Georgia-Pacific Gypsum

Industry's first 90-day limited warranty for exposure to normal weather conditions in **vertical** parapet wall applications (1/2" and 5/8" only). Go to www.densdeck.com for warranty details.

TECHTALK Technical Insight from the Roof Board Experts

Parapet Walls: When is a Wall a Roof?*

Some discussion to clarify the use of DensDeck® Roof Board vs. DensGlass® Sheathing on vertical surfaces.

In some cases, a wall isn't a wall. A parapet wall projecting above the roof plane may be a part of the roof. According to Webster, a parapet wall is "a low wall or railing to protect the edge of a platform, roof or bridge." Laly's *The Science and Technology of Traditional and Modern Roofing Systems* says it is "generally an extension of exterior building walls or party- and fire-walls that usually extend about three feet or less above the roof."

Why do we have parapet walls?

Parapet walls can serve several purposes. One of them is fire protection. By extending the wall above the roof plane, a parapet wall prevents flames coming up the exterior of a building from immediately igniting a combustible roofing membrane.

A parapet wall can improve wind-uplift resistance. Wind-induced catastrophic roofing failures typically start when wind forces lift the roof edge, and then peel back the entire roof system. A parapet wall helps prevent elevated wind pressure from compromising the vulnerable roof edge.

In older masonry buildings, parapet walls provided vapor pressure relief for the building. Since water vapor can't pass through the roofing membrane, it finds its way to the roof edge and exits through the back side of the parapet, which is typically finished with permeable clay bricks.

A parapet wall can also perform an aesthetic function. It may hide rooftop equipment or may increase the apparent height of the building to improve the proportions.

Parapet wall designs may have several parts

On frame-construction buildings, the exterior finish of the front of the parapet wall will usually be similar to the rest of the exterior walls. But the sheathing used on the roof side of the parapet wall will be dependent on the surface treatment.

If the front of the parapet wall is EIFS (Exterior Insulation Finish Systems), brick veneer, stone or metal, then the sheathing could be DensGlass® Sheathing. But if the back side of the parapet wall is to be covered with roofing membrane to help keep water out of the building, that surface actually becomes part of the roof. Then the sheathing should be DensDeck® Prime Roof Board.

Testing and warranties

Much of the choice between DensDeck Roof Boards and DensGlass Sheathing in parapet wall applications centers on testing, certification and roof-system warranty.

Georgia-Pacific Gypsum and the roofing industry have aggressively tested all types of DensDeck and DensDeck Prime Roof Boards to UL, FM and other test standards as a substrate for roofing systems including EPDM, PVC, TPO, SBS torched and modified bitumen cold mastics. The test results and product properties have earned certifications for DensDeck Roof Board as a non-structural component in many membrane roofing systems.

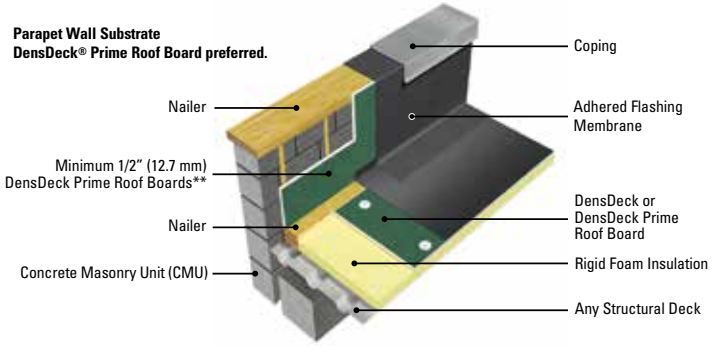
In contrast, DensGlass Sheathing board is designed for vertical applications. It has been tested as a component in EIFS and exterior insulation systems, and also with brick veneer, where the DensGlass Sheathing is a fire barrier or secondary weather barrier behind the facing. Georgia-Pacific Gypsum has not tested DensGlass Sheathing or any of the other Dens® Brand products for roofing applications, and DensGlass Sheathing is not certified in membrane roofing systems.

So if you put DensGlass Sheathing behind a vertical membrane, you're putting a component into the roofing assembly that hasn't been evaluated by the agencies that give approval and certification. With DensGlass Sheathing as a substrate, roof system warranties may not apply. Some roof system manufacturers say, "If the membrane bonds satisfactorily, we'll accept DensGlass Sheathing as a substrate, but we won't warrant it."

DensDeck may be used above vertical membranes

Most roofing membrane manufacturers require that the membrane come up the wall at least eight inches above the roof plane. The edge of the membrane is sealed and flashed and the rest of the wall may have another finish on it. DensGlass Sheathing is appropriate for finishing the rest of the vertical surface above the membrane, but DensDeck Roof Board could also be used, so there's only one substrate material to deal with.

Parapet Wall Substrate
DensDeck® Prime Roof Board preferred.



** Fastened 8" (203 mm) o.c.
- 1/2" (12.7 mm) for 16" (406 mm) metal stud spacing
- 5/8" (15.9 mm) for 24" (610 mm) metal stud spacing
- ***5/8" (15.9 mm) minimum over wood framing, 24" maximum stud spacing***

* Information presented in this article concerning roofing systems and assemblies is presented as a general guide for illustration purposes only. Please consult the appropriate system manufacturer or design authority for system specifications and instructions for any specific system or assembly. Georgia-Pacific Gypsum does not provide roofing design services.

continues on reverse

TECHTALK

continued from front

Fire ratings require tested substrates

The membrane could go over the top of the wall, be covered with a cap and finished off on the outside. (See diagram on front.) In this case, the entire inside of the parapet wall is a vertical roof, and you need to deal with it as a roof.

Fire ratings on vertical surfaces may require non-combustible substrates such as DensDeck® Roof Boards. If there's a combustible surface such as plywood or OSB behind a vertical membrane, it may not have a fire rating, because of the slope limitations on combustible decks. If you put in a component that has not been approved for fire resistance, you may lose the fire performance for the whole roof system.

Bond strength matters on vertical surfaces

Another issue in the vertical wall is the strength of the bond of the membrane to the substrate. When the membrane comes up just eight inches, it's virtually self-supporting. But if the membrane goes up the vertical surface two, three, five, even ten feet, some manufacturers require additional attachments, such as rails or plates. That's because, on a vertical surface, the weight of the membrane tends to pull it off the substrate. If the substrate isn't tested for that application, the whole roof may be in jeopardy.

Bond strength is also tested by pressure differentials that try to separate the membrane from the wall. Wind turbulence may tend to pull the membrane away from the vertical surface. Direct wind forces that come through defects in the wall, or building air pressure that comes up inside the wall may tend to push the membrane away from the substrate. DensDeck Roof Board has been tested for peel bond strength, which is critical in membrane to substrate bonding.

Construction decisions can pose dilemmas

In the real world, the substrate choice can be complicated. When a building is built, the contractor will sometimes put DensGlass® Sheathing on the vertical inside face of a parapet wall. When the roofers arrive on the job, the wall already has DensGlass Sheathing on it. Now the roofers have a dilemma: Is the DensGlass Sheathing acceptable?

In some cases, the roofers may apply a layer of DensDeck Roof Board over the DensGlass Sheathing so they'll have an acceptable substrate for the membrane. They may even remove the DensGlass Sheathing and replace it with DensDeck Roof Board. But if the installers attach the membrane directly to the DensGlass Sheathing, the building may not have a fire-rated roof.

On any roof assembly, designers should consider factors of moisture gain, proper ventilation and allowances for condensation. For example, if a brick wall has deteriorated and is being refaced with a non-permeable membrane, the designer should allow for proper venting between the brick and the DensDeck Roof Board substrate.

GP support can help with choices

For all these reasons, the appropriate board behind a vertical roof membrane is DensDeck Roof Board, not DensGlass Sheathing.

U.S.A.– Georgia-Pacific Gypsum LLC
Canada – Georgia-Pacific Canada LP

Sales Information & Order Placement
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CANADA Canada Toll Free: **1-800-387-6823**
Quebec Toll Free: **1-800-361-0486**

Technical Information
Georgia-Pacific Gypsum Technical Hotline
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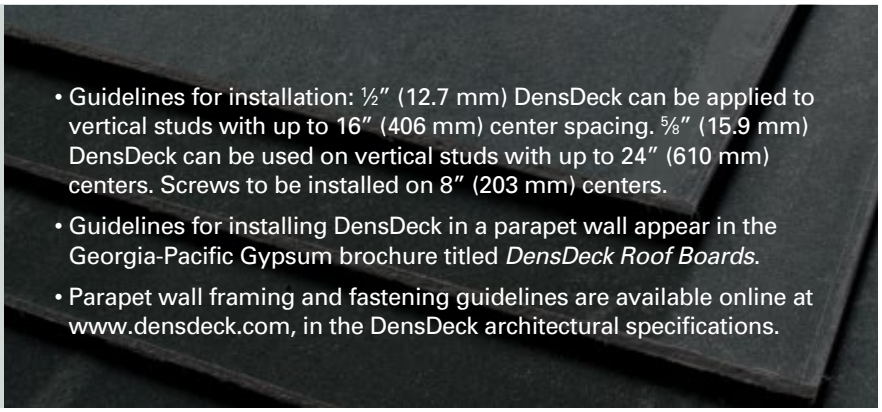
www.DensDeck.com



- Guidelines for installation: ½" (12.7 mm) DensDeck can be applied to vertical studs with up to 16" (406 mm) center spacing. ⅝" (15.9 mm) DensDeck can be used on vertical studs with up to 24" (610 mm) centers. Screws to be installed on 8" (203 mm) centers.
- Guidelines for installing DensDeck in a parapet wall appear in the Georgia-Pacific Gypsum brochure titled *DensDeck Roof Boards*.
- Parapet wall framing and fastening guidelines are available online at www.densdeck.com, in the DensDeck architectural specifications.

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