

# ROOF MOUNT PHOTOVOLTAIC SYSTEM

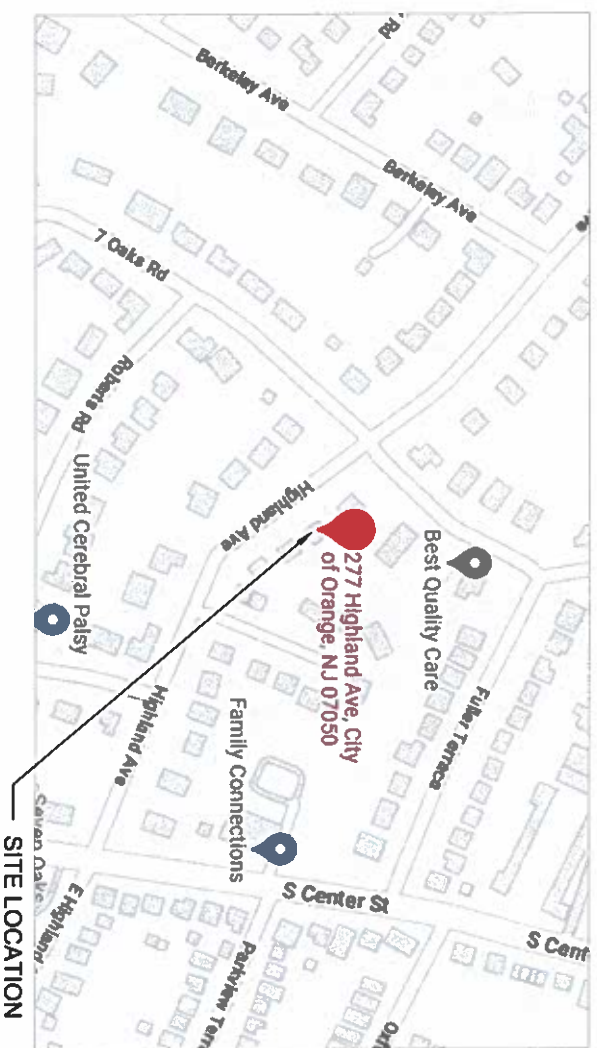
**CODES:**

THIS PROJECT COMPLIES WITH THE FOLLOWING:  
 2021 INTERNATIONAL BUILDING CODE  
 2021 INTERNATIONAL RESIDENTIAL CODE  
 2020 NATIONAL ELECTRIC CODE  
 AS ADOPTED BY CITY OF ORANGE TOWNSHIP (ESSEX COUNTY)

**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 CHECK AHJ AC SEC 250.166(A).  
 SOLAR PHOTOVOLTAIC SYSTEM EQUIPMENT WILL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF ART. 690 OF THE CHECK AHJ AC  
 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.

**VICINITY MAP:**



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**CLIENT:**  
 DWANA WATERS  
 277 HIGHLAND AVENUE, CITY OF ORANGE,  
 NJ 07050  
 AHJ: CITY OF ORANGE TOWNSHIP (ESSEX COUNTY)  
 UTILITY: PSE&G - PUBLIC SERVICE ELECTRIC & GAS  
 PHONE: (808) 280-1739  
 EMAIL: TIFANYLONG7@YAHOO.COM  
 FINANCE: SUNRUN

**SYSTEM:**  
 SYSTEM SIZE (DC) 26 X 395 = 10 270 KW  
 SYSTEM SIZE (AC) 7 600 KW @ 240V  
 MODULES 26 X HANWHA QCELL  
 Q.PEAK-DUCL-67 3 395  
 OPTIMIZERS 26 X SOLAREEDGE S440  
 INVERTER SOLAREEDGE SET600H-USRGM (S11)

NO.	REVISIONS	DATE
-	REVISED BY	
-		
-		

**freedom FOREVER**  
 FREEDOM FOREVER LLC  
 201 COMMERCE DR #5, MOORESTOWN, NJ 08057  
 Tel: (800) 385-1075  
 GREG ALBRIGHT

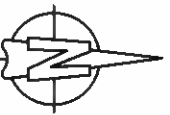
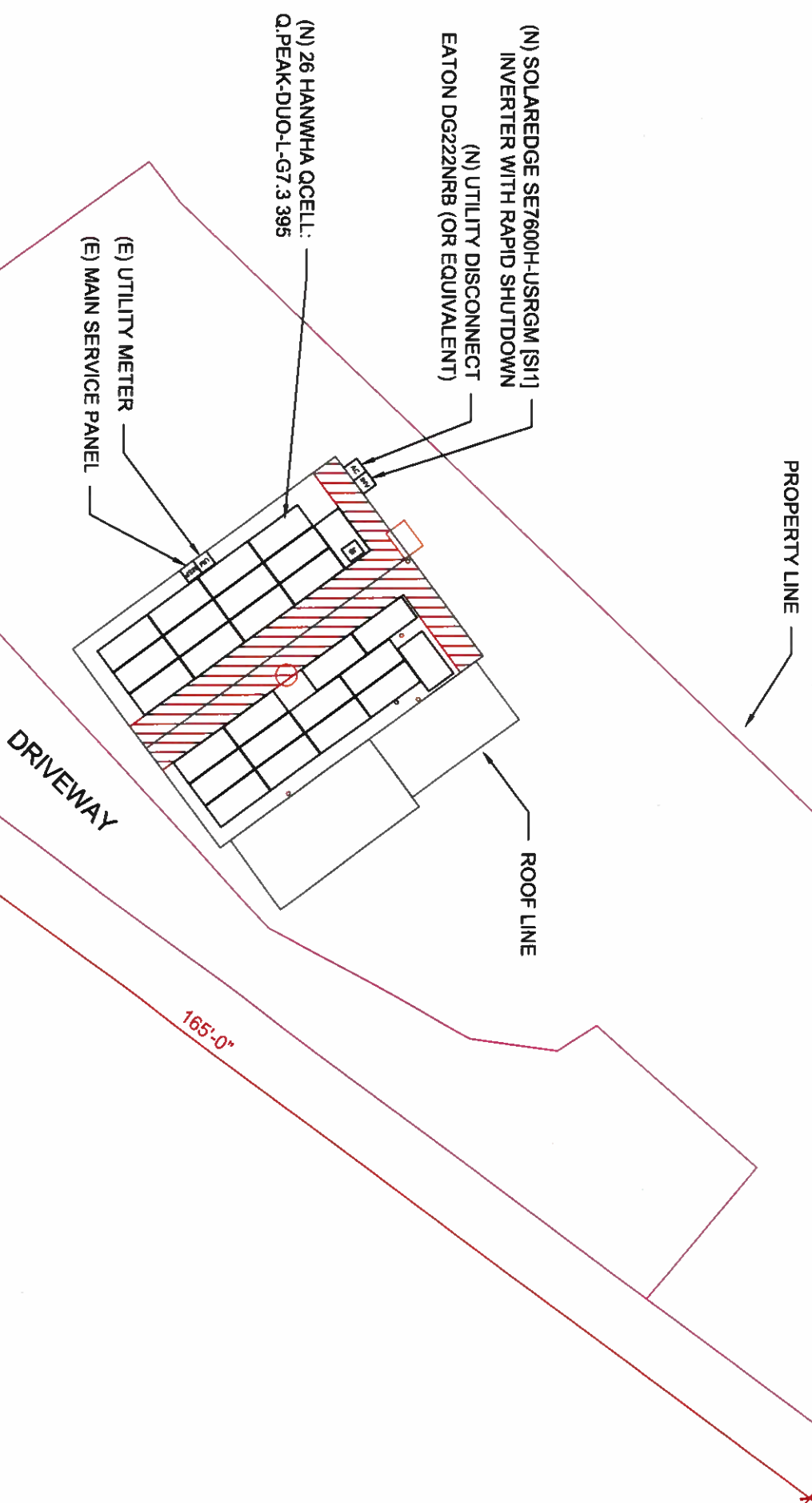
*Greg Albright*  
 CONTRACTOR LICENSE:  
 HOME IMPROVEMENT CONTRACTOR  
 13VH11080100

JOB NO:	DATE:	DESIGNED BY:	SHEET:
298406	2/17/2023	N.B.	PV-1

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

TOTAL ROOF AREA RIDGE SETBACK CALCS:  
 TOTAL ROOF AREA: 1420.86 SQ FT  
 SINGLE MODULE AREA: 21.68946 SQ FT  
 TOTAL NUMBER OF MODULES: 26  
 TOTAL AREA OF MODULES: 563.93 SQ FT  
 ROOF COVERAGE: 39.69%  
 FIRE SPRINKLERS : NO

HIGHLAND AVENUE



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

1

**S. M. Mehdi Zomorodian**  
 Digitally signed by S. M. Mehdi Zomorodian  
 Date: 2023.02.18 09:57:64  
 09:21:14-0900

ROOF AREA: 1420.86 SQ FT

CLIENT:  
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 ELECTRIC & GAS  
 PHONE: (908) 290-1739  
 EMAIL: TIFFANYLONG7@YAHOO.COM  
 FINANCE: SUNRUN

SYSTEM:  
 SYSTEM SIZE (DC): 26 X 395 = 10,270 KW  
 SYSTEM SIZE (AC): 7,800 KW @ 240V  
 MODULES: 26 X HANWHA QCELL  
 Q.PEAK-DUO-L-G7.3.395  
 OPTIMIZERS: 26 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM (S11)

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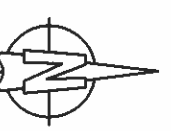
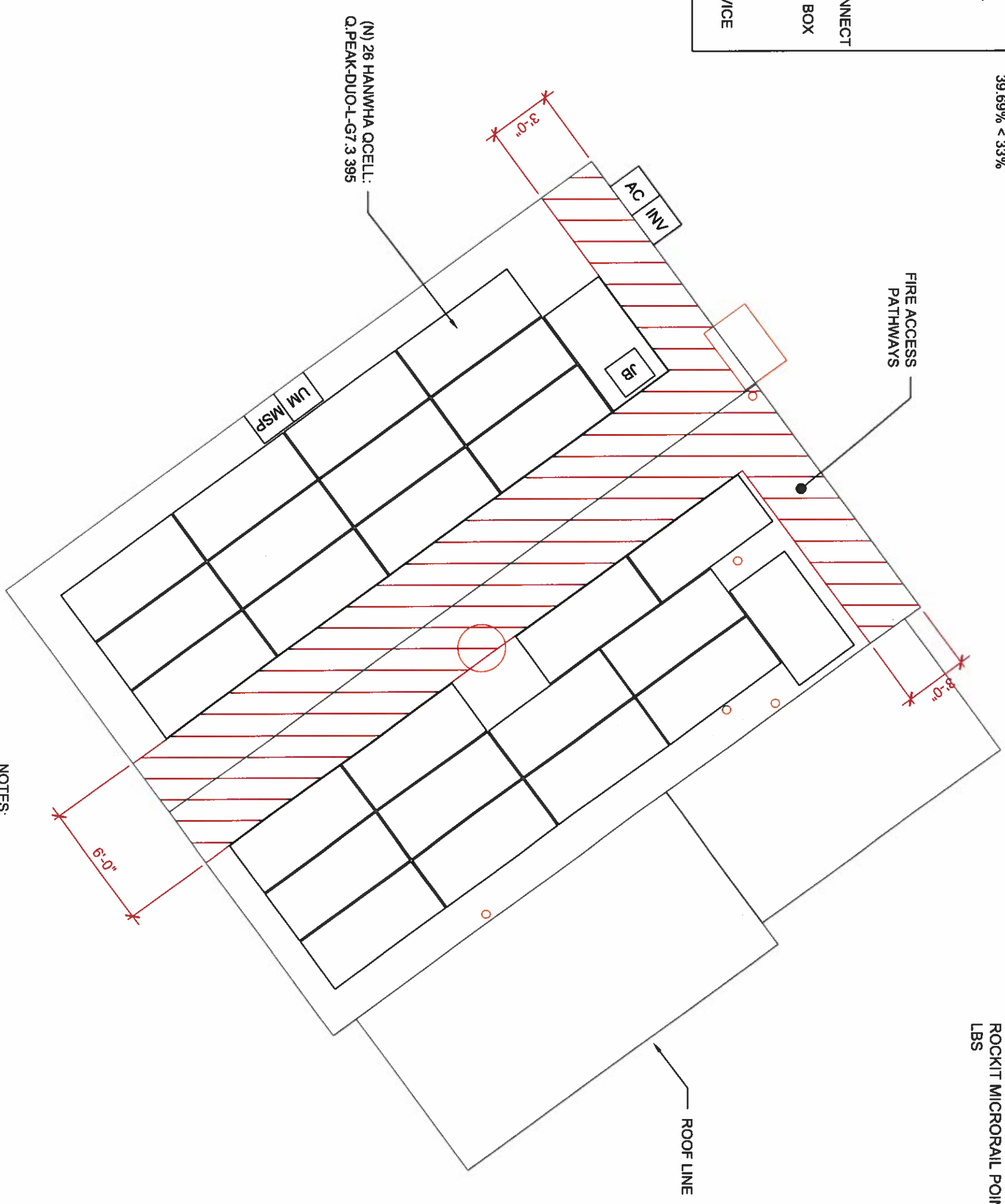
FREEDOM FOREVER LLC  
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SITE PLAN			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
298406	2/17/2023	N.B.	PV-2

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

MODIFIED SETBACKS PROPOSED AT RIDGE:  
 TOTAL ARRAY AREA = 563.93 SF  
 TOTAL ROOF AREA = 1420.86 SF  
 TOTAL ARRAY AREA AS A % TO ROOF AREA = 39.69%  
 39.69% < 33%

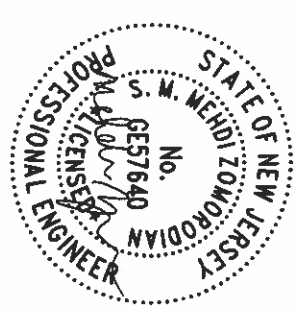
TOTAL ROOF AREA: 1420.86 SQ FT  
 TOTAL ARRAY AREA: 563.93 SQ FT  
 ARRAY COVERAGE: 39.69%  
 SYSTEM DISTRIBUTED WEIGHT: 2.34 LBS  
 ROCKIT MICRORAIL POINT-LOAD: 22.74 LBS



ROOF PLAN  
 SCALE: 3/16" = 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.



ROOF AREA: 1420.86 SQ FT

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 PHONE: (908) 280-1739  
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 FINANCE: SUNRUN

SYSTEM:  
 SYSTEM SIZE (DC): 26 X 395 = 10,270 kW  
 SYSTEM SIZE (AC): 7,600 kW @ 240V  
 MODULES: 26 X HANWHA QCELL:  
 Q.PEAK-DUO-L-G7.3.395  
 OPTIMIZERS: 26 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SET600H-USRGM (S11)

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289406	2/17/2023	N.B.	PV-2A

**ROOF DETAILS:**

TOTAL ROOF AREA: 1420.86 SQ. FT  
 TOTAL ARRAY AREA: 563.93 SQ. FT  
 ARRAY COVERAGE: 39.69%  
 SYSTEM DISTRIBUTED WEIGHT: 2.34 LBS  
 ROCKIT MICRORAIL POINT-LOAD: 22.74 LBS


ROOF AREA STATEMENT						
ROOF	MODULE QUANTITY	ROOF PITCH	ARRAY PITCH	AZIMUTH	ROOF AREA	ARRAY AREA
ROOF 1	13	30	30	234	547.17 SQ. FT	281.96 SQ. FT
ROOF 2	13	30	30	54	547.17 SQ. FT	281.96 SQ. FT
-----	-----	-----	-----	-----	SQ. FT	SQ. FT
-----	-----	-----	-----	-----	SQ. FT	SQ. FT
-----	-----	-----	-----	-----	SQ. FT	SQ. FT
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-----	-----	-----	-----	-----	SQ. FT	SQ. FT
-----	-----	-----	-----	-----	SQ. FT	SQ. FT
-----	-----	-----	-----	-----	SQ. FT	SQ. FT



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 Q.PEAK-DUO-L-G7.3 395  
 OPTIMIZERS: 26 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SET600H-USRGM  
 (S11)

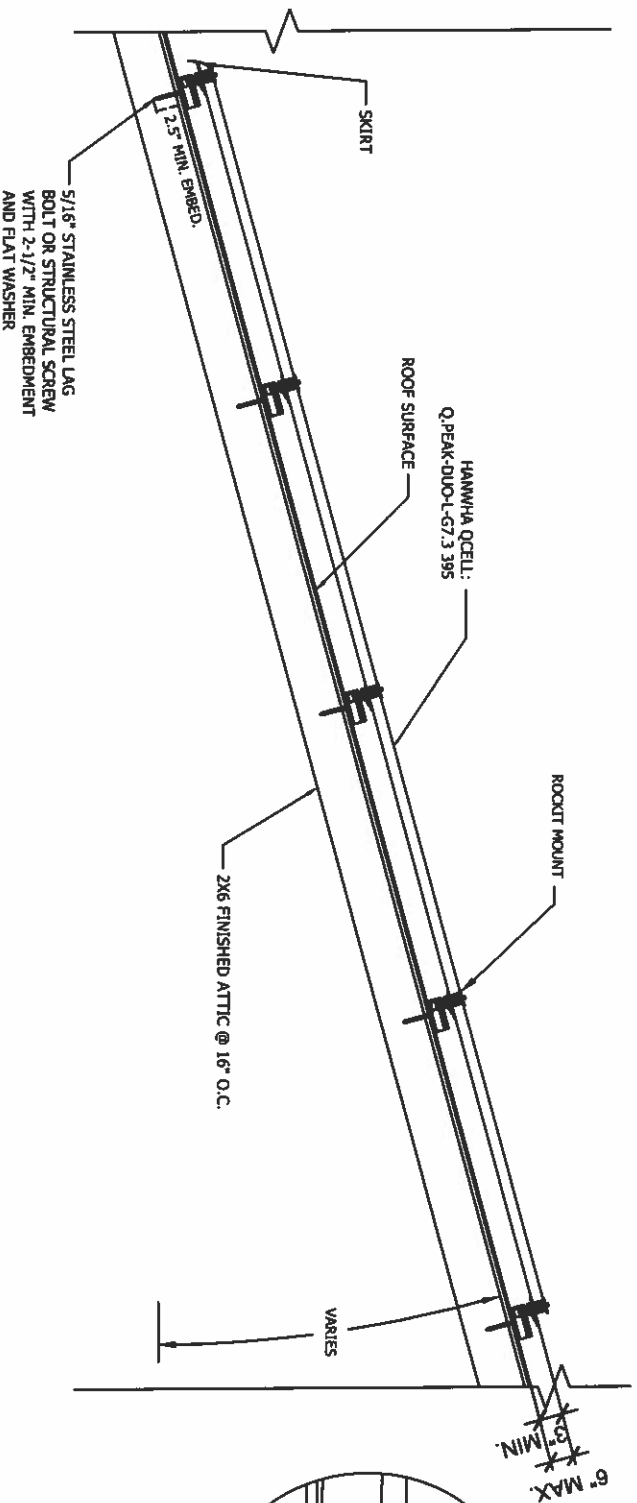
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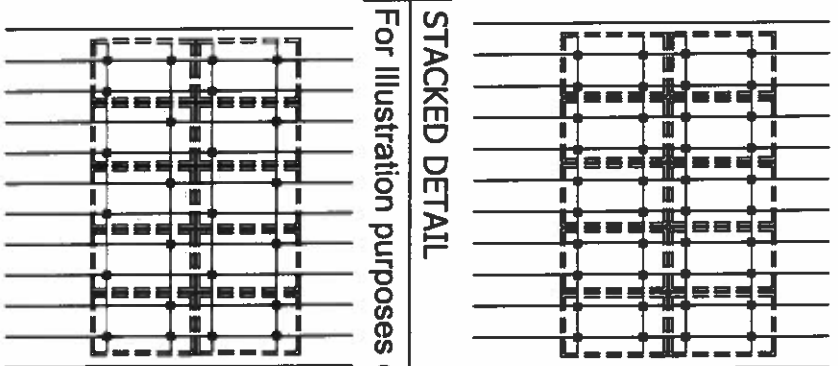
ROOF DETAILS			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
299406	2/17/2023	N.B.	PV.2B

ROOF PITCH	ROOFING TYPE	ATTACHMENT TYPE	FRAMING TYPE <sup>1</sup>	MAX UNBRACED LENGTH(FT.) <sup>1</sup>	RAFTER/TRUSS SISTERING	PENETRATION PATTERN <sup>2</sup>	MAX ATTACHMENT SPACING (IN.) <sup>2</sup>	MAX RAIL OVERHANG(I N.) <sup>3</sup>
ROOF 1 30	COMP SHINGLE	ECOFASTEN ROCKIT SLIDE	2X6 FINISHED ATTIC @ 16" OC	6.00'	NOT REQ'D	STAGGERED	48" OC	16"
ROOF 2 30	COMP SHINGLE	ECOFASTEN ROCKIT SLIDE	2X6 FINISHED ATTIC @ 16" OC	6.00'	NOT REQ'D	STAGGERED	48" OC	16"

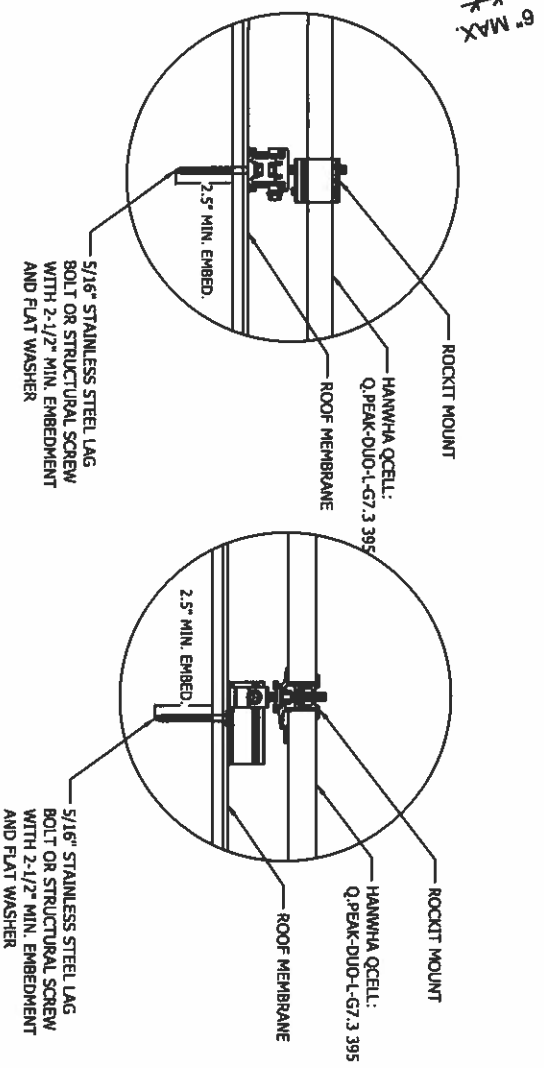
1. CONTRACTOR TO VERIFY FRAMING TYPE AND MAX UNBRACED LENGTH PRIOR TO INSTALLATION. IF THE ABOVE INFORMATION DOES NOT MATCH FIELD CONDITIONS, NOTIFY ENGINEER OF RECORD IMMEDIATELY.  
2. WHERE COLLAR TIES OR RAFTER SUPPORTS EXIST, CONTRACTOR SHALL USE RAFTERS WITH COLLAR TIES AS ATTACHMENT POINTS.  
3. WHERE APPLICABLE FOR RAILED ATTACHMENT INSTALLATIONS.



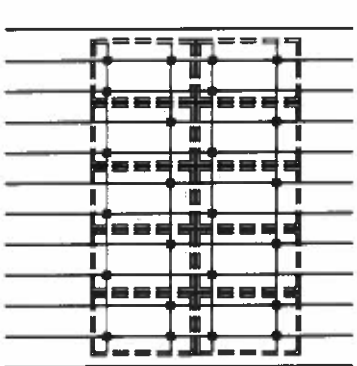
**SOLAR PV ARRAY SECTION VIEW**  
Scale: NTS



**STACKED DETAIL**  
For illustration purposes only



**ATTACHMENT DETAIL**  
Scale: NTS



**STAGGERED DETAIL**  
For illustration purposes only



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SYSTEM SIZE (AC): 7.800 kW @ 240V  
MODULES: 26 X HANWHYA QCELL:  
Q-PEAK-DUO-L-G7.3.395  
OPTIMIZERS: 26 X SOLAREEDGE S440  
INVERTER: SOLAREEDGE SET600H-USRGM  
(S11)

NO	REVISIONS	DATE
-	REVISED BY	
-	DATE	

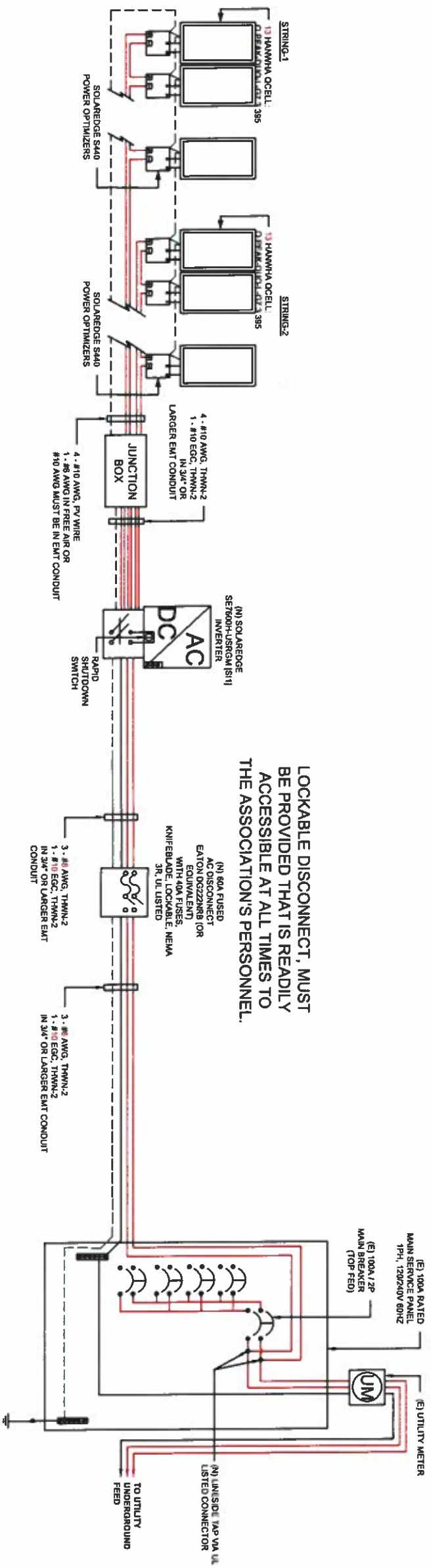
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 GREG AL BRIGHT  
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 13VH11080100

JOB NO:	DATE:	DESIGNED BY:	SHEET:
298406	2/17/2023	N.B.	PV-3

MOUNTING DETAILS

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

A TAPBOX MAY BE USED IN LIEU OF PERFORMING THE LINESIDE TAP IN THE MAIN SERVICE PANEL. THIS IS DEPENDENT UPON SITE CONDITIONS



LOCKABLE DISCONNECT, MUST BE PROVIDED THAT IS READILY ACCESSIBLE AT ALL TIMES TO THE ASSOCIATION'S PERSONNEL.

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 PHONE: (908) 290-1739  
 EMAIL: TIFFANYLONG7@YAHOO.COM  
 FINANCE: SUNRUN

SYSTEM:  
 SYSTEM SIZE (DC): 28 X 395 = 10,270 KW  
 SYSTEM SIZE (AC): 7,600 KW @ 240V  
 MODULES: 28 X HANWHA QCELL  
 Q.PEAK-DUO-L-67.3.395  
 OPTIMIZERS: 28 X SOLAREGE SA40  
 INVERTER: SOLAREGE SET7800H-USRGM (S11)

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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

JOB NO.	DATE	DESIGNED BY	SHEET
298406	2/17/2023	N.B.	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	1	1	40.00	15.84
2	DC OPTIMIZER TO JUNCTION BOX	2	10	40	15.00	1	1	40.00	18.75
3	DC JUNCTION BOX TO INVERTER	4	10	40	15.00	1	0.8	32.00	18.75
4	AC INVERTER TO AC DISCONNECT	3	8	55	32.00	1	1	55.00	40.00
5	AC AC DISCONNECT TO POI	3	6	75	32.00	1	1	75.00	40.00

CONDUCTOR AMPACITY CALCULATIONS IN ACCORDANCE WITH AC 690.8.

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 ELECTRIC & GAS  
 PHONE: (800) 290-1739  
 EMAIL: TIFFANYLONG7@YAHOO.COM  
 FINANCE: SUNRUN

**SYSTEM:**  
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 SYSTEM SIZE (AC): 7,800 KW @ 240V  
 MODULES: 28 X HANWHA QCELL  
 Q.PEAK-DUC-L-67 3 395  
 OPTIMIZERS: 28 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7500H-USRGM (S11)

NO.	REVISIONS	DATE
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**FREEDOM FOREVER LLC**  
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 08057  
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*[Signature]*  
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 HOME IMPROVEMENT CONTRACTOR  
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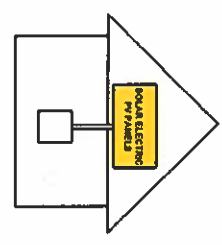


**WARNING:**  
POWER SOURCE OUTPUT  
CONNECTION  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE.

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

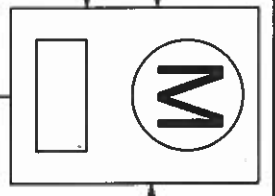
**SOLAR PV SYSTEM EQUIPPED  
WITH RAPID SHUTDOWN**

**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)

PV METER



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

690.54



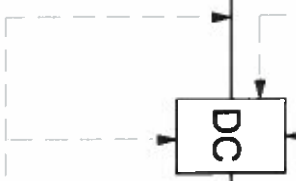
PV SYSTEM AC DISCONNECT  
RATED AC OUTPUT CURRENT - 32.00 AMPS  
AC NORMAL OPERATING VOLTAGE - 240 VOLTS

690.15, 690.54

**RAPID SHUTDOWN SWITCH FOR  
SOLAR PV SYSTEM**

690.56(C)(3)

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



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

690.13 (B)

PV SYSTEM DC DISCONNECT  
MAXIMUM VOLTAGE: 480V  
MAXIMUM CIRCUIT CURRENT: 20A  
MAX RATED OUTPUT CURRENT OF  
THE CONTROLLER OR DC-TO-DC  
CONVERTER: 15A

690.53



AC 690.31(G)(3) & (4)

**"WARNING"**  
PHOTOVOLTALIC POWER SOURCE  
EVERY 10' ON CONDUIT AND ENCLOSURES

- NOTES:**
1. AC 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

CLIENT:  
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OPTIMIZERS: 28 X SOLAREEDGE S440  
INVERTER: SOLAREEDGE SE7600H-USRGM  
(S11)

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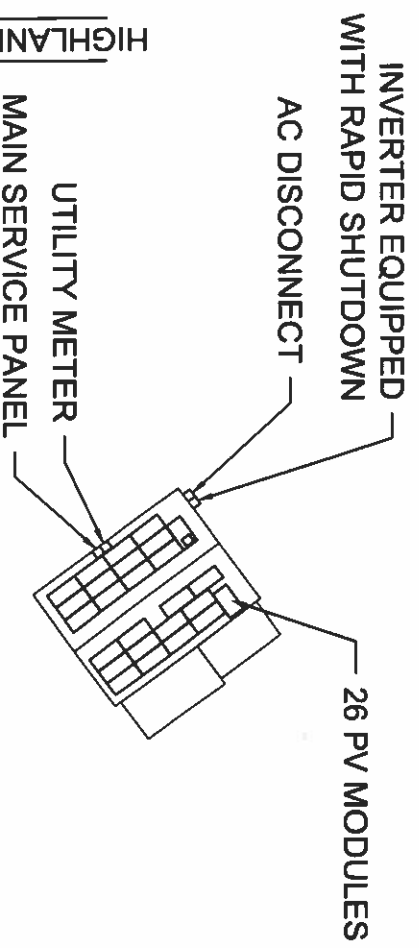
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GREG ALBRIGHT  
CONTRACTOR LICENSE:  
HOME IMPROVEMENT CONTRACTOR  
13VH1080100

LABELS

JOB NO.	DATE	DESIGNED BY	SHEET
294408	2/17/2023	N.B.	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



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 SYSTEM SIZE (AC): 7,800 KW @ 240V  
 MODULES: 28 X HANWHHA QCELL  
 Q.PEAK-DUO-L-67.3.395  
 OPTIMIZERS: 28 X SOLAREDEGE S440  
 INVERTER: SOLAREDEGE SE7800H-USRGM (S11)

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

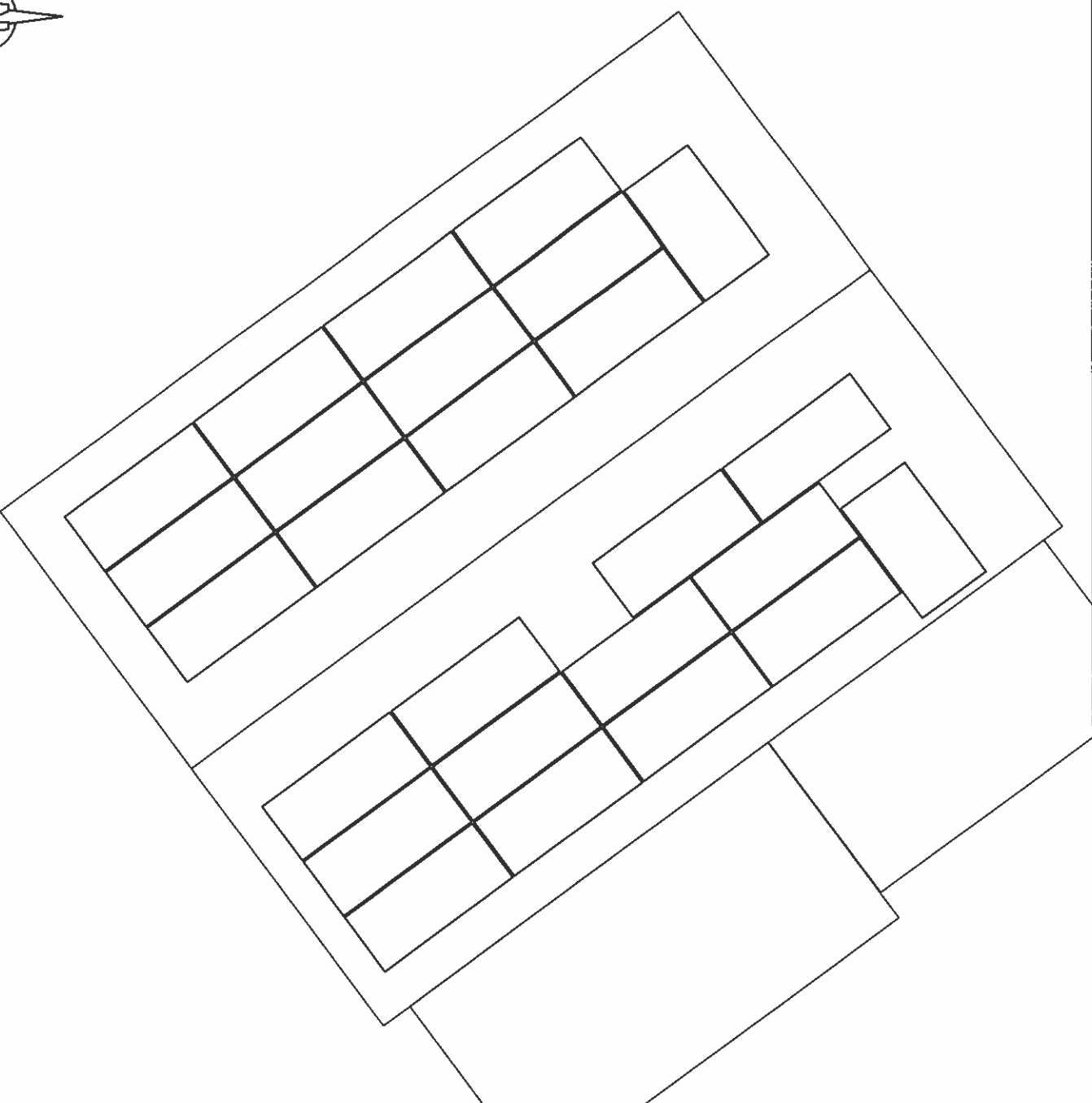
**freedom FOREVER**  
 FREEDOM FOREVER LLC  
 201 COMMERCE DR #5, MOORESTOWN, NJ 08057  
 Tel: (800) 385-1075  
 GREG ALBRIGHT

*Greg Albright*  
 CONTRACTOR LICENSE:  
 HOME IMPROVEMENT CONTRACTOR  
 13VH110890100

SITE PLACARD			
JOB NO.	DATE	DESIGNED BY:	SHEET:
298406	2/17/2023	N.B.	PV-7A

# SOLAREEDGE OPTIMIZER CHART


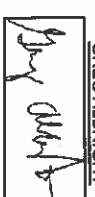
	1-10	11-20	21-30	31-40	41-50	51-60
1						
2						
3						
4						
5						
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7						
8						
9						
10						



CLIENT:  
 DWANA WATERS  
 277 HIGHLAND AVENUE, CITY OF ORANGE,  
 NJ 07050  
 A/H: CITY OF ORANGE TOWNSHIP (ESSEX  
 COUNTY)  
 UTILITY: PSE&G - PUBLIC SERVICE  
 ELECTRIC & GAS  
 PHONE: (908) 280-1739  
 EMAIL: TIFFANYLONG7@YAHOO.COM  
 FINANCE: SUNRUN

SYSTEM:  
 SYSTEM SIZE (DC): 26 X 395 = 10,270 KW  
 SYSTEM SIZE (AC): 7,800 KW @ 240V  
 MODULES: 26 X HANWHA QCELL:  
 Q.PEAK-DUO-L-67.3.395  
 OPTIMIZERS: 26 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SE7600H-USRGM  
 (S11)

NO.	REVISIONS	DATE
-	REVISED BY	-
-	DATE	-


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 08057  
 Tel: (800) 385-1075  
 GREG ALBRIGHT  
  
 CONTRACTOR LICENSE  
 HOME IMPROVEMENT CONTRACTOR  
 13VH1 1080 100

# 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.

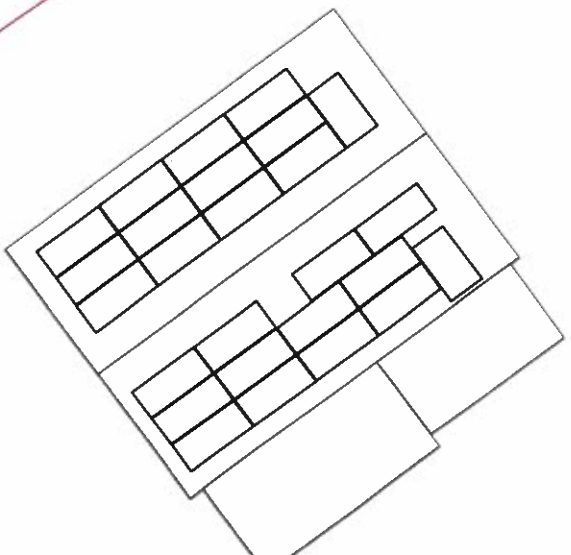
NAME \_\_\_\_\_

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

## MARK UP KEY

- P PERMANENT ANCHOR
- T TEMPORARY ANCHOR
- IL INSTALLER LADDER
- B JUNCTION / COMBINER BOX
- S STUB-OUT
- SKYLIGHT
- NO LADDER ACCESS (STEEP GRADE OR GROUND LEVEL OBSTRUCTIONS)
- RESTRICTED ACCESS
- CONDUIT
- GAS GAS SHUT OFF
- H<sub>2</sub>O WATER SHUT OFF
- 7 SERVICE DROP
- Z POWER LINES



## 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

**CLIENT:**  
DWAYNA WATERS  
277 HIGHLAND AVENUE, CITY OF ORANGE,  
NJ 07050  
A/E: CITY OF ORANGE TOWNSHIP (ESSEX  
COUNTY)  
UTILITY: PSE&G - PUBLIC SERVICE  
ELECTRIC & GAS  
PHONE: (908) 280-1739  
EMAIL: TIFPANTONGI@YAHOO.COM  
FINANCE: SUNRUN

**SYSTEM:**  
SYSTEM SIZE (DC): 28 X 395 = 10,270 KW  
SYSTEM SIZE (AC): 7,600 KW @ 240V  
MODULES: 28 X HANWHA OCELL  
O.PEAKDUDL-G7.3.395  
OPTIMIZERS: 28 X SOLAREEDGE S440  
INVERTERS: SOLAREEDGE SE7600H-USRGM  
(S11)

NO.	REVISIONS	DATE

**freedom FOREVER**  
FREEDOM FOREVER LLC  
201 COMMERCE DR #5, MOORESTOWN, NJ  
08057  
Tel: (800) 365-1075  
GREG ALBRIGHT  
CONTRACTOR LICENSE:  
HOME IMPROVEMENT CONTRACTOR  
13VHT1080100

JOB NO.	DATE	DESIGNED BY	SHEET
299406	2/17/2023	N.B.	PV-8

# 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 falling 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):

- 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 utilize 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 closest 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:


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

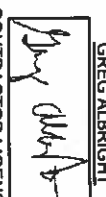
Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:
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**CLIENT:**  
 DWANA WATERS  
 277 HIGHLAND AVENUE, CITY OF ORANGE,  
 NJ 07050  
 AHI: CITY OF ORANGE TOWNSHIP (ESSEX COUNTY)  
 UTILITY: PSE&G - PUBLIC SERVICE ELECTRIC & GAS  
 PHONE: (808) 290-1739  
 EMAIL: TIFFANYLONG7@YAHOO.COM  
 FINANCE: SUNRUN

**SYSTEM:**  
 SYSTEM SIZE (DC): 26 X 395 = 10,270 kW  
 SYSTEM SIZE (AC): 7,600 kW @ 240V  
 MODUL ESS: 26 X HANWHA OCELL  
 O.PEAK-DUOL-07.3.395  
 OPTIMIZERS: 26 X SOLAREEDGE S440  
 INVERTER: SOLAREEDGE SET800H-USRGM (S11)

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


  
**Freedom FOREVER**  
 FREEDOM FOREVER LLC  
 201 COMMERCE DR #5, MOORESTOWN, NJ 08057  
 Tel: (800) 365-1075  
 GREG ALBRIGHT

  
 CONTRACTOR LICENSE  
 HOME IMPROVEMENT CONTRACTOR  
 13VH11080100

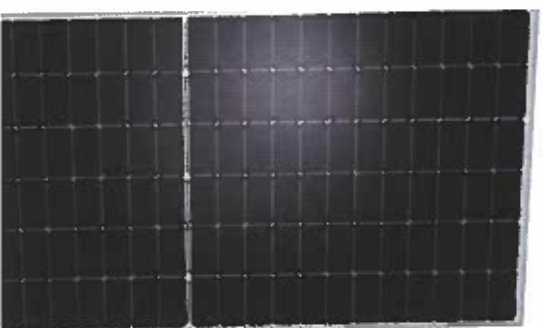
**SAFETY PLAN**

JOB NO:	DATE:	DESIGNED BY:	SHEET:
298406	2/17/2023	N.B.	PV-10

# Q.PEAK DUO L-G7.3

## 385-405

ENDURING HIGH PERFORMANCE



**LOW ELECTRICITY GENERATION COSTS**  
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 20.3%.



**INNOVATIVE ALL-WEATHER TECHNOLOGY**  
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.



**ENDURING HIGH PERFORMANCE**  
Long-term yield security with Anti LID Technology, Anti PID Technology<sup>1</sup>, Hot-Spot Protect and Traceable Quality Tra Q™.



**EXTREME WEATHER RATING**  
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (2400 Pa).



**A RELIABLE INVESTMENT**  
Inclusive 12-year product warranty and 25-year linear performance warranty<sup>2</sup>.

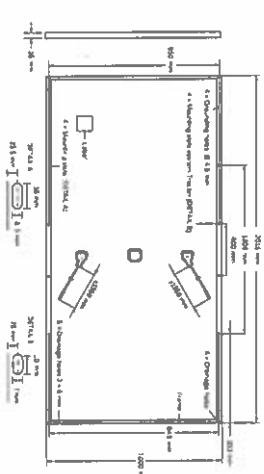


**STATE OF THE ART MODULE TECHNOLOGY**  
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

<sup>1</sup> APT test conditions according to IEC/TS 62904-1:2016, method B (-1500V, 1.88h)  
<sup>2</sup> See data sheet on rear for further information.

### MECHANICAL SPECIFICATION

Format	2015mm x 1000mm x 35mm (including frame)
Weight	23kg
Front Cover	3.2mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 x 24 monocrystalline Q.ANTUM solar half cells
Junction box	59.101mm x 32.60mm x 15.18mm Protection class IP67, with bypass diodes
Cable	4mm <sup>2</sup> Solar cable (+) ≥ 1350mm, (-) ≥ 1350mm
Connector	Subli MC4 Evo2, Hanwha Q CELLS HCC4, Amphenol UTx, Renhe 05-8, JMTHV JM50LA, Tongling Cabelfus F1-IP68 or Friends PV2g, IP67

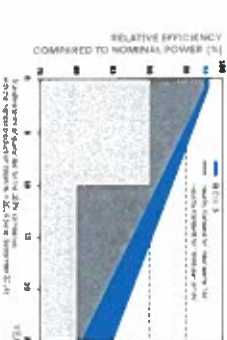


### ELECTRICAL CHARACTERISTICS

POWER CLASS	MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC <sup>1</sup> (POWER TOLERANCE: ±5W/-0W)					
	385	390	395	400	405	
Power at MPP:	$P_{MPP}$	385	390	395	400	405
Short Circuit Current:	$I_{sc}$	10.05	10.10	10.14	10.19	10.23
Open Circuit Voltage:	$V_{oc}$	48.17	48.44	48.70	48.96	49.22
Current at MPP:	$I_{MPP}$	9.57	9.61	9.66	9.70	9.75
Voltage at MPP:	$V_{MPP}$	40.24	40.57	40.90	41.23	41.56
Efficiency:	$\eta$	219.1	219.4	219.6	219.9	220.1
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT <sup>2</sup>						
Power at MPP:	$P_{MPP}$	288.3	292.1	295.8	299.6	303.3
Short Circuit Current:	$I_{sc}$	8.10	8.14	8.17	8.21	8.24
Open Circuit Voltage:	$V_{oc}$	45.42	45.67	45.92	46.17	46.41
Current at MPP:	$I_{MPP}$	7.53	7.57	7.60	7.64	7.67
Voltage at MPP:	$V_{MPP}$	38.29	38.60	38.92	39.23	39.54

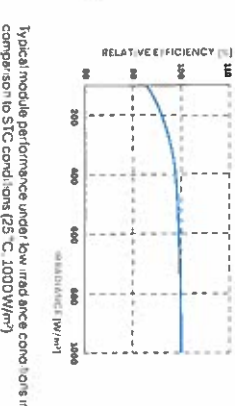
Measurements tolerances  $P_{MPP}$ : ±3%,  $I_{sc}$ : ±5%,  $V_{oc}$ : ±5% at STC, 1000W/m<sup>2</sup>, 25±2°C, AM 1.5 according to IEC 60904-3, 800W/m<sup>2</sup>, NMOT, spectrum AM 1.5

### Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 93.1% of nominal power up to 10 years. At least 85% of nominal power up to 25 years.

All data with measurement tolerances. Full warranties according with the warranty terms of the Q CELLS sales organization of your respective country.



Typical module performance under low and high irradiance conditions at STC (1000W/m<sup>2</sup>)

### TEMPERATURE COEFFICIENTS

Temperature Coefficient of $I_{sc}$	0	%/K	+0.04	Temperature Coefficient of $V_{oc}$	-0.27	%/K	-0.27
Temperature Coefficient of $P_{MPP}$	-0.35	%/K	-0.35	Normal Module Operating Temperature	NMOT	[°C]	43±3

### PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	$V_{max}$	[V]	1500 (IEC)/1500 (UL)	Safety Class	II
Maximum Reverse Current	$I_r$	[A]	20	Fire Rating based on ANSI/UL 1703	C/TYPE 1
Max. Design Load, Push/Pull	$P_{d1}$	[Pa]	3600/1600	Permitted Module Temperature on Continuous Duty	-40°C - +85°C
Max. Test Load, Push/Pull	$P_{t1}$	[Pa]	5400/2400		

### QUALIFICATIONS AND CERTIFICATES

IEC 61215-2016, IEC 61730-2016 Application Class II  
This data sheet complies with DIN EN 50380

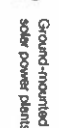
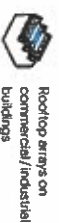


### PACKAGING INFORMATION

Number of Modules per Pallet	28
Number of Pallets per Trailer (24)	24
Number of Pallets per 40' HC-Container (26)	22
Pallet Dimensions (L x W x H)	2080 x 1150 x 1185mm
Pallet Weight	727kg

**Note:** Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

**THE IDEAL SOLUTION FOR:**



Engineered in Germany

# Q CELLS

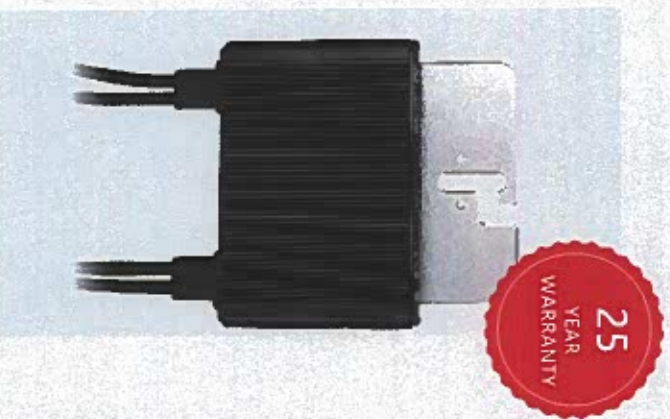
Engineered in Germany

# Q CELLS

# Power Optimizer

For North America

S440, S500



# POWER OPTIMIZER

## 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
MPIPT 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	
<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-2000-712:2013-05	
<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		MK4r	m / ft
Input Wire Length		0.1 / 0.32	m / ft
Output Connector		MK4	m / ft
Output Wire Length		(+) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32	m / ft
Operating Temperature Range <sup>(2)</sup>		-40 to +85	°C
Protection Rating		IP68 / Type68	
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 -20°C / -15°F power derating is applied. Refer to Power Optimizers Temperature Derating Technical Note for more details.

## 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

\* Expected availability in 2022

solaredge.com

- 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 (PVRS)

solar**edge**

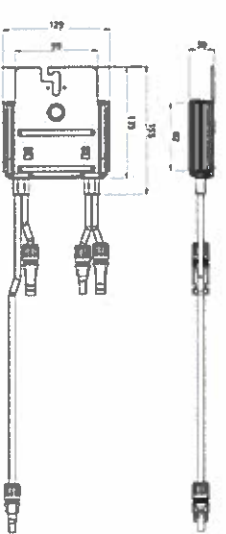
PV System Design Using a SolarEdge Inverter	Single Phase HD-Wave	Three Phase for 208V grid	Three Phase for 277/480V grid
Minimum String Length (Power Optimizers)	8	14	18
Maximum String Length (Power Optimizers)	25	6000	50%
Maximum Nominal Power per String	5700 (6000 with SE7600-US-SE11400-U)	6000	12750
Maximum Allowed Connected Power per String <sup>(1)</sup> (Recommended only when the difference in connected power between strings is 1000W or less)	Refer to Footnote 5	One String 7200W Two strings or more 7800W	15,000W

Parallel Strings of Different Lengths or Orientations

(1) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.

(2) If the inverter is rated AC power < maximum nominal power per string, then the maximum power per string will be able to reach up to the inverter's maximum input DC power. Refer to [https://www.solaredge.com/sites/default/files/power\\_optimizer\\_single\\_string\\_design\\_application\\_note.pdf](https://www.solaredge.com/sites/default/files/power_optimizer_single_string_design_application_note.pdf)

(3) It is not allowed to mix S series and P series Power Optimizers in new installations.



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ETL  
UL  
RoHS  
Intertek

# INVERTERS

## Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US /  
SE7600H-US / SE10000H-US / SE11400H-US



### 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 the SolarEdge SetApp
- ! Fixed voltage inverter for longer strings
- ! Integrated arc fault protection and rapid shutdown for NEC 2014, NEC 2017 and NEC 2020 per article 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)

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### / Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US /  
SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXXBXX4						
<b>OUTPUT</b>							
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓
AC Frequency (Nominal)	59.3 - 60 - 60.5 <sup>(1)</sup>						
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5
Power Factor	Adjustable - 0.85 to 0.85						
GFDI Threshold	1						
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes						
<b>INPUT</b>							
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650
Maximum DC Power @208V	-	5100	-	7750	-	-	15500
Transformer-less, Ungrounded	Yes						
Maximum Input Voltage	480						
Nominal DC Input Voltage	390						
Maximum Input Current @240V <sup>(2)</sup>	8.5	10.5	13.5	16.5	20	27	30.5
Maximum Input Current @208V <sup>(2)</sup>	-	9	-	13.5	-	-	27
Max. Input Short Circuit Current	45						
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600V <sup>(1)</sup> Sensitivity						
Maximum Inverter Efficiency	99			99			99 @ 240V 98.5 @ 208V
CEC Weighted Efficiency	99						
Nighttime Power Consumption	< 2.5						

(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



# / Single Phase Inverter with HD-Wave Technology for North America

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SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER SE3000H-US SE3800H-US SE5000H-US SE6000H-US SE7600H-US SE10000H-US SE11400H-US

## ADDITIONAL FEATURES

Supported Communication Interfaces	RS485, Ethernet, Zigbee (optional), Cellular (optional)
Revenue Grade Metering, ANSI C12.20	Optional <sup>1</sup>
Consumption metering	
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for local connection
Rapid Shutdown - NEC 2014, NEC 2017 and NEC 2020, 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect

## STANDARD COMPLIANCE

Safety	UL 724, UL 1741 SA, UL 1699B, CSA C22.2, Canadian AECI according to TLL M-07
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (H)
Emissions	FCC Part 15 Class B

## INSTALLATION SPECIFICATIONS

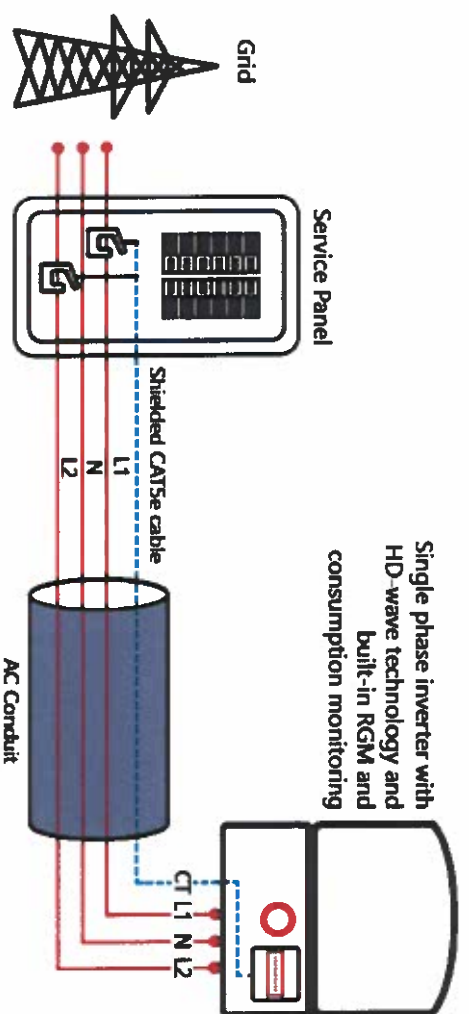
AC Output Conduit Size / AWG Range	1" Maximum / 14-6 AWG		1" Maximum / 14-4 AWG
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1-2 strings / 14-6 AWG		1" Maximum / 1-3 strings / 14-6 AWG
Dimensions with Safety Switch (HXWD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174	26.2 / 11.9	21.3 x 14.6 x 7.3 / 540 x 370 x 185
Weight with Safety Switch	22 / 10	25.1 / 11.4	38.8 / 17.6
Noise	< 25		< 50
Cooling	Natural Convection		
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>3</sup>		
Protection Rating	NEMA 4X (Inverter with Safety Switch)		

(3) Inverter with Revenue Grade Meter P/N: SE3000H-US000BNCA, Inverter with Revenue Grade Production and Consumption Meter P/N: SE3800H-US000BNM4. For consumption metering, current transformers should be ordered separately. SEAC10750-200VA-20 or SEAC10750-400VA-20, 20 units per box

(4) Full power up to at least: 50°C / 122°F, for power derating information refer to: <https://www.solar-edge.com/rev/derating/derating-note-na.pdf>

## 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



## Eaton general duty cartridge fuse safety switch

DG222NRB

UPC:782113144221

### Dimensions:

- Height: 14.37 IN
- Length: 7.35 IN
- Width: 8.4 IN

Weight:10 LB

**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.

### Warranties:

- 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.

### Specifications:

- **Type:** General duty, cartridge fused
- **Amperage Rating:** 60A
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Painted galvanized steel
- **Fuse Class Provision:** Class H fuses
- **Fuse Configuration:** Fusible with neutral
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Three-wire
- **Product Category:** General duty safety switch
- **Voltage Rating:** 240V

### Supporting documents:

- [Eatons Volume 2-Commercial Distribution](#)
- [Eaton Specification Sheet - DG222NRB](#)

### Certifications:

- UL Listed

**Product compliance:** No Data





# ROCKIT

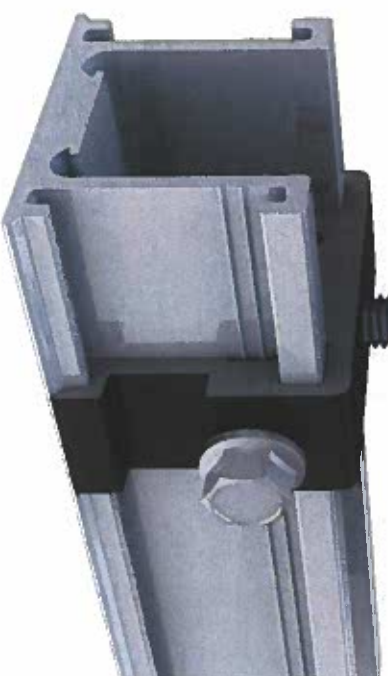
## COMPLETE RAIL-LESS RACKING SYSTEM

The Rockit system is the industry's premier rail-less PV racking system for composition shingle, tile, and metal roofs. Designed in conjunction with the needs of installers, Rockit quickly & easily installs with a single tool. Featuring an easy-to-position alignment slide and a top-down leveling system, Rockit is logistically intelligent with no need to ship or transport long rails. Components are available in a black finish that complements both commercial and residential applications. Conforms to UL 2703.

### FEATURES & BENEFITS

- Patented watertight technology
- Fully integrated bonding
- Top-down leveling system
- North-South adjustability
- Single tool install

## STREAMLINED INSTALLATION WITH MINIMAL ROOF PENETRATIONS



**Composition Shingle, Tile, Metal**



**Rail-Less**



**Structural-Attach Direct-Attach**



## ROCKIT

### COUPLING

The fast installing Rockit Coupling easily attaches to the module frame to bridge the gaps between modules.



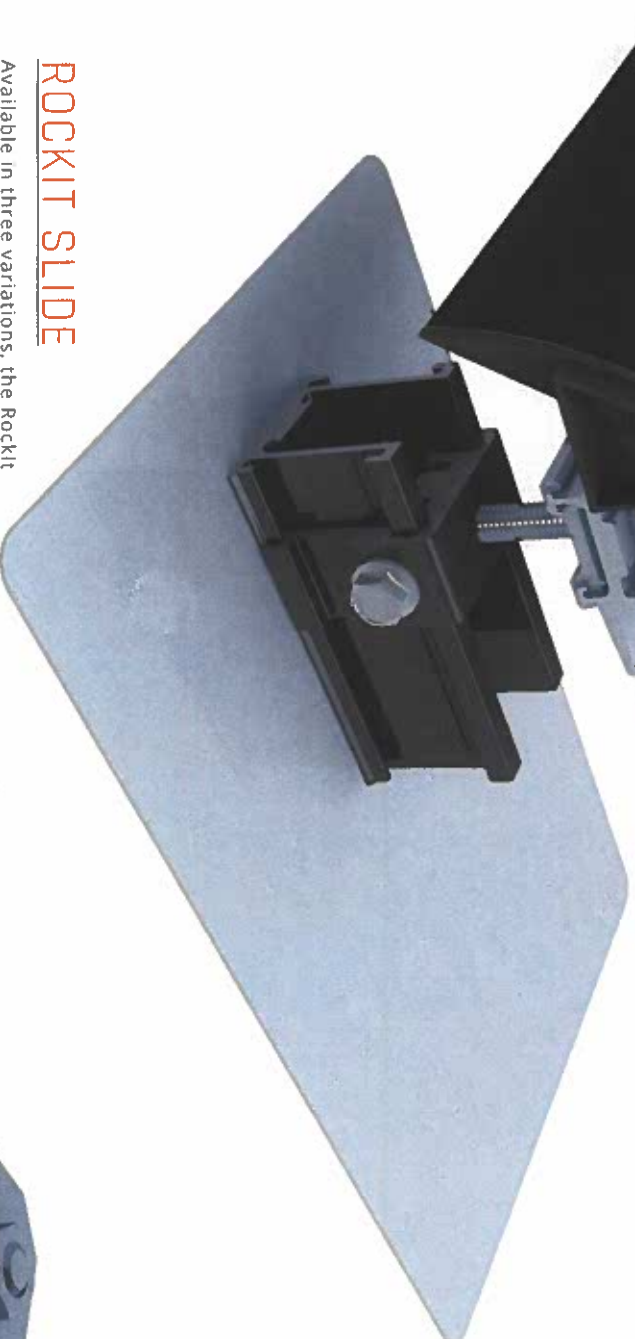
### SKIRT

The sleek black Skirt installs first and acts as an alignment guide for the entire array. The Skirt End Cap does double duty as a skirt coupling device and an aesthetically-pleasing finishing touch.



### ROCKIT MOUNT

Featuring integrated bonding pins, the Rockit Mount connects to the Slide and can easily be positioned for fast installation. Features top-down leveling.



### ROCKIT SLIDE

Available in three variations, the Rockit Slide allows installation on composition shingle, tile, and metal roofs.

### FRAME MLPE MOUNT

Attaches and fully bonds MLPE's (Module Level Power Electronics) to the module frame with a single bolt clip.



## COMPATIBLE MODULES

The Rockit System has been tested and evaluated to UL 2703 for bonding, grounding, mechanical loading and fire classification, and may be used to ground and/or mount PV modules listed to UL 1703 or UL 61730. A list of approved modules is included below.

Unless otherwise noted, "xxx" refers to the module power rating and both black and silver frames are included in the certification.

\*Class A System fire rating with Type 1, 2, and 29 PV modules with no skirt required.

**NOTE:** Modules with flange widths shorter than 22mm cannot be installed in portrait.

### TYPE 1, 2 & 29 MODULES

MANUFACTURER	LIST OF UL 2703 APPROVED TYPE 1, 2 & 29 PV MODULES*
<b>Adani</b>	Adani modules with 35 and 40mm frames ASX-Y-ZZ-xxx Where "x" can be B, M or P, "y" can be 6 or 7, and "Z" can be blank, PERC, B-PERC, or AB-PERC
<b>AIONRISE</b>	Aionrise modules with 35 and 40mm frames AIONYG1-xxx Where "yy" can be 60 or 72 Aptos modules with 35 and 40 mm frames DNA-yy-zzaa-xxx
<b>Aptos Solar</b>	Where "yy" can be 108, 120 or 144; "z" can be Mf or Bf; and "aa" can be 10, 23 or 26 Astronergy modules with 35 and 40 mm frames CHSMbbyC/z-xxx
<b>Astronergy Solar</b>	Where "bb" can be 60, 66, or 72; "yy" can be blank, 10 or 12; "c" can be M, M(BL), M-HC, P, P(BL) or P-HC; and "z" can be blank or HV
<b>Auxin</b>	Auxin modules with 40 mm frames AXN6M6VMxxxZ Where "yy" can be 10 or 12; "z" can be blank, A, B or C
<b>Axitec</b>	Axitec Modules with 30 and 35 mm frames AC-xxxV/aaZZ "y" can be M, P, MH or MBT; and "aa" can be blank, 125 or 156; and "ZZ" can be 605, 108V, 108VB, 1205, 120V or 120VB

# MODULES

### LIST OF UL 2703 APPROVED TYPE 1, 2 & 29 PV MODULES\*

MANUFACTURER	LIST OF UL 2703 APPROVED TYPE 1, 2 & 29 PV MODULES*
<b>Bluesun Solar</b>	Bluesun modules with 30 and 35mm frames BSMxxxM-AAA Where "AAA" can be 60HPH or 72HBD
<b>Boviet</b>	Boviet modules with 35 and 40mm frames BVM66aay-xxxBcc Where "aa" can be 9, 10 or 12; "yy" is M, or P; and "b" can be blank, L or S; and "c" can be blank, H, H-BF, HHC or HC-BF
<b>Canadian Solar</b>	Canadian Solar modules with 35 and 40 mm frames CSbV-xxxZ Where "b" can be 1, 3 or 6; "y" can be H, K, L, N, P, R, V or Y; and "z" can be M, MS, M-SD, MS-HL, MS-SD, P, PX, or P-SD
<b>CertainTeed</b>	CertainTeed modules with 35 and 40mm frames CTxxxYZ-AA Where "y" can be M, HC; "Z" can be 00, 10, 11; and "AA" can be 04 or 06
<b>CSUN</b>	CSUN modules with 35 and 40 mm frames CSUNxxx-zzAbb Where "z" is 60 or 72; and "A" is M or MM; "bb" is blank or 5BB
<b>Dehui</b>	Dehui modules with 35 and 40mm frames DH-MVYZ-xxx Where "yy" can be 760, 772, 860, 872; and "z" can be B or W
<b>ET Solar</b>	ET Solar modules with 35 and 40mm frames ET-YZZxxxxAA Where "y" can be P, L, or M; "ZZZ" can be 660, 660BH, 672, 672BH, or 754BH; and "AA" can be TB, TW, WB, WW, BB, WBG, WWG, WBAC, WBCO, WWCO, WWBCO or BBAC
<b>Freedom Forever</b>	Freedom Forever modules with 35mm frames FF-MPa-88B-xxx Where "a" can be blank or 1
<b>Freevolt</b>	Freevolt modules with 35mm frames ECP-PVGRAF-144H-C-xxx

# MODULES

MANUFACTURER	LIST OF UL 2703 APPROVED TYPE 1, 2 & 29 PV MODULES*
<b>Hanwha Q CELLS</b>	<p>Hamwha Q CELLS Modules with 32, 35 and 40mm frames</p> <p>aaYY-ZZ-xxx</p> <p>where "aa" can be Q, or B; "YY" can be PLUS, PRO, PEAK, LINE PRO, LINE PLUS, PLUS DUO or PEAK DUO; and "ZZ" can be G3, G3.1, G4, G4.1, L-G2, L-G2.3, L-G3, L-G3.1, L-G3Y, L-G4, L-G4.2, L-G4Y, LG4.2/TAA, BFR-G3, BLK-G3, BFR-G3.1, BLK-G3.1, BFR-G4, BFR-G4.1, BFR-G4.3, BLK-G4.1, G4/SC, G4.1/SC, G4.1/TAA, G4.1/MAX, BFR-G4.1/TAA, BFR-G4.1/MAX, BLK-G4.1/TAA, BLK-G4.1/SC, EC-G4.4, G5, G5/SC, G5/T5, BLK-G5, BLK-G5/SC, BLK-G5/T5, L-G5, L-G5.1, L-G5.2, L-G5.2/H, L-G5.3, G6, G6/SC, G6/T5, G6+, G6+T5, BLK-G6, G7, BLK-G6+, BLK-G6+/AC, BLK-G6+/HL, BLK-G6+/SC, BLK-G6/T5, BLK-G6+T5, BLK-G7, G7.2, G8, BLK-G8, G8+, BLK-G8+ L-G7, L-G7.1, L-G7.2, L-G7.3, BLK-ML-G9, ML-G9+, BLK ML-G9+, ML-G9, BLK-G10+, BLK-G10+/AC, ML-G10, BLK ML-G10, ML-G10+, BLK ML-G10+, ML-G10.a, BLK ML-G10.a, ML-G10.a+ or BLK ML-G10.a+</p>
<b>Heliene</b>	<p>Heliene modules with 35 and 40 mm frames</p> <p>YYZZxxxx</p> <p>Where "YY" can be 60, 72, 108 or 120; "ZZ" can be HC, M or P; and "A" can be blank, M10-SL, M10-SL-BLK or M10-SL-Bifacial</p>
<b>HT-SAAE</b>	<p>HT-SAAE modules with 35 and 40 mm frames</p> <p>HTyy-aaaz-xxx</p> <p>Where "yy" can be 60 or 72, "aaaz" can be 156 or 166, "z" can be M, M(V), M(S), M(VS), M-C, M(V)-C, P or P(V)</p>
<b>Hyperion</b>	<p>Hyperion modules with 35mm frames</p> <p>HY-DH108P8-xxx</p> <p>Huyndai modules with 32, 35 and 40 mm frames</p> <p>HY-SxxxxZ</p>
<b>Hyundai</b>	<p>Where "yy" can be A or S; "s" can be M or S; and "ZZ" can be HG, KI, MF, MG, PI, SG, RG, RG (BK), TG or YH(BK) or XG(BK)</p>
<b>Itek</b>	<p>Itek Modules with 40 mm frames</p> <p>IT-xxx-yy</p> <p>"yy" can be blank, HE, or SE</p>
<b>JA Solar</b>	<p>JA Solar modules with 30, 35 and 40mm frames</p> <p>JAYzz-bbww-xxx/aa</p> <p>Where "yy" can be M, P, M6 or P6; "zz" can be blank, (K), (L), (R), (V), (BK), (FA), (SE), (TG), (FAYR), (KJSE), (KJTG), (LJBK), (LXTG), (R)(BK), (R)(TG), (V)(BK), (BK) (TG), or (L)(BK)(TG); "bb" can be 54, 60 or 72; "ww" can be blank, D30, S01, S02, S03, S09, S10, S17, S30 or S31; and "aa" can be MR, SI, SC, PR, RE, 388, 48B, 48B/RE, 48B/1500V, PR/1500V, 588</p>

# MODULES

MANUFACTURER	LIST OF UL 2703 APPROVED TYPE 1, 2 & 29 PV MODULES*
<b>Jinko</b>	<p>Jinko modules with 35 and 40 mm frames</p> <p>JKMxxxxZ-aa</p> <p>Where "a" can either be blank or S; "ZZ" can be M, P, PP, or -V; and "aa" can be blank, 60, 60B, 60H, 60HB, 60L, 60BL, 60HL, 60HBL, 60-J4, 60B-J4, 60B-EP, 60(Plus), 60-V, 60-MX, 72H, 72H-V, 72HL-V, 72HBL-V, 72L-V, 6RL3, 6RL3-B or 6TL3-B</p>
<b>LG</b>	<p>LG modules with 40mm frames</p> <p>LGxxxxyz-bb</p> <p>"y" can be A, E, M, N, Q, or S; "a" can be A, 1, 2 or 3; "z" can be C, K or W; and "bb" can be G4, A5, A6, B6, E6, EGAW5, L5, N5, V5, V6</p>
<b>Longi</b>	<p>Longi modules with 35 and 40 mm frames</p> <p>LRA-YZZ-xxxxM</p> <p>Where "a" can be 4, 5 or 6; "YY" can be 54, 60 or 66 "ZZ" can be blank, BK, PB, PE, PH, HPB, or HPH</p>
<b>Maxeon</b>	<p>Maxeon modules with 35, 40 and 46mm frames</p> <p>SPR-AAAY-xxx-zzz</p> <p>Where "AAA" can be MAX or X; "y" can be 3, 5, 6, 21 or 22; and "zzz" can be R, BLK or COM</p>
<b>Meyer Burger</b>	<p>Meyer Burger Modules with 35mm frames</p> <p>Meyer Burger Glass</p>
<b>Mission Solar</b>	<p>Mission Solar modules with 35, 40 mm frames</p> <p>YYYbb-xxxZZaa</p> <p>Where "YYY" can be MSE or TXS; "bb" can be blank, 6 or 60A; "ZZ" can be blank, 50, SQ, SX, 120 or 144; and "aa" can be blank, 88, BW, 4l, 45, 5K, 5R, 5T, 8T, 8K, 9R or 9Z</p>
<b>Next Energy Alliance</b>	<p>Next Energy Alliance modules with 35 and 40mm frames</p> <p>YNEA-xxxxZZ</p> <p>where "yy" can be blank or US; "ZZ" can be M, MIB or M-60</p>
<b>NE Solar</b>	<p>NE Solar modules with 30, 35 and 40mm frames</p> <p>NESExxx-zzMH-yy</p> <p>Where "zz" can be 54 or 60; and "yy" can be M6 or M10</p>
<b>Panasonic (HIT)</b>	<p>Panasonic modules with 40 mm frames</p> <p>VBHNxxxxYYZZA</p> <p>"YY" can be either SA or KA; "ZZ" can be either 03, 04, 17 or 18; and "A" can be blank, E or G</p>

# MODULES

**MANUFACTURER LIST OF UL 2703 APPROVED TYPE 1, 2 & 29 PV MODULES\***

<b>Panasonic (EverVolt)</b>	Panasonic modules with 30 mm frames EVPVxxxx Where "A" can be blank or H, K or PK
<b>Philadelphia Solar</b>	Philadelphia modules with 35 and 40 mm frames PS-YzzAA-xxx Where "y" can be M or P; "zz" can be 60, 72 or 144; and "AA" can be blank, (BF), (HJ) or (HCBF)
<b>Phono Solar</b>	Phono Solar modules with 30 and 35 mm frames PSxxxY-ZZA Where "y" can be M4, M4H, MSGF, MSGFH, M6, M6H, M8GF or M8GFH; "ZZ" can be 18, 20 or 24; and "A" can be TH, UH8, VH or VH8
<b>Prism Solar</b>	Prism Solar modules with 35mm frames PST-xxxW-M7ZY Where "y" can be H, HB or HBI
<b>REC</b>	REC modules with 30 and 38 mm frames RECKXXYYZZ Where "YY" can be AA, M, NP, NP2, PE, PE72, TP, TP2, TP2M, TP2SM, TP2S, TP3M or TP4; and "ZZ" can be blank, Black, BLK, BLK2, SLV, 72, Pure or Pure-R
<b>Recom</b>	Recom modules with 35 and 40 mm frames RCM-xxx-6y Where "yy" can be MA, MB, ME or MF
<b>Renesola</b>	Renesola 60-cell modules with 40 mm frames JCxxxY-ZZ "y" can be F, M or S; and "ZZ" can be Ab, Ab-b, Abh, Abh-b, Abv, Abv-b, Bb, Bb-b, Bbh, Bbh-b, Bbv, Bbv-b, Db, or Db-b
<b>S-Energy</b>	S-Energy modules with 35 and 40mm frames SABB-CCYY-xxxZ Where "A" can be C, L or N; "BB" can be blank, 20, 40 or 45; "CC" can be blank, 60 or 72; "YY" can be blank, MAE, MAI, MBE, MBI, MCE or MCI; and "Z" can be V, M-10, P-10 or P-15
<b>Seraphim USA</b>	Seraphim modules with 35 and 40 mm frames SRP-xxx-YYV-ZZ Where "yyy" can be 6MA, 6MB, 6PA, 6PB, or BMD; "ZZ" is blank or HV

**MODULES**

**MANUFACTURER LIST OF UL 2703 APPROVED TYPE 1, 2 & 29 PV MODULES\***

<b>SEG Solar</b>	SEG Solar Modules with 35 and 40mm frames SEG-xxx-YYV-ZZ Where "YYY" can be BMB, BMD or 6MA; "Z" can be BB, BW, HV, TB, WB or WW
<b>Shinsung E&amp;G</b>	Shinsung Modules with 35mm frames SSVxxx-144MH
<b>Silfab</b>	Silfab Modules with 35 and 38 mm frames SYV-Z-xxxxAb Where "YY" can be L, SA, LA, SG or LG; "Z" can be blank, M, P, or X; "A" can be blank, B, H, M, N; and "b" can be A, C, G, K, L, N, T, U or X
<b>Solar4America</b>	Solar4America modules with 35 and 40mm frames S4Axxx-72y Where "y" can be MH5 or MH5BB
<b>Solarever</b>	Solarever modules with 35mm frames SE-zzz-yy-xxxN-aaa Where "zzz" can be 166 or 182; "yy" can be 83 or 91; and "aaa" can be 108 or 144
<b>Solaria</b>	Solaria modules with 35 and 40 mm frames PowerA-xxxR-ZZ Where "A" can be XT or X; and "Z" can be blank, AC, BD, BX, BY, PD, PL, PX, PZ, WX or WZ
<b>SolarTech</b>	SolarTech modules with 40 mm frames AAA-xxx Where "AAA" can be PERCB-B, PERCB-W, HJTB-B or HJTB-W
<b>Sonali</b>	Sonali Modules with 35mm frames SS-M-xxx
<b>Star Solar</b>	Star Solar modules with 35mm frames Star-xxxYYV-ZZZ Where "YYV" can be M60H or M60HB; and "ZZZ" can be blank or M10
<b>Sunmac Solar</b>	Sunmac modules with 30 and 35mm frames SMxxxMaazZ-BB Where "aa" can be 660 or 754; and "ZZ" can be NH or SH
<b>Sunpower</b>	Sunpower modules with 35 and 40 mm frames SPR-A-xxx-VY Where "A" can be A or M; and "V" can be blank, COM, G-AC, BLK-G-AC, H-AC or BLK-H-AC
<b>Sunpreme</b>	Sunpreme Modules with 40mm frames GXB-xxT

**MODULES**

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<b>Sunspark</b>	Sunspark modules with 40 mm frames SYY-xxxZ-A Where "yy" can be MX or SJ; and "z" can be M, MB, M3, M3B, P or W; and "A" can be 60 or 72
<b>Suntech</b>	Suntech Modules with 35mm frames STPxxxS-zz/aa Where "zz" can be B60 or B72; and "aa" can be Vnh or Vnhb
<b>Talesun</b>	Talesun modules with 30mm frames TD6y72M-xxx Where "y" can be G or I
<b>Tesla</b>	Tesla modules with 40 mm frames TxxxY Where "y" can be H or S
<b>Trina</b>	Trina modules with 30, 35 and 40 mm frames TSM-xxxxVZZ "yy" can be DDD5, DDD5A, DD06, DE05, DE09, DX05A, DE06X, PA05, PC05, PD05, PE14 or PX05; and "ZZ" can be blank or A, .05, .05(I), .08, A.05, A.08, A(I), A.05(I), A.08(I), C.05, C.07, C.05(I), C.07(I), H, H.05, H.08, H.05(I), H.08 (I), M, M(I) or M.05(I)
<b>Universal</b>	Universal Solar Modules with 35mm frames UNI-xxx-yyZZZ-aa Where "yy" can be 108, 120 or 144; "ZZZ" can be M, MH or BMH; and "aa" can be blank, BB or DG
<b>URE</b>	URE modules with 35 mm frames DyMxxxxaa Where "D" can be D or F; "y" can be A, B, 6 or 7; "M" can be K or M; and "aa" can be C8G, H3A, H4A, H8A, H8A, ETG-BB or MFG-BB
<b>Vikram</b>	Vikram solar modules with 35 and 40 mm frames XV5y.ZZAAA.bb Where "x" can be blank, Paradea, Prexos or Somera; "yy" can be MDH, MDHT, MH or MHBB; "Z" can be 60 or 72; "AAA" is the module power rating; and "bb" can be 05
<b>VSUN</b>	VSUN modules with 30, 35 and 40 mm frames VSUNxxx-VYz-aa Where "yy" can be 108 or 120; "z" can be BMH or M; and "aa" can be blank, BB or BW
<b>Waaree</b>	Waaree modules with 40mm frames WSy-xxx where "yy" can be blank, M or MB

## MODULES

MANUFACTURER	LIST OF UL 2703 APPROVED TYPE 1, 2 & 29 PV MODULES*
<b>Yingli</b>	Yingli modules with 35 and 40 mm frames YLxxxZ-yy Where "z" can be D or P; "yy" can be 29b, 30b, 34d, 35b, 36b or 40d
<b>Yotta</b>	Yotta modules with 30mm frames YSM-Bxxx-06-72-1
<b>Zeus</b>	Zeus Solar Modules with 40mm frames ZxxxM-HB
<b>ZN Shine</b>	ZN Shine modules with 35mm frames ZXM6-AAA-xxx/M Where "AAA" can be 72, NH120 or NHD8144

### TYPE 4 & 5 MODULES

\*\*Class A System fire rating with Type 4 and 5 modules with south edge skirt required. Class B System fire rating with Type 4 and 5 modules, no skirt required. Any roof-to-module gap is permitted. This rating is applicable with any roof attachment.

MANUFACTURER	LIST OF UL 2703 APPROVED TYPE 4, & 5 PV MODULES**
<b>Bluesun Solar</b>	Bluesun modules with 35mm frames BSMxxxM10-54HPH
<b>Meyer Burger</b>	Meyer Burger Modules with 35mm frames Meyer Burger Black or White
<b>Talesun</b>	Talesun modules with 30mm frames TP7G54M(H)xxx

## MODULES