

City of Loveland Building Division
410 E 5th Street Loveland, CO 80537
(970) 962-2505



Solar Photovoltaic Systems Checklist as of 9/4/2020

Solar Photovoltaic applications are reviewed by the City of Loveland through a parallel, multi-department process. The following checklist shall be submitted with your plans. Each item on the list shall be marked to verify it is part of the submittal. Incomplete information may result in delay in the review & issuance of your permit. Design shall meet all applicable conditions of [Requirements for Electric Service](#).

Plan Submittal Requirements

The following documents shall be submitted for review:

- 1) A completed application form. Include the proposed PV System capacity in DC watts, and whether the system is a stand-alone, grid-tied, or hybrid system
- 2) A plan review fee deposit (the balance of fees are due at the time of permit issuance).
- 3) Two sets of plans. (Unless filing electronically)
- 4) Submit output of NREL's PVWatts Calculator, <https://pvwatts.nrel.gov/>, to verify estimated annual energy output. Size of system cannot exceed 120% of previous year's usage. If no history exists, then proper sizing justification must be provided with calculations shown.
- 5) Panel Systems – See requirements below
- 6) Prior to permit application, contractor must contact Distribution Design Supervisor, William Ullom at 970-962-3561, to schedule site walk with COL Designer. An Electric Service Worksheet shall be submitted with the permit application (<http://www.cityofloveland.org/departments/water-and-power/development-building/requirements-for-electric-service>)
- 7) Submit an Interconnection Agreement signed by the customer (owner of the system) with package. <http://www.cityofloveland.org/home/showdocument?id=37789>

Site Plan – Equipment Outside of Structure

- Type of isolation device.
- Show the location of the existing service disconnect from top view.
- Show the detailed location of all modules, including ridgeline and edge setbacks.
- Show the location of panels, including ridgeline and edge setbacks if roof-mounted.
- Show the location and connection of all grounding electrode conductors.
- Show the dimensions and clearances between equipment and structures. This needs elevation drawings
- Show the dimensions between equipment and property lines
- The PV system must have AC disconnect within 10 ft. of the meter that shows a visible open.
- Clear signage must be located at the meter and on the PV system itself – Both High Voltage Danger and Emergency Shut-Off. This signage must be shown in plans.
- Provide elevation drawings, showing horizontal and vertical clearances, of service entrance, meter equipment, PV AC disconnect, PV inverters/combiner boxes, and all other added equipment.

Note: See the ***Pole or Ground Mounted Panels*** section for additional site plan requirements.

Floor Plan – Equipment within the Structure

- Show the location of all disconnects and isolation device.
- Type of isolation device.
- Show the location of all batteries (if applicable).
- Show the location of inverters.
- Show the location and connection of all grounding electrode conductors.
- Show the location of all equipment within structures.
- Label the use of the room in which the equipment is placed.
- Show clearances of the equipment.

Wiring Requirements

Provide a one-line diagram that includes the following information:

- Label whether the system is stand-alone, grid-tied, or hybrid.
- Conductor Sizes
- Conductor insulation types (i.e., THHN, THWN, direct burial cable, etc.).
- Conductor material types (i.e., copper/aluminum).
- Conduit sizes.
- Conduit materials (i.e., non-metallic, EMT, etc.).
- Over current device ratings.
- Existing and new panel amperage ratings (buss ratings).
- Series and parallel configuration of the module connections.

Equipment Requirements

Provide the following general information:

- Module short circuit current ratings.
- Module open circuit voltage ratings.
- Module series fuse ratings.
- Inverter output circuit current rating.
- **Inverter must be IEEE 1547 2018 and UL 1741 SA17 certified.**
- All associated documentation (i.e. batteries, inverters, disconnects, modules, charge controllers, over-current devices etc.).
- Method of grounding for modules and array.

Note: Voltage correction factor is based on 2020 NEC guidelines in the FPN.

Panels

Provide the following for Roof Mounted Panels

- A Colorado licensed design professional's evaluation regarding the dead-load capability of the existing roof structure and its ability to support the added weight of the PV panels.
- For flat roof installations, provide method of repair for roof penetration.

Provide the following for Pole or Ground Mounted Panels

- Site Plan Review Waiver approval (as of January 1, 2011).
- Site Plan to include the following:
 - Location of panel(s) on property.
 - Dimensions for panel(s) to property lines.
 - Dimensions from panel(s) to other structures on the property and property easements.
- Colorado licensed design professional footing design.