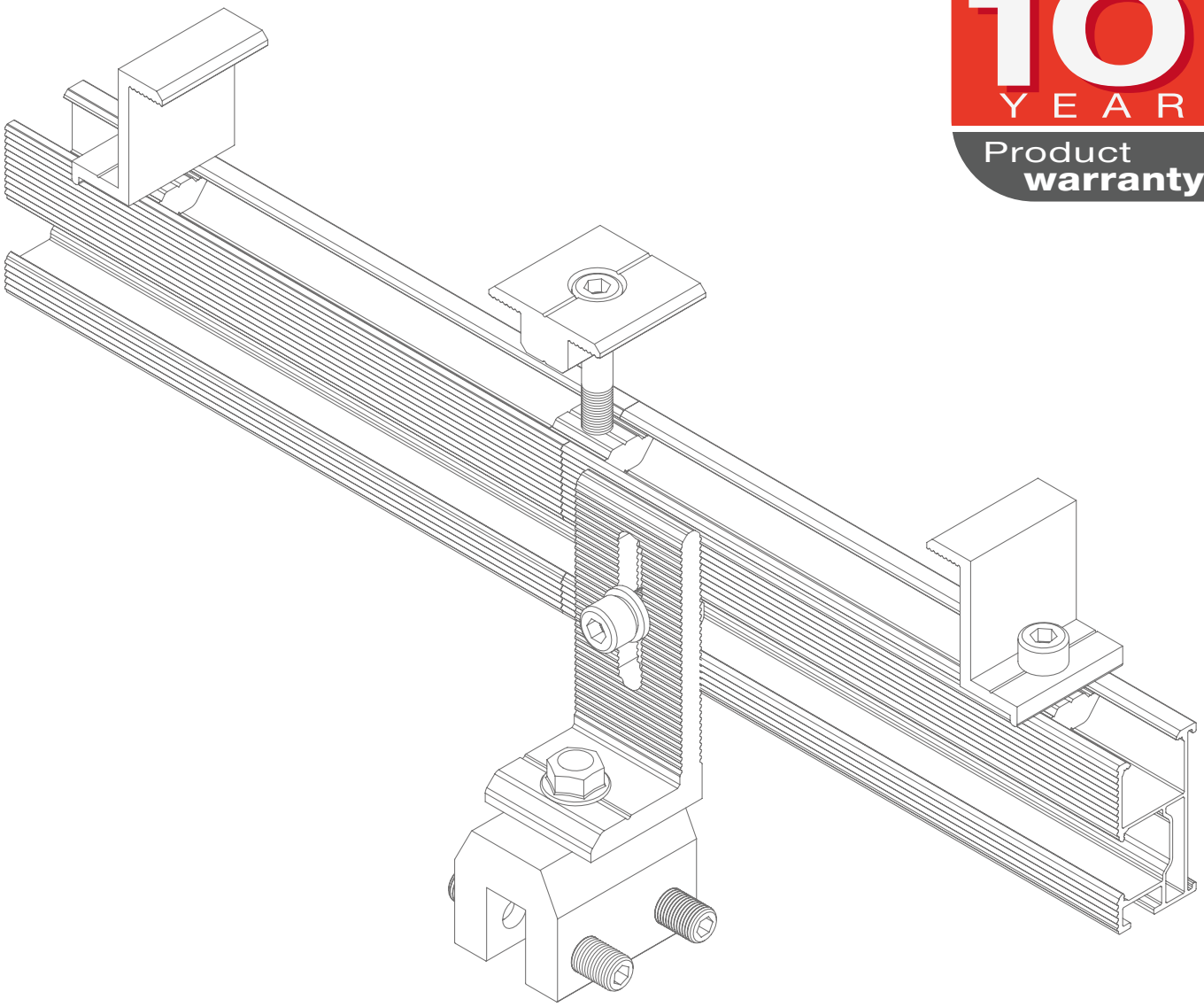
Standing seam clamp installation manual

For flush mount with rail
Planning and Installation Complying with
AS/NZS1170.2:2011 AMDT 3-2012

10 YEAR Product warranty



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Disclaimer

This manual describes the proper installation procedures and provides minimum standard required for product reliability and warranty. Thoroughly understanding this manual is imperative to proper installation.

Please review the following before installation

- Make sure the roof is in proper condition prior to installation. Do not install on damage roofs.
- Comply with roofing manufacturer's warranty terms.
- Ensure your work comply with local building codes and requirements, include any that may supersede this manual
- Ensure all products are appropriate for the installation, environments, and array under the site's loading conditions.
- Ensure the installation is performed by licensed contractors,` electrical installation must be conducted by licensed electrician. Ensure all work comply with local requirements.
- Use system components supplied by Lockseam or parts recommended by Lockseam.

This manual does not list all precautions needed for safe work. The installation must comply with health and safety requirements and other relevant standards and codes of practice. The manual provides guidelines for installation, but it does not guarantee the quality of installation work. Please complete the installation in a responsible and professional manner.

RAIL MOUNT COMPONENTS LIST

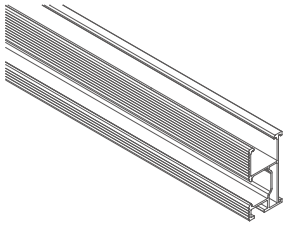
TOOLS AND TORQUE VALUE

Installation tools

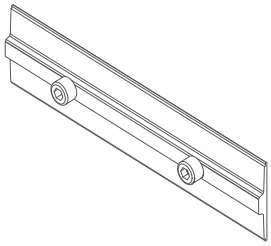
- 6 mm Allen key or drill bit
- 5 mm Allen key or drill bit (for grub screw)
- Cordless drill (non-impact)
- 13mm socket

torque value

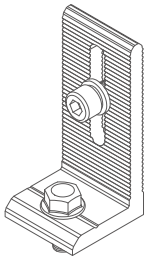
- standing seam clamp grub screw: 4-11 N·m
- standing seam clamp hex flange screw: 15N·m
- Rail splice: 8N·m
- L foot to rail: 16 N·m
- Mid clamp: 10 N·m
- End clamp: 10 N·m
- Grounding lug to rail: 8 N·m
- Grounding lug for copper: 3 N·m



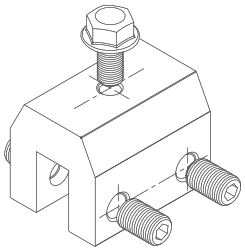
Rail
Material: Aluminum extrusion, AL 6005 T5
Finish: Clear anodized
Item number: SR-R-05



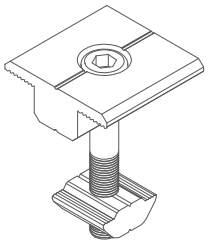
Rail splice
Material: Aluminum extrusion, AL 6005 T5
Finish: Clear anodized
Item number: SR-R05-S



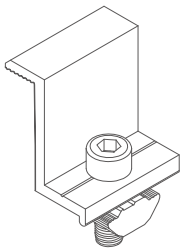
L foot
Material: Aluminum extrusion, AL 6005 T5
Finish: Clear anodized
Item number: SR-L



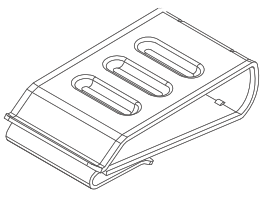
Standing seam clamp
Material: Aluminum extrusion, AL 6005 T5
Finish: Clear anodized
Item number: SR-U-01



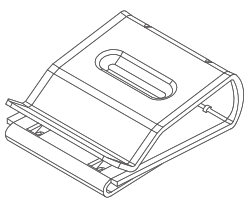
Mid clamp
Material: Aluminum extrusion, AL 6005 T5
Finish: Clear anodized
Item number: SR-M
Frame size: 35/40/45/50mm



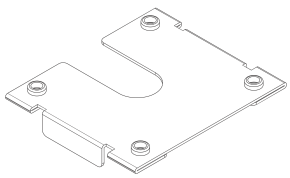
End clamp
Material: Aluminum extrusion, AL 6005 T5
Finish: Clear anodized
Item number: SR-E
Frame size: 35/40/45/50mm



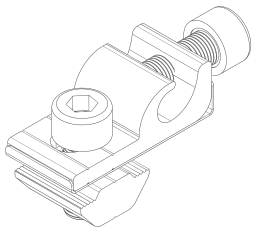
Cable clip
Material: stainless steel 304
Item number: SR-WC4-4
For 4 x PV cables 4mm2



Cable clip
Material: stainless steel 304
Item number: SR-WC4-2
For 2 x PV cables 4mm2

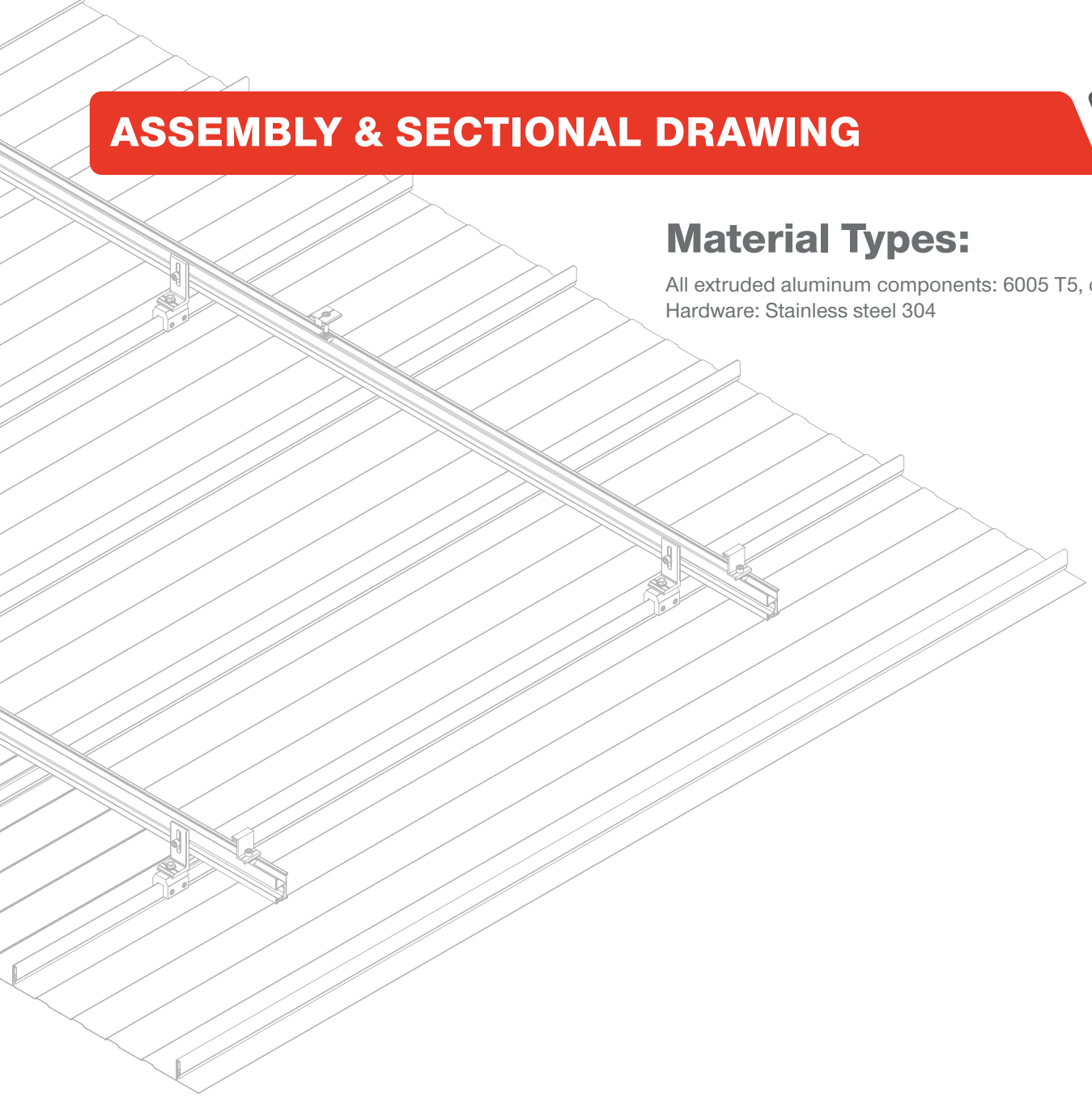


Grounding clip
Material: stainless steel 304
Item number: SR-GC-R05



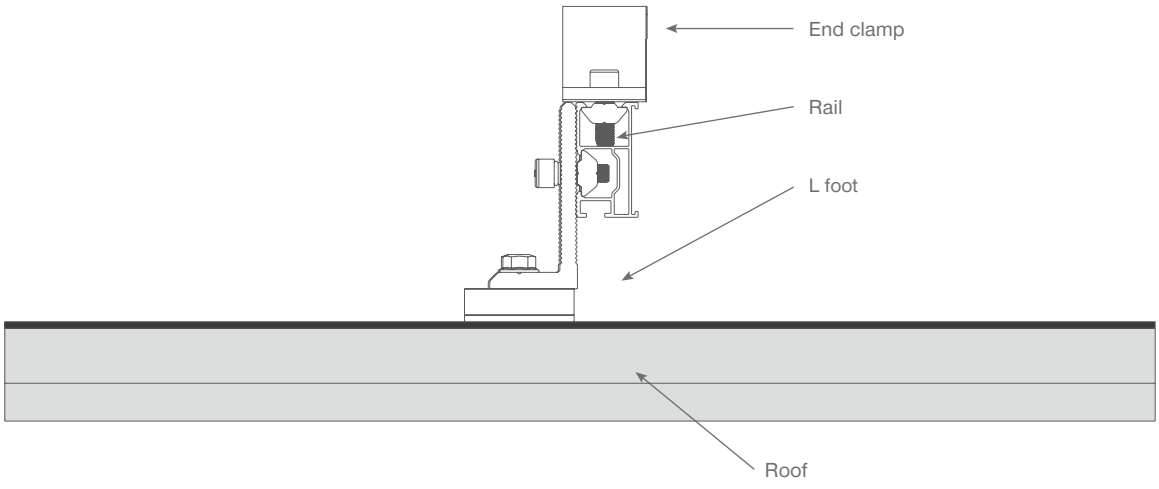
Grounding lug
Material: stainless steel 304
Item number: SR-GC-R05

ASSEMBLY & SECTIONAL DRAWING



Material Types:

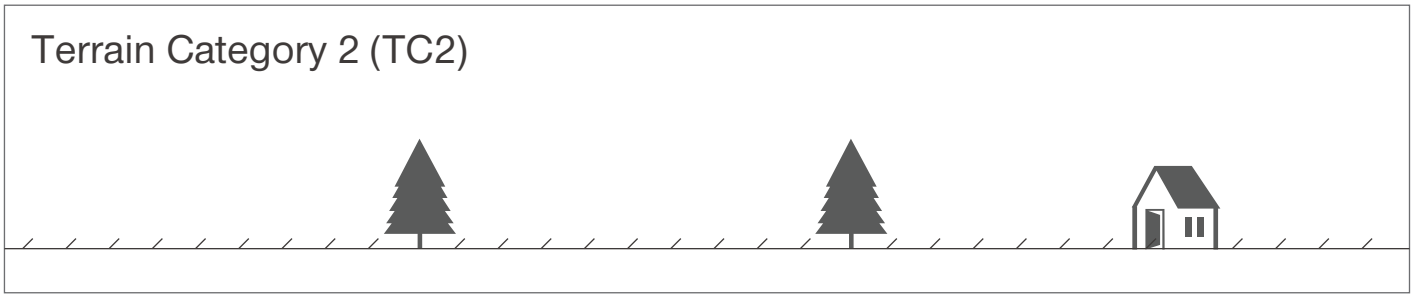
All extruded aluminum components: 6005 T5, clear anodized
Hardware: Stainless steel 304



- **Determine the max wind speed region of your installation site**

Wind zone	A	B	C	D
Max wind speedm/s	43	56	66	88

- **Determine the Terrain Category**



Terrain Category 2 (TC2)

Open terrain, including grassland, with well scattered obstructions having heights generally from 1.5m to 5m, with no more than two obstructions per hectare, e.g. farmland and cleared subdivisions with isolated trees and uncut grass.

Terrain Category 3 (TC3)

Terrain with numerous closely spaced obstruction having heights generally from 3m to 10m. The minimum density f obstructions shall be at least the equivalent of 10 house sizes obstructions per hectare, e.g. suburban housing or light industrial estates.

- **Determine the height of building**

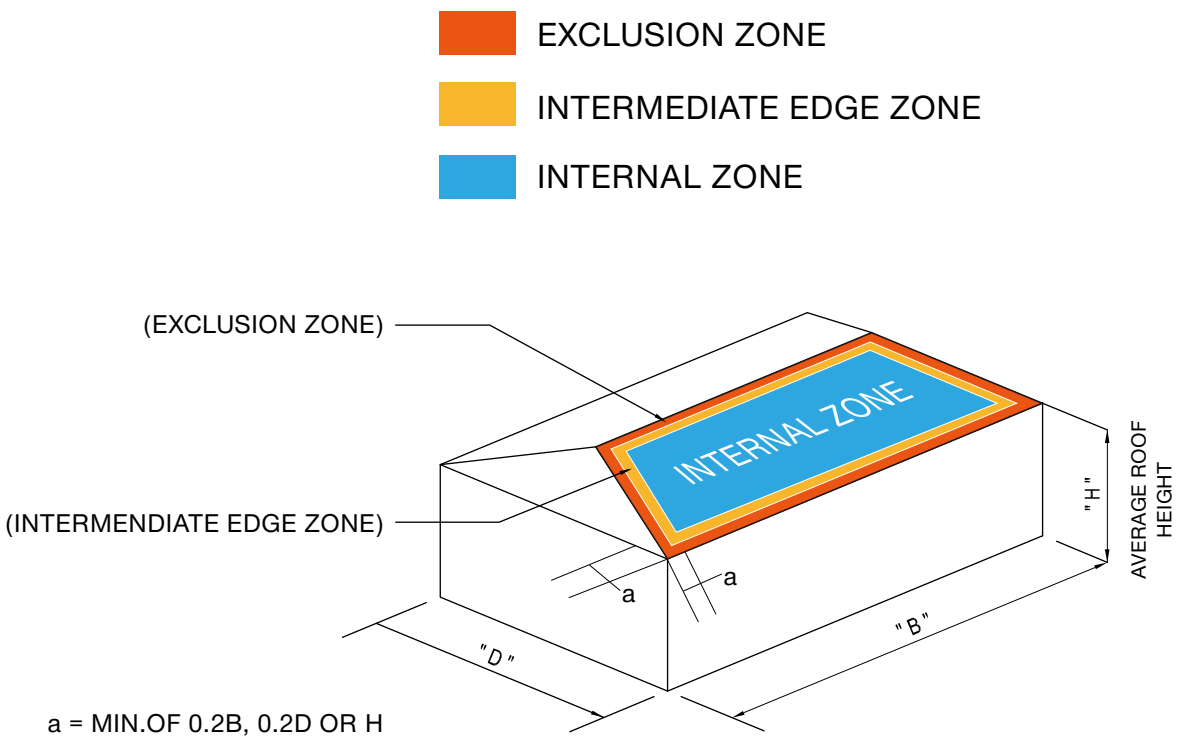
  Note: This manual is for installation in building height≤20 meters

- **Determine Roof slope**

  Note: The installation manual is for roof slope up to 30 degrees.

- **Determine Roof zone.**

  The roof zone describes the amount of the wind load that is subjected to the roof. Internal zone has the lowest load, the mounting system are designed to be installed to the internal zone. The installation is recommended to be over the internal zone as much as possible.



ROOF REGIONS

STANDING SEAM CLAMP SPACING CHART

Please use the following table to determine the standing seam clamp spacing for installation.

• Design code reference

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

- AS/NZS 1170.2:2011 Admt 3-2012
- AS 1664.1.1:1997 on aluminum structures

• Design criteria

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

- Wind region A.B, C, D
- WIND TERRAIN Category 3
- PV modules to be flush installed on the roof
- Max building height 20m
- Max roof slope: 30 degree
- Max PV module: 2000 x 1000mm

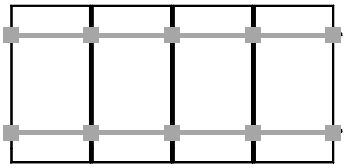
Roof Angle(ϕ) – ϕ < 5°

	Building height H (m)		
	H≤10m	10<H≤15	15<H≤20
Wind zone	Internal zone	Internal zone	Internal zone
A	1600	1500	1350
B	1450	1400	1250
C	900	800	600
D	660	600	400

Roof Angle(ϕ) – 5°≤ϕ≤30

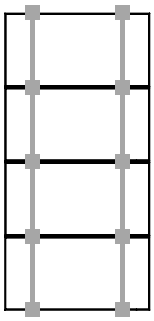
	Building height H (m)		
	H≤10m	10<H≤15	15<H≤20
Wind zone	Internal zone	Internal zone	Internal zone
A	1700	1600	1450
B	1550	1500	1350
C	1050	900	700
D	800	700	500

PV ARRAY LAYOUT & LOCATION



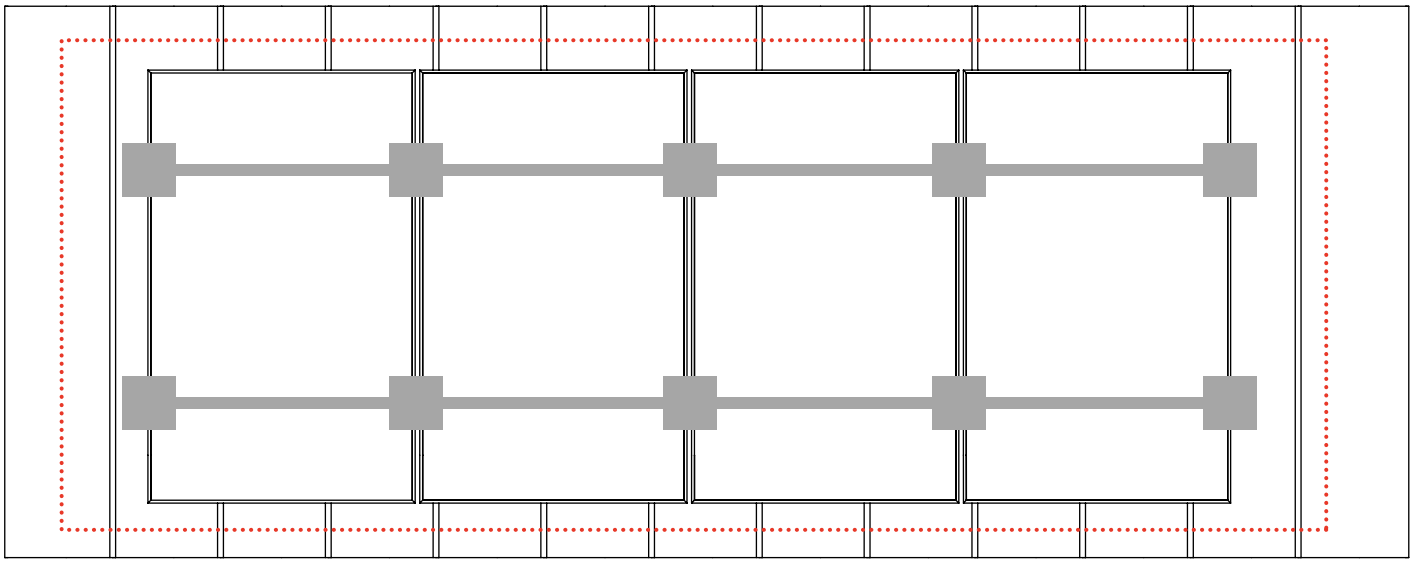
PV array Length required

1. Total width of the modules
2. 17mm for each mid clamp
3. 20.5mm for each end clamp
4. 20mm for 1 grounding lug per row of module
5. 50-100mm extra length for any adjustment or other application.



PV array orientation

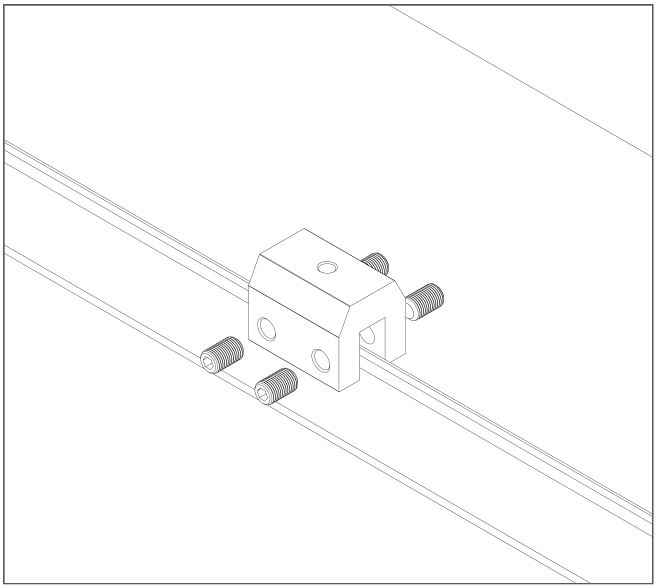
Each row of modules is held to the roof using rails which are to be fastened by a number of standing seam clamps and L foot connectors. The rails can be laid out parallel to seams or perpendicular to the seams.

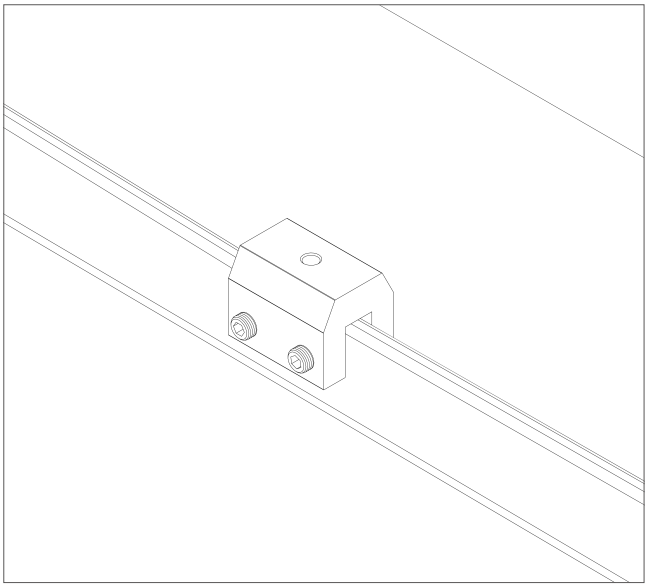


PV array location

- Determine the appropriate installation area on the roof. Make sure the installation area to be center over the roof as much as possible.
- locate the row positions for standing seam clamps and mark them on the seams as outlined in your plans and engineering documents. Ensure they are in line with the each other.
- Locate each standing seam clamp on appropriate span and mark them on seams.

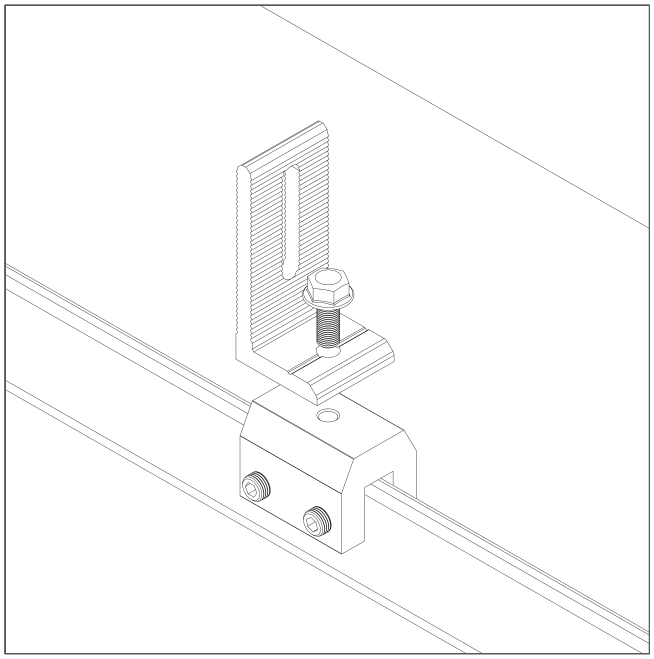
Note: the PV array should not be installed closer than 500mm to the perimeter of the roof including ridge line and eaves (unless verified by a professional engineer).

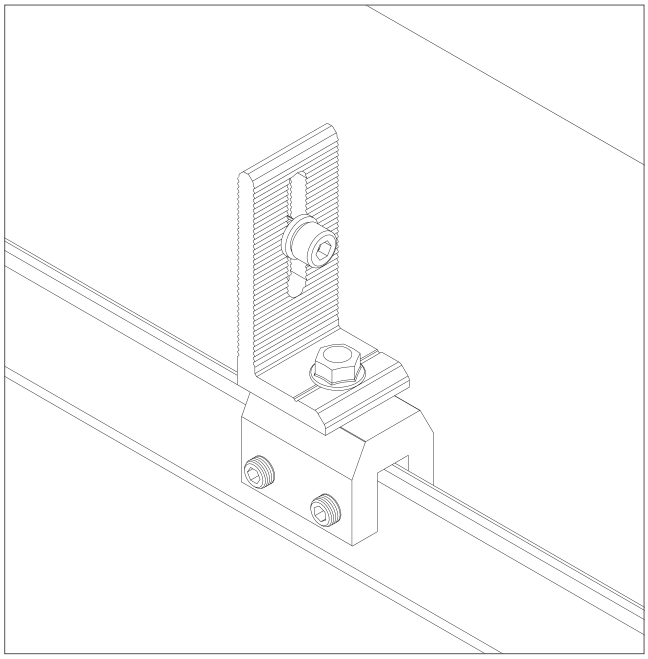




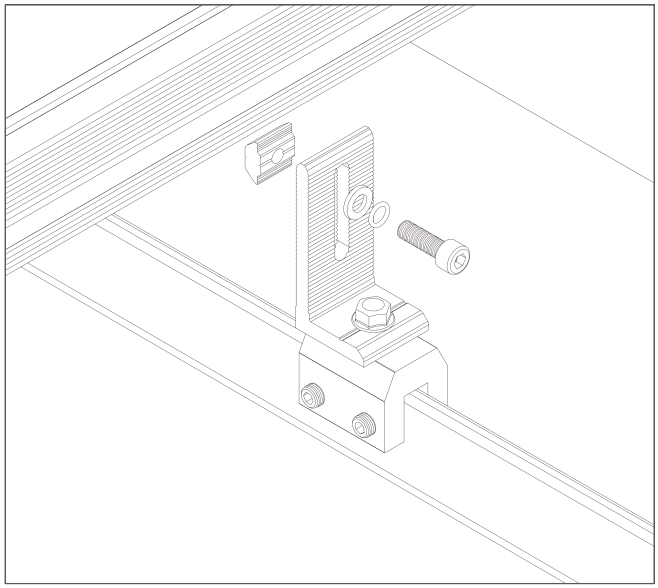
Install standing seam clamps and rails

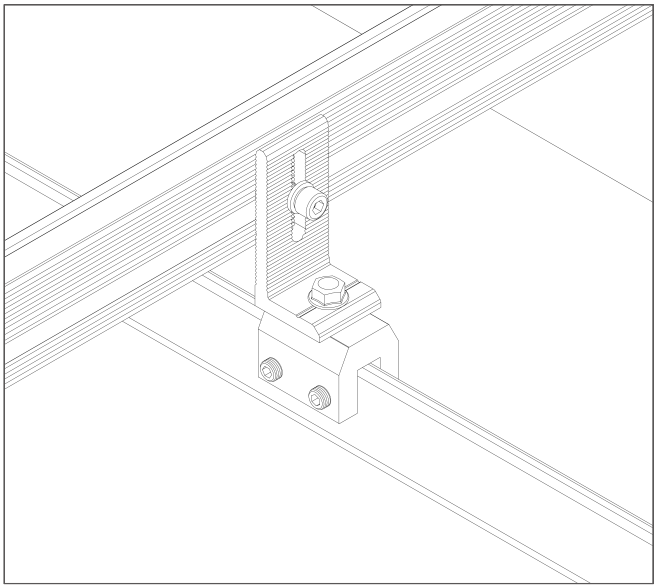
1. Attach standing seam clamp and tighten the grub screws to 11 N·m using 5 mm Allen key or hex driver bit to roof per as standing seam clamp positions



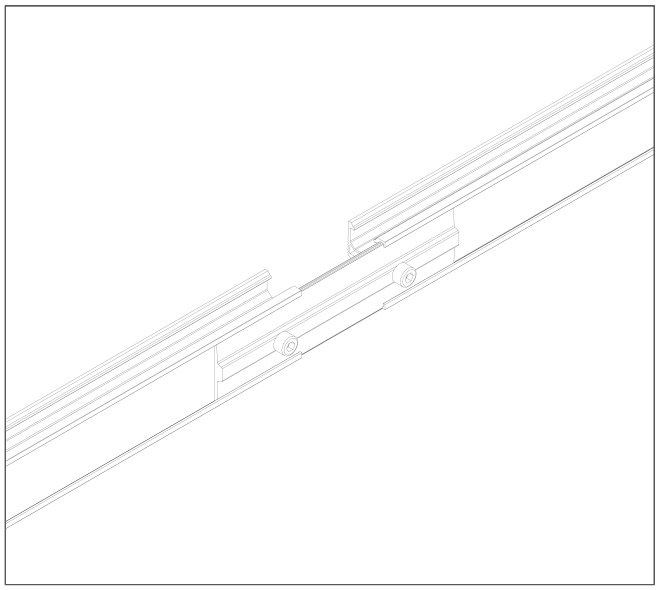


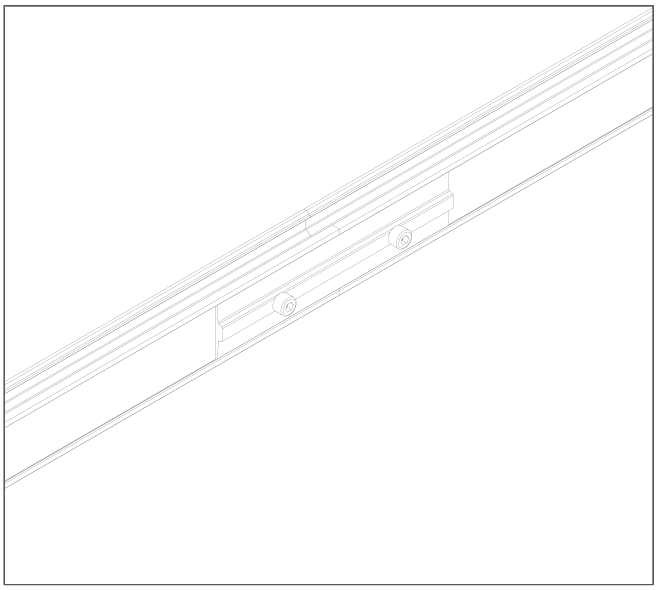
2. Tighten the L foot connector to 15 N·m using 6 mm Allen key or hex driver bit





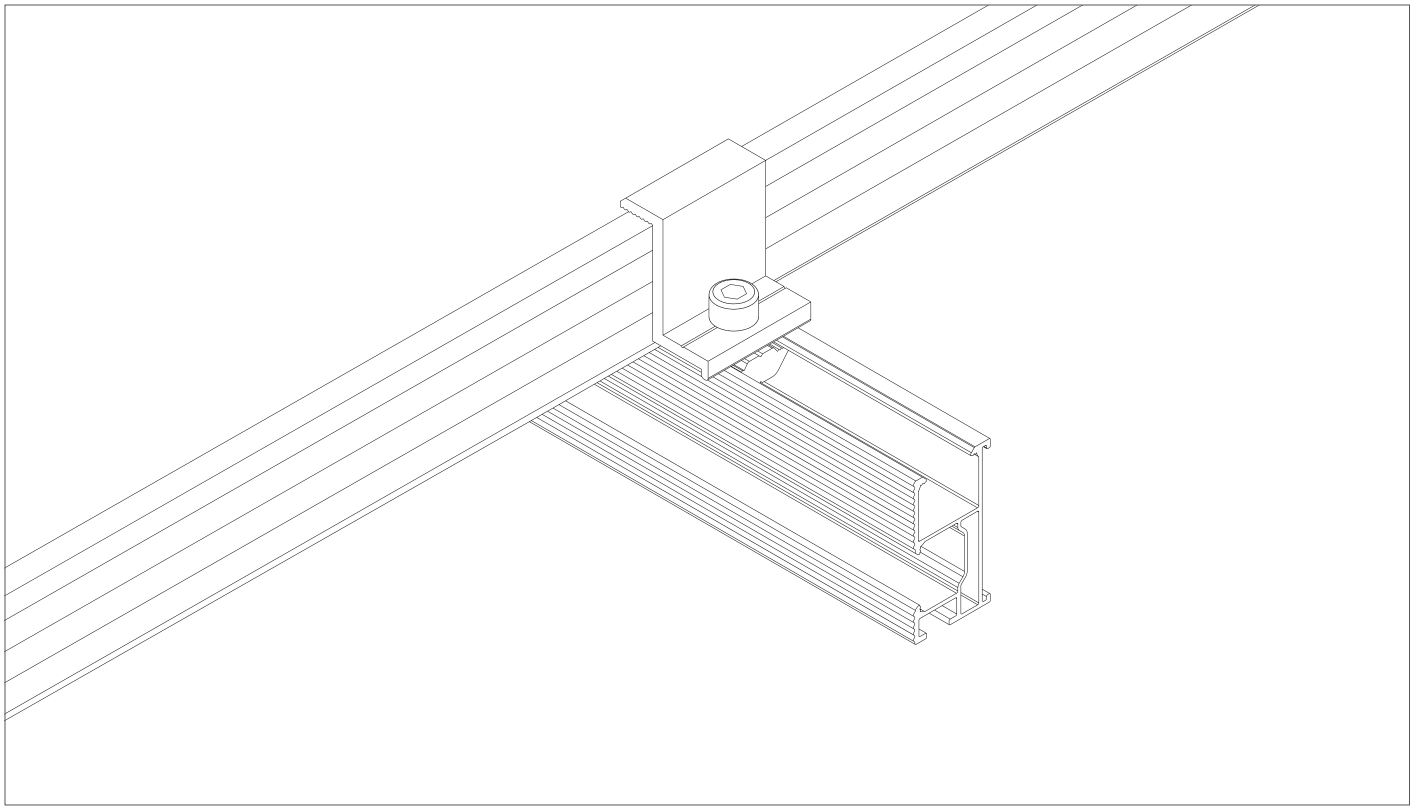
3. Connect rails to L foot to 16 N·m using a M6 Allen key or hex driver bit

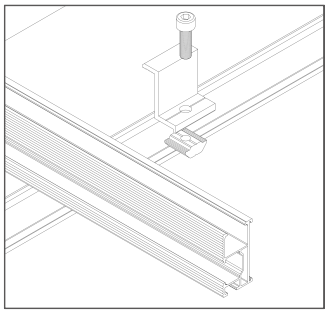


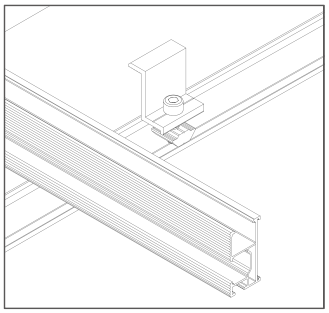


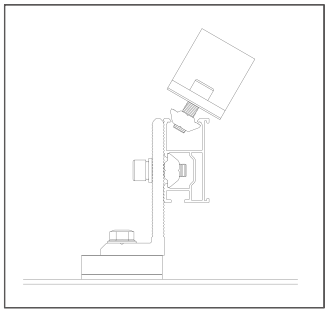
4. Connect multiple rails by using rail splice (if required per system design)

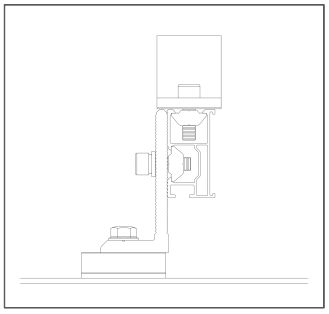
Note: Ensure the rails are square before placing modules









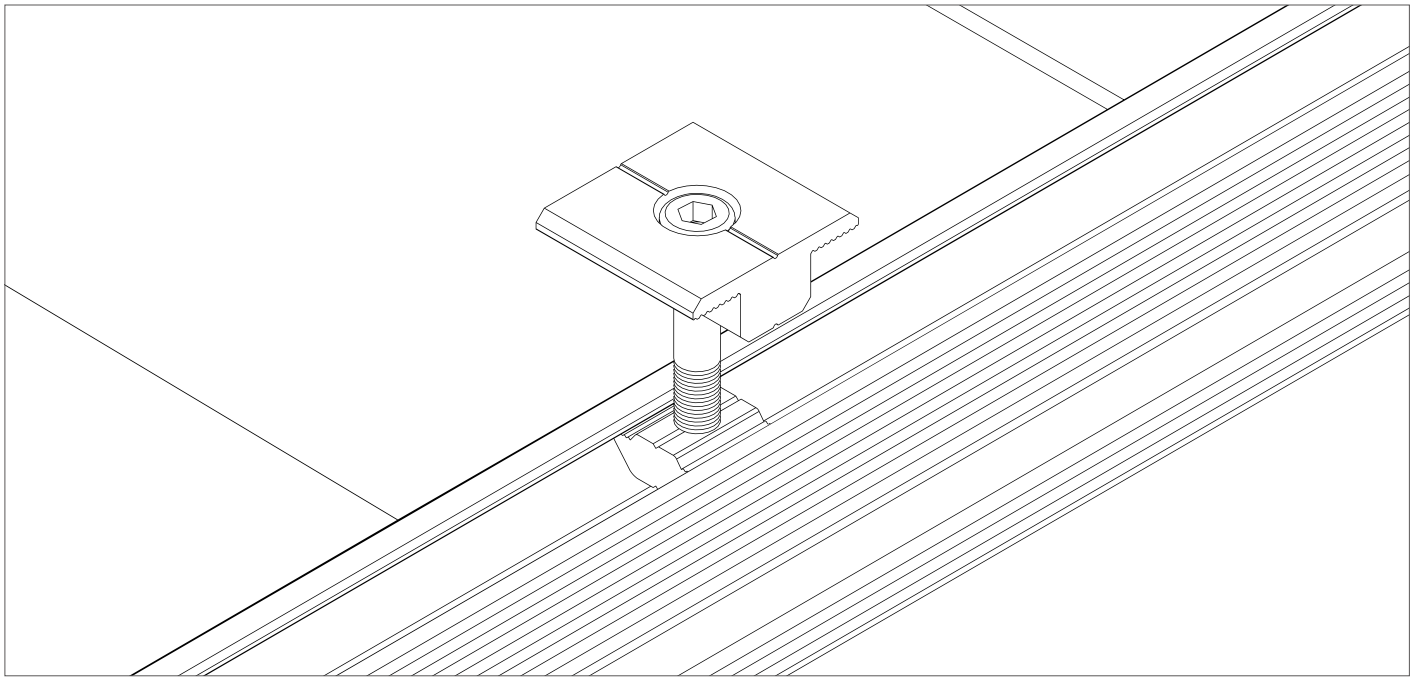


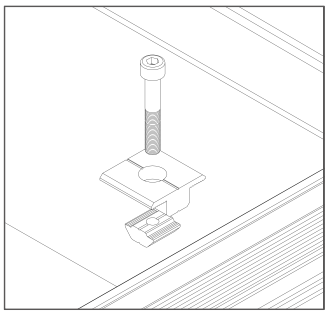
install the mid clamp and end clamp

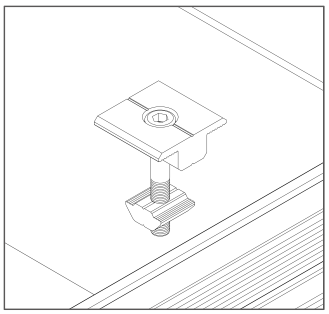
1. Place the first PV module with a minimum 25mm from rail ends, slide end clamp into both rails and tighten the end clamp to 10 N·m using 6 mm Allen key or hex driver bit

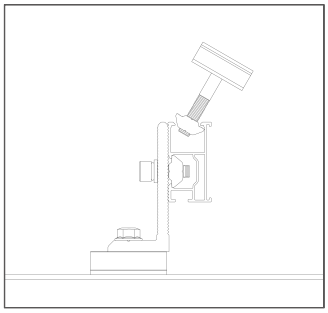
Note:

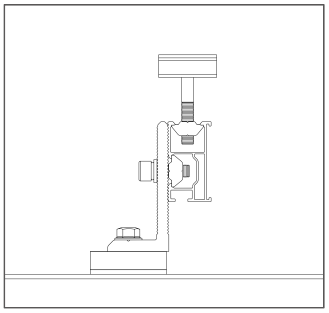
- Leave extra 25mm If grounding lug is to be installed at this end of rail
- Ensure the module length is align with the rails ends.







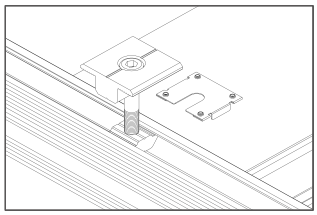


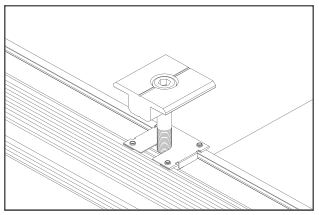


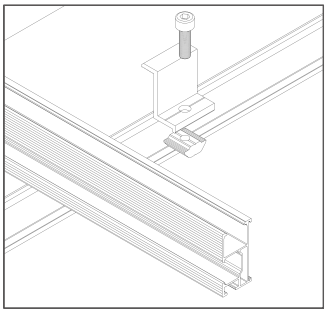
2. Place second PV module into rail, leaving a 20mm gap between modules and insert the mid clamps, slide the PV module flush against mid clamp closely, then tighten the mid clamp screw to 10 N·m using 6 mm Allen key or hex driver bit. Repeat procedure for follow mid clamps.

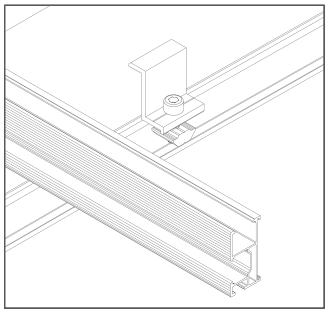
Note:

- Ensure the PV modules are neatly square to one another
- Ensure the array is straight,
- Ensure the mid clamp is secured tighten
- If a grounding clip is used, please insert the grounding clip properly to mid clamp and place the modules. Make sure PV modules are well contacted to the grounding clips before the mid clamps are tighten

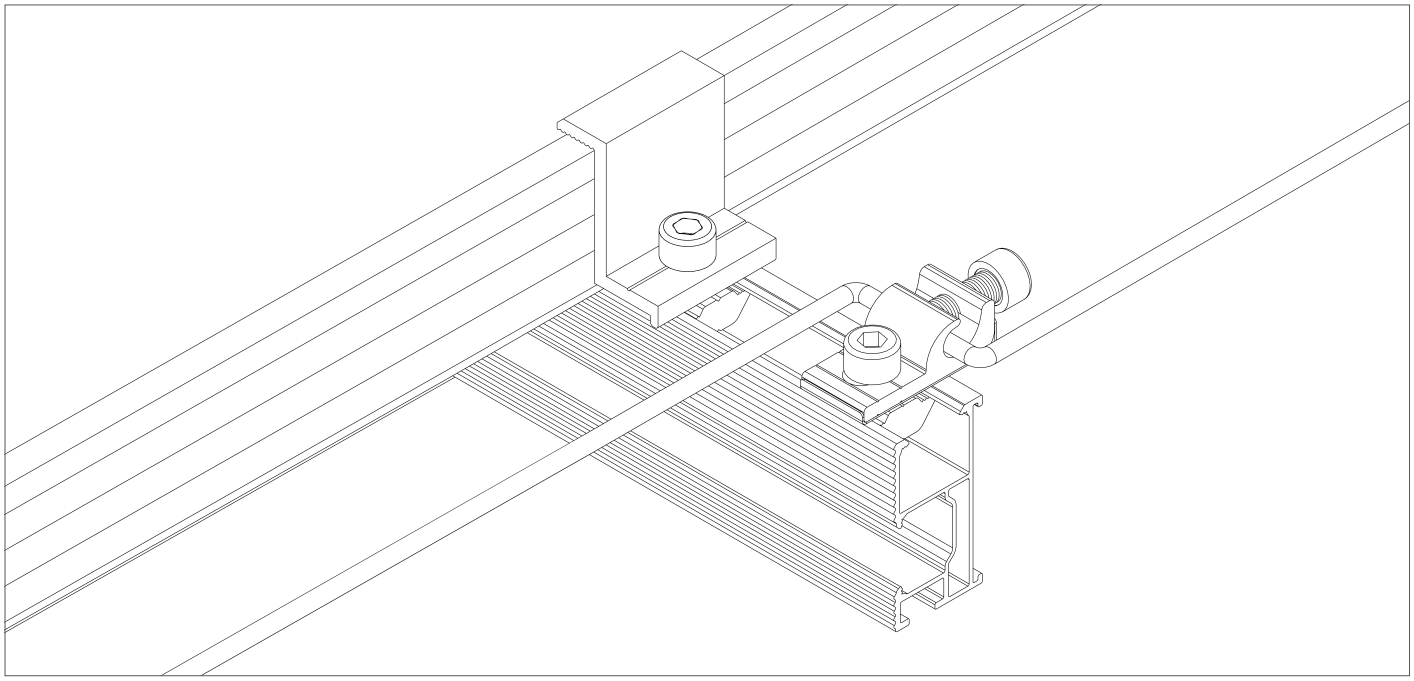


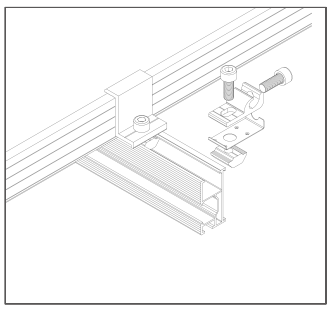


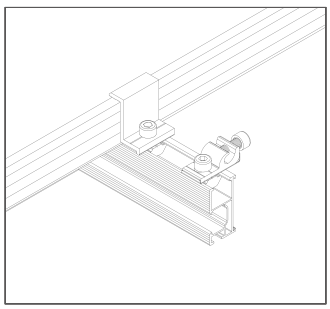




3. Place last module in position on rail with a minimal 50mm from rail end, slide end clamps onto both rails and tighten the screws to secure the PV module.



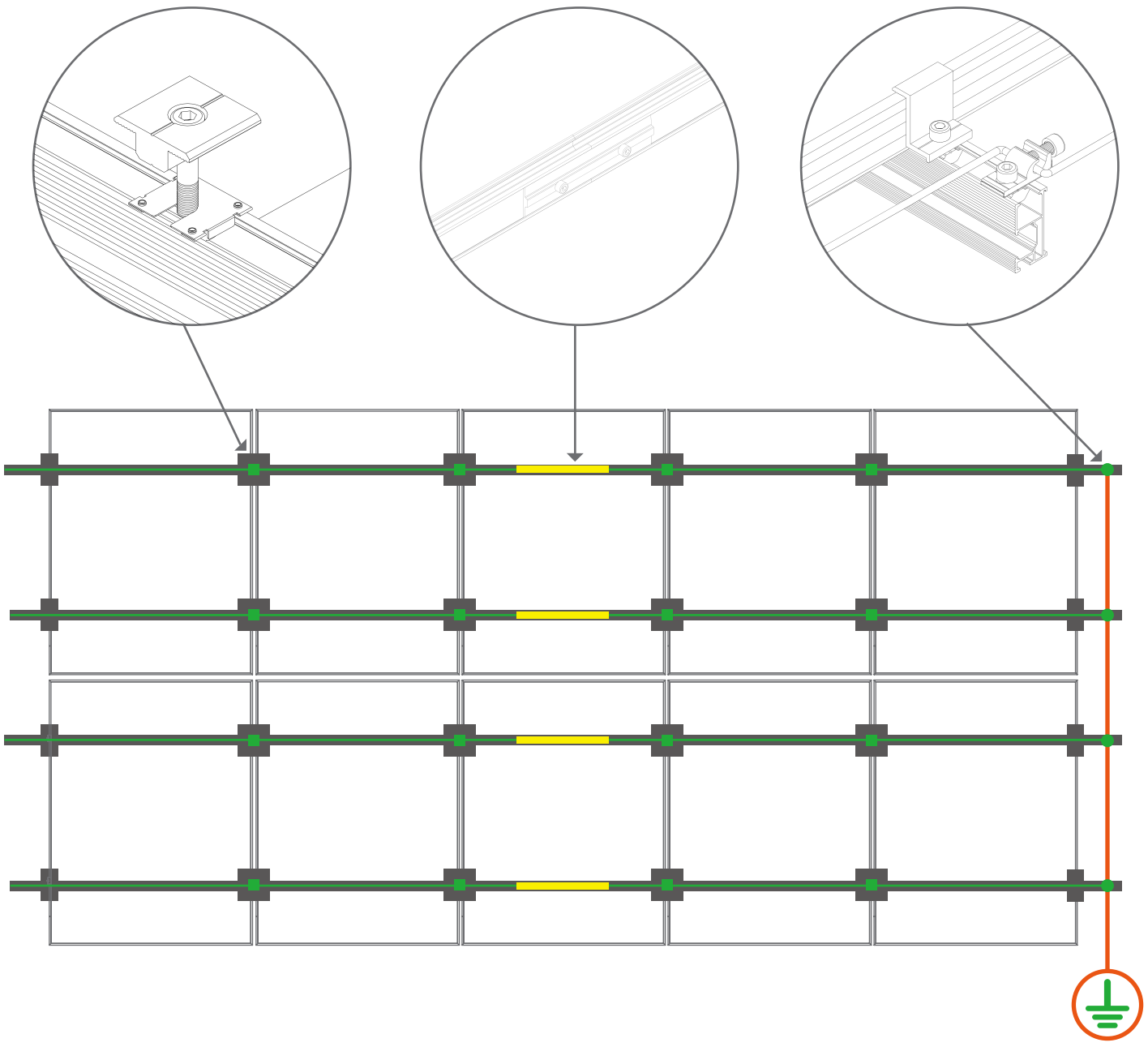




install the grounding lug.

Install the grounding lug to 8 N·m using 6 mm Allen key or hex driver bit at the end of a rail. Run grounding wire to connect all grounding lugs.

GROUNDING COMPONENTS & ELECTRICAL DIAGRAM



Solar Module
Mid Clamp
End Clamp
Ground Path
Copper Wire
Rail splice Kit
Ground Lug
Ground Clip

10 years limited product warranty, 5 years limited finish warranty

Lockseam warrants to the original purchaser ("Purchaser") of product(s) that it manufactures ("Product") at the original installation site that the Product shall be free from defects in material and workmanship for a period of ten (10) years, except for the anodized finish, which finish shall be free from visible peeling, or cracking or chalking under normal atmospheric conditions for a period of ten five (10) years, from the earlier of 1) the date the installation of the Product is completed, or 2) 30 days after the purchase of the Product by the original Purchaser ("Finish Warranty").

The Finish Warranty does not apply to any foreign residue deposited on the finish. All installations in corrosive atmospheric conditions are excluded. The Finish Warranty is VOID if the practices specified by AAMA 609 & 610-02 – "Cleaning and Maintenance for Architecturally Finished Aluminum" (www.aamanet.org) are not followed by Purchaser. This Warranty does not cover damage to the Product that occurs during its shipment, storage, or installation.

This Warranty shall be VOID if installation of the Product is not performed in accordance with Lockseam's written installation instructions, or if the Product has been modified, repaired, or reworked in a manner not previously authorized by Lockseam IN WRITING, or if the Product is installed in an environment for which it was not designed. Lockseam shall not be liable for consequential, contingent or incidental damages arising out of the use of the Product by Purchaser under any circumstances.

If within the specified Warranty periods the Product shall be reasonably proven to be defective, then Lockseam shall repair or replace the defective Product, or any part thereof, at Lockseam's sole discretion. Such repair or replacement shall completely satisfy and discharge all of Lockseam's liability with respect to this limited Warranty. Under no circumstances shall Lockseam be liable for special, indirect or consequential damages arising out of or related to use by Purchaser of the Product.

Manufacturers of related items, such as solar modules and flashings, may provide written
warranties of their own. Lockseam's limited Warranty covers only its Product, and not any related items.