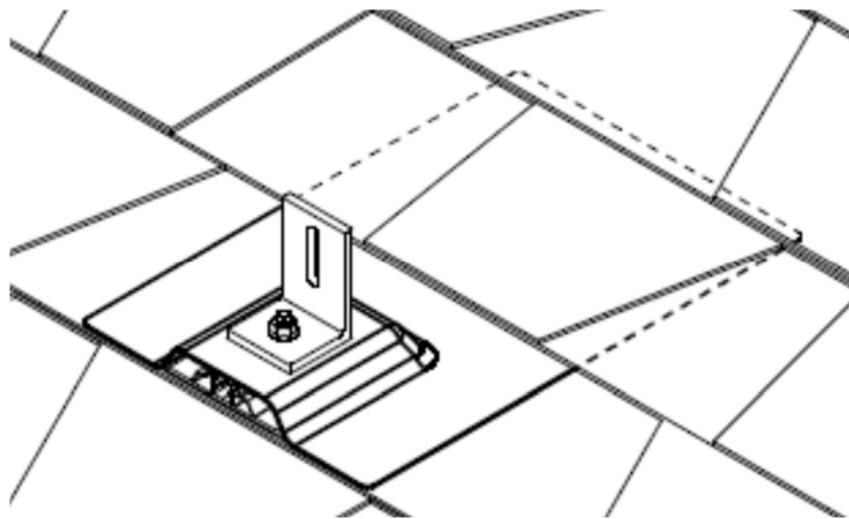


INSTALLATION MANUAL

RT-MINI Double Flashing Option



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Introduction

Please review this manual thoroughly before installing your Roof-Tech system.

Aside from reading this manual, please review the P.E. Stamped Engineering Letters for the RT-MINI products for your State. This manual provides supporting documentation for the installation of RT-MINI products.

We recommend installer to carefully review the instructions provided by the other manufacturers of the products being installed with the RT-Mini and become acquainted with OSHA's safety procedures prior to installing the PV system.

The installer is solely responsible for:

- Handling and installing the PV modules and rail system according to the manufacturer's instruction, with special attention for the suggested clamping locations on the PV frame and maximum cantilever and span values for the rail.
- Complying with all applicable local or national building codes, standards and industry best practices including any code that may supersede this manual.
- Ensuring that Roof-Tech's and other products are appropriate for the particular installation and the installation location.
- Ensuring that the roof, its rafters, connections, and other structural support members can support the array under all code level loading conditions.
- Using only Roof-Tech parts and installer-supplied parts as specified by Roof-Tech. (Substitution of parts may void the warranty and invalidate the letters of certification.)
- Maintaining the waterproof integrity of the roof.



Attention

To maintain the flashing performance, avoid installation when the temperature is below 22F or above 176F. RT Butyl must be installed on a dry surface.

- Ensuring safe installation of all electrical and mechanical aspects of the PV array.
- **PE Stamped letters for the rail option are available at <https://roof-tech.us/support/>**
- Ensuring correct and appropriate design parameters are used in determining the design loading used for design of the specific installation. Parameters, such as snow loading, wind speed, exposure and topographic factor should be confirmed with the local building official or a licensed professional engineer.

Periodical Inspection

Roof Tech Inc. recommends inspecting installed racking system periodically for loose components, loose fasteners and any corrosion. If found, those components are to be re-tightened, or replaced immediately. When a PV module needs to be removed from the PV array for maintenance and/or replacement, the electric bonding system may need to be temporarily restored to maintain the electrical bonding path. Please make sure the system electrical circuits and disconnects are in the open position and the entire system is powered down. Cover the fronts of modules in the array with an opaque material to stop the production of electricity. Use appropriate safety equipment such as insulated tools and insulating gloves to protect yourself.

Maintenance of the PV modules should be carried out by licensed contractors, according to the PV manufacturer's installation/maintenance instructions and Roof Tech's installation instructions.

Maintenance should not be conducted under a wet and/or high wind conditions.

Tools Required for Assembly

Tools needed for installing the RT-MINI

- Hex bit socket (8 mm)
- Drill and ϕ 3 mm Drill Bit for sheet metal (for Installation on Metal Roof)
- Measuring tape
- Chalk line

※L-Foot mounting option

Torque Values for Dry Bolts: 12 N·m applied to L-foot. (in-lbs)

| Item | Torque |
|------------------|--------------|
| W5/16 or M8 Bolt | 12 N·m (106) |

Technical Note

Proper torque values for a wood screw will vary depending on the rafter and/or deck characteristics; hardness, age, and moisture of the wood. Tighten the M5x60mm wood screws until the conical washer stop rotating.

Stainless hardware is soft and if dry torqued too quickly it may cause the nut and bolt to seize. Avoid the use of Impact drivers as they tend to tighten the nut at high speeds and strong torque which may cause galling.

Installation Safety

The installation process requires working on sloped and elevated building surfaces, in outdoor weather conditions, using tools and heavy components designed for the generation of electricity.

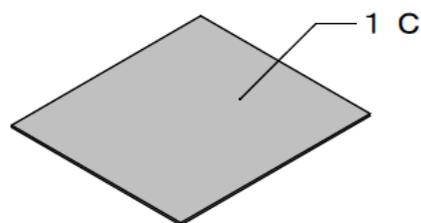
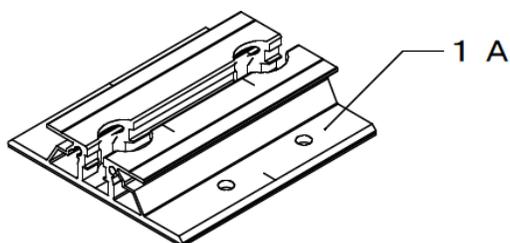
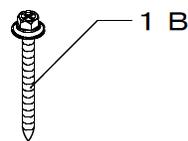
- Use properly anchored fall protection equipment.
- Use caution to prevent objects from falling or dropping off the roof area.
- Cordon off ground areas directly beneath the roof work area when possible.
- Always use personal protection equipment such as safety glasses, gloves, etc.
- Do not perform installation in excessively wet, windy, or inclement weather conditions.
- When working in hot weather, work crews should take care to prevent symptoms of over-heating or dehydration.
- Use proper lifting and carrying techniques when handling heavy components at the job site. If conditions are challenging for moving PV modules to the roof area, use a mechanical lift.
- Follow best practices when working around high-voltage electrical equipment.
- Do not anchor fall protection equipment to roof mounts, or any other inappropriate roof structure

PART A: Materials

1. Items with RT-MINI

① RT-MINI Bracket Set

| | Item |
|----|-------------------|
| 1A | RT-MINI |
| 1B | Screw 5.0×60 |
| 1C | RT Butyl Flashing |

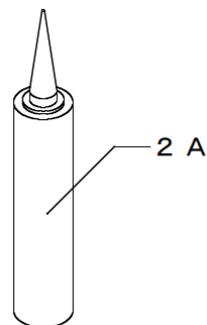


② Roof sealant

| | Item |
|----|--------------|
| 2A | Roof sealant |

※Recommended Product

- Henry : 208R, 209, 925 (Black)
- Geocel:S2, S4 (Black)
- Sashco : Through the Roof
- Boss : 125 (Black)
- Top Industrial: Rain Buster 850, 900
- Chem Link: M1
- NPC Solar Seal 900



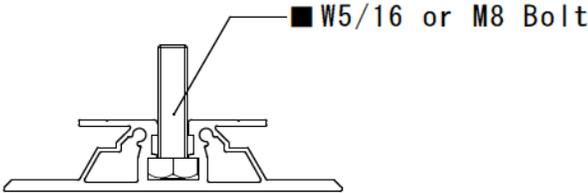
NOTE: When installing the RT MINI with the metal flashing option, it is not necessary to add a bead of sealant around the base to add extra protection to the RT Butyl tape against UV light.

PART B: Bracket Installation

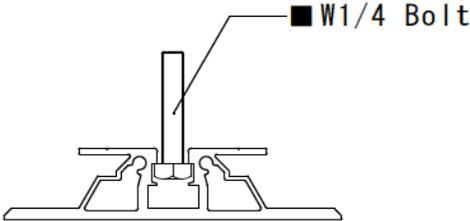
1. Installation of Brackets

(1) Bolt options

- a) For the 5/16" or M8 hex bolt, use the lower slot. (L-Foot mounting option)

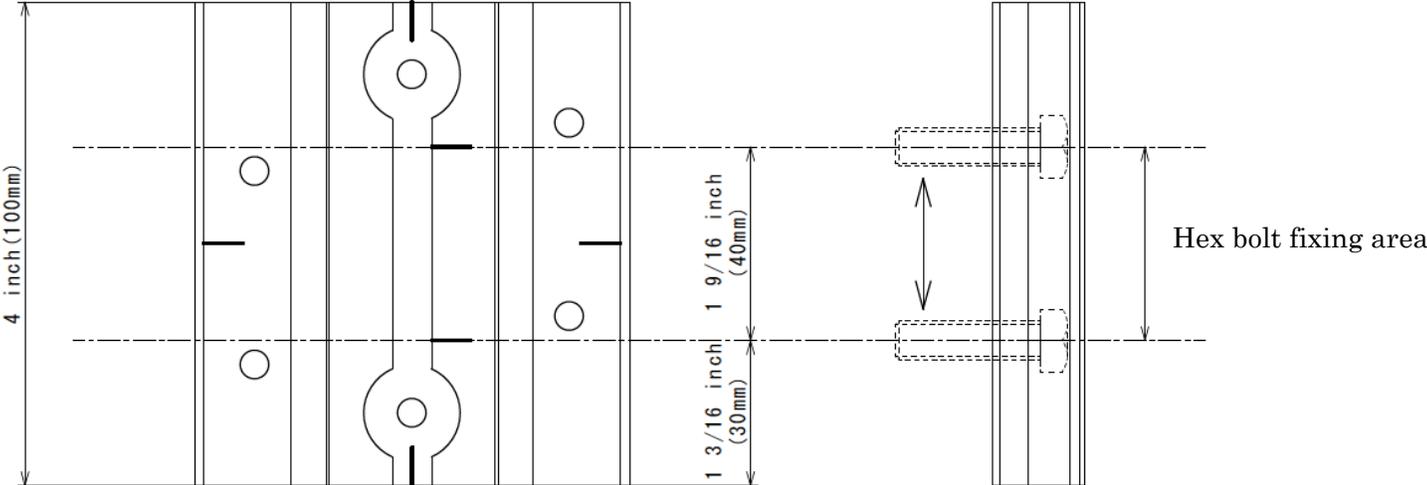


- b) For the 1/4" hex bolt, use upper slot. (EMT and accessories clamp mounting option)

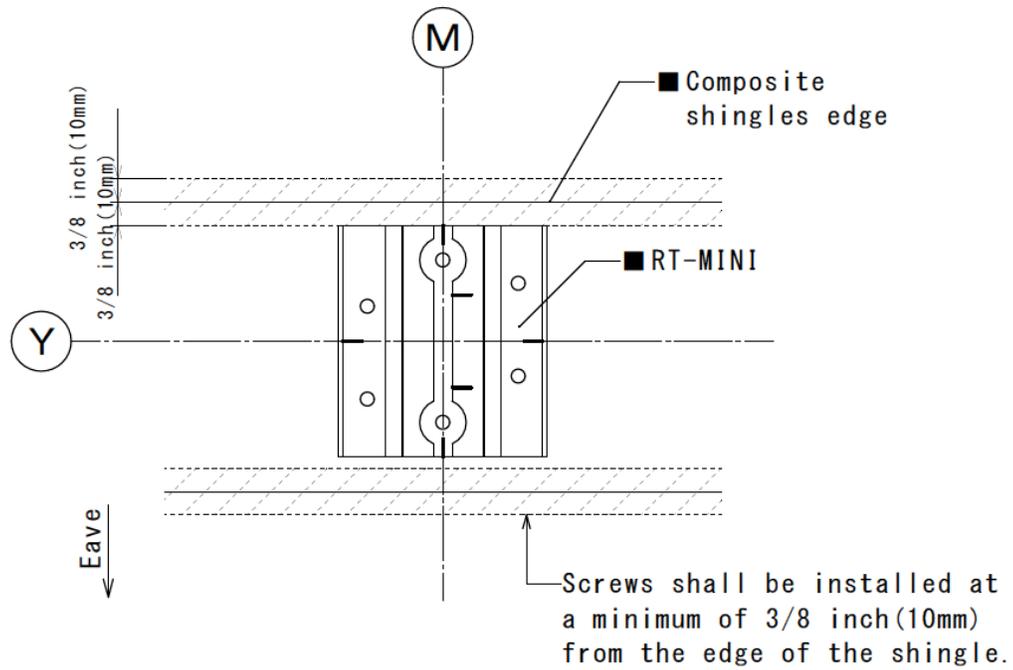


(2) Brackets Layout

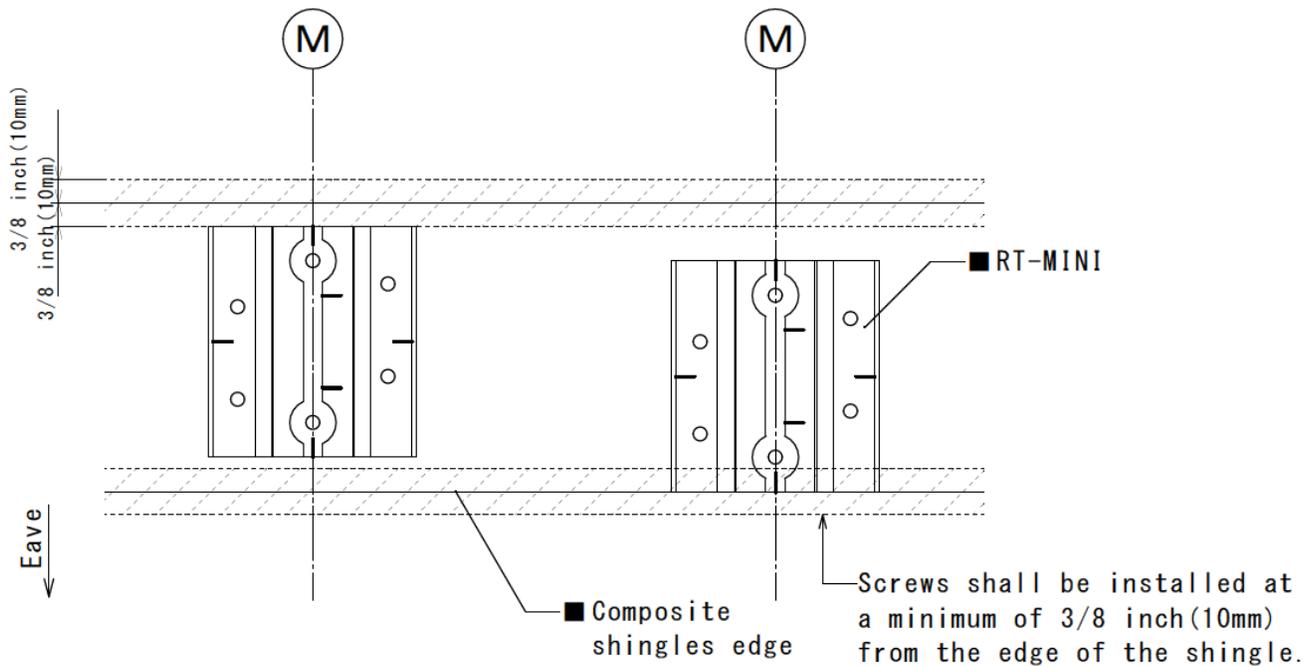
There is 1 9/16 inch (40mm) adjustability to secure the bolt.



- ① Locate and place MINI base on the cross section of chalk line.



- ② Protecting the edge of the shingles.



Note: Mini base is engineered to be mounted in only one direction (shown above).

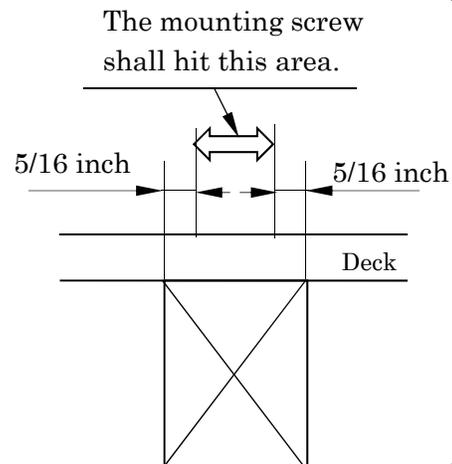
- ① Chalk line according to the layout plans to indicate bracket's position.
- ② Aligning the brackets. Choose the most suitable rafter, then mark the center.
 - (i) Line M: Bracket center line.
 - (ii) Line Y: Bracket center line.

The Engineer of Record (EOR) shall verify the framing capacity and fastener installation for building code compliance including those of the National Design Specification for Wood Construction (NDS 2005/2012/2015) as applicable.

! Attention

According to the NDS, the distance from the side edge of the rafter and the 5 mm diameter mounting screws for RT-MINI shall be at least 5/16 inch (7.9 mm) from the edge.

Note: Minimum Edge Distance = 1.5D
 Where D is the Diameter of the screw.
Direction of Loading: Parallel to Grain
 (See NDS 2015 Table 12.5.1c.)

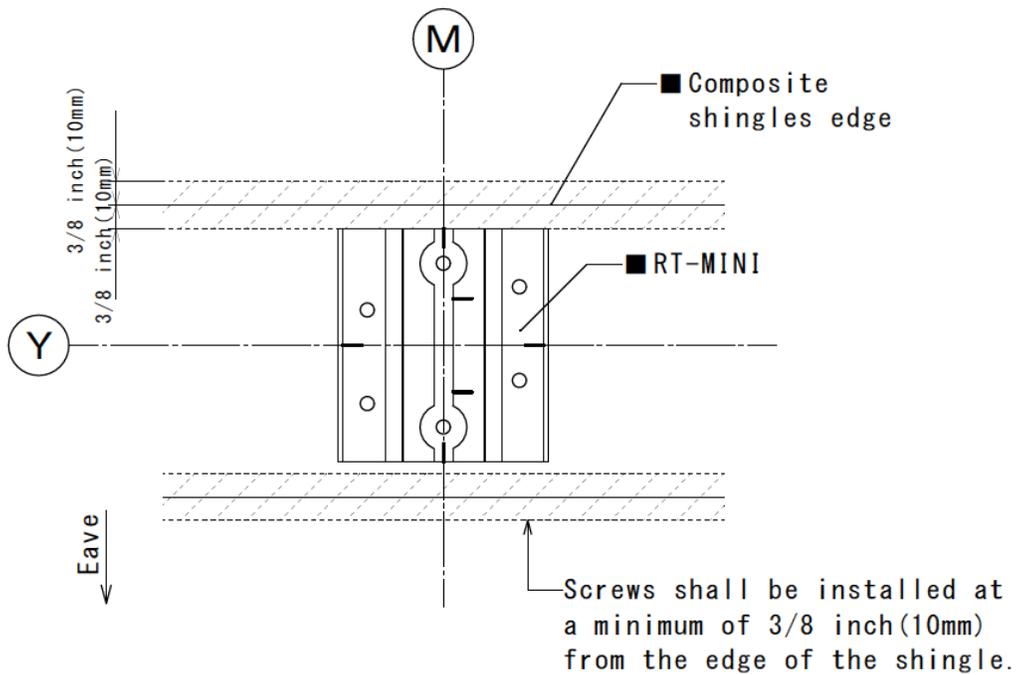


(3) Bracket Installation

! Attention

To maintain the flashing performance, avoid installation when the temperature is below 22F or above 176F. RT Butyl must be installed on a dry surface.

- ① Mark the location at the intersection of the Y Line and M Line.



! Attention

Minimum clearance between mounting screws and the edge of the roofing shingle shall be 3/8 inch (10 mm).

In case the stainless screw hit the nail underneath the shingle;

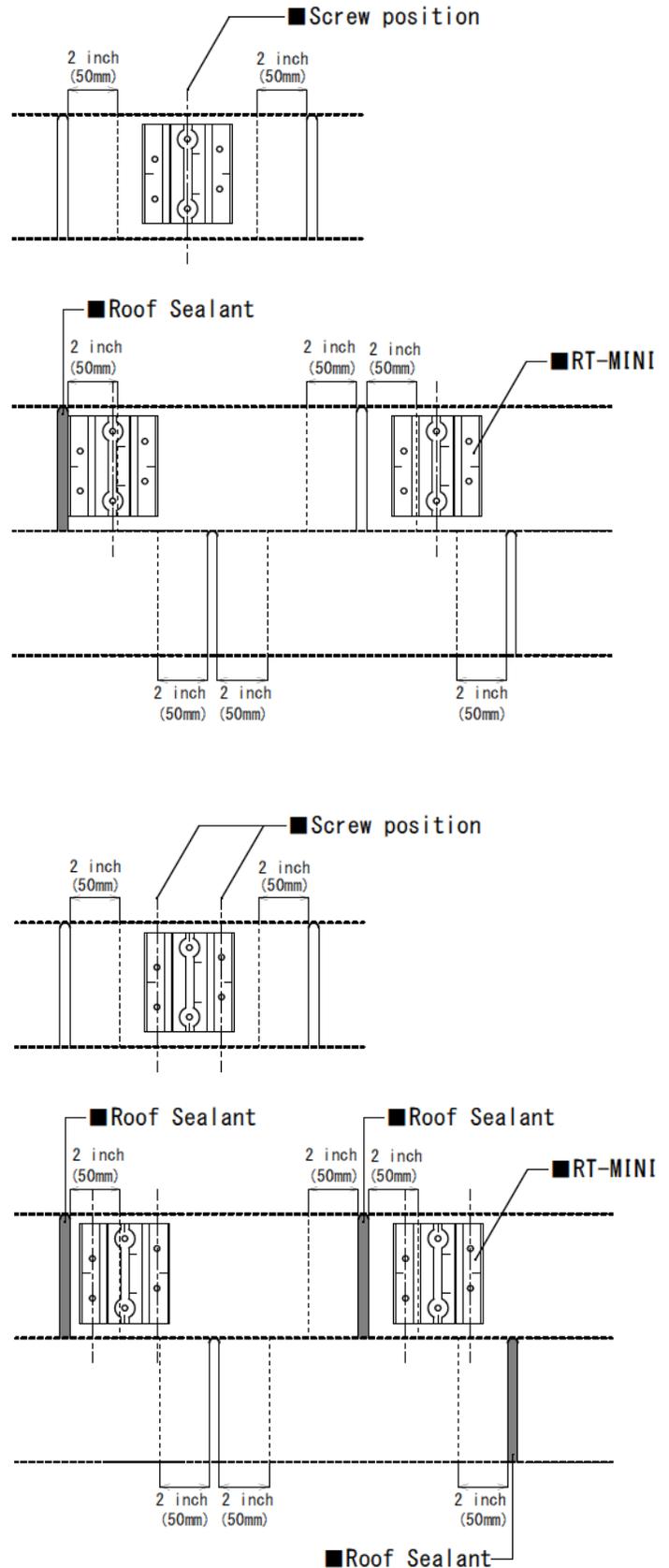
- 1) Tip the driver at an angle.
- 2) Use a 3 mm steel drill to make a hole.
- 3) If possible, remove the nail from underneath.

Rafter or Deck Install

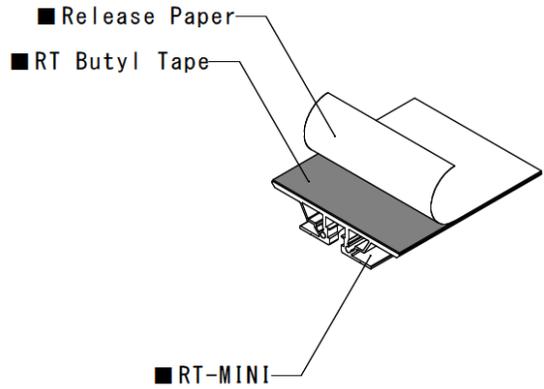
② If there is a shingle gap within 2 inches from the base, sealant shall be applied to the gap as it is shown.

● Best to position the bracket 2 inches away from the slit.

● If the mounting screw is within less than 2 inches from the slit, fill the slit with roof sealant.



- ③ Peel off the release paper from the RT butyl tape.

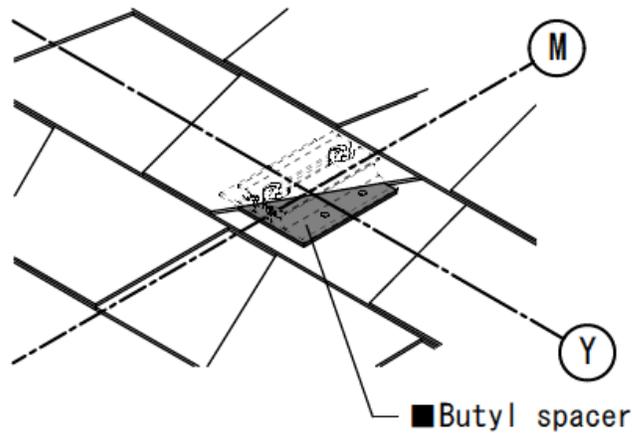


! Attention

Do not leave any protective paper on the surface of the RT butyl tape, it can cause an improper seal and may allow water intrusion under the bracket.

- When there are gaps in the position to install, fill them in with the additional RT butyl tape.

Note: Each bracket comes with RT butyl tape installed.



! Attention

Peel off the protection paper from both sides of any additional RT butyl tape.

③ Installing the bracket.

Place the brackets at the specified position and make sure the RT butyl makes good contact with the roofing surface.

Slide the M8 or 5/16" Hex bolt into place before fastening the bracket on the roof.

Set the bracket with 2 ea. Screws, M 5.0 × 60 mm stainless wood screw using 8 mm hex socket.

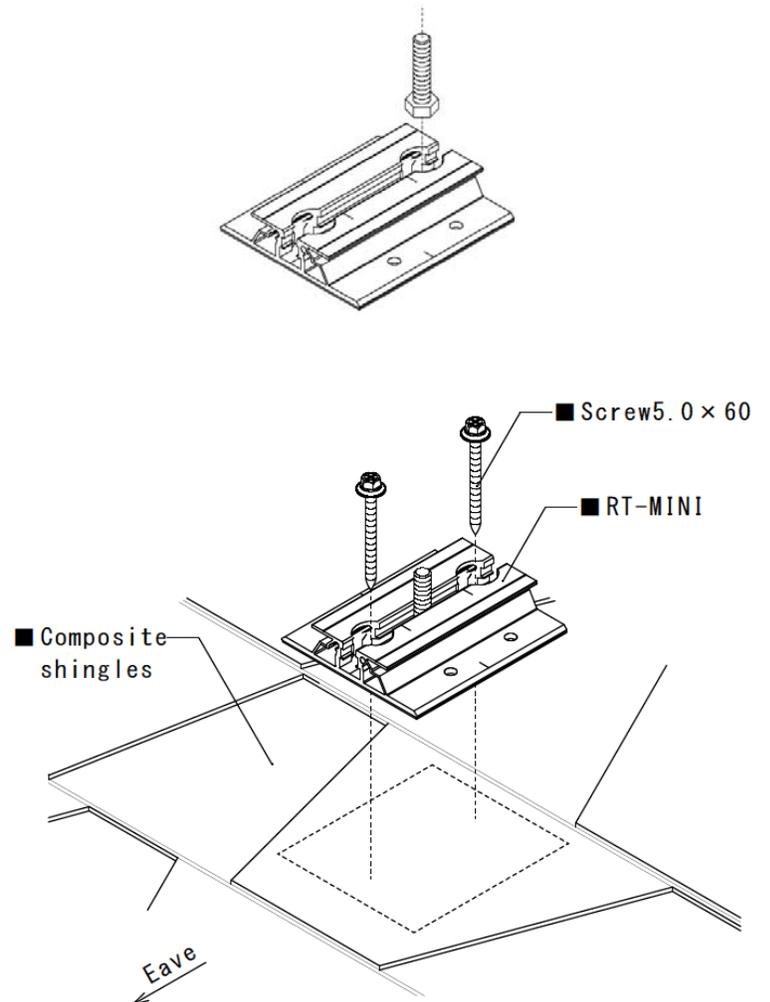
After completing process, make sure the brackets are securely fixed.



Attention

The 5/16" or M8 Hex bolt must be set on the lower channel before both wood screws are fixed to the rafter.

[Fastening it to the Rafter]

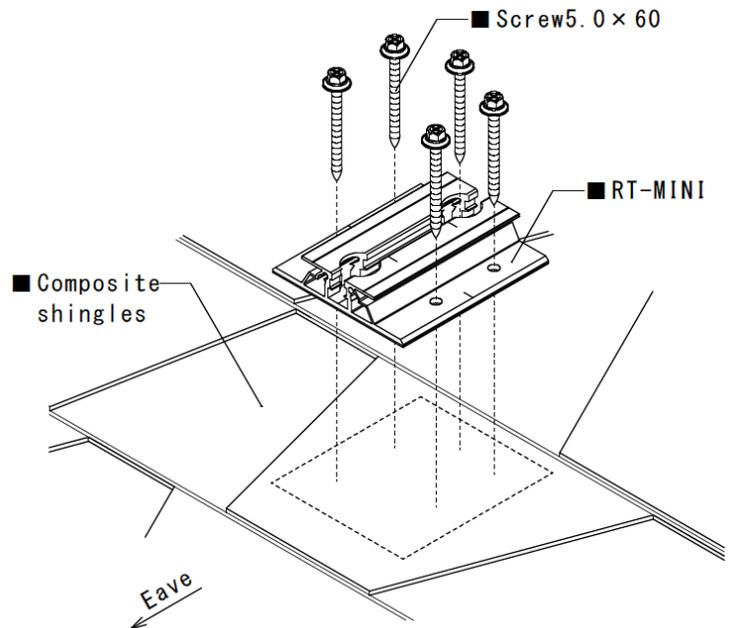


[Fastening it to the Roof Deck]

! Attention

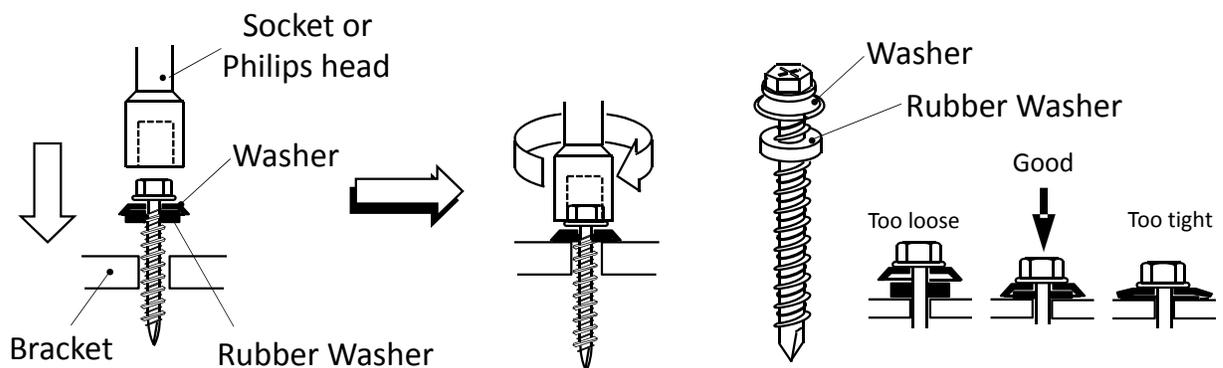
When the MINI base is installed on the deck, 5 screws must be used. Four screws are fixed into the sides and 1 on the ridge side.

Note; Each MINI is shipped with 2 mounting screws. The installer must purchase additional screws when mounting it to the roof deck.



! Attention

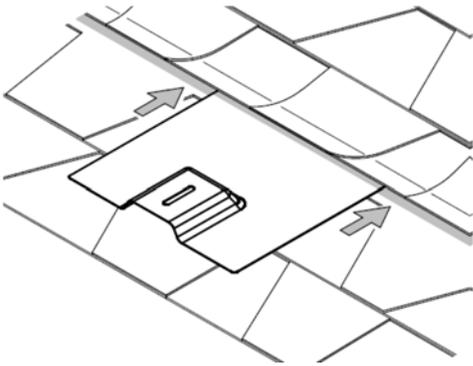
Note: Proper torque values for a wood screw will vary depending on the rafter and/or deck characteristics; hardness, age, and moisture of the wood. Tighten the M5x60mm wood screws until the conical washer stop rotating.



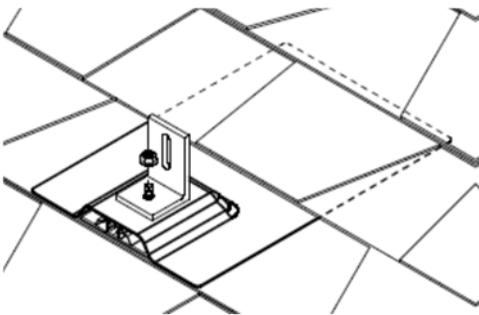
When tightening the screws please tighten all screws equally and avoid using an impact driver as it can over torque the screws or even snap off the head.

Metal Flashing Installation

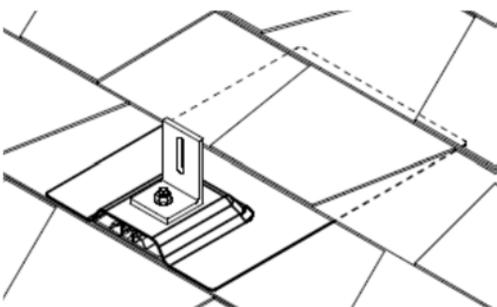
1. Slide Metal flashing into shingle roof.



2. Install L-Foot on top of metal flashing.



3. Tighten the L-foot nut to secure both L-Foot and the metal flashing flange to the Mini base.

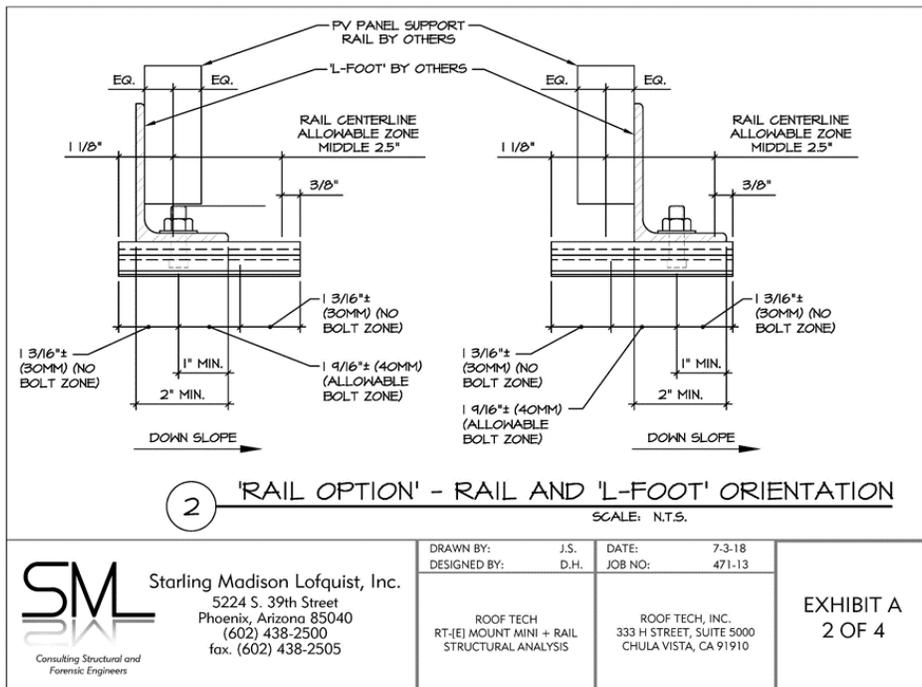
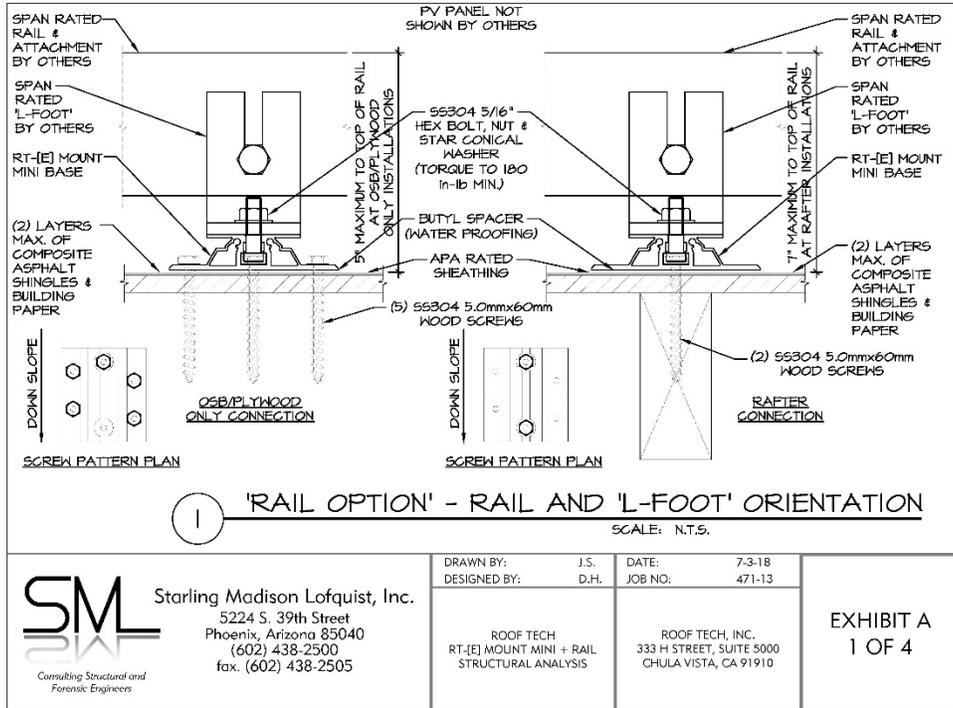


! Attention

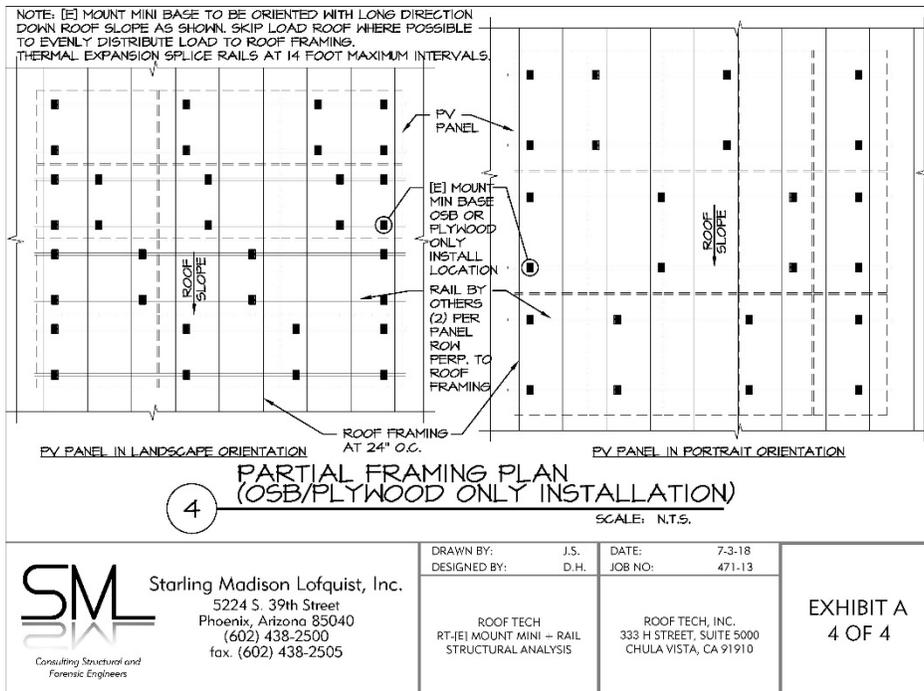
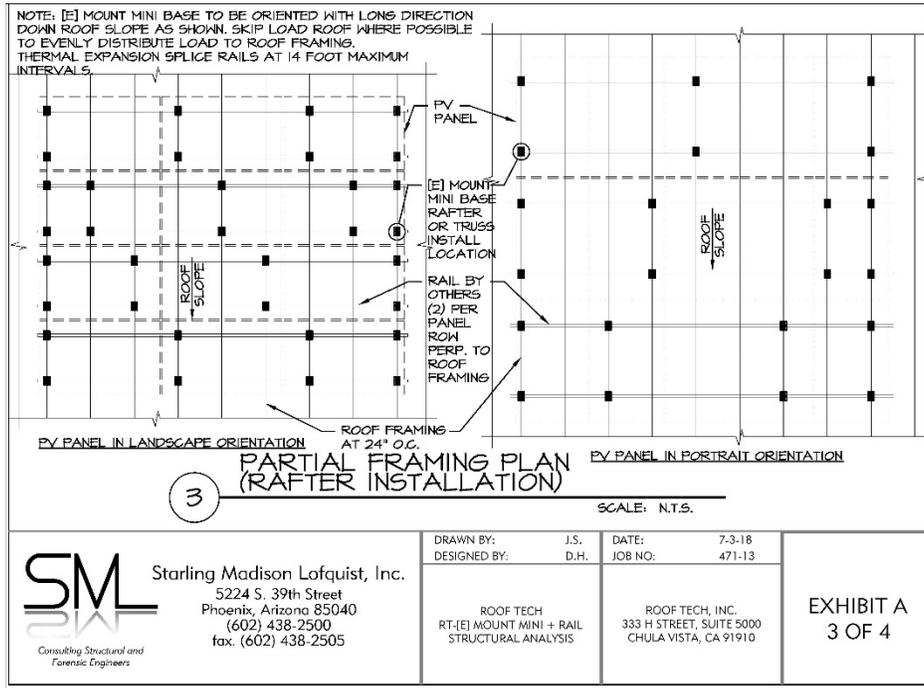
Stainless hardware is soft and if dry torqued too quickly it may cause the nut and bolt to seize. Avoid the use of Impact drivers as they tend to tighten the nut at high speeds and strong torque which may cause galling.

ADDENDUM
MINI used with L-Foot and Rail

It is important that the designer and installer are acquainted with the PE stamped Letters posted on <http://www.roof-tech.us/support>



ADDENDUM
MINI used with L-Foot and Rail



Customer Support

For assistance: call Roof-Tech customer support.

(619) 551-7029

<http://roof-tech.us/>

