PHOTOVOLTAIC ROOF MOUNT SYSTEM

CODE AND STANDARDS

THE INSTALLATION OF SOLAR ARRAYS AND PHOTOVOLTAIC POWER SYSTEMS SHALL COMPLY WITH THE FOLLOWING CODES:

- 2020 NATIONAL ELECTRICAL CODE
- 2018 NORTH CAROLINA BUILDING CODE
- ALL OTHER ORDINANCE ADOPTED BY THE LOCAL GOVERNING AGENCIES

SITE NOTES / OSHA REGULATION

1. A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
2. THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
3. ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED AND IDENTIFIED BY RECOGNIZED ELECTRICAL TESTING LABORATORY.
4. MODULES AND SUPPORT STRUCTURES SHALL BE GROUNDED
5. SOLAR INVERTER SHALL BE LISTED TO UL1741
6. ALL CONDUCTORS SHALL BE COPPER AND SHOULD BE 75 AND 90 DEG RATED
7. REMOVAL OF AN INTERACTIVE INVERTER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BONDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR, THE PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUIT GROUNDED CONDUCTORS.
8. LIVE PARTS OF PV SOURCE CIRCUITS AND PV OUTPUT CIRCUITS OVER 150V TO GROUND SHALL NOT BE ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS WHILE ENERGIZED.
9. ALL PV MODULES AND ASSOCIATED EQUIPMENT AND WIRING SHALL BE PROTECTED FROM PHYSICAL DAMAGE.

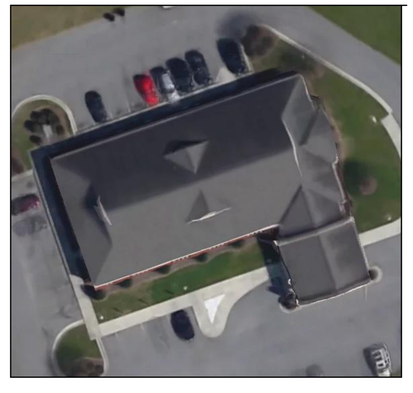
SOLAR CONTRACTOR

1. MODULE CERTIFICATIONS INCLUDE UL1703, IEC61646, IEC61370.
2. IF APPLICABLE, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE MARKED GROUNDING LUG HOLES PER THE MANUFACTURERS INSTALLATION REQUIREMENTS.
3. AS INDICATED BY DESIGN, OTHER NRTL LISTED MODULE GROUNDING DEVICES MAY BE USED IN PLACE OF STANDARD GROUNDING LUGS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ.
4. ALL MICROINVERTERS, PHOTOVOLTAIC MODULES, AC COMBINERS, DC-AC CONVERTERS AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER NEC690.4(B).
5. ALL SIGNAGE TO BE INSTALLED IN ACCORDANCE WITH LOCAL BUILDING CODE.
6. TERMINALS AND LUGS WILL BE TIGHTENED TO MANUFACTURER TORQUE SPECIFICATIONS (WHEN PROVIDED) IN ACCORDANCE WITH NEC CODE 110.14(D) ON ALL ELECTRICAL CONNECTIONS.
7. MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC UNLESS NOT AVAILABLE.

SR.#	PROJECT INFORMATION	
1	PV MODULES	76 X Q.PEAK DUO XL-G10.3 / BFG 480W
2	OPTIMIZER	40 X P1101
3	INVERTER	02 X SE17.3KUS
4	ROOF TYPE	ASPHALT SHINGLES
5	RACKING	PSR-B84 RAILS (BLACK)
6	MOUNTING TYPE	COMP MOUNT FLASHING (BLACK)
7	DC SIZE	36.480 KW
8	AC SIZE	34.6 KVA

SR.#	PROJECT INFORMATION	
1	PV1	DRAWING INDEX
2	PV2	SITE LAYOUT
3	PV3	STRING MAPPING
4	PV4	ELECTRICAL ONE LINE DIAGRAM
5	PV5	DETAILED ELECTRICAL WIRING SCHEMATIC
6	PV6	PV LABELS
7	PV7	BILL OF MATERIALS
8	PV8	RACKING DETAILS

VICINITY MAP



TOP VIEW OF THE BUILDING

DESIGN CRITERIA
WIND SPEED: 115 MPH
GROUND SNOW LOAD: 15 LB/FT²
WIND EXPOSURE FACTOR: B

UTILITY COMPANY:
DUKE ENERGY PROGRESS

PERMIT ISSUER (AHJ):
HARNETT COUNTY

SCOPE OF WORK
INSTALLATION OF UTILITY INTERACTIVE PHOTOVOLTAIC SOLAR SYSTEM.

8MSOLAR
ADVANCING ENERGY INDEPENDENCE

1600 Heritage Commerce Ct Ste 104,
Wake Forest NC 27587
O: 919.948.6474
E: info@8msolar.com

Customer Information:

LifeLink Medical Group

901 Denim Dr.
Erwin, NC 28339

Customer Signature:

Sheet Name:

Drawing Index

JOB NUMBER:

23-439-LLM

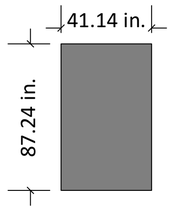
Date:	Revision A:
11/21/2023	
Sheet Size:	**Sheet Number:**
22" X 28.7"	PV1

NABCEP CERTIFIED
PV Installation Professional
Ali Buttar
PVIP #031310-32

NORTH CAROLINA PROFESSIONAL SEAL 043525 ENGINEER USMAN NOOR
09-17-2024

ROOF DESCRIPTION			
ROOF	PITCH	AZIMUTH	NO. OF MODULES
A	23°	250°	11
B	23°	160°	59
C	23°	340°	06

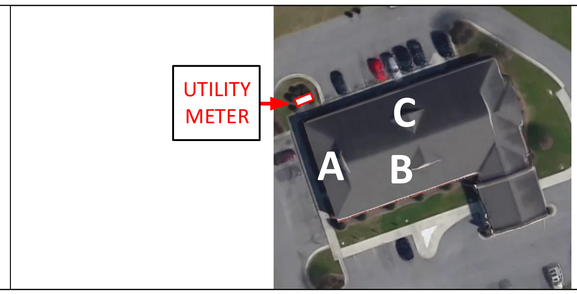
MODULE DIMENSIONS

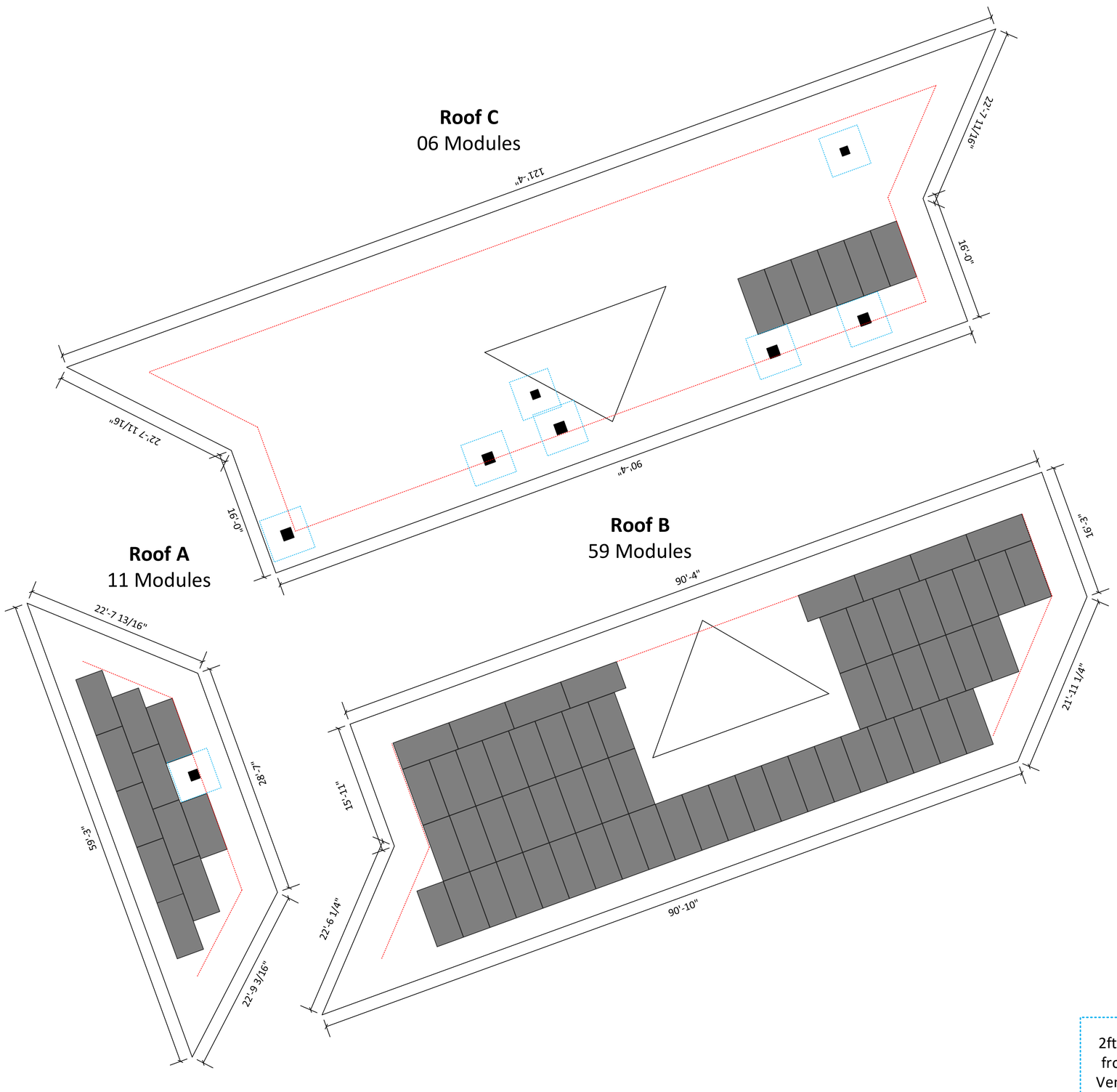


LAGENDS	
SYMBOLS	DESCRIPTION
■	Roof Vent

SYSTEM DETAILS

Modules:
76 x Q.PEAK DUO XL-G10.3 / BFG 480W
Optimizer:
30 x SOLAREDGE P1101 OPTIMIZER
RAPID SHUTDOWN EQUIPPED





N

SITE LAYOUT
SCALE: 1/8" - 1'

2ft setback from each Vent on the roof

4ft setback from sides of the roof

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Customer Signature:

Sheet Name:

Site Layout

JOB NUMBER:

23-439-LLM

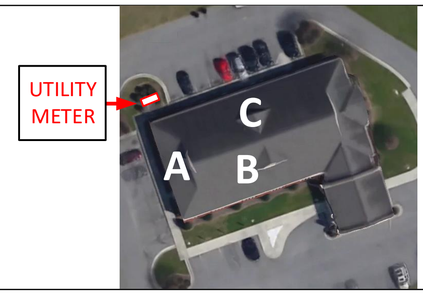
Date:	Revision A:
11/21/2023	
Sheet Size:	**Sheet Number:**
22" X 28.7"	PV2

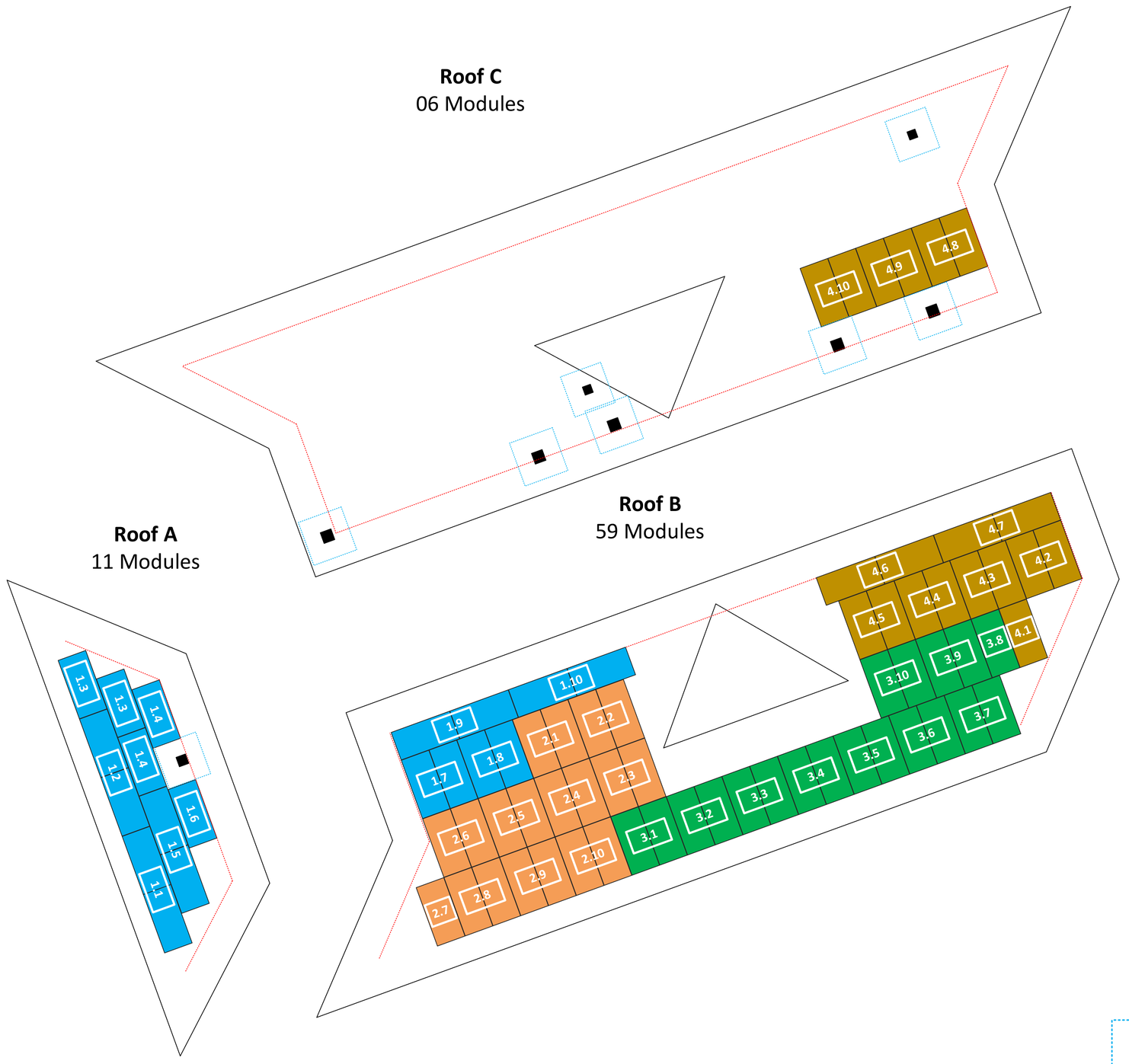
NABCEP CERTIFIED PV Installation Professional
Ali Buttar
PVIP #031310-32

NORTH CAROLINA PROFESSIONAL SEAL 039284 ENGINEER USMAN NOOR

09-17-2024

String Layout – Inverter: SE17.3KUS							
Inverter 1				Inverter 2			
Strings #	No. of Modules	No. of Optimizer	Color	Strings #	No. of Modules	No. of Optimizer	Color
String 1	19	10		**String 3**	19	10	
String 2	19	10		**String 4**	19	10	





N

STRING MAPPING
SCALE: 1/8" - 1'

2ft setback from each Vent on the roof

4ft setback from sides of the roof

8MSOLAR
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Customer Information:

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Erwin, NC 28339

Customer Signature:

Sheet Name:

String Mapping

JOB NUMBER:

23-439-LLM

Date:	**Revision A:**
11/21/2023	
Sheet Size:	**Sheet Number:**
22" X 28.7"	PV3

NABCEP CERTIFIED PV Installation Professional
Ali Buttar
PVIP #031310-32

NORTH CAROLINA PROFESSIONAL SEAL 039291 ENGINEER USMAN NOOR

09-17-2024

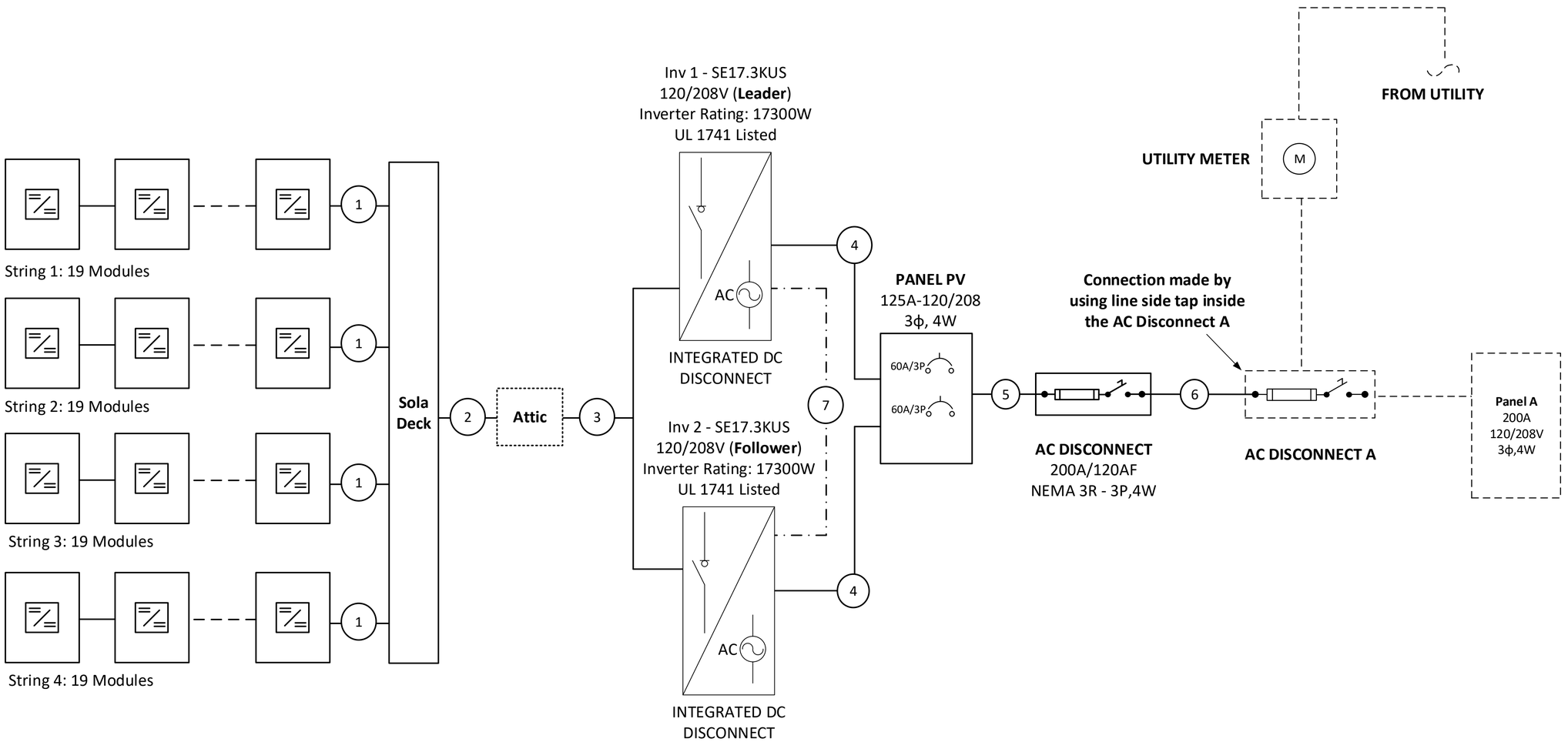
STRING CALCULATION

String #	No of Modules	Estimated Power	Impp	Imax	Voc	Vmpp
1	19	9,120W	15.2A	28.08A	10	600V DC
2	19	9,120W	15.2A	28.08A	10	600V DC
3	19	9,120W	15.2A	28.08A	10	600V DC
4	19	9,120W	15.2A	28.08A	10	600V DC

Modules:
76 x Q.PEAK DUO XL-G10.3 / BFG 480W
Optimizer:
40 x SOLAREDGE P1101 OPTIMIZER
RAPID SHUTDOWN EQUIPPED

NEC Code and UL Standard Refrences

Rapid Shut Down	NEC 690.12 (A-D), UL1741	Grounding	NEC Article 250.30(A)
Grid Connection Standards	IEEE 1547, Rule 21, 14(HI)	Conduit Fill	NEC Table C.9, 310.15(B)(3)(a)
Feeder Sizing	NEC Table 310, 15(B)(16, 17)	Interconnection	NEC 705.12
Over current Protection	NEC 690.9	Disconnecting Means	NEC 690.13



- **System Size**: 36,480W DC
- (76) Q.PEAK DUO XL-G10.3 / BFG 480W
- (40) SOLAREDGE P1101 OPTIMIZERS
- (02) SOLAREDGE SE17.3KUS Inverter
- SE17.3KUS Inverter Output: 48.25A max (per phase)
- Combined AC output max: 34.6 kVA

- Grounding will be done via grounding lugs and mid-clamps to ensure the rail and panels are continuously grounded.
- Rapid Shutdown is included in the Inverters, refer to Inverter & Optimizer attached datasheets.
- The load center / disconnect will be visible, lockable accessible to utility linesmen and will be properly labelled as per NEC requirements. It will be located on the exterior wall of the building, next to the utility meter.

Sr.No	#Wire	Conduit Size	Ground Wire	Amperage
1	2 x #10 PV Wire		#10 Bare CU	28.08
2	8 x #8 XHHW-2	1.25" LFMC	#10 Green	
3	8 x #8 XHHW-2	1.25" EMT	#10 Green	
4	4 x #6 THHN	1" EMT	#8 Green	60A
5	4 x #1 THHN	1.5" EMT	#6 Green	120A
6	4 x #1 THHN	1.5" EMT		120A
7	CAT 5e Shielded	1" EMT		

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Customer Information:

LifeLink Medical Group

901 Denim Dr.
Erwin, NC 28339

Customer Signature:

Sheet Name:

Electrical One Line Diagram

JOB NUMBER:

23-439-LLM

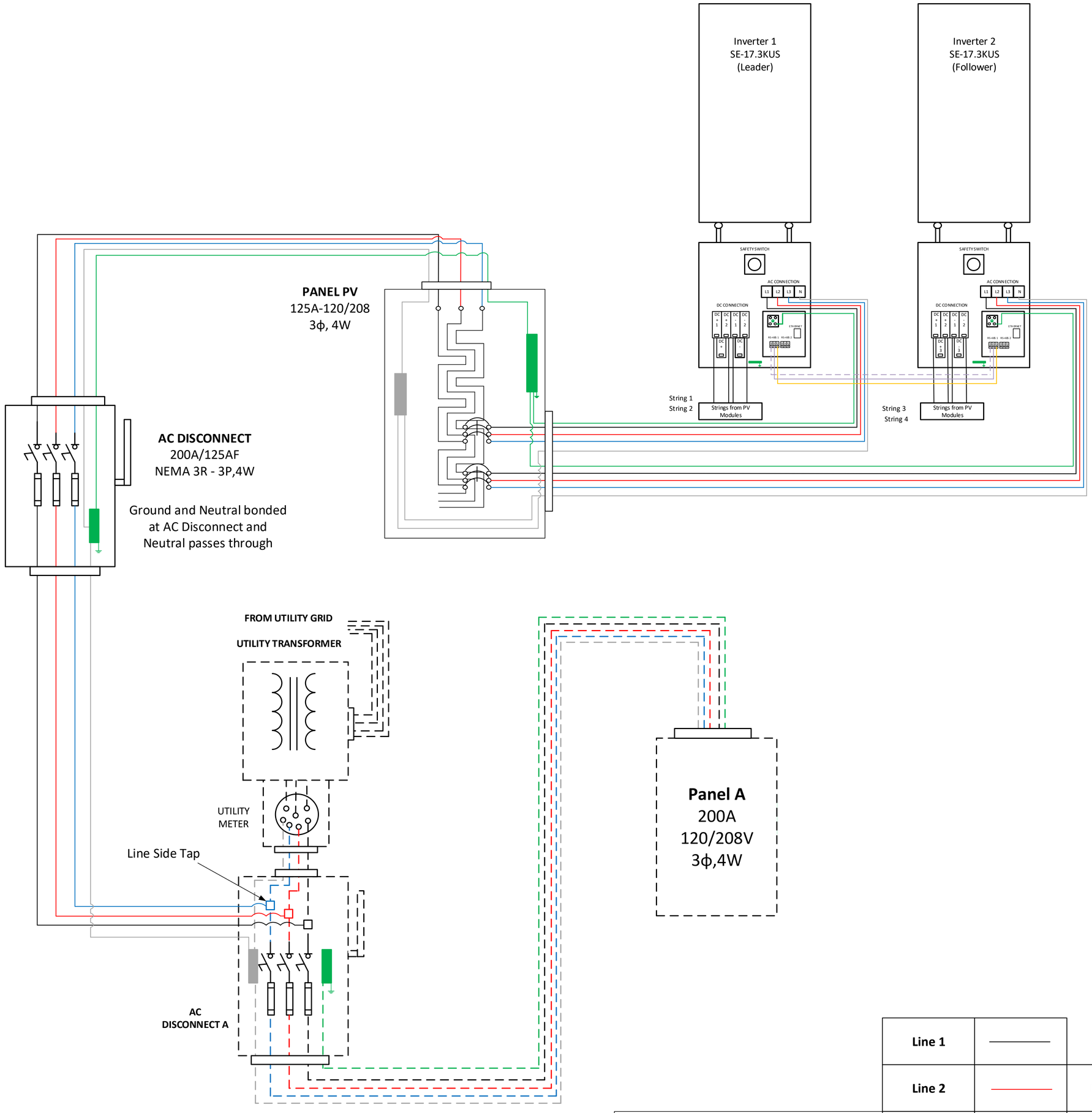
Date:	Revision A:
11/21/2023	

Sheet Size:	Sheet Number:
22" X 28.7"	PV4

NABCEP CERTIFIED
PV Installation Professional
Ali Buttar
PVIP #031310-32

NORTH CAROLINA PROFESSIONAL SEAL 039628 ENGINEER USMAN NOOR

09-17-2024



Line 1			
Line 2		**Neutral**	
Line 3		**Ground**	

Note: LifeLink Medical Group will provide an ethernet port within the 10 feet of inverter for the communication.

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ADVANCING ENERGY INDEPENDENCE

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Customer Information:

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Erwin, NC 28339

Customer Signature:

Sheet Name:

Detailed Electrical Diagram

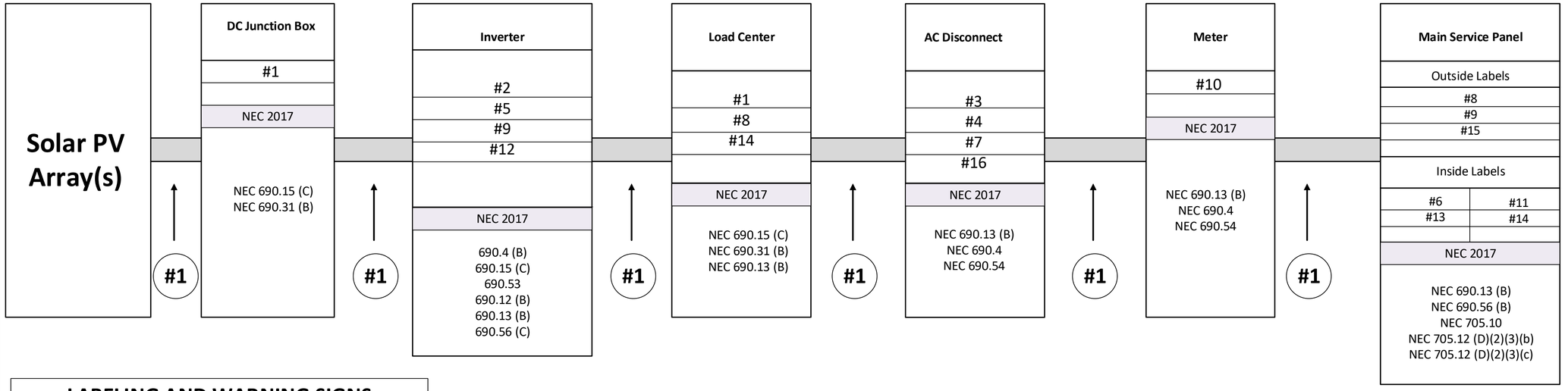
JOB NUMBER:

23-439-LLM

Date:	**Revision A:**
11/21/2023	
Sheet Size:	**Sheet Number:**
22" X 28.7"	PV5

NABCEP CERTIFIED PV Installation Professional
Ali Buttar
PVIP #031310-32

NORTH CAROLINA PROFESSIONAL SEAL 043529 ENGINEER USMAN NOOR
09-17-2024



LABELING AND WARNING SIGNS

A. PURPOSE
PROVIDE EMERGENCY RESPONDERS WITH APPROPRIATE WARNING AND GUIDANCE WITH RESPECT TO ISOLATING THE SOLAR ELECTRIC SYSTEM. THIS
CAN FACILITATE IDENTIFYING ENERGIZED ELECTRICAL LINES THAT CONNECT THE SOLAR PANELS TO THE INVERTER, AS SHOULD NOT BE CUT WHEN VENTING FOR SMOKE REMOVAL.

B. MAIN SERVICE DISCONNECT:
1. RESIDENTIAL BUILDINGS- THE MARKING MAY BE PLACED WITHIN THE
MAIN SERVICE DISCONNECT. THE MARKING SHALL BE PLACED ON THE
OUTSIDE COVER IF THE MAIN SERVICE DISCONNECT IS OPERABLE WITH
THE SERVICE PANEL CLOSED.

2. COMMERCIAL BUILDINGS- THE MARKINGS SHALL BE PLACED
ADJACENT TO THE MAIN SERVICE DISCONNECTCLEARLY VISIBLE FROM
THE LOCATION WHERE THE LEVER IS OPERATED

3. MARKINGS, VERBIAGE, FORMAT AND TYPE OF MATERIAL

a. VERBIAGE: CAUTION; SOLAR ELECTRIC SYSTEM CONNECTED
b. FORMAT:

(1) WHITE LETTERING ON A RED BACKGROUND
(2) MINIMUM 3/8 INCH LETTER HEIGHT
(3) ALL LETTERS SHALL BE CAPITALIZED
(4) ARIAL OR SIMILAR FONT, NON-BOLD

c. MATERIAL:

(1) REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE
FOR THE ENVIRONMENT (USE UL-969) AS STANDARD FOR WEATHER RATING): DURABLE ADHESIVE MATERIALS MEET
THIS REQUIREMENT.

C. MARKING REQUIREMENTS ON DC CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, DC COMBINERS AND JUNCTION BOXES;
1. MARKING: PLACEMENT, VERBIAGE, FORMAT AND TYPE OF MATERIAL.

a. PLACEMENT: MARKINGS SHALL BE PLACED EVERY 10 (TEN) FEET ON ALL INTERIOR AND EXTERIOR DC CONDUITS, RACEWAYS,
ENCLOSURES AND CABLE ASSEMBLIES, AT TURNS ABOVE AND/OR
BELOW PENETRATIONS, ALL DC COMBINERS AND JUNCTION BOXES.
b. VERBIAGE: CAUTION SOLAR CIRCUIT
c. THE FORMAT AND TYPE OF MATERIAL SHALL ADHERE TO SECTION B-3.B & C ABOVE

D. INVERTERS ARE NOT REQUIRED TO HAVE CAUTION MARKINGS

#1
WARNING : PHOTOVOLATIC POWER SOURCE

#2
PHOTOVOLATIC
DC DISCONNECT

#3
PHOTOVOLATIC
AC DISCONNECT

#4
RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

#5
MAXIMUM VOLTAGE
MAXIMUM CIRCUIT CURRENT
MAX. RATED OUTPUT CURRENT
OFF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)

#6
PHOTOVOLTIVC POWER SOURCE
OPERATING AC VOLTAGE ___ V
MAXIMUN OPERATING AC OUTPUT CURRENT ___ A

#7
AC DISCONNECT
PHOTOVOLTAIC SYSTEM POWER SOURCE
RATED AC OUTPUT CURRENT ___ AMPS
NOMINAL OPERATING AC VOLTAGE ___ VOLTS

#8
⚠ WARNING
ELECTRIC SHOCK HAZARD
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

#9
⚠ WARNING
DUAL POWER SUPPLY
SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

#10
⚠ WARNING
THIS SERVICE METER IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM

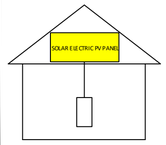
#11
⚠ WARNING
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

#12
⚠ WARNING
BIPOLAR PHOTOVOLTAIC ARRAY DISCONNECTION OF NEUTRAL GROUND CONDUCTORS MAY RESULT IN OVERVOLTAGE ON ARRAY OR INVERTER

#13
⚠ WARNING
THIS EQUIPMENT FED BY MULTIPLE SOURCES.TOTAL RARTING OF ALL OVERCURRENT DEVICES,EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE,SHALL NOT EXCEED AMPACITY OF BUSBAR

#14
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



#15
SOLAR AC DISCONNECT LOCATED AT SOUTH-EAST SIDE WALL OF THE HOUSE BESIDE THE UTILITY METER

#16
SERVICE DISCONNECT LOCATED IN MAIN LOAD PANEL INSIDE THE HOUSE

8MSOLAR
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901 Denim Dr.
Erwin, NC 28339

Customer Signature:

Sheet Name:

PV Labels

JOB NUMBER:

23-439-LLM

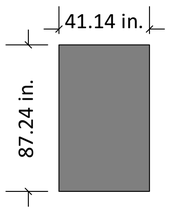
Date:	**Revision A:**
11/21/2023	
Sheet Size:	**Sheet Number:**
22" X 28.7"	PV6

NABCEP CERTIFIED
PV Installation Professional
Ali Buttar
PVIP #031310-32

NORTH CAROLINA PROFESSIONAL SEAL 037525 ENGINEER USMAN NOOR

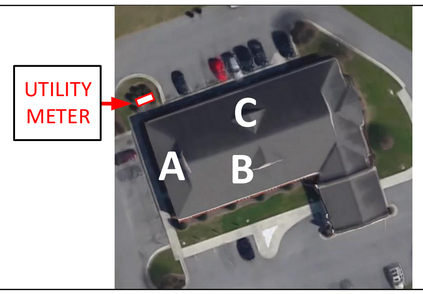
09-17-2024

MODULE DIMENSIONS



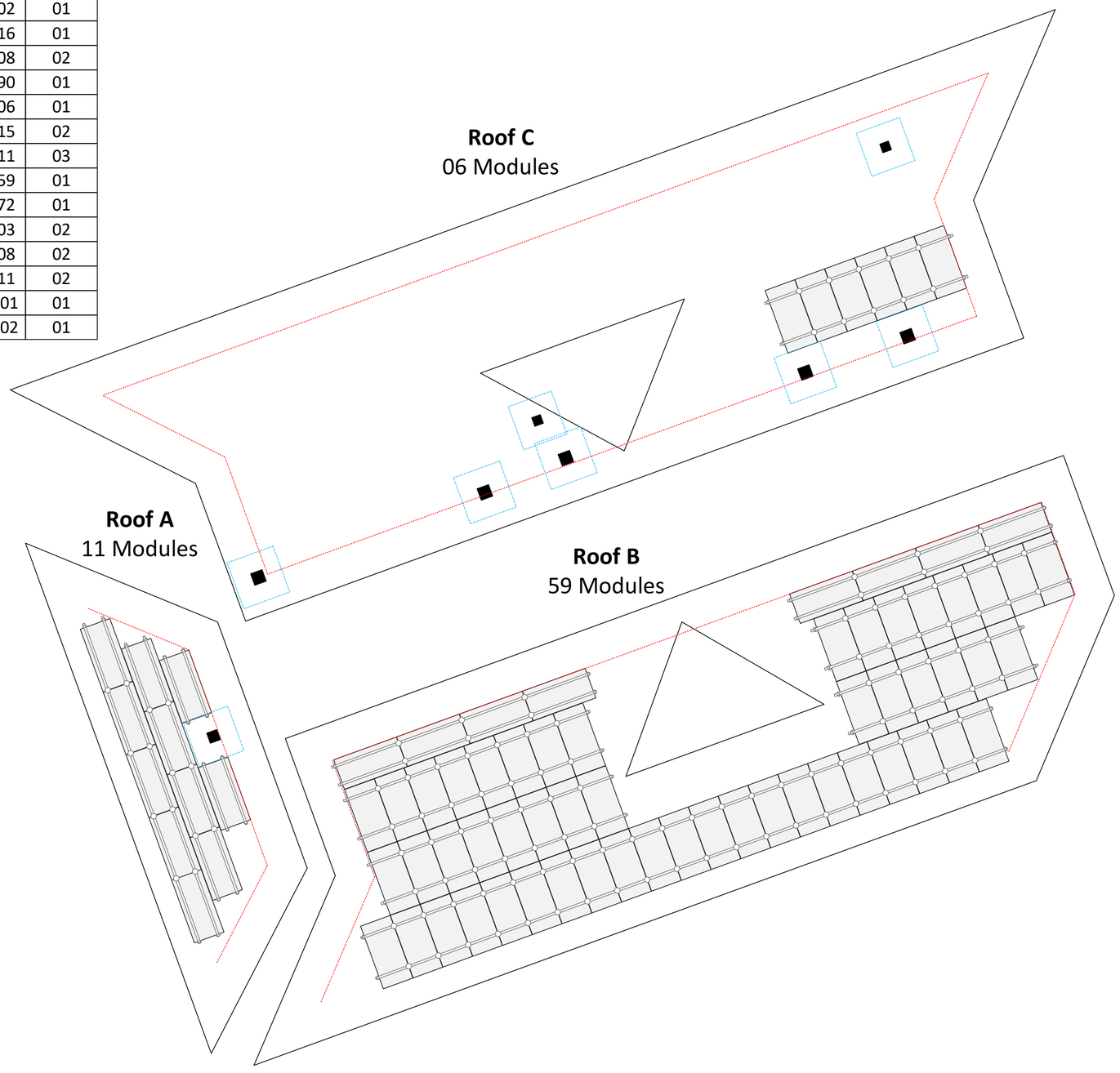
SYSTEM DETAILS

Modules:
76 x Q.PEAK DUO XL-G10.3 / BFG 480W
Optimizer:
40 x SOLAREDGE P1101 OPTIMIZER
RAPID SHUTDOWN EQUIPPED



PV LABELS

Sr No	Code	Qty
01	02-314	11
02	03-301	02
03	03-302	01
04	02-316	01
05	03-308	02
06	03-390	01
07	03-306	01
08	05-215	02
09	05-211	03
10	07-359	01
11	05-372	01
12	05-103	02
13	05-108	02
14	07-111	02
15	8M-001	01
16	8M-002	01



- RAILS AND MOUNTING SYSTEM
- 108 x PSR-B84: Pegasus Rail, Black, 84" (7 Feet)
- 84 x PSR-SPL: Pegasus - Bonded, Structural Splice
- 128 x PSR-MCB: Pegasus - Multiclamp, Mid/End, 30 to 40 mm, Black
- 48 x PSR-HEC: Pegasus - Hidden End Clamp
- 40 x PSR-MLP: Pegasus - MLPE Mount
- 15 x PSR-LUG: Pegasus - Grounding Lug
- 115 x PSR-WMC: Pegasus - Wire Management Clip
- 13 x PSR-CBG: Pegasus - Cable Grip
- 48 x PSR-CAP: Pegasus - End Cap
- 180 x PSCR-UBBDT: Pegasus Comp Mount - Open Slot, Black L Foot, Black Flashing, Dovetail 3/8" T-Bolt
- 228 x Heyco Wire Clips
- 228 x Zip Ties

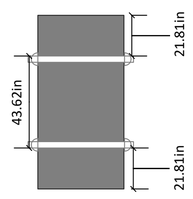
- 25 x SNRAC 232-01259: SNAPNRACK, ARRAY SKIRT, 162"(13.5 Feet) BLK.
- 90 x SNRAC 242-92211: SNAPNRACK, SKIRT FRAME MOUNT.
- 11 x SNRAC 232-01251: SNAPNRACK, SKIRT SPLICE
- 27 x SNRAC 232-01250: SANPNRACK, SKIRT END CAP PAIR.

- SOLAR MODULES
- 76 x Q.PEAK DUO XL-G10.3 / BFG 480W

- INVERTER & SUPPORTING ITEMS
- 02 x SolarEdge SE17.3kUS
- 40 x SolarEdge Power Optimizer P1101
- 04 x IPCS 2540: Line/Load Side Hot Taps (#250-#1 main - #4/0-#4 tap) Large types

- WIRE & DISCONNECTS
- 500 ft x #10 PV WIRE BLK (Cu)

Panel Cantilever (Top & Bottom)



4ft setback from sides of the roof

BILL OF MATERIAL
SCALE: 1/8" - 1'

8MSOLAR
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Erwin, NC 28339

Customer Signature:

Sheet Name:

BILL OF MATERIAL

JOB NUMBER:

23-439-LLM

Date:	**Revision A:**
11/21/2023	
Sheet Size:	**Sheet Number:**
22" X 28.7"	PV7

NABCEP CERTIFIED PV Installation Professional
Ali Buttar
PVIP #031310-32

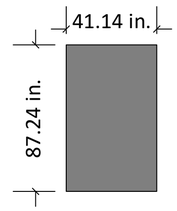
NORTH CAROLINA PROFESSIONAL SEAL 039525 ENGINEER USMAN NOOR

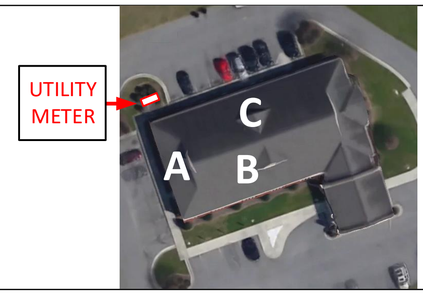
09-17-2024

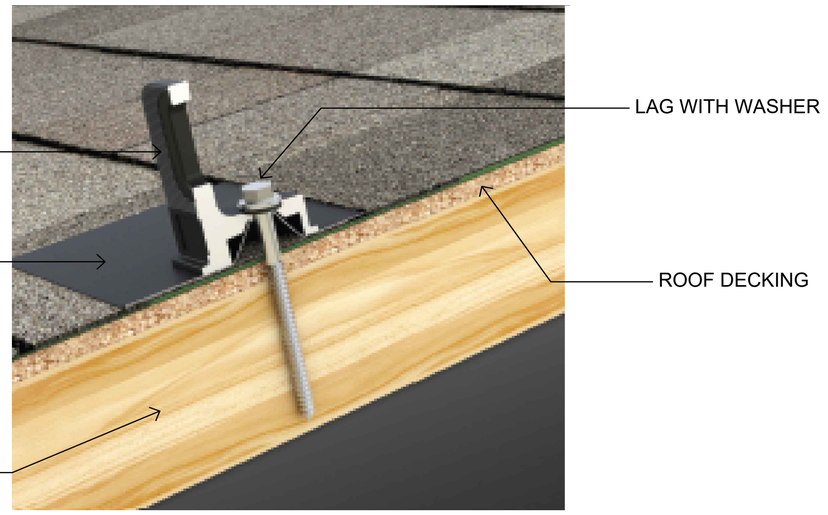
SYSTEM DETAILS
Number of Panels: 76
Panels Module: Q.PEAK DUO XL-G10.3 / BFG 480W
DC Size: 36.480 kW
AC Size: 34.6 kVA

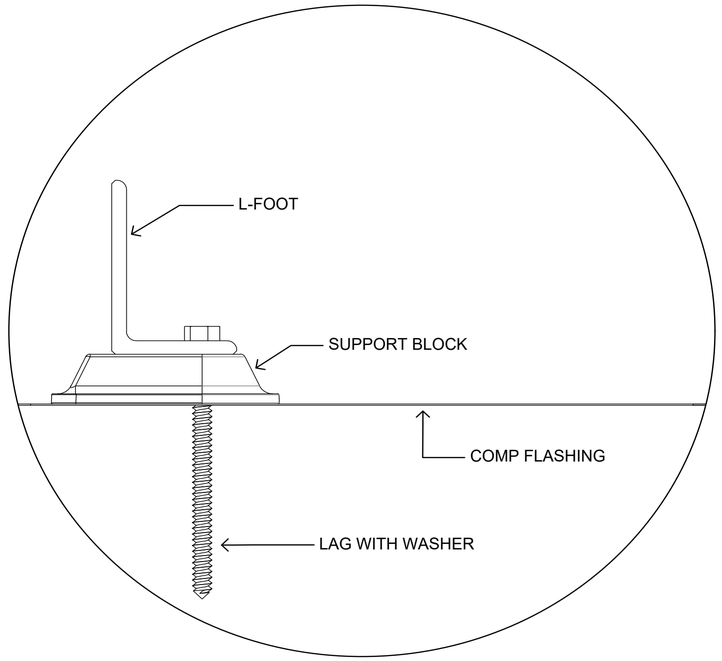
RACKIGN DETAILS
Pegasus Rails
Pegasus Comp Mounts

MODULE DIMENSIONS

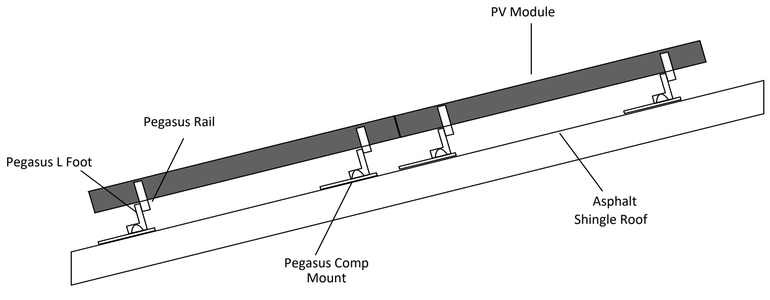








					
Multi-Clamp	Hidden End Clamp	MLPE Mount	Dovetail T-Bolt	Ground Lug	Cable Grip
Torque Value 100 in-lbs.	Torque Value 135 in-lbs.	Torque Value 135 in-lbs.	Torque Value 300 in-lbs.	Torque Value 135 in-lbs.	Torque Value 135 in-lbs.



SIDE VIEW

8MSOLAR
ADVANCING ENERGY INDEPENDENCE

1600 Heritage Commerce Ct Ste 104,
Wake Forest NC 27587
O: 919.948.6474
E: info@8msolar.com

Customer Information:

LifeLink Medical Group

901 Denim Dr.
Erwin, NC 28339

Customer Signature:

Sheet Name:

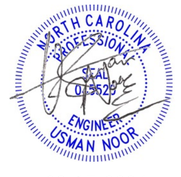
Racking Details

JOB NUMBER:

23-439-LLM

Date:	**Revision A:**
11/21/2023	
Sheet Size:	**Sheet Number:**
22" X 28.7"	PV8

NABCEP CERTIFIED PV Installation Professional
Ali Buttar
PVIP #031310-32



09-17-2024

powered by Q.ANTUM DUO Z

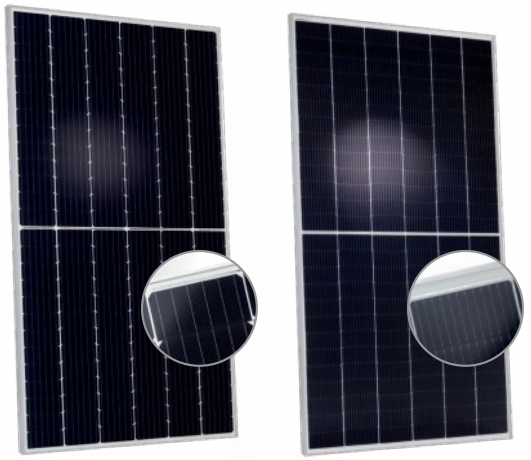
Q.PEAK DUO XL-G10.3 / BFG
475-490

BIFACIAL DOUBLE GLASS MODULE
WITH EXCELLENT RELIABILITY
AND ADDITIONAL YIELD

Quality Controlled PV
TÜVRheinland CERTIFIED
www.tuv.com
ID 1111232615

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2021

Q CELLS Yield Security



6 BUSBAR CELL TECHNOLOGY

12 BUSBAR CELL TECHNOLOGY

BIFACIAL ENERGY YIELD GAIN OF UP TO 20 %
Bifacial Q.ANTUM solar cells with zero gap cell layout make efficient use of light shining on the module rear-side for radically improved LCOE.

LOW ELECTRICITY GENERATION COSTS
Q.ANTUM DUO Z combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology for higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 21.4 %.

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 and Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

FRAME FOR VERSATILE MOUNTING OPTIONS
High-tech aluminum alloy frame protects from damage, enables use of a wide range of mounting structures and is certified regarding IEC for high snow (5400 Pa) and wind loads (2400 Pa).

A RELIABLE INVESTMENT
Double glass module design enables extended lifetime with 12-year product warranty and improved 30-year performance warranty[2].

[1] APT test conditions according to IEC / TS 62804-1:2015 method B (–1500 V, 168 h) including post treatment according to IEC 61215-1-1 Ed. 2.0 (CD)
[2] See data sheet on rear for further information.

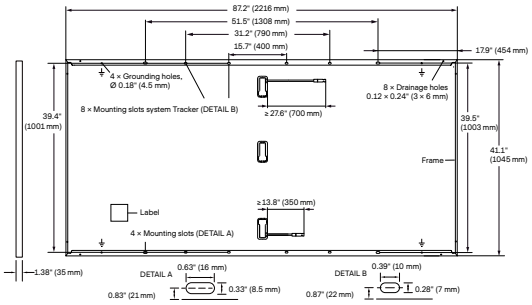
THE IDEAL SOLUTION FOR:
Ground-mounted solar power plants

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	87.2 in × 41.1 in × 1.38 in (including frame) (2216 mm × 1045 mm × 35 mm)
Weight	64.2 lbs (29.1 kg)
Front Cover	0.08 in (2.0 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	0.08 in (2.0 mm) semi-tempered glass
Frame	Anodized aluminum
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥27.6 in (700 mm), (–) ≥13.8 in (350 mm)
Connector	Stäubli MC4, Stäubli MC4-Evo2, Hanwha Q CELLS HQC4, IP68



Drawing not to scale

ELECTRICAL CHARACTERISTICS

POWER CLASS				475		480		485		490	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] AND BSTC[1] (POWER TOLERANCE +5 W / –0 W)					BSTC*		BSTC*		BSTC*		BSTC*
Minimum	Power at MPP[1]	P_{MPP}	[W]	475	519.6	480	525.0	485	530.5	490	536.0
	Short Circuit Current[1]	I_{SC}	[A]	11.08	12.12	11.12	12.17	11.16	12.21	11.20	12.26
	Open Circuit Voltage[1]	V_{OC}	[V]	53.15	53.34	53.39	53.58	53.63	53.82	53.86	54.06
	Current at MPP	I_{MPP}	[A]	10.55	11.54	10.59	11.58	10.63	11.63	10.67	11.67
	Voltage at MPP	V_{MPP}	[V]	45.03	45.02	45.33	45.32	45.63	45.62	45.93	45.92
	Efficiency[1]	η	[%]	≥20.5	≥22.4	≥20.7	≥22.7	≥20.9	≥22.9	≥21.2	≥23.1

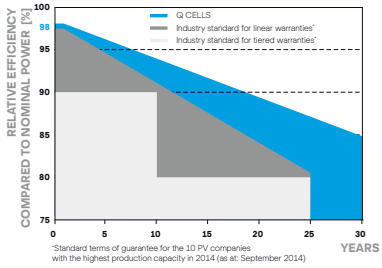
Bifaciality of P_{MPP} and I_{SC} 70 % ±5 % • Bifaciality given for rear side irradiation on top of STC (front side) • According to IEC 60904-1-2

[1]Measurement tolerances P_{MPP} ±3 %; I_{SC}, V_{OC} ±5 % at STC: 1000 W/m²; *at BSTC: 1000 W/m² + φ × 135 W/m², φ = 70 % ±5 %, 25±2 °C, AM 1.5 according to IEC 60904-3

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP}	[W]	357.6	361.4	365.1	368.9
	Short Circuit Current	I_{SC}	[A]	8.92	8.96	8.99	9.02
	Open Circuit Voltage	V_{OC}	[V]	50.27	50.49	50.72	50.95
	Current at MPP	I_{MPP}	[A]	8.30	8.34	8.37	8.40
	Voltage at MPP	V_{MPP}	[V]	43.06	43.35	43.63	43.92

[2]800 W/m², NMOT, spectrum AM 1.5

Q CELLS PERFORMANCE WARRANTY

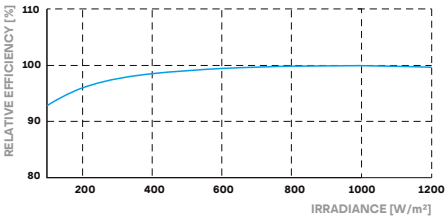


*Standard terms of guarantee for the 10 PV companies with the highest production capacity in 2014 (as at: September 2014)

At least 98 % of nominal power during first year. Thereafter max. 0.45 % degradation per year. At least 93.95 % of nominal power up to 10 years. At least 84.95 % of nominal power up to 30 years.

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

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²)

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.34	Nominal Module Operating Temperature	NMOT	[°F]	108±5.4 (42±3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 29[4]
Max. Design Load, Push / Pull[3]	[lbs/ft²]	75 (3600 Pa) / 33 (1600 Pa)	Permitted Module Temperature on Continuous Duty	–40 °F up to +185 °F (–40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]	[lbs/ft²]	113 (5400 Pa) / 50 (2400 Pa)		

[3] See Installation Manual

[4] New Type is similar to Type 3 but with metallic frame

QUALIFICATIONS AND CERTIFICATES

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

C Certified US UL 61730

CE

TÜVRheinland CERTIFIED
www.tuv.com ID 1111220277

PACKAGING INFORMATION

					53'	40' HC	
Horizontal packaging	89.4 in 2270 mm	43.1 in 1095 mm	47.6 in 1210 mm	1975 lbs 896 kg	20 pallets	20 pallets	29 modules
Vertical packaging	90.8 in 2306 mm	45.3 in 1150 mm	47.4 in 1205 mm	2013 lbs 913 kg	20 pallets	20 pallets	30 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 59 96 | **EMAIL** inquiry@us.q-cells.com | **WEB** www.q-cells.us

Three Phase Inverters for the 120/208V Grid

For North America

SE10KUS / SE17.3KUS

INVERTERS

The best choice for SolarEdge enabled systems

- Specifically designed to work with power optimizers
- Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- Fixed voltage inverter for superior efficiency and longer strings
- Built-in type 2 DC and AC Surge Protection, to better withstand lightning events
- Small, lightest in its class, and easy to install outdoors or indoors on provided bracket
- Integrated arc fault protection and rapid shutdown for NEC 2014, 2017, and 2020, per article 690.11 and 690.12
- Built-in module-level monitoring with Ethernet, wireless or cellular communication for full system visibility
- Integrated Safety Switch
- UL1741 SA and SB certified, for CPUC Rule 21 grid compliance

solaredge

Three Phase Inverters for the 120/208V Grid[1]

For North America

SE10KUS / SE17.3KUS

Model Number	SE10KUS	SE17.3KUS	
Applicable to inverters with part number	SEXXK-USX2IXXXX		
OUTPUT			
Rated AC Power Output	10000	17300	W
Maximum Apparent AC Output Power	10000	17300	VA
AC Output Line Connections	3W + PE, 4W + PE		
AC Output Voltage Minimum-Nominal-Maximum[2] (L-N)	105 – 120 – 132.5		Vac
AC Output Voltage Minimum-Nominal-Maximum[2] (L-L)	183 – 208 – 229		Vac
AC Frequency Minimum-Nominal-Maximum[2]	59.3 – 60 – 60.5		Hz
Continuous Output Current (per Phase)	27.8	48.25	Aac
GFDI Threshold	1		A
Utility Monitoring, Islanding Protection, Country Configurable Set Points	Yes		
THD	≤ 3		%
Power Factor Range	+/- 0.85 to 1		
INPUT			
Maximum DC Power (Module STC)	17500	30275	W
Transformer-less, Ungrounded	Yes		
Maximum Input Voltage DC+ to DC-	600		Vdc
Operating Voltage Range	370 – 600		Vdc
Maximum Input Current	27.8	48.25	Adc
Maximum Input Short Circuit Current	55		Adc
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	167kΩ Sensitivity[3]		
CEC Weighted Efficiency	97	97.5	%
Night-time Power Consumption	< 4		W
ADDITIONAL FEATURES			
Supported Communication Interfaces	2 x RS485, Ethernet, Cellular (optional)		
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection		
Rapid Shutdown	NEC2014, NEC2017 and NEC2020 compliant/certified		
RS485 Surge Protection Plug-in	Supplied with the inverter, Built-in		
AC, DC Surge Protection	Type II, field replaceable, Built-in		
DC Fuses (Single Pole)	25A, Built-in		
Smart Energy Management	Export Limitation		
DC SAFETY SWITCH			
DC Disconnect	Integrated		
STANDARD COMPLIANCE			
Safety	UL1741, UL1741 SA, UL1741 SB, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07		
Grid Connection Standards	IEEE1547-2018, Rule 21, Rule 14 (HI)		
Emissions	FCC part15 class A		
INSTALLATION SPECIFICATIONS			
AC Output Conduit size /AWG range	¾" or 1" / 6 - 10 AWG		
DC Input Conduit size / AWG range	¾" or 1" / 6 - 12 AWG		
Number of DC inputs pairs	4		
Dimensions with Safety Switch (H x W x D)	31.8 x 12.5 x 11.8 / 808 x 317 x 300		in / mm
Weight with Safety Switch	78.2 / 35.5		lb / kg
Cooling	Fans (user replaceable)		
Noise	< 62		dBA
Operating Temperature Range	-40 to +140 / -40 to +60(4)		°F / °C
Protection Rating	NEMA 3R		
Mounting	Bracket provided		

(1) For 277/480V inverters refer to the Three Phase Inverters for the 277/480V Grid for North America datasheet.
(2) For other regional settings please contact SolarEdge support.
(3) Where permitted by local regulations.
(4) For power de-rating information refer to the Temperature De-rating - Technical Note (North America).

CE

Power Optimizer

For North America

P1101

POWER OPTIMIZER

PV power optimization at the module level

The most cost-effective solution for commercial and large field installations

- Specifically designed to work with SolarEdge inverters
- High efficiency with module-level MPPT, for maximized system energy production and revenue, and fast project ROI
- Superior efficiency (99.5%)
- Balance of System cost reduction; 50% less cables, fuses, and combiner boxes; over 2x longer string lengths possible
- Fast installation with a single bolt
- Advanced maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

solaredge

/ Power Optimizer

For North America

P1101

Power Optimizer Model (Typical Module Compatibility)	P1101 (for up to 2 x high power or bi-facial modules)	Units
INPUT		
Rated Input DC Power(1)	1100	W
Connection Method	Single input for series connected modules	
Absolute Maximum Input Voltage (Voc at lowest temperature)	125	Vdc
MPPT Operating Range	12.5 – 105	Vdc
Maximum Short Circuit Current (Isc)	14.1	Adc
Maximum Short Circuit Current per Input (Isc)	-	Adc
Maximum Efficiency	99.5	%
Weighted Efficiency	98.6	%
Overvoltage Category	II	
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)		
Maximum Output Current	18	Adc
Maximum Output Voltage	80	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)		
Safety Output Voltage per Power Optimizer	1 ± 0.1	Vdc
STANDARD COMPLIANCE		
Photovoltaic Rapid Shutdown System	Compliant with NEC 2014, 2017, 2020	
EMC	FCC Part 15 Class A, IEC61000-6-2, IEC61000-6-3	
Safety	IEC62109-1 (class II safety), UL1741, UL3741, CSA C22.2#107.1	
Material	UL94 V-0, UV resistant	
RoHS	Yes	
INSTALLATION SPECIFICATIONS		
Compatible SolarEdge Inverters	All commercial three phase inverters	
Maximum Allowed System Voltage	1000	Vdc
Dimensions (W x L x H)	129 x 162 x 59 / 5.1 x 6.4 x 2.32	mm / in
Weight	1064 / 2.34	gr / lb
Input Connector	MC4(2)	
Input Wire Length Options: 1	1.6 / 5.2	m / ft
Input Wire Length Options: 2	1.6 / 5.2	m / ft
Input Wire Length Options: 3	1.6 / 5.2	m / ft
Output Wire Type / Connector	Double insulated; MC4	
Output Wire Length	2.4 / 7.8	m / ft
Operating Temperature Range(3)	-40 to +85 / -40 to +185	˚C / ˚F
Protection Rating	IP68 / NEMA6P	
Relative Humidity	0 – 100	%

(1) Rated power of the module at STC will not exceed the Power Optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed.
(2) For other connector types please refer to the Power Optimizer Input Connector Compatibility Technical Note.
(3) For ambient temperatures above +70˚C / +158˚F power de-rating is applied. Refer to Power Optimizers De-Rating Application Note for more details.

PV System Design Using a SolarEdge Inverter(4)(5)		208V Grid SE10K	208V Grid SE17.3K*	277/480V Grid SE30K	277/480V Grid SE40K*	
Compatible Power Optimizers		P1101				
Minimum String Length	Power Optimizers	8	10	14	14	
	PV Modules	15	19	27	27	
Maximum String Length	Power Optimizers	30	30	30	30	
	PV Modules	60	60	60	60	
Maximum Continuous Power per String		7200	8820	15300	15300	W
Maximum Allowed Connected Power per String(6)		1 string – 8400	1 string – 10020	1 string – 17550	2 strings or less – 17550	W
		2 strings or more – 9800	2 strings or more – 12020	2 strings or more – 20300	3 strings or more – 20300	
Parallel Strings of Different Lengths or Orientations		Yes				
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers				

* The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter.
(4) For each string, a Power Optimizer may be connected to a single PV module if 1) each Power Optimizer is connected to a single PV module or 2) it is the only Power Optimizer connected to a single PV module in the string.
(5) Design with three phase 208V inverters is limited. Use the SolarEdge Designer for verification.
(6) To connect more STC power per string, design your project using SolarEdge Designer.

RoHS

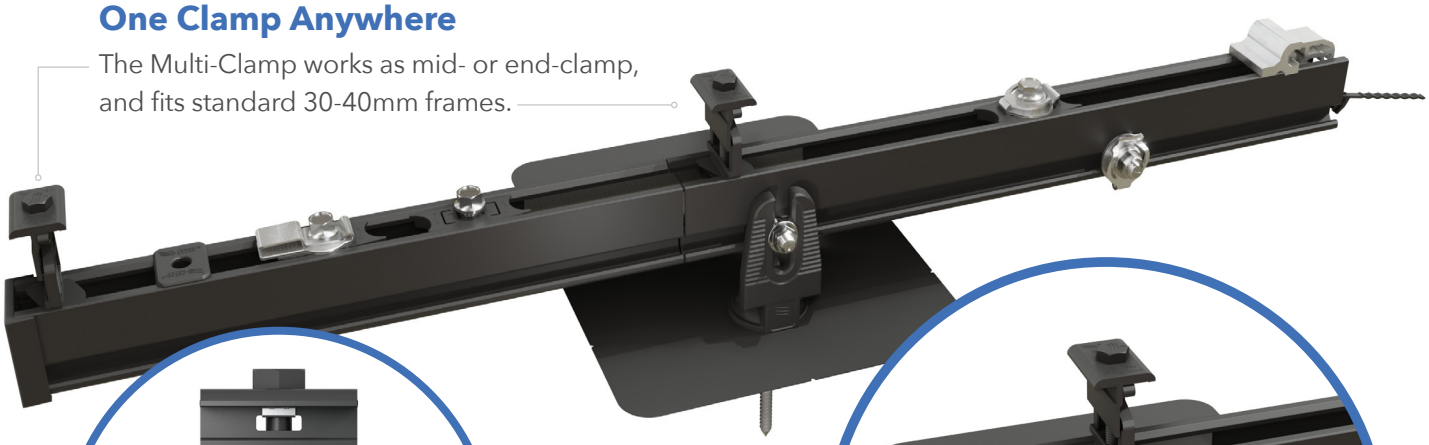
Intertek

PEGASUS SOLAR™
A Better Day on the Job

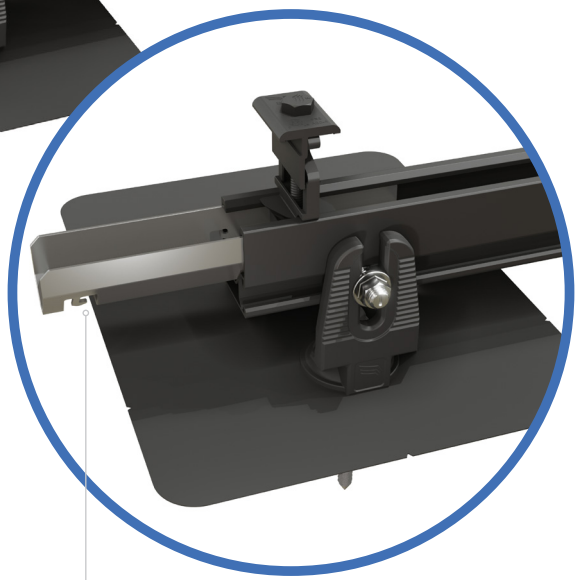
RAIL SYSTEM

Instant Bonding
The N-S Bonding Jumper bonds row to row with no tools.

One Clamp Anywhere
The Multi-Clamp works as mid- or end-clamp, and fits standard 30-40mm frames.



Lifetime Wire Management
Open rail channel holds and protects wires. Clamps won't pinch wires after tightening.



Bonding Structural Splice
Connect rails instantly, without tools, interference or limitations.

Next-Level Solar Mounting

A complete system for hassle-free rooftop installation, from watertight mounts to lifetime wire management.

Simplicity

1/2"socket for everything.
One clamp for mid or end.
No tool splicing and bonding.
Easy wire management.

Code Compliant

UL 2703 listed
LTR-AE-001-2012 listed
Class A fire rating for any slope
ASCE 7-16 PE Certified

Premium Aesthetics

The narrowest panel gap available. Optional Hidden End Clamps and End Caps provide a flush look on the edge of the array.

Watertight for Life

Secured on industry-leading Pegasus Mounts, for composite shingle and tile roofs.
Backed by a 25-year warranty.

Pegasus Solar Inc | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | **www.pegasussolar.com**

RAIL SYSTEM

Pegasus Rail

Available in 14′ and 7′ lengths for easy layout and shipping.

Open-channel design holds MC4 connectors, PV wire and trunk cables.

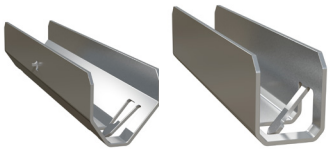
Black and Mill finish

Pegasus Max Rail

Maximum-strength design.

Meets specifications for high snow-load and hurricane zones.

Black and Mill finish

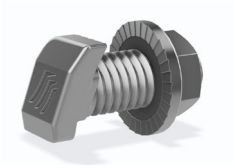


Splice and Max Splice

Installs by hand.

Works over mounts.

Structurally connects and bonds rails automatically; UL2703 listed as reusable.



Dovetail T-bolt

Dovetail shape for extra strength.

Uses ½″ socket.

Multi-Clamp

Fits 30-40mm PV frames, as mid- or end-clamp.

Twist-locks into position; doesn't pinch wires in rail.

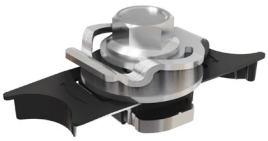
Bonds modules to rail; UL2703 listed as reusable

Hidden End Clamp

Offers premium edge appearance.

Preinstalled pull-tab grips rail edge, allowing easy, one-hand installation.

Tucks away for reuse.



Ground Lug

Holds 6 or 8 AWG wire.

Mounts on top or side of rail.

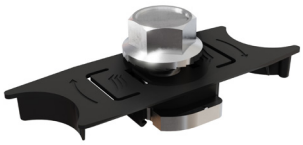
Assembled on MLPE Mount.

UL2703 listed as reusable.

N-S Bonding Jumper

Installs by hand, eliminates row-to-row copper wire.

UL2703 listed as reusable only with Pegasus Rail.

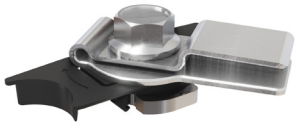


MLPE Mount

Secures and bonds most micro-inverters and optimizers to rail.

Connectors and wires easily route underneath after installation.

UL2703 listed as reusable.



Cable Grip

Secures four PV wires or two trunk cables.

Stainless-steel backing provides durable grip.

Eliminates sagging wires.

Wire Clip

Hand operable.

Holds wires in channel.

Won't slip.

End Cap and Max End Cap

Fits flush to PV module and hides raw or angled cuts.

Hidden drain quickly clears water from rail.

Certifications:

- UL 2703, Edition 1
- LTR-AE-001-2012
- ASCE 7-16 PE certified
- Class A fire rating for any slope roof

LOAD		SPAN			
SNOW (PSF)	WIND (MPH)	32″	4′	6′	8′
0	120				
	160				
	190				
15	140				
	160				
	190				
30	160				
	190				
45	190				
70	190				
110	190				

PEGASUS RAIL PEGASUS MAX RAIL

For reference only. Spans above are calculated using ASCE 7-16 for a Gable Roof, Exposure Category B, 7-20deg roof angle, 30ft mean roof height with non-exposed modules. For PE certified span tables, visit www.pegasussolar.com/spans.

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MODEL ENERGY, PLLC
MODELENERGY.COM
919-274-9905
300 FAYETTEVILLE ST., #1430
RALEIGH, NC 27602

Customer: LifeLinkMedical Group
Installer: 8M Solar
Subject: PV System Structural Compliance
Date: 10/27/2023

To whom it may concern:

Model Energy, PLLC has reviewed the installation details of the proposed PV system that is to be installed by 8M Solar at 901 Denim Dr, Erwin, NC 28339. The review was limited to the structural elements involved in the construction and not the electrical, mechanical, etc. The conditions of the existing structure have been reviewed and validated by Model Energy, PLLC. The Installation design and corresponding calculations are informed by the 2018 North Carolina Building Code and comply with the 2018 NCBC.

System/Structural Information

Wind Speed: 119 mph	Exposure Category: B
Dead Load: 10 psf	Live Load: 20 psf Snow Load: 15 psf,
Mean Roof Height: 25 ft.	Roof Pitch: 22.5°,
Truss Size & Spacing, and Span:	2" X 6"@ 24" O.C., RA & RC:18', RB:30'.
Roof Construction:	Trusses, PLYWOOD, Asphalt Shingles,
Wood Type and Grade:	Southern Pine, #2,
Solar Module, Make, Dimens., and Weight:	Q.PEAK DUO XL-G10.3/BFG 480W, 41.1" x 87.2", 64.2lbs.
Racking System Make and Weight:	Pegasus PSR-B84 (Black), 1 lbs. per foot.
Roof Attachment Make:	Pegasus Comp Mount 5/16" x 4 ½" SS Lag Round-Point Setscrews.
Roof Attachment Weight:	0.17 lb. per foot.

PV System Dead Load: (Panel + Racking weight) / PV System Area

RA: (11 modules x 64.2lbs./module + 166 ft. of racking x 1.17 lb./ft) / (11 modules x41.1" x87.2") = 3.28 psf
RB: (59 modules x 64.2lbs./module + 479 ft. of racking x 1.17 lb./ft) / (59 modules x41.1" x87.2") = 2.95 psf
RC: (06 modules x 64.2lbs./module + 47 ft. of racking x 1.17 lb./ft) / (06 modules x41.1" x87.2") = 2.94 psf

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Additional Dead Load

The existing roof structure is comprised of 2" X 6" Trusses. The effective span of these members is RA, RC:18', RB:30'. On top of this is 5/8" thick PLYWOOD, with tar paper, and Asphalt Shingles. The estimated dead load of the existing materials is 3.20 psf (1.90 psf for PLYWOOD + 1.30 psf for Asphalt Shingles). The existing structure has been sized and spaced for supporting a dead load up to 10.0 psf. The additional dead load of the PV system and the existing roof elements gives a total max. dead load of 6.48 psf which can be adequately supported by the existing roof structure.

Wind Load and Roof Attachments

Based on the wind loading method outlined in ASCE 7-10 and the conditions/materials used in this installation, the following roof attachment layout is required for properly securing the PV system to the roof structure:

1. The attachments on the end of each rail shall be within 16" of the end of the rail.
2. Interior attachments within three feet of the roof edge and ridge, "Zone 3", may be spaced apart no more than 24" for landscape modules and do not place portrait modules on this zone.
3. Interior attachments within three feet of the roof edge or ridge, "Zone 2", may be spaced apart no more than 48" for landscape modules and 24" for portrait modules.
4. Interior attachments further than within three feet of the roof edge and ridge, "Zone 1", may be spaced apart no more than 72" for landscape modules and 48" for portrait modules.
5. Staggering the attachments of the top and bottom rails is preferable, but not required.
6. Pegasus Comp Mount 5/16" x 4 ½" SS Lag Round-Point Setscrews shall secure each attachment foot to the roofing and sub-roofing materials. Follow the manufacturer's instructions to ensure proper fastening.

Thank you,

Andrew King, PE