WHITE PAPER

Energy Savings Start With the Framing™

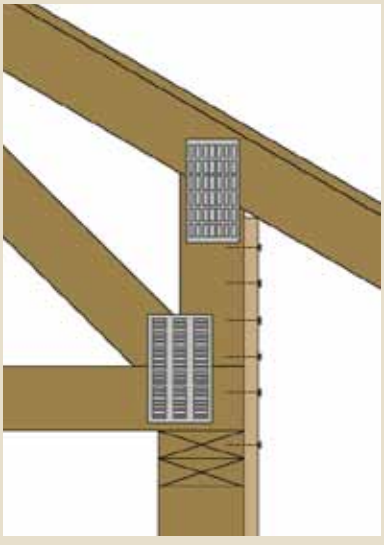
Raised-heel roof trusses and TallWall/Windstorm OSB sidewall sheathing combine to deliver both improved home performance and labor and materials savings critical to success in the new housing economy.

You have a challenge. Whether by choice or mandate, and probably a bit of both, you're on a mission to build homes that save more energy and better withstand harsh conditions. You want to build homes that result in fewer callbacks and more-satisfied customers and that keep profits in your pocket and work coming in.

That's easier said than done, especially if you've got a stable of old-school trade partners and suppliers who resist change. Ideally, you need building solutions that improve on traditional techniques. You need tested products that make common sense to your crews and combine to create a tight, strong building envelope that is your first and best defense against energy loss and storm damage.

It may seem almost too simple, but a combination of raised-heel roof trusses and Norbord's TallWall/Windstorm OSB sidewall sheathing panels meets those needs, and more.

Available as TallWall 9- and 10-foot sheets or in Windstorm lengths from 97 1/8" up to 145 1/8" (instead of standard 8-foot panels), TallWall/Windstorm OSB can extend from the sill plate to the full height of the raised heel, effectively stabilizing the entire wall-roof truss assembly while minimizing any gaps in the sidewall.



What's a Raised-Heel Truss?

A raised-heel truss (also called high-heel or energy truss) features a vertical member at the bearing point that raises the top chord of the truss a foot or more above the bottom chord. The design creates a full-depth, full-length cavity for uncompressed attic floor insulation to help reduce air-pressure differences and retard heat transfer between the attic and the conditioned living spaces below. Combined with proper air sealing and attic ventilation, the system is critical to lowering energy demand on a home's heating and cooling equipment and mitigating moisture problems such as ice dams and mold growth.

"A tall OSB panel provides stability for a raised-heel truss system, a continuous load path with one panel, and backing for attic insulation."

— Vladimir Kochkin
division director, NAHB Research Center

That assembly also allows a full amount of uncompressed attic floor insulation to the outside edge of the top plates. In fact, some energy codes allow reduced R-values in the attic in that situation.

Similarly, the absence of any mid-wall blocking creates full cavity bays for an optimum amount of wall insulation and an effective thermal barrier to help achieve your energy-efficiency goals.

Add to that the labor and material savings, thanks to fewer panel splices, no mid-wall blocking, and far fewer — if any — metal connectors through the entire load path, and the combination of TallWall/Windstorm OSB and raised-heel trusses delivers performance that complies with more stringent energy and building codes and meets your high standards for quality construction.

VERIFIED PERFORMANCE

Let's get down to details. First, does this assembly work? Tests using full-scale roof-wall assemblies and simulating real-world shear and uplift conditions at the NAHB Research Center in Upper Marlboro, Md., verified that TallWall/Windstorm OSB meets high-wind building code requirements for a continuous load path from the raised heel of an energy truss to the sill plate or floor system.

In most code jurisdictions, the assembly also eliminates all of the clips, straps, and other metal connectors that would normally be required to meet wind uplift and shear standards.

"You can't do that (reduce or eliminate metal connectors) with traditional [4x8] panels," says Vladimir Kochkin, division director for

"For most areas of the country with low wind hazard, we expect you can eliminate the need for hurricane clips at the bearing point of the truss and comply with wind-uplift standards."

— Vladimir Kochkin
division director, NAHB Research Center

When to Use Windstorm OSB

Designed and manufactured for high-wind and hurricane-prone areas, Norbord's Windstorm OSB is manufactured in lengths from 97 1/8" all the way up to 145 1/8".

For single-story homes on either slab-on-grade or raised-floor foundations, the panels span from the bottom of the sill plate to the full height of a raised-heel truss. Thus, they satisfy combined uplift and shear values and continuous load path requirements set by building codes along the Gulf and Atlantic coasts, among other areas, where the lengths are ideal for that style of construction.

For two-story or taller homes, the panels meet at the mid-band (or platform frame) between floors, strengthening that area of the structural frame while still enabling the top panel to extend to the full height of a raised-heel truss and preserve a continuous load path from top to bottom.

the Research Center. "You'd need to splice panels and add blocking in the wall for shear strength." Those are extra steps that not only add time, material, and cost but also undermine energy efficiency and may intrude on ideal mechanical runs.

The energy truss–TallWall/Windstorm OSB assembly also bridges the shear plane (the floor-to-floor or floor-to-roof connection in a platform frame, according to APA — The Engineered Wood Association, which rates and certifies structural sheathing products for construction. The panels strengthen what is essentially a bunch of nails used to fasten the framing members at that critical joint to make the house considerably stronger and safer.

In addition, TallWall/Windstorm OSB panels tie the roof truss frame together without the need for blocking between truss chords or additional straps and clips at bearing points to keep them stable, another labor-saving and quality-control benefit. Metal connectors can be easily misapplied in the field, leading to costly callbacks and latent performance problems, whereas fastening OSB sheathing is far more familiar to framing crews.

CODE COMPLIANCE

As building codes move toward requiring greater structural resiliency against wind and seismic forces, standards for improved home energy efficiency are also becoming more stringent. Whether by code, conscience, or consumer demand — and likely a combination of all three — builders are being asked to deliver homes that reduce energy use and ongoing energy costs for their homeowners.

"We expect the use of raised-heel trusses to increase as the 2012 International Energy Conservation Code is adopted across the country," says Kochkin, noting the 18 percent market share energy trusses currently capture in new-home construction, according to NAHB Research Center data. It's an optimized solution for better energy efficiency among a narrowing number of options that comply with the energy code, he says.

TallWall/Windstorm OSB sheathing furthers the energy-efficiency cause. Extended to the full height of raised-heel roof trusses, the sheathing provides a strong backing for the attic floor cavities, enabling insulation to fully extend to the outside edge of the top sidewall plate without loss of R-value from compression. The one-piece structural panel solution also eliminates the need and cost to install baffles across or between truss heels to contain the insulation.

Further, fewer horizontal joints along the height of TallWall/Windstorm OSB sheathing reduces the opportunity for pressure-driven air and moisture vapor to transfer through the building envelope, arguably the most critical aspect of energy-efficient home performance.

In fact, locating the manufacturer's recommended 1/8-inch gaps of the vertical and horizontal joints of TallWall/Windstorm OSB sheathing directly over the structural framing members effectively mitigates air leakage by up to 63 percent through a fully sheathed wall, according to NAHB Research Center testing.

Combined Shear & Uplift

Complying with prescriptive code language for both shear (or lateral) and wind uplift has traditionally required a progression of materials and methods. But with TallWall/Windstorm OSB, the long-length sheathing can be part of a shear wall assembly that addresses both forces with one solution. While holddowns and plates are still required for the shear wall assembly, strapping at window and door rough openings can be eliminated when builders span and cut those openings from a full sheet of TallWall/Windstorm OSB. That's a significant labor and materials savings that doesn't sacrifice quality and performance.

"This is an optimized solution for better energy efficiency, driven by energy codes, that doesn't add significant costs."

— Vladimir Kochkin
division director, NAHB Research Center

And not just in the lab. "By minimizing the sheathing joints with TallWall/Windstorm OSB, we've seen blower door testing on homes with fiberglass batt insulation that approach the same air leakage rates as homes insulated with spray foam," a result that represents a potentially significant cost savings for insulation, says Claude St. Hilaire, owner of Home Energy Group, a green building consulting and training firm in Mt. Pleasant, S.C.

Without the need to splice sheathing panels to span the entire height of the wall and the heels of the energy trusses, there's no mid-wall blocking to interrupt a continuous layer of insulation along the entire length of the wall cavities.

Tests conducted at Virginia Tech University showed that 4x10 TallWall OSB sheathing installed vertically and spanning from top plates into the joist area increased the overall strength of a 9-foot-high wall by 38 percent compared with the same wall sheathed with 4x8 OSB panels.

About Norbord

Based in Toronto, Norbord Inc. is an international producer of wood-based panels with assets of $1 billion and U.S. annual sales of $1 billion. Norbord has 14 operations in the United States, Europe, and Canada. Norbord is a publicly traded company listed on the Toronto Stock Exchange under the symbol NBD. For more information, visit **www.norbord.com**.

What Is TallWall OSB?

TallWall panels from Norbord are 4x9 and 4x10 structural oriented strand board (OSB) sheathing panels designed to reduce air infiltration and increase wall strength without requiring extra tools or training. Norbord developed code-approved and APA-rated TallWall sheathing to deliver these benefits without changing the way builders and framers handle, cut, and fasten structural wall sheathing. The panels also afford them the additional benefits of faster and simpler installation, lower labor and material costs, and fewer service callbacks for problems such as nail pops and drywall cracks.

Installation

As with any building product or system, proper installation is critical to achieving desired and lasting performance. TallWall/Windstorm OSB sheathing is engineered specifically to be used for structural wall framing applications and must be installed according to Construction Guide E30 from APA, a design professional's instructions, and/or the appropriate building code.

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