



Freedom Forever  
Planset Revision Letter

12/15/2022  
REV #2

Attn. City of Lake City:

The changes outlined in Revision Details have been applied to the plans corresponding to the following customer:

JENNA HANSEN  
428 NORTHWEST FOREST MEADOWS AVENUE, LAKE CITY, FL 32055

**Revision Details:**

POI CHANGE TO BREAKER TIE IN DERATE TO 175 ADDED LOAD CALCS TO PLANS

All corresponding changes are notated on the plans by revision clouds.

Thank you for your time in reviewing these plans. Please reach out if you have any additional questions or concerns.

Construction Engineering  
Freedom Forever  
[engineering@freedomforever.com](mailto:engineering@freedomforever.com)

# BARUN CORP

December 17, 2022

Dear Whom It May Concern,

Project Name : JENNA HANSEN RESIDENCE, 428 NORTHWEST FOREST MEADOWS AVENUE, LAKE CITY, FL 32055

Installation of a 13.3 kW (DC) Rooftop PV Solar System

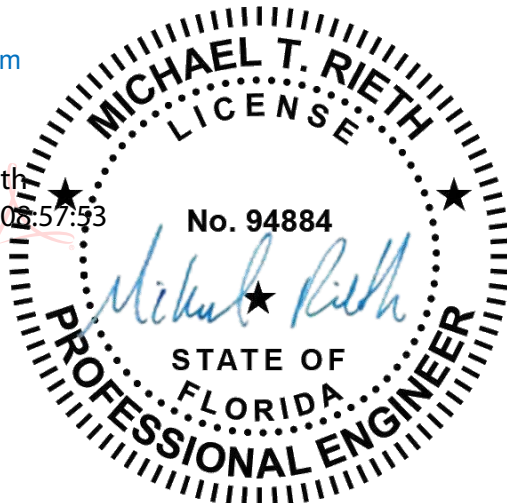
Per Florida Statute 377-705 (revised 7/01/2017), I, Mike Rieth, P.E., a licensed engineer pursuant to Chapter 471, certify that the PV electrical system and electrical components are designed and approved using the code requirements and standards contained in the Florida Building Code.

If you have any questions regarding this project, please feel free to contact me.

Sincerely,

Mike Rieth, P.E.  
[miker@baruncorp.com](mailto:miker@baruncorp.com)

Michael Rieth  
2022.12.17 08:57:53  
-05'00'



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# ROOF MOUNT PHOTOVOLTAIC SYSTEM

## CODES:

THIS PROJECT COMPLIES WITH THE FOLLOWING:  
 2020 FLORIDA BUILDING CODE: BUILDING  
 2020 FLORIDA BUILDING CODE: RESIDENTIAL  
 2020 FLORIDA BUILDING CODE: MECHANICAL  
 2020 FLORIDA BUILDING CODE: PLUMBING  
 2020 FLORIDA BUILDING CODE: FUEL GAS  
 2020 FLORIDA BUILDING CODE: ENERGY CONSERVATION  
 2020 FLORIDA BUILDING CODE: EXISTING BUILDING  
 2020 FLORIDA BUILDING CODE: ACCESSIBILITY  
 2020 FLORIDA FIRE PREVENTION CODE  
 2017 NATIONAL ELECTRIC CODE  
 AS ADOPTED BY CITY OF LAKE CITY

## 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

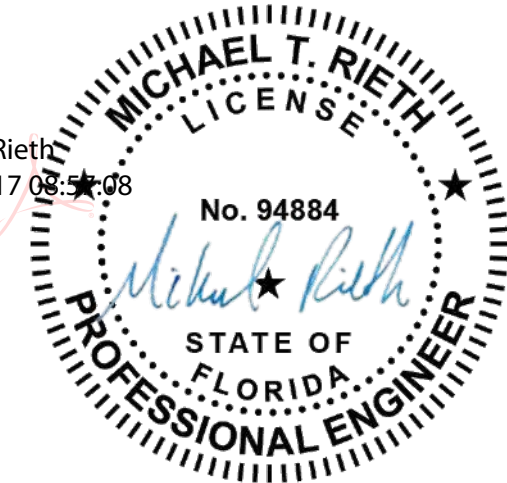
THE MAIN SERVICE PANEL WILL BE EQUIPPED WITH A GROUND ROD OR UFER

UTILITY COMPANY WILL BE NOTIFIED PRIOR TO ACTIVATION OF THE SOLAR PV SYSTEM

SOLAREGE OPTIMIZERS ARE LISTED TO IEC 62109-1 (CLASS II SAFETY) AND UL 1741 STANDARDS

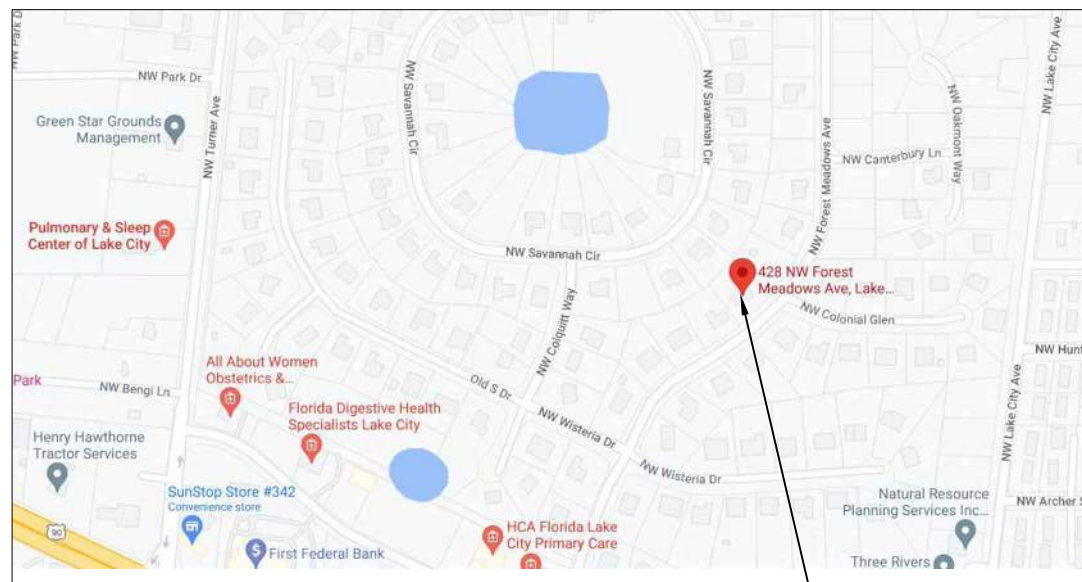
INSTALL CREW TO VERIFY ROOF STRUCTURE PRIOR TO COMMENCING WORK. EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNT.

Michael Rieth  
 2022.12.17 08:57:08  
 -05'00'



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## VICINITY MAP:



SITE LOCATION



CLIENT:  
 JENNA HANSEN  
 428 NORTHWEST FOREST MEADOWS AVENUE, LAKE CITY, FL 32055  
 AHJ: CITY OF LAKE CITY  
 UTILITY: FPL - FLORIDA POWER & LIGHT  
 METER: 401-634-840  
 PHONE: (386) 292-3432  
 EMAIL: JENNALYNNHANSEN@HOTMAIL.COM

SYSTEM:  
 SYSTEM SIZE (DC): 38 X 350 = 13.300 kW  
 SYSTEM SIZE (AC): 10.000 kW @ 240V  
 MODULES: 38 X LONGI SOLAR:  
 LR4-60HPB-350M  
 OPTIMIZERS: 38 X SOLAREGE S440  
 INVERTER: SOLAREGE SE10000H-USRGM [S11]



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REVISIONS		
NO.	REVISED BY	DATE
1	B.F.	11/30/2022
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







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

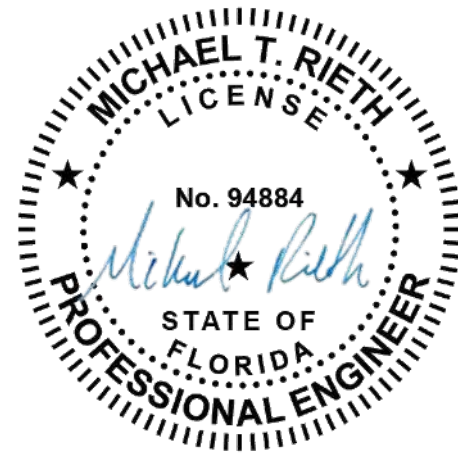
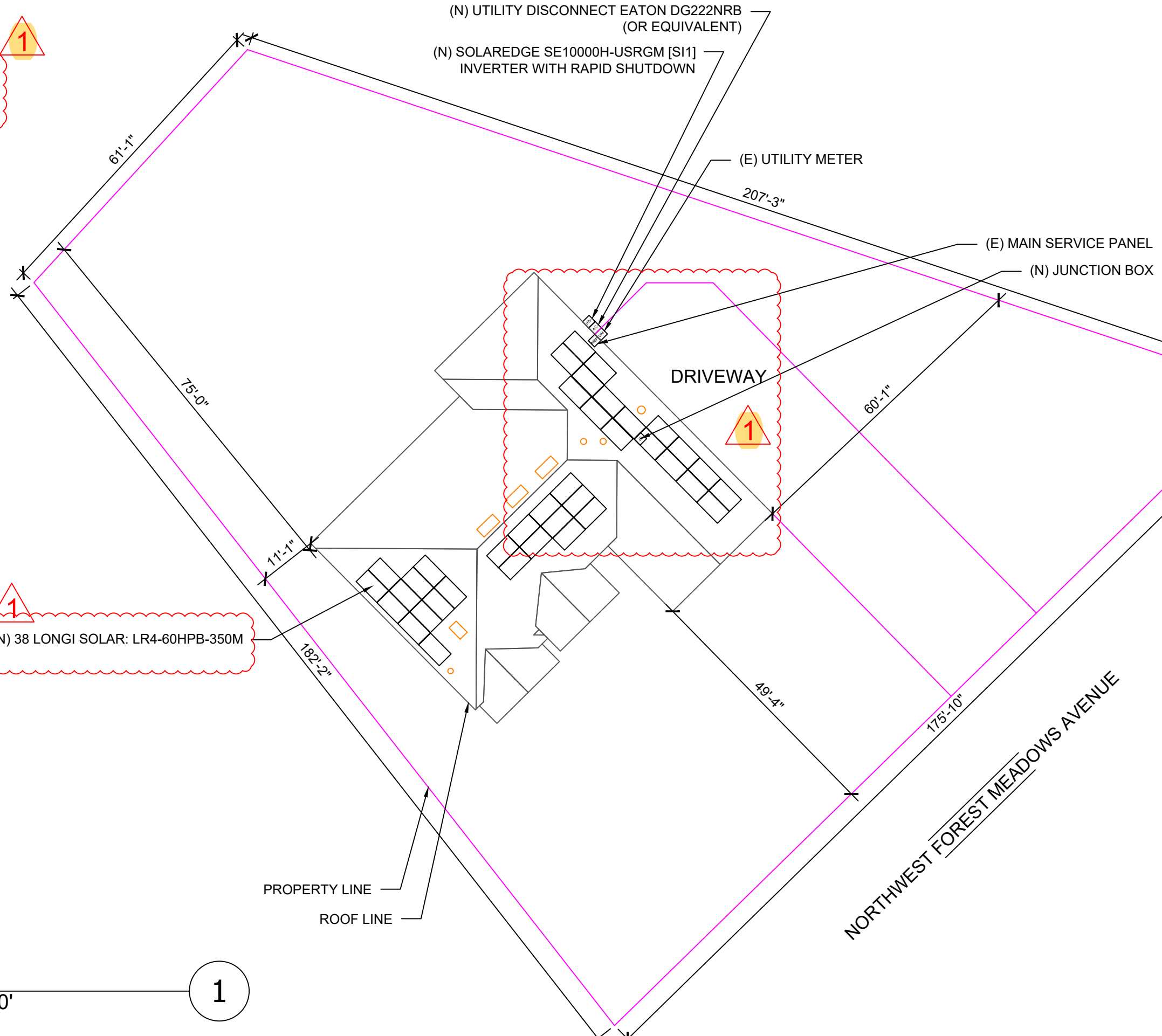
GREG ALBRIGHT

CONTRACTOR LICENSE:  
 CERTIFIED ELECTRICAL CONTRACTOR  
 EC13008056

SITE LOCATION			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
276016	12/15/2022	B.F.	PV-1

**LEGEND:**

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



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ROOF AREA: 4275.24 SQ FT

**CLIENT:**  
 JENNA HANSEN  
 428 NORTHWEST FOREST MEADOWS AVENUE, LAKE CITY, FL 32055  
 AHJ: CITY OF LAKE CITY  
 UTILITY: FPL - FLORIDA POWER & LIGHT  
 METER: 401-634-840  
 PHONE: (386) 292-3432  
 EMAIL: JENNALYNNHANSEN@HOTMAIL.COM

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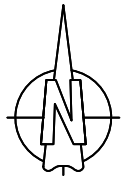
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




**SITE PLAN**  
 SCALE: 1"=20'

1

SITE PLAN			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
276016	12/15/2022	B.F.	PV-2

**LEGEND:**

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

1

TOTAL ROOF AREA: 4275.24 SQ FT  
 TOTAL ARRAY AREA: 745.13 SQ FT  
 ARRAY COVERAGE: 17.43%  
 SYSTEM DISTRIBUTED WEIGHT: 2.19 LBS  
 ROCKIT MICRORAIL POINT-LOAD: 20.69 LBS



**Xiaojian Xie** Digitally signed by Xi  
 Date: 2022.12.16 18:4  
 -05'00'




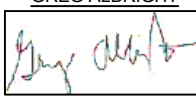
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ROOF AREA: 4275.24 SQ FT

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**freedom FOREVER**  
 FREEDOM FOREVER LLC  
 2619 CONSULATE DR SUITE 800, ORLANDO, FL 32819  
 Tel: (800) 385-1075  
**GREG ALBRIGHT**  
  
 CONTRACTOR LICENSE:  
 CERTIFIED ELECTRICAL CONTRACTOR  
 EC13008056



**ROOF PLAN**  
 SCALE: 3/32" = 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 PLAN WITH MODULES LAYOUT			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
276016	12/15/2022	B.F.	PV-2A

# ROOF DETAILS:

TOTAL ROOF AREA: 4275.24 SQ FT  
 TOTAL ARRAY AREA: 745.13 SQFT  
 ARRAY COVERAGE: 17.43%  
 SYSTEM DISTRIBUTED WEIGHT: 2.19 LBS  
 ROCKIT MICRORAIL POINT-LOAD: 20.69 LBS

Structural Components Only



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## ROOF AREA STATEMENT

ROOF	MODULE QUANTITY	ROOF PITCH	ARRAY PITCH	AZIMUTH	ROOF AREA	ARRAY AREA
ROOF 1	17	27	27	45	985.45 SQ FT	333.35 SQ FT
ROOF 2	11	27	27	225	562.54 SQ FT	215.7 SQ FT
ROOF 3	10	27	27	135	700.06 SQ FT	196.09 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:**  
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 INVERTER: SOLAREEDGE SE10000H-USRGM [S1]

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**freedom**  
 FOREVER  
 FREEDOM FOREVER LLC  
 2619 CONSULATE DR SUITE 800, ORLANDO,  
 FL 32819  
 Tel: (800) 385-1075  
**GREG ALBRIGHT**  
  
**CONTRACTOR LICENSE:**  
 CERTIFIED ELECTRICAL CONTRACTOR  
 EC13008056

ROOF DETAILS			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
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**BACKFEED BREAKER SIZING**

MAX. CONTINUOUS OUTPUT 42.00A @ 240V

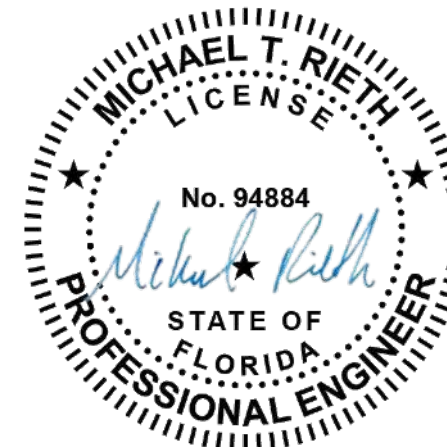
42.00 X 1.25 = 52.50AMPS 60A BREAKER - OK

SEE 705.12 OF 2017 NEC

LOCKABLE DISCONNECT WITHIN 10' OF THE METER, MUST BE PROVIDED THAT IS

READILY ACCESSIBLE AT ALL TIMES TO THE ASSOCIATION'S PERSONNEL.

240 - 175 = 65A ALLOWABLE BACKFEED



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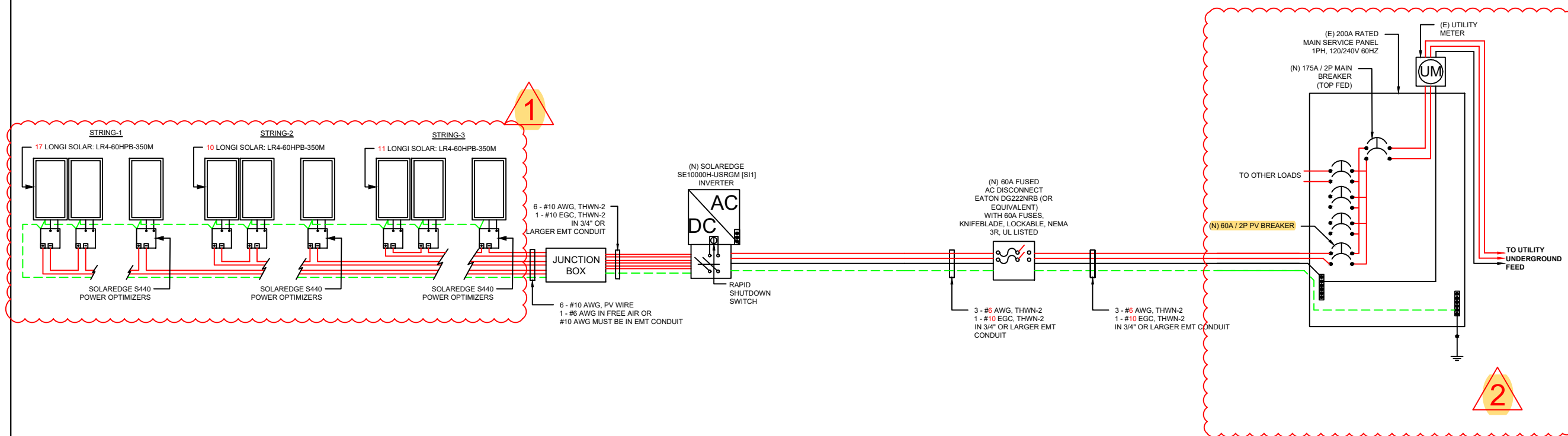
**FREEDOM FOREVER LLC**  
 2619 CONSULATE DR SUITE 800, ORLANDO, FL 32819  
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**THREE LINE DIAGRAM**

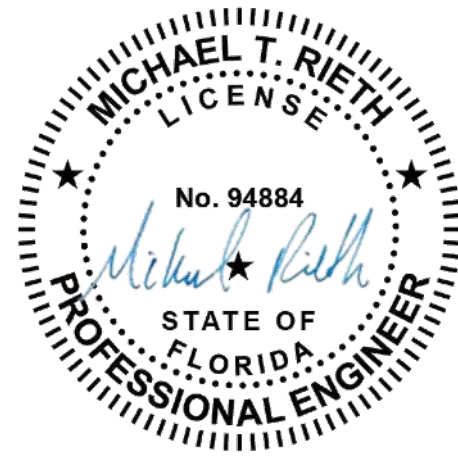
JOB NO:	DATE:	DESIGNED BY:	SHEET:
276016	12/15/2022	B.F.	PV-4



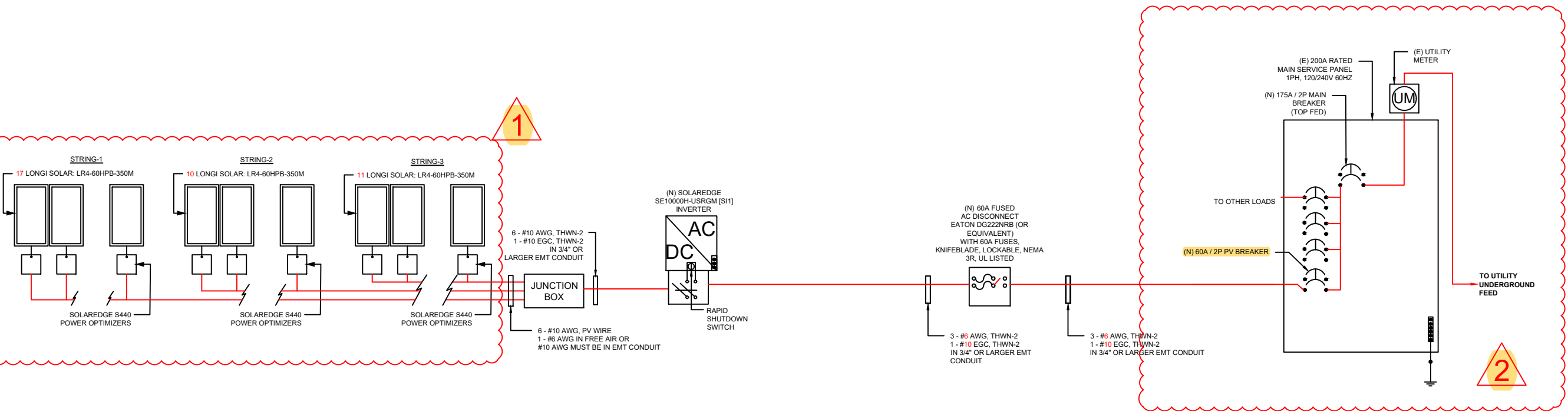
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**BACKFEED BREAKER SIZING**  
 MAX. CONTINUOUS OUTPUT 42.00A @ 240V  
 42.00 X 1.25 = 52.50AMPS 60A BREAKER - OK  
 SEE 705.12 OF 2017 NEC  
 LOCKABLE DISCONNECT WITHIN 10' OF THE METER, MUST BE PROVIDED THAT IS  
 EASILY ACCESSIBLE AT ALL TIMES TO THE ASSOCIATION'S PERSONNEL.

**PV SYSTEM**  
 3.015 kW-DC  
 2.738 kW-CEC AC



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SINGLE LINE DIAGRAM			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
276016	12/15/2022	B.F.	PV-4A



**Residential Optional Calculation**

9/25/1997

Freedom Forever LLC

by John Salsola

Version 2014

**STEP 1 Article 220.82 (B) (1),(2)**

sq. ft	2221	General Lighting load	6,663 VA
	2	Small Appliance	3,000 VA
	1	Laundry circuit	1,500 VA
		Gen.Lgt, Sm App.& Laun. Load	11,163 VA

**Company Name**

Address  
City, State, Zip Code  
Telephone & Fax

12/15/2022 10:22

**STEP 2 Article 220.82 (C)**

**A/C Condenser & Fixed Electric Space Heating**

A/C #	Capacity	VA	AHU	kW	VA	QTY
4 ton	5,700 VA	AHU 1	5kW	5,800 VA	1	
A/C #2	VA	AHU 2	Select	VA	Qty	
A/C #3	VA	AHU 3	Select	VA	Qty	
A/C #4	VA	AHU 4	Select	VA	Qty	
A/C #5	VA	AHU 5	Select	VA	Qty	

General lighting, Sm. Appl. & Laundry **11,163 VA**

Total 1 65% Demand Factor

Heating Load	4,050 VA
CU Load	6,500 VA

Electric Space Heat @ 65% <4, 40% >3, vs. A/C @ 100% **6,500 VA**

**STEP 3 Article 220.82 (B) (3)**

<input type="checkbox"/>	3,500 VA	1	Water Heater	3,500 VA
<input type="checkbox"/>	1,400 VA	1	Refrigerator	1,400 VA
<input type="checkbox"/>	800 VA	1	Freezer	800 VA
<input type="checkbox"/>	1,200 VA	1	Dishwasher	1,200 VA
<input type="checkbox"/>	1,127 VA	1	Disposal	1,127 VA
<input type="checkbox"/>	540 VA	1	Range Hood	540 VA
<input type="checkbox"/>	1,400 VA	1	Microwave	1,400 VA
<input type="checkbox"/>	1,440 VA		Central Vac	VA
<input type="checkbox"/>	288 VA		Mini Refrig	VA
<input type="checkbox"/>	400 VA		Compactor	VA
<input type="checkbox"/>	12,000 VA		Tankless heater	VA
<input type="checkbox"/>	1,500 VA		Wine Cooler	VA
<input type="checkbox"/>	select		Jacuzzi Tub	VA
<input type="checkbox"/>	select		Sprinkler	VA
<input type="checkbox"/>	select		Well Pump	VA
<input type="checkbox"/>	select		Fountain Pump	VA
<input type="checkbox"/>	select		Elevator	VA
<input type="checkbox"/>			Pool Equip. Panel	VA Apply Demand
<input type="checkbox"/>	15360		Other load	15,360 VA Apply Demand
<input type="checkbox"/>	11520		Other load	11,520 VA Apply Demand

Appliance Demand Load **36,847 VA**

Dryer Demand Load **6,720 VA**

Range Demand Load **9,600 VA**

Service Demand **38,232 VA**

Demand Load @ 240V, 1ph **159 A**

Neutral Demand **88 A**

Min.Service Req. **175 A**

Total Appliance Load **36,847 VA**

**STEP 4 Article 220.82 (B) (3)**

Electric Clothes Dryers **6,720 VA**

**STEP 5 Article 220.82 (B) (3)**

Electric Ranges **9,600 W** Col C demand **8000**  
or Number of appliances

<input type="checkbox"/>	Check Box for Gas Range	Cooktop	Col B demand
		Cooktop	Col B demand
		Oven(s)	Col B demand
		Oven(s)	Col B demand
	Number of appliances	Dem. Factor	
		Cooktop & Oven Demand Load	

Use this area for your own notes



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**CLIENT:**  
JENNA HANSEN  
428 NORTHWEST FOREST MEADOWS  
AVENUE, LAKE CITY, FL 32055  
AHJ: CITY OF LAKE CITY  
UTILITY: FPL - FLORIDA POWER & LIGHT  
METER: 401-634-840  
PHONE: (386) 292-3432  
EMAIL: JENNALYNNHANSEN@HOTMAIL.COM

**SYSTEM:**  
SYSTEM SIZE (DC): 38 X 350 = 13,300 kW  
SYSTEM SIZE (AC): 10,000 kW @ 240V  
MODULES: 38 X LONGI SOLAR:  
LR4-60HPB-350M  
OPTIMIZERS: 38 X SOLAREEDGE S440  
INVERTER: SOLAREEDGE SE10000H-USRGM [S11]

REVISIONS		
NO.	REVISED BY	DATE
1	B.F.	11/30/2022
2	B.F.	12/15/2022
-	-	-



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

*Greg Albright*

CONTRACTOR LICENSE:  
CERTIFIED ELECTRICAL CONTRACTOR  
EC13008056

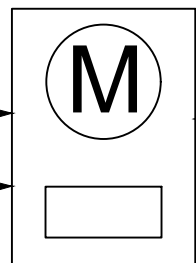
**ELECTRICAL CALCULATIONS**

JOB NO:	DATE:	DESIGNED BY:	SHEET:
276016	12/15/2022	B.F.	PV-5A



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

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



**"WARNING"**  
DUAL POWER SOURCES  
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM  
RATED AC OUTPUT CURRENT - 42.00 AMPS  
AC NORMAL OPERATING VOLTAGE - 240 VOLTS

690.54

**NOTES:**

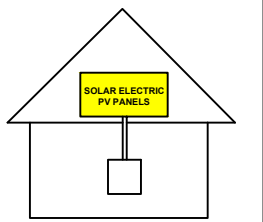
- NEC ARTICLES 690 AND 705 AND IRC SECTION R324 MARKINGS SHOWN HEREON.
- ALL MARKING SHALL CONSIST OF THE FOLLOWING:
  - UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING.
  - RED BACKGROUND COLOR WHITE TEXT AND LINE WORK.
  - ARIAL FONT.
- ALL SIGNS SHALL BE SIZED 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



This item has been digitally signed and sealed by Michael Rieth on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

**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

PM

AC

**PV SYSTEM AC DISCONNECT**  
RATED AC OUTPUT CURRENT - 42.00 AMPS  
AC NORMAL OPERATING VOLTAGE - 240 VOLTS

690.15, 690.54

**RAPID SHUTDOWN SWITCH FOR  
SOLAR PV SYSTEM**

690.56(C)(3)

INVERTER

MAXIMUM VOLTAGE  V  
MAXIMUM CIRCUIT CURRENT  A  
MAX DC-DC CONVERTER  
OUTPUT CURRENT  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: 27A  
MAX RATED OUTPUT CURRENT OF  
THE CONTROLLER OR DC-TO-DC  
CONVERTER: 15A

690.53

ARRAY



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

**"WARNING"**  
PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT AND ENCLOSURES

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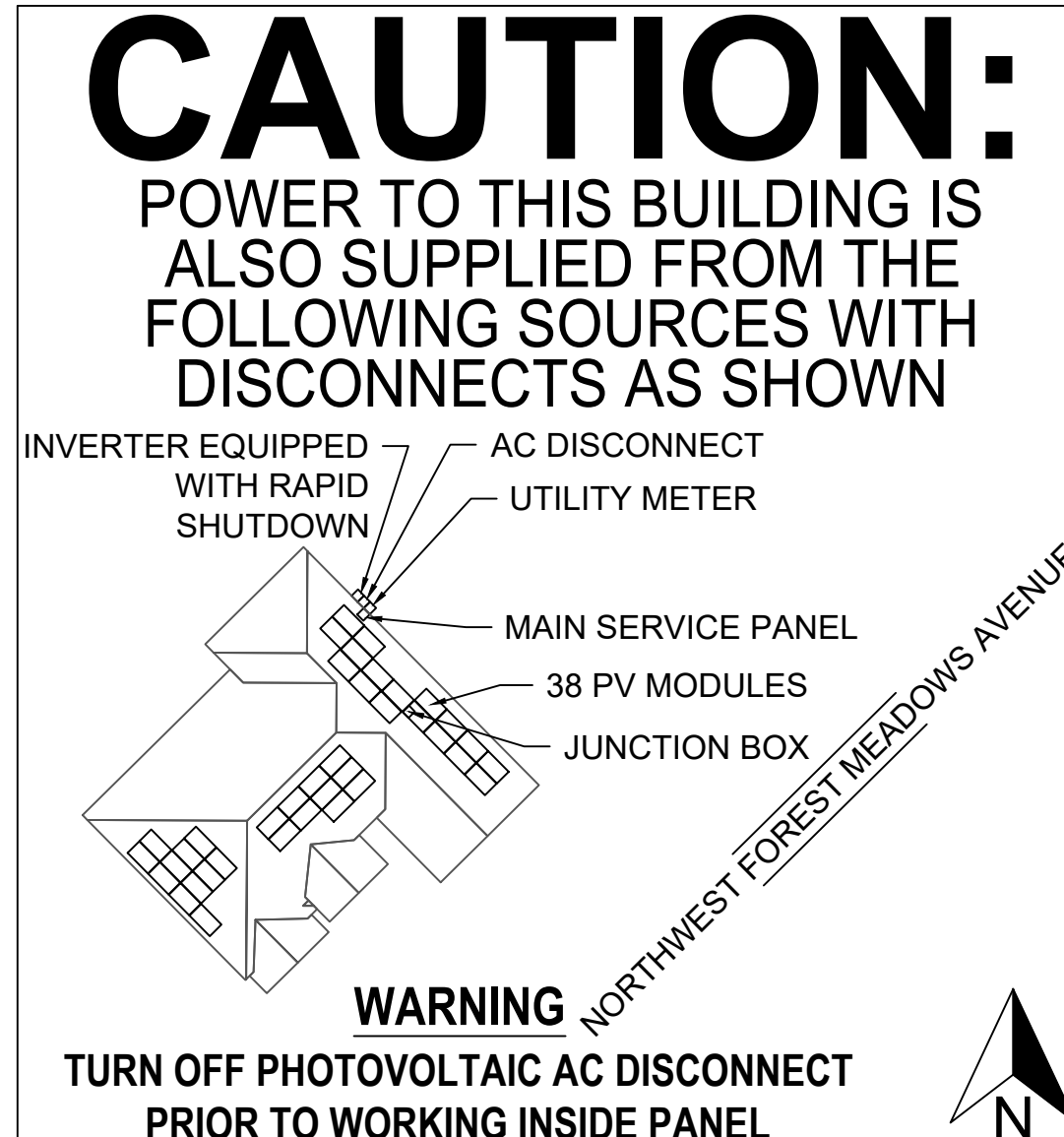
*Greg Albright*

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LABELS			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
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**GREG ALBRIGHT**



**CONTRACTOR LICENSE:**  
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SITE PLACARD			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
276016	12/15/2022	B.F.	PV-7A

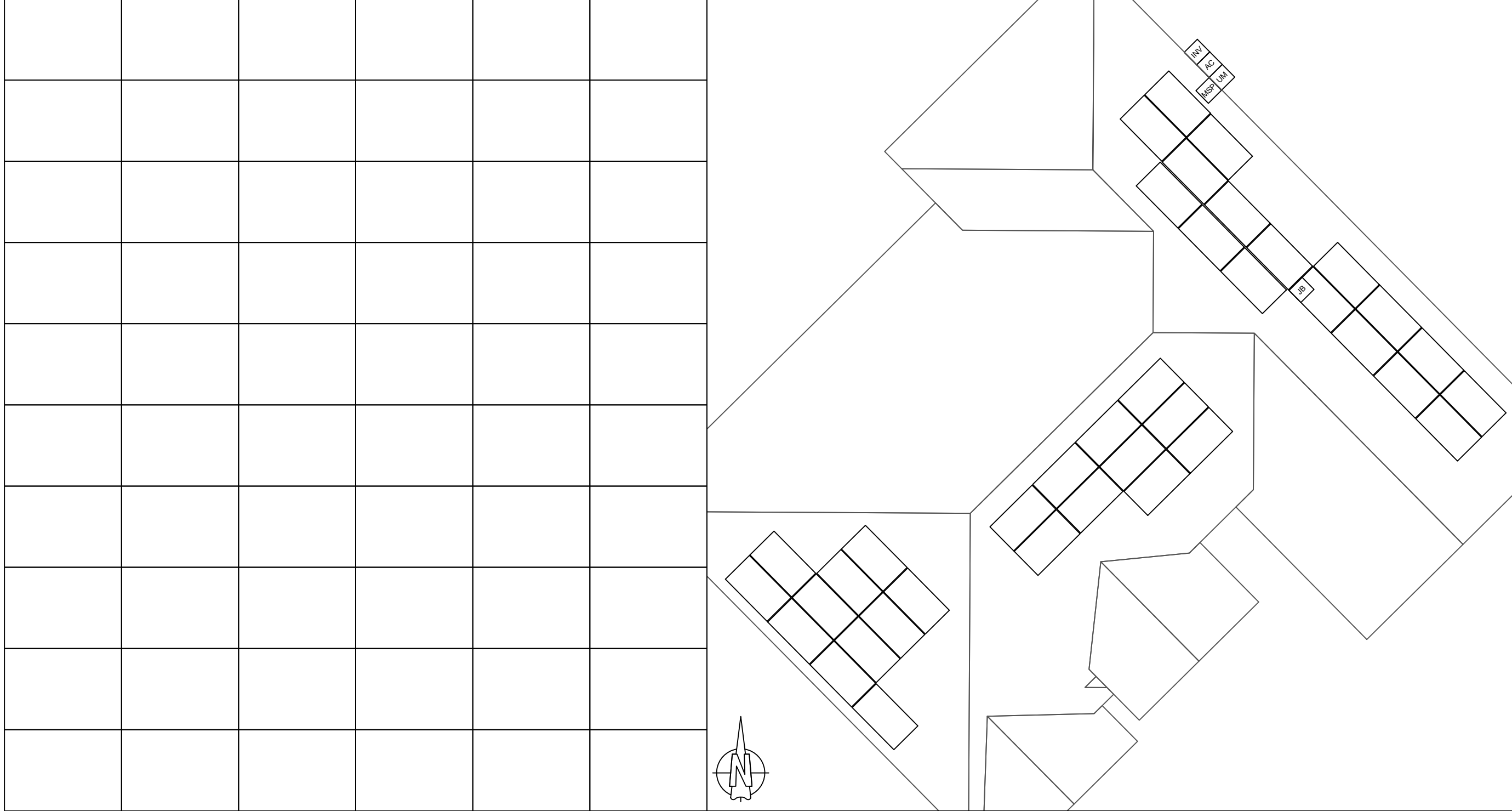
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4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH POP-RIVETS OR SCREWS.

# SOLAREEDGE OPTIMIZER CHART

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

1  
2  
3  
4  
5  
6  
7  
8  
9  
10



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**OPTIMIZER CHART**

JOB NO: 276016	DATE: 12/15/2022	DESIGNED BY: B.F.	SHEET: PV-8
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# JOB HAZARD ANALYSIS

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

## Ladder Access

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

Additional notes:

## Mobile Equipment

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

## Material Handling and Storage

- Materials will be staged/stored in a way that does not present a hazard to client, personnel or public. Materials stored on the roof will be physically protect from 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 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:
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**freedom FOREVER**  
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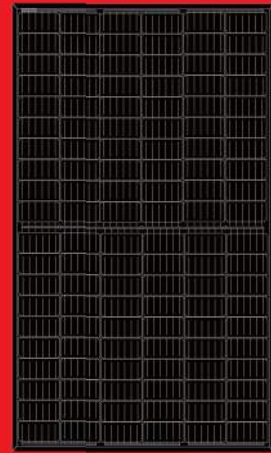
## SAFETY PLAN

JOB NO: 276016	DATE: 12/15/2022	DESIGNED BY: B.F.	SHEET: PV-10
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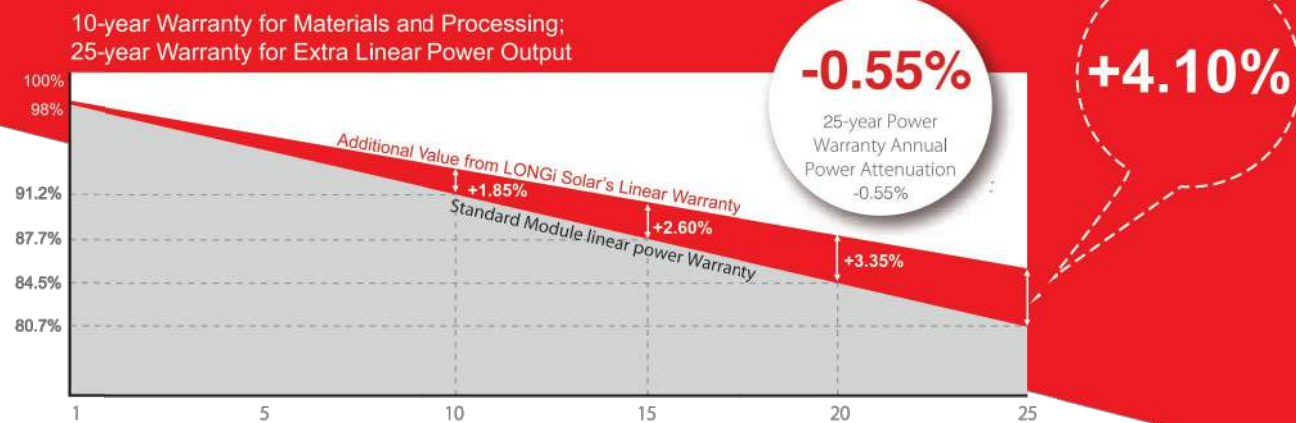
# LR4-60HPB 345~365M

Hi-MO 4m  
NEW

High Efficiency  
Low LID Mono PERC with  
Half-cut Technology



\*Both 6BB & 9BB are available



### Complete System and Product Certifications

IEC 61215, IEC61730, UL61730  
ISO 9001:2008: ISO Quality Management System  
ISO 14001: 2004: ISO Environment Management System  
TS62941: Guideline for module design qualification and type approval  
OHSAS 18001: 2007 Occupational Health and Safety



\* Specifications subject to technical changes and tests. LONGI Solar reserves the right of interpretation.

**Positive power tolerance** (0 ~ +5W) guaranteed

**High module conversion efficiency** (up to 20%)

**Slower power degradation** enabled by Low LID Mono PERC technology: first year <2%, 0.55% year 2-25

**Solid PID resistance** ensured by solar cell process optimization and careful module BOM selection

**Reduced resistive loss** with lower operating current

**Higher energy yield** with lower operating temperature

**Reduced hot spot risk** with optimized electrical design and lower operating current

# LONGI

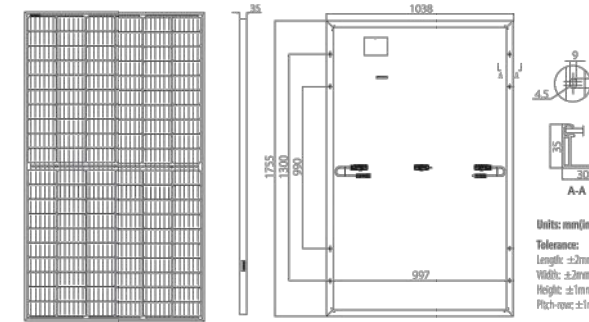
Room 801, Tower 3, Lujiazui Financial Plaza, No.826 Century Avenue, Pudong Shanghai, 200120, China  
Tel: +86-21-80162606 E-mail: module@longi-silicon.com Facebook: www.facebook.com/LONGI Solar

Note: Due to continuous technical innovation, R&D and improvement, technical data above mentioned may be of modification accordingly. LONGI have the sole right to make such modification at anytime without further notice; Demanding party shall request for the latest datasheet for such as contract need, and make it a consisting and binding part of lawful documentation duly signed by both parties.

20200106-Draft

# LR4-60HPB 345~365M

## Design (mm)



## Mechanical Parameters

Cell Orientation: 120 (6x20)  
Junction Box: IP68, three diodes  
Output Cable: 4mm<sup>2</sup>, 300mm in length, length can be customized  
Glass: Single glass  
3.2mm coated tempered glass  
Frame: Anodized aluminum alloy frame  
Weight: 19.5kg  
Dimension: 1755x1038x35mm  
Packaging: 30pcs per pallet  
180pcs per 20'GP  
780pcs per 40'HC

## Operating Parameters

Operational Temperature: -40°C ~ +85°C  
Power Output Tolerance: 0 ~ +5 W  
Voc and Isc Tolerance: ±3%  
Maximum System Voltage: DC1000V (IEC/UL)  
Maximum Series Fuse Rating: 20A  
Nominal Operating Cell Temperature: 45±2°C  
Safety Class: Class II  
Fire Rating: UL type 1 or 2

## Electrical Characteristics

Test uncertainty for Pmax: ±3%

Model Number	LR4-60HPB-345M		LR4-60HPB-350M		LR4-60HPB-355M		LR4-60HPB-360M		LR4-60HPB-365M	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	345	255.6	350	259.3	355	263.0	360	266.7	365	270.4
Open Circuit Voltage (Voc/V)	40.2	37.5	40.4	37.7	40.6	37.9	40.8	38.1	41.0	38.3
Short Circuit Current (Isc/A)	11.06	8.92	11.16	8.99	11.25	9.06	11.33	9.13	11.41	9.20
Voltage at Maximum Power (Vmp/V)	34.2	31.6	34.4	31.8	34.6	32.0	34.8	32.1	35.0	32.3
Current at Maximum Power (Imp/A)	10.09	8.09	10.18	8.16	10.27	8.23	10.35	8.30	10.43	8.36
Module Efficiency(%)	18.9		19.2		19.5		19.8		20.0	

STC (Standard Testing Conditions): Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, Spectra at AM1.5, Wind at 1m/S

## Temperature Ratings ( STC )

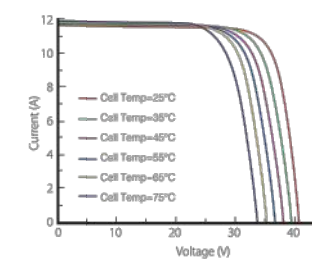
Temperature Coefficient of Isc: +0.057%/C  
Temperature Coefficient of Voc: -0.286%/C  
Temperature Coefficient of Pmax: -0.370%/C

## Mechanical Loading

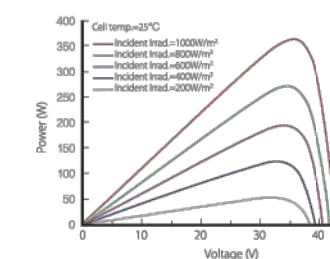
Front Side Maximum Static Loading: 5400Pa  
Rear Side Maximum Static Loading: 2400Pa  
Hailstone Test: 25mm Hailstone at the speed of 23m/s

## I-V Curve

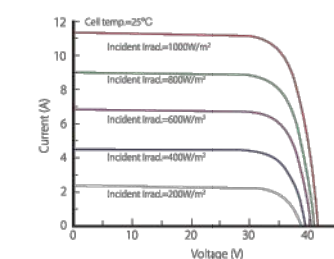
Current-Voltage Curve (LR4-60HPB-360M)



Power-Voltage Curve (LR4-60HPB-360M)



Current-Voltage Curve (LR4-60HPB-360M)



# LONGI

Room 801, Tower 3, Lujiazui Financial Plaza, No.826 Century Avenue, Pudong Shanghai, 200120, China  
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20200106-Draft

# Power Optimizer For North America

S440, S500



POWER OPTIMIZER

## PV power optimization at the module level

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

\* Expected availability in 2022

[solaredge.com](http://solaredge.com)



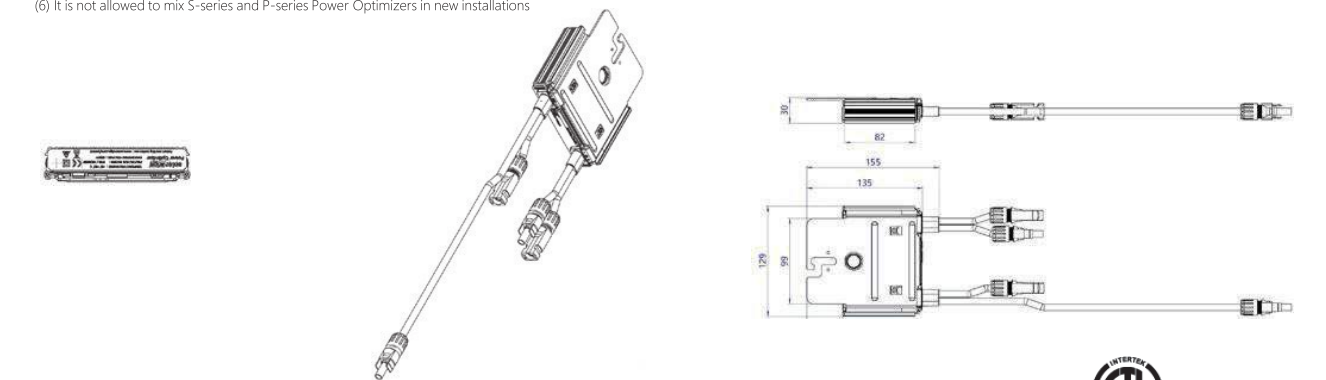
# Power Optimizer For North America S440, S500

	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 < maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power. Refer to: <https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf>  
 (6) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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

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

12-25  
YEAR  
WARRANTY



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 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)

## 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-XXXXXBXX4							
<b>OUTPUT</b>								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	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	12.5	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	4650	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>	8.5	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 <sub>a</sub> Sensitivity							
Maximum Inverter Efficiency	99	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

# / Single Phase Inverter with HD-Wave Technology

## for North America

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

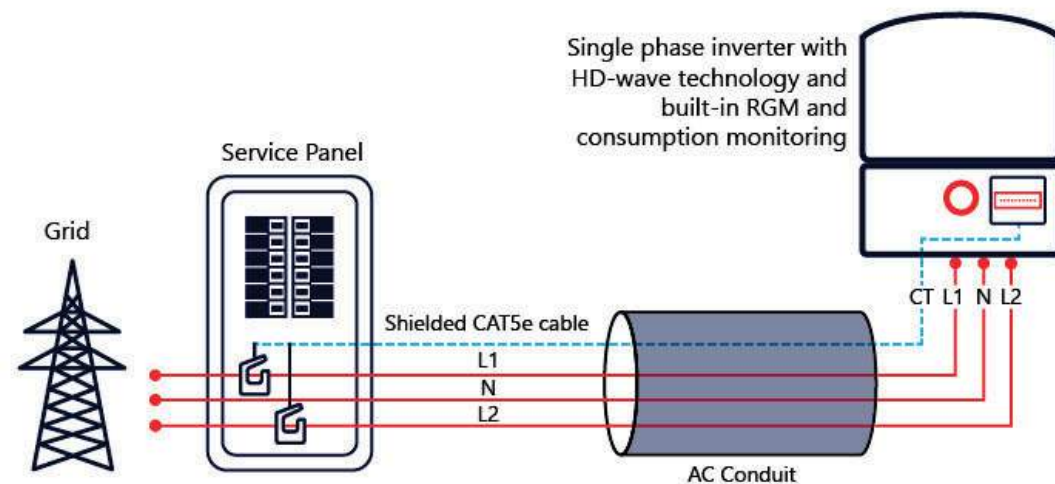
MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US
<b>ADDITIONAL FEATURES</b>							
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)						
Revenue Grade Metering, ANSI C12.20	Optional <sup>(3)</sup>						
Consumption 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						
<b>STANDARD COMPLIANCE</b>							
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07						
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)						
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 (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174			21.3 x 14.6 x 7.3 / 540 x 370 x 185			
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6			
Noise	< 25			< 50			
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>(4)</sup>						
Protection Rating	NEMA 4X (Inverter with Safety Switch)						

(3) Inverter with Revenue Grade Meter P/N: SExxxxH-US000BNC4; Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BNI4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box

(4) Full power up to at least 50°C / 122°F; for power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-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



[pe.eaton.com](http://pe.eaton.com)

## 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



## 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.





May 21, 2021

EcoFasten Solar LLC  
4141 W Van Buren St, Ste 2  
Phoenix, AZ 85009  
TEL: (877) 859-3947

Attn.: Eco Fasten Solar LLC - Engineering Department

Re: Report # 2015-05884HG.07.01 – EcoFasten - RockIt System for Gable and Hip Roofs  
Subject: Engineering Certification for the State of Florida

PZSE, Inc. – Structural Engineers has provided engineering and span tables for the EcoFasten - RockIt System, as presented in PZSE Report # 2015-05884HG.07.01, "Engineering Certification for the EcoFasten - RockIt System for Gable and Hip Roofs". All information, data, and analysis therein are based on, and comply with, the following building codes and typical specifications:

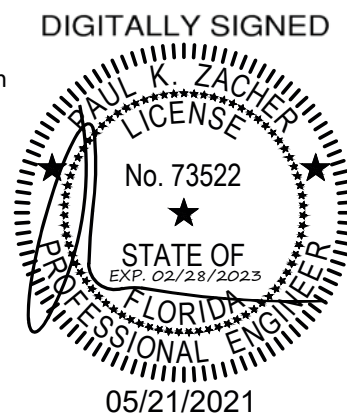
- Building Codes:
1. ASCE/SEI 7-16, Minimum Design Loads for Buildings and Other Structures, by American Society of Civil Engineers
  2. 2020 FBC - Building, 7th Edition, Based on 2018 International Building Code
  3. 2020 FRC - Residential, 7th Edition, Based on 2018 International Residential Code
  4. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES
  5. Aluminum Design Manual 2015, by The Aluminum Association, Inc.
  6. ANSI/AWC NDS-2018, National Design Specification for Wood Construction, by the American Wood Council

- Design Criteria:
- Risk Category II
  - Seismic Design Category = A - E
  - Exposure Category = B, C & D
  - Basic Wind Speed (ultimate) per ASCE 7-16 = 90 mph to 180 mph
  - Ground Snow Load = 0 to 60 (psf)

This letter certifies that the loading criteria and design basis for the EcoFasten - RockIt System Span Tables are in compliance with the above codes.

If you have any questions on the above, do not hesitate to call.

Prepared by:  
PZSE, Inc. – Structural Engineers  
Roseville, CA



THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY PAUL K. ZACHER, PE ON 05/21/2021 USING A SHA-1 AUTHENTICATION CODE.

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