

**Mono County
Community Development Department**

**Expedited Permit Process for Solar
Photovoltaic (PV) Systems**

Provided for use within Mono County excluding the incorporated area of Mammoth Lakes



Effective dates: January 1, 2020 through December 31, 2023

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CODE APPLICATIONS AND INTERPRETATIONS:

<u>DATE:</u>	June 28, 2019
<u>SUBJECT:</u>	Residential Solar Photovoltaic Rooftop Installations
<u>CODE CYCLE:</u>	2019 California Building Codes Standards
<u>CODES AND SECTIONS:</u>	2019 California Existing Building Code 503.3. California Assembly Bill 2188 (2014)

Section 503.3 of the 2019 California Existing Building Code (CEBC) states “Any existing gravity load-carrying structural element for which an alteration causes an increase in design gravity load of more than 5 percent shall be replaced or altered as needed to carry the gravity load required by the California Building Code for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the alteration shall be shown to have the capacity to resist the applicable design dead, live and snow loads including snow drift effects required by the California Building Code (CBC) for new structures.”

California Assembly Bill 2188 (2014) states, in part: “Review of the application to install a solar energy system shall be limited to the Building Official’s review of whether it meets all health and safety requirements of local, state, and federal law.”

This legislation also requires that building departments create “an expedited, streamlined permitting process for small residential rooftop solar energy systems.”

DISCUSSION:

The above code sections are both applicable to the installation of residential rooftop solar PV systems, as are other applicable codes, such as the California Electrical Code (CEC). With regard to § 503.3 of the CEBC, this code standard applies to the installation of solar PV rooftop systems, and requires an existing roof structure receiving such a solar PV system to be able to tolerate the added load of the PV system in addition to other design gravity loads, such as dead loads and environmental loads. In Mono County, the environmental load of snow must be considered for all rooftop structures.

AB 2188 (2014) places additional requirements on a building department to expedite and streamline its processing and permitting of small residential rooftop solar energy systems, but also requires that submittals for these permits be reviewed to see if it meets all health and safety requirements in local, state, and federal law. Since the 2019 CEBC is state law (Title 24 of the California Code of Regulations, part 10), the existing roof’s structure must be analyzed consistent with §503.3 of the CEBC.

POLICY AND PROCEDURE FOR RESIDENTIAL ROOFTOP SOLAR PV INSTALLATIONS:

Since the 2019 CEBC is state law (Title 24 of the California Code of Regulations, part 10), the existing roof's structure must be analyzed consistent with §503.3 of the CEBC if the total load of the PV system increases the existing roof's design gravity load of more than 5%. Residential rooftop solar PV permit applications shall be expedited and streamlined pursuant to AB 2188.

In order to expedite small residential solar PV rooftop installations and to adequately address an existing roof's structure as required by state law, an applicant for a residential rooftop residential solar PV system permit shall provide a complete application pursuant to the checklist found in the expedited solar PV document.

To determine if the PV system increases an existing roof's design gravity load by more than 5%, multiply .05 by the specific flat roof snow load (P_f) of the project's location. If the total load of the PV system is greater than the product of $.05 \times P_f$, then the existing roof's structure must be analyzed with the procedure outlined below. If the total load of the PV system is equal to or less than the product of $.05 \times P_f$, then no analysis of the existing roof is required. For example, if a project in Chalfant Valley is proposed, the flat roof snow load of that location is 38 psf; $38 \text{ psf} \times .05 = 1.9 \text{ psf}$. If the PV system's load is greater than 1.9 psf, then the roof must be analyzed. If the PV system's load is equal to or less than 1.9 psf, then no analysis of the roof is needed.

If the PV system's load increases an existing roof's design gravity load of more than 5% as outlined above, and if the roof structure is composed of wood rafters or wood trusses, then an applicant for a residential rooftop solar PV permit shall populate the roof loading worksheet provided in the expedited solar PV package based on as-built conditions of the roof. Existing roofs that have framing members other than wood rafters or trusses will be addressed on a case-by-case basis. The existing dead load of the roof structure plus the added load of the entire rooftop PV system shall be the total roof load.

For existing roofs with wood rafters, the rafter span tables found in the latest versions of the California Residential Code (CRC) for detached one- and two-family dwellings and townhouses not more than three stories in height inclusive of their ancillary structures may be used. The CRC rafter span tables are good up to a maximum of 70 psf ground snow load (P_g). If the total roof load is equal to or less than 20 psf, and the existing roof's rafter size, spacing, wood species and length conform to the data in the CRC rafter span tables, then engineering is not required. If the rafters do not conform to the data in the CRC rafter tables, site specific engineering for the existing roof structure will be required.

For wood roof trusses manufactured by Roof Components, Inc, trusses installed in regions with a flat roof snow load of 58 psf or less will be able to withstand an additional load of 6-26 psf. If the PV system's load is equal to or less than 6 psf, then no additional engineering or analysis is required for existing roof structures with these roof trusses.

For more information, please contact the Mono County Building Division. Building Division staff may be contacted at the contact information provided at the top of this document or at: (760) 965-3635, or tperry@mono.ca.gov.

Purpose

To promote a consistent methodology of processing (PV) permits for all regions within Mono County, this standardized permit submittal has been developed for both ground mounted, and roof mounted residential solar photovoltaic single-phase systems of 10KW or less.

Referenced Codes

California Building Code, Title 24, Part 2

California Residential Code, Title 24, Part 2.5(One- and Two-family dwellings)

California Electrical Code, Title 24, Part 3

California Mechanical Code, Title 24, Part 4

California Plumbing Code, Title 24, Part 5

California Energy Code, Title 24, Part 6

California Fire Code, Title 24, Part 9

California Existing Building Code, Title 24, Part 10

NFPA and NEC

Submittal Requirements

1. General information: Completed Building permit application and documents.
2. Local Utility Approval: Interconnection approval from servicing utility company.
3. Design Documents: Completed prescriptive design forms (roof / ground mount) or engineer stamped structural design (per Mono County design criteria).
4. Documents and information as detailed in the following plan submittal checklist.

GENERAL REQUIREMENTS

- A. System size is 10 kW AC CEC rating or less Y N
- B. The solar array is roof-mounted on one- or two-family dwelling or accessory structure Y N
- C. The solar panel/module arrays will not exceed the maximum legal building height Y N
- D. Solar system is utility interactive and without battery storage Y N
- E. Permit application is completed and attached Y N

ELECTRICAL REQUIREMENTS

- A. No more than four photovoltaic module strings are connected to each Maximum Power Point Tracking (MPPT) input where source circuit fusing is included in the inverter Y N
 - 1) No more than two strings per MPPT input where source circuit fusing is not included Y N
 - 2) Fuses (if needed) are rated to the series fuse rating of the PV module Y N
 - 3) No more than one noninverter-integrated DC combiner is utilized per inverter Y N
- B. For central inverter systems: No more than two inverters are utilized Y N
- C. The PV system is interconnected to a single-phase AC service panel of nominal 120/220 Vac with a bus bar rating of 225 A or less Y N
- D. The PV system is connected to the load side of the utility distribution equipment Y N
- E. A Solar PV Plan and supporting documentation is completed and attached Y N

STRUCTURAL REQUIREMENTS

- A. A completed Structural Criteria and supporting documentation is attached (if required) Y N

FIRE SAFETY REQUIREMENTS

- A. Clear access pathways provided Y N
- B. Fire classification solar system is provided Y N
- C. All required markings and labels are provided Y N
- D. A site plan and diagram of the roof layout of all panels, modules, clear access approximate locations of electrical disconnecting means and roof access points is completed and attached Y N

Notes:

1. *These criteria are intended for expedited solar permitting process.*
2. *If any items are checked NO, revise design to fit within Eligibility Checklist, otherwise permit application may go through standard process.*
3. *Projects shall comply with local fire codes of the respective jurisdiction. The State Fire Marshal amendments to the 2016 Fire Code are enforced by local jurisdiction for all PV systems.*

DESIGN & REVIEW

1. All PV applications will be reviewed at the front counter for completeness.
2. Systems using new technology (i.e., micro inverters, thin-film panels, etc.) may be required to submit detailed plans and specifications for plan review.
3. All PV system plans shall specify:
 - a. Conductor wiring methods and wire type, system and solar panel grounding methods as per inverter and solar panel manufacturer's listings, and PV system DC and AC disconnects.
 - b. Signage [on panel(s), disconnects and transmission line conductors].
 - c. Placement of equipment and modules with associated access and pathways for roof-mounted systems.
 - d. Equipment type, listing, testing agency approvals, etc.
 - e. Module attachment details and data from manufacturer.
 - f. Inverter location(s), if applicable.
4. All rooftop systems will comply with the POLICY AND PROCEDURES FOR RESIDENTIAL ROOFTOP SOLAR PV INSTALLATIONS.

PHOTOVOLTAIC DISCONNECT & RAPID SHUTDOWN REQUIREMENTS

- 1) PV disconnects shall be installed in accordance with CEC 690 III. Disconnects will be provided to isolate all ungrounded dc conductors from the building service as well as domestic service, inverters and other equipment. Disconnects will be located in accessible locations and grouped accordingly with other system disconnects.
- 2) Rapid Shutdown equipment shall be installed in accordance with CEC 690.12. The rapid shutdown initiation device shall be labeled according to CEC 690.56(C), and its location shall be shown on the site plan drawing. The rapid shutdown initiation device may be the inverter output or input circuits' disconnecting means, the service main disconnect, or a separate device as approved by the AHJ. The disconnecting means shall be identified for the purpose, suitable for their environment, and listed as a disconnecting means. A single rapid shutdown initiation device shall operate all disconnecting means necessary to control conductors in compliance with CEC 690.12. Note: Check with the AHJ regarding approval where field verification of reduction of voltage within the time required by CEC 690.12 is performed.

PROTECTION OF EMERGENCY RESPONDERS

1. All sharp edges and fasteners shall be covered, crimped or countersunk to minimize hazard to emergency responders, service personnel or others accessing the installation area.
2. All roof surface-mounted conduits, pipes, braces, etc. crossing pathways on roof mounted systems are to be clearly identified as per CRC R324, CEC 690 and 705 in approved visible and durable materials.
3. Check with the local fire protection district in which the project is located for any special requirements for disconnects or other applicable fire-safety related criteria.

ROOF ACCESS REQUIREMENTS & ARRAY CONFIGURATION

All arrays shall be mounted per listing installation instructions of the system manufacturer. Pathways shall be established in the design of the solar installation and clearly indicated on the plans. All roof access pathways shall be located at a structurally supported location on the building, such as over a bearing wall or beam lines. Arrays shall be located in a manner that provides access pathways for the following conditions.

1. Residential buildings with hip-roof layouts: Modules shall be located in a manner that provides one three-foot-wide access pathway from the eave to the ridge on each roof slope where panels are located.
2. Residential buildings with a single ridge and mono slope: Modules shall be located in a manner that provides a three-foot-wide access pathway between the panels and the ridge on each roof slope.
3. Hips and valleys and eaves: Modules shall be located no closer than 18 inches to a hip or valley if modules are to be placed on both sides of a hip or valley. If modules are to be located on only on side of a hip or valley that is of equal length, then the modules shall be permitted to be placed directly adjacent to the hip or valley. Modules shall not be located over eaves outside the exterior walls of building.

Modules may not be located closer than three feet below a roof ridge without written approval by the fire chief of the local jurisdiction.

