



## **PHOTOVOLTAIC SYSTEMS ELECTRICAL**

### **ALL WORK SHALL COMPLY WITH ARTICLE 690 OF THE 2013 CALIFORNIA ELECTRICAL CODE**

#### **GENERAL**

1. Provide the following information for the photovoltaic (PV) System:
  - a) Scope of the project, including system KW rating.
  - b) Complete single line diagram of the PV and utility interconnect.
  - c) Site plan, including location of system components, (i.e. inverter, convertor,
  - d) batteries, modules, disconnects, etc).
  - e) Type of system (i.e Alternating-Current Modules, Bipolar, grounded, ungrounded, Hybrid, isolated, interactive, stand-alone, etc).
  - f) Utility service Operating voltage or class.
  - g) Provide information on the size, type, and insulation ratings (voltage, temperature, etc) of all conductors and associated wiring components on the direct current (DC) and alternating (AC) side of the PV system.
  - h) Indicate type, size and material of raceway(s).

#### **SOURCE**

2. Provide the following information (as applicable) for the direct current (DC) side of the PV system:
  - a) Number of series connected modules in every PV source circuit.
  - b) Number of parallel connected modules or panels PV source circuits in each array or PV power source.
  - c) Number of combiner boxes, control boxes, or PV power centers for each array, sub array or PV power source.
  - d) Equipment Grounding Conductor (EGC) landing at each module at manufacturers recommended location.
  - e) Number of PV output circuits.
  - f) PV source circuit modules or panels connection arrangement.
  - g) Operating and open-circuit voltage of each module or panel.
  - h) Operating voltage of each array or PV power source.
  - i) Operating current of every PV source circuit.

- j) Operating current of each array.
  - k) Maximum array, panel or module system voltage.
  - l) Short circuit current of modules or panels.
  - m) Short circuit current of array and sub arrays.
  - n) Short circuit current of battery systems
  - o) Disconnecting means electrical ratings.
  - o) Disconnecting means wiring diagram.
3. Provide the manufacturer's specification sheets for the PV modules (or panels), including manufacturer's name, catalog numbers, complete electrical information,
4. Provide the manufacturer's specification sheets for the inverters, converters, charge controllers, and AC modules, indicating the following ratings:
- a) Maximum Input AC and DC voltage, and the range of operating voltage(s),
  - b) Nominal AC output voltage,
  - c) Nominal DC voltage and operating range for Utility Interactive or Stand-Alone
  - d) systems with charge controller,
  - e) Maximum Input AC and DC current, and maximum input short circuit current,
  - f) Maximum inverter output short circuit current and duration.
  - g) Maximum utility source backfeed current(short or open circuit) for utility interactive system with or without charge controller,
  - h) Maximum continuous AC output current and power,
9. Provide information on the size, type, and insulation ratings (voltage, temperature, etc) of all conductors and associated wiring components on the DC and AC side of the PV system.
10. The roof mounted photovoltaic modules or panel layout shall be approved by the Fire Department.
12. Provide information indicating compliance with the CEC 690.61 requirement, Loss of Interactive System Power.
13. The circuit conductors and overcurrent protective devices shall be sized to carry not less than 125% of the maximum current
14. The overcurrent protection of output circuits with internal current limiting devices shall be not less than 125% of the maximum limited current of the output circuit.
15. Provide a disconnecting means for all current carrying conductors of PV sources from all other conductors in the building or other structure. This

disconnecting means shall be installed at a readily accessible location either on the outside of the building or structure or inside nearest the point of entrance of the PV system conductors.

16. Indicate if the components of the system are negatively or positively grounded.
17. Provide signage on all photo voltaic raceways stating CAUTION: SOLAR CIRCUIT every 10 feet and on each side of any building component penetration.
18. Provide all signage required by CEC 690 and 705.