

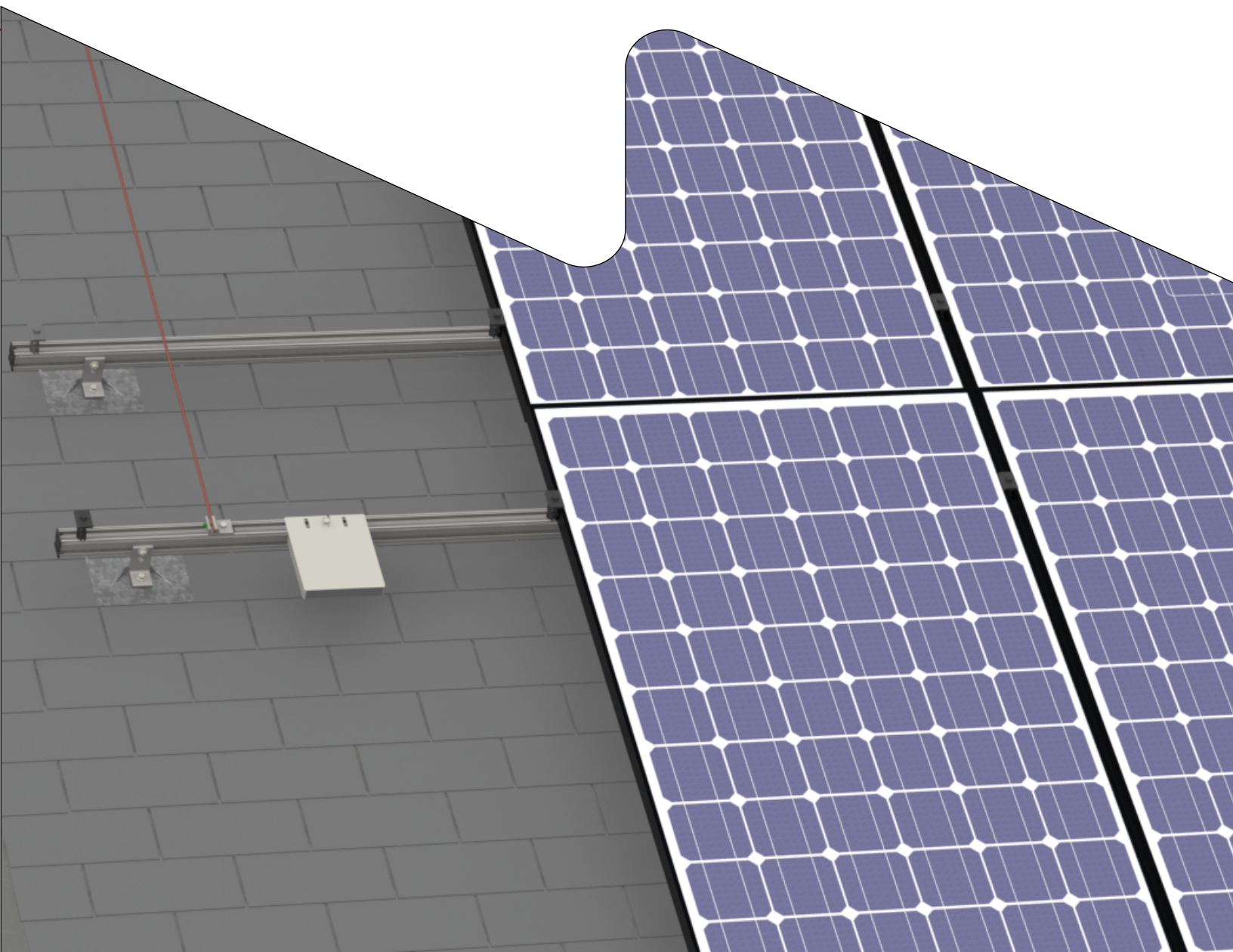


**Connecting Strength**

# CrossRail System



**ASSEMBLY INSTRUCTIONS**





# Content

/About Us	3
/General Safety Information	4
/Roof requirements	5
/Structural requirements	5
/Important mounting instructions	5
/Bonding and Grounding	6
/Fire Rating	7
/Compatible Modules	7
/Torque Specs	8
/Tools Overview	8
/Components	9
/Composition shingle	11
/Tile	11
/Metal	12
/Assembly	13
/Notes	19

## Quality tested - several certifications

K2 Systems stands for secure connections, highest quality and precision. Our customers and business partners have known that for a long time. Independent institutes have tested, confirmed and certified our capabilities and components.

Please find our quality and product certificates under:

<https://k2-systems.com/en-us/company/quality-management/>

# Engineering strength is at our core



With sophisticated product innovations and a deep customer focus, K2 Systems is the engineering leader for all your mounting system needs. We are a market leader with more than 32 GW installed worldwide.

We offer proven product solutions and innovative designs. Wind tunnel testing along with advanced structural and electrical validation to facilitate permitting, design and installation. Our designs result in cost competitive racking systems with dedicated support that will position you to win more projects.

We partner with our customers and suppliers for the long-term. High quality materials and cutting edge designs provide a durable, yet functional system. Our product line is comprised of a few, coordinated components that lower the cost of materials, and simplify installation, saving you time and money. All backed by German engineering, a long track record of quality and a company that is here to stay.

Thank you for choosing K2 Systems for your Solar PV Project.

# General Safety Information



Please note that our general mounting instructions must be followed at all times and can be viewed online at <https://k2-systems.com/en-us/services/resource-center/>

- /The equipment may only be installed and operated by qualified and adequately trained installers.
- /Prior to installation, ensure that the product complies with on-site static loading requirements.  
For roof-mounted systems, the roof load-bearing capacity must always be checked.
- /National and local building regulations and environmental requirements must be adhered to.
- /Compliance with health and safety regulations, accident prevention guidelines and applicable standards are required.
  - /Protective equipment such as safety helmet, boots and gloves must be worn.
  - /Roofing works must be in accordance with roofing regulations utilizing fall protection safeguards when working at heights of 6 feet or more above a lower level.
  - /At least two people must be present for the duration of the installation work in order to provide rapid assistance in the event of an emergency.
- /K2 mounting systems are continuously developed and improved and the installation process may thereby change at any time. Prior to installation consult our website at:  
<https://k2-systems.com/en-us/resource-center-2/>.  
We can send you the latest version on request.
- /The assembly instructions of the module manufacturer must be adhered to.
- /Equipotential bonding/grounding/earthing between individual parts is to be performed according to country specific standards, as well as national laws and regulations.
- /At least one copy of the assembly instructions should be available on site throughout the duration of the installation.
- /Failure to adhere to our general safety and assembly instructions and not using all system components, K2 is not liable for any resulting defects or damages. We do not accept liability for any damage resulting in the use of competitor's parts. Warranty is excluded in such cases.
- /If all safety instructions are adhered to and the system is correctly installed, there is a product warranty entitlement of 25 years! We strongly recommend reviewing our terms of guarantee, which can be viewed at <https://k2-systems.com/en-us/resource-center-2/>. We will also send this information on request.
- /Dismantling of the system is performed in reverse order to the assembly.
- /K2 stainless steel components are available in different corrosion resistance classes. Each structure or component must be carefully checked for possible corrosion exposure.



# The following guidelines apply



The CrossRail System can be installed as standard under the following conditions. Even if the system is capable of meeting higher demands through the integration of safety standards, please get in touch with your contact at K2 Systems if the specified values are exceeded.



## Roof requirements

/The sufficient holding force of the roof covering at the support or substructure must be ensured on site.

/Roof pitch: 5 - 75°

/Roof mean height: 0-60 ft



## Structural requirements

The static verification of the component is automatically calculated with the K2 Base planning software for the respective location. The design provided in a project report must be followed.

/Wind speed: 95-200 mph

/Ground snow load: 0-100 psf

/Clearance: 2" to 10" clear from the top of the roof to the top of PV panel

/Maximum Rail Cantilever: Refer to the CrossRail engineering letters for maximum rail span between roof attachments. Maximum cantilever value is 1/3 of maximum rail span between roof attachments installed on the roof.



## Important Mounting Instructions

/On-site general standards and regulations for lightning protection must be observed and consultation with a specialist to create a lightning protection concept is recommended (use lightning protection clamp if necessary). Country-specific regulations must be observed.

/Due to thermal expansion and contraction we recommend placing a movement joint, or break, in connected rail lengths that exceed 65 feet (20 meters). Maximum allowable spacing between thermal expansion joints shall not exceed 80 feet with a minimum gap of 1.25" between rails at the joint.

# Bonding and Grounding



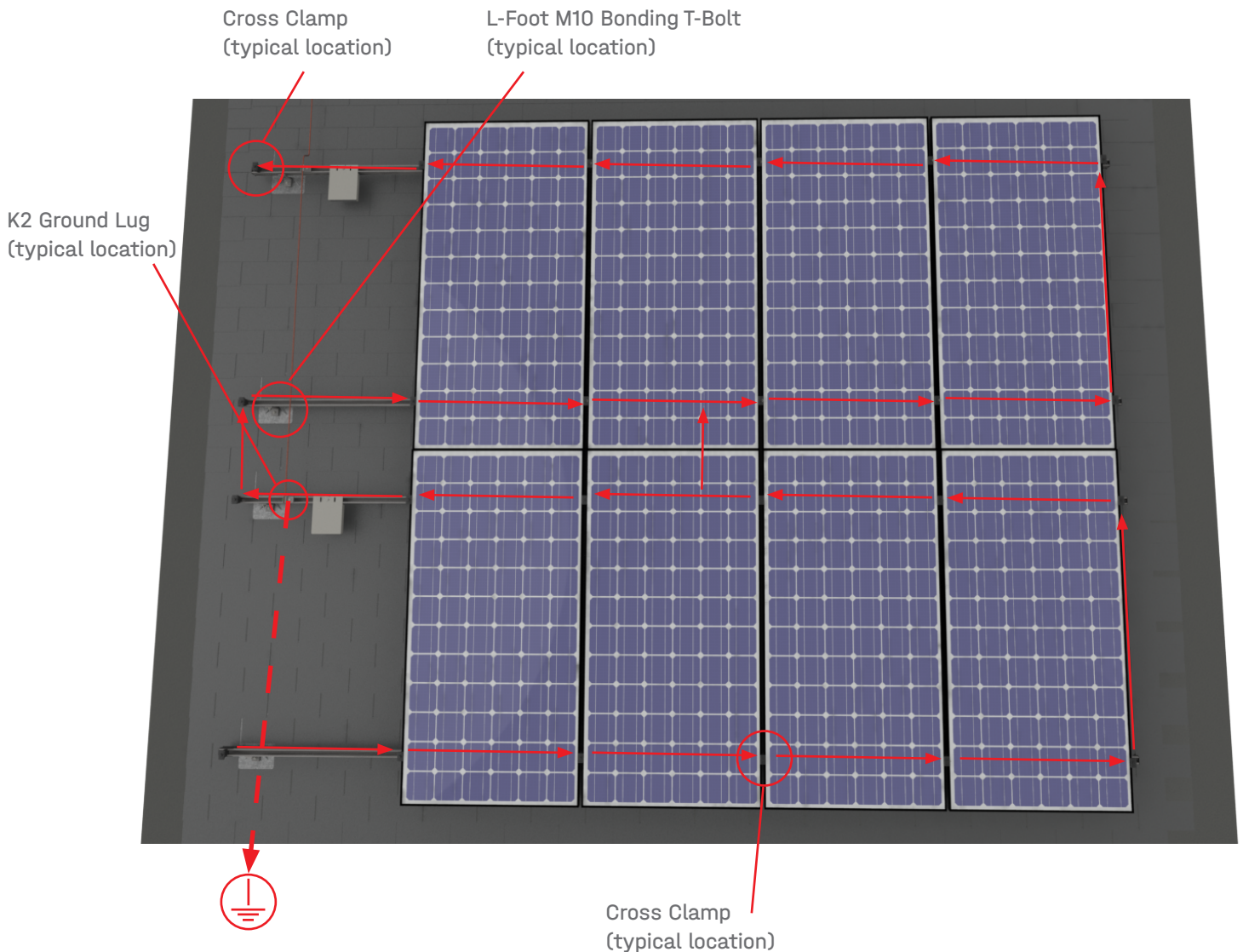
Appropriate means of bonding and grounding are required by regulation. The information provided in this manual shall always be verified with local and national building codes.

K2 Systems has obtained a UL 2703 system listing from Underwriter's Laboratories (UL).

A sample bonding path diagram is shown in Figure 1 below. Your specific installation may vary, based upon site conditions and your AHJ's requirements.

Each electrical connection has been evaluated to a maximum fuse rating of 30A. At least one ground lug per row of modules must be used to ground all equipment within each sub-array, although additional may be used for redundancy. When installed per these installation instructions, all connections meet the requirements of NEC 690.43.

This racking system may be used to ground and/or mount a PV module complying with UL 61730 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.



# Fire Rating



The CrossRail System has undergone fire performance testing in accordance with UL 2703, Fire Performance. A System Class A fire rating is achieved when using CrossRail 44-X/48-X/48-XL under the following conditions:

/Roof slope of 2/12" rise per linear foot or greater

/Used in combination with a UL 61730 Listed module with a fire performance rating of Type 1, Type 2, or Type 3. Consult the module manufacturer for specific fire performance rating information.

/CrossRail may be mounted using any stand-off height to maintain the Class A fire rating. Always consult the module manufacturer's installation instructions to ensure your installation is in compliance with their UL 61730 Listing.

/The results of the racking system do not improve a roof covering Class rating.

All documentation can be found on UL's Online Database as well as K2 Systems' website.

## Approved Modules

To view our list of compatible modules, please click this link or scan the QR code: <https://k2-systems.com/wp-content/uploads/2023/04/Approved-Modules-EN-US.pdf>





# Torque Overview

/M10 T-Bolts: 25.8 ft-lbs (35Nm)

/K2 Ground Lug: M8 Hex Bolt: 10.3 ft-lbs [14Nm], Terminal Screw: 3-5 ft-lbs [4-6.8Nm]

/K2 Cross Clamp Hex Head M8×50mm: 12 ft-lbs (16.3Nm)

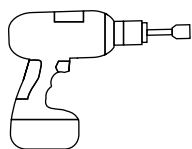
/MLPE, Module Frame Mount, Kit: 15 ft-lbs (20.3Nm)

/CR Micro inverter & OPT, 13mm Hex Kit: 10.3 ft-lbs [14 Nm]

/Yeti Clamp 2.0 : 12 ft-lbs (16.3Nm)

## Tools Overview

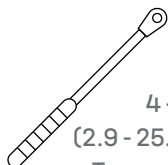
Refer to the specific roof attachment Quick Guides for additional tools needed



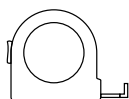
Cordless Drill



13mm deep socket  
7/16" socket



4 - 35 Nm  
(2.9 - 25.8 ft-lb)  
Torque Wrench

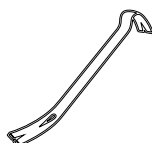


Measuring Tape



Chalk Line

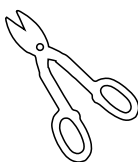
## Optional



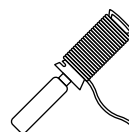
Roofing Bar



Caulk Gun

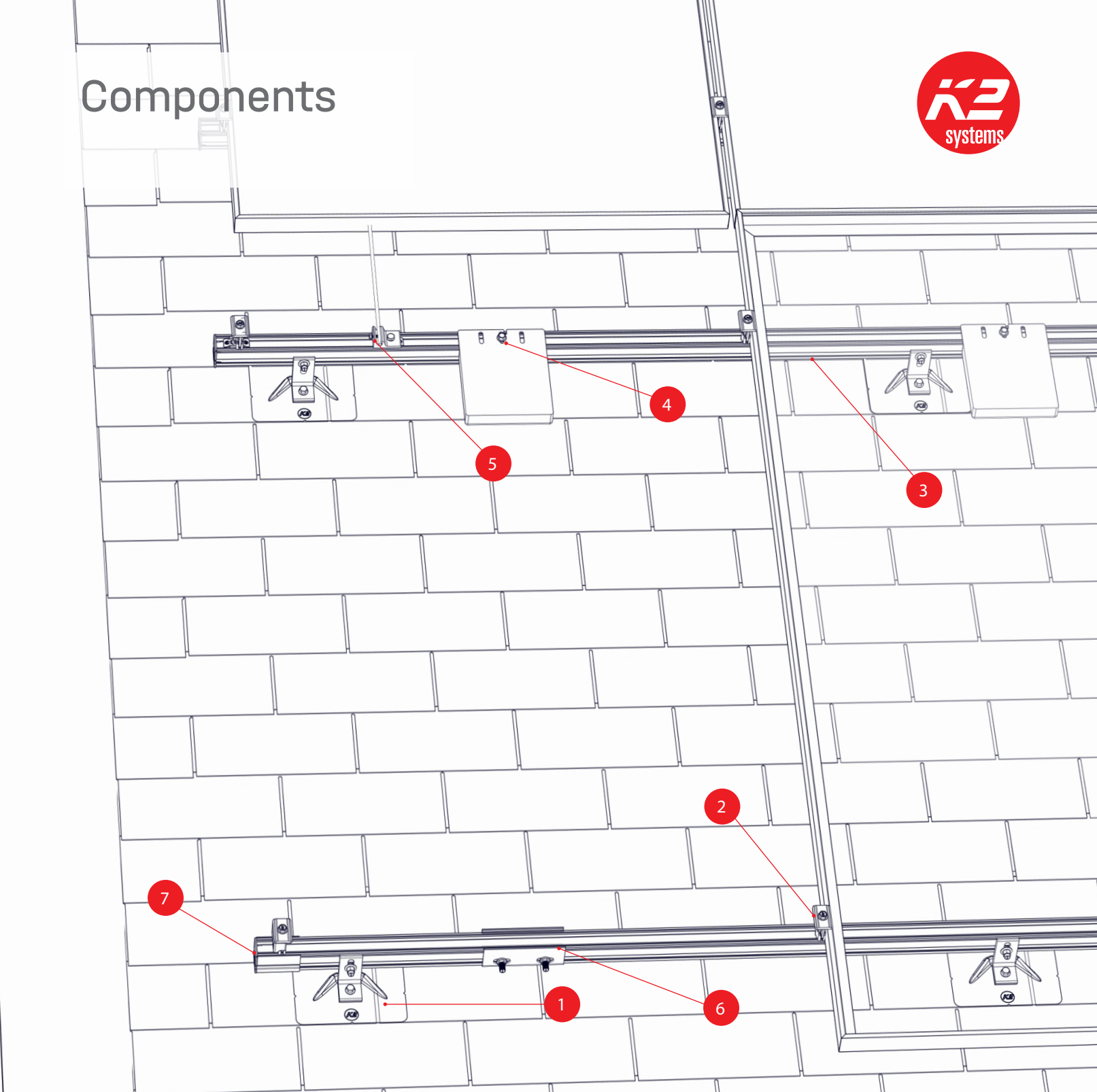


Tin Snips



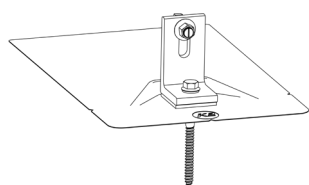
Stringline

# Components



1

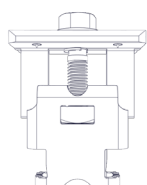
4000156 / 4000157



K2 Flash Comp Kit, Mill /Dark

2

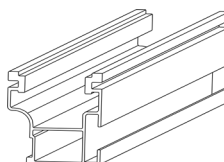
4000135/4000145



K2 Cross Clamp Set

3

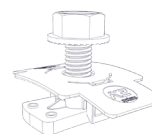
Multiple PN's



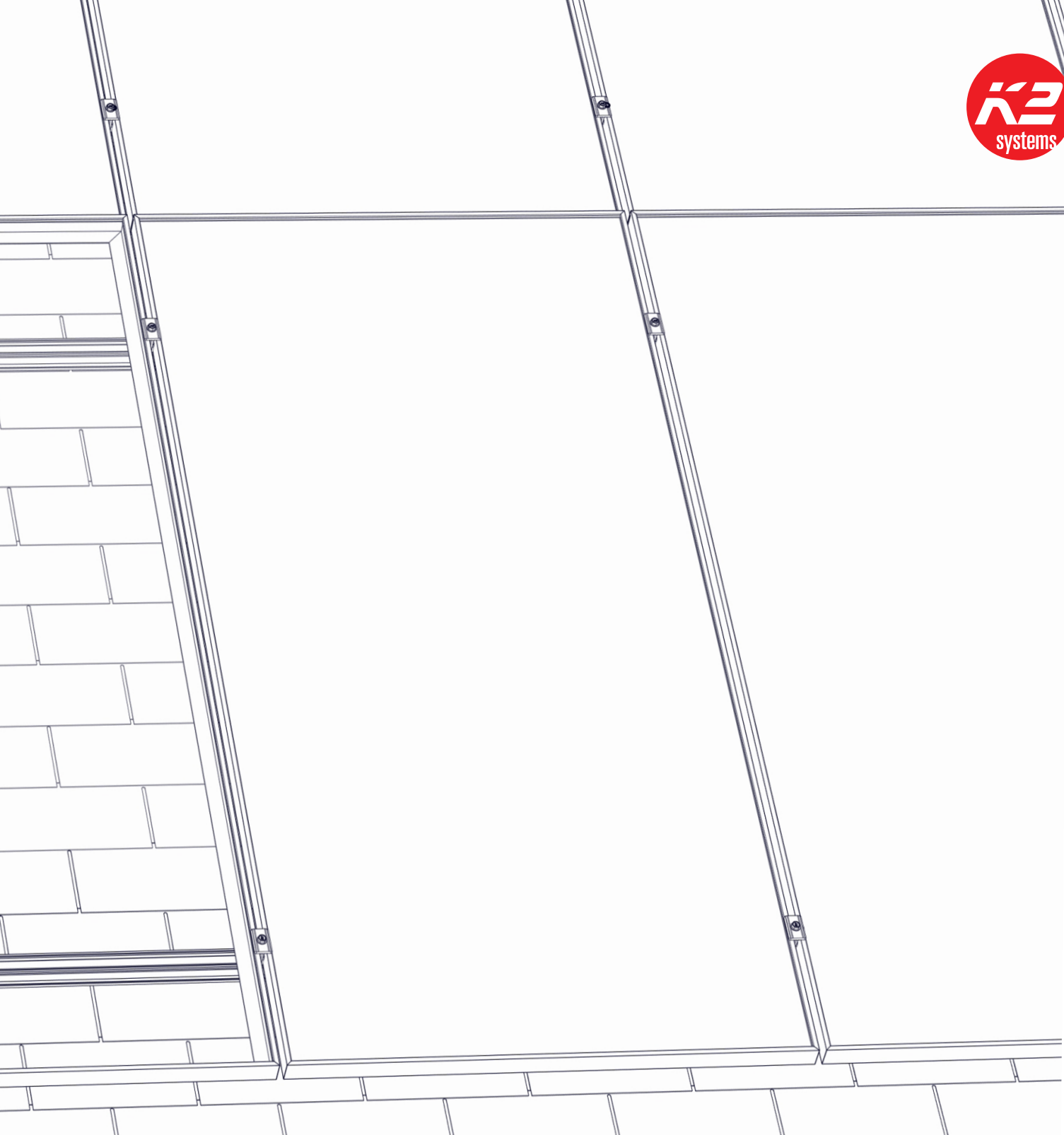
CrossRail 44-X,  
48-X or 48-XL

4

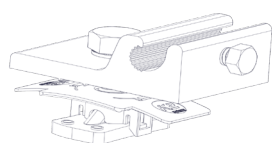
4000629-H



CR Micro inverter & OPT,  
13mm Hex Kit

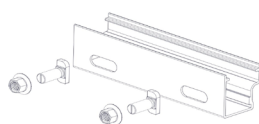


**5** 4000006-H



**K2 Ground Lug,  
13mm Hex Set**

**6** 4000051/4000052



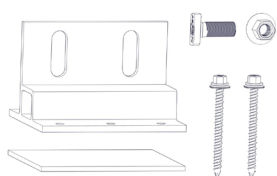
**Rail Connector CR 44-  
X, Set, Mill / Dark**

**7** 4000176

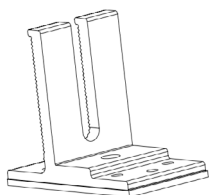


**EndCap 44-X, K2**

# Other Compatible Comp Attachments

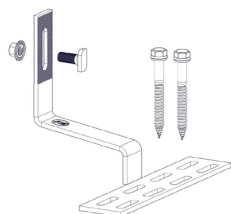


**Splice Foot XL, Set, Mill**  
4000300

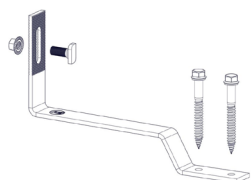


**K2 Multi Mount Kit, Mill/Dark**  
4000282/4000284

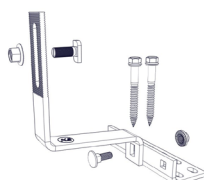
## Tile Roof Attachments



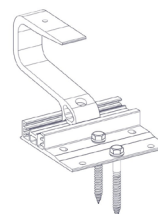
**Universal Standard Hook, 9" Base, Kit**  
4000140



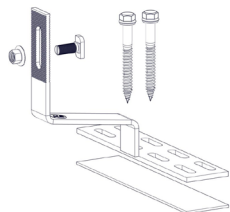
**Flat Tile Hook X, Kit**  
4000141



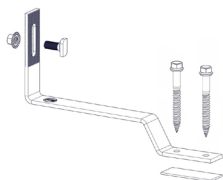
**Universal Standard Hook +2, 5.5" Base, Kit**  
4000142



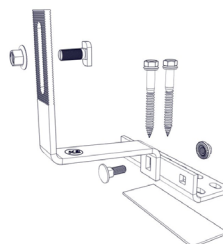
**Tile Hook 3S Wide Base w/Hardware**  
4001294



**USH, 9", Base Kit, w/Butyl**  
4000140-B



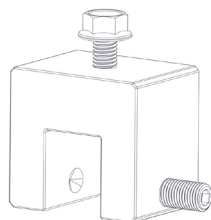
**Flat Tile Hook X Kit, w/ Butyl**  
4000141-B



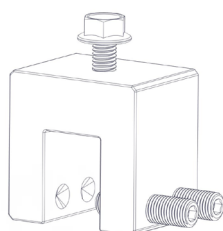
**USH +2, 5.5" Base Kit, w/ Butyl**  
4000142-B



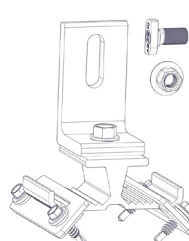
# Metal Roof Attachments



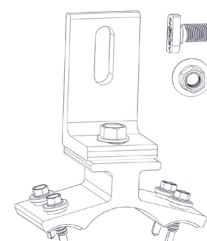
**Standing Seam Power-Clamp Mini, Set**  
4000016



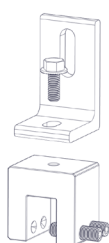
**Standing Seam Power-Clamp Standard, Set**  
4000017



**Trapezoidal PowerClamp, Kit**  
4000308



**Corrugated PowerClamp, Kit**  
4000307

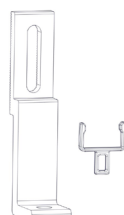


**Standing Seam Power-Clamp Standard, Set, DC**  
4000017-US

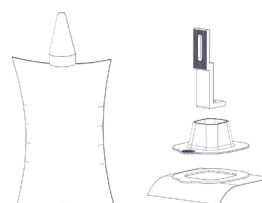
# Flat/Concrete Low Slope Roofs



**T-Foot X 6" Kit, Mill**  
4000080



**Big Foot 6" w/ 3"+ Chem Link Clip**  
4000218



**K2 Armor w/ Big Foot, Kit**  
4000559

# Other Compatible Accessories



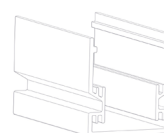
**Wire Management Clip, Omega, Black**  
4005394



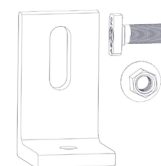
**Wire Management Clip, TC**  
4000069



**HEYClip SunRunner Cable Clip SS, S6404**  
4000382



**CrossRail 3" Black Sleeve 48-X, 48-XL**  
4000583



**L-Foot Slotted Set, Mill/Dark**  
4000630/631

# Assembly

## Composition shingle

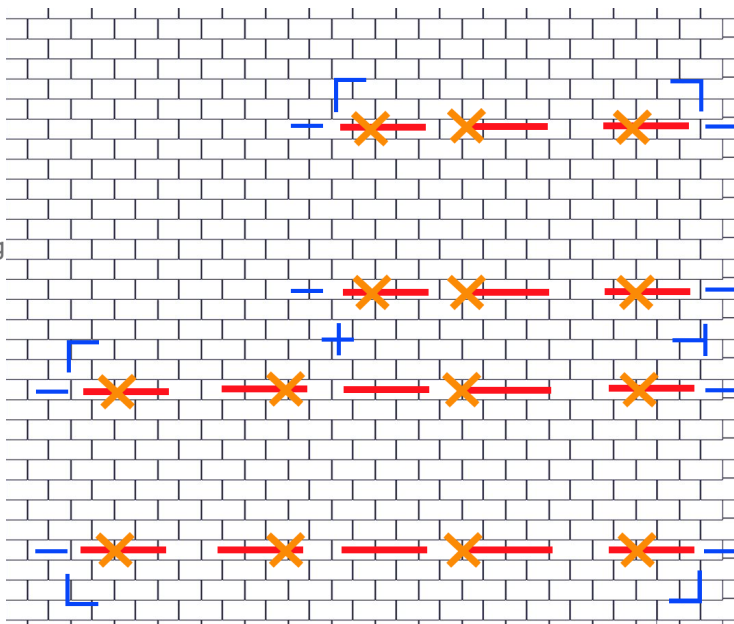


NOTE: Choose the appropriate roof attachment from the options above, and follow roof attachment quick guide for detailed layout and installation instructions. You can also find installation videos for all roof attachments on our website.

1



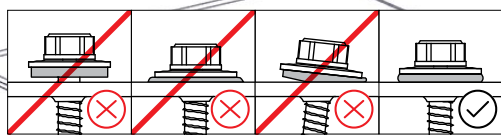
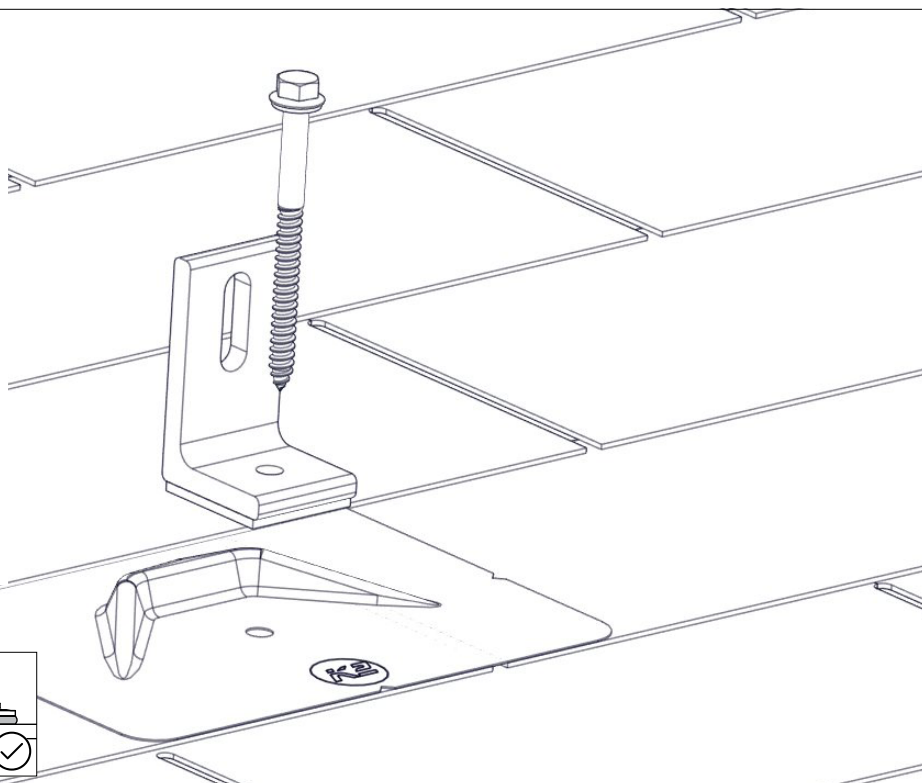
With chalk or crayon mark the module corners on the outer edge of the array. When marking the array footprint factor in  $+.67''$  for mid clamp gaps at each module intersection, and  $+.25-.75''$  of thermal gap between separate rows of modules. Mark the locations of rails on both sides of the array in accordance with the module manufacturer's clamping zone. Then strike chalk lines between rail marks to install attachments in a straight line across shingles. Now mark the attachment points along the chalk line, referring to the designed maximum attachment spacing and rail cantilever. When attaching to rafters on a comp shingle roof, use a hammer to knock on roof and locate structural members.

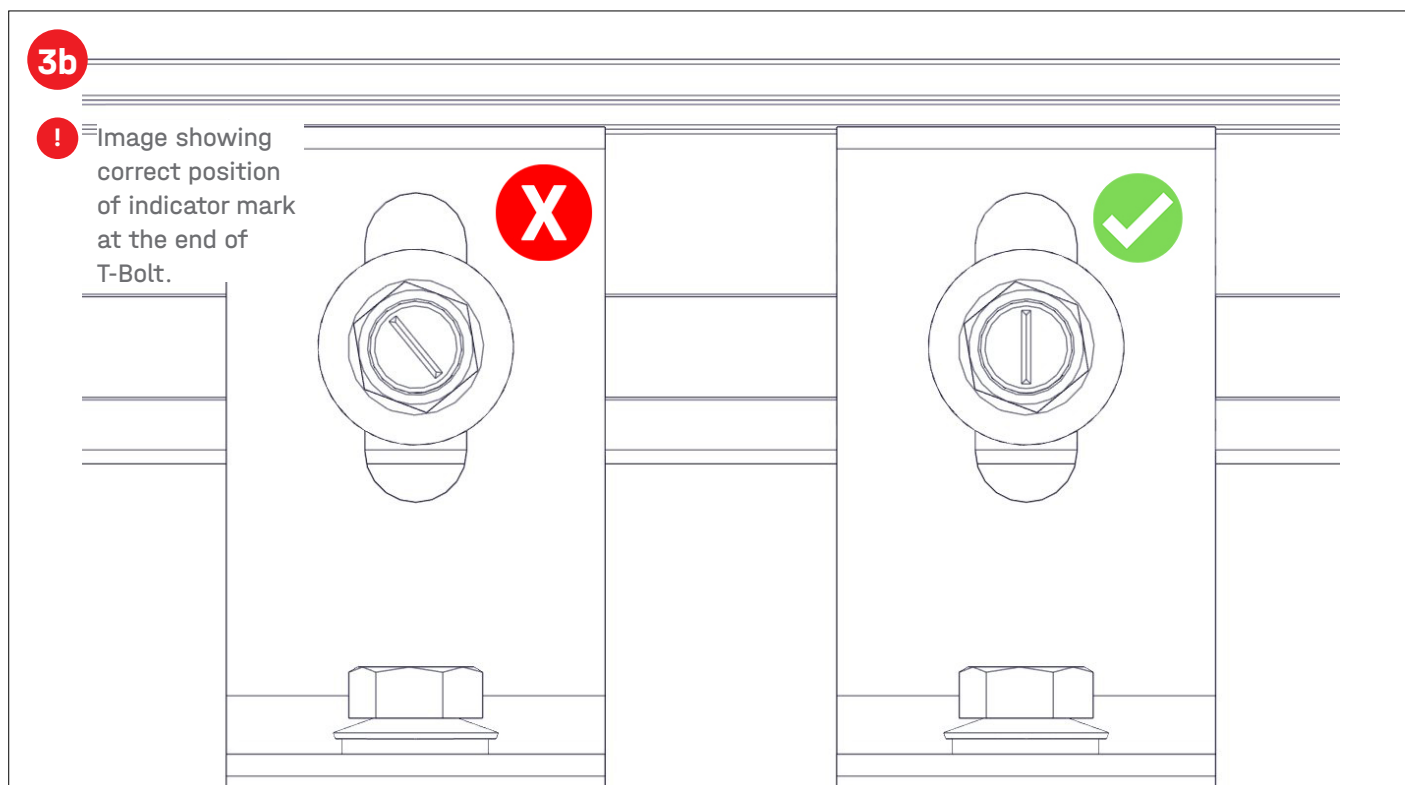
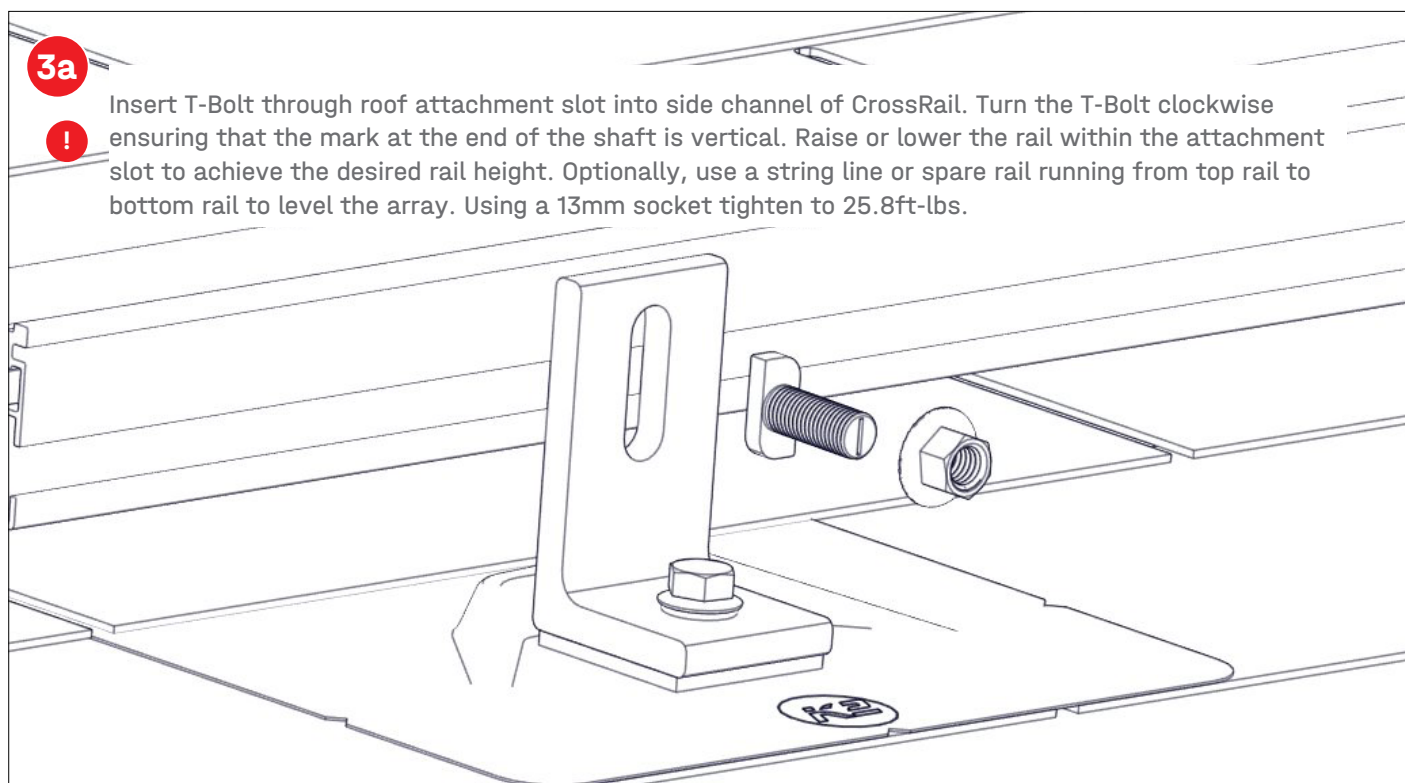


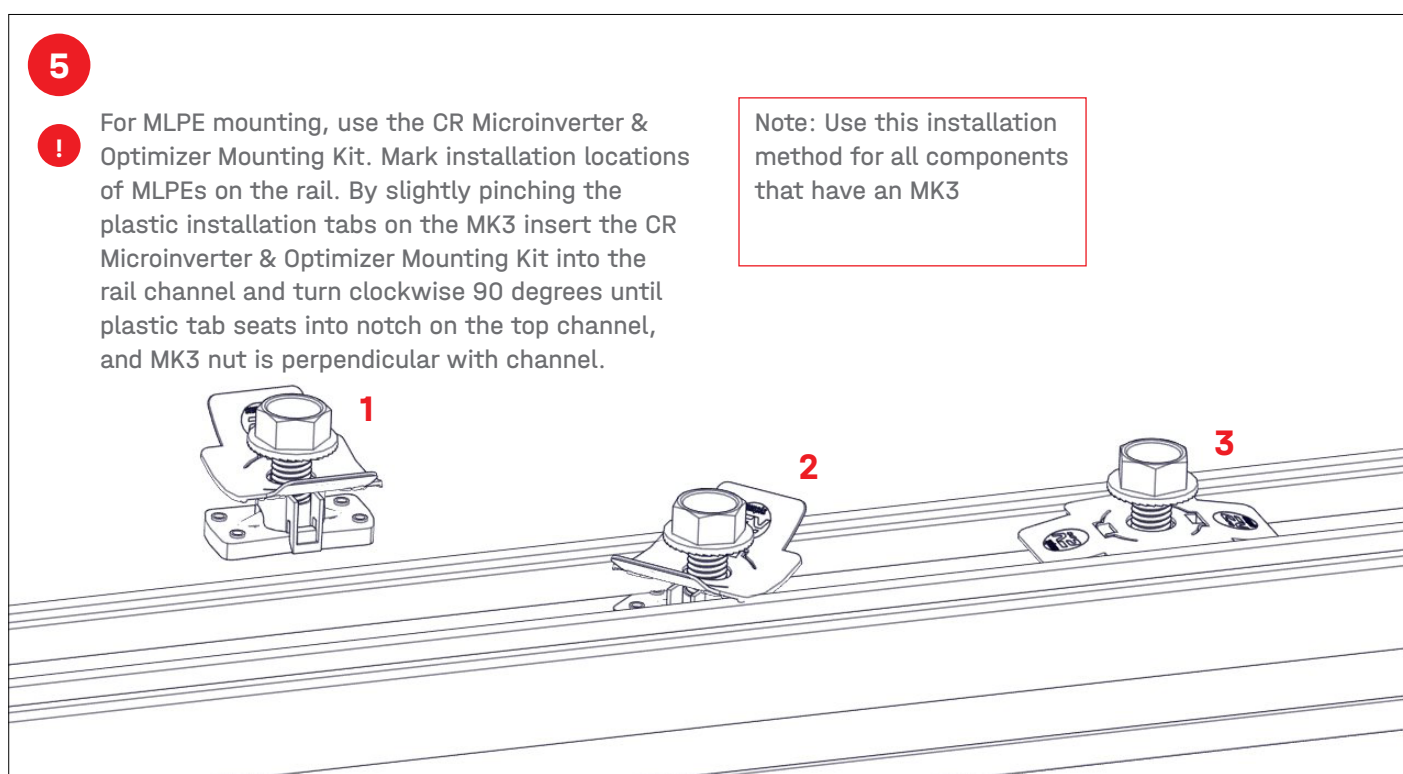
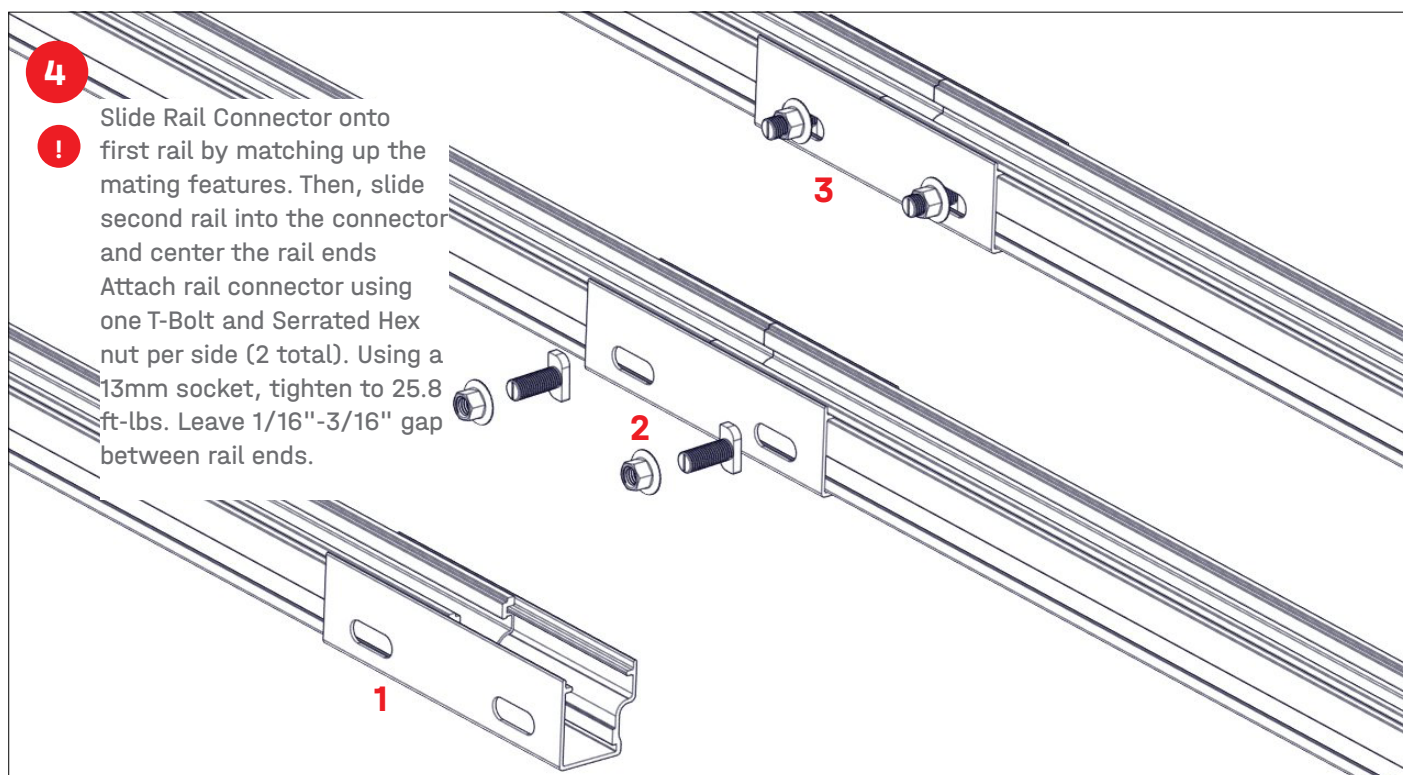
2



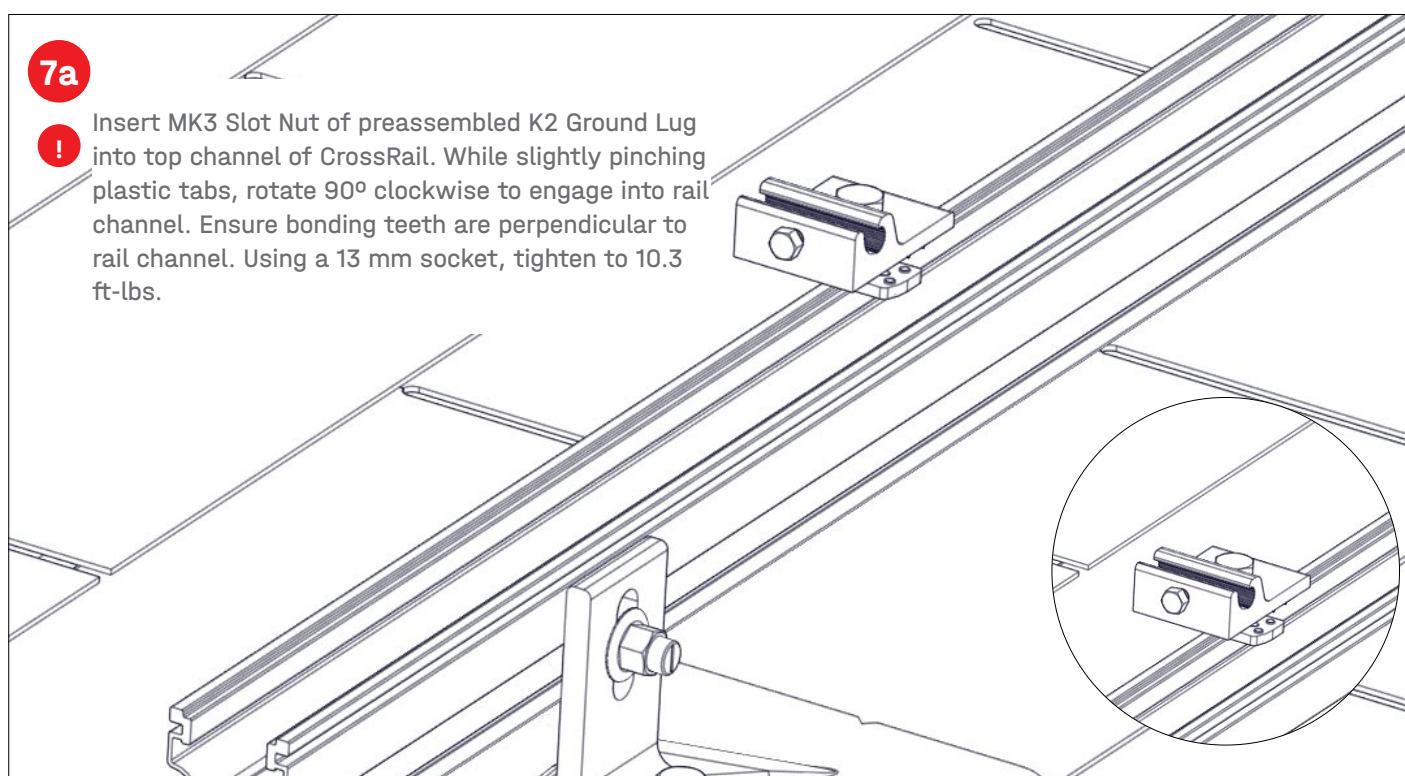
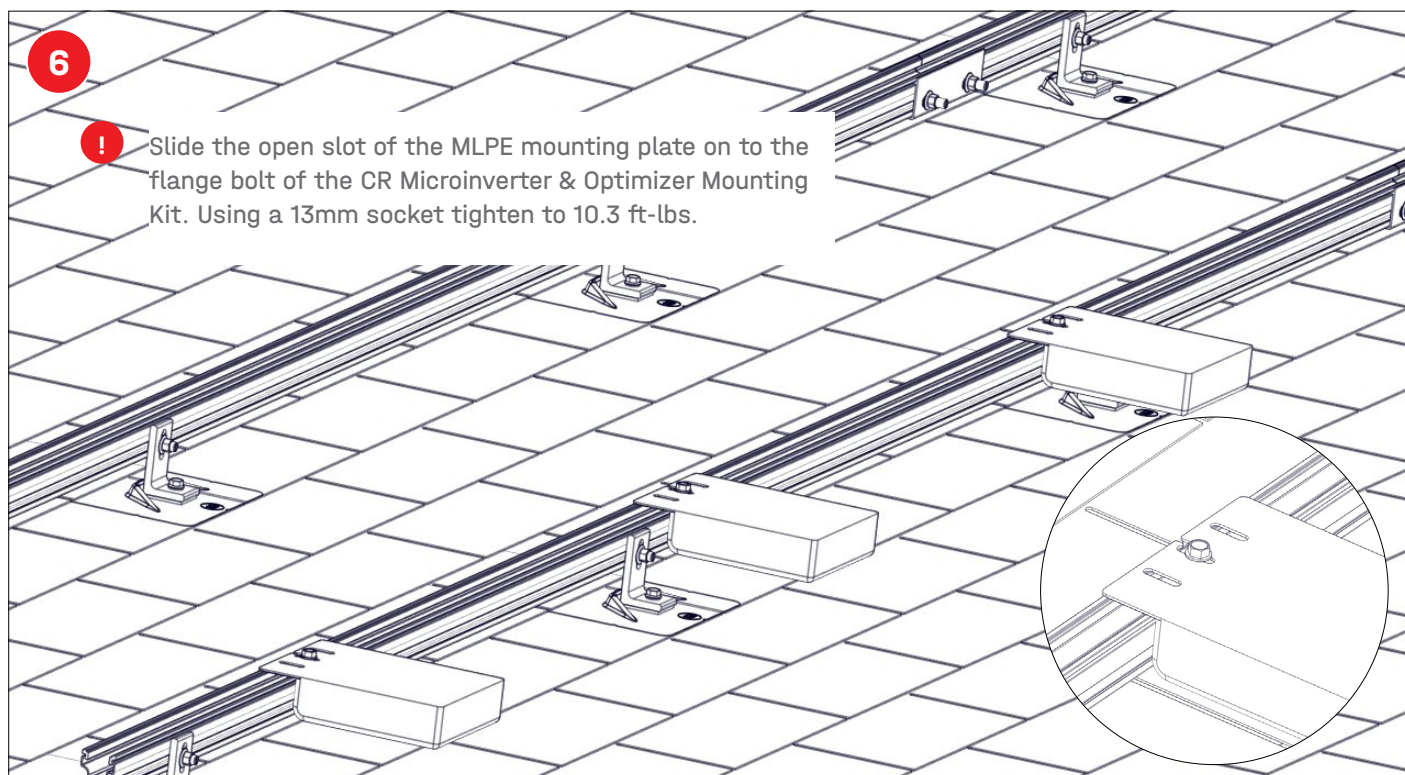
Install attachments at specified mounting positions based on project design plan set. [For more detailed instructions on K2 Flash Comp Kit refer to Quick Guide]. For all K2 roof attachments that use a sealing washer on the fastener. The fastener should be tightened until the EPDM rubber begins to push out the sides as the washer is compressed. Do not overtorque or undertorque the fastener.

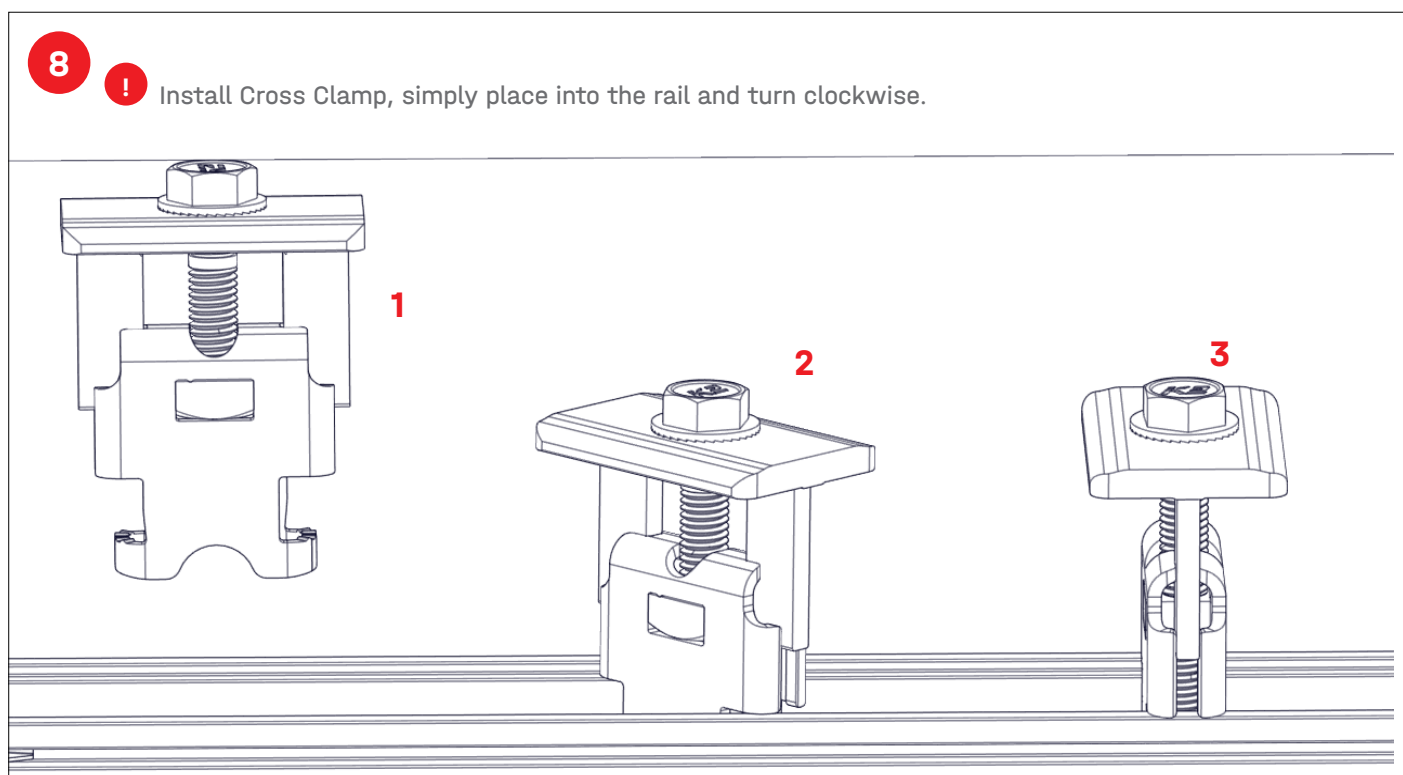
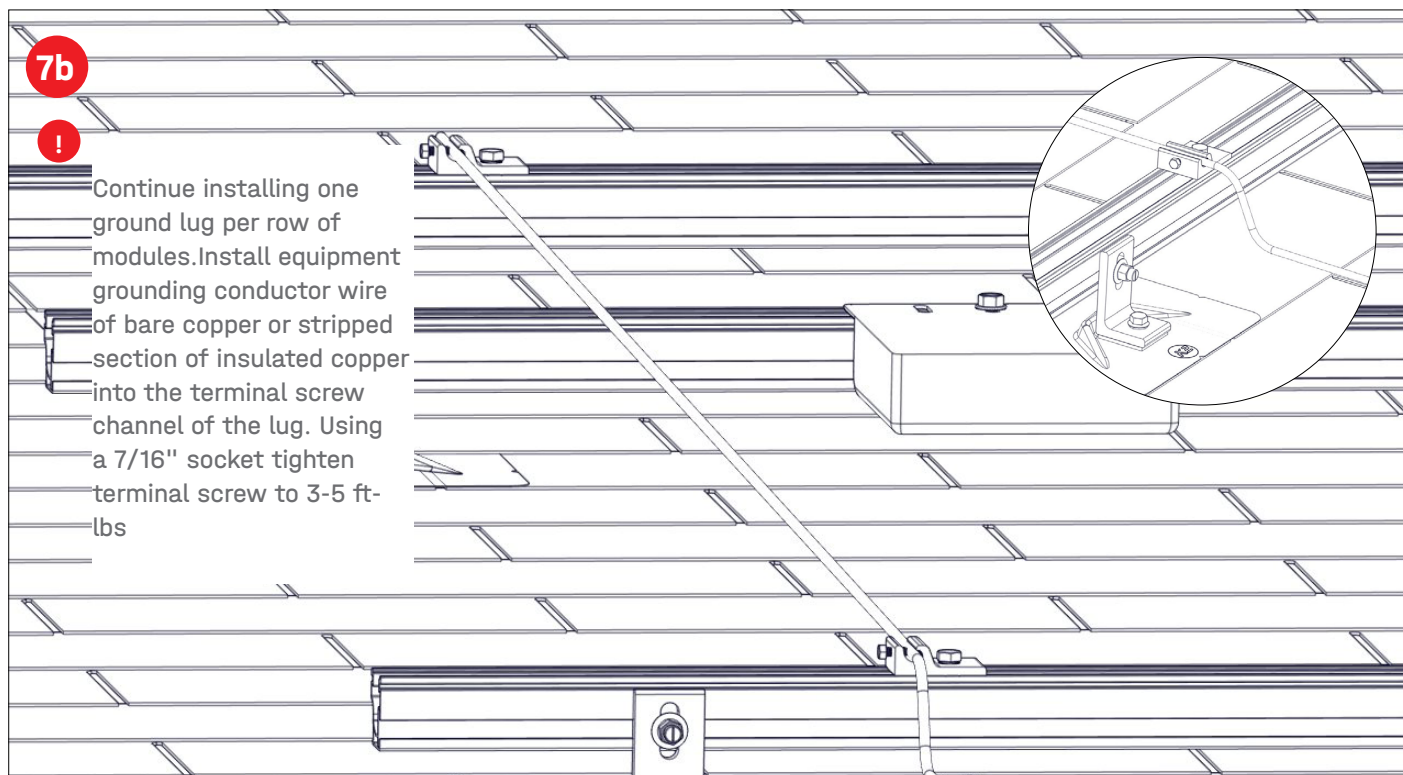


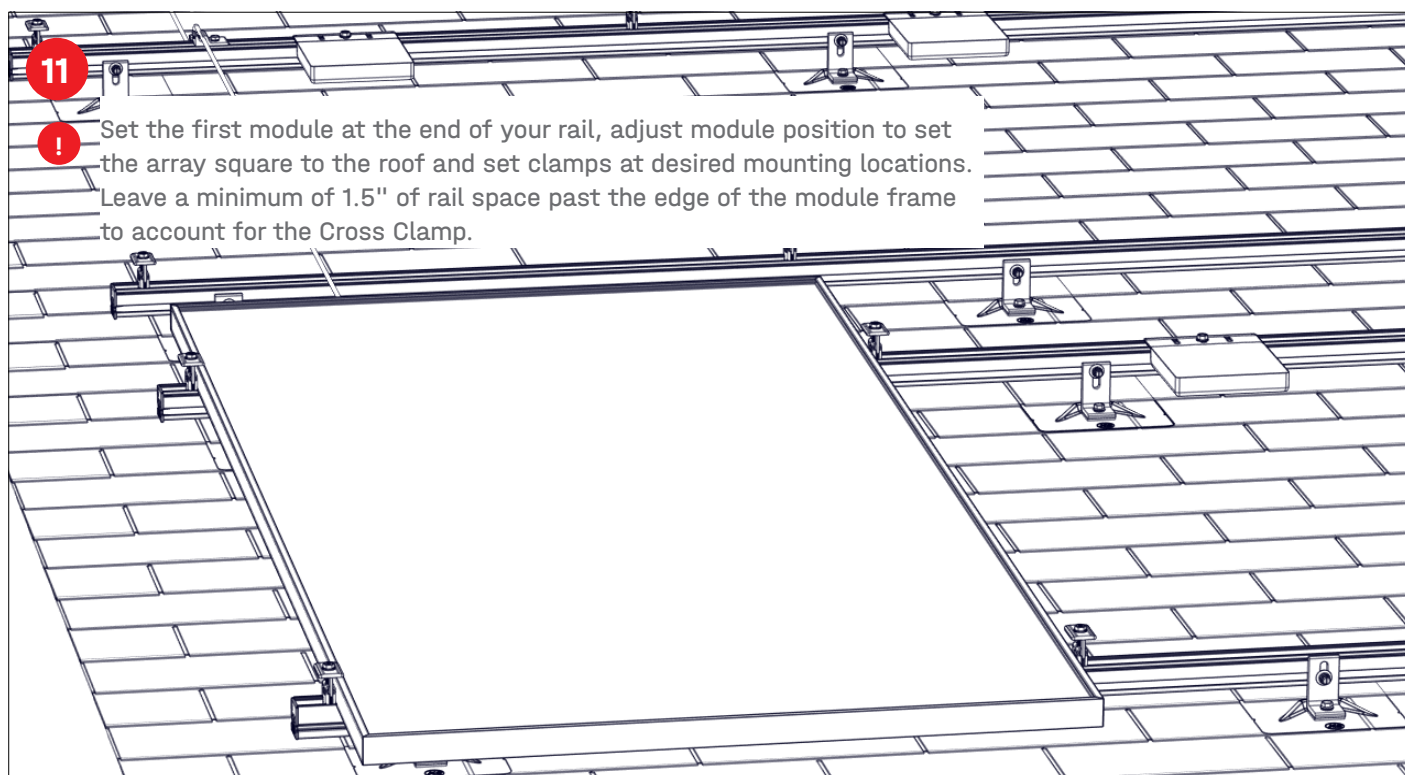
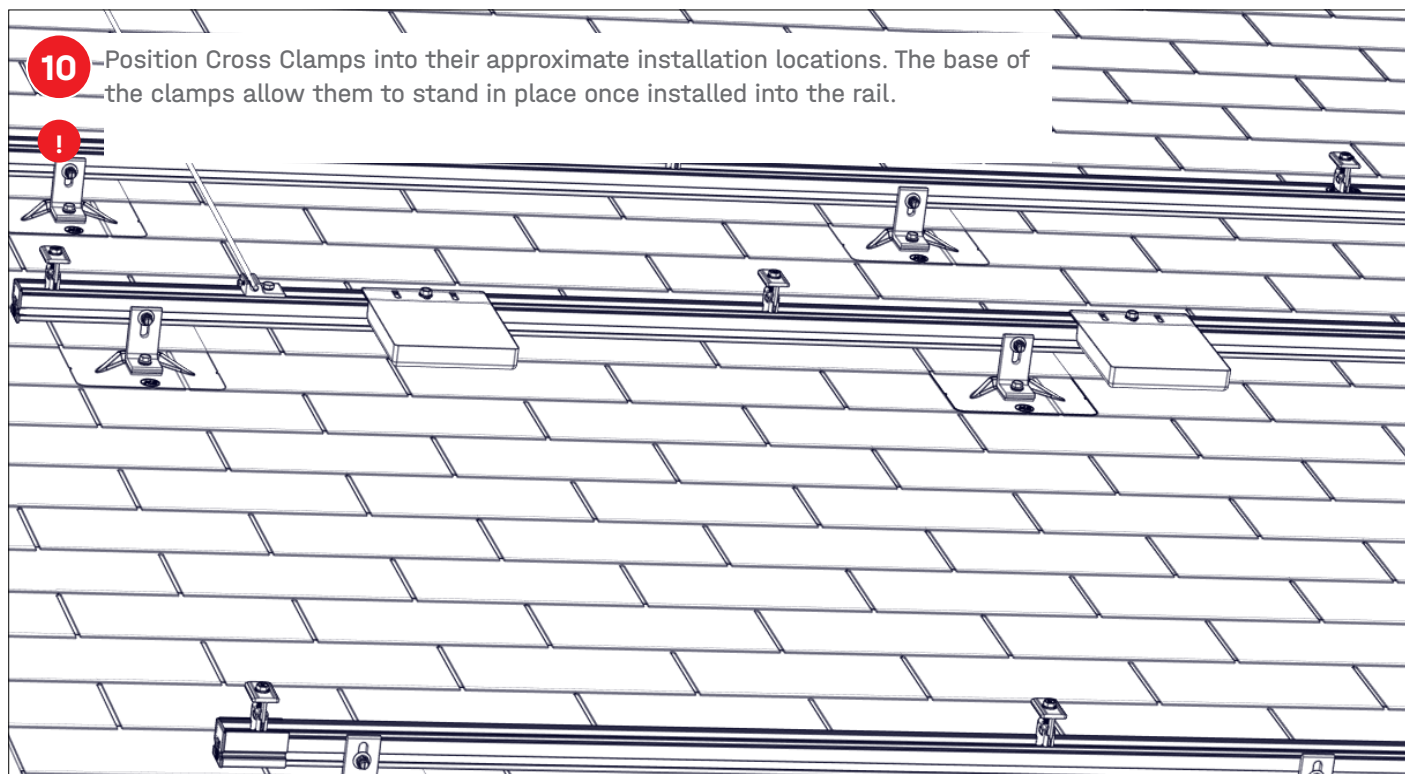




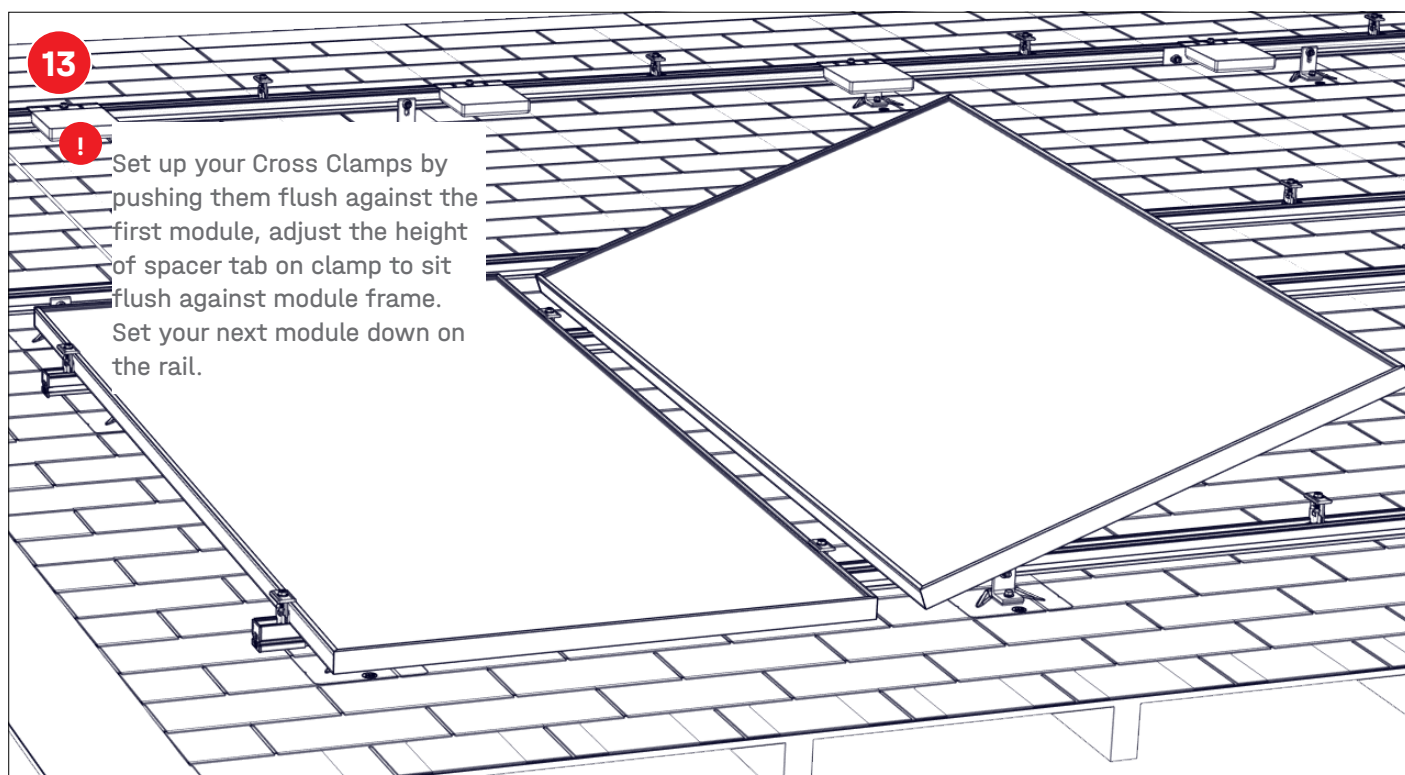
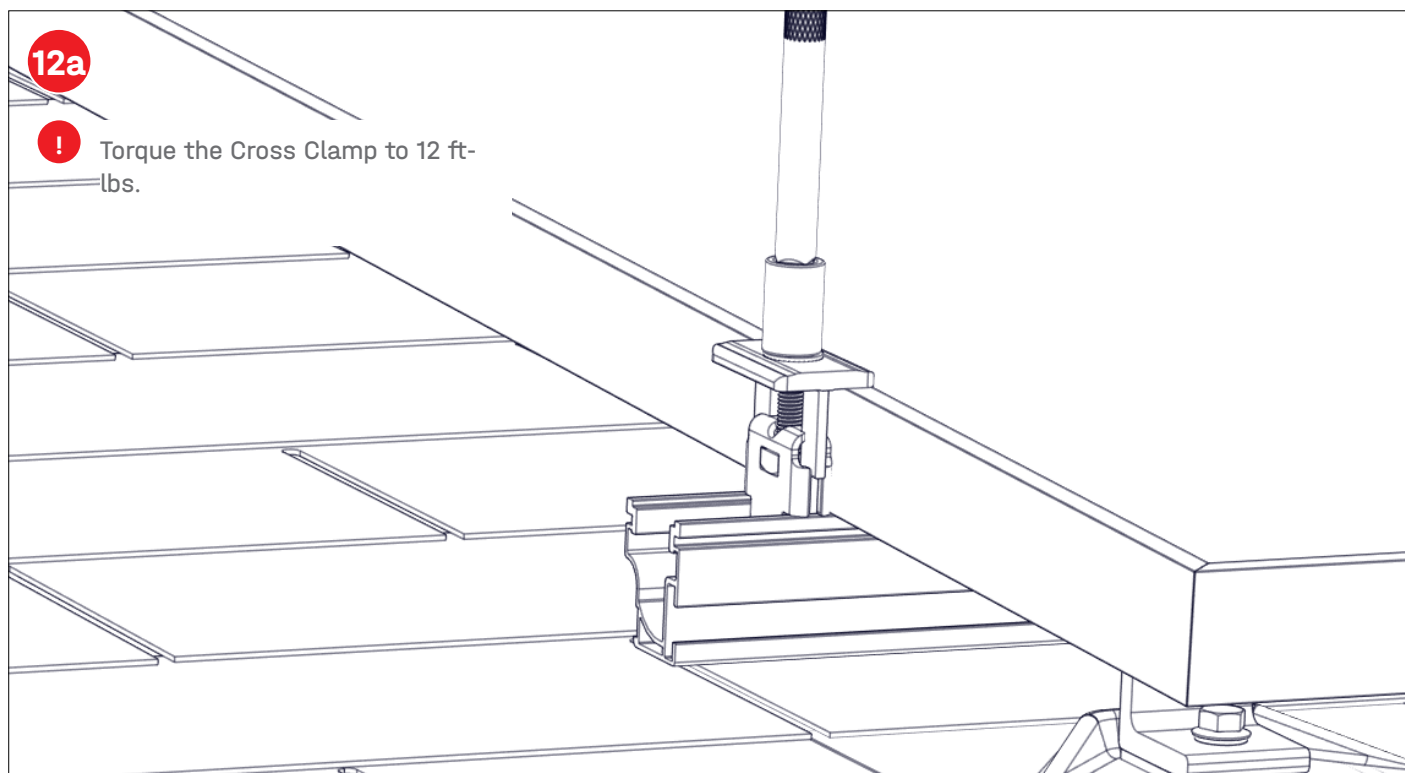








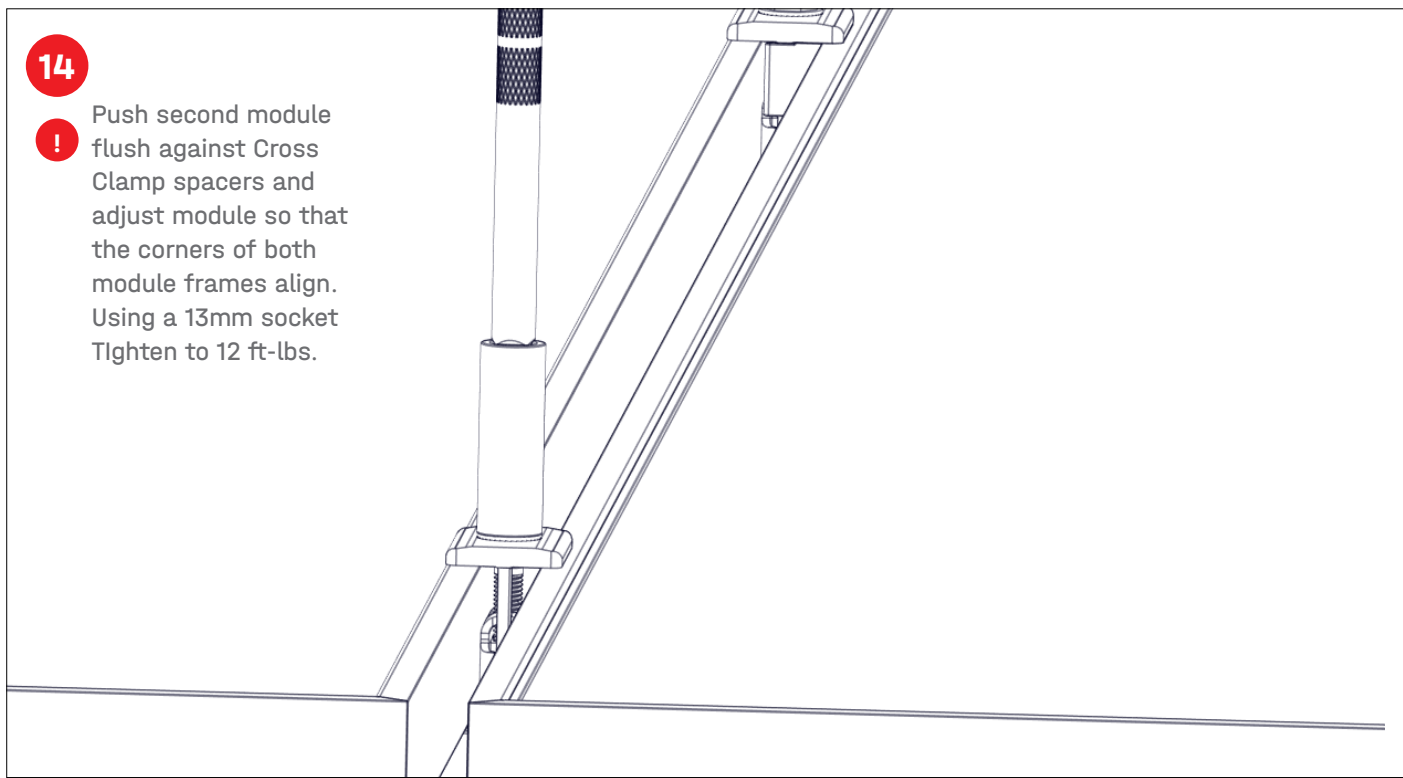




14



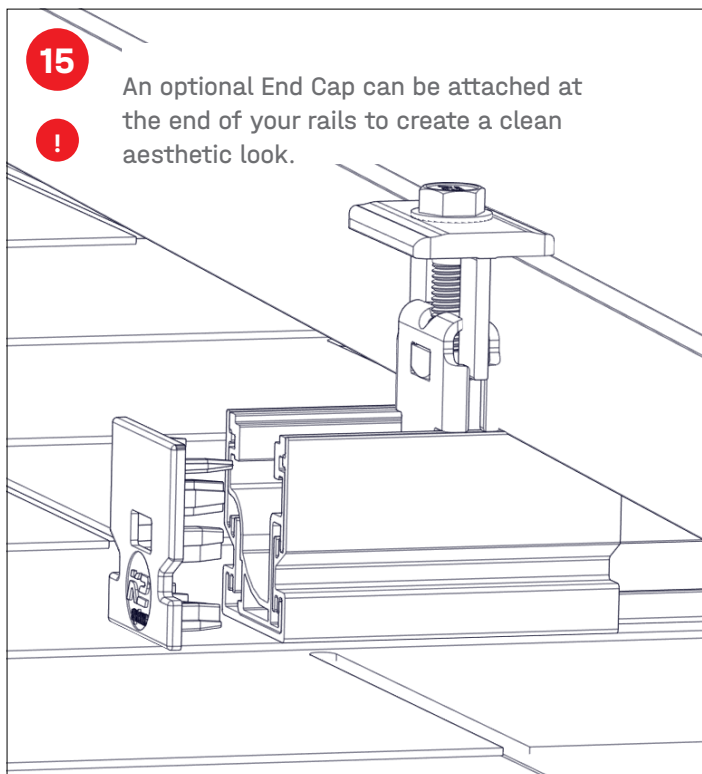
Push second module flush against Cross Clamp spacers and adjust module so that the corners of both module frames align. Using a 13mm socket Tighten to 12 ft-lbs.



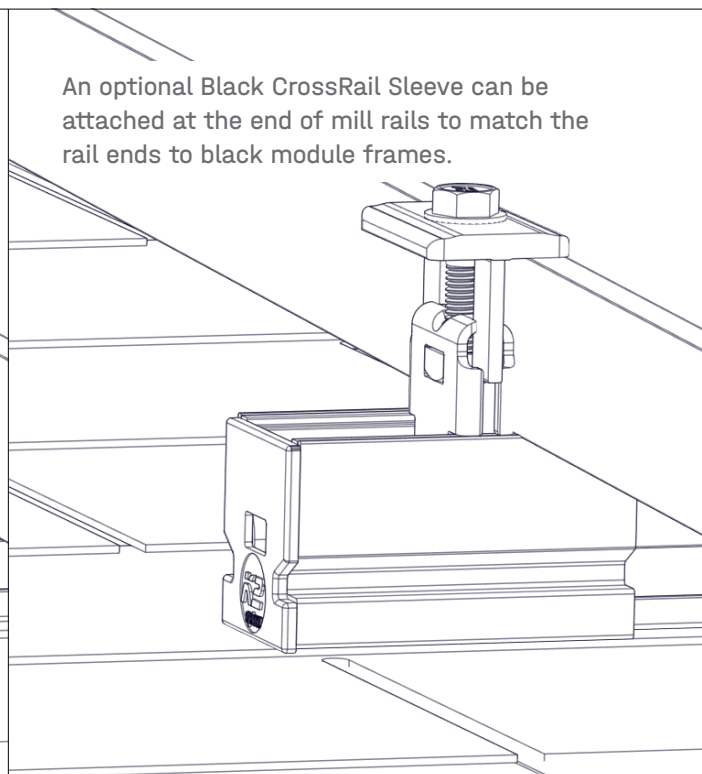
15

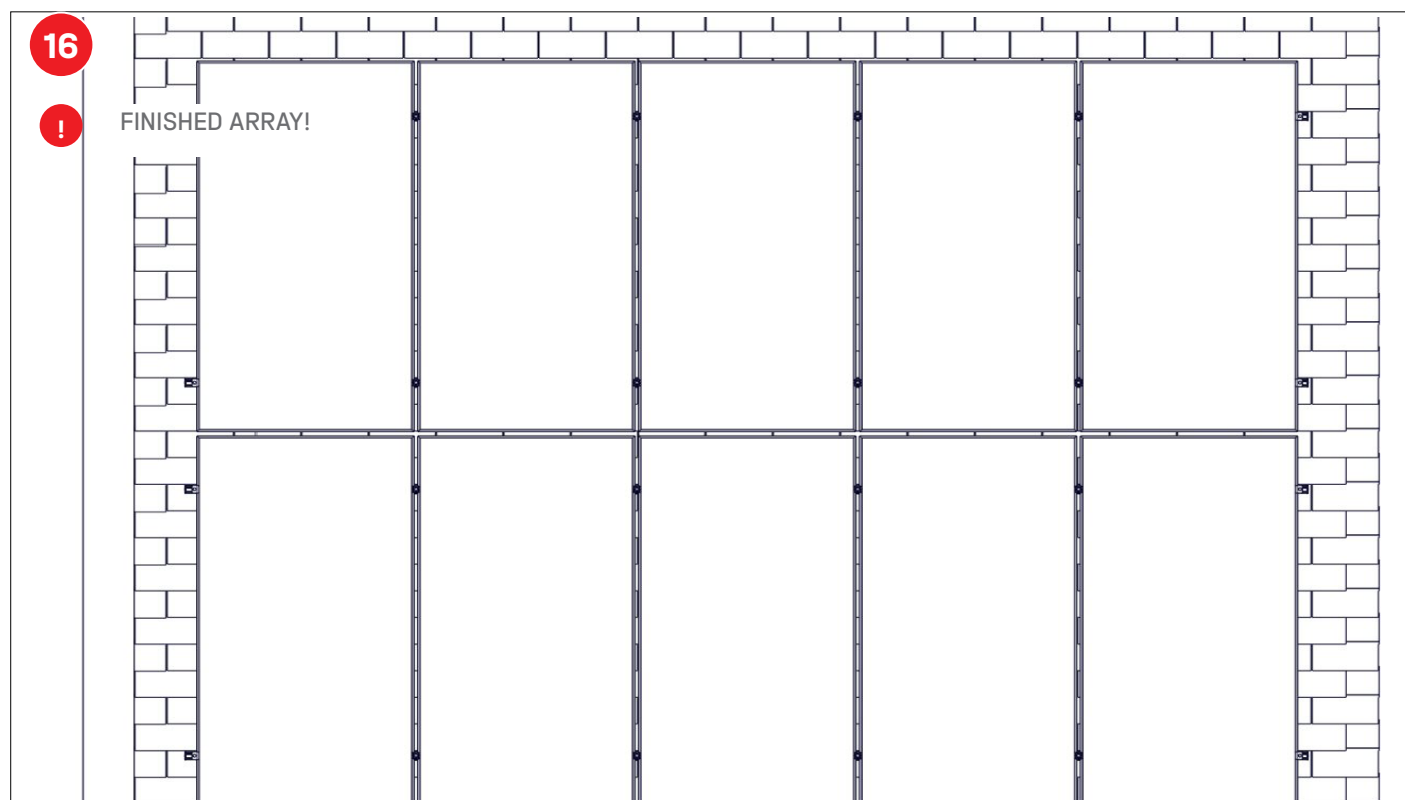


An optional End Cap can be attached at the end of your rails to create a clean aesthetic look.



An optional Black CrossRail Sleeve can be attached at the end of mill rails to match the rail ends to black module frames.





## Notes

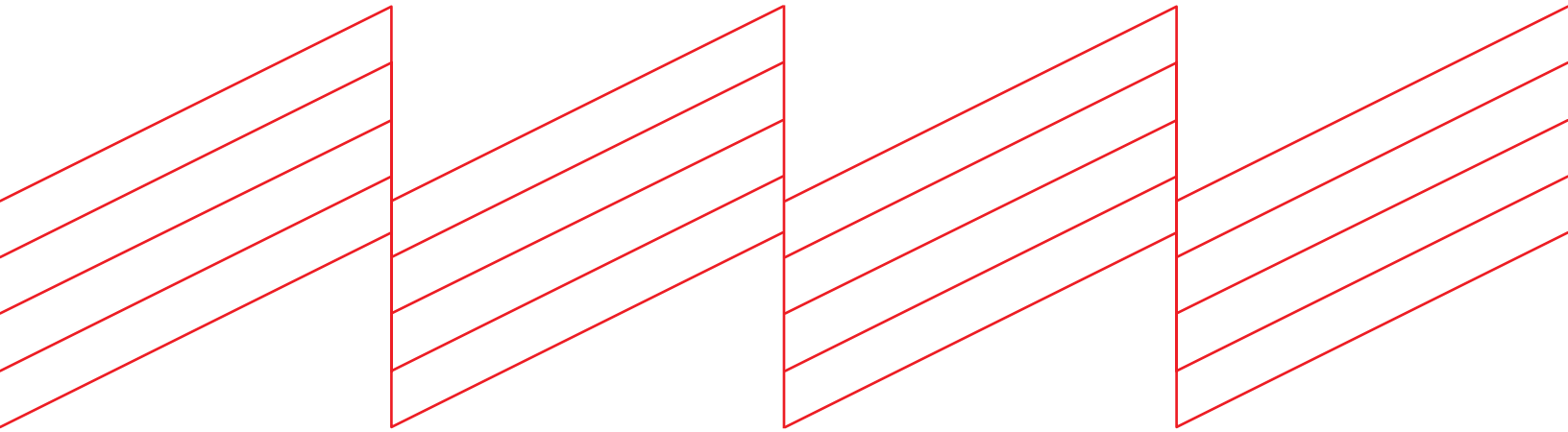


## Notes





# Connecting Strength



## K2 Systems, LLC

4665 North Ave. Suite I • Oceanside, CA 92056 •  
USA +1.760.301.5300 • [infous@k2-systems.com](mailto:infous@k2-systems.com)  
[www.k2-systems.com/en-us](http://www.k2-systems.com/en-us)

CrossRail System Assembly V11 | 0824 • Subject to change  
Product illustrations are exemplary and may differ from the original.

## Everest Solar Systems S de RL de CV

Calle Coral 2628 Int. 1 • Col. Residencial  
Victoria, CP 44560 • Guadalajara, Jal. • México  
+52.33.3575.9380 • [info@k2-systems.mx](mailto:info@k2-systems.mx)  
[www.k2-systems.com/es-mx](http://www.k2-systems.com/es-mx)

CrossRail System Assembly ENV11 | 0824 • Sujeta a cambios  
Las ilustraciones del producto son ejemplares y pueden diferir del original.