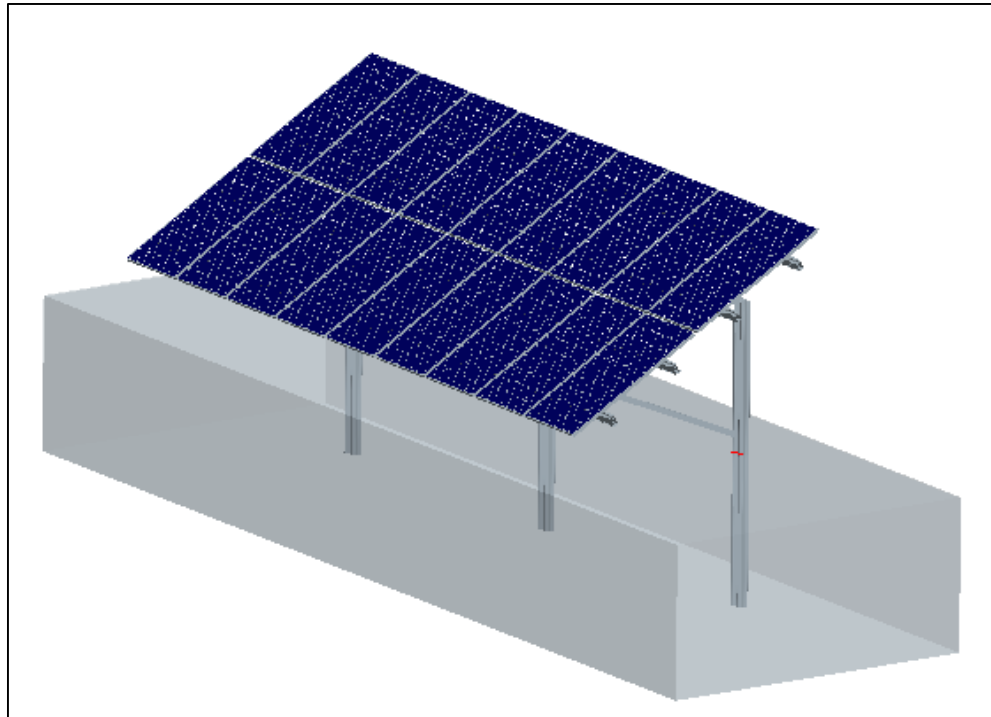


Alu-Pile Ground System

Installation Manual 2012



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1. Introduction

1.1 Intended use

- Are intended to be used by individuals with sufficient technical skills for the task. Knowledge and use of hand tools, measuring devices and values is also required.
- Include various precautions in the forms of Notes, Cautions, and Warnings. These are to assist in the assembly process and/or to draw attention to the fact that certain assembly steps may be dangerous could cause serious personal injury and/or damage to components. Following the step-by-step procedures and these precautions should minimize the risk of any personal injury or damage to components making the installation not only safe but an efficient process.

1.2 Service life warranty

Fasten Solar Solar provides a warranty of 10 years for the service life of all materials used.

1.3 Safety

The following basic safety instructions and warning symbols form an essential part of this manual and are of fundamental importance when handling this product.

- Do not remove or disable any safety devices.
- Comply with the relevant safety regulations.
- The presence of a second party who can provide help in the event of an accident is obligatory during the entire installation process.
- Keep a copy of this installation manual in the immediate vicinity of the system.

1.4 Responsibilities of the owner/operator

The system operator has the following safety-related responsibilities:

- To ensure that installation of the system is only carried out by individuals with specialist technical knowledge and basic knowledge of mechanical engineering.
- To ensure that those commissioned to perform the work can evaluate their assigned tasks and recognize possible risks.
- To ensure that those commissioned to perform the work are familiar with the system components.
- To ensure that the installation manual is available during installation. The installation manual is an integral part of the product.
- Ensure that the installation manual, and in particular the safety instructions, are read and understood by the relevant personnel before installation.
- Ensure that the permissible operation conditions are observed. Mounting systems is not liable for damage occurring when these conditions are not adhered to.
- Ensure the durability of all connections and the attachment of the system.
- Ensure that suitable lifting gear is used for installation.

- Ensure that only Mounting System components are used when parts need to be replaced. Otherwise any warranty claim is null and void.

2. Planning

2.1 Installation Location

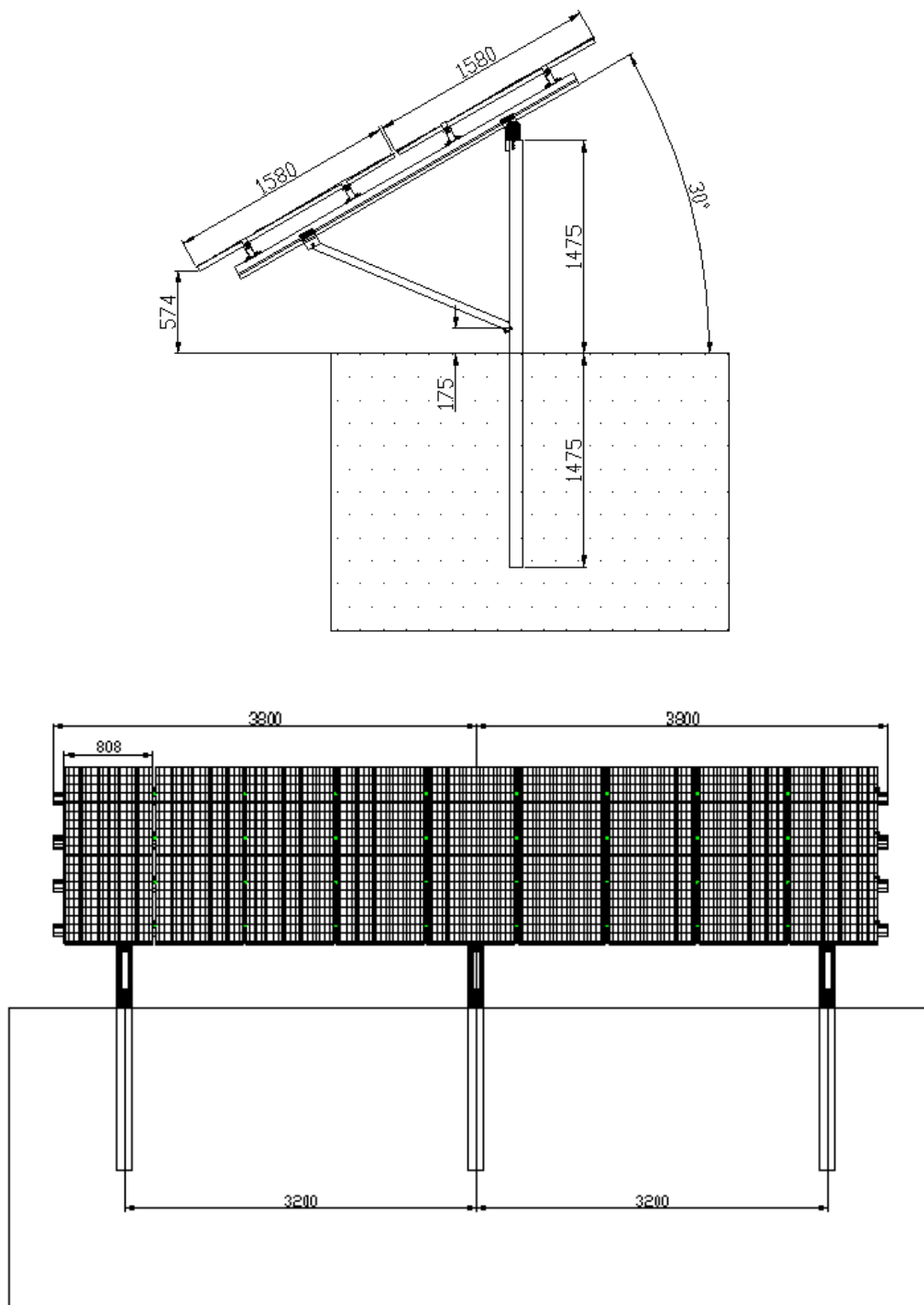
The Pile-Ground Mounting System is application for the particular location ,such as non-sandy soil with dense enough. It is recommended to consult with the local engineer to do it before the beginning of the project.

number	Item of Inspection		Application conditions
1	Soil	Soil Type	No hard thick underground obstacles silty clay and sand soil which is close-grained
2		Acidity and Alkalinity	Neutral soil PH: 6.5~7.2
3		Moisture content	Soil moisture less than 30%

2.1 Construction of soil condition to Pile-Ground Mounting System

2.2 Layout Drawing

A general layout drawing is made of every system before delivery. This drawings show the accordant admeasurements and the position of every components and also the type of the connectors. Example : when the module size is 1580x808x46mm, the array configure is 2x9, which placed portrait. The tilt angle is 30deg. The planning drawing could be as shown as below.



Front view

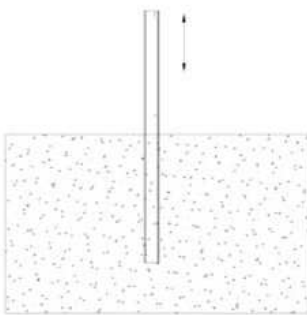
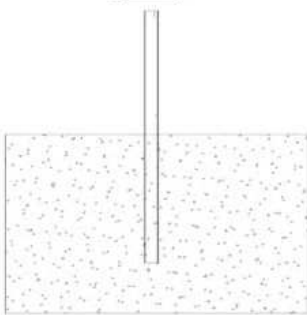
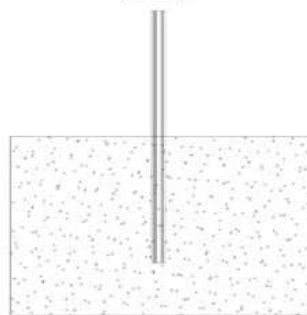
2.3 Grounding Planning

The grounding work has to be carried out by business specializing in grounding. Based on our design of the units you have to compile grounding plans so that the works flow smoothly. These plans have to be completed at least a week before the beginning of the grounding work. These plans have to show the position of the piles and have to dimension it accordingly. Furthermore, you have to mark the first and the last pile of

every line with a dowel. If a line is longer than 50m there will be markings(dowels) necessary within the lines.

2.3.1 Tolerance by grounding:

The grounding company should keep the following tolerances to provide a good basis for the further mounting.

Height	Slop (North-South)	Slop (East-West)
		
$\pm 10\text{mm}$	$\pm 2 \text{ deg}$	$\pm 2 \text{ deg}$

Tolerance grounding

2.3.2

After the grounding the upper parts of the piles have to be coated with zinc dust primer.

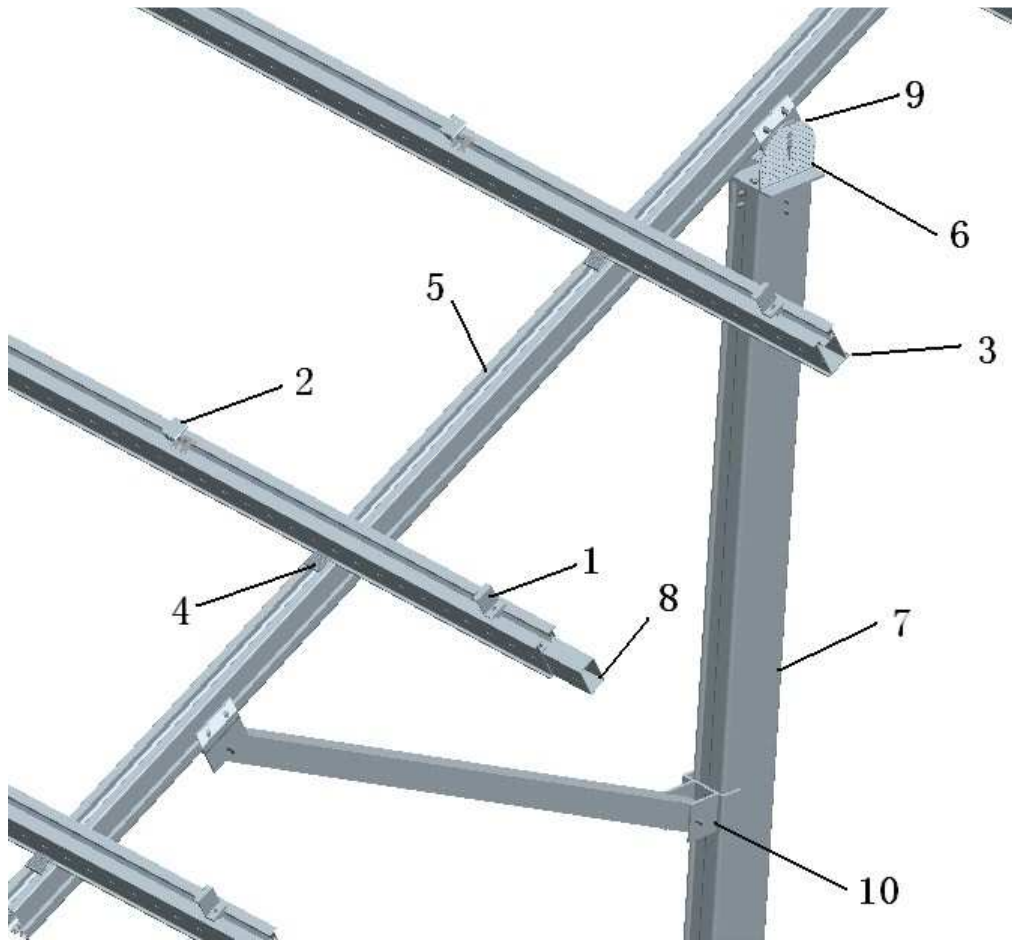
Attention!

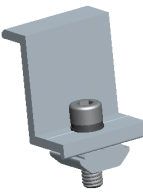
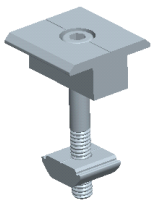
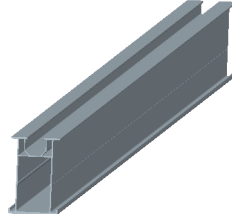
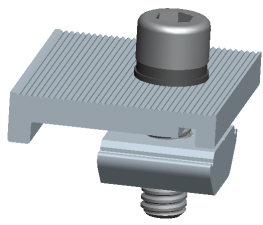

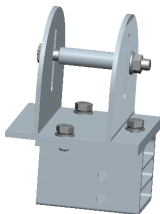
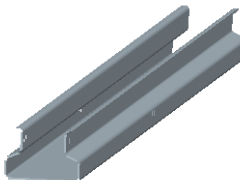
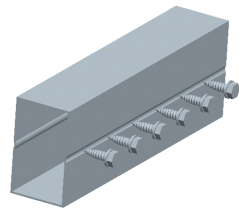
Only a special color (Zinc Dust Primer) will give the needed protection and is accredited according to the standards. Simple zinc color-sprays will not give long-term protection!

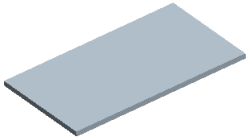
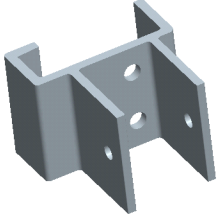
2.4 Installation tools

- Hydraulic Pile Driver equipment
- Hexagon Key
- Electrical drill
- Adjustable wrench
- String
- 5 meter tape

3. Overview of system components (one unit)



Overview of system components			
			
1. End Clamp(8pcs)	2. Middle Clamp (32pcs)	3. Heavy-Rail (8pcs)	4. Clamp for Heavy-Rail (24pcs)
			
5. Support(Pre-assembled)(3pcs)	6. Pile Head (3pcs)	7. C-Pile(3pcs)	8. Splice for Heavy-Rail(4pcs)

	
<p>9.Barrier Block(3pcs)</p>	<p>10.Pile brace(3pcs)</p>

4. Installation Steps

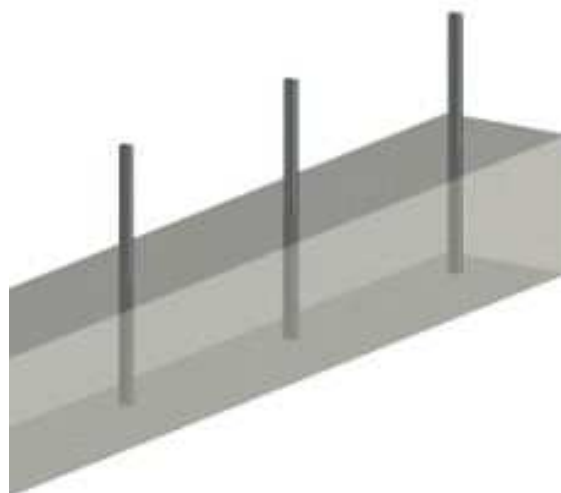
Installation instruction in six steps:

1 . Install the C-Pile

Before installation, please prepare the products and installation tools. Make sure the Hydraulic pile driver equipment can be applied in the construction work. Please confirm whether the soil conditions is all right before piling, if not satisfy please contact Fasten Solar customer services.

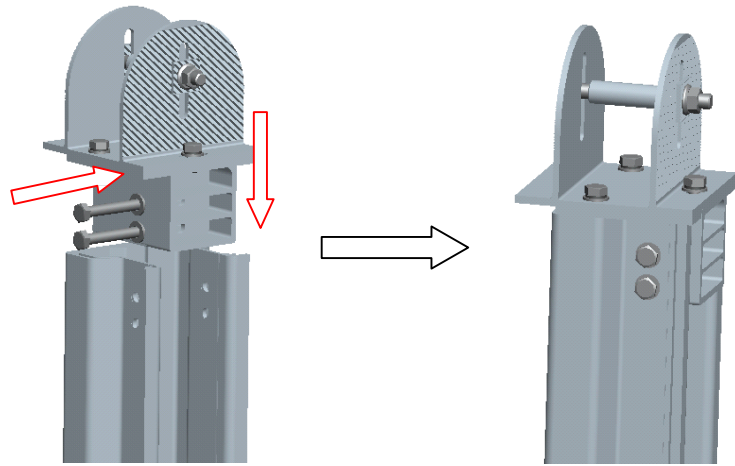
Mark the line of the C-Pile array. Define the distance of two **Piles**, drive the piles into the earth with the help of a string to make sure all the Piles are in the same line and height (The Tolerance for the height: $\pm 10\text{mm}$) .

Note: Please make sure **piles** are stable after piling



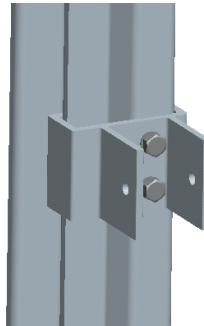
2 . Mount Pile Head

Install the **Pile Head** and fix it with Hexagonal Bolt and Nut. (Recommended bolt torque 40N·M)



3 . Mount Post Brace

Snap the **Pile Brace** from one side of Post. Then fold it and fasten it to pile with Hexagonal Bolt and Nut. (Recommended bolt torque 40 N·M)

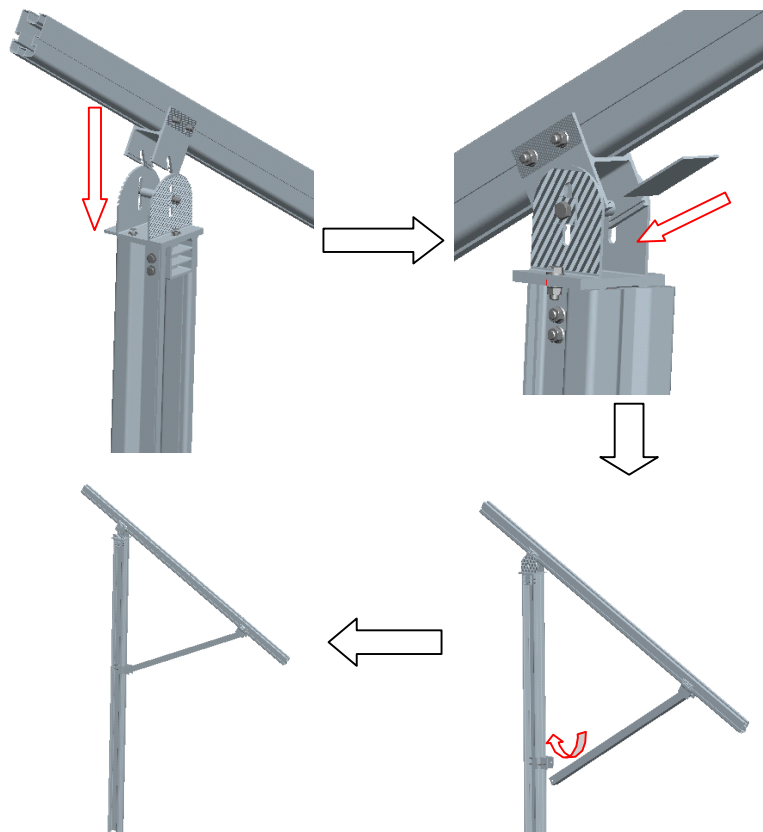


4 . Install the Support(Pre-assembled)

Connect **support** with Pile Head and fasten it with Hexagonal Bolt and Nut. (Recommended bolt torque 40N·M)

Connect **support** with **pile brace** fasten them with Hexagonal Bolt and Nut. (Recommended bolt torque 40N·M)

After installing the **support**, adjust the system to make sure all the **support** Beams are in the same line and height.



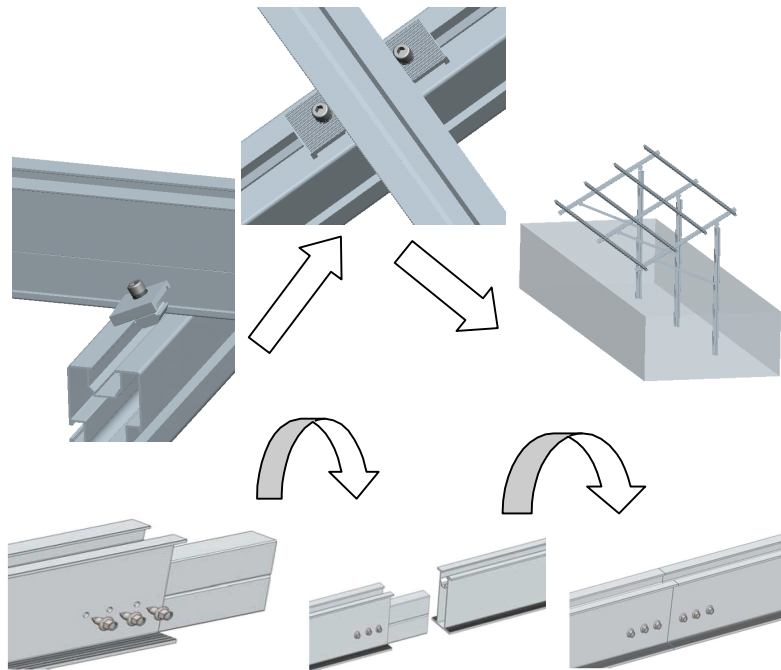
5. Install the heavy-rail on the beam

Make sure the distance between two **Heavy-Rails**, and attach **Heavy-Rail** to **Beam** with one **Clamp for Heavy-Rail** on each side.

(Recommended bolt torque 18N·M)

Make sure the length of Heavy-rail is long enough before connecting it with **Beam**.

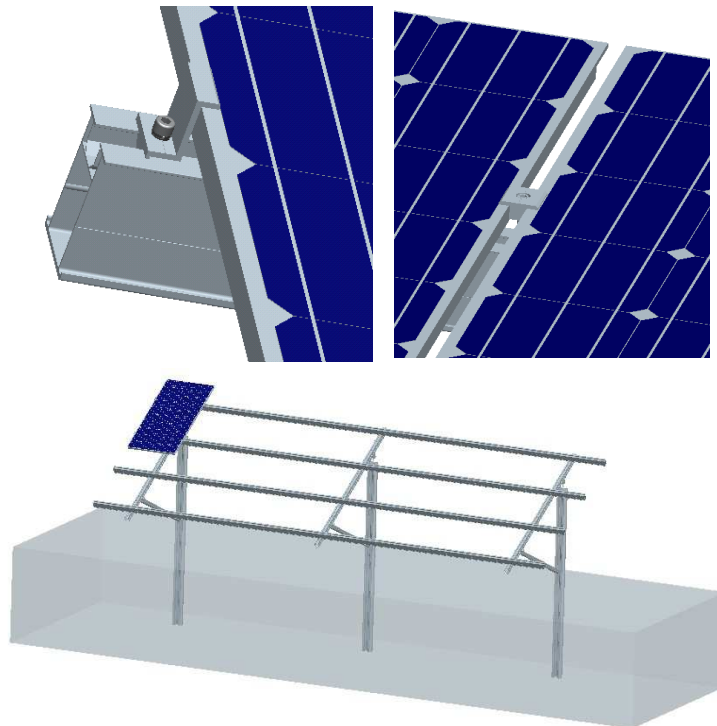
Splice for Heavy-Rail can be used to extend the rails.



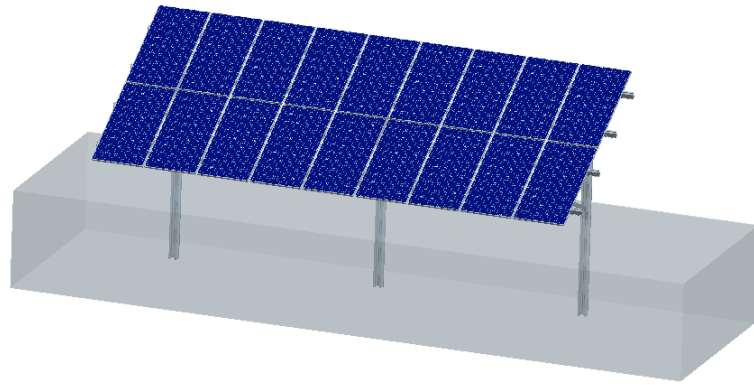
6. Mount the panels

Use **End Clamps** and **Middle Clamps** to fix the panels. Then fasten them using Allen key.

(Recommended bolt torque 18N·M)



The installation of the structure is finished.



5. Warranty

10 years limited Product Warranty, 25 years long life span.

Fasten Solar Solar Ltd warrants to the original purchaser (“Purchaser”) of product(s) that it manufactures (“Product”) at the original installation site that the Product shall be free from defects in material and workmanship for a period of ten (10) years, except for the anodized finish, which finish shall be free from visible peeling, or cracking or chalking under normal atmospheric conditions for a period of five (5) years, from the earlier of

- 1) the date when the installation of the Product is completed, or
- 2) 30 days after the purchase of the Product by the original Purchaser (“Finish Warranty”).

The Finish Warranty does not apply to any foreign residue deposited on the finish. All installations in corrosive atmospheric conditions are excluded. The Finish Warranty is VOID if the practices specified by AAMA 609 & 610-02 – “Cleaning and Maintenance for Architecturally Finished Aluminum” (www.aamanet.org) is not followed by Purchaser. This Warranty does not cover any damage to the Product that occurs during its shipment, storage, or installation.

This Warranty shall be VOID if installation of the Product is not performed in accordance with Fasten Solar’s written installation instructions, or if the Product has been modified, repaired, or reworked in a manner not previously authorized by Fasten Solar IN WRITING, or if the Product is installed in an environment for which it was not designed. Fasten Solar shall not be liable for consequential, contingent or incidental damages arising out of the use of the Product by Purchaser under any circumstances.

If within the specified Warranty periods the Product shall be reasonably proven to be defective, then Fasten Solar shall repair or replace the defective Product, or any part thereof, in Fasten Solar's sole discretion. Such repair or replacement shall completely satisfy and discharge all of Fasten Solar's liability with respect to this limited Warranty. Under no circumstances shall Fasten Solar be liable for special, indirect or consequential damages arising out of or related to use by Purchaser of the Product.

Manufacturers of related items, such as PV modules and flashings, may provide written warranties of their own. Fasten Solar's limited Warranty covers only its Product, and not any related items.