



DefendEX™

METAL ROOFING SYSTEM APPLICATION GUIDE

SEPTEMBER 2026



NOTE: The contents of this guide are considered accurate at the time of posting. All information contained within should be validated for accuracy as it relates to specific project conditions or requirements. Specific codes, uplifts or other factors may result in changes to the information contained within this document.



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GENERAL

This guide outlines the minimum requirements to qualify for warranty protection with the DefendEX™ Paneling System. Refer to the Metal Design Guide, individual Product Data Sheets (PDS) and Safety Data Sheets (SDS), and Details for additional requirements. Local code and insurance requirements may impose further conditions.

Statements in this guide are provided in good faith, with the expectation that a design professional and/or local code authority will be consulted, as necessary, prior to project implementation.

Contact EXCEPTIONAL® Metals Technical Services at (866) 337-4599 when any circumstance conflicts with these standards.

A material only warranty is available for all DefendEX products.

Only the following DefendEX panels are eligible for a full commercial warranty after inspection by the Duro-Last® Quality Assurance Department (QA):

- A. DefendEX SL1500
- B. DefendEX SL1750
- C. DefendEX SS1500
- D. DefendEX SS2000

NOTE 1: If a full commercial warranty is requested, reference the Metal Design Guide for the DefendEX Metal Roof inspection and warranty process.

NOTE 2: The DefendEX Metal Roofing system and Warranty require special considerations with regards to fasteners, insulations, and attachment requirements. These requirements are provided as part of this application guide.

NOTE 3: Temporary closures, which assure that moisture does not damage any completed section of the new roofing system, are the responsibility of the licensed applicator and ARE NOT WARRANTED. Completion of flashings, terminations and temporary closures are required to provide a watertight condition.

STORAGE

- DefendEx products should be stored in a well-ventilated, dry place where no moisture can contact them.
 - Moisture (from rain, snow, condensation, etc.) trapped between layers of material may cause water stains or white rust, which can affect the service life of the material and will detract from its appearance.
- If outdoor storage cannot be avoided, protect the panels with a ventilated canvas or waterproof paper cover.
 - Do not use plastic, which can cause condensation.
 - Keep the material off the ground in an inclined position with an insulator such as wood.
- Storage of end-use materials with protective film applied to the surface should be:
- Less than six months with masking applied (warehouse storage and outdoor exposure combined).
- Stored in an enclosed building or holding facility.
- Wrapped/packaged to prevent exposure to direct UV, water, oils, or other contaminants.
- Protective film may become brittle with long term UV exposure.
- Maintained in an environment within a temperature range of 45° - 90° F (7° - 32° C) and 20 - 80% relative humidity.

PRECAUTIONS

- Always use an appropriate method of fall protection.
- Ensure that the load weight of product pallets do not exceed the capabilities of the structure.
- Keep all adhesives, sealants, and cleaning materials away from ALL ignition sources.
- Oil canning is not a cause for rejection.
 - Heavier gauges, narrower widths, striations, and embossing minimize oil canning.
- Do not use oil-based or bituminous-based roof cement with the DefendEX Metal Roofing systems.
- Sealant for end laps and lap joints shall be non-drying, non-toxic, and non-shrinking with a serviceable temperature of -60° - 212° F (-51° - 100° C).
 - Quality, long-life butyl sealants work best as a gasket sandwiched between two pieces of metal.
- Non-acetic cured, silicone, color-matching sealants are recommended when voids must be filled.
- Sealants are not a substitute for proper assembly and workmanship.
- Insulation must be properly stored and protected from ignition sources, moisture, and damage.
- Do not allow incompatible materials to interact with the DefendEX components.
- Exercise caution when handling to avoid injury or product damage.
- Consult container labels, SDS, and PDS for specific safety instructions for all products used on the project.
- Immediately remove protective film after installation.

PRIOR TO INSTALLATION

1. Confirm that all proper system materials and quantity have been delivered to meet the project requirements:
 - **Metal Panel and Trim** - Style/Metal/Gauge/Color/Size/Sealant
 - **Clips** - Type/Metal
 - **Fasteners** - Type/Metal/Size/Length/Color
 - **Underlayment** - Type
 - **Sheet Stock** - Metal/Gauge/Color/Size
 - **Bearing Plates** - Metal
 - **Accessories** - Pipe boots, touch-up paint, or any other manufacturer-supplied items
2. Perform a "dry run" for fitting all of the components together.
3. For a "seamed" roof:
 - a. Test manual and power seaming tools on panels with clips and fasteners.
 - b. Make any and all adjustments necessary to equipment to allow for proper installation, per manufacturer's recommended guidelines.
4. Snap systems must be checked with clips and/or fasteners, as required.

NOTE: Failure to confirm the above products and conditions prior to the start of a project may affect the eligibility for a warranty and related claims.

MATERIAL PREPARATION

- DefendEX aluminum can be cut, formed, and fastened using conventional hand or power tools.
 - For best results cutting tool edges should be kept sharp, clean, properly dressed, and closely aligned.
- Fabrication and erection can be accomplished with strippable plastic film in place.
 - Equipment adjustments may be needed to allow for the film thickness.
 - Film should be removed from areas of concealed or joined pieces.
- Stage all materials to minimize handling during the project.
- Confirm load limits of the structure to distribute product evenly and not to exceed building limits.
- For additional installation instructions for DefendEX sheet metal, refer to the System Design Guide, details, and product data sheets.
- For sheet metal work not supplied by EXCEPTIONAL Metals, refer to fabrication and installation requirements specified by the Project Designer, as well as industry standards.
- All deviations for special conditions must be reviewed and approved by EXCEPTIONAL Metals for them to be included in the warranty.
- General sheet metal and work by others may not be covered by the EXCEPTIONAL Metals warranty and may even void the warranty.

INSTALLATION PREPARATION

A. Preparatory Requirements

1. Contact EXCEPTIONAL Metals Technical Services at (866) 337-4599 for information about approved seamers. Clipped systems do not require seaming.
2. Out-of-plane areas will need corrective action prior to proceeding.
 - The substrate must be no more than 1/4 in. (6 mm) in 10 ft (3 m) out-of-plane in any direction.
 - Adjacent decking shall not be more than 1/8 in. (3 mm) out-of-plane.
3. The building must be checked for "squareness" within acceptable standard practices.
 - Out of square roofing areas will require adjustments in installation of system to accommodate irregularities or the structure will need corrective action.
4. Verify that the purlins under the decks at the ridge and end laps are installed as detailed and that they are straight from rafter to rafter.

B. Cautions

- Assure proper placement of fasteners per the appropriate project specifications.
- Do not rigidly attach panels to the substrate at both ends.
- Do not fasten panels through insulation to primary decking on open-frame or clear-span cathedral-type structures.

NOTE 1: If desired for minimizing noise telegraphing, install cover boards prior to panel application.

NOTE 2: Large areas which require fastening panels to steel decks may result in "popping" noises. Alternative design installation should be investigated. Consult with a design professional.

C. Wood Nailer and Location

Wood nailers (nailers) must be installed as specified by the Project Designer or as noted in EXCEPTIONAL Metals Details and the Metal Roofing System Design Guide, when insulations are used between the deck and coverboard or panels.

Install nailers as follows:

- Total nailer height must:
 - Match the total thickness of insulation and/or coverboard being used
 - Be installed with an 1/8-in. (3-mm) gap between each length and each change of direction.
- Multiple nailers must have joints staggered a minimum of 6 in. (152 mm) with staggered ends secured.
- Multiple corner boards must alternate crossovers and be fastened.
- Mechanically fasten nailers with appropriate fastener for each substrate
 - Must resist a minimum force of 200 lbf (890 N) in any direction
 - Typically spaced 12 in. (305 mm) o.c.
 - Refer to attachment requirements as specified by the Project Designer.
 - Higher building design pressures may require additional attachment.
- The nailer must always be flush at the point of contact with the insulation. Taper the nailer if necessary. Refer to EXCEPTIONAL Metals Details.
- Chemical treating of nailers for fire resistance or pressure treating for rot resistance is not required by EXCEPTIONAL Metals.

Submit SDSs for any chemically-treated nailers to EXCEPTIONAL Metals Technical Services for acceptance regarding compatibility.

D. Remove Moisture, Oils, Grease, and Foreign Matter

Water, snow, frost, dew and/or ice, and dust, dirt, or other foreign material, present in more than trace amounts must be removed from the work surface(s) prior to installing the DefendEX Metal Roofing system.

E. Prepare Surface

Properly prepare acceptable substrates prior to installation of the underlayment and the metal roofing system.

- Bring substrate defects to the attention of the General Contractor or Owner, in writing.
- Complete removal of all existing roofing system components is required.

The surface must be:

- Flat
 - No more than 1/4 in. (6 mm) per 10 ft (3 m) out-of-plane in any direction
 - More than 1/8 in. (3 mm) out-of-plane of adjacent substrates
- Clean
- Dry
- Smooth and free of sharp edges or fins
- Rough or irregular surfaces must be overlaid with insulation or cover board

F. Material Staging

- Materials should be positioned to minimize handling at the jobsite.
- Position panels to be loaded directly onto the roof without any additional turning or flipping.
- Check load limits.
 - Distribute the load evenly
 - Do not exceed the building capabilities.
- Minimize foot traffic over completed work areas.

G. Install Underlayment

Install approved underlayment, appropriate for the installed substrate and desired warranty term. Consult the underlayment PDS for these products for installation instructions.

- Install approved underlayment to achieve 100% coverage, allowing for proper side- and end-overlaps.

H. System Installation Guidelines

The following guidelines are for installing the DefendEX SS1500, SL1500, SL2000 and SL1750 Metal Roofing Systems.

- Refer to system details for additional specific installation information.
- Ensure all components are available and correct prior to starting any installation.

SL1500 NO-CLIP METAL ROOFING SYSTEM

NOTE: Every SL1500 panel installed will require approved fasteners with nylon washers to be installed in the slotted holes on the panel side. Install fasteners at the prescribed spacing for the job conditions and area of the roof (field, perimeter, or corner).

A. Fixed Hip/Ridge

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install hip/ridge flashing, and finish closing the hem, leaving room for thermal movement.

B. Fixed Headwall/J-channel at Reglet or Wall Panel

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install pitch break flashing, if necessary.
 - Fasten with approved fasteners into the structural substrate 12 in. (305 mm) o.c.
3. Install reglet flashings, as per field conditions.

C. Fixed High Eave

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install pitch break flashing, if necessary.
 - Fasten with approved fasteners into the structural substrate 12 in. (305 mm) o.c.
3. Apply approved butyl sealant at flashing overlaps.
4. Install Wall Panel. (Optional)

D. Vented Ridge

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install baffling material on top of the trim per the relevant detail.
3. Install the ridge flashing.

E. Rake Edge

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install the rake flashing.

F. Side Wall Flashing at Reglet

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install sidewall flashing
 - Fasten into structural substrate 12 in. (305 mm) o.c.
3. Install reglet flashing, as per field conditions.

G. Fixed High Eave

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install the high eave, as per field conditions.

H. Valley Flashing

1. Install the valley flashing into the valley starting at the bottom and working up.
 - Overlap must be at least 8 in. (203 mm)
2. Install the cleat, 1 in. (25 mm) from the top-edge hems of the valley flashings (both sides).
 - Fasten over approved triple beaded butyl tape measuring 3/16 x 2-1/2 in. (5 x 64 mm), with approved fasteners, through the valley flashing into the structural substrate.
3. Install the SL1500 panel using approved fasteners, noting that the first fastener is spaced maximum 18 in. (457 mm) from the centerline of the valley (both sides).
4. Hem the ends of the panels.
5. Fill the hem with approved butyl sealant (both sides).

SS1500 AND SS2000 DOUBLE LOCK METAL ROOFING SYSTEMS

A. Fixed Hip/Ridge

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install hip/ridge flashing, and finish closing the hem, leaving room for thermal movement.

B. Eave at Gutter

1. Place gutter tightly against the eave.
2. Install eave starter flashing.
 - Fasten with approved EXCEPTIONAL Metals fastener at 8 in. (203 mm) o.c.
3. Flash in with an approved underlayment over the top of the eave starter flashing.
4. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
5. Hem the panel over the lip of the eave starter flashing.
 - Leave the hem partially open for drainage.
6. Fold the end tabs of the panel seams over the end of the seam.
 - Always fold the tab to the inside of the seam.
7. Install gutter strap into gutter assembly.
 - Fasten using #12 or #14 x 1-1/4 in. (32 mm) fasteners with self-sealing washers through the eave starter flashing.

NOTE: Max 24 in. (610 mm) o.c. gutter strap spacing.

 - EXCEPTIONAL Metals does not warrant gutter systems, downspouts, etc.

C. Fixed Pitch break at Reglet

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install pitch break flashing, if necessary.
 - Fasten with approved fasteners into the structural substrate 12 in. (305 mm) o.c.
3. Install reglet flashings, as per field conditions.

D. Fixed Pitch Break at Wall Panel

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install pitch break flashing, if necessary.
 - Fasten with approved fasteners into the structural substrate 12 in. (305 mm) o.c.
3. Install wall panel (optional).

E. Rake at Gable End

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install rake flashing, and finish closing hem.

F. Wall Flashing at Reglet

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install sidewall flashing and fasten into exterior substrate at 12 in. (305 mm) o.c.
3. Install reglet flashing, as per field conditions.

G. Fixed High Eave

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
3. Install reglet flashings, as per field conditions.

H. Vented High Eave

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
3. Install baffling material on top of the trim per the relevant detail.
4. Install high eave flashing, as per EXCEPTIONAL Metals requirements and field conditions.

I. Valley Flashing

1. Install valley flashing into valley.
2. Install the cleat, 1 in. (25 mm) from the top-edge hems of the valley flashings (both sides).
 - Fasten over approved triple beaded butyl tape measuring 3/16 x 2-1/2 in. (5 x 64 mm), with approved fasteners, through the valley flashing into the structural substrate.
3. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
4. Install panel over end of cleat (both sides).

J. Seam Section - End Lap Seam

1. Run a 1/4 in. (6 mm) diameter bead of butyl sealant across the clip/cleat the width of the panes and up the sides of the seams at 10 in. (254 mm) from high end of panel to marry with the above panel.
2. Fold end tabs of seams over the end of the seam.
 - Always fold to the inside of the panel seam.

K. Vented Ridge

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
3. Install baffling material on top of the trim per the relevant detail.
4. Install high eave flashing, as per EXCEPTIONAL Metals requirements and field conditions.

SL1750 SNAP-LOCK METAL ROOFING SYSTEM

A. Fixed Hip/Ridge

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install hip/ridge flashing, and finish closing the hem, leaving room for thermal movement.

B. Eave at Gutter

1. Place gutter tightly against the eave.
 2. Install eave starter flashing.
 - Fasten with approved EXCEPTIONAL Metals fastener at 8 in. (203 mm) o.c.
 3. Flash in with an approved underlayment over the top of the eave starter flashing.
 4. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
 5. Hem the panel over the lip of the eave starter flashing.
 - Leave the hem partially open for drainage.
 6. Fold the end tabs of the panel seams over the end of the seam.
 - Always fold the tab to the inside of the seam.
 7. Install gutter strap into gutter assembly.
 - Fasten using #12 or #14 x 1-1/4 in. (32 mm) fasteners with self-sealing washers through the eave starter flashing.
- NOTE: Max 24 in. (610 mm) o.c. gutter strap spacing.

C. Fixed Headwall at Reglet

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install pitch break flashing, if necessary.
 - Fasten with approved fasteners into the structural substrate 12 in. (305 mm) o.c.
3. Install reglet flashing, as per field conditions.

D. Fixed Headwall at Wall Panel

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install panel using approved EXCEPTIONAL Metals fasteners and panel clips, noting that the first clip is to be 18 in. (457 mm) from high end of the panel.
3. Install pitch break flashing, if necessary.
 - Fasten with approved fasteners into the structural substrate 12 in. (305 mm) o.c.
4. Install wall panel (optional).

E. Rake at Gable End

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install rake flashing, and finish closing hem.

F. Wall flashing at Reglet

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install sidewall flashing and fasten into exterior substrate at 12 in. (305 mm) o.c.
3. Install reglet flashing, as per field conditions.

G. Fixed High Eave

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
 - Overlap must be at least 8 in. (203 mm)
2. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
3. Install high eave flashing as per field conditions.

H. Vented High Eave

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
3. Install baffling material on top of the trim per the relevant detail.
 - Install high eave flashing, as per EXCEPTIONAL Metals requirements and field conditions.

I. Valley Flashing

1. Install valley flashing into valley.
2. Install the cleat, 1 in. (25 mm) from the top-edge hems of the valley flashings (both sides).
 - Fasten over approved triple beaded butyl tape measuring 3/16 x 2-1/2 in. (5 x 64 mm), with approved fasteners, through the valley flashing into the structural substrate.
3. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
4. Install panel over end of cleat (both sides).

J. Seam Section - End Lap Seam

1. Install valley flashing into valley.
2. Install the cleat, 1 in. (25 mm) from the top-edge hems of the valley flashings (both sides).
 - Fasten over approved triple beaded butyl tape measuring 3/16 x 2-1/2 in. (5 x 64 mm), with approved fasteners, through the valley flashing into the structural substrate.

K. Vented Ridge

1. Install the appropriate EXCEPTIONAL Metal trim per relevant detail.
2. Install the panel using appropriate panel clips and fasteners.
 - Position the first clip 18 in. (457 mm) maximum from the eave.
3. Install baffling material on top of the trim per the relevant detail.
4. Install high eave flashing, as per EXCEPTIONAL Metals requirements and field conditions.

FLASHINGS

Design Considerations

Many factors affect the performance of the flashing system for specific detail requirements; refer to the Metal Application Guide, all EXCEPTIONAL Metals details.

Minimum Metal Thickness standards:

- **Galvanized, Galvalume[®], Painted or Mill Acrylume[®]** - 24 gauge (0.6 mm)
- **Aluminum, Mill, Anodized, Painted** - 0.32 inch (0.8 mm)
- **Copper (Any Finish)** - 16 oz. (0.7 mm)

A flashing is a roofing element used to divert water to the roofing panels. The panels then channel the water to the gutters or the roof edge. There are four typical locations where flashing is needed: terminations, penetrations, joints, and junctions.

A. General

1. Remove all existing flashing (i.e., metal, bituminous materials, mastic, etc.).
2. Flash all penetrations passing through the panel.
3. Relocate any penetration that will be within 4 in. (102 mm) of a metal roof seam.
4. The flashing seal must be made directly to the metal roof penetration.

B. Penetrations: Pipes, Round Supports, Structural Steel Tubing, etc.

1. Flash penetrations with pre-molded pipe boots wherever possible.
2. Refer to EXCEPTIONAL Metals Product Data Sheets for minimum and maximum pipe diameters that can be successfully flashed with EXCEPTIONAL Metals Metal Pipe Boot.
3. Structural Steel Tubing:
 - Use a field-fabricated pipe flashing detail when the corner radius is greater than 1/4 in. (6 mm) and the longest side of the tube does not exceed 4 in. (102 mm).
 - When the tube exceeds 4 in. (102 mm), use a standard curb detail, including base tie-in and suitable termination.
4. Additional flashing treatments are required for pipe flashings. See the applicable EXCEPTIONAL Metals detail for flashing requirements.

C. Expansion Joints

Install flashings where specified by the Project Designer, unless it fails to continue through the roof edge cleat, high eave flashing, fascia board, and gutter tie into a logical transition with another joint.

If the joint intersects a valley contact EXCEPTIONAL Metals Technical Services.

Install expansion joints in accordance with EXCEPTIONAL Metals details.

D. Snow Guards

1. The installation of snow guards must be restricted to non-penetrating mechanical attachment to the seams of the roof panels.
2. Mechanically attached snow guards through the pan of the panel are unacceptable due to potential rupture of the underlayment by fasteners and may void the EXCEPTIONAL Metals Metal roof warranty.
3. Adhesive attachment of snow guards to the panels can be detrimental to the finish of the metal roofing system and may void the DefendEX Metal Roofing system Paint-Finish warranty.

E. Installation of Proper Fasteners and Clips

The table below is EXCEPTIONAL Metals required minimum fastening for a metal roofing system to receive a warranty. Building code or agency listings may require increased fastening.

MINIMUM FASTENER AND CLIP SPACING				
System	Fasteners†, †† Per Clip/Slots	Clip Spacing		
		Roof Height Ft (m)	Field In. O.C. (mm)	Perimeter & Corners* In. O.C. (mm)
SS1500 (5 – 20 years)	2	0 – 50 (0 – 15.2)	35 (914)	12 (305)
		51 – 75 (15.5 – 22.9)	24 (610)	12 (305)
		76 – 120 (23.2 – 36.6)	16 (406)	12 (305)
		121 – 250 (36.9 – 76.2)	12 (305)	6 (152)
SL1500 (5 – 20 years)	1	0 – 75 (0 – 22.9)	24 (610)	12 (305)
		76 – 120 (23.2 – 36.6)	16 (406)	12 (305)
	2 Consecutive slots	121 – 250 (36.9 – 76.2)	12 (305)	6 (152)
(25 years)	1	0 – 120 (0 – 36.6)	12 (305)	12 (305)
	2 Consecutive slots	121 – 250 (36.9 – 76.2)	12 (305)	6 (152)
SS2000 (5 – 20 years)	2	0 – 50 (0 – 15.2)	48 (1,219)	24 (610)
		51 – 75 (15.5 – 22.9)	30 (762)	12 (305)
		76 – 120 (23.2 – 36.6)	24 (610)	12 (305)
		121 – 250 (36.9 – 76.2)	16 (406)	12 (305)
SL1750 (5 – 20 years)	2	0 – 50 (0 – 15.2)	48 (1,219)	24 (610)
		51 – 75 (15.5 – 22.9)	30 (762)	12 (305)
		76 – 120 (23.2 – 36.6)	24 (610)	12 (305)
		121 – 250 (36.9 – 76.2)	16 (406)	12 (305)
NOTES: † Panel attachment requires placement of a bearing plate beneath each clip and an approved fastener for required penetration through all layers into the approved deck. †† Panel attachment directly over approved plywood, OSB, or tongue and groove plank decking requires fastener penetration into the deck. * For perimeter and corner widths, contact EXCEPTIONAL Metals Technical Services.				

ROOF MAINTENANCE

As an Owner, you have invested time and financial resources into selecting a high-performance metal roofing system. Maintaining your investment will assure that you get the full benefits a metal roofing system can deliver. With this comes the added responsibility of making sure that you and those you employ keep the roofing system well maintained. All roofs, metal or shingle, require periodic maintenance. There are certain tasks that any Owner can perform in order to keep the roofing system in excellent condition. Only a licensed metal roofing contractor should perform any complex repair or component addition to keep the warranty valid. In order to validate the warranty, the Owner must perform required periodic maintenance.

ROOF MAINTENANCE GUIDELINES

- A. To assure continued coverage under the Warranty provisions, the Owner must perform regular inspection of the roofing system. Failure to perform any of these as required may result in suspension or loss of the roofing warranty. The inspections must meet the following criteria:
- Notify EXCEPTIONAL Metals immediately of any leaks or areas that indicate potential concerns. If repairs are required, as determined under the coverage of the Warranty or necessary by the Building Owner, engage an EXCEPTIONAL Metals Licensed installer to perform the repairs.
 - Notify EXCEPTIONAL Metals of any leaks that occur between inspections. Please refer to the "Leak Notification" section of the "Terms and Conditions".
 - Failure of the Owner to adhere to the maintenance required may void the Warranty in place for the roofing system. Roofing systems are exposed to severe weather conditions and, as a result, require inspections and maintenance. EXCEPTIONAL Metals suggests that a comprehensive maintenance program suited to your building be established.
- B. As discussed above, regularly scheduled maintenance is required. Additional inspections should be conducted if any of the following occurs:
- Fire, vandalism, damage from debris or other non-weather-related causes.
 - In the event of high winds, the roofing system should be inspected for debris from trees or other structures. Inspect for loose flashings and fasteners. Inspect the roof panels for damage from falling debris. After hailstorms, inspect the roof panels and components for puncture damage. Heavy rains will cause gutters to overfill. Inspect for ponding or trapped water on the roof panels and clear all debris from the gutter system. Inspect the gutter brackets for loose fasteners or supports. After heavy snow or ice storms, inspect all penetrations for damage to the pipe flashings, curb housings, skylights, etc.
 - Untrained personnel can cause unintentional damage to the roofing system. Inspect the roofing system for the use of chemicals or solvents that may have spilled on the roofing panels. Inspect for scratches in the finish of the panels. Inspect for bent or depressed panels from excessive walking. Inspect for punctures from dropped equipment or tools. Inspect for debris left behind and clean immediately. Inspect that the roof panels were protected from the use of welder, torches or other cutting tools that produce sparks or flames.
- C. **DO:**
- Inspect the roofing system on a regular basis.
 - Remove any debris from the roof and gutter system.
 - Inspect the roofing system after heavy snow or ice storms.
 - Provide instructions for untrained personnel to protect the roof panels.
 - Obtain written approval from EXCEPTIONAL Metals prior to any roof modification.
 - Implement a regular roof maintenance program.
- D. **DO NOT:**
- Neglect the roofing system.
 - Walk on the major ribs of the roof panels.
 - Allow storm debris to collect on the roof panels.
 - Allow any roof damage to go undetected.
 - Allow metal tools and mechanical equipment to be used for snow or ice removal.
 - Use any roof coatings not approved in writing by EXCEPTIONAL Metals.
 - Allow additional equipment or accessories to be installed without written approval from EXCEPTIONAL Metals.

NOTE: Temporary closures, which assure that moisture does not damage any completed section of the new roofing system, are the responsibility of the licensed applicator and ARE NOT WARRANTED. Completion of flashings, terminations and temporary closures are required to provide a watertight condition.

PROTECTING THE METAL ROOFING SYSTEM

In order to maintain the effectiveness of your DefendEX metal roofing system, EXCEPTIONAL Metals recommends that the following precautions be taken.

- A. All foot traffic should be kept to a minimum and allowed only when necessary.
 - Never step on the rib portion of the roof panel.
- B. Keep all roof hatches and access ladders or other access points secured.
 - Only allow properly trained and authorized personnel on the roofing system.
 - Have authorized personnel accompany untrained individuals while they are on the roofing system.
 - Maintain a "Roof Access Log" to track individuals that have accessed the roofing system.
- C. The design of the roofing system is to drain or shed water. Avoid the following:
 - **Do not** allow equipment or structures to be installed that would impair or trap the flow of water.
 - **Do not** allow debris to collect in the gutter system or on the roof panels.
 - **Do not** allow wood blocking to be used as equipment supports or shims.
 - **Do not** allow water to shed freely from one roofing system onto a lower roof.
 - **Do not** allow condensation from air conditioning units to drain onto the roof panels.
 - Use PVC pipes for drainpipes.
 - After heavy snow or ice storms, the excessive snow should be removed from the roofing system.
 - **Do not** use mechanical equipment to remove snow.
 - **Do not** use metal tools. Use extreme caution when removing snow or ice around roof penetration flashings.
 - **BE CAUTIOUS OF SKYLIGHTS, FIBERGLASS PANELS, ETC.**
 - Prior to the installation of additional equipment, pipes, vents, stacks, curbs, etc., EXCEPTIONAL Metals must be notified in writing.
 - EXCEPTIONAL Metals must approve all added conditions, or the warranty may be voided.
 - Dissimilar metals and certain chemicals can be harmful to the roof panels.
 - **Do not** allow metals such as copper, lead or graphite to come in contact with the roof panels.
 - If roofing system panels become scratched, follow manufacturer's guidelines for use of touch-up paint.

TOUCH-UP PAINT APPLICATION

EXCEPTIONAL Metals may supply touch-up paint with each project order, upon request.

The touch-up paint will be supplied in small aerosol cans. The product is intended to touch-up small blemishes or exposed cut edges on fabricated components.

NOTE: Touch-up paint does not have the same adhesion or durability as factory applied coatings and will exhibit chalking and fading characteristics at a noticeably higher rate than that of the factory applied coatings.

Use touch-up paint as sparingly as possible; no more than a few square inches.

When using touch-up paint, use EXTREME CAUTION as excessive use may void the warranties.

For proper performance of the touch-up paint, it is important to follow touch-up paint directions.

1. Clean surface of any dirt, grease, oil, etc.
 - Sand only scratched areas lightly with #400 grit sandpaper.
 - Remove sanding dust with a solvent dampened lint-free cloth.
 - If painting over exposed or bare metal, priming with an automotive grade primer may be necessary.
2. The temperature of the surface and paint should be between 68° - 92° F (20° - 33° C).
3. Apply touch-up paint in small amounts.
4. Spray into the container cap or a small cup.
5. Apply with as small a brush as possible.

For small blemishes, such as a surface scratch, a small brush similar to a fingernail polish brush is best.

- a. Dip the brush half the length of the bristles into the paint.
 - b. Tap the brush against the side of the container, but do not wipe against the lid.
 - c. Hold at the handle near the base and apply light pressure with the fingertips to make the bristles slightly flex.
 - d. Feather the touch-up paint into the scratch.
 - e. Applying touch-up paint with anything larger than a small artist's brush is not recommended.
6. Clean brush with paint thinner after use.

For areas larger than minor blemishes, contact EXCEPTIONAL Metals Technical Services.

CLEANING THE METAL ROOF

Immediate cleanup is required by all workers.

- If the use of mortar or concrete is necessary on or near the roof panels, the roof panels must be protected to avoid chemical reaction and abrasion from the mortar or concrete.
- If solvents are spilled on the roof panels, immediately clean by scrubbing and flushing with fresh clean water.

CLEANING PRECAUTIONS

- Do not use wire brushes, abrasives, or similar cleaning tools which will mechanically abrade the coatings surface and expose the base metal or affect the product adversely.
- For cleaning agents, refer to the *EXCEPTIONAL Metals Roofing System Maintenance Guide*.
- It is recommended that approved agents be tested in an inconspicuous area before use on a large scale.

THERMAL MOVEMENT OF METAL ROOF PANELS (100° F PANEL CHANGE)

Panel Material	Coefficient of Expansion	Total Movement per 100° F (38° C)		
		In. (mm)		
		10 Ft (3 m)	50 Ft (15 m)	100 Ft (30 m)
Steel	6.7×10^{-6} in/in/°F (10.9×10^{-6} mm/mm/°C)	0.08 (2)	0.40 (10)	0.80 (20)
Aluminum (3000 Series Type)	12.7×10^{-6} in/in/°F (10.9×10^{-6} mm/mm/°C)	0.16 (4)	0.80 (20)	1.6 (41)
Copper	9.3×10^{-6} in/in/°F (10.9×10^{-6} mm/mm/°C)	0.12 (3)	0.60 (15)	1.2 (30)

Contact EXCEPTIONAL Metals Technical Services at (866) 337-4599 for further information.

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