

Handbook for Photovoltaic Interconnection





This document describes what the APS Field Inspector is looking for when they inspect your Renewable Energy Installation. We are providing this information for your use in an effort to make the process easier and faster.

RESIDENTIAL PV AND WIND SITE INSPECTION CHECKLIST

Log # _____ Inspection Date _____
Inspector _____ Coordinator _____
Engineer _____
Installer Contact Name and Phone # _____
Installation Address _____

1	All loads are on the correct side of the dedicated kWh meter (Customer Owned)	Yes	No
2	APS personnel have unobstructed, unrestricted 24 hour access to the Utility Disconnect switch per approved site plan.	Yes	No
3	SES, PV kWh meter and breakers are all labeled as possible Backfeed sources. The labels are Micarta labels	Yes	No
4	Installed APS provided "Caution—Possible Backfeed" label on APS meter	Yes	No
5	Placed electric shock warning label and utility disconnect label on the Utility Disconnect switch or verified they are in place.	Yes	No
6	Utility Disconnect switch is grounded	Yes	No
7	Utility Disconnect switch is visibly open	Yes	No
8	Utility Disconnect switch has no fuses (unless it is a supply side tap)	Yes	No
9	Utility Disconnect switch is properly wired	Yes	No
10	GEC (Ground Electric Conductor) is present	Yes	No
11	Utility Disconnect Switch is not used as a raceway for wiring to other components	Yes	No
12	Put APS lock on Utility Disconnect switch	Yes	No
13	Utility disconnect switch has not been modified to accommodate the APS lock	Yes	No
14	Utility Disconnect switch handle can be locked in the OFF position	Yes	No
15	Dedicated kWh meter (customer owned meter) turns in the correct direction normally forward rotation	Yes	No
16	Dedicated kWh meter is grounded	Yes	No
17	Dedicated kWh meter is not used as a raceway for wiring to other Components	Yes	No
18	Can you verify the size and UL listing of the inverter?	Yes	No
19	Combiner box has a label affixed that states no loads should be added to the panel (only if combiner box is present and may not be applicable to all inspection locations)	Yes	No
20	No added loads are present in the combiner box (only if combiner box	Yes	No



	is present and may not be applicable to all inspection locations)		
21	Are azimuth and tilt angles and shading information from the Interconnection Application consistent with what you can observe in the field?	Yes	No
22	Tagged transformer?	Yes	No



Witness System Shutdown Test –

Turn off the backfeed breaker at load panel and witness voltage collapse in less than one second and inverter shuts down
 Yes No

System passed above shutdown test? Yes No

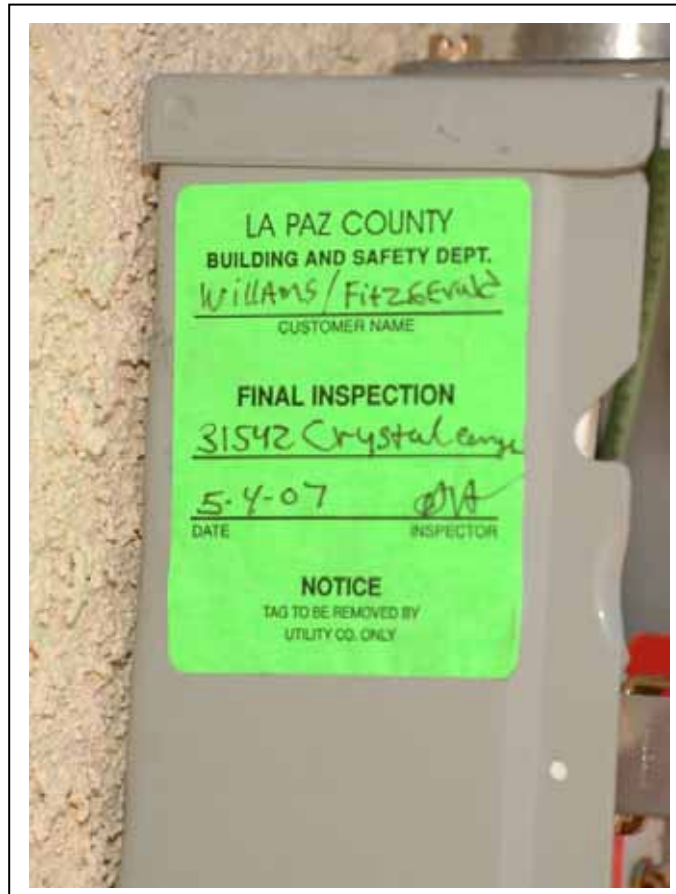
Inspection Results: Pass Fail

Transformer # _____

Inspector Signature **Date**

Inspection Comments: _____

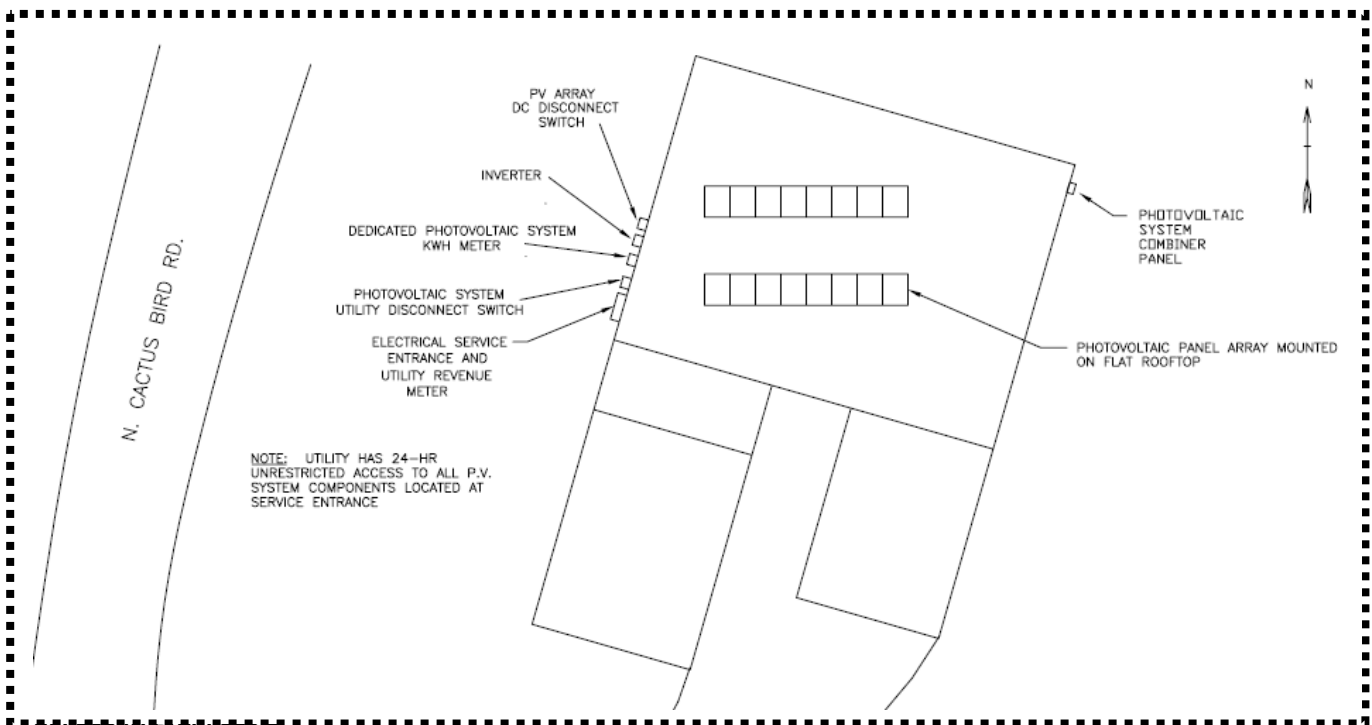
Step 1: The final city clearance has been issued by the AHJ (Authority having jurisdiction), and the customer has scheduled the APS inspection expecting to be placed “on-grid” to the APS system, given the PV system passes the following inspection.



System Layout -

The physical location of major equipment, such as the utility disconnect switch, generation source and service entrance section is in accordance with the Diagram(s)/Equipment Information Form submitted to APS. Determine the best that you can that the loads are on the correct side of the PV dedicated kWh meter (#1 on the inspection sheet). (These items are included in the packet of information sent you by Renewable Energy Incentive Program group.

- If total system kW is **10 kW or greater**, the Site Plan & Site Location must be 100% Correct.



Verify that APS personnel have 24 hour, unobstructed, unrestricted access to the Utility Disconnect Switch (# 2 on inspection sheet)

NOTE: The Utility Disconnect switch cannot be located behind a fence or gate as APS requires 24 hour unrestricted access to this switch. If the service entrance is behind a fence or gate, APS will require the Utility Disconnect switch to be separate from the service entrance and installed in a location as close to the service entrance as possible but NOT located behind the fence or gate.



Service Entrance Panel / Meter -

Install "Caution – Possible Backfeed..." label on the meter can (#4 on the inspection sheet).



CAUTION - POSSIBLE BACKFEED - EQUIPMENT CONNECTED TO TWO OR MORE SOURCES OF POWER

#4 on the inspection sheet



Removing this because they will be installing the meter

Inspect that the Equipment such as the Service Entrance Panel, meter can, PV (Photovoltaic) (backfeed) breaker(s), switches are appropriately labeled as to the possibility of backfeed, and the presence of additional power source(s). These labels must be permanently installed, plastic engraved placards (# 3 and 4 on the inspection sheet).

Equipment-Grounding Conductor Size

<i>Overcurrent Device Size (Amps)</i>	<i>Conductor Size (AWG)</i>
15	14
20	12
30	10
40	10
60	10
100	8
200	6
300	4
400	3
500	2



GEC Standard Size is 8 AWG

(#10 on the inspection worksheet)

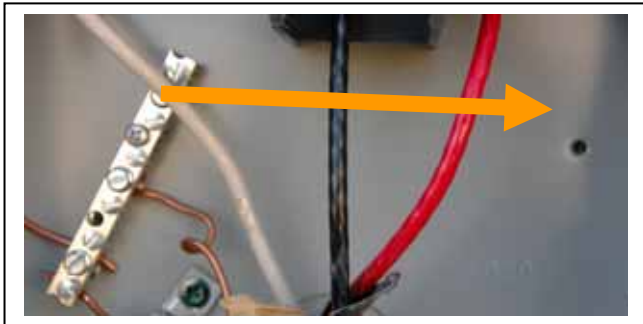
Utility Visible Open Disconnect Device -

Label with "Utility Disconnect Switch" & "WARNING: Electric Shock..." labels on outside of Disconnect Switch? These labels must be permanently installed, plastic engraved placards (Install labels if not present) (#5 on inspection worksheet)_



WARNING
ELECTRIC SHOCK HAZARD
- DO NOT TOUCH TERMINALS -
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OFF POSITON

PHOTOVOLTAIC SYSTEM
UTILITY DISCONNECT SWITCH

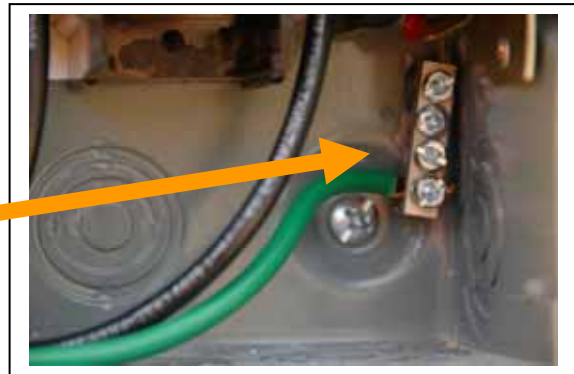


An APS approved visible-open and lockable disconnect device is installed which shall constitute the APS clearance point. Ensure that the switch is secured at all times. Disconnect is clearly;

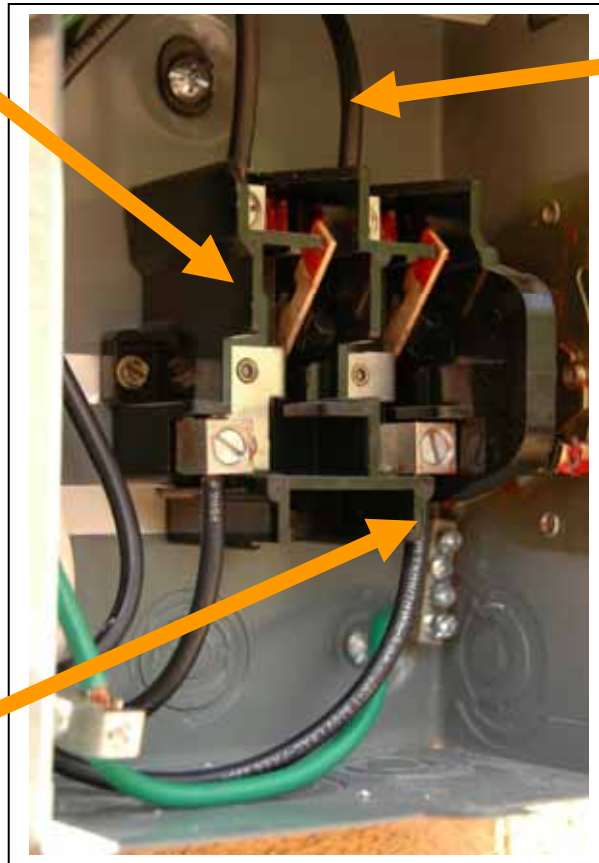
(1) Grounded: (Paint is scraped from Box where Ground Bar is bonded / connects to the box.)

Single Ground Bar, wire is straight thru, not cut, insulation stripped, screw is tight.

Multiple Ground Bar, Wire can be cut, but must land on 2 separate points of attachment. (#6 on the inspection worksheet)



(2) Visible Open and no fuses (Supply Side Tap may contain Fuses) (#7 and 8 on the inspection worksheet)

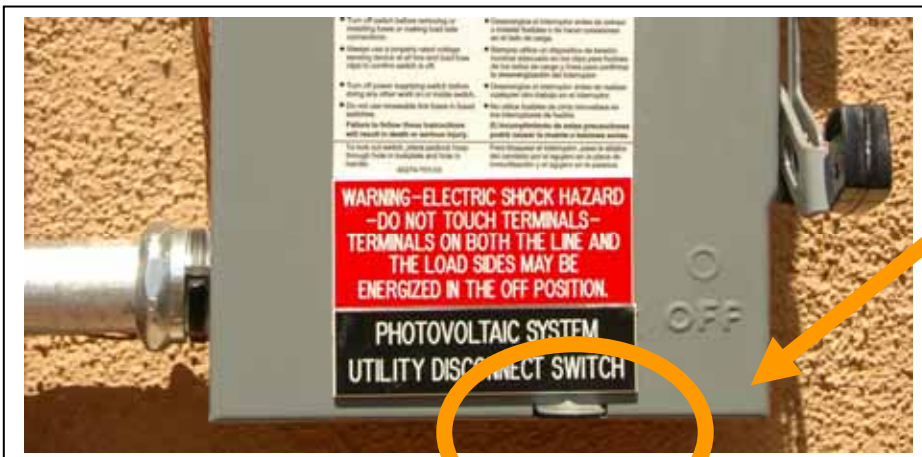


Top wires come from APS SES

Bottom wires run to the bottom of the kWh meter socket (typically)

(3) Check Wiring (Inverter wires must land on the “hinged” terminals of the switch, and box must not be used as a raceway for wiring to other components.), (#11 on inspection worksheet).

(4) Cover lock point must fit APS Lock and be locked with APS Lock. Switch handle must be lockable in the OFF position (#13 and 14 on the inspection worksheet).

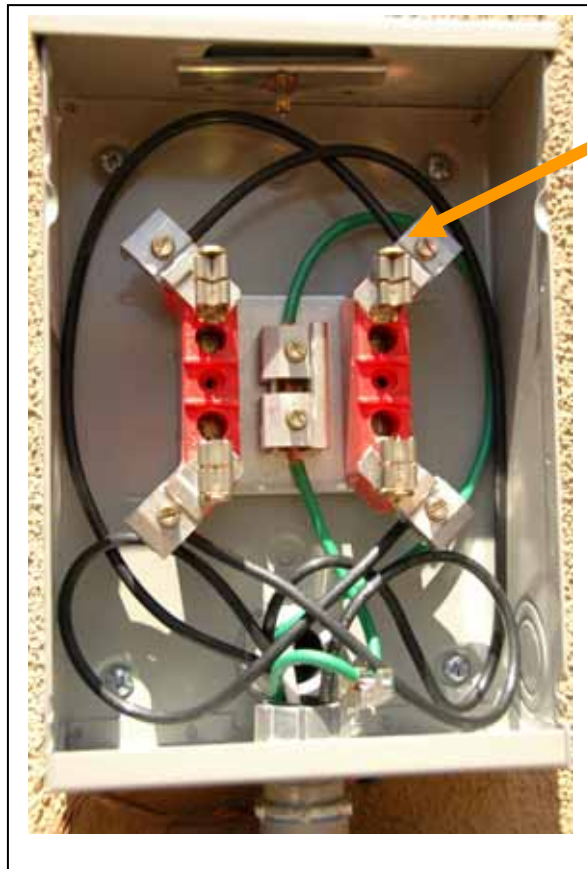


PV Dedicated kWh Meter -

- Max Meter Height 75 inch
- Min Meter Height 48 inch
- Require 36 inch clearance in front of meter
- Minimum of 10 inch clearance on one side of meter



Label must be present. These labels must be permanently installed, plastic engraved placards



AC Wires from inverter run to the top of the meter socket

With the meter pulled out of the socket, determine that the meter appears to be;

- Wired correctly to turn in the correct direction (wiring from inverter lands on the top terminals,) – normally forward rotation (#15 on the inspection worksheet)
- Grounded. (Equipment ground is landed), (#16 on the inspection worksheet.)
- Not used as a raceway for wiring to other components (#17 on the inspection worksheet.)



Combiner Panel(s) – (If Applicable)

If the system contains a combiner panel:



A label "Combiner Panel, NO LOADS to be added to this panel" should be present, if not install label. These labels must be permanently installed, plastic engraved placards

Open and inspect the panel(s) to ensure No loads have been added to the panel (#19 and 20 on the inspection worksheet)

**DEDICATED PHOTOVOLTAIC
SYSTEM COMBINER PANEL
LOADS NOT TO BE ADDED
TO THIS PANEL**

OR

**NOTICE
PV SYSTEM COMBINER
PANEL
DO NOT ADD LOADS TO
THIS PANEL**

Inverter Ratings -

The Inverter Nameplate is clearly visible with adequate space to be readable by APS personnel. Verify that the Inverter Manufacturer, Model # and nameplate ratings (kW, Phase, UL listing) are consistent with the customer supplied information... (#18 on the inspection worksheet)

Inverter must not be used as a raceway for wiring to other components.



Witness System Shutdown Test – (Page 2 on inspection worksheet)

Inverters are automatically disconnected from the source in less than 1 second upon loss/simulated loss of power to inverter.

Turn off the backfeed breaker at load panel and witness voltage collapse in less than one second and inverter shuts down



PV Panels

Observe whether or not the azimuth and tilt angles and shading information from the Interconnection Application appear to be consistent – (#21 on the inspection worksheet)



Co-Gen Equipment Labels –

The APS provided "Caution" labels for the Transformer/ Pole has been installed or has been left for the APS Troubleshooter/lineman to install at a later date. (#22 on the inspection worksheet) In addition, transformer number needs to be recorded on page two of the inspection worksheet.

