

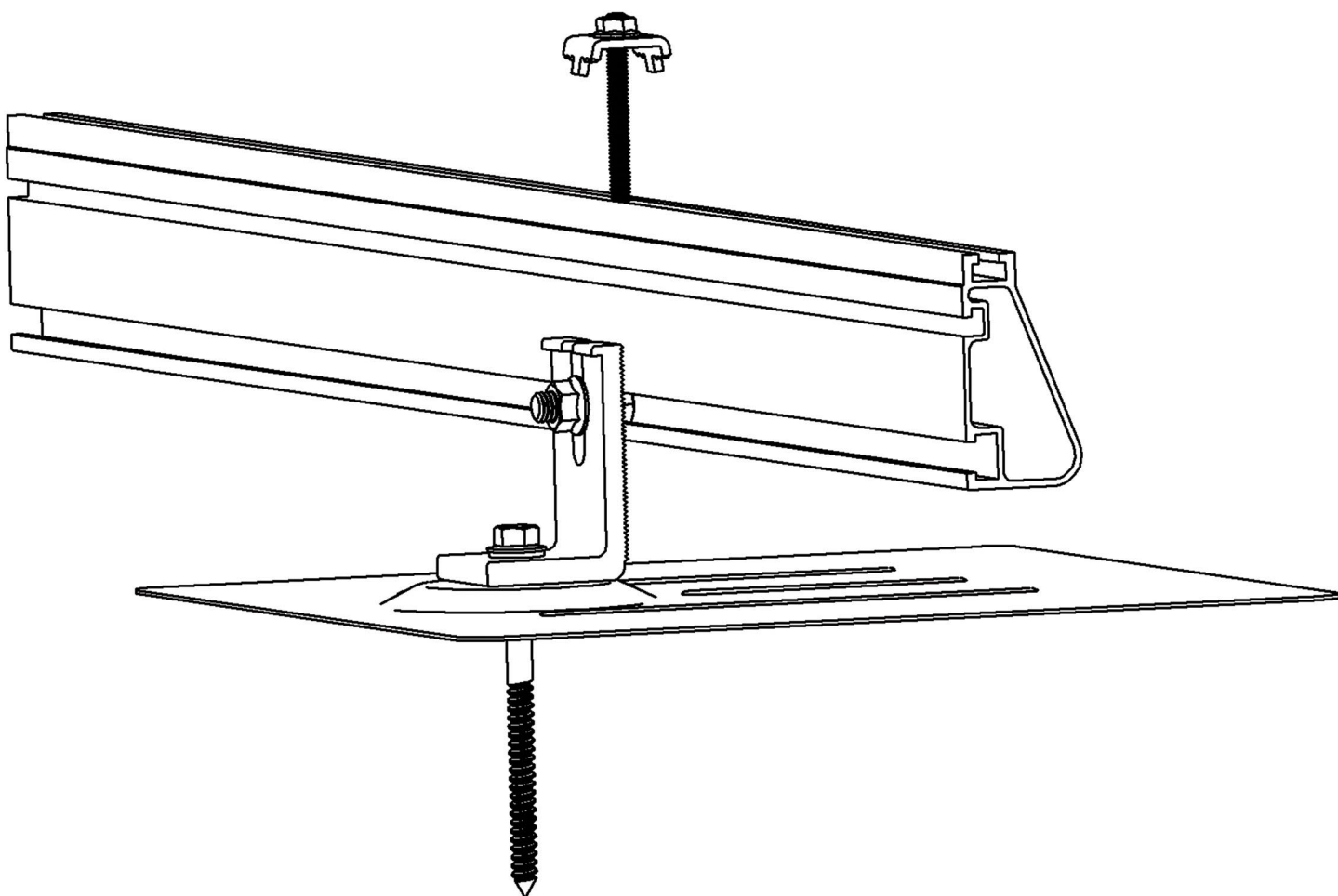
# ROOF MOUNT

ETL CLASSIFIED



Intertek  
4008083

\*Class A\*  
Fire Rated



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## DISCLAIMER

This manual describes the proper installation procedures and provides minimum standards required for product reliability and warranty. Thoroughly understanding this manual is imperative to proper installation; failure to follow the guidelines set forth can result in property damage, bodily injury, or even death.

### IT IS THE INSTALLER'S RESPONSIBILITY TO:

- Comply with all applicable local or national building codes, including any that may supersede this manual.
- Ensure all products are appropriate for the installation, environment, and array under the site's loading conditions.
- Comply with roofing manufacturer's warranty terms including: using protective barriers between mounting and roofing and roof penetrations and removing all loose debris or gravel prior to installation.
- Use only IronRidge parts or parts recommended by IronRidge; substituting parts may void any applicable warranty.
- Ensure that the installation is completed by a licensed solar professional. All electrical installation and procedures should be conducted by a licensed and bonded electrician or solar contractor. All work must comply with national, state and local requirements.
- Comply with all applicable fire codes including, but not limited to, keeping walkways clear and avoiding obstacles.
- Ensure provided information is accurate. Issues resulting from inaccurate information are the installers' responsibility.
- Confirm with the selected module manufacturer that the mounting is compatible with the selected module.

## RATINGS





### STRUCTURAL CODE PER ASCE 7-10

- › All components covered in this manual (review [Engineering Design Guide](#) and [Certification Letters](#))

### INTEGRATED GROUNDING PER UL 2703

- › Flush mount systems (tilt mount systems require other code-compliant grounding means)

### CLASS A FIRE RATED PER UL 1703

ROOF SLOPE	MOUNT	MODULE	FIRE RATING*
Steep Slope (≥ 9.5 degrees)	Flush 	Type 1, 2, & 3	Class A
	Tilt 	Type 1 & 2	Class A
Low Slope (< 9.5 degrees)	Flush 	Type 1, 2, & 3	Class A
	Tilt 	Type 1, 2, & 3	Class A

\*Class A rated PV systems can be installed on Class A, B, and C roofs.

# CHECKLIST

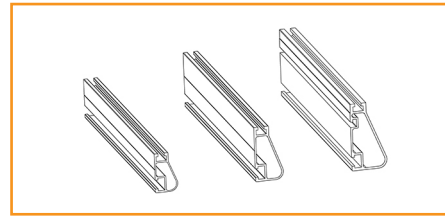
## TOOLS REQUIRED

- Cordless Drill (non-impact)
- Torque Wrench (0-240 in-lbs)
- 5/16" Socket (deep)
- 7/16" Socket (deep)
- 9/16" Socket (deep)
- 1/8" Allen Wrench
- 3/8" Socket (for Tilt Legs)

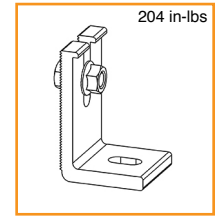
## TORQUE VALUES

- FlashFoot Lag Bolts (5/16"-9): Fully seat
- L-Feet Nuts (3/8"-16): 204 in-lbs
- Internal Splice Screws (1/4"-14): Fully seat
- Grounding Lug Nuts (1/4"-20): 84 in-lbs
- Grounding Lug Set Screws (1/4"-28): 20 in-lbs
- End Clamp Nuts (1/4"-20): 84 in-lbs
- Mid Clamp Nuts (1/4"-20): 84 in-lbs  
(55 in-lbs for SunPower Modules)
- Expansion Joint Nuts (1/4"-20): 84 in-lbs
- Tilt Leg Nuts (3/8"-16): 180 in-lbs
- Flush Standoff (5/16"-18): 139 in-lbs

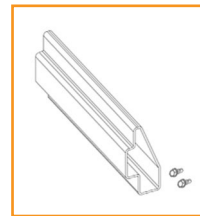
## PRIMARY COMPONENTS



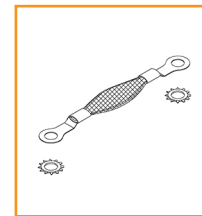
XR Rail  
Aluminum



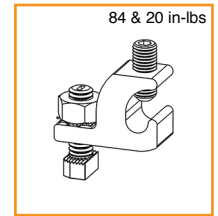
L-Foot  
Aluminum



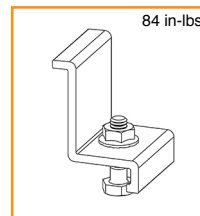
Internal Splice  
Aluminum



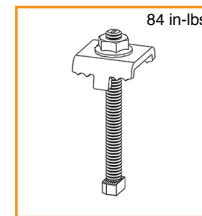
Grounding Strap  
Tinned Copper



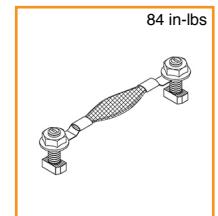
Grounding Lug  
Tinned Copper & SS



End Clamp  
Aluminum

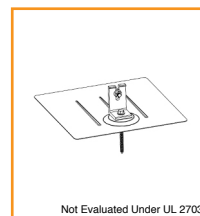


Mid Clamp  
Stainless Steel



Expansion Joint  
Tinned Copper & SS

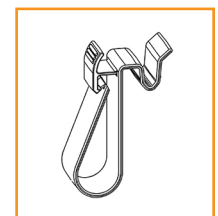
## OPTIONAL COMPONENTS



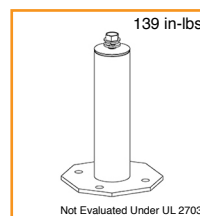
FlashFoot™  
Aluminum



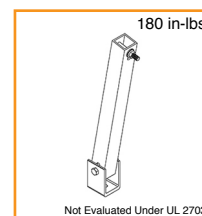
End Cap  
Polycarbonate



Wire Clip  
Polycarbonate






Standoff  
Aluminum & SS



Tilt Leg  
Aluminum

# PRIMARY COMPONENTS

Components in this section are classified for Integrated Grounding (UL 2703). Follow these installation procedures to ensure compliance with the following standards:

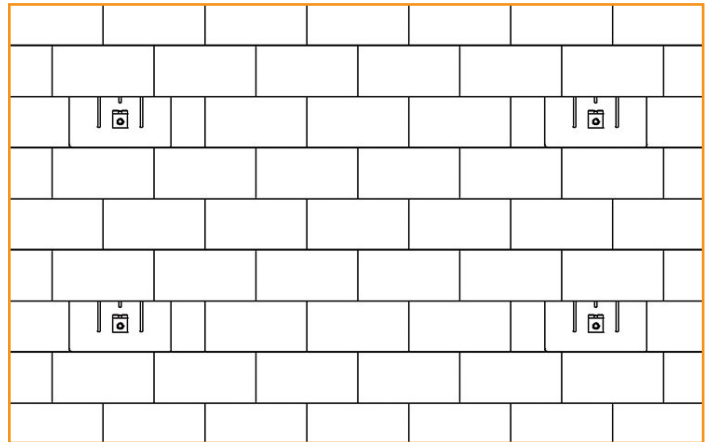
-  **INTEGRATED GROUNDING PER UL 2703**
-  **STRUCTURAL CODE PER ASCE 7-10**
-  **CLASS A FIRE RATED PER UL 1703 WITH TYPE 1, 2, & 3 SOLAR MODULES**  
(FLUSH MOUNT, ANY ROOF SLOPE, ANY MODULE TO ROOF GAP, NO PERIMETER GUARDING REQUIRED)

## 0. ATTACH BASES

### ROOF ATTACHMENTS

Install base attachments. Mount Slotted L-Feet on FlashFoot or compatible third-party roof attachments.

- ▶ IronRidge's all-in-one FlashFoot roof attachment is for pitched, composition shingle roofs. Refer to [Page 6](#) or [provided manual](#).
- ▶ Compatible third-party roof attachments:
  - S-5! [Standing Seam Metal Roof Clamps](#)
  - EcoFasten [Green Fasten GF-1 Anchors](#)
  - QuickMount PV [Flush Mounts](#), [Tilt Standoffs](#), and [Tile Hook](#)
- ▶ Refer to [Pages 7-8](#) for installing Standoffs or Tilt Legs.

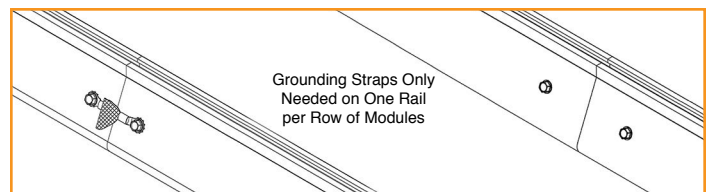
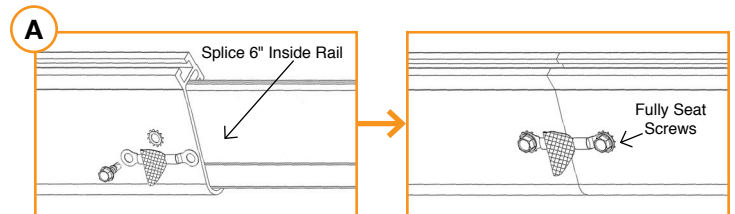


## 1. PLACE RAILS

### A. CONNECT SPLICES

Insert Internal Splice 6" into first rail and secure with star washer, Grounding Strap, and screw. Slide second rail over Internal Splice and secure. Ensure screws are fully seated. Repeat for all splices, but with star washers and Grounding Straps only on one rail per row of modules.

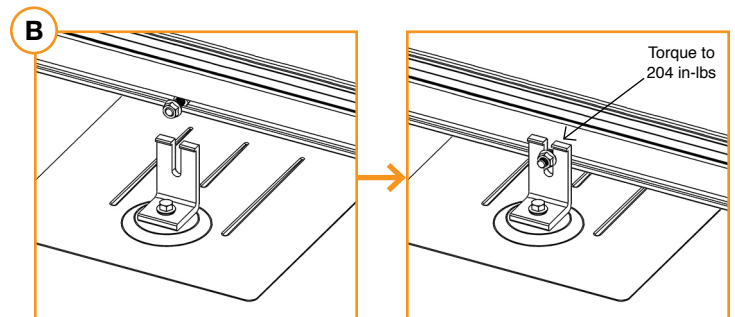
- ▶ Rows exceeding 100 feet of rail must use [Expansion Joints](#).
  - ▶ For XR10 and XR100 rails, insert screws along the provided lines.
  - ▶ Don't use rail splices in middle 1/3 of interior spans or end spans.
- 💡 Screws can be inserted on front or back of rails.



### B. ATTACH RAILS

Slide 3/8"-16 hardware into side-facing rail slot. Space bolts to match attachment spacing. Drop rail with hardware into Slotted L-Feet. Level rail at desired height, then torque to **204 in-lbs**.

- ▶ If using Mid Clamps with hex bolts, slide bolts into top rail slot.
- 💡 Rail and L-Feet can face either upslope or downslope on roof.

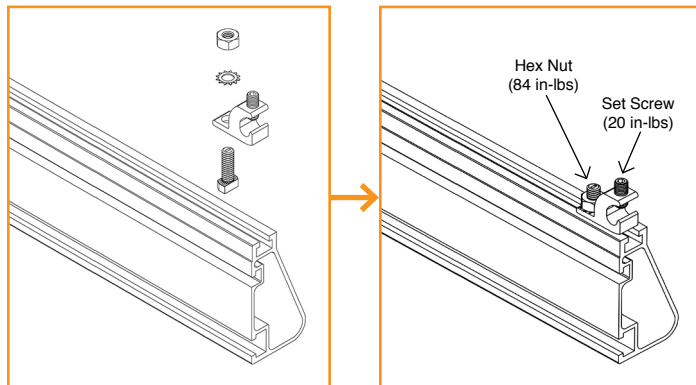


## 2. SECURE LUG

### GROUNDING LUG

Assemble Grounding Lug with provided hardware. Torque hex nut to **84 in-lbs**. Install a minimum 10 AWG solid copper grounding wire. Torque set screw to **20 in-lbs**.

- ▶ Grounding hardware is only needed on one rail per row of modules. Grounding Lugs must be installed on same rail as Grounding Straps.

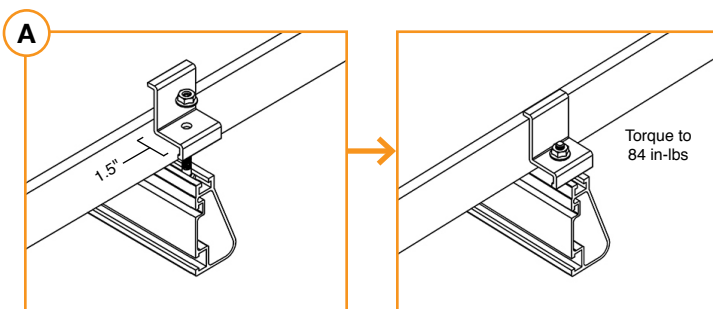


## 3. CLAMP MODULES

### A. FIRST END CLAMPS

Place first module a minimum of 1.5" from rail ends. Slide End Clamps into both rails and hook over top of module. Torque to **84 in-lbs**.

- 💡 Ensure rails are square before placing modules.
- 💡 Hold End Clamps while torquing to prevent rotation.

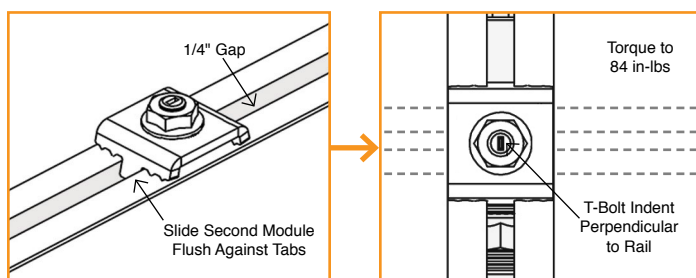
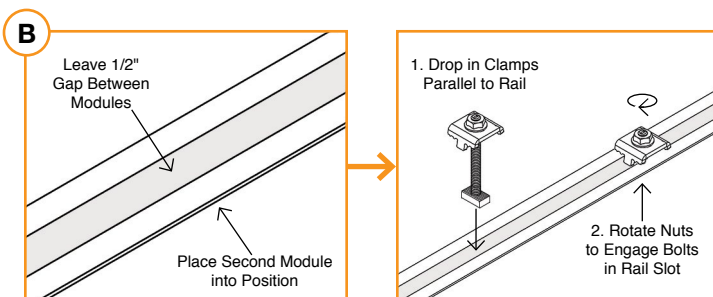


### B. MID CLAMPS

Place second module into position, leaving a 1/2" gap between it and the previous module. While holding module in place, drop Grounding Mid Clamps into rail slots and rotate nuts to engage T-bolts.

Slide second module flush against clamp tabs. Once clamp teeth are in contact with both module frames and the bolts are properly aligned in slots, torque to **84 in-lbs**. Repeat procedure for each following module.

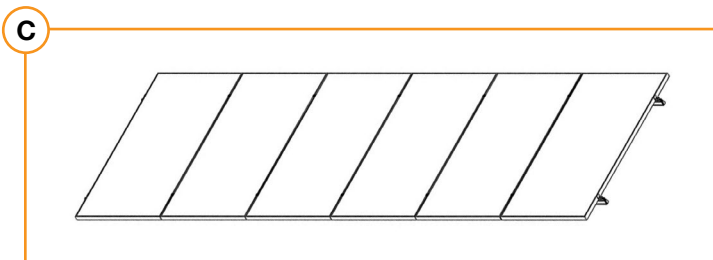
- ▶ Make sure indent at top of T-bolt is perpendicular to rail slot to ensure T-bolts are properly seated.
- ▶ If using Standard Mid Clamps with ETL-listed WEEB Clips, refer to [WEEB Installation Instructions](#). Torque to 120 in-lbs.



### C. LAST END CLAMPS

Place last module in position on rails, a minimum of 1.5" from rail ends. Slide End Clamps into both rails, ensuring it is hooked over top of module. Torque to **84 in-lbs**.

- ▶ Repeat all steps for each following row of modules.



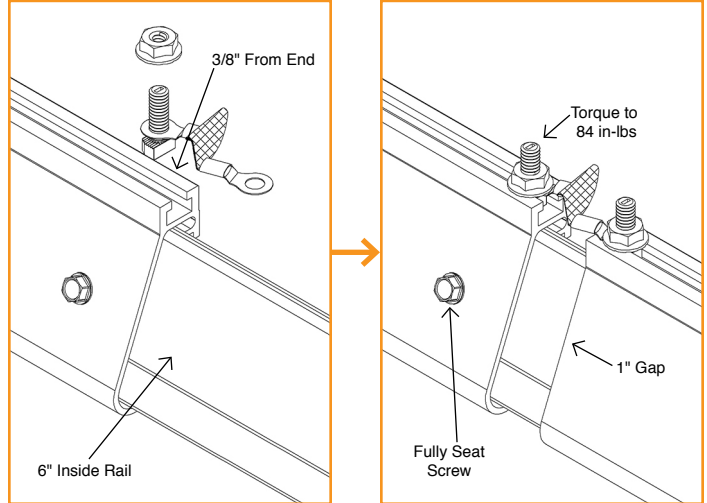
# EXPANSION JOINTS

## GROUNDING STRAP EXPANSION JOINT

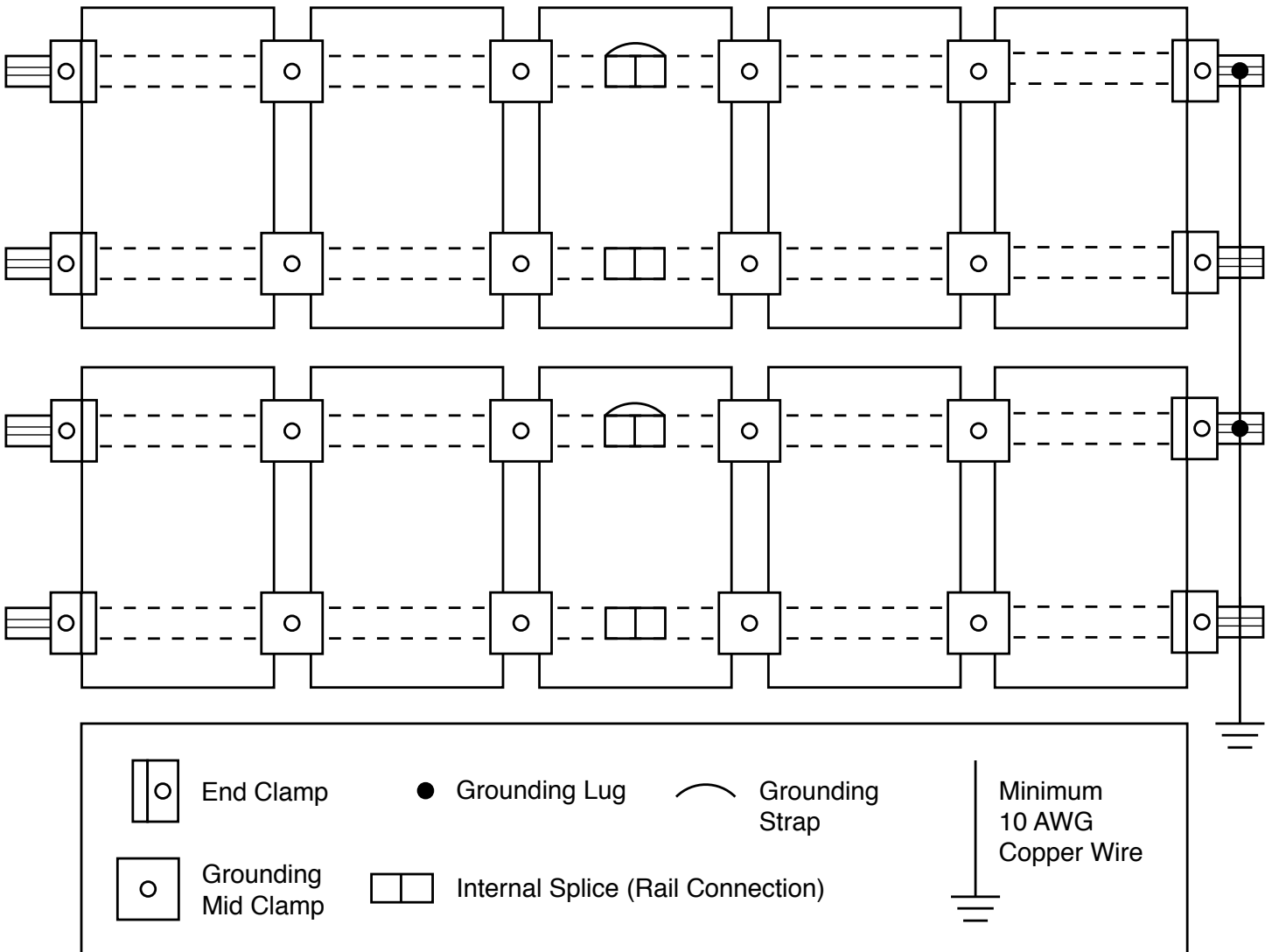
Grounding Strap Expansion Joints are required for thermal expansion of rows exceeding 100 feet of rail.

Insert Internal Splice into first rail and secure with screw. Assemble and secure Grounding Strap 3/8" from rail end. Slide second rail over Internal Splice leaving 1" gap between rails. Attach other end of Grounding Strap with hardware, and torque hex nuts to **84 in-lbs**.

- ▶ Second Internal Splice screw is not used with Expansion Joints.
- ▶ Do not install module over top of expansion joint location.







## ELECTRICAL DIAGRAM



## OPTIONAL COMPONENTS

Components in this section are not required for Integrated Grounding (UL 2703). The markings below indicate that the component complies with or does not violate the requirements of the listing indicated:

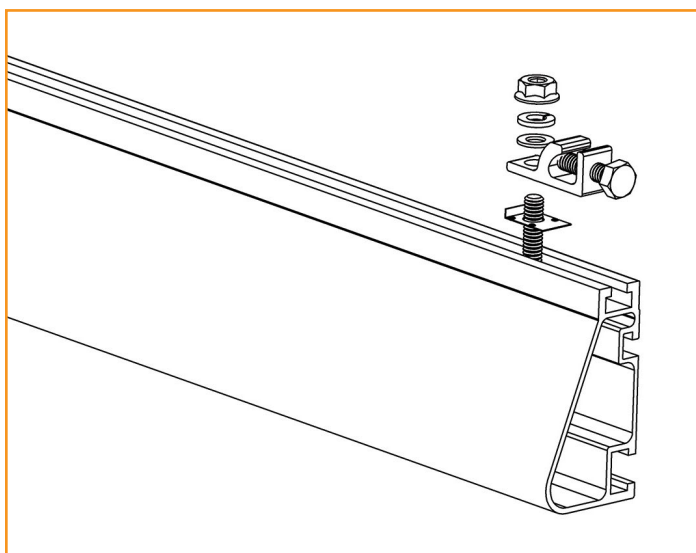
-  **INTEGRATED GROUNDING PER UL 2703**
-  **STRUCTURAL CODE COMPLIANCE PER ASCE 7-10**
-  **CLASS A FIRE RATED PER UL 1703 WITH TYPE 1 & 2 MODULES (TILT MOUNT, ANY ROOF SLOPE)\***
-  **CLASS A FIRE RATED PER UL 1703 WITH TYPE 3 MODULES (TILT MOUNT, < 9.5 DEGREE ROOF SLOPE)\***

\*APPLICABLE TO ANY MODULE TO ROOF GAP FOR MODULE TILT OF 1 DEGREE AND HIGHER. DOES NOT REQUIRE PERIMETER GUARDING.

## ALTERNATIVE LUGS

### WEEB LUGS

Review Wiley [WEEB Installation Instructions](#), using 6-10 AWG (minimum) solid copper grounding wire. Torque hex nut to 120 in-lbs and set screw to 84 in-lbs.

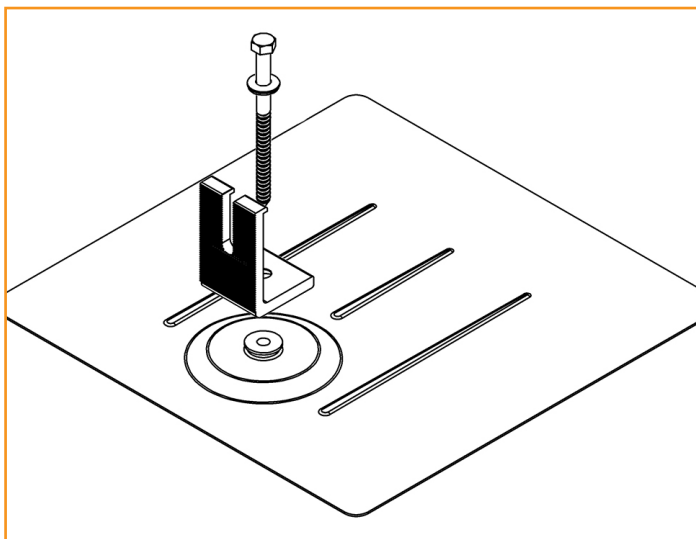


## FLASHFOOT

Locate and mark locations on roof. Drill 1/4" pilot holes and backfill with approved sealant. Slide flashing between 1st and 2nd course of shingles. Line up pilot hole and insert lag bolt through washer, L-Foot, and flashing. Fully seat.

- ▶ Replace L-Foot with U-Foot and add [CP-SQ-Slotted Bracket](#) with an extra flat washer per foot, if using FlashFoot with Tilt Legs.

💡 L-Foot can face either upslope or downslope on roof.



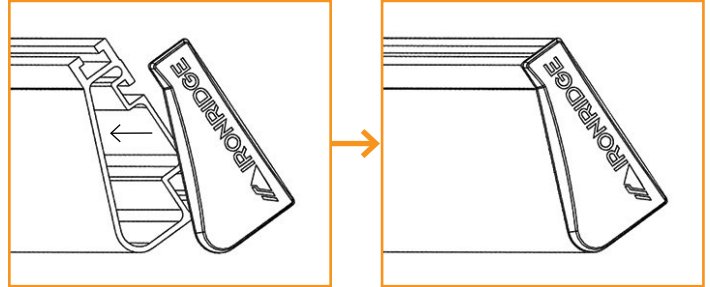


## END CAPS

End Caps add a completed look and keep debris and pests from collecting inside rail.

Firmly press End Cap onto rail end.

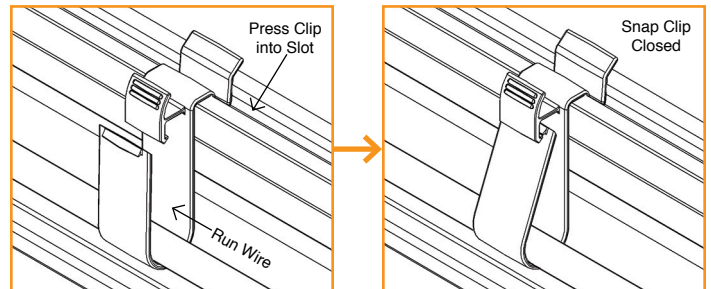
 End Caps come in sets of left and right. Check that the proper amount of each has been provided.



## WIRE CLIPS

Wire Clips offer a simple wire management solution.

Firmly press Wire Clip into top rail slot. Run electrical wire through open clip. Snap closed once all wires have been placed.

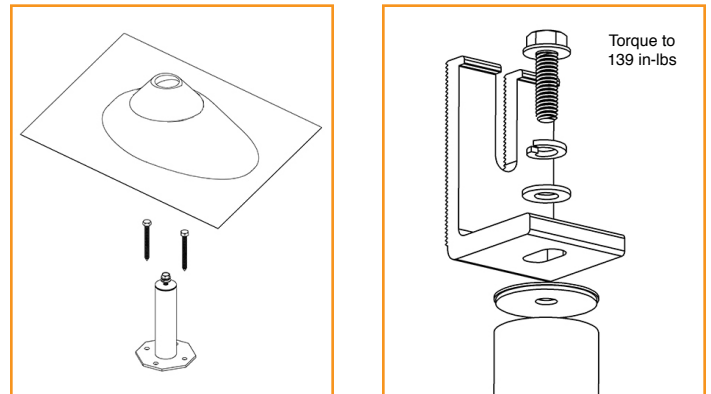


## STANDOFFS

### FLUSH STANDOFFS

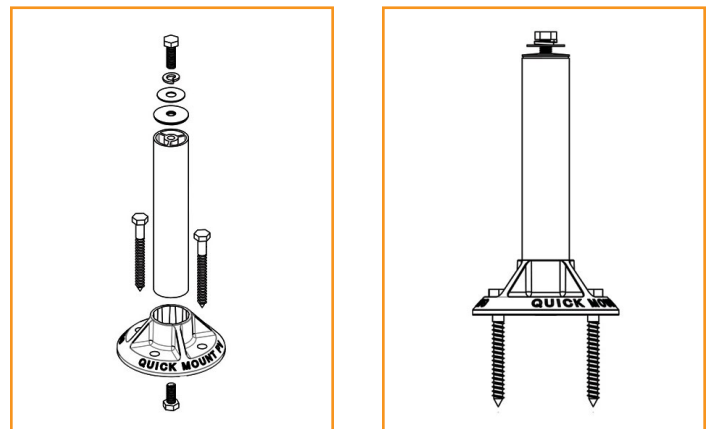
Attach Standoffs to roof locations with lag bolts (not included). Place flashing over Standoff. Attach L-Foot on Standoff washer with hardware. Torque to **139 in-lbs**.

► Only attach to Tilt Legs if assembly is tilted 10 degrees or less.



### TILT STANDOFFS

Refer to Quick Mount PV's [Low Slope Roof Mount Manual](#).



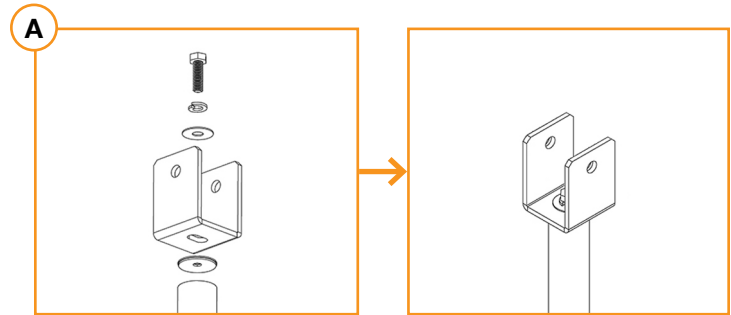


## FIXED TILT LEGS



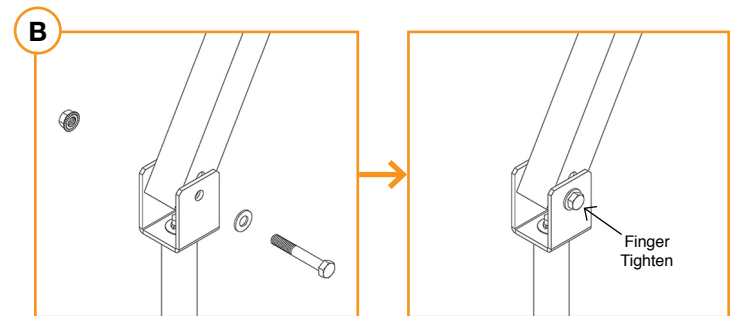
### A. MOUNT U-FEET

Mount U-Feet to roof attachments, torquing as required by roof attachment manufacturer's specifications.



### B. PLACE TILT LEGS

Place Tilt Legs into U-Feet, inserting 3/8"-16 bolts with washers into holes and attaching nuts. Finger tighten.

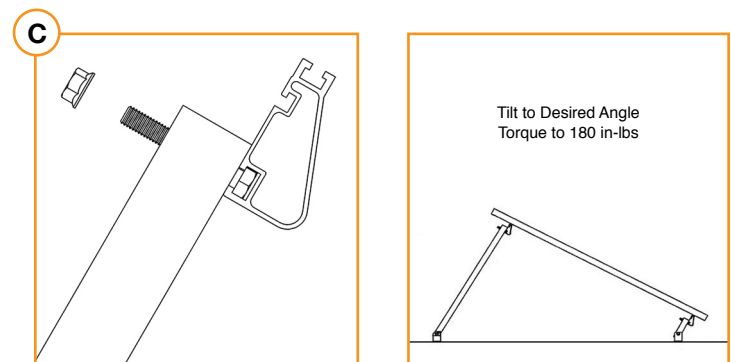


### C. ATTACH RAILS

Slide bolts into 3/8" rail slots, then line up rails with Tilt Legs and attach. Place nuts and finger tighten. Tilt to desired angle and tighten all bolts to **180 in-lbs**.

- ▶ Check with module manufacturer for rail placement specifications. Place rails from module's edge, up to 20% of module's length.

💡 Use a straightedge across the rails, pivot legs, and adjust tilt until rails are flush with straightedge.



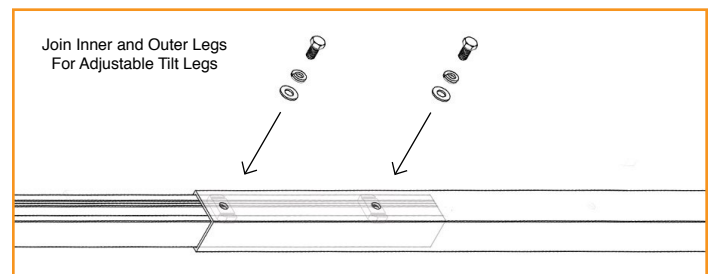
## ADJUSTABLE TILT LEGS



### A. ASSEMBLE TILT LEGS

After mounting U-Feet, join inner and outer legs with hardware, then place Tilt Legs into U-Feet and attach.

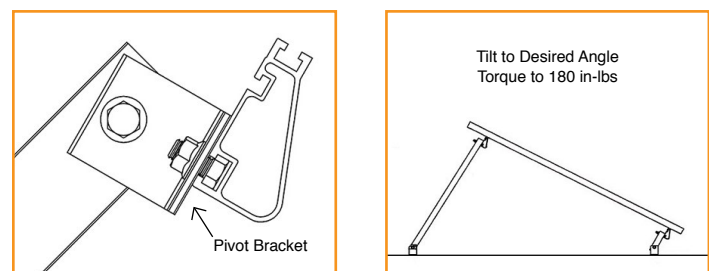
- ▶ Refer to Fixed Tilt Leg instructions (above) for more details.



### B. ATTACH PIVOT BRACKETS

Slide bolts into 3/8" rails slots, attaching pivot brackets to north rails, then line up rails with Tilt Legs and attach. Adjust legs to desired length, tilting assembly to desired angle, and then tighten all bolts to **180 in-lbs**.

- ▶ Place rails from module's edge, up to 20% of module's length.



## WARRANTY

Effective for IronRidge, Inc. (“IronRidge”) mounting structure components (“Products”) manufactured after April 1st, 2012, IronRidge provides the following warranties, for Products installed properly and used for the purpose for which the Products are designed:

- finishes shall be free of visible defects, peeling, or cracking, under normal atmospheric conditions, for a period of three (3) years from the earlier of (i) the date of complete installation of the Product or (ii) thirty days after the original purchaser’s date of purchase of the Product (“Finish Warranty”);
- components shall be free of structurally-related defects in materials for a period of ten (10) years from the earlier of (i) the date of complete installation of the Product or (ii) thirty days after the original purchaser’s date of purchase of the Product;
- components shall be free of functionally-related manufacturing defects for a period of twenty (20) years from date of manufacture.

The Finish Warranty does not apply to: (a) surface oxidation of the galvanized steel components or any foreign residue deposited on Product finish; and (b) Products installed in corrosive atmospheric conditions, as defined solely by IronRidge; corrosive atmospheric conditions include, but are not limited to, conditions where Product is exposed to corrosive chemicals, fumes, cement dust, salt water marine environments or to continual spraying of either salt or fresh water. The Finish Warranty is VOID if (c) the practices specified by AAMA 609 & 610-02 – “Cleaning and Maintenance for Architecturally Finished Aluminum” ([www.aamanet.org](http://www.aamanet.org)) are not followed by Purchaser for IronRidge’s aluminum based components; and (d) if the practices specified by ASTM A780 / A780M - 09 “Standard Practice for Repair of Damaged and Uncoated Areas of HotDip Galvanized Coatings” are not followed by Purchaser for IronRidge’s galvanized steel-based components.

The warranties above do not cover any parts or materials not manufactured by IronRidge, and exclude nonfunctionally-related defects, as defined solely by IronRidge. The warranties do not cover any defect that has not been reported to IronRidge in writing within twenty (20) days after discovery of such defect.

In the event of breach of or non-compliance with the warranties set forth above, IronRidge’s sole obligation and liability, and the sole and exclusive remedy for such breach or non-compliance, shall be correction of defects by repair, replacement, or credit, at IronRidge’s sole discretion. Such repair, replacement or credit shall completely satisfy and discharge all of IronRidge’s liability with respect to these warranties.

Refurbished Product may be used to repair or replace the defective components. Transportation, installation, labor, or any other costs associated with Product replacement are not covered by these warranties and are not reimbursable. These warranties additionally do not cover (a) normal wear, or damage resulting from misuse, overloading, abuse, improper installation (including failure to follow professional instruction and certification), negligence, or accident, or from force major acts including any natural disasters, war or criminal acts; and (b) Products that have been altered, modified or repaired without written authorization from IronRidge or its authorized representative; and (c) Products used in a manner or for a purpose other than that specified by IronRidge. A formal document proving the purchase and the purchase date of the Product is required with any warranty claim.

Except as set forth above, IronRidge sells the Products on an “AS IS” basis, which may not be free of errors or defects, and ALL EXPRESS OR IMPLIED REPRESENTATIONS AND WARRANTIES, INCLUDING ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUALITY, WORKMANLIKE EFFORT, CORRESPONDENCE TO DESCRIPTION, DESIGN, TITLE OR NON-INFRINGEMENT, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR TRADE PRACTICE, ARE HEREBY DISCLAIMED.