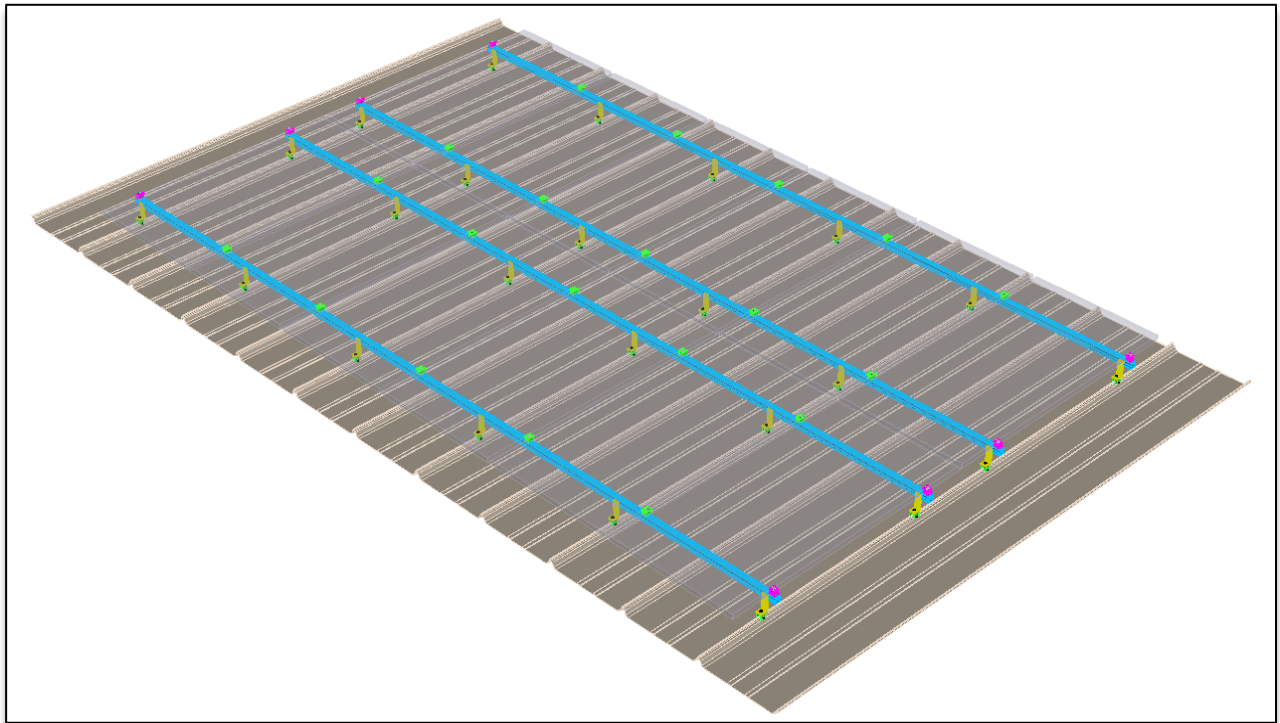




## RAIL-BASED ON METAL-STANDING SEAM

Standing Seam Roof



**INSTALLATION MANUAL REV.1.0.**

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## NOTES

### UL2703 verified compatible modules

Modules chosen for UL2703 grounding/bonding testing were chosen to represent a range of available solar modules. Modules tested were from the following manufacturers:

- LG NeON– Model LGxxxN2W-A5
- Jinko Solar – Model JKMxxxM-72L-V, JKM-xxx-M-72-H
- Seraphim SRP-xxx-BMA
- Mission MSE-xxx-SQ8T
- Axitec AC-xxx-MH
- Canadian CS6X-xxx-P

### Grounding/Bonding

- Only grounding/bonding devices listed in this manual have been approved for use with this racking and qualified per UL2703 installation details provided in this document
- This racking system may be used to ground and/or mount a PV module complying with UL 1703 only when the specific modules has been evaluated for grounding and/or mounting in compliance with the included instructions.
- Routine maintenance of a module or panel shall not involve breaking or disturbing the bonding path of the system.
- The racking system has a 25 Amp fuse series rating.
- Installer is responsible for and shall provide an appropriate method of direct-to-earth grounding according to the latest edition of the National Electrical Code, including NEC 250: Grounding and Bonding, and NEC 690: Solar Photovoltaic Systems.
- Installation shall be in accordance with CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1.

### Periodic Inspection

Periodic re-inspection of installed racking components must take place to identify any loose components, loose fasteners or corrosion. Loose or corroded components or fasteners must be replaced immediately.

### Fire Rating

**\*\*UL1703 FIRE CLASSIFICATION\*\***

This system has achieved a Class A fire rating when installed using UL1703 Fire Classification Type 1 and Type 2 modules under the following conditions:

- Installation must be done in strict accordance to this instruction manual.
- The maximum roof slope may be up to 2"/12" or 9.46°.

### Design Load Rating

System Level Allowable Design Load Rating: 35 psf downward, 20 psf upward, 10 psf down-slope.

Each set of site-specific plans must have system loads evaluated and approved by an appropriate structural engineer. This system is designed to be expandable and is not limited by a maximum number of PV modules. Maximum size of PV modules evaluated was 79.7" x 40.3" (i.e. typical 72-cell) and modules are mounted in portrait. A typical modular rail length is approximately 20' (6m) and could hold up to 6 modules.

### Label

After the racking system is fully assembled, a single Marking Label should be applied to the rail at the edge of the array. Note: The sticker label should be placed such that it is visible, but not outward facing.



### Sharp Edges and Piercing Module Clamps

Ensure wiring is kept away from any sharp edges that may have resulted from cutting rails etc. Module clamps contain pre-installed bonding nodes which are designed to pierce the module frame when tightened to proper torque.

### Site-Specific Engineering Drawings

This manual is to be used in conjunction with any site-specific engineering drawings that have been developed for your specific project.

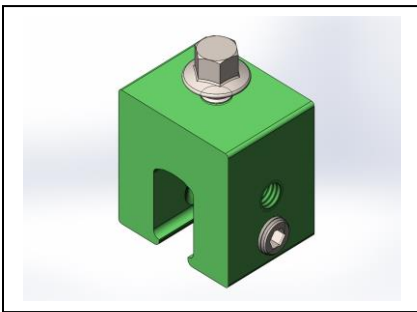
# 1. Roof Attachment

## 1.1 Components

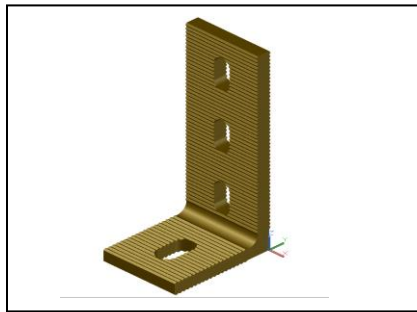
**TOOL LIST:**

- String Line
- Measuring Tape
- Sharpie
- 13 mm Socket
- Impact Driver
- Saw For Cutting Rail

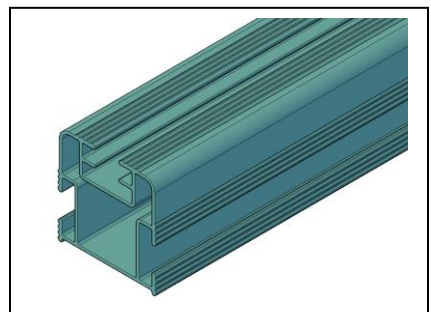
Advanced Seam Clamp



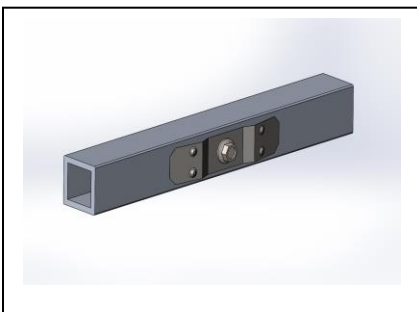
Advanced L Bracket



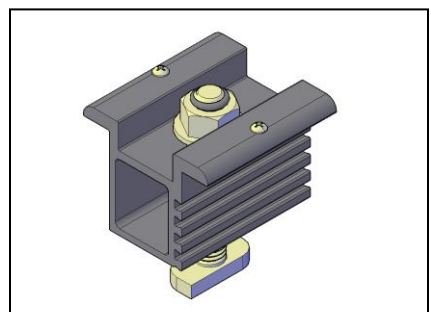
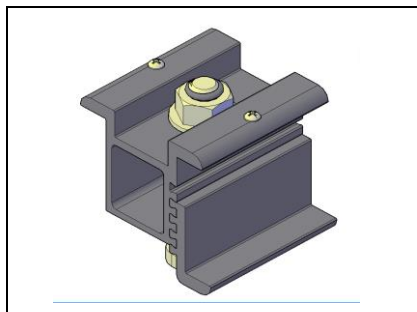
Advanced Rail



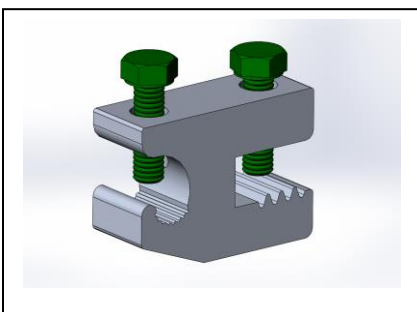
Advanced Rail Splice



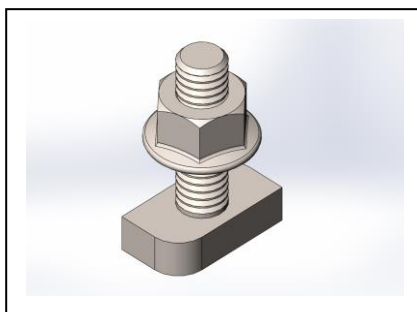
Advanced Clamp "End Setting" Advanced Clamp "Mid Setting"



Grounding Lug



T Bolt & Nut



## 1.2 Racking Installation & GA drawings

### Seam Clamp Installation



- Standing seam clamps are used on standing seam roofs.
- Use string line to mark the location points for clamps.



- Crimp seams if necessary, to get the clamps to fit over the seam and sit flat.

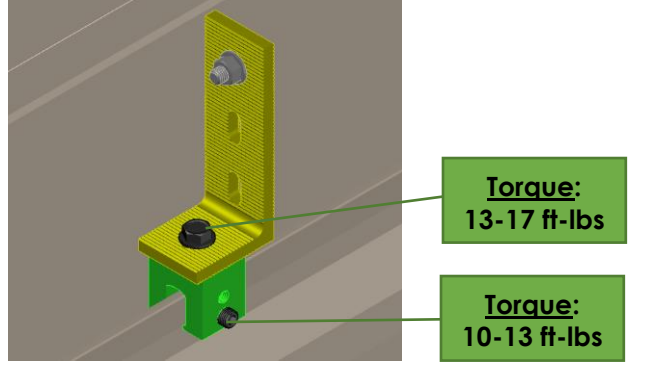


- Use 5mm allen bit to secure the clamp.



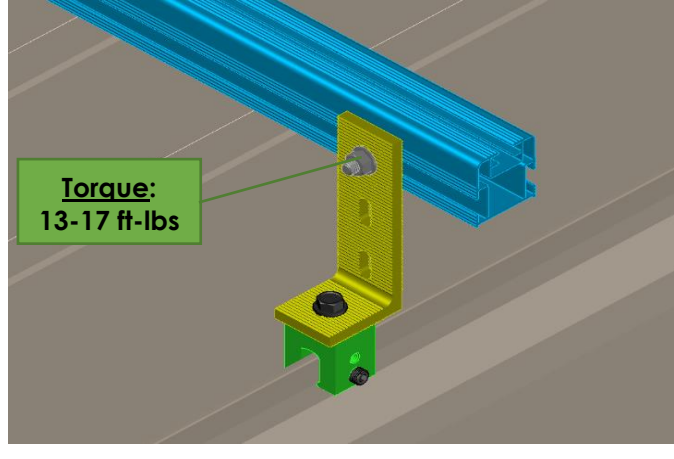
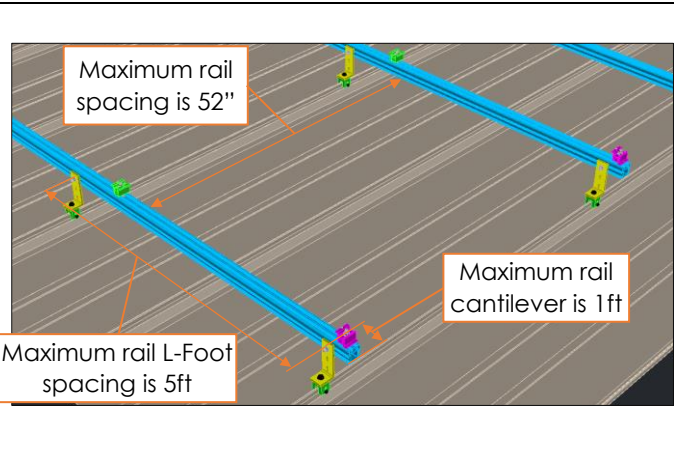
- Standing seam clamps will work both in the vertical or horizontal position.

## Advanced L Bracket Installation

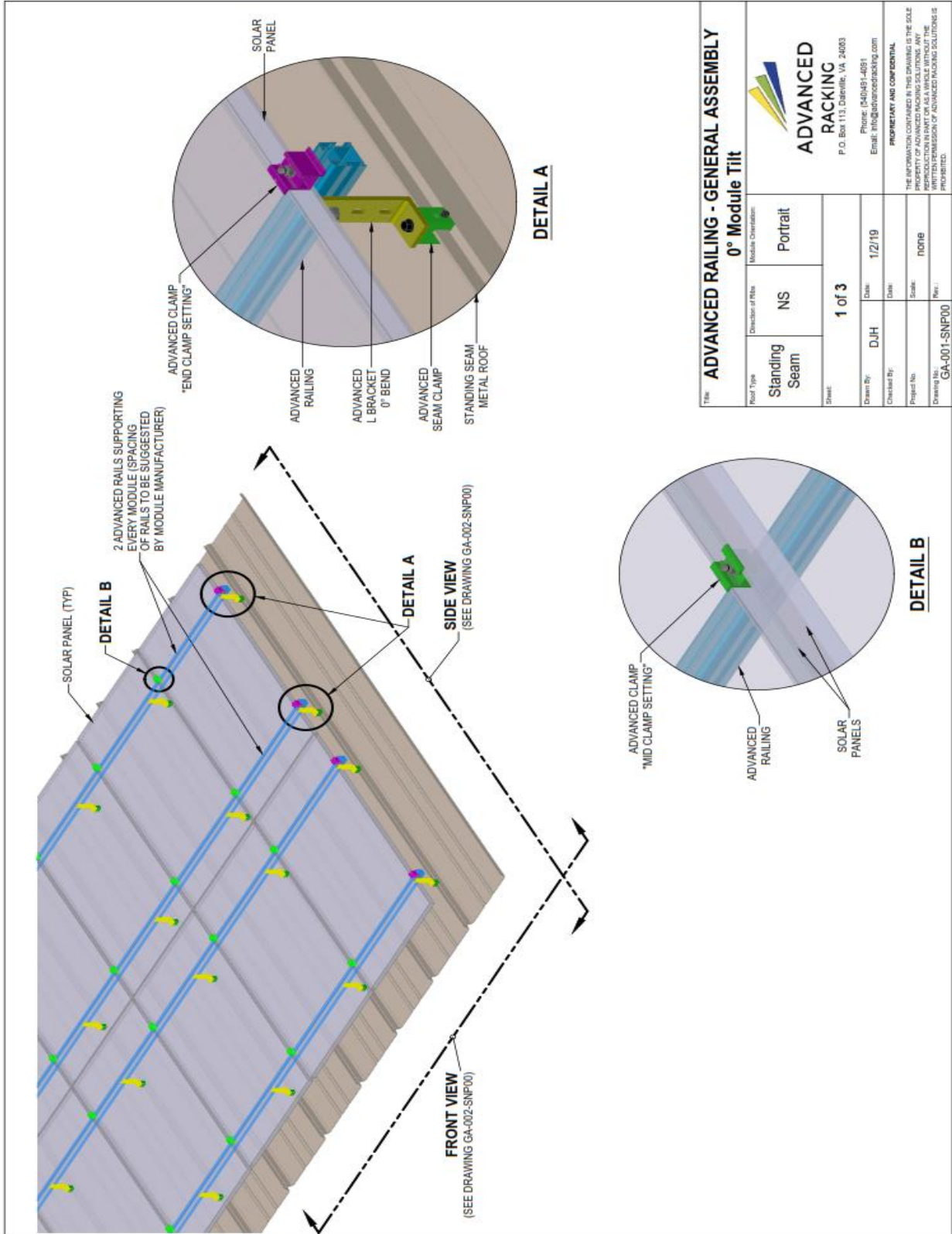
|   |   |
|---|---|
|  | <ul style="list-style-type: none"> <li>Attach advanced L bracket to seam clamp using supplied hex bolt</li> </ul> |
|---|---|

***IMPORTANT NOTE:*** Before installing all rails for entire array, always confirm using modules, or accurate measuring, that expected module row lengths will not only fit on installed rails, but that there will be no interference between rail splice points and modules clamps.

## Rail Installation

|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>Attach Rail to Advanced L Bracket using provided T bolt and nut.</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>The system must be installed such as to meet the Max. rail cantilever (1ft), Max. L-foot spacing (5ft) and Max. rail spacing requirements (52").</li> </ul> |

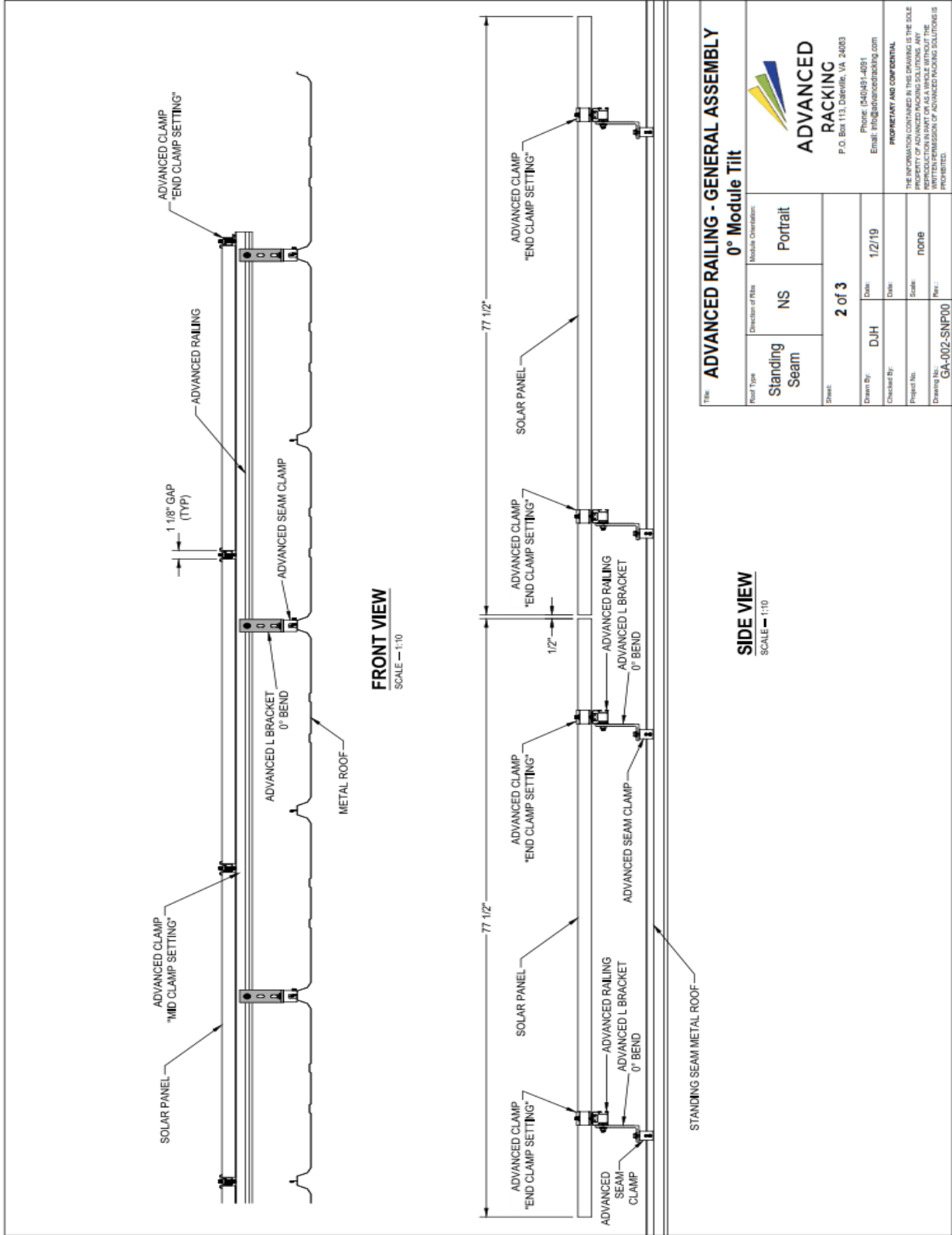




|   |                     |                     |  |
|---|---------------------|---------------------|--|
| Title: <b>ADVANCED RAILING - GENERAL ASSEMBLY</b> |                     | Module Orientation: |  |
| 0° Module Tilt                                    |                     |                     |  |
| Roof Type:  | Direction of Rails: | Module Orientation: |  |
| Standing Seam                                     | NS                  | Portrait            |  |
| Sheet:  | 1 of 3              |                     |  |
| Drawn By:   | Date:               | 1/2/19              |  |
| D.J.H.  | Date:               |                     |  |
| Checked By:                                       |                     |                     |  |
| Project No.:                                      | Scale:              | NONE                |  |
| Drawing No.:                                      | Rev.:               |                     |  |
| GA-001-SNP00                                      |                     |                     |  |



**PROPRIETARY AND CONFIDENTIAL**  
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ADVANCED RACKING SOLUTIONS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ADVANCED RACKING SOLUTIONS IS PROHIBITED.

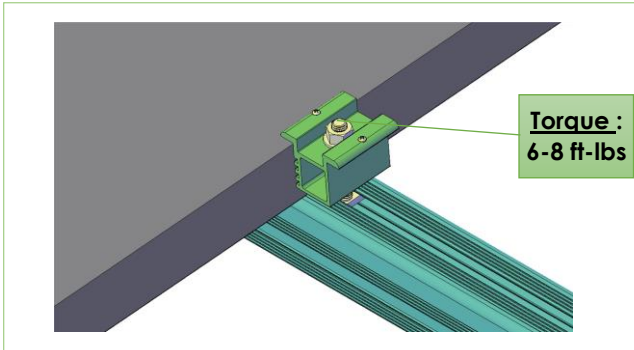




## 2. Module Clamping

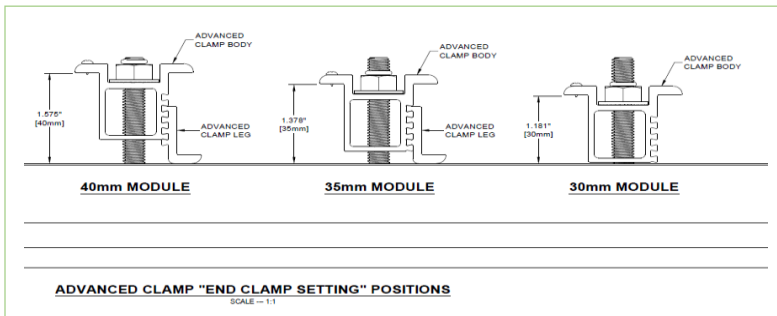
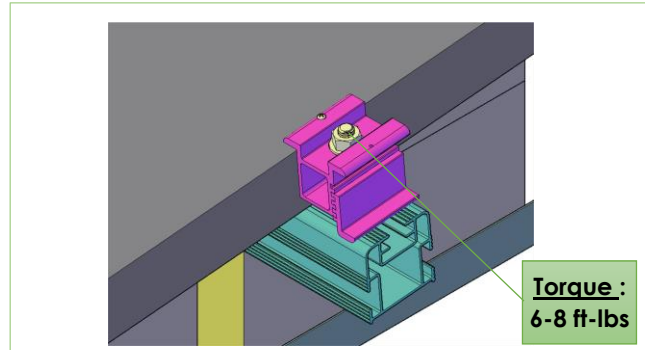
### Mid Clamp

1. Place clamp on rail near first module.  
Insert T-bolt inside the **TOP SLOT of the rail**.
2. Slide next module. Torque bolt to 6-8 ft-lbs



### End Clamp

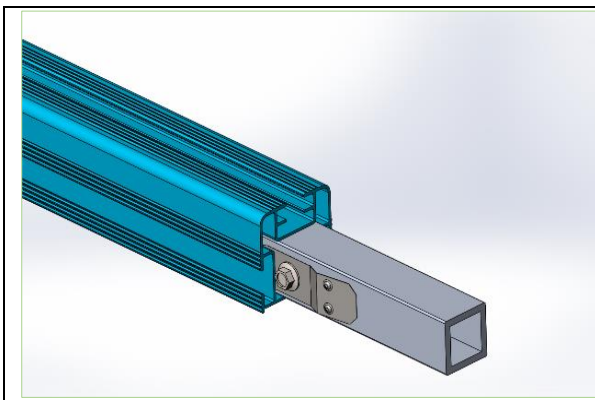
1. Place clamp on rail near end module.
2. For 30 mm thick module only, Mid clamp must be used to replace End Clamp (See figure below).  
Torque bolt to 6-8 ft-lbs



For 40mm, 35mm and 30mm thick modules, use corresponding end clamp configuration as shown on the figure beside.

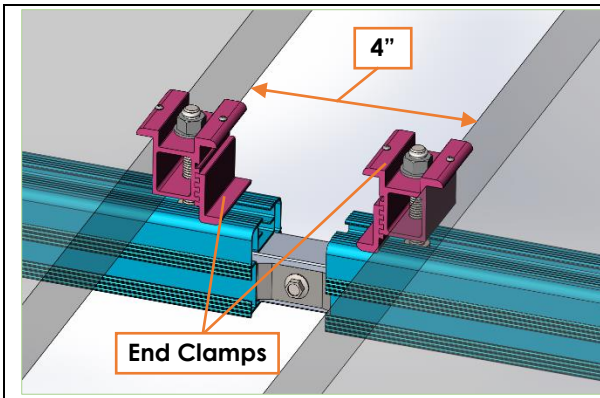
**Note:** T Bolts are inserted into the **TOP SLOT of the rail**.

## 3. Rail Splice Installation



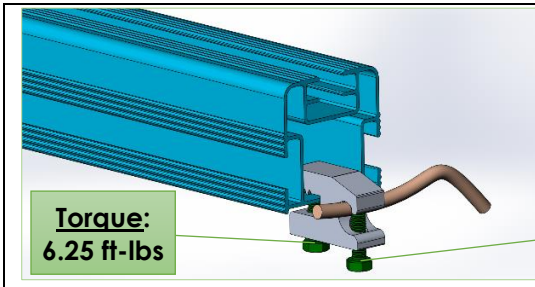
- Join rails by inserting splice bar into first rail, then sliding second rail over splice. The integrated bonding washer bonds the two pieces of rail. No braided jumper is necessary.
- Splice bars must be inserted into the cavity of the Advanced rail before you can complete the installation to the L-Foot
- Make sure splice bar locations do not land directly over an L-Foot. Splice bars should be roughly 1/3 distance between L-Foot locations

#### 4. Expansion Joints

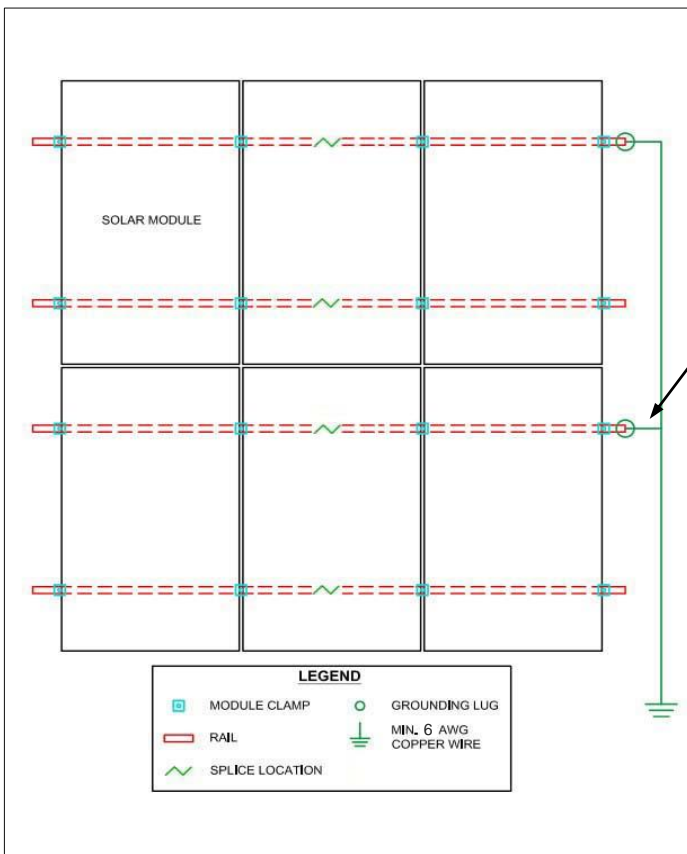


- Expansion joints are required to minimize stresses to the racking, modules and the roof due to thermal expansion.
- Adding an expansion joint consists of ending a row of modules using end clamps, adding rail splices, then beginning the row again using end clamps on the adjacent rail.
- Expansion joints are typically added every 27 modules, though it is recommended to follow the rail layout drawings provided.

#### 5. Grounding / Bonding



- As per the diagram beside, use SGB-4 to bond one rail per row of modules using #6 copper wire. System grounding must be in accordance with the National Electrical Code, ANSI/NFPA 70.



Affix UL2703 label to racking near final ground lug (i.e. last ground lug before ground wire leaves array for combiner or inverter).

**NOTE:** Module clamps have piercing pins achieving an electrical bonding between the module and the advanced rail.

**NOTE:** ISOLATE COPPER FROM ALUMINUM CONTACT TO PREVENT CORROSION.

**NOTE:** AFFIX UL2703 LABEL TO THE RACKING IN A VISIBLE LOCATION NEAR THE GROUND LUG AT FINAL BONDING LOCATION.