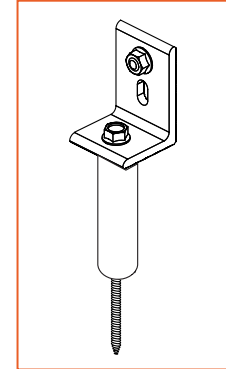


### Layout out standoffs

Standoffs (**Figure 9**) are used to increase the height of the array above the surface of the roof. Pair each standoff with a flashing to seal the lag bolt penetrations to the roof. Use **Figure 10 or 11** to locate and mark the location of the standoff lag screw holes within the installation area. Remove the tile or shake underneath each standoff location, exposing the roofing underlayment. Ensure that the standoff base lies flat on the underlayment, but remove no more material than required for the flashings to be installed properly. The standoffs must be firmly attached to the building structure.



**Figure 9. Standoff in conjunction with an L-Bracket.**

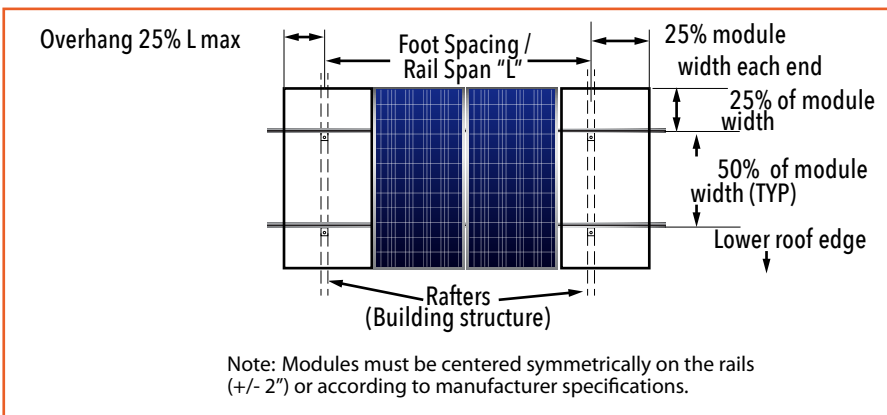
If multiple high-profile rows are to be installed adjacent to each other, it may not be possible for each row to be centered above the rafters. Adjust as needed, following the guidelines of **Fig. 11** as closely as possible.

### Installing Standoffs:

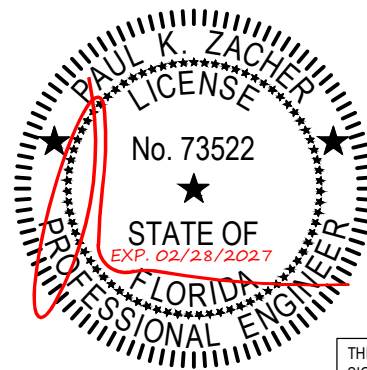
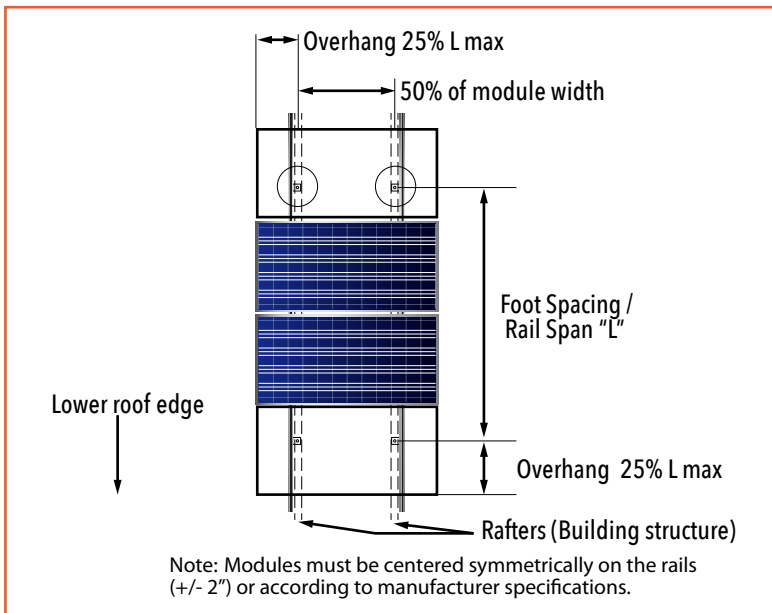
Drill 3/16 inch pilot holes through the underlayment into the center of the rafters at each standoff location. Apply sealant to the hole. Securely fasten 5/16" lag screw with thread top.

SWH aluminum standoffs ( 1" O.D.) are designed for collared flashings. Install and seal flashings and standoffs using standard building practices or as the company providing roofing warranty directs.

**Figure 10. Layout with rails perpendicular to rafters**



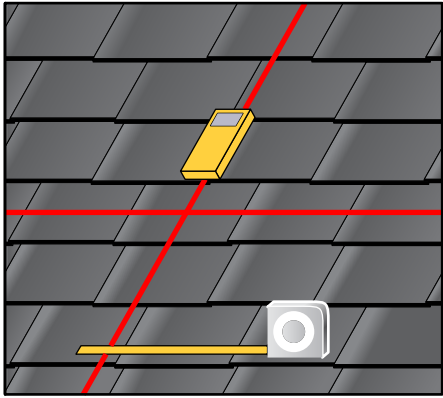
**Figure 11. Layout with rails parallel to rafters.**



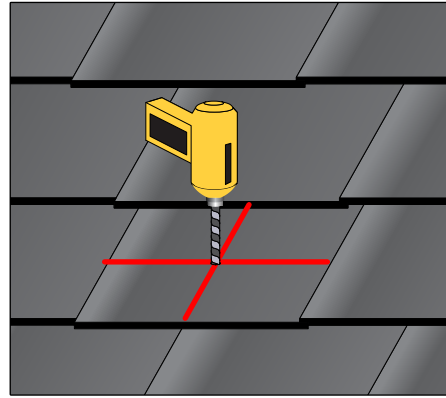
THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY PAUL K. ZACHER, PE ON 11/21/2024 USING A SHA-1 AUTHENTICATION CODE.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SHA-1 AUTHENTICATION CODE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

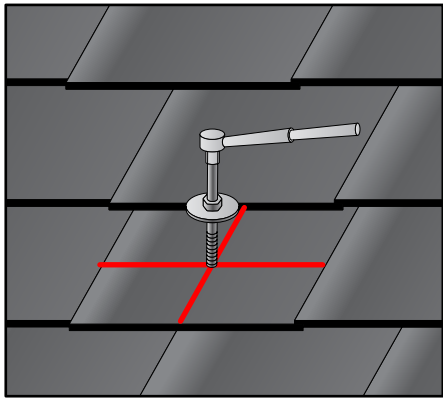
## Standoff Installation



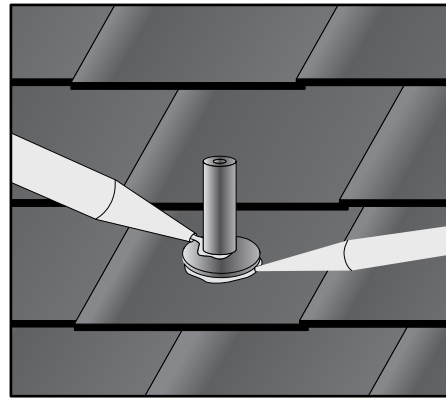
STEP 1: Locate the rafters and snap horizontal and vertical lines to mark installation position.



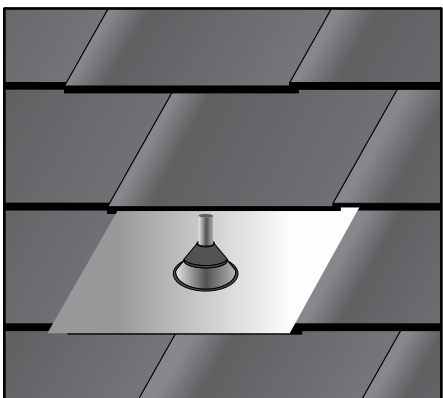
STEP 2: Drill a pilot hole using a 3/16" drill bit for the 5/16" hanger bolt. Backfill the pilot hole with waterproof / caulking materials.



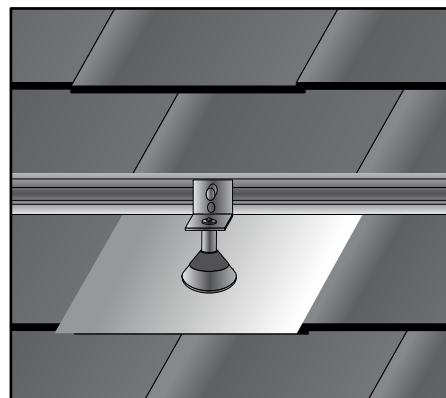
STEP 3: Drive the hanger bolt through the 1.5" sealing washer into pilot hole and tighten hanger bolt to 100-140 inch pounds depending on the type of wood and time of year.



STEP 4: Screw and tighten the standoff post to the hanger bolt. Tighten to 20 foot pounds. Add more waterproofing /caulking compound around joint.



STEP 5: Insert the 12x12 roof flashing over the standoff post, followed by the rubber collar. Tuck upper flashing under roofing material.



STEP 6: Mount the L bracket on top of the standoff post using the 3/8" washer followed by the 3/8" hex bolt and tighten to 20 foot pounds. Mount rail to L bracket using 3/8" T bolt and flange nut and tighten to 20 foot pounds.