SIP BUILDER BEST PRACTICES #7

Structural Insulated Panels:

BUILDING WITH SIPS: SIP INSTALLATION

PREMIER SIPS
STRUCTURAL INSULATED PANELS

SIP BUILDER-BP 7:

SIP Installation

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 in-field project experience 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 7:
SIP Installation

SIP BUILDER-BP 7.0:
Introductory Installation Overview:

1. The standard carpentry skills required for successful layout, leveling and squaring of framing elements apply to a SIP install as they would to any other building project. Confirm that you are using a properly calibrated level.

2. Confirm that you are building on a square and level surface (i.e., floor or foundation). If you identify variations, square and level the surface to provide required bearing conditions for both facers of SIP walls.

3. Measure and re-measure as you go to make sure you are staying on track in critical areas such as pockets for support beam placement or window locations, especially kitchens where cabinets might be installed to each side.

4. As SIPs are installed, SIP sealant should be applied at all SIP joints for wall, floor and roof SIPs. Refer to Premier's shop drawing details. See Images 7.1 through 7.7.

IMAGE 7.1
SIP ROOF SEALANT APPLICATION

IMAGE 7.2

EXPANDING FOAM INSULATION AT SIP ROOF RIDGE JOINT

IMAGE 7.3

AUTOMATED SEALANT APPLICATOR

IMAGE 7.4

SIP WALL SEALANT APPLICATION

IMAGE 7.5

SIP WALL SEALANT WITH MANUAL APPLICATOR

IMAGE 7.6

TALL SIP WALL SEALANT APPLICATION

IMAGE 7.7

SEALANT ON SILL PLATE

Checklist of Tools

- ☐ Auger bit (1-1/2" x 12)
- ☐ Bits for panel screws/fasteners (e.g., Torx or star drive)
- ☐ Caulking guns
- ☐ Chain saw or Prazi saw with 14" - 21" bar and chain saw guide for site fabrication
- ☐ Chalk line
- ☐ Circular saws
- ☐ Come-along with 2" ratchet straps for pulling SIPs together
- ☐ Drill motor (1/2") for 1-1/2" diameter electrical chase holes
- ☐ Drill motors (3/8")
- ☐ Dunnage for supporting panels
- ☐ Expanding foam
- ☐ Fall arrest gear for roofs (if applicable)
- ☐ Foam scoop and/or Wind-lock hot knife
- ☐ Framing square
- ☐ Hand saw
- ☐ J roller for SIP tape application
- ☐ Ladders - step and extension
- ☐ Levels (4' or longer)
- ☐ Lifting plates/pins
- ☐ Mineral spirits to clean caulking/sealants from tools
- ☐ Miter saw
- ☐ Nail gun
- ☐ Power planer
- ☐ Pry bars
- ☐ Reciprocating saw
- ☐ Sledge hammers
- ☐ String line
- ☐ Wrench and socket for tightening anchor bolts

SIP Installation Tips

1. Project must meet local code.
2. Confirm your installation date at least two weeks prior to requesting on-site assistance.
3. Schedule a preconstruction meeting with your installation crew (concrete, plumbing, electrical,siding, roofing, etc.).
4. Review SIP shop drawings for hold-downs locations if applicable.
5. Inventory materials when you receive them.
6. Check all SIPs for proper cuts and recesses.
7. Double check SIPs sizes and compare to shop drawings before installation.
8. Project-specific SIP shop drawings take precedence over SIP manufacturer's standard/ typical details. Always confirm with SIP manufacturer if there are questions or concerns.
9. Follow SIP details regarding sealant and SIP tapeinstallation as described in *Builder Best Practices 8: SIP Roof and Wall Assemblies* or *Design Best Practices 8: SIP Roof and Wall Assemblies.*
10. Fabricate and pre-install box spline, dimensional lumber or I-joist spline material as specified.
11. Any changes to the SIPs required at the job site should be double-checked with the SIP manufacturer.
12. Make sure to pre-drill for electrical chases:
    a) For vertical electrical chases, drill the bottom/sill plates, top and cap plates
    b) For horizontal electrical chases, drill the vertical splines (i.e., 2x's or block splines
13. Plumbing is not recommended inside exterior SIP walls. Refer to *Builder Best Practices 10: SIP Plumbing for more information.*
14. Do not cut the SIP facers (OSB) for extra electrical chases or plumbing. Refer to *Builder Best Practices 9: SIP Electrical* or *Builder Best Practices 10: SIP Plumbing* for more information.
15. Do not pick up the SIPs by the edge of the top facer.
16. Remove debris from sill plate before you place the SIP wall on it.
17. Use sealant on all connections as shown in the SIP shop drawing details.
18. Make sure that both of the wall SIP facers are fully supported on the subfloor or sill plate.
19. Follow proper nailing requirements according to SIP shop drawing details.
20. Plumb/level each SIP in each direction, then secure with fasteners.
21. Temporarily brace walls adequately to stabilize during installation.
22. Only apply interior or exterior finish materials over dry SIPs.
23. Fill all voids with expanding foam.

SIP BUILDER-BP 7.1:
Assure there is a capillary break between the SIPs and concrete floors, foundations and walls.

A capillary break in construction is the use of a hydrophobic/water-repelling material (non-porous) that acts as a barrier between two layers of material that can stop capillary action. Various types of materials may be used as the capillary break, including but not limited to sill seal, waterproofing membrane, or other non-permeable materials.

In many parts of the country, a treated sill (aka sole plate) is considered a capillary break with traditional stick framing. Other parts of the country traditionally place a capillary separation layer between the concrete foundation and the sill/sole plate. The treated sill plate separates the concrete from the untreated outer SIP facers.

The treated sill plate allows for minor imperfections in concrete surfaces and provides adequate bearing surface for both facers of the SIP. Note that foundations out of square might not fully support the entire sill plate and cause a cantilever situation which would require a structurally designed sill plate, as seen in Image 7.10. Contact your SIP manufacturer for an engineered solution.

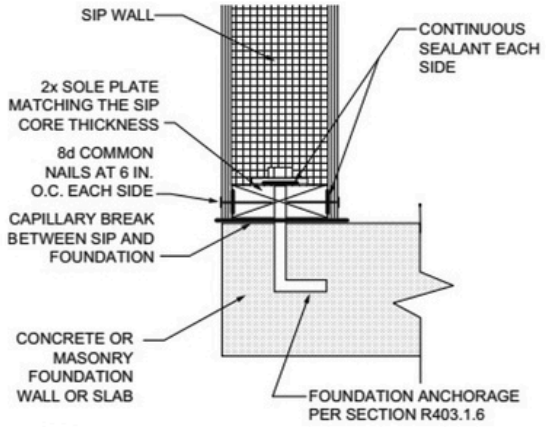
IRC 2021, section R610.5.2 (see Image 7.8) requires that a capillary break be installed between the SIP wall and the concrete or masonry foundation wall or slab.

While the IRC does not illustrate a treated sill plate, SIPA best practices do recommend it. See Image 7.9: Figure 4 from SIPA's SIP Basic Connection Details showing a SIP wall to a foundation.

IMAGE 7.8

FROM IRC (INTERNATIONAL RESIDENTIAL CODE) 2021

R6 10.5.2 Bottom (sole) plate conncection.
Where SIP walls are supported directly on continuous foundations, the wall wood sill plate shall be anchored to the foundation in accordance with Figure R6 10.5.2 and Section R403.1



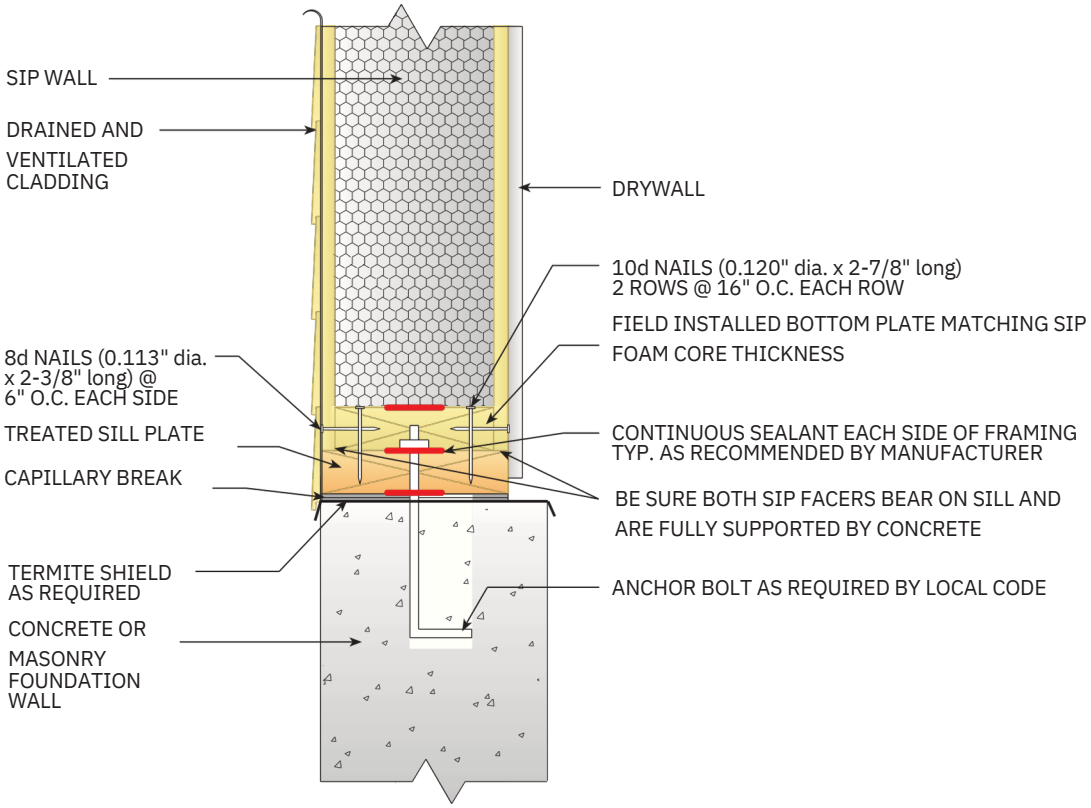
For SI: 1 inch = 25.4 mm.

FIGURE R610.5.2
SIP WALL TO CONCRETE SLAB FOR FOUNDATION WALL ATTACHMENT

Note that sill seal also reduces air leakage between the concrete surface and the bottom of the SIP wall. Sill seal is used in both SIP and wood framed construction.

IMAGE 7.9

FROM SIPS BASIC CONNECTION DETAILS



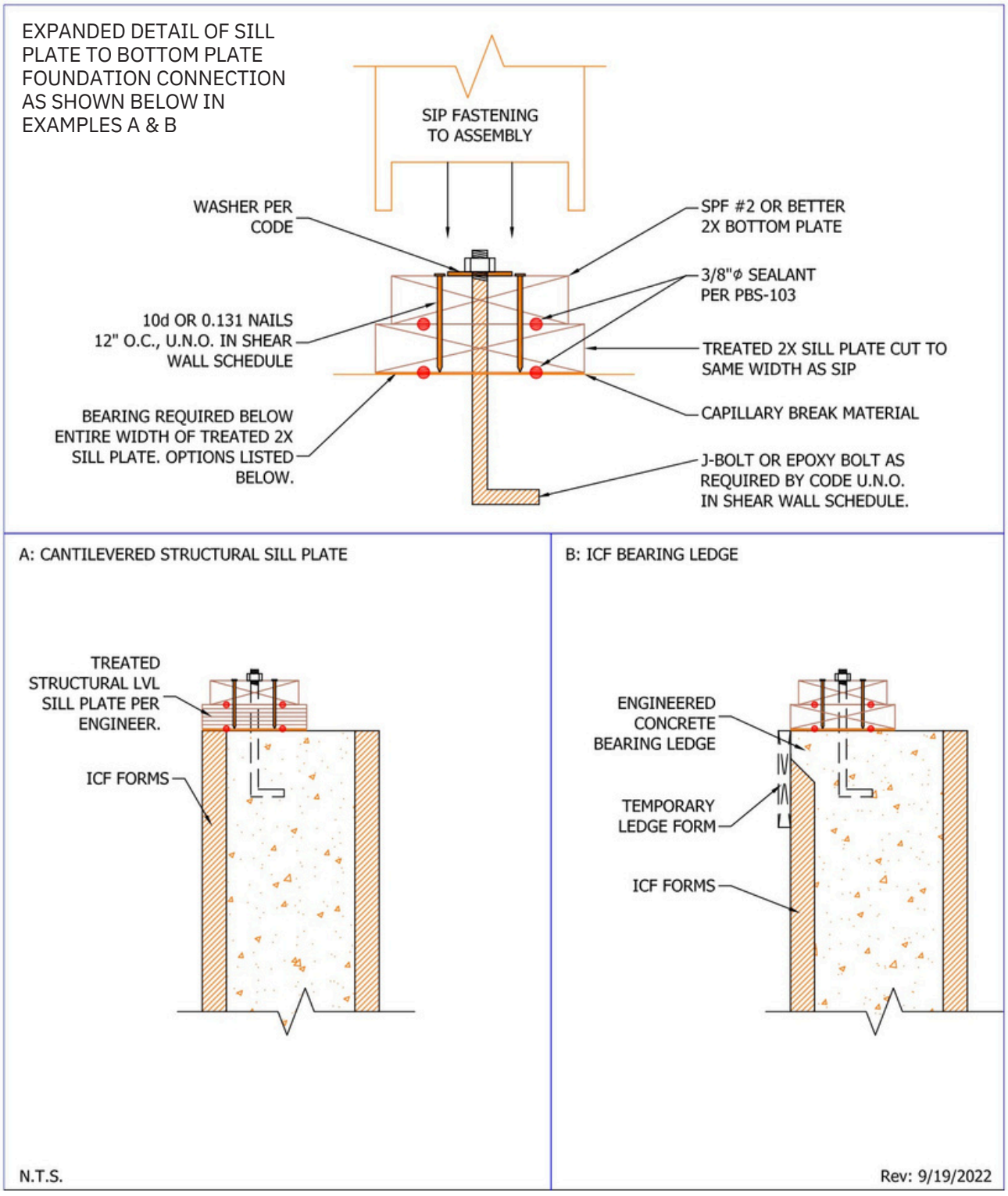
ALL SIP JOINTS SHALL BE AIR SEALED WITH SEALANT AND/OR SIP TAPE. FOLLOW SIP MANUFACTURER'S RECOMMENDATIONS FOR SIP TAPE WIDTHS AND SEALANT PATTERN AND THICKNESSES. VERIFY NAIL SPACING PER MANUFACTURER SPECS/CODE LISTING

FOUNDATION CONNECTIONS SIP WALL ON FOUNDATION

Note the red lines representing continuous sealant for air leakage control. Sill seal also reduces air leakage between the concrete surface and the bottom of the SIP wall. Sill seal is used in both SIP and wood framed construction.

IMAGE 7.10

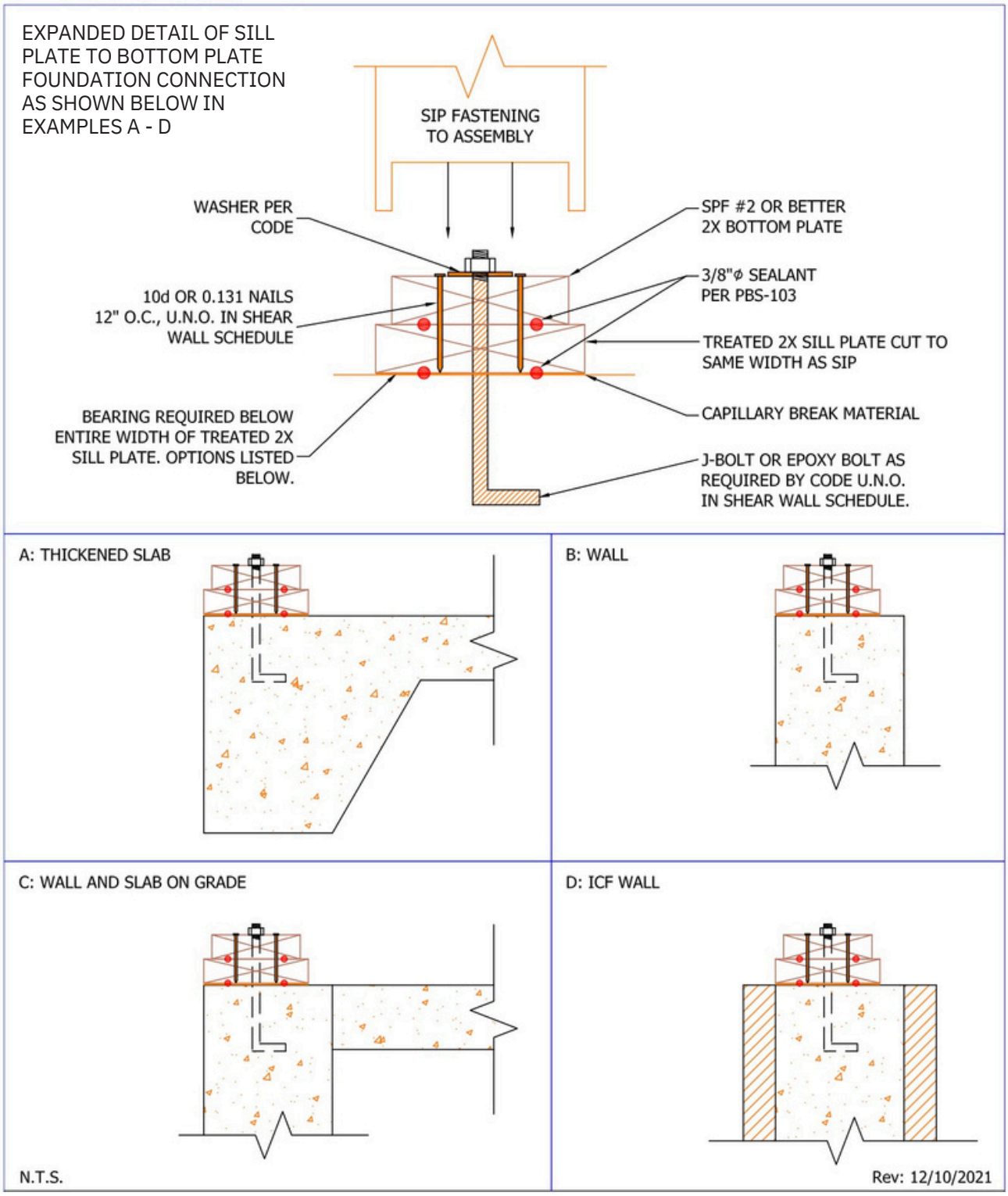
TYPICAL CANTILEVERED SILL PLATE/FOUNDATION CONNECTION DETAILS



Note that sill seal also reduces air leakage between the concrete surface and the bottom of the SIP wall. Sill seal is used in both SIP and wood framed construction.

IMAGE 7.11

TYPICAL CAPILLARY 2X SILL PLATE/FOUNDATION CONNECTION DETAILS



Note that sill seal also reduces air leakage between the concrete surface and the bottom of the SIP wall. Sill seal is used in both SIP and wood framed construction.

IMAGE 7.12

TREATED SILL PLATE AND CAPILLARY BREAK

IMAGE 7.13

WATERPROOFING MEMBRANE FUNCTIONING AS CAPILLARY BREAK ON TOP OF ICF (INSULATED CONCRETE FORMS) WALL

IMAGE 7.14

WATERPROOFING MEMBRANE FUNCTIONING AS CAPILLARY BREAK ON TOP OF ICF WALL (ALTERNATE VIEW)

IMAGE 7.15

TREATED SILL PLATE AND SILL SEAL (CAPILLARY BREAK)

SIP BUILDER-BP 7.2:
Typically, it is best to start installation of wall SIPs at a corner.

It is typically best to start installing wall SIPs in the corner to ensure that the adjacent SIPs are plumb and square. Starting to install the wall SIPs in the corner also allows you to work in two directions. If you have a large enough crew along with equipment, this will speed up the installation of SIPs. See Images 7.16A and 7.16B.

IMAGE 7.16A

SETTING CORNER PANELS

IMAGE 7.16B

SETTING CORNER PANELS (ALTERNATE VIEW)

There are, however, times when you would want to start in the middle of the wall and work to the corners. This methodology should be considered if you have a gable wall supporting ridge beams. Image 7.17 shows a pocket in the SIP gable wall for the ridge beam. Working from the middle of the gable wall to the eave walls helps ensure proper alignment of the ridge beam.

IMAGE 7.17

GABLE WALL WITH RIDGE BEAM POCKET

Images 7.18 and 7.19 show starting in the middle of a gable wall and installing temporary bracing to ensure wall SIPs stay plumb and withstand wind-related forces. Temporary bracing will be discussed more in Section 7.5 of this document.

IMAGE 7.18
SIP GABLE WALL INSTALLATION STARTING AT CENTER OF WALL

IMAGE 7.19
SIP GABLE WALL INSTALLATION OF ADJACENT SIP

The APA recommends a 1/8" gap to help mitigate issues that would otherwise require trimming of the SIP. Gaps can be installed large or small as required to align with SIP layout per shop drawings. If gable ends need to be trimmed, this should occur at the downslope ends (eave end of the gable wall). Otherwise, trimming gable wall SIPs as they are set could cause stair-stepping of the gable slope.

When installing SIP walls, it is important to consider point load locations, supporting posts of structural members, and locations of doors, windows and sinks. Make sure to measure and mark on the plate/deck these locations and trim the wall SIPs if they are growing in length (overall wall length of combined SIP sections). Trimming a SIP is much easier before it is set in place. Referring to SIP shop drawings beforehand will help identify these critical locations.

Consult with your Premier Rep if you have any questions or concerns about where to start installing wall SIPs.

SIP BUILDER-BP 7.3:
The use of ratchet straps to pull SIPs together can be very helpful during installation.

Several types of splines (e.g., box/block, surface, etc. – reference images 7.20 and 7.21) are used to connect SIPs together. Before the SIPs are drawn together, ensure the sealant is applied according to the SIP shop drawing details. To make the spline connection, it is important to pull the SIPs snugly together (i.e., not too much pressure to damage the SIP) to fully engage the EPS foam core with the connecting spline in the recesses of the two SIPs. This may or may not cause the OSB facers to touch. The priority is that the inner foam core surfaces should be in contact. If the OSB facers are touching, validate that the EPS foam cores are touching by observing from the top of the wall looking downward or at the end of roof SIPs. In the event that the foam surfaces are not touching, contact your SIP manufacturer to determine how best to accomplish this.

IMAGE 7.20

FROM *SIPS BASIC CONNECTION DETAILS* (SURFACE SPLINE EXAMPLE)

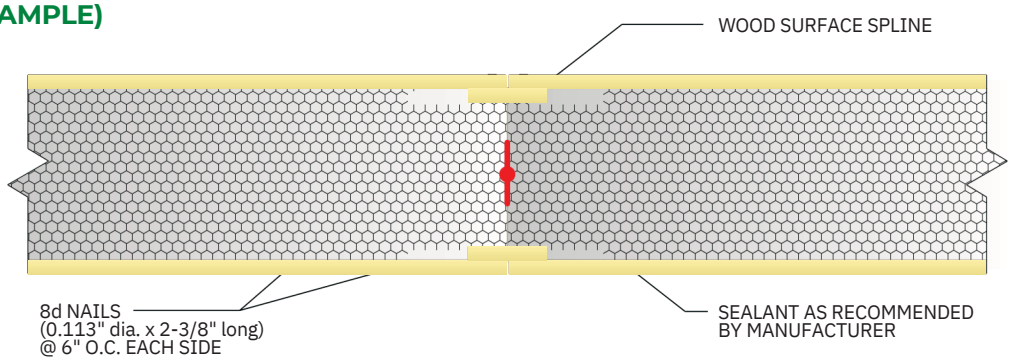
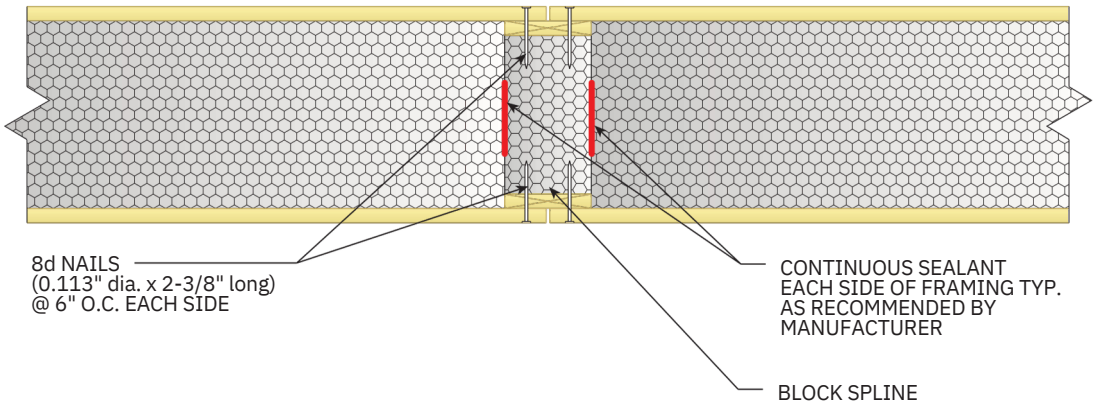


IMAGE 7.21

FROM *SIPS BASIC CONNECTION DETAILS* (BOX/BLOCK SPLINE EXAMPLE)



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

The assembly process can be made easier with the use of a ratchet strap type (i.e., “Come-Along”). Adding a beveled edge on the spline can also aid in joining the SIPs together. Once the installer has the SIPs pulled together, the SIPs should be nailed off on both the interior and exterior sides of the bottom plate along with the vertical spline joint before the ratchet is released. Reference the SIP shop drawings for the appropriate OSB “Gap” at SIP joints. This Gap can also mitigate “popping” complaints due to thermal expansion and contraction. Follow the SIP shop drawings for nail size and spacing.

Note that ratchet straps are not typically supplied by Premier SIPS. There are different types, and it is up to the installers to purchase the equipment that
works best for them.

Images 7.22A, 7.22B and 7.22C show some examples of installers using ratchet straps to pull panels together.

IMAGE 7.22A

USING RATCHET STRAPS TO PULL SIPS TOGETHER

NOTE: Hook on end of wall to pull a SIP into place with a ratchet

IMAGE 7.22B

USING RATCHET STRAPS TO PULL SIPS TOGETHER

NOTE: Suspended header SIP being pulled tight (making sure to align beam pockets with opposite wall)

IMAGE 7.22C

USING RATCHET STRAPS TO PULL SIPS TOGETHER

NOTE: Plate screwed to SIPs and ratchet strap used to pull them together.

There are two types of hooks at the end of ratchet straps: flat hooks and wire hooks. There is typically a preference to use the flat hook when pulling from the edge of a SIP to prevent damage to the OSB, and the wire hook when using lifting plates screwed to the SIPs. See Images 7.23A, 7.23B and 7.23C.

IMAGE 7.23A

VARIOUS RATCHET STRAP HOOKS

IMAGE 7.23B

VARIOUS RATCHET STRAP HOOKS

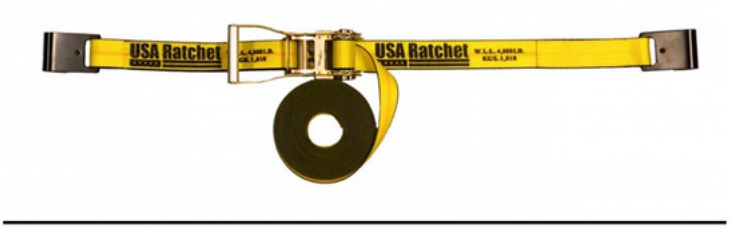


IMAGE 7.23C

COME-ALONG STYLE ASSEMBLY WITH HOOKS AND LIFTING PLATES

SIP BUILDER-BP 7.4:
During installation, it is important to drill plates and connectors (i.e., splines) to allow access to electrical chases.

SIP manufacturers may provide electrical wiring chases in wall SIPs. The chases are approximately 1-1/4" in diameter and are located in the EPS foam core of the SIP. Horizontal chases in the wall SIPs are located at switch and outlet heights, approximately 14" and 48" from the bottom of the SIP. Vertical chases are located approximately 4' on center in the wall SIP. Additional chases may be added if required; consult with the SIP manufacturer.

The sill plates, bottom and top plates, cap plates and connection splines need to be drilled with an approximate 1-1/2" diameter drill bit at the vertical and horizontal chase locations when the SIPs are being installed. These holes facilitate the installation of the electrical wires during the wiring process. As shown in Image 7.24, when drilling the sill plate one might have to angle the drill bit to facilitate electrical wire placement through the floor system depending on the RIM board material. When drilling top and cap plates, the hole will be vertical matching the electrical chase in the SIP wall. Consult with your Premier SIP Rep with any questions.
The SIP installer should double check that all splines used to connect the vertical SIP joints have the holes drilled to match the horizontal electrical chases.

IMAGE 7.24
DRILLED TOP PLATE AND CAP PLATE FOR VERTICAL ELECTRICAL CHASE

IMAGE 7.25
SILL PLATE CHASE CUT OUT TO PASS FROM SIP WALL TO BELOW FLOOR

IMAGE 7.26
DRILLING SILL PLATE

NOTE: One might have to angle the drill bit to facilitate electrical wire placement through the floor system depending on the RIM board material.

SIP BUILDER-BP 7.5:
Brace SIPs appropriately during construction to withstand wind-related issues.

SIPs are designed to withstand loading conditions over the course of the life of the structure under normal use conditions. However, during construction, the lack of temporary bracing may lead to instability and even collapse under certain conditions such as high- wind events. During SIP installation, the purpose of temporary bracing is to provide stability and stiffness to the framing against unintended movement or loading prior to the installation of the entire structural system. Temporary bracing may also be used to plumb the wall prior to installing floor/roof systems.

Dimensional lumber is often used as temporary bracing of wall and roof elements. Refer to images 7.27, 7.28, 7.29 and 7.30.

IMAGE 7.27

GABLE WALL BRACING

IMAGE 7.28

EXTERIOR SIP WALL BRACING FROM THE EXTERIOR OF THE BUILDING

IMAGE 7.29

EXTERIOR SIP WALL BRACING FROM THE INTERIOR OF THE BUILDING

IMAGE 7.30

ROOF RAFTER BRACING PRIOR TO SIP ROOF INSTALLATION

SIP BUILDER-BP 7.6:
When installing roof SIPs, install splines and “chicken sticks” on the ground, to make the process easier.

Toe boards, also known as “chicken sticks,” can be used to help installers move around on the sloped roof SIP. Often the toe boards are 2x4s that are fastened to the exterior side of the roof SIPs. They need to be securely fastened so that they support the weight of the workers without shifting or loosening.

IMAGE 7.31A

ROOF SIPS WITH TOE BOARDS

IMAGE 7.31B

ROOF SIPS WITH TOE BOARDS

IMAGE 7.31C

ROOF SIPS WITH TOE BOARDS

IMAGE 7.31D

ROOF SIPS WITH TOE BOARDS

IMAGE 7.31E

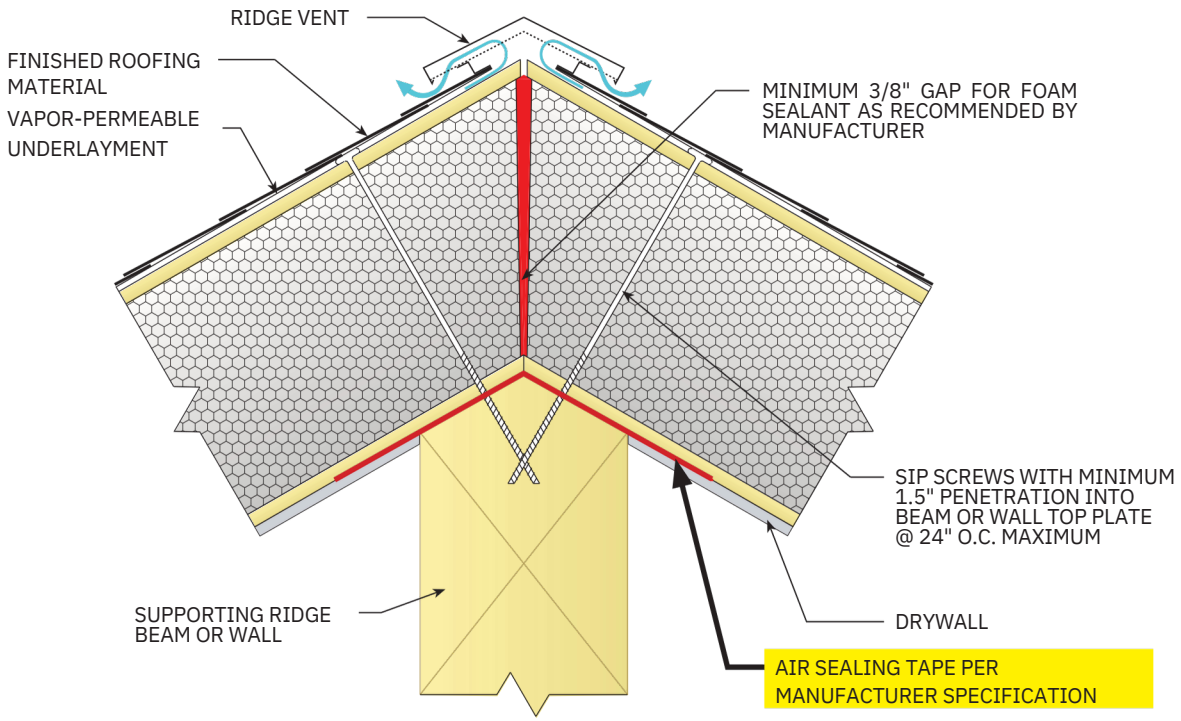
ROOF SIPS WITH TOE BOARDS

SIP BUILDER-BP 7.7:
Due to the "stack effect," the ridge joint is the most important joint in the house. Follow manufacturer's ridge sealing detail to the letter!

The stack effect or chimney effect is the rising of warm air and movement out of buildings through unsealed openings at ridge beams, chimneys, stack vents, etc., resulting from warm air rising (buoyancy). SIP tape is an important part of your SIP installation to minimize movement of warm, moist air through panel joints due to stack effect (see Image 7.32 and 7.33). Refer to Section 8.8 of *SIP BUILDER-BP 8: Roof and Wall Assemblies* for taping recommendations.

IMAGE 7.32

SIP TAPE AT RIDGE BEAM DETAIL FROM *SIPS 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

IMAGE 7.33

EXPANDING FOAM INSULATION AT SIP ROOF RIDGE JOINT

At roof supports (beams/walls), SIP tape (typically a wide width with 2 inches of attachment to each side of the roof support; check with your SIP manufacturer) should be centered and attached with the release paper side up over all roof supports with panel joints before roof SIPs are set (see Image 7.34). Overlap the SIP tape segments at least three inches at the tape- end joints. SIP tape is best attached in place using staples or a hammer tacker prior to setting roof SIPs. Do not remove the paper backing until the roof SIPs are in place and fastened to the beam or supporting walls. SIP tape should be installed in the temperature range from 0°F to 120°F. Refer to *SIP DESIGN-BP 1: High-Performance SIP Building Envelope* for climates in which you may need SIP tape.

IMAGE 7.34

WIDE-WIDTH SIP TAPE DRAPED/STAPLED OVER ROOF SUPPORT BEAMS PRIOR TO SETTING ROOF SIPS

SIP surfaces should be clean, dry, free of dirt and debris, and free of damage, sharp protrusions, or voids. On the SIP tape, peel back a few inches of one side of the split paper release liner to facilitate the SIP tape sticking to the underside of the SIP above. Remove the release paper applying firm pressure to the SIP tape surface as it comes in contact with the SIP surface. Repeat this procedure with the remaining side of the paper release liner. Using a spatula or roller (rubber, wood or a steel J roller; see Images 7.35 and 7.36), apply sufficient pressure along the entire tape surface to ensure a continuous wrinkle-free seal and to eliminate trapping air between the OSB and the tape.

IMAGE 7.35
SPATULA/FLAT BLADE APPLICATOR

IMAGE 7.36
ROLLER APPLICATOR

Other interior roof SIP joints not occurring at roof supports also need to have SIP tape applied. See images 7.37 and 7.38. Refer to SIP BUILDER-BP 8: Roof and Wall Assemblies for additional recommendations.

IMAGE 7.37
SIP TAPE APPLIED TO INTERIOR SIP ROOF AND SIP WALL JOINTS

IMAGE 7.38
SIP TAPE APPLIED TO INTERIOR SIP ROOF AND SIP WALL JOINTS

SIP BUILDER-BP 7.8:
A factory representative is recommended during the initial stages of installation for a first-time SIP user, to help expedite the SIP installation, ensuring the system is installed as required and meets performance targets.

SIP manufacturers may have representatives that can provide advice on site, assist with installation, and help teach a building crew how to install SIPs. Check with the manufacturer you are working with to determine what types of installation training options are available and the fees associated with these services.

SIP BUILDER-BP 7.9:
After the project has been erected, review all SIP joints to ensure they are properly nailed/fastened and sealed/taped.

Once the SIP installation is completed, prior to installation of the SIP tape if required, inspect all SIP joints and connections to ensure proper nailing and installation of sealant. Nailing of SIP joints and connections should be according to the SIP manufacturer shop drawings, listing reports, or other pertinent technical documents.

If SIP tape is required, apply SIP tape over the SIP joints. Ensure that the SIP tape over the roof supports has been properly attached to the underside of the SIP roof panels.

Proper sealing of the SIP joints with sealant and SIP tape mitigates air leakage through the SIP joints helping to ensure a high-performance assembly.

Refer to Images 7.37 and 7.38 for proper SIP tape installation examples.

Refer to Images 7.39 through 7.44 for proper sealant installation examples.

All of these air sealing and taping steps will help to pass the air leakage checks (i.e., blower door tests mandated by building codes)

IMAGE 7.39

SIP ROOF SEALANT APPLICATION

IMAGE 7.40

AUTOMATED SEALANT APPLICATOR

IMAGE 7.41

SIP WALL SEALANT APPLICATION

IMAGE 7.42

SIP WALL SEALANT WITH MANUAL APPLICATOR

IMAGE 7.43

TALL SIP WALL SEALANT APPLICATION

IMAGE 7.44

SEALANT ON SILL PLATE

SIP BUILDER-BP 7.10:
Training programs are available to installers, ensuring that an educated installer understands the importance of proper installing and sealing of the SIP package.

SIPA has numerous programs in place to train installers to make sure SIPs are installed according to their architectural plans and the manufacturers' subsequent shop drawings.

7.10.1:
SIPA online training courses

A variety of online training resources for both commercial and residential applications are available for both designers (*https://www.sips.org/resources/architect-education*) and builders (*https://www.sips.org/resources/builder-education*). Many of these are officially credentialed and approved for continuing education credits from American Institute of Architects (AIA) and other organizations. The on-demand video sessions can be watched, and separate ten-question tests taken online, after which certificates will be automatically emailed immediately after passing.

7.10.2:
SIPA Registered Master Builder & Designer programs

A guided curriculum of ten courses called *Building Education with SIPs Training* or the *BEST* program has been developed to orient those new to SIPs. The self-standing educational units each have a narrated video, study guide, and an optional accompanying quiz to test comprehension. An overview is available at:
https://www.sips.org/resources/bestprogram

Lesson 1 - *Introduction to SIPs*

Lesson 2 - *Basic SIP Design & Engineering*

Lesson 3 - *SIP Order Process*

Lesson 4 - *SIP Building Science*

Lesson 5 - *SIP Layout Drawings*

Lesson 6 - *SIP Site Planning & Coordination*

Lesson 7 - *SIP Layout & Panel Installation*

Lesson 8 - *Integrating Mechanical Systems with SIPs*

Lesson 9 - *SIP Finish Materials & Detailing*

Lesson 10 - *Common Objections for SIP Designs*

Once completing the set of ten courses, individuals interested can receive a $50 discount for first-year membership to join SIPA as a builder or design professional member. SIPA members are eligible to enter a two-step program. The first step is to become a *Registered SIP Builder* or *Registered SIP Designer*. Individuals desiring to take the second step toward the prestigious *Master SIP Builder* or *Master SIP Designer* credential must then fulfill the further requirements illustrating mastery of SIPs by:

Master SIP Builder Program Requirements

- Completing at least ten (10) SIP structures or having worked with SIPs for a minimum of five (5) years and
- Passing the Registered SIP Builder/Designer test of 100 questions with a score of 80% or better and
- Submitting a blower door test result conducted by a RESNET-certified energy rater from a recently completed SIP project with a result not to exceed 2.0 ACH50 and
- Completing the SIPA Master Builder Checklist on the blower door tested project

Master SIP Designer Program Requirements

- Completing at least ten (10) SIP structures or having worked with SIPs for a minimum of five (5) years and
- Passing the Registered SIP Builder/ Designer test of 100 questions with a score of 80% or better

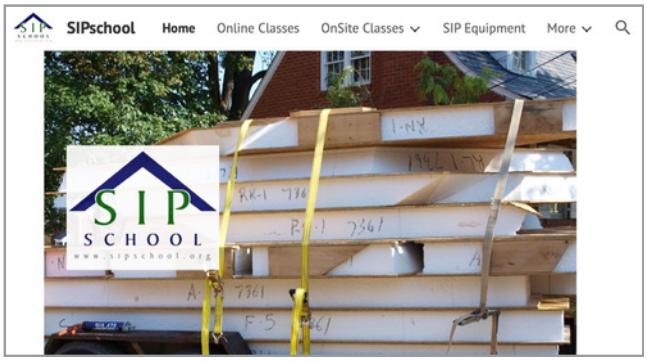
Master SIP Builders and Master SIP Designers are distinguished by unique profiles on the SIPA website (*https://www.sips.org/sip-experts/master-builder-profiles*) and also receive special designations and filtering included as part of the SIPA member directory. Special promotional mentions in SIPA newsletters and social media channels are additional benefits of achieving the *Master SIP* designation. Members holding this highest SIP designation enjoy elevated business traffic.

IMAGE 7.45
SIPA BADGES

7.10.3:
SIPschool hands-on field training

SIPschool (*www.sipschool.org*) was established in 2006 by industry veteran Al Cobb to provide training and consulting in SIP manufacturing, design and construction for a fee. For those considering building with and/or installing SIPs in a hands-on or supervisory role, in-person *SIPschool* training can give you the knowledge to help ensure your successful SIP installation. Instructors address the details used within the SIP industry, across all SIP manufacturers. Regardless of which structural insulated panel system you're using, the building science to SIP installation is universal. Find out more at: *https://www.sipschool.org/ OnSiteClasses*

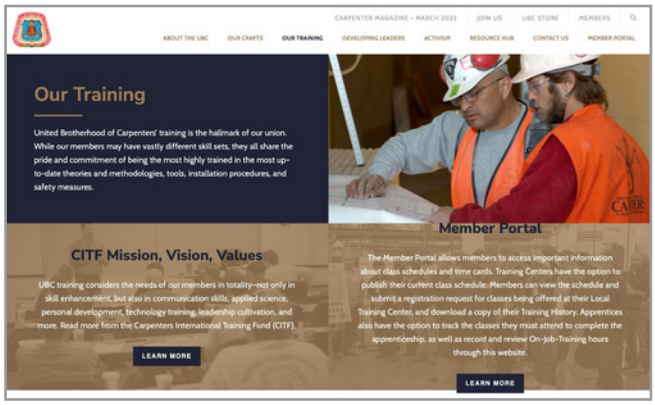
IMAGE 7.46
SIPSCHOOL HOME PAGE



7.10.4:
Carpenters International Training Fund (CITF) for SIPs

SIPA collaborated with the United Brotherhood of Carpenters (UBC) trade union, which focuses primarily on commercial construction, in the creation of a detailed 'train the trainer' program curriculum. Contact the national training headquarters in Las Vegas, Nevada or the local union to conduct this training. More information can be found at: *https://www.carpenters.org/citf-training/*.

IMAGE 7.47
CITF WEBSITE



7.10.5:
SIP manufacturer in-house training programs

SIP manufacturers offer a variety of training programs to help designers, builders and owners become familiar with the design, use and installation of SIPs. These training programs may consist of the following, to name a few:

- On-site training
- Training at the manufacturer's facility
- AIA accredited training sessions
- Live webinars
- Recorded training sessions
- YouTube videos
- Construction/installation guides

Check with the various SIP manufacturers you are working with for the training programs that are offered. Visit online at https://www.sips.org/resources/architect-education for help in scheduling face-to-face educational presentations.

Glossary of Terms

ACH50: the abbreviation for air changes per hour at 50 pascals (Pa) pressure differential and one of the most important metrics used to determine the energy efficiency of a house. It is the measurement of the rate of air leakage: the number of times the air volume in a building exchanges per hour at 50 Pa of pressure from a blower door test. It is considered equal to wind of approximately 25 miles per hour blowing on the outside of a building.

Bottom Plate (SIP wall): the horizontal pieces of wood that are recessed between the OSB facers, in contact with the EPS foam core, at the bottom of a SIP wall.

Capillary break: a non-porous material membrane or coating to prevent moisture migration from the concrete foundation into wood wall assemblies. This prevents wicking of moisture from the foundation.

Chicken boards (chicken sticks, toe kicks, toe boards): non-slip foot holds temporarily nailed onto a roof panel for workers to walk on while doing the install of steep SIP roof panels.

Come-Along: a ratchet system used to pull things (e.g., SIPs) together.

Dimensional lumber: lumber that is cut to pre-defined, standard sizes (e.g., 1-inch x 4-inch, 2-inch x 4-inch, etc.).

Framing factor: the ratio of the area of all wood structural members in contact with both the interior and exterior facers of the panels (e.g., studs and top and bottom plates) to the total surface area of the panel being considered.

HERS: Home Energy Rating System. The HERS index measures energy consumption from heating, cooling, water heating, lights, and some appliances. The lower the index, the less energy a building is consuming. A HERS rating of zero signifies a net-zero energy building.

HVAC: heating, ventilation and air conditioning.

R-value (thermal resistance): the inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area (h*ft2*0F/Btu).

Sill plate (SIP wall) (also known as sole plate): the horizontal pieces of treated wood on a concrete or block foundation on which the OSB facers bear.

Sill seal (foam gasket): provides a seal against air leakage and moisture intrusion between concrete foundation and sill plate.

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.
SIPschool: SIPschool (www.sipschool.org) was established in 2006 by industry veteran Al Cobb to provide training and consulting in SIP manufacturing, design and construction for a fee.

Stack effect (chimney effect): the rising of warm air and movement out of buildings through unsealed openings at ridge beams, chimneys, stack vents, etc., resulting from warm air rising (buoyancy).

Thermal bridging: the movement of heat across an object that is more conductive than the materials around it. The conductive material creates a path of least resistance for heat. Thermal bridging can be a major source of energy loss in homes and buildings.

PREMIER SIPS
STRUCTURAL INSULATED PANELS

LET'S CONNECT

Premier is ready to help you convert from your current building practices to SIPs. In the office or in the field, our construction support is why our clients come back to us year after year. Find your Regional Premier contact at **www.premiersips.com**.

PREMIER BUILDING SYSTEMS

B-BP7-1