



CITY OF LONG BEACH

Department of Development Services

333 W. Ocean Blvd. Long Beach, CA 90802 Telephone: 562-570-6651 FAX: 562-570-6753

Plan Review Checklist for
PhotoVoltaic System Installations
All of the following items must be included on the required
plan sheets prior to issuance of any/all permits:

Project # _____ Address _____ System Wattage _____

- Provide 3 sets of plans, stamped and signed by the **responsible party* on minimum 18" x 24" paper.

**responsible party*: State of California licensed architect, electrical engineer, design build C-10, C-46 or the single family/duplex owner

- Provide a complete plan view drawing. Include:
 - a.) Array rooftop layout. Indicate the overall height of the installation, referenced from grade level.
 - b.) All raceway runs, cable runs, combiner boxes, junction boxes, disconnects, inverters, subpanels, utility electrical service, etc.
 - c.) If the system is a "ground mount" system, provide a complete, dimensioned site plan.

- Provide a complete single line schematic drawing. Include:
 - a.) Photo voltaic panels/arrays, raceway runs, cable runs, combiner boxes, junction boxes, disconnects, inverters, subpanels, utility electrical service, etc.
 - b.) Indicate the quantity of photovoltaic modules in each array.
 - d.) Indicate how the modules and arrays are electrically configured with regards to series and/or parallel circuitry.
 - e.) All raceway and conductor sizes, types and quantities.
 - f.) All disconnecting and overcurrent device ratings.
 - g.) The buss amperage ratings of the utility service and any intermediate load centers that will conduct the PhotoVoltaic AC power contribution.
 - h.) All system grounding. Include all grounding electrode(s) to be used, grounding electrode conductor size(s) and type(s), location of all grounding and bonding terminations, etc.

IMPORTANT: The code required PhotoVoltaic grounding electrode conductor shall be routed separately from all other conductors.

- Provide a plan note requiring all code required signage.
- Provide a **highly visible** plan note stating the polarity of the DC grounded conductor.

(continued on reverse side)

- Provide the photovoltaic equipment manufacture's specification sheets **on the plans. (not attached 8 1/2" x 11")**

Verify inclusion of all information below:

Inverter

- Maximum system voltage (DC)
- Operating DC voltage range voltage
- DC maximum operating current
- Maximum array short circuit current
- Operating AC voltage range
- Nominal AC output voltage
- Maximum continuous output AC current
- Maximum output overcurrent protection
- Continuous power output

Photovoltaic Module

- Open circuit voltage
- Maximum power
- Short circuit current
- Maximum power current
- Maximum system voltage
- Series fuse rating

- In order to verify sizing of all equipment, conductors, overcurrent devices, buss ratings, etc., include all pertinent calculations detailed in the currently adopted version of the California Electrical Code.

DC Side:

- a.) $N_{modules} \times V_{oc} \times 1.13$ (T-690.7) = string V_{oc}
- b.) $module I_{sc} \times N_{strings} \times 1.25 \times 1.25$ = DC conductor *basis amperage* (BA_{DC}) and Max. DC overcurrent amperage
- c.) proposed conductor amperage (T-310.16 – 90°) x ambient Temp. correction factor (T-310.16) x fill factor (T-310.15(B)(2)(a)) = minimum DC conductor amperage
(result must be => BA_{DC} **and** =< the corresponding AWG entry at the 75° Col. of T310.16, factor in conductor size adjustments for all runs with > 3% VD)

AC Side:

- a.) Inverter maximum output current x 1.25 = AC conductor *basis amperage* (BA_{AC}) and Max. AC overcurrent amperage
- b.) proposed conductor amperage (T-310.16 – 90°) x ambient Temp. correction factor (T-310.16) x fill factor (T-310.15(B)(2)(a)) = minimum AC conductor amperage
(result must be => BA_{AC} **and** =< the corresponding AWG entry at the 75° Col. of T310.16, factor in conductor size adjustments for all runs with > 3% VD)

All PhotoVoltaic System installations require “Building Review” and a “Building Permit” or “Combination Permit”.

- The plan package shall contain the manufacture's specification sheets for any/all prefabricated, pre-engineered PhotoVoltaic Module support and attachment systems.
- The plan package shall contain engineered plans for any/all *“field built”* PhotoVoltaic Module support and attachment systems.
- The plan package shall contain all applicable engineered attachment details regardless of which system above is utilized.

The undersigned individual certifies all of the information above has been included in the photovoltaic plan package.

Print Name _____

Signature _____

Date _____