

# Solar Roof Mounting System Installation Manual



XIAMEN GRACE SOLAR TECHNOLOGY CO., LTD.



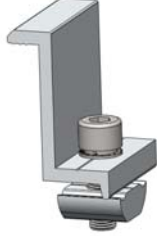
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## Simply installation for Flat Rail on the Shingle Roof

### 1.1 Components

 <p>GR-IK-FR FB Rail Hook for Shingle Roof, include 2 pcs wood screw M6x80</p>	 <p>GR-IC-F Framed Inter Clamp</p>	 <p>GR-EC-F Framed End Clamp</p>
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### 1.2 Install tool

<ul style="list-style-type: none"> <li>✓ 6 mm Allen key or hexagonal driver bit. If using a 6mm driver bit, make sure the cordless power tool used for the driving has a hand-tight clutch setting a fine (soft) impact drive to prevent damage to the fragile glass panels and threads on the Structure.</li> </ul>	
<ul style="list-style-type: none"> <li>✓ Cordless drill; Drill or impact driver for driving roof material fixings</li> </ul>	
<ul style="list-style-type: none"> <li>✓ Gloves; Protect the hazard of the sharp corners.</li> </ul>	
<ul style="list-style-type: none"> <li>✓ Cord or color pen; Mark the installation position;</li> </ul>	
<ul style="list-style-type: none"> <li>✓ Spirit level</li> </ul>	
<ul style="list-style-type: none"> <li>✓ Rule</li> </ul>	

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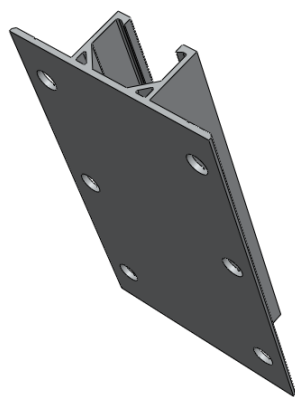
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## 1.3 Install Steps

### 1.3.1 Solution one: no rail install

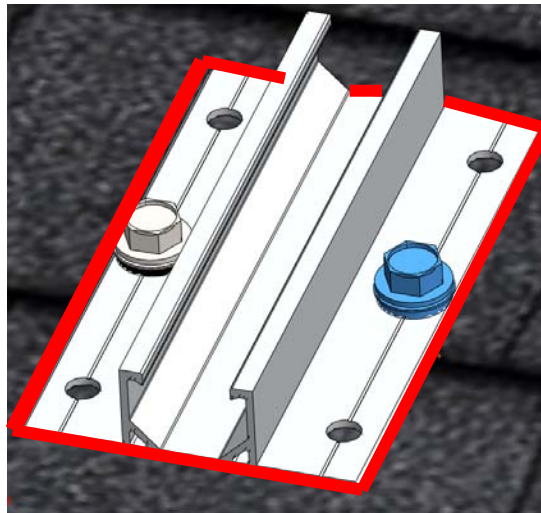
a. Label need installed hook in asphalt shingle, then coated glue in the bottom of FB rail. Use wood screw lock FB rail hook desired location, wood screw head also coated gule; Please note FB rail hook need to combination with wood beam, if wood beam distance is not suitable, then need combination with roof boarding, need according to roof boarding thickness depend on wood screw specification and quantity.



FB RAIL



waterproof glue



installed wood screw, and in around glue



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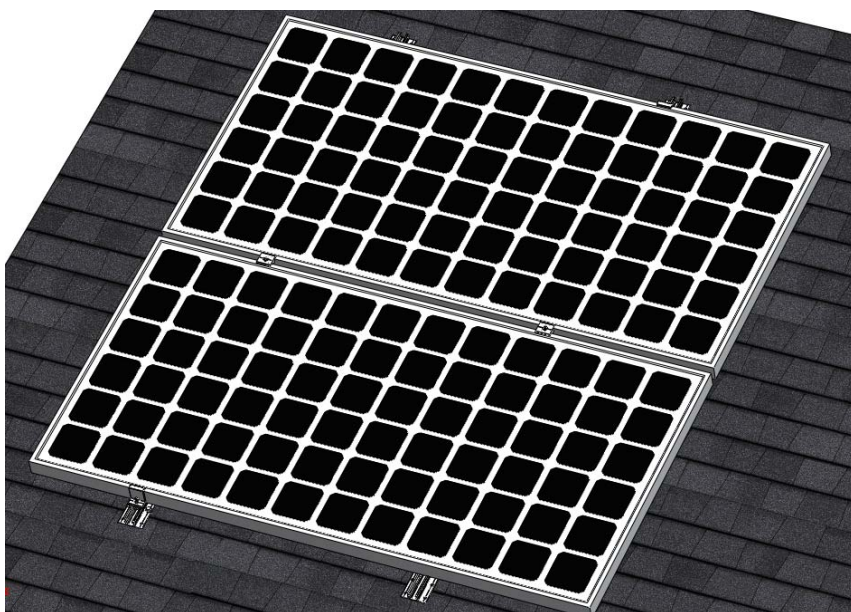
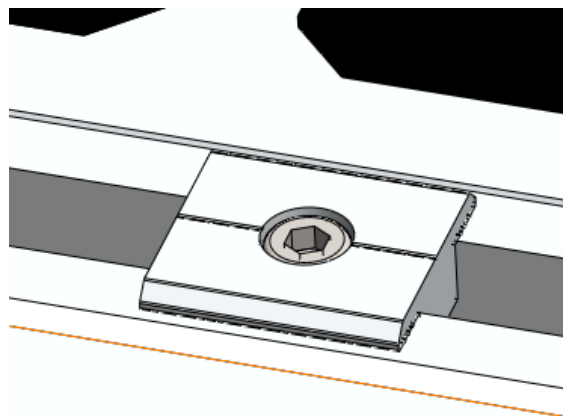
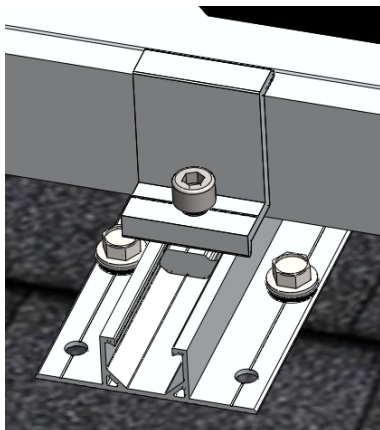
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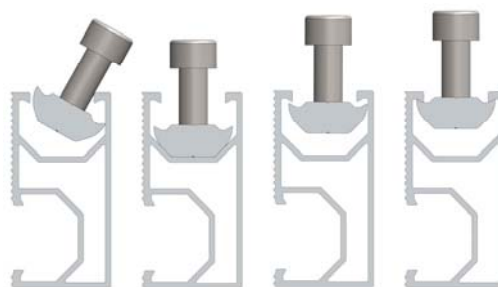
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b. Installed panel from bottom, put solar panel, fix with end clamp, with inter clamp fixed between two solar panels.



1. D-Module quick mount.  
Four steps to quick mount the D-Module into GD-Rail channel.  
Move the assembly to its desired final position, and fastens firmly in place by torque bolt to 10Nm.



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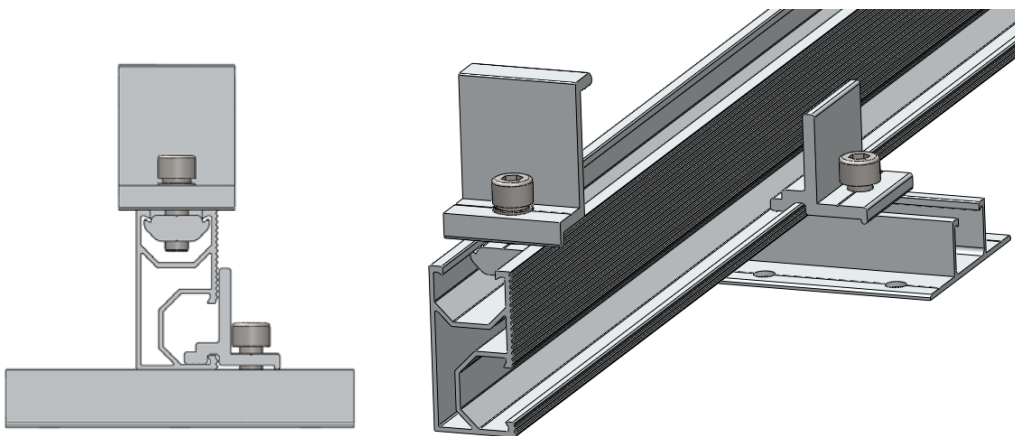


## 1.3.2 Solution 2: with Rail install

a. install the Flat Rail Hook as 1.3.1 shown. The spacing is complied with the chapter 2.



b. install the GD Rail on the Flat Rail Hook by the Rail clamp



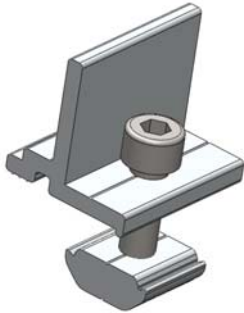
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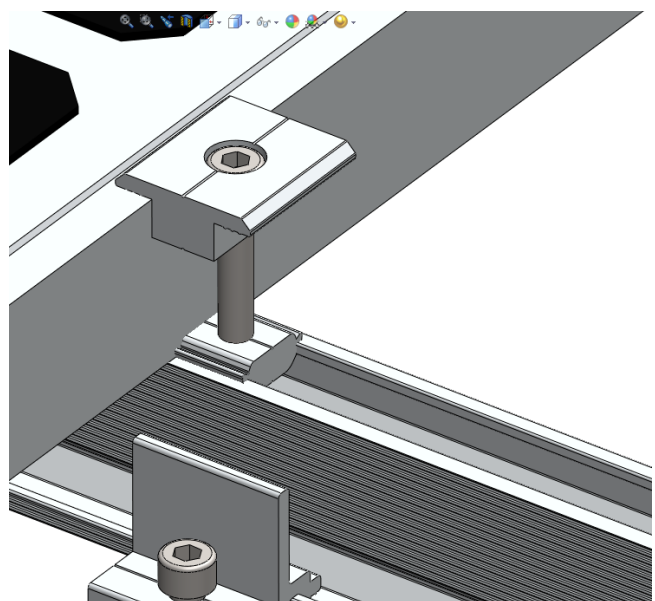
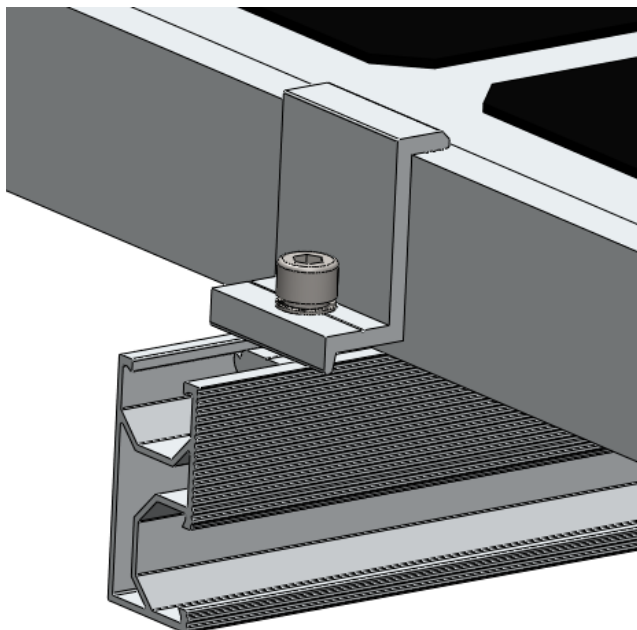
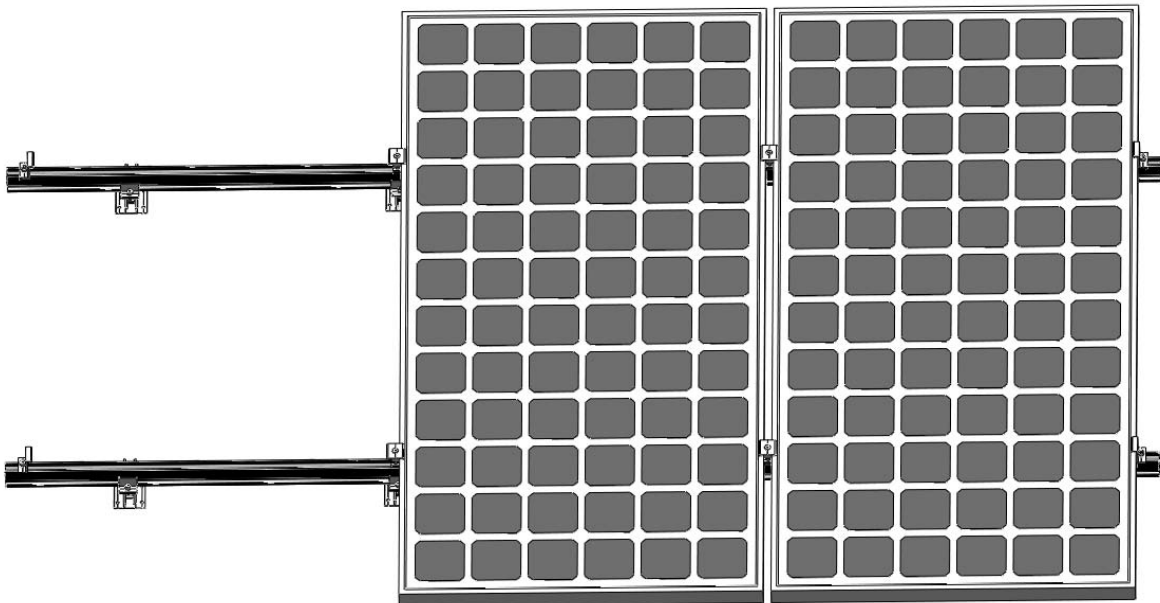
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Rail Clamp

c. Install the Module by the End Clamp and the Inter Clamp



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## 2. code-compliant AS/NZS 1170 planning

### 2.1 Determine the wind region of your installation site

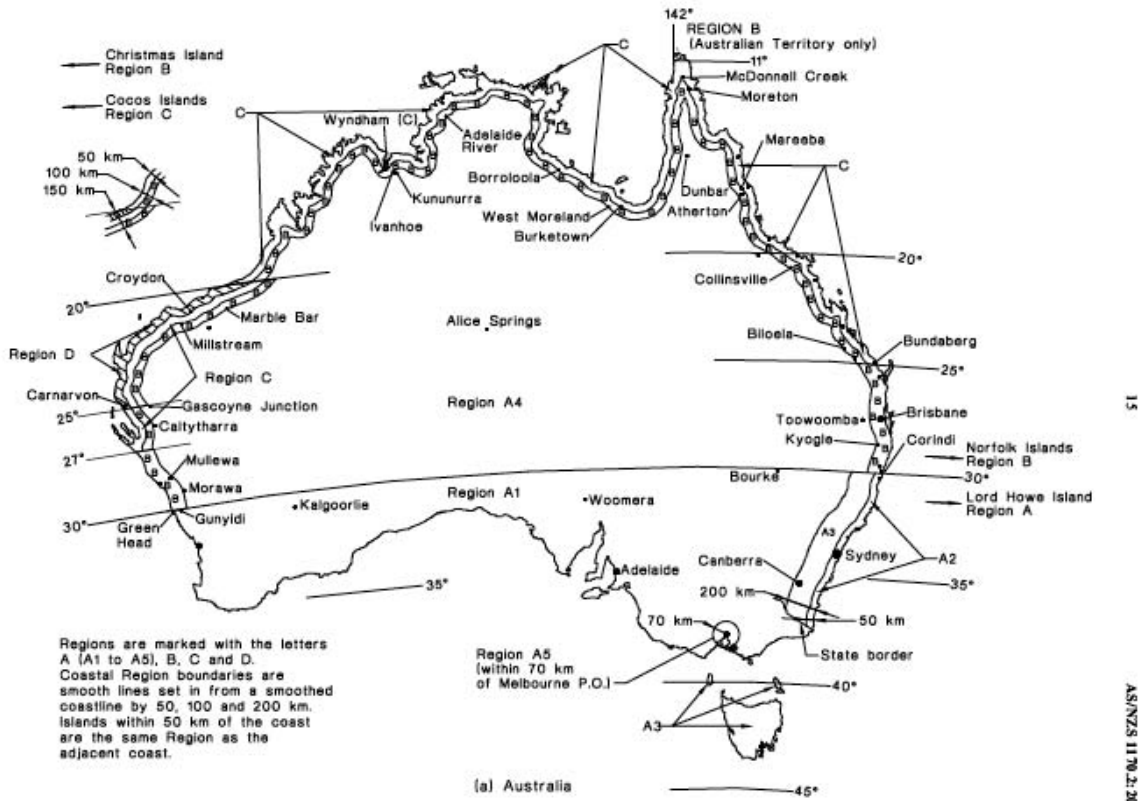


FIGURE 3.1 (in part) WIND REGIONS

#### Region Definition:

Wind regions are pre defined for all of Australia by Australian Standard 1170. The Wind Region has nothing to do with surrounding topography or buildings.

- Most of Australia is designated Region A which indicates a Regional Ultimate Basic Wind Velocity of 45msec.
- Some areas are designated Region B (57msec). Local authorities will advise if this applies in your area.
- Region C areas (66msec) are generally referred to as Cyclonic and are generally limited to northern

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coastal areas. Most Region C zones end 100km inland.

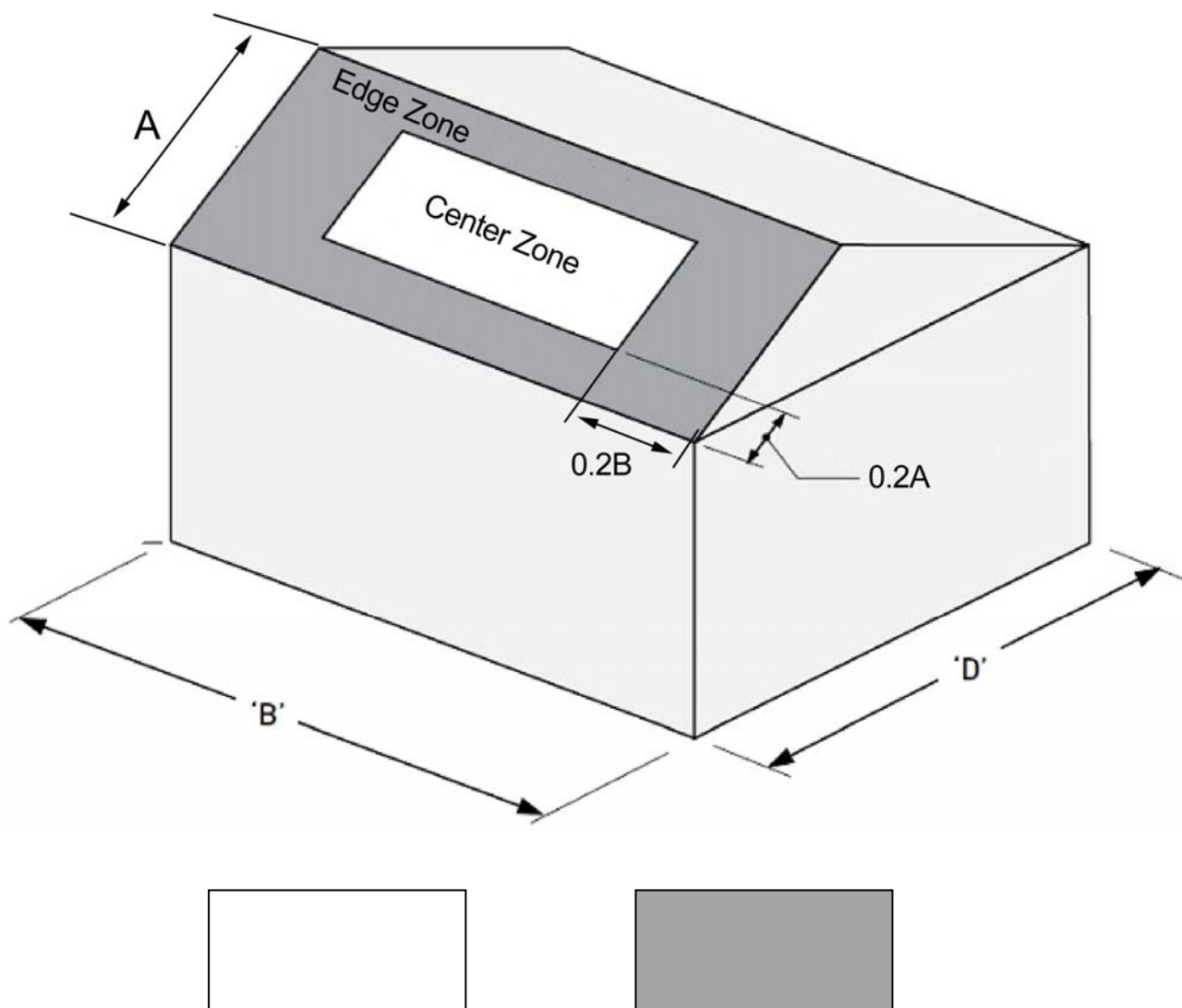
- Region D (80msec) Australia's worst Cyclonic Region between Carnarvon and Pardoo in Western Australia.

## 2.2. Determine the height of the of your installation site

This document provides sufficient information for Grace solar system installation height less than 20 meters. If your installation site is more than 20 meters in height, please contact Grace solar to obtain engineering data to support your installation.

## 2.3 Determine Roof Installation Roof Areas

Grace solar system can be installed anywhere on a roof but fixing centers are required to be reduced at ridges and edges. The diagram below shows the area of higher wind loadings within 0.2A and 0.2B of a roof edge ridge (where A and B are the planned dimension of the building).



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Center Zone

Edge Zone

The following table will help you determine the maximum rail support spacing for your project. Also note that if the roof slope is less than 10 degree the reduction on spacing does not apply.

## 2.4 Determine the Maximum Rail Support Spacing

a. Please use the following table to determine the GR Rail support spacing for Flat Rail hook.

1970mm Long Panels fixed to Shingle Roof								
Installation Height	Region A (mm)		Region B (mm)		Region C (mm)		Region D (mm)	
Max area of one panel	3.0m <sup>2</sup>		2.5m <sup>2</sup>		2.0m <sup>2</sup>		1.5m <sup>2</sup>	
Roof Area	Center Zone	Edge Zone	Center Zone	Edge Zone	Center Zone	Edge Zone	Center Zone	Edge Zone
5 Meters	2130	1500	1690	1200	1380	980	1080	
10 Meters	1940	1370	1540	1090	1260	890	990	
15 Meters	1840	1230	1460	980	1190	800	940	
20 Meters	1740		1380		1130		890	

- ✓ The above figures are based on modules lengths of up to 1970mm, maximum weight of 15Kg/m<sup>2</sup>
- ✓ The above spacing applies for fixing through thin sheet purlins (greater than 1.0mm thickness) or a minimum embedment of 50mm into timber purlins.
- ✓ Tile brackets should fixed to the rafter using two 12g mounting screws (M6x80mm)
- ✓ For 35mm embedment into timber of fixings into 0.55mm thickness steel for regions A+B remain unchanged. For regions C reduce the spacing by 15%. For region D reduce the spacing by 35%.
- ✓ In case the wooden rafters/trusses you wish to mount on are too thin and the screws would be too close to the edge of the rafters please pre-drill with a 3~4mm drill in order to avoid the splitting of the timber ( or use the side mount roof hook).

## 2.5 Verify acceptable Rail End Overhang

Rail End Overhang must equal 50 percent or less of foot spacing. Thus, if foot spacing is 1200mm, the Rail End Over hang can be up to 600mm. In this case, two feet can support a rail of as much as 2400mm (1200mm between the feet and 600mm of overhang at each end).

## 2.6 Determine Roof slope

Grace solar system can be used for roof slope up to 60 degrees. Please verify the Installation site roof slope should be between 0 degrees and 60 degrees.



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