



Photovoltaic Checklist

Photovoltaic Solar Permit Guidelines

For the successful completion of your application, the following process is required:

1. Miscellaneous Application
2. Notice of Commencement (if applicable)
3. Owner Builder Affidavit (if owns and occupies)
4. Identify the on-site location (site plan) showing all related equipment.
 - a. Indicate back-up battery location¹
5. Rough layout showing location of solar panels on roof (2 copies) (see fillable example)
6. Photovoltaic Engineering (2 copies) (see fillable example)
 - a. Panels mount (tie down) structural attachment
7. Complete the Checklist on pages 6 and 7 (2 copies)

Code Compliance Information

1. All information, drawings, specifications and accompanying data shall bear the name and signature of the person responsible for the design. Refer to 106.1 Florida Building Code and 471.003.2(h)2.a Florida Statute: Identification of design professional of the photovoltaic system.
2. Chapter 16 Florida Building Code: structural mounting, attachments and design of all equipment shall be F.B.C. 2007 compliant.
3. 304.4.1. and 502.5.3 of the Florida Building Code. Are storage batteries being used? If so, size and type?
4. Has mechanical (battery ventilation) and fire requirements been addressed, as necessary?
5. Chapter III NEC (National Electrical Code): Identify type and size of conductors, conduit or raceways. Is it suitable for installation in the outdoor (sun, heat and wet) environment?

¹ Applied for by a Solar contractor. Electric is applied for by Subcontractor.



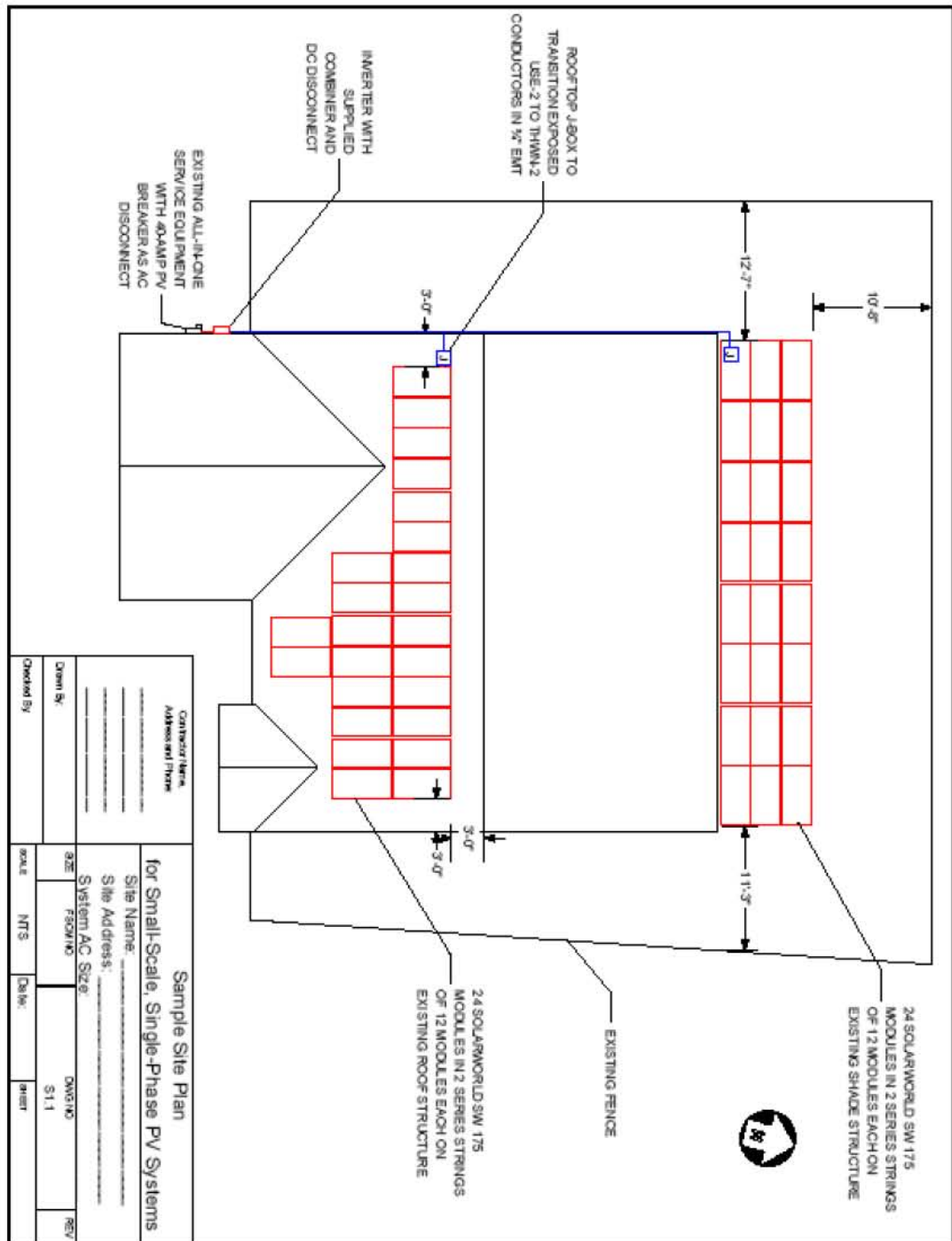
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6. 110.3(B) NEC Installation and use all equipment shall be installed per instructions on it's listing or labeling.
7. Transfer switch, manual or automatic. Detail to be shown for all switching equipment and methods from and to public utility electrical system.
8. 240.24. NEC: Each occupant shall have ready access to all over current devices which protect the conductors and equipment of that occupancy.
9. Photovoltaic installations shall comply with all National Electric Code requirements, especially those stipulated in article 690 of the 2005 (NEC):
 - a. 690.4(c) NEC: Identify services string connections, not to interrupt conductors if a module is removed.
 - b. 690.4(d) NEC: Provide specifications of inverter, and assure identification for use in solar photovoltaic systems.
 - c. 690.5. NEC: ground fault protection requirements satisfied?
 - d. 690.6. NEC: inverter modules device and systems.
 - e. 690.8(A) NEC: Technical data. Show calculations which were used to derive the maximum circuit current.
 - f. 250 NEC: Detail grounding electrode system of utility service and photovoltaic system.
 - g. 690 III NEC: Identify location of disconnecting means and other related P.V. systems at this structure.
 - h. 690 IV NEC: use approved wiring methods.

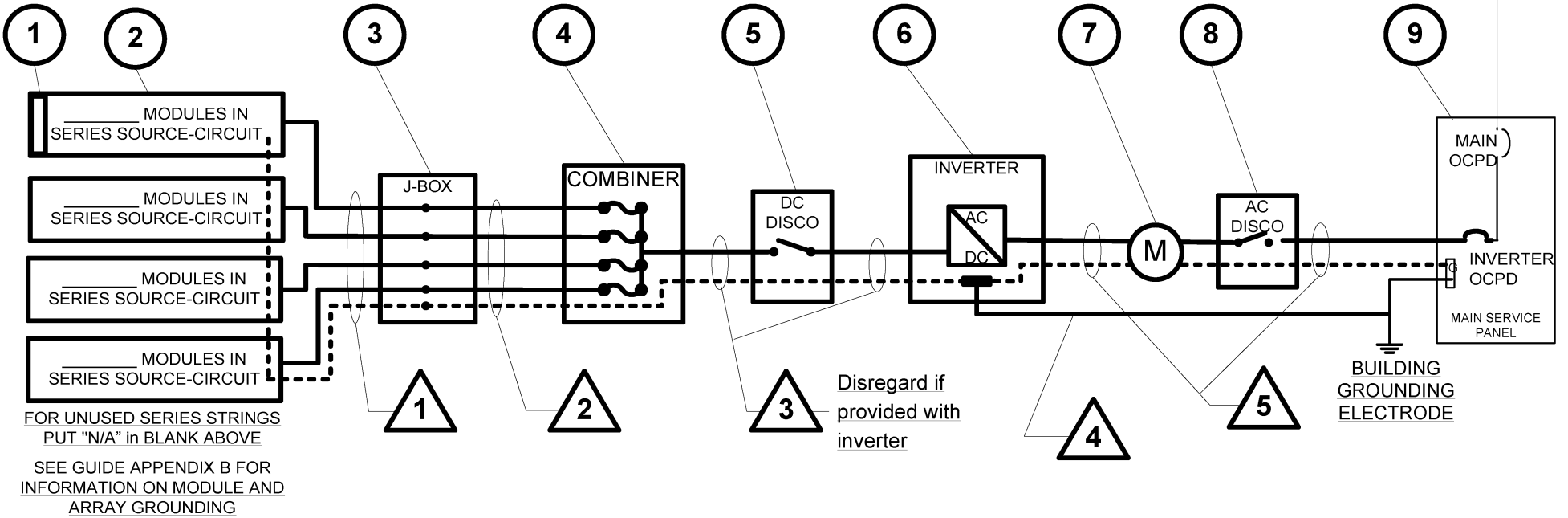
[Click here](#) for the Expedited Permit Process for PV Systems Help Guide or visit www.solarabcs.org.



Layout Example



EQUIPMENT SCHEDULE			
TAG	DESCRIPTION	PART NUMBER	NOTES
1	SOLAR PV MODULE		
2	PV ARRAY		
3	J-BOX (IF USED)		
4	COMBINER (IF USED)		
5	DC DISCONNECT		
6	DC/AC INVERTER		
7	GEN METER (IF USED)		
8	AC DISCONNECT (IF USED)		
9	SERVICE PANEL		_____ VAC, _____ A MAIN, _____ A BUS, _____ A INVERTER OCPD (SEE NOTE 5 FOR INVERTER OCPDs, ALSO SEE GUIDE SECTION 9)



CONDUIT AND CONDUCTOR SCHEDULE					
TAG	DESCRIPTION OR CONDUCTOR TYPE	COND. GAUGE	NUMBER OF CONDUCTORS	CONDUIT TYPE	CONDUIT SIZE
1	USE-2 <input type="checkbox"/> or PV WIRE <input type="checkbox"/>			N/A	N/A
	BARE COPPER EQ. GRD. COND. (EGC)			N/A	N/A
2	THWN-2 <input type="checkbox"/> or XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>				
3	THWN-2 <input type="checkbox"/> or XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>				
	INSULATED EGC				
4	DC GROUNDING ELECTRODE COND.				
5	THWN-2 <input type="checkbox"/> or XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>				
	INSULATED EGC				

Contractor Name, Address and Phone: _____ _____ _____		One-Line Standard Electrical Diagram for Small-Scale, Single-Phase PV Systems Site Name: _____ Site Address: _____ System AC Size: _____						
Drawn By:	SIZE					FSCM NO	DWG NO	REV
Checked By:	SCALE					NTS	Date:	SHEET

SIGNS--SEE GUIDE SECTION 7

PV MODULE RATINGS @ STC (Guide Section 5)

MODULE MAKE	
MODULE MODEL	
MAX POWER-POINT CURRENT (I_{MP})	A
MAX POWER-POINT VOLTAGE (V_{MP})	V
OPEN-CIRCUIT VOLTAGE (V_{OC})	V
SHORT-CIRCUIT CURRENT (I_{SC})	A
MAX SERIES FUSE (OCPD)	A
MAXIMUM POWER (P_{MAX})	W
MAX VOLTAGE (TYP 600V _{DC})	V
VOC TEMP COEFF (mV/°C <input type="checkbox"/> or %/°C <input type="checkbox"/>)	
IF COEFF SUPPLIED, CIRCLE UNITS	

NOTES FOR ALL DRAWINGS:

OCPD = OVERCURRENT PROTECTION DEVICE
 NATIONAL ELECTRICAL CODE® REFERENCES SHOWN AS (NEC XXX.XX)

INVERTER RATINGS (Guide Section 4)

INVERTER MAKE	
INVERTER MODEL	
MAX DC VOLT RATING	V
MAX POWER @ 40°C	W
NOMINAL AC VOLTAGE	V
MAX AC CURRENT	A
MAX OCPD RATING	A

SIGN FOR DC DISCONNECT

PHOTOVOLTAIC POWER SOURCE	
RATED MPP CURRENT	A
RATED MPP VOLTAGE	V
MAX SYSTEM VOLTAGE	V
MAX CIRCUIT CURRENT	A
WARNING: ELECTRICAL SHOCK HAZARD--LINE AND LOAD MAY BE ENERGIZED IN OPEN POSITION	

SIGN FOR INVERTER OCPD AND AC DISCONNECT (IF USED)

SOLAR PV SYSTEM AC POINT OF CONNECTION	
AC OUTPUT CURRENT	A
NOMINAL AC VOLTAGE	V
THIS PANEL FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)	

NOTES FOR ARRAY CIRCUIT WIRING (Guide Section 6 and 8 and Appendix D):

- 1.) LOWEST EXPECT AMBIENT TEMPERATURE BASED ON ASHRAE MINIMUM MEAN EXTREME DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. LOWEST EXPECTED AMBIENT TEMP _____°C
- 2.) HIGHEST CONTINUOUS AMBIENT TEMPERATURE BASED ON ASHRAE HIGHEST MONTH 2% DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. HIGHEST CONTINUOUS TEMPERATURE _____°C
- 2.) 2005 ASHRAE FUNDAMENTALS 2% DESIGN TEMPERATURES DO NOT EXCEED 47°C IN THE UNITED STATES (PALM SPRINGS, CA IS 44.1°C). FOR LESS THAN 9 CURRENT-CARRYING CONDUCTORS IN ROOF-MOUNTED SUNLIT CONDUIT AT LEAST 0.5" ABOVE ROOF AND USING THE OUTDOOR DESIGN TEMPERATURE OF 47°C OR LESS (ALL OF UNITED STATES),
 - a) 12 AWG, 90°C CONDUCTORS ARE GENERALLY ACCEPTABLE FOR MODULES WITH I_{sc} OF 7.68 AMPS OR LESS WHEN PROTECTED BY A 12-AMP OR SMALLER FUSE.
 - b) 10 AWG, 90°C CONDUCTORS ARE GENERALLY ACCEPTABLE FOR MODULES WITH I_{sc} OF 9.6 AMPS OR LESS WHEN PROTECTED BY A 15-AMP OR SMALLER FUSE.

NOTES FOR INVERTER CIRCUITS (Guide Section 8 and 9):

- 1) IF UTILITY REQUIRES A VISIBLE-BREAK SWITCH, DOES THIS SWITCH MEET THE REQUIREMENT? YES NO N/A
- 2) IF GENERATION METER REQUIRED, DOES THIS METER SOCKET MEET THE REQUIREMENT? YES NO N/A
- 3) SIZE PHOTOVOLTAIC POWER SOURCE (DC) CONDUCTORS BASED ON MAX CURRENT ON NEC 690.53 SIGN OR OCPD RATING AT DISCONNECT
- 4) SIZE INVERTER OUTPUT CIRCUIT (AC) CONDUCTORS ACCORDING TO INVERTER OCPD AMPERE RATING. (See Guide Section 9)
- 5) TOTAL OF _____ INVERTER OCPD(S), ONE FOR EACH INVERTER. DOES TOTAL SUPPLY BREAKERS COMPLY WITH 120% BUSBAR EXCEPTION IN 690.64(B)(2)(a)? YES NO

Contractor Name, Address and Phone: _____ _____ _____ _____	Notes for One-Line Standard Electrical Diagram for Single-Phase PV Systems			
	Site Name: _____			
Site Address: _____				
System AC Size: _____				
Drawn By:	SIZE	FSCM NO	DWG NO	REV
			E1.2	
Checked By:	SCALE	NTS	Date:	SHEET



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Expedited Permit Process for Small-Scale PV Systems

The information in this guideline is intended to help local jurisdictions and contractors identify when PV system installations are simple, needing only a basic review, and when an installation is more complex. It is likely that 50%-75% of all residential systems will comply with these simple criteria. For projects that fail to meet the simple criteria, a resolution steps may be suggested to provide a path to permit approval.

Required information for Permit:

1. Site plan showing location of major components on the property. This drawing need not be exactly to scale, but it should represent relative location of components at site (see supplied example site plan). PV arrays on dwellings with a 3' perimeter space at ridge and sides may not need separate fire service review.
2. Electrical diagram showing PV array configuration, wiring system, overcurrent protection, inverter, disconnects, required signs, and ac connection to building (see supplied standard electrical diagram).
3. Specification sheets and installation manuals (if available) for all manufactured components including, but not limited to, PV modules, inverter(s), combiner box, disconnects, and mounting system.

Step 1: Structural Review of PV Array Mounting System

Roofing Information:

Is the array to be mounted on a defined, permitted roof structure? **Yes** **No**

If No due to non-compliant roof or a ground mount, submit completed worksheet for the structure WKS1.

1. Is the roofing type lightweight (Yes = composition, lightweight masonry, metal, etc...) _____
If No, submit completed worksheet for roof structure WKS1 (No = heavy masonry, slate, etc...).
2. Does the roof have a single roof covering **Yes** **No**
If No, submit completed worksheet for roof structure WKS1.

Mounting System Information:

1. Provide details of structural attachment certified by a design professional
2. For manufactured mounting systems, fill out information on the mounting system below:



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Three foot walkway indicated on Sample Site Plan is encouraged and access to the peak of the roof is required by the Cape Coral Fire Department. However, if there are other pathways to the peak, this specific access pathway is not required.

- a. Mounting System Manufacturer _____ Product Name and Model # _____
- b. Total Weight of PV Modules and Rails _____ lbs
- c. Total Number of Attachment Points _____
- d. Weight per Attachment Point ($b \div c$) _____ lbs (if greater than 40 lbs, see WKS1)
- e. Maximum Spacing Between Attachment Points on a Rail _____ inches (see product manual for maximum spacing allowed based on maximum design wide speed)
- f. Total Surface Area of PV Modules (square feet) _____ ft^2
- g. Distributed Weight of PV Module on Roof ($b \div f$) _____ lbs/ft^2
If distributed weight of the PV system is greater than 5 lbs/ft^2 , see WKS1.

Step 2: Electrical Review of PV System (Calculations for Electrical Diagram)

In order for a PV system to be considered for an expedited permit process, the following must apply:

1. PV modules, utility-interactive inverters, and combiner boxes are identified for use in PV systems.
2. The PV array is composed of 4 series strings or less per inverter, and 15 kW_{STC} or less.
3. The total inverter capacity has a continuous power output 13,440 Watts or less.
4. The ac interconnection point is on the load side of service disconnecting means (690.64(B)).
5. The electrical diagram (E1.1 on page 4) can be used to accurately represent the PV system.

Fill out the standard electrical diagram completely. A guide to the electrical diagram is provided to help the applicant understand each blank to fill in. If the electrical system is more complex than the standard electrical diagram can effectively communicate, provide an alternative diagram with appropriate detail.