



## Solar PV Standard Plan – Simplified Microinverter and ACM Systems for One-and Two-Family Dwellings

**SCOPE:** Use this online application and plan ONLY for a new photovoltaic (PV) system using utility interactive Microinverters or AC Modules (ACM), with or without an energy storage system (ESS), not exceeding a combined output rating of 38.4 kW, with a maximum of eight branch circuits, one PV module per inverter and with the module ISC maximum of 10 amps dc, installed on the roof of a one-or-two family dwelling, detached garage, or accessory dwelling unit that has no other PV system or ESS on the site. This application is not for installations on sheds, patio covers, and structures not having or requiring a building permit. The PV system / ESS must connect on the load side of a single-phase AC service panel of normal 120/240Vac with a busbar rating of 800 amps or less. This plan is not intended for bipolar systems or trackers. Systems must be in compliance with current California Building Standard Codes and local amendments of the authority having jurisdiction (AHJ). For systems beyond this scope or the criteria in this plan, consult the AHJ for details regarding the standard plan review process.

**MANUFACTURER’S SPECIFICATION SHEETS MUST BE PROVIDED** for all items installed, including proposed inverters, microinverters, modules, combiner/junction boxes, ESS equipment, power control systems (PCS), charge controllers, racking systems, and associated mounting hardware, hazard control systems, and rapid shutdown systems or equipment. This is not an all-inclusive list of items that may be required for a code compliant system. Installation instructions for all equipment associated with the PV / ESS installation shall be provided, and the local AHJ, including Utility / Fire Department, may have additional requirements (one of the added requirements includes adding an external ac disconnect with 3’ of the main electrical service). Listed and labeled equipment shall be installed and used in accordance with any instructions included in the listing of labeling (CEC 110.3). Equipment intended for use with the PV system shall be listed or be evaluated for the application with a field label applied.

### Applicant and Site Information

Job Address: \_\_\_\_\_ Permit #: \_\_\_\_\_

Contractor/Engineer Name: \_\_\_\_\_ License # and Class: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Phone Number: \_\_\_\_\_

### 1. General Requirements and System Information

Microinverter

AC Module (ACM)

Number of PV modules installed: \_\_\_\_\_

Number of ACMs installed: \_\_\_\_\_

*Note: Listed Alternating-Current Module (ACM) is defined in CEC 690.2 and installed per CEC690.6*

Number of Microinverters installed: \_\_\_\_\_

1.1 Number of Branch Circuits, 1, 2, 3, 4, 5, 6, 7, 8: \_\_\_\_\_

1.2 Actual number of Microinverters or ACMs per branch circuits: 1.\_\_\_\_2.\_\_\_\_3.\_\_\_\_4.\_\_\_\_5.\_\_\_\_6.\_\_\_\_7.\_\_\_\_8.\_\_\_\_

1.3 Total AC system power rating = (Total Number of Microinverters or ACMs) \* (AC inverter power output)  
= \_\_\_\_\_ Watts (38.4 kw max.)

1.4 Lowest expected ambient temperature for this plan in Table 1: For -1° to -5° C use 1.12. or for -6° to -10° C use 1.14 correction factors.

1.5 Average ambient high temperature for this plan: = +47° C

Note: For lower expected ambient or higher average ambient high temperatures, use Standard Plan. Check Method.

**2. Microinverter or ACM Information and Ratings**

Listed to UL 1741 or has been evaluated for the application with a field label applied.  Yes  No (if no this plan is not applicable)

Microinverter or ACM Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_

2.1 Rated (continuous) AC output power: \_\_\_\_\_ Watts

2.2 Nominal AC voltage rating: \_\_\_\_\_ Volts

2.3 Rated (continuous) AC output current: \_\_\_\_\_ Amps

***If installing ACMs, skip [STEPS 2.4]***

2.4 Maximum DC input voltage rating: \_\_\_\_\_ Volts (limited to 79 V) for express permits

2.5 Maximum AC output overcurrent protection device (OCPD) \_\_\_\_\_ Amps

2.6 Maximum number of microinverters or ACMs per branch circuit: \_\_\_\_\_

**3. PV Module Information**

***(If stalling ACMs, skip to [STEP 4])*** PV modules listed to UL 1703 or UL 61730 or has been evaluated for application with a field label applied.  Yes  No (if no, not applicable)

PV Module Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_

Module DC output power under standard test conditions (STC) = \_\_\_\_\_

3.1 Module  $V_{oc}$  at STC (from module nameplate): \_\_\_\_\_ Volts

3.2 Module  $I_{sc}$  at STC (from module nameplate): \_\_\_\_\_ Amps

3.3 Adjustment PV Module DC voltage at minimum temperature = [Table1] \_\_\_\_\_ [cannot exceed Step 2.4]

Microinverter Max. DC Input [STEP 2.4] (Volts)	34	37	40	43	46	49	52	55	58	61	64	67	70	73	76	79
Max. Module VOC @ STC, 1.12 (-1° to -5° C) Correction Factor (Volts)	30.4	33.0	35.7	38.4	41.1	43.8	46.4	49.1	51.8	54.5	57.1	59.8	62.5	65.2	67.9	70.5
Max. Module VOC @ STC, 1.14 (-6° to -10° C) Correction Factor (Volts)	29.8	32.5	35.1	37.7	40.4	43.0	45.6	48.2	50.9	53.5	56.1	58.8	61.4	64.0	66.7	69.3

**4. Branch Circuit Output Information**

Fill in [Table 3] to describe the branch circuit inverter output conductor and OCPD size. Use [Table 2] for determining the OCPD and Minimum Conductor size.

Circuit Current (Amps)	Circuit Power (Watts)	OCPD (Amps)	Minimum Conductor Size (AWG)	Minimum Metal Conduit Size for 6 Current Carrying Conductors
12	2880	15	12	¾"
16	3840	20	10	¾"



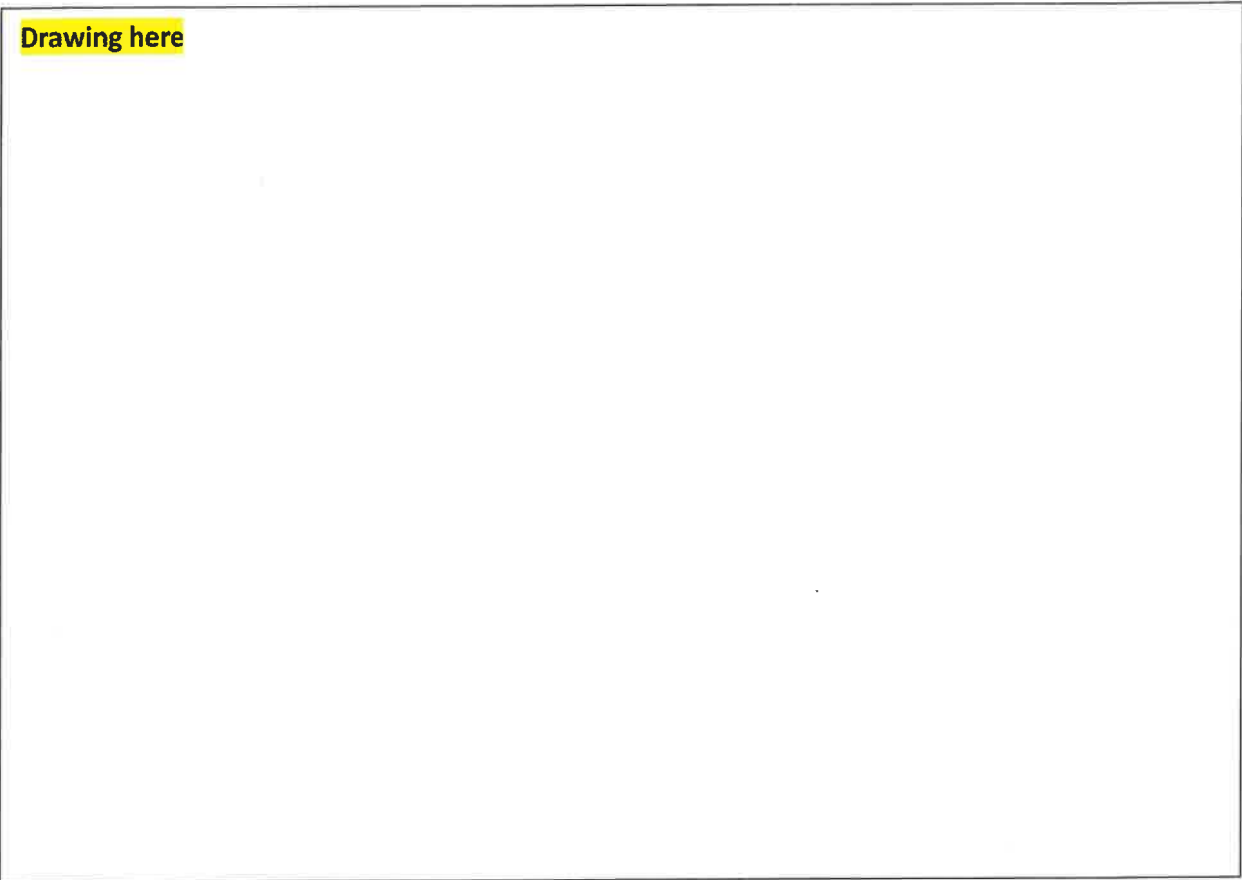
Will a new main electrical service upgrade over 225 amps be installed and approved prior to this proposal?

Yes  No

**Solar PV Standard Plan – Simplified  
Central/String Inverter Systems for One- and Two-Family Dwellings**

**9. Single-Inverter Line Diagram**

**Drawing here**



## **7. Grounding and Bonding**

System shall be grounded

All Microinverters and ACM, systems must follow the requirements of Part V. "Grounds and Bonding" of the current Electrical code.

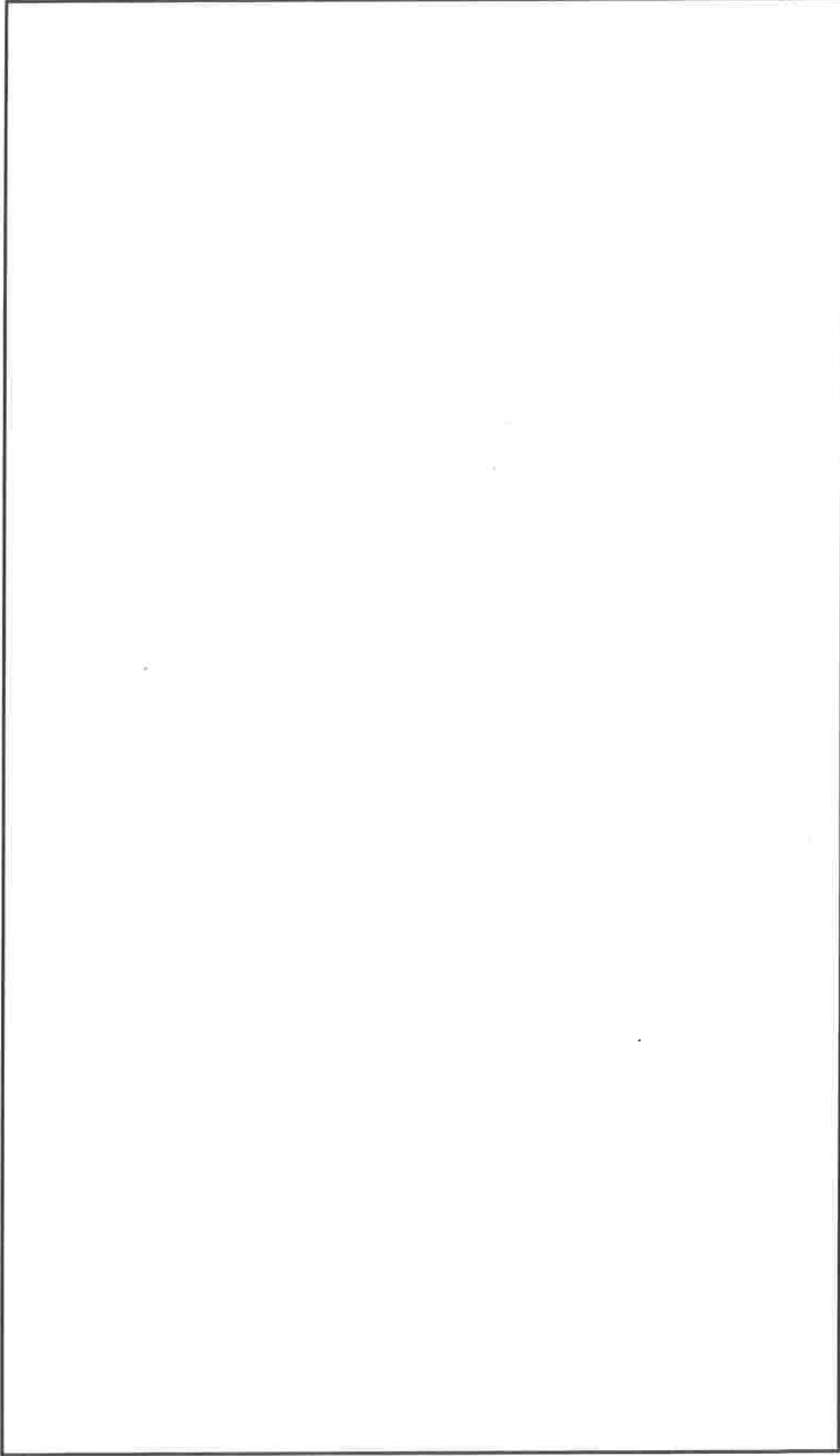
## **8. Markings**

Informational note: ANSI Z535.4 provides guidelines for the design of safety signs and labels for application to products where not otherwise identified. A phenolic plaque with contrasting colors between the text and background would meet the intent of the code for permanency, with a type size of 20 point (3/8") being considered the minimum.



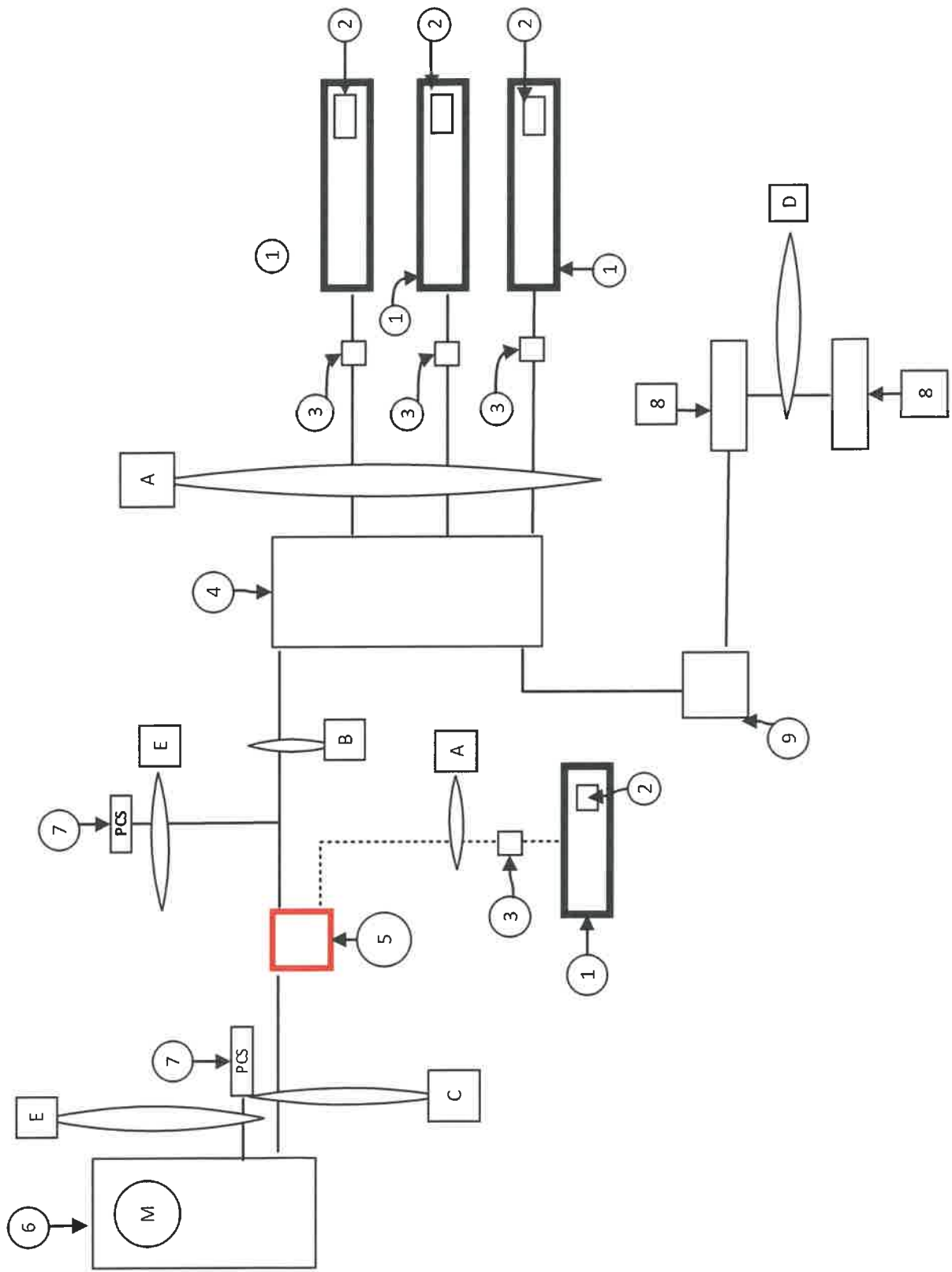
**SOLAR PV STANDARD PLAN – SIMPLIFIED**

Microinverter and ACM Systems for one- and Two-Family Dwellings  
**ROOF LAYOUT PLAN**



Items required: roof layout of all panels, modules, clear access pathways and approximate locations of electrical disconnecting means and roof access points.

# Microinverter System - With/Without ESS





# SINGLE CIRCUIT OR MULTIPLE CIRCUIT MICROINVERTER LINE DIAGRAM

## EQUIPMENT SCHEDULE

O Tag	DESCRIPTION (Provide Model # If Provided)	with ESS	YES <input type="checkbox"/> NO <input type="checkbox"/>
1	Solar PV Module/ or ACM		
2	Microinverter (if not ACM)		
3	Junction Box		
4	IQ Combiner Panel (ESS) / Solar Load Center (no ESS)	Bus bar = _____ A	Min. OCPD = _____ A
5	AFD Disconnect (within 3' of Main Electric Service Panel)		
6	Main Electric Service Panel	PV OCPD= _____ A	Bus bar rating= _____ A Main OCPD = _____ A
7	Power Control System (PCS) / Energy Monitor / IQ System Controller		
8	IQ Battery	Max continuous power = _____ kw	Max OCP= _____ A
8.2	IQ Battery	Max continuous power = _____ kw	Max OCP= _____ A
8.3	IQ Battery	Max continuous power = _____ kw	Max OCP= _____ A
8.4	IQ Battery	Max continuous power = _____ kw	Max OCP= _____ A
9	Disconnect		

## CONDUCTOR, CABLE, CONDUIT AND BRANCH OCPD SCHEDULE (COPPER CONDUCTORS ONLY)

TAG	CURRENT CARRYING BRANCH CONDUCTOR SIZE	EGC SIZE	GEC (SIZE-when required)	BRANCH CIRCUIT CONDUCTOR	CONDUCTOR OR TYPE OF CABLE	CONDUIT SIZE	BRANCH CONDUIT OCPD
1 A							
2 A							
3 A							
4 A							
5 A							
7 A							
8A							
B							
C							
D							
E							