



RESIDENTIAL SOLAR (PV) & ENERGY STORAGE SYSTEMS (BATTERIES)

REQUIRED DOCUMENTS

- Completed Building Application, and two sets of plans. Minimum size of plans shall be 11" x 17", with scale 1/4" = 1'.
- All work shall comply with 2019 California Residential Code (CRC), California Electrical Code (CEC), California Energy Efficiency Standards, and California Green Building Standards (CalGreen)

SITE PLAN/ROOF INFORMATION

- Site plan shall include location of all new (and/or existing) solar modules and electrical equipment
- Fire access pathways, clearances, and access points shall abide by CRC section 324. Modules shall not be placed on a portion of the roof that provides an existing 36" pathway from an emergency escape and rescue opening (e.g. second floor bedroom window).
- Existing roof membrane information shall be provided, and the existing structural support system shall be indicated (e.g. 2x6 rafters spaced 16" O.C). Solar arrays that exceed the prescriptive installation instructions of manufactured products shall require additional structural engineering.
- Solar racking systems shall have a Class A Fire Rating, and comply with UL 1703 and UL 2703 test standards.
- Provide flashing/waterproofing details of all roof-penetrating systems. Non-penetrating systems (i.e. ballast racking designs) shall include design pages that indicate the specific locations and weight values for ballast block placements, as required by the manufacturer.

ELECTRICAL DIAGRAM

- Include all conductor/conduit types and sizes, with electrical calculations.
- Identify all required AC and DC disconnects.
- Include all panelboards incorporated into the new system, including busbar ratings and main circuit breaker ratings. If an interconnection occurs at an existing sub panel, the interconnection calculations shall be sized for both the sub panel and the main service panel.
- Load calculations shall be required if:
 - A main circuit breaker "de-rate" occurs
 - Existing circuits are relocated to a new or existing sub panel, to verify the feeding breaker is adequately sized to serve the relocated loads.
- Equipment Grounding Conductors shall be sized based on CEC Table 250.122. All DC based inverter systems shall include a #8 EGC, per CEC 250.169.

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- EGCs exposed to free air and not routed with circuit conductors shall not be smaller than #6AWG copper [CEC 250.120 (C)].
- All secondary power source interconnection circuits (both PV and ESS), and combinations thereof, shall be sized to abide by CEC section 705.12. The size of new circuits shall be indicated on the plan sets, including specific point of interconnection. Currently, the most common interconnection methods incorporate:
 - 1) The “120% Rule” – CEC 705.12(B)(2)(3)(b) – the secondary source (be it PV, ESS, or a combination thereof), when combined with the amperage of the overcurrent device protecting the busbar (aka main circuit breaker), shall not exceed 120% of the rating of the busbar itself. Example: an 100A busbar rated service panel with an 100A main circuit breaker is limited to a 20A secondary source interconnection breaker.
 - 2) CEC 705.12(B)(2)(3)(c) – *New addition to 2019 CEC* – the sum of all breakers, both load and supply devices, excluding the rating of the main breaker, shall not exceed the ampacity of the busbar. This interconnection method typically involves installation of a new sub panel, and relocation of circuits that were previously housed in the main service panel. Example: a 200A busbar rated service panel with a 200A main breaker contains multiple circuit breakers. All the existing loads are relocated to a new sub panel, fed by an 100A sub panel breaker installed in the main service panel. If the only circuit breakers in that main service panel are now the 200A main breaker and the new 100A breaker feeding the new sub panel, this main service panel can now accommodate up to 100A of secondary-source circuit breakers.
- NOTE: there are numerous methods to make a secondary-source interconnection, and this design should be completed by an experienced professional. The heat generated by all electrical systems can be a fire hazard, and limitation of power supply sources (both utility and secondary-source) on conductors and busbars is an essential part of fire safety and PV/ESS design.

PRODUCT DATASHEETS & ADDITIONAL PLAN CHECK REQUIREMENTS

- Provide data sheets for all new equipment, including: roof attachments, solar racking, solar modules, optimizers, micro-inverters, string inverters, battery equipment, “gateway” or other energy management hardware, etc.
- Plan set must include pictures of the existing main service panel and/or interconnection panel, as well as manufacturer’s labeling on that panel. All panels involved in the secondary-source interconnection must be included.
- Provide plan set pages to depict labels and placards abiding by CEC sections 690 and 705.12

INSPECTION

- Stamped plans and permit shall be on site.
- The permit holder shall provide safe access to all work areas:
 - All electrical boxes shall be opened and ready to inspect, with deadfronts removed.
 - For roof-mounted PV, a CAL-OSHA approved extension ladder shall be provided for inspection. The ladder must extend a minimum of 3 feet above the roof.
- The grounding electrode system of the property shall be confirmed at the inspection, including gas and water bonds. If no ufer connection can be verified, two ground rods driven a minimum of 6’ apart shall be required.
- All exterior equipment (including conduit and fittings) shall be rated for exterior use.
- All smoke alarms and carbon monoxide detectors must be in working condition and installed in all required locations (CA Health and Safety, 13113.7).

For additional information on solar visit the Cool Davis website: <https://www.cooldavis.org/solar>