

POWER MAX™
Flush Array
ASSEMBLY INSTRUCTIONS

step-by-step
assembly and installation

SAFETY CONSIDERATIONS

This application procedure is not intended to supersede any company construction or safety standards. This procedure is offered only to illustrate safe application for the individual. **FAILURE TO FOLLOW THESE PROCEDURES MAY RESULT IN PERSONAL INJURY OR DEATH.**

Do not modify this product under any circumstances, except where noted in this application procedure.

This product is intended for use by trained technicians only. **This product should not be used by anyone who is not familiar with, and not trained to use it.**

When working in the area of energized lines, extra care should be taken to prevent accidental electrical contact. Be sure to wear proper safety equipment per your company protocol.

For proper performance and personal safety, be sure to select the proper size PREFORMED™ product before application.

PREFORMED products are precision devices. To ensure proper performance, they should be stored in cartons under cover and handled carefully.

POWER MAX™ Flush Array

WARNING

Be certain that the ballast is carefully followed in accordance to the project specific design specifications. Failure to do so could lead to catastrophic structural failure and severe personal injury or death.

About the product

The POWER MAX™ is a non-penetrating structure, i.e., the structure does not get screwed, bolted or otherwise fastened to the roof substrate. Instead, it is weighted in place to the roof substrate using concrete-cap blocks as ballast.

Important Installation Considerations

- Minimum Setback of 3 feet
- Roof slope cannot exceed 5°
- Consulting with a local building department and/or professional engineer is recommended.

Grounding Considerations

The POWER MAX™ requires no additional grounding devices and has been evaluated to meet UL2703 standard for PV mounting systems.

For questions on a specific installation, please:

Contact us by Phone: 800-260-3792

Send an Email request: info@plpsolar.com

About these instructions:

- They are intended to be used by individuals with sufficient technical skills for the task. Knowledge and use of hand tools, measuring devices and torque values is also required.
- They include various precautions in the forms of Notes, Cautions, and Warnings

to assist in the assembly process and/or to draw attention to the fact that failure to follow certain assembly steps may be dangerous and could cause serious personal injury and/or damage to components. Following the step-by-step procedures and these precautions should minimize the risk of personal injury or damage to components while making the installation safe and efficient.

Periodic Inspection

Periodic re-inspection is a recommended system maintenance procedure to check for any loose components and any corrosion. If any loose components or any corrosion is found, the affected components are required to be replaced immediately, with the original mounting system manufacturer's component parts.

Required Tools

- 1/2 inch wrench or socket for 5/16 inch module clamp hardware
- Torque wrench
- Ratchet wrench
- Ratchet extension bar
- Tape Measure
- Square
- Chalk Line

WARNING

1. Preformed Line Products (PLP) is not liable for, and makes no warranty on, expressed or implied, the suitability of roofing, *in situ* weatherproofing materials, effect of adjacent buildings and/or equipment geometry, and other installation issues which are outside of PLP's scope. PLP's sole liability is set forth in its terms and conditions of sale. Please contact the roofer or warranty holder of the roof or building envelope system prior to the installation of a solar structural array, to confirm acceptance and compatibility of the penetration, attachment, and roof contact methods provided and/or proposed in this manual.
2. PLP offers no liability/warranty on any racks not installed to approved layout by PLP. Furthermore, PLP has no obligation to evaluate adjacent building or equipment geometry that may affect the wind dynamics and pressures exerted on the solar array and disclaims any liability related thereto.
3. The POWER MAX™ system is to be installed over adhered or fixed roof surfaces only. If additional roof protection materials are added under the POWER MAX™ structure, including slip sheets, drain mats or sacrificial layers, those materials must either be adhered to the main roofing material or trimmed to fit only under the POWER MAX™ trays.
4. Stainless Steel hardware can gall when tightened too quickly. Installer should use a Silver Grade anti-seize compound prior to assembling any stainless steel hardware. Do not use an impact driver. All other driver types should be set to low speed settings.
5. Periodic re-inspection is a recommended system maintenance procedure to check for any loose components and any corrosion. If any loose components or any corrosion is found, the affected components are required to be replaced immediately, with the original mounting system manufacturer's component parts.

POWER MAX™ Flush Array Ratings

The POWER MAX™ conforms to ANSI/UL UL2703 (2015) Standard for Safety First Edition: Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels.

Electrical

Note: Electrical installations must be in accordance with the National Electric Code ANSI / NFPA 70. Contact your local Authorities Having Jurisdiction (AHJ) for additional details.

Max Overcurrent Protective Device (OCPD) Rating: 25A

Equipment Grounding Conductor Sizing

Module Fuse Rating	Copper Wire Size
<15 AMPS	#14 AWG 90°C
<20 AMPS	#12 AWG 90°C
20-60 AMPS	#10 AWG 90°C

Module Clamps

Module clamps have integrated grounding and have been tested to UL2703.

See Module Compatibility List for list of approved modules.

Module Orientation: Landscape

Fire Class Resistance Rating

The system fire class rating is only valid when the installation is conducted strictly in accordance with this manual.

The assembly is to be mounted over a fire resistant roof covering rated for the application.

Meets the requirements of Class A Low Slope Symmetrical & Asymmetrical Applications when using Type 1, Listed Photovoltaic Modules.

Structural Certification

Mechanical Load Rating: Exceeds the minimum design load rating of UL2703 section 21.4 (10 psf downward, 5 psf upward, 5 psf downslope) load. See Module Compatibility List for rated loads. Structural capacity also available upon PE review.

Marking

Product markings identified per UL2703 are to be located in a location that is readily accessible for inspection.

Preformed Line Products
Model: Power Max
Manufacture Date: xx/xx
Load Rating: See Installation Instructions
Fire Class Rating: See Installation Instructions for Installation Requirements to achieve a Specified Fire Class Rating.




p/n 5800113

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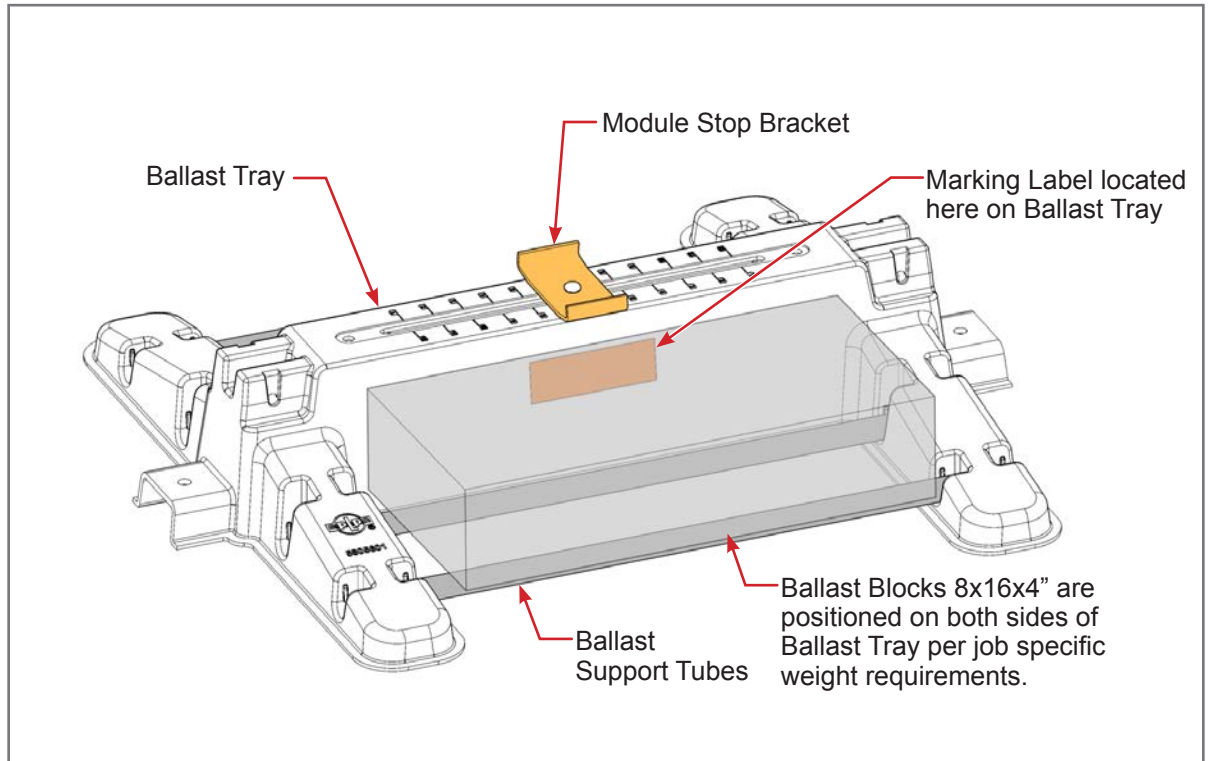
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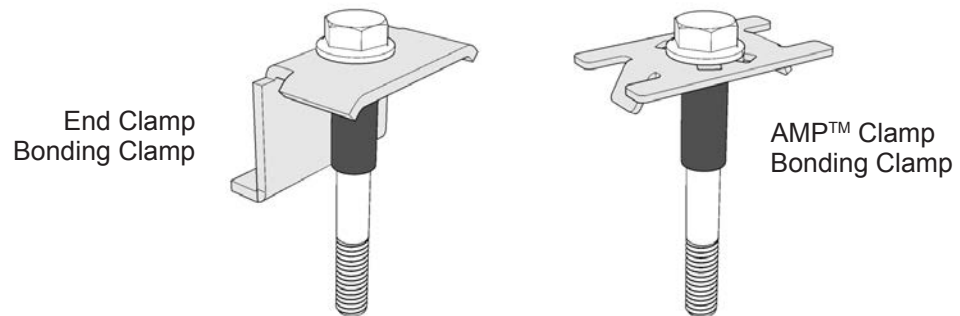
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Flush Array Components



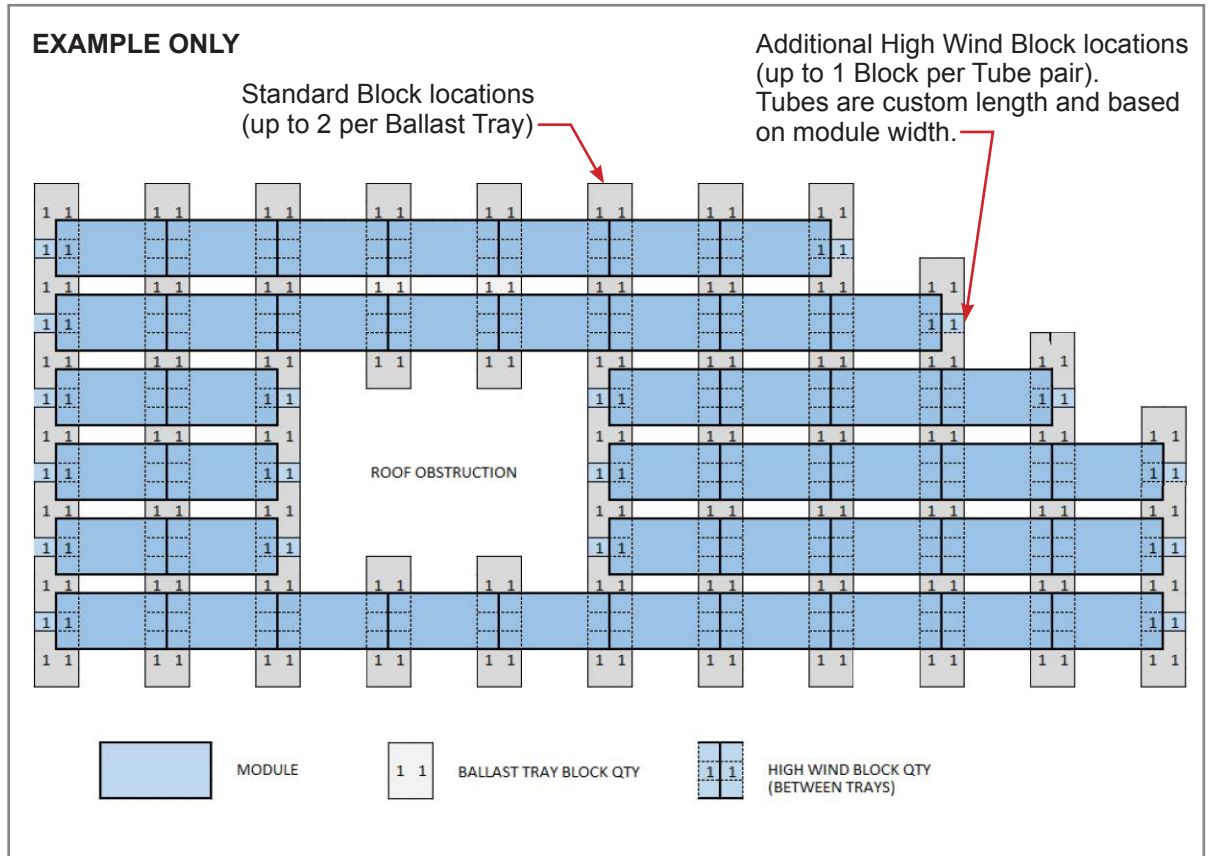
Factory Assembled Module Clamps



Understanding Ballast Requirements

CAUTION

Without exception, the ballast must be installed/applied per the job specific project drawings and weight requirements. Be absolutely certain that the concrete blocks meet the specified weights. Failure to do so could lead to a catastrophic structural failure and severe personal injury or death. Furthermore, failure to meet specifications voids the system warranty.



This sample layout shows the specific number of Ballast Block required per Tray by Tray location. These numbers will range from 1-4 blocks.

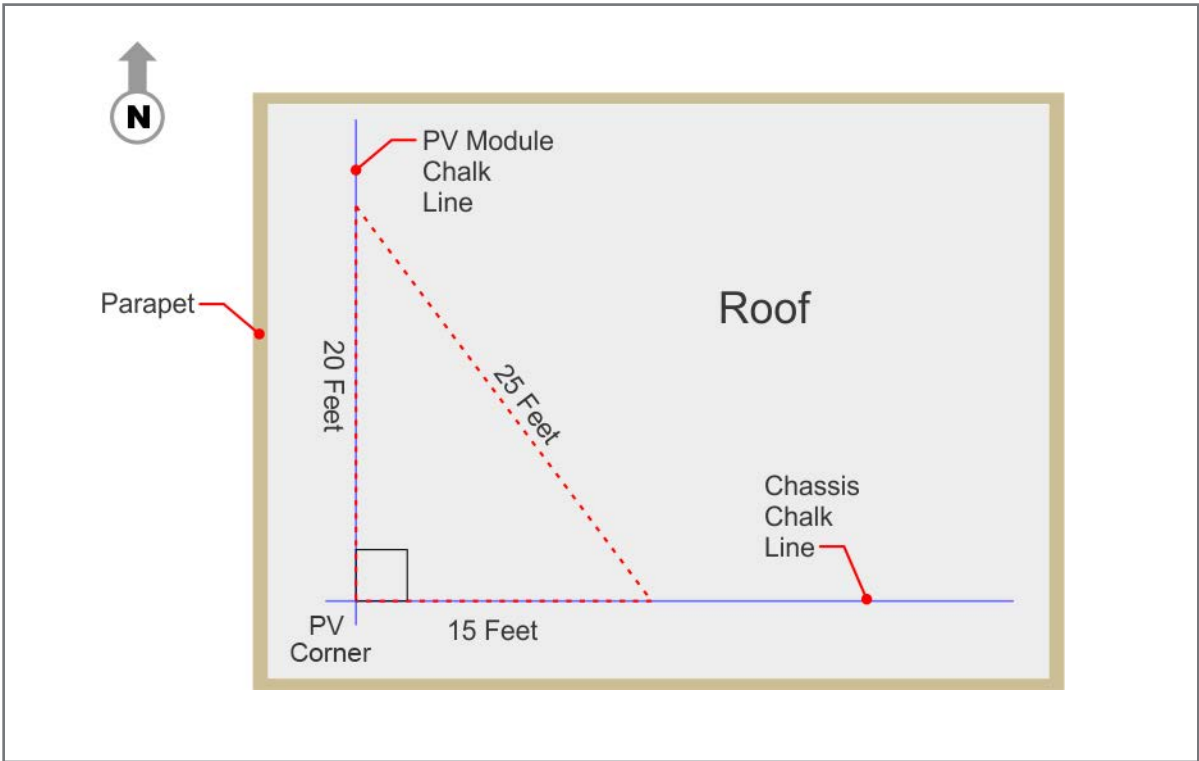
For further details on minimum/maximum block quantities and arranging of ballast blocks, refer to project specific drawing.

1 Snap Chalk Lines on Roof

Snap perpendicular chalk lines using the 3-4-5 triangulation method. In this example, a factor of 5 feet has been used. On larger systems, use a factor of 10 feet.

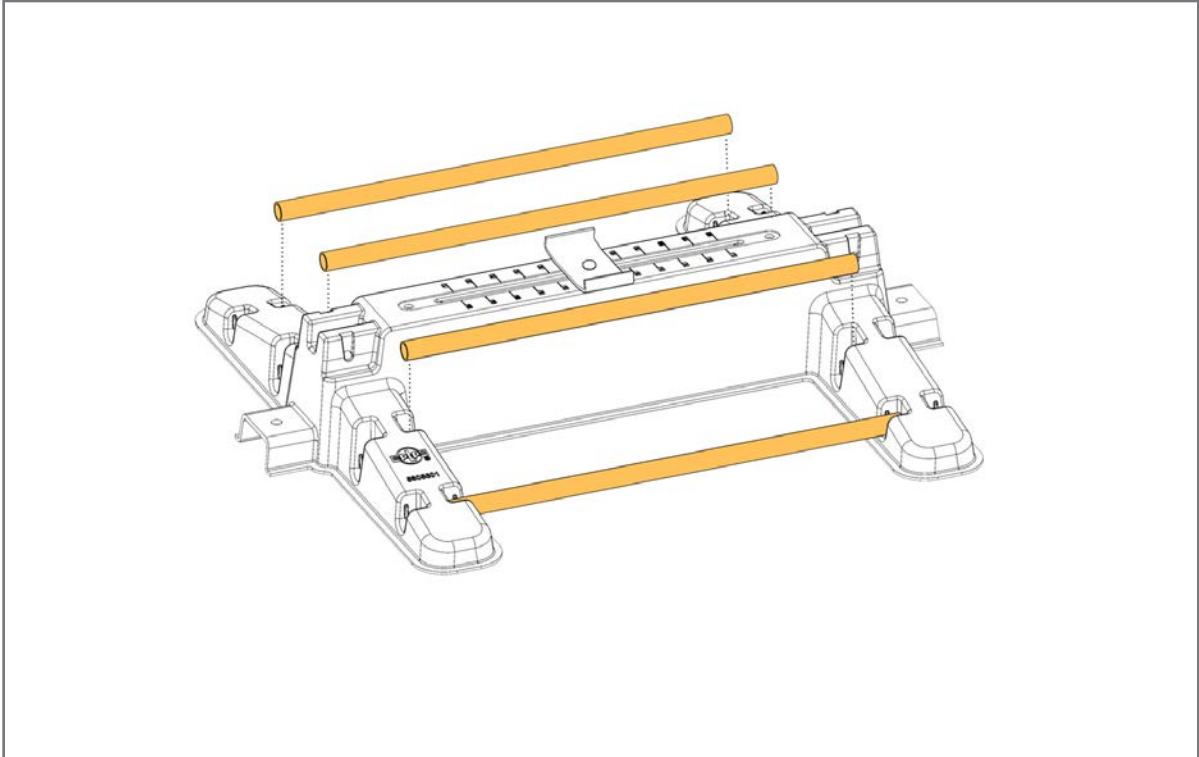
The chalk lines represent the E-W and N-S coordinates of the array.

CAUTION
Do not rely on the roof edges or parapets when snapping chalk lines, as they are not always square.



2 Install the Ballast Support Tubes

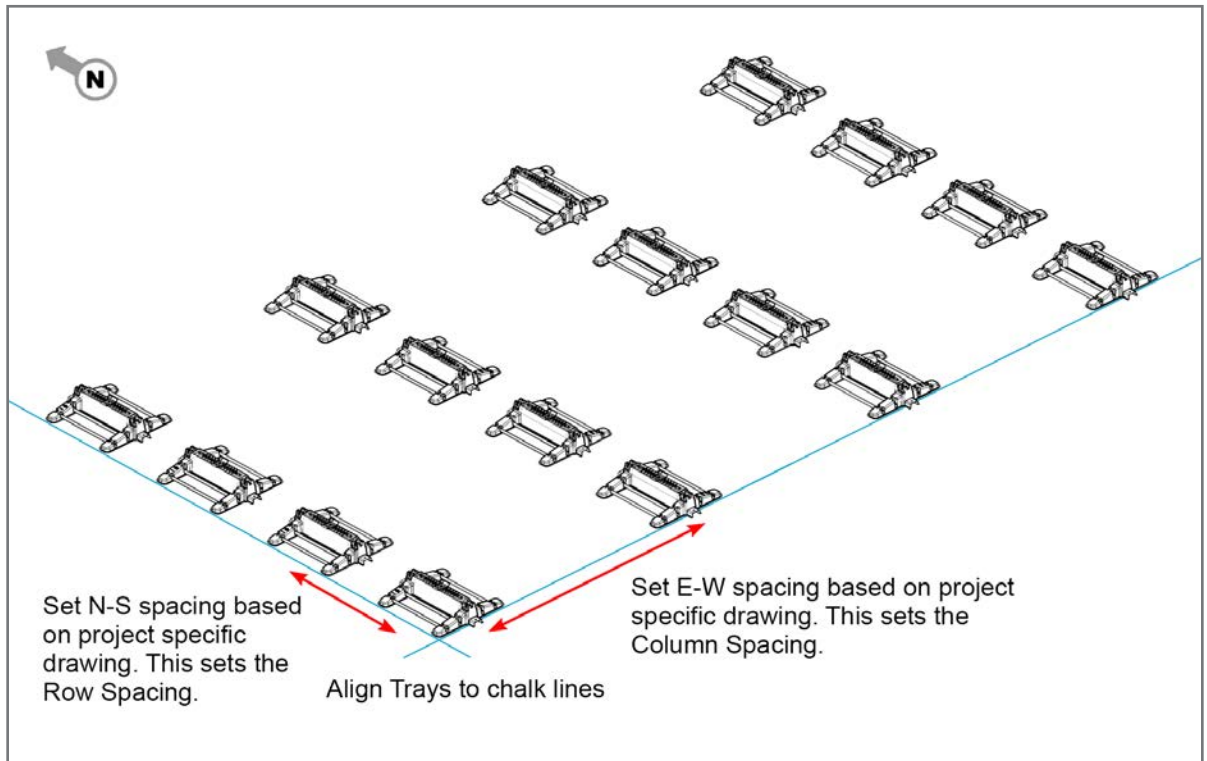
CAUTION
If the Ballast Support Tubes come in contact with the roof surface, that surface must be protected with a manufacturer approved slip sheet. Be aware of peaks on the roof which may come in contact with the Ballast Support Tubes.



Install each of the four Ballast Support Tubes into their respective notches of the Tray.

3 Positioning the Trays on Roof Top (rough positioning)

NOTE
Final spacing and alignment of the Trays will be set as PV Modules are installed.



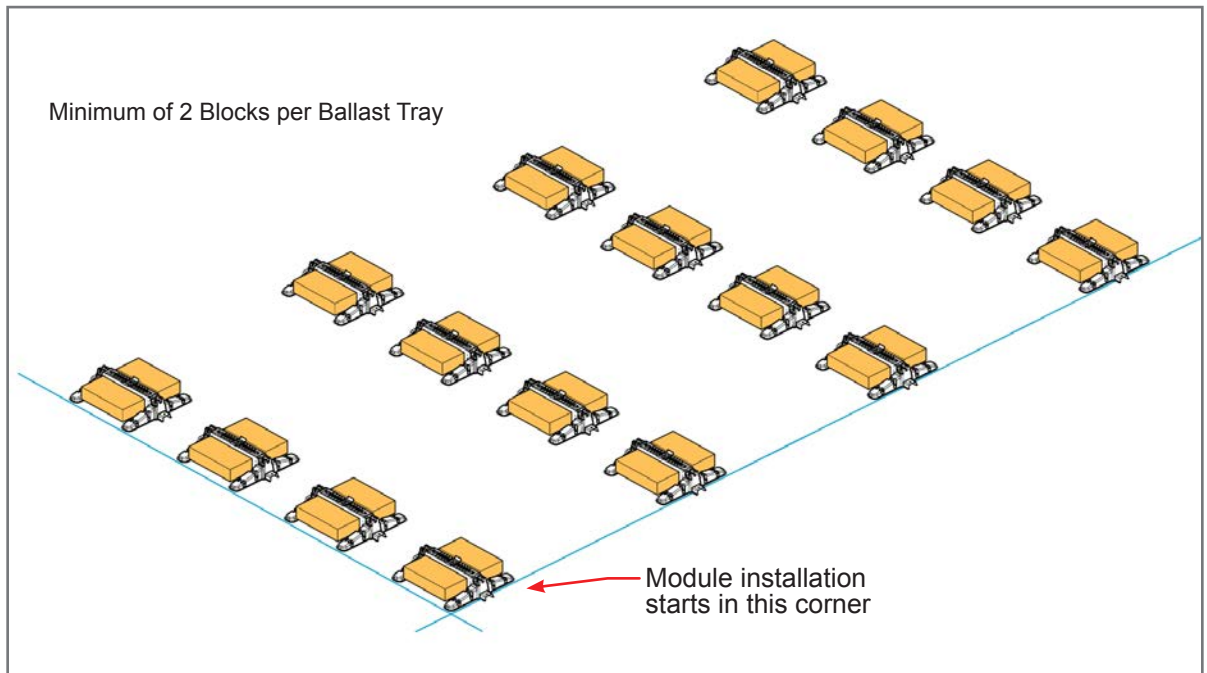
Position the southernmost and (in this example) the easternmost Trays along their respective chalk lines, roughly spacing the Trays as shown. Roughly place

the Trays within the interior of the array using the dimensions shown above.

4 Install Ballast

CAUTION
Without exception, ballast must be installed/applied per the job specific project drawings. Be absolutely certain that the concrete blocks meet the specified weights. Failure to do so could lead to a catastrophic structural failure and severe personal injury or death. Furthermore, failure to meet specifications voids the system warranty.

PLP Tip!
Place all Ballast Blocks in location prior to Module installation.

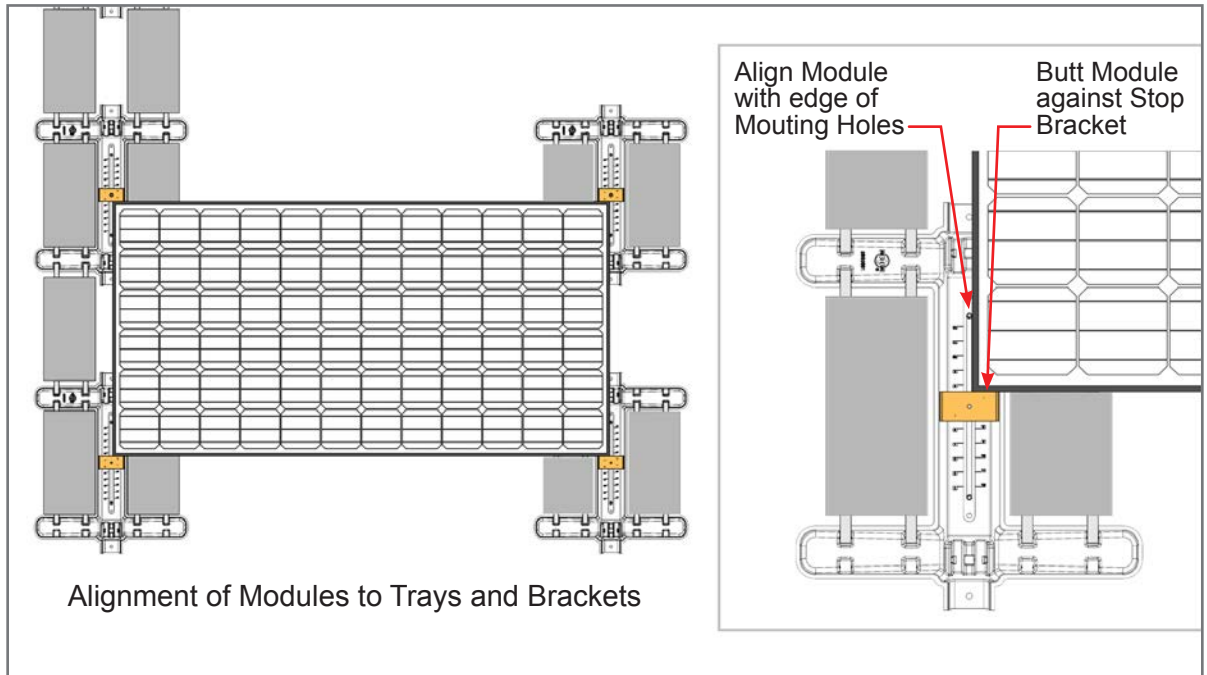


Install the required Ballast per the job specific ballast requirements. As the first row will set the alignment and positioning of the array, it's important to ensure that its Ballast Trays are aligned with the chalk lines.

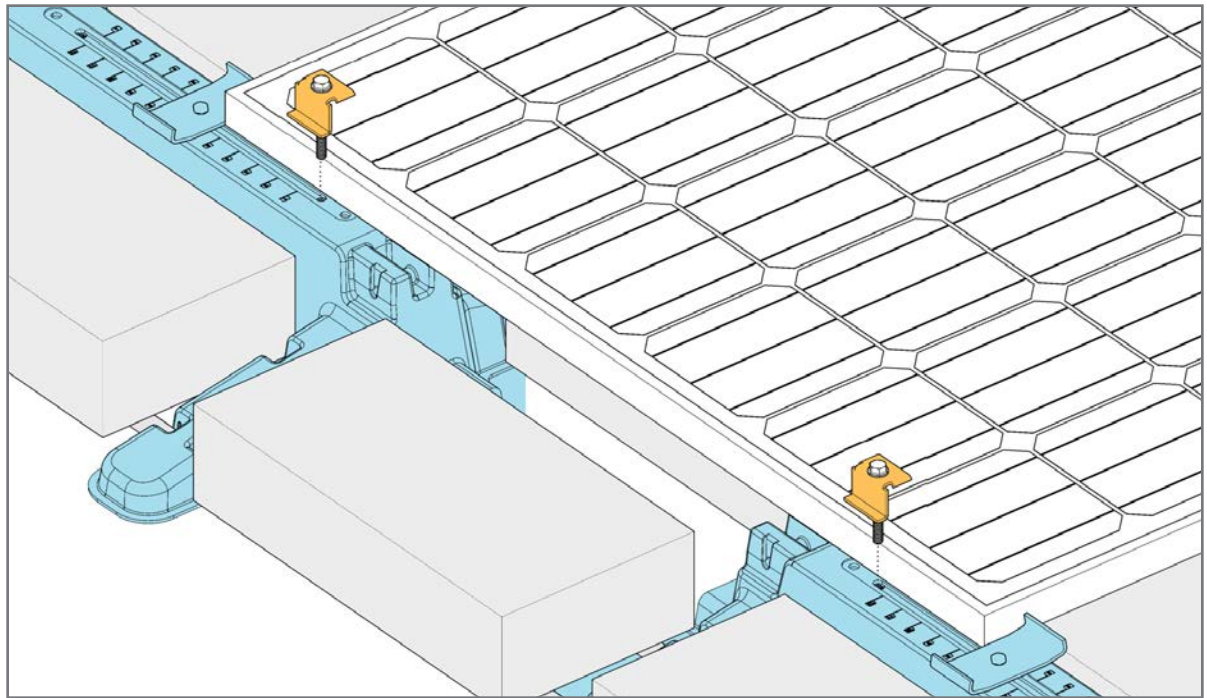
5 Install Modules

CAUTION

It's extremely important that Module positioning/alignment to the trays is tight and precise to ensure the electrical bonding from Module to Module via the self bonding Mid Clamps. If the gap between the Modules too wide where a Mid Clamp is to be used the bonding may not occur.



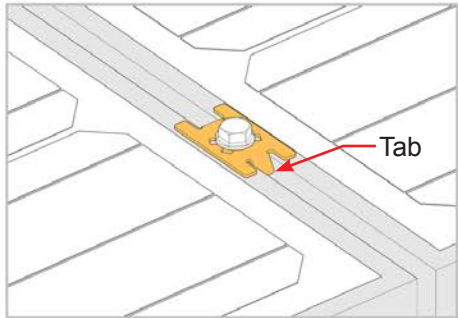
Position Module on four Trays. Align the Module Frame to the edge of the mounting holes while leaving clearance for the Module Clamps to thread into the Tray. Next, butt the Module up against the Stop Brackets on all four corners of Module frame.



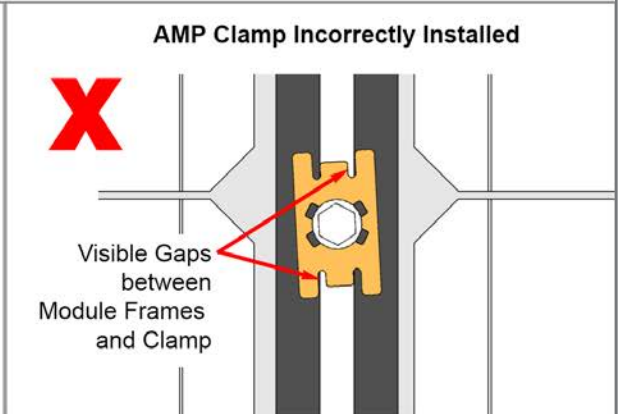
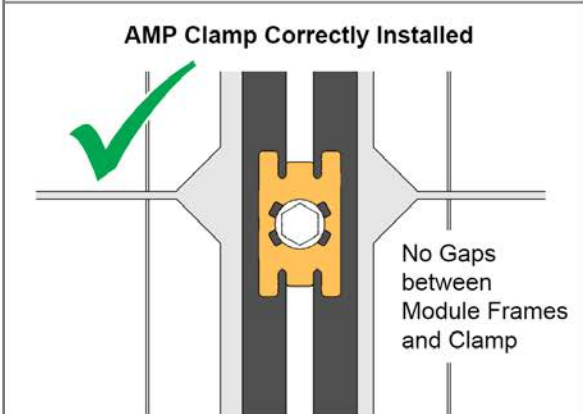
Install one End Clamp assembly into each Tray. Ensure that the Module is square to the Trays and there are no visible gaps between the Sleeve of End

Clamp Assembly and the Module Frame (butt Frame up against the Sleeve/Bolt of End Clamp). Tighten the Bolt and **Torque to 15 ft.-lbs.**

5 Install Modules (cont.)

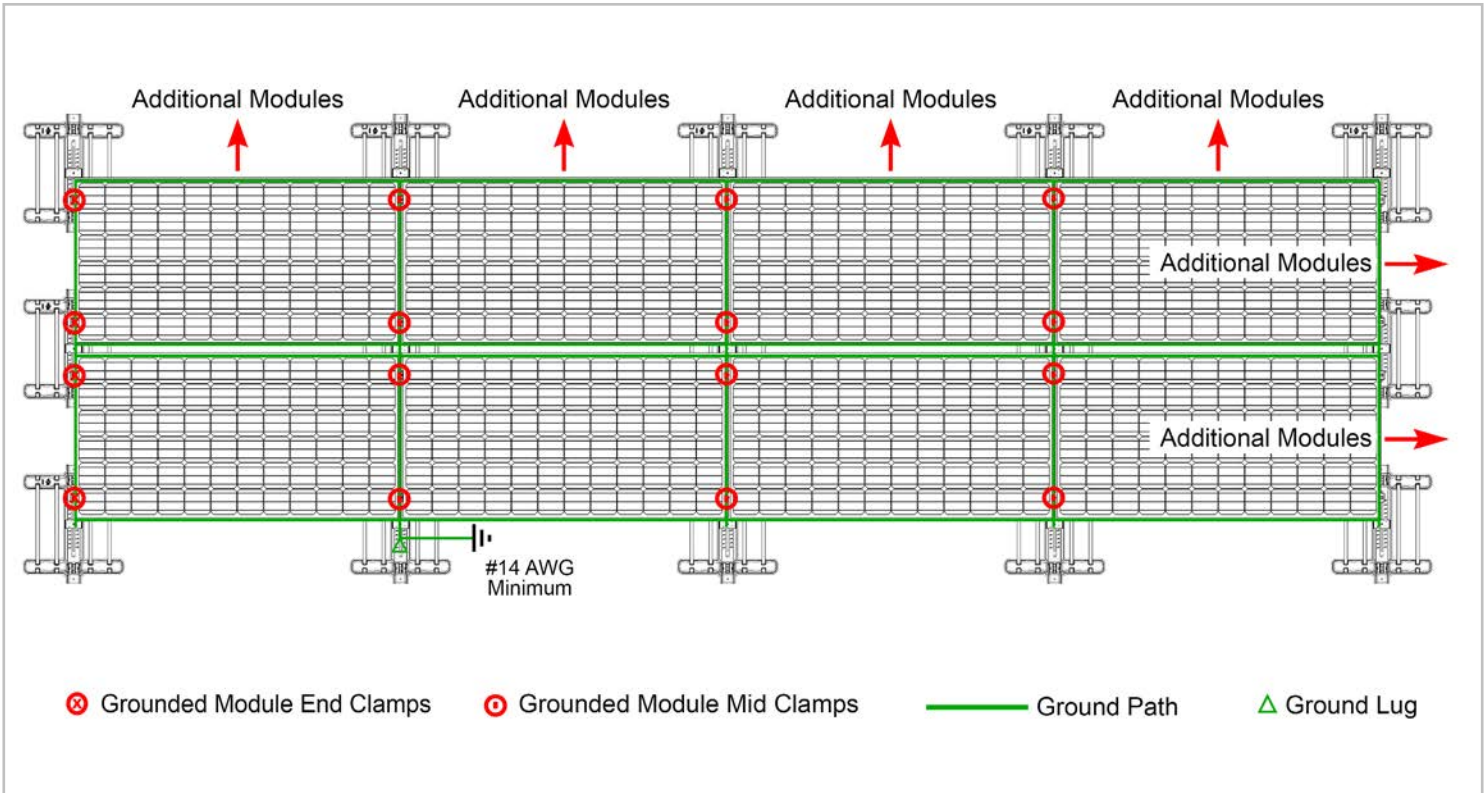


Install the AMP Clamp with its tabs between the two Modules, then push the Modules up against the tabs.



Install one AMP Clamp bonding Mid Clamp assembly into each Tray. Ensure that the Clamp is square to the Module frames and there are no visible gaps. Tighten the Bolt and **Torque to 15 ft.-lbs.** Continue in this manner installing the remaining Modules.

Appendix A-1 Grounding/Bonding Path

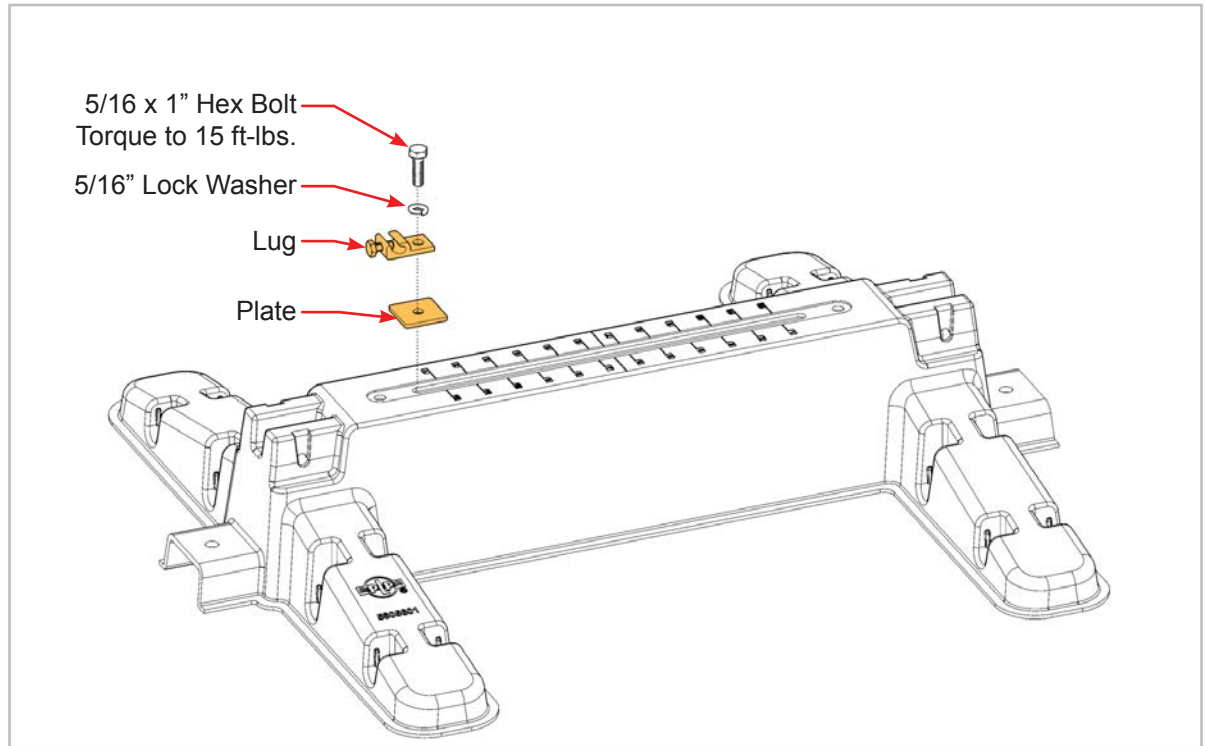


Appendix A-2 Install WEEB-LUG-8.0

IMPORTANT

Before installing, verify with the lug manufacturer for any updates or revisions to these lug installation instructions.

Lug is suitable for use with 14-6 AWG solid or stranded copper conductor when tightened to 5ft-lbs.

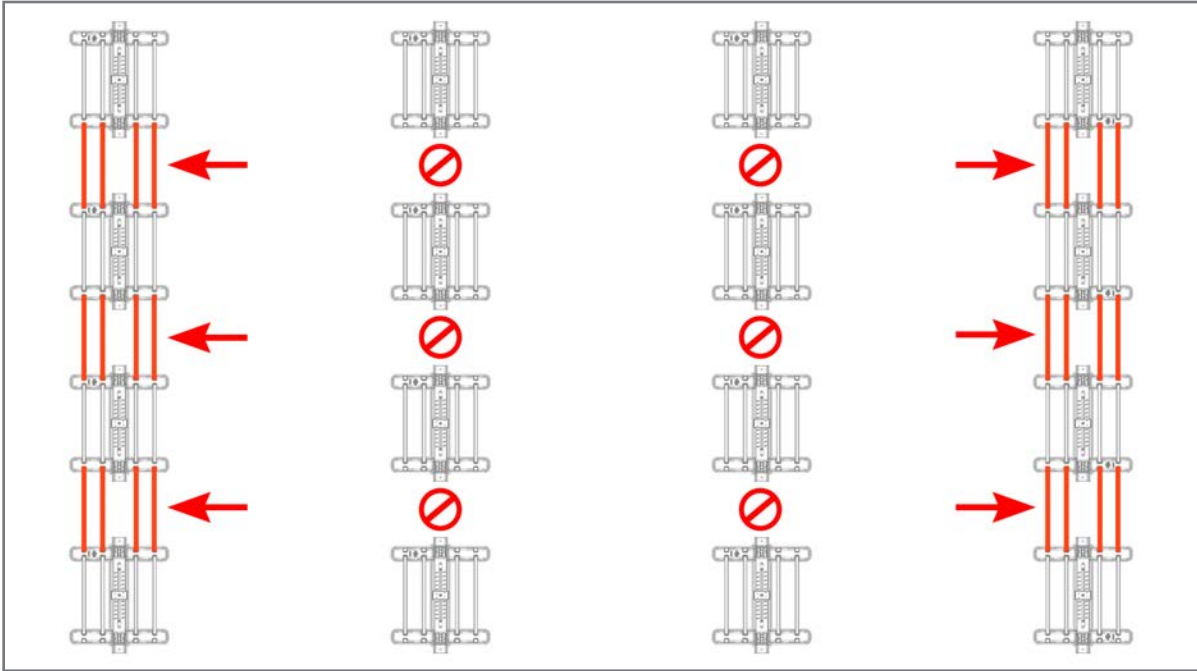


IMPORTANT NOTES

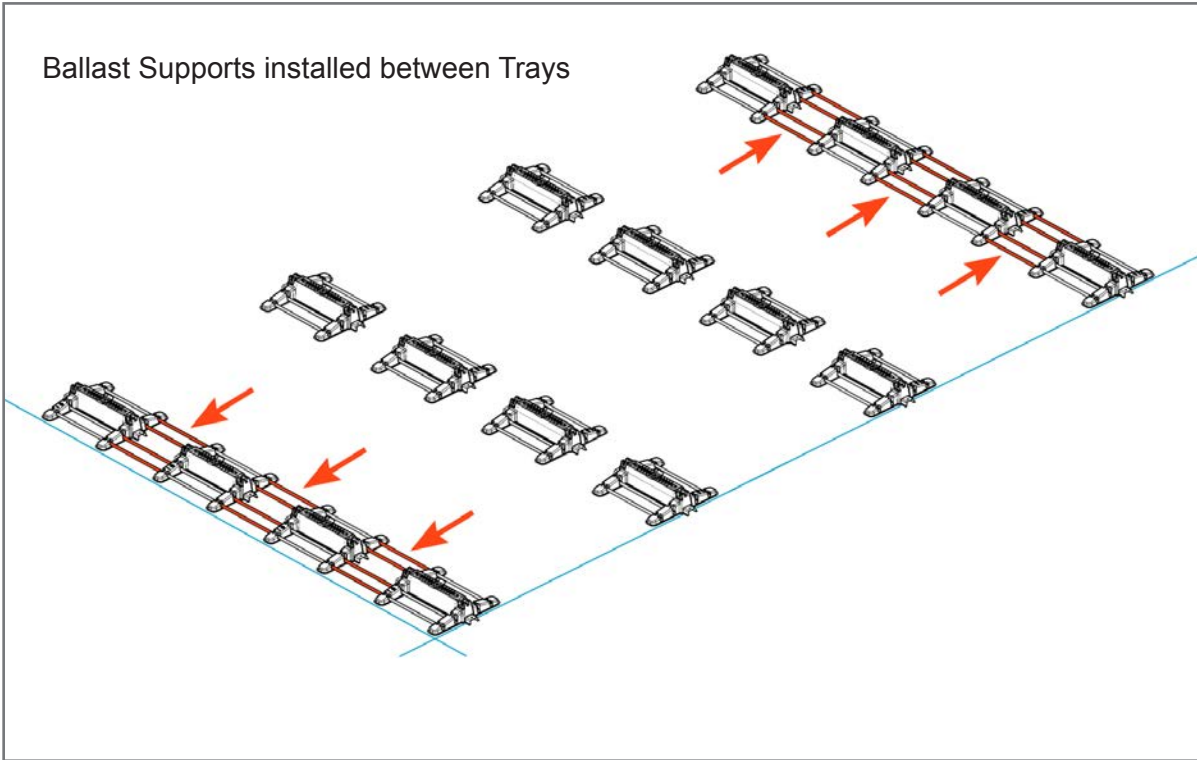
1. Before installing, verify with the lug manufacturer for any updates or revisions to these lug installation instructions. The instructions on this page only address the WEEB-LUG-8.0 as found within the manufacturers (Burndy) document number 50016572 Rev E.
2. For Proper Equipment Grounding Conductor (EGC) and Overcurrent Protection Device (OCPD) sizing, refer to NEC sections 250.66, 250.122 and 250.166.

Appendix A-3 Installing High Wind Ballast Tubes (not required on all systems)

NOTE
 See project specific drawing for High Wind Tube placement. The High Wind Tubes and ballast are not required on all systems.



High Wind Ballast Tubes are installed between Trays. In this example, the High Wind Ballast Tubes were required on the outer rows only. (See job specific drawing for any High Wind Ballast requirements)



Appendix A-4 POWER MAX™ Compatible Modules - these modules meet the UL2703 standard

Please reference application procedure SP3559 for POWER MAX Compatible Modules on preformed.com.

PV Modules Tested

Manufacturer	Model	Weight (lbs)	UL2703 Load Rating (psf)		
			Downward*	Upward	Slope
Canadian Solar	CS6P-xxxP	40.9	15	10	10
LG	LGxxxN2W-G4	44.7	15	10	10
Suntech	STPxxx-24/Vd	59.4	15	10	10
Solar World	SWxxx XL 33mm FR	39.6	15	10	10

* Downward loading rated higher with use of High Load Brackets. See POWER MAX Accessories Installation Instructions SP3470 for specific instructions:

Suntech 50 mm Frame: Rated 40 psf - Tested 60 psf

Solar World 33 mm Frame: Rated 30 psf - Tested 45 psf



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