

Solar Panels

We've all seen them and heard about the great value solar panels can bring. As time goes on, the cost to install solar energy has decreased and their usage has increased. With growth averaging 60% annually since 2007, a new solar project is installed every 2.5 minutes. As of 2014, nearly 645,000 U.S. homes and businesses have gone solar.



Before installing solar panels on your home or business, here are some things to consider:

Spacing requirements:

- All buildings with rooftop solar panels are required to have a four-foot wide, clear-walking perimeter around all edges of the roof. This allows fire fighters to access the roof at any area of the building.
 - On buildings with a roof larger than 250' x 250', a 6-foot wide clear-walking perimeter is required.
- Four-foot wide pathways are required to extend from the perimeter access area to any skylights, ventilation hatches, roof standpipes, and roof access hatch.
- There must be at least one pathway between the access hatch and the perimeter access area.
- Roof pathway areas must be structurally capable of supporting the live load.
- Panel array sections can be no greater than 150' by 150' in distance in either axis.

Weight restrictions/structural support:

- Typical solar panels weigh 20 to 50 pounds each and are distributed and attached evenly across roof-racking systems. The racking system fastens them to the roof at a desired angle and prevents water and debris from penetrating the roof.
- Consider the weight of solar panels. Make certain your structure is designed to support them. Also take into consideration the added weight of snow and ice. **Roofs need to be inspected by an engineer before installation to ensure strength is adequate to support the load.**

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- Local permitting rules must be consulted when installing solar panels.
- It's important to consider weather conditions and the structural integrity of the panels. Snow loads could obstruct the panels; wind and hail could damage the panels.
- Consult your roofer to ensure there are not any exclusions in warranties on a new roof when putting in a solar panel system.

Maintenance:

- Once solar panels are installed, maintenance is minimal due to very few moving parts.
- Panels should be inspected a few times a year for debris or dirt build up and any damage to the panels. Debris collection may also impact roof drainage and/or create drainage issues. **A preventative maintenance plan should be put in place for debris management.**
- **An electrician should inspect wiring connections and terminations annually for corrosion and tightness, and repair or replace as needed.**
- You can purchase a system that monitors exactly how much energy is being produced by the solar panels, alerting you when there's a problem with a panel that needs repair or cleaning.

Fire protection:

- The facility should have a site plan that shows the location of major components on the property, including solar array layout, location of access pathways for the rooftop system for fire department review, and the location of the utility disconnect.
- Detailed electrical diagrams showing and specifying all major components used in the electrical portion of the solar system are needed. They must show the configuration of the solar array, location and rating of overcurrent protection and disconnecting means, callout conduit, and wire size, type, and rating.
- Conduit, wiring systems, and raceways for solar panel wiring and circuits should be located in areas to prevent trip hazards and maximize ventilation opportunities. To limit the hazard of cutting live conduit in ventilation operations, wiring should be run in metallic conduit or raceways and should be run to the maximum extent possible along the bottom of load-bearing members.
- Due to the fire concerns an electrical system presents, a preventative maintenance program should be put in place and reviewed and practiced regularly.

Concerns to consider:

- In the event of a fire, first responders will cut the power to the building before attempting to fight the fire. Solar panels are designed to generate electricity

if there's any light present; this is also true in low-light settings. There may be a delayed response from a fire department when a building has solar panels, especially if the fire department isn't confident the power is cut. **Pre-planning with your fire department is extremely important so the responding department fully understands your system.**

- Electrified solar panels prohibit firefighters from using a direct stream of water on the building; instead, they must use a fog stream method that restricts the reach of water.
- Vertical ventilation of buildings is harder due to large portions of the roof being covered in solar panels. Firefighters cannot cut through solar panels and cannot move them easily because they're energized and fastened to the roof.
- Solar arrays pose a tripping hazard and inability to access all parts of the building.
- Faulty wiring can cause fires to start underneath solar panels, and there's little to no fire suppression or detection in these areas. The solar panels provide another barrier to stop the water from reaching the fires beneath them.
- Consider any insurance policies, warranties, and guarantees offered by the manufacturer and/or installer.

