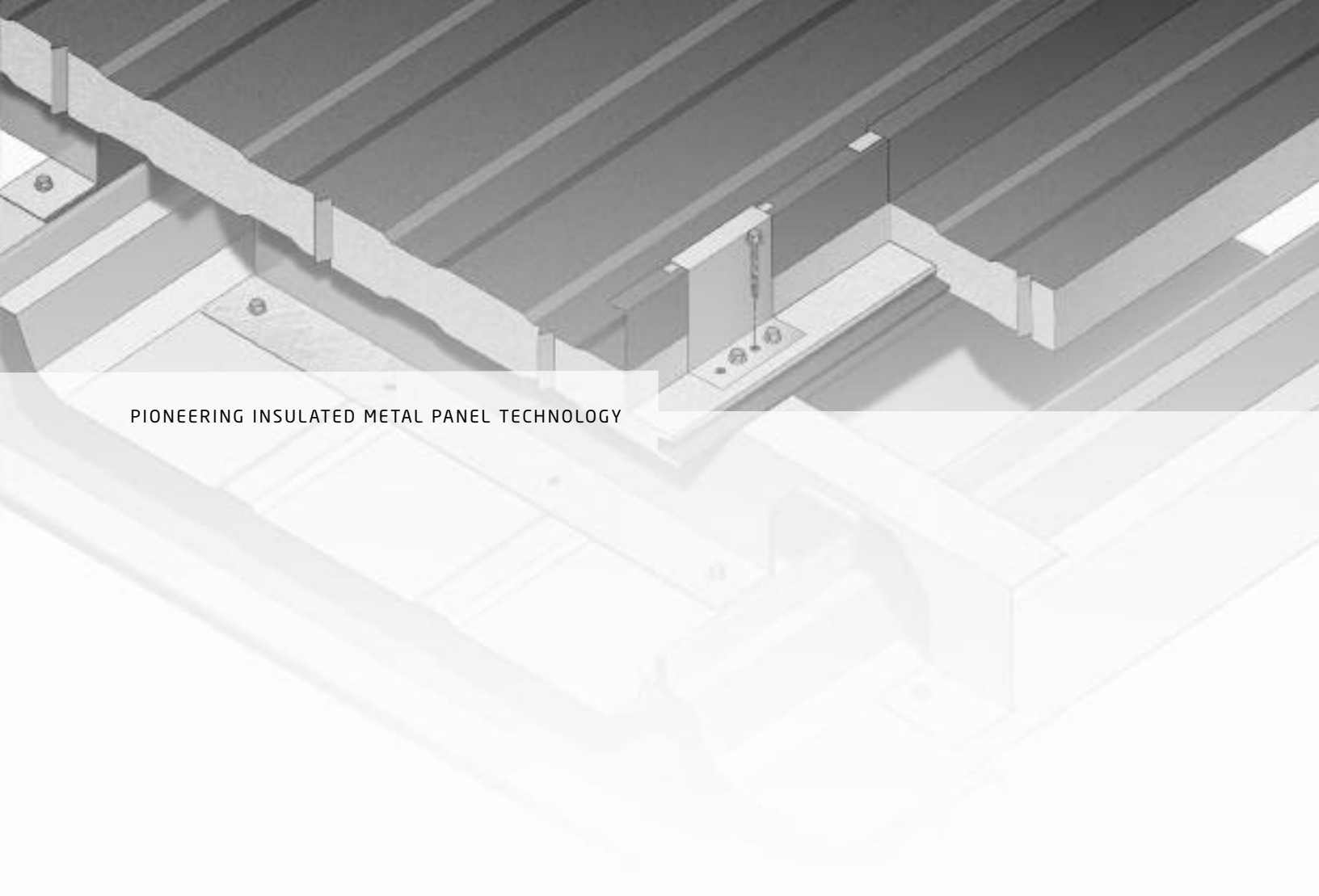


CFR RETRO-SEAM™
WITH ROOF HUGGER®
SUB-PURLIN SYSTEM

DESIGN & INSTALLATION GUIDE



PIONEERING INSULATED METAL PANEL TECHNOLOGY



PIONEERING INSULATED METAL PANEL TECHNOLOGY

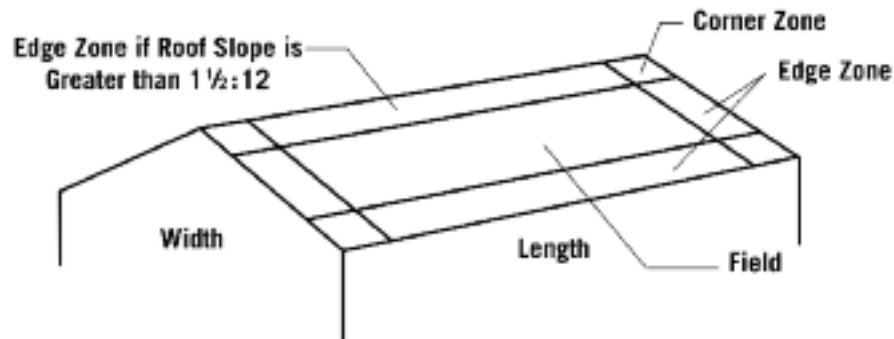


C O N T E N T S

INTRODUCTION	2-3
ROOF HUGGER® APPLICATIONS	4
ROOF HUGGER® PROFILES	4
ALLOWABLE UPLIFT PRESSURE TABLES	5
GUIDE SPECIFICATIONS: CFR ROOF PANEL	5
Part 1 - General	5-9
Part 2 - Products	9-10
Part 3 - Execution	10-11
GUIDE SPECIFICATIONS: ROOF HUGGER® RETROFIT STEEL SUBPURLINS	11
Part 1 - General	12
Part 2 - Products	13
Part 3 - Execution	14-15
ROOF HUGGER® INSTALLATION	16
Receiving Materials	16
Handling	16
Fasteners	16
Common Hugger Attachment	17
FASTENERS PATTERNS	17
Existing Corrugated Panels	17
Midspan Attachment	17
Purlin Strengthening Attachment	17
Existing Fasteners	17
ERECTION	18
Layout	18
Skylights	18
Weathertightness	18
Bridging	18
Midspan Attachment	18
Purlin Strengthening Attachment	19
Out of Module Existing Roof Panels	19
Measuring Existing Corrugated Panels	19
Flashing and Trim	20
STEP-BY-STEP ROOF HUGGER® INSTALLATION	20
Standard Installation (Corner/Edge Zone Framing not required)	20
Corner and/or Edge Zone Framing Installation	21-22
Corner and/or Edge Zone Framing Installation Using Structural Hats	22
INSTALLATION DRAWING DETAILS	
DETAIL INDEX	23
DETAIL DRAWINGS	24-76

INTRODUCTION

In 2004 most states and municipalities adopted the new "International Building Code" (IBC). This code differs dramatically from the previous building codes in many ways. The most important to you and your project is how it looks at the design load for wind uplift pressures subjected to the roof. Different from years past, the roof is now divided into three zones: The "Field" or central areas of the roof, the "Edge or Perimeter" and the "Corner" zones of the roof. The loads for each "Zone" as shown in the below illustration must now be calculated separately to determine attachment points of the new roof panel system to the Roof Hugger[®] framing system. Essentially, these locations are the same as "Panel Clip" spacing in the case of standing seam metal roofs or fastener placement for thru-fastened metal roofs. It is very important to understand that the required locations of new Roof Huggers on the existing roof will be governed by the new metal roof system's ASTM E-1592 tested values.



The new roof must withstand the full forces calculated for each of these "Zones" on a per project basis. It is important to understand that code based reductions allowed in the past are usually no longer permitted. Since no two buildings are exactly alike, the size and shape of these "Zones" vary from building to building and depends on numerous factors. Included in these factors are height above ground, roof geometry, exposure of the roof to surrounding obstructions, distance from coastal areas, etc. Each building must be considered individually and engineered based on the existing conditions and proposed changes. The basic steps in the evaluation process are as follows:

STEP 1: Collect the basic information needed as requested in our Project Questionnaire.

STEP 2: An engineer should calculate the design pressures for each zone of the roof. This can be completed by Metl-Span[®] when you request a "Clip Analysis" for the new CFR Retro-Seam[™] metal roof.

STEP 3: Once the design analysis is completed, the next step is to determine what is required in the Roof Hugger sub-framing system. This is done by comparing the new CFR IMP maximum allowed pressures (uplift capacity) with the existing building's

INTRODUCTION (c o n t .)

purlin spacing. If the existing purlin spacing is 5' (typical in older buildings) you would compare the capacity of the new panel on 5' purlin spacing. If the new panel cannot meet the required uplift pressures (PSF) for a 5' purlin spacing, then an additional Roof Hugger® will be necessary between the existing building's purlins. This needed framing can be achieved by adding additional purlins from under the old roof or by adding additional framing on top of the existing roof.

STEP 4: If additional framing is needed to reduce the purlin spacing, it must be determined what that framing consists of. Roof Hugger, Inc. has designed a number of above roof options for reducing the purlin spacing in the corner and edge zones when needed. The specific design will depend on the existing panel type and rib spacing. If the existing roof is a 12" o.c., "PBR" type panel, Roof Hugger, Inc. has several FLORIDA PRODUCT APPROVED Systems that may work in this case. Other existing panels may require special grid designs consisting of Hats, Cee's or Zee's or a combination of all.

STEP 5: Once the new roof's sub-framing has been determined and the overall height of the framing is established, the Roof Huggers can be estimated. If you need assistance with the above process please feel free to call Metl-Span® Estimating: 877-585-9969 to discuss your specific project.

Clarification concerning the installation of CFR Retro-Seam™ metal roof should be directed to the Metl-Span Technical Services Dept. Contact the Metl-Span office:

1720 Lakepointe Drive, Suite #101
Lewisville, Texas 75057
TEL: (972) 221-6656
FAX: (972) 436-7028
WEB: metlspan.com

ROOF HUGGER® APPLICATIONS

Roof Hugger's products are protected under U.S. Patent 5367848. Initially developed for reroofing existing metal buildings and metal roofing, they are also used very effectively with installation over conventional roofing materials in sloped applications. For new construction applications where an airspace cavity is necessary between a new metal roof and a sub-deck for energy efficient and solar thermal systems, Huggers can accommodate the needed airflow.

Below are the most common Hugger profiles for adaptation to an existing metal roof. If your project includes a profile not seen here, all that is needed are the physical dimensions of the existing roof.

ROOF HUGGER PROFILES		
Existing Roof Panel with Required Dimensions		Compatible Hugger
12" O.C. Ribbed Panel (Roll-Formed)		
6"-10" O.C. Ribbed Panel		
7.2" Industrial Rib		
Corrugated 2.5", 2.67", 2.75" and 4.2"		
Trapezoidal SSR 12" 18" and 24" (Roll-Formed)		
Vertical Rib SSR 12", 16" 18" and 24"		

Because of the manner Huggers are manufactured, they can match virtually any known metal roof profile. As you can see from the profiles above, the most common are ribbed panels with varying rib spacing and standing seam systems (SSR) with varying seam spacing. Also very common are corrugated type panels found primarily in industrial and agricultural applications.

ALLOWABLE UPLIFT PRESSURE TABLES

METL-SPAN® 2" CFR 30 ROOF PANEL		
MAXIMUM ALLOWABLE UPLIFT PRESSURE (PSF)		
SPAN	16GA PURLINS	14GA PURLINS
1.50	163.30	176.40
2.00	122.40	132.30
2.50	97.90	105.80
3.00	81.00	88.20
3.50	69.90	75.60
4.00	61.00	66.10
4.50	54.00	58.80
5.00	48.50	51.60

METL-SPAN® 2" CFR 36 ROOF PANEL		
MAXIMUM ALLOWABLE UPLIFT PRESSURE (PSF)		
SPAN	16GA PURLINS	14GA PURLINS
1.50	135.00	160.30
2.00	102.00	120.30
2.50	81.00	96.20
3.00	68.00	80.20
3.50	58.00	68.70
4.00	51.00	60.10
4.50	45.00	53.40
5.00	39.90	46.70

METL-SPAN® 2" CFR 42 ROOF PANEL		
MAXIMUM ALLOWABLE UPLIFT PRESSURE (PSF)		
SPAN	16GA PURLINS	14GA PURLINS
1.50	115.00	136.30
2.00	87.00	102.20
2.50	69.00	81.80
3.00	58.00	68.10
3.50	49.90	58.40
4.00	43.00	51.10
4.50	38.80	45.40
5.00	34.90	39.70

Notes:

- A. All panels have a 26ga interior steel skin and a 24ga exterior skin.
- B. All roof panel clip tabs are fabricated from 20ga steel.
- C. All roof panel clip bases are fabricated from 12ga steel.
- D. All interior support clips are attached to 16ga purlins with (3ea) 1/4-14x3" #3SD.
- E. All interior support clips are attached to 14ga purlins with (2ea) 1/4-14x3" #3SD.
- F. All 14ga purlin uplift values are based on ASTM E1592 uplift testing & NOA 05-0830.04 Evaluation Report.
- G. All 16ga purlin uplift values are based on empirical data derived from Dade Cty NOA 05-0830.04.
- H. All 16ga purlin uplift values are based on a pullout safety factor of 3.0 per AISI 2001.
- I. All 16ga purlin uplift values are based on a clip prying coefficient of 1.6 applied to the interior uplift reaction.
- J. All uplift values are based on a minimum of a 3-span or 4-span condition.
- K. All uplift values are based on a maximum deflection of L/240.

GUIDE SPECIFICATIONS: CFR ROOF PANEL

PART 1 - GENERAL

1.1 SUMMARY

A. Pre-insulated CFR Standing Seam Roof Panels where indicated on the drawings. Also included, are all necessary trims, fasteners and sealants as required for a weathertight installation. Panels shall be secured to the structure with concealed clips, mechanically closed single lock at the standing seam for weather tightness.

1. Steel faced factory foamed-in-place profiled panels with compatible joinery.
2. Sealants between panels and their intersection.
3. Mechanically closed single lock standing seam at exterior side joint. Interior side joint is a single tongue and groove interlock.

GUIDE SPECIFICATIONS: CFR ROOF PANEL (cont.)

1.2 RELATED SECTIONS

- A. Section 07 62 00 – Sheet Metal Flashing and Trim
- B. Section 07 92 00 – Joint Sealants
- C. Section 01 81 13 – Sustainable Design Requirements – LEED: The Leadership in Energy & Environmental Design green building rating systems developed and adopted by the U.S. Green Building Council (USGBC). The systems certify levels of environmental achievement based on a point and credit scoring system.

1.3 REFERENCES

A. Fire Performance

- 1. **ASTM E 84** – Standard Test Method for Surface Burning Characteristics of Building Materials

B. Structural Performance

- 1. **ASTM E 1592** – Structural Performance of Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
- 2. **FM 4471** – Class 1 Exterior Roof Structure Performance
- 3. **UL 580** – Uplift Resistance of Roof Assemblies
- 4. **UL 1897** – Uplift Test for Roof Covering Systems

C. Vapor Barrier Performance

- 1. **ASTM E 1646** – Water Penetration of Exterior Metal Roof Panel Systems by Static Air Pressure Difference
- 2. **ASTM E 1680** – Rate of Air Leakage Through Exterior Metal Roof Panel Systems

D. Thermal Performance

- 1. **ASTM C 518** – Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

E. Metal Coatings

- 1. **ASTM E 18** – Test Methods for Rockwell Hardness of Metallic Finishes
- 2. **ASTM A 653** – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
- 3. **ASTM A 792** – Standard Specification for Steel Sheet, Aluminum-Zinc Alloy Coated Steel by the Hot-Dip Process
- 4. **ASTM A 924** – General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

F. Canadian Certifications

- 1. **CAN/ULC S102** – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
- 2. **CAN/ULC S126** – Fire Spread Under Roof-Deck Assemblies
- 3. **CAN/ULC S138** – Fire Growth of Insulated Building Panels in a Full-Scale Room Configuration

G. Special Approvals

- 1. **City of Los Angeles** – Product Approval for City/County of Los Angeles
- 2. **Miami Dade Roof** – Product Approval for City of Miami and Dade County

H. Foam Properties

- 1. **ASTM D 1621** – Compressive Properties of Rigid Cellular Plastics
- 2. **ASTM D 1622** – Apparent Density of Rigid Cellular Plastics
- 3. **ASTM D 1623** – Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
- 4. **ASTM C 273** – Shear Properties of Sandwich Core Materials

1.4 PERFORMANCE REQUIREMENTS

A. STRUCTURAL TESTS

- 1. **Factory Mutual Research Corporation (FMRC) Standard 4471:** The panel meets requirements for I-60 or I-90 windstorm classifications and a hailstorm classification of Class 1-SH.

GUIDE SPECIFICATIONS: CFR ROOF PANEL (cont.)

2. Underwriters Laboratory (UL) Uplift Tests for Roof Assemblies: UL Class 90 uplift in accordance with UL 580, 16 gauge support members at 7'-0", maximum spacing. Uplift resistance of 166 psf at 5'-0" and 140 psf at 7'-0" in accordance with UL 1897, using 16 gauge support members.

3. Static Air Pressure Difference: Conducted in accordance with ASTM E 1592 Structural Performance of Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

B. THERMAL PERFORMANCE

1. Testing in accordance with ASTM C 518, "Measurement of Steady State Thermal Transmission", the panels shall provide a K-factor of .140 btu/sf/hr/deg. F at 75° F (24° C) mean temperature.

C. VAPOR BARRIER

1. Water and Air Penetration: The panel assembly was tested in accordance with ASTM E 1646 Water Penetration of Exterior Metal Roof Panel Systems by Static Air Pressure Difference and ASTM E 1680 Rate of Air Leakage Through Exterior Metal Roof Panel Systems. Both tests were found in compliance with the test methods.

D. FIRE

1. Factory Mutual Research Corporation (FMRC) Standard 4471: The panel meets requirements of a Class 1A fire classification.

2. Surface Burning Characteristics: The insulated core shall have been tested in accordance with ASTM E 84 and CAN/ULC S102 for surface burning characteristics. The core shall have a maximum flame spread of 25 and a maximum smoke developed rating of 450.

3. Canadian Certifications – Flame Spread: Evaluation of fire spread over their exterior surface was conducted in accordance with CAN/ULC S138 Fire Growth of Insulated Building Panels in a Full-Scale Room Configuration and CAN/ULC S126 Fire Spread Under Roof-Deck Assemblies. Both tests were found to be in compliance

E. SPECIAL APPROVALS

1. Miami Dade County: The product has been designed to comply with the High Velocity Hurricane Zone of the Florida Building Code, have a large and small missile impact rating. NOA number 09-0310.10.

2. City of Los Angeles: Under General Approval for CFR-42 Insulated Roof Panel with minimum density polyurethane foam core and minimum painted (optional) interior and exterior face. Research Report RR-25441.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00 (previously 01300).

B. Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Material type, metal thickness and finish.
4. Installation methods.

C. Shop Drawings: Including elevations, fastening patterns, sections of each condition and details as required.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Panel Sample: Submit 1' (305 mm) high joint panel sample for each profile specified indicating the metal, texture and finish.

F. LEED Submittals:

1. SS – Sustainable Sites

a. SS Credit 7.2: Heat Island Effect

a. Solar Reflectance Index (SRI) for low sloped and/or steep sloped roof application.–Any color from Metl-Span standard color chart.

GUIDE SPECIFICATIONS: CFR ROOF PANEL (cont.)

2. EA – Energy and Atmosphere

a. EA Credit 1: Optimize Energy Performance

a. Demonstrating percentage of performance improvement that meets or surpasses ASHRAE/IESNA Standard 90.1-2004.

b. EA Credit 2: On-Site Renewable Energy

a. Using the CFR Insul-Solar product in conjunction with the CFR Roof Panel. Renewable system as a percentage of the buildings annual cost per ASHRAE/IESNA Standard 90.1-2004 or US DOE Commercial Buildings Energy Consumption Survey Database.

3. MR – Material and Resource

a. MR Credit 4.1 & 4.2: Recycled Content

a. Percentage weight of post-consumer and pre-consumer recycled content – use materials with recycled content.

b. Recycled content value of product assembly by weight.

c. Indicate total value (cost) of each product used.

4. IEQ – Indoor Environmental Quality

a. IEQ Credit 4.1: Low-Emitting Materials – Adhesives and Sealants

a. Product data on adhesives and sealants to comply with standards of South Coast Air Quality Management District Rule #1168.

b. Product data for paint and coatings have no VOC's.

5. WE – Water Efficiency

a. WE Credit 1 & 2: Water Efficient Landscaping and Innovative Wastewater Technology

a. Demonstrated reduction in irrigation water by 50% from calculated mid-summer base line case.

b. Demonstrated reduction in potable used for building sewage conveyance by 50%.

G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

H. Miami Dade County Approval: Manufacturer is accepted under the rules governing the use of construction materials for Miami-Dade County and has been designed to comply with the High Velocity Hurricane Zone of the Florida Building Code.

I. City of Los Angeles: Complete plans and calculations signed by a licensed engineer or architect registered in the State of California for framing and panel attachment and submitted to the structural plan check section for approval.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing factory foamed-in-place insulated metal panels with a minimum documented experience of ten (10) years.

B. Installer Qualifications: Company specializing in installation of the products specified for projects of similar size and scope with minimum five (5) years documented experience.

1.7 SUBSTITUTIONS

A. Materials, accessories and testing specified shall establish the minimum level of quality, performance, dimension and appearance required of any substitution.

B. No substitution will be considered unless a written request to the specifying architect is received for approval at least ten (10) days prior to the established bid date. Evidence shall be submitted to demonstrate equivalency to the products and performance levels specified. Laminated panels shall not be considered acceptable substitutes for the specified foamed-in-place panels.

GUIDE SPECIFICATIONS: CFR ROOF PANEL (cont.)

1. A complete description of the substitution including details referenced to the roof panel shown on the contract drawings.
 2. Independent test reports verifying compliance with specified performance requirements.
 3. A detailed listing of each specification item with which the substitution does not fully comply.
- C. The manufacturer or roof panel contractor proposing the substitution shall pay the costs of any other subcontractor affected by the proposed substitution.

1.8 DELIVERY STORAGE AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products off the ground, with panels sloped for drainage and covered to protect factory finishes from damage. Stack bundles no more than two (2) high.

1.9 WARRANTY

- A. **Manufacturer's Warranty:** Manufacturer's two (2) year limited warranty that panels are free from defects in materials and workmanship, beginning from the date of shipment of panels, but excluding coil coatings (paint finishes) covered under a separate warranty.
- B. The installation contractor shall issue a separate one (1) year warranty against defects in installed materials and workmanship, beginning from the date of substantial completion of the installation.
- C. Submit exterior paint manufacturer's forty (40) year limited warranty on paint finish against cracking, peeling and blistering. Exterior paint manufacturers twenty (20) year limited warranty on paint finish against chalk and color change.
- D. **Specifier:** No warranty is offered for the interior painted surface of the panel.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. **Acceptable Manufacturer:** Metl-Span, LLC; 1720 Lakepointe Drive, Suite #101, Lewisville, TX 75057; Toll-Free (877) 585-9969; Fax: (972) 420-9382; E-mail: panel@metlspan.com; Web site: www.metlspan.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 23 00 (previously 01230).

2.2 PANEL DESIGN

- A. **Panel – General Requirements:** Metl-Span CFR Roof Panel - Roll-formed exterior and interior steel sheet faces chemically bonded to continuously foamed-in-place polyurethane core; laminated panels are not acceptable.
1. **Exterior Face:** G-90 galvanized stucco embossed painted steel, minimum Grade 50 and/or AZ-50 Aluminum-Zinc stucco embossed, painted steel in 24ga (0.0236") & 22 ga (0.0296"); or AZ-55 Aluminum-Zinc stucco embossed, unpainted steel in 24ga (0.0236") unless otherwise indicated.
 2. **Interior Face:** G-90 galvanized unembossed painted steel, minimum Grade 33 and/or AZ-50 Aluminum-Zinc stucco embossed painted steel, minimum Grade 33 in 26ga (0.0187"), 24ga (0.0236"), 22ga (0.0296"), unless otherwise indicated.
 3. **Longitudinal Joint Sealants:** Field applied.
 4. **Foam Core:** Non-CFC, Non-VOC, Class I, polyurethane.
 5. **Exterior Finish:** One coat 70% polyvinylidene fluoride (PVDF) coil coating, nominal 0.7 mil (0.02 mm), over 0.2 mil (0.005 mm) primer; color as selected by Architect from manufacturer's standard colors; or a clear acrylic finish.
 6. **Interior Finish:** Once coat factory applied Polyester coil coating nominal 0.7 mil (0.02 mm) in Igloo White, over 0.2 mil (0.005 mm) primer.

GUIDE SPECIFICATIONS: CFR ROOF PANEL (cont.)

B. Metl-Span® CFR Roof Panel: The CFR insulated metal roof panel shall have a tongue and groove interlock at the base of the panel and a mechanically closed standing seam at the exterior surface of the panel. The CFR roof panel shall be attached to the structure with a clip and fasteners concealed within the side joint of the panel and the installation shall be completely from the exterior side of the building envelope. Exposed through fasteners into the ribs or flat areas of the panel from the exterior side are not acceptable. The roof panels shall be factory notched and swaged to facilitate endlapping of the panels, and the endlap extensions shall be factory cut and have all foam removed. Field notching, swaging and cutting of endlap extensions shall not be accepted. Endlaps shall also have factory installed backer plates to insure proper fit-up of the exterior faces for maximum water tightness.

1. **Exterior Profile:** 2" high mechanically closed standing seam; with an 1/8" deep Mesa Wave profile between the seams

2. **Interior Profile:** Mesa Wave Pattern, 1/8" deep or Light Mesa Wave Pattern, 1/16" deep.

3. **Module Width:** 30", 36" & 42"

4. **Thickness:** 2", 2.5", 2.75", 3", 4", 5" & 6"

5. Foam core shall be continuously foamed-in-place min 92% closed cell structure, Non-CFC, Non-VOC polyurethane.

C. Flashing and trim shall be brake-formed sheet metal in the same thickness and finish to match the panels.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Panel installer shall examine all structural steel before beginning installation to ensure that all supporting members are straight, level, plumb, properly braced and satisfactory for panel installation.

B. Proper alignment of the roof framing members is necessary to ensure proper fit up and performance of the roof assembly. Alignment tolerances required are specified below.

1. **Out of Square:** The roof system can accommodate 1/4" of saw tooth tolerance at the eave and end laps.

2. **Structural Length:** The roof system can accommodate an overall +/- 2" rake to rake tolerance or +/- 1" at each rake.

3. **Structural Width:** The roof system can accommodate an overall +/- 1" eave to ridge tolerance, or +/- 1/2" at the eave, end lap and ridge.

4. **Vertical Alignment:** The roof system can accommodate a vertical deviation from the nominal roof plane of +/- 1/8" in any 5' length, +/- 1/4" in any 20' length and +/- 1/2" over the entire roof area.

C. Do not begin installation until unsatisfactory conditions are corrected.

D. Start of installation shall signify structure and adjacent conditions as being proper and acceptable.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions and recommendations including approved shop drawings, installation guidebook and manufacturer's handbook of construction details.

B. Install panel as indicated on drawings, accurate in size, square, and free from distortion or defects.

C. Install flashing and trim true and in proper alignment.

GUIDE SPECIFICATIONS: CFR ROOF PANEL (cont.)

D. Install sealants where indicated to clean dry surfaces only without skips or voids, to ensure weathertightness and integrity of the vapor barrier.

E. Conduct Pre-Installation meeting on site with Owner, Architect, Panel Installer, and other trade contractors.

F. Field cut the panels prior to installation to structural steel members.

Caution: When cutting panels, always wear protective eye shields, gloves and long sleeve clothing to protect eyes and skin from the saw chips and saw dust.

3.3 DAMAGED MATERIAL

A. Damage caused by the manufacturer or panel contractor shall be replaced or repaired to as new construction.

B. The panel installer shall inspect and approve each completed area and shall be responsible for protection of completed work from damage by other trades.

C. Specifier: The use of touch-up paint is not recommended for minor surface scratches. However, it is recommended to always use touch-up paint if the scratch goes through the bare metal. When using touch-up paint, it should be limited to small areas. Touch-up paint will never match coil-coated finishes' longevity, color and gloss.

3.4 CLEANING

A. Replace damaged panels and other components of work, which cannot be repaired by finish touch-up or similar minor repair.

B. Wipe finished surfaces clean of any filings caused by drilling or cutting to prevent rust staining.

C. Protective film on trim should be removed before exposure to sunlight.

GUIDE SPECIFICATIONS: ROOF HUGGER® RETROFIT STEEL SUBPURLINS

Specifier Notes: This section covers "Roof Hugger" sub-purlins for retrofitting roofs, walls, and fascias over existing rib metal panels. The one-piece, custom-punched, galvanized steel, Z-section fits into and over existing profile to be covered. The sub-purlins are prepunched to nest into the existing rib profiles, prepunched for fasteners, and fasten directly into the existing purlins with fasteners.

The new International Building Code adopted by all U.S. states requires the roofs to be analyzed by zones, i.e., corner, edge and field zones. Each zone will have a different uplift load requirement. Older buildings were designed with uniform roof loading; as a result the 5' purlin spacing typically found in older buildings may not be adequate to meet current code requirements in high wind zone areas. The new sub-purlin type and spacing will be a function of the uplift loads, the type of existing panel, and the type and gauge of the new roof panel specified. Roof Hugger recommends consulting a qualified design professional to determine the loads, a compliant roof panel and the proper sub-frame spacing.

Retrofitting an existing roof will create a cavity between the new and existing roofs. Consideration for ventilating and/or insulating this cavity must be given.

Consult Roof Hugger, if needed, for assistance in editing this section for the specific application.

GUIDE SPECIFICATIONS: ROOF HUGGER® RETROFIT STEEL SUBPURLINS (cont.)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Retrofit steel sub-purlins.

1.2 RELATED SECTIONS

***Specifier Notes:** Edit the following list of related sections as required for the project. List other sections with work directly related to this section.*

A. Section 05400 (05 40 00) - Cold-Formed Metal Framing.

B. Section 07220 (07 22 00) - Roof and Deck Insulation.

C. Section 07400 (07 40 00) - Roofing and Siding Panels.

D. Section 07720 (07 72 00) - Roof Accessories.

E. Section 13120 (13 34 19) - Pre-Engineered Structures (Metal Building Systems).

1.3 REFERENCES

A. **ASTM A 653/A 653M** - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

B. **ASTM A 1011/A 1011M** - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

1.4 SUBMITTALS

A. Comply with Section 01330 (01 33 00) - Submittal Procedures.

B. **Product Data:** Submit manufacturer's product data, including installation instructions.

***Specifier Notes:** Edit the following paragraph regarding shop drawings as required for the project. Sub-purlins are typically produced 3/8 inch to 1 inch taller than the height of the major ribs of the existing roof panels. Indicate on the shop drawings if a specific sub-purlin height is required.*

C. **Shop Drawings:** Submit manufacturer's shop drawings for sub-purlins indicating gage, yield strength, flange and web sizes, cutout dimensions, and punch pattern for attachment holes in base flange.

D. **Design Data:** Submit design data from independent engineering firm indicating table of wind uplift capacity of sub-purlins.

1.5 DELIVERY, STORAGE, AND HANDLING

A. **Delivery:** Deliver materials to site in manufacturer's original, unopened bundles, containers, and packaging, with labels clearly identifying product name and manufacturer.

B. **Storage:**

1. Store materials in accordance with manufacturer's instructions.

2. Protect sub-purlins from corrosion, deformation, and other damage.

3. Store sub-purlins off ground, with 1 end elevated to provide drainage.

C. **Handling:** Protect materials during handling and installation from corrosion, deformation, and other damage.

GUIDE SPECIFICATIONS: ROOF HUGGER® RETROFIT STEEL SUBPURLINS (cont.)

PART 2 PRODUCTS

2.1 Manufacturer:

Roof Hugger, Inc., PO Box 1027, Odessa, Florida 33556.

Toll Free Phone: (800) 771-1711. Toll Free Fax: (877) 202-2254. Phone: (813) 909-4424.

Fax: (813) 909-4511. Website www.roofhugger.com. E-Mail dale@roofhugger.com.

2.2 RETROFIT STEEL SUB-PURLINS

A. Retrofit Sub-Purlins: "Roof Hugger".

1. Description:

- a. 1-piece, custom-punched, Z-section.
- b. Prepunched to nest into existing rib profiles.
- c. Prepunched for fasteners.
- d. Fastens directly into existing purlins with fasteners.

2. Material: Galvanized steel, ASTM A 653 or A 1011, G-90, yield strength 50 ksi.

Specifier Notes: Specify gauge. 16 gauge is standard. Consult Roof Hugger for other gauges, including engineering values and lead time.

3. Thickness: [16] [14] [_____] gauge.

Specifier Notes: Sub-purlins are typically produced 3/8 inch to 1 inch taller than the height of the major ribs of the existing roof panels. Consult Roof Hugger for cost-efficient sizes to meet project requirements if web height other than manufacturer's standard is needed.

4. Web Height: [_____ inches] [manufacturer's standard].

Specifier Notes: The number of holes provided in the base flange will be greater than or equal to the required number of fasteners to be installed per linear foot. Custom hole punching of the base flange is available upon request. Roof Hugger may punch additional unused holes in the base flange to aid in installation or to minimize conflict with existing fasteners.

B. Base Flange: Prepunch base flange to manufacturer's standard.

C. Fasteners:

Specifier Notes: The following fasteners are typical minimum for attachment of new sub-purlins to existing metal building purlins. Fastener length will vary with thickness of existing insulation. Fastener length of 1-1/4 to 1-1/2 inches is typical.

Attachment of sub-purlins to existing structural steel (i.e. bar joist/structural channels) will require appropriate fasteners. Roof Hugger does not supply fasteners. Consult Roof Hugger for additional information regarding fasteners.

1. Attachment to Existing Purlins: #12-14 threads per inch, self-drilling, Tek-3.

- a. Length: Required to penetrate existing purlins in accordance with fastener attachment standards.

2. Sub-Purlins Installed Mid-Span: #12-14 threads per inch, self-drilling, Tek-3 fasteners or equal into sub-rafter structure, #17-14 into existing panel when indicated and #10 pancake head through Hugger top flange into sub-rafter when indicated.

GUIDE SPECIFICATIONS: ROOF HUGGER® RETROFIT STEEL SUBPURLINS (cont.)

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive sub-purlins. Notify Architect if areas are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

B. Verify existing purlins and eave struts are in good serviceable condition, without rust-thru of flanges.

C. Field Verify Before Installation of Sub-Purlins:

1. Existing panel profile and panel rib dimensions.

2. Existing panel run-out by measuring roof over several 20-foot areas to confirm panels were installed on module and in-square. Note variations.

Specifier Notes: Indicate on the Drawings details of the major and minor rib configurations of the existing roof panels. If the existing roof is standing seam, verify whether thermal blocking has been installed. If thermal blocking exists consult Roof Hugger, Inc. regarding this situation because special details and parts may be required for this type of panel. Roof Hugger existing panel details are available to aid in obtaining this information. Refer to www.roofhugger.com/roof_details.html, details 17, 18, 19, and 20.

3.2 INSTALLATION

Specifier Notes: Consult Roof Hugger for information regarding the installation of sub-purlins for special situations.

A. Install sub-purlins in accordance with manufacturer's instructions at locations indicated on the standard details or Engineered Drawings if provided.

Specifier Notes: The existing roof is not weathertight until new roof panels are installed over the sub-purlins. Installation of sub-purlins may need to be limited to the amount that can be roofed over each day. Consult Roof Hugger to discuss other options to minimize weather issues.

B. Edit the following paragraph as required.

Limit installation of sub-purlins to amount that can be roofed over each day.

Specifier Notes: Specify number of fasteners (typically less than or equal to the number of holes specified in paragraph 2.2.B) required to be installed per linear foot, as determined by wind load criteria. Typically 2 fasteners per linear foot are required. Refer to Roof Hugger engineering data for allowable uplift loads. Edge zones and field can be specified separately if desired.

C. Install [1] [2] [3] fasteners per linear foot.

GUIDE SPECIFICATIONS: ROOF HUGGER® RETROFIT STEEL SUBPURLINS (cont.)

D. Install sub-purlins directly over existing purlins and fasten to existing purlin through existing panel pan section.

Specifier Notes: *In high-wind zones, special fitted sub-rafter may be required to allow for the installation of Huggers mid-span between existing purlins. Grids made of "Cee's", "Zee's", and/or "hats" may be specified in lieu of special fitted sub-rafter in the corner and/or edge areas to meet the load requirements. The selection of the fitted sub-rafter, or grid system is a function of existing roof panel, the new roof panel and the corner, edge and field pressures. A preliminary estimate of the roof zone pressures can be made at <http://www.roofwinddesigner.com/>*

E. Install Sub-rafter between the existing purlins with #12-14 threads per inch, T-3 fasteners into the existing purlins. Sub-rafter spacing and number of fasteners shall be as specified on the engineered drawings or as specified in the Roof Hugger, Florida Product Approval.

F. Install Huggers over the sub-rafter in areas where they are specified and into the existing purlins being careful to maintain the alignment of the sub-rafter.

G. Install Huggers onto the sub-rafter between the existing purlins as specified with #12-14 threads per inch, T-3 fasteners, typically one fastener on each side of the sub-rafter unless otherwise specified.

H. Where the Roof Hugger is attached to the existing roof panel the hole should be drilled out to the correct diameter to allow for the installation of a #17 fastener through the Roof Hugger and into the existing roof panel.

I. Where the Roof Hugger passes over the fitted sub-rafter a #10 pancake head fastener should be installed through the top flange of the Roof Hugger into the top of the new fitted sub-rafter.

Specifier Notes: *Removal of Existing Roof Fasteners: Typically, the existing roof fasteners are located adjacent to the major panel ribs and need not be removed. When the Hugger is installed atop these fasteners they may cause the base flange of the new Hugger to bend, this is normal. Fasteners located in the center of the existing roof pan can cause sub-purlins to roll or "porpoise". These fasteners would need to be removed. Special punching by Roof Hugger may be possible to minimize the removal of existing roof fasteners located in the center of the existing roof pan. Consult Roof Hugger to review options.*

J. Removal of Existing Roof Fasteners:

1. Do not remove existing roof fasteners unless installation of sub-purlins over fasteners causes sub-purlins to roll or "porpoise". Some distortion of base flange of sub-purlins caused by existing roof fasteners is normal.

Specifier Notes: *In colder climates, special attention should be given to flashing the opening created by removal of the existing skylights to minimize migration of warm, moist air into this cavity.*

K. Existing Skylights:

1. Install sub-purlins over existing skylights.
2. Cut out existing skylights after sub-purlins are installed if new skylights are to be installed over existing skylights.
3. Trim openings as required.

ROOF HUGGER® INSTALLATION

RECEIVING MATERIALS: Roof Huggers are typically placed on wood pallets 3'-5' wide and approximately 10' long weighing up to 3,500 lbs. Roof Huggers are shipped via closed van for less than truckload "LTL" quantities or flatbed trailer for truckload quantities. The installer is responsible for unloading the material and for providing suitable equipment to safely unload the material from the delivery truck. Upon receipt, check material for damage. If any is found note this damage on the shipping documents immediately prior to the truck leaving the delivery site. Please notify Roof Hugger, Inc. of this damage within 48 hours with a faxed copy of the notated shipping documents.

HANDLING: Proper care is required while unloading to prevent personal injury or material damage. Band straps should never be used for pulling or lifting of the pallets. If the pallets are to be lifted onto the roof, confirm the structure has adequate capacity first. If the structure is capable, the pallet should only be placed above the existing structural frames, 1-pallet per frame maximum unless otherwise directed by the engineer of record for the project.

FASTENERS: The following fasteners are those used in typical Roof Hugger installations as indicated. Please note their specific use as described elsewhere in this manual. Typical Nomenclature: #12 (screw diameter) – 14 (threads per inch) x 1 ¼" (length) DP3 (self drilling drill tip size).



Size: #12-14 X 1 ¼" or 1 ½" DP3
Location: Attaching Hugger to existing purlins or joist



Size: #10-16 X 1" DP3
Location: A. Attaching Hugger top flange to subrafter at corner/edge wind uplift zones
 B. At Hugger laps for Purlin Strengthening



Size: #17-14 AB (shown with washer)
Location: A. Attaching Hugger into existing roof panels at Mid-span locations
 B. Securing Hugger anti-rotational arm to existing SSR panel rib (vertical or trapezoidal)



Size: ¼"-14 X 1 ¼" DP3
Location: A. Attachment of Hugger Strut to existing purlin or joist
 B. Attachment of Hugger corner/edge zone Hat Purlin to Strut



Size: #17-5/16" DP3
Location: Attachment of Hugger to existing purlin or joist when existing roof panel is a trapezoidal or vertical rib standing with standoff clip and thermal spacer



Size: ¼"-14 X 3" DP3 with "Spirol" spacer
Location: Attachment of Hugger to existing purlin or joist when existing roof panel is a trapezoidal or vertical rib standing with standoff clip and thermal spacer

ROOF HUGGER® INSTALLATION (cont.)

COMMON HUGGER ATTACHMENT: Roof Huggers are typically attached with #12, self drilling, DP3 fasteners, 14 threads per inch, 1-1/4" to 1-1/2" in length (#12-14 DP3). The number of fasteners per L.F. is determined by Roof Hugger's engineering chart for allowable uniform wind uplift using the new metal roof panel's ASTM E-1592 testing values or as specified by the engineer of record. Generally speaking 2-fasteners are required per L.F. for proper attachment or if more is required, refer to the Roof Hugger quote. Holes are pre-punched in the bottom flange of the Huggers for installation of the fasteners.

***Note:** There may be more holes punched in the base flange than are required for attachment. Roof Hugger does not provide fasteners unless specifically noted otherwise in these instructions and material quotation.*

FASTENER PATTERNS

EXISTING CORRUGATED PANELS: Roof Huggers punched for existing 2.50", 2.67" and 2.75" corrugated panels will have a base flange with a fastener hole between every corrugation. Unless otherwise specified, fasteners are only required at each end of the Hugger and in every other base flange tab. Other corrugated panels such as 4.20" and 7.20" will have additional holes in their base flanges as required for correct attachment.

MIDSPAN ATTACHMENT: Roof Huggers may be attached to the existing panels or to a structural hat or "Z". Attachment to the panel shall be with 2-#17 fasteners (one on each side of the major rib). Attachment to structural hats or "Z" shall be with 1/4" self-drilling fasteners.

PURLIN STRENGTHENING ATTACHMENT: Where the Roof Huggers lap over an existing panel high rib install 2 or 4 - #10-16 x 5/8" (or equal) pancake head self drilling fasteners per lap, pulling both flanges tightly together plus 2-#12 fasteners in the vertical flange as indicated by design.

EXISTING FASTENERS: The existing fasteners can remain provided they do not cause the Roof Huggers to "porpoise" up or roll front to back out of plane with the existing roof. When the Huggers are torque-down by installation of the new fasteners, bending of the bottom flange caused by the existing fastener is normal. Fasteners located in the center of the pan of the existing panel may need to be removed. On an 8"-12" o.c. rib panel this should only occur at a panel lap, ridge cap or eave area. Narrower ribbed panel such as 6" o.c. panels, with fasteners in the center of the sheet pan, may require removal of all fasteners. Roof Hugger can provide special punching to minimize or eliminate removal of these fasteners if requested during the pricing and ordering of the Huggers.

ROOF HUGGER® INSTALLATION (cont.)

ERECTION

ONLY install Huggers directly over and into existing structural members (purlins, joist, etc.) and fastened through the existing panel pan section. This is true unless otherwise explained for mid-span attachment to Hugger sub-rafters at corner and edge wind uplift zones. Huggers should be installed with the top flange pointing up the roof slope.

LAYOUT: Layout Roof Huggers so to minimize top panel fasteners or attachment clips falling on the cut ends of the Huggers. This is normally accomplished in standing seam systems with a narrower starter panel to offset the new panel from the existing panel module. If landing on the cut ends is unavoidable, then attach the adjacent Huggers overlapping top flange ends with 2-#10-16 DP3 pancake head fasteners or back lap the Huggers one full corrugation to produce a double thickness and continuity of the top flange across the lap.

SKYLIGHTS: If existing roof has skylights, DO NOT REMOVE THEM prior to installing the Huggers. Run Huggers across existing skylight and screw into position. Cut out and trim opening if new skylights are to be installed above, or leave panel in position if skylights are to be eliminated. Removal of skylight prior to installing Huggers may result in an undesirable depression of the new roof in old skylight area. In cold climates, if skylights are to be installed, it is desirable to replace the old skylight with a new one and install another new skylight above it to minimize any condensation issues in this area. Consult your local moisture control professional.

WEATHERTIGHTNESS: During erection, prior to the installation of the new roof panel the Roof Huggers are NOT watertight. It is recommended that only the amount of Huggers to be covered with new roof panels be installed in a given workday. Mastic can be placed beneath the Roof Huggers at the attachment points to minimize water intrusion during construction but this may not provide a complete water seal.

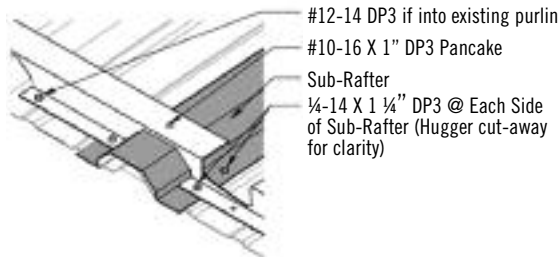
BRIDGING: Bracing or bridging may be required where the Hugger height exceeds 3-3/8." Consult your local engineer for specific requirements for your locale. We can provide details of previous installations upon request.

MIDSPAN ATTACHMENT: If Roof Huggers are to be installed "mid-span" between the existing purlins, a special #17-14 AB fastener will be required for attachment to the panel. The #17's are only used for attachment to the existing panel and always on each side of the major ribs. Care must be used not to strip the fastener in the panel.

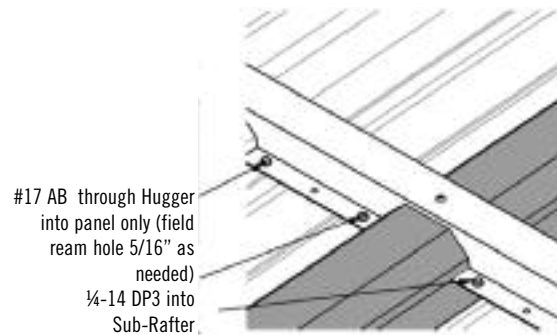
ROOF HUGGER® INSTALLATION (cont.)

This attachment is similar for existing thru-fastened and standing seam panels. Huggers may be installed onto structural “Hats” or “Z’s” in this area. A ¼”-#14 self-drilling fastener shall be used to attach the Hugger to this member. This assembly or other grid assemblies are used to achieve higher loads than the existing purlin spacing may allow and require special attachment as follows:

HUGGER OVER PURLIN

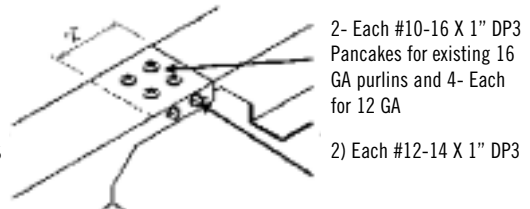


HUGGER NOT OVER PURLIN



Note: If structural hats are provided, loosely place hats and Huggers in position prior to installing any fasteners to prevent alignment problems in these areas.

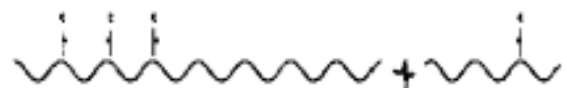
PURLIN STRENGTHENING ATTACHMENT: If Roof Huggers are to be installed to strengthen the existing purlins, the top flanges of the Roof Huggers must form a continuous band. At each lap point of the Roof Huggers the over lapping top flanges must be pulled together and joined by #10-16 DP3 pancake head fasteners as shown below.



OUT OF MODULE EXISTING ROOF PANELS: In some rare cases, the existing roof panels may be installed so poorly they do not maintain the proper panel spacing (i.e.: a 12" o.c. “R” panel may gain 1/8" per L.F., so in 10' the roof would measure a gain of 1 ¼"). The Roof Hugger “notches” are over cut to allow for most conditions; however some cases may exceed our tolerances. If this occurs, the Roof Hugger may be cut to allow proper fit. Use care to avoid fasteners or clips from falling on the resulting gap and back lap the Huggers if necessary.

MEASURING EXISTING CORRUGATED PANELS

If corrugated panel is 2.67", then 9 ribs = 24"
If corrugated panel is 2.50", then 8 ribs = 20"
If corrugated panel is 2.75", then 8 ribs = 22"
If corrugated panel is 4.20", then 5 ribs = 21"



ROOF HUGGER® INSTALLATION (cont.)

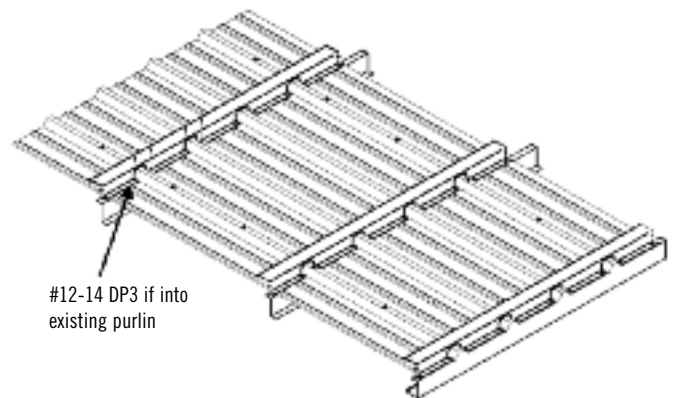
FLASHING AND TRIM: Rake angles, trims, curbs and flashings are not provided by Roof Hugger. Consult your panel manufacturer for the necessary details and required materials to meet their design requirements. Roof Hugger is available to discuss any special situations.

WHEN IN DOUBT ABOUT ANY SPECIAL SITUATION, CONSULT YOUR PROJECT ARCHITECT OR ENGINEER FIRST. ROOF HUGGER IS ALSO AVAILABLE TO DISCUSS ANY ISSUES OR DETAILS. IN THIS MANNER, PROBLEMS CAN BE AVOIDED AND THE HIGHEST INDUSTRY STANDARDS OF A QUALITY INSTALLATION WILL BE ASSURED.

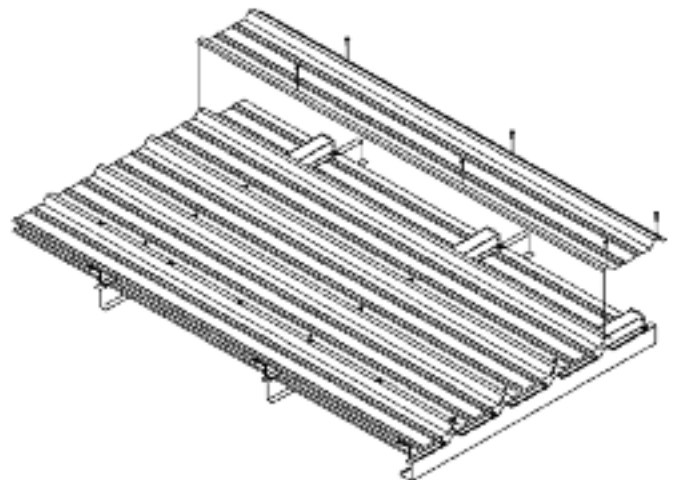
STEP-BY-STEP ROOF HUGGER® INSTALLATION

STANDARD INSTALLATION (Corner/Edge Zone Framing not required)

Step 1: Install Huggers directly over and into existing building purlins with #12-14 self-drilling fasteners. Center existing panel's major rib in Hugger cut-out. Ensure Hugger straightness along purlin run by frequently monitoring dimension from existing roof eave. Stringlines can be used if elected by installer.



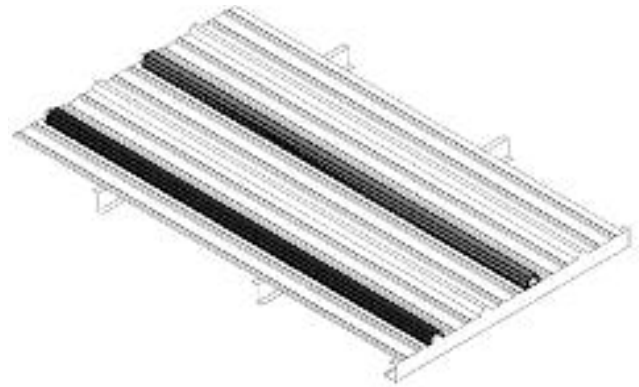
Step 2: Install metal roof panel system in accordance with manufacturer's standards.



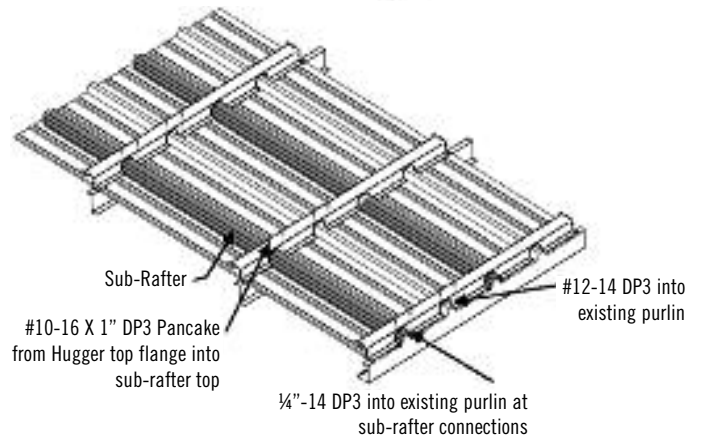
STEP-BY-STEP ROOF HUGGER® INSTALLATION (cont.)

CORNER AND/OR EDGE ZONE FRAMING INSTALLATION

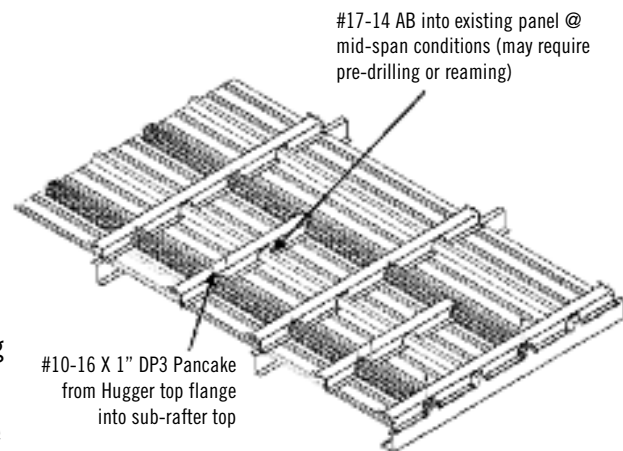
Step 1: Loosely place Hugger sub-rafters spaced perpendicular to roof slope as directed (normally no more than 2'-0" o.c.). DO NOT ATTACH sub-rafters until new Huggers have been placed into position.



Step 2: Place new Huggers into position ensuring all new sub-framing is square and tightly fitted. Secure the positioning of the Huggers and sub-rafters by installing one #12-14 DP3 at juncture of the two members (Hugger top flange into top of sub-rafter). Begin final attachment of members at juncture of the Hugger and sub-rafter's base flanges for locations that are directly over an existing purlin using #12-14 DP3 fasteners at each side of sub-rafter.



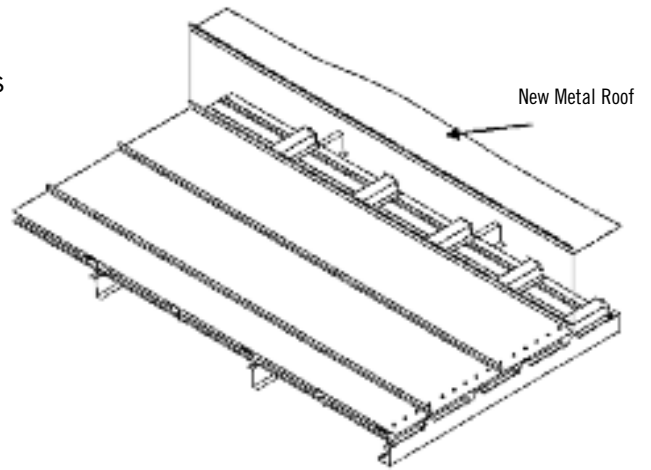
Step 3: Begin positioning mid-span Huggers as directed. These are the Huggers that will not be installed over an existing purlin, rather over the existing panel only. Once in place, install a #17-14 AB fasteners through the Hugger into the existing roof panel at each side of the panel's major rib. Pre-drilling of Hugger and panel may be necessary. Complete installation by installing a #10-16 DP3 Pancake at the intersection of each Hugger and sub-rafter. Refer to page 19 for more information.



STEP-BY-STEP ROOF HUGGER® INSTALLATION (cont.)

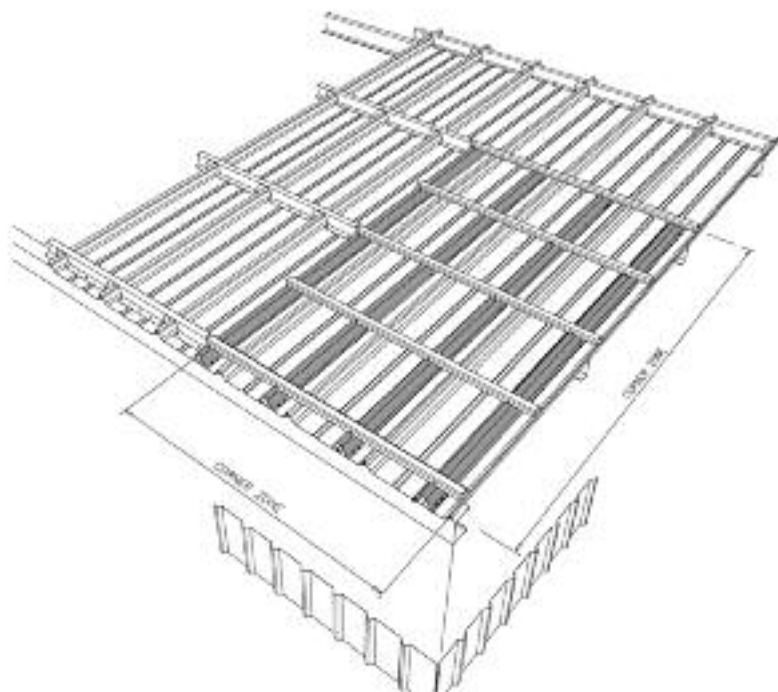
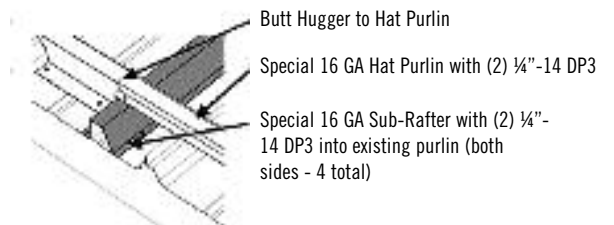
CORNER AND/OR EDGE ZONE FRAMING INSTALLATION

Step 4: Install metal roof panel system in accordance with manufacturer's standards



CORNER AND/OR EDGE ZONE FRAMING INSTALLATION USING STRUCTURAL HATS

Dependent on panel clip attachment and wind uplift tested values, usually in higher wind zone areas, Roof Hugger will have to utilize structural 16 GA hat-shaped members to make up the corner and/or edge zone framing. The illustration below explains the difference.



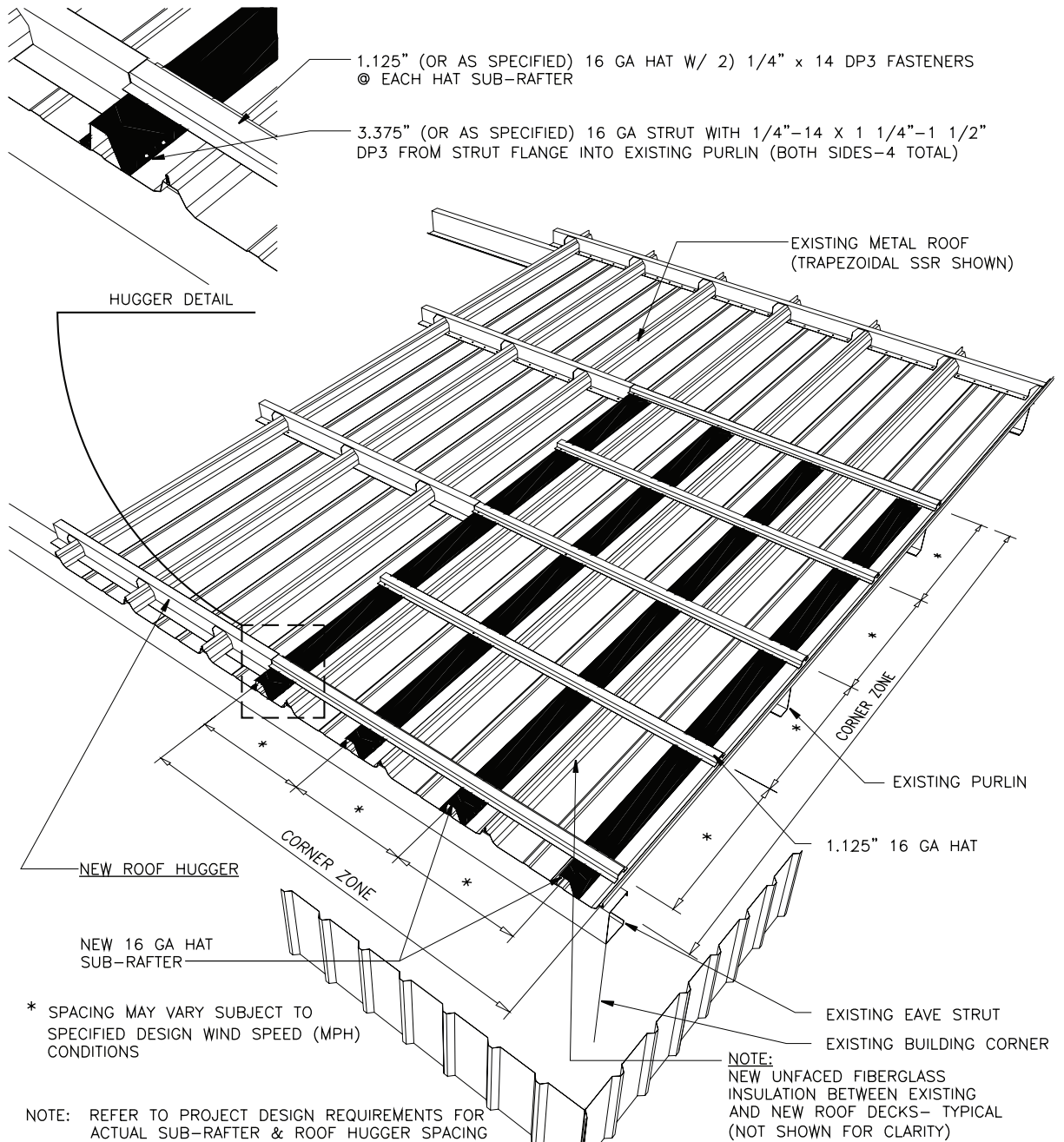
DETAIL INDEX

TITLE	AUTOCAD FILE NO.	PAGE NO.
HAT GRID ROOF HUGGER JUNCTION	RH C450.501 HAT	24
CORNER/EDGE WIND UPLIFT ZONE FRAMING	RH C450.501 R	25
CORNER/EDGE WIND UPLIFT ZONE FRAMING	RH C450.501 T	26
SIDELAP SECTION	RH C450.502 R	27
SIDELAP SECTION	RH C450.502 T	28
PANEL ATTACHMENT SECTION	RH C450.503 R	29
PANEL ATTACHMENT SECTION	RH C450.503 T	30
PANEL ATTACHMENT AND SIDELAP DETAIL	RH C450.504 R	31
PANEL ATTACHMENT AND SIDELAP DETAIL	RH C450.504 T	32
PANEL ENDLAP SECTION	RH C450.505 R	33
PANEL ENDLAP SECTION	RH C450.505 T	34
PANEL ENDLAP DETAIL	RH C450.506 R	35
PANEL ENDLAP DETAIL	RH C450.506 T	36
LOW EAVE SECTION	RH C450.507 R	37
LOW EAVE SECTION	RH C450.507 T	38
LOW EAVE SECTION	RH C450.508 R	39
LOW EAVE SECTION	RH C450.508 T	40
LOW EAVE SECTION @ CANOPY	RH C450.510 R	41
LOW EAVE SECTION @ CANOPY	RH C450.510 T	42
EAVE GUTTER SECTION	RH C450.511 R	43
EAVE GUTTER SECTION	RH C450.511 T	44
EAVE GUTTER DETAIL	RH C450.512 R	45
EAVE GUTTER DETAIL	RH C450.512 T	46
EAVE GUTTER SECTION	RH C450.513 R	47
EAVE GUTTER SECTION	RH C450.513 T	48
HIGH SIDE EAVE SECTION	RH C450.514 R	49
HIGH SIDE EAVE SECTION	RH C450.514 T	50
HIGH SIDE EAVE DETAIL	RH C450.515 R	51
HIGH SIDE EAVE DETAIL	RH C450.515 T	52
HIGH SIDE EAVE SECTION @ CANOPY	RH C450.516 R	53
HIGH SIDE EAVE SECTION @ CANOPY	RH C450.516 T	54
HIGH SIDE TRANSITION SECTION (WALL BELOW)	RH C450.517 R	55
HIGH SIDE TRANSITION SECTION (WALL BELOW)	RH C450.517 T	56
HIGH SIDE TRANSITION SECTION (OPEN BELOW)	RH C450.518 R	57
HIGH SIDE TRANSITION SECTION (OPEN BELOW)	RH C450.518 T	58
RIDGE SECTION	RH C450.519 R	59
RIDGE SECTION	RH C450.519 T	60
RAKE SECTION	RH C450.520 R	61
RAKE SECTION	RH C450.520 T	62
RAKE DETAIL	RH C450.521 R	63
RAKE DETAIL	RH C450.521 T	64
RAKE SECTION	RH C450.522 R	65
RAKE SECTION	RH C450.522 T	66
RAKE SECTION @ CANOPY	RH C450.523 R	67
RAKE SECTION @ CANOPY	RH C450.523 T	68
RAKE TRANSITION SECTION	RH C450.524 R	69
RAKE TRANSITION SECTION	RH C450.524 T	70
INTERIOR GUTTER SECTION	RH C450.527 R	71
INTERIOR GUTTER SECTION	RH C450.527 T	72
VALLEY SECTION	RH C450.528 R	73
VALLEY SECTION	RH C450.528 T	74
HIP SECTION	RH C450.529 R	75
HIP SECTION	RH C450.529 T	76

HAT GRID ROOF HUGGER JUNCTION

EXISTING TRAPEZOIDAL SSR ROOF PROFILE

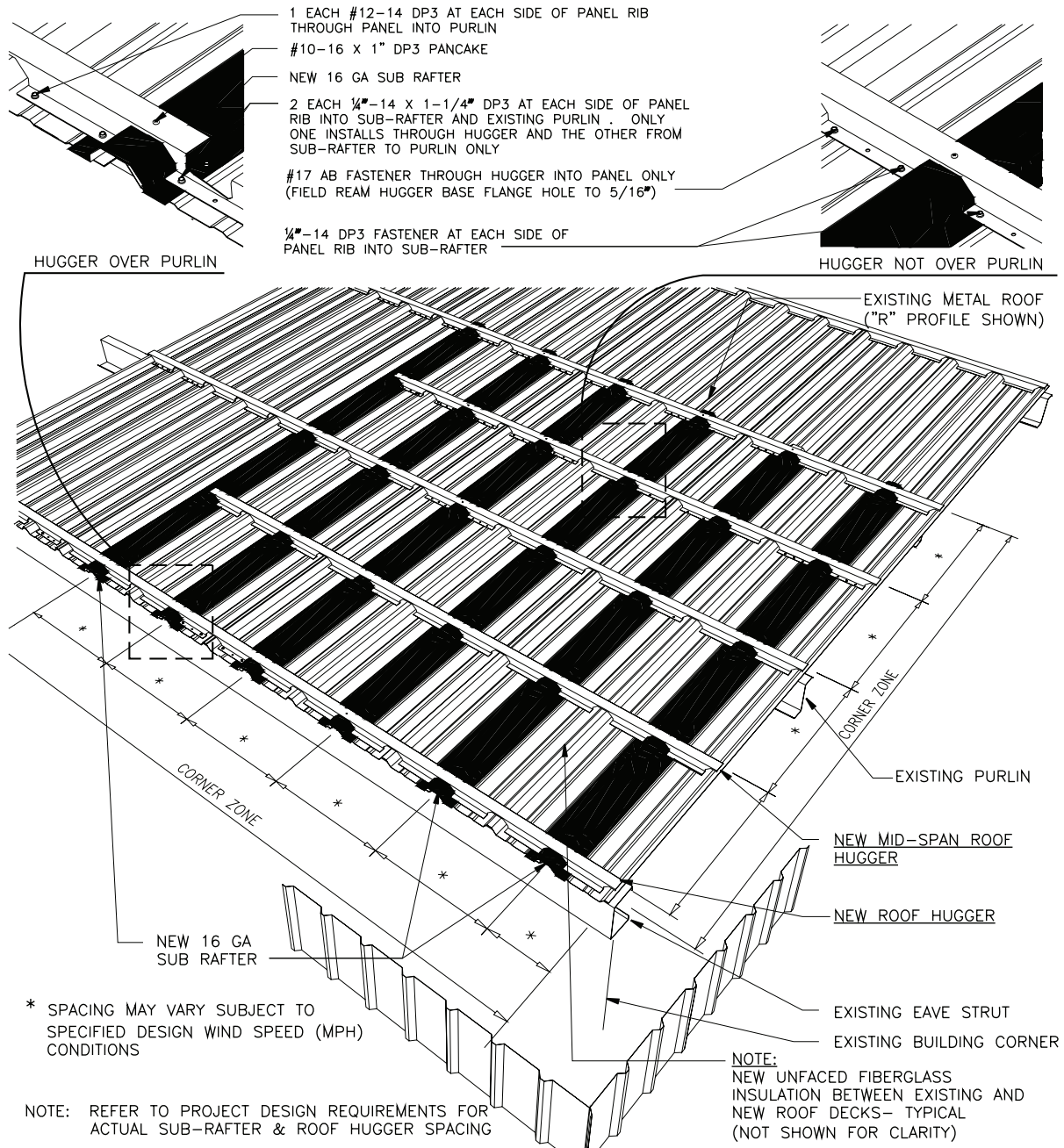
RH C450.501 HAT



CORNER/EDGE WIND UPLIFT ZONE FRAMING

EXISTING "R" PROFILE METAL ROOF

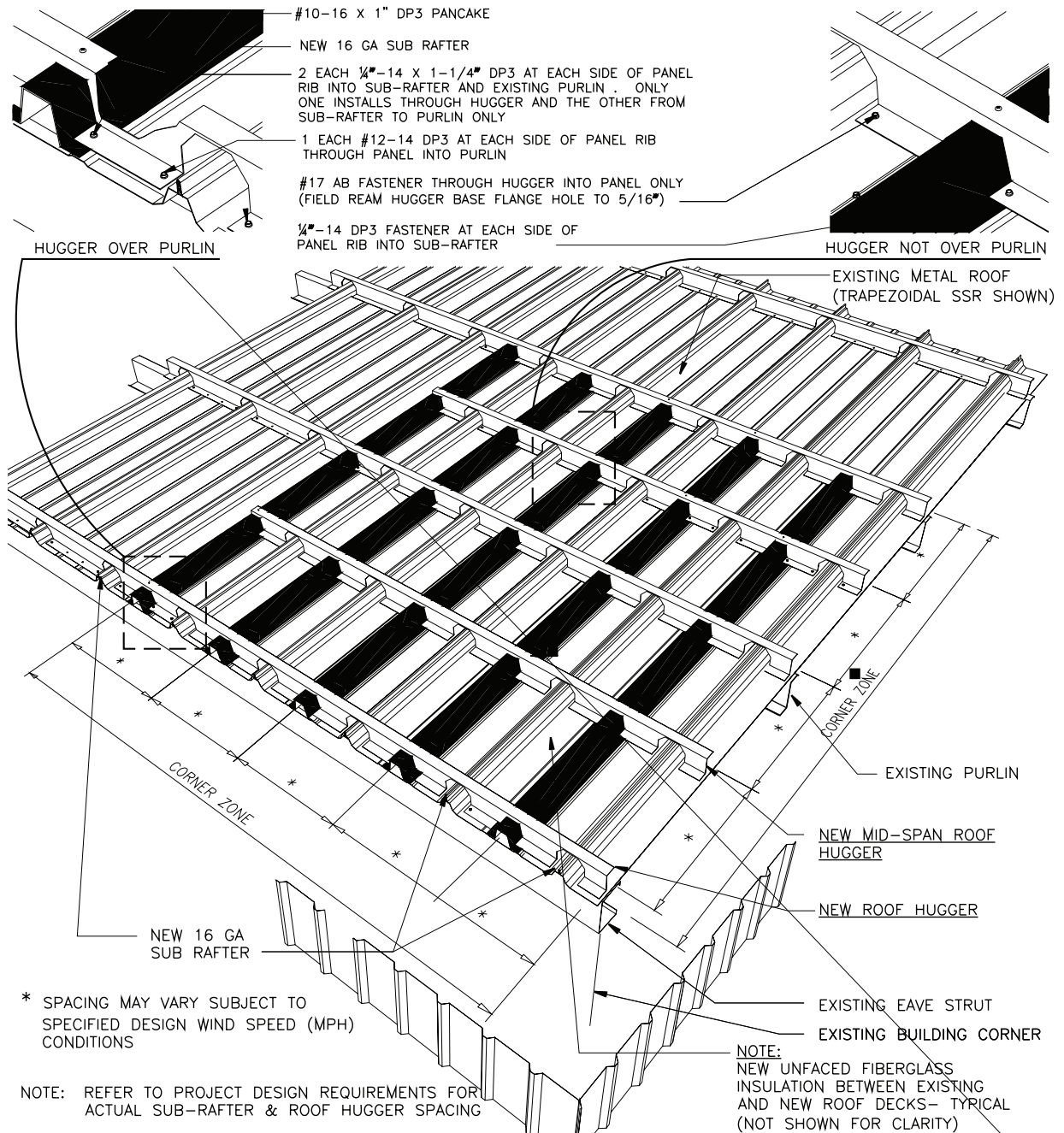
RH C450.501 R



CORNER/EDGE WIND UPLIFT ZONE FRAMING

EXISTING TRAPEZOIDAL SSR ROOF PROFILE

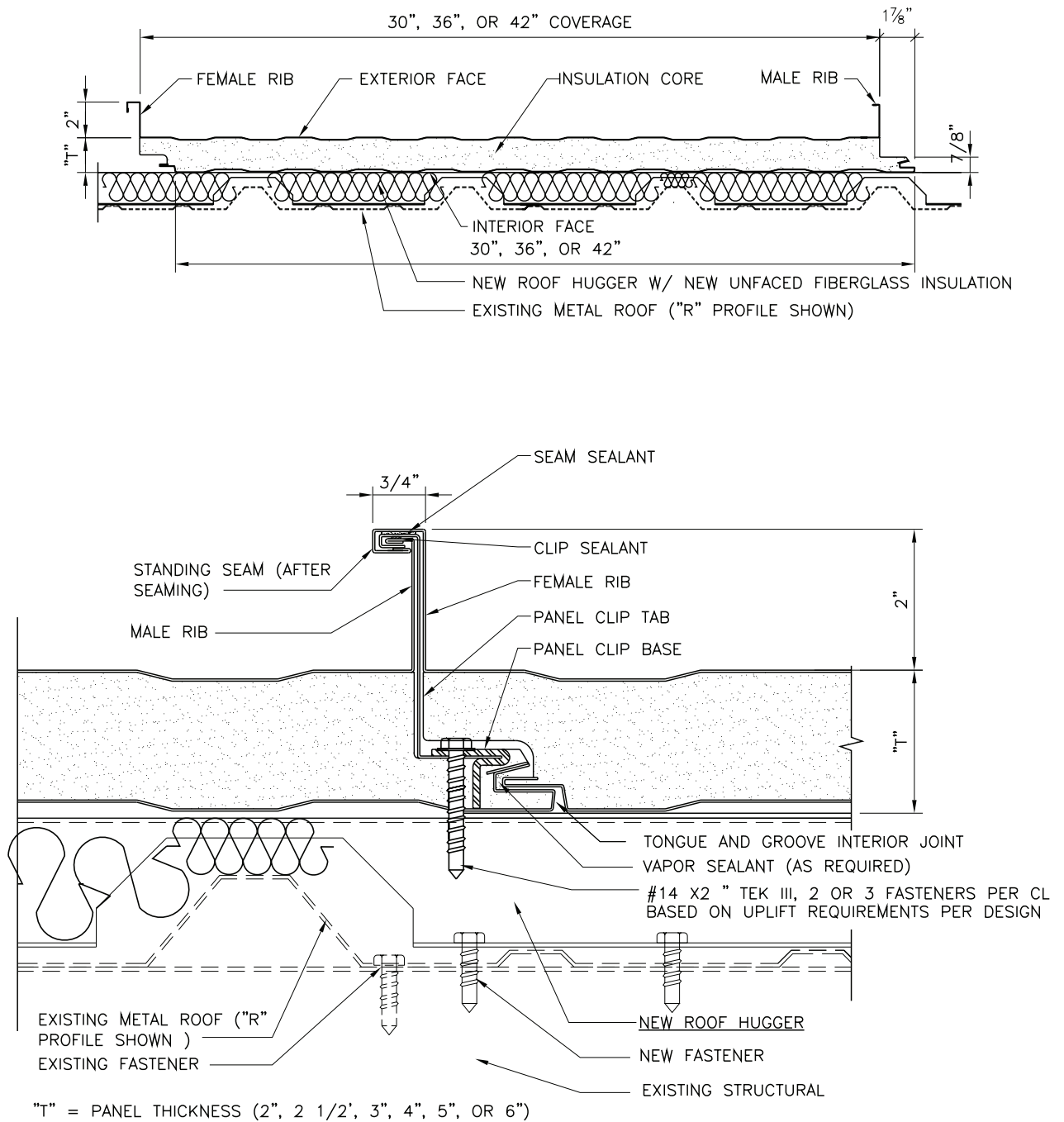
RH C450.501 T



SIDELAP SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

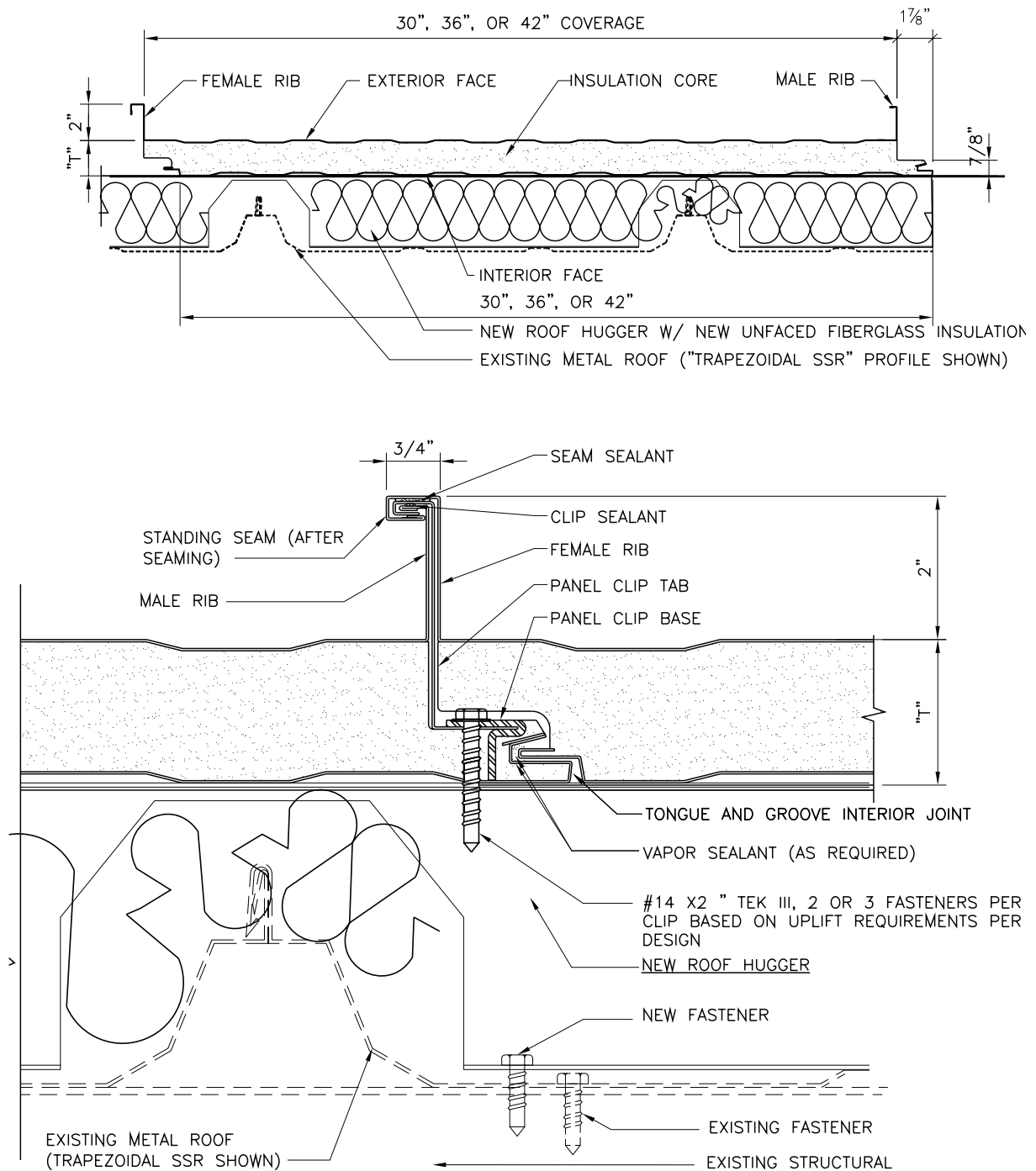
RH C450.502 R



SIDELAP SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

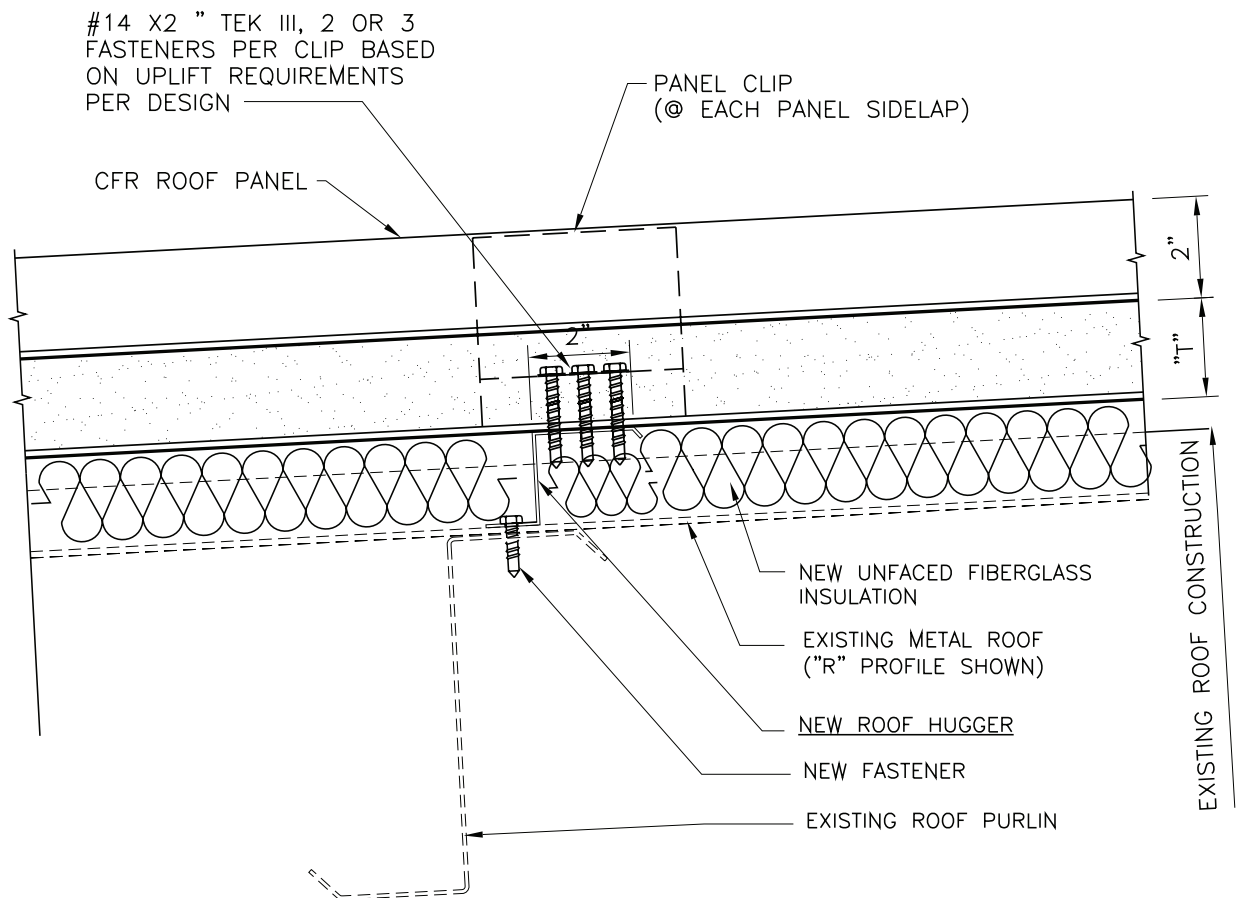
RH C450.502 T



PANEL ATTACHMENT SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

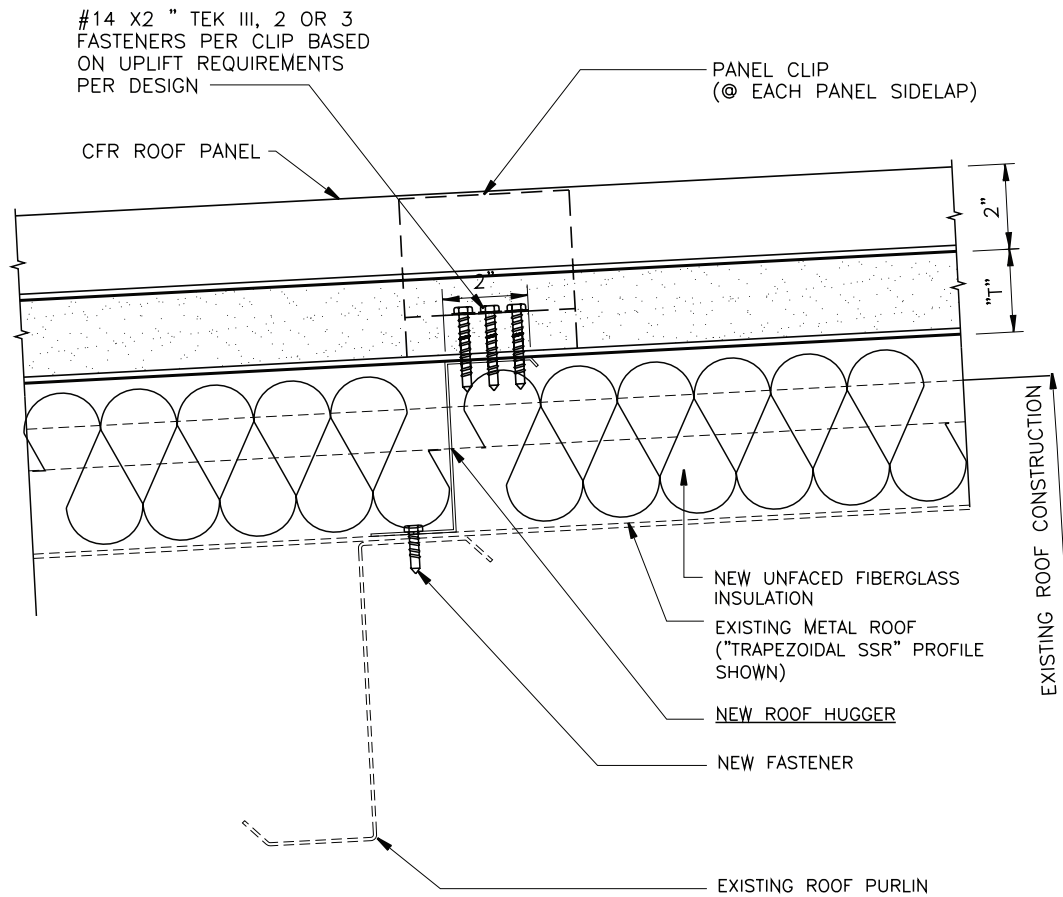
RH C450.503 R



PANEL ATTACHMENT SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.503 T

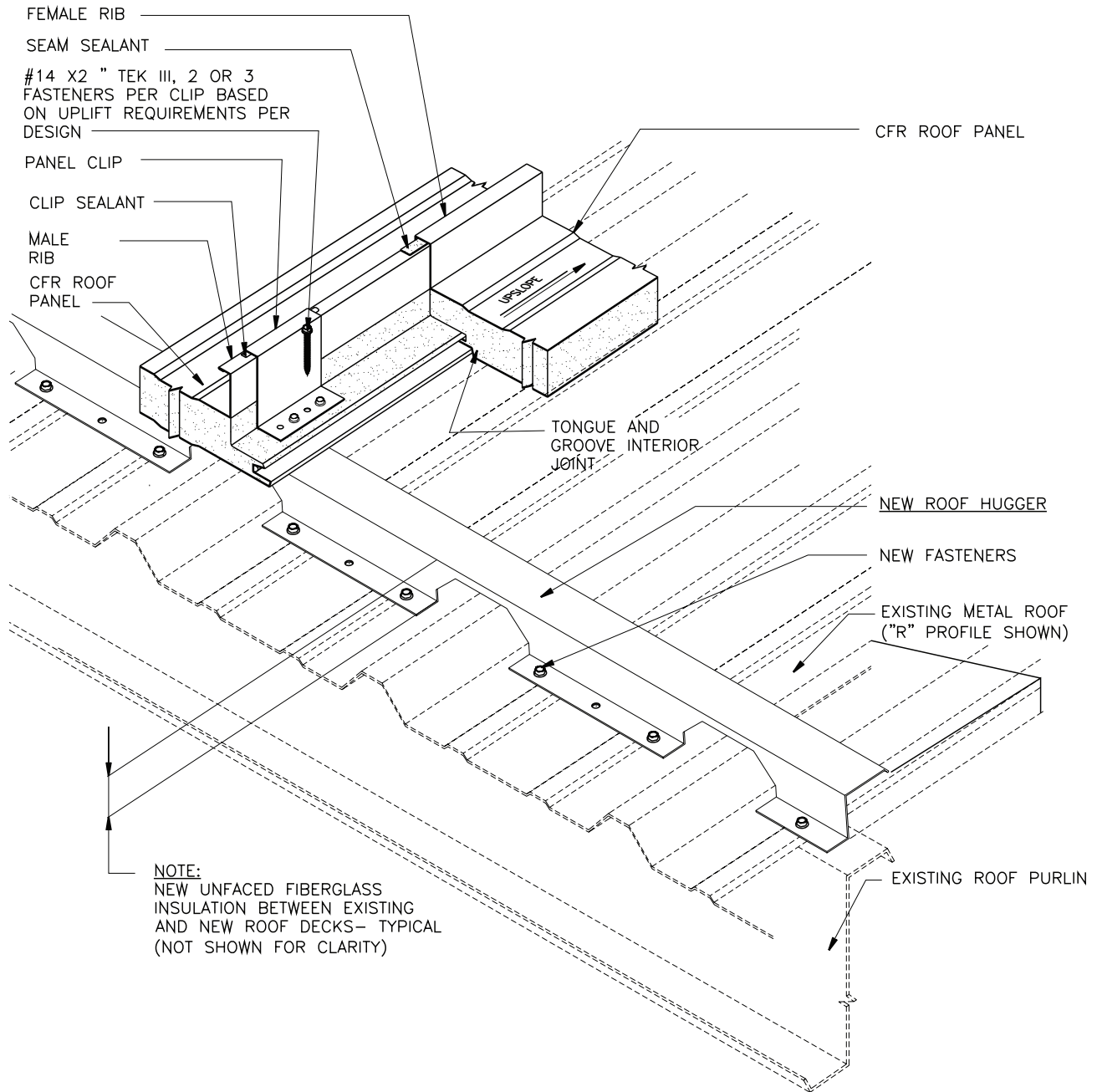


"T" = ROOF PANEL THICKNESS

PANEL ATTACHMENT AND SIDELAP DETAIL

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

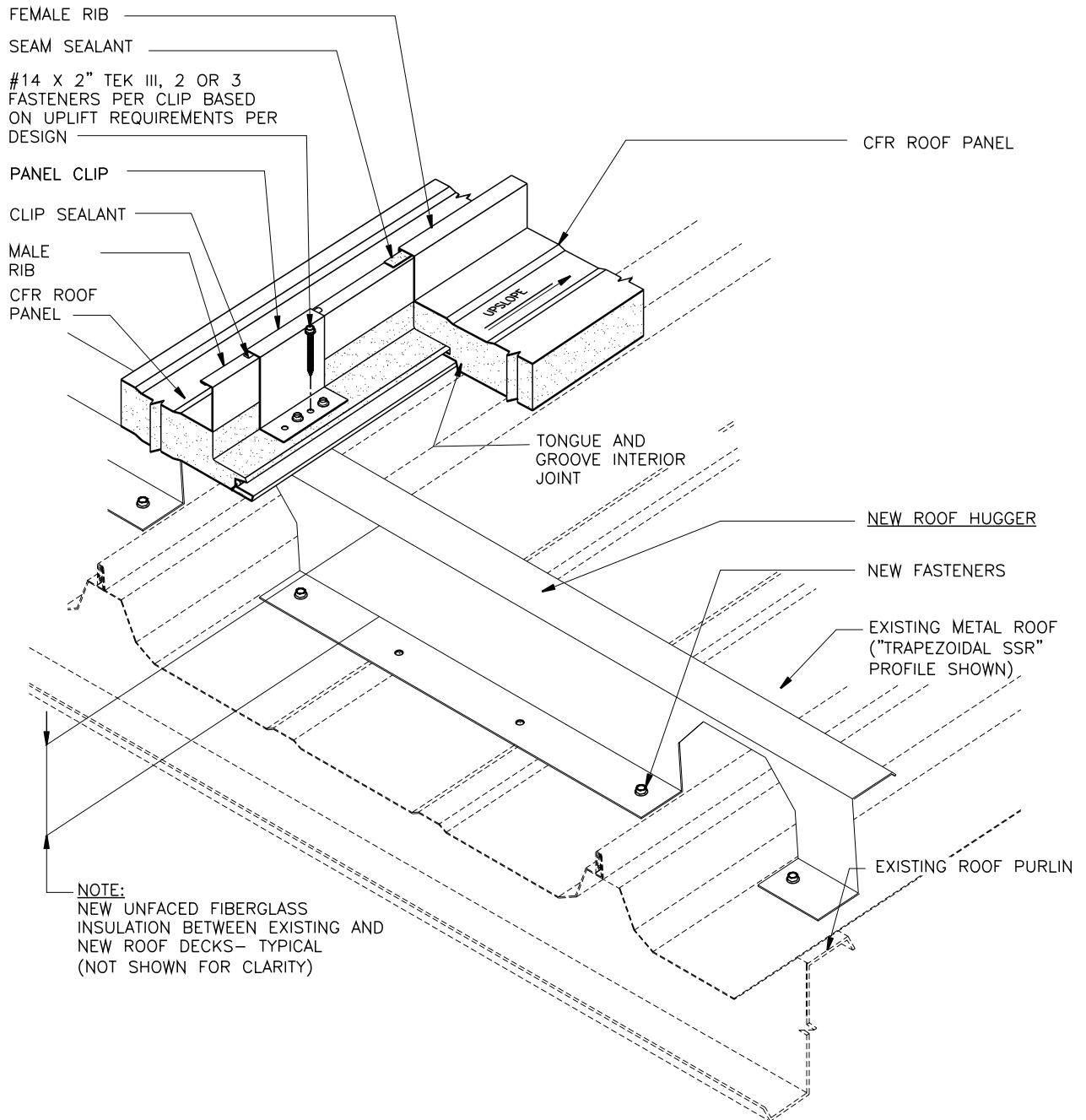
RH C450.504 R



PANEL ATTACHMENT AND SIDELAP DETAIL

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

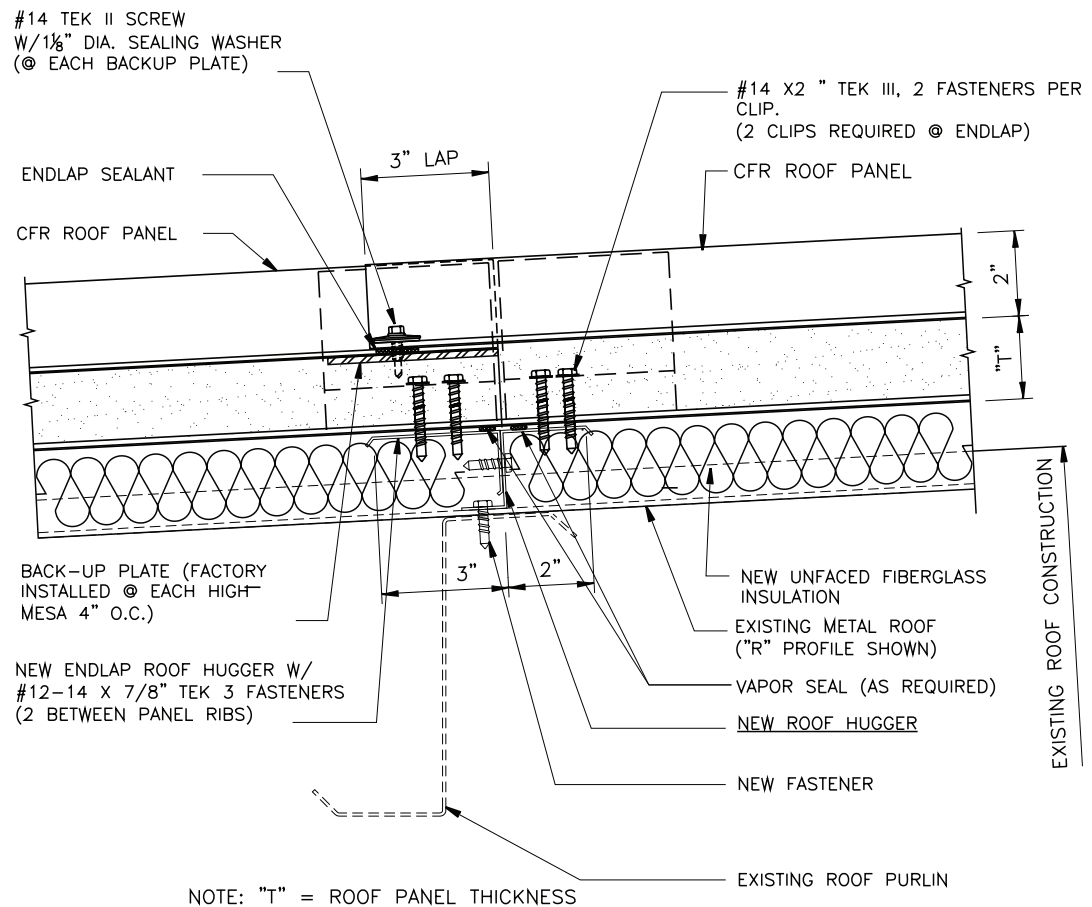
RH C450.504 T



PANEL ENDLAP SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

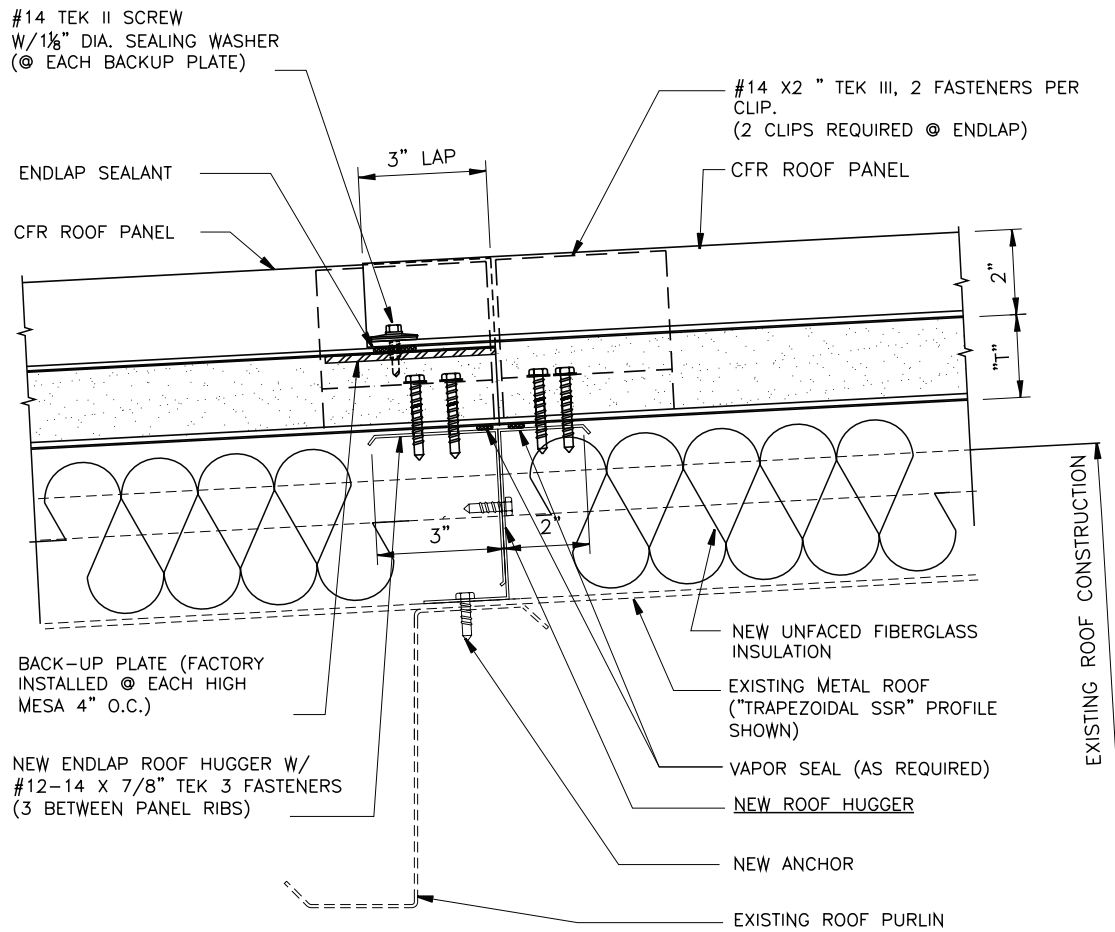
RH C450.505 R



PANEL ENDLAP SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.505 T

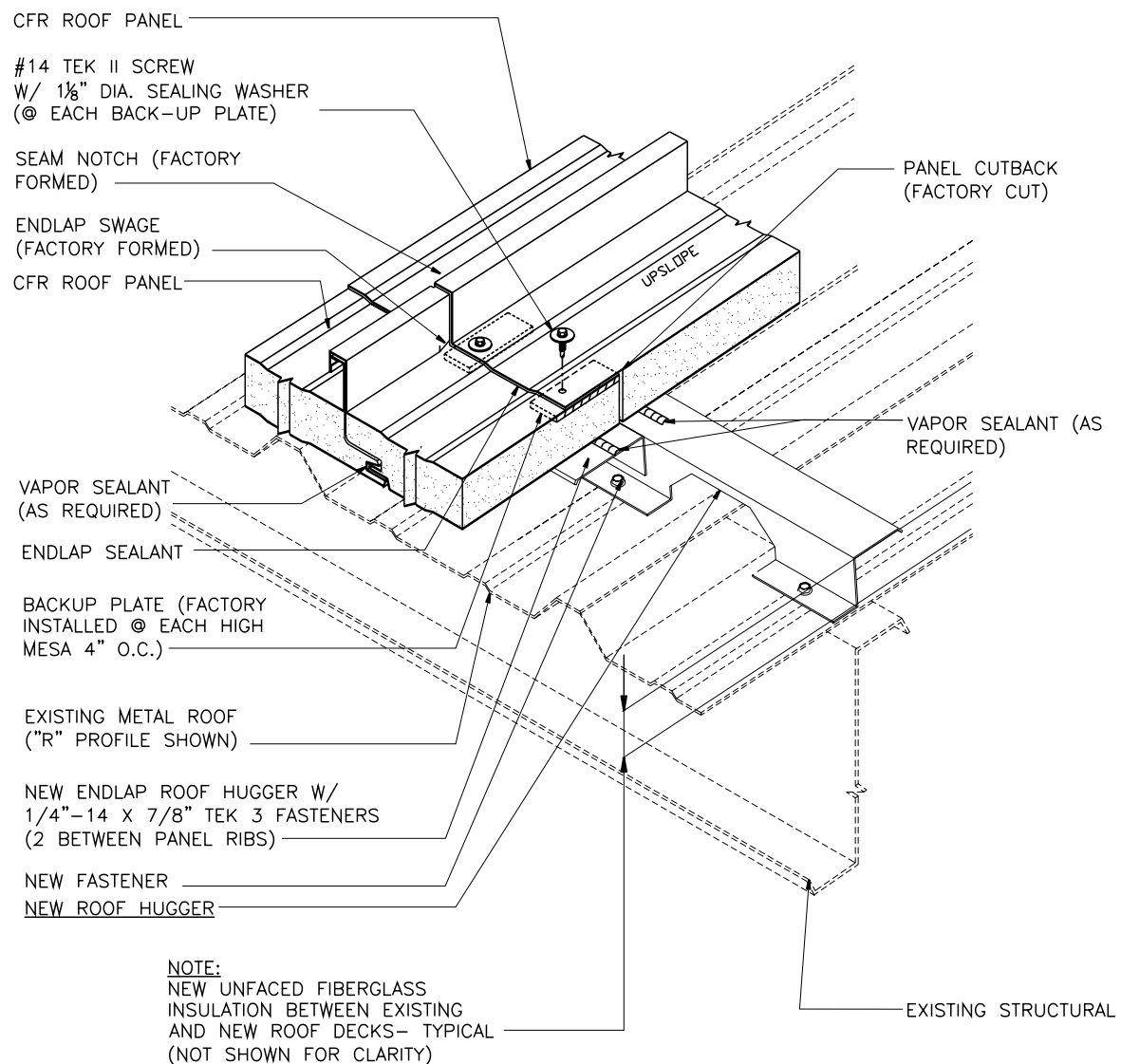


NOTE: "T" = ROOF PANEL THICKNESS

PANEL ENDLAP DETAIL

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

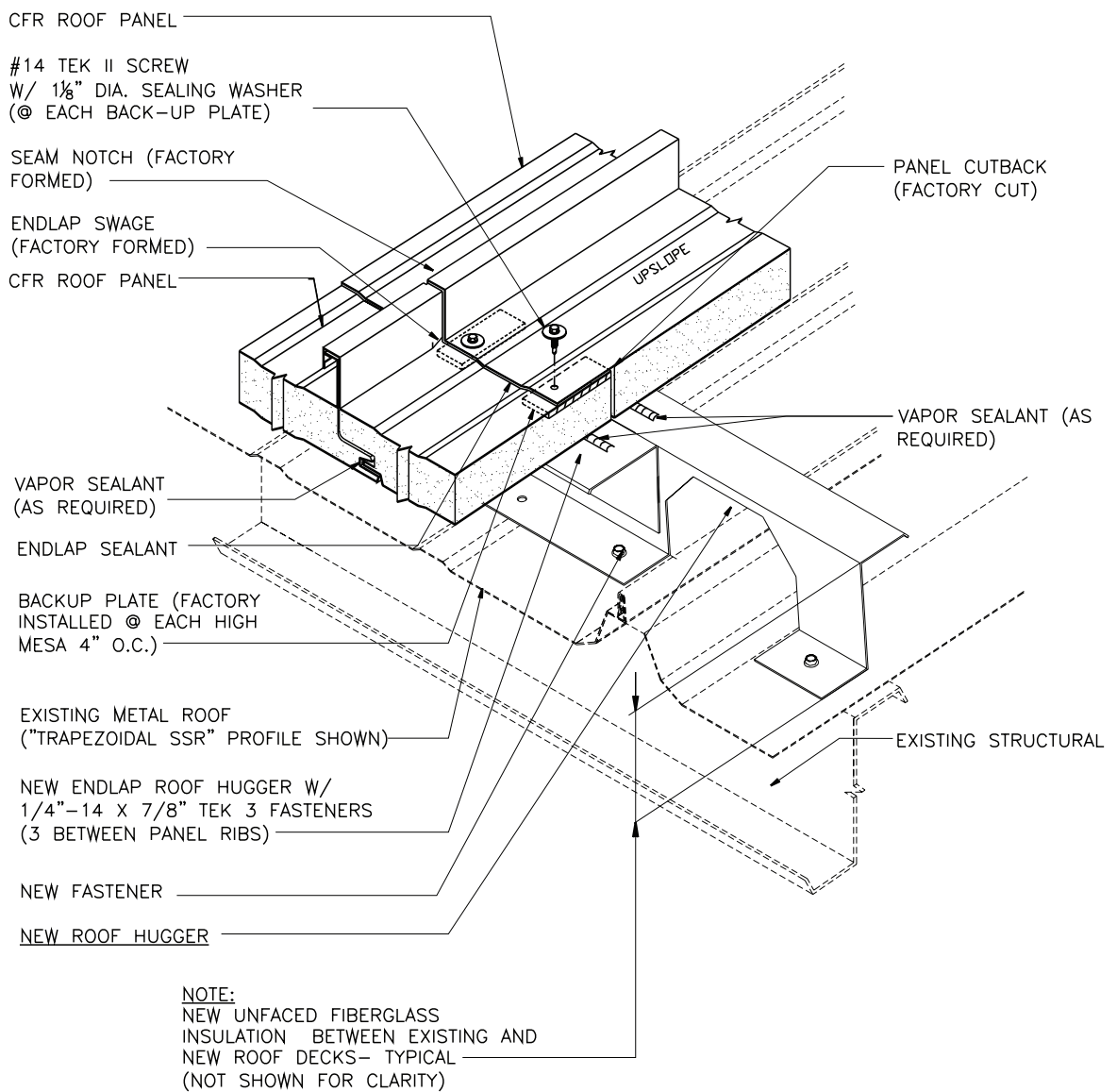
RH C450.506 R



PANEL ENDLAP DETAIL

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

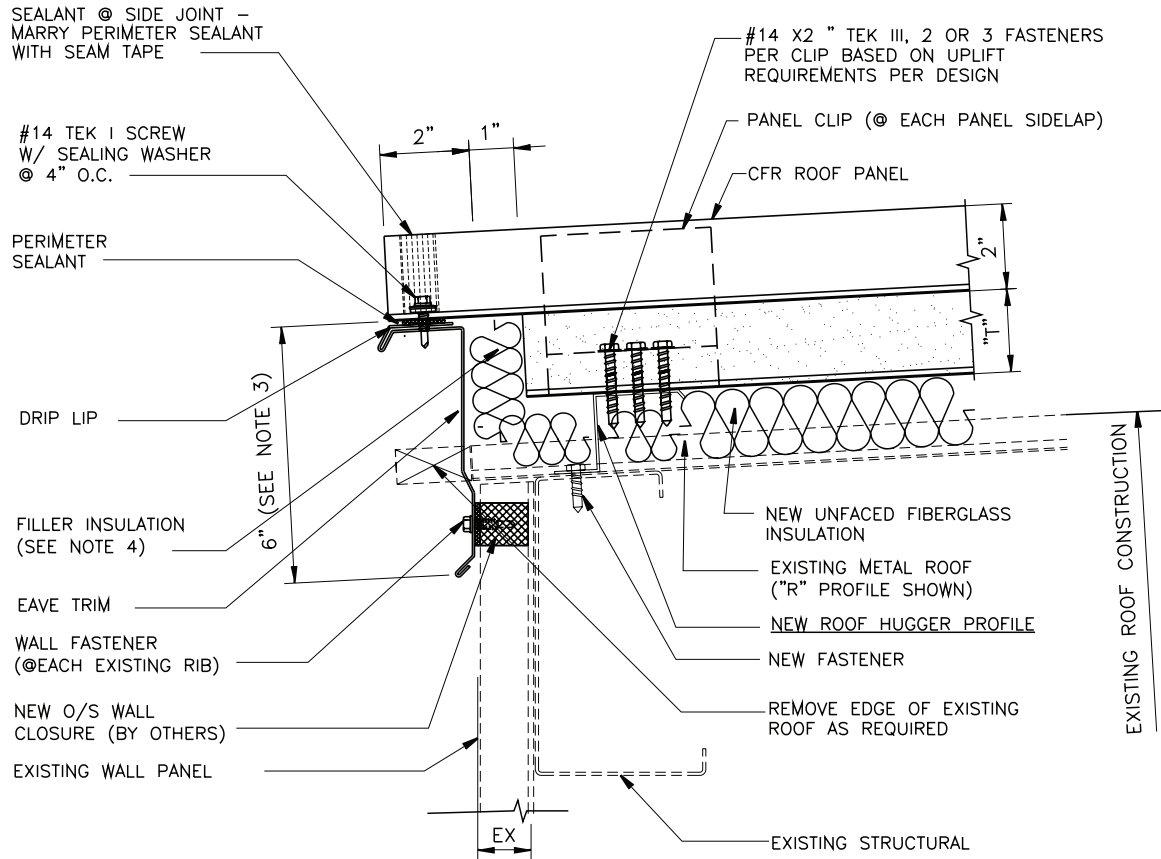
RH C450.506 T



LOW EAVE SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.507 R



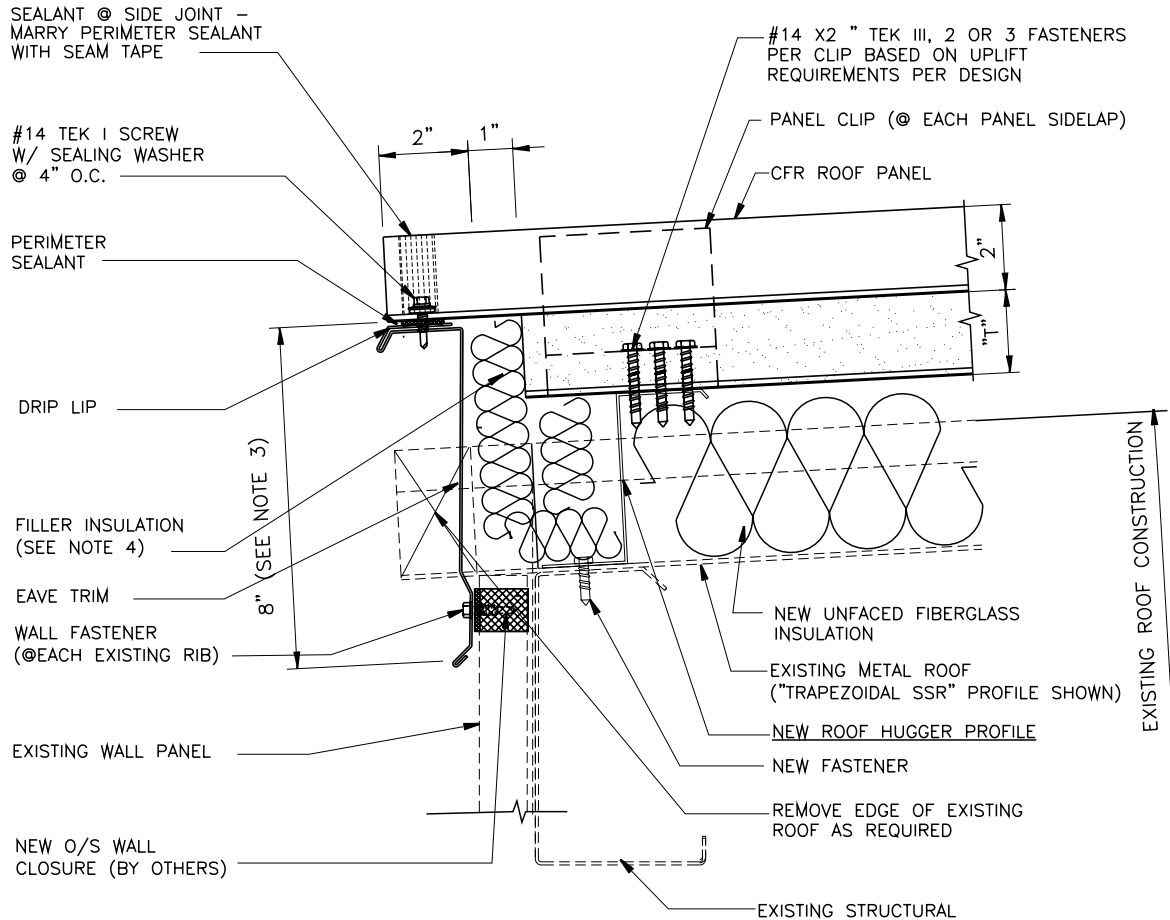
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. STANDARD CUT-BACK IS 3", CONSULT FACTORY FOR AVAILABILITY OF OTHER CUT-BACK DIMENSIONS.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. WALL FASTENERS AND WALL CLOSURES PROVIDED WITH WALL SYSTEM.
5. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

LOW EAVE SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.507 T



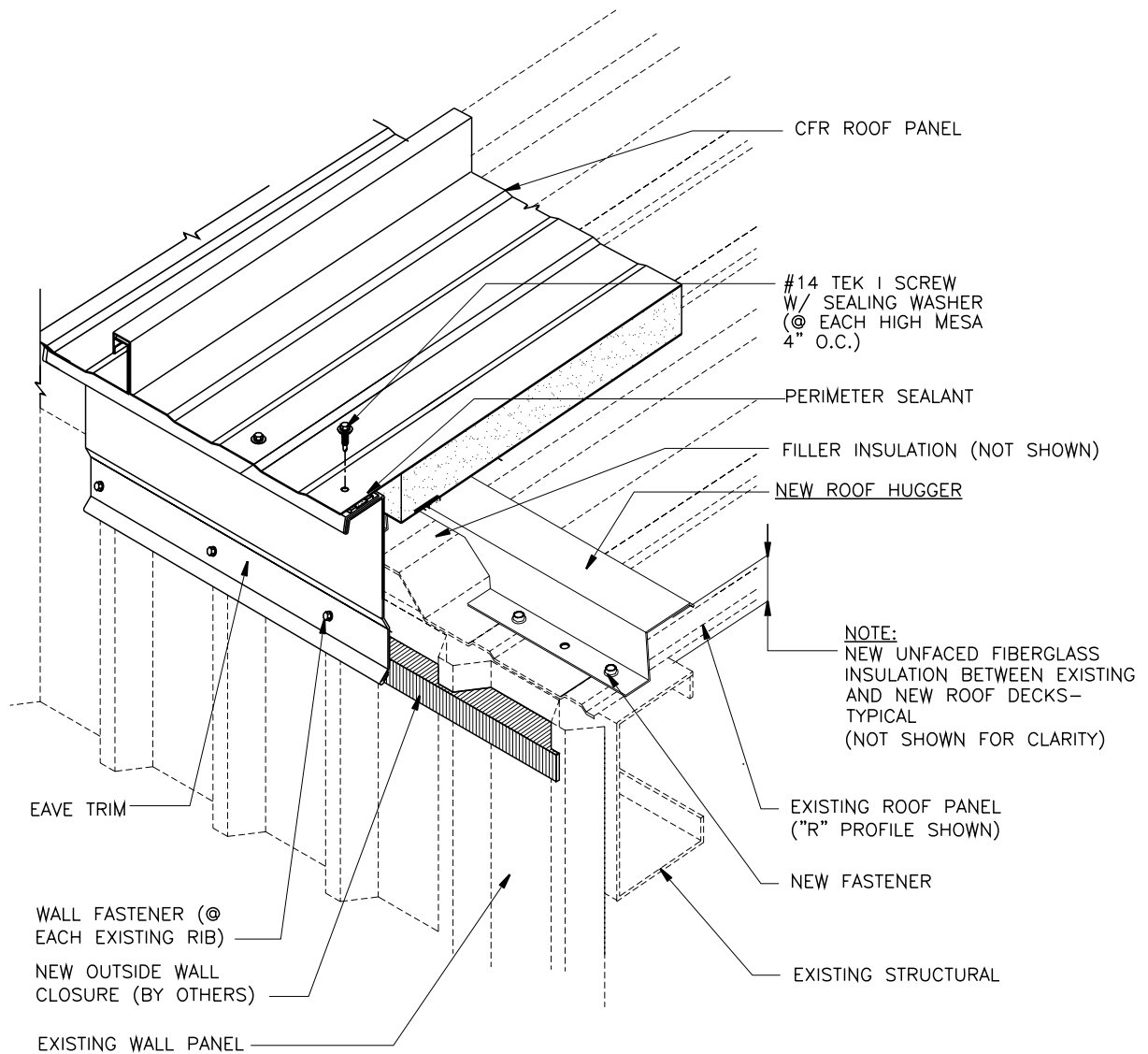
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. STANDARD CUT-BACK IS 3", CONSULT FACTORY FOR AVAILABILITY OF OTHER CUT-BACK DIMENSIONS.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. WALL FASTENERS AND WALL CLOSURES PROVIDED WITH WALL SYSTEM.
5. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

LOW EAVE SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

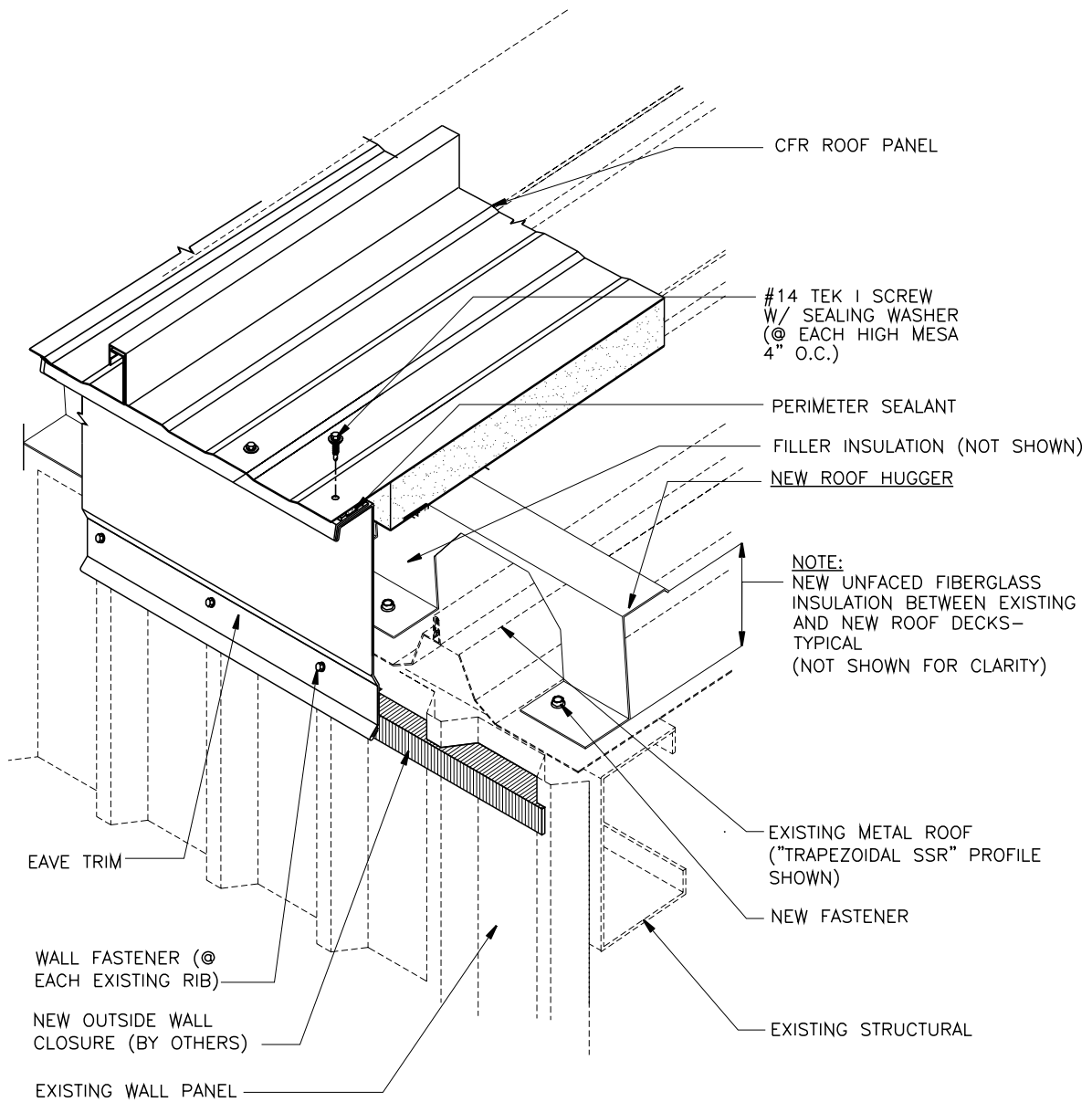
RH C450.508 R



LOW EAVE SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

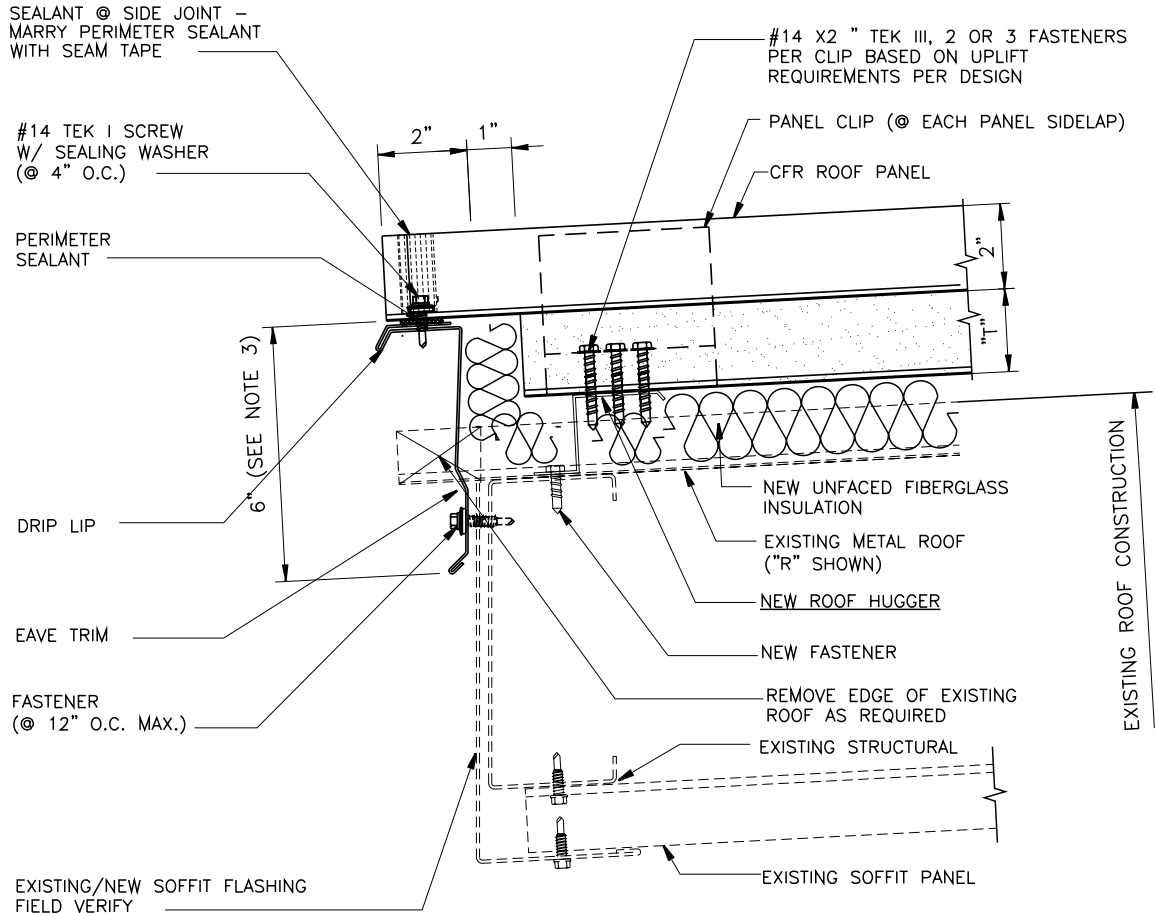
RH C450.508 T



LOW EAVE SECTION @ CANOPY

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.510 R

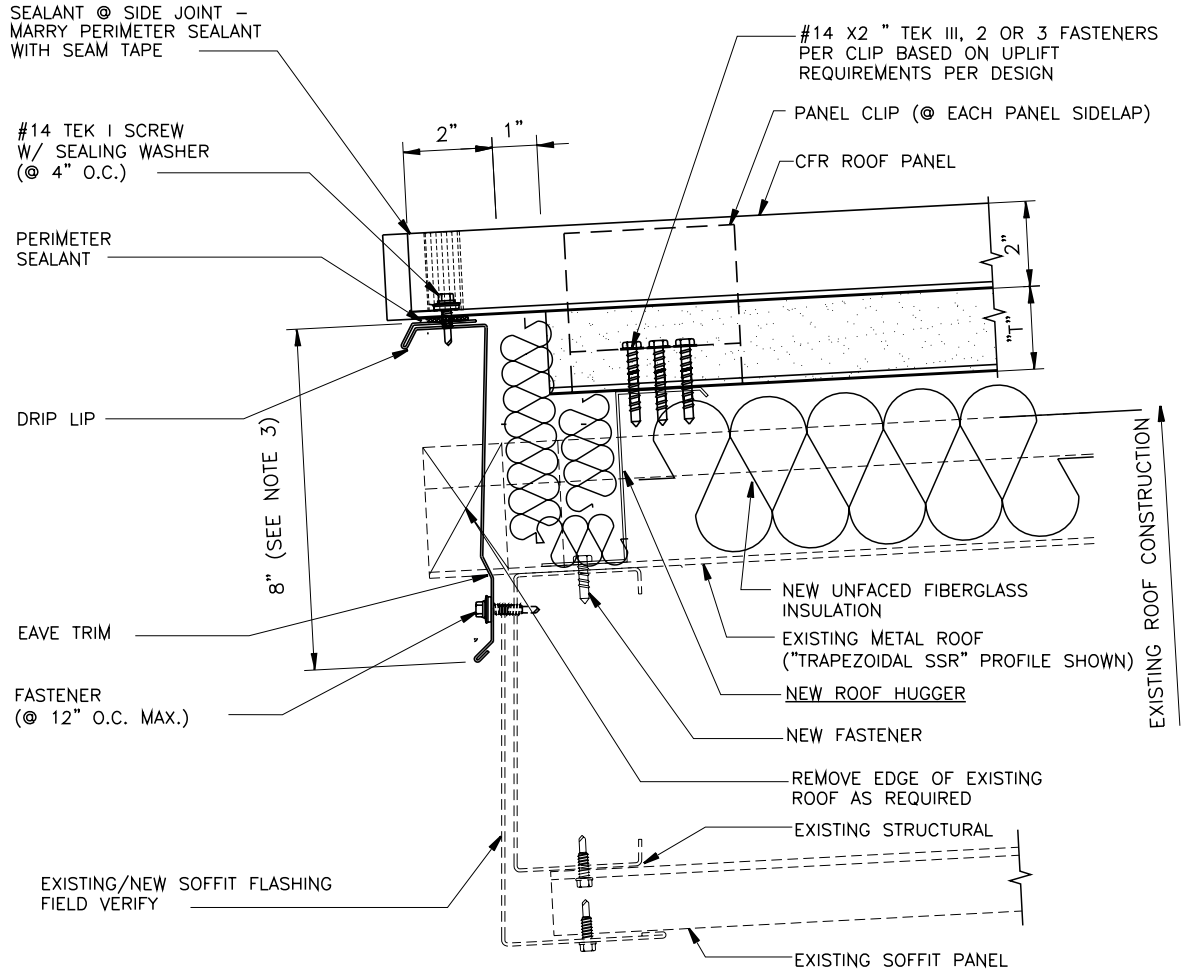


NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. STANDARD CUT-BACK IS 3", CONSULT FACTORY FOR AVAILABILITY OF OTHER CUT-BACK DIMENSIONS.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. WALL FASTENERS AND WALL CLOSURES PROVIDED WITH WALL SYSTEM.
5. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

LOW EAVE SECTION @ CANOPY **EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER**

RH C450.510 T



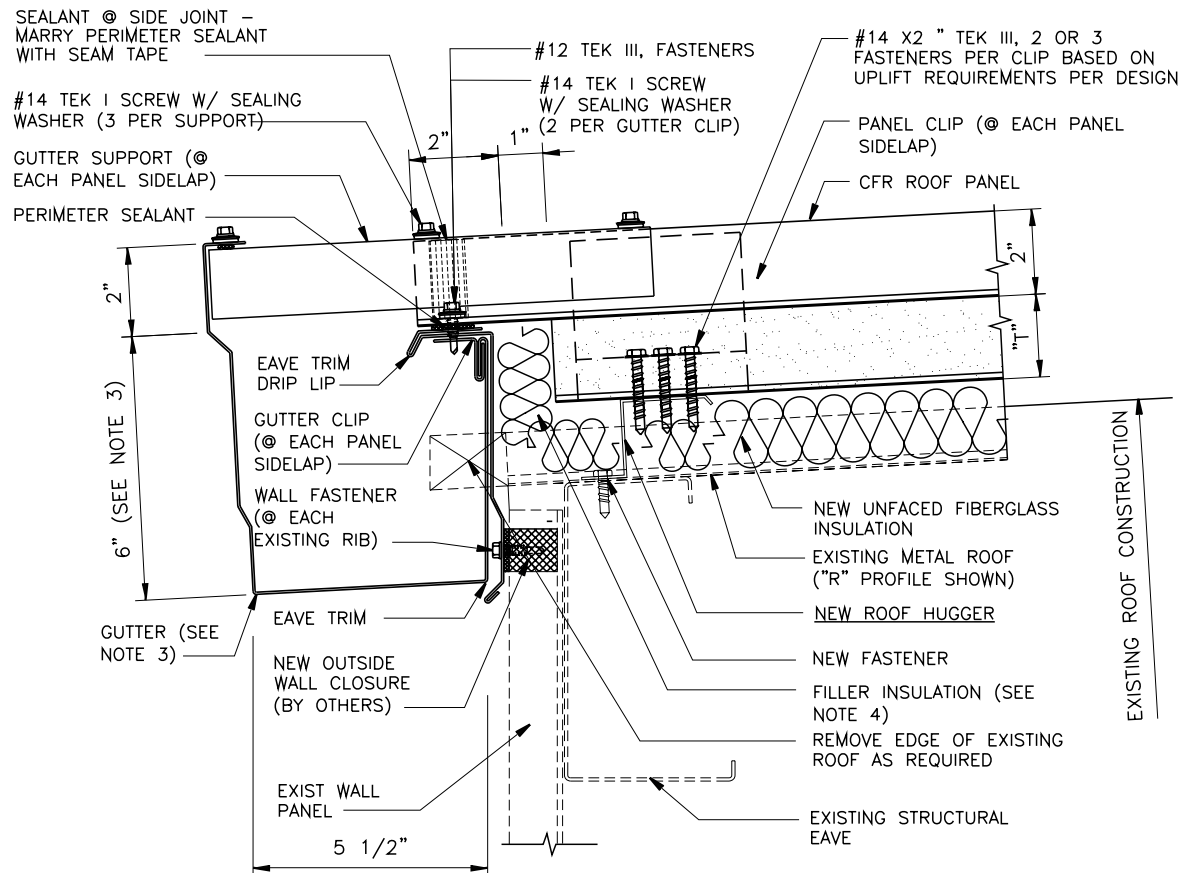
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. STANDARD CUT-BACK IS 3", CONSULT FACTORY FOR AVAILABILITY OF OTHER CUT-BACK DIMENSIONS.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. WALL FASTENERS AND WALL CLOSURES PROVIDED WITH WALL SYSTEM.
5. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

EAVE GUTTER SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.511 R

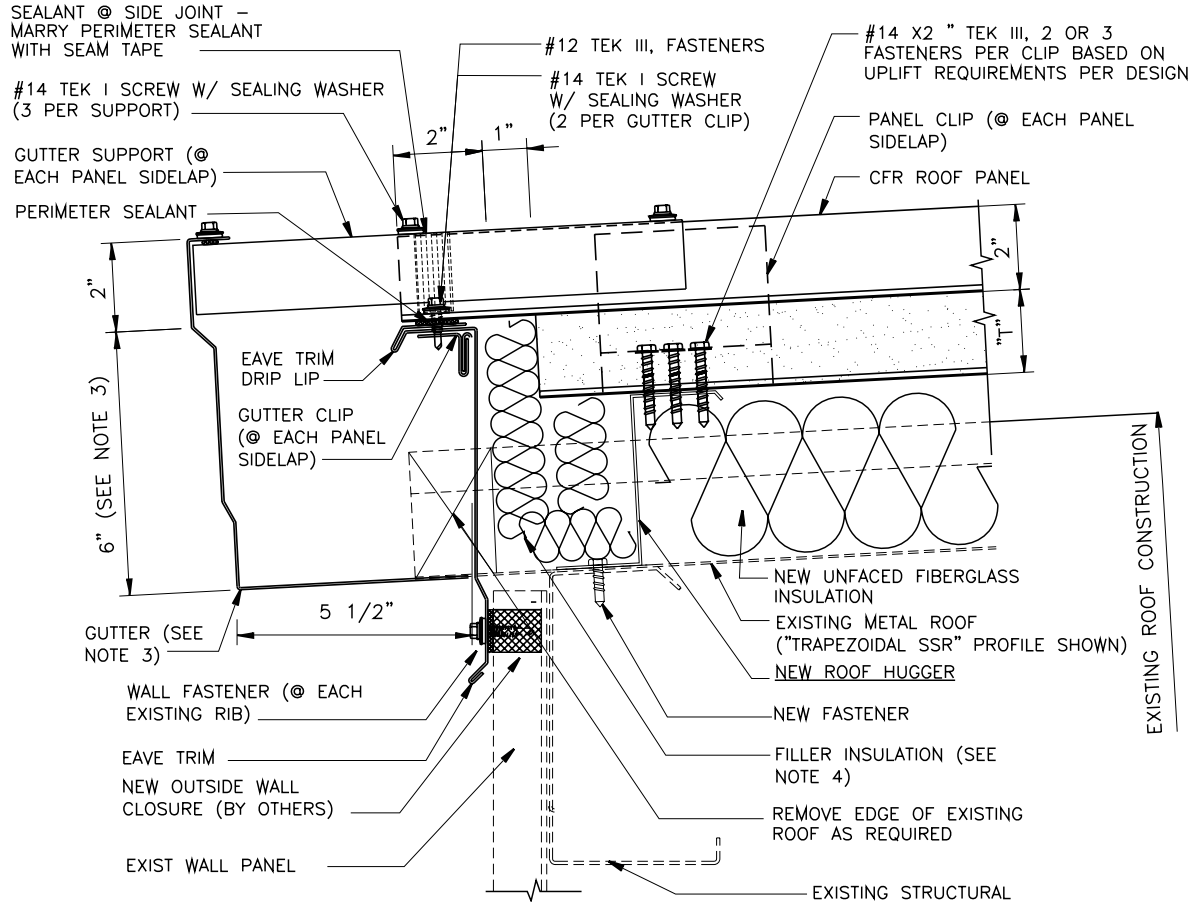


NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. STANDARD CUT-BACK IS 3", CONSULT FACTORY FOR AVAILABILITY OF OTHER CUT-BACK DIMENSIONS.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. WALL FASTENERS AND WALL CLOSURES PROVIDED WITH WALL SYSTEM.
5. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

EAVE GUTTER SECTION EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.511 T



(REFER TO EAVE TRIM SECTION FOR EAVE TRIM DETAILS)

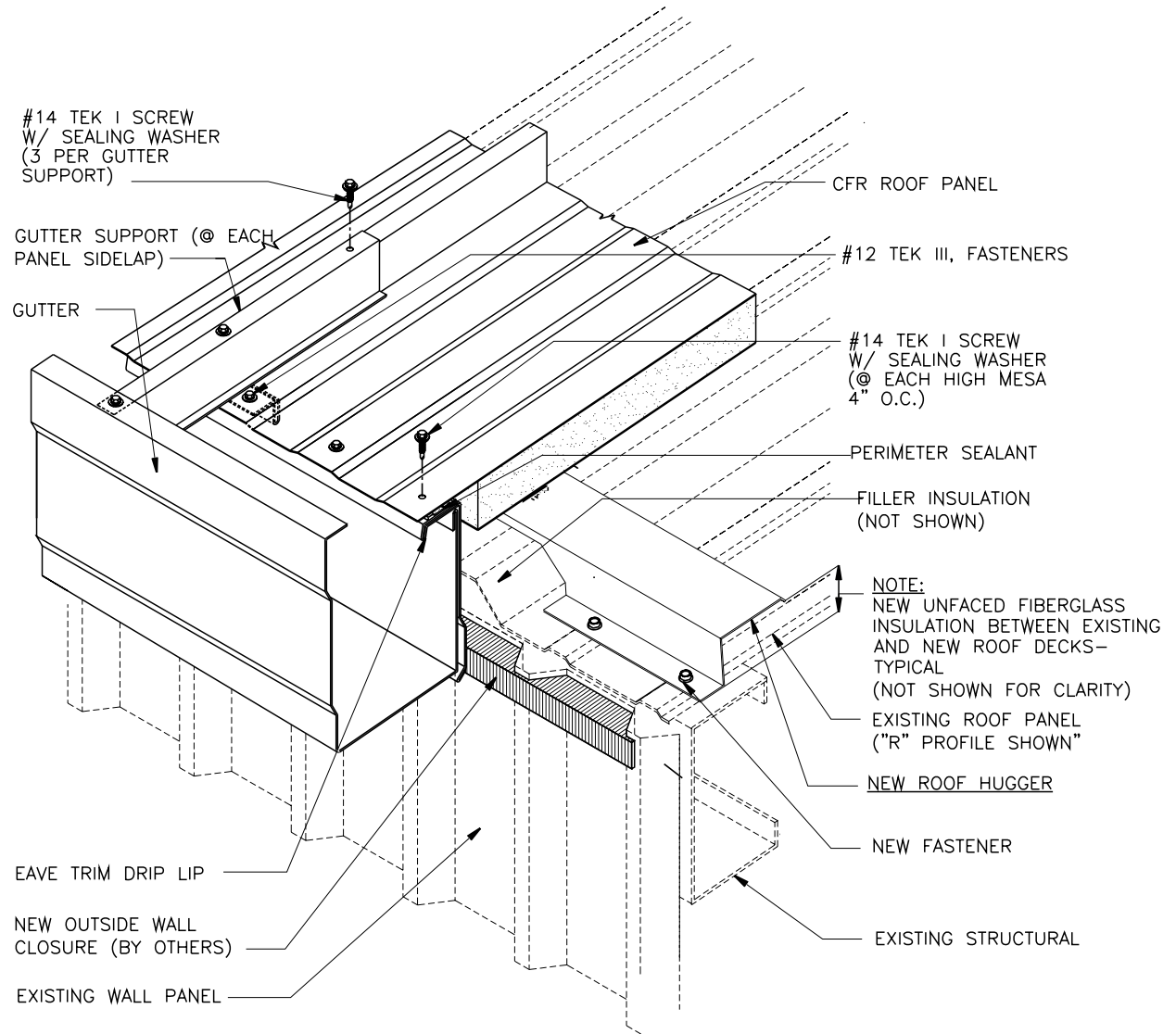
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. STANDARD CUT-BACK IS 3", CONSULT FACTORY FOR AVAILABILITY OF OTHER CUT-BACK DIMENSIONS.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. WALL FASTENERS AND WALL CLOSURES PROVIDED WITH WALL SYSTEM.
5. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

EAVE GUTTER DETAIL

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

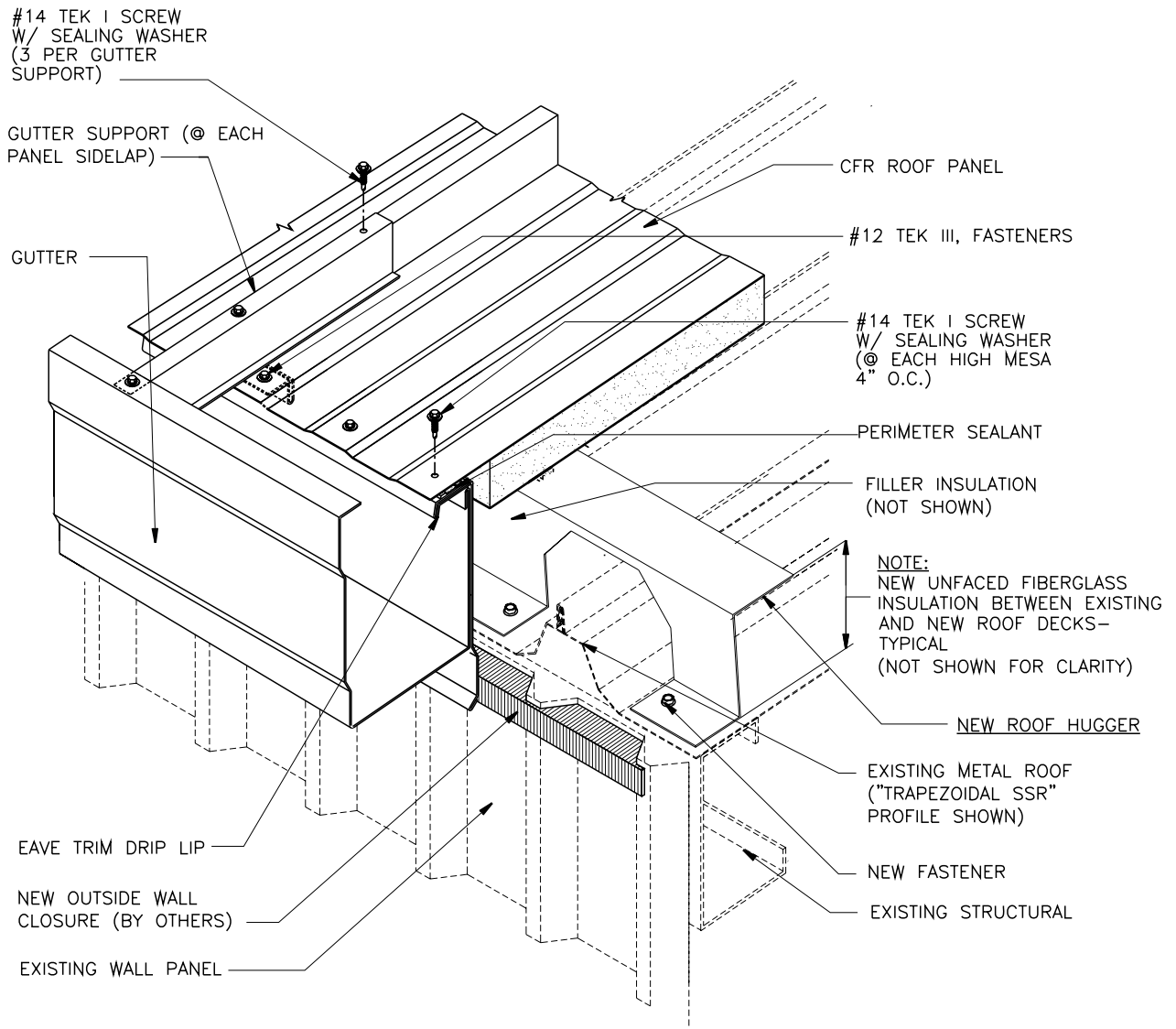
RH C450.512 R



EAVE GUTTER DETAIL

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

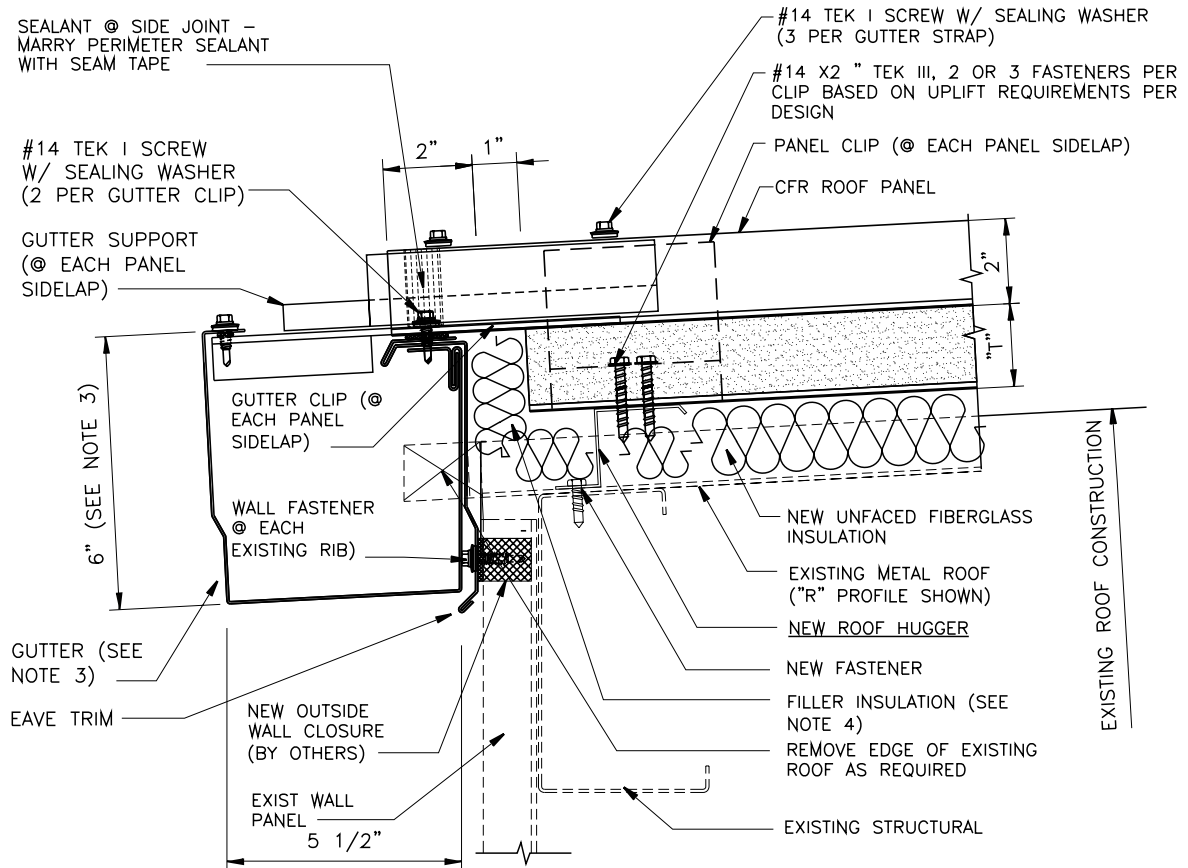
RH C450.512 T



EAVE GUTTER SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER LOW GUTTER PROFILE

RH C450.513 R



(REFER TO EAVE TRIM SECTION FOR EAVE TRIM DETAILS)

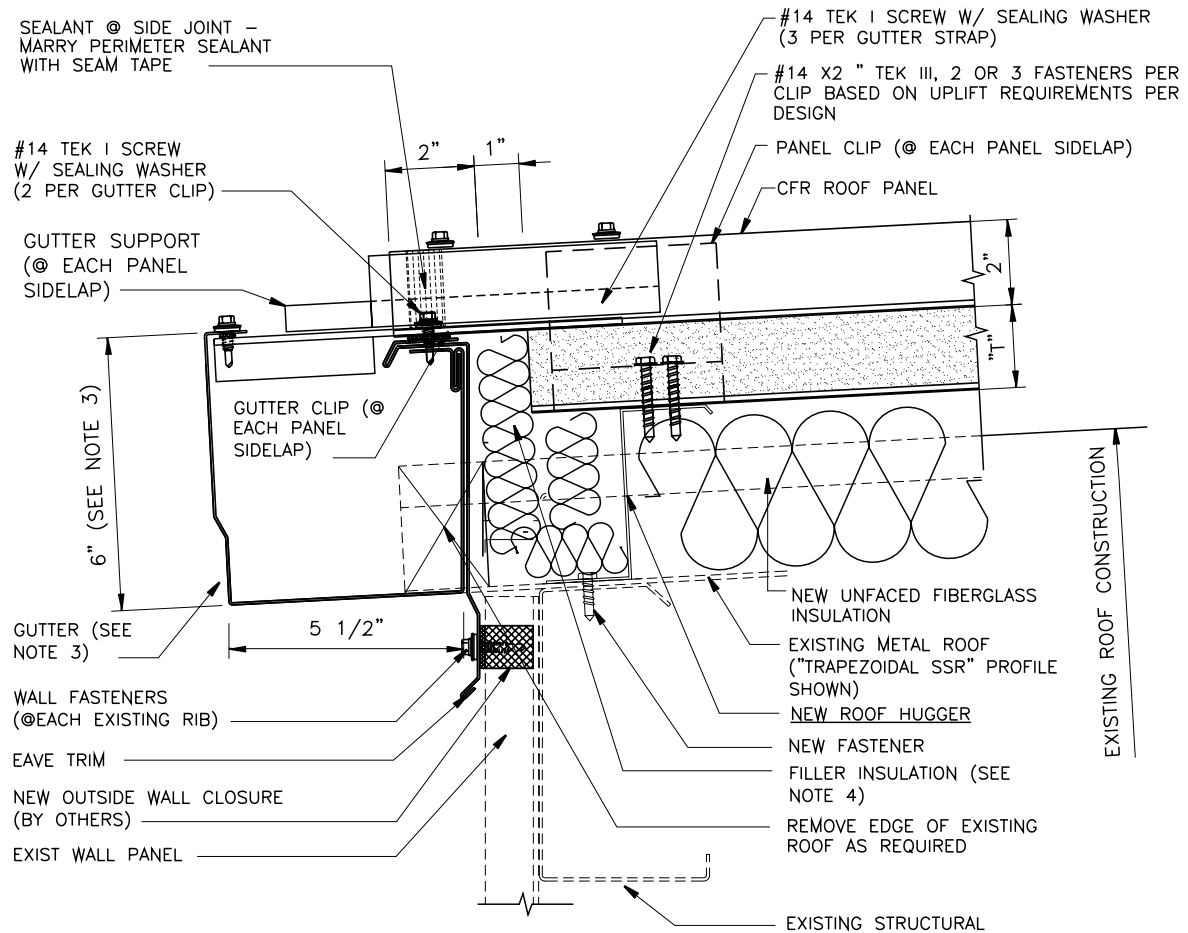
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. STANDARD GUTTER SHOWN, CONSULT FACTORY FOR AVAILABILITY OF LARGER CAPACITY GUTTERS.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
5. EAVE GUTTERS ARE NOT RECOMMENDED FOR APPLICATIONS SUBJECT TO SNOW AND ICE DAMMING OR OTHER CAUSES OF GUTTER OVERFLOW.

EAVE GUTTER SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER LOW GUTTER PROFILE

RH C450.513 T



(REFER TO EAVE TRIM SECTION FOR EAVE TRIM DETAILS)

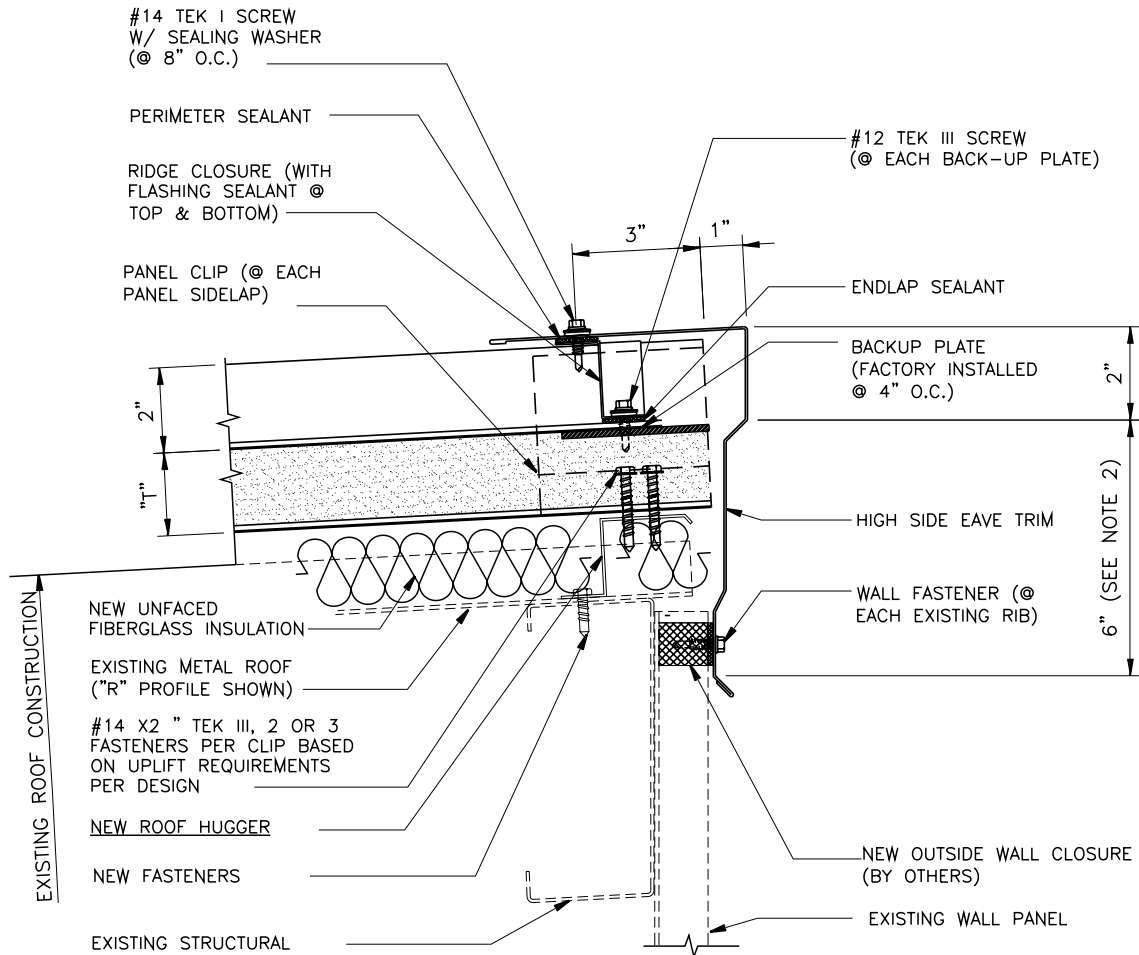
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. STANDARD GUTTER SHOWN, CONSULT FACTORY FOR AVAILABILITY OF LARGER CAPACITY GUTTERS.
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4. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
5. EAVE GUTTERS ARE NOT RECOMMENDED FOR APPLICATIONS SUBJECT TO SNOW AND ICE DAMMING OR OTHER CAUSES OF GUTTER OVERFLOW.

HIGH SIDE EAVE SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.514 R



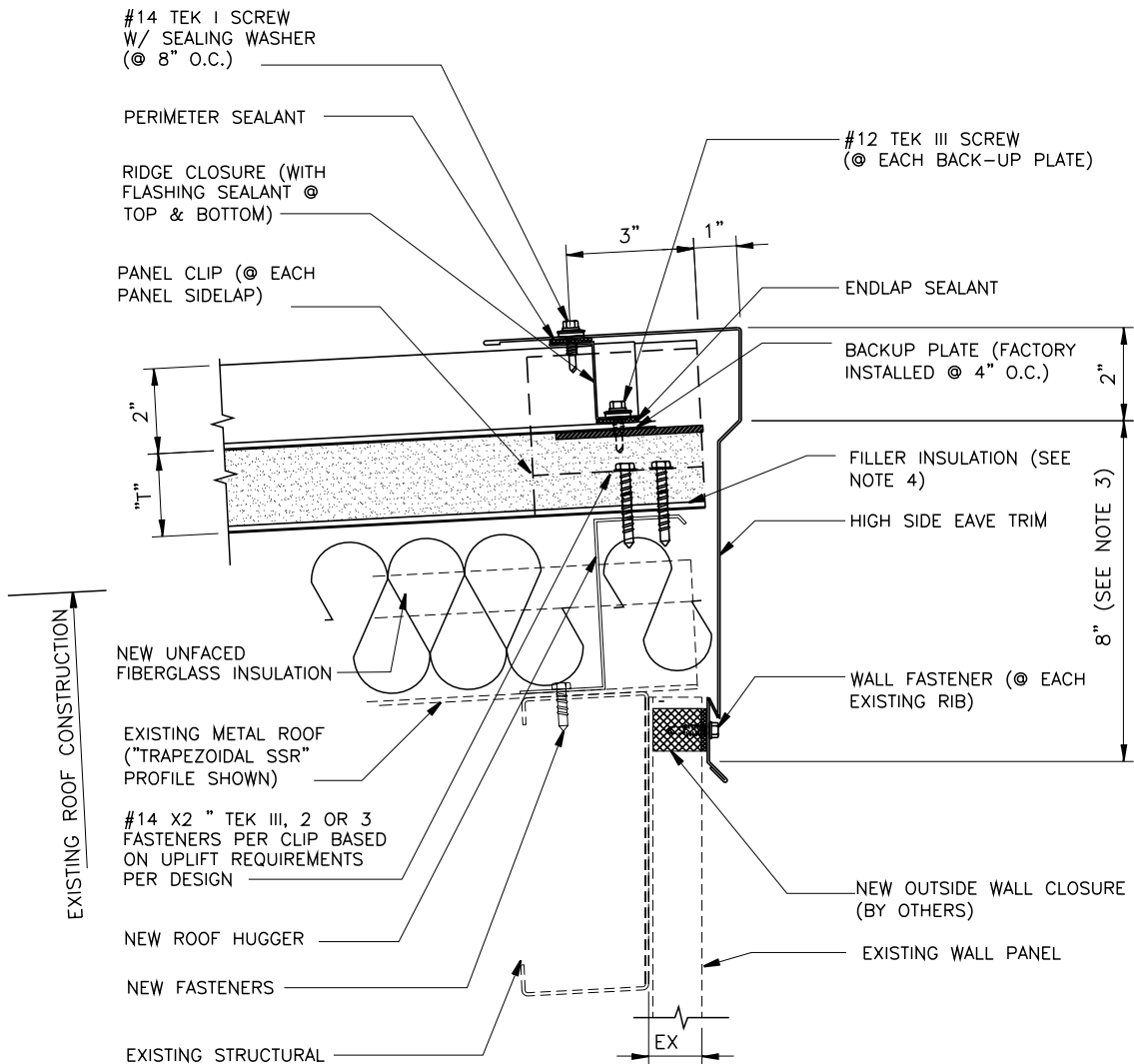
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. WALL FASTENER AND WALL CLOSURES ARE PROVIDED WITH WALL SYSTEM.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

HIGH SIDE EAVE SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.514 T



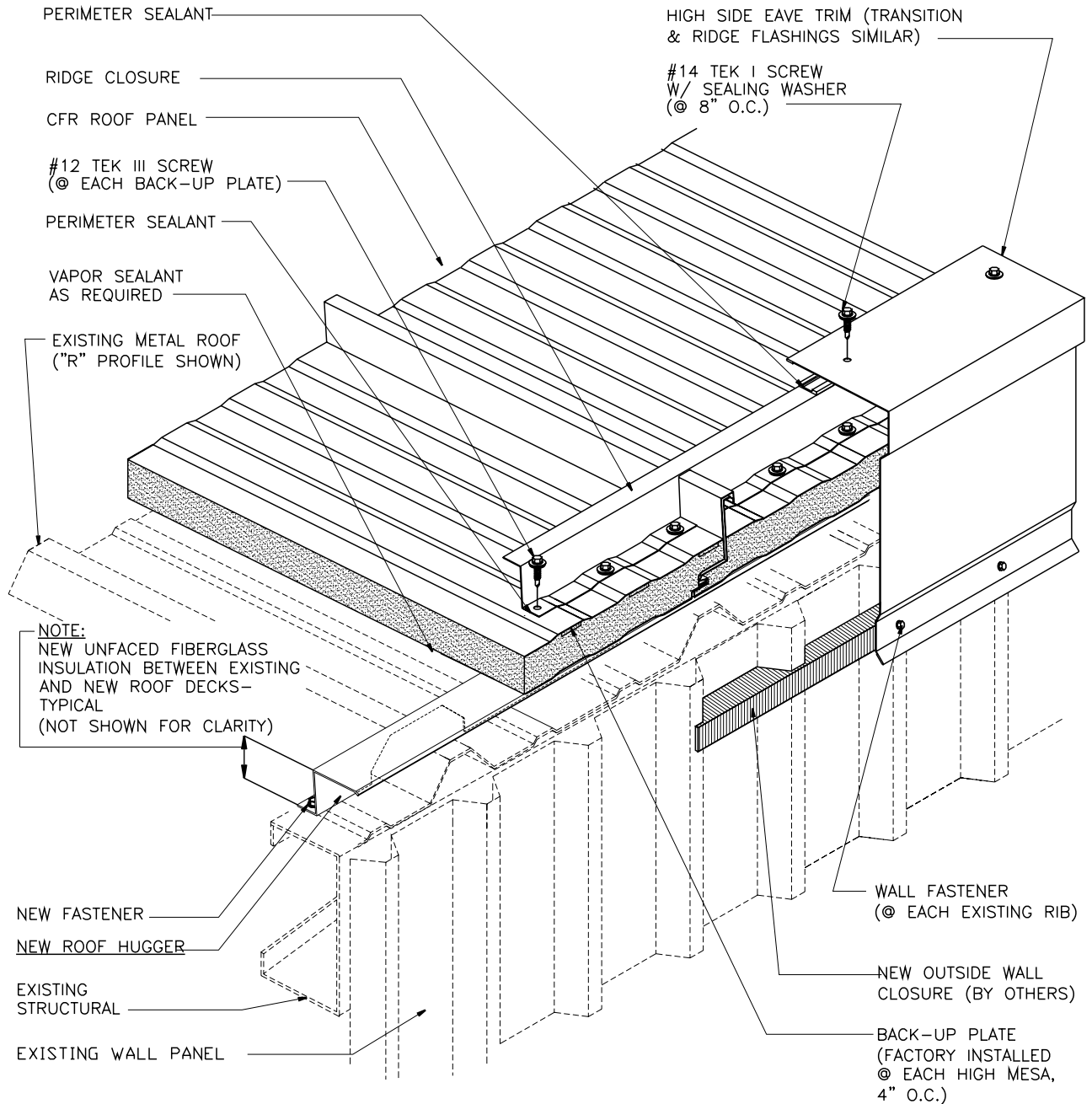
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. WALL FASTENER AND WALL CLOSURES ARE PROVIDED WITH WALL SYSTEM.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

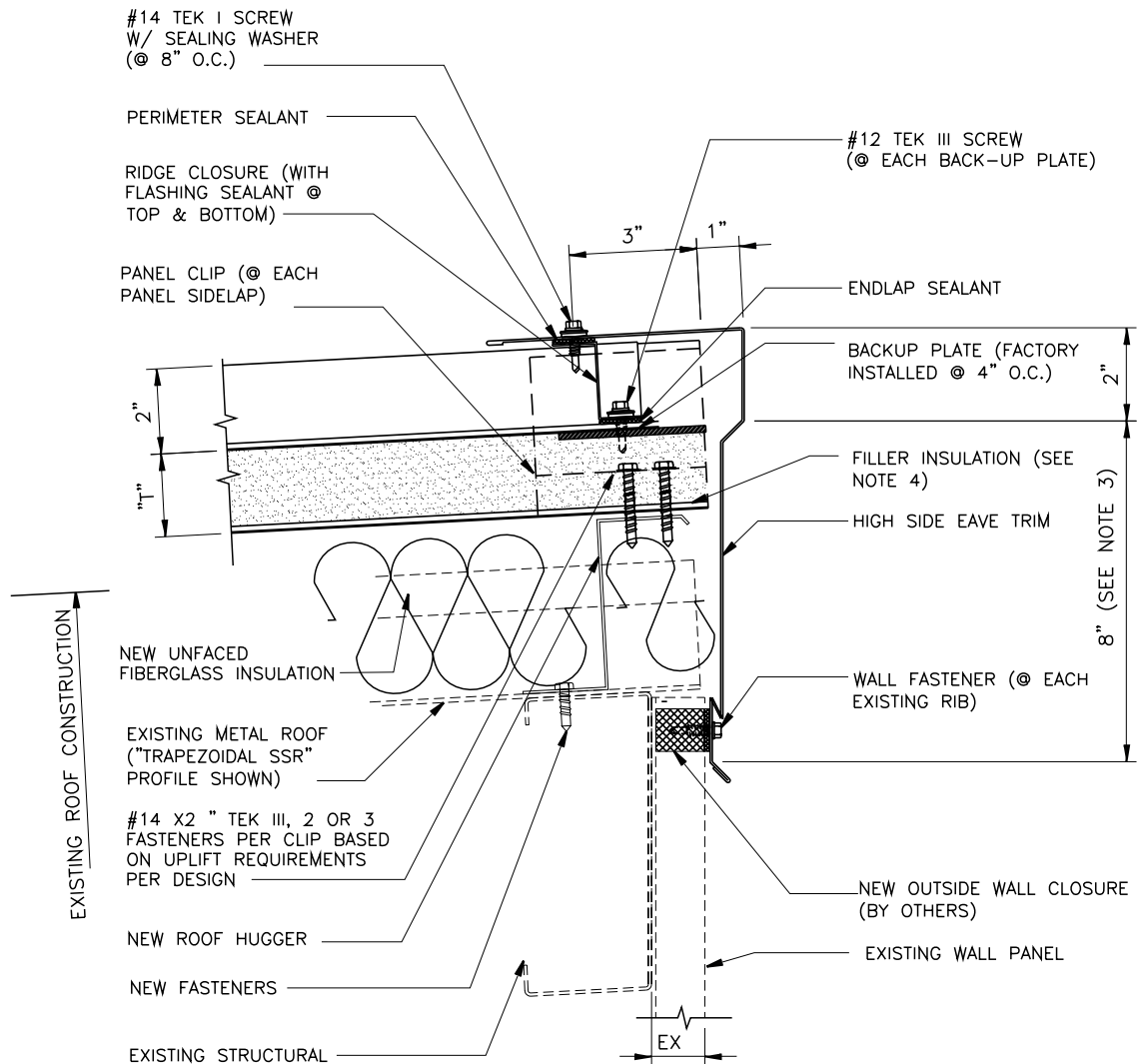
HIGH SIDE EAVE DETAIL

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.515 R



RH C450.515 T



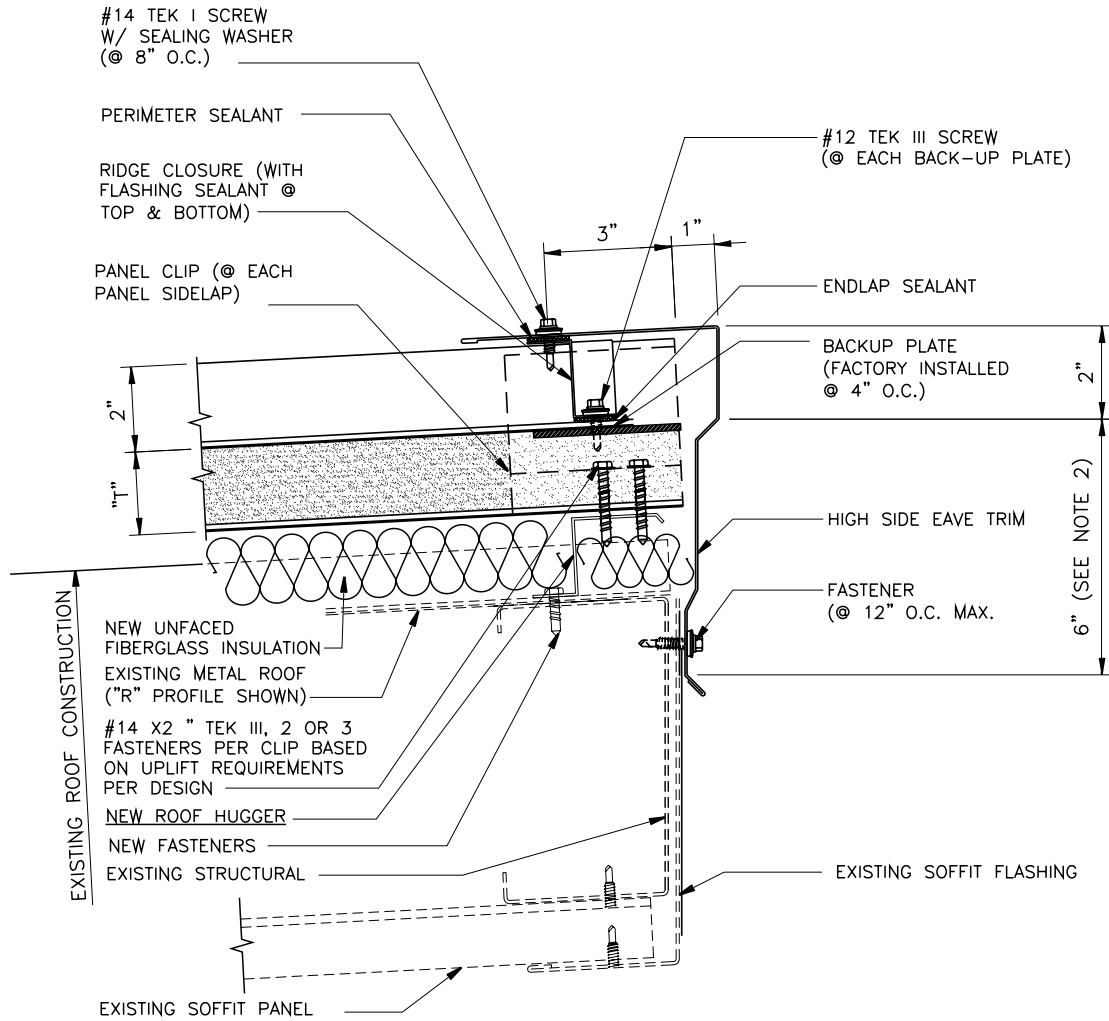
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. WALL FASTENER AND WALL CLOSURES ARE PROVIDED WITH WALL SYSTEM.
3. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
4. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

HIGH SIDE EAVE SECTION @ CANOPY

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.516 R

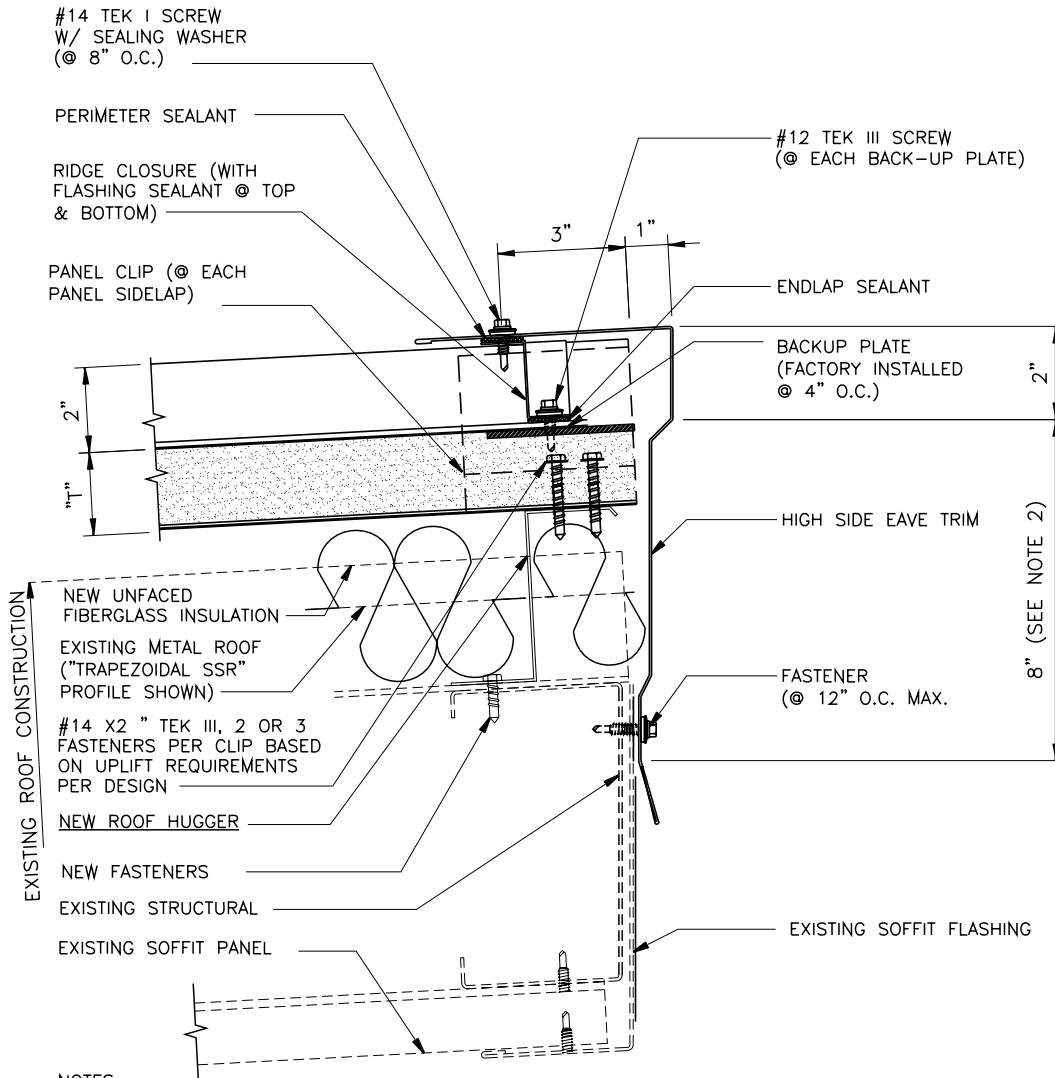


NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
3. WALL FASTENER AND WALL CLOSURES ARE PROVIDED WITH WALL SYSTEM.
4. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

HIGH SIDE EAVE SECTION @ CANOPY **EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER**

RH C450.516 T

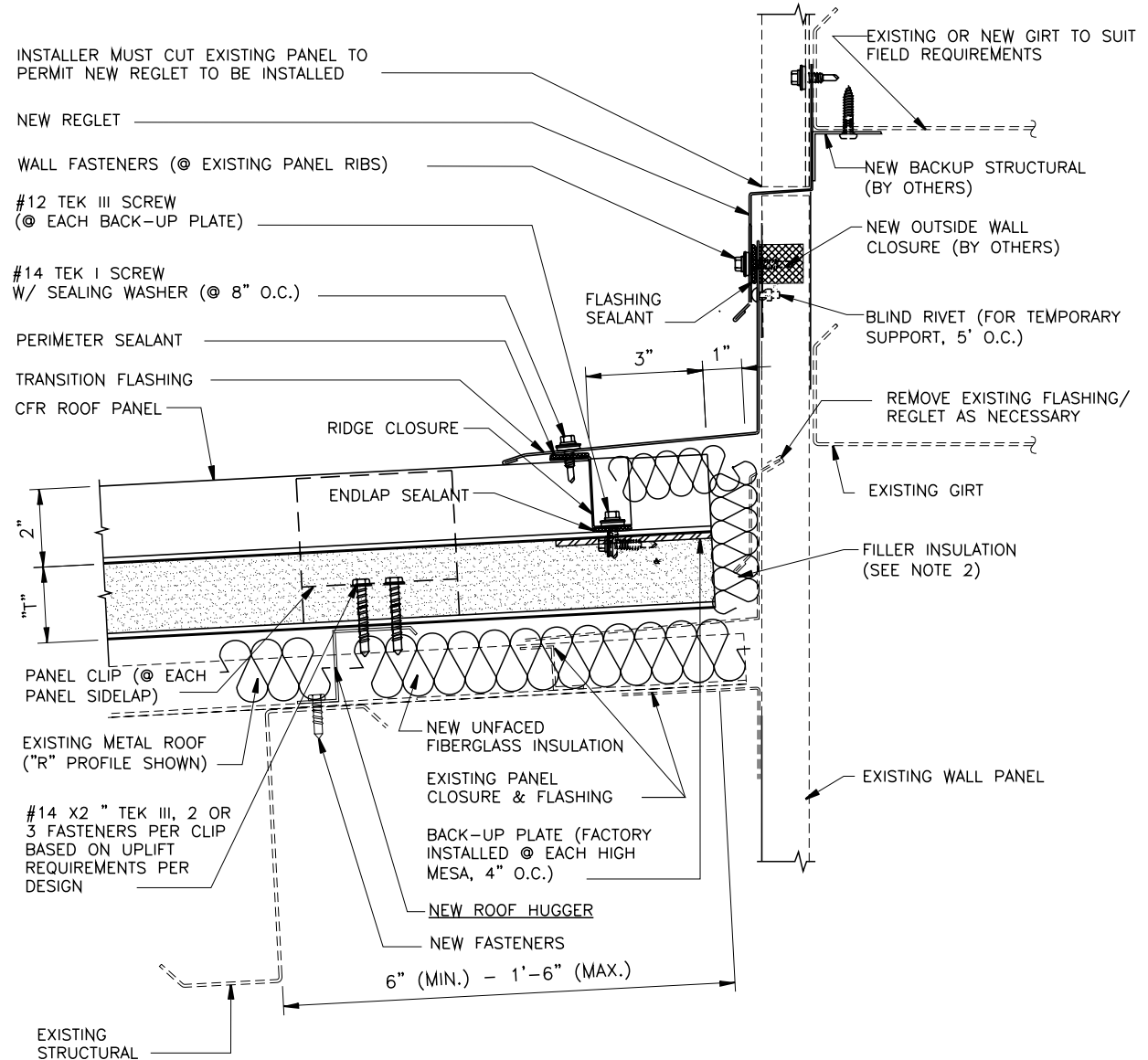


NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
3. WALL FASTENER AND WALL CLOSURES ARE PROVIDED WITH WALL SYSTEM.
4. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

HIGH SIDE TRANSITION SECTION (WALL BELOW) EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.517 R

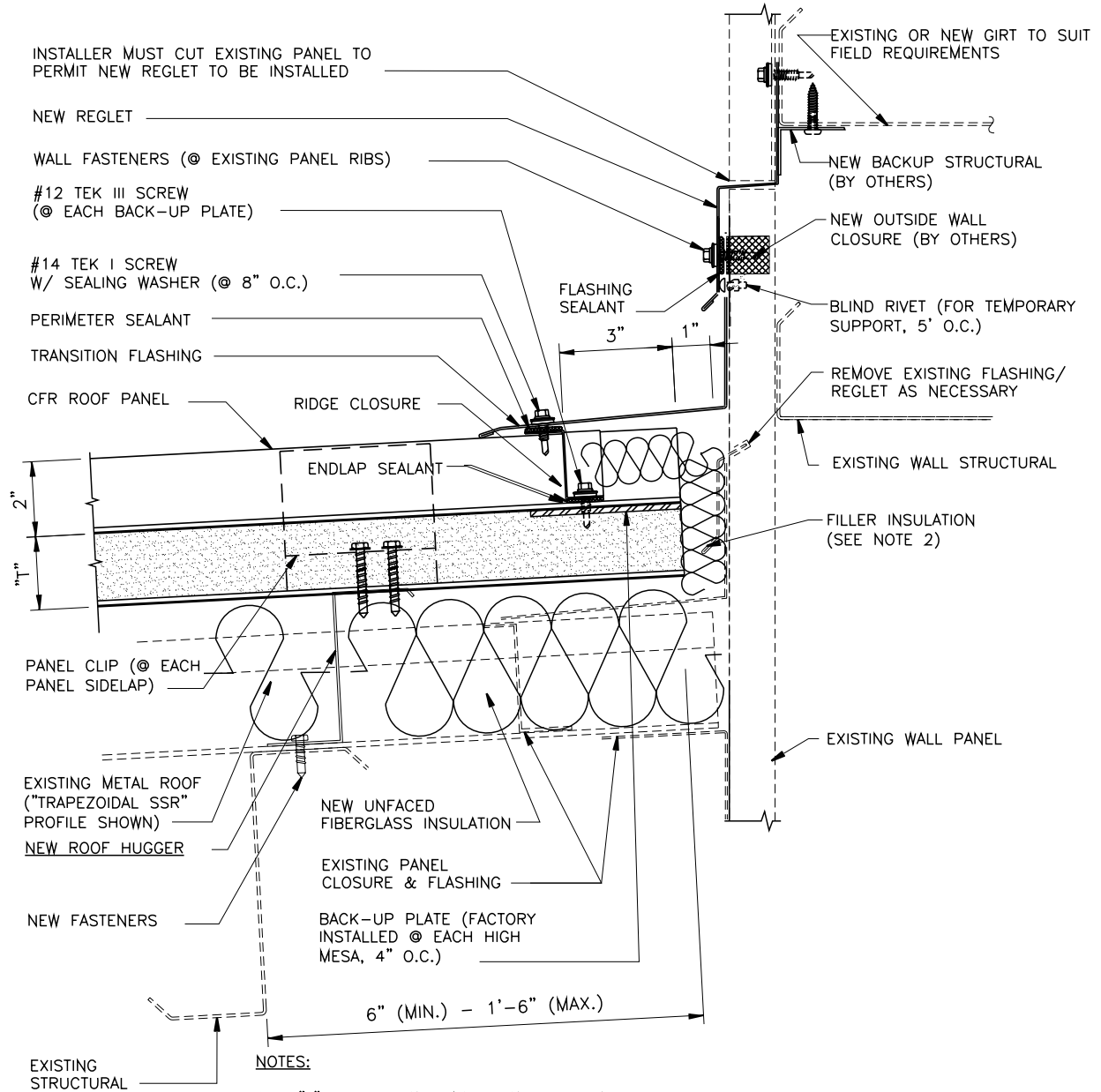


NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. TRANSITION FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.

HIGH SIDE TRANSITION SECTION (WALL BELOW) EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

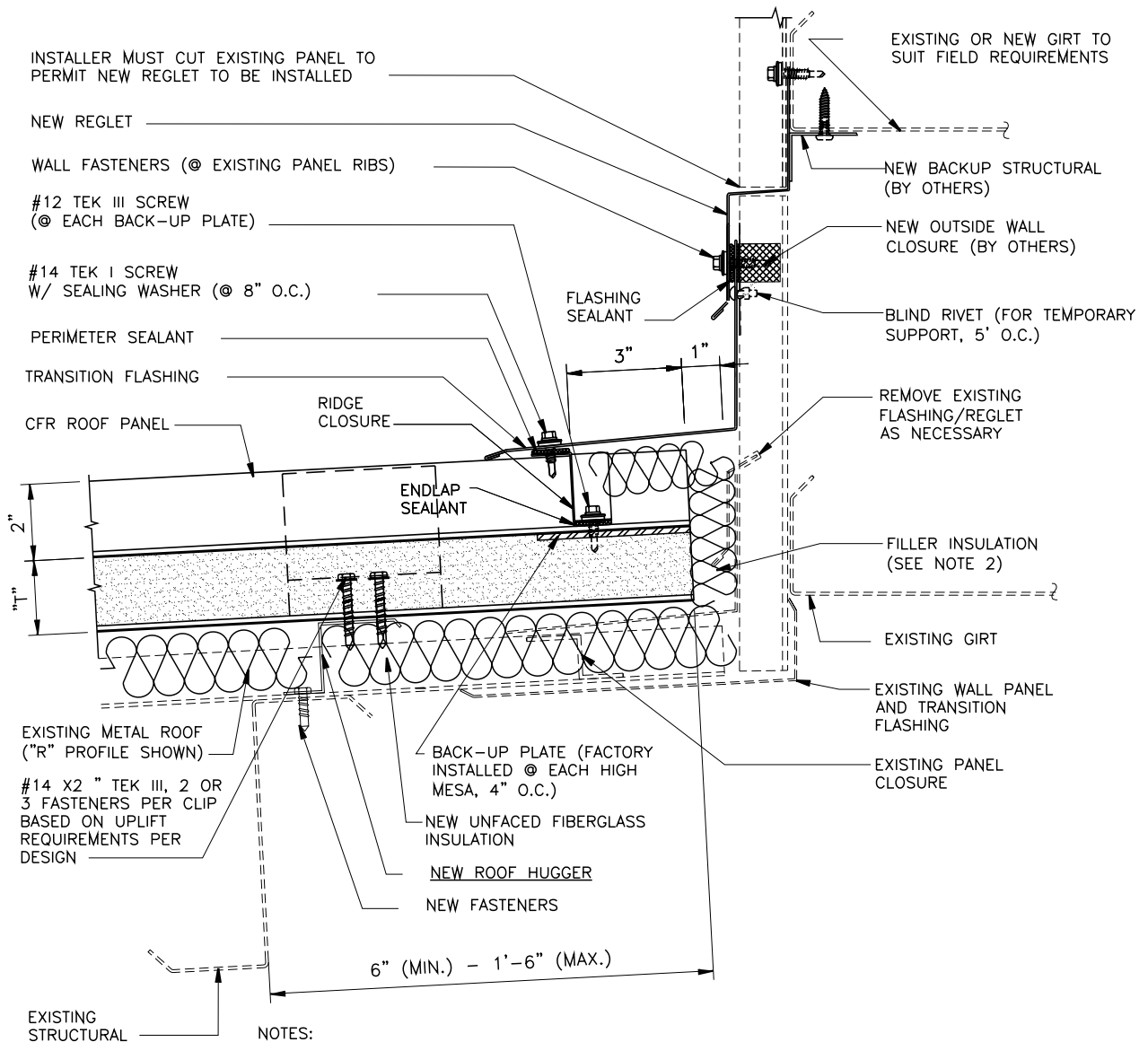
RH C450.517 T



1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. TRANSITION FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.

HIGH SIDE TRANSITION SECTION (OPEN BELOW) **EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER**

RH C450.518 R

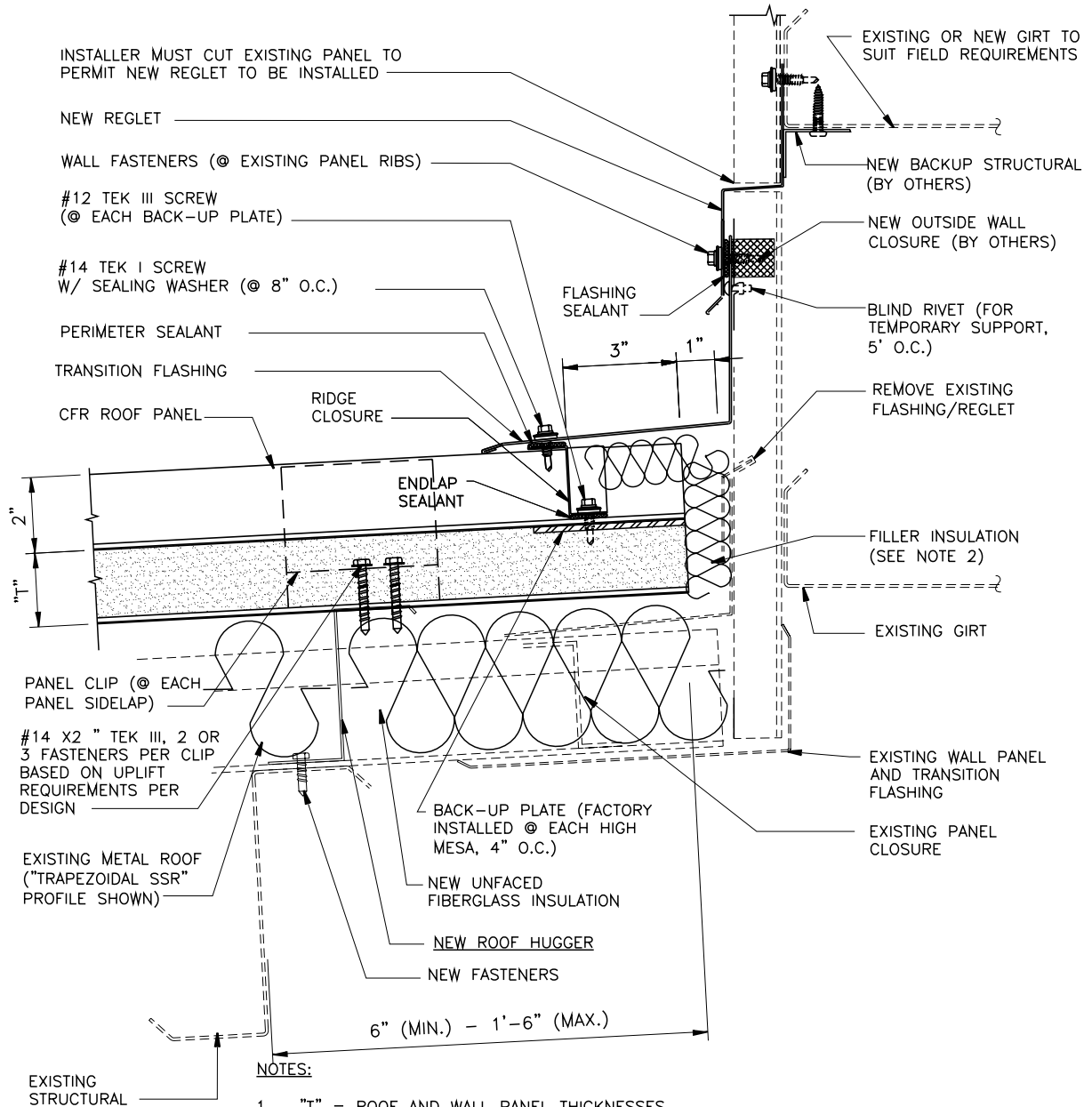


NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. TRANSITION FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.

HIGH SIDE TRANSITION SECTION (OPEN BELOW) **EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER**

RH C450.518 T

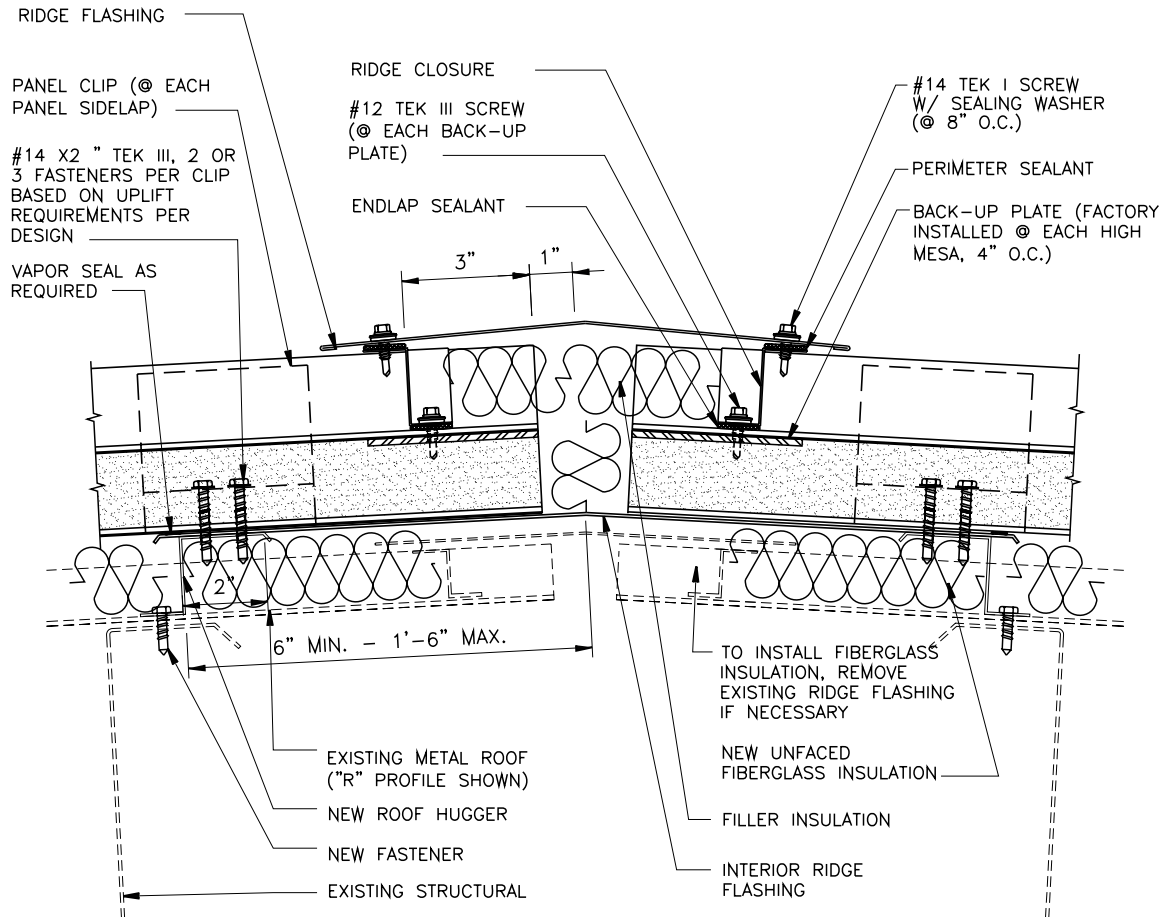


1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. TRANSITION FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.

RIDGE SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.519 R



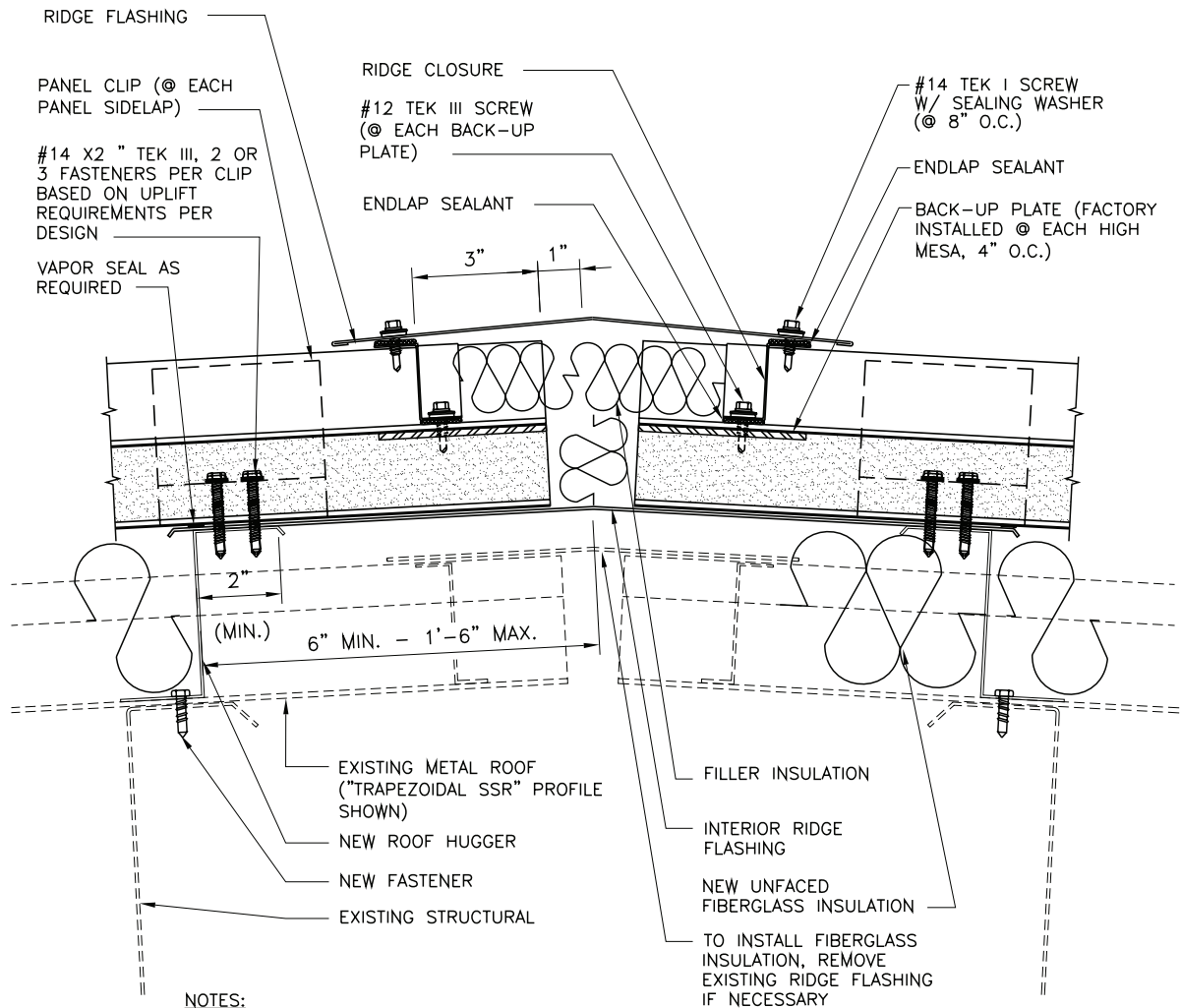
NOTES:

1. "T" = ROOF PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. RIDGE FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.

RIDGE SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.519 T



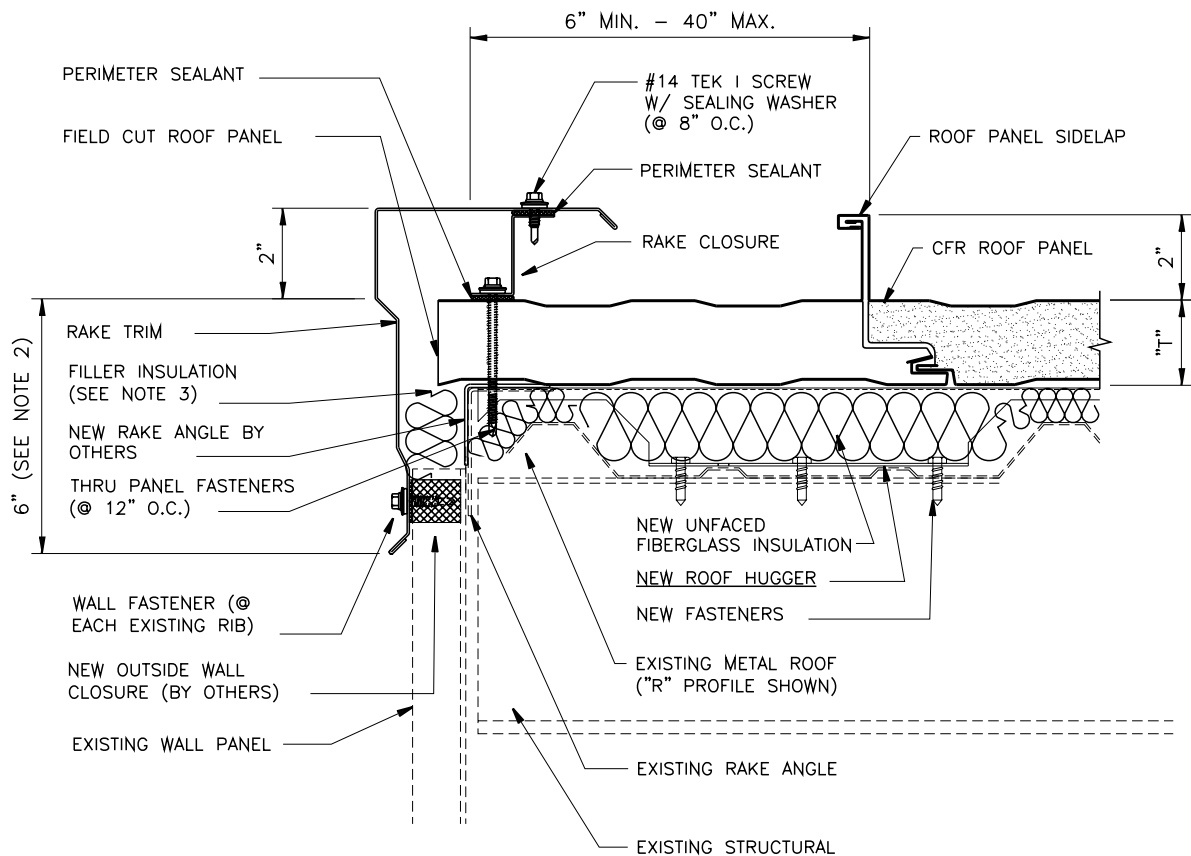
NOTES:

1. "T" = ROOF PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. RIDGE FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.

RAKE SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.520 R



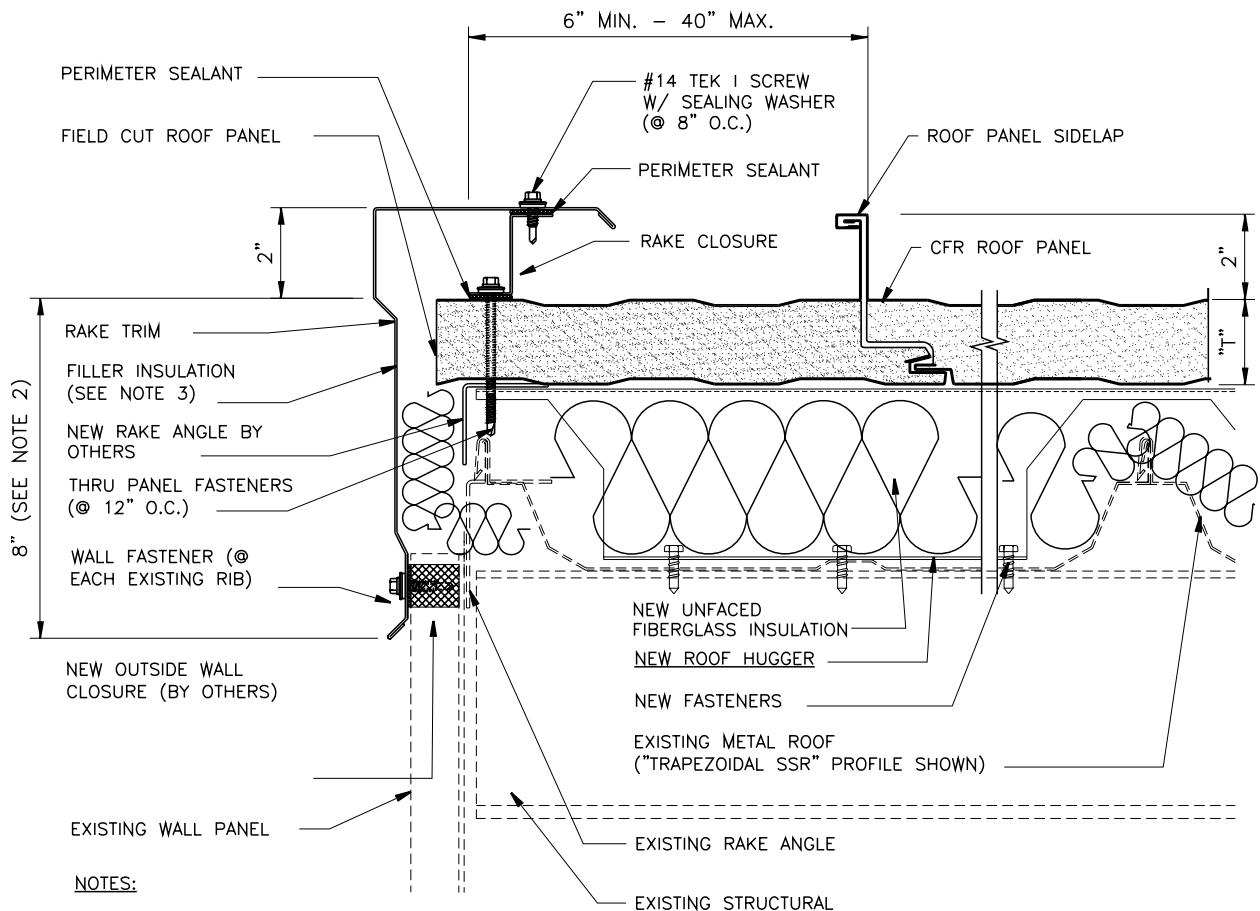
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESSES.
2. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
3. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
4. WALL FASTENERS AND CLOSURES PROVIDED WITH WALL SYSTEM.

RAKE SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.520 T



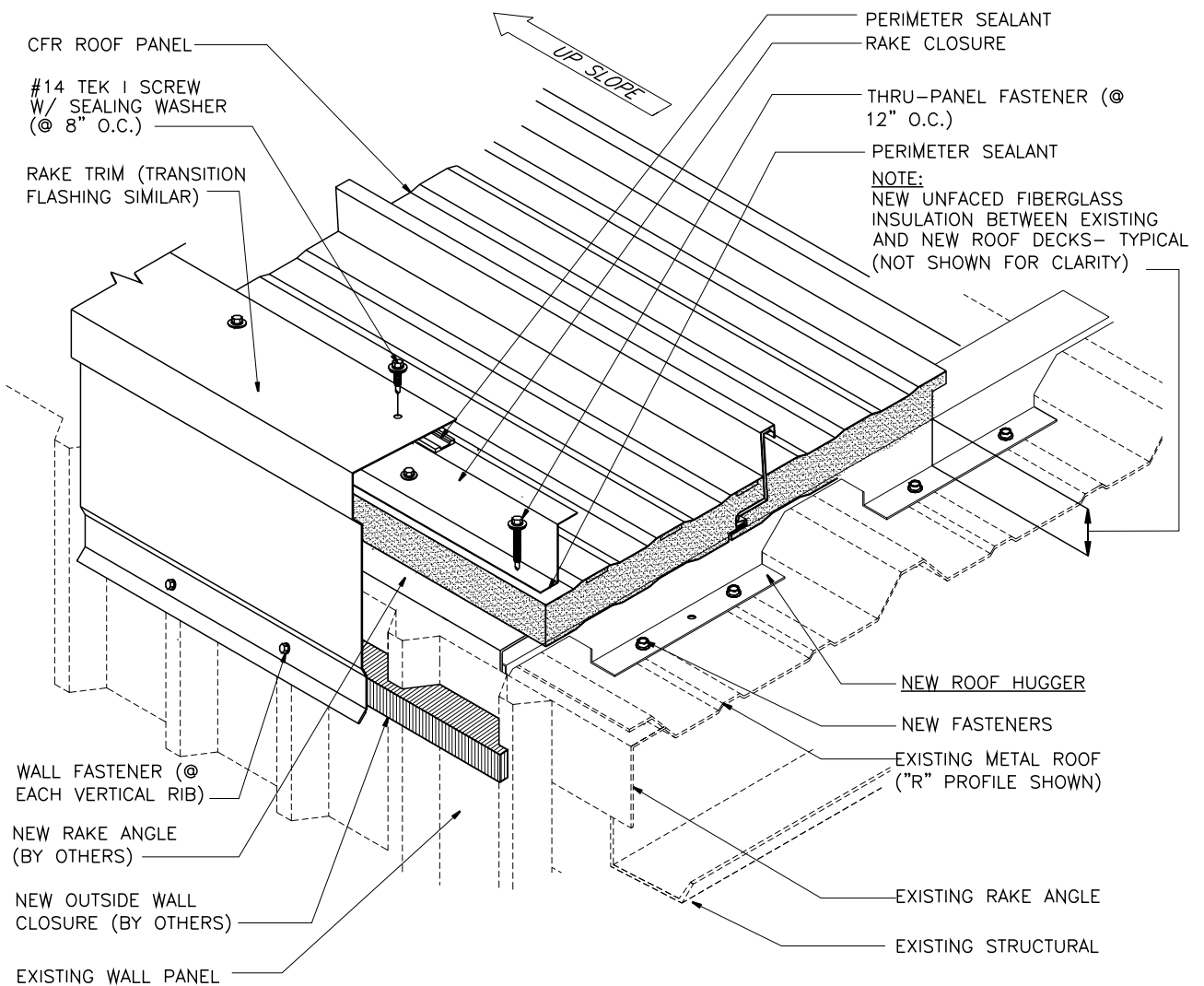
NOTES:

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3. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
4. WALL FASTENERS AND CLOSURES PROVIDED WITH WALL SYSTEM.

RAKE DETAIL

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

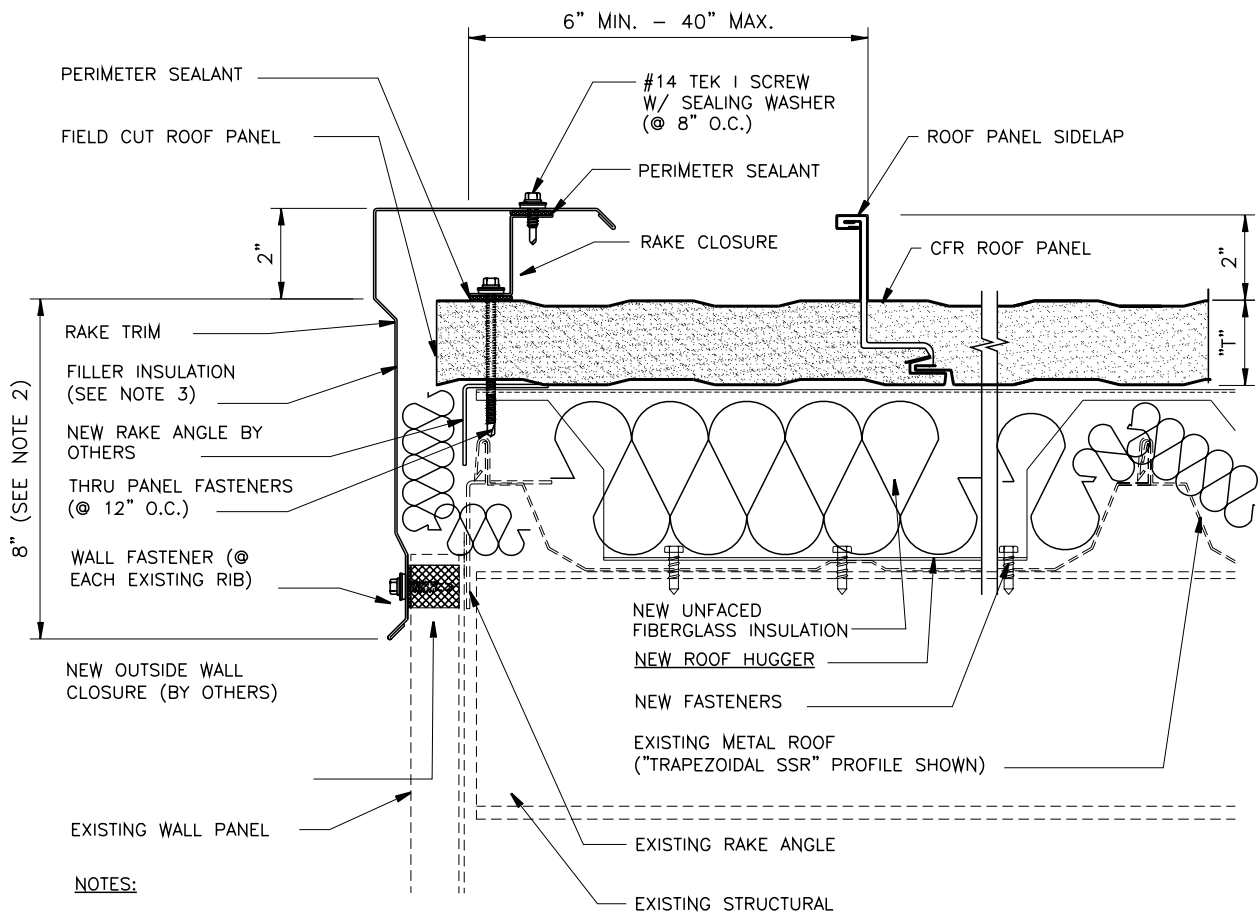
RH C450.521 R



RAKE DETAIL

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.521 T



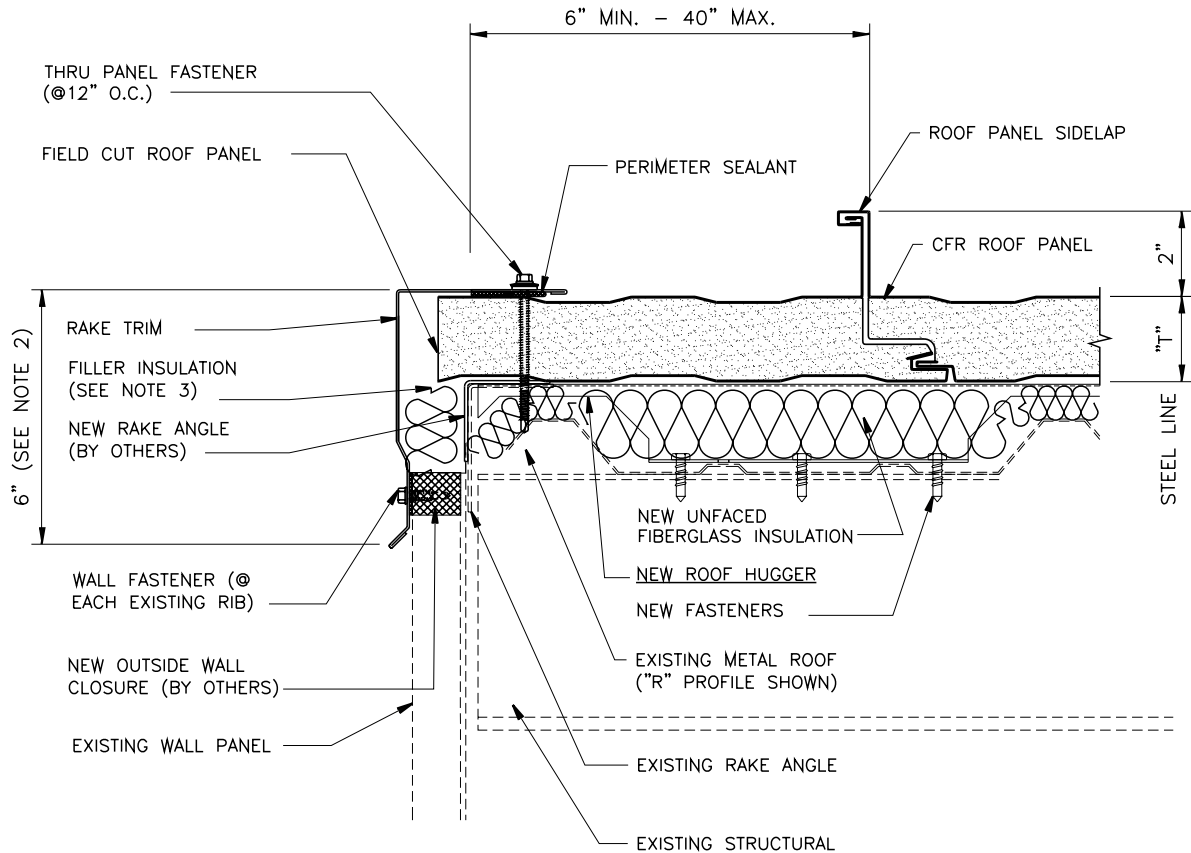
NOTES:

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2. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
3. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
4. WALL FASTENERS AND CLOSURES PROVIDED WITH WALL SYSTEM.

RAKE SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER LOW PROFILE RAKE TRIM

RH C450.522 R



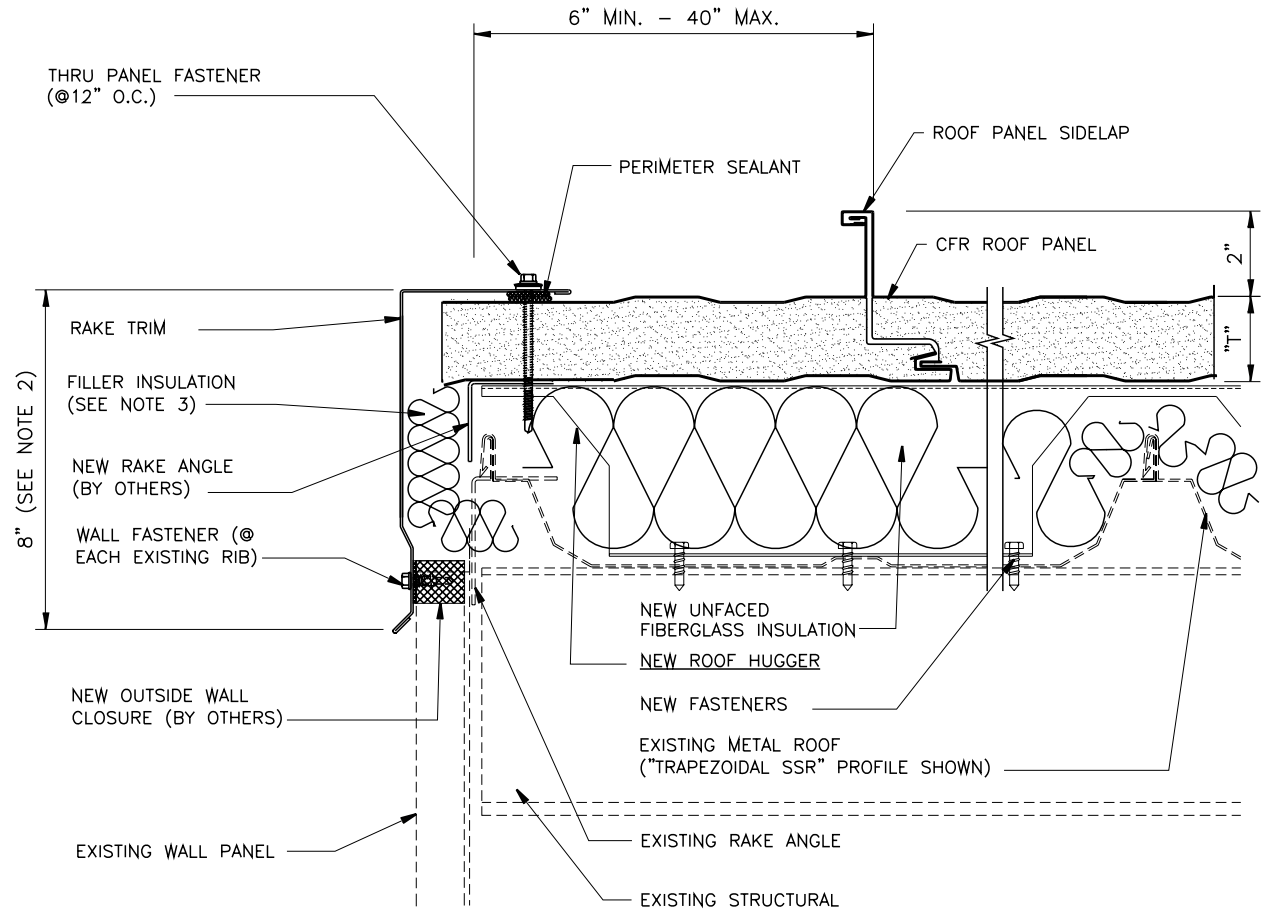
NOTES:

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3. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
4. WALL FASTENERS AND CLOSURES PROVIDED WITH WALL SYSTEM.
5. LOW PROFILE RAKE TRIM CANNOT BE USED WITH HIGH PROFILE EAVE GUTTER.

RAKE SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER LOW PROFILE RAKE TRIM

RH C450.522 T



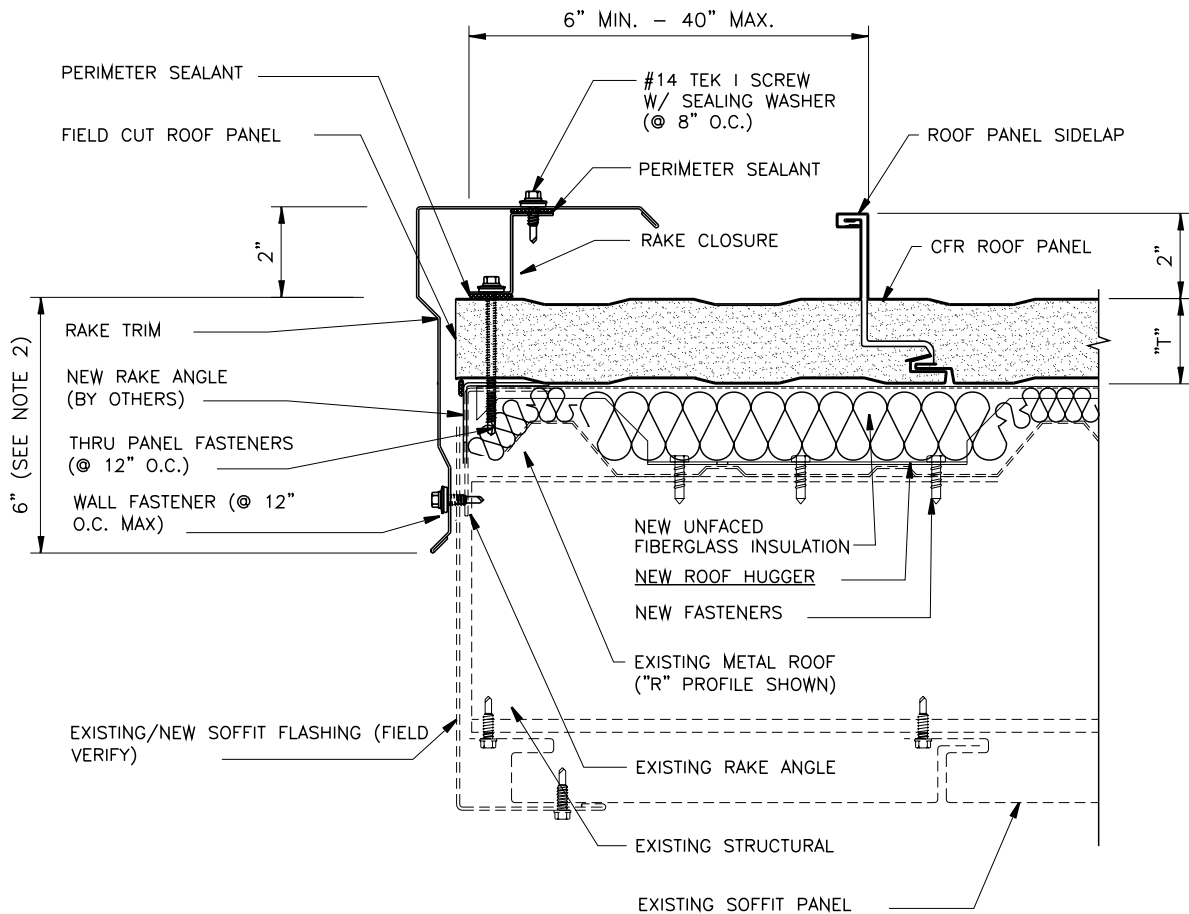
NOTES:

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3. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
4. WALL FASTENERS AND CLOSURES PROVIDED WITH WALL SYSTEM.
5. LOW PROFILE RAKE TRIM CANNOT BE USED WITH HIGH PROFILE EAVE GUTTER.

RAKE SECTION @ CANOPY

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.523 R

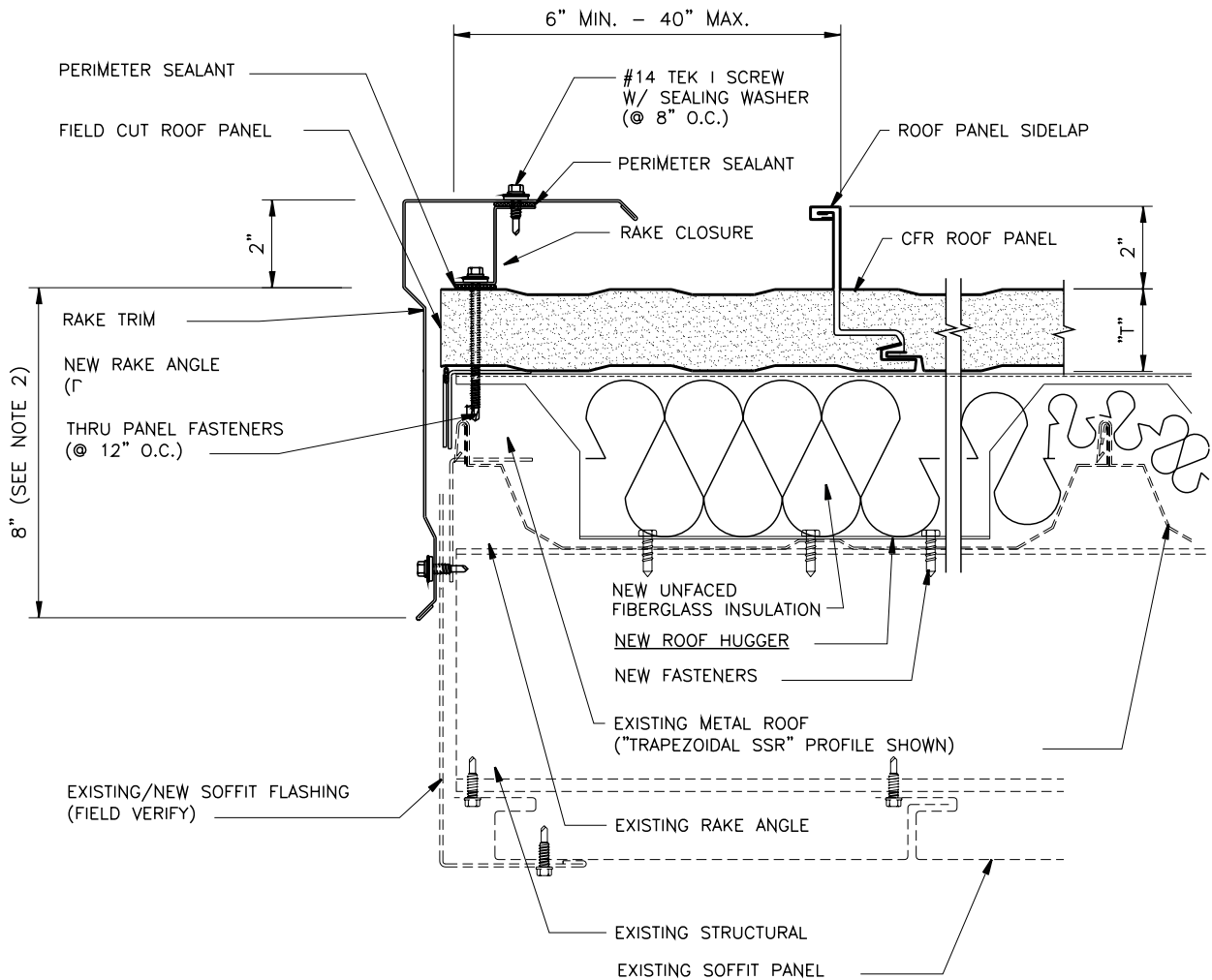


NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESS.
2. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
3. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

RAKE SECTION @ CANOPY **EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER**

RH C450.523 T



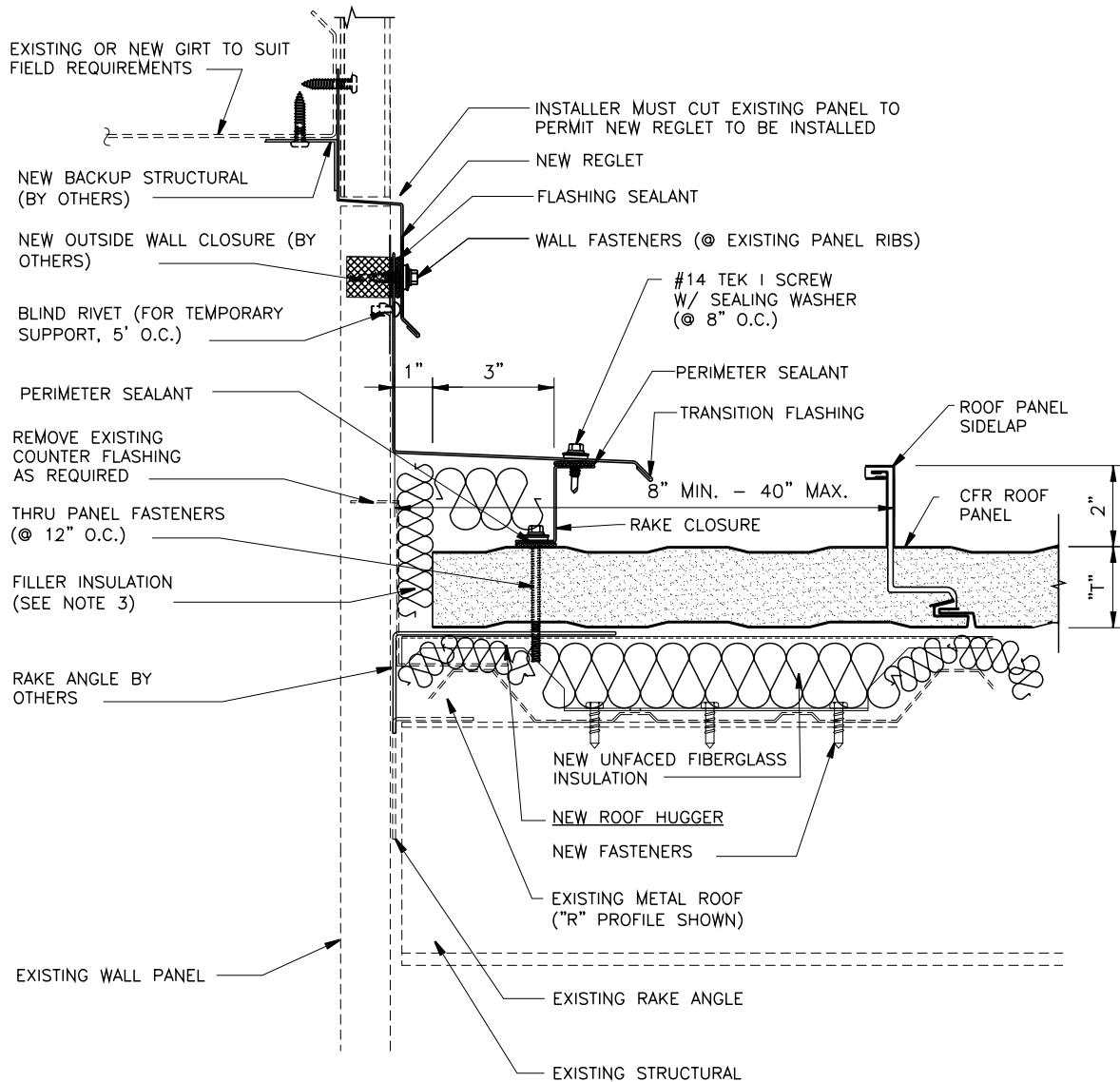
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESS.
2. DIMENSION SHOWN IS FOR 2" TO 3" THICK ROOF PANEL. ADJUST DIMENSION PROPORTIONALLY FOR OTHER ROOF PANEL THICKNESS AND AS REQUIRED FOR SPECIFIC JOB REQUIREMENTS.
3. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.

RAKE TRANSITION SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.524 R



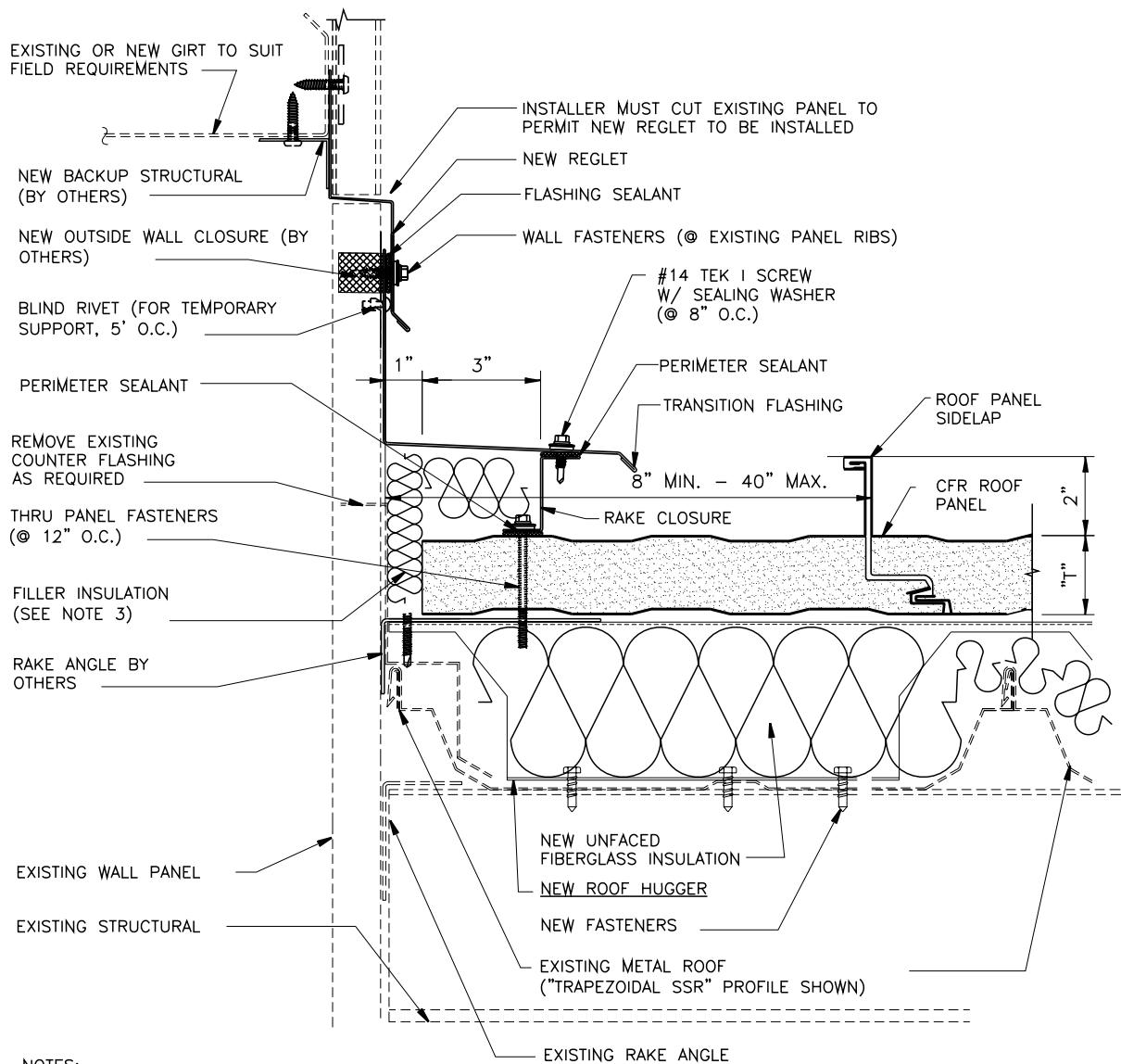
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR
3. TRANSITION FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.

RAKE TRANSITION SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.524 T



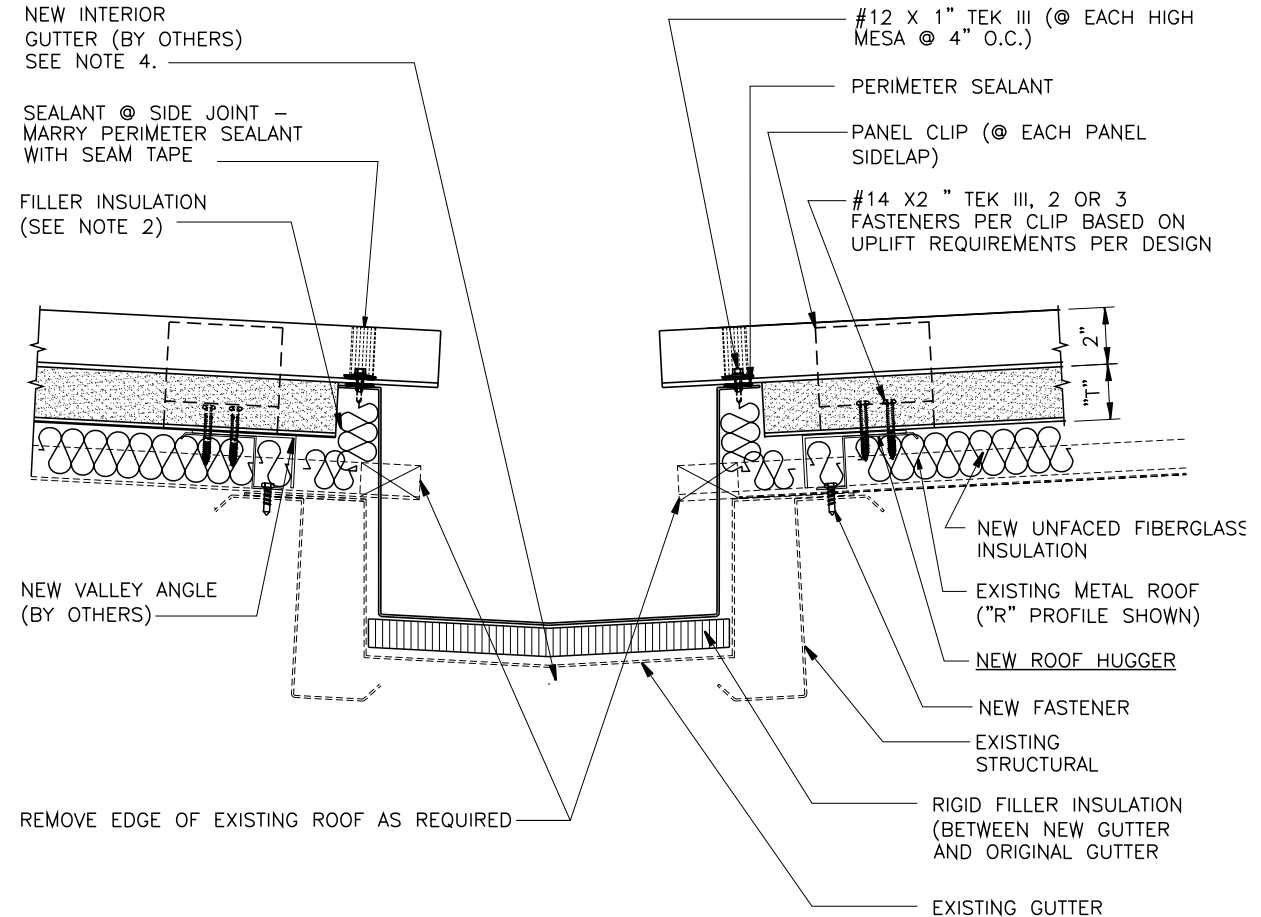
NOTES:

1. "T" = ROOF AND WALL PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR
3. TRANSITION FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.

INTERIOR GUTTER SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.527 R



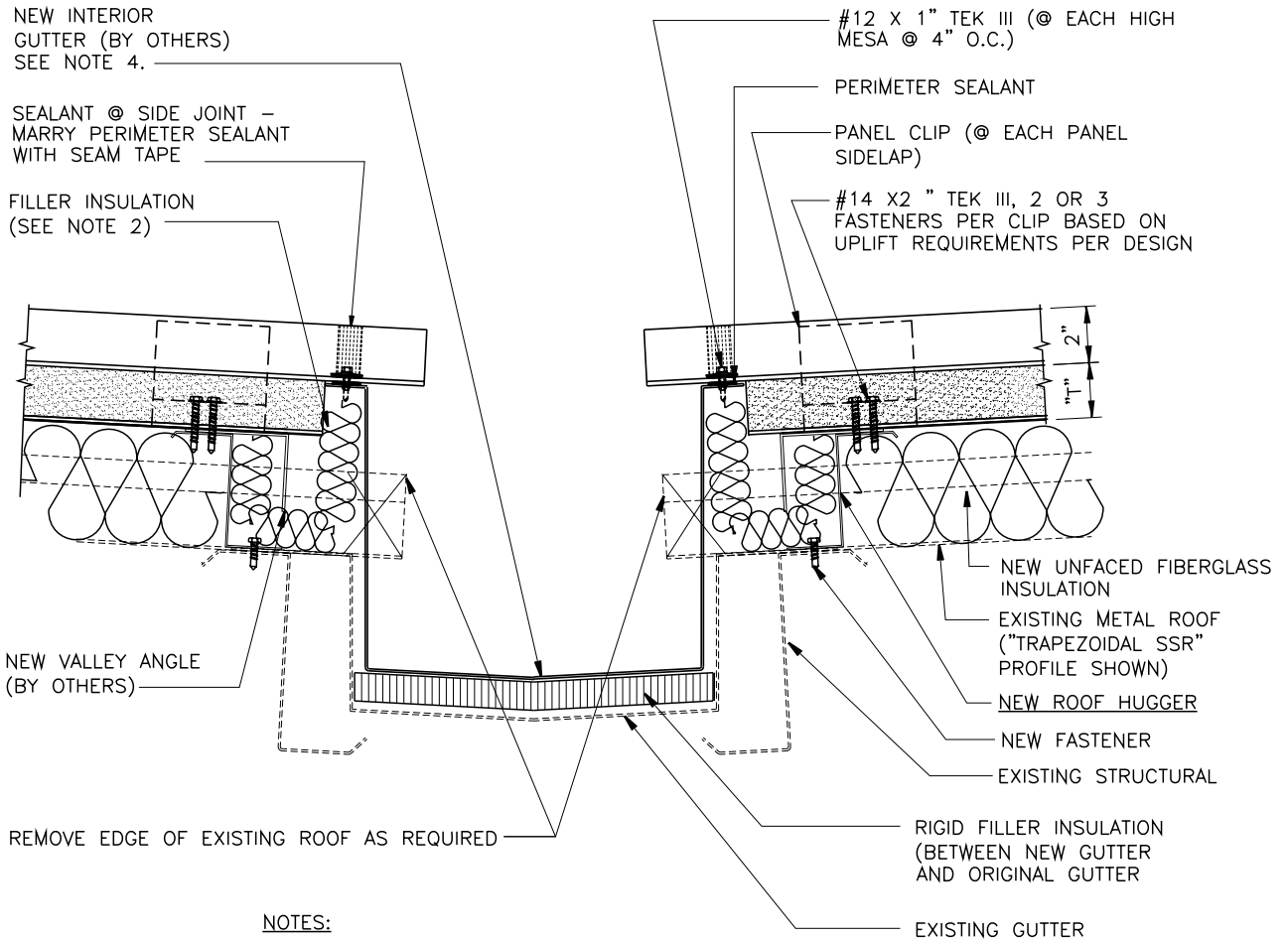
NOTES:

1. "T" = ROOF PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. INTERIOR GUTTERS ARE NOT RECOMMENDED FOR APPLICATIONS SUBJECT TO SNOW OR ICE DAMMING OR OTHER CAUSES OF GUTTER OVERFLOW.
4. RECOMMENDED GUTTER IS 16 GA. MIN. STEEL, WELDED WATER-TIGHT AND COATED OR LINED WITH MEMBRANE.

INTERIOR GUTTER SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.527 T



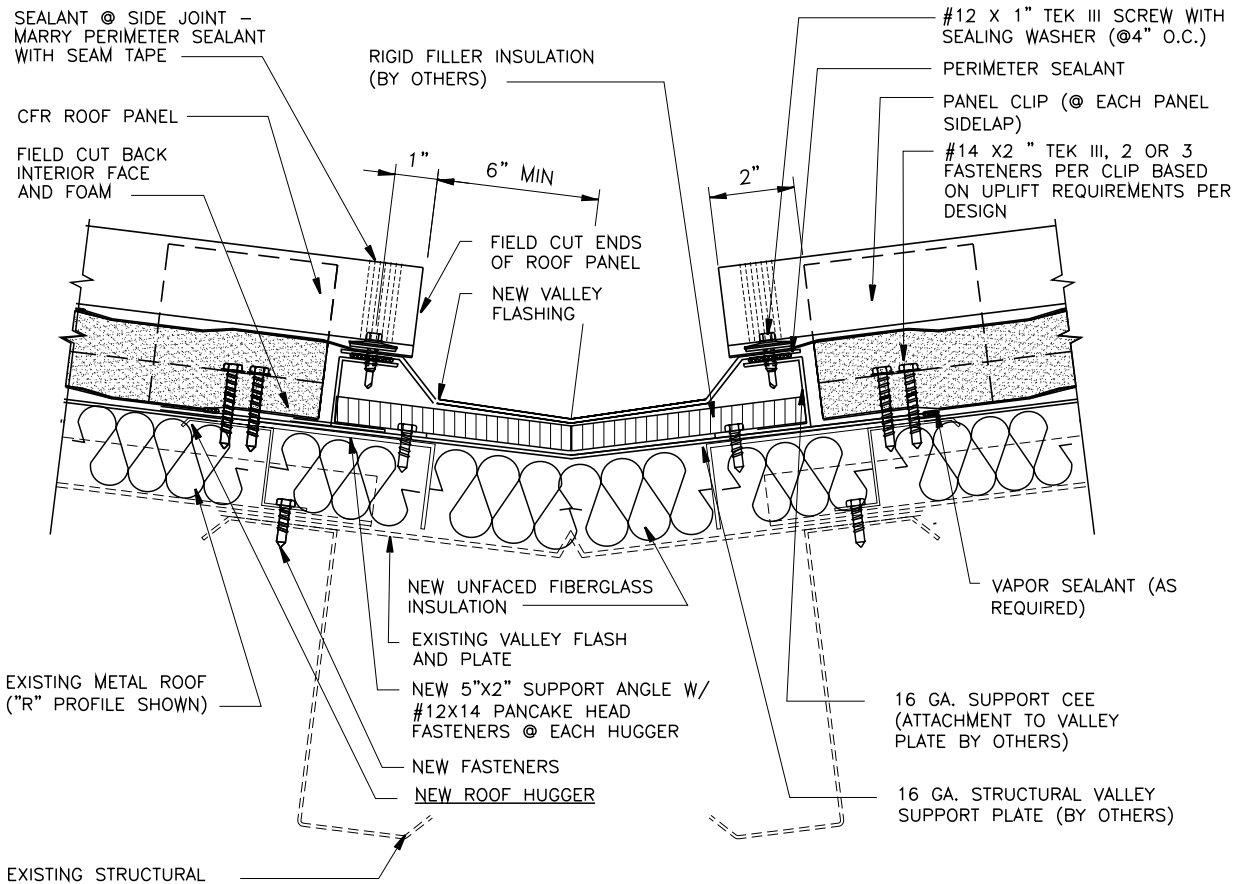
NOTES:

1. "T" = ROOF PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. INTERIOR GUTTERS ARE NOT RECOMMENDED FOR APPLICATIONS SUBJECT TO SNOW OR ICE DAMMING OR OTHER CAUSES OF GUTTER OVERFLOW.
4. RECOMMENDED GUTTER IS 16 GA. MIN. STEEL, WELDED WATER-TIGHT AND COATED OR LINED WITH MEMBRANE.

VALLEY SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.528 R



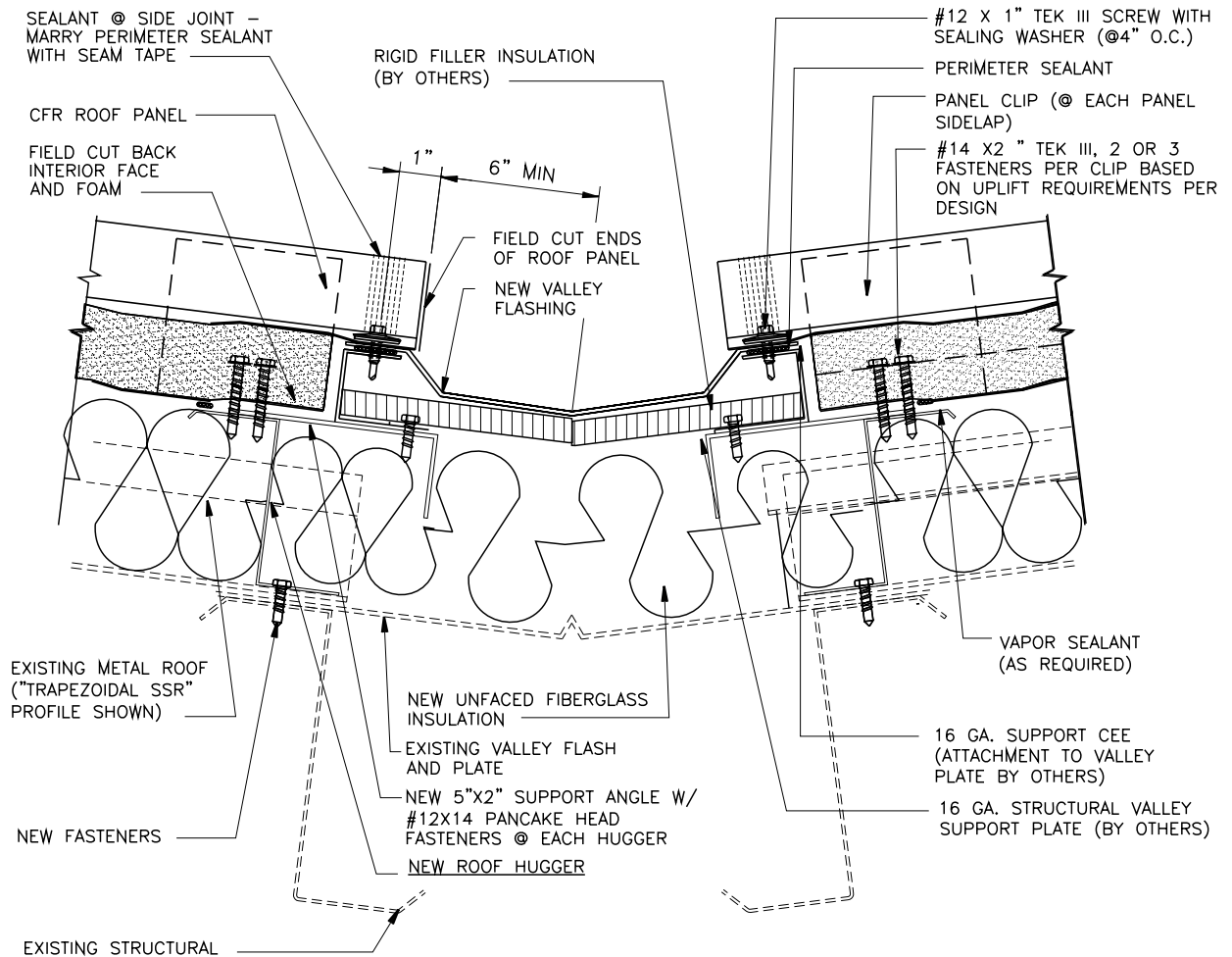
NOTES:

1. "T" = ROOF PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. VALLEY CONDITIONS ARE NOT RECOMMENDED FOR APPLICATIONS WITH ROOF PITCH LESS THAN 3:12.
4. THE VALLEY PAN WIDTH VARIES WITH THE ROOF'S DRAINAGE REQUIREMENTS.
5. RECOMMENDED VALLEY PAN IS 16 GA. MIN. STEEL, WELDED WATER-TIGHT AND COATED OR LINED WITH MEMBRANE.

VALLEY SECTION

EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER

RH C450.528 T



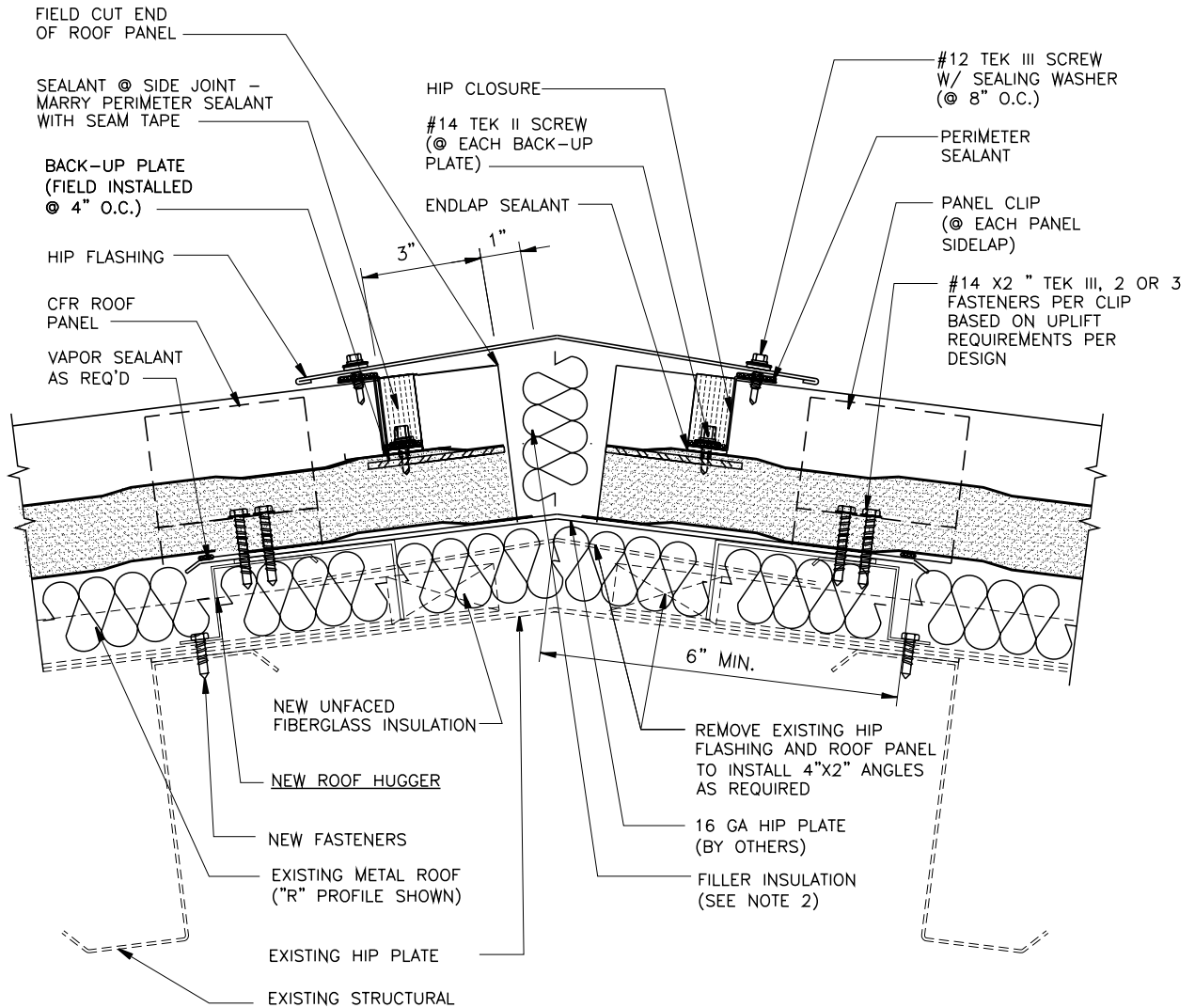
NOTES:

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2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. VALLEY CONDITIONS ARE NOT RECOMMENDED FOR APPLICATIONS WITH ROOF PITCH LESS THAN 3:12.
4. THE VALLEY PAN WIDTH VARIES WITH THE ROOF'S DRAINAGE REQUIREMENTS.
5. RECOMMENDED VALLEY PAN IS 16 GA. MIN. STEEL, WELDED WATER-TIGHT AND COATED OR LINED WITH MEMBRANE.

HIP SECTION

EXISTING "R" OR "PBR" PROFILE METAL ROOF w/NEW ROOF HUGGER

RH C450.529 R

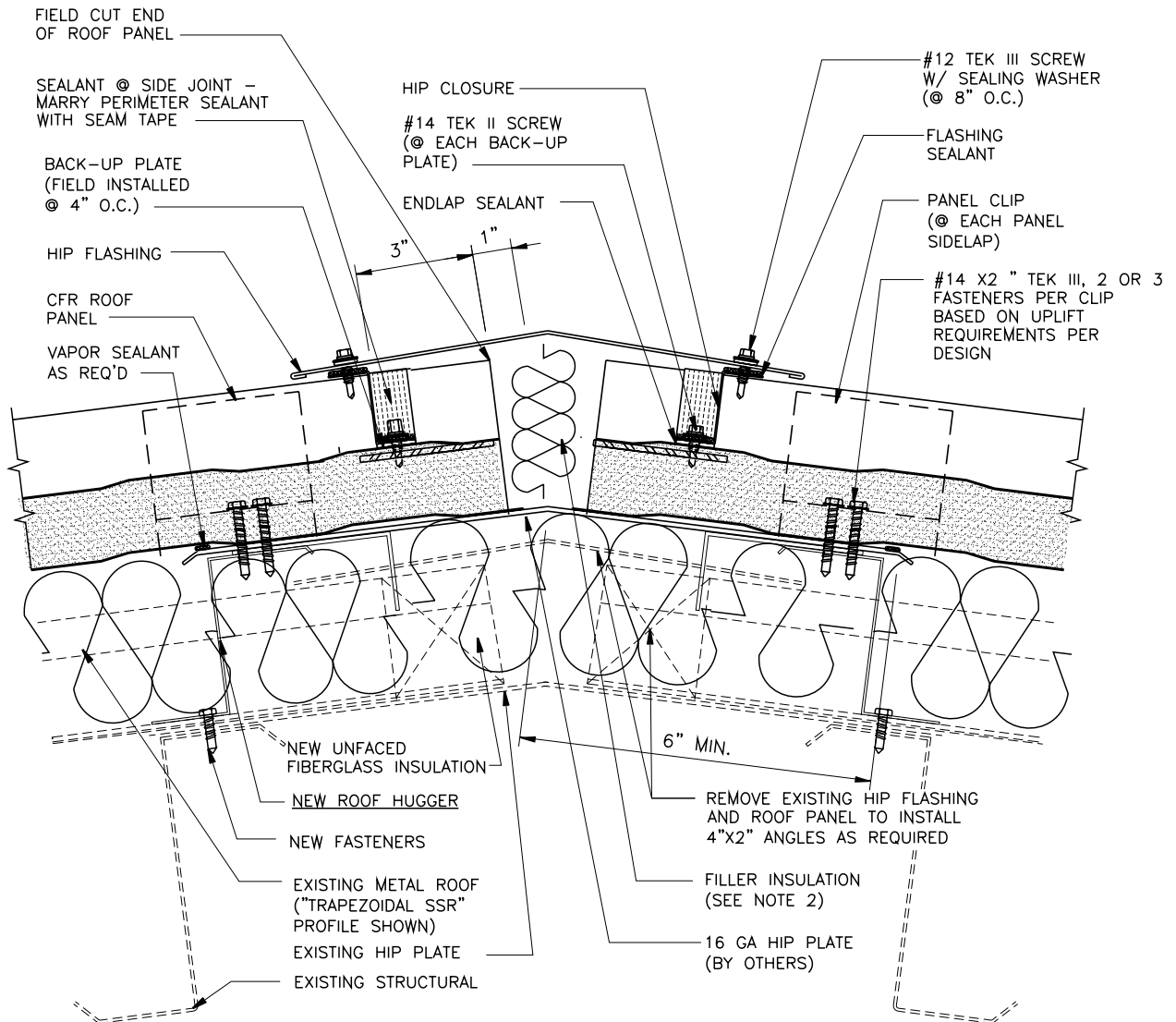


NOTES:

1. "T" = ROOF PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. HIP FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.
4. HIP CONDITIONS ARE NOT RECOMMENDED FOR APPLICATIONS WITH ROOF PITCH LESS THAN 3:12.

HIP SECTION **EXISTING TRAPEZOIDAL SSR METAL ROOF w/NEW ROOF HUGGER**

RH C450.529 T



NOTES:

1. "T" = ROOF PANEL THICKNESS.
2. FILLER INSULATION MATERIAL AND APPLICATION IS SPECIFIED BY THE ROOFING CONTRACTOR.
3. HIP FLASHING IS INSTALLED WITH A PITCH 1/2:12 GREATER THAN THE ROOF PITCH.
4. HIP CONDITIONS ARE NOT RECOMMENDED FOR APPLICATIONS WITH ROOF PITCH LESS THAN 3:12.

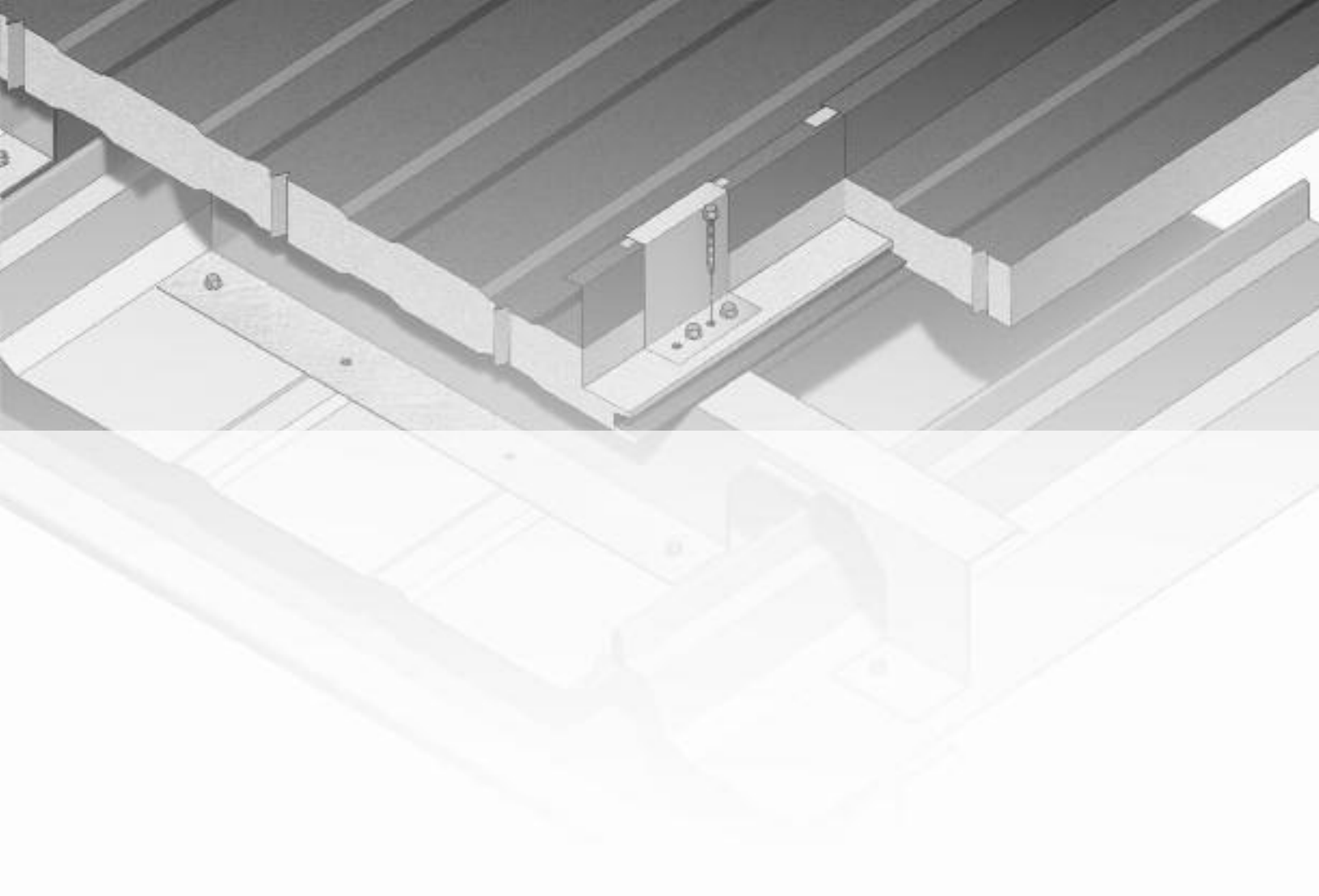


PIONEERING INSULATED METAL PANEL TECHNOLOGY



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