



Solar Energy Systems

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The purpose of the Village's solar energy system regulations is to promote and accommodate the provisions of solar energy systems as an environmentally friendly alternative source of energy for village residents and businesses. The Village shares the general goal of encouraging solar energy generation with federal and state programs. However, those programs focus on total energy production and operational characteristics of solar energy systems, while the Village is more concerned with the physical characteristics and impact upon neighboring properties. *Please see Appendix H of Chapter 14 of the Municipal Code Book to review the Village's regulations.*

Date: _____

Property Owner's Name: _____

Property Owner's Phone #: _____ email: _____

Property Address: _____

Subdivision: _____ Lot #: _____

Installer's Business Name: _____

Installer's Business Address: _____

Installer's Contact Name: _____ Phone #: _____

Installer's License #: _____ email: _____

Electrician's Business Name: _____ & License #: _____

Permit Requested

Building Mounted Ground Mounted

Provide the total system capacity rating (sum of all panels): Solar Electric System: _____ kW-DC

What is the existing roofing material? _____

Estimated Cost: \$ _____

Will pick up permit Email permit to: _____

Official Use Only

Date: _____ Request: Approved Denied PIN #: _____

Permit Number: _____ Permit fee \$: _____ Performance bond \$: _____

_____ Date Paid: _____ Check# _____ Cash Credit

Building Official Signature

Provide the following information about the mounting system:

1. Mounting System Manufacturer: _____
2. Product Name and Model Number: _____
3. Total Weight of Solar Electric Modules and Rails _____ lbs.
4. Total Number of Attachment Points _____
5. Weight per Attachment Point _____ lbs.
6. Maximum Spacing Between Attachment Points on a Rail (See product manual for maximum spacing allowed based on maximum design wind speed) _____ inches
7. Total Surface Area of Solar Electric Modules _____ sq. ft.
8. Distributed Weight of Solar Electric Module on Roof _____ lbs./sq. ft.
9. Indicate quantity, brand, and make of :

Inverter(s):

Quantity	Make	Model

Modules:

Quantity	Make	Model

I hereby certify that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and we agree to conform to all applicable laws of this jurisdiction.

Signature of Applicant _____

Date _____

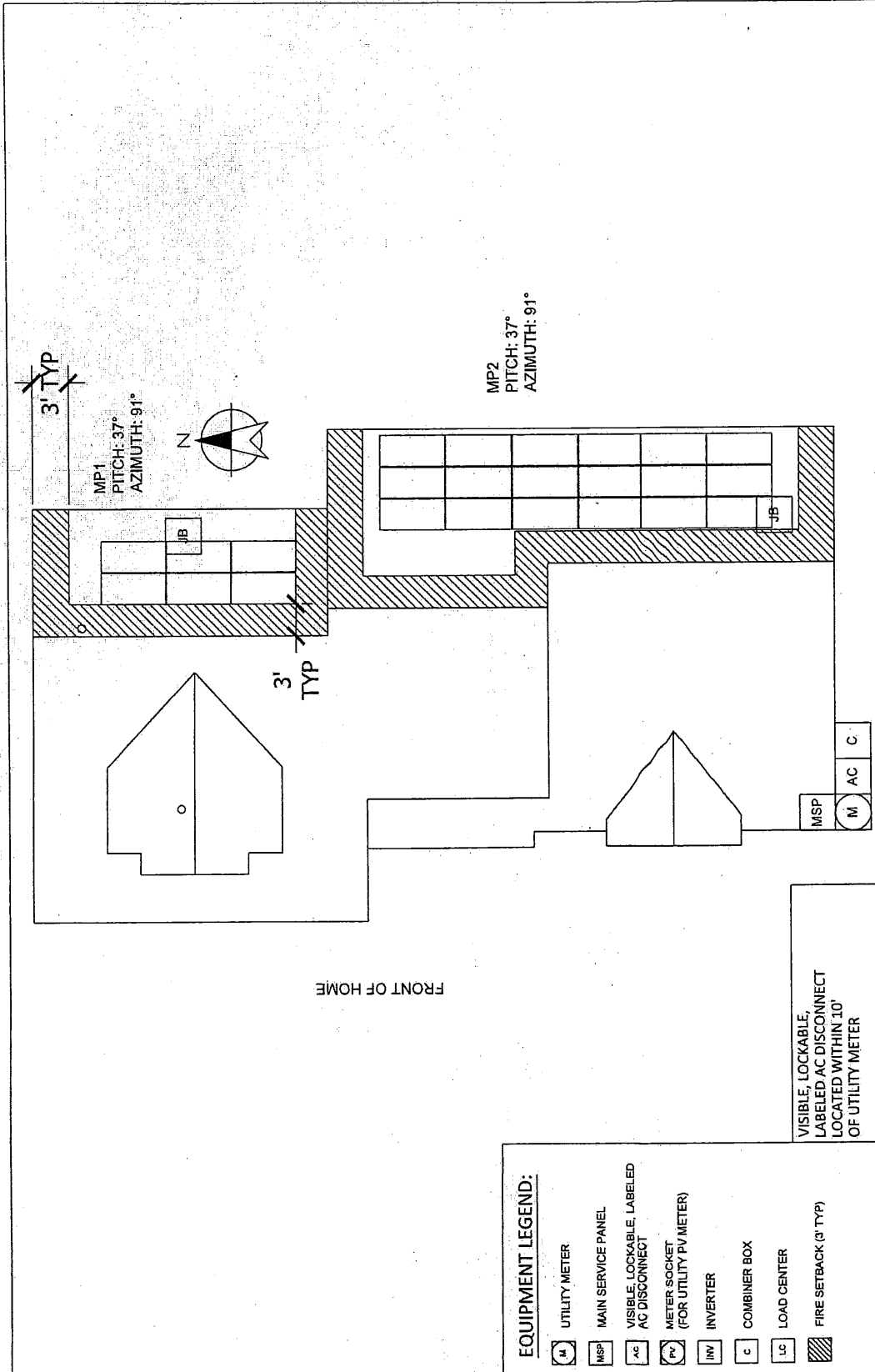
Official Use Only

Conditions of Approval.

1. This permit is granted upon the express condition that the said applicant of this permit shall conform in all respects to all the Ordinances of the Village of Spring Grove and may be revoked at any time upon the violation of any of the provisions of said ordinances, or failure to follow plans as approved to comply with said ordinances.
2. Permit expires one (1) year from the date issued unless otherwise approved by the Building Inspector.
3. The applicant agrees to comply with the Municipal Ordinances and with the conditions of this permit; understands that the issuance of the permit creates no legal liability, express or implied, on the Department or Municipality; and certifies that all the above information is accurate.
4. As a reminder, you need to make sure your structure complies with the covenants of your respective Homeowner's Association. Your compliance with these covenants is your responsibility, not the Village's. If you fail to comply with your respective Homeowner's Association covenants, they may take legal action.
5. **Hours of Construction:** The construction (including excavating), demolition, alteration or repair of any building is permitted between the hours of **7:00 a.m. and 8:00 p.m. Mon. - Sat. and 8:00 a.m. - 6:00 p.m. on Sundays or legal holidays** except in case of urgent necessity in the interest of public health and safety, and then only with the written permission of the Building Inspector.

Other conditions of approval are per plans and any notations made on plans. All work and materials to comply with all applicable codes and ordinances. _____

Site Plan Layout



EQUIPMENT LEGEND:

- UTILITY METER
- MAIN SERVICE PANEL
- VISIBLE, LOCKABLE, LABELED AC DISCONNECT
- METER SOCKET (FOR UTILITY PV METER)
- INVERTER
- COMBINER BOX
- LOAD CENTER
- FIRE SETBACK (3' TYP)

VISIBLE, LOCKABLE, LABELED AC DISCONNECT LOCATED WITHIN 10' OF UTILITY METER

FRONT OF HOME

SUBMITTAL DIAGRAM TEMPLATES

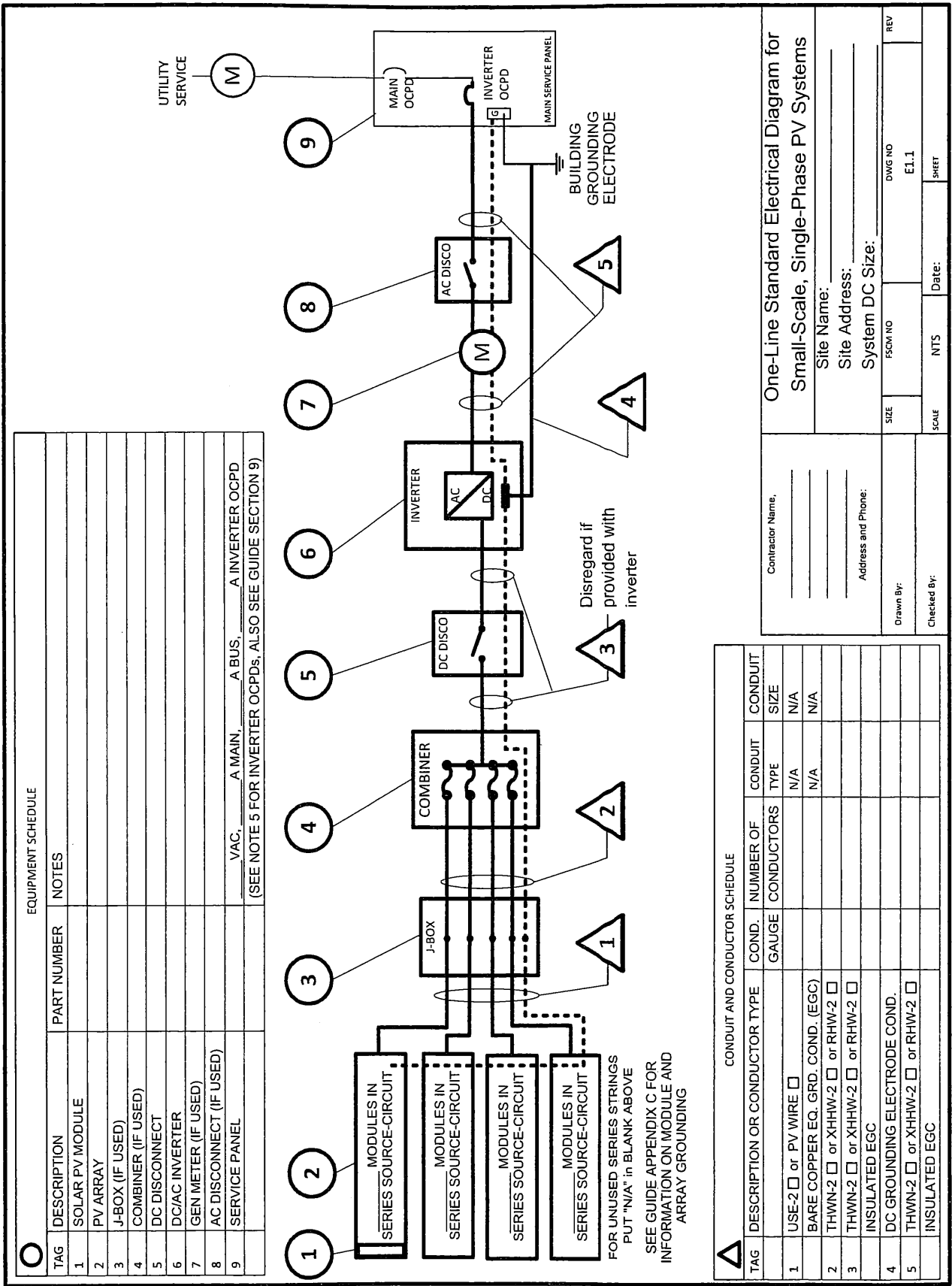
SITE PLAN

Contractor Name, Address and Phone:	Site Plan for Small-Scale, Single-Phase PV Systems			
	Site Name:			
	Site Address:			
	System DC Size:			
Drawn By:	SIZE	PSCM NO	DWG NO	REV
Checked By:	SCALE		Date:	

SOLAR AMERICA BOARD FOR CODES AND STANDARDS REPORT: EXPEDITED PERMIT PROCESS FOR PV SYSTEMS

SUBMITTAL DIAGRAM TEMPLATES

STANDARD ELECTRICAL DIAGRAM



EQUIPMENT SCHEDULE	
○ TAG	DESCRIPTION
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
2	BAFE COPPER EQ. GRD. COND. (EGC)			N/A	N/A
3	THWN-2 <input type="checkbox"/> or XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>				
4	THWN-2 <input type="checkbox"/> or XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>				
5	INSULATED EGC				
6	DC GROUNDING ELECTRODE COND.				
7	THWN-2 <input type="checkbox"/> or XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>				
8	INSULATED EGC				

One-Line Standard Electrical Diagram for Small-Scale, Single-Phase PV Systems

Contractor Name: _____

Site Name: _____

Site Address: _____

System DC Size: _____

Drawn By: _____ FSCM NO _____ DWG NO _____ REV _____

Checked By: _____ SCALE _____ NTS _____ DATE: _____ SHEET _____

SUBMITTAL DIAGRAM TEMPLATES

NOTES FOR STANDARD ELECTRICAL DIAGRAM

NOTES FOR ALL DRAWINGS:

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

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"/> %/°C <input type="checkbox"/>	
IF COEFF SUPPLIED, CIRCLE UNITS	

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

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

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 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 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 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

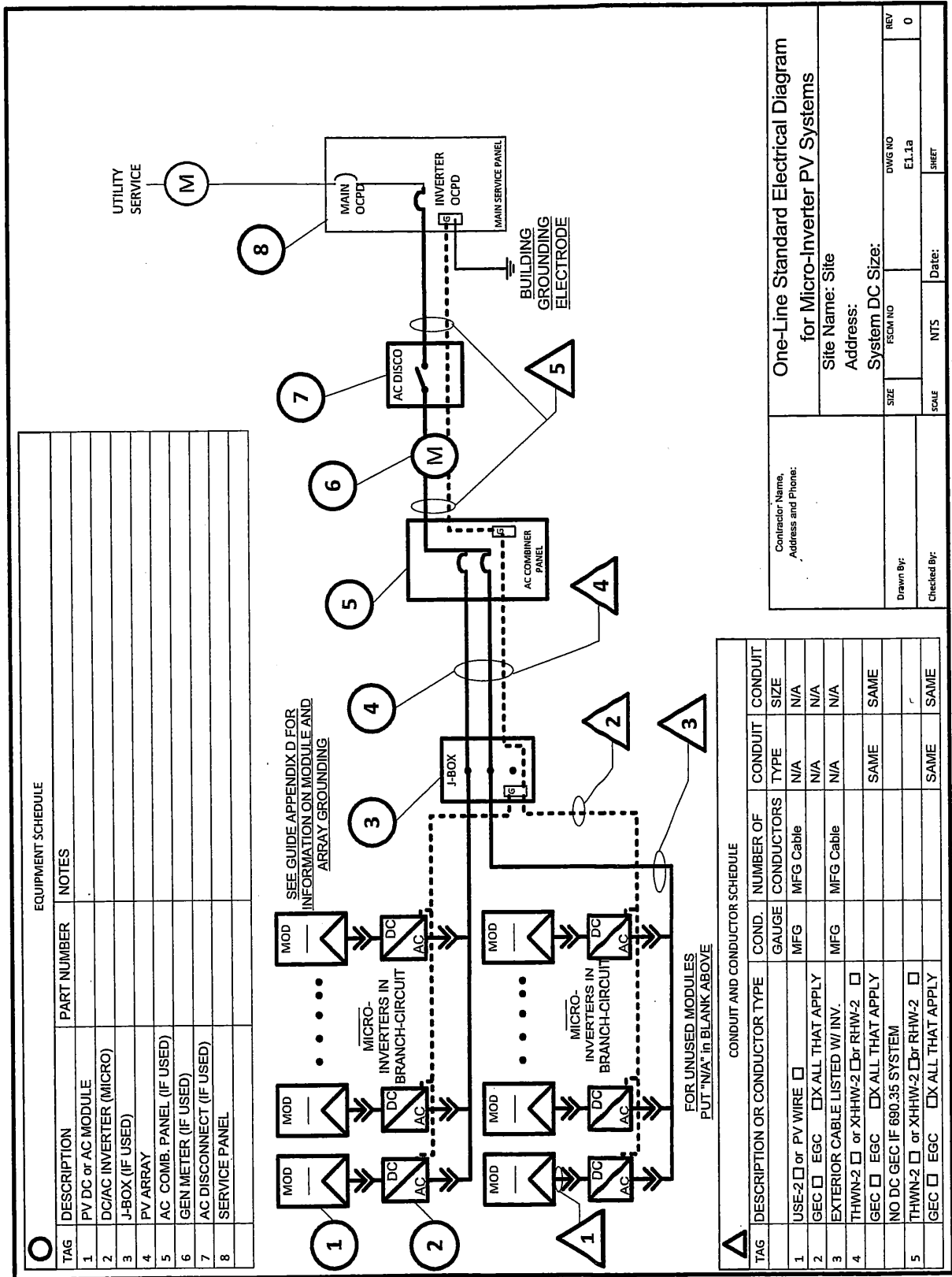
AC OUTPUT CURRENT _____ A

NOMINAL AC VOLTAGE _____ V

THIS PANEL FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)

SUBMITTAL DIAGRAM TEMPLATES

MICRO-INVERTER ELECTRICAL DIAGRAM



SUBMITTAL DIAGRAM TEMPLATES

NOTES FOR MICRO-INVERTER ELECTRICAL DIAGRAM

NOTES FOR ALL DRAWINGS:

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

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

- 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
- 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
- 2009 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 1.5' ABOVE ROOF AND USING THE OUTDOOR DESIGN TEMPERATURE OF 47°C OR LESS (ALL OF UNITED STATES).
 - 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.
 - 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):

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

NOTES FOR DC DISCONNECT

No sign necessary since 690.51 marking on PV module covers needed information

SIGN FOR INVERTER OCPD AND AC DISCONNECT (IF USED)

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

NOTES FOR ALL DRAWINGS:

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

INVERTER RATINGS (Guide Section 4)

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

PV MODULE RATINGS @ STC (Guide Section 5)

MODULE MAKE	
MODULE MODEL	
MAX POWER-POINT CURRENT (I _{mp})	
MAX POWER-POINT VOLTAGE (V _{mp})	
OPEN-CIRCUIT VOLTAGE (V _{oc})	
SHORT-CIRCUIT CURRENT (I _{sc})	
MAX SERIES FUSE (OCPD)	
MAXIMUM POWER (P _{max})	
MAX VOLTAGE (TYP 600V _{oc})	
VOC TEMP COEFF (mV/°C) or %/°C <input type="checkbox"/>	
IF COEFF SUPPLIED, CIRCLE UNITS	

SIGNS-SEE GUIDE SECTION 7

SIGN FOR DC DISCONNECT

No sign necessary since 690.51 marking on PV module covers needed information

SIGN FOR INVERTER OCPD AND AC DISCONNECT (IF USED)

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

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

- 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
- 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
- 2009 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 1.5' ABOVE ROOF AND USING THE OUTDOOR DESIGN TEMPERATURE OF 47°C OR LESS (ALL OF UNITED STATES).
 - 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.
 - 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):

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

Notes for One-Line Standard Electrical Diagram for Single-Phase PV Systems

Contractor Name, Address and Phone: _____

Site Name: Site _____

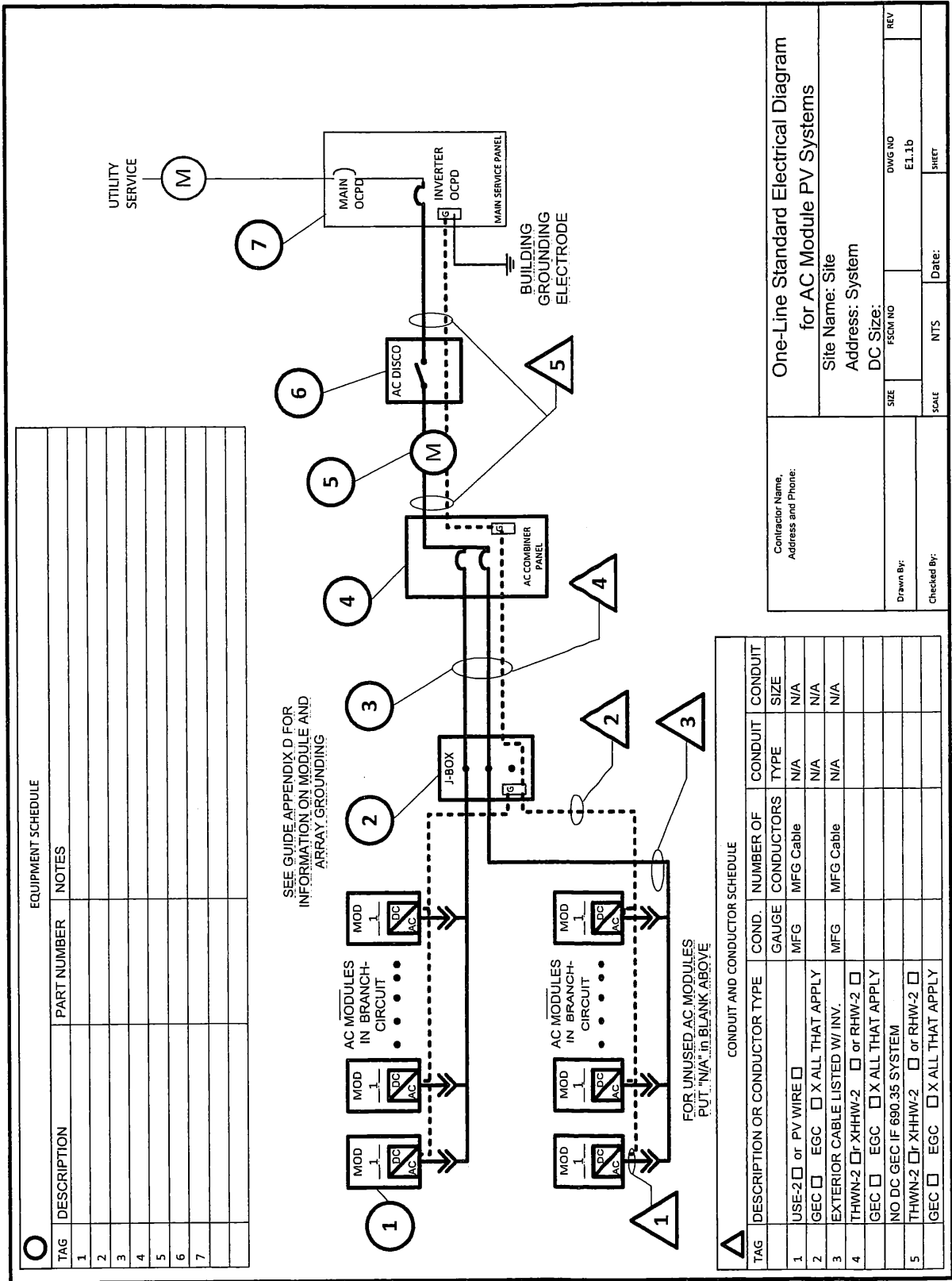
Address: _____

System DC Size: _____

Drawn By: _____	SIZE: _____	FSCM NO: _____	DWG NO: _____	REV: _____
Checked By: _____	SCALE: _____	NTS	Date: _____	SHEET _____

SUBMITTAL DIAGRAM TEMPLATES

AC MODULE ELECTRICAL DIAGRAM



EQUIPMENT SCHEDULE	
TAG	DESCRIPTION
1	
2	
3	
4	
5	
6	
7	

SEE GUIDE, APPENDIX D FOR INFORMATION ON MODULE AND ARRAY GROUNDING

FOR UNUSED AC MODULES PUT "N/A" IN BLANK ABOVE

CONDUIT AND CONDUCTOR SCHEDULE					
TAG	DESCRIPTION OR CONDUCTOR TYPE	CONDUIT GAUGE	NUMBER OF CONDUCTORS	CONDUIT TYPE	CONDUIT SIZE
1	USE-2 <input type="checkbox"/> or PV WIRE <input type="checkbox"/>	MFG	MFG Cable	N/A	N/A
2	GEC <input type="checkbox"/> EGC <input type="checkbox"/> X ALL THAT APPLY	MFG	MFG Cable	N/A	N/A
3	THWN-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>	MFG	MFG Cable	N/A	N/A
4	GEC <input type="checkbox"/> EGC <input type="checkbox"/> X ALL THAT APPLY				
5	NO DC GEC IF 690.35 SYSTEM				
	THWN-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>				
	GEC <input type="checkbox"/> EGC <input type="checkbox"/> X ALL THAT APPLY				

Contractor Name, Address and Phone:

One-Line Standard Electrical Diagram for AC Module PV Systems

Site Name: Site

Address: System

DC Size:

Drawn By: _____

Checked By: _____

Scale: _____

Date: _____

Size: _____

FSCM NO: _____

DWG NO: E1.1B

REV: _____

SHEET: _____

SUBMITTAL DIAGRAM TEMPLATES

NOTES FOR AC MODULE ELECTRICAL DIAGRAM

NOTES FOR ALL DRAWINGS:

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

AC MODULE RATINGS (Guide Appendix C)

AC MODULE MAKE	
AC MODULE MODEL	
NOMINAL OPERATING AC VOLTAGE	
NOMINAL OPERATING AC FREQUENCY	
MAXIMUM AC POWER	
MAXIMUM AC CURRENT	
MAXIMUM OCPCD RATING	

SIGNS—SEE GUIDE SECTION 7

SIGN FOR DC DISCONNECT

N/A since no dc wiring

SIGN FOR INVERTER OCPCD AND AC DISCONNECT (IF USED)

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

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

- 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.) 2009 ASHRAE FUNDAMENTALS 2% DESIGN TEMPERATURES DO NOT EXCEED 40°C IN THE UNITED STATES (PALM SPRINGS, CA IS 44.1°C). FOR 6 OR LESS 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 AC MODULES INVERTER OUTPUT CIRCUITS WITH 12 AMPS OR LESS WHEN PROTECTED BY A 15-AMP OR SMALLER OCPCD.
- b) 10 AWG, 90°C CONDUCTORS ARE GENERALLY ACCEPTABLE FOR AC MODULES INVERTER OUTPUT CIRCUITS WITH 16 AMPS OR LESS WHEN PROTECTED BY A 20-AMP OR SMALLER OCPCD.

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

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

Contractor Name,
 Address and Phone:

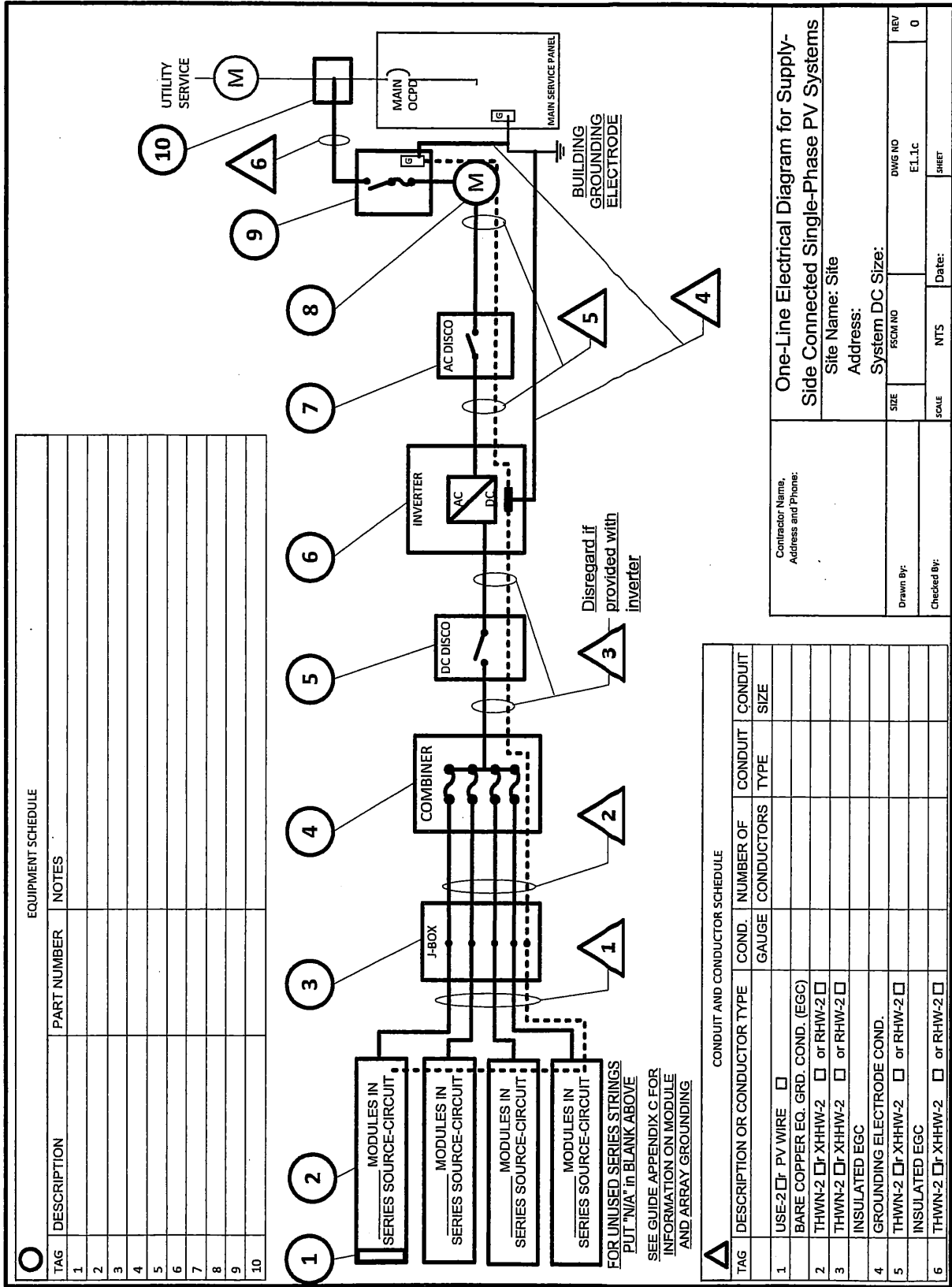
Notes for One-Line Standard Electrical
 Diagram for Single-Phase PV Systems

Site Name: Site
 Address:
 System DC Size:

Drawn By:	Bill	SIZE	FSC/NO	DWG NO	REV
Checked By:	Ted	SCALE	NTS	EL.2b	0
				SHEET	

SUBMITTAL DIAGRAM TEMPLATES

SUPPLY-SIDE CONNECTED ELECTRICAL DIAGRAM



EQUIPMENT SCHEDULE	
TAG	DESCRIPTION
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

CONDUIT AND CONDUCTOR SCHEDULE	
TAG	DESCRIPTION OR CONDUCTOR TYPE
1	USE-2 <input type="checkbox"/> PV WIRE <input type="checkbox"/>
2	BARE COPPER EQ. GRD. COND. (EGC)
3	THWN-2 <input type="checkbox"/> XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>
4	THWN-2 <input type="checkbox"/> XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>
5	INSULATED EGC
6	THWN-2 <input type="checkbox"/> XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>
7	THWN-2 <input type="checkbox"/> XHHW-2 <input type="checkbox"/> or RHW-2 <input type="checkbox"/>

Contractor Name, Address and Phone:

One-Line Electrical Diagram for Supply-Side Connected Single-Phase PV Systems

Site Name: Site
Address:
System DC Size:

Drawn By: _____ DWG NO _____ REV 0
Checked By: _____ SCALE _____ NTS _____ Date: _____ SHEET _____

SUBMITTAL DIAGRAM TEMPLATES

NOTES FOR SUPPLY-SIDE CONNECTED ELECTRICAL DIAGRAM

NOTES FOR ALL DRAWINGS:

OCPD = OVERCURRENT PROTECTION DEVICE
 NATIONAL ELECTRICAL CODE® REFERENCES SHOWN AS (NEC XXXX.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

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)(e)? YES NO

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 Isc 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 Isc OF 9.6 AMPS OR LESS WHEN PROTECTED BY A 15-AMP OR SMALLER FUSE.

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 _{oc})	V
VOC TEMP COEFF (mV/°C) [r %/°C] <input type="checkbox"/>	
IF COEFF SUPPLIED, CIRCLE UNITS	

NOTES 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)	

SIGNS—SEE GUIDE SECTION 7

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

Notes for One-Line Standard Electrical Diagram for Single-Phase PV Systems

Contractor Name, Address and Phone: _____

Site Name: _____

Site Address: _____

System DC Size: _____

SIZE FSCM NO DWG NO
 Drawn By: _____ E1.2
 SCALE NTS Date: _____ SHEET
 Checked By: _____ REV