SIP BUILDER-BP 8:
SIP Roof and Wall Assemblies

SIP BUILDER BEST PRACTICES

SIPA
Structural Insulated Panel Association

SIP BUILDER-BP 8:

SIP Roof and Wall Assemblies

This document is created specifically for builders by the manufacturing members of the Structural Insulated Panel Association (SIPA). It dives deeper and provides more background into each of the summarized topics presented in the *Building with SIPs: NEED TO KNOW* overview which highlights important considerations during the construction phase of a Structural Insulated Panel (SIP) structure. Decades of combined knowledge from SIPA manufacturers will help reduce the learning curve and leverage SIPs' exceptional qualities to achieve the high-performance results owners expect when building with SIPs. The considerations of how and why the best practices were developed as the common industry platform for SIP construction are explored here.

The index below outlines eleven topical areas, listed in sequence to match the order of building considerations and construction. The details in each chapter provide a deeper understanding of the subject matter to facilitate successful SIP construction. The current chapter is highlighted in blue.

SIP BUILDER-BP 8:

SIP Roof and Wall Assemblies

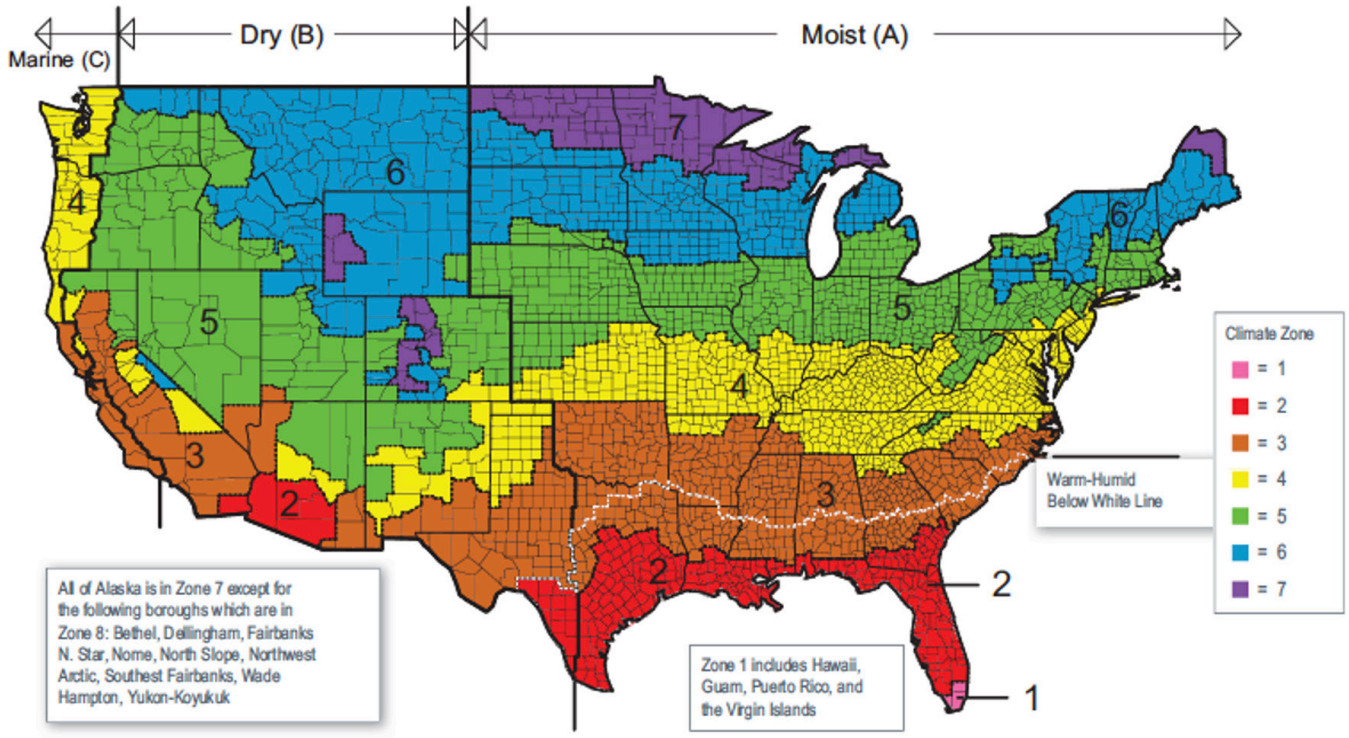
SIP BUILDER-BP 8.1:
Design for the appropriate climate zone to maximize durability.

Wall and roof connection joints are the weakest link of any building. It is no different when building with SIPs. It is important to understand in which climate zone the project you are designing will be built, to control air and moisture migration at panel joints for long-term durability. Depending on the location, the appropriate use and position of vapor retarder products like sealants, tapes and liquid applied barriers will change. Reference Figure 8.1 to understand the project's specific weather region and climate zone, which will dictate the proper building energy code and insulation requirements for your design.

Climate zones are determined by cooling/heating degree days, average temperatures and precipitation. In Figure 8.1, notice the white line across the southeast of the U.S., below which it is considered 'warm and humid' so SIP joint tape should go on the outside of the SIP. Refer to the next section, SIP DESIGN-BP 8.2, to determine which climate zone requires a vapor retarder to be applied to the interior facing of SIPs. By designing to the correct climate zone, you will be maximizing the durability of the SIP structure.

Additional helpful references are the Department of Energy's (DOE) *Building America Best Practices Series, Volume 7.3: Guide to Determining Climate Regions by County* and Joseph Lstiburek's *Builders Guide to Structural Insulated Panels (SIPs) for all Climates.*

FIGURE 8.1:
U.S. DEPT. OF ENERGY CLIMATE MAPS BY COUNTY



SIP BUILDER-BP 8.2:
Do not use low-perm underlayments (i.e., ice and water shield) on a SIP roof. Use high-perm underlayments on SIP roofs to allow for water vapor / moisture to escape.

Three key points to always keep in mind when dealing with SIPs and roofing assemblies:

1. Always allow the SIP to dry to the side to which the SIP gets wet.
2. If a self-adhered (non-petroleum-based solvent only – see section 8.7 for more information) underlayment material is used, be careful not to damage the outer facer surface of the SIP when removing the self-adhered layer should that ever be necessary. Consider using a divorcement layer; consult your SIP manufacturer for details.
3. SIPs are considered by code to be in the class of non-ventilated decks (similar to other underdeck insulations like spray foam or unventilated attics). This means all moisture must dry to the side to which the SIP gets wet. As per ASTM D1970, **do not use polymer modified bitumen underlayments (i.e., ice and water shield/peel and stick) over a SIP.** The use of two layers of mechanically fastened or self-adhered underlayment with perm rating greater than 10 meets the building code (depending on wind design requirements) and promotes drying to the side that gets wet.

The long-term performance and durability of SIP roof assemblies is dependent on the assembly's ability to dry to the side to which it gets wet. SIPs have low permeability (i.e., perm rating less than 0.1[1]), which means that they cannot dry through the thickness of the SIP.

The definition of vapor retarder class from the IRC is:

"VAPOR RETARDER CLASS. A measure of the ability of a material or assembly to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method with Procedure A of ASTM E 96 as follows:

Class I: 0.1 perm or less

Class II: 0.1 < perm ≤ 1.0 perm

Class III: 1.0 < perm ≤ 10 perm"

Roofing durability is related to the ability for bulk water to run off the roof surface and not pool or stand in place. Any slope less than 4/12 requires special design and installation precautions against potential long-term moisture damage.[2] SIP roofs of all slopes perform well when properly designed and installed.

In situations that require the use (e.g., design requirement, metal roofs, code requirements, valleys/overhangs or ice dams) of a self-adhered low-permeable underlayment (sometimes called "peel and stick") over the entire roof, an additional sheathing layer must be installed (refer to Figure 27, reproduced below, from *SIPs Basic Connection Details*) over stickering/furring as a vented layer on the top side of the SIP roof. The self-adhered, low-permeable underlayment should be installed on the exterior side of this second sheathing layer.

[1] The 0.1 perm rating is based on proprietary test data of an entire 4.5-inch SIP assembly.

[2] See section R905 of the 2024 IRC and section 1507 of the 2024 IBC.

A vapor-permeable (i.e., perm rating greater than ten[3]) underlayment needs to be installed on the exterior side of the SIP roof facer. It is desirable to create this air space, and to have eave and ridge venting between the exterior OSB facing of the SIP roof and the additional layer of sheathing. This condition is referred to as a vented cold roof. The detailing of the roof assembly using a vented cold-roof approach may mitigate ice damming of the snow and provide an air space that will allow the OSB facing of the SIP roof to dry should it get wet. See Figure 8.2 (Fig. 27 from *SIPs Basic Connection Details*), available for free download on the SIPA website, under Resources, Installation.)

It is important not to confuse SIP vented cold roof assemblies with conventionally stick-framed vented attics. They are two completely different roof assemblies.

Product examples of vapor-permeable underlayments typically have perm ratings of 10 or above. VaproShield SA, Dörken, Benjamin Obdyke, or asphalt-saturated felt / 15- or 30-pound felt have perm rating values in excess of 10 when wet and allow for vapor flow and drying capacity. Tar paper – as commonly referred to – is NOT the same as asphalt-saturated felt and is not recommended for SIPs. It is also important to make sure that solvent-based adhesives or primers, which might cause deterioration of polystyrene rigid foam insulations, are NOT used. Acrylic-based (i.e., water-based) adhesives are good examples offering rigid foam compatibility.

Regardless of the roof cladding materials and underlayment used, they must meet all applicable code requirements to ensure that they protect the SIPs from direct exposure to moisture and still allow them to dry.

Historical Context and Composition

- **Tar Paper (not recommended for SIPs):** Historically, tar paper referred to a paper-based material that was impregnated with tar (or more commonly, asphalt today) to provide a basic moisture barrier. Early versions did not always involve full saturation of the paper, meaning portions of the paper could still absorb moisture. Over time, “tar paper” became a generic term for roofing underlayments that used a paper base soaked in asphalt.
- **Asphalt-Saturated Felt:** Modern products are typically termed asphalt saturated felt. Here, the base—whether organic (paper-based) or sometimes even fiberglass-based—is fully saturated with asphalt. This results in a more uniform, durable, and water-resistant product. Manufacturers produce these felts to meet specific performance requirements, reducing issues such as moisture absorption, tearing, and waviness.

[3] Moisture Control Handbook: Principles and Practices for Residential and Small Commercial Buildings, 1st Edition, by Joseph Lstiburek and John Carmody

ASTM Standards

ASTM standards have played a critical role in standardizing the performance characteristics of these products:

- **ASTM D226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing:**
  This specification sets forth requirements for organic asphalt-saturated felts typically available in commonly used weights like the “15 pound” (Type I) and “30 pound” (Type II) felts. It covers aspects such as the degree of saturation, thickness, tensile strength, and flexibility.
- **ASTM D4869 – Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing:**
  This standard is directed toward felts used under steep–slope roofing, ensuring that the product performs adequately under the dynamic conditions associated with steeper pitches.
- **ASTM D6757 (and related test methods):**
  Additional test methods, like those outlined in ASTM D6757, evaluate properties such as tear resistance and the ability to withstand other environmental and handling stresses.

These ASTM standards ensure that the products perform predictably, offering the necessary protection against moisture, wind-driven rain, and, in some cases, fire.

IBC and IRC References

Both the **International Building Code (IBC)** and the **International Residential Code (IRC)** reference roofing underlayments and require that they meet established performance standards. While the codes may not list “tar paper” or “asphalt-saturated felt” by name, they typically specify the use of roofing underlayments that conform to ASTM standards—most notably ASTM D226 and ASTM D4869. This requirement ensures that any underlayment used in a roofing assembly will provide reliable protection to the roof deck under various environmental conditions.

Summary

- **Tar Paper (not recommended for SIPs):** Originates as a term for the traditional paper-based roofing underlayment that was once only partially saturated with tar or asphalt.
- **Asphalt-Saturated Felt:** Refers to a modern product that is fully saturated with asphalt and manufactured to meet specific ASTM standards (such as ASTM D226, ASTM D4869, and others), ensuring enhanced moisture resistance, durability, and consistency.
- **ASTM Standards, IBC, and IRC:** The ASTM standards provide specific, measurable performance criteria, while the IBC and IRC indirectly enforce these standards by requiring compliant underlayments. This evolution reflects an industry move from loosely defined materials (tar paper) toward more rigorously tested and standardized products (asphalt-saturated felt).
- **The SIP Industry rationale provided for roofing underlayment is intended to promote the best building science material selection practices across all climate zones.** Since this is a complex issue, it is recommended to always confer with the specific SIPA Manufacturer for unique climate zone nuances associated with a project’s exact geographic location and building roof orientation. Micro-climates, shading and thermal drying characteristics can vary considerably and impact the long-term SIP durability relating to underlayment composition and performance.

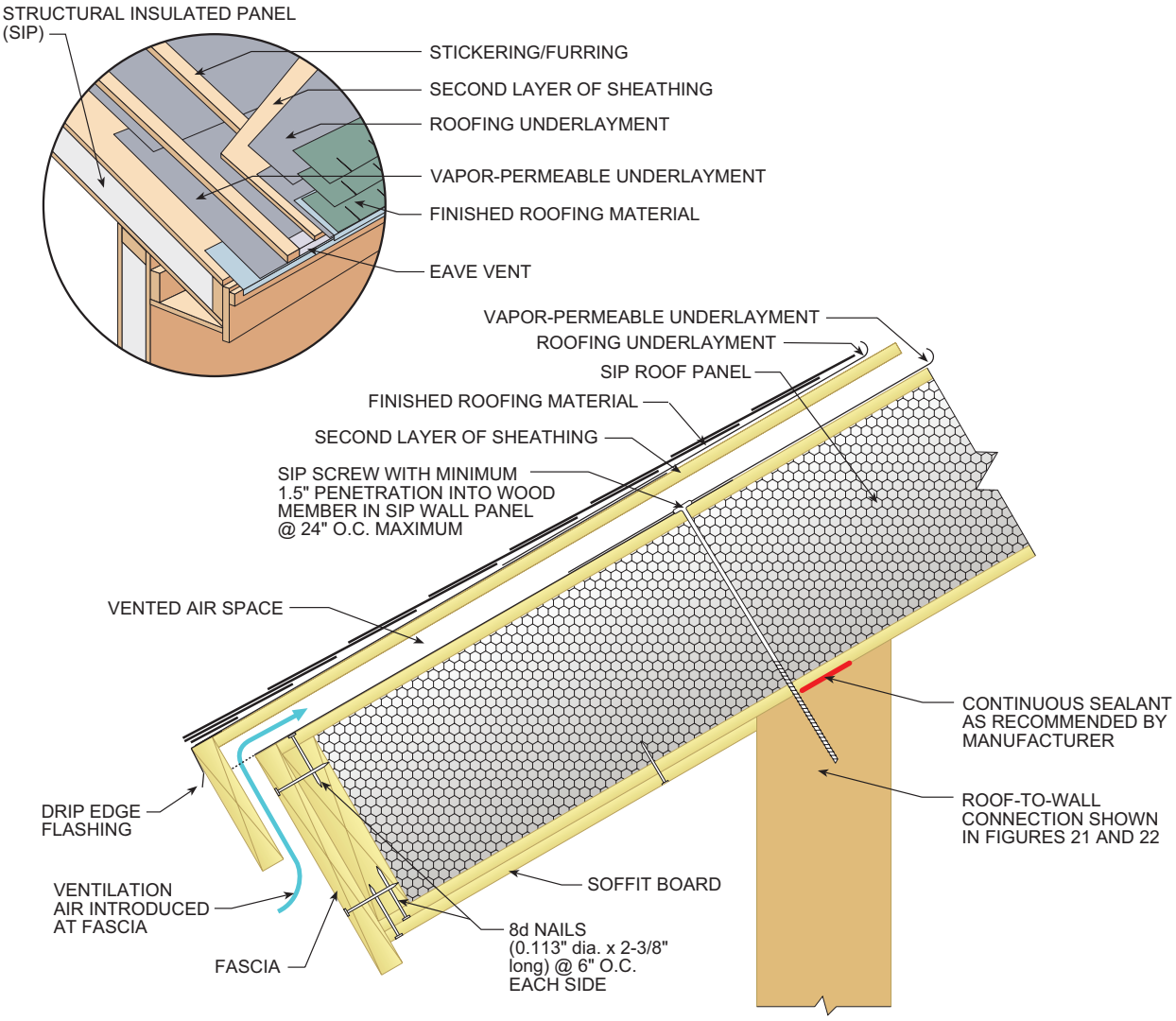
1: New ASTM Standard Replaces Felt Standards for Qualification of Synthetic Underlayments

2: Asphalt-Saturated Felts Used as Roofing Underlayment - IBHS

3: Changes in Standards - Roofing Elements Magazine

FIGURE 8.2:

VENTED COLD ROOF ASSEMBLY (FIG. 27 FROM SIP BASIC CONNECTION DETAILS)



ALL SIP JOINTS SHALL BE AIR SEALED WITH SEALANT AND/OR SIP TAPE. FOLLOW SIP MANUFACTURER'S RECOMMENDATIONS FOR SIP TAPE WIDTHS AND SEALANT PATTERN AND THICKNESSES.

VERIFY NAIL SPACING PER MANUFACTURER SPECS/CODE LISTING

VENTED COLD ROOF GENERIC DETAIL

Fig. 27

Fig. 27 from *SIPs Basic Connection Details*.

SIP BUILDER-BP 8.3:

Reservoir wall cladding (e.g., brick, stone, cementitious products, stucco, etc.) should have a rainscreen design that allows water to drain and air to circulate while increasing drying.

Extensive testing by APA-The Engineered Wood Association has demonstrated that SIPs with OSB facers can withstand exposure to the elements during the construction process without significant loss in structural strength. (See SIPA Technical Bulletin 09: *Durability of SIPs Exposed to Moisture*).

However, as with other wood-based products, long-term exposure of SIPs to moisture can result in structural degradation of the OSB. Therefore, it is imperative that the wall cladding system used with the SIPs – which may include metal, wood, stucco, masonry or others – provides drainage and air circulation between the SIP and cladding.

Many options are available to the builder for cladding applications. Special precautions need to be taken when reservoir claddings are used. Reservoir claddings are those which readily absorb water such as brick, stone, stucco, cementitious sheeting, wood, etc. Claddings such as these retain water and when beginning to dry (say from heat or sunshine) the water vaporizes and creates vapor pressure driving the moisture inward and into the wall assembly. Hence a rainscreen system is needed.

A rainscreen system consists of an exterior cladding, an air gap created by stickering or furring strips (refer to Images 8.1 through 8.4 for examples), a water resistive barrier (WRB layer), and the OSB facer of the SIP. The function of the cladding is to shed the large majority of the bulk water and to protect the WRB/substrate from UV degradation. Since the cladding will not completely shed external moisture, it is imperative to provide drainage of any moisture that penetrates through the cladding. The ventilated air gap made by furring between the cladding and WRB in a rainscreen allows the moisture that penetrates or is absorbed by the cladding from rain and dew to drain and evaporate.

IMAGE 8.1

BACK VENTILATION EXAMPLE WITH EL DORADO BATTENS (FURRING STRIPS)

IMAGE 8.2

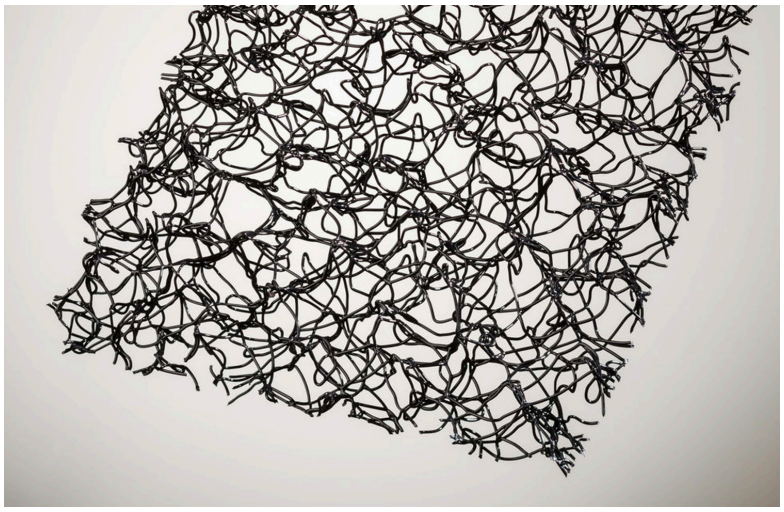
BACK VENTILATION WITH KEENE DRIWALL™ RAINSCREEN

IMAGE 8.3

BACK VENTILATION WITH BENJAMIN OBDYKE CEDAR BREATHER

IMAGE 8.4

BACK VENTILATION WITH ENKAMAT 7020



SIP BUILDER-BP 8.4:
A back-ventilated cladding may be appropriate for some climate zones and moisture regions.

As shown in Figure 8.1, climate zones are also divided into three moisture regions of Moist (A), Dry (B), and Marine (C). For example, the DOE's *Building America Best Practices Series, Volume 7.3: Guide to Determining Climate Regions by County* shows climate zone 4 has all three moisture regions.

In the Moist and Marine moisture regions, back-ventilated cladding or rainscreen (achieved by using a minimum 3/8-inch gap between cladding and housewrap) is highly recommended to be designed into the exterior cladding system, whereas in other areas it may not be necessary depending on annual precipitation.

Construction Instruction, *Building Science Corporation*, & Joseph Lstiburek's *Builders Guide to Structural Insulated Panels (SIPs) for all Climates*[4] are very good references to proper guidelines and design for rainscreens (aka exterior drainage planes) in different climate zones and moisture regions.

SIP BUILDER-BP 8.5:
Some claddings may require special fastening patterns for attachment to SIP facings.

The installation instructions of cladding manufacturers often require fastener embedment into the stud framing of the wall. SIPs may not have studs in the wall as required in light frame construction. The OSB facing is the material that provides the structural integrity for the attachment of wall and roof cladding systems.

Fastening of common exterior cladding materials into SIPs is achieved by following cladding manufacturers' instructions. Check with your cladding manufacturer and your SIP supplier for more information regarding the proper fastening of exterior siding to SIPs.

SIP BUILDER-BP 8.6:
Use code-approved underlayment and roof covering.

For SIP roof assemblies, a vapor-permeable (perm rating greater than 10) underlayment should be installed on the exterior side of the roof panels. The higher the perm rating, the more 'breathable' the material is. This higher permeability allows the OSB to dry to the exterior should the OSB get wet during the life of the building. SIPs have low permeability, which means that they cannot dry through the thickness of the SIP.

As discussed in ***SIP BUILDER-BP 8.3***, extensive testing by APA-The Engineered Wood Association has demonstrated that SIPs with OSB facers can withstand exposure to the elements during the construction process without significant loss in structural strength. (See SIPA Technical Bulletin 09: *Durability of SIPs Exposed to Moisture*).

However, as with other wood products, long-term exposure to moisture can result in structural degradation of the SIP OSB facers. Therefore, it is imperative that the roof covering assembly used with the SIPs provide protection from long-term exposure to moisture. A wide variety of roof coverings such as asphalt shingles, metal roofing, clay tiles, built-up roofing and many other roof cladding materials can be used with SIPs.

There are also many options for water-resistant roofing underlayment such as asphalt-saturated felt, rubberized asphalt and non-bitumen synthetics, which lie between the actual roof cladding and the SIP to provide a secondary layer of protection from the elements. Regardless of the roof cladding materials and underlayment used, they must meet all applicable code requirements to ensure that they protect the SIPs from direct exposure to moisture and still allow them to dry. Refer to section R905 of the 2024 IRC and section 1507 of the 2024 IBC.

[4] See Chapter 2: Rain, Drainage Planes and Flashings and Chapter 10: Assembly and Framing with SIPs.

SIP BUILDER-BP 8.7:
Application of fully adhered organic (petroleum) solvent based, low permeable products to SIP roofs is not recommended. A separation layer is recommended to facilitate future roofing (cladding system) replacement.

For OSB durability reasons, as described above in ***SIP BUILDER-BP 8.2*** and ***8.6***, drying ability of the outer OSB layer is imperative both in low slope roof applications in which membrane is often applied and in steep slope roofs where ice and water shields are frequently used.

When a mechanically fastened or fully adhered roofing material (such as TPO, PVC, EPDM, or bitumen built-up roofing [BUR]) on a "flat" roof [0.25"/12"]) is going to be installed on SIPs, the SIP roof must be separated from the adhered material by a cover board/divorcement layer placed over the SIP prior to the adhered roofing material. This separation layer (or divorcement material) can be a slip sheet on ballasted roof systems, a nailed base sheet for BUR systems, a cover board such as gypsum or wood fiber with adhered membrane systems, or a field-installed second layer of OSB installed over sleepers on metal roofing systems or tile applications (i.e., cold roof). Refer to Figure 8.3 and Image 8.5. The separation layer will allow for the removal of the old roof cladding system and prevent damage to the top OSB facer of the SIP roof. SIPs require this protection since the OSB facing needs to remain intact to ensure structural performance is not compromised over the life of the building.

When membrane-adhered systems are to be attached to the cover board/divorcement layer applied over SIPs, it is recommended that the membrane material be attached with asphalt, pre-applied pressure-sensitive adhesives, or water-based adhesives. Solvent-based adhesives will cause deterioration to the core of the SIPs.

Exception: Commercial structures using thermoplastic membranes with roof vents (e.g., Duro-Last® two-way air vents, see Images 8.6A and 8.6B) are outside the scope of this section. In lieu of any specific recommendations, proper drainage using crickets and scuppers shall be considered (see Figure 8.4). Installing roof vents to remove any moisture beneath the membrane shall also be considered (see Images 8.6A and 8.6B).

FIGURE 8.3
SIP ROOF WITH COVER BOARD

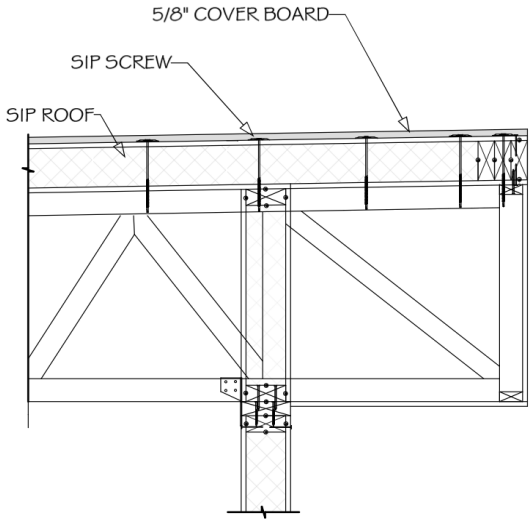


IMAGE 8.5
MECHANICALLY ATTACHED MEMBRANE OVER COVER BOARD

IMAGE 8.6A

DURO-LAST® TWO-WAY AIR VENT ON LOW-SLOPE TPO ROOF

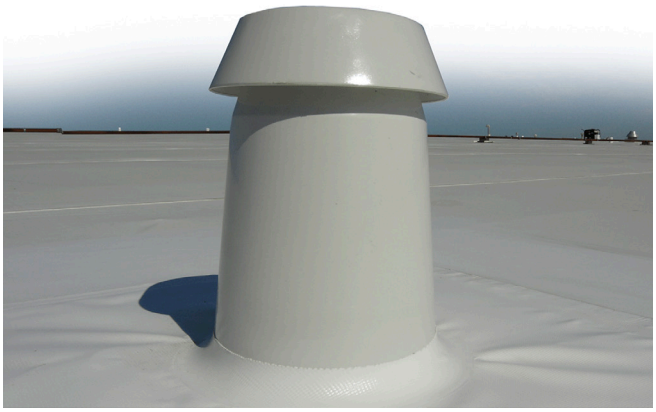


IMAGE 8.6B

DURO-LAST® ROOF VENT INSTALLATION

FIGURE 8.4

TAPERED INSULATION

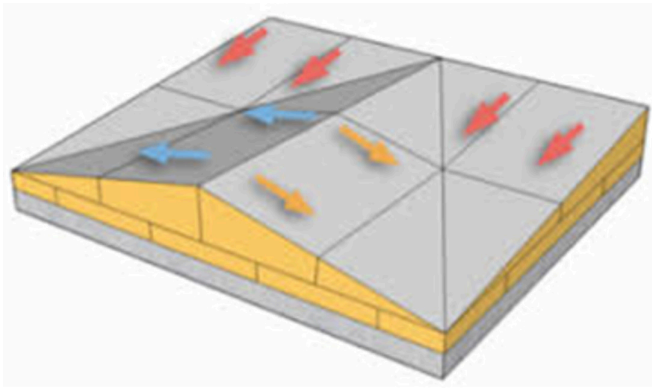


IMAGE 8.7

EXAMPLE OF FINISHED ROOF - BUR (BUILT-UP ROOFING)

IMAGE 8.8

EXAMPLE OF FINISHED LOW-SLOPE ROOF (WHITE FLAT MEMBRANE)

Readers may find the following links useful to further explore specific products:

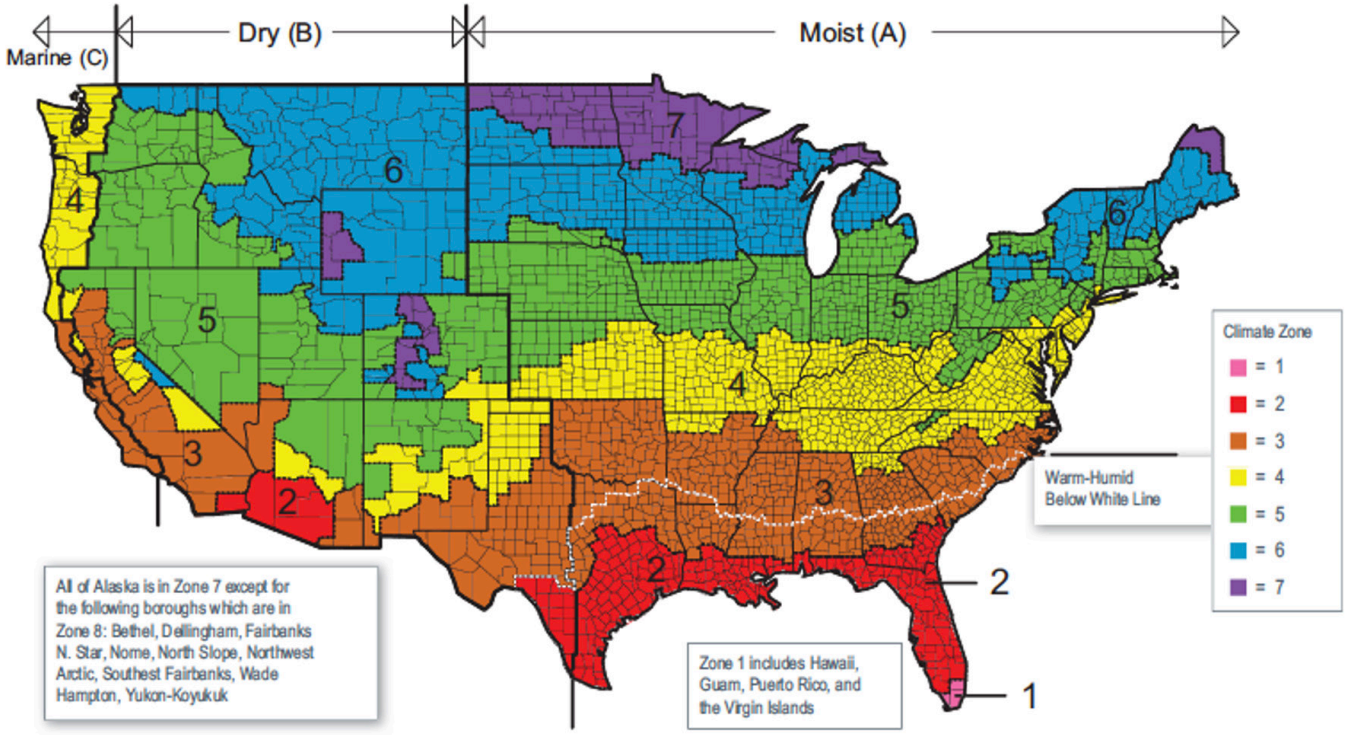
1. VaproShield – SlopeShield® Plus Self-Adhered: www.vaproshield.com
2. Benjamin Obdyke (VaporDry SH): www.benjaminobdyke.com/product-systems/system-wood-roof/
3. Malarkey Roofing – Secure Start® Permeable: www.malarkeyroofing.com
4. GAF – Deck-Armor™: www.gaf.com/en-us/products/deck-armor
5. ACGI - Air Outshield Roof Underlayment: allenconsultinggroup.net
6. DELTA®-Trella Vapor Permeable Underlayment: www.dorken.com

SIP BUILDER-BP 8.8:

In climate zones 4 and colder (climate zones 5, 6, 7 and 8), SIP tape should be installed on the interior of the structure.

FIGURE 8.1:

U.S. DEPT. OF ENERGY CLIMATE MAPS BY COUNTY



The International Residential Code (IRC R702.7 - 2021) requires the following:

> "VAPOR RETARDERS Class I or II vapor retarders are required on the interior side of frame walls in Climate Zones 5, 6, 7, 8 and Marine 4."

The definition of vapor retarder class from the IRC is:

"VAPOR RETARDER CLASS. A measure of the ability of a material or assembly to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method with Procedure A of ASTM E 96 as follows:

> Class I: 0.1 perm or less
>
> Class II: 0.1 < perm ≤ 1.0 perm
>
> Class III: 1.0 < perm ≤ 10 perm"

SIPs have a perm rating of 0.1 (based on proprietary test data of an entire 4.5-inch SIP assembly). According to the IRC definition of vapor retarder class, SIPs meet the Class I definition of a vapor retarder. SIP joints must be constructed in a manner that achieves the same level of airtightness as the field area of the SIP.

Proper installation of SIPs requires that a sealant be installed when joining SIPs. The use of SIP tape over the SIP joints is also suggested depending on climate zone.

The SIP tape is formulated with a perm of less than 0.1. The combination of the SIPs and the SIP tape meets the building code requirements for vapor retarders.

SIP tape should be used at wall and roof SIP joints, SIP wall corners, ridge supports, midspan-supported SIP joints and valleys to mitigate air flow through the SIP joints. Refer to manufacturer recommendations for SIP tape widths.

The SIP tape is applied on the interior side of the panels in climate zones 5, 6, 7 and 8. The use of SIP tape over the SIP joints meets the building code requirements of a vapor retarder for the assembly. Consult the local building code for your project.

The use of an additional vapor retarder layer, such as polyethylene sheeting, should not be used with SIPs. This additional layer of vapor retarder material will inhibit the ability of the OSB facing to dry should it get wet.

IMAGE 8.9

EXAMPLE OF SIP TAPE INSTALLED ON THE WARM-IN-WINTER SIDE OF SIPS

SIP BUILDER-BP 8.9:
Obtain construction language from specification.

SIPA's *Guide Specification 06 12 00 for Structural Insulated Panels (SIPs)* is a great tool to use when designing and specifying assemblies for your project. It will walk you through the different steps of the project to create the best specification possible. You can also refer to SIPA's *Designing with SIPs: Design Considerations* available on the SIPA website.

SIP BUILDER-BP 8.10:
Consider PV (solar) array attachment to roof SIPs.

Solar Photovoltaic (PV) arrays may be attached to a SIP roof. The manufacturer of the solar panels and mounting racks will need to provide the weight (dead load) of the equipment being used. Along with the dead load of the panel, the design professional will need to consider the wind load, which is dependent on the geographic location of the project. When provided with this information, the design professional can determine how many and what type of fasteners are to be used.

The location and connection of the PV array and mounts needs to be clearly defined on the designer plans or SIP shop drawings. Details of the PV array mounts are also required. The SIP manufacturer along with the design professional will determine if additional support is needed and what connection details are required in the SIP roof.

SIP BUILDER-BP 8.11:
SIPs and Ridge Vents.

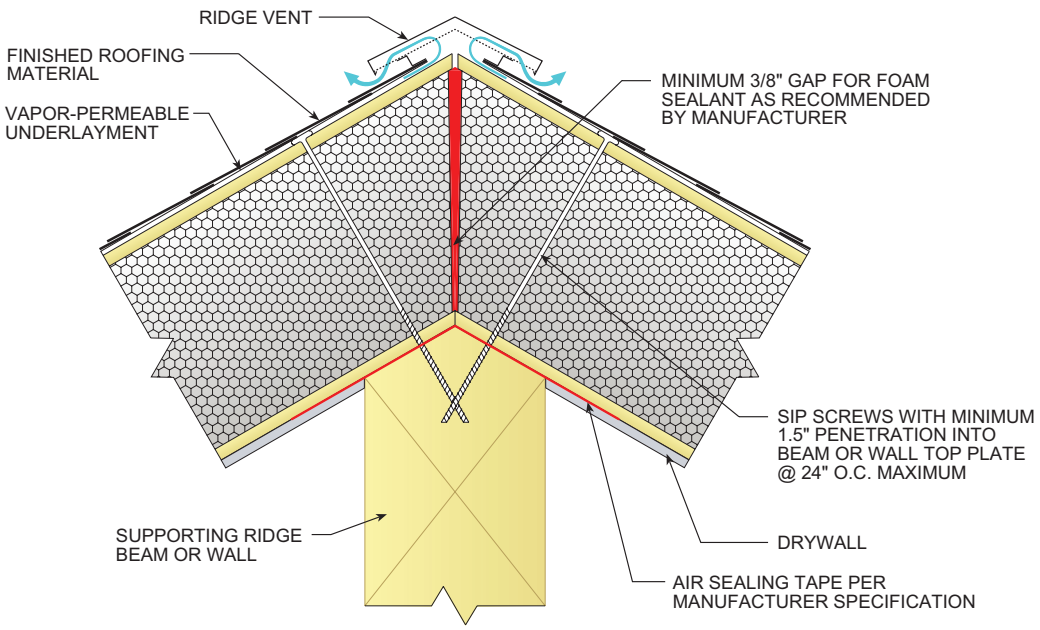
In a **conventionally framed roof**, a ridge vent is an air exhaust vent installed on the peak of a roof. When installing a ridge vent in a **conventionally framed attic**, an air slot is cut in the roof deck along the roof's peak. This air slot is then covered by the ridge vent. Ridge vents help to provide continuous, uniform exhaust ventilation at the highest portion of the attic and are designed to resist wind-driven rain and snow, as well as insect and debris infiltration. Ridge cap shingles are typically installed over the ridge vent to protect the vent and provide a clean finished look on the roof.

In SIP construction, when SIPs are used as the roofing system, an attic space is not created. An attic, as defined by the IRC, is the unfinished space between the ceiling assembly and roof assembly. In conventional construction there is an insulated ceiling assembly and an uninsulated roof deck assembly. The space between these two assemblies is what the IRC defines as an attic. **With SIPs, the roof assembly is the insulated assembly and is typically the external envelope of the structure.** (Refer to Image 8.10.) T**he space above a flat ceiling is within the conditioned space.**

SIP roof assemblies can benefit from the use of ridge vents. The use of breathable, high perm underlayments are strongly recommended in SIP roof assemblies. Due to the nature of a SIP, the OSB facers are only able to dry to the side they are on. The use of a high perm, breathable underlayment allows moist air from the environment to work its way away from the OSB, through the breathable underlayment, and up toward the ridge. The ridge vent along the peak of the roof provides an exit route for this moist air. **The major difference in installing a ridge vent in a SIP roof assembly is that no slots are cut in the roof SIPs OSB along the ridge** (see Figure 8.5). The ridge vent is installed over the breathable roofing underlayment at the ridge, providing the exit path for moist air that is under the roof covering.

FIGURE 8.5

SIP WITH RIDGE VENT (FIG. 18A FROM SIP BASIC CONNECTION DETAILS)



ALL SIP JOINTS SHALL BE AIR SEALED WITH SEALANT AND/OR SIP TAPE. FOLLOW SIP MANUFACTURER'S RECOMMENDATIONS FOR SIP TAPE WIDTHS AND SEALANT PATTERN AND THICKNESSES.

VERIFY NAIL SPACING PER MANUFACTURER SPECS/CODE LISTING

ROOF-TO-ROOF PANEL CONNECTIONS

SIP WITH RIDGE VENT

Fig. 18a

Fig.18a from *SIPs Basic Connection Details*.

IMAGE 8.10

INSULATED SIP ROOF ASSEMBLY

Glossary of Terms

Acrylic adhesive: a water-based adhesive (i.e., non-solvent), polymeric acrylic dispersions.

APA: APA – the Engineered Wood Association (www.apawood.org) is a nonprofit trade association helping the industry create structural wood products of exceptional strength, versatility and reliability.

Asphalt-saturated felt: modern products are typically termed asphalt-saturated felt. Here, the base—whether organic (paper-based) or sometimes even fiberglass-based—is fully saturated with asphalt.

Attic: the unfinished space between the ceiling assembly and roof assembly.

Attic, habitable: a finished or unfinished habitable space within an attic.

Back-ventilated cladding: a ventilated or pressure moderated air space immediately behind the exterior cladding to control entry of rain moisture by air pressure differences by reducing those air pressure differences and providing moisture removal (see "Stickering").

Cold roof: a vented roof in any hygro-thermal zone.

Cover Board: see definition of divorcement layer.

Divorcement layer: separation material between exterior OSB facer of SIP roof and roofing membrane. It should have a perm rating greater than 10. Also known as a cover board.

Flat roofs: roofs with a pitch/slope of 0.25"/12".

IBS: the International Building Code is a model building code developed by the International Code Council (ICC). The code provisions are intended to protect public health and safety while avoiding both unnecessary costs and preferential treatment of specific materials or methods of construction.

IRC: the International Residential Code addresses the design and construction of one- and two-family dwellings and townhouses not more than three stories above grade, establishing model code regulations that safeguard the public health and safety in all communities, large and small.

Low slope: any with a pitch/slope less than 4/12 pitch according to the IRC and IBC.

Organic solvent based: Organic solvents are carbon-based substances that dissolve or disperse other substances. They are a type of volatile organic compound (VOC). These should be avoided with SIPs with cellular polystyrene foam cores (EPS, XPS).

Peel and stick underlayment/membrane: generic term used for low (typically less than or equal to 10) perm self-adhering roofing underlayment.

Permeability: quality of a material or membrane that causes it to allow liquids or gases to pass through it, i.e., moisture or vapor transfer. A rating measured in perms.

Permeance: the degree to which a material admits a flow of matter or energy, i.e., moisture or vapor transfer.

Rainscreen: an exterior wall detail where the siding (wall cladding) stands off from the moisture-resistant surface of an air/water barrier applied to the sheathing to create a capillary break and to allow drainage and evaporation. The rainscreen is the cladding or siding itself but the term rainscreen implies a system of building. Ideally the rainscreen prevents the wall air/water barrier from getting wet but because of cladding attachments and penetrations (such as windows and doors) water is likely to reach this point, and hence materials are selected to be moisture tolerant and integrated with flashing. In some cases a rainscreen wall is called a pressure-equalized rainscreen wall where the ventilation openings are large enough for the air pressure to nearly equalize on both sides of the rain screen, but this name has been criticized as being redundant and is only useful to scientists and engineers.

Reservoir Wall Cladding: a cladding that absorbs and stores moisture, such as brick, stone, wood, non-synthetic stucco and fiber cement.

Ridge Vent: an air exhaust vent installed on the peak of a roof.

Roof Covering: any system covering a roof.

SIP tape: an all-weather vapor-tight joint sealing tape developed for SIPs and other high-performance building envelopes.

SIPA: Structural Insulated Panel Association (www.sips.org), a non-profit trade association representing manufacturers, suppliers, dealer/distributors, design professionals and builders committed to providing quality structural insulated panels for all segments of the construction industry.

SIPs: Structural Insulated Panels, a high-performance building component for residential and light commercial construction.

Steep slope: any roof with a slope of 4/12 pitch or greater.

Stickering: also known as furring strips, sleepers, slats or stickers, these are strips of material inserted between layers to provide air flow and permit drying.

Tar paper: historically, tar paper referred to a paper-based material that was impregnated with tar (or more commonly, asphalt today) to provide a basic moisture barrier.

Underlayments: roofing underlayments go directly under shingles or other roofing material, forming a second line of defense against the elements. These may be mechanically fastened or self-adhering with a perm rating greater than 10.

UV Degradation: the cracking or disintegration of materials exposed to ultraviolet radiation, most commonly due to sunlight exposure.

Water-Resistive Barrier (WRB): thin wrap/membrane with a perm rating of 10 or greater intended to resist water which penetrated behind the exterior cladding; also referred to as a drainage plane.

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