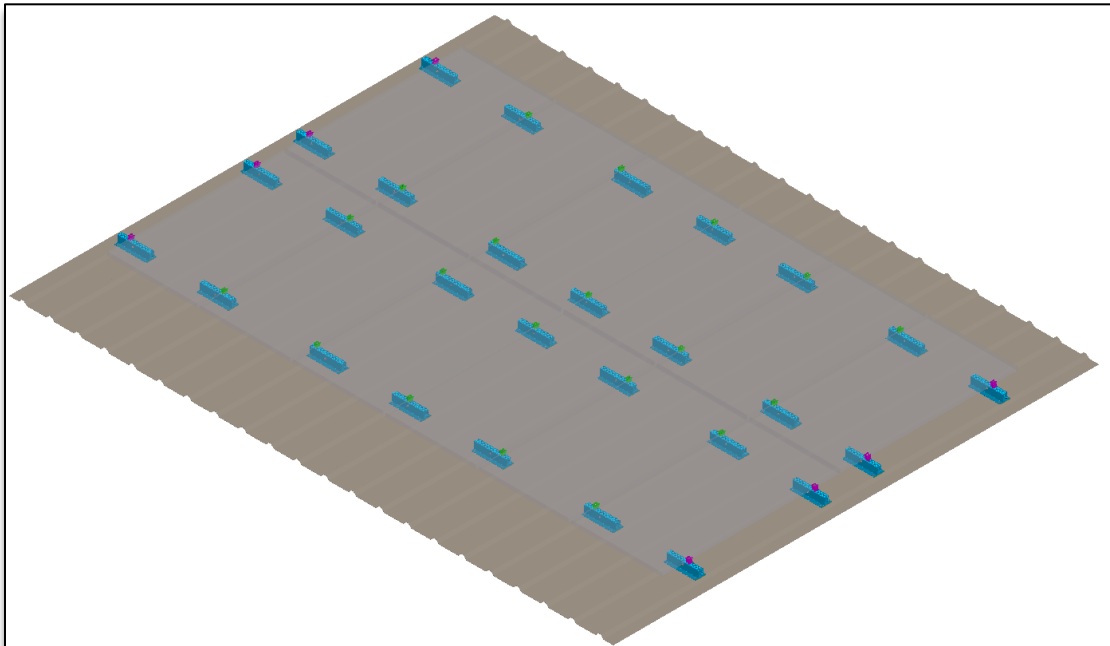




# RAIL-FREE FLUSH ON TRAPEZOIDAL METAL

Exposed Fastener 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°.

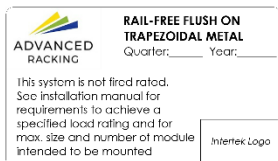
### Design Load Rating

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

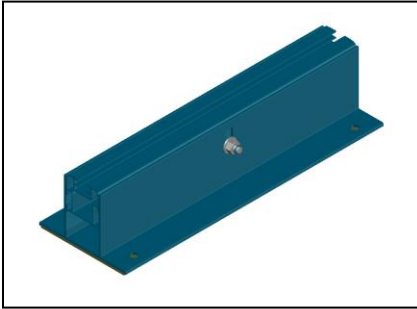
This manual is to be used in conjunction with any site-specific engineering drawings that have been developed for your specific project.

### TOOL LIST:

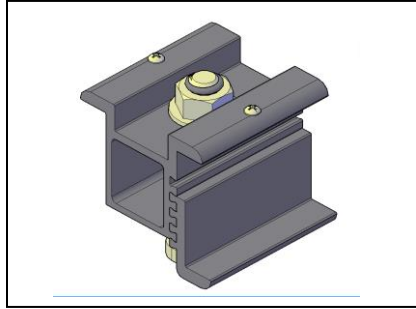
- String Line
- Measuring Tape
- Sharpie
- 13 mm Socket
- Impact Driver

## 1. Components

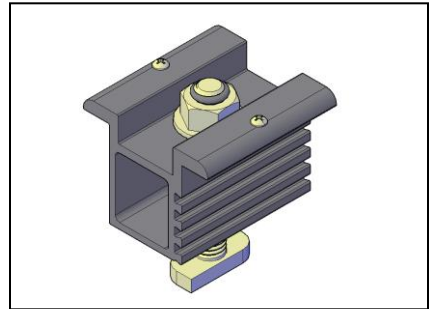
Advanced Bridging Rail



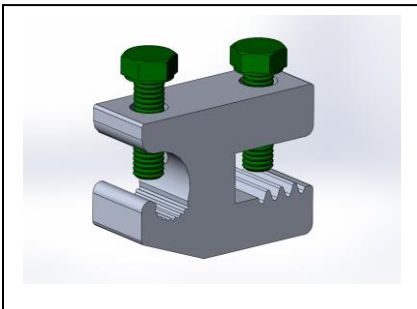
Advanced End Clamp



Advanced Mid Clamp



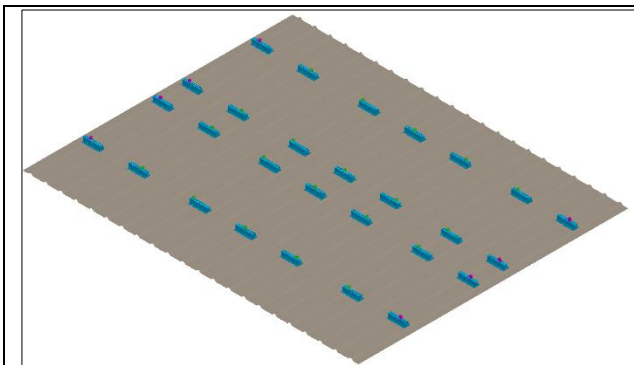
Grounding Lug



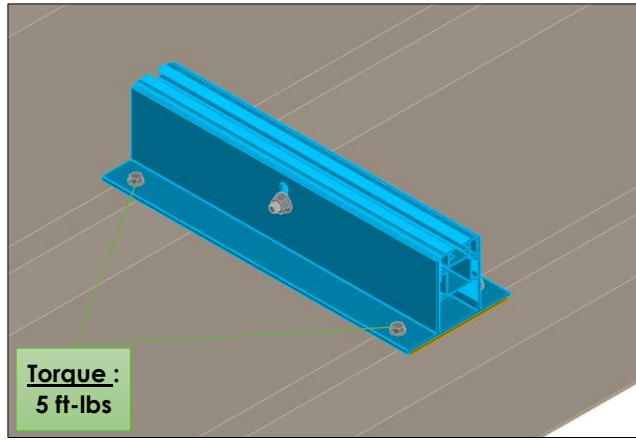
EJOT



## 2. Racking Installation

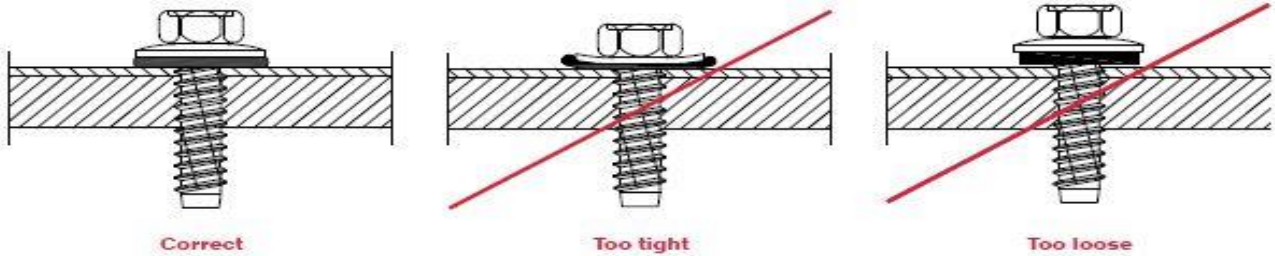


- Use string line to mark the location points for Bridging Rails.
- Before installing the bridging rails, make sure to mark the position of mid clamps in between two seams. The bridging rails should then be fastened to those adjacent two seams such as to hold the mid-clamps.
- Bridging Rails have to be spaced such as to meet module manufacturer's approved clamping locations.

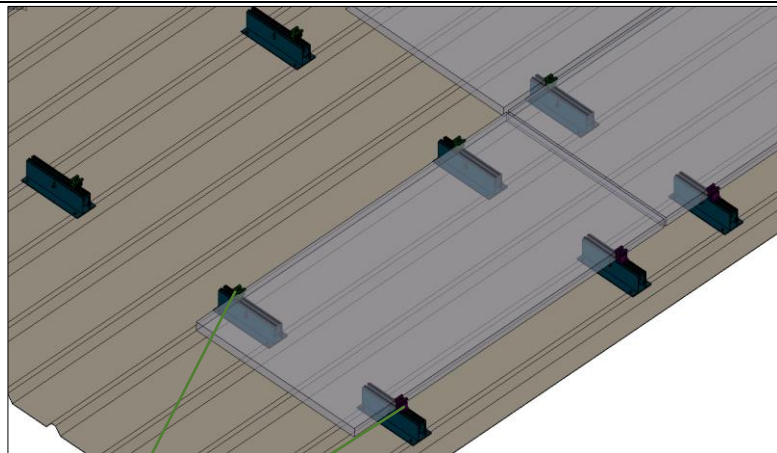


- Use 8mm or 5/16" hex bit to fasten the Bridging Rails to the roof.
- The number of screws used is determined by the number of pre-punched holes in the Bridging Rails.
- It is recommended to fasten the screws manually, by hand
- If a drill is used, start fastening the screw slowly and on the lowest speed setting, then finish by hand to achieve the correct compression as shown in the figure below.

Fasteners with bonded washers should achieve 25% compression to ensure weather seal.



### 3. Solar Module & Module Clamps Installation

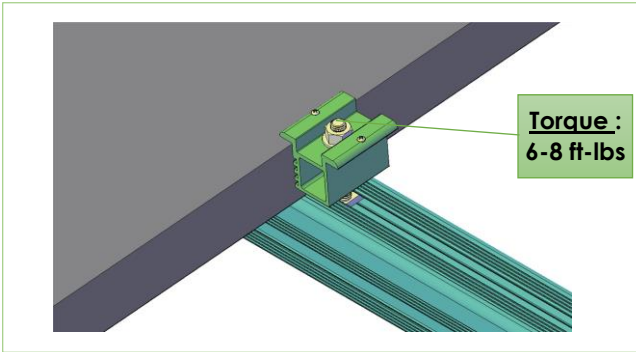


- Place module end clamp into rail by inserting the T bolt into bridging rail's top channel. Tighten once clamp is flush with module
- Once module end clamp is secure and module in place, insert the mid clamp into the rail flush against module
- Confirm modules are flush with clamps. Taking time/care in getting the first PV module square, following modules line up more easily
- Consult module and rail layout when placing the first module.

## 4. Module Clamping

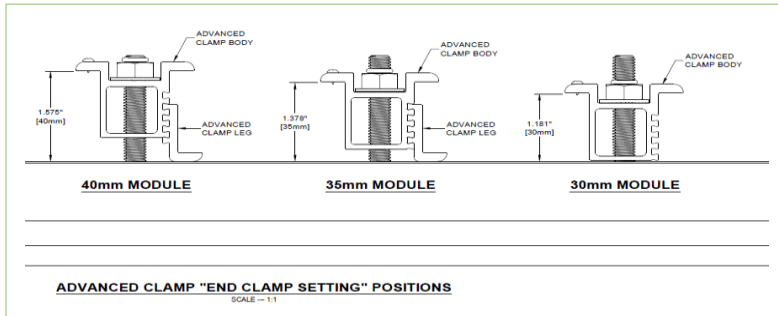
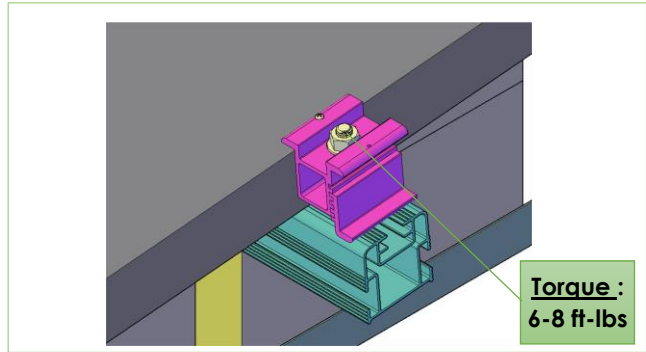
### Mid Clamp

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

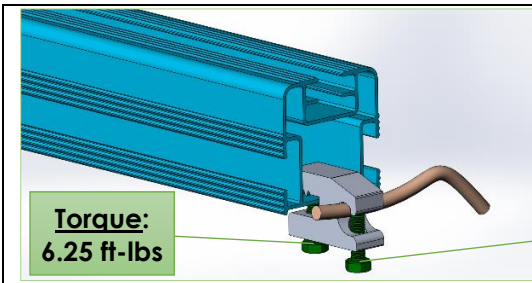
1. Place clamp on rail near end module.
2. For 30 mm thick module only, Mid clamp must be used to replace End Clamp (See figure below).  
Torque bolt to 6-8 ft-lbs



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

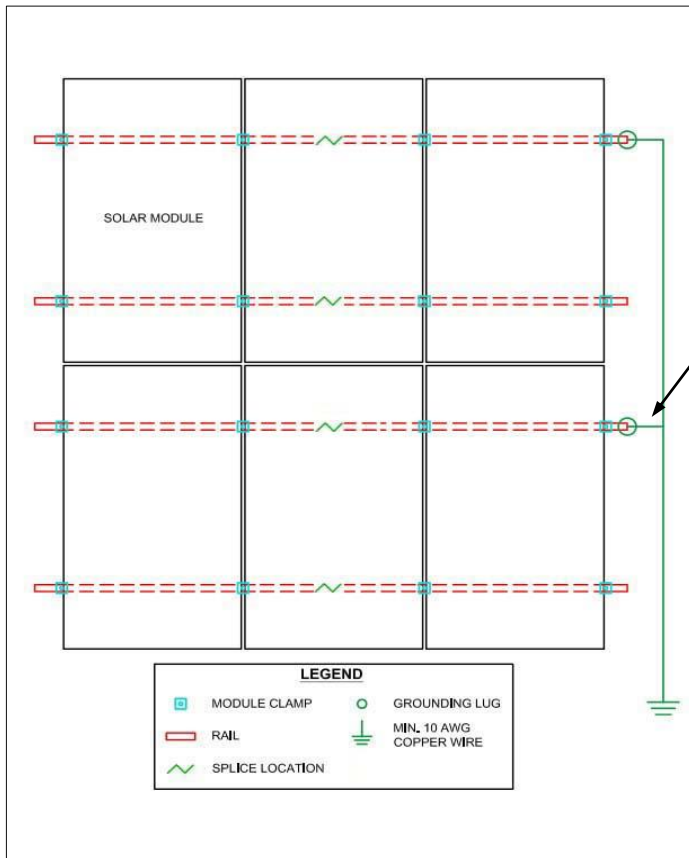
**Note:** T Bolts are inserted into the **TOP SLOT** of the rail.

## 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).

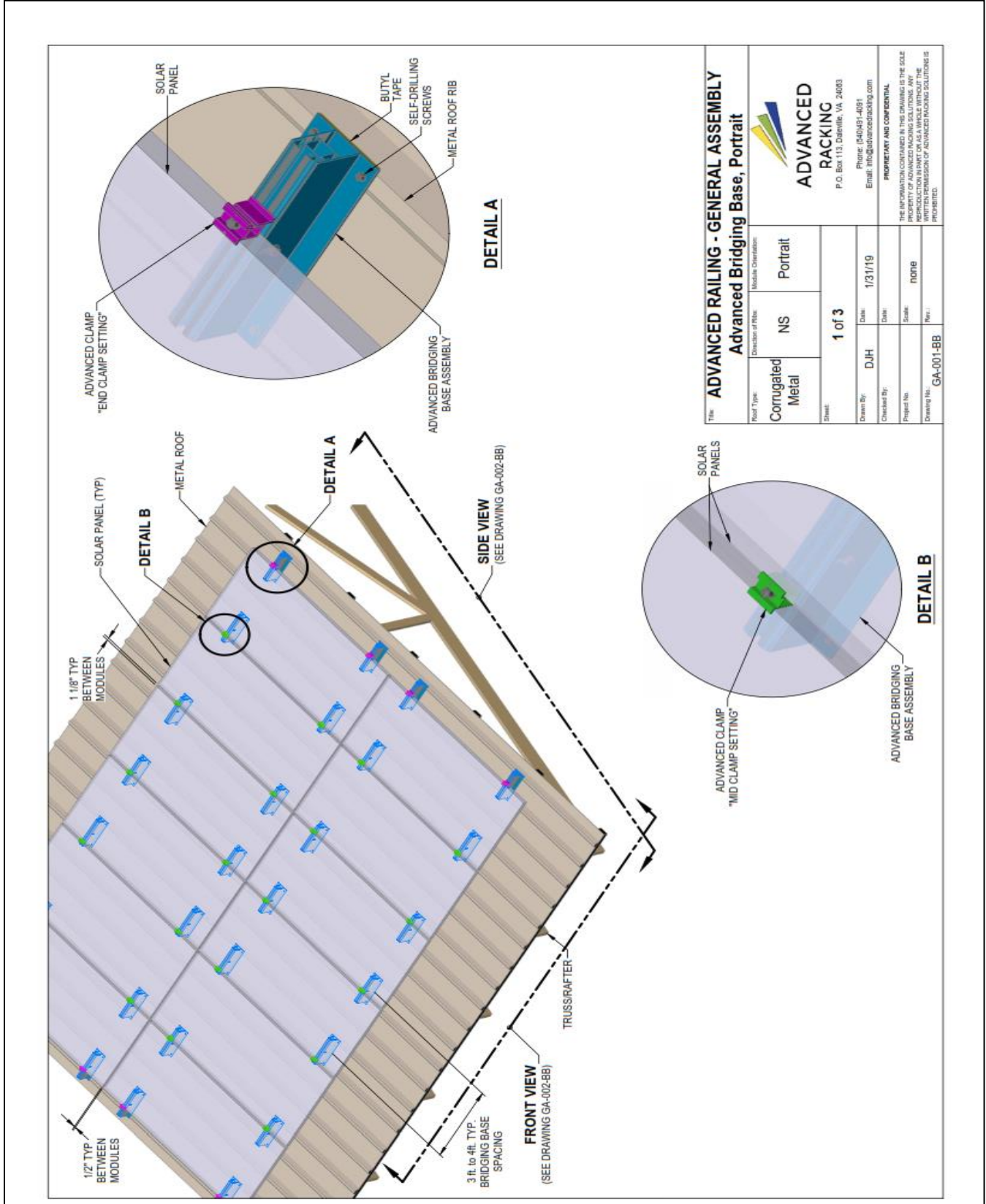
**NOTE:** Module clamps have piercing pins achieving an electrical bonding between the module and the advanced rail.

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

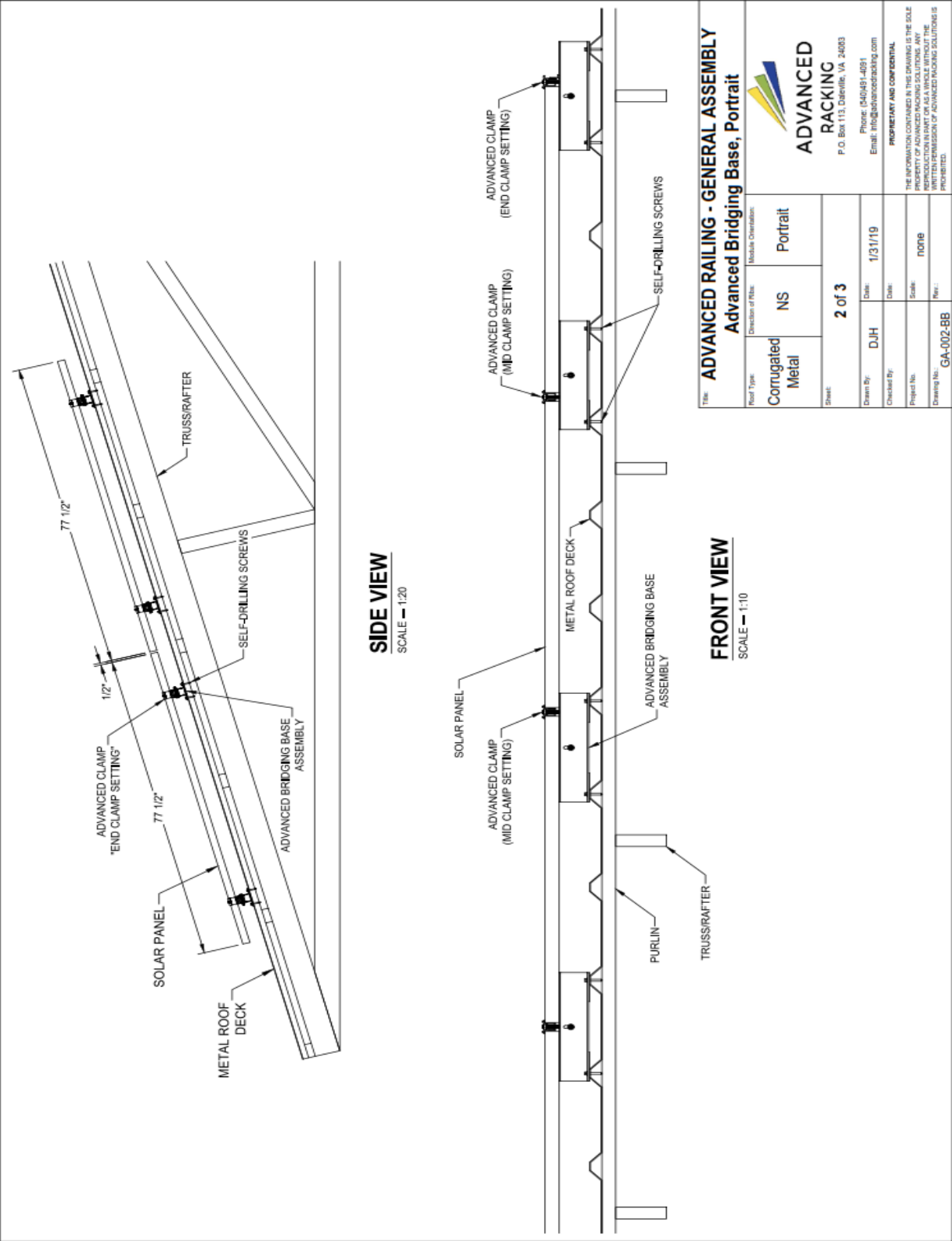
**NOTE:** AFFIX UL2703 LABEL TO THE RACKING IN A VISIBLE LOCATION NEAR THE GROUND LUG AT FINAL BONDING LOCATION.



## 5. General Arrangement Drawings







Title: <b>ADVANCED RAILING - GENERAL ASSEMBLY</b>		Revision: <b>Advanced Bridging Base, Portrait</b>	
Floor Type: <b>Corrugated Metal</b>	Direction of Rise: <b>NS</b>	Module Orientation: <b>Portrait</b>	
Sheet: <b>2 of 3</b>	Drawn By: <b>DJH</b>	Date: <b>1/31/19</b>	
	Checked By:	Date:	
	Project No.:	Scale: <b>NOTED</b>	
Drawing No.:	GA-002-BB	Rev.:	

**ADVANCED RACKING**  
P.O. Box 113, Danville, VA, 24003  
Phone: (840)981-4051  
Email: info@advancedracking.com

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