

SECTION 07 72 53

DUALGARD® SNOW GUARDS

This section has been prepared by Metal Roof Innovations, Ltd. for use in the preparation of a project specification. Attachment may be by one of the following methods:

S-5! Mini Clamps: A non-penetrating system for use on standing seam metal roofs.

The following should be noted in using this specification:

Notes are included to assist the user in editing the section to suit project requirements. These notes are included as hidden text, and can be revealed or hidden by one of the following methods:

Microsoft Word: From the pull-down menus select TOOLS, then OPTIONS. Under the tab labeled VIEW, select or deselect the HIDDEN TEXT option.

Corel WordPerfect: From the pull-down menus select VIEW, then select or deselect the HIDDEN TEXT option.

Hypertext links to specific websites are included after manufacturer names and names of organizations whose standards are referenced within the text, to assist in product selection and further research. Hypertext links are contained in parenthesis, e.g.:

(www.S-5.com)

Optional text requiring a selection by the user is enclosed within brackets, e.g.: "Section [09 00 00.] [____.]"

Items requiring user input are enclosed within brackets, e.g.: "Section [____ - ____]."

Optional paragraphs are separated by an "OR" statement, e.g.:

**** OR ****

"Green" requirements are included for projects requiring LEED certification, and are included as green text. For additional information on LEED, visit the U.S. Green Building Council website at www.usgbc.org.

For assistance on the use of the products in this section, contact Metal Roof Innovations, Ltd. by calling 888-825-3432, by email at info@S-5solutions.com, or visit our website at www.S-5.com.

PART 1 - GENERAL

1.1 SUMMARY

Edit the following paragraphs to include only those items specified in this section.

- A. Section Includes:
1. Snow guards for metal roofs.
 2. Non-penetrating attachment system.

1.2 RELATED SECTIONS

Coordinate the following paragraphs with other sections in the project manual.

- A. Division 01: Administrative, procedural, and temporary work requirements apply to this section.
- B. Section 07 41 13 - Metal Roof Panels
- C. Section 07 61 00 - Sheet Metal Roofing
- D. Section 07 62 00 – Sheet Metal Flashing and Trim
- E. Section 07 72 55 - Roof Accessory Attachment System
- F. Section 13 34 19 – Metal Building Systems

1.3 REFERENCES

- A. Aluminum Association (AA) (www.aluminum.org) - Aluminum Standards and Data, 2003 Edition.
- B. ASTM International (ASTM) (www.astm.org):
 1. A484/A484M-16 – Standard Specifications for General Requirements for Stainless Steel Bars, Billets, and Forgings
 2. A554-16 – Standard Specification for Welded Stainless Steel Mechanical Tubing
 3. A555/A555M-16 – Standard Specification for General Requirements for Stainless Steel Wire and Wire Rods
 4. B85-03 - Standard Specification for Aluminum-Alloy Die Castings
 5. B221-04a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
 6. F836M-02 (2015) – Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric).
 7. F880-12 – Standard Specification for Stainless Steel Socket, Square Head, and Slotted Headless-Set Screws

1.4 SUBMITTALS

Limiting submittals to only those actually required helps to minimize liability arising from the review of submittals. Minimize submittals on smaller, less complex products.

Include the following for submission of shop drawings, product data, and samples for the Architect's review.

- A. Action Submittal:
 1. Shop Drawings: Include roof plans showing locations of snow guards on roof and attachment details and spacing signed and sealed by a professional engineer.
 2. Product Data:
 - a. Product description.
 - b. Construction details.
 - c. Material descriptions.
 - d. Individual component dimensions.
 - e. Finishes.
 - f. Installation instructions.
 3. Samples:
 - a. Clamp samples.
 - b. 12-inch long cross member samples including all associated hardware.
- B. Informational Submittals:
 1. Include calculation of number and location of snow guards based on designed roof snow load, roof slope, roof type, components, spacings and finish.
 2. Test results: Results of product tensile load testing, issued by a recognized independent testing laboratory, showing ultimate load-to-failure value of attachment.

Include the following for submission of closeout submittals for the Owner's record purposes.

- C. Closeout Submittals:

1. Certification: Installer's certification that snow guard system was installed in accordance with manufacturer's instructions and approved Shop Drawings.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer to specialize in production of Snow Guard Products of the type specified with a minimum of 20 years documented experience.
- B. Installer Qualifications: Installer to specialize in metal roof installation and installation of Snow Guard Products with a minimum of 5 years documented experience.

Include the following for full size mockups for review of construction and coordination of work of several sections.

- C. Mockup:
 1. Size: Minimum [8] [___] feet long.
 2. Show: Snow guard attachment, cross members, and accessories.
 3. Locate [where directed.] [____.]
 4. Approved mockup may remain as part of the Work.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver components to jobsite properly packaged to provide protection during transport, delivery and handling.
- B. Store products in manufacturer's original labeled and unopened packaging in a clean and dry location, protected from potential damage, until ready for application.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

Include the following for snow guards installed using S-5! clamps on standing seam roofs only.

- A. Attachment system to provide attachment to standing seam metal roofs:
 1. With only minor dimpling of panel seams.
 2. Without penetrations through roof seams or panels.
 3. Without use of sealers or adhesives.
 4. Without voiding roof warranty.

Roof snow loads that can be expected for any given project vary based on project location, roof dimensions, roof slope, wind effects, and building configuration. The following paragraph establishes the minimum in-service vector load in pounds per linear foot of eave, which is then used to design the attachment system. This vector load must be determined from the site-specific details by a structural engineer or in conjunction with the S-5! distributor. Note that the in-service vector load is not the same as the code-dictated snow load based on horizontal at-grade surfaces.

- B. Performance Requirements: Provide snow guards to withstand exposure to the weather and environmental elements, and resist design forces without failure due to defective manufacture.
 1. Loading: Design snow guard system to resist minimum in-service vector load of [___] pounds per linear foot of eave.
 2. Factor of safety: Utilize a factor of safety \geq [2] [____] to determine allowable loads from ultimate tested clamp tensile load values.
 3. Source Limitation: Provide snow guard system as designed and tested by the manufacturer as a complete system. Install components by the same manufacturer.

2.2 MANUFACTURER

- A. Acceptable Manufacturer: S-5! Metal Roof Innovations, Ltd., 8655 Table Butte Road, Colorado Springs, CO. 80908; Tel: 888-825-3432; Fax: 719-495-0045; Email: support@s-5.com; Web: www.s-5.com (www.S-5.com)

Edit the following to indicate whether or not substitutions will be permitted for the products in this section.

- B. Substitutions: Not permitted.

2.3 PIPE-TYPE SNOW RETENTION SYSTEMS FOR STANDING SEAM METAL ROOFS

Include the following for roofs using S-5! non-penetrating attachment clamps. Do not use S-5! Standard Clamps for the attachment of DualGard with the exception of the S-5-KHD.

- A. Basis of Design: DualGard, manufactured by S-5! Metal Roof Innovations, Ltd.
- B. Components:
 - 1. Clamps
 - a. Manufactured from 6061-T6 aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards and Data.
 - 1) Model: No. [S-5-U Mini.] [S-5-S Mini.] [S-5-T Mini.] [S-5-Z Mini.] [S-5-E Mini.] [S-5-B Mini.] [S-5-Q Mini.] [S-5-H Mini.] [S-5-H90 Mini.] [S-5-N Mini.] [S-5-N 1.5 Mini.] [S-5-KHD.] [S-5-V Mini.] [S-5-K Grip Mini.] [S-5-R465 Mini.]
 - b. Set screws: 300 Series stainless steel, 18-8 alloy, 3/8 inch (9.525 mm) diameter, with round nose point.
 - c. Attachment bolts: 300 Series stainless steel, 18-8 alloy, 8 mm diameter, hex flange bolt.
 - 2. Pipe Brackets:
 - a. Manufactured from 5000 Series alloy and temper aluminum conforming to ASTM B221 and AA Aluminum Standards and Data.
 - 3. Pipe Couplings (Splices):
 - a. Manufactured from 6005a-T61 Series alloy and temper aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
 - 4. Pipes (Cross Members):
 - a. Manufactured 6005a-T61 Series alloy and temper aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
 - 5. Snow and Ice Clips:
 - a. Aluminum, with rubber foot, minimum 3 inches wide.
 - 1) Model: DualClip II for standing seam heights 1 inch (25.4 mm) to 1.5 inch (38.1 mm)
 - 2) Model: DualClip III for standing seam heights 1.75 inch (38.1 mm) to 3.25 inch (82.55 mm)
 - 6. End Caps:
 - a. Rubber or metal, black or color-matched.

Snow and ice clips are required for standing seam roofs with seam heights of 2 inches or more and are optional for seam heights less than 2 inches.

PART 3- EXECUTION

3.1 EXAMINATION

Include the following for roofs using S-5! attachment.

- A. Prior to beginning installation, verify that:
 - 1. Panel seaming is complete.
 - 2. Panel attachment is sufficient to withstand loads applied by snow guard system.
 - 3. Installation will not impede roof drainage.

3.2 PREPARATION

- A. Clean areas to receive attachments; remove loose and foreign matter that could interfere with installation or performance.

Include the following for roofs using S-5! clamp attachment.

3.3 INSTALLATION

- A. Install system in accordance with manufacturer's instructions and approved Shop Drawings.
- B. DualGard Snow Retention System:
1. Pre-assemble one S-5! Mini clamp to each pipe bracket assuring the set screws are facing the correct side of the standing seam they will be applied to. Attach S-5! Mini clamps to pipe brackets on what will become the upslope side of the assembly. Hand tighten M8 bolt fastening S-5! Mini clamp to pipe bracket. Pre-load set screws into clamps.
 2. Insert pipes into pre-assembled upslope pipe bracket and S-5! Mini clamp assemblies. Insert a pipe collar inside last bracket of either end of the run as pipe is inserted into brackets.
 3. Place downslope clamps on standing seams at maximum 48 inches (1219 mm) on center or as required by in-service loads.
 4. Place downslope clamps in straight, aligned rows using a string line.
 5. Some clamps are directional. Reference installation instructions for the specific clamp used to assure they are oriented correctly.
 6. Tighten downslope clamp set screws to manufacturers recommended torque. Test set screw torque using calibrated torque wrench.
 7. Attach pre-assembled upslope row of S-5! Mini clamps with attached pipe brackets and pipes aligning with downslope clamps. Tighten M8 bolt to fasten pre-assembly on downslope clamps to recommended torque of 156 inch pounds (13 foot pounds) (17.63 Newton meters)
 8. Tighten upslope clamp set screws to standing seams to manufacturers recommended torque. Test set screw torque using calibrated torque wrench. Then, tighten M8 bolt on upslope clamps to recommended torque of 156 inch pounds. (13 foot pounds) (17.63 Newton meters)
 9. Install pipe coupling at adjoining pipe end joints. Insert coupling halfway into pipe that will be joined to next pipe in the run.
 10. Cut extended end of pipe at end of run. Do not cantilever pipes more than 4 inches beyond last clamp and bracket at ends.
 11. Apply end cap to each pipe.

Include the following when applicable. Use one DualClip per panel for panels up to and including 24 inch seam spacing and two per panel over 24 inches.

12. Install [one DualClip] [two DualClips] per panel between panel seams.
 - a. DualClips: Secure [DualClip II] [DualClip III] to back side of cross member using stainless steel #10 x ½ inch (12.7 mm) screw.

END OF SECTION