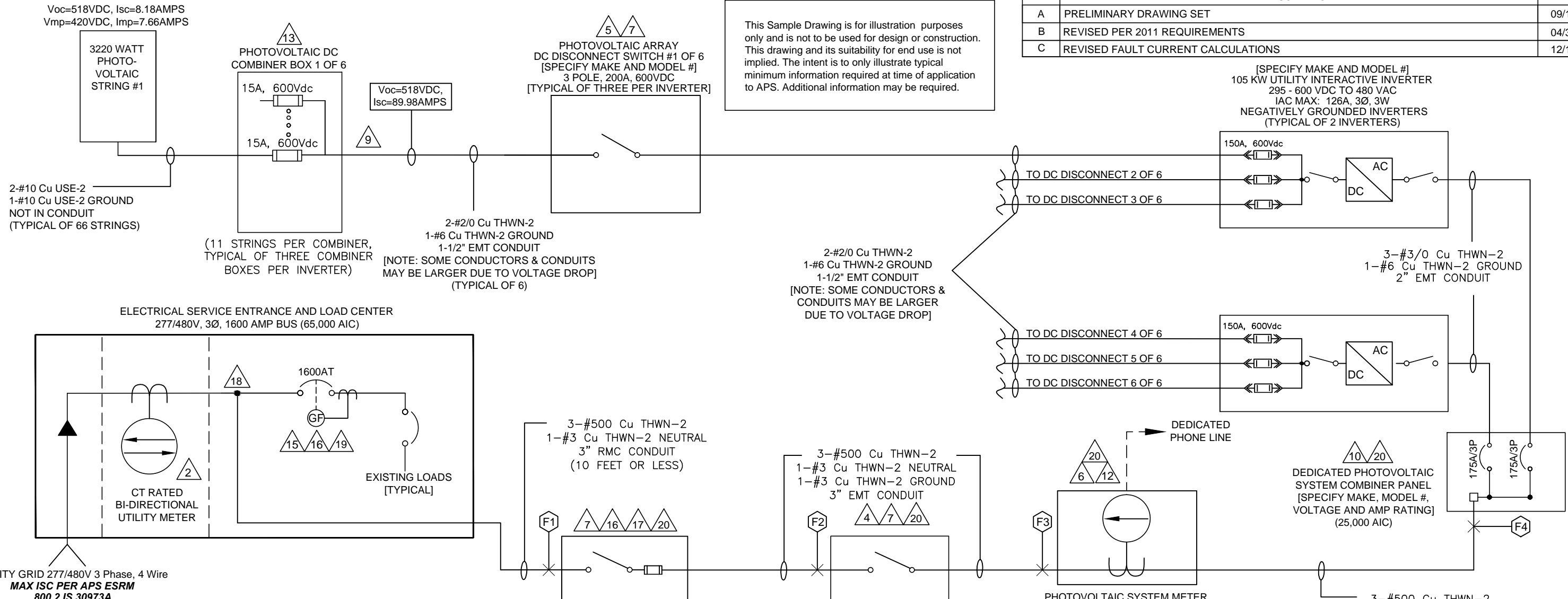


REV.	DESCRIPTION	DATE
A	PRELIMINARY DRAWING SET	09/10/10
B	REVISED PER 2011 REQUIREMENTS	04/30/13
C	REVISED FAULT CURRENT CALCULATIONS	12/19/14

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**NOTES:**

- 1 ALL EQUIPMENT SHALL BE INSTALLED AND LABELED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.
- 2 CT RATED BI-DIRECTIONAL UTILITY METER INSTALLED BY UTILITY COMPANY (AS REQUIRED).
- 4 LABEL "PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH". SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE VISUAL OPEN AND ACCESSIBLE PER UTILITY REQUIREMENTS AND CONFORM TO NEC 705.22, AND IS RATED FOR THE AVAILABLE FAULT CURRENT.
- 5 LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT DEVICE #/6" PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.53. SWITCH TO BE LOCKED PER NEC 690.7(D). **[PLEASE SHOW SWITCH INTERNAL WIRING CONFIGURATION PER MANUFACTURER'S REQUIREMENTS.]**
- 6 LABEL "PHOTOVOLTAIC SYSTEM METER". METER ENCLOSURE AND SOCKET PROVIDED AND INSTALLED BY CUSTOMER PER APS ESRM. METER, CTs AND TEST SWITCHES PROVIDED BY UTILITY COMPANY WHEN REQUIRED. **NOTE 1: CUSTOMER TO SUBMIT SHOP DRAWINGS OF METERING CABINET TO APS METERSHOP FOR APPROVAL. NOTE 2: CT RATED PRODUCTION METERING ENCLOSURES SHALL HAVE THE BUS IDENTIFIED WITH REFERENCE TO THE GENERATION SOURCE SIDE PRIOR TO METERING INSTALLATION WITH A TEMPORARY TAG LABELED "GENERATION SOURCE"**
- 7 PROVIDE WARNING SIGN PER NEC 690.17 READING "WARNING-ELECTRIC SHOCK HAZARD-DO NOT TOUCH TERMINALS-TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OFF POSITION".
- 9 METALLIC CONDUIT SHALL BE USED WITHIN BUILDING PER NEC 690.31(E).
- 10 LABEL "DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL" AND "DO NOT ADD LOADS TO THIS PANEL".
- 11 GEC TO BE INSTALLED AS REQUIRED BY MANUFACTURER INSTRUCTIONS AND NEC 690.47.
- 12 CUSTOMER TO PROVIDE A DEDICATED PHONE LINE TO THE PHOTOVOLTAIC SYSTEM METER. CONNECT INTO THE APS PROVIDED TELEPHONE INTERFACE MODULE WHICH WILL BE LOCATED WITHIN TWO FEET OF THE METER. **NOTE: ONLY REQUIRED FOR APPLICABLE APS RATES AND INCENTIVE PROGRAMS. A DEDICATED PHONE LINE MAY BE REQUIRED AT THE BI-DIRECTIONAL METER AS WELL.**
- 13 DC COMBINER BOX, LABEL "WARNING, DO NOT OPEN FUSES UNDER LOAD."
- 15 A PLACARD OR DIRECTORY IS INSTALLED AT THE SERVICE ENTRANCE WITH EXPLICIT DIRECTIONS TO THE LOCATION OF THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH AS REQUIRED BY APS.
- 16 A PERMANENT PLACARD OR DIRECTORY IS INSTALLED PER NEC 705.10.
- 17 SUPPLY SIDE CONNECTION IS INSTALLED PER NEC 230.79(D), 240.24(B), 225.32, APS ESRM, AND APS INTERCONNECTION REQUIREMENTS. LABEL "PHOTOVOLTAIC SYSTEM SERVICE DISCONNECT SWITCH". SWITCH COVER TO BE LOCKED AT ALL TIMES.
- 18 SUPPLY SIDE CONNECTION IS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. DOCUMENTATION IS INCLUDED WITH THE APS INTERCONNECTION APPLICATION.
- 19 LABEL "WARNING - A GENERATION SOURCE IS CONNECTED TO THE SUPPLY (UTILITY) SIDE OF THE SERVICE DISCONNECTING MEANS. FOLLOW PROPER LOCKOUT/ TAGOUT PROCEDURES TO ENSURE THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH IS OPENED PRIOR TO PERFORMING WORK ON THIS DEVICE."
- 20 EQUIPMENT SHALL BE TESTED, LISTED AND MARKED TO WITHSTAND THE AVAILABLE SHORT CIRCUIT CURRENT.

FAULT CALCS:			
F1:	AVAIL = 30,973 AIC	F2:	AVAIL = 28,137 AIC
	d = 10 feet		d = 10 feet
	f = 0.050		f = 0.046
	m = 0.952		m = 0.956
	Isc = 29,487 AIC		Isc = 26,906 AIC
F3:	AVAIL = 29,487 AIC	F4:	AVAIL = 26,906 AIC
	d = 10 feet		d = 25 feet
	f = 0.048		f = 0.109
	m = 0.954		m = 0.901
	Isc = 28,137 AIC		Isc = 24,253 AIC

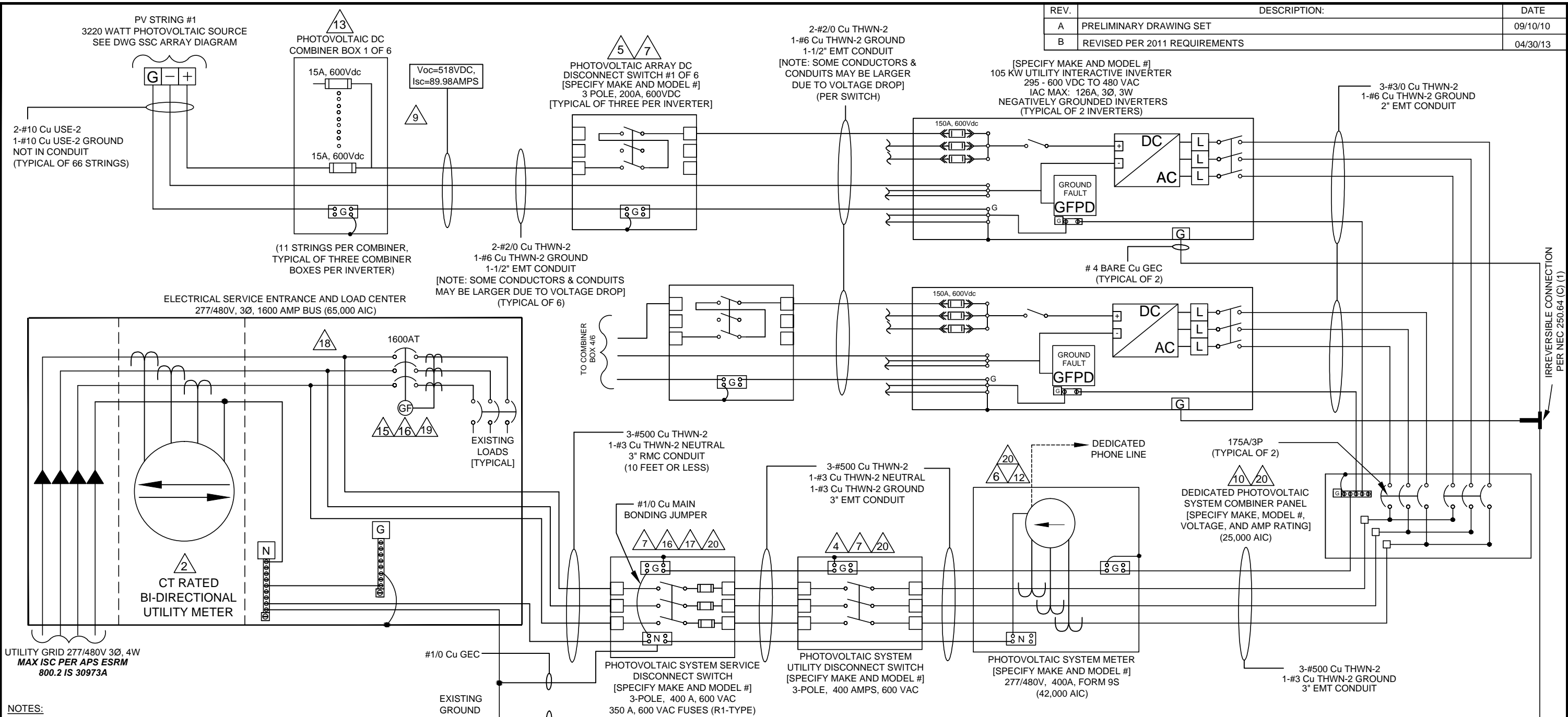
\* SOURCE: COOPER BUSSMAN SPD MANUAL, REV 2009. CALCULATIONS IN ACCORDANCE WITH NEC ART 110.9 & 110.10.

**NOTE: SYSTEM DESIGNED IN ACCORDANCE WITH THE 2011 N.E.C.**

**SAMPLE SUPPLY SIDE CONNECTION ONE-LINE DIAGRAM**

1234 South Main Street Any City, Arizona 85123 Tel: 602-555-5555		<b>ABC SOLAR COMPANY INC.</b>	
APPROVALS		DATE	
DRAWN ABC		09-10-10	
CHECKED			
ENGINEER			
REV. C		12-19-14	
ABC PROJECT #1111-9999		<b>SSC ONE-LINE</b>	
SIZE	CODE INTENT NO.	DRAWING NO.	
<b>B</b>			
SCALE	<b>NA</b>	<b>REV. C</b>	SHEET <b>1</b> OF <b>5</b>

REV.	DESCRIPTION:	DATE
A	PRELIMINARY DRAWING SET	09/10/10
B	REVISED PER 2011 REQUIREMENTS	04/30/13



- NOTES:**
- 1 ALL EQUIPMENT SHALL BE INSTALLED AND LABELED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.
  - 2 CT-RATED BI-DIRECTIONAL UTILITY METER INSTALLED BY UTILITY COMPANY (AS REQUIRED).
  - 4 LABEL "PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH". SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE VISUAL OPEN AND ACCESSIBLE PER UTILITY REQUIREMENTS AND CONFORM TO NEC 705.22, AND IS RATED FOR THE AVAILABLE FAULT CURRENT.
  - 5 LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT DEVICE #6" PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.53. SWITCH TO BE LOCKED PER NEC 690.7(D). [PLEASE SHOW SWITCH INTERNAL WIRING CONFIGURATION PER MANUFACTURER'S REQUIREMENTS.]
  - 6 LABEL "PHOTOVOLTAIC SYSTEM METER". METER ENCLOSURE AND SOCKET PROVIDED AND INSTALLED BY CUSTOMER PER APS ESRM. METER, CTs AND TEST SWITCHES PROVIDED BY UTILITY COMPANY WHEN REQUIRED. **NOTE 1: CUSTOMER TO SUBMIT SHOP DRAWINGS OF METERING CABINET TO APS METERSHOP FOR APPROVAL. NOTE 2: CT RATED PRODUCTION METERING ENCLOSURES SHALL HAVE THE BUS IDENTIFIED WITH REFERENCE TO THE GENERATION SOURCE SIDE PRIOR TO METERING INSTALLATION WITH A TEMPORARY TAG LABELED "GENERATION SOURCE"**
  - 7 PROVIDE WARNING SIGN PER NEC 690.17 READING "WARNING-ELECTRIC SHOCK HAZARD-DO NOT TOUCH TERMINALS-TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OFF POSITION".
  - 9 METALLIC CONDUIT SHALL BE USED WITHIN BUILDING PER NEC 690.31(E).
  - 10 LABEL "DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL" AND "DO NOT ADD LOADS TO THIS PANEL".
  - 11 GEC TO BE INSTALLED AS REQUIRED BY MANUFACTURER INSTRUCTIONS AND NEC 690.47.
  - 12 CUSTOMER TO PROVIDE A DEDICATED PHONE LINE TO THE PHOTOVOLTAIC SYSTEM METER. CONNECT INTO THE APS PROVIDED TELEPHONE INTERFACE MODULE WHICH WILL BE LOCATED WITHIN TWO FEET OF THE METER. **NOTE: ONLY REQUIRED FOR APPLICABLE APS RATES AND INCENTIVE PROGRAMS. A DEDICATED PHONE LINE MAY BE REQUIRED AT THE BI-DIRECTIONAL METER AS WELL.**

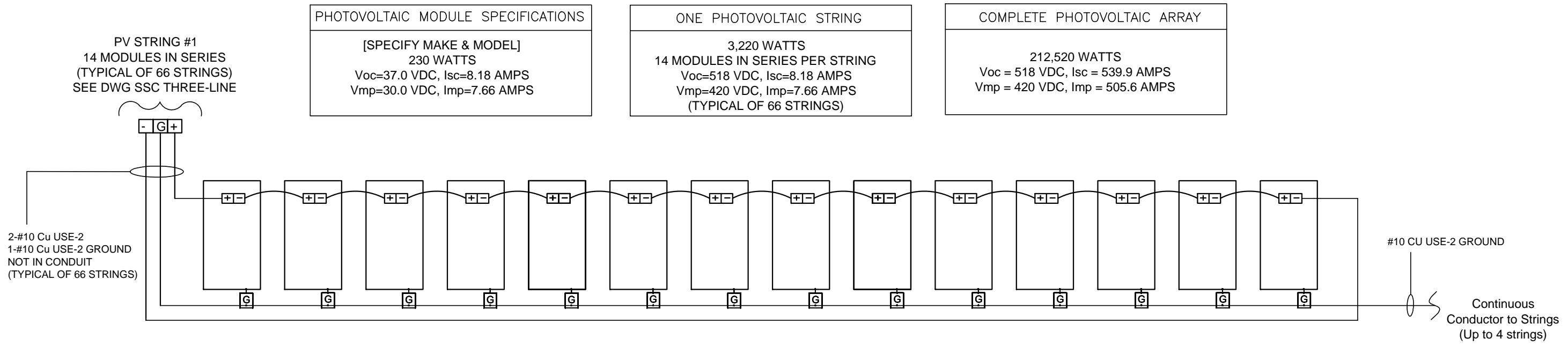
- 13 DC COMBINER BOX, LABEL "WARNING, DO NOT OPEN FUSES UNDER LOAD."
- 15 A PLACARD OR DIRECTORY IS INSTALLED AT THE SERVICE ENTRANCE WITH EXPLICIT DIRECTIONS TO THE LOCATION OF THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH AS REQUIRED BY APS.
- 16 A PERMANENT PLACARD OR DIRECTORY IS INSTALLED PER NEC 705.10.
- 17 SUPPLY SIDE CONNECTION IS INSTALLED PER NEC 230.79(D), 240.24(B), 225.32, APS ESRM, AND APS INTERCONNECTION REQUIREMENTS. LABEL "PHOTOVOLTAIC SYSTEM SERVICE DISCONNECT SWITCH". SWITCH COVER TO BE LOCKED AT ALL TIMES.
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**SAMPLE SUPPLY SIDE CONNECTION 3-LINE DIAGRAM**

1234 South Main Street Any City, Arizona 85123 Tel: 602-555-5555		<b>ABC SOLAR COMPANY INC.</b>	
APPROVALS		DATE	
DRAWN	ABC	09-10-10	
CHECKED			
ENGINEER			
REV. B		04-30-13	
ABC PROJECT #1111-9999		SIZE <b>B</b>	CODE INTENT NO.
		DRAWING NO. <b>SSC THREE-LINE</b>	
SCALE <b>NA</b>		REV. <b>B</b>	SHEET <b>2 OF 5</b>

REV.	DESCRIPTION	DATE
A	PRELIMINARY DRAWING SET	09/10/10
B	REVISED PER 2011 REQUIREMENTS	04/30/13



PHOTOVOLTAIC MODULE SPECIFICATIONS
[SPECIFY MAKE & MODEL] 230 WATTS Voc=37.0 VDC, Isc=8.18 AMPS Vmp=30.0 VDC, Imp=7.66 AMPS

ONE PHOTOVOLTAIC STRING
3,220 WATTS 14 MODULES IN SERIES PER STRING Voc=518 VDC, Isc=8.18 AMPS Vmp=420 VDC, Imp=7.66 AMPS (TYPICAL OF 66 STRINGS)

COMPLETE PHOTOVOLTAIC ARRAY
212,520 WATTS Voc = 518 VDC, Isc = 539.9 AMPS Vmp = 420 VDC, Imp = 505.6 AMPS

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**NOTES:**

- EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
- GROUND WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW FOR PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690-4 (C).
- FOLLOW MANUFACTURERS SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.
- WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS.

**SAMPLE SUPPLY SIDE CONNECTION ARRAY DRAWING**

1234 South Main Street Any City, Arizona 85123 Tel: 602-555-5555		<b>ABC SOLAR COMPANY INC.</b>		
APPROVALS		THREE-LINE ELECTRICAL ARRAY DIAGRAM		
DATE		210 KW AC PHOTOVOLTAIC SYSTEM		
DRAWN	ABC	999 N. CACTUS BIRD RD.		
CHECKED		ANY CITY, AZ 85123		
ENGINEER		SIZE	CODE INTENT NO.	DRAWING NO.
REV. B	04-30-13	B		<b>SSC ARRAY DIAGRAM</b>
ABC PROJECT #1111-9999		SCALE	NA	REV. B
				SHEET 3 OF 5

REV.	DESCRIPTION:	DATE
A	PRELIMINARY DRAWING SET	09/10/10

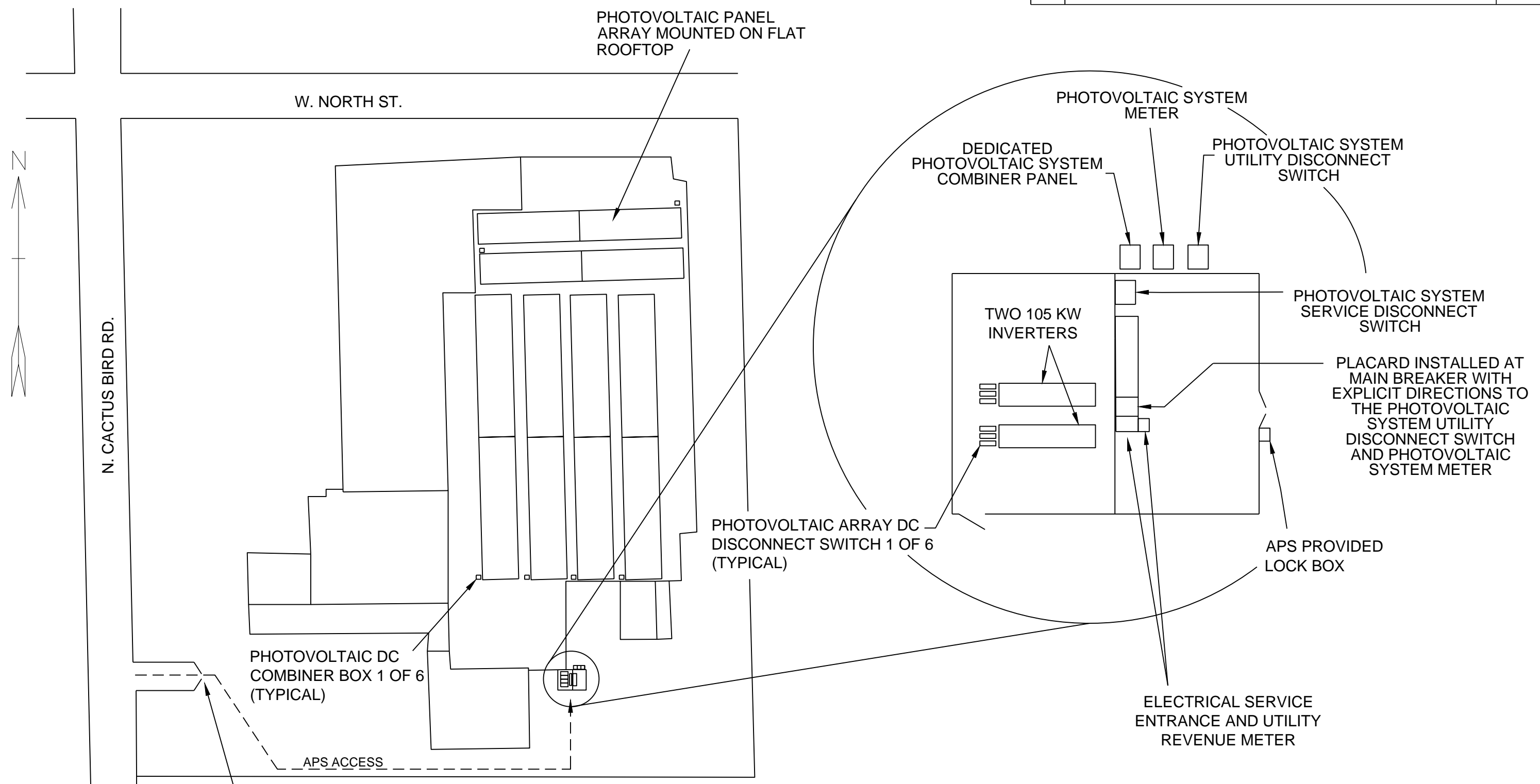


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**SAMPLE SUPPLY SIDE CONNECTION PLANT LOCATION**

1234 South Main Street Any City, Arizona 85123 Tel: 602-555-5555		<b>ABC SOLAR COMPANY INC.</b>		
APPROVALS		PLANT LOCATION		
DRAWN	ABC	210 KW AC PHOTOVOLTAIC SYSTEM		
CHECKED		999 N. CACTUS BIRD RD.		
ENGINEER		ANY CITY, AZ 85123		
REV. A	09-10-10	SIZE	CODE INTENT NO.	DRAWING NO.
ABC PROJECT #1111-9999		<b>B</b>		<b>SSC PLANT LOCATION</b>
		SCALE	<b>NA</b>	<b>REV. A</b>
				SHEET <b>4</b> OF <b>5</b>

REV.	DESCRIPTION:	DATE
A	PRELIMINARY DRAWING SET	09/10/10
B	WORKSPACE NOTE	04/30/13



DRIVEWAY WITH GATE & KEY CODE SECURITY IN APS PROVIDED LOCKBOX  
**ACCESS CODE: 12345#**

**NOTE: UTILITY HAS 24-HR UNRESTRICTED ACCESS TO THE PHOTOVOLTAIC SYSTEM METER AND PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH THROUGH THE SECURITY GATE**

**NOTE: WORKSPACE IN FRONT OF AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH APS AND NEC REQUIREMENTS.**

**SAMPLE SUPPLY SIDE CONNECTION SITE PLAN**

1234 South Main Street Any City, Arizona 85123 Tel: 602-555-5555		<b>ABC SOLAR COMPANY INC.</b>	
APPROVALS		DATE	
DRAWN	ABC	09-10-10	
CHECKED			
ENGINEER			
REV. B		04-30-13	
ABC PROJECT #1111-9999		SIZE <b>B</b>	CODE INTENT NO.
		DRAWING NO. <b>SSC SITE PLAN</b>	
		SCALE <b>NA</b>	REV. <b>B</b>
		SHEET <b>5 OF 5</b>	

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