



SOLAR PV PLAN SUBMITTAL REQUIREMENTS

For questions please email: buildinginspection@lakelandgov.net

Plans and inspections must be compliant with the [Florida Building Code](#) (2020), [National Electrical Code](#) (2017), [Florida Fire Prevention Code](#) (2020), and any applicable city ordinances or state laws.

GENERAL REQUIREMENTS

1. Solar Photovoltaic (PV) permit application
2. Construction drawings – Site plan(s), Roof plan, Structural plan
3. Electrical calculations and plans – Electrical diagram, Array and module plan, Overcurrent protection plan.
4. Manufacturer installation instruction and specification sheets for all equipment
5. Completed and signed Lakeland Electric PV system agreement document

NOTE: Plans shall be signed and sealed by a Registered Design Professional or Florida SolarEnergy Center (FSEC) system approval report per Florida Statute 377.705.

CONSTRUCTION DRAWINGS

Site Plan(s)

- Provide an aerial view of the structure and orientation. 107.3.5
- Show the location of all existing and proposed electrical equipment.
- Note all power sources on premises. 705.10
- Identify Lakeland Electric disconnect on exterior of structure.
- Provide clearances for all venting, openings, mechanical equipment, and skylights.
[FFPC 11.12.2.2.2.1](#)

Roof Plan

- Describe age, covering type (shingles, shake, etc.), pitch, and condition of roof, including the design and condition of the rafter or truss system.

- Provide scale drawing indicating the number, layout, location, and orientation of the solar panels to be installed on the roof, including conduit size and location.
- Show fire department setbacks/roof access pathway and point of access. [FFPC 11.12.2.2.2.1](#)
- Provide documentation that roof can support the distributed weight of the proposed system, signed and sealed by a design professional. 107.3.5

Structural Plan

- Provide uplift Wind Zone (per [ASCE-7](#)) and site conditions.
- Identify all components including racking, brackets, fasteners, etc. that are integral to wind-load resistance and transfer path.
- Provide support rail and module dimensions, weights, materials, and method of attachment. (cut sheet)
- Identify fastener type, material, diameter, length, and spacing. (cut sheet)
- Provide flashing and waterproofing details. (cut sheet)
- Provide certification of structural components to wind load, signed and sealed by a design professional. 107.3.5

ELECTRICAL CALCULATIONS & PLANS

- Electrical calculations** showing that all wire sizing has been determined with proper ampacity, conduit fill, and ambient derating factors.
 - Maximum system voltage (open circuit voltage with temperature factor). 690.7, 690.53
 - Maximum rated current (SCC per string and parallel strings). 690.53
 - Rated AC output and nominal operating AC voltage. 690.54
- For energy storage systems (ESS), include power ratings and estimated daily energy consumption for each load to show that inverter and battery selection will meet the standby needs. (Inverter output rating must be equal to or greater than the load of the largest piece of utilization equipment.) 710.15(A)
- Systems with DC-to-DC converters (optimizers) to be calculated by manufacturer instructions. 690.53
- Electrical Diagram**
 - One-line electrical diagram should show PV array configuration, wiring system, overcurrent protection, inverter, disconnects, required signs, and AC connection to the building.
 - Include conductor types, conductor ampacity, conductor schedule, and existing service size.
 - Conductor sizes with correction factors of derating (ambient temp, number of conductors in conduit, voltage drop) 690.8
 - Point of connection must comply with 705.12 for line and load side connections (taps)

- Provide details of grounding electrode system/equipment grounding. 690.47
- PVC/ENT not allowed in attics. 352.12(D)
- PVC Expansion fittings to comply with 352.44
- Provide Short Circuit Current Rating (SCCR) of new electrical equipment and Amperes Interrupting Rating (AIR) ratings of breakers. Provide Lakeland Electric transformer SCA. Ratings of electrical equipment and breakers must be greater than the transformer SCA or a fault study will be required. 110.9, 110.10

Array and Module Plan

- Total number of modules 690.8
- Number of modules in series. 690.51
- Number of parallel source circuits
- Total number of micro-inverters connected to a branch circuit.
- Total number of micro-inverters connected to a panel. 690.54, 690.8(A)(3), 690.9(B), 705.12(B)

Overcurrent Protection Plan

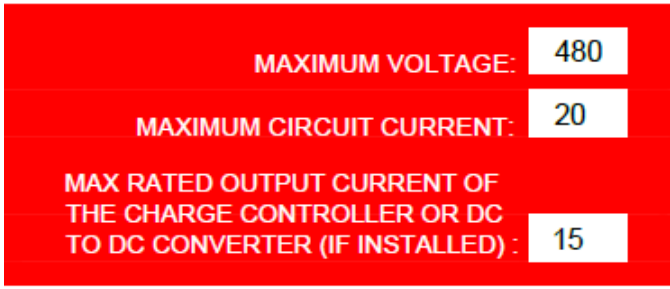
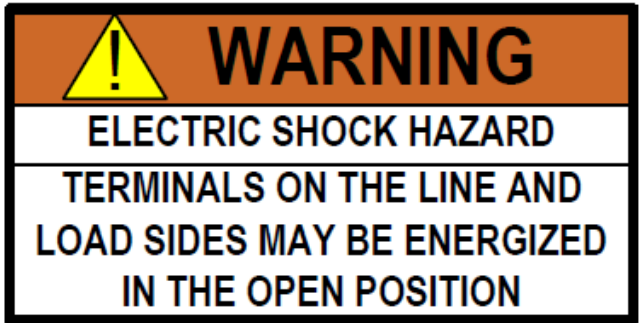


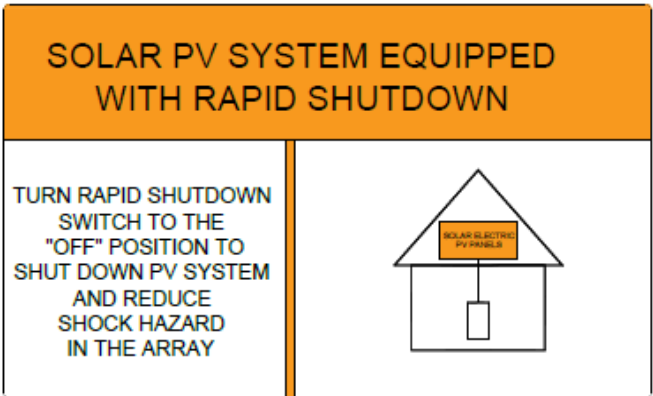
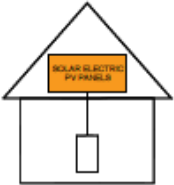
- Provide PV power source disconnect means and sizing. 690.13
- Provide Lakeland Electric disconnect one-line diagram.
- Provide overcurrent protection plan for supply-side tap devices, load-side connections, inverter output, battery storage systems, micro-inverter circuits
- When more than two strings are installed in parallel, OCP may be required for each string. 690.9
- For storage systems, provide disconnect and overcurrent protection per 706.7, 706.21
- Provide existing electrical panel/combiner panel bus bar sizing per 705.12(B)(2)(3)


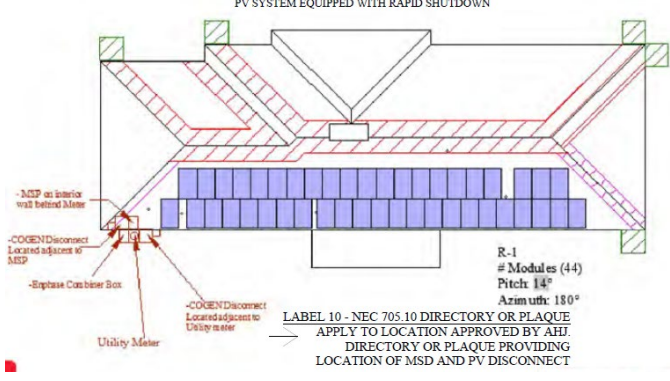
MANUFACTURER SPEC SHEETS

- Provide manufacturer specifications and installation instructions for all system components, including but not limited to (690.4)
- PV modules
 - Inverters
 - AC/DC combiner boxes and electrical panels
 - Disconnects
 - Mounting system
 - Energy storage systems (ESS)
 - Micro-inverters
 - DC to DC converters (optimizers)
 - Grounding/bonding of support system and modules

LABELS

The following items must be labeled where applicable.

	CODE	LOCATION	TEXT	EXAMPLE
<input type="checkbox"/>	690.53	On the DC disconnects	<ul style="list-style-type: none"> • Max voltage • Max current • Max output current of charge controller or DC-to-DC converter, if installed 	 <p>MAXIMUM VOLTAGE: 480</p> <p>MAXIMUM CIRCUIT CURRENT: 20</p> <p>MAX RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC TO DC CONVERTER (IF INSTALLED): 15</p>
<input type="checkbox"/>	690.13 (B)	On the DC disconnect and any equipment that stays energized in the off position from the PV supply	<p>Electric Shock Hazard.</p> <p>Line load may be energized on both sides when in the open position</p>	 <p>WARNING</p> <p>ELECTRIC SHOCK HAZARD</p> <p>TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION</p>
<input type="checkbox"/>	690.54	Interactive point of connection (usually the main service panel)	<ul style="list-style-type: none"> • Rated AC output current • Nominal operating AC voltage 	 <p>PHOTOVOLTAIC AC DISCONNECT</p> <p>RATED AC OUTPUT CURRENT: 57</p> <p>NOMINAL OPERATING AC VOLTAGE: 240</p>
<input type="checkbox"/>	705.12 (B)(2)(3)(b)	Inverter output connection (AC systems; usually the main service panel)	Do not relocate	 <p>WARNING</p> <p>INVERTER OUTPUT CONNECTION</p> <p>DO NOT RELOCATE THIS OVERCURRENT DEVICE</p>
<input type="checkbox"/>	690.12 690.56 (C)(1)(a)	Within 3 ft. of rapid shutdown initiation method	System is equipped with rapid shutdown; Method to initiate rapid shutdown	 <p>SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN</p> <p>TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY</p> 

<input type="checkbox"/>	690.56 (B) 690.56 (C)(3)	At rapid shutdown initiation method	Rapid shutdown switch for Solar PV system	RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM
<input type="checkbox"/>	705.12 (B)(2)(3)(c)	At any AC combiner panel	Overcurrent devices not to exceed ampacity of bus bar	 WARNING THIS EQUIPMENT IS FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.
<input type="checkbox"/>	690.31 (G)(3)	On all DC conduits and boxes	DC circuit wiring systems identified	WARNING: PHOTOVOLTAIC POWER SOURCE
<input type="checkbox"/>	705.10	At the main service disconnect, the PV disconnect, and on the energy storage system (if applicable)	Plaque denoting all electric power sources on or in the premises	<p>CAUTION POWER TO THIS BUILDING IS ALSO SUPPLIED FROM ROOF MOUNTED PV ARRAY WITH SAFETY DISCONNECTS AS SHOWN. PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN</p> 

REVISIONS

- Any revisions to the plans are to be clouded
- All responses are to include a narrative
- All revision drawings shall be named the same as the original drawing name.

INSPECTIONS

- ROUGH: Building & Electrical
- FINAL: Building & Electrical