Keeping It Lean In 2019

Rooftop solar has come a long way over the past decade. The ever-improving quality of equipment and components, enhanced level of expertise, consumer-friendly financing and huge price drops have all contributed mightily to turning residential and commercial/industrial solar into a thriving multibillion-dollar construction/energy sector in the United States and other countries. As the industry grows and more contractors get into the solar business, we know how important it is to provide useful tips and solid information on installation best practices from the mounting perspective—especially those that help installers keep their operations lean, the quality of their work high, and their businesses profitable.
As a company that has been at the forefront designing, manufacturing and supplying PV mounting systems and components for more than a decade, and one that innovates alongside installers, EcoFasten is in a unique position to provide valuable guidance on the latest best practices for installers. We’ve therefore created a guide to the three key areas for installers to consider when choosing your mounting systems and best practices for each one, helping you to keep it lean in 2019 and beyond.

1. Take A Close Look at the Roof
Although it may seem obvious, one of the first things that any solar contractor should do is make a holistic assessment of the condition and design constraints of the customer’s roof and the building itself. No reputable integrator wants to be held responsible for roof failure. Although it may seem obvious, one of the first things that any solar contractor should do is make a holistic assessment of the condition and design constraints of the customer’s roof and the building itself. No reputable integrator wants to be held responsible for roof failure.

Here’s a checklist of things to look at and take care of during the inspection of the roof prior to starting the design of the PV array:

- Structural evaluation of the building envelope and the roof.
- Age of the roofing materials. Don’t install on a roof that will need to be replaced before the 20-25 year lifetime of a rooftop solar system ends.
- Type of roofing materials. This assessment is especially important, in order to determine the correct steps needed, if any, to maintain the integrity of the roof.
- Dirt build-up and pest damage. Many roofs offer an ideal home for bats, squirrels, rats, wasps and other pests. Gnawing and added moisture can degrade materials rapidly, causing structural or waterproofing failure.
- Condition of underlayment. This step is most essential, since this structure is the primary source of waterproofing for the roof. Curling and cracking of underlayment are not a good sign.
- Damage from past work. Remember, the last one on the roof is the one who gets blamed for damage, so repair any damage before installing the PV system.

- Roof drainage and snowload. Proper drainage extends the lifetime of a roof and greatly reduces the likelihood of any water or moisture damage to the array. In regions prone to sliding snow and ice, snow guards should be installed in areas where homeowners are at risk of snow and ice shedding.
- Roof traffic, access and safety. A PV system cannot interfere with roof maintenance, so any design needs to accommodate that factor. And if a roof or part of a roof looks unsafe, it probably is.

Another important factor to consider as part of your lean installation process is the need to pre-drill and backfill. If you skip this step, you run the risk of cracking or splitting rafters, which will cause leaking and will ultimately be your fault. If it’s done the right way to begin with, there will be no headaches later on.

2. Roof Types and Materials Matter
With all the different types, shapes and orientations of roofs, not to mention the various roofing materials, the choice of roof attachment components and mounting systems depends on many factors. While there is no “one size fits all” for solar mounting, here are some lean best practices to follow when installing on specific roof types that will ensure the integrity of the roof.

Composition shingle
Make sure to notch your flashing to fit around nails to ensure code compliance by allowing the flashing to extend up and under the third course of shingles. You should also position the flashing between vertical joints of shingles for additional waterproofing measures.

Tile
It’s important to keep your time on the roof to a minimum. Even the strongest tiles can be brittle and break easily. Be especially careful not to drop tools while on a tile roof. Replace all cracked or damaged tiles prior to installing. Mission (clay) tiles are fragile, so it’s not ideal to install over clay tiles because of excessive risk of breakage. The “strip and go” method is often used, where the tiles are removed from the section of the roof that the array will be installed on and replaced with asphalt shingles. Solar mounting solutions that replace a tile with flashing are also a great source for replacement tiles. Make sure the flashing meets UL 441 and ICC-ES AC 286 standards and specifications.

Slate
The slate roof installation process is very similar to a composition shingle install, but the slate tiles will need to be removed prior to installing. Whatever you do, do not drill through slate. For code compliance and waterproofing properties to remain intact on slate roofs, make sure the top edge of the flashing extends up and under the third course of slate.

Metal
For installations on metal standing seam roofing, make sure to choose roof mounts that employ clamp-to-seam technology, which will never penetrate the roofing materials due to the use of set screws. Make sure the mounts you use will not void the roofing manufacturer’s warranties. When installing on corrugated metal, it’s important to use a mount that either attaches to the ribs of the panel (as opposed to in the channel, where water flows and moisture accumulates) or to use mounts that employ waterproofing technologies such as EPDM rubber bushings that form a compression-
fit once the fastener is attached. One of the advantages of installing a solar array to a metal roof is that metal offers one of the longest lasting materials on the roofing market, so there’s only a slim chance you’ll need to re-roof before installing the PV system.

Low-Slope/Membrane
It goes without saying, but we’ll say it anyway: the roof must remain watertight. In most low-slope roofing, this is achieved by flashing the attachment points. Different low-slope roof coverings and membranes will have different flashing requirements. For example, TPO, PVC, EPDM and other single-ply membranes use thermally or chemically welded flashings, while torchdown flashings are standard on asphalt roofs. In addition, it’s essential to select a corrosion-resistant metal such as aluminum for flashings on shingle or tile roofs to ensure the flashing stays robust for the lifetime of the PV system.

Structural insulated panels (SIPs)
It’s important to choose a mounting system that has a lightweight, durable construction that will enhance uplift and seismic values without adding additional weight. Opt for a system with a large baseplate, allowing multiple attachments points to distribute compressive loads over standard insulation.

3. Different Slopes for Different Folks
Of course, the slope of the different roof types also plays a critical role in the design and installation of PV mounting systems. Here’s an assortment of roof slope and roof condition basics from a roofer’s perspective that solar installers on the go should know:

• Installing any roofing material on a roof with less than 3:12 pitch does not make it low-slope roofing.
• The minimum slope that asphalt shingles should be installed on is typically 2:12 pitch.
• Low-slope roofs can be used on commercial roofing as well as residential.
• Low-slope roofs have a minimum 1/4-inch rise over a 12-inch run, so follow the roofing manufacturer's instructions.
• All low-slope roofs must allow water to drain.
• All low-slope roofs must have the ability to dry within 24 hours, apart from humidity-induced moisture conditions.
• If the roof does not drain properly, bacteria and organic growth will appear on the surface of the roof; organic growth will break down the roofing materials prematurely.
• Roof inspections increase the life of the roof and should be done at least twice a year.
• Low-slope roofs are often patched during roof inspections.
• Roofers look for signs of wear and patch the roof prior to any problems.

Designed with the Installer in Mind
Maintaining the integrity of the roof should be first and foremost in the approach of solar installers. As a company that was founded by roofers, we at EcoFasten know this better than most and is something we preach to our installation customers. By following the above guiding principles, installers will ensure they place their best foot forward with their residential projects. However, the efficiency, quality and reliability of their installation will be equally reliant on the mounting product they use.

What sets EcoFasten apart is how central installers are to our business. We work hand in hand with installers across the U.S. to understand the latest challenges they face on the roof, so that we can design and deliver the most innovative products possible. It is this close collaboration that has allowed us to fulfill our mantra of by installers, for installers, and launch products such as RockIt and GreenFasten.

We hope that this guide to solar mounting installation best practices helps you keep it lean in 2019 and accelerate your success in the years ahead.


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