

# Residential Solar Photovoltaic Systems

California Govt. Code [§65850.5](#), often referred to as the Solar Rights Act, sets forth a series of laws designed to protect and promote a consumer's right to install and operate solar technology on their property. To implement state law, as well as help achieve the goals set forth in the city's [Climate Action Plan](#), this info-bulletin provides an overview of the city's expedited permit review and processing requirements for eligible residential solar projects.



## BACKGROUND

It has been well established that greenhouse gases (GHG), namely carbon dioxide (CO<sub>2</sub>), trap heat and make the planet warmer. Pursuant to the Environmental Protection Agency ([EPA](#)), electricity production, where roughly 62% is generated from burning fossil fuels like natural gas, coal, and oil, generates the second largest share of the nation's greenhouse gas emissions --- transportation is the largest producer of CO<sub>2</sub>.

Solar power reduces CO<sub>2</sub> emissions by providing a clean and renewable source of energy. The use of solar increases energy reliability for residents and businesses by generating electricity near where it is consumed and the electricity it generates provides stable (lower) electricity prices for consumers.

In order to meet the state's aggressive GHG reduction targets, the city, through the adoption of its [Climate Action Plan](#) and building code standards under CMC [§18.25](#), have simplified and standardized the permit processing of small-scale residential solar photovoltaic systems.

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### Documents Referenced

Solar Rights Act; [§65850.5](#)  
Small Residential Solar Energy Systems; CMC [§18.25](#)  
Carlsbad Climate Action Plan; [CAP](#)  
[Carlsbad Payment Portal](#)  
Site Plan Requirements; [B-5](#)  
Residential Building Permit; [B-1](#)

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## PROJECT ELIGIBILITY

A solar energy system includes any solar collector or other solar energy device whose primary purpose is to provide for the collection, storage, and distribution of solar energy for space heating/cooling, electric generation, or water heating. Solar projects eligible for this expedited permit review shall meet the following:

- The rating of the service panel system shall not exceed 225 amperes.
- If a DC combiner box is utilized, it must be part of, and listed with the inverter.
- Devices such as GFCI or AFCI shall not be added in the field.
- Output shall be limited to 10kW.
- Installation shall not include hybrid systems, building integrated photovoltaic, solar water heating systems or photovoltaic roll roofing.
- Batteries listed per UL 9540 are allowed provided they are designed and installed per the manufacturer's instructions and listing.

## APPLICATION REQUIREMENTS

An acceptable application submittal must include the following documents and information. Please ensure that the information that you provide is complete and accurate as this will help streamline the review process.

- Residential Building Permit Application ([B-1](#)).
- A site plan consistent with the requirements listed in form [B-5](#), and includes the following additional information:

- Location of panels and roof layout
- Location of all required PV signage
- Fire setbacks shall be notated on roof layout to minimum current Fire Code.
- Place the following note on the site plan:

*"No vents (dormers, plumbing and mechanical) shall be covered or relocated". "All equipment shall be painted prior to inspection."*

- An electrical plot plan, which includes the following information:
  - Single line diagram to include wire/conduit size and type
  - Existing main service size, location; proposed panel location or upgrade.
- All technical documents that describe the performance and mechanical features of the PV system being installed (i.e., cut sheets and structural calculations).



## APPLICATION SUBMITTAL & REVIEW

Residential solar submissions are accepted using the city's [Customer Self Service portal](#).

The documents described above must be individually saved in .PDF format and Uploaded to the portal.

Depending upon workload, the city's review following submittal of the initial permit application typically takes three to five days to complete.

Applications that provide the requested information rarely require corrections, but should information be missing or unclear, we will email you the comments and corrections following our review. Please make the

required changes to the documents per our instructions and email the corrections: [Building@CarlsbadCA.Gov](mailto:Building@CarlsbadCA.Gov). The subject line of the email should read "Residential Solar Permit Application – SECOND SUBMITAL." Our re-review is typically done within one business day.

## PERMIT APPROVAL

Once the application has been reviewed and is ready for issuance, the applicant will receive an email with instructions to make payment online. Permit issuance will follow within 24-hours of payment completion.

## BUILDING INSPECTION CHECKLIST

The purpose of inspections by city staff is to ensure compliance with the California Electrical Code (CEC), other applicable codes and regulations, and approved plans. The intent of the regulations is the practical safeguarding of persons and property from hazards arising from installation of solar systems. The following checklist was developed to assist you with the inspection process for the installation of residential solar photovoltaic systems. It is the contractor or property owner's responsibility to schedule and coordinate all required inspections and obtain approvals before completing any work. The contractor or responsible party shall be available at the jobsite and provide access for the inspector.

## General Requirements

Prior to any work being conducted, the following must be completed and available at the jobsite.

- Approved plans, inspection record card and manufacture installation instructions shall be made available on site.
- Installation of equipment shall be per the approved plans.
- Work shall be ready for the inspection requested.
- A ladder complying with CAL-OSHA requirements shall be made available and secured in place for the inspection.
- For projects with an electrical service upgrade, an SDGE service order and completed City of Carlsbad Final Inspection & Permit Card shall be available on site.
- (If earth disturbance will occur) Written findings and determinations from DIGALERT shall be available on site.

- All required working clearances for electrical equipment must be provided and maintained.
- All required labels must be properly in place.

### Service Equipment

- Service equipment and its verifiable bus rating shall be adequate and properly sized for the designed PV source.
- The service grounding and bonding connections shall be located and verified.
- All grounding requirements shall be verified on the PV installations.
- Install a placard for all customer self-generating electrical equipment as required by the California Electrical Code.
- New circuit breakers shall be of the same manufacturer as the existing service equipment or listed to be used with the existing electrical equipment. When existing circuits are relocated to accommodate the PV breaker, a new circuit card is required, and loads remained balanced.



### PV Array Installed on the Roof

- All roof-mounted PV arrays and racking systems require inspection of the wiring, attachments, and grounding. Inspectors must be provided a safe access path for this inspection.
- The racking system and the modules must be installed in compliance with the manufacture installation instructions.
- The installed racking system and PV modules shall be the same as those identified on the approved plans.

- The racking system must be positively attached to the structure and the weather protection of the roof membrane shall be maintained.
- Roof-mounted arrays may not compromise or obstruct roof vents, plumbing vents, or chimneys.
- Class A fire rating shall be provided.

### Combiner Boxes, Junction Boxes, and Wiring Methods

- Source wiring conductors shall be of the approved type and properly sized.
- Metallic raceways containing DC source circuits over 250 volts shall be properly bonded through concentric knock-outs at boxes or enclosures (where applicable).
- Combiner boxes, disconnects and fusing used in DC source wiring shall be DC rated.
- Intermediate enclosures, boxes, and conduit body covers must be accessible for servicing and properly grounded.

### PV Inverters and DC Disconnects

- The placard or label with the actual power source operating voltages and currents shall be affixed to or located immediately adjacent to either the inverter or the DC disconnect.
- The installed inverters shall be the same as those identified on the approved plans.
- A properly sized system grounding electrode conductor shall be installed to the appropriate grounding terminal.
- Metallic raceways, enclosures, and enclosing system grounding electrode conductors shall be bonded at each end of the raceways & enclosure.





## AC Overcurrent Protection and Required Utility Disconnects

- When a lockable AC disconnect is required by the utility (SDGE), it shall be located at the service equipment unless the utility approves a remote location.
- When the utility disconnect is required, it shall be identified on the placard as “PV System Disconnect for Utility Operation.”
- All back-fed circuit breakers and disconnects shall be properly labeled.

## Service Upgrade Involving Scheduled Outages with the Utility Company

The deadline established by the utility for receiving city approval to re-energize service equipment is 2:00 P.M. To avoid a lapse in electrical service during a service upgrade which requires a scheduled outage, please adhere to the following:

- Schedule in advance a city inspection for the day of the outage and enter a note stating this inspection involves a scheduled outage for a disconnect/reconnect.
- On the morning of the outage, contact the inspector between 7:30A.M. and 8:00A.M. and inform him/ her that this inspection involves a scheduled outage for a disconnect/ reconnect.
- Before the inspector will issue an inspection clearance to re-energize the service equipment, this equipment must be installed, grounded and bonded. Any required service entrance conductors and raceways shall be installed to the utility’s service point. If the meter panel is a flush or semi-flush type, flashing around the panel must be installed for weather protection of the building.

Due to the narrow timeframe between the 8:00A.M. disconnection of power and the 2:00P.M. approval deadline, it is highly recommended that as much pre-wiring, grounding, and bonding, and other preparation work be completed in advance. Cut over wiring, branch circuit modifications, and the PV system can be inspected later (if necessary) for final project approval.

## City Building Inspection Types Required

- Ground-Mounted System inspection includes
  - Footing and underground electrical (raceway and conduits)

- Final inspection of the complete system including modules, panel, wire terminations, grounding, etc.
- Roof-Mounted System inspection includes
  - Rough electrical for concealed wiring
  - Array bonding and grounding
  - Inspection of the complete system including modules, panel, wire terminations, grounding, etc.

## YOUR OPTIONS FOR SERVICE

To schedule an appointment or to learn more about this process, please contact the Building Division at 760-602-2719 or via email at [Building@CarlsbadCA.gov](mailto:Building@CarlsbadCA.gov)

