The better way to build™

Installation Manual

ROOF SIPs

Thermapan
Structural
Insulated
Panels

ROOF SIPs
Installation Manual

Table of Contents

Topics

Details

ROOF SIPs
Installation Manual

1. General Requirements

1.1 Scope

The basic design and construction requirements for the Thermapan Structural Insulated Panel (SIP) roof system is set forth in this specification. Criteria for materials, environmental control, design loads, and structural design are included. Where requirements are based on internationally recognized standards and specifications, these standards and specifications are referenced without elaboration.

Installers shall reference engineering design package for fastening arrangements.

2. Materials

2.1 The Thermapan Roof SIP is composed of an expanded polystyrene (EPS) foam core laminated between two layers of oriented strand board (OSB) with a structural adhesive.

2.2 Framing Lumber shall be DOC PS 20 or NLGA No.2 or better.

2.3 Wire nails, ring nails, spikes and staples shall conform to CSA B111 or ANSI/ASME B11.1.

2.4 Wood screws shall conform to ANSI/ASME B18.6.1..

2.5 SIP screws shall conform to ICC-AC233.

2.6 Caulking Compounds shall conform to CAN/CGSB 19.13 or ASTM C 920.

2.7 Polyethylene Sheeting shall conform to CAN/CGSB-37.2, CAN/CGSB-37.16, or ASTM D 4397.

2.8 Low expansion foam seal shall conform to AAMA 812-04.

2.9 Structural adhesive shall conform to CAN/CGSB 71GP26, APA AFG-01 or ASTM D3498.

3. Electrical Wiring

3.1 An optional furring for electrical passage should be fastened to the underside of the roof SIP between the vapour barrier and the interior finish. See details R-1, R-4 and R-5.

4. Interior Finish

4.1 The interior of the roof SIP can be finished with any of the common required building code materials. It is recommended that the SIP joints and connections be sealed as per Details AB-1, AB-2 and VB-1.

5. Exterior Roofing

5.1 Consult your local building code and refer to details R-11 and R-12 for roofing applied to SIPs.

MATERIALS ESTIMATING

Roof (Vaulted Ceiling) Estimation Only

Lumber Requirements:

- Perimeter of roof or fascia length

Caulking and Sealant Requirements:

- Every 1200 sqft (111 m^2) of SIP equals 1 case of Expandable Foam
- Every 2000 sqft (185 m^2) of SIP requires 1 case of Sealant

Fasteners:

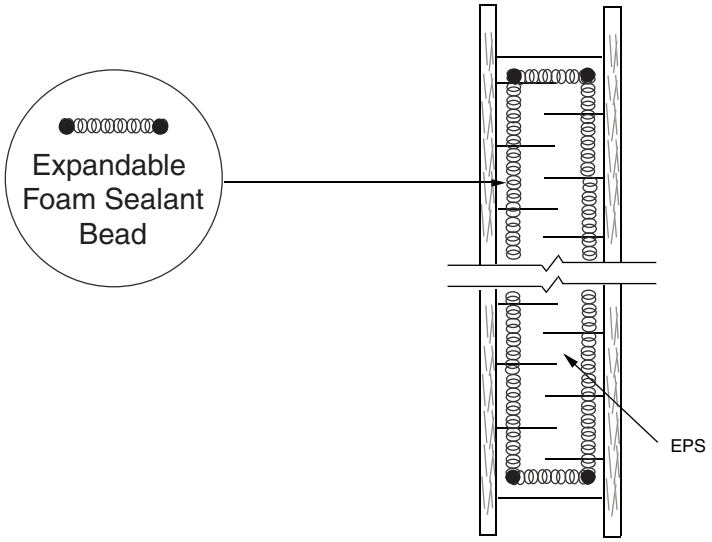
- Recommend 2" (50mm) Ring nail or 2" (50mm) screws for connection to panel
- ~ 1.25 times the square footage of SIPs... nailing of spline
- SIP screws use 40% of Roof square footage

AIR BARRIER

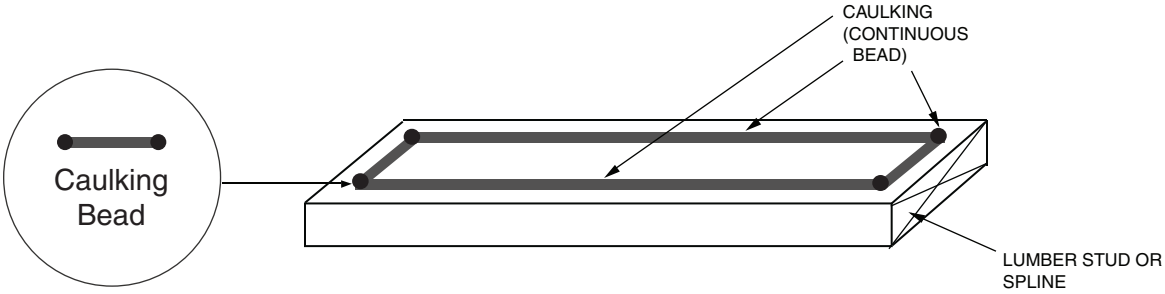
RECOMMENDED DETAILS FOR AIR BARRIER SEALANTS

All sealants, FOAM (A) or CAULKING (B), should be applied onto the SIP in a continuous rectangular pattern along the outer most edge of the area to be sealed.

(A) A low expansion EXPANDABLE FOAM SEALANT should conform to the AAMA 812-04 standard. Apply a 1/2 inch or a 12.5 mm diameter of a *continuous* bead of expandable foam sealant onto the SIP:



(B) A CAULKING SEALANT should conform to ASTM C920-02 and/or CAN/CGSB 19.13-M. Apply a 3/8 inch or a 10 mm diameter *continuous* bead of caulking onto the lumber spline:



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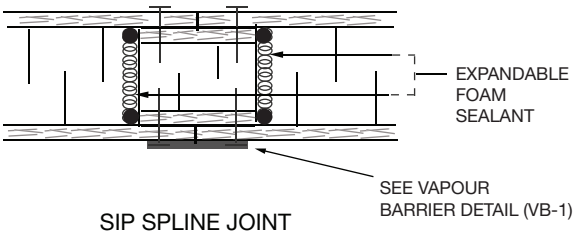
TITLE		PROJECT
AIR BARRIER DETAILS FOR AIR BARRIER SEALANTS		
REFERENCE	SCALE N.T.S.	
DATE NOVEMBER 2010	REVISION 1	DWG. No. AB-1

AIR BARRIER

RECOMMENDED DETAILS FOR SEALING SIP CONNECTIONS

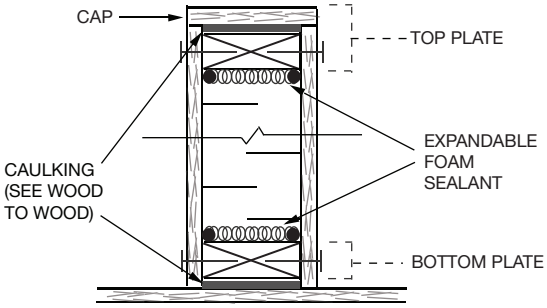
(1) Foam to Foam: Use a low expansion foam sealant.



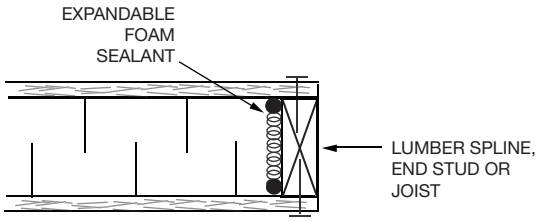
SIP SPLINE JOINT

(2) Foam to Wood: Use a low expansion foam sealant.

PLATES SECTION

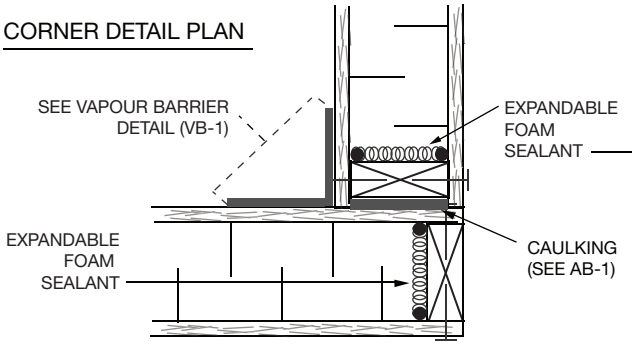


LUMBER SPLINES

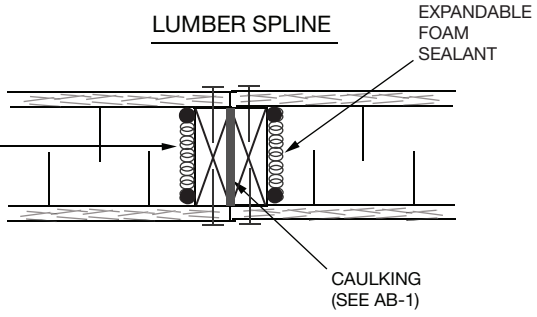


(3) Wood to Wood: Use caulking and a low expansion foam sealant.

CORNER DETAIL PLAN



LUMBER SPLINE



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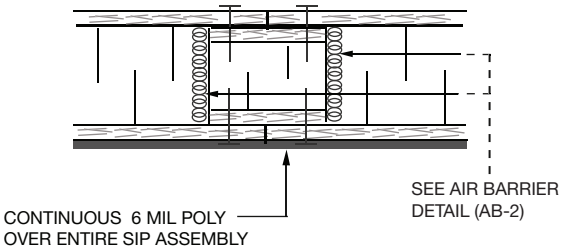
TITLE		PROJECT
AIR BARRIER DETAILS FOR SEALING SIP CONNECTIONS		
REFERENCE	SCALE	
	N.T.S.	
DATE	REVISION	DWG. No.
MAY 2020	1	AB-2

VAPOUR BARRIER

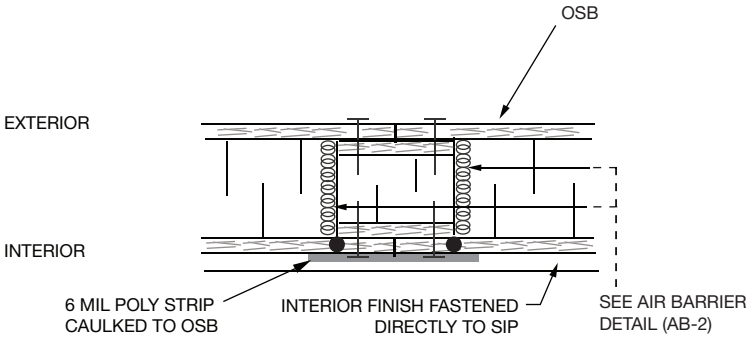
RECOMMENDED DETAILS FOR VAPOUR SEALING SIP CONNECTIONS

The function of a vapour barrier is to control the entry of water vapour into the building assembly. Vapour barriers should not be confused with an air barrier.

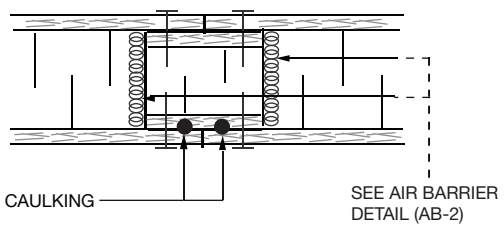
All SIP seams and connections must be VAPOUR SEALED from the INTERIOR.
These are recommended vapour barrier methods:



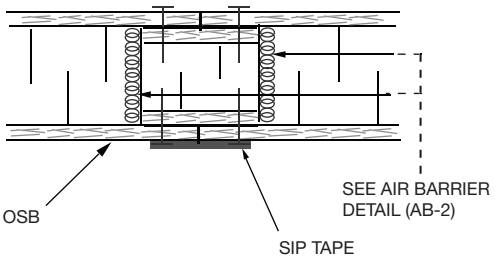
CONTINUOUS 6 MIL POLY
RECOMMENDED



6 MIL POLY STRIPS & CAULKING



CAULKING



SIP TAPE

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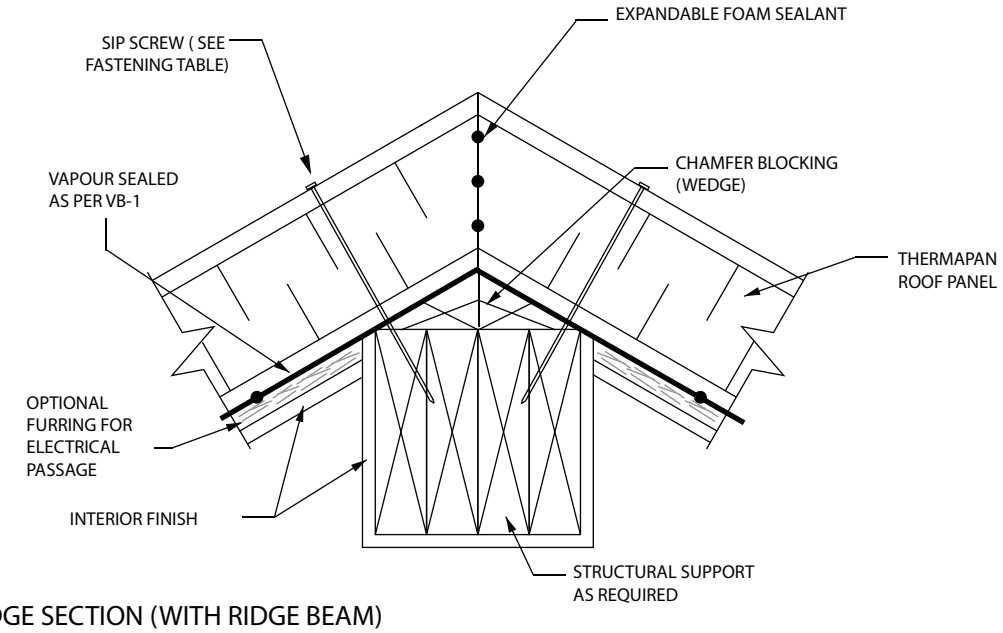
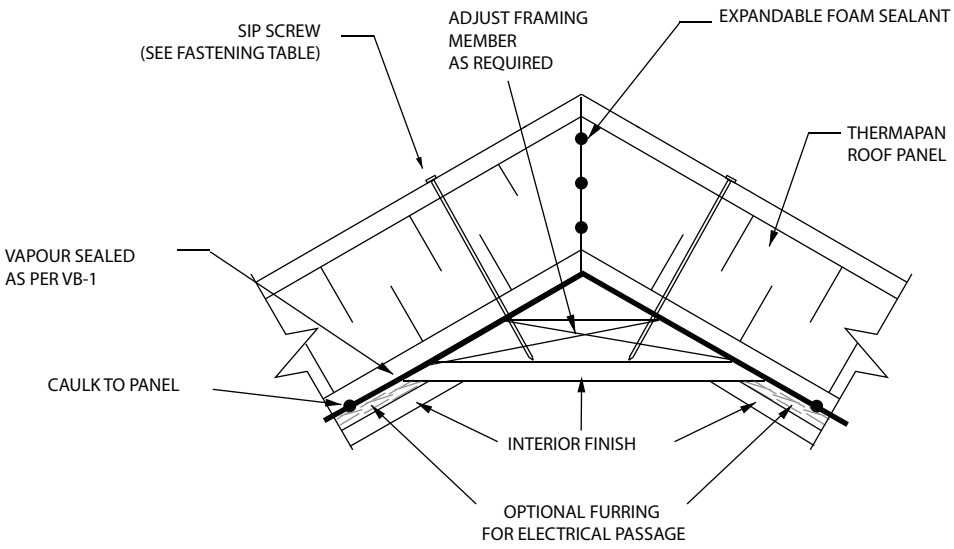
TITLE: VAPOUR BARRIER DETAILS FOR VAPOUR SEALING SIP CONNECTIONS			PROJECT
REFERENCE	SCALE: N.T.S.		
DATE: MAY 2020	REVISION: 2	DWG. No.: VB-1	



RIDGE SECTION (WITH RIDGE BEAM)



"RIDGE" SECTION (NO RIDGE BEAM)

NOTE: REFERENCE ROOF PANEL FASTENING TABLE ON CONNECTION DESIGN (CD) SHEET OF ENGINEERED SHOP DRAWINGS

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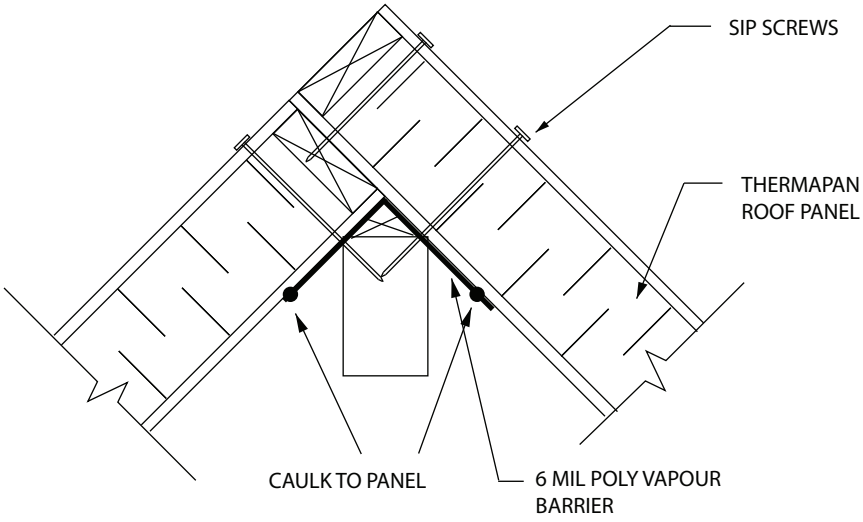
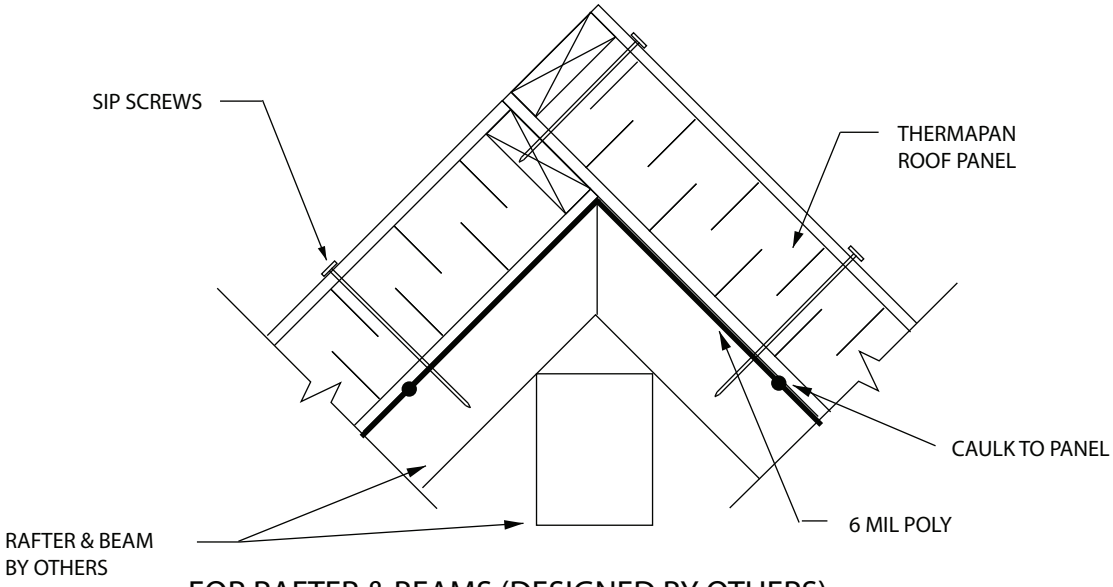
TITLE			PROJECT
ROOF RIDGE DETAILS			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
FEBRUARY 2012	5	R-1	



RIDGE SECTION (TYPICAL RIDGE BEAM)



FOR RAFTER & BEAMS (DESIGNED BY OTHERS)

NOTE: REFER TO AIR BARRIER (AB-2) AND VAPOUR BARRIER (VB-1) DETAILS FOR SEALING SIP CONNECTIONS
NOTE: REFERENCE ROOF PANEL FASTENING TABLE ON CONNECTION DESIGN (CD) SHEET OF ENGINEERED SHOP DRAWINGS

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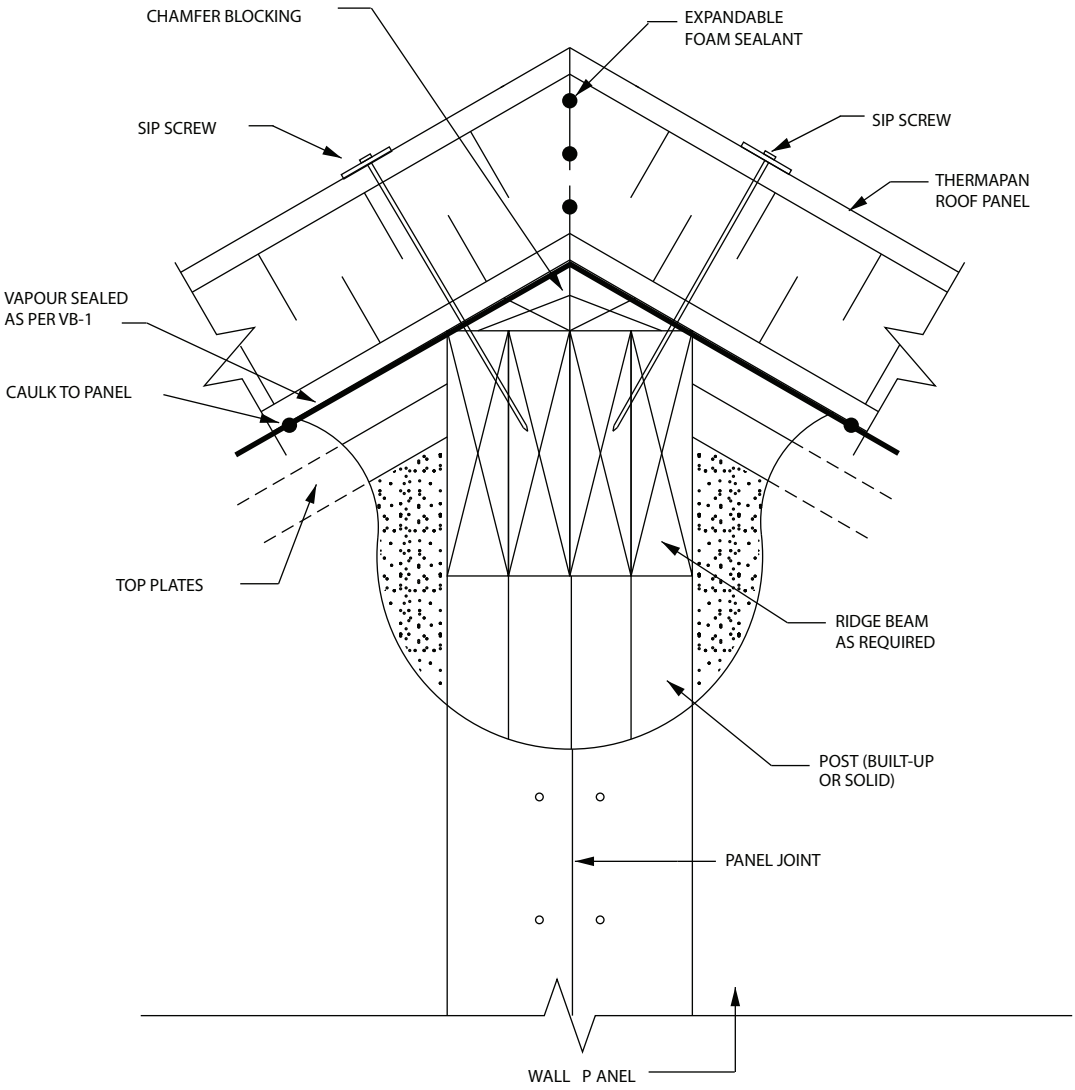
TITLE			PROJECT
SECTIONS - ROOF RIDGE DETAILS FOR 12/12 PITCH ROOF			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
FEBRUARY 2012	R-2	R-2	



RIDGE BEAM & POST POCKET

NOTE: REFERENCE ROOF PANEL FASTENING TABLE ON CONNECTION DESIGN (CD) SHEET OF ENGINEERED SHOP DRAWINGS

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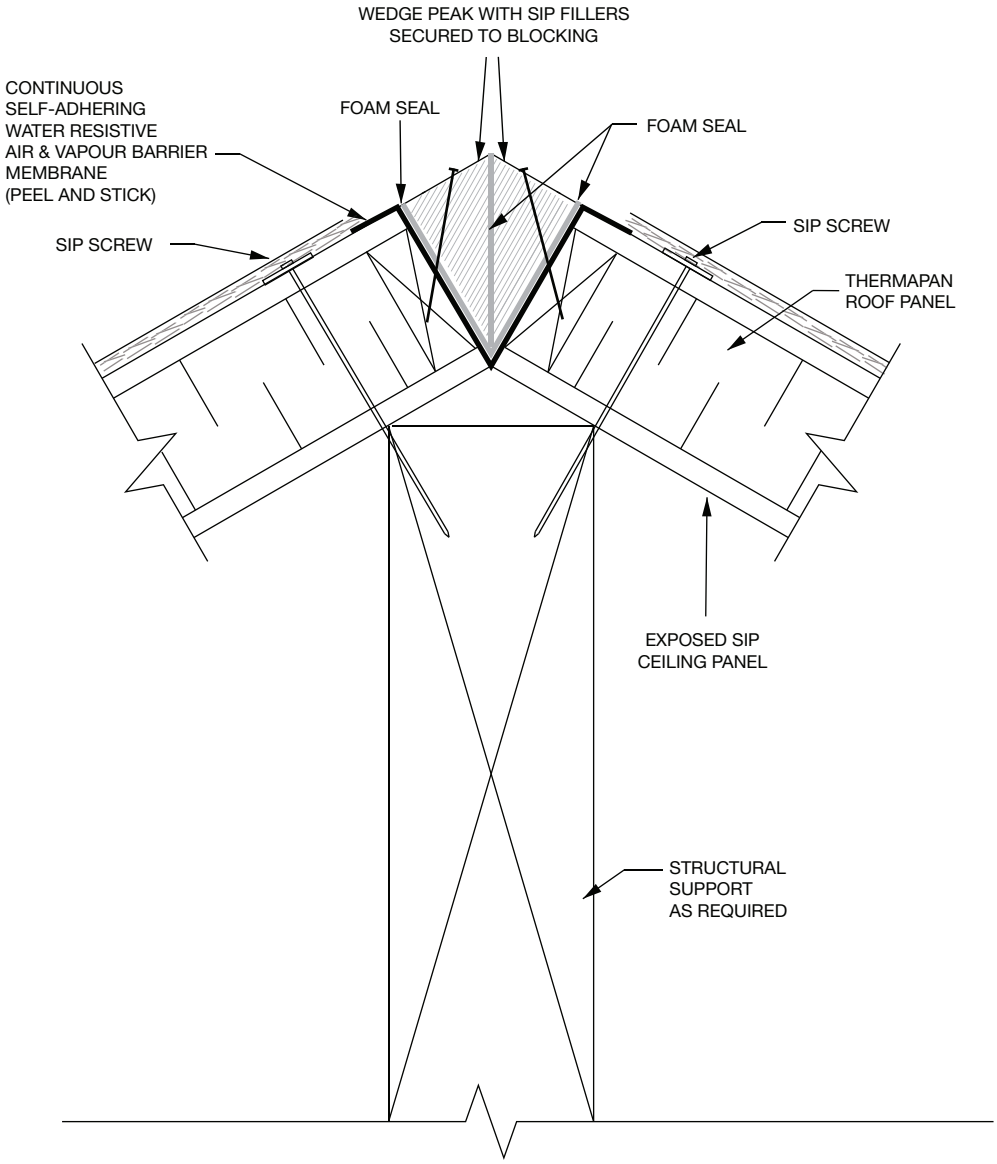
TITLE			PROJECT
BEAM POCKET DETAIL			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
DECEMBER 2010	2	R-3	



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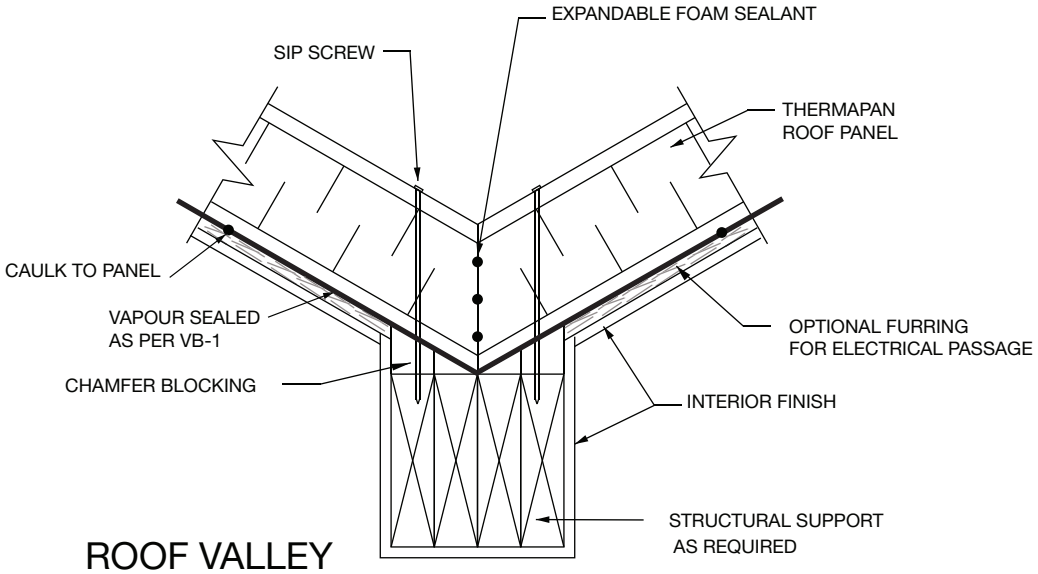
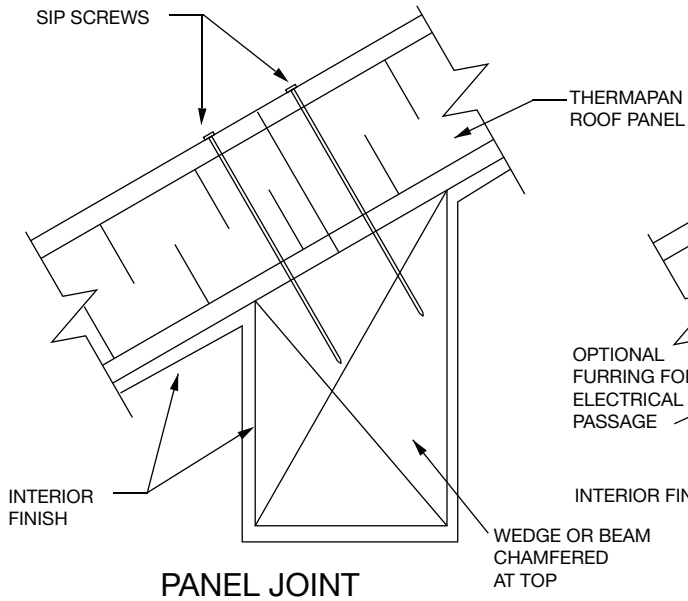
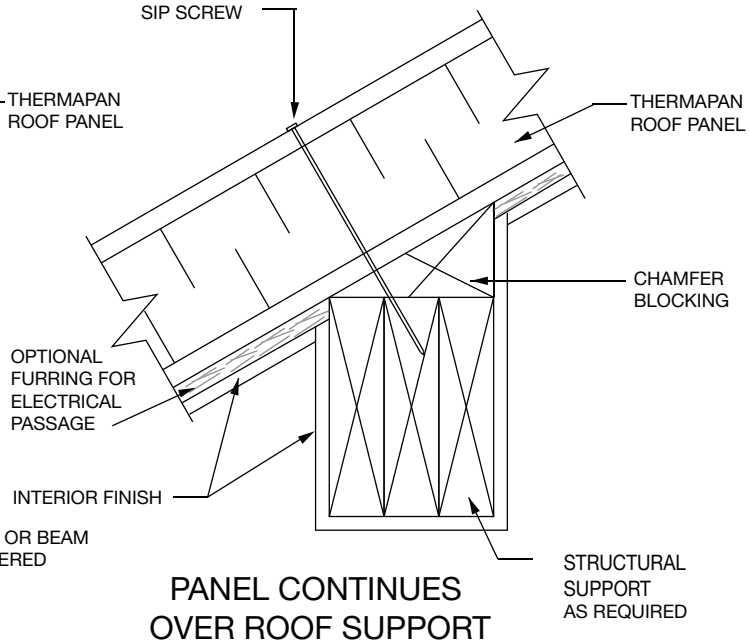
TITLE			PROJECT
SIP PEAK CONNECTION (ALTERNATIVE)			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
JUNE 2023	1	R-4	



ROOF VALLEY



PANEL JOINT AT ROOF SUPPORT



PANEL CONTINUES OVER ROOF SUPPORT

NOTE: REFERENCE ROOF PANEL FASTENING TABLE ON CONNECTION DESIGN (CD) SHEET OF ENGINEERED SHOP DRAWINGS

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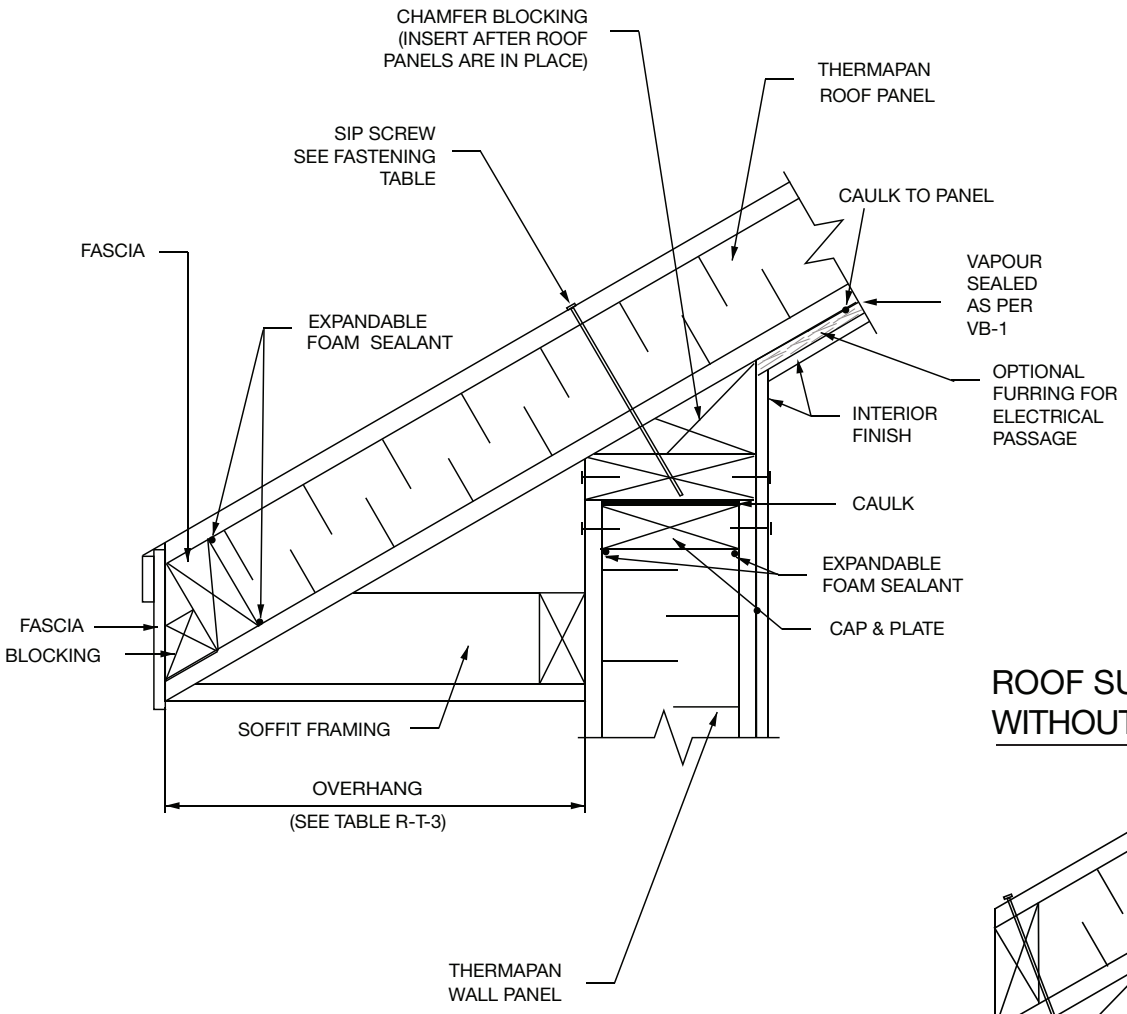
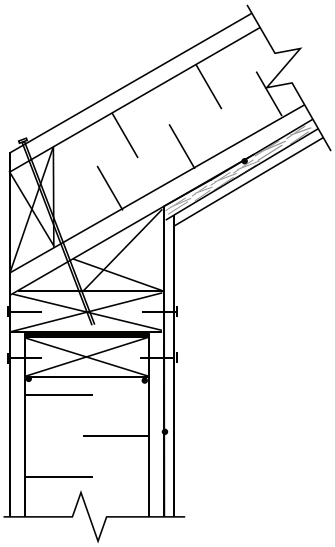
TITLE			PROJECT
ROOF VALLEY & INTERMEDIATE ROOF SUPPORT			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
JULY 2018	4	R-5	

ROOF SUPPORT WITH OVERHANG



ROOF SUPPORT WITHOUT OVERHANG



NOTE: REFERENCE ROOF PANEL FASTENING TABLE
ON CONNECTION DESIGN (CD) SHEET OF ENGINEERED SHOP DRAWINGS

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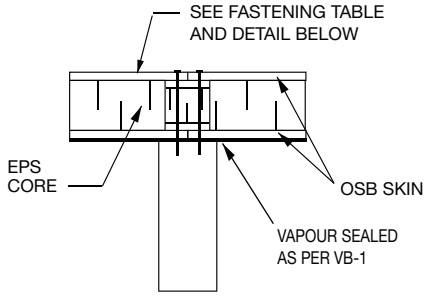
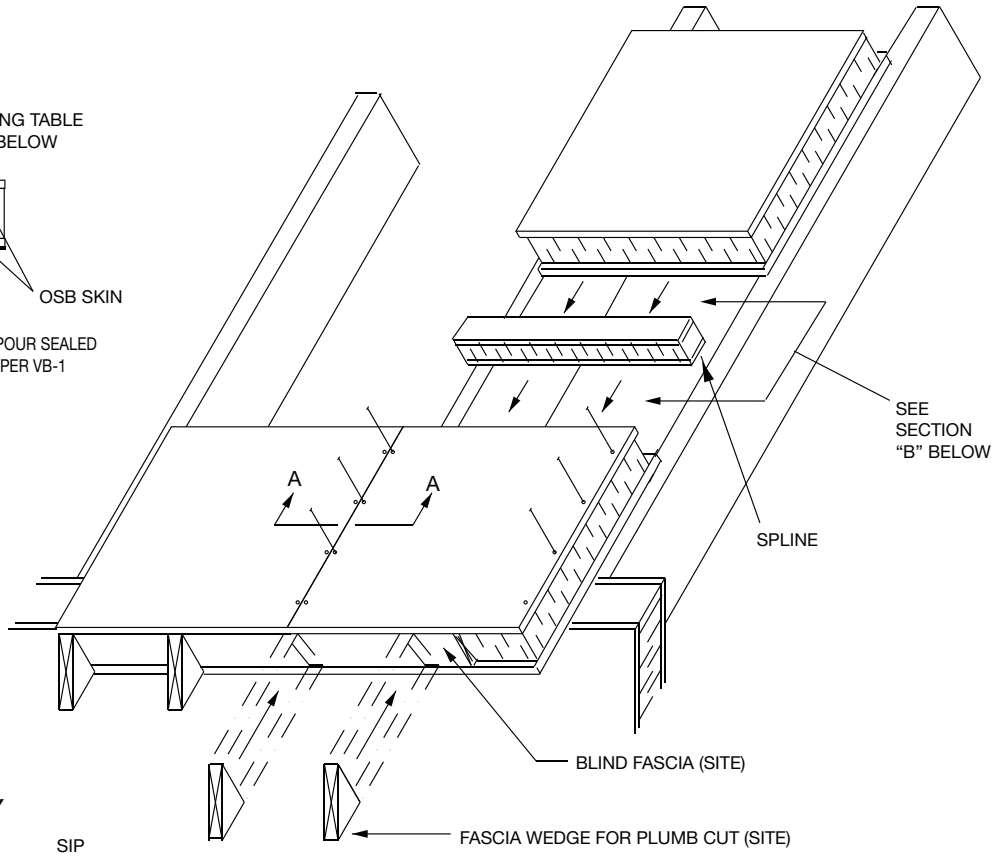
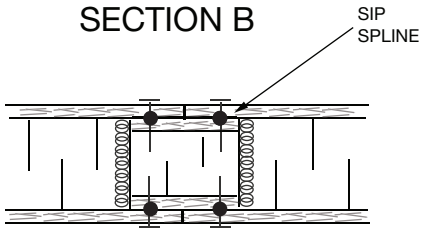
TITLE		PROJECT
EAVE DETAIL & ROOF SUPPORT AT EXTERIOR WALL		
REFERENCE	SCALE	
	N.T.S.	
DATE	REVISION	DWG. No.
MARCH 2020	7	R-6

SECTION
A-A





ROOF ASSEMBLY
SECTION B



NOTE: REFER TO AIR BARRIER (AB-2) AND VAPOUR BARRIER (VB-1) DETAILS FOR SEALING SIP CONNECTIONS.

NOTE: REFERENCE ROOF PANEL FASTENING TABLE ON CONNECTION DESIGN (CD) SHEET OF ENGINEERED SHOP DRAWINGS

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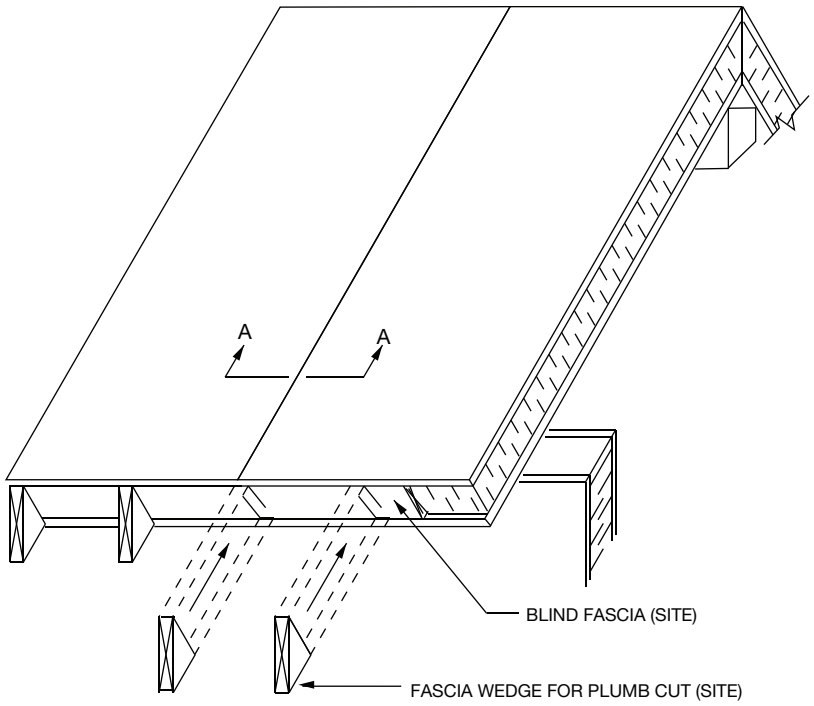
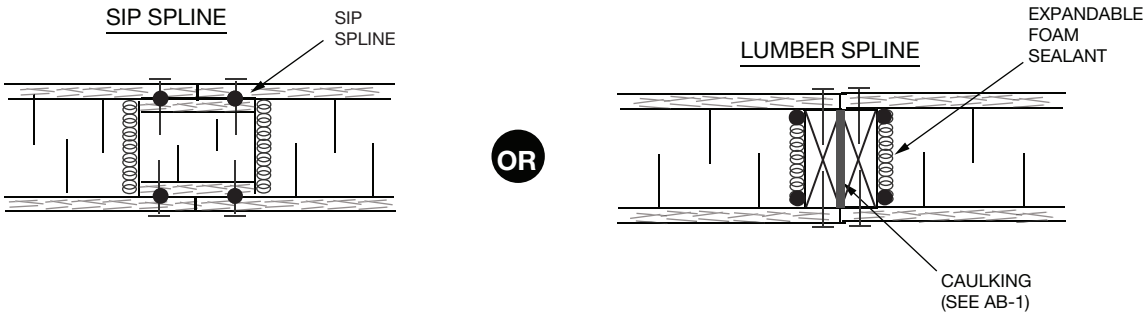
TITLE			PROJECT
TYPICAL SLOPED ROOF ASSEMBLY			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
FEBRUARY 2012	6	R-7	



ROOF ASSEMBLY SECTION A-A



NOTE: REFER TO AIR BARRIER (AB-2) AND VAPOUR BARRIER (VB-1) DETAILS FOR SEALING SIP CONNECTIONS.

NOTE: REFERENCE ROOF PANEL FASTENING TABLE ON CONNECTION DESIGN (CD) SHEET OF ENGINEERED SHOP DRAWINGS

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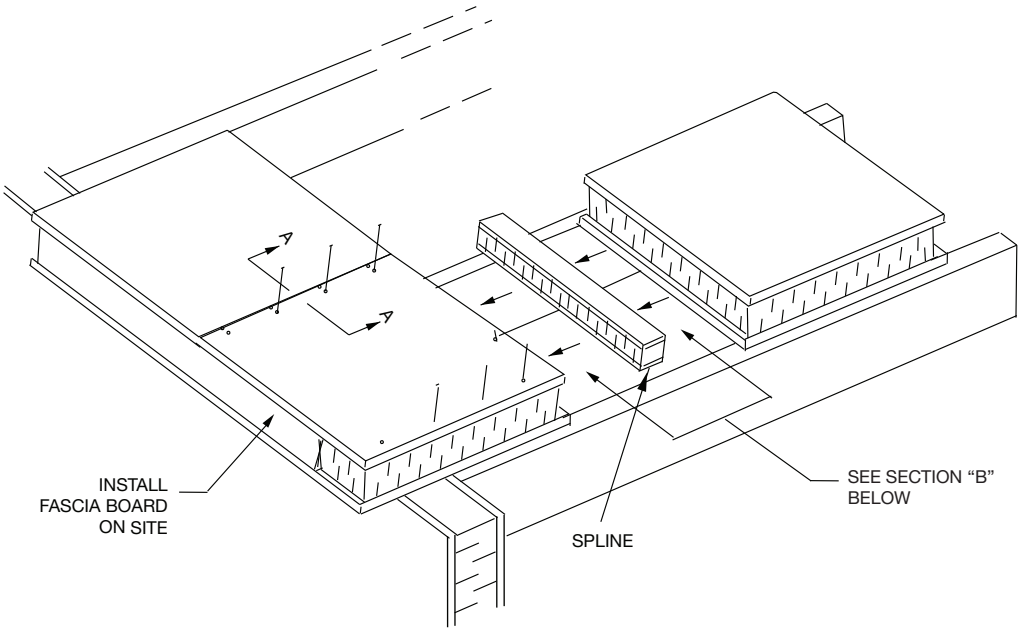
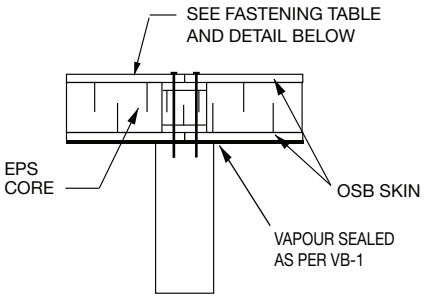
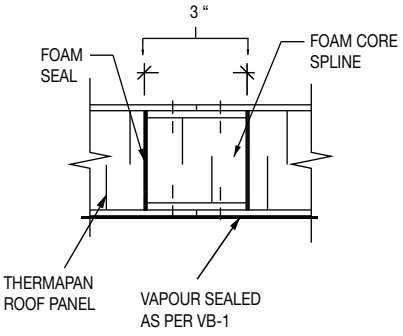
TITLE			PROJECT
SLOPED ROOF ASSEMBLY WITH RIDGE BEAM			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
FEBRUARY 2012	2	R-8	



SECTION A-A



SECTION B
ISOMETRIC ROOF ASSEMBLY
GENERIC DETAIL FOR FLAT ROOF



NOTE: REFER TO AIR BARRIER (AB-2) AND VAPOUR BARRIER (VB-1) DETAILS FOR SEALING SIP CONNECTIONS.

NOTE: REFERENCE ROOF PANEL FASTENING TABLE ON CONNECTION DESIGN (CD) SHEET OF ENGINEERED SHOP DRAWINGS

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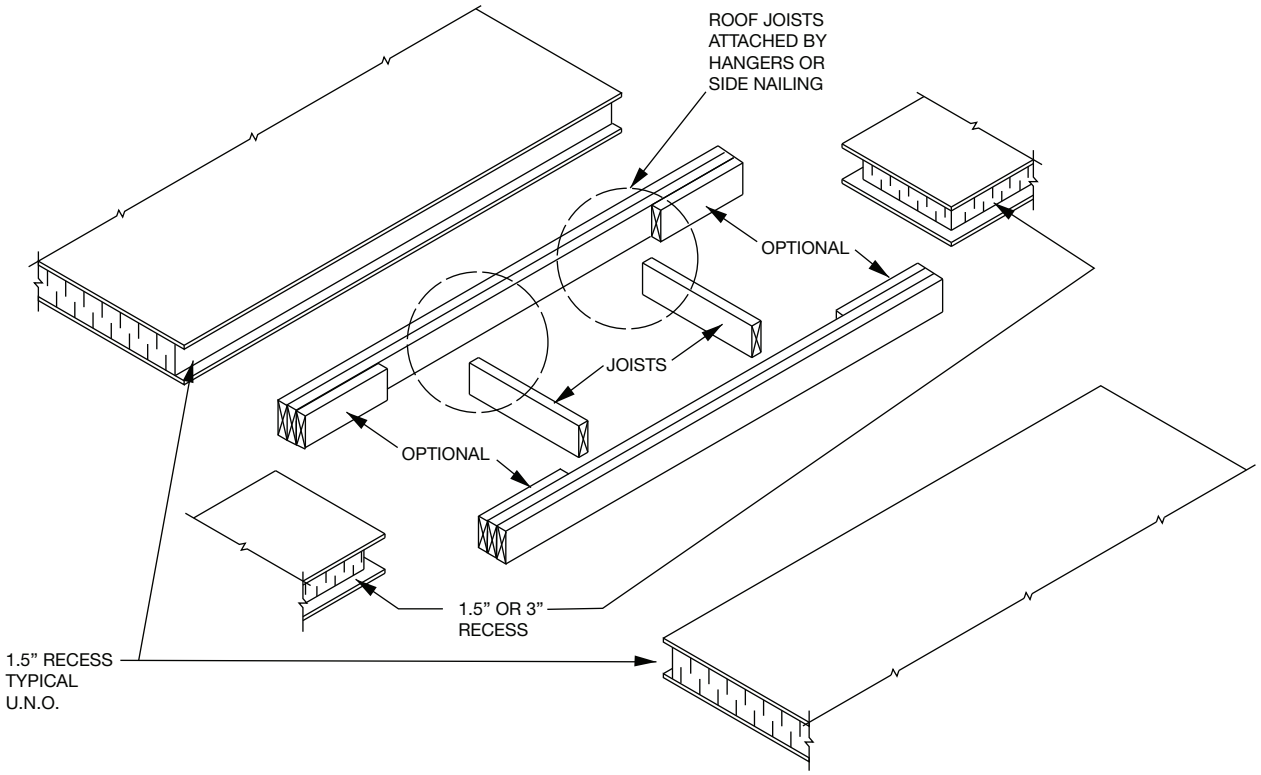
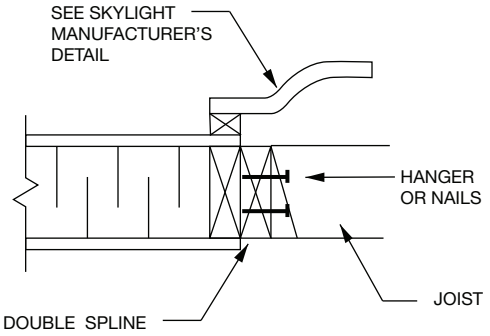
TITLE			PROJECT
FLAT ROOF ASSEMBLY			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
FEBRUARY 2012	3	R-9	





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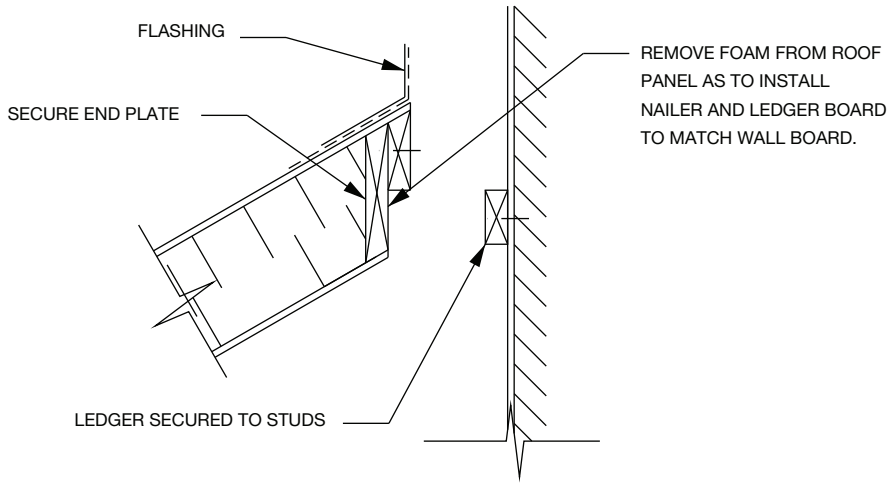
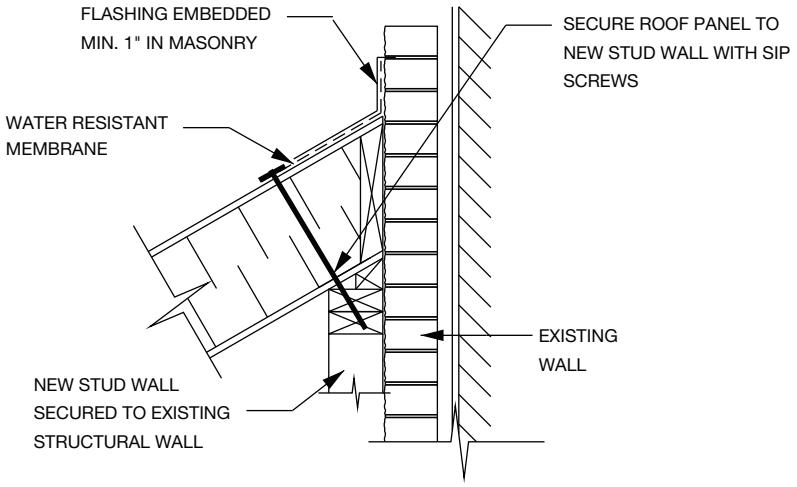
TITLE		PROJECT
SKYLIGHT OPENING & ASSEMBLY		
REFERENCE	SCALE	
	N.T.S.	
DATE	REVISION	DWG. No.
FEBRUARY 2012	3	R-10



OPTION 1



OPTION 2

NEW ROOF TO EXISTING WALL

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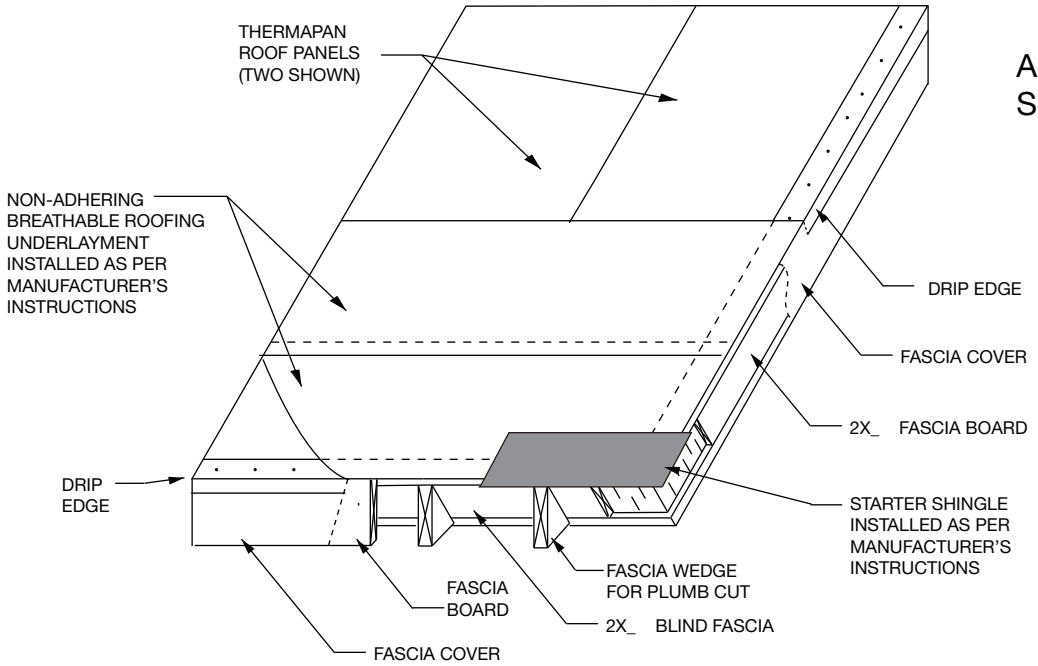
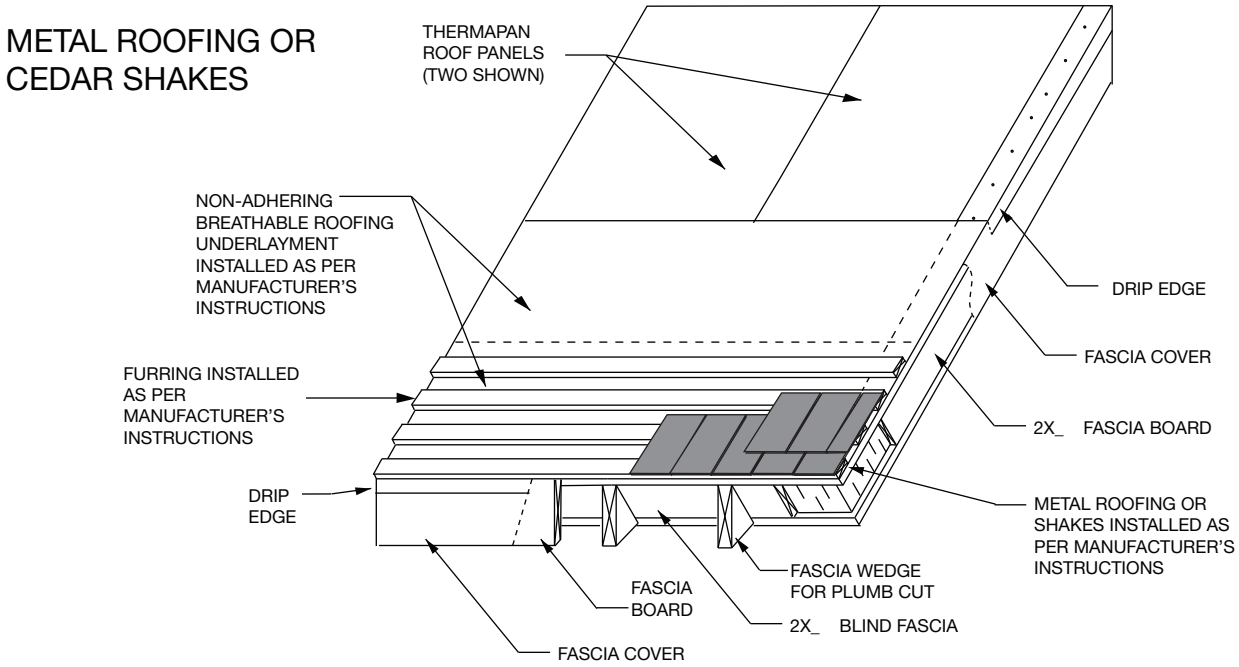
TITLE			PROJECT
TYPICAL ROOF CONNECTION SECTIONS (ROOF TO WALL)			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
FEBRUARY 2012	3	R-11	

ASPHALT SHINGLES



METAL ROOFING OR CEDAR SHAKES



NOTE: VENTILATION OF SIP ROOF NOT REQUIRED.

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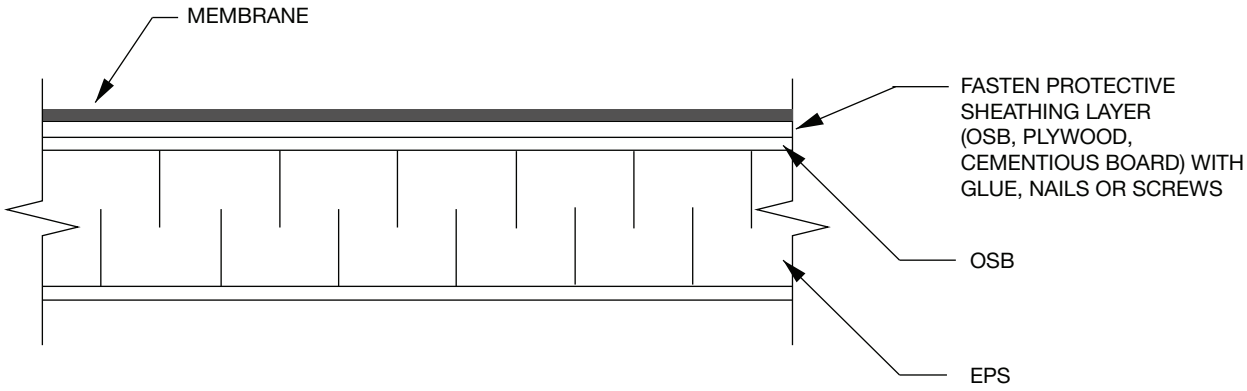
TITLE		PROJECT
ROOFING APPLIED TO SLOPED SIPS		
REFERENCE	SCALE	
	N.T.S.	
DATE	REVISION	DWG. No.
AUGUST 2017	2	R-12

MEMBRANE
(EPDM, PVC, TPO, ETC.)



NOTES:

- SIP SURFACE TO BE DRY AND FREE OF MOISTURE
- PROTECTIVE SHEATHING LAYER TO BE DRY AND FREE OF MOISTURE
- SOLVENT BASED ADHESIVES ARE NOT PERMITTED
- INSTALL MEMBRANE ACCORDING TO MEMBRANE MANUFACTURER'S DETAILS AND IN CONFORMANCE TO REQUIREMENTS OF LOCAL BUILDING CODE

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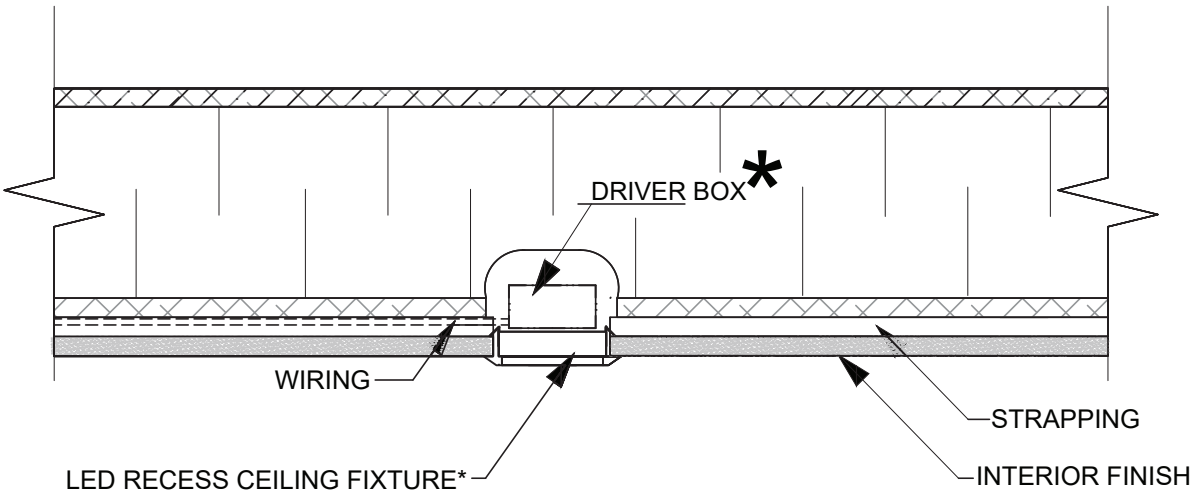
TITLE			PROJECT
FLAT ROOFING APPLIED TO SIPS			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
NOVEMBER 2022		R-13	



*FIXTURE SPECIFICATIONS

FIXTURE TO HAVE AMBIENT OPERATING TEMPERATURE +140F(+40C) MAXIMUM

INSTALL AS PER MANUFACTURERS SPECIFICATIONS

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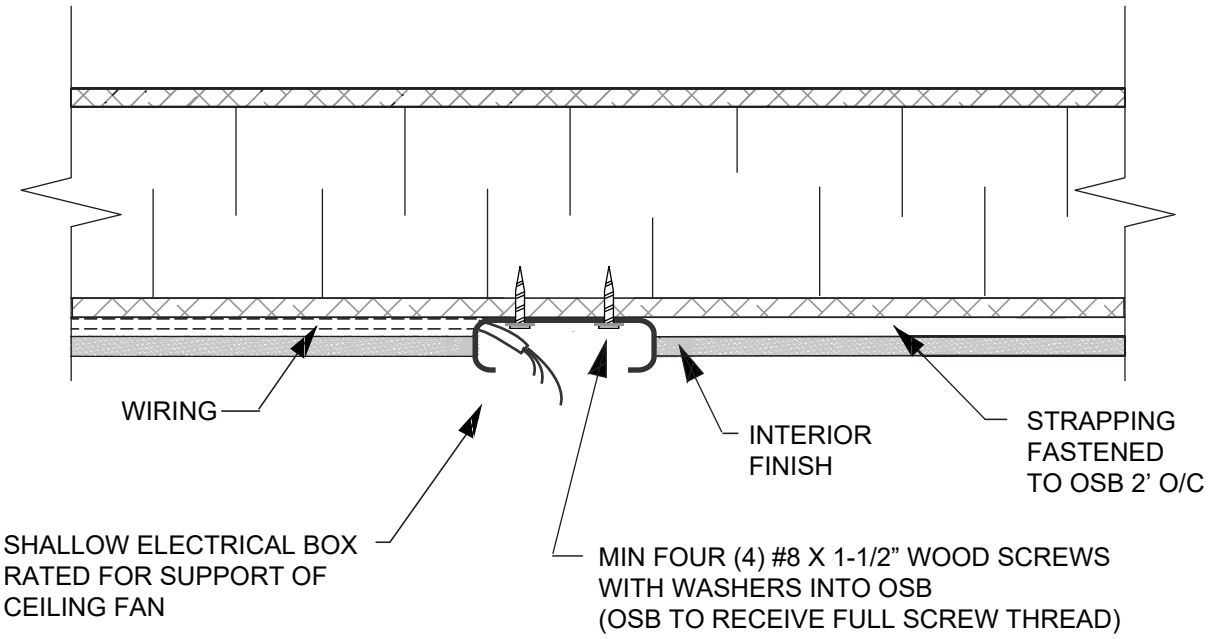
TITLE: LED POT LIGHT INSTALLATION IN CEILING SIPS			PROJECT:
REFERENCE:	SCALE: N.T.S.		
DATE: JANUARY 2017	REVISION:	DWG. No.: R-14	



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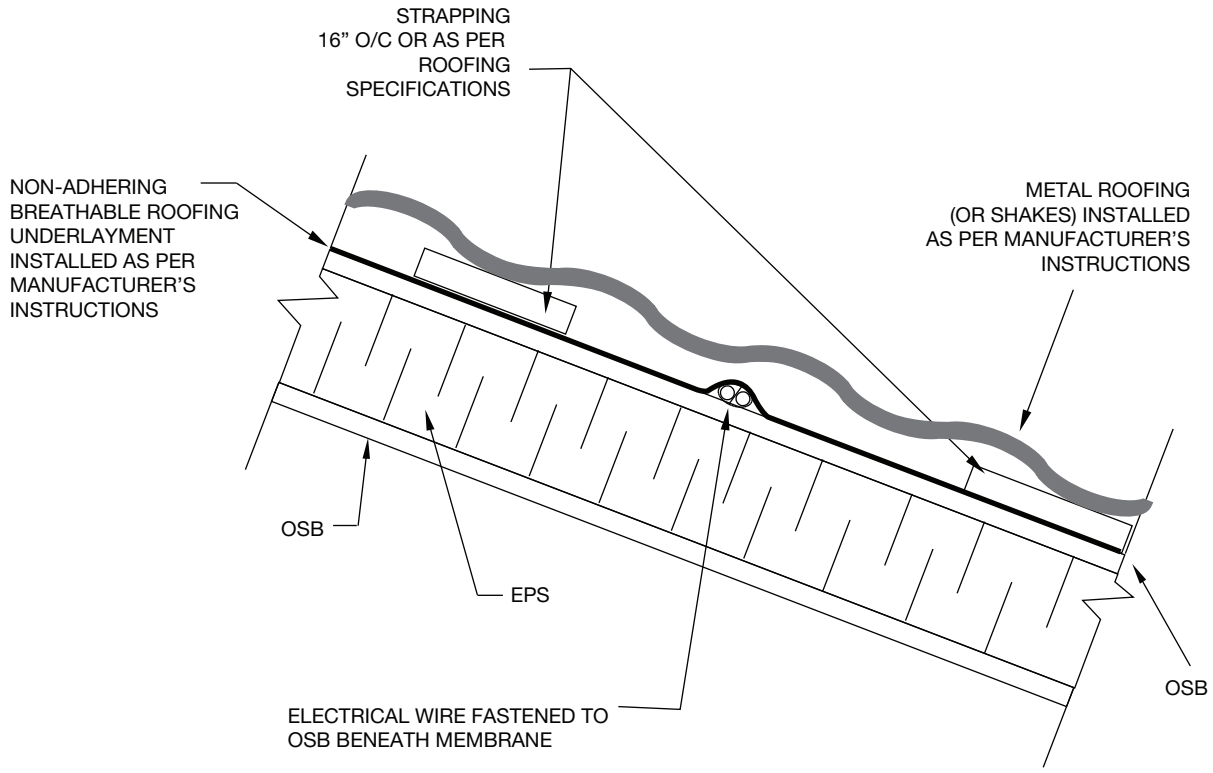
TITLE			PROJECT
CEILING FAN ATTACHMENT			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
FEBRUARY 2018		R-15	

METAL ROOFING OR CEDAR SHAKES



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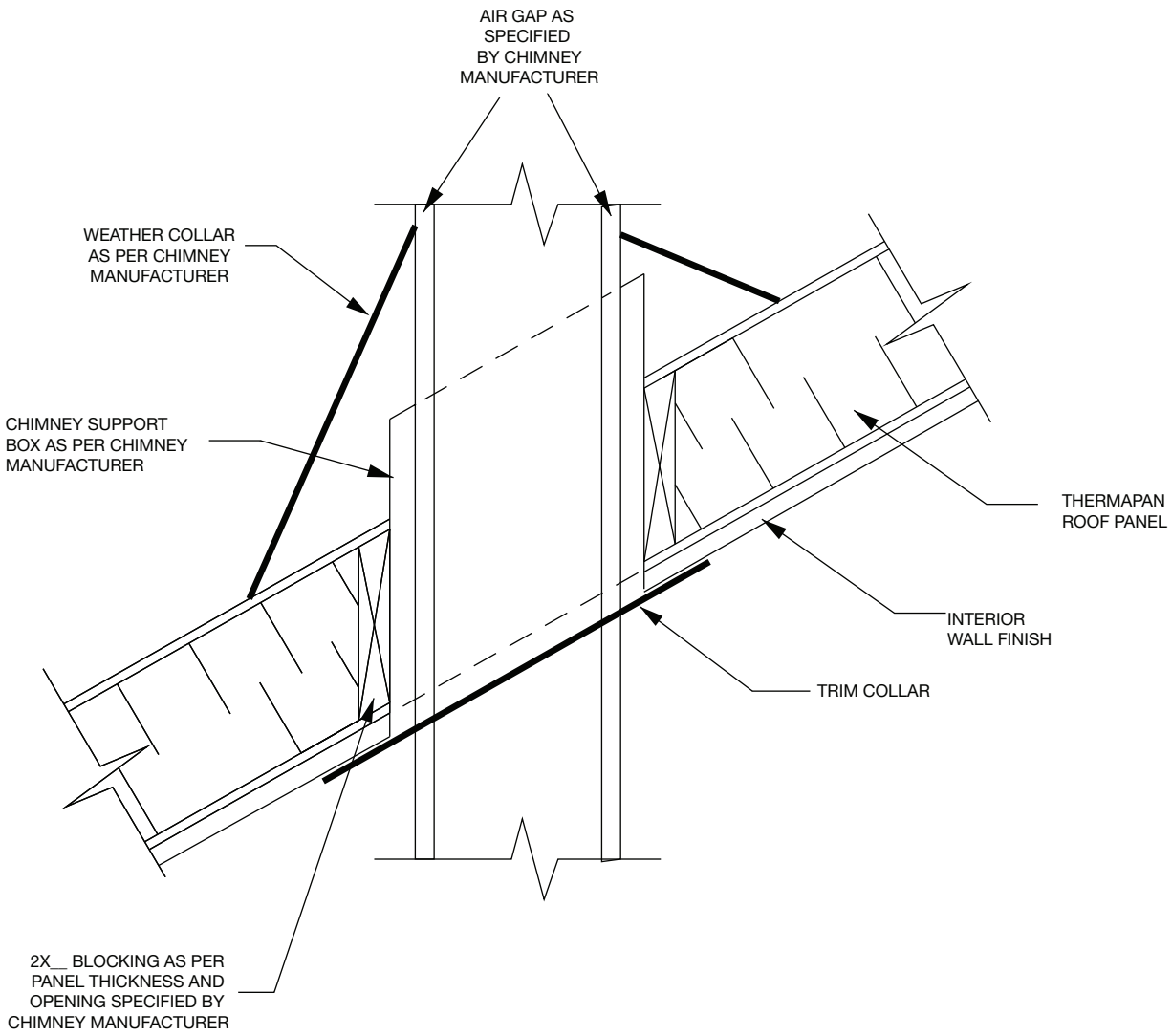
TITLE			PROJECT
ELECTRICAL WIRE FASTENED TO ROOF SIP			
REFERENCE	SCALE		
	N.T.S.		
DATE	REVISION	DWG. No.	
MARCH 2021		R-16	



NOTE: ABOVE DETAILS ARE TYPICAL REQUIREMENTS TO INSTALL A PREFABRICATED METAL CHIMNEY IN A THERMAPAN STRUCTURAL INSULATED PANEL. THE CHIMNEY INSTALLATION MUST COMPLY WITH THE CHIMNEY MANUFACTURERS'S SPECIFICATION AND THE APPLICABLE BUILDING CODE.

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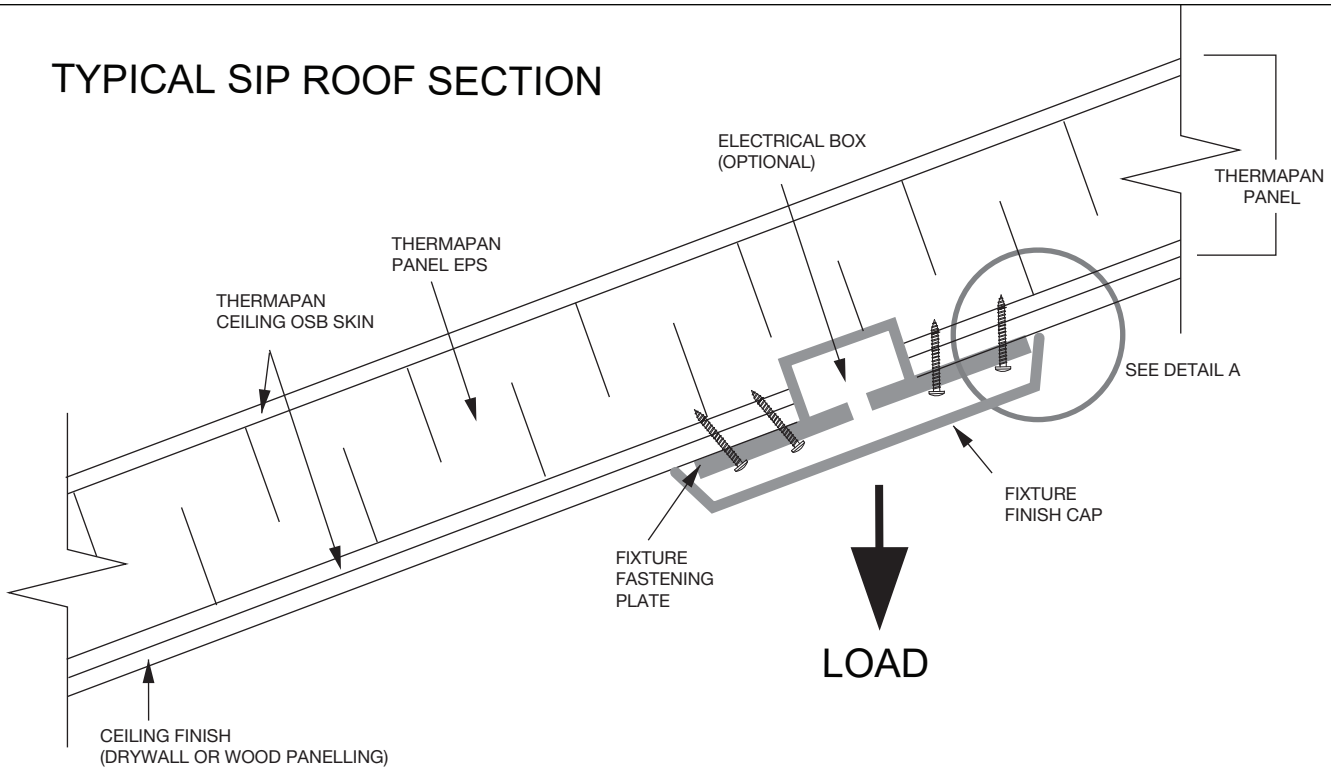
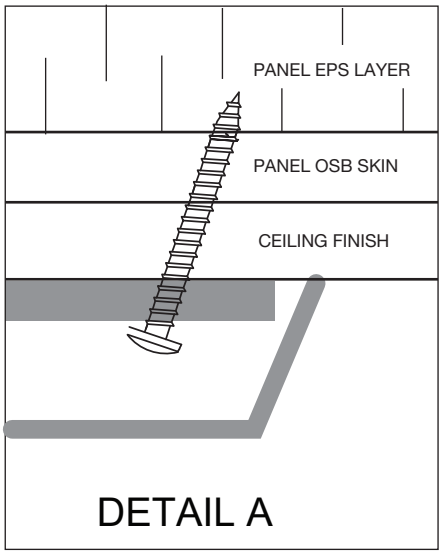
TITLE		PROJECT
PRE-FABRICATED METAL CHIMNEY – ROOF INSTALLATION		
REFERENCE	SCALE: N.T.S.	
DATE: FEBRUARY 2019	REVISION	DWG. No.: R-17

TYPICAL SIP ROOF SECTION





DETAIL A

CEILING LOAD RESISTANCE CAN BE ACHIEVED WITH NUMBER 10 SHEET METAL SCREWS INSTALLED TO A SIP CEILING FINISH AS DETAILED OR TO THE SIP SKIN DIRECTLY.

EACH SCREW CAN RESIST A PULL OUT OF 90 POUNDS IN 7/16" OSB. CONTRACTOR TO CONFIRM LOAD TO BE SECURED AND NUMBER OF FASTENERS REQUIRED. MINIMUM 4 SCREWS PER FIXTURES. FULL THICKNESS OF OSB TO RECEIVE SCREW THREAD ON ANGLE AS DETAILED

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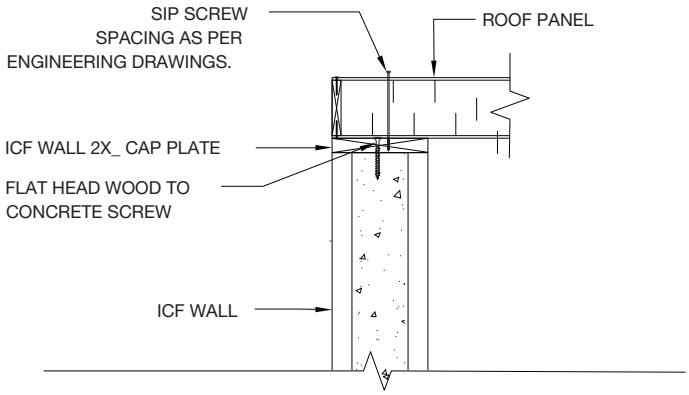
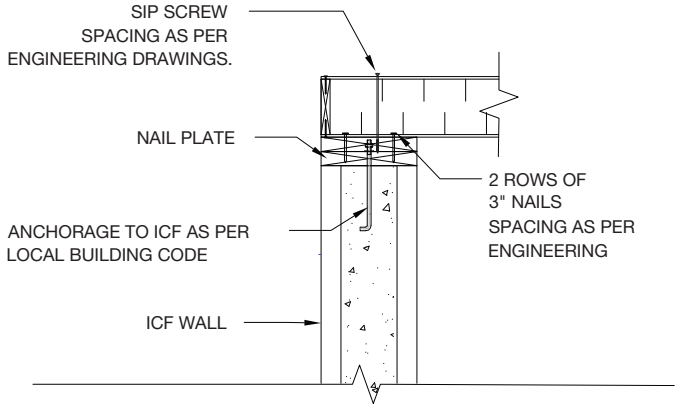
TITLE		PROJECT
SCREW FASTENER DETAIL FOR SECURING LOAD TO THERMAPAN CEILING PANEL		
REFERENCE	SCALE N.T.S.	
DATE FEBRUARY 2020	REVISION	DWG. No. R-18



ROOF SIP PANEL TO ICF CONNECTION
(CONCRETE SCREW OPTION)



ROOF SIP PANEL TO ICF CONNECTION
(ANCHORAGE OPTION)

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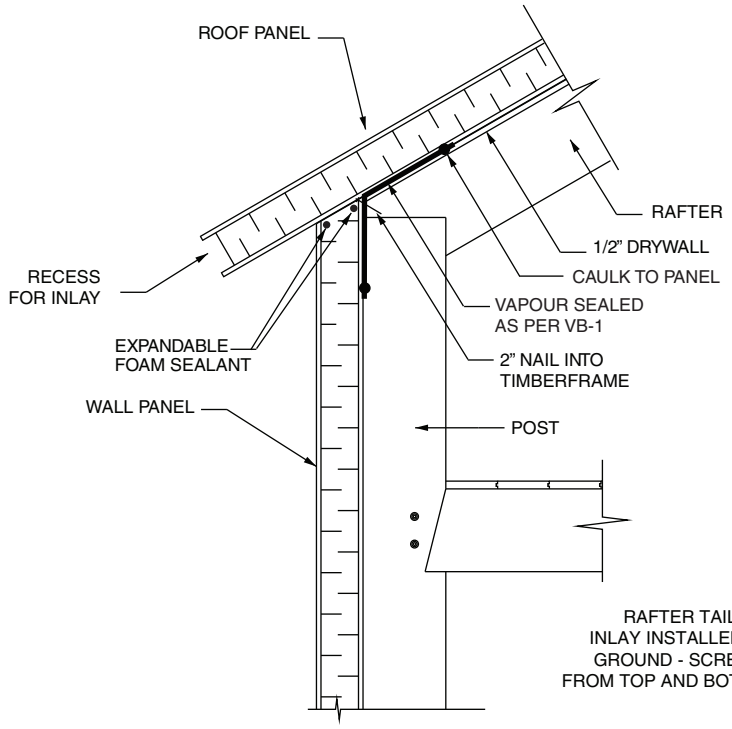
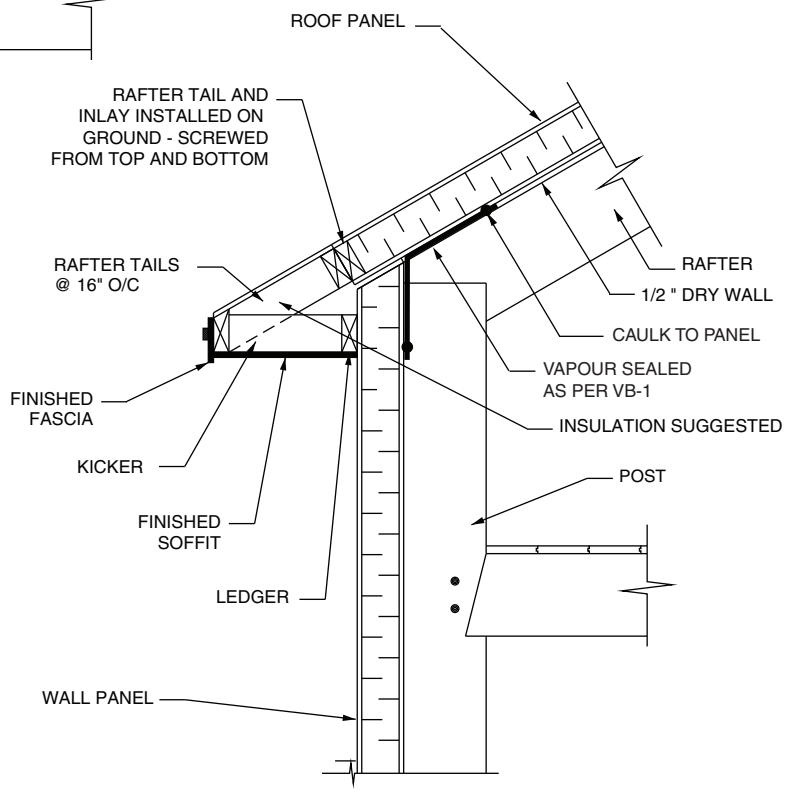
TITLE: ROOF SIP TO ICF CONNECTION DETAIL			PROJECT:
REFERENCE:	SCALE: N.T.S.		
DATE: MARCH 2024	REVISION:	DWG. No.: R-19	

UNFINISHED EAVE DETAIL FOR LEVEL SOFFIT



FINISHED EAVE DETAIL WITH LEVEL SOFFIT



NOTE: REFER TO AIR BARRIER (AB-2) AND VAPOUR BARRIER (VB-1) DETAILS FOR SEALING SIP CONNECTIONS.

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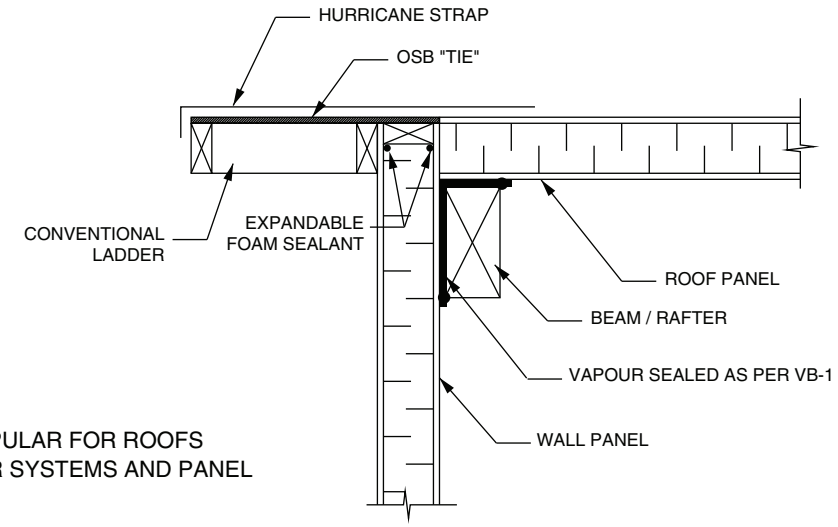
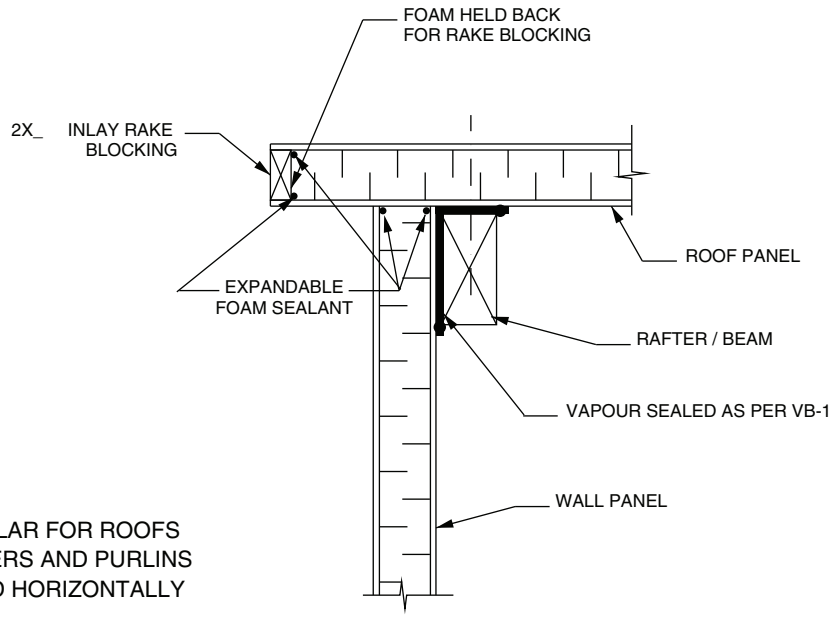
TITLE			PROJECT
ROOF OVERHANG EAVE DETAILS (TIMBERFRAME)			
REFERENCE	SCALE		
8020	N.T.S.		
DATE	REVISION	DWG. No.	
FEBRUARY 2012	3	R-TF-1	



BUILT OUT OPTION POPULAR FOR ROOFS
WITH COMMON RAFTER SYSTEMS AND PANEL
ORIENTED VERTICALLY

NOTE: SCREW AND GLUE LADDER TO WALL PANEL



RUN-BY OPTION, POPULAR FOR ROOFS
WITH PRINCIPAL RAFTERS AND PURLINS
AND PANELS ORIENTED HORIZONTALLY

NOTE: REFER TO AIR BARRIER (AB-2) AND VAPOUR BARRIER (VB-1) DETAILS FOR SEALING SIP CONNECTIONS.

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TITLE			PROJECT
ROOF OVERHANG & RAKE (TIMBERFRAME)			
REFERENCE	SCALE		
8020	N.T.S.		
DATE	REVISION	DWG. No.	
MAY 2009	2	R-TF-2	