Structural Insulated Panel Envelope Inspection

RESNET

Orlando 2013

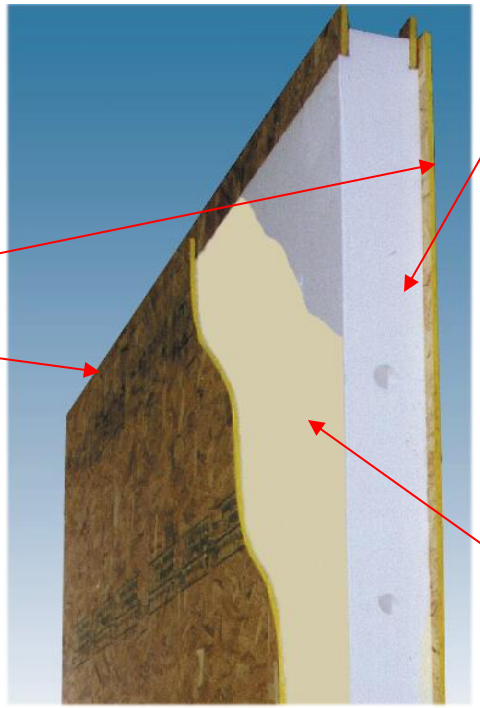
Content

- History
- Types of Panels
- Standard Details
- Mechanical systems
- Leaks & Failures
- Retrofit Panels
- Installation and Training

History of SIPs

Forest Product Labs-1935
Alden B. Dow – 1950
Timber Framing
SIPA- 1980
OSB Jumbo skins
CNC fabrication
Green Revolution

Anatomy of a SIP



Facings

OSB

Metal

Concrete

finish cladding

Mag Oxide

Rigid Insulation

Expanded Polystyrene (EPS) or polyurethane (PU) or Extruded polystyrene (XPS) or Wheat Straw

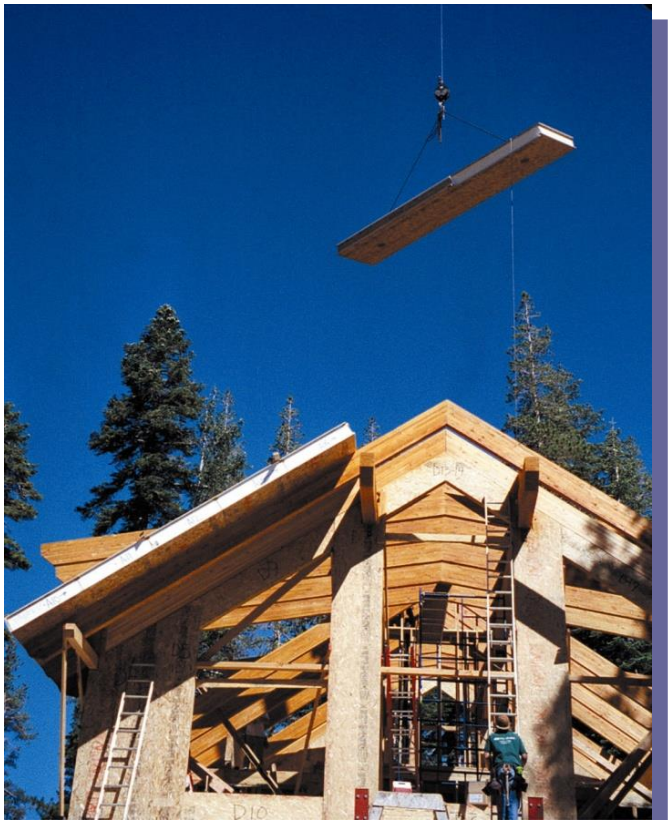
Structural Adhesive

2-part water based moisture cured Urethane Hot Melt poly-vinyl

The Envelope

Floors

Roof



Walls

Modern Manufacturing


Tyvek
STOCK

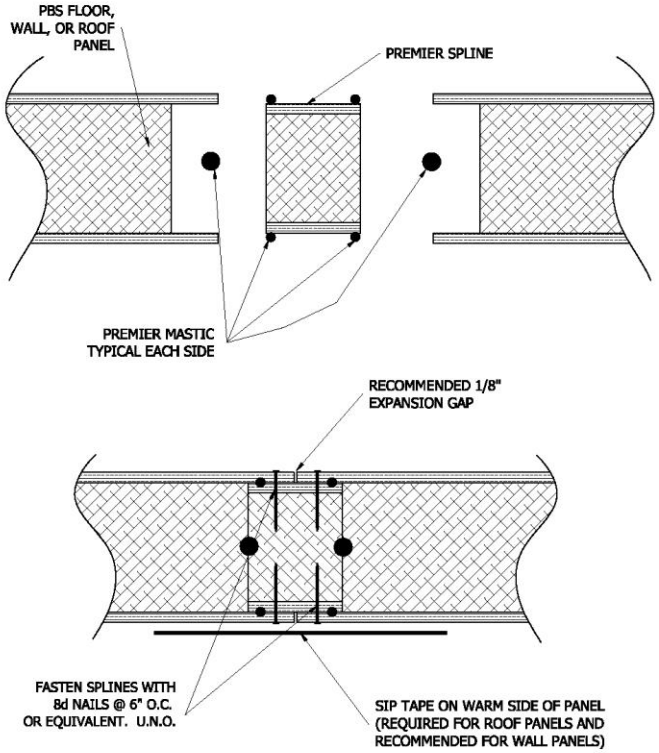

Tyvek

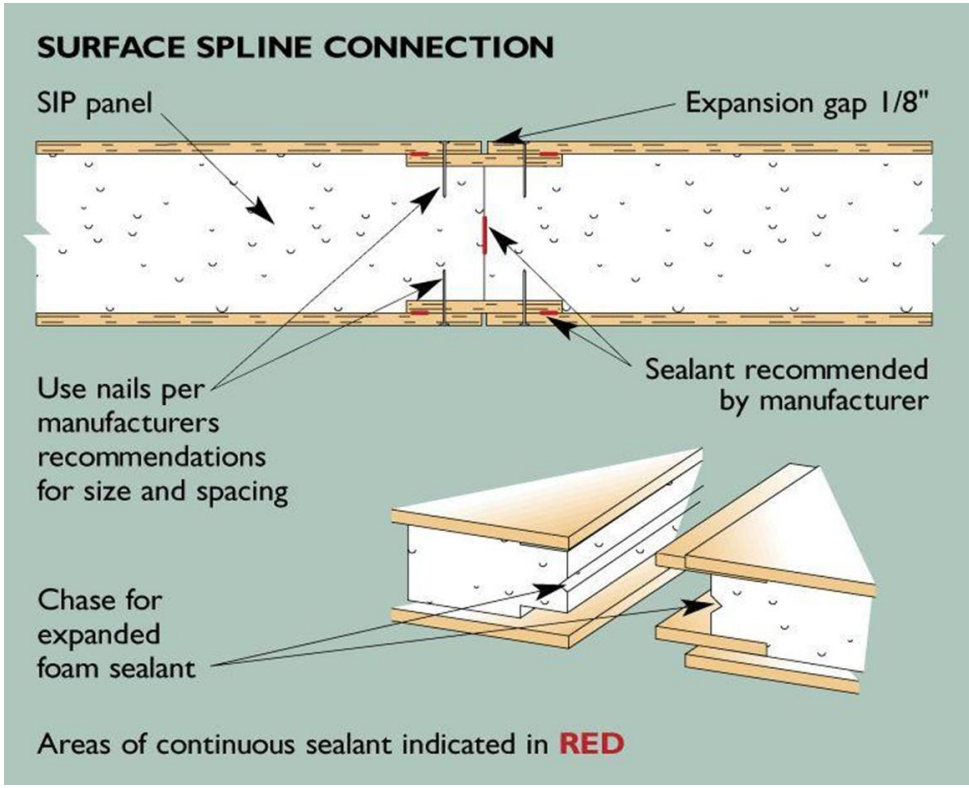
Timber Frame

EPS(Neopor) vs. XPS vs. PU

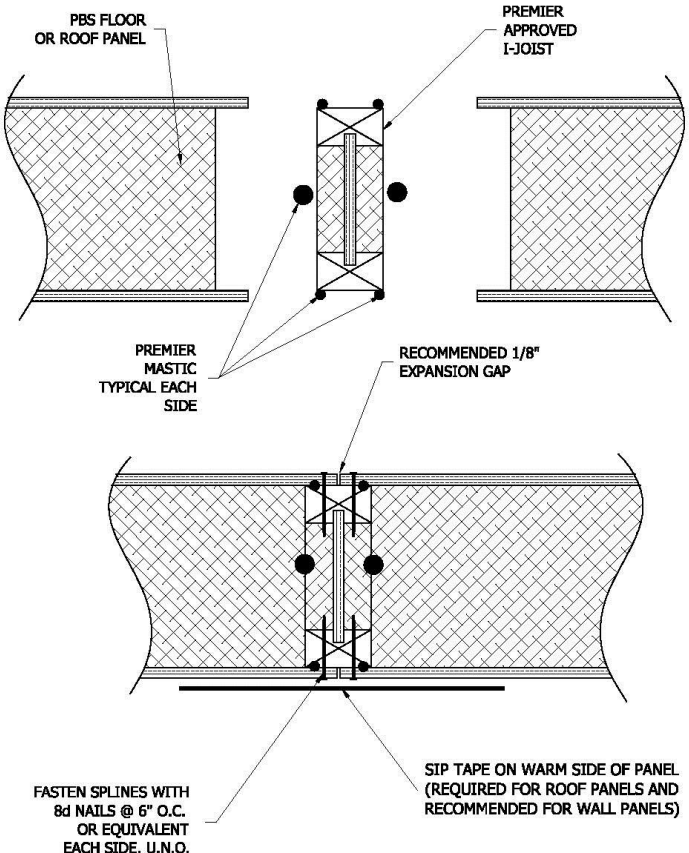
- R-Value
- Compressive Strength (Density: lb per Cu Ft)
- Perm ratings
- Available sizes and thickness

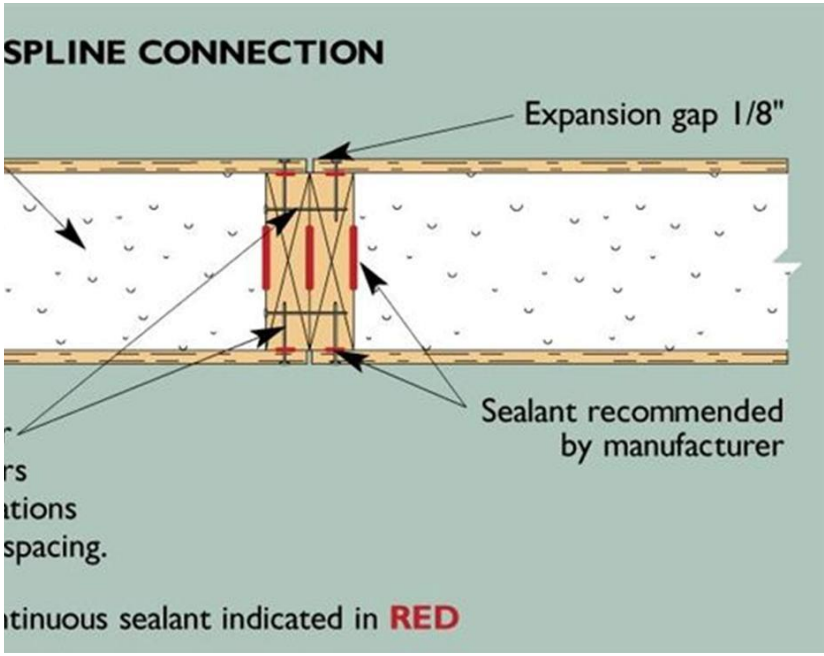
OSB/Plywood Spline Connection





Lumber/EWP Spline Connection

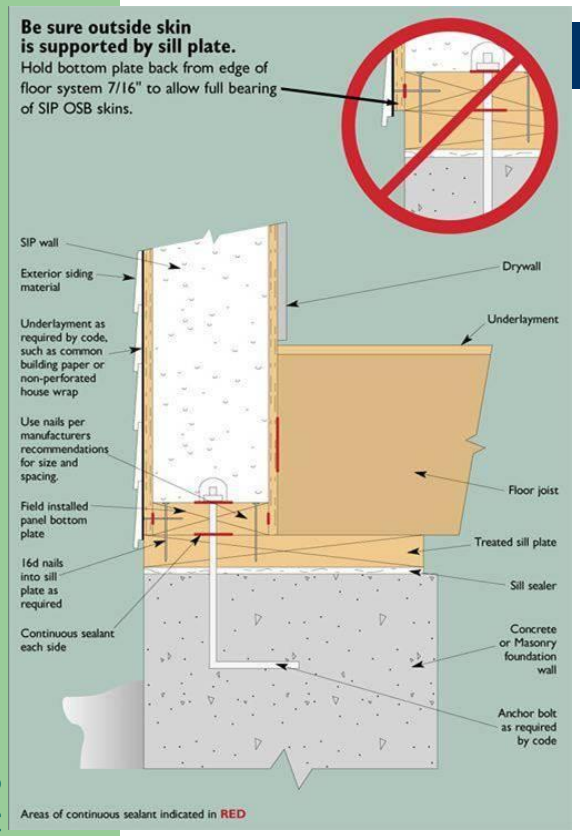


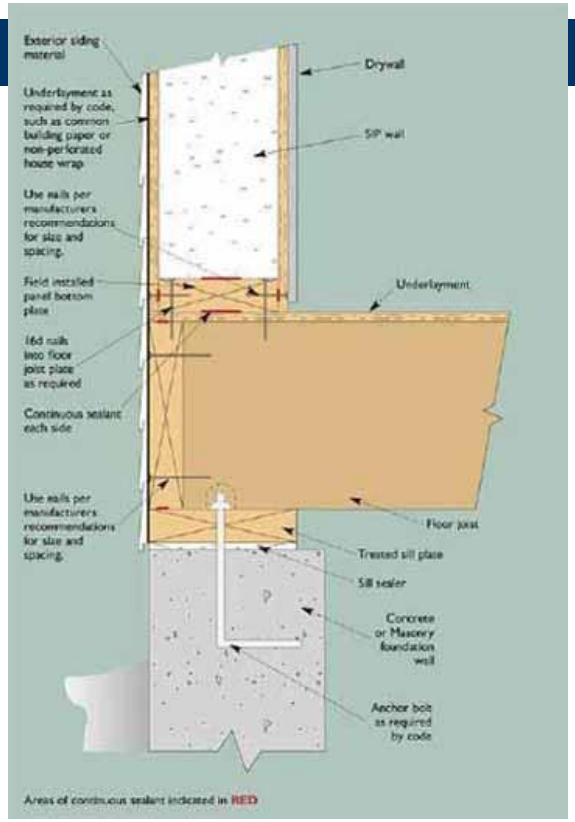


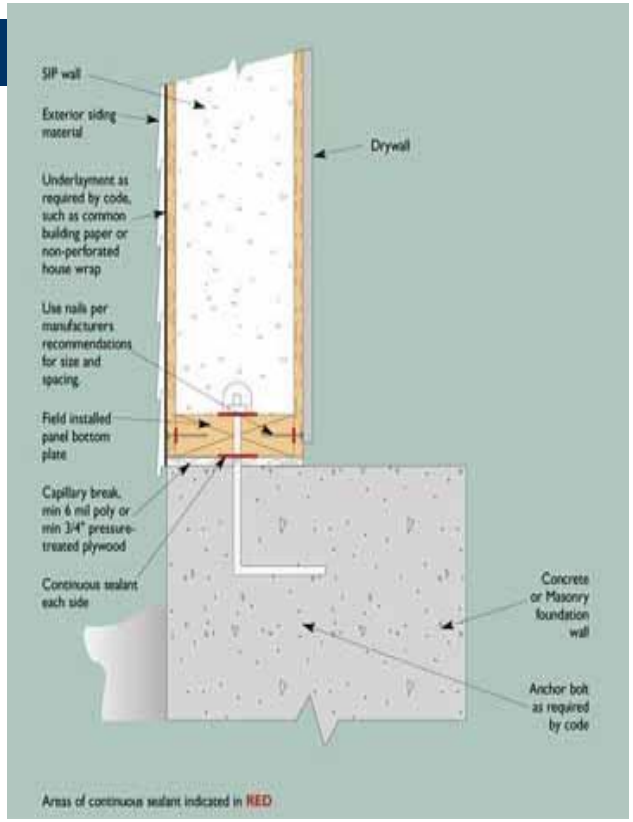
<< Parallel Heat Transfer Paths

	Wall	Framing		
Inside Air Film	0.8240	0.8240	0.0000	0.0000
Gyp board	0.4500	0.4500	0.0000	0.0000
OSB	0.5700	0.5700	0.0000	0.0000
Cavity ins/Frm	0.0000	0.0000	0.0000	0.0000
EPS Foam Core	14.0000	4.3750	0.0000	0.0000
OSB	0.5700	0.5700	0.0000	0.0000
Ext Finish	0.9400	0.9400	0.0000	0.0000
Outside Air Film	0.2760	0.2760	0.0000	0.0000
Relative Area	0.9082	0.0918	0.0000	0.0000

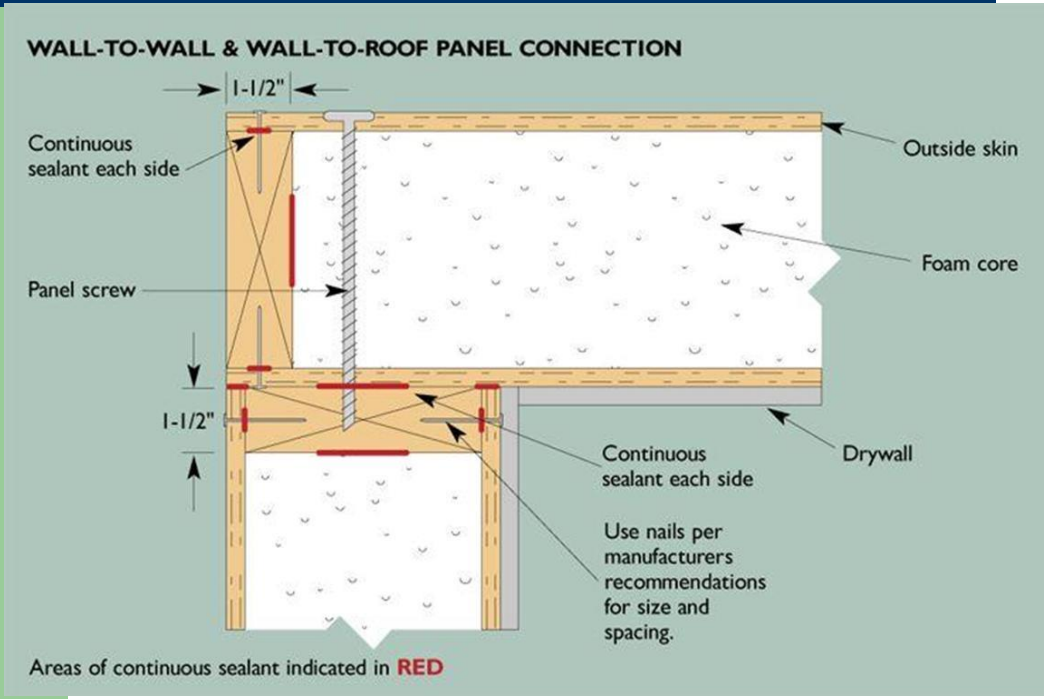
Wall to Floor Connection

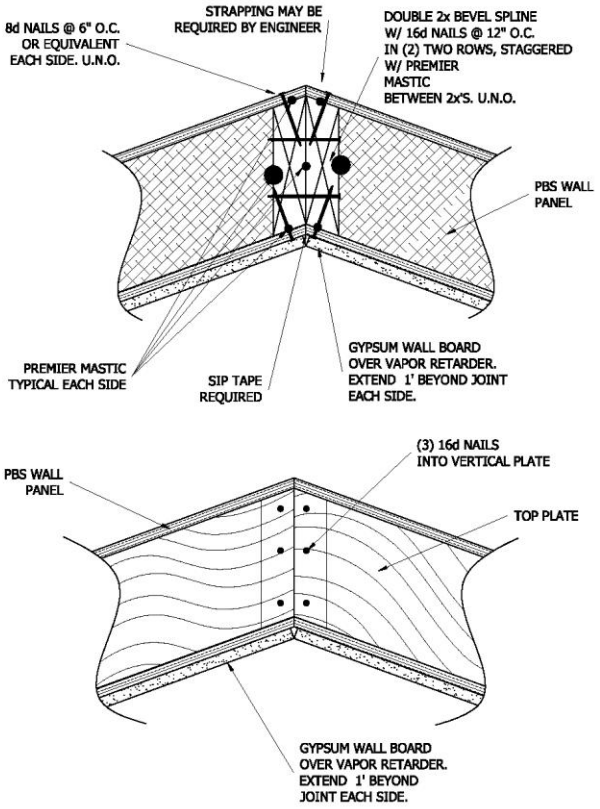




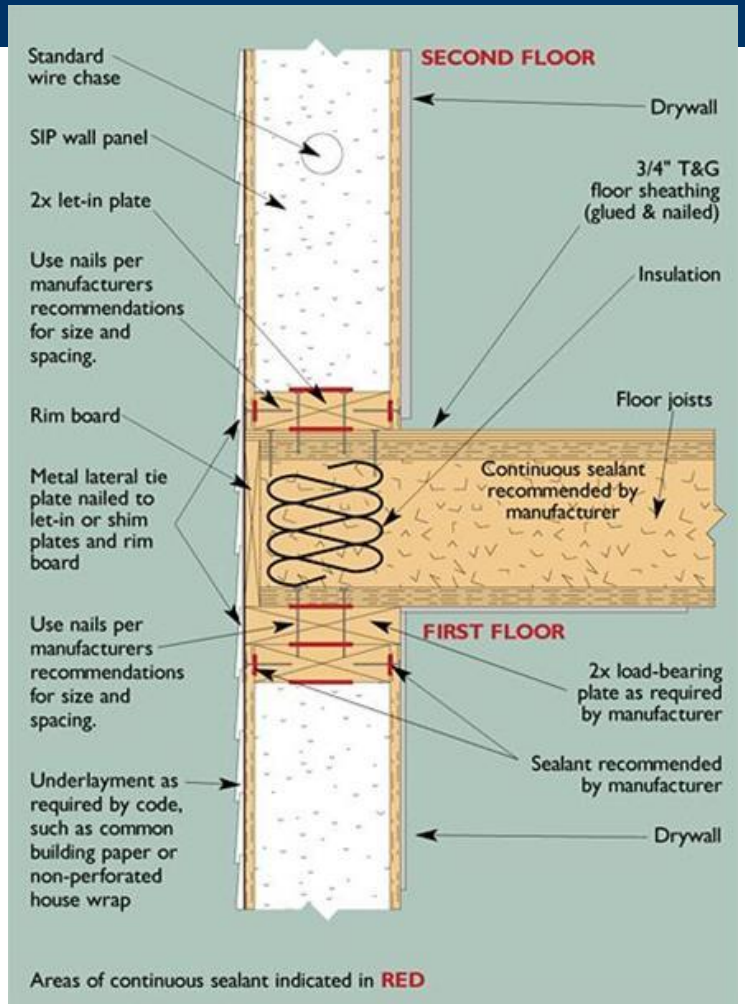


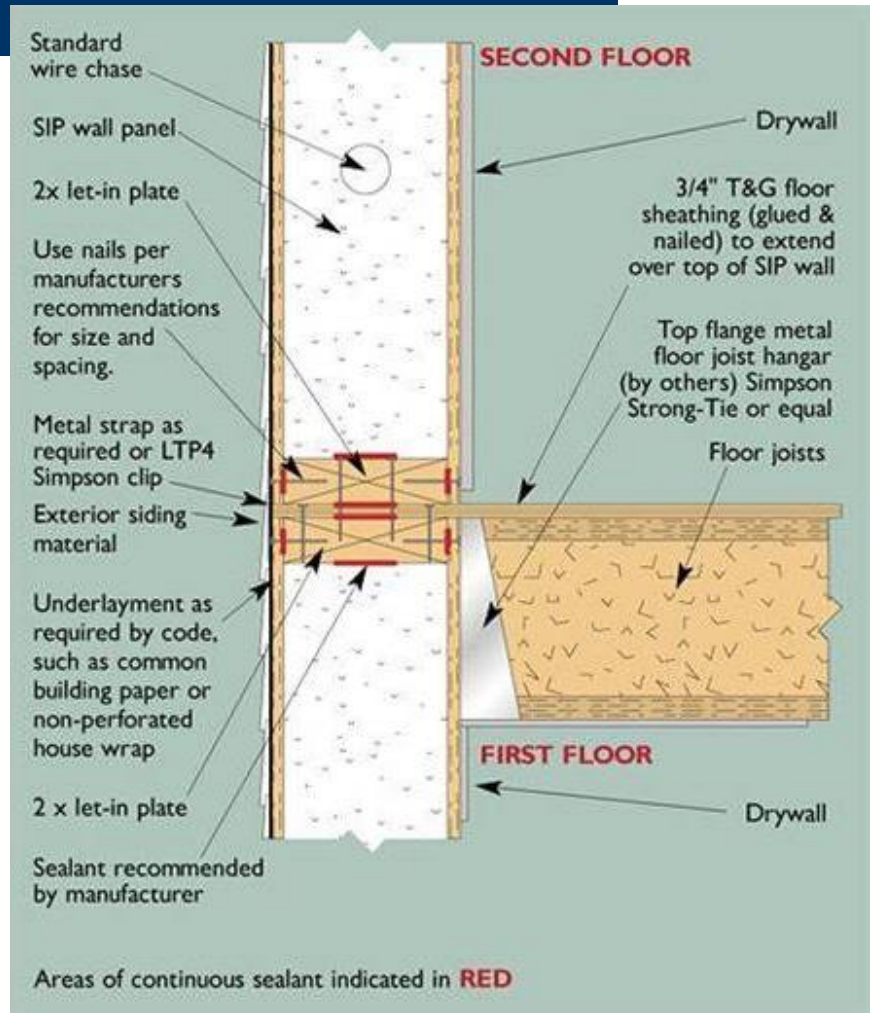
Wall Corner Connections



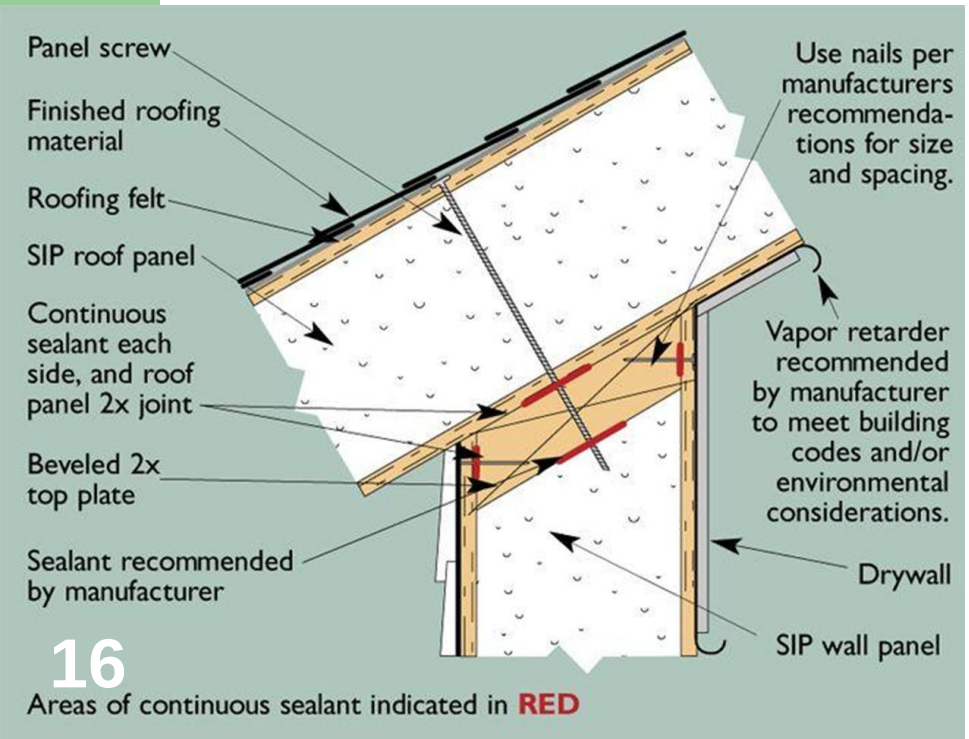


Second Floor Details

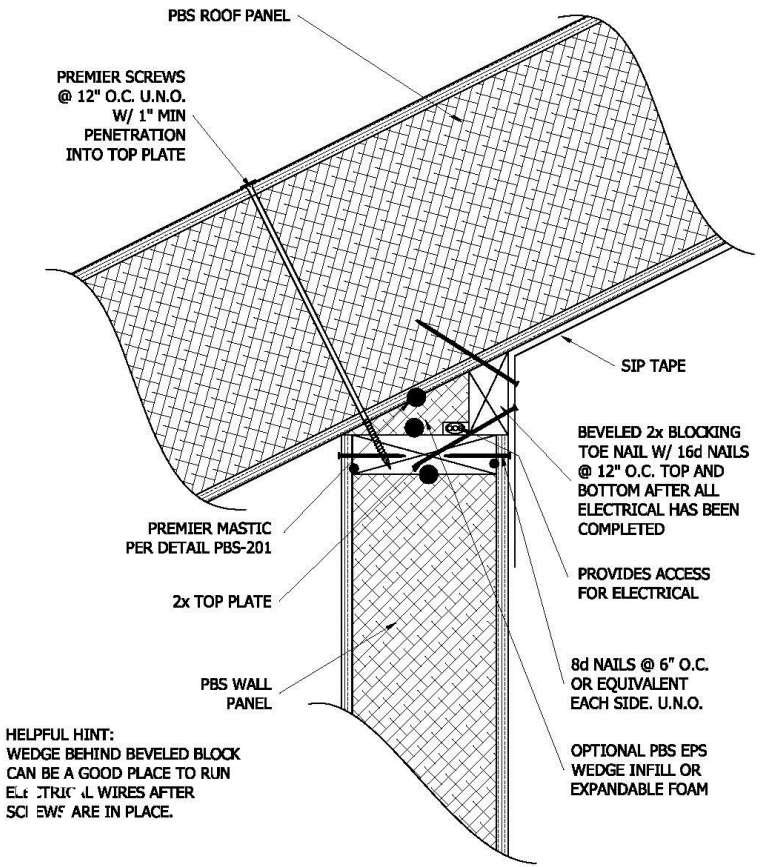


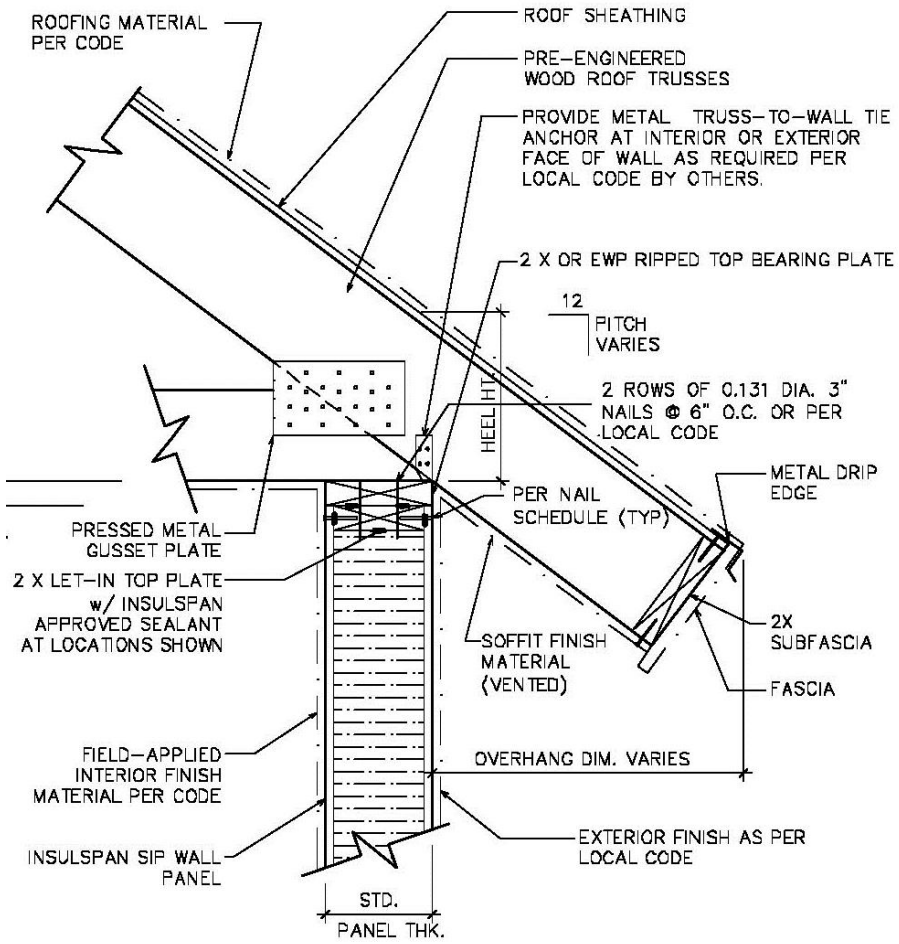


Bevel Cut Top of Wall

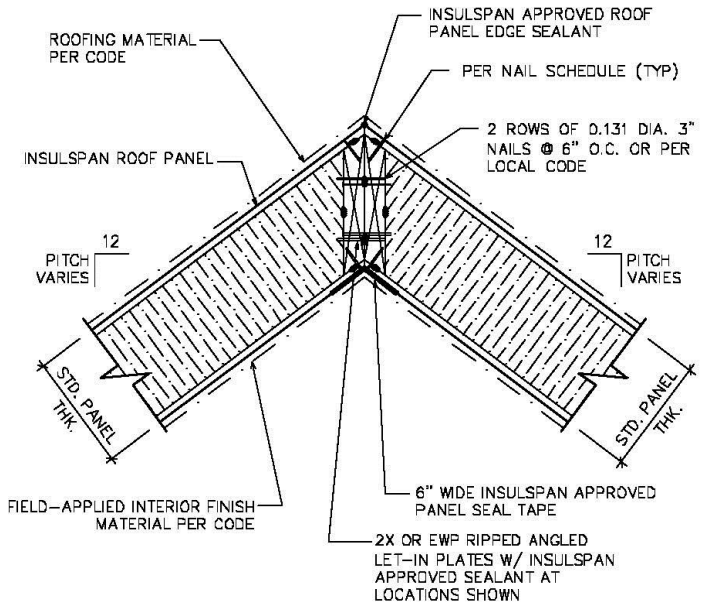


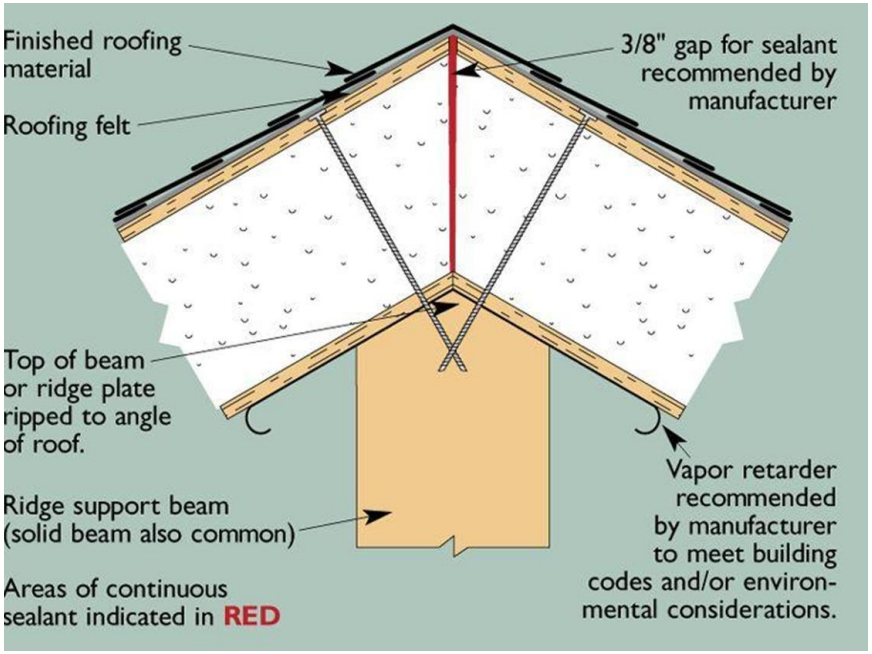
Square Cut Top of Wall



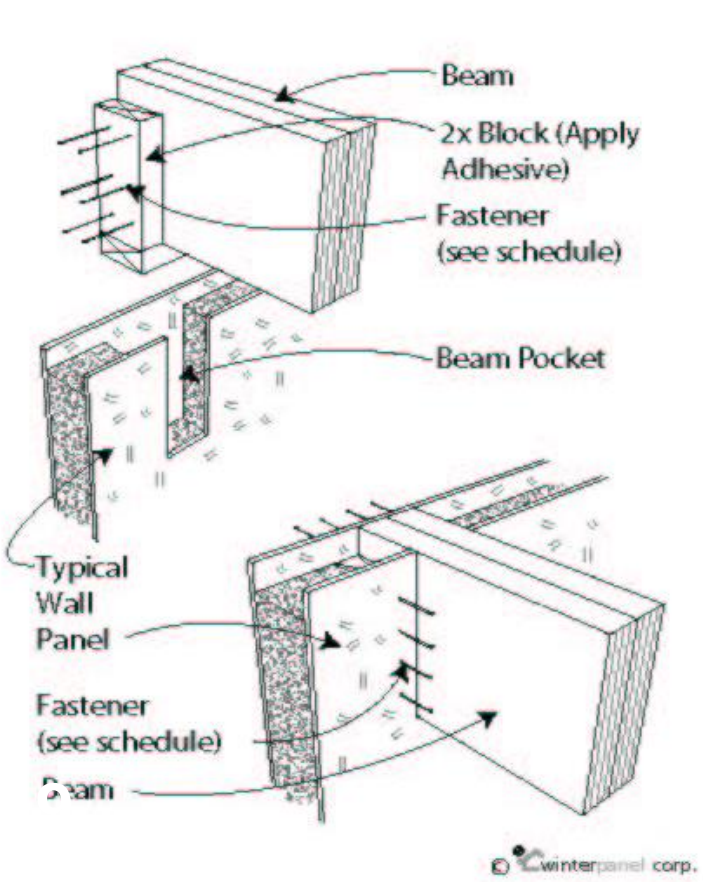


Ridge Details



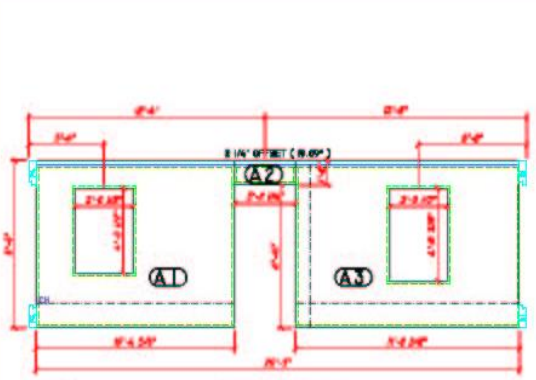


Beam Pockets – No Posts

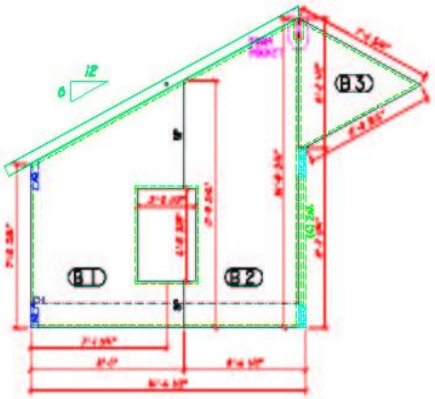


5” Wide Beam (Oak or Douglas Fir) = 1750 lbs

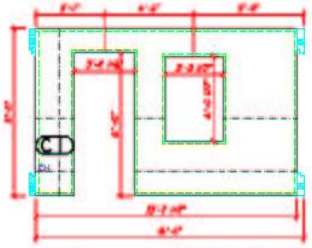
7” Wide Beam (Oak or Douglas Fir) = 2450 lbs



A P-2 PANEL GROUP A
SCALE: 3/16" = 1'-0"

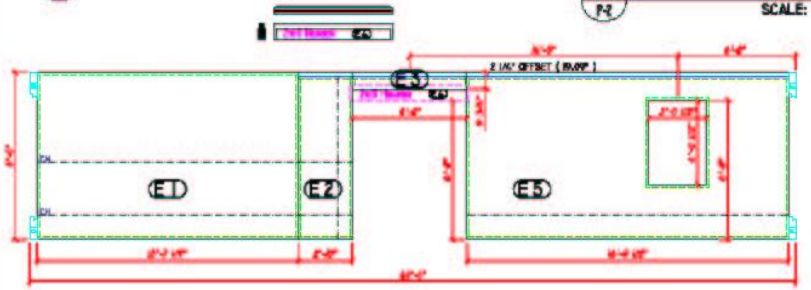


B P-2 PANEL GROUP B
SCALE: 3/16" = 1'-0"

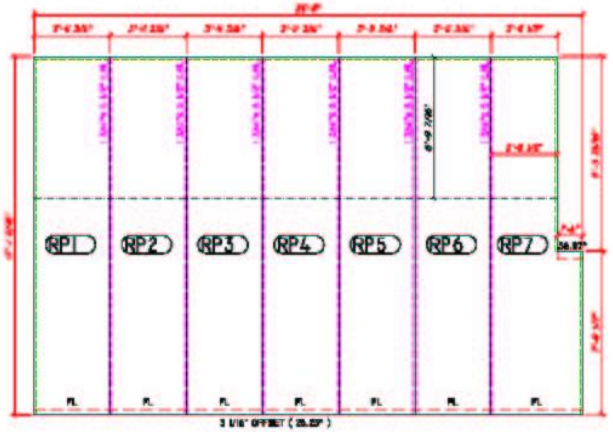


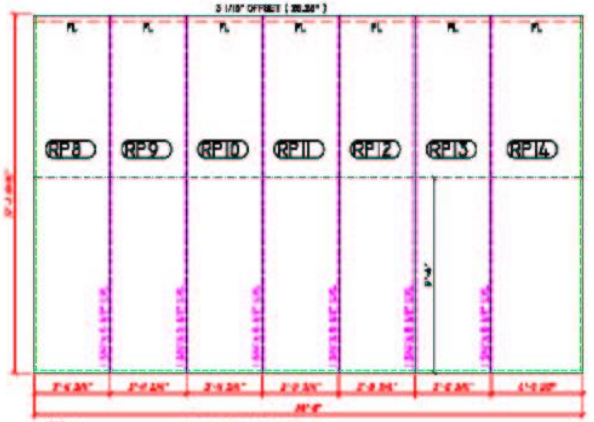
C P-2 PANEL GROUP C
SCALE: 3/16" = 1'-0"

D P-2 PANEL GROUP D
SCALE: 3/16" = 1'-0"

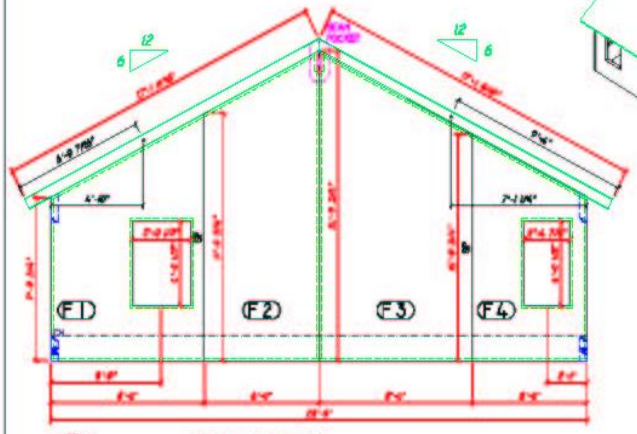


E P-2 PANEL GROUP E
SCALE: 3/16" = 1'-0"

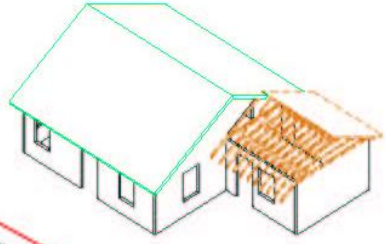


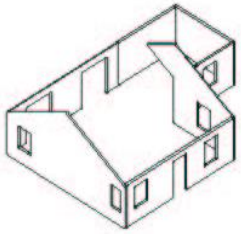


RP P-2 ROOF PANEL GROUP
SCALE: 3/16" = 1'-0"



F P-2 PANEL GROUP F
SCALE: 3/16" = 1'-0"





PANELWRIGHTS
806 FRENCH ROAD
SHENANDOAH JUNCTION, WV 25442
Phone 304-876-0262 Fax 304-876-0272
www.panelwrights.com

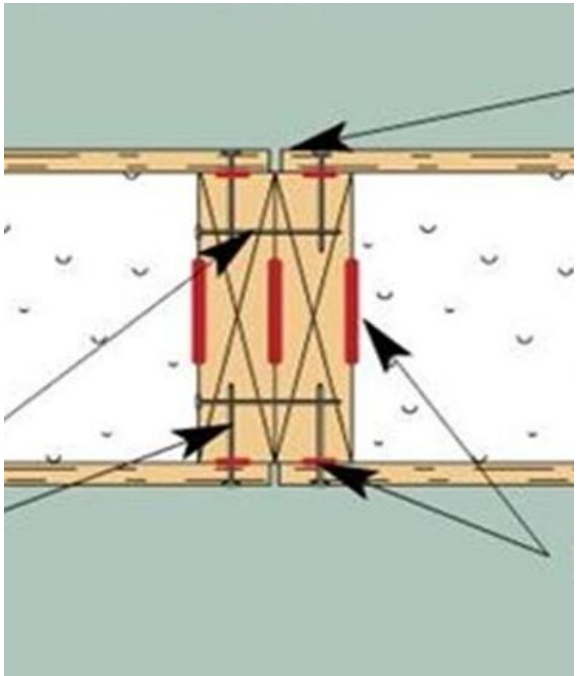
Williams Inlaw Suite
Lynch Station, VA

CONTACT PERSON: KEVIN K.
DRAWN BY: Spiller J.
ISSUE DATE: 02/09/06
02/15/06
PW JOB # 5-165
GLI JOB # 5128

P-2
SHEET

Sealing the SIP system

SIP Mastic



Sealing the SIP system

Single component and two-component expanding foams

Sealing the SIP system

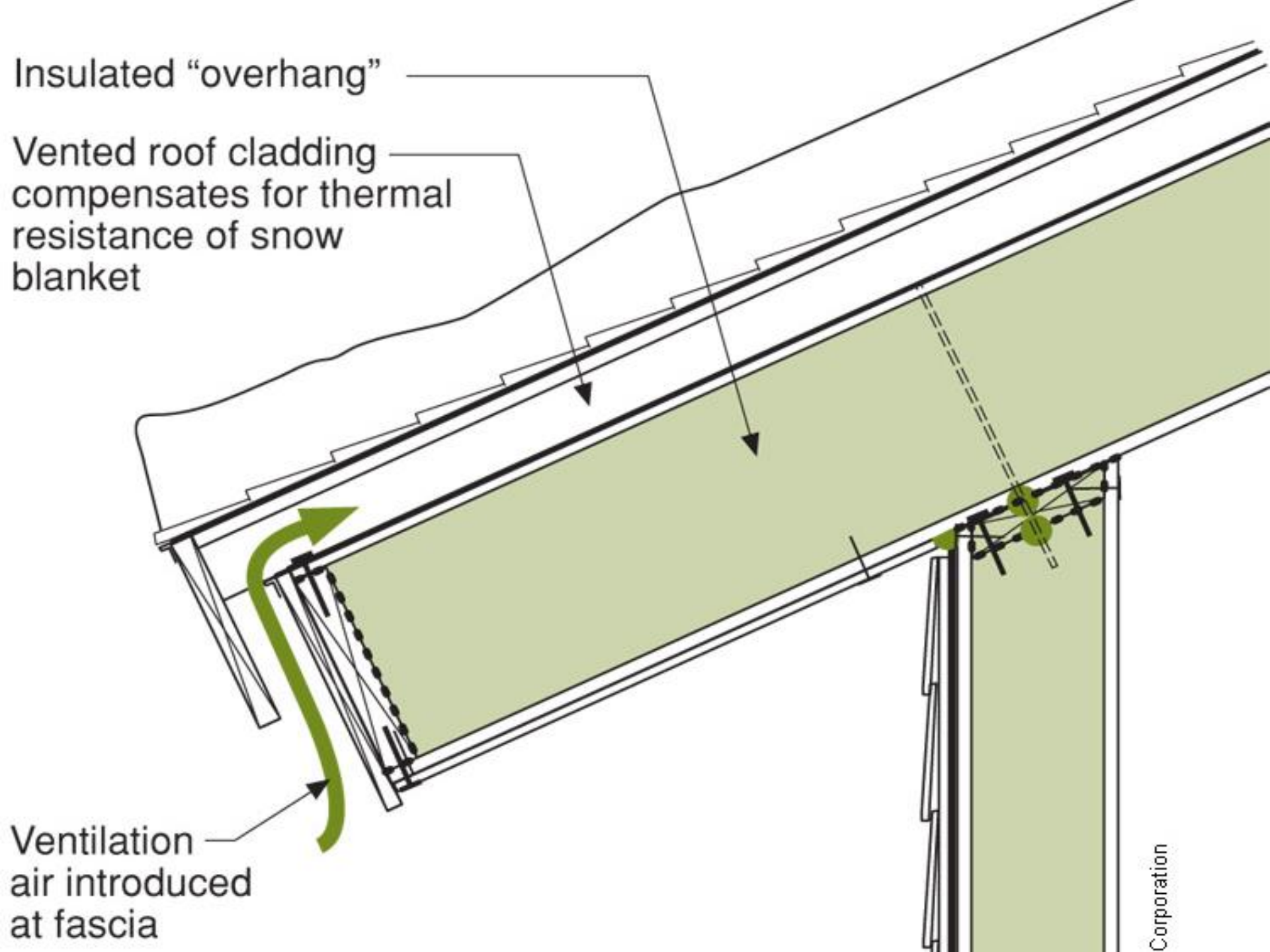
Gaskets and tape

Sealing the SIP system

SIP tape

Back-Ventilate

Increase the capacity to DRY!


Insulated “overhang”
Vented roof cladding compensates for thermal resistance of snow blanket
Ventilation air introduced at fascia
Corporation

Cold Roof VS. Dry Roof

HRV vs. ERV

Mandatory use with some manufacturers

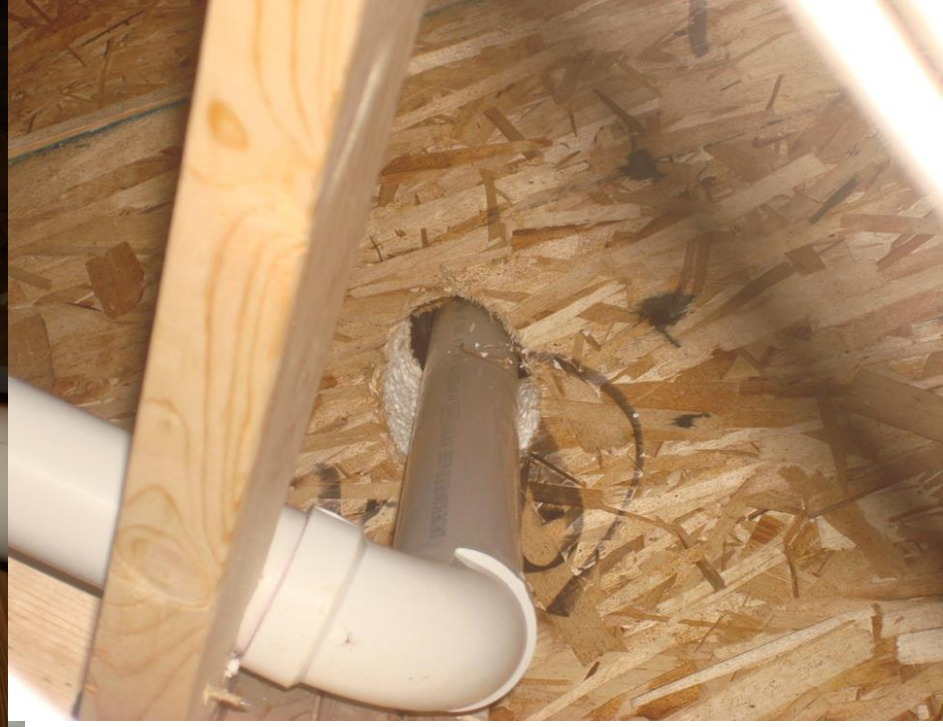
Tied to warranty

Mechanical Systems

Train the Trades!

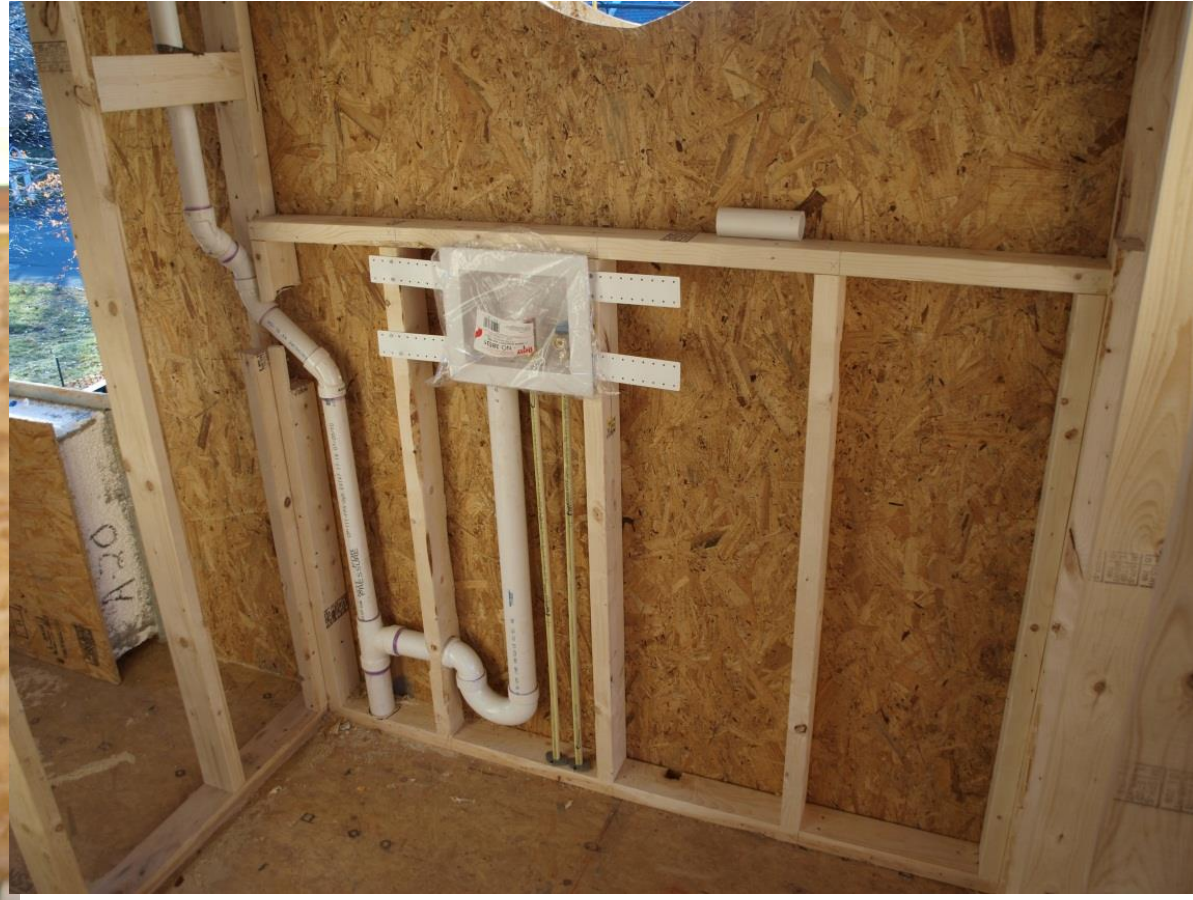
How to penetrate the envelope and how to seal it!


26 3:06PM




26 3:06PM


253-620-7
EXEMPT FRO
FORMALDEH
REGULATION
HUD
CARB
JUN
19
2010
MADE IN CANA
C-DWV PIPE IPS-SCH-40 SERIE



Planning
VS. Not

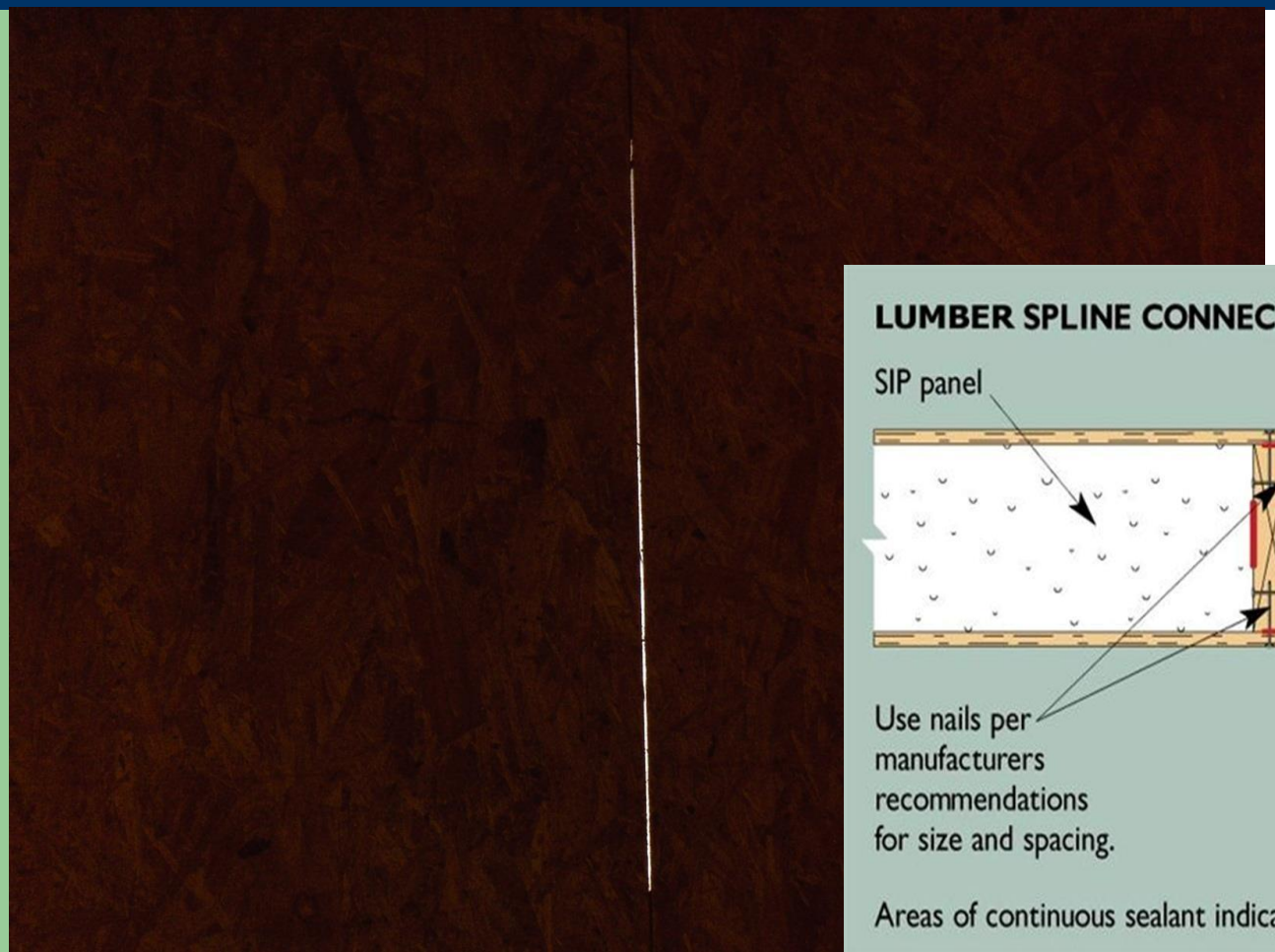
Electrical Chases

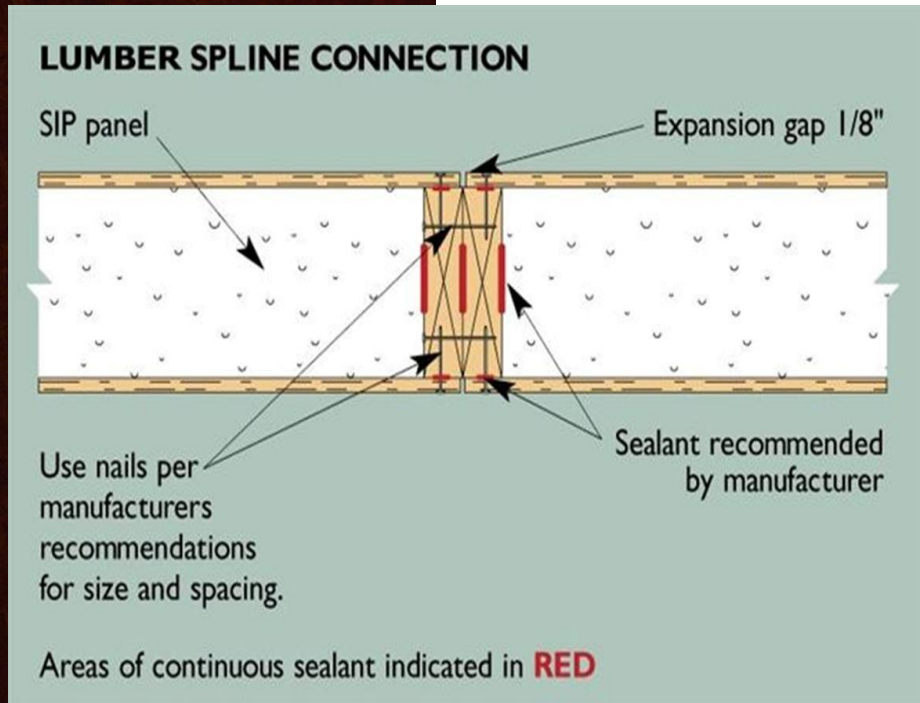
Where does the envelope leak?

- Floor system
- Windows
- Wall to roof connection
- Ridge

Expected tightness?

Sealed joint?



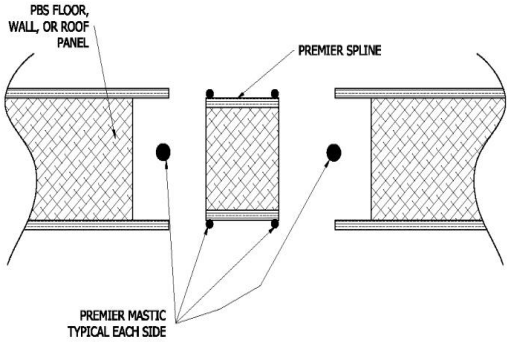


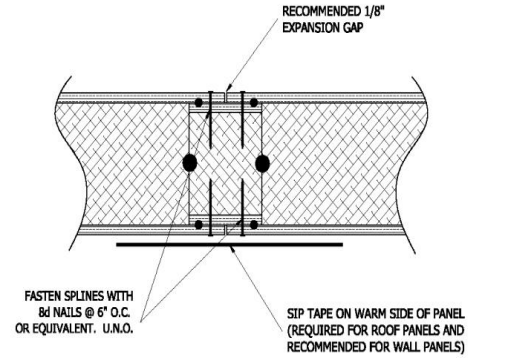
Joints

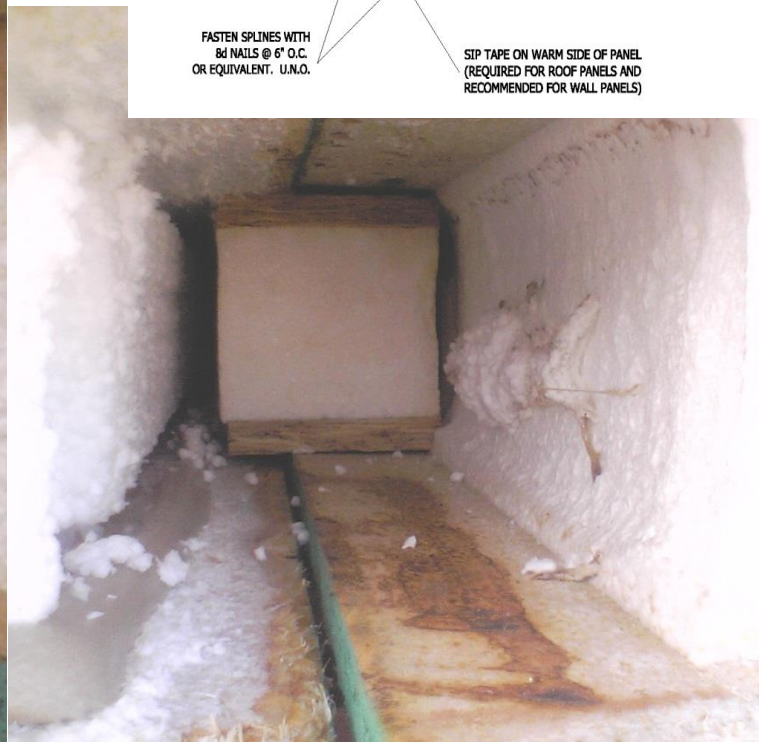
Properly sealed at panel joint

Single spline joint without any seal

Block Spline joint







Ridge Joint

Stack Effect

meet

Dew Point

Retrofit Insulated Panels


TITANIUM UDL 30
SYNTHETIC ROOFING UNDERLAYMENT
SHIELDSA

Installation

90% of SIP failures are installation specific

Specification of properly trained Installers

Not a DIY System

Builder Training

SIPA
Structural Insulated Panel Association

OR SIPschool

Registered
Builder Program

Training:

1. Classroom
2. Field
3. Demonstrated Performance
   < 2ach@50

Questions

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