BUILDING JOB SITE CARD

City of Belle Isle

ELECTRICAL PERMIT 2018-03-075

PERMIT MUST BE POSTED ON SITE

Permit Number: 2018-03-075
Site Address: **6609 Franconia Dr 32812**
Subdivision:
Description of Work: **PHOTOVOLTAIC SYSTEM, RESDENTIAL**

Issue Date: 03-29-2018
Parcel Number: 20-23-30-1618-00-030
Class: Residential

Issued To: SUNRUN INSTALLATION SERVICES INC.
Name: JOYCE, PAUL
Payment Date & Method: 4 /12/ 2018
■ Visa □ Master Card □ Amex □ Discover □ Check / Money Order # 4731

Business Phone: 732 552-61333
Contractor License EC13007964

"WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCEMENT MAY RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. IYOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT."

ELECTRICAL	INSPECTOR	DATE	COMMENTS
300 Temp Pole			
310 TUG			
320 Underground			
330 Rough			
340 Footer Steel Bonding			
350 Pool Light			
360 PrePower			
370 Meter ReSet			
380 Final			

Inspection requests are to be emailed to BIDscheduling@UniversalEngineering.com; a confirmation email will be sent back to you upon scheduling. Next-Day Inspection requests must be made by 4pm. Please include the following in your request: Permit #, project address, type of inspection, date of the requested inspection, a contact name & a contact phone number. AM or PM may be requested but cannot be guaranteed.

Universal Engineering Sciences - 3532 Maggie Blvd., Orlando, FL 32811 Tel 407-581-8161
* Fax 407-581-0313 * www.universalengineering.com

City of Belle Isle

Universal Engineering Sciences 3532 Maggie Blvd., Orlando, FL 32811
Tel 407-581-8161 * Fax 407-581-0313 * www.universalengineering.com

RECEIVED IN PERSON MAR 26 2018

APPLICATION FOR ELECTRICAL PERMIT

WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCEMENT MAY RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. A NOTICE OF COMMENCEMENT MUST BE RECORDED AND POSTED ON THE JOB SITE BEFORE THE FIRST INSPECTION. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT.

DATE OF APPLICATION: _____ **PERMIT NUMBER** 2018-03-075

The undersigned hereby applies for a permit to make electrical installations as indicated below. PLEASE PRINT

Project Address 6609 Franconia Dr., Belle Isle FL ___32809 X 32812

Property Owner Ralph Meloon Jr. Phone 907-252-7110

Property Owner's Mailing Address 6609 Franconia Dr. City Belle Isle

State FL Zip Code 32812 **Parcel Id Number:** 20-23-30-1618-00-030

To obtain this information, please visit http://www.ocpafl.org/Searches/ParcelSearch.aspx

Class of Building: Old ☐ New ☐ **Type of Building:** Residential ☒ Commercial ☐ Other ☐

Type of Work: New ☐ Alteration ☐ Addition ☐ Repair ☐ Low Voltage New ☐ Existing ☐

INDICATE THE QUANTITY OF ALL EQUIPMENT TO BE INSTALLED

Dishwasher ____	Exhaust Fan ____	Disposal ____	Water Heater ____
Hood Fan ____	Dryer ____	Paddle Fan ____	Outlets ____
Fixtures ____	Spa ____	Pool ____	Switches ____
Electric Signs ____	Meter Reset ____	Low Voltage ____	Stoves ____
Pumps ____	Motors ____	Air Conditioning (tons) ____	Furnace (KW) ____

Temporary Construction Pole _____ **One (1) New Meter Service** _____ Amperage/Voltage/Phase

Meter Service Upgrade from _____ (Amperage/Voltage/Phase) to _____ (Amperage/Voltage/Phase) = _____ (Difference in Size)

Relocate Existing Meter Service (No Service Size Change) _____

Other: Photovoltaic System, residential

☐ **PERMIT FEE BASED ON METER SERVICE SIZE SCHEDULE** ..... $ _____
(IF NO METER SERVICE WORK BEING DONE, USE VALUATION OF JOB FOR PERMIT FEE)

☐ **VALUATION OF JOB** (VALUATION OF ALL MATERIALS, LABOR, AND FIXTURES INSTALLED $ 18,700.00

Building Official: _____ Date 3-27-18

Verified Contractor's Licenses & Insurance are on file ☑ Date 3-27-18

need NOC

Permit Fee = $ 127.-
Review Fee = $ 63.50
1% BCAIB Fee – $ 2.- min
1.5% DCA Fee = $ 2.86
TOTAL Permit = $ 195.36

I hereby certify that the above is true and correct to the best of my knowledge.

I hereby make Application for Permit as outlined above, and if same is granted I agree to conform to all Florida Building Code Regulations and City Ordinances regulating same and in accordance with plans submitted. The issuance of this permit does not grant permission to violate any applicable Town and/or State of Florida codes and/or ordinances.

LICENSE HOLDER SIGNATURE _____ LICENSE # EC13007964

LICENSE HOLDER NAME Paul Joyce COMPANY NAME Sunrun Installation Services Inc.

Street Address 5208 Tampa W Blvd.

City Tampa State FL Zip Code 33634 Phone Number 732-552-6133

Email Address Samantha.hernander@sunrun.com

NOTE: The Building Permit Number is required if the Electrical Installation is associated with any construction or alteration where a Building Permit has been issued.

1ST IK 37
5x18 90
127 ÷2
63.50
190.50

Building Permit Number _____ PAID 4-12-2018 USA 4731

104732

Permit Number: _____
Folio/Parcel ID #: _____
Prepared by: _____
_____
_____
Return to: _____
_____
_____

DOC# 20180218543
04/12/2018 09:08:39 AM Page 1 of 1
Rec Fee: $10.00
Phil Diamond, Comptroller
Orange County, FL
MB - Ret To: SUNRUN SOLAR INSTALLATION

NOTICE OF COMMENCEMENT

State of Florida, County of Orange

The undersigned hereby gives notice that improvement will be made to certain real property, and in accordance with Chapter 713, Florida Statutes, the following information is provided in this Notice of Commencement.

1. **Description of property** (legal description of the property, and street address if available)
   6609 Franconia Drive. Belle Isle, Fl
2. **General description of improvement**
   Roof Mounted Solar Panel System
3. **Owner information or Lessee information if the Lessee contracted for the improvement**
   Name Ralph Meloon Jr
   Address 6609 Franconia dr. Belle Isle
   Interest in Property _____
   Name and address of fee simple titleholder (if different from Owner listed above)
   Name _____
   Address _____
4. **Contractor**
   Name Sunrun Solar Installation Telephone Number 631-994-9025
   Address 5208 Tampa West Blvd, Tampa, Fl
5. **Surety** (if applicable, a copy of the payment bond is attached)
   Name _____ Telephone Number _____
   Address _____ Amount of Bond $ _____
6. **Lender**
   Name Loan Pal Telephone Number (916) 290-9999
   Address 8781 Sierra College Blvd, Roseville, CA. 95661
7. **Persons within the State of Florida designated by Owner upon whom notices or other documents may be served as provided by §713.13(1)(a)7, Florida Statutes.**
   Name _____ Telephone Number _____
   Address _____
8. **In addition to himself or herself, Owner designates the following to receive a copy of the Lienor's Notice as provided in §713.13(1)(b), Florida Statutes.**
   Name _____ Telephone Number _____
   Address _____
9. **Expiration date of notice of commencement** (the expiration date will be 1 year from the date of recording unless a different date is specified) _____

WARNING TO OWNER: ANY PAYMENTS MADE BY THE OWNER AFTER THE EXPIRATION OF THE NOTICE OF COMMENCEMENT ARE CONSIDERED IMPROPER PAYMENTS UNDER CHAPTER 713, PART I, SECTION 713.13, FLORIDA STATUTES, AND CAN RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. A NOTICE OF COMMENCEMENT MUST BE RECORDED AND POSTED ON THE JOB SITE BEFORE THE FIRST INSPECTION. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE COMMENCING WORK OR RECORDING YOUR NOTICE OF COMMENCEMENT.

Signature of Owner or Lessee, or Owner's or Lessee's Authorized Officer/Director/Partner/Manager — Signatory's Title/Office

The foregoing instrument was acknowledged before me this 17 day of 02/17 (month/year) by _____ (name of person)

Print as Ralph C Meloon Jr for _____
Type of authority, e.g., officer, trustee, attorney in fact — Name of party on behalf of whom instrument was executed

Signature of Notary Public – State of Florida — Print, type, or stamp commissioned name of Notary Public

ADRIAN SALINAS
State of Florida-Notary Public
Commission # GG 155553
My Commission Expires
October 29, 2021

Personally Known ____ OR Produced ID DL
Type of ID Produced _____

State of FLORIDA, County of ORANGE
I hereby certify that this is a true copy of the document as reflected in the Official Records
PHIL DIAMOND, COUNTY COMPTROLLER
BY: _____, D.C.
DATED: APR 12 2018

Form content revised: 01/23/14

595 Market Street
29th Floor
San Francisco, CA 94105

March 13, 2018

Contractor Affidavit

Address: 6609 Franconia Dr. Belle Isle, FL 32812

To Whom It May Concern,

I, Paul Joyce, Contractor License EC13007964, hereby authorize the following to act as my agent(s) in obtaining permits. All person(s) are able to obtain permits on all construction permits.

Samantha Hernandez

Best regards,

Paul Joyce

STATE OF FLORIDA

COUNTY OF _____

The foregoing instrument was acknowledged before me this 13 day of 03, 2018, by (name of person acknowledging).

(NOTARY SEAL)

JENNIFER FUNARO
State of Florida-Notary Public
Commission # GG 155559
My Commission Expires
October 29, 2021

Notary Signature

Jennifer Funaro

Notary Printed Name

Personally Known _____ OR Produced Identification L

Type of Identification Produced License

Reviewed for Code Compliance
Universal Engineering Sciences

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

ELECTRICAL CONTRACTORS LICENSING BOARD (850) 487-1395
2601 BLAIR STONE ROAD
TALLAHASSEE FL 32399-0783

JOYCE, PAUL
SUNRUN INSTALLATION SERVICES INC.
223 KENDALL ROAD
KENDALL PARK NJ 08824

Congratulations! With this license you become one of the nearly one million Floridians licensed by the Department of Business and Professional Regulation. Our professionals and businesses range from architects to yacht brokers, from boxers to barbeque restaurants, and they keep Florida's economy strong.

Every day we work to improve the way we do business in order to serve you better. For information about our services, please log onto **www.myfloridalicense.com**. There you can find more information about our divisions and the regulations that impact you, subscribe to department newsletters and learn more about the Department's initiatives.

Our mission at the Department is: License Efficiently, Regulate Fairly. We constantly strive to serve you better so that you can serve your customers. Thank you for doing business in Florida, and congratulations on your new license!

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND
PROFESSIONAL REGULATION

EC13007964 ISSUED: 05/24/2017

CERTIFIED ELECTRICAL CONTRACTOR
JOYCE, PAUL
SUNRUN INSTALLATION SERVICES INC.

IS CERTIFIED under the provisions of Ch.489 FS.
Expiration date AUG 31, 2018 L1705240000563

DETACH HERE

RICK SCOTT, GOVERNOR MATILDE MILLER, INTERIM SECRETARY

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
ELECTRICAL CONTRACTORS LICENSING BOARD

LICENSE NUMBER
EC13007964

The ELECTRICAL CONTRACTOR
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2018

JOYCE, PAUL
SUNRUN INSTALLATION SERVICES INC.
26 WORLDS FAIR DRIVE
SOMERSET NJ 08873

ISSUED: 05/24/2017 DISPLAY AS REQUIRED BY LAW

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 3/16/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Arthur J. Gallagher & Co.
Insurance Brokers of CA. Inc. License #0726293
1255 Battery Street #450
San Francisco CA 94111

CONTACT NAME:
PHONE (A/C, No, Ext): 415-546-9300 FAX (A/C, No): 415-536-8499
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Zurich American Insurance Company	16535
INSURER B : Navigators Specialty Insurance Company	36056
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED SUNRINC-01
Sunrun Installation Services Inc.
595 Market St 29th Floor
San Francisco, CA 94105

COVERAGES **CERTIFICATE NUMBER:** 2017593343 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
B	X COMMERCIAL GENERAL LIABILITY			LA17CGL230321IC	10/1/2017	10/1/2018	EACH OCCURRENCE	$1,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$1,000,000
	X $50,000Retention						MED EXP (Any one person)	$5,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PERSONAL & ADV INJURY	$1,000,000
	X POLICY X PRO-JECT LOC						GENERAL AGGREGATE	$2,000,000
	OTHER:						PRODUCTS - COMP/OP AGG	$2,000,000
							Total Policy Limit	$10,000,000
A	AUTOMOBILE LIABILITY			BAP915542504	10/1/2017	10/1/2018	COMBINED SINGLE LIMIT (Ea accident)	$2,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / HIRED AUTOS ONLY / SCHEDULED AUTOS / NON-OWNED AUTOS ONLY						BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB OCCUR						EACH OCCURRENCE	$
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$
	DED RETENTION $							$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N			WC013696003	10/1/2017	10/1/2018	X PER STATUTE OTH-ER	
A	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N/A (Mandatory in NH)			WC013696103	10/1/2017	10/1/2018	E.L. EACH ACCIDENT	$1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$1,000,000
							E.L. DISEASE - POLICY LIMIT	$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

WC013696003 - $25,000 Deductible; WC013696103 - FL, HI, MA, NJ, NY, OR, VA, WI only. Named Insureds: Sunrun Inc., Sunrun Installation Services Inc., Sunrun South LLC, AEE Solar, Inc., Clean Energy Experts LLC, Sunrun Solar Electrical Corporation
RE: Paul Joyce, Master Electrician.

CERTIFICATE HOLDER

City of Belle Isle
1600 Nela Avenue
Belle Isle, FL 32809

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

2017 - 2018 HILLSBOROUGH COUNTY BUSINESS TAX RECEIPT **EXPIRES SEPTEMBER 30, 2018**

ACCOUNT NO.
41184
NEW BUSINESS

OCC. CODE
090.008002 ELECTRICAL CONTRACTOR

15 Employees

Receipt Fee	36.00
Hazardous Waste Surcharge	0.00
Law Library Fee	0.00

EC13007964

BUSINESS JOYCE PAUL
5208 W TAMPA BLVD
TAMPA, FL 33634

2017 - 2018

NAME SUNRUN INSTALLATION SERVICES INC
MAILING ADDRESS 5208 W TAMPA BLVD
TAMPA, FL 33634

Paid 17-0-025145
11/02/2017 36.00

BUSINESS TAX RECEIPT

HAS HEREBY PAID A PRIVILEGE TAX TO ENGAGE
IN BUSINESS, PROFESSION, OR OCCUPATION SPECIFIED HEREON

DOUG BELDEN, TAX COLLECTOR
813-635-5200
THIS BECOMES A TAX RECEIPT WHEN VALIDATED.

Penn FUSION Engineering

152 S. Broad St
Lansdale, PA 19446
(215) 361-8040

March 12, 2018

Subject: Structural Certification for Proposed Residential Solar Installation.
Job Number: 802R-449FERG; Plan Set: Rev A, Dated 3/08/18
Client: Susan FERGUSON
Address: 5449 Jobeth Dr., New Port Richey, FL 34652

Attn: To Whom It May Concern

A field observation was performed to document the existing framing of the above mentioned address. From the field observation, the existing roof structure was observed as 1 layer Composition Shingle roofing over roof plywood supported by 2x4 Truss @ 24" OC. The roof is sloped at approximately 25 degrees and has a max truss top chord span of 6' 0" between truss web members.

Design Criteria:

- 2017 Florida Building Code 6th Edition
- Basic Wind Speed Vult = 145 mph (Vasd = 113 mph), Exposure B
- Ground Snow Load = 0 psf

Our analysis is based on the information provided by Sunrun Inc. and is isolated only to the areas where the modules are intended to be placed. After review of the field observation report, the existing roof framing supporting the proposed solar panel layout has been determined to meet or exceed the requirements based on our structural capacity calculations in accordance with applicable building codes. Therefore, no structural upgrades are required.

If you have any further questions on the above for mentioned, please do not hesitate to call.

Sincerely,
Penn Fusion Engineering LLC

Andrew D. Leone, P.E.
Principal

Reviewed for Code Compliance
Universal Engineering Sciences

ANDREW D. LEONE
LICENSE
No. 60669
STATE OF FLORIDA
PROFESSIONAL ENGINEER
3/9/18

solaredge

SolarEdge Single Phase StorEdge™ Solutions for North America

STOREDGE™

SolarEdge StorEdge™ Solutions Benefits:

- **More Energy** - DC-coupled architecture stores PV power directly to the battery without AC conversion losses
- **Simple Design & Installation** - single inverter for PV, battery storage, grid-tied and backup applications
- **Enhanced Safety** - no high voltage during installation, maintenance or firefighting
- **Full Visibility** - monitor battery status, PV production, remaining backup power and self-consumption data

SolarEdge Single Phase StorEdge Inverter
for North America SE7600A-US[1]

- Single inverter for PV, grid-tied storage and backup power
- Includes the hardware required to provide automatic backup power to backed-up loads in case of grid interruption
- Includes all interfaces needed for battery connection
- UL1741 SA certified, for CPUC Rule 21 grid compliance

	Lower Power Output	Higher Power Output	
OUTPUT - AC (LOADS/GRID)			
Rated AC Power Output	7600		VA
Max AC Power Output	8350		VA
AC Output Voltage Min-Nom-Max (L-L)[2]	211-240-264		Vac
AC Frequency Min-Nom-Max[2]	59.3 - 60 - 60.5		Hz
Maximum Continuous Output Current @240V	32		A
GFDI	1		A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes		
Charge Battery from AC (if Allowed)	Yes		
THD	<3		%
Power factor with rated power	>0.99 (configurable; 0.9 leading to 0.9 lagging)		
Typical Nighttime Power Consumption	<5		W
OUTPUT - AC (BACKUP POWER)[3]			
Rated AC Power Output	5000 [4]		VA
Max AC Power Output - Surge	6600 [4]		VA
AC Output Voltage Min-Nom-Max (L-L)	211-240-264		Vac
AC Output Voltage Min-Nom-Max (L-N)	105-120-132		Vac
AC Frequency Min-Nom-Max	55 - 60 - 65		Hz
Maximum Continuous Output Current @240V - Backup Mode	21		A
Max Continuous Output Current per Phase @120V	25		A
GFDI	1		A
AC Circuit Breaker	Yes		
THD	<5		%
Power factor with rated power	0.2 leading to 0.2 lagging		
Automatic switchover time	<2		sec
Typical Nighttime Power Consumption	<5		W
INPUT - DC (PV and BATTERY)			
Transformer-less, Ungrounded	Yes		
Max Input Voltage	500		Vdc
Nom DC Input Voltage	400		Vdc
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	600kΩ Sensitivity		
Maximum Inverter Efficiency	98		%
CEC Weighted Efficiency	97.5		%
INPUT - DC (PV)			
Maximum DC Power (STC)	10250		W
Max Input Current[5]	23		Adc
2-pole Disconnection	Yes		
INPUT - DC (BATTERY)			
Supported Battery Types	LG Chem RESU10H, Tesla Powerwall 1		
Number of Batteries per Inverter	2[6]		
Continuous Power	3300	5000	W
Peak Power	5000	7000	W
Max Input Current	8.5	17.5	Adc
2-pole Disconnection	Yes		
DC Fuses on Plus and Minus	12A (field replaceable)	25A (field replaceable)	
ADDITIONAL FEATURES			
Supported Communication Interfaces	RS485 for battery, RS485, Ethernet, ZigBee (optional)		
Battery Power Supply	Yes, 12V / 53W		
Revenue Grade Data, ANSI C12.1	Optional[7]		
Integrated AC, DC and Communication Connection Unit	Yes		
AC Disconnect	Yes		
Manual Inverter Bypass Switch	Yes		
DC Voltage Rapid Shutdown (PV and Battery)	Yes, according to NEC 2014 and 2017 690.12		
Auto-transformer thermal protection	Yes		

(1) These specifications apply to inverters with part numbers SE7600A-US52XXXXX and connection unit model number BCU-1PH-US5
(2) For other regional settings please contact SolarEdge Support
(3) Not designed for standalone applications and requires AC for commissioning
(4) The rated AC power output is the minimum between the AC Power Output and the battery continuous peak power
(5) A higher current source may be used; the inverter will limit its input current to the values stated
(6) Two LG Chem batteries connection is expected to be supported in Q3. A new LG battery will be available for such systems; at least one of the batteries must be a new one
(7) Revenue grade inverter P/N: SE7600A-US52ONNM2

SolarEdge Auto-transformer

SEAUTO-TX-5000

	SEAUTO-TX-5000	
ELECTRICAL RATINGS		
Rated Power - Continuous	5000	VA
Rated Power - Peak	7600 for 10sec	VA
Output Voltage	120/240V Split Phase	
Max Continuous Output Current per Phase @120V	25	A
Split Phase Imbalance (@Rated Power)	Yes, up to 25A difference between phases	
Thermal Protection	Yes	
INSTALLATION SPECIFICATIONS		
AC Output conduit size / AWG range	0.75" / 14-6 AWG	
Dimensions (HxWxD)	6.7 x 7.9 x 5.5 / 170 x 200 x 140	in / mm
Weight	29.7 / 13.5	lb / kg
Min - Max Operating Temperature	-13 to +140 / -25 to +60	°F / °C
Protection Rating	NEMA 3R	
Installation	Wall mounted	

SolarEdge Electricity Meter for North America

SE-MTR240-0-000-S2

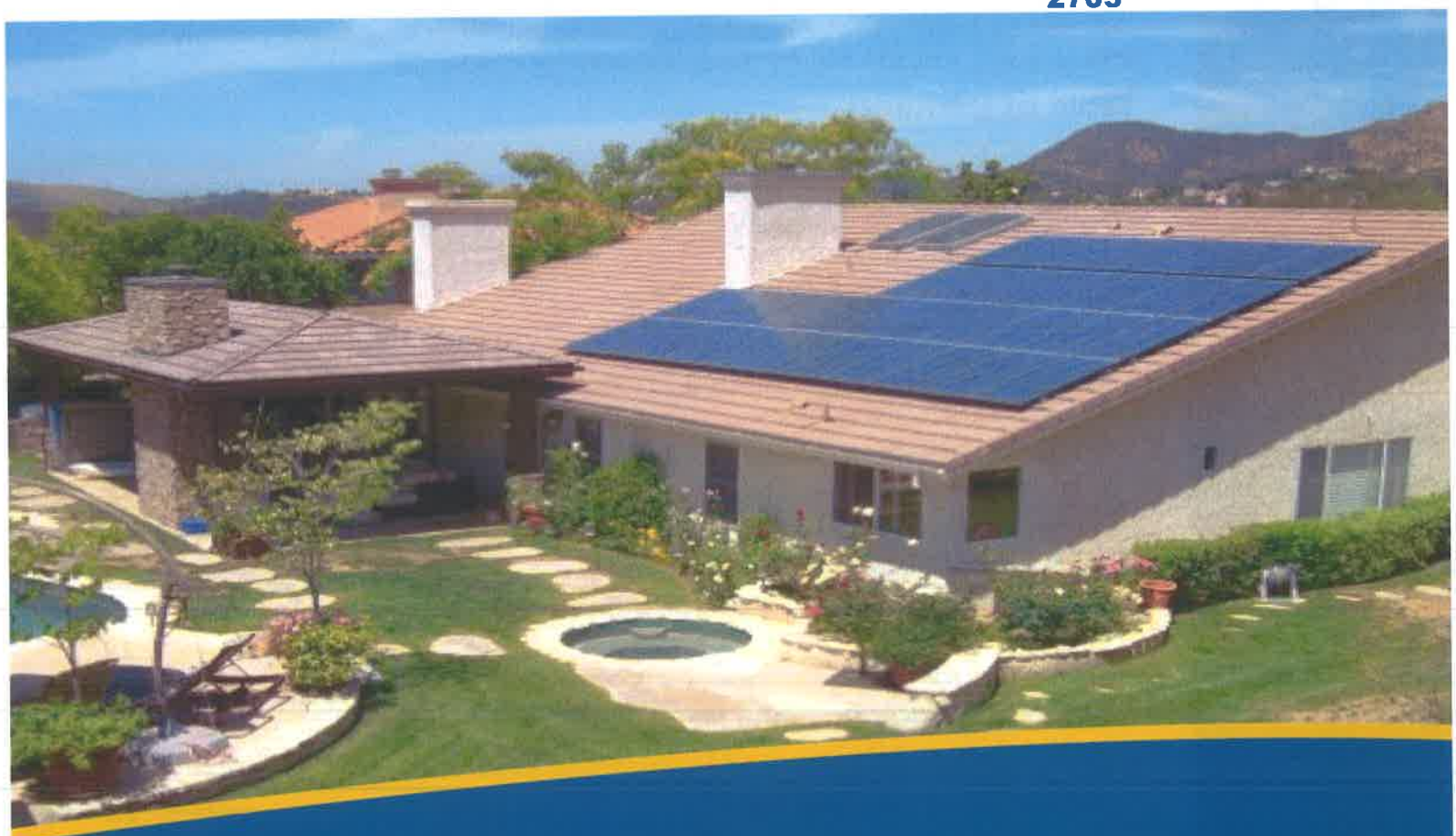
For meter specifications refer to: http://www.solaredge.us/files/pdfs/products/se_electricity_meter_na.pdf

CE ETL FC

SnapNrack™
Solar Mounting Solutions

Reviewed for Code Compliance
Universal Engineering Sciences

UL LISTED
PV Mounting System
2703



SERIES 100 UL

ROOF MOUNT SYSTEM

SnapNrack Residential PV Mounting Systems
Code Compliant Installation Manual

How to Configure Your System

First calculate the spans and penetration count. There is a SnapNrack span calculation table on the back of this Manual. Determine site conditions: general building height, array pitch, the wind speed, and snow load or topographical condition. Find appropriate railspan from table.

Span Table Example

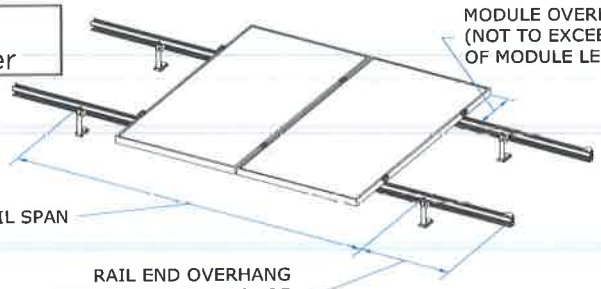
Building Height	0 - 30 ft
Array Pitch	16°
2012 IBC Wind Speed	120 mph
Snow Load	8 lbs/ft²
Topo. Cond.	None
Rail Span	104"
Rail Span on 24" spacing roof	96" (8 ft)
Do edge/corner reductions apply	Yes, shaded cell
Edge Zone Span	72" (6 ft)
Corner Zone Span	24" (2 ft)

0-30 ft. Roof Height

Table 1A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° *6063 Alloy*

Ground Snow Load (psf)		Wind Load													
Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
q_h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
P_E	P_S	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
0	0														
10	8														
20	15														
30	23	75	75	75											
40	31	66	66	66	66	66	66	66							
50	39	60	60	60	60	60	60	60	60	60	60				
60	46	55	55	55	55	55	55	55	55	55	55	55			
70	54	51	51	51	51	51	51	51	51	51	51	51	51	51	
80	62	48	48	48	48	48	48	48	48	48	48	48	48	48	48

*CS-Consult Structural Engineer



Series 100 UL Roof Mounted System

Safety Guidance

- Always wear the proper OSHA approved safety equipment when working on a roof .

- Safety equipment should be checked annually for wear and quality.

- Always wear proper eye protection.

- When walking on the roof avoid walking on installed rails. If this is unavoidable check L-feet for fatigue before final installation.

- Appropriate fall protection gear should be used. Extreme caution should be used when near the edge of the roof.

Notes

- The UL Listing covers bonding for a load rating up to 45 psf.

- Series 100 UL has been tested with the following UL Listed modules; See Appendix on page 40.

- These systems have been evaluated for module to system bonding, only to the requirements of UL Subject 2703.

- This system has also been evaluated for a Class A System Fire Classification for a steep-sloped roof with Type 1 modules.

Arrays can also be installed in landscape mode, with the modules oriented so that their long edge runs horizontally across the roof and the rails run up the roof slope. Landscape mode is typically used in cases where the roof has been constructed with structural elements running horizontally across the roof, but can also be used on standard residential buildings for a variety of reasons including to facilitate a convenient layout. When laying out the array, be sure to leave space for the module clamps on the rails. Module mid clamps are installed between modules in a row and require 0.5 inch of space between the modules.

Adjustable end clamps require 1.5 inches of extra rail to extend past the end of the module frame. If using the Universal End Clamp, the rail is first cut flush to the module using the rail cutting tool.

When installing multiple rows of modules, a minimum spacing gap of 1/8" should be used between rows.

Submit array plans to local permitting jurisdiction and proceed with the roof layout only when all permits for the project have been granted by the authority having jurisdiction.

Transfer the array layout to the roof using a roof marking crayon to mark the inside and outside corners of the array. Locate the estimated rafter positions and mark them in the array area with a roof marking crayon.

Transfer rail and estimated attachment locations to the roof, noting that attachments will be located at intersections of rails and rafters. Layout rails such that module frame ends do not overhang mounting rails by more than 25% of total module length.

Project Information Sections

Building Height	_____		
Roof Pitch	_____		
Wind Speed	_____		
Snow Load	_____		
Topo. Cond.	_____	Max Rail Span	_____

Roof Structure Type	_____
Roff Structure Size	_____
Roof Structure Span	_____
	_____
Roof Type & Condition	_____
Stories from the Ground	_____
Roof Orientation	_____

Series 100 UL Surveying and Layout

Tips and Tricks

- Layout the entire array on the roof by drawing all of the corners of the modules on the roof with a roof marking crayon.

- Use a chalk line to help identify the rest of the roof penetrations

- When leveling rails, hand tighten the hardware to easily level and position the rails. Once rails are level, fully tighten hardware to specified torque.

Notes

- SnapNrack engineered systems should only be used with SnapNrack components and hardware. Any alternate application may void the warranty and structural calculations could become invalid.

1) Locate the rafter

2) Drill the pilot hole

3) Prep the base

4) Attach base

5) Set the flashing

6) Attach L-Foot

Series 100 UL Flashed L-Foot

Step-by-Step Instructions

1) Locate the rafter underneath the decking of the roof by looking underneath the eaves or in the attic.

2) Drill a pilot hole through the roofing material into the rafter to ensure that the lag bolt will be located into a solid portion of the rafter. If the rafter is not found then seal the pilot hole immediately with roofing sealant.

3) Apply roofing sealant to the bottom of the base and directly onto the lag bolt to ensure a water tight seal.

4) Attach the L-foot base with a 5/16" lag bolt and a minimum embedment of 2 ½" lag shank into the rafter. Tighten Lag bolt to seat with a hand wrench.

5) Slide the flashing underneath the row of shingles, directly above the installed standard base, and then line up the hole in the flashing with the threads on the base. It may be necessary to pry up shingles with a breaker bar.

6) Attach the L-foot to the threaded portion of the base that is protruding from the flashing. Then tighten the flange bolt over the threads to 10 – 16 ft-lbs. The L-foot can be attached in any orientation.

Notes

- Alternative 90° L Foot included in UL 2703 Listing
- SnapNrack engineered systems should only be used with SnapNrack components and hardware. Any alternate application may void the warranty and structural calculations could become invalid.

Warning

- If a pilot hole is drilled and a rafter is not found, immediately seal pilot hole with roofing sealant to avoid water damage.
- Do not over tighten hardware.
- Always wear fall protection and safety gear.

Design Tools

- SnapNrack has a suite of design tools to help configure your PV installation to be an accurate and fast install. Please visit us at: www.SnapNrack.com

1) Remove tile and locate the rafter

2) Drill pilot hole

3) Prep the base and attach base

4) Set flashing

5) Attach post

6) Replace tile and attach standoff clamp

Series 100 UL Standoff Post

Step-by-Step Instructions

1) Remove roof tile where the penetration will be installed. Locate the rafter underneath the decking of the roof by locating under the eave, in the attic, or by tapping the roof surface with a hammer.

2) Drill a pilot hole through the roofing material into the rafter to ensure that the lag bolt will be located into a solid portion of the rafter. If the rafter is not found then seal the pilot hole immediately with roofing sealant.

3) Apply roofing sealant to the bottom of the base and directly onto the lag bolt to ensure a water tight seal. Attach the Standoff base with a 5/16" lag bolt and a minimum embedment of 2 ½" lag shank into the rafter. Tighten lag bolt to seat using a hand wrench.

4) Set the flashing by sliding the flashing underneath the row of tiles directly above the installed base, with the hole in the flashing directly above the threaded portion of the base.

5) Attach the standoff shaft by sliding it through the hole in the flashing and tightening it onto the threads protruding from the base snug with channel locks.

6) Cut the tile to fit around the flashing, replace the tile, then attach the standoff clamp by first sliding the rubber rain collar over the standoff shaft then the standoff clamp with bolt, washer and channel nut.

Notes

- SnapNrack engineered systems should only be used with SnapNrack components and hardware. Any alternate application may void the warranty and structural calculations could become invalid.

Warning

- If a pilot hole is drilled and a rafter is not found, immediately seal pilot hole with roofing sealant to avoid water damage.
- Do not over tighten hardware.
- Always wear fall protection and safety gear.

Design Tools

- SnapNrack has a suite of design tools to help configure your PV installation to be an accurate and fast install. Please visit us at: www.SnapNrack.com

Penn FUSION Engineering

152 S. Broad St
Lansdale, PA 19446
(215) 361-8040

Structural Calculations for the Susan FERGUSON Residence PV Installation

Date: 3/12/2018
Job Address: 5449 Jobeth Dr.
New Port Richey, FL 34652

Job Number: 802R-449FERG

Scope of Work

These calculations are for the existing roof framing which supports the new PV modules as well as the attachment of the PV system to existing roof framing. All PV mounting equipment shall be designed and installed per manufacturer's approved installation specifications.

Calculation Index

Engineering Calculations Summary

Code:	2017 Florida Building Code 6th Edition ASCE 7-10			
Snow Load:	S =	0	psf	
Live Load:	LL =	20	psf	
Wind:	Wind Speed Ult. (V) =	145	mph	Exp. = B
PV Dead Load:	DPV =	3.0	psf	

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Universal Engineering Sciences

Sincerely,
Penn Fusion Engineering LLC
Andrew D. Leone, P.E.
Principal

ANDREW D. LEONE LICENSE No. 60669 STATE OF FLORIDA PROFESSIONAL ENGINEER
3/13/18

Penn FUSION Engineering

Structrure Geometry:

Mean Roof Height, h_n	=	24	ft
Eave Height, h_e	=	18	ft
Buiding Length, L	=	65	ft
Building Width, B	=	44	ft
Module Area	=	20	ft^2
Roof Pitch, θ	=	25	degrees

Snow Load:

Ground Snow Load, p_g	=	0	Fig. 7-1

Wind Load:

Basic Wind Speed (3s-gust)	=	145 mph	Figure 26.5-1A
Building Occupancy Category	=	2	Table 1.5-1
Wind Importance Factor, I_w	=	1.00	Table 1.5-2
Exposure Category	=	B	Sec 26.7.3
Topographic Factor, K_{ZT}	=	1.00	Equation 26.8-1
Adjustment Factor, λ	=	1.00	Figure 30.5-1
Edge Zone, a	=	4.40 ft	Figure 30.5-1

Uplift (0.6W)		Zone 1 (psf)	Zone 2 (psf)	Zone 3 (psf)	
P_{net30}	=	-33.70	-55.50	-83.45	Figure 30.5-1
$P_{net} = 0.6 \times \lambda \times K_{ZT} \times P_{net30}$	=	-20.22	-33.30	-50.07	Equation 30.5-1

Downward (0.6W)		Zone 1 (psf)	Zone 2 (psf)	Zone 3 (psf)	
P_{net30}	=	19.90	19.90	19.90	Figure 30.5-1
$P_{net} = 0.6 \times \lambda \times K_{ZT} \times P_{net30}$	=	11.94	11.94	11.94	Equation 30.5-1

Dead Load:

Roof (1):

Roof		Walls - Exterior	
Composition Shingle	3.0 psf	Stucco	10.0 psf
5/8 OSB Sheathing	2.0	2x4 Studs @ 16"	2.0
2x4 Truss @ 24" OC	1.0	Gypsum	3.0
Misc. (Ceiling, Insulation, etc.)	1.0	Misc. (Insulation, etc.)	2.0
PV System, Ppv	3.0		
Total Roof DL =	10.0 psf	Total Wall DL =	17.0 psf

Roof (1) Framing Check:

Roof Framing	=	2x4 Truss @ 24" OC
Timber Species	=	Doug Fir-Larch #2
Max Beam Span	=	6.00 ft
b	=	1.5 in
d	=	3.50 in
Moment of Inertia, I_x	=	5.36 in^4
Section Modulus, S_x	=	3.06 in^3
Bending Stress, F_b	=	900 psi
Elastic Modulus, E_{min}	=	580000 psi

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Wood Adjustment Factors:

C_D (Wind)	C_D (Snow)	C_{LS}	C_M	C_t
1.60	1.15	1.15	1.00	1.00
C_L	C_F	C_{fu}	C_i	C_r
1.00	1.50	1.00	1.00	1.15

Penn FUSION Engineering

Roof (1) Framing Check Continued:

PV Tributary Width, W_{pv}	=	1.60 ft			
PV Tributary Length, L_{pv}	=	4.0 ft			
PV Tributary Area, A_t	=	6.4 ft^2			
PV Dead Point Load, $P_D = P_{pv} \times A_t$	=	17 lb			
Roof Distributed Load, wDL	=	13 plf			

Load Case: 0.6DL + 0.6W (CD = 1.6)

Roof Zone	=	1			
$P_{up} = P_{net} \times A_t + 0.6 \times P_D \times \cos(\theta)$	=	119 lb			
$M_{b(wind\_up)}$	=	227 lb-ft			
$F_b'_{(wind)} = F_b \times C_D \times C_{LS} \times C_M \times C_t \times C_L \times C_F \times C_{fu} \times C_i \times C_r$	=	2857 psi			
$M_{allowable} = S_x \times F_b'_{(wind)}$	=	729 lb-ft	>	227	OK

Load Case: DL + 0.6W (CD = 1.6)

$P_{down} = P_{net} \times A_t + P_D \times \cos(\theta)$	=	94 lb			
$M_{b(wind\_down)}$	=	263 lb-ft			
$F_b'_{(wind)} = F_b \times C_D \times C_{LS} \times C_M \times C_t \times C_L \times C_F \times C_{fu} \times C_i \times C_r$	=	2857 psi			
$M_{allowable} = S_x \times F_b'_{(wind)}$	=	729 lb-ft	>	263	OK

Rafter Attachments: 0.6D+0.6W (Zone 2)

$P_{uplift} = A_t \times P_{net}$	=	203 lb			
Connector Uplift Capcity per SnapNRack Test Results	=	309 lb	>	203	OK
5/16" Lag Screw Withdrawl Value	=	266 lb/in	Table 12.2A - NDS		
Lag Screw Penetration	=	2.50 in			
Allowable Capacity with C_D	=	1064 lb	>	203	OK

Seismic Check:

Existing Dead Load:			Solar Dead Load:		
$A_{roofexisting}$	=	2860 ft^2	W_{panel}	=	42 lb
$W_{roofexisting}$	=	20020 lb	Num_{panel}	=	31
$A_{wallexisting}$	=	3924 ft^2	W_{panel_tot}	=	1302 lb
$W_{wallexisting}$	=	66708 lb	W_{bos}	=	304 lb
W_{total}	=	86728 lb	W_{array}	=	1606 lb

$$\%increase = (W_{total} + W_{array}) / W_{total} = \frac{88334}{86728} * 100\% - 100\% = 1.85\% **$$

**The increase in weight as a result of the solar system is less than 10% of the existing structure and therefore no further seismic analysis is required.

Limits of Scope of Work and Liability

We have based our structural capacity determination on applicable building codes, professional engineering inspection and design experience, opinions and judgments. The calculations produced for this dwelling's assessment are only for the proposed solar panel installation referenced in the stamped plan set and were made according to generally recognized structural analysis standards and procedures.

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SOLAR'S MOST TRUSTED

REC

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REC TWINPEAK 2 SERIES

PREMIUM SOLAR PANELS 100% MADE IN SINGAPORE

REC TwinPeak 2 Series solar panels feature an innovative design with high panel efficiency and power output, enabling customers to get the most out of the space used for the installation.

Combined with industry-leading product quality and the reliability of a strong and established European brand, REC TwinPeak 2 panels are ideal for residential and commercial rooftops worldwide.

INTEGRATED MANUFACTURING IN SINGAPORE

WAFERS

CELLS

MODULES

SCOPE OF WORK

- **SYSTEM SIZE:** 9405W DC, 10000W AC
- **MODULES:** (33) REC SOLAR: REC285TP2 BLK
- **INVERTER(S):**
  (1) SOLAREDGE TECHNOLOGIES: SE10000A-US WITH REVENUE GRADE METERING
- **RACKING:** SNAPNRACK SERIES 100 UL; FLASHED L FOOT. SEE PEN D03.

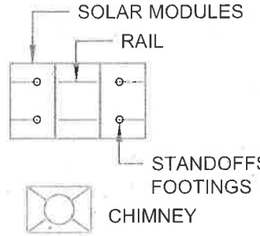
VICINITY MAP

GENERAL NOTES

- ALL WORK SHALL COMPLY WITH NEC 2014, 2017 FBC 6TH EDITION, MUNICIPAL CODE, AND ALL MANUFACTURERS' LISTINGS AND INSTALLATION INSTRUCTIONS
- PHOTOVOLTAIC SYSTEM WILL COMPLY WITH NEC 2014.
- ELECTRICAL SYSTEM GROUNDING WILL COMPLY WITH NEC 2014.
- PHOTOVOLTAIC SYSTEM IS UNGROUNDED. NO CONDUCTORS ARE SOLIDLY GROUNDED IN THE INVERTER. SYSTEM COMPLIES WITH 690.35.
- MODULES CONFORM TO AND ARE LISTED UNDER UL 1703
- INVERTER CONFORMS TO AND IS LISTED UNDER UL 1741.
- RACKING CONFORMS TO AND IS LISTED UNDER UL 2703.
- SNAPNRACK RACKING SYSTEMS, IN COMBINATION WITH TYPE I, OR TYPE II MODULES, ARE CLASS A FIRE RATED.
- RAPID SHUTDOWN REQUIREMENTS MET WHEN INVERTERS AND ALL CONDUCTORS ARE WITHIN ARRAY BOUNDARIES PER NEC 690.12(1).
- CONSTRUCTION FOREMAN TO PLACE CONDUIT RUN PER 690.31(G).
- ARRAY DC CONDUCTORS ARE SIZED FOR DERATED CURRENT.
- 9.66 AMPS MODULE SHORT CIRCUIT CURRENT.
- 15.09 AMPS DERATED SHORT CIRCUIT CURRENT [690.8 (a) & 690.8 (b)].

LEGEND AND ABBREVIATIONS

- SE — SERVICE ENTRANCE
- MP — MAIN PANEL
- SP — SUB-PANEL
- LC — PV LOAD CENTER
- SM — SUNRUN METER
- PM — DEDICATED PV METER
- INV — INVERTER(S) WITH INTEGRATED DC DISCONNECT AND AFCI
- AC — AC DISCONNECT(S)
- DC — DC DISCONNECT(S)
- CB — COMBINER BOX
- INTERIOR EQUIPMENT SHOWN AS DASHED



- CHIMNEY
- ATTIC VENT
- FLUSH ATTIC VENT
- PVC PIPE VENT
- METAL PIPE VENT
- T-VENT
- SATELLITE DISH
- FIRE SETBACKS
- HARDSCAPE
- — PL — PROPERTY LINE

SCALE: NTS

A	AMPERE
AC	ALTERNATING CURRENT
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AZIM	AZIMUTH
COMP	COMPOSITION
DC	DIRECT CURRENT
(E)	EXISTING
EXT	EXTERIOR
FRM	FRAMING
INT	INTERIOR
LBW	LOAD BEARING WALL
MAG	MAGNETIC
MSP	MAIN SERVICE PANEL
(N)	NEW
NTS	NOT TO SCALE
OC	ON CENTER
PRE-FAB	PRE-FABRICATED
PSF	POUNDS PER SQUARE FOOT
PV	PHOTOVOLTAIC
TL	TRANSFORMERLESS
TYP	TYPICAL
V	VOLTS
W	WATTS

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REV	NAME	DATE	COMMENTS

TABLE OF CONTENTS

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3/13/18

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PROJECT NUMBER:
801R-609MELO

DESIGNER: 720.475.7994
JULIA LONGINOTTI

SHEET
COVER SHEET

REV: A.1 3/12/2018

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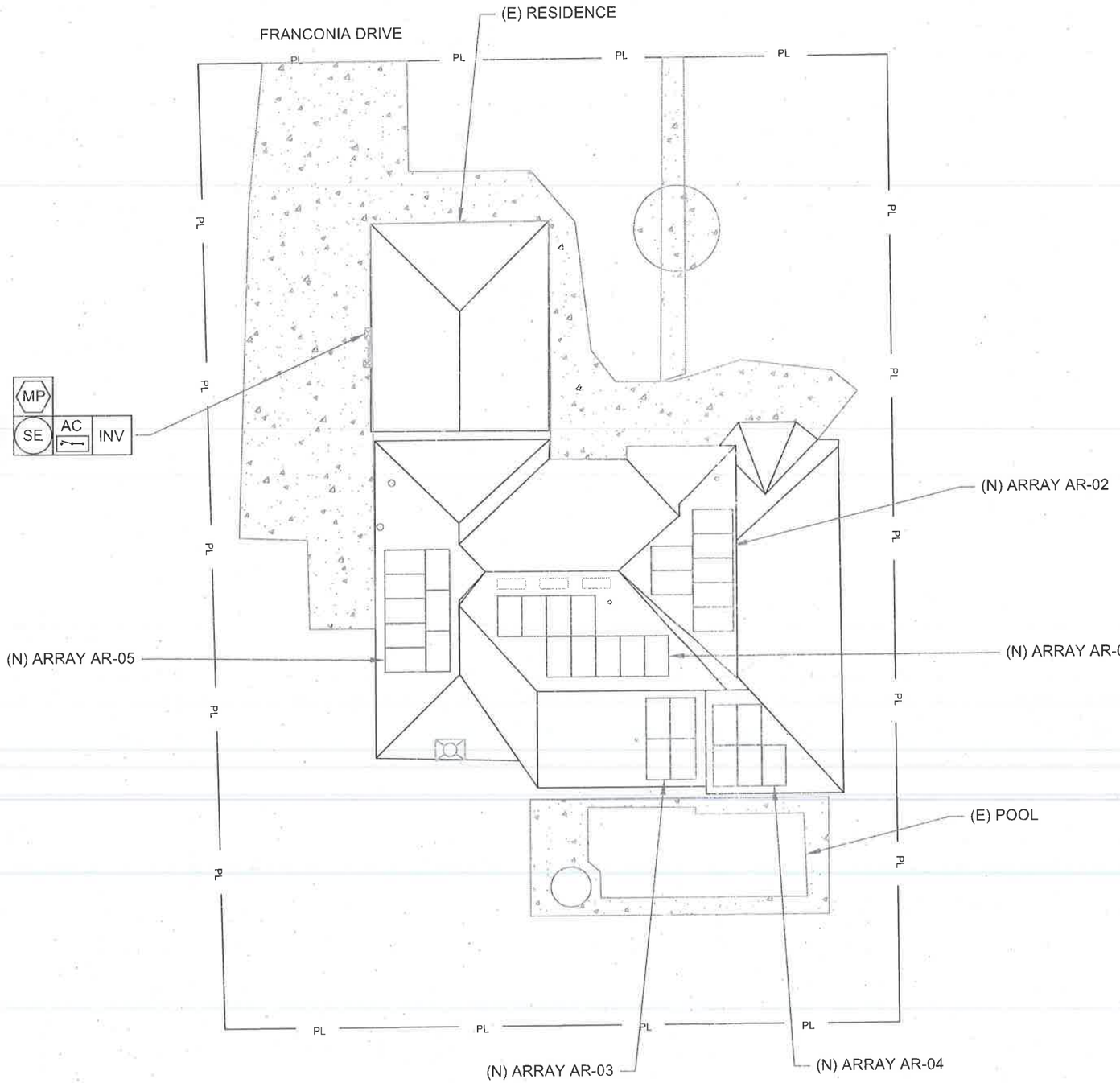
SITE PLAN - SCALE = 1/16" = 1'-0"



	PITCH	TRUE AZIM	MAG AZIM	PV AREA (SQFT)
AR-01	27°	180°	189°	161.8
AR-02	27°	90°	99°	125.8
AR-03	16°	180°	189°	71.9
AR-04	25°	180°	189°	89.9
AR-05	27°	270°	279°	143.8

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SITE PLAN

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PAGE
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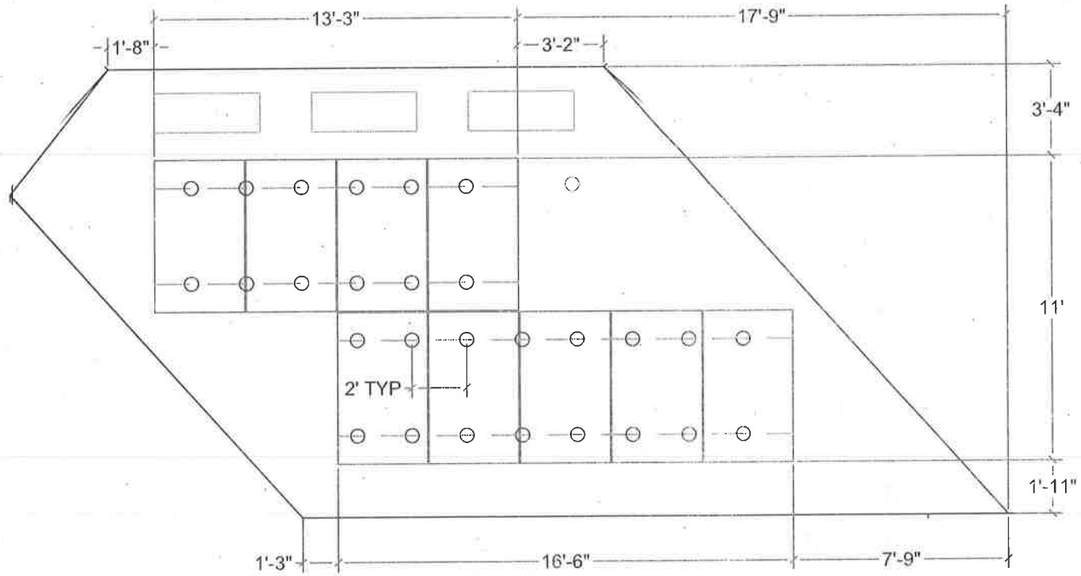
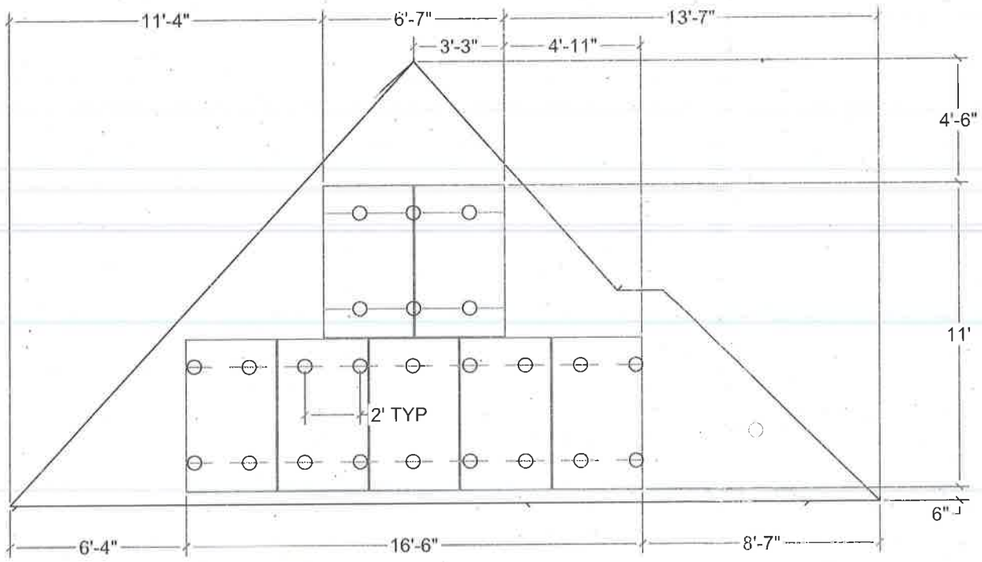
	ROOF TYPE	MOUNTING DETAIL	ROOF HEIGHT	ROOF EXPOSURE	FRAME MATERIAL	FRAME TYPE	FRAME SIZE	MAX FRAME SPAN	OC SPACING	ROOF EDGE ZONE	MAX RAIL SPAN	MAX RAIL OVERHANG
AR-01	COMP SHINGLE	FLASHED L FOOT. SEE PEN D03.	2 STORY	ATTIC	WOOD	PREFABRICATED TRUSS	2 X 4	8' - 0"	24"	3' - 0"	2' - 0"	2' - 0"
AR-02	COMP SHINGLE	FLASHED L FOOT. SEE PEN D03.	2 STORY	ATTIC	WOOD	PREFABRICATED TRUSS	2 X 4	8' - 0"	24"	3' - 0"	2' - 0"	1' - 4"

D1 - AR-01 - SCALE: 3/16" = 1'-0"
PITCH: 27°
AZIM: 180°



1 / PV-3.2 ADD (N) 2X6 BLOCKING AS NEEDED FOR PV ATTACHMENT

D2 - AR-02 - SCALE: 3/16" = 1'-0"
PITCH: 27°
AZIM: 90°



1 / PV-3.2 ADD (N) 2X6 BLOCKING AS NEEDED FOR PV ATTACHMENT

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DESIGN CRITERIA

MODULES:
REC SOLAR: REC285TP2 BLK
MODULE DIMS:
65.94" x 39.25" x 1.49" (38mm)
MODULE CLAMPS:
Portrait: 8.2" - 16.4"
Landscape: 4.9" - 9.8"
MAX DISTRIBUTED LOAD: 3 PSF
SNOW LOAD: 0 PSF
WIND SPEED:
145 MPH 3-SEC GUST.
LAG SCREWS:
5/16"x3.5": 2.5" MIN EMBEDMENT
NOTE:
INSTALLERS TO VERIFY RAFTER SIZE, SPACING AND SLOPED SPANS, AND NOTIFY E.O.R. OF ANY DISCREPANCIES BEFORE PROCEEDING.

ANDREW D. LEON
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3/12/18
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LAYOUT

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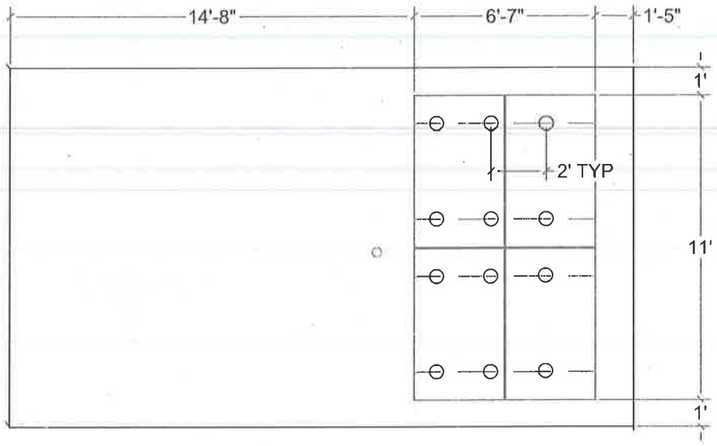
	ROOF TYPE	MOUNTING DETAIL	ROOF HEIGHT	ROOF EXPOSURE	FRAME MATERIAL	FRAME TYPE	FRAME SIZE	MAX FRAME SPAN	OC SPACING	ROOF EDGE ZONE	MAX RAIL SPAN	MAX RAIL OVERHANG
AR-03	COMP SHINGLE	FLASHED L FOOT. SEE PEN D03.	1 STORY	VAULTED	WOOD	PREFABRICATED TRUSS	2 X 4	8' - 0"	24"	3' - 0"	2' - 0"	2' - 0"
AR-04	COMP SHINGLE	FLASHED L FOOT. SEE PEN D03.	1 STORY	ATTIC	WOOD	PREFABRICATED TRUSS	2 X 4	8' - 0"	24"	3' - 0"	2' - 0"	2' - 0"
AR-05	COMP SHINGLE	FLASHED L FOOT. SEE PEN D03.	2 STORY	ATTIC	WOOD	PREFABRICATED TRUSS	2 X 4	8' - 0"	24"	3' - 0"	2' - 0"	1' - 4"

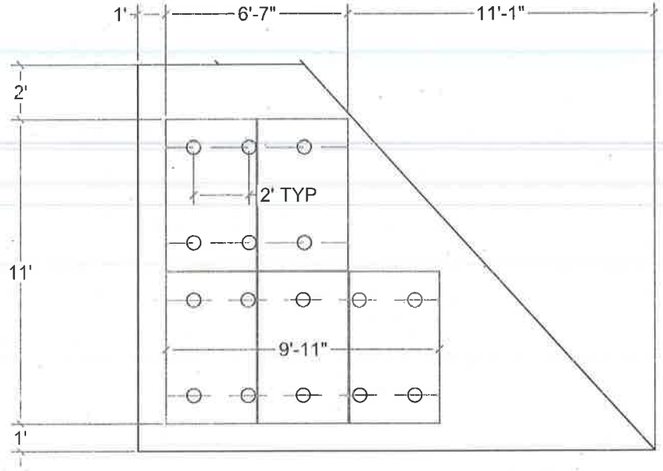
D3 - AR-03 - SCALE: 3/16" = 1'-0"
PITCH: 16°
AZIM: 180°

1 / PV-3.2 ADD (N) 2X6 BLOCKING AS NEEDED FOR PV ATTACHMENT



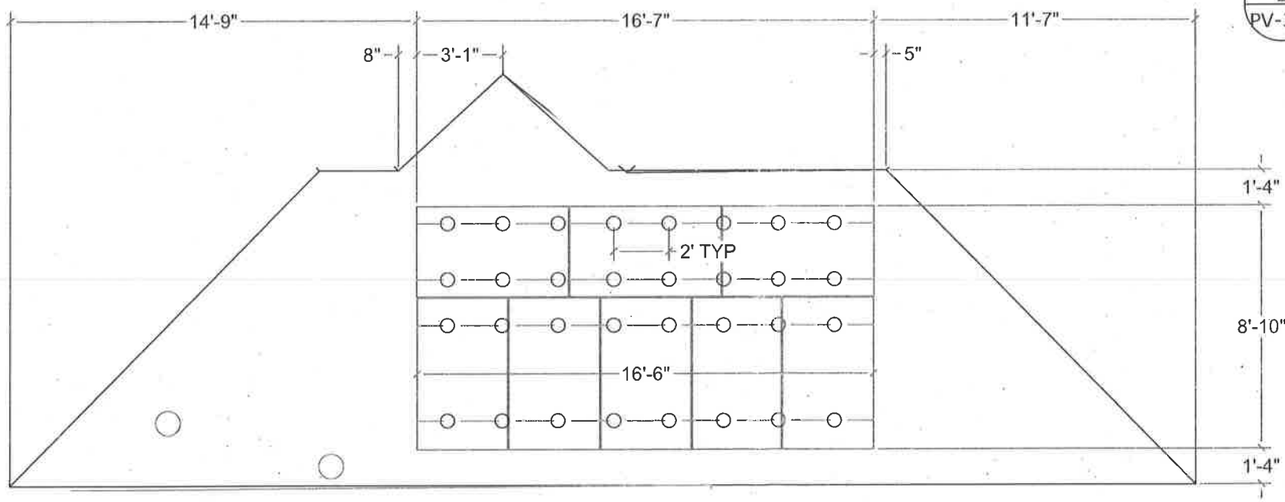
D4 - AR-04 - SCALE: 3/16" = 1'-0"
PITCH: 25°
AZIM: 180°

1 / PV-3.2 ADD (N) 2X6 BLOCKING AS NEEDED FOR PV ATTACHMENT



D5 - AR-05 - SCALE: 3/16" = 1'-0"
PITCH: 27°
AZIM: 270°

1 / PV-3.2 ADD (N) 2X6 BLOCKING AS NEEDED FOR PV ATTACHMENT



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DESIGN CRITERIA

MODULES:
REC SOLAR: REC285TP2 BLK
MODULE DIMS:
65.94" x 39.25" x 1.49" (38mm)
MODULE CLAMPS:
Portrait: 8.2" - 16.4"
Landscape: 4.9" - 9.8"
MAX DISTRIBUTED LOAD: 3 PSF
SNOW LOAD: 0 PSF
WIND SPEED:
145 MPH 3-SEC GUST.
LAG SCREWS:
5/16"x3.5": 2.5" MIN EMBEDMENT
NOTE:
INSTALLERS TO VERIFY RAFTER SIZE, SPACING AND SLOPED SPANS, AND NOTIFY E.O.R. OF ANY DISCREPANCIES BEFORE PROCEEDING.

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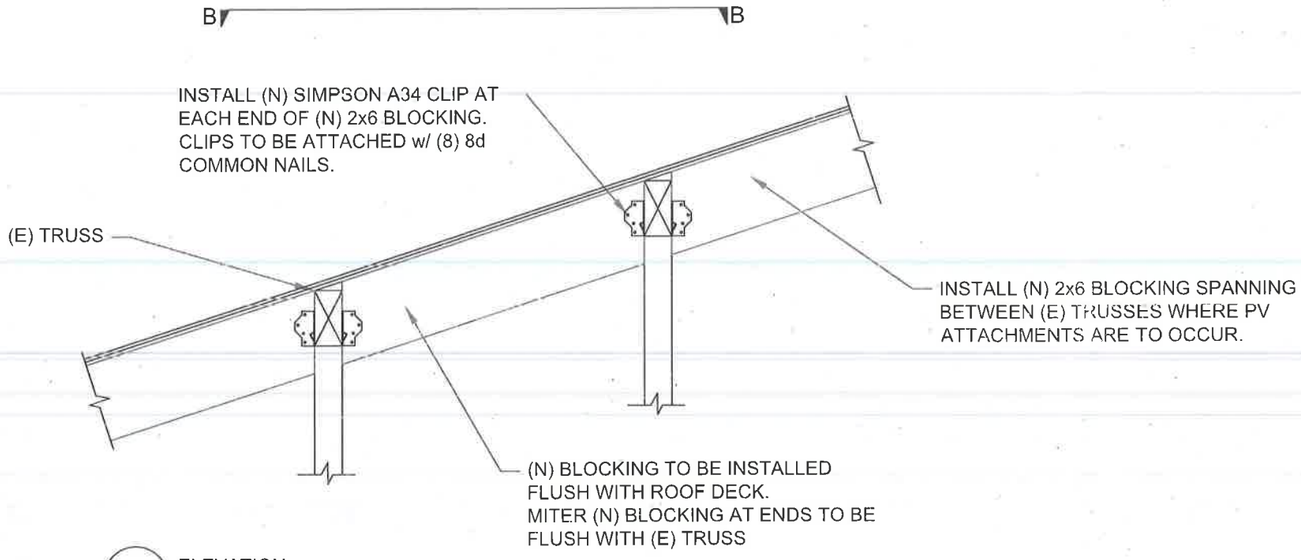
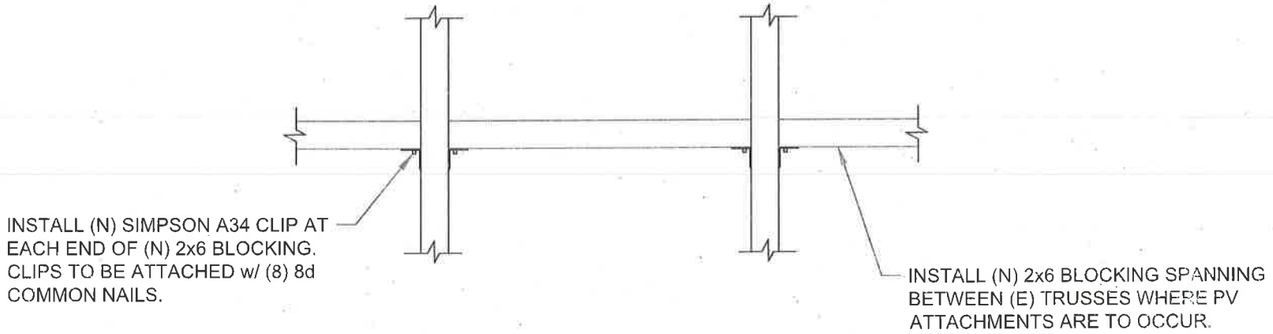
ACCEPTABLE MIN. LUMBER TYPE	
LUMBER TYPE	MIN. Fb (psi)
DOUG FIR-LARCH #2	900
SOUTHERN PINE #1	1500
HEM-FIR #2	850
SPRUCE PINE FIR #2	875



A ELEVATION
SCALE: NTS



B TOP VIEW
SCALE: NTS

1 **PV ATTACHMENT BLOCKING**
SCALE: NTS

NOTES:
1. INSTALLATION CREW TO INSTALL BLOCKING PRIOR TO INSTALLATION OF PV SYSTEM.
2. CREW TO VERIFY THAT LAG BOLTS HAVE NOT MISSED VERTICAL BLOCKING BEFORE COMPLETION OF JOB.

ANDREW D. LEON LICENSE No. 60669 STATE OF FLORIDA PROFESSIONAL ENGINEER
3/13/18

Reviewed for Code Compliance Universal Engineering Sciences

sunrun

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CUSTOMER RESIDENCE:
RALPH MELOON JR
6609 FRANCONIA DRIVE, BELLE ISLE, FL, 32812

TEL. (907) 252-7110
APN #: 30-23-20-1618-00-030

PROJECT NUMBER:
801R-609MELO

DESIGNER: 720.475.7994
JULIA LONGINOTTI

SHEET
DETAIL

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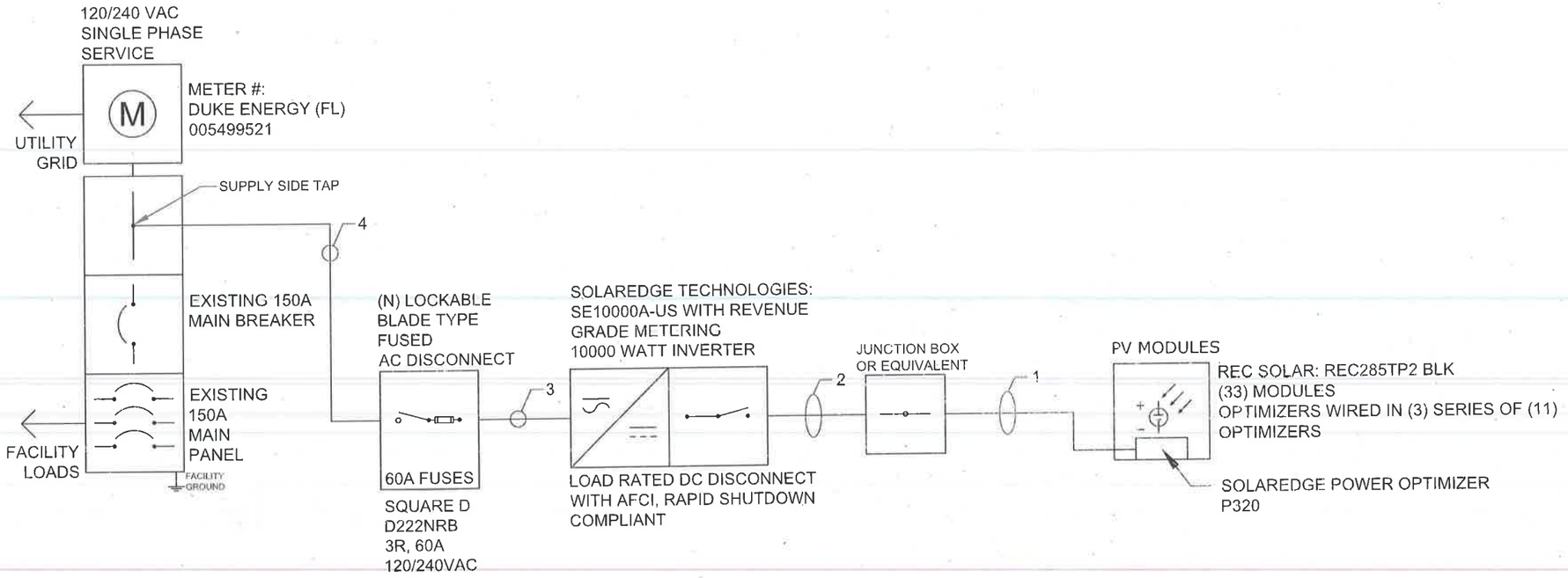

CONDUIT SCHEDULE

#	CONDUIT	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(6) 10 AWG PV WIRE	NONE	(1) 10 AWG BARE COPPER
2	3/4" EMT OR EQUIV.	(6) 10 AWG THHN/THWN-2	NONE	(1) 10 AWG THHN/THWN-2
3	3/4" EMT OR EQUIV.	(2) 6 AWG THHN/THWN-2	(1) 10 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2
4	3/4" EMT OR EQUIV.	(2) 6 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2

NOTES TO INSTALLER:

1. 11 VDC EXPECTED OPEN CIRCUIT STRING VOLTAGE.
2. CONNECT SYSTEM VIA INSULATION PIERCING ON SUPPLY SIDE OF MAIN BREAKER IN MAIN PANEL ENCLOSURE. CONDUCTORS ARE FIELD INSTALLED.

MODULE CHARACTERISTICS

REC SOLAR: REC285TP2 BLK:	285 W
OPEN CIRCUIT VOLTAGE:	38.6 V
MAX POWER VOLTAGE:	31.9 V
SHORT CIRCUIT CURRENT:	9.66 A

P320 OPTIMIZER CHARACTERISTICS:

MIN INPUT VOLTAGE:	8 VDC
MAX INPUT VOLTAGE:	48 VDC
MAX INPUT ISC:	11 ADC
MAX OUTPUT CURRENT:	15 ADC

SYSTEM CHARACTERISTICS - INVERTER 1

SYSTEM SIZE:	9405 W
SYSTEM OPEN CIRCUIT VOLTAGE:	11 V
SYSTEM OPERATING VOLTAGE:	350 V
MAX ALLOWABLE DC VOLTAGE:	500 V
SYSTEM OPERATING CURRENT:	26.87 A
SYSTEM SHORT CIRCUIT CURRENT:	45 A

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Universal Engineering Sciences

ANDREW D. LEON
LICENSE
No. 60669
STATE OF FLORIDA
PROFESSIONAL ENGINEER
3/12/18

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801R-609MELO

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JULIA LONGINOTTI

SHEET
ELECTRICAL

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⚠WARNING

ELECTRICAL SHOCK HAZARD

DO NOT TOUCH TERMINALS. TERMINALS ON LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION:
INVERTER(S), AC DISCONNECT(S), AC COMBINER PANEL (IF APPLICABLE).
PER CODE(S): CEC 2016: 690.17(E), NEC 2014: 690.17(E), NEC 2011: 690.17(4)

⚠WARNING

ELECTRICAL SHOCK HAZARD

IF GROUND FAULT IS INDICATED ALL NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED

LABEL LOCATION:
INVERTER(S), ENPHASE ENVOY ENCLOSURE (IF APPLICABLE).
PER CODE(S): CEC 2016: 690.5(C), NEC 2014: 690.5(C), NEC 2011: 690.5(C)

⚠WARNING

ELECTRICAL SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

LABEL LOCATION:
INVERTER(S), DC DISCONNECTS.
PER CODE(S): CEC 2016: 690.35(F), NEC 2014: 690.35(F), NEC 2011: 690.35(F)

⚠WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL LOCATION:
UTILITY SERVICE METER AND MAIN SERVICE PANEL.
PER CODE(S): CEC 2016: 705.12(D)(3), NEC 2014: 705.12(D)(3), NEC 2011: 705.12(D)(4)

⚠WARNING

INVERTER OUTPUT CONNECTION

DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
ADJACENT TO PV BREAKER (IF APPLICABLE).
PER CODE(S): CEC 2016: 705.12(D)(2)(3)(b), NEC 2014: 705.12(D)(2)(3)(b), NEC 2011: 705.12(D)(7)

⚠WARNING

PHOTOVOLTAIC SYSTEM COMBINER PANEL

DO NOT ADD LOADS

LABEL LOCATION:
PHOTOVOLTAIC AC COMBINER (IF APPLICABLE).
PER CODE(S): CEC 2016: 705.12(D)(2)(3)(c), NEC 2014: 705.12(D)(2)(3)(c), NEC 2011: 705.12(D)(4)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
INTERIOR AND EXTERIOR DC CONDUIT EVERY 10 FT, AT EACH TURN, ABOVE AND BELOW PENETRATIONS, ON EVERY JB/PULL BOX CONTAINING DC CIRCUITS.
PER CODE(S): CEC 2016: 690.31(G)(3), 690.31(G)(4), NEC 2014: 690.31(G)(3), 690.31(G)(4), NEC 2011: 690.31(E)(3), 690.31(E)(4), IFC 2012: 605.11.1.4

PHOTOVOLTAIC AC DISCONNECT

MAXIMUM AC OPERATING CURRENT: 41.67 AMPS

NOMINAL OPERATING AC VOLTAGE: 240 VAC

LABEL LOCATION:
AC DISCONNECT(S), PHOTOVOLTAIC SYSTEM POINT OF INTERCONNECTION.
PER CODE(S): CEC 2016: 690.54, NEC 2014: 690.54, NEC 2011: 690.54

INVERTER 1

PHOTOVOLTAIC DC DISCONNECT

RATED MAXIMUM POWER-POINT CURRENT:	26.87	ADC
RATED MAXIMUM POWER-POINT VOLTAGE:	350	VDC
MAXIMUM SYSTEM VOLTAGE:	500	VDC
MAXIMUM SHORT CIRCUIT CURRENT:	45	ADC

LABEL LOCATION:
INVERTER(S), DC DISCONNECT(S).
PER CODE(S): CEC 2016: 690.53, NEC 2017: 690.53, NEC 2014: 690.53, NEC 2011: 690.53

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

LABEL LOCATION:
UTILITY SERVICE ENTRANCE/METER, INVERTER/DC DISCONNECT IF REQUIRED BY LOCAL AHJ, OR OTHER LOCATIONS AS REQUIRED BY LOCAL AHJ.
PER CODE(S): CEC 2016: 690.12, NEC 2014: 690.12, NEC 690.56, IFC 2012: 605.11.1

NOTES AND SPECIFICATIONS:

- SIGNS AND LABELS SHALL MEET THE REQUIREMENTS OF THE NEC 2014 ARTICLE 110.21(B), UNLESS SPECIFIC INSTRUCTIONS ARE REQUIRED BY SECTION 690, OR IF REQUESTED BY THE LOCAL AHJ.
- SIGNS AND LABELS SHALL ADEQUATELY WARN OF HAZARDS USING EFFECTIVE WORDS, COLORS AND SYMBOLS.
- LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN.
- LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
- SIGNS AND LABELS SHALL COMPLY WITH ANSI Z535.4-2011, PRODUCT SAFETY SIGNS AND LABELS, UNLESS OTHERWISE SPECIFIED.
- DO NOT COVER EXISTING MANUFACTURER LABELS.

ANDREW D. LEONI LICENSE No. 60669 STATE OF FLORIDA PROFESSIONAL ENGINEER
3/13/18

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SHEET
SIGNAGE

REV: A.1 3/12/2018

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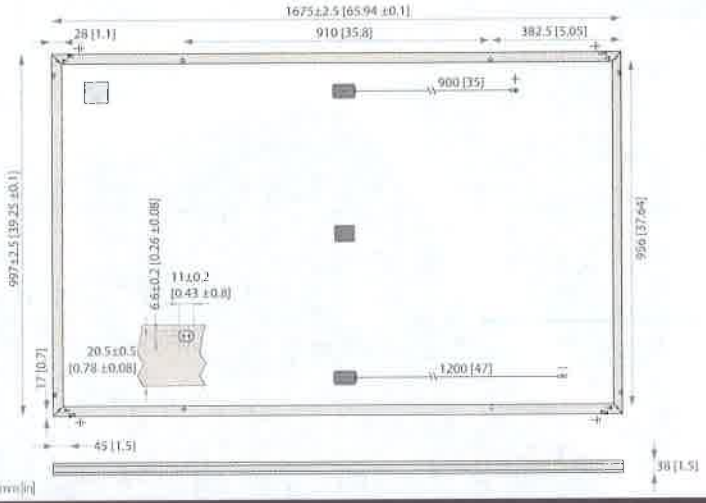
REC TWINPEAK 2 SERIES



Measurements in mm [in]

ELECTRICAL DATA @ STC	Product Code*: RECxxxTP2				
Nominal Power - P_{MPP} (Wp)	275	280	285	290	295
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V_{MPP} (V)	31.5	31.7	31.9	32.1	32.3
Nominal Power Current - I_{MPP} (A)	8.74	8.84	8.95	9.05	9.14
Open Circuit Voltage - V_{OC} (V)	38.2	38.4	38.6	38.8	39.0
Short Circuit Current - I_{SC} (A)	9.52	9.61	9.66	9.71	9.76
Panel Efficiency (%)	16.5	16.8	17.1	17.4	17.7

Values at standard test conditions STC (airmass AM 1.5, irradiance 1000 W/m², cell temperature 25°C).
At low irradiance of 200 W/m² (AM 1.5 and cell temperature 25°C) at least 95% of the STC module efficiency will be achieved.
*Where xxx indicates the nominal power class (P_{MPP}) at STC above, and can be followed by the suffix BLK for black framed modules.

ELECTRICAL DATA @ NOCT	Product Code*: RECxxxTP2				
Nominal Power - P_{MPP} (Wp)	206	210	214	218	223
Nominal Power Voltage - V_{MPP} (V)	29.2	29.4	29.6	29.8	30.0
Nominal Power Current - I_{MPP} (A)	7.07	7.15	7.24	7.32	7.43
Open Circuit Voltage - V_{OC} (V)	35.4	35.6	35.8	36.0	36.2
Short Circuit Current - I_{SC} (A)	7.52	7.59	7.68	7.75	7.85

Nominal operating cell temperature NOCT (800 W/m², AM 1.5, windspeed 1 m/s, ambient temperature 20°C).
*Where xxx indicates the nominal power class (P_{MPP}) at STC above, and can be followed by the suffix BLK for black framed modules.

CERTIFICATIONS

UL 1703, Fire classification Type 2, IEC 61215, IEC 61730, IEC 61701 (Salt Mist - severity level 6), IEC 62804 (PID Free), IEC 62716 (Ammonia Resistance), ISO 11925-2 (Ignitability Class I), UNI 8457/9174 (Class A), ISO 9001:2015, ISO 14001, OHSAS 18001

WARRANTY

10 year product warranty
25 year linear power output warranty
(max. degression in performance of 0.7% p.a. from 97% after the first year)

See warranty conditions for further details.

17.7% EFFICIENCY

10 YEAR PRODUCT WARRANTY

25 YEAR LINEAR POWER OUTPUT WARRANTY

DUTY*FREE US IMPORT DUTY FREE

TEMPERATURE RATINGS

Nominal operating cell temperature (NOCT)	44.6°C (±2°C)
Temperature coefficient of P_{MPP}	-0.36 %/°C
Temperature coefficient of V_{OC}	-0.30 %/°C
Temperature coefficient of I_{SC}	0.066 %/°C

GENERAL DATA

Cell type:	6 strings of 20 REC HC multicrystalline PERC
Glass:	0.13" (3.2 mm) solar glass with anti-reflective surface treatment
Back sheet:	Highly resistant polyester polyolefin construction
Frame:	Anodized aluminum (Available in silver or black)
Junction box:	IP67 rated, 3-part with 3 bypass diodes 12 AWG (4 mm²) PV wire, 35" + 47" (0.9 m + 1.2 m)
Connectors:	Stäubli MC4 PV-KBT4/PV-KST4, 12 AWG (4 mm²)
Origins:	Silicon: Made in USA & Norway Wafer/Cell/Module: Made in Singapore

MAXIMUM RATINGS

Operational temperature:	-40...+185°F (-40...+85°C)
Maximum system voltage:	1000 V
Design Loads:	(+) 75.2 lbs/ft² (3600 Pa) (-) 33.4 lbs/ft² (1600 Pa) Refer to installation manual
Max series fuse rating:	20 A
Max reverse current:	20 A

MECHANICAL DATA

Dimensions:	65.9 x 39.25 x 1.5 (1675 x 997 x 38 mm)
Area:	17.98 ft² (1.67 m²)
Weight:	40.8 lbs (18.5 kg)

Note! Specifications subject to change without notice

REC

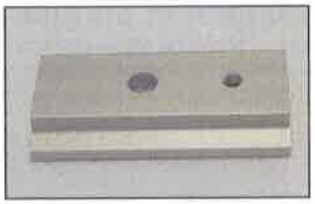
www.recgroup.com

Series 100 UL
Standoff Options

Materials Included In Series 100 Standoff Kit (Steel Structural Member):

❶ (1) SnapNrack Standoff Base
❷ (1) SnapNrack Standoff Shaft
❸ (1) SnapNrack Rubber Rain Collar
❹ (1) SnapNrack Standoff Clamp
❺ (1) 5/16in SS Split Lock Washer
❻ (1) 5/16in - 18 X 2in SS HCS Bolt
❼ (1) SnapNrack Bonding Channel Nut, 5/16in - 18

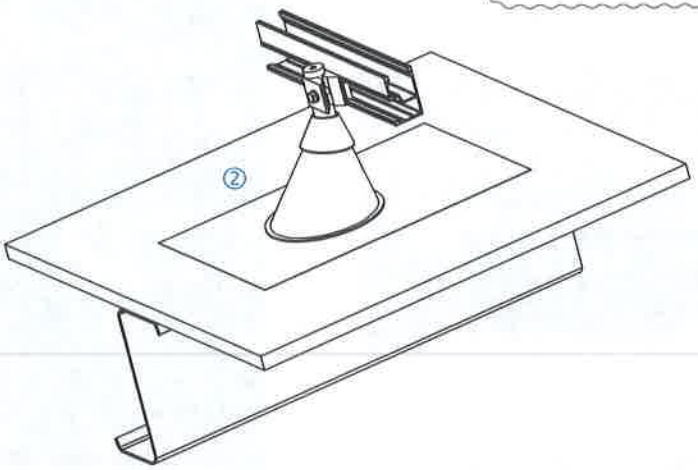
Standard Standoff Base

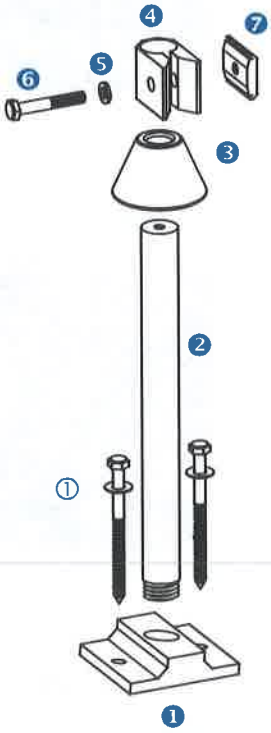


Other Materials Required:

① (1) 1/4in Tek Screw
(1) Roof Cone Flashing

When To Use:
Steel Structural
Member Configurations





Materials Included In Series 100 Four Hole Standoff Kit:

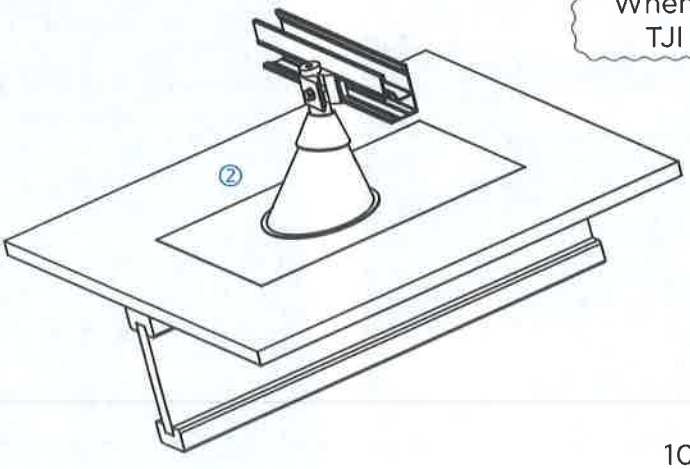
❶ (1) SnapNrack Four Hole Standoff Base
❷ (1) SnapNrack Standoff Shaft
❸ (1) SnapNrack Rubber Rain Collar
❹ (1) SnapNrack Standoff Clamp
❺ (1) 5/16in SS Split Lock Washer
❻ (1) 5/16in - 18 X 2in SS HCS Bolt
❼ (1) SnapNrack Bonding Channel Nut, 5/16in - 18

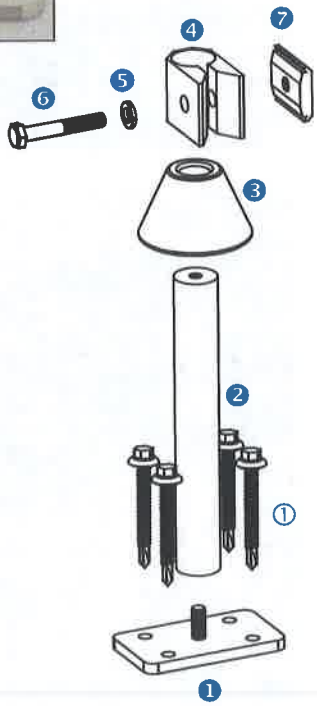
Four Hole Base

Other Materials Required:

① (4) Wood Screws 1/4"
② (1) Roof Cone Flashing

When To Use:
TJI Jolsts



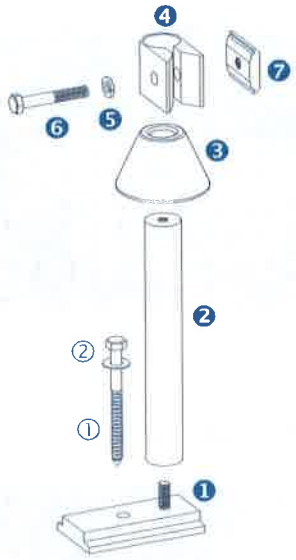


Series 100 UL
Standoff Post

Required Tools:

Hammer or Stud Finder
Roof Marking Crayon
Drill with 1/8 inch Pilot Drill Bit
Roof Sealant
Torque Driver with Bit Adapter
Channel Locks
1/2 inch Socket Wrench

When To Use:
Concrete or Clay Tile Roofs



Materials Included In Series 100 Standoff Kit:

❶ (1) SnapNrack Standoff Base
❷ (1) SnapNrack Standoff Shaft
❸ (1) SnapNrack Rubber Rain Collar
❹ (1) SnapNrack Standoff Clamp
❺ (1) 5/16in SS Split Lock Washer
❻ (1) 5/16in - 18 X 2in SS HCS Bolt
❼ (1) SnapNrack Bonding Channel Nut, 5/16in - 18

Other Materials Required:

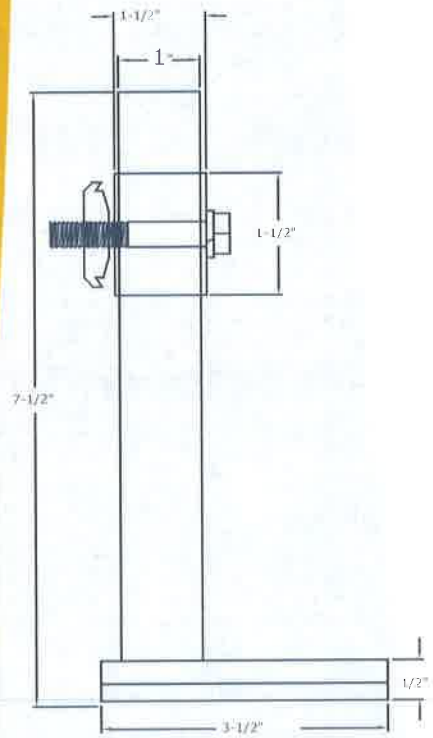
① (1) 5/16in Lag Screw
② (1) 5/16in Washer
(1) Roof Cone Flashing

Technical Standoff Shaft Data:

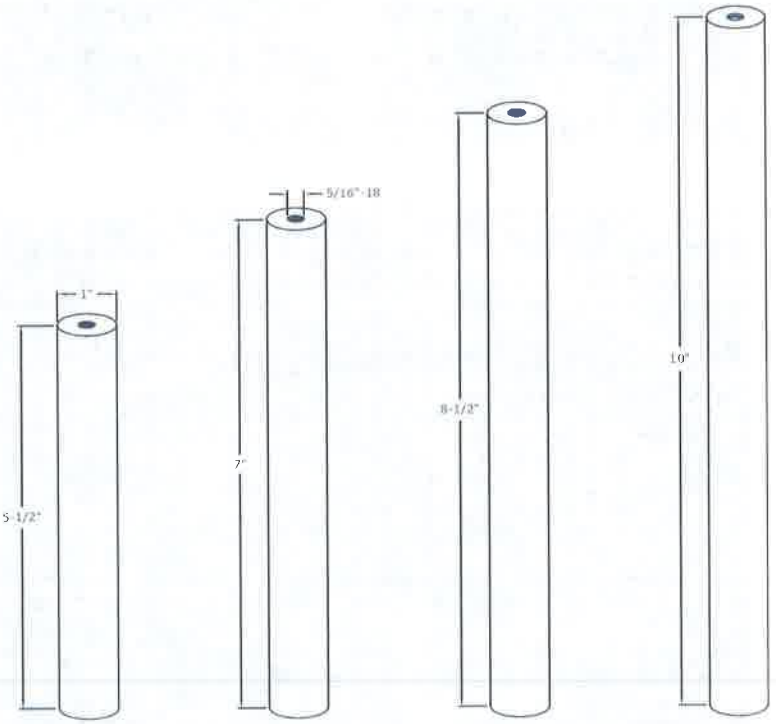
Material	6000 Series Heat Treated Aluminum
Finish	Mill
Weight	5.5" Shaft = 0.4 LBS 7" Shaft = 0.5 LBS 8.5" Shaft = 0.6 LBS
Design Uplift Load	200 LBS Uplift
Design Ultimate Load	1600 LBS Uplift

All Standoff shafts are mill finished

Dimensioned Assembly



Dimensioned Shaft



Series 100 UL
Flashed L-Foot

Step 2: Roof Attachment

Required Tools:

Hammer Or Stud Finder
Roof Marking Crayon
Drill with 1/8 inch Pilot Drill Bit
Roof Sealant
Torque Driver with Bit Adapter
1/2 inch Socket Wrench

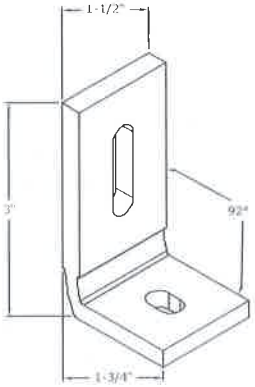
Materials Included in Series 100 L-Foot Kit:

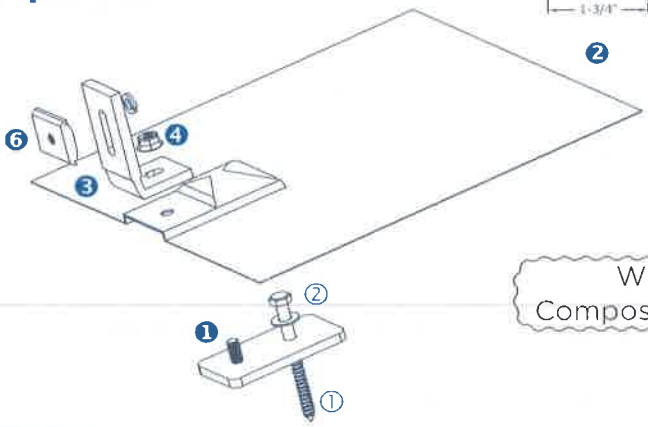
❶ (1) SnapNrack Flashed Base
❷ (1) SnapNrack Composition Flashing
❸ (1) SnapNrack L Foot, Composition 92°
❹ (1) 5/16in- 18 SS Flange Hex Nut
❺ (1) 5/16in Flange Bolt
❻ (1) SnapNrack Bonding Channel Nut, 5/16in - 18

Other Materials Required:

① (1) 5/16 in Lag Screw
② (1) 5/16 in Washer

Dimensioned L-Foot



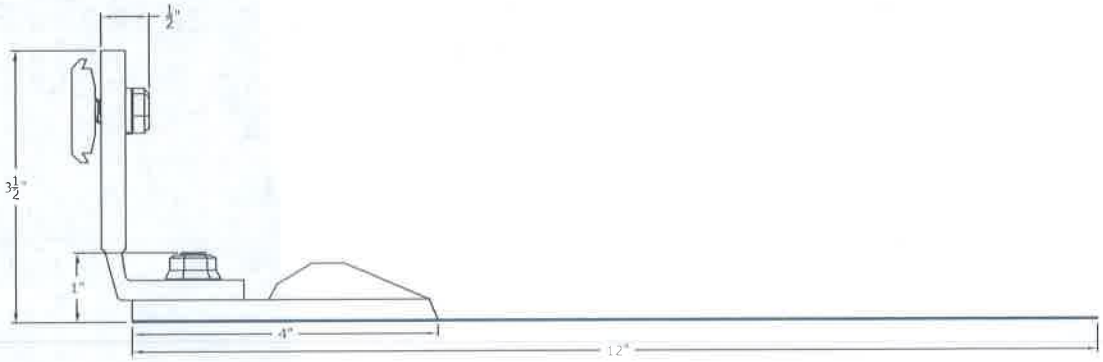


When To Use:
Composite Shingle Roofs

Technical L-Foot Data:

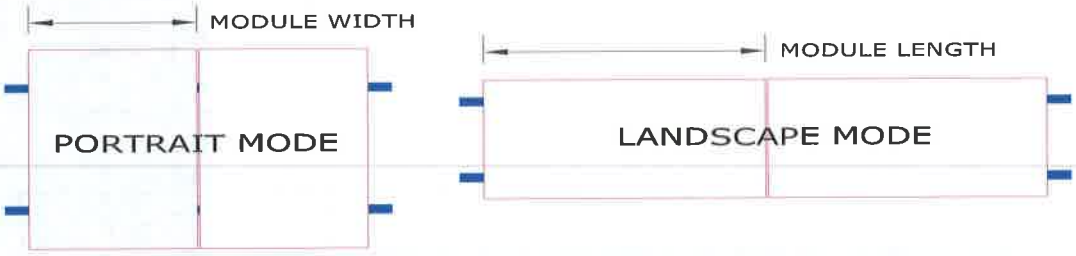
Material	6000 Series Heat Treated Aluminum
Finish	Class 2 Anodized Finish Clear and Black Finish Available
Weight	0.16 LBS
Design Uplift Load	200 LBS Uplift
Design Ultimate Load	1000 LBS Uplift

Dimensioned Assembly



Survey the Site

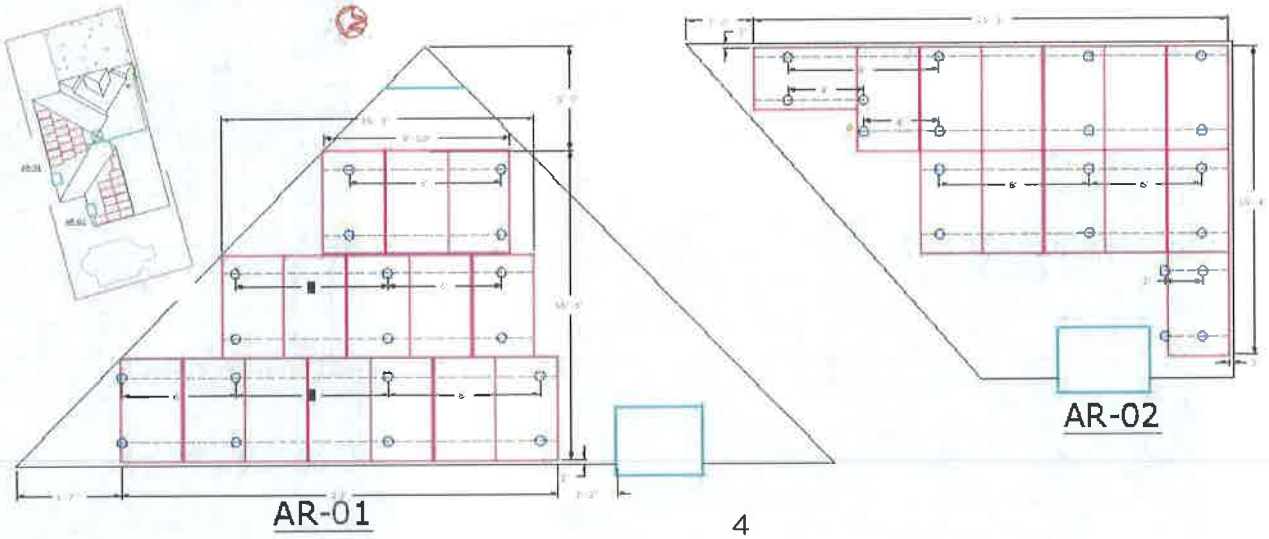
- Measure the roof surfaces and develop an accurate drawing, including any obstacles such as chimneys and roof vents.
- If plans are available, check to make sure that the plans match the final structure.
- Review the shading pattern across the roof surface from the residence itself, from adjacent structures, and from other nearby features such as trees.
- Identify any roof access areas or keep-out areas as required by the local jurisdiction.
- Confirm roof construction, type, and condition.
- Assess roof rafter size, material, and spacing to confirm that the structure is sound and can support the additional load of the array.
- Identify any construction anomalies that may complicate the process of locating rafters from the roof surface.
- If you find structural problems such as termite damage or cracked rafters that may compromise the structure's integrity, consult a structural engineer.



Develop a Layout

Using the information collected in the site survey and from the span tables, complete a system layout showing array location and distances from key roof features. Include any information necessary for the permitting process.

Typically, PV modules are installed in portrait mode, with the long side of the module running up the roof slope and the rails running horizontally across the roof perpendicular to the roof rafters, which commonly run down slope.



Series 100 UL Introduction

SnapNrack Series 100 UL PV Mounting System offers a low profile, visually appealing, photovoltaic (PV) module installation system. This innovative system simplifies the process of installing solar PV modules, shortens installation times, and lowers installation costs.

SnapNrack systems, when installed in accordance with this manual, will be structurally adequate for the specific installation site and will meet the local and International Building Code. Systems will also be bonded to ground, under SnapNrack's UL 2703 Certification.

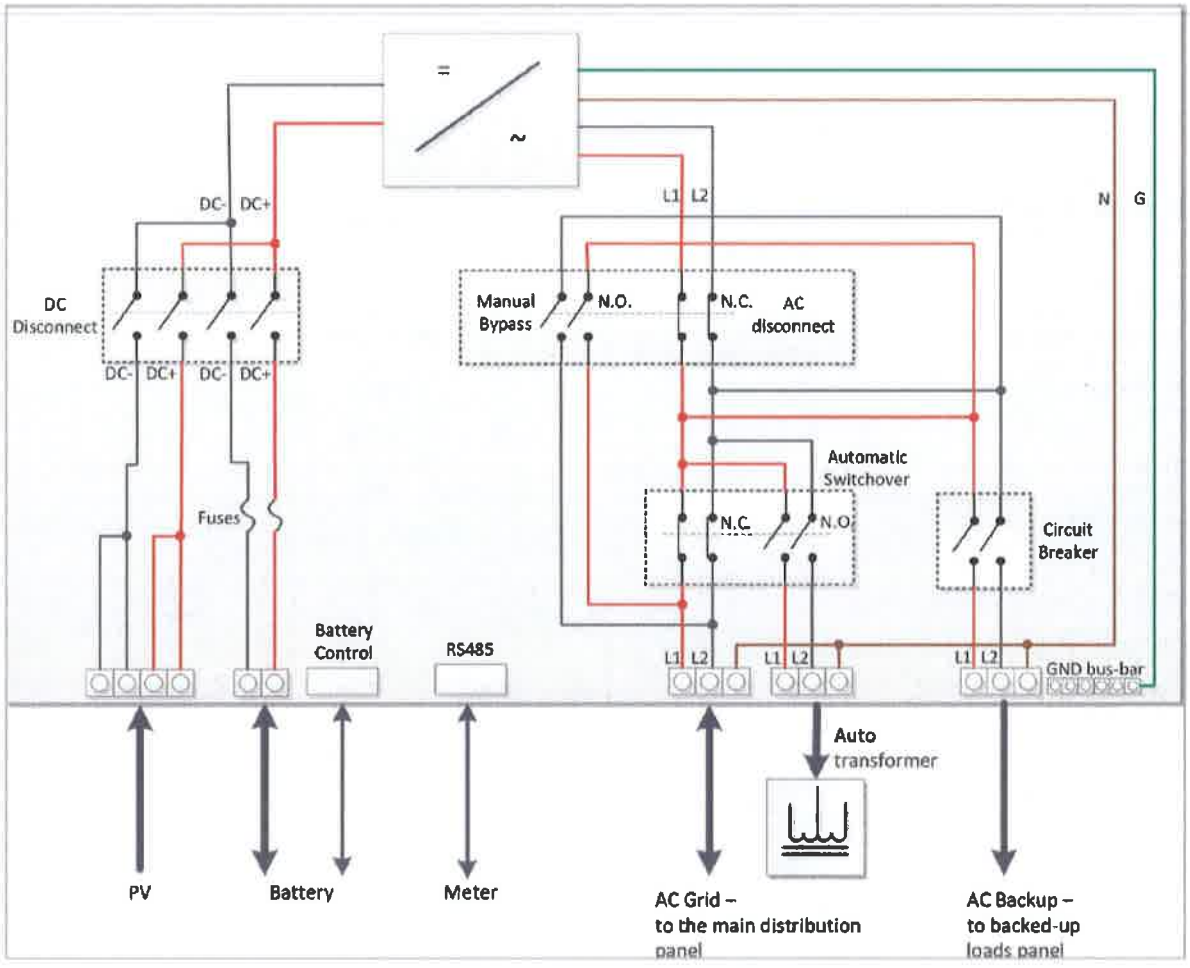
The SnapNrack installation system is a set of engineered components that can be assembled into a wide variety of PV mounting structures. It is designed to be installed by qualified solar installation technicians. With SnapNrack you will be able to solve virtually any PV module mounting challenge.

Table of Contents

SolarEdge Single Phase StorEdge Inverter
for North America SE7600A-US

	Lower Power Output	Higher Power Output	
STANDARD COMPLIANCE			
Safety	UL1741, UL1741 SA, UL1699B, UL1998, CSA 22.2		
Grid Connection Standards	IEEE1547, Rule 21, Rule 14H		
Emissions	FCC part15 class B		
INSTALLATION SPECIFICATIONS			
AC Output (Loads/Grid) conduit size / AWG range	1" / 14-6 AWG		
AC Output (Backup) conduit size / AWG range	0.75-1" knockouts / 14-6 AWG		
AC Input (Auto-transformer) conduit size / AWG range	0.75-1" / 14-6 AWG		
DC Input (PV) conduit size / AWG range	0.75" / 14-8 AWG		
DC Input (Battery) conduit size / AWG range	0.75" / 12-10 AWG		
Dimensions with Connection Unit (HxWxD)	37 x 12.5 x 7.2 / 940 x 315 x 184		in / mm
Weight with Connection Unit	58.5 / 26.5		lb / kg
Cooling	Natural convection and internal fan (user replaceable)		
Noise	<50		dBA
Min - Max Operating Temperature	-13 to +140 / -25 to +60		°F / °C
Protection Rating	NEMA 3R		

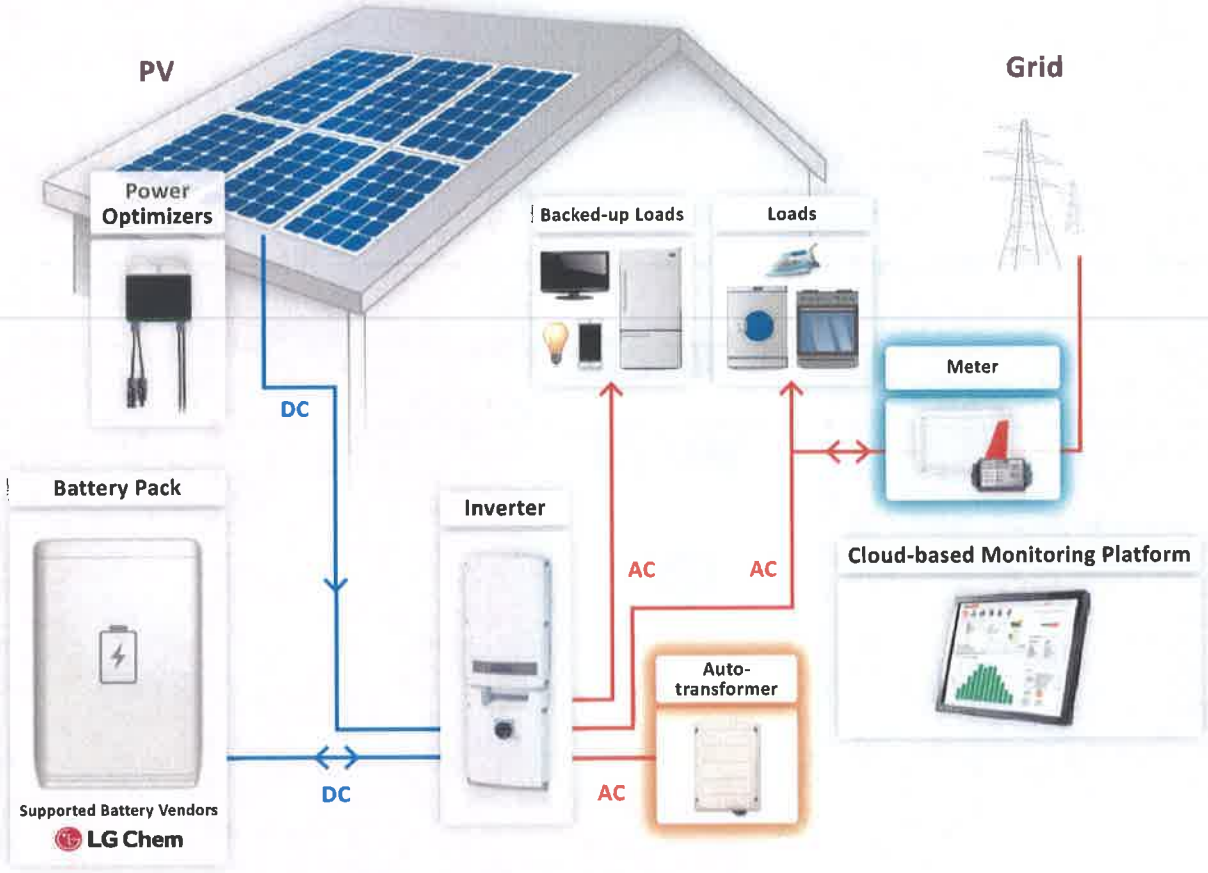
Inverter Interface



SolarEdge Single Phase StorEdge™ Solutions for North America

StorEdge™ Features:

- Smart Energy Management - export control, time-of-use shifting, maximized self-consumption, demand response and peak shaving capabilities
- Backup power - automatically provides power to backed-up loads in the event of grid interruption
- All-in-one solution uses a single DC optimized phase inverter to manage and monitor both PV generation and energy storage
- Compatible with the LG Chem RESU battery.



SolarEdge StorEdge™ Solutions for North America - Product Selector				
	Grid-tied solar, backup power and smart energy management	Grid-tied solar and backup power	Grid-tied solar and smart energy management	
Single Phase StorEdge™ Inverter	✓	✓	✓	
Auto-transformer	✓	✓		
SolarEdge Electricity Meter	✓		✓	
Battery	✓	✓	✓	