

<p><b>Full Service Center</b>              827 7th Street, Room 102              Sacramento, CA 95814  <i>M-F 8:30am - 4:30pm</i></p>	<p><b>East Area Service Center</b>              5229 Hazel Avenue, Suite B              Fair Oaks, CA 95628  <i>M-Tu. 9:00am - 4:00pm</i></p>
<p><b>Bradshaw Center</b>              9700 Goethe Road, Suite A              Sacramento, CA 95827  <i>M-F 8:30am - 4:30pm</i></p>	<p><b>North Area Service Center</b>              3331 Peacekeeper Wy, Suite 100              McClellan, CA 95652  <i>W-Th. 9:00am - 4:00pm</i></p>

Sacramento County encourages the installation of solar energy systems and has stream-lined the review process for solar photovoltaic and water heating projects. All new installations require review for building permits and for interconnection with the Sacramento Municipal Utility District (SMUD). This guide has been developed primarily as an overview of county permit requirements. If you will be rewiring or replacing your electrical panel, please contact SMUD for possible additional requirements.

**Definitions:**

**Solar Photovoltaic (PV)** are solar collector modules that capture the sun’s energy and converts it into electricity.

**Solar Thermal or Solar Water Heating Systems (SWHS)** are solar collector modules and a storage tank that captures the sun’s energy to heat water either for indoor or swimming pool use. This type of system may be considered an active system with the inclusion of mechanical components or passive if without such components.

**Building Integrated Photovoltaic (BIPV)** refers to solar PV integrated into construction materials such as roof tiles, awnings and curtain walls.

**When is a planning department review required?**

In some instances, planning review is required before a solar PV or SWHS can apply for building permits. This depends on where your site is located, size and design of the solar energy system, and the age of any existing building(s) onsite. Email the Sacramento County planning helpdesk at [sacplan@saccounty.net](mailto:sacplan@saccounty.net) to determine site specific requirements.

**Roof-mounted systems on an existing building:**

Roof-mounted solar energy systems that are located on an existing building or structure do not require planning review or a discretionary design review (*California State Code, Section 65850.5*) as long as the proposed PV or SHW system does not encroach on setbacks or height requirements in the zone given the following height and setback [exceptions](#).

However, due to weight, some roof mounted systems will require a structural analysis by a California licensed professional engineer.

If a project site is located within a [historic district](#) or is located on a building/structure that is 50 years or older then [preservation review](#) will be required for all proposed solar energy systems.

**Solar PV or SWHS as an ancillary use:**

Any solar energy system to be built on a new structure (i.e. carport, pergola, etc.) that is ancillary to an existing building is subject to the [Residential Accessory Structure and Use regulations](#). Nonresidential accessory structures may require planning review based on previous planning approval for the site.

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**PV Freestanding or ground-mount systems:**

Any solar energy system that is a freestanding system and is the primary use of a site is allowed in *select zones with the approval of the Zoning Administrator.*

**Permit Fees**

Permit fees for solar projects are determined by Kw (Kilowatt) based on a pre-determined fee per Kw for each system size level. Additional fees will apply for reviews that exceed the indicated number of inspections due to project complexity or for multiple rounds of plan revisions. See the attached fee schedule for an estimate of permit fees.

For smaller projects, review can typically occur within one business day with permits being issued the following business day.

## Steps to Getting a Solar Permit

**\*Residential solar projects that are 10 kW or less MUST meet the requirements of the standardized solar submission checklist to qualify. Failure to follow these guidelines will**

**result in additional fees.**

**Incentives & Rebates<sup>1</sup>**

To qualify for rebates from SMUD—

- System design is optimized for solar orientation, tilt and shading-reduction. See the Sacramento [Solar Map](#) to determine your rooftop solar potential.
- System is sized appropriately not to exceed customer's anticipated annual energy demands.
- All PV modules and inverters must be new equipment and listed with the California Energy Commission. A list of approved PV equipment can be located at the [GoSolar California website](#).
- All systems must have a minimum 10-year warranty.

**Reserve  
Incentive and  
System Design**

**PRE-PERMIT – SMUD**

1. Contact SMUD at [solarpv@smud.org](mailto:solarpv@smud.org) or 916-732-5700 to make a Reservation Request for rebates. See SMUD's PV Handbook for more information.

Visit [www.SMUD.org](http://www.SMUD.org) to complete and submit SMUD's Generating Facility Interconnection Application.

2. Gain pre-approval from SMUD (**generally obtained as a confirmation letter or email**), who will verify documents and conduct an inspection during the application phase to verify accuracy of shading, array tilt and orientation, and physical location. **If you are rewiring or replacing an electrical panel then additional requirements may apply.**

**PERMIT – County Planning & Building Review**

3. Verify if the zone of the project site requires planning review if located within a historic district/design review area or is a freestanding, ground-mount system within ACG zones. If planning review is required, submit appropriate planning application and fees.
4. Submit a completed application for a building permit (either AP-01 or AP-02) to Sacramento County Building Division that includes proof of SMUD confirmation, plans and applicable fees at the Building Assistance Center at 827 7<sup>th</sup> Street, Room 102
5. Permits may be issued on the next business day. **In order to qualify for next day review, all residential applications MUST comply with the standardized solar submission checklist and sample plans.**
6. Please note that the field inspections are per project size. Any additional plan review or field inspections beyond the pre-determined number of field inspections will incur additional fees.

**Submit for City  
Building Permit**

**Interconnection  
&  
Rebates**

**POST-PERMIT – SMUD**

7. Send copy of building permit and final inspection to SMUD.
8. SMUD completes their review & conducts a final inspection, and then rebate is issued.



## Building Permits & Inspection Division

General Information: (916) 875-5296  
[www.building.saccounty.net](http://www.building.saccounty.net)

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Sacramento County - Community Development Department

## New Fee Schedule for Solar PV and SWHS Permits

### Solar Permit Fees

**1 Residential Rooftop Solar Panel fees (calculated per SB1222/Cal. Govt. Code 66015 limits)**

System size - Kilowatts	Solar Fees
1 kW to 8 kW	\$232.00 for 1 kW plus \$35.00 for each additional system kW up to 8 kW
9 kW to 15 kW	\$477.00
16 kW and greater	\$477.00 plus \$15.00 per additional kW over 15 kW

**2 Commercial Rooftop Solar Panel fees (calculated per SB1222/Cal. Govt. Code 66015 limits)**

System size - Kilowatts	Solar Fees
1 kW to 17 kW	\$348.00 for 1 kW plus \$35.00 for each additional system kW up to 16 kW
18 kW to 50 kW	\$943.00
51 kW to 250 kW	\$943.00 plus \$7.00 per additional system kW up to 250 kW
251 kW and greater	\$2343.00 plus \$5.00 for each additional system kW over 250 kW

**3 Solar Permit Fees for ground mount panels for Commercial or Residential Projects**

System size - Kilowatts	Fee (minimum fee based on units of current hourly rate \$112.00)
1 kW to 10 kW	\$812.00 (7 hourly units)
11 kW to 1.0 MW	\$812.00 + 1 hourly unit for each additional 10 kW or portion thereof
1 MW and greater	\$12,296.00+ 25 hourly units for each additional MW or portion thereof

The following fees are in addition to the above fees:

- IT Recovery Fee
- Green Building Standards SB1473
- Document Scanning Fees
- Main Service Panel Change Out Inspection Fee

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**Submission Checklist for Residential Photovoltaic Installations**

**General Requirements:**

1. A scaled, dimensioned Site Plan. The Site Plan must show all property line dimensions and the dimensions and locations of all structures on the parcel. Show the location of all electric service and PV equipment; meter(s), inverter(s), AC & DC disconnects, etc whether they are new or existing. Specify the distance from the property line to the wall where the service panel, inverter, etc. will be mounted. Any street(s)/alley(s) that the parcel borders on must be shown, as well as fences, walls or trees, etc. that are within five feet (5') of the PV equipment. Include a project data section which states the address of the project and the contact information for the owner and contractor.
2. Prior to submitting for the Building Permit, meet with the Planning Staff to verify that the location of the installation is permitted by local Zoning Codes.

**Structural Requirements:**

1. A Roof Framing Plan. Specify the size, grade and maximum spans of all roof framing members that will carry the weight of the PV arrays. Specify the roofing material and number of overlays, if applicable. Show the location of all arrays on this drawing.
2. Installation details and instructions.
  - Attachment details for PV modules. Provide enough information to clearly verify the size, type, and spacing of all fasteners.
  - Show how waterproofing will be addressed.
  - “Cut Sheets” in order to verify panel weights.
3. Structural calculation (stamped and wet signed by a California licensed design professional) are required for:
  - Tile roofs, or systems involving panels which are integrated into roof tiles.
  - On roofs that contain more than two (2) overlays of roofing material.

**Electrical Requirements:**

1. “Cut Sheets” for:
  - PV modules.
  - Inverters.
2. One-line diagram; please include:
  - Load calculations for arrays.
  - Wire types and sizes.
  - All associated equipment and disconnects whether they are new (N) or existing (E).
  - Location, wire sizes, and details for all grounding methods.
3. When considering the location of disconnects, be sure to consider how any given piece of equipment can be replaced or serviced, without the hazard of “hot” conductors.

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## Photovoltaic Inspection Guidelines

### Residential Interactive Systems

**In General**

- Per 2013 CEC 690.4(E) – the equipment and systems in 690.4(A) through (D) and all associated wiring and interconnections shall be installed only by Qualified Persons.
- Customer/Installer shall provide Approved Plans on site for inspector.
- Photovoltaic module number and location of installation must match Approved Site Plan.
- Customer/Installer shall provide access to all areas needed for inspection.
- On Roof, if Tile – Installer shall provide properly supported temporary walking surface to access all connections of all modules or the contractor shall provide a letter to the building inspector stating that the solar company will assume responsibility for any tile broken by the inspector. If two story – Installer shall provide a proper and secured ladder(s) to access all areas.
- In House – If wiring in attic and/or garage area, the customer/installer shall ensure access to attic and/or garage.

**On Roof**

- Verify all structural supports are properly installed per listing and properly sealed.
- Verify all metallic raceways, J-boxes, supports and modules are properly grounded. Modules shall be grounded separately to allow removal of a single module and without disrupting the grounding of other modules by means of properly installed wires, lugs, screws, bolts or other listed methods. (Sheet Metal Screws are not allowed – 250.8). 2013 CEC, Article 690.43
- Verify all exposed wiring is listed Sunlight Resistant. 2013 CEC, Article 690.31
- Verify all module interconnections connectors require a tool for opening. 2013 CEC, Article 690.33

**DC Disconnect**

- If DC wiring is run through the building, a DC Disconnect shall be installed prior to the conductors entering the building or the conductors shall be installed in metallic raceways, mc cable or metallic enclosures from the point of entrance to the DC Disconnect and all conduits and J-boxes shall be labeled “PHOTOVOLTAIC POWER SOURCE”. 2013 CEC, Article 690.31(E)
- Verify proper and permanent labeling with the following information; “PHOTOVOLTAIC DC DISCONNECT” and “WARNING ELECTRIC SHOCK HAZARD – DO NOT TOUCH TERMINALS – TERMINALS ON BOTH THE LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION”. 2013 CEC, Article 690.17. And for ungrounded systems, “WARNING – ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED”. 2013 CEC 690.35(F).
- The DC disconnect shall also be properly and permanently labeled with the following Installed System Information: (1) Rated Maximum Power-Point Current (2) Rated Maximum Power-Point Voltage (3) Maximum System Voltage & (4) Short Circuit Current. 2013 CEC, Article 690.53

Note: Rooftop Micro-Inverter Systems have no DC Disconnect Switches. AC Disconnect shall be installed on the roof or at the Utility panel and be capable of being locked OFF. Installed System Information shall be installed on Utility Service Panel.

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**Grounding**

- Photovoltaic systems with voltage over 50 volts shall be solidly grounded. 2013 CEC, Article 690.41
- The Utility Service Panel shall have a grounding electrode system. 2013 CEC, Article 690.47(A)
- Both the DC system and the AC system shall have a minimum of a # 8 copper grounding electrode conductor and both electrode conductors shall be solidly bonded to the Utility Service Panel electrode system as well as any new grounding electrodes. 2013 CEC, Article 690.47(B,C) and Article 250.166 (A and B).

**AC Disconnect and Utility Panel**

- The AC Disconnect shall be permanently identified with (1) Maximum AC Output, and (2) Operating AC Voltage. 2013 CEC, Article 690.54
- If DC Disconnect, Inverter, and/or AC Disconnect are not in the same location as the Utility Service Panel is located, a permanent Plaque shall be installed on the Utility Panel identifying the location(s) of the other equipment. 2013 CEC, Article 690.56
- Photovoltaic interconnection circuit breaker at the Utility Service Panel shall not exceed 20% of the bussing rating (END-FED Only) and **shall** be positioned at the opposite end of the bussing from the main input circuit location (i.e. 20 amp for 100 amp panel). 2013 CEC, Article 705.12

**Testing**

- Verify Installer has installed meter jumpers, if so equipped, at PV meter socket.
- Energize system and check display for output (wait time could be up to 5 min).
- Once output observed, turn off AC power at PV interconnection circuit breaker and verify inverter output drops to 0 watts. 2013 CEC, Article 690.61

Note: Rooftop Micro-inverter Systems have LED lights to show conditions or a Voltage tester can be used at load terminals of the circuit breaker/disconnect at the service panel.

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## Submission Checklist for Solar Water Heating Systems Up to 120 Gallons

### General Requirements

Please provide plans and or documents that clearly show the following:

1. Basic roof plan to scale, which shows the location and number of collector panels.
2. Solar Rating Certification Corporation (SRCC) listing, with diagram.
3. Manufacturer's installation instructions including attachment details for solar collectors to roof.
  - Attachment detail must be specific to the type of roofing.
  - Must be designed to withstand a wind load of 85 MPH.
  - Provide enough information to clearly verify the size, type and spacing of all fasteners.

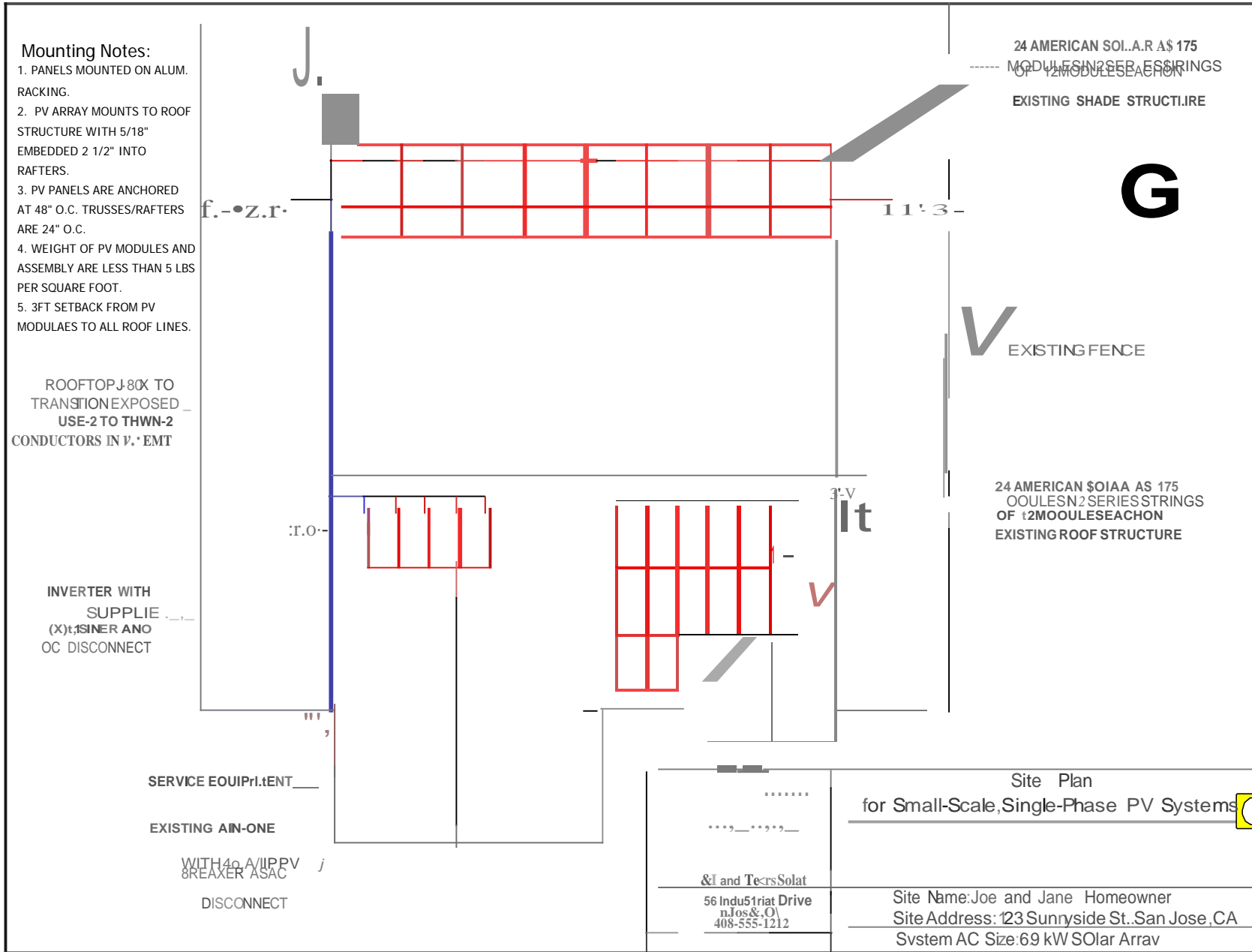
### Structural Requirements

1. Structural drawings and calculations may be required if:
    - The weight of the solar collectors exceeds 5 pounds per square foot.
    - Storage tank is located in the attic, on the roof, or on a raised floor.
- 
- Storage tanks installed on a concrete slab do not require structural drawings or calculations.
  - Storage tanks must be protected from seismic damage as per 508.2 of the California Plumbing Code.



# PV ARRAY LAYOUT, MOUNTING & WIRING PLANS

\*This sample plan is for illustrative purposes only. All building applications must reflect site specific conditions and the Submission Checklist for Photovoltaic Installations.







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# SAMPLE ELECTRICAL DIAGRAM

