



Solar Photovoltaic Systems Installed On Residential Rooftops

Standardized Permit Submittal and Review Process

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INFORMATION
BULLETIN

IB-010

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The California Solar Rights Act elevates the timely and cost-effective installation of solar energy systems as a matter of statewide importance. The purpose of this Information Bulletin is to provide a consistent methodology of processing permits for solar photovoltaic (PV) systems up to 10 kW in size installed on single family residential rooftops. Adoption of standard submittal requirements, review processes, and inspection procedures, along with uniform interpretation and enforcement of building codes promotes a streamlined permit process for solar PV installations.

I. PERMIT APPROVAL REQUIREMENTS

All solar PV system installations are required to file a building permit application to ensure compliance with respective codes. A streamlined process for standard installations is established herein for PV systems up to 10 kW installed on single-family residential rooftops (1 & 2 unit dwellings) that meet all of the conditions listed below. PV installations will be reviewed for compliance with the Electrical Code. Structural review is not required if no modifications to the existing structure are necessary to support the PV system and the proposed installation is located on an existing rooftop and meets the prescriptive requirements of this Information Bulletin.

This streamlined process does not include new structures such as trellises, patio covers, canopies, platforms, etc. that support PV systems.

II. ELIGIBLE PROJECTS

Solar PV systems up to 10 kW capacity installed on single family residential rooftops (1 & 2 unit dwellings) will be reviewed in accordance with the streamlined permit process set forth herein if they qualify as a standard installation. Residential PV systems qualify as a standard installation if they comply with all of the following:

- Existing roof system currently has one layer of roofing, the solar array does not exceed 5 lbs per square foot and structural information is sufficient to determine that the roof structure can accommodate the additional load;

- Maximum concentrated load imposed on the roof structure is less than 50 lbs per attachment;
- Installation includes a pre-engineered mounting system with attachments designed for a wind speed of at least 85 mph;
- All components are listed by an acceptable rating agency (including PV panels, mounting structures, inverters, disconnects, combiner boxes, and breaker panels) and installed per the manufacturer's instructions.

If the project does not qualify as a standard installation, is located on an historical building or in a historical district, or is ground-mounted, additional requirements for review may be required. Non-standard installations that do not qualify for the streamlined review process shall be submitted through the regular permit process.

III. COMPLIANCE WITH LAWS & CODES

All photovoltaic systems shall be installed in accordance with the current edition of the California Building, Electrical, and Fire Codes and all applicable laws, regulations, licensing, and permit requirements adopted by this jurisdiction, and any and all manufacturers' installation requirements.

Referenced Documents

Current California Building Code as amended by the City of Concord.

Current California Fire Code as amended by the City of Concord.

Current California Electrical Code as amended by the City of Concord.

Standard Plan Templates for Solar PV Residential Rooftop Installations (either Configuration A, B, C, or D)

- WKS-1 Structural Information Worksheet
- WKS-2 Electrical Information Worksheet
- PV-1 Cover Sheet
- PV-2 Roof Plan
- PV-3 Electrical Diagram
- PV-4 Signage and Labeling

IV. SUBMITTAL REQUIREMENTS

A complete Submittal Package shall include the Permit Application, Plans, Worksheets, and Product Data Sheets identified below. All required documentation shall be submitted to the Building Division with the payment of permit fees due upon permit approval and issuance. Additional information may be required to ensure proper compliance with code requirements. Plans may be submitted over the counter or electronically through Solar FasTrac™.

Electronic Submittals: The permit application, together with the required plans and supporting information may be submitted in an electronic format on a CD or PDF provided they contain digital signatures from the applicant and designer of record (if applicable). Standard Plan templates are available in an interactive PDF format through the Building Division's website that can be printed or filled out electronically and submitted either in printed form or via email.

If the interactive Standard Plan template PDF is used, the appropriate plans for the applicable PV system being installed must be selected:

- a. For Central Inverter System with separate inverter, DC disconnect, and combiner box, select Configuration A or;
- b. For Central Inverter System with integral DC disconnect and separate combiner box, select Configuration B or;
- c. For Central Inverter System with integrated inverter, DC disconnect, and internal bus bar, select Configuration C or;
- d. For Micro-Inverter System, select Configuration D.

Signatures – The permit application shall be signed by the applicant, contractor, or authorized agent. When required plans shall be signed and stamped in accordance with the California Business and Professions Code. Plans may be signed and stamped by a registered electrical engineer or a licensed electrical contractor (C-10 License) or a solar contractor (C-46 License) who is responsible for the installation of the system. A general contractor (B-License) may also sign and stamp the plans only if the PV Panels are installed in a new building or new addition area. A registered architect, civil engineer or structural engineer shall sign structural plans and calculations when required. A system designed by a registered engineer may be installed by the owner or licensed electrical or solar contractor.

Digital Signatures are acceptable and shall comply with the California Secretary of State's requirements, which can be found at

<http://www.sos.ca.gov/digsig/digital-signature-regulations.htm>.

A. Permit Application

The City's Interactive Solar PV Permit Application, available online, must be completed and signed by the applicant (either the contractor or property owner).

B. Standard Plans

Three (3) hard copy sets of plans must be submitted or one set of plans in electronic format on CD or PDF. An 8-1/2" x 11" format is acceptable if the drawings are clearly legible. Standard Plan templates (PV-1 through PV-4) referenced above and accessible through the Building Division's website may be used in preparing the required drawings. Plans that are laid out with the required information in accordance with the Standard Plan templates or by filling in the required information using the interactive Standard Plan template PDF provided by the Building Division using project-specific details will streamline the review process. Plans submitted as part of the permit application must contain the following information:

1. **Cover Sheet (PV-1)** – showing location of the property, street address, assessor's parcel number; name, address, and phone number of the property owner, contractor, designer(s); license number; engineer, architect or designer as appropriate; statement of code compliance; engineer's stamp/signature; building information; and description of the proposed project.

2. **Roof Plan (PV-2)** – showing the general configuration of the roof including hips and valleys; location and proposed PV array layout, total number of modules, number of strings, number of modules per string; conduit runs; existing equipment, sky lights, attic and plumbing vents; roof access, pathways, and setbacks; location of combiners, disconnects, inverters, and main electrical service. The roof plan should also include information and notes about the:

- a. Framing, layout and sizing of existing roof framing members, and wind load criteria.
- b. Mounting details and method of attachment of the PV modules to the existing roof structure; type and number of roof penetrations; and subsequent weatherproofing of the roof. Provide the manufacturer's installation specifications if using pre-manufactured racking systems.
- c. Framing plan and details where alterations are required to existing structures to support and/or provide an attachment for PV systems shall be provided that are sufficient in scope and detail.

d. Height of the PV panels and supporting structure above the roof. Solar panels are not included in building height calculations if they meet the following requirements:

Flat Roofs: The panels do not extend beyond 30 inches above the roof surface.

Pitched or Hipped Roofs: The panels are mounted no more than 18 inches from the surface of the roof at any point and do not extend above the ridgeline of the roof. The 18 inches is measured from the upper side of the solar panel.

e. Roofing Material including the type and thickness of roof sheathing; and number of layers of roofing materials.

f. PV System Layout and Configuration showing arrays, total number of modules, number of strings, number of modules per string, conduit and conductor locations.

g. Structural calculations and plans are not required if it can be determined that the existing roof structure can support the additional weight of the new solar PV system and meets the following prescriptive requirements: the distributed load does not exceed five pounds per square foot, attachment point loads are less than 50 lbs, structural modifications are not required to support the PV system, there is only one layer of roofing material, and the PV system is positively anchored to the building.

3. **Electrical Diagram (PV-3)** – a single line diagram (select appropriate installation using either standard plan Configuration A, B, C, or D) clearly identifying all devices installed in the PV system, the point of interconnection with the utility supplied meter, grounding, and total kW rating of system. The electrical plan should indicate the system size (DC-STC “nameplate” rating), number of photovoltaic panels and their voltage, current and power output, insulation types, AC and DC disconnect ratings and ground fault protection devices, all combiners, all inverters with input and output ratings, the size of the main electrical panel bussing in amperes, the size of the main service disconnect, the size of the PV circuit breaker in amperes. The following information also should be provided:

- a. Equipment Schedule listing all equipment, manufacturer, model, and rating.
- b. Details on main breaker, PV breaker, and rating of bussing.
- c. Type, size, and length of all wiring throughout the PV system including grounding

- d. Current protection and disconnects.
- e. Voltage and current ratings.
- f. Grid interconnection location with AC load panel and back feed breaker rating.
- g. If batteries are to be installed, include them in the electrical plan and show their locations and venting. PV systems with battery back-up are not standard installations and must go through the normal permit review process.
- h. If any equipment is ground-mounted a site plan and details will be required and may be subject to the normal permit review process.

Signage and Labeling (PV-4) – to be placed on equipment and system as required by CEC Sections 690 and 705. If the interactive PDF from the Building Division’s website is used, select the applicable PV system to be installed for either a central inverter or micro-inverter system (using the appropriate standard plan Configuration A, B, C, or D) for the installation.

4. **Plan Notes** - structural and electrical information including vertical and lateral loads, number of strings, type and size of conductors, grounding, current protection and disconnects, voltage and current ratings, inverter manufacturer and model number, and rated AC output (wattage) and voltage, grid interconnection location with AC load panel and back-feed breaker rating shall be included on the relevant plans.

C. Worksheets (WKS 1 & 2)

Structural Information Worksheet (WKS-1) must be completed and submitted to demonstrate compliance with the structural requirements of the Building Code.

Installations meeting the prescriptive requirements described in this Information Bulletin do not require separate structural calculations if the solar PV modules do not exceed the weight limitation and are fastened to the roof in accordance with either the manufacturer’s pre-engineered support/fastening system per ICC-ES evaluation report, or is being installed in accordance with:

- Manufacturer’s installation requirements pre-approved by the Building Division;
- Support/fastening system pre-approved by the Building Division; or
- Module mounting rack and roof attachments designed and/or installed under the direct supervision of a California registered engineer or licensed architect.

If the system does not meet the prescriptive requirements, then structural calculations may be required and must be prepared by a registered engineer in the State of California. When structural calculations are required, calculations shall demonstrate that the primary structure will support the additional vertical and lateral loads from the PV panels and related equipment.

Structural plans and/or calculations, prepared by a California registered design professional, may be required if:

1. Non-Standard Installation: where the weight of the photovoltaic system exceeds five (5) pounds per square foot, or exceeds the maximum concentrated load.
2. Structural Alterations to the Existing Roof Structure Are Necessary: to support the added weight of the PV system or provide a method of attachment to the building's roof framing system.

Structural Plans and Calculations shall be provided when structural modifications or alterations are required to the existing structure to support the PV system being installed. Drawings shall include a roof-framing plan (member size, type, span, and spacing) and any additional framing required to reinforce the existing framing. The plans shall include the layout of the module system and its mounting points. Drawings should also provide information on any support strut or frame that supports the rails including frame member sizes, lateral bracing where required and method of attachment.

3. Custom Mounting/Racking System: If custom racking is being installed, a site specific engineered design is required with calculations and plans signed and stamped by a licensed engineer. Details shall include manufacturer's spec sheets for wind loads and attachment details (type, size, and spacing of fasteners).

4. Multiple Roof Layers: there exists more than one layer of roofing as verified in the field.

Electrical Information Worksheet (WKS-2) must be completed and submitted to demonstrate compliance with the electrical requirements of the Electrical Code. Electrical calculations may be required to show that the PV system voltage does not exceed the maximum rated DC inverter conductor per CEC 690.43 and ground electrode conductor per CEC 690.47 or to determine wire sizes.

If the proposed PV system includes Electric Battery Backup then the system shall be designed by a registered electrical engineer.

D. Manufacturer's Cut Sheets

All manufactured components used in the photovoltaic power system must be listed by a nationally recognized testing organization to standards appropriate for the intended applications. A copy of the manufacturer's specifications and installation instructions for all PV modules, mounting systems, combiner boxes (if used), inverters, and disconnects being installed with all electrical information shall be included in the submittal package. Manufacturer's data must include pounds per square foot weight of the solar panels and mounting system.

E. Fire Code

The PV installation must comply with Fire Code including labeling and marking, location of DC conductors, access, pathways and smoke ventilation.

V. MASTER FILE DOCUMENTS

A licensed Contractor can establish a Master File that includes standard information such as product data sheets of listed equipment, standard details, engineering reports, and manufacturer's specifications and installation instructions. Solar PV installers can get a Master File approved for the PV system installations they most often use. Site-specific permit applications must include and be identical to the details, equipment specifications, and plans that have been pre-approved by the Building Division.

Master File Documents must be kept up to-date so they are consistent with current codes.

VI. FEE SCHEDULE & PAYMENT

The permit fee for a standard residential rooftop PV installation of 10 kW or less in size is a flat fee of \$322 plus administrative fees. Permit fees are due and payable upon issuance of a permit. Permit fees can be paid in person, by telephone, or online. Residential rooftop solar permit fees are computed on actual costs associated with the City's permit review and inspection process with a maximum cap of \$500 for installations less than 15 kW.

Credit Card Payment: Permit fees may be paid using a credit card. We accept VISA, MasterCard, and American Express. To make a credit card payment, please call 925-671-3107 from 8:00 am to 5:00 pm weekdays, except holidays.

VII. REVIEW PROCESS

All solar PV projects must submit plans for review. Residential PV projects prepared in accordance with the Standard Plan Templates will be reviewed

in a streamlined process per this Information Bulletin. Solar permits can also be issued electronically if submitted online through Solar FasTrac™.

If the PV system meets the requirements for a standard installation, every attempt will be made to complete the permit review process over-the-counter or within two full business days after filing of a complete permit application packet depending on staff availability and workload constraints. If the permit application cannot be processed within the designated timeframe, the Contractor will be notified of any delay and an estimate of the new timeframe will be provided.

Plans will be reviewed for code compliance. Structural review will be required when PV systems exceed the weight or mounting height limits or require structural calculations in Section IV C above.

Over-the-Counter Approvals: Over-the-counter review may be available depending on current staffing and workload levels. Appointments to submit applications and plans are recommended and can be made by calling the Building Division.

VIII. INSPECTIONS

Permit holders must be prepared to show conformance with all technical requirements in the field at the time of inspection. The inspector will verify that the installation is in conformance with applicable code requirements and with the approved plans. Required inspections may include: electrical and final. Inspection appointments can be scheduled for the following day by contacting the Building Division prior to 4:00 pm. Every effort will be made to limit the inspection window waiting time period to four hours or less, depending on the number of inspections scheduled on any given day and on staff availability.

IX. OTHER CONSIDERATIONS

A. Fire Department/District Review: Residential PV installations are normally reviewed and inspected by the Fire Prevention Bureau under the direction of the Fire Marshall. In order to provide a streamlined and efficient plan review and inspection process for photovoltaic systems installed on rooftops of one and two-family dwellings the City and Fire District have entered into an agreement where the City Building Division shall perform all plan review and inspections for the installation of PV systems within the City on all Group R-3 occupancies (which includes duplex residential buildings) and detached Group U Non-Habitable Structures accessory to R-3 occupancies.

The Fire District Engineering and Plan Review Division can be contacted at: (925) 941-3300 or <http://www.cccfpd.org/planreview.html>.

B. Electric Utility Provider: An application for interconnection must be filed with the local electric utility provider before a solar PV system can be connected to the electric power grid. A Generating Facility Interconnection Application (Form No. 79-974) and Distributed Generation Application Checklist can be obtained online from PG&E. Solar PV systems cannot be interconnected with the utility's distribution facilities until written authorization has been received and PG&E has inspected your system and installed the net meter.

The PV system is not approved to be energized until PG&E approval has been obtained. After the final building inspection contact your local utility provider. PG&E requires the final signed off permit showing that the construction is complete. For PG&E's requirements regarding their net metering and interconnection process go to: <http://www.pge.com/b2b/newgenerator/netenergymetering/standardnem/index.shtml>. PG&E also may be contacted by telephone at (415) 972-5676 or e-mail at gen@pge.com.

C. Planning and Zoning Clearance(s): No planning review is required for rooftop solar installations consistent with this Information Bulletin. State law limits local government review of solar PV systems primarily to health and safety issues. Applicants proposing to install or modify a photovoltaic system on a historical building should check with the Planning Department prior to submittal of the solar permit application. Historical Resources Staff will work with the applicant to reduce to the extent possible any adverse impact to the historical property through project design and location. Historical Resources Staff will then stamp the plans as conforming to the City Municipal Code and will recommend application of the State Historic Building Code. There is no charge for this meeting and review of photovoltaic projects by Historical Resources Staff.

D. CEQA Review: Rooftop solar photovoltaic projects, and their associated equipment, are statutorily exempt from environmental review under CEQA. The passage of SB 226 added Section 21080.35 to the California Public Resources Code which exempts from the requirements of CEQA the installation of a solar energy system, including associated equipment, on the roof of an existing building or an existing parking lot structure meeting specified conditions.

X. CONTACT INFORMATION

Our office is located at 1950 Parkside Drive, MS/51, Concord, CA 94519. Operating hours are Monday thru Thursday from 8:00 am to 5:00 pm and Friday from 8:00 am to 12 Noon. You may contact us at:

(925) 671-3107 for appointments and information;

or

Permit Center Technician

Phone: 925-671-3119

Email: bldgpermits@cityofconcord.org