 System

The Securock ExoAir 430 System can be installed on either steel or wood framing. When installing on wood framing, all four bracing methods discussed in this document help buildings stand the test of time while protecting against structural damage, moisture infiltration, and fire propagation. Refer to the Securock ExoAir 430 System Installation Instructions for complete installation information.

The Securock ExoAir 430 Panel is a glass mat-faced, moisture- and mold-resistant gypsum panel, with a non-combustible core integrated with a factory-applied, synthetic, vapor permeable air/water barrier membrane. The in-plant application of the membrane provides uniformity and superior bond resulting in predictable air and water barrier performance.



Tremco Commercial Sealants & Waterproofing | 3735 Green Road | Beachwood, OH 44122 | US: 800.852.9068 | CAN: 800.363.3213 | tremcosealants.com

Manufactured by
United States Gypsum Company
550 West Adams Street
Chicago, IL 60661

For Tremco Technical Support
866-209-2402
216-292-5181
tremcosealants.com



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