



FLOOR, ROOF AND WALL PANEL INSTALLATION

Achieving optimum performance with Weyerhaeuser Edge™ and Edge Gold™ oriented strand board (OSB) flooring and Weyerhaeuser sheathing depends heavily on correct installation and panel choice. End-user complaints can be avoided by choosing an appropriate panel for the application, practicing quality work, and installing Weyerhaeuser panels according to the techniques recommended here.

Minimize the chance for accidents by installing panels with the textured side up.

Safety

Always make safety a priority on the job site. Follow all OSHA requirements for proper personal protection equipment (PPE), fall protection, forklift safety, and the use of equipment. Adhere to Weyerhaeuser installation details, including the installation of safety bracing on unsheathed floors and roofs.

Consider that wet and/or steeply pitched sheathing may be slippery. Make sure workers have clean, slip-resistant roofing shoes and use all safety restraints required by OSHA. To help minimize the chance for accidents, install panels with the textured (or screen) side up. Weyerhaeuser sheathing is stamped “This side down” on the smooth face to facilitate safe installation.

Storage

Like any wood product, wood-based panels are at risk of fungal decay or rot if exposed to repeated wetting or high-moisture environments. Panels that are exposed to such conditions may deteriorate, lose strength, or support mold growth. For these reasons, protection from these conditions must be provided.

Keep all building materials dry and out of standing water prior to installation. Weyerhaeuser panels should be stored at least 4" off the ground. During transit and storage, make sure the panels are not damaged.

Floors

Laying Panels

Before installing flooring, make sure the framing underneath is level and not twisted. Add shims or blocking as necessary to create a smooth, flat surface. Verify that the panel's span rating meets or exceeds job requirements. Soft spots may occur if joist on-center spacing exceeds panel span rating.

Panels should be installed with the 8' length perpendicular to support members. When laying out flooring, make certain that each panel covers at least two spans and the panel edges fall at the center of the support. It may be necessary to trim some panels. Make sure that the “This side down” stamp is on the underside. Lay out rows of panels so that end joints are offset by at least one on-center spacing of the supports.

Gapping Panels

The panel industry recommends spacing wood-based panels to allow for the expansion that occurs when they are exposed to moisture. When installing Weyerhaeuser flooring, maintain a $\frac{1}{8}$ " gap at panel ends and edges. See *Figure 1* on page 2.

Weyerhaeuser single-layer flooring is manufactured with a self-gapping tongue-and-groove (T&G) profile that automatically gaps the edges as the floor is assembled. See *Figure 2*. A 10d box nail can be used to gauge the $\frac{1}{8}$ " gap between panel ends.

These spacing recommendations may not be adequate for buildings over 80' in length or width. For these cases, consider installing temporary expansion joints and drilling drainage holes through floors to allow water to escape. Patch the holes later with wood dowels or non-shrink grout and backer plates. See *Figure 3* for detail. Alternatively, use Weyerhaeuser's Edge Gold™ flooring panels with self-draining Down Pore™ technology. The Down Pore™ drainage grooves in Edge Gold™ flooring do not require plugs or patching later. Also, see the recommendations for **Expansion Joints for Floors in Large Buildings** on page 3.

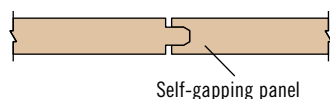


Figure 2

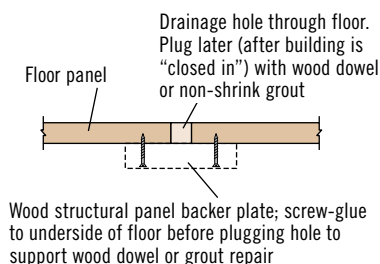


Figure 3

If spacing recommendations are not followed, the flooring may buckle as it expands. While buckling itself may not cause any loss of structural integrity, it can result in other problems, including cracks in tile work and squeaks under hardwood floors. See page 7 for additional information on panel buckling.

Gluing and Nailing

Weyerhaeuser recommends gluing and nailing flooring to the joists and other applicable structural components. A glue-nailed floor assembly not only improves floor stiffness, especially with T&G panels, but also helps eliminate nail pops, floor squeaks, vibrations, and bounce. Weyerhaeuser suggests using

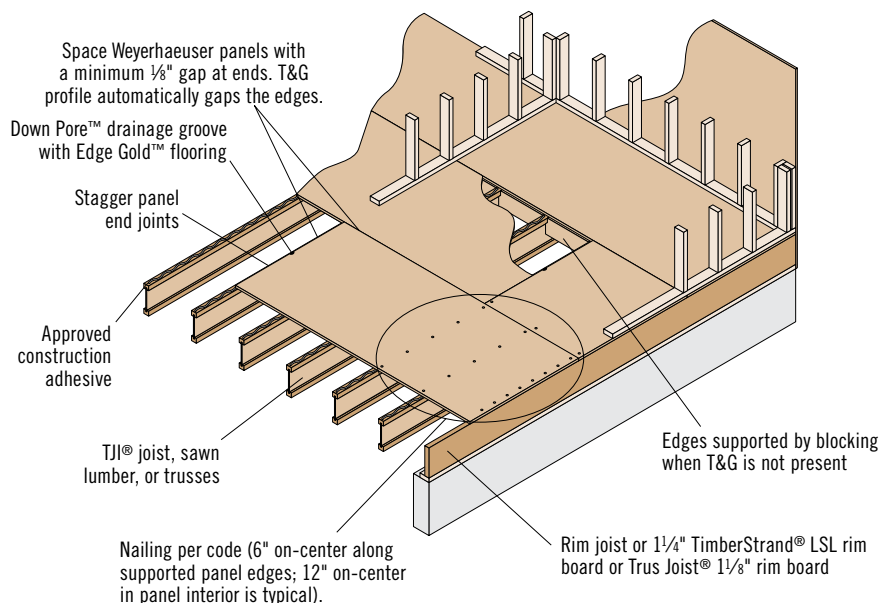


Figure 1

only solvent-based construction adhesives that meet ASTM D 3498 (AFG-01) performance standards. Based on experience and customer feedback, Weyerhaeuser does not recommend using water-based or polyurethane adhesives.

Start by snapping chalk lines across joists every 4' as a visual aid for aligning panels and spreading glue. Before gluing, make sure joists are dry and free of dirt. Apply a 1/4" bead of approved elastomeric adhesive to the top of the joists and blocking (if used); use a serpentine pattern on supports that are 3 1/2" or wider.

Apply only enough adhesive to install one or two panels at a time. Use two beads of adhesive on joists where panels meet to ensure that both panels will adhere to the framing.

Install the first panel with the tongue edge toward the perimeter. This protects the tongues on the remaining panels from being damaged when they are slid into place.

Apply a thin 1/8" bead of glue in each groove and tap panels together. To reduce bumps in the finished floor, remove any excess glue that may squeeze out.

Nail the flooring in place before the glue sets; follow the adhesive manufacturer's instructions for allowable cure time. Remember that cure time is dependent on temperature, climate, and other conditions.

Begin nailing by starting a row 3/8" from one edge and work across the flooring in rows. Continue working in rows until the flooring is completely fastened. This technique keeps internal stresses—which could contribute to buckling later—from building up inside the flooring.

Drive nails flush to the panel face. Avoid over-driving nails through the panel surface, especially when using a power-driven tool. Refer to the recommendations under **Special Considerations for Power-Driven Fasteners** below. While nailing flooring, straddle the fastener location to ensure contact between the flooring and the framing.

Nailing schedules and types of fasteners will vary depending upon the application and the thickness of the panel. See the table on page 3 for Weyerhaeuser's recommended schedules for single- and double-layer floors. Other code-approved fasteners may be used, but verify the spacing requirements.

High-wind and seismic areas may require a different nailing schedule. In such cases, see section 2306.3 of the IBC for diaphragm connection requirements, and check local building codes for requirements.

Special Considerations for Power-Driven Fasteners

Pneumatic staplers and nail guns are light-weight and do not provide enough force on

the panel to hold it tight to the framing as it is nailed. Poor contact can cause the nail to pop or become loose enough to squeak against the panel later on. Avoid this by having the operator stand on the flooring, or apply hand pressure, next to the area being fastened as the nail is driven.

Most power-driven fasteners have adjustments for controlling pressure. If the pressure is set too high, it will countersink the fastener—something that should be avoided when installing flooring or sheathing. Adjust the pressure until the nails drive flush to the panel face.

Expansion Joints for Floors in Large Buildings

Dimensional changes in large buildings can be significant when the flooring absorbs surrounding moisture and expands. Consider drilling drainage holes through floors to allow water to escape. Patch the holes later with wood dowels or non-shrink grout and backer plates. See Figure 3 on page 2 for detail.

The typical 1/8" panel gaps used in smaller structures may not be adequate for buildings over 80' in length or width. In these buildings, add 3/4" gaps at 80' intervals (or as specified on the plan). Alternatively, do not nail the flooring at double joist locations until after the building has been dried in. After drying-in, fill the expansion joints with a wood filler piece or non-shrink grout.

Make sure that the wall bottom plates do not cross expansion joints. After drying-in, splice the bottom plate of the wall together by adding a filler block and a doubler between the wall studs. See Figure 4 for one framing possibility.

Subflooring

Weyerhaeuser single-layer flooring is designed and rated for use as a combination subfloor and underlayment in single-layer floor construction, providing cost savings and improved floor performance over multi-layer installations. Weyerhaeuser sheathing may be used as a subfloor in

flooring applications where two layers of sheathing are used. Weyerhaeuser single-layer flooring is manufactured to meet or exceed Voluntary Product Standard PS 2.

Installing Finish Flooring

Weyerhaeuser single-layer flooring does not require an additional underlayment beneath a pad and carpet or hardwood flooring finish. In all other applications such as tile, fully adhered carpet, or sheet flooring, the floor panels should be supplemented with an underlayment. Check the manufacturer's recommendations before installing. To ensure tight joints and smooth appearance of the finish floor covering, be sure to glue the T&G joints.

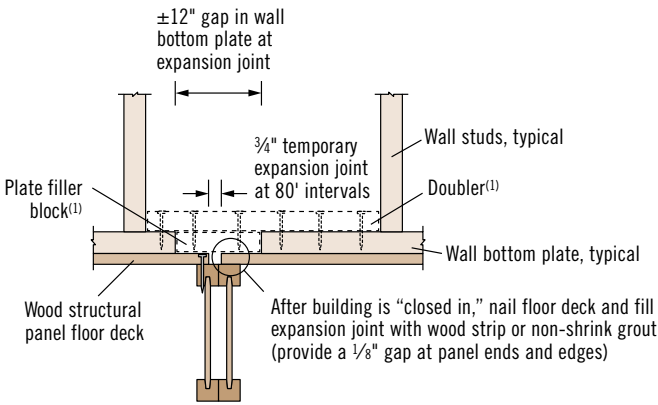
Allow the flooring to dry before installing underlayment or finish flooring. Sand any

uneven areas, making sure to check the joints thoroughly. Inspect the fasteners, making sure they are flush, and reset any nail pops that may have occurred during construction. Do not fill nail holes, but do fill and sand edge joints and any damaged areas or gaps as necessary.

Installing Non-Load-Bearing Partition Walls

Due to the strength and stiffness of Weyerhaeuser flooring, a typical partition wall can be supported anywhere along the flooring without additional blocking when the flooring is installed in accordance with its labeled span rating (verify that the floor joists can carry the additional load).

For the best performance and to minimize squeaks, we recommend nailing the bottom plate of the partition wall only where it



(1) Install plate filler block and doubler to splice bottom plate after floor deck is nailed and building is "closed in."

Figure 4

Fastening Schedule(1) for Flooring

	Panel Thickness	Nail Type	Nail Spacing	
			At Panel Edge(2)	Intermediate Supports(3)
Single-Layer Flooring	19/32" – 1"	8d (0.131" x 2½")	6" o.c.	12" o.c.
	1½" – 1¾"	10d (0.148" x 3")	6" o.c.	12" o.c.
Subflooring in Double-Layer Flooring	¾" and less	6d deformed-shank (0.120" x 2")	6" o.c.	12" o.c.
	7/8" – 1"	8d (0.131" x 2½")	6" o.c.	12" o.c.
	1½" – 1¾"	10d (0.148" x 3")	6" o.c.	12" o.c.

- (1) Minimum per code. Tighter spacings may be required by the design professional of record.
- (2) Nail spacing at panel edges applies to edges supported by framing members and edges at floor perimeters.
- (3) Nails must be spaced no more than 6" on-center at all supports where spans are 48" or greater.

intersects with a joist. The optimal placement of non-load-bearing partitions that are parallel to the joists is directly over a joist. When it is necessary to nail directly to the flooring, clinch all nails while they are still accessible. Placing a bead of construction adhesive between the bottom plate and the flooring will enhance the connection and help prevent squeaks.

Floor Performance

Floor panels are an important component in creating a floor system that feels good to customers. The span rating shown on a panel represents a structurally acceptable performance level. Performance can be enhanced to meet higher customer expectations in several ways. Consider using thicker panels for improved stiffness. Glue and nail flooring for improved connections that help resist vibrations, minimize nail pops, and transfer loads more evenly. Enhance overall floor performance by using stiffer joists or narrower joist spacing.

Choosing the optimal combination of these parameters is difficult. However, Trus Joist® TJ-Pro™ Ratings provide a reliable method for accurately predicting floor performance. Contact your Weyerhaeuser representative for more information.

Roofs

Laying Sheathing

Before installing sheathing, make sure the framing underneath is level and not twisted. Add shims or blocking as necessary to create a smooth, flat surface.

Panels should be installed with the 8' length perpendicular to support members. When laying out sheathing, make certain that each panel covers at least two spans and panel edges fall at the center of a support. It may be necessary to trim some panels. Make sure that the "This side down" stamp is on the underside. Layout rows of panels so that end joints are offset by at least one on-center spacing of the supports.

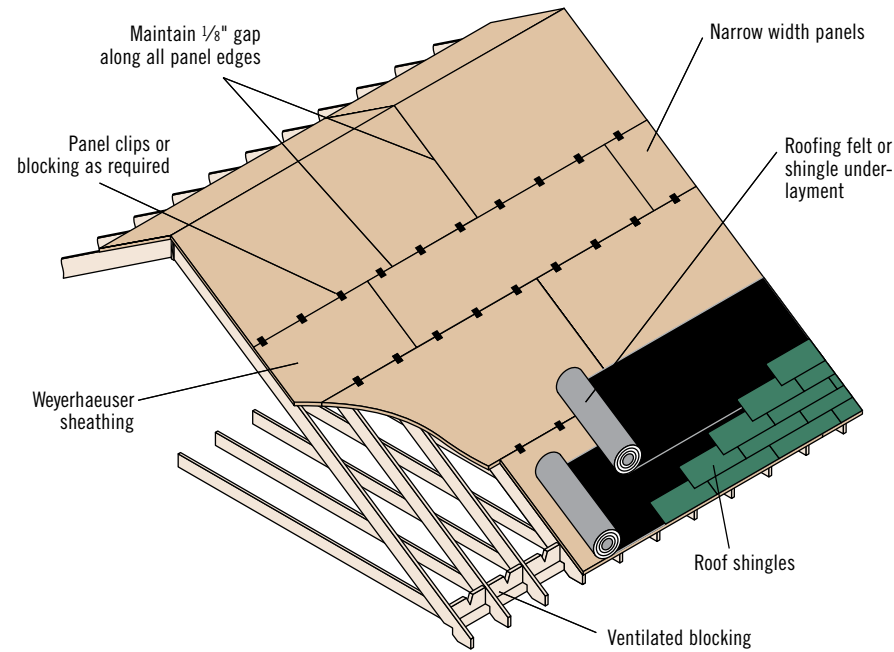


Figure 5

Fastening Schedule⁽¹⁾ for Walls and Roofs In Regions with Basic Wind Speed Below 100 mph⁽³⁾

Sheathing Application	Nail Type	Nail Spacing	
		At Panel Edge	Intermediate Support
Walls	6d (0.113" x 2") ⁽²⁾	6" o.c.	12" o.c.
Roofs ⁽³⁾	8d (0.131" x 2½")	6" o.c.	12" o.c.

- (1) Minimum per code. Tighter spacings may be specified by the design professional of record and/or contract drawings.
 (2) 8d (0.131" x 2½") nails are required with sheathing thicker than 7/16"
 (3) In regions with a basic wind speed greater than 100 mph, roof sheathing must be fastened to intermediate supports at 6" o.c. for a minimum of 48" from ridges, eaves and gable-end walls, and 4" o.c. for fastening to gable-end wall framing.

Gapping Panels

The panel industry recommends spacing wood-based panels to allow for the expansion that occurs when they are exposed to excessive moisture. When installing Weyerhaeuser sheathing, maintain a 1/8" gap at panel ends and edges. See Figure 5. Use clips or blocking to support the roof sheathing edges.

With full panels, use a 10d box nail to gauge the 1/8" gap between panels. In roof applications, some panel clips are designed to serve as spacers between panels. See Figure 6 on page 5.

 If spacing recommendations are not followed, sheathing may buckle as it expands. While buckling itself may not cause any loss

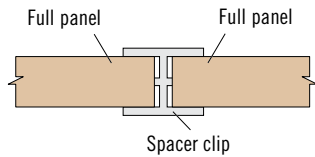


Figure 6

of structural integrity, it can result in other problems, including ridging in roof shingles. See page 7 for additional information on panel buckling.

These spacing recommendations may not be adequate for buildings over 80' in length or width. See the recommendations for **Expansion Joints for Roofs in Large Buildings**.

Nailing

In general, begin nailing by starting a row $\frac{3}{8}$ " from one edge and work across the sheathing in rows. Continue working in rows until the sheathing is completely fastened. This technique keeps internal stresses—which could contribute to buckling later—from building up inside the panel. Unlike flooring, DO NOT glue roof sheathing.

Drive nails flush to the panel. Avoid over-driving nails through the panel surface, especially when using a power-driven tool. See **Special Considerations for Power-driven Fasteners** on page 2.

Nailing schedules and types of fasteners will vary depending upon the application and the thickness of the panel. See the table on page 4 for Weyerhaeuser's recommended schedules. Other code-approved fasteners may be used, but verify required spacing.

High-wind and seismic areas may require a different nailing schedule. In such cases, see Section 2306.3 of the IBC for diaphragm connection requirements. Panel clips may also be required depending on the sheathing's span rating and the actual framing spacing. Check local building codes for requirements.

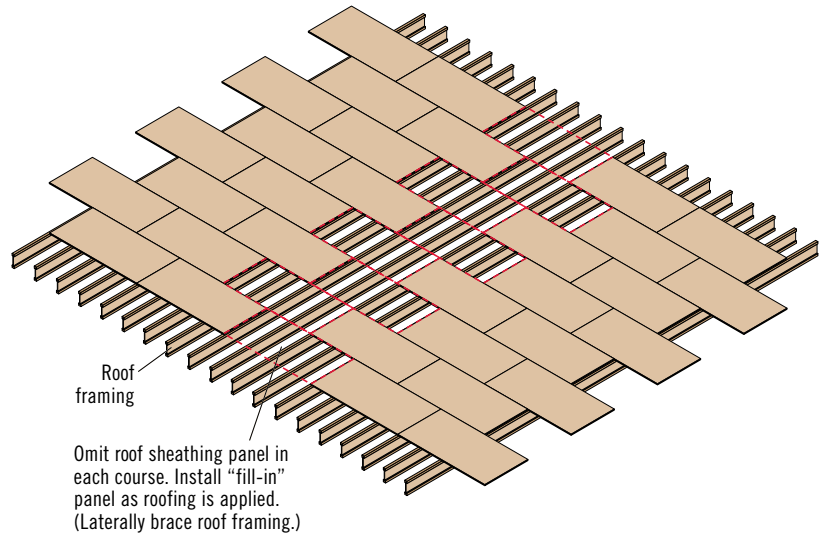


Figure 7

Cover with roofing felt or shingle underlayment as soon as possible. See Figure 5 on page 4 and the **Roof Performance** section on page 6.

Expansion Joints for Roofs in Large Buildings

Dimensional changes in large buildings can be significant when the roof absorbs surrounding moisture and expands. An effective expansion joint in roofs can be created by omitting one panel in each course. See Figure 7. Make sure adequate safety precautions are in place to prevent workers from falling through openings.

Complete the sheathing process by installing cut-to-size panels in the gaps. Cover with roofing felt or shingle underlayment as soon as possible to minimize moisture absorption. If the roof is very large, consider scheduling panel and underlayment installation in sections.

Ventilation

Avoid moisture accumulation under the roof sheathing by providing adequate ventilation

that meets applicable building codes. Per the 2006 IBC, Section 1203.2, install insulation with at least 1" of airspace between the insulation and the sheathing to provide adequate ventilation. Install baffles at the eaves to ensure that the insulation does not block the ventilation paths.

The minimum net area of free ventilation space required is $\frac{1}{150}$ of the area of the space ventilated. This works out to be 960 square inches for every 1,000 square feet of ceiling area. If an appropriate vapor retarder is installed on the warm side of the attic insulation, the net area of free ventilation may be reduced to a minimum of $\frac{1}{300}$ of the area of the space ventilated, or 480 square inches per 1,000 square feet of ceiling area.

A minimum of 50% of the required vents must be at least 3' above the eave vents. When a ceiling is applied directly to the underside of the roof framing, unobstructed ventilation paths from the eaves to the ridge are required between each rafter. Finally, install vent pipes with roof ventilators to avoid heat and humidity build up.

Narrow Width Roof Sheathing

Frequently when framing roofs, it is necessary to cut sheathing in narrow widths (24" wide or less) to accommodate ridges, hips, and valleys. In specialized construction, sheathing widths may even be 12" or less in width. However, every effort should be made to ensure that no panel is less than 24" wide even if more than one row of panels must be cut. When narrow-width sheathing cannot be avoided, keep in mind the installation recommendations that follow.

Do not install narrow width sheathing at the ridge, which often experiences heavier foot traffic during construction and maintenance. Instead, locate them in intermediate rows in the roof diaphragm. See *Figure 5* on page 4. Narrow-width sheathing should cover at least two spans between rafters with the long dimension of the sheathing running perpendicular to the supports. One sheathing clip is required in a span of 16" or less and 2 clips—equally spaced—are required for spans over 16".

Alternatively, lumber blocking may be used either edgewise or flatwise along panel edges. The minimum requirement is a 2x4, of any grade except utility, attached per code. See the table below for minimum support recommendations.

Roof Performance

Roof performance can be enhanced in several ways. Consider using thicker panels or panel clips, especially for low-slope or flat roofs. Minimize exposure to weather by applying shingle underlayment or #15 roofing felt (use #30 for extended exposures) that meets ASTM D 226 or ASTM D 4869 standards. Minimize buckling by allowing the sheathing to reach ambient moisture conditions before installing roof coverings. See page 7 for additional information on buckling. Use heavyweight or laminated and textured shingles to help hide any imperfections in the roof and to give the best appearance.

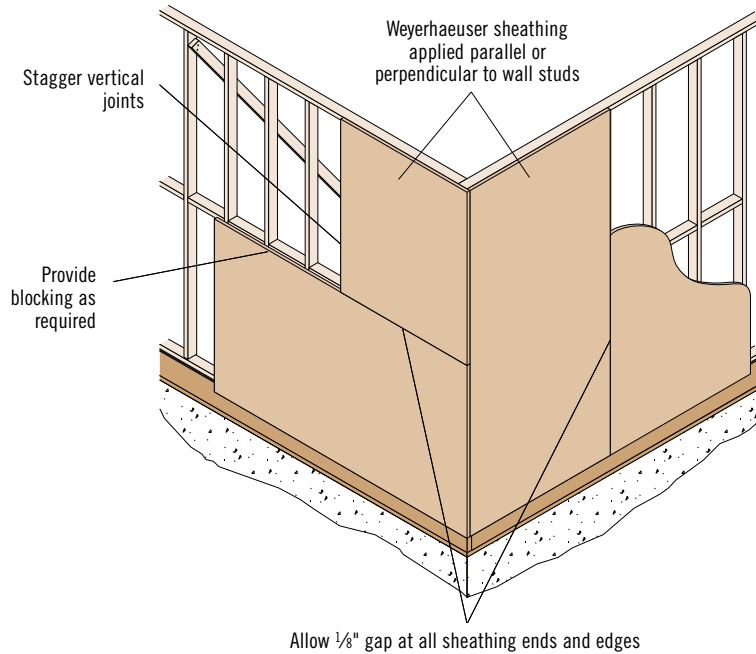


Figure 8

Support Recommendations for Narrow-Width Roof Panels

Panel Width (PW)	Support Recommendations
$16" \leq PW < 24"$	Panel clips or blocking along the edge adjacent to the full width panel. An edge adjacent to a ridge or valley does not require additional support unless required by code.
$12" \leq PW < 16"$	Lumber blocking along the edge adjacent to the full width panel. An edge adjacent to a ridge or valley does not require additional support unless required by code.
$PW < 12"$	Lumber blocking along both edges. A single piece of lumber may be considered blocking for both edges if both panel edges are 1" or less from the lumber edge.

Walls

Laying Panels

Weyerhaeuser sheathing is stamped "This side down." For wall applications, this stamp has no relevance; it is intended for roof and floor applications only.

Start the wall sheathing layout by placing the 8' panel dimension either parallel or perpendicular to the studs. See *Figure 8*. However, when the 8' dimension is installed perpendicular to the studs, blocking at the panel edges may be required. When sheathing is installed horizontally, vertical joints should be staggered at least one on-center stud space. Always leave a $\frac{1}{8}"$ gap around all ends and edges of the sheathing, and around windows and doors. Check local building codes for

requirements on blocking edges with panels in either orientation.

Do not exceed the approved spans stamped on the sheathing. Even if the sheathing has a roof span rating of 24" or greater, it should not be used on walls with stud spacing greater than 24" on-center.

It is extremely important to fasten wall sheathing properly. Improper fastening of wall and roof sheathing and their coverings is the primary cause of failure in high-wind events. See the table on page 4 for Weyerhaeuser's recommended fastening schedules. Check with local building codes for any allowable fastener substitutions.

Gapping Panels

The panel industry recommends spacing wood-based panels to allow for the expansion that occurs when they are exposed to excessive moisture. When installing sheathing, maintain a $\frac{1}{8}$ " gap at panel ends and edges. See *Figure 8* on page 6. Use clips or blocking to support the panel edges.

With full panels, use a 10d box nail to gauge the $\frac{1}{8}$ " gap between panels. Additionally, some panel clips are designed to serve as spacers between panels. See *Figure 6* on page 5.

If spacing recommendations are not followed, sheathing may buckle as it expands. See **Panel Buckling** below. While buckling itself may not cause any loss of structural integrity, it can result in other problems, including buckling of exterior siding.

General Roof and Wall Panel Considerations

Substitution for Plywood

Weyerhaeuser sheathing is an acceptable substitute for code-specified plywood sheathing. It also acts as conventional construction corner bracing so no additional bracing is required. If the wall is a shear wall, additional considerations may apply.

Exposure Rating

The allowable exposure conditions for the panel are indicated in the grade stamp. Weyerhaeuser panels are rated for Exposure 1 bond performance under Voluntary Product Standard PS 2. Exposure 1 panels are intended to resist the effects of moisture on structural performance due to construction delays or other conditions of similar severity. Panels must be covered with a code-approved exterior roof or wall covering.

Weyerhaeuser sheathing, like all wood building materials, should be allowed to reach ambient moisture conditions before installation and before application of water-resistant coverings.

Panel Dimensions

On Weyerhaeuser square-edge, span-rated panels, both the length and width dimensions are sized for spacing. Panels are manufactured to a nominal length of 96" and a nominal width of 48". The PS 2 standard sets dimensional requirements for panels and allows a tolerance of $\pm \frac{1}{16}$ " on the manufactured length and width. This tolerance enables panel manufacturers to cut panels that fit common support spacing yet still allow for the required $\frac{1}{8}$ " gap between panels. All Weyerhaeuser OSB panels are cut to allow for this $\frac{1}{8}$ " expansion gap, and their grade stamps include the notation "Sized for Spacing" to verify that fact. See page 8 for grade stamp examples.

Panel Buckling

High-Risk Applications

Certain field applications involve an increased potential for buckling and require additional preventive measures. These applications include diaphragm or shear wall construction with edge nail spacing at 4" on-center or less, oversized panels (larger than 4' x 8'), and multiple panels installed with strength axis parallel to the framing.

In situations where shear wall or diaphragm sheathing with a tight (4" on-center or less) nailing schedule is likely to get wet during installation, temporarily fasten the sheathing at 12" on-center at ends, edges, and intermediate supports. Then, finish nailing the panels at the specified nailing schedule after the panels have adjusted to moisture conditions, or just before covering the panels.

Troubleshooting and Repair of Panel Buckling

Before attempting to repair or correct for sheathing unevenness, make sure that the problem is actually caused by buckling. Make a thorough inspection of the structure and framing supports. Often, what appears at first glance to be a case of buckling turns out to be the result of faulty framing (warping, misalignment, etc.).

If buckling is the problem, one or more of the following methods may help restore buckled panels to a more satisfactory condition or make the problem less noticeable:

- Begin with moisture control. Find out what caused, or is still causing, the high moisture condition and takes steps to eliminate it. Address ventilation problems, examine where moisture may be coming from within the building and redirect it to the outside.
- Try to speed up the drying process with fans or heaters to see whether sheathing material recovers sufficiently.
- Saw-kerf the edges of panels that have been installed too tightly together to allow room for expansion and alleviate built-up pressure.
- Install blocking under buckled areas and flatten the sheathing to the blocking with nails or screws.
- If roofing is already installed and buckled panel joint is only accessible from below, screw in a cleat, as shown below in *Figure 9*.
- If sheathing buckles between fasteners, installing additional fasteners may help to level it out.

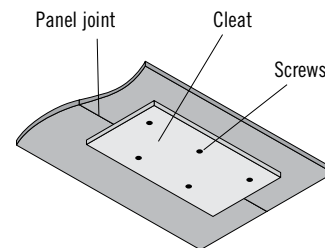
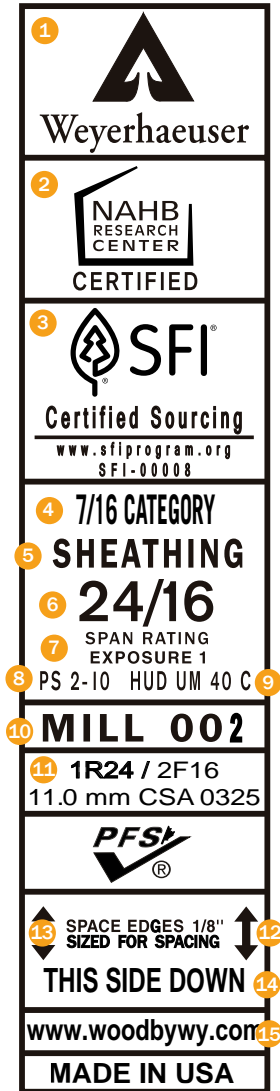
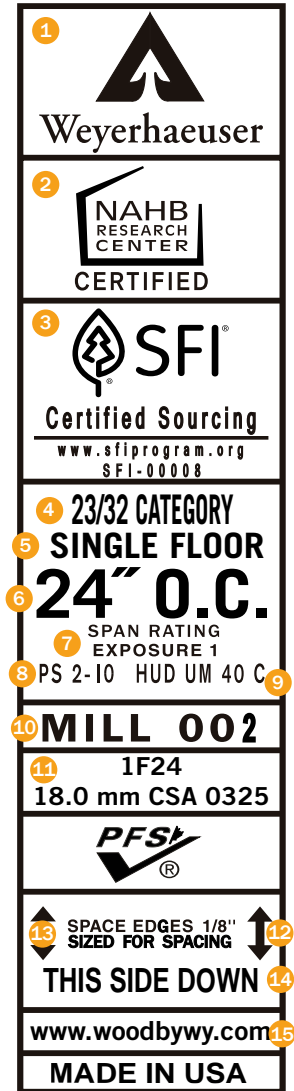


Figure 9

THICKNESS 0.418 IN



THICKNESS 0.703 IN



How to Read a Weyerhaeuser Grade Stamp

- 1 Company logo.
- 2 Recognized certification agency logo.
- 3 Wood fiber sourcing certification
- 4 PS 2 performance category.
- 5 Panel grade. Single floor panels are intended for single-layer floor applications. Sheathing panels are intended for roof, sub-floor, and wall applications.
- 6 Span rating indicates the maximum single-layer floor support spacing for floor panels or the maximum roof/subfloor support spacing for sheathing panels.
- 7 PS 2 bond classification. Exposure 1 panels are suitable for uses not permanently exposed to weather. Panels classified as Exposure 1 are intended to resist the effects of moisture on structural performance due to construction delays or other conditions of similar severity.
- 8 The most recent version of U.S. Dept. of Commerce Voluntary Product Standard PS 2.
- 9 HUD/FHA recognition.
- 10 Mill number.
- 11 Grade stamp information for Canadian markets.
- 12 Strength axis indicates the orientation direction of the face layers.
- 13 **Sized for Spacing** indicates the panel has been sized to allow for an expansion gap between panels.
- 14 Indicates which face of the panel should be placed down on the surface of the supports.
- 15 Weyerhaeuser website for more information.

WARNING: Drilling, sawing, sanding or machining wood products generates wood dust, a substance known to the State of California to cause cancer. For more information on Proposition 65, visit www.wy.com/inform.

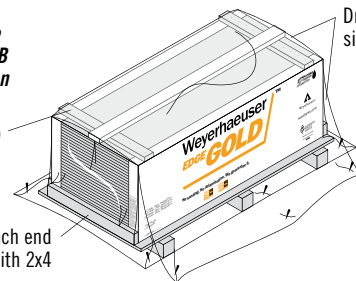
Weyerhaeuser floor, roof and wall panels are intended for dry-use applications

Storing Weyerhaeuser OSB Products

Store and handle Weyerhaeuser OSB in a flat orientation

Nail plastic to top

Drape plastic over each end and hold down with 2x4



Drape plastic over top and sides. Allow air circulation.

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