

Structural Insulated Panels:

BUILDING WITH SIPS: SIP PLUMBLING



SIP BUILDER-BP 10: SIP Plumbing

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.

1. High-Performance SIP Building Envelope
2. HVAC Systems with SIPs
3. SIP Structural Capabilities
4. SIP Sizes
5. SIP Shop Drawings
6. SIP Fabrication/Manufacturing
7. SIP Installation
8. SIP Roof and Wall Assemblies
9. SIP Electrical

10. SIP Plumbing

- 10.1. Plumbing is recommended to be placed in interior walls to provide for an optimal exterior building envelope.
 - 10.2. Minimize roof penetrations and consider consolidating all vents away from south facing roof planes for potential solar array.
11. SIP Field Modifications

SIP BUILDER-BP 10: SIP Plumbing

SIP BUILDER-BP 10.1: Plumbing is recommended to be placed in interior walls to provide for an optimal exterior building envelope.

Plumbing lines should be pre-planned during the SIP design stage of the project. Plumbing supply lines should be kept out of SIP exterior walls. Placement of any piping in the exterior SIP wall reduces the thermal insulation of the EPS core and in cold climates could be at risk of freezing and maybe bursting. Faucet, spigot or hose bibs that are of the frost-free protected design (used in cold climates) are acceptable because they don't retain water in the pipe as it penetrates the exterior wall, thus decreasing the chance of freezing water damaging pipes.

Even though plumbing vent lines don't risk freezing/bursting, where possible it is discouraged to place them in exterior SIP walls and care must be taken NOT to jeopardize the structural capacity of a wall (see Images 10.1A, B and C, 10.2, and 10.3A and B). Consult with your Premier Rep.

Do not make any cuts to the SIP facers without coordinating with the SIP manufacturer or design professional to verify structural capacities are not compromised.

IMAGE 10.1A
HOSE BIB



A few options to consider are:

1. Furr out the exterior wall (see Images 10.4 and 10.5).
2. Preplan with your Premier Rep to build into the SIP panel a dedicated void space for the vent pipe (see Image 10.6).
3. Use an island vent option (see Images 10.7, 10.8, 10.9 and 10.10).

Facers of the SIP walls should *never* be field cut to accommodate plumbing runs unless Premier or design professional is consulted. If piping must be placed along an exterior wall, furring out the interior is recommended (see Images 10.4 and 10.5), or place the piping in a cabinet (e.g., kitchen sink or bathroom, see Image 10.11).

Some jurisdictions allow for a mechanical vent or air admittance valve to be used. The use of an "island or loop" style vent also works well to allow multiple fixtures to be brought to a more central vertical vent pipe location in interior walls, which also minimizes the penetrations through the roof system (see Images 10.7, 10.8, 10.9 and 10.10).

IMAGE 10.1B

PLUMBING VENT PIPE GOING INTO SIP WALL (NOTE: DO NOT DO THIS WITHOUT CONSULTING THE SIP MANUFACTURER)



IMAGE 10.1C

PLUMBING VENT PIPE GOING INTO SIP WALL (NOTE: DO NOT DO THIS WITHOUT CONSULTING THE SIP MANUFACTURER)



IMAGE 10.2

**DIRECTING VENTING INTO NON-SIP INTERIOR WALL
(PREFERRED ALTERNATIVE TO IMAGES 10.1A AND B)**

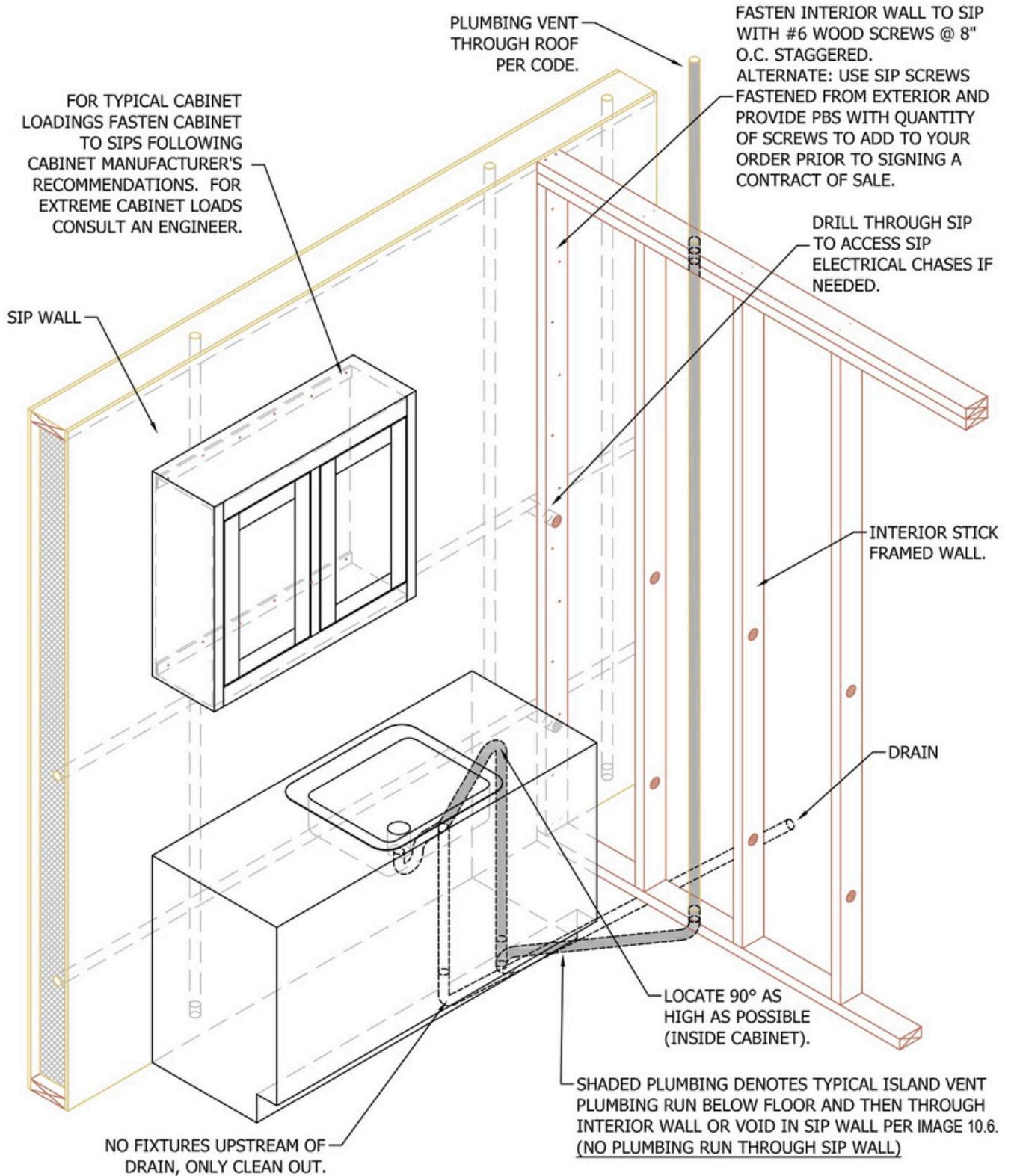


IMAGE 10.3A

WALL AND ROOF FURRING OUT OPTION (PREFERRED ALTERNATIVE TO IMAGES 10.1A AND B)

NOTE:

FASTENER / ADHESIVE ATTACHMENT OF 2X'S AND SPRINKLER SYSTEM TO BE SPECIFIED BY AN ENGINEER.

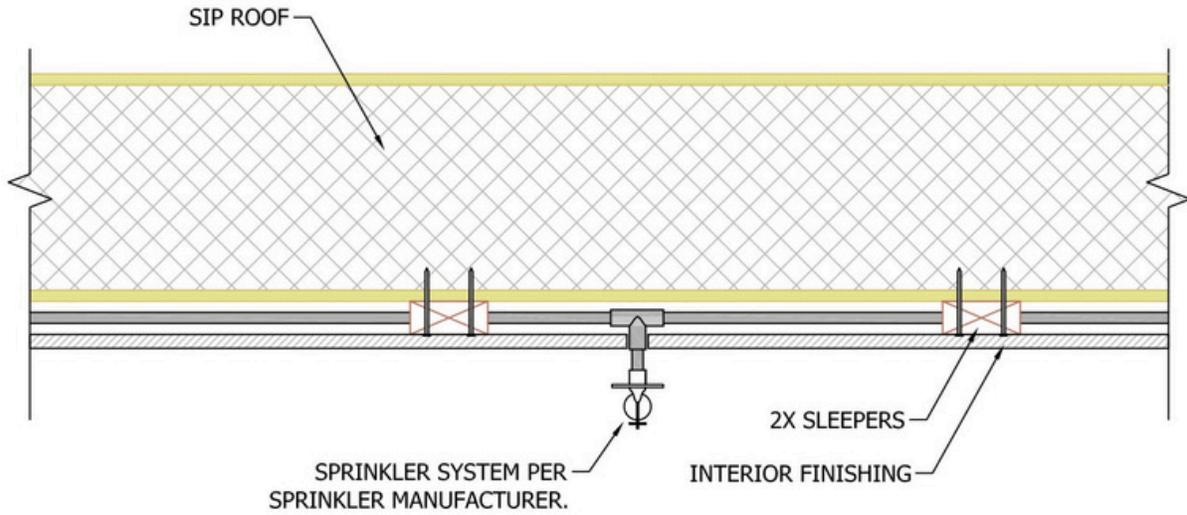


IMAGE 10.3B

WALL AND ROOF FURRING OUT OPTION (PREFERRED ALTERNATIVE TO IMAGES 10.1A AND B)

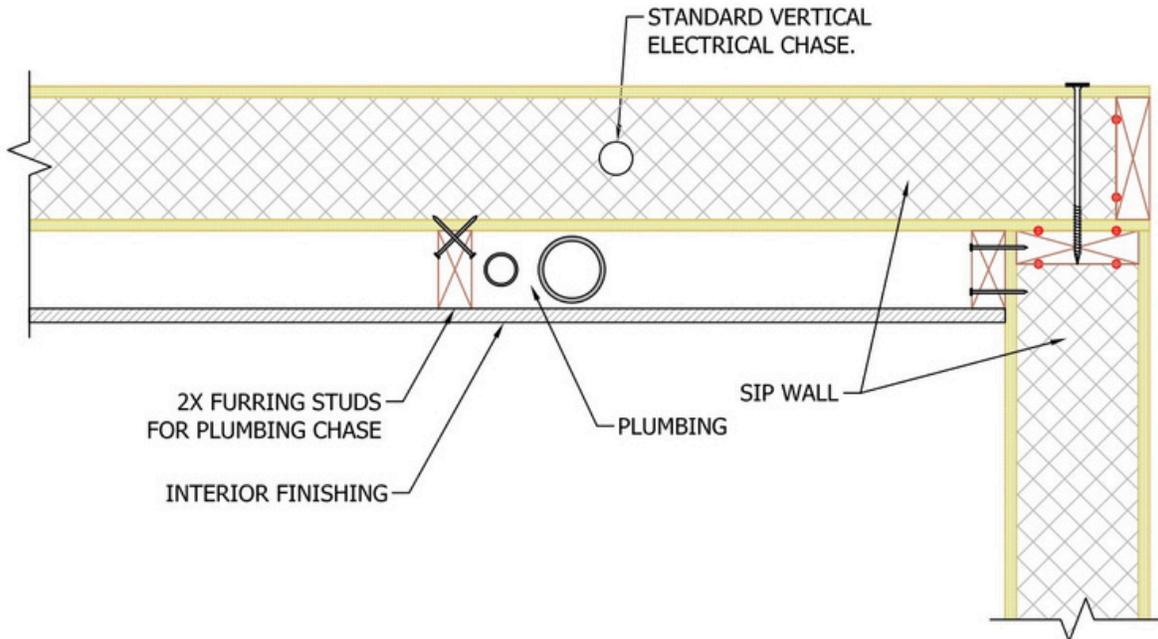


IMAGE 10.4

EXTERIOR SIP WALL WITH FURRED OUT STUD WALL ON INSIDE FACER FOR UTILITIES (PHOTO ILLUSTRATION OF IMAGE 10.3B)



IMAGE 10.5

INTERIOR FURRED OUT STUD WALL FOR UTILITIES WITH DRY WALL (PHOTO ILLUSTRATION OF IMAGE 10.3B)



IMAGE 10.6
VOID IN SIP WALL

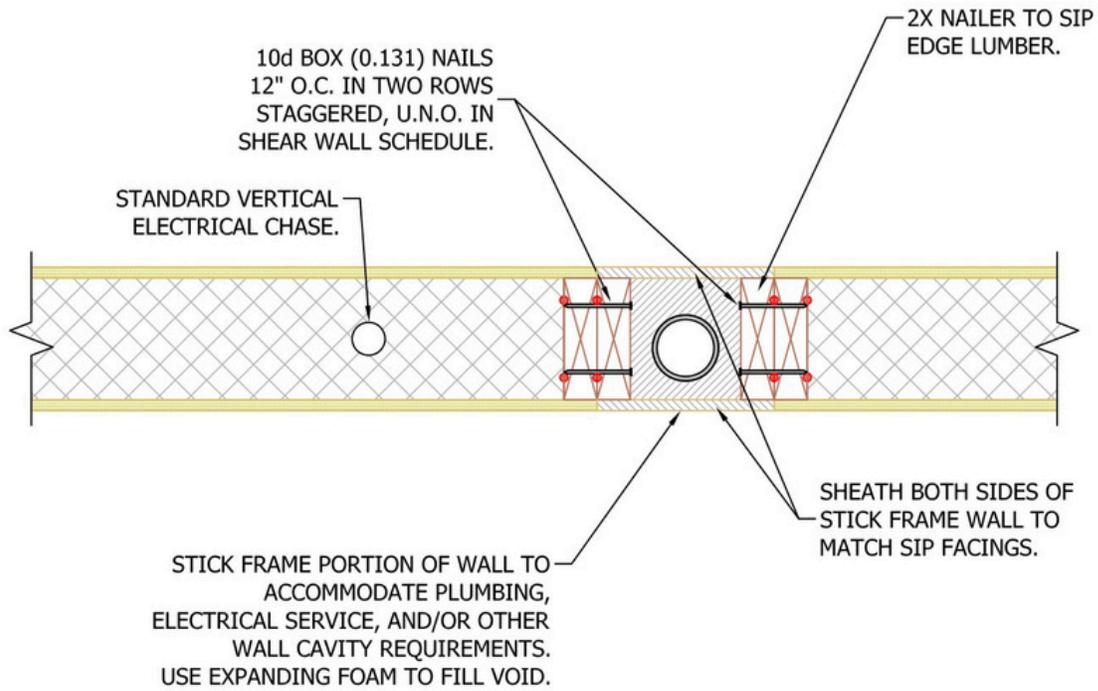


IMAGE 10.7
KITCHEN ISLAND WITH SINK



IMAGE 10.8
ISLAND FIXTURE VENT

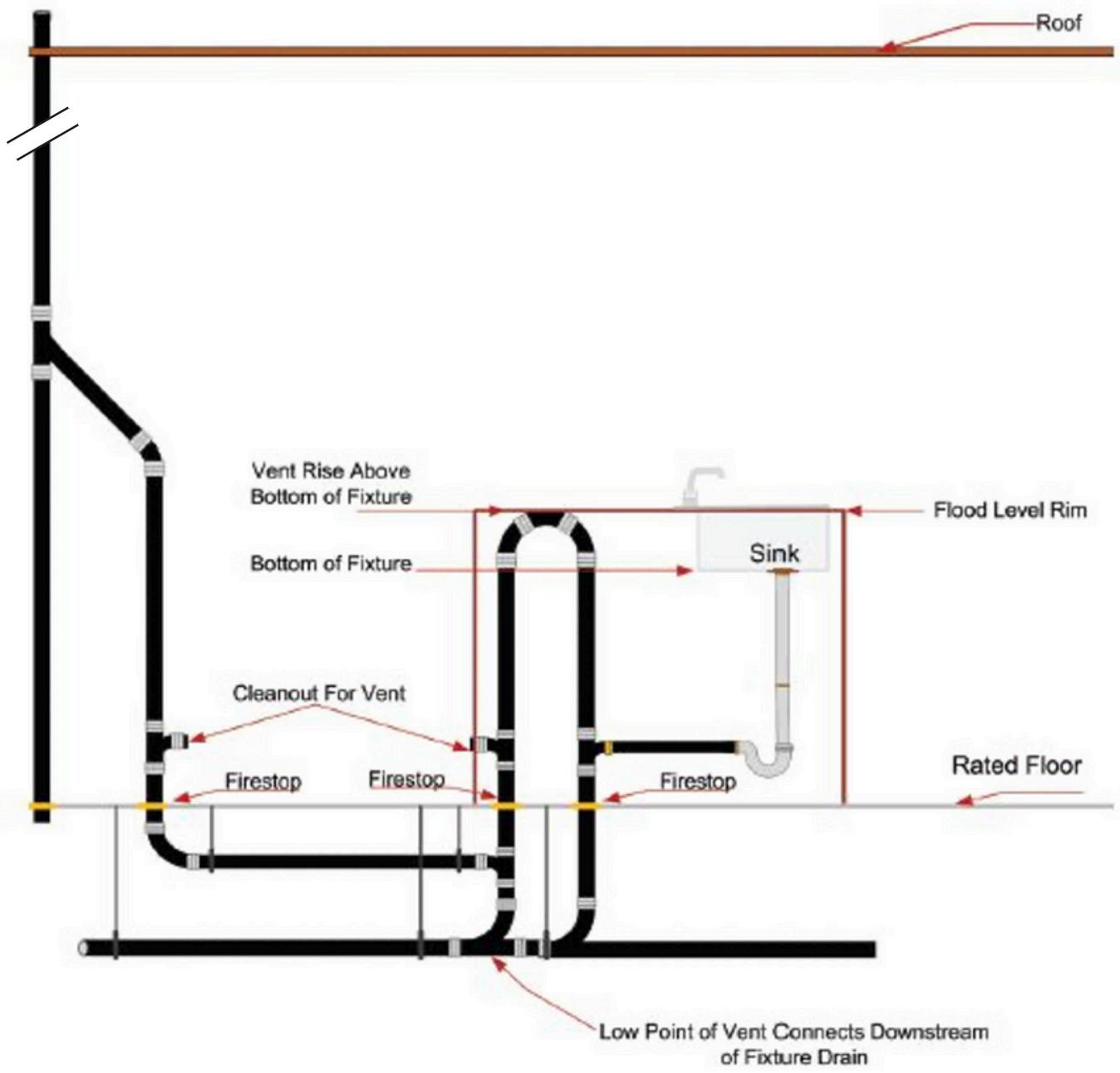


IMAGE 10.9

AIR ADMITTANCE - INDIVIDUAL VENT

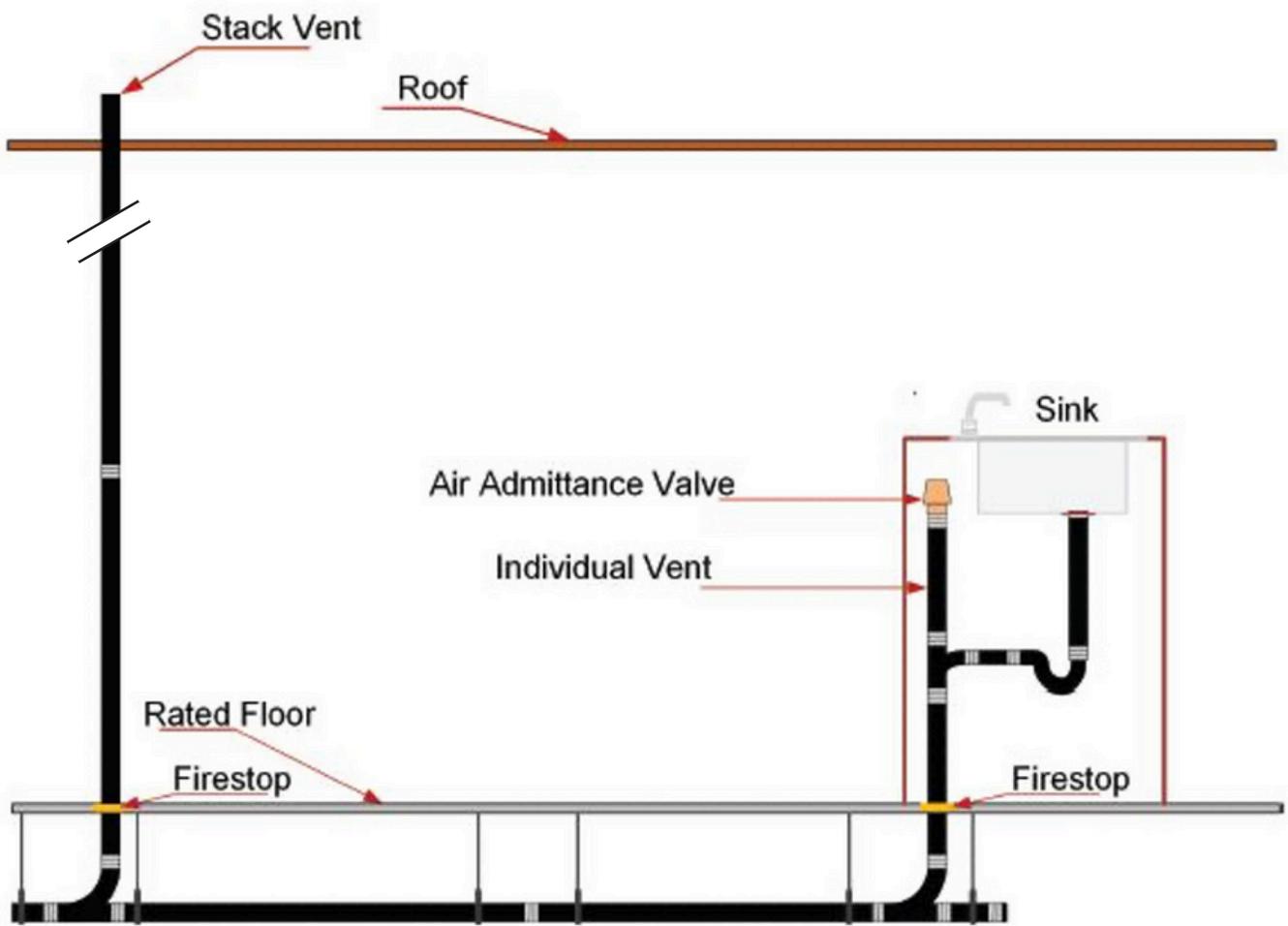
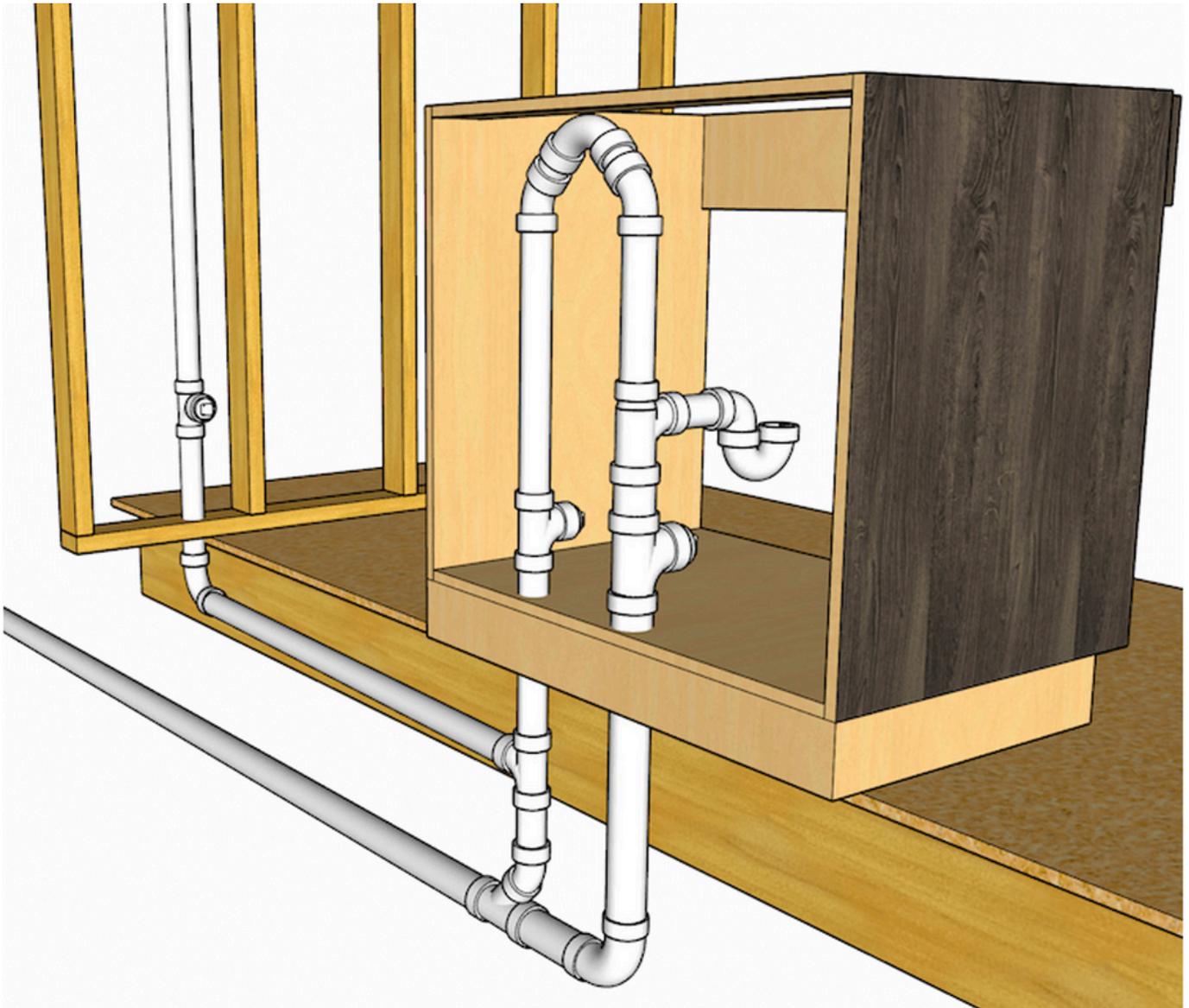


IMAGE 10.10
LOOP STYLE VENT



Note: in this drawing, the exterior wall has been removed for clarity; i.e., this does not depict a kitchen island.

IMAGE 10.11

PLUMBING SUPPLY AND DRAIN PIPING ROUGHED IN FROM FLOOR TO BE HIDDEN IN A CABINET



SIP BUILDER-BP 10.2: Minimize roof penetrations and consider consolidating all vents away from south facing roof planes for potential solar array.

Limiting penetrations through a SIP roof is advised. Penetrations lend themselves to air and moisture leakage. SIPs are considered a high-performance building system based on the airtightness created when monolithic panels are assembled with the intent of reducing joints and air movement. It is strongly recommended that no SIP penetrations are made by trades without field supervision's approval so a structural review can be done and follow-up sealing accomplished to minimize moisture and air leakage at the new penetrations.

Every effort should be made to avoid disturbing a properly sealed SIP joint, which has already been field assembled to limit movement of air and moisture. If it is necessary to modify a roof panel in any way, it is important to avoid compromising structural elements such as I-joists or double lumber supports. Be sure to reference SIP shop drawings (see [SIP DESIGN-BP 5 SIP Shop Drawings](#)) to determine which joints are structural in nature.

Key considerations when penetrations are necessary in a SIP roof:

- 1) Limit openings to as small a diameter as possible.
- 2) Always apply a high-expanding foam around the perimeter of a vent pipe, where it exits the SIP. Include this note in plans (see Image 10.12).
- 3) With sustainable, zero-energy-ready design in mind, avoid running vent piping through south-facing roof planes. Whether in initial design, or added later, avoiding a south-facing roof plane will make a future solar array easier to install.
- 4) Combining vents, where feasible, will help to limit penetrations.
- 5) Avoid running plumbing through a SIP-to-SIP spline joint connection.
- 6) As is the case with any roof system, consideration should be given to avoid venting in a path created to remove water from a roof, as is the case in the eave of a dormer (see Image 10.13).

IMAGE 10.12

ROOF PENETRATION

NOTE:

PROTECT SIP CORE FROM TEMPERATURES OF 160°F OR ABOVE. USE ZERO CLEARANCE INSULATING MATERIAL DESIGNED FOR HIGH TEMPS AS REQUIRED.

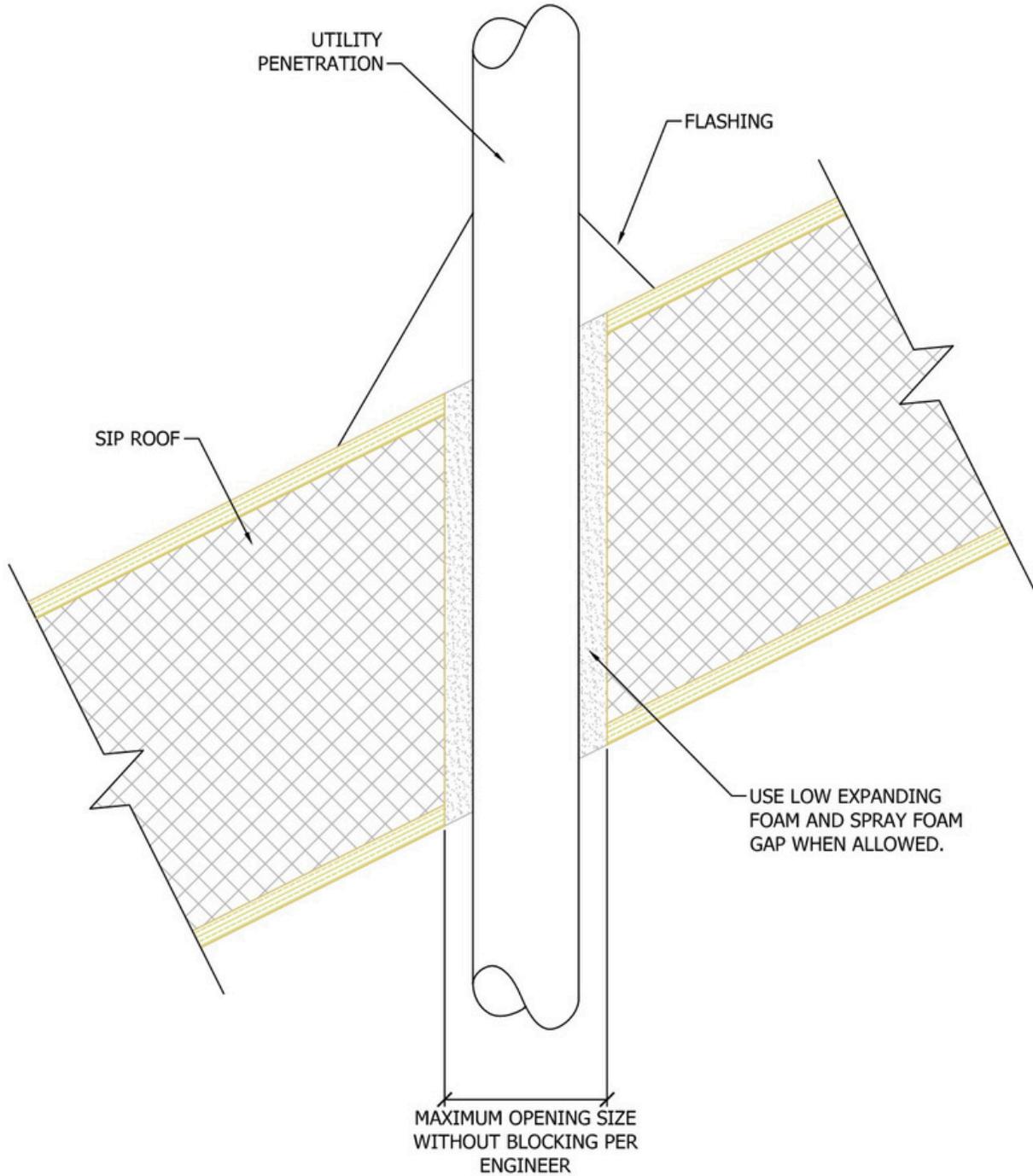


IMAGE 10.13

ROOFING PENETRATION: WHAT NOT TO DO. DO NOT LOCATE VENT PIPES BELOW THE EAVE OF A DORMER WHERE THEY CAN GET FILLED WITH WATER OR SNOW.



Glossary of Terms

Air admittance valve: See Image 10.9. Not allowed in all states.

Island vent: See Images 10.8 and 10.10. Sometimes called loop vent.

Loop vent: See Images 10.8 and 10.10. Sometimes called island vent.

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.



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.