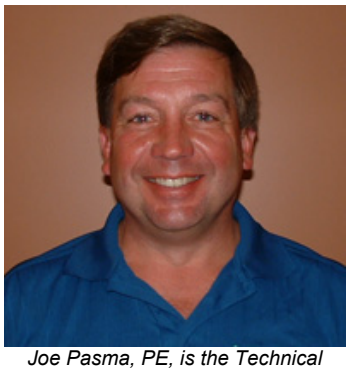
"Ask the Expert"

Question: "Can SIPs be used in moist climates?"



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When asking if structural insulated panels (SIPs) work in wet, rainy, humid and/or cold climates, the underlying question is, "can I build with wood in this type of climate?" Almost always, the answer is "yes."

You'll find stick-framed buildings from the Louisiana Gulf Coast to above the Arctic Circle in Alaska. Likewise, SIPs can be used in demanding climates. Similar to any wood-based building product, the key is proper flashing to keep water out of the building envelope, and sealing joints to prevent leakage of warm, moist air into and out of the wall and roof assemblies.

Numerous commercial and institutional buildings demonstrate the effectiveness of SIP construction in wet and cold climates. Examples include:

• George Morgan High School, Kalskag, Alaska (a community that averages 60 inches of snow per year and regularly experiences sub-zero temperatures)
• Cody Cattle Company restaurant in Northern Wyoming near Yellowstone National Park
• Little Big Horn College Health and Wellness Center on the high plains of Montana
• Finn Hill Jr. High School, Kirkland, Washington (an area of suburban Seattle that receives 39 inches of rain annually)
• Portland Community College Newberg Center, Newberg, Oregon (an AIA Committee on the Environment [COTE] 2012 Top Ten Green Project – located in rainy western Oregon)

The reason the question about climate comes up with SIPs, is a perception that the oriented strand board (OSB) sheathing in the panels is at risk for water damage. SIPs are manufactured with OSB that has an Exposure 1 bond rating according to the APA. The bond classification relates to the ability of the glue bond to resist moisture and thus to the structural integrity of the OSB. Exposure 1 rated materials are permitted where temporary exposure, such as construction delays, occur prior to providing protection that leads to dry end-use conditions.

To some people, SIPs have a "gee-whiz" futuristic aura, but the panels have been analyzed extensively in laboratory tests and proven to be durable in real-world installations for several decades.

The choice to use SIPs is often driven by two things: energy efficiency and the need for speed. SIPs have monolithic insulation and fewer gaps to seal than other construction methods, so they dramatically reduce a building's heating and cooling energy consumption – up to 60%. The panels are now common in net-zero energy schools and other ultra energy-efficient buildings. Building professionals also use SIPs to deliver projects quickly while achieving high quality. For example, in Las Vegas contractors cut the framing schedule for a 70,000 square-foot elementary school from 121 days to 47 days (a 60% time savings).

The 2013 construction season is shaping up to be especially challenging for completing projects under tight turn-around. Many experienced laborers that contractors counted on have found other jobs, leaving framers with untrained workers. This will be a big problem for school districts that have to finish new buildings in time for the start of fall classes. SIPs provide a good way around this limitation since SIP framing contractors can have crews comprised of one experienced foreman and two or three less-experienced laborers, yet still install the panels quickly and accurately.

As with any building system, when using SIPs it's not enough to throw them up and hope for the best. Following are some key points to keep in mind to prevent water intrusion into the building envelope and block the flow of humid air through the panel joints (for additional details, see the article "Tight, but Not Uptight").

Just like other wall and roof assemblies, it is crucial to protect the building envelope in SIP construction from water accumulation. The International Building Code (IBC) requires flashing, a weather-resistant barrier and a means of draining to the exterior any water that enters the assembly.

With SIP walls, commonly used weather-resistive barriers include synthetic weather barriers and building wraps.

In SIP roof assemblies, synthetic, breathable roofing underlayments provide an alternative to traditional No. 15 and No. 30 felts. Like a quality rain jacket, breathable underlayments allow water vapor to pass up and out, yet keep bulk water out. This can be especially beneficial when the OSB skins of SIP roof panels have been exposed to precipitation during construction.

Although the techniques to protect SIPs from water are similar to those used with other building envelope assemblies, with SIPs, crews must be mindful of properly sealing all joints between panels. This is not hard, as easy-to-apply mastics and tapes are used to block air and vapor transmission. In some instances, a code mandated vapor retarder might also be required – check with your local building official and SIP manufacturer for details.

To learn more about the uses and benefits of SIPs, contact a manufacturer or visit the Structural Insulated Panel Association at www.sips.org.

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