R-SHIELD®
NAILBASE Ci

R-Shield®

NAILBASE Ci

R-Shield®

MAX NAILBASE Ci

ROOF APPLICATIONS CONSTRUCTION MANUAL

Note: Information deemed reliable at time of printing.
Please visit www.rshieldinsulation.com for the latest information.

R-SHIELD®
NAILBASE

ROOF APPLICATIONS CONSTRUCTION MANUAL

When you choose R-Shield Nailbase, you're collaborating with a team of experts who work with you every step of the way. We're here to answer your questions, solve your problems, and do everything we can to make sure your project proceeds smoothly—and ends successfully.

R-Shield products are manufactured by Premier Building Systems. Premier Building Systems adhere to strict, consistent standards to ensure high-quality.

This network allows us to offer architects, designers and builders the best of both worlds: the resources of the country's largest provider of R-Shield Nailbase products and systems, and the superior attention and customer service of a local supplier.

Note: Information deemed reliable at time of printing.
Please visit: www.rshieldinsulation.com for the latest information.
Sept. 2022.

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Standard Nailbase Details

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General Recommendations

R-Shield Nailbase Sizes

R-Shield Nailbase is made in a variety of sizes, most commonly 4' x 8'. Consult Premier Building Systems for sizes, thicknesses, and fabrication services available in your area.

Environmentally Safe

The core material for R-Shield Nailbase, R-Shield insulation, contains no CFCs, HCFCs, HFCs or formaldehyde and is recyclable. R-Shield insulation is inert, non-nutritive and highly stable. Premier Building Systems encourages you to support recycling and energy conservation.

Warranty

Premier Building Systems provide a 50-year warranty covering thermal performance. Contact Premier Building Systems for details regarding the warranty program.

Handling - Storage - Protection

R-Shield Nailbase should be stored in a fully supported manner and protected from weather. Cover stored R-Shield Nailbase with tarps or similar protective wraps. Important! Do not use clear plastic covering file on Nailbase with Max cores (Gray foam) and avoid using very dark colored coverings. Opaque, white, and light-colored coverings are recommended. Exposure 1 OSB facings are used in R-Shield Nailbase manufacture; however, panels used for roof systems must have temporary roofing applied at the time of installation. Apply finished roofing when immediately practical.

Metal roof systems have inherent properties that may cause R-Shield Nailbase roofs covered with these materials to become hotter than other roof systems. When installing metal roof systems on R-Shield Nailbase, additional design considerations may be necessary to protect the roofing underlayment and the R-Shield Nailbase from excessive temperatures. These design precautions may include the use of a ventilated air space above the R-Shield Nailbase to minimize temperature exposure. Consult Premier Building Systems for local recommendations.

Expanded polystyrene contains a flame retardant additive. However, the expanded polystyrene should be considered combustible and used with code approved thermal barriers and should not be stored near any open flame or source of ignition. Do not install or use expanded polystyrene with coal-tar pitch or highly solvent extended mastics, adhesives or sealants. Consult Premier Building Systems for suggested adhesives, sealants, and assembly specifications not otherwise detailed in this manual.

General Recommendations - cont'd

Low VOC Sealant and Splines

R-Shield Nailbase may be joined as needed using splines. These attachments are made with nails, staples, or screws and Low VOC Sealant.

Spline Connection and Low VOC Sealant use shall be as specified by the design professional based upon structure design, climate zone, and moisture vapor analysis.

Vapor Retarders

R-Shield Nailbase may require the use of a vapor retarder to ensure long term durable roof structures. Consult with a local design professional for a recommendation.

Special Treatments

One of the most destructive forces anywhere is termites. R-Shield can be manufactured with a proven and safe additive, that effectively resists termites.

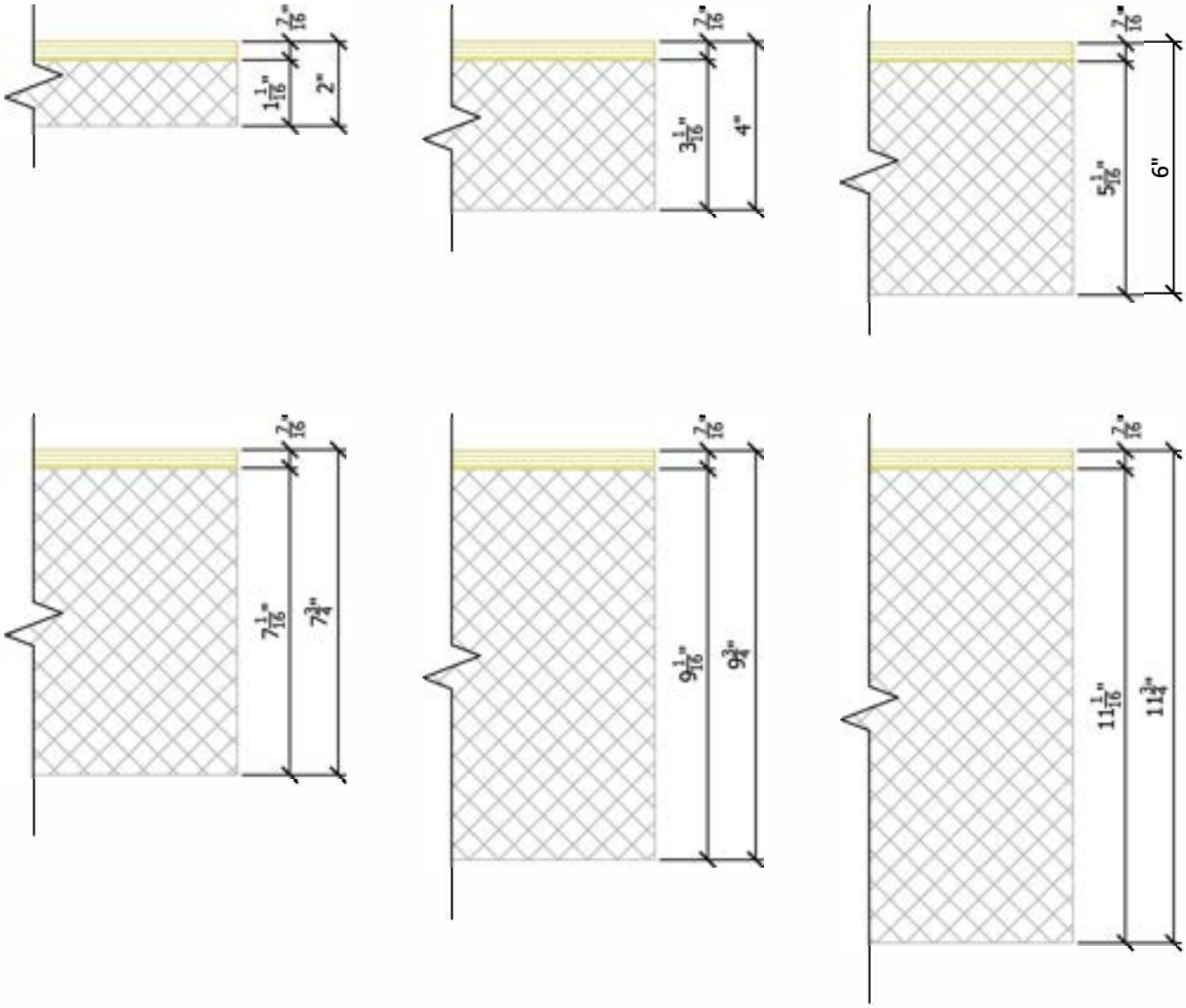
R-Shield is treated to meet ICC ES AC239, "Acceptance Criteria for Termite-Resistant Foam Plastics."

Disclaimer

Details, illustrations, pictures and guidelines provided herein give basic information and illustrate examples of R-Shield Nailbase installation. The basic information provide herein is not intended to cover every potential use and application of R-Shield Nailbase. It is the responsibility of the installer to become familiar with his specific application and determine if R-Shield Nailbase is suitable. By commencing work, the installer accepts full responsibility for the proper and safe installation of R-Shield Nailbase at his job site. Adding an insulation component may change the behavior of a roof assembly with regard to air movement, water vapor transmittance, bulk water management and heating, cooling and ventilation systems. It is the responsibility of the owner or the owner's representative to design the insulated roof assembly to perform in a manner ensuring function and durability. Furthermore, it is the sole responsibility of the installer to meet all federal and local regulatory requirements for job site safety for himself, his workers and any others on the job site while in the execution of all phases of R-Shield Nailbase installation.

NOTES:

1. STANDARD NAILBASE Ci WIDTH AND LENGTH IS 4' X 8'.
2. STANDARD THICKNESSES OF NAILBASE Ci ARE SIZED TO ACCOMMODATE STANDARD 2X LUMBER DIMENSION VARIANCES.
3. NAILBASE Ci FOAM IS TYPE 1 EPS OR TYPE 1 GPS.
4. STANDARD FACING IS 7/16" OSB.
5. CUSTOM WIDTH, LENGTH, THICKNESS, AND FACINGS AVAILABLE.



N.T.S.

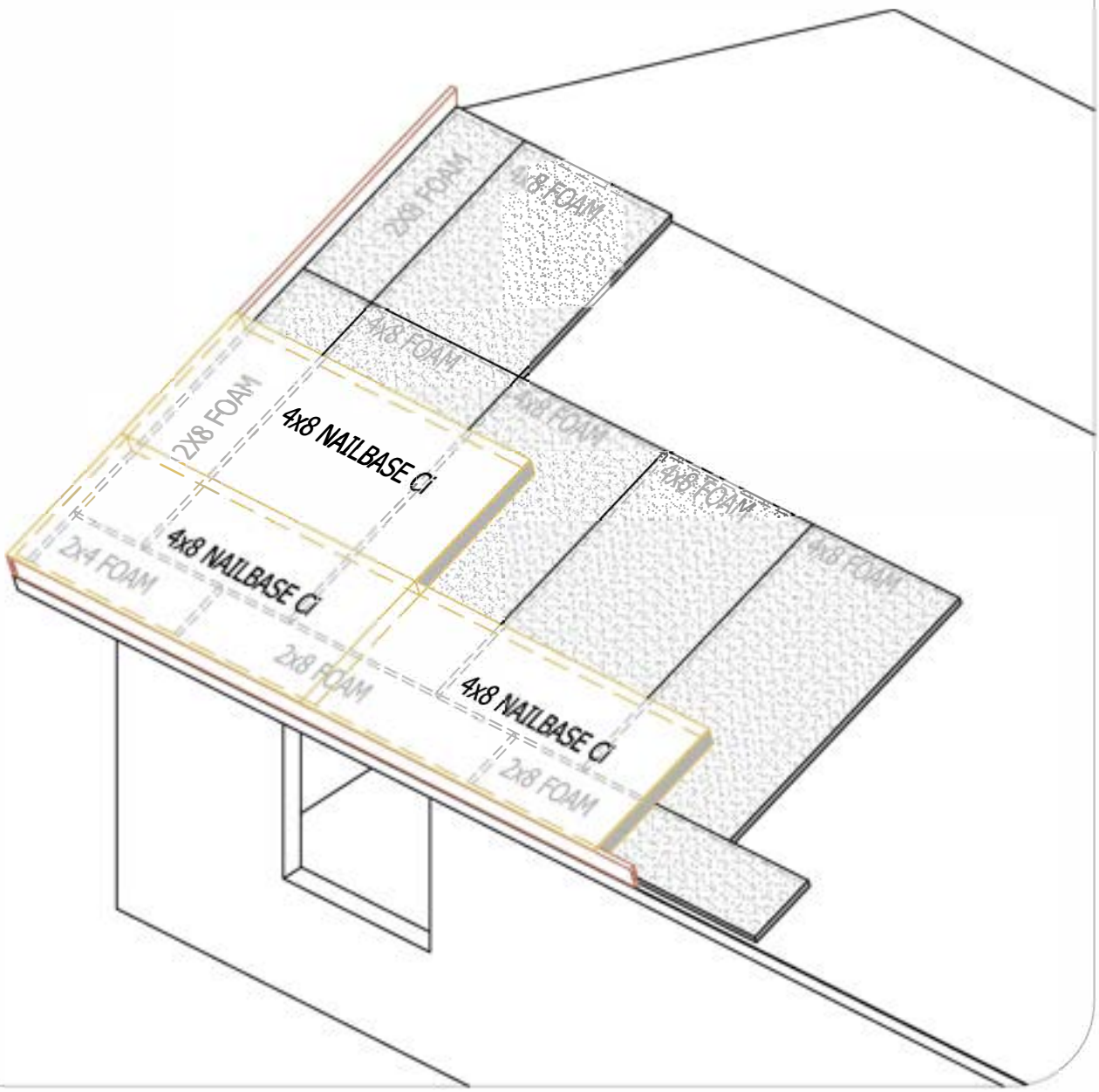
Rev: 1/26/2024

NB-100	STANDARD NAILBASE Ci SIZES AND DIMENSIONS

R-SHIELD® RIGID INSULATION

NOTES:

1. STAGGER EDGES OF TOP AND BOTTOM LAYERS TO ELIMINATE COLD JOINTS AND THE NEED TO APPLY SEALANT WITHIN THE FIELD OF THE ASSEMBLY.
2. FASTENERS TO PENETRATE BOTH LAYERS INTO STRUCTURE BELOW.
3. STANDARD TOTAL NAILBASE Ci ASSEMBLY THICKNESSES ARE IDENTICAL TO 1-PART NAILBASE Ci PER #400100.
4. REFERENCE TECHNICAL BULLETIN #4001 FOR FASTENING REQUIREMENTS.

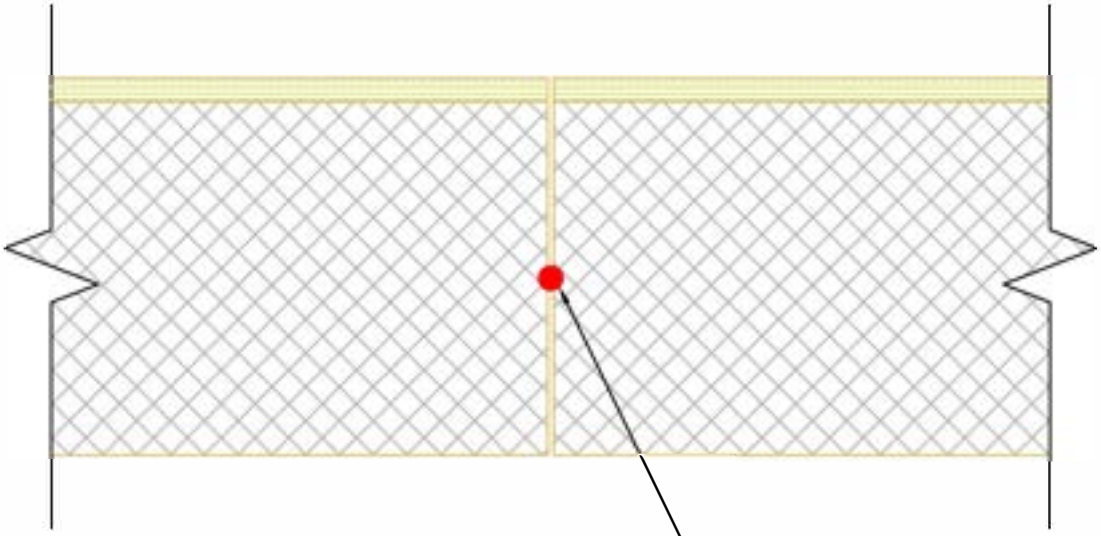


N.T.S.

Rev: 3/20/2023

NB-101	2-PART NAILBASE Ci STAGGERED LAYERS

R-SHIELD® RIGID INSULATION



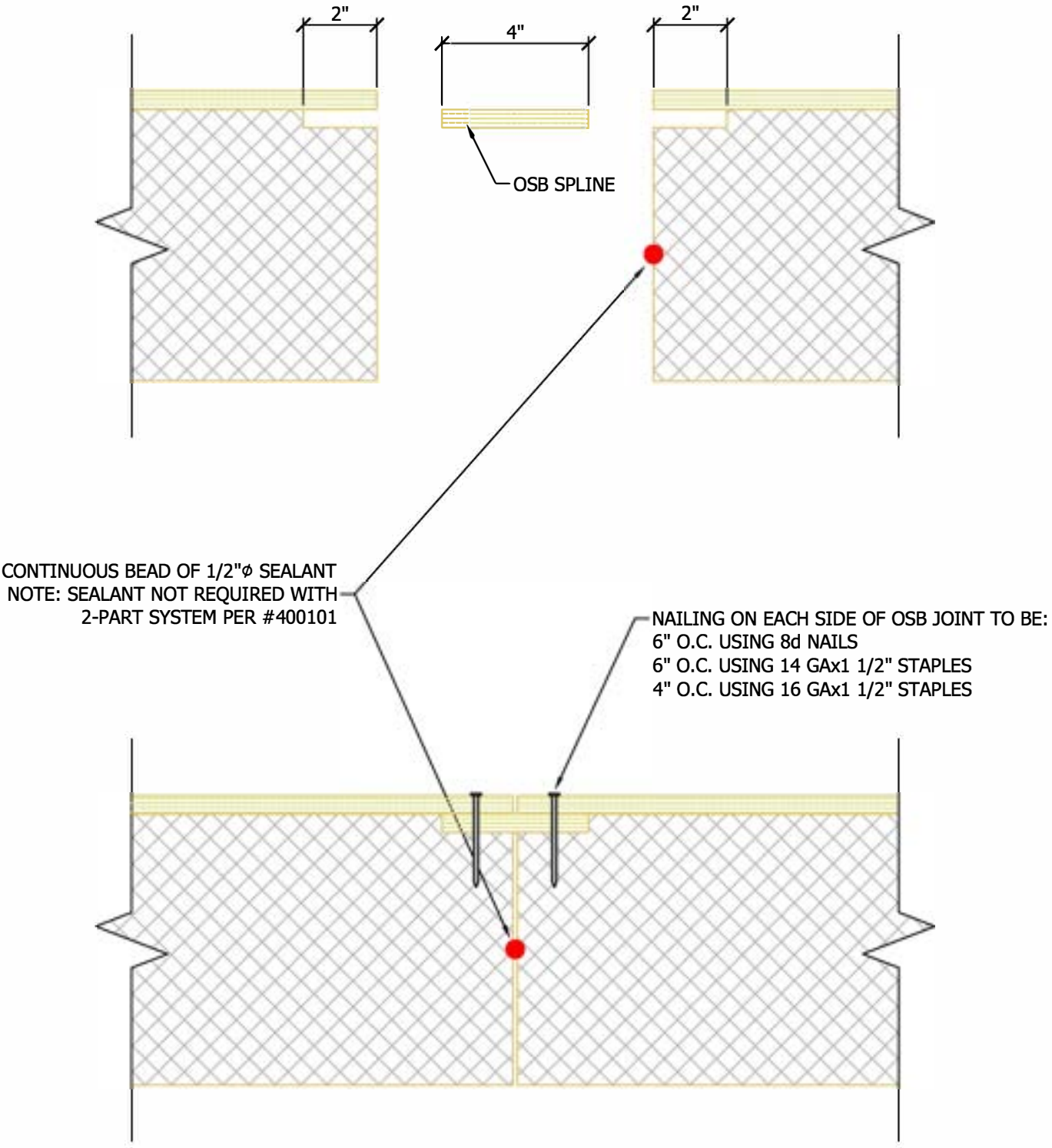
N.T.S.

Rev: 3/20/2023

NB-102

NAILBASE Ci
BUTT CONNECTION

R-SHIELD® RIGID INSULATION



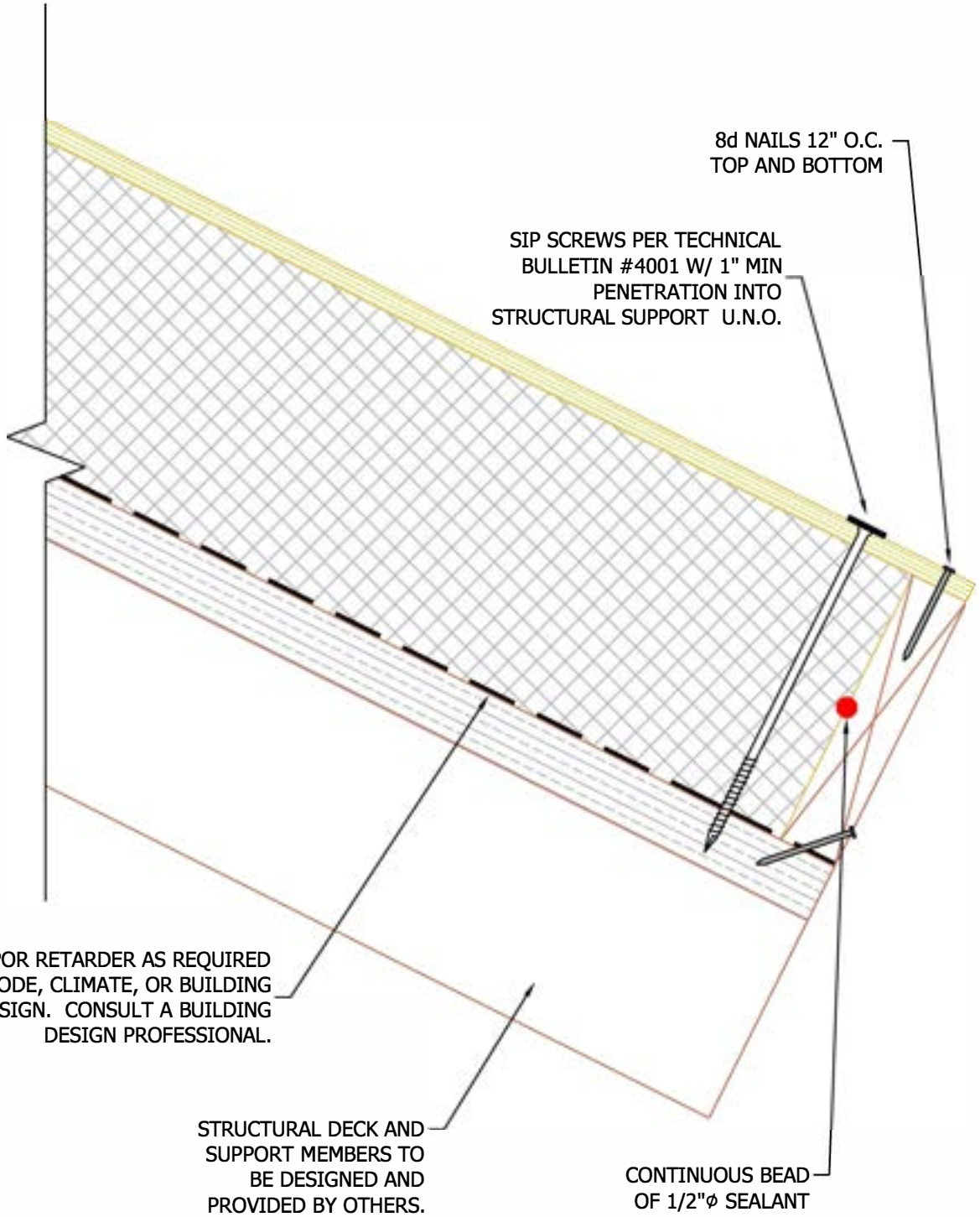
N.T.S.

Rev: 3/20/2023

NB-103

NAILBASE Ci
SPLINE CONNECTION

R-SHIELD® RIGID INSULATION



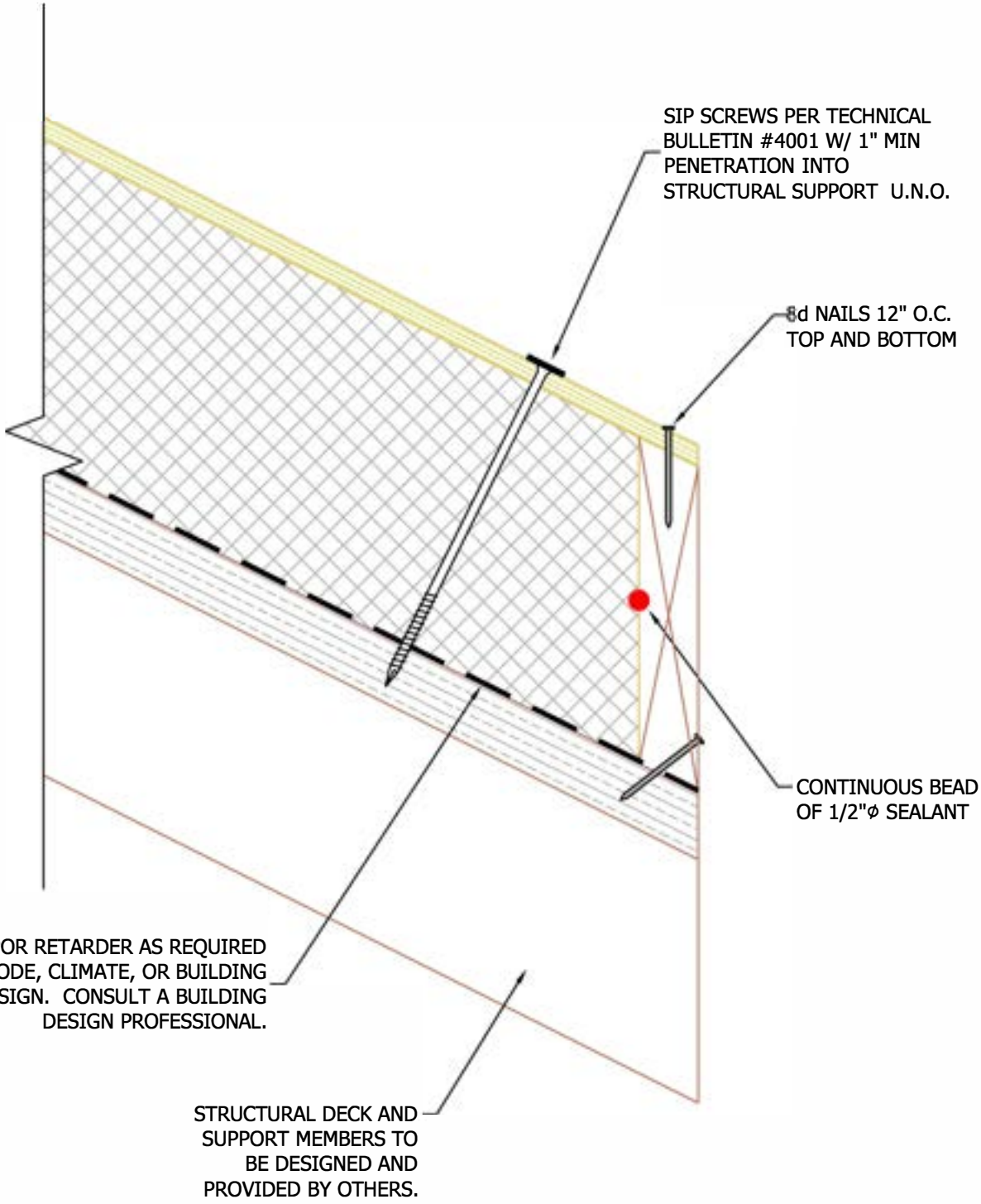
N.T.S.

Rev: 3/20/2023

NB-104

NAILBASE Ci
SQUARE CUT EAVE

R-SHIELD®
RIGID INSULATION



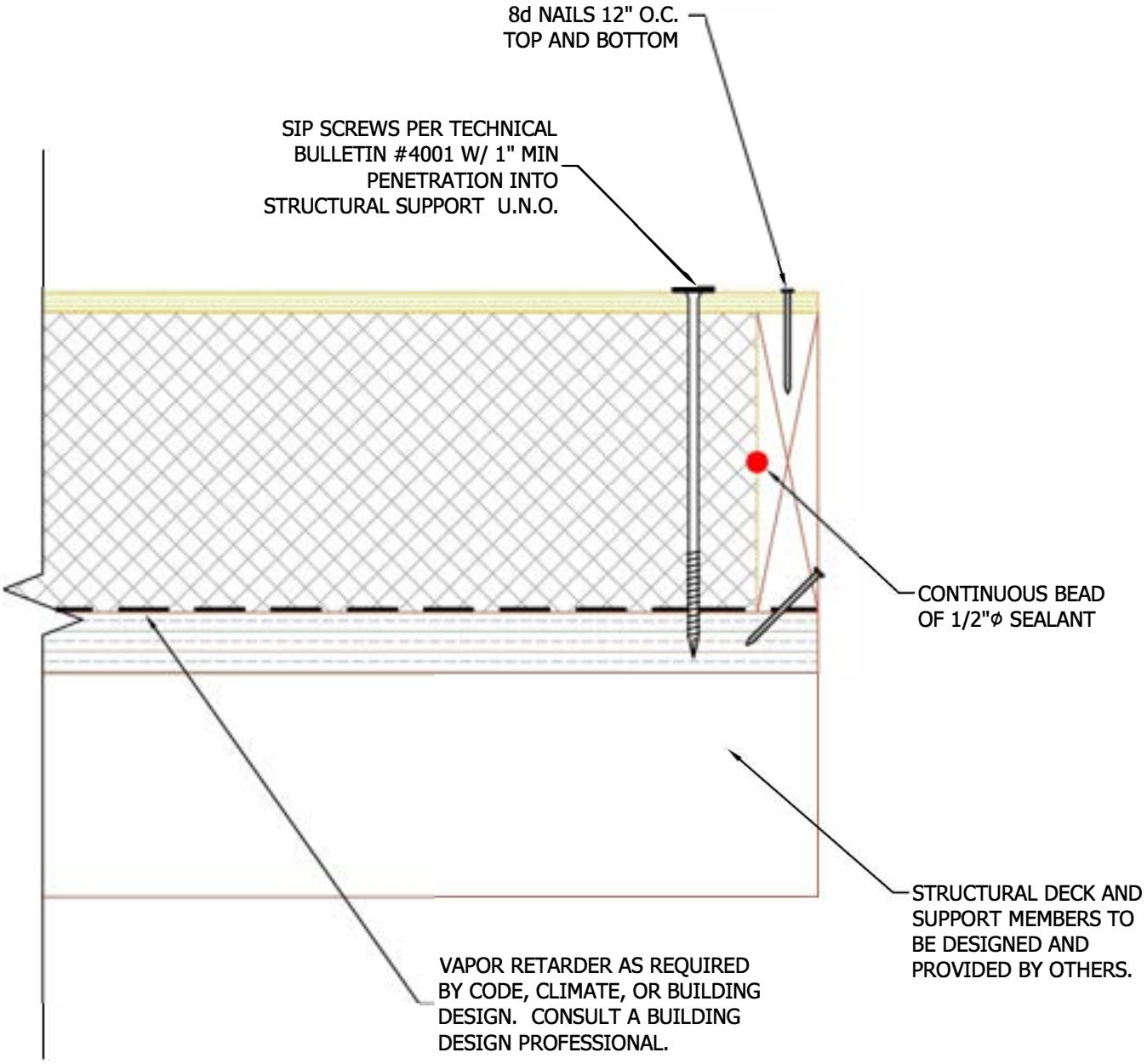
N.T.S.

Rev: 3/20/2023

NB-105

NAILBASE Ci
PLUMB CUT EAVE

R-SHIELD® RIGID INSULATION

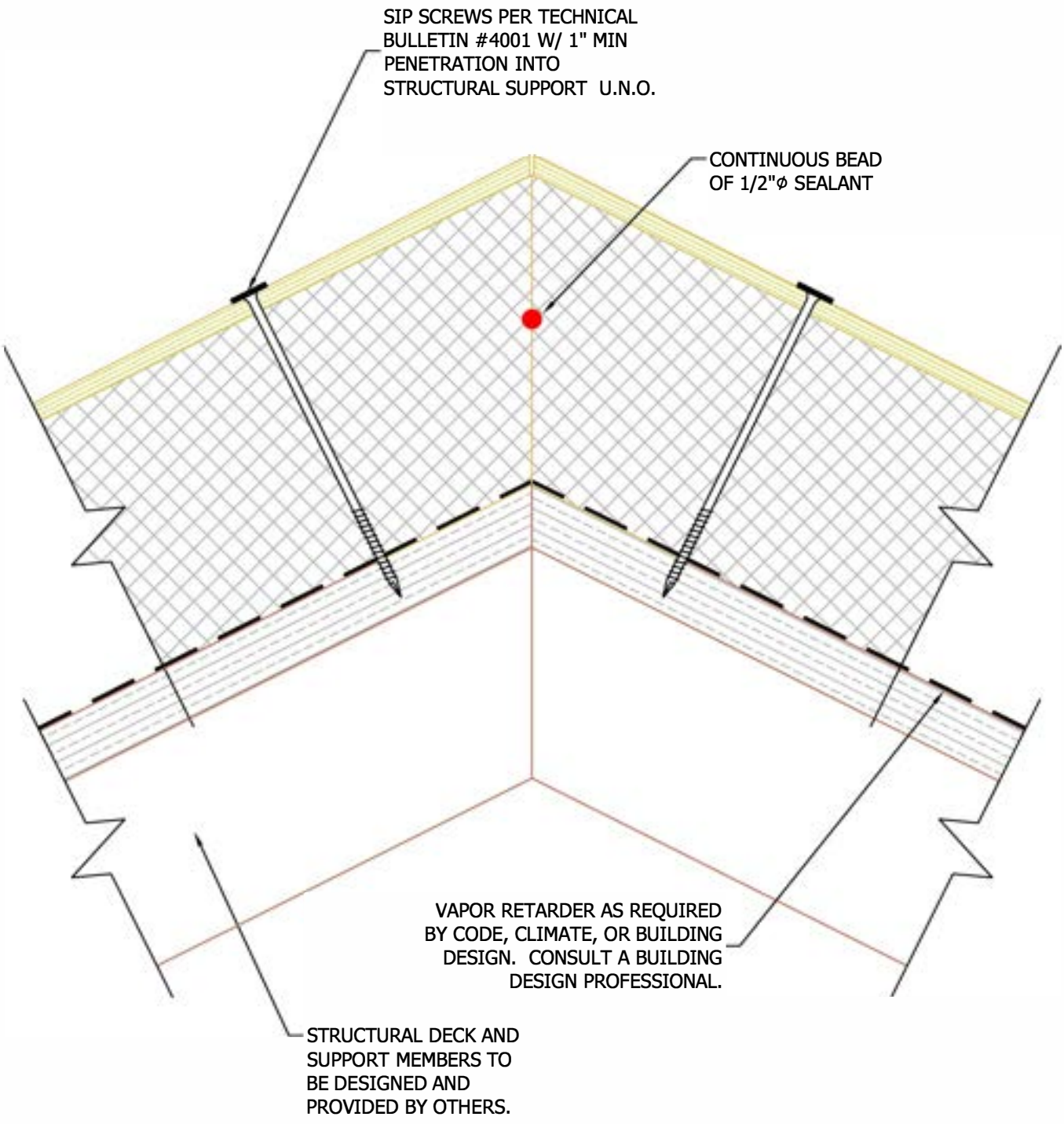


N.T.S.

Rev: 3/20/2023

NB-106	NAILBASE Ci GABLE END

R-SHIELD®
RIGID INSULATION



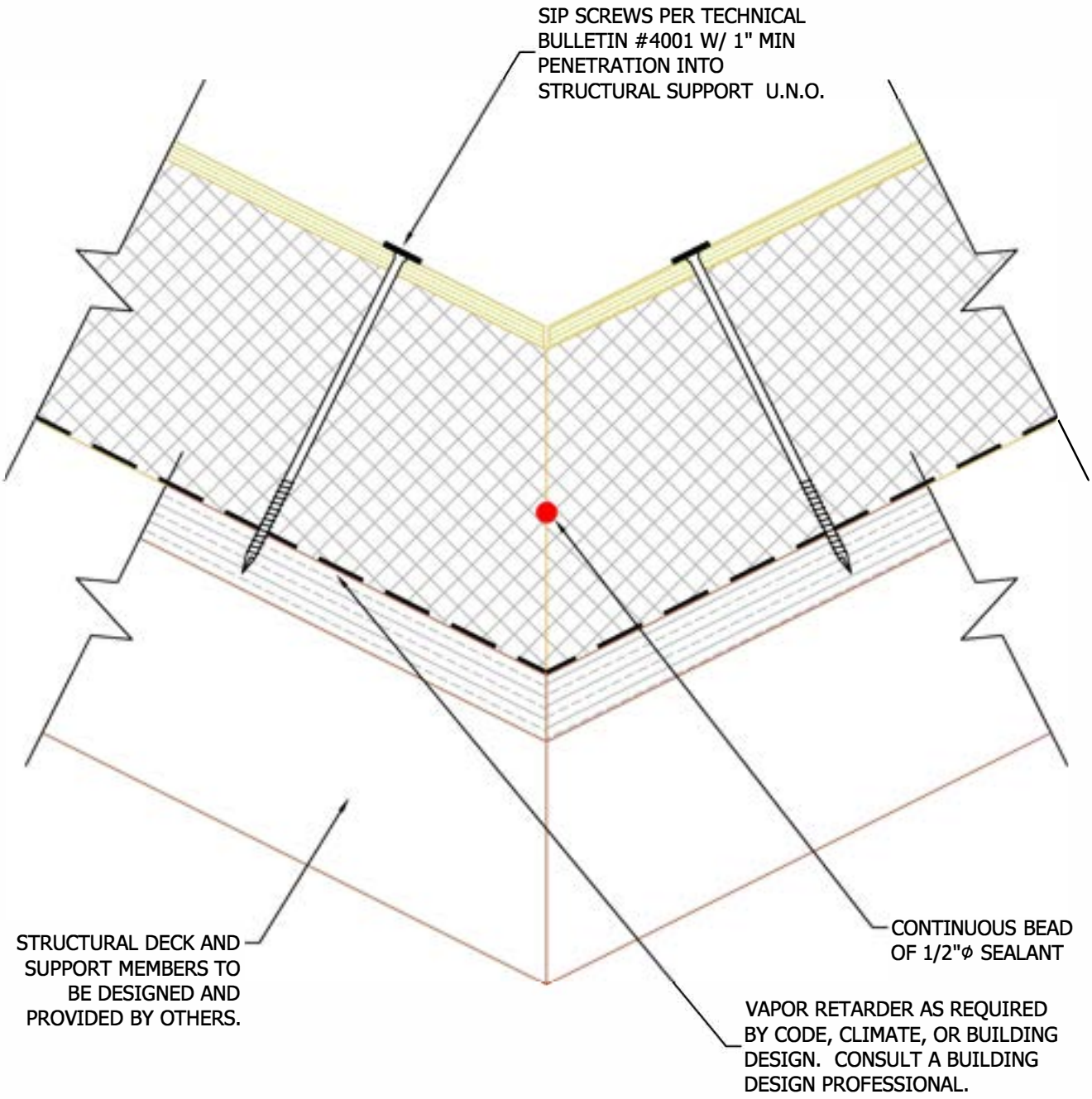
N.T.S.

Rev: 3/20/2023

NB-107

NAILBASE Ci
ROOF RIDGE / HIP

R-SHIELD® RIGID INSULATION



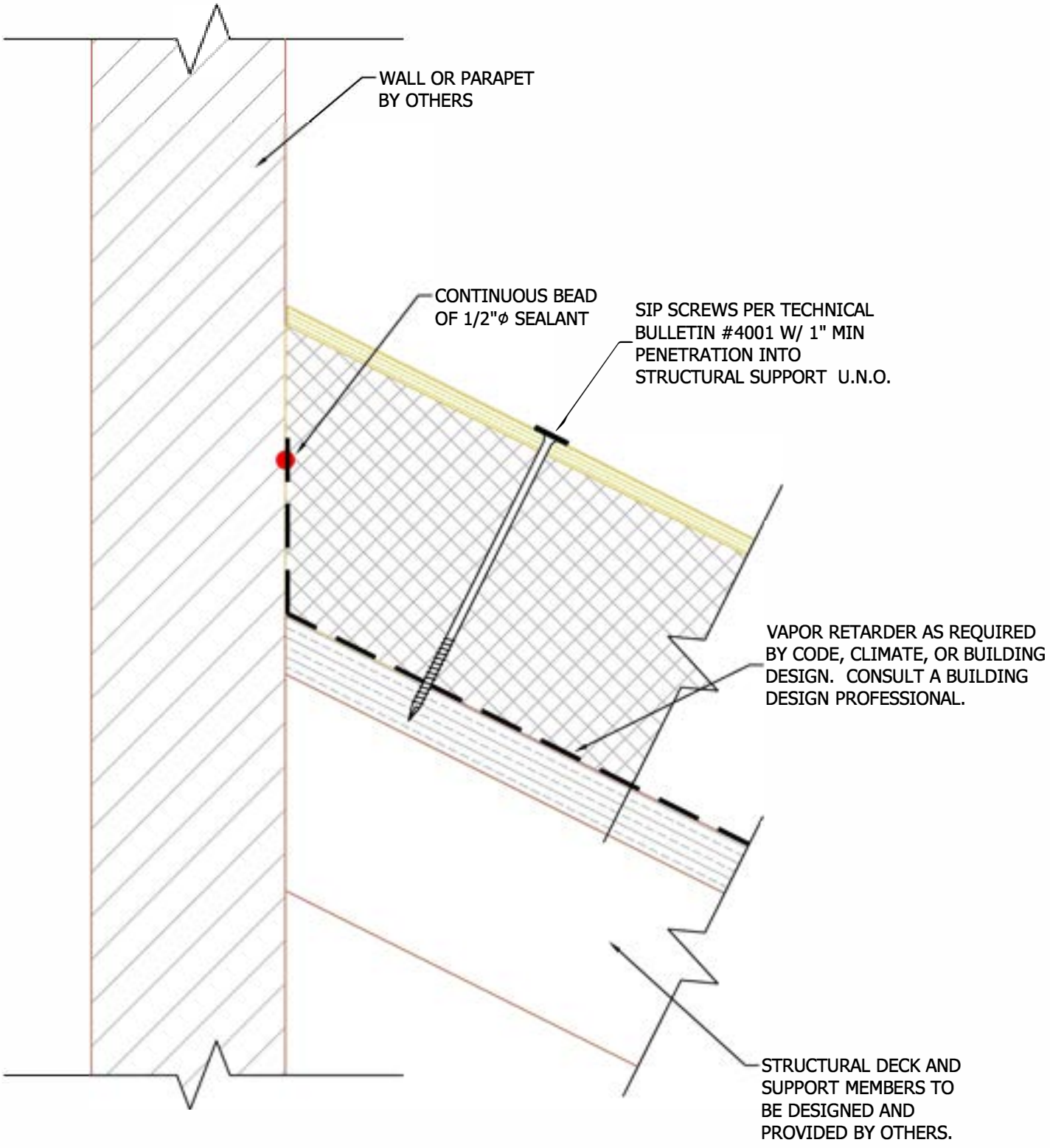
N.T.S.

Rev: 3/20/2023

NB-108

NAILBASE Ci ROOF VALLEY

R-SHIELD® RIGID INSULATION



N.T.S.

Rev: 3/20/2023

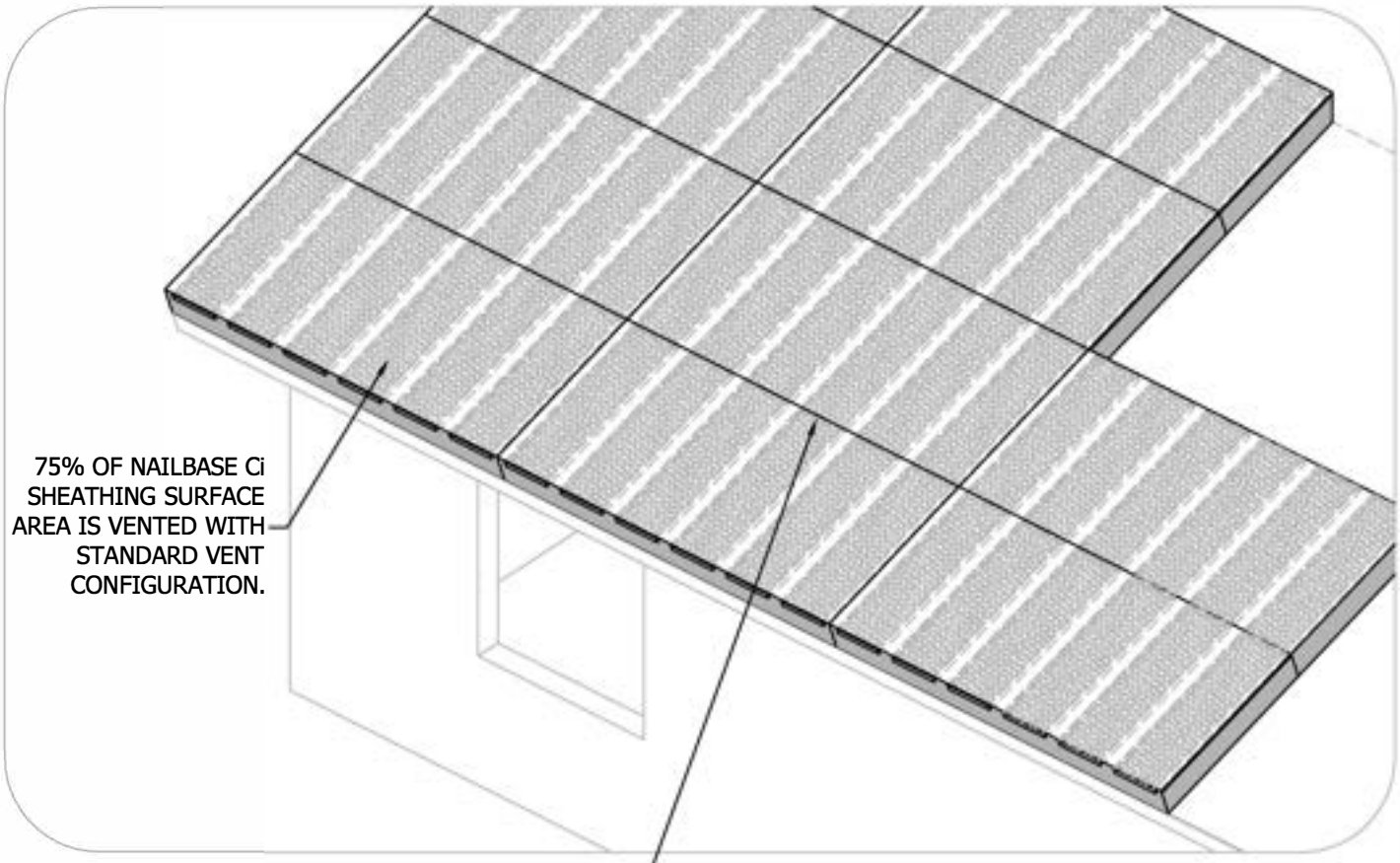
NB-109

NAILBASE Ci
WALL INTERSECTION

R-SHIELD®
RIGID INSULATION

NOTES:

1. STANDARD NAILBASE Ci WIDTH AND LENGTH IS 4' X 8'.
2. STANDARD THICKNESSES OF NAILBASE Ci ARE SIZED TO ACCOMMODATE STANDARD 2X LUMBER DIMENSION VARIANCES.
3. NAILBASE Ci FOAM IS TYPE 1 EPS OR TYPE 1 GPS.
4. STANDARD FACING IS 7/16" OSB.
5. CUSTOM WIDTH, LENGTH, THICKNESS, AND FACINGS AVAILABLE.
6. REFERENCE TECHNICAL BULLETIN #4001 FOR FASTENING REQUIREMENTS.

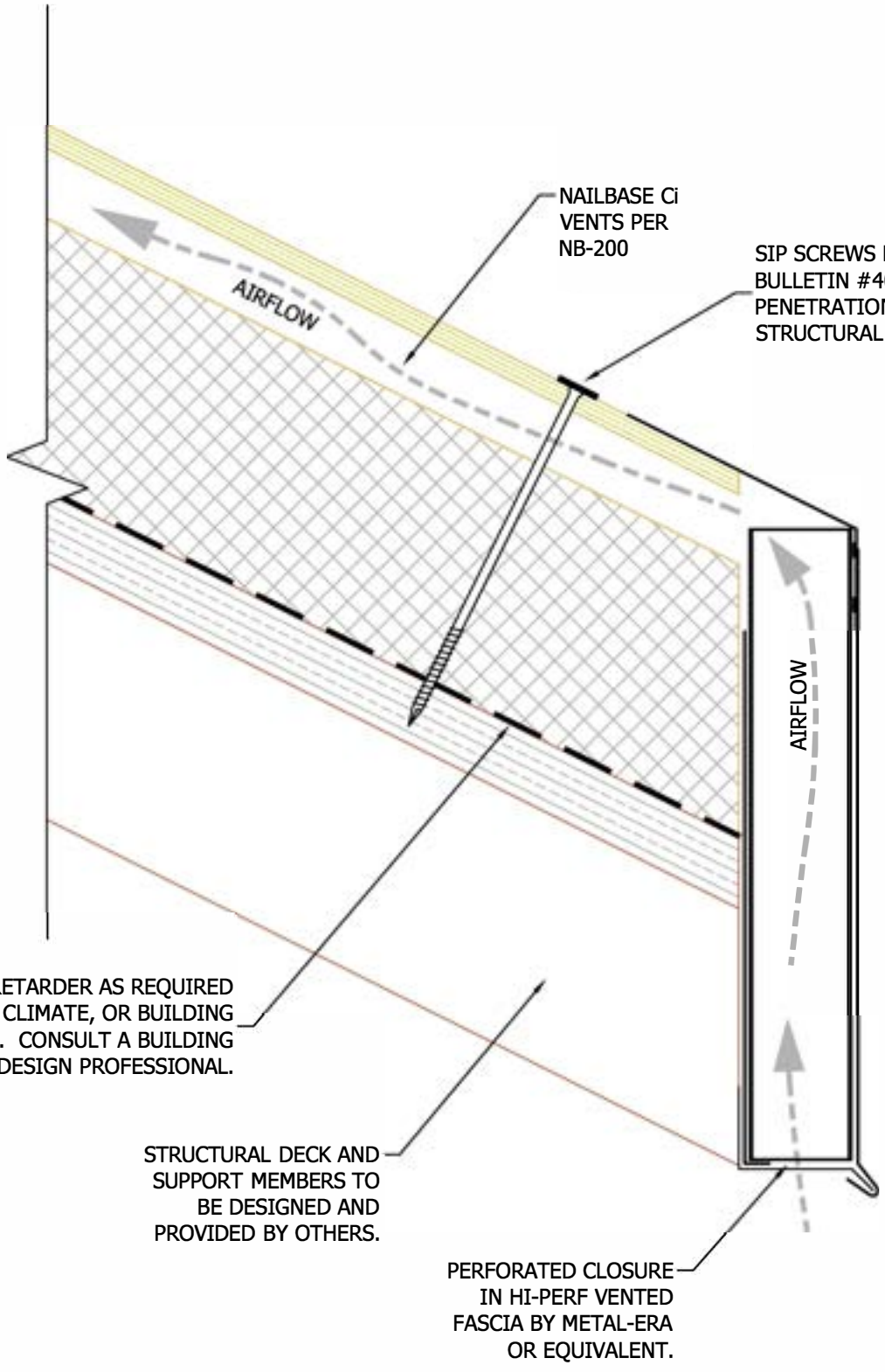


N.T.S.

Rev: 1/26/2024

NB-200 | VENTED NAILBASE Ci

R-SHIELD® RIGID INSULATION



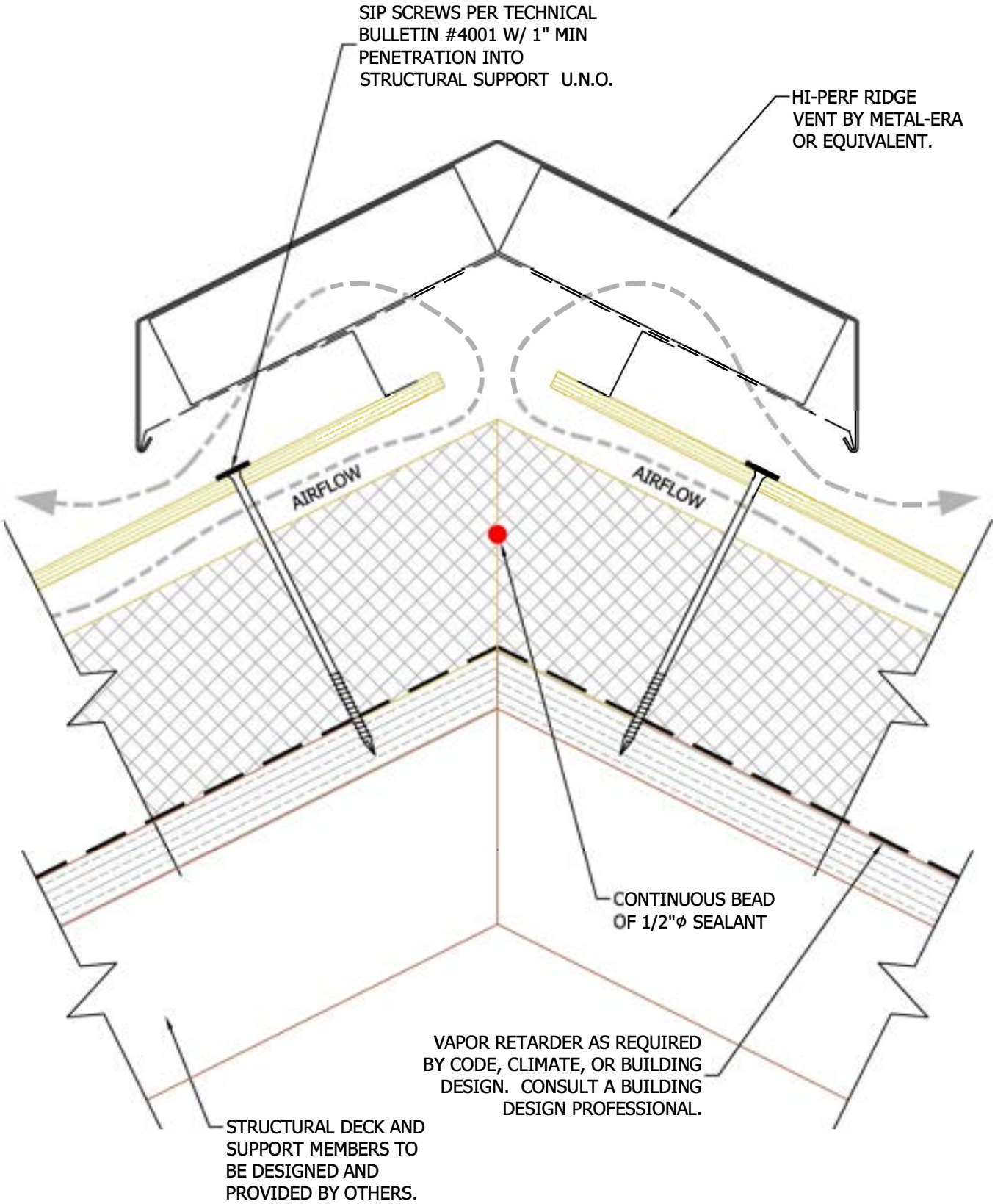
N.T.S.

Rev: 3/20/2023

NB-201

VENTED NAILBASE Ci
VENTED EAVE

R-SHIELD®
RIGID INSULATION



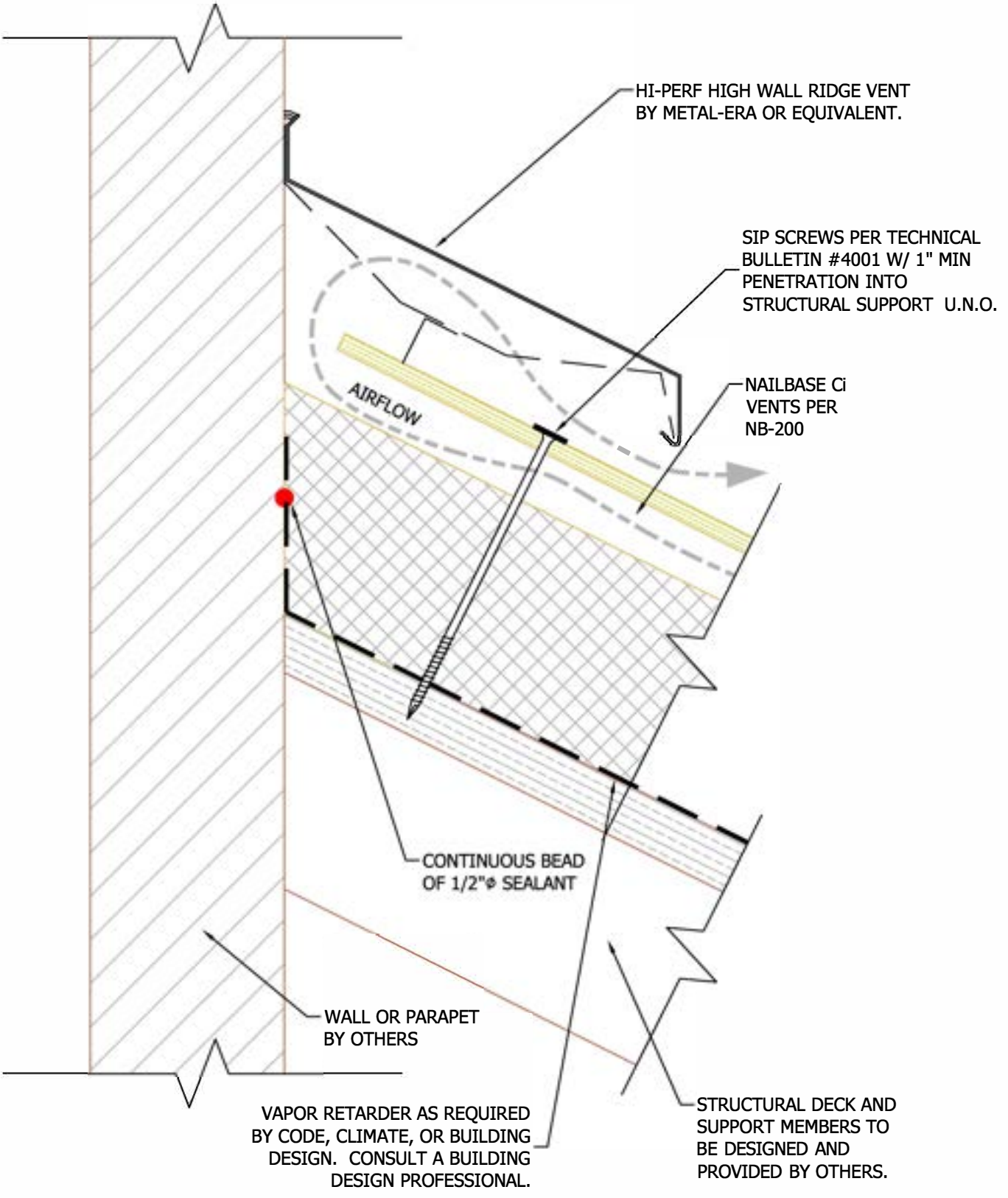
N.T.S.

Rev: 3/20/2023

NB-202

VENTED NAILBASE Ci ROOF RIDGE / HIP

R-SHIELD® RIGID INSULATION



N.T.S.

Rev: 3/20/2023

NB-203

VENTED NAILBASE Ci WALL INTERSECTION

R-SHIELD® RIGID INSULATION

NAILBASE NO. 4001

SUBJECT: FASTENING REQUIREMENTS FOR SLOPED ROOFS

DATE: MARCH 2008 (REVISED JANUARY 2019)

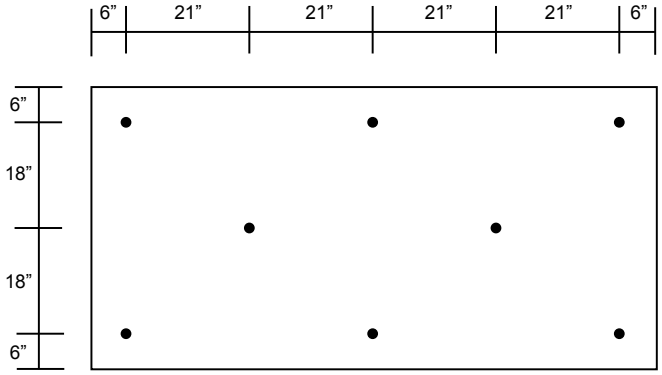
Minimum fastening requirements for R-Shield® Nailbase have been calculated in accordance with ASCE 7-05 Method 2, Exposure C, Importance factor of 1.0, a maximum roof height of 60 ft. For projects with snow loads and wind speeds in excess of 110 mph, consult a professional engineer for fastening requirements.

FIELD OF ROOF										
Number of Fasteners for 4' x 8' (1.2m x 2.4m) Nailbase										
Total Load (Snow Load + Dead Load)	Roof Slope									
	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12
30 psf	8	8	8	8	8	8	8	8	8	8
40 psf	8	8	8	8	8	8	8	8	12	12
50 psf	8	8	8	8	12	12	12	12	12	12
60 psf	8	8	8	12	12	12	12	12	12	12
70 psf	8	8	12	12	12	12	16	16	16	16
80 psf	8	12	12	12	16	16	16	16	16	16
90 psf	8	16	16	16	16	16	16	16	16	16

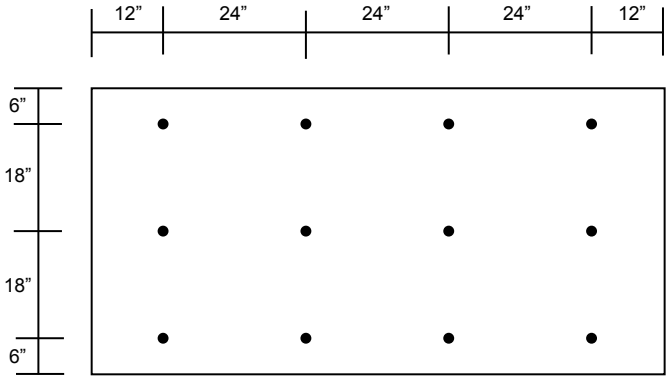
PERIMETER OF ROOF										
Number of Fasteners for 4' x 8' (1.2m x 2.4m) Nailbase										
Total Load (Snow Load + Dead Load)	Roof Slope									
	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12
30 psf	16	16	16	16	8	8	8	8	8	8
40 psf	16	16	16	16	8	8	8	8	12	12
50 psf	16	16	16	16	12	12	12	12	12	12
60 psf	16	16	16	16	12	12	12	12	12	12
70 psf	16	16	16	16	12	12	16	16	16	16
80 psf	16	16	16	16	16	16	16	16	16	16
90 psf	16	16	16	16	16	16	16	16	16	16

The values in the tables are applicable to R-Control Wood Screws when installed into a SPF or equal wood deck (min. 1" penetration) and to R-Control Metal Deck Screws when installed into a steel deck (22 min. gauge).

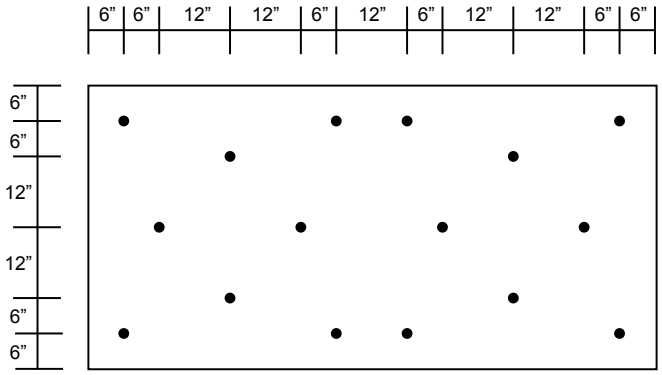
FASTENING PATTERNS FOR 4′ X 8′ NAILBASE



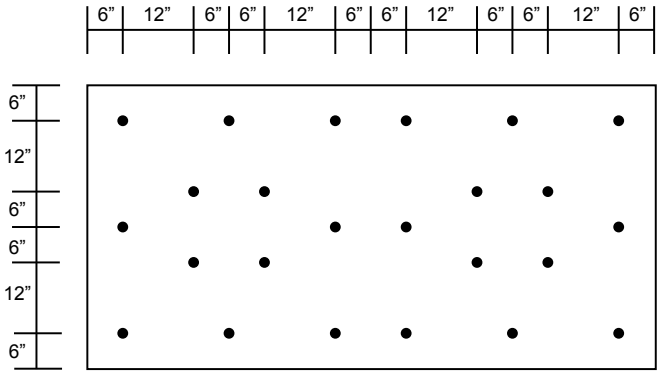
8 FASTENERS/BD.



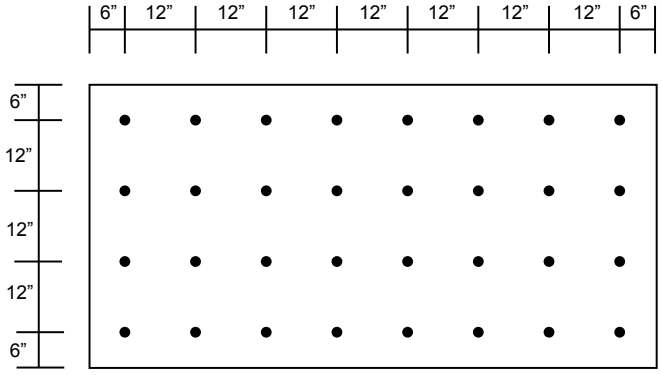
12 FASTENERS/BD.



16 FASTENERS/BD.



24 FASTENERS/BD.



32 FASTENERS/BD.

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NAILBASE NO. 4002

SUBJECT: ASPHALT SHINGLES

DATE: FEBRUARY 2009 (REVISED JANUARY 2019)

GAF, a leader in the manufacture of shingles, has examined the use of their asphalt shingles with R-Shield® Nailbase substrates and have authored the attached Technical Advisory Bulletin. GAF has served notice that their products applied directly over R-Shield Nailbase substrates are acceptable and that no restrictions will be placed on their warranty.

GAF's shingles are recommended as the preferred asphalt shingle product for use with R-Shield Nailbase substrates.

When using shingles other than GAF, please contact your asphalt shingle manufacturer to clarify their warranty coverage when applied over R-Shield Nailbase.

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TECHNICAL ADVISORY BULLETIN

To: GAF Residential Sales, GAF Contractors, GAF Field Services

From: Technical Services Department

GAF Quality You Can Trust… From North America's Largest Roofing Manufacturer!™

Date: 07/31/2014

No: TAB-R 2011-101-**R1**

Subject: Acceptable Substrate For GAF Asphalt Shingle Applications

Why Is The Substrate So Important?

A shingle roof substrate is the "foundation" for your roofing system. The substrate provides the smooth structural base on which asphalt shingles are installed. If the substrate is inferior, the integrity of the roofing system may be compromised.

What's Considered A "Standard Deck" For Shingles?

Standard decks include:

- **Plywood or OSB…** 3/8" minimum thickness, exterior grade as recommended by APA – The Engineered Wood Association
- **Wood planking…** Nominal 1" thick (min.) x 6" wide (max.) wood planking, with a maximum 1/8" spacing at the ends and sides

Note: For existing older installations, if spacing is > 1/8" ≤ 1/4", install a double layer of underlayment. If the spacing is greater than 1/4" install a layer of 3/8" minimum thickness APA labeled exterior grade plywood or OSB over the wood planking.

Can The Other Substrates Be Used Without Prior Approval?

When properly installed using the fasteners and construction design recommended by the deck manufacturer, the following substrates may be used:

- GAF Cornell ThermaCal® 1 Ventilating Roof Insulation Panels
- GAF Cornell ThermaCal® 2 Ventilating Roof Insulation Panels
- Loadmaster Shingle Deck
- Tech Shield or equivalent Radiant Barrier Decking systems with vapor permeable, perforated foil backing
- Ainsworth's Thermastrand Radiant Barrier
- 2" Minimum Homasote or Thermasote (Homasote Co.)
- 2" Minimum Span Rock Gypsum Plank (USG) – fasteners must have a minimum 40 lbs. of pullout
- Vented-R (Atlas)
- Vented Nail-Line (Apache)
- Hunter Vented Nail Base
- R-Shield Nail Base (Big Sky Insulations, Inc.)
- Tectum III, Tectum E and Tectum NS (Tectum, Inc.)
- Huber Zip Deck System – A waterproof underlayment such as StormGuard® leak barrier must be used at eaves as required by code or for certain warranty considerations and additional underlayment may be needed on slopes less than 4:12 or on re-roofing projects.

Note: GAF shingles are **not** approved for applications directly over any insulation or fiberboard.

What About Structural Insulated Panels (SIP)?

SIP may be use when:

- Approved/rated by UL for use as a shingle roof deck
- With the minimum thickness of plywood or OSB as recommended above installed in accordance with the SIP panel manufacturers recommendations for use as a shingle roof deck

What About Codes?

Roof decks must meet local codes… and approval from the local building department should be obtained to confirm the deck construction and ventilation meets local code requirements.

Is The Substrate Or Workmanship Covered Under GAF Warranties?

Only GAF Cornell ThermaCal® 1 & 2 Ventilating Roof Insulation Panels are covered by GAF under the GAF Cornell ThermaCal® Nail Base Roof Insulation Limited Warranty. See this limited warranty for complete coverage and restrictions.

All substrates must be installed in accordance with the deck manufacturer's specifications. Roof deck installation instructions, including the need for a vapor retarder, for specific deck types must be obtained from the respective manufacturer. GAF does not warrant the installation method, the performance of the decking or problems with the shingles caused by the deck or substrate, including but not limited to: physical movement, thermal bridging and/or moisture migration at the joints.

Where Can I Get More Information?

GAF Technical Services can assist you… with these and other questions you may have regarding your new roof installation. GAF Technical Services can be contacted **at 800-ROOF-411** (800-766-3411). Also, the GAF website is a great resource for just about any question you may have or for additional information you may require. Please visit: www.gaf.com.

Residential

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NAILBASE NO. 4003

SUBJECT: METAL ROOF VENTILATION WITH ENKAMAT

DATE: APRIL 2024

The ventilation of metal roofing when installed over R-Shield Nailbase provides many building science benefits. The primary benefit of venting above a R-Shield Nailbase roof deck is the removal of unintended moisture vapor that may emanate (known as “vapor drive”) from the interior of the building from the misapplication of R-Shield Nailbase sealant and tape at spline joints and Nailbase to Nailbase intersections. The venting of moisture vapor between the metal roof covering and the top of the Nailbase roof deck reduces the risk of condensation and the potential of moisture damage of the Nailbase upper skin. It should also be noted that vapor permeable underlayments should also be used in metal roof assemblies when applied over Nailbase roof decks (See Premier Technical Bulletins R3 & R6). In addition to the venting of interior moisture, any rainwater or melting snow that circumvents the metal roofing materials is also removed by virtue of the ventilation space.

Additional benefits of a ventilation cavity are: The reduction in the temperature of the R-Shield Nailbase upper skin from high heat generated by direct sunlight exposure in hot climate zones and the potential of concentrated heat from reflective surfaces, such as windows and reflective ponds. Metal roofing systems, particularly Zinc and Copper, can expose R-Shield Nailbase roof decks to high temperatures and potential damage to its rigid insulation core. Underlayments can also be damaged by excessive heat exposure. The vented cavity keeps temperatures at the R-Shield Nailbase roof surface within safe operating temperatures for both the Nailbase and underlayment. In winter, the ventilated space results in a cold roof, thereby reducing the potential for ice damns when the depth of snow on the roof is significant. Impact noise of rain and hail are mitigated as well.

R-Shield has investigated a unique product that is compatible with R-Shield Nailbase for achieving a cost effective above the roof deck ventilation cavity - Colbond’s Enkamat 7020. Enkamat 7020 is commonly used in roofing applications to provide the ventilation, drainage, and thermal separatio needed for the long service life of roof structures.

Enkamat 7020 from Colbond

Enkamat 7020 is a three-dimensional mat made of continuous nylon filaments fused at their intersections. The 95% open structure of the entangled filaments facilitates drying of condensed water vapor from the building interior, while giving full support to the metal roof. The nylon filaments do not fail under the load of the roof and the rigors of the construction environment, including construction foot traffic. The space created between the R-Shield Nailbase roof deck and the roof covering will allow moisture to flow away or evaporate.

Testing has been conducted on the temperature difference that a R-Shield Nailbase surface experiences when ventilated with Enkamat 7020 when compared to no ventilation. A standing seam metal roof was applied over a R-Shield Nailbase small scale roof structure for testing evaluation. Dark colored standing seam metal roof panels were fixed to the Nailbase roof over the Enkamat 7020/roofing underlayment. An assembly of metal roof panels over roofing underlayment alone was also tested for comparison. The top surface of both metal roofing assemblies was brought to a temperature of 194oF (90OC) using infrared heat lamps. This temperature was held for 6 hours to ensure that temperatures moving through the assembly would stabilize.

The temperature recorded on the top surface of the R-Shield Nailbase was reduced by 18% with the use of the Enkamat 7020. These results clearly demonstrate the effect of an air space lowering the temperature of a R-Shield Nailbase roof deck, when metal roofing experiences solar exposure, resulting in high surface temperatures.

R-Shield Nailbase Ventilation	Temp Reduction From Metal Roof to Top Surface of R-Shield Nailbase
None	10°F
Enkamat 7020	43°F

R-Shield recommends Colbond's Enkamat 7020 as a product that provides the important benefit of easy, cost-effective installation over R-Shield Nailbase, thereby achieving the additional building science benefits of ventilation: Cooling top of roof deck air temperature, allowing above roof deck evaporation of moisture and mitigating the sounds of rain and/or hail striking the metal roof.

Similar performing ventilating mats may be available in the marketplace. It is the responsibility of the designer and installer to determine if the manufacturer of these ventilating mats recommends the use of their products and provide installation instructions and details for application when applied over SIP roof deck assemblies.

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NAILBASE NO. 4006

SUBJECT: VENTILATION ACCESSORY PRODUCTS

DATE: JULY 2011 (REVISED JANUARY 2019)

Metal-Era, a leader in roof ventilation systems, provides a wide range of ventilation products for roof systems. Hi-Perf ridge vents and Hi-Perf vented fascia are two key products offered by Metal-Era that are suitable for use with R-Shield® Nailbase Vent-1. Metal-Era offers a wide range of technical service for designing a properly balanced system with appropriate net free area (NFA) to ensure optimum service life.

Metal-Era Hi-Perf ventilation products are recommended as the preferred product for use with R-Shield Nailbase Vent-1.

Attached to this bulletin is introductory information on Metal-Era's Intake & Exhaust Roof Ventilation Systems. Please visit www.metalera.com for complete information on Metal-Era products for use with R-Shield Nailbase Vent-1.

When using ventilation products other than Metal-Era, please contact the ventilation product manufacturer for installation recommendations and technical support.

Call: 800-558-2162
Email: airflow@metalera.com
Visit: www.metalera.com

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NAILBASE NO. 4008

SUBJECT: SCREWS

DATE: APRIL 2024

R-Shield® Wood and Metal screws are available from Premier Building Systems for the attachment of R-Shield Nailbase to wood or metal substrates. These screws were developed to provide an engineered fastener that meets the requirements of R-Shield Nailbase building code recognized assemblies. Please find attached engineering properties (pages 2-4) for the R-Shield Wood Screws, Light-Duty Metal Screws and Heavy Duty-Metal Screws. The properties include withdrawal, shear, pull through and tensile strength. The values provided for the Screws are maximum values. Appropriate safety factors should be applied for the design as determined by the project architect and/or engineer.

WOOD SCREWS:

R-Shield Wood Screws are used to attach R-Shield Nailbase to wood structural members and substrates.

LIGHT-DUTY METAL SCREWS:

R-Shield Light-Duty Fasteners are used to attach R-Shield Nailbase to light gauge steel members up to 16-gauge thickness metal.

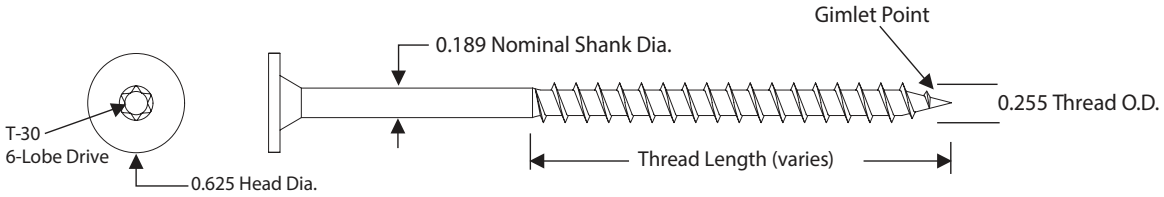
HEAVY-DUTY METAL SCREWS:

R-Shield Heavy-Duty Metal Screws are used to attach R-Shield Nailbase to metal structural members and substrates. R-Shield Heavy-Duty Metal Screws can self-drill into 3/16” steel without pilot hole predrilling. Installation is direct and fast; no wood nailers are required.

The Heavy-Duty Metal Screw should be driven with a low rpm (<1500 rpm) high torque drill. Firm, but not excessive, pressure should be applied. This allows the drill point to engage the surface of the metal to cut and clear away metal kerf, letting the threads of the screw pull through the metal substrate. Excessive pressure and/or rpm will dull the drill point and render the screw ineffective.

R-SHIELD WOOD SCREW PROPERTIES

The R-Shield® Wood and Metal screw property values provided are average ultimate values. As determined by the project architect/engineer, appropriate safety factors must be used in design.



WOOD SCREW PROPERTIES			
Tensile (lbs) AISI S904	Shear (lbs) AISI S904	Bending Yield Strength - Fyb (psi) ASTM F1575	Corrosive Resistance ASTM D6294, ETAG 006
3555	2580	185,000	<15% Red Rust after 30 cycles

WITHDRAWAL: LUMBER & ENGINEERED WOOD - LBS./IN.[1,2]							
SPF/HF (0.42)		DF/SP (0.50)		LVL (0.50)		LSL (0.50)	OSB (7/16")
Face Grain	Edge Grain	Face Grain	Edge Grain	Face Grain	Edge Grain	Face Grain	Face
799	615	899	702	556	495	711	265

[1] Load values include fastener tip.
[2] 1" fastener embedment into face / edge grain.

WITHDRAWAL: CONCRETE & CMU - LBS.[1]		
2500 psi Concrete	5000 psi Concrete	CMU[2]
682	869	713

[1] Fastener penetrates 1" into concrete or CMU clock, including the tip.
[2] Concrete Masonary unit (CMU) conforming to ASTM C90.

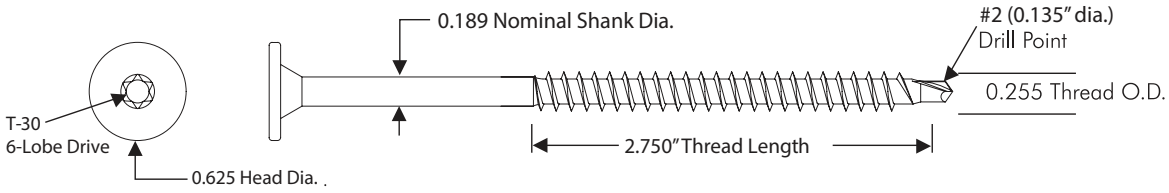
HEAD PULL-THRU - LBS.	
7/16" OSB	NAILBASE
490	630

LATERAL LOAD RESISTANCE - LBS.		
Main Member	Side Member	Load
SPF[1,2]	4-1/2" to 12-1/4" NAILBASE	943

[1] 1-3/4" fastener embedment into edge grain, including tip.
[2] 1" fastener embedment into face grain, including tip.

R-SHIELD LIGHT DUTY METAL SCREW PROPERTIES

The R-Shield® Light Duty Metal screw property values provided are average ultimate values. As determined by the project architect/engineer, appropriate safety factors must be used in design.



LIGHT DUTY METAL SCREW PROPERTIES			
Tensile (lbs) AISI S904	Shear (lbs) AISI S904	Bending Yield Strength - Fyb (psi) ASTM F1575	Corrosive Resistance ASTM D6294, ETAG 006
3390	2490	185,000	<15% Red Rust after 30 cycles

WITHDRAWAL: CORRUGATED STEEL DECK - LBS.						
24 ga. (36 ksi)	22 ga. (36 ksi)	22 ga. (85 ksi)	20 ga. (36 ksi)	18 ga. (36 ksi)	16 ga. (36 ksi)	16 ga. (100 ksi)
250	381	435	449	694	896	1186

* Minimum 3/4" penetration of fastener through deck from underside of deck.

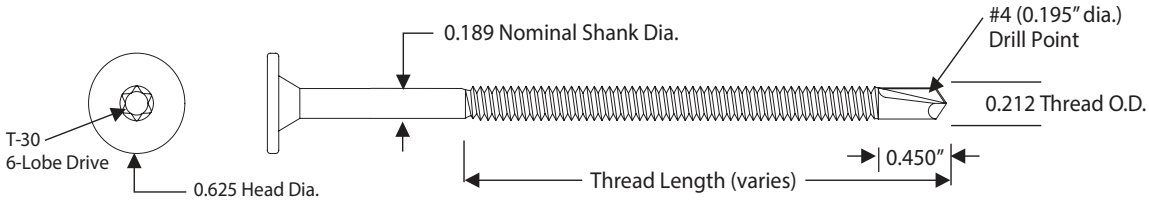
WITHDRAWAL: LUMBER & ENGINEERED WOOD - LBS./IN.[1]							
SPF/HF (0.42)		DF/SP (0.50)		LVL (0.50)		LSL (0.50)	OSB (7/16")
Face Grain	Edge Grain	Face Grain	Edge Grain	Face Grain	Edge Grain	Face Grain	Face
662	497	732	720	540	469	646	284

[1] Load values include fastener tip.

HEAD PULL-THRU - LBS.	
7/16" OSB	NAILBASE
490	630

R-SHIELD HEAVY DUTY METAL SCREW PROPERTIES

The R-Shield® Heavy Duty Metal screw property values provided are average ultimate values. As determined by the project architect/ engineer, appropriate safety factors must be used in design.



HEAVY DUTY METAL SCREW PROPERTIES			
Tensile (lbs) AISI S904	Shear (lbs) AISI S904	Bending Yield Strength - Fyb (psi) ASTM F1575	Corrosive Resistance ASTM D6294, ETAG 006
3855	2625	185,000	<15% Red Rust after 30 cycles

WITHDRAWAL: CORRUGATED STEEL DECK - LBS.[1]					
16 ga. (36 ksi)	16 ga. (100 ksi)	12 ga. (50 ksi)	1/8" (36 ksi)	3/16" (60 ksi)	1/4" (60 ksi)
491	794	1255	1454	3098	3814

[1] Minimum (3) threads of penetration of fastener through deck as measured from underside of steel.

HEAD PULL-THRU - LBS.	
7/16" OSB	NAILBASE
490	630

LATERAL LOAD RESISTANCE - LBS.		
Main Member	Side Member	Load
1/8" Structural Steel[1]	4-1/2" to 12-1/4" SIP	929

[1] Minimum (3) threads of penetration of fastener through steel as measured from underside of steel.

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NAILBASE NO. 4009

SUBJECT: SCREW WITHDRAWAL CAPACITIES OF OSB

DATE: APRIL 2024

To finish a project that utilizes R-Shield® Nailbase for the walls and roof of a structure, many types of materials need to be fastened to Nailbase. These materials can include siding, roofing materials, other structural elements, cabinets and a host of others. In many of these applications screws are the preferred method of fastening. To help quantify the performance of screw withdrawal from OSB, a major manufacturer of OSB generated test data on various screw types and sizes withdrawn from various thicknesses of OSB. Prior to the withdrawal testing, the OSB was exposed to three different environmental conditions – dry, wet, wet/dry. Fifteen repetitions of both direct and lateral withdrawal from the environmentally conditioned OSB were conducted on the screw types and sizes shown in the charts below. The following tables summarize the lowest ultimate average value achieved for each screw type and size when withdrawn from three different thicknesses of environmentally conditioned OSB.

Average Direct Withdrawal (Pullout) - lbs.

Screw Size	7/16" OSB	5/8" OSB	3/4" OSB
#6 Deck Screw	177	272	324
#8 Deck Screw	182	309	359
#10 Deck Screw	198	355	363
#12 Deck Screw	190	312	360
#14 Deck Screw	177	340	393

These Values are ultimate values. Appropriate safety factors should be applied to obtain design values.

Average Lateral Withdrawal (Shear) - lbs.

Screw Size	7/16" OSB	5/8" OSB	3/4" OSB
#6 Deck Screw	198	273	295
#8 Deck Screw	118	197	224
#10 Deck Screw	143	260	301
#12 Deck Screw	436	581	561
#14 Deck Screw	466	630	797

These Values are ultimate values. Appropriate safety factors should be applied to obtain design values.

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NAILBASE NO. 4010

SUBJECT: NAIL WITHDRAWAL CAPACITIES OF OSB

DATE: APRIL 2024

With the use of R-Shield® Nailbase, the attachment of finishing materials such as roof shingles, siding, drywall, etc., is required. The appliction of these materials is typically accomplished with conventional nail products. An independent code recognized testing agency conduced withdrawal tests following ASTM D1037 procedures to provide data on the direct withdrawal resistance of nail fasteners when driven into the 7/16" OSB face of Nailbase. The following is a summary of the average ultimate values achieved for various nail fasteners.

Average Direct Withdrawal (Pullout) - lbs.

Nail Size & Description	Avg. Ultimate Pullout	Nominal Shank Diameter
4d ring shank-drywall nail	133	0.109
6d smooth galvanized	59	0.120
Roofing Nail-smooth galvanized	51	0.110
8d smooth coated sinker	150	0.131
8d smooth galvanized spiral shank	112	0.120
8d galvanized ring shank	77	0.113
8d smooth galvanized	65	0.134
8d bright box	107	0.113
10d galvanized ring shank	164	0.148
16d smooth galvanized	63	0.165
16d bright box	90	0.135

These Values are ultimate values. Appropriate safety factors should be applied to obtain design values.

This data has been compiled to provide manufacturers, designers and engineers with values for the assessment of fastener requirement

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ROOFING NO. 3019

SUBJECT: METAL ROOFING ATTACHMENT

DATE: APRIL 2024

R-Shield® roofs can be finished with a wide range of roof covering systems. Metal roofing is one type of roof covering that has been used successfully over R-Shield Roofing Nailbase for many years. Metal roofing provides a water-tight roof system and has a long-life expectancy when compared to many other roof claddings. One major advantage of metal roofing is that minimal maintenance is required over the life of the roof. As with all roof covering systems, the installation must comply with the metal roofing manufacturer's recommended installation details.

The primary consideration when installing metal roofing over R-Shield Roofing Nailbase is to ensure the metal roofing manufacturer provides installation recommendations for proper attachment into the 7/16" OSB facing of the R-Shield Roofing Nailbase. Berridge Manufacturing Company, a leader in the metal roofing industry, provides installation recommendations for the attachment of their metal roof system directly into the 7/16" OSB facing of R-Shield Roofing Nailbase. Following their installation recommendations provides assurance that the metal roof system will provide the long-term durability that is expected.

Premier Building Systems confirmed the strength of the Berridge attachment recommendations by testing the uplift resistance of Berridge 24-gauge Zee- Lock panel in accordance with UL 580, "Tests for Uplift Resistance of Roof Assemblies". The tested assembly consisted of the Zee-Lock panel installed with a double lock, continuous Zee Rib, and #14 x 1-1/2 in. hex washer head Type A w/sealing washer from SFS Intec directly into the 7/16 in. OSB facing of the R-Shield Roofing Nailbase. Two different fastening frequencies were evaluated. below.:

Ultimate Pressure	Fastener Spacing
160 psf	14 in. o.c.
265 psf	8 in. o.c.

The test results clearly demonstrate that metal roofing can meet high wind uplift pressures when fastened directly into the 7/16 in. OSB of R-Shield Roofing Nailbase. For further information regarding Berridge Manufacturing Company products, please visit www.berridge.com

In addition, MBCI, another leader in the metal roofing industry can provide installation recommendations for the installation of their metal roofing products directly into the 7/16" OSB facing of R-Shield Roofing Nailbase. Following the MBCI installation recommendations provides assurance that their metal roofing materials will provide long-term durability when their metal roofing is selected. For further information regarding MBCI Metal Roofing, please visit www.mbci.com

Similar performing metal roofing systems may be available in the marketplace. It is the responsibility of the designer and installer to determine if the manufacturer of these metal roofing systems recommends the use of their products and provide installation instructions and details for application when applied over SIP roof deck assemblies.

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ROOFING NO. 3020

SUBJECT: ROOFNG UNDERLAYMENTS OVER R-SHIELD NAILBASE

DATE: APRIL 2024

One of the many benefits of building with R-Shield Roofing Nailbase is speed of construction. Speed of roof installation is especially beneficial in climates where precipitation is prevalent. However, precipitation during installation and its effects on a Nailbase roof assembly and roofing materials should be fully understood and mitigated. Proper construction methodology and sequencing for the installation of roofing materials over Nailbase, is to allow the OSB and the interior of the Nailbase joints to dry adequately, prior to the installation of the roofing underlayment. When these conditions present themselves on your project, R-Shield Roofing Nailbase perform best with the use of a synthetic, breathable roofing underlayment below the final roof covering material as an alternative to traditional 15# or 30# asphalt saturated or coated roofing felts. Breathable roofing underlayment's having perm ratings of 15 or higher are recommended. Breathable underlayment allows water vapor to pass through the membrane yet restricts the bulk water movement back through the membrane toward the OSB facer of the Nailbase roof deck. The science behind a breathable underlayment is to allow water vapor, that gets trapped at the OSB interface to pass through the synthetic roofing underlayment and once on the exterior side of the membrane it can condensate on the underside of the roofing material and run off the roof. Adhered underlayment can be used on sloped roofs as code recognized ice barriers for roof eaves, valleys and gables. When adhered underlayment is used over a R-Shield Roofing Nailbase roof deck, they should be vapor permeable and applied over a first layer of vapor permeable underlayment, nail applied to the Nailbase roof deck. There are many manufactures of breathable underlayment's in North America. A quick internet search will turn up manufactures and suppliers available to supply your project. Be sure you: verify with the manufacture that the perm rating of their breathable underlayment is 15 or greater and that their breathable underlayment is compatible with the roofing materials you intend to install on your Nailbase project. Following is a partial list of Vapor Permeable Underlayment* manufacturers you may contact to learn about their products:

1. Vapro Shield – SlopeShield® Plus Self Adhered
   www.vaproshield.com
2. Malarky Roofing Products – Secure Start® Permeable
   www.malarkyroofing.com
3. GAF – Deck-Armor™
   www.gaf.com/en-us/products/deck-armor
4. ACGI - USP Underlayments
   https://allenconsultinggroup.net
5. DELTA®-FOXX
   www.dorken.com/en/our-products/products/residential/delta-foxx.php

*R-Shield has no business relationship, financial interest or involvement in the performance or warranty claims made by the companies listed above. It is the responsibility of our customer to research the information obtained from these companies and

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Product Availability and Support.

R-Shield Nailbase is supported by a team of experts who work with you to answer your questions, offer solutions, and do everything they can to make sure your project goes smoothly and ends successfully.

Ready to take control? Start here.

If you're ready to have R-Shield Nailbase contribute to your next project, just contact your Premier Building Systems Technical Sales Representative. We will be happy to give you design consultation, information about R-Shield Nailbase products, pricing, and answers to all of your questions.

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