



Technical Guide

Single-Ply Insulation Attachment Guidelines

SINGLE-PLY INSULATION ATTACHMENT GUIDELINES

Attachment Overview

MuleHide offers a variety of Insulation Fasteners and plates as well as Low-Rise Foam Adhesive:

MuleHide fasteners or insulation adhesive must be used when attaching the roof insulation on all warranted projects. On a job-to-job basis, the MuleHide Technical Department may accept the use of non-MuleHide products for attachment of MuleHide accepted insulation. Any non-MuleHide fastener and plate or adhesive must obtain written approval by the MuleHide Technical Department prior to job start-up. Your local MuleHide Territory Manager can assist you in contacting the MuleHide Technical Department to inquire about any proposed non-MuleHide product.

MuleHide Brand Insulation Fasteners:

- **Drill Point Fasteners (#12)**
Primarily used for insulation attachment in Fully Adhered Roofing Systems. Specifically for Wood Plank, Plywood, and Steel decks.
- **Pre-Assembled Fastener System (#12 and 3" Insulation Plate)**
Pre-Assembled fastener and insulation plate specifically for Wood Plank, Plywood, and Steel decks.
- **HDP Fasteners (#14)**
Can be used for insulation attachment in Fully Adhered Roofing Systems or membrane securement in Mechanically Fastened Roofing Systems. Specifically for Wood Plank, Plywood, OSB, Steel, and Structural Concrete decks.
- **EHD Fasteners (#15)**
Can be used for insulation attachment in Fully Adhered Roofing Systems or membrane securement in Mechanically Fastened Roofing Systems. Specifically for Wood Plank, Plywood, OSB and Steel decks.
- **LWG Fasteners**
Can be used for insulation attachment in Fully Adhered Roofing Systems specifically for Lightweight Insulating Concrete and Gypsum decks.
- **TL Fasteners (and Insulation Plates)**
Can be used for insulation attachment in Fully Adhered Roofing Systems specifically for Cementitious Wood Fiber, Lightweight Insulating Concrete and Gypsum decks.
- **Tru-Spike Fasteners**
Can be used for insulation attachment in Fully Adhered Roofing Systems or membrane securement in Mechanically Fastened Roofing Systems. Specifically for Structural Concrete decks.
- **3" Insulation Plate**
Can be used in conjunction with Drill Point, HDP, EHD, and Tru-Spike fasteners for insulation attachment in Fully Adhered Roofing Systems.
- **3" LWG Metal Plate**
Can be used in conjunction with LWG fasteners for insulation attachment in Fully Adhered Roofing Systems.
- **Induction Weld Plates**
Can be used in conjunction with EHD, Tru-Spike, or PFC Purlin Fasteners
- **RhinoBond Plates**
Can be used in conjunction with EHD, or PFC Purlin Fasteners

Minimum Fastener Embedment / Penetration based on Deck type:

- **Plywood, Wood Plank, and OSB decks** require a 3/4" penetration through the bottom surface of the deck.

- **Steel decks** require 3/4" minimum deck penetration by the fastener. The threaded portion of the fastener must engage the deck. Fasteners must engage the top rib of fluted steel decks. Fastening through the bottom rib of a fluted steel deck is not permitted.
- **Structural Concrete decks** require the fastener to penetrate the deck at least one inch. It is suggested that each hole drilled in a concrete deck be at least 1/2" deeper than the potential penetration of the concrete fastener. The additional 1/2" depth is for the residual filings left by the concrete after the drill has been removed.
- **Gypsum, either poured or precast, cementitious fiber decks (tectum, etc.).** Minimum embedment and pre-drilling requirements are on the Product Data Sheet for these fasteners as they can vary from 1-1/2" to 2-1/2" of embedment.
- **Lightweight Insulating Concrete over Steel or Structural Concrete.** It is possible to fasten directly into the Lightweight Insulating Concrete if the minimum pullout for the tested fastener is achieved. If this cannot be achieved by a pull test then fastening to the structural deck below must occur, see the requirements for these deck types above.

General Requirements:

All decks must have a minimum pull-out resistance of **300** pounds to be considered for fully adhered projects. For a mechanically attached or induction welded project, a minimum pull-out resistance of **360** pounds is required. MuleHide recommends a test installation be performed to check the pull-out resistance of the appropriate fastener prior to bidding the project. Pull-out tests should be performed by a qualified individual and include different sections of the roof to assure uniformity of the deck. Instructions for the completion of a pull test are outlined in Technical Bulletin 07-2001.

Insulation Adhesive:

- **Helix® Max Low-Rise Adhesive**
 - A low-rise, VOC-free, construction-grade, two-component polyurethane adhesive designed to bond MuleHide insulations to a variety of deck types.
 - Available in Drums, Jugs, Dual Tanks, and Dual Cartridges.
 - Substrate compatibility, and coverage rate requirements are available on the various Helix Max Product Data Sheets.

Refer to Mule-Hide's specifications for requirements for wind speed coverage greater than 55 MPH.

Bead Spacing Requirements Warranted wind speed of 55 MPH and 20-Year Max				
Building Height	Perimeter Width	Bead Spacing		
		Field	Perimeter	Corner
0-25'	4 Feet	12" OC	6" OC	6" OC
26'-49'	8 Feet	12" OC	6" OC	6" OC
50'-74'	12 Feet	12" OC	6" OC	6" OC
75'-100'	16 Feet	12" OC	6" OC	6" OC
101' or greater	Contact MuleHide Technical Department			

Insulation Fasteners:

- **MuleHide insulation fastening rates for Fully Adhered Systems**
 - Mule-Hide's minimum fastening rate is 1 per 2 SF or 16 plates and fasteners per board.
 - Based on deck and or insulation type reduced fastening patterns may be used.
- **Reduced insulation fastening rates for Fully Adhered Systems**
 - Reduced patterns are limited to Structural Concrete, Steel (min 22ga.), 5/8" Plywood, and min 1.5" Wood Plank Decks.
 - Maximum warranty terms for decks using reduced fastening rates listed is 20-years and 72 MPH
 - Maximum building height for reduced patterns is 50' in height.
 - Rates are based on the single or top layer of insulation (or cover board) installed.
 - Minimum fastening rates for various thicknesses and types of MuleHide Insulations and Cover Boards are outlined below.

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Refer to Mule-Hide's specifications for requirements for wind speed coverage or buildings greater than 50' in height.

Minimum MuleHide Fastener Requirements Warranted wind speed up to 72 MPH, Max 50' building height			
Insulation Type or Cover Board	Fasteners per 4' x 8' board		
	Field	Perimeter	Corner
*MuleHide Polyisocyanurate (1 or 2)- Min 2" thick (top layer)	8	8	8
*MuleHide Polyisocyanurate (1 or 2)- Min 1.5" up to 2" thick	12	12	12
MuleHide Polyisocyanurate (1 or 2)- Min 1.0" up to 1.5" thick	16	16	16
Poly-ISO (1 or 2) HD (1/2" thick) - Installed over Approved Insulation	12	12	12
Poly-ISO1 HD Plus (1/2" thick) -Installed over an Approved Insulation	8	8	8
Structodek HD Wood Fiberboard - Min 1/2" thick- Installed over Approved Insulation	16	16	16
Dens Deck Prime or Securock - Min 1/4" thick - Installed over Approved Insulation	12	12	12
Dens Deck Prime or Securock - Min 1/2" thick - Installed over Approved Insulation	8	8	8
OSB - Min 7/16" thick - Installed over Approved Insulation	17	17	17
Approved OSB/Polyisocyanurate Composite - Min 2" thick	17	17	17

*4'x12' Poly-ISO 1 Boards shall be fastened at the same or greater rate per square foot of the roof board

- **MuleHide insulation fastening Mechanically Fastened Systems**
 - Standard pattern is 6 plates and fasteners per 4' x 8' board
- **Reduced insulation fastening rates for Mechanically Fastened Systems**
 - When the top layer of insulation is Poly-Iso greater than 2" in thickness then the pattern can be reduced to 5 plates and fasteners per 4' x 8' board
 - When using 4'x12' Poly-Iso 1 boards, 6 fasteners and plates per board are acceptable on system warranties up to 20 years (minimum 1.5" board thickness). Not acceptable on Recover / No Tear-off projects, or Metal Retrofit roof systems.
- **MuleHide insulation and membrane attachment for Induction Welded Systems – Maximum warranty term of 20 years, 72 mph wind speed coverage, or max 50' building height**
 - Secure an acceptable top layer of insulation to minimum 22 gauge steel deck or 15/32" thick plywood at a minimum rate of six (6) EHD fasteners and Induction Welding Plates or RhinoBond plates per 4'x8' board in the field. Eight (8) fasteners and plates per 4'x8' board are required on perimeters, which must extend a minimum of 8' from the perimeter edge.
 - 4'x12' Poly-ISO 1 boards shall be fastened at the same or greater rate per square foot of roof board.
 - For warranty terms exceeding 20 years, 72 mph, or building heights over 50' contact MuleHide Technical Services for Minimum fastening requirements and acceptable insulation attachment details.

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Approved Fasteners

- A. Only approved MuleHide fasteners supplied by MuleHide Products Co. may be used on warranted MuleHide systems. **Caution:** Some fasteners have unusual design characteristics which could harm the membrane if used with the MuleHide membrane; therefore, it is recommended that MuleHide approved fasteners be used whenever possible.
- B. All fasteners shall be corrosion resistant coated and meet the corrosion resistance requirements of Factory Mutual Standard 4470.
- C. All fasteners shall be compatible with and suitable for the insulation used and the deck to be penetrated.

Fastener Patterns - Insulation

- A. Insulation shall be mechanically attached using approved fasteners per insulation manufacturers' specifications and FM wind uplift requirements. Unless the insulation manufacturer's fastening requirements are more stringent,
- B. MuleHide requires the following minimum fastening rates from the chart above be achieved following the patterns in the attached drawings. All fasteners must be at least six (6) inches from the edge of the board and centered as shown in the attached drawings.

Information and details included are intended for Mule-Hide's sole benefit for the limited purpose of considering a project for the manufacturer's warranty requested. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the responsibility of the owner and/or architect to design the roof and select the roofing system. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

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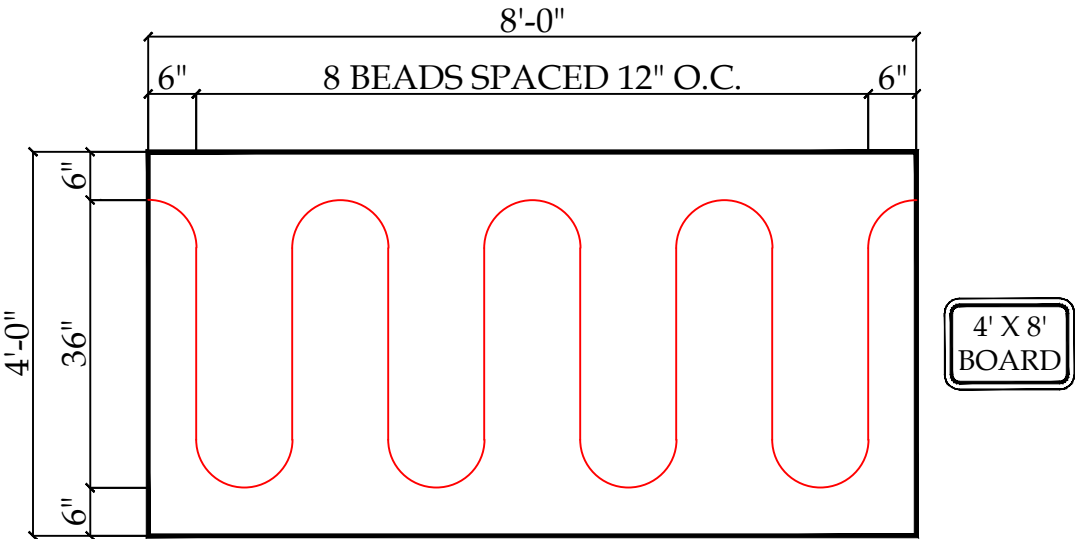
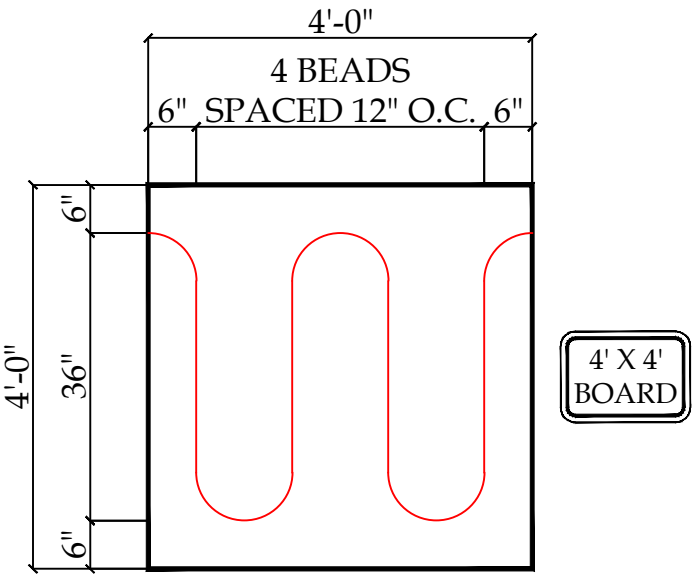
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NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.
- 4. **Maximum 4'x4' Insulation Boards When Adhesive is dispensed at 12" on Center or When Boards Exceed 4" Thickness.**



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

HELIX or HELIX MAX FOAM ADHESIVE 12" RIBBON PATTERN

APPLICABLE SYSTEMS

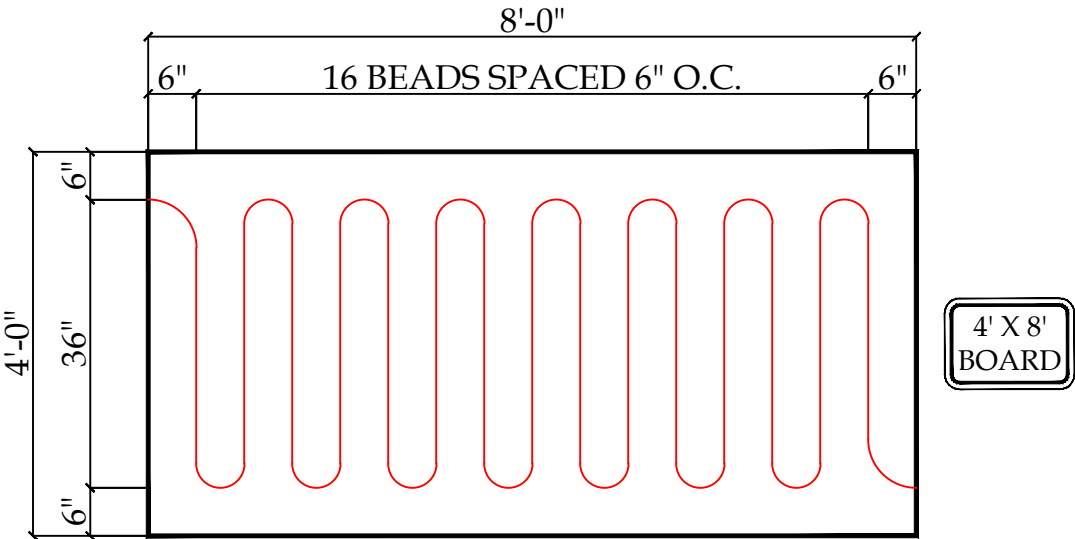
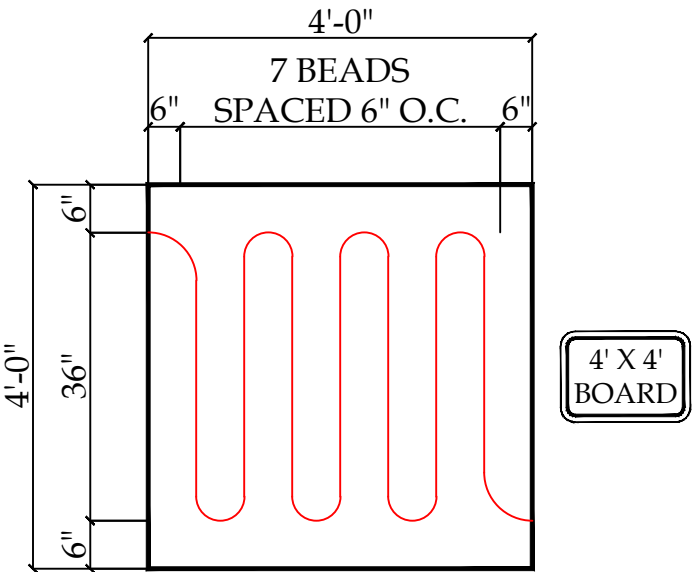
ALL SYSTEMS

DETAIL NO.:
MHHA-UN-12

REVISION DATE: 2/9/2026

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HELIX or HELIX MAX FOAM ADHESIVE 6" RIBBON PATTERN

APPLICABLE SYSTEMS

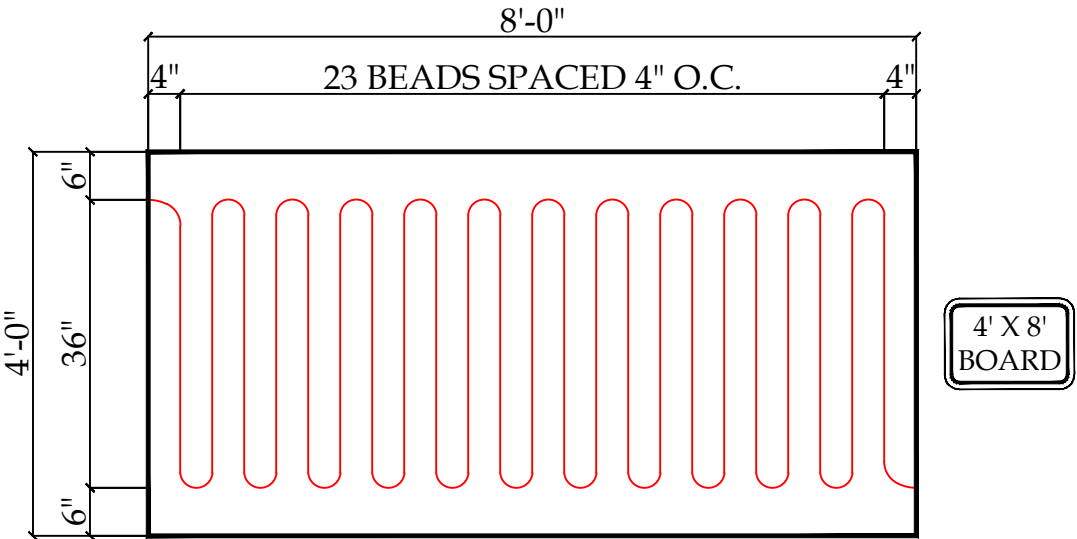
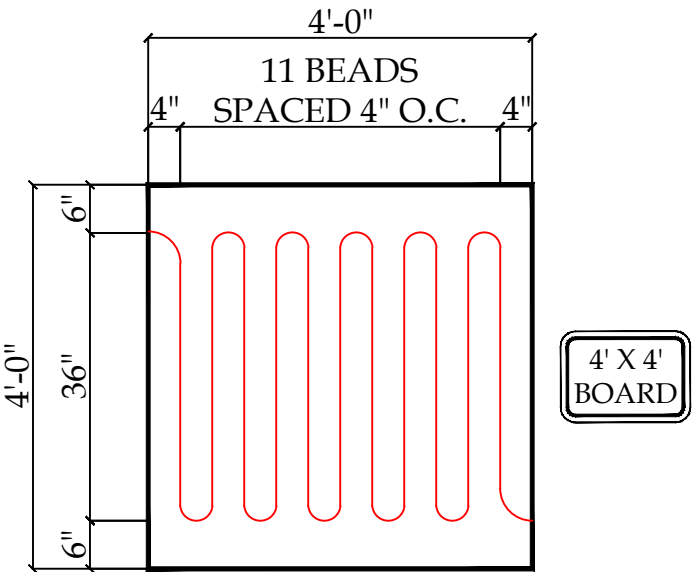
ALL SYSTEMS

DETAIL NO.:
MHHA-UN-6

REVISION DATE: 2/9/2026

NOTES:

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MULEHIDE

HELIX or HELIX MAX FOAM ADHESIVE 4" RIBBON PATTERN

APPLICABLE SYSTEMS

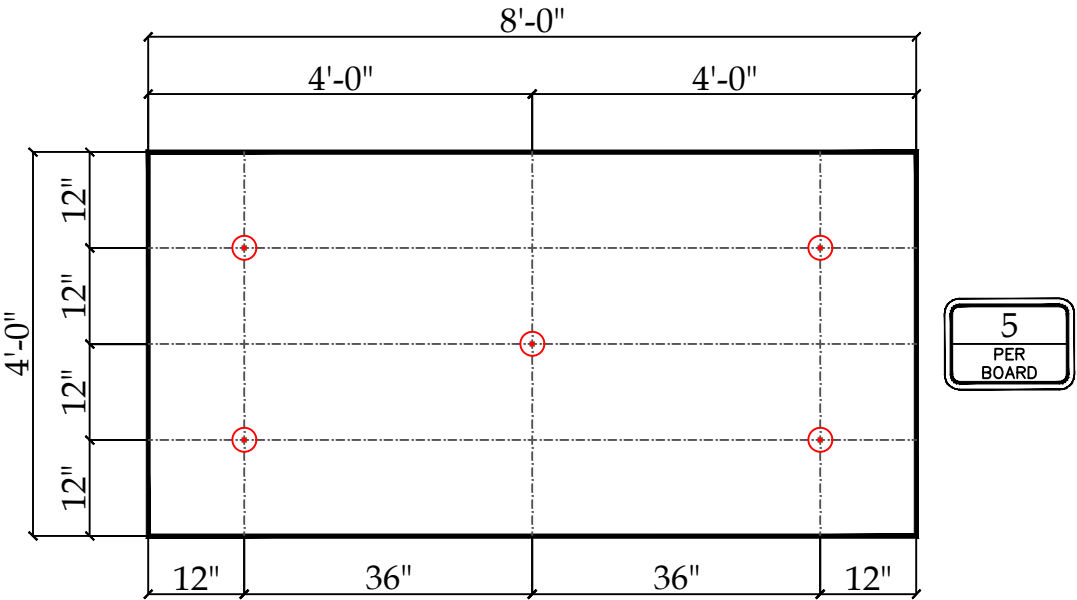
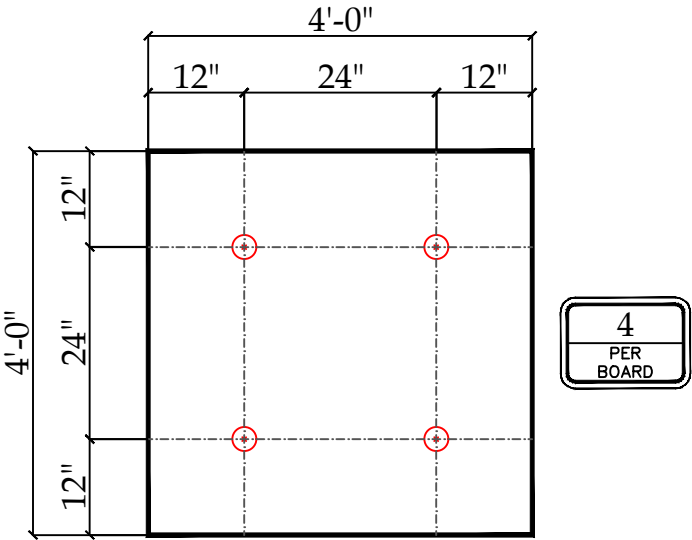
ALL SYSTEMS

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REVISION DATE: 2/9/2026

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MULEHIDE

Fastened - 1 per 6.4 SF (5 per 4x8)
Fastened - 1 per 4 SF (4 per 4x4)

APPLICABLE SYSTEMS

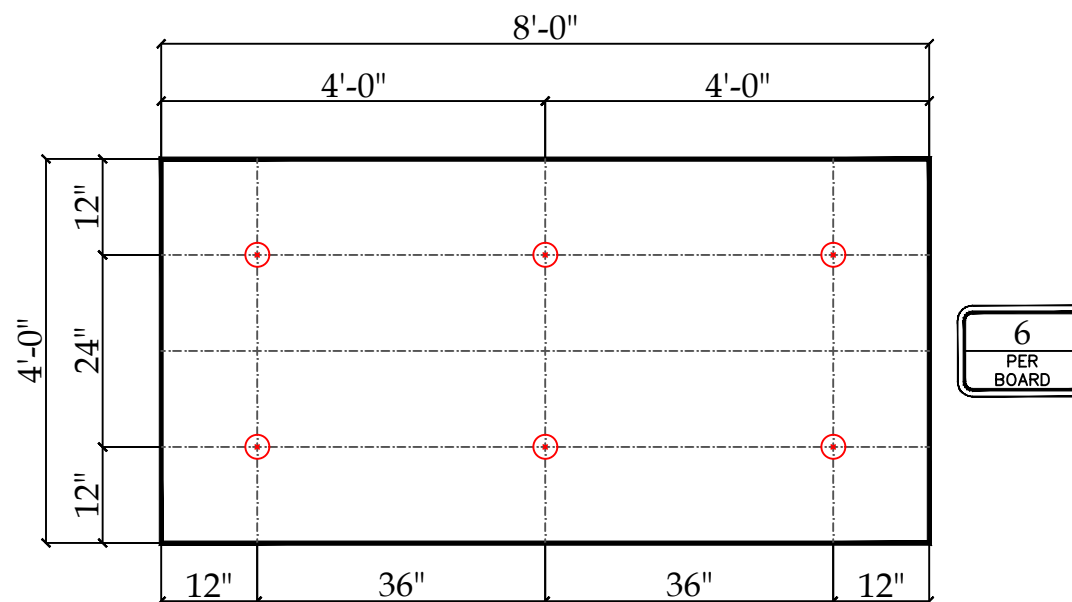
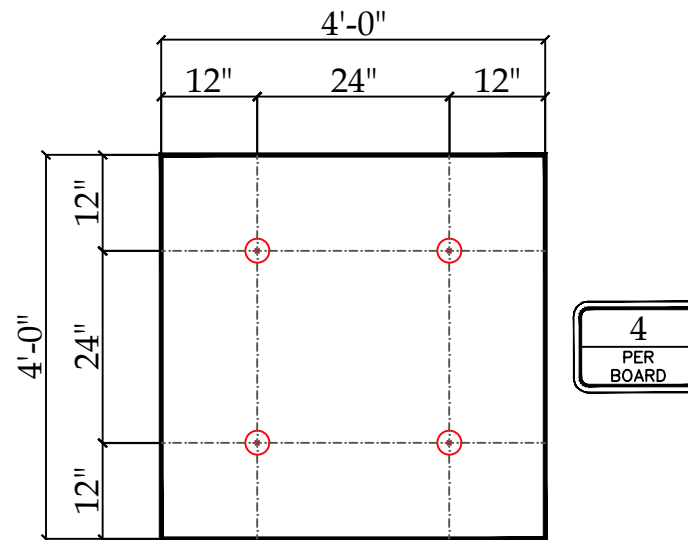
MECHANICALLY ATTACHED

DETAIL NO.:
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REVISION DATE: 2/10/2026

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MULEHIDE

Fastened - 1 per 5.33 SF (6 per 4x8)
Fastened - 1 per 4 SF (4 er 4x4)

APPLICABLE SYSTEMS
INDUCTION WELDED
MECHANICALLY ATTACHED

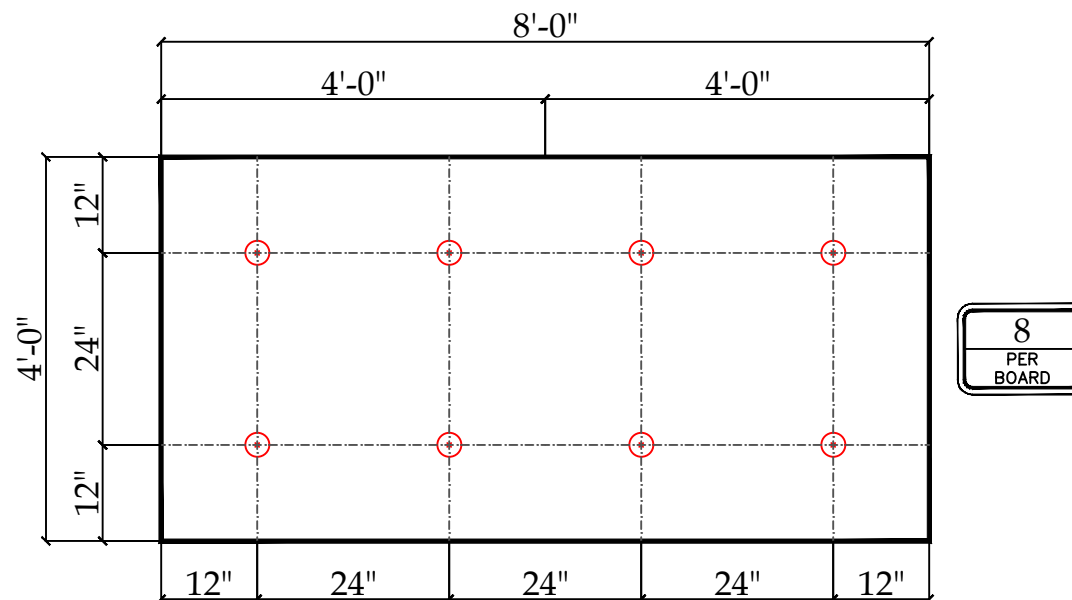
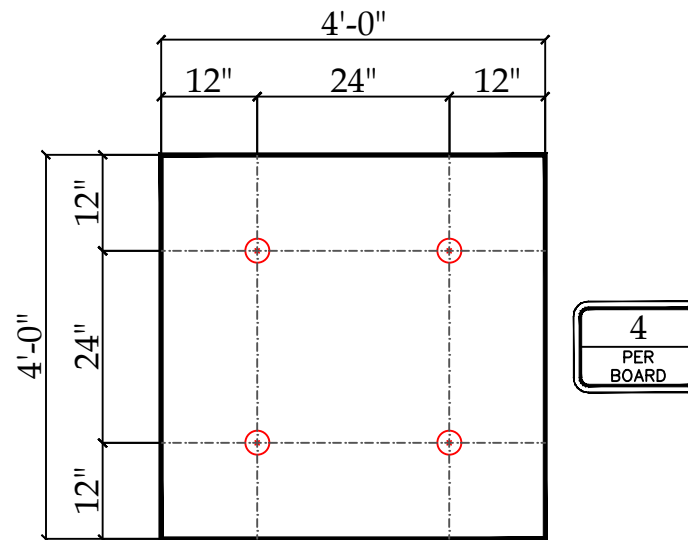
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INS-UN-6F-4H

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MULEHIDE

Fastened -1 per 4 SF (8 per 4x8)
Fastened -1 per 4 SF (4 per 4x4)

APPLICABLE SYSTEMS
FULLY ADHERED
INDUCTION WELDED

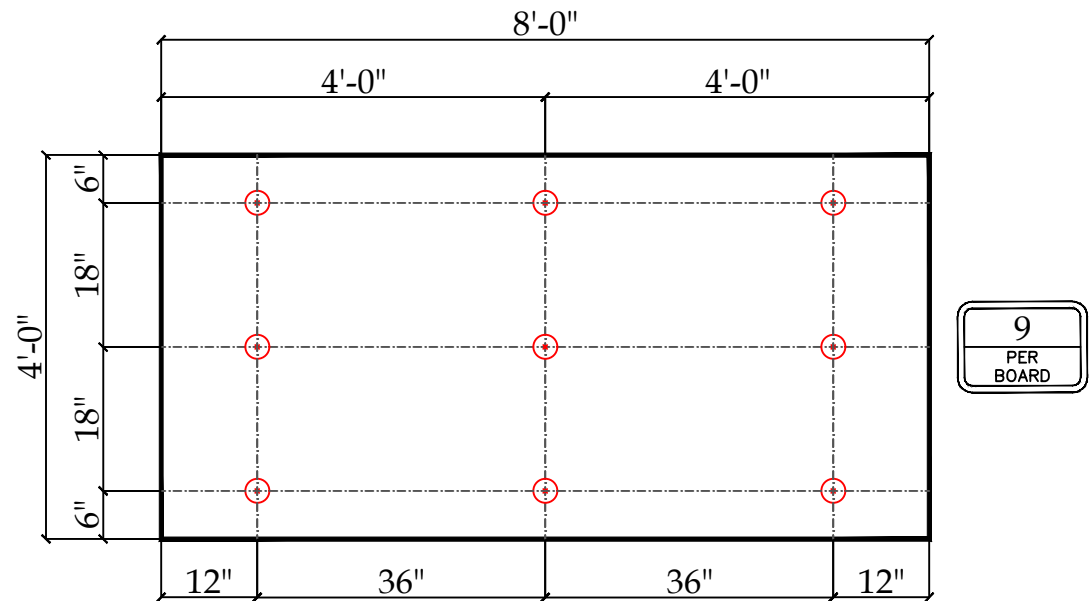
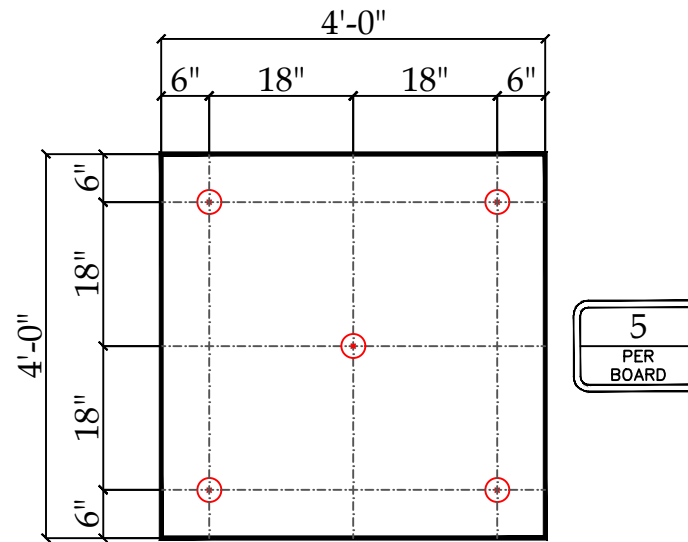
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INS-UN-8F-4H

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MULEHIDE

Fastened -1 per 3.55 SF (9 per 4x8)
Fastened -1 per 3.2 SF (5 per 4x4)

APPLICABLE SYSTEMS

INDUCTION WELDED

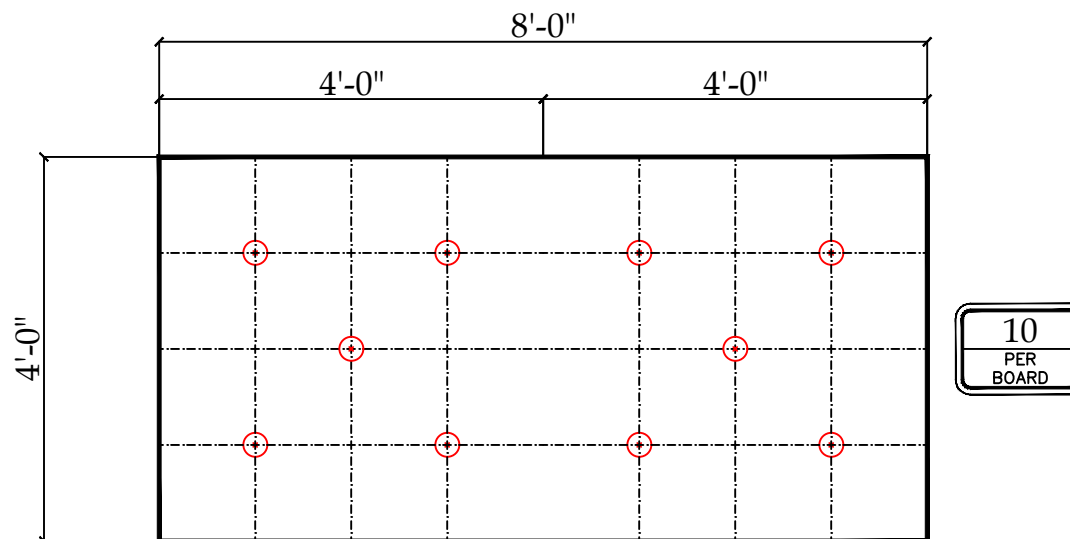
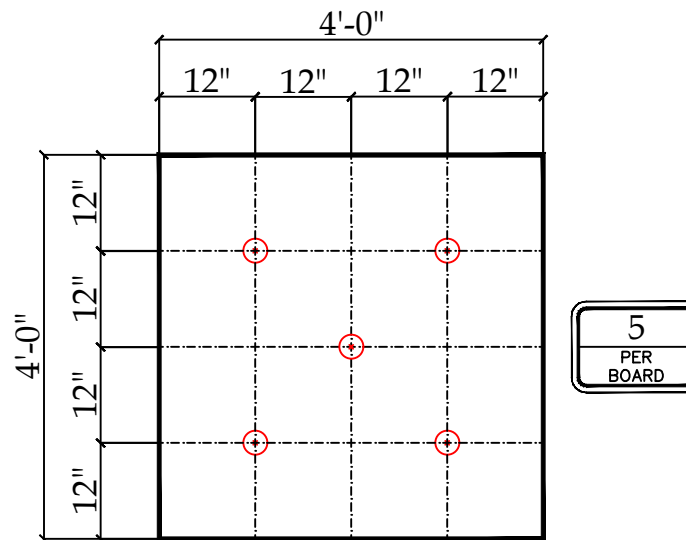
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REVISION DATE: 2/18/2026

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MULEHIDE

Fastened -1 per 3.2 SF (10 per 4x8)
Fastened -1 per 3.2 SF (5 per 4x4)

APPLICABLE SYSTEMS
FULLY ADHERED
INDUCTION WELDED

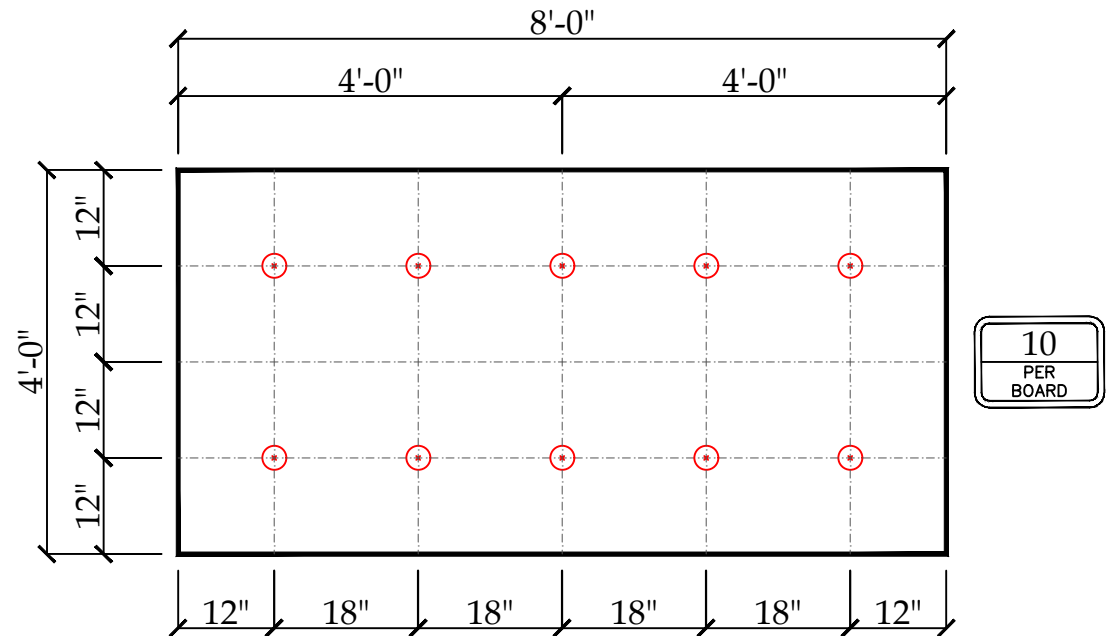
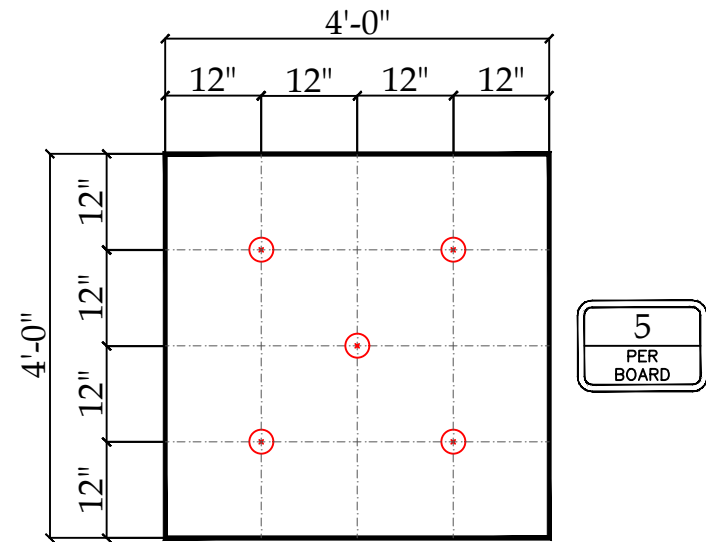
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REVISION DATE: 2/10/2026

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MULEHIDE

Fastened - 1 per 3.2 SF (10 per 4x8)
Fastened - 1 per 3.2 SF (5 per 4x4)

APPLICABLE SYSTEMS

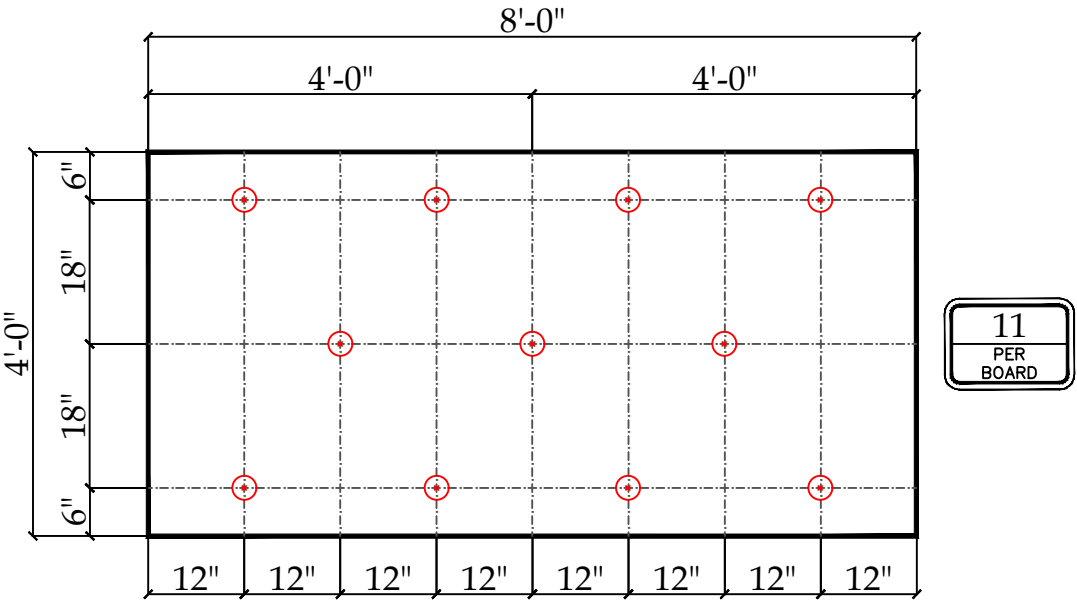
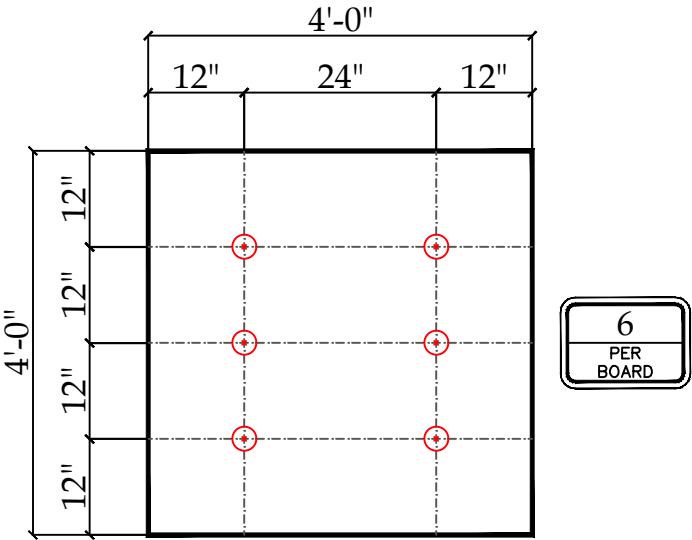
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DETAIL NO.:
INS-IW-10F-5H

REVISION DATE: 4/28/2026

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* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened -1 per 2.91 SF (11 per 4x8)
Fastened -1 per 2.67 SF (6 per 4x8)

APPLICABLE SYSTEMS

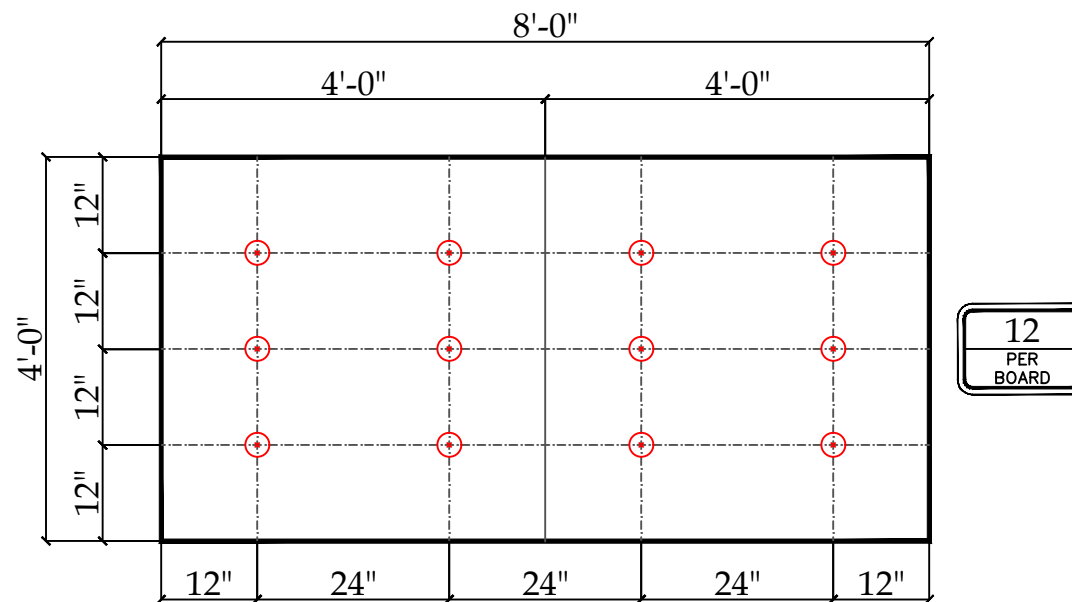
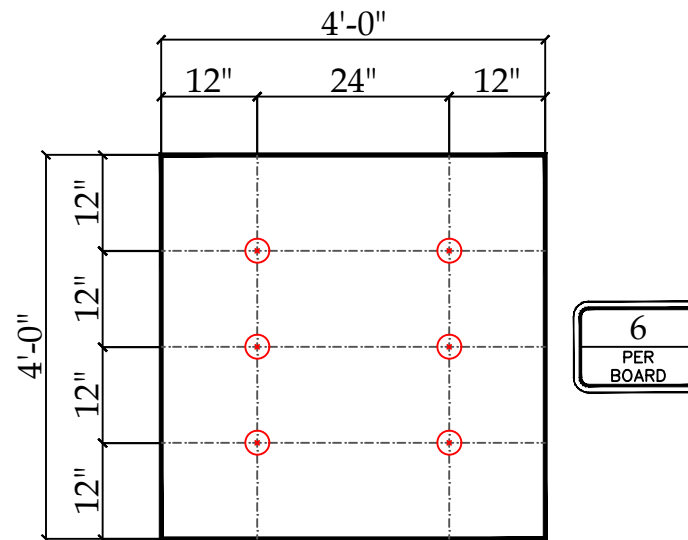
FULLY ADHERED

DETAIL NO.:
INS-UN-11F-6H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened - 1 per 2.67 SF (12 per 4x8)
Fastened - 1 per 2.67 SF (6 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

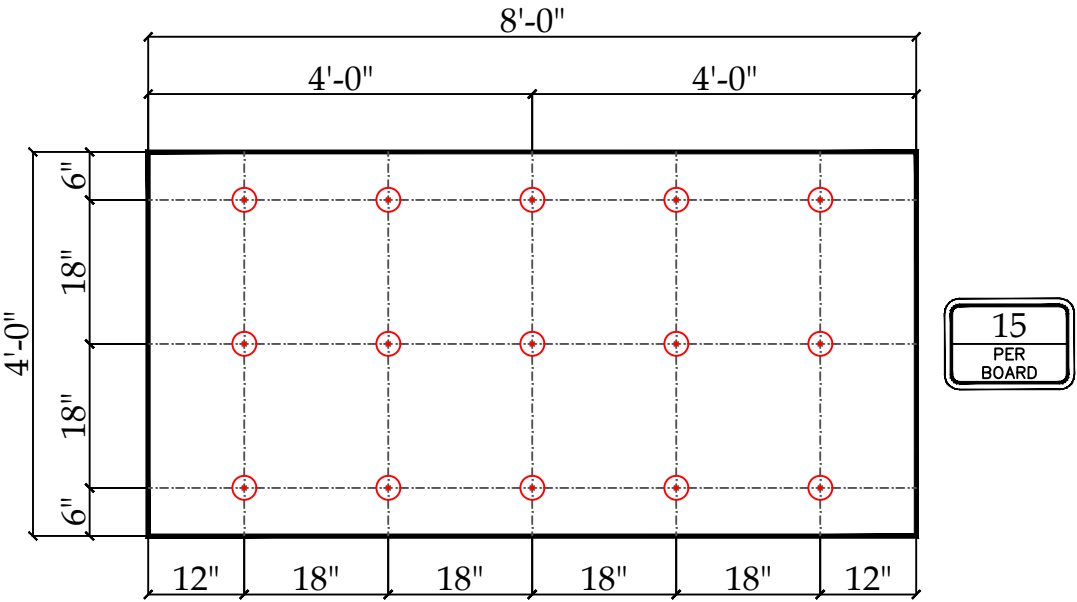
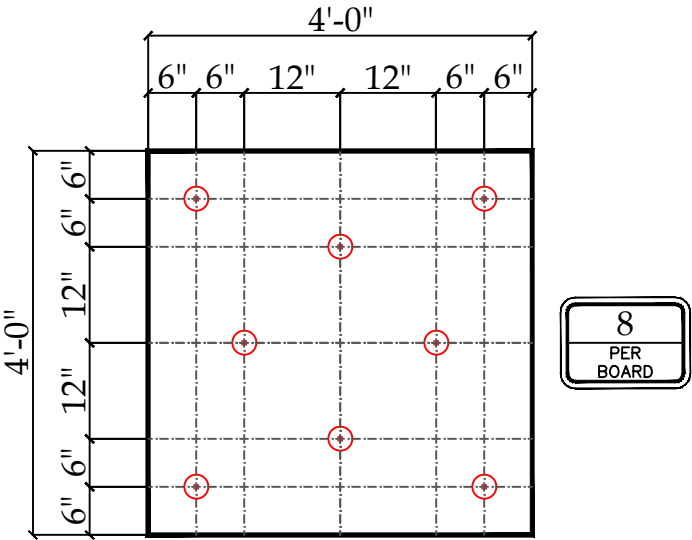
DETAIL NO.:

INS-UN-12F-6H

REVISION DATE: 4/27/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened -1 per 2.13 SF (15 per 4x8)
Fastened -1 per 2 SF (8 per 4x4)

APPLICABLE SYSTEMS

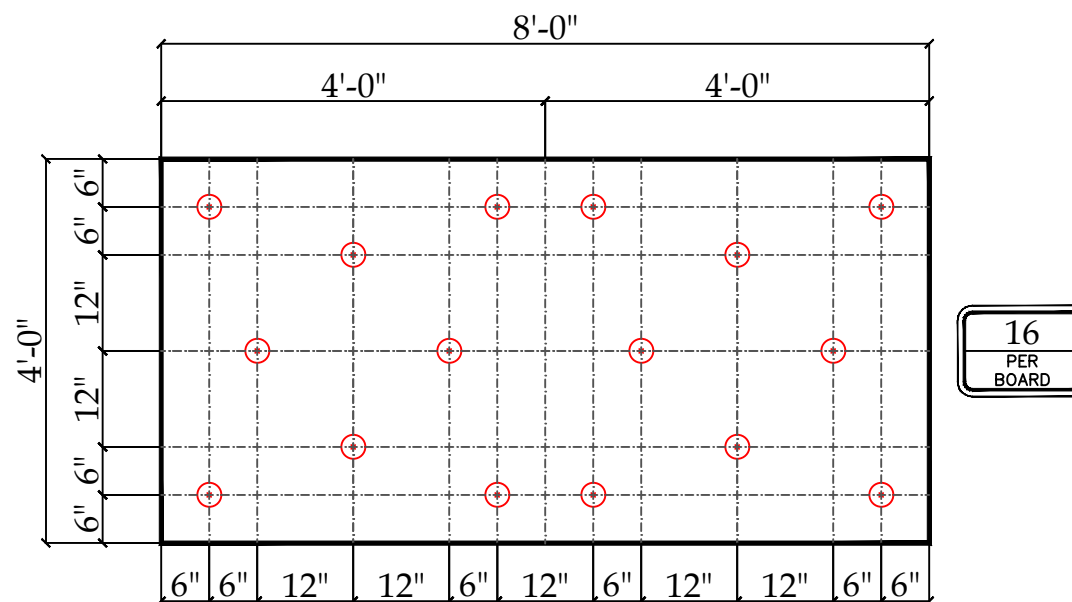
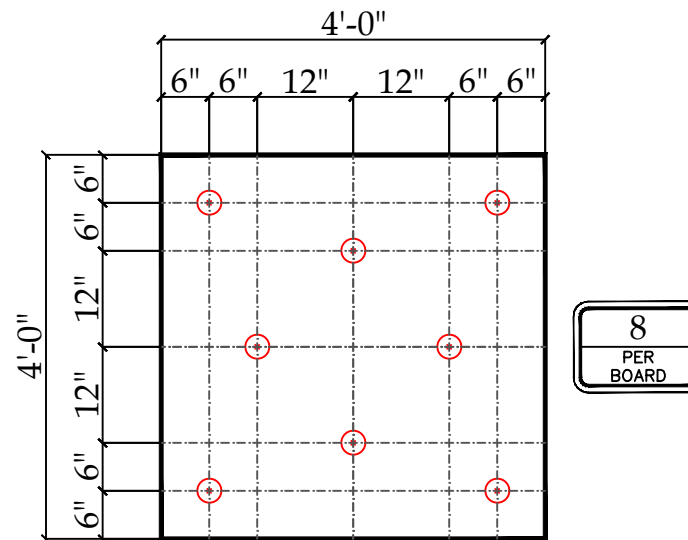
FULLY ADHERED

DETAIL NO.:
INS-UN-15F-8H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened -1 per 2 SF (16 per 4x8)
Fastened -1 per 2 SF (8 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

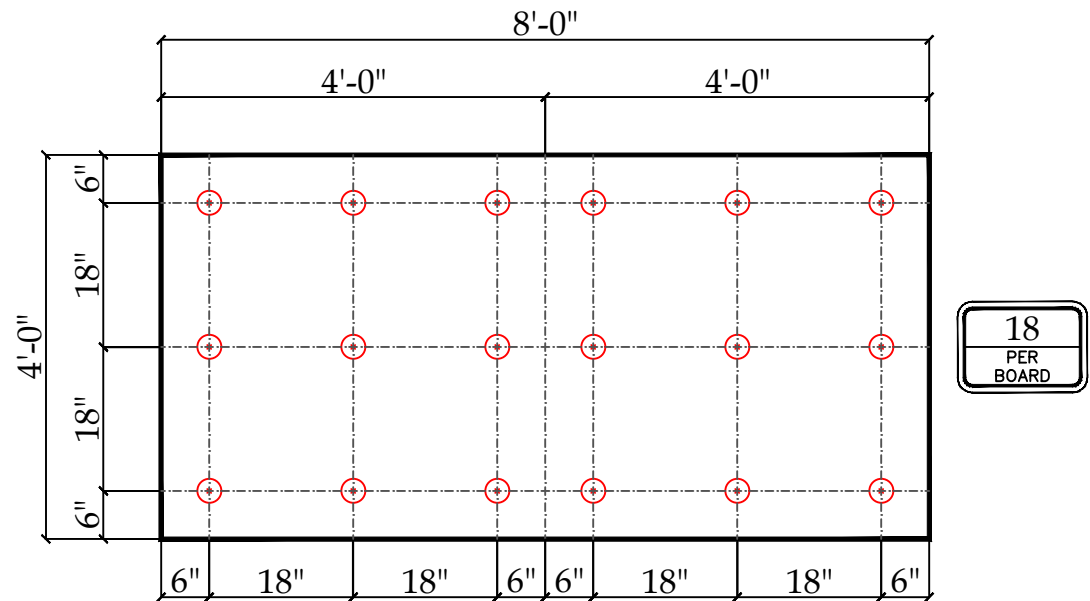
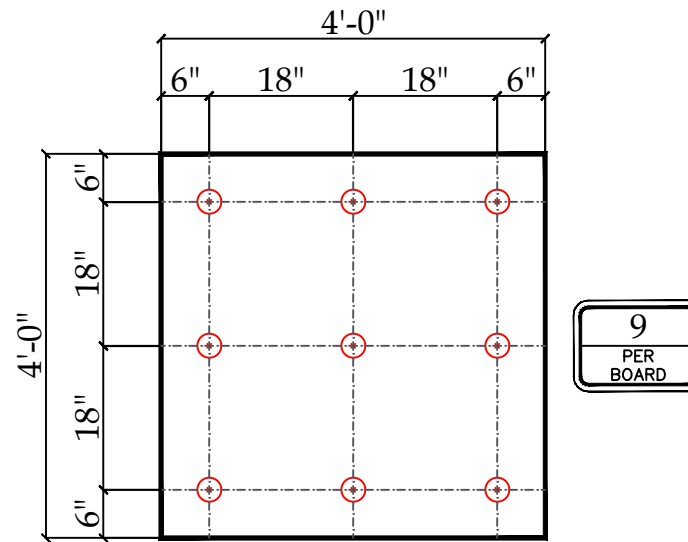
DETAIL NO.:

INS-UN-16F-8H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened -1 per 1.77 SF (18 per 4x8)
Fastened -1 per 1.77 SF (9 per 4x4)

APPLICABLE SYSTEMS
INDUCTION WELDED
FULLY ADHERED

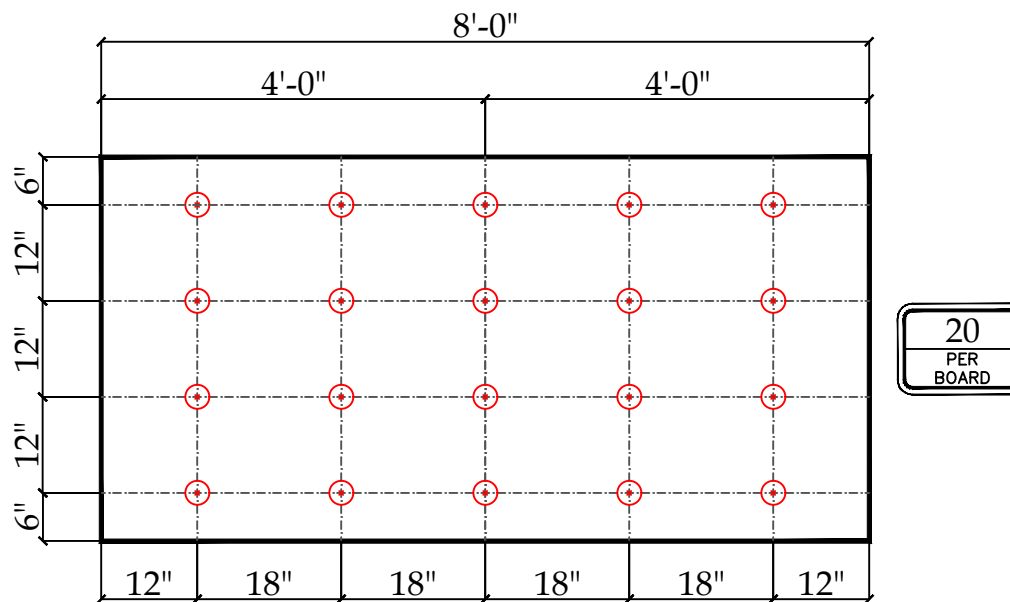
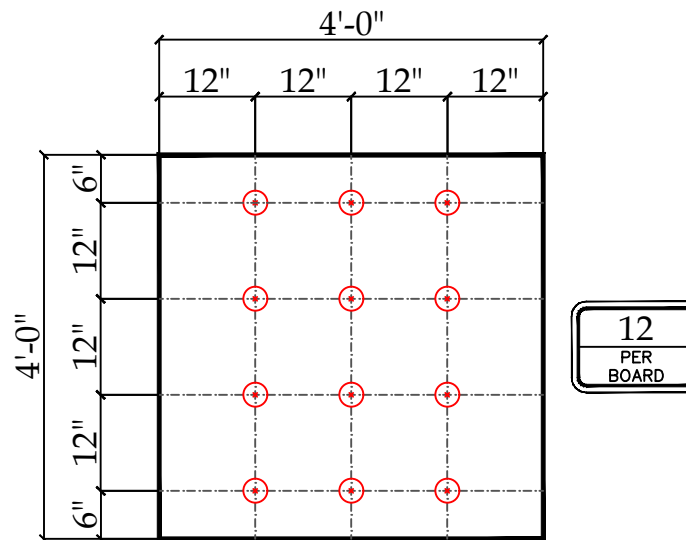
DETAIL NO.:

INS-UN-18F-9H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened -1 per 1.6 SF (20 per 4x8)
Fastened -1 per 1.33 SF (12 per 4x4)

APPLICABLE SYSTEMS

INDUCTION WELDED

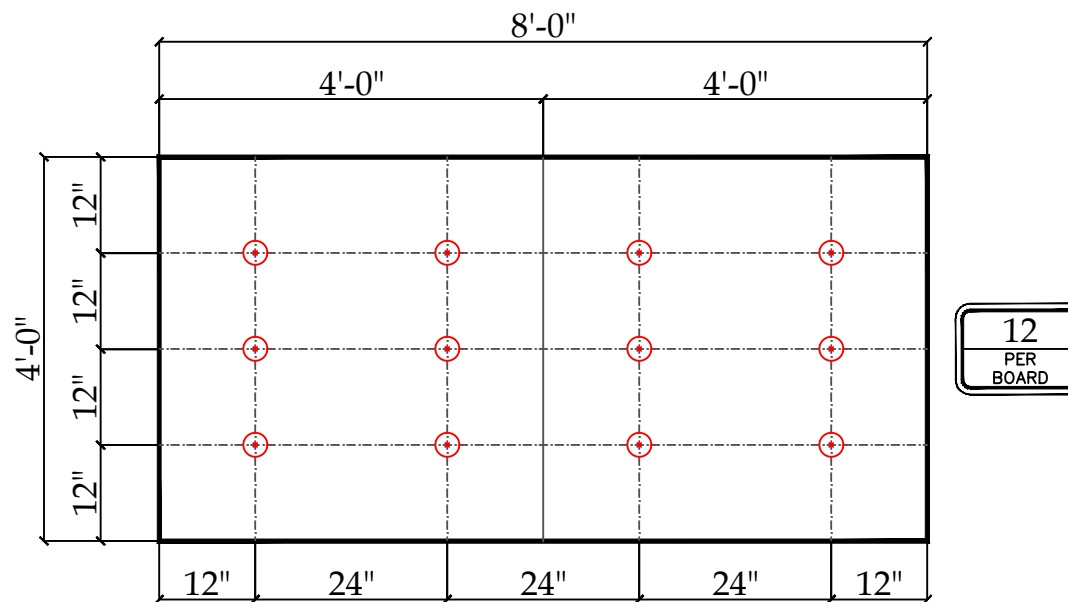
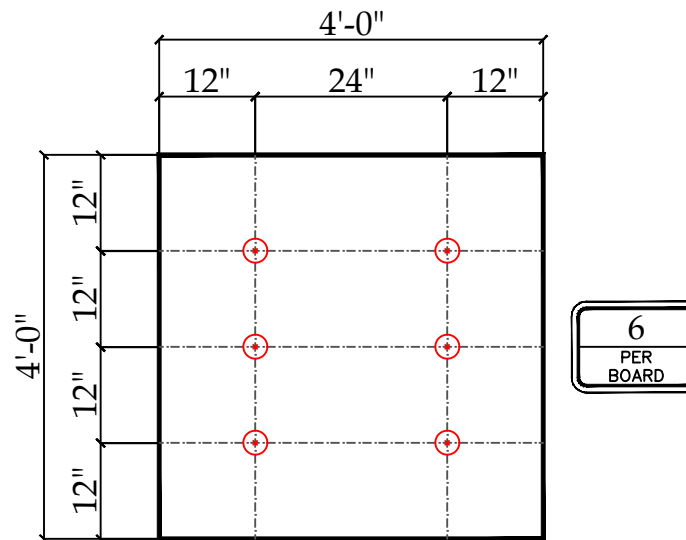
DETAIL NO.:

INS-IW-20F-12H

REVISION DATE: 2/18/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened -1 per 2.67 SF (12 per 4x8)
Fastened -1 per 2.67 SF (6 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

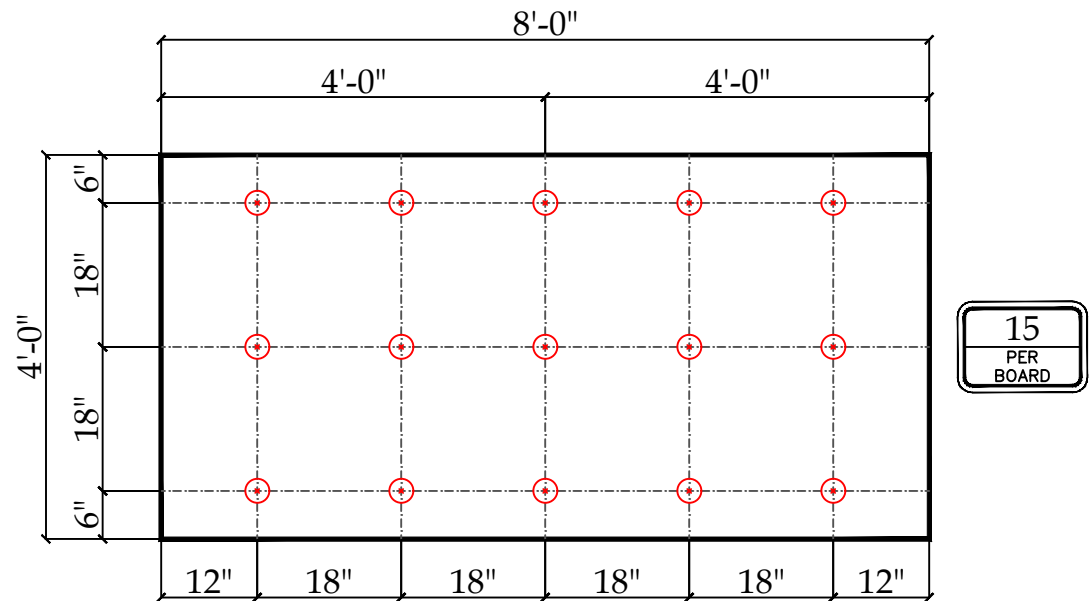
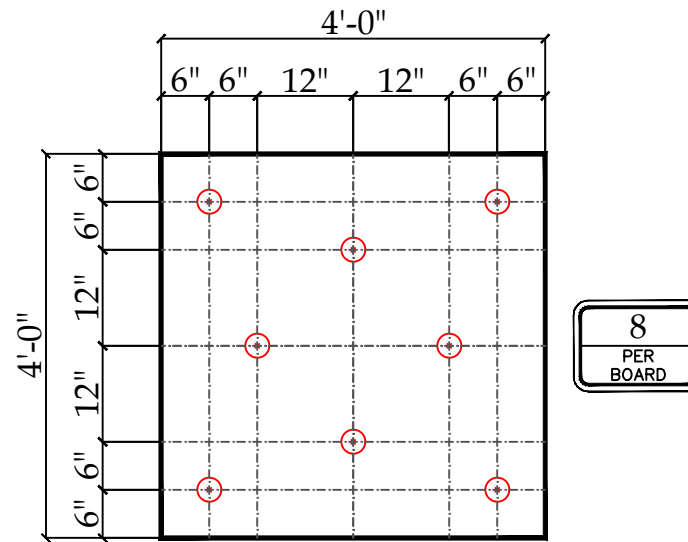
DETAIL NO.:

INS-UN-12F-6H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened -1 per 2.13 SF (15 per 4x8)

Fastened -1 per 2 SF (8 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

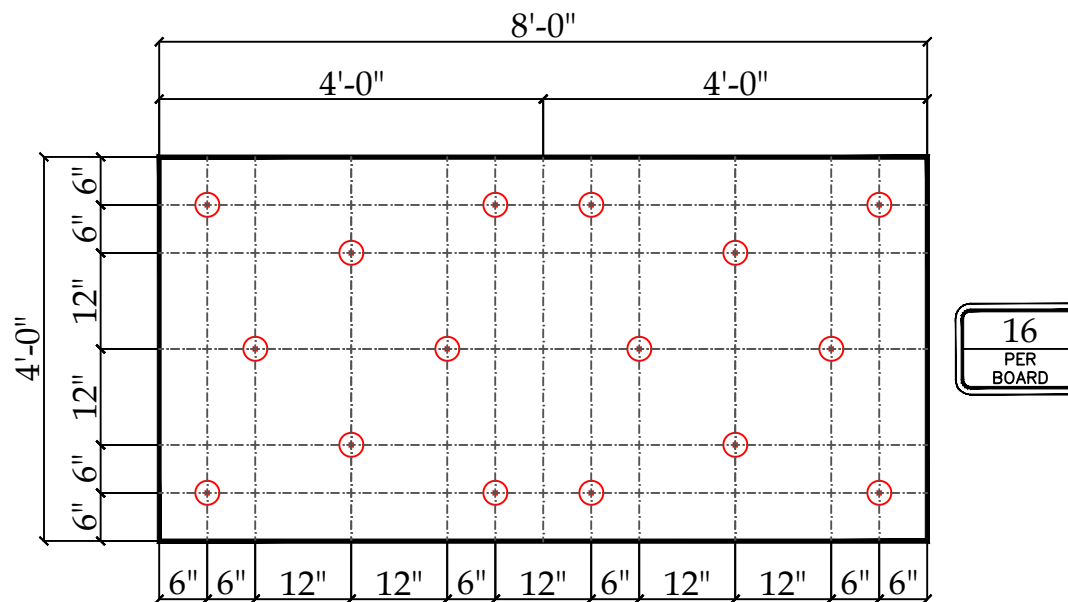
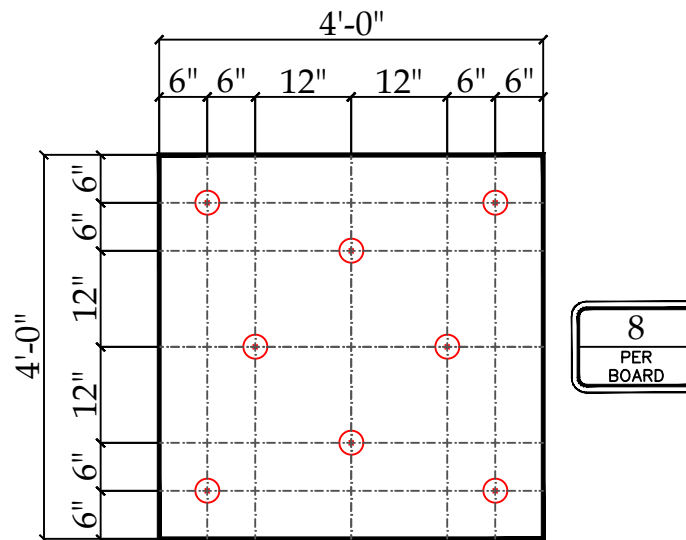
DETAIL NO.:

INS-UN-15F-8H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened -1 per 2 SF (16 per 4x8)
Fastened -1 per 2 SF (8 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

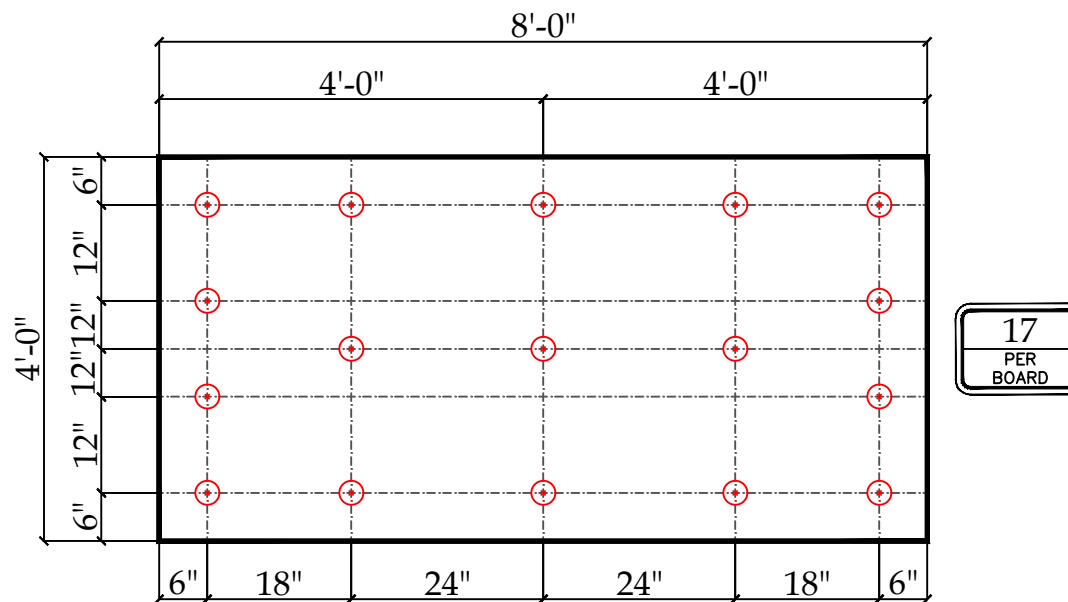
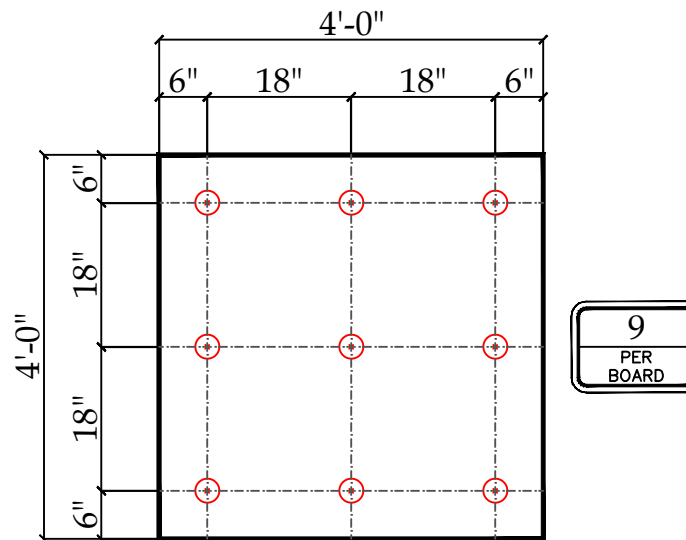
DETAIL NO.:

INS-UN-16F-8H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened -1 per 1.88 SF (17 per 4x8)
Fastened -1 per 1.77 SF (9 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

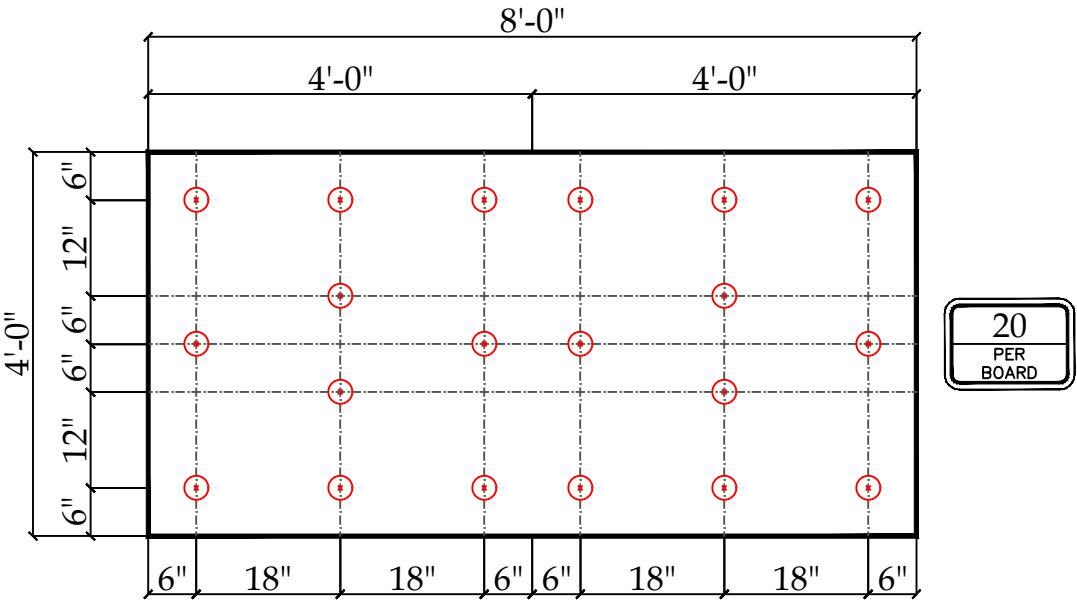
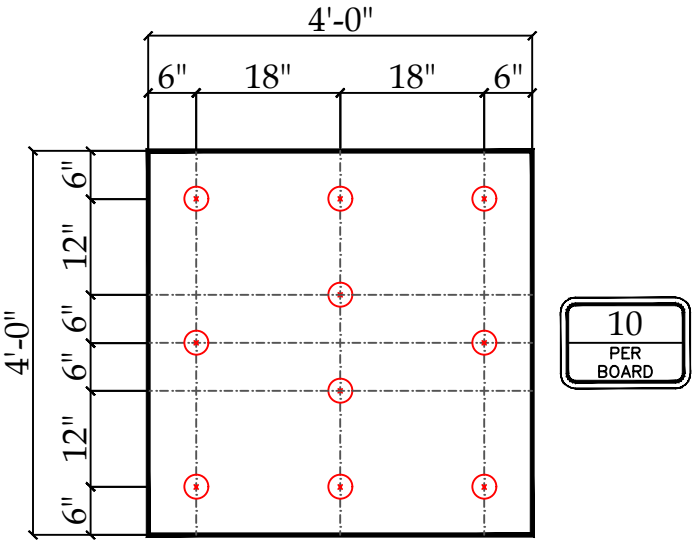
DETAIL NO.:

INS-UN-17F-9H

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened -1 per 1.6 SF (20 per 4x8)
Fastened -1 per 1.6 SF (10 per 4x4)

APPLICABLE SYSTEMS

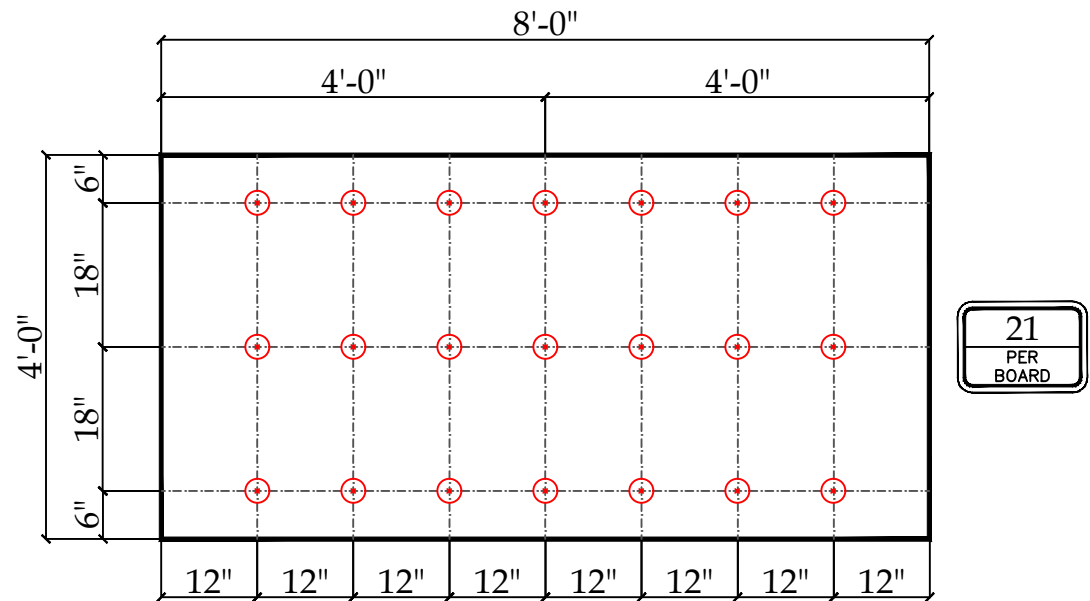
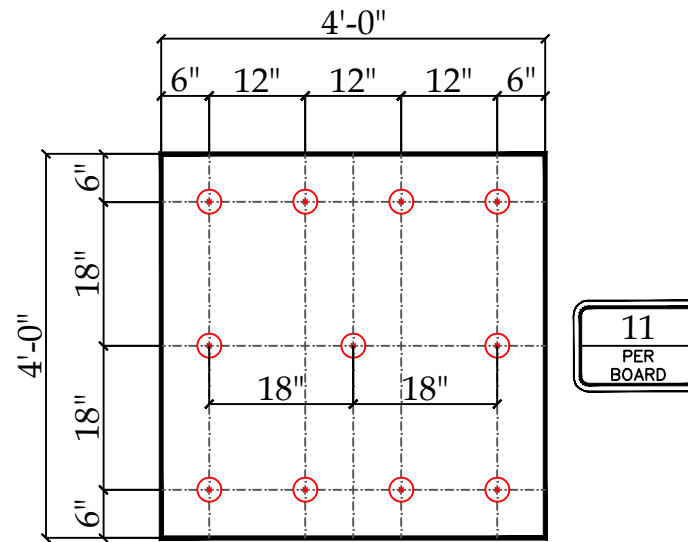
FULLY ADHERED

DETAIL NO.:
INS-UN-20F-10H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened -1 per 1.52 SF (21 per 4x8)

Fastened -1 per 1.45 SF (11 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

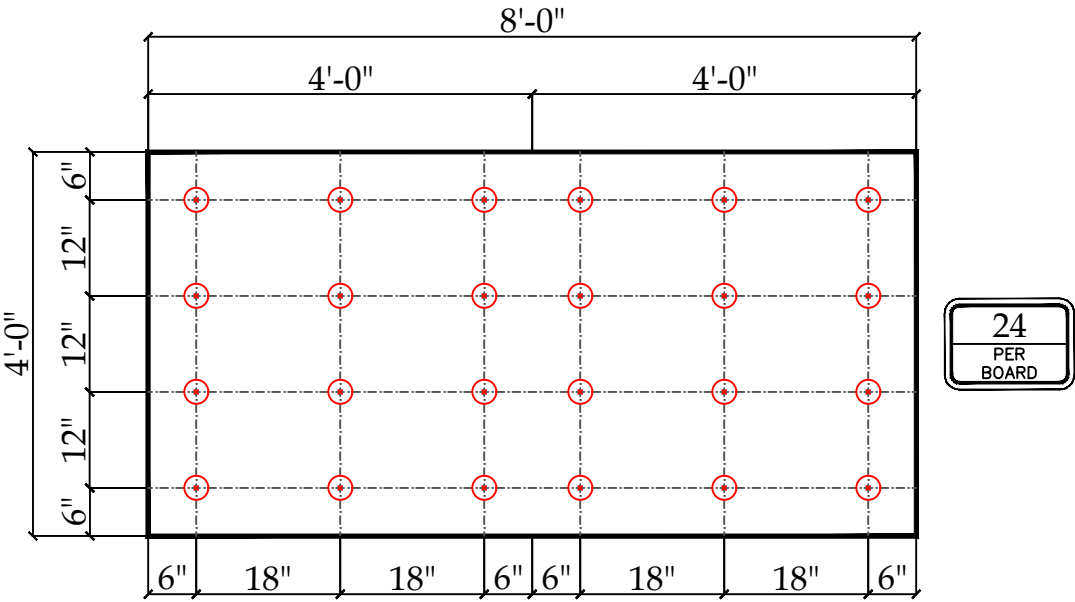
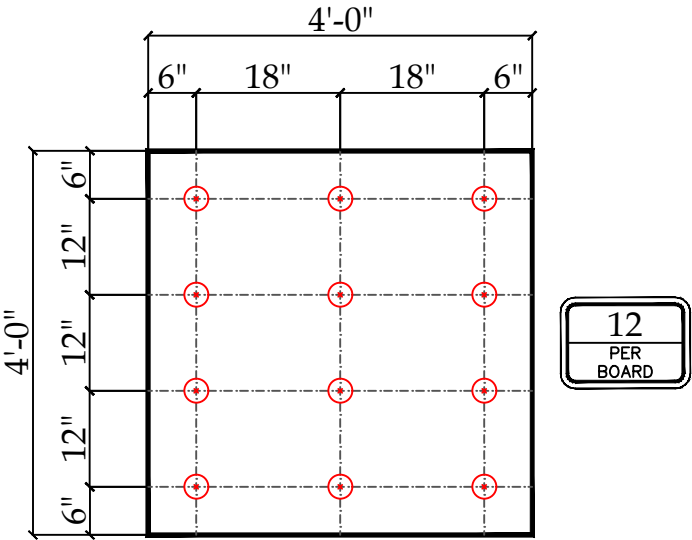
DETAIL NO.:

INS-UN-21F-11H

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened - 1 per 1.33 SF (24 per 4x8)
Fastened - 1 per 1.33 SF (12 per 4x4)

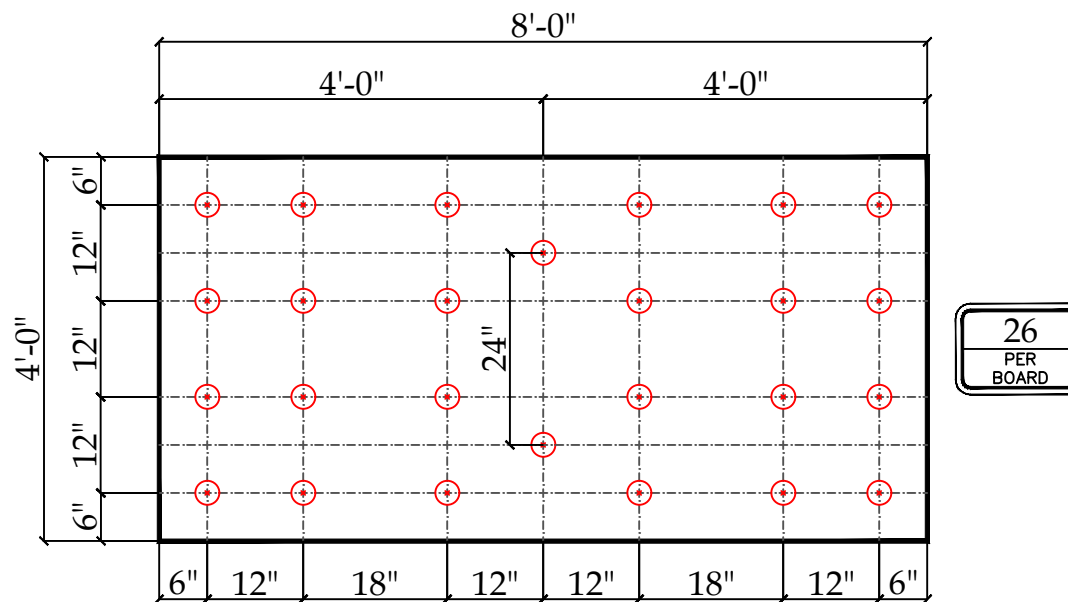
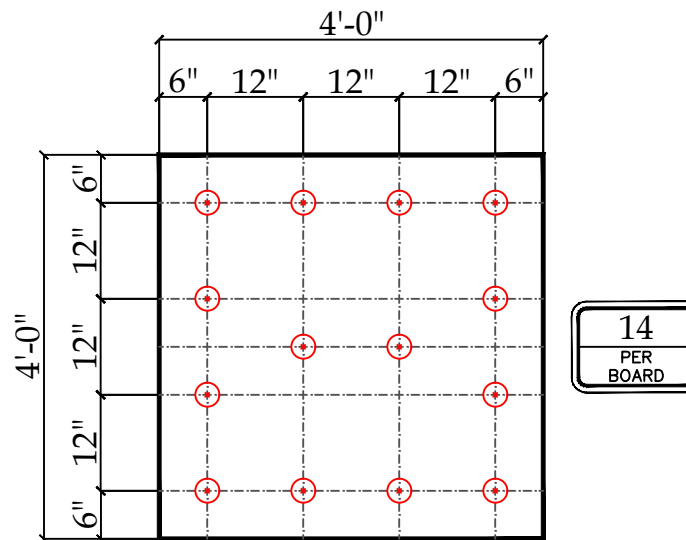
APPLICABLE SYSTEMS
INDUCTION WELDED
FULLY ADHERED

DETAIL NO.:
INS-UN-24F-12H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 1.23 SF (26 per 4x8)
Fastened - 1 per 1.14 SF (14 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

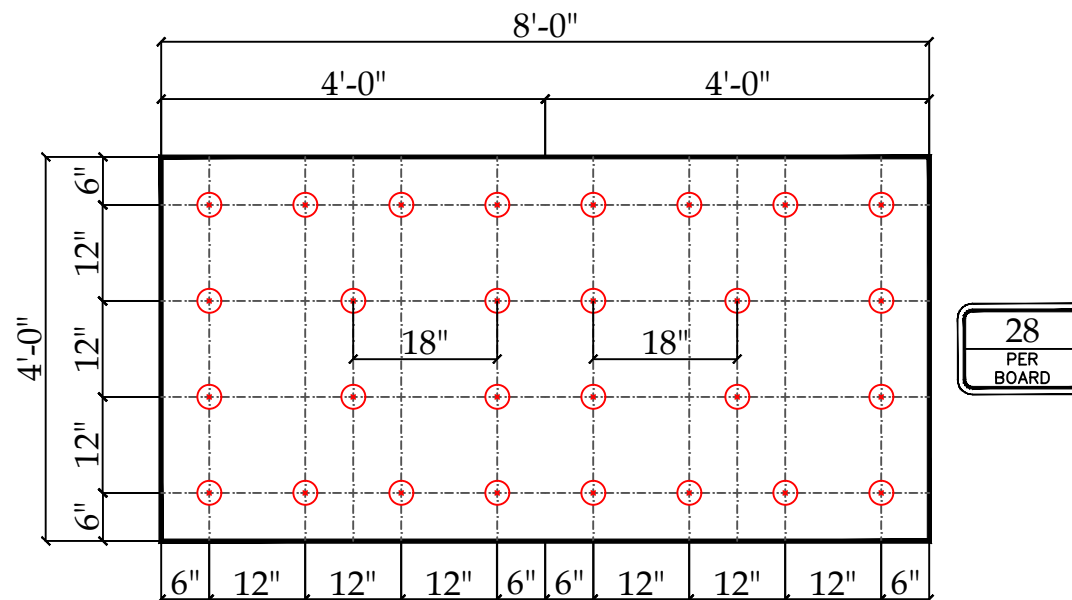
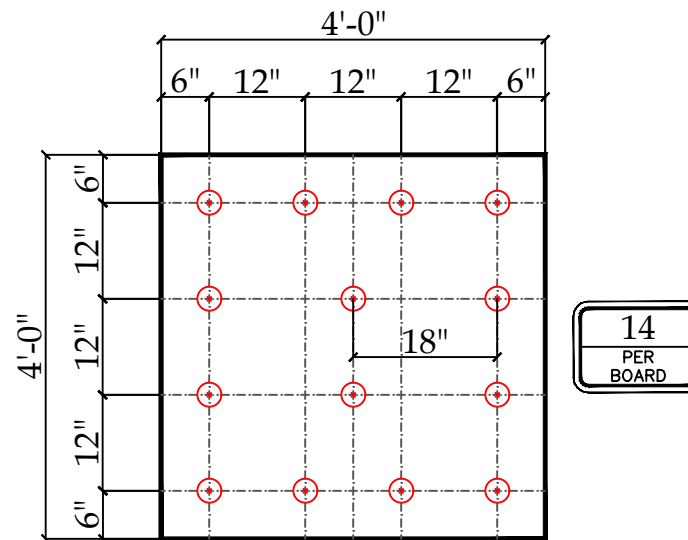
DETAIL NO.:

INS-UN-26F-14H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 1.14 SF (28 per 4x8)
Fastened - 1 per 1.14 SF (14 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

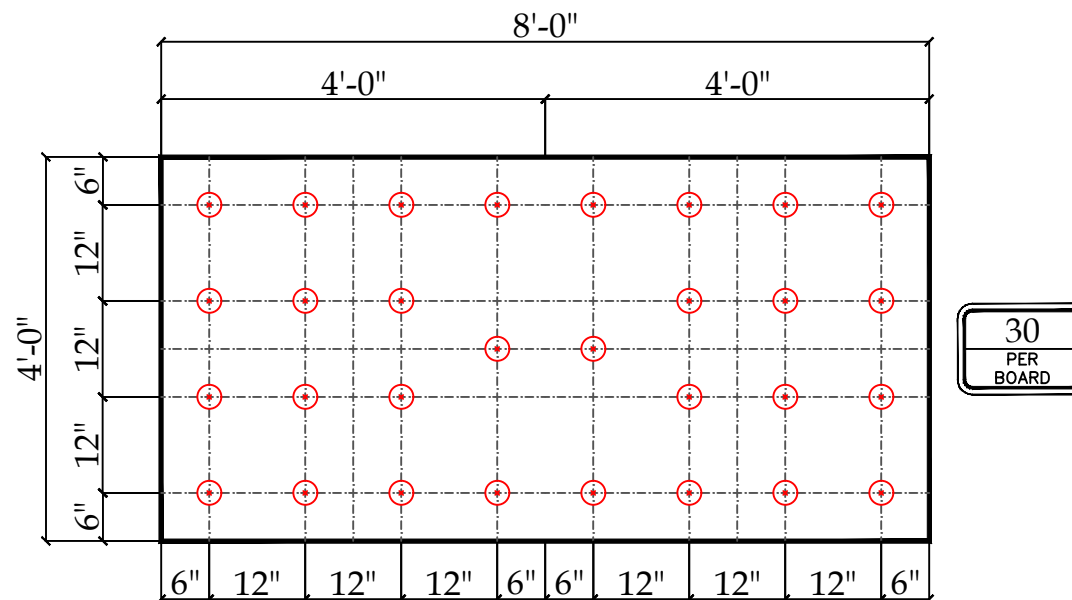
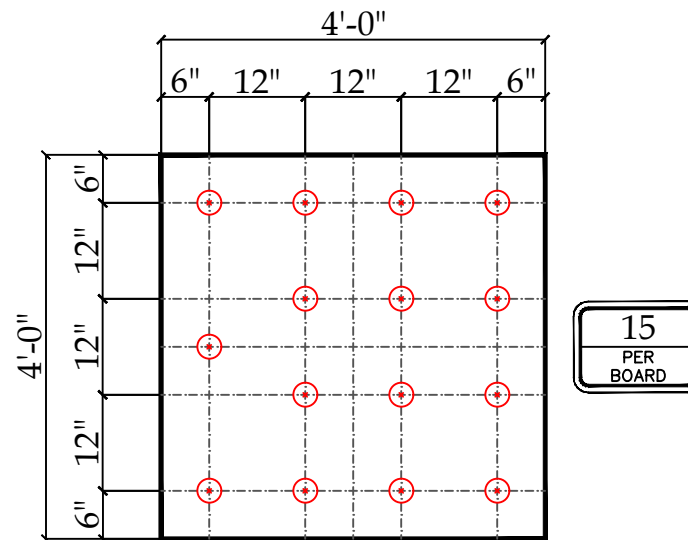
DETAIL NO.:

INS-UN-28F-14H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 1.06 SF (30 per 4x8)
Fastened - 1 per 1.06 SF (15 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

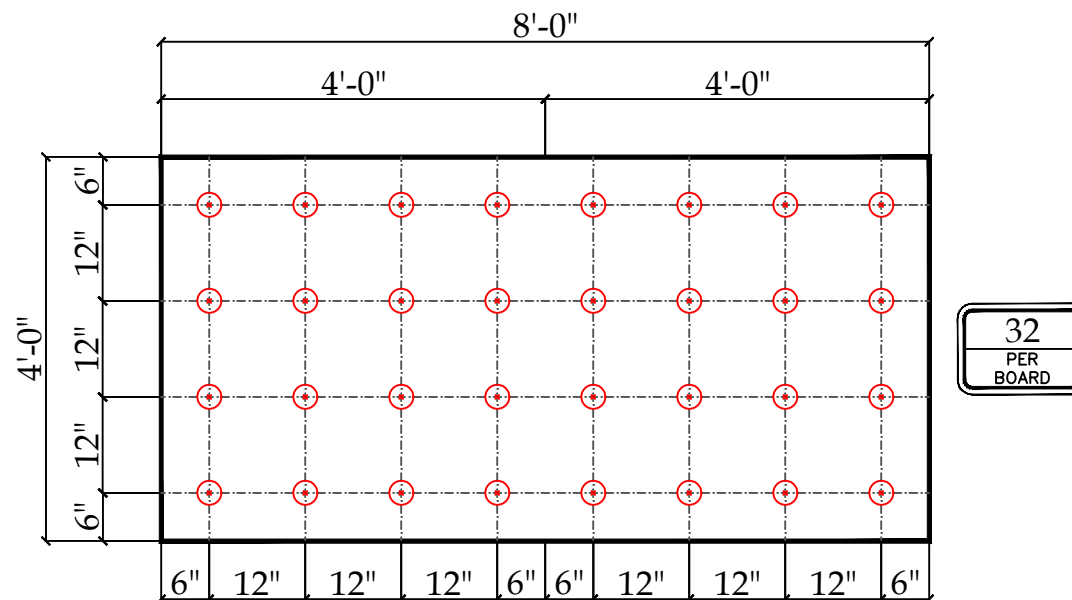
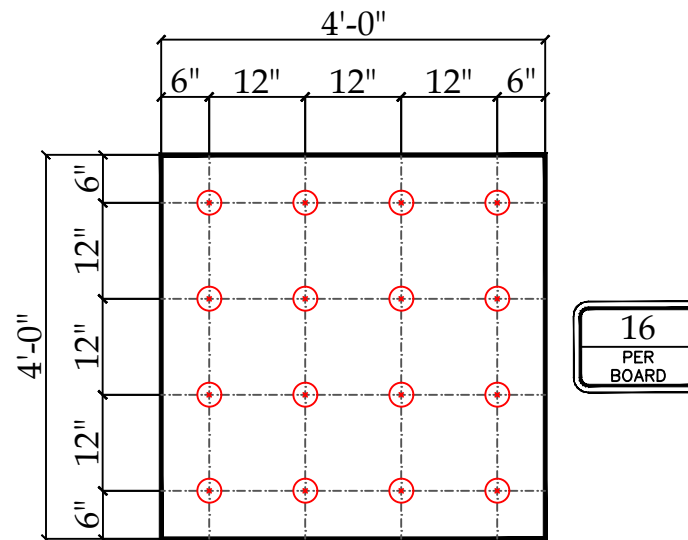
DETAIL NO.:

INS-UN-30F-15H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened -1 per 1 SF (32 per 4x8)
Fastened -1 per 1 SF (16 per 4x4)

APPLICABLE SYSTEMS

FULLY ADHERED

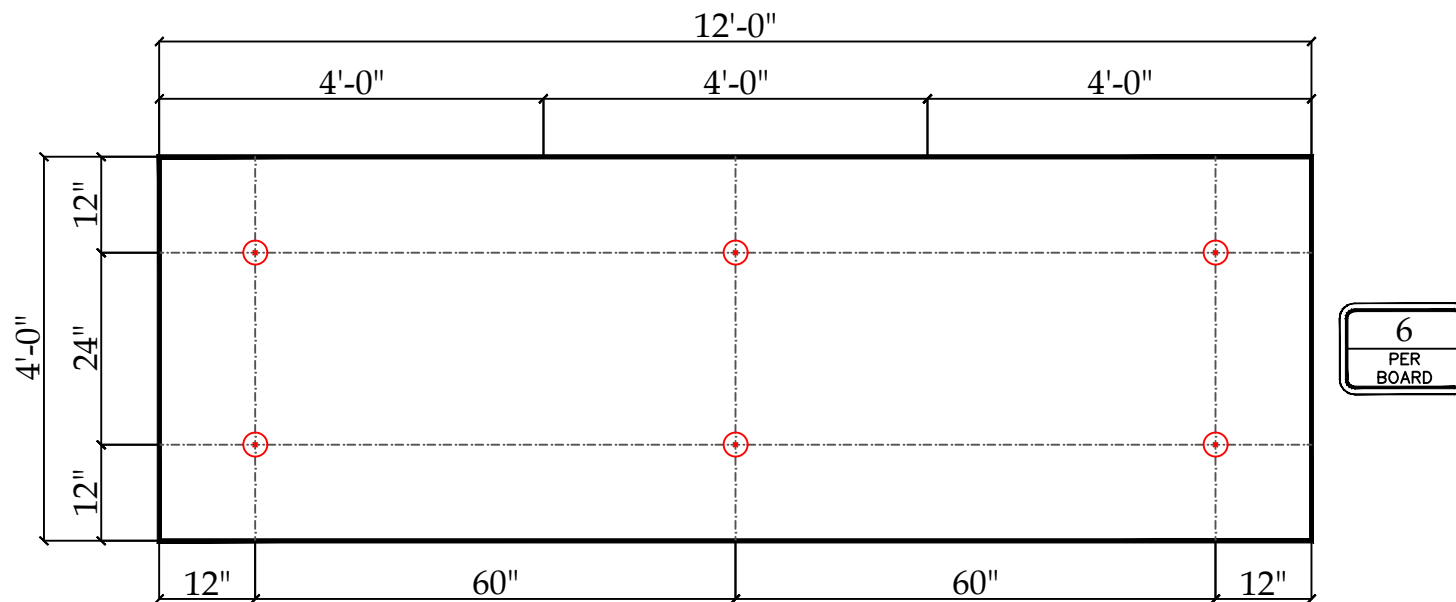
DETAIL NO.:

INS-UN-32F-16H

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.
4. Detail acceptable on MuleHide Products system warranties up to 20 years.
5. Detail Not acceptable on Recover / No Tear-Off projects.
6. Detail Not Acceptable on Metal Retrofit roof systems.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 8 SF (6 per 4x12)

APPLICABLE SYSTEMS

MECHANICALLY ATTACHED

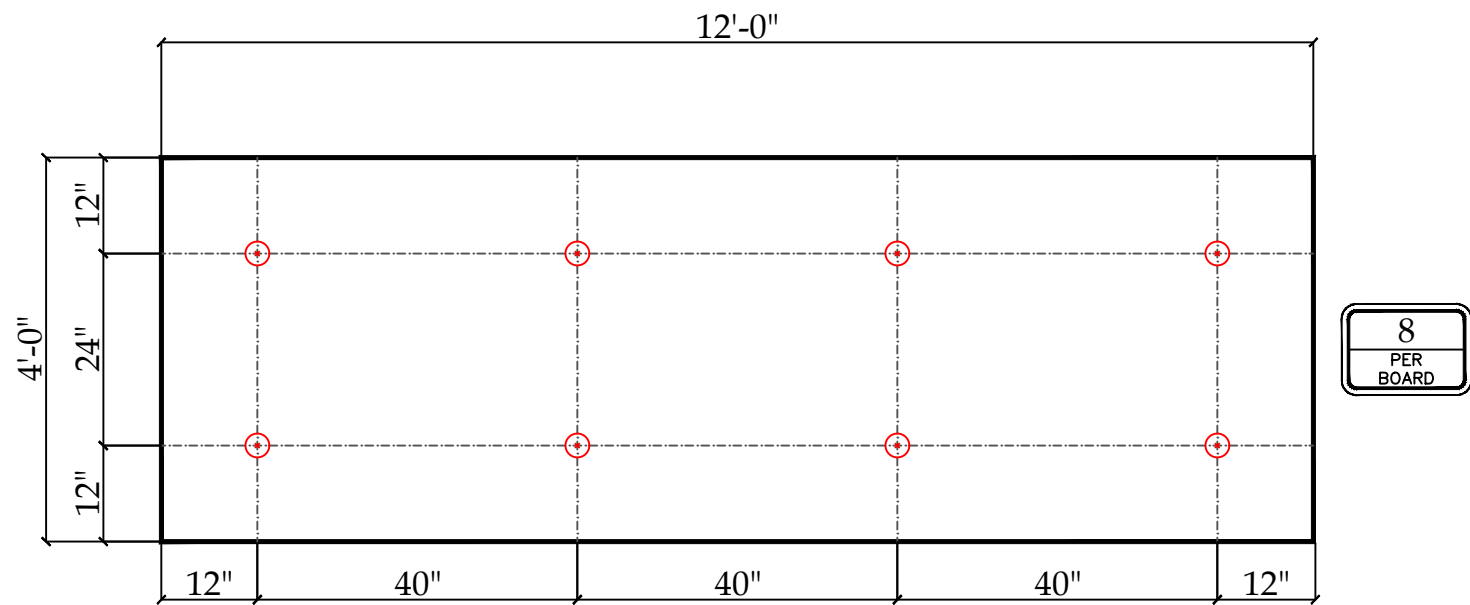
DETAIL NO.:

INS-UN-6F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.
- 4. Detail acceptable on MuleHide Products system warranties up to 30 years.
- 5. Detail Not acceptable on Recover / No Tear-Off projects.
- 6. Detail Not Acceptable on Metal Retrofit roof systems.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.



Fastened - 1 per 6 SF (8 per 4x12)

APPLICABLE SYSTEMS

MECHANICALLY ATTACHED

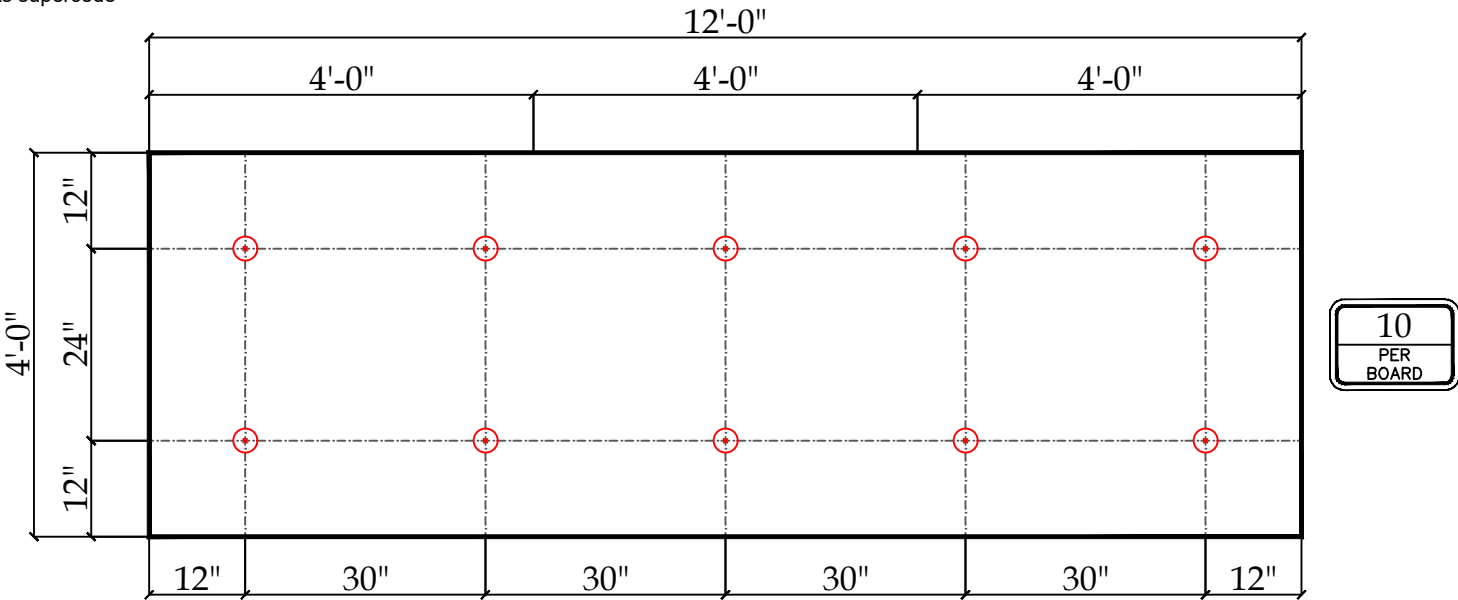
DETAIL NO.:

INS-UN-8F

REVISION DATE: 2/12/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 4.8 SF (10 per 4x12)

APPLICABLE SYSTEMS
INDUCTION WELDED
MECHANICALLY ATTACHED

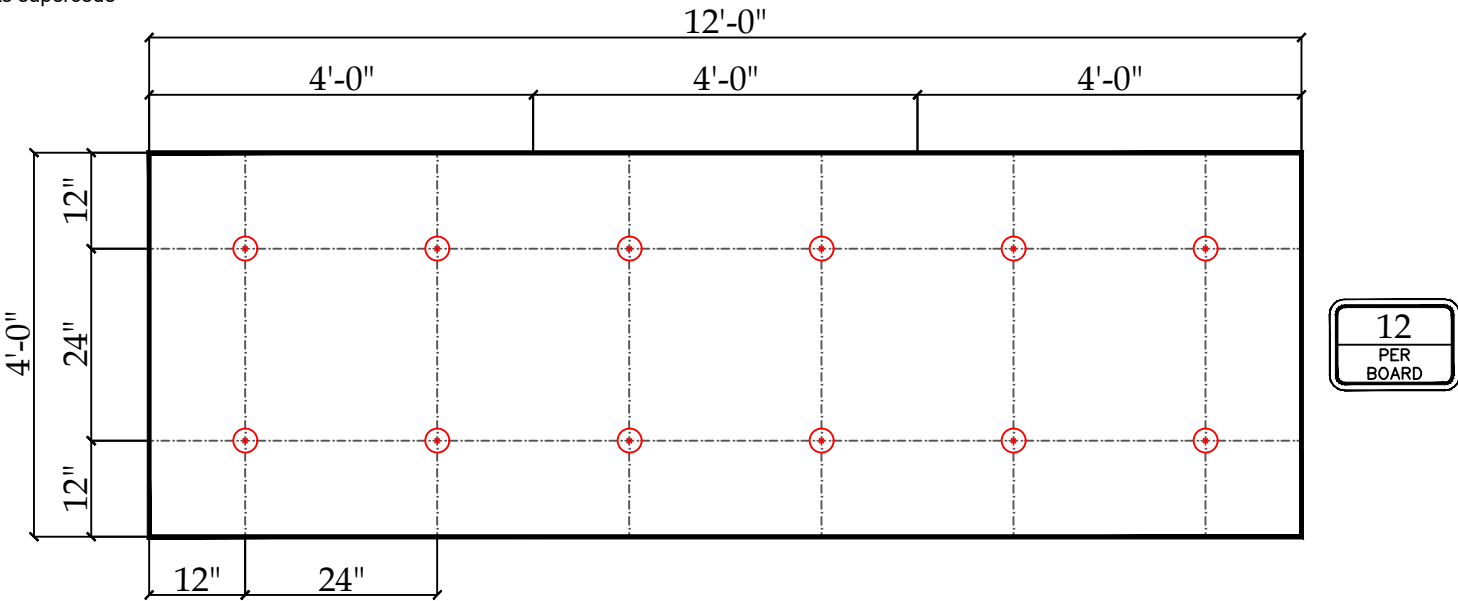
DETAIL NO.:

INS-UN-10F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened- 1 per 4 SF (12 per 4 x 12)

APPLICABLE SYSTEMS
INDUCTION WELDED
FULLY ADHERED

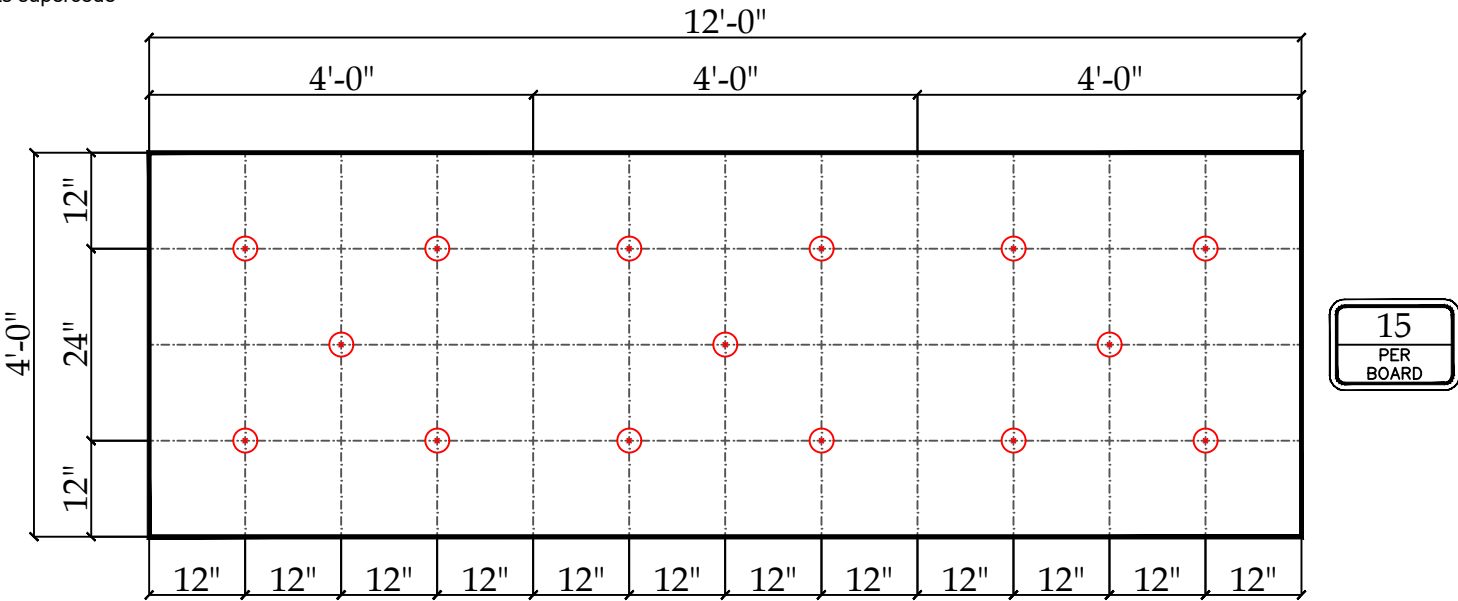
DETAIL NO.:

INS-UN-12F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 3.2 SF (15 per 4x12)

APPLICABLE SYSTEMS
INDUCTION WELDED
FULLY ADHERED

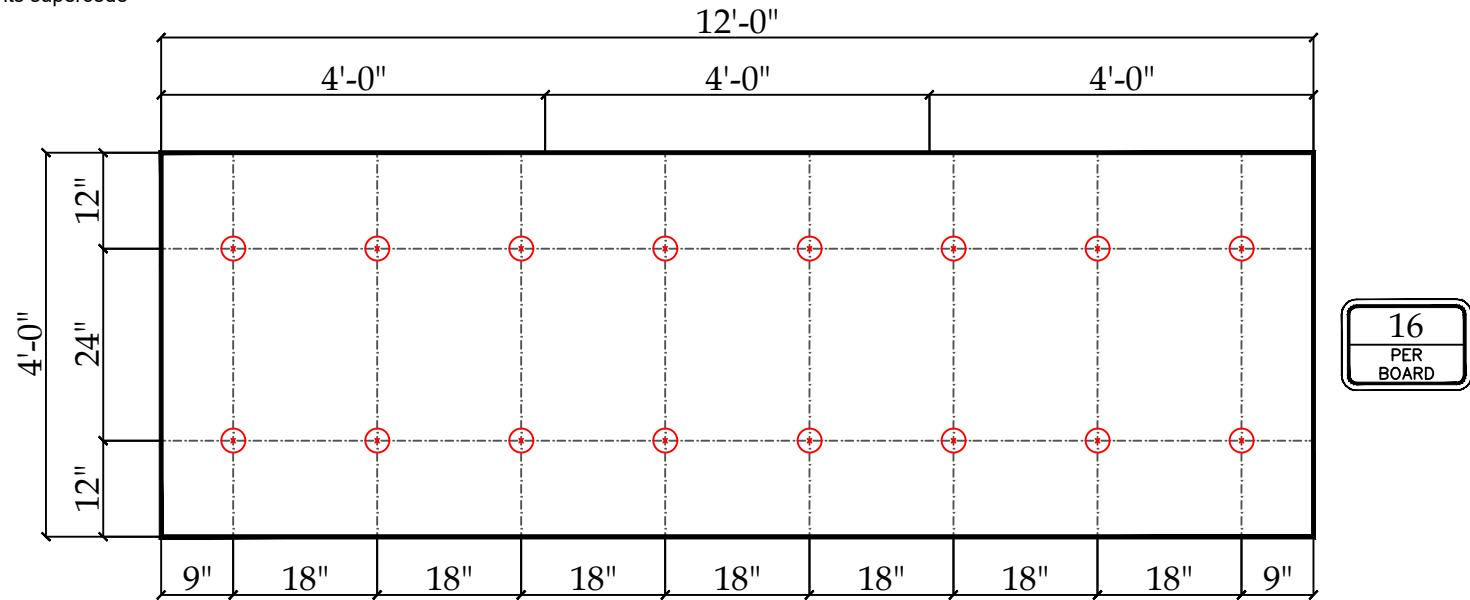
DETAIL NO.:

INS-UN-15F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 3 SF (16 per 4x12)

APPLICABLE SYSTEMS

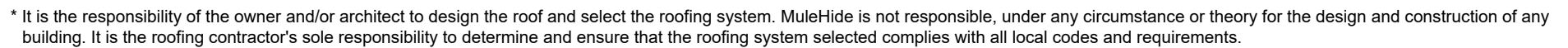
INDUCTION WELDED

DETAIL NO.:

INS-IW-16F

REVISION DATE: 2/10/2026

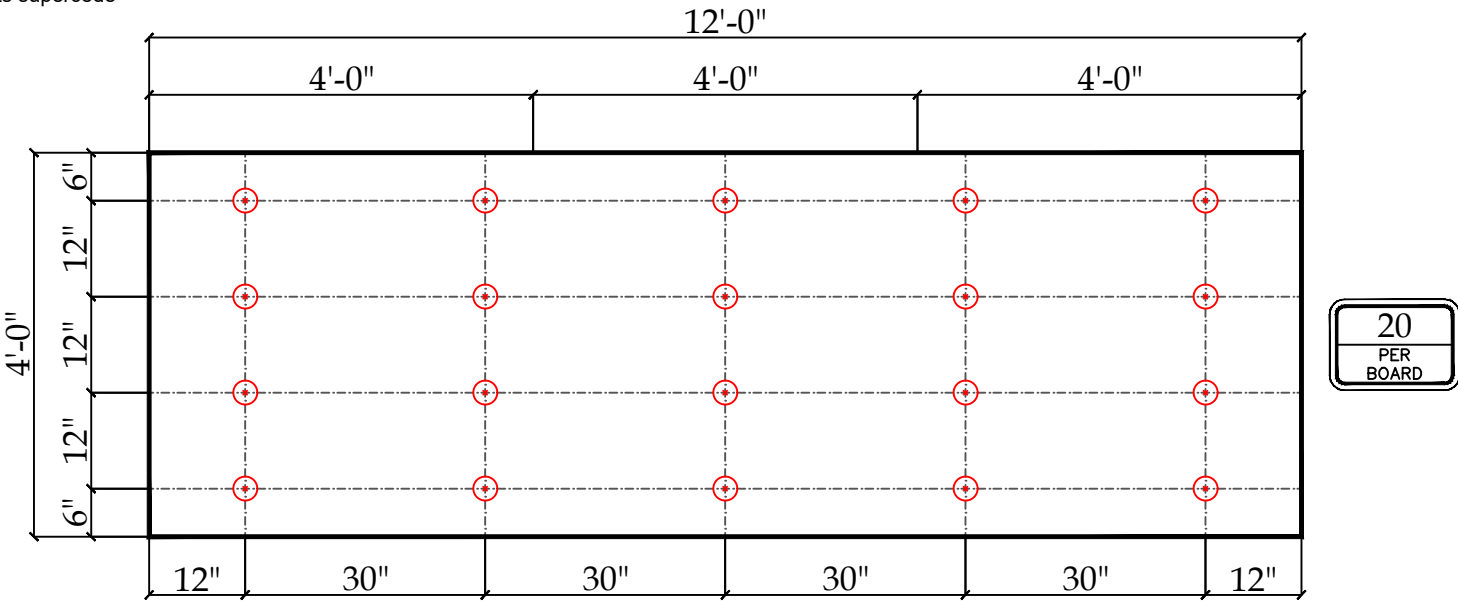
1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened - 1 per 2.4 SF (20 per 4x12)

APPLICABLE SYSTEMS

INDUCTION WELDED

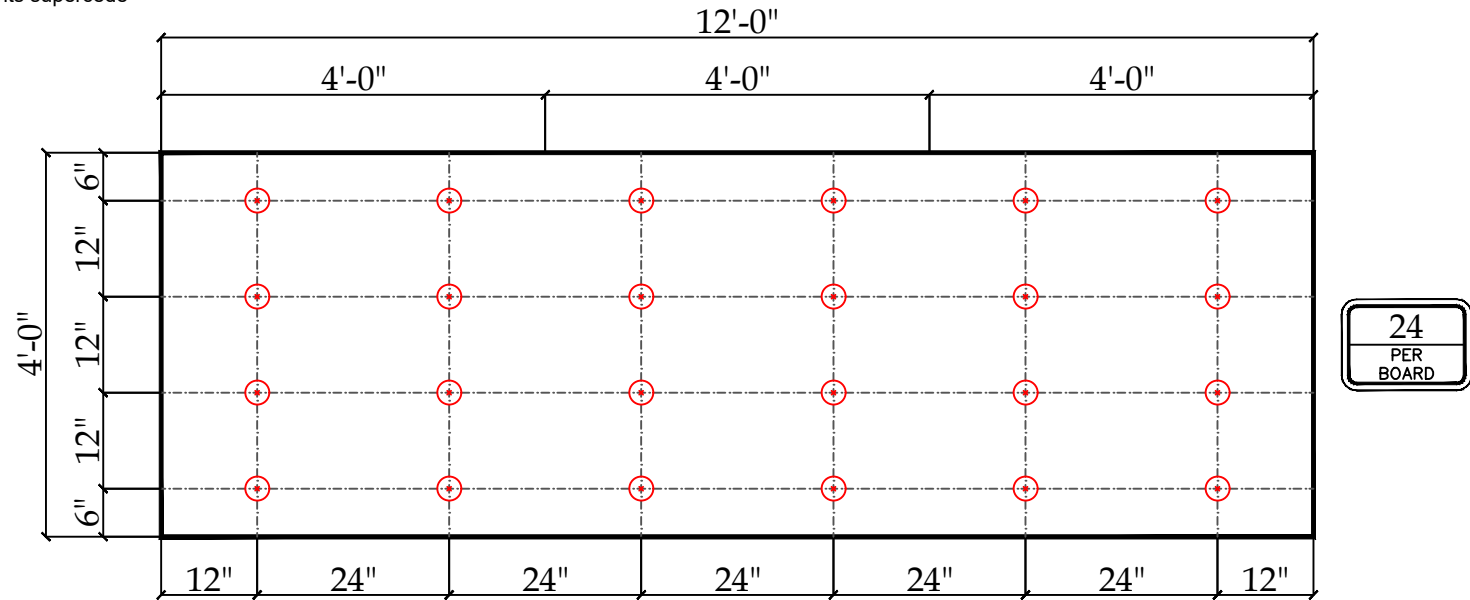
DETAIL NO.:

INS-IW-20F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 2 SF (24 per 4x12)

APPLICABLE SYSTEMS

INDUCTION WELDED

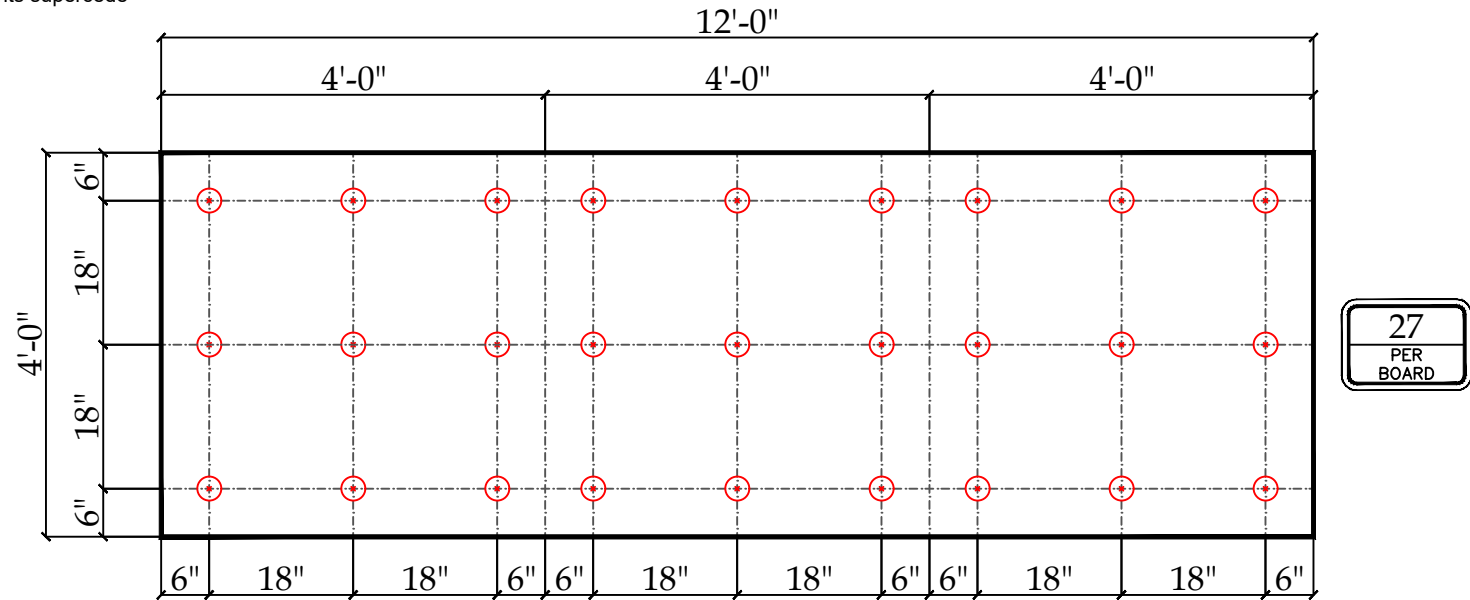
DETAIL NO.:

INS-IW-24F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 1.77 SF (27 per 4x12)

APPLICABLE SYSTEMS
INDUCTION WELDED
FULLY ADHERED

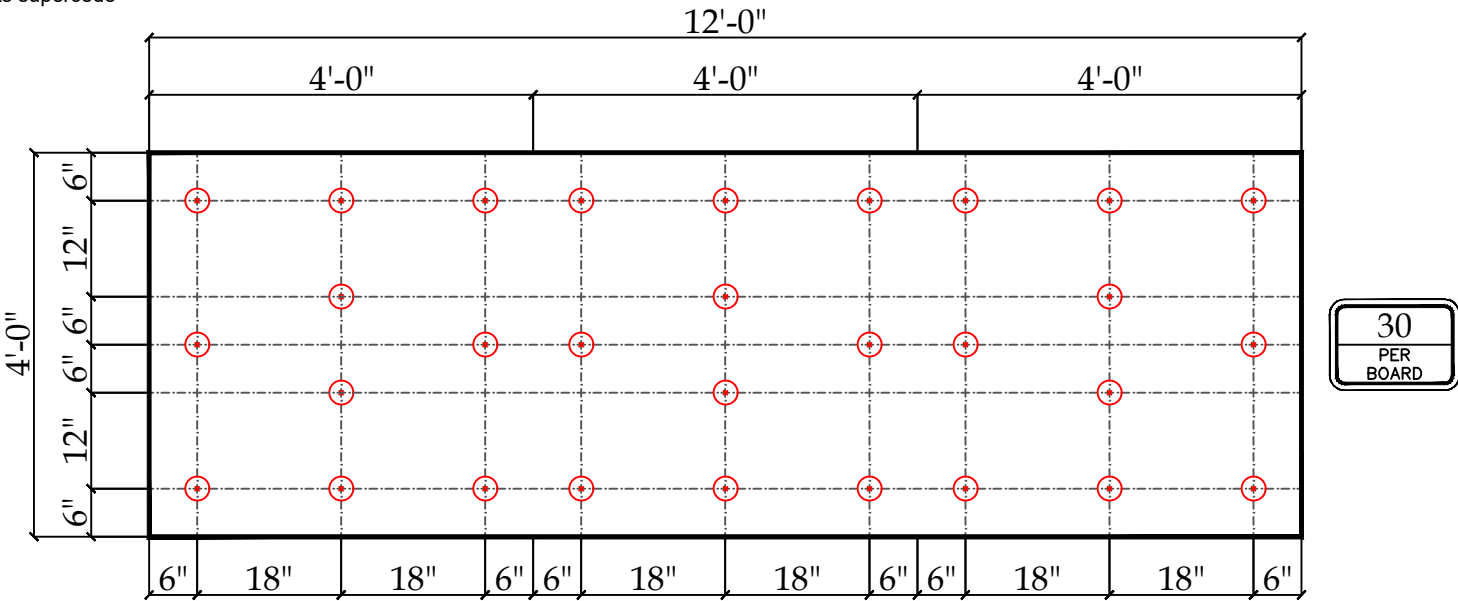
DETAIL NO.:

INS-UN-27F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 1.6 SF (30 per 4x12)

APPLICABLE SYSTEMS

FULLY ADHERED

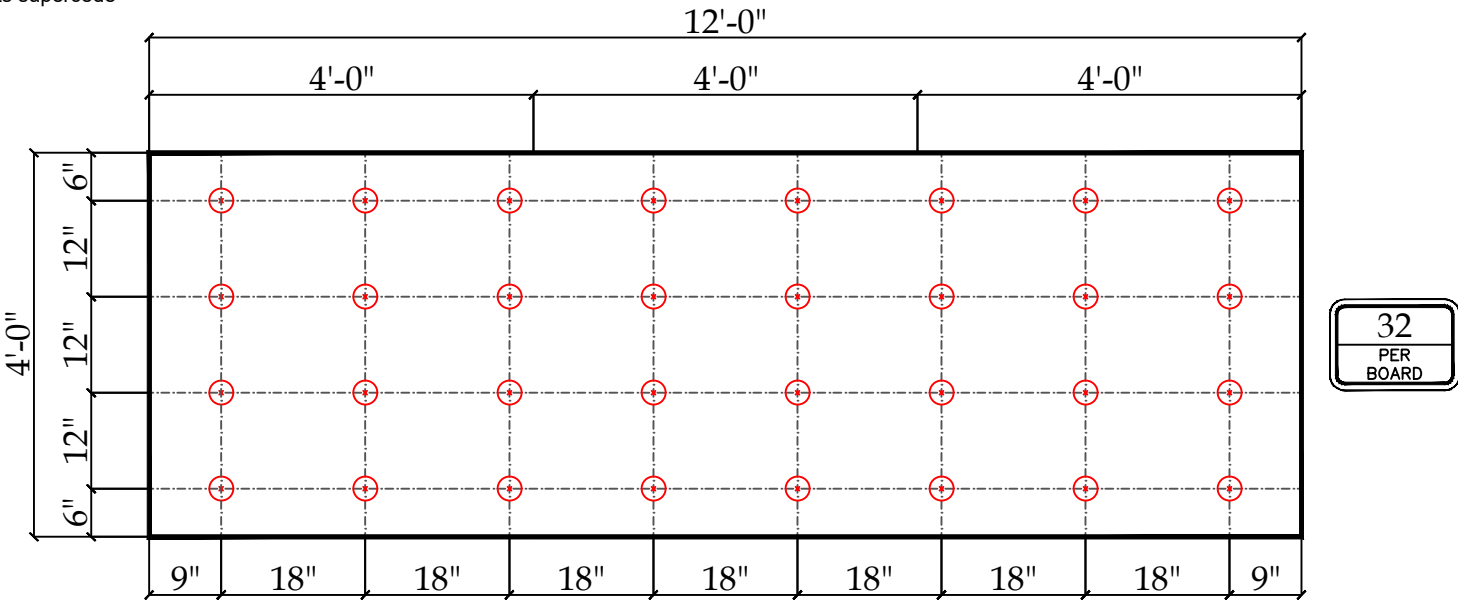
DETAIL NO.:

INS-UN-30F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened- 1 per 1.5 SF (32 per 4x12)

APPLICABLE SYSTEMS

INDUCTION WELDED

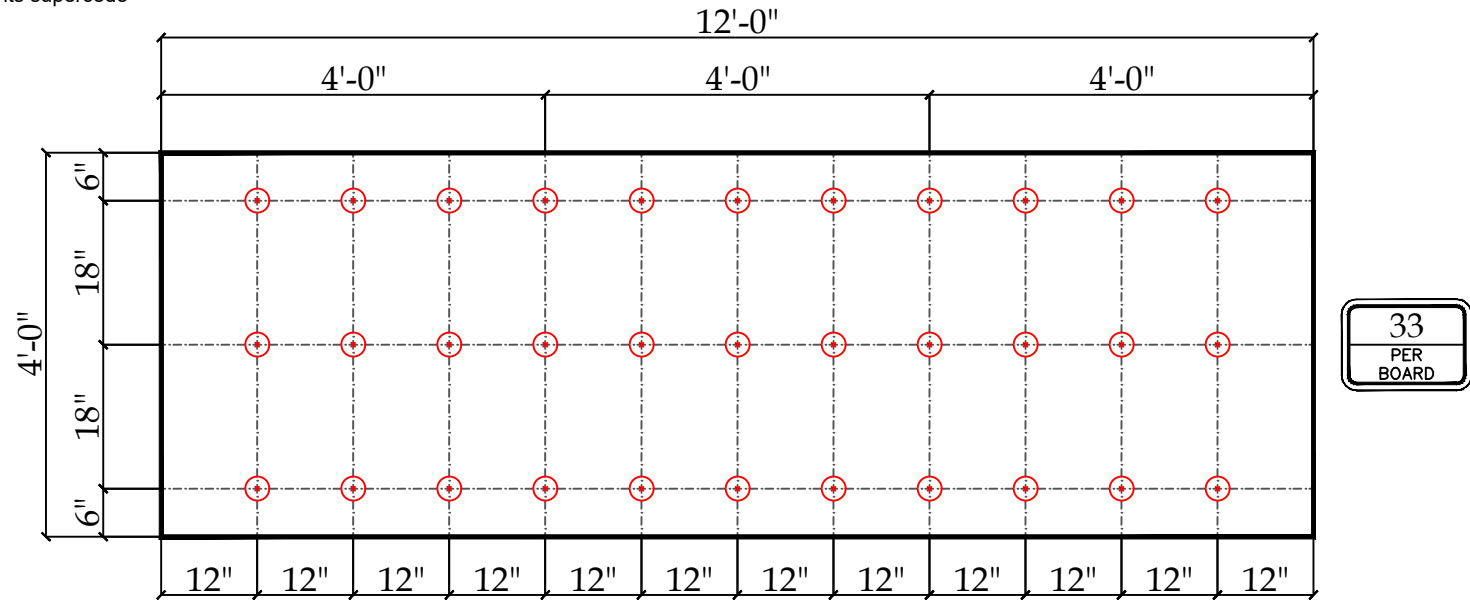
DETAIL NO.:

INS-IW-32F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened - 1 per 1.45 SF (33 per 4x12)

APPLICABLE SYSTEMS

FULLY ADHERED

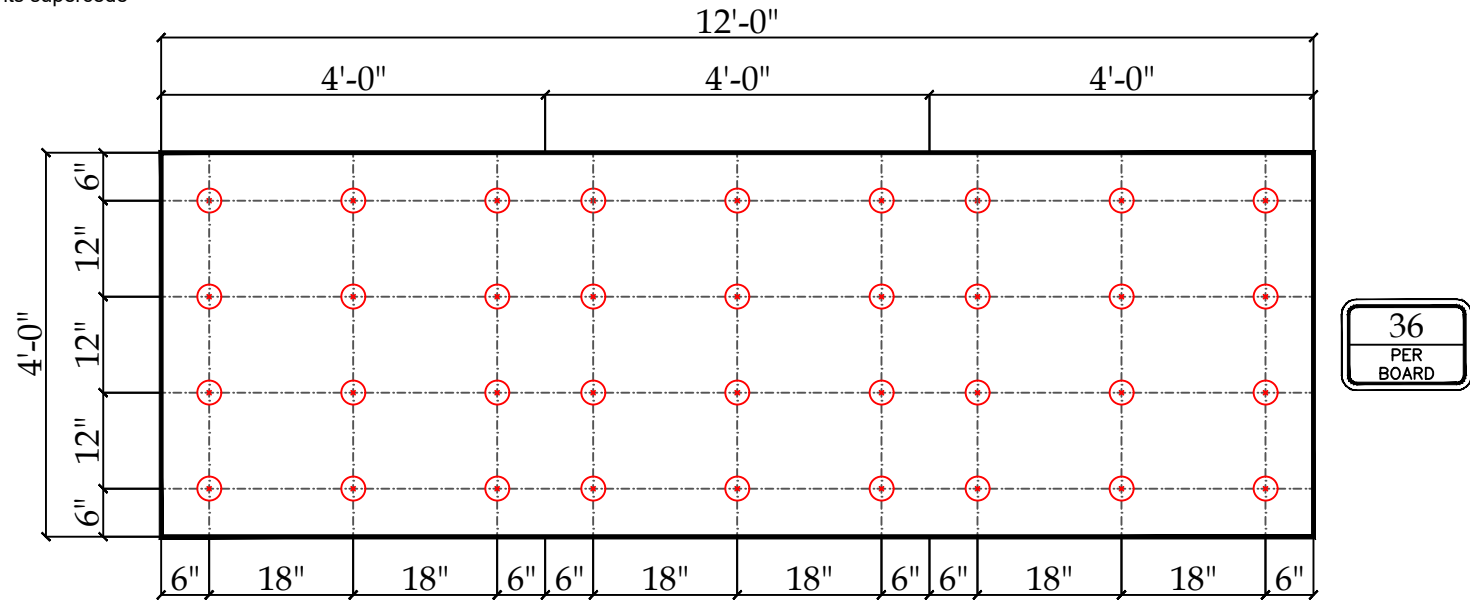
DETAIL NO.:

INS-UN-F33

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



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MULEHIDE

Fastened - 1 per 1.33 SF (36 per 4x12)

APPLICABLE SYSTEMS
FULLY ADHERED
INDUCTION WELDED

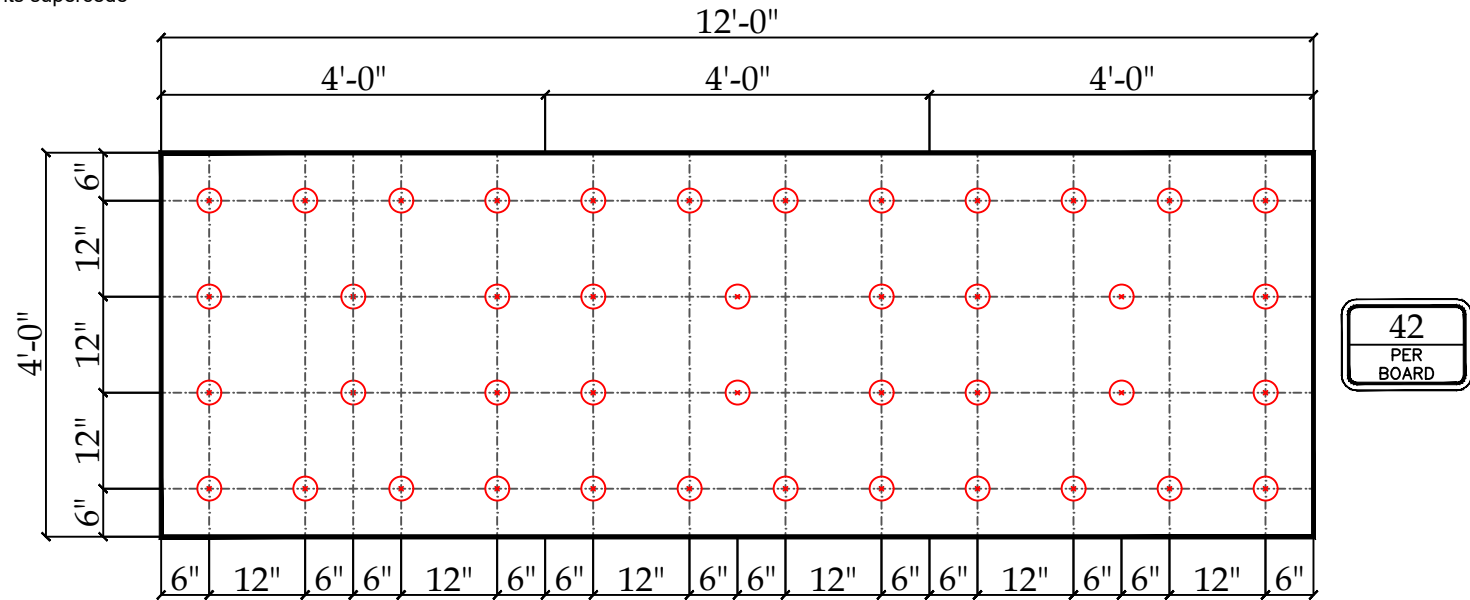
DETAIL NO.:

INS-UN-36F

REVISION DATE: 2/10/2026

NOTES:

1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
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MULEHIDE

Fastened - 1 per 1.14 SF (42 per 4x12)

APPLICABLE SYSTEMS

FULLY ADHERED

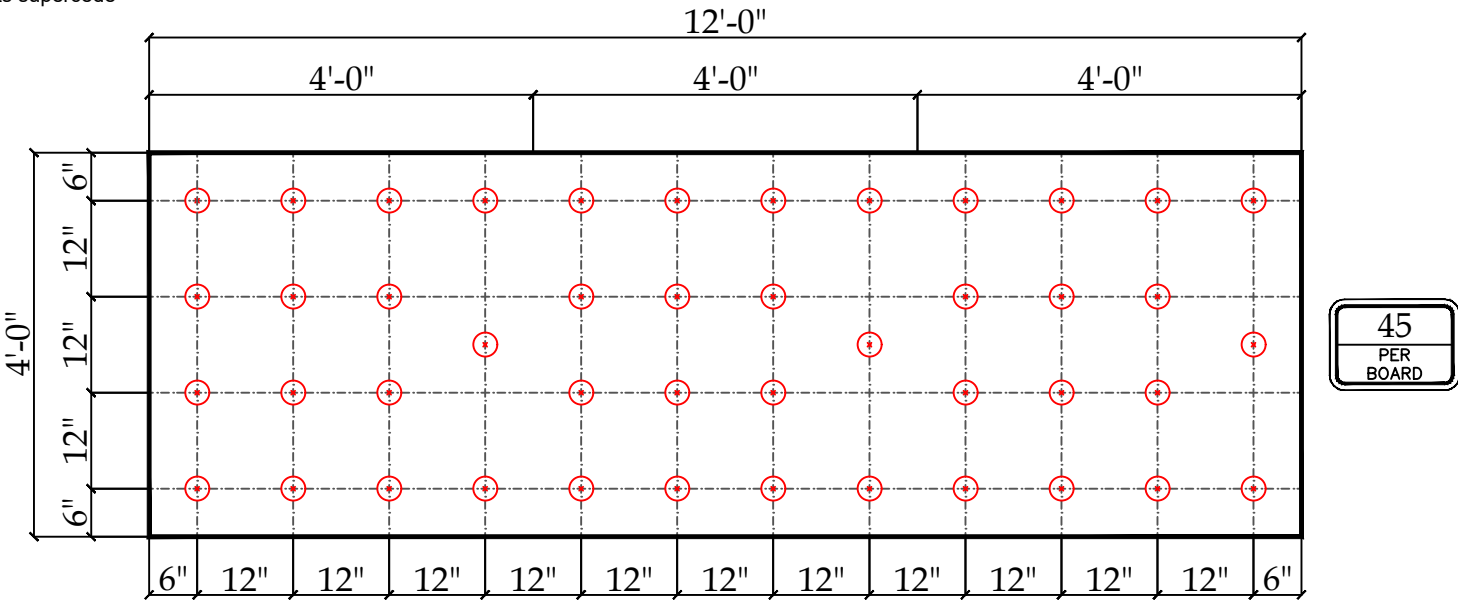
DETAIL NO.:

INS-UN-42F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
- 2. Factory Mutual Insulation attachment rates and patterns may differ from MuleHide Products. Refer to FM recommendations on FM insured projects
- 3. If a MuleHide Products system warranty is sought and requires an enhanced fastening rate beyond Factory Mutual's requirements, then the MuleHide requirements supercede the FM requirements.



* It is the responsibility of the owner and/or architect to design the roof and select the roofing system. MuleHide is not responsible, under any circumstance or theory for the design and construction of any building. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

MULEHIDE

Fastened - 1 per 1.06 SF (45 per 4x12)

APPLICABLE SYSTEMS

FULLY ADHERED

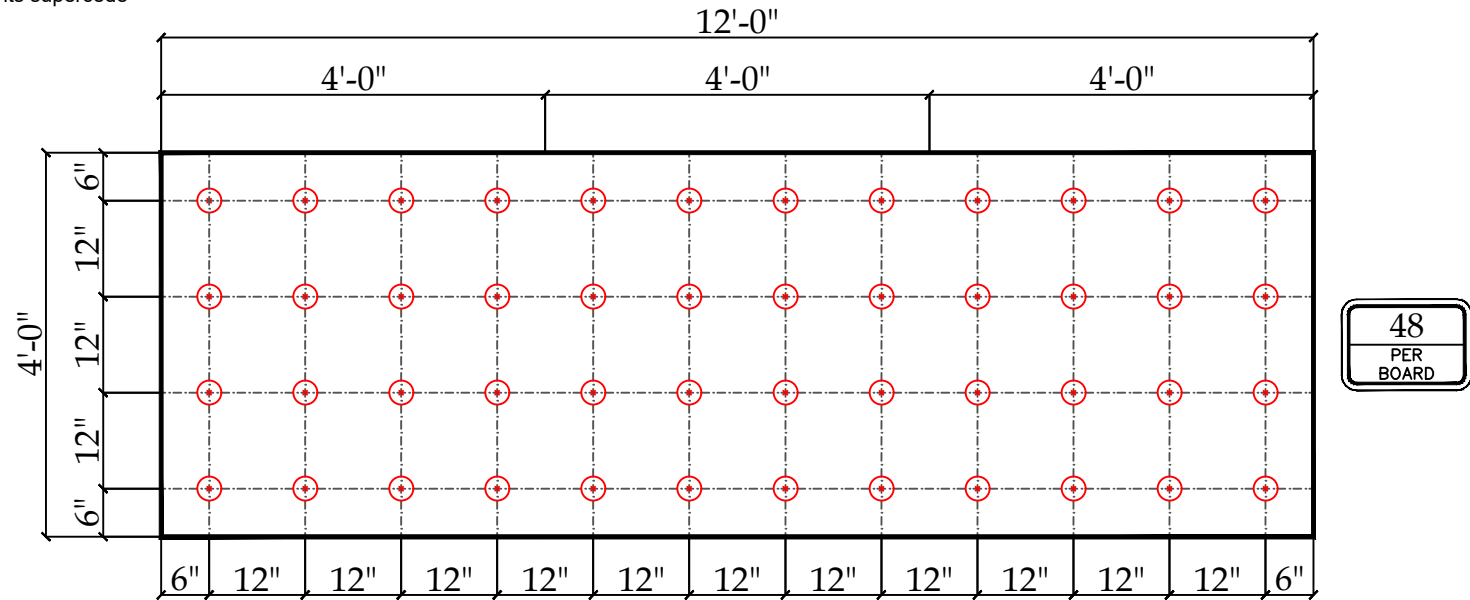
DETAIL NO.:

INS-UN-45F

REVISION DATE: 2/10/2026

NOTES:

- 1. Various design criteria will determine minimum fastening rate. Reference the Technical Guide "Single-Ply Insulation Attachment Guidelines" document for minimum quantity of fasteners per board.
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MULEHIDE

Fastened - 1 per 1 SF (48 per 4x12)

APPLICABLE SYSTEMS

FULLY ADHERED

DETAIL NO.:

INS-UN-48F

REVISION DATE: 2/10/2026