



Basic Information Required for Photovoltaic Plan Check Submittal

Informational Purposes Only

ADMINISTRATIVE

1. The following clearances or approvals are required before a building permit can be issued:
 - a. Planning Department
 - b. Building and Safety

SITE PLAN

2. Provide full dimensioned site plan. Show lot size, street, alley, easements, parking spaces, location, size and use of all structures on the lot, and property line. Identify property lines, lot dimensions, and distance to property line.
3. Show size and location of the service meter, location of all solar photovoltaic system

LINE DIAGRAMS

4. Provide a minimum of a single line diagram showing:
 - a. Array configuration
 - b. Array wiring identified
 - c. Combiner/junction box identified
 - d. Conduit/wiring from array to inverter identified
 - e. DC grounding system specified
 - f. Disconnecting means specified
 - g. Inverter specified
 - h. Conduit/wiring from inverter to Utility point of connection identified
 - i. AC grounding and system grounding specified
 - j. Point of connection attachment method identified

INVERTER INFORMATION

5. Provide inverter manufacturer specification sheet

PV MODULE INFORMATION

6. Provide module manufacturer specification sheet

ARRAY INFORMATION

7. Show the following on the plan:
 - a. Number of module in series
 - b. Number of parallel source circuits
 - c. Total number of modules
 - d. Operating voltage
 - e. Operating current
 - f. Maximum system voltage
 - g. Short-circuit current

WIRING AND OVERCURRENT PROTECTION

8. Show the following on plan:
 - a. Wire type shall be 90° C wet and continuous rated
 - b. Overcurrent protection on inverter output circuit is sufficient

ROOF INFORMATION (ROOF TOP SYSTEM)

9. Show the following information on plan:
 - a. Weight of the arrays (pounds per square foot including mounting hardware)
 - b. Describe and show the roof structural elements
 - c. Identify roof type
 - d. Provide detail of photovoltaic panel mounting hardware attachment to the roof framing members
 - e. Provide mounting hardware manufacturer specification
 - f. Provide engineering calculations and details demonstrating adequacy of supporting members, including wind uplift effects

REQUIRED PHOTOVOLTAIC SIGNS**1. DC COMBINER/ JUNCTION BOX:**

- a. "Warning. Electrical shock hazard. The direct current circuit conductors of this photovoltaic power system are ungrounded but may be energized with respect to ground due to leakage paths and/or ground faults."

2. DC DISCONNECT:

- a. "Warning. Electrical shock hazard. The direct current circuit conductors of this photovoltaic power system are ungrounded but may be energized with respect to ground due to leakage paths and/or ground faults."
- b. "PV system- DC disconnect"
- c. *At accessible location*
 - 1) Operating current
 - 2) Operating voltage
 - 3) Maximum system voltage
 - 4) Short-circuit current

3. INVERTER:

- a. "If a ground fault is indicated, the normally grounded conductors may be energized and ungrounded."
- b. "Warning. Electrical shock hazard. Do not touch terminals. Terminals on both the line and load sides may be energized in the open position."
- c. "The maximum AC output operating current_____"
- d. "The operating AC voltage_____"
- e. PV power source (DC)
 - 1) Operating current
 - 2) Operating voltage
 - 3) Maximum system voltage
 - 4) Short-circuit current

4. AC DISCONNECT:

- a. "PV system- AC disconnect" PV Signage

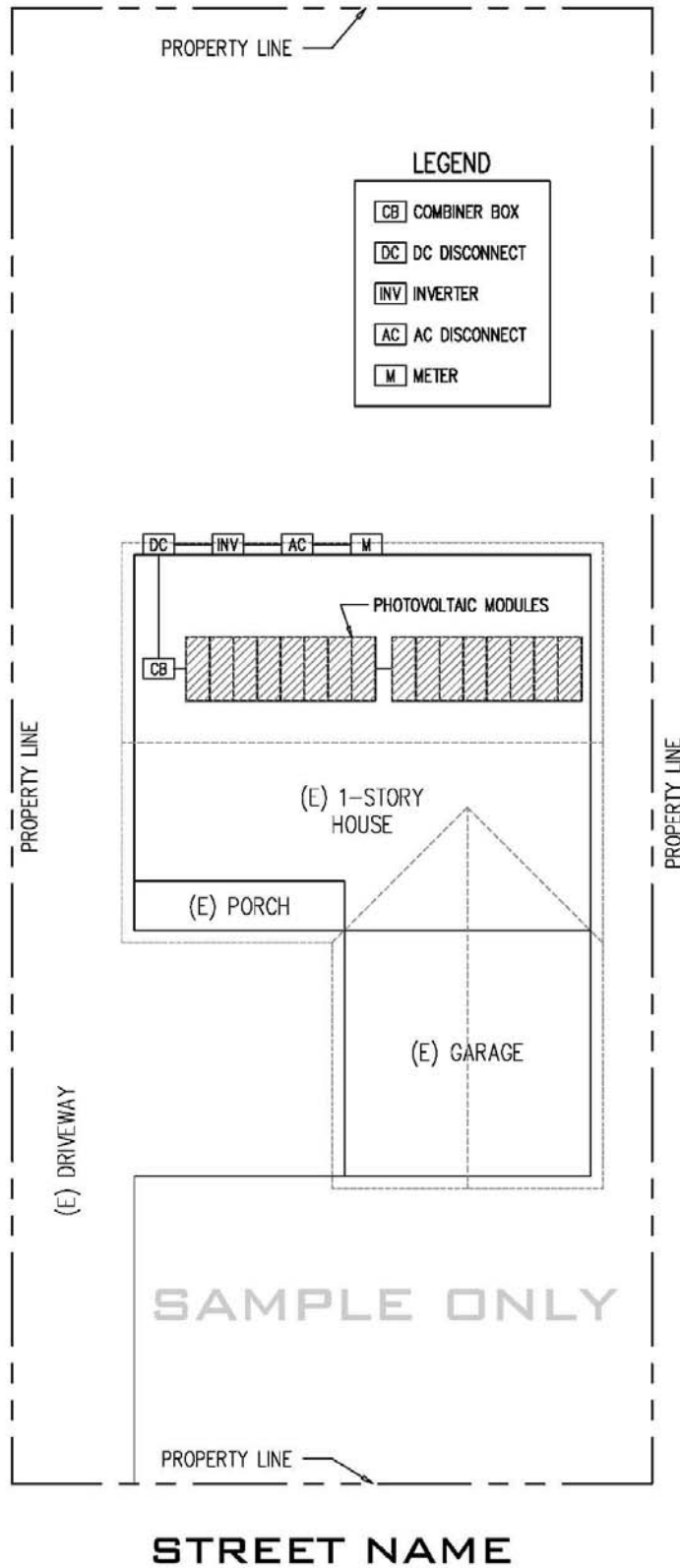
5. METER:

- a. "The maximum AC output operating current_____"
- b. "The operating AC voltage_____"
- c. "Dual sources: Second source is Photovoltaic"

6. Permanent directory or plaque providing location of service disconnecting means and photovoltaic system disconnecting means, if not located at the same location.

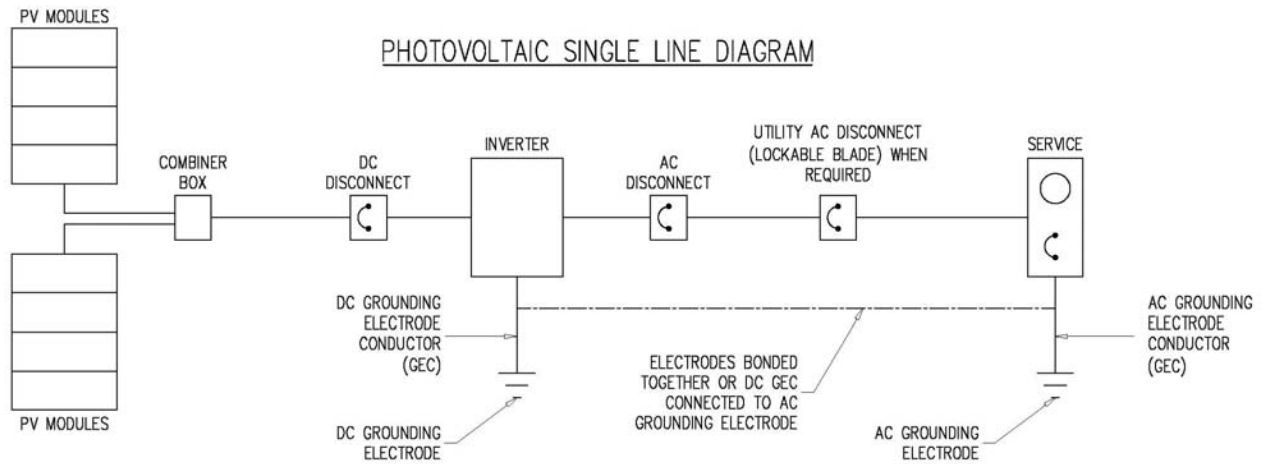
SAMPLE SITE PLAN

Site plan shown is to illustrate the necessary information required for full plan review. Complete and accurate site plan is required for review and approval.



SAMPLE LINE DIAGRAM

For informational purposes only



- ALL WIRING IN A SOLAR PHOTOVOLTAIC SYSTEM SHALL BE IDENTIFIED
- FOR INFORMATIONAL PURPOSES ONLY.



City of West Covina
BUILDING DIVISION
1444 West Garvey Avenue
West Covina, CA 91793
Phone: 626-939-8425

PHOTOVOLTAIC PANELS PLAN CORRECTION LIST

2007 California Building Codes and West Covina Municipal Code.

ADDRESS: _____
PLAN CHECK No.: _____ VALUATION: _____
OWNER: _____ DESIGNER: _____
CONTACT PERSON: _____ TELEPHONE #: _____
PLAN REVIEWER: _____ 1ST CHK DATE: _____
TELEPHONE #: _____ 2ND CHK DATE: _____
FAX #: _____ 3RD CHK DATE: _____
HOURS: _____ APPROVED: _____

Your application for a permit, together with plans and specifications, has been examined and the issuance of a permit is withheld for the reasons set forth. The approval of plans and specifications does not permit the violation of any section of the Building Code, or other local ordinance or state law.

CODES: Unless noted otherwise, all references pertain to the current edition of the California Building Code [CBC], California Plumbing Code [CPC], California Mechanical Code [CMC], California Electrical Code [CEC], California Fire Code [CFC], California Health and Safety Code [H&S], or West Covina Municipal Code [WCMC].

INSTRUCTIONS:

- Comments CIRCLED/LISTED are correction items applicable to this plan check. Please respond to all comments.
- In the left-hand margin of the circled corrections, please indicate the sheet number and detail or note number on the plans where the corrections are made. Be as specific as possible.
- Incorporate all comments as marked on the checked set of plans, calculations and this correction sheet on the revised plans. Resubmit marked original plans and two corrected sets of plans, calculations and this plan review list. Incomplete or unreadable drawings or calculations will not be accepted.

Recheck comments/corrections: _____

GENERAL/ADMINISTRATIVE:

1. See plans for additional corrections/comments. Return check set of plans with all documents and revised plans.
2. Obtain Planning Department approval for the location of the equipment. Provide Planning Department approval stamp on the site plan.

3. Provide 2 reduced copies on 8.5"x11" paper of the plot/site plan showing LEGIBLY the following information:
 - a. Area of addition graphically with clear distinction between existing and new work and a written description of proposed work.
 - b. All property lines of the lot and street.
 - c. Project address
 - d. Existing square footage and proposed square footage.
 - e. Existing number of stories (floors) and proposed number of stories (floors)
4. Submit a complete site plan. Show property lines, lot dimensions, side yards, existing buildings, distances between adjacent buildings, public right of way, location of photovoltaic panels. Obtain Planning approval prior to submittal to building division. CBC App. 1, § 106.2.
5. At resubmittal, provide [2] sets of plans minimum 11"x17", attach all manufacturer's specification sheets, installation instructions, and listings.
6. On the title sheet of plans, show the name and address of the owner and designer, site address, and list all consultants associated with the project. CBC App. 1, § 106.1.1.
7. Provide the following notes on the plans:
 - a. *"All work shall comply with 2007 California Building Code, 2007 California Electric Code, Article 690, and all manufacturer's listings and installation instructions."*
 - b. *"The following inspections will be required: (1) Inspection required for roof connection mounting assemblies prior to installation of solar module."*
8. Plans are to be signed by a California licensed contractor classification C-46 or C-10. Provide signature and license number on each sheets. Contractor who signs the document must be the one doing the work, Business and Professions Code Section 7031.5.
9. Structural plans and calculations shall be stamped and signed by state licensed engineer or architect. The first page of the structural calculation and every sheet of the plans containing structural plans, specifications, and details shall bear the engineer/architect professional seal, signature, and expiration date. California Business and Profession Code.

PLAN CORRECTION COMMENTS:

10. Show location of all system equipment on site plan including building service.
11. Show existing main electric service equipment and grounding electrode system.
12. Add note to plans "DC array conductors are to remain outside of building prior to fuseable combiner box or fuseable DC disconnecting means." Fuseable disconnecting means is required outside of the building, CEC § 690.14(C)(1)
13. Provide DC array solar panel Voc and Isc ratings, show calculations per inspector / installer checklist – Example of Maximum system voltage calculation: $Voc \times 1.10$ (Temp Corr.)- Example of Isc calculation: $Isc \times 156\%$ [Maximum current factor and continuous duty factor], CEC §690.8 (A)(1), and (B)(1).
14. System exceeds inverter maximum useable DC input current shown on inverter specification sheet.
15. Provide complete inverter and solar module manufacturer's specification sheet(s).
16. Show all conduits and conductor types and sizes including duration of conductors, Table 310.15(B)(2)(a).
17. Photovoltaic source circuits and output circuits wiring shall be suitable for the location and condition. CEC §300.2, §690.8, §690.31.

- 18. Provide specification of connectors for DC circuits, CEC §690.33.
- 19. Inverter integral AC/DC disconnects not approved unless disconnects are a separate component and the inverter can be removed for service or replacement without removing disconnect means.
- 20. AC disconnect between inverter AC output and connection to utility to be a visible blade, lockable type disconnect listed for its use.
- 21. The output of a photovoltaic power source shall be connected to the supply side of the service disconnecting means or the load side of the service disconnecting means provided it is made at a dedicated circuit breaker and the sum of the ampere ratings of overcurrent devices in the circuits supplying power to a busbar or conductor shall not exceed the rating of the busbar or conductor, CEC §690.64.
- 22. Verify main electrical service overcurrent device and buss rating. For a dwelling unit, the sum of the ampere ratings of the overcurrent devices shall not exceed 120 % or the rating of the busbar or conductor, CEC §690.64(B)(2)Exception.
- 23. For PV power source, one conductor of a two-wire system with a photovoltaic system voltage over 50 volts shall be solidly grounded that accomplish system protection accordance to CEC §250.4(A), §250.162, §690.41.
- 24. The DC grounding electrode conductor shall be bonded to the AC grounding electrode conductor to make a grounding electrode system according to CEC §250.52 and §250.53. The bonding conductor shall be no smaller than the largest grounding electrode conductor, either DC or AC, CEC §690.47(C)(1).
- 25. Grounding electrode conductor from inverter to grounding electrode shall be a minimum of bare copper armor sheathed cable and sized per the largest conductor supplied by the system, CEC §250.64(B), 250.166(B).
- 26. For circuits over 250 volts to ground, the electrical continuity of metal raceways shall be ensured by connections utilizing threaded couplings or listed devices such as bonding type locknuts or bushing with bonding jumpers, CEC §250.97, 250.92(B) except for (B)(1).
- 27. Raceway for grounding electrode conductor shall be bonded at each end, CEC §250.64(E).
- 28. Identify and indicate all photovoltaic system equipment required signage, CEC §690.5(C), §690.14(C)(2), §690.15, §690.17, §690.35(F), §690.53, §690.54, §690.56(B), §690.64(B)(4).
- 29. Provide stamped and signed engineering plans, calculations and details demonstrating method of attachment of panels and adequacy of supporting members, including wind uplift effects, CBC §1603, 1604.
- 30. Plans are incomplete, additional comments/corrections may follow.

ADDITIONAL REQUIREMENTS:
