SolarReadyFlorida

CONSTRUCTION GUIDELINES

September 2014

Solar Ready II

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These voluntary guidelines are provided to assist developers in the design and construction of new residential buildings. By incorporating these guidelines early in the design process, developers can make new homes solar ready without adding unduly to the cost of new construction. Homeowners in solar-ready buildings can make the decision to install solar later with less difficulty and at lower cost.

1. Orientation and Location of Building

1.1 **Orient Roofs to Face the South.** Buildings should be oriented to afford a south-facing roof and designed in a way that minimizes the obtrusiveness of solar panels that may be located on the south face of the roof.

1.2 **Avoid Shading.** Buildings should be designed in such a way that there is no shading to the south. Shade tree species should be selected and planting locations identified that will allow trees to shade windows and walls but not the identified solar collector location on the roof *(See the FAQ – How do I balance shade trees and solar?)*

2. Roof Design

2.1 **Preserve Rooftop Space for Solar Collectors.** The south-facing portion of the roof should include a contiguous area, free of rooftop obstruction, of sufficient size to allow for a solar system. At minimum, an area of several square feet (100 sq. ft. per kW) should be identified. Residential solar systems in Florida may cover up to 1,000 square feet of roof space. *(See the FAQ – How much rooftop space does solar need?)*

2.2 **Flat Roof Configuration.** For flat roofs, designers should ensure that the building has adequate roof access, and should consider integrating rooftop safety equipment such as guardrails when appropriate. The area identified for solar collection should be near the middle of the roof, away from any parapets to avoid shading. Any rooftop HVAC equipment should be positioned to avoid conflicting with the location of the solar collector.

2.3 **Pitched Roof Configuration.** For pitched roofs, designers should take into account the degree of pitch that would maximize the generation of solar panels located flush against the roof. In Southwest Florida, an optimal roof pitch for solar is 25° to 28°. *(See the FAQ – Why is this the right pitch?)*

2.4 **Allow for additional weight.** The roof should be adequately reinforced to allow for the additional weight, including both the weight of the solar systems itself and the impact of wind loads. Solar PV systems add 3-6 lbs. per square foot to the dead load of a roof, and up to 45 lbs. at specific attachment points. If a ballasted system is installed on a flat roof, it may add up to 20-30 lbs. per square foot to the roof's dead load.

2.5 **Record Roof Reinforcements.** Any reinforcements to the roof should be recorded on official drawings, such as the code sheet, for the benefit of solar developers.

3. Inverter & Mechanical Systems

3.1 **Reserve Wall Space for Inverter.** A 3'x3' area of wall space next to the building's main electrical panel, with an additional 3' of clearance space in front of the wall, should be reserved for the installation of an inverter. To minimize voltage loss, the meter box and reserved inverter space should be located just below the rooftop space reserved for the solar collector.

3.2 **Install Conduit.** Metallic conduit at least 2" in diameter should be installed that will run through the building from the area identified for the inverter to the area identified for the solar collector.

3.3 **Leave Room for PV Breaker.** The electric panel should include the necessary space for a power input breaker at the opposite end of the electric service panel from the main breaker.

3.4 **Provide Adequate Home Electrical Service.** Electrical service of at least 200 amperes in residential buildings is preferable to ensure that PV power generation can be accommodated.

Frequently Asked Questions

1. How do I balance shade trees and solar?

Some municipalities may encourage the planting of shade trees on the south side of homes in order to provide shade and reduce cooling loads. However, solar cannot be installed cost-effectively on a shaded roof. There is a direct trade-off between shading a home's roof with trees and preserving the ability to install rooftop solar. One strategy to deal with this is to encourage the planting of tree species that will not grow high enough to shade a home's roof, but will still shade windows and walls or to encourage other "green" building techniques that minimize cooling loads.

2. How much rooftop space does solar need?

As a rough guide, solar panels produce 1 kW of energy per 100 square feet. In Florida, a 10 KW system—the largest that can easily be installed by a Florida homeowner under current policies and regulations—would take up approximately 1,000 square feet of roof space. With Florida's solar resources, a 10 KW would produce roughly 13,600 kWh every year, just under the average statewide household consumption of 15,000 kWh. Many homeowners choose to install a smaller system that does not completely offset their energy usage, but these will still require several hundred square feet of rooftop space.

3. Why is this the right pitch?

In general, the pitch of a solar system should be equal to the latitude at which the system is installed. In Florida, latitudes range from 24.5° to the south in Key West to 30.3° to the north in Jacksonville. Pitch is less critical to maximizing solar output than orientation and shading, though, and there is some flexibility for solar-ready homes in this regard.