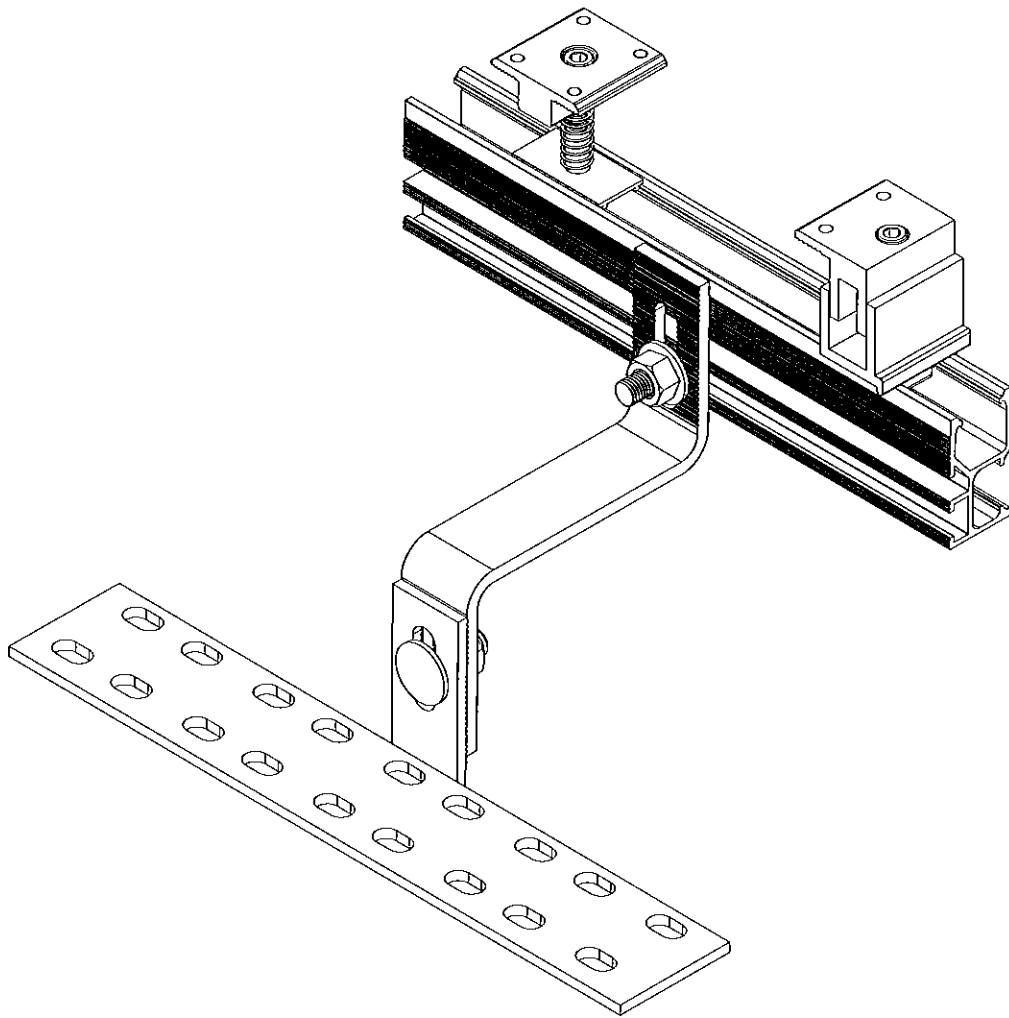


SOLARACK



Adjustable S-Tile Installation Manual

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Before Installation, Please Review the Following Checklist

- Ensure that SolaRack® is compliant with your module manufacturer.
- Ensure compliance with any clearances required by your local fire department or building & safety code.
- Ensure your work complies with national, state and local requirements - Even those that may supersede this manual.
- All installations must be performed by licensed contractors & electricians that are bonded and insured.
- Only use system components supplied by SolaRack®
- Make sure your roof is in proper condition prior to installation. Do not install on damaged roofs!
- Use only appropriate, recommended tools and wear safety goggles and gloves during installation

Fire Classification UL 1703

- Any Roof Slope with Module Types 1 and 2
- Testing performed at 5" from roof surface (worst case). System can be installed at any height.
- Class A rated PV systems can be installed on Class A, B, and C roofs without affecting the roof fire rating.

Grounding & Bonding UL2703

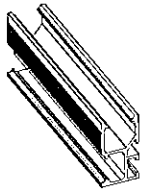
Components tested and listed as a grounding method are:

- Universal Mid Clamp
- Universal End Clamp
- Splice Kit
- Micro Bolt, Listed to ground Solaredge Optimizers



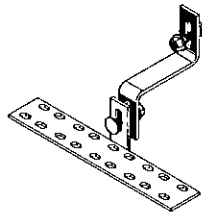
Intertek
5011267
CONFORMS TO
UL STD 2703

SolaRack Components



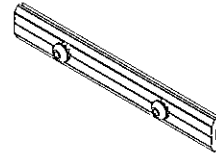
SolaRack MCR 2.0 Rail

Material: Aluminum AL 6000 Series
Finish: Anodized Clear or Black
Item Number: IGB-SR-2.0MCR136
or IGB-SR-2.0MCR172



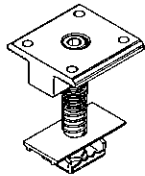
Adjustable S-Tile Hook

Material: SUS304
Item Number: IGB-SR-ADJS



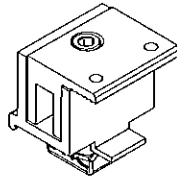
SolaRack Splice Kit

Material: Aluminum AL 6000 Series
Finish: Clear Anodized / Black Electrophoresis
Item Number: IGB-SR-SK or IGB-SR-SKB
Features: Tightening screws and star washers ground the splice bar and rail.



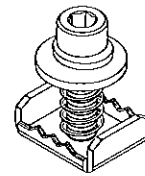
Universal Mid Clamp

Material: Aluminum AL 6000 Series
Finish: Clear Anodized
Black Electrophoresis
Item Number: IGB-SR-MUNI2846S
or IGB-SR-MUNI2846B
Frame Size: 28mm-46mm



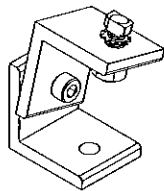
Universal End Clamp

Material: Aluminum AL 6000 Series
Finish: Clear Anodized
Black Electrophoresis
Item Number: IGB-SR-EUNI2846S
or IGB-SR-EUNI2846B
Frame Size: 28mm-46mm



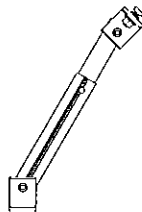
SolaRack Micro Bolt

Material: SUS304
Finish: Stainless Steel
Item Number: IGB-SR-MICRO
Features: UL Listed to ground Solaredge optimizers SE-Pxxx



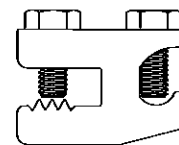
Front Tilt Kit

Material: Aluminum AL 6000 Series
Finish: Anodized Clear
Item Number: IGB-SR-FT
Features: Dual tilt bracket, L-Foot attachment and rail attachment



SolaRack Back Tilt Leg

Material: Aluminum 6000 Series
Finish: Clear Anodized
Item Number: IGB-SR-xxx
Features: Available in 3 different sizes 10°-15°, 15°-30° & 30°-45°



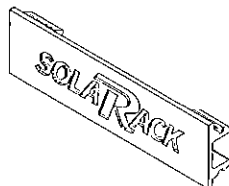
ILSCO Grounding

Material: 6061-T6 Aluminum
Finish: Clear
Item Number: SGB-4
Features: UL Listed 467,
"For single-use only"



Universal Rail Cap

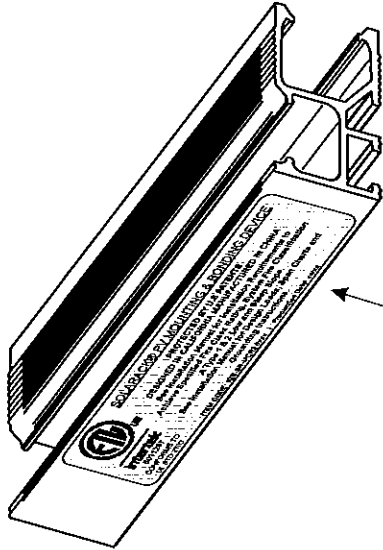
Material: UV-Rated PVC
Finish: Black
Item Number: IGB-SR-ENDCAP



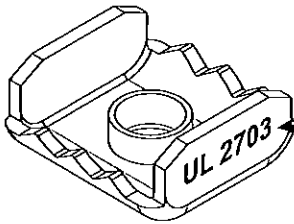
Wire Management

Material: UV Rated PVC
Finish: Black
Item Number: IGB-SR-EUNI2846S

Markings

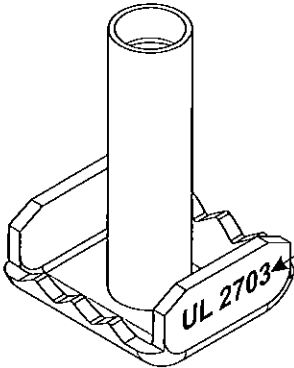


All Solarack MCR 2.0 Rails are marked by the following label



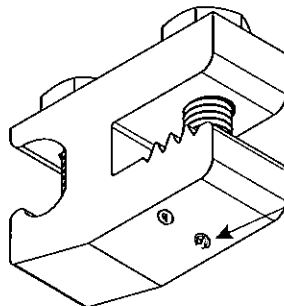
UL 2703

Stamped on Solarack® Micro attachment bolt channel nut. Item # IGB-SR-MICRO



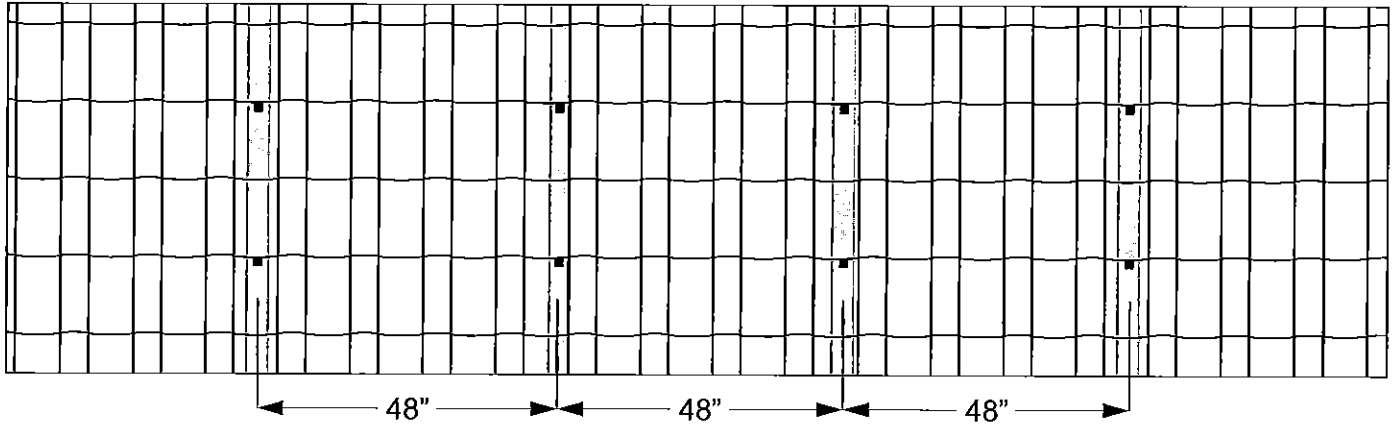
UL 2703

Stamped on Solarack® Mid & End Clamps Channel nut. Item # IGB-SR-MUNI2846 / EUNI2846



Stamped on ILSCO SGB-4 Grounding Lug

Recommended Placement & Spacing of Roof Attachments

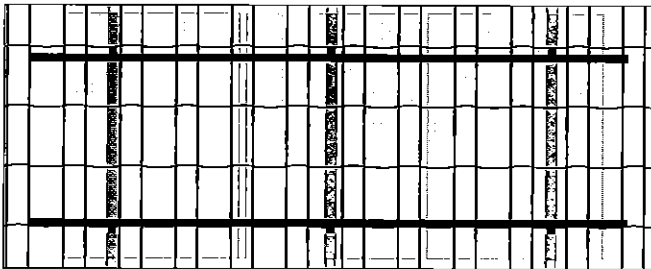


IMPORTANT:

Maximum span allowed is 4 ft between attachments.

The SolaRack® Adjustable S-Tile Hook is fully adjustable in height to accommodate all curved tiles. For measurements related to clearances and roof setbacks, please refer to your local building and safety office or other authorities having jurisdiction. When using the Adjustable S-Tile with SolaRack® MCR 2.0 Rails, attachments may be spaced up to 48". For proper installation, please refer to the **detailed installation guide on page 11**. Lag screw must be installed in the center of a roof rafter and sealant must be applied during installation. Installation must be performed by licensed professionals to avoid roof damage. Deforming tiles in any way during installation can and will shorten the lifespan of the roofing. Be sure not to install systems on poor quality or damaged surfaces.

Mounting Instructions: Portrait

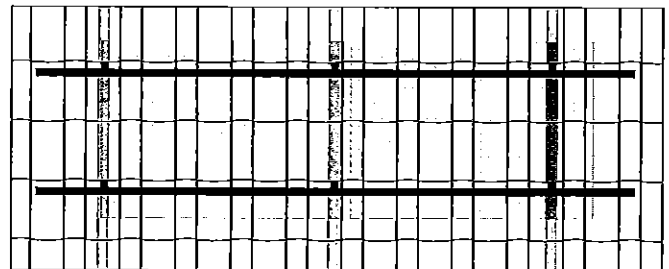


Please follow this instruction graphic when solar modules are mounted in portrait alignment. Rail must be mounted 8"-18" from the top and bottom edge of the solar module.

Some solar module manufacturers may have specific requirements rail placement that differs from these instructions, please check with your module manufacture for compliance regarding mounting requirements.

Rail must not exceed 16" cantilever past the last attachment.

Mounting Instructions: Landscape

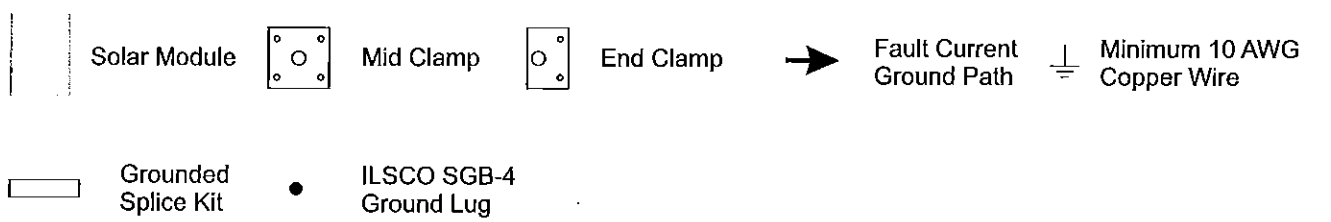
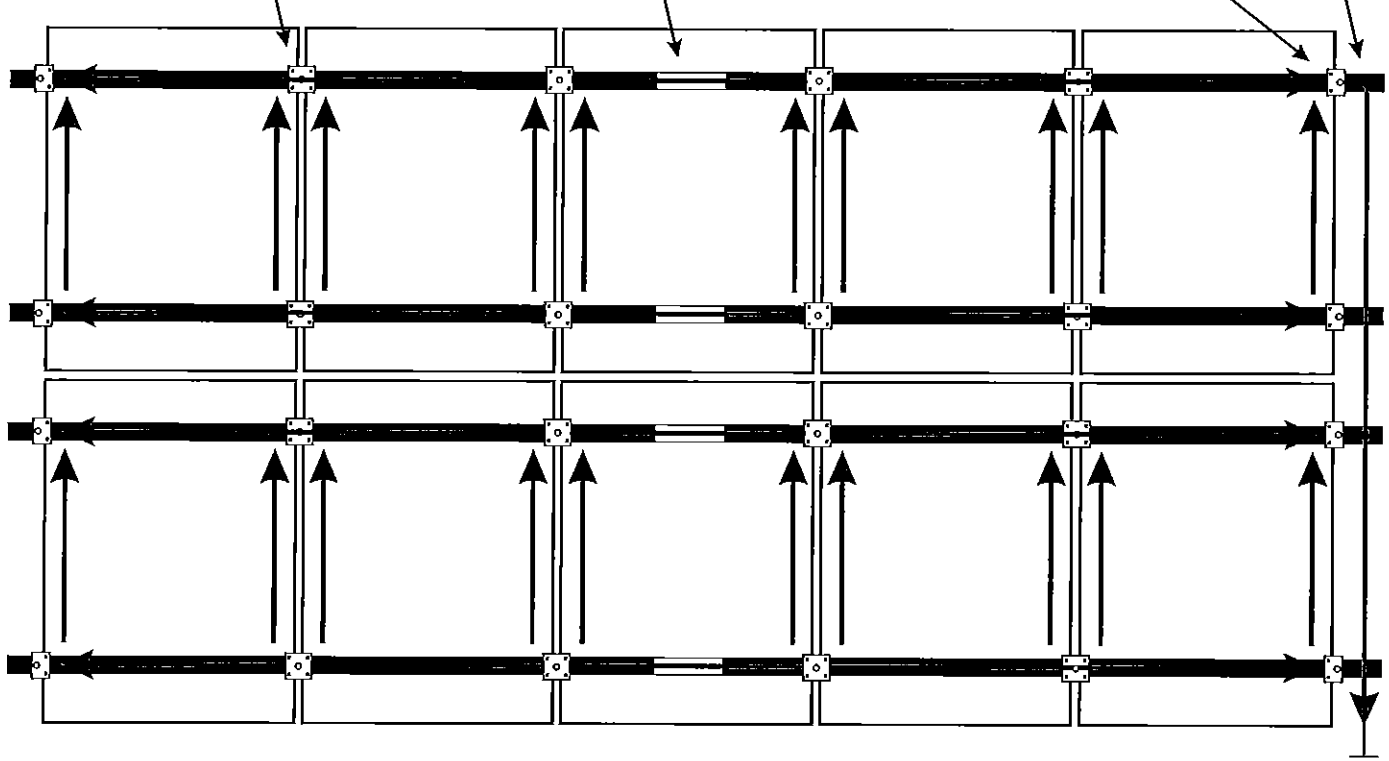
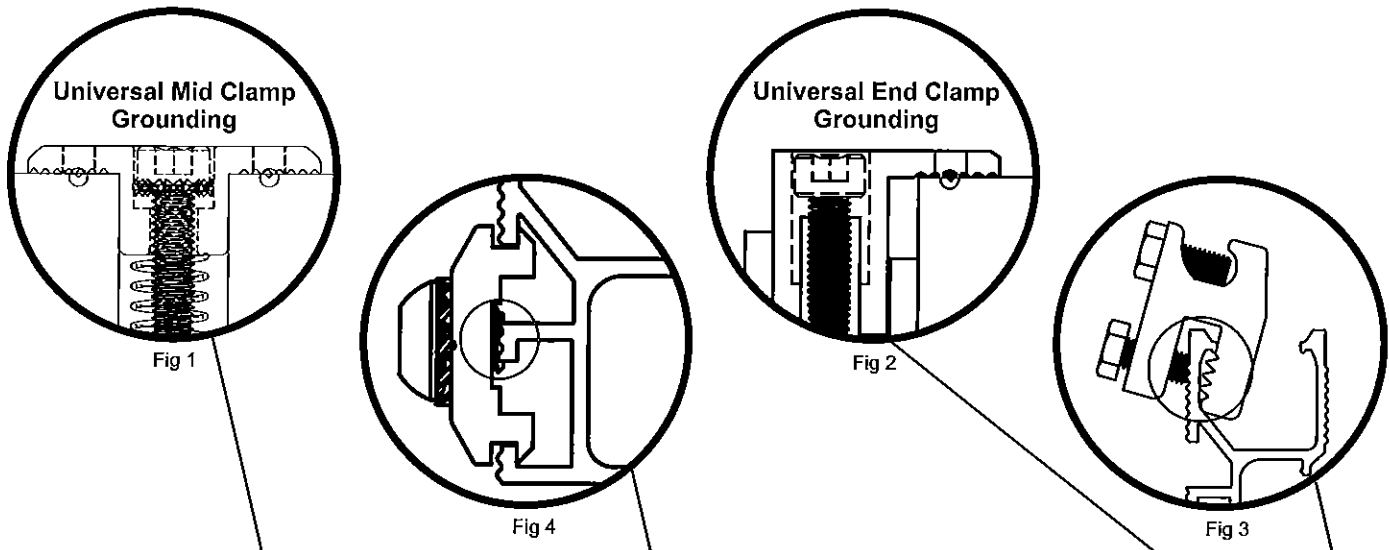


Please follow this instruction graphic when solar modules are mounted in landscape alignment. Rail must be mounted 4"-7" from the top and bottom edge of the solar module.

Some solar module manufacturers may have specific requirements rail placement that differs from these instructions, please check with your module manufacture for compliance regarding mounting requirements.

Rail must not exceed 16" cantilever past the last attachment.

Grounding Component & Electrical Diagram



Qualified Solar PV Frames

Manufacturer	Model Numbers
Systems are allowed to mount module frame/ profile height: 28mm - 46mm	
Boviet	BVM6610M-###, BVM6612M-PERC-###, BVM6610P-###, BVM6612P-###, (where ### represents the wattage)
Canadian Solar	40mm frames and model identifier CS6Y-xxxZ; where "Y" can be K, P, V, or X; and "Z" can be M, P, PX, or P-SD (where xxx represents the wattage)
JA Solar	Modules with 35, 40 and 45mm frames and model identifier JAyyzz-bb-xxx/aa; where "yy" can be M, P, M6 or P6; "zz" can be blank, (K), (L), (R), (V), (BK), (FA), (TG), (FA)(R), (L)(BK), (L)(TG), (R)(BK), (R), (TG), (V)(BK), (BK)(TG), or (L)(BK)(TG); "bb" can be 48, 60, 72, 60S01 or 72S01; and "aa" can be MP, SI, SC, PR, RE, 3BB, 4BB, 4BB/RE, 5BB
Hyundai Solar	HiS-M###RI, HiS-S###RI, HiS-M###RG, HiS-S###RG (Where ### represents the wattage)
Kyocera	Modules with 46mm frames and model identifier KYxxxZZ-AA; where "Y" is D or U; "ZZ" is blank, GX, or SX; and "AA" is LPU, LFU, UPU, LPS, LPB, LFB, LFBS, LFB2, LPB2, 3AC, 3BC, 3FC, 4AC, 4BC, 4FC, 4UC, 5AC, 5BC, 5FC, 5UC, 6BC, 6FC, 8BC, 6MCA, or 6MPA
Mission Solar	MSE### (Where ### represents the wattage)
LG Electronics	LG### (where ### represents the wattage)
Phono Solar	Modules with 35, 40, or 45mm frames and model identifier PSxxxY-ZZ/A; where "Y" is M or P; "ZZ" is 20 or 24; and "A" is F, T or U
Solar World	SW ### (where ### represents the wattage)
Silfab	Modules with 38mm frames and model identifier. SYZ-xxx; where "YY" can be SA or LA; SG or LG; and "Z" can be M, P, or X
Suniva	Modules with 35, 38, 40, or 46mm frames and model identifiers OPTxxx-AA-B-YYY-Z or MVXxxx-AA-B-YYY-Z; where "AA" is either 60 or 72; "B" is either 4 or 5; "YYY" is either 100,101,700,1B0, or 1B1; and "Z" is blank or B
Sunpower Corp	SPR-EYY-### (where YY represents numbers 18, 19, 20 or 21, and ### represents the wattage)
Suntech	Vd, Vem, Wdb, Wde, and Wd series modules with 35, 40, and 50mm frames
Trina Solar	TSM-### (where ### represents the wattage)
Yingli	Panda, YGE, and YGE-U series modules with 35 or 40mm frames

UL Requirement & Guidelines

Please read carefully and follow the following guidelines and standards set by UL to comply with the ETL certification issued. SolaRack® is certified by ETL for the following listing: UL STD 1703 Fire Rating & UL STD 2703 Grounding and Bonding. The components evaluated for grounding and bonding that has passed received the UL STD 2703 by ETL are as follow:

- SolaRack® Integrated Grounding & Bonding Series IGB-SR-MUNI2846 Universal Mid Clamp both in clear anodized and black electrophoresis.
- SolaRack® Integrated Grounding & Bonding Series IGB-SR-EUNI2846 Universal End Clamp both in clear anodized and black electrophoresis.
- SolaRack® Integrated Grounding & Bonding Series IGB-SR-SK Splice Kit both in clear anodized and black electrophoresis.
- SolaRack® Integrated Grounding & Bonding Series IGB-SR-MICRO Micro Attachment Bolt Listed to ground Solaredge Optimizers.

CONFORMS TO **UL STD 1703**

SolaRack® racking systems have been tested and listed by ETL for system fire classification Class A type 1& 2. Testing was preformed and passed at 5" above the roof, allowing installation without limitation of distance between the roof and solar modules. System assembly to be mounted over a fire resistant roof covering rated for application. Re-inspect the installation for loose components, loose fasteners and any corrosion. If found, the affected components are to be replaced immediately.

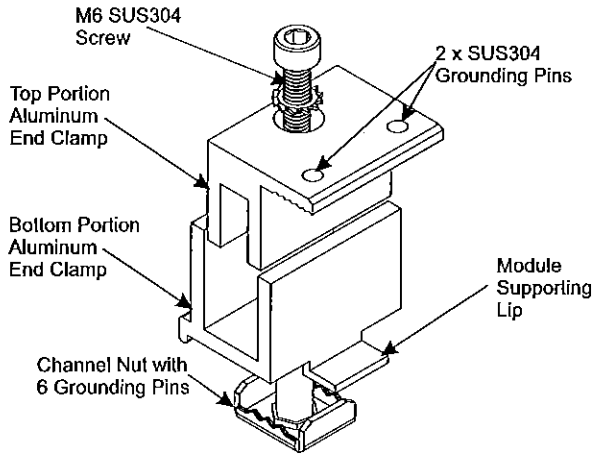
CONFORMS TO **UL STD 2703**

SolaRack® system components were evaluated assuming a 20 Amp maximum series fuse size. SolaRack® mid & end clamps bond and ground the system by penetrating the anodized surface of the solar module with our stainless steel pointed pins. (Fig 1,2) The system is grounded to the rails by stainless steel channel nut. At the end of every array, an ILSCO SGB-4 ground lug must be used for grounding (Fig 3), ILSCO SGB-4 acceptable wire size is 4-14 SOL-STR and is suitable for use with either copper or aluminum wire, The size of grounding wire will be determined by electrical code. The SolaRack® splice kit was tested as a grounding & bonding method and is also listed under UL 2703 (Fig 4). SolaRack® does not require jumpers! Periodic inspection is required. Re-inspect installation for loose components, loose fasteners and any corrosion, such that if found the affected components are to be replaced immediately.

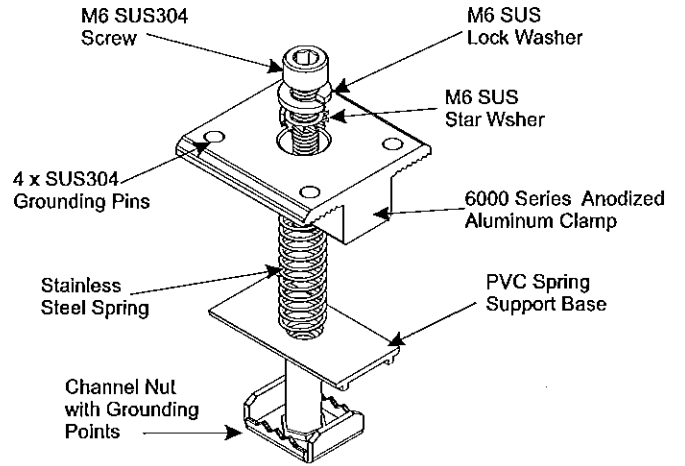
Important

- All bare copper must be separated from any aluminum surface.
- Check with your local AHJ regarding roof setbacks or any special requirements.
- Some jurisdiction's require visible labels to easily identify UL listed systems.

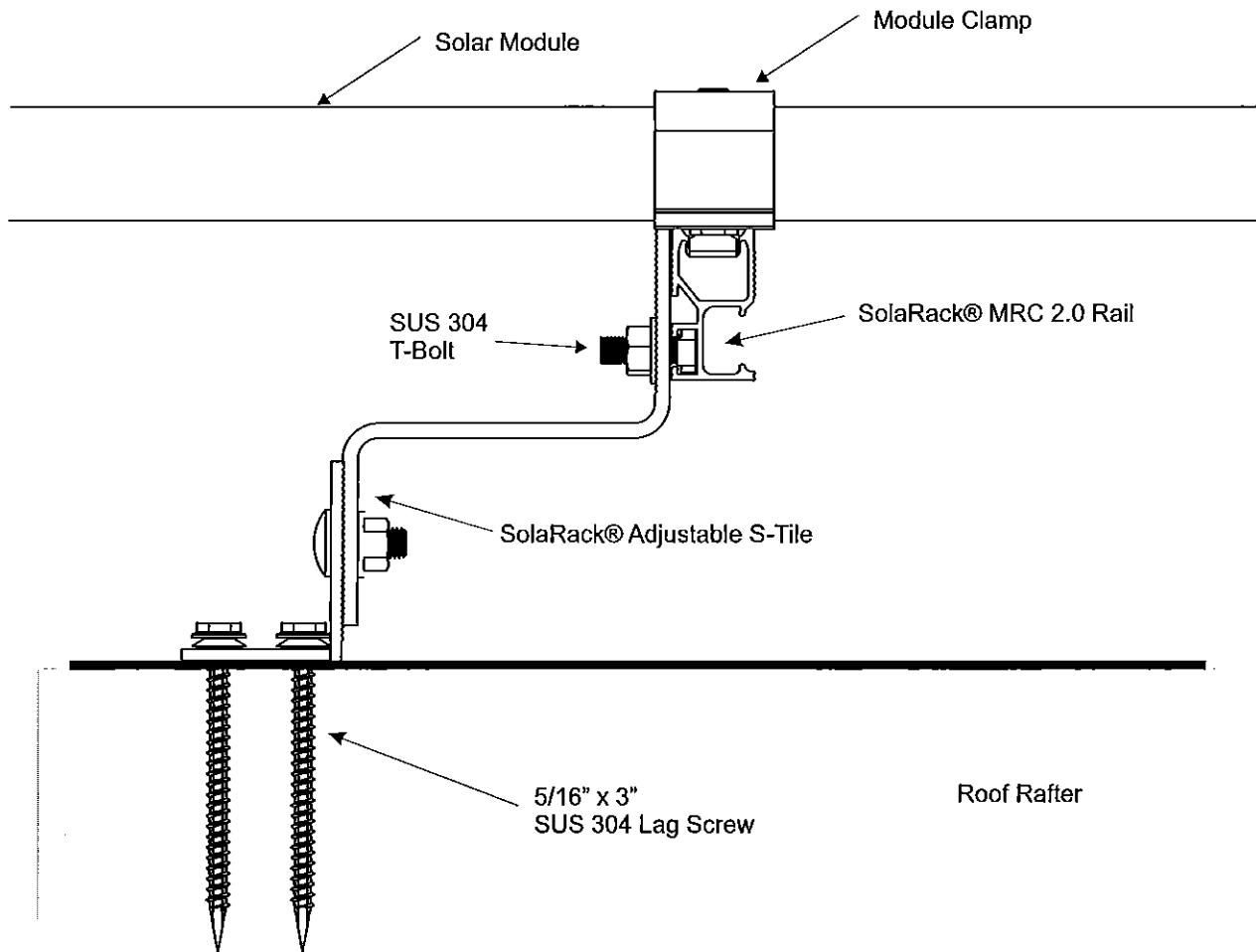
Universal End Clamp



Universal Mid Clamp



Detail Sectional Drawing



Design Code References

The following engineering references were considered in determining the values of the wind load conditions and material properties of the aluminum railing.

- IBC 2015 / CALIFORNIA BUILDING CODE 2016
- ASCE 7-10(wind loading)
- Aluminum Design: Aluminum Design Manual 2010

Design Load Rating in Accordance with UL 2703

Downward Pressure - 10 psf
Upward Pressure - 5 psf
Down-slope Load - 5 psf

Worst Case Loading

Worst case loading conditions were based on the following two load combinations per section 2.4 of ASCE 7-10:

- 1) $0.6D + 0.6W$
- 2) $D + 0.75L + 4W + 0.75S (L=0)$

Span Charts

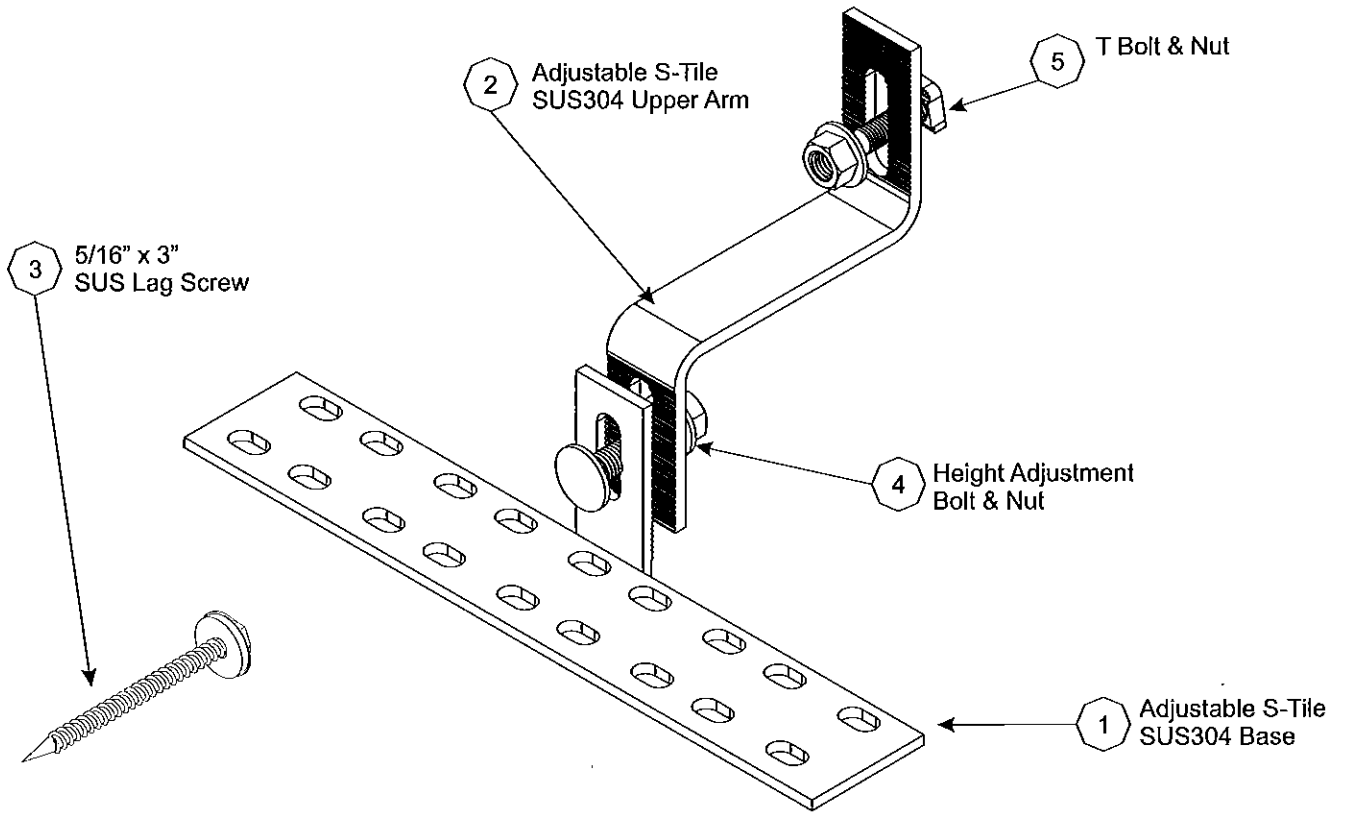
For span charts please refer to solarack's MCR2.0 state letters

Design Criteria

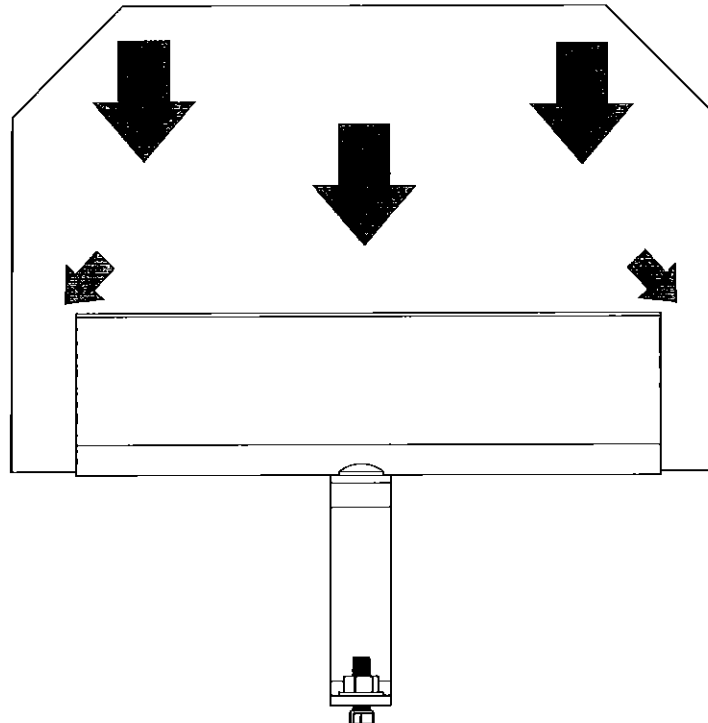
The following parameters were considered in determining the values of the allowable span charts of the railing.

- Maximum Building Height Considered = 30ft
- Exposure Categories Considered: B & C
- Wind Pressure Based on Section 30.4 (C&C Method 1)
- Gust Factor, $G = 0.85$
- Topography Factor, $K_{zt} = 1.0$
- Directionality Factor, $K_d = 0.85$
- Importance Factor, $I = 1.0$
- Zone 2 Pressures Only Considered
- Minimum 2 Rails Per Panel
- Maximum Cantilever of Railing from Anchor 12 Inches
- Tilt Angles Considered: 0 to 30 degrees
- Performance Not Limited to Deflection
- Adequacy of Attachments Based on Evaluation Report

This photovoltaic system is to be installed in accordance with the National Electrical Code, ANSI/NFPA70



SolaRack® Optional Water Deflector Flahing



Tools Required

- R** Cordless Drill (non-impact)
- R** Impact Driver (for lag screw)
- R** Torque Wrench (0-250 in-lbs)
- R** M6 Allen Head
- R** 13mm Socket (for lag screw)
- R** 15mm Socket (for T-Bolts)
- R** 11mm Socket (for SGB-4)

Torque Values

- R** Adjustable S-Tile Lag Screw (13mm Socket): Fully seat
- R** T-Bolt to Rail (15mm Socket): 18.5 ft lb
- R** ILSCO SGB-4 Ground Lag (11mm Socket): 35 in-lbs
- R** Splice Kit (M5 Allen Head): 10ft lb
- R** Universal Mid Clamp (M5 Allen Head): 16 ft lb
- R** Universal End Clamp (M5 Allen Head): 14 ft lb
- R** Micro Attachment Kit (M5 Allen Head): 20 ft lb

Step by Step Installation Guide for Single Composition

The SolaRack Adjustable S-Tile kit is designed to be installed on S, M, W and Clay roofs. This system has been listed by ETL and conforms to UL STD 2703 for Grounding & Bonding & UL STD 1703 Class A Type 1&2. Installation of the SolaRack@Adjustable S-Tile Hook doesn't require any modification to existing roofing materials and will provide a watertight seal when installed according to the following installation guide. Please follow the steps below to achieve a complete seal and proper installation. The product warranty will be VOIDED if installed differently then specified in this manual or if any alterations or modifications are made to the product. Roof must be in good condition prior to installation.(condition of roof is to be verified and determined by the contractor / installer and SolaRack doesn't take any responsibility of determining the quality of the roof prior installation).

Step 1

Locate the roof penetrations at the rafter locations.

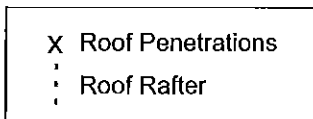
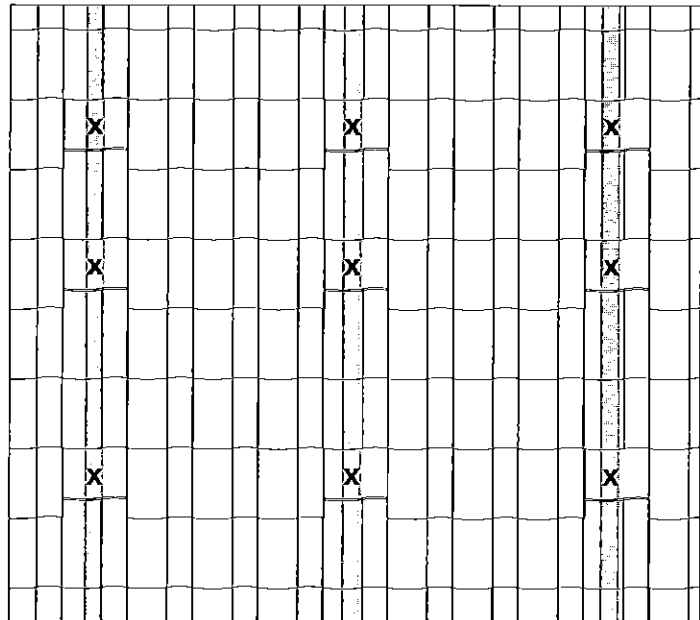
Use a crow or nail bar to lift the roofing material where the Hook is installed, make sure to remove or loosen any nails on the way.

Mark the location of your roof penetrations at the rafter locations as outlined in your plans and engineering documents.

Drill 2 1/4" Pilot hole at the center of the roof rafter. * Check local jurisdiction regarding minimum embedment.

Recommended to use all 3 Leg Screws. The 3rd Lag Screw can be installed without a rafter.

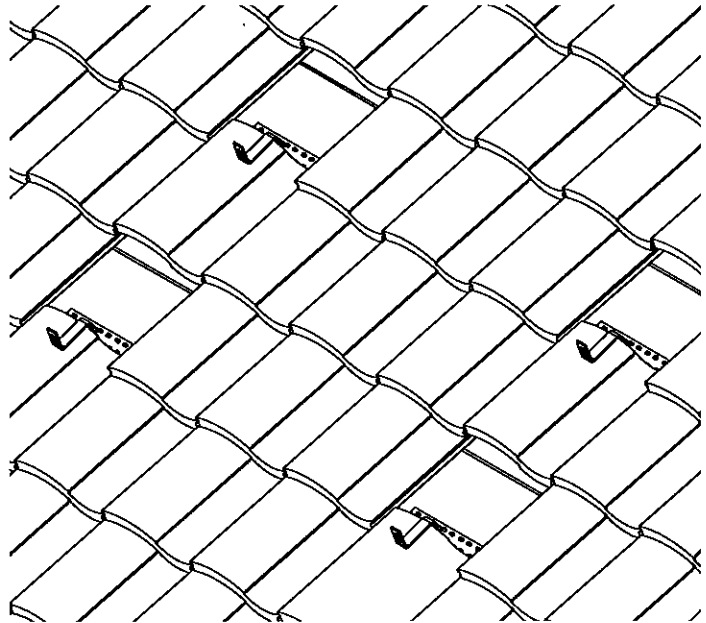
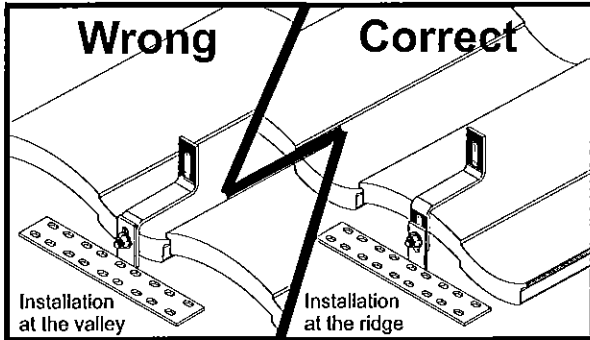
Backfill the pilot hole with sealant.



Step 2

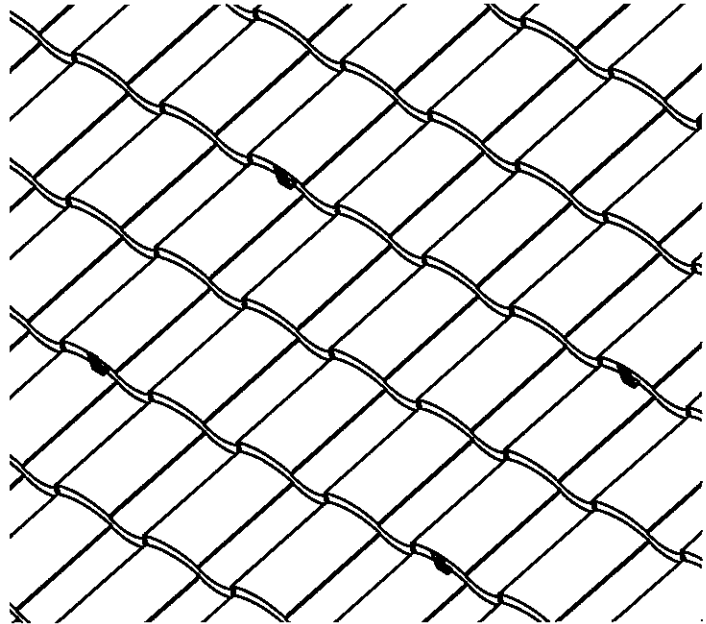
Place the SolaRack® Adjustable S-Tile hook on top of the rafter which it will be installed. Make sure the hook is installed at the ridge point of the tile and secure the connecting bolt to lock in the height.

Drive (3) 5/16x3 Lag Screws to connect the hook to the roof until fully seated. (2 Lag screws must be to the rafter).



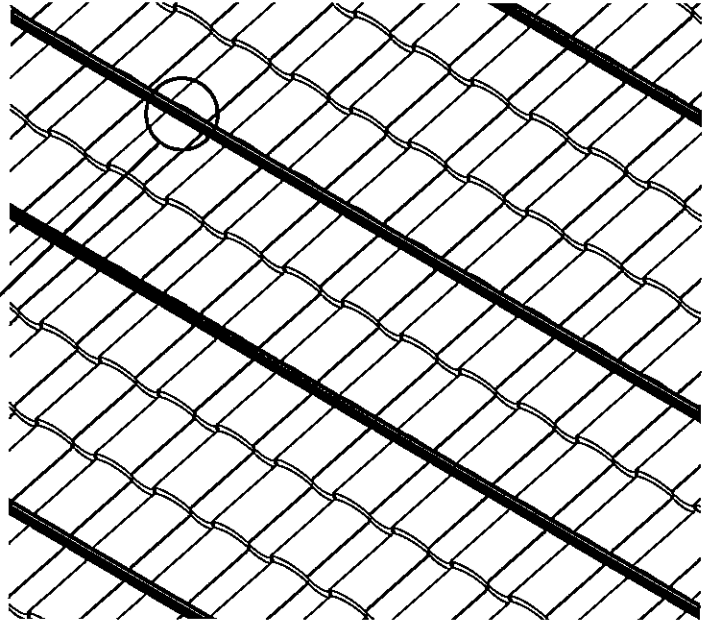
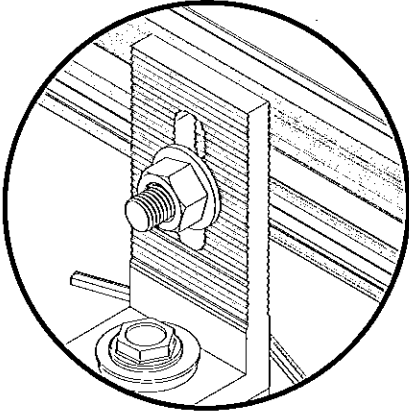
Step 3

Re-install the tile to its original location. Slight alteration to the bottom of the tile may be suggested where the hook protrudes.



Step 4

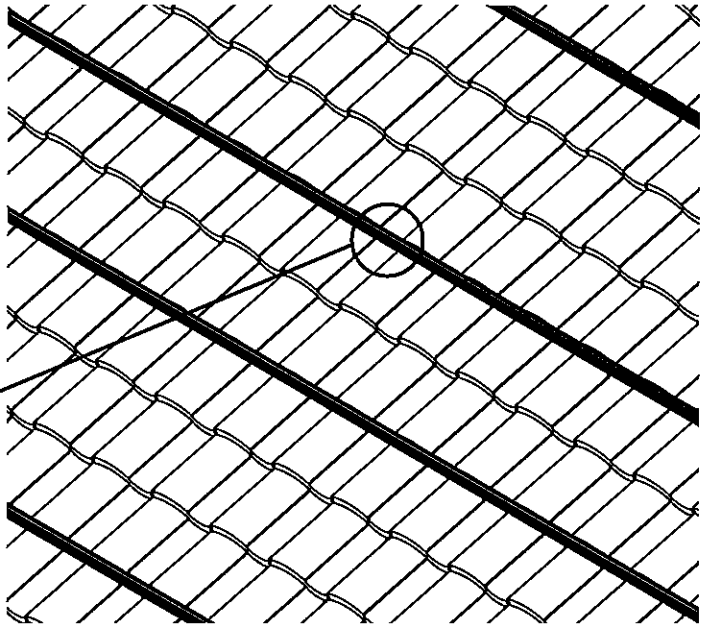
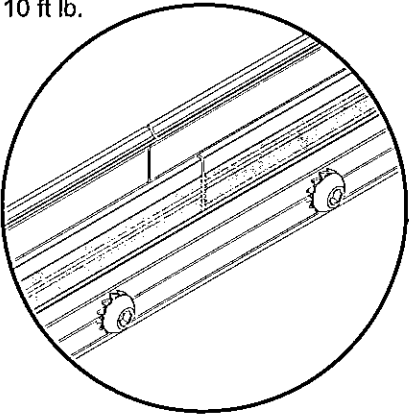
Insert SolaRack® T-Bolt through the Adjustable S -Tile opening into the rail opening. Torque 18.5 ft lb



Step 5

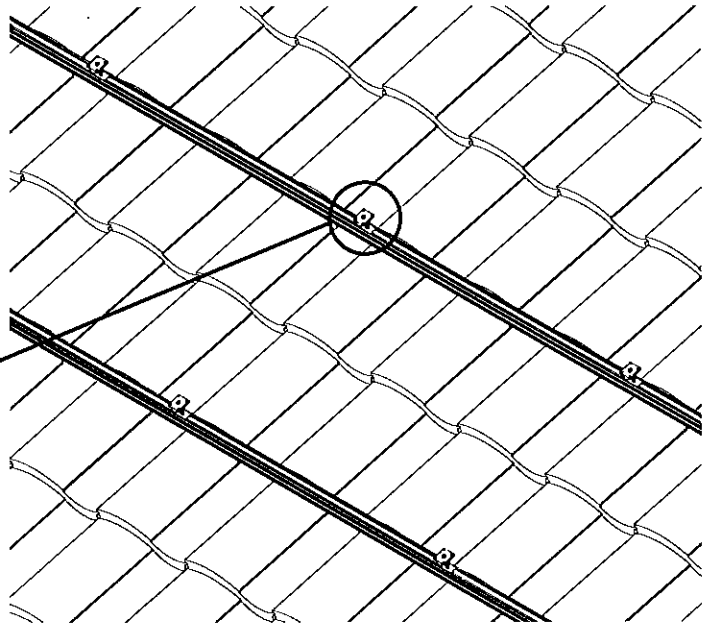
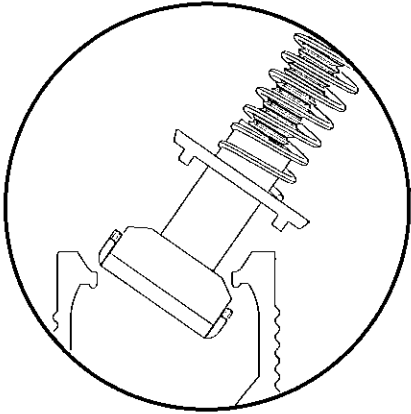
Insert SolaRack® Integrated Grounding Splice Kit at the rail opening. Splice bar must be installed 50% set in each rail segment.

Use the Integrated Grounding & Bonding splice kit at all connections between two rails. Maximum distance from L-Foot is no more than 36" from each side of the Splice Kit
Torque to 10 ft lb.



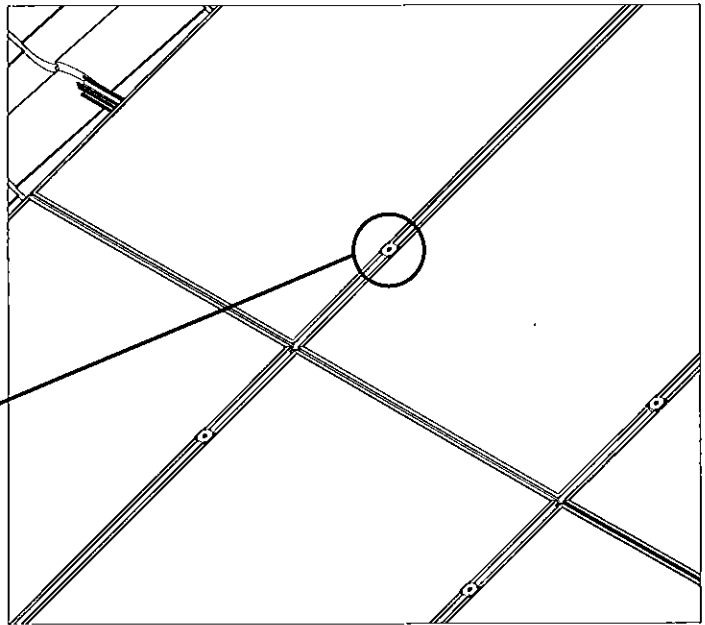
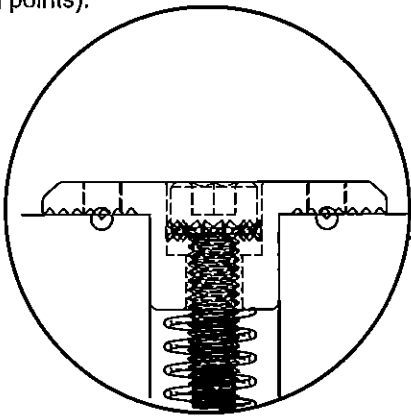
Step 6

Insert SolaRack Integrated Grounding & Bonding Universal Mid Clamp by lifting the Plastic Support Base with two fingers and tilting the Channel nut into the rails upper opening. Release the Plastic Support Base and the Mid Clamp will stay in the open position.



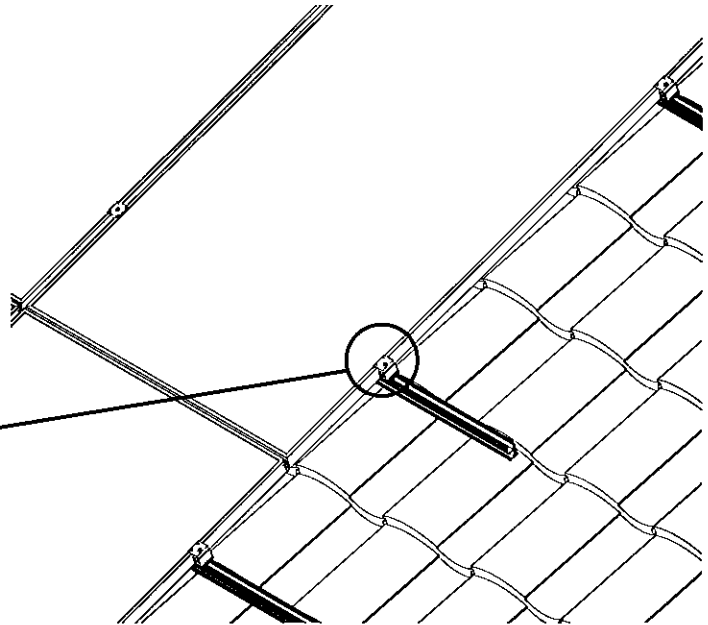
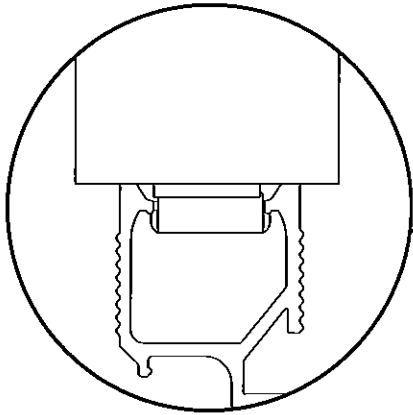
Step 7

Fasten and install at locations where two solar modules meet. Location of mid clamps from rail end should comply with module manufacture guidelines. Torque to 16 ft lb. Once Mid Clamps are fastened the Stainless Steel Pins will penetrate the anodization coating on the module frame for bonding (red circles below show grounding points).



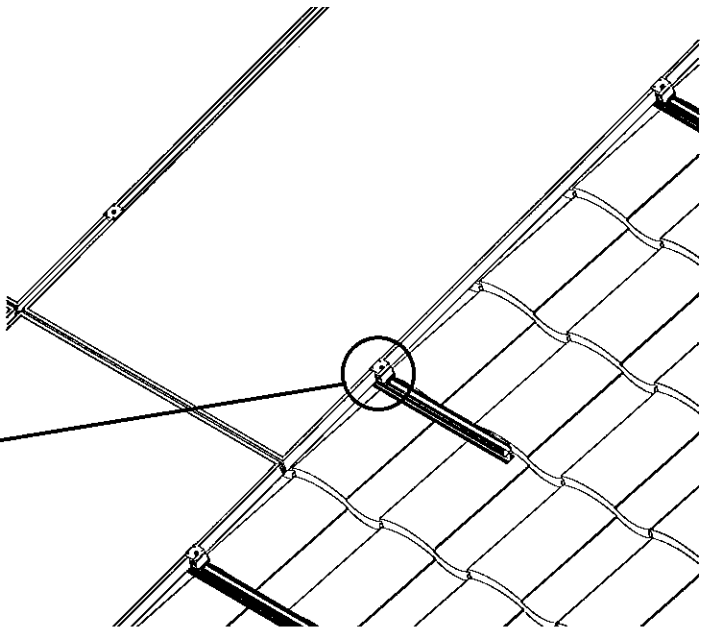
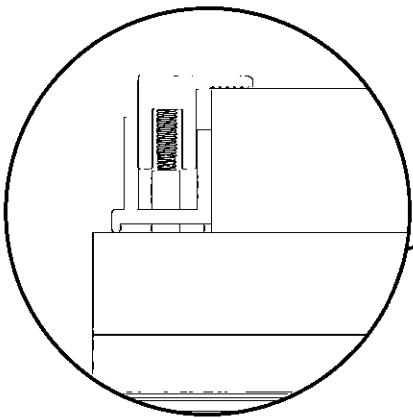
Step 8

Insert SolaRack Integrated Grounding & Bonding Universal End Clamp by sliding it into the rail upper opening. Make sure the lip at the front of the End Clamp is placed below the Module frame.



Step 9

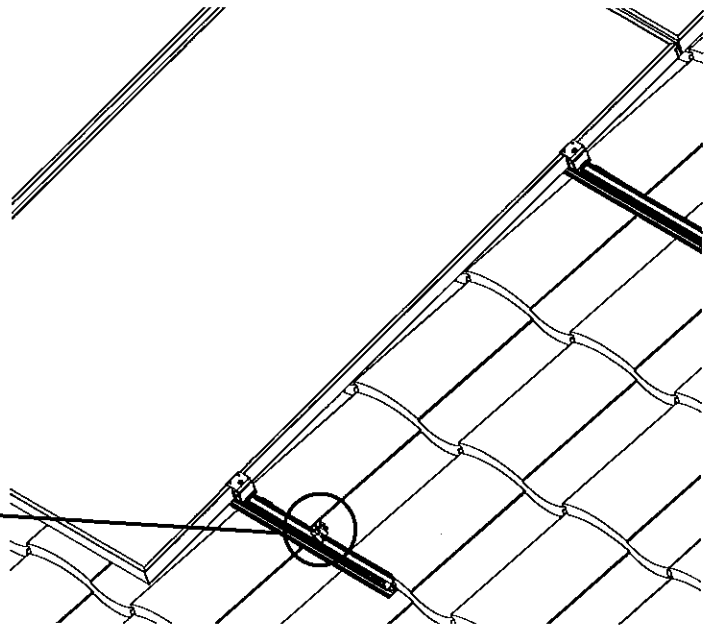
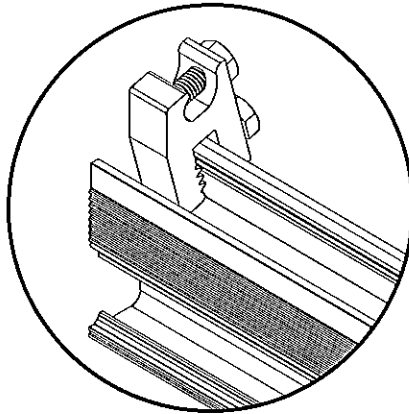
Fasten and install at the end of each array
Minimum 2 End Clamps per Module.
Location of End clamps should comply with
module manufacture guidelines. Torque to 14 ft lb.
Once End Clamps are fasten the Stainless Steel
Pins will penetrate the anodization coating on the
module frame for bonding



Step 10

Install ILSCO SGB-4 Grounding Lug at the end of a rail (please refer to Grounding Diagram on page 6). Run copper wire to connect all grounding lugs. Copper wire must not touch any aluminum surface. Tighten each bolt to 35 in-lbs as recommended by ILSCO.

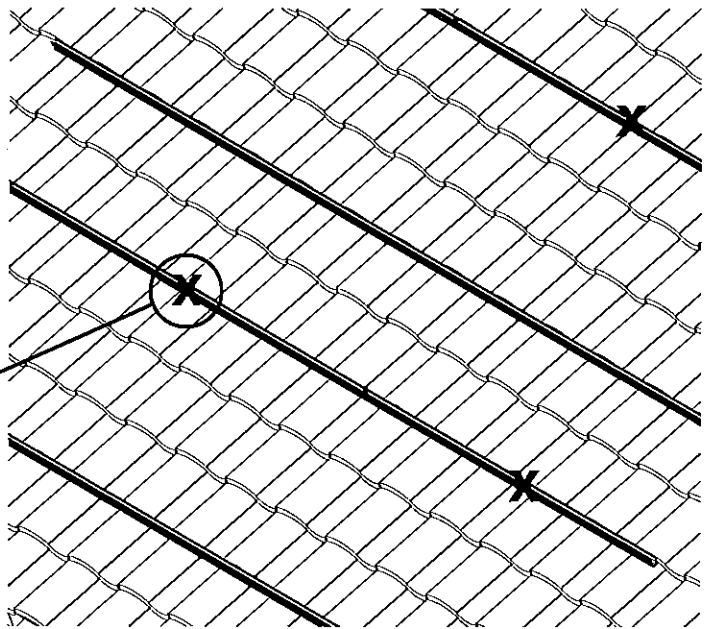
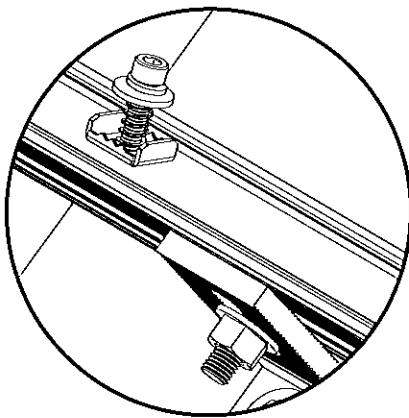
Acceptable wire size is 4-14SOL-STR. Suitable for use with either copper or aluminum. Size of grounding wire will be determined by electrical code.



Installing Micro Inverters / Optimizers

Step 1

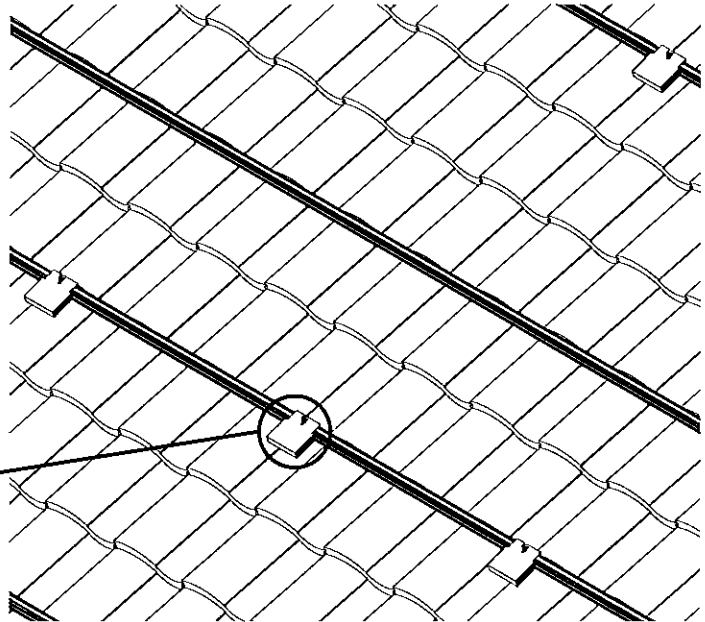
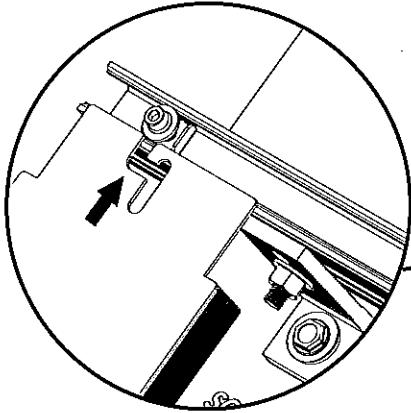
Insert the Micro Bolt Attachment by tilting it into the upper opening of the rail.



X - Micro Attachment

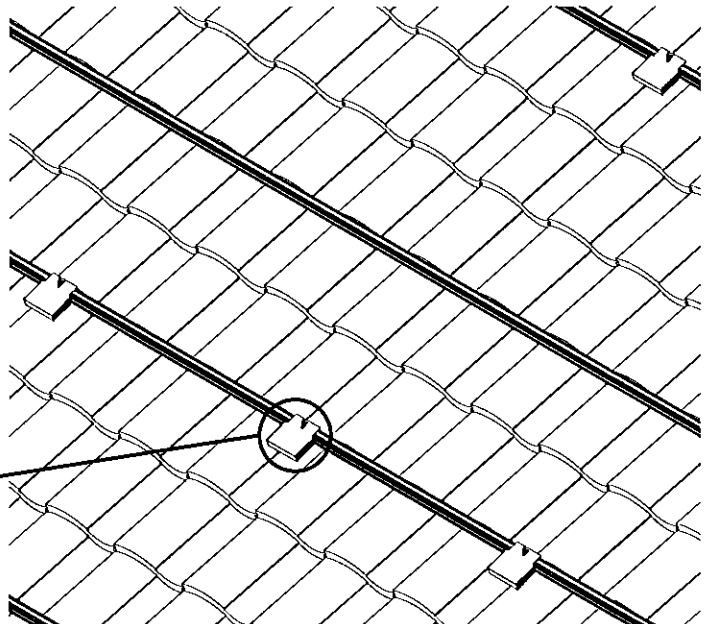
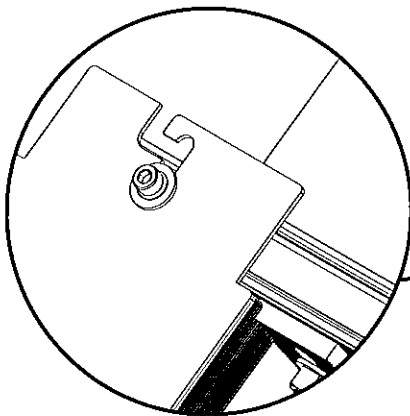
Step 2

Slide The Micro Inverter / Optimizer into place, make sure the washer is on top of the Micro Inverter / Optimizer Plate.



Step 3

Tighte the Micro Bolt to secure the Micro Inverter / Optimizer in place, Torque to 20 ft lb.



SolaRack Limited Product Warranty

This warranty is for SolaRack "products" manufactured after June of 2018, SolaRack® provides the following warranties, for the products installed according to our installation manual on the proper roofing structure that the product was designed for: SolaRack Inc. ("SolaRack"), warrants to the buyer (Buyer") at the original installation site, ("product") shall be free from defects in material and workmanship which substantially impair their ability to perform their intended function, for a period of Twenty five (25) years, except for anodized finish ("Finish Warranty"), which finish shall be free from visible peeling, cracking or chalking under normal atmospheric conditions for a period of five (5) years, from the 1) The date the installation of the product at the site is substantially completed, or 2) 60 days after the initial purchase of the products from SolaRack.

This warranty does not cover the following:

- 1) Any defect that has not been reported to SolaRack in writing within the warranty periods set above and or within 60 days after discovery of such defect.
- 2) PV modules, electrical components and or wiring used in conjunction with the product or any other materials not provided by solarack.
- 3) Goods that are sold by SolaRack, which are not designed or manufactured by SolaRack.
- 4) Damage to the product that occurs during its shipment, storage, installation or majeure acts including fire, flood, earthquake, storm, hurricane or other natural disaster, war, terrorist activities, acts of foreign enemies and criminal acts.
- 5) Normal wear, or damage, resulting from misuse, overloading, improper installation.
- 6) Installation of the product is not performed according with SolaRack® written installation manual (guide), or if the product has been modified, repaired, painted or reworked in a manner not previously authorized by SolaRack in writing, or if the product is consequential, contingent or incidental damages arising out of the use of the product by any circumstances.

The "Finish Warranty" does not apply to surface oxidation or any foreign residue deposited on the finish, or to all installation in corrosive atmospheric conditions (at SolaRack® sole discretion). The "Finish Warranty" is VOID if the practices specified by AAMA 609 & 610-02 "Cleaning and Maintenance for Architecturally Finished Aluminum", or ASTM A780/A780M-09 "Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coating" as applicable, are not followed.

If within the specified Warranty periods the "Products" shall be reasonably proved to be defective, then SolaRack shall correct the defect by repair, replacement, or credit at SolaRack's sole discretion. Refurbished products may be used to repair or replace the defective components. Transportation, installation, or any other costs associated with product repayment are not covered by these warranties and are not reimbursable. Such repair or replacement shall completely satisfy and discharge all of SolaRack's liability in respect to these warranties.

A formal document providing the purchase location, installation address and purchase date of the "Product" is required with any warranty claim.

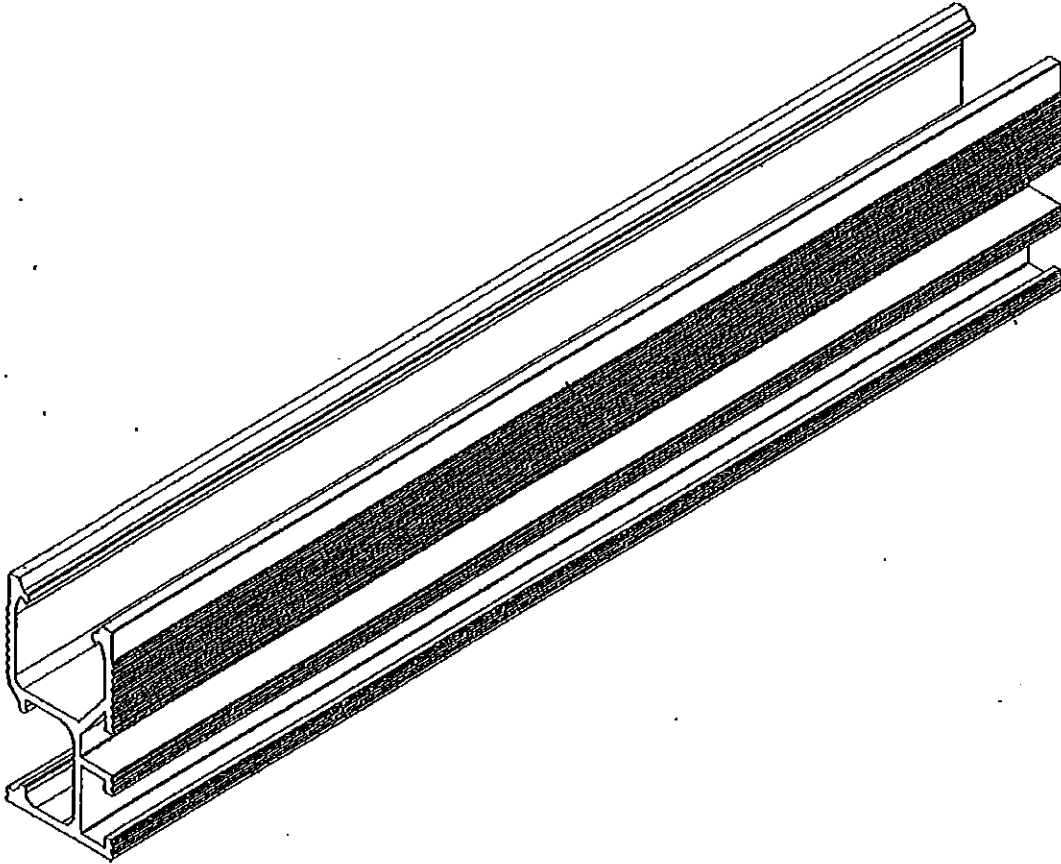
Transfer of Warranty

This "Limited Warranty" is transferable with respect to products purchased and manufactured by SolaRack to a new owner of the entire photovoltaic system, in which SolaRack products are originally installed, provided that such product remains intact in its original place of installation. Any subsequent owner must agree in writing to be bound by the terms of this SolaRack Limited Warranty document. Change in ownership of the Products or assignment of this Limited Warranty will not cause the warranty periods above to reset.

Except as set forth above, SolaRack® sell products on "AS IS" basis, which may not be free of errors or defects, AND ALL EXPRESS OR IMPLIED REPRESENTATION AND WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, QUALITY, WORKMANSHIP, EFFORT, CORRESPONDENCE TO DESCRIPTION, DESIGN, TITLE OR NON- INFRINGEMENT, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR TRADE PRACTICE, ARE HEREBY DISCLAIMED.

SOLAR RACK

Just Makes Cents... Per Watt



MCR2.0 Rail Span Chart State of California

September 25th 2017



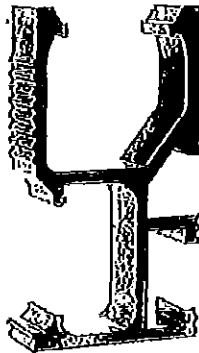
1103 Lawrence Dr. Suite A
Newbury Park, CA 91320

RE: Sunstrong Structural Compliance Report of
SolaRack Aluminum MCR 2.0 Rail

The scope of this report focuses on providing a structural evaluation of aluminum extruded ralling intended for mounting solar panels atop of rooftops for the racking manufactured by SolaRack.

The structural performance of the ralling has been verified to be in compliance with the requirements of the 2016 California Building Code and ASCE 7-10 under prescribed wind and snow loading in the state of California. The construction and application of the aluminum ralling shall be accordance with the installation guide provided by SolaRack. Structural verification of the roof frame members and the solar panels are excluded and beyond the scope of this report.

Figure 1:



Rail Section Sketch

Design Approach

The ralling section as illustrated in Figure 1: was modeled as a simply supported beam undergoing wind loads applied as a point load from the mid-clamps at the panel joints. The resulting applied bending moments was then checked with the allowable bending moment of the aluminum rail section based on the equation below:

$$F_a = 0.6 F_y = 0.6 \times 35 \text{ ksi} = 21 \text{ ksi}$$

$$F_y = 35 \text{ ksi (6006 T-6 Aluminum)}$$

The applied bending stress from the various wind loading conditions is based on the following equation, where the geometric properties were derived mathematically from vertical bend section dimensions (See Figure 2):

$$f = M \div S = M \times (1 \div C)$$

M is the moment based on the wind loads
S is the section modulus of vertical section

Figure 2:

Dimensions	
Depth	1.764 in
Width	1.134 in
Perimeter	11.22 in
Geometric	
Area	0.5087 in ²
I _x	0.1634 in ⁴
I _y	0.0695 in ⁴
I _{xy}	-0.0048 in ⁴
I _x	0.6503 in
I _y	0.3704 in
S _{x+}	0.1661 in ³
S _{x-}	0.1827 in ³
S _{y+}	0.1323 in ³
S _{y-}	0.1142 in ³
X _c	12.38 in
Y _c	4.113 in
Principal	
I ₁	0.1537 in ⁴
I ₂	0.0693 in ⁴
a	3.128 deg
r ₁	0.6508 in
r ₂	0.3697 in
S ₁₊	0.1611 in ³
S ₁₋	0.1776 in ³
S ₂₊	0.1231 in ³
S ₂₋	0.1061 in ³
Polar	
I _p	0.223 in ⁴
r _p	0.6634 in

Geometric Properties Output for ShapeBuilder Software (IES)

Worst case loading conditions were based on the following two load combinations per section 2.4 of ASCE 7-10:

1. 0.6D + 0.6W
2. D + 0.75L + 0.4W + 0.75S (L=0)

Where D is the dead load of the panels and racking equipment, W is the wind uplift loads at the anchors and S represents the ground snow load value. The tabulated results of the maximum rail span according to the worst case loading conditions are provided in this report (See Figure 3).

Design Criteria

The following parameters were considered in determining the values of the allowable span charts of the tile railing:

Maximum Building Height Considered = 30ft
Exposure Categories Considered: B & C
Wind Pressure Based on Section 30.4 (C&C Method 1)
Gust Factor, $G = 0.85$
Topography Factor, $K_{zt} = 1.0$
Directionality Factor, $K_d = 0.85$
Importance Factor, $I = 1.0$
Zone 2 Pressures Only Considered
Minimum 2 Rails Per Panel
Maximum Cantilever of Railing from Anchor 12 Inches
Tilt Angles Considered: 0 to 30 degrees
Performance Not Limited to Deflection
Adequacy of Attachments Based on Evaluation Report (Attached)

Design Code References

The following engineering references were considered in determining the values of the wind load conditions and material properties of the aluminum railing:

IBC 2015 / CALIFORNIA BUILDING CODE 2016
ASCE 7-10 (Wind Loading)
Aluminum Design: Aluminum Design Manual 2010

SolaRack Aluminum Railing Span Chart State of California

Figure 3:

GROUND SNOW LOAD (PSF)	RACKING MAX. RAIL SPAN (FT) FOR ZONE 2*					
	EXPOSURE B WIND SPEEDS (MPH)			EXPOSURE C WIND SPEEDS (MPH)		
	110	130	150	110	130	150
0	6	6	4	6	4	2
10	6	6	4	6	4	2
20	6	6	4	6	4	2
30	6	6	4	6	4	2
40	6	6	4	6	4	2
50	6	6	4	6	4	2
60	6	6	4	6	4	2
70	6	6	4	6	4	2
80	4	6	4	4	4	2
80	4	6	4	4	4	2
90	2	6	4	2	2	2

* Maximum Building Height Considered = 30ft