SECTION 12:
SIP Design BP 10: Plumbing

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Structural Insulated Panel Association

SIP DESIGN-BP 10:

SIP Plumbing

This document is created specifically for design professionals 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 *Design with SIPs: DESIGN CONSIDERATIONS* overview which highlights important considerations during the design 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 design are explored here.

The index below outlines ten topical areas, listed in sequence to match the order of design considerations and construction. The details in each chapter provide a deeper understanding of the subject matter to facilitate successful SIP design and later implementation. 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
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.**

SIP DESIGN-BP 10:

SIP Plumbing

SIP DESIGN-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 climate could be at risk of freezing. Plumbing vent lines can be installed in exterior SIP walls. Coordinate with SIP manufacturer.

IMAGE 10.1
PLUMBING VENT PIPE GOING INTO SIP WALL

Facers of the SIP walls should ***never*** be field cut to accommodate plumbing runs unless the manufacturer or design professional is consulted. If piping must be placed along an exterior wall, furring out the interior is recommended (see Images 10.2 and 10.3), or place the piping in a cabinet (e.g., kitchen sink or bathroom, see image 10.4).

IMAGE 10.2

EXTERIOR SIP WALL WITH FURRED OUT STUD WALL ON INSIDE FACER FOR UTILITIES

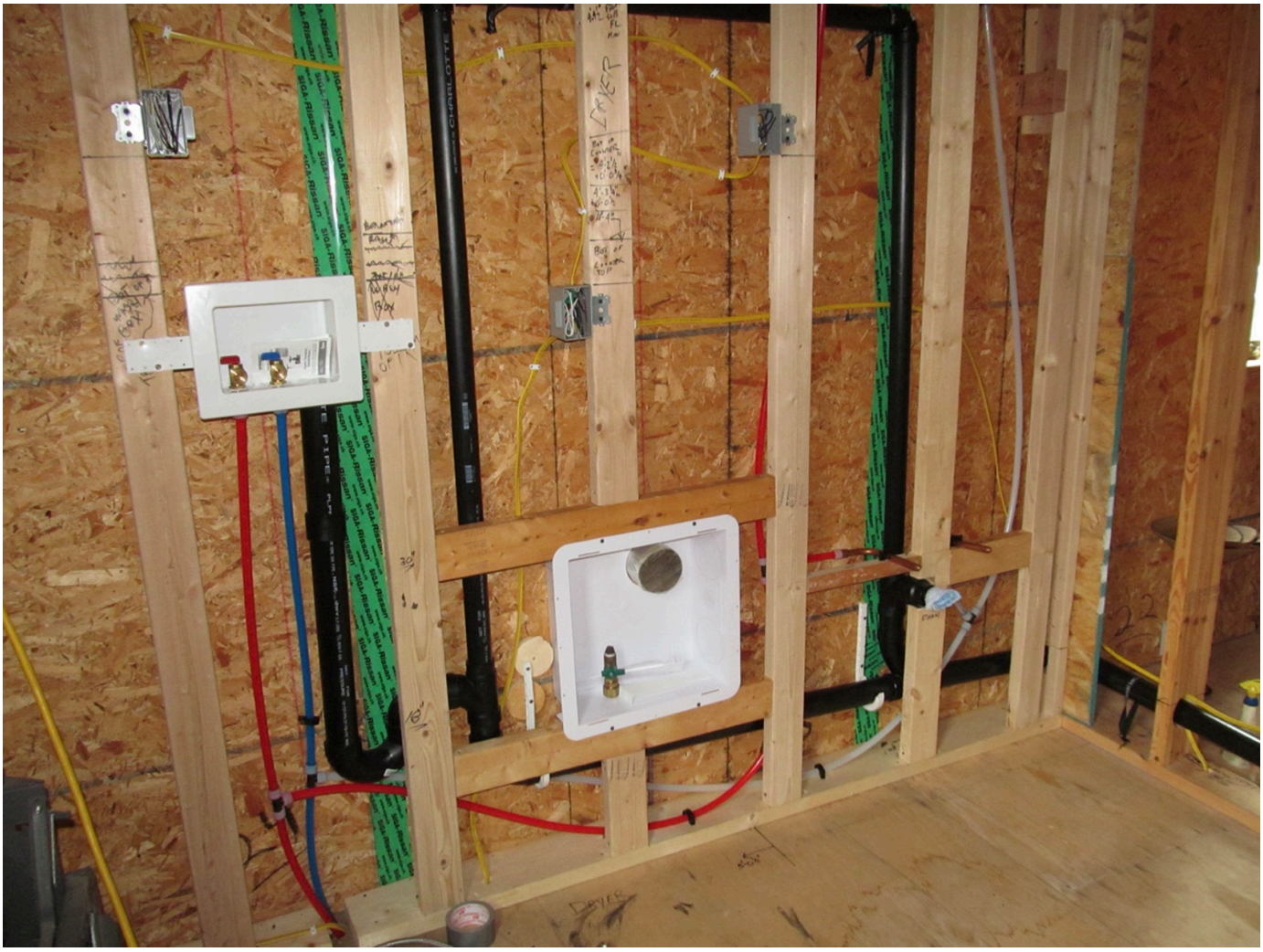


IMAGE 10.3

INTERIOR FURRED OUT STUD WALL FOR UTILITIES WITH DRY WALL

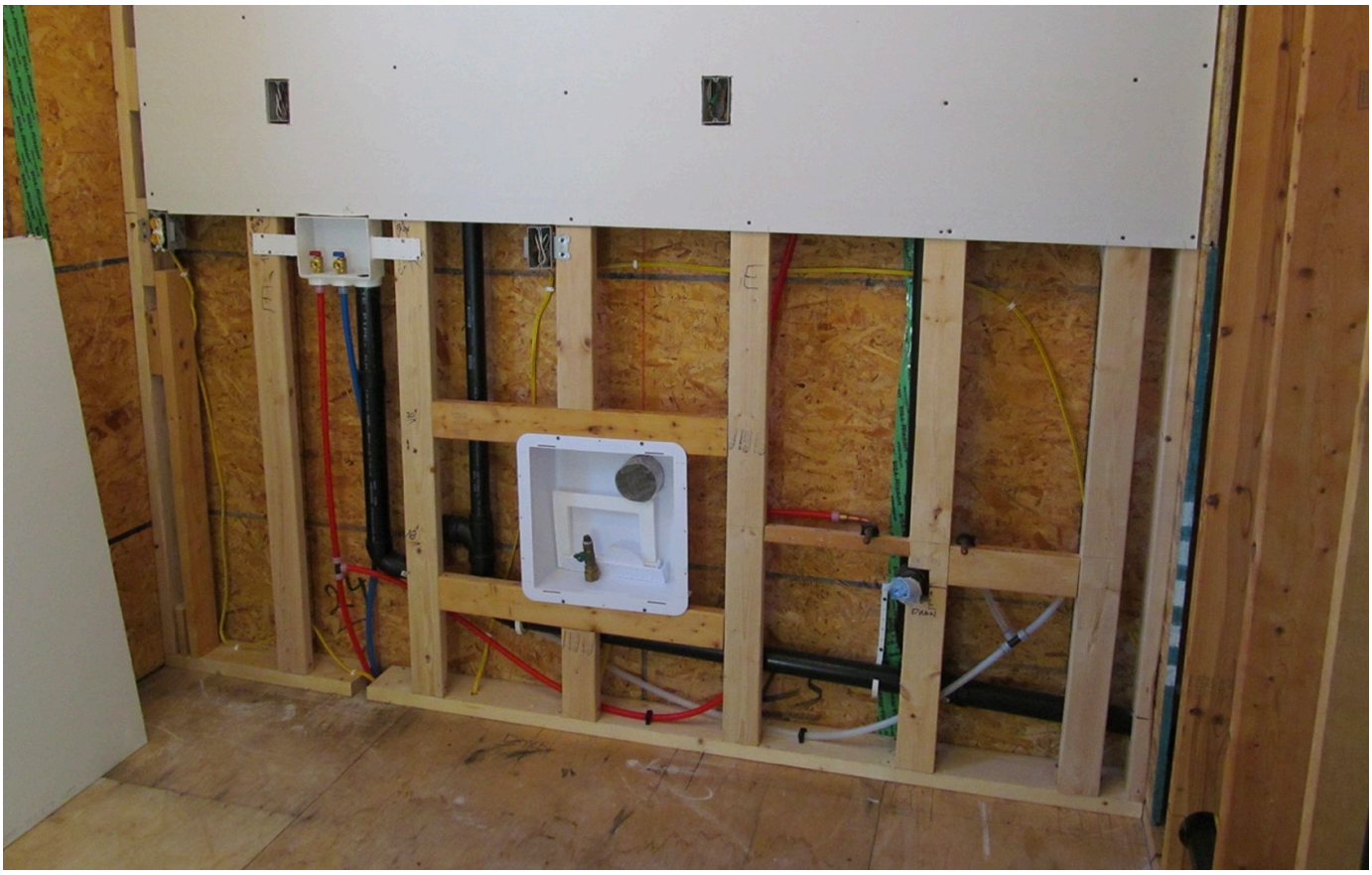


IMAGE 10.4

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

IMAGE 10.5

WHAT **NEVER** TO DO: CUTTING OF INTERIOR SIP FACER FOR ELECTRICAL OR PLUMBING

IMAGE 10.5.1

EXPANDED VIEW OF IMAGE 10.5

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.

IMAGE 10.6

KITCHEN ISLAND WITH SINK

IMAGE 10.7

ISLAND FIXTURE VENT

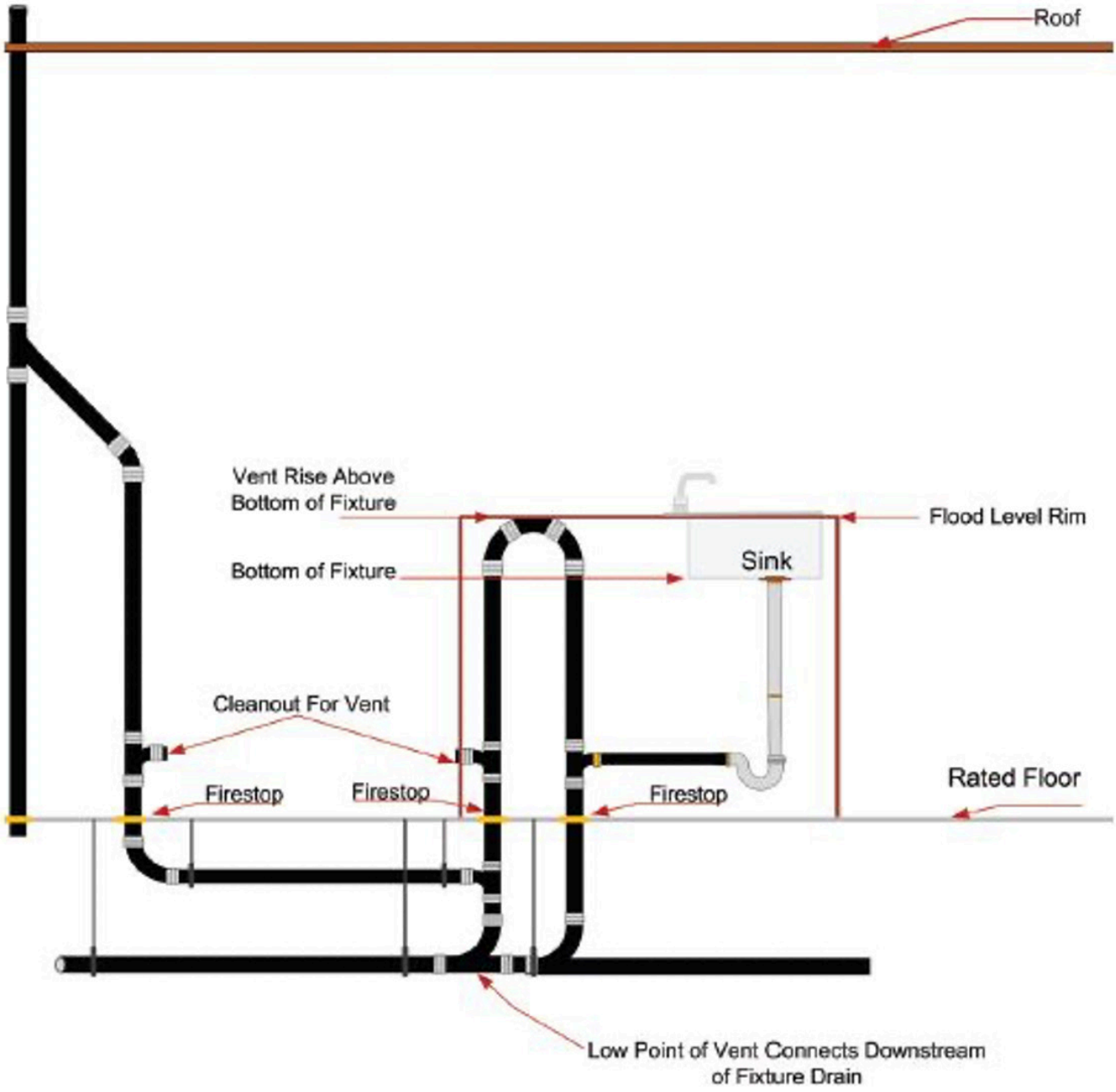


IMAGE 10.8

AIR ADMITTANCE – INDIVIDUAL VENT

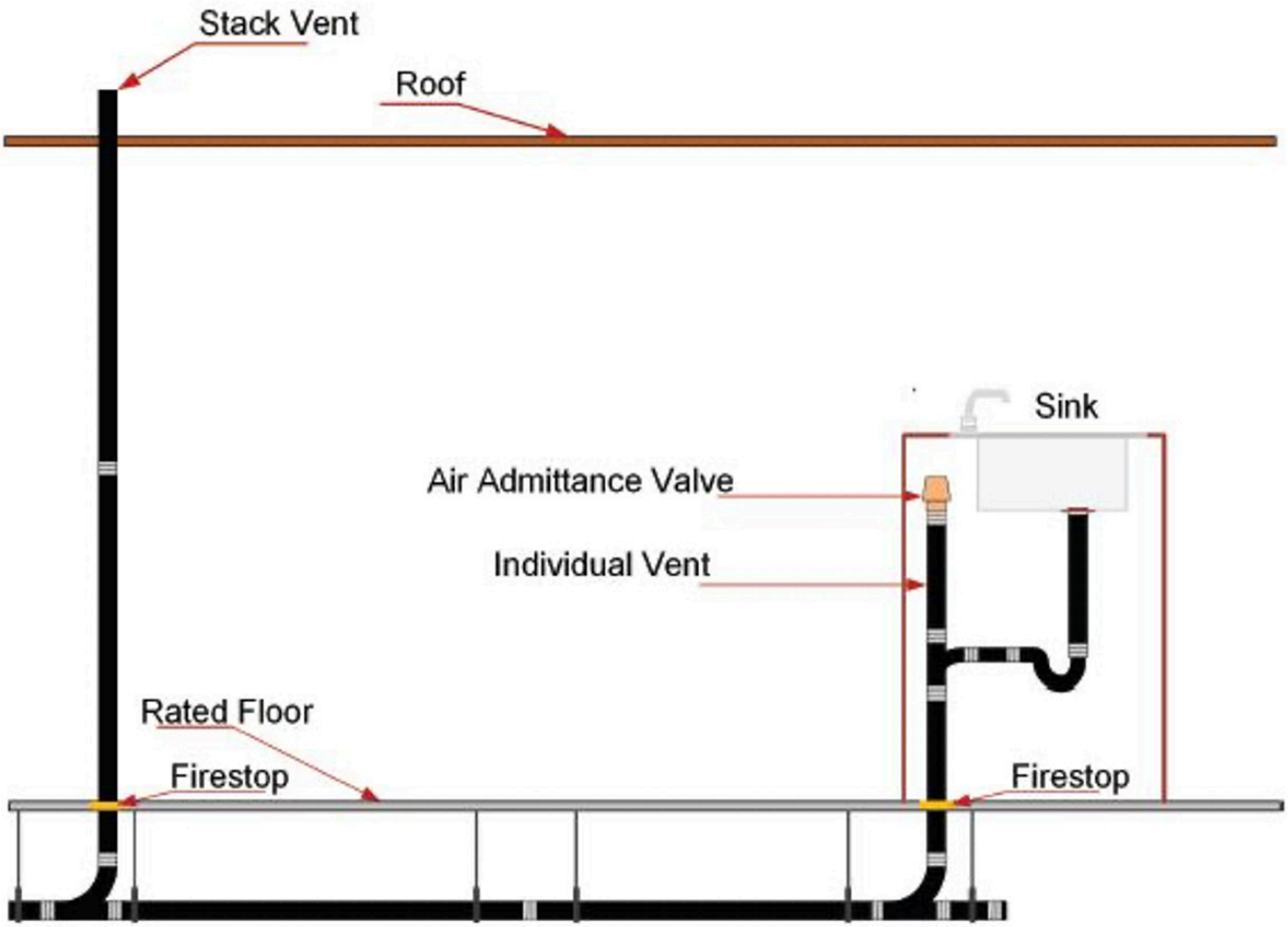
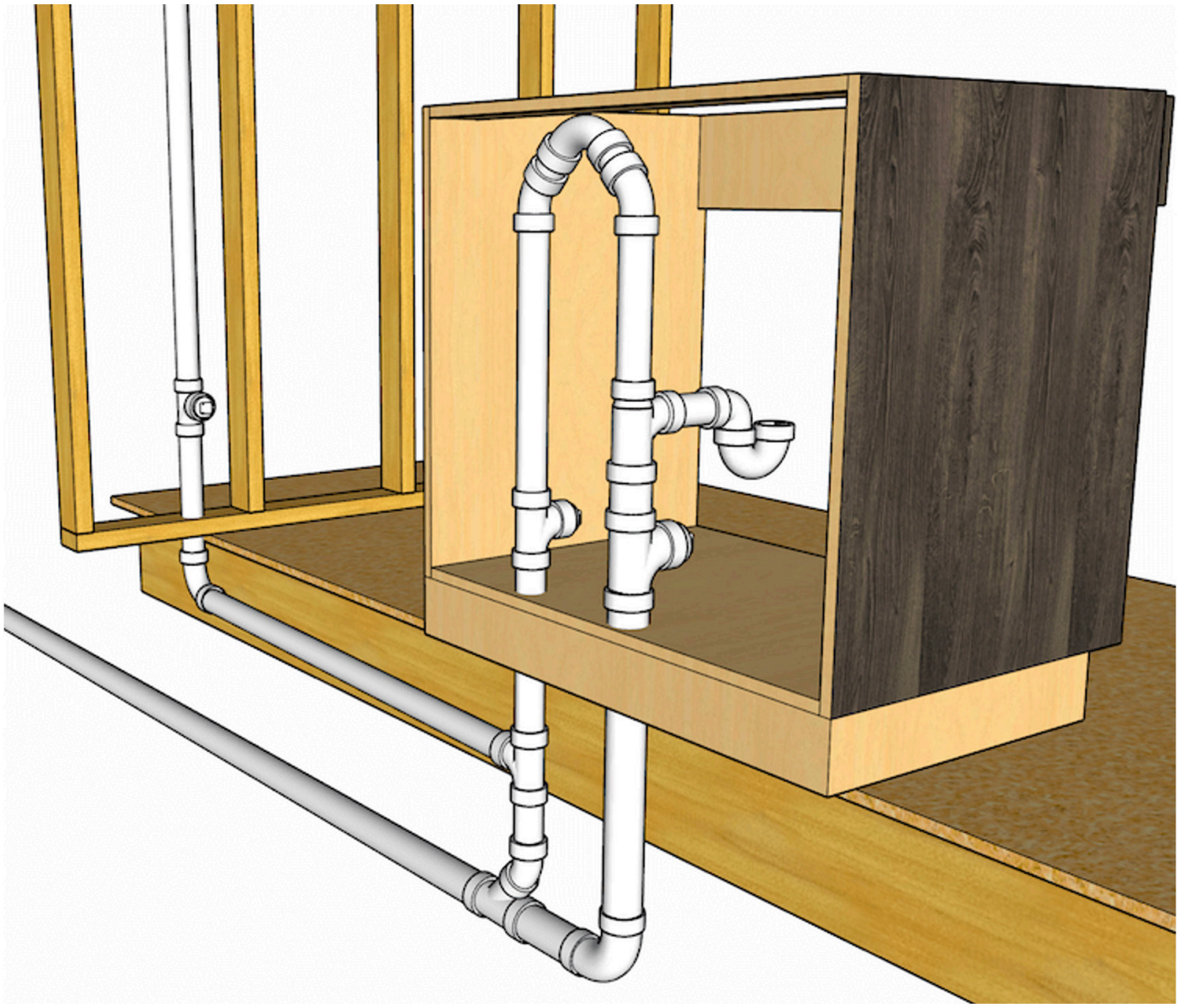


IMAGE 10.9

LOOP STYLE VENT



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

SIP DESIGN-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 material based on the airtightness created when monolithic panels are assembled with the intent of reducing joints and air movement.

Even though vent penetrations are site cut, it is recommended to notate these on the shop drawings. This will help to ensure penetration cuts do not coincide with panel connections. 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.

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.
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 10.10).

IMAGE 10.10
WHAT NOT TO DO: VENTING BELOW THE EAVE OF A DORMER

IMAGE 10.11
WHAT NOT TO DO: CUTTING INTO A SIP TO RUN PIPING

Glossary of Terms

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.

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