Attachment Guide

IKO COMMERCIAL SINGLE-PLY

INNOVI™ TPO

Single-Ply Roofing System Solutions

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SECTION 1

GENERAL CRITERIA.

A. This guide describes the minimum attachment requirements for IKO Innovi™ TPO roofing systems. Refer also to all IKO Innovi TPO technical documents, including Installation Manuals, Detail Drawings and Product Data Sheets, to ensure that the installed roofing system complies with all IKO technical requirements.

B. IKO Commercial does not practice architecture or engineering. IKO provides the general information in this guide in good faith, as a courtesy only, and not as a substitute for consultation with a design professional to determine the applicability of IKO technical requirements for a specific project.

C. The building owner or project design professional is responsible for consulting with all local authorities having jurisdiction (AHJs), national and local building codes, and insurance requirements to determine project-specific requirements. These codes and requirements may supersede IKO technical requirements, where the codes and requirements are more restrictive.

D. Not all possible conditions are covered in this document. Whenever any project condition or specification requirement falls outside the guidance given herein, IKO Technical Services must be consulted.

i. The following special conditions ALWAYS require consultation with IKO Technical Services prior to installation:

1. Warranty requirements to include wind speed coverage in excess of 55 mph (88 kph).

2. Warranty requirements to include leaks caused by hail.

3. Projects located in the following geographic locations:

a. Areas susceptible to hurricanes as shown on the American Society of Civil Engineers' ASCE-7 maps.

b. Within 5 miles (8 km) of open water, including, but not limited to, oceans and lakes larger than 25 square miles (65 square kilometers).

c. Mountains, foothills and cliffs.

d. High Wind Zones as shown IN FIGURE 1-1 on the American Society of Civil Engineers' ASCE-7 maps.

e. IKO Technical Services contact information:

i. In Canada: IKOTECHCANADA@iko.com.

ii. In the U.S.: IKOTECHUSA@iko.com.

f. The following special conditions require consultation with a design professional: architect, engineer or roof consultant:

i. Roofs that exceed the slope and height limits shown in Table 1-1. Height and Slope Limits.

ii. Roofs that do not meet minimum fastener pullout or adhesion tests.

iii. Roofs with bay doors or other large openings that may be opened during a wind event.

iv. Roofs on buildings with positive pressure.

v. Roofs subject to chemical or other discharge, including restaurants.

vi. Roofs with heavy or frequent foot traffic.

vii. Roofs over swimming pools or other high-humidity conditions.

viii. Roofs over freezers or other cold storage conditions.

ix. Roofs over data centers, military buildings, emergency services, medical facilities and other secure locations.

FIGURE 1-1. HIGH WIND ZONES

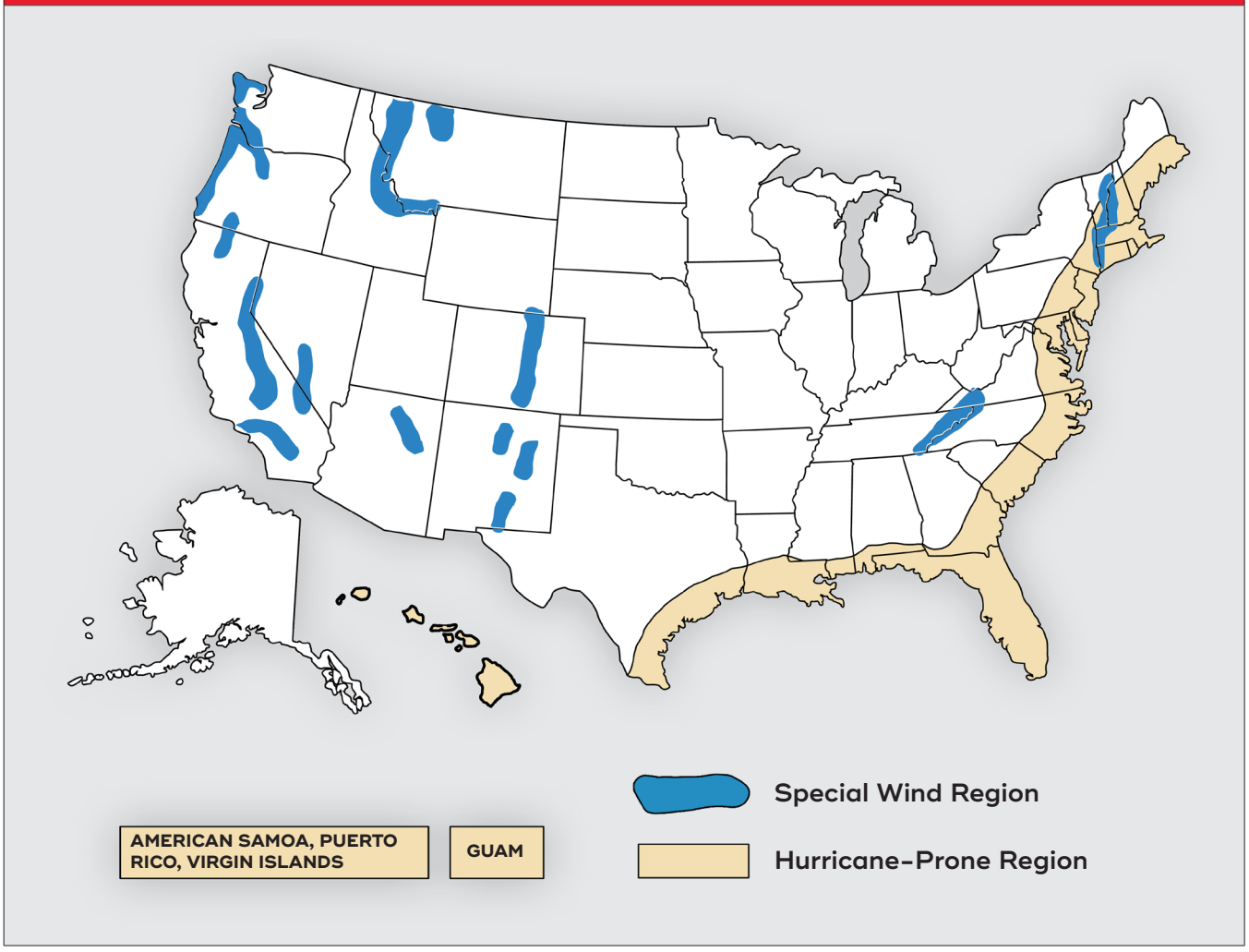


TABLE 1-1. HEIGHT AND SLOPE LIMITS		
Attachment	**Height Limit**	**Maximum Slope**
Fully Adhered	250 ft	No Limit
Mechanically Attached	120 ft	4:12 in
Induction Welded	120 ft	4:12 in
Ballasted	75 ft (ballast rock) 250 ft (ballast pavers*)	2:12 in

*Ballast pavers must be interlocking on two sides; additional attachment is required for roof heights over 120 ft.

g. Roofing System Definitions.

i. Fully Adhered Systems. Single-ply roofing systems with an adhered membrane and either mechanically or adhesively attached insulation.

ii. Mechanically Attached Systems. Single-ply roofing systems with an in-seam mechanically attached membrane and either mechanically or adhesively attached insulation.

iii. Induction Welded Systems. Single-ply roofing systems with a membrane point-attached from below using special induction weld plates; these plates are fastened through the insulation layers into the structural deck.

iv. Ballasted Systems. Single-ply roofing systems with membrane and top insulating layer loose-laid; either ballast stone or ballast pavers are installed over the roofing membrane to hold the components in place.

v. Acceptable Membrane, Substrate and Flashings, by Warranty Term.

1. Thicker membranes can receive longer warranty terms.

2. All membrane thicknesses can be used in adhered and mechanically attached systems.

3. Only 60-mil and 80-mil membranes are approved for induction welded systems. A 45-mil membrane is not approved.

4. A minimum of 1.0-inch IKOTherm™ or IKOTherm III, or a minimum of 0.50-inch CoverShield™ is required for all IKO Diamond Shield Limited Warranties of 20 years or longer.

5. Both 25- and 30-year Diamond Shield Limited Warranties require an 80-mil membrane and a minimum of 1.0-inch IKO Therm or IKOTherm III, even when a cover board is used as an immediate substrate for the membrane.

TABLE 1-2. ACCEPTABLE PRODUCTS FOR THE DIAMOND SHIELD LIMITED WARRANTY

Warranty Term	5 Years	10 Years	15 Years	20 Years	25 Years[1]	30 Years[1]	Materials
Membrane[2]	✔	✔	✔				IKO Innovi™ TPO 45-mil
	✔	✔	✔	✔			IKO Innovi TPO 60-mil[3]
	✔	✔	✔	✔	✔	✔	IKO Innovi TPO 80-mil[3]
Substrate	✔	✔	✔	✔	✔	✔	IKOTherm™ CoverShield™ HD Polyiso
	✔	✔	✔	✔	✔	✔	IKOTherm Polyiso
	✔	✔	✔	✔	✔	✔	IKOTherm III Polyiso
	✔	✔	✔	✔	✔	✔	DensDeck® or DensDeck® Prime Roof Board
Flashings	✔	✔	✔	✔			IKO Innovi TPO 45 mil
	✔	✔	✔	✔	✔	✔	IKO Innovi TPO 60 mil
	✔	✔	✔	✔	✔	✔	IKO Innovi TPO 80 mil

[1]Both 25- and 30-year warranties require min. 1.0-inch IKOTherm or IKOTherm III, even if a cover board is used.
[2]A 12-foot-width membrane is approved for fully adhered and induction welded systems only.
[3]Only 60-mil and 80-mil membranes are approved for induction welded systems.

TABLE 1-3. ACCEPTABLE MEMBRANES FOR A MATERIAL WARRANTY, BY WARRANTY TERM

Warranty Term	10 Years	15 Years	20 Years
45-mil Membrane	✔	Not Acceptable	Not Acceptable
60-mil Membrane	✔	✔	✔
80-mil Membrane	✔	✔	✔

SECTION 2

WIND UPLIFT.

A. **Wind uplift** is defined as the force of negative pressure exerted on the building during a wind event. This force is measured in pounds per square foot (psf) and/or kilopascals (kPa). **See the IKO InnoviTPO website at www.iko.com/innovi for information on specific IKO Innovi TPO Roofing System assemblies that are rated for wind uplift resistance by Factory Mutual (FM) and Canadian Standards Association (CSA).**

B. **Wind speed** is not the same as wind uplift. Wind speed is measured in miles per hour (mph) and/or kilometers per hour (kph), and is one of the variables used in calculating wind uplift. **See Section 7 of this guide for information regarding system requirements for warranty wind speed coverage over 55 mph (88 kph).**

C. **Wind uplift calculators**, which may be used to determine uplift conditions for specific projects, are available at the following public websites:

- **i.** National Roofing Contractors Association's Roof Wind Designer, at www.roofwinddesigner.com.
- **ii.** National Research Council Canada's Wind Uplift Resistance Calculator, at Wind-Roof Calculators on the Internet (Wind-RCI) — National Research Council Canada.

D. **For further information regarding wind uplift**, please consult the following resources:

- **i.** American Society of Civil Engineers (ASCE) Standard ASCE 7, "Minimum Design Loads for Buildings and Other Structures."
- **ii.** FM Global Property Loss Prevention Data Sheet 1-28, "Wind Design."
- **iii.** FM Global Property Loss Prevention Data Sheet 1-29, "Roof Deck Securement and Above-Deck Roof Components."
- **iv.** CSA A123.21-20, Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane Roofing Systems.
- **v.** Always follow the most stringent applicable requirements, whether from a codes body or from IKO Commercial, when determining attachment rates.

SECTION 3

ROOF ZONES.

A. **Wind uplift pressure varies at different zones on a roof**. Commercial roofs are divided into three (3) primary zones. These zones are attached at different rates due to the different levels of wind uplift pressure that they experience during a wind event. These zones are identified as:

   i. **Field.** This is the central area of the roof and experiences the least wind uplift pressure.

   ii. **Perimeter.** This is the area located a certain distance from the roof edge toward the field of the roof that experiences increased wind uplift pressure.

   iii. **Corners.** These are areas where Perimeters intersect, which experience the highest wind uplift pressure.

   iv. If a **continuous parapet a minimum of 36 inches** is present, Corner areas may be treated as Perimeter.

B. **To determine the area of a roof's Perimeter:**

   i. For roof heights **less than or equal to 60 feet**:

      1. Use the smaller dimension of either 10% of the shortest plan view dimension, or 40% of the roof height, but not less than 4% of the shortest side, but at a minimum of 3 feet.

   ii. For roof heights **greater than 60 feet**:

      1. Use 10% of the shortest plan view dimension, but at a minimum of 3 feet.

C. **To determine the area of a roof's Corners:**

   i. For roof heights less than or equal to 60 feet:

      1. Corners are the areas of intersection of two Perimeter areas.

   ii. For roof heights greater than 60 feet:

      1. Corners are the areas of intersection of two Perimeter areas, extended twice the width of the Perimeter area along the edge of the roof.

D. **See Drawing 3-1. Roof Zones** for visual representation of these areas.

E. **FM, CSA and other applicable codes bodies may work from different definitions of Roof Zones.** Consult the relevant documents from the codes bodies specified for their definitions and requirements regarding Roof Zones.

F. **Perimeter and Corner Enhancements.**

   i. **IKO Commercial requires that enhanced attachment rates are used at the Perimeter and in the Corners.** These enhancements roughly follow the following increases:

      a. Perimeter: 50% increase from the Field rate.

      b. Corners: 100% increase from the Field rate.

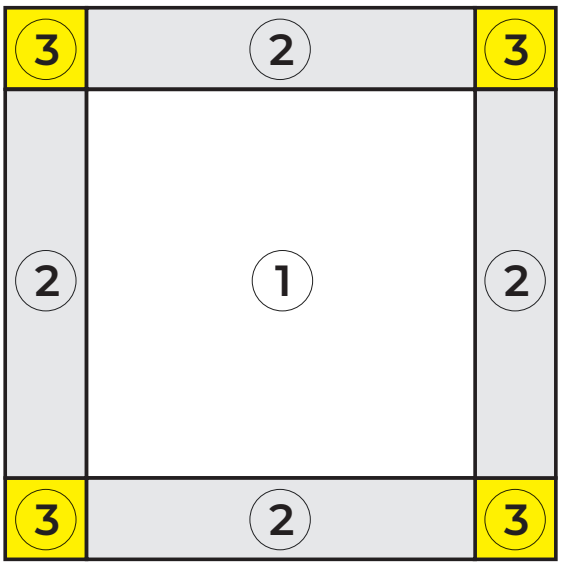
      c. Specific information regarding minimum fastening rates for Perimeter and Corner enhancements are found in the tables below.

ii. **Prescriptive enhancements stated in this guide are those required for eligibility for an IKO Diamond Shield Limited Warranty with no additional coverage or adherence to a project's specification requirements.** Other requirements called out in project specifications, including, but not limited to, warranty coverage for increased wind speeds and wind uplift code requirements, may require additional enhancements.

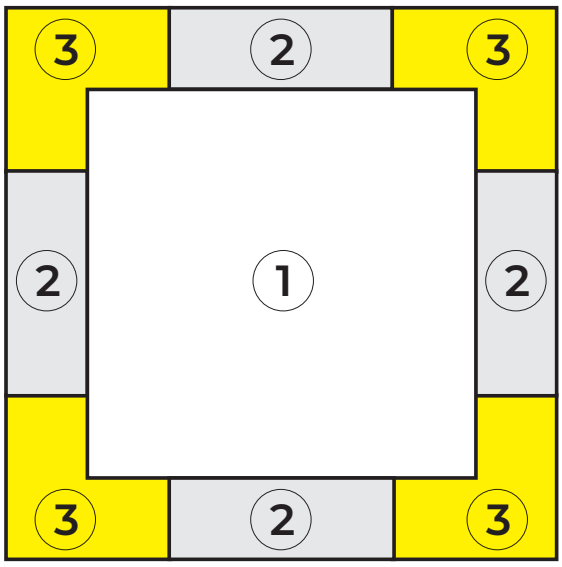
iii. Always follow the most stringent applicable requirements, whether from a codes body or from IKO Commercial, when determining attachment rates.

DRAWING 3-1. ROOF ZONES

Roof Heights ≤ 60 ft



Roof Heights > 60 ft



1 Field
2 Permimeter
3 Corners

SECTION 4

ACCEPTABLE DECKS, PLATES, FASTENERS AND ADHESIVES.

A. Fastener Pullout Requirements

i. Minimum required pullout values for all deck types:

- Insulation fasteners: 300 lbs.
- Membrane fasteners: 400 lbs.
- Systems using induction weld plates: 400 lbs.

a. Note: Certain deck types, including steel decks less than 22-gauge, gypsum, Tectum and cementitious wood fiber, may not achieve the minimum required pullout values. Contact IKO Technical for guidance when roofing systems over these deck types are specified.

b. Pullout tests are always required for steel decks less than 22-gauge.

c. To preserve the integrity of the deck, nondestructive pullout tests should be attempted for gypsum, Tectum and cementitious wood fiber, and lightweight insulating concrete/cellular concrete decks. These tests stop at the required minimum pullout and do not proceed until failure.

ii. Fastener pull tests must be performed in accordance with ANSI/SPRI FX-1, "Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners."

iii. Request pullout tests through your IKO Commercial sales representative or Field Services Technician.

iv. Pullout test results can impact the fastening rates required for the project, at IKO's discretion.

TABLE 4-1. PLATES BY USE AND WARRANTY TERM

InnoviFast Plate	Insulation	Membrane
3" Insulation Plate	Up to 30 years	**Not Acceptable**
2 3/8" HD Seam Plate	**Not Acceptable**	Up to 30 years
Induction Weld Plate and Induction Weld Plate-TF	Up to 30 years	
Auger Insulation Plate	Up to 20 years	**Not Acceptable**
Auger Seam Plate	**Not Acceptable**	Up to 20 years

TABLE 4-2. INSULATION FASTENERS BY DECK TYPE AND WARRANTY TERM[1]

Deck Type	Insulation Fasteners (#12)	AP Fasteners (#14)	HD Fasteners (#15)	SS Fasteners (#14)	Concrete Drive Pins	Polymer Augers
Steel, 22-gauge or heavier	Up to 20 years	Up to 30 years	Up to 30 years	Up to 30 years	**Not Acceptable**	**Not Acceptable**
Steel, lighter than 22-gauge	**Not Acceptable**	Up to 10 years	Up to 10 years	Up to 10 years	**Not Acceptable**	**Not Acceptable**
Structural Concrete, 2,500 psi or greater	**Not Acceptable**	**Not Acceptable**	Up to 30 years	**Not Acceptable**	Up to 20 years	**Not Acceptable**
Wood Plank, min. 3/4"	Up to 20 years	Up to 30 years	Up to 30 years	Up to 30 years	**Not Acceptable**	**Not Acceptable**
Oriented Strand Board (OSB), min. 7/16"	Up to 20 years	Up to 30 years	Up to 30 years	Up to 30 years	**Not Acceptable**	**Not Acceptable**
Plywood, min. 15/32"	Up to 20 years	Up to 30 years	Up to 30 years	Up to 15 years	**Not Acceptable**	**Not Acceptable**
Lightweight Insulating Concrete Over Steel Pan[2]	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	**Not Acceptable**	**Not Acceptable**
Lightweight Insulating Concrete Over Structural Concrete	**Not Acceptable**	**Not Acceptable**	Up to 20 years	**Not Acceptable**	Up to 20 years	**Not Acceptable**
Gypsum, min. 2.0"	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	Up to 15 years
Tectum, Cementitious Wood Fiber, min. 2.0"	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	Up to 15 years

[1]HD Fasteners (#15) are required for all induction welded systems and for all re-cover projects.
[2]A pullout test is required.

B. Adhesive Attachment of Insulation.

i. IKO Millennium Adhesive is the only acceptable adhesive for attachment of insulation to acceptable deck types. IKO Millennium is available in a variety of formats:

1. 1.5-milliliter cartridges, gun-applied.
2. 5-gallon boxes, pump-grade.
3. 15-gallon drums, pump-grade.
4. 50-gallon drums, pump-grade.

ii. **Use of asphalt.**

1. Asphalt attachment of insulation is acceptable over properly prepared structural concrete, in a full mopping only; spot-mopping is not allowed.

TABLE 4-3. MEMBRANE FASTENERS BY SUBSTRATE AND WARRANTY TERM1[1]

Substrate	AP Fasteners (#14)	HD Fasteners (#15)	SS Fasteners (#14)	Concrete Drive Pins	Polymer Augers
Steel, 22-gauge or heavier	Up to 15 years	Up to 30 years	Up to 15 years	**Not Acceptable**	**Not Acceptable**
Steel,[2] lighter than 22-gauge	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**
Structural Concrete, 2,500 psi or greater	**Not Acceptable**	Up to 30 years	**Not Acceptable**	Up to 30 years	**Not Acceptable**
Wood Plank, min. 3/4"	Up to 15 years	Up to 20 years	Up to 15 years	**Not Acceptable**	**Not Acceptable**
Oriented Strand Board (OSB), min. 7/16"	Up to 15 years	Up to 20 years	Up to 15 years	**Not Acceptable**	**Not Acceptable**
Plywood, min. 15/32"	Up to 15 years	Up to 20 years	Up to 15 years	**Not Acceptable**	**Not Acceptable**
Lightweight Insulating Concrete Over Steel Pan[2]	Up to 15 years	Up to 20 years	Up to 15 years	**Not Acceptable**	**Not Acceptable**
Lightweight Insulating Concrete Over Structural Concrete	Up to 15 years	Up to 20 years	Up to 15 years	Up to 20 years	**Not Acceptable**
Gypsum, min. 2.0"	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	Up to 15 years
Tectum, Cementitious Wood Fiber, min. 2.0"	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	Up to 15 years

[1]HD Fasteners (#15) are required for all induction welded systems and for all re-cover projects.
[2]A pullout test is required.

TABLE 4-4. INSULATION ADHESIVE BY SUBSTRATE AND WARRANTY TERM

	IKO Millennium™ Adhesive				Asphalt
Substrate	**1.5-ml Cartridges**	**5-gal Bags/ Boxes**	**15-gal Drums, 2-part, pump-grade**	**50-gal Drums, 2-part, pump-grade**	**Roofing Asphalt**
Steel,* 22-gauge or heavier	Up to 15 years	Up to 15 years	Up to 15 years	Up to 15 years	**Not Acceptable**
Steel,* lighter than 22-gauge	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**
Structural Concrete, 2,500 psi or greater	Up to 30 years	Up to 30 years	Up to 30 years	Up to 30 years	Up to 15 years
Wood Plank, min. 3/4"	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	**Not Acceptable**
Oriented Strand Board (OSB), min. 7/16"	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	**Not Acceptable**
Plywood, min. 15/32"	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	**Not Acceptable**
Lightweight Insulating Concrete Over Steel Pan	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	**Not Acceptable**
Lightweight Insulating Concrete Over Structural Concrete	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	**Not Acceptable**
Gypsum, min. 2.0"	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	**Not Acceptable**
Tectum, Cementitious Wood Fiber, min. 2.0"	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	**Not Acceptable**
IKO MVP Sand Vapour Retarder	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years	Up to 15 years

*New steel decks must be wiped completely clean of residual oils prior to use of adhesive.

SECTION 5

INSULATION ATTACHMENT.

A. Fully Adhered Systems.

i. Insulation attachment rates.

1. Attachment rates vary by insulation type and thickness of the top insulating layer. Please see **Table 5-1. Fully Adhered Roofing Systems – Insulation Attachment Rates**, for specific information.

2. Always follow the most stringent applicable project requirements, whether from a codes body or from IKO Commercial, when determining attachment rates for mechanically attached systems.

TABLE 5-1. FULLY ADHERED ROOFING SYSTEMS – INSULATION ATTACHMENT RATES

Insulation		Fastening Rates*			Adhesive Ribbon Spacing**		
Insulation Type	*Thickness*	*Field*	*Perimeter†*	*Corners†*	*Field*	*Perimeter†*	*Corners†*
IKOTherm™, IKOTherm III	0.5"-1.4"	16	24	32	12.0" o.c.	6.0" o.c.	6.0" o.c.
	1.5"-1.9"	12	18	24	12.0" o.c.	6.0" o.c.	6.0" o.c.
	≥ 2.0"	8	12	16	12.0" o.c.	6.0" o.c.	6.0" o.c.
CoverShield™ HD	0.5"	12	18	24	12.0" o.c.	6.0" o.c.	6.0" o.c.
DensDeck® Prime	1/4"	12	18	24	12.0" o.c.	6.0" o.c.	6.0" o.c.
	1/2"	10	15	20	12.0" o.c.	6.0" o.c.	6.0" o.c.
	5/8"	8	12	16	12.0" o.c.	6.0" o.c.	6.0" o.c.
DensDeck StormX™ Prime	5/8"	8	12	16	12.0" o.c.	6.0" o.c.	6.0" o.c.

*Fastening rates provided are for 4' x 8' boards.
**4' x 4' boards are required for IKO Millennium Adhesive attachment.
†**These fastening rates are minimum requirements for eligibility to receive an IKO Diamond Shield Warranty with standard 55 mph wind speed coverage. Other code or specification requirements may require additional enhancements**. Always follow the most stringent applicable requirements, whether from a codes body or from IKO Commercial, when determining attachment rates.

B. Mechanically Attached Systems.

i. Insulation attachment rates in mechanically attached systems are typically static across the roof and do not change among the Field, Perimeter and Corner zones.

ii. Use of an air and/or vapor barrier requires increased attachment rates.

a. Always follow the most stringent applicable project requirements, whether from a codes body or from IKO Commercial, when determining attachment rates for mechanically attached systems.

TABLE 5-2. MECHANICALLY ATTACHED SYSTEMS – INSULATION ATTACHMENT RATES

Insulation		**Fastening Rates†** (No Air/Vapor Barrier)		**Fastening Rates†** (With Air/Vapor Barrier)*	
Insulation Type	***Thickness***	***Per 4' x 4' Board***	***Per 4' x 8' Board***	***Per 4' x 4' Board***	***Per 4' x 8' Board***
IKOTherm™, IKOTherm III	0.5"-1.4"	4	5	8	16
	1.5"-1.9"	4	5	6	12
	≥ 2.0"	4	5	5	8
CoverShield™ HD	0.5"	4	5	8	16
DensDeck® Prime	1/4"	4	5	8	16
	1/2"	4	5	6	12
	5/8"	4	5	5	8
DensDeck StormX™ Prime	5/8"	4	5	5	8

***Installations that include a 6-mil poly non-sealing air/vapor barrier may be fastened at the "No Air/Vapor Barrier" rates.**

†**These fastening rates are minimum requirements for eligibility to receive an IKO Diamond Shield Warranty with standard 55 mph wind speed coverage. Other code or specification requirements may require additional enhancements**. Always follow the most stringent applicable requirements, whether from a codes body or from IKO Commercial, when determining attachment rates.

C. Induction Welded Systems.

i. Preliminary attachment of insulation.

1. In addition to the fasteners and induction weld plates, used both to attach the insulation and to provide bonding for membrane attachment, insulation in induction welded systems can also require attachment of fasteners and insulation plates; this is called preliminary attachment or pre-securement. These rates may be found in the listings of approved assemblies by FM, DORA and other codes bodies.

2. IKO Commercial attachment rates for induction welded systems are found in Section 6 of this guide.

a. Always follow the most stringent applicable project requirements, whether from a codes body or from IKO Commercial, when determining attachment rates for induction welded systems.

SECTION 6

MEMBRANE ATTACHMENT.

A. Fully Adhered Systems.

i. Follow the adhesive coverage rates and installation instructions provided in the Product Data Sheets for InnoviBond™ Membrane Adhesive, Membrane Adhesive LVOC and Membrane Adhesive SPR, and in the IKO InnoviTPO Installation Manual.

ii. Peel Stops (See Drawing 7-2).

1. Peel Stops are rows of fasteners and seam plates attached 12.0 inches (30 cm) o.c. along the perimeter of a roof, a minimum of 12 inches (30 cm) to a maximum of 24 inches (61 cm) from the roof edge, stripped in using a minimum 8-inch (20 cm) wide strip of InnoviTPO membrane, heat-welded a minimum of 2.0 inches (5 cm) along all edges. Install Peel Stops when fully adhered systems are installed in the following conditions:

   a. Whenever wind speed warranty coverage greater than 80 mph (129 kph) is required.

   b. Projects located in High Velocity Hurricane Zones (HVHZ), coastal areas or other high-wind zones per ASCE 7.

   c. Projects over wood, lightweight concrete (LWC/LWIC), Tectum or gypsum decking.

   d. Projects with bay/dock doors or similar large wall openings.

B. Mechanically Attached Systems.

i. Field attachment.

1. Attach the membrane using appropriate fasteners (see tables above) and seam plates in the seam at 12 inches (30 cm) o.c.

2. For 25- and 30-year warranties, attach fasteners and seam plates in the seam at 6 inches (15 cm) o.c.

3. NOTE: Specified performance requirements may change the above fastening rates; the most stringent requirements, whether IKO's or those required by the project specification, should always be used.

ii. Perimeter and corner enhancements. Choose one of two ways to enhance fastening:

1. Finger method: Install all field membrane sheets perpendicular to the flutes in steel deck applications. At the perimeter, install additional fasteners in rows no greater than 40% of the width of the field sheets. Strip in the rows with a minimum of 8.0-inch-wide strips of reinforced membrane, welded a minimum of 1.5 inches on all sides of the strips (2.0 inches minimum if a hand welder is used), and apply TPO Edge Sealant around the perimeter of the strips.

   a. Induction weld option: Alternatively, fingers may be accomplished by using rows of induction weld plates in place of the rows of fasteners and seam plates. The same spacing requirements apply. This alternate method eliminates the need for stripping in the rows.

2. Picture frame method: Install outer perimeter membrane sheets all the way into the corner. The other perimeter sheets are fastened up to the previously installed perimeter sheets, and then the fastener rows are continued to the corner through the top of the previously installed sheets. Strip in the rows with a minimum of 8.0-inch-wide strips of reinforced membrane, welded a minimum of 1.5 inches on all sides of the strip (a minimum of 2.0 inches if a hand welder is used), and apply InnoviTPO Edge Sealant around the perimeter of the strips.

C. Induction Welded Systems

i. Only HD fasteners (#15) may be used in induction welded systems.

ii. Whenever possible, install fasteners and induction weld plates in rows on the top flute of steel decks.

iii. Base tie-ins and other details can be accomplished using induction weld plates and fasteners. However, some details may require membrane attachment using fasteners and seam plates. See IKO Innovi TPO Standard Details at: www.iko.com/innovi for specific information.

iv. Presence of an air/vapor barrier: Installations that include a 6-mil or 10-mil poly non-sealing air/vapor barrier may be fastened at the "No Air/Vapor Barrier" rates shown in Table 6-1. All installations that include an asphaltic membrane or any other sealed air/vapor barrier must follow the fastening rates indicated in Table 6-1 for assemblies with air/vapor barriers.

TABLE 6-1. INDUCTION WELDED SYSTEMS – ATTACHMENT RATES[1]

Insulation		Fastening Rates per 4' x 8' Board, 5-20-Year Warranty, No Air/Vapor Barrier			Fastening Rates per 4' x 8' Board, 5-20-Year Warranty, With Air/Vapor Barrier[2]			Any 25-30-Year Warranty
Insulation Type	*Thickness*	*Field*	*Perimeter*	*Corners*	*Field*	*Perimeter*	*Corners*	*F/P/C*
IKOTherm™, IKOTherm III	0.5"-1.4"	6	9	12	16	24	32	16/24/32
	1.5"-1.9"	6	9	12	12	18	24	
	≥ 2.0"	6	9	12	8	12	16	
CoverShield™ HD	0.5"	6	9	12	12	18	24	
DensDeck® Prime	1/4"	6	9	12	12	18	24	
	1/2"	6	9	12	8	12	16	
	5/8"	6	9	12	8	12	16	
DensDeck StormX™ Prime	5/8"	6	9	12	8	12	16	

[1]**These fastening rates are minimum requirements for eligibility to receive an IKO Diamond Shield Warranty with standard 55 mph wind speed coverage. Other code or specification requirements may require additional enhancements**. Always follow the most stringent applicable requirements, whether from a codes body or from IKO Commercial, when determining attachment rates.

[2]**Installations that include a 6-mil poly non-sealing air/vapor barrier may be fastened at the "No Air/Vapor Barrier" rates.**

NOTE: Preliminary securement of insulation may be required to meet specification or code requirements.

D. Ballasted Systems.

i. Neither the insulation nor the membrane is mechanically attached in ballasted systems, except at elevation changes and around penetrations. Instead, these systems use ASTM #2 or #4 ballast rock, or ballast pavers, to hold the system in place.

ii. Ballasted systems should only be used when the following conditions are present:

1. Roof height does not exceed 75 feet.
2. Continuous parapet is present.
3. Wind uplift pressures are never expected to exceed 30 psf on any portion of the roof.
4. No bay/dock doors or large wall openings are present.

NOTE: Should any proposed ballasted roof system fail to meet any of the above conditions, IKO Technical must be consulted before roofing work commences. Failure to consult with IKO may result in removal or refusal of warranty coverage.

iii. Minimum ballast weights.

1. Given the conditions stated above in i) and ii) are met, the following are minimum ballast weights required per roof area:
   - **a.** Field: 10 lbs. psf.
   - **b.** Perimeter: 12 lbs. psf.
   - **c.** Corners: 15 lb. psf.

SECTION 7

ATTACHMENT REQUIREMENTS OVER BAY DOORS/LOADING DOCKS.

A. Mechanically Attached Systems.

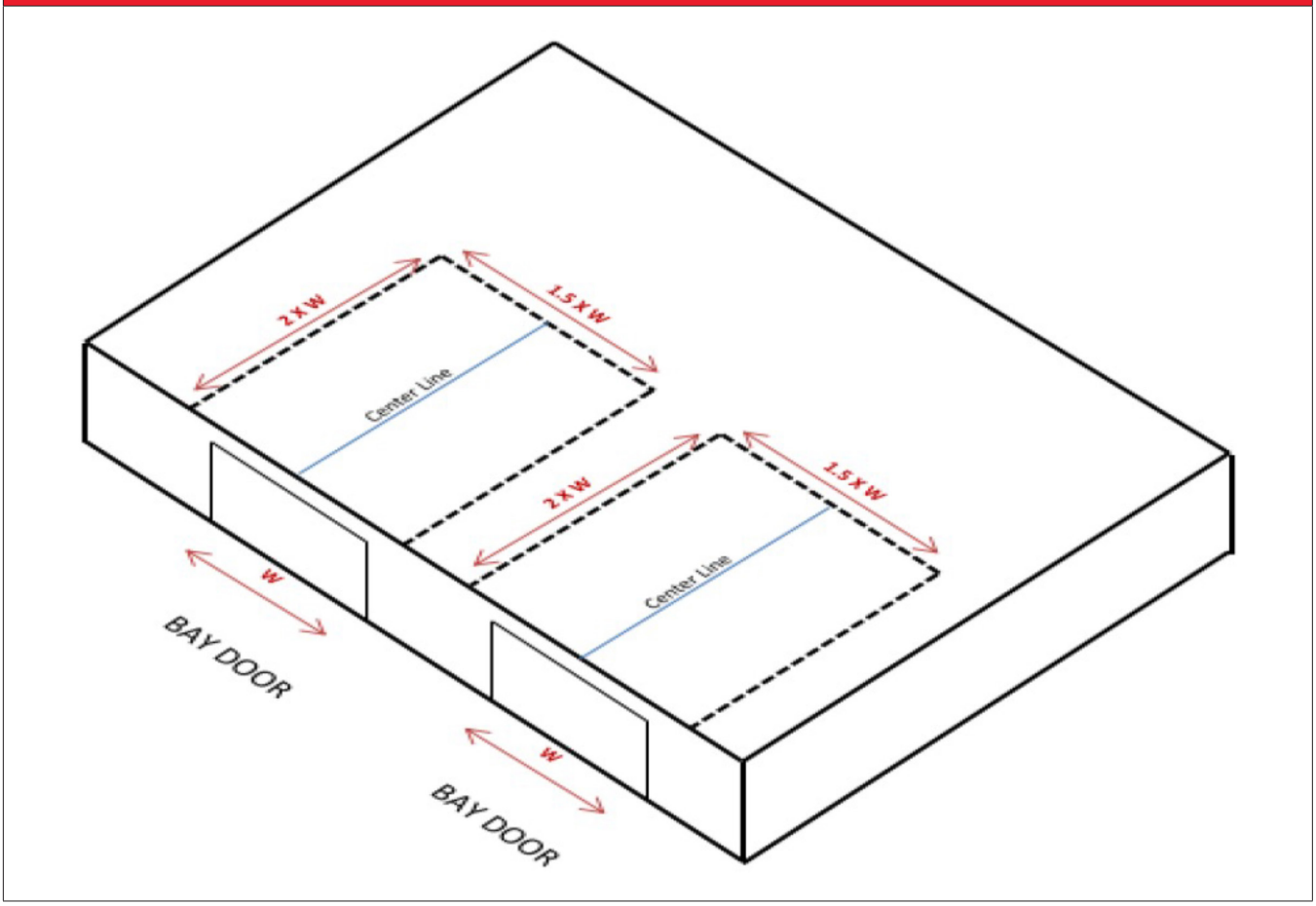
i. Perimeter half-sheets must be continued for a distance from the roof edge equaling twice the width of the door and laterally o.c. 1.5 times the width of the door (see Drawing 7-1).

B. Fully Adhered Systems.

i. Perimeter insulation fastening rates must be continued for a distance from the roof edge equaling twice the width of the door and laterally o.c. 1.5 times the width of the door (see Drawing 7-1).

ii. A Peel Stop must be installed. See Section 6.A.ii, and Drawing 7-2, for guidance.

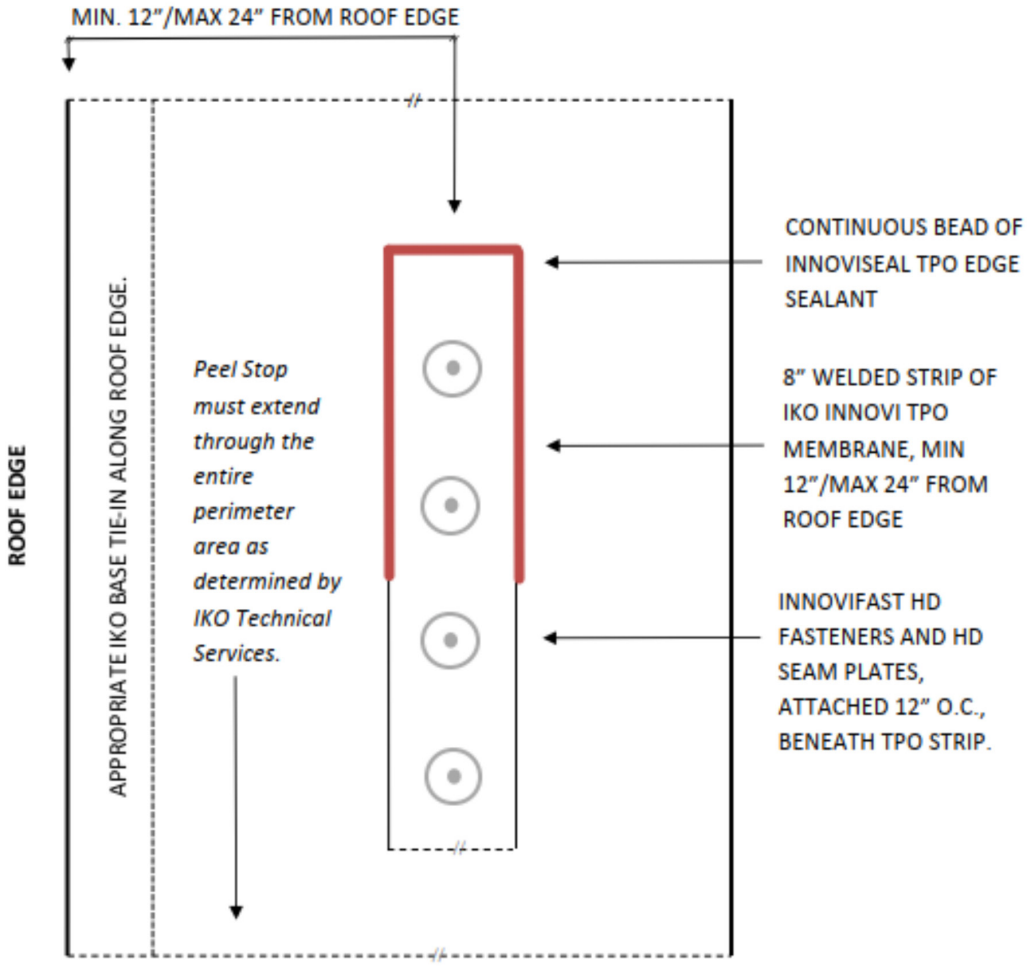
DRAWING 7-1. ATTACHMENT REQUIREMENT FOR OVERBAY DOOR



C. Induction Welded Systems:

i. Perimeter fastening rates must be continued for a distance from the roof edge equaling twice the width of the door and laterally o.c. 1.5 times the width of the door (see Drawing 7-1).

DRAWING 7-2. PEEL STOP DETAIL



NOTE: InnoviWeld Induction Weld Plates may be used.

ii. A Peel Stop must be installed (See Drawing 7-2). Peel Stops in induction welded systems may be accomplished in one of two ways:

1. A single row of induction weld plates, parallel to the roof edge, set a minimum of 12 inches and a maximum of 24 inches from the roof edge, and attached a minimum of 12 inches o.c. Fasteners and seam plates may be used; see Section 6.A.ii for guidance.

D. Ballasted systems are not acceptable for buildings with bay doors/loading docks.

SECTION 8

METAL EDGE SECUREMENT.

A. Appropriate Fasteners for Wall Substrates.

i. For wood and metal substrates, use InnoviFast™ HD Fasteners.

ii. For concrete, brick, stone and masonry block substrates, use InnoviFast Zinc Nail-ins. InnoviFast Concrete Drive Pins or HD fasteners may also be used with these substrates.

B. Termination Fastener Spacing. Mechanically attach all metal edge securement systems to enable maximum compression along the entire edge, but at no less than 12 inches o.c.

C. ES-1 Edge Securement Requirements.

i. IKO requires the use of metal edge securement systems that have been tested and certified in accordance with test methods RE-1, RE-2 and RE-3 of FM 4435/ANSI/ES-1, "Wind Test Design Standard for Edge Systems Used With Low Slope Roofing Systems," for all projects receiving a 20-year or longer warranty term and for all projects that include increased wind speeds over 55 mph.

ii. IKO strongly recommends the use of ES-1 certified metal edge securement systems for projects receiving warranty terms of less than 20 years.

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