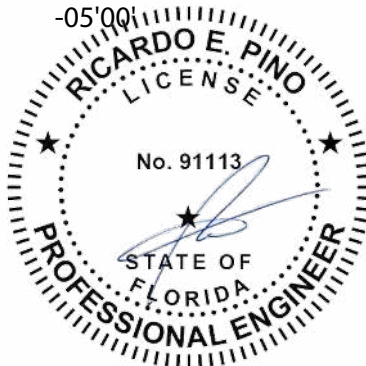
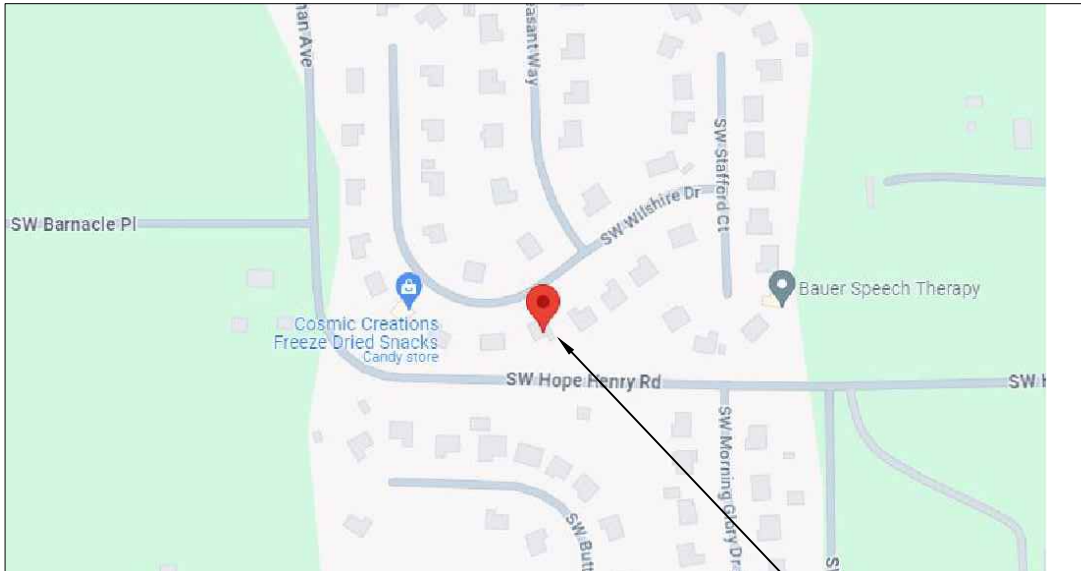


ROOF MOUNT PHOTOVOLTAIC SYSTEM									
CODES:				CONSTRUCTION NOTES:				Date: 2024.01.30 12:57:37 -05'00'  This item has been digitally signed and sealed by Ricardo E. Pino on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.	
THIS PROJECT COMPLIES WITH THE FOLLOWING: 2020 7TH EDITION FLORIDA BUILDING CODE: BUILDING 2020 7TH EDITION FLORIDA BUILDING CODE: RESIDENTIAL 2020 7TH EDITION FLORIDA BUILDING CODE: MECHANICAL 2020 7TH EDITION FLORIDA BUILDING CODE: PLUMBING 2020 7TH EDITION FLORIDA BUILDING CODE: FUEL GAS 2020 7TH EDITION FLORIDA BUILDING CODE: ENERGY CONSERVATION 2020 7TH EDITION FLORIDA BUILDING CODE: EXISTING BUILDING 2020 7TH EDITION FLORIDA BUILDING CODE: ACCESSIBILITY 2020 7TH EDITION FLORIDA FIRE PREVENTION CODE 2017 NATIONAL ELECTRIC CODE AS ADOPTED BY COUNTY OF COLUMBIA				CONDUIT AND CONDUCTOR SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.					
				ALL SOLAR ENERGY SYSTEM EQUIPMENT SHALL BE SCREENED TO THE MAXIMUM EXTENT POSSIBLE AND SHALL BE PAINTED A COLOR SIMILAR TO THE SURFACE UPON WHICH THEY ARE MOUNTED.					
				MODULES SHALL BE TESTED , LISTED AND INDENTIFIED WITH FIRE CLASSIFICATION IN ACCORDANCE WITH UL 2703. SMOKE AND CARBON MONOXIDE ALARMS ARE REQUIRED PER SECTION R314 AND 315 TO BE VERIFIED AND INSPECTED BY INSPECTOR IN THE FIELD.					
				DIG ALERT (811) TO BE CONTACTED AND COMPLIANCE WITH EXCAVATION SAFETY PRIOR TO ANY EXCAVATION TAKING PLACE					
				PHOTOVOLTAIC SYSTEM GROUND WILL BE TIED INTO EXISTING GROUND AT MAIN SERVICE FROM DC DISCONNECT/INVERTER AS PER 2017 NEC SEC 250.166(A).					
				SOLAR PHOTOVOLTAIC SYSTEM EQUIPMENT WILL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF ART. 690 OF THE 2017 NEC					
VICINITY MAP:				THE MAIN SERVICE PANEL WILL BE EQUIPPED WITH A GROUND ROD OR UFER					
				UTILITY COMPANY WILL BE NOTIFIED PRIOR TO ACTIVATION OF THE SOLAR PV SYSTEM					
				SOLAREEDGE OPTIMIZERS ARE LISTED TO IEC 62109-1 (CLASS II SAFETY) AND UL 1741 STANDARDS					
				INSTALL CREW TO VERIFY ROOF STRUCTURE PRIOR TO COMMENCING WORK. EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNT.					

LEGEND:



CHIMNEY



PIPE VENT



MODULES



CONDUIT



SETBACK



AC DISCONNECT



JUNCTION BOX



INVERTER



MAIN SERVICE PANEL

TOTAL ROOF AREA RIDGE SETBACK CALCS:

TOTAL ROOF AREA: 2993.27 SQ FT

SINGLE MODULE AREA: 20.54626938 SQ FT

TOTAL NUMBER OF MODULES: 27

TOTAL AREA OF MODULES: 554.75 SQ FT

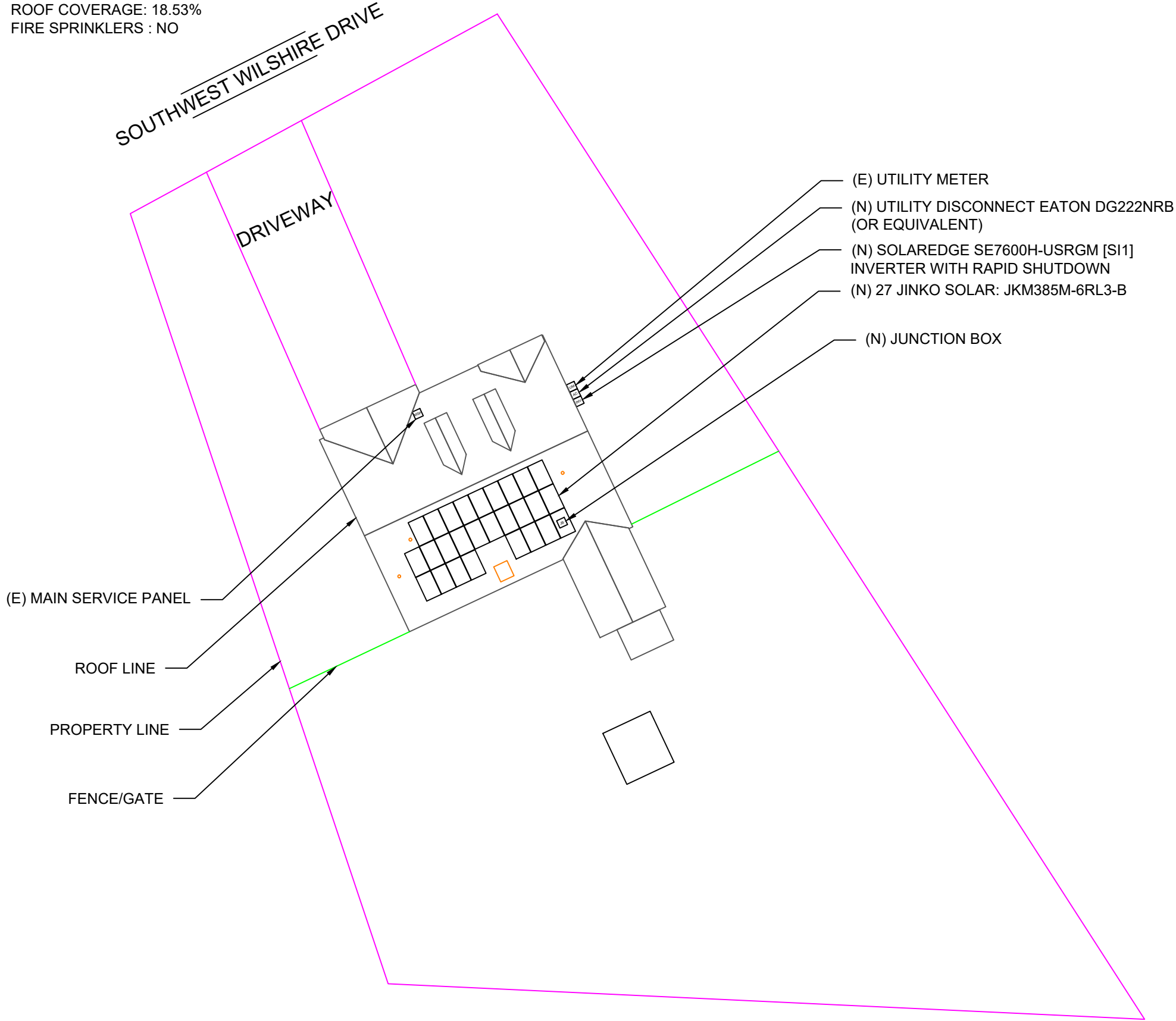
ROOF COVERAGE: 18.53%

FIRE SPRINKLERS : NO

THIS SYSTEM DESIGNED WITH:

WIND SPEED: 120

WIND EXPOSURE: C



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PV SYSTEM
10.395 kW-DC
7.600 kW-AC

ROOF AREA: 2993.27 SQ FT

CLIENT:
LOURDES VALIDO
212 SOUTHWEST WILSHIRE DRIVE, LAKE CITY, FL 32024
AHJ: COUNTY OF COLUMBIA
UTILITY: "CLAY ELECTRIC COOPERATIVE, INC. "
METER: 156 216 474
PHONE: (386) 466-7028
EMAIL: LORIVALIDO07@GMAIL.COM
FINANCE: OTHER

SYSTEM:
SYSTEM SIZE (DC): 27 X 385 = 10.395 kW
SYSTEM SIZE (AC): 7.600 kW @ 240V
MODULES: 27 X JINKO SOLAR: JKM385M-6RL3-B
OPTIMIZERS: 27 X SOLAREDGE S440
INVERTER: SOLAREDGE SE7600H-USRGM [SI1]

REVISIONS		
NO.	REVISED BY	DATE
-	-	-
-	-	-
-	-	-



FREEDOM FOREVER LLC
2619 CONSULATE DR SUITE 800, ORLANDO, FL 32819
Tel: (800) 385-1075
GREG ALBRIGHT

CONTRACTOR LICENSE:
CERTIFIED ELECTRICAL CONTRACTOR
EC13008056

SITE PLAN

JOB NO:	DATE:	DESIGNED BY:	SHEET:
402297	1/25/2024	P.O.	PV-2



SITE PLAN
SCALE: 1/24" = 1'-0"

1

LEGEND:

 CHIMNEY

 PIPE VENT

 MODULES

 CONDUIT

 SETBACK

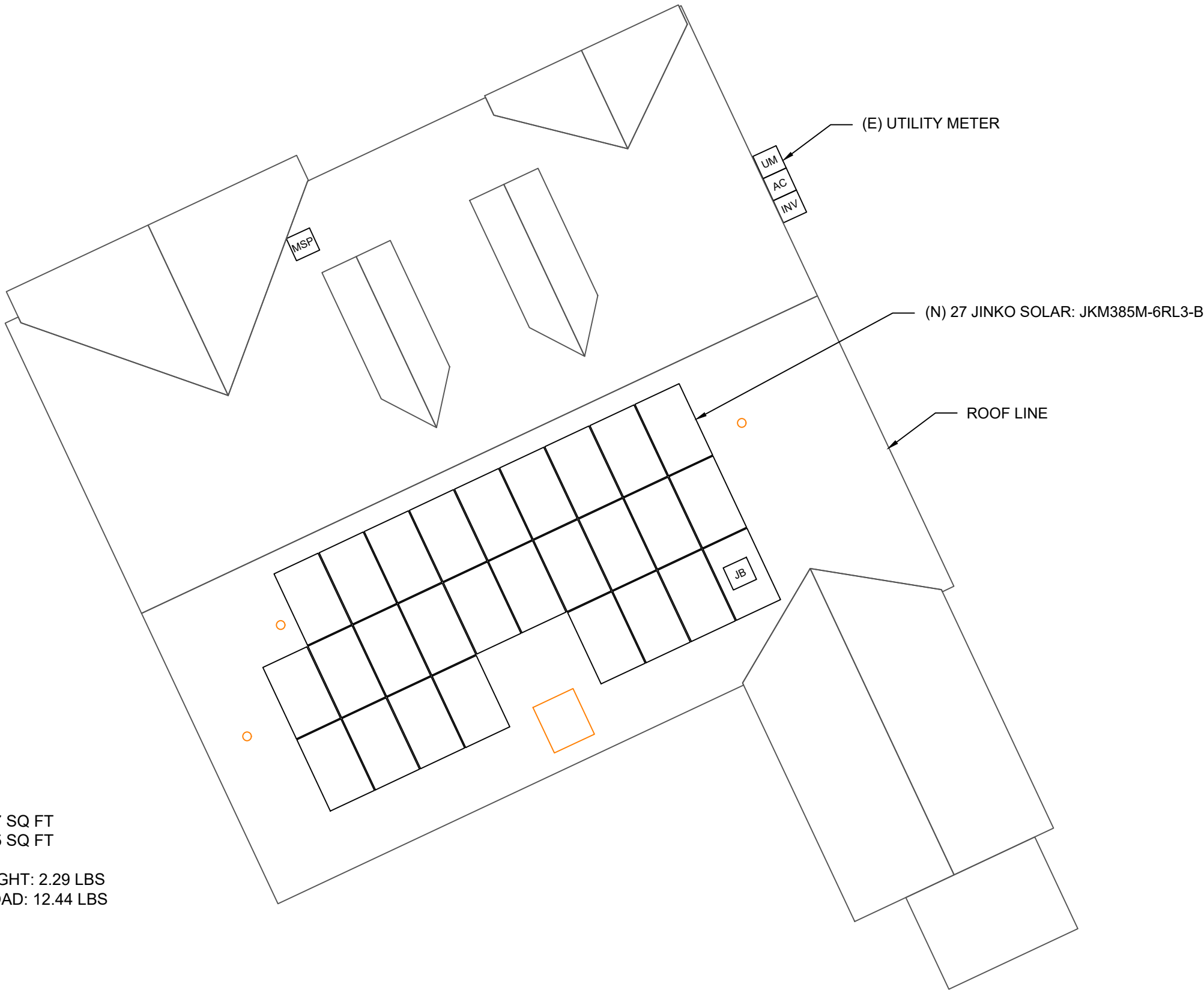
 AC DISCONNECT

 JUNCTION BOX

 INVERTER

 MAIN SERVICE PANEL

THIS SYSTEM DESIGNED WITH:
WIND SPEED: 120
WIND EXPOSURE: C



TOTAL ROOF AREA: 2993.27 SQ FT
TOTAL ARRAY AREA: 554.75 SQ FT
ARRAY COVERAGE: 18.53%
SYSTEM DISTRIBUTED WEIGHT: 2.29 LBS
S-5!: SOLARFOOT POINT-LOAD: 12.44 LBS



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

1

- NOTES:
- EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNTS
 - ATTACHED CLAMPS AT 25% FROM THE EDGE AND 50% FROM THE CENTER OF THE MODULES
 - JUNCTION BOX IS MOUNTED TO THE RAIL.

Avial
Lumagui

Digitally signed
by Avial Lumagui
Date: 2024.01.30
11:58:55 -05'00'



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PV SYSTEM
10.395 kW-DC
7.600 kW-AC

ROOF AREA: 2993.27 SQ FT

CLIENT:
LOURDES VALIDO
212 SOUTHWEST WILSHIRE DRIVE, LAKE
CITY, FL 32024
AHJ: COUNTY OF COLUMBIA
UTILITY: "CLAY ELECTRIC COOPERATIVE,
INC. "
METER: 156 216 474
PHONE: (386) 466-7028
EMAIL: LORIVALIDO07@GMAIL.COM
FINANCE: OTHER

SYSTEM:
SYSTEM SIZE (DC): 27 X 385 = 10.395 kW
SYSTEM SIZE (AC): 7.600 kW @ 240V
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JKM385M-6RL3-B
OPTIMIZERS: 27 X SOLAREEDGE S440
INVERTER: SOLAREEDGE SE7600H-USRGM
[S11]

REVISIONS		
NO.	REVISED BY	DATE
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-	-	-
-	-	-



FREEDOM FOREVER LLC
2619 CONSULATE DR SUITE 800, ORLANDO,
FL 32819
Tel: (800) 385-1075
GREG ALBRIGHT

Signature of Greg Albright

CONTRACTOR LICENSE:
CERTIFIED ELECTRICAL CONTRACTOR
EC13008056

ROOF PLAN WITH MODULES LAYOUT

JOB NO:	DATE:	DESIGNED BY:	SHEET:
402297	1/25/2024	P.O.	PV-2A

ROOF DETAILS:

TOTAL ROOF AREA: 2993.27 SQ FT
TOTAL ARRAY AREA: 554.75 SQFT
ARRAY COVERAGE: 18.53%
SYSTEM DISTRIBUTED WEIGHT: 2.29 LBS
S-5I: SOLARFOOT POINT-LOAD: 12.44 LBS



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ROOF AREA STATEMENT						
ROOF	MODULE QUANTITY	ROOF PITCH	ARRAY PITCH	AZIMUTH	ROOF AREA	ARRAY AREA
ROOF 1	27	26	26	154.84	1237.09 SQ FT	554.75 SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT

CLIENT:
LOURDES VALIDO
212 SOUTHWEST WILSHIRE DRIVE, LAKE CITY, FL 32024
AHJ: COUNTY OF COLUMBIA
UTILITY: "CLAY ELECTRIC COOPERATIVE, INC. "
METER: 156 216 474
PHONE: (386) 466-7028
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FINANCE: OTHER

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JKM385M-6RL3-B
OPTIMIZERS: 27 X SOLAREEDGE S440
INVERTER: SOLAREEDGE SE7600H-USRGM [S11]

REVISIONS		
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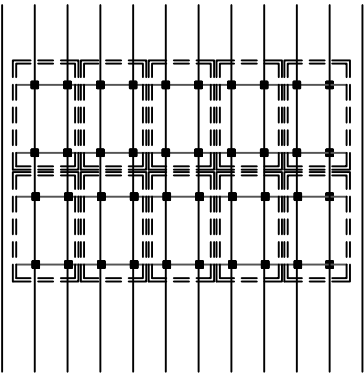
FREEDOM FOREVER LLC
2619 CONSULATE DR SUITE 800, ORLANDO, FL 32819
Tel: (800) 385-1075
GREG ALBRIGHT



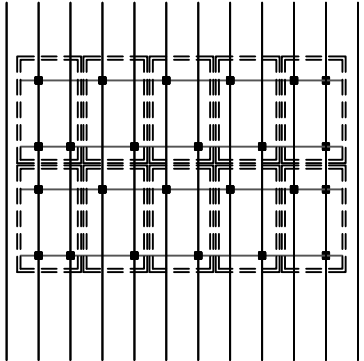
CONTRACTOR LICENSE:
CERTIFIED ELECTRICAL CONTRACTOR
EC13008056

ARRAY DETAILS			
JOB NO: 402297	DATE: 1/25/2024	DESIGNED BY: P.O.	SHEET: PV-2B

TABLE 1 - ARRAY INSTALLATION									
	ROOF PITCH	ROOFING TYPE	ATTACHMENT TYPE	FRAMING TYPE	MAX UNBRACED LENGTH(FT.)	STRUCTURAL ANALYSIS RESULT	PENETRATION PATTERN	MAX ATTACHMENT SPACING (IN.)	MAX RAIL OVERHANG(I N.)
ROOF 1	26	Trapezoidal Metal	S-5 Solarfoot	2x4 @ 24" O.C.	7	PASS	STACKED	33	24
1. CONTRACTOR TO VERIFY FRAMING TYPE AND MAX UNBRACED LENGTH PRIOR TO INSTALLATION. IF THE ABOVE INFORMATION DOES NOT MATCH FIELD CONDITIONS, NOTIFY ENGINEER OF RECORD IMMEDIATELY.									
2. WHERE COLLAR TIES OR RAFTER SUPPORTS EXIST, CONTRACTOR SHALL USE RAFTERS WITH COLLAR TIES AS ATTACHMENT POINTS.									
3. MAX RAIL OVERHANG APPLICABLE FOR RAILED ATTACHMENT INSTALLATIONS.									



STACKED DETAIL
For Illustration purposes only



STAGGERED DETAIL
For Illustration purposes only



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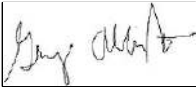
CLIENT:
LOURDES VALIDO
212 SOUTHWEST WILSHIRE DRIVE, LAKE CITY, FL 32024
AHJ: COUNTY OF COLUMBIA
UTILITY: "CLAY ELECTRIC COOPERATIVE, INC. "
METER: 156 216 474
PHONE: (386) 466-7028
EMAIL: LORIVALIDO07@GMAIL.COM
FINANCE: OTHER

SYSTEM:
SYSTEM SIZE (DC): 27 X 385 = 10.395 kW
SYSTEM SIZE (AC): 7.600 kW @ 240V
MODULES: 27 X JINKO SOLAR:
JKM385M-6RL3-B
OPTIMIZERS: 27 X SOLAREEDGE S440
INVERTER: SOLAREEDGE SE7600H-USRGM [SI1]

REVISIONS		
NO.	REVISED BY	DATE
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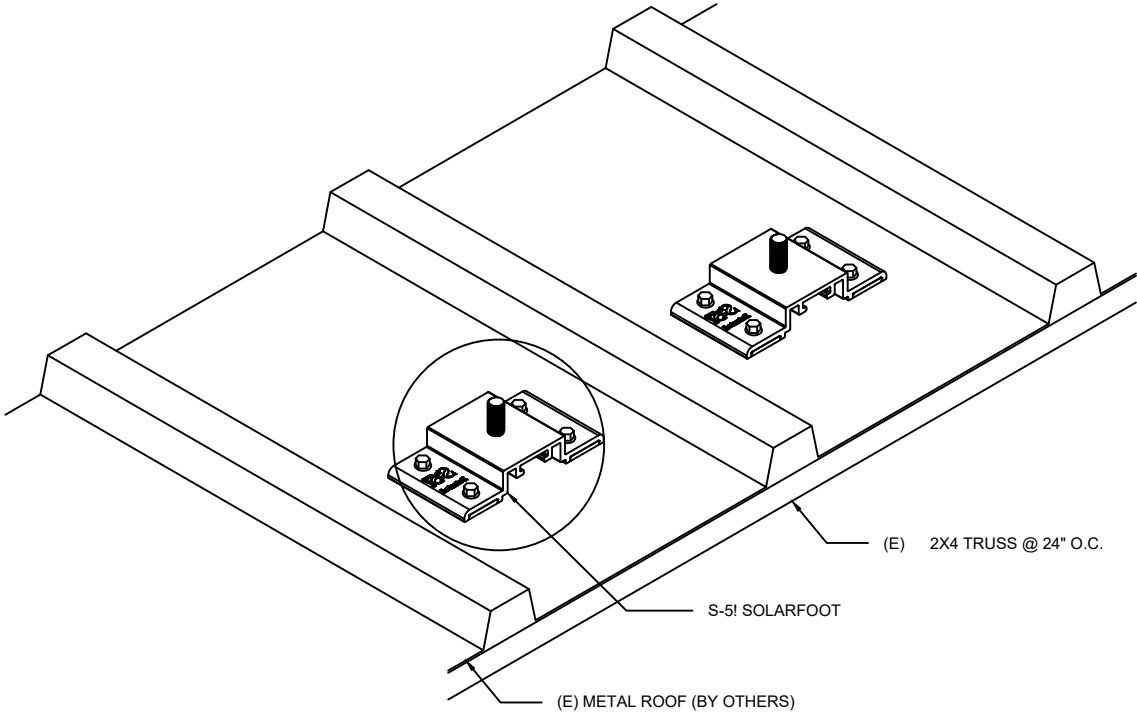
FREEDOM FOREVER LLC
2619 CONSULATE DR SUITE 800, ORLANDO, FL 32819
Tel: (800) 385-1075
GREG ALBRIGHT



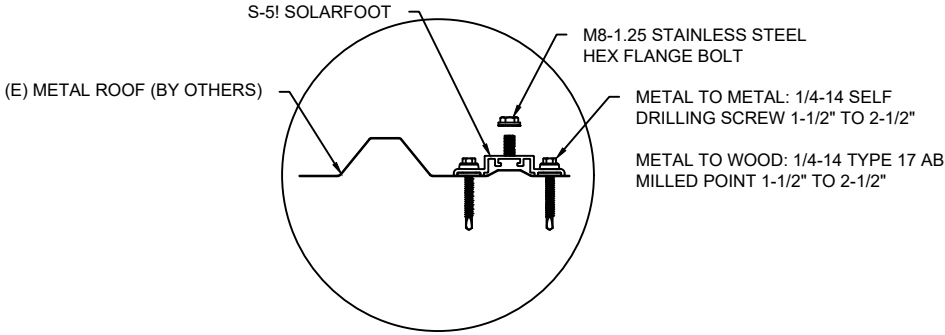
CONTRACTOR LICENSE:
CERTIFIED ELECTRICAL CONTRACTOR
EC13008056

MOUNTING DETAILS

JOB NO:	DATE:	DESIGNED BY:	SHEET:
402297	1/25/2024	P.O.	PV-3



SOLAR PV ARRAY SECTION VIEW
Scale: NTS



ATTACHMENT DETAIL
Scale: NTS

BACKFEED FUSE SIZING						
MAX. CONTINUOUS OUTPUT 32.00A @ 240V						
32.00	X	1.25	=	40AMPS	40A FUSES - OK	



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PV SYSTEM
10.395 kW-DC
7.600 kW-AC

CLIENT:
LOURDES VALIDO
212 SOUTHWEST WILSHIRE DRIVE, LAKE CITY, FL 32024
AHJ: COUNTY OF COLUMBIA
UTILITY: "CLAY ELECTRIC COOPERATIVE, INC. "
METER: 156 216 474
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OPTIMIZERS: 27 X SOLAREEDGE S440
INVERTER: SOLAREEDGE SE7600H-USRGM [SI1]

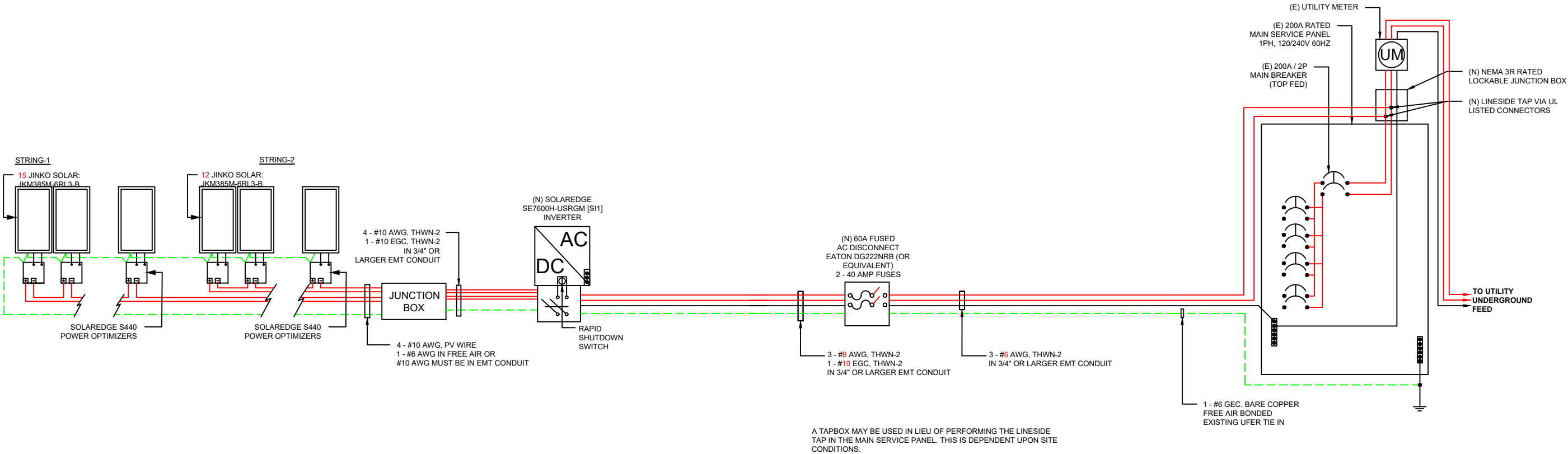
REVISIONS		
NO.	REVISED BY	DATE
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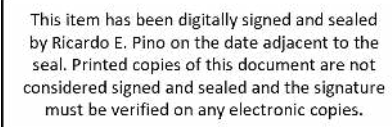
FREEDOM FOREVER LLC
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Tel: (800) 385-1075
GREG ALBRIGHT
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CERTIFIED ELECTRICAL CONTRACTOR
EC13008056

THREE LINE DIAGRAM

JOB NO: 402297	DATE: 1/25/2024	DESIGNED BY: P.O.	SHEET: PV-4
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NOTE:
CONDUIT AND CONDUCTORS SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS



CONDUCTOR AMPACITY CALCULATIONS IN ACCORDANCE WITH NEC 690.8.

SYSTEM:
SYSTEM SIZE (DC): 27 X 385 = 10.395 kW
SYSTEM SIZE (AC): 7.600 kW @ 240V
MODULES: 27 X JINKO SOLAR:
JKM385M-6RL3-B
OPTIMIZERS: 27 X SOLAREEDGE S440
INVERTER: SOLAREEDGE SE7600H-USRGM
[SI1]



freedom™
FOREVER

Gay Albert

CONDUCTOR CALCULATIONS

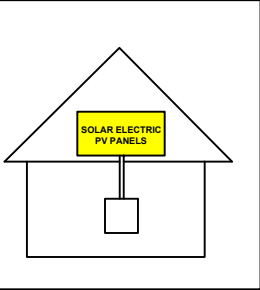
JOB NO: 402297	DATE: 1/25/2024	DESIGNED BY: P.O.	SHEET: PV-5
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WARNING:
POWER SOURCE OUTPUT
CONNECTION
DO NOT RELOCATE THIS
OVERCURRENT DEVICE.

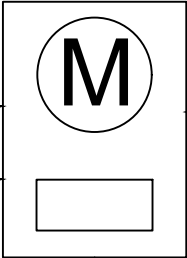
705.12(B)(2)(3)(b)

**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



690.56(C)(1)(A)

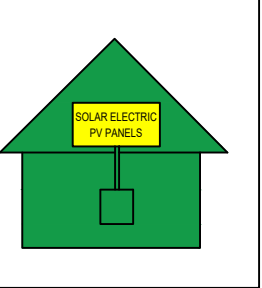


"WARNING"
DUAL POWER SOURCES
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM
RATED AC OUTPUT CURRENT - 32.00 AMPS
AC NORMAL OPERATING VOLTAGE - 240 VOLTS

690.54

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

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



NFPA 11.12.2.1.1.1.1

**PV SYSTEM AC DISCONNECT
RATED AC OUTPUT CURRENT - 32.00 AMPS
AC NORMAL OPERATING VOLTAGE - 240 VOLTS**

690.15, 690.54

**RAPID SHUTDOWN SWITCH FOR
SOLAR PV SYSTEM**

690.56(C)(3)

AC

INVERTER

If you have any questions about your system, please call
our Customer Support Team at
888.557.6431
or visit freedomforever.com/customer-service

This solar PV system was installed by

freedom
FOREVER

*Freedom Forever is a licensed contractor in all states it operates in. For more information visit freedomforever.com/licenses

NOTES:

1. NEC ARTICLES 690 AND 705 AND IRC SECTION R324 MARKINGS SHOWN HEREON.
2. ALL MARKING SHALL CONSIST OF THE FOLLOWING:
 - A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING.
 - B. RED BACKGROUND COLOR WHITE TEXT AND LINE WORK.
 - C. ARIAL FONT.
3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATIONS SPECIFIED. SIGNAGE CANNOT BE HAND-WRITTEN.
4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH POP-RIVETS OR SCREWS



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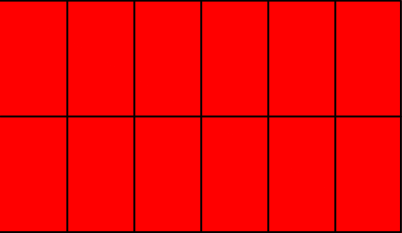
"WARNING"
ELECTRICAL SHOCK HAZARD.
TERMINALS ON BOTH LINE AND LOAD SIDES
MAY BE ENERGIZED IN THE OPEN POSITION.

690.13 (B)

**MAXIMUM POWER
POINT CURRENT (Impp) 25.253/256A or 20A
MAXIMUM POWER
POINT VOLTAGE (Vmp): 400V
MAXIMUM SYSTEM
VOLTAGE (Vmax): 480V
SHORT-CIRCUIT
CURRENT (Isc): 20A**

690.53

ARRAY



NEC 690.31(G)(3) & (4)

"WARNING"
PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT AND ENCLOSURES

CLIENT:
LOURDES VALIDO
212 SOUTHWEST WILSHIRE DRIVE, LAKE
CITY, FL 32024
AHJ: COUNTY OF COLUMBIA
UTILITY: "CLAY ELECTRIC COOPERATIVE,
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MODULES: 27 X JINKO SOLAR:
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OPTIMIZERS: 27 X SOLAREEDGE S440
INVERTER: SOLAREEDGE SE7600H-USRGM
[SI1]

REVISIONS		
NO.	REVISED BY	DATE
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-	-	-
-	-	-



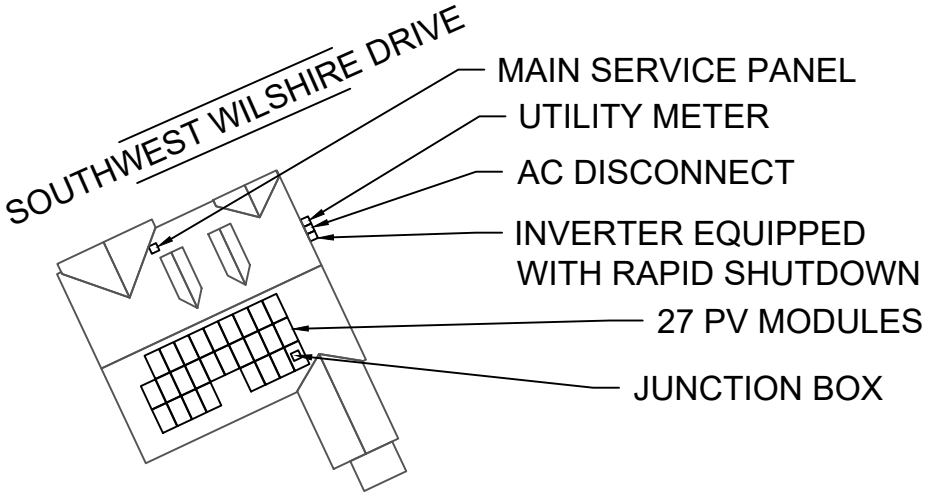
FREEDOM FOREVER LLC
2619 CONSULATE DR SUITE 800, ORLANDO,
FL 32819
Tel: (800) 385-1075
GREG ALBRIGHT

CONTRACTOR LICENSE:
CERTIFIED ELECTRICAL CONTRACTOR
EC13008056

LABELS			
JOB NO: 402297	DATE: 1/25/2024	DESIGNED BY: P.O.	SHEET: PV-7

CAUTION:

POWER TO THIS BUILDING IS
ALSO SUPPLIED FROM THE
FOLLOWING SOURCES WITH
DISCONNECTS AS SHOWN



WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT
PRIOR TO WORKING INSIDE PANEL



NOTES:

1. NEC ARTICLES 690 AND 705 AND IRC SECTION R324 MARKINGS SHOWN HEREON.
2. ALL MARKING SHALL CONSIST OF THE FOLLOWING:
 - A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING.
 - B. RED BACKGROUND COLOR WHITE TEXT AND LINE WORK.
 - C. AERIAL FONT.
3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATIONS SPECIFIED. SIGNAGE CANNOT BE HAND-WRITTEN.
4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH POP-RIVETS OR SCREWS.



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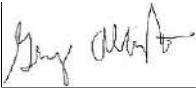
CLIENT:
LOURDES VALIDO
212 SOUTHWEST WILSHIRE DRIVE, LAKE CITY, FL 32024
AHJ: COUNTY OF COLUMBIA
UTILITY: "CLAY ELECTRIC COOPERATIVE, INC. "
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REVISIONS		
NO.	REVISED BY	DATE
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-	-	-
-	-	-



FREEDOM FOREVER LLC
2619 CONSULATE DR SUITE 800, ORLANDO, FL 32819
Tel: (800) 385-1075
GREG ALBRIGHT



CONTRACTOR LICENSE:
CERTIFIED ELECTRICAL CONTRACTOR
EC13008056

SITE PLACARD			
JOB NO: 402297	DATE: 1/25/2024	DESIGNED BY: P.O.	SHEET: PV-7A

SAFETY PLAN

INSTRUCTIONS:

1. USE SYMBOLS IN KEY TO MARK UP THIS SHEET.
2. SAFETY PLAN MUST BE MARKED BEFORE JOB STARTS AS PART OF THE PRE-PLAN
3. DOCUMENT ALL ADDITIONAL HAZARDS ON THIS PAGE & MAKE NOTES ON THE JHA SHEET

INCIDENT REPORTING:

INJURIES - CALL INJURY HOTLINE
(855) 400-7233
**If injury is life threatening, call 911 first THEN the Injury Hotline*

NON-INJURIES - USE MOBILE INCIDENT REPORTING
 (Auto, Property Damage, Near Miss)

NEAREST OCCUPATIONAL/INDUSTRIAL CLINIC:

NAME: _____

ADDRESS: _____

NEAREST HOSPITAL:

NAME: _____

ADDRESS: _____

SAFETY COACH CONTACT INFORMATION:

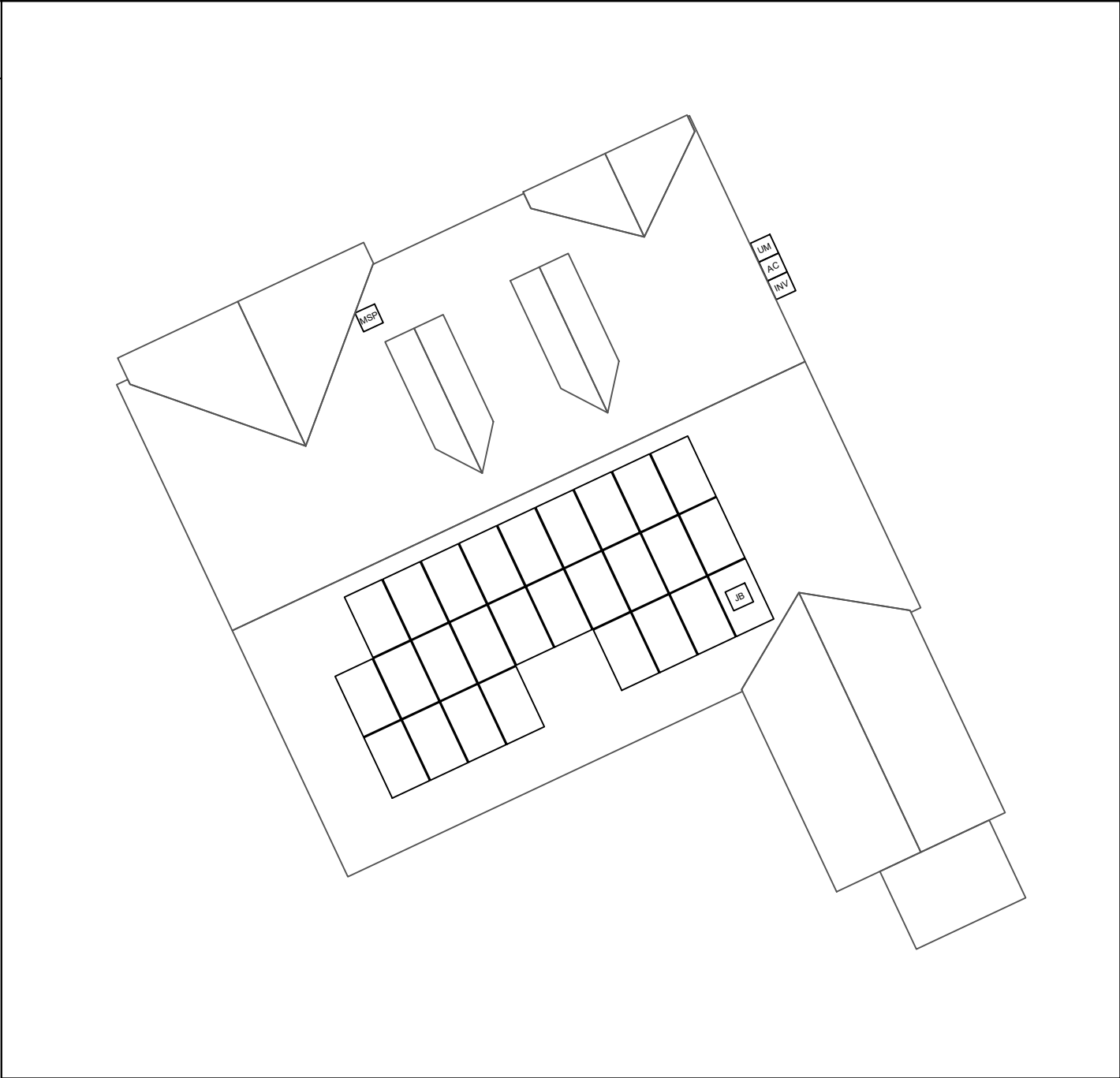
NAME: _____

PHONE NUMBER: _____

ALL EMPLOYEES ON SITE SHALL BE MADE AWARE OF THE SAFETY PLAN AND SIGN INDICATING THAT THEY ARE AWARE OF THE HAZARDS ON-SITE AND THE PLAN FOR WORKING SAFELY.

<u>NAME</u>	<u>SIGNATURE</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

DATE: _____ TIME: _____



MARK UP KEY

	PERMANENT ANCHOR
	TEMPORARY ANCHOR
	INSTALLER LADDER
	JUNCTION / COMBINER BOX
	STUB-OUT
	SKYLIGHT
	NO LADDER ACCESS (STEEP GRADE OR GROUND LEVEL OBSTRUCTIONS)
	RESTRICTED ACCESS
	CONDUIT
	GAS SHUT OFF
	WATER SHUT OFF
	SERVICE DROP
	POWER LINES

POLICIES

INSTRUCTIONS:

1. SCAN QR LINK BELOW TO ACCESS ALL FREEDOM FOREVER SAFETY POLICIES AND PROGRAMS.

CLIENT:

LOURDES VALIDO
212 SOUTHWEST WILSHIRE DRIVE, LAKE CITY, FL 32024
AHJ: COUNTY OF COLUMBIA
UTILITY: "CLAY ELECTRIC COOPERATIVE, INC. "
METER: 156 216 474
PHONE: (386) 466-7028
EMAIL: LORIVALIDO07@GMAIL.COM
FINANCE: OTHER

SYSTEM:

SYSTEM SIZE (DC): 27 X 385 = 10.395 kW
SYSTEM SIZE (AC): 7.600 kW @ 240V
MODULES: 27 X JINKO SOLAR:
JKM385M-6RL3-B
OPTIMIZERS: 27 X SOLAREEDGE S440
INVERTER: SOLAREEDGE SE7600H-USRGM [SI1]

REVISIONS		
NO.	REVISED BY	DATE
-	-	-
-	-	-
-	-	-

freedom[™]
FOREVER

FREEDOM FOREVER LLC

2619 CONSULATE DR SUITE 800, ORLANDO, FL 32819

Tel: (800) 385-1075

GREG ALBRIGHT

CONTRACTOR LICENSE:

CERTIFIED ELECTRICAL CONTRACTOR
EC13008056

SAFETY PLAN

JOB NO:	DATE:	DESIGNED BY:	SHEET:
402297	1/25/2024	P.O.	PV-9

	REVISIONS	
NO.	REVISED BY	DATE
-	-	-
-	-	-
-	-	-



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FL 32819
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GREG ALBRIGHT

Gay Allen

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SAFETY PLAN

JOB NO: 402297	DATE: 1/25/2024	DESIGNED BY: P.O.	SHEET: PV-9
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JOB HAZARD ANALYSIS

Crew leader to fill out all sections below, hold a pre-job safety meeting with all personnel, and upload this completed document and the Safety Plan to Site Capture

Ladder Access

- Ladders must be inspected before each use.
 - Extension ladders must be set up on a firm and level surface at a 4-to-1 rise to run angle (or 75 degrees) and the top must be secured to the structure. Extension style ladders placed on uneven, loose or slippery surfaces must additionally have the base firmly anchored or lashed so the base will not slip out.
 - Extension ladders must be used with walk-through devices or the ladder must extend 36" above the stepping off point.
 - A-frame ladders must only be climbed with the ladder spreader bars locked in the open position; A-frame ladders shall not be climbed while in the closed position (ex, closed and used while leaned against a structure).
- Additional notes:

Mobile Equipment

- Only Qualified operators will operate equipment; operators must maintain a certification on their person for the equipment being operated.
- Type(s) of mobile equipment (Type/Make/Model):
- Qualified operator(s):

Material Handling and Storage

- Materials will be staged/stored in a way that does not present a hazard to client, personnel or public. Materials stored on the roof will be physically protect from failing or sliding off.

Fall Protection

- A site-specific plan for fall prevention and protection is required prior to starting work and must remain onsite at all times until work is complete; a fall rescue plan must be outlined and discussed among the crew prior to work start.
- First-person-Up (FPU) must install their anchor and connect before any other task, including installing other anchors. The Last-Person-Down (LPD) must be the only person on a roof uninstalling fall protection.

- FPCP (name and title):
- FPU and LPD (name and title):

Electrical Safety

- The Electrical Qualified Person (EQP) is required onsite to perform electrical work.
 - All electrical work will be performed with equipment in an electrically safe condition (de-energized) unless approval has been granted prior to work.
 - Service drops and overhead electrical hazards will be indentified and protected from contact, as neccessary.
- EQP (name and tile):

Public Protection

- The safety of the Client and Public must be maintained at all times.
- The Client and the Public shall be prevented from entering the work zone through the use of barriers and/or signage, as required.
- Company, Client and Public property shall be protected from falling objects.
- Pets (including dogs) shall be secured by their owners prior to work start.
- The Client should not leave pets, family members, or others in charge or care of Employees, Contractors, or Temporary Workers.

- Crew leader responsible for communication with the client:
- Client and public is excluded from work area by barricades (N/A, Yes, No):

Training and Pre-Job Safety Briefing

- All employees onsite shall be made aware of the specific hazards of this project and review this HJA during a pre-job briefing, and their signature indicates awareness of site conditions and the plan to eliminate any hazards identified prior to and during the project.
- Crew leader (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):

Airborne Contaminants:

- Asbestos-containing (Transite) piping (ACP) - Do not disturb (move, drill, cut fracture, etc.)
- Asbestos-containing thermal insulation (ACI) and Asbestos-containing duct wrapping (ACW) - do not disturb, no attic or crawlspace access is allowed if work to be performed could cause exposure to personnel, client or public.

- If yes, list specific tasks and protection in place:

Weather and Environment

- The site supervisor shall forecast the weather conditions at the job site, prior to crew arrival, in order to mitigate any hazards associated with inclement weather (heat, cold, wind, rain, etc.)
 - The site supervisor will utilized a portable wind meter (anemometer) to verify actual onsite wind conditions, by checking at the ground and on any elevated work surface (ex, rooftop) prior to work start, at midday and prior to solar panel staging on a roof.
 - Elevated work involving the moving or maneuvering of solar panels shall cease at 25mph (sustained wind) until wind subsides.
- Forecasted weather maximum temp (degrees f):

Heat Related Illness Prevention

- Employees shall have access to potable drinking water that is fresh, pure, and suitably cool. The water shall be located as close as practicable to the areas where employees are working. Water shall be supplied in sufficient quantity at the beginning of the work shift to provide at least one quart per employee per hour for drinking for the entire shift. Employees may begin the shift with smaller quantities of water if they identify the location and have effective means for replenishment during the shift to allow employees to drink on quart or more per hour. The frequent drinking of water shall be encouraged.
- Shade shall be present when temperature exceeds 80 degrees Fahrenheit. When the outdoor temperature in the work exceeds 80 degrees Fahrenheit, employees shall have and maintain one or more areas with shade at all times.
- New employees must be acclimatized. New employees will be monitored by their Crew Leader (site supervisor) for the first two (2) weeks of employment or longer when necessary.
- Employees will be allowed and encouraged to implement scheduled breaks during each shift. Employees must take cool-down breaks in the shade any time they feel the need to do so to protect them from overheating. Supervisors are REQUIRED to allow employees any break period they need during high heat conditions.
- Cool Vests are encouraged for all employees at all times during periods of high heat.
- Identify the location of the closet Occupational/Industrial Clinic or Hospital in case a crew member becomes ill.

What is the specific plan to provide and replenish sufficient water for all employees on site?

- If offsite replenish is necessary, where will you go to replenish water (location/address):
- Who will replenish the drinking water (name):

Restroom facilities

- Employees shall have access to restroom facilities with hand-washing stations. Use of onsite restroom is at the client's discretion (location is annotated below). If client does not give permission, location of suitable restroom facilities with hand-washing stations offsite will be provided. The onsite supervisor will identify location and make arrangements to ensure all employees have access at any point.

- Restroom facilities will be (circle one): Onsite - Offsite
- If Offsite, add location name and address:

Incident Reporting Procedure

- Contact your Site Supervisor
- Name:
- Phone:
- Contact your Manager
- Name:
- Phone:
- Contact your Site Supervisor
- Name:
- Phone:

With: Your full name, phone number, office location, brief description of what happen and when.

NOTE ADDITIONAL HAZARDS NOT ADDRESSED ABOVE
(add as many as necessary by using additional sheets)

Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:
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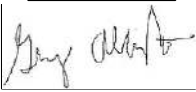
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AHJ: COUNTY OF COLUMBIA
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OPTIMIZERS: 27 X SOLAREEDGE S440
INVERTER: SOLAREEDGE SE7600H-USRGM [S11]

	REVISIONS	
NO.	REVISED BY	DATE
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EC13008056

SAFETY PLAN			
JOB NO: 402297	DATE: 1/25/2024	DESIGNED BY: P.O.	SHEET: PV-10

FOR INSTALLATION REFERENCE ONLY

SCAN QR CODE TO ACCESS REFERENCE LINK

FREEDOM REFERENCES



INSTALL HOTLINE

PV INSTALLATION REFERENCES



ENPHASE



SOLAREEDGE



TESLA

BATTERY INSTALLATION REFERENCES



Enphase Storage Systems



SOLAREEDGE Storage Systems



TESLA Storage Systems



NON-BACKUP Battery Systems



Misc. Quick Guide



EAGLE
MODULES

THE MOST DEPENDABLE SOLAR PRODUCT

EAGLE 66TR G4

380-400 WATT TILING RIBBON MODULE

Positive power tolerance of 0~+3%

- NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- Top performance in the strictest 3rd party labs
- Premium solar factories in USA, Vietnam, and Malaysia

KEY FEATURES



TR Technology

Tiling Ribbon eliminates cell gaps to increase module efficiency and power.



9BB Half Cell Technology

Uniquely designed 9 busbar half cut solar cells deliver ultra-high power in a small footprint.



Shade Tolerant

Twin array design allows continued performance even with shading by trees or debris.



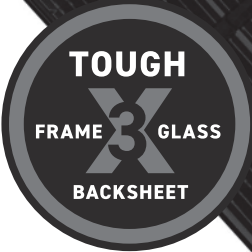
Thick and Tough

Fire Type 1 rated module engineered with a thick frame, 3.2mm front side glass, and thick backsheet for added durability.

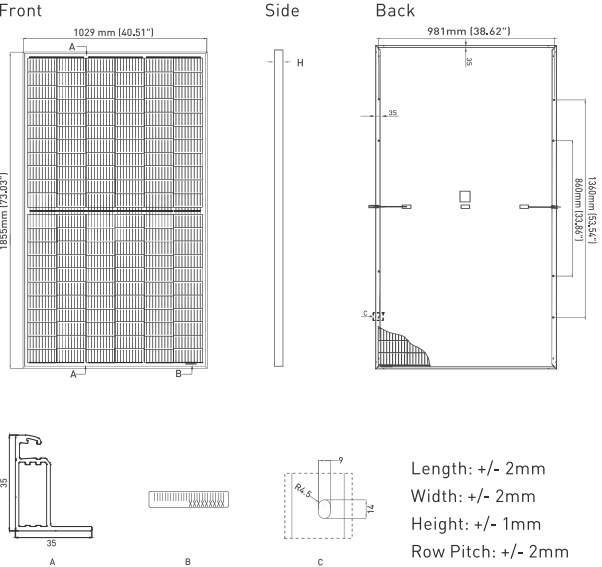


Leading Warranty

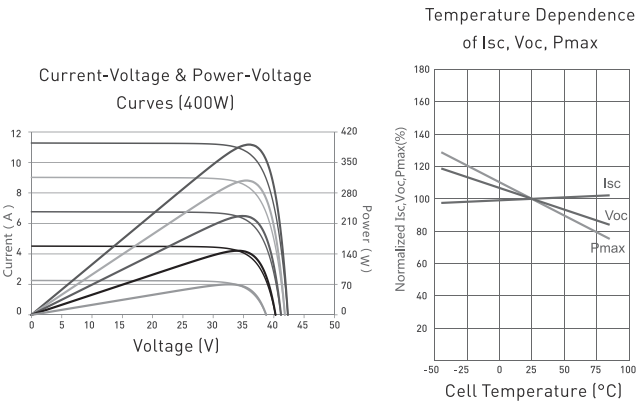
25-year product and 25-year linear power warranty; 98% guaranteed first year, max 0.55% annual loss.



ENGINEERING DRAWINGS



ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE



ELECTRICAL CHARACTERISTICS

Module Type	JKM380M-6RL3-B		JKM385M-6RL3-B		JKM390M-6RL3-B		JKM395M-6RL3-B		JKM400M-6RL3-B	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	380Wp	283Wp	385Wp	286Wp	390Wp	290Wp	395Wp	294Wp	400Wp	298Wp
Maximum Power Voltage (Vmp)	36.90V	33.70V	37.02V	33.90V	37.15V	34.02V	37.27V	34.13V	37.39V	34.25V
Maximum Power Current (Imp)	10.30A	8.39A	10.40A	8.45A	10.50A	8.53A	10.60A	8.61A	10.70A	8.69A
Open-circuit Voltage (Voc)	44.22V	41.74V	44.34V	41.85V	44.47V	41.97V	44.59V	42.09V	44.71V	42.20V
Short-circuit Current (Isc)	11.12A	8.98A	11.22A	9.06A	11.32A	9.14A	11.42A	9.22A	11.52A	9.30A
Module Efficiency STC (%)	19.91%		20.17%		20.43%		20.69%		20.96%	

***STC:** ☀ Irradiance 1000W/m²
NOCT: ☀ Irradiance 800W/m²

🌡 Cell Temperature 25°C
🌡 Ambient Temperature 20°C

☁ AM = 1.5
☁ AM = 1.5

🌀 Wind Speed 1m/s

*Power measurement tolerance: +/- 3%

MECHANICAL CHARACTERISTICS

No. of Cells	132 [2x66]
Dimensions	1855x1029x35mm [73.03×40.51×1.37 in]
Weight	21.5 kg [47.40 lbs]
Front Glass	3.2mm, Anti-Reflection Coating High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP67 Rated
Output Cables	12 AWG, 2053mm [80.83in] or Customized Length
Connector	Staubli MC4
Fire Type	Type 1
Pressure Rating	5400Pa (Snow) & 2400Pa (Wind)

TEMPERATURE CHARACTERISTICS

Temperature Coefficients of Pmax	-0.35%/°C
Temperature Coefficients of Voc	-0.28%/°C
Temperature Coefficients of Isc	0.048%/°C
Nominal Operating Cell Temperature (NOCT)	45 ± 2°C

MAXIMUM RATINGS

Operating Temperature [°C]	-40°C~+85°C
Maximum System Voltage	1000VDC
Maximum Series Fuse Rating	20A

PACKAGING CONFIGURATION

2 pallets = 1 stack; 30pcs/pallets, 60pcs/stack, 720pcs/ 40'HQ Container

- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- IEC61215, IEC61730 certified products
- UL61730 Certification
- ISO45001:2018 Occupational Health & Safety Standards



Power Optimizer

For North America

S440, S500



POWER OPTIMIZER

PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detected abnormal PV connector behavior, preventing potential safety issues*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

* Expected availability in 2022

[solaredge.com](https://www.solaredge.com)



/ Power Optimizer

For North America

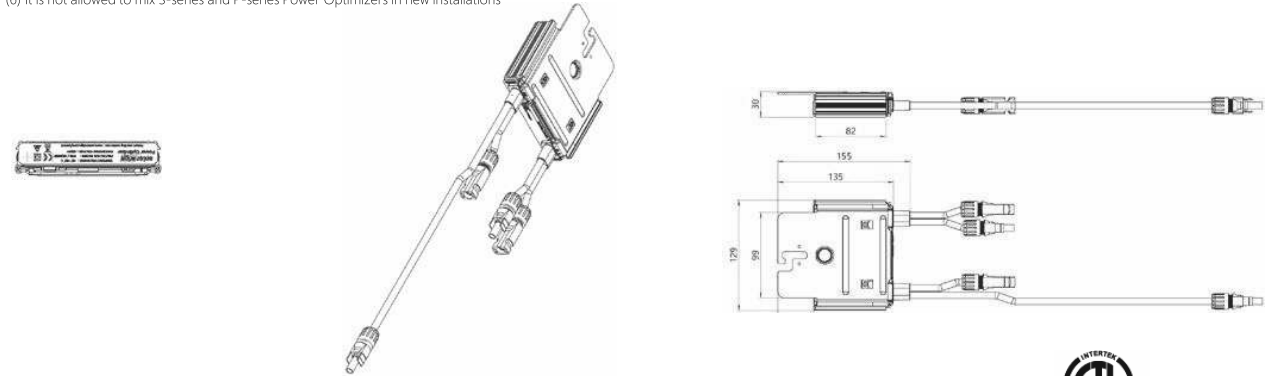
S440, S500

	S440	S500	Unit
INPUT			
Rated Input DC Power ⁽¹⁾	440	500	W
Absolute Maximum Input Voltage (Voc)	60		Vdc
MPPT Operating Range	8 - 60		Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15	Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.6		%
Overvoltage Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	15		Adc
Maximum Output Voltage	60		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1+/-0.1		Vdc
STANDARD COMPLIANCE			
Photovoltaic Rapid Shutdown System	NEC 2014, 2017 & 2020		
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3		
Safety	IEC62109-1 (class II safety), UL1741		
Material	UL94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 153 x 30 / 5.07 x 6.02 x 1.18		mm / in
Weight (including cables)	655 / 1.5		gr / lb
Input Connector	MC4 ⁽²⁾		
Input Wire Length	0.1 / 0.32		m / ft
Output Connector	MC4		
Output Wire Length	(+) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32		m / ft
Operating Temperature Range ⁽³⁾	-40 to +85		°C
Protection Rating	IP68 / Type6B		
Relative Humidity	0 - 100		%

(1) Rated power of the module at STC will not exceed the power optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed
(2) For other connector types please contact SolarEdge
(3) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

PV System Design Using a SolarEdge Inverter		Single Phase HD-Wave	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	S440, S500	8	14	18	
Maximum String Length (Power Optimizers)		25		50 ⁽⁴⁾	
Maximum Nominal Power per String		5700 (6000 with SE7600-US-SE11400-U)	6000	12750	W
Maximum Allowed Connected Power per String ⁽⁵⁾ (Permitted only when the difference in connected power between strings is 1,000W or less)		Refer to Footnote 5	One String 7200W Two strings or more 7800W	15,000W	
Parallel Strings of Different Lengths or Orientations		Y			

(4) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement
(5) If the inverters rated AC power < maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power. Refer to: <https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf>
(6) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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SolarEdge Home Wave Inverter
For North America

SE3800H-US / SE5000H-US / SE6000H-US /
SE7600H-US / SE10000H-US / SE11400H-US



INVERTERS

Optimized installation with HD-Wave technology

- /

Specifically designed to work with power optimizers
- /

Record-breaking 99% weighted efficiency
- /

Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- /

Fixed voltage inverter for longer strings
- /

Integrated arc fault protection and rapid shutdown for NEC 2014-2023 per articles 690.11 and 690.12
- /

UL1741 SA certified, for CPUC Rule 21 grid compliance
- /

Small, lightweight, and easy to install both outdoors or indoors
- /

Built-in module-level monitoring
- /

Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

/ SolarEdge Home Wave Inverter
For North America

SE3800H-US / SE5000H-US / SE6000H-US/
SE7600H-US / SE10000H-US / SE11400H-US

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4					SE11400H-XXXXXBXX5	Units
	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
OUTPUT							
Rated AC Power Output	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5 ⁽¹⁾						Hz
Maximum Continuous Output Current @240V	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	16	-	24	-	-	48.5	A
Power Factor	1, Adjustable - 0.85 to 0.85						
GFDI Threshold	1						A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes						
INPUT							
Maximum DC Power @240V	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes						
Maximum Input Voltage	480						Vdc
Nominal DC Input Voltage	380						Vdc
Maximum Input Current @240V ⁽²⁾	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V ⁽²⁾	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45						Adc
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600k Sensitivity						
Maximum Inverter Efficiency	99.2						%
CEC Weighted Efficiency	99					99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5						W

(1) For other regional settings please contact SolarEdge support.
(2) A higher current source may be used; the inverter will limit its input current to the values stated.

/ SolarEdge Home Wave Inverter

For North America

SE3800H-US / SE5000H-US / SE6000H-US/

SE7600H-US / SE10000H-US / SE11400H-US

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4					SE11400H-XXXXXBXX5	
	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
ADDITIONAL FEATURES							
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), wireless SolarEdge Home Network (optional) ⁽³⁾ , Wi-Fi (optional), Cellular (optional)						
Revenue Grade Metering, ANSI C12.20	Optional ⁽⁴⁾						
Consumption Metering							
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection						
Rapid Shutdown - NEC 2014-2023 per articles 690.11 and 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect						
STANDARD COMPLIANCE							
Safety	UL1741, UL1741 SA, UL1741 SB, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07						
Grid Connection Standards	IEEE1547-2018, Rule 21, Rule 14 (H1), CSA C22.3 No. 9						
Emissions	FCC Part 15 Class B						
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range	1" Maximum / 14 – 6 AWG				1" Maximum / 14 – 4 AWG		
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1 – 2 strings / 14 – 6 AWG				1" Maximum / 1 – 3 strings / 14 – 6 AWG		
Dimensions with Safety Switch (H x W x D)	17.7 x 14.6 x 6.8 / 450 x 370 x 174				21.06 x 14.6 x 7.3 / 535 x 370 x 185	21.06 x 14.6 x 8.2 / 535 x 370 x 208 ⁽⁵⁾	in / mm
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9		38.8 / 17.6	44.9 / 20.4 ⁽⁵⁾	lb / kg
Noise	< 25			<50			dBA
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60 ⁽⁶⁾						°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)						

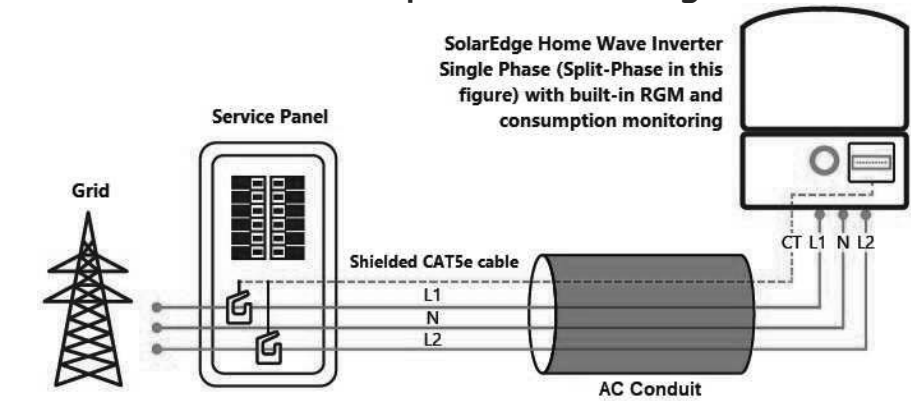
(3) For more information, refer to the [SolarEdge Home Network](#) datasheet

(4) Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BEI4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box.

(5) SE11400H-USxxxBox**5** is the updated PN, though SE11400H-USxxxBox**4** will still be available. All specifications are similar for both models, **EXCLUDING** the weight and dimensions [HxWxD]; The weight and dimensions of SE11400H-USxxxBox**4** are 17.6 [kg] and 21.06-14.6-7.3 / 535-370-185 [in/mm], accordingly.

(6) Full power up to at least 50°C / 122°F; for power de-rating information refer to the [Temperature De-rating Technical Note for North America](#).

How to Enable Consumption Monitoring



By simply wiring current transformers through the inverter's existing AC conduits and connecting them to the service panel, homeowners will gain full insight into their household energy usage helping them to avoid high electricity bills.

Product specifications

Eaton DG222NRB

Catalog Number: DG222NRB

Eaton General duty cartridge fuse safety switch, 60 A, NEMA 3R, Painted galvanized steel, Class H fuses, Fusible with neutral, Two-pole, Three-wire, Category: general duty safety switch, 240 V

General specifications

Product Name	Catalog Number
Eaton general duty cartridge fuse safety switch	DG222NRB
	UPC
	782113144221
Product Length/Depth	Product Height
7.35 in	14.37 in
Product Width	Product Weight
8.4 in	10 lb
Warranty	Certifications
Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.	UL Listed
	Catalog Notes
	Maximum hp ratings apply only when dual element fuses are used. 3-Phase hp rating shown is a grounded B phase rating, UL listed.



Physical Attributes

Enclosure
NEMA 3R
Enclosure material
Painted galvanized steel
Fuse configuration
Fusible with neutral
Number Of Poles
Two-pole
Number of wires
3
Type
General duty, cartridge fused

Performance Ratings

Amperage Rating
60A
Fuse class provision
Class H fuses
Voltage rating
240V

Miscellaneous

Product Category
General duty safety switch

Resources

Catalogs
Eaton's Volume 2—Commercial Distribution
Multimedia
Double Up on Safety
Switching Devices Flex Center
Specifications and datasheets
Eaton Specification Sheet - DG222NRB



Eaton Corporation plc
Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com
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Eaton.com/socialmedia



SKU: PBTD-3-250

UPC: 0783669077902

Features & Benefits:

Description:Nimbus Insulated Aluminum Multi-Tap Connector, Conductor Range 250-6, 3 Ports, Dual Sided Entry, Tin Plated, UL, CSA

Specs

Additional Class Attributes

Connection	Mechanical
Contains DE-OX®	Yes
Number of Conductors	3
Number of Poles	1
Number of Ports / Wireways	3
Number of Usable Ports	3
Number of Usable Taps	3
Replacement Part(s)	PORTPLUG-250, SCREWCAP-250

Dimensions

Drive Size Main	5/16
Drive Type Main	Internal Hex
Height (IN)	2.041
Height BX (IN)	2.75
Height (mm)	51.8414
Length (IN)	3.024
Length (mm)	76.8096
Max Insulation OD (IN)	0.75
Max Insulation OD (mm)	19.05
Weight (LB)	0.501
Weight BX (LB)	3.253
Width (IN)	2.318
Width BX (IN)	6
Width (mm)	58.8772

Material and Finish

Conductor Material	Copper
Connector Finish	Tin
Insulation	Plastisol
Material	Aluminum
Wire Binding Hardware Finish	Tin
Wire Binding Hardware Material	Aluminum

Additional Technical Specifications

Conductor Type	Stranded
----------------	----------

ILSCO
4730 MADISON ROAD
CINCINNATI, OH 45227
513-533-6200
800-776-9775



Bolt and Screw Sizes

Number of Wire Binding Screws per Port	1
Wire Binding Screw Size	9/16
Wire Binding Torque	275

General

Bag Quantity	1
Carton Quantity Description	STD PACK QTY 6
Dual Rated	Yes
NEMA Code	S-588-4
UPC Code	78366907790

Testing Standards

CSA File Number	LR-29601
CSA Standard	C22.2 No. 65-03
Prop65 Compliance	WARNING: Cancer and Reproductive Harm - www.P65warnings.ca.gov
UL Control Number	453G
UL / CULUS Specification	UL 486A/B Listed
UL File Number	E6207

Conductor Ranges

Conductor Range AL Solid (Secondary, tap, load)	NA
Conductor Range AL Stranded (Primary, run, main, line)	250 kcmil - 6 Str
Conductor Range AL Stranded (Secondary, tap, load)	NA
Conductor Range CU Solid (Primary, run, main, line)	NA
Conductor Range CU Solid (Secondary, tap, load)	NA
Conductor Range CU Stranded (Primary, run, main, line)	250 kcmil - 6 Str
Conductor Range CU Stranded (Secondary, tap, load)	NA
Conductor Range AL Solid (Primary, run, main, line)	NA
Flex Conductor Range	NA

Voltage

Voltage Rating	600 V
----------------	-------

Color

Cap Color Main	Black
Cap Color Tap	Black
Color	Black

Environment and Temperature

Environmental Conditions	Cold temperature rated to -45°C
Flammability Rating	Insulation rated per UL 94
Temperature Rating	90°C

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800-776-9775

S-5!®

The Right Way!

NEW PRODUCT

SolarFoot™

Introducing the new SolarFoot™ for exposed fastener metal roofing with the strength, testing, quality, and time-proven integrity you expect from S-5!. The SolarFoot provides an ideal mounting platform to attach the L-Foot (not included) of a rail-mounted PV system to the roof. This solution is The Right Way to secure rail-mounted solar systems to exposed fastener metal such as AG-Panel or R-Panel.

SolarFoot Features:

Manufactured in the U.S.A. from certified raw material

Fabricated in our own ISO 9001:2015 certified factory

All aluminum and stainless components

25yr limited warranty

Compatible with all commercial L-Foot products on the market

Factory applied 40-year isobutylene/isoprene crosslink polymer sealant for reliable weathertightness

Sealant reservoir to prevent over-compression of sealant

Load-to-failure tested Normal to Seam by a nationally accredited laboratory on numerous metal roof materials and substrates

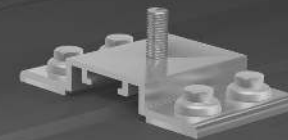
Four points of attachment into structure or deck with tested holding strength for engineered applications

Integrated M8-1.25x17mm stud and M8-1.25 stainless steel hex flange nut included



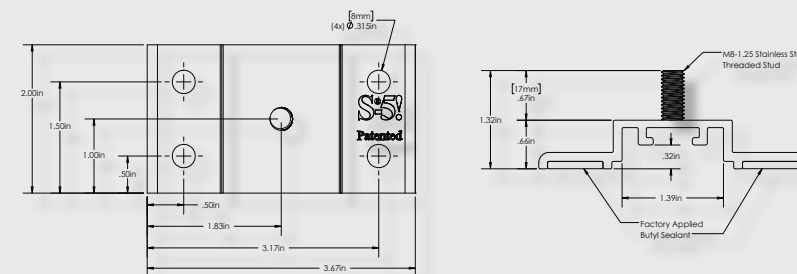
888-825-3432 | www.S-5.com

S-5!®
The Right Way!



SolarFoot™ Mounting for Exposed Fastener Roofing

The SolarFoot is a simple, cost-effective pedestal for L-Foot (not included) attachment of rail-mounted solar PV. The unique design is compatible with all rail producer L-Foot components. The new SolarFoot assembly ensures a durable weathertight solution for the life of the roof. Special factory applied butyl co-polymeric sealant contained in a reservoir is The Right Way, allowing a water-tested seal. Stainless integrated stud and hex flange lock-nut secure the L-Foot into position. A low center of gravity reduces the moment arm commonly associated with L-Foot attachments. Direct attachment of the SolarFoot to the structural member or deck provides unparalleled holding strength.



*Fasteners sold separately. Fastener type varies with substrate. Contact S-5! on how to purchase fasteners and obtain our test results. L-Foot also sold separately.

Fastener Selection



Metal to Metal:
1/4-14 Self Drilling Screw
1-1/2" to 2-1/2"



Metal to Wood:
1/4-14 Type 17 AB Milled Point
1-1/2" to 2-1/2"

To source fasteners for your projects, contact S-5!
When other brands claim to be "just as good as S-5!", tell them to PROVE IT.

SolarFoot Advantages:

Exposed fastener mounting platform for solar arrays attached via L-Foot and Rails

Weatherproof attachment to exposed fastener roofing

Butyl sealant reservoir provides long-term waterproof seal

M8-1.25x17mm stud with M8 hex flange nut for attachment of all popular L-Foot/rail combinations

Tool: 13 mm Hex Socket or 1/2" Hex Socket

Tool Required: Electric screw gun with hex drive socket for self-tapping screws.

Low Center of Gravity reduces moment arm commonly associated with L-Foot/Rail solar mounting scenarios

Attaches directly to structure or deck for optimal holding strength

S-5! Recommended substrate-specific (e.g. steel purlin, wood 2x4, OSB, etc.) fasteners provide excellent waterproofing and pull-out strength

Fastener through-hole locations comply with NDS (National Design Specification) for Wood Construction

S-5!® Warning! Please use this product responsibly!

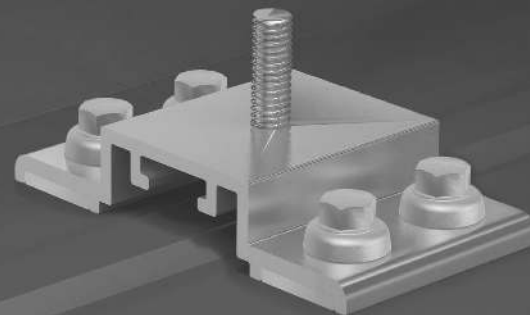
The independent lab test data found at www.S-5.com can be used for load-critical designs and applications.

Products are protected by multiple U.S. and foreign patents. For published data regarding holding strength, fastener torque, patents, and trademarks, visit the S-5! website at www.S-5.com. Copyright 2017, Metal Roof Innovations, Ltd. S-5! products are patent protected.

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Distributed by:

The right way to attach almost anything to metal roofs!



SOLARMOUNT



SOLARMOUNT is the professionals' choice for residential PV mounting applications. Every aspect of the system is designed for an easier, faster installation experience. **SOLARMOUNT** is a complete solution with revolutionary universal clamps, **FLASHKIT PRO**, full system UL 2703 certification and 25-year warranty. Not only is **SOLARMOUNT** easy to install, but best-in-class aesthetics make it the most attractive on any block!

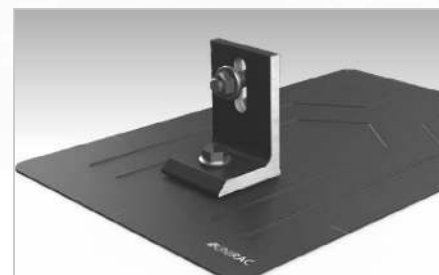


CONCEALED
UNIVERSAL
CLAMPS

OPTIONAL
FRONT TRIM

UNIRAC
25
YEAR
FULL-SYSTEM
WARRANTY

New & Improved:
THE PROFESSIONALS' CHOICE
With Superior Aesthetics



NOW FEATURING FLASHKIT PRO
The Complete Roof Attachment Solution
FEATURING **SHED & SEAL** TECHNOLOGY



NOW WITH UNIVERSAL MIDCLAMPS
Accommodates 30mm-51mm module frames
One tool, one-person installs are here!



REVOLUTIONARY NEW ENDCLAMPS
Concealed design and included End Caps

THE PROFESSIONALS' CHOICE FOR RESIDENTIAL RACKING

BEST INSTALLATION EXPERIENCE • CURB APPEAL • COMPLETE SOLUTION • UNIRAC SUPPORT

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

SOLARMOUNT



BETTER DESIGNS

TRUST THE INDUSTRY'S BEST DESIGN TOOL

Start the design process for every project in our U-Builder on-line design tool. It's a great way to save time and money.

BETTER SYSTEMS

ONE SYSTEM - MANY APPLICATIONS

Quickly set modules flush to the roof on steep pitched roofs. Orient a large variety of modules in Portrait or Landscape. Tilt the system up on flat or low slow roofs. Components available in mill, clear, and dark finishes to optimize your design financials and aesthetics.

BETTER RESULTS

MAXIMIZE PROFITABILITY ON EVERY JOB

Trust Unirac to help you minimize both system and labor costs from the time the job is quoted to the time your teams get off the roof. Faster installs. Less Waste. More Profits.

BETTER SUPPORT

WORK WITH THE INDUSTRIES MOST EXPERIENCED TEAM

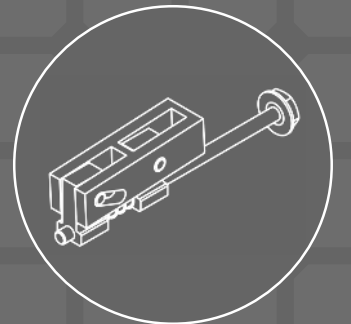
Professional support for professional installers and designers. You have access to our technical support and training groups. Whatever your support needs, we've got you covered. Visit Unirac.com/solarmount for more information.



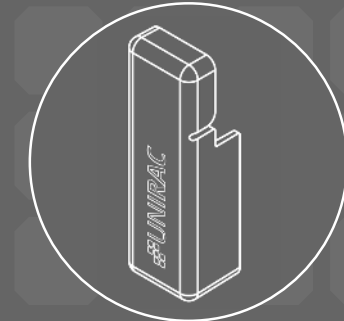
UL2703

BONDING & GROUNDING
MECHANICAL LOADING
SYSTEM FIRE CLASSIFICATION

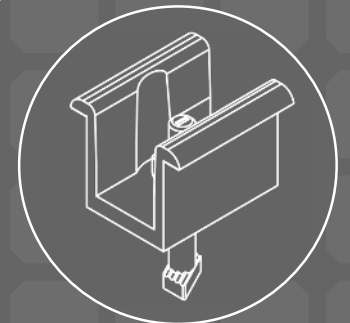
CONCEALED UNIVERSAL
ENDCLAMPS



END CAPS INCLUDED
WITH EVERY ENDCLAMP



UNIVERSAL SELF
STANDING MIDCLAMPS



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UNMATCHED
EXPERIENCE



CERTIFIED
QUALITY



ENGINEERING
EXCELLENCE



BANKABLE
WARRANTY



DESIGN
TOOLS



PERMIT
DOCUMENTATION

TECHNICAL SUPPORT

Unirac's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

CERTIFIED QUALITY PROVIDER

Unirac is the only PV mounting vendor with ISO certifications for 9001:2008, 14001:2004 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

BANKABLE WARRANTY

Don't leave your project to chance. Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are providing products of exceptional quality. SOLARMOUNT is covered by a 25 year limited product warranty and a 5 year limited finish warranty.

ENHANCE YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN

PUB2018AUG31 - PRINTED UPDATE

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702



Certificate of Compliance

Certificate: 70131735

Master Contract: 266909

Project: 80082031

Date Issued: 2021-06-02

Issued To: **Unirac**
1411 Broadway NE
Albuquerque, New Mexico, 87102
United States

Attention: Klaus Nicolaedis

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: *Michael Hoffnagle*
Michael Hoffnagle



PRODUCTS

CLASS - C531302 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems
CLASS - C531382 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems -
Certified to US Standards

Models:	SM	-	SOLARMOUNT Flush-to-Roof is an extruded aluminum rail PV racking system that is installed parallel to the roof in landscape or portrait orientations.
	ULA	-	Unirac Large Array is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules.

Solarmount



Certificate: 70131735
Project: 80082031

Master Contract: 266909
Date Issued: 2021-06-02

The system listed is designed to provide bonding/grounding, and mechanical stability for photovoltaic modules. The system is secured to the roof with the L-Foot components through the roofing material to building structure. Modules are secured to the racking system with stainless steel or aluminum mid clamps and Aluminum end clamps. The modules are bonded to the racking system with the stainless-steel bonding mid clamps with piercing points. The system is grounded with 10 AWG copper wire to bonding/grounding lugs. Fire ratings of Class A with Type 1, 2, 3, 10, 19, 22 or 25 for steep slope. Tested at 5" interstitial gap which allows installation at any stand-off height.

The grounding of the system is intended to comply with the latest edition of the National Electrical Code, to include NEC 250 & 690. Local codes compliance is required, in addition to national codes. All grounding/bonding connections are to be torqued in accordance with the Installation Manual and the settings used during the certification testing for the current edition of the project report.

The system may employ optimizers/micro-inverters and used for grounding when installed per installation instructions.

UL 2703 Mechanical Load ratings:

Downward Design Load (lb/ft ²)	113.5
Upward Design Load (lb/ft ²)	50.7
Down-Slope Load (lb/ft ²)	16.13

Test Loads:

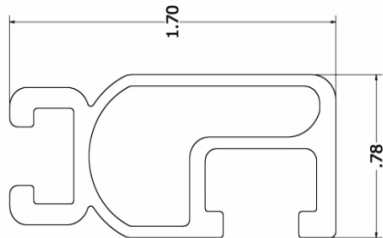
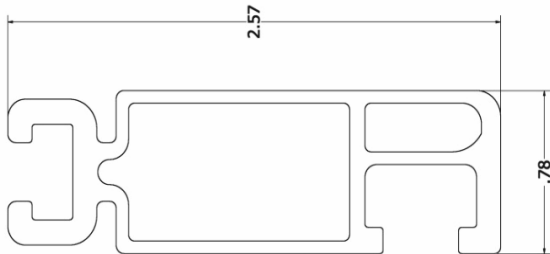
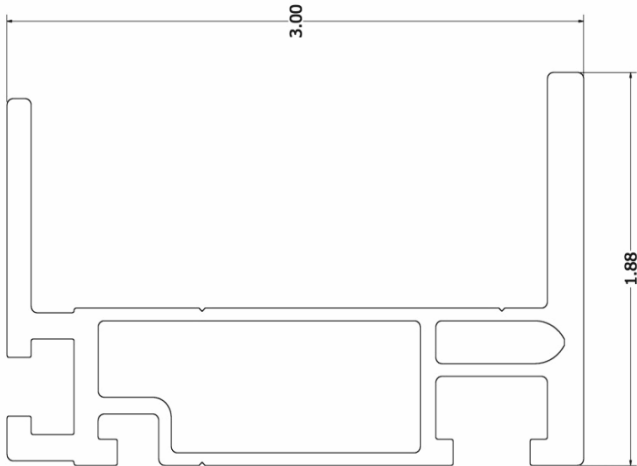
Downward Load (lb/ft ²)	170.20
Upward Load (lb/ft ²)	76.07
Down-Slope Load (lb/ft ²)	24.2

Unirac Large Array

ULA is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules. ULA aluminum components merge with SM rails and installer-supplied steel pipe. The SM rail system is secured to the horizontal Pipe using the Rail Bracket components. The Rear and Front cap secures the horizontal Pipe to the vertical Pipe. The Front cap is also used to secure the Cross brace. A Slider is attached to the vertical Pipe to secure the Cross brace. The SM rails, caps, slider, rail brackets, and cross braces materials are 6105-T5 aluminum extrusion. Fasteners materials are 304 stainless steel. Horizontal and vertical pipe materials meet the minimum requirements of ASTM A53 for galvanized steel pipe in 2" and 3" diameter.

The mechanical load ratings from the SM test data will be applied to the ULA model.

Fire Testing is not applicable due to being a ground mount system.



Properties	SOLARMOUNT Light	SOLARMOUNT Rail Profile 2	SOLARMOUNT HD	Units
BEAM HEIGHT	1.70	2.57	3.00	in
APPROX WEIGHT	0.491	0.728	1.271	plf
CROSS SECTION AREA	0.409	0.625	1.059	in ²
SECTION MODULUS (X-AXIS)	0.15	0.363	0.898	in ³
SECTION MODULUS (Y-AXIS)	0.067	0.113	0.221	in ³
MOMENT OF INERTIA (X-AXIS)	0.13	0.467	1.45	in ⁴
MOMENT OF INERTIA (Y-AXIS)	0.026	0.045	0.267	in ⁴
RADIUS OF GYRATION (X-AXIS)	0.564	0.865	1.17	in
RADIUS OF GYRATION (Y-AXIS)	0.254	0.269	0.502	in

Certificate



Certificate no. US 82160015 01

License Holder:
Unirac Inc.
1411 Broadway NE
Albuquerque NM 87102
USA

Manufacturing Plant:
Unirac Inc.
1411 Broadway NE
Albuquerque NM 87102
USA

Test report no.: USA- 31440029 005 Client Reference: Tom Young
Tested to: UL 2703:2015

Certified Product: Module Rack Mounting System License Fee - Units

Model Designation: SolarMount (SM) 7

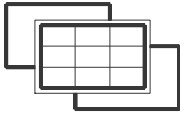
Max System Voltage of PV Module: 1000 VDC
Max Size of PV Module: 20.8 sq.ft. surface area
Max Overcurrent Protection Rating of PV Module:
30 A when using the qualified grounding lugs;
20 A when using the Enphase micro inverter EGC.

Fire Rating: Class A when installed with
Type 1, Type 2, Type3, or Type 10 fire rated modules.

(continued)

Appendix: 1,1-5

Licensed Test mark: 	Date of Issue (day/mo/yr) 27/07/2016
--	--



12-May-2023

Unirac
1411 Broadway Blvd. NE
Albuquerque, NM 87101
Tel: 505 242 6411

Attn.: Engineering Department

Subject: Engineering Certification for the Unirac SOLARMOUNT Flush Rail System to Support Photovoltaic Panels.

The Unirac SOLARMOUNT Flush-to-Roof is an extruded aluminum rail system that is engineered to hold most framed solar modules to a roof structure and installed parallel to the roof.

We have reviewed the SOLARMOUNT system, a proprietary mounting system constructed from modular parts which are intended for rooftop installation of solar photovoltaic (PV) panels; and have reviewed the U-Builder 2.0 Online tool. This U-Builder 2.0 software includes analysis for the SOLARMOUNT rails (SM LIGHT rail, SM STANDARD rail, and SM HEAVY DUTY rail) with Standard, Universal AF, and Pro Series hardware. All information, data, and analysis are in compliance with the following codes, city ordinances, and typical specifications:

- Codes:**
1. 2014-2020 Florida Building Code.

2. ASCE/SEI 7-10, 7-16 Minimum Design Loads for Buildings and Other Structures.

3. International Building Code, 2012- 2018 Edition w/ Provisions from SEAOC PV-2 2017.

4. International Residential Code, 2012- 2018 Edition w/ Provisions from SEAOC PV-2 2017.

5. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES.

6. Aluminum Design Manual, 2015 & 2020 Edition.

Following are typical specifications to meet the above code requirements:

- Design Criteria:**

Ground Snow Load = 0 - 100 (psf)

Basic Wind Speed = 85 - 190 (mph)

Roof Mean Height = 0 - 60 (ft)

Roof Pitch = 0 - 45 (degrees)

Exposure Category = B, C & D
- Attachment:**

Shingle Roof:

L-Foot, Flashkit Pro, Flashloc Comp, Flashloc Duo, Flashkit Pro SB

Metal Roof:

Standing Seam attachments, PM-9000S, PM Adjust Slotted

Tile Roofs:

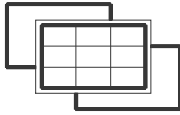
Solar Hooks, Tile Replacement
- Attachment Spacing:**

Per U-Builder 2.0 Engineering report.
- Cantilever:**

The maximum cantilever length is L/3, where “L” is the span noted in the U-Builder 2.0 online tool.
- Clearance:**

2” to 10” clear from top of roof to top of PV panel
- Tolerance(s):**

1.0” tolerance for any specified dimension in this report is allowed for installation



- Installation Orientation:**
- See SOLARMOUNT Rail Flush Installation Guide.

Landscape - PV Panel long dimension is parallel to ridge/eave line of the roof and the PV panel is mounted on the long side.

Portrait - PV Panel short dimension is parallel to ridge/eave line of the roof and the PV panel is mounted on the short side.

Components and Cladding Roof Zones:

The Components and Cladding Roof Zones shall be determined based on ASCE 7-10 & 7-16 Component and Cladding design.

- Notes:**
1. U-Builder 2.0 Online tool analysis is only for Unirac SM SOLARMOUNT Rail Flush systems and do not include roof capacity check.

2. Risk Category II per ASCE 7-16.

3. Topographic factor, kzt is 1.0.

4. Array Edge Factor Y_E = 1.5

5. Average parapet height is 0.0 ft.

6. Wind speeds are LRFD values.

7. Attachment spacing(s) apply to a seismic design category E or less.

Design Responsibility:

The U-Builder 2.0 design software is intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, this U-Builder 2.0 software should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether the U-Builder 2.0 Software is applicable to the project, and

• Understand and determine the appropriate values for all input parameters of the U-Builder 2.0 software.

This letter certifies that the Unirac SM SOLARMOUNT Rails Flush, when installed according to the U-Builder 2.0 engineering report and the manufacturer specifications are in compliance with the above codes and loading criteria.

- This certification excludes evaluation of the following components:
- 1) The structure to support the loads imposed on the building by the array; including, but not limited to: strength and deflection of structural framing members, fastening and/or strength of roofing materials, and/or the effects of snow accumulation on the structure.

2) The attachment of the SM SOLARMOUNT Rails to the existing structure.

3) The capacity of the solar module frame to resist the loads.

This requires additional knowledge of the building and is outside the scope of the certification of this racking system.

Please feel free to call for any questions or clarifications.

Prepared By:
Engineering Alliance, Inc
Sugar Land, TX

Saddam

Ahmad

Digitally signed by Saddam Ahmad

Date: 2023.05.12 08:33:34 -05'00'



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