

PHOTOVOLTAIC ROOF MOUNT SYSTEM

12 MODULES-ROOF MOUNTED - 4.980 kW DC, 7.600 kW AC
275 SE FAYE LN, LAKE CITY, FL 32025



4721 N GRADY AVE
TAMPA FL 33614
LIC #: CVC57085
PHONE: 813-540-8807

PROJECT DATA

PROJECT ADDRESS

275 SE FAYE LN,
LAKE CITY, FL 32025

OWNER:

BROOKS REDDING

CONTRACTOR:

LUNEX POWER,
4721 N GRADY AVE
TAMPA FL 33614
PHONE: 813-540-8807

DESIGNER:

ESR

SCOPE:

4.980 KW DC ROOF MOUNT
SOLAR PV SYSTEM WITH
12 TRINA SOLAR: TSM-NE09RC.05 415W
PV MODULES WITH
04 TESLA: MCI-2 RAPID SHUTDOWN
DEVICE WITH
01 TESLA : SOLAR INVERTER 7.6KW

AUTHORITIES HAVING JURISDICTION:

BUILDING: COLUMBIA COUNTY
ZONING: COLUMBIA COUNTY
UTILITY: FPL

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EQUIPMENT SPECIFICATIONS

PROFESSIONAL ENGINEER SEAL	
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GENERAL NOTES	
1. ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED. 2. THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2020. 3. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION. 4. ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY. 5. WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT. 6. HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24. 7. A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH NEC 2020 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM. 8. PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE. 9. PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING. MECHANICAL, OR BUILDING ROOF VENTS. 10. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE. 11. ALL SINAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SINAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ. 12. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED. 13. THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)] 14. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES. 15. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250. 16. SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41. 17. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12 18. DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)] 19. ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31 20. WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3). 21. ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703 22. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.	

VICINITY	
HOUSE PHOTO	

CODE REFERENCES	
PROJECT TO COMPLY WITH THE FOLLOWING: FLORIDA RESIDENTIAL CODE, 8TH EDITION 2023 (FRC) FLORIDA PLUMBING CODE, 8TH EDITION 2023 (FPC) FLORIDA BUILDING CODE, 8TH EDITION 2023 EDITION (FBC) FLORIDA MECHANICAL CODE, 8TH EDITION 2023 (FMC) 2020 NATIONAL ELECTRICAL CODE FLORIDA FIRE PREVENTION CODE, 8TH EDITION 2023 (FFPC) Andrew D. Leone Digitally signed by Andrew D. Leone Date: 2025.02.28 16:16:04 -05'00'	

REVISIONS		
DESCRIPTION	DATE	REV
ANDREW D. LEONE LICENSE No. 60669 STATE OF FLORIDA PROFESSIONAL ENGINEER / / DATE: 02/28/2025		
PROJECT NAME & ADDRESS BROOKS REDDING RESIDENCE 275 SE FAYE LN, LAKE CITY, FL 32025		
DRAWN BY ESR		
SHEET NAME COVER SHEET		
SHEET SIZE ANSI B 11" X 17"		
SHEET NUMBER PV-1		

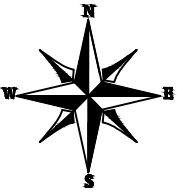
PROJECT DESCRIPTION:

12 X TRINA SOLAR: TSM-NE09RC.05 415W PV MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
DC SYSTEM SIZE: 12 x 415 = 4.980KW DC
AC SYSTEM SIZE: 1 x 7600 = 7.600KW AC

EQUIPMENT SUMMARY
12 TRINA SOLAR: TSM-NE09RC.05 415W MONO MODULES
04 TESLA: MCI-2 RAPID SHUTDOWN DEVICE WITH
01 TESLA : SOLAR INVERTER 7.6KW

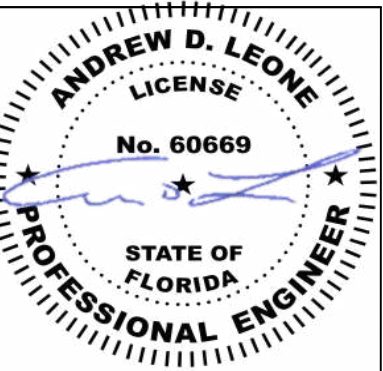
ROOF ARRAY AREA #1:- 258.00 SQ FT.

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



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/ /
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RESIDENCE
275 SE FAYE LN,
LAKE CITY, FL 32025

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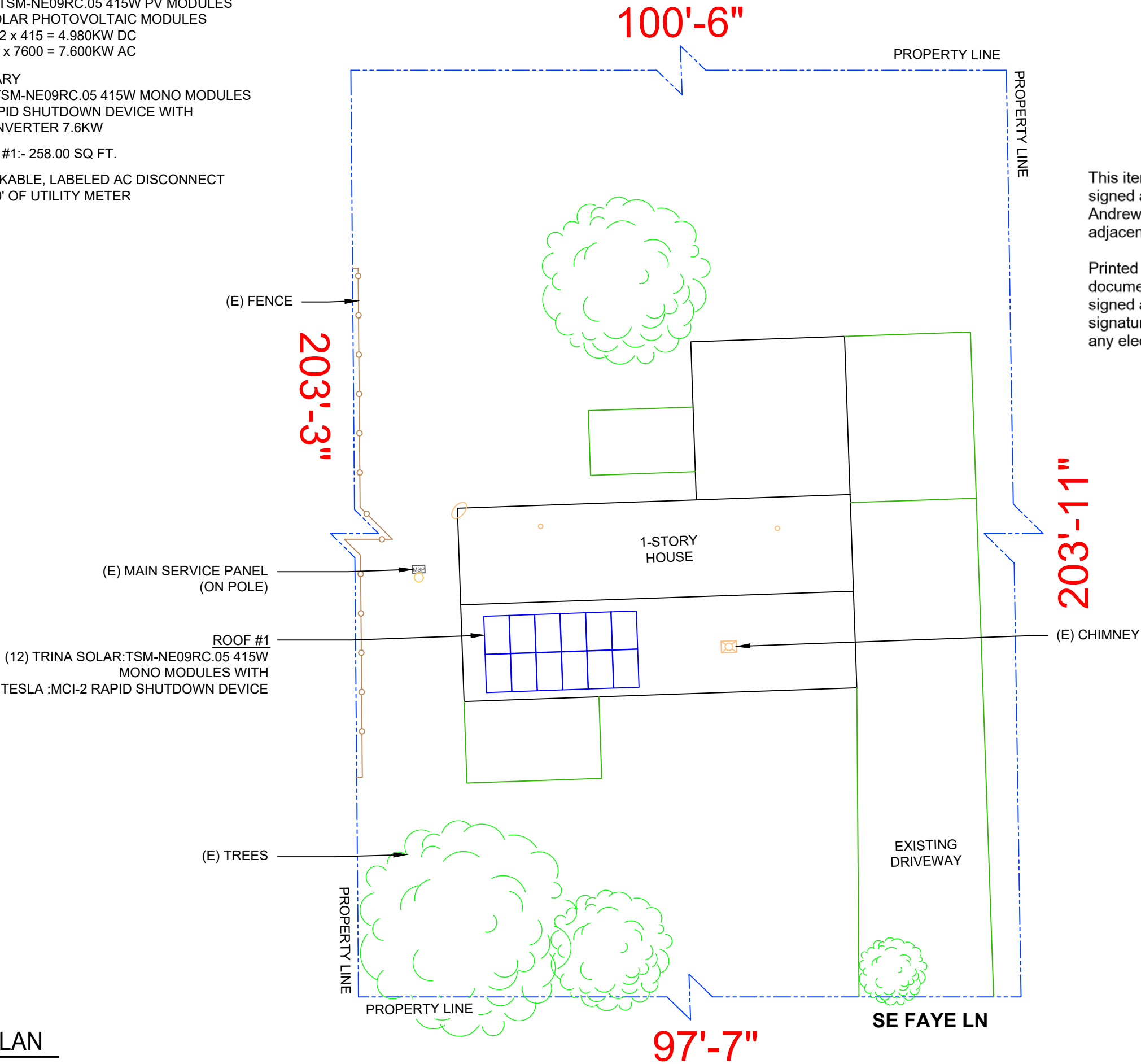
SHEET NAME
SITE PLAN

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

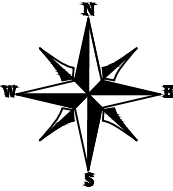
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MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 12 MODULES
MODULE TYPE = TRINA SOLAR: TSM-NE09RC.05 415W MONO MODULES
MODULE WEIGHT = 47.0 LBS / 21.3 KG.
MODULE DIMENSIONS = 69.37" x 44.65" = 21.50 SF



ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	12	258.00	827.58	31
TOTAL	12	258.00	2185.42	12

ROOF DESCRIPTION			
ROOF TYPE		METAL	
ROOF	ROOF PITCH	AZIMUTH	SEAM SPACING
#1	14°	178°	9"

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SHEET NAME

ROOF PLAN & MODULES

SHEET SIZE

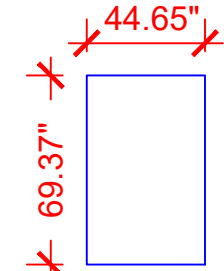
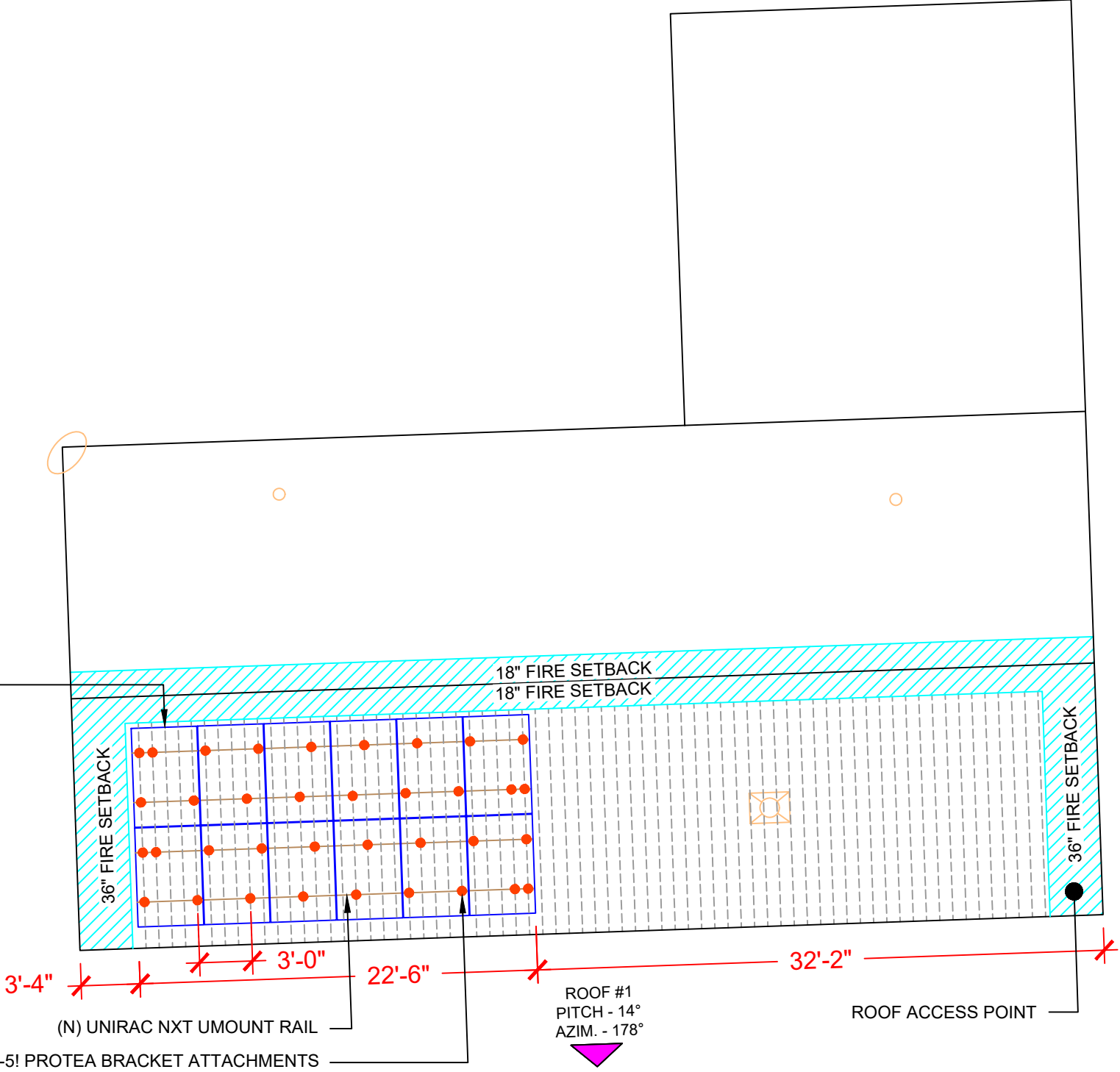
ANSI B
11" X 17"

SHEET NUMBER

PV-3

(E) MAIN SERVICE PANEL (ON POLE)

ROOF #1
(12) TRINA SOLAR:TSM-NE09RC.05 415W MONO MODULES WITH TESLA :MCI-2 RAPID SHUTDOWN DEVICE



TRINA SOLAR:
TSM-NE09RC.05 415W
MODULES

LEGEND

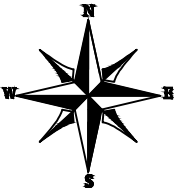
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- ROOF ATTACHMENT
- SUB - SUB PANEL
- MSP - MAIN SERVICE PANEL

1 ROOF PLAN & MODULES

PV-3

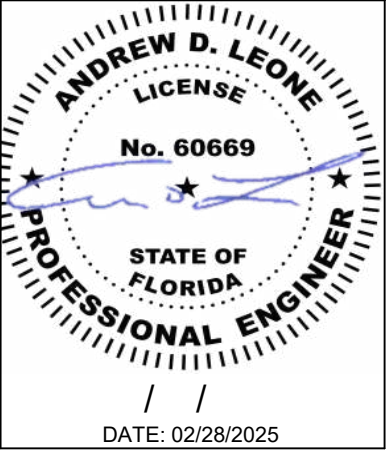
SCALE: 1/8" = 1'-0"

CIRCUIT LEGENDS	
---	STRING #1
---	STRING #2



BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULES	12	TRINA SOLAR: TSM-NE09RC.05 415W MODULE
INVERTER	1	TESLA : SOLAR INVERTER 7.6KW
RAPID SHUTDOWN DEVICE	4	TESLA:MCI-2 RAPID SHUTDOWN DEVICE
JUNCTION BOX	1	JUNCTION BOXES
RAILS	7	UNIRAC NXT UMount RAIL
SPLICES	4	SPLICE KIT
MID MODULE CLAMPS	20	MID MODULE CLAMPS
END CLAMPS	8	END CLAMPS / STOPPER SLEEVE
ATTACHMENTS	36	S-5! PROTEA BRACKET ATTACHMENTS

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PROJECT NAME & ADDRESS	
BROOKS REDDING RESIDENCE	275 SE FAYE LN, LAKE CITY, FL 32025

DRAWN BY ESR

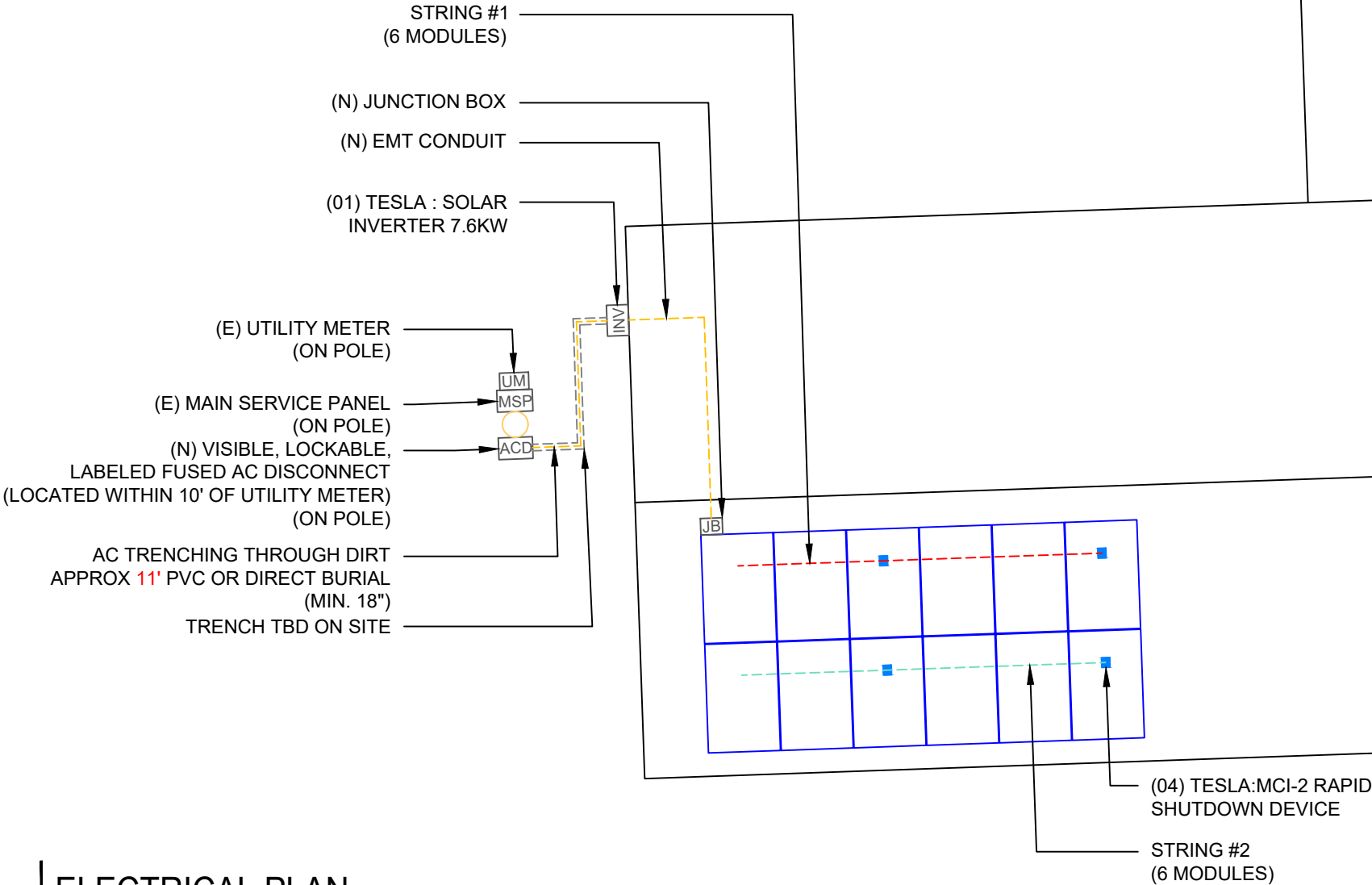
SHEET NAME ELECTRICAL PLAN

SHEET SIZE ANSI B 11" X 17"

SHEET NUMBER PV-4

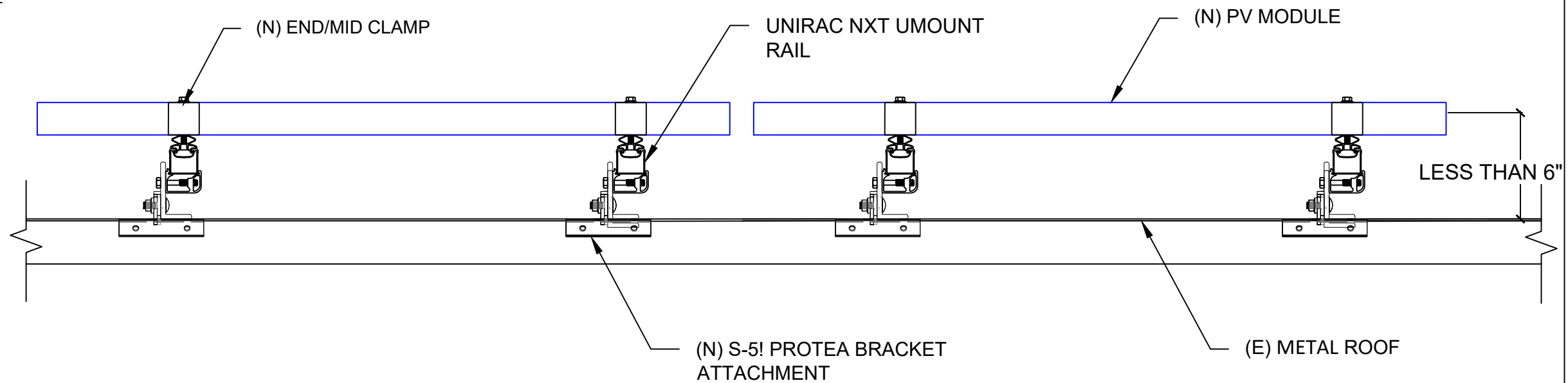
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LEGEND	
JB	- JUNCTION BOX
INV	- INVERTER
UM	- UTILITY METER
MSP	- MAIN SERVICE PANEL
SUB	- SUB PANEL
---	- CONDUIT

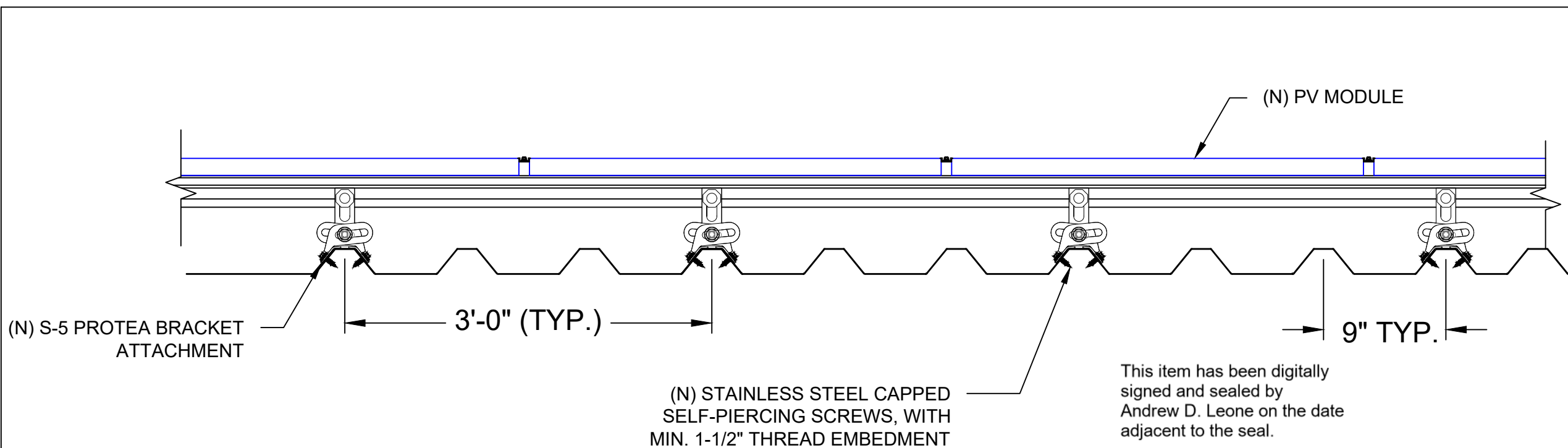
DESCRIPTION: CANTILEVER
CANTILEVER CONSIDER 1/3RD OF ROOF ATTACHMENT SPACING.
ATTACHMENT SPACING= 36" O/C
CANTILEVER = 12"



1 STRUCTURAL ATTACHMENT (SIDE VIEW)

PV-5

SCALE: N.T.S.



2 ATTACHMENT DETAIL (FRONT VIEW)

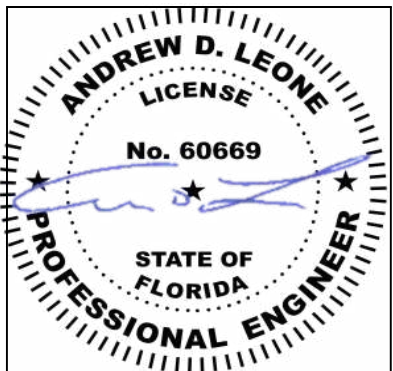
PV-5

SCALE: N.T.S.

LUNEX POWER
THE PURE SOURCE

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SHEET NAME
STRUCTURAL DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

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DC SYSTEM SIZE: 12 x 415 = 4.980 kW DC
AC SYSTEM SIZE: 1 X 7600 = 7.600 KW AC

- (12) TRINA SOLAR: TSM-NE09RC.05 415W MONO MODULES WITH
(04) TESLA: MCI-2 RAPID SUTDOWN DEVICES
(01) TESLA : SOLAR INVERTER 7.6KW
(2) BRANCH CIRCUIT OF 06 MODULES ARE CONNECTED IN SERIES

INSTALLER / ELECTRICIAN NOTE:

EC IS TO MEASURE VOLTAGE BEFORE STARTING WORK.
IF RESULT IS ANY OTHER VOLTAGE MEASURED THAN 120/240V IS
OBSERVED, DO NOT PROCEED. CONTACT ENGINEER.

INTERCONNECTION NOTES:

- INTERCONNECTION SIZING, LIMITATIONS AND COMPLIANCE DETERMINED IN ACCORDANCE WITH [NEC 705.12], AND [NEC 690.59].
- GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9], [NEC 230.95].
- ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
- PV BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR RELATIVE TO THE MAIN BREAKER.

DISCONNECT NOTES:

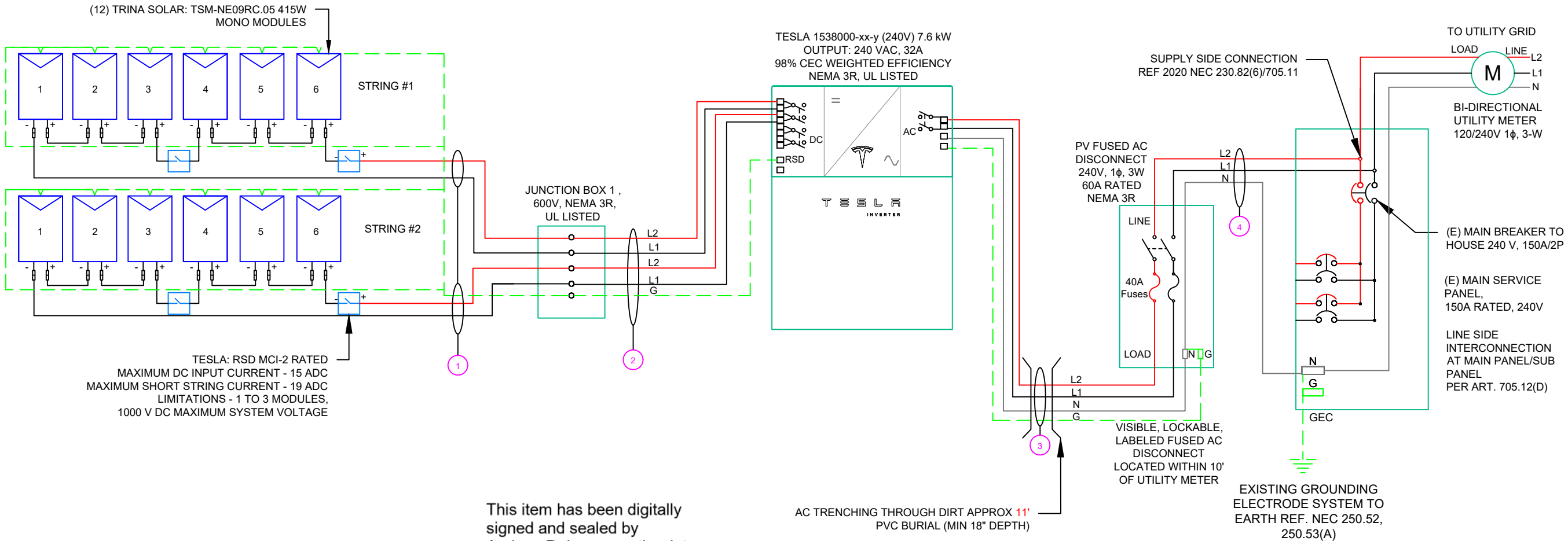
- DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
- AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
- DISCONNECT MEANS AND THEIR LOCATION SHALL BE IN ACCORDANCE WITH [NEC 225.31] AND [NEC 225.32].

RACKING NOTES:

- BOND EVERY OTHER RAIL WITH #6 BARE COPPER

GROUNDING & GENERAL NOTES:

- GROUNDING ELECTRODES AND GROUNDING ELECTRODE CONDUCTORS.** ADDITIONAL GROUNDING ELECTRODES SHALL BE PERMITTED TO BE INSTALLED IN ACCORDANCE WITH 250.52 AND 250.54. GROUNDING ELECTRODES SHALL BE PERMITTED TO BE CONNECTED DIRECTLY TO THE PV MODULE FRAME(S) OR SUPPORT STRUCTURE PER [NEC 690.47(B)]
- PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
- DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
- ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
- JUNCTION BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - JUNCTION BOX DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
- AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.
- RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.



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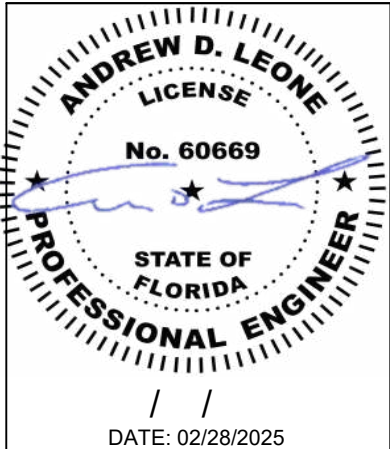
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QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
1	(4)	CU#10AWG - PV WIRE (L1 & L2 NO NEUTRAL)	N/A	N/A
	(1)	CU#6AWG - BARE COPPER IN FREE AIR		
2	(4)	CU#10AWG - THWN-2 (L1,L2)	EMT OR LFMC IN ATTIC	3/4"
	(1)	CU#10AWG - THWN-2 GND		
3	(2)	CU#6AWG - THWN-2 (L1,L2)	PVC BURIAL (MIN 18")	3/4"
	(1)	CU#6AWG - THWN-2 N		
	(1)	CU#6AWG - THWN-2 GND		
4	(2)	CU#6AWG - THWN-2 (L1,L2)	EMT, LFMC OR LFNC	3/4"
	(1)	CU#6AWG - THWN-2 N		



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DRAWN BY

ESR

SHEET NAME

ELECTRICAL LINE DIAGRAM

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-6

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	TESLA :: SOLAR INVERTER 7.6KW
NOMINAL AC POWER	7.600KW
NOMINAL GRID VOLTAGE	120/240 VAC
NOMINAL OUTPUT CURRENT	32A
PV MAXIMUM INPUT VOLTAGE	600 VDC

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	TRINA SOLAR: TSM-NE09RC.05 415W MODULE
VMP	42.5V
IMP	9.77A
VOC	50.5V
ISC	10.40A
TEMP. COEFF. VOC	-0.244%/°C
MODULE DIMENSION	69.37"L x 44.65"W x 1.18"D (In Inch)

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-5°
AMBIENT TEMP (HIGH TEMP 2%)	37°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.234%/°C
PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

DC FEEDER CALCULATIONS																						
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(1)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(C)(1)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
STRING 1	JUNCTION BOX	600	15.00	19.00	20	N/A	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	37	2	40	0.91	1	36.4	PASS	19	1.24	0.118	N/A	#N/A
STRING 2	JUNCTION BOX	600	15.00	19.00	20	N/A	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	37	2	40	0.91	1	36.4	PASS	19	1.24	0.118	N/A	#N/A
JUNCTION BOX	INVERTER	600	15.00	19.00	20	N/A	CU #10 AWG	CU #10 AWG	35	PASS	37	4	40	0.91	0.8	29.12	PASS	27	1.24	0.167	3/4" EMT	19.79362

String 1 Voltage Drop	0.285
String 2 Voltage Drop	0.285

AC FEEDER CALCULATIONS																						
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(1)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(C)(1)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
INVERTER	AC DISCONNECT	240	32	40	40	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	37	2	75	0.91	1	68.25	PASS	11	0.491	0.144	3/4" PVC	39.9213
AC DISCONNECT	POI	240	32	40	40	CU #6 AWG	N/A	CU #6 AWG	65	PASS	37	2	75	0.91	1	68.25	PASS	5	0.491	0.065	3/4" FMT	28.5366
																		CUMULATIVE VOLTAGE INV		0.209		

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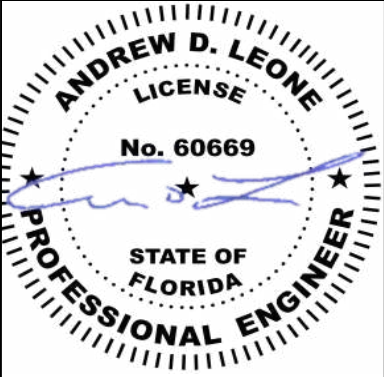
ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE RATED UPTO 600V FOR RESIDENTIAL AND 1000V FOR COMMERCIAL AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF JUNCTION BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.



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DATE: 02/28/2025

PROJECT NAME & ADDRESS

BROOKS REDDING
RESIDENCE

275 SE FAYE LN,
LAKE CITY, FL 32025

DRAWN BY
ESR

SHEET NAME
WIRING CALCULATIONS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-7

CAUTION:
AUTHORIZED SOLAR
PERSONNEL ONLY!

LABEL-1:
LABEL LOCATION:
AC DISCONNECT

 **WARNING**

ELECTRICAL SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY
BE ENERGIZED IN THE OPEN POSITION

LABEL- 2:
LABEL LOCATION:
AC DISCONNECT
COMBINER
MAIN SERVICE PANEL
SUBPANEL
MAIN SERVICE DISCONNECT
CODE REF: NEC 690.13(B)

 **WARNING DUAL POWER SOURCE**

SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL- 3:
LABEL LOCATION:
PRODUCTION METER
UTILITY METER
MAIN SERVICE PANEL
SUBPANEL
CODE REF: NEC 705.12(C) & NEC 690.59

 **WARNING**

**TURN OFF PHOTOVOLTAIC AC
DISCONNECT PRIOR TO
WORKING INSIDE PANEL**

LABEL- 4:
LABEL LOCATION:
MAIN SERVICE PANEL
SUBPANEL
MAIN SERVICE DISCONNECT
COMBINER
CODE REF: NEC 110.27(C) & OSHA 1910.145 (f) (7)

 **CAUTION**

**PHOTOVOLTAIC SYSTEM CIRCUIT IS
BACKFEED**

LABEL- 5:
LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(D) & NEC 690.59

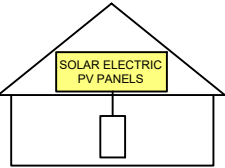
 **WARNING**

**POWER SOURCE OUTPUT
CONNECTION. DO NOT
RELOCATE THIS
OVERCURRENT DEVICE**

LABEL- 6:
LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(B)(3)(2)

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN
SWITCH TO THE
"OFF" POSITION TO
SHUT DOWN PV SYSTEM
AND REDUCE
SHOCK HAZARD
IN THE ARRAY



LABEL- 7:
LABEL LOCATION:
AC DISCONNECT
CODE REF: IFC 605.11.3.1(1) & NEC 690.56(C)

RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM

LABEL- 8:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.56(C)(2)

PHOTOVOLTAIC

AC DISCONNECT

LABEL- 9:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.13(B)

**PHOTOVOLTAIC
AC DISCONNECT**

NOMINAL OPERATING AC VOLATGE **240 V**

RATED AC OUTPUT CURRENT **32.00 A**

LABEL- 10:
LABEL LOCATION:
MAIN SERVICE PANEL
SUBPANEL
AC DISCONNECT
CODE REF: NEC 690.54

MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT

LABEL- 11:
LABEL LOCATION:
MAIN SERVICE DISCONNECT (ONLY IF MAIN SERVICE DISCONNECT IS PRESENT)
CODE REF: NEC 690.13(B)

PRODUCTION
METER

LABEL- 12:
LABEL LOCATION:
PRODUCTION METER (ONLY IF PRODUCTION METER IS USED)

CAUTION: PHOTOVOLTAIC SYSTEM
FOR SERVICE : LUNEX POWER
813-540-8807

LABEL-13:

WARNING: PHOTOVOLTAIC
POWER SOURCE

LABEL-14:
LABEL LOCATION:
EMT/CONDUIT RACEWAY
SOLADECK/JUNCTION BOX
CODE REF : NEC 690.31 (D) (14)

MAXIMU VOLTAGE: **600 V**

MAXIMUM CIRCUIT CURRENT: **15.0 A**

MAXIMUM RATED OUTPUT
CURRENT OF THE CHARGE
CONTROLLER OR DC-TO-DC
CONVERTER (IF INSTALLED):

LABEL- 15:
LABEL LOCATION:
INVERTER
CODE REF: NEC 690.53

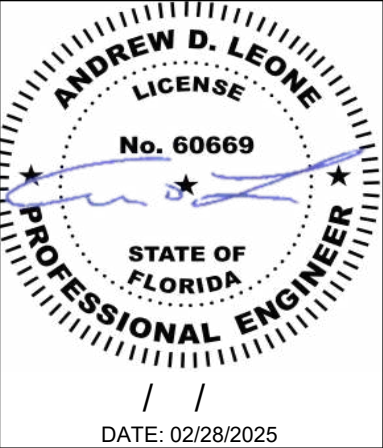
This item has been digitally
signed and sealed by
Andrew D. Leone on the date
adjacent to the seal.

Printed copies of this
document are not considered
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signature must be verified on
any electronic copies.



4721 N GRADY AVE
TAMPA FL 33614
LIC #: CVC57085
PHONE: 813-540-8807

REVISIONS		
DESCRIPTION	DATE	REV



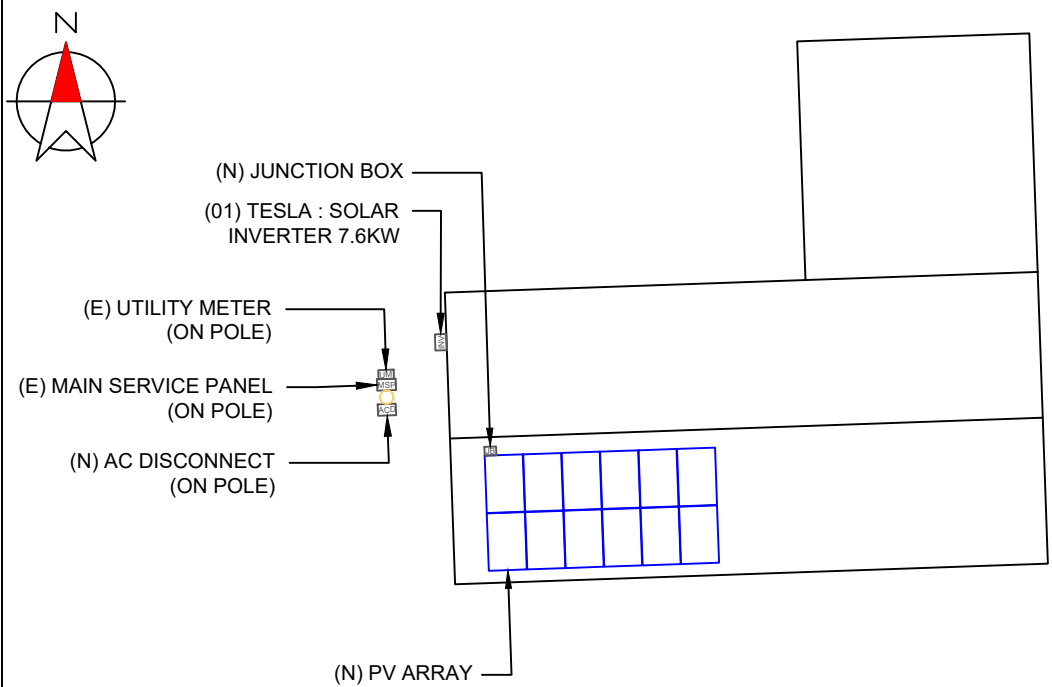
PROJECT NAME & ADDRESS

BROOKS REDDING
RESIDENCE

275 SE FAYE LN,
LAKE CITY, FL 32025

DRAWN BY ESR
SHEET NAME LABELS
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-8

CAUTION
MULTIPLE SOURCES OF POWER



DIRECTORY
PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM.

(ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS OUTLINED WITHIN:
NEC 690.56(B)&(C), [NEC 705.10])

LABELING NOTES:

1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
2. LABELING REQUIREMENTS BASED ON THE 2020 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
3. MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21]
5. LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.1]

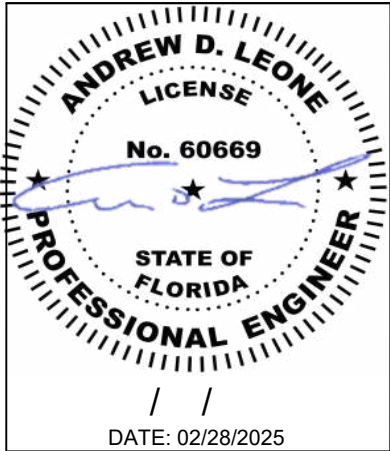
This item has been digitally signed and sealed by Andrew D. Leone on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.



4721 N GRADY AVE
TAMPA FL 33614
LIC #: CVC57085
PHONE: 813-540-8807

REVISIONS		
DESCRIPTION	DATE	REV



PROJECT NAME & ADDRESS

BROOKS REDDING
RESIDENCE
275 SE FAYE LN,
LAKE CITY, FL 32025

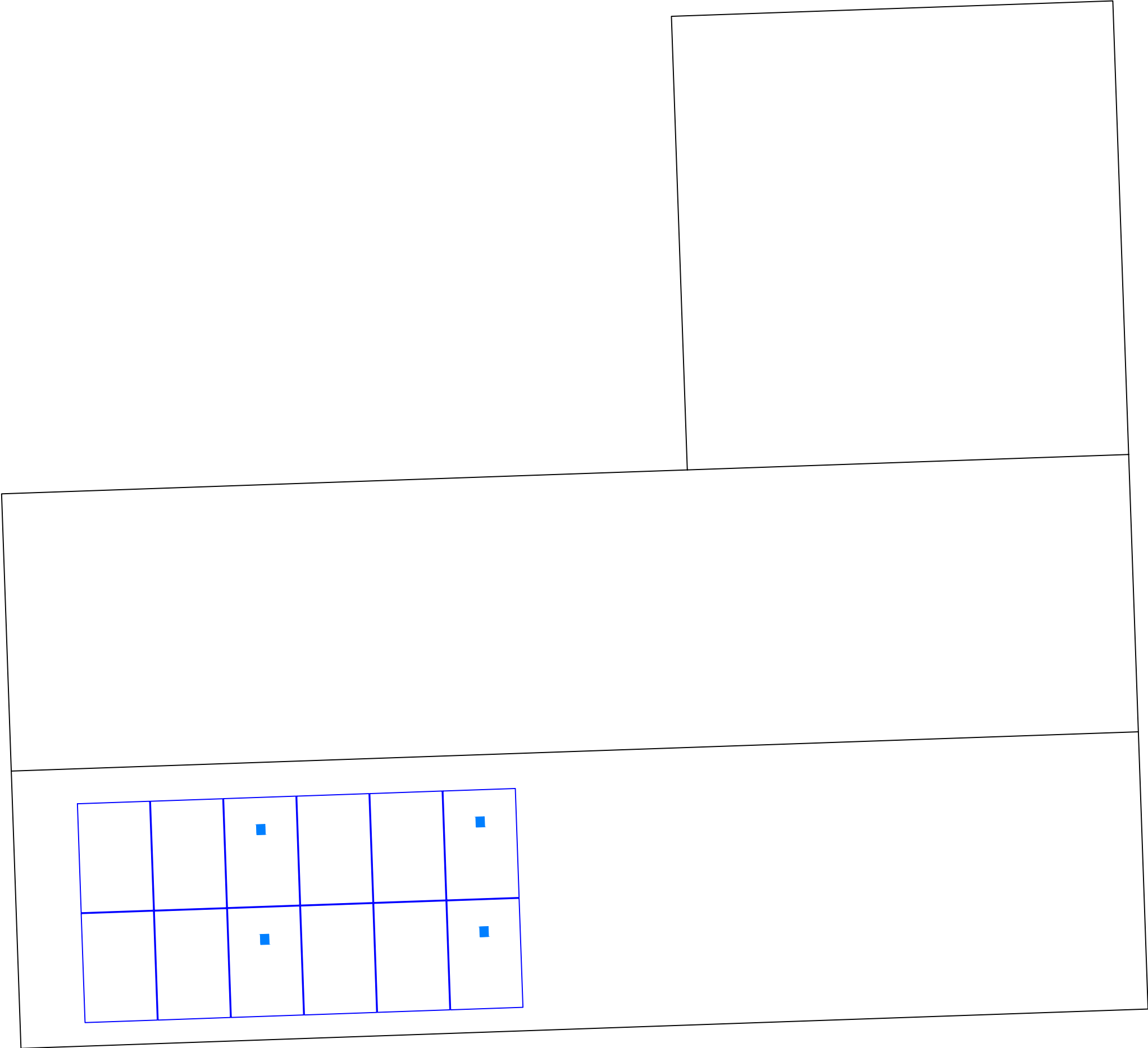
DRAWN BY
ESR

SHEET NAME
PLACARD

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

RAPID SHUTDOWN CHART





4721 N GRADY AVE
TAMPA FL 33614
LIC #: CVC57085
PHONE: 813-540-8807

REVISIONS		
DESCRIPTION	DATE	REV

DATE: 02/28/2025

BROOKS REDDING
RESIDENCE

275 SE FAYE LN,
LAKE CITY, FL 32025

DRAWN BY
ESR

SHEET NAME
RAPID SHUTDOWN
CHART

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10



BACKSHEET MONOCRYSTALLINE MODULE

430W

MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

21.5%

MAXIMUM EFFICIENCY

Mono Multi Solutions

PRODUCT: TSM-NE09RC.05
PRODUCT RANGE: 400-430W



Small in size, bigger on power

- Up to 430W, 21.5% module efficiency with high density interconnect technology
- Reduce installation cost with higher power bin and efficiency
- Boost performance in warm weather with low temperature coefficient and operating temperature



High Reliability

- Innovative non-destructive cutting for improved mechanical resistance and strength
- Excellent fire rating, weather resistance, salt spray, sand dust, ammonia performance which is fully applicable in coastal, high temperature, humidity area and harsh environment



Ultra-low Degradation, longer warranty, higher output

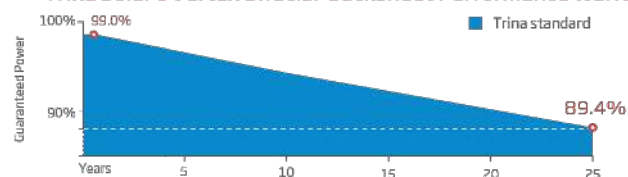
- First-year degradation 1% and annual degradation at 0.4%
- Up to 25 years product warranty and 25 years power warranty



Universal solution for residential and C&I rooftops

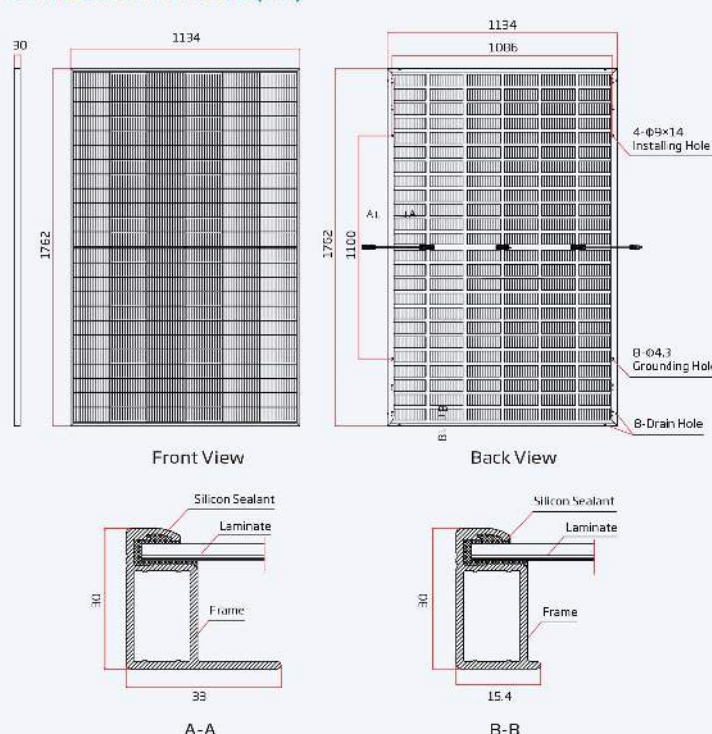
- Easy for integration, designed for compatibility with existing mainstream inverters and diverse mounting systems
- Perfect size and low weight for handling and installation
- Most valuable solution on low load capacity rooftops (weight similar to backsheet version)
- Mechanical performance up to 6000 Pa positive load and 4000 Pa negative load

Trina Solar's Vertex Bifacial Backsheet Performance Warranty

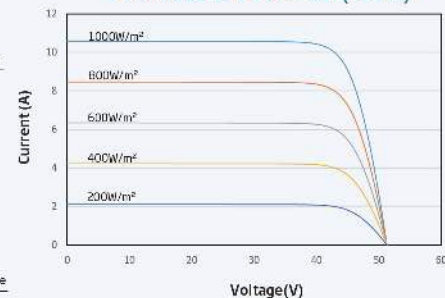


BACKSHEET MONOCRYSTALLINE MODULE

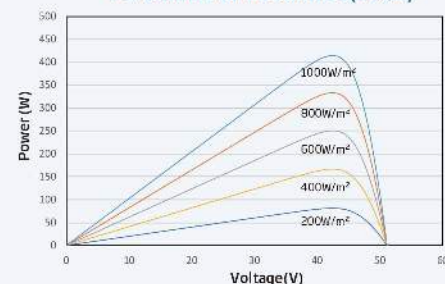
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(415 W)



P-V CURVES OF PV MODULE(415W)



ELECTRICAL DATA (STC)

Peak Power Watts-P _{max} (Wp)*	400	405	410	415	420	425	430
Power Tolerance-PMAX (W)				0~+5			
Maximum Power Voltage-V _{mp} (V)	41.3	41.7	42.1	42.5	42.8	43.2	43.6
Maximum Power Current-I _{mp} (A)	9.68	9.71	9.73	9.77	9.80	9.84	9.87
Open Circuit Voltage-V _{oc} (V)	49.2	49.6	50.1	50.5	50.9	51.4	51.8
Short Circuit Current-I _{sc} (A)	10.30	10.33	10.37	10.40	10.43	10.47	10.50
Module Efficiency-η _m (%)	20.0	20.3	20.5	20.8	21.0	21.3	21.5

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

Electrical characteristics with different power bin (reference to 10% Irradiance ratio)

Total Equivalent power -P _{max} (Wp)	426	431	437	442	447	453	458
Maximum Power Voltage-V _{mp} (V)	41.3	41.7	42.1	42.5	42.8	43.2	43.6
Maximum Power Current-I _{mp} (A)	10.31	10.34	10.36	10.41	10.44	10.48	10.51
Open Circuit Voltage-V _{oc} (V)	49.2	49.6	50.1	50.5	50.9	51.4	51.8
Short Circuit Current-I _{sc} (A)	10.97	11.00	11.04	11.08	11.11	11.15	11.18

Power tolerance: ±3.00%.

ELECTRICAL DATA (NOCT)

Maximum Power P _{max} (Wp)	312	308	312	316	319	324	328
Maximum Power Voltage-V _{mp} (V)	30.6	30.0	30.3	30.7	30.0	30.4	30.7
Maximum Power Current-I _{mp} (A)	7.08	7.91	7.93	7.96	7.98	8.01	8.04
Open Circuit Voltage-V _{oc} (V)	46.6	47.0	47.5	47.8	48.2	48.7	49.1
Short Circuit Current-I _{sc} (A)	8.30	8.32	8.35	8.38	8.41	8.44	8.46

NOCT: Irradiance: 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s

MECHANICAL DATA

Solar Cells	Topcon Bifacial
No. of cells	144cells
Module Dimensions	1762×1134×30 mm (69.37×44.65×1.18 inches)
Weight	21.3kg (47.0 lb)
Front Glass	3.2 mm (0.12 inches), High Transmission, Tempered Glass
Encapsulant material	POE/EVA
Backsheet	Black Grid Transparent Backsheet
Frame	30mm (1.18 inches) Anodized Aluminium Alloy, Black
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²) LandscapeN 1100 mm/P1100 mm(43.31/43.31 inches)
Connector	MC4 EV02
Fire Type	Type1 or Type2

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P _{max}	-0.30%/°C
Temperature Coefficient of V _{oc}	-0.24%/°C
Temperature Coefficient of I _{sc}	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	25 A

WARRANTY

25 year Product Workmanship Warranty
25 year Power Warranty
1% first year degradation
0.4% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 36 pieces
Modules per 40' container: 792 pieces
Pallet dimensions (L x W x H): 1800 x 1135 x 1259 mm
Pallet weight: 829 kg (1827 lb)

Comprehensive Products and System Certificates



CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

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Version number: TSM_NA_EN_2023_A

www.trinasolar.com



4721 N GRADY AVE
TAMPA FL 33614
LIC #: CVC57085
PHONE: 813-540-8807

REVISIONS

DESCRIPTION	DATE	REV

DATE: 02/28/2025

PROJECT NAME & ADDRESS

BROOKS REDDING
RESIDENCE
275 SE FAYE LN,
LAKE CITY, FL 32025

DRAWN BY

ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-11

Tesla Solar Inverter
with Site Controller

Tesla Solar Inverter completes the Tesla home solar system, converting DC power from solar to AC power for home consumption. Tesla's renowned expertise in power electronics has been combined with robust safety features and a simple installation process to produce an outstanding solar inverter that is compatible with both Solar Roof and traditional solar panels. Once installed, homeowners use the Tesla mobile app to manage their solar system and monitor energy consumption, resulting in a truly unique ecosystem experience.

KEY FEATURES

- Built on Powerwall technology for exceptional efficiency and reliability
- Designed to integrate with Tesla Powerwall and Tesla App
- Wi-Fi, Ethernet, and cellular connectivity with easy over-the-air updates
- 0.5% revenue-grade metering for Solar Renewable Energy Credit (SREC) programs included



March 17, 2024

Tesla Solar Inverter Technical Specifications

Electrical Specifications: Output (AC)	Model Number	1538000-xx-y			
	Output (AC) ¹	3.8 kW	5 kW	5.7 kW	7.6 kW
	Nominal Power	3,800 W	5,000 W	5,700 W	7,600 W
	Maximum Apparent Power	3,840 VA	5,040 VA	6,000 VA	7,680 VA
	Maximum Continuous Current	16 A	21 A	24 A	32 A
	Breaker (Overcurrent Protection)	20 A	30 A	30 A	40 A
	Nominal Power Factor	1 - 0.9 (leading / lagging)			
THD (at Nominal Power)		<5%			

Electrical Specifications: Input (DC)	MPPT	4
	Input Connectors per MPPT	1-2-1-2
	Maximum Input Voltage	600 VDC
	DC Input Voltage Range	60 - 550 VDC
	DC MPPT Voltage Range	60 - 480 VDC ²
	Maximum Current per MPPT (I _{mp})	13 A ²
	Maximum Short Circuit Current per MPPT (I _{sc})	17 A ²

¹Maximum current.
²Where the DC input current exceeds an MPPT rating, jumpers can be used to allow a single MPPT to intake additional DC current up to 26 A I_{mp} / 34 A I_{sc}.

Performance Specifications	Peak Efficiency	98.6% at 240 V
	CEC Efficiency	98.0% at 240 V
	Allowable DC/AC Ratio	1.7
	Customer Interface	Tesla Mobile App
	Internet Connectivity	Wi-Fi (2.4 GHz, 802.11 b/g/n), Ethernet, Cellular (LTE/4G) ³
	Revenue Grade Meter	Revenue Accurate (+/- 0.5%)
	AC Remote Metering Support	Wi-Fi (2.4 GHz, 802.11 b/g/n)
	Protections	Integrated arc fault circuit interrupter (AFCI), Rapid Shutdown
	Supported Grid Types	60 Hz, 240 V Split Phase
	Warranty	12.5 years

³Cellular connectivity subject to network operator service coverage and signal strength.

Tesla Solar Inverter and Solar Shutdown Device Datasheet

2

Tesla Solar Inverter Technical Specifications

Mechanical Specifications	Dimensions	660 mm x 411 mm x 158 mm (26 in x 16 in x 6 in)
Weight	52 lb ⁴	
	Mounting Options	Wall mount (bracket)
⁴ Door and bracket can be removed for a mounting weight of 37 lb.		

Environmental Specifications	Operating Temperature	-30°C to 45°C (-22°F to 113°F) ¹
	Operating Humidity (RH)	Up to 100%, condensing
	Storage Temperature	-30°C to 70°C (-22°F to 158°F)
	Maximum Elevation	3000 m (9843 ft)
	Environment	Indoor and outdoor rated
	Enclosure Rating	Type 3R
	Ingress Rating	IP55 (Wiring compartment)
Pollution Rating	PD2 for power electronics and terminal wiring compartment, PD3 for all other components	
	Operating Noise @ 1 m	< 40 db(A) nominal, < 50 db(A) maximum
	¹ Performance may be de-rated to 6.2 kW at 240 V when operating at temperatures greater than 45°C.	

Compliance Information	Grid Certifications	UL 1741, UL 1741 SA, UL 1741 SB, UL 1741 PCS, IEEE 1547-2018, IEEE 1547.1
	Safety Certifications Emissions	UL 1741 PVRSS, UL 1699B, UL 1998 (US), UL 3741 EN 61000-6-3 (Residential), FCC 47CFR15.109 (a)

Tesla Solar Inverter and Solar Shutdown Device Datasheet

3



4721 N GRADY AVE
TAMPA FL 33614
LIC #: CVC57085
PHONE: 813-540-8807

REVISIONS		
DESCRIPTION	DATE	REV

DATE: 02/28/2025

PROJECT NAME & ADDRESS

BROOKS REDDING
RESIDENCE
275 SE FAYE LN,
LAKE CITY, FL 32025

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12

Solar Shutdown Device Technical Specifications

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is integral to the rapid shutdown (RSD) function required for rooftop PV systems in accordance with Article 690 of the NEC. When paired with Powerwall 3, solar array shutdown is initiated by an External System Shutdown Switch or the On/Off Enable switch located on Powerwall 3. Systems not subject to rapid shutdown requirements must still install one or more MCIs for functional purposes; see the Powerwall 3 installation manual for details.

Electrical Specifications	Model	MCI-1	MCI-2	MCI-2 High Current
	Nominal Input DC Current Rating (I_{MP})	13 A	13 A	15 A
	Maximum Input Short Circuit Current (I_{SC})	19 A	17 A	19 A
	Maximum System Voltage	600 V DC	1000 V DC ¹⁴	1000 V DC ¹⁴
	Maximum Disconnect Voltage ¹⁵	600 V DC	165 V DC	165 V DC

¹⁴ Maximum System Voltage is limited by Powerwall to 600 V DC.

¹⁵ Maximum Disconnect Voltage is the maximum voltage allowed across each MCI in the open position (Rapid Shutdown Initiated). An individual MCI-2 has a voltage rating of 165V but in combination (connected in the same string) their voltage ratings are additive.

RSD Module Performance	Maximum Number of Devices per String	5
	Control	Power Line Excitation
	Passive State	Normally Open
	Maximum Power Consumption	7 W
	Warranty	25 years

Environmental Specifications	Operating Temperature	-40°C to 50°C (-40°F to 122°F)	-45°C to 70°C (-49°F to 158°F)
	Storage Temperature	-30°C to 70°C (-22°F to 158°F)	-30°C to 70°C (-22°F to 158°F)
	Enclosure Rating	NEMA 4X / IP65	

Mechanical Specifications	Electrical Connections	MC4 Connector	
	Housing	Plastic	
	Dimensions	125 x 150 x 22 mm (5 x 6 x 1 in)	173 x 45 x 22 mm (6.8 x 1.8 x 1 in)
	Weight	350 g (0.77 lb)	120 g (0.26 lb)
	Mounting Options	ZEP Home Run Clip M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw	Wire Clip

Compliance Information	Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)
	RSD Initiation Method	External System Shutdown Switch or Powerwall 3 Enable Switch

UL 3741 PV Hazard Control (and PVRSA) Compatibility	See UL 3741 Application Addendum
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DRAWN BY

ESR

SHEET NAME

EQUIPMENT SPECIFICATION

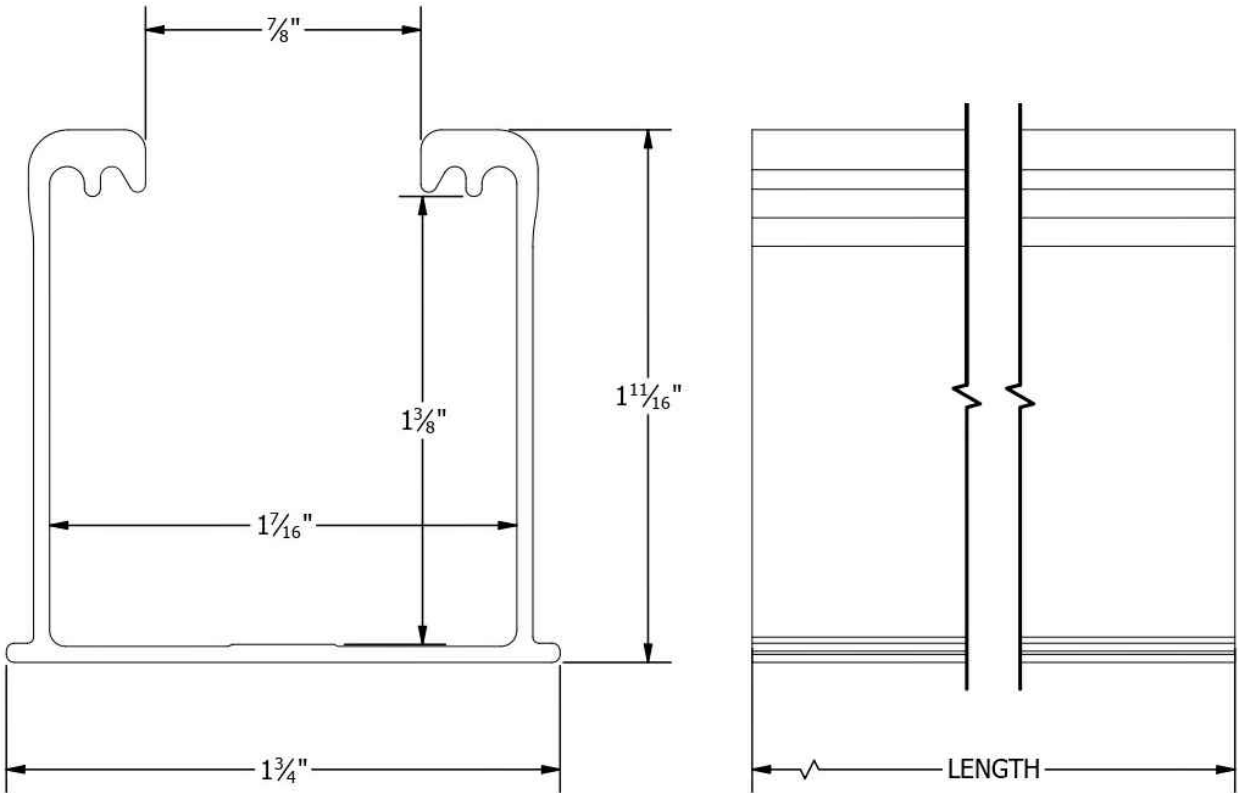
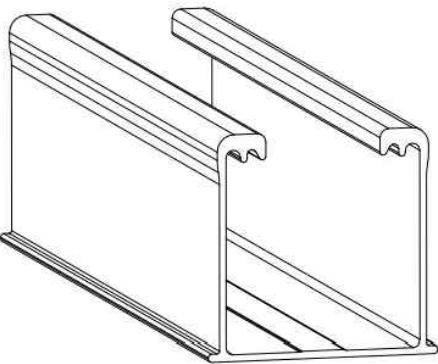
SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-13

PART # TABLE		
P/N	DESCRIPTION	LENGTH
084RLM1	NXT HORIZON RAIL 84" MILL	84"
084RLD1	NXT HORIZON RAIL 84" DARK	84"
168RLM1	NXT HORIZON RAIL 168" MILL	168"
168RLD1	NXT HORIZON RAIL 168" DARK	168"
208RLM1	NXT HORIZON RAIL 208" MILL	208"
208RLD1	NXT HORIZON RAIL 208" DARK	208"
246RLM1	NXT HORIZON RAIL 246" MILL	246"
246RLD1	NXT HORIZON RAIL 246" DARK	246"





1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PART DETAIL
DESCRIPTION:	RAIL
REVISION DATE:	9/13/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE
NOMINAL

PRODUCT PROTECTED BY
ONE OR MORE US PATENTS
LEGAL NOTICE

NH-P01

SHEET



4721 N GRADY AVE
TAMPA FL 33614
LIC #: CVC57085
PHONE: 813-540-8807

REVISIONS		
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PROJECT NAME & ADDRESS

BROOKS REDDING
RESIDENCE
275 SE FAYE LN,
LAKE CITY, FL 32025

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14

S-5!® The Right Way!

ProteaBracket™

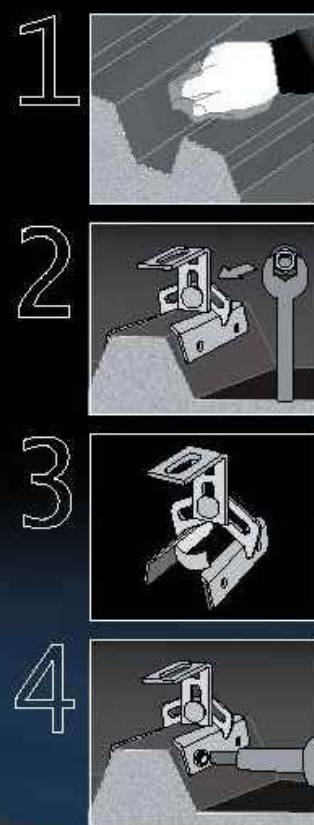
ProteaBracket™ is the most versatile standing seam metal roof attachment solution on the market, fitting most trapezoidal sheet profiles with and without intermediate insulation. It features an adjustable attachment base and multiple solar module attachment options (illustrated on back) to accommodate varying widths and heights. There are no messy sealants to apply and no chance for leaks; the ProteaBracket comes with factory-applied, adhesive rubber sealant to ensure quick installation and a weather-proof fit.

Installation is simple! The ProteaBracket is mounted directly onto the crown of the panel, straddling the profile. No surface preparation is necessary; simply wipe away excess oil and debris, align, and apply. Secure ProteaBracket through its pre-punched holes, using the hardened drill point S-5!® screws.

ProteaBracket is the perfect match for our S-5-PV Kit and spares you the hassle of cold-bridging! For a solar attachment solution that is both economical and easy to use, choose ProteaBracket.*

*When ProteaBracket is used in conjunction with the S-5-PV Kit, an additional nut is required during installation.

S-5!® ProteaBracket™ is a versatile bracket that adjusts easily to most trapezoidal roof profiles.



ProteaBracket™

888-825-3432 | www.S-5.com

S-5!® The Right Way!

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal exposed-fastened metal roof profiles! No messy sealants to apply. The factory-applied adhesive rubber sealant weather-proofs and makes installation easy!

Each ProteaBracket™ comes with a factory-applied, adhesive rubber sealant on the base. A structural A2 stainless steel bimetal attachment bracket, ProteaBracket is compatible with most common metal roofing materials. All four pre-punched holes must be used to achieve tested strength. Mounting hardware is furnished with the ProteaBracket. For design assistance, ask your distributor, or visit www.S-5.com for the independent lab test data that can be used for load-critical designs and applications. Also, please visit our website for more information including metallurgical compatibilities and specifications. S-5!® holding strength is unmatched in the industry.

Multiple Attachment Options:

Side Rail Option



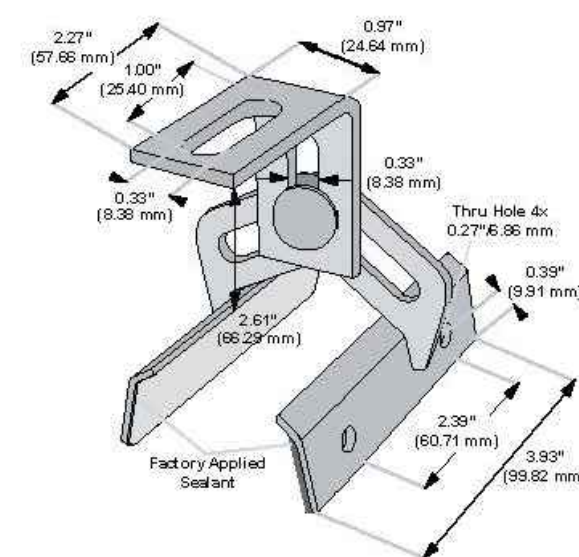
Top Rail Option



S-5-PV Kit Option



ProteaBracket™



Please note: All measurements are rounded to the second decimal place.

Example Applications



S-5-PV Kit demonstrated with a ProteaBracket on a trapezoidal profile.

Example Profile



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S-5!® Warning! Please use this product responsibly!
Products are protected by multiple U.S. and foreign patents. For published data regarding holding strength, bolt torque, patents, and trademarks, visit the S-5! website at www.S-5.com.
Copyright 2015, Metal Roof Innovations, Ltd. S-5! products are patent protected.
S-5! aggressively protects its patents, trademarks, and copyrights. Version 052115.

LUNEX POWER
THE PURE SOURCE

4721 N GRADY AVE
TAMPA FL 33614
LIC #: CVC57085
PHONE: 813-540-8807

REVISIONS

DESCRIPTION	DATE	REV

DATE: 02/28/2025

PROJECT NAME & ADDRESS

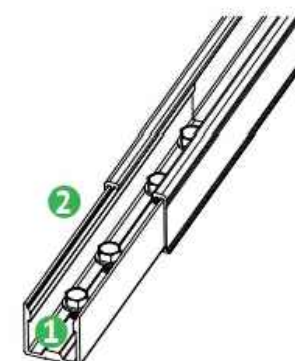
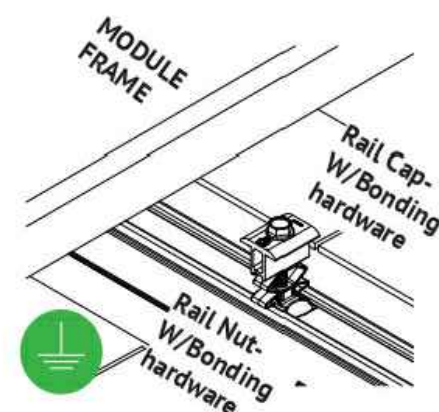
BROOKS REDDING
RESIDENCE
275 SE FAYE LN,
LAKE CITY, FL 32025

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

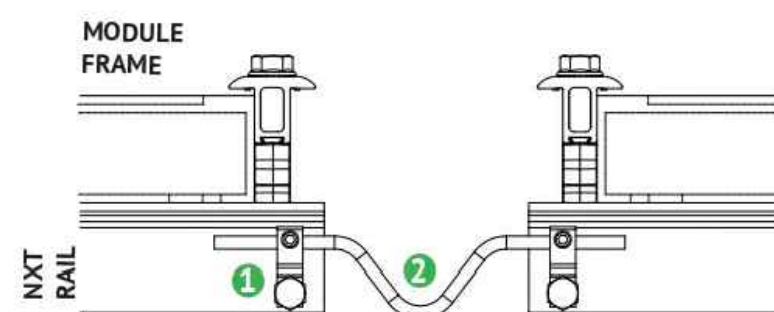
SHEET NUMBER
PV-15



BONDING COMBO MID-END CLAMP ASSEMBLY

- 1 Aluminum combo mid-end clamp cap with stainless steel bonding pins that pierce module frame anodization to bond module to module through clamp
- 2 Stainless steel bolt bonds aluminum clamp to stainless steel Hex bolt
- 3 Aluminum combo mid-end clamp rail nut with stainless steel bonding pins that pierce rail anodization to bond module to module through clamp

NOTE: See Page 19 for installation details.



BONDING BETWEEN THERMAL BREAKS

- 1 Lug is connected at the end of each thermal break to the rail.
- 2 Solid copper wire is connected across the gap to bond the two ends.

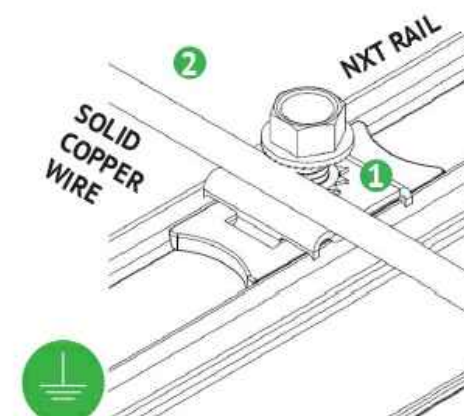
NOTE: See Page 5 for installation details.

BONDING RAIL SPLICE

- 1 Bonding Hardware creates bond between Splice bar and each rail section.
- 2 Aluminum splice bar spans across rail gap to create rail to rail bond. Rail on at least one side of splice will be grounded.

NOTE:

- See Page 15 for installation details
- Splice certified for single-use only



RACK SYSTEM GROUNDING

- 1 Tabs on the stainless-steel washer pierce anodization on the rail to bond rail to ground wire.
- 2 Solid copper wire connected to lug is routed to provide final system ground connection.

NOTE: See Page 16 for installation details and alternate racking system grounding methods.

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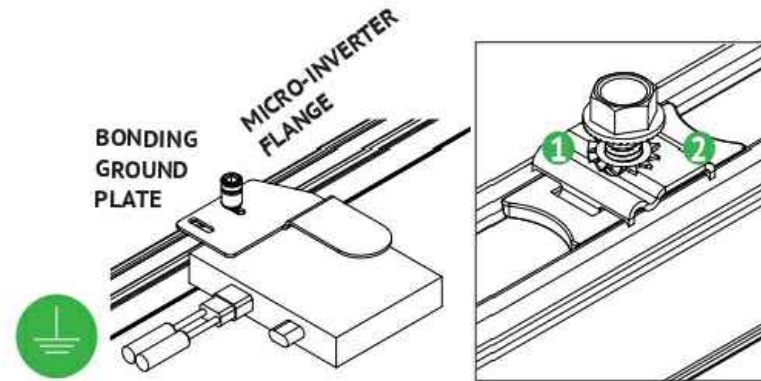
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ANSI B
11" X 17"

SHEET NUMBER

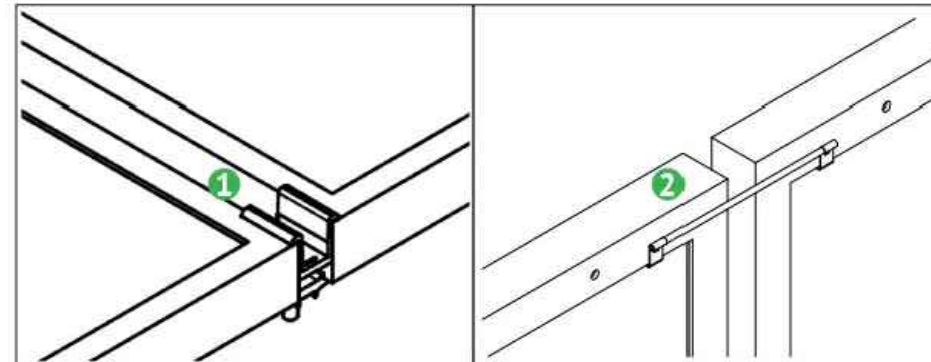
PV-16



BONDING MICROINVERTER MOUNT

- 1 Stainless steel Tooth lock washer beneath the MLPE flange remove anodization on the MLPE and bonds.
- 2 Tabs on the stainless steel washer remove anodization on the rail and bonds.

NOTE: See Page 17 for installation details



ALTERNATE ROW-TO-ROW BONDING PATHS

- 1 Row-to-row module bonding is accomplished with bonding clamp with 2 integral bonding pins.
- 2 Alternate method by connecting clips on either module to complete the bonding path.

NOTE:

- See Page 16 for installation details
- Row-to-row module bonding certified for single-use only

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11" X 17"

SHEET NUMBER
PV-17

A. System Specifications and Ratings

- Maximum Voltage: 1,000 Volts
- Maximum Current: 80 Amps
- Allowable Wire: 14 AWG – 6 AWG
- Maximum Number of Input Circuits: 4
- Spacing: Please maintain a spacing of at least ½” between uninsulated live parts and fittings for conduit, armored cable, and uninsulated live parts of opposite polarity.
- Enclosure Rating: Type 3R
- Roof Slope Range: 2.5 – 12:12
- Max Side Wall Fitting Size: 1”
- Max Floor Pass-Through Fitting Size: 1”
- Ambient Operating Conditions: (-35°C) - (+75°C)
- Compliance:
 - JB-3: UL1741, CSA C22.2 No. 290
 - Approved wire connectors: must conform to UL1741
- System Marking: **Intertek Symbol and File #5025824**
- Periodic Re-inspections: If re-inspections yield loose components, loose fasteners, or any corrosion between components, components that are found to be affected are to be replaced immediately.

Table 1: Typical Wire Size, Torque Loads and Ratings

	1 Conductor	2 Conductor	Torque				
			Type	NM	Inch Lbs	Voltage	Current
ABB ZS6 terminal block	10-24 awg	16-24 awg	Sol/Str	0.5-0.7	6.2-8.85	600V	30 amp
ABB ZS10 terminal block	6-24 awg	12-20 awg	Sol/Str	1.0-1.6	8.85-14.16	600V	40 amp
ABB ZS16 terminal block	4-24 awg	10-20 awg	Sol/Str	1.6-2.4	14.6-21.24	600V	60 amp
ABB M6/8 terminal block	8-22 awg		Sol/Str	.08-1	8.85	600V	50 amp
Ideal 452 Red (WING-NUT Wire Connector)	8-18 awg		Sol/Str	Self-Torque	Self-Torque	600V	
Ideal 451 Yellow (WING-NUT Wire Connector)	10-18 awg		Sol/Str	Self-Torque	Self-Torque	600V	
Ideal, In-Sure (Push-In Connector Part #IS)	10-14 awg		Sol/Str	Self-Torque	Self-Torque	600V	
WAGO, 2204-1201	10-20 awg	16-24 awg	Sol/Str	Self-Torque	Self-Torque	600V	30 amp
WAGO, 221-612	10-20 awg	10-24 awg	Sol/Str	Self-Torque	Self-Torque	600V	30 amp
Dottie DRC75	6-12 awg		Sol/Str	Snap-In	Snap-In		
ESP NG-53	4-6 awg		Sol/Str		45	2000V	
	10-14 awg		Sol/Str		35		
ESP NG-717	4-6 awg		Sol/Str		45	2000V	
	10-14 awg		Sol/Str		35		
Brumall 4-5,3	4-6 awg		Sol/Str		45	2000V	
	10-14 awg		Sol/Str		35		

Table 2: Minimum wire-bending space for conductors through a wall opposite terminals in mm (inches)

Wire size, AWG or kcmil (mm2)	Wires per terminal (pole)			
	1 mm (inch)	2 mm (inch)	3 mm (inch)	4 or More mm (inch)
14-10 (2.1-5.3)	Not Specified	-	-	-
8 (8.4)	38.1 (1-1/2)	-	-	-
6 (13.3)	50.8 (2)	-	-	-



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PV-18