

SECTION 26 31 00.01

PHOTOVOLTAIC COLLECTOR ATTACHMENT SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Photovoltaic Collector Attachment for metal roofs.
 - 2. Non-penetrating attachment system.
 - 3. Exposed fastened/Face fastened attachment system.

1.2 RELATED SECTIONS

- 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 00 – Roof Accessories
- F. Section 13 34 19 – Metal Building Systems
- G. Section 26 31 00 – Photovoltaic Collectors

1.3 REFERENCES

- A. Aluminum Association (AA) - Aluminum Standards and Data, 2003 Edition.
- B. ASTM International (ASTM):
 - 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. F836M-02 (2015) – Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric).
 - 6. F880-12 – Standard Specification for Stainless Steel Socket, Square Head, and Slotted Headless-Set Screws.
- C. Underwriters Laboratory (U.L.)
 - 1. UL 2703 – Standard for Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for use with Flat-Plate Photovoltaic Modules.

1.4 SUBMITTALS

- A. Action Submittal:
 - 1. Shop Drawings: Include roof plans showing locations of photovoltaic attachment devices on roof and attachment details and spacing.

2. Product Data:
 - a. Product description.
 - b. Construction details.
 - c. Material descriptions.
 - d. Individual component dimensions.
 - e. Finishes.
 - f. Test report.
 - g. Installation instructions.
 3. Samples:
 - a. Clamp or Bracket samples.
 - b. All associated attachment hardware.
- B. Informational Submittals:
1. Test results: Results of product tensile load testing of attachment clamp, issued by a recognized independent testing laboratory, showing ultimate load-to-failure value of attachment specific to the manufacturer of the roofing, profile of the roof panel, and material of the roofing.
- C. Closeout Submittals:
1. Certification: Installer's certification that utility attachment 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 Metal Roof Attachment Products of the type specified with a minimum of 20 years documented experience.
- B. Installer Qualifications: Installer to be certified in Photovoltaic Collector installation and specialized in installation of Metal Roof Attachment Products with a minimum of 5 years documented experience.
- C. Mockup:
 1. Size: Minimum [8] [___] feet long.
 2. Show: Photovoltaic attachment clamps, attachment hardware, and accessories.
 3. Locate [where directed.] [____.]
 4. Approved mockup may remain as part of the Work.
- D. Field Testing: Installer to complete required field testing of Photovoltaic Attachment devices as required by building codes.

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

- 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.
- B. Attachment system to provide attachment to exposed fastened/face fastened rib, trapezoidal of corrugated metal roofs:
 1. Attached with gasketed fasteners.
 2. With use of integrated EPDM seals if fixed above the water plane.
 3. With use of integrated butyl seals if fixed below the water plane.

4. Without voiding roof warranty.
- C. Performance Requirements: Provide attachments to withstand exposure to the weather and environmental elements, and resist design forces without failure due to defective manufacture.

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
- B. Substitutions: Not permitted.

2.3 PHOTOVOLTAIC ATTACHMENT SYSTEMS FOR STANDING SEAM METAL ROOFS

- A. Basis of Design: S-5-PV Kit and EgdeGrab manufactured by S-5! Metal Roof Innovations, Ltd.
- B. Components:
 1. Clamps:
 - a. Manufactured from 6000 series aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards and Data.
 - 1) Model: S-5! Standard Mini Clamp No. [S-5-U MINI.] [S-5-S MINI.] [S-5-T MINI.] [S-5-Z MINI.] [S-5-E MINI.] [S-5-Q MINI.] [S-5-H MINI.] [S-5-K700 MINI.] [S-5-H90 MINI.] [S-5-N MINI.] [S-5-N 1.5 MINI.] [S-5-KHD MINI.] [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 diameter, with round head point.
 2. Universal Mounting stud and disk:
 - a. Manufactured from 300 series stainless steel conforming to ASTM A484/A484M-16 for mounting disk and stainless steel conforming to ASTM A555/A555M-16 for mounting stud.
 - 1) Model: S-5! Universal Mounting Disk and Universal PV Stud
 3. Universal PV Grab:
 - a. Manufactured from 6000 series aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
 - 1) Model: S-5! Universal PV Grab
 4. Universal Edge Grab:
 - a. Manufactured from 6000 series aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
 - 1) Model: S-5! EdgeGrab

2.4 PHOTOVOLTAIC ATTACHMENT SYSTEMS FOR EXPOSED FASTENED/FACE FASTENED RIB, TRAPEZOIDAL AND CORRUGATED METAL ROOFS

- A. Basis of Design: S-5-PV Kit and EgdeGrab manufactured by S-5! Metal Roof Innovations, Ltd.
- B. Components:
 1. Brackets:
 - a. Manufactured from 6000 series aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards and Data or stainless-steel conforming to ASTM A484/A484M-16 and A554-16.
 - 1) Model: S-5! Standard Mini Clamp No. [RibBracket MINI.] [CorruBracket T100 MINI.]
 - 2) Model: S-5! Standard Clamp No. [CorruBracket.] [VersaBracket 47.] [ProteaBracket.]
 - b. Set screws: 300 Series stainless steel, 18-8 alloy, 3/8 inch diameter, with round head point.
 - c. Clamp gasket: Factory applied EPDM.

- d. Attachment screws: 1/4" (6.3mm) Diameter - 1" (25mm) Length - Stainless Steel Self-Tapping Screw with Hardened Steel Piercing Point - 5/16" (8mm) Hex Head - 5/8" (16mm) Stainless Steel/EPDM Sealing Washer
- 2. Universal Mounting stud and disk:
 - a. Manufactured from 300 series stainless steel conforming to ASTM A484/A484M-16 for mounting disk and stainless-steel conforming to ASTM A555/A555M-16 for mounting stud.
 - 2) Model: S-5! Universal Mounting Disc and Universal PV Stud
- 3. Universal PV Grab:
 - a. Manufactured from 6000 series aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
 - 2) Model: S-5! Universal PV Grab
- 4. Universal Edge Grab:
 - a. Manufactured from 6000 series aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
 - 2) Model: S-5! EdgeGrab

PART 3- EXECUTION

3.1 EXAMINATION

Prior to beginning installation, verify that:

1. Panel seaming or fastening is complete.
2. Roof panel attachment is sufficient to withstand loads applied by the photovoltaic attachment system, photovoltaic system and associated components.
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.

3.3 INSTALLATION

- A. Install system in accordance with manufacturer's instructions and approved Shop Drawings

- B. S-5! P-V-Kit and Edge Grab System on Standing Seam Metal Roofs:

1. Place clamps as required by PV layout and in-service loads.
2. Place clamps in straight, aligned rows.
3. Tighten set screws to manufacturer's recommended torque. Randomly test set screw torque using calibrated torque wrench.
4. Attach Universal Mounting stud and disc to clamp; tighten to manufacturer's recommended torque.
5. Apply PV panels on top of mounting disc.
6. Attach Universal PV EdgeGrab to Mounting stud on edges of PV panels; tighten bolts to manufacturer's recommended torque.
7. Attach Universal PV Grab to Mounting stud between PV panels; tighten bolts to manufacturer's recommended torque.

- C. S-5! P-V-Kit and Edge Grab System on Exposed Fastened/Face Fastened Rib, Trapezoidal Corrugated Metal Roofs:

or

1. Place brackets as required by PV layout and in-service loads.
2. Place brackets in straight, aligned rows.
3. Peel protective strip from factory applied EPDM or butyl seals prior to attaching bracket. Attach brackets to metal roof with recommended fasteners. Do not remove EPDM Sealing Washer on fastener. Do not over-drive fastener.

4. Attach Universal Mounting stud and disc to bracket; tighten to manufacturer's recommended torque.
5. Apply PV panels on top of mounting disc.
6. Attach Universal PV EdgeGrab to Mounting stud on edges of PV panels; tighten bolts to manufacturer's recommended torque.
7. Attach Universal PV Grab to Mounting stud between PV panels; tighten bolts to manufacturer's recommended torque.

END OF SECTION