

City of Sacramento Guide to Solar Energy Permits

Solar Energy Permits - Introduction

The City of Sacramento 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 city 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 planning review required?

In some instances, planning review is required before a solar PV or SWHS can apply for building permits. Email the planning helpdesk at planning@cityofsacramento.org 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](#).

If a project site is either a listed [historic landmark](#), or is located within a historic district, then [preservation review](#) may be required for all proposed solar energy systems, unless the project qualifies for planning exemptions in Form CDD-0035 or CDD-0031.

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.

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 a **Zoning Administrator's Special Permit** before obtaining building permits.

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Building Permit Fees

Building Permit Fees for **Roof-mounted systems on existing buildings** are determined by an hourly review rate, based on a pre-determined number of review hours for each system size level. Additional fees will apply for reviews that exceed the indicated number of hours due to project complexity or for multiple rounds of plan revisions. See the attached fee schedule for an estimate of permit fees based on the systems installed.

Building Permit Fees for **Solar PV or SWHS as an ancillary use** and **PV Freestanding or ground-mount systems** are based on the project valuation as opposed to hourly plan review rates.

For smaller projects, review can typically occur over-the counter with permits being issued the same day, or by next business day.

***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 & Rebates¹

To qualify for rebates from SMUD–

- System design is optimized for solar orientation, tilt and shading-reduction.
- 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.

¹ Visit SMUD's [website](#) to find the most up-to-date information about rebates for solar.

Steps to Getting a Solar Permit

Reserve Incentive and System Design	PRE-PERMIT – SMUD
	<ol style="list-style-type: none"> 1. Contact SMUD at solarpv@smud.org or 916-732-5081 to make a Reservation Request for rebates. See SMUD's PV Handbook for more information. 2. Visit www.SMUD.org to complete and submit SMUD's Generating Facility Interconnection Application. 3. 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.
Submit for City Building Permit	PERMIT – City Planning & Building Review
	<ol style="list-style-type: none"> 4. Verify if the project requires planning review, or if it qualifies for planning exemptions in Planning Forms CDD-0031 and/or CDD-0035. If planning review is required, submit appropriate planning application and fees. 5. Submit a complete application for building permits from the City of Sacramento, that includes proof of SMUD confirmation, plans and applicable fees, at the public counter at 300 Richards Blvd., 3rd Floor². 6. Obtain city issued permit and complete work. Permits will be issued typically same day for over-the-counter submittals, or next business day. In order to qualify for over-the-counter review, all residential applications MUST comply with the standardized solar submission checklist and sample plans. 7. Schedule and complete building inspection. Please note that the number of hours indicated for plan review and field inspections per project size. Any additional plan review or field inspections beyond the pre-determined number of hours will incur additional fees.
Interconnection & Rebates	POST-PERMIT – SMUD
	<ol style="list-style-type: none"> 8. Send copy of building permit & PV System Certification Sheet to SMUD 9. SMUD completes their review & conducts a final inspection, and then rebate is issued.

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(Footnotes)

² Please verify hours for over-the-counter plan check online at www.cityofsacramento.org/dsd

Fee Schedule for Solar PV and SWHS Permits For Installation on Existing Structures

Technology	Application Type, Size	How Fee is Determined ¹	Permit Fee
SWHS	Residential, up to 120 gallons tanks (ground-mounted on slab only)	1 hour Plan Review + 1 Inspection =	\$328
PV	Residential, up to 10 kW	1 hour Plan Review + 1 Inspection =	\$328
PV	Residential, 10.1 kW - above	1.5 hour Plan Review + 1 Inspection =	\$410
PV	Commercial, up to 10 kW	1 hours Plan Review + 1 inspections =	\$594
PV	Commercial, 10.1 kW – 25 kW	3 hours Plan Review + 2 Inspections =	\$1,211
PV	Commercial, 25.1 kW -50 kW	4 hours Plan Review + 2 Inspections =	\$1,375
PV	Commercial, 50.1 kW -150 kW	8 hours Plan Review + 4 Inspections =	\$2,500
PV	Commercial , 150.1 kW – 500 kW	10 hours Plan Review + 10 Inspections =	\$3,812
PV	Commercial , 500.1 kW – 3 MW	27 hours Plan Review + 20 Inspections =	\$8,240

¹ Fee shown is the base rate only and does not include estimates of valuation-based surcharges, which will vary from project to project. Additional fees may apply if pre-determined hours of review and number of inspection are exceeded. Projects that involve construction of a new structure to support a solar system require additional fees and structural plan review.

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.

Photovoltaic Inspection Guidelines

Residential Interactive Systems

In General

- ☐ Per 2019 CEC 690.4(C) – the installation of equipment and associated wiring and interconnections (of a PV system) shall be performed 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). 2019 CEC 690.43
- ☐ Verify all exposed wiring is listed Sunlight Resistant. 2019 CEC 690.31
- ☐ Verify all module interconnections connectors require a tool for opening. 2019 CEC 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”. 2019 CEC 690.31(G)
- ☐ Verify proper and permanent labeling with the following information; “PV SYSTEM 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”. 2019 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”. 2019 CEC 690.13.
- ☐ The DC disconnect shall also be properly and permanently labeled with the following Installed System Information: (1) Maximum Voltage (2) Maximum Circuit Current (3) Maximum Rated Output Current of the Charge Controller or DC to DC Converter. 2019 CEC, 690.53

Grounding

- ☐ The Utility Service Panel shall have a grounding electrode system. 2019 CEC 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. 2019 CEC 690.47(B)

AC Disconnect and Utility Panel

- ☐ The AC Disconnect shall be permanently identified with (1) Rated AC Output Current, and (2) Operating AC Voltage. 2019 CEC 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. 2019 CEC 705.10.
- ☐ Photovoltaic interconnection circuit breaker at the Utility Service Panel shall not exceed 20% of the bussing rating. 2019 CEC 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).

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.

Solar Water Heating Systems Up to 120 Gallons Submission Checklist

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 ultimate wind speed of 95 MPH for Category II buildings.
 - Provide enough information to clearly verify the size, type and spacing of all fasteners.

Structural Requirements

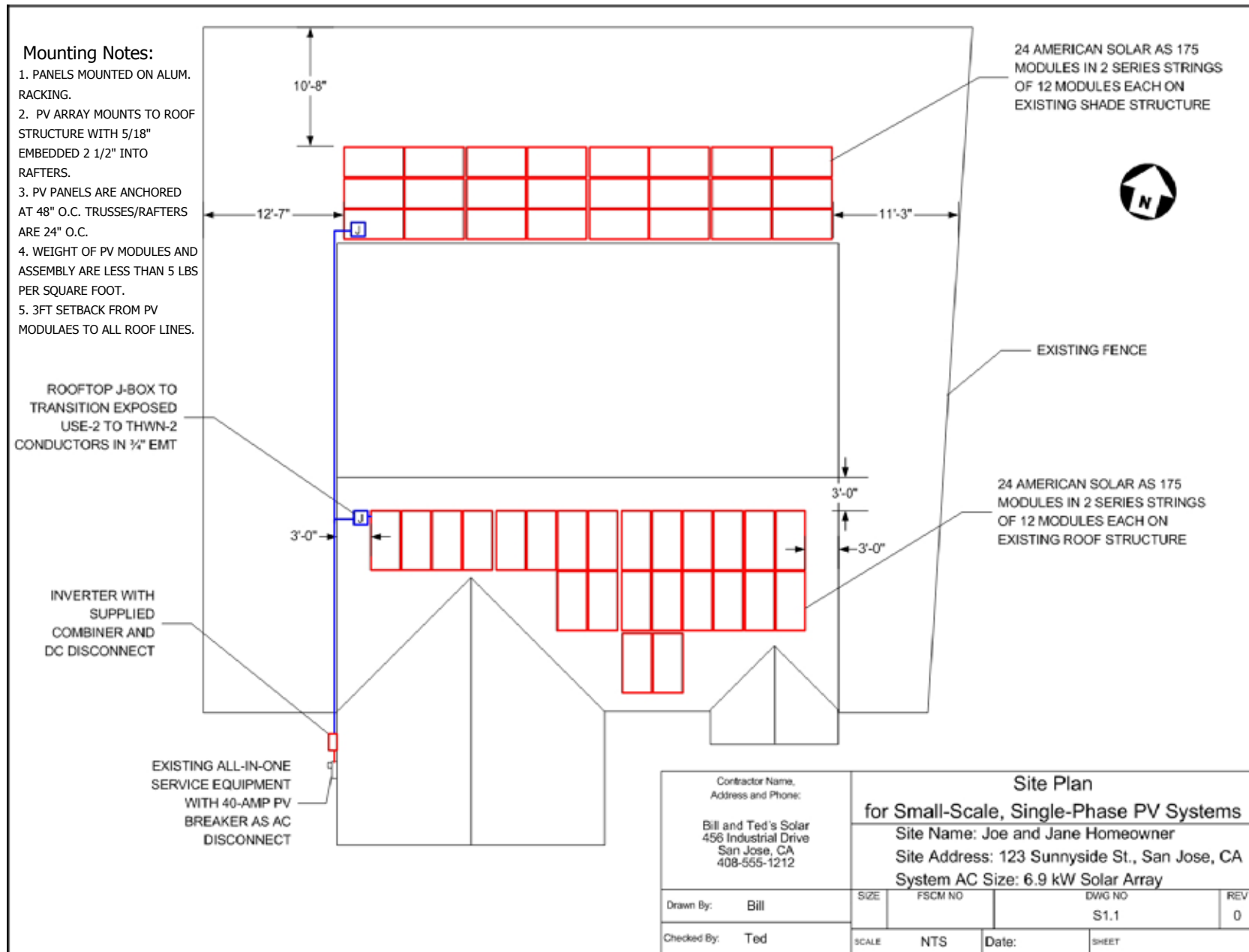
1. Structural drawings and calculations may be required if:
 - The weight of the solar collectors exceeds 5 pounds per square foot.
 - Storage tank is located in the attic, on the roof, or on a raised floor.

* Storage tanks installed on a concrete slab do not require structural drawings or calculations.

* Storage tanks must be protected from seismic damage as per 507.2 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.



SAMPLE ELECTRICAL DIAGRAM

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