

Fixed Angle Ground Mount Installation Guide

High Wind Fixed Angle and Fixed Angle Ground Mount Installation Guide

KLGM-G / KRGM-G April 2020 Revision

Commercial | Residential | Industrial | Institutional

Product Certifications

SBWK-312

WEEB-M-KR

CL501TN

The above products are tested to UL 467, CAN/CSA-C22.2 No.41 US/Can safety standards for safety grounding and bonding equipment.

Hat rails, Mid Clamps and Kinetic Ground Lugs have been certified to meet the bonding requirements of UL 2703 and LTR AE-001-2012 please contact us for more details

Disclaimer

Kinetic Solar Racking and Mounting Inc. (Kinetic Solar) does not install any components of its Racking and Mounting systems. Kinetic Solar Racking and Mounting does not have any duty or responsibility for safe and proper installation and/or maintenance of its Racking and Mounting systems; including job site safety standards and procedures.

All installation work must comply with the applicable regional and local regulations or other national or international electrical standards and are the sole responsibility of the installer, contractor and/or developer.

Kinetic Solar Racking and Mounting shall not be held responsible for damages of any kind, including but not limited to: bodily harm, damage to property or injury. Kinetic Solar Inc. shall not be held responsible for the proper compliance or non-compliance with the instructions detailed in this manual including handling solar modules, solar racking or system installation.

Before attempting to install, operate or service a Kinetic Solar system, all instructions should be read and understood. Failure to follow these instructions/guidelines may result in death, injury or property damage.

Module manufacturer's guidelines should be followed at all times. Modules mounting guidelines should be followed at all times. Ensure recommended rail spacing is consistent with the provided structure. It is the sole responsibility of the customer to ensure that a compatible module is used.

Solar module width and/or length will determine the exact rail spacing. (Please refer to the module manufacturer's specifications)

Please retain this manual for future reference. Kinetic Solar reserves the right to make additions, deletions and modifications to the content of this document without prior notice.

This manual is only valid for the following Kinetic Solar Racking Systems: Static Ground Mount Models Starting with SKU KLGGM or KRGM

The instructions contained in this manual are exclusive to the products referenced. Use of any other products in conjunction with the listed products is done at one's own risk.



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General Notes

- The hot dip galvanizing process may sometimes cause zinc accumulation inside holes or along edges. This is normal. Bolts / hardware can be lightly tapped through the holes to clear the buildup. Alternatively they can be cleaned up with a drill so long as the Zinc is not completely stripped
- Drawings in this installation manual are examples and are NOT specific to your order.
- When installing components do not fully tighten components until specified
- Prior to installation, ensure that you are in possess all of the required components for installation

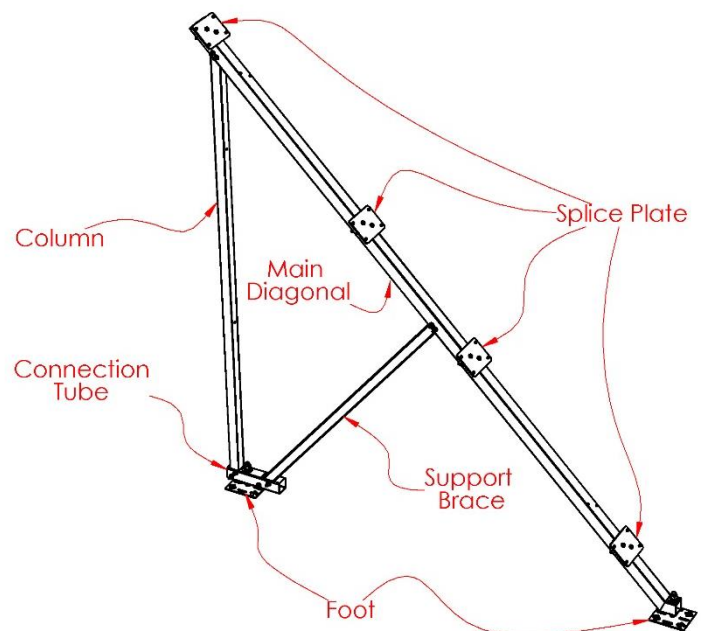
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Tools required	Main components
Measuring Tape	A-Frames (8 pcs each)
Chalk /String Line	Feet
Impact Wrench	6,8,10 Module Hat Rails
1/2" Wrench	Cross Braces
1/2" Socket	End Clamps
9/16" Socket	Mid Clamps
9/16" Wrench	Hardware
1 1/8" Wrench	
1 1/8" Socket (Deep)	
Torque Wrench	
Hammer	

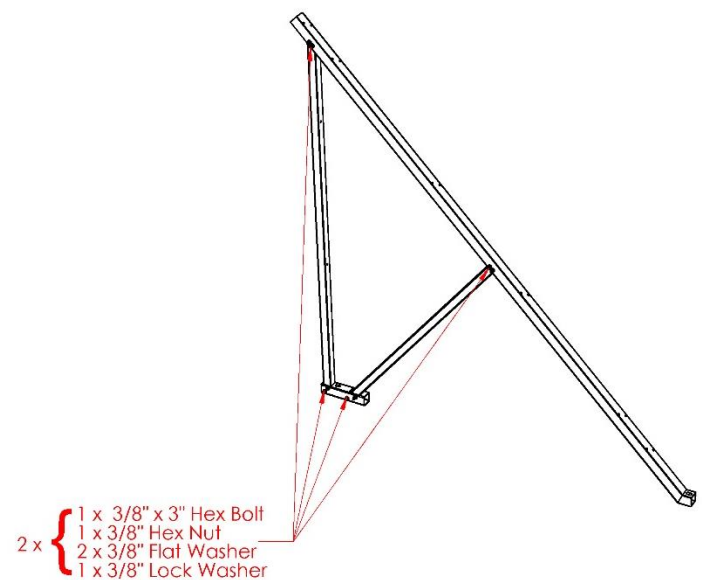
Mounting Procedure

Step 1A: Pre-Assemble A-Frames

- a. Each A-Frame consists of the following:
 - i. Main diagonal member
 - ii. Column
 - iii. Support Brace
 - iv. Connection Tube
 - v. Splice Plates (4)
 - vi. Feet (2)

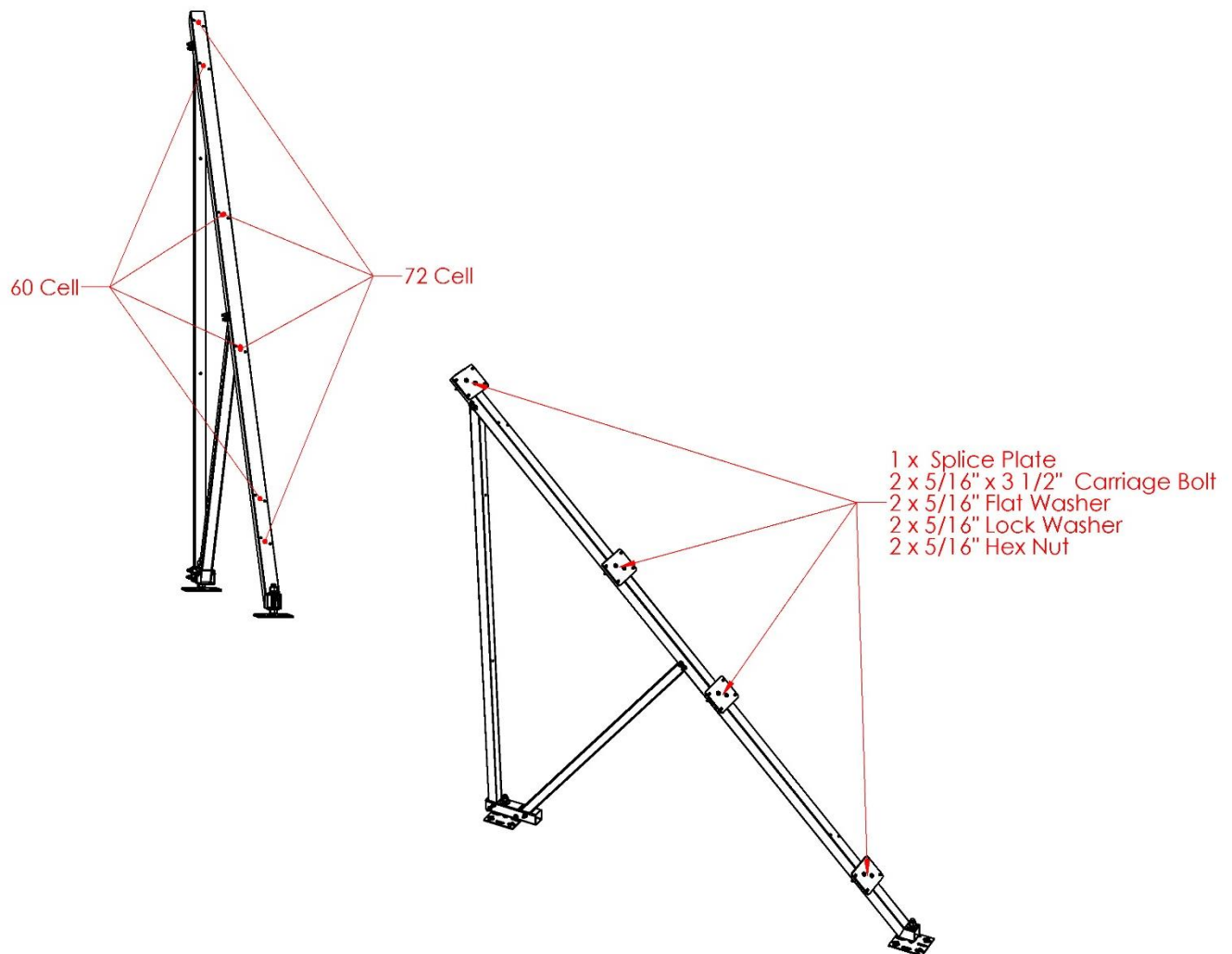


- b. Pre-Assemble the A-Frame using the included 3/8" hardware with the lock washer positioned between the flat washer and the hex nut



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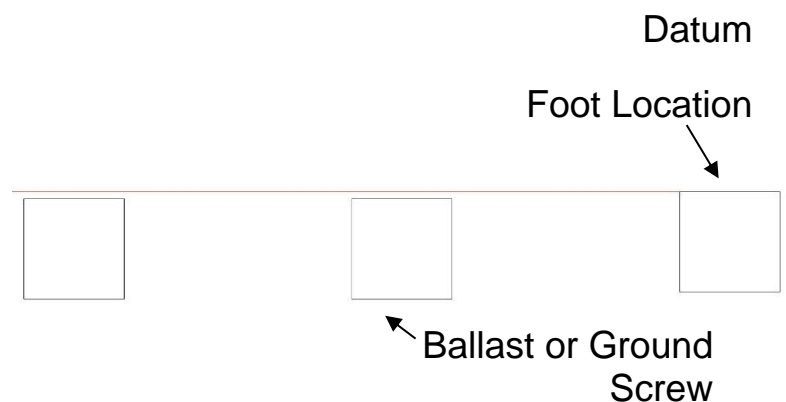
- c. Attach splice plates using supplied carriage bolts and hardware so that the slots are perpendicular to the main diagonal. The location of the plates depends on whether you are using 60 or 72 cell modules. Check the module manufacturers guidelines to ensure that your modules are compatible. Ensure that they are square and torque to 12 ft-lbs.



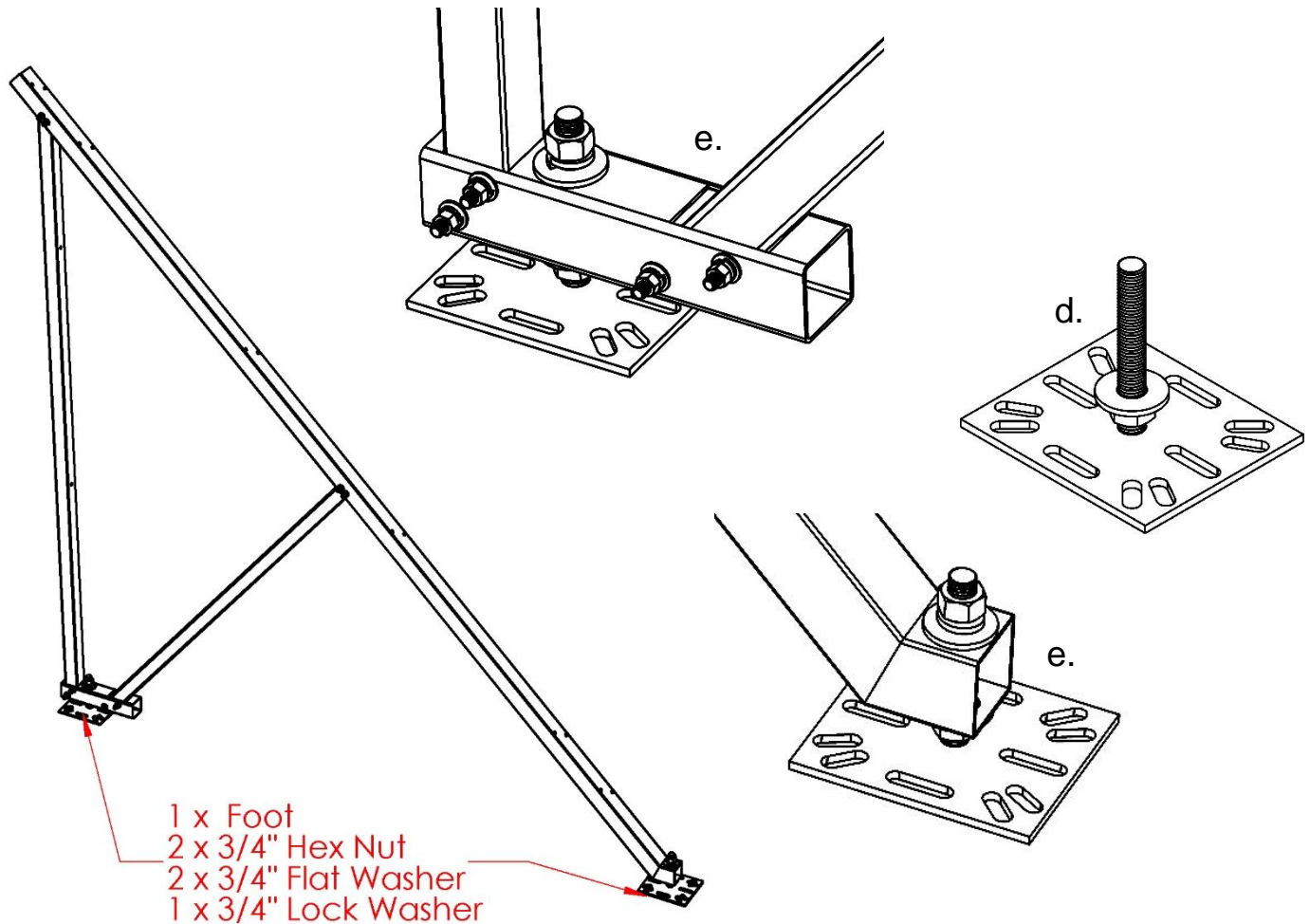
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Step 1B: Place A-Frames

- a. Determine the model of ground mount that you are installing. If you are using the **High Wind Ground Mount**, the length of the cross bracing will be 131.45”, if you are using the **Standard Ground Mount** model the cross bracing will be 170.6”
- b. Position feet on foundation – See Appendix 2 Spacing Guidelines and Appendix 3 Foot Detail
 - i. Spacing between A-Frames is 124.5” if using the **High Wind Ground Mount** and 165.17” if using the **Standard Ground Mount**
 - ii. Spacing between front and rear feet is 72.25”
- c. Establish the highest point (ballast or ground screw) where an A-Frame foot will be located. This will be known as the datum foot. Once the position is confirmed for all feet fasten them in place (Hardware not included)



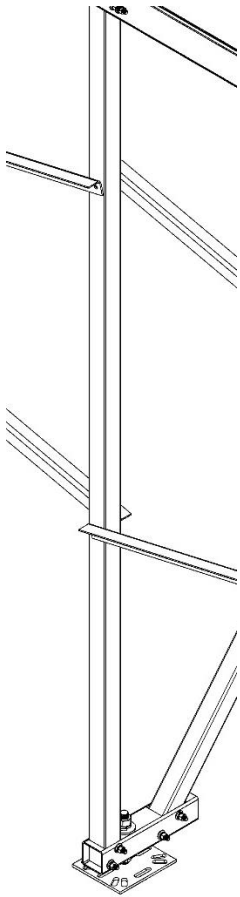
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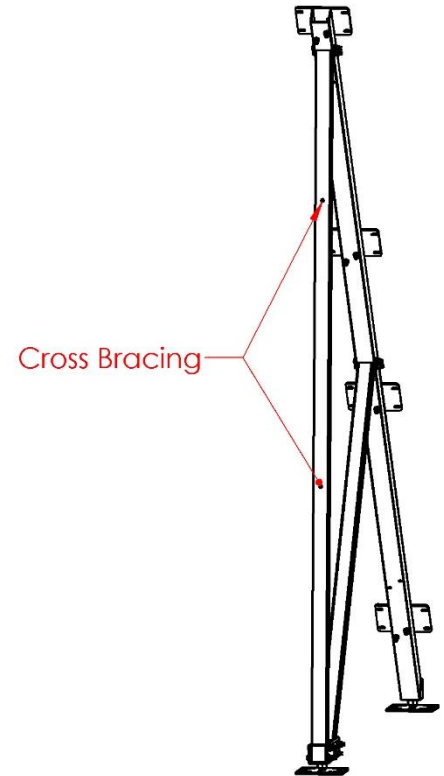
- d. Place the assembled A-Frame on top of the feet with the hex nut and flat washer pre-installed
- e. Secure in place using the flat washer (3/4"), lock washer (3/4") and hex nut (3/4") do not fully torque

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Step 2: Attach cross bracing



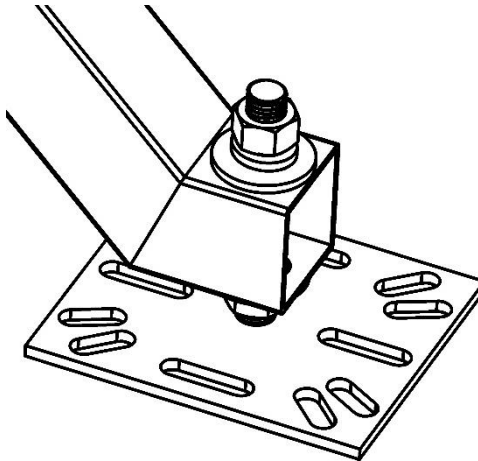
- a. Mount cross bracing to A-frames
 - iii. If the A-frame is in the middle of the array, the bolt (5/16" x 3 1/2") goes through both pieces of cross bracing
 - iv. Refer to diagram to ensure the correct holes are being used
 - v. The cross bracing is designed to be installed on opposite sides of the A-Frame
- b. Fully tighten and torque the cross bracing



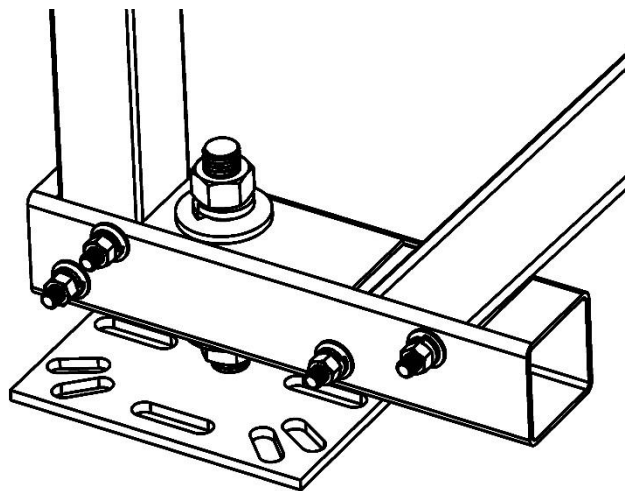
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Step 3: Secure Structure

- a. The front and rear feet should look as shown. Do not fully torque $\frac{3}{4}$ " hardware until all of the feet have been determined to be level.



Note: Feet Shown Before Torqueing

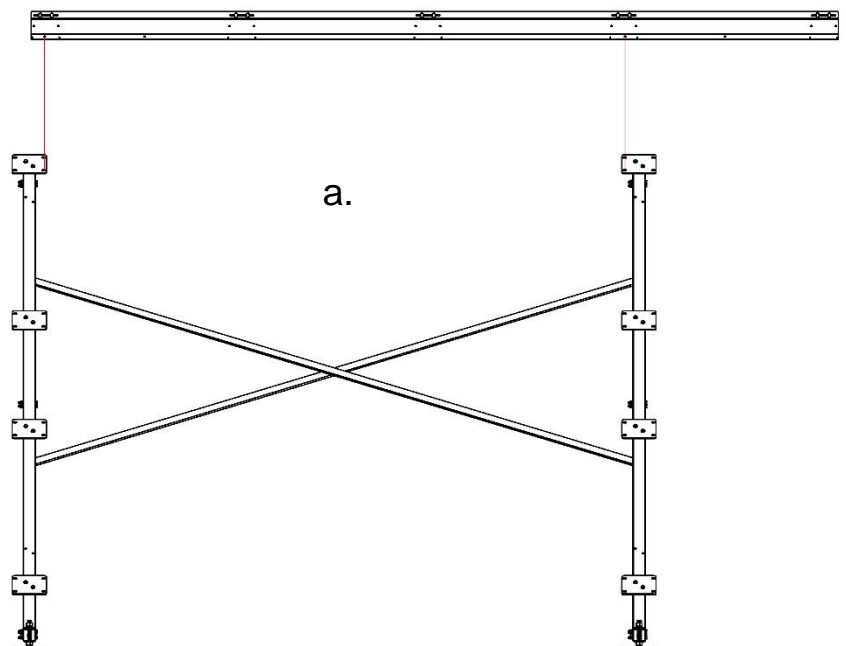


- b. Fully torque all of the nuts related to the height adjustment of the feet once the position and level has been confirmed
- c. Fully torque the rest of the hardware

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Step 4: Mount Hat Rails

- a. Mount the hat rails to the splice plates that have been installed on the A-Frames. Hat rails always attach to the innermost set of holes of the splice plate.
- b. The splice plates have slots to accommodate the hat rail in order to provide some tolerance for error. It is best to install the bolt in the middle of the slot wherever possible.
- c. The hardware must be assembled in the following order from top to bottom:
 - i. 5/16" x 3/4" bolt
 - ii. Lock washer
 - iii. Flat washer
 - iv. Hat rail
 - v. Flat washer
 - vi. Hex nut



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Step 5: Final Tighten and Torque

- a. Systematically tighten and torque all of the bolts in the structure to the following values.

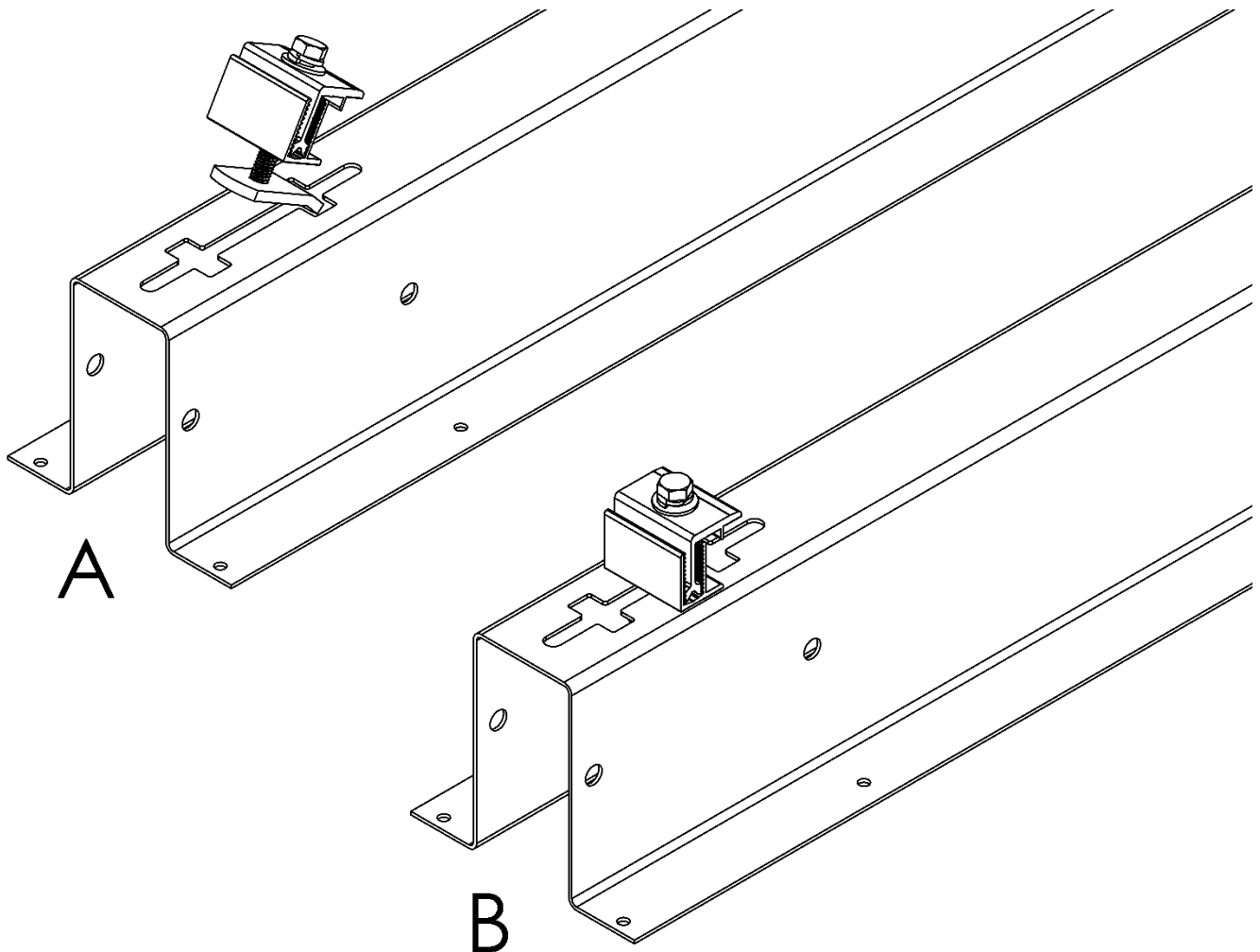
Torque Chart

5/16"	12 ft-lbs
3/8"	20 ft-lbs
3/4"	125 ft-lbs

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Step 6: Mount Modules

- a. Insert the end clamps at the end of each rail by inserting the bent end of the nut into the large cutout portion of the slot and pivoting so that the nut is in the channel of the hat rail and the end clamp is sitting on top



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- i. Make sure that the end clamp is set to the correct size for the module you are using.
 - ii. The end clamp should touch both the rail and the module without tightening
 - iii. If it is not the correct height, disassemble the clamp, slide the teeth into the correct spot and reassemble
- b. Position modules on top of rails in desired position
 - c. Insert mid clamps by sliding or lifting edge of module and inserting in a similar fashion to the end clamps
 - d. Slide modules into desired position (ensure squareness) and torque end and mid clamps to fix in place

Required Maintenance

At 6 months and 12 months after installation and at least once yearly afterwards, check to ensure that all bolts remain at the proper torque setting.

Appendix 1 – Grounding Guidelines

One grounding lug is required per array. Grounding can be achieved using a Kinetic Grounding Lug attached to either Hat Rail or the A-Frame.

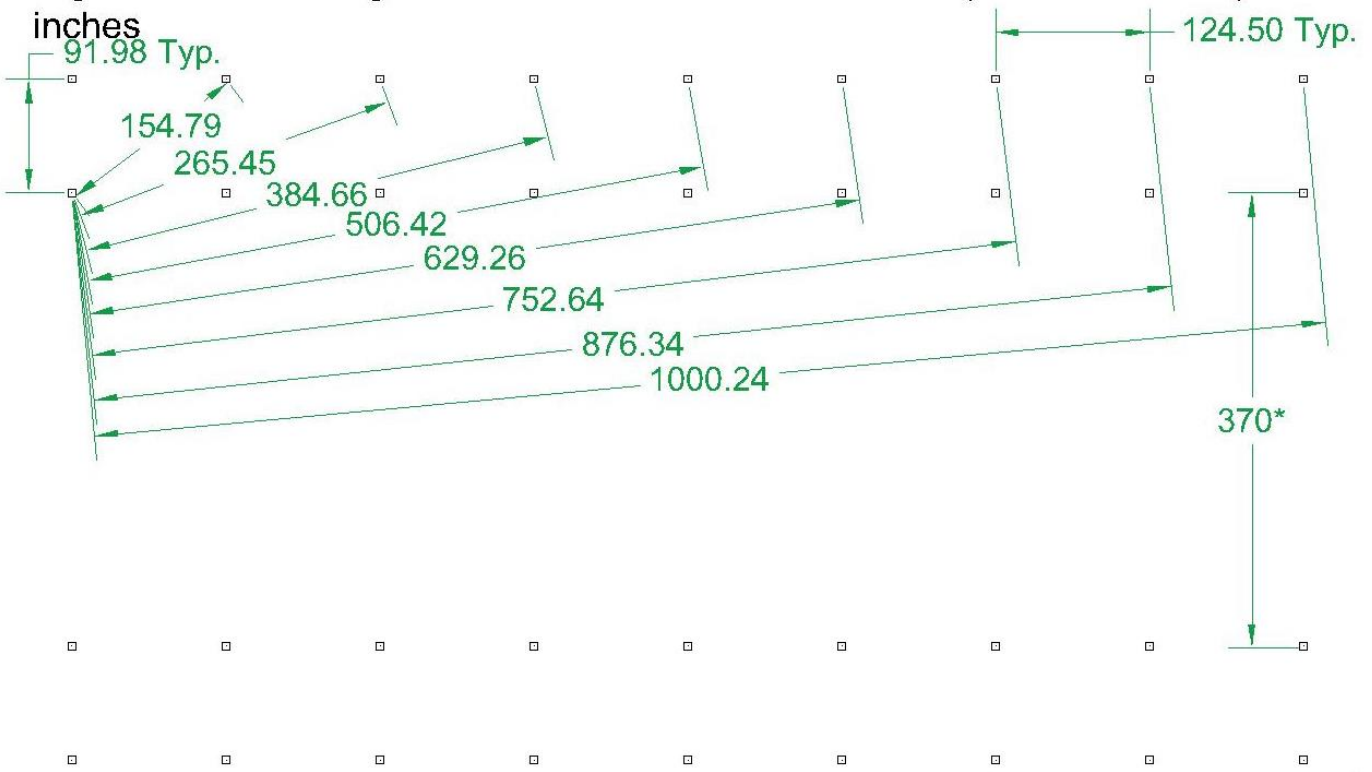
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Appendix 2 – Spacing Guidelines

See next page for Standard Ground Mount Foot Spacing Guide

KRGM-G Foot Spacing Guide

High Wind Fixed Angle Ground Mount - All Dimensions (Centre to Centre) are in inches



*Reccomended spacing, optimal spacing will vary from site to site (based on 18° back angle)

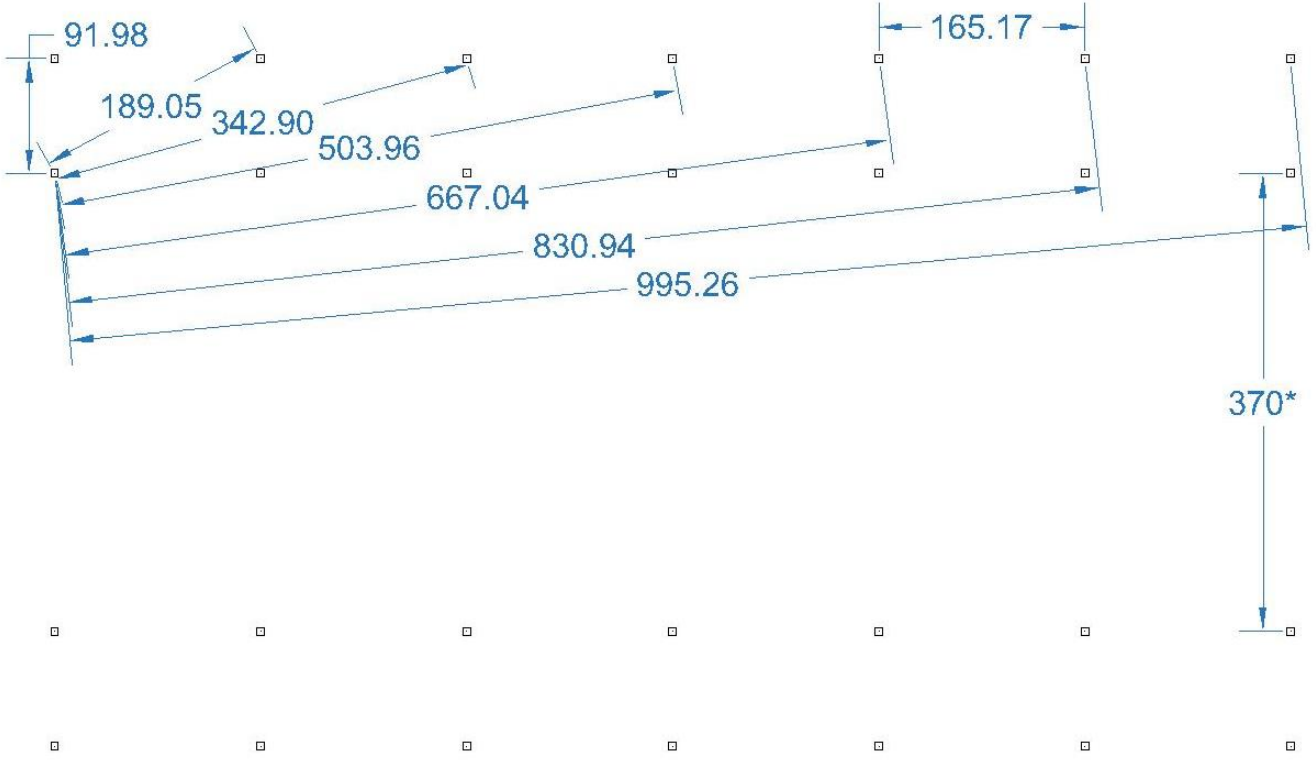


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See previous page for High Wind Ground Mount Foot Spacing Guide

KLGM-G Foot Spacing Guide

Fixed Angle Ground Mount - All Dimensions (Centre to Centre) are in inches

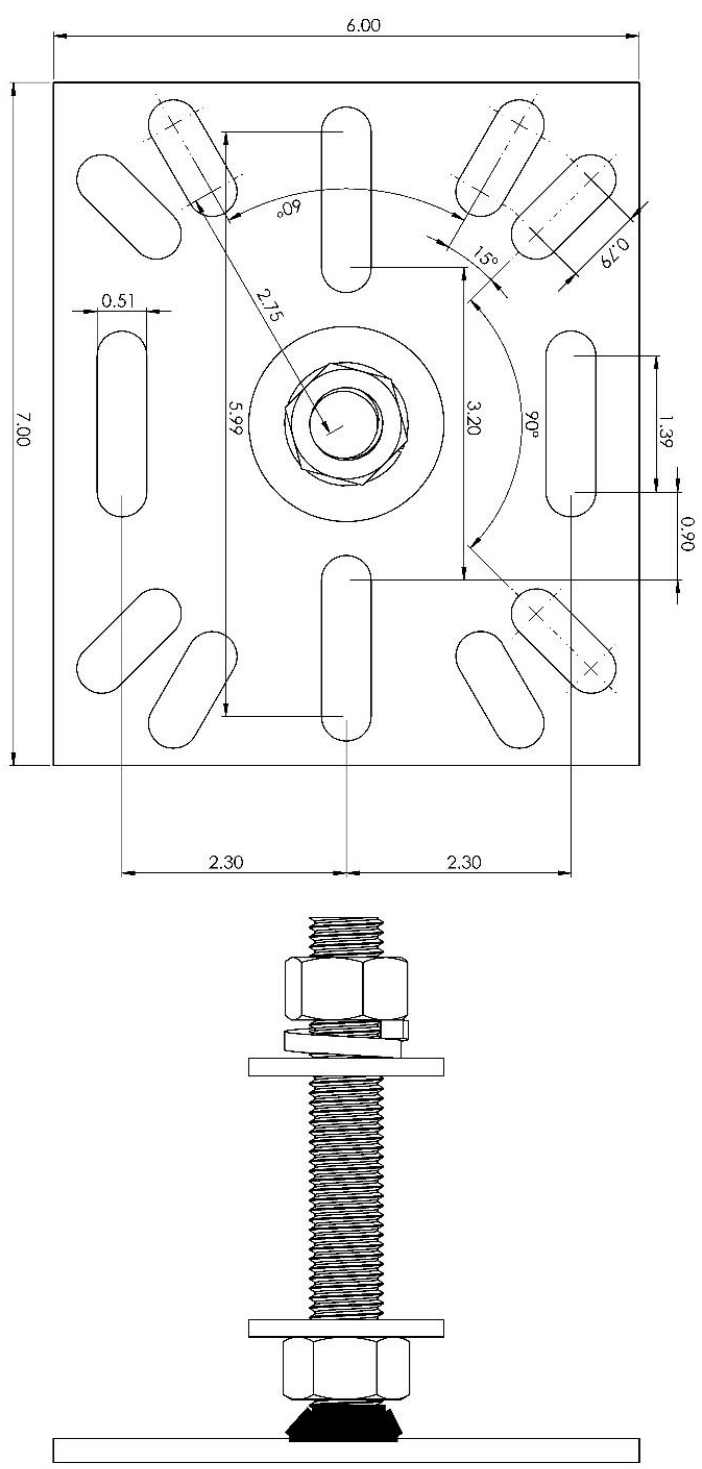


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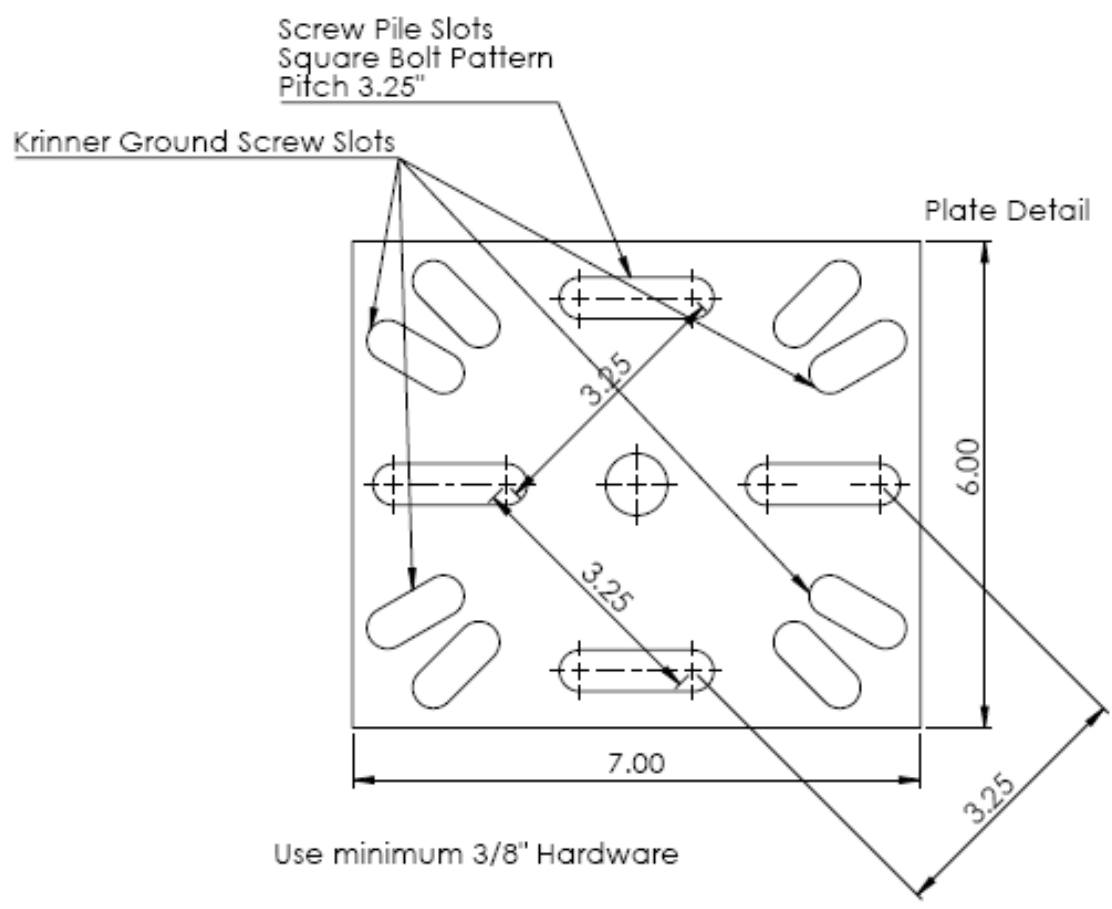


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Appendix 3 – Foot Detail



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Foot Positioning Tolerance	Screw Piles / Ballast Blocks / Sonotubes	Krinner Ground Screws
Z Tolerance	± 0.5"	± 0.5"
X Tolerance	± 1.07" ^{**} or ± 0.375" ^{****}	± 0.375"
Y Tolerance	± 0.25" ^{**} or ± 0.945" ^{****}	± 0.25"

*Tolerance is the maximum cumulative tolerance allowable
 ** Slot Oriented in the X direction
 *** Slot Oriented in the Y direction