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Solar Photovoltaic System Submittals

PHOTOVOLTAIC DESIGN AND REVIEW

1. All PV applications shall be reviewed at the front counter for completeness.
2. Larger PV systems (>30KW) may be required to be submitted for plan review.
3. All PV system plans shall be reviewed for:
 - a. Electrical wiring and configuration, including system disconnects.
 - b. Signage
 - c. Placement of equipment and modules with associated access and pathways.
 - d. Equipment type, listing, testing agency approvals, etc
4. Any applications that do not meet the listed requirements will be forwarded to the Petaluma Fire Department for their review.

The following requirements are compiled from the REACO and CalFire recommendations.

SUBMITTAL REQUIREMENTS

1. General information: Name of applicant, address of project, name of licensed contractor, size of system being installed.
2. Roof plan, drawn to scale, with the following information: North arrow; direction to street frontage; location of service lateral conductors, main electric meter and panel, DC disconnect, inverter, AC disconnect; roof slope, materials of roof covering, roof dimensions, location of array(s) and dimension of arrays; all skylights, roof ventilation openings, or other mechanical equipment on the roof; access location; clearances around arrays for pathways and access; approximate location of conduit and where it turns to go down to electrical service panel.
3. Single line diagram of electrical equipment clearly showing: Size of main panel, sub panels, PV system equipment including: make, model and size of units, disconnects, associated electrical devices, the size, conduit size and type, and wire size and type.
4. Mounting information: Specify and detail mounting of modules to roof or other assembly.
5. Per section 1503.2 – **Flashing**. Flashing shall be installed in such a manner so as to prevent moisture entering the wall and roof at penetrations through the roof plane.
6. Show actual proposed labels as required by code and policy. Note where to be located with approx. dimension of the label.

PHOTOVOLTAIC DISCONNECT REQUIREMENTS

1. A mechanism shall be provided to allow safe installation or servicing of portions of the PV array or the entire array (2007 California Electrical Code, Article 690.18). The system must be “disabled” to allow safe access to the photovoltaic system.
2. PV disconnect shall be installed in a readily accessible location at the point where the PV conductors first penetrate the structure.
3. Additional disconnect requirements for protection of emergency personnel:
 - a. A main separate emergency disconnect shall be installed to disconnect from interior and exterior wiring running to inverter.
 - b. Each disconnect for an array portion shall state the maximum possible KW of power generated by that portion of the array.
 - c. All disconnects shall be accessible to fire department and located together when possible.
 - d. All electrical panel shut-offs shall be designed to shut off all power (Solar and Domestic) after the panel.

ACCESS REQUIREMENTS AND ARRAY CONFIGURATIONS

All arrays shall be mounted per the listing installation instructions of the system. Pathways shall be established in the design of the solar installation and clearly indicated on the plans. Arrays shall be located in a manner that provides access pathways for the following conditions:

- 1) Residential Buildings with hip roof layouts.
 - a) Three foot (3') wide pathways shall be in the area from the eave to the ridge on each roof slope on each side of the array(s).
 - b) All roof access pathways shall be located at a structurally supported location on the building, such as over a bearing wall, or beam lines.
 - c) Hips and Valleys: Arrays 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.
- 2) Residential Buildings with a single ridge (Gable Roof). Modules shall be located in a manner that provides;
 - a) Two three-foot (3') wide access pathways from the eave to the ridge on each roof slope where arrays are located.
 - b) Arrays shall be located no higher than two feet (2') below the ridge.

SIGNAGE REQUIREMENTS FOR PV SYSTEMS

Three forms of signage are required for Solar PV Systems. Permanently affixed labels shall have a red background with white lettering. Printed material shall be resistant to fading per UL 969.

1. Exterior/Interior Conduit signage: The label shall state, “CAUTION: SOLAR PV SYSTEM MAY REMAIN ENERGIZED AFTER DISCONNECTION DURING DAYLIGHT HOURS”
 - a. Required shut off marking is required on all interior and exterior dc conduit, raceways, enclosures, cable assemblies, and junction boxes to alert the fire service to avoid cutting them.
 - b. Marking shall be placed every 10 feet, at turns and above and/or below penetrations and at all dc combiner and junction boxes.
 - c. Vertical conduits shall be provided with a minimum of one label to be affixed 66” above clear standing surface.
 - d. Exterior/Interior Conduit signage shall be:
 - i. Red background with white lettering.
 - ii. Reflective, weather resistant printed material shall be resistant to fading per UL 969.

- iii. Letters shall be "Arial" font or similar, non bold, a minimum of 3/8" height lettering, and be all capital letters
2. Exterior/interior of Electrical Panel signage: Exterior/Interior of Electrical Panel signage: Signs are required on all interior and exterior overcurrent devices (electrical panels, etc.)
3. A permanent placard with fade resistant material listed per UL 969 shall be installed on exterior and interior of main electrical panel stating: "CAUTION: SOLAR PV SYSTEM MAY REMAIN ENERGIZED AFTER DISCONNECTION DURING DAYLIGHT HOURS".

**CAUTION: SOLAR PV WIRING
MAY REMAIN ENERGIZED
AFTER DISCONNECTION
DURING DAYLIGHT HOURS**

- a. Exterior/Interior overcurrent device signage shall be:
 - i. Red background with white lettering.
 - ii. Of durable non fading weather resistant material attached or adhered to panel or directly adjacent to the panel.
 - iii. Letters shall be "Arial" font or similar, non bold, a minimum of 3/8" height lettering, and

be all capital letters

4. Roof top signage: All roof top disconnects are to be labeled as to be easily identified.

PROTECTION OF EMERGENCY RESPONDERS

The following conditions shall be verified and apply to all roof and ground mount Solar PV systems:

1. All sharp edges and fastener tips shall be covered or crimped over as to not provide a sharp edge where emergency responders or any other individual accessing the roof top may be injured.
2. All roof surface mounted conduits, pipes, braces, etc crossing the pathways are to be clearly identified by a red/white reflective tape or other fire department approved identifying material. Any item higher than 18" must have steps up and down on either side.

SYSTEM MAINTENANCE

1. For all new Photovoltaic systems a maintenance manual of the system shall be required to be on site prior to permit final.
2. The maintenance Manual shall include (as applicable), but not limited to:
 - a. The required schedule of maintenance.
 - b. Required periodic inspection and maintenance of all components of the new PV system including: mechanical connections, electrical connections and necessary inspection of all source circuits, check all voltages, and/or programming.
 - c. Specific battery maintenance, if applicable.