

# PHOTOVOLTAIC ROOF MOUNT SYSTEM

24 MODULES-ROOF MOUNTED - 9.600 kW DC, 6.960 kW AC

244 SE BROWN ST, LAKE CITY, FL 32025



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

## PROJECT DATA

PROJECT ADDRESS: 244 SE BROWN ST, LAKE CITY, FL 32025

OWNER: DAVID R BOWMAN

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

DESIGNER: ESR

SCOPE: 9.600 KW DC ROOF MOUNT SOLAR PV SYSTEM WITH 24 HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W PV MODULES WITH 24 IQ8PLUS-72-2-US (240V) MICROINVERTERS (COMPLIANT WITH RAPID SHUTDOWN)

AUTHORITIES HAVING JURISDICTION:  
BUILDING: LAKE CITY  
ZONING: LAKE CITY  
UTILITY: FPL

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## GENERAL NOTES

- ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED.
- THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.
- THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
- 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.
- WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
- HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
- A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 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.
- PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
- PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- 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.
- ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
- INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
- THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
- ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
- SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
- PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
- 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)]
- ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
- WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
- ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
- ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

## VICINITY MAP



## HOUSE PHOTO



## CODE REFERENCES

PROJECT TO COMPLY WITH THE FOLLOWING:

FLORIDA RESIDENTIAL CODE, 7TH EDITION 2020 (FRC)  
FLORIDA PLUMBING CODE, 7TH EDITION 2020 (FPC)  
FLORIDA BUILDING CODE, 7TH EDITION 2020 EDITION (FBC)  
FLORIDA MECHANICAL CODE, 7TH EDITION 2020 (FMC)  
2017 NATIONAL ELECTRICAL CODE  
FLORIDA FIRE PREVENTION CODE, 7TH EDITION (FFPC)

Andrew D.  
Leone

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Andrew D. Leone  
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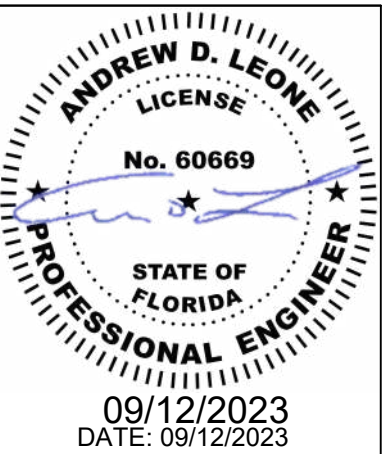
## PROFESSIONAL ENGINEER SEAL

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### REVISIONS

DESCRIPTION	DATE	REV



### PROJECT NAME & ADDRESS

DAVID R BOWMAN  
RESIDENCE  
244 SE BROWN ST,  
LAKE CITY,  
FL 32025

### DRAWN BY

ESR

### SHEET NAME

COVER SHEET

### SHEET SIZE

ANSI B  
11" X 17"

### SHEET NUMBER

PV-1

# PROJECT DESCRIPTION:

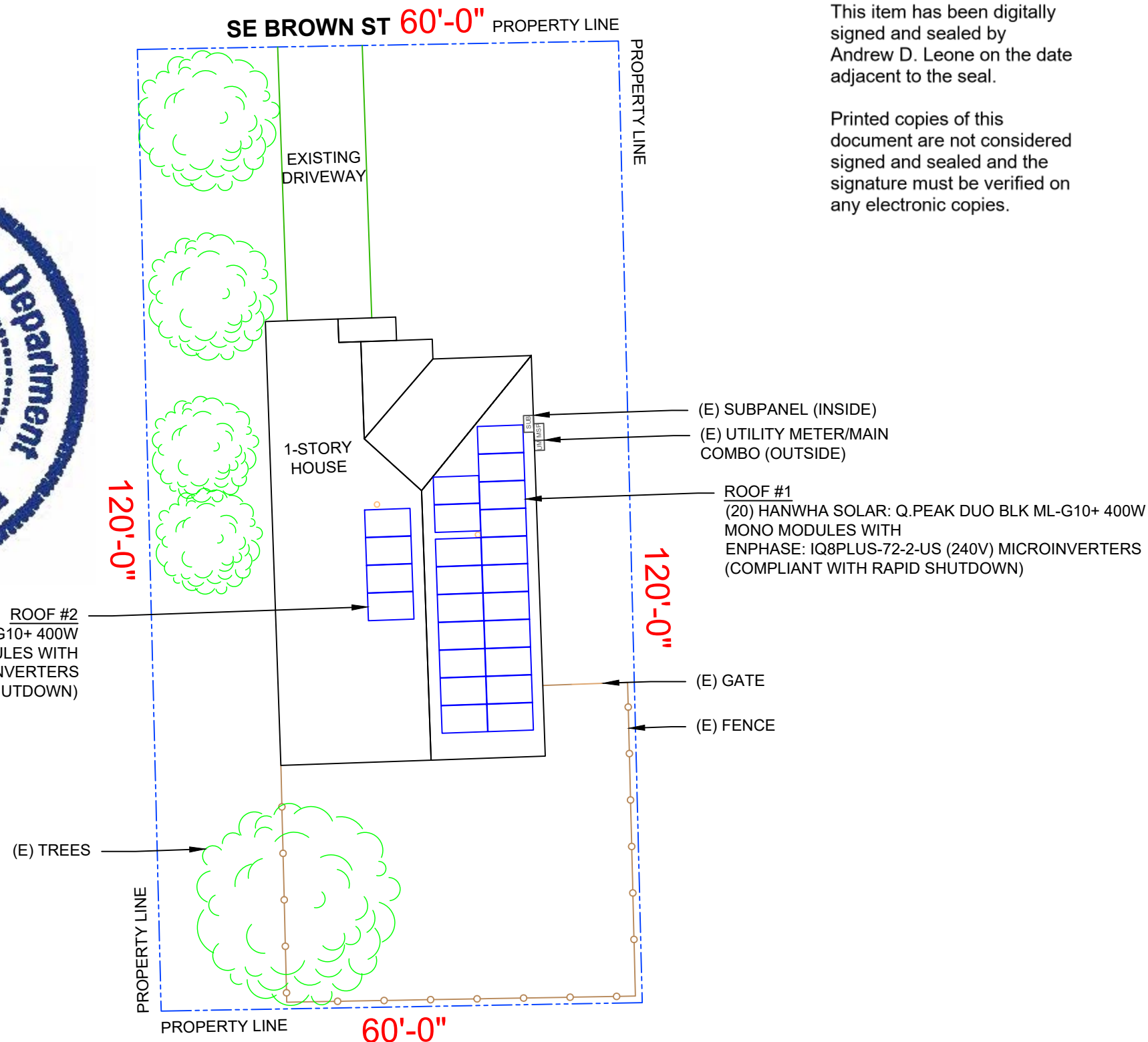
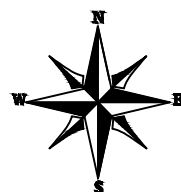
24 X HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W PV MODULES  
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES  
 DC SYSTEM SIZE: 24 x 400 = 9.600KW DC  
 AC SYSTEM SIZE: 24 x 290 = 6.960KW AC

## EQUIPMENT SUMMARY

24 HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W MONO MODULES  
 24 ENPHASE: IQ8PLUS-72-2-US (240V) MICROINVERTERS (COMPLIANT WITH RAPID SHUTDOWN)

ROOF ARRAY AREA #1:- 422.40 SQ FT.  
 ROOF ARRAY AREA #2:- 84.48 SQ FT.

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



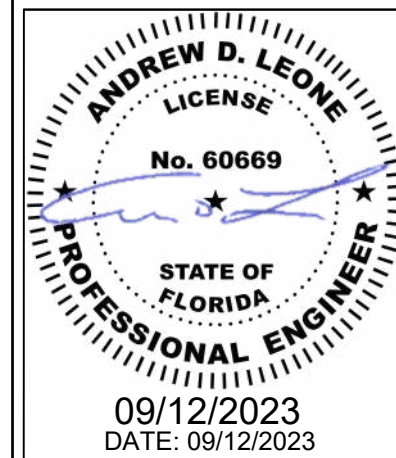
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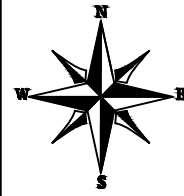
SHEET NAME  
 SITE PLAN

SHEET SIZE  
 ANSI B  
 11" X 17"

SHEET NUMBER  
 PV-2

**MODULE TYPE, DIMENSIONS & WEIGHT**

NUMBER OF MODULES = 24 MODULES  
 MODULE TYPE = HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W MONO MODULES  
 MODULE WEIGHT = 48.5 LBS / 22.0KG.  
 MODULE DIMENSIONS = 74.0" x 41.1" = 21.12 SF



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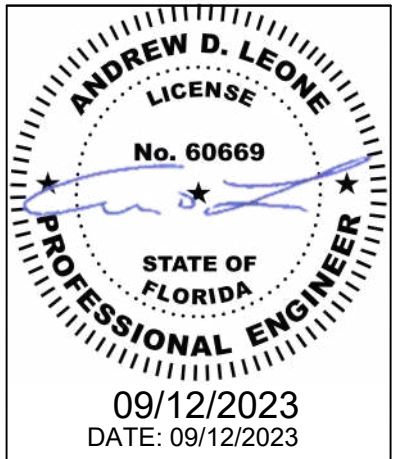
ROOF DESCRIPTION				
ROOF TYPE			COMP. SHINGLE	
ROOF	ROOF PITCH	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	23°	88°	2"X4"	24"
#2	23°	268°	2"X4"	24"

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	20	422.40	596.27	71
#2	4	84.48	902.52	9
TOTAL	24	506.88	1748.60	29



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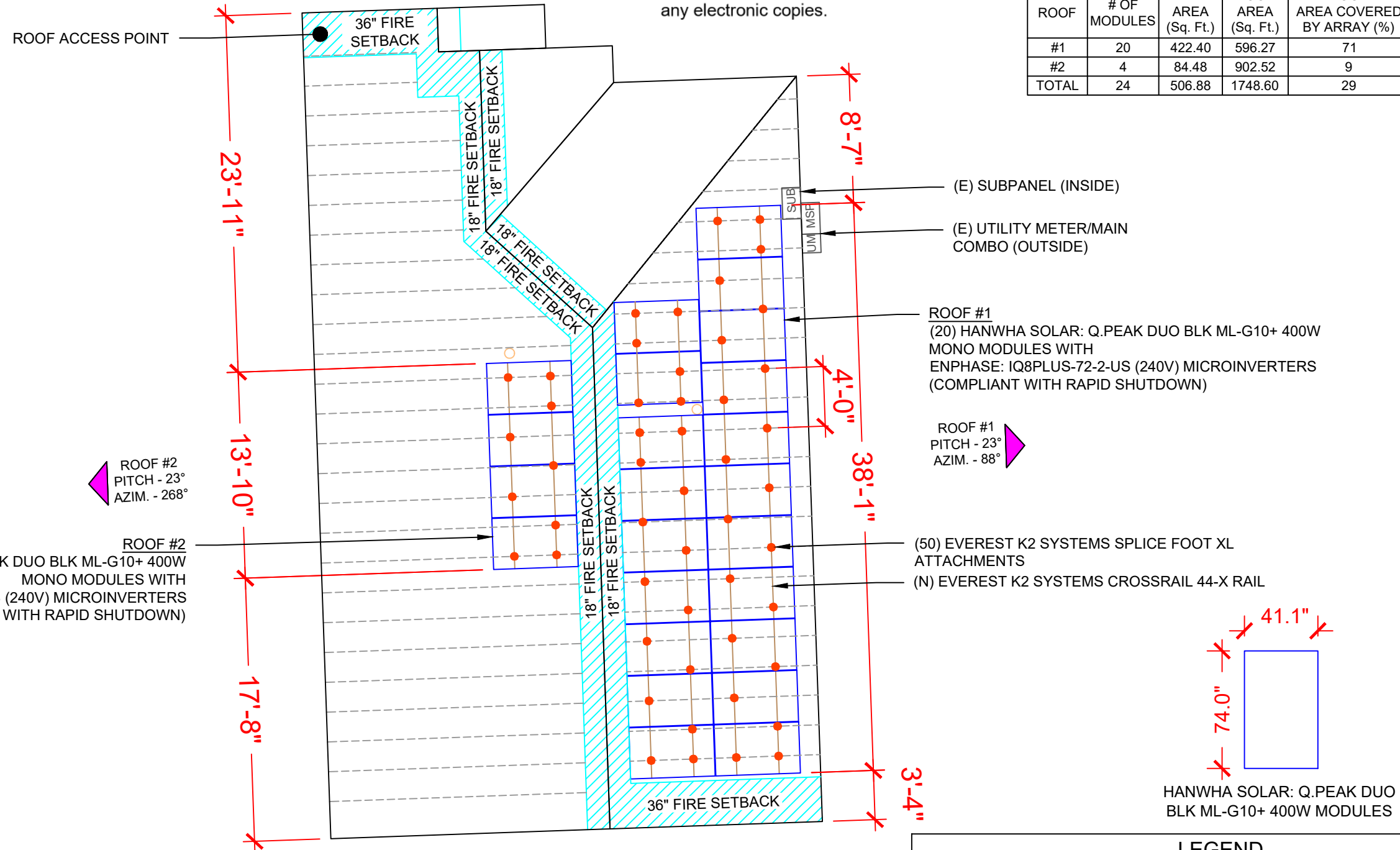
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 ESR

SHEET NAME  
 ROOF PLAN &  
 MODULES

SHEET SIZE  
 ANSI B  
 11" X 17"

SHEET NUMBER  
 PV-3



ROOF #2  
 PITCH - 23°  
 AZIM. - 268°

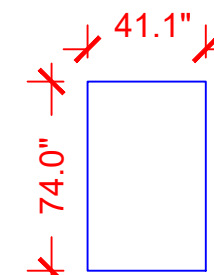
ROOF #2  
 (4) HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W  
 MONO MODULES WITH  
 ENPHASE: IQ8PLUS-72-2-US (240V) MICROINVERTERS  
 (COMPLIANT WITH RAPID SHUTDOWN)

(E) SUBPANEL (INSIDE)  
 (E) UTILITY METER/MAIN  
 COMBO (OUTSIDE)

ROOF #1  
 (20) HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W  
 MONO MODULES WITH  
 ENPHASE: IQ8PLUS-72-2-US (240V) MICROINVERTERS  
 (COMPLIANT WITH RAPID SHUTDOWN)

ROOF #1  
 PITCH - 23°  
 AZIM. - 88°

(50) EVEREST K2 SYSTEMS SPLICE FOOT XL  
 ATTACHMENTS  
 (N) EVEREST K2 SYSTEMS CROSSRAIL 44-X RAIL





HANWHA SOLAR: Q.PEAK DUO  
 BLK ML-G10+ 400W MODULES

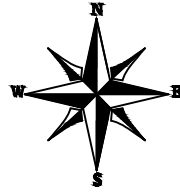
LEGEND	
[SD]	- SOLADECK
[PM]	- PV PRODUCTION METER
[CB]	- COMBINER BOX
[ACD]	- AC DISCONNECT
[SLD]	- SOLAR LOAD CENTER
[UM]	- UTILITY METER
[MSP]	- MAIN SERVICE PANEL
[INV]	- INVERTER
[JB]	- JUNCTION BOX
○	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
●	- ROOF ATTACHMENT
---	- TRUSS
----	- CONDUIT

**1 ROOF PLAN & MODULES**

PV-3

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

CIRCUIT LEGENDS	
	CIRCUIT #1
	CIRCUIT #2

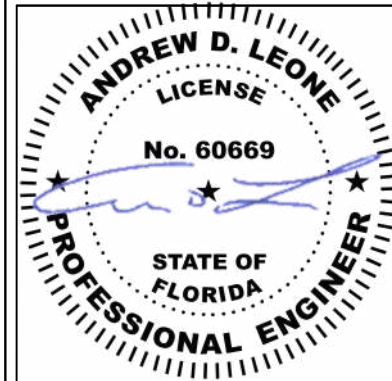


BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULES	24	HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W MODULE
MICROINVERTERS	24	ENPHASE: IQ8PLUS-72-2-US (240V) MICROINVERTERS (COMPLIANT WITH RAPID SHUTDOWN)
SOLADECKS	2	SOLADECK
RAILS	12	EVEREST K2 SYSTEMS CROSSRAIL 44-X, 166" ALUMINIUM
SPLICES	6	SPLICE KIT
MID MODULE CLAMPS	40	MID MODULE CLAMPS
END CLAMPS	16	END CLAMPS / STOPPER SLEEVE
ATTACHMENTS	50	EVEREST K2 SYSTEMS SPLICE FOOT XL ATTACHMENTS



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09/12/2023  
 DATE: 09/12/2023

PROJECT NAME & ADDRESS

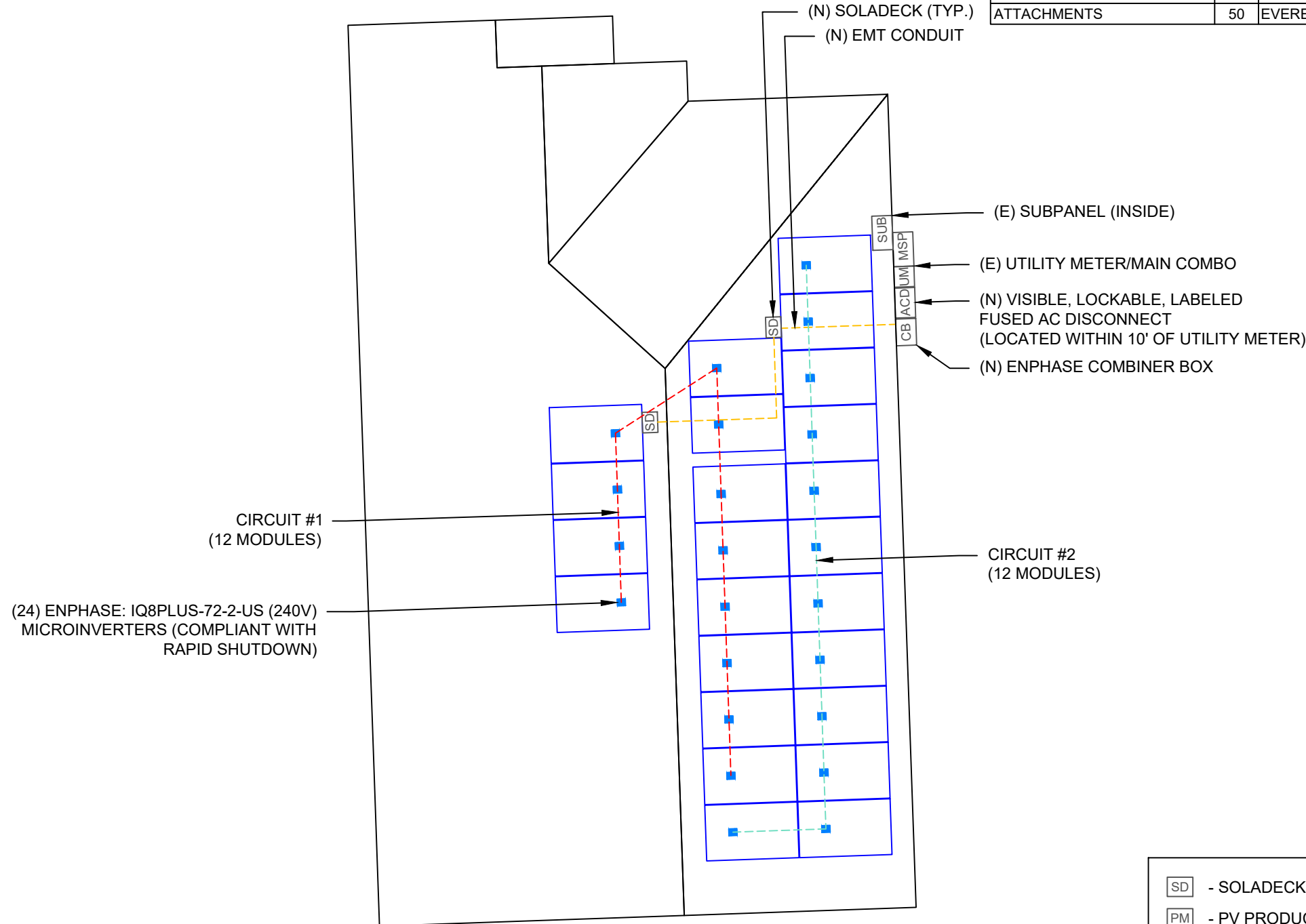
DAVID R BOWMAN  
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DRAWN BY  
 ESR

SHEET NAME  
 ELECTRICAL PLAN














SHEET SIZE  
 ANSI B  
 11" X 17"

SHEET NUMBER  
 PV-4

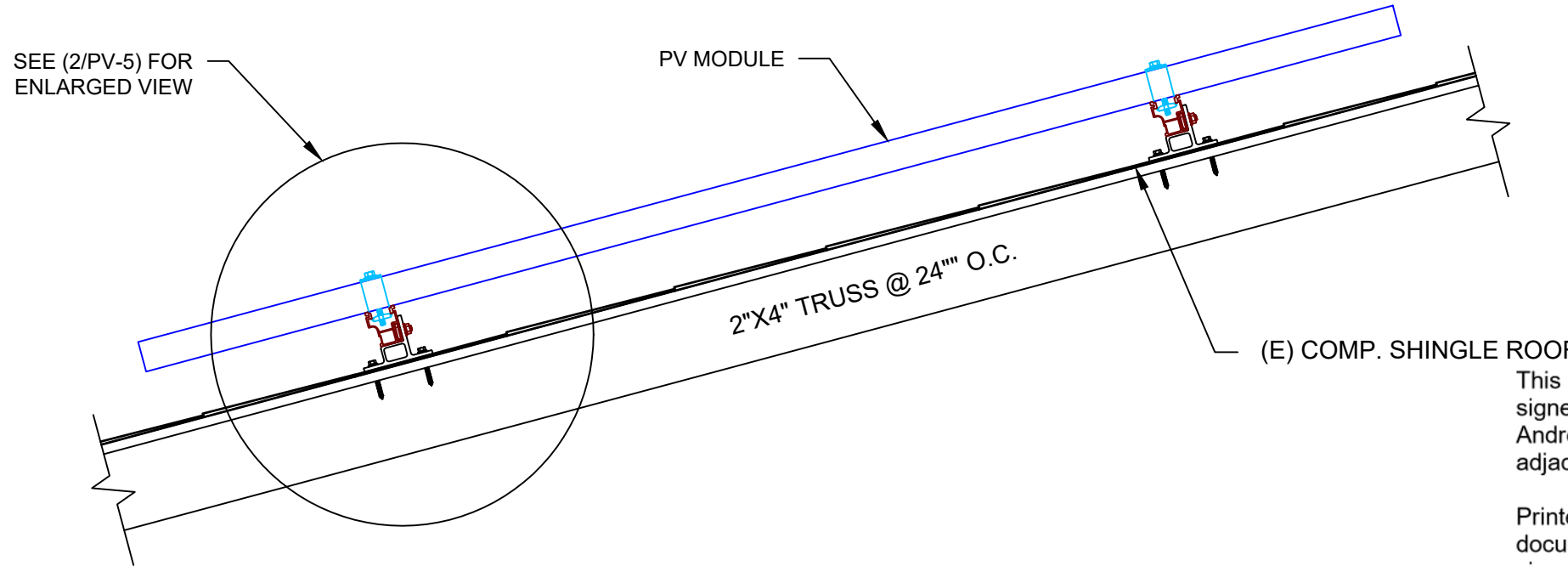


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LEGEND			
	- SOLADECK		- INVERTER
	- PV PRODUCTION METER		- JUNCTION BOX
	- COMBINER BOX		- VENT, ATTIC FAN (ROOF OBSTRUCTION)
	- AC DISCONNECT		- ROOF ATTACHMENT
	- SOLAR LOAD CENTER		- TRUSS
	- UTILITY METER		- CONDUIT
	- MAIN SERVICE PANEL		

**DESCRIPTION:** CANTILEVER  
 CANTILEVER CONSIDER 1/3<sup>RD</sup> OF ROOF ATTACHMENT SPACING.  
 ATTACHMENT SPACING= 48" O/C  
 CANTILEVER = 16"



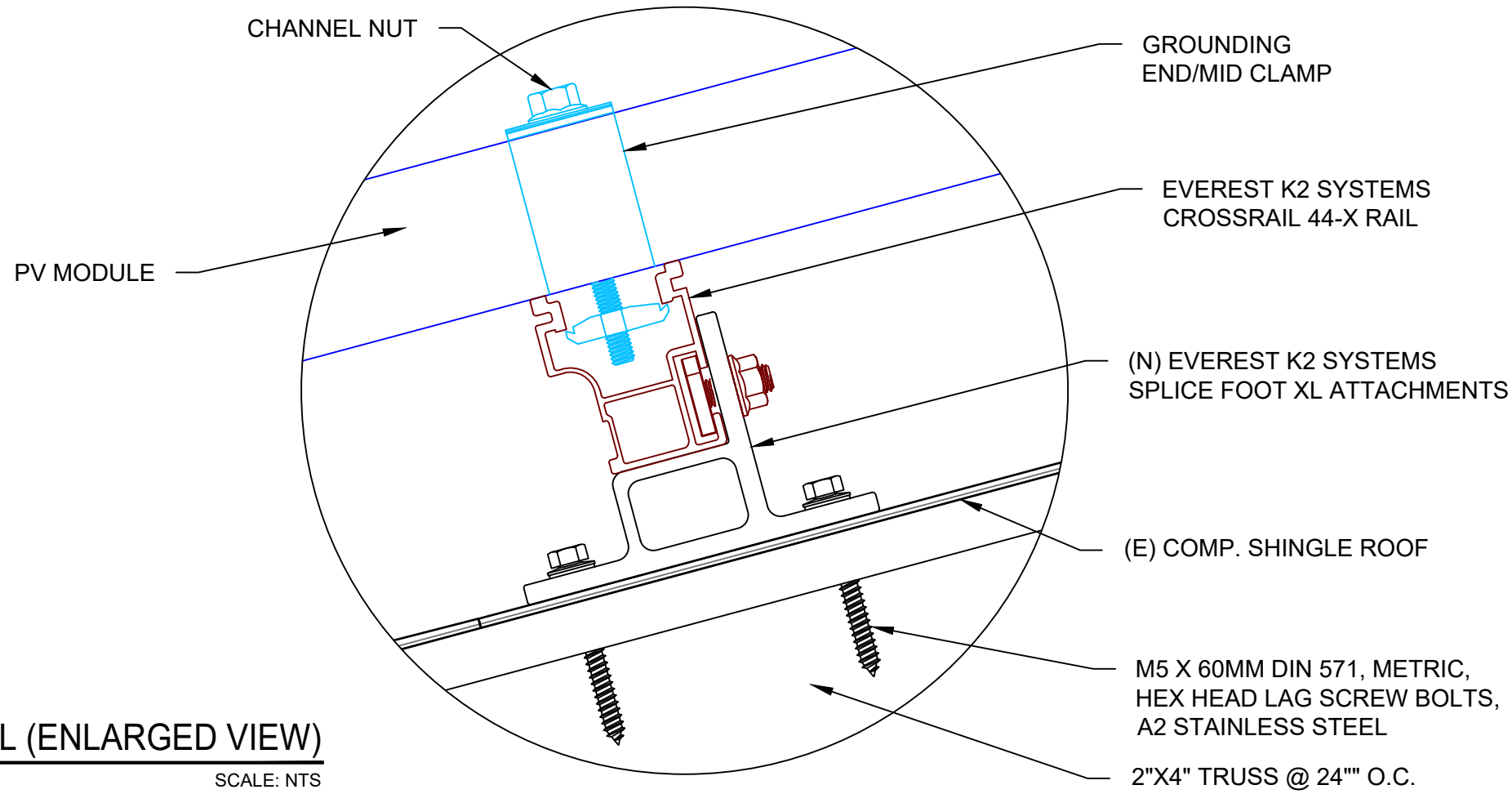
**1 ATTACHMENT DETAIL**

PV-5 SCALE: NTS

(E) COMP. SHINGLE ROOF

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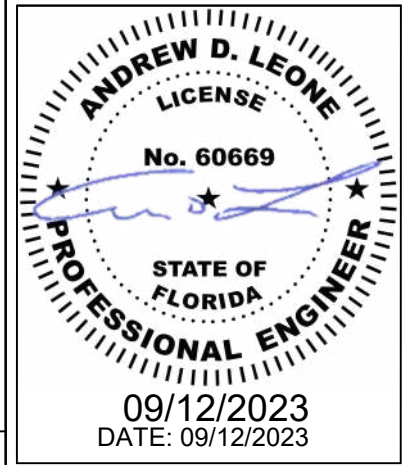
**2 ATTACHMENT DETAIL (ENLARGED VIEW)**

PV-5 SCALE: NTS



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**ESR**

SHEET NAME  
**STRUCTURAL DETAIL**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-5**

DC SYSTEM SIZE: 24 x 400 = 9.600KW DC  
 AC SYSTEM SIZE: 24 x 290 = 6.960KW AC

(24) HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W MONO MODULES WITH (24) ENPHASE: IQ8PLUS-72-2-US (240V) MICROINVERTERS (COMPLIANT WITH RAPID SHUTDOWN)

(2) BRANCH CIRCUITS OF 12 MODULES ARE CONNECTED IN PARALLEL

**INTERCONNECTION NOTES:**

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

**DISCONNECT NOTES:**

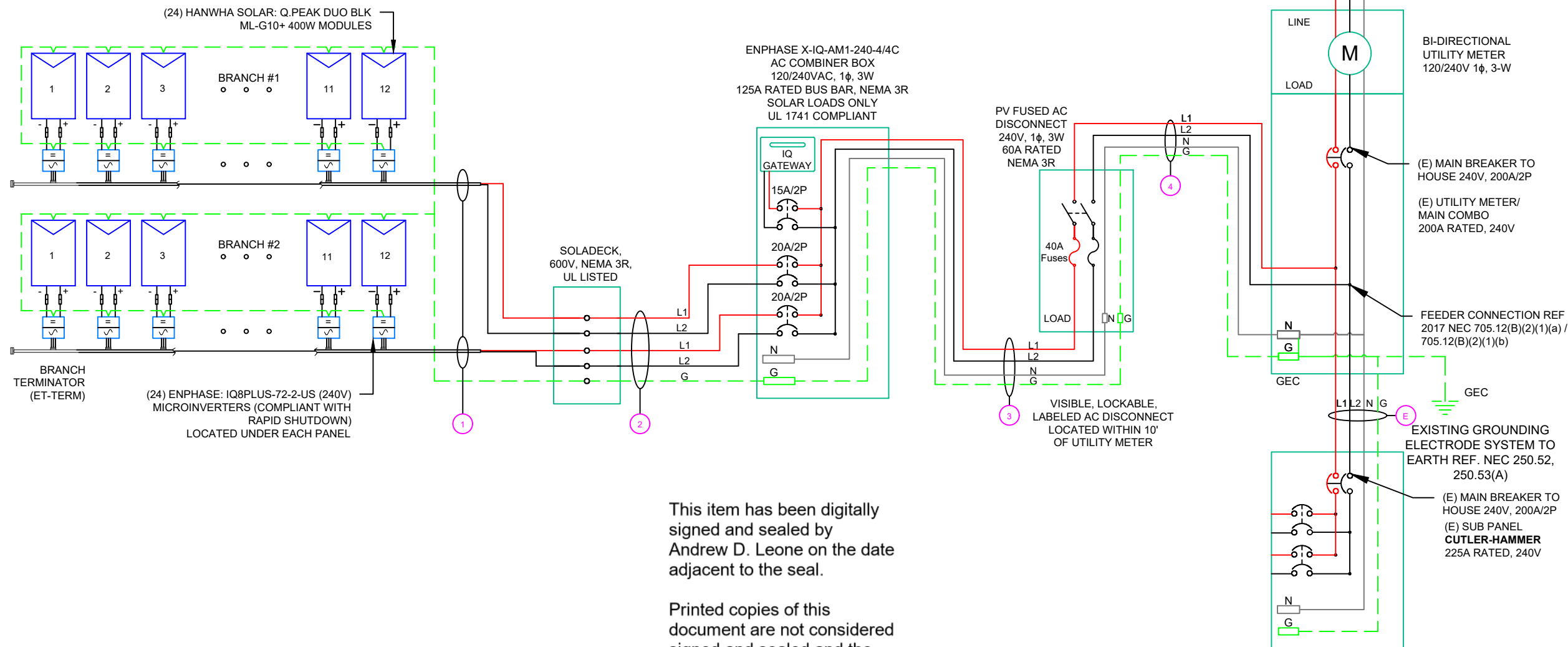
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3.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

**RACKING NOTE:**

1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER

**GROUNDING & GENERAL NOTES:**

1. **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)]
2. PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
3. DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
4. ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
5. JUNCTION BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - JUNCTION BOX DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
6. AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.
7. 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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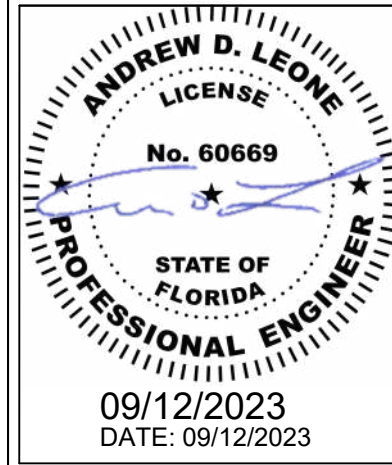
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QTY	CONDUCTOR INFORMATION	CONDUIT TYPE	CONDUIT SIZE
① (4)	CU #12AWG - Q CABLE (L1 & L2 NO NEUTRAL)	N/A	N/A
(1)	CU #6AWG - BARE COPPER IN FREE AIR		
② (4)	CU #10AWG - THWN-2 (L1,L2) (EXTERIOR) / #12/2 ROMEX IN ATTIC	EMT, LFMC IN ATTIC	3/4"
(1)	CU #10AWG - THWN-2 GND		
③ (2)	CU #6AWG - THWN-2 (L1,L2)		
(1)	CU #6AWG - THWN-2 N	EMT, LFMC OR LFNC	3/4"
(1)	CU #6AWG - THWN-2 GND		
④ (3)	CU #6AWG - THWN-2 (L1,L2,N)		
(1)	CU #6AWG - THWN-2 GND	EMT, LFMC OR LFNC	3/4"



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 ESR

SHEET NAME  
 ELECTRICAL LINE DIAGRAM

SHEET SIZE  
 ANSI B  
 11" X 17"

SHEET NUMBER  
 PV-6

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	ENPHASE: IQ8PLUS-72-2-US (240V) MICROINVERTERS (COMPLIANT WITH RAPID SHUTDOWN)
MIN/MAX DC VOLT RATING	30V MIN/ 58V MAX
MAX INPUT POWER	235W-440W
NOMINAL AC VOLTAGE RATING	240V/ 211-264V
MAX AC CURRENT	1.21A
MAX MODULES PER CIRCUIT	13 (SINGLE PHASE)
MAX OUTPUT POWER	290 VA

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	HANWHA SOLAR: Q.PEAK DUO BLK ML-G10+ 400W MODULE
VMP	37.13V
IMP	10.77A
VOC	45.30V
ISC	11.14A
TEMP. COEFF. VOC	-0.27%/K
MODULE DIMENSION	74.0"L x 41.1"W x 1.26"D (In Inch)

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-5°
AMBIENT TEMP (HIGH TEMP 2%)	34°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.27%/K

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

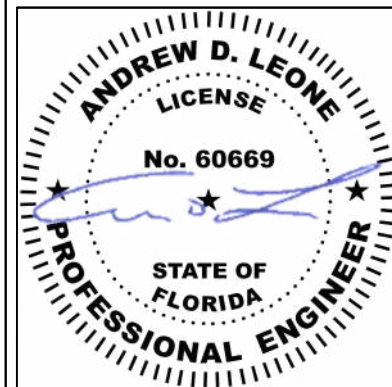


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AC CALCULATIONS																						
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OC PD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
CIRCUIT 1	SOLADECK	240	14.52	18.15	20	N/A	BARE COPPER #6 AWG	CU #12 AWG	25	PASS	34	2	30	0.96	1	28.8	PASS			0.65	N/A	#N/A
CIRCUIT 2	SOLADECK	240	14.52	18.15	20	N/A	BARE COPPER #6 AWG	CU #12 AWG	25	PASS	34	2	30	0.96	1	28.8	PASS			0.65	N/A	#N/A
SOLADECK	COMBINER BOX	240	14.52	18.15	20	N/A	CU #10 AWG	CU #10 AWG	35	PASS	34	4	40	0.96	0.8	30.72	PASS	32	1.24	0.480	3/4" EMT	19.79362
COMBINER BOX	AC DISCONNECT	240	29.04	36.3	40	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	34	2	75	0.96	1	72	PASS	5	0.491	0.059	3/4" EMT	38.04878
AC DISCONNECT	POI	240	29.04	36.3	40	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	34	2	75	0.96	1	72	PASS	5	0.491	0.059	3/4" EMT	38.04878

Circuit 1 Voltage Drop	1.249
Circuit 2 Voltage Drop	1.249



09/12/2023  
DATE: 09/12/2023

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PROJECT NAME & ADDRESS

DAVID R BOWMAN  
RESIDENCE  
244 SE BROWN ST,  
LAKE CITY,  
FL 32025

DRAWN BY

ESR

SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-7

#### ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V 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 SOLADECKS, 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.

**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**

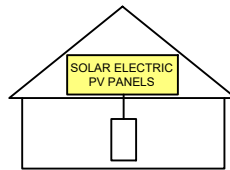
LABEL- 5:  
LABEL LOCATION:  
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)  
SUBPANEL (ONLY IF SOLAR IS BACK-FED)  
CODE REF: NEC 705.12(D) & NEC 690.59

**⚠ 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	<b>240 V</b>
RATED AC OUTPUT CURRENT	<b>29.04A</b>

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**

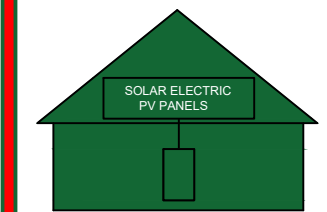
LABEL-13:

**WARNING: PHOTOVOLTAIC  
POWER SOURCE**

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

**EMERGENCY RESPONDER  
THIS SOLAR PV SYSTEM EQUIPPED  
WITH RAPID SHUTDOWN**

TURN RAPID SHUTDOWN  
SWITCH TO THE 'OFF'  
POSITION TO SHUTDOWN  
ENTIRE PV SYSTEM.



**THE LABEL SHALL BE REFLECTIVE, WITH ALL LETTERS CAPITALIZED AND HAVING  
A MINIMUM HEIGHT OF 3/8 IN. (9.5 MM), IN WHITE ON A RED BACKGROUND.**

LABEL- 15:  
LABEL LOCATION:  
AC DISCONNECT  
CODE REF:NFPA 1 (11.12.2.1.1.1.1)  
1. THE RAPID SHUTDOWN LABEL SHALL BE LOCATED ON OR NO MORE  
THAN 3 FT (1 M) FROM THE SERVICE DISCONNECTING MEANS  
2. (HEIGHT OF LABEL IS 3/8 IN. (9.5 MM), IN WHITE ON A RED BACKGROUND)

This item has been digitally  
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Andrew D. Leone on the date  
adjacent to the seal.

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signature must be verified on  
any electronic copies.



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

REVISIONS		
DESCRIPTION	DATE	REV

**ANDREW D. LEONE**  
LICENSE  
No. 60669  
STATE OF  
FLORIDA  
**PROFESSIONAL ENGINEER**

09/12/2023  
DATE: 09/12/2023

PROJECT NAME & ADDRESS

**DAVID R BOWMAN  
RESIDENCE  
244 SE BROWN ST,  
LAKE CITY,  
FL 32025**

DRAWN BY  
**ESR**

SHEET NAME  
**LABELS**

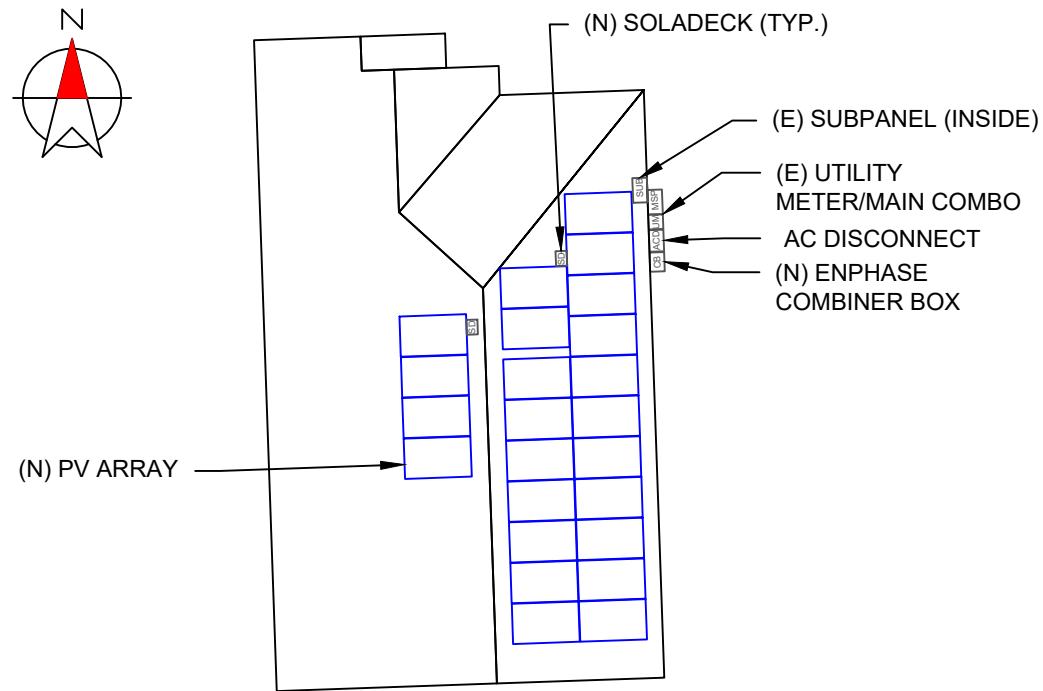
SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-8**

# CAUTION

## MULTIPLE SOURCES OF POWER

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTING MEANS LOCATED AS SHOWN:



244 SE BROWN ST, LAKE CITY, FL 32025

### 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])

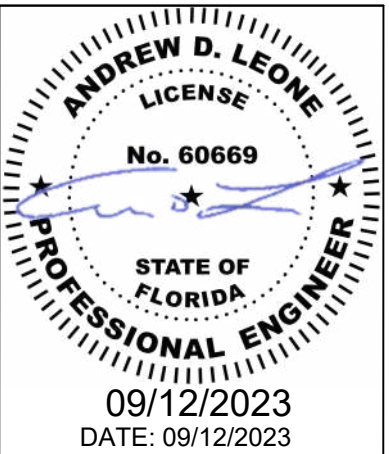
### LABELING NOTES:

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 2017 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]



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

REVISIONS		
DESCRIPTION	DATE	REV



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### PROJECT NAME & ADDRESS

DAVID R BOWMAN  
RESIDENCE  
244 SE BROWN ST,  
LAKE CITY,  
FL 32025

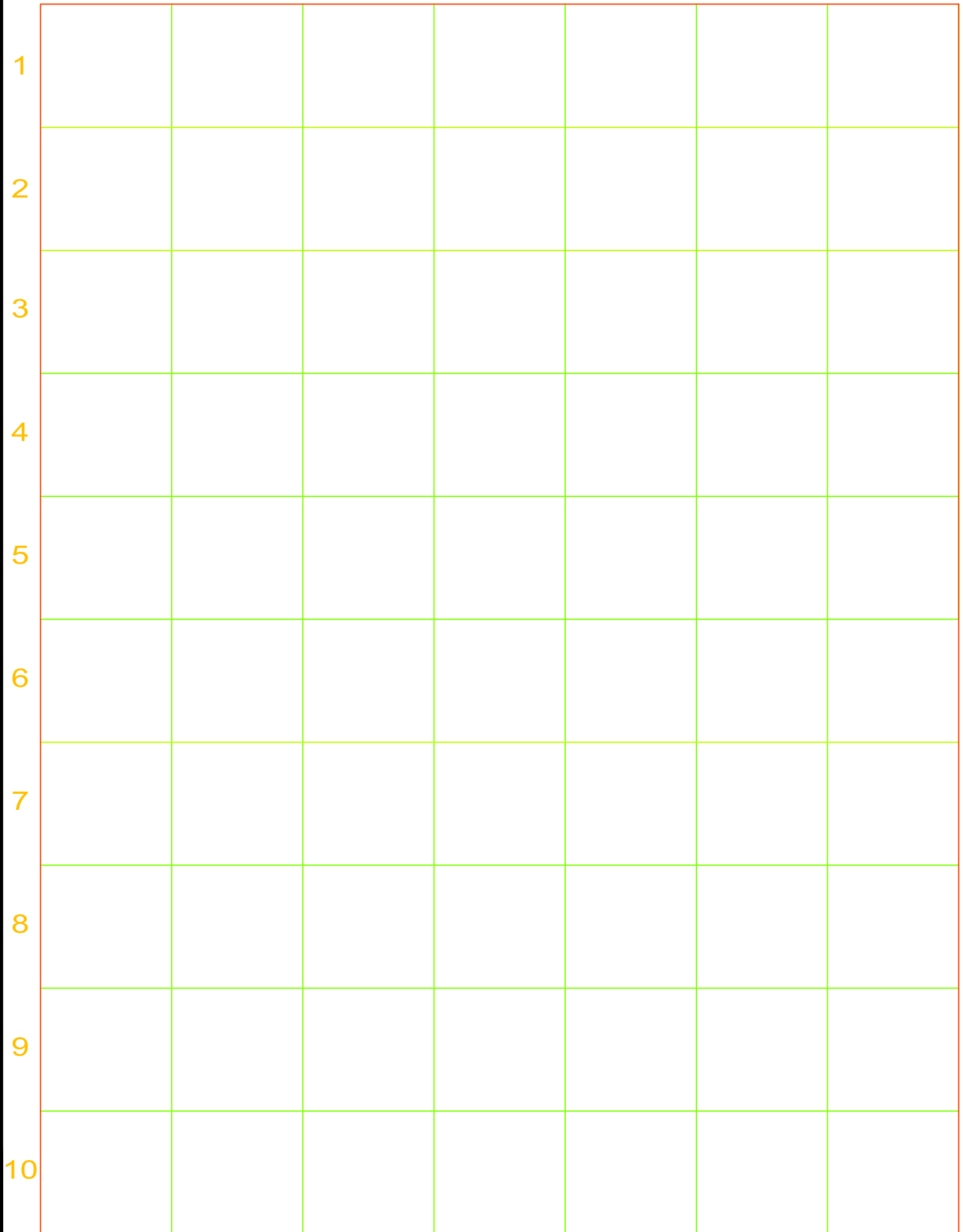
DRAWN BY  
ESR

SHEET NAME  
PLACARD

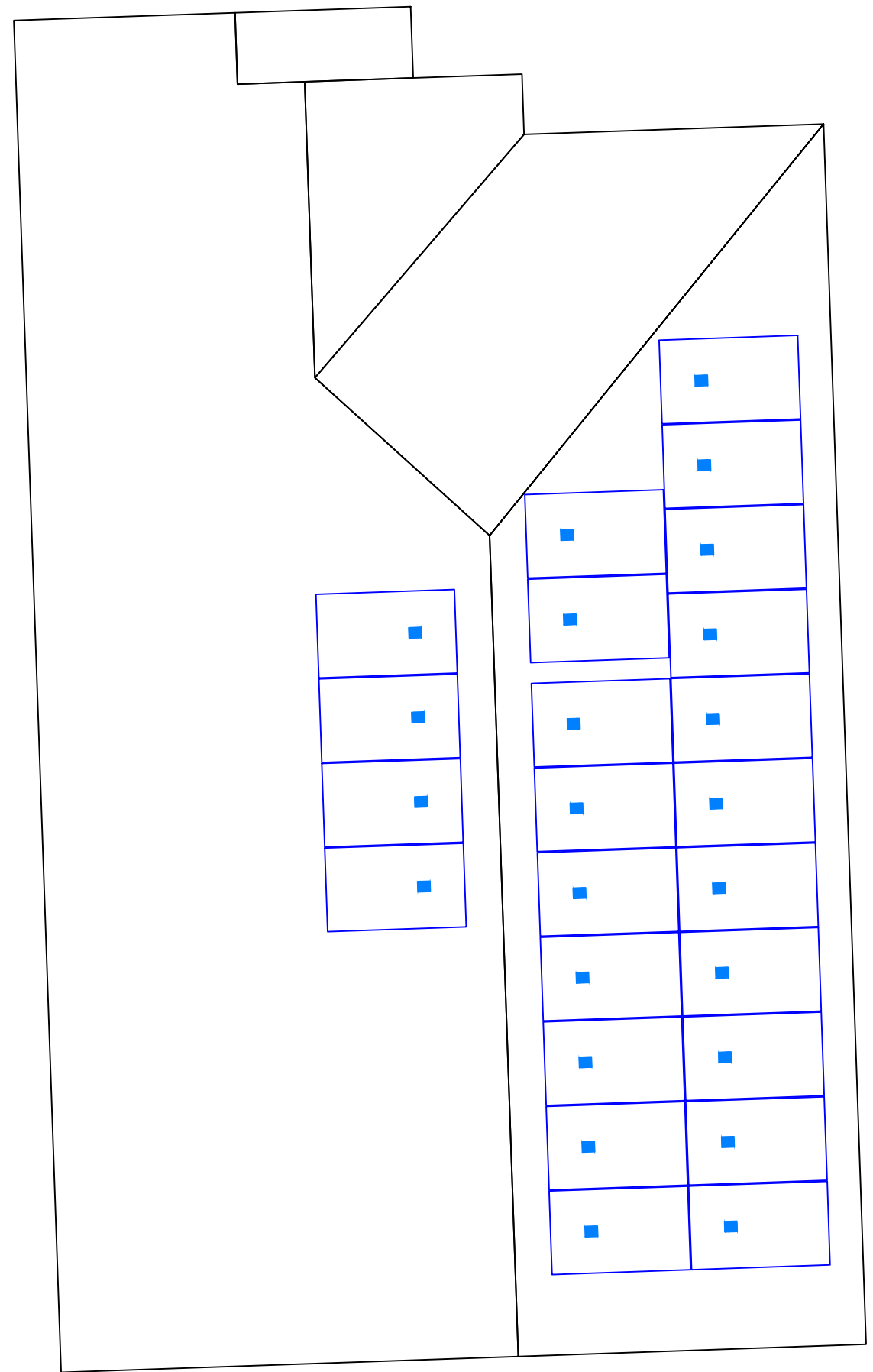
SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-9

1-10    11-20    21-30    31-40    41-50    51-60    61-70



# MICRO INVERTER CHART



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

REVISIONS		
DESCRIPTION	DATE	REV

DATE: 09/12/2023

PROJECT NAME & ADDRESS

**DAVID R BOWMAN  
 RESIDENCE  
 244 SE BROWN ST,  
 LAKE CITY,  
 FL 32025**

DRAWN BY  
**ESR**

SHEET NAME  
**MICRO INVERTER CHART**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-10**

REVISIONS

DESCRIPTION	DATE	REV

DATE: 09/12/2023

PROJECT NAME & ADDRESS

DAVID R BOWMAN  
RESIDENCE  
244 SE BROWN ST,  
LAKE CITY,  
FL 32025

DRAWN BY  
ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-11

Specifications subject to technical changes © Q CELLS Q PEAK DUO BLK ML-G10+ 2021.05 Rev.01.USA

powered by  
**Q.ANTUM DUO Z**

# Q.PEAK DUO BLK ML-G10+

## 385-405

ENDURING HIGH PERFORMANCE



### BREAKING THE 20% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.



### THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY

Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.



### INNOVATIVE ALL-WEATHER TECHNOLOGY

Optimal yields, whatever the weather with excellent low-light and temperature behavior.



### ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology<sup>1</sup>, Hot-Spot Protect and Traceable Quality Tra.Q™.



### EXTREME WEATHER RATING

High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).



### A RELIABLE INVESTMENT

Inclusive 25-year product warranty and 25-year linear performance warranty<sup>2</sup>.

<sup>1</sup> APT test conditions according to IEC/TS 62804-1:2015, method A (-1500V, 96h)

<sup>2</sup> See data sheet on rear for further information.



6 BUSBAR CELL TECHNOLOGY

12 BUSBAR CELL TECHNOLOGY

### THE IDEAL SOLUTION FOR:

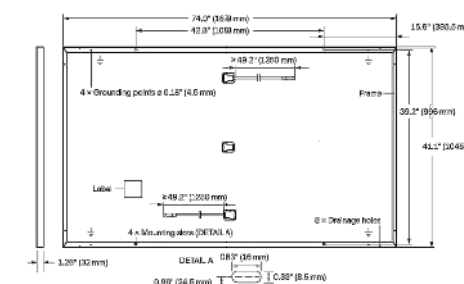


Engineered in Germany



### MECHANICAL SPECIFICATION

Format	74.0 in x 41.1 in x 1.26 in (including frame) (1878 mm x 1045 mm x 32 mm)
Weight	48.5 lbs (22.0 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 x 22 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in x 1.26-2.36 in x 0.59-0.71 in (53-101 mm x 32-60 mm x 15-18 mm), IP67, with bypass diodes
Cable	4 mm <sup>2</sup> solar cable; (+) ≥ 49.2 in (1250 mm), (-) ≥ 49.2 in (1250 mm)
Connector	Stäubli MC4; IP68



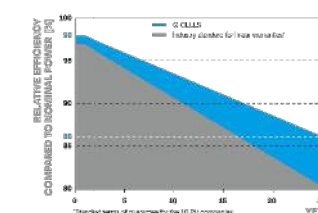
### ELECTRICAL CHARACTERISTICS

POWER CLASS	385	390	395	400	405	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC <sup>1</sup> (POWER TOLERANCE +5W/-0W)						
Power at MPP <sup>2</sup>	P <sub>MPP</sub> [W]	385	390	395	400	405
Short Circuit Current <sup>4</sup>	I <sub>SC</sub> [A]	11.04	11.07	11.10	11.14	11.17
Open Circuit Voltage <sup>4</sup>	V <sub>OC</sub> [V]	46.19	46.23	46.27	46.30	46.34
Current at MPP	I <sub>MPP</sub> [A]	10.59	10.65	10.71	10.77	10.83
Voltage at MPP	V <sub>MPP</sub> [V]	36.36	36.62	36.88	37.13	37.39
Efficiency <sup>4</sup>	η [%]	≥ 19.6	≥ 19.9	≥ 20.1	≥ 20.4	≥ 20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT <sup>2</sup>						
Power at MPP	P <sub>MPP</sub> [W]	288.8	292.6	296.3	300.1	303.8
Short Circuit Current	I <sub>SC</sub> [A]	8.90	8.92	8.95	8.97	9.00
Open Circuit Voltage	V <sub>OC</sub> [V]	42.62	42.65	42.69	42.72	42.76
Current at MPP	I <sub>MPP</sub> [A]	8.35	8.41	8.46	8.51	8.57
Voltage at MPP	V <sub>MPP</sub> [V]	34.59	34.81	35.03	35.25	35.46

<sup>1</sup> Measurement tolerances P<sub>MPP</sub> ± 3%; I<sub>SC</sub>, V<sub>OC</sub> ± 5% at STC: 1000 W/m<sup>2</sup>, 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • \*800 W/m<sup>2</sup>, NMOT, spectrum AM 1.5

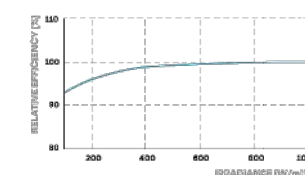
### Q CELLS PERFORMANCE WARRANTY

### PERFORMANCE AT LOW IRRADIANCE



At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m<sup>2</sup>)

### TEMPERATURE COEFFICIENTS

Temperature Coefficient of I <sub>SC</sub>	α [%/K]	+0.04	Temperature Coefficient of V <sub>OC</sub>	β [%/K]	-0.27
Temperature Coefficient of P <sub>MPP</sub>	γ [%/K]	-0.34	Nominal Module Operating Temperature	NMOT [°F]	1.09 ± 5.4 (4.3 ± 3 °C)

### PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V <sub>sys</sub> [V]	1000 (IEC)/1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating [A DC]	20	Fire Rating based on ANSI/UL 61730	TYPE 2
Max. Design Load, Push/Pull <sup>3</sup> [lcs/ft <sup>2</sup> ]	75 (3600 Pa)/55 (2660 Pa)	Permitted Module Temperature on Continuous Duty	-40 °F up to +185 °F (-40 °C up to +85 °C)
Max. Test Load, Push/Pull <sup>3</sup> [lcs/ft <sup>2</sup> ]	113 (5400 Pa)/84 (4000 Pa)		

<sup>3</sup> See Installation Manual

### QUALIFICATIONS AND CERTIFICATES

### PACKAGING INFORMATION

UL 61730, CE-compliant, Quality Controlled PV - TÜV Rheinland, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells), QCPV Certification ongoing.



Horizontal packaging	76.4 in 1940 mm	43.3 in 1100 mm	48.0 in 1220 mm	1856 lbs 761 kg	24 pallets	24 pallets	32 modules
----------------------	--------------------	--------------------	--------------------	--------------------	---------------	---------------	---------------

**Note:** Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS America Inc.  
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 69 96 | EMAIL inquiry@us.q-cells.com | WEB www.q-cells.us



## IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.



IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.



Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.



IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down Equipment and conform with various regulations, when installed according to manufacturer's instructions.

### Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

### High productivity and reliability

- Produce power even when the grid is down\*
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

### Microgrid-forming

- Complies with the latest advanced grid support\*\*
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) requirements

\* Only when installed with IQ System Controller 2, meets UL 1741.

\*\* IQ8 and IQ8Plus supports split phase, 240V installations only.

## IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings <sup>1</sup>	W	235 – 350	235 – 440
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell
MPPT voltage range	V	27 – 37	29 – 45
Operating range	V	25 – 48	25 – 58
Min/max start voltage	V	30 / 48	30 / 58
Max input DC voltage	V	50	60
Max DC current <sup>2</sup> [module Isc]	A		15
Overvoltage class DC port			II
DC port backfeed current	mA		0
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Peak output power	VA	245	300
Max continuous output power	VA	240	290
Nominal (L-L) voltage/range <sup>3</sup>	V	240 / 211 – 264	
Max continuous output current	A	10	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 – 68	
AC short circuit fault current over 3 cycles	Arms	2	
Max units per 20 A (L-L) branch circuit <sup>4</sup>		16	13
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.5	97.6
CEC weighted efficiency	%	97	97
Night-time power consumption	mW	60	
MECHANICAL DATA			
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)	
Relative humidity range		4% to 100% (condensing)	
DC Connector type		MC4	
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection – no fans	
Approved for wet locations		Yes	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure	
Environ. category / UV exposure rating		NEMA Type 6 / outdoor	
COMPLIANCE			
Certifications		CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO.107.1-01	
		This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.	

(1) No enforced DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility>  
 (2) Maximum continuous input DC current is 10.6A (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

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

REVISIONS		
DESCRIPTION	DATE	REV

DATE: 09/12/2023		
PROJECT NAME & ADDRESS		
DAVID R BOWMAN RESIDENCE 244 SE BROWN ST, LAKE CITY, FL 32025		

PROJECT NAME & ADDRESS		
DAVID R BOWMAN RESIDENCE 244 SE BROWN ST, LAKE CITY, FL 32025		

DRAWN BY ESR
-----------------

SHEET NAME EQUIPMENT SPECIFICATION
---------------------------------------

SHEET SIZE ANSI B 11" X 17"
-----------------------------------

SHEET NUMBER PV-12
-----------------------

# Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4  
X-IQ-AM1-240-4C



The **Enphase IQ Combiner 4/4C** with Enphase IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure and streamlines IQ microinverters and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.

### Smart

- Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ Combiner 4C
- Includes solar shield to match Enphase IQ Battery aesthetics and deflect heat
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

### Simple

- Centered mounting brackets support single stud mounting
- Supports bottom, back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80A total PV or storage branch circuits

### Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed



To learn more about Enphase offerings, visit [enphase.com](http://enphase.com)



## Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
ACCESSORIES AND REPLACEMENT PARTS (not included, order separately)	
Ensemble Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Envoy breaker	10A or 15A rating GE/Siemens/Eaton included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
COMPLIANCE	
Compliance, IQ Combiner	UL 1741, CAN/CSA C22.2 No. 107.1, 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit [enphase.com](http://enphase.com)

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

REVISIONS		
DESCRIPTION	DATE	REV

DATE: 09/12/2023

PROJECT NAME & ADDRESS

DAVID R BOWMAN  
RESIDENCE  
244 SE BROWN ST,  
LAKE CITY,  
FL 32025

DRAWN BY  
ESR

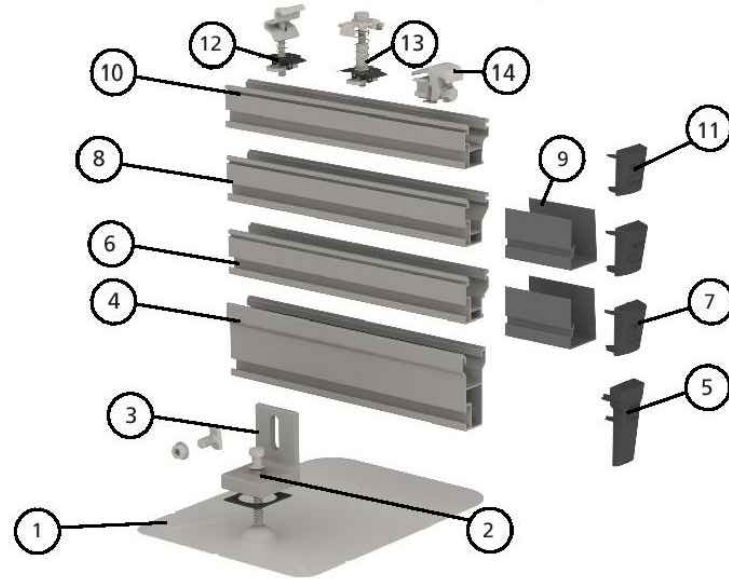
SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-13



# CrossRail System



Item No.	Description	Part No.
1	EverFlash XP Comp Kit, Mill or Dark	4000060, 4000061, 4000057
2	Lag Bolt D145/16 x 4" SS	4000359
3	L-Foot XP Set, Mill or Dark	4000036, 4000038
4	CrossRail 80 168" Rail, Mill	4000508
5	CrossRail 80 End Cap, Black	4001221
6	CrossRail 48-XL 166", Mill or Dark	4000695, 4000705
7	CrossRail 48-X/48-XL End Cap or Flat End Cap	4000433, 4000431
8	CrossRail 48-X 166" or 180", Mill or Dark	4000662, 4000675, 4000663
9	CrossRail 48-X/48-XL 3" Sleeve	4000583
10	CrossRail 44-X 166", Mill or Dark	4000019, 4000020
11	CrossRail 44-X End Cap	4000067
12	CR Mid Clamp Silver or Dark	4000601-H, 4000602-H
13	CR End Clamp Silver or Dark	4000429, 4000430
14	Yeti Clamp (Hidden End Clamp)	40000050-H

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## CrossRail 44-X

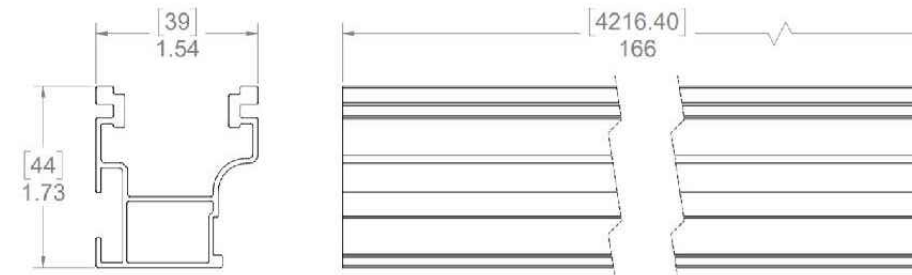


### Mechanical Properties

	CrossRail 44-X
Material	6000 Series Aluminum
Ultimate Tensile Strength	37.7 ksi (260 MPa)
Yield Strength	34.8 ksi (240 MPa)
Weight	0.47 lbs/ft (0.699 kg/m)
Finish	Mill or Dark Anodized

### Section Properties

	CrossRail 44-X
S <sub>x</sub>	0.1490 in <sup>3</sup> (0.3785 cm <sup>3</sup> )
S <sub>y</sub>	0.1450 in <sup>3</sup> (0.3683 cm <sup>3</sup> )
A (X-Section)	0.4050 in <sup>2</sup> (1.0287 cm <sup>2</sup> )



Dimensions in [mm] Inches

#### Notes:

- ▶ Structural values and span charts determined in accordance with Aluminum Design Manual and ASCE 7-16
- ▶ UL2703 Listed System for Fire and Bonding

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SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-14

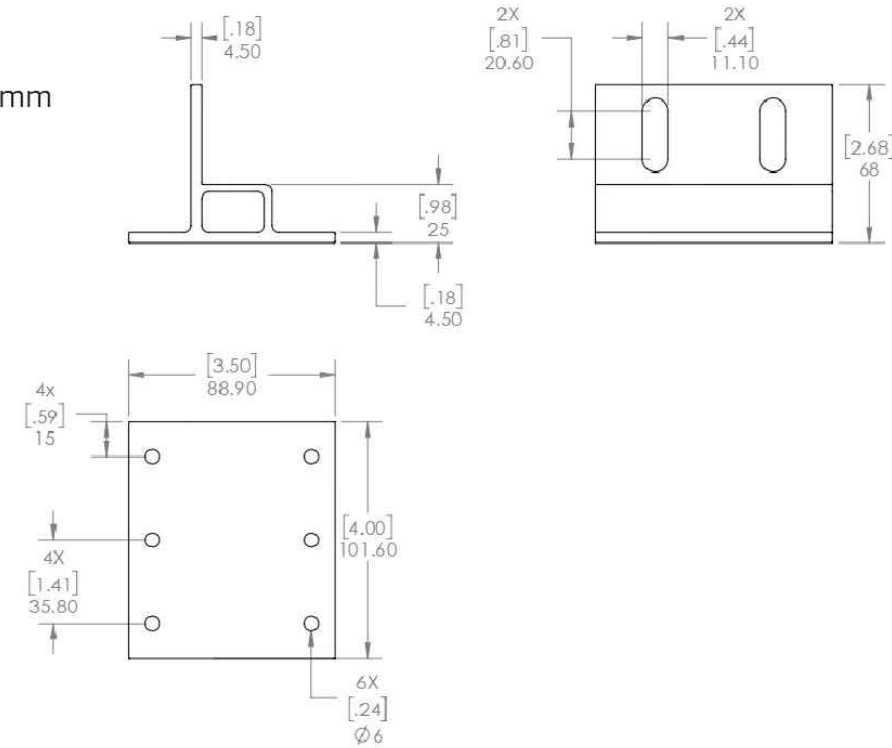
We support PV systems  
Formerly Everest Solar Systems



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Units: [in] mm



# Splice Foot XL

Patent Pending

## TECHNICAL SHEET

Item Number	Description	Part Number
1	Splice Foot XL	4000162   Splice Foot XL Kit, Mill
2	K2 EverSeal	
3	M5 x 60 lag screws	
4	T-Bolt & Hex Nut Set	

### Technical Data

	Splice Foot XL
Roof Type	Composition shingle
Material	Aluminum with stainless steel hardware
Finish	Mill
Roof Connection	M5 x 60 lag screws
Code Compliance	UL 2703
Compatibility	CrossRail 44-X, 48-X, 48-XL, 80



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SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-15

# SolaDeck

FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURE

## Basic Features

- Stamped Seamless Construction
- 18 Gauge Galvanized Steel
- Powder Coated Surfaces
- Flashes into the roof deck
- 3 Roof deck knockouts .5", .75", 1"
- 5 Centering dimples for entry/exit fittings or conduit
- 2 Position Ground lug installed
- Mounting Hardware Included



SolaDeck Model SD 0783



## SolaDeck UL50 Type 3R Enclosures

Available Models:

- Model SD 0783 - (3" fixed Din Rail)
- Model SD 0786 - (6" slotted Din Rail)



## SolaDeck UL 1741 Combiner/Enclosures

Models SD 0783-41 and SD 0786-41 are labeled and ETL listed UL STD 1741 according to the UL STD 1741 for photovoltaic combiner enclosures.

Max Rated - 600VDC, 120AMPS

**Model SD 0783-41** 3" Fixed Din Rail fastened using Norlock System

### \*\*Typical System Configuration

- 4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
- 1- Power Distribution Block 600VDC 175AMP
- 1- Bus Bar with UL lug

**Model SD 0786-41** 6" Slotted Din Rail fastened using steel studs

### \*\*Typical System Configuration

- 4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
- 4- Din Rail Mounted Terminal Blocks
- Bus Bars with UL lug

\*\*Fuse holders and terminal blocks added in the field must be UL listed or recognized and meet 600 VDC 30 AMP 110C for fuse holders, 600V 50 AMP 90C for rail mounted terminal blocks and 600 V 175 AMP 90C for Power Distribution Blocks. Use Copper Wire Conductors.



Cover is trimmed to allow conduit or fittings, base is center dimpled for fitting locations.



Model SD 0783-41, wired with Din Rail mounted fuse holders, bus bar and power distribution block.



Model SD 0786-41, wired with Din Rail mounted fuse holders, terminal blocks and bus bars.



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SHEET NUMBER

PV-16