



**METAL ROOFING**

**S y s t e m s , I n c**

**METAL ROOFING SYSTEMS, INC.**

**APPLICATION GUIDE FOR STANDING SEAM PANELS**

## **GENERAL**

*This section of the Technical Manual provides instructions for the Application of Metal Roof Systems.*

*The Metal Roof System and Warranty requires special considerations with regards to fasteners, insulations, and attachment requirements. These requirements are provided as a part of this application guide.*

***NOTE: IF A PROPOSED APPLICATION FALLS OUTSIDE OF THIS SPECIFICATION, CONTACT YOUR METAL ROOFING SYSTEMS TECHNICAL COORDINATOR at 704-820-3110 FOR ADDITIONAL INFORMATION, PRIOR TO BID AND INSTALLATION.***

**PRIOR TO INSTALLATION OF ANY METAL ROOFING SYSTEM COMPONENT, ASSURE THAT ALL THE PROPER SYSTEM MATERIALS AND QUANTITY HAVE BEEN DELIVERED TO MEET THE JOB INSTALLATION AND PERFORMANCE REQUIREMENTS OF THE SYSTEM FOR ASSEMBLY:**

**METAL PANELS and TRIM – Style/ Metal/Gauge/Color/Size/Sealant**

**FASTENER – Type/ Metal/Size/Length/Color**

**CLIPS – Type/Metal**

**BEARING PLATES – Metal**

**SHEET STOCK – Metal/Gauge/Color/Size**

**UNDERLAYMENT – Type**

**ACCESSORIES – Pipe boots, touchup paint or any other supplied items**

**Do a trial “dry run” of fitting components together. If roof is a “seamed” roof, test manual and power seaming tools on panels, with clips and fasteners, prior to doing any installation on the roof. Make any and all adjustments necessary to equipment in order for proper installation. Snap systems must be checked with clips and/or fasteners as required. If proper seaming can not be achieved, confirm the seamer is the correct/specific one for that specific panel style and measurements.**

***Failure to confirm all of the above items and conditions prior to start of the job may affect the ability to issue a roof warranty and any product claims.***

### ***APPLICABILITY***

- A. Parameters of this manual outline the **minimum** requirements for a Metal Roofing Systems Inc., watertight warranty. Local code and insurance requirements may require specific enhancements for a given performance level.*
- B. Statements in this Application Guide are provided in good faith with the expectation that a design professional be consulted prior to any job decisions being made.*

The following are just a few of the conditions, which may influence the need for a design professional:

- Structural conditions that might not be sufficient to support the anticipated load of the completed roof installation.
- Structural conditions to support the dynamic loading of the roof system.
- The need to review the proposed system assembly for its applicability on specific projects such as churches, gyms or large gathering places for acoustic considerations.
- The requirements of local building codes for the need of a thermal barrier.
- The requirements of local building codes for the need of an underlayment or air barrier.
- When considering the effect of loads on the structure/decking due to the loading/staging of materials as a part of system installation, The building owner or his design professional should specify the load limitations to be observed by the Metal Roofing Systems, Inc. licensed applicator.

C. The Metal roof system shall consist of: System 1000, System 1500, System 2000, and System 2500 metal roof panels all over underlayment, mechanically attached to an acceptable substrate combined with other Metal Roofing Systems accessories as indicated in the following text, tables and manual details.

- D. It is the building owner's or the design professional's responsibility to consult with the controlling code agency official(s) and others to determine the specific requirements of each project and each system.
- E. Your Metal Roofing Systems Inc., Technical Coordinator should be contacted at 704-820-31101 when local or controlling codes or insurance requirements are in conflict with our recommendations. Contacts:

**Certain situations may arise where our specifications and/or roofing requirements cannot be applied. It may not be possible to issue the desired warranty for projects that deviate from current requirements and standards, unless a written request for approval has been received, reviewed and approved by your Technical Coordinator prior to application of the proposed system.**

The following conditions require special consideration and may not be warrantable. Contact your Technical Coordinator if any of the following conditions are present:

- Roofs that do not meet the minimum slope and/or exceed the maximum height limits for the Metal Roof system assembly see Table 1.01-1.
- Projects that require special wind coverage greater than 55 mph.
- Roofs located where localized wind phenomenon may occur, reference ASCE-7 wind maps and local building officials.
- Roofs located down slope, foothills, mountain ranges, or escarpments.
- Geographical areas susceptible to hurricanes.
- Roofs subject to chemical or process byproduct discharge.
- Buildings with large openings in a wall (greater than 10% of the wall surface) that could be left open in a storm such as warehouses, airplane hangers or open air performance centers.

- Roofs subject to positive pressure situations such as: pressurized buildings, air infiltrating decks, canopies, overhangs, airplane hangars, distribution centers, laboratories and etc.
- Buildings with high interior humidity such as swimming pools, paper mills or textile mills, for example.
- Roof decks that do not provide adequate fastener pullout resistance.
- Roofs with domes, barrels or swales, or other curvatures or unusual shapes.
- Cold storage and freezer facilities constitute a special condition. A design professional familiar with cold storage construction and vapor migration should be consulted in the design of the roof system and integration with the building envelope.

### **JOB SITE CONSIDERATIONS (CAUTION AND WARNINGS)**

- A. Keep all adhesives, sealants and cleaning materials away from ALL ignition sources (i.e. a flame, fire, sparks & static, etc.). Do not smoke while using these materials.
- B. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety instructions for all products used on the project.
- C. Care must be used when installing fasteners to avoid possible conduits and other piping in and or under the deck.
- D. Do not use oil-base or bituminous-base roof cement with the Metal Roof Systems roof panels.
- E. Insulation must be properly stored and protected from ignition sources, moisture and damage.
- F. Store all material and accessories above ground on well-supported platforms that provide a minimum of 1/4 in 12 slope. Store materials under waterproof covering or indoors and provide proper ventilation of metal roofing system to prevent condensation build-up between each panel, trim or flashing component.
- G. Do not allow other incompatible metals to interact with the Metal Roof System Components.

### **PERSONAL SAFETY**

Safety has to be the top priority. Walking on any roof system can be dangerous. Always use a method of fall protection that will meet the approved OSHA standards or any regulatory agency responsible for your building. Serious injury or death can result if the proper safety equipment is not provided. Monetary fines for noncompliance could result from any neglect in fall protection.

It is your responsibility as an Owner or employer to make sure that proper training of your maintenance personnel and other employees is adequate for safety procedures and that safety equipment is in proper working condition.

Remember during roof inspections, take the following precautions and any others deemed appropriate by governing authority:

- A. Use fall protection and all appropriate safety equipment as agencies and or job site require
- B. .Assure proper and clean footwear.
- C. Never walk on ribs, eave, rake, valley, hip or ridge flashings.
- D. Never walk or stand on any skylight, fiberglass type panel or any other component not designed for the weight of a person.

- E. Rope off open areas or assign a person to guard these locations during the inspection process to prevent accidental injury both on the roof and below openings and the perimeter of the roof area.
- F. .Never go on a roof with any moisture or other substance present that may cause unsure footing.

## **ROOF AND SUBSTRATE PREPARATION**

### **A. Preparatory Requirements**

1. The System 1500 and System 2500 requires field seaming. Specific 1500 and 2500 profile seamers may be available upon request. Other types of similar styles of field seaming machines may NOT properly seam the System 1500 and System 2500 Double Lock panels and Metal Roofing Systems, Inc. cannot be responsible for any damage caused by using another type of field seamer.
2. The System 1000 and System 2000 snap-lock, clipped Systems do not require mechanical field seaming. They both have snap together seams.
3. The substrate must be no more than ¼” (6.4mm) in 10’ (3048mm) out of plane in any direction. Adjacent decking shall not be more than 1/8” (3.2mm) out of plane. Out of specified plane areas will need corrective action prior to proceeding.
4. 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.
5. 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. Misplacement or swaying of the members will cause the fasteners to fail at the ridge or end laps as the panels expand, contract and possibly oilcan.

### **B. Cautions**

1. Avoid restricting the thermal expansion and contraction of the System 1500 and System 2500 Double-Lock and the System 2000 Snap-Lock panels.
2. Avoid restricting the thermal expansion and contraction of the System 2000 Snap-Lock panel by assuring proper placement of fasteners in the attachment slots.
3. Do not rigidly attach panels to the substrate at both ends. This will eliminate movement capability. Consult specifications, details, design professional and M.R.S. as needed for verification of requirements. Generally panels are fastened at the top or in some cases the mid-point of the panel.
4. Limit panel length to account for movement range of system components and flashing details.
5. Open frame or clear span cathedral type structures - install coverboard and fasten roofing to it to minimize telegraphing of noises. *(Be aware that large clear span areas with steel decking systems that require fastening panels to decking may result in “popping” noises due to telegraphing of thermal movement noise of the entire roof system acting on the diaphragm . Alternative design installation should be investigated, consult with job design professional.)*

### **C. Correct Substrate Defects**

1. Defects that need to be corrected before work can commence should be brought to the attention of the General Contractor or Owner in writing and addressed by them.
2. Complete removal of all existing roof system components is required. Re-cover applications are not acceptable for the Metal Roofing Systems, Inc., Watertight Warranty.

#### **D. Remove Moisture or Foreign Matter**

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

#### **E. Prepare Surface**

Acceptable substrates to which the Metal Roof System is installed must be properly prepared prior to accepting underlayment or metal roof system installation. The surface must be relatively even (no more than 1/4" (6.4mm) in 10' (3048mm) out of plane in any direction or more than 1/8" (3.2mm) out of plane of adjacent substrates, clean, dry, smooth and free of sharp edges, fins, loose or foreign materials, oil, grease and other materials that may damage the metal roof system. Rough or irregular surfaces that could cause damage to the roof panel must be overlaid with insulation or coverboard.

#### **F. Install Underlayment**

Install underlayment, appropriate to the substrate and warranty term.

### **MATERIAL HANDLING**

#### **A. Shipping**

1. Metal panels are shipped with the panels stacked vertically, on edge, and braced as needed for security. Handling requirements are the same as listed below.
2. BLOCK AND BAND - 2x4's are strapped under the bundles to allow access for straps or a forklift. Bundles less than 25' (7620mm) long may be handled by a forklift. The forklift should have at least 5' (1524mm) between forks. Bundles longer than 25' (7620mm) should be lifted utilizing a spreader bar with appropriate straps spaced secured about 1/4 of the way from each end of the crate/bundle.

#### **B. Staging Materials**

Materials should be placed at jobsite in such a way as to minimize handling.

1. Position crates or bundles with the panels in the correct position to be loaded directly on the roof without any additional turning or flipping.
2. Space materials out to limit having to shift on the ground or roof. Check load limits of structure to distribute load evenly and not to exceed building limits.
3. Assure all accessory items are conveniently located for workers and they will not have to leave area or cross over installed work.

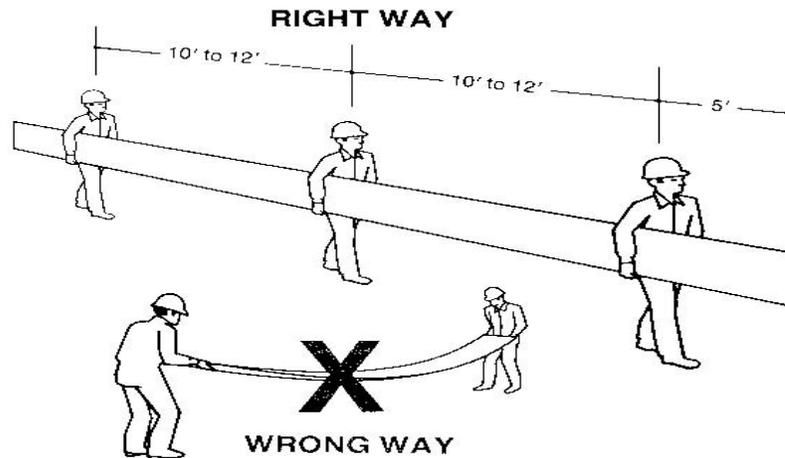
### C. Handling

For correct and safe handling of a Metal panel, use the following handling procedure:

| TABLE 2.05.1<br>PANEL HANDLING |              |          |          |           |                                    |
|--------------------------------|--------------|----------|----------|-----------|------------------------------------|
| Panel length*                  | Less than 6' | 6' – 15' | 16'- 30' | 31' - 45' | > 45'                              |
| Handlers*                      | 1            | 2 - 3    | 3 - 4    | 4 - 5     | 4 or more<br>with extreme<br>care. |

\* Handling of panels and the number of handlers required are a function of Panel length and width, combined with the experience of the handlers and weather conditions. Final handling decision rests with the handling party.

Please ensure metal panel does not bend in any direction, up, down or torque, from its shipped or formed shape and maintains it throughout the transportation and installation process.



### WOOD NAILER LOCATION AND INSTALLATION

Wood nailers must be installed as specified by the project designer or as noted in our Details and when insulations are used between the deck and coverboard or panels. Install wood nailers as follows:

#### A. Position Wood Nailer

Total wood nailer height must match the total thickness of insulation and or coverboard being used and should be installed with an 1/8" (3.2 mm) gap between each length and each change of direction. Multiple nailers must have joints staggered a minimum of 6" (152.4mm) with staggered ends secured. Multiple corner boards must alternate crossovers and be fastened.

#### B. Secure Wood Nailer

Wood nailers must be firmly fastened to the deck or building. Mechanically fasten wood nailers with appropriate fastener for substrate to resist a minimum force of 200 lbf (890 N) in any direction, typically 12" (305 mm) o.c. Refer to attachment requirements as specified by the project designer. Higher building design pressures may require additional attachment.

**C. Taper Wood Nailer**

The wood nailer must be tapered (if applicable) so that it will always be flush at the point of contact with the insulation.

**D. Chemical Treating of Wood Nailer**

Chemical treating for fire resistance or pressure treating for rot resistance is not required, it may affect the performance of the Metal Roof Panels and accessories.

Submit MSDS's for any chemically treated lumber that comes in contact with the Metal Roof System, with active ingredients listed, to your Technical Coordinator for acceptance regarding compatibility.

**E. Installation of Wood Nailers by Others**

Make these specifications and details available when nailers are to be installed by others. Work that compromises the integrity of the system may jeopardize the warranty for the entire Metal Roof system project.

## **UNDERLAYMENT INSTALLATION**

**A.** Install Metal Roofing Systems approved underlayment over an approved substrate to achieve 100% coverage with proper side and end overlaps.

1. Start at the lowest part of the roof deck and install the valleys first. Lay the membrane flat in place with the print side up.
2. Cut the Underlayment to a length that can easily be managed.
3. Along the side of the sheet, overlap the seams a minimum of 3" (76 mm).
4. At the ends of the sheet, overlap a minimum of 6" (152 mm).
5. Peel half of the release liner off the roll diagonally and apply with heavy, even hand pressure or brooming from the center of the sheet to the outer edges. Remove the remaining release liner from the other half of the roll and apply pressure in the same manner. Use of a hand roller at the laps is recommended.
6. In very steep slope applications, back nailing may be recommended. When back nailing, be sure that all nails are covered by the next overlapping sheet.

**B.** Install approved underlayment on slopes greater than 5:12, mechanically attached, provided underlayment is used at all eaves, rakes, sidewalls, ridges/hips, valleys and around penetrations - as directed.

1. Start at the lowest part of the roof deck and install valley conditions first. Lay the membrane flat in place with the print side up.
2. Cut the underlayment to have 4" (101 mm) horizontal laps and 6" (152 mm) vertical laps on a minimum 5:12 roof slope. Overlaps should run with the flow of water in a shingling fashion.
3. Using a minimum 1" (25 mm) diameter cap nails, secure the underlayment by driving the nails squarely into the approved substrate.
4. Spacing should be 6" (152 mm) on center on both head and end laps, and 12" (304 mm) on center in the field area in the center of the roll. Note: please contact roof solutions for attachment recommendations for high wind areas.
5. Cap nails may be installed by hand or machine applied.

## 20 Year Watertight Warranty Assembly

25 year system requires a full application of approved underlayment at any slope greater than or equal to the minimum of 3:12

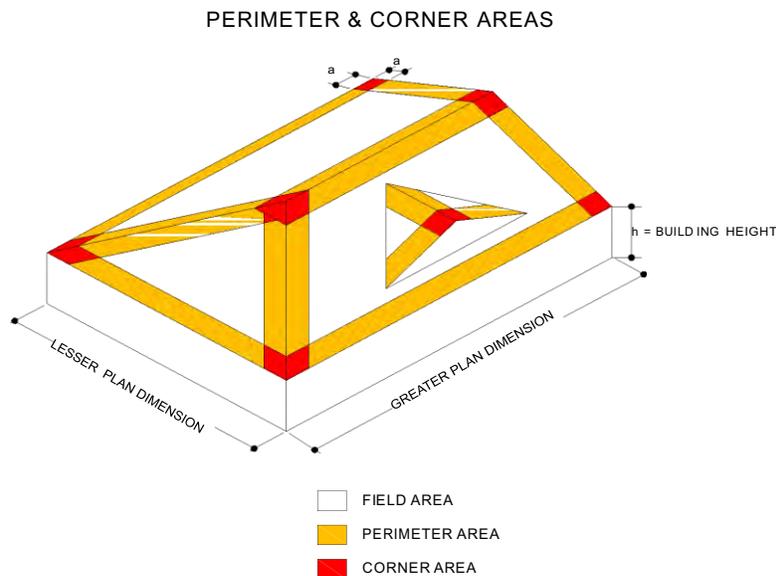
### SYSTEM INSTALLATION GUIDELINES

The following guidelines are for installing the Standing Seam Metal Roofing Panels. Refer to system details for additional specific installation information. ASSURE all installation components are available and correct prior to starting any installation.

#### A. Installation considerations to reduce oil canning

1. Assure that all substrates are within roofing manufacturer's required or approved designs and tolerances prior to commencement of work.
2. Assure that all supplied materials are as specified, approved and ordered for the job.
3. Proper care and handling of all materials at all times.
4. Proper use and adjustment of all installation tools.
5. Install all materials with proper clearance for thermal movements, both plus and minus, with manufacture's supplied accessories and details.
6. These installation guidelines are not in order of application. In most cases there are multiple steps that require blending of instructions and details.

#### B. Field, Perimeter and Corner areas of a metal roof



#### NOTE:

"a" = the lesser value of:  $(0.1 \times \text{"lesser plan dimension"})$  or  $(0.4 \times \text{"h"})$

"h" = building height

#### AND

"a" is never less than  $(0.04 \times \text{"lesser plan dimension"})$  or  $(4' \text{min})$

## **FLASHINGS**

### **DESIGN CONSIDERATIONS**

*Many factors affect the performance of the flashing system for specific detail requirements.*

*A flashing is a roofing element used to prevent water from penetrating the exterior surface of a roof or to intercept and lead water off of it. Flashings divert the water to the roofing panels. The panel then carries it to the gutters or roof edge. Typically, flashing intercepts water flowing down parapets, walls of higher adjacent construction, and roof penetrations. There are four typical locations where flashing is needed:*

- *Terminations*
- *Penetrations*
- *Joints*
- *Junctions*

#### **A. General**

1. Remove all existing flashing (i.e. metal, bituminous materials, mastic, etc.) .Flash all penetrations passing through the panel.
2. The flashing seal must be made directly to the (Metal Roof) penetration.

#### **B. Pipes, Round Supports, Structural Steel Tubing, etc.**

1. Flash penetrations with Pre-Molded Pipe boots wherever possible.
2. Structural Steel Tubing: Use a field-fabricated pipe flashing detail when the corner radius is greater than 1/4" (6.35 mm) and the longest side of the tube does not exceed 4" (101.6mm). When the tube exceeds 4" (101.6 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 Details for flashing requirements.

#### **C. Expansion Joints**

Install where specified by the project designer unless it intersects a valley or fails to continue through the roof edge cleat, high eave flashing, fascia board and gutter or tie into a logical transition with another joint. Install expansion joints in accordance with 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 is unacceptable due to potential rupture of the underlayment by fasteners and may void the Metal roof warranty.

## **ROOF PANEL FLASHINGS**

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### **A. Fixed Hip / Ridge**

1. Panel using appropriate specified Panel clips and fasteners, noting that first clip is to be 12" maximum from the centerline of hip / ridge.
2. Zee Closure must be cut to width of panel. Place butyl tape on bottom edge of Zee closure. Insert Zee Closure between seams of panel. Make sure to measure Zee Closure placement on panel using ridge flashing. Install 3 fasteners per panel for 16" panel, 4 fasteners for 18" panel.
3. Install Hip / Ridge flashing by locking onto Zee Closure. Pop rivet Ridge/Hip as needed.

### **B. Eave at Gutter**

1. Place gutter tightly against the eave.
2. Install drip edge flashing, fasten with approved fastener at 12" o.c. min.
3. Install panel using panel clips and fasteners, noting that the first clip is to be 18" maximum from eave.
4. Hem panel over lip of eave starter flashing, leaving the hem partially open for drainage.
5. Fold end tabs of panel seams over the end of the seam. Always fold tab to the inside of the seam.
6. Install Gutter Strap into Gutter assembly and fasten using approved fastener through eave starter flashing. \*Note Max 30" o.c. gutter strap spacing.

### **C. Rake at Gable End**

1. Install Modified J-channel at 2" minimum from rake edge. Fasten with approved fastener at 12" o.c.
2. Fill hem of Modified J-Channel with Butyl Sealant, and insert panel tightly into Modified J-Channel.
3. Install rake flashing and finish closing hem.

### **D. Fixed High Eave**

1. Install Cleat on high eave , from top of high eave and fasten with approved fastener at 12" o.c.
2. Zee Closure must be cut to width of panel. Place butyl tape on bottom edge of Zee closure. Insert Zee Closure between seams of panel. Make sure to measure Zee Closure placement on panel using high eave flashing. Install 3 fasteners per panel for 16" panel, 4 fasteners for 18" panel.
3. Install Panel using approved and specified panel clip and faster, noting that first clip is to be 12" maximum from high end of the panel
4. Install High eave flashing by locking onto cleat and zee closure.

### **E. Valley**

1. Install Valley Flashing into Valley.
2. Install cleat at 1" from top hems of valley flashing (both sides). Fasten over 3/16 x 2-1/2" triple beaded Butyl Tape, with approved fastener, through valley flashing into substrate..
3. Install Panel using specified and approved Panel clips, noting that first clip is paced at maximum 12" from centerline of valley (both sides).
4. Hem end of panels and fill hem with Butyl Sealant (both sides).
5. Install Panel over end of cleat (both sides).

### **F. Seam Section –end lap seam**

1. Run a 1/4" Diameter Bead of Butyl Sealant across the clip/cleat the width of the panes and up the sides of the seams at 10" 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.

## ROOF MAINTANENCE

As an owner, you have invested time and financial resources into selecting a high performance metal roof system. Maintaining your investment will assure that you get the full benefits a metal roof system can deliver. With this comes the added responsibility of making sure that you and those you employ keep the roof 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 roof system in excellent condition. Only a Metal Roofing Systems approved Installer should perform any complex repair or component addition to keep the warranty valid. In order to validate the watertight Warranty the owner must perform required periodic maintenance.

### ROOF MAINTANENCE GUIDELINES

- A.** To assure continued coverage under the Watertight Warranty provisions, the owner must perform regular inspection of the roof 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:
1. Notify us 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 approved installer to perform the repairs.
  2. Notify Metal Roofing Systems, Inc. of any leaks that occur between inspections. Please refer to the "Leak Notification" section of the "Terms and Conditions".
- B.** As discussed above, regularly scheduled maintenance is required. Additional inspections should be conducted if any of the following occurs:
1. *Fire, vandalism, damage from debris or other non-weather related causes.*
  2. *Extreme or severe weather such as high winds, hail, heavy rain, ice or snowstorms.* In the event of high winds the roof 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 over fill. 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.

3. *Un-trained individuals access the roof system.* 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.

## **SUGGESTIONS**

### **DO:**

- Inspect the roof system on a regular basis.
- Remove any debris from the roof and gutter system.
- Inspect the roof system after heavy snow or ice storms.
- Provide instructions for untrained personnel to protect the roof panels.
- Obtain written approval prior to any roof modification.
- Implement a regular roof maintenance program.

### **DON'T:**

- Neglect to maintain the roof 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 Metal Roofing Systems.
- Allow additional equipment or accessories to be installed without written approval from Metal Roofing Systems, Inc..

## **PROTECTING YOUR ROOF SYSTEM**

In order to maintain the effectiveness of your metal roofing System, We recommend that the following precautions be taken:

- A. All foot traffic should be kept to a minimum and only walk on the roof when absolutely required. Never step on the rib portion of the roof panel.
- B. Keep foot traffic to a minimum. Keep all roof hatches and access ladders or other access points secured. Only allow properly trained and authorized personnel on the roof system. Have authorized personnel accompany untrained individuals while they are on the roof system. Maintain a "Roof Access Log" to track individuals that have accessed the roof system.
- C. The design of the roof system is to drain or shed water. The following items should be avoided and could hinder water drainage:
  1. Do not allow equipment or structures to be installed that would impair or trap the flow of water.
  2. Do not allow debris to collect in the gutter system or on the roof panels.
  3. Do not allow wood blocking to be used as equipment supports or shims. The blocking will trap water and chemically treated wood contains salts and copper sulfates that harm the roof panels.

4. Do not allow water to shed freely from one roof system onto a lower roof.
5. Do not allow condensation from air conditioning units to drain onto the roof panels. Condensate will cause galvanic corrosion and will harm the roof panels. Use PVC pipes for drainpipes.
6. After heavy snow or ice storms the excessive snow should be removed from the roof 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.
7. Prior to the installation of additional equipment, pipes, vents, stacks, curbs, etc. We must be notified in writing. "M.R.S." must approve all added conditions or the warranty may be voided.
8. 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. Some examples are plumbing vents, copper lightning rods, copper trim or copper gutter systems.
9. If the roof system panels become scratched, completely clean with mineral spirits and use touch up paint supplied by the roof panel manufacturer.

### **TOUCH-UP PAINT APPLICATION**

Metal Roofing Systems may supply, upon request, touch-up paint with each project order. The touch-up paint may be supplied in small aerosol cans or bottles with a built-in brush applicator. The product is intended to touch-up small blemishes or exposed cut edges on fabricated components. Please be aware that touch-up paint does not have the same adhesion or durability as the factory applied coatings, and will exhibit chalking and fading characteristics at a noticeably faster rate than that of the factory applied coatings. Therefore, it is recommended that touch-up paint be used as sparingly as possible, no more than a few square inches, as any touch-up paint will become faded in contrast with the original factory applied color. When using touch-up paint, use extreme caution as excessive use may void the Watertight and Paint Finish warranties.

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

1. Preparation: Clean surface of any dirt, grease, oil, etc. If painting over exposed or bare metal, priming with an appropriate grade primer may be necessary.
2. Temperature: The temperature of the surface and paint should be between 68° and 92°F.
3. Application: Apply in small amounts.
4. For aerosol cans, spray into the container cap or a small cup.
5. Apply with as small an applicator brush as possible. For small blemishes, such as a surface scratch, a small brush similar to a finger nail polish brush is best. Dip the brush half the length of the bristles into the paint. Tap the brush against the side of the container but don't wipe against the lid. Hold at the handle near the base and apply light pressure with the fingertips to make the bristles slightly flex. Feather the touch-up paint into the scratch. Applying touch-up paint with a wide brush or anything larger than a small artist's brush is not recommended.

**B.** For areas larger than minor blemishes, contact your Technical Coordinator.

## **CLEAN THE METAL ROOF**

Immediate clean up is required by all workers. If the use of mortar or concrete is necessary near or on 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**

Two precautions should be observed:

1. 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.
2. For cleaning agents only use soap and water or contact technical representative.

## **TEMPORARY CLOSURE (NOT WARRANTED)**

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

-- END OF SECTION --