

**SOP Title:** Installing on standing seam roofs (w. Clenergy ER-I-33)  
**Version:** SOP1137-PV-v1.1  
**Effective Date:** 12/05/2019

**DOCUMENT CONTROL**

Version no.	Date	Significant Changes	Author	Reviewers
0.1	26/11/18	Draft	AF	KT
1.0	28/11/18	First version	AF	KT, TH
1.1	06/05/19	Updated earth bonding instructions	AF	TH

**Table of Contents**

**1. PURPOSE .....2**

**2. SCOPE.....2**

**3. GENERAL GUIDELINES .....2**

**3.1 Behavioural..... 2**

**3.2 Safety ..... 2**

**3.3 Background..... 2**

**3.4 Responsibility..... 2**

**4. INSTALLATION ..... 3**

**4.1 Product Introduction ..... 3**

**4.2 Essential equipment..... 3**

**4.3 Components ..... 3**

**4.4 Before the installation..... 4**

**4.5 Limitations..... 4**

**4.6 Standard installation ..... 5**

## 1. PURPOSE

This document provides all solarcity installation partners and employees with guidelines and instructions for the installation of solar panels on standing seam roof sheets.

## 2. SCOPE

This document applies to standard solarZero installations and covers the mechanical specifics of installing the framing with the Clenergy ER-I-33 standing seam clamp.

## 3. GENERAL GUIDELINES

### 3.1 Behavioural

Always follow solarcity's Code of Conduct while on site.

### 3.2 Safety

Follow NZ Health & Safety laws and regulations, your company's and/or solarcity's Health & Safety Policy.

### 3.3 Background

Roof cladding with a standing seam is becoming more and more popular in New Zealand. The option of installing solar panels on that kind of roof cladding opens solarcity to a large number of new customers who had to be put on hold in the past.

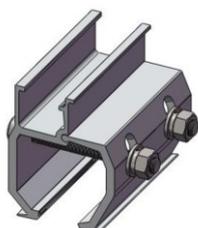
### 3.4 Responsibility

The installer is solely responsible for:

- Complying with all applicable local or national building codes
- Before going on the roof, ensuring that the roof, its rafters, connections, and other structural support members can support the array under building live load conditions (this total assembly is hereafter referred to as the roof assembly)
- Using only genuine Clenergy PV-ezRack® parts (substitution of parts may void the warranty and invalidate the letter of certification)
- Ensuring that bolts are tightened at the specified torque
- Maintaining the waterproof integrity of the roof, including selection of appropriate flashing
- Ensuring safe installation of all mechanical and electrical components of the PV array

## 4. INSTALLATION

### 4.1 Product Introduction



The Clenergy **ER-I-33** PV-ezRack Universal Klip-lok Interface is designed for standing seam metal sheet roofs. When installed in accordance with this SOP, the PV-ezRack Universal Klip-lok Interface parts will be structurally adequate and comply with the AS/NZS1170.2:2011 standard.

Figure 1 – Clenergy ER-I-33 Universal Klip-lok Interface

### 4.2 Essential equipment

- Battery drill or driver
- Torque wrench (10 - 20 Nm)
- Builder's line (string line)
- Measuring tape
- 6 mm hex bits and hex keys
- 13 mm spanners or sockets
- Crimping tool for 4mm cable lugs

### 4.3 Components

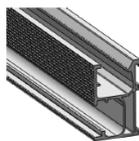
Main Components			
 ER-I-33 Universal Klip-lok Interface with Z-Module Channel	 ER-IC-ST Inter Clamp	 ER-EC-ST End Clamp	 ER-R-ECO ECO Rail
 EZ-GC-ST Grounding Washer	 Cable lug 4 mm (8 mm hole)	 Star washer (8 mm hole)	 EZ-CC-PV/4 Cable clip

Table 1 – Main components for standing seam roof installations

#### 4.4 Before the installation

There is a large number of different standing seam products with different shapes that are installed across the country. The Clenergy ER-I-33 PV-ezRack Universal Klip-lok Interface is not compatible with all of them. The exact product name and type of the standing seam sheets on the roof of a customer’s house will remain unknown in most cases. There are also other implications that make it compulsory to have a site assessment done prior to the installation.

Examples of different shapes:

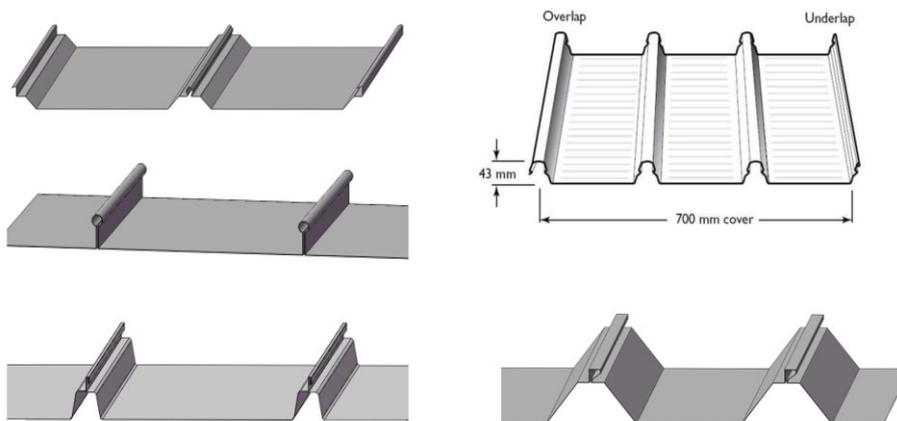


Figure 2 – Different Types of standing seam roof sheets

At the current stage, every standing seam roof installation will have a site assessment done and will be assessed by one of solarcity’s engineers before an installation date is booked.

#### 4.5 Limitations

Solarcity will limit its installations on standing seam roofs as follows:

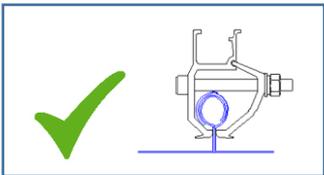
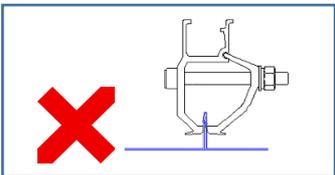
Limitation	Reason
<p><b>Only certain shapes</b></p> <p>Only shapes with a wider ‘head’ section will meet the requirements for installation</p>	<p>To avoid relying on friction only when vertical pull-out forces are present the ER-I-33 will only be installed on standing seam shapes that have a top section that is wider than the lower section.</p> <p>Examples:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div>
<p><b>No tilt kits</b></p> <p>Roof parallel installation on North, East or West facing roofs with pitch angles between 5° and 35°<sup>1</sup> only</p>	<p>The pull-out force of the ER-I-33 is limited to around 2.7 kN. Wind forces on panels that have been installed on tilt kits may exceed that value and will therefore be excluded as an option for installation on standing seam roofs. Pitch angles lower than 5° are excluded due to insufficient self-cleaning of the solar panels.</p>

Table 2 – Limitations regarding sheet type and roof pitch

<sup>1</sup> Feasibility of installing on roofs with a pitch angle higher than 35° will be discussed with the installer on a case-by-case basis before the installation is booked.

#### 4.6 Standard installation

The standard installation on standing seam roofs does not require Clenergy ECO-Rails. The frame of the panel is placed directly onto the ER-I-33 clamp and fixed with either an end clamp or a inter clamp.

The panels rest on the ER-I-33 clamps on their long edge and will therefore be installed in landscape orientation. The clamping distance and maximum panel overhang must be taken into consideration by choosing a proper mounting distance of the clamps on the seams. The panel overhang should not exceed  $\frac{1}{4}$  of the panel length.

Example:

Panel length = 1650 mm  $\rightarrow$  maximum overhang = 412 mm

##### Step 1

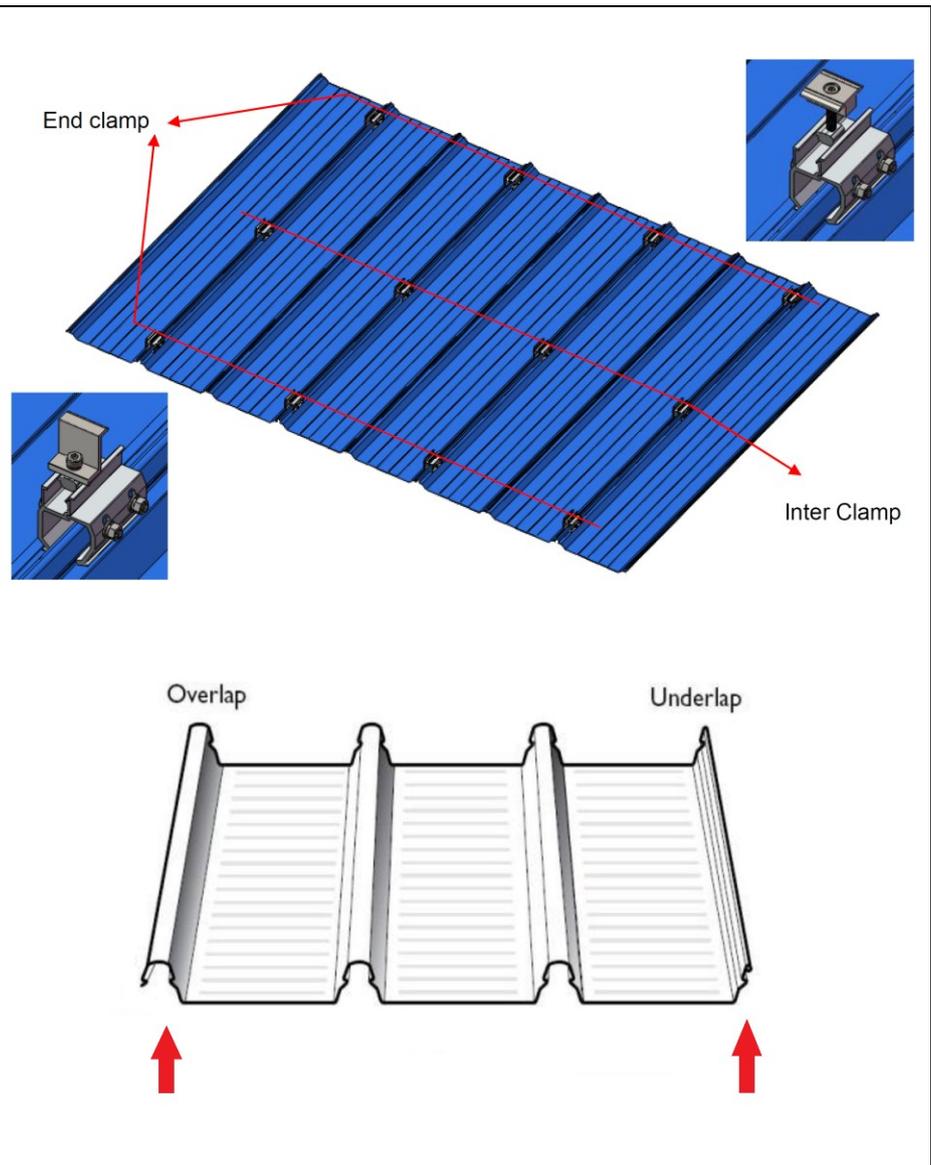
Install the Klip-lok Interfaces in the specified location.

The clamps at the outer edges of the array will support the frame of one module fixed with an end-clamp (see picture in the centre left section).

The clamps in the middle section of the array will support the frames of two adjacent modules fixed with a mid-clamp (see picture in the top right corner).

If the sheet consists of more than one tray (three or more seams per sheet), the ER-I-33 clamps must always be installed on the overlap (outermost seams of each sheet), as indicated by the red arrows in the picture to the right. That is where the standing seam sheet is fixed to the mounting bracket and the roof structure underneath.

Fasten the two M8 bolts holding the clamp to the roof sheet with a torque of **10-12 Nm**.

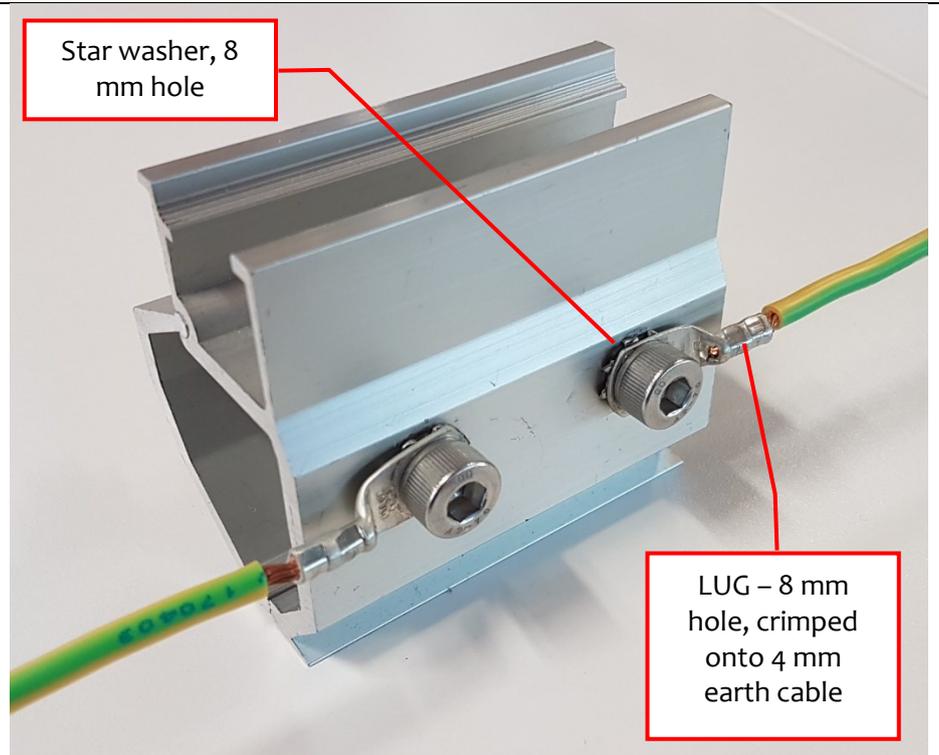


**Step 2**

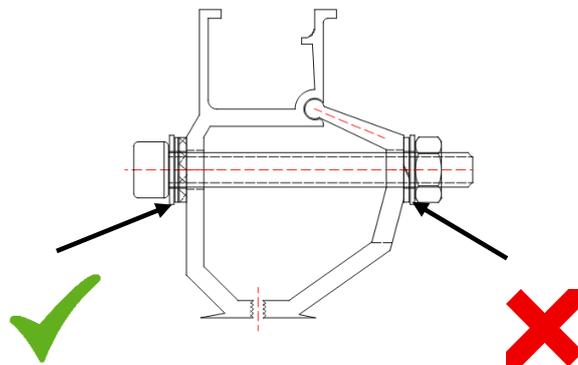
a. Earth bonding the ER-I-33 clamps:

At least one of the four ER-I-33 clamps that each panel will be resting on must be connected to potential earth (PE).

This is required for the standing seam installation to be compliant to AS/NZS 5033:2014 section 4.4.2.2 (a).



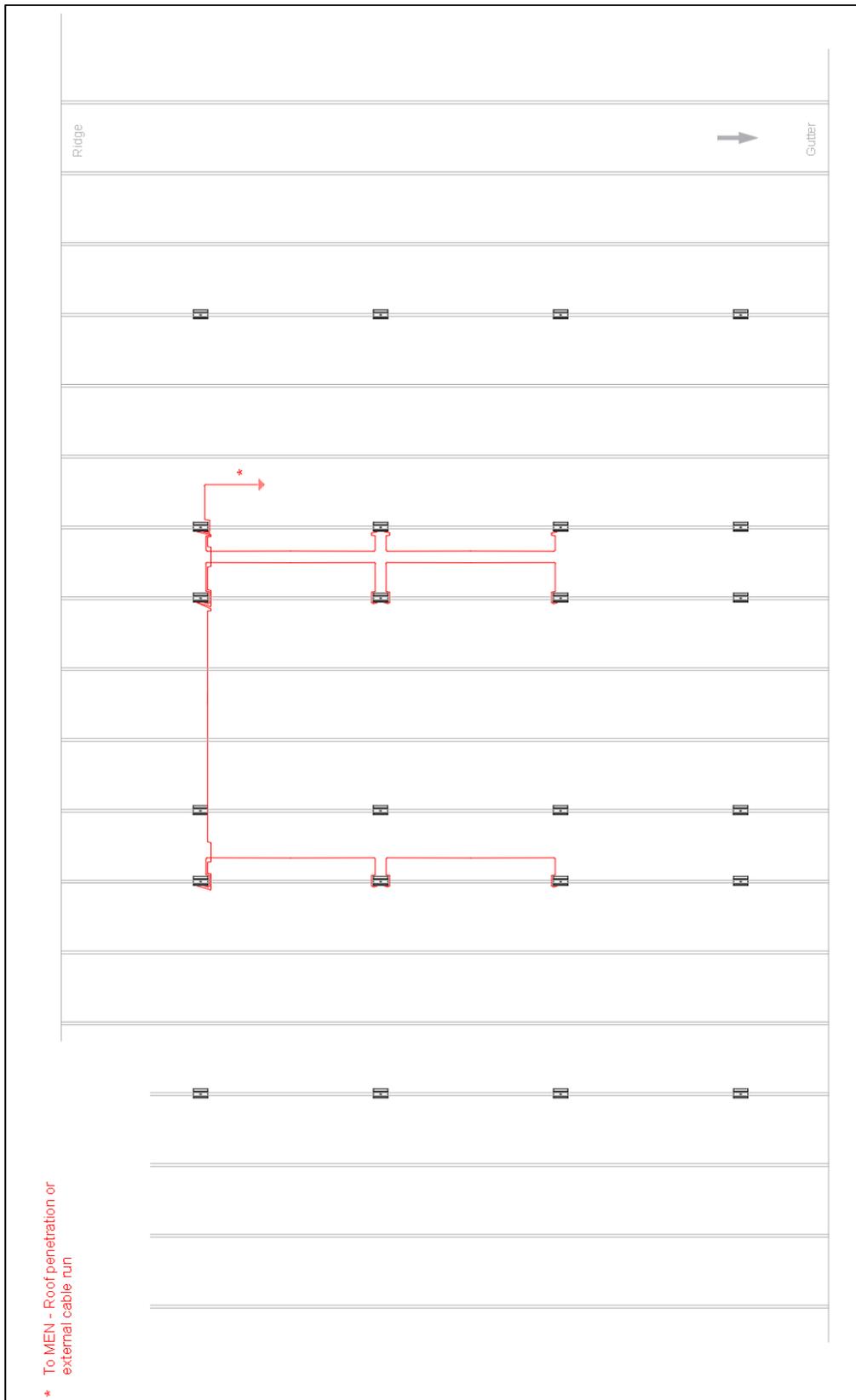
ER-I-33 clamp with 4 mm earth cable connected with lugs and star washers



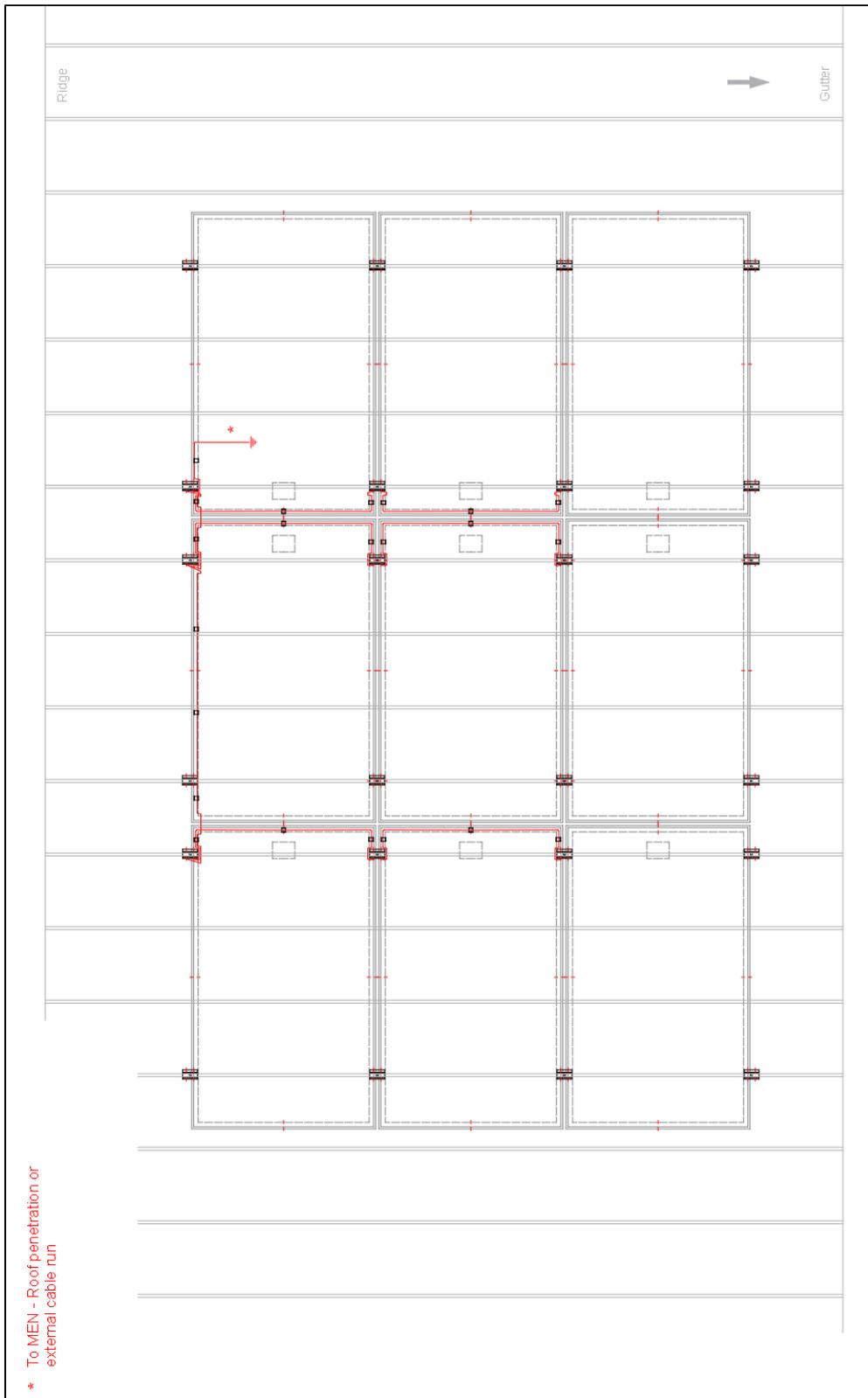
The next two pages show an example of the earth bonding of a 9-panel system

The lugs and star washers must be fixed to the flat side of the clamp (head of the bolts, not the side of the nuts). The ER-I-33 needs to be disassembled to mount the lugs and star washers.

Example for earth bonding of a 9-panel standing seam installation (before placement of panels)



Example for earth bonding of a 9-panel standing seam installation (after placement of panels)

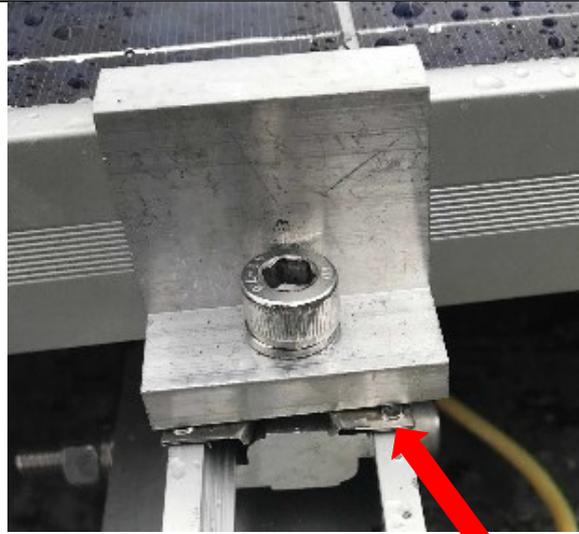


**Note:** Panels are mounted in landscape (clamps on the long edge of the module). The earth cable must be run along the frame of the modules and secured with cable clips.

b. Earth Bonding the panel array:

Every connection between a solar panel frame and an ER-I-33 clamp must have an earth washer added in between.

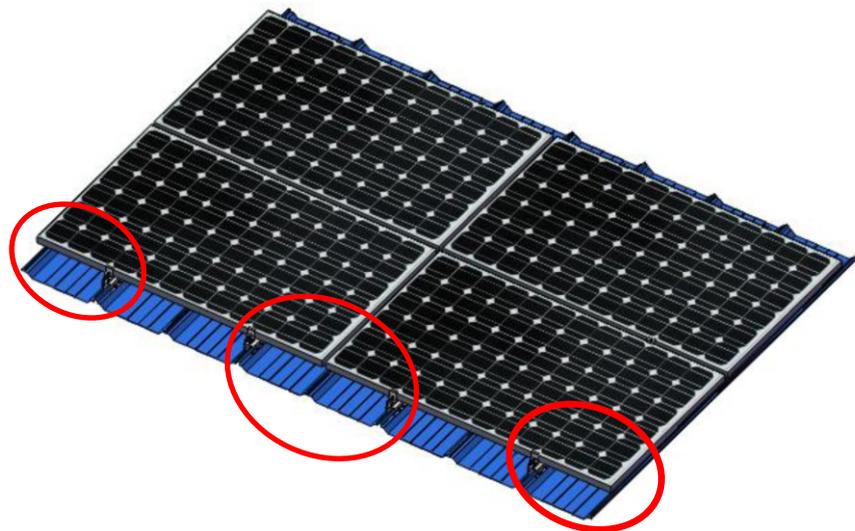
Continuity must be confirmed for each panel after the installation is finished



**Step 3**

The DC wiring and cable management is done as per the instructions for the standard roof parallel installation.

Install the solar panels and fasten the bolts of the inter and end clamps with a torque of **18-20 Nm**



**Panel overhang max ¼ of total panel length!**

Table 3 – Installation steps for ER-I-33 standing seam interface