



RESIDENTIAL SOLAR PV STANDARD PLAN GUIDELINE

This Solar PV Standard Plan Guideline can guide installers in preparing residential rooftop solar PV plans. Local governments could also use this Solar PV Standard Plan Guideline in conjunction with the Solar PV Expedited Permit Checklist to provide conditions to installers that if met, would qualify for an over-the-counter permit, in lieu of being submitted. Even if over-the-counter review is not available, following this guideline is recommended to assist in streamlining coordination and permit processes with the local government permitting the project. Local governments may modify this guideline to accommodate their local ordinances, code requirements, and permit procedures to expedite the solar PV permit process. *Plans shall be modified by contractors to reflect the actual project-specific details.*

This Standard Plan Guideline may be used for PV projects with a distributed weight of less than 5 lbs. per square foot and less than 45 lbs. per attachment point to roof. Additionally, if a sub-panel and/or line-side tap are a part of the design, the PV system should not be eligible for simplified/expedited permitting.

Standard Plan Guidelines

1. A Residential Solar PV Standard Plan should include clear documentation including, but not limited to the following:

Page/Sheet 1: Cover Sheet: A proper cover sheet should include general information about the project:

- A location map and aerial image of project site
- Owner name and address
- Installer Name and Contact Information
- Design Professional
- Drawing Index

Page/Sheet 2: Site and Roof Plan: A proper site plan should, at a minimum, include:

- Roof plan showing modules placement on roof, disconnect locations, and fire setbacks, as applicable or required by local government
- Location of all existing structures and proposed PV system equipment (including modules, disconnects, inverters, panel boards, combiner boxes, storage batteries, utility meters, etc.)
- Plumbing vent termination: Vent termination is not allowed under solar installations and must be relocated or modified, or an air admittance valve may be utilized in accordance with the International Plumbing Code (IPC) and/or the International Residential Code (IRC).

Page/Sheet 3: System Drawings: System drawings should show, at a minimum (may require additional sheets):

- AC and/or DC circuit arc fault protection as required by the NEC or ordinance (if any)
- Inverter listed to the UL 62109 or UL 1741 Safety Standard; photovoltaic module(s) listed to the UL 1703 safety standard. Listings conducted by a Nationally Recognized Testing Laboratory.
- Inverter AC output disconnect location, utility disconnect location, and AC output over-current protection device rating.
- Combiner box(es), disconnect switch, size of source circuit overcurrent protection, if required
- Main service entry panelboard bus rating and main circuit breaker/fuse ampere rating.
- Circuit diagram with conduit, wire type and sizes, and/or cable type and wire sizes
- Equipment grounding and bonding conductors and grounding electrode conductor, if applicable
- Battery disconnect and overcurrent protection, if applicable
- Appropriate calculations as referenced in the Solar America Board for Codes and Standards (Solar ABCs) Expedited Permit Process for PV Systems and the California Solar Permitting Guidebook Solar Permitting Toolkit Standard Plan Templates* including, but not limited to, calculations used to: determine wire sizes; fuse and breaker type and sizing; temperature deration factors; PV system voltage not exceeding the maximum rated DC inverter input voltage or that of the connected equipment; and size equipment grounding conductor per NEC.
- A line diagram that meets the requirements of the local government (e.g. one or three line diagram), and complies with the state NEC.

- As determined by local government, the appropriate design professional seals or signatures (*e.g. preparation by a master electrician licensed by TDLR; designed and sealed by an engineer, if required by the Texas Engineering Practice Act; or PV equipment manufacturer's engineered line diagram*)

Page 4: Attachment Detail

- Framing plans showing supporting structure for arrays
- Details of attachment of the panels to the roof
- Manufacturer's installation specifications (if using manufactured racking systems)
- Make, model, and quantity of racking system major components certified to the UL 2703, UL 62109, or UL 1741 standard by a Nationally Recognized Testing Laboratory as appropriate.

Page 5: Label Standards

- List of all appropriate labels and markings and their locations per NEC and IFC requirements

2. The total system capacity, number and type of modules, number and type of inverters, type of racking, and the degree of tilt and orientations should be noted in the Standard Plan.

3. Manufacturer's specifications for the proposed PV modules and the proposed PV inverter(s) with all electrical information shall be attached to the electrical plans.

4. Tips for Preparing Standard Plans for Solar PV:

- Do not sign over the design professional signature, number, or stamp
- Ensure that electrical layout on electrical plans matches the actual installation (to avoid re-submittal of drawings after inspections occur)
- Including a Label Standards sheet in a Solar PV Plan is strongly recommended to facilitate coordination with the local government

***References:**

California Solar Permitting Guidebook Solar Permitting Toolkit: <http://energycenter.org/permitting/guidebook/toolkit>

Solar America Board for Codes and Standards (Solar ABCs) Expedited Permit Process for PV Systems:

<http://www.solarabcs.org/about/publications/reports/expedited-permit/>