



The City of Menifee encourages the installation of renewable systems through low permit fees for solar photovoltaic (PV) installations and standardized solar permitting guidelines. All solar PV installations need an electrical permit. Building permits are needed only if structural work is necessary to support the solar PV system (such as the addition of new struts and purlins or new framing members between existing framing to reduce spacing). The required elements for permit applications for solar PV installations are detailed below.

All plans submitted for solar PV systems must comply with, and reference, the 2019 California Building Standards Code that became effective on January 1, 2020, including the 2019 California Residential Code (CRC), 2019 California Electric Code (CEC), 2019 California Plumbing Code (CPC), and 2019 California Mechanical Code (CMC) as appropriate including any amendments and/or errata.

Effective September 8, 2017; all inverters installed after this date must be a listed “smart inverter”.

The City of Menifee Building and Safety Department has a plan check wait time of up to 7 business days.

The City of Menifee does not currently perform any over-the-counter plan reviews for solar systems due staffing levels.

### **Requirements for Permit Submittal**

Before approval and issuance of permit(s) for solar PV systems, the applicant shall submit three (3) sets of plans (minimum size 11”x17”), which are drawn to scale (or at the very minimum are fully dimensioned), readable, and legible with a minimum of #12 font for text. Electronic plans that are designed to be printed at a minimum of 11”x17” in size and meeting the requirements listed above (one set of plans shall be required for electronic plans). Electronic plans may be submitted to [solar@cityofmenifee.us](mailto:solar@cityofmenifee.us)

(For ground mounted PV systems, see our handout specifically for ground mounted systems and their additional requirements)

All plans shall include the following information:

*(Plan information listed in the items below could be combined if clarity is maintained.)*

1. **Cover Sheet** showing the following information: (a) project address; (b) owner’s name, address, and phone number; (c) name, address, and phone number of the person preparing the plans; (d) scope of work statement; (e) number of stories and number of dwelling units; (f) sheet index indicating each sheet title and number; (g) legend for symbols, abbreviations, and notations used in the drawings.
2. **Schematic Site Plan** showing building footprint with locations of property lines, distances of building walls to property lines, location of the solar PV systems, location of the main service and the exterior and interior locations of all equipment and disconnects with working space clearances, and locations of other structures (if any) on the property and all fences, walls, and gates. For multi-story buildings, indicate the roofline at each floor level on the site plan.



3. **Electrical Plan** showing:
  - a. The kW rating of the solar PV system and whether it is a utility interactive, stand-alone system;
  - b. Complete electrical calculations for the proposed solar PV system;
  - c. Single line diagram of the electrical installation which includes the solar PV panel layout, PV power source short circuit current rating, conductor size and type, conduit size and type, location and lengths of runs, junction boxes, wiring methods, inverter location, disconnect locations, battery locations (if applicable), point of connection to the existing electrical system (with the existing service and disconnect size and the number of meters) and existing PV system (if applicable);
  - d. Site specific signage information required for the solar PV installation suitable for the environment per 2019 CEC 690.51-690.56; 705.10
  - e. **Informational note:** Service panel upgrades and main service panel disconnect de-rates require a separate permit with the City of Menifee. De-rating of a main service will require the submittal of electrical load calculations for the existing electrical system.
  
4. **Battery Storage Systems** (if provided) shall comply with Article 690 of the 2019 California Electrical Code. Some basic information to comply with is listed below:
  - a. Indicate that the battery is to be installed per the manufacturer's clearance requirements.
  - b. Energy storage system conforms to and is listed under UL 9540.
  - c. Energy storage system live parts are not accessible during routine maintenance. System voltage in accordance with CEC 690.7 and exception 1 CEC 690.71(b)(1).
  - d. Additional disconnecting means shall be installed where the energy storage device input and output terminals are more than 5 ft. from connected equipment, or where the circuits from these terminals pass through a wall or partition per CEC 690.71(h) or 706.7(e).
  
5. **Roof Plan and Cross-Section** including:
  - a. An aerial photo of the structure, such as Google Earth;
  - b. The existing roof types, slopes (i.e. hip roof, slope less than 2:12 or greater than 2:12, as appropriate), roofing material, and number of layers;
  - c. Indicate the locations of all attic vents, plumbing waste vents, other mechanical vents, and roof mounted HVAC systems or similar systems, and chimneys.
  - d. The proposed location and path-of-travel of the electrical conduit.
  - e. For a roof-mounted array, please provide the following:
    - i. Wind uplift values.
    - ii. The array per square foot weight.
    - iii. The per square foot dead load of the existing roof (roof covering material + underlayment + sheathing weight). Total dead load, existing per square foot roof dead load plus per square



- foot array weight, in excess of ten (10) pounds per square foot requires a structural analysis to be included with plan submittal. Required 2019 CRC Section R324.4.1, R324.4.1.1
- iv. Show the array supports, the roof penetrations and the connection to the roof- framing members.
  - v. Identify the method of flashing and sealing of the roof penetrations. Required 2019 CRC Section R324.4.3
  - vi. Engineering calculations when Total Dead Load exceeds ten (10) pounds and the roofing material is TILE. See 2019 CBC [ASCE/SEI 7-10] Seismic Loads. (2) sets minimum
- f. Location of load bearing walls on the framing cross-section;
- g. Section or detail showing that the solar PV panels are flush mounted 10” or less
- i. **Note:** Panels that are not flush mounted require a licensed engineer to provide structural design calculations and details for wind uplift and all connections. Allow 5 working days for review of plans with structural calculations;
- h. Attachment details showing the type, diameter, and length of embedment of bolts and their spacing; the number of bolts per solar PV panel (or alternatively, the square footage of panel per bolt).
6. **Manufacturer’s Specification Sheets** with make, model, listing, size, and weight for all components including, but not limited to, inverters, panels, racks, and combiner boxes, junction boxes, disconnects, panel boards. Provide two (2) complete copies of the Solar Panel Installation Manual as well as the specifications for the grounding method to be used. Grounding method used must comply with installation manual requirements.
7. **Placard Requirements** as shown on plans must include:
- a. A placard detail sheet shall be provided on the plans indicating markings on the interior and exterior DC conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes, inverters, service panels, load centers, and disconnects per 2019 California Fire Code (CFC) Section 605.11.1., Article 690, and 705.10 of the 2019 California Electric Code, and the City of Menifee adopted PV placard requirement handout as follows:
    - i. Material: Hard plastic or metal engraved or etched weather resistant and suitable for the environment. Interior labels and any label that is required to be reflective or installed on a conduit can be a sticker. Exterior stickers shall be able to withstand the environmental conditions.
    - ii. Content: Placards that require values to be completed per site are provided on the placard (no “permanent” markers or pens or other non-paint based makers or pens.)
    - iii. Location: Provide the exact location of all placards that are to be installed on the equipment.
  - b. Locations of DC conductors to meet the criteria of 2019 CRC Section R324.7.3 and 2019 CFC Section 605.11.2:
    - i. Conduit, wiring systems, and raceways shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities;
    - ii. Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to



the DC combiner box.

- iii. DC wiring shall be installed in metallic conduit or raceways when located within enclosed spaces in a building.
- iv. Conduit shall run along the bottom of load bearing members.

**8. Roof access and pathways:**

Locations of clear access paths as required by 2019 CRC Section R324.6.1 through R324.6.2.4 and 2016 CFC 605.11.3.2. Access to residential photovoltaic systems shall be in accordance with:

- a. R324.6.1 Pathways. Not less than two minimum 36-inchwide (914 mm) pathways on separate roof planes, from lowest roof edge to ridge, shall be provided on all buildings. At least one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, a minimum 36-inch-wide (914 mm) pathway from the lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and adjacent roof planes. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions such as vent pipes, conduit, or mechanical equipment;
- b. R324.6.2 Setback at ridge. For photovoltaic arrays occupying not more than 33 percent of the plan view total roof area, not less than an 18-inch (457 mm) clear set back is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, not less than a 36-inch (914 mm) clear set back is required on both sides of a horizontal ridge; provide the roof area square footage, the array square footage and coverage percentage.
- c. R324.6.2.1 Alternative setback at ridge. Where an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D setbacks at ridges shall conform with one of the following: 1. For photovoltaic arrays occupying not more than 66 percent of the plan view total roof area, not less than an 18-inch (457 mm) clear setback is required on both sides of a horizontal ridge. 2. For photovoltaic arrays occupying more than 66 percent of the plan view total roof area, not less than a 36-inch (914 mm) clear setback is required on both sides of a horizontal ridge;

**Table 3-1 Minimum Ridge Setback**

Array Percentage of Roof Area	Fire Sprinkler System	Minimum Setback on Both sides of Ridges (inches )
≤ 33%	No	18
> 33%	No	36
≤ 66%	Yes	18
> 66%	Yes	36



- d. R324.6.2.2 Emergency escape and rescue opening. Panels and modules installed on dwellings shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A 36-inch-wide (914 mm) pathway shall be provided to the emergency escape and rescue opening;
- e. **Exceptions:** Roofs with slopes of 2:12 or less.
  - i. Detached, non-habitable structures, including but not limited to detached garages, parking shade structures, carports, solar trellises, and similar structures, shall not be required to provide roof access.

9. **Building Integrated Photovoltaic** panels to comply with R905.17

10. **Inspection** requirements:

- a. Grounding method of solar panels must follow manufacturer's specific listing. Approved documentation must be provided to field inspector at time of inspection;
- b. The systems shall be ready for inspection and all boxes, panel fronts, access panels, and similar devices shall be open and an OSHA approved (contractor provided) ladder(s) shall be set-up and tied-off prior to the inspection;
- c. The original permit and approved plans and specifications shall be readily accessible at the time of inspection;
- d. A qualified individual from the solar company shall be present to accompany the inspector during the inspection;
- e. Adding a photovoltaic (PV) solar system is classified as a separately derived electric system, all grounding and bonding of the existing electrical system for the building shall be upgraded or installed if the electrical grounding and bonding system is not in compliance with the current electrical code. The grounding and bonding system for the building shall comply with all of the requirements of Article 250 of the CEC:
  - i. A properly sized grounding electrode (ground rod, ufer, etc...) shall be installed. The grounding electrode shall be visually verified by the city inspector. 250.52(A)(1) through (A)(8)
  - ii. A properly sized and properly installed grounding electrode conductor (ground wire) shall be installed. The grounding electrode conductor shall be visually verified by the city inspector. 250.64(A) through (F), Table 250.66, 250.66 (A) through (C)
  - iii. An approved ground clamp for attachment of the grounding electrode conductor to the grounding electrode shall be accessible and shall be visually verified by the city inspector. 250.68(A) through (C)
  - iv. If a grounding electrode is not available for inspection or, there is not a compliant grounding electrode that is installed, two (2) 8' long x 5/8" diameter copper ground rods shall be installed at a minimum distance of 6' apart and connected to the main electrical service panel ground bus. Other code approved grounding electrodes may be installed. Exception: Only one grounding electrode may be installed if a (third party) passing grounding electrode resistance test is provided to the inspector or a grounding electrode resistance test is conducted in the presence of a city inspector showing a passing result of 25 ohms or less. 250.53(A)(2), 250.53(A)(3), 250.53(C), 250.53(G), 250.53



- v. A properly sized bonding wire shall be installed from the main electrical service panel grounding bus bar to the cold water service line on the customer side of the water system with an approved clamp. The connection of the bond wire to the water pipe shall be accessible and shall be visually verified by the city inspector. Exception: A bond wire shall not be required to be connected to any PEX or similar plastic water piping. 250.104(A)(1) through (A)(3), 250.104(D), 250.104(D)(1)
- vi. A properly sized bonding wire shall be installed from the main electrical service panel grounding bus bar to any metallic fuel gas/propane piping system on the customer side of the fuel gas/propane system with an approved clamp. The connection of the bond wire to the metallic fuel gas/propane piping shall be accessible and shall be visually verified by the city inspector. 250.104(B)
- f. Any changes to the photovoltaic (PV) solar system installation that do not match the approved plans shall require the plans to be amended and submitted to the City of Menifee Building & Safety Department for review and approval prior to scheduling the inspection. No inspection shall be scheduled if the approved plans do not match the actual installation on site.

Work that is not ready for inspection when the inspector arrives on the site shall result in a re-inspection fee of \$152.60

Any PV installation that begins prior to the issuance of a building permit shall result in an investigation fee of \$152.60 and the permit shall fee be doubled. CBC 1.8.4.2, 109.4, 109.5, CRC 108.4, R108.6

Any comments/objections concerning the PC review or inspection should be noted on the revised documents.

Free to use code books are available from the State of California Building Standards commission at:

<https://www.dgs.ca.gov/BSC/Codes>