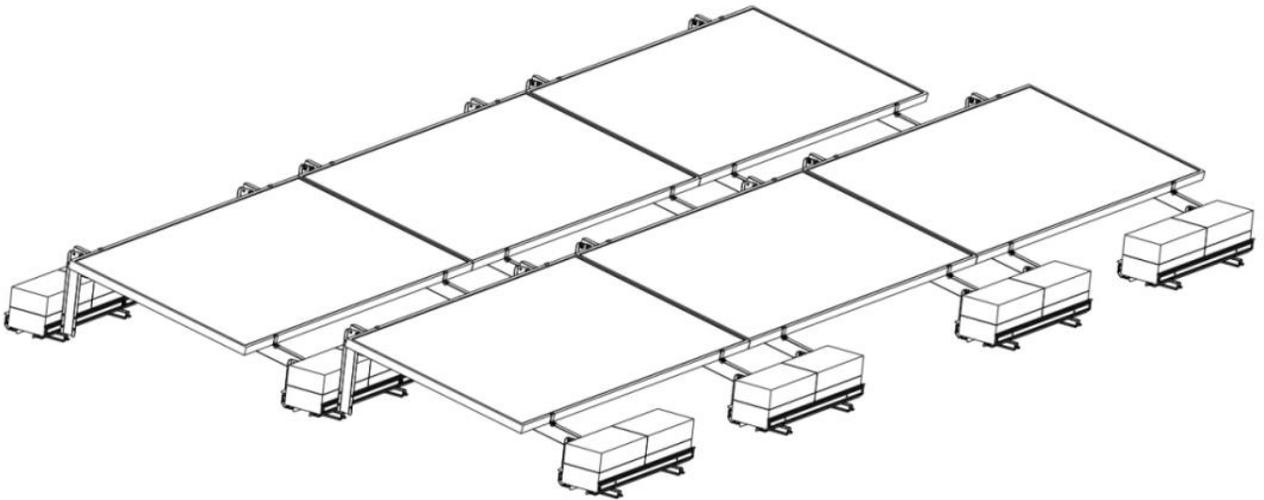




Applied Energy Technologies

Rayport™ • B ECO

Installation Guide



P/N: 81466 Rev: A

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2. Installer Notes

Thank you for purchasing AET's Rayport™ B Eco flat roof top ballasted racking system manufactured in Maumee, Ohio. The system has been configured to accommodate both framed (30-51mm thick) or unframed modules with either one or two modules per support rail. Designed with the installer in mind, the Rayport™ B Eco system allows for a top down installation, common fasteners, and integrated grounding.

The Rayport™ B Eco racking system has been evaluated for module-to-system bonding to the requirements of UL Subject 2703 Issue 2. The system has been assessed to a maximum Over-Current Device (OCD) Protection level of 25 Amps. The recommended torques shown throughout these instructions must be followed for proper assembly and bonding of the system.

The Rayport™ B Eco racking system has been evaluated for system fire resistance to the requirements of UL Subject 2703 Issue 2. The system achieved a Fire Class A rating when used with UL 1703 listed PV modules with a fire performance rating type 1 and type 2.

Warning: Roofs that are intended to support the Rayport™ racking system should be classified with an A, B or C Fire Rating, depending on the regional location and codes.

Warning: Bare copper must not contact aluminum or galvanized steel once the installation has been completed.

Note: This installation guide must be read in its entirety prior to installation.

Note: Documented inspection, maintenance, cleaning and adjustments are required periodically (at least once per year) to maintain product warranty. Re-inspect the installation for loose components, loose fasteners and corrosion. Visible red rust corrosion on any galvanized steel components must be repaired or replaced in accordance to ASTM A780/A780M or UL2703 section 26.5.

2. Installer Notes - Continued

Note: This racking system may be used to ground and/or mount a PV module complying with UL1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.

3. Array Layout

W_A = Array Width (east/west)
 W_M = Module Width (east/west dimension)
 C = Number of Columns
 G = Gap Between Modules (normally $\frac{1}{4}$ ")

L_A = Array Length (north/south)
 D_R = Repeating Rack Dimension
 R = Number of Rows
 T = Tray Dimension

$$W_A = (W_M \times C) + (G \times (C - 1))$$

$$L_A = (D_R \times R) + T$$

Assuming a 58.3" wide module for the example below:

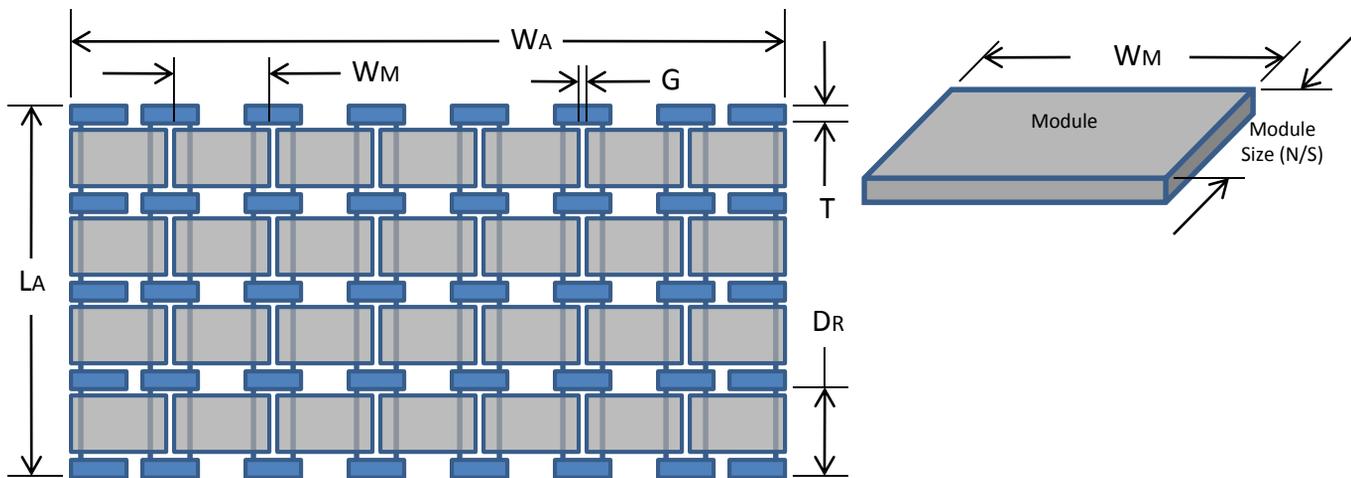
$$W_A = (58.3 \times 7) + (0.25 \times (7 - 1))$$

$$W_A = 409.6" \text{ or } 34.1 \text{ feet}$$

Assuming a standard 10° rail and narrow tray for the example below:

$$L_A = (58.62 \times 4) + 10.6$$

$$L_A = 245.08" \text{ or } 20.42 \text{ feet}$$



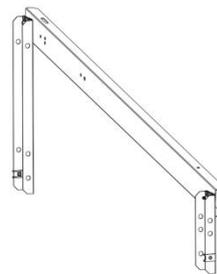
Note: Typical module orientation is landscape

The Repeating Dimension varies depending on the Support Rail and Ballast Tray. The Repeating Dimension should be verified against the layout provided by AET.

4. Parts List

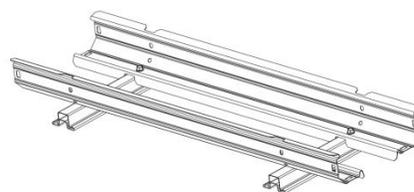
Support Rail Assembly

-Multiple design configurations are available based on customer design constraints.



Ballast Tray Assembly

-Multiple design configurations are available based on customer design constraints.



Module Clamp

-Clamps available for modules ranging from 30-51mm thick.



Bolt

M6 x 1 Hex Flange HD w/ Lock Patch



Nut

M6 x 1 Rectangular



5. Tool List

Layout/BOM from AET

Ballast / Support Rail Spacer Bar (Available from AET)

10mm Socket w/ Ratchet or Drill/Driver

100 ft. Tape Measure

Mason String or Chalk Line

Industrial Adhesive (as needed)

Torque Wrench

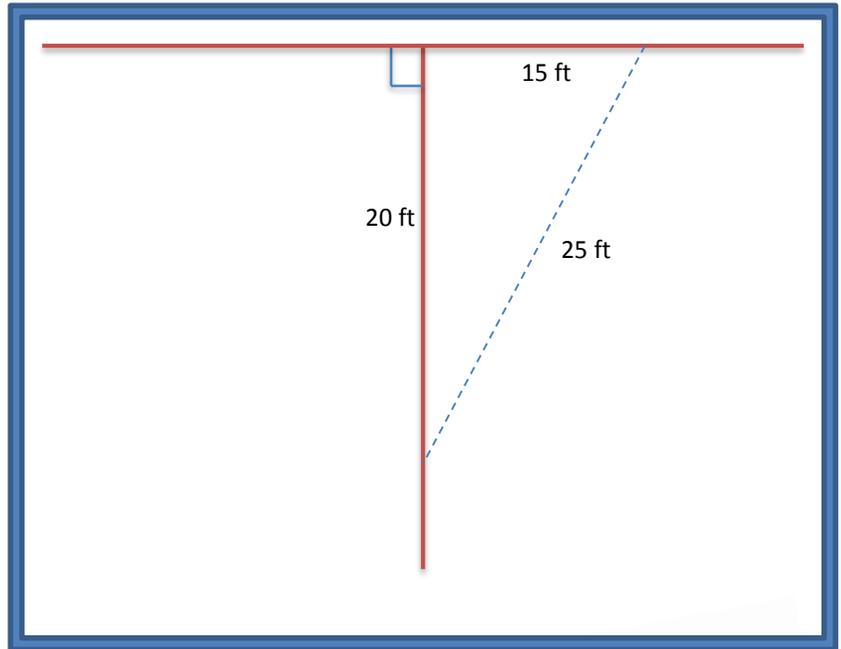
Support Rail Assembly Fixture (Available from AET)

6. Assembly

1. Establish perpendicular lines for array alignment

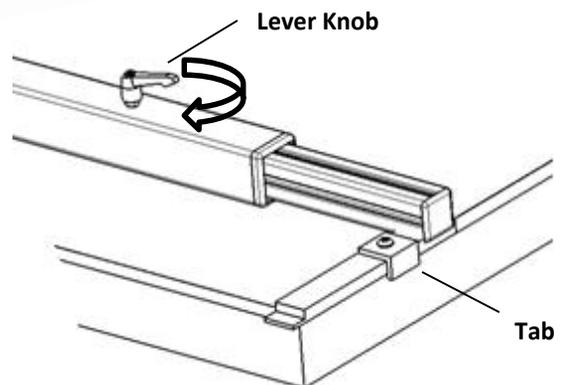
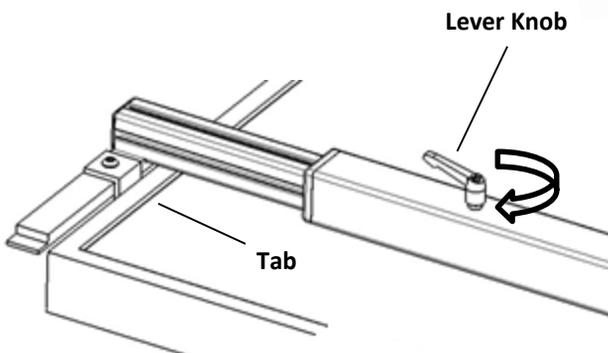
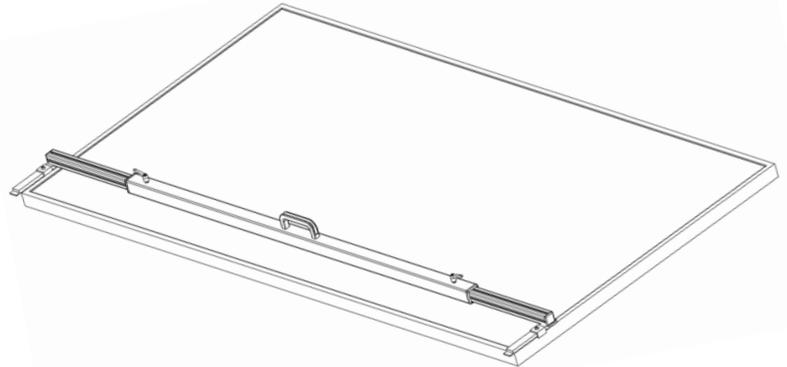
Using a string or chalk line, create an east/west line. Typically, this would be the front or rear of the PV array. Next, establish a north/south line perpendicular to the first line near the center of the array using a multiple of a 3-4-5 triangle. Larger triangles of 15-20-25 or 30-40-50 should be used for larger arrays.

It's important to perform the layout independent of existing building structure. Not all parapets or roof edges are square or parallel. This may cause alignment issues with the PV array.



2. Setting the Spacer Bar

Loosen both Lever Knobs on the Spacer Bar to allow the ends to slide freely. Place the Spacer Bar on the east/west dimension of the module. The two small tabs on the ends of the Spacer Bar should nest tightly against the module. Lock the ends of the Spacer Bar by tightening the Lever Knobs. **Note: The Spacer Bar adds an additional 1/4" to the overall length of each module. This spacing is required between modules for thermal growth.**



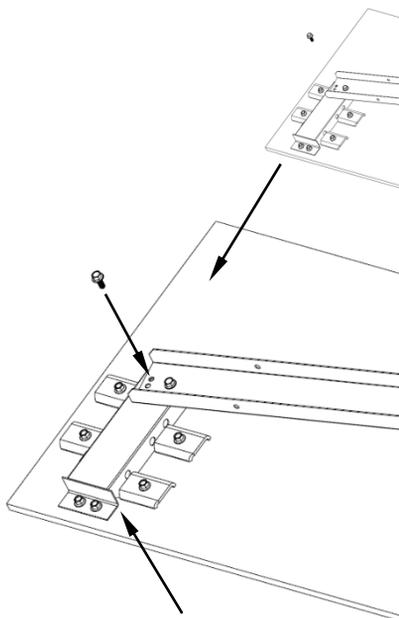
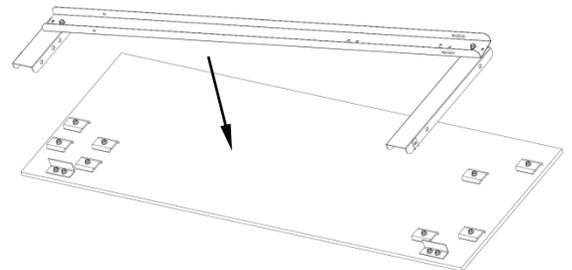
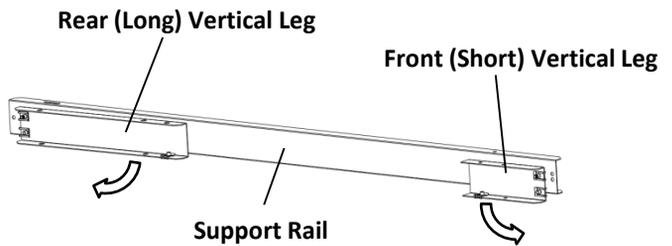
6. Assembly - Continued

3. Complete Support Rail Assembly (Skip this step if Support Rails are Pre-Assembled)

The support rails are shipped “folded” to the job site. Rotate the vertical legs and position on the support rail assembly fixture as shown.

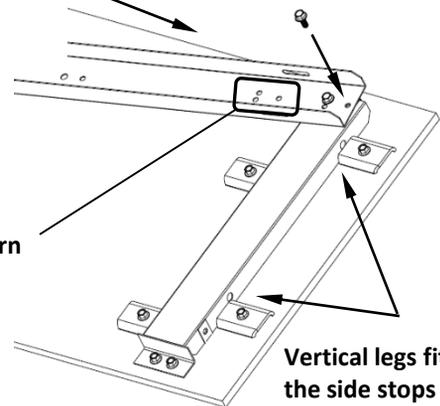
Note: The support rail assembly fixture must be used to set the correct sun angle and row spacing. It will also align the u-nuts in the vertical legs with the correct thru holes in the support rail. A standard support rail assembly is shown in the illustrations. The extra hole pattern is used for a reduced row spacing (RRS) support rail assembly and requires a RRS assembly fixture.

Complete the assembly using two (2) M6x1 bolts. Torque all fasteners to 40-50 in-lb.



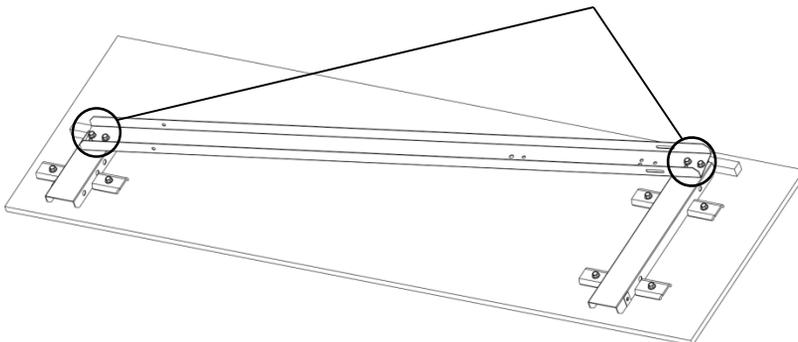
Bottom of vertical legs must rest against the stop

RRS hole pattern



Vertical legs fit between the side stops and must rest on the table top.

Torque all fasteners to 40-50 in-lb

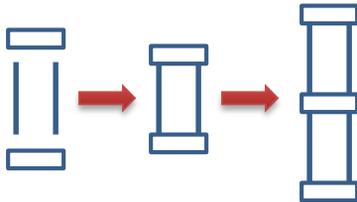


6. Assembly - Continued

4. Assemble racking units

Assemble two (2) support rails to two (2) ballast trays using four (4) M6x1 bolts. Attach two (2) additional support rails and a ballast tray as shown.

Note: Torque all fasteners to 40-50 in-lb. Reference Appendix A for further information regarding the assembly of the support rails to the ballast trays.



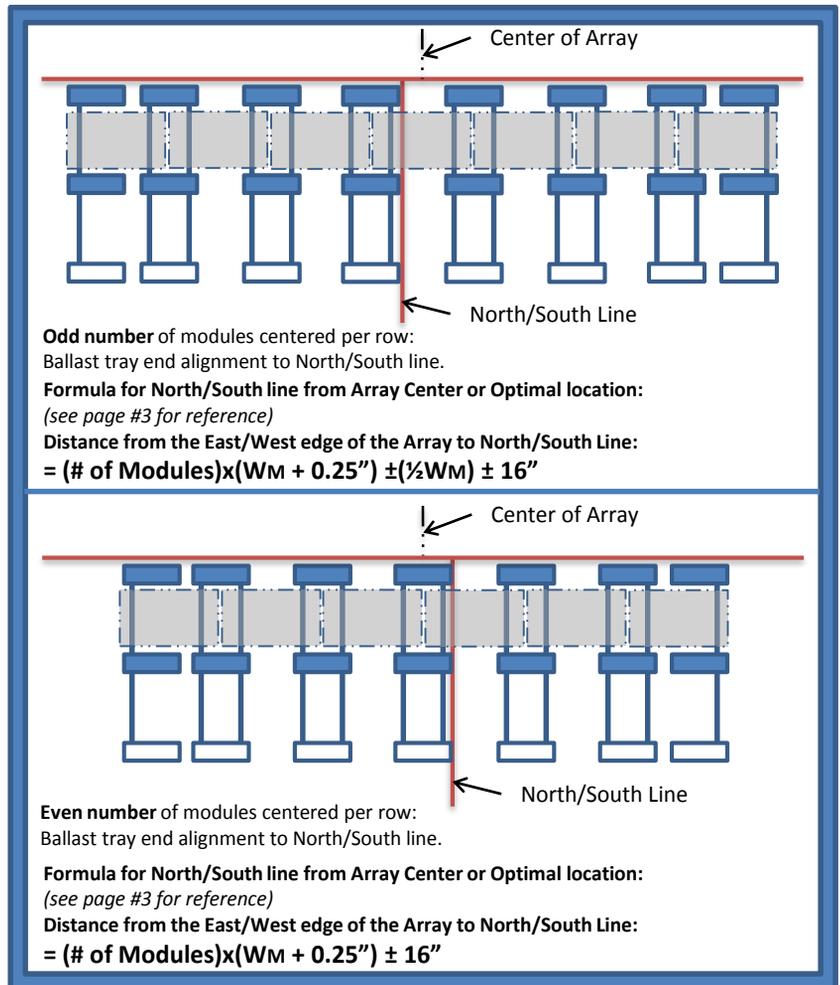
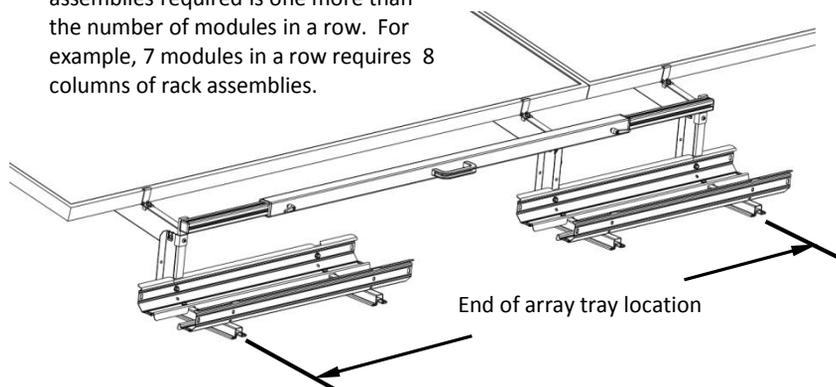
5. Positioning the first racking units

Starting from the optimal North/South line location, position the first rack assembly so the ballast tray ends align to the North/South construction line and the ballast tray front align with the East/West line that was established in step 1. Once the first assembly is in position add ballast blocks to the first two trays. Using the Spacer Bar that was set to length in step 2, position the next assembly by placing the Spacer Bar into the corresponding notches in the trays as shown.

Note: The spacing between assemblies will be closer together on the extreme east and west ends of the array as shown. Reference Appendix D before continuing if installing Fire Shields.

6. Layout first two rows of racking

Repeat steps 3 and 4 for the number of racking units required for an entire row of modules. The number of rack assemblies required is one more than the number of modules in a row. For example, 7 modules in a row requires 8 columns of rack assemblies.

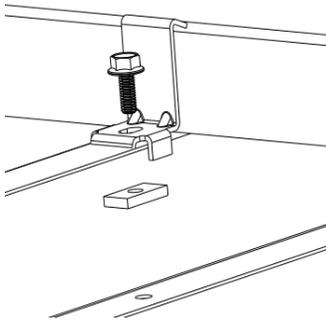


6. Assembly - Continued

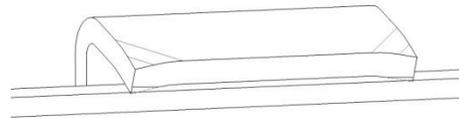
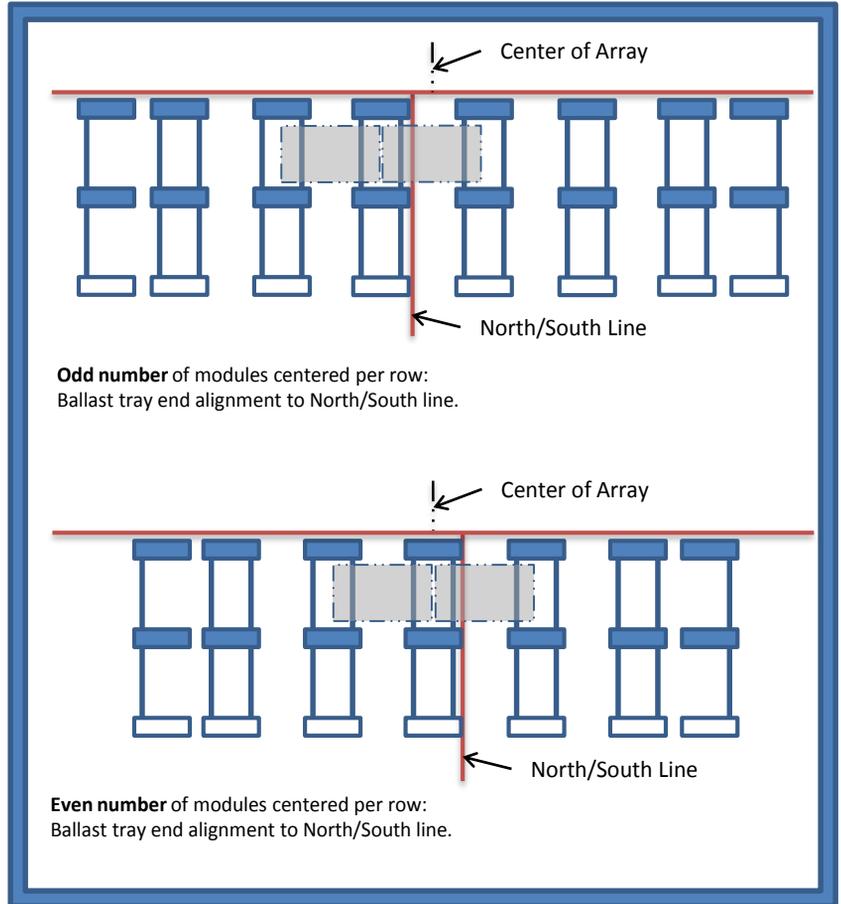
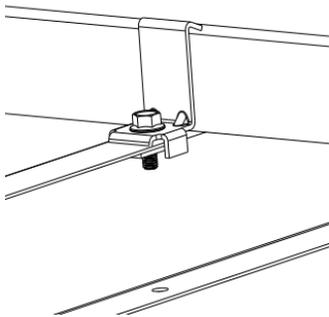
7. Begin to install first row of modules

Load the ballast trays with the specified number of ballast blocks per the AET supplied layout. Ballast should be added to the trays in front and behind the module prior to installing the module. Once the four (4) corners around the module have been secured with ballast, the module can be installed using the provided M6x1 bolts, rectangular nuts and module clamps. Torque fasteners to 40-50 in-lb.

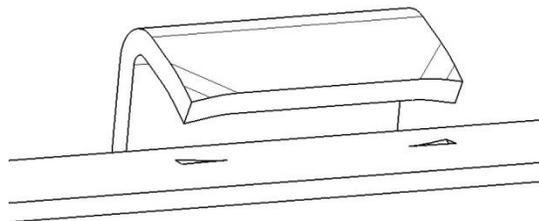
Note: Grounding of the module has been integrated into the module clamp. The module/module clamp position (penetration points) must change if the module clamp is loosened after it has been tightened to the recommended torque.



One (1) module clamp installed with one (1) M6x1 bolt and one (1) rectangular nut.



Installed position with integrated pierce points penetrating the anodize frame coating.

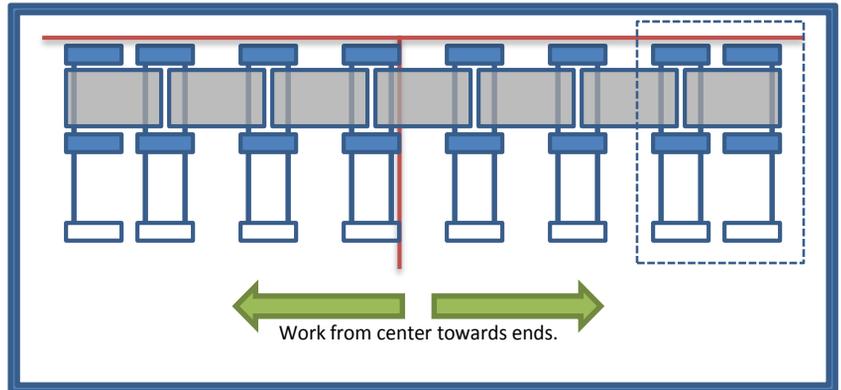


Resulting penetrating points through the anodize frame coating.

6. Assembly - Continued

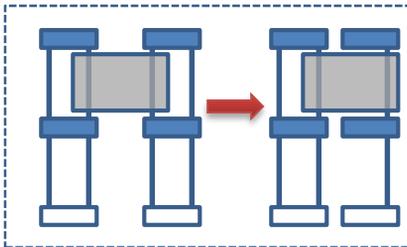
8. Finish installing modules in 1st row

Working from the center out towards the sides, continue spacing the rack assemblies with the spacer bar and installing ballast in the trays. Follow with the installation of the modules prior to moving on to the next row. There should be approximately $\frac{1}{4}$ " gap between each module.



9. End module racking location

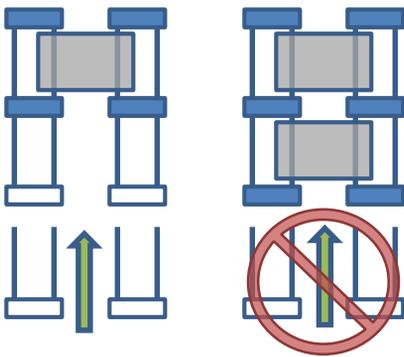
The end columns located at the extreme east and west of the system array may be located entirely under the last modules as shown below.



10. Build additional rows of racking

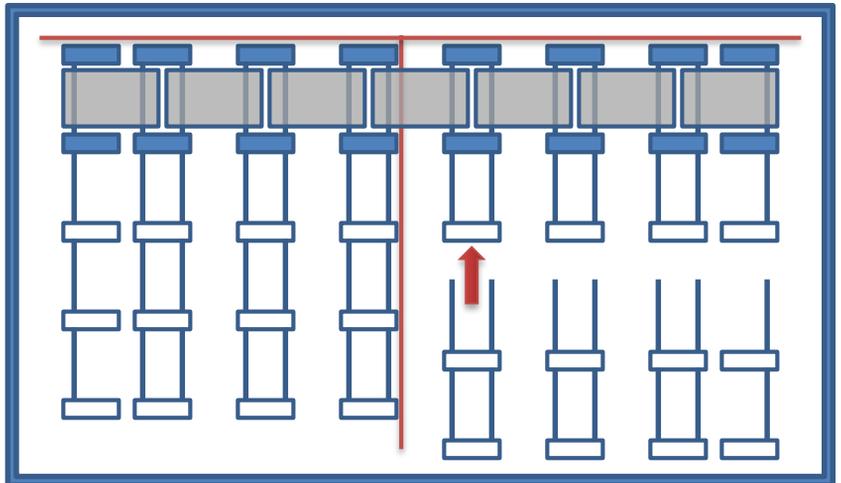
Additional rows of racking can now be assembled.

Note: Connect the support rail and ballast tray assemblies prior to installing ballast bricks.



CORRECT

NOT
CORRECT



6. Assembly - Continued

11. Install second row of modules

Now that the third and fourth rows of racking are assembled, position and ballast each tray as described in steps 4 and 5. The second row of PV modules can now be installed starting from the center of the array.

12. Working around roof obstructions

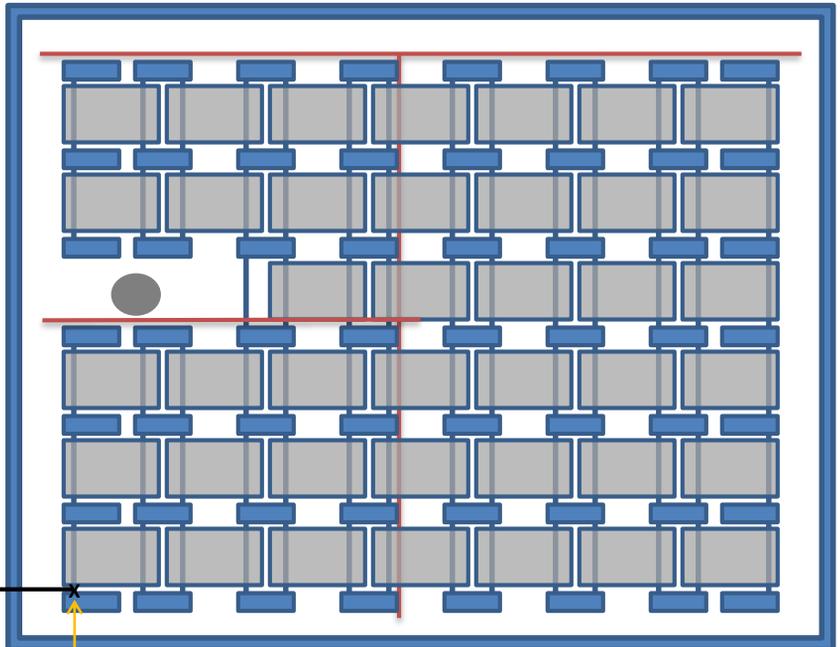
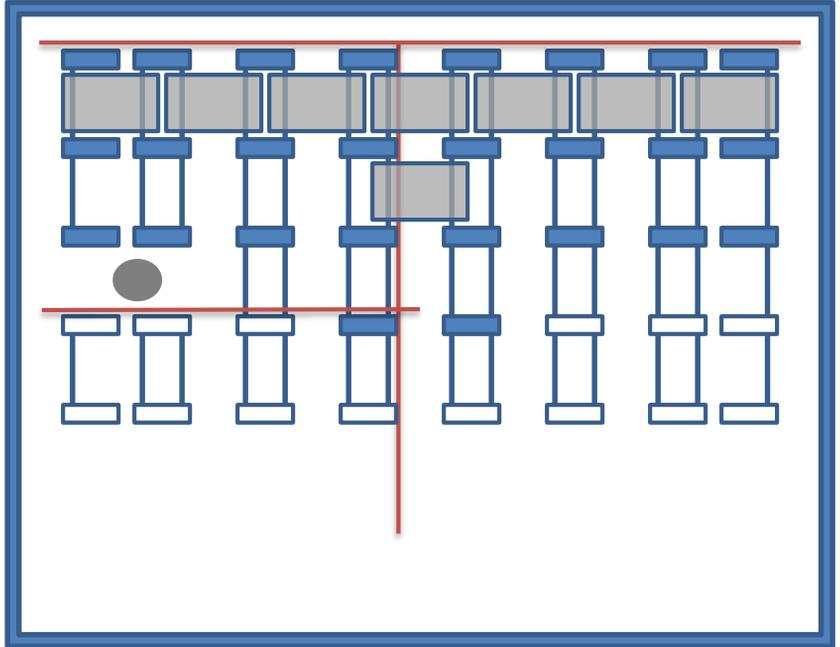
Multiple string or chalk lines should be created to maintain the racking alignment.

13. Complete the module installation

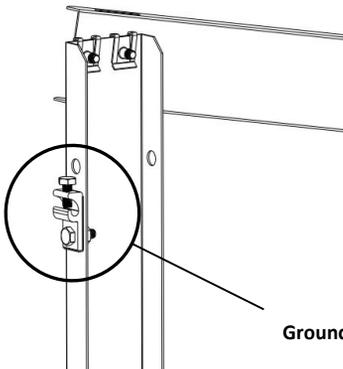
The modules can be wired and the rack grounded once the last row of modules and ballast have been installed.

At least one rail per array needs to be grounded. Reference the National Electrical Code (NEC) to determine the grounding conductor size relative to the short circuit current rating of the array. Torque the grounding lug per the lug manufacturer's torque requirements.

Note: Reference Appendix G for additional information regarding the installation of the grounding lug.



Grounding Lug - WEEB Lug-6.7 (one per array).

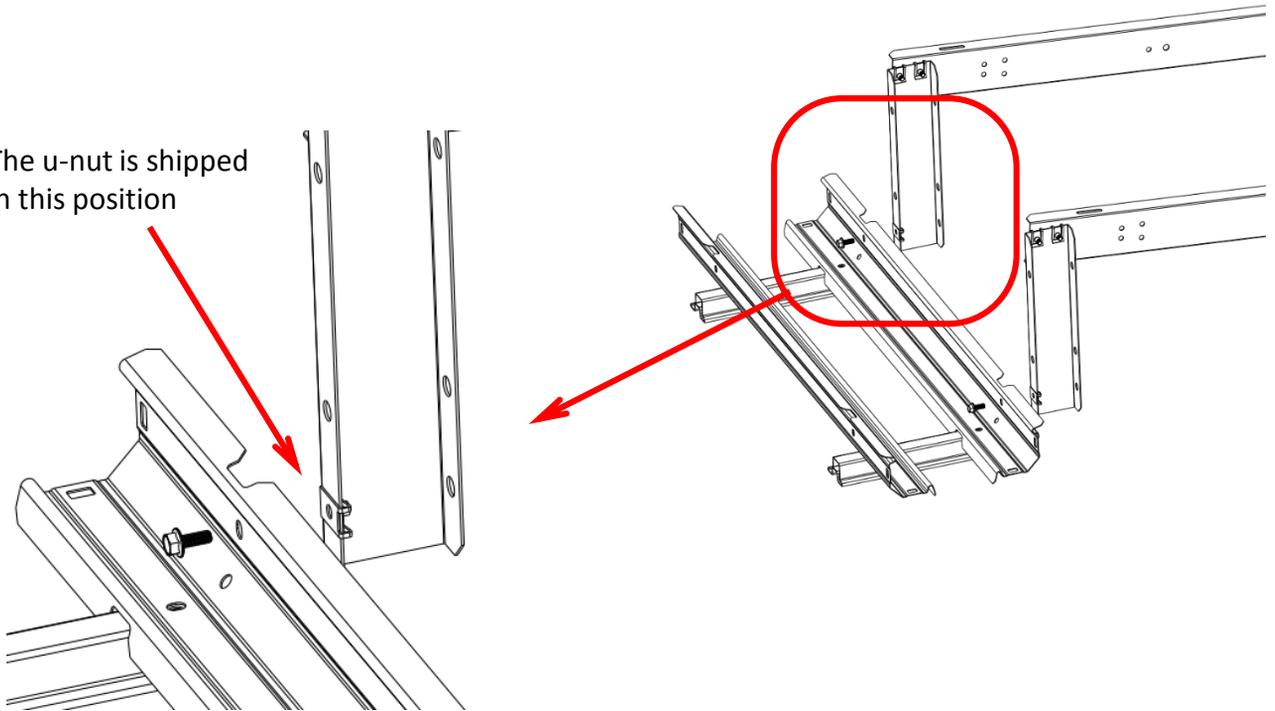


Grounding Lug - WEEB-Lug 6.7

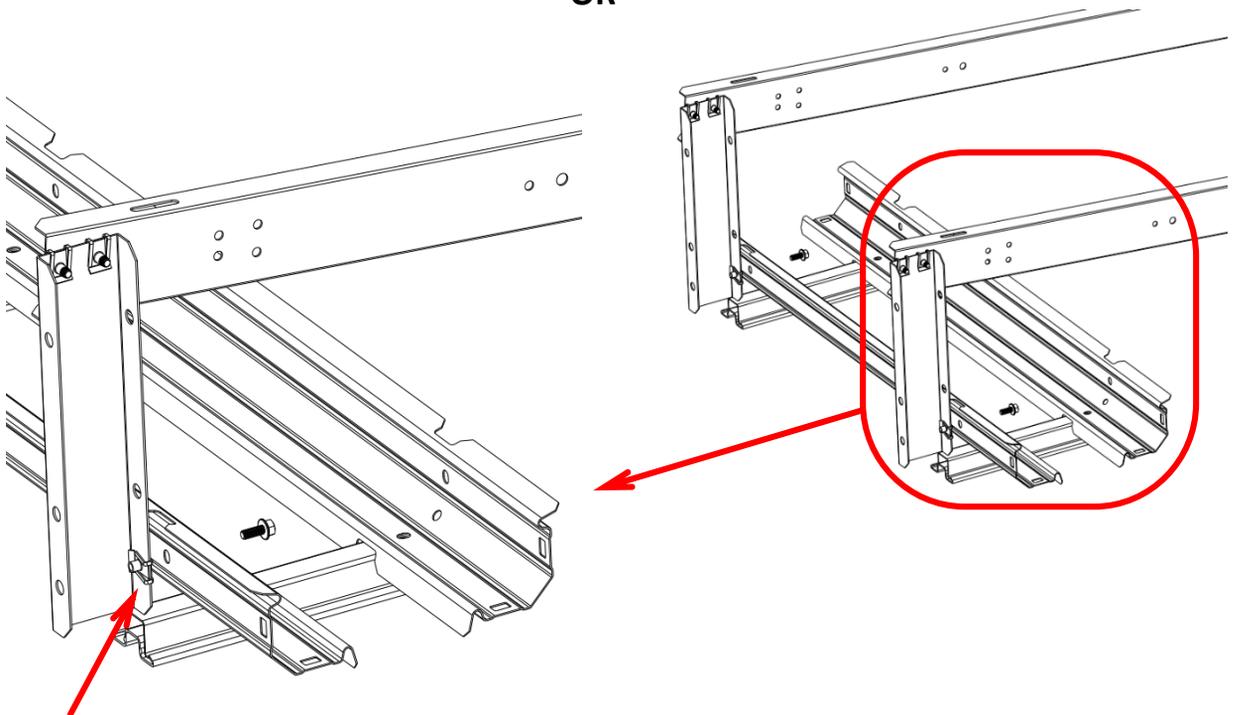
7. Appendix A: Support Rail / Ballast Tray Assembly

North Row Support Rail / Ballast Tray Assembly

The u-nut is shipped in this position



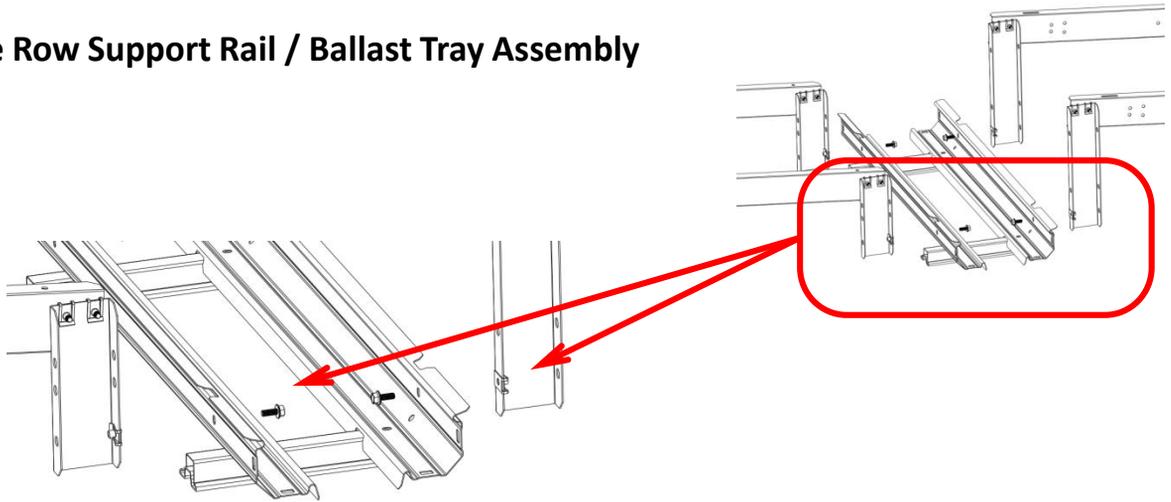
OR



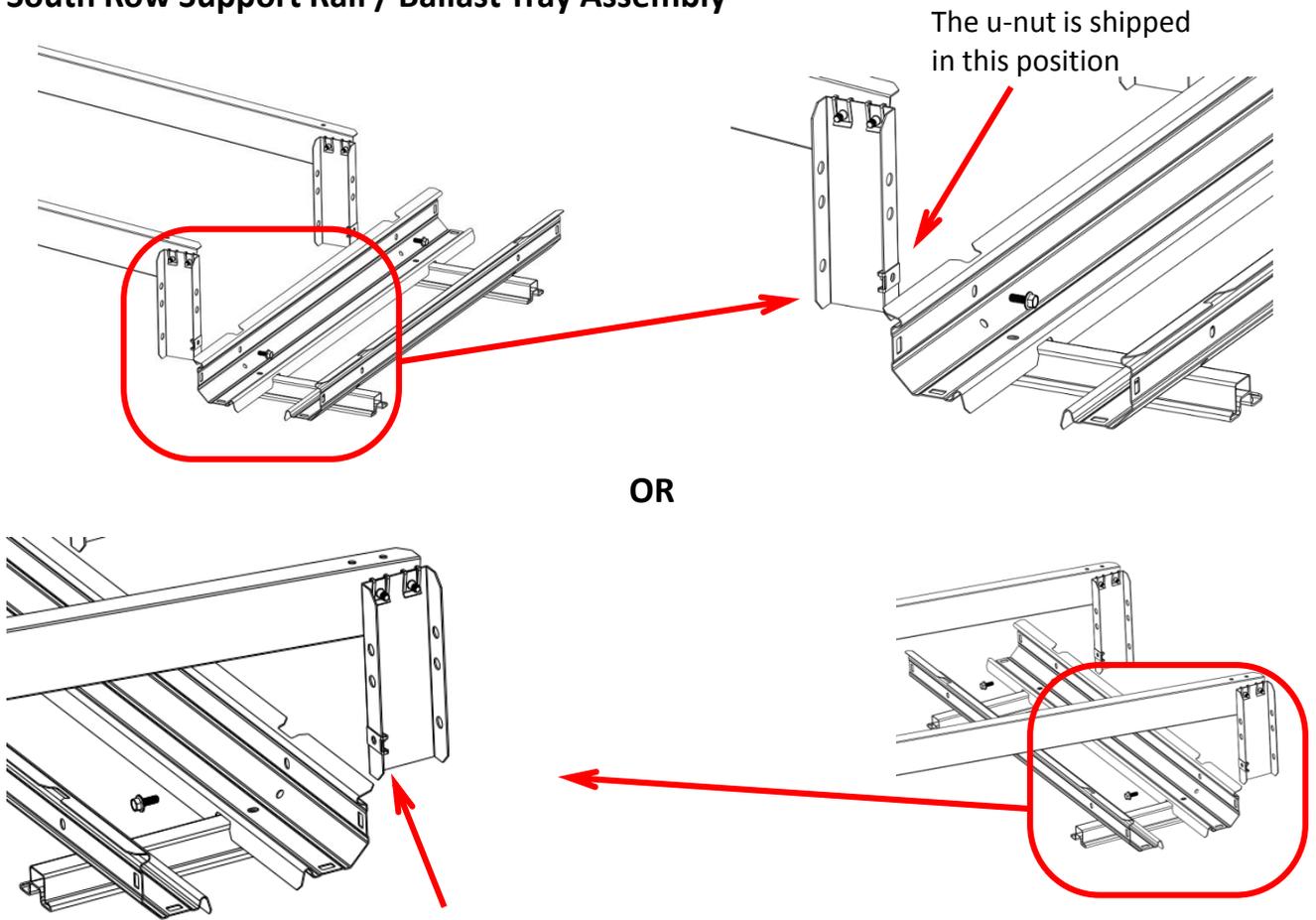
The u-nut must be moved to this position when tucking the ballast tray under the support rail.

7. Appendix A: Support Rail / Ballast Tray Assembly - Continued

Middle Row Support Rail / Ballast Tray Assembly



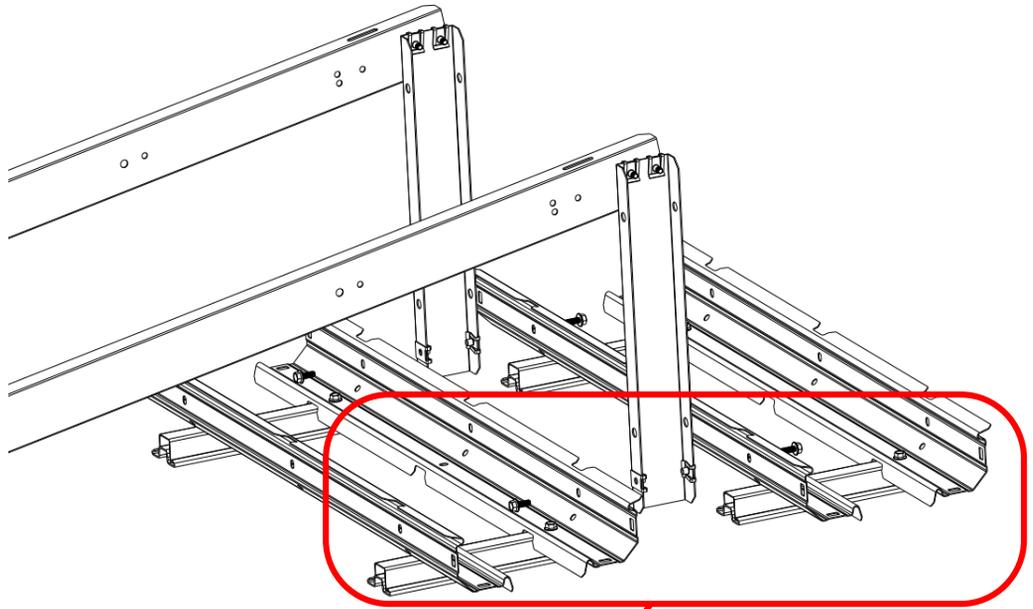
South Row Support Rail / Ballast Tray Assembly



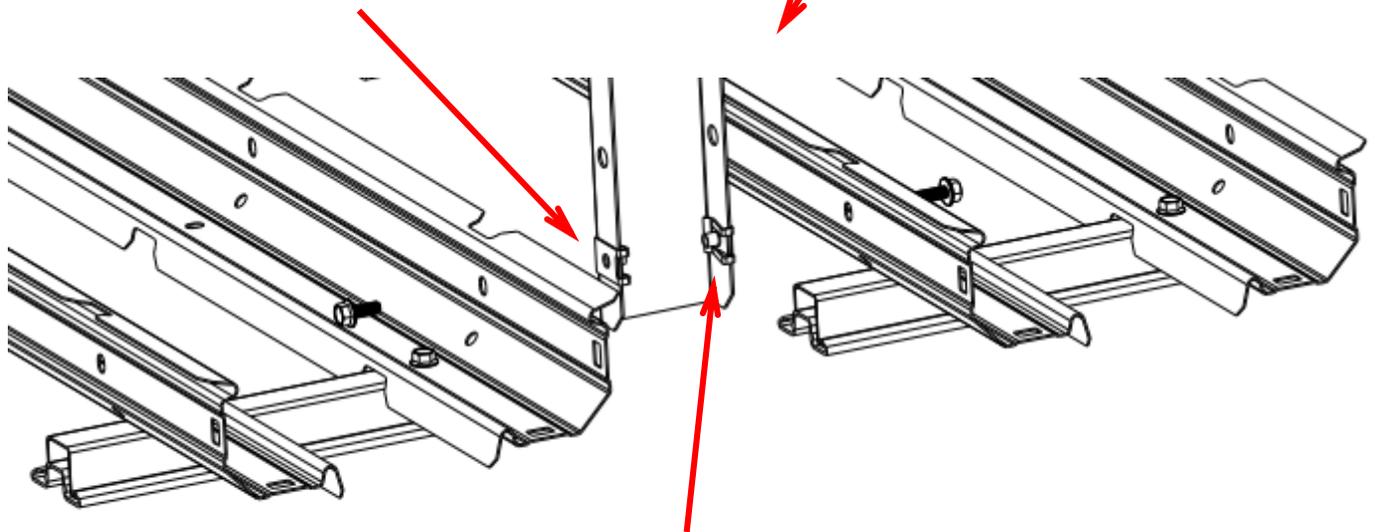
Note: Only two (2) bricks can be placed in the ballast tray when using this setup.

7. Appendix A: Support Rail / Ballast Tray Assembly

North Row Support Rail / Dual Ballast Tray Assembly (When Specified on AET Layout)



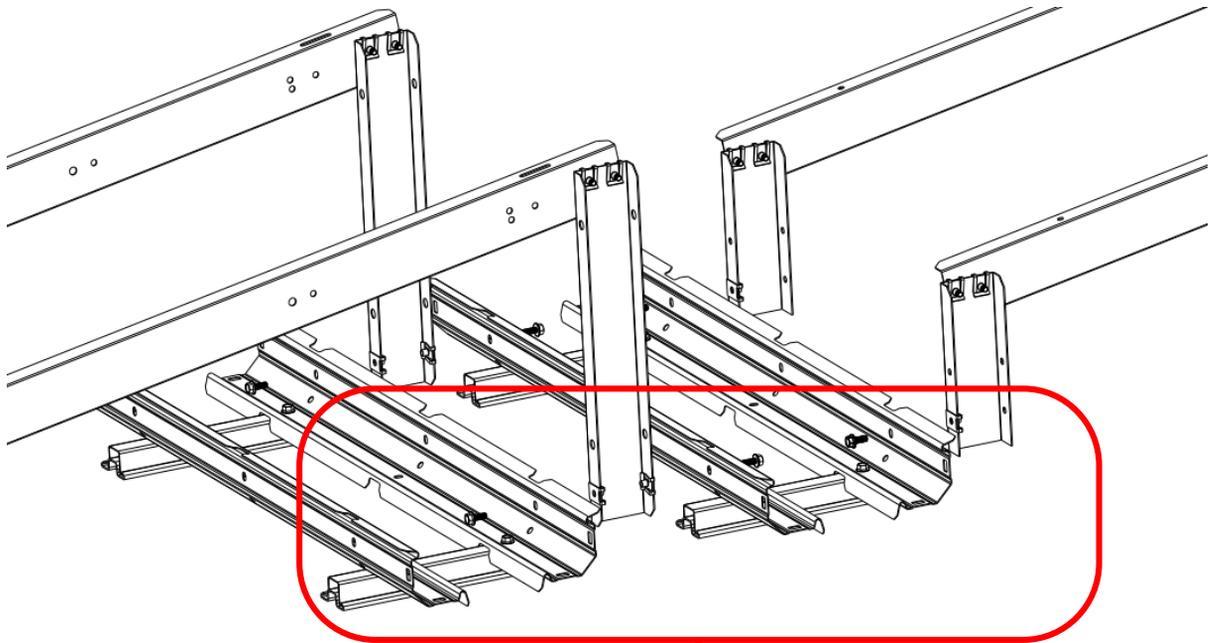
The additional u-nuts supplied with the shipment must be installed at this location on the rear vertical legs of the support rail assemblies



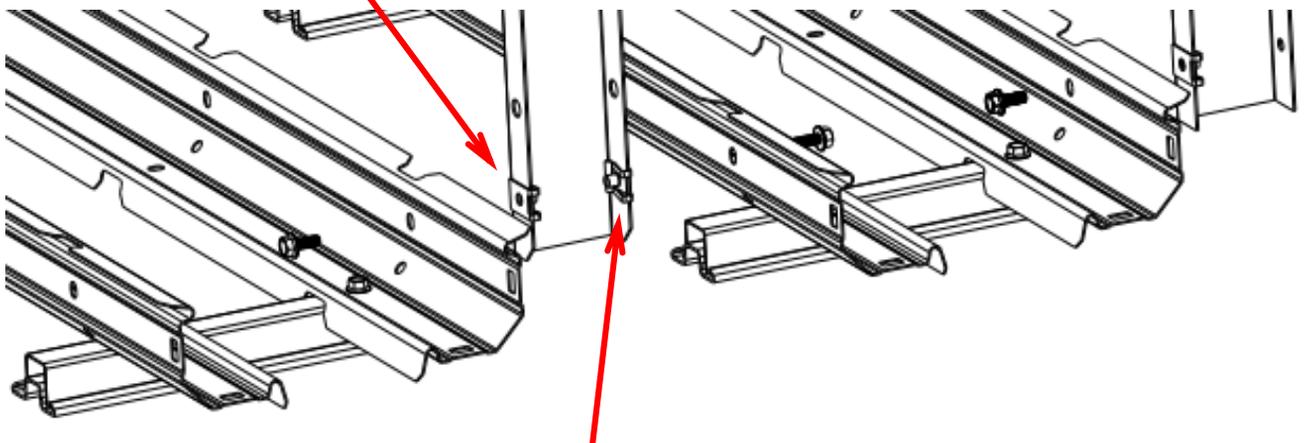
A u-nut is installed at this location prior to shipment.

7. Appendix A: Support Rail / Ballast Tray Assembly

Middle Row Support Rail / Dual Ballast Tray Assembly (When Specified on AET Layout)



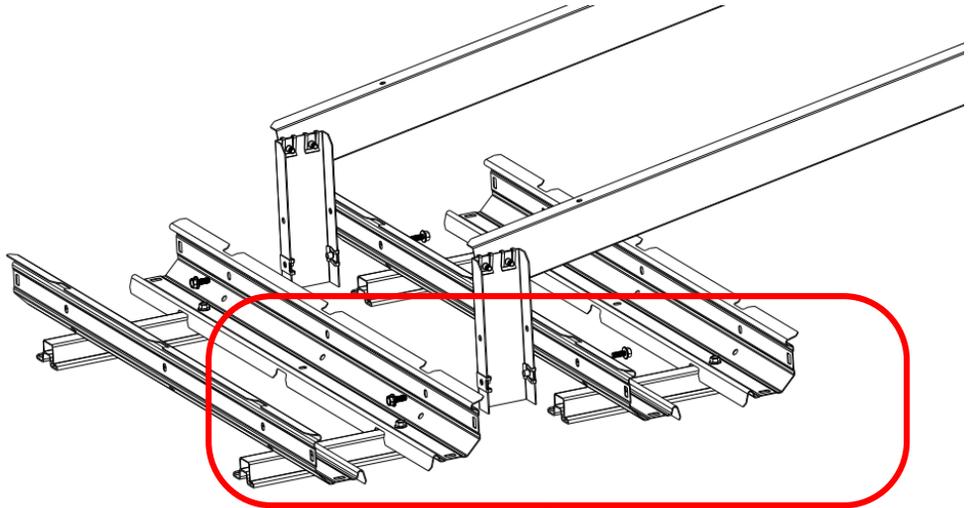
The additional u-nuts supplied with the shipment must be installed at this location on the rear vertical legs of the support rail assemblies



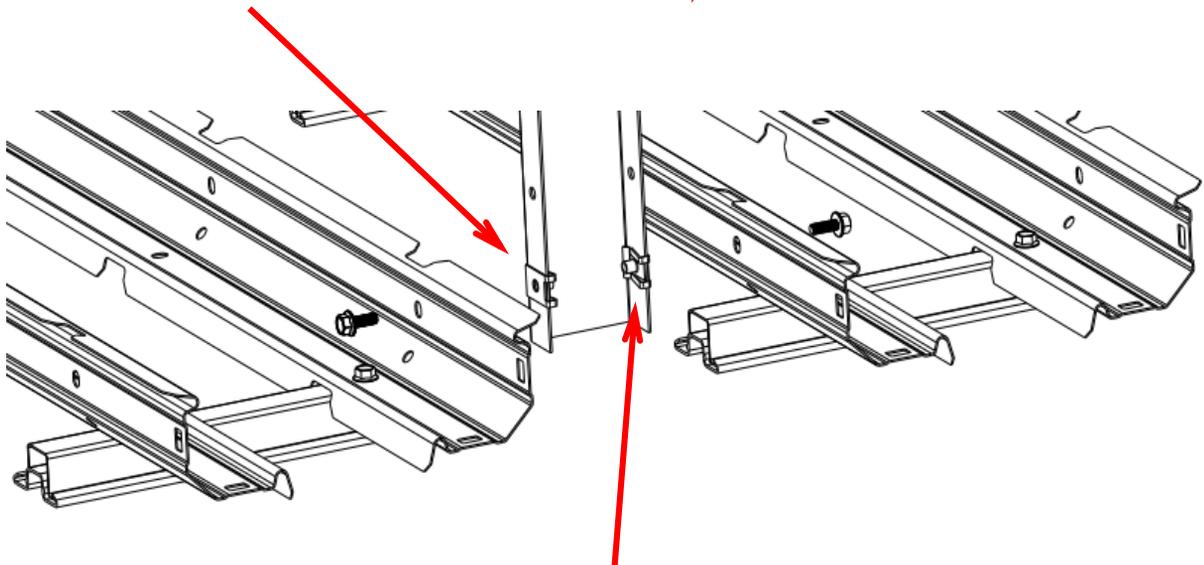
A u-nut is installed at this location prior to shipment.

7. Appendix A: Support Rail / Ballast Tray Assembly

South Row Support Rail / Dual Ballast Tray Assembly (When Specified on AET Layout)

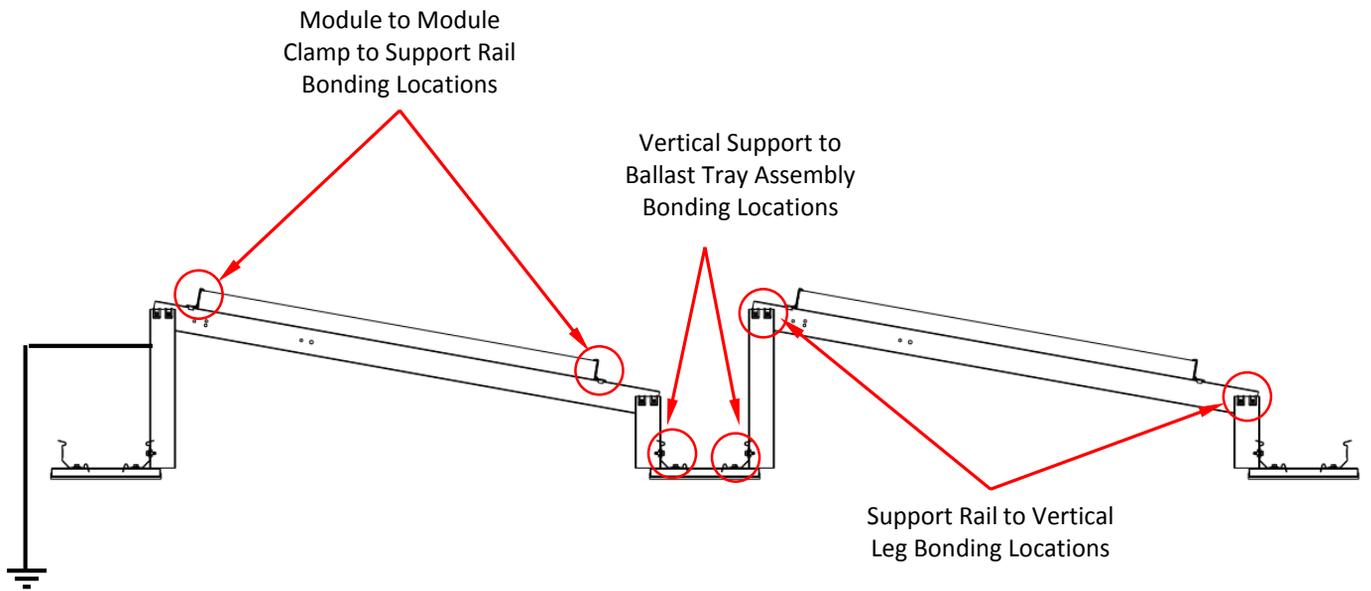


A u-nut is installed at this location prior to shipment.



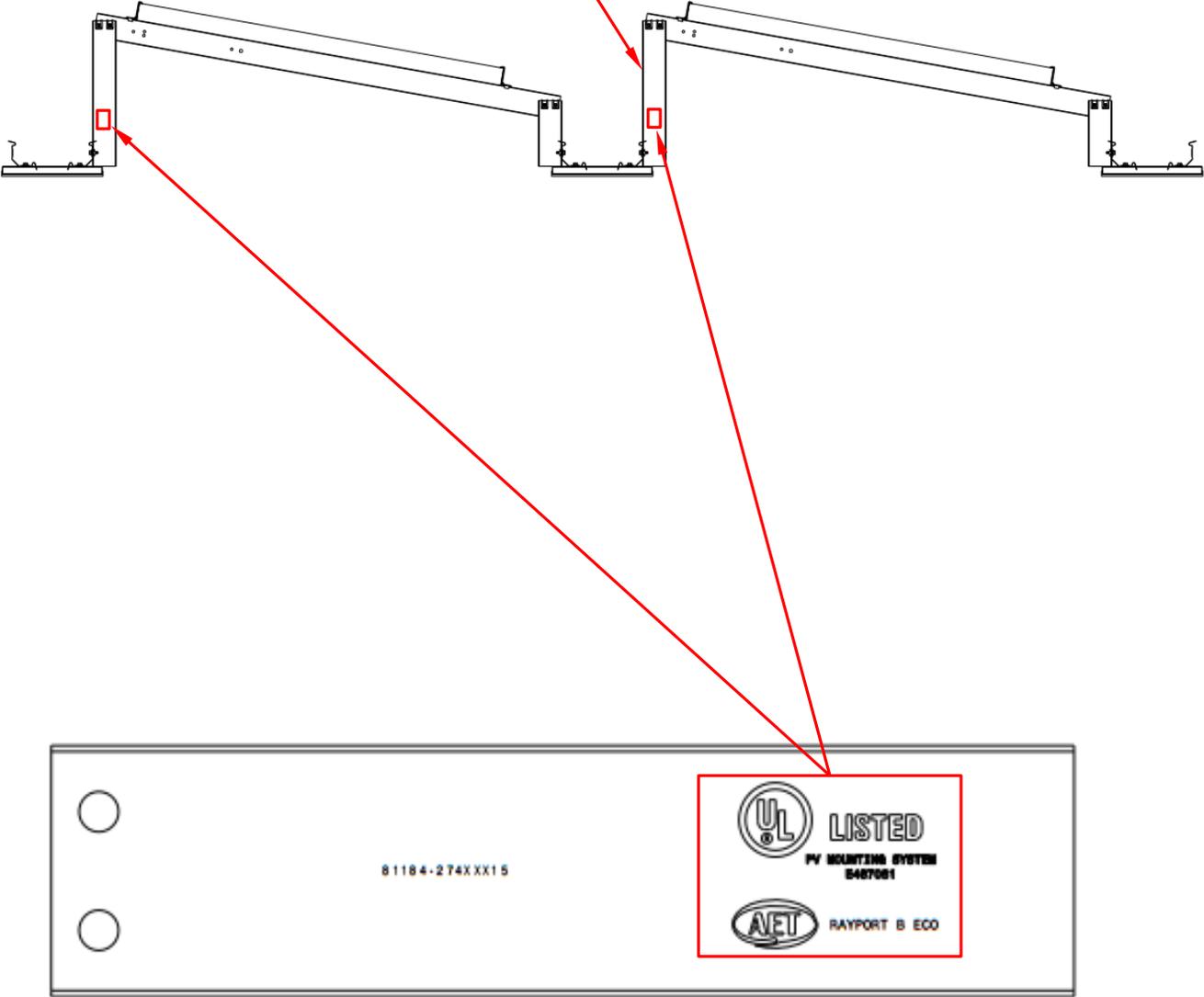
The additional u-nuts supplied with the shipment must be installed at this location on the front vertical legs of the support rail assemblies

8. Appendix B: Grounding and Bonding Diagram



9. Appendix C: Racking Identification

The Applied Energy Technologies Logo, System Name, and UL Logo is stamped into the rear Vertical Support of every Support Rail Assembly



10. Appendix D: Micro Inverter/Power Optimizer Mounting Kit with Integrated Grounding

14. Installer Notes

Thank you for purchasing AET's Rayport™ B Eco Micro Inverter/Power Optimizer Mounting Kit with integrated grounding that is manufactured in Maumee, Ohio. This kit has been designed to ground a Micro Inverter or Power Optimizer directly to the Rayport™ B Eco racking system.

15. Parts List

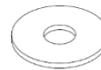
Bolt

- $\frac{5}{16}$ " - 18 Hex HD with Lock Patch



Washer

- $\frac{5}{16}$ " inner diameter
- .06" thick



WEEB

- 11.5 WEEB Clip



Nut

- $\frac{5}{16}$ " - 18 Flange Hex



Washer

- $\frac{5}{16}$ " inner diameter
- .17" thick



16. Tool List

$\frac{1}{2}$ " Deep Well Socket w/ Ratchet or Impact Driver

$\frac{1}{2}$ " Socket w/ Ratchet

Torque Wrench

10. Appendix D: Micro Inverter/Power Optimizer Mounting Kit with Integrated Grounding - Continued

17. WEEB to Inverter/Optimizer Assembly

Attach the WEEB to the inverter/optimizer. The WEEB tabs fit into the inverter/optimizer slot. Reference figures 17a and 17b.

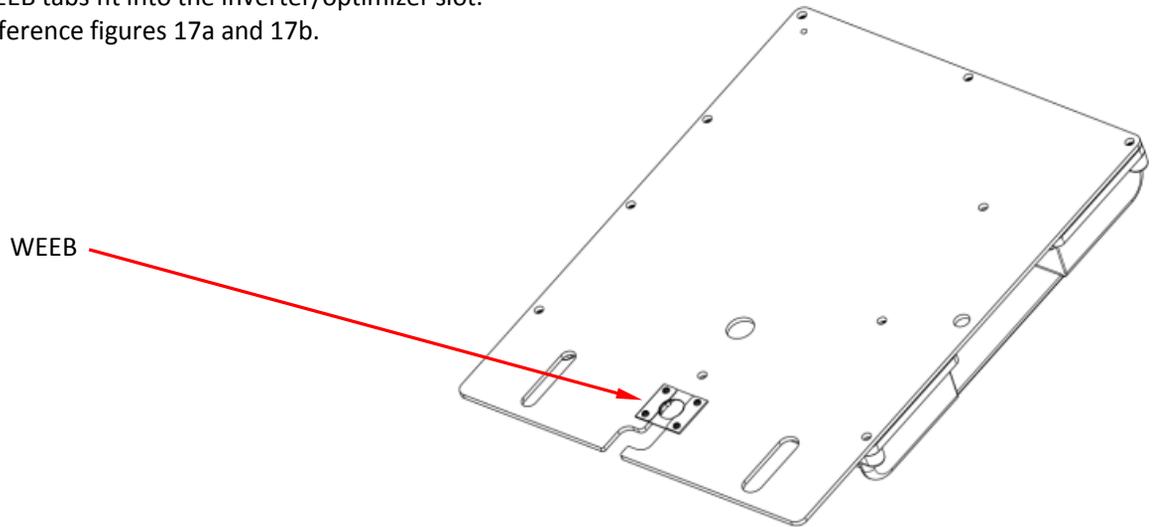


Figure 17a

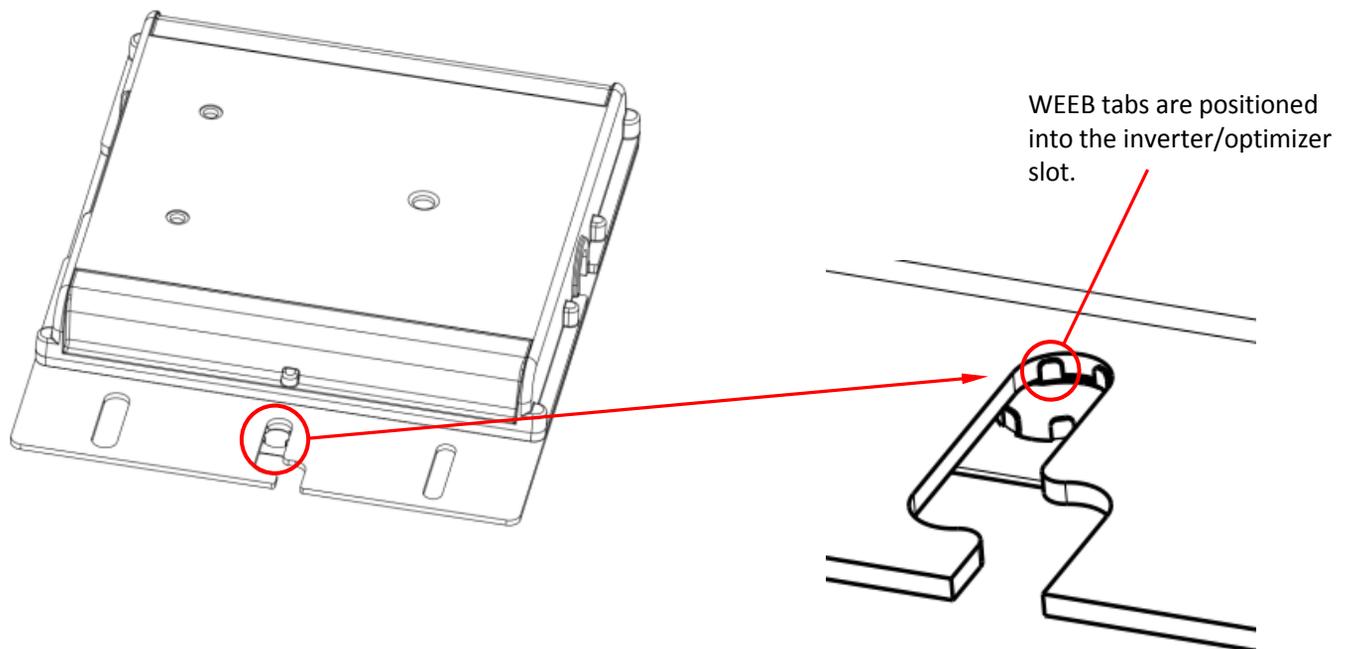


Figure 17b

10. Appendix D: Micro Inverter/Power Optimizer Mounting Kit with Integrated Grounding - Continued

18. Inverter/Optimizer to Support Rail Assembly

Attach the inverter/optimizer with WEEB to the support rail using a $\frac{5}{16}$ " bolt, nut, washer and the $\frac{7}{16}$ " washer. Torque the $\frac{5}{16}$ " bolt to 10 ft-lb (120 in-lb). Reference figures 18a, 18b, 18c and 18d.

Note: The $\frac{7}{16}$ " washer must be positioned around the WEEB tabs, not on top of them. Also, the WEEB must be sandwiched between the micro inverter and the support rail.

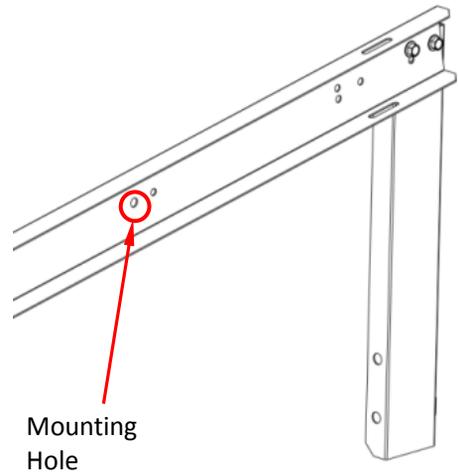


Figure 18a

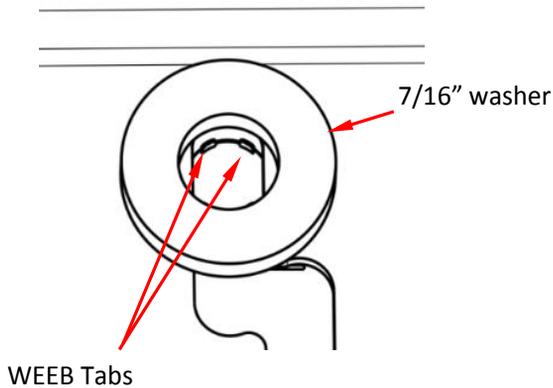


Figure 18b

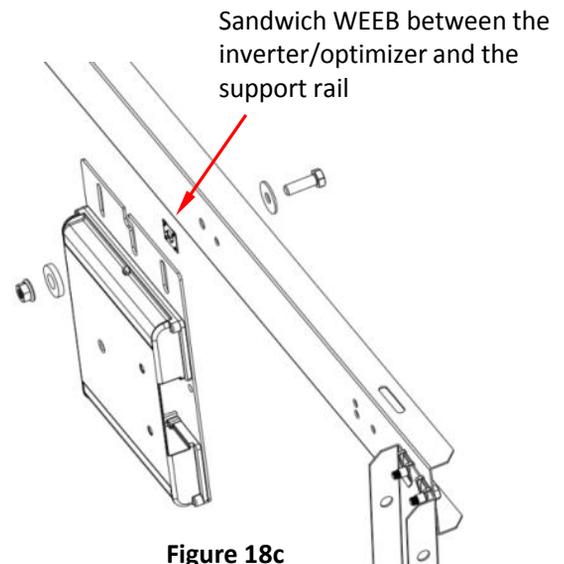


Figure 18c

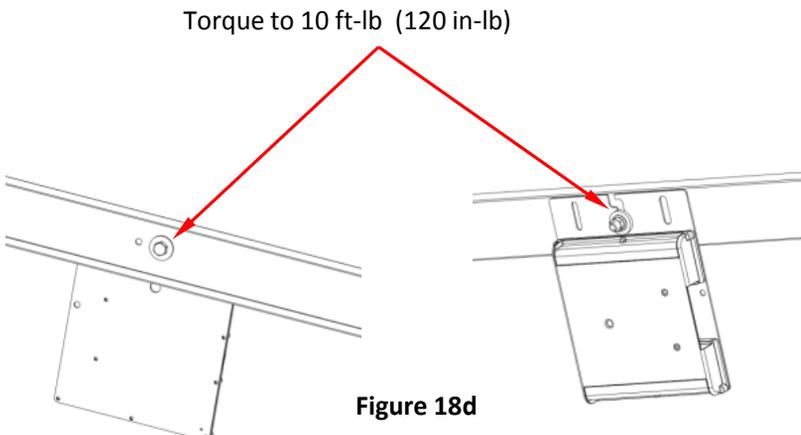


Figure 18d

10. Appendix D: Micro Inverter/Power Optimizer Mounting Kit without Integrated Grounding

19. Installer Notes

Thank you for purchasing AET's Rayport™ B Eco Micro Inverter/Power Optimizer Mounting Kit without integrated grounding that is manufactured in Maumee, Ohio. This kit has been designed to mount a Micro Inverter or Power Optimizer directly to the Rayport™ B Eco racking system.

20. Parts List

Bolt

- $\frac{5}{16}$ " - 18 Hex HD with Lock Patch



Washer

- $\frac{5}{16}$ " inner diameter
- .06" thick



Nut

- $\frac{5}{16}$ " - 18 Flange Hex



21. Tool List

$\frac{1}{2}$ " Deep Well Socket w/ Ratchet or Impact Driver

$\frac{1}{2}$ " Socket w/ Ratchet

Torque Wrench

10. Appendix D: Micro Inverter/Power Optimizer Mounting Kit without Integrated Grounding - Continued

22. Inverter/Optimizer to Support Rail Assembly

Attach the inverter/optimizer to the support rail using one (1) $\frac{5}{16}$ " bolt, two (2) $\frac{5}{16}$ " washers and one (1) $\frac{5}{16}$ " hex nut. Reference figures 22a, 22b and 22c.

Torque the $\frac{5}{16}$ " bolt to 5-7 ft-lb (60-84 in-lb).

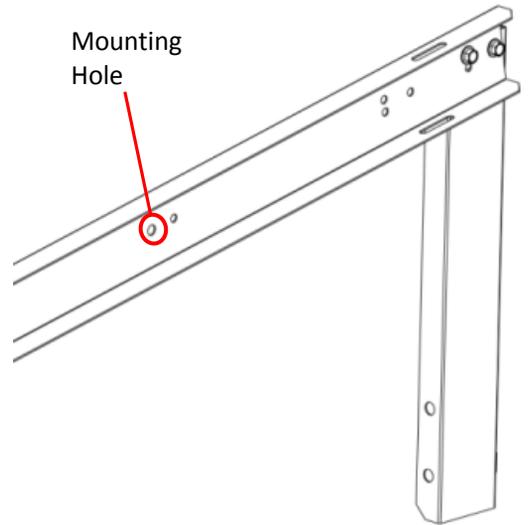


Figure 22a

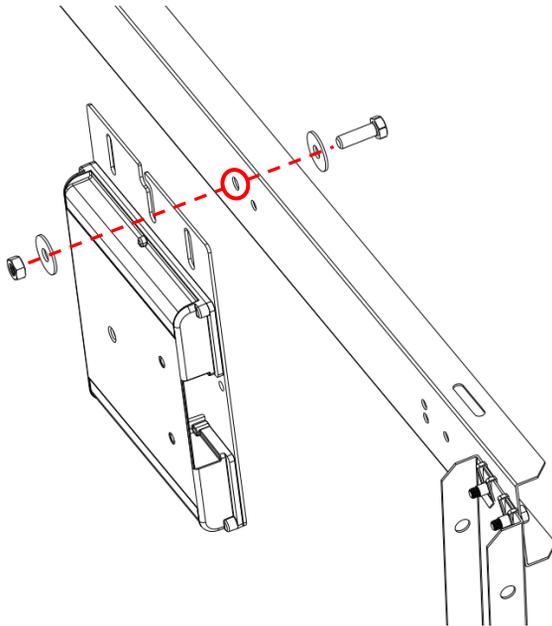


Figure 22b

Torque to 5-7 ft-lb (60-84 in-lb)

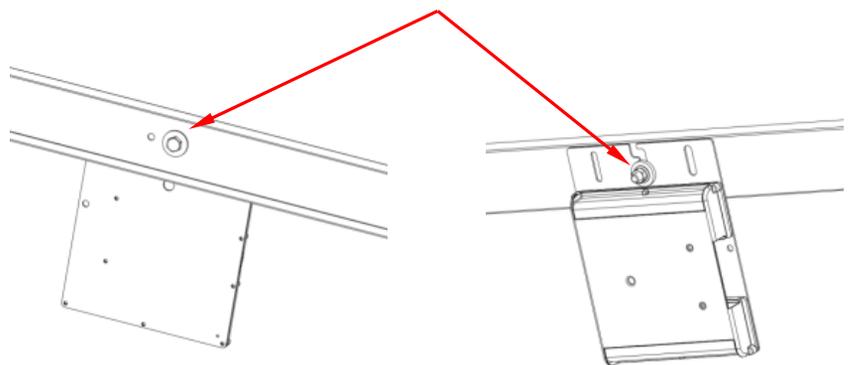


Figure 22c

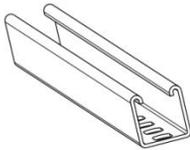
11. Appendix E: Hardmount Installation

23. Installer Notes

Thank you for purchasing AET's Rayport™ B Eco Low Profile Hardmount Kit. This kit has been designed to attach the Rayport™ B Eco racking system to low profile roof standoff's.

24. Parts List

Unistrut



25. Tool List

Reference hardmount suppliers install manual for the required tools.

11. Appendix E: Hardmount Installation - Continued

26. Unistrut to Hardmount Assembly

Loosely attach the Unistrut to the low profile hardmount using the hardware supplied by the hardmount manufacturer. See figure 26a

Align the Unistrut on the ballast tray such that it contacts the ballast tray feet as shown in figures 26b and 26c.

Torque the bolt to the hardmount manufacturer specifications.

Note: An Eco-Fasten (Eco-65 Base Plate and F-203 Bracket) low profile hardmount is shown in the illustrations. OMG and Anchor Products(AET model) can also be used with this kit. The system has a $\frac{3}{16}$ " designed in gap between the hardmount surface and the Unistrut. A spacer should be used if a larger gap exist.

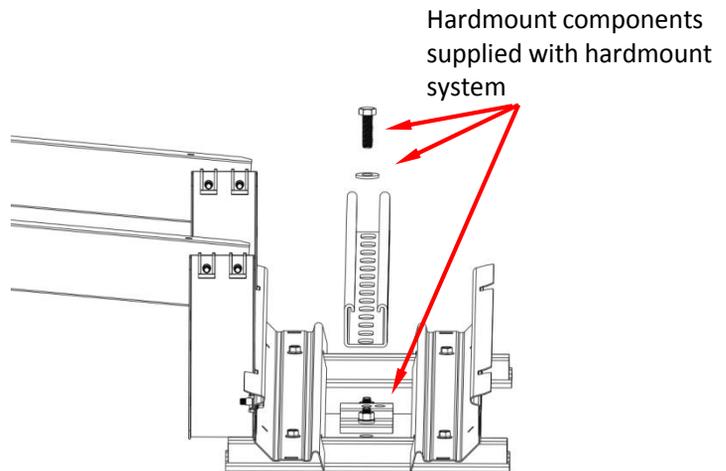


Figure 26a

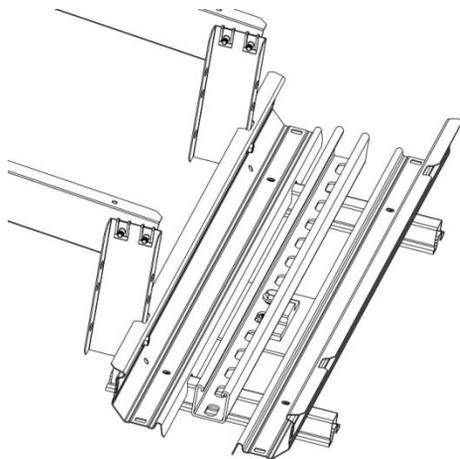
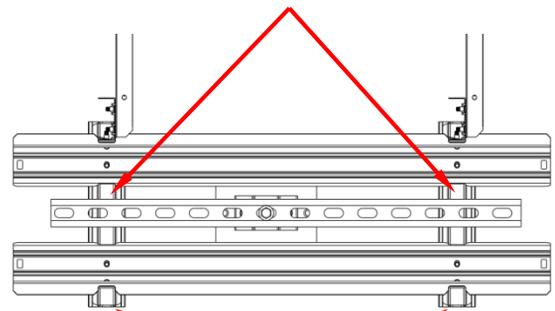


Figure 26c

Unistrut and Ballast Tray contact points



Ballast Tray Feet

Figure 26b

12. Appendix F: Fire Shield Installation

27. Installer Notes

Thank you for purchasing AET's Rayport™ B Eco Fire Shield Kit that is manufactured in Maumee, Ohio. This kit must be installed to the perimeter ballast trays of the system in areas that require a Fire Class A system fire rating when using type 1 and type 2 UL 1703 listed PV modules.

28. Parts List

Fire Shield



Bracket Assembly



Bolt

-M6 x 1 Hex Flange HD w/ Lock Patch



U-Nut

-M6 x 1 Thread



29. Tool List

10mm Socket w/ Ratchet or Impact Driver

12. Appendix F: Fire Shield Installation - Continued

30. Fire Shield Location on Array

The Fire Shields are installed to the perimeter Ballast Trays of the system. Reference the AET layout for Fire Shield locations. See figures 30a.

Note: The Ballast Trays in the E-W columns must be positioned as shown in figure 30b. They can not be tucked under the modules. Reference page 11.

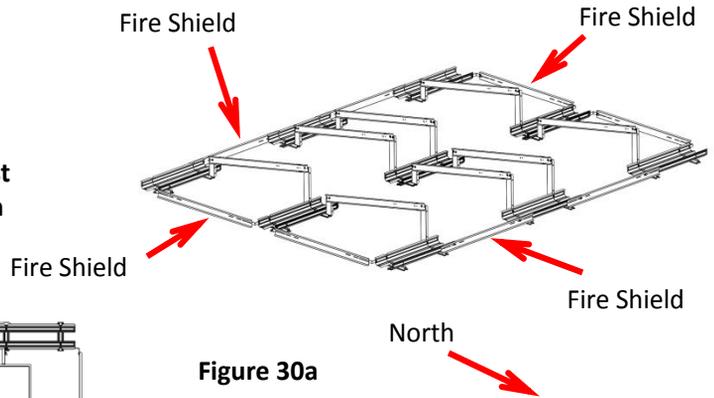


Figure 30a

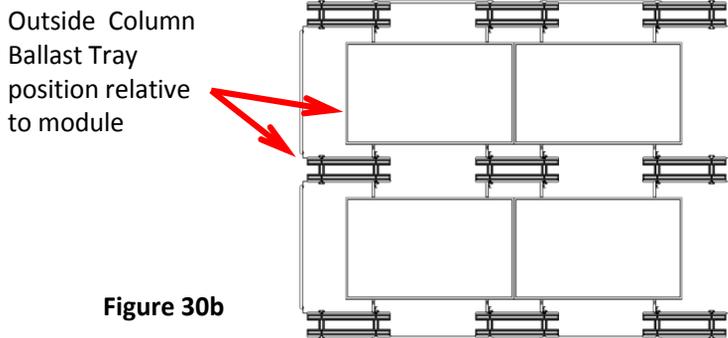


Figure 30b

31. U-Nut to N-S Ballast Tray Assembly

Attach U-Nuts to the N-S Ballast Trays. Slide the U-Nuts over the rectangular holes in the outboard guide rails until they snap into place. The barrel of the U-Nuts must be facing towards the inside of the Ballast Trays. See figure 31a.

U-Nuts are not required for the outside rectangular holes located in the E-W column ballast trays. See figure 31b.

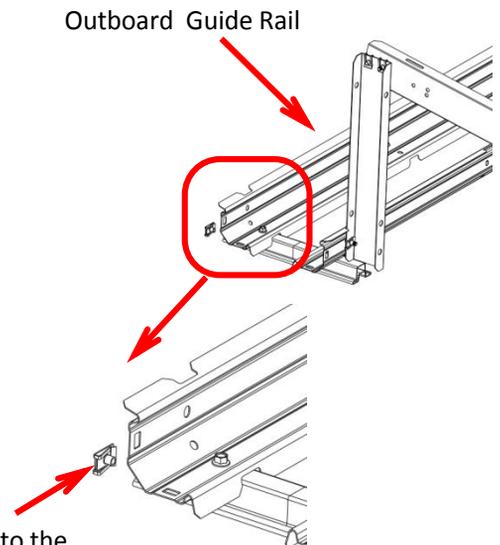


Figure 31a

Position U-Nut barrel to the inside of the ballast tray

U-Nuts are not required at the outside rectangular hole locations

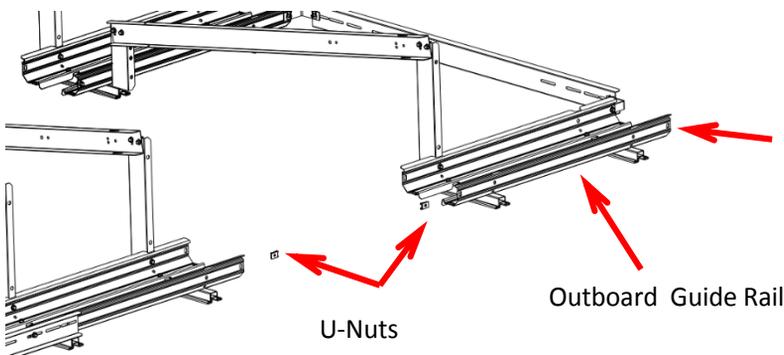
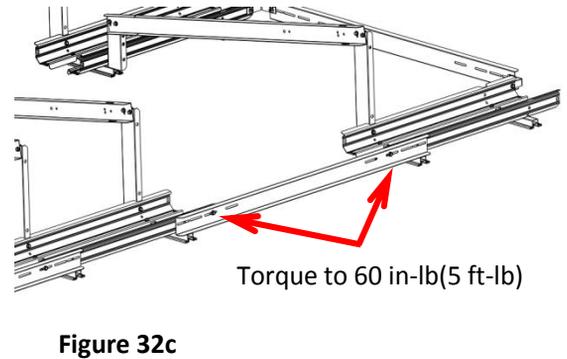
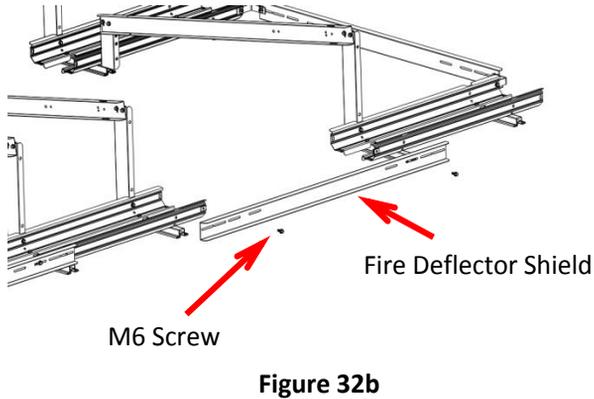
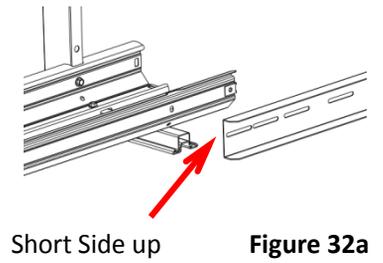


Figure 31b

12. Appendix F: Fire Shield Installation - Continued

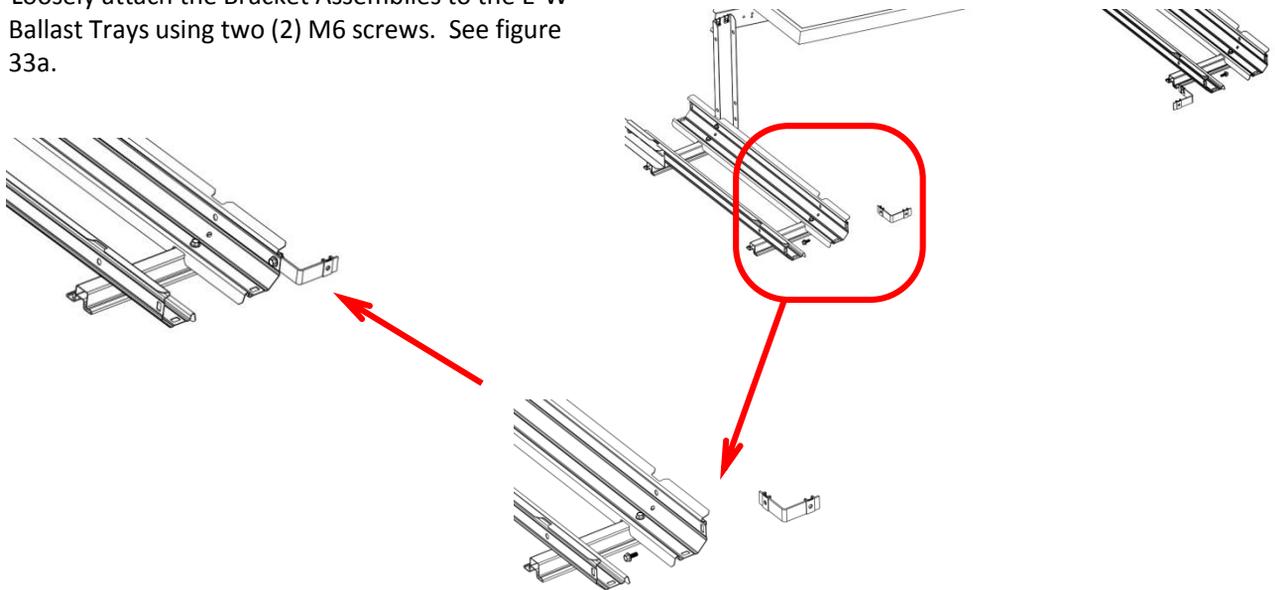
32. Fire Shield to N-S Ballast Tray Assembly

Attach the Fire Shield to the U-Nuts using two (2) M6 screws. The slots in the rail are off center, the short side must be positioned up. See figure 32a. There are four (4) slots per rail, use the set of slots that best matches the distance between the Ballast Trays. See figures 32b and 32c. Torque the screws to 40-50 in-lb.



33. Bracket Assembly to E-W Ballast Tray

Loosely attach the Bracket Assemblies to the E-W Ballast Trays using two (2) M6 screws. See figure 33a.



12. Appendix F: Fire Shield Installation - Continued

34. Fire Shield to E-W Ballast Tray

Attach the Fire Shield to the Ballast Tray/Bracket Assemblies using two (2) M6 screws. The slots are off center, the short side must be positioned up. Use the set of slots that best match the distance between the ballast trays. Torque to 40-50 in-lb.

Position the Fire Shield so there is a 1 inch gap between the bottom of the shield and the roof. Torque the Ballast Tray/Bracket Assembly screws to 40-50 in-lb. See figure 34a and 34b.

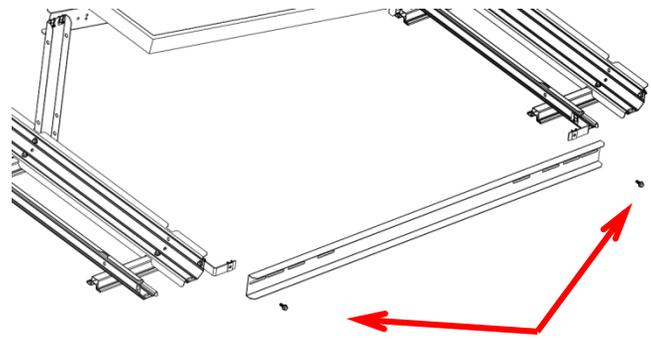


Figure 34a

M6 Screw

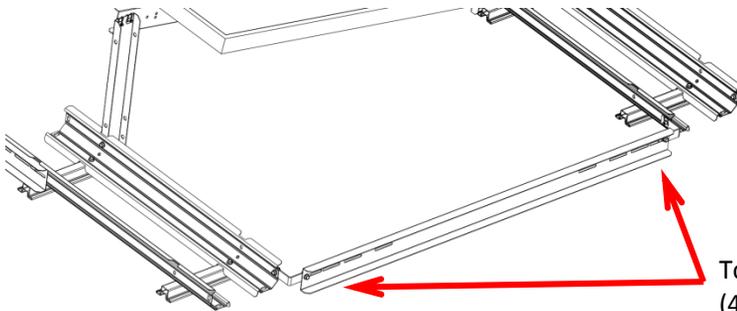
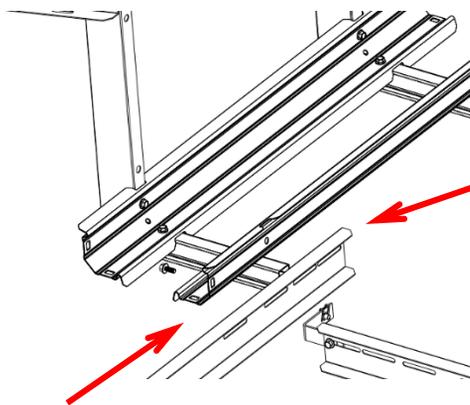


Figure 34b

Torque to 60 in-lb(5 ft-lb)
(4) places.

35. Fire Shield and Roof Obstructions

A U-nut is not required on N-S ballast trays at N-S/E-W Fire Shield intersection points. This may occur when working around roof obstructions. See figures 35a.



U-Nut not required on
this N-S ballast tray

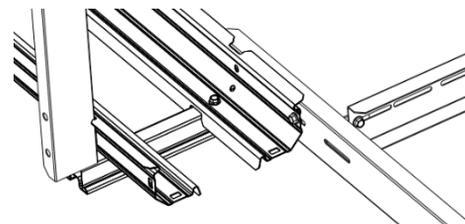
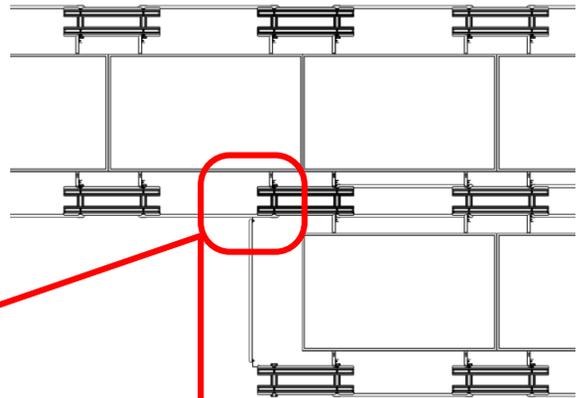


Figure 35a

12. Appendix G: WEEB – Lug 6.7 Installation

35. WEEB – Lug 6.7 to Support Rail Assembly

Drill a ¼" hole into the rear vertical leg of the support rail assembly. Deburr the hole to create a clean contact surface with the Lug. See figure 35a.

Attached the WEEB-Lug 6.7 to the rear vertical leg using the hardware provided with the Lug. Apply Penetrox-A to the threads and torque the fastener to 10 ft-lb. See figures 35b and 35c

Lay in equipment ground conductor and torque the fastener to 7 ft-lb. See figures 35d.

Drill a ¼" hole on the rear vertical leg of the support rail assembly. Deburr the hole.

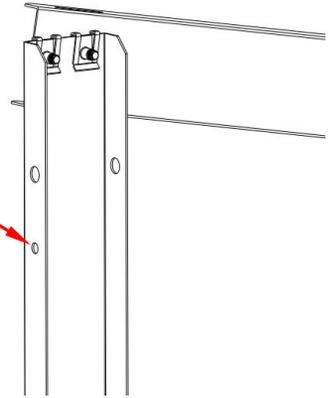


Figure 35a

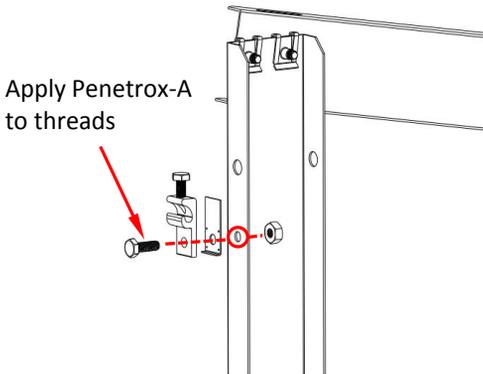


Figure 35b

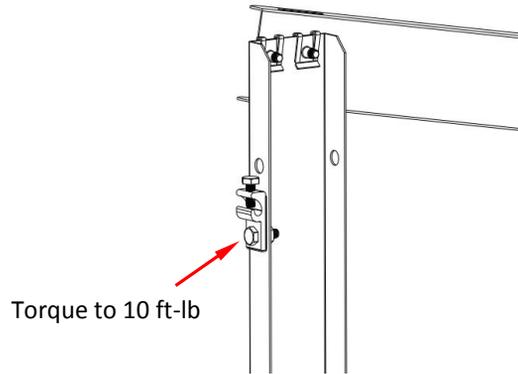


Figure 35c

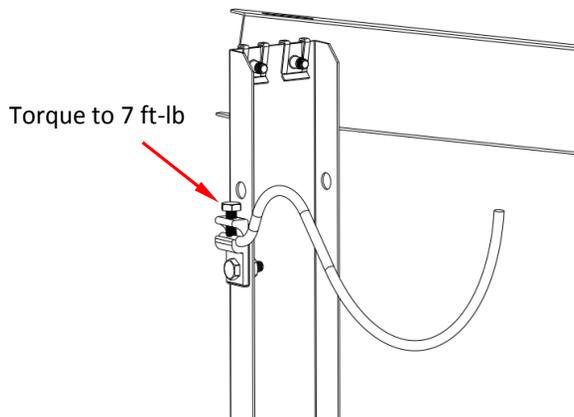


Figure 35d

13. Appendix H: List of Evaluated Modules

35. The following modules have been evaluated and approved for bonding to UL2703.

Manufacturer	Module Model Number
BYD	Listed by TUV: 185P6C-24, 190P6C-24, 195P6C-24, 200P6C-24, 205P6C-24 Listed by CSA Group: 245P6C-30, 250P6C-30, 255P6C-30, 260P6C-30 295P6C-36, 300P6C-36, 305P6C-36, 310P6C-36
Canadian Solar	Listed by CSA Group: CS6X-300P, CS6X-305P CS6P-255M, CS6P-260M, CS6P-265M CS6P-250P, CS6P-255P CS6P-260MM, CS6P-265MM CS6V-205P, CS6V-210P, CS6V-215M, CS6V-220M CS6V-220MM, CS6V-225MM, CS6A-210MM, CS6A-215MM CS5A-200M, CS5A-205M
ET Solar	Listed by Intertek: ET-M572195BB-Mono, ET-M572200BB-Mono ET-P660240BB-Poly, ET-P660245BB-Poly, ET-P660250BB-Poly, ET-P660255BB-Poly ET-P672290BB-Poly, ET-P672295BB-Poly, ET-P672300BB-Poly ET-M572200WW-Mono, ET-M572205WW-Mono ET-P660245WB/WW-Poly, ET-P660250WB/WW-Poly, ET-P660255WB/WW-Poly, ET-P660260WB/WW-Poly ET-P648195WW-Poly, ET-P648200WW-Poly ET-P672290WB/WW-Poly, ET-P672295WB/WW-Poly, ET-P672300WB/WW-Poly, ET-P672305WB/WW-Poly
Hanwha SolarOne	Listed by UL: HSL60P6-PA-0-235T, HSL60P6-PA-0-240T, HSL60P6-PA-0-245T, HSL60P6-PA-0-250T, HSL60P6-PA-0-255T HSL60P6-PA-4-235T, HSL60P6-PA-4-240T, HSL60P6-PA-4-245T, HSL60P6-PA-4-250T, HSL60P6-PA-4-255T HSL72P6-PB-0-285T, HSL72P6-PB-0-290T, HSL72P6-PB-0-295T, HSL72P6-PB-0-300T, HSL72P6-PB-0-305T HSL72P6-PB-4-285T, HSL72P6-PB-4-290T, HSL72P6-PB-4-295T, HSL72P6-PB-4-300T, HSL72P6-PB-4-305T HSL60P6-PA-0-235TW(or TB), HSL60P6-PA-0-240TW(or TB), HSL60P6-PA-0-245TW(or TB), HSL60P6-PA-0-250TW(or TB), HSL60P6-PA-0-255TW(or TB) HSL60P6-PA-4-235TW(or TB), HSL60P6-PA-4-240TW(or TB), HSL60P6-PA-4-245TW(or TB), HSL60P6-PA-4-250TW(or TB), HSL60P6-PA-4-255TW(or TB) HSL72P6-PB-0-285TW(or TB), HSL72P6-PB-0-290TW(or TB), HSL72P6-PB-0-295TW(or TB), HSL72P6-PB-0-300TW(or TB), HSL72P6-PB-0-305TW(or TB) HSL72P6-PB-4-285TW(or TB), HSL72P6-PB-4-290TW(or TB), HSL72P6-PB-4-295TW(or TB), HSL72P6-PB-4-300TW(or TB), HSL72P6-PB-4-305TW(or TB)
Isofoton	Listed by UL: ISF-245, ISF-250, ISF-255, ISF-260

13. Appendix H: List of Evaluated Modules - Continued

Manufacturer	Module Model Number
Kyocera	Listed by UL: KD135GX-LFBS, KD140GX-LFBS, KD215GX-LFBS, KD220GX-LFBS, KD225GX-LFBS KD240GX-LFB, KD245GX-LFB, KD250GX-LFB KD135SX-UFBS, KD140SX-UFBS KD315GX-LFB, KD320GX-LFB, KD325GX-LFB KU325-8BCA, KU330-8BCA
Lightway	Listed by UL: LW230, LW235, LW240, LW245, LW250, LW255, LW260 LW285, LW290, LW295, LW300
Renesola	Listed by UL: JC290M-24/Ab, JC295M-24/Ab, JC300M-24/Ab, JC305M-24/Ab, JC310M-24/Ab
Sharp	Listed by UL: ND-240QCJ, ND-250QCS, ND-F4Q300
Suniva	Listed by Intertek: OPT310-72-4-100, OPT315-72-4-100, OPT320-72-4-100, OPT325-72-4-100,
Trina Solar	Listed by CSA Group: TSM-295PD14, TSM-300PD14, TSM-305PD14, TSM-310PD14
Yingli	Listed by UL: YL240P-29b, YL245P-29b, YL250P-29b, YL255P-29b, YL260P-29b YL260C-30b, YL265C-30b, YL270C-30b, YL275C-30b, YL280C-30b YL290P-35b, YL295P-35b, YL300P-35b, YL305P-35b