

SOLAR COLLECTOR TILE ROOF MOUNTING INSTRUCTIONS

CAUTION

ALL PERSONS WORKING ON ROOFS SHOULD HAVE SUCCESSFULLY COMPLETED A FALL SAFETY COURSE AND SHOULD BE PROPERLY EQUIPPED WITH THE APPROPRIATE SAFETY EQUIPMENT

⚠ WARNING

AFTER COMPLETION OF THE COLLECTOR MOUNTING AND PRIOR TO SYSTEM CHARGING THE COLLECTORS MUST BE COVERED BY A BLANKET OR OTHER MEANS TO AVOID SOLAR RADIATION FROM HEATING THE COLLECTORS. THE SURFACES OF THE COLLECTOR CAN BECOME EXTREMELY HOT AND COULD POSE A BURN HAZARD.

The most important structural consideration is to securely

anchor the solar collector and the mounting hardware to the structural members of the roof with the stainless steel hardware provided. The solar collector must be attached to the mounting hardware as detailed in Figure 17.

Preserving the integrity of the roof membrane is the most important roofing consideration. Ensure that all roof penetrations required to plumb and mount the solar collector are properly flashed and sealed in accordance with standard roofing practices.

If the region is subject to hurricane conditions, additional steps may be required to secure the collector and mounting hardware to the structural members. In certain areas of the country, local building codes may require collector wind load testing or prescribe specific mounting procedures. Consult your local building department.

Install the collectors as described in the Tile Roof Mounting instructions.

BASIC TOOLS AND MATERIALS

Drill & Drill Bits
 Saw (Hand or Circular w/Extension Cord)
 Tape Measure
 Chalk Line
 Utility Knife
 Level
 Pliers
 7/16" & 9/16" Wrenches & 8" & 10" Adjustable Wrenches

Ratchet w/ 7/16" & 9/16" Sockets
 Roof Sealant
 10 linear feet of 2" x 4" or 2" x 6" lumber for spanner mounting per number of collectors in the system
 6' x 8' or 6' x 10' Tarp (1 per collector)

Installation Hardware (Supplied) Includes:
 • Hardware & Mounting Brackets

TILE ROOF MOUNTING / SPANNER MOUNTING

Although there are other installation methods for mounting solar collectors, it has been determined that the spanner mounting method is the most suitable for this application. Consult with you installer if other mounting means are required for your installation.

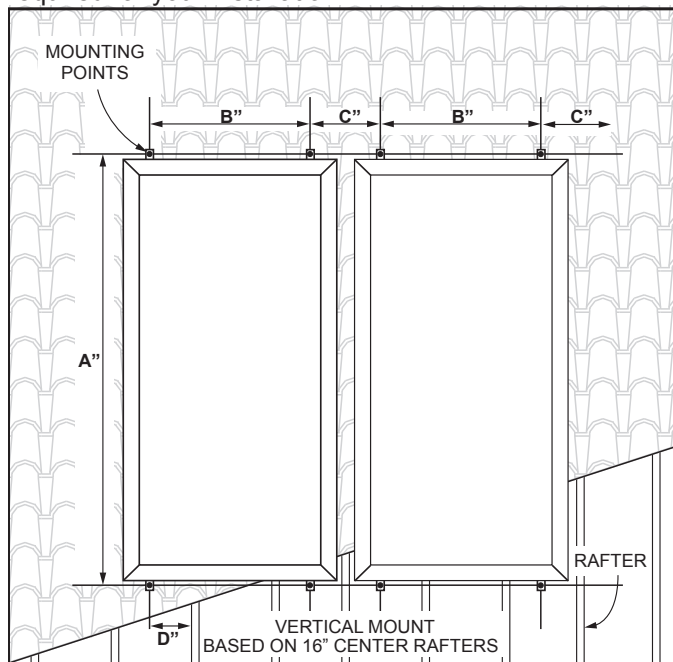


Figure 1.

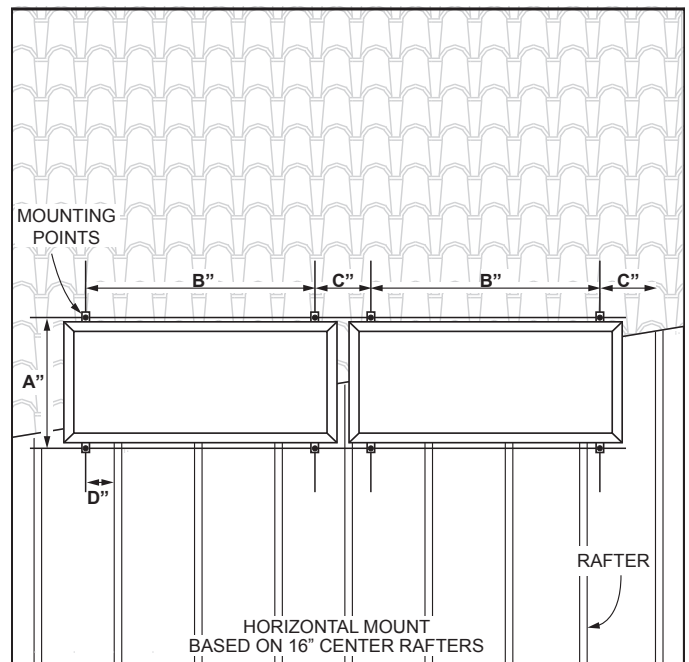


Figure 2.

NOTICE

* IF MOUNTING WITH AN OPTIONAL TILT MOUNT KIT, FOR OPTIMAL COLLECTOR ANGLE REFER TO ITS INSTRUCTION SHEET FOR THE APPLICABLE "A" DIMENSION.

COLLECTOR	A	B	C	D
Vert. 3.5' X 7'	86*	32	14	7-1/4
Vert. 4' X 8'	97*	35	16	11-3/4
Vert. 4' X 10'	121*	35	16	11-3/4
Horiz. 3.5' X 7'	42.25*	62	28	13-1/2
Horiz. 4' X 8'	47*	72	28	12
Horiz. 4' X 10'	47*	94	30	9

Table 1.

1. Locate the mounting points for the mounting brackets per Figure 1 for vertical mounting or Figure 2 for horizontal mounting and Table 1. Layout the roof as specified.

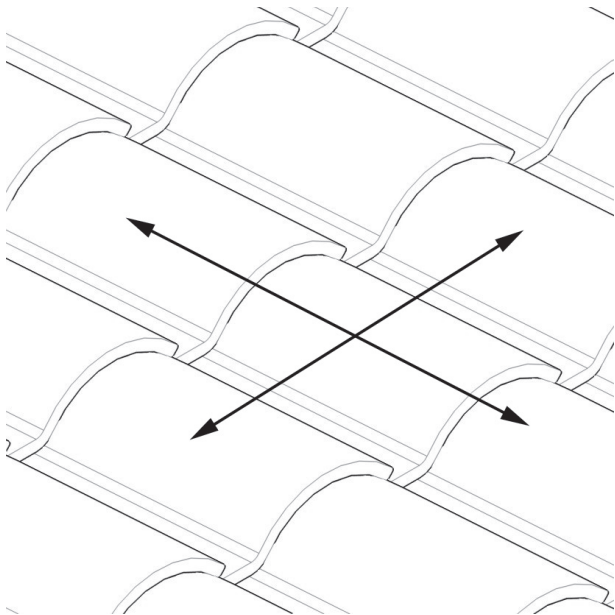


Figure 3.

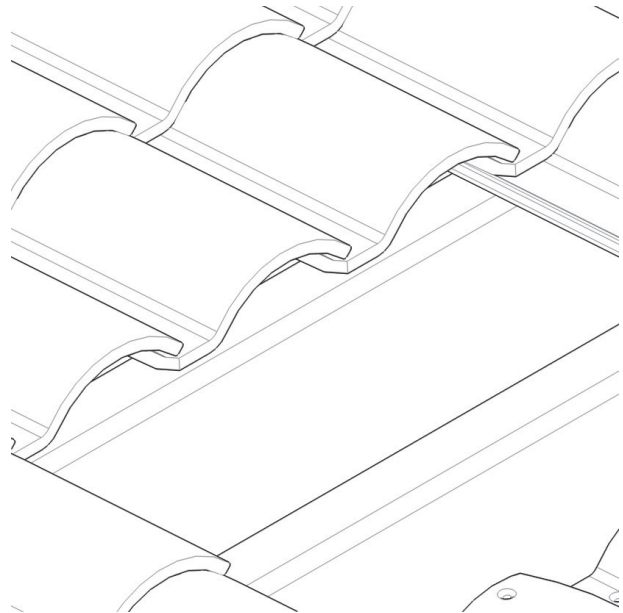


Figure 4.

2. Determine which course of the roof you wish to penetrate. It may be necessary to remove a few tiles to locate the rafter locations. See Figures 3 & 4.

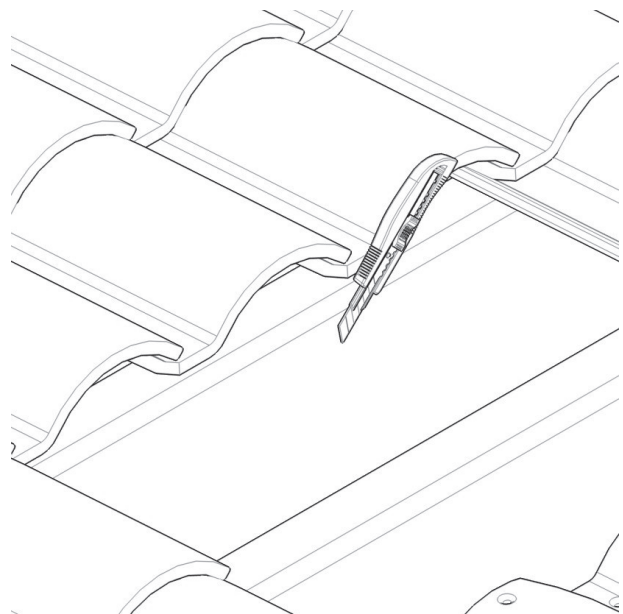


Figure 5.

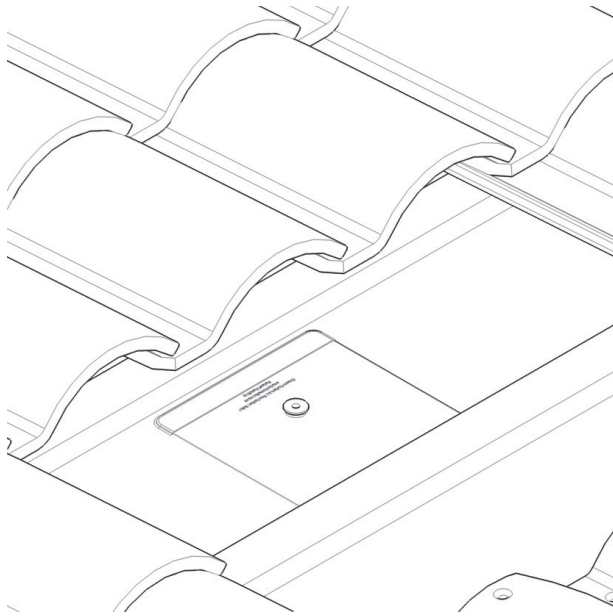


Figure 6.

3. Determine the location of the flashing and cut a slit in the roofing paper so the upslope edge of the flashing can slide under the paper when installed. See Figures 5 & 6.
4. Once the flashing location has been determined, mark the position of the center of the flashing bushing on the roof paper. Remove the flashing.
5. Drill a 5/16" hole between the rafters at the center mark of the flashing bushing.

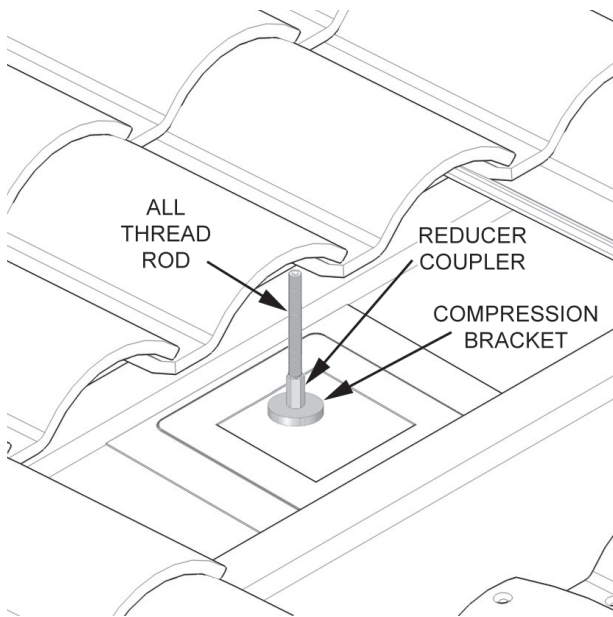


Figure 7.

6. Slide the flashing back under the roof paper and position it so that the center of the flashing bushing is aligned with the center of the drilled hole.
7. A piece of 12" length of stainless steel 5/16" all-thread is then inserted through the hole in the roof and the flashing bushing. Attach the compression bracket washer and 5/16" x 3/8" SS reducer coupler to the 5/16" SS –all thread as shown. The all-thread should extend about 4" below the roof rafters. See Figures 7 & 16.
8. Fabricate spanners, one for each mounting bracket,

using a 2" x 4" or similar lumber. Spanners must be long enough to span at least two rafters. In the attic or crawl space drill a 5/16" hole through each spanner and insert the all-thread through it. Secure each spanner to the rafters with decking or wood screws. See Figure 16.

9. Fabricate spacer blocks, one for each mounting bracket, using a 2" x 4" or similar lumber the same width of the rafter next to each all-thread. Place spacer blocks next to the all-thread between the spanner and roof. Secure each spacer block to the spanners with decking or wood screws. Spacer blocks are necessary to avoid deformation of the roof. See Figure 16.
10. With a stainless steel nut, lock washer and fender washer secure the all-thread to each spanner. Tighten down until the compression bracket washer is tightly secured to the roof and flashing (approx. 97 inch pounds). Be careful not to over tighten and dish out the roof underneath the mounting bracket washer and flashing. See Figure 16.

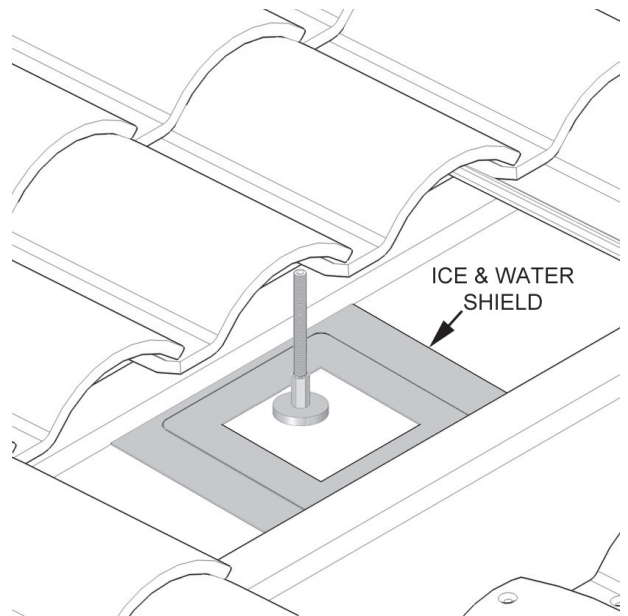


Figure 8.

11. Install an Ice & Water Shield (not included) around the flashing to provide a water tight seal. See Figure 8.

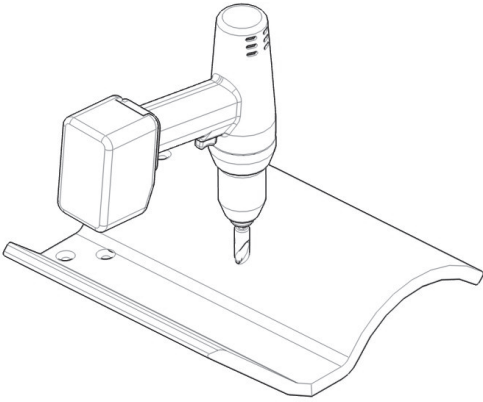


Figure 9.

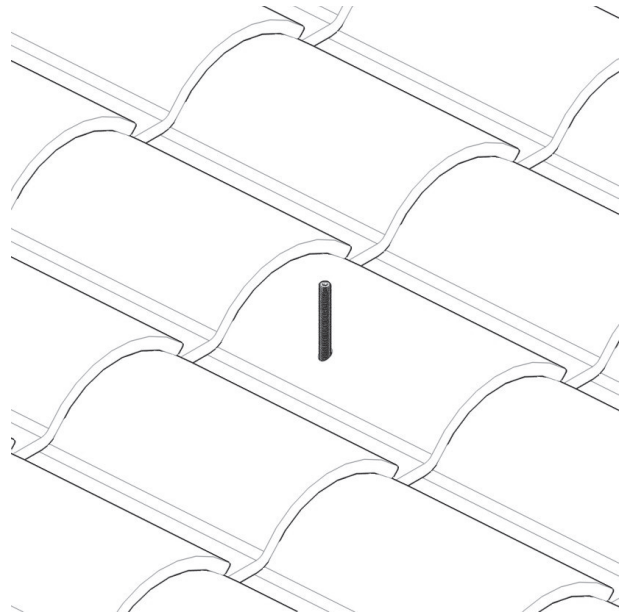


Figure 11.

12. Measure from the surrounding tiles to determine where the 3/8" x 6" SS all-thread will penetrate the tile and mark the tile accordingly.
13. Drill a 3/8" hole through the tile at the marked location. See Figure 9.

15. Position the 3/8" SS all-thread through the hole in the tile, thread it into the SS coupler and tighten. See Figure 11.

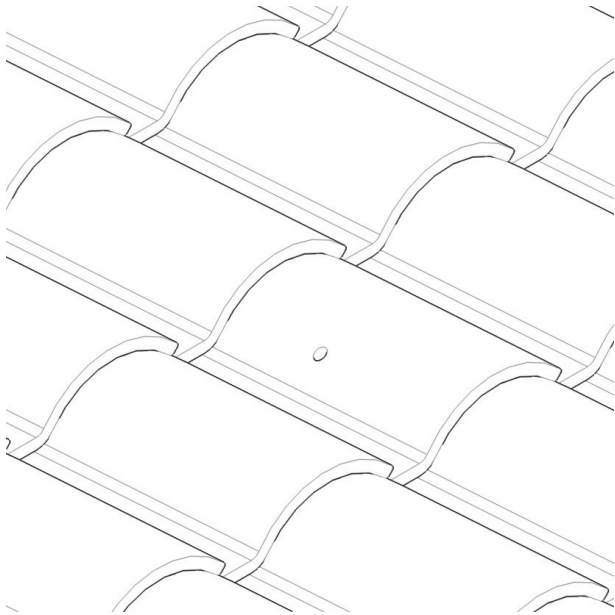


Figure 10.

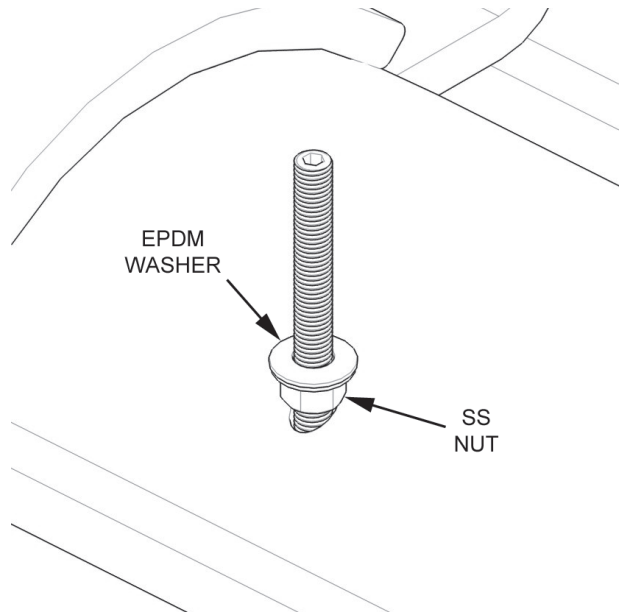


Figure 12.

14. Replace the tile being certain that the drilled hole aligns with the SS coupler. See Figure 10.

16. Thread a 3/8"-16 SS hex nut down the 3/8" SS all-thread to just above the top surface of the tile. Do not tighten the nut against the tile. See Figure 12.
17. Push one of the EPDM bonded washers down the 3/8" all-thread until it rests against the top of the nut. Be sure that the EPDM side is facing up. See Figure 12.

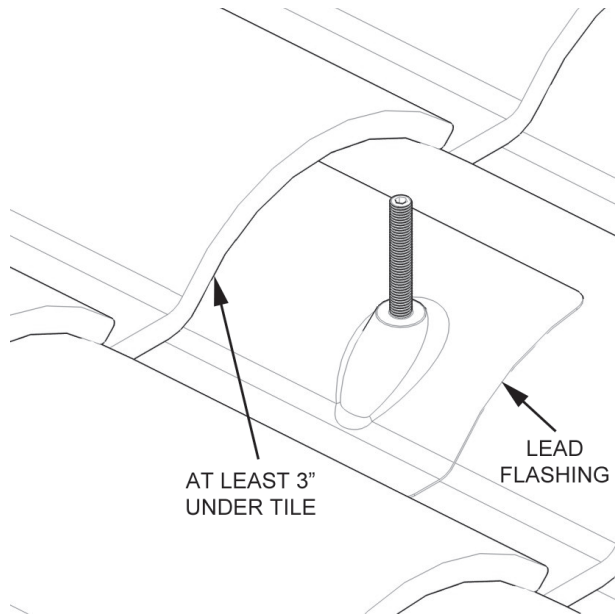


Figure 13.

18. Clean the tile and cover the penetration with the included 12" x 12" 3 Lb. lead flashing. Form the lead flashing to match the contour of the tile. Measure and drill a 3/8" hole in the lead flashing for the location of the 3/8" all-thread. Be sure that there is a minimum of 3" of flashing all the way around the 3/8" all-thread and tuck the up slope end of the flashing a minimum of 3" up under the above tile. See Figure 13.

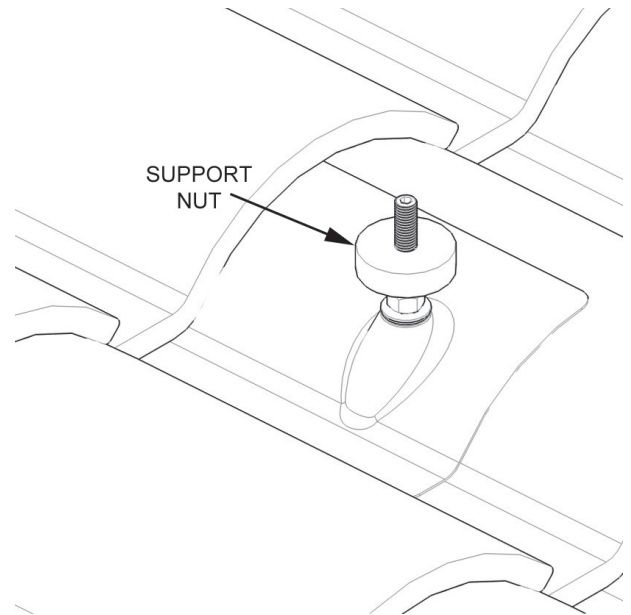


Figure 15.

21. Thread the support nut down the 3/8" all-thread to the desired height. See Figure 15.
22. When installing the remainder of the support nuts be sure all are at the same height as the others.

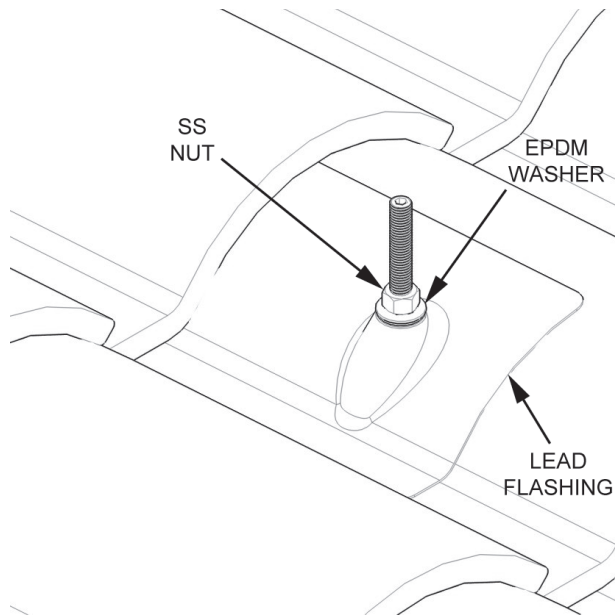


Figure 14.

19. Push another EPDM bonded washer down the threaded rod until it rests against the top of the flashing being sure that the EPDM side is facing down. Refer to Figure 14.
20. Thread another 3/8"-16 SS hex nut down the 3/8" all-thread and tighten it against the washer. Refer to Figure 14.

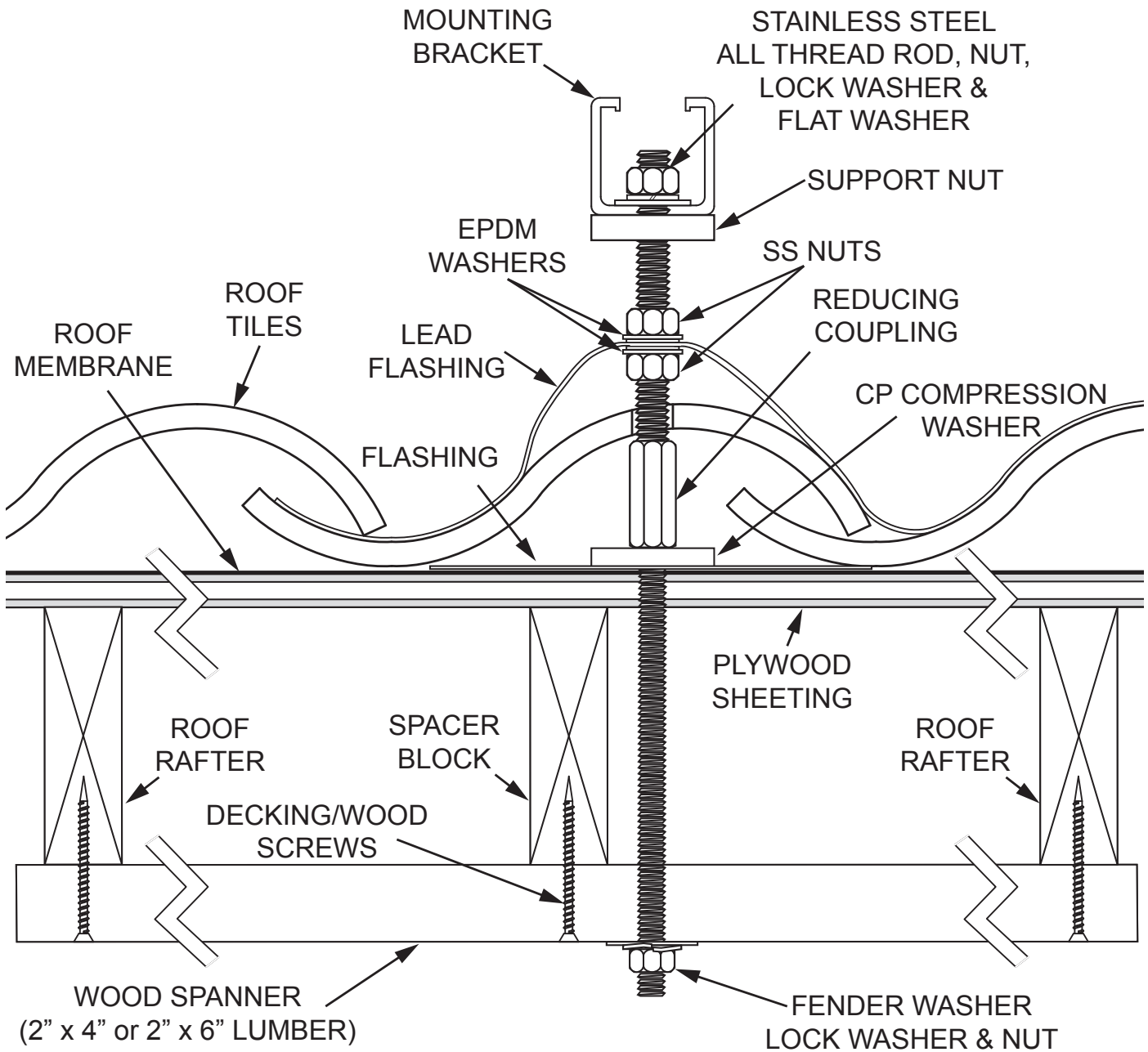


Figure 16.

23. Install the mounting brackets on top of the support nut with the stainless steel flat washer, lock washer, & nut. See Figure 16.
24. Install the mounting brackets on top of the support nut with the stainless steel flat washer, lock washer, & nut. See Figure 16.
25. Repeat steps 1 - 24 as needed for the remainder of the mounting bracket locations.

ATTACHING COLLECTOR TO MOUNTING BRACKETS

Once all of the mounting brackets have been secured to the roof the solar collector(s) can be installed. See Figure 17 for these instructions.

1. Insert the stainless steel channel nut w/spring inside of the mounting bracket.
2. Fasten the solar collector mounting clip to the channel nut with the stainless steel bolt, lock-washer, and flat washer as shown. Do not tighten. Repeat step for the other mounting bracket locations.
3. The solar collector can now be set on the mounting brackets. To aid in handling the collectors on the roof the mounting clips may be tightened to the lower mounting brackets prior to raising the collectors. The collector can then be set on the lower mounting brackets while the top clips are fastened over the lip on the collector frame.
4. After the solar collector is in position, locate the upper mounting clip so that its lip over-hangs the lip of the solar collector frame as shown. Tighten the mounting clip to the solar collector frame securely. Repeat for the other upper mounting clips.
5. Once the upper mounting clips are secured, the bottom mounting clips can be loosened and retightened over the collector lip as directed in step 4.
6. Repeat steps as needed for other solar collectors.

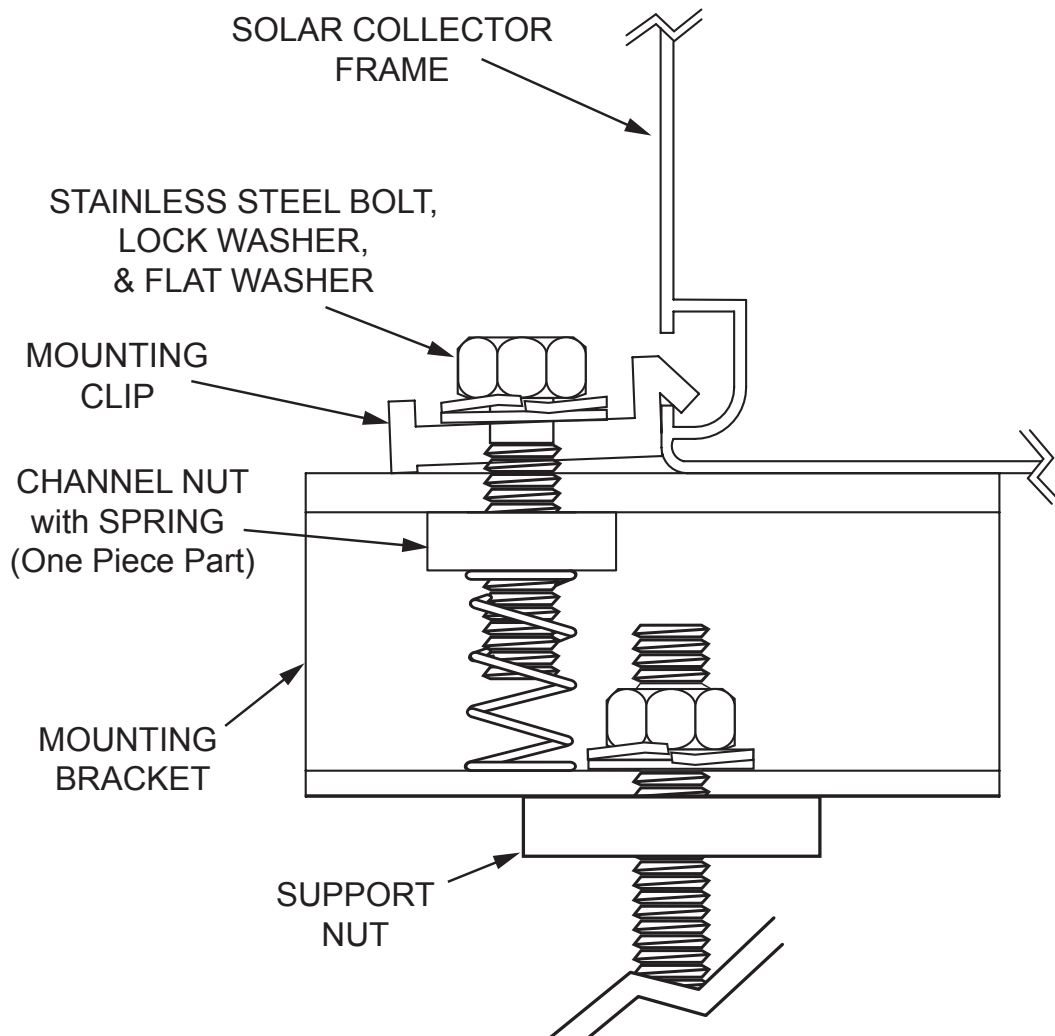


Figure 17.