ORDINANCE NO. 872-15

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BLYTHE ADDING CHAPTER 15.62 OF TITLE 15 OF THE BLYTHE MUNICIPAL CODE RELATING TO PERMITTING PROCEDURES FOR SMALL RESIDENTIAL SOLAR ENERGY SYSTEMS

WHEREAS, as set forth in Government Code Section 65850.5(a) it is the policy of the State of California that local agencies encourage the installation of solar energy systems by removing obstacles to, and minimizing the costs of, permitting such energy systems; and

WHEREAS, as set forth in Government Code Section 65850.5(g), cities must adopt an ordinance on or before September 30, 2015 that creates an expedited and streamlined permitting process for small residential rooftop solar energy systems; and

WHEREAS, the ordinance must substantially conform with the recommendations set forth in the California Solar Permitting Guidebook, including the use of a checklist of all requirements that, if complied with, requires cities to approve the application and issue the applied for permits; and

WHEREAS, the City Council of the City of Blythe finds that it is in the interest of the health, welfare and safety of the people of Blythe to provide an expedited permitting process to encourage the effective development of solar technology; and

WHEREAS, the City Council of the City of Blythe finds that the following ordinance will have the effect of encouraging the installation of small residential solar energy systems and minimizing barriers, obstacles, and costs of obtaining permits for their installation.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BLYTHE DOES HEREBY ORDAIN AS FOLLOWS:

Section 1. Chapter 15.62 of Title 15 of the Blythe Municipal Code is hereby added as follows.

Chapter 15.62 – SMALL RESIDENTIAL SOLAR ENERGY SYSTEM PERMITS

Sec. 15.62.010. Purpose.

The purpose of this chapter is to adopt an expedited, streamlined solar permitting process that complies with the Solar Rights Act and AB 2188 (Chapter 521, Statutes 2014) to achieve timely and cost-effective installations of small residential rooftop solar energy systems. This chapter is designed to encourage the use of solar systems by removing unreasonable barriers, minimizing costs to property owners and the City of Blythe and expanding the ability of property owners to install solar energy systems. This chapter allows the City of Blythe to achieve these goals while protecting the public health and safety.

Sec. 15.62.020. Definitions.

A. "Association" means a nonprofit corporation or unincorporated association created for the purpose of managing a common interest development.

B. "Building department" means the Building Department for the City of Blythe.

C. "Building official" means the Building Official for the City of Blythe.

D. "City" means the City of Blythe.

E. "Common interest development" means any of the following:
   1. A community apartment project
   2. A condominium project
   3. A planned development
   4. A stock cooperative

F. "Electronic submittal" means the utilization of one or more of the following:
   1. Email
   2. The Internet
   3. Facsimile

G. "Expedited permitting," and "expedited review," means the process outlined in Section 15.62.070.

H. A "feasible method to satisfactorily mitigate or avoid the specific, adverse impact" includes, but is not limited to, any cost-effective method, condition or mitigation imposed by the City on another similarly situated application in a prior successful application for a similar permit.

I. "Planning commission" means the Planning Commission for the City of Blythe.

J. "Reasonable restrictions" on a solar system are those restrictions that do not significantly increase the cost of the system or significantly decrease its efficiency or specific performance, or that allow for an alternative system of comparable cost, efficiency, and energy conservation benefits.

K. "Restrictions that do not significantly increase the cost of the system or decrease its efficiency or specified performance" means:
   1. For water heater systems or solar swimming pool heating systems: an amount exceeding 10% of the cost of the system, but in no case more than $1,000.00, or decreasing the efficiency of the solar energy system by an amount exceeding 10%, as originally specified and proposed.
   2. For photovoltaic systems: an amount not to exceed $1,000.00 over the system cost as originally specified and proposed, or a decrease in system efficiency of an amount exceeding 10% as originally specified and proposed.

L. "Small residential rooftop solar energy system" means all of the following:
   1. A solar energy system that is not larger than 10 kilowatts alternating current nameplate rating or 30 kilowatts thermal.
   2. A solar energy system that conforms to all applicable state fire, structural, electrical, and other building codes as adopted or amended by the City of Blythe and all State of California health and safety standards.
   3. A solar energy system that is installed on a single or duplex family dwelling.
   4. A solar panel or module array that does not exceed the maximum legal building height as defined by the City of Blythe.

M. "Solar energy system" means either of the following:
   1. Any solar collector or other solar energy device whose primary purpose is to provide for the collection, storage, and distribution of solar energy for space heating, space cooling, electric generation, or water heating.
   2. Any structural design feature of a building whose primary purpose is to provide for the collection, storage, and distribution of solar energy for electricity generation, space heating, space cooling or water heating.

N. "Specific adverse impact" means a significant, quantifiable, direct and unavoidable impact, based on objective, identified and written public health or safety standards, policies or conditions as they existed on the date the application was deemed complete.

Sec. 15.62.030. Applicability.

This chapter applies to the permitting of all small residential rooftop solar energy systems in the City of Blythe. Small residential rooftop solar energy systems legally established or permitted prior to the effective date of this chapter are not subject to the requirements of this chapter unless physical modifications or alterations are undertaken that materially change the size, type, or components of a small rooftop energy system in such a way as to require new permitting. Routine operation and maintenance or like-kind replacements shall not require a permit.

Sec. 16.62.040. Solar Energy System Requirements.

A. All solar energy systems shall meet applicable health and safety standards and requirements imposed by the City and the State of California.
B. Solar energy systems for heating water in single-family residences and for heating water in commercial or swimming pool applications shall be certified by an accredited listing agency as defined by the California Plumbing and Mechanical Codes.
C. Solar energy systems for producing electricity shall meet all applicable safety and performance standards established by the California Electrical Code, the Institute of Electrical and Electronics Engineers, and accredited testing laboratories such as Underwriters Laboratories and, where applicable, rules of the Public Utilities Commission regarding safety and reliability.

Sec. 15.62.060. Duties of Building Department and Building Official.

A. All documents required for the submission of an expedited small residential rooftop solar energy system application shall be made available on the City of Blythe's publicly accessible website.

B. Electronic submittal of the required permit application and documents via email or facsimile shall be made available to all small residential rooftop solar energy system permit applicants.

C. An applicant's electronic signature shall be accepted on all forms, applications, and other documents in lieu of a wet signature.

D. The Building Department shall adopt a standard plan and checklist of all requirements with which small residential rooftop solar energy systems shall comply with to be eligible for expedited review.

E. The small residential rooftop solar system permit process, standard plans, and checklist shall substantially conform to the recommendations for expedited permitting, including the checklist and standard contained in the most current version of the California Solar Permitting Guidebook adopted by the Governor's Office of Planning and Research.

F. All fees prescribed for the permitting of small residential rooftop solar energy systems must comply with Government Code Sections 65850.55 and 66015 and Health & Safety Code Section 17951.

Sec. 15.62.070. Expedited permit review and inspection requirements.

A. The City of Blythe Building Department shall adopt an administrative, nondiscretionary review process to expedite the approval of small residential rooftop solar energy system applications within 30 days of adoption of this chapter. For an application for a small residential rooftop solar energy system that meets the requirements of the approved checklist and standard plan, the Building Department shall issue a building permit or other non-discretionary permit the same day for over-the-counter applications or within 3 business days for electronically filed applications. A building official may require an applicant to apply for a use permit if the official finds, based on substantial evidence, that the solar energy system could have a specific, adverse impact upon the public health and safety. Such decisions may be appealed pursuant to the procedures outlined in Sections 2.64.170, 2.64.180 and 2.64.190 of this code.

B. Review of the application shall be limited to the Building Department's official review of whether the applicant meets local, state and federal health and safety requirements.

C. If a use permit is required, a building official may deny an application for the use permit if the official makes written findings based upon substantive evidence in the record that the proposed installation would have a specific, adverse impact upon public health or safety and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. Such findings shall include the basis for the rejection of the potential feasible alternative for preventing the adverse impact. Such decisions may be appealed pursuant to procedures outlined in Sections 2.64.170,

2.64.180 and 2.64.190 of this code.

D. Any condition imposed on an application shall be designed to mitigate the specific, adverse impact upon health and safety at the lowest possible cost. The City shall use its best efforts to ensure that the selected method, condition, or mitigation meets the conditions of Civil Code Section 714(d)(1)(A)-(B).

E. The City shall not condition the approval of an application on the approval of an association as defined in Civil Code Section 4080.

F. If an application for a small residential rooftop solar energy system is deemed incomplete, a written correction notice detailing all deficiencies in the application and any additional information or documentation required to be eligible for expedited permitting shall be sent to the applicant for resubmission.

G. Only one inspection shall be required and performed by the Building Department for small residential rooftop solar energy systems eligible for expedited review.

H. The Inspection shall be done in a timely manner and should include consolidated inspections. An inspection will be scheduled within two business days of a request and will provide the applicant with a two-hour inspection window.

I. If a small residential rooftop solar energy system fails inspection, a subsequent inspection is authorized but need not conform to the requirements of this chapter.

Section 2. Any provision of the Blythe Municipal Code or appendices thereto inconsistent with the provisions of this Ordinance, to the extent of such inconsistencies and no further, is hereby repealed or modified to that extent necessary to effect the provisions of this Ordinance.

Section 3. If any section, subsection, sentence, clause, phrase or portion of this ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Ordinance. The City Council of the City of Blythe hereby declares that it would have adopted this Ordinance and each section, subsection, sentence, clause, phrase, or portion thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, phrases or portions be declared invalid or unconstitutional.

Section 4. The Mayor shall sign and the City Clerk shall certify to the passage and adoption of this Ordinance and shall cause the same to be published and posted pursuant to the provisions of law in that regard and this Ordinance shall take effect 30 days after its final passage.

PASSED, APPROVED AND ADOPTED this 25th day of August, 2015.

Joseph DeConinck, Mayor

ATTEST:

Mallory Sutterfield, City Clerk

STATE OF CALIFORNIA)
COUNTY OF RIVERSIDE) ss
CITY OF BLYTHE)

I, MALLORY SUTTERFIELD, City Clerk and ex-officio clerk of the City Council of the City of Blythe, hereby certify that the above and foregoing Ordinance No. 872-15 was introduced and considered at a regular meeting of said City Council held on the July 14, 2015 and thereafter passed and adopted as a whole at a regular meeting of said City Council held on August 25, 2015 by the following roll call vote:

AYES: DeConinck, Wade and Cusick

NOES: None

ABSENT: Galvan

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Seal of the City of Blythe this 25th day of August, 2015.

Mallory Sutterfield, City Clerk

City of Blythe Development Services Dept.
235 North Broadway – Blythe, CA 92225
(760) 922-6130

Submittal Requirements
For Small Residential Solar Energy Systems

This information bulletin is published to guide applicants through a streamlined permitting process for solar photovoltaic (PV) projects under 10KW in size. This checklist provides information about submittal requirements for plan review, required fees, and inspections.

1. **Approval Requirements:**
   The following permits are required to install a PV System under 10KW:
   a. Building review and permit is required.
   b. Planning review is not required for roof mount, but is required for grount mount.
   c. Fire Marshal approval is required for a solar PV installation of this size.

2. **Submittal Requirements:**

a. Completed permit application form. This permit application form can be downloaded at: www.cityofblythe.ca.gov.

b. A completed Standard Electrical Plan. The standard plan may be used for proposed solar installations under 10kW in size and can be downloaded at: www.cityofblythe.ca.gov.

c. If prefer not to implement the Standard Electrical Plan, an electrical plan shall be submitted that includes the following:
   - Locations of main service or utility disconnect.
   - Total number of modules, number of modules per string and the total number of strings.
   - Make and model of inverter(s) and/or combiner box, if used.
   - One-line diagram of system.
   - Specify grounding/bonding, conductor type and size, conduit type and size, and number of conductors in each section of conduit.
   - If batteries are to be installed, include them in the diagram and show their location and venting.
   - Equipment cut sheets including inverters, modules, AC and DC disconnects, combiners and wind generators.
   - Labeling of equipment, as required by 2013 CEC, Sections 690 and 705.
   - Site diagram showing the arrangement of panels on the roof or ground, north arrow, lot dimensions, EXISTING SHADING ELEMENTS, the distance from property lines to adjacent buildings/structures (existing and proposed).

d. Structural requirements:
   - Roof mount – provide stamped, signed structural engineering for the roof.
   - Where an approved racking system is used, provide documentation showing manufacturer of the rack system, maximum allowable weight the system can support, attachment method to the roof or ground, product evaluation information and structural design with stamp and signature for the rack system.

3. **Plan Review:**

Permit applications can be submitted to the City of Blythe Building Department in person at 235 North Broadway, or via email at: mvandyke@cityofblythe.ca.gov

Permit applications utilizing standard plans that are submitted in person can be approved by end of business day at 235 North Broadway. Those received via other submittal will be approved within three business days.

4. **Fees:**

Fees will be calculated as they've always been, based upon Table 3-B – Electrical Permit Fees, contained in the 1997 Uniform Administrative Code. The Uniform Administrative Code was first adopted by the City of Blythe in 1990, with the 1997 edition adopted in 1999.

5. **Inspections:**

Once all permits to construct the solar installations have been issued and the system has been installed, it must be inspected before final approval is granted for the solar system. On-site inspections can be scheduled by contacting the City of Blythe Building Department by telephone at (760) 922-6130. Permit holders must be prepared to show conformance with all technical requirements in the field at the time of inspection. The inspector will verify that the installation is in conformance with applicable code requirements and with the approved plans.

Below are common points of inspection with which the applicant should be prepared to show compliance.

- Number of PV modules and model number matches plans, and specification sheets number matches plans and specifications sheets.
- Array conductors and components are installed in a neat and workman-like-manner.
- PV array is properly grounded.
- Electrical boxes are accessible and connections are suitable for environment.
- Array is fastened and sealed according to attachment detail.
- Conductors ratings and sizes match plans.
- Appropriate signs are properly constructed, installed, and displayed, including:
  - -Sign identifying PV power source system attributes at DC disconnect.
  - -Sign identifying AC point of connection.
  - -Sign identifying switch for alternative power system.
  - -Sign on main panel of disconnect map & location of all solar arrays.
- Equipment ratings are consistent with application and installed signs on the installation, including:
  - -Inverter has a rating as high as max voltage on PV power source sign.
  - -DC-side overcurrent circuit protection devices (OCPD) are DC rated at least as high as max voltage on sign.
  - -Switches and OCPDs are installed according to the manufacturer's specifications (i.e. many 600VDC switches require passing through the switch poles twice in a specific way).
  - -inverter is rated for the site AC voltage supplied and shown on the AC

point of connection sign.
-OCPD connected to the ac output of the inverter is rated at least 125% of the maximum current on sign, and is no larger than the maximum OCPD on the inverter listing label.
-Sum of the main OCPD and the inverter OCPD is rated for not more that 120% of the bus bar rating.

6. **Departmental Contact Information:**

For any questions regarding this permit process, please contact City of Blythe Building Department at (760) 922-6130.

SOLAR PV STANDARD ELECTRICAL PLAN
Microinverter Systems for Single Family Dwellings

*** Provide this document to the inspector along with ALL system installation instructions ***

Project Address: _____

Permit Number: _____

Scope: Standard plan for the installation of microinverter solar PV systems, not exceeding a total AC output of 10kW, in single family dwellings having a 3 wire electrical service not larger than 225 amps at a voltage of 120/240. This plan covers crystalline and multicrystalline type modules where all the modules and microinverters are mounted on the roof of the single family dwelling. For installations exceeding this scope, Electrical Plan review is required.

Note: This plan is not intended for systems containing batteries. This document addresses only the requirements of the 2013 California Electrical Code (CEC), refer to other toolkit documents for California Residential Code (CRC) requirements.

NOTE: Calculate the total AC output of the system.

# of microinverters ____ x Inverter AC Output Current ____amps x 240 volts = _____ watts divided by 1,000 = ____ kW.

Installer Information:

Name:	Phone Number: ( ) -
Address: _____	Homeowner: ☐
City: _____	Contractor: ☐
State: _____ Zip _____	Contractor License # _____
	License type _____

A) **Module information:**

1) Manufacturer _____

2) Model number _____

3) Total number of modules being installed _____

4) Maximum DC output voltage (Voc) _____ Volts

5) Maximum DC current output (Isc) _____ Amps

Important: Not all modules are suitable for use with microinverter systems. Review the microinverter installation manual prior to beginning any installation to avoid costly errors.

B) Microinverter Information:

Each microinverter shall be listed by a recognized listing agency, have factory installed Ground Fault protection and be identified as "Utility-Interactive".

Provide the following information from the microinverter installation manual. If any information is not provided by the manufacturer write "not given" in the appropriate box

6) Manufacturer _____

7) Model number _____

8) Minimum mounting height above the roof surface _____ inches

9) Maximum DC input voltage _____ Volts

10) Maximum DC input current _____ Amps

11) Maximum AC output current _____ Amps

12) Maximum size branch circuit breaker permitted _____ Amps

13) Maximum number of inverters permitted per branch circuit _____

Note: The number of microinverters installed per branch circuit may be less than the maximum number permitted by the manufacturer, but it shall not be more.

C) Manufacturer "Trunk" cable (if supplied):

Some microinverter manufacturers include as part of their installation kit a "Trunk" cable that each microinverter of the branch circuit plugs into. These cables must be listed by a recognized listing agency, have a wet insulation temperature rating of at least 90 degrees celsius, be provided with an equipment grounding conductor inside of the overall cable sheath and contain no more than three current carrying conductors. Cables that will be exposed to sunlight must be listed as such. This cable will typically be run underneath the array where it will not be subject to physical damage. This cable, if provided, must be used. Non-manufacturer supplied cables or installer fabricated assemblies are not approved. Where the cable is exposed to physical damage, the cable shall be protected.

14) Provide the conductor size of the manufacturer supplied "Trunk" cable _____ AWG (From cable jacket)

15) Provide the **MINIMUM INSTALLATION** spacing above the roof surface to the bottom of the "Trunk" cable per the installation instructions _____ inches (If no dimension specified, write "None given").

16) Provide the **MINIMUM INSTALLATION** spacing below the array modules to the top of the "Trunk" cable per the installation instructions _____ inches (If no dimension specified write "None given").

Project Address: _____

Permit Number: _____

D) Temperature compensation for roof mounted cables under the array:

17) Temperatures under the array may be higher than the surrounding ambient air. Where cables are installed close to the roof surface or to the modules, local jurisdictions may require the ambient air temperature to be higher based on local conditions. Some local enforcing agencies use ASHRAE to determine the local ambient temperature. Below are the temperatures for the local jurisdiction.

(i) The Ambient Air Temperature for this jurisdiction is: _____ °C

Note: Some local jurisdictions may require this temperature to be increased when sizing conductors beneath the module or array

E) Sizing the conductors for the microinverter branch circuit:

The amount of current that will be carried by the conductors shall be calculated as follows:

18) Maximum # of inverters installed per branch circuit _____ x Maximum inverter AC output (Step #11) _____ A x 1.25 (for long continuous load) = _____ Amps.

Where the manufacturer supplied cable transitions to regular building wire installed inside of a raceway, a reduction in the amount of current these conductors can carry may be required based on the exposed ambient air temperature and number of conductors in the raceway.

Note how many conductors will be in the raceway and how high above the roof surface the raceway will be mounted. Using Table A on page 4, select the appropriate "Ambient Temperature" section for your project location from (Step #17(i)) and choose a conductor size that will meet or exceed the result from Step #18. Your selected conductor size is permitted to have a higher ampacity than the number in step #18, **but it shall not be less**.

Selected conductor size for branch circuit wiring in raceway _____ **AWG.**

Project Address: _____

Permit Number: _____

Table A

Table A is based on the following:

A. Table 310.16 - Allowable Ampacity of Insulated Conductors, 90 C rated conductors.
B. Table 310.16 - Correction Factors based on temperature ranges.
C. Table 310.15(B)(2)(c) - Ambient Temperature Adjustments for Conduits Exposed to Sunlight On or Above Rooftops.
D. Table 310.15(B)(2)(a) Adjustment Factors for More Than Three Current-Carrying Conductors in a Raceway or Cable.
E. Sections 240.4(D)(5) and 240.4(D)(7) for 10 AWG and 12 AWG conductors.

Table A: Maximum Allowable Ampacity of Conductors Installed in a Circular Raceway, Exposed to Sunlight, On or Above Rooftops

Number of Current Carrying Conductors in a Raceway	Height Above Rooftop	Highest Ambient Temp									
		12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG
Up to 3 Conductors	0 to 0.5"	17	23	32	44	55	17	23	32	44	55
	above 0.5" to 3.5"	20	30	42	57	72	20	28	39	53	67
	above 3.5" to 12"	20	30	45	62	78	20	30	42	57	72
	above 12"	20	30	48	65	83	20	30	45	62	78
4 to 6 Conductors	0 to 0.5"	14	19	26	35	44	14	19	25	35	44
	above 0.5" to 3.5"	18	24	33	46	58	17	23	31	43	54
	above 3.5" to 12"	20	26	36	49	62	19	24	33	46	58
	above 12"	20	26	38	52	66	20	26	36	49	62
7 to 9 Conductors	0 to 0.5"	12	16	22	30	39	12	16	22	30	39
	above 0.5" to 3.5"	16	21	29	40	51	15	20	27	37	47
	above 3.5" to 12"	17	23	32	43	55	16	21	29	40	51
	above 12"	18	24	33	46	58	17	23	32	43	55
10 to 20 Conductors	0 to 0.5"	9	12	16	22	28	9	12	16	22	28
	above 0.5" to 3.5"	11	15	21	29	36	11	14	20	27	34
	above 3.5" to 12"	12	16	23	31	39	11	15	21	29	36
	above 12"	13	17	24	33	41	12	16	23	31	39
Up to 3 Conductors	0 to 0.5"	12	16	23	31	39	12	16	23	31	39
	above 0.5" to 3.5"	17	23	32	44	55	17	23	32	44	55
	above 3.5" to 12"	20	28	39	53	67	17	23	32	44	55
	above 12"	20	30	42	57	72	20	28	39	53	67
4 to 6 Conductors	0 to 0.5"	10	13	18	25	31	10	13	18	25	31
	above 0.5" to 3.5"	14	19	26	35	44	14	19	26	35	44
	above 3.5" to 12"	17	23	31	43	54	14	19	26	35	44
	above 12"	18	24	33	46	58	17	23	31	43	54
7 to 9 Conductors	0 to 0.5"	9	11	16	22	27	9	11	16	22	27
	above 0.5" to 3.5"	12	16	22	30	39	12	16	22	30	39
	above 3.5" to 12"	15	20	27	37	47	12	16	22	30	39
	above 12"	16	21	29	40	51	15	20	27	37	47
10 to 20 Conductors	0 to 0.5"	8	8	11	15	19	8	8	11	15	19
	above 0.5" to 3.5"	9	12	16	22	28	8	12	16	22	28
	above 3.5" to 12"	11	14	20	27	34	9	12	15	22	28
	above 12"	11	15	21	29	36	11	14	20	27	34
Up to 3 Conductors	0 to 0.5"	0	0	0	0	0	0	0	0	0	0
	above 0.5" to 3.5"	12	16	23	31	39	12	16	23	31	39
	above 3.5" to 12"	17	23	32	44	55	12	16	23	31	39
	above 12"	17	23	32	44	55	17	23	32	44	55
4 to 6 Conductors	0 to 0.5"	0	0	0	0	0	0	0	0	0	0
	above 0.5" to 3.5"	10	13	18	25	31	10	13	18	25	31
	above 3.5" to 12"	14	19	26	35	44	10	13	18	25	31
	above 12"	14	19	26	35	44	14	19	26	35	44
7 to 9 Conductors	0 to 0.5"	0	0	0	0	0	0	0	0	0	0
	above 0.5" to 3.5"	9	11	16	22	27	9	11	16	22	27
	above 3.5" to 12"	12	16	22	30	39	9	11	16	22	27
	above 12"	12	16	22	30	39	12	16	22	30	39
10 to 20 Conductors	0 to 0.5"	0	0	0	0	0	0	0	0	0	0
	above 0.5" to 3.5"	8	8	11	15	19	8	8	11	15	19
	above 3.5" to 12"	9	12	16	22	28	8	9	11	15	19
	above 12"	9	12	16	22	28	9	12	16	22	28

Project Address: _____

Permit Number: _____

F) Solar Load Center and circuit breakers, sizing information:

Many utility providers require a performance meter and a safety disconnect switch to be installed between the PV power source and their equipment. This means that the microinverter branch circuits may not connect directly into the electrical panel of the house. They may go first to a solar load center. This is just a standard circuit breaker panel that collects together the individual branch circuits from the microinverters. Each branch circuit **shall** have its own dedicated circuit breaker. From this panel one feeder will go to the performance meter (if required), then to the safety disconnect switch (if required), and finally to the point of interconnection at the house electrical panel. Only PV system monitoring equipment/devices are permitted to be connected between the output of the inverter and the house electrical panel. Contact your local utilities for performance meter and AC utility disconnect switch requirements.

19) Total number of microinverter branch circuits installed in the solar load center _____

20) List the current in Amps (from step 18) for each individual branch circuit in the solar load center.

Circuit #1 output _____ Amps, Circuit #2 output _____ Amps, Circuit #3 _____ Amps, Circuit #4 _____ Amps.

21) Total PV current in Amps connected to the panel (sum of the individual branch circuits from step 20) = _____ Amps

22) Panel bus bar rating (from panel label) _____ Amps. This figure must be larger than the number at step #21 or the panel will be undersized.

23) Size of Main breaker if installed (If no main write NONE) _____ Amps

24) To size the feeder conductors leaving the solar load center use the result from step #21 and go to table 310.16, using the 75°C column, to select the correct size conductor for your installation.

G) Utility "Performance" meter (if required):

Where an additional meter is required by the local Utility to record the power produced by the PV system the output wiring from the microinverters shall always connect to the **"LINE"** side terminals at the top of the meter. The wiring from the meter to the electrical panel will connect to the **"LOAD"** side terminals at the bottom. Not all utility providers have the same requirements for connecting solar power systems to their electrical systems. Contact the local utility for specific requirements in the local jurisdiction.

H) Utility "Safety Disconnect Switch" (if required):

Where disconnect switches (with or without fuses) are installed in the circuit(s) from the microinverters to the house electrical panel, the wiring originating at the microinverters shall always connect to the **"LOAD" side (bottom)** terminals of **ANY** disconnect switch that has been installed. The wiring originating at the electric service panel shall always connect to the **"LINE" side (top)** terminals. Check with the local utility for specific requirements.

I) Connection to the house electrical panel:

The connection to the service panel **shall** be through a dedicated circuit breaker that connects to the panel bus bars in an approved manner. "Load Side Taps" where the inverter AC wiring does not terminate using a dedicated breaker or set of fuses are prohibited under **ANY** condition by **Section 690.64 (B)**.

Project Address: _____

Permit Number: _____

Where the main breaker of the electrical panel that the PV system will interconnect to is located at either the top or bottom of the panel distribution bus bars and the PV interconnect breaker is located at the opposite end, the code permits the sum of the ratings of the main breaker and the PV breaker to exceed the rating of the panel bus bars. Per **Section 690.64 (B)(2)**, the sum of the electrical panel main breaker and the microinverter PV interconnect breaker shall not add up to more than 120% of the rating of the panel bus bars. For a 100 amp rated bus this means that both breakers together shall not add up to more than **120 amps**. For a 200 amp rated bus, not more than **240 amps** and for 225 amps, not more than **270 amps.** In order to qualify for this additional allowance, the PV breaker must be located at the opposite end of the breaker panel from the main breaker and shall have the warning label installed next to it per **Section 690.64 (B)(7)**. "WARNING INVERTER OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE".

Note:
Certain "All-in-One" service panels have the factory installed main breaker in the center of the distribution section. Because of the possibility of overloading the bus bars, this type of service is not able to take advantage of the 120% overage permitted for top or bottom fed bussing. For this type of installation the sum of the main circuit breaker and the PV breaker may not exceed 100% of the rating of the factory bussing. For example, if the service panel label states that the bus bars are rated for 200 amps you cannot exceed that figure. In some cases it may be possible to reduce the size of the main circuit breaker to accommodate the addition of a PV breaker and still not exceed the bus bar rating. This requires that a "load calculation" of the house electrical power consumption be made in order to see if this is an acceptable solution. Where it is necessary to install the PV interconnection as a "Line Side Tap" and where the electrical service panel at the dwelling is an "All-in-One" type, the service shall be provided with factory installed terminals designed specifically to accommodate this type of connection. Where these terminals are not provided there shall be **NO** PV connection between the load side of the meter and the line side of the main circuit breaker.

J) **Grounding the photovoltaic system:**

A **Grounding Electrode Conductor** sized per the manufacturer's installation instructions, (minimum #8 AWG solid copper), shall be run **UNSPLICED** from the factory identified grounding terminal of each microinverter to the grounding electrode system of the house, (i.e. ground rod, Ufer ground, or metallic water pipe with a minimum of 10 feet in the ground).

Note: The Grounding Electrode Conductor is permitted to be spliced per **Section 250.64 (C)** using an irreversible means or by the installation of a "Ground Plate". (A Ground Plate is defined as a copper bus bar ¼" thick by 2" wide by whatever length is needed to terminate the conductors). This conductor may also be used as the required equipment grounding conductor for the modules and the frame rails of the array. (Equipment grounding conductors may be connected to the Grounding Electrode Conductor by non-irreversible means such as listed split bolts).

K) **Disconnection of photovoltaic equipment:**

Section 690.15 requires that means are provided to disconnect equipment from all ungrounded conductors of all sources. Such disconnecting means shall comply with Sections 690.16 and 690.17.

Note: Section 690.17 contains an exception which states "A connector shall be permitted to be used as an ac or a dc disconnecting means, provided that it complies with the requirements of 690.33 and is listed and identified for the use."

L) **Signage:**

Per Section 690.54, a permanent label for the microinverter AC power source shall be installed at the point of interconnection at an accessible location. This label shall show that it is a PV source and additionally, the rated AC output current and the nominal operating AC voltage.

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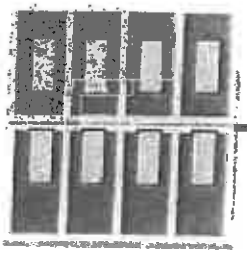
SOLAR PV STANDARD PLAN
Microinverter Systems for Single Family Dwellings



Array (Modules and Microinverters)

J/B

Collector Panel / Solar Load Center

PV SYSTEM AC DISCONNECT
RATED AC OUTPUT CURRENT-AMPS
AC NORMAL OPERATING VOLTAGE- ### VOLTS
690.54

M

UTILITY PERFORMANCE METER (IF REQUIRED)

PHOTOVOLTAIC SYSTEM UTILITY SAFETY DISCONNECT SWITCH (IF REQUIRED)

A C

M

WARNING
DUAL POWER SOURCES
SECOND SOURCE IS PHOTO-VOLTAIC SYSTEM
RATED AC OUTPUT CURRENT- ## AMPS
AC NORMAL OPERATING VOLTAGE-### VOLTS
690.54

INTALL PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS, AND PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT INSTALLED AT THE SAME LOCATION. PLAQUE SHALL BE MOUNTED ON THE EXTERIOR OF THE BUILDING

Minimum 20 point type on a sharply contrasting background

690.56-(B), 705.10

WARNING
PV OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE
(UNLESS BUSBAR IS FULLY RATED)
690.64(B)(7), 705.12(D)(7)

Note: Italicized text shown inside the boxes is not required to be part of the sign, it is only for reference

*** PROVIDE DISCONNECT MAP ON MAIN PANEL TO INCLUDE LOCATION OF ALL SOLAR ARRAYS.

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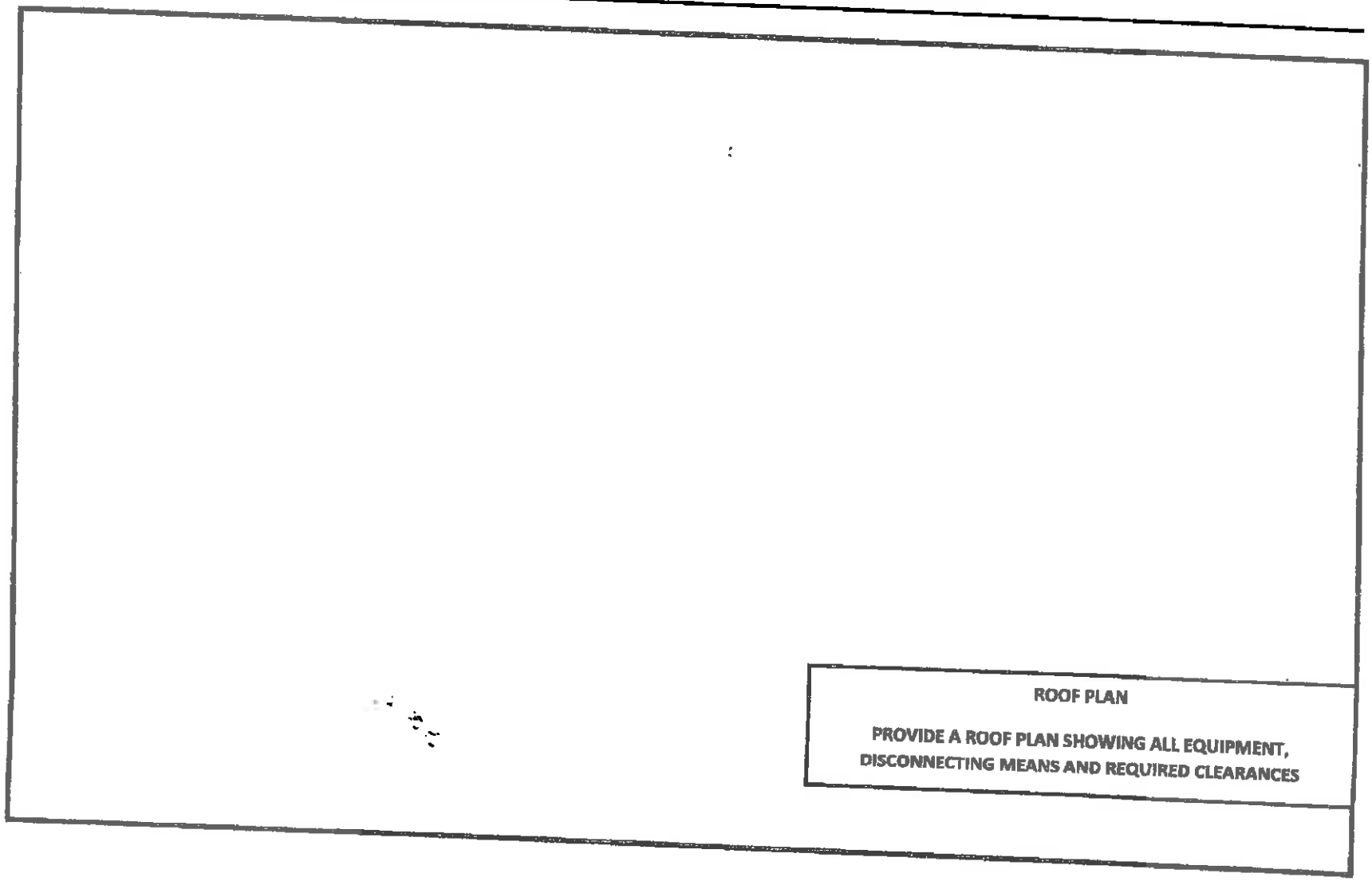
SOLAR PV STANDARD PLAN

Microinverter Systems for Single Family Dwellings



Project Address: _____

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blythe

SOLAR PV STANDARD ELECTRICAL PLAN
Central Inverter Systems for Single Family Dwellings

***** Provide this document to the inspector along with ALL system installation instructions *****

Project Address: _____

Permit Number: _____

Scope: **Standard plan for installation of solar PV systems utilizing 2 wire multiple string central inverters, not exceeding a total AC output of 10kW, in single family dwellings having a 3 wire electrical service not larger than 225 amps at a voltage of 120/240. This plan covers Crystalline and Multi-Crystalline type modules where all the modules are mounted on the roof of the single family dwelling. For installations exceeding this scope, Electrical Plan review is required.**

NOTE: This plan is intended for use with standard DC to AC inverters containing an isolation transformer. This plan is NOT intended to be used with micro inverters or transformer-less inverters and is limited to installations where the DC system voltage does not exceed 600 volts. This plan is not intended for systems containing batteries or power optimizer. This document addresses only the requirements of the 2013 California Electrical Code (CEC), refer to other toolkit documents for California Residential code (CRC) requirements.

Installer information:

Name:	Phone Number: ( ) -
Address: _____	Homeowner: ☐
City: _____	Contractor: ☐
State: _____ Zip _____	Contractor License # _____
	License type _____

Required information for DC wiring:

1. Total number of solar modules being installed: ☐	2. Number of modules per string: ☐
3. How many strings total? ☐	4. Are any strings wired in parallel? ☐ Yes ☐ No If "Yes", how many are paralleled together? ☐ Two _____ ☐ Other (specify) _____
5. Are you installing a combiner box with fuses? ☐ Yes ☐ No (If Yes, include calculation in Step # 13)	
6. Module Voc (from module nameplate): ☐	7. Module Isc (from module nameplate): ☐
8. Module maximum fuse or circuit breaker size (from module nameplate): ☐	9. Temperature correction factor from Table 690.7 of the 2013 CEC. Varies by location. (Check with the local building department for this figure) _____

10. Calculate the maximum DC system voltage (Shall not exceed the inverter maximum DC input voltage and shall not exceed 600 volts):

    Maximum number of modules per string _____ x Voc _____ x temperature correction factor _____ = _____ volts

    Note: This formula is intended to provide a close approximation of the maximum DC system voltage possible at the job location under the lowest ambient temperature condition. This result will always be slightly higher than when using the module manufacturer supplied temperature coefficient. The intent is to alert the installer that the 600 volt limit is close to being exceeded and is not intended to provide as accurate a result as the calculation employing the manufacturer supplied coefficient. Where the installer chooses to use the manufacturer's supplied coefficient, approval by the local enforcing agency is required.

11. Calculate the maximum DC current per string to allow for peak sunlight conditions and continuous operation in excess of three hours:

    Module Isc _____ x 1.56 = _____ **Max amps carried by the conductor.**

12. **Choosing a conductor size for the DC source circuits & output circuit:**
    Where Type USE-2 or other listed PV conductors are run in free air from the module locations to a junction box or combiner box, the minimum size permitted shall be #12 AWG per the module manufacturers' installation instructions and the conductor material shall be copper.

    If any part of the wiring from the modules to the combiner box or inverter is to be installed in a raceway, reductions in the amount of current the conductors can carry may have to be made. Conductors to be installed in a raceway shall be Type THWN-2 or equivalent and the conductor material shall be copper.

    To select the correct conductor size for the PV source circuits from the modules to the combiner box or to the inverter, go to Table A on page 4. Select how many conductors you will have in the raceway and how high above the roof surface the raceway will be mounted. Using the appropriate "Ambient Temperature" section for the job location, select the number from the column in Table A that matches the result you entered in item #11. (The number in Table A may be the same or larger than the number in item #11, **but it shall not be less**). Move to the top of the column to see the minimum size conductor needed for this part of the installation. Enter the number here for the **Source Circuit conductor size**: # _____ **AWG.**

    Note: Per Section 338.12(B)(1), USE-2 shall not be used for interior wiring.

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SOLAR PV STANDARD PLAN
Central Inverter Systems for Single Family Dwellings

13. If a combiner box is to be installed to connect the string circuits together, then the size of the "Output circuit" conductors from the combiner to the inverter must be determined. To do this, multiply the number of strings that are to be combined (from item #3) with the "Max amps" (from item #11) _____ x _____ = _____ Amps. Using Table A, repeat the process used to select the conductor size for the source circuits and enter the number here for **Output Circuit conductor size:** # _____ **AWG.** (If no combiner box, enter N/A)

14. Where a combiner box is installed, or where more than two strings of modules are electrically connected together in "parallel", each individual string shall be protected by its own over current protection or feeders to be sized for sum of all short circuit current of all strings. The fuse or breaker shall be listed as being suitable for use in a DC circuit and shall meet or exceed the maximum voltage of the circuit. The rating of the fuse or circuit breaker shall not be larger than the maximum size specified on the lowest rated module in the string. All combiner boxes shall be listed by a recognized listting agency and labeled as such.
Max fuse / breaker size permitted (from step #8) _____ **A.** **Fuse / breaker size installed** _____ A.

Note: Where the module specifies "Max fuse size" a circuit breaker shall not be substituted. Where the module specifies "Max overcurrent protective device" (Max OCPD), then either a fuse or DC rated circuit breaker may be used.

NOTE: Per **Section 690.31 (E),** DC wiring can only be run inside of the house if it is installed in a listed **metallic raceway or enclosure**.

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Table A

Table A is based on the following:

A. Table 310.16 - Allowable Ampacity of Insulated Conductors, 90 C rated conductors.
B. Table 310.16 - Correction Factors based on temperature ranges.
C. Table 310.15(B)(2)(c) - Ambient Temperature Adjustments for Conduits Exposed to Sunlight On or Above Rooftops.
D. Table 310.15(B)(2)(a) Adjustment Factors for More Than Three Current-Carrying Conductors in a Raceway or Cable.
E. Sections 240.4(D)(5) and 240.4(D)(7) for 10 AWG and 12 AWG conductors

Table A: Maximum Allowable Ampacity of Conductors Installed in a Circular Raceway, Exposed to Sunlight, On or Above Rooftops

Number of Current Carrying Conductors in a Raceway	Height Above Rooftop	Highest Ambient Temp									
		12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG
Up to 3 Conductors	0 to 0.5"	17	23	32	44	55	17	23	32	44	55
	above 0.5" to 3.5"	20	30	42	57	72	20	28	39	53	67
	above 3.5" to 12"	20	30	45	62	78	20	30	42	57	72
	above 12"	20	30	48	66	84	20	30	45	62	78
4 to 6 Conductors	0 to 0.5"	14	19	26	35	44	14	19	26	35	44
	above 0.5" to 3.5"	16	24	33	46	58	17	23	31	43	54
	above 3.5" to 12"	20	26	36	49	62	16	24	33	46	58
	above 12"	20	28	38	52	66	20	26	36	49	62
7 to 9 Conductors	0 to 0.5"	12	16	22	30	39	12	16	22	30	39
	above 0.5" to 3.5"	16	21	29	40	51	15	20	27	37	47
	above 3.5" to 12"	17	23	32	43	55	16	21	29	40	51
	above 12"	18	24	33	46	59	17	23	32	43	55
10 to 20 Conductors	0 to 0.5"	9	12	16	22	28	8	12	16	22	28
	above 0.5" to 3.5"	11	15	21	29	36	11	14	20	27	34
	above 3.5" to 12"	12	16	23	31	39	11	15	21	29	36
	above 12"	13	17	24	33	41	12	16	23	31	39
		[illegible]					[illegible]				
Up to 3 Conductors	0 to 0.5"	12	16	23	31	39	12	16	23	31	39
	above 0.5" to 3.5"	17	23	32	44	55	17	23	32	44	55
	above 3.5" to 12"	20	28	39	53	67	17	23	32	44	55
	above 12"	20	30	42	57	72	20	28	39	53	67
4 to 6 Conductors	0 to 0.5"	10	13	18	25	31	10	13	18	25	31
	above 0.5" to 3.5"	14	18	26	35	44	14	18	26	35	44
	above 3.5" to 12"	17	23	31	43	54	14	19	26	35	44
	above 12"	18	24	33	46	58	17	23	31	43	54
7 to 9 Conductors	0 to 0.5"	9	11	16	22	27	9	11	16	22	27
	above 0.5" to 3.5"	12	15	22	30	39	12	16	22	30	39
	above 3.5" to 12"	15	20	27	37	47	12	16	22	30	39
	above 12"	16	21	29	40	51	15	20	27	37	47
10 to 20 Conductors	0 to 0.5"	6	8	11	15	19	6	8	11	15	19
	above 0.5" to 3.5"	9	12	16	22	28	8	12	16	22	28
	above 3.5" to 12"	11	14	20	27	34	9	12	16	22	28
	above 12"	11	15	21	29	36	11	14	20	27	34
		[illegible]					[illegible]				
Up to 3 Conductors	0 to 0.5"	0	0	0	0	0	0	0	0	0	0
	above 0.5" to 3.5"	12	16	23	31	39	0	16	23	31	39
	above 3.5" to 12"	17	23	32	44	55	12	16	23	31	39
	above 12"	17	23	32	44	55	17	23	32	44	55
4 to 6 Conductors	0 to 0.5"	0	0	0	0	0	0	0	0	0	0
	above 0.5" to 3.5"	10	13	18	25	31	10	13	18	25	31
	above 3.5" to 12"	14	18	26	35	44	10	13	18	25	31
	above 12"	14	19	26	35	44	14	19	26	35	44
7 to 9 Conductors	0 to 0.5"	0	0	0	0	0	0	0	0	0	0
	above 0.5" to 3.5"	9	11	16	22	27	9	11	16	22	27
	above 3.5" to 12"	12	16	22	30	39	9	11	16	22	27
	above 12"	12	16	22	30	39	12	16	22	30	39
10 to 20 Conductors	0 to 0.5"	0	0	0	0	0	0	0	0	0	0
	above 0.5" to 3.5"	6	8	11	15	19	6	8	11	15	19
	above 3.5" to 12"	9	12	16	22	28	8	8	11	15	19
	above 12"	9	12	16	22	28	8	12	16	22	28

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Grounding the DC side of the inverter:

A minimum #8 copper Grounding Electrode conductor must be run un-spliced from the factory identified system grounding terminal of the inverter to the grounding electrode system of the house. The grounding electrode system may consist of one or more of the following: Ground rod(s), Ufer ground, or metallic water pipe with a minimum of 10 feet in the ground. **(Section 690.47)**

AC wiring information:

15. The inverter shall be listed and labeled by a recognized testing agency and be identified as "Utility interactive" Ground fault protection (GFP) shall comply with **Section 690.5** 2013 CEC.

    Specify Inverter: Make _____ **Model #** _____ **Elec rating** _____ **kW**

16. **Per Section 690.9** 2013 CEC, each inverter shall be protected by an overcurrent device on the AC output side of the inverter. This can be a fuse or a circuit breaker. To correctly size the overcurrent device, locate the maximum AC output of the inverter (in amps) on the inverter nameplate, and multiply by 1.25 (This is required because the unit will be in continuous use for more than three hours).
    Maximum AC output current _____ **x 1.25 = _____ Amps.** (This number will also be used to size the inverter output circuit conductors.)
    Where the "Maximum AC output" is shown only in Watts, divide that number by 240 and then multiply by 1.25 to get the correct size breaker or fuse.
    If the maximum AC output is between standard breaker or fuse sizes, the next higher size can be used so long as the inverter output conductors are sized sufficiently large enough for the amount of current produced by the inverter.
    Important note: Where a fused disconnect switch is installed, the output conductors from the inverter will connect to the **"LOAD"** side **(bottom)** terminals of the switch and the wiring from the utility will connect to the **"LINE"** side (top) terminals. This meets the requirement of **Section 404.6(C)** and will reduce the risk of electrical shock hazards when changing a fuse with the system still energized by the utility electrical supply.

17 Many utility providers require a performance meter and a safety disconnect switch to be installed between the PV power source and their equipment. This means that the AC power output from the inverter(s) may not connect directly into the electrical panel of the house. For a single inverter, the output from the inverter disconnect switch will connect to the performance meter (if required). Where multiple central inverters are installed, they will usually go first to a solar load center. This is just a standard circuit breaker panel that collects together the output circuits from the individual inverters. Each inverter will have its own circuit breaker. The size of each circuit breaker will be determined from step #16. From this panel one feeder will go to the performance meter, then to the safety disconnect switch and lastly to the point of interconnection at the house electrical panel. No electrical loads shall be connected between the output of the inverter and the connection to the house electrical panel. Contact your local utilities for performance meter and AC utility disconnect switch requirements.

18. Where a performance meter is required by the local utility to record the power produced by the PV system, the output wiring from the inverter shall always connect to the **"LINE"** side terminals of the meter.

19. Where disconnect switches (with or without fuses) are installed in the circuit from the inverter output terminals to the house electrical panel, the wiring originating at the inverter(s) shall always connect to the **"LOAD"** side terminals of **ANY** disconnect that has been installed

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20. The connection to the breaker panel **shall** be through a dedicated circuit breaker that connects to the panel bus bars in an approved manner. "Load Side Taps" where the inverter AC wiring does not terminate using a dedicated breaker or set of fuses are prohibited under **ANY** condition by **Section 690.64 (B)**.

21. Per Section 690.64(B)(2), the sum of all overcurrent protective devices supplying power to the busbar or conductor shall not exceed 120% of their rating. In most PV installations, the breakers feeding the busbar are the main breaker and the backfed PV breaker. Per Section 690.64(B)(7), to utilize the 120% rule, the PV backfed breaker must be at the opposite end of the main breaker location. For a 100 amp rated bus, this means that the main breaker and the PV backfed breaker shall not add up to more than 120 amps. For a 200 amp rated bus, the combined ampacity of the two breakers (the main breaker and the PV breaker) shall not exceed 240 amps and so on. The location of the PV backfed breaker must be identified per 690.64(B)(7) with the following verbiage: "WARNING INVERTER OUTPUT CONNECTION. DO NOT RELOCATE THE OVERCURRENT DEVICE."

    Where it is not possible to locate the breakers at opposite ends of the panel bus, the sum of the two breakers is not permitted to exceed 100% of the bus rating.

    Note: In some cases it may be possible to reduce the size of the main circuit breaker to accommodate the addition of a PV breaker and still not exceed the bus bar rating. This requires that a "load calculation" of the house electrical power consumption be made in order to see if this is an acceptable solution.

22. **Per Section 690.53**, a permanent label for the DC power source shall be installed at the PV DC disconnecting means. This label shall show the following: (a) Rated maximum power-point current, (b) Rated maximum power-point voltage, (c) Maximum system voltage, (d) Short circuit current of the PV system.

    (a) **Rated maximum power-point current (mppA)** (this is the actual current in amps produced by the PV system). Multiply the **Imax** value from the module nameplate by the number of strings in the system.
    Imax _____ x **# of strings** _____ = _____ Amps.

    (b) **Rated maximum power-point voltage (mppV)** (this is the highest operating voltage of the PV system). Multiply the **Vmax** value from the module nameplate by the number of modules in the **largest** string.
    Vmax _____ x **# of modules** _____ = _____ Volts.

    (c) **Maximum system voltage** (see step #10) _____ Volts

    (d) **Short circuit current** of the PV system (module Isc from step #7 x 1.25). **Isc** _____ x **1.25** = _____ Amps.

Note: A phenolic plaque with contrasting colors between the text and background would meet the intent of the code for permanency. No type size is specified, but 20 point (3/8") should be considered the minimum.

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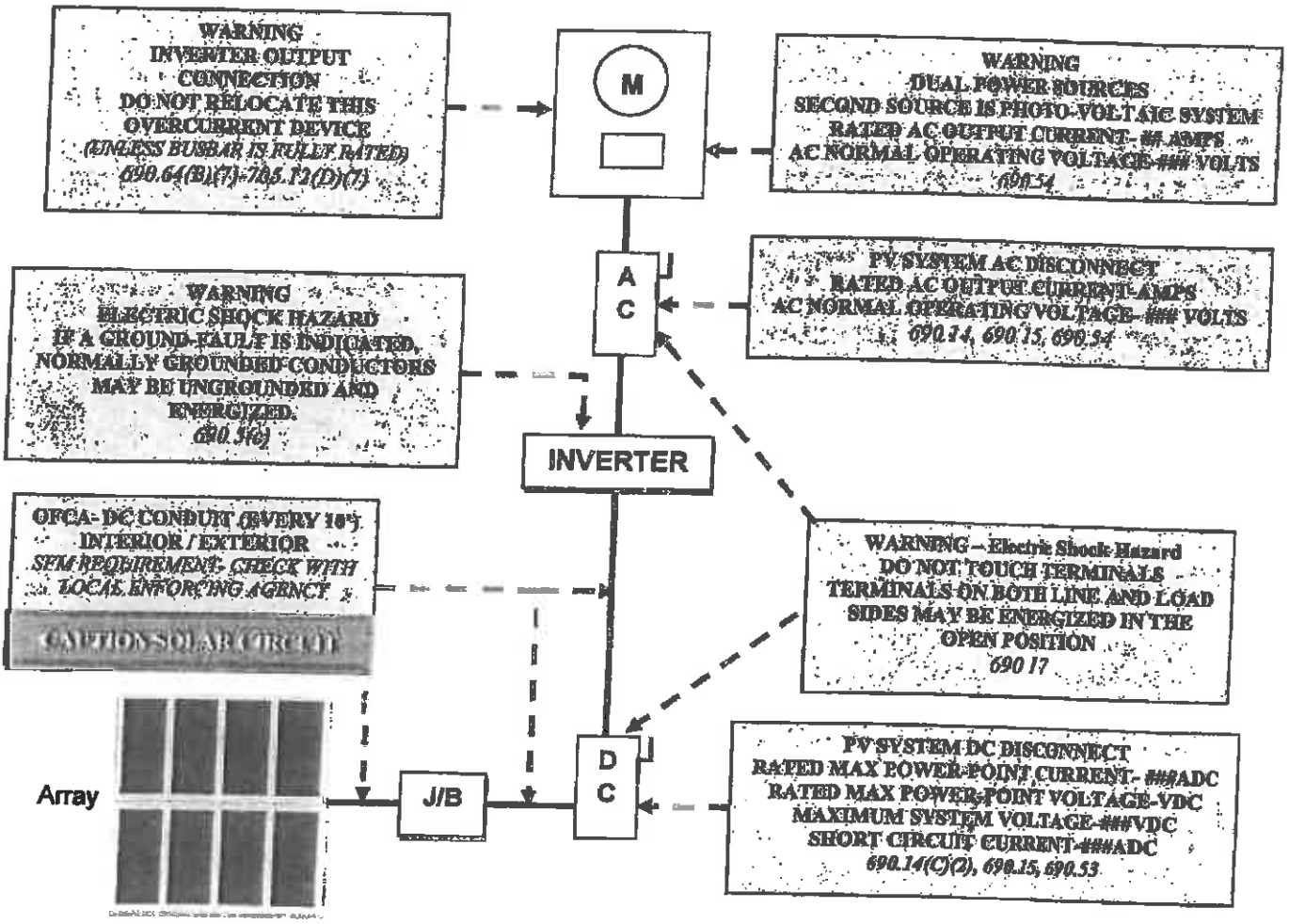
23. The following signage is required to be installed:

(a) Per Section 690.17 2013 CEC, where both the line and load side terminals of any disconnect may be live in the "OFF" position the following warning shall be placed on the front of the disconnect "WARNING LINE AND LOAD TERMINALS MAY BE ENERGIZED IN THE OPEN POSITION".



*** PROVIDE DISCONNECT MAP ON MAIN PANEL TO INCLUDE LOCATION OF ALL SOLAR ARRAYS.

Note: Italicized text shown inside the boxes is not required to be part of the sign, it is only for reference.

Project Address: _____

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SOLAR PV STANDARD PLAN

Central Inverter Systems for Single Family Dwellings

TAG	DESCRIPTION
1	SOLAR PV MODULE
2	DC PV SOURCE CIRCUIT
3	COMBINER BOX (If installed), refer to item 14 on page 3
4	DC PV OUTPUT CIRCUIT
5	DC EQUIPMENT GROUNDING CONDUCTOR per 690.43 NEC
6	INVERTER DC DISCONNECT
7	DC TO AC INVERTER WITH ISOLATION TRANSFORMER
8	GROUND FAULT DETECTION INTERRUPTER
9	AC DISCONNECT
10	SOLAR LOAD CENTER (If installed)
11	UTILITY PERFORMANCE METER (If installed)
12	UTILITY SAFETY SWITCH (If installed)
13	INVERTER DC GROUNDING ELECTRODE CONDUCTOR (MIN #6 AWG COPPER)
14	ELECTRICAL SERVICE PANEL

STANDARD PV PLAN FOR SINGLE FAMILY DWELLING
CENTRAL INVERTER

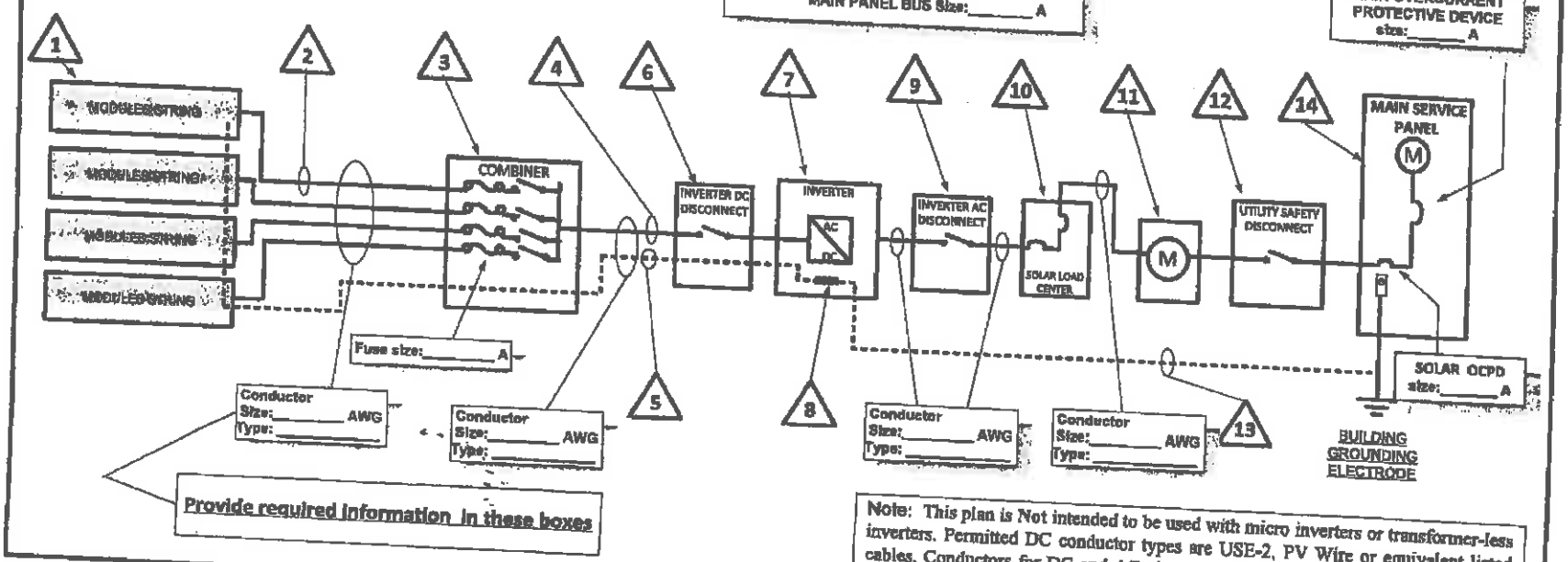
MAXIMUM 10 KW
MAXIMUM 225 AMP SERVICE

THIS PLAN MUST BE PROVIDED TO THE FIELD INSPECTOR

MAIN BREAKER / FUSE Size:_____A

SOLAR BREAKER/ FUSE Size:_____A

MAIN PANEL BUS Size:_____A



Provide required information in these boxes

Note: This plan is Not intended to be used with micro inverters or transformer-less inverters. Permitted DC conductor types are USE-2, PV Wire or equivalent listed cables. Conductors for DC and AC circuits, where installed in raceways outdoors, shall be "W" rated and have an insulation rating of 90 degrees Centigrade.

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SOLAR PV STANDARD PLAN

Central Inverter Systems for Single Family Dwellings

ROOF PLAN

PROVIDE A ROOF PLAN SHOWING LOCATION OF ALL EQUIPMENT, DISCONNECTING MEANS AND REQUIRED CLEARANCES.

Project Address: ____________________

Permit Number: ____________________