

# ROOF MOUNT PHOTOVOLTAIC SYSTEM

## CODES:

THIS PROJECT COMPLIES WITH THE FOLLOWING:  
 2018 NORTH CAROLINA BUILDING CODE  
 2018 NORTH CAROLINA RESIDENTIAL CODE  
 2018 NORTH CAROLINA PLUMBING CODE  
 2018 NORTH CAROLINA MECHANICAL CODE  
 2018 NORTH CAROLINA FUEL GAS CODE  
 2017 NATIONAL ELECTRICAL CODE  
 AS ADOPTED BY COUNTY OF HARNETT

## CONSTRUCTION NOTES:

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 IDENTIFIED 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

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.



**STRUCTURAL ONLY**

## VICINITY MAP:



SITE LOCATION

## TABLE OF CONTENTS:

PV-1	SITE LOCATION
PV-2	SITE PLAN
PV-2A	ROOF PLAN WITH MODULES LAYOUT
PV-2B	ARRAY AND STRUCTURAL TABLES
PV-3	MOUNTING DETAILS
PV-3A	MOUNTING DETAILS
PV-4	THREE LINE DIAGRAM
PV-5	CONDUCTOR CALCULATIONS
PV-6	EQUIPMENT & SERVICE LIST
PV-7	LABELS
PV-7A	SITE PLACARD
PV-8	OPTIMIZER CHART
PV-9	SAFETY PLAN
PV-10	SAFETY PLAN
APPENDIX	MANUFACTURER SPECIFICATION SHEETS



**CLIENT:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON,  
 NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [S11]











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



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075

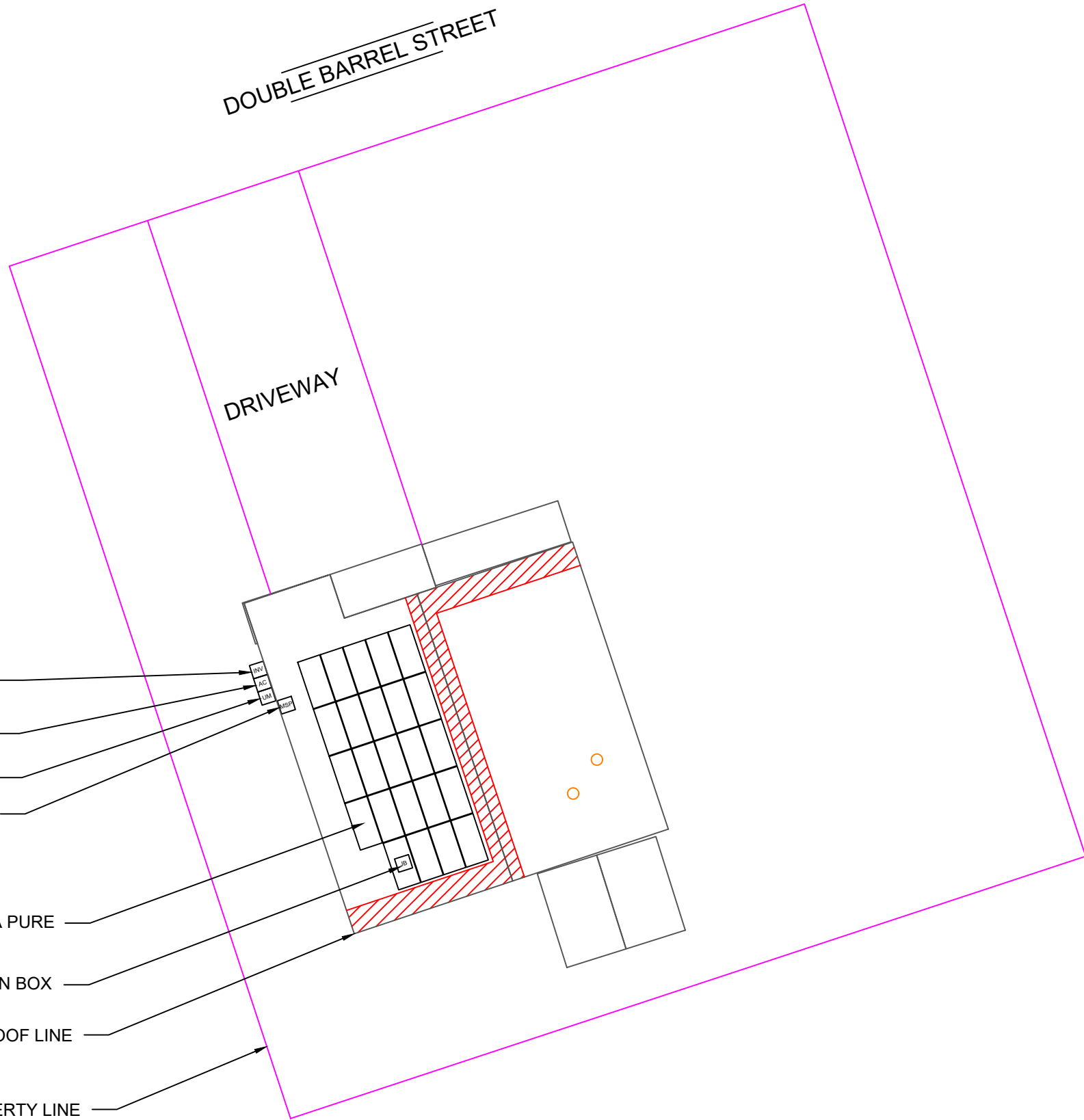
**GREG ALBRIGHT**

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043

- LEGEND:**
-  CHIMNEY
  -  PIPE VENT
  -  MODULES
  -  CONDUIT
  -  SETBACK
  -  AC DISCONNECT
  -  UTILITY METER
  -  JUNCTION BOX
  -  INVERTER
  -  MAIN SERVICE PANEL

**TOTAL ROOF AREA RIDGE SETBACK CALCS:**  
 TOTAL ROOF AREA: 2088 SQ FT  
 SINGLE MODULE AREA: 19.9148639 SQ FT  
 TOTAL NUMBER OF MODULES: 24  
 TOTAL AREA OF MODULES: 477.96 SQ FT  
 ROOF COVERAGE: 22.89%  
 FIRE SPRINKLERS : NO

**THIS SYSTEM DESIGNED WITH:**  
 WIND SPEED: 130  
 WIND EXPOSURE: B  
 SNOW LOAD: 15



- (N) SOLAREEDGE SE7600H-USRGM [SI1] INVERTER WITH RAPID SHUTDOWN
- (N) UTILITY DISCONNECT EATON DG222URB (OR EQUIVALENT)
- (E) UTILITY METER
- (E) MAIN SERVICE PANEL

- (N) 24 REC SOLAR: REC405AA PURE
- (N) JUNCTION BOX
- ROOF LINE
- PROPERTY LINE

**PV SYSTEM**  
 9.720 kW-DC  
 7.600 kW-AC

ROOF AREA: 2088 SQ FT

**CLIENT:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON, NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

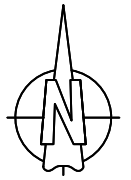
**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [SI1]

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



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075  
**GREG ALBRIGHT**

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043













**SITE PLAN**  
 SCALE: 1/16" = 1'-0"

1

SITE PLAN			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
409874	2/24/2024	P.O.	PV-2

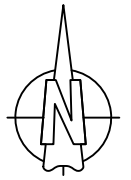
**LEGEND:**

-  CHIMNEY
-  PIPE VENT
-  MODULES
-  CONDUIT
-  SETBACK
-  AC DISCONNECT
-  UTILITY METER
-  JUNCTION BOX
-  INVERTER
-  MAIN SERVICE PANEL

THIS SYSTEM DESIGNED WITH:  
 WIND SPEED: 130  
 WIND EXPOSURE: B  
 SNOW LOAD: 15



TOTAL ROOF AREA: 2088 SQ FT  
 TOTAL ARRAY AREA: 477.96 SQ FT  
 ARRAY COVERAGE: 22.89%  
 SYSTEM DISTRIBUTED WEIGHT: 2.26 LBS  
 ROCKIT SMART SLIDE POINT-LOAD: 22.05 LBS



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

1

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



**PV SYSTEM**  
 9.720 kW-DC  
 7.600 kW-AC

ROOF AREA: 2088 SQ FT

**CLIENT:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON,  
 NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [S1]

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



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075  
**GREG ALBRIGHT**

*Greg Albright*

CONTRACTOR LICENSE:  
 ELECTRICAL CONTRACTOR U.34043

ROOF PLAN WITH MODULES LAYOUT			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
409874	2/24/2024	P.O.	PV-2A

# ROOF DETAILS:

TOTAL ROOF AREA: 2088 SQ FT  
 TOTAL ARRAY AREA: 477.96 SQFT  
 ARRAY COVERAGE: 22.89%  
 SYSTEM DISTRIBUTED WEIGHT: 2.26 LBS  
 ROCKIT SMART SLIDE POINT-LOAD: 22.05 LBS



ROOF AREA STATEMENT						
ROOF	MODULE QUANTITY	ROOF PITCH	ARRAY PITCH	AZIMUTH	ROOF AREA	ARRAY AREA
ROOF 1	24	32	32	252	900.81 SQ FT	477.96 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:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON,  
 NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [S1]

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



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075  
**GREG ALBRIGHT**

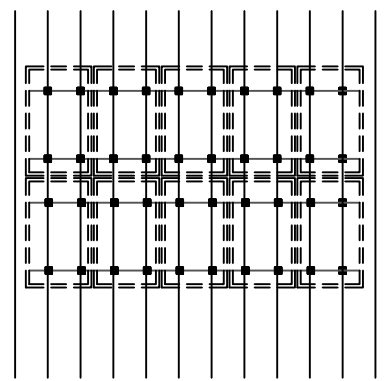
**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043

ARRAY DETAILS			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
409874	2/24/2024	P.O.	PV-2B

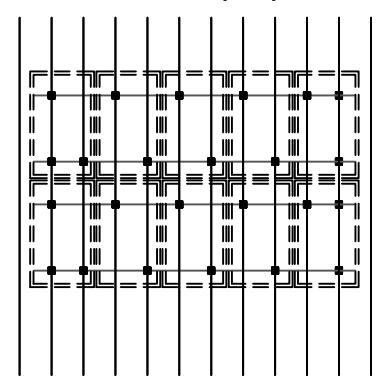
**TABLE 1 - ARRAY INSTALLATION**

	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	32	Comp Shingle	Ecofasten RockIt Smart Slide	2x6 @ 24" O.C.	8	PASS	STAGGERED	48	16

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



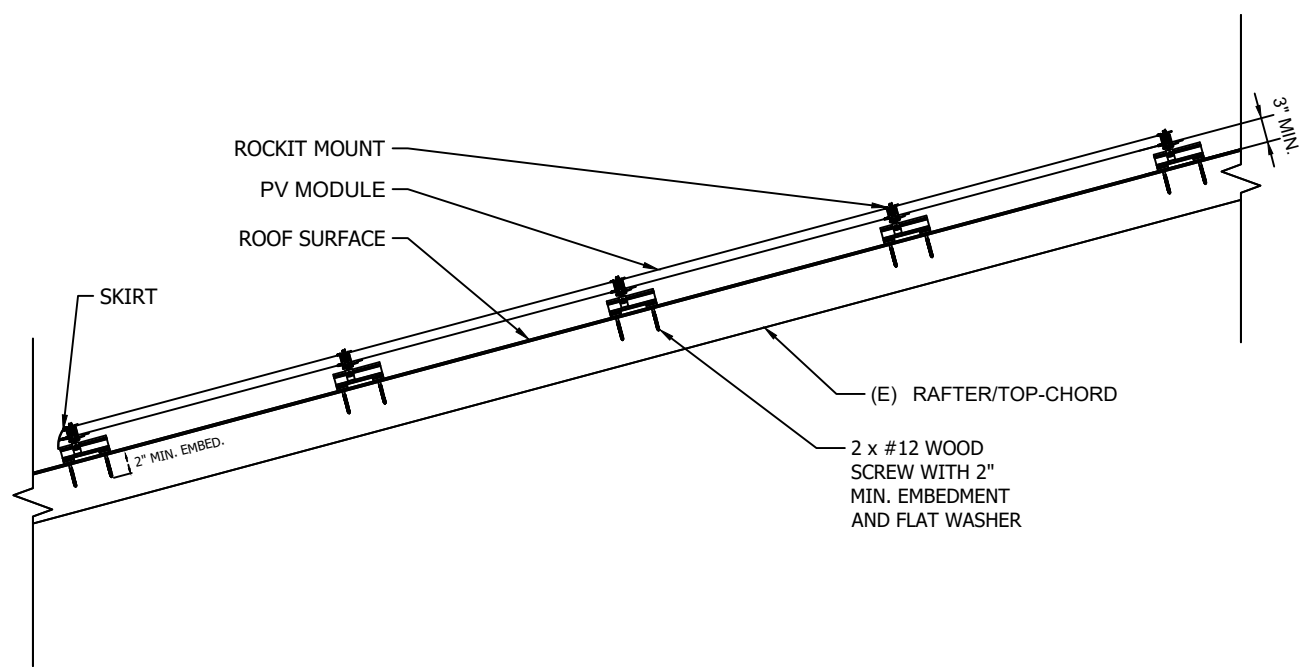
**STAGGERED DETAIL**  
For Illustration purposes only



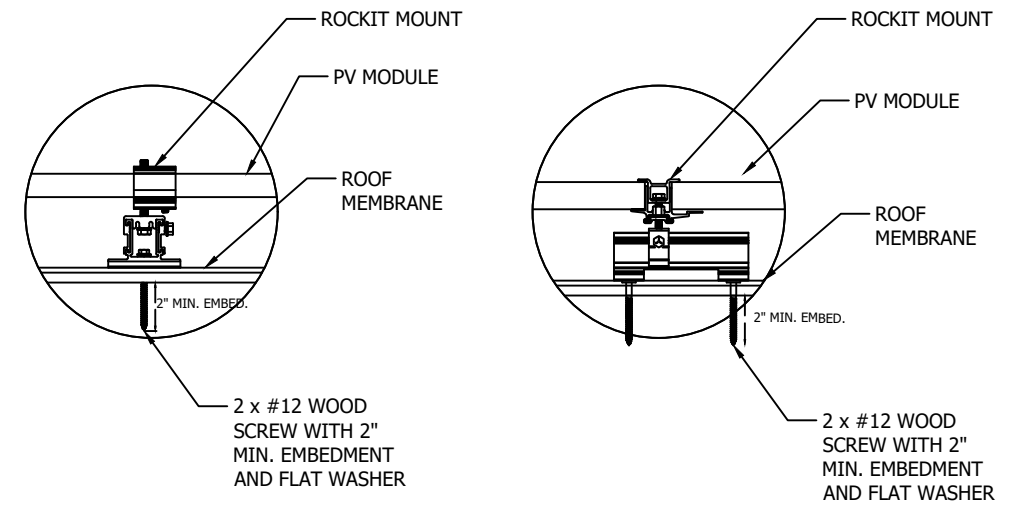
CLIENT:  
MATTHEW LIBY  
150 DOUBLE BARREL STREET, LILLINGTON,  
NC 27546  
AHJ: COUNTY OF HARNETT  
UTILITY: DUKE ENERGY  
METER: 348798055  
PHONE: (910) 922-4945  
EMAIL: MLIBY03@GMAIL.COM  
FINANCE: OTHER

SYSTEM:  
SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
SYSTEM SIZE (AC): 7.600 kW @ 240V  
MODULES: 24 X REC SOLAR: REC405AA PURE  
OPTIMIZERS: 24 X SOLAREEDGE S440  
INVERTER: SOLAREEDGE SE7600H-USRGM [S1]

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



**SOLAR PV ARRAY SECTION VIEW**  
Scale: NTS



**ATTACHMENT DETAIL**  
Scale: NTS

**FREEDOM FOREVER LLC**  
415 INDUSTRIAL CT., GREER, SC 29651  
Tel: (800) 385-1075  
GREG ALBRIGHT

MOUNTING DETAILS			
JOB NO: 409874	DATE: 2/24/2024	DESIGNED BY: P.O.	SHEET: PV-3

BACKFEED BREAKER SIZING					
MAX. CONTINUOUS OUTPUT 32.00A @ 240V					
32.00	X	1.25	=	40.00AMPS	40A BREAKER - OK
SEE 705.12 OF 2017 NEC					
200	X	1.20	=	240	
240	-	200	=	40A ALLOWABLE BACKFEED	

**PV SYSTEM**  
**9.720 kW-DC**  
**7.600 kW-AC**

**CLIENT:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON,  
 NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [SI1]

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

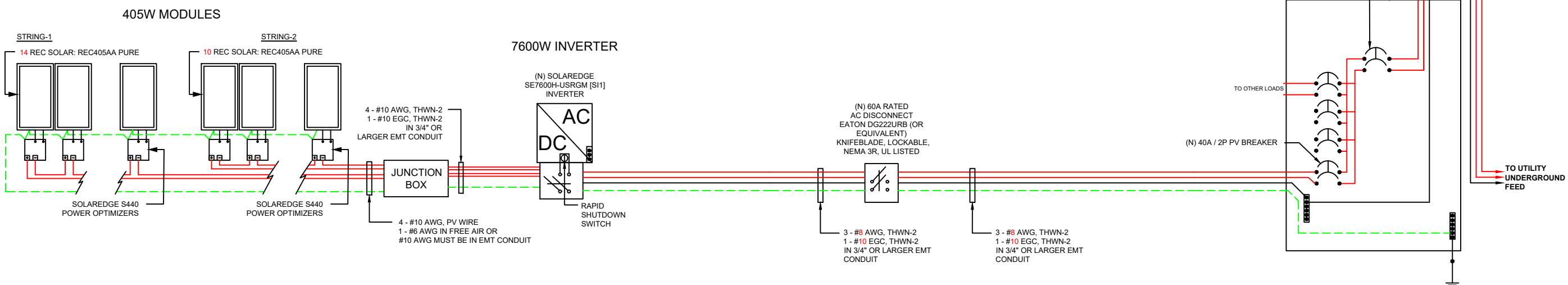


**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075

**GREG ALBRIGHT**

*Greg Albright*

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043



**NOTE:**  
 CONDUIT AND CONDUCTORS SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS

THREE LINE DIAGRAM

JOB NO: 409874	DATE: 2/24/2024	DESIGNED BY: P.O.	SHEET: PV-4
-------------------	--------------------	----------------------	----------------


WIRE SCHEDULE												
RACEWAY #		EQUIPMENT			CONDUCTOR QTY.	AWG WIRE SIZE	STARTING ALLOWABLE AMPACITY @ 90°C 310.15(B)(16)	STARTING CURRENT APPLIED TO CONDUCTORS IN RACEWAY	TEMPERATURE CORRECTION FACTOR 310.15(B)(2)(a)	ADJUSTMENT FACTOR FOR MORE THAN 3 CONDUCTORS 310.15(B)(3)(a)	ADJUSTED CONDUCTOR AMPACITY @ 90°C	MAXIMUM CURRENT APPLIED TO CONDUCTORS IN RACEWAY
1	DC	MODULE	TO	OPTIMIZER	2	10	40	12.68	0.91	1	36.40	15.84
2	DC	OPTIMIZER	TO	JUNCTION BOX	2	10	40	15.00	0.91	1	36.40	18.75
3	DC	JUNCTION BOX	TO	INVERTER	4	10	40	15.00	0.91	0.8	29.12	18.75
4	AC	INVERTER	TO	AC DISCONNECT	3	8	55	32.00	0.91	1	50.05	40.00
5	AC	AC DISCONNECT	TO	POI	3	8	55	32.00	0.91	1	50.05	40.00

CONDUCTOR AMPACITY CALCULATIONS IN ACCORDANCE WITH NEC 690.8.

**CLIENT:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON, NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

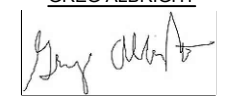
**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [S1]

REVISIONS		
NO.	REVISED BY	DATE



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075

**GREG ALBRIGHT**



CONTRACTOR LICENSE:  
 ELECTRICAL CONTRACTOR U.34043

**CONDUCTOR CALCULATIONS**

JOB NO: 409874	DATE: 2/24/2024	DESIGNED BY: P.O.	SHEET: PV-5
-------------------	--------------------	----------------------	----------------

**OCPD SIZES:**

40A BREAKER

**SERVICE LIST:**

NONE

**MATERIAL LIST:**

QTY.	PART	PART #	DESCRIPTION
24	110 - MODULES	PV-117-405	"MFG: REC, 405W POLY BOB, MFG SKU: REC405AA PURE"
1	120 - INVERTERS	INV-120-768	"MFG: SOLAREEDGE, 7.6 KW RGM SCREENLESS W/CONSUMPTION MONITORING, MFG SKU: SE7600H-US000BEI4"
1	180 - MONITORING EQUIPMENT	ME-180-502	"MFG: SOLAREEDGE, CELL MODEM W/5 YRS, MFG SKU: SE-CELL-B-R05-US-S2"
24	130 - OPTIMIZERS	OPT-130-440-2	"MFG: SOLAREEDGE, 440W 60V OPTIMIZER, MFG SKU: S440"
2	260 - FITTINGS/ANCHORS	RAC-261-527	"MFG: UNIRAC, JUNCTION BOX, COMP SHINGLE AND RAIL MOUNT APPLICATIONS, MFG SKU: SOLOBOX-D"
2	210 - RAILS	RAC-211-201	"MFG: UNIRAC, E-BOSS J-BOX MOUNTING BRACKET, MFG SKU: 00802JB"
1	320 - DISCONNECTS	EE-321-060	"MFG: EATON, DISCONNECT, GENERAL DUTY, 2P, 240V, 60A, NON FUSIBLE, NEMA 3R, MFG SKU: DG222URB"
6	350 - ELECTRICAL ACCESSORIES	EA-350-326	"MFG: STAUBLI MULTI-CONTACT, MC4 CONNECTORS (FEMALE), MFG SKU: PV-KBT4/6I-UR"
6	350 - ELECTRICAL ACCESSORIES	EA-350-327	"MFG: STAUBLI MULTI-CONTACT, MC4 CONNECTORS (MALE), MFG SKU: PV-KST4/6I-UR"
49	260 - FITTINGS/ANCHORS	RAC-265-034	"MFG: ECO FASTEN, ROCKIT SMART SLIDE BLK 6 - 75", MFG SKU: 2011024"
31	260 - FITTINGS/ANCHORS	RAC-261-602	"MFG: UNIRAC, SFM 2" MICRORAIL, MFG SKU: 250020U"
144	260 - FITTINGS/ANCHORS	RAC-265-004	"MFG: ECO FASTEN, ROCKIT COMP COUPLING AL BLK, MFG SKU: 2011021"
1	260 - FITTINGS/ANCHORS	RAC-265-028	"MFG: ECO FASTEN, SKIRT AL BLK 35MM & 40MM A80, MFG SKU: 2099012"
1	260 - FITTINGS/ANCHORS	RAC-265-031	"MFG: ECO FASTEN, SKIRT END CAP PLS 35MM&40MM-A, MFG SKU: 2099035"
24	260 - FITTINGS/ANCHORS	RAC-265-018	"MFG: ECO FASTEN, FRAME MLPE MOUNT SS, MFG SKU: 4011012"
1	260 - FITTINGS/ANCHORS	RAC-260-049	"MFG: EZ SOLAR, JUNCTION BOX, PV, MFG SKU: JB-1.2"
1	260 - FITTINGS/ANCHORS	RAC-263-101	"MFG: SNAP N RACK, WIRE SAVER, TOP AND BOTTOM, MFG SKU: 242-92262"
49	260 - FITTINGS/ANCHORS	RAC-265-034	"MFG: ECO FASTEN, ROCKIT SMART SLIDE BLK 6 - 75", MFG SKU: 2011024"
196	260 - FITTINGS/ANCHORS	RAC-265-035	"MFG: ECO FASTEN, ROCKIT SCREW #12X3" W/BW, MFG SKU: 2011025"
2	350 - ELECTRICAL ACCESSORIES	EA-350-585	"MFG: ILSCO, GROUND LUG, MFG SKU: SGB-4"
49	260 - FITTINGS/ANCHORS	RAC-265-003	"MFG: ECO FASTEN, ROCKIT MOUNT AL BLK, MFG SKU: 2011020"
1	260 - FITTINGS/ANCHORS	RAC-263-509	"MFG: SNAP N RACK, CONDUIT SUPPORT FOR COMP, MFG SKU: 242-02730"

**CLIENT:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON,  
 NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM  
 [S11]

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



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075

**GREG ALBRIGHT**

CONTRACTOR LICENSE:  
 ELECTRICAL CONTRACTOR U.34043

EQUIPMENT & SERVICE LIST			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
409874	2/24/2024	P.O.	PV-6



**MAIN PHOTOVOLTAIC SYSTEM DISCONNECT**  
690.13(B)

**DO NOT DISCONNECT UNDER LOAD**  
NEC 690.15 (B) & NEC 690.33(D)(2)

**WARNING**  
SINGLE 120-VOLT SUPPLY DO NOT CONNECT MULTIWIRED BRANCH CIRCUITS  
NEC 710.15(C) & 692.9 (C)

**WARNING DUAL POWER SOURCE**  
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM  
NEC 705.12(D) & NEC 690.59

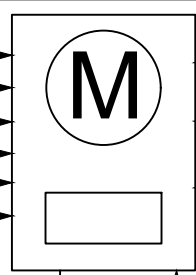
**WARNING**  
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL  
NEC 110.27(C) & OSHA 1910.145(F)(7)

**WARNING**  
ELECTRICAL SHOCK HAZARD  
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION  
706.15(C)(4) & 690.13(B)

**WARNING**  
THIS EQUIPMENT FED BY MULTIPLE SOURCES: TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN POWER SUPPLY SHALL NOT EXCEED AMPACITY OF BUSBAR  
NEC 705.12(B)(3)(3)

**WARNING**  
THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT  
NEC 690.31(E)

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**  
690.56(C)(3)



**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

IFC 605.11.3.1(1) & 690.56(C)

**CAUTION**  
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED  
NEC 705.12(D) & NEC 690.59

**WARNING**  
POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE.  
NEC 705.12(C) & NEC 690.59

**WARNING**  
ARC FLASH AND SHOCK HAZARD APPROPRIATE PPE REQUIRED  
24 INCH FLASH HAZARD BOUNDARY  
3 CALCMF2 FLASH HAZARD AT 18 INCHES  
480 VAC SHOCK HAZARD WHEN COVER IS REMOVED  
42 INCH LIMITED APPROACH  
12 INCH RESTRICTED APPROACH - 500 V CLASS 00 GLOVES  
1 INCH PROHIBITED APPROACH - 500 V CLASS 00 GLOVES  
LOCATION: 150 DOUBLE BARREL STREET, LILLINGTON, NC 27546

**PHOTOVOLTAIC AC DISCONNECT**  
NEC 690.13(B)

**PHOTOVOLTAIC AC DISCONNECT**  
RATED AC OUTPUT CURRENT: **32.00A**  
NOMINAL OPERATING AC VOLTAGE: **240V**  
NEC 690.54

**WARNING DUAL POWER SOURCE**  
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM  
NEC 705.12(D) & NEC 690.59

**SOLAR PV DC CIRCUIT**  
EVERY 10' ON CONDUIT AND ENCLOSURES  
NEC 690.31

**PHOTOVOLTAIC POWER SOURCE**  
EVERY 10' ON CONDUIT AND ENCLOSURES  
NEC 690.31(D)(2)

MAXIMUM VOLTAGE **480** V  
MAXIMUM CIRCUIT CURRENT **20** A  
MAX DC-DC CONVERTER OUTPUT CURRENT **15** A

**NOTES:**

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

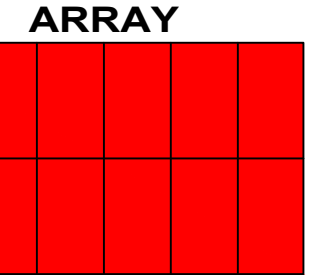
**PHOTOVOLTAIC DC DISCONNECT**  
NEC 690.13(B)

**MAXIMUM DC VOLTAGE OF PV SYSTEM**  
NEC 690.53

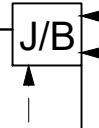
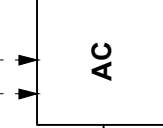
**WARNING**  
ELECTRICAL SHOCK HAZARD  
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION  
DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT  
706.15(C)(4) & 690.13(B)

**WARNING**  
ELECTRICAL SHOCK HAZARD  
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION  
706.15(C)(4) & 690.13(B)

**WARNING**  
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL  
NEC 110.27(C) & OSHA 1910.145(F)(7)



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



CLIENT:  
MATTHEW LIBY  
150 DOUBLE BARREL STREET, LILLINGTON, NC 27546  
AHJ: COUNTY OF HARNETT  
UTILITY: DUKE ENERGY  
METER: 348798055  
PHONE: (910) 922-4945  
EMAIL: MLIBY03@GMAIL.COM  
FINANCE: OTHER

SYSTEM:  
SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
SYSTEM SIZE (AC): 7.600 kW @ 240V  
MODULES: 24 X REC SOLAR: REC405AA PURE  
OPTIMIZERS: 24 X SOLAREEDGE S440  
INVERTER: SOLAREEDGE SE7600H-USRGM [S11]

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



FREEDOM FOREVER LLC  
415 INDUSTRIAL CT., GREER, SC 29651  
Tel: (800) 385-1075

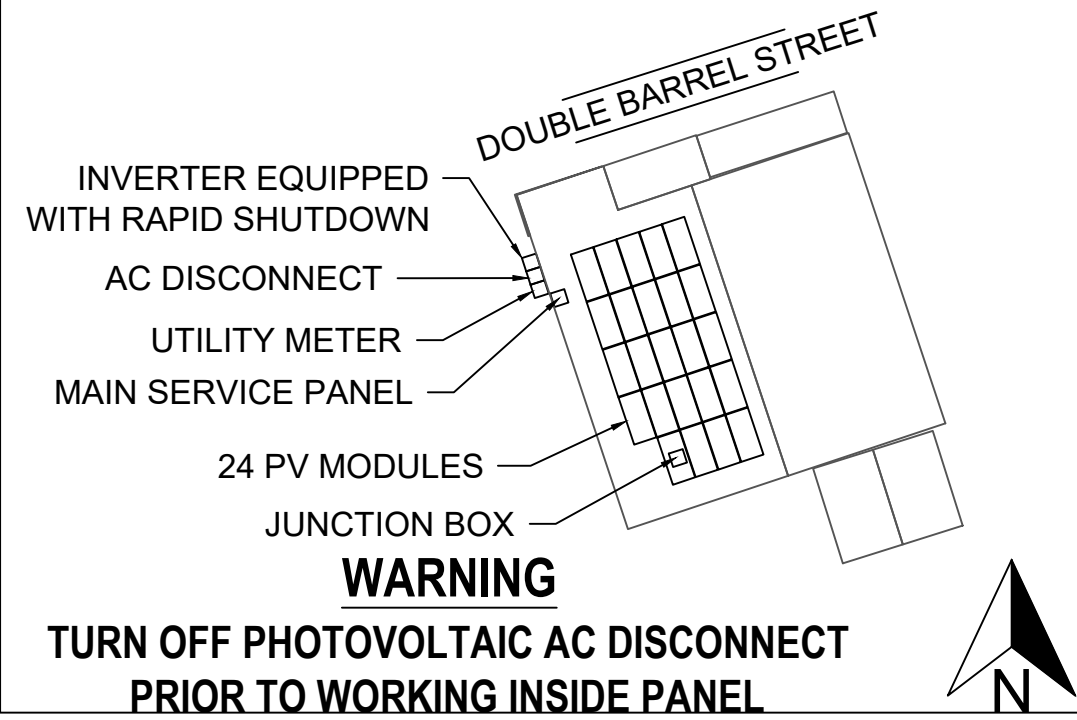
GREG ALBRIGHT

CONTRACTOR LICENSE:  
ELECTRICAL CONTRACTOR U.34043

LABELS			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
409874	2/24/2024	P.O.	PV-7

# CAUTION:

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



**CLIENT:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON, NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [S1]

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



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075

**GREG ALBRIGHT**

*Greg Albright*

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043

SITE PLACARD			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
409874	2/24/2024	P.O.	PV-7A

**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.

1-10    11-20    21-30    31-40    41-50    51-60

# SOLAREEDGE OPTIMIZER CHART

1

2

3

4

5

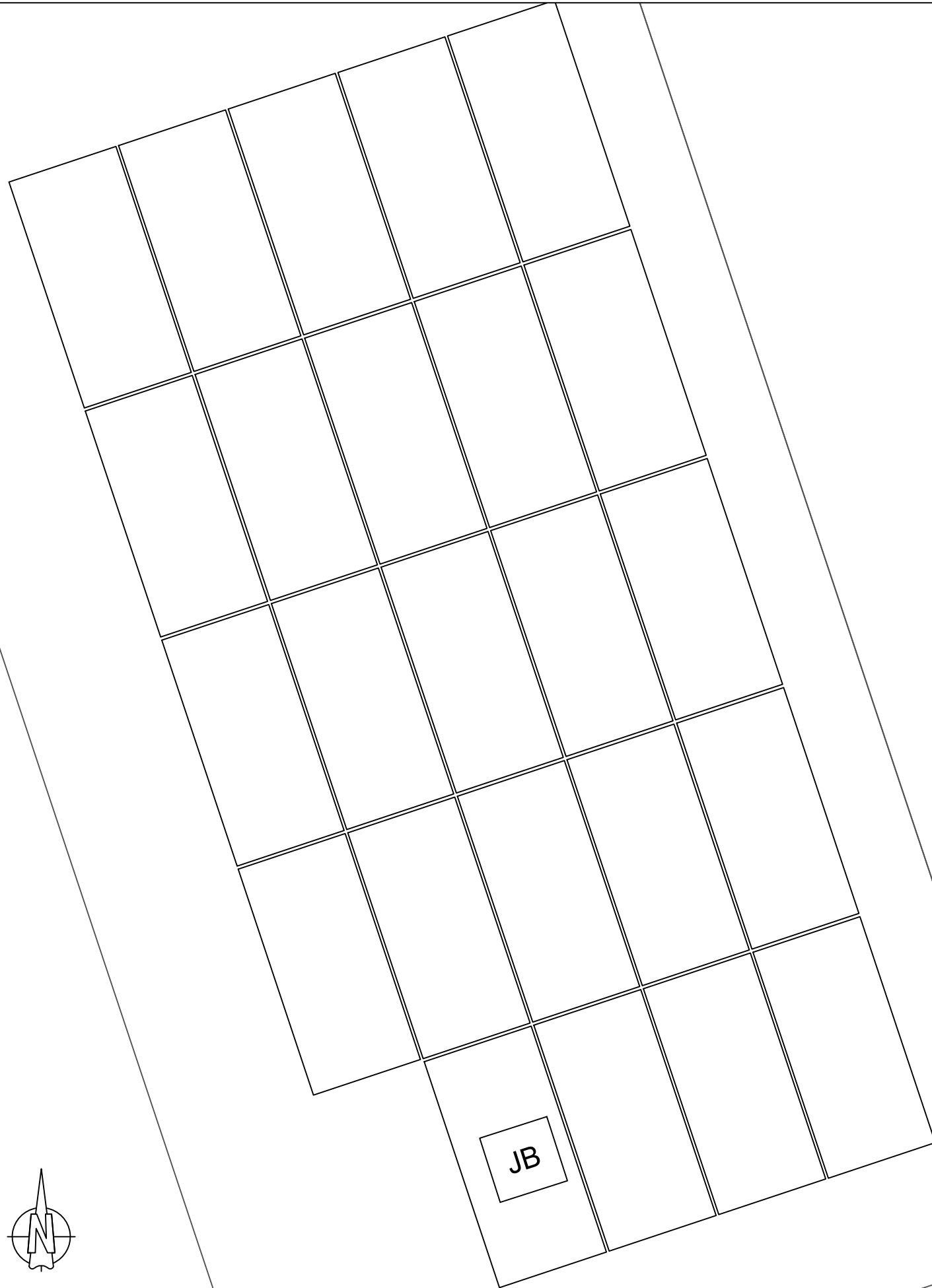
6

7

8

9

10



**CLIENT:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON,  
 NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE  
 OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [S1]

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



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075

**GREG ALBRIGHT**

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043



JB

**OPTIMIZER CHART**

JOB NO: 409874	DATE: 2/24/2024	DESIGNED BY: P.O.	SHEET: PV-8
-------------------	--------------------	----------------------	----------------

# 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: \_\_\_\_\_

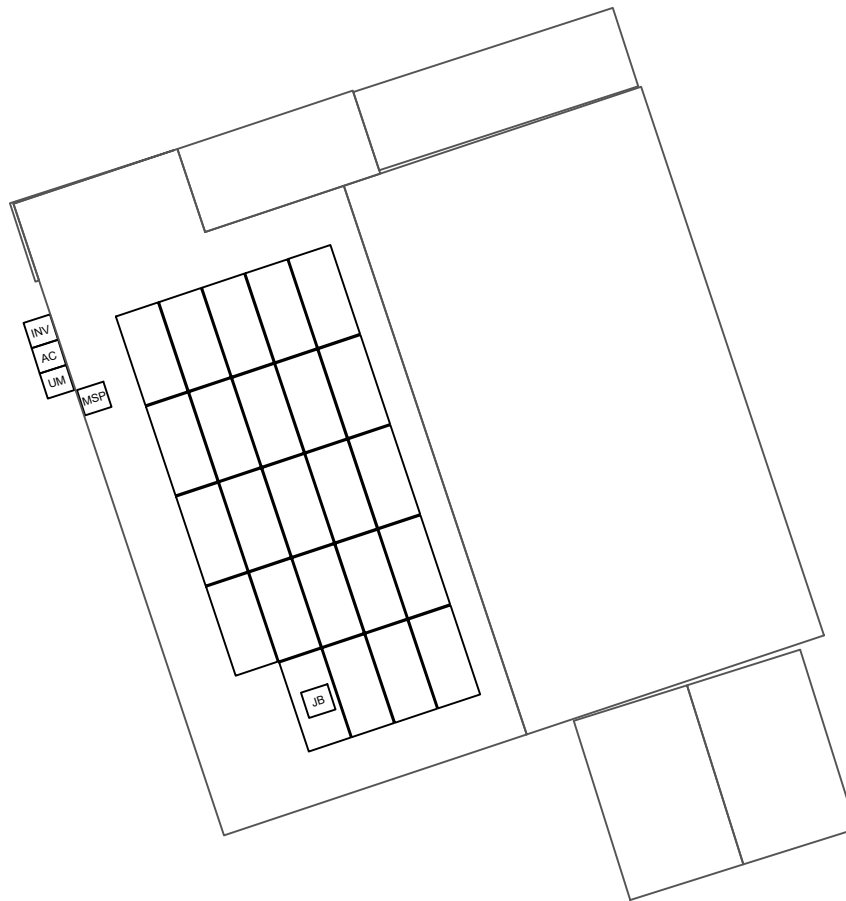
ALL EMPLOYEES ON SITE SHALL BE MADE AWARE OF THE SAFETY PLAN AND SIGN INDICATING THAT THEY ARE AWARE OF THE HAZARDS ON-SITE AND THE PLAN FOR WORKING SAFELY.

NAME

SIGNATURE

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

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:**  
 MATTHEW LIBY  
 150 DOUBLE BARREL STREET, LILLINGTON, NC 27546  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 348798055  
 PHONE: (910) 922-4945  
 EMAIL: MLIBY03@GMAIL.COM  
 FINANCE: OTHER

**SYSTEM:**  
 SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
 SYSTEM SIZE (AC): 7.600 kW @ 240V  
 MODULES: 24 X REC SOLAR: REC405AA PURE OPTIMIZERS: 24 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM [S11]

# BREAK AND WATER LOG

THIS LOG IS TO BE FILLED OUT ANY TIME THE TEMP EXCEEDS **90** DEGREES. THE CREW LEAD AND ROOF LEAD ARE RESPONSIBLE FOR ENSURING THIS IS COMPLETED AND UPLOADED AT THE END OF EVERYDAY WHEN TEMPS EXCEED **90** DEGREES

NAME	0800HRS	0900HRS	1000HRS	1100HRS	1200HRS	1300HRS	1400HRS	1500HRS	1600HRS

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



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075

GREG ALBRIGHT

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043

SAFETY PLAN

JOB NO: 409874	DATE: 2/24/2024	DESIGNED BY: P.O.	SHEET: PV-9
-------------------	--------------------	----------------------	----------------

# 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 identified and protected from contact, as necessary.

EQP (name and title):

## 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):

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:
Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:

**CLIENT:**  
MATTHEW LIBY  
150 DOUBLE BARREL STREET, LILLINGTON, NC 27546  
AHJ: COUNTY OF HARNETT  
UTILITY: DUKE ENERGY  
METER: 348798055  
PHONE: (910) 922-4945  
EMAIL: MLIBY03@GMAIL.COM  
FINANCE: OTHER

**SYSTEM:**  
SYSTEM SIZE (DC): 24 X 405 = 9.720 kW  
SYSTEM SIZE (AC): 7.600 kW @ 240V  
MODULES: 24 X REC SOLAR: REC405AA PURE  
OPTIMIZERS: 24 X SOLAREEDGE S440  
INVERTER: SOLAREEDGE SE7600H-USRGM [S11]

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



**FREEDOM FOREVER LLC**  
415 INDUSTRIAL CT., GREER, SC 29651  
Tel: (800) 385-1075

**GREG ALBRIGHT**

*Greg Albright*

**CONTRACTOR LICENSE:**  
ELECTRICAL CONTRACTOR U.34043

## SAFETY PLAN

JOB NO: 409874	DATE: 2/24/2024	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

SOLAR'S MOST TRUSTED



# REC ALPHA<sup>®</sup> PURE SERIES PRODUCT SPECIFICATIONS

**410 Wp**  
**20.6 W/FT<sup>2</sup>**  
**22.2% EFFICIENCY**



**LEAD-FREE**  
ROHS COMPLIANT

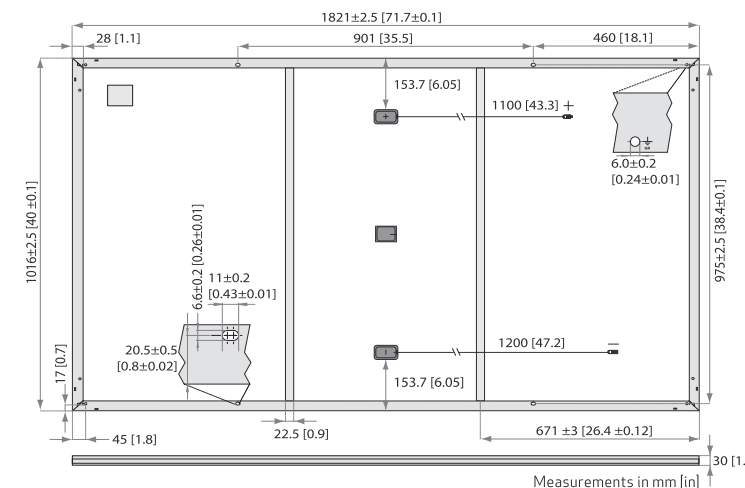
EXPERIENCE  
**α**  
PERFORMANCE

## REC ALPHA PURE SERIES PRODUCT SPECIFICATIONS



### GENERAL DATA

Cell type:	132 half-cut REC heterojunction bifacial cells with lead-free, gapless technology, 6 strings of 22 cells in series
Glass:	0.13in (3.2mm) solar glass with anti-reflective surface treatment in accordance with EN12150
Backsheet:	Highly resistant polymer (black)
Frame:	Anodized aluminum (black)
Junction box:	3-part, 3 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790
Connectors:	Stäubli MC4 PV-KBT4/KST4 (4 mm <sup>2</sup> ) in accordance with IEC 62852, IP68 only when connected
Cable:	12 AWG (4 mm <sup>2</sup> ) PV wire, 43+ 47 in (1.1 + 1.2 m) in accordance with EN 50618
Dimensions:	71.7 x 40 x 1.2 in (19.91 ft <sup>3</sup> ) / 1821 x 1016 x 30 mm (1.85 m <sup>3</sup> )
Weight:	45 lbs (20.5 kg)
Origin:	Made in Singapore



### ELECTRICAL DATA

	Product Code*: RECxxxAA Pure				
Power Output - P <sub>MAX</sub> (Wp)	390	395	400	405	410
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V <sub>MPP</sub> (V)	40.6	41.0	41.4	41.8	42.2
Nominal Power Current - I <sub>MPP</sub> (A)	9.61	9.64	9.67	9.69	9.72
Open Circuit Voltage - V <sub>OC</sub> (V)	48.4	48.6	48.8	49.1	49.4
Short Circuit Current - I <sub>SC</sub> (A)	10.38	10.39	10.40	10.41	10.42
Power Density (W/ft <sup>2</sup> )	19.6	19.8	20.1	20.3	20.6
Panel Efficiency (%)	21.1	21.4	21.6	21.9	22.2
Power Output - P <sub>MAX</sub> (Wp)	297	301	305	308	312
Nominal Power Voltage - V <sub>MPP</sub> (V)	38.3	38.6	39.0	39.4	39.8
Nominal Power Current - I <sub>MPP</sub> (A)	7.77	7.79	7.82	7.83	7.85
Open Circuit Voltage - V <sub>OC</sub> (V)	45.6	45.8	46.0	46.3	46.6
Short Circuit Current - I <sub>SC</sub> (A)	8.38	8.39	8.40	8.41	8.42

Values at standard test conditions (STC: air mass AM1.5, irradiance 10.75 W/sq ft (1000 W/m<sup>2</sup>), temperature 77°F (25°C), based on a production spread with a tolerance of P<sub>MAX</sub>, V<sub>OC</sub> & I<sub>SC</sub> ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m<sup>2</sup>, temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s). \*Where xxx indicates the nominal power class (P<sub>MAX</sub>) at STC above.

### MAXIMUM RATINGS

Operational temperature:	-40...+85°C
Maximum system voltage:	1000 V
Maximum test load (front):	+7000 Pa (146 lbs/ft <sup>2</sup> )
Maximum test load (rear):	-4000 Pa (83.5 lbs/ft <sup>2</sup> )
Max series fuse rating:	25 A
Max reverse current:	25 A

\*See installation manual for mounting instructions.  
Design load = Test load / 1.5 (safety factor)

### WARRANTY

	Standard	REC ProTrust	
Installed by an REC Certified Solar Professional	No	Yes	Yes
System Size	All	≤25 kW	25-500 kW
Product Warranty (yrs)	20	25	25
Power Warranty (yrs)	25	25	25
Labor Warranty (yrs)	0	25	10
Power in Year 1	98%	98%	98%
Annual Degradation	0.25%	0.25%	0.25%
Power in Year 25	92%	92%	92%

See warranty documents for details. Conditions apply

Available from:

Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.

### CERTIFICATIONS

IEC 61215:2016, IEC 61730:2016, UL 61730
IEC 62804 PID
IEC 61701 Salt Mist
IEC 62716 Ammonia Resistance
UL 61730 Fire Type Class 2
IEC 62782 Dynamic Mechanical Load
IEC 61215-2:2016 Hailstone (35mm)
IEC 62321 Lead-free acc. to RoHS EU 863/2015
ISO 14001, ISO 9001, IEC 45001, IEC 62941



### TEMPERATURE RATINGS\*

Nominal Module Operating Temperature:	44°C (±2°C)
Temperature coefficient of P <sub>MAX</sub> :	-0.24 %/°C
Temperature coefficient of V <sub>OC</sub> :	-0.24 %/°C
Temperature coefficient of I <sub>SC</sub> :	0.04 %/°C

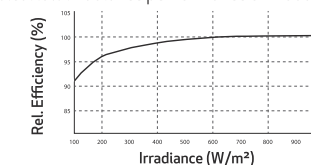
\*The temperature coefficients stated are linear values

### DELIVERY INFORMATION

Panels per pallet:	33
Panels per 40 ft GP/high cube container:	792 (24 pallets)
Panels per 53 ft truck:	891 (27 pallets)

### LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



Typical low irradiance performance of module at STC:

Typical low irradiance performance of module at STC:

Specifications subject to change without notice.

Ref: PM-DS-12-06-Rev-9 02.23

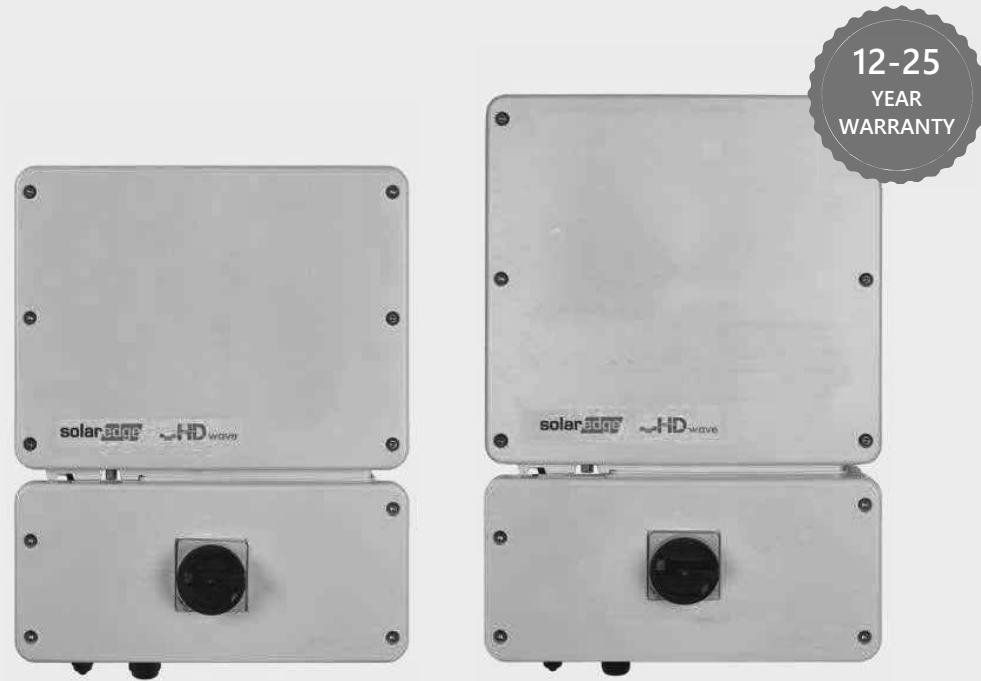
REC Solar PTE. LTD.  
20 Tuas South Ave. 14  
Singapore 637312  
post@recgroup.com



REC  
www.recgroup.com

# 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-XXXXBXX4					SE11400H-XXXXBXX5	Units
	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
<b>OUTPUT</b>							
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 <sup>(1)</sup>						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						
<b>INPUT</b>							
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 <sup>(2)</sup>	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V <sup>(2)</sup>	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	
<b>ADDITIONAL FEATURES</b>							
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), wireless SolarEdge Home Network (optional) <sup>(3)</sup> , Wi-Fi (optional), Cellular (optional)						
Revenue Grade Metering, ANSI C12.20	Optional <sup>(4)</sup>						
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						
<b>STANDARD COMPLIANCE</b>							
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						
<b>INSTALLATION SPECIFICATIONS</b>							
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 <sup>(5)</sup>	in / mm	
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6	44.9 / 20.4 <sup>(5)</sup>	lb / kg	
Noise	< 25			< 50			
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>(6)</sup>						
Protection Rating	NEMA 4X (Inverter with Safety Switch)						

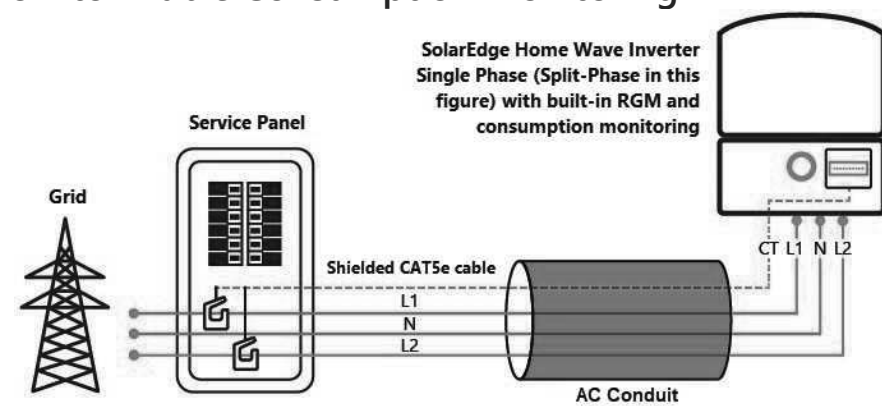
(3) For more information, refer to the [SolarEdge Home Network](#) datasheet

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

(5) SE11400H-USxxxBox5 is the updated PN, though SE11400H-USxxxBox4 will still be available. All specifications are similar for both models, **EXCLUDING** the weight and dimensions [HxWxD]. The weight and dimensions of SE11400H-USxxxBox4 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.

# Power Optimizer For North America

S440, S500



POWER OPTIMIZER

## PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects 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](http://solaredge.com)



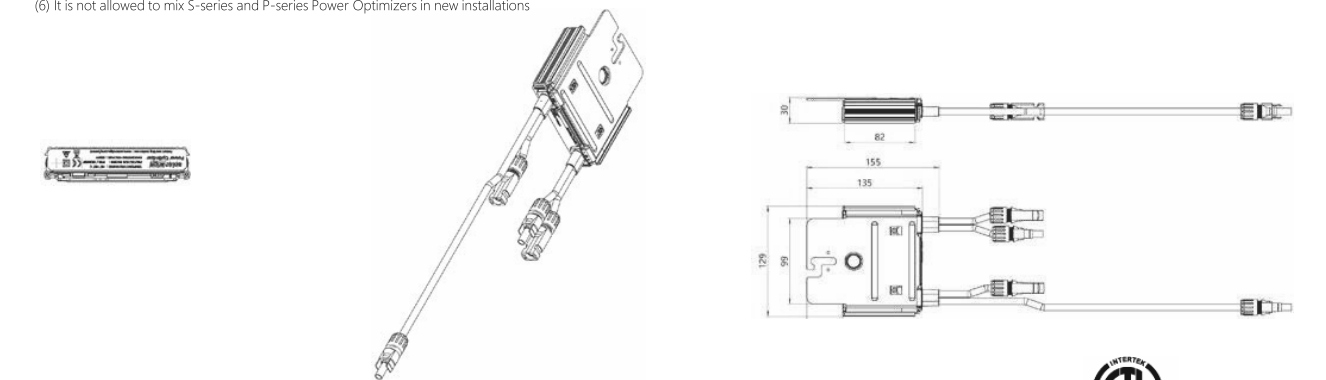
# / Power Optimizer For North America S440, S500

	S440	S500	Unit
<b>INPUT</b>			
Rated Input DC Power <sup>(1)</sup>	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		%
Oversvoltage Category	II		
<b>OUTPUT DURING OPERATION</b>			
Maximum Output Current	15		Adc
Maximum Output Voltage	60		Vdc
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)</b>			
Safety Output Voltage per Power Optimizer	1+/-0.1		Vdc
<b>STANDARD COMPLIANCE</b>			
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		
<b>INSTALLATION SPECIFICATIONS</b>			
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 <sup>(2)</sup>		
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 <sup>(3)</sup>	-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 <sup>(4)</sup>	
Maximum Nominal Power per String	5700 (6000 with SE7600-US-SE11400-U)	6000	12750	W
Maximum Allowed Connected Power per String <sup>(5)</sup> (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  $\leq$  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



© SolarEdge Technologies, Inc. All rights reserved. SOLAREEDGE, the SolarEdge logo, OPTIMIZED BY SOLAREEDGE are trademarks or registered trademarks of SolarEdge Technologies, Inc. All other trademarks mentioned herein are trademarks of their respective owners. Date: February 8, 2022 DS-000018-NA. Subject to change without notice.



## Product specifications

# Eaton DG222URB

Catalog Number: DG222URB

Eaton General duty non-fusible safety switch, single-throw, 60 A, NEMA 3R, Rainproof, Painted galvanized steel, Two-pole, Two-wire, 240 V

## General specifications

Product Name	Catalog Number
Eaton general duty non-fusible safety switch	DG222URB
	UPC
	782113144238
Product Length/Depth	Product Height
7.38 in	14.38 in
Product Width	Product Weight
8.69 in	9 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
	WARNING! Switch is not approved for service entrance unless a neutral kit is installed.



## Product specifications

Product Category
General duty safety switch
Enclosure material
Painted galvanized steel
Type
Non-fusible, single-throw
Fuse configuration
Non-fusible
Number of wires
2
Enclosure
NEMA 3R
Voltage rating
240V
Amperage Rating
60A
Number Of Poles
Two-pole

## Resources

Catalogs
Eaton's Volume 2—Commercial Distribution
Multimedia
Double Up on Safety
Switching Devices Flex Center
Specifications and datasheets
Eaton Specification Sheet - DG222URB
Warranty guides
Selling Policy 25-000 - Distribution and Control Products and Services



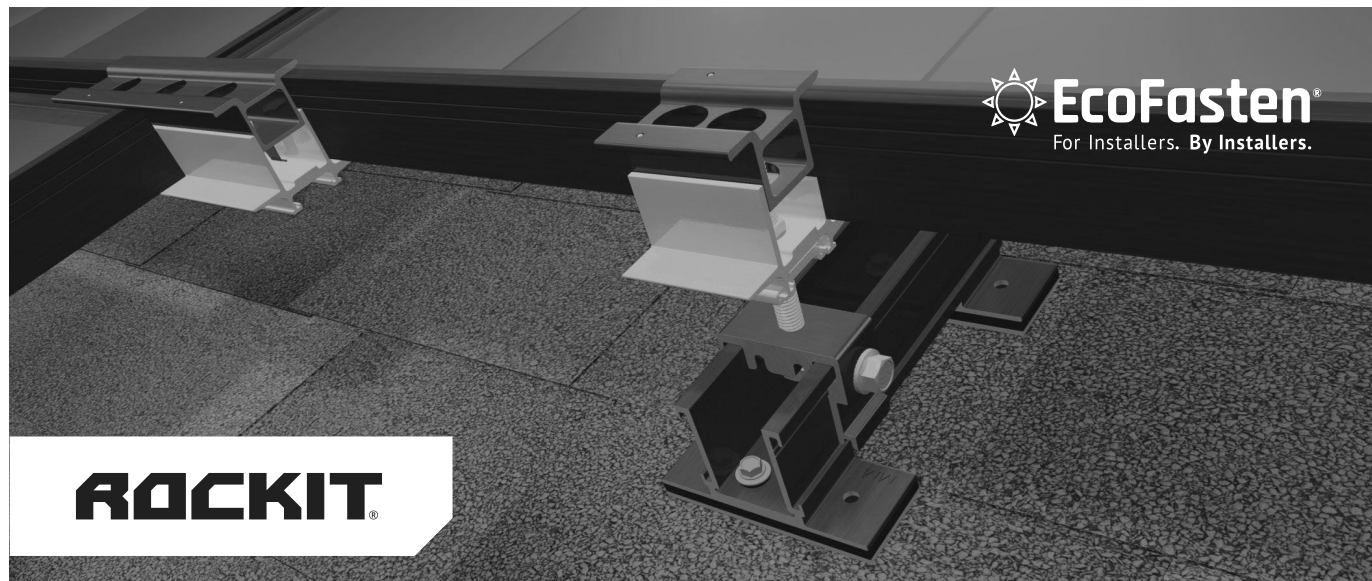
Eaton Corporation plc  
Eaton House  
30 Pembroke Road  
Dublin 4, Ireland  
Eaton.com  
© 2023 Eaton. All Rights Reserved.

Eaton is a registered trademark.

All other trademarks are property of their respective owners.



Eaton.com/socialmedia



# ROCKIT SMART SLIDE

## Integrated UltraGrip Technology™

Pre-installed sealing pads are compatible with all composition shingle roofs. The compression achieved when fastened to the roof creates a super strong watertight seal. In most cases, the slide can be mounted to the deck without the need for sealant. A layer of flexible foam provides cushioning, which allows the waterproofing sealant to embed deep into the granules of the shingle as well as to flexibly conform over the steps found on architectural-style shingles.



**ROCKIT**

## INTRODUCING ROCKIT SMART SLIDE!

Introducing EcoFasten's patent pending RockIt Smart Slide, our simple solution for quickly installing the popular RockIt rail-less racking system to composition shingle roofs.

### Features & Benefits

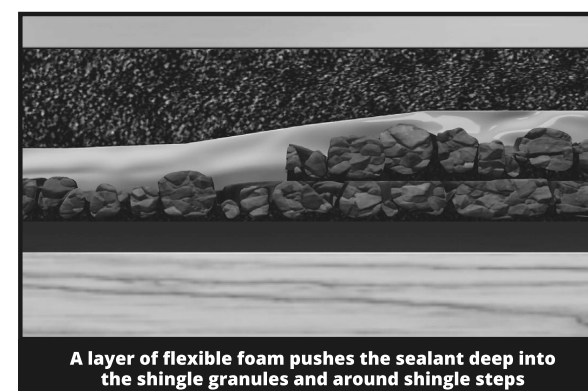
- Eliminates the need to pry up shingle courses and install a metal flashing
- Multiple opportunities to find the rafter
- No need for additional material when architectural shingles are not level
- Longer 6.75" slide avoids overlaps in shingle courses
- Integrated flashing utilizes UltraGrip Technology™ to create a watertight seal



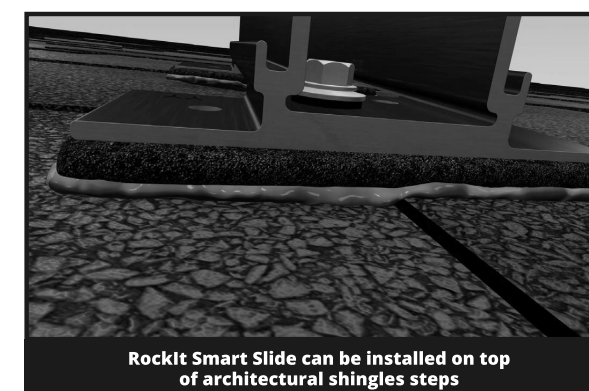
ROCKIT SMART SLIDE

### Required Components:

Part Number:	Description:
2011024	RI SMART SLIDE BLK 6.75"
2011025	RI SMART SCRW #12X3" W/BW



A layer of flexible foam pushes the sealant deep into the shingle granules and around shingle steps



RockIt Smart Slide can be installed on top of architectural shingles steps

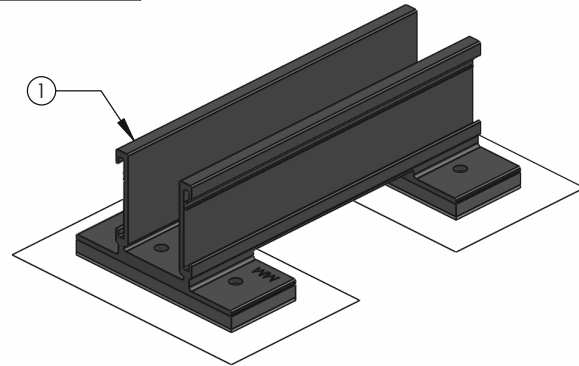
## Testing & Documentation

- [UL441 Rain Report](#)
- [TAS 100 \(A\)-95 Wind and Wind Driven Rain Resistance](#)
- [Mechanical Load Test/Structural Capacity Certification](#)
- [Florida Product Approval](#)
- [RockIt Installation Manual](#)
- [RockIt CutSheets](#)



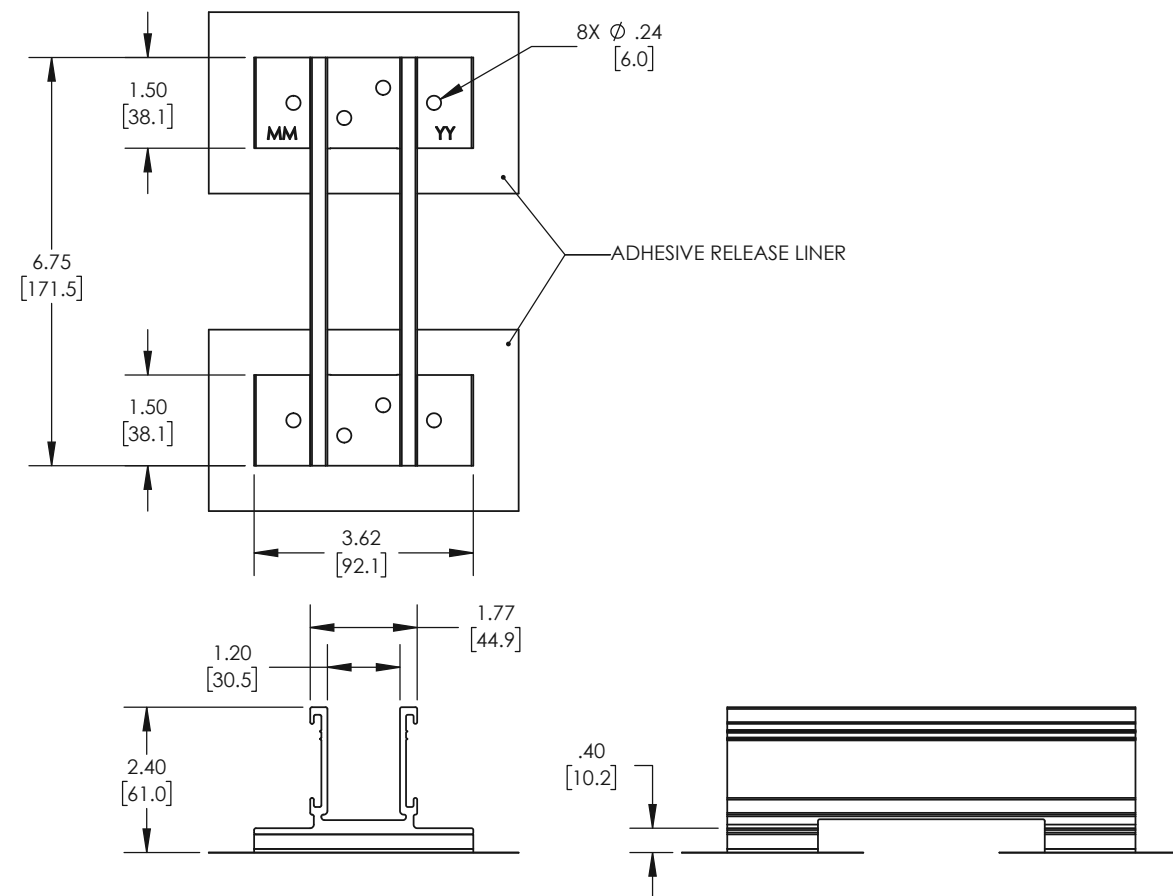
# RI SMART SLIDE BLK 6.75"

PART NUMBER	DESCRIPTION
2011024	RI SMART SLIDE BLK 6.75"



ITEM NO.	DESCRIPTION
1	ROCKIT SMART SLIDE ASSEMBLY

1) ROCKIT FLASHLESS SLIDE ASSEMBLY

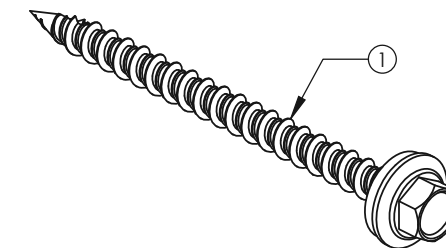


MATERIAL	ALUMINUM, EPDM, ADHESIVE, TREATED PAPER
FINISH	BLACK

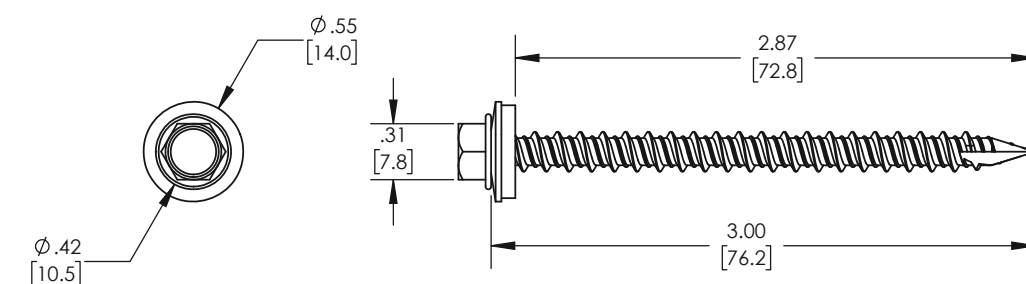
Rev: CS-3

# RI SMART SCREW #12X3" W/BW

PART NUMBER	DESCRIPTION
2011025	RI SMART SCREW #12X3" W/BW



ITEM NO.	DESCRIPTION
1	SELF TAPPING SCREW #12 WITH SEALING WASHER ASSEMBLY



MATERIAL	STAINLESS STEEL, EPDM RUBBER
FINISH	MILL, BLACK

Rev: CS-2

June 22, 2023

EcoFasten  
4141 West Van Buren St.  
Phoenix, AZ 85009

Attn.: EcoFasten Solar Engineering Department

**Re:** EcoFasten *RockIt System, with Comp Slide or Smart Slide*, Engineering Certification for Gable and Hip roofs.

This letter addresses the structural performance and code compliance of EcoFasten's RockIt Flush Mount System. The contents of the letter shall be reviewed in its entirety before application to any project design. The RockIt System is a proprietary rooftop mounting system used to support photovoltaic (PV) modules installed in portrait or landscape orientation and set parallel to the underlying roof surface. PV modules are supported by extruded aluminum RockIt Mount assemblies which are connected to a RockIt roof attachment, either the RockIt Comp Slide or RockIt Smart Slide, which is attached directly to the roof structure. Assembly details of a typical RockIt system and its core components are shown in Exhibit ECO 1.0. The RockIt Comp Slide assembly is shown in drawing EX-1 and the RockIt Smart Slide assembly is shown in drawing 850076. The EcoFasten RockIt System is designed and certified to the structural requirements of the reference standards listed below, for the load conditions and configurations tabulated in the attached span tables.

- Minimum Design Loads for Buildings and Other Structures, ASCE/SEI 7-16
- 2021 International Building Code, by the International Code Council, Inc.
- 2021 International Residential Code, by the International Code Council, Inc.
- SEAOC (Structural Engineer Association of California) report PV2-2017 Wind Design for Solar Arrays
- Aluminum Design Manual 2015, by The Aluminum Association, Inc.
- NDS-2018, National Design Specification for Wood Construction, by the American Wood Council

The span tables provided in this letter are certified based on the structural performance of EcoFasten RockIt System in conjunction with RockIt Comp Slide or Smart Slide only, with no consideration of the structural adequacy of the PV modules, or the underlying roof supporting members. The certified capacities in these tables shall be used when all EcoFasten provided components are installed with no generic replacement parts. These tables are intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. It is the responsibility of the installer or system designer to verify the structural capacity and adequacy of the system components regarding the applied or resultant loads of any chosen array configuration.

Sincerely,

Matthew S Kuzila, PE



Digitally Sealed 6.22.2023  
Expires 12.31.2023