

Submittal Requirements – Photovoltaic System Ground or Roof Mounted

2016 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 2016 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: Roof-mounted PV solar system _____

Installation to comply with article 690 of the 2016 CEC.

Reference Codes:
California Code of Regulations, Title 24
As amended by the City of Livermore, CA

2016 California Building Code
2016 California Electrical Code
2016 California Energy Code
2016 California Fire Code
2016 California Mechanical Code
2016 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 manufacturer
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 _____ |

Continued on next page

| Article | Location of Label | Verbiage |
|--------------------------------------|---|---|
| 690.13-690.15 | 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 ____ Minimumt 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 |
| 690.15(A)(4) | Backfed panelboards | “WARNING: INVERTER OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE.” |
| UTILITIES REQUIREME NTS | 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 250.64
- 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.