

PHOTOVOLTAIC ROOF MOUNT SYSTEM

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
11/20/2023 5:15:40

22 MODULES-ROOF MOUNTED - 8.580 KW DC, 6.380 KW AC

2915 SW ARBOR TREE DRIVE, LEE'S SUMMIT, MO 64082



SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

PROJECT DATA

PROJECT ADDRESS 2915 SW ARBOR TREE DRIVE,
LEE'S SUMMIT, MO 64082

OWNER: TAVITA PONCE

DESIGNER: ESR

SCOPE: 8.580 KW DC ROOF MOUNT
SOLAR PV SYSTEM WITH
22 TRINA SOLAR TSM-390DE09C.07
390W PV MODULES WITH
22 ENPHASE IQ8PLUS-72-2-US
MICROINVERTERS

AUTHORITIES HAVING JURISDICTION:
BUILDING: CITY OF LEE'S SUMMIT
ZONING: CITY OF LEE'S SUMMIT
UTILITY: EVERGY METRO

SHEET INDEX

G001	COVER SHEET
E001	SITE PLAN
S001	ROOF PLAN AND MODULES
E002	ELECTRICAL PLAN
S002	STRUCTURAL DETAIL
E003	ELECTRICAL LINE DIAGRAM
E004	WIRING CALCULATIONS
E005	LABELS
E006	PLACARD
PD001+	EQUIPMENT SPECIFICATIONS

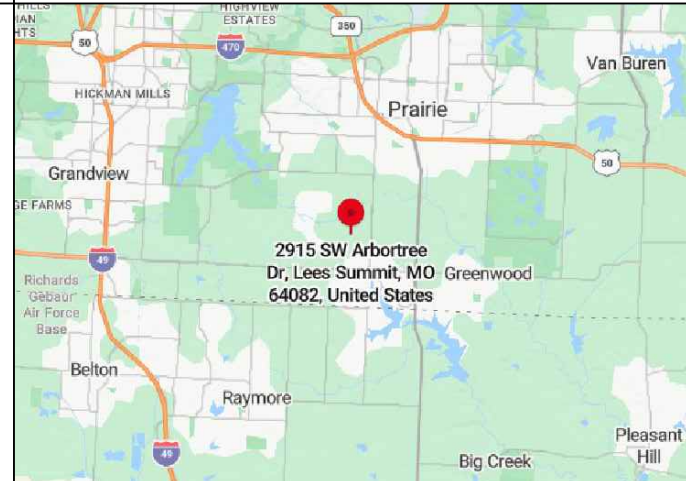
SIGNATURE



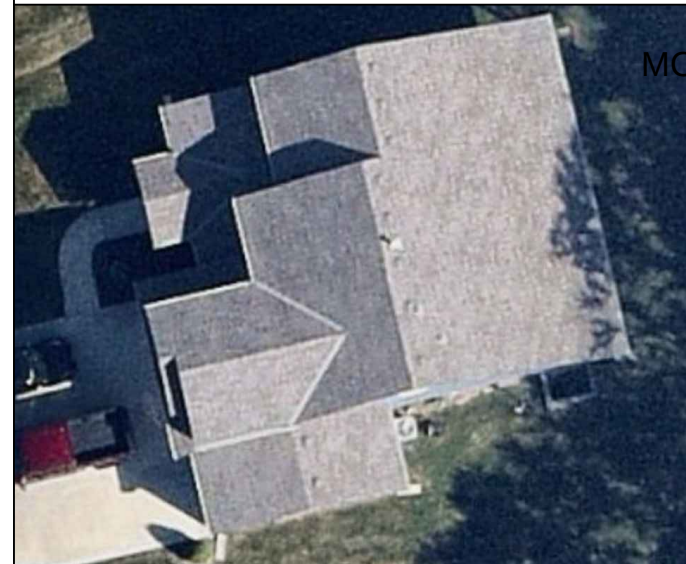
GENERAL NOTES

- ALL COMPONENTS ARE UL LISTED AND NEC CERTIFIED, WHERE WARRANTED.
- THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.
- THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
- ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY.
- WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
- HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
- A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH NEC 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
- PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
- PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE.
- ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
- INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
- THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
- ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
- SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
- PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
- DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]
- ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
- WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
- ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
- ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.
- IN ACCORDANCE WITH 2021 IFC 1205.5, 2018 IFC 1204.4, AND 2015 IFC 605.11.2 A CLEAR, BRUSH-FREE AREA OF 10 FEET(3048 MM) SHALL BE REQUIRED FOR GROUND-MOUNTED PHOTOVOLTAIC ARRAYS.
- PANEL LAYOUT ORIENTATION IS SUBJECT TO CHANGE ON DESIGNED MOUNTING PLANES.

VICINITY MAP



HOUSE PHOTO



CODE REFERENCES

PROJECT TO COMPLY WITH THE FOLLOWING:

2018 INTERNATIONAL BUILDING CODE (IBC)
2018 INTERNATIONAL RESIDENTIAL CODE (IRC)
2018 INTERNATIONAL FIRE CODE (IFC)
2017 NATIONAL ELECTRICAL CODE (NEC)

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



Reviewed and approved
Richard Pantel, P.E.
MO Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

COVER SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

G001

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
11/29/2023 5:13:46

PROJECT DESCRIPTION:

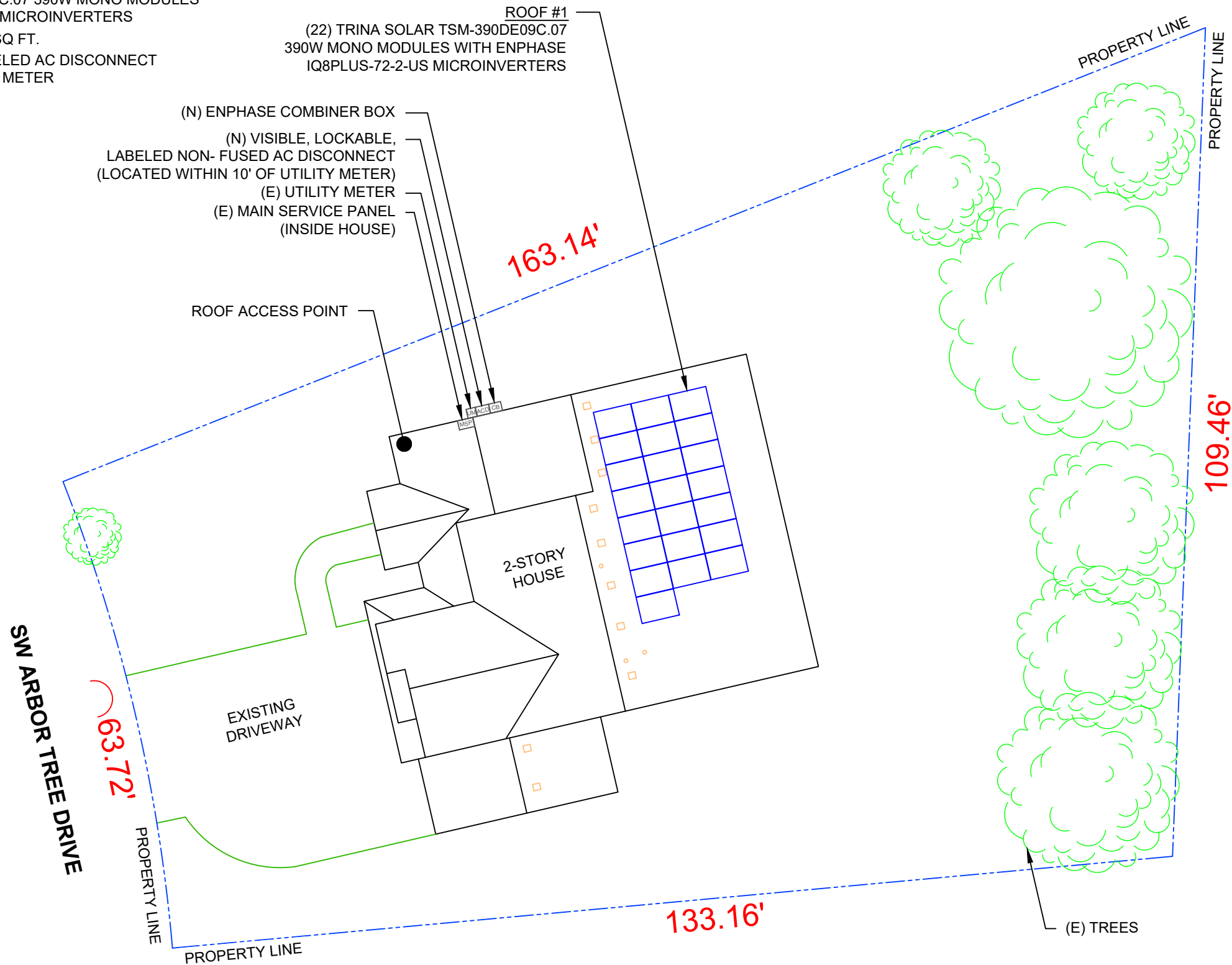
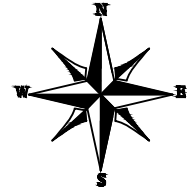
22 TRINA SOLAR TSM-390DE09C.07 390W MONO MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
DC SYSTEM SIZE: 22 x 390 = 8.580KW DC
AC SYSTEM SIZE: 22 x 290 = 6.380KW AC

EQUIPMENT SUMMARY

22 TRINA SOLAR TSM-390DE09C.07 390W MONO MODULES
22 ENPHASE IQ8PLUS-72-2-US MICROINVERTERS

ROOF ARRAY AREA #1:- 455.18 SQ FT.

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



SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



Reviewed and approved
Richard Pantel, P.E.
MO Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

SITE PLAN

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

E001

1

SITE PLAN

E001

SCALE: 1/16" = 1'-0"

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEES SUMMIT, MISSOURI
11/29/2023 5:15:40

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 22 MODULES
MODULE TYPE = TRINA SOLAR TSM-390DE09C.07 390W MONO MODULES
MODULE WEIGHT = 46.3 LBS / 21.0KG.
MODULE DIMENSIONS = 69.06" x 43.15" = 20.69 SF

ACTUAL MAXIMUM CANTILEVER ALLOWED = $L/3$,
WHERE L IS THE ATTACHMENT SPACING
ATTACHMENT SPACING, L = 48"
ACTUAL MAXIMUM CANTILEVER ALLOWED = 48/3
ACTUAL MAXIMUM CANTILEVER ALLOWED = 16", i.e., 1'-4"

ROOF DESCRIPTION					
ROOF TYPE				ASPHALT SHINGLE	
ROOF	# OF MODULES	ROOF PITCH	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	22	27°	77°	2"X4"	24"

ARRAY AREA & ROOF AREA CALC'S		
TOTAL PV ARRAY AREA (SQ. FT.)	TOTAL ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
455.18	2606.34	17

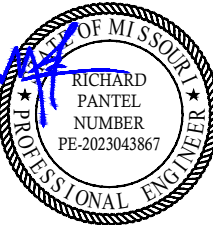


SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



Reviewed and approved
Richard Pantel, P.E.
MO Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

ROOF PLAN AND
MODULES

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

S001

ROOF ACCESS POINT

(E) MAIN SERVICE PANEL
(INSIDE HOUSE)

MSP

18" FIRE SETBACK

18" FIRE SETBACK

18" FIRE SETBACK

36" FIRE SETBACK

36" FIRE SETBACK

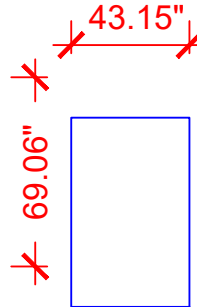
ROOF #1
PITCH - 27°
AZIM. - 77°

CANTILEVER LENGTH 10"

ROOF #1
(22) TRINA SOLAR TSM-390DE09C.07
390W MONO MODULES WITH ENPHASE
IQ8PLUS-72-2-US MICROINVERTERS

(47) EVEREST K2 SYSTEMS SPLICE FOOT XL
ATTACHMENTS

(N) EVEREST K2 SYSTEMS CROSSRAIL 44-X RAIL



TRINA SOLAR
TSM-390DE09C.07
390W MODULES

LEGEND

MSP

- MAIN SERVICE PANEL



- VENT, ATTIC FAN
(ROOF OBSTRUCTION)



- ROOF ATTACHMENT



- TRUSS

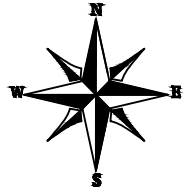
1 ROOF PLAN AND MODULES

S001

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

CIRCUIT LEGENDS
CIRCUIT #1
CIRCUIT #2

NOTE : CONDUIT INSTALLED AT
MINIMUM DISTANCE OF 7/8 INCHES
ABOVE ROOF

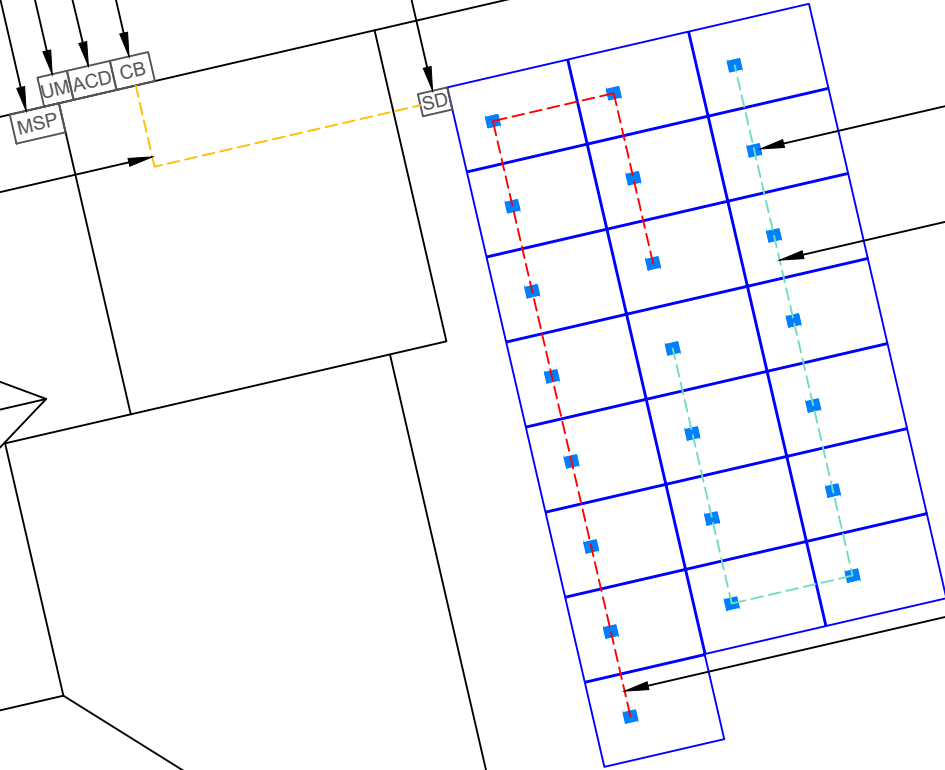


(N) ENPHASE COMBINER BOX
(N) VISIBLE, LOCKABLE,
LABELED NON-FUSED AC DISCONNECT
(LOCATED WITHIN 10' OF UTILITY METER)
(E) UTILITY METER
(E) MAIN SERVICE PANEL
(INSIDE HOUSE)

(N) SOLADECK

(N) CONDUIT

SW ARBOR TREE DRIVE



(22) ENPHASE
IQ8PLUS-72-2-US MICROINVERTERS
LOCATED UNDER EACH PANEL (240V)

CIRCUIT #2
(11 MODULES)

CIRCUIT #1
(11 MODULES)

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULES	22	TRINA SOLAR TSM-390DE09C.07 390W MODULE
MICRO INVERTERS	22	ENPHASE IQ8PLUS-72-2-US MICROINVERTERS
SOLADECK	1	SOLADECK
RAIL	13	EVEREST K2 SYSTEMS CROSSRAIL 44-X RAIL
SPLICES	8	SPLICES
MID MODULE CLAMPS	38	MID MODULE CLAMPS
END CLAMPS	12	END CLAMPS / STOPPER SLEEVE
ATTACHMENTS	47	EVEREST K2 SYSTEMS SPLICE FOOT XL ATTACHMENTS

LEGEND

	- COMBINER BOX		- SOLADECK
	- AC DISCONNECT		- VENT, ATTIC FAN
	- UTILITY METER		(ROOF OBSTRUCTION)
	- MAIN SERVICE PANEL		- ROOF ATTACHMENT
			- TRUSS
			- CONDUIT



SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



Reviewed and approved
Richard Pantel, P.E.
MO Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

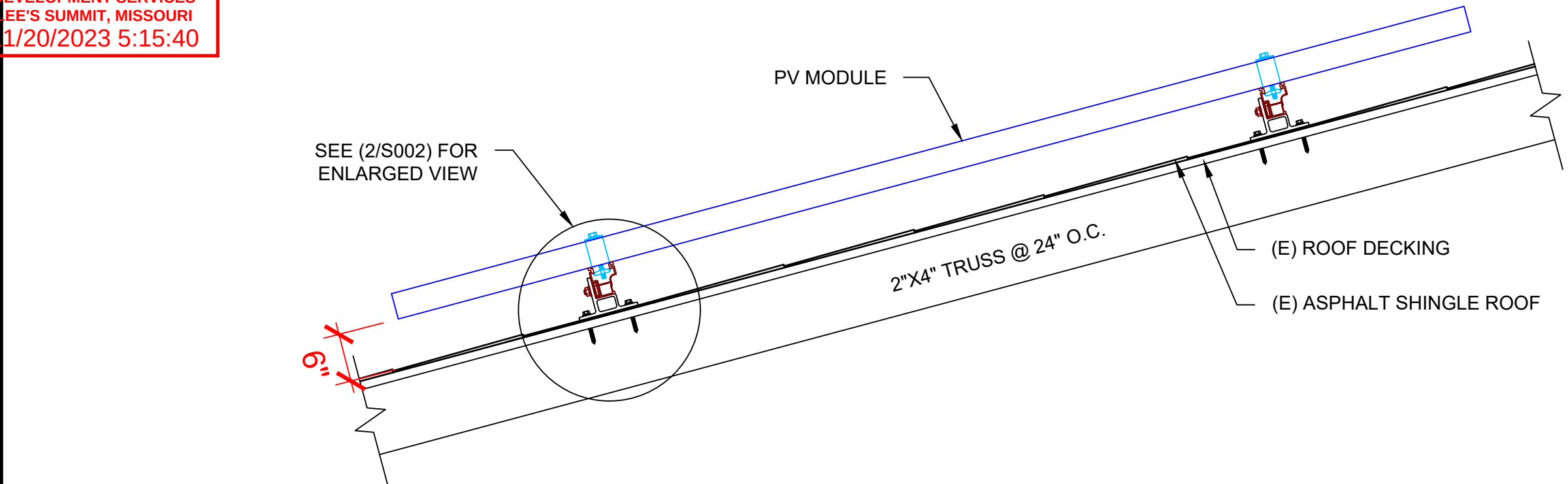
ELECTRICAL PLAN

SHEET SIZE

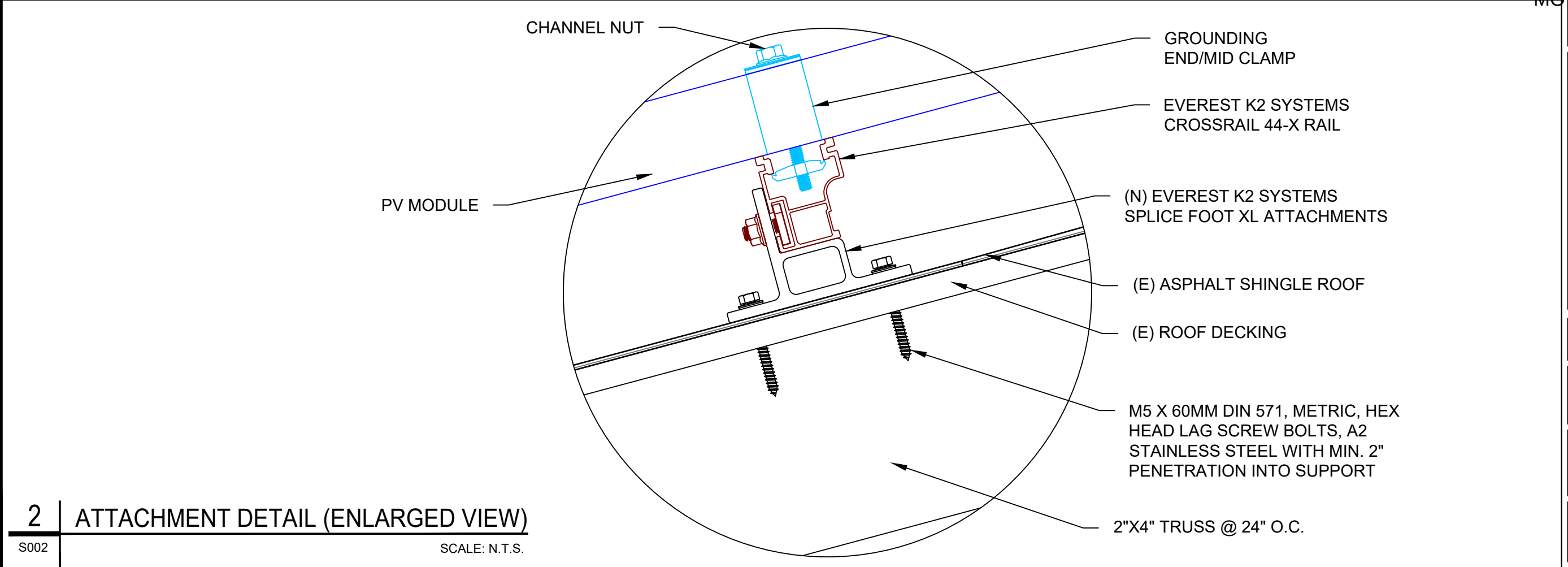
ANSI B
11" X 17"

SHEET NUMBER

E002



1 ATTACHMENT DETAIL (SIDE VIEW)
S002 SCALE: N.T.S.



2 ATTACHMENT DETAIL (ENLARGED VIEW)
S002 SCALE: N.T.S.

SUNERGY SOLAR LLC
7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	

Reviewed and approved
Richard Pantel, P.E.
Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

STRUCTURAL DETAIL

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

S002

DC SYSTEM SIZE: 22 X 390 = 8.580KW DC
AC SYSTEM SIZE: 22 X 250 = 6.380KW AC
11/22 TRINA SOLAR TSM-390DE09C.07 390W MONO MODULES
WITH (22) ENPHASE IQ8PLUS-72-2-US MICROINVERTERS
LOCATED UNDER EACH PANEL (240V)

(2) BRANCH CIRCUITS OF 11 MODULES ARE CONNECTED IN PARALLEL

BACKFEED BREAKER CALCULATION (120% RULE):

(MAIN BUS X 1.2 - MAIN BREAKER) >= (INVERTER CURRENT*1.25)
(200A X 1.2 - 200A) >= (33.28A)
(40A) >= (33.28A) HENCE OK

OCPD CALCULATIONS:

NEC 690.9(B)
(22 IQ8 PLUS) * 1.21A * 1.25 = 33.28A

INTERCONNECTION NOTES:

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

DISCONNECT NOTES:

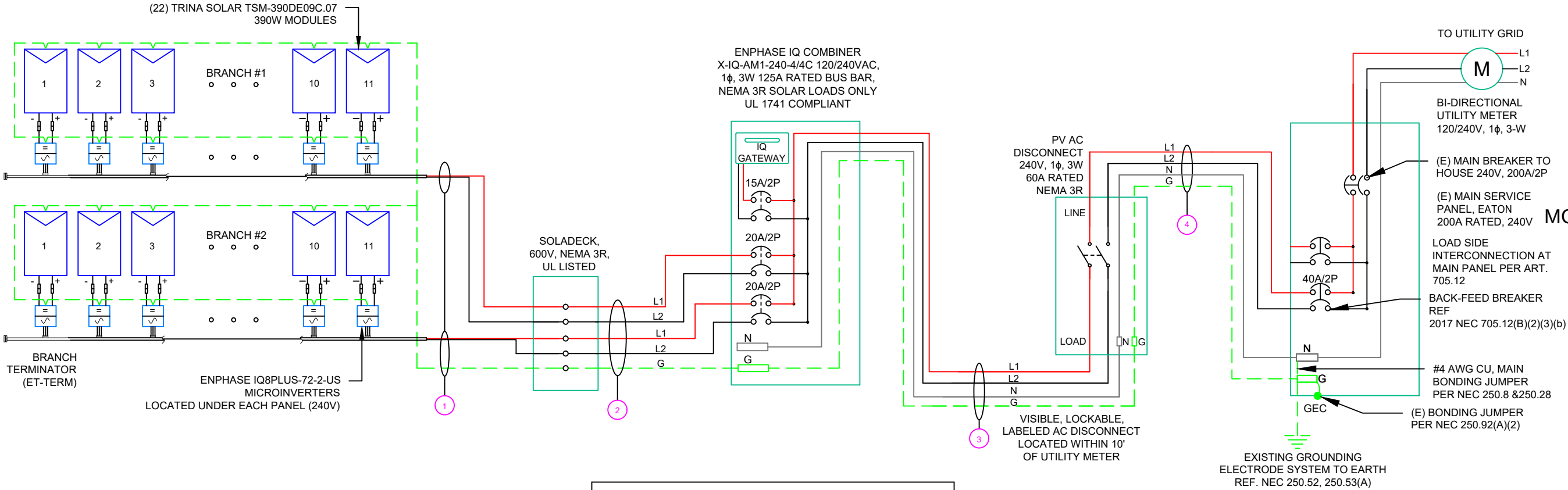
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3.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

RACKING NOTE:

1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER

GROUNDING & GENERAL NOTES:

1. PV GROUNDING ELECTRODE SYSTEM NEEDS TO BE INSTALLED IN ACCORDANCE WITH [NEC 690.43]
2. PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
3. DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
4. ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
5. SOLADECK QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - SOLADECK DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
6. AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.
7. RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.



OCPD CONDUCTOR SIZE	
BREAKER/FUSE SIZE	WIRE GAUGE SIZE (75°C,COPPER)
20A	10 AWG
25A	10 AWG
30A	10 AWG
35A	8 AWG
40A	8 AWG
45A	8 AWG
50A	8 AWG
60A	6 AWG
70A	4 AWG
80A	4 AWG
90A	3 AWG
100A	3 AWG
110A	2 AWG
125A	1 AWG
150A	1/0 AWG
175A	2/0 AWG
200A	3/0 AWG

QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
(4)	CU#12AWG -	ENPHASE ENGAGE CABLE (L1 & L2 NO NEUTRAL)	N/A	N/A
(1)	CU #6AWG -	BARE COPPER IN FREE AIR		
(4)	CU#10AWG -	THWN-2 L1 & L2 #12/2 ROMEX IN	ENT OR LFMC IN ATTIC	3/4"
(1)	CU #10AWG -	CU,THWN-2 GND ATTIC		
(2)	CU #8AWG -	THWN-2 OR THHN L1 & L2	EMT, LFMC OR PVC	3/4"
(1)	CU #8AWG -	CU,THWN-2 OR THHN N		
(1)	CU #10AWG -	CU,THWN-2 OR THHN GND		
(2)	CU #8AWG -	THWN-2 OR THHN L1 & L2		
(1)	CU #8AWG -	CU,THWN-2 OR THHN N	EMT, LFMC OR PVC	3/4"
(1)	CU #10AWG -	CU,THWN-2 OR THHN GND		

NOTE : "CONDUIT SIZE IS MINIMUM REQUIRED PER NEC300.17. CONTRACTOR MAY UPSIZE AS NEEDED".

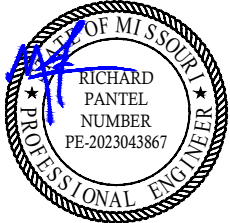


SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



Reviewed and approved
Richard Pantel, P.E.
Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

ELECTRICAL LINE DIAGRAM

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

E003

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEASING AND RENTALS
11/11/2023 5:15:40

INVERTER SPECIFICATIONS	
INVERTER	ENPHASE IQ8PLUS-72-2-US MICROINVERTERS
VOLTAJE	30V MIN/ 58V MAX
MAX INPUT POWER	235W-440W
NOMINAL AC VOLTAGE RATING	240V/ 211-264V
MAX AC CURRENT	1.21A
MAX MODULES PER CIRCUIT	13 (SINGLE PHASE)
MAX OUTPUT POWER	290 VA

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	TRINA SOLAR TSM-390DE09C.07 390W MODULE
VMP	33.8V
IMP	11.54A
VOC	40.8V
ISC	12.14A
TEMP. COEFF. VOC	-0.25%/°C
MODULE DIMENSION	69.06"L x 43.15"W x 1.18"D (In Inch)

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-19°
AMBIENT TEMP (HIGH TEMP 2%)	38°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.25%/°C

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

AC CALCULATIONS																						
CIRCUIT ORIGIN	CIRCIUT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
CIRCUIT 1	SOLADECK	240	13.31	16.64	20	N/A	BARE COPPER #6 AWG	CU #12 AWG	25	PASS	38	2	30	0.91	1	27.3	PASS			0.55	N/A	#N/A
CIRCUIT 2	SOLADECK	240	13.31	16.64	20	N/A	BARE COPPER #6 AWG	CU #12 AWG	25	PASS	38	2	30	0.91	1	27.3	PASS			0.55	N/A	#N/A
SOLADECK	COMBINER BOX	240	13.31	16.64	20	N/A	CU #10 AWG	CU #10 AWG	35	PASS	38	4	40	0.91	0.8	29.12	PASS	30	1.24	0.413	3/4" ENT	19.79362
COMBINER BOX	AC DISCONNECT	240	26.62	33.28	40	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	5	0.778	0.086	3/4" EMT	24.5591
AC DISCONNECT	POI	240	26.62	33.28	40	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	5	0.778	0.086	3/4" EMT	24.5591

Circuit 1 Voltage Drop	1.135
Circuit 2 Voltage Drop	1.135



SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



Reviewed and approved
Richard Pantel, P.E.
MO Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE

2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

E004

ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF SOLADECK, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.
- CONDUIT INSTALLED AT MINIMUM DISTANCE OF 7/8 INCHES ABOVE ROOFNEC 310.15(B)(3)(C)

CAUTION:
AUTHORIZED SOLAR
PERSONNEL ONLY!

LABEL- 1:
LABEL LOCATION:
AC DISCONNECT

WARNING

ELECTRICAL SHOCK HAZARD

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

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

WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

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

WARNING

TURN OFF PHOTOVOLTAIC AC
DISCONNECT PRIOR TO
WORKING INSIDE PANEL

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

CAUTION

PHOTOVOLTAIC SYSTEM CIRCUIT IS
BACKFEED

LABEL- 5:
LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(B)(3-4) & NEC 690.59



WARNING

POWER SOURCE OUTPUT
CONNECTION. DO NOT
RELOCATE THIS
OVERCURRENT DEVICE

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



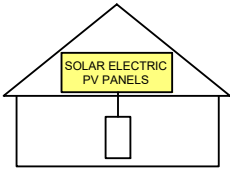
WARNING

THIS EQUIPMENT FED BY
MULTIPLE SOURCES. TOTAL
RATING OF ALL OVERCURRENT
DEVICES EXCLUDING MAIN
SUPPLY OVERCURRENT DEVICE
SHALL NOT EXCEED AMPACITY
OF BUSBAR.

LABEL- 7:
LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(B)(3)(2)

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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



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

RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM

LABEL- 9:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.56(C)(2)

PHOTOVOLTAIC

AC DISCONNECT

LABEL- 10:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.13(B)

PHOTOVOLTAIC
AC DISCONNECT

NOMINAL OPERATING AC VOLATGE 240 V
RATED AC OUTPUT CURRENT 26.62 A

LABEL- 11:
LABEL LOCATION:
MAIN SERVICE PANEL
SUBPANEL
AC DISCONNECT
CODE REF: NEC 690.54

MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT

LABEL- 12:
LABEL LOCATION:
MAIN SERVICE DISCONNECT (ONLY IF MAIN SERVICE DISCONNECT IS PRESENT)
CODE REF: NEC 690.13(B)

CAUTION
POWER TO THIS SERVICE IS
ALSO SUPPLIED FROM ON-SITE
SOLAR/WIND GENERATION

AC SYSTEM DISCONNECT

LABEL-13:
LABEL LOCATION:
AC DISCONNECT

CAUTION

ALTERNATIVE POWER SUPPLY
AC SYSTEM DISCONNECT

LABEL-14:
LABEL LOCATION:
AC DISCONNECT

SUNERGY SOLAR LLC
EMERGENCY CONTACT
(727) 375-9375

LABEL- 15:
LABEL LOCATION:
MAIN SERVICE DISCONNECT
CODE REF: NFPA 1 (11.12.2.1.5)

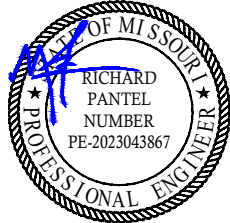


SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



Reviewed and approved
Richard Pantel, P.E.
MO Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

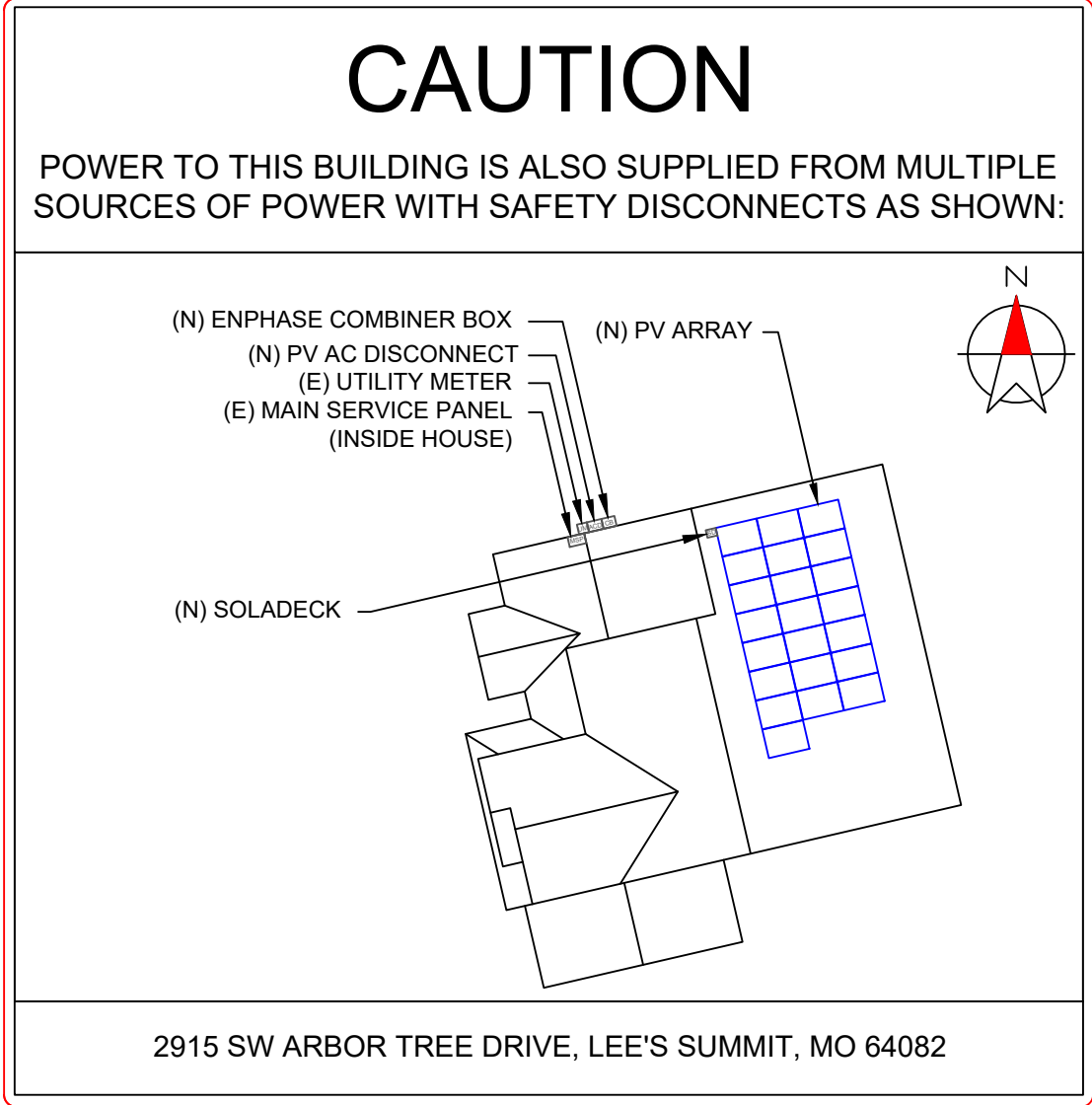
LABELS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

E005



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(A)&(B), [NEC 705.10])

LABELING NOTES:

1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
2. LABELING REQUIREMENTS BASED ON THE 2017 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
3. MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21]
5. LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY



SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



Reviewed and approved
Richard Pantel, P.E.
MO Lic. No. PE-2023043867
11/1/2023

PROJECT NAME & ADDRESS

PONCE
RESIDENCE

2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY
ESR

SHEET NAME
PLACARD

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

SHEET NUMBER
E006

Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

Mono Multi Solutions

PRODUCT: TSM-DE09C.07
PRODUCT RANGE: 380-405W

405W

MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

21.1%

MAXIMUM EFFICIENCY



High value

- More productivity from same roof size.
- Outstanding visual appearance.
- Leading 210mm cell technology.



Small in size, big on power

- Small format module allow greater energy generation in limited space.
- Up to 405W, 21.1% module efficiency with high density interconnect technology.
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current.
- Reduce installation cost with higher power bin and efficiency.
- Boost performance in warm weather with lower temperature coefficient (-0.34%) and operating temperature.



Universal solution for residential and C&I rooftops

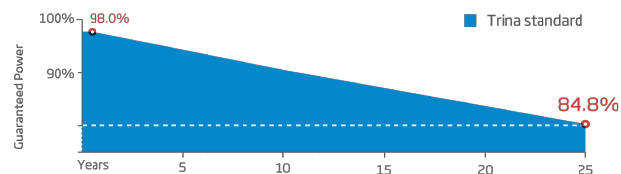
- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems.
- Perfect size and low weight makes handling and transportation easier and more cost-effective.
- Diverse installation solutions for flexibility in system deployment



High Reliability

- 25 year product warranty.
- 25 year performance warranty with lowest degradation.
- Minimized micro-cracks with innovative non-destructive cutting technology.
- Ensured PID resistance through cell process and module material control.
- Mechanical performance up to +6000 Pa and -4000 Pa negative load

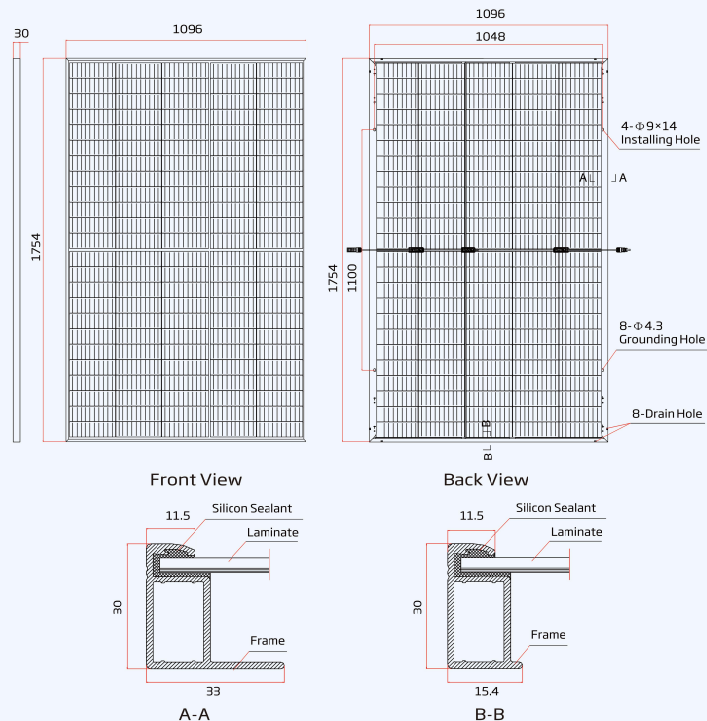
Trina Solar's Backsheet Performance Warranty



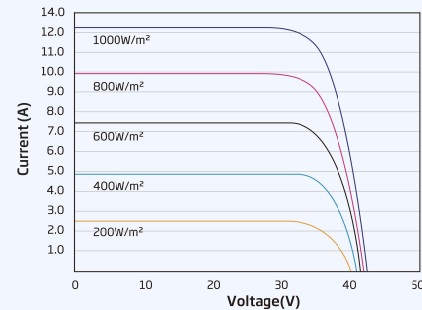
Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

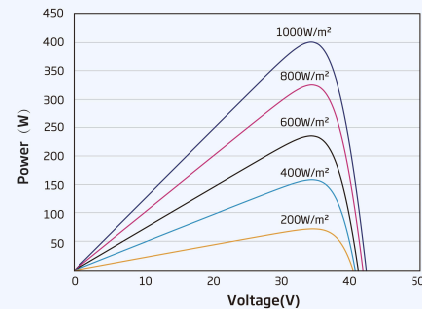
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(400W)



P-V CURVES OF PV MODULE(400W)



ELECTRICAL DATA (STC)

Peak Power Watts - P _{MAX} (Wp)*	380	385	390	395	400	405
Power Tolerance - P _{MAX} (W)			0 ~ +5			
Maximum Power Voltage - V _{MPP} (V)	33.4	33.6	33.8	34.0	34.2	34.4
Maximum Power Current - I _{MPP} (A)	11.38	11.46	11.54	11.52	11.70	11.77
Open Circuit Voltage - V _{OC} (V)	40.4	40.6	40.8	41.0	41.2	41.4
Short Circuit Current - I _{SC} (A)	12.00	12.07	12.14	12.21	12.28	12.34
Module Efficiency - η _m (%)	19.8	20.0	20.3	20.5	20.8	21.1

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

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

Total Equivalent power - P _{MAX} (Wp)	407	412	417	423	428	433
Maximum Power Voltage - V _{MPP} (V)	33.4	33.6	33.8	34.0	34.2	34.4
Maximum Power Current - I _{MPP} (A)	12.19	12.26	12.34	12.44	12.51	12.59
Open Circuit Voltage - V _{OC} (V)	40.4	40.6	40.8	41.0	41.2	41.4
Short Circuit Current - I _{SC} (A)	12.92	13.00	13.08	13.20	13.25	13.36
Irradiance ratio (rear/front)	10%					

Power Bifaciality: 70±5%.

ELECTRICAL DATA (NOCT)

Maximum Power - P _{MAX} (Wp)	286	290	294	298	302	305
Maximum Power Voltage - V _{MPP} (V)	31.4	31.6	31.8	31.9	32.1	32.4
Maximum Power Current - I _{MPP} (A)	9.12	9.18	9.24	9.32	9.38	9.42
Open Circuit Voltage - V _{OC} (V)	38.0	38.2	38.4	38.6	38.8	38.9
Short Circuit Current - I _{SC} (A)	9.67	9.73	9.78	9.84	9.90	9.94

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

MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	120 cells
Module Dimensions	1754×1096×30 mm (69.06×43.15×1.18 inches)
Weight	21.0 kg (45.3 lb)
Glass	3.2mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Backsheet	Transparent backsheet
Frame	30mm(1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), Portrait: 350/280 mm (13.78/11.02 inches) Landscape: N 1100 mm / P 1100 mm (43.31/43.31 inches)
Connector	MC4 EVQ2 / TS4*

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P _{MAX}	-0.34%/°C
Temperature Coefficient of V _{OC}	-0.25%/°C
Temperature Coefficient of I _{SC}	0.04%/°C

MAXIMUM RATINGS

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

WARRANTY

25 year Product Workmanship Warranty
25 year Power Warranty
2% first year degradation
0.55% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 36 pieces
Modules per 40' container: 828 pieces

Comprehensive Products and System Certificates



IEC61215/IEC61730/IEC61701/IEC62716/UL61730
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupational Health and Safety Management System

Trina solar

Trina solar

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

© 2022 Trina Solar Co., Ltd. All rights reserved. Specifications included in this datasheet are subject to change without notice.

Version number: TSM_NA_2022_A

www.trinasolar.com

sunergy

SUNERGY SOLAR LLC

7625 LITTLE RD, SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME
MODULE
DATASHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PD001



DATA SHEET



IQ8 and IQ8+ Microinverters

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



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



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



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



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

Easy to install

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

High productivity and reliability

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

Microgrid-forming

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

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

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

IQ8 and IQ8+ Microinverters

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

(1) No enforced DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility>

(2) Maximum continuous input DC current is 10.6A (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-DS-0002-01-EN-US-2022-03-17



SUNERGY SOLAR LLC

7625 LITTLE RD, SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

MICROINVERTER
DATASHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PD002

Data Sheet
Enphase Networking

Enphase
IQ Combiner 4/4C
X-IQ-AM1-240-4
X-IQ-AM1-240-4C



LISTED
To learn more about Enphase offerings, visit enphase.com

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



Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
ACCESSORIES AND REPLACEMENT PARTS (not included, order separately)	
Ensemble Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
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

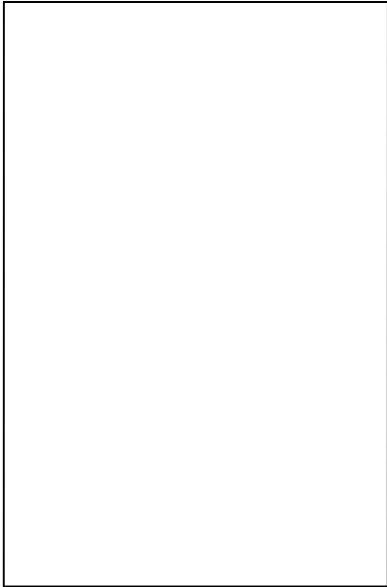
To learn more about Enphase offerings, visit enphase.com
© 2021 Enphase Energy. All rights reserved. Enphase, the Enphase logo, IQ Combiner 4/4C, and other names are trademarks of Enphase Energy, Inc. Data subject to change. 10-21-2021



SUNERGY SOLAR LLC

7625 LITTLE RD. SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



PROJECT NAME & ADDRESS

PONCE
RESIDENCE

2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY
ESR

SHEET NAME
COMBINER BOX
DATASHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PD003

We support PV systems
Formerly Everest Solar Systems



Splice Foot XL

Patent Pending

TECHNICAL SHEET

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

Technical Data

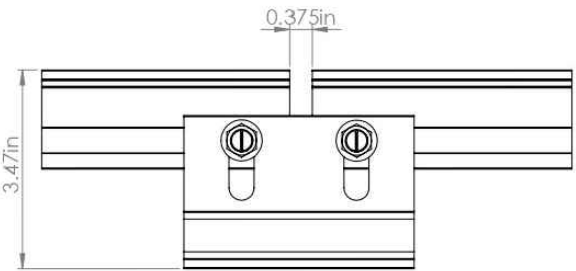
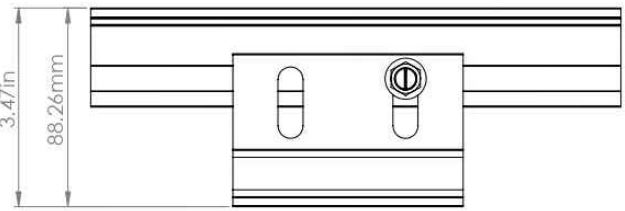
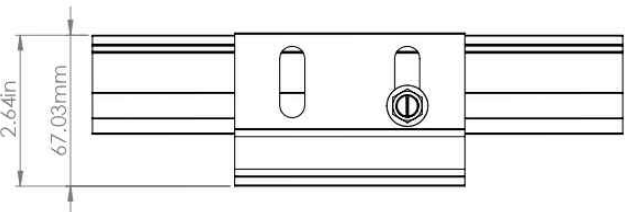
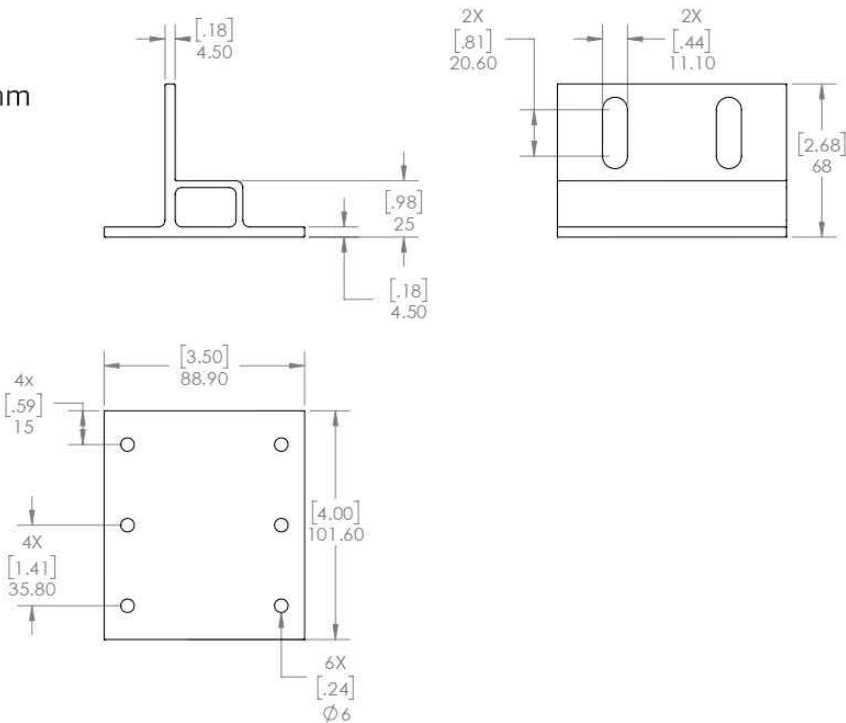
	Splice Foot XL
Roof Type	Composition shingle
Material	Aluminum with stainless steel hardware
Finish	Mill
Roof Connection	M5 x 60 lag screws
Code Compliance	UL 2703
Compatibility	CrossRail 44-X, 48-X, 48-XL, 80

k2-systems.com

We support PV systems
Formerly Everest Solar Systems



Units: [in] mm



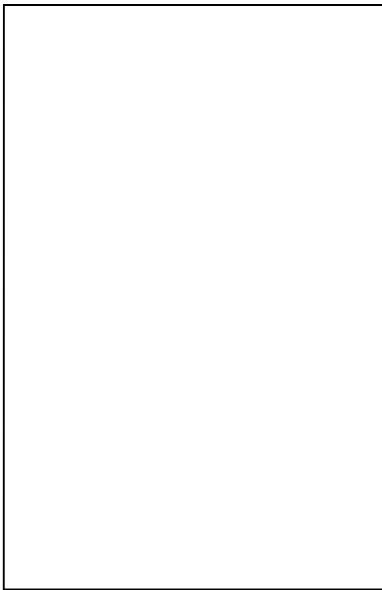
k2-systems.com



SUNERGY SOLAR LLC

7625 LITTLE RD, SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

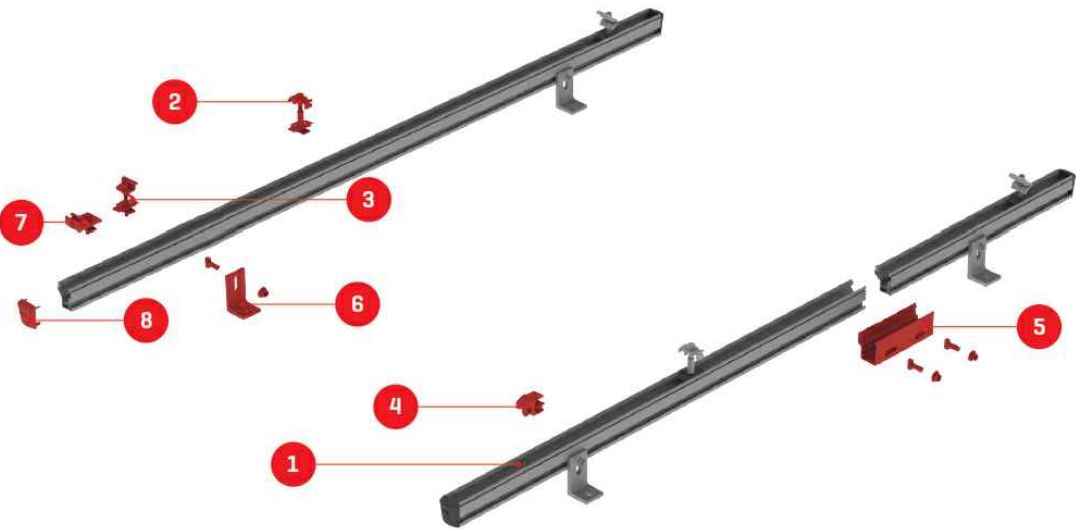
DRAWN BY ESR

SHEET NAME ATTACHMENT DATASHEET

SHEET SIZE ANSI B 11" X 17"

SHEET NUMBER PD004

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

k2-systems.com

We support PV systems
Formerly Everest Solar Systems



CROSSRAIL 44-X



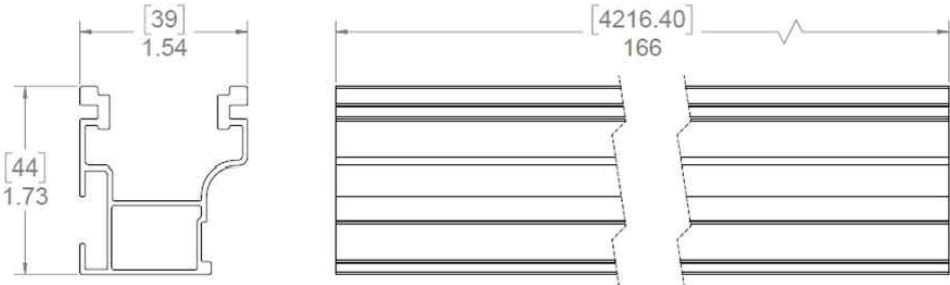
Mechanical Properties

	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

k2-systems.com



SUNERGY SOLAR LLC

7625 LITTLE RD, SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	

PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY

ESR

SHEET NAME

RACKING
DATASHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PD005

SolaDeck

FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURE

Basic Features

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



SolaDeck Model SD 0783



SolaDeck UL50 Type 3R Enclosures

Available Models:

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



SolaDeck UL 1741 Combiner/Enclosures

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

Max Rated - 600VDC, 120AMPS

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

**Typical System Configuration

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

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

**Typical System Configuration

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

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



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



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



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

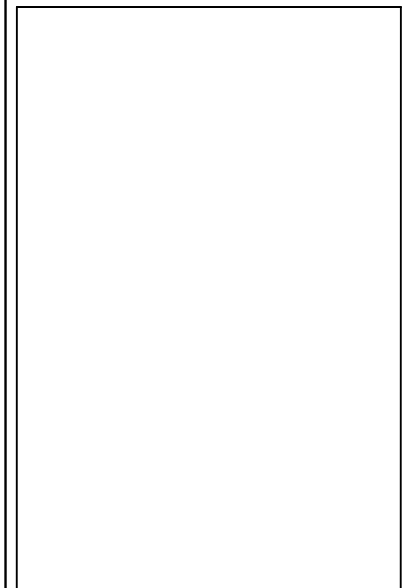
RSTC Enterprises, Inc • 2219 Heimstead Road • Eau Claire, WI 54703
For product information call 1(866) 367-7782



SUNERGY SOLAR LLC

7625 LITTLE RD, SUITE 200A,
NEW PORT RICHEY, FL 34654

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	11/01/2023	



PROJECT NAME & ADDRESS

PONCE
RESIDENCE
2915 SW ARBOR TREE
DRIVE, LEE'S SUMMIT,
MO 64082

DRAWN BY
ESR

SHEET NAME
SOLADECK DATASHEET

SHEET SIZE
ANSI B 11" X 17"

SHEET NUMBER
PD006