



1-800-472-1142

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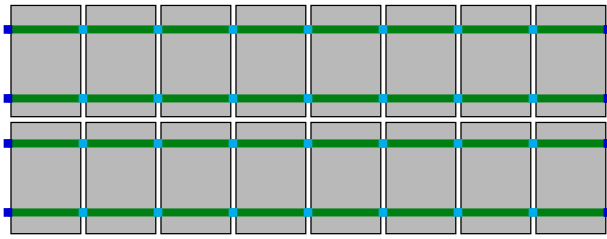
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2. IronRidge Roof Mounting System (page 4-12)
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RACKING LAYOUT OPTIONS

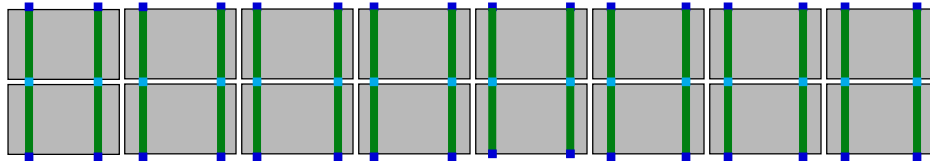
MID CLAMP ■
 END CLAMP ■
 RAIL —

D
 PANELS VERTICAL
 RAILS HORIZONTAL

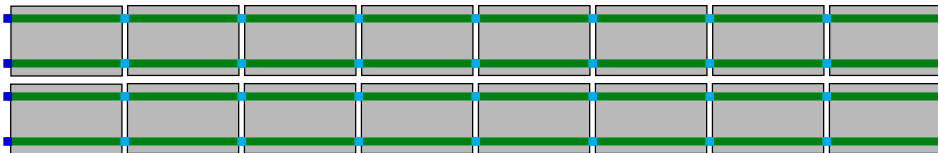


UNLESS OTHERWISE NOTED ON YOUR QUOTE, THIS IS THE CONFIGURATION THAT YOUR RACKING HAS BEEN DESIGNED FOR.

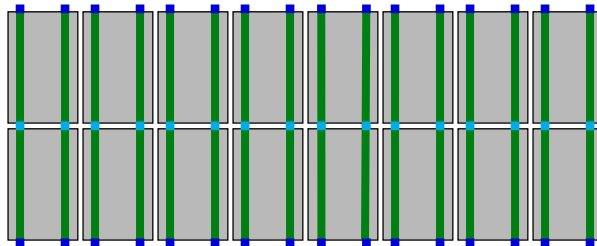
C
 PANELS HORIZONTAL
 RAILS VERTICAL



B
 PANELS HORIZONTAL
 RAILS HORIZONTAL



A
 PANELS VERTICAL
 RAILS VERTICAL



RAIL RUNS THAT ARE PARALLEL TO PV MODULES (OPTIONS A & B) MAY VOID PV MODULE WARRANTY. CALL WHOLESALE SOLAR FOR DETAILS.

MODULE MOUNTING RAILS SHOULD CROSS THE LONG SIDE OF THE MODULES WITHIN 2" EITHER SIDE OF THE MANUFACTURER'S PRE-DRILLED MOUNTING HOLES. WITH RAILS, THE MOUNTING HOLES ARE NOT USED BUT DO GIVE THE PROPER LOCATION RECOMMENDED BY THE MANUFACTURERS TO SUPPORT SNOW AND WIND LOADING. THESE HOLES CAN BE SEEN ON THE BACK LONG SIDES OF THE MODULE BETWEEN 7 TO 11 INCHES FROM THE ENDS OF THE MODULE DEPENDING ON THE MODEL.

CLAMPS ATTACH MODULES TO RAILS WITHOUT USING MODULE MOUNTING HOLES

END CLAMPS



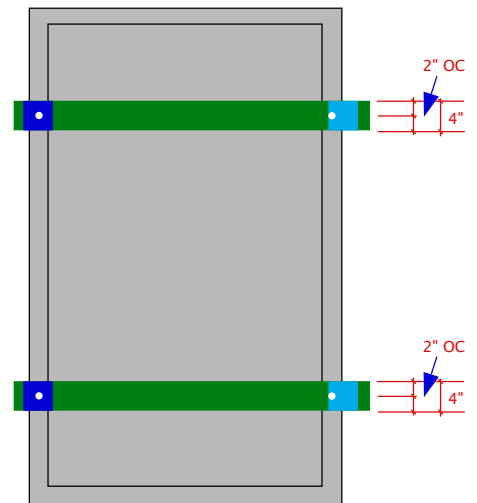
IRONRIDGE

MID CLAMPS



IRONRIDGE

OPTIONS D & C



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MODULE GROUNDING

MODULE FRAMES MUST BE GROUNDED (EGC) VIA UL APPROVED WEEB CLIPS OR UL APPROVED LAY-IN LUGS.



WEEB CLIPS - "LEGS" IN RAIL GROOVES, ONE PER MODULE FOR MODULE OR MICRO INVERTER GROUNDING (EGC)



DMC (IRONRIDGE)
6400014



4-LEG 9.5
6949504



NO-LEG 9.5NL
2 PER MODULE FOR
GROUND OR POLE MOUNTS
6949504

LAY-IN LUGS - ONE ONLY AT ONE END OF RAIL LENGTH OR ONE PER MODULE FOR ELECTRICAL GROUNDING (GEC) [N/A FOR ENPHASE]



IRONRIDGE LUG
W/WEEB CLIP
6910554
6400024



MODULE LUG
9934145

WIRE MANAGEMENT CLIPS

(2-3 CLIPS PER MODULE)

RACKING INSTALLATIONS WITHOUT WIRE MANAGEMENT CLIPS MAY LEAVE PV WIRE LOOSE AND IN CONTACT WITH ROOF OR OTHER SURFACES. OVER TIME THE EXTERIOR WIRE INSULATION MAY BE WORN AWAY FROM RUBBING AGAINST SURFACES, EXPOSING LIVE WIRE, THUS BECOMING AN ELECTROCUTION OR FIRE RISK.

RAIL CLIPS



ENPHASE
7500011

MODULE CLIP



.005 - .125 INCH
MODULE EDGE
7500013

RAIL CLIPS FOR IRONRIDGE XRS/XRL



ENPHASE
2977175



IRONRIDGE
6400077

RAIL L-FEET



IRONRIDGE
6410004

RAIL GROUND BONDING JUMPER



IRONRIDGE
6400343

RAIL INTERNAL SPLICE CONNECTORS



IRONRIDGE XRS
6400104



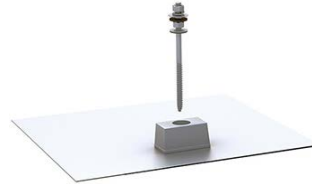
IRONRIDGE XRL
6500002

ROOF ATTACHMENT

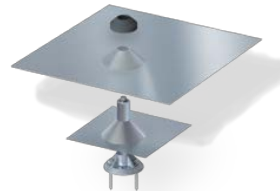
QUICK MOUNT QMSE - 6963152



QUICK MOUNT COMPOSITION FLASHING KIT - 6963150



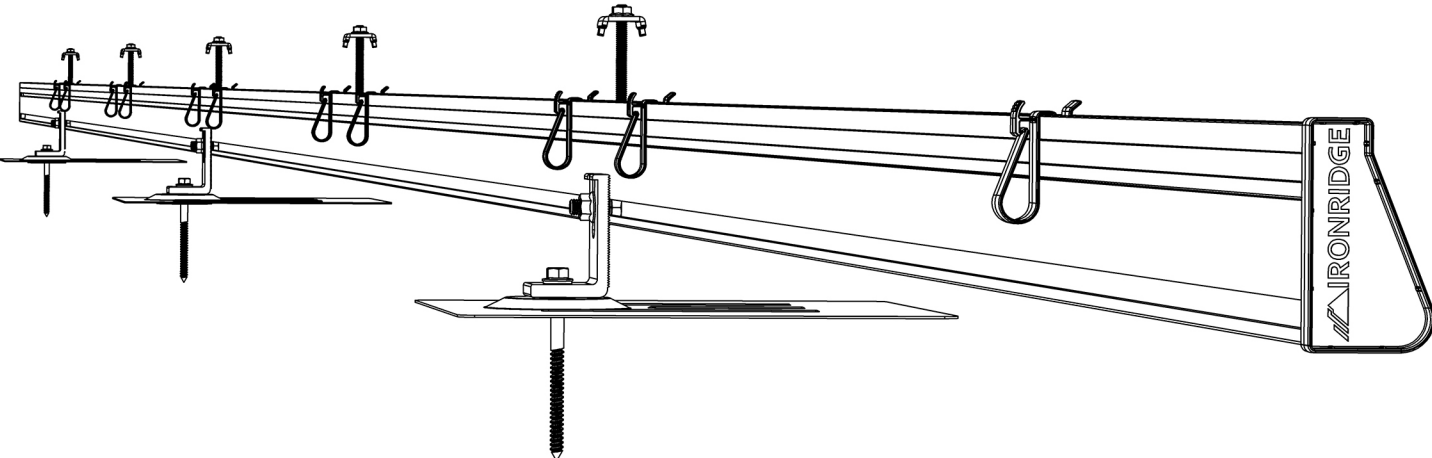
QUICK MOUNT UNIVERSAL TILE FLASHING KIT - 6963287



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*IronRidge FlashFoot and Quick Mount PV flashings sold separately from XR rail system hardware

ROOF MOUNT



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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 all of roofing manufacturer's warranty terms, ensuring that any loose debris potentially obstructing installation procedures is removed from the installation area.
- Use only IronRidge parts or parts recommended by IronRidge; substituting parts may void any applicable warranty.
- Ensure safe installation of all electrical aspects of the array. 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 installation procedures, product and safety standards.
- 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.
- Ensure that the installation is completed by a licensed solar professional.
- Review the [Engineering Design Guide](#) and [Certification Letters](#) to confirm any engineering specifications.
- 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. Please consult module manufacturer's installation guidelines in order to verify mounting compatibility.

CHECKLIST

PRE-INSTALLATION

- Plan project with a Professional Engineer, reviewing the [Engineering Design Guide](#) and [Design Assistant](#).
- Schedule any necessary inspections and acquire any needed approval from the roofing manufacturer.
- Verify module compatibility with Roof Mount. For Integrated Grounding, ensure module is UL-listed.
- Verify that needed components have been obtained. Contact your local distributor for any additional parts.

TOOLS REQUIRED

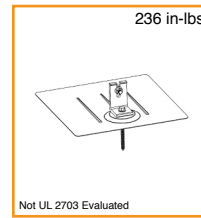
- Cordless Drill (non-impact)
- Torque Wrench (0-240 in-lbs)
- 5/16" Socket (deep)
- 7/16" Socket (deep)
- 9/16" Socket (deep)
- 1/8" Allen Wrench
- 3/8" Socket (for Tilt Legs)

TORQUE VALUES

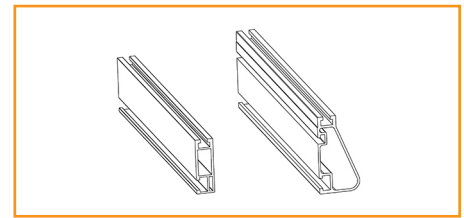
Reduce torque values by 15% when lubricated.

- FlashFoot Lag Bolts (5/16"-9): Fully seat
- L-Feet Nuts (3/8"-16): 236 in-lbs (dry)
- Internal Splice Screws (1/4"-14): 84 in-lbs (dry)
- Grounding Lug Nuts (1/4"-20): 84 in-lbs (dry)
- Grounding Lug Set Screws (1/4"-28): 15 in-lbs (dry)
- End Clamp Nuts (1/4"-20): 65 in-lbs (dry)
- Mid Clamp Nuts (1/4"-20): 84 in-lbs (dry)
- Expansion Joint Nuts (1/4"-20): 84 in-lbs (dry)
- Tilt Leg Nuts (3/8"-16): 180 in-lbs (dry)
- Flush Standoff (5/16"-18): 139 in-lbs (dry)

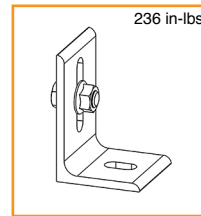
PRIMARY COMPONENTS



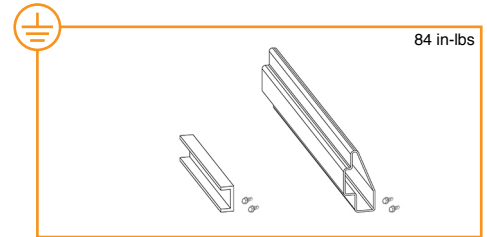
FlashFoot™
Aluminum



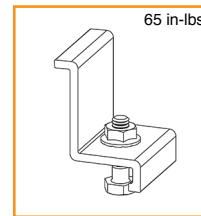
IronRidge Rail
Aluminum



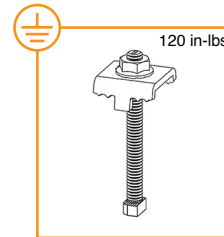
L-Foot
Aluminum



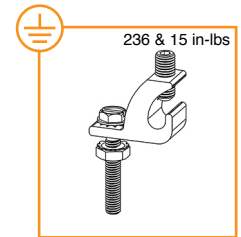
Internal Splice
Aluminum



End Clamp
Aluminum



Mid Clamp
Stainless Steel



Grounding Lug
Tinned Cu & SS

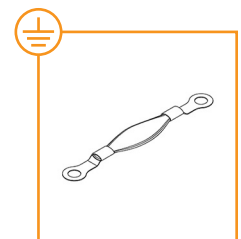
SECONDARY COMPONENTS



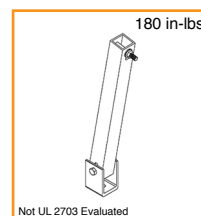
End Cap
Polycarbonate



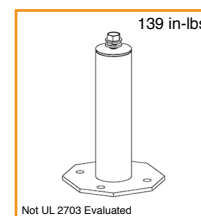
Wire Clip
Polycarbonate



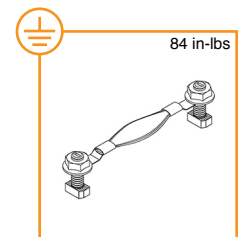
Grounding Strap
Tinned Copper



Tilt Leg
Aluminum



Standoff
Aluminum & SS



Expansion Joint
Tinned Cu & SS

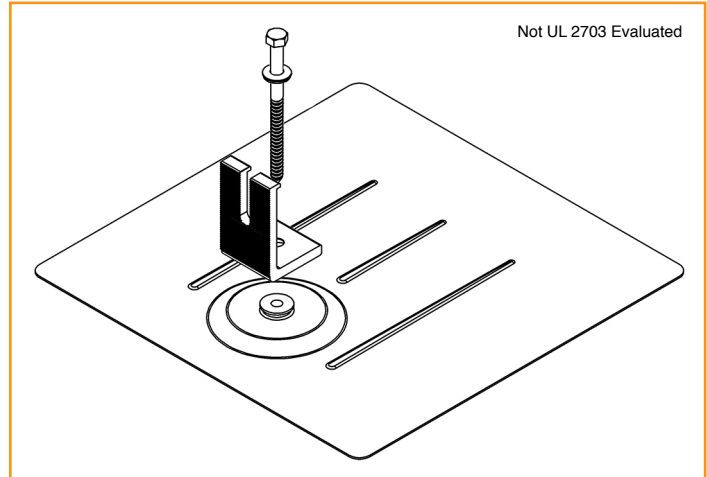
1. ATTACH BASE

For composition shingle roofs, use FlashFoot. For other roofs, mount L-Feet on suitable third-party attachments.

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 fully seat lag bolt through washer, L-Foot, and flashing.

- ☑ Spacing varies with load conditions. Consult engineering specs.
- ☑ Refer to [Page 7](#) for installing Standoffs or Tilt Legs.
- ☑ If using FlashFoot with Tilt Legs, replace L-Foot with U-Foot and add [EcoFasten CP-SQ-Slotted Bracket](#) with extra flat washer.

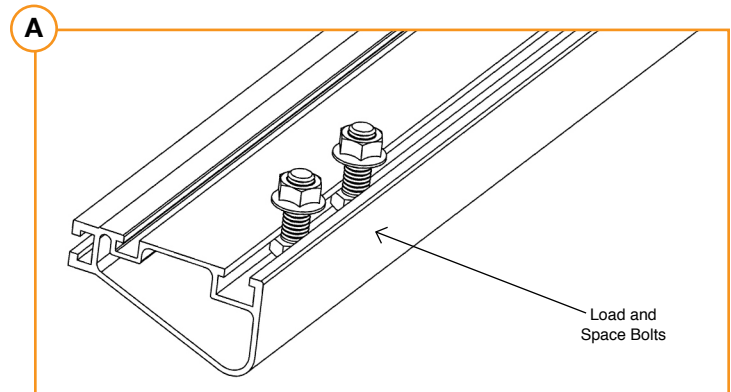


2. PLACE RAILS

A. PREPARE HARDWARE

On the ground, slide 3/8"-16 hardware into side-facing rail slot. Space out bolts to match L-Feet spacing.

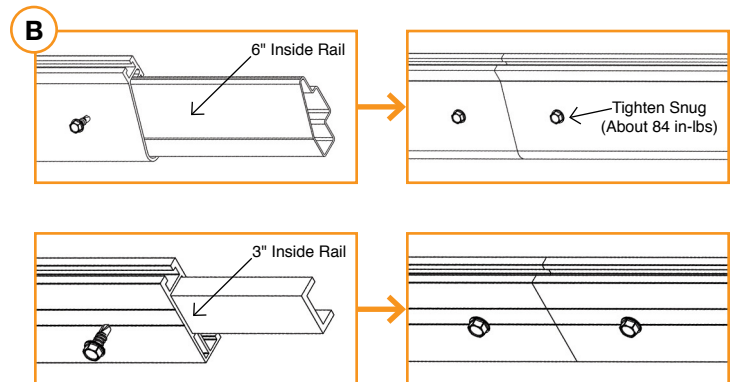
- ☑ Tape ends of rail, to keep bolts from sliding out while moving.
- ▶ If using Mid Clamps with hex bolts, slide provided 1/4"-20 bolts into top slot of rails at this time. Space bolts for panel spacing.



B. SPLICE CONNECTIONS ⚠

Insert Internal Splice into first rail and secure with provided screw. Slide second rail over Internal Splice and secure with provided screw. Torque screws to 84 in-lbs (dry). Repeat splices for all rail connections.

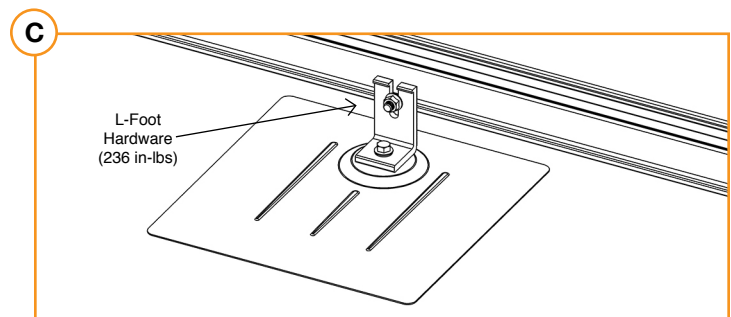
- ☑ [Grounding Straps](#) should be installed at this time. For rows exceeding 100 feet of rail, an [Expansion Joint](#) is needed for thermal expansion. See [Pages 5-6](#) for more info.



C. FASTEN L-FEET

Attach rails to L-Feet using preloaded hardware. Position rails at desired height and level. Torque to 236 in-lbs (dry).

- ☑ To level rails, adjust L-Foot attachments to same height from roof.



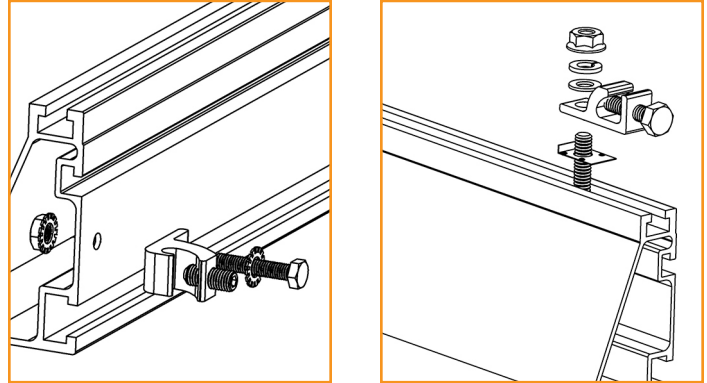
3. SECURE LUGS

IRONRIDGE LUGS ⊕

Using a 13/64" or #7 drill bit, drill a hole through side of rail at least 1/2" from the end and centered. Attach lug and secure 10AWG (minimum) copper grounding wire. Torque hex bolt to 32 in-lbs (dry). Torque set screw to 20 in-lbs for 10AWG, 25 in-lbs for 8AWG, or 35 in-lbs for 4-6AWG (dry).

☑ For WEEB Lugs, review [Wiley WEEB Installation Instructions](#).

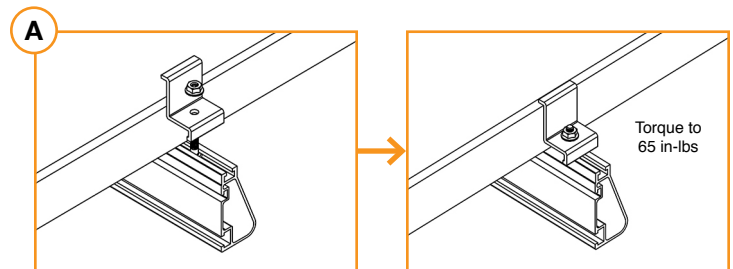
☑ Grounding hardware is only needed on one rail per row of modules. Grounding Lugs and Straps should be on same rail.



4. CLAMP MODULES

A. END CLAMPS

Place first module in position on rails, a minimum of 1.5" from rail ends. Secure End Clamp on rail, ensuring it is hooked over top of module. Torque to 65 in-lbs (dry). Repeat with End Clamp on other rail.

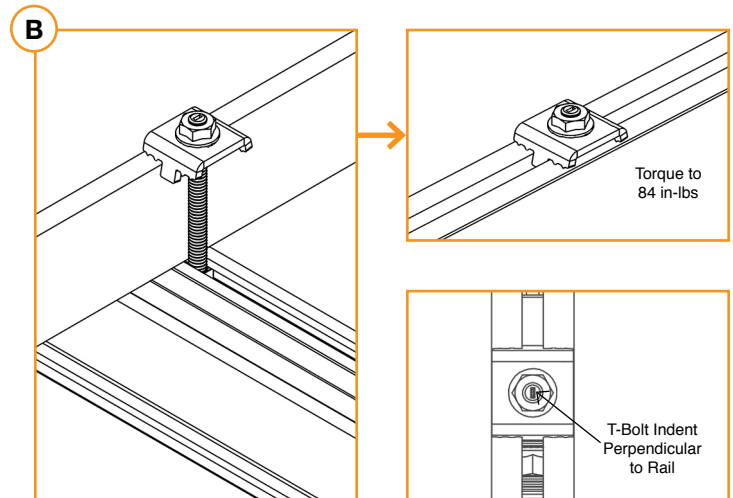


B. GROUNDING MID CLAMPS ⊕

Assemble Grounding Mid Clamp and position next to first module. Slide second module into position under clamp and secure. Ensure the clamp teeth are in contact with both of the module frames and the bolt is properly aligned in slot. Torque to 84 in-lbs (dry). Repeat the procedure to secure each following module.

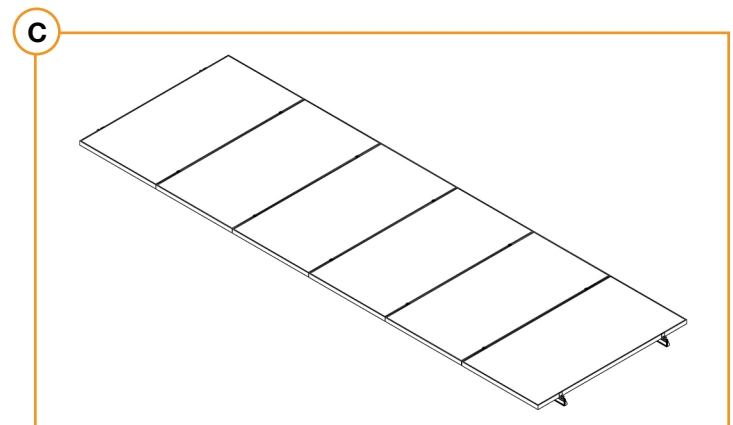
☑ If needed, present [Integrated Grounding Certification Letter](#) to inspector.

► If using Standard Mid Clamps with ETL-listed WEEB Clips, refer to [Wiley WEEB Installation Instructions](#). Torque to 120 in-lbs (dry).



C. END CLAMPS

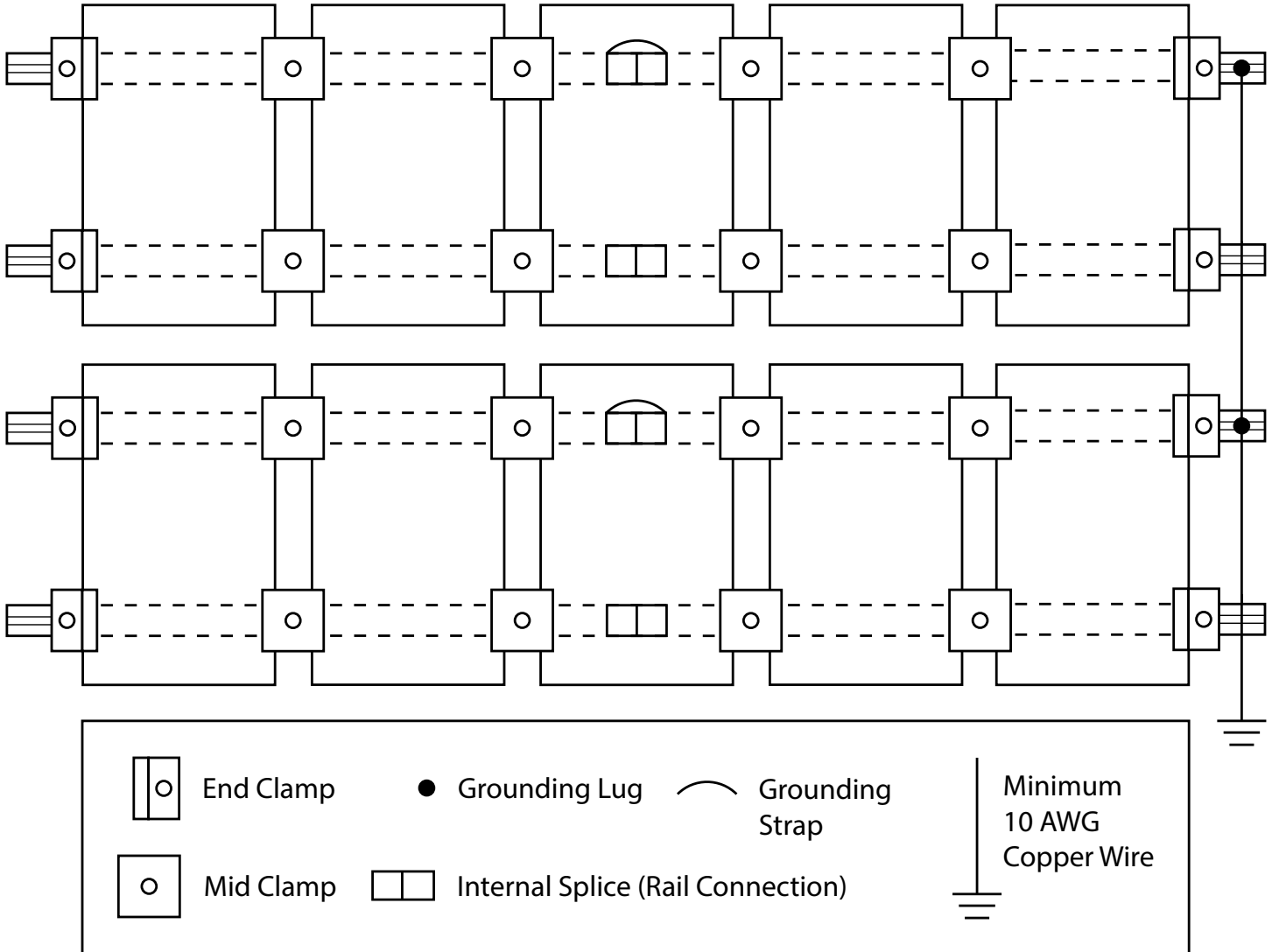
Place last module in position on rails, a minimum of 1.5" from rail ends. Secure End Clamp on rail, ensuring it is hooked over top of module. Torque to 65 in-lbs (dry). Repeat with End Clamp on other rail.



D. REPEAT STEPS

Install remaining module rows.

ELECTRICAL DIAGRAM

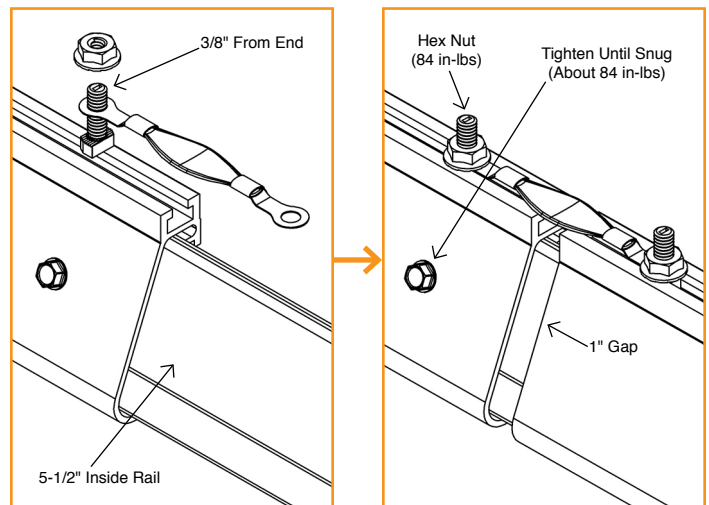


EXPANSION JOINTS

For rows exceeding 100 feet of rail, a Grounding Strap Expansion Joint is required for thermal expansion.

Insert Internal Splice into first rail and secure with screw. Assemble and secure Expansion Joint an inch from rail end. Slide second rail over splice and attach other end of Expansion Joint with hardware, leaving splice secured only on one side. Torque screws and nuts to 84 in-lbs (dry).

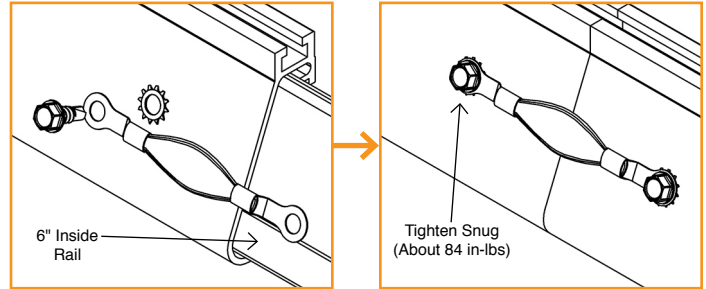
- ☑ Do not splice middle 1/3 of spans nor end spans of rows.
- ☑ Modules should not span over Expansion Joints and should have End Clamps on each side of joint.



GROUNDING STRAPS

Insert Internal Splice into first rail and secure with strap, star washer, and screw. Slide second rail over Internal Splice and secure with strap, star washer, and screw. Torque screws to 84 in-lbs (dry). Repeat for all splices.

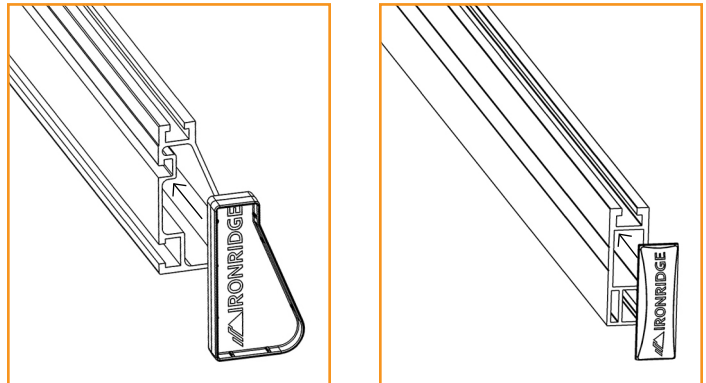
☑ Grounding hardware is only needed on same rail as lug.



END CAPS (OPTIONAL)

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

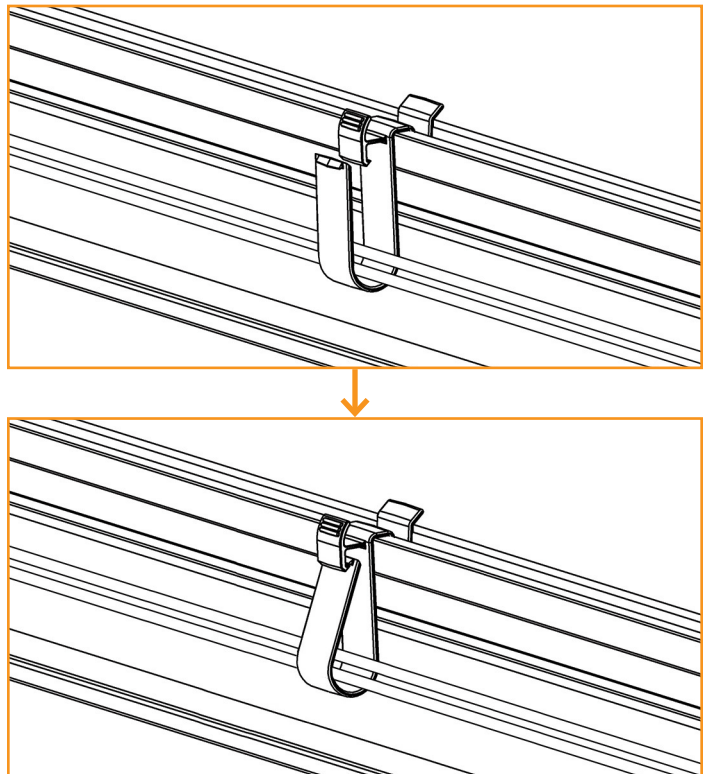
Firmly press End Cap onto rail end.



WIRE CLIPS (OPTIONAL)

Wire Clips offer a simple wire management solution.

Firmly press Wire Clip into top rail slot. Open clip and insert electrical wire accordingly. Close clip once complete.



STANDOFFS (OPTIONAL)

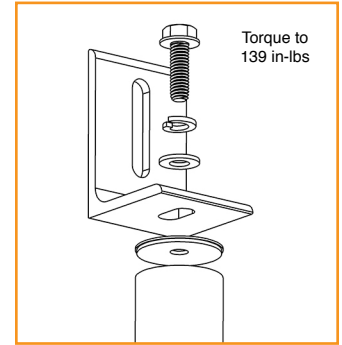
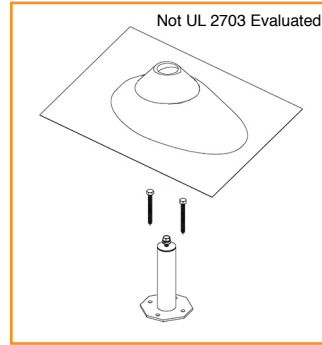
FLUSH STANDOFFS

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

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

TILT STANDOFFS

Refer to [QuickMount PV QBase Low Slope Mount Manual](#).

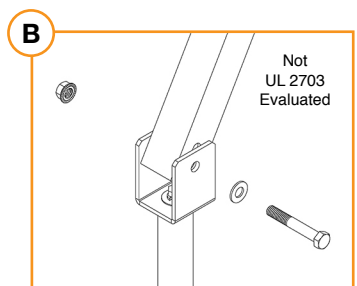
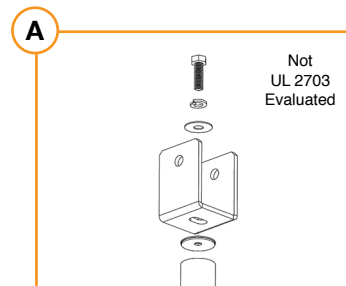


TILT LEGS (OPTIONAL)

A. MOUNT U-FEET

Mount all U-Feet on top of roof attachments and torque to required specifications.

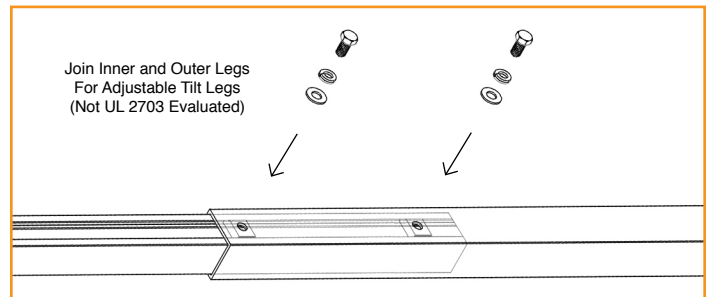
- ☑ Determine the maximum distance between U-Feet, according to engineering specifications.



B. PLACE TILT LEGS

Place Tilt Legs into U-Feet, aligning slots of legs with U-Footer holes. Insert 3/8"-16 bolt with washer into hole and attach nut. Finger tighten, to allow pivoting.

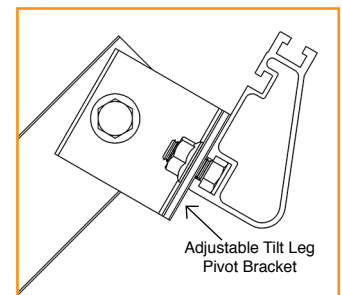
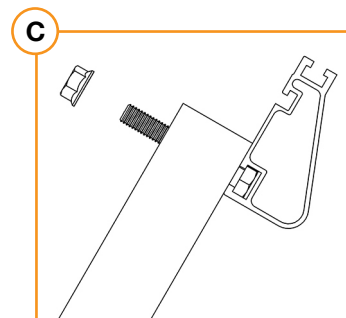
- ☑ For Adjustable Tilt Legs, join inner and outer legs with hardware.



C. ATTACH RAILS

Slide bolts into 3/8" rail slot. Lay rail in place, next to legs, and line up bolts with rail to attach. Place nut and finger tighten, to allow alignment.

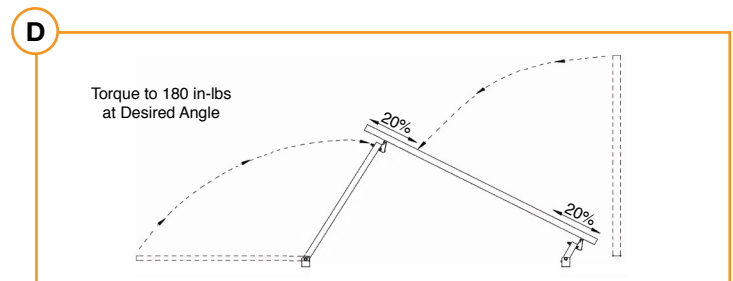
- ☑ For Adjustable Tilt Legs, attach pivot bracket to north rail in each position where legs will connect. Adjust leg to desired length.



D. TILT ASSEMBLY

Make sure assembly is aligned and square. Tilt assembly to desired angle. Tighten all bolts to 180 in-lbs (dry).

- ☑ Check with module manufacturer for rail placement specifics. Place rails from module's edge, up to 20% of the 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) 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.

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Wiley Electronics LLC

Washer, Electrical Equipment Bond

WEEB

Patent Pending

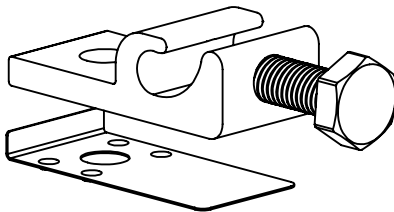
INSTALLATION INSTRUCTIONS

For IronRidge

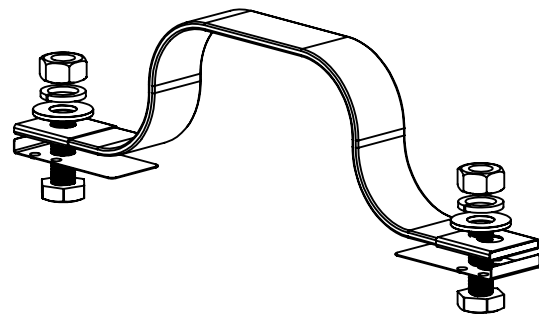
Please read carefully before installing.



WEEB-DMC



WEEBL-6.7



WEEB Bonding Jumper-6.7



Intertek
3098177

Products are tested to UL 467
UL standard for safety grounding and bonding equipment

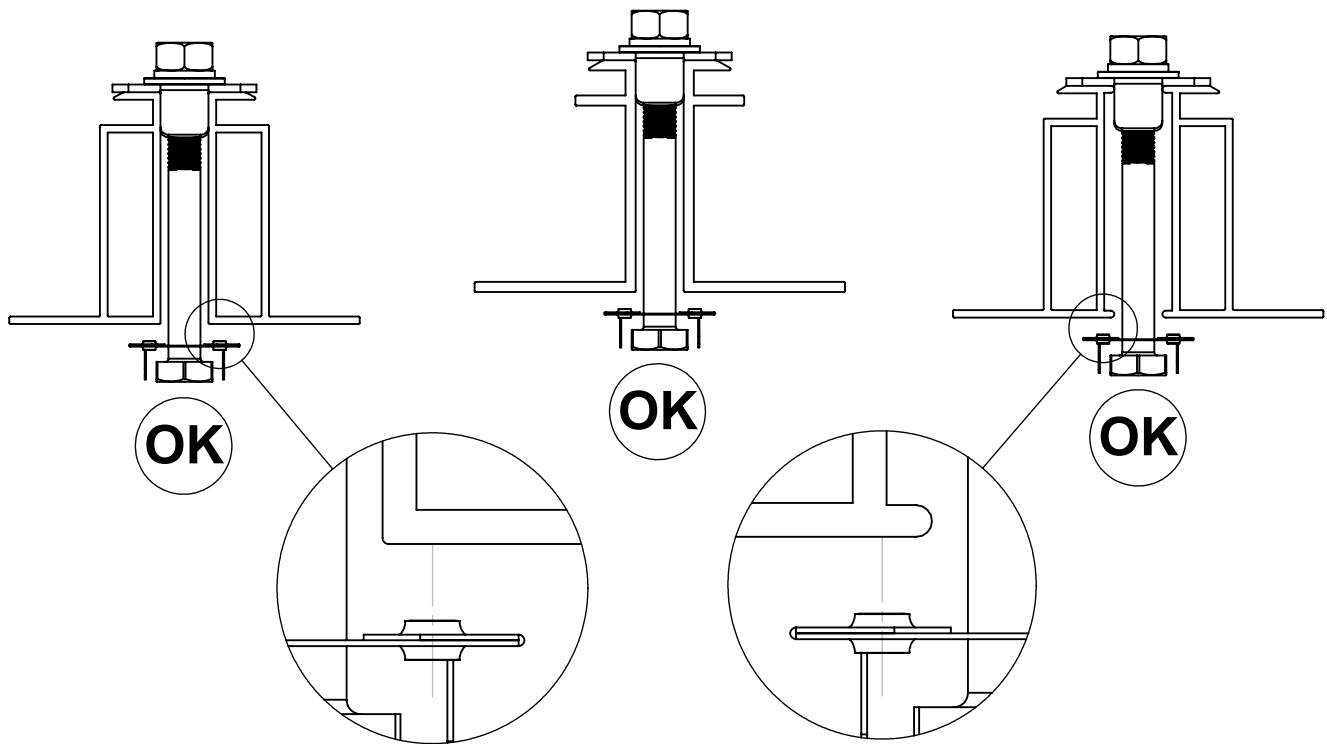
Document Number 104-0404-000039-000

WEEB COMPATIBILITY

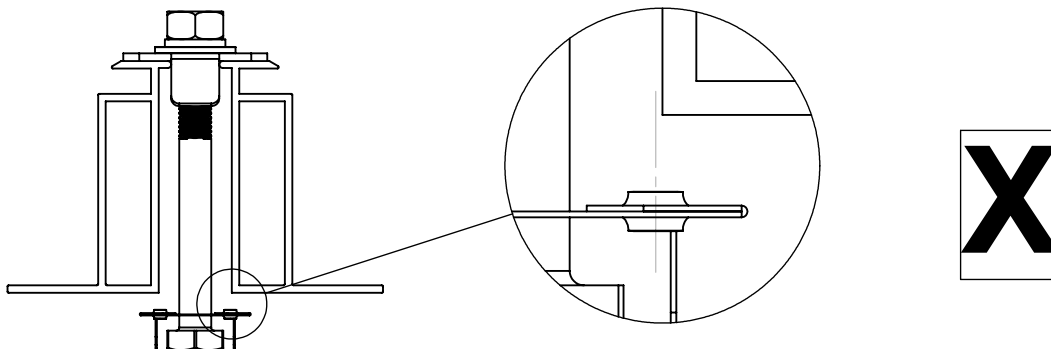
The WEEB family of products can be used to bond anodized aluminum, galvanized steel, steel and other electrically conductive metal structures.

Standard Top Down Clamps

The WEEBs used for bonding the PV modules to the mounting rails are compatible with various cross-sections of module frames. The following are examples of module frames that are compatible. Notice that the WEEB teeth are positioned completely under the edge of the module frame.

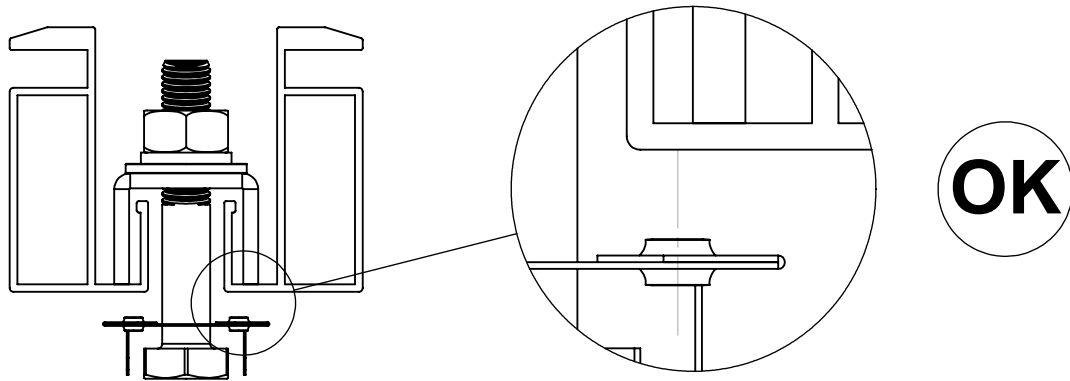


The following is an example of a module frame that is incompatible with the WEEB. The WEEB teeth are positioned only partially under the edge of the module due to the lip on the top edge of the module frame.



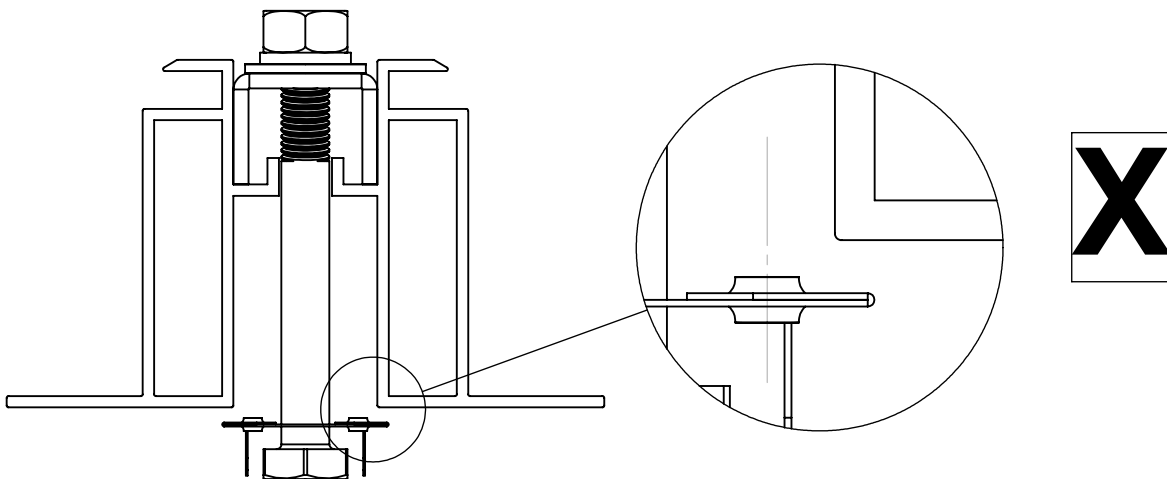
Top Down Clamps for Lipped Modules

The following are a few variations of lipped solar modules mounted with inverted U-shaped clamps. Notice that the force which the inverted U-shaped clamp exerts is in line with the WEEB teeth.



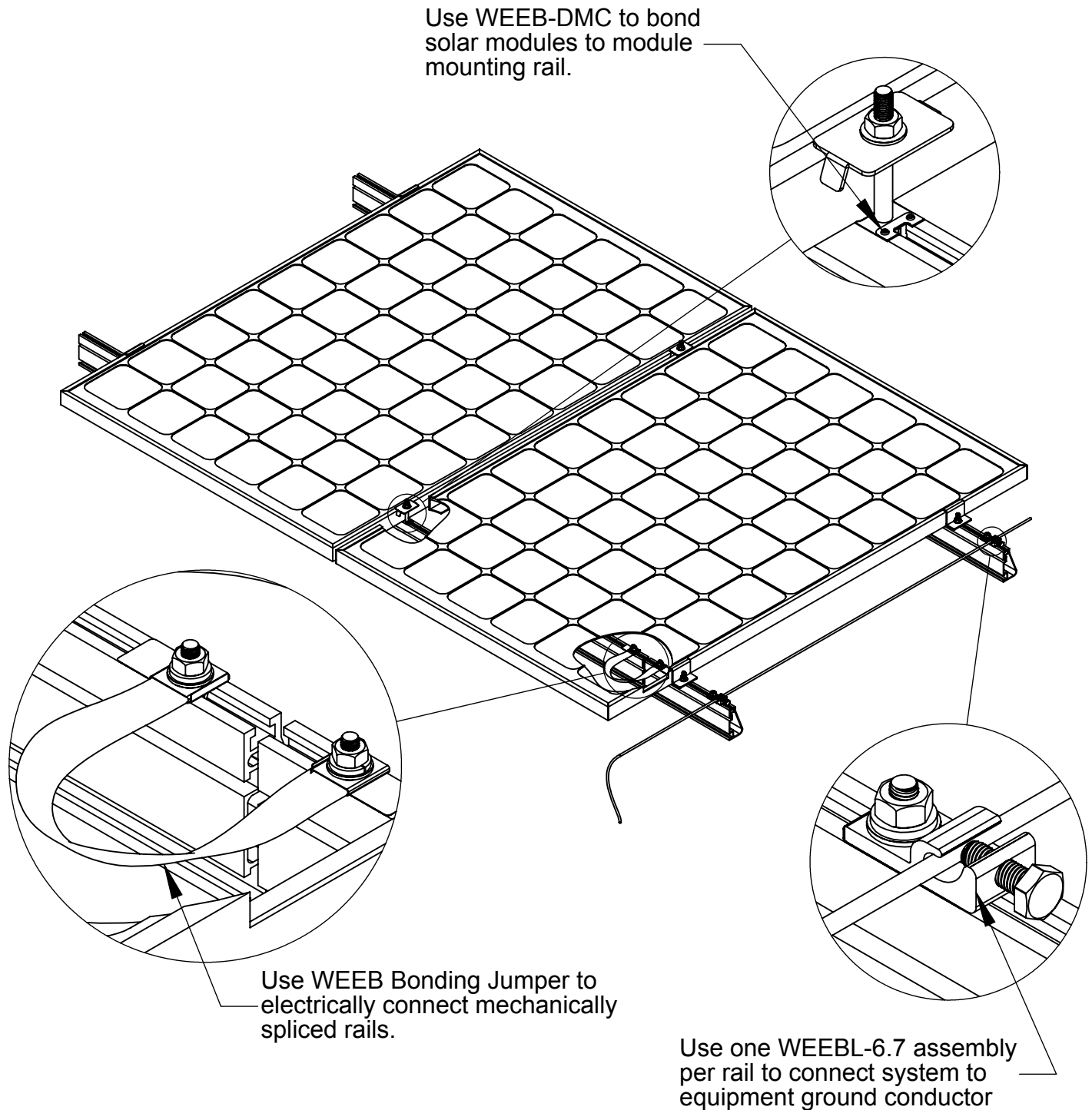
Low-Lipped Module

WEEB-DMC is not compatible with high lipped modules. The WEEB teeth do not intersect with the solar module frame.



High-Lipped Module

SYSTEM OVERVIEW

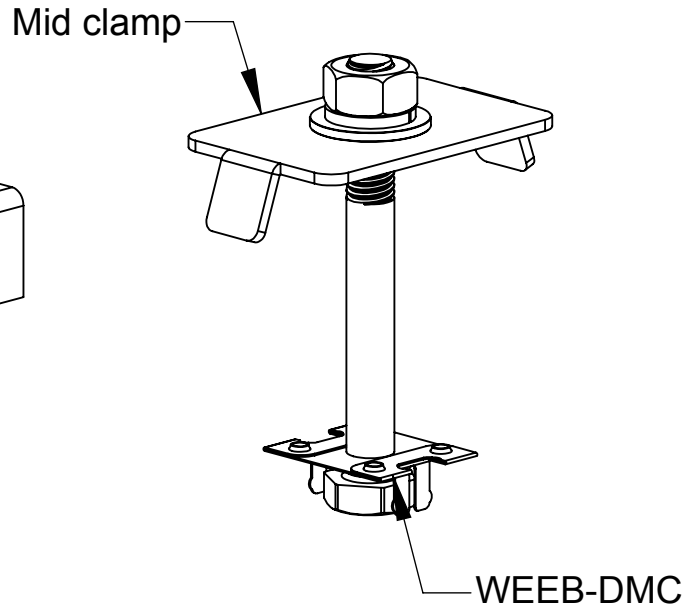
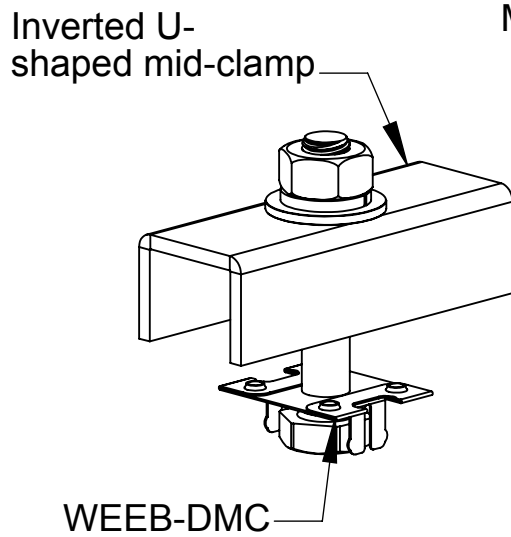


Important notes:

1. Use general purpose anti-seize compound on fastener threads when installing WEEBs.
2. WEEBs are intended for **SINGLE USE ONLY**. Functionality will not be guaranteed if reused.

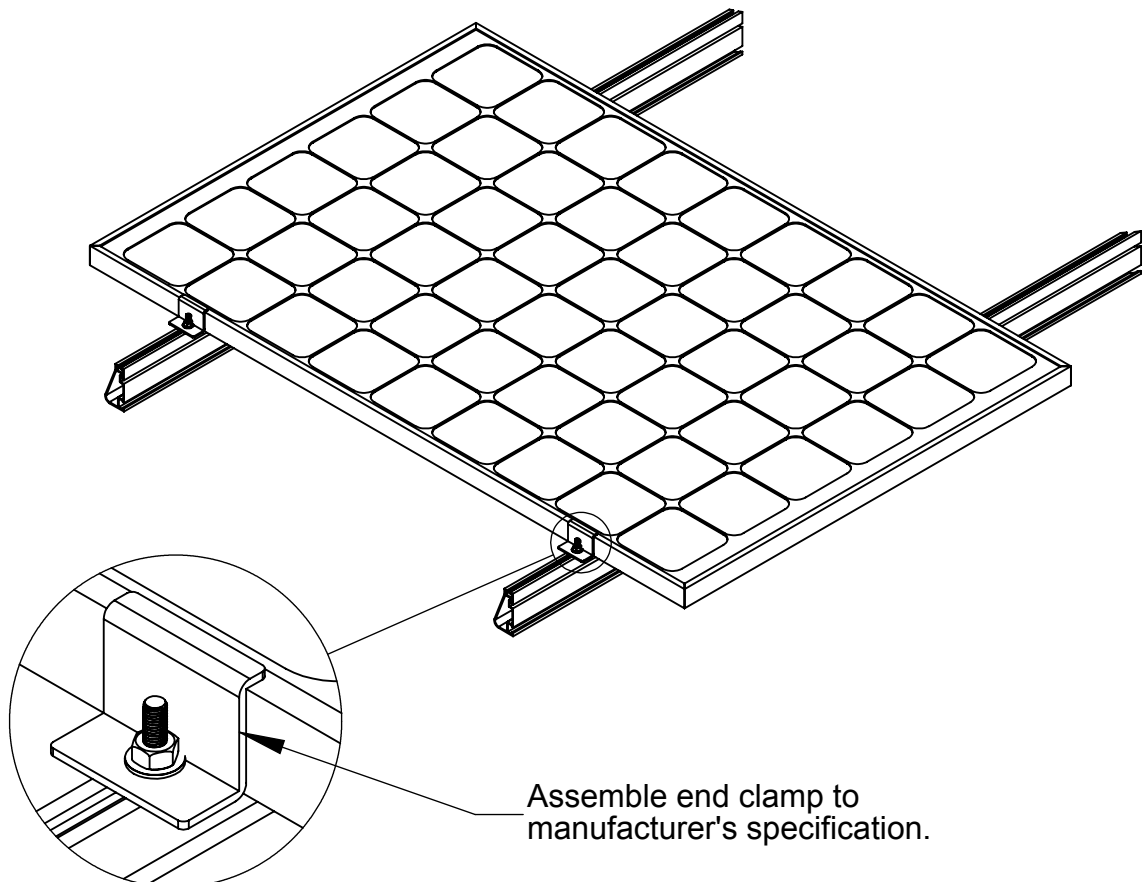
WEEB-DMC ASSEMBLY

①



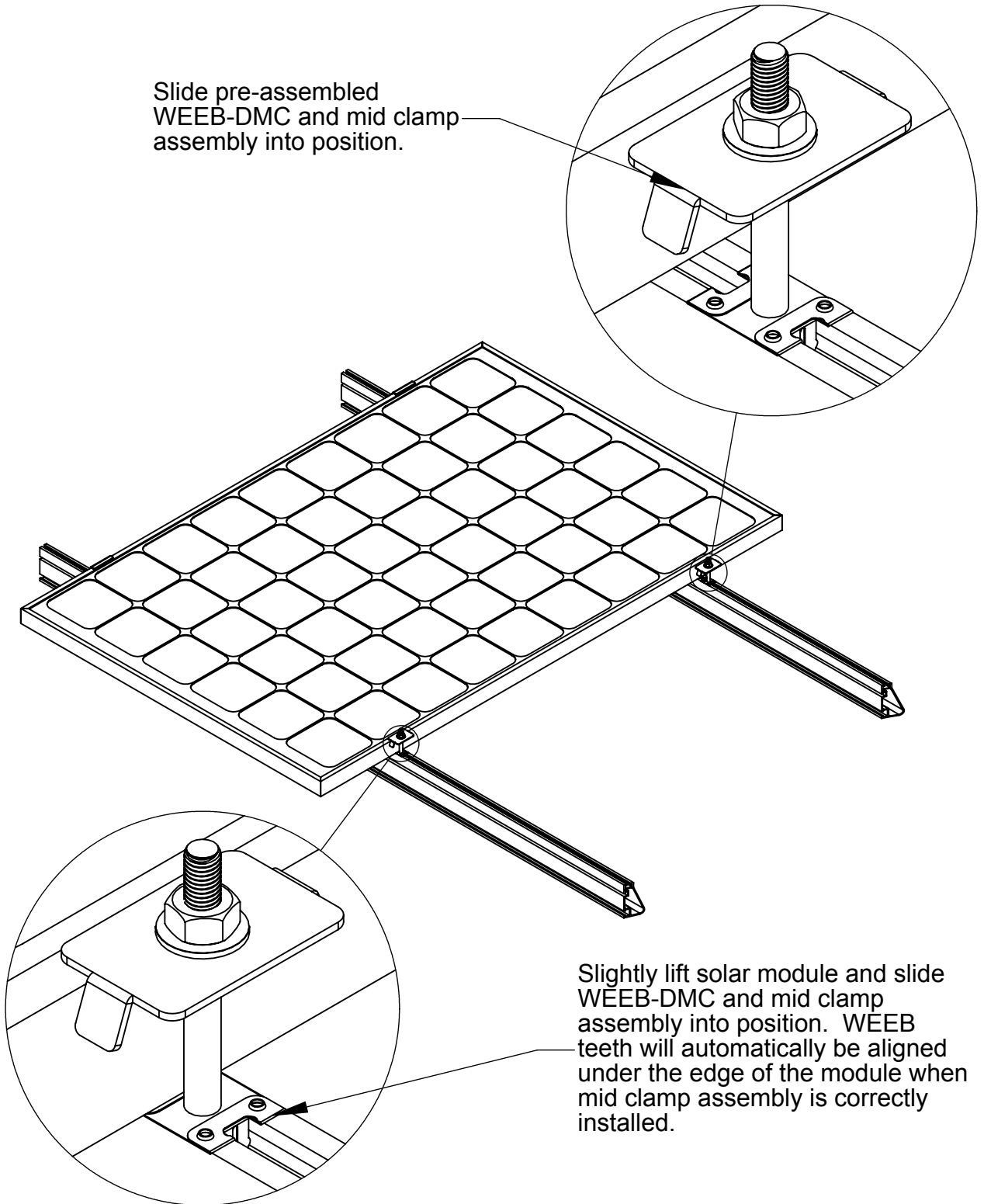
Pre-assemble WEEB-DMC to mid clamp assembly as shown. Pre-assembling WEEB-DMC to mid clamp assembly will contain the small individual parts, reducing the possibility of losing parts during installation.

②



3

Slide pre-assembled
WEEB-DMC and mid clamp
assembly into position.

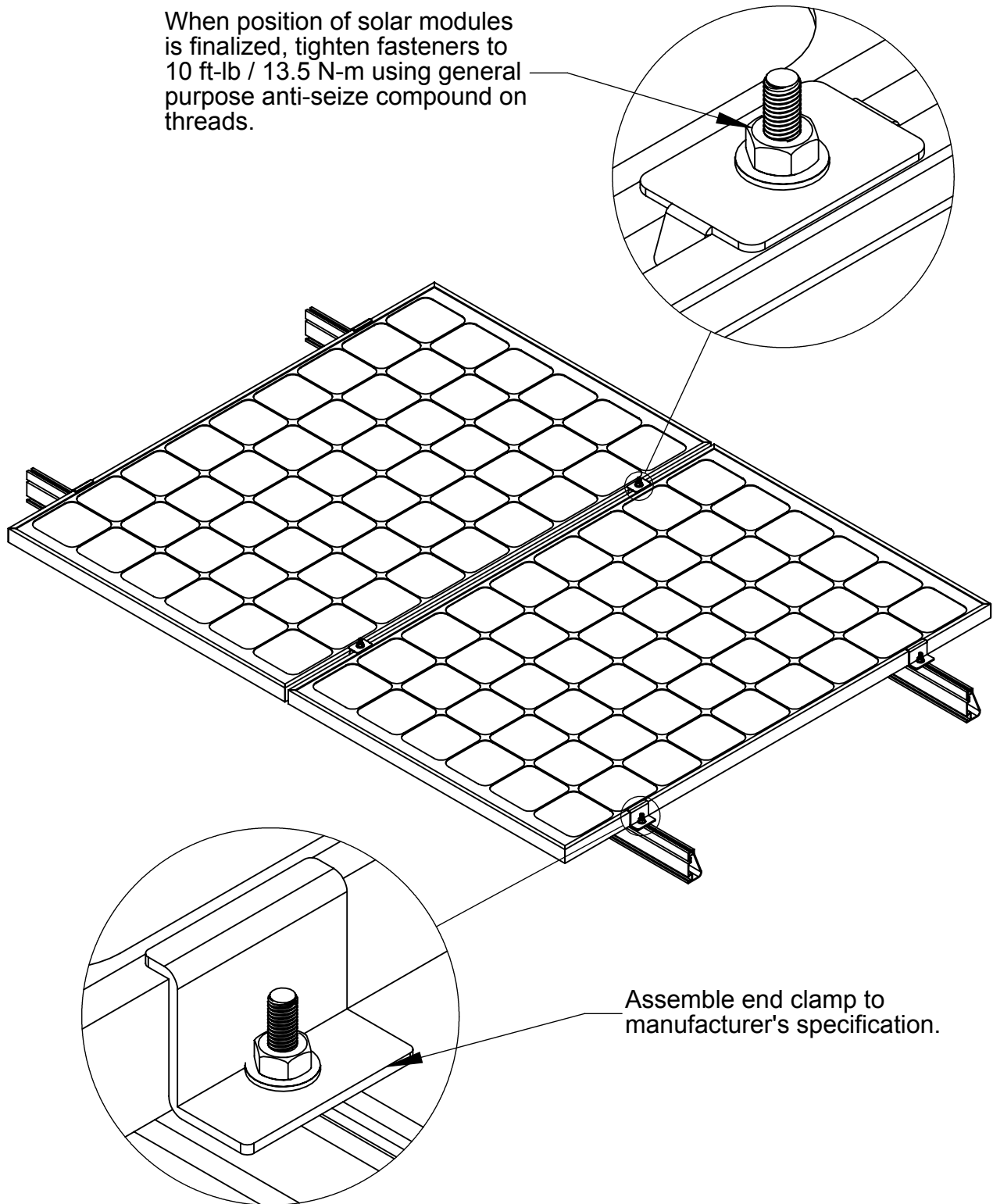


Important note:

To correctly install mid clamp assembly, ensure that the bolt is perpendicular to the mounting rail and both sides of the solar modules are completely positioned against the mid clamp. Refer to WEEB compatibility page for illustrations.

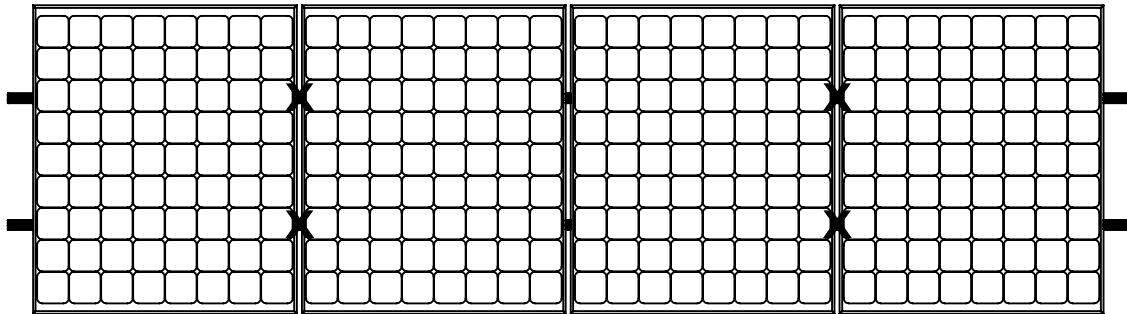
- ④ **Important note:**
WEEBs are for SINGLE USE ONLY! Do not torque fasteners down if position of solar modules is not finalized. Only slightly tighten fasteners to keep modules in place.

When position of solar modules is finalized, tighten fasteners to 10 ft-lb / 13.5 N-m using general purpose anti-seize compound on threads.



WEEB-DMC LAYOUT

EVEN NUMBER OF MODULES IN ROW

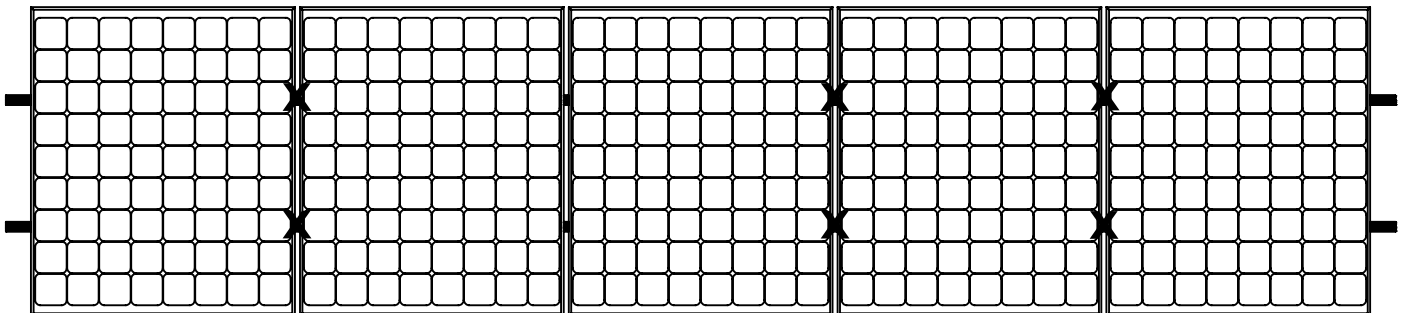


X DENOTES PLACES TO INSTALL WEEB-DMC

$$C \times R = 4 \times 1$$

$$\text{WEEB-DMC NEEDED} = C \times R = 4 \times 1 = 4$$

ODD NUMBER OF MODULES IN ROW



X DENOTES PLACES TO INSTALL WEEB-DMC

$$C \times R = 5 \times 1$$

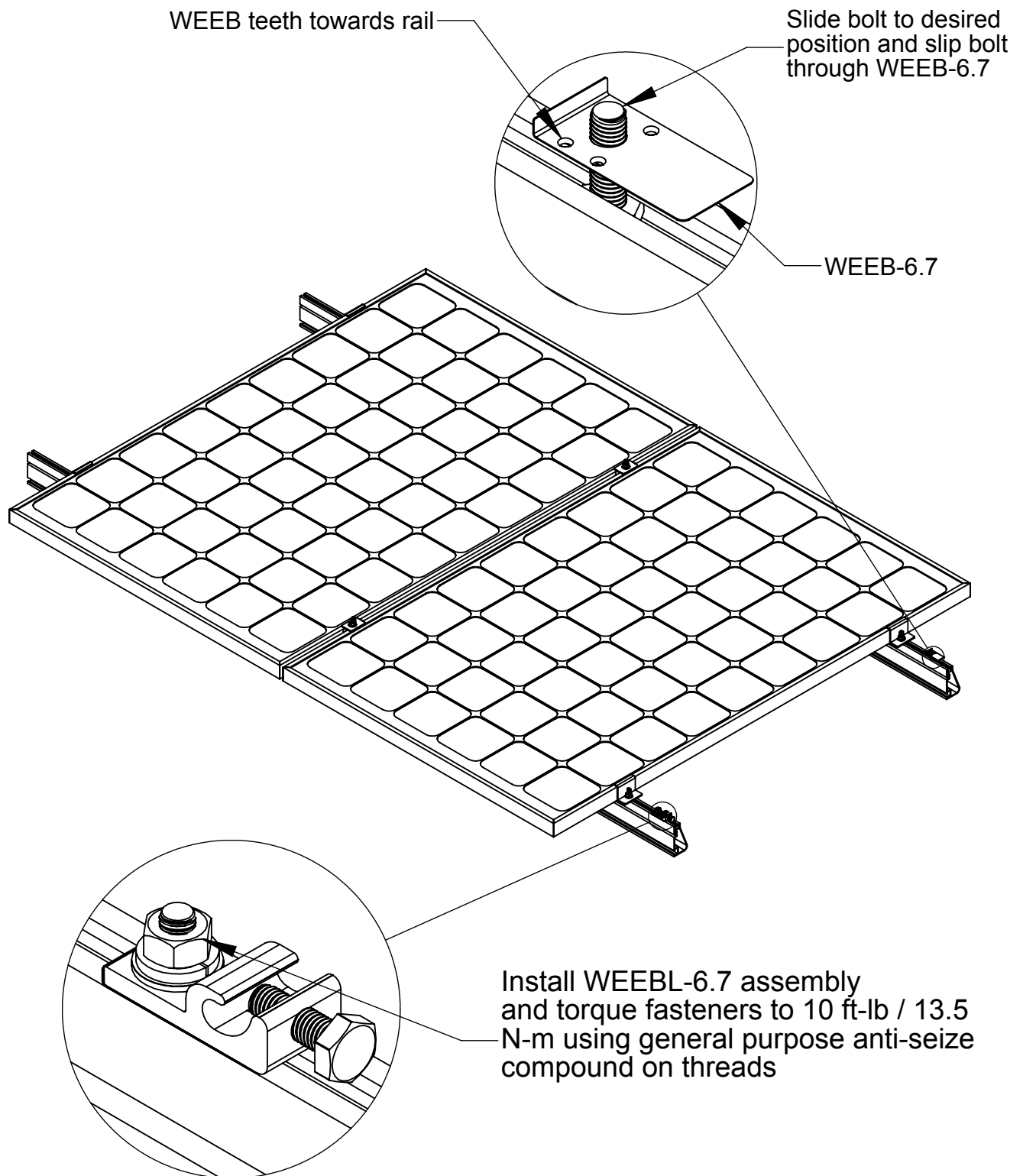
$$\text{WEEB-DMC NEEDED} = [C+1] \times R = [5+1] \times 1 = 6$$

Note:

When replacing a single faulty module, also remove the adjacent module which contacts the same WEEBs as the faulty module. This will ensure that there are never ungrounded modules in the array.

WEEBLUG ASSEMBLY

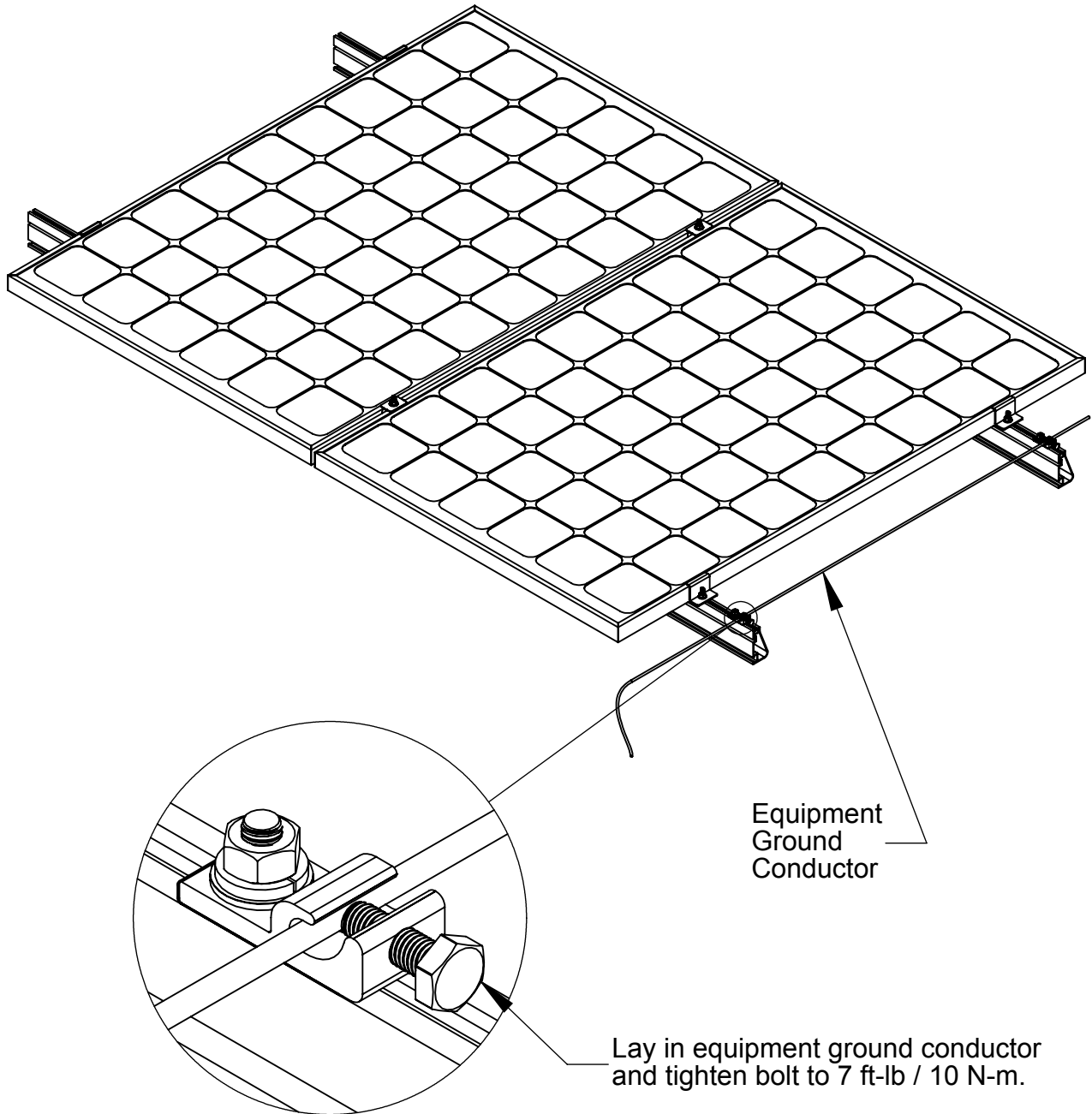
5



Important note:

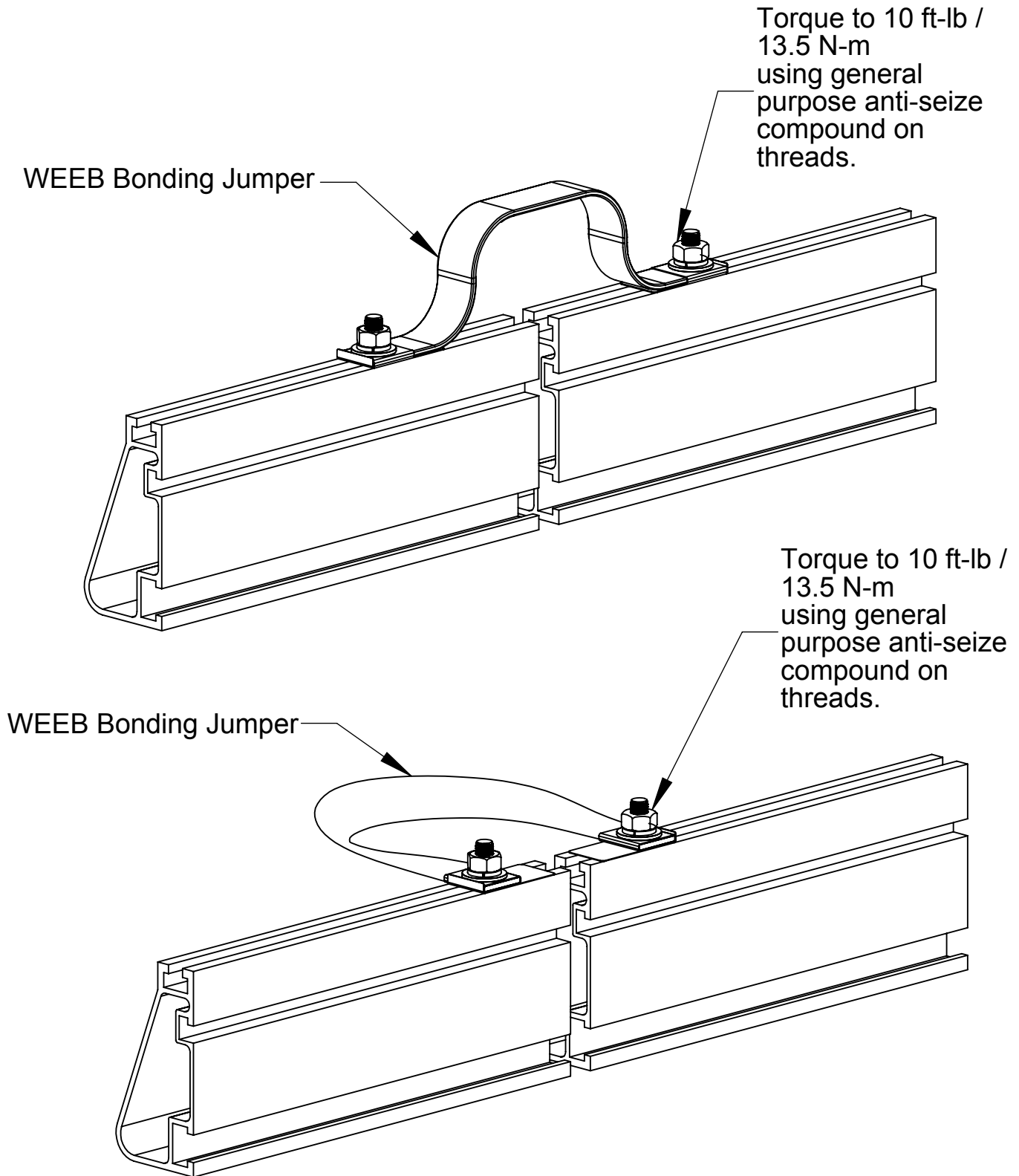
WEEEB-6.7 that sits under the WEEBLug is for single use only. Ensure position is correct before tightening down.

6



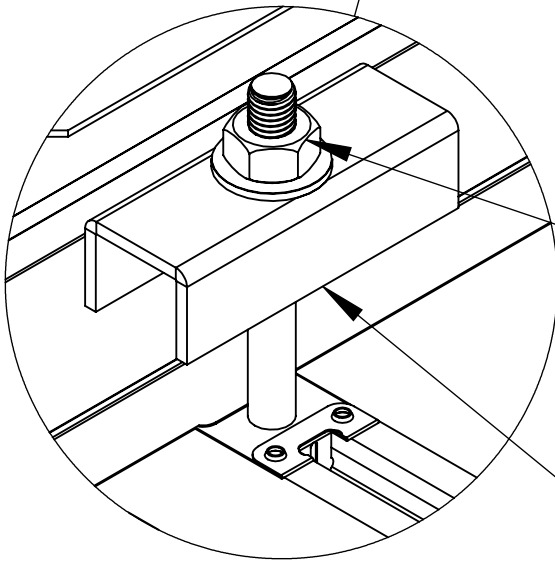
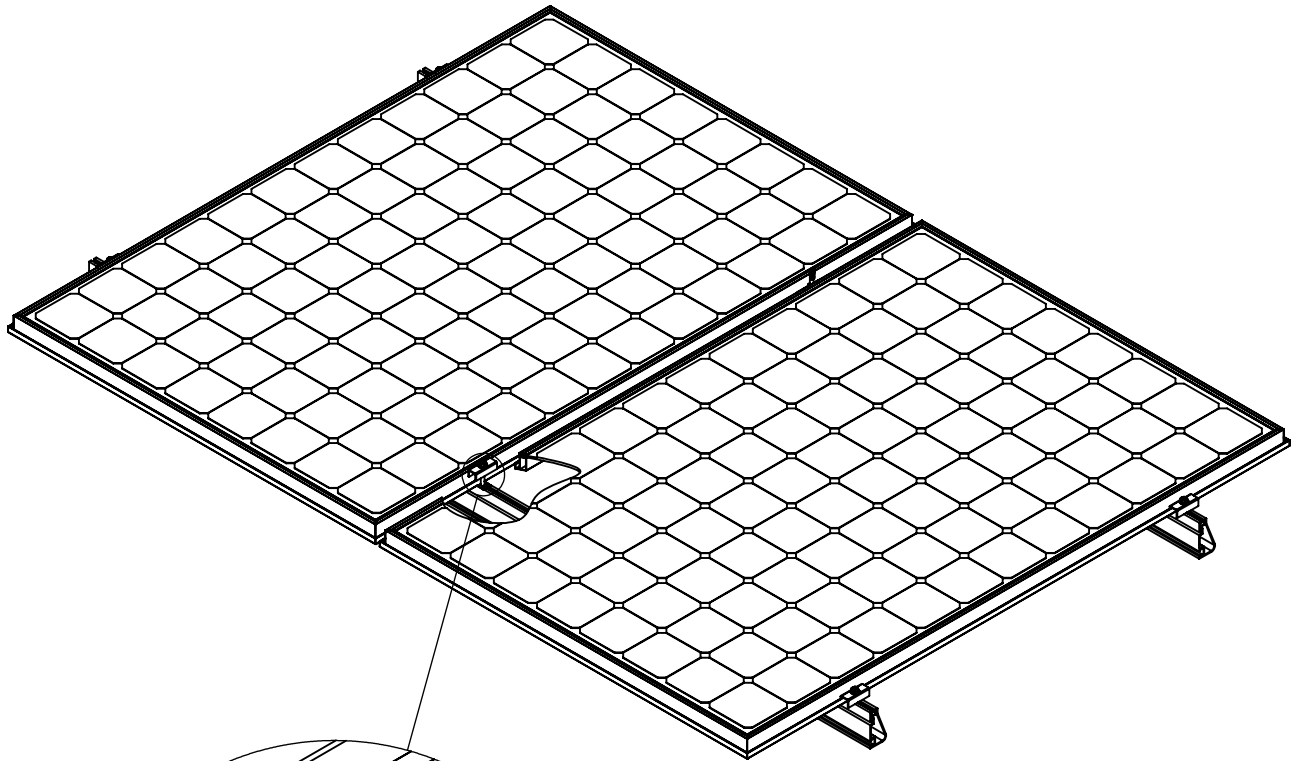
IRONRIDGE SPLICE KIT ASSEMBLY

- ⑦ The flexible WEEB Bonding Jumper can be mounted in different ways shown below.



Route WEEB Bonding Jumper as shown above if edge of solar module lands between two splice rails.

LOW-LIPPED MODULE INSTALLATION



Tighten to 10 ft-lb / 13.5 N-m using general purpose anti-seize compound on threads.

Inverted U-shaped mid clamp