



**SAN JOAQUIN COUNTY  
COMMUNITY DEVELOPMENT DEPARTMENT**

1810 E. HAZELTON AVE., STOCKTON, CA 95205-6232  
PHONE: 209/468-3121 FAX: 209/468-3163

## **PHOTOVOLTAIC PERMITTING**

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

### **PRIOR TO INSTALLATION**

- Prior to installation plans shall be submitted and approved.

### **PLAN SUBMITTAL REQUIREMENTS**

**All information listed below MUST be provided at time of permit application for plan review to occur.**

- Two complete sets of plans. Three, if in the City of Stockton Fire District.
- Minimum plan dimension is 18"x24".
- All drawings to be wet signed by the designer.
- Ground mount arrays require Planning Department approval prior to application submittal.
- Show all property lines, buildings/structures (existing and proposed), north arrow, lot dimensions and easements.
- Show location of all equipment and components.
- All electrical equipment specifications.
- All electrical calculations.
- Show means of grounding and bonding for all equipment and support systems.
- Structural analysis of support structure required if dead load of array exceeds three pounds per square foot.
- Structures located within flood or fire hazard zones shall be designed in accordance with San Joaquin County ordinances.

### **REQUIRED INSPECTIONS**

- Footings for ground mount support systems
- Structural attachment of racking
- Rough wiring/conduit
- Underground conduit
- Final

### **GENERAL REQUIREMENTS**

- The plans, permit and installation instructions shall be on site at time of inspection.
- Field installation shall be per code/plan. Changes shall be submitted to the county for approval prior to inspection.

- Structural attachments must be inspected prior to cover.
- If a new roofing system is going to be installed, a separate roofing permit and inspections are required.
- Where dc wiring is installed inside the structure a rough inspection is required prior to installing conductors.
- DC wires installed inside the structure shall be installed in a metallic raceway. CEC 690.31 (e)
- Installer shall have ladder on site and set up at time of inspection. The ladder shall be extended 36" above the roof and ladder shall be secured at roof.
- All equipment shall be open and ready for inspection.
- If using the WEEB system for grounding, a letter of acceptance from the module manufacturer, signed by their engineer, is required.

### **MAIN ELECTRIC SERVICE**

- Verify utility point of interconnection (circuit breaker) is per plan and does not exceed 120% of the bus rating(CEC 690.64 for residential. for commercial the bus rating shall not exceed 100% of its rating)
- Circuit breakers shall be of the same manufacturer as the main electrical service.
- All underground conduits shall be sealed. Sealants must be listed for such use. (example: duct seal) CEC 300.5(G).
- Verify existing ac grounding electrode system UFER or driven ground rod. The connection to the grounding electrode shall remain accessible. CEC 250.68 (a)
- If there is not an existing ac grounding electrode, PV contractor shall install a ground rod at the main electrical service per CEC 250.52(5).
- Verify grounding electrode system from inverter to ground rod then bonded to existing ac grounding electrode or provide grounding electrode conductor directly from inverter to existing grounding electrode with separate attachment.

### **INVERTER LOCATION**

- AC and DC disconnects shall be located at inverter. CEC 690.14 A-D
- Verify maximum/minimum height per manufacturers installation instructions.

### **ROOF TOP INSTALLATION**

- All equipment on the roof requiring servicing shall meet the required clearances of CEC 110.26 and California Department of Forestry and Fire Protection. See all requirements at:  
<http://osfm.fire.ca.gov/pdf/reports/solarphotovoltaicguideline.pdf>

Residential Systems—Single and Two-Unit Residential Dwellings  
Access/Pathways

- a. Residential Buildings with hip roof layouts: Modules shall be located in a manner that provides one (1) three-foot (3') wide clear access pathway from the

eave to the ridge on each roof slope where modules are located. The access pathway shall be located at a structurally strong location on the building (such as a bearing wall).

b. Residential Buildings with a single ridge: Modules shall be located in a manner that provides two (2) three-foot (3') wide access pathways from the eave to the ridge on each roof slope where modules are located.

c. Hips and Valleys: Modules shall be located no closer than one and one half (1.5) feet to a hip or a valley if modules are to be placed on both sides of a hip or valley. If the modules are to be located on only one side of a hip or valley that is of equal length then the modules may be placed directly adjacent to the hip or valley.

d. Metal raceways in attics are not to run perpendicular to rafters except at the ridge and at the top plate of the walls.

### **Smoke Ventilation**

The modules shall be located no higher than three feet (3') below the ridge.

### **Commercial Buildings and Residential Housing Comprised of Three (3) or More Units**

See requirements at

<http://osfm.fire.ca.gov/pdf/reports/solarphotovoltaicguideline.pdf>

- Where the connections of the supports are going to be covered up, an inspection is required to verify connections.
- Verify roof penetrations are flashed and counter flashed.
- Verify grounding lugs are installed per the module manufacturer's installation instructions.
- Module wiring shall be properly secured and protected from damage.
- Equipment on dc side of inverter shall be rated 600vdc.
- Where three or more strings are being combined, combiner box shall be listed/factory assembled. 600Vdc fuses are required.
- Array conductors must be connected to the line side input terminals at the top of the main dc disconnect and conductors to inverter input shall be connected to the load side output terminals (bottom) of dc disconnect.

### **GROUND MOUNTED PHOTOVOLTAIC ARRAYS (CDF)**

A clear brush area of ten feet (10') is required for ground mounted photovoltaic arrays.

### **SIGNAGE**

- Marking is required on dc conduit, raceways, enclosures, cable assemblies and junction boxes. **"CAUTION: SOLAR CIRCUIT"**. Marking shall be reflective, weather resistant and suitable for the environment. Marking shall be every 10', at turns and above and/or below penetrations and at all dc combiner and

junction boxes. Labels should be red background, white lettering 3/8" high minimum, and capitalize all letters.

## MAIN ELECTRICAL SERVICE

- Install a permanent phenolic plaque at the service entrance equipment denoting all electrical power sources. Signage shall be red background with white engraved letters. Minimum size shall be 3"x4" (**indicate this on plans**)
- Buildings or structures with both utility service and a photovoltaic system shall have a permanent plaque or directory providing the location of the service disconnecting means and the photovoltaic system disconnecting means, if not located at the same location. CEC 690.56 (b)
- A permanent phenolic plaque shall be placed at the point of interconnection stating the **MAXIMUM AC OUTPUT OPERATING CURRENT** and the **OPERATING AC VOLTAGE**. CEC 690.54
- Provide a permanent phenolic plaque at the main electrical service when a supply side tap is necessary. **"CAUTION! SUPPLY SIDE TAP. OPEN AND LOCK AC DISCONNECT BEFORE REMOVING THE METER."**

## AC DISCONNECT

- Provide permanent phenolic plaques at all ac disconnects **CEC 690.14 (c) (2)"PHOTOVOLTAIC ARRAY AC DISCONNECT SWITCH"**.
- Load centers used as photovoltaic combiner boxes shall be labeled..."**PHOTOVOLTAIC CIRCUITS ONLY. NO ADDITIONAL CIRCUITS ALLOWED"**.

## DC DISCONNECT

- Provide a permanent phenolic plaque at all dc disconnects **CEC 690.14 (c) (2) "PHOTOVOLTAIC ARRAY DC DISCONNECT SWITCH"**. Additional signage is required at dc disconnects providing **OPERATING CURRENT and VOLTAGE, MAXIMUM SYSTEM VOLTAGE and SHORT-CIRCUIT CURRENT**. CEC 690.53

## INVERTERS

- Where inverters are located other than at the main electrical service locations, a permanent phenolic plaque or directory denoting all electrical power sources shall be installed. CEC 690.14 (d), 705.10
- Where systems are positively grounded, signage shall be provided indicating "POSITIVE GROUNDED SYSTEM".

## PLACARDS REQUIRED

- All placards to be red with white lettering and of Bake-lite material or similar.
- At disconnecting means: 690.17(4)

WARNING  
ELECTRICAL SHOCK HAZARD  
DO NOT TOUCH TERMINALS. TERMINALS

ON BOTH LINE AND  
LOAD SIDES MAY BE ENERGIZED  
IN THE OPEN POSITION

- The photovoltaic power source shall be labeled with the following warning at each junction box, combiner box, disconnect, and device where the ungrounded circuits may be exposed during service: 690.35(F)

WARNING

ELECTRIC SHOCK HAZARD. THE DIRECT  
CURRENT CIRCUIT CONDUCTORS OF THIS  
PHOTOVOLTAIC POWER SYSTEM ARE  
UNGROUNDING BUT MAY BE ENERGIZED  
WITH RESPECT TO GROUND DUE TO  
LEAKAGE PATHS ADD/OR GROUND FAULTS