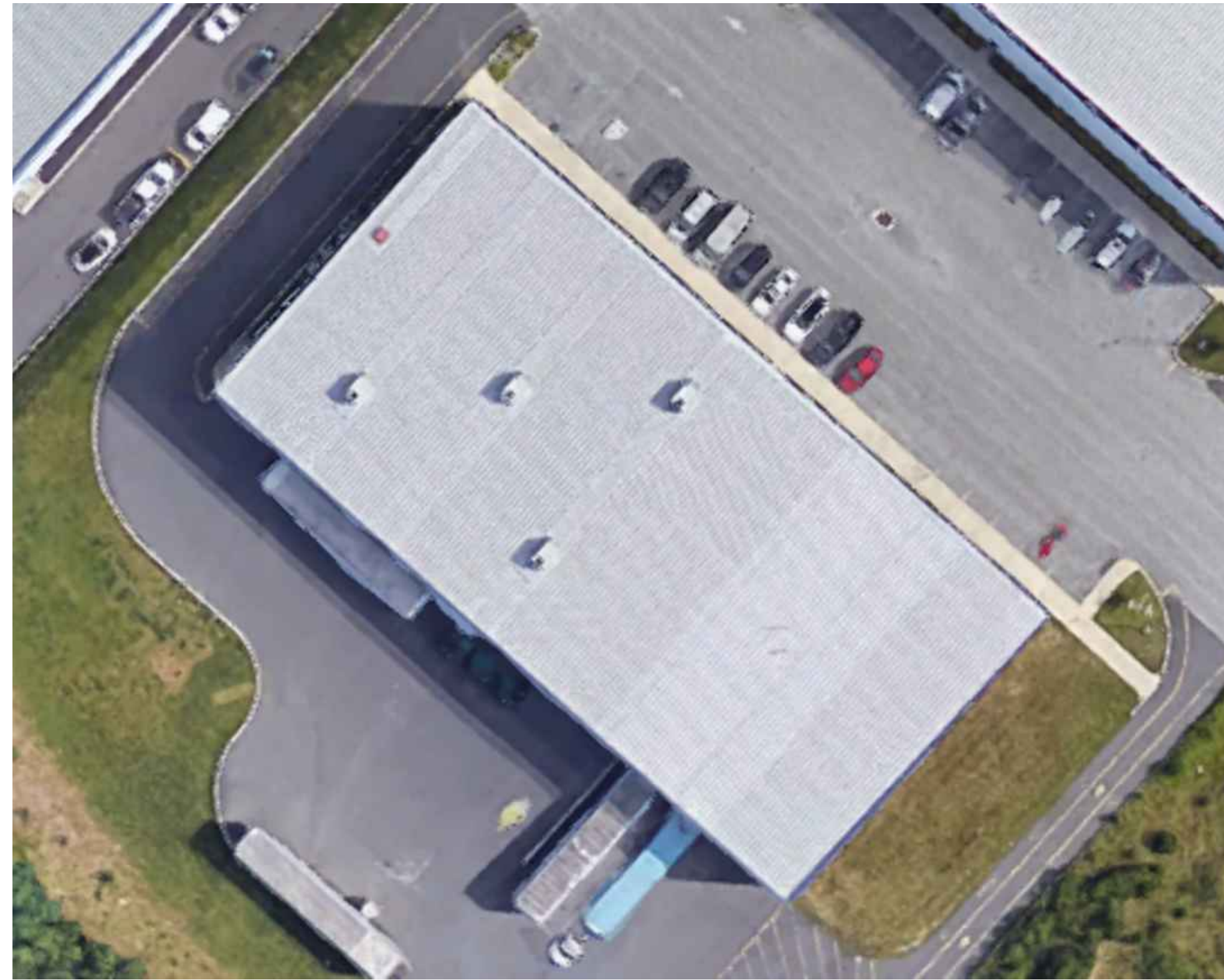


# NEW PV SYSTEM: 133.5 kWp DC

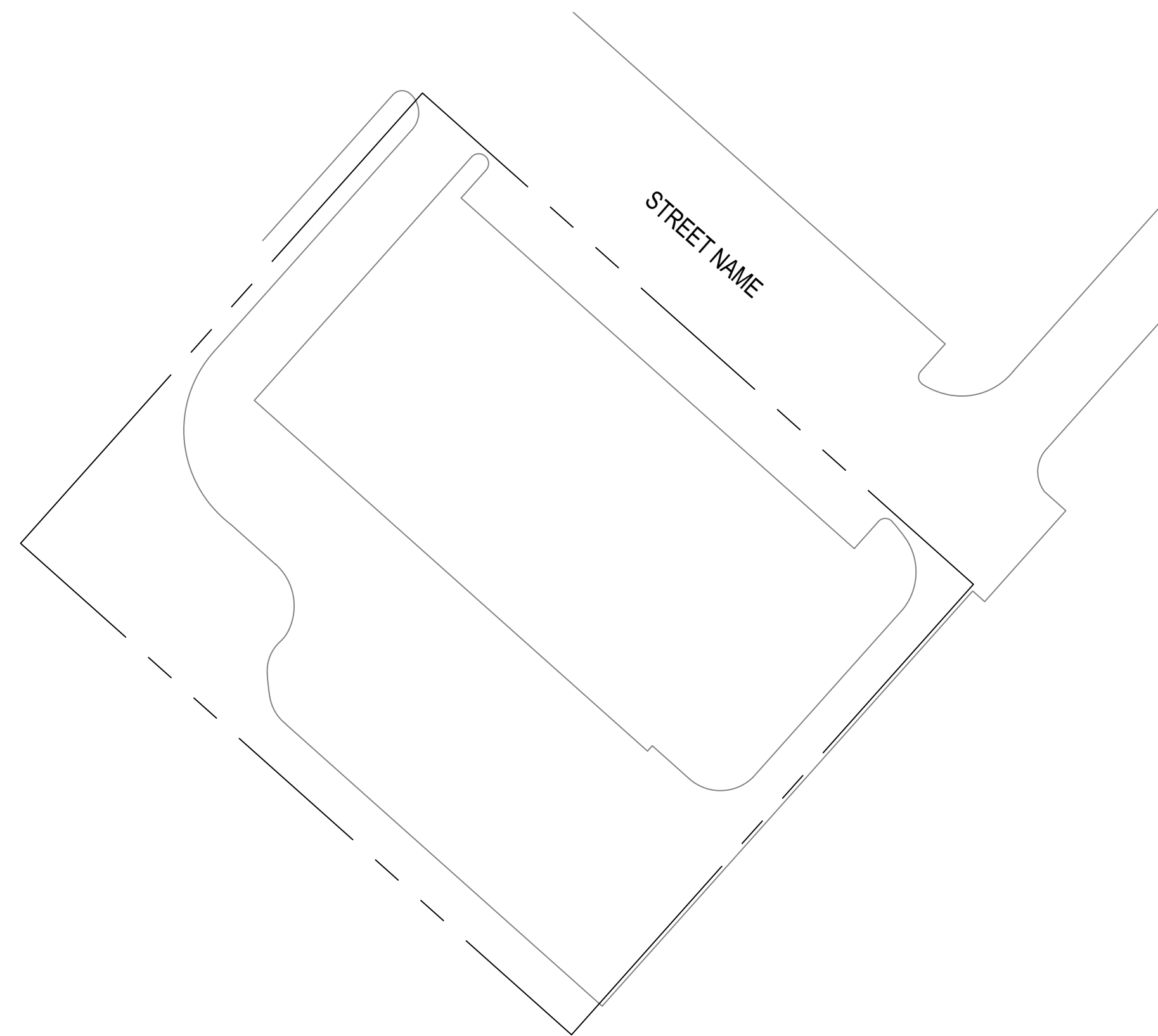
## OWNER NAME

FULL ADDRESS

ASSESSOR'S #: \_\_\_\_\_



01 AERIAL PHOTO  
NOT TO SCALE



02 PLAT MAP  
NOT TO SCALE

- 2.1.1 **SITE NOTES:**  
A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- 2.1.2 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
- 2.1.3 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- 2.1.4 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION NEC 110.26.
- 2.1.5 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.
- 2.1.6
- 2.2.1 **EQUIPMENT LOCATIONS**  
ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.
- 2.2.2 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).
- 2.2.3 RACKING, MID CLIPS, END CLIPS, AND MODULES 2703 LISTED
- 2.2.4 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.
- 2.2.5 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
- 2.2.6 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.
- 2.3.1 **STRUCTURAL NOTES:**  
RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAIL MANUFACTURER'S INSTRUCTIONS.
- 2.3.2 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
- 2.3.3 ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
- 2.3.4 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.
- 2.3.5 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.
- 2.3.6
- 2.4.1 **GROUNDING NOTES:**  
GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
- 2.4.2 AS IN CONVENTIONAL PV SYSTEMS, UNGROUNDED PV SYSTEMS REQUIRE AN EQUIPMENT GROUNDING CONDUCTOR. ALL METAL ELECTRICAL EQUIPMENT AND STRUCTURAL COMPONENTS BONDED TO GROUND, IN ACCORDANCE WITH 250.134 OR 250.136(A). ONLY THE DC CONDUCTORS ARE UNGROUNDED.
- 2.4.3 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.
- 2.4.4 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURE CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).
- 2.4.5 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
- 2.4.6 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119].
- 2.4.7 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, AND AHJ.
- 2.4.8 IN UNGROUNDED INVERTERS, GROUND FAULT PROTECTION IS PROVIDED BY "ISOLATION MONITOR INTERRUPTOR," AND GROUND FAULT DETECTION PERFORMED BY "RESIDUAL-CURRENT DETECTOR."
- 2.4.9
- 2.4.11
- 2.5.1 **INTERCONNECTION NOTES:**  
THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS INPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(D)(2)(3)].
- 2.5.2 WHEN SUM OF THE PV SOURCES EQUALS >100% OF BUSBAR RATING, PV DEDICATED BACKFEDD BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(D)(2)(3)].
- 2.5.3 AT MULTIPLE INVERTERS OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (D)(2)(3)(C).
- 2.5.4 FEEDER TAP INTERCONNECTION (LOAD SIDE) ACCORDING TO NEC 705.12 (D)(2)(1).
- 2.5.5 SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42.
- 2.5.6 BACKFEEDING BREAKER FOR UTILITY-INTERACTIVE INVERTER OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (D)(5)].
- 2.5.7
- 2.5.8
- 2.6.1 **DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:**  
DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
- 2.6.2 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH.
- 2.6.3 BOTH POSITIVE AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED.
- 2.6.4

THEREFORE BOTH MUST OPEN WHERE A DISCONNECT IS REQUIRED, ACCORDING TO NEC 690.13.

DC DISCONNECT INTEGRATED INTO ROOFTOP DC COMBINER OR INSTALLED WITHIN 6 FT, ACCORDING TO NEC 690.15 (C).

RAPID SHUTDOWN OF ENERGIZED CONDUCTORS BEYOND 10 FT OF PV ARRAY OR 5 FT INSIDE A BUILDING WITHIN 10 SECONDS. CONTROLLED CONDUCTORS ≤30V AND ≤240VA [NEC 690.12]. LOCATION OF LABEL ACCORDING TO AHJ.

ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.

BOTH POSITIVE AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED, THEREFORE BOTH REQUIRE OVER-CURRENT PROTECTION, ACCORDING TO NEC 240.21. (SEE EXCEPTION IN NEC 690.9)

IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.

**WIRING & CONDUIT NOTES:**  
ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.

ALL CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.

EXPOSED UNGROUNDED PV SOURCE AND OUTPUT CIRCUITS SHALL USE WIRE LISTED AND IDENTIFIED AS PHOTOVOLTAIC (PV) WIRE [690.35 (D)]. PV MODULES WIRE LEADS SHALL BE LISTED FOR USE WITH UNGROUNDED SYSTEMS, ACCORDING TO NEC 690.35 (D)(3).

PV WIRE BLACK WIRE MAY BE FIELD-MARKED WHITE [NEC 200.6 (A)(6)].

MODULE WIRING SHALL BE LOCATED AND SECURED UNDER THE ARRAY.

RACKING, MID CLIPS, END CLIPS, AND MODULES 2703 LISTED

AC CONDUCTORS COLORED OR MARKED AS FOLLOWS:  
PHASE A OR L1- BLACK  
PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE  
PHASE C OR L3- BLUE, YELLOW, ORANGE\*, OR OTHER CONVENTION  
NEUTRAL- WHITE OR GREY

\* IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].

SHEET SCHEDULE	
SHEET NUMBER	SHEET TITLE
T-001	COVER PAGE
A-101	SITE PLAN
A-102	ELECTRICAL PLAN
A-103	ROOF ARRAY PLAN
E-601	THREE LINE DIAGRAM
E-602	PLACARDS
R-001	RESOURCE DOCUMENTS
R-002	RESOURCE DOCUMENTS

### PROJECT INFORMATION

**OWNER**  
NAME: \_\_\_\_\_  
OWNER NAME: \_\_\_\_\_

**PROJECT MANAGER**  
NAME: \_\_\_\_\_  
PHONE: \_\_\_\_\_

**CONTRACTOR**  
NAME: \_\_\_\_\_  
YOUR COMPANY NAME  
ADDRESS: \_\_\_\_\_  
PHONE: \_\_\_\_\_

**APPLICABLE CODES & STANDARDS**  
BUILDING: IBC 2015  
ELECTRICAL: NEC 2014  
FIRE: IFC 2015  
AHJ: \_\_\_\_\_  
UTILITY: \_\_\_\_\_

**SCOPE OF WORK**  
SYSTEM SIZE: STC: 356 X 375 = 133.50 KW DC  
PTC: 356 X 345.75 = 123.087 KW DC  
  
(356) TRINA TSM-375 DE14A(I)  
PERC MONO (375W)  
(3) SOLAR EDGE SE43.2 (208V)

ATTACHMENT TYPE: SIS STANDING SEAM CLAMP

MSP UPGRADE: NO

### CONTRACTOR

YOUR COMPANY NAME

PHONE: \_\_\_\_\_  
LIC. NO.: \_\_\_\_\_

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

### REVISION / RELEASE

NO.	DESCRIPTION	DATE

### PROJECT

NEW PV SYSTEM: 133.50 kWp DC

OWNER NAME

FULL ADDRESS

APN: \_\_\_\_\_

### ENGINEER OF RECORD

PAPER SIZE: 36" x 24" (ARCH D)

SHEET TITLE:  
COVER PAGE

(SHEET 1)

DATE: \_\_\_\_\_

DESIGN BY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

SHEET NUMBER:  
T-001.00

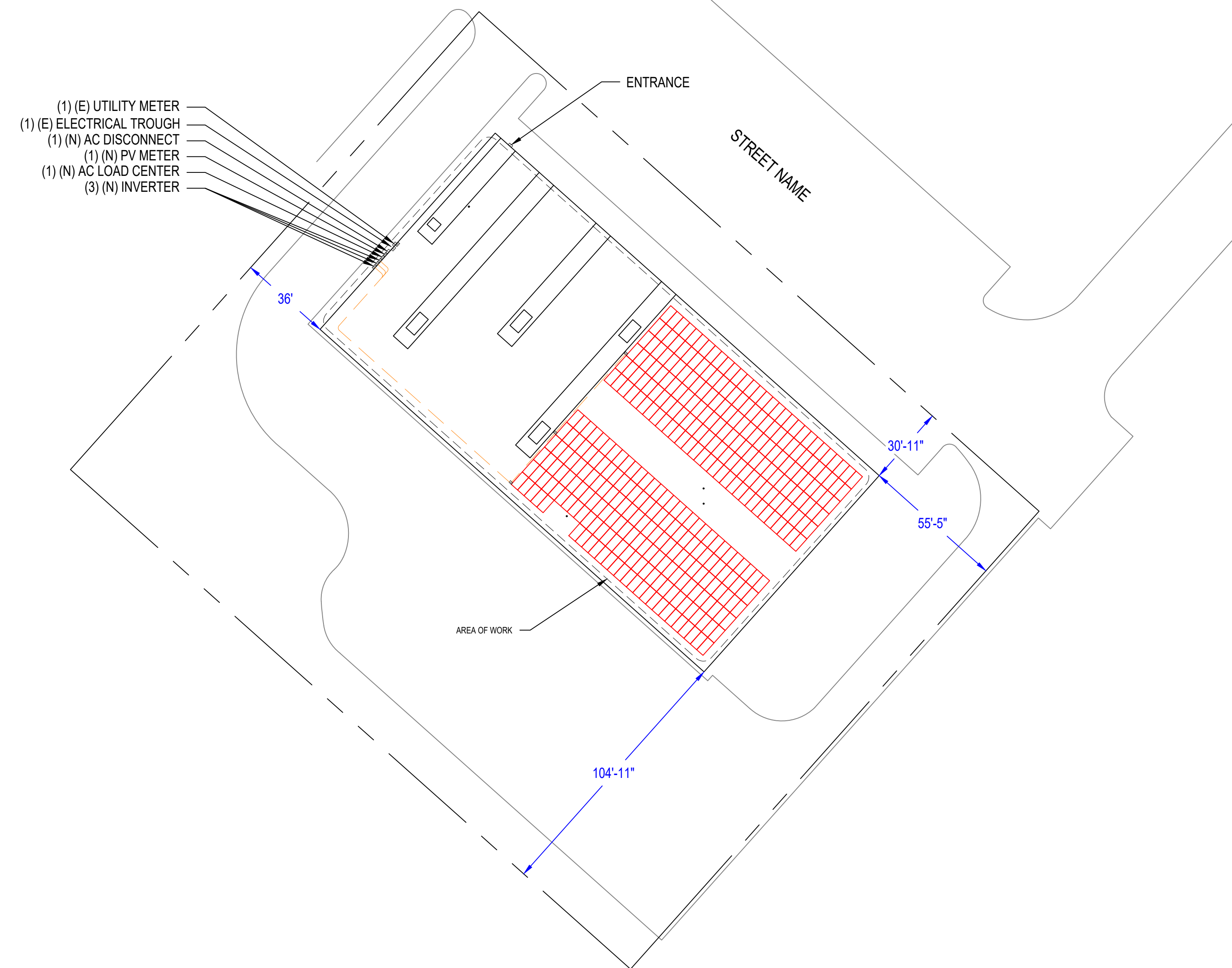
SYMBOL LEGEND			
E	MAIN ENTRANCE DOOR	CBR	COMBINER BOX
MEP	MAIN ELECTRICAL PANEL	TR	TAP BOX
JR	JUNCTION BOX	SUB	SUB (AC) PANEL
S	AC DISCONNECT	MM	METERMAN
IN	DC/AC INVERTER	RSD	RAPID SHUTDOWN
DCN	DC DISCONNECT	CBR	(DC) COMBINER BOX
PHL	AC PANELBOARD	M	METER
ALC	AC LOAD CENTER	PVM	PV METER
(U)	(U) UTILITY METER	(R)	PV REVENUE METER
(V)	UTILITY POLE	(A)	MODULE STRINGING
(B)	MODULE STRINGING	(C)	MODULE STRINGING
(D)	MODULE STRINGING	(E)	MODULE STRINGING
(F)	PROPERTY LINE	(G)	ROOF RAFTERS
(H)	MODULE STRINGING	(I)	EQUIPMENT GROUND
(J)	CONDUIT	(K)	FIRE CLEARANCE
(L)	RAILS	(M)	ATTACHMENTS
(N)	SHEET KEYNOTE INDICATOR	(O)	DETAIL INDICATOR
(P)	ELEVATION INDICATOR	(Q)	NORTH INDICATOR

DISCLAIMER: PLEASE NOTE THAT THE ABBREVIATIONS, ANNOTATIONS, AND SYMBOLS LISTED ARE INTENDED TO ILLUSTRATE THOSE THAT ARE COMMONLY USED; NOT ALL ARE NECESSARILY UTILIZED WITHIN THIS SET OF DRAWINGS.



**GENERAL NOTES**

1. FIELD VERIFY ALL MEASUREMENTS
2. SEE SHEET T-001 FOR LEGEND OF SYMBOLS



01 SITE PLAN  
 1/32" = 1'  
 0 16' 32'  
 N  
 W E  
 S

**CONTRACTOR**

YOUR COMPANY NAME

PHONE: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

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**REVISION / RELEASE**

NO.	DESCRIPTION	DATE

**PROJECT**

NEW PV SYSTEM: 133.50 kWp DC

**OWNER NAME**

FULL ADDRESS

APN: \_\_\_\_\_

**ENGINEER OF RECORD**

PAPER SIZE: 36" x 24" (ARCH D)

SHEET TITLE: **SITE PLAN**

(SHEET 2)

DATE: \_\_\_\_\_

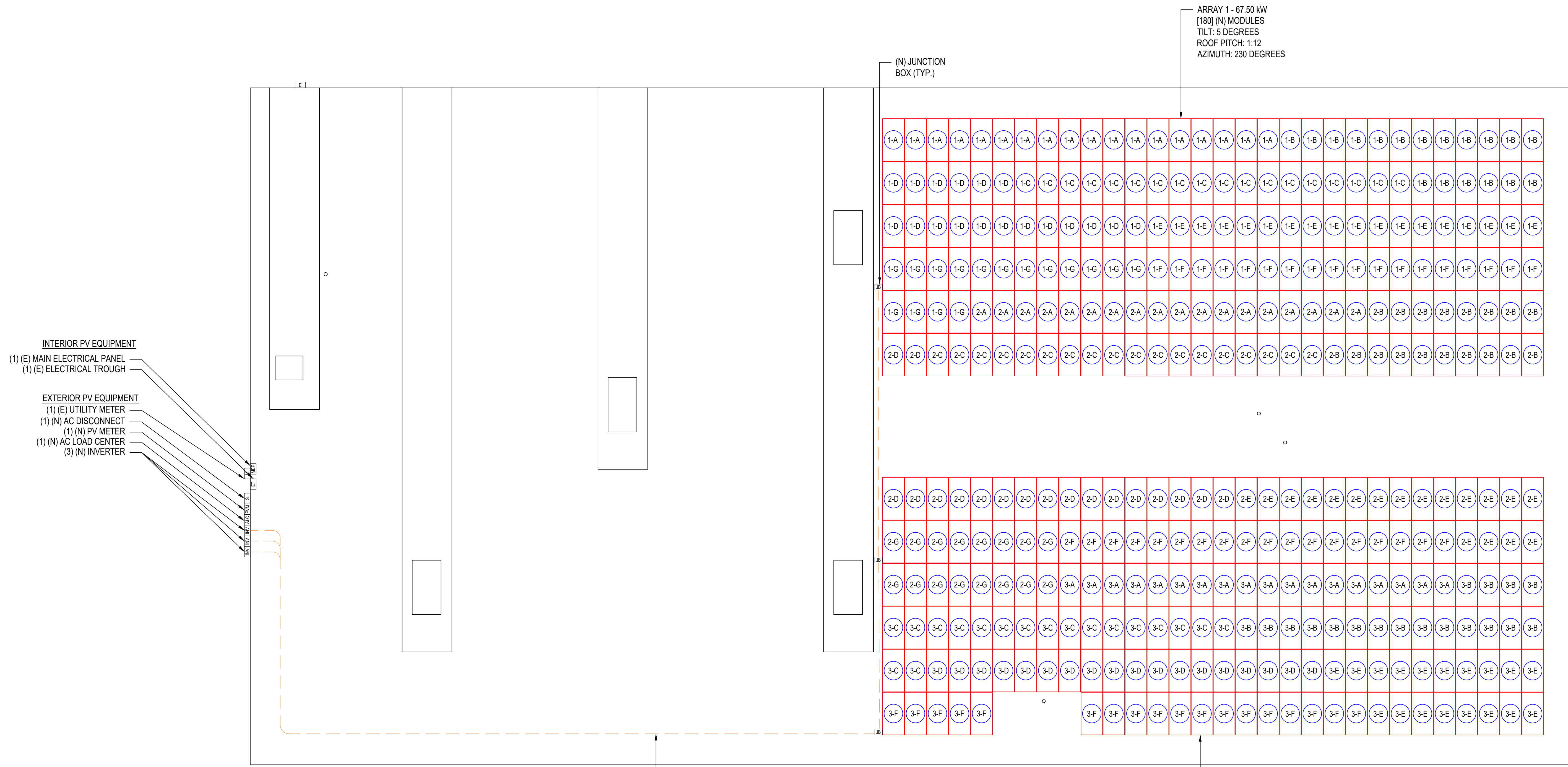
DESIGN BY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

SHEET NUMBER: **A-101.00**

**GENERAL NOTES**

1. FIELD VERIFY ALL MEASUREMENTS
2. SEE SHEET 1-001 FOR LEGEND OF SYMBOLS



ARRAY 1 - 67.50 kW  
 [180] (N) MODULES  
 TILT: 5 DEGREES  
 ROOF PITCH: 1:12  
 AZIMUTH: 230 DEGREES

(N) JUNCTION  
 BOX (TYP.)

(N) 1.5" DIA  
 CONDUIT RUN (TYP.)

ARRAY 2 - 66.00 kW  
 [176] (N) MODULES  
 TILT: 5 DEGREES  
 ROOF PITCH: 1:12  
 AZIMUTH: 230 DEGREES

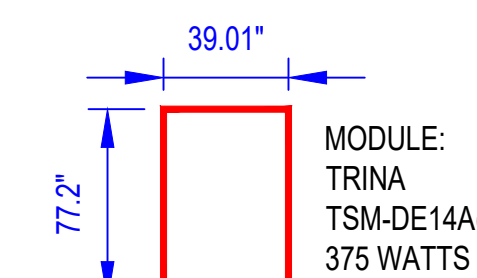
**INTERIOR PV EQUIPMENT**

- (1) (E) MAIN ELECTRICAL PANEL
- (1) (E) ELECTRICAL TROUGH

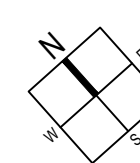
**EXTERIOR PV EQUIPMENT**

- (1) (E) UTILITY METER
- (1) (N) AC DISCONNECT
- (1) (N) PV METER
- (1) (N) AC LOAD CENTER
- (3) (N) INVERTER

ATTACHMENT TYPE: SSI PROTEA BRACKET MOUNT



01 ELECTRICAL PLAN  
 1/8" = 1' 0 4' 8'



**CONTRACTOR**

YOUR COMPANY NAME

PHONE: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

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**REVISION / RELEASE**

NO.	DESCRIPTION	DATE

**PROJECT**

NEW PV SYSTEM: 133.50 kWp DC

**OWNER NAME**

FULL ADDRESS

APN: \_\_\_\_\_

**ENGINEER OF RECORD**

PAPER SIZE: 36" x 24" (ARCH D)

SHEET TITLE:

ELECTRICAL PLAN

(SHEET 3)

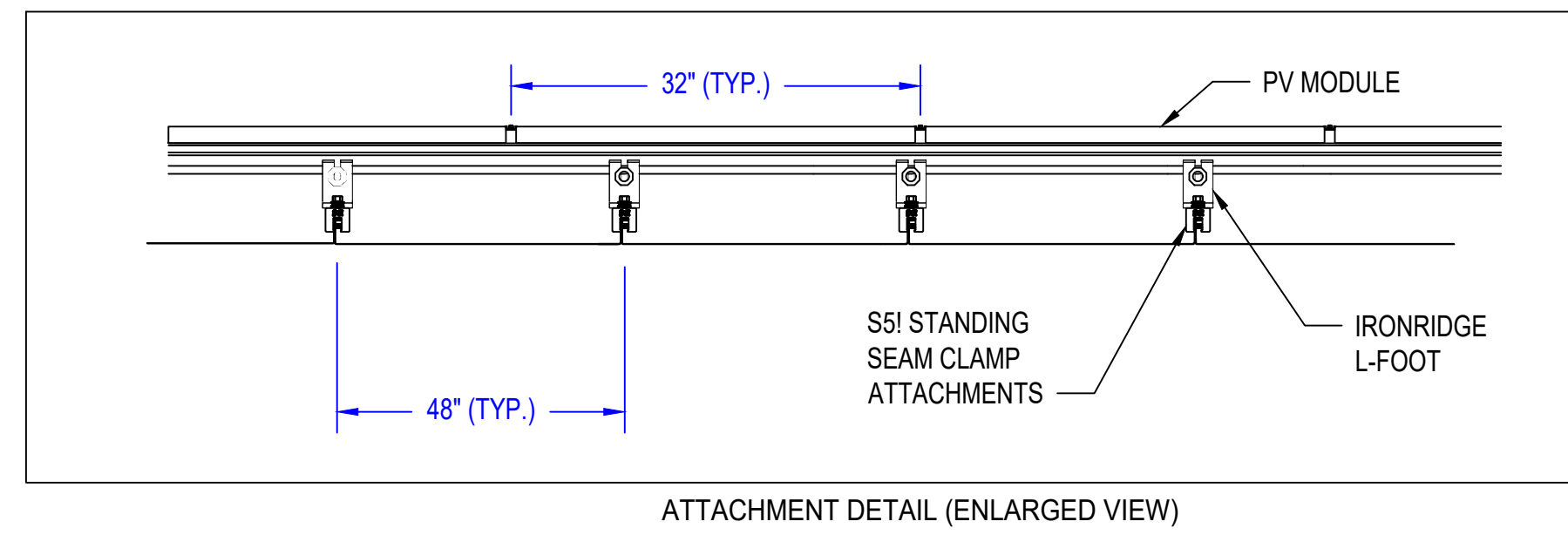
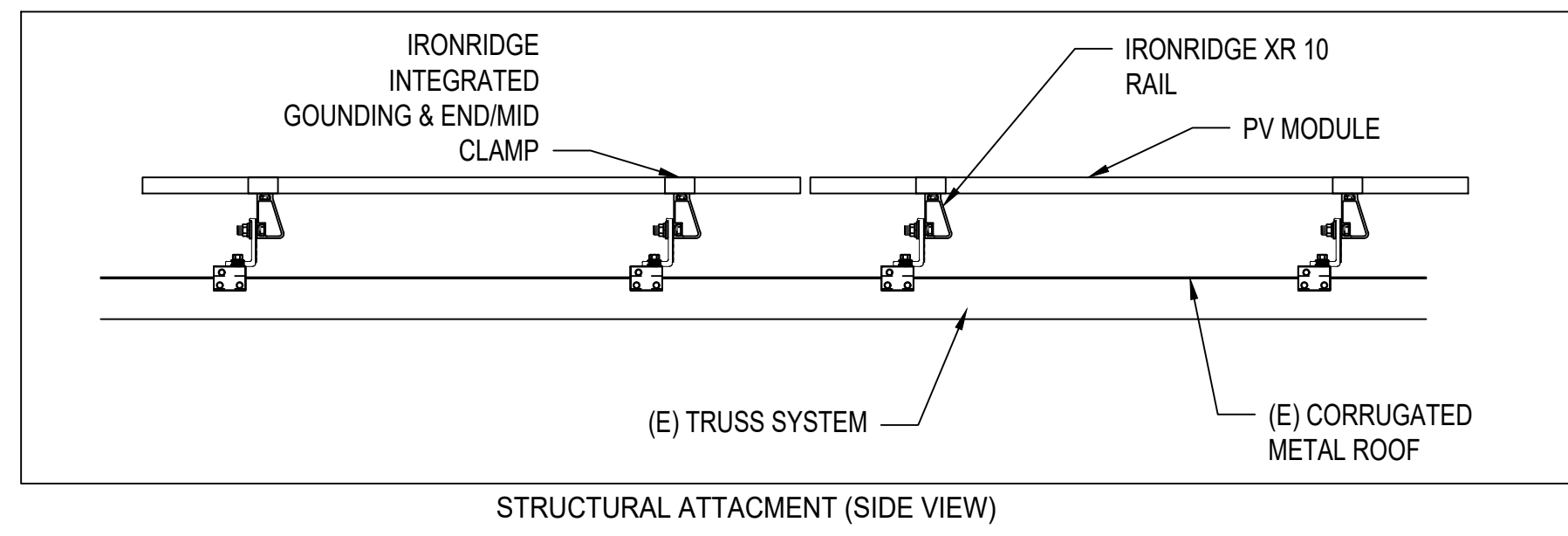
DATE: \_\_\_\_\_

DESIGN BY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

SHEET NUMBER:

A-102.00



**GENERAL NOTES**

1. FIELD VERIFY ALL MEASUREMENTS
2. SEE SHEET T-001 FOR LEGEND OF SYMBOLS

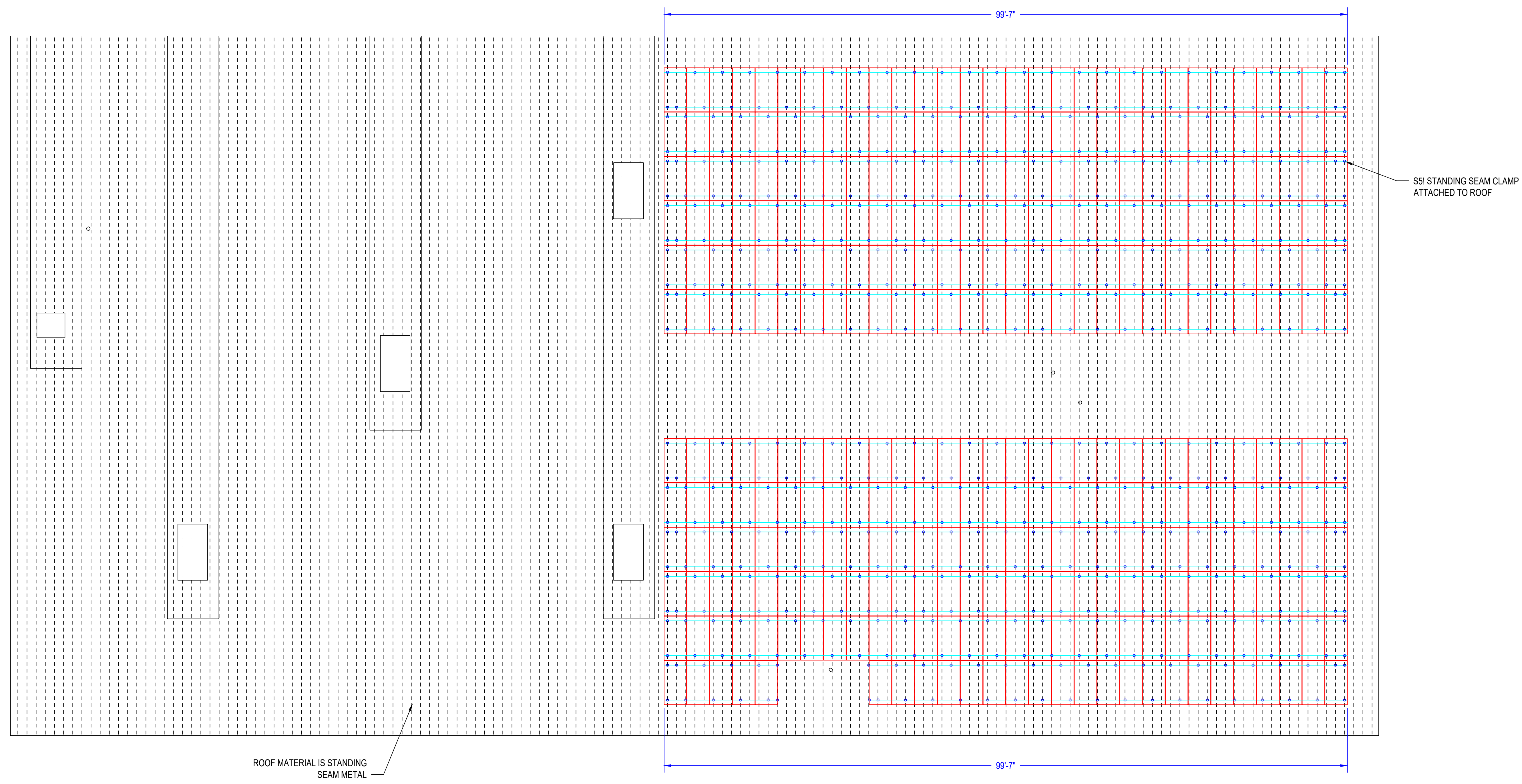
**CONTRACTOR**

YOUR COMPANY NAME

PHONE: \_\_\_\_\_

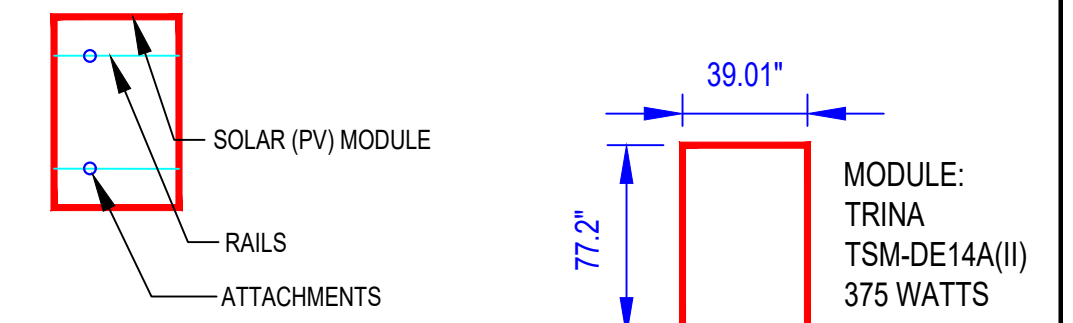
LIC. NO.: \_\_\_\_\_

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**01 ROOF ARRAY PLAN**

1/8"=1'-0" 0 4'-0" 8'-0"



**REVISION / RELEASE**

NO.	DESCRIPTION	DATE

**PROJECT**

NEW PV SYSTEM: 133.50 kWp DC

**OWNER NAME**

FULL ADDRESS

APN: \_\_\_\_\_

**ENGINEER OF RECORD**

PAPER SIZE: 36" x 24" (ARCH D)

**SHEET TITLE**

ROOF ARRAY PLAN

(SHEET 4)

DATE: \_\_\_\_\_

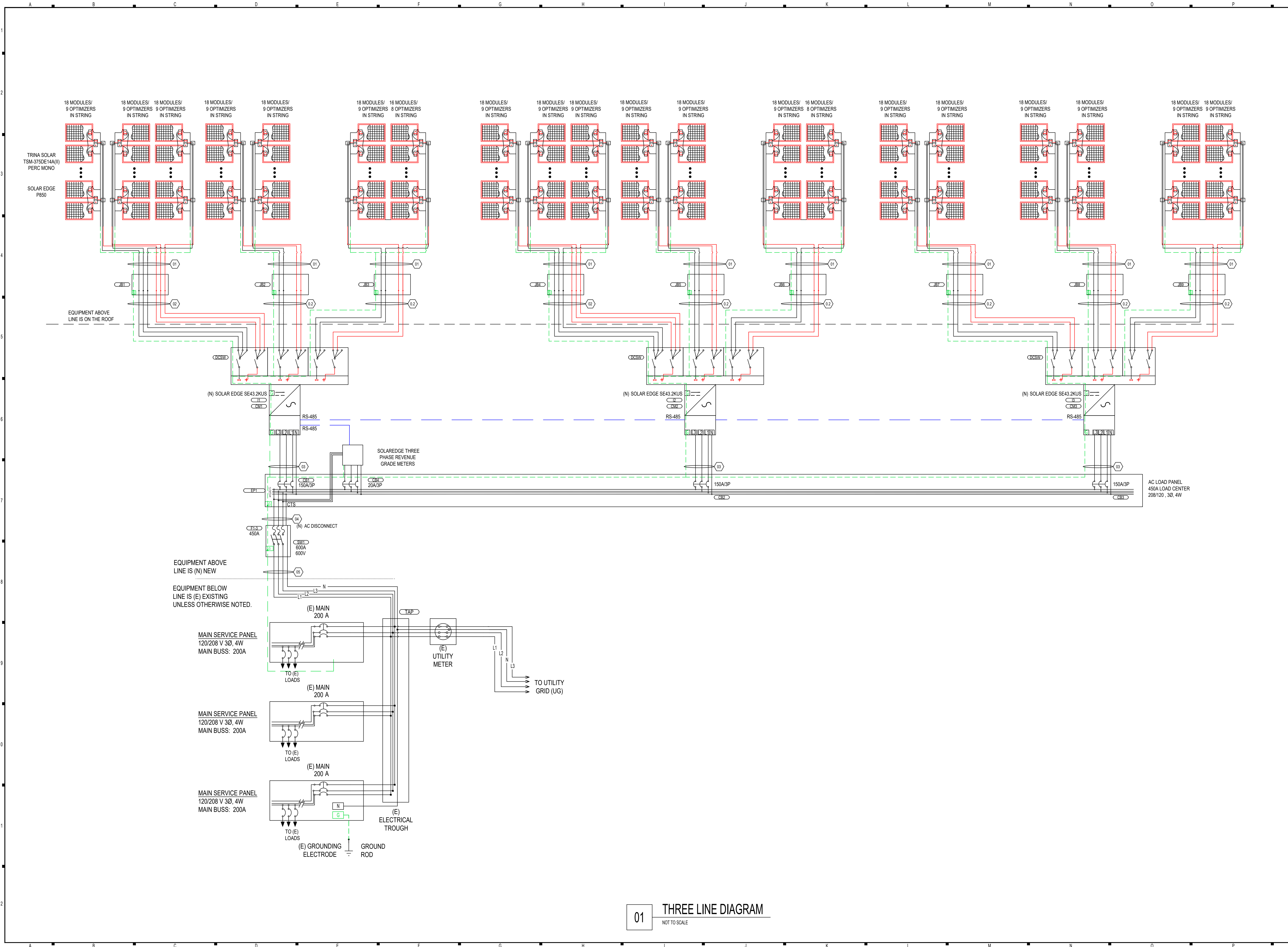
DESIGN BY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

SHEET NUMBER:

**A-103.00**





01 THREE LINE DIAGRAM  
NOT TO SCALE

**CONTRACTOR**  
YOUR COMPANY NAME  
PHONE: \_\_\_\_\_  
LIC. NO.: \_\_\_\_\_  
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**REVISION / RELEASE**

NO.	DESCRIPTION	DATE

**PROJECT**  
NEW PV SYSTEM: 133.50 kWp DC  
**OWNER NAME**  
  
FULL ADDRESS  
APN: \_\_\_\_\_

**ENGINEER OF RECORD**  
  
PAPER SIZE: 36" x 24" (ARCH D)

**SHEET TITLE**  
THREE LINE DIAGRAM  
(SHEET 5)  
DATE: \_\_\_\_\_  
DESIGN BY: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_  
**SHEET NUMBER**  
E-601.00

SYSTEM SUMMARY																				
	INVERTER #1						INVERTER #2						INVERTER #3							
	STRING #1	STRING #2	STRING #3	STRING #4	STRING #5	STRING #6	STRING #7	STRING #1	STRING #2	STRING #3	STRING #4	STRING #5	STRING #6	STRING #7	STRING #1	STRING #2	STRING #3	STRING #4	STRING #5	STRING #6
POWERBOX MAX OUTPUT CURRENT	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A	18A
OPTIMIZERS IN SERIES	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
NOMINAL STRING VOLTAGE	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V	400V
ARRAY OPERATING CURRENT	16.88A	16.88A	16.88A	16.88A	16.88A	15A	16.88A	16.88A	16.88A	16.88A	16.88A	16.88A	15A	16.88A	16.88A	16.88A	16.88A	16.88A	16.88A	16.88A
ARRAY STC POWER	46,500W						46,500W						40,500W							
ARRAY PTC POWER	42,873W						42,873W						37,341W							
MAX AC CURRENT	120A						120A						120A							
MAX AC POWER	43,200W						43,200W						43,200W							
DERATED (CEC) AC POWER	41,005W						41,005W						35,714W							
ARRAY STC POWER	133,500W												123,087W							
ARRAY PTC POWER	123,087W												360A							
MAX AC CURRENT	360A												129,600W							
MAX AC POWER	129,600W												117,724W							
DERATED (CEC) AC POWER	117,724W																			

DESIGN TEMPERATURES	
ASHRAE EXTREME LOW	-16.9°C (1.6°F), SOURCE: SOUTH JERSEY RGNL (39.94°; -74.84°)
ASHRAE 2% HIGH	33.8°C (92.8°F), SOURCE: SOUTH JERSEY RGNL (39.94°; -74.84°)

MODULES										
REF.	QTY.	MAKE AND MODEL	PMAX	PTC	ISC	IMP	VOC	VMP	TEMP. COEFF. OF VOC	FUSE RATING
PM1-356	356	TRINA SOLAR TSM-375DE14A(II) PERC MONO	375W	345.75W	9.88A	9.37A	48.5V	40V	-0.141V/°C (-0.29%/°C)	20A

POWER OPTIMIZERS							
REF.	QTY.	MODEL	RATED INPUT POWER	MAX OUTPUT CURRENT	MAX INPUT ISC	MAX DC VOLTAGE	WEIGHTED EFFICIENCY
PO1-356	356	SOLAR EDGE P850	850W	18A	12.5A	120V	98.6%

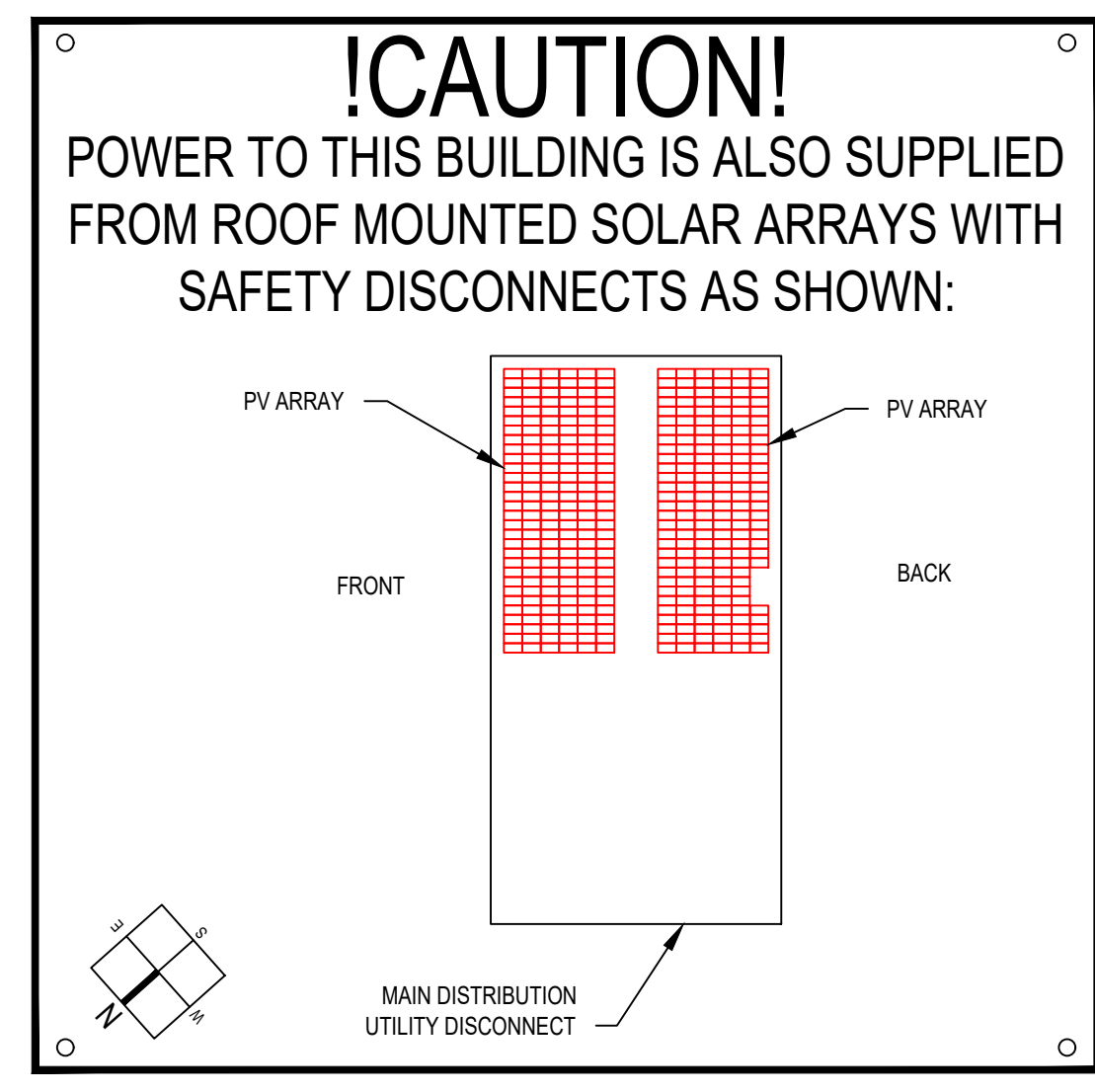
INVERTERS										
REF.	QTY.	MAKE AND MODEL	AC VOLTAGE	GROUND	OCPD RATING	RATED POWER	MAX OUTPUT CURRENT	MAX INPUT CURRENT	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY
I1-3	3	SOLAR EDGE SE43.2 (208V)	208V	FLOATING	150A	43200W	120A	114A	600V	97.0%

DISCONNECTS				
REF.	QTY.	MAKE AND MODEL	RATED CURRENT	MAX RATED VOLTAGE
SW1	1	SQUARE D H366NR OR EQUIV.	600A	600VAC

OCPDS			
REF.	QTY.	RATED CURRENT	MAX VOLTAGE
F1-3	3	450A	600VAC
CB1-3	3	150A	240VAC
CB4	1	20A	240VAC

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS														
ID	TYPICAL	CONDUCTOR	CONDUIT	CURRENT-CARRYING CONDUCTORS IN CONDUIT	OCPD	EGC	TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	AMP. @ TERMINAL
01	20	10 AWG PV WIRE, COPPER	1.5" DIA PVC-40	2	N/A	6 AWG BARE, COPPER	0.71 (55.8°C)	1	18A	22.5A	55A	39.05A	75°C	50A
02	3	6 AWG THWN-2, COPPER	1.5" DIA PVC-40	14	N/A	6 AWG THWN-2, COPPER	0.71 (55.8°C)	0.5	18A	22.5A	75A	26.63A	75°C	65A
03	3	1/0 AWG THWN-2, COPPER	1.5" DIA PVC-40	3	150A	6 AWG THWN-2, COPPER	0.96 (33.8°C)	1	120A	150A	170A	163.2A	75°C	150A
04	1	(2) 4/0 AWG THWN-2, COPPER	3.0" DIA PVC-40	3+N (2 COND. IN PARALLEL)	450A	2 AWG THWN-2, COPPER	0.96 (33.8°C)	1	360A	450A	520A	499.2A	75°C	460A
05	1	(2) 4/0 AWG THWN-2, COPPER	3.0" DIA PVC-40	3+N (2 COND. IN PARALLEL)	N/A	2 AWG THWN-2, COPPER	0.96 (33.8°C)	1	360A	450A	520A	499.2A	75°C	460A

BILL OF MATERIALS										
CATEGORY	MAKE	MODEL NUMBER	REF	QTY	UNIT	QTY/UNIT	DESCRIPTION	REF	QTY	UNIT
MODULE	TRINA SOLAR	TSM-375DE14A(II) PERC MONO	PM1-356	356	PIECES	1	TRINA SOLAR TSM-375DE14A(II) PERC MONO 375W 72 CELLS, MONOCRYSTALLINE SILICON			
INVERTER	SOLAR EDGE	SE43.2 (208V)	I1-3	3	PIECES	1	SOLAR EDGE SE43.2 (208V) 43200W INVERTER			
MODULE OPTIMIZER	SOLAR EDGE	P850	PO1-178	178	PIECES	1	SOLAR EDGE P850 OPTIMIZER (REQUIRED PART OF INVERTER'S DISTRIBUTED DC ARCHITECTURE)			
DISCONNECT	SQUARE D	H366NR	SW1	1	PIECE	1	SQUARE D H366NR, 3-POLE, 600A, 600VAC OR EQUIVALENT			
PRODUCTION METER	SOLAR EDGE	PROD-METER	M1	1	PIECE	1	REVENUE GRADE METER SE-RWIND-3D-208-MB			
WIRING		GEN-10-AWG-PV-WIRE-CU	WR1	3600	FEET	1	10 AWG PV WIRE, COPPER (POSITIVE AND NEGATIVE)			
WIRING		GEN-6-AWG-BARE-CU	WR1	1800	FEET	1	6 AWG BARE, COPPER (GROUND)			
WIRING		GEN-6-AWG-THWN-2-CU-RD	WR2	3780	FEET	1	6 AWG THWN-2, COPPER, RED (POSITIVE)			
WIRING		GEN-6-AWG-THWN-2-CU-BLK	WR2	3780	FEET	1	6 AWG THWN-2, COPPER, BLACK (NEGATIVE)			
WIRING		GEN-6-AWG-THWN-2-CU-GR	WR2	3780	FEET	1	6 AWG THWN-2, COPPER, GREEN (GROUND)			
WIRING		GEN-1/0-AWG-THWN-2-CU-RD	WR3	45	FEET	1	1/0 AWG THWN-2, COPPER, RED (LINE 1)			
WIRING		GEN-1/0-AWG-THWN-2-CU-BLK	WR3	45	FEET	1	1/0 AWG THWN-2, COPPER, BLACK (LINE 2)			
WIRING		GEN-1/0-AWG-THWN-2-CU-BL	WR3	45	FEET	1	1/0 AWG THWN-2, COPPER, BLUE (LINE 3)			
WIRING		GEN-1/0-AWG-THWN-2-CU-WH	WR3	45	FEET	1	1/0 AWG THWN-2, COPPER, WHITE (NEUTRAL)			
WIRING		GEN-6-AWG-THWN-2-CU-GR	WR3	45	FEET	1	6 AWG THWN-2, COPPER, GREEN (GROUND)			
WIRING		GEN-4/0-AWG-AWG-THWN-2-RD	WR4-5	20	FEET	1	4/0 AWG THWN-2, COPPER, RED (LINE 1)			
WIRING		GEN-4/0-AWG-AWG-THWN-2-BLK	WR4-5	20	FEET	1	4/0 AWG THWN-2, COPPER, BLACK (LINE 2)			
WIRING		GEN-4/0-AWG-AWG-THWN-2-BL	WR4-5	20	FEET	1	4/0 AWG THWN-2, COPPER, BLUE (LINE 3)			
WIRING		GEN-4/0-AWG-AWG-THWN-2-WH	WR4-5	20	FEET	1	4/0 AWG THWN-2, COPPER, WHITE (NEUTRAL)			
WIRING		GEN-2-AWG-THWN-2-CU-GR	WR4-5	20	FEET	1	2 AWG THWN-2, COPPER, GREEN (GROUND)			
WIREWAY		GEN-PVC-40-1.5" DIA	WM1-3	1800	FEET	1	PVC-40 CONDUIT, 1.5" DIA			
WIREWAY		GEN-PVC-40-3.0" DIA	WM4-5	20	FEET	1	PVC-40 CONDUIT, 3.0" DIA			
OCPD	GENERIC MANUFACTURER	GEN-CB-150A-240VAC	CB1-3	3	PIECES	1	CIRCUIT BREAKER, 150A/3P, 240VAC			
OCPD	GENERIC MANUFACTURER	GEN-FU-450A-600VAC	F1-3	3	PIECES	1	FUSE, 450A, 600VAC			
TRANSITION BOX	GENERIC MANUFACTURER	GEN-AWB-TB-4-4X	JB9	9	PIECES	1	TRANSITION/PASS-THROUGH BOX, WITH 4 TERMINAL BLOCKS			



**DIRECTORY**  
PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT IN THE SAME LOCATION [NEC 690.56(B)]  
WHERE THE INVERTERS ARE REMOTELY LOCATED FROM EACH OTHER, A DIRECTORY IN ACCORDANCE WITH 705.10 SHALL BE INSTALLED AT EACH DC PV SYSTEM DISCONNECTING MEANS, AT EACH AC DISCONNECTING MEANS, AND AT THE MAIN SERVICE DISCONNECTING MEANS SHOWING THE LOCATION OF ALL AC AND DC PV SYSTEM DISCONNECTING MEANS IN THE BUILDING. [NEC 690.4(H)]

**LABELING NOTES**  
1.1 LABELING REQUIREMENTS BASED ON THE 2017 NATIONAL ELECTRICAL CODE, INTERNATIONAL FIRE CODE 605.11, OSHA STANDARD 1910.145, ANSI Z535  
1.2 MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.  
1.3 LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.  
1.4 LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8" AND PERMANENTLY AFFIXED.  
1.5 ALERTING WORDS TO BE COLOR CODED. "DANGER" WILL HAVE RED BACKGROUND; "WARNING" WILL HAVE ORANGE BACKGROUND; "CAUTION" WILL HAVE YELLOW BACKGROUND. [ANSI Z535]

**! WARNING !**  
ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED.

**! WARNING !**  
ELECTRIC SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

OPERATING CURRENT: 67.52 A DC  
OPERATING VOLTAGE: 400 V DC  
MAX SHORT CURRENT: 126 A DC  
MAX VOLTAGE: 600 V DC

**PHOTOVOLTAIC AC DISCONNECT**  
OPERATING CURRENT: 259.5 A AC  
OPERATING VOLTAGE: 208 V AC

**! WARNING !**  
DUAL POWER SOURCES. SECOND SOURCE IS PV SYSTEM

**! CAUTION !**  
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED

**PLACARD 3**  
AT EACH JUNCTION, COMBINER, DISCONNECT AND DEVICE WHERE ENERGIZED UNGROUNDED PHOTOVOLTAIC EQUIPMENT CONDUCTORS MAY BE EXPOSED DURING SERVICE [NEC 690.35(F)]

**LABEL 2**  
AT EACH DISCONNECTING MEANS FOR PHOTOVOLTAIC EQUIPMENT [NEC 690.17]

**LABEL 3** INVERTERS # 1-3  
AT EACH DC DISCONNECTING MEANS [NEC 690.53]

**LABEL 4**  
AT POINT OF INTERCONNECTION, MARKED AT DISCONNECTING MEANS [NEC 690.54]

**LABEL 5**  
AT POINT OF INTERCONNECTION; LABEL, SUCH AS LABEL 5 OR LABEL 6 MUST IDENTIFY PHOTOVOLTAIC SYSTEM [NEC 705.12(D)(4)]

**LABEL 6**  
AT UTILITY METER [NEC 690.56(B)]

**LABEL 8**  
AT EACH DC DISCONNECTING MEANS [NEC 690.13(B)]

**LABEL 9**  
AT RAPID SHUTDOWN SWITCH [NEC 690.56(B)]  
LETTERS AT LEAST 3/8 INCH; WHITE ON RED BACKGROUND; REFLECTIVE [IFC 605.11.1.1]

**LABEL 10**  
AT EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10 FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS. [NEC 690.31(G)]  
LETTERS AT LEAST 3/8 INCH; WHITE ON RED BACKGROUND; REFLECTIVE [IFC 605.11.1.1]

**LABEL 11**  
AT EACH AC DISCONNECTING MEANS [NEC 690.13(B)]

**LABEL 12**  
AT POINT OF INTERCONNECTION OVERCURRENT DEVICE [NEC 705.12(D)(7)]

**PLAQUE**  
INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED  
PHOTOVOLTAIC SYSTEM DISCONNECT LOCATED EAST SIDE OF THE BUILDING

**CONTRACTOR**  
YOUR COMPANY NAME

PHONE: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

REVISION / RELEASE		
NO.	DESCRIPTION	DATE

**PROJECT**  
NEW PV SYSTEM: 133.50 kWp DC

**OWNER NAME**  
\_\_\_\_\_

**FULL ADDRESS**  
\_\_\_\_\_

APN: \_\_\_\_\_

**ENGINEER OF RECORD**  
\_\_\_\_\_

PAPER SIZE: 36" x 24" (ARCH D)

**SHEET TITLE:**  
PLACARDS (SHEET 6)

DATE: \_\_\_\_\_

DESIGN BY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

**SHEET NUMBER:**  
E-602.00









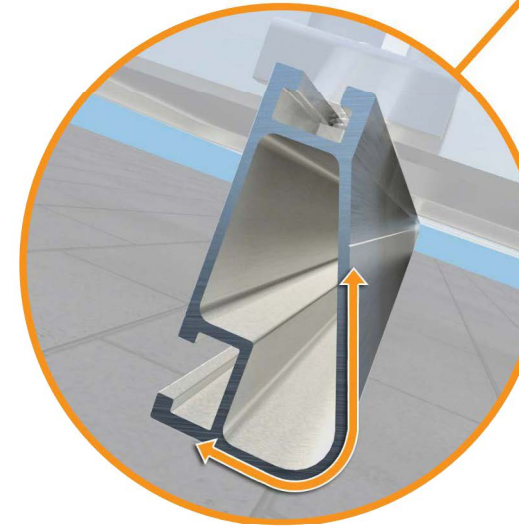
## XR Rail Family

Tech Brief

### Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



#### Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

#### Compatible with Flat & Pitched Roofs

XR Rails are compatible with Flash-Foot and other pitched roof attachments.

IronRidge offers a range of tie leg options for flat roof mounting applications.

#### Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

# S-5!®

## The Right Way!

### The S-5-S Clamp

The S-5-S clamp is an extraordinarily versatile clamp. It was created especially for popular snap-together profiles—including residential profiles—by Taylor Metals and Easy Lock Standing Seam. For horizontal seams under .540 inches (like the Firestone UC4) the S-5-S or S-5-S Mini can be used to avoid the necessity of crimping the seam.

Thanks to our patented round-point setscrews, S-5! clamps do not pierce metal roof paneling, thereby protecting roof coatings and weather-tightness warranties.

Its simple design and ample size make it so strong and versatile it can be used with S-5! snow retention products and other heavy-duty applications.

Installation is as simple as setting the specially patented round-point setscrews into the clamp, placing the clamp on the seam, and tightening them to the specified tension. Then, affix ancillary items using the bolt provided with the product. Go to [www.S-5.com/tools](http://www.S-5.com/tools) for information and tools available for properly attaching and tensioning S-5-S clamps.



### The S-5-S Mini

The S-5-S Mini is a medium-duty, non-penetrating seam clamp. A bit shorter than the S-5-S, the Mini has one setscrew rather than two. The Mini is the choice for attaching all kinds of rooftop accessories: signs, walkways, satellite dishes, antennas, rooftop lighting, lightning protection systems, solar arrays, exhaust stack bracing, conduit, condensate lines, mechanical equipment—just about anything!

\*S-5! Mini clamps can be used with RamGuard® unitized snow guards. They are not compatible with, and should not be used with, S-5! SnoRail™/SnoFence™ or ColorGuard® snow retention systems.

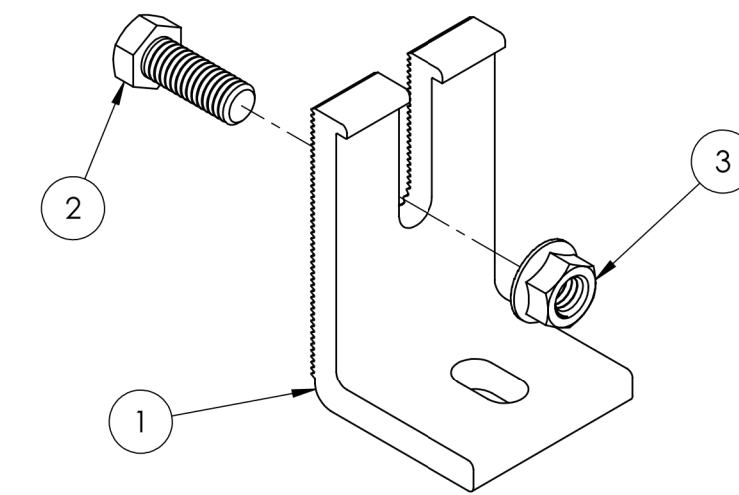
Attach almost anything to standing seam metal roofs without piercing the panel!

888-825-3432 [www.S-5.com](http://www.S-5.com)



## Slotted L-Foot

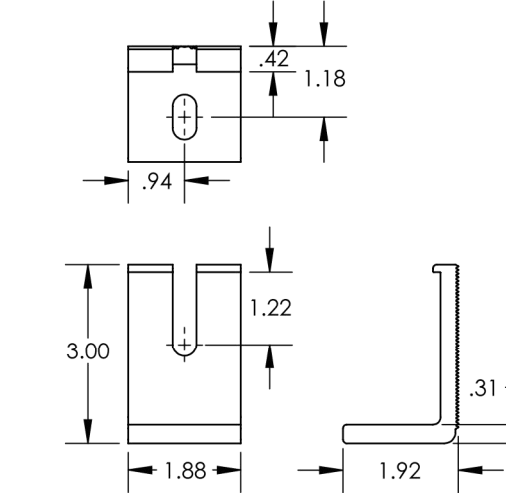
Cut Sheet



Item Number	Component	Qty in Kit
1	FOOT, EXTRUDED L - SLOTTED	4
2	BOLT, 3/8-16 X 1" HEX CS SS	4
3	NUT, FLANGE HEX 3/8-16 SS	4

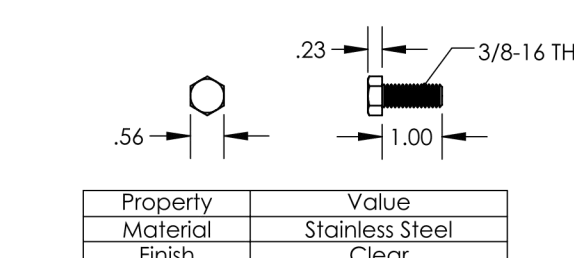
Part Number	Description
RS-LFT-001	Kit of 4, Slotted L-Foot (Mill Finish)
RS-LFT-001B	Kit of 4, Slotted L-Foot (Black Finish)

#### 1) Foot, Extruded L - Slotted



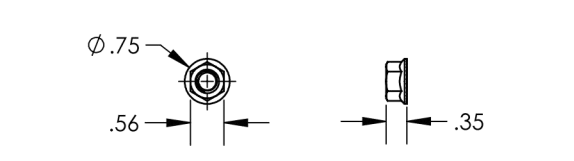
Property	Value
Material	Aluminum
Finish	Mill / Black

#### 2) Bolt, 3/8-16 x 1" Hex CS SS



Property	Value
Material	Stainless Steel
Finish	Clear

#### 3) Nut, Flange Hex 3/8-16 SS



Property	Value
Material	Stainless Steel
Finish	Clear

v1.0

## XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



### XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 8 foot spans, while remaining light and economical.

- 8' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available



### XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



### XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

### Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit [IronRidge.com](http://IronRidge.com) for detailed span tables and certifications.

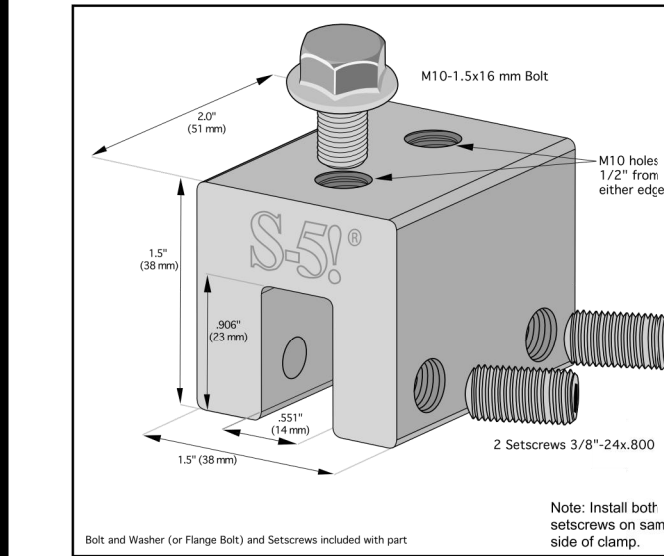
Snow (PSF)	Wind (MPH)	Rail Span					
		4'	5' 4"	6'	8'	10'	12'
None	100	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	120						
	140						
10-20	100	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	120						
	140						
30	100	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	120						
	140						
40	100	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	120						
	140						
50-70	160	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	160						
80-90	160	XR10	XR100	XR1000	XR1000	XR1000	XR1000

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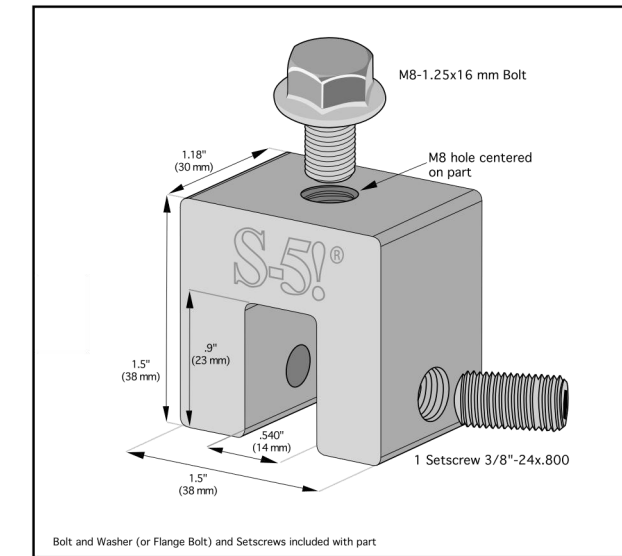
# S-5!®

## The Right Way!

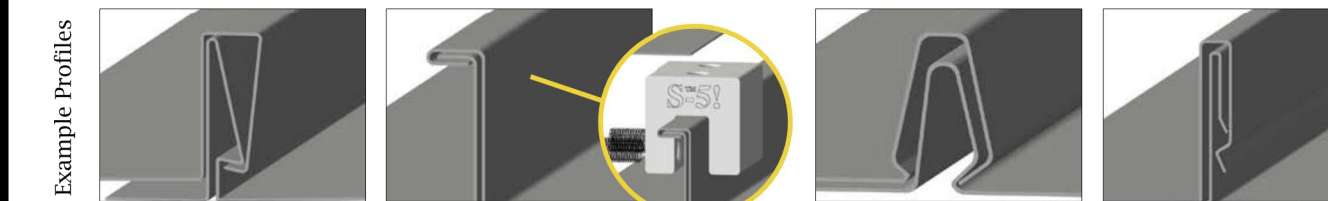
### S-5-S



### S-5-S Mini



The S-5-S and S-5-S Mini clamps are each furnished with the hardware shown above. Each box also includes a bit tip for tightening setscrews using an electric screw gun. A structural aluminum attachment clamp, the S-5-S is compatible with most common metal roofing materials excluding copper. All included hardware is stainless steel. Please visit [www.S-5.com](http://www.S-5.com) for more information including CAD details, metallurgical compatibilities and specifications.



The S-5-S clamp has been tested for load-to-failure results on most major brands and profiles of standing seam roofing. The independent lab test data found at [www.S-5.com](http://www.S-5.com) can be used for load-critical designs and applications. S-5! holding strength is unmatched in the industry.

The strength of the S-5-S clamp is in its simple design. The patented setscrews will slightly dimple the metal seam material but not pierce it—leaving roof warranties intact.

**S-5! Warning!** Please use this product responsibly! Products are protected by multiple U.S. and foreign patents. Visit the website at [www.S-5.com](http://www.S-5.com) for complete information on patents and trademarks. For maximum holding strength, clamps should be installed on or over the seam material centerline. Clamp setscrew tension should be verified using a calibrated torque wrench between 160 and 180 inch pounds when used on 22-gauge steel and between 130 and 150 inch pounds for all other metals and thinner gauges of steel. Consult the S-5! website at [www.S-5.com](http://www.S-5.com) for published data regarding holding strength.

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### CONTRACTOR

YOUR COMPANY NAME

PHONE: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

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### REVISION / RELEASE

NO.	DESCRIPTION	DATE

### PROJECT

NEW PV SYSTEM: 133.50 kWp DC

OWNER NAME

FULL ADDRESS

APN: \_\_\_\_\_

ENGINEER OF RECORD

PAPER SIZE: 36" x 24" (ARCH D)

SHEET TITLE:

RESOURCE DOCUMENTS

(SHEET #)

DATE: \_\_\_\_\_

DESIGN BY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

SHEET NUMBER:

R-002.00