



**SIERRA COUNTY DEPARTMENT OF
PLANNING AND BUILDING** P.O BOX 530
Downieville, California 95936 (530)
289-3251 FAX (530) 289-2828
building@sierracounty.ca.gov

FORM NUMBER

BD-14

Tim Beals
Building Official

**BUILDING PERMIT SUBMITTAL REQUIREMENTS FOR
RESIDENTIAL ROOF OR GROUND MOUNT
PHOTOVOLTAIC SYSTEMS**

THIS CHECKLIST IS PROVIDED TO ASSIST BOTH YOU AND STAFF TO HELP IN THE REVIEW AND PROCESSING OF YOUR PERMIT. PLEASE READ CAREFULLY! *Construction Plans and supporting documentation shall be sufficient detail and clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of the California Building Standards Codes and relevant laws, ordinances, rules and regulations, as determined by the Building Official (CRC R106.1.1, CBC 107.2.1).*

The following items are required for a complete application submittal for a permit to install a residential photovoltaic system in Sierra County. Incomplete submittals may delay the plan check process

- COMPLETED AND SIGNED BUILDING PERMIT APPLICATION FORM** Clearly describe complete scope of work, valuation, and specify Permit Holder. (Form BD-01)
- ENCROACHMENT PERMIT APPLICATION** If encroaching onto County Right-of-Way. Alternatively, approved CALTRANS Encroachment Permit, USFS Special Use Permit, or copy of Private Easement Deed demonstrating legal access to/from a public right-of way. Contact Public Works for more information (530) 289-3201.
- SITE/PLOT PLAN** Two (2) Copies (See Form BD-05 for plot plan requirements.)
- ENGINEERED DETAILS** (Two Copies) that show the footings and attachments of photovoltaic panels. These details must be signed and stamped by the engineer who prepared them.
- LETTER FROM ENGINEER** Stating that the existing roof will meet snow load requirements with the added weight from the solar panels.
- ELECTRICAL SINGLE LINE DIAGRAM** (Two Copies) This should include:
 - Amperage size and location of the main electrical panels and subpanels
 - Grounding/bonding conductor sizes/types for structure (main ground, water bonding, gas bonding, etc.)
 - Equipment grounding conductor size, type and location for circuits and module/rack grounding
 - Combiner/junction box locations
 - AC/DC disconnect types, sizes and locations
 - Conduit sizes/types from the array to the power source
 - Inverter string sizing or micro inverter branch circuit details
 - Conductor wiring types and sizes, system and solar panel
- REQUIRED SIGNAGE** for panels, disconnects, conduits, junction boxes, etc. Permanent labels with red and white lettering resistant to fading pursuant to CA Electrical Code Article 690.

CUT SHEETS/MANUFACTURER'S SPECIFICATION Two (2) Copies that detail all PV equipment and mounting systems including but not limited to: PV modules, rack mounting system with complete details, mounting brackets, grounding hardware, **module fire rating** and inverters.

PV SYSTEM MOUNTING HARDWARE (ROOF MOUNT ONLY) shall be designed by CA licensed engineer. (must meet snow load requirements, see form BD-06)

STRUCTURAL ENGINEERING CALCULATIONS (GROUND MOUNT ONLY) for the PV system mounting hardware & foundation. Two Copies Wet Stamped and Signed by a CA licensed engineer. All details described in the structural calculations must be shown on the plans.

ARRAY CONFIGURATION indication the placement of equipment and modules on the roof including junction boxes and other related electrical equipment. Configuration shall also show required fire clearances per the 2016 CA Fire and Residential Codes.

SOLAR PV REQUIREMENTS IN THE 2016 CA FIRE, ELECTRICAL & RESIDENTIAL CODES

WIRING/CIRCUIT INSTALLATION:

- 1.) Direct current (DC) conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes and disconnects shall be labeled per the following:
 - Labels shall be reflective, water resistant and can withstand the environment; lettering shall be a minimum 3/8" in height with white on red background.
 - Labels shall state, "WARNING: PHOTOVOLTAIC POWER SOURCE".
 - Labels shall be placed at every service disconnect; also on ever DC conduit, raceways, enclosures, etc at 10 ft).C. and within 1 foot of turns, bends, and penetrations.
- 2.) Conduit, raceways and wiring system shall be run as close as possible to ridges, hips, valleys, etc; they shall also be installed in such a manner to limit trip hazards and maximize ventilation opportunities. DC wiring in enclosed spaces shall be installed in metallic conduit; conduit shall be run along the bottom of load bearing members.
- 3.) PV source and output circuits inside a building shall be routed along building structural members where the members can be observed (accessible attics, etc). If circuits are embedded in areas (not accessible) that are not covered by PV modules, those areas shall be clearly marked indication their locations.
- 4.) DC Circuits ran inside a building 80 volts or greater shall be protected by a listed arc-fault circuit interrupter.
- 5.) Where multiple inverters are installed and not grouped a clear location directory shall be provided at each AC & DC disconnect location.
- 6.) FMC 3/4" or smaller, MC conduit 1" or smaller or exposed wiring installed across ceiling joist or floor joists shall be protected by guard strips.

ACCESS & PATHWAYS:

- 1.) Residential structures shall be designed with a maximum PV array axis of 150ft x 150ft.
 - **Residential Hip Roof Layouts:** Minimum 3 ft clear walkway from eave to ridge on side of roof mounted PV modules.
 - **Residential with Single Ridge:** Minimum of two (2) 3 ft clear walkways from the eave to the ridge or each roof slope.
 - **Residential with Hips & Valleys:** Modules installed no closer than 18" to the hip or valley when modules are installed on each side of the hip/valley.
 - **All Residential roofs:** Modules shall not be installed within 3 ft of the ridge for fire department ventilation..

EXCEPTIONS: Roofs with a slope of less than or equal to 2:12 or when the Fire Chief approves alternative ventilation methods or determines vertical ventilation techniques will not be used.
- 2.) Roof access shall be available that doesn't require placement of ladders over windows, doors, etc. and located at strong points of the building construction that allow unobstructed access.

- 3.) Commercial Access: A minimum 6 ft wide clearance shall be provided around the parameter of the roof **unless** the longest building axis does not exceed 250 ft.
- 4.) Commercial Roof Pathways: Structurally sound centerline pathways shall be provided a minimum of 4 ft wide and 4 ft clear to skylights, hatches, standpipes, parapets and/or roof edges.
- 5.) Commercial Smoke Ventilation Requirements: Arrays shall be no greater than 150 ft X 150 ft in size; a minimum 8 ft clear space (see code for alt. clearance between arrays) shall be provided between arrays.
- 6.) Ground Mount Arrays: A minimum 10 ft clear “brush-free” area around the array shall be provided.

FIRE RATING:

- Modules shall be tested, listed and identified with the fire classification based on the specific type of building construction. (See California building Code (CBC) Table 1505.1 for specific classification requirements)