

## ***Submittal Requirements – Photovoltaic System Ground or Roof Mounted***

### **2013 California Electrical and Building Codes.**

#### **Residential or Commercial Submittal Requirements:**

1. Two sets of Construction plans, including plot plan.
2. Cover Sheet: See our attached Cover Sheet, page 2 and 3, with the following information for use in your submittal package.
  - a) Potential limitations for Homeowners
  - b) List of reference codes
  - c) Required signage (CA Electrical Code, Article 690 of the 2013 CEC)
  - d) Contractor shall verify... statement (see attached sample cover sheet)
  - e) Lag screws shall penetrate a minimum 2" into structural members statement
3. Roof plan or ground mount plan with panel location.
4. Panel anchorage/attachment details.
  - a) A mounting detail from the manufacturer such as Unirac or Tilerac is required.
  - b) If ground mounted; footing and structural details are required.
5. Electrical one line diagram.
  - a) Show panels, inverter, main panel disconnects and wire size.
6. Equipment cut sheets (inverter and photovoltaic panels).
  - a) Inverter and panel must be a listed product.
  - b) Indicate panels listed product weight.
7. Address on first page and number all pages.
8. Responsible designer to sign all plans that they prepared.

**This information may be used for the cover page of your plan.**

Project Address: \_\_\_\_\_

Scope of work: \_\_\_\_\_

**Installation to comply with article 690 of the 2013 CEC.**

**Reference Codes:**  
California Code of Regulations, Title 24  
As amended by the City of Livermore, CA  
  
2013 California Building Code  
2013 California Electrical Code  
2013 California Energy Code  
2013 California Fire Code  
2013 California Mechanical Code  
2013 California Plumbing Code

Contractor shall verify that the roof  
Structure will withstand the additional loads

Lag Screws shall penetrate a minimum 2”  
into solid sawn structural members and  
shall not exceed manufacture  
recommendations for fasteners into  
engineered structural members.

**Notice to property owner:**

Your homeowners’ association may have potential limitations applicable to your project.

**Photovoltaic Sign and Label Requirements**

Labels shall be phenolic where exposed to sunlight. Labels required on conduit shall be permanent, weather resistant and suitable for the environment. Labels shall be red background with white lettering. The following labels must be provided:

Article	Location of Label	Verbiage
690.5(C)	Utility-interactive inverter, battery enclosure	“WARNING: ELECTRIC SHOCK HAZARD IF A GROUND FAULT IS INDICATED, NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED”.
	On the main service when DC wiring is run through the building and the DC disconnect is located other than at the main service	DC Disconnect IS LOCATED _____

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Article	Location of Label	Verbiage
690.14(C)(2)	AC and DC disconnects	DC Photovoltaic Disconnect AC Photovoltaic Disconnect
690.17	Main electrical service	WARNING ELECTRICAL SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.
690.35(F)	For ungrounded systems. On each junction box, combiner box, disconnect	WARNING ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNDERGROUNDED AND MAY BE ENERGIZED.
690.53	DC disconnects	Rated maximum power-point current ___ Rated maximum power-point voltage ___ Maximum system voltage ____ Short circuit current ____ Maximum rated output current of the charge controller (if installed) ____
	At interactive points of interconnection, usually the main service	Rated AC operating current _____ Nominal operating AC voltage _____
690.56(B)/ 690.14(D)(4) 705.10	At the electrical service and at the photovoltaic inverter if not located at the same location.	A directory providing the location of the service disconnecting means and the photovoltaic system disconnecting means
690.64(B)(7)	Backfed panelboards	"WARNING: INVERTER OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE."
UTILITIES REQUIREMENTS	At the main electrical service when a supply side tap is used	"CAUTION! SUPPLY SIDE TAP. OPEN AND LOCK AC PV DISCONNECT BEFORE REMOVING METER"
SFM – GUIDELINES	On DC conduit, raceways, enclosures, mark every 10', at turns, above/below penetrations	"CAUTION: SOLAR CIRCUIT"
	On the inverter where PV systems are positively grounded	"POSITIVE GROUNDED SYSTEM"
	Load centers used as PV circuits combiner boxes shall be labeled	"PHOTOVOLTAIC CIRCUITS ONLY. NO ADDITIONAL CIRCUITS ALLOWED"

### General Guidelines

- When transitioning occurs from free air to in conduit, install a cord grip fitting with a rubber grommet or a bushing and sealant such as Sikaflex.
- Where conductors are installed underground, section 300.5 of the CEC must be followed to ensure proper protection.

### Grounding

- Grounding of the system must comply with CEC 690.47 ©. Note where an existing grounding electrode system is a driven ground rod, an additional ground rod is required per CEC 250.560
- Each PV system must attach to the grounding electrode with a continuous grounding electrode conductor. An approved irreversible grounding splice may also be accepted.
- Connection of the grounding electrode conductor to the grounding electrode must be made with an approved connection that is listed for the application location.
- Grounding electrode conductors must be sized to comply with article CEC 690.47.