

# PHOTOVOLTAIC GROUND MOUNT SYSTEM

35 MODULES - SYSTEM SIZE STC (13.650 kW DC / 10.150 kW AC)  
1763 WIRE ROAD, BUNNLEVEL, NC 28323, USA (35.2960167, -78.8078452)

## SYSTEM SUMMARY STC (13.650 kW DC / 10.150 kW AC)

- STC DC: (85) 390W = 13,650 kW
- STC AC: (85) 290W = 10,150 kW
- 1 (50) ENPHASE (200V) MICROINVERTERS
- 2x BRANCHES OF 13 CONNECTED IN PARALLEL
- 1x BRANCH OF 11 CONNECTED IN PARALLEL

## GOVERNING CODES

- 2018 NORTH CAROLINA STATE BUILDING CODE: FIRE PREVENTION CODE
- 2018 NORTH CAROLINA STATE BUILDING CODE
- 2018 NORTH CAROLINA STATE BUILDING CODE: RESIDENTIAL CODE
- 2017 NFPA 70 - NATIONAL ELECTRICAL CODE

## GENERAL NOTES

- ALL PANELS, SWITCHES, ETC. SHALL HAVE SUFFICIENT GUTTER SPACE AND LUGS IN COMPLIANCE WITH UL REQUIREMENTS TO ACCOMMODATE CONDUCTORS SHOWN.
- ALL WIRING SHALL BE INTERCONNECTED UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND UTILITY IS OBTAINED.
- ALL EXTERIOR ELECTRICAL DEVICES AND EQUIPMENT INCLUDING THOSE THAT ARE EXPOSED TO OUTSIDE ENVIRONMENT SHALL BE WEATHERPROOF AND SHALL BE LISTED BY UL FOR THE TYPE OF EQUIPMENT.
- WIRING METHOD SHALL BE EMT ABOVE GROUND MOUNTED IN CONCEALED SPACES (UNLESS APPROVED OTHERWISE) AND SCHEDULE-40 PVC FOR BELOW GROUND INSTALLATIONS UNLESS NOTED OTHERWISE.
- ALL APPLICABLE LOCAL PERMITS AND REGULATIONS SHALL BE OBTAINED PRIOR TO ANY WORK BEING PERFORMED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND INSURING THE PROJECT.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE CONDUCTOR IF NECESSARY.

## SAFETY PLAN NOTES

- INSTALLERS SHALL DRAWN IN DESIGNATED SAFETY AREA AROUND HOME.
- NEAREST URGENT CARE FACILITY IS LOCATED AT THE CORNER OF NEAREST URGENT CARE FACILITY RELATIVE TO THE SITE BEFORE STARTING WORK.

## LOCATION OF NEAREST URGENT CARE FACILITY

- NAME:
- ADDRESS:
- PHONE NUMBER:

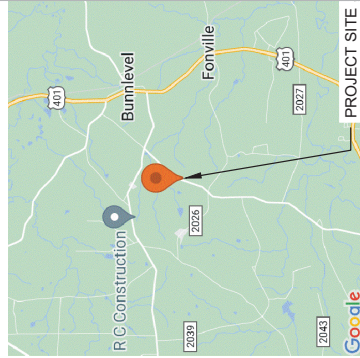
LEGEND	
	PV MODULE
	DIMENSIONS
	PROPERTY LINE
	TRENCH
	TRUSS
	MAIN SERVICE PANEL (EXISTING, 200A)
	UTILITY METER (EXISTING)
	PRODUCTION METER (N/A)
	BATTERY (N/A)
	(0) INVERTER (N/A)
	LOAD CENTER (COMBINER PANEL) (NEW)
	SOLAR EDGE METER (N/A)
	BACKUP LOAD PANEL (N/A)
	AC DISCONNECT UNFUSED (N/A)
	AC DISCONNECT FUSED (NEW)
	JUNCTION BOX (NEW)
	AUTO TRANSFORMER (N/A)
	SUBPANEL (N/A)
	DC DISCONNECT (N/A)
	DC COMBINER (N/A)
	EXISTING EQUIPMENT

SHEET INDEX	COVER PAGE
PV-1	COVER PLAN WITH MODULES
PV-2	ATTACHMENT DETAILS
PV-3	SINGLE LINE DIAGRAM
PV-4	WIRING CALCULATIONS
PV-5	PLACARDS
PV-6	EQUIPMENT SPECIFICATION
PV-7+	

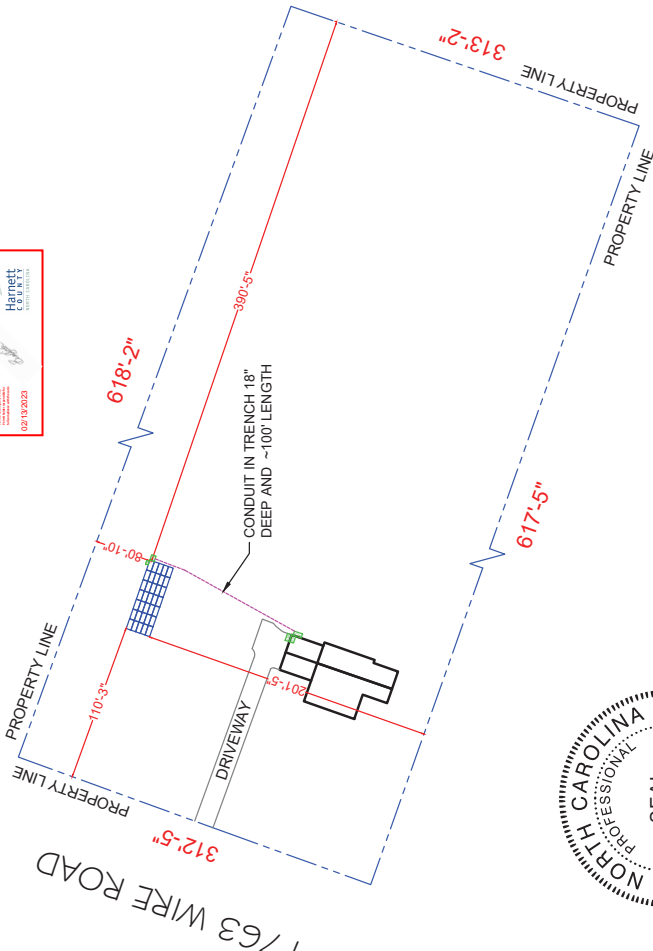
AHJ: HARNETT COUNTY  
UTILITY: DUKE ENERGY CAROLINAS, LLC



HOUSE PHOTO  
SCALE: NTS



VICINITY MAP  
SCALE: NTS



## SITE PLAN & SAFETY PLAN SCALE: 1"= 80"



**CONTRACTOR**  
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REVISIONS	DATE	REV

SIGNATURE & SEAL

## HOMEOWNER INFO

MAYRENE HERTZLER  
1763 WIRE ROAD, BUNNLEVEL,  
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EMAIL:   
PHONE:   
SHEET NAME

COVER PAGE

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-1



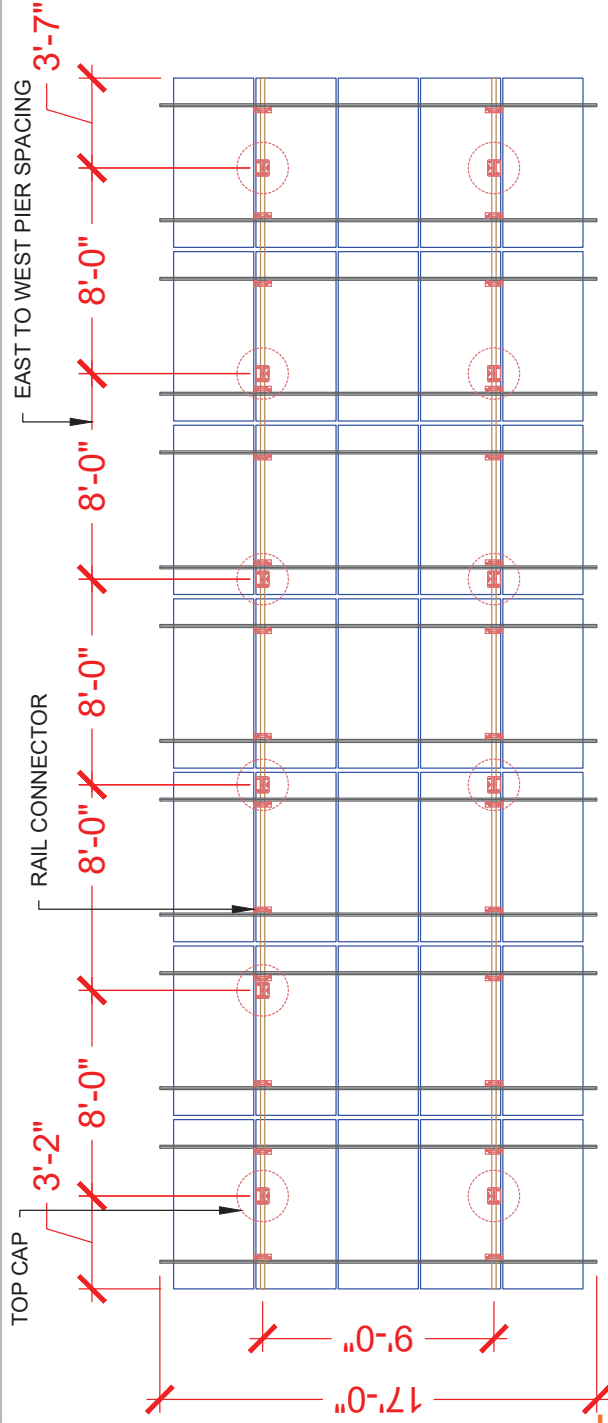


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 EMAIL: b.hunnlevel@top tiersolutions.com

REVISIONS	DESCRIPTION	DATE	REV

SIGNATURE & SEAL

**ATTACHMENT DETAIL**  
 SCALE: NTS



HOMEOWNER INFO

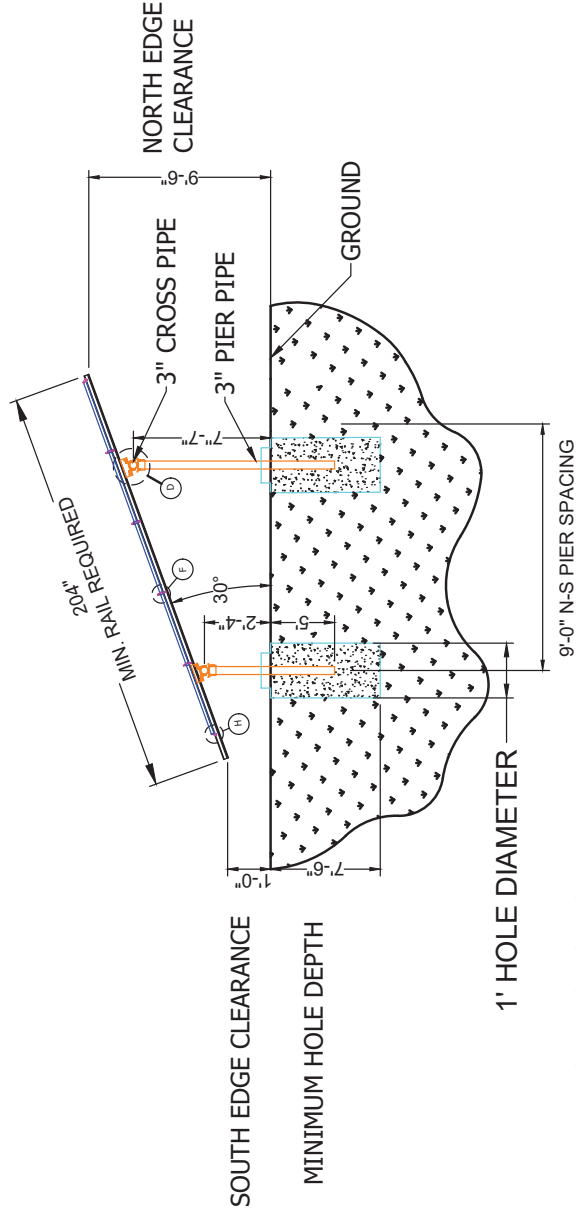
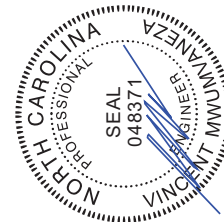
**MAYRENE HERTZLER**  
 1763 WIRE ROAD, BUNNLEVEL,  
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APR 12 09:56 - 0130-08  
 EMAIL:  
 PHONE:

**SHEET NAME**  
 ATTACHMENT  
 DETAIL

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

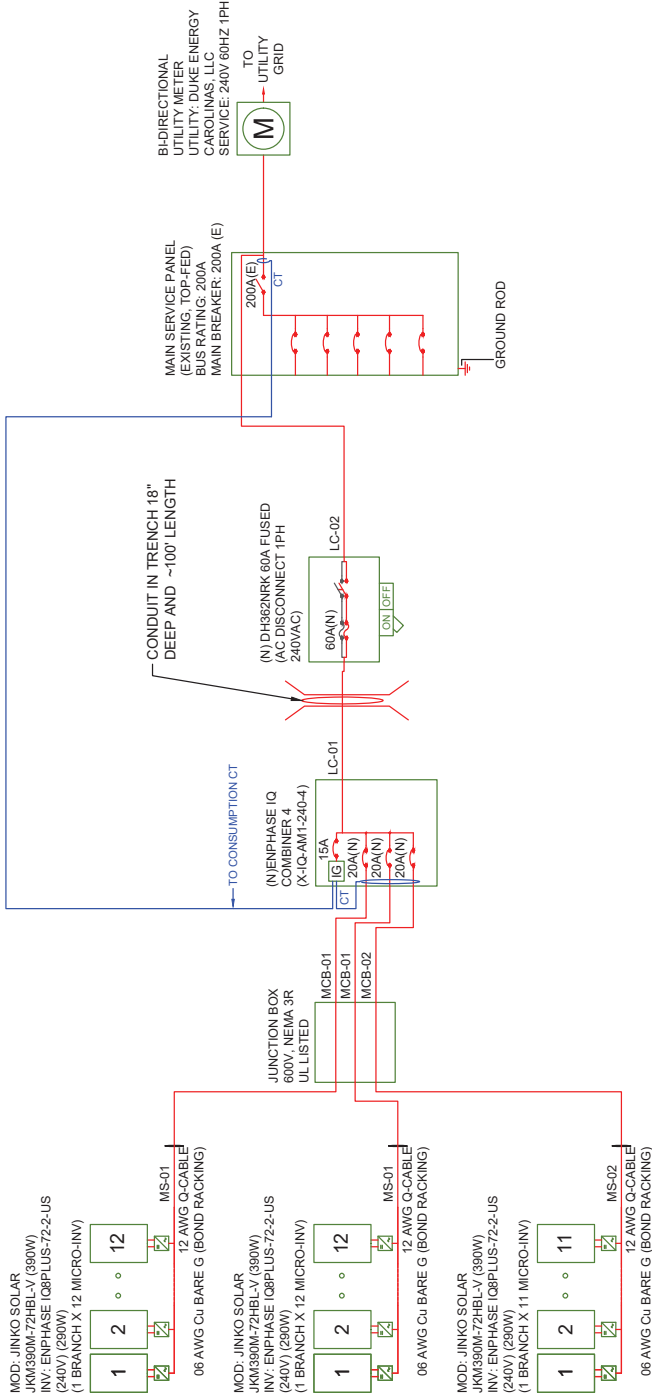
**SHEET NUMBER**  
 PV-3



**ATTACHMENT DETAIL (ENLARGED SECTION VIEW)**  
 SCALE: NTS

**SYSTEM SUMMARY STC (13,650 kW DC / 10,150 kW AC)**

- STC DC: (95) 3900W = 13,650 kW
- STC AC: (35) 2900W = 10,150 kW
- (35) JINKO SOLAR JKM390M-72HBL-V (390W) MODULES
- (35) ENPHASE IQ8PLUS-72-2-US (240V) MICROINVERTERS
- 2x BRANCHES OF 12 CONNECTED IN PARALLEL
- 1x BRANCH OF 11 CONNECTED IN PARALLEL



AC wire details						
Wire	Min Ampacity	Live	Neutral	Ground	Min EMT	Min RMC
MS-01	18.15A	12 AWG (Q-Cable)	-	06 AWG BARE (NOT IN CONDUIT)	-	-
MS-02	16.64A	12 AWG (Q-Cable)	-	06 AWG BARE (NOT IN CONDUIT)	-	-
MCB-01	18.15A	(2) 10 AWG THWN-2	-	10 AWG THWN-2	1/2 in	1/2 in
MCB-02	16.64A	(2) 10 AWG THWN-2	-	10 AWG THWN-2	1/2 in	1/2 in
LC-01	52.94A	(2) 06 AWG THWN-2	06 AWG THWN-2	10 AWG THWN-2	1 in	-
LC-02	52.94A	(2) 06 AWG THWN-2	06 AWG THWN-2	10 AWG THWN-2	3/4 in	3/4 in

**ELECTRICAL NOTES**

- ALL GROUNDING TO COMPLY WITH NEC 680.47.
- ROOFTOP CONDUIT SHALL BE LOCATED MIN. 78" ABOVE ROOF SURFACE.
- ALL TERMINALS SHALL BE MIN. 75°C RATED.
- IF ENVOY PRESENT, ENVOY BREAKER DETERMINED AT FACTORY BY MANUFACTURER.
- IF ENVOY PRESENT, FOR IQ COMBINER USE SINGLE CT ON L1, AT SYSTEM CONTROLLER MAIN USE DOUBLE CT ON L1 AND L2.

**ELECTRICAL SINGLE LINE DIAGRAM**

SCALE: NTS

**INTERCONNECTION 120% RULE (MAIN PANEL)**

**INTERCONNECTION 120% RULE NOT APPLICABLE**

**LINE-SIDE TAP DOES NOT AFFECT MAIN PANEL**

**EXTREME CASE MODULE OUTPUT (JINKO SOLAR JKM390M-72HBL-V (390W))**

$I_{sc}(25^{\circ}\text{C}) = 10.46\text{A}$ ,  $T_{isc} = 0.048\text{A}/^{\circ}\text{C}$   
 $I_{sc}(T) = I_{sc}(25^{\circ}\text{C}) + [T_{isc} \times (T - 25^{\circ}\text{C})]$   
 $I_{sc}(9^{\circ}\text{C}) = 8.89\text{A}$ ,  $I_{sc}(35^{\circ}\text{C}) = 10.94\text{A}$   
 $V_{oc}(25^{\circ}\text{C}) = 48.60\text{V}$ ,  $T_{voc} = -0.290\text{V}/^{\circ}\text{C}$   
 $V_{oc}(T) = V_{oc}(25^{\circ}\text{C}) + [T_{voc} \times (T - 25^{\circ}\text{C})]$   
 $V_{oc}(9^{\circ}\text{C}) = 58.46\text{V}$ ,  $V_{oc}(35^{\circ}\text{C}) = 45.70\text{V}$



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**SIGNATURE & SEAL**

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 EMAIL:  
 PHONE:

**SHEET NAME**  
 SINGLE LINE  
 DIAGRAM

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

**SHEET NUMBER**  
 PV-4

**SYSTEM SUMMARY STC (13.650 kW DC / 10.150 kW AC)**

- STC DC: (35) 390W = 13.650 kW
- STC AC: (35) 290W = 10.150 kW
- (35) JINKO SOLAR JKM390M-72HBL-V (390W) MODULES
- (35) ENPHASE IQ8PLUS-72-2-US (240V) MICROINVERTERS
- 2x BRANCHES OF 12 CONNECTED IN PARALLEL
- 1x BRANCH OF 11 CONNECTED IN PARALLEL



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REVISIONS	DESCRIPTION	DATE	REV

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 EMAIL: -  
 PHONE: -

**SHEET NAME**

**WIRING  
 CALCULATION**

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

**SHEET NUMBER**

**PV-5**

**AC wire details**

WireID	#Modules	Nominal Voltage	Backfeed *1,25 /cond. set	Min OCPD	Total Power	Conductor sets	ccConductors /conduit	Expected max temp	Adjusted ampacity (ampacity x temp derate x conduit fill derate)	Conductor & neutral size	EGC size (Cu)	Conductor metal	Max length	V drop	Min EMT size	Min PVC size	Min RMC size
MS-01	12	240 V	18.15 A	20 A	3.5 kW	1	2	35	25 x 0.94 x 1.00 = 23.50 A	12 AWG (Q-Cable)	06 AWG BARE (NOT IN CONDUIT)	Cu	50 ft	1.05 %	-	-	-
MS-02	11	240 V	16.64 A	20 A	3.2 kW	1	2	35	25 x 0.94 x 1.00 = 23.50 A	12 AWG (Q-Cable)	06 AWG BARE (NOT IN CONDUIT)	Cu	50 ft	0.97 %	-	-	-
MCB-01	12	240 V	18.15 A	20 A	3.5 kW	1	2	35	35 x 0.94 x 1.00 = 32.90 A	10 AWG THWN-2	10 AWG THWN-2	Cu	50 ft	0.63 %	1/2 in	1/2 in	1/2 in
MCB-02	11	240 V	16.64 A	20 A	3.2 kW	1	2	35	35 x 0.94 x 1.00 = 32.90 A	10 AWG THWN-2	10 AWG THWN-2	Cu	50 ft	0.58 %	1/2 in	1/2 in	1/2 in
LC-01	35	240 V	52.94 A	60 A	10.2 kW	1	2	35	65 x 0.94 x 1.00 = 61.10 A	06 AWG THWN-2	10 AWG THWN-2	Cu	100 ft	0.15 %	-	1 in	-
LC-02	35	240 V	52.94 A	60 A	10.2 kW	1	2	35	65 x 0.94 x 1.00 = 61.10 A	06 AWG THWN-2	10 AWG THWN-2	Cu	10 ft	0.15 %	3/4 in	3/4 in	3/4 in

INTERCONNECTION 120% RULE (MAIN PANEL)

INTERCONNECTION 120% RULE NOT APPLICABLE

LINE-SIDE TAP DOES NOT AFFECT MAIN PANEL

EXTREME CASE MODULE OUTPUT (JINKO SOLAR JKM390M-72HBL-V (390W))

$I_{sc}(25^{\circ}C) = 10.46A, T_{isc} = 0.048A/^{\circ}C$   
 $I_{sc}(T) = I_{sc}(25^{\circ}C) + [T_{isc} \times (T - 25^{\circ}C)]$   
 $I_{sc}(9^{\circ}C) = 8.83A, I_{sc}(35^{\circ}C) = 10.94A$   
 $V_{oc}(25^{\circ}C) = 48.60V, T_{voc} = -0.290V/^{\circ}C$   
 $V_{oc}(T) = V_{oc}(25^{\circ}C) + [T_{voc} \times (T - 25^{\circ}C)]$   
 $V_{oc}(9^{\circ}C) = 58.46V, V_{oc}(35^{\circ}C) = 45.70V$

**ELECTRICAL NOTES**

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600V AND 90°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 BOXES, 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 WEBB LUG OR LSC0 GBL-4DBT LAY-IN LUG.
- PV EQUIPMENT SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NEC 690.
- EXACT LOCATION OF AUXILIARY GROUNDING TO BE DETERMINED AT TIME OF INS FALL.
- EXISTING PRESS MUST BE REPLACED IF SMALLER THAN LISTED MINIMUM SIZES PER NEC 310.15(B) (16).
- IF ANY OF THE ABOVE NOT PRESENT, CONTRACTOR SHALL PROVIDE THE FOLLOWING: (1) GROUNDING CLIP ON L1, AT SYSTEM CONTROLLER MAIN USE DOUBLE CT ON L1 AND L2.
- IF ENVOY PRESENT, FOR IQ COMBINER USE SINGLE CT ON L1, AT SYSTEM CONTROLLER MAIN USE DOUBLE CT ON L1 AND L2.

**WARNING**  
ELECTRICAL SHOCK HAZARD  
TERMINALS ON LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION: INVERTERS, AC DISCONNECTS, AC COMBINER BOXES  
CODE REF: NEC 2017 - 690.13(B)

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

LABEL LOCATION: UTILITY SERVICE ENTRANCE (MSP OR AC DISCONNECT IF LINE SIDE TAP), AND WHEREVER REQUIRED BY AHJ (INVERTERS, DC DISCONNECTS, OTHER)  
CODE REF: NEC 2017 - 690.56(C)(2)

**PV SYSTEM DISCONNECT**  
MAXIMUM AC OPERATING CURRENT: 42.35 AMPS  
NOMINAL OPERATING AC VOLTAGE: 240.0 VAC

LABEL LOCATION: INTERCONNECTION Placard (MSP BACKFEED BREAKER OR TAP BOX IF LINE SIDE TAP), AC DISCONNECTS  
CODE REF: NEC 2017 - 690.54

**PHOTOVOLTAIC AC DISCONNECT**

LABEL LOCATION: INTERCONNECTION Placard (MSP BACKFEED BREAKER OR TAP BOX IF LINE SIDE TAP), AC DISCONNECTS  
CODE REF: NEC 2017 - 690.13(B)

**MAIN PHOTOVOLTAIC SYSTEM DISCONNECT**

LABEL LOCATION: AC DISCONNECTS FOR UTILITY ACCESS  
CODE REF: NEC 2017 - 690.13(B)

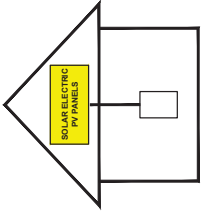
**WARNING**  
POWER SOURCE OUTPUT CONNECTION  
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION: FIRST BACKFEED BREAKER (MSP/SUBPANEL) IF NO LINE SIDE TAP  
CODE REF: NEC 2017 - 705.12(B)(3)(2), CEC 2019 - 705.12(B)(2)(3)(b), CEC 2019 - 705.12(B)(3)

**CAUTION: MULTIPLE POWER SOURCES**

LABEL LOCATION: N/A  
CODE REF: NEC 2017 - 690.56(B), NEC 2017 - 705.10

**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 LOCATION: INTERCONNECTION POINT (MSP OR AC DISCONNECT IF LINE SIDE TAP)  
CODE REF: NEC 2017 - 690.56(C)

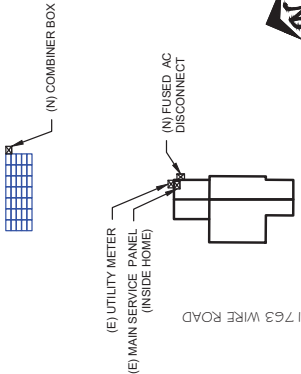
**WARNING**  
SOLAR SYSTEM CONNECTED AND ENERGISED

LABEL LOCATION: UTILITY METER  
CODE REF: NEC 2017 - 690.13(B)

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

LABEL LOCATION: MSP  
CODE REF: NEC 2017 - 110.27(C)

**CAUTION: MULTIPLE SOURCES OF POWER**  
POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN AT:  MAIN SERVICE PANEL & UTILITY METER FUSED AC DISCONNECT COMBINER BOX



LABEL LOCATION: MSP  
CODE REF: NEC 2017 - 705.10, NEC 2017 - 710.10

**NOTES AND SPECIFICATIONS**

- 1) SIGNS AND LABELS SHALL MEET THE REQUIREMENTS OF NEC 110.21(B), UNLESS SPECIFIC INSTRUCTIONS ARE REQUIRED BY SECTION 690, OR IF REQUESTED BY THE LOCAL AHJ.
- 2) SIGNS AND LABELS SHALL ADEQUATELY WARN OF HAZARDS USING EFFECTIVE WORDS, COLORS AND SYMBOLS.
- 3) LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN.
- 4) LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
- 5) SIGNS AND LABELS SHALL COMPLY WITH ANSI Z535.4 - 2011, PRODUCT SAFETY SIGNS AND LABELS, UNLESS OTHERWISE SPECIFIED.
- 6) DO NOT COVER EXISTING MANUFACTURER LABELS.



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REVISIONS	DESCRIPTION	DATE	REV

SIGNATURE & SEAL

HOMEOWNER INFO

MAYRENE HERTZLER  
1763 WIRE ROAD, BUNNLEVEL,  
NC 28323, USA

APR 12-0556 - 0130-08  
EMAIL:  
PHONE:

SHEET NAME

PLACARDS

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-6





## IQ8 Series Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase per 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 59nm 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 IQ7+ Solar Charge Controller, and the Enphase App monitoring and analysis software.



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

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IQ8SE-05-0001-01-EN-US-2022-03-17

## IQ8 Series Microinverters

INPUT DATA (DCI)	IQ8LUS-72-2-US	IQ8M-72-2-US	IQ8H-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US
Commonly used module pairings <sup>2</sup>	235 - 350	235 - 440	260 - 480	296 - 500	320 - 540*
Module compatibility	60-cell/120 half-cell	60-cell/120 half-cell	60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell		
MPP1 voltage range	27 - 37	29 - 45	33 - 45	36 - 45	38 - 45
Operating range	25 - 48	25 - 48	25 - 58		
Min/max start voltage	30 / 48		30 / 58		
Max input DC voltage	50		60		
Max DC current <sup>1</sup> (module I <sub>sc</sub> )	A		15		
Overvoltage class DC port	II		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 (ACI)	IQ8LUS-72-2-US	IQ8M-72-2-US	IQ8H-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US
Peak output power	245	300	330	366	384
Max continuous output power	240	290	325	349	360
Nominal (L-L) voltage/range <sup>4</sup>	V	240 / 211 - 264			208 / 183 - 250
Max continuous output current	A	1.0	1.21	1.35	1.45
Nominal frequency	Hz			60	173
Extended frequency range	Hz			50 - 68	
AC short circuit fault current over 3 cycles	Amps		2		4.4
Max units per 20 A (L-L) branch circuit <sup>6</sup>		16	13	11	10
Total harmonic distortion	%			<5%	9
Overvoltage class AC port	III				
Power factor setting	mA		30		
Grid-tied power factor (adjustable)			0.85 leading - 0.85 lagging		
Peak efficiency	%	97.5	97.6	97.6	97.6
CEC weighted efficiency	%	97	97	97.5	97
Night-time power consumption	mW			60	

TECHNICAL DATA	-40°C to +60°C (-40°F to +140°F)
Ambient temperature range	4% to 100% (condensing)
Relative humidity range	MC4
DC Connector Type	212 mm (8.37") x 175 mm (6.91") x 30.2 mm (1.2")
Dimensions (HxWxD)	108 kg (23.8 lbs)
Weight	Natural convection - no fans
Cooling	Yes
Approved for wet locations	PO3
Pollution degree	Class II (double-insulated, corrosion resistant polymeric enclosure)
Enclosure	NEMA Type 6 / outdoor
Environment / UV exposure rating	

CERTIFICATION	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.1071-01
Certifications	This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 sections 690.12 and 2021-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.

(1) The IQ8H-208 variant will be operating in grid-tied mode only at 208V AC. (2) No external DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility> (3) Maximum continuous input DC current is 10.6A. (4) Nominal voltage range can be extended beyond nominal if required by the utility. (5) Limits may vary, refer to local requirements to define the number of microinverters per branch in your area.

IQ8SE-05-0001-01-EN-US-2022-03-17



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PHONE: 858-987-1213  
LICENSE # A-55, C-5, G-133883  
EMAIL: [b.bourgeois@top-tier.com](mailto:b.bourgeois@top-tier.com)

REVISIONS	DESCRIPTION	DATE	REV

**SIGNATURE & SEAL**

**HOMEOWNER INFO**

**MAYRENE HERTZLER**  
1763 WIRE ROAD, BUNNLEVEL,  
NC 28323, USA

APN: 12-0516 - 0130 - 08  
EMAIL: -  
PHONE: -

**SHEET NAME**  
**EQUIPMENT**  
**SPECIFICATION**

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

**SHEET NUMBER**  
**PV-8**



## IQ Combiner 4/4C

The **IQ Combiner 4/4C** with IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure. It 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 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
- Supports Wi-Fi, Ethernet, or cellular connectivity
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

### Simple

- Mounts on single stud with centered brackets
- Supports bottom, back and side conduit entry
- Allows up to four 2-pole branch circuits for 240VAC 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-year labor reimbursement program coverage included for both the IQ Combiner 4C and IQ Combiner 4
- UL listed
- X2-IQ-AMI-240-4 and X2-IQ-AMI-240-4C comply with IEEE 1547-2018 (UL 1741-SB, 3<sup>rd</sup> Ed.)



X-IQ-AMI-240-4C

X2-IQ-AMI-240-4C (IEEE 1547:2018)

X-IQ-AMI-240-4

X2-IQ-AMI-240-4 (IEEE 1547:2018)



To learn more about Enphase offerings, visit [enphase.com](http://enphase.com)  
IQ-C-4-4C-05-0103-EN-US-12-29-2022

## IQ Combiner 4/4C

### MODEL NUMBER

IQ Combiner 4	IQ Combiner 4 with 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 and IQ System Controller 2 and to deflect heat.
X-IQ-AMI-240-4	IQ Combiner 4 with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 ± 0.5%) and consumption monitoring (± 2.5%). Includes 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 call JAR service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
X2-IQ-AMI-240-4C (IEEE 1547:2018)	IQ Combiner 4C with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 ± 0.5%) and consumption monitoring (± 2.5%). Includes 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 call JAR 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)

Supported microinverters	IQ6, IQ7, and IQ8. (Do not mix IQ6/7 Microinverters with IQ8)
Communications Kit	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan - 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
COMMS-CELLMODEM-M1-06-SP-05	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers.
CELLMODEM-M1-06-AT-05	Circuit Breakers BRK-10A-2P-240V BRK-15A-2P-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B
Circuit Breakers	BRK-15A-2P-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B
BRK-10A-2P-240V	Circuit breaker, 2 pole, 10A, Eaton BR210
BRK-15A-2P-240V	Circuit breaker, 2 pole, 15A, Eaton BR215
BRK-20A-2P-240V	Circuit breaker, 2 pole, 20A, Eaton BR220
BRK-15A-2P-240V-B	Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support
BRK-20A-2P-240V-B	Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
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)
X-IQ-NA-HD-125A	Hold-down kit for Eaton circuit breaker with 5 screws
Consumption monitoring CT (CT-200-SPLIT/CT-200-CLAMP)	A pair of 200A split core current transformers

### ELECTRICAL SPECIFICATIONS

Rating	Continuous duty
System voltage	120/240VAC, 60 Hz
Eaton BR series busbar rating	125A
Max. continuous current rating	65A
Max. continuous current rating (equal from PV/storage)	64A
Max. fuse/circuit rating (output)	90A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distribute Generation (DG) breakers only (not included)
80A of distributed generation/95A with IQ Gateway breaker included	
Max. total branch circuit breaker rating (input)	10A or 15A rating GE/Siemens/Eaton included
IQ Gateway breaker	200A solid core pre-installed and wired to IQ Gateway
Production metering CT	

### MECHANICAL DATA

Dimensions (WHKHD)	37.5 cm x 49.5 cm x 16.8 cm (14.75 in x 19.5 in x 6.63 in). Height is 53.5 cm (21.06 in) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40°C to +45°C (-40°F to +115°F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20A to 50A breaker inputs: 14 to 4 AWG copper conductors • 60A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Always follow local code requirements for conductor sizing.
Altitude	Up to 3,000 meters (9,842 feet)

### INTERNET CONNECTION OPTIONS

Integrated Wi-Fi	IEEE 802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Mobile Connect cellular modem is required for all Enphase Energy System installations.
Ethernet	Optional, IEEE 802.3, Cat5E (or Cat6) UTP/Ethernet cable (not included)

### COMPLIANCE

Compliance, IQ Combiner	CA Rule 21 (UL 1741-SA) IEEE 1547-2018 (UL 1741-SB, 3 <sup>rd</sup> Ed.) (95, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000
Compliance, IQ Gateway	UL 6960-1/CANCSA 22.2 No. 61010-1
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IQ-C-4-4C-05-0103-EN-US-12-29-2022



### CONTRACTOR

NAME: [REDACTED]  
ADDRESS: 1500 COLLETT ROAD, DR.  
CHARLOTTE, NC 28217  
PHONE: 858-997-213  
LICENSE # P.S.C. C-1 13983  
EMAIL: [REDACTED]

REVISIONS	DESCRIPTION	DATE	REV

### SIGNATURE & SEAL

### HOMEOWNER INFO

MAYRENE HERTZLER  
1763 WIRE ROAD, BUNNLEVEL,  
NC 28323, USA

APN: 10-0596-0130-08  
EMAIL: [REDACTED]  
PHONE: [REDACTED]

### SHEET NAME EQUIPMENT SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-9



## Ground Mount System

Datasheet



### All-Terrain Mounting

The IronRidge Ground Mount System combines our XR1000 or XR1000 rails with locally-sourced steel pipes or mechanical tubing, to create a cost-effective structure capable of handling any site or terrain challenge. Installation is simple with only a few structural components and no drilling, welding, or heavy machinery required. In addition, the system works with a variety of foundation options—including concrete piers, ground screws, helical or driven piles, and above-ground ballast blocks.



**Rugged Construction**  
Engineered steel and aluminum components ensure durability.



**UL 2703 Listed System**  
Meets newest effective UL 2703 standard.



**Flexible Architecture**  
Multiple foundation and array configuration options.



**PE Certified**  
Pre-stamped engineering letters available in most states.



**Design Software**  
Online tool generates engineering values and bill of materials.



**25-Year Warranty**  
Products guaranteed to be free of impairing defects.

Datasheet



**360° Product Tour**  
Visit [ironridge.com](http://ironridge.com)

### Substructure

#### Top Caps



Connect vertical and cross pipes.

#### Bonded Rail Connectors



Attach and bond rail Assembly to cross pipes.

#### Diagonal Braces



Optional Brace provides additional support.

#### Cross Pipe & Piers



Steel pipes or mechanical tubing for substructure.

### Rail Assembly

#### XR100/XR1000 Rails



Curved rails increase spanning capabilities.

#### UFOs



Universal Fastening Objects bond modules to rails.

#### Stopper Sleeves



Snap onto the UFO to turn into a bonded end clamp.

#### CAMO



Bond modules to rails while staying completely hidden.

### Resources



**Design Assistant**  
Go from rough layout to fully engineered system. For free. Go to [ironridge.com/design](http://ironridge.com/design)



**NABCEP Certified Training**  
Earn free continuing education credits, while learning more about our systems. Go to [ironridge.com/training](http://ironridge.com/training)

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**CONTRACTOR**  
IRONRIDGE SOLUTIONS  
ADDRESS: 1530 COLONY PARK DR.  
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LICENSE # 8150, C.C. 01133823  
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REVISIONS	DESCRIPTION	DATE	REV

SIGNATURE & SEAL

### HOMEOWNER INFO

MAYRENE HERTZLER  
1763 WIRE ROAD, BUNNLEVEL,  
NC 28323, USA

APR 12 09:56 - 0130-08  
EMAIL:  
PHONE:

### SHEET NAME

EQUIPMENT  
SPECIFICATION

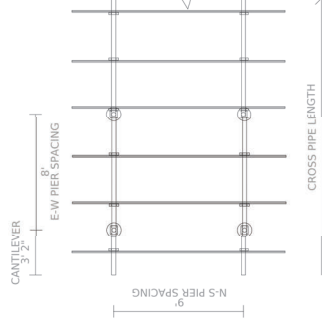
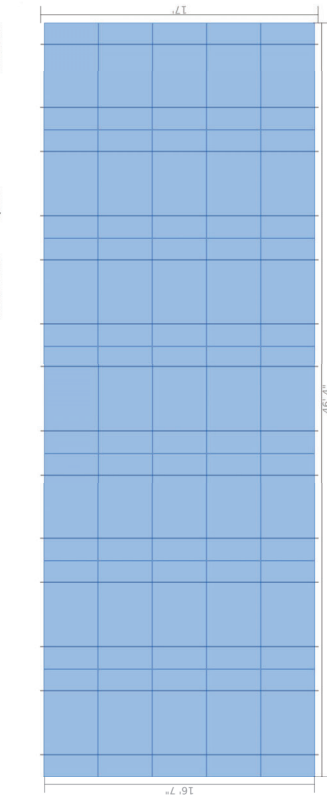
SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-10

Project Details	
Name	MAYRENE HERTZLER
Date	01/29/2023
Location	1763 Wire Road, Bunnlevel, NC 28323
ASCE code	7.16
Total modules	35
Wind speed	110 mph
Module	JMK0360-72HBL-V (40mm)
Snow load	10 psf
Wind exposure	C
Dimensions	79.06" x 39.45" x 1.57" (2008.0mm x 1002.0mm x 40.0mm)
Total watts	13.650 KW
Piers	12
Concrete	5.62 yd <sup>3</sup>

Substructure & Foundation	
Tilt	0°
South facing grade	30°
Pipe/tubing diameter	3"
Soil class	Concrete
Foundation type	Concrete
Hole diameter	12"

Sub array #1	
Rows	5
Area	46' 4" (EW) x 16' 9" (NS)
E/W spacing	8'
Piers/array	12
Total south piers	6 (7' 4")
Total north piers	6 (12' 7")
Total cross pipes	2 (46' 4")
Shear	1.532 lbs
Moment	3.830 ft-lbs
Uplift	-1.380 lbs



**CONTRACTOR**  
MAYRENE HERTZLER SOLUTIONS  
1763 WIRE ROAD, BUNNLEVEL, NC  
CHARLOTTE, NC 28117  
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REVISIONS	DATE	REV

**SIGNATURE & SEAL**

**HOMEOWNER INFO**

**MAYRENE HERTZLER**  
1763 WIRE ROAD, BUNNLEVEL,  
NC 28323, USA

APN: 12-0566-0130-08  
EMAIL:  
PHONE:

**SHEET NAME**  
**EQUIPMENT**  
**SPECIFICATION**

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

**SHEET NUMBER**  
**PV-11**



**CONTRACTOR**  
 TOP TIER SOLUTIONS  
 ADDRESS: 1530 CLAYTON STREET, DFC  
 CHARLOTTE, NC, 28217  
 PHONE: 858-987-7213  
 LICENSE # 858-987-7213  
 EMAIL: [top.tier@top.tiersolutions.com](mailto:top.tier@top.tiersolutions.com)

REVISIONS	DESCRIPTION	DATE	REV

**SIGNATURE & SEAL**

**HOMEOWNER INFO**

**MAYRENE HERTZLER**  
 1763 WIRE ROAD, BUNNLEVEL,  
 NC 28323, USA

APN: 12-0556--0130--08  
 EMAIL: -  
 PHONE: -

**SHEET NAME**  
**EQUIPMENT**  
**SPECIFICATION**

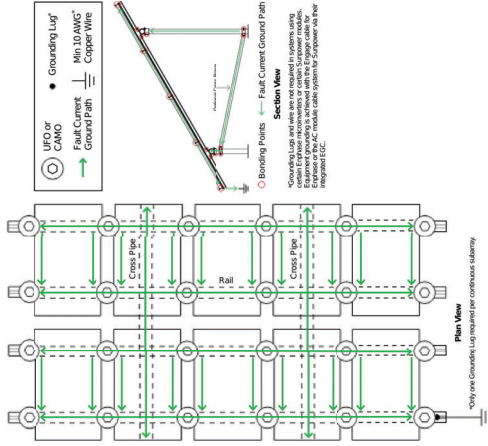
**SHEET SIZE**  
**ANSI B**  
**11" X 17"**

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

**IRONRIDGE**  
 2837 INDUSTRIAL BLVD., HAYWARD, CA 94545

MAYRENE HERTZLER (41103851)  
 ground (sheet)

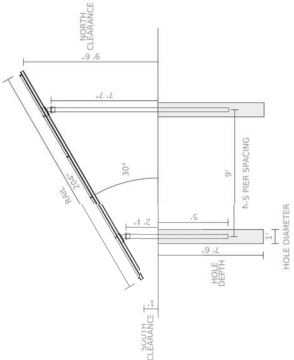
**Grounding Diagram**



Only one Grounding Lug required per continuous subarray.

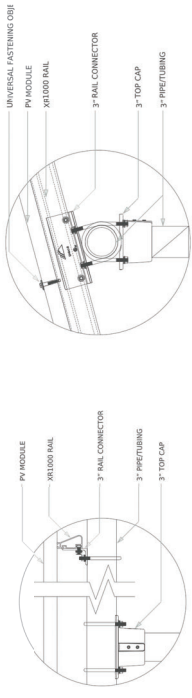
**IRONRIDGE**  
 2837 INDUSTRIAL BLVD., HAYWARD, CA 94545

MAYRENE HERTZLER (41103851)  
 ground (sheet)



**Pipe Fitting Detail**

**XR1000 Rail**



Front View

Side View

**Clamp Detail**



Mid Clamp, Front

Mid Clamp, Plan

End Clamp, Front

End Clamp, Plan

MAYRENE HERTZLER (#1103951)  
ground based

**IRONRIDGE**  
 2837 INDUSTRIAL BLVD., HAYWARD, CA 94545

**Bill of Materials**

Part	Spares	Total Qty
<b>Rails</b>		
XR-1000-204A		
XR1000, Rail 204" (17 Feet) Clear	0	14
<b>Clamps &amp; Grounding</b>		
UFO-CL-01-A1		
Universal Module Clamp, Clear	0	84
UFO-STP-40MM-M1		
Stopper Sleeve, 40MM, Null	0	28
XR-LUG-03-A1		
Grounding Lug, Low Profile	0	1
<b>Substructure</b>		
70-0300-SGA		
SGA Top Cap 3"	0	12
GM-BRC-003		
Ground Mount Bonded Rail Connector - 3"	0	28

Last updated by Eugene Muryanets on 01/28/23 06:29 PM

Page 5 of 5



**CONTRACTOR**  
 NAME: TOP TIER SOLUTIONS  
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REVISIONS	DESCRIPTION	DATE	REV

**SIGNATURE & SEAL**

**HOMEOWNER INFO**

MAYRENE HERTZLER  
 1763 WIRE ROAD, BUNNLEVEL,  
 NC 28323, USA

APN: 19-0656--0130--08  
 EMAIL:  
 PHONE:

**SHEET NAME**  
**EQUIPMENT**  
**SPECIFICATION**

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

**SHEET NUMBER**  
**PV-13**