

State of the Art, SOTA, PLLC. Fact Sheet Q & A:

Q: What are the fees for small residential Solar PV projects?

A: Fees, for the electrical permit drawings, are from \$650 and up depending on the size and complexity of the system, plus GE tax. We gather information using web forms and these can be used to get a fee or to start work.

<https://barthurr.com/request-pv-engineering/>

Q: Are there different requirements between islands for Solar PV?

A: The Big Island requires electrical engineering on all residential, commercial, on-grid, and off-grid projects. Hawaii County also requires drawings for the module attachments and roof layout, by an architect. We can sometimes provide this if the customer chooses to take the self-liability option and complete the county form.

Maui County requires electrical engineering for residential off-grid and commercial projects.

Oahu requires permitting for commercial projects and some off-grid projects.

Q: I want to take my home off grid, what would be the process to do so?

A: To go off-grid completely, it is good to understand all of the electrical loads and determine an energy system size that matches your needs.

First we would need to know what size system you want. If you are not yet sure, you can let us know what major appliances you have that are gas and what appliances are electric.

Next we would need to know the square footage of the residence and any special loads you may have like a pool, spa, electric dryer, etc. We have an online form which can give us an idea of your loads at: <https://barthurr.com/new-service/>

For the energy system design we will need some basic information. A web form can be filled out and other information such as pictures, site plan, and desired locations can be emailed to us.

Submit your energy form: <https://barthurr.com/request-pv-engineering/>

Q: What does Hawaii County and utility require for PV energy systems?

A: The county requires both an Electrical Permit (which we can provide) and a Building Permit (which are drawings for the roof panel layout, sealing, racking, attachment, wind loading). The Building Permit drawings are supplied by an architect. There is another option where you can sign a county form and use an additional drawing that I can provide (let me know if you want to consider this option). But, most use an architect for the Building Permit.

<https://records.hawaiicounty.gov/weblink/ElectronicFile.aspx?openfile=true&dbid=1&docid=115205>

The building permit for the layout and module attachment, self-liability option is a form the county offers. (There is also possibility that the module attachment and layout drawing requirement might go away in the future)

The county and utility require the quantities and the equipment model numbers on the drawings to match the applications, and the construction.

The county requires us to put the building permit number on the Electrical plans. Let us know when that is available.

If the design changes, the county requires revision clouds, deltas, and a letter. Once those changes are submitted to the utility, they will require that the application be changed and the drawings be updated. These changes can create a lot of extra work for everyone involved, so it is helpful if the design does not change too often.

The county and utility require us to put the electrical contractor contact info with name, address, phone, license number on the drawings.

Q: I want a PV system for a new building/house, how does this work?

A: It is best to engage us once the floor plan is final and once the mechanical design is finished.

In order to accommodate the PV energy system we would need to know:

- what size your PV energy System (size in KW) will be and if there are any batteries.
- If the energy system is off-grid or if it is interconnected with the grid

Let us know when you are at that point.

Q: What other information needs to be provided for solar PV energy systems?

A: In addition to the web form, we will need pictures of:

- new equipment location
- the existing electrical
- meter from 10' away
- meter close-up
- meter-can breaker sizes
- meter amp rating shown on sticker inside the right lid
- house ac panel
- any other general pictures you think we might need.

It would also be helpful to get a list of all the equipment you are having installed, a site plan, desired locations for equipment, and the arch plans.

Q: What are the clearances for residential PV Solar modules on the roof?

Basically it is either 18" or 36" from ridge and there has to be a 36" wide pathway across two roof planes. If the panels occupy 33% or less of the roof plane, then it is 18" clear from ridge. If panels occupy more than 33% of roof plane then it is 36" clear from ridge.

A: R324.6.1 PATHWAYS. Not fewer than two pathways, on separate roof plans from lowest roof edge to ridge and not less than 36 inches (914mm).

Wide shall be provided on all buildings. Not fewer than one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, a pathway not less than 36-inches wide (914mm) shall be provided.

From the lowest roof edge to ridge on the same roof plane as the photovoltaic array on an adjacent roof plane, or straddling the same and adjacent roof planes. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in the areas with minimum obstructions such as vent pipes, conduit, or mechanical equipment.

R324.6.2 SETBACK AT RIDGE. For photovoltaic arrays occupying not more than 33-percent of the plan view total roof area, not less than an 18-inch (457mm) clear setback is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33-percent of the plan view total roof area, not less than a 36-inch (914mm) clear setback is required on both sides of a horizontal ridge.

R324.6.2.1 ALTERNATIVE SETBACK AT RIDGE. Where an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D or section P2904, setbacks at ridges shall comply within the following

1. For photovoltaic arrays occupying not more than 66-percent of the plan view total roof area, not less than an 18-in (457mm) clear setback is required on both sides of a horizontal ridge.
2. For photovoltaic arrays occupying more than 66-percent of the plan view total roof area, not less than 36-inch (914mm) clear setback is required on both sides of a horizontal ridge.

R324.6.2.2 EMERGENCY ESCAPE AND RESCUE OPENING. Panels and modules install on dwellings shall not be placed on the portion of the roof that is below an emergency escape and rescue opening. A pathway not less than 36-inches (914mm) wide shall be provided to the emergency escape.

Q: What does Hawaii County require for large residential services, power and lighting?

A: It is our understanding that HI County now requires full complete electrical engineered plans for homes with services larger than 200A.

Q: What do I need to know if I need service, power, and lighting design?

A: Assuming that we are provided AutoCAD background files, with all desire lighting, receptacles and mechanical drawings, our estimated fee would be \$0.65 per square foot plus GE tax. We also need to know all the electric major appliances that are not gas.

Fill out web form for general info: <https://barthurr.com/request-power-and-lighting/>

Q: How are electric services sized?

A: The service is based on the NEC formula and load calculations. To perform these calculations we will need to know the square footage of the building and all the electric loads – which should be determined in drawings.