

K ALLEN CSG LLC SOLAR

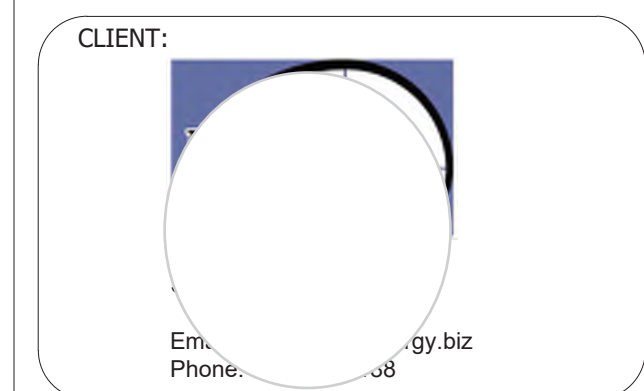
0.67 MWDC - 0.50 MWAC SOLAR PROJECT



NO ALTERATION PERMITTED EXCEPT AS PROVIDED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

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REV.	DATE	DESCRIPTION
0	10/29/21	IC (15%) SUBMITTAL



PROJECT:
K ALLEN CSG LLC SOLAR

ADDRESS:
 WESTFIELD, ME 04787

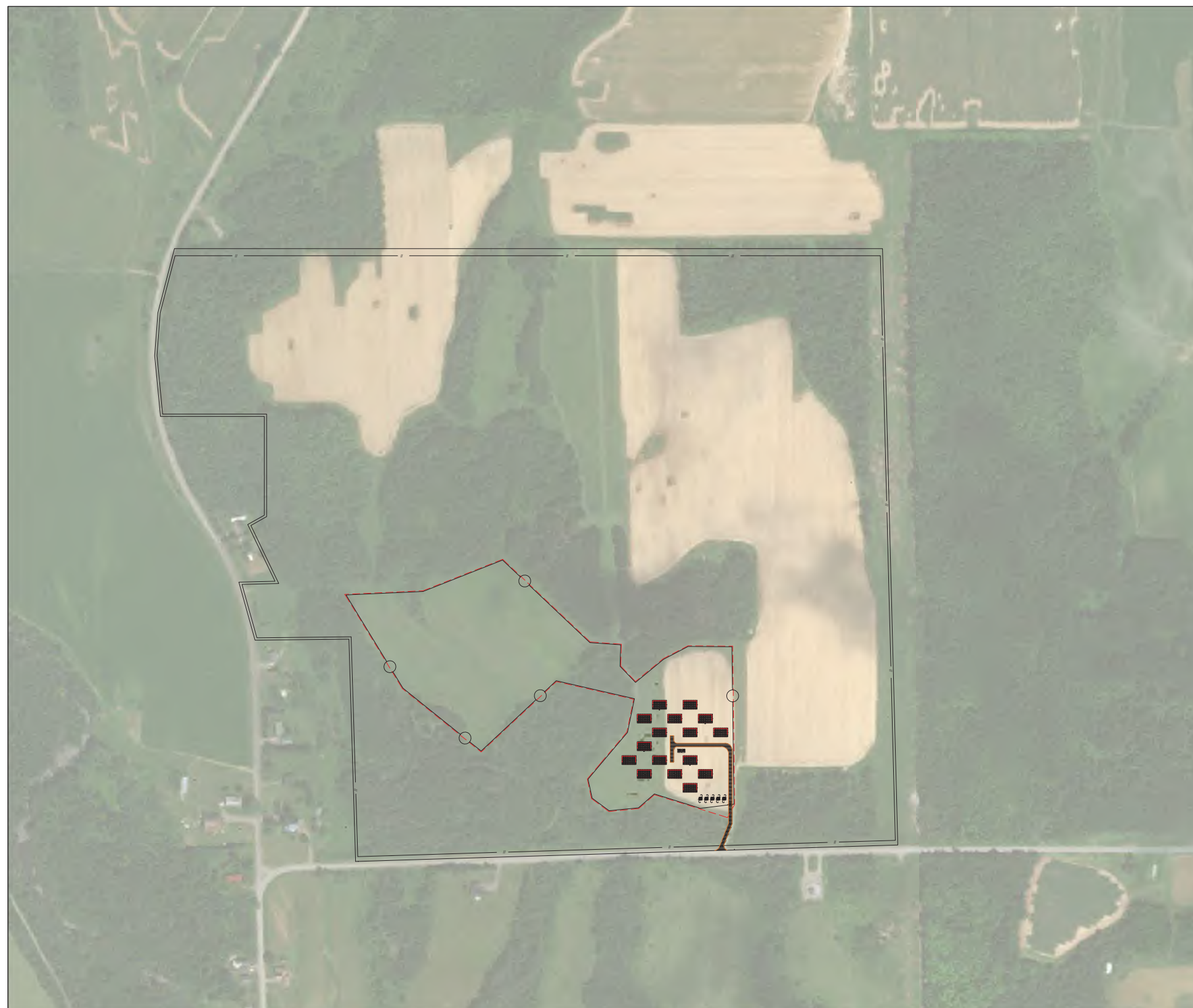
PROJECT NUMBER:
 AE# 1379

SHEET SIZE: 24x36
 DESIGNED BY: AC

DRAWN BY: DS
 CHECKED BY: DEE

DRAWING TITLE:
COVER SHEET

SHEET NO:
E001



1 SITE OVERVIEW
 E001 SCALE: 1"=500'

SCOPE OF WORK:

THE PROPOSED PROJECT IS A GROUND MOUNTED SOLAR PV FARM INCORPORATING DOUBLE AXIS TRACKER RACKING AND SOLAR BIFACIAL TECHNOLOGY. THE NEW PV SYSTEM IS TO BE INSTALLED ON THE ZONED PROPERTY IN THE TOWN OF WESTFIELD, MAINE. THE PV SYSTEM IS TO BE INTERCONNECTED WITH THE UTILITY GRID, WHEREIN THE GENERATED ENERGY SHALL BE FED IN TO UTILITY POLES.

PROJECT DETAILS	
PROJECT ADDRESS:	WESTFIELD, ME 04787
PROJECT LOCATION:	1313
TAX ID:	009-
PROJECT AREA:	~18.75 ACRES
ROW-TO-ROW SPACING:	58.8 FT
FREE ROW SPACING:	21 FT
ARRAY WIDTH:	59.8 FT
SETBACKS:	MIN 15 FT FROM PROJECT BOUNDARY

2 SCOPE OF WORKS AND PROJECT DETAILS
 E001 SCALE: NTS



3 LOCATION MAP
 E001 SCALE: NTS



4 AERIAL VIEW
 E001 SCALE: NTS

DEVELOPER:

ENGINEERED BY:

DURAK EVRIM ERCAN, P.E.
 TEL: (201) 920-2899
 EMAIL: INFO@AMPERENGINEERING.COM

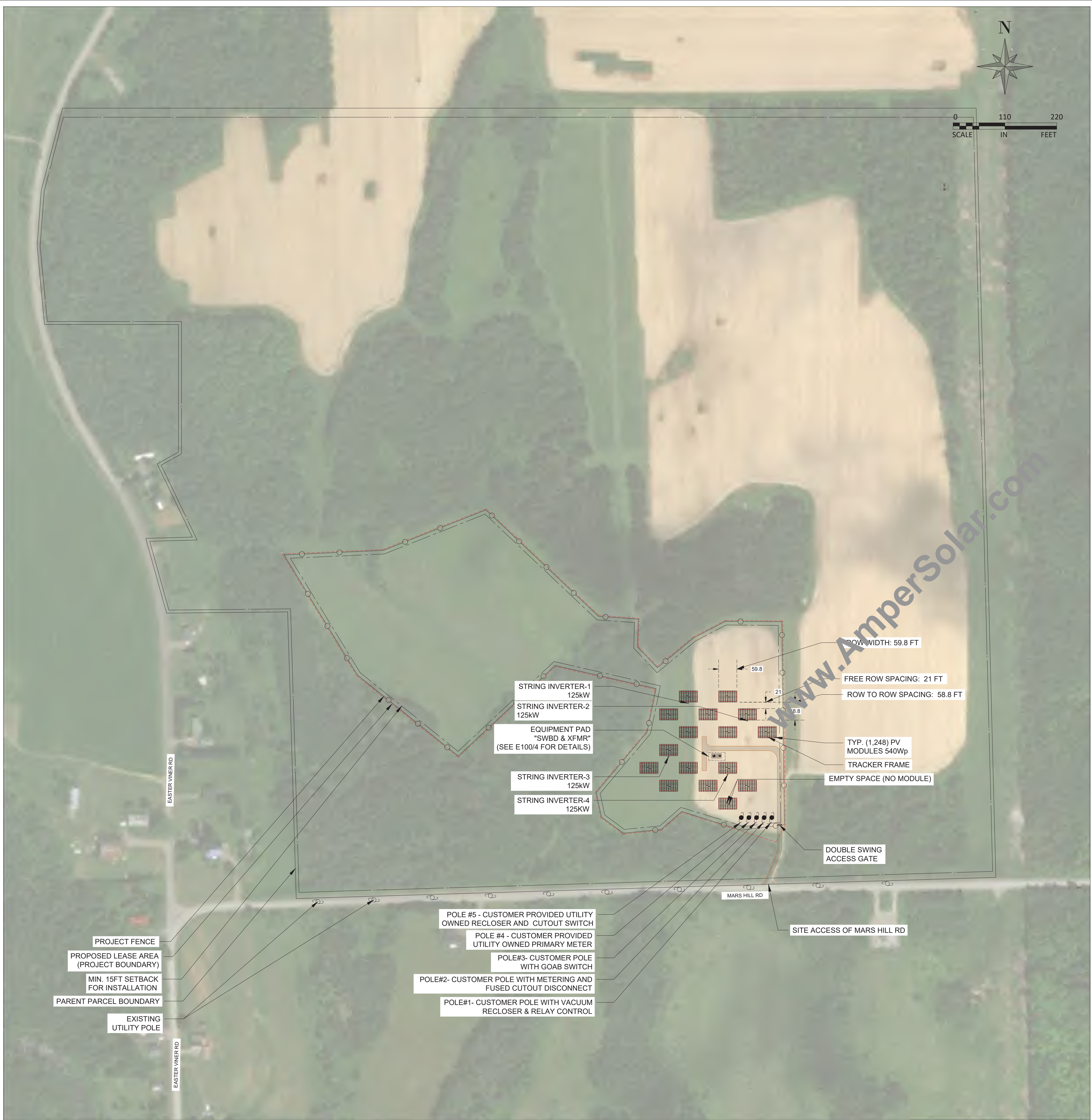
SHEET	DESCRIPTION
E001	COVER SHEET
E100	OVERALL SITE PLAN
E200	ONE LINE DIAGRAM - AC ELECTRICAL SYSTEM
E450	LABELS

LEGEND	
UPDATED DRAWING ISSUE	●
UNCHANGED, PREVIOUSLY ISSUED STILL CURRENT	○
DRAWINGS REMOVED FROM SET	✕

5 SHEET INDEX
 E001 SCALE: NTS

INTERCONNECTION DESIGN (15%)
 10/29/21

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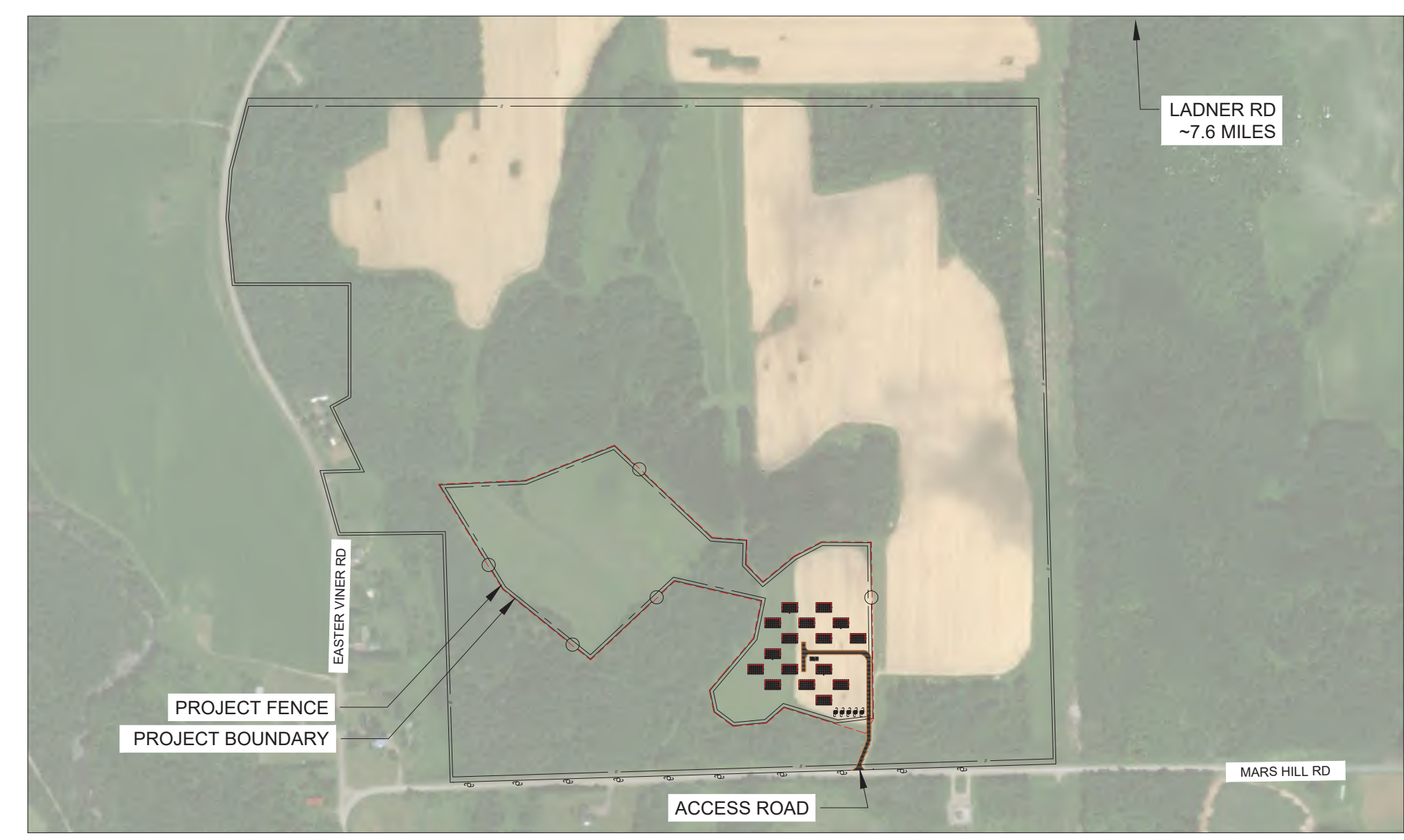


1 OVERALL SITE PLAN
E100 SCALE: 1"=170'

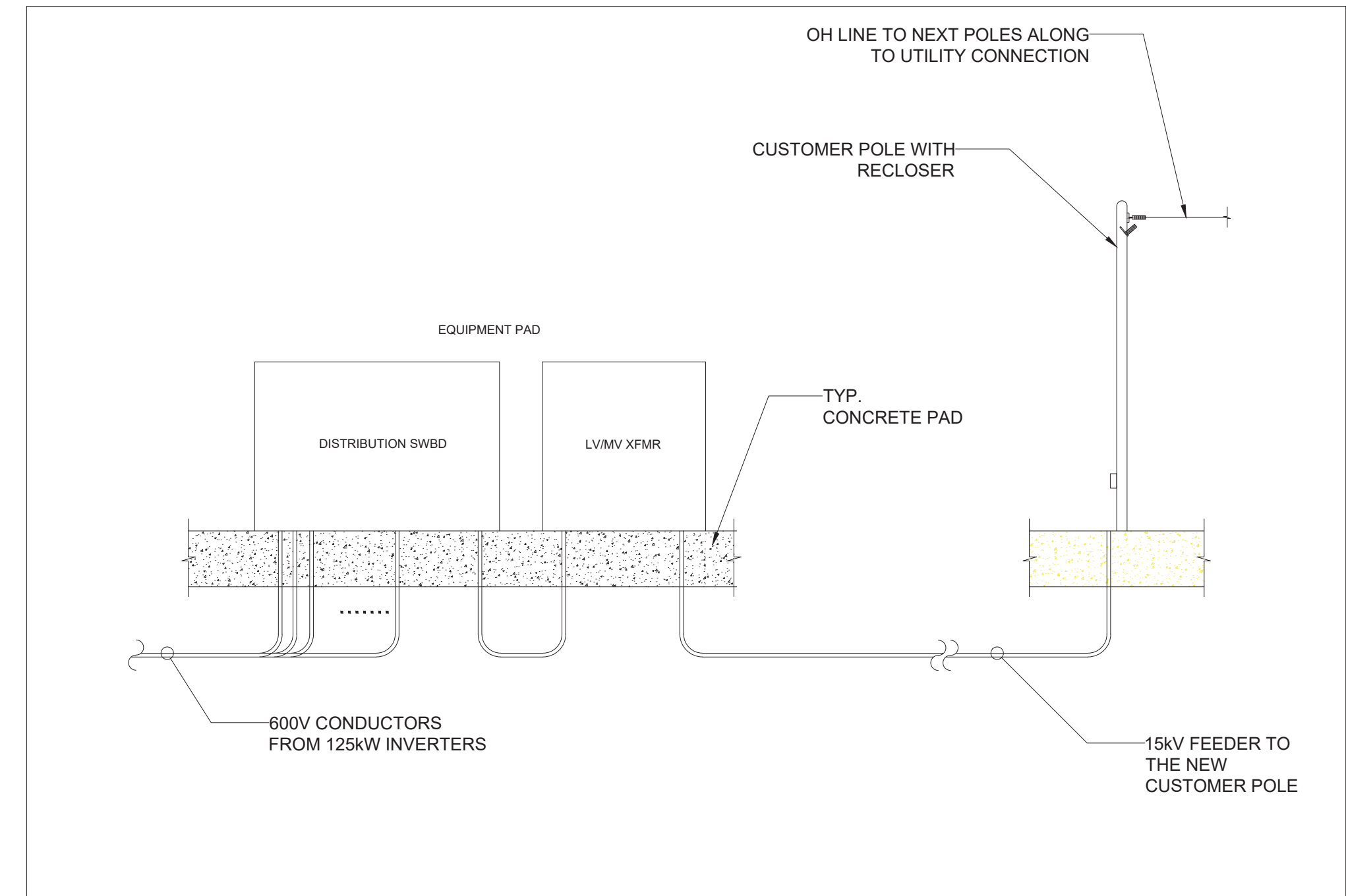
SYSTEM SUMMARY

DC SYSTEM SIZE:	0.67MW
AC SYSTEM SIZE:	0.50MW
DC/AC RATIO:	1.26
PV MODULE MANUFACTURER:	ZNSHINESOLAR
PV MODULE TYPE:	BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULES (ZXM7-SHLDD144 540W)
PV MODULE OUTPUT (STC):	540Wp
TOTAL NO. OF PV MODULES:	1248
TOTAL NO. OF STRINGS:	48
MODULES PER STRING:	26
MAX VOLTAGE PER MODULE:	58.19 V
MAX VOLTAGE PER STRING:	1512.99 V
INVERTER MANUFACTURER:	CHINT POWER SYSTEMS
INVERTER TYPE:	STRING INVERTER (CPS SCH125KTL-DO/US-600)
INVERTER AC OUTPUT POWER:	125 kW
TOTAL NO. OF INVERTERS:	4
MOUNTING SYSTEM:	DOUBLE AXIS TRACKER AZIMUTH: 0°-360°; TILT: 0°-90°
ASHRAE DB EXTREME MIN (Mean):	-32.3°C
ASHRAE DB EXTREME MAX (Mean):	32.4°C
MAX DC SYSTEM VOLTAGE:	1500 V
AC SYSTEM VOLTAGE:	600 V @ INVERTERS OUTPUT; 12.47 kV @ PCC

2 PROJECT SUMMARY
E100 SCALE: NTS



3 OVERALL VIEW
E100 SCALE: 1"=500'



4 EQUIPMENT LAYOUT
E100 SCALE: NTS

PROFESSIONAL ENGINEERING:

DURAK EVRIM ERCAN P.E.
ENGINEERING | CONSULTING | ESTIMATING
201-920-2899 | info@AmperEngineering.com

SEAL & SIGNATURE:

Durak Ercan

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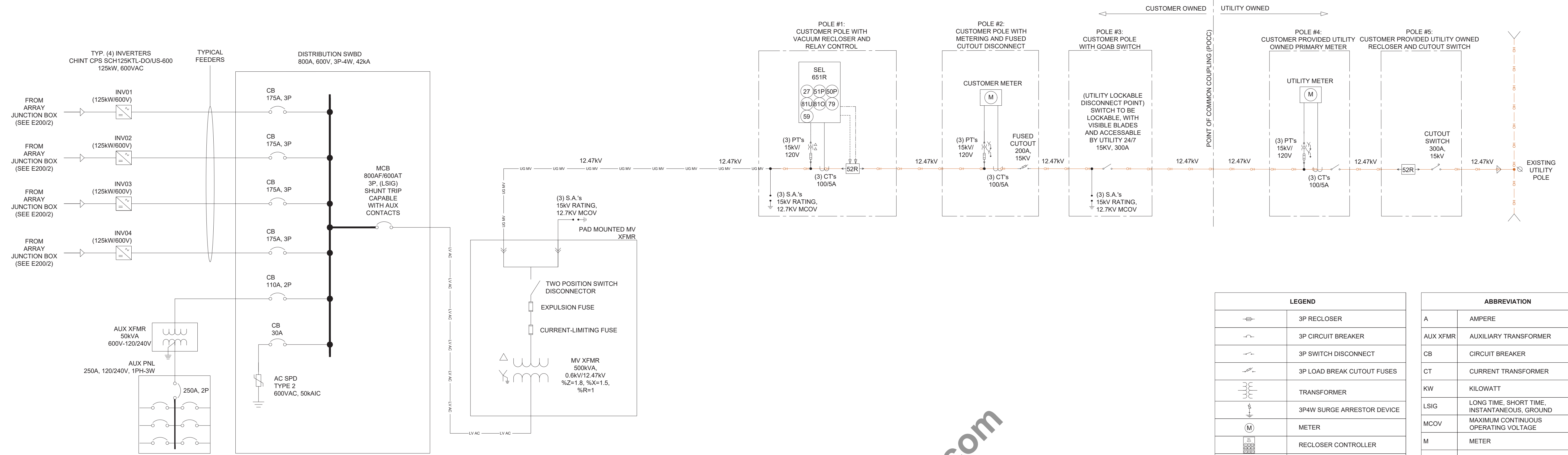
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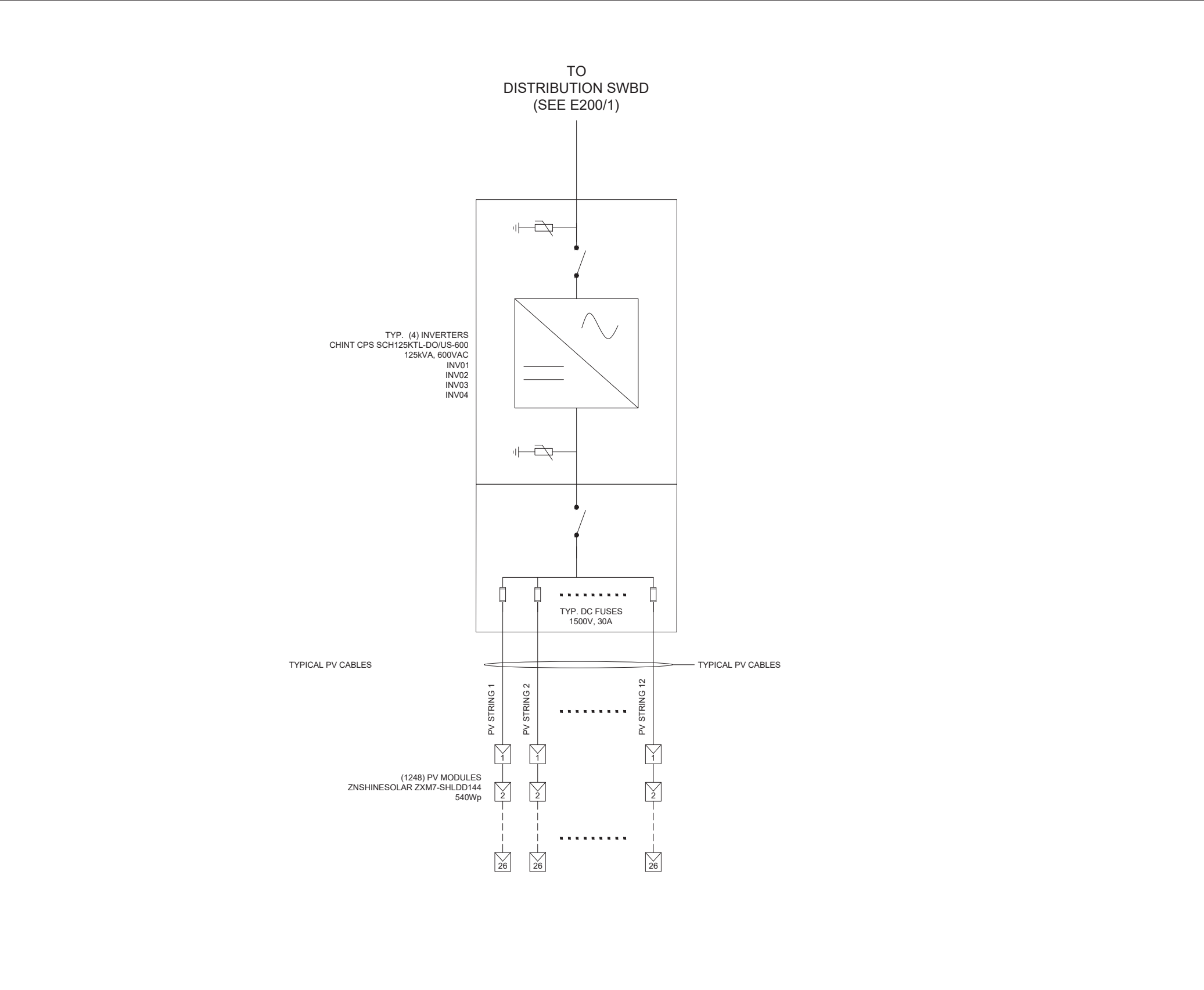
SHEET NO:
E100

1 AC ONE LINE DIAGRAM
E200 SCALE: NTS



LEGEND		ABBREVIATION	
	3P RECLOSER	A	AMPERE
	3P CIRCUIT BREAKER	AUX XFMR	AUXILIARY TRANSFORMER
	3P SWITCH DISCONNECT	CB	CIRCUIT BREAKER
	3P LOAD BREAK CUTOUT FUSES	CT	CURRENT TRANSFORMER
	TRANSFORMER	KW	KILOWATT
	3P4W SURGE ARRESTOR DEVICE	LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, GROUND
	METER	MCOV	MAXIMUM CONTINUOUS OPERATING VOLTAGE
	RECLOSER CONTROLLER	M	METER
	CURRENT TRANSFORMER	SWBD	SWITCHBOARD
	POTENTIAL TRANSFORMER	SPD	SURGE PROTECTION DEVICE
	OVERHEAD POWER LINE	PT	POTENTIAL TRANSFORMER
	BUS	XFMR	TRANSFORMER
	UNDERGROUND MV POWER LINE		
	UNDERGROUND LV POWER LINE		

2 INVERTER DC INPUT DETAILS
E200 SCALE: NTS



EXTERNAL RELAY SETTINGS 12.47KV								
ANSI FUNCTION	PICKUP	NOMINAL VALUE	UNITS	LEVEL	DELAY (SEC)	TOTAL CLEAR TIME (SEC)	CURVE	DESCRIPTION
27	10973.6	12470	V	88%	1.95	2.00		SLOW UV
27	6235	12470	V	50%	1.05	1.10		FAST UV
59	13717	12470	V	110%	2.00	2.00		SLOW OV
59	14964	12470	V	120%	0.16	0.16		FAST OV
81U-1	56.4	60	HZ	94%	0.11	0.16		FAST UF
81U-2	58.8	60	HZ	98%	299.95	300.00		SLOW UF
81O-1	61.8	60	HZ	103%	0.11	0.16		FAST OF
81O-2	61.2	60	HZ	102%	299.95	300.00		SLOW OF
50P	231.50	23.15	A	1000%	0.00	0.05		INST PU PHASE OC
51P	34.73	23.15	A	150%	1.95	2.00	U4	TIME PU PHASE OC
79	11846.3	12470	V	95%	299.95	500.00		MIN RECLOSING VOLTAGE VALUE
79	13093.3	12470	V	105%	299.95	500.00		MAX RECLOSING VOLTAGE VALUE
79	59.4	60	HZ	99%	299.95	300.00		MIN RECLOSING FREQ VALUE
79	60.6	60	HZ	101%	299.95	300.00		MIN RECLOSING FREQ VALUE

INVERTER PROTECTION SETTINGS						
ANSI FUNCTION	PICKUP	NOMINAL VALUE	UNITS	LEVEL	TOTAL CLEAR TIME (SEC)	DESCRIPTION
27	528	600	V	88%	2.00	SLOW UV
27	300	600	V	50%	1.10	FAST UV
59	660	600	V	110%	2.00	SLOW OV
59	720	600	V	120%	0.16	FAST OV
81U-1	56.4	60	HZ	94%	0.16	FAST UF
81U-2	58.8	60	HZ	98%	300.00	SLOW UF
81O-1	61.8	60	HZ	103%	0.16	FAST OF
81O-2	61.2	60	HZ	102%	300.00	SLOW OF
79	570	600	V	95%	300.00	MIN RECL. VOLTAGE
79	630	600	V	105%	300.00	MAX RECL. VOLTAGE
79	59.4	60	HZ	99%	300.00	MIN RECL. FREQ
79	60.6	60	HZ	101%	300.00	MAX RECL. FREQ

- ALL WORK SHALL BE IN ACCORDANCE WITH STATE AND LOCAL CODES, UTILITY REQUIREMENTS, AND THE NEC, ESPECIALLY ARTICLE 690 & 705.
- METERING AND SCADA TO BE CONFIRMED BY UTILITY.
- ACCESSIBLE, LOCKABLE, UTILITY AC DISCONNECT WITH VISIBLE BLADES SHALL BE WITHIN 10' OF UTILITY METER.
- PHOTOVOLTAIC SYSTEM TO OPERATE AT PF AS REQUIRED BY UTILITY. INVERTER WILL HAVE CAPABILITY OF .80 TO .80 PF. (LEADING TO LAGGING) EXACT POWER FACTOR/VAR CONTROL OF INVERTERS TO BE DETERMINED BASED ON UTILITY REQUIREMENTS.
- AC AND DC DISCONNECTS SHALL BE LABELED AS SUCH AND READILY ACCESSIBLE IN THEIR APPROPRIATE LOCATIONS.
- SOLAR PV MODULE FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER E.G.C PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEETS.
- ALL JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION.
- THESE DRAWINGS REPRESENT ASSUMED FIELD CONDITIONS. INSTALLATION SPECIFICATIONS MAY NEED TO BE ADJUSTED BASED ON ACTUAL FIELD CONDITIONS.
- OUTDOOR EQUIPMENT AND SWITCHGEAR SHALL BE IN ACCORDANCE WITH APPLICABLE INDUSTRY STANDARDS.
- METAL ENCLOSED LOW VOLTAGE SWITCHGEAR SHALL BE AS PER ANSI/IEEE C37.20.1.
- POLE-MOUNTED EQUIPMENT ENCLOSURES SHALL BE AS PER ANSI/IEEE C57.12.31.
- 24/7 UNESCORTED KEYLESS ACCESS SHALL BE PROVIDED TO ALL UTILITY COMPANY OWNED EQUIPMENT.
- MAIN BILLING METER SHALL BE MARKED IN ACCORDANCE WITH THE REQUIRMENTS FOR UTILITY COMPANY STANDARD.

2 NOTES
E200 SCALE: NTS

PROFESSIONAL ENGINEERING:
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SEAL & SIGNATURE:
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Professional Engineer
Maine
No. 16059
10/29/2021

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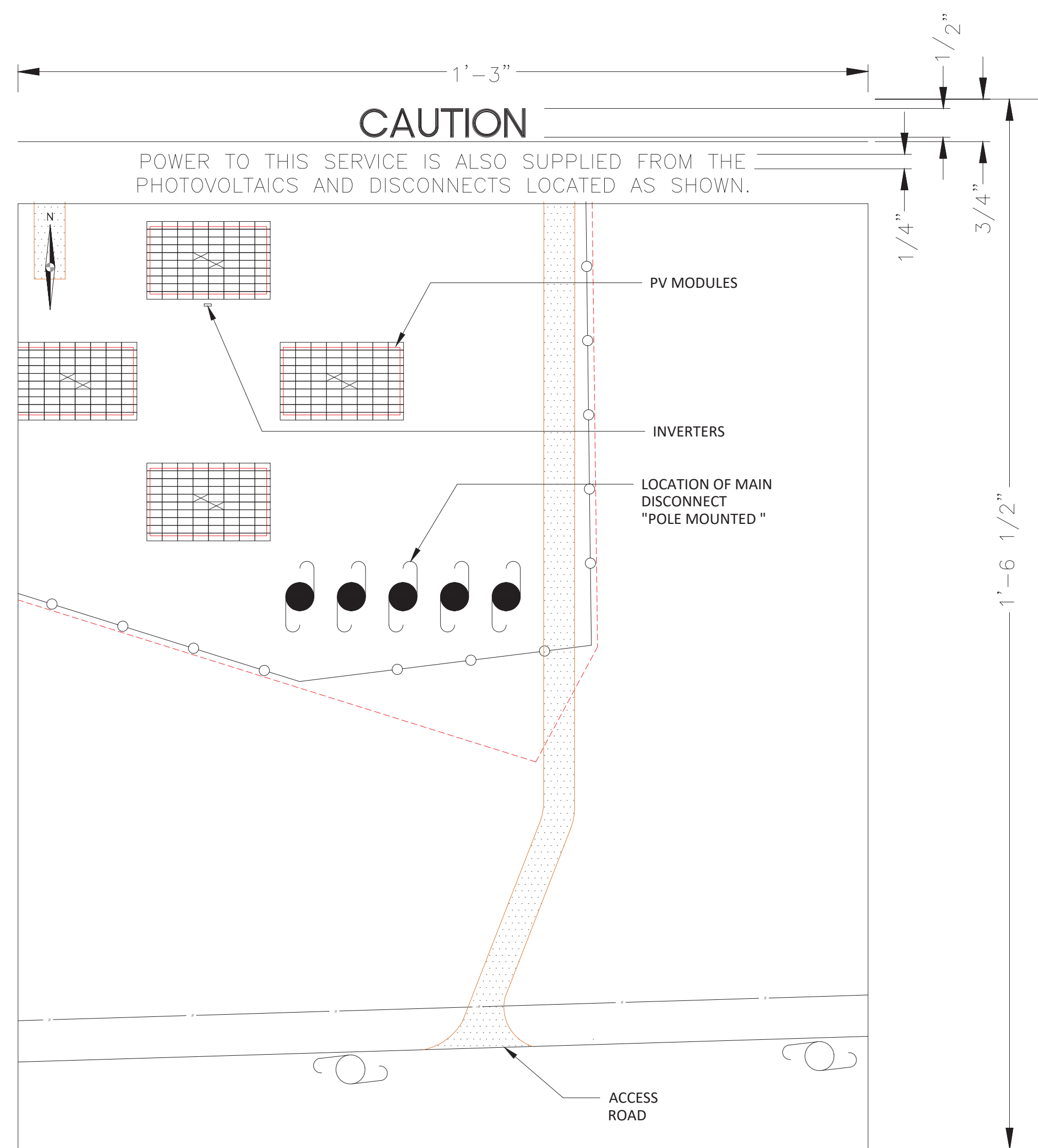
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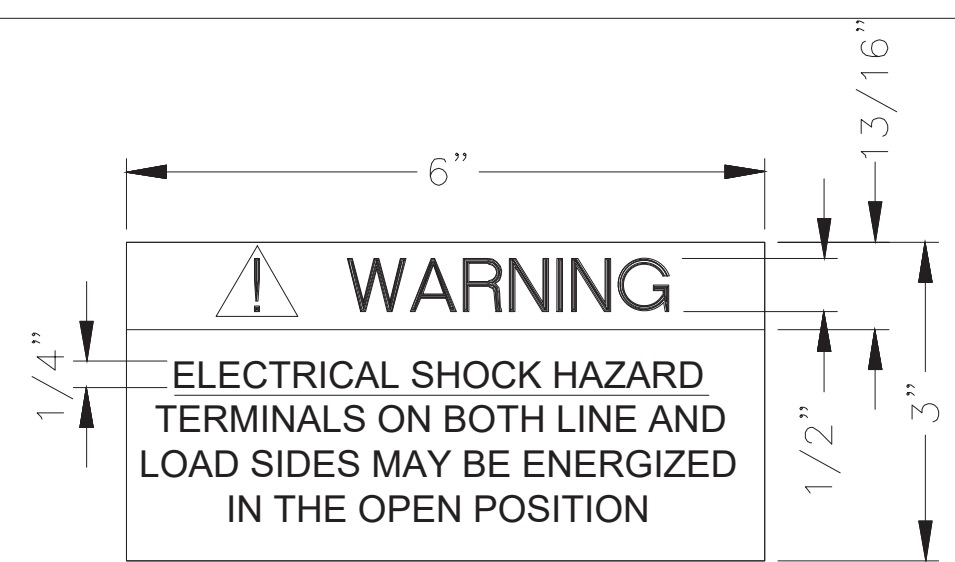
DRAWING TITLE:
ONE LINE DIAGRAM-AC ELECTRICAL SYSTEM

SHEET NO:
E200

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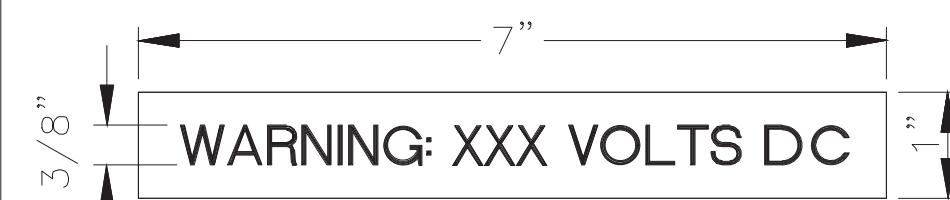
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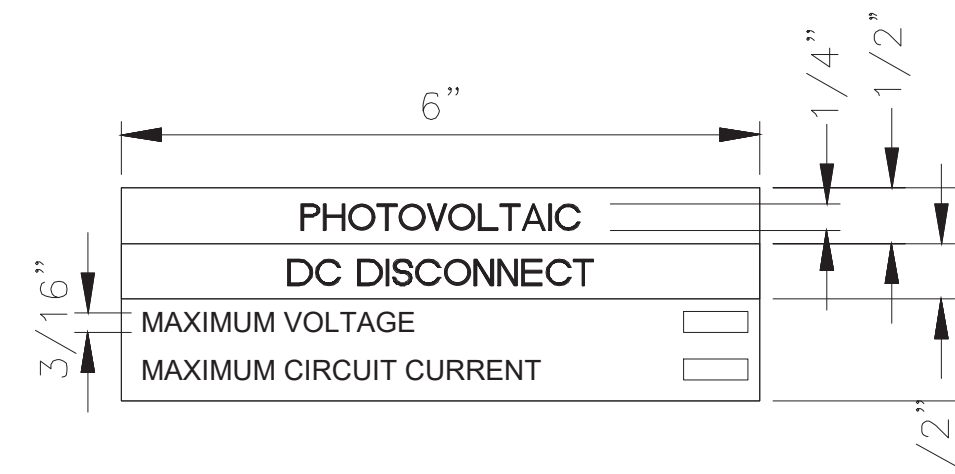
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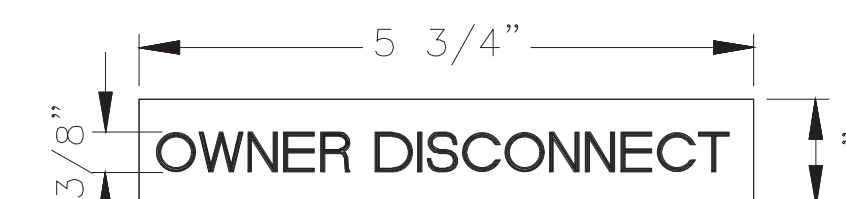
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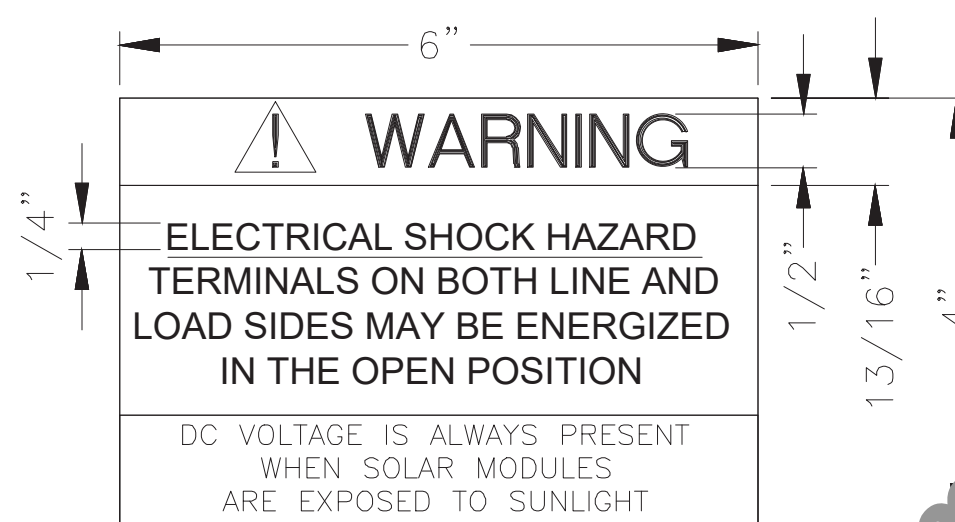
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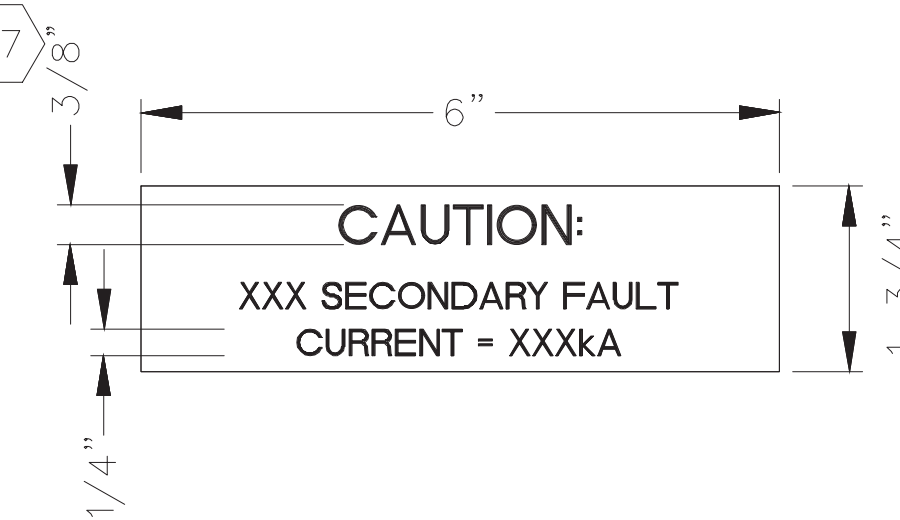
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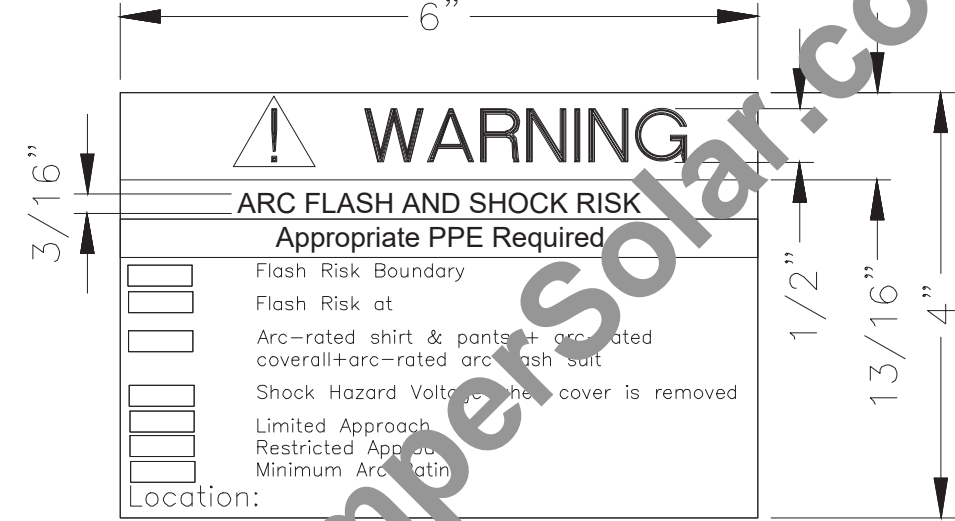
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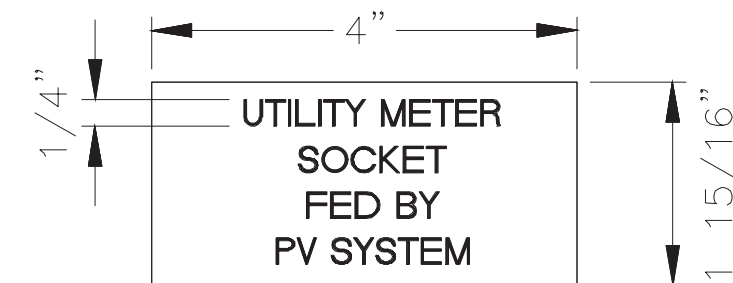


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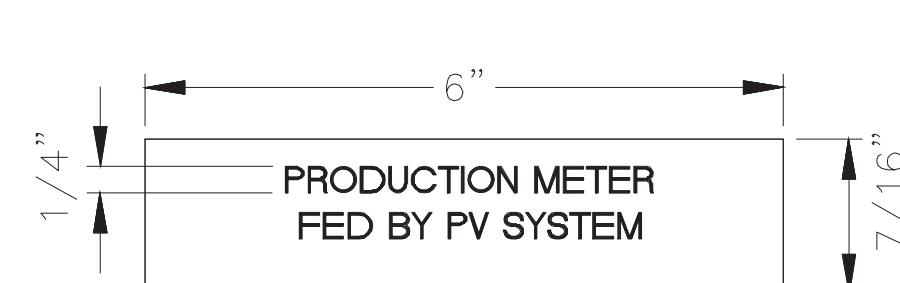


LABEL #	QTY	LABEL LOCATION	DETAILS
1	TBD	MAIN UTILITY SERVICE DISCONNECT AT POCC	<ul style="list-style-type: none"> PLAQUE FOR LOCATING THE MAIN SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC DISCONNECTING MEANS. WHITE BACKGROUND, BLACK LETTERS 690.15(A), 705.10, 690.56(B) FACILITIES WITH UTILITY SERVICE AND PV SYSTEMS.
2	TBD	UTILITY SERVICE METER	<ul style="list-style-type: none"> RED BACKGROUND, WHITE LETTERS
3	TBD	METERS, PULLBOXES, SWITCHGEAR, DISCONNECTS	<ul style="list-style-type: none"> RED BACKGROUND, WHITE LETTERS
4	TBD	PHOTOVOLTAIC DISCONNECTING MEANS AT PROJECT INSTALLED DISCONNECT	<ul style="list-style-type: none"> UTILITY MAIN PV AC DISCONNECT RED BACKGROUND, WHITE LETTERS 690.13(B)
5	TBD	PV PRODUCTION METER	<ul style="list-style-type: none"> RED BACKGROUND, WHITE LETTERS
6	TBD	P&C UTILITY AC DISCONNECTS, INVERTER DISCONNECTS	<ul style="list-style-type: none"> AC UTILITY DISCONNECT SYSTEM DESCRIPTION RED BACKGROUND, WHITE LETTERS
7	TBD	METERS, UTILITY MAIN SERVICE DISCONNECT, FEEDER BREAKERS	<ul style="list-style-type: none"> RED BACKGROUND, WHITE LETTERS
8	TBD	UTILITY MAIN SERVICE DISCONNECT, UTILITY AC PV DISCONNECT	<ul style="list-style-type: none"> FOR DISCONNECTING MEANS WHERE BOTH SIDES MAY BE ENERGIZED IN OPEN POSITIONS. RED BACKGROUND, WHITE LETTERS 690.13(B), 690.15(D)
9	TBD	COMBINER BOXES, RE-COMBINER, INVERTER	<ul style="list-style-type: none"> RED BACKGROUND, WHITE LETTERS 690.53
10	TBD	COMBINER BOXES, RE-COMBINER, DISCONNECTS	<ul style="list-style-type: none"> BUILDING OR STRUCTURE DISCONNECTING MEANS RED BACKGROUND, WHITE LETTERS 690.17(E)
11	TBD	DURING ARC FLASH STUDY IN TRANSFORMER, INVERTER, DISCONNECTS, STUDY PANEL BOARDS, COMBINER BOXES	<ul style="list-style-type: none"> WARNING: ORANGE BACKGROUND, WHITE LETTERS DANGER: RED BACKGROUND, WHITE LETTERS DETAILED TEXT AREA: WHITE BACKGROUND, BLACK LETTERS 110.16
12	TBD	SECURITY FENCE	<ul style="list-style-type: none"> SPACED EVERY 100 FEET AT PERIMETER OF ARRAY. SIGN SHALL BE AT LEAST 14AWG GALVANIZED STEEL, 20 YEAR LIFE WITH RESISTANCE TO UV. INSTALL TO STANDARD ASSEMBLY
13	TBD	PV POWER SOURCE CONDUCTORS ENCLOSURE	<ul style="list-style-type: none"> WHERE PV SOURCE CONDUCTORS ARE CONTAINED: CONDUIT BODIES IN WHICH ANY OF THE AVAILABLE CONDUIT OPENINGS ARE UNUSED. EVERY 10 FEET 690.31(G)(3)
14	TBD	AC CIRCUIT	<ul style="list-style-type: none"> (208v, 480v, 600v) AS NEEDED
15	TBD	SERVICE METER AND PRODUCTION METER	<ul style="list-style-type: none"> AS NEEDED
16	TBD	DISCONNECT	<ul style="list-style-type: none"> ADDITIONAL SIGNAGE REQUIREMENT
17	TBD	MAIN AC SWITCHGEAR	<ul style="list-style-type: none"> PROJECT SPECIFICATION
18	TBD	DC CIRCUIT	<ul style="list-style-type: none"> (600v, 1000v, 1500v) AS NEEDED

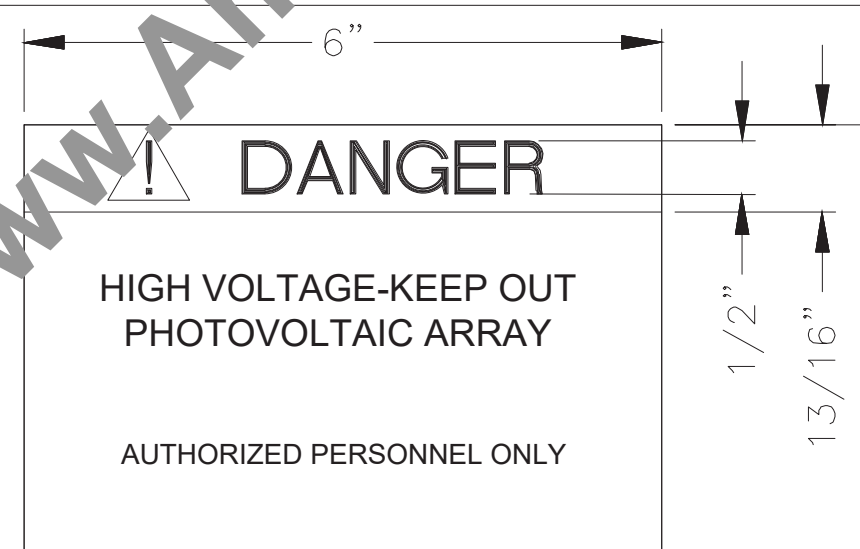
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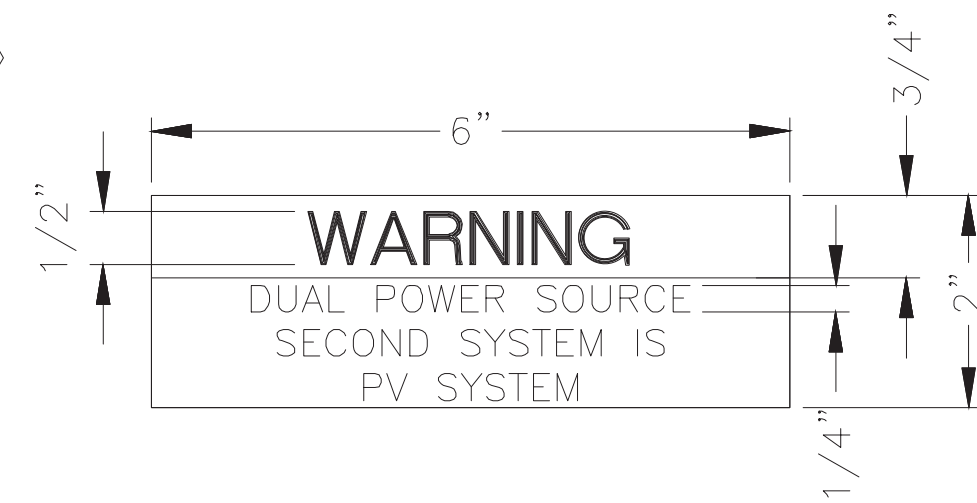
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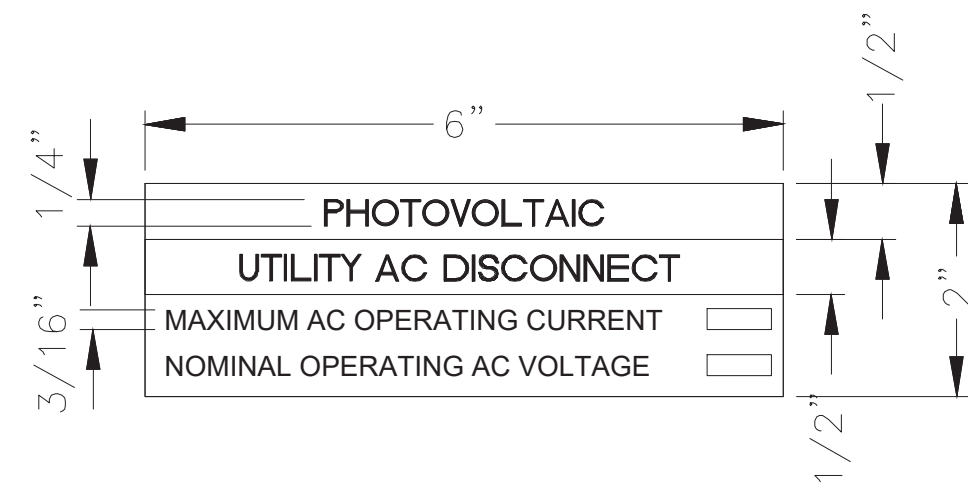
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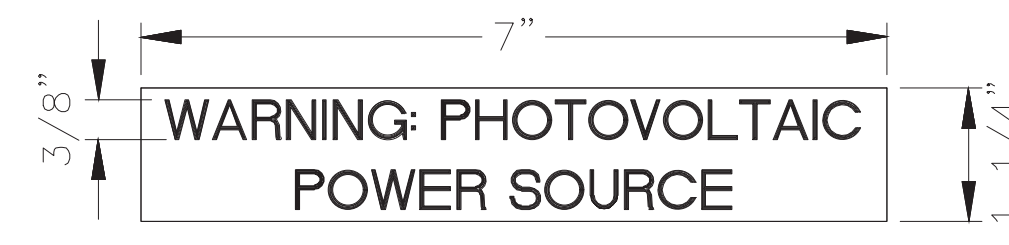
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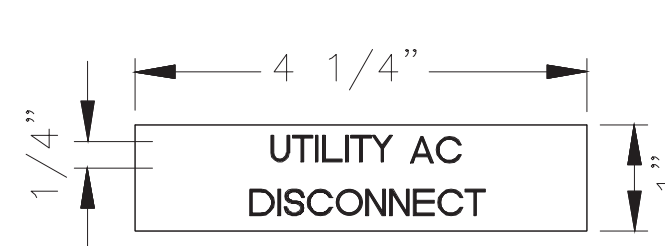
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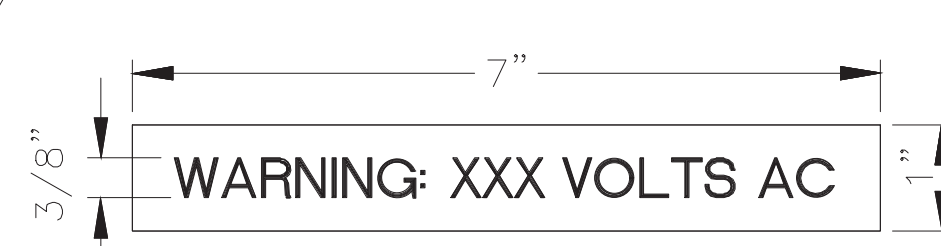
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7



14



GENERAL NOTES:

- ALL SIGNAGE SHALL HAVE ALL CAPITAL LETTERS, ARIAL OR OWNER APPROVED FONT. SIZES AND FORMAT FOR REFERENCE AND OTHER EQUIVALENT LABELS ACCEPTABLE.
- SOLAR PANELS AND INVERTERS ARE EXPECTED TO HAVE NEC REQUIRED LABELING PREVIOUSLY AFFIXED.
- ESTIMATED QUANTITIES PROVIDED HERE ONLY AND FINAL LABEL QUANTITIES TO BE DETERMINED BY CONTRACTOR.
- QUANTITIES ARE BASED ON PER MW PROJECT UNLESS OTHERWISE NOTED.
- UV RESISTANT VINYL LABELS MUST MEET REQUIREMENTS OF UL696.
- MATERIALS ON THIS PAGE ARE CALLED OUT WITH SYMBOL: (XX)
- ALL LABELS PRINTED ON STOCK HELLERMAN-TYTON LABELS.
- ALL LABELS SHALL BE WEATHERPROOF, DURABLE AND PERMANENTLY MOUNTED.

1

LABELS LAYOUT AND SIZE

E450 SCALE: NTS

3

LABELS DETAILS AND GENERAL NOTES

E450 SCALE: NTS

SEAL & SIGNATURE:

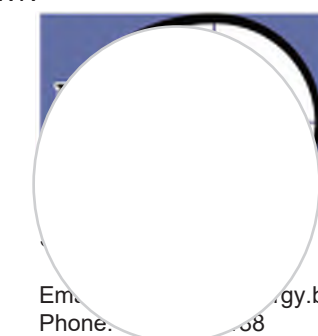


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