

September 21, 2022

Posigen Solar
1600 Olden Avenue, Unit 10
Ewing, NJ 08638

Re: Engineering Services
Majoue Residence
2327 Soniat Street, New Orleans, LA
4.500 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

A. Site Assessment Information

1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.
3. The addition of solar panels will not exceed the height of the existing building
4. The outermost part of the solar panels will be less than 6 inches off the existing slope of the existing roof.

B. Description of Structure:

Roof Framing: 2x6 dimensional lumber at 16" on center.
Roof Material: Composite Asphalt Shingles
Roof Slope: 30 degrees
Attic Access: Accessible
Foundation: Permanent

C. Loading Criteria Used

- **Dead Load**
 - Existing Roofing and framing = 7 psf
 - New Solar Panels and Racking = 3 psf
 - TOTAL = 10 PSF
- **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
- **Ground Snow Load** = 0 psf
- **Wind Load** based on ASCE 7-10
 - Ultimate Wind Speed = 144 mph (based on Risk Category II)
 - Exposure Category C

Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the 2015 International Residential Code, including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.

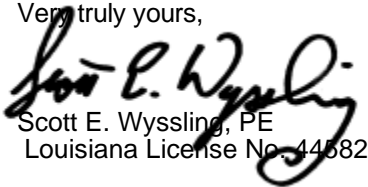
D. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent K2 Systems installation manual. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. The maximum allowable withdrawal force for a $\frac{5}{16}$ " lag screw is 235 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of $2\frac{1}{2}$ ", the allowable capacity per connection is greater than the design withdrawal force (demand). Considering the variable factors for the existing roof framing and installation tolerances, the connection using one $\frac{5}{16}$ " diameter lag screw with a minimum of $2\frac{1}{2}$ " embedment will be adequate and will include a sufficient factor of safety.
3. Considering the wind speed, roof slopes, size and spacing of framing members, and condition of the roof, the panel supports shall be placed no greater than 48" on center.
4. Panel supports connections shall be staggered to distribute load to adjacent framing members.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the 2015 IRC, current industry standards, and is based on information supplied to us at the time of this report.

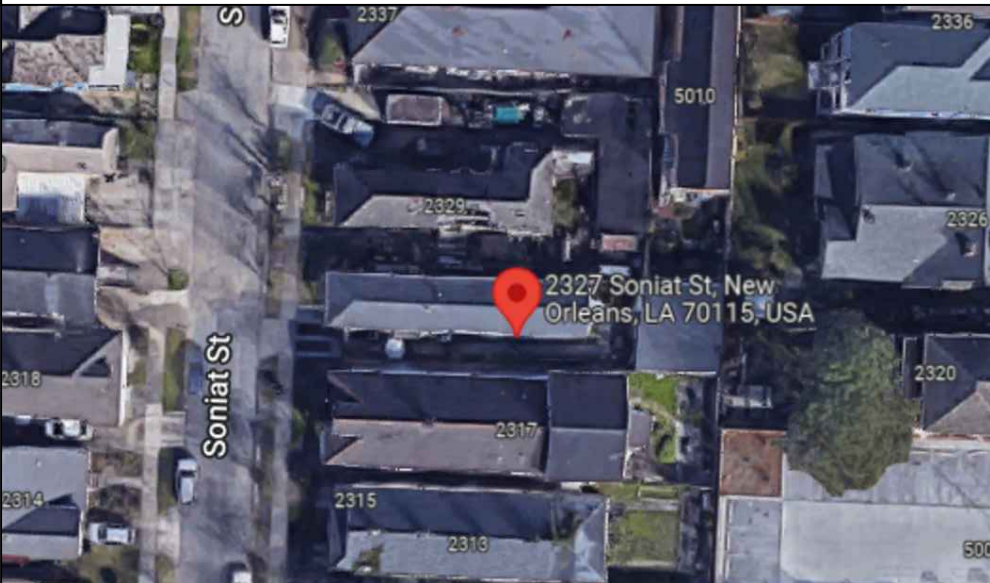
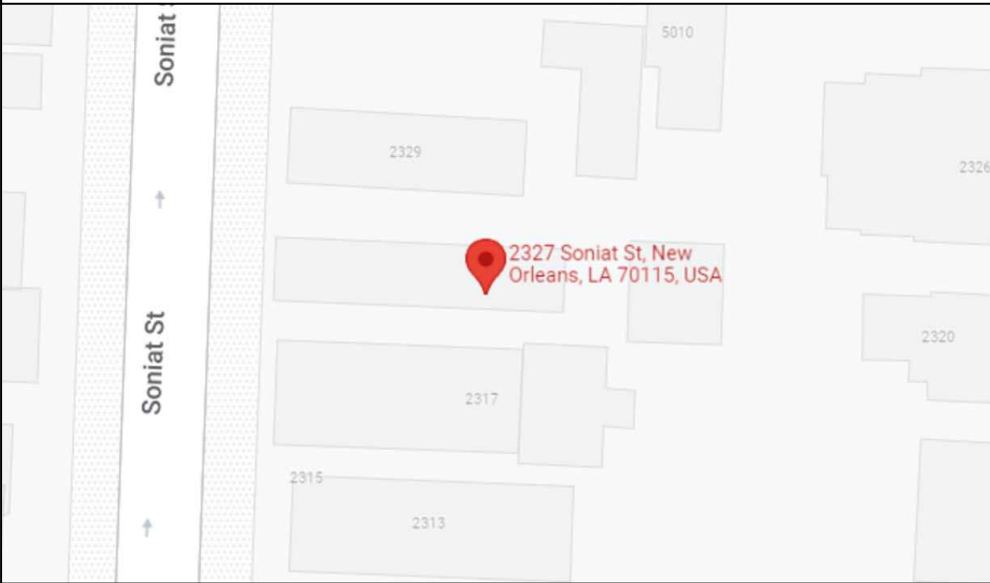
Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

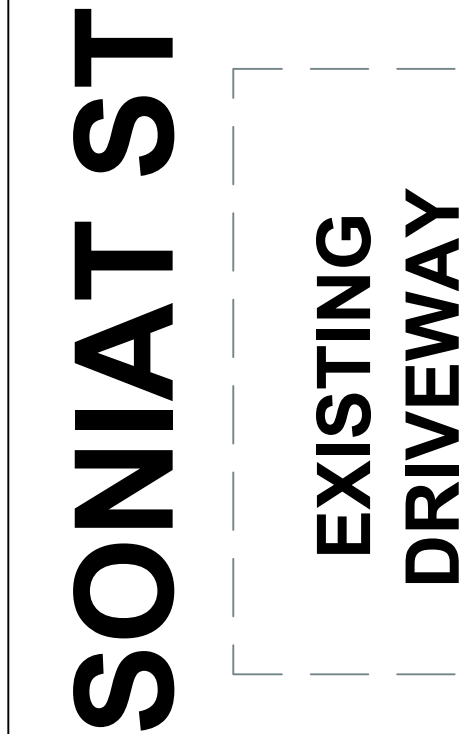
Very truly yours,


Scott E. Wyssling, PE
Louisiana License No. 44582















Date Signed 9/21/22

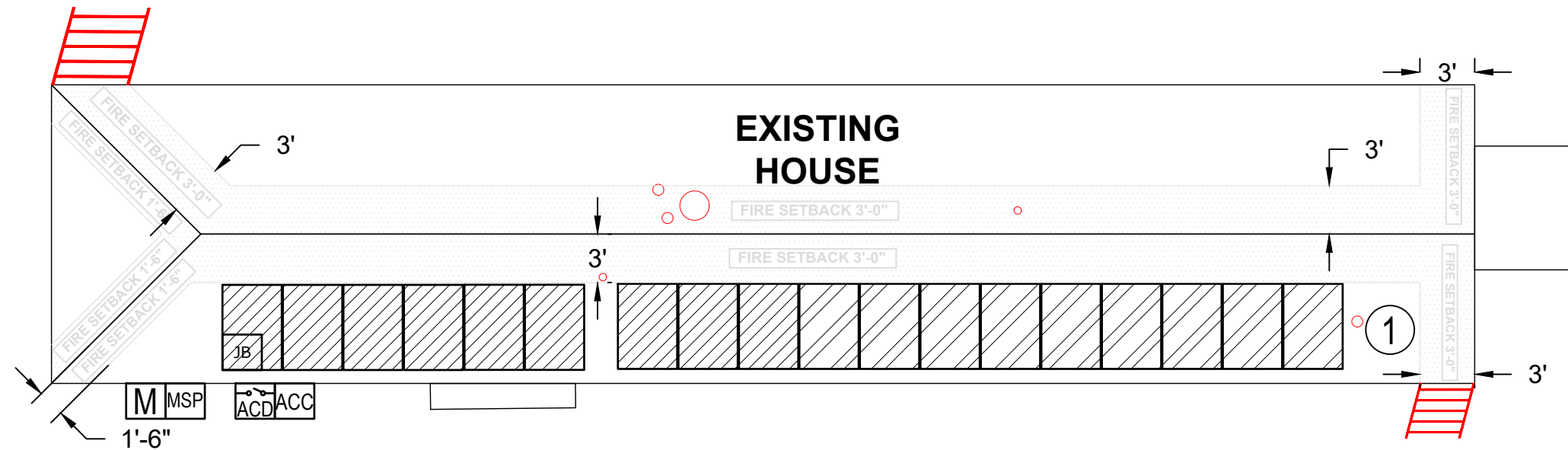
ABBREVIATIONS		ELECTRICAL NOTES		AERIAL VIEW		INDEX	
A	AMPERE	1.	WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A SIGN WILL BE PROVIDED WARNING OF THE HAZARDS PER ART. 690.17.			PV-1	COVER SHEET
AC	ALTERNATING CURRENT	2.	EACH UNGROUNDED CONDUCTOR OF THE MULTIWIRE BRANCH CIRCUIT WILL BE IDENTIFIED BY PHASE AND SYSTEM PER ART. 210.5.			PV-2	SITE PLAN
BLDG	BUILDING	3.	A NATIONALLY-RECOGNIZED TESTING LABORATORY SHALL LIST ALL EQUIPMENT IN COMPLIANCE WITH ART. 110.3.			PV-3	ATTACHMENT PLAN
CONC	CONCRETE	4.	CIRCUITS OVER 250V TO GROUND SHALL COMPLY WITH ART. 250.97, 250.92(B)			PV-4	ATTACHMENT DETAIL
C	COMBINER BOX	5.	DC CONDUCTORS EITHER DO NOT ENTER BUILDING OR ARE RUN IN METALLIC RACEWAYS OR ENCLOSURES TO THE FIRST ACCESSIBLE DC DISCONNECTING MEANS PER ART. 690.31(E).			PV-5	SINGLE-LINE DIAGRAM
D	DISTRIBUTION PANEL	6.	ALL WIRES SHALL BE PROVIDED WITH STRAIN RELIEF AT ALL ENTRY INTO BOXES AS REQUIRED BY UL LISTING.			PV-5.1	ELECTRICAL NOTES
DC	DIRECT CURRENT	7.	MODULE FRAMES SHALL BE GROUNDED AT THE UL-LISTED LOCATION PROVIDED BY THE MANUFACTURER USING UL LISTED GROUNDING HARDWARE.			PV-6	PLACARD
EGC	EQUIPMENT GROUNDING CONDUCTOR	8.	ALL EXPOSED METAL PARTS (MODULE FRAMES, RAIL, BOXES, ETC.) SHALL BE GROUNDED USING UL LISTED LAY-IN LUGS LISTED FOR THE PURPOSE. POSTS SHALL BE MADE ELECTRICALLY CONTINUOUS WITH ATTACHED RAIL.			PV-7	SAFETY LABELS
(E)	EXISTING	9.	MODULE FRAMES, RAIL, AND POSTS SHALL BE BONDED WITH EQUIPMENT GROUND CONDUCTORS AND GROUNDED AT THE MAIN ELECTRIC PANEL.			<div>BILL OF MATERIAL</div> <div>MODULE DATASHEET</div> <div>MICROINVERTER DATASHEET</div> <div>COMBINER DATASHEET</div> <div>MOUNTING SYSTEM DATASHEET</div> <div>MOUNTING SYSTEM ENGINEERING LETTER</div> <div>UL 2703 GROUND AND BONDING CERTIFICATION</div>	
EMT	ELECTRICAL METALLIC TUBING	10.	THE DC GROUNDING ELECTRODE CONDUCTOR SHALL BE SIZED ACCORDING TO ART. 250.166(B) & 690.47.				
GALV	GALVANIZED						
GEC	GROUNDING ELECTRODE CONDUCTOR						
GND	GROUND						
HDG	HOT DIPPED GALVANIZED						
I	CURRENT						
Imp	CURRENT AT MAX POWER						
INVS	INVERTERS						
Isc	SHORT CIRCUIT CURRENT						
kVA	KILOVOLT AMPERE						
kW	KILOWATT						
LBW	LOAD BEARING WALL						
MIN	MINIMUM						
(N)	NEW						
NEC	NATIONAL ELECTRIC CODE						
NIC	NOT IN CONTRACT						
NTS	NOT TO SCALE						
OC	ON CENTER						
P	PANEL BOARD						
PL	PROPERTY LINES						
PV	PHOTOVOLTAIC						
PVC	POLYVINYL CHLORIDE						
S	SUBPANEL						
SCH	SCHEDULE						
SS	STAINLESS STEEL						
SSD	SEE STRUCTURAL DIAGRAMS						
STC	STANDARD TESTING CONDITIONS						
SWH	SOLAR WATER HEATER						
TYP	TYPICAL						
UON	UNLESS OTHERWISE NOTED						
UPS	UNINTERRUPTIBLE POWER SUPPLY						
V	VOLT						
Vmp	VOLTAGE AT MAX POWER						
Voc	VOLTAGE AT OPEN CIRCUIT						
W	WATT						
3R	NEMA 3R, RAIN TIGHT						
				VICINITY MAP			
							
				GENERAL NOTES			
				1. THIS SYSTEM IS GRID-INTERTIED VIA A UL-LISTED POWER-CONDITIONING INVERTER.			
				2. THIS SYSTEM HAS NO BATTERIES, NO UPS.			
				3. ALL INVERTERS AND ARRAYS ARE NEGATIVELY GROUNDED.			
				4. SOLAR MOUNTING FRAMES ARE TO BE GROUNDED.			
						APPLICABLE CODE	
						INTERNATIONAL BUILDING CODE 2015 ((IBC 2015))	
						INTERNATIONAL RESIDENTIAL CODE 2015 (IRC 2015)	
						INTERNATIONAL FIRE CODE 2015 (IFC 2015)	
						NATIONAL ELECTRICAL CODE 2014(NEC 2014)	
						AHJ: NEW ORLEANS CITY	
						UTILITY: ENTERGY	



① SLOPE - 30
AZIMUTH - 182
MATERIAL - COMP.
SHINGLE

LEGEND

	METER
	AC COMBINER BOX
	INVERTER
	AC DISCONNECT
	MAIN SERVICE PANEL
	JUNCTION BOX
	OBSTRUCTION
	DRIVEWAY
	SOLAR MODULE
	STRING #1 9 MODULE
	STRING #2 9 MODULE
	FIRE CODE OFFSET



NOTE :- "ALL BOS COMPONENTS SHALL BE INSTALLED WITHIN 10 FT OF ADJACENT COMPONENTS



JOB NUMBER: P-004218

UTILITY: ENTERGY

RACKING: K2 CROSSRAIL SYSTEM

MODULES: (18)TALESUN TP660M-250W

MICROINVERTER: (18) ENPHASE M215-60-2LL-S22-IG

COMBINER: (1) ENPHASE IQ COMBINER 4/4C

OWNER:

GARRETT MAJOUÉ,
2327 SONIAT ST,
NEW ORLEANS, LA 70115

ACCOUNT NUMBER : 113181713

DESCRIPTION:

GARRETT MAJOUÉ,
RESIDENCE

4.50 kWDC ROOF SOLAR SYSTEM
PRODUCTION: 5,243kWH

DESIGNED BY:

ENERQUAL



Signed 9/21/2022

REV:

PV-2

PAGE NAME:
SITE PLAN

SCALE:
1/8" = 1'

DATE:
9/20/2022

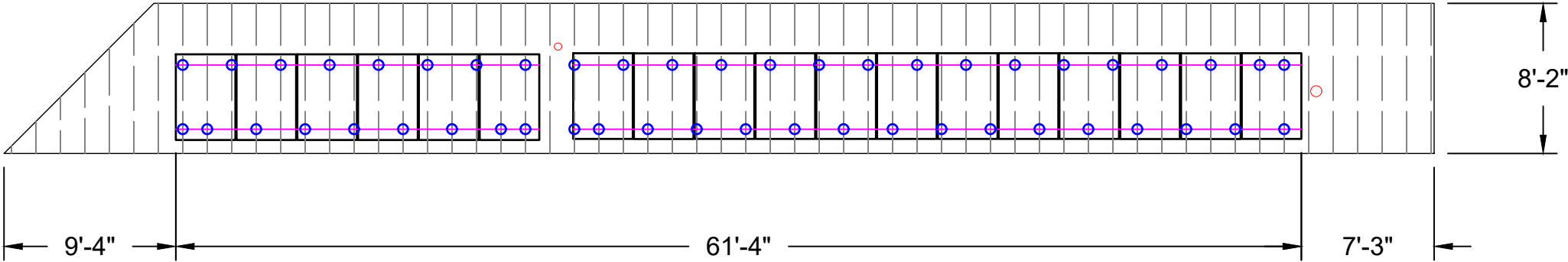
ARRAY 1


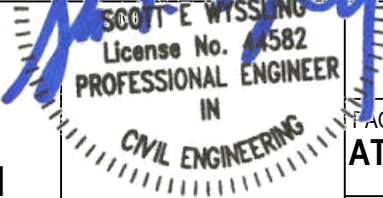
LEGEND

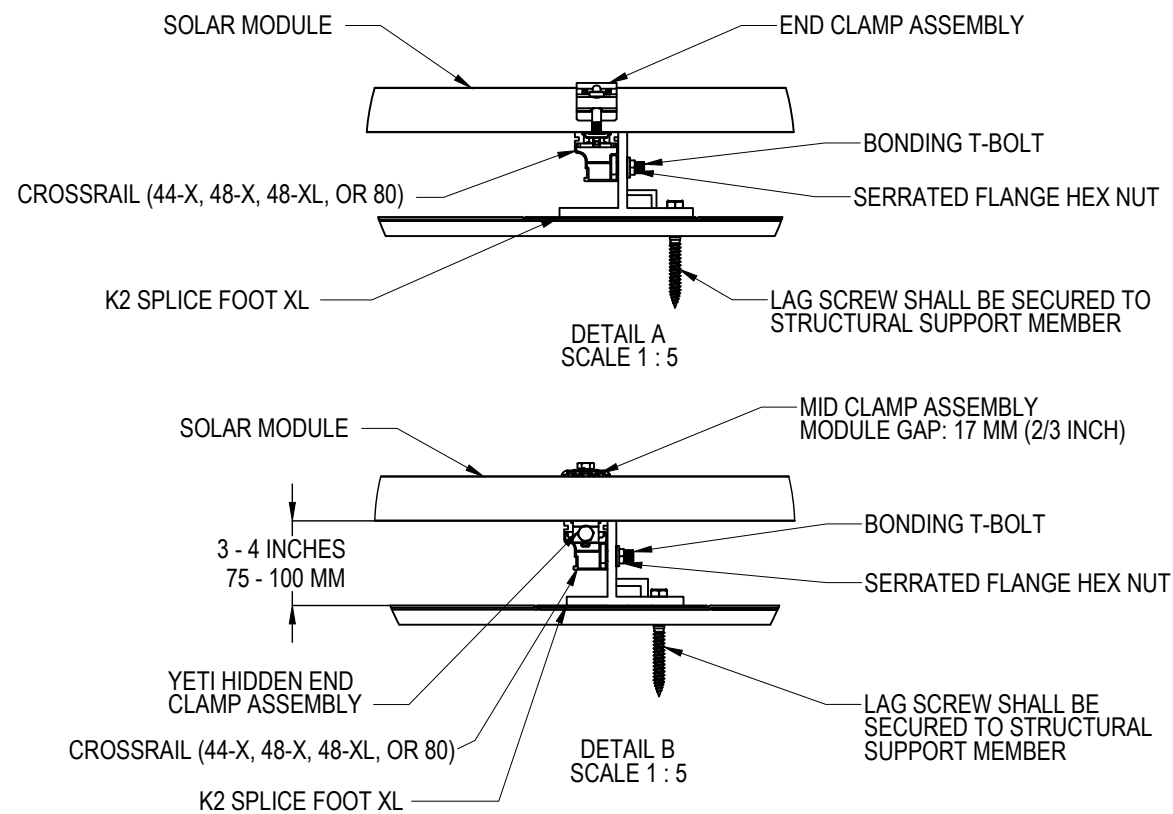
- ROOF
- RAFTERS
- RAIL
- MOUNT
- OBSTRUCTION

TOTAL PENETRATION COUNT: 49

ARRAY 1	
RAFTER PROFILE	2"X6"
RAFTER SPACING	16"OC
RIDGE PROFILE	2"X8"
C.T. PROFILE	----
C.T. SPACING	----OC
ARRAY PITCH	30°
ARRAY AZIMUTH	182°
ROOF SURFACE TYPE	COMP. SHINGLE
TOTAL NO. OF PENETRATION	49
STORIES	1

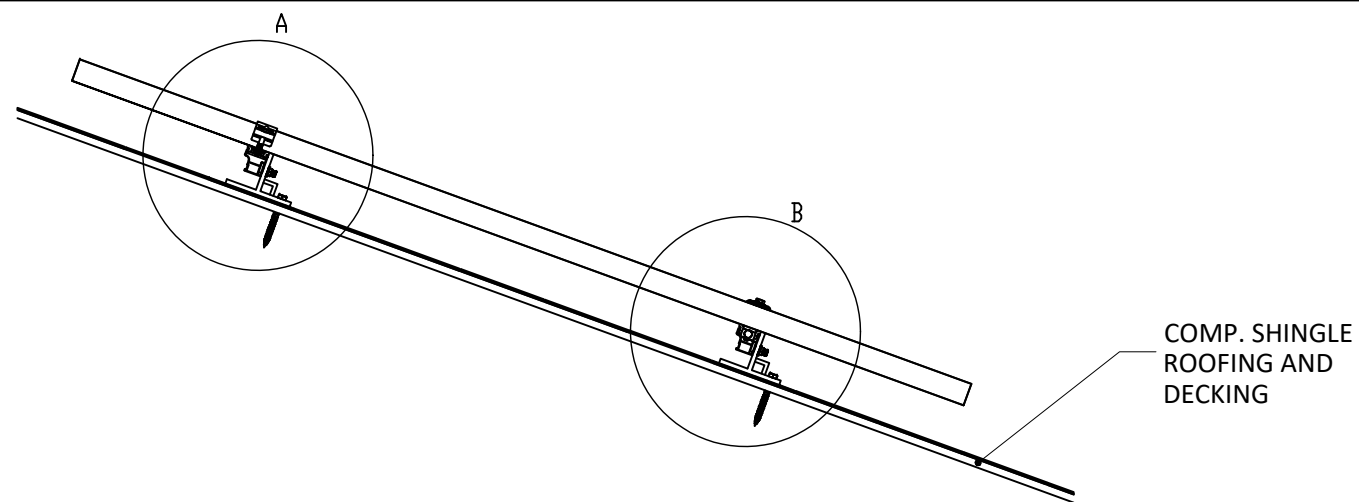


 Solar Energy and Energy Efficiency	JOB NUMBER: P-004218	OWNER: GARRETT MAJOUÉ, 2327 SONIAT ST, NEW ORLEANS,LA 70115	DESCRIPTION: GARRETT MAJOUÉ, RESIDENCE 4.50 kWDC ROOF SOLAR SYSTEM PRODUCTION: 5,243kWH	 PV-3
	UTILITY: ENTERGY			
	RACKING: K2 CROSSRAIL SYSTEM			
POSIGEN DEVELOPER, LLC 819 CENTRAL AVE STE 210 JEFFERSON, LA 70121 LA ELECTRICAL LICENSE :74446	MODULES: (18)TALESUN TP660M-250W	ACCOUNT NUMBER : 113181713		Signed 9/21/2022
	MICROINVERTER: (18) ENPHASE M215-60-2LL-S22-IG		DESIGNED BY: ENERQUAL	REV:
	COMBINER: (1) ENPHASE IQ COMBINER 4/4C			
				SCALE: 1/8" = 1'
				DATE: 9/20/2022



1 ENLARGED VIEW

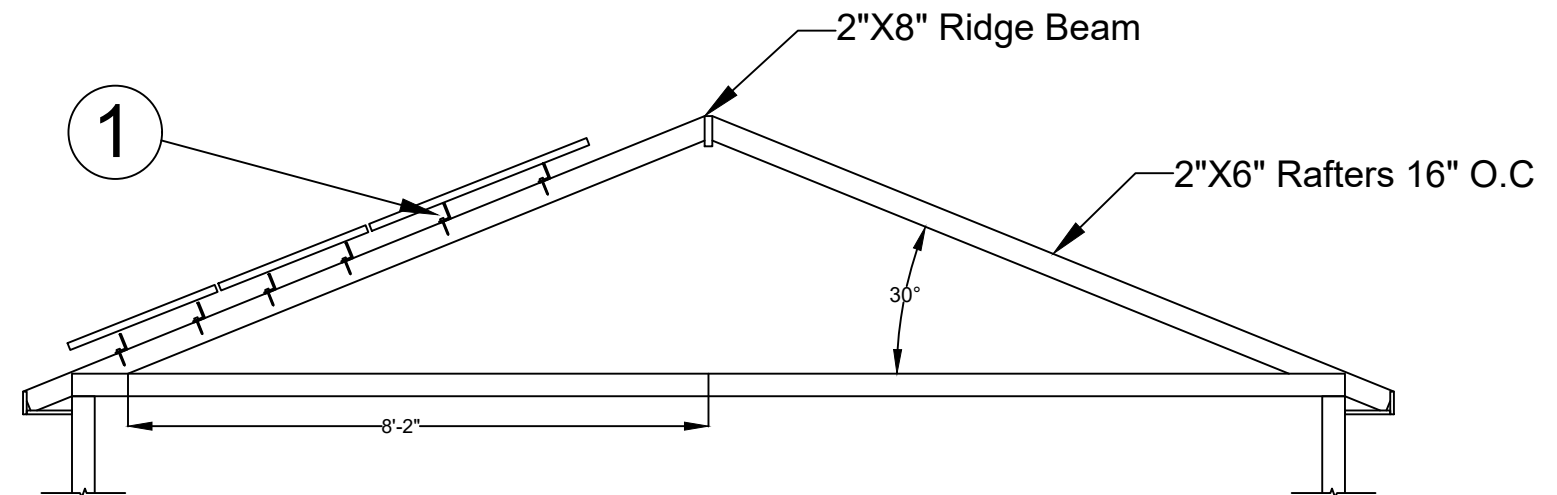
SCALE: NTS



2 ATTACHMENT DETAIL (SIDE VIEW)

SCALE: NTS

FRAME SECTION 1



JOB NUMBER: P-004218

UTILITY: ENTERGY

RACKING: K2 CROSSRAIL SYSTEM

MODULES: (18)TALESUN TP660M-250W

MICROINVERTER: (18) ENPHASE M215-60-2LL-S22-IG

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4.50 kWDC ROOF SOLAR SYSTEM
PRODUCTION: 5,243kWH

DESIGNED BY:

ENERQUAL

Signed 9/21/2022

REV:



PV-4

PAGE NAME:
ATTACHMENT DETAIL

SCALE:
NTS

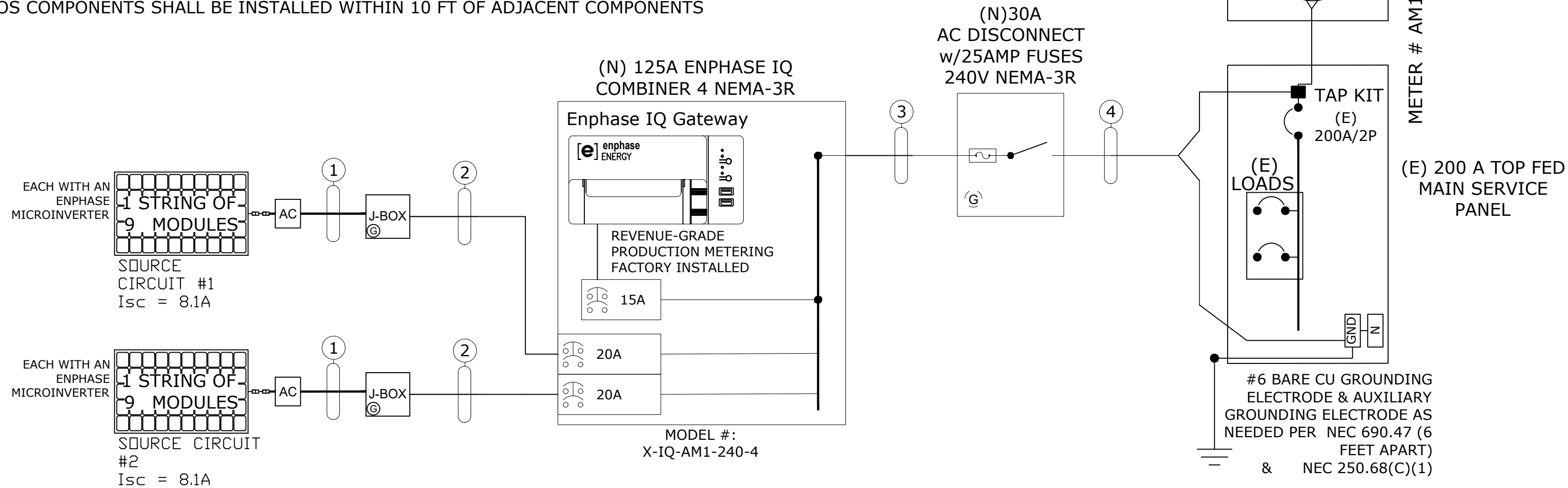
DATE:
9/20/2022


POSIGEN DEVELOPER, LLC
819 CENTRAL AVE STE 210
JEFFERSON, LA 70121
LA ELECTRICAL LICENSE :74446

WIRE TAG #	CONDUIT	WIRE QTY	WIRE GAUGE:	WIRE TYPE ENPHASE TRUNK CABLE INCLUDES #12 GROUND	TEMP RATING:	WIRE AMP	TEMP DE-RATE:	CONDUIT FILL:	WIRE OCP:	TERMINAL 75°C RATING:	INVERTER QTY:	NOC:	NEC:	STRING AMPS	GRND SIZE	GRND WIRE TYPE
①	OPEN AIR	2	#12	Q-CABLE	90°C	40	x 0.96	x 1	= 38.40A	35	9	x 0.9	x 1.25	= 10.12 A	#6	SBC
②	3/4" EMT	2	#10	THWN -2	90°C	40	x 0.96	x 1	= 38.40A	35	9	x 0.9	x 1.25	= 10.12 A	#8	THWN -2
③	3/4" EMT	3	#10	THWN -2	90°C	40	x 0.96	x 1	= 38.40A	35	18	x 0.9	x 1.25	= 20.25 A	#10	THWN -2
④	3/4" EMT	3	#6	THWN-2	90°C	75	x 0.96	x 1	= 72.00A	65	18	x 0.9	x 1.25	= 20.25 A	#8	THWN-2

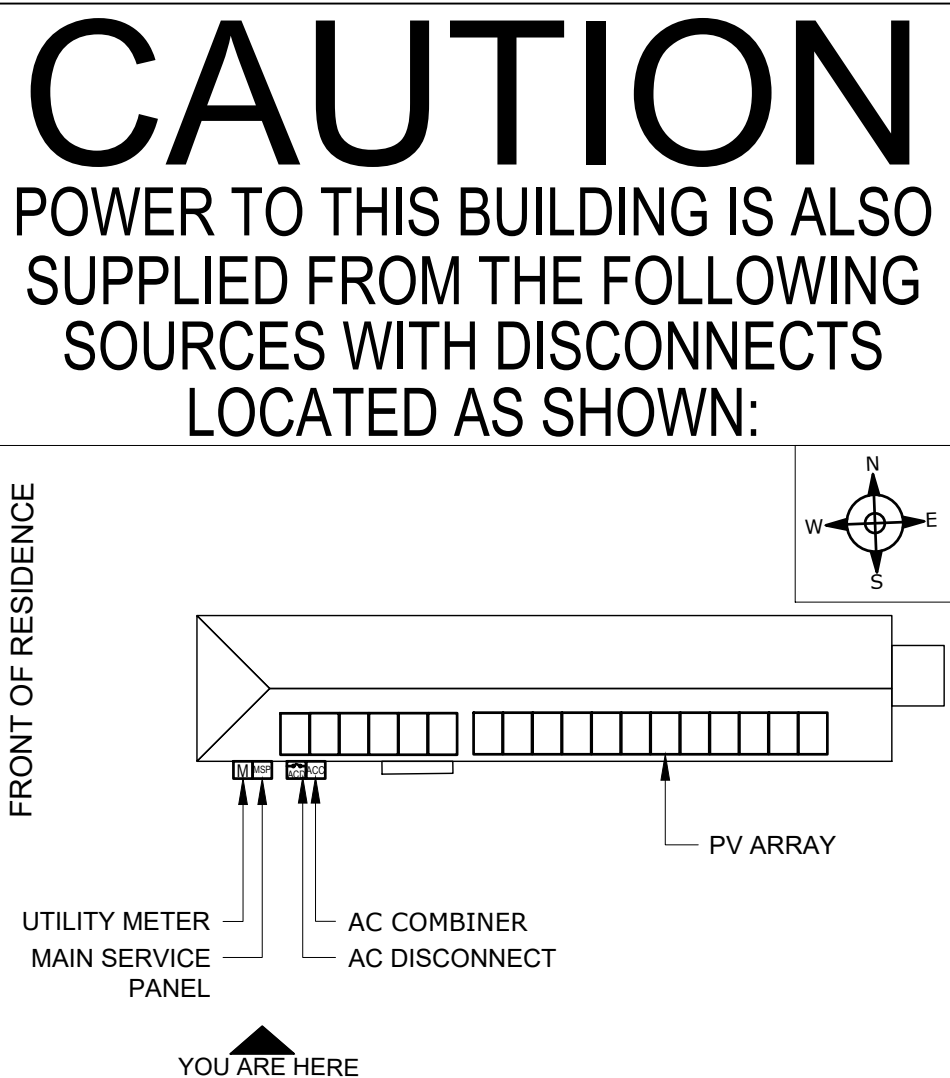
INVERTER SPECS		DISCONNECTS		MODULE SPECS				ASHRAE AMBIENT TEMPERATURE SPECS		
INVERTER:M215-60-2LL-S22-IG QTY:18		MAKE:EATON DG221NRB QTY:1		MODULE TYPE:	QTY:	WATTAGE:	FRAME COLOR:	High Temp	DISTANCE ABOVE ROOF	EXTREME
VOLTAGE: 240		WATTAGE: 225		RATED CURRENT: 30A		MAX RATED VOLTAGE: 240V		2% Avg.	1"	MIN
NEC EFF: 99%				Voc: 37.7V		Isc: 8.68A		34.2° C	NO TEMP ADDER PER 310.15(B)(3)(C)	-1.4° C

UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.10 (D).
CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).
ALL BOS COMPONENTS SHALL BE INSTALLED WITHIN 10 FT OF ADJACENT COMPONENTS




 <div>PosiGen</div> <div>Solar Energy and Energy Efficiency</div>	JOB NUMBER: P-004218	OWNER: GARRETT MAJOUÉ, 2327 SONIAT ST, NEW ORLEANS,LA 70115	DESCRIPTION: GARRETT MAJOUÉ, RESIDENCE 4.50 kWDC ROOF SOLAR SYSTEM PRODUCTION: 5,243kWH	STAMP:	PV-5	
	UTILITY: ENTERGY					
	RACKING: K2 CROSSRAIL SYSTEM					PAGE NAME: SINGLE-LINE DIAGRAM
POSIGEN DEVELOPER, LLC 819 CENTRAL AVE STE 210 JEFFERSON, LA 70121 LA ELECTRICAL LICENSE :74446	MODULES: (18)TALESUN TP660M-250W	ACCOUNT NUMBER : 113181713			SCALE: NTS	
	MICROINVERTER: (18) ENPHASE M215-60-2LL-S22-IG			DESIGNED BY: ENERQUAL	REV:	DATE: 9/20/2022
	COMBINER: (1) ENPHASE IQ COMBINER 4/4C					

	GROUNDING NOTES		<div>NOTES :</div> <div>1. MATING CONNECTORS SHALL COMPLY WITH NEC 690.33.</div> <div>2. SOLAR EDGE SYSTEM MEETS REQUIREMENTS FOR PHOTOVOLTAIC RAPID SHUTDOWN SYSTEM (PVRSS), AS PER NEC 690.12(B).</div> <div>3. THE SPECIFIED OPTIMIZER CAN BE SUBSTITUTED WITH A P400, P405, P505, P401, OR P485. THESE OPTIMIZERS HAVE AN INPUT VOLTAGE WINDOW WIDE ENOUGH TO ACCOMMODATE THE OUTPUT VOLTAGE RANGE OF THE MODULE AT THE DESIGN TEMPERATURES, HAVE A MAX INPUT CURRENT RATING THAT IS ABOVE THE MAX OUTPUT CURRENT OF THE MODULE, AND A MAX POWER INPUT THAT IS ABOVE THE RATED POWER OUTPUT OF THE MODULE.</div> <div>4. DC PV CONDUCTORS ARE NOT SOLIDLY-GROUNDED. NO DC PV CONDUCTOR SHALL BE WHITE- OR GRAY-COLORED</div> <div>5. ALL METAL ENCLOSURES, RACEWAYS, CABLES AND EXPOSED NONCURRENT-CARRYING METAL PARTS OF EQUIPMENT SHALL BE GROUNDED TO EARTH AS REQUIRED BY NEC 250.4(A) AND PART III OF ARTICLE 250 AND EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 690.45. THE GROUNDING ELECTRODE SYSTEM SHALL ADHERE TO NEC 690.47(A) AND NEC 250.169. THE DC GROUNDING ELECTRODE SHALL BE SIZED ACCORDING TO NEC 250.166 AND INSTALLED IN COMPLIANCE WITH NEC 250.64.</div> <div>6. MAX DC VOLTAGE OF ARRAY FIXED BY THE INVERTER AT 380V REGARDLESS OF TEMPERATURE. THE MAX DC VOLTAGE OF THE MODULE AT -15°C IS 53.2V (-15°C - 25°C) X -0.138V/C + 47.7V = 53.2V).</div> <div>7. POINT-OF-CONNECTION IS ON THE SUPPLY SIDE OF SERVICE DISCONNECT, INSIDE PANELBOARD ENCLOSURE USING UNUSED TERMINALS, TERMINALS THAT ARE SUITABLE FOR DOUBLE LUGGING, OR USING OTHER LOCALLY-APPROVED METHODS AND HARDWARE, IN COMPLIANCE WITH NEC 705.12(A). THE PANELBOARD SHALL HAVE SUFFICIENT SPACE TO ALLOW FOR ANY TAP HARDWARE AS REQUIRED BY NEC 110.3 AND NEC 312.8(A)</div> <div>8. PV SYSTEM DISCONNECT SHALL BE A VISIBLE KNIFE-BLADE TYPE DISCONNECT THAT IS ACCESSIBLE AND LOCKABLE BY THE UTILITY. THE DISCONNECT SHALL BE LOCATED WITHIN 10 FT OF UTILITY METER. DISCONNECT SHALL BE GROUPED IN ACCORDANCE WITH NEC 230.72.</div>			
1	ALL EQUIPMENT SHALL BE PROPERLY GROUNDED PER THE REQUIREMENTS OF NEC ARTICLES 250 & 690	7				
2	INSTALLER SHALL CONFIRM THAT MOUNTING SYSTEM HAS BEEN EVALUATED FOR COMPLIANCE WITH UL 2703 "GROUNDING AND BONDING" WHEN USED WITH PROPOSED PV MODULE.					
3	PV MODULES SHALL BE GROUNDED TO MOUNTING RAILS USING MODULE LUGS OR RACKING INTEGRATED GROUNDING CLAMPS AS ALLOWED BY LOCAL JURISDICTION. ALL OTHER EXPOSED METAL PARTS SHALL BE GROUNDED USING UL-LISTED LAY-IN LUGS.					
4	GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLOR CODED GREEN, OR MARKED GREEN IF #4AWG OR LARGER					
5	AC SYSTEM GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL BE A MINIMUM SIZE #8AWG WHEN INSULATED, #6AWG IF BARE WIRE.					
6	IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE A VERIFIABLE GROUNDING ELECTRODE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.					
<div><div><div><div></div><div></div><div></div><div></div></div><div>PosiGen</div><div>Solar Energy and Energy Efficiency</div></div><div><div>POSIGEN DEVELOPER, LLC</div><div>819 CENTRAL AVE STE 210</div><div>JEFFERSON, LA 70121</div><div>LA ELECTRICAL LICENSE :74446</div></div></div>		JOB NUMBER: P-004218	OWNER: GARRETT MAJOUÉ, 2327 SONIAT ST, NEW ORLEANS,LA 70115	DESCRIPTION: GARRETT MAJOUÉ, RESIDENCE 4.50 kWDC ROOF SOLAR SYSTEM PRODUCTION: 5,243kWH	STAMP:	PV-5.1
		UTILITY: ENTERGY				
		RACKING: K2 CROSSRAIL SYSTEM				
		MODULES: (18)TALESUN TP660M-250W	ACCOUNT NUMBER : 113181713	DESIGNED BY: ENERQUAL	REV:	SCALE: NTS
		MICROINVERTER: (18) ENPHASE M215-60-2LL-S22-IG	COMBINER: (1) ENPHASE IQ COMBINER 4/4C			DATE: 9/20/2022



PLACARD RIVETED TO THE MAIN SERVICE PANEL
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])

<div><div>Solar Energy and Energy Efficiency</div></div>	JOB NUMBER: P-004218	OWNER: GARRETT MAJOUÉ, 2327 SONIAT ST, NEW ORLEANS,LA 70115	DESCRIPTION: GARRETT MAJOUÉ, RESIDENCE 4.50 kWDC ROOF SOLAR SYSTEM PRODUCTION: 5,243kWH	STAMP:
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DC RACEWAYS

2

SW1 - DISCONNECT
(EATON DG221NRB)

3

5

6

I1 - INVERTER
(M215-60-2LL-S22-IG 000BNC4)

3

4

MSP - MAIN SERVICE PANEL

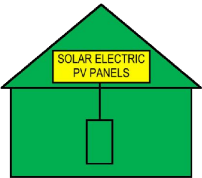
1

7

1 SEE NOTE NO. 4 (MSP)

EMERGENCY RESPONDER
THIS SOLAR PV SYSTEM IS
EQUIPPED WITH RAPID SHUTDOWN

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



NEC690.56(C)(1) AND NFPA
111.12.2.1.1.1.1,11.12.2.1.4

2 SEE NOTE NO. 5 (DC RACEWAYS)

WARNING
PHOTOVOLTAIC POWER SOURCE

NEC690.31(G)(3) AND NFPA 111.12.2.1.3

5 AC SOLAR DISCONNECT (SW1)

PV SYSTEM DISCONNECT

NEC690.13(B)

7 ANY AC ELECTRICAL PANEL THAT IS FED BY
BOTH THE UTILITY AND THE PHOTOVOLTAIC
SYSTEM (MSP)

! WARNING !

DUAL POWER SOURCE. SECOND SOURCE IS
PHOTOVOLTAIC SYSTEM.

NEC705.12(B)(3)

3 EACH DISCONNECTING MEANS FOR
PHOTOVOLTAIC EQUIPMENT (SW1, I1)

! WARNING !

ELECTRIC SHOCK HAZARD. TERMINALS ON BOTH
LINE AND LOAD SIDES MAY BE ENERGIZED IN
THE OPEN POSITION.

NEC690.13(B)

6 AC DISCONNECT (SW1)

MAXIMUM AC OPERATING CURRENT: 16.2A
MAXIMUM AC OPERATING VOLTAGE: 240V

NEC690.54

LABELING NOTES

1 ALL PLAQUES AND SIGNAGE REQUIRED BY 2017 NEC
AND 2018 NFPA 1 WILL BE INSTALLED AS REQUIRED.

2 LABELS, WARNING(S) AND MARKING SHALL COMPLY
WITH ANSI Z535.4, WHICH REQUIRES THAT DANGER,
WARNING, AND CAUTION SIGNS USED THE STANDARD
HEADER COLORS, HEADER TEXT, AND SAFETY ALERT
SYMBOL ON EACH LABEL. THE ANSI STANDARD
REQUIRES A HEADING THAT IS AT LEAST 50% TALLER
THAN THE BODY TEXT, IN ACCORDANCE WITH NEC
110.21(B).

3 A PERMANENT PLAQUE OR DIRECTORY SHALL BE
INSTALLED PROVIDING THE LOCATION OF THE
SERVICE DISCONNECTING MEANS AND THE
PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF
NOT IN THE SAME LOCATION IN ACCORDANCE WITH
NEC 690.56(B).

4 LABEL(S) WITH MARKING, "TURN RAPID SHUTDOWN
SWITCH TO THE 'OFF' POSITION TO SHUT DOWN THE
ENTIRE PV SYSTEM," SHALL BE LOCATED WITHIN 3 FT
OF SERVICE DISCONNECTING MEANS THE TITLE SHALL
UTILIZE CAPITALIZED LETTERS WITH A MINIMUM
HEIGHT OF 3/8" IN BLACK ON A RED BACKGROUND,
AND REMAINING TEXT SHALL BE CAPITALIZED WITH A
MINIMUM HEIGHT OF 3/16" IN BLACK ON WHITE
BACKGROUND

5 LABEL(S) WITH MARKING, "WARNING PHOTOVOLTAIC
POWER SOURCE," SHALL BE LOCATED AT EVERY 10
FEET OF EACH DC RACEWAY AND WITHIN ONE FOOT
OF EVERY TURN OR BEND AND WITHIN ONE FOOT
ABOVE AND BELOW ALL PENETRATIONS OF
ROOF/CEILING ASSEMBLIES, WALLS AND BARRIERS.
THE LABEL SHALL HAVE 3/8" TALL LETTERS AND BE
REFLECTIVE WITH WHITE TEXT ON A RED
BACKGROUND



POSIGEN DEVELOPER, LLC
819 CENTRAL AVE STE 210
JEFFERSON, LA 70121
LA ELECTRICAL LICENSE :74446

JOB NUMBER: P-004218

UTILITY: ENTERGY

RACKING: K2 CROSSRAIL SYSTEM

MODULES: (18)TALESUN TP660M-250W

MICROINVERTER: (18) ENPHASE M215-60-2LL-S22-IG

COMBINER: (1) ENPHASE IQ COMBINER 4/4C

OWNER:

GARRETT MAJOUÉ,
2327 SONIAT ST,
NEW ORLEANS,LA 70115

ACCOUNT NUMBER : 113181713

DESCRIPTION:

GARRETT MAJOUÉ,
RESIDENCE

4.50 kWDC ROOF SOLAR SYSTEM
PRODUCTION: 5,243kWH

STAMP:

PV-7

PAGE NAME:
SAFETY LABELS

SCALE:
NTS

DATE:
9/20/2022

DESIGNED BY:

ENERQUAL

REV:

Bill Of Materials

GARRETT MAJOUE 2327 SONIAT ST, NEW ORLEANS, LA 70115		
	Electrical Equipment	
QTY	Part #	Description
18	TALESUN TP660M-250W	TALESUN TP660M-250W Solar Modules
18	M215-60-2LL-S22-IG MicroInverter	ENPHASE M215-60-2LL-S22-IG (240V) MicroInverter
1	30A FUSED AC Disconnect	AC Disconnect, NEMA 3R, 30A, 240VAC, 2-Pole
1	Combiner Box	125A ENPHASE IQ COMBINER 4/4C
1	Junction Box	Junction Box
2	Tap Connector	Tap Connector
Breakers and Fuses		
1	25A Fuses	General 25A Fuses
Racking		
TBD	4000021 (180" mill)	CrossRail 44-X (shown) all CR profiles applicable
TBD	4000019 (168" mill)	CrossRail 44-X (shown) all CR profiles applicable
TBD	4000051 (mill)	CrossRail 44-X Rail Connector
32	4000601-H (mill)	CrossRail Mid Clamp
8	4000429 (mill)	CrossRail (Standard) End Clamp
49	4000630 (mill)	L-Foot Slotted Set
2	4000006-H	Everest Ground Lug

TP660M – B

Peak Power: 240 – 260 Wp



Module characteristics:

- Positive only power tolerance: 0 to +3 %
- High mechanical load strength:
Product to withstand high loading pressure of 5400 Pa in accordance with IEC 61215ed.2
- Fully automated production line:
 - Better soldering / Better cell spacing tolerance: ± 0.3 mm
 - Better and more consistent product quality
- Black frame and black back sheet
- All Talesun modules have been tested and certified by TUV for ammonia resistance and salt mist corrosion.



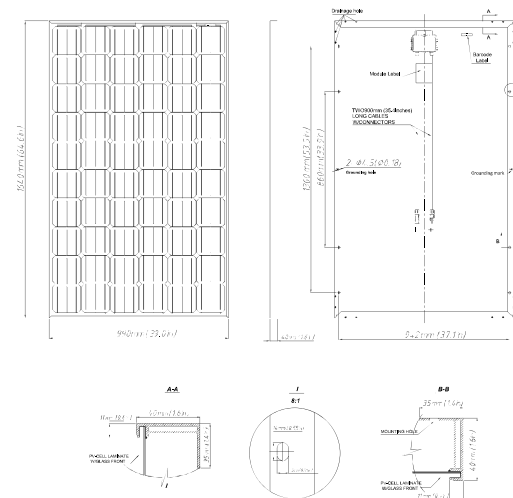
Electrical parameters:

MODEL	240	245	250	255	260
Maximum rated power at STC (Pmax)	240W	245W	250W	255W	260W
Voltage at maximum power (Vmpp)	30.3V	30.5V	30.7V	30.7V	30.8V
Current at maximum power (Impp)	7.95 A	8.05 A	8.17 A	8.33 A	8.46 A
Open circuit voltage (Voc)	37.4V	37.5V	37.7V	37.8V	37.9V
Short circuit current (Isc)	8.58A	8.63A	8.68A	8.73A	8.78A
Module efficiency η (%)	14.8	15.1	15.4	15.7	16.0
Power tolerance	0 to +3 %				
Temperature coefficient	Pmpp	-0.45 % / °C			
	Voc	-0.35 % / °C			
	Isc	+0.05 % / °C			
	NOCT	45 \pm 2 °C			

* STC: Standard Test Conditions at 1000 W/m², Cell temperature 25°C, AM 1.5



Technical drawings:



Dimensions:

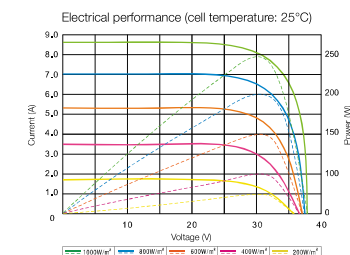
Cell type	Mono Crystalline
Cell dimensions	156x156 mm (6 inch)
Cell arrangement	6 x 10 (60)
Weight	20 kg
Module dimensions	1640x990x40 mm
Cable length	900 mm
Cable cross section size	4 mm ²
No. of bypass diodes	3/6
Packing configuration	25 per pallet
Frame	Anodized Aluminium, black
Junction box	IP 65 rate

Operating conditions:

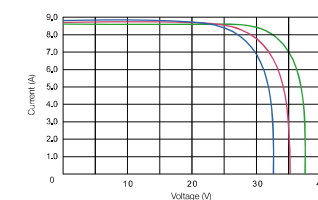
Maximum system voltage	1000 V/DC (IEC)
Operating temperature	-40°C to +85°C
Maximum reverse current (I _r)	15 A
Static loading	5400 Pa
Conductivity at ground	0.1 Ω
Safety class	II
Resistance	≥ 100 M Ω
Connector	MC4 or identical in construction

I-V curve:

Output under different radiation and temperature conditions.

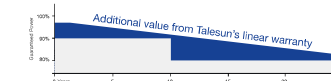


TP660M-B Pm(W)250



Warranty:

Product Quality Warranty: 10 years



Power warranty – performance as set forth below:

- During the first year, Talesun guarantees the actual power output of the module will be no less than 97% of the labeled power output.
- From year 2 to year 24, the actual annual power decline will be no more than 0.7%; by the end of year 25, the actual power output will be no less than 80% of the labeled power output.

25 year insurance-based guarantee to ensure our product and power output warranty (with non cancelable term).

Certifications & Standards:

- IEC 61215ed.2
- IEC 61701
- IEC 61730
- IEC 62716
- UL 1703
- ISO 9001:2008
- ISO 14001:2004
- OHSAS 18001:2007

Enphase® M215



The **Enphase® M215 Microinverter** with integrated ground delivers increased energy harvest and reduces design and installation complexity with its all-AC approach. With the advanced M215, the DC circuit is isolated and insulated from ground, so **no Ground Electrode Conductor (GEC) is required for the microinverter**. This further simplifies installation, enhances safety, and saves on labor and materials costs.

The Enphase M215 integrates seamlessly with the Engage® Cable, the Envoy® Communications Gateway™, and Enlighten®, Enphase's monitoring and analysis software.

PRODUCTIVE

- Maximizes energy production
- Minimizes impact of shading, dust, and debris
- No single point of system failure

SIMPLE

- No GEC needed for microinverter
- No DC design or string calculation required
- Easy installation with Engage Cable

RELIABLE

- More than 1 million hours of testing and millions of units shipped
- Industry-leading warranty, up to 25 years

Enphase® M215 Microinverter // DATA

INPUT DATA (DC)	M215-60-2LL-S22-IG / S23-IG / S24-IG	
Recommended input power (STC)	190 - 270 W	
Maximum input DC voltage	48 V	
Peak power tracking voltage	27 V - 39 V	
Operating range	16 V - 48 V	
Min/Max start voltage	22 V / 48 V	
Max DC short circuit current	15 A	
Max input current	10 A	
OUTPUT DATA (AC)	@208 VAC	@240 VAC
Peak output power	225 W	225 W
Rated (continuous) output power	215 W	215 W
Nominal output current	1.1 A (A rms at nominal duration)	0.9 A (A rms at nominal duration)
Nominal voltage/range	208 V / 183-229 V	240 V / 211-264 V
Nominal frequency/range	60.0 / 57-61 Hz	60.0 / 57-61 Hz
Extended frequency range*	57-62.5 Hz	57-62.5 Hz
Power factor	>0.95	>0.95
Maximum units per 20 A branch circuit	25 (three phase)	17 (single phase)
Maximum output fault current	850 mA rms for 6 cycles	850 mA rms for 6 cycles
EFFICIENCY		
CEC weighted efficiency, 240 VAC	96.5%	
CEC weighted efficiency, 208 VAC	96.5%	
Peak inverter efficiency	96.5%	
Static MPPT efficiency (weighted, reference EN50530)	99.4 %	
Night time power consumption	65 mW max	
MECHANICAL DATA		
Ambient temperature range	-40°C to +65°C	
Dimensions (WxHxD)	163 mm x 173 mm x 25 mm (without mounting bracket)	
Weight	1.6 kg (3.4 lbs)	
Cooling	Natural convection - No fans	
Enclosure environmental rating	Outdoor - NEMA 6	
FEATURES		
Compatibility	Compatible with 60-cell PV modules.	
Communication	Power line	
Integrated ground	The DC circuit meets the requirements for ungrounded PV arrays in NEC 690.35. Equipment ground is provided in the Engage Cable. No additional GEC or ground is required. Ground fault protection (GFP) is integrated into the microinverter.	
Monitoring	Enlighten Manager and MyEnlighten monitoring options	
Compliance	UL1741/IEEE1547, FCC Part 15 Class B, CAN/CSA-C22.2 NO. 0-M91, 0.4-04, and 107.1-01	

* Frequency ranges can be extended beyond nominal if required by the utility

To learn more about Enphase Microinverter technology, visit enphase.com

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



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	
Ensemble Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	(not included, order separately) - 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
Envy 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

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KUP-L-Tap® Insulation Piercing Connectors Dual Rated

TYPE IPC



Features

- Body is molded from tough, resilient glass-filled nylon
- Compact design
- Tin plated copper contact teeth
- Insulation piercing
- Perforated end tabs
- Pre-filled with silicone lubricant
- Versatile
- Increased safety

- Horizontal line grid
- Temperature rating 90° C

Benefits

- Provides high degree of breakage resistance and long dependable use
- Saves space
- Easily penetrates most types of insulation
- No need to strip the conductor which saves installation time
- Break out easily by hand
- Prevents oxidation and moisture from entering the contact area
- Can be used as a splice or tap connector
- Contains no external energized parts. Can be installed "hot" on energized conductors providing tap conductor is not under load.
- Provides a visual guide for proper installation of conductors

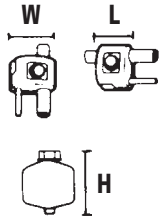


Fig. 1



Fig. 2



Fig. 3



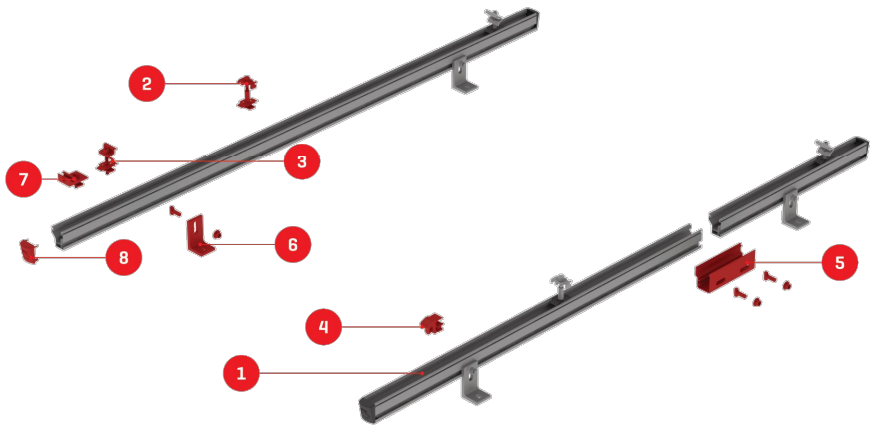
Fig. 4

Catalog Number	Figure Number	Wire Range		Volts	Current Rating		Dimensions			Torque Ft. Lbs.	Bolt Head Size
		Main	Tap		CU	AL	L	W	H		
IPC-1/0-2	3	1/0-8	2-8	300 (480 Grounded Y System)	130	100	1-7/32	1-15/32	2-5/16	16	1/2
IPC-4/0-6	2	4/0-4	6-14	600	75	60	1-27/64	1	1-7/8	13	1/2
IPC-4/0-2/0	3	4/0-2	2/0-6	600	195	150	1-21/32	1-7/8	2-7/8	25	1/2
IPC-250-4/0	2	250kcmil-1	4/0-6	600	260	205	1-7/8	2-11/32	3-11/32	30	5/8
IPC-350-4/0	3	350kcmil-4/0	4/0-10	300 (480 Grounded Y System)	260	205	1-43/64	2-7/16	3-1/8	25	5/8
IPC-350-350	4	350kcmil-4/0	350kcmil-4/0	300 (480 Grounded Y System)	350	280	2-43/64	2-23/32	3-1/4	25	5/8
IPC-500-12	1	500kcmil-250kcmil	10-12	300 (480 Grounded Y System)	40	35	1-43/64	2-7/16	3-1/4	25	5/8
IPC-500-250	1	500kcmil-250kcmil	250kcmil-4	600	290	230	2-27/64	2-29/32	3-3/4	55	5/8-11/16
IPC-500-500	1	500kcmil-300kcmil	500kcmil-250kcmil	600	430	350	3-3/16	3-5/8	5	75	7/8-7/8
IPC-750-500	1	750kcmil-500kcmil	500kcmil-350kcmil	600	430	350	3-3/16	3-5/8	5	75	7/8-7/8

All wire sizes, unless noted otherwise, are American Wire Gauge (AWG)

Tested to UL 486A/B, UL File E6207

We support PV systems
Formerly Everest Solar Systems



CrossRail System

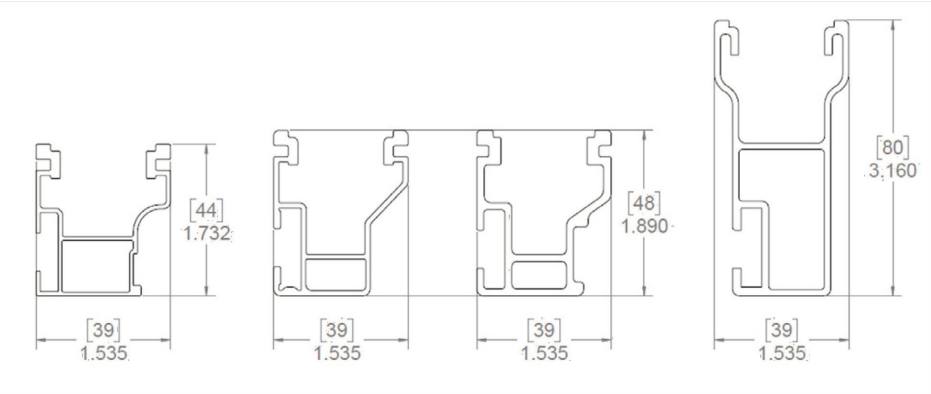
TECHNICAL SHEET

Item Number	Description	Part Number
1	CrossRail 44-X [shown] all CR profiles applicable	4000019 [166" mill], 4000020 [166" dark] , 4000021 [180" mill], 4000022 [180" dark]
2	CrossRail Mid Clamp	4000601-H (mill), 4000602-H (dark)
3	CrossRail (Standard) End Clamp	4000429 (mill), 4000430 (dark)
4	Yeti Hidden End Clamp for CR	4000050-H
5	CrossRail 44-X Rail Connector [shown] CR 48-X, 48-XL Rail Connector available	4000051 (mill), 4000052 (dark)
6	L-Foot Slotted Set	4000630 (mill), 4000631 (dark)
7	Everest Ground Lug	4000006-H
8	CrossRail 44-X End Cap [shown] CrossRail 48-X, 48-XL and 80 available	4000067

We support PV systems
Formerly Everest Solar Systems



Units: [mm] in



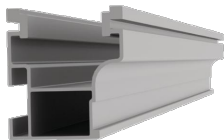
Technical Data

	CrossRail System
Roof Type	Composition shingle, tile, standing seam
Material	High corrosion resistance stainless steel and high grade aluminum
Flexibility	Modular construction, suitable for any system size, height adjustable
PV Modules	For all common module types
Module Orientation	Portrait and landscape
Roof Connection	Drill connection into rafter
Structural Validity	IBC compliant, stamped engineering letters available for all solar states
Warranty	25 years

We support PV systems
Formerly Everest Solar Systems



CROSSRAIL 44-X



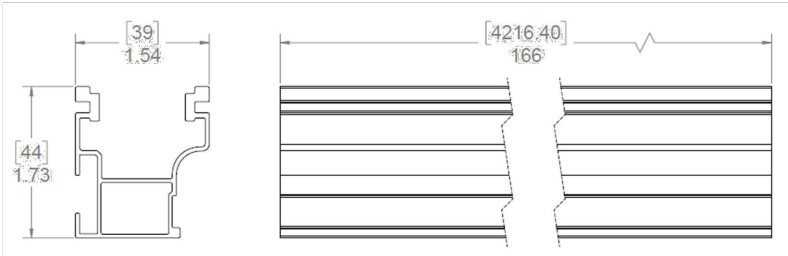
Mechanical Properties

	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

Sectional Properties

	CrossRail 44-X
Sx	0.1490 in3 [0.3785 cm3]
Sy	0.1450 in3 [0.3683 cm3]
A [X-Section]	0.4050 in2 [1.0287 cm2]

Units: [mm] in



Notes:

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

Certificate

Standard **ISO 9001:2015**

Certificate Registr. No. **01 100 101608**

Certificate Holder:



K2 Systems GmbH

Industriestr. 18
71272 Renningen
Germany

Scope:

Development, production and distribution of innovative and customer-specific mounting systems for solar technology, including customer-oriented design calculations and services

Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.

Validity:

The certificate is valid from 2020-03-09 until 2023-02-27.
First certification 2017
Date of recertification audit: 2020-02-28
Expiry date of last certification cycle: 2020-02-27

2020-03-09

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln