

# VILLAGE OF IRVINGTON

## BUILDING DEPARTMENT

85 MAIN STREET

IRVINGTON, NEW YORK 10533

TEL: (914) 591-8335 • FAX: (914) 591-5870



## PHOTOVOLTAIC (PV SOLAR) RESIDENTIAL SYSTEMS PERMIT APPLICATION CHECK LIST

Revised June 7, 2017

It is suggested that all applicants applying for a permit read and understand the manufacture installation instructions prior to applying for a building permit and attached ARB guide lines and Village code for Solar Energy Equipment.

### REQUIREMENTS TO APPLY FOR A PHOTOVOLTAIC (PV SOLAR) SYSTEM PERMIT

- ☒ 1) Apply on line at [www.irvingtonny.gov](http://www.irvingtonny.gov) for a mechanical permit, under building permits and along with your application, submit to the building department the following;
- ☒ 2) Owners phone number and email address entered in the online permit application
- ☒ 3) Evidence of Workers Compensation Insurance (on a C-105 or equivalent)
- ☒ 4) Evidence of Liability Insurance naming the Village of Irvington additional insured
- ☒ 5) A copy of the contractors Westchester County Department of Consumer Protection License
- ☐ 6) Pursuant to 9-12-A. provide evidence of notice to adjacent properties owners not less than 10 days prior to the meeting (see attached code section for more details)
- ☐ 7) Submit permit fee: (all fees must be paid at time of submission)
  - ☒ \$85 application fee
  - ☐ \$200 for systems up to 5 kilowatts
  - ☐ \$450 for systems above 5 kilowatts and less than 10 kilowatts
  - ☒ \$700 for systems above 10 kilowatts and less than 20 kilowatts
  - ☐ \$700 plus \$250 per additional 10 kilowatts above 20 for systems above 20 kilowatts
  - ☒ \$75 Certificate of Completion inspection and fee
- ☒ 8) An affidavit from a NYS licensed professional detailing and certifying that the existing structure meets or exceeds the minimum load requirement's as per TABLE R301.2(1) for wind and load before and after installation of the proposed equipment or the proposed upgrades to the existing structure to accomplish the aforesaid.
- ☒ 9) Drawings (signed and sealed by a NYS licensed professional) of the roof plan showing the following criteria;
  - a. ☒ Showing all proposed PV panels on all proposed roof surfaces.
  - b. ☒ Showing all equipment on all elevations including
  - c. ☒ Show / list all roof connectors and flashing details
  - d. ☒ Show compliance with section R902.4 (fire classification in accordance with UL1703 and 3' from any lot line)
  - e. ☒ Show compliance with sections R324.3.1 through R324.7.2.5 and NFPA 70 (installation)
  - f. ☒ Show compliance with section R324.7 (access and pathways) (see attachment)
  - g. ☒ Show compliance with section R324.7.2.1-6. (roof access points) (see attachment)
  - h. ☒ Show compliance with section R324.7.3 (ground access areas) (see attachment)
  - i. ☒ Show compliance with section R324.7.4 (single ridge roofs *when applicable*) (see attachment)
  - j. ☒ Show compliance with section R324.7.5 (hip roofs *when applicable*) (see attachment)
  - k. ☒ Show compliance with section R324.7.6 (roof with valleys *when applicable*) (see attachment)
  - l. ☒ Show compliance with section R324.7.7 (allowance for smoke ventilation operations) (see attachment)
  - m. ☒ Show a Fire Department AC disconnect, located outside by the Utility meter on all systems.
- ☒ 10) Provide a drawing or manufactures cut sheets of array mounting hardware and interconnection diagram and specifications.
- ☒ 11) Provide a drawing or manufactures cut sheets of the unit mount and roof penetration's flashing system.
- ☒ 12) 3 wire diagram showing all proposed equipment as governed by the National Electrical Code (NEC)
- ☒ 13) Provide a diagram showing all proposed labels and labeling locations including; Solar AC Disconnect, Inverter Output, Connection Warning, Dual Power Source Warning, Solar AC Combiner Panel, Solar PV Circuits Only, Solar Production meter. (see attachment)
- ☒ 14) Provide snow guards on panels were snow has the potential of sliding of the panel into a neighbor's property
- ☒ 15) Pictures of dwelling showing photo shopped arrays on the structure.
- ☒ 16) Provide a drawing or photo shop picture of all proposed equipment on all effected elevations (including FD emergency disconnect switch)
- ☒ 17) A Fire Department AC disconnect, located outside by the Utility meter on all systems.



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- ☒ 18) Separate Electrical Permit application by a Westchester County Department of Licensing, licensed Electrician with required insurances and the appropriate fee (must be filed by the licensed contractor, see village application for further details).
- ☒ 19) Submit signed check list with submission and appropriate building permit fee.
- ☒ 20) Applicant has provided seven copies of the entire submittal for Architectural Review Board approval.

#### Applicant Affidavit:

Applicants Name: Apex Roofing  
Applicants Address: 3221 N. Deerfield Ave  
Yorktown HTS NY 10598  
Applicants Phone # 845-505-8840  
Applicants Email bmonter@seamless.solar

Applicant Name Barbara Morley Signature [Signature] Date: 9.2.21 By signing this affidavit I attest to have read the attached Solar Energy Equipment Code and the Solar Equipment Guidelines manufactures installation instructions and that all information asked for above has been submitted and that the submitted information is correct.

#### General Contractor Affidavit:

Contractors Name: Apex Roofing, LLC  
Contractors Address: Same as applicant  
Contractors Phone # Same as applicant  
Contractors Email Same as applicant

General Contractor Name: Apex Roofing LLC Signature: [Signature] Date: 9/2/21 By signing this affidavit I attest to being the general contractor of record for this application and will be responsible for oversight and direct supervision of same, and will maintain a valid Westchester County Department of Consumer Protection License, a valid for Workers Compensation Policy and a General Liability Policy listing the Village of Irvington as Certificate Holder and additional insured with no conditions until such time I apply for and receive a Certificate of Completion.

#### Electrical Contractor Affidavit:

Electrical Contractors Name: Robert Kidd  
Electrical Contractors Address: 3221 N. Deerfield Ave  
Yorktown HTS NY 10598  
Electrical Contractors Phone # 845-505-8840  
Electrical Contractors Email bob@seamless.solar

Electrical Contractor Name: Robert Kidd Signature: [Signature] Date: 9/4/2021 By signing this affidavit I attest to being the electrical contractor of record for this application and will be responsible for oversight and direct supervision of same, and will maintain a valid Westchester County Electrical License, a valid for Workers Compensation Policy and a General Liability Policy listing the Village of Irvington as Certificate Holder and additional insured with no conditions until such time I apply for and receive a Certificate of Completion.

Note: Applications for all exterior elevation changes including photovoltaic solar systems are required to apply for, make a presentation in front of, and receive approval from the Village of Irvington Architectural Review Board (ARB) prior to issuance of a building permit. The ARB meetings are the second and fourth Mondays of the month, with a deadline for submissions one week prior to the meetings (see village web site for confirmation of meetings). Seven sets of copies of the entire application are required to be submitted at the deadline with appropriate fee at the time of submission.

Note: The following list above is given to assist in the application process. It is not intended to be a replacement for the Building or Zoning Code, County or State Regulations, or Consolidate Edison Requirements. Unique and Special projects may require additional information.

**\*Hours of Construction: Monday-Friday 7AM-7PM; Saturday 9AM-5PM; Sunday and holiday's construction is prohibited**  
**\*Only completed applications will be accepted with attached insurance certificates and County license**



# APPLICATION FOR BUILDING PERMIT

The Village of Irvington | 85 Main St | Irvington NY 10533

Application Number:	875	Date:	09/02/2021
Job Location:	18 MEADOWBROOK RD	Parcel ID:	2.50-15-10
Property Owner:	Jacob Styburski	Property Class:	1 FAMILY RES
Occupancy:	One/ Two Family	Zoning:	
Common Name:			

Applicant	Contractor
Barbara Morley	Barbara Morley
Apex Roofing, LLC	Apex Roofing, LLC
3221 N. Deerfield Ave Yorktown Hts NY 10598	3221 N. Deerfield Ave Yorktown Hts NY 10598
18455058840	18455058840

## Description of Work

Type of Work:	Solar Panels	Applicant is:	Contractor
Work Requested by:	The Owner	In association with:	
Cost of Work (Est.):	54600.00	Property Class:	1 FAMILY RES

## Description of Work

**15.60kW roof mounted photovoltaic system**

**Please Note:** Completing the application does not constitute a permit to commence construction. To obtain your permit follow the instructions on the instruction page provided on page 3.



## DMV EQUITY, INC.

CUSTOMER NAME: Jacob Styburski  
COMPANY NAME (IF APPLICABLE): n/a  
CUSTOMER ADDRESS: 18 Meadowbrook Rd  
CITY, STATE, ZIP: Irvington, NY 10533  
ACCOUNT NUMBER: 51-1702-5250-0003-3  
DATE (INCLUDE MONTH, DAY, YEAR): 8/18/2021

TO WHOM IT MAY CONCERN:

I, Jacob Styburski (Customer Name), authorize my contractor  
DMV Equity, Inc.  
APEX Roofing, LLC. (Installer Company) to act on my behalf on all matters pertaining to the  
installation of the 15.6DC (Size in KW) Distributed Generation project to be installed at my property located at:  
18 Meadowbrook Rd, Irvington, NY 10533 (Customer Property Address).

If you have any questions I can be reached at 646-455-8309 (Customer Phone Number).

Sincerely,

DocuSigned by:  
Jacob Styburski 8/18/2021  
FDF28CC63A1E44F...  
Signature Date

Jacob Styburski

Print Name

525 ROCKLAND AVENUE MAMARONECK, NY 10543  
www.dmvequityrealestate.com

[info@dmvequityrealestate.com](mailto:info@dmvequityrealestate.com)  
P: 808-218-4169  
F: 866-594-5966



Job Location: 18 MEADOWBROOK RD

Parcel Id: 2.50-15-10

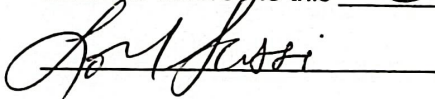
**AFFIDAVIT OF APPLICANT**

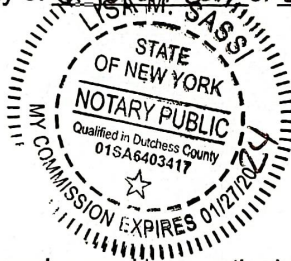
I **Barbara Morley** being duly sworn, depose and says: That s/he does business as: **Apex Roofing, LLC** with offices at: **3221 N. Deerfield Ave Yorktown Hts NY 10598** and that s/he is:

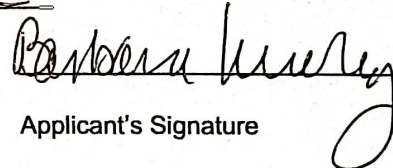
- ☐ The owner of the property described herein.
- ☐ The \_\_\_\_\_ of the New York Corporation \_\_\_\_\_ with offices at: \_\_\_\_\_ duly authorized by resolution of the Board of Directors, and that said corporation is duly authorized by the owner to make this application.
- ☐ A general partner of \_\_\_\_\_ with offices \_\_\_\_\_ and that said Partnership is duly authorized by the Owner to make this application.
- ☐ The Lessee of the premises, duly authorized by the owner to make this application.
- ☐ The Architect of Engineer duly authorized by the owner to make this application.
- ☒ The contractor authorized by the owner to make this application.

That the information contained in this application and on the accompanying drawings is true to the best of his knowledge and belief. The undersigned hereby agrees to comply with all the requirements of the New York State Uniform Fire Prevention and Building Code, the Village of Irvington Building Code, Zoning Ordinance and all other laws pertaining to same, in the construction applied for, whether or not shown on plans or specify in this application.

Sworn to before me this 2 day of September of 2021

  
Notary Public / Commission of Deeds



  
Applicant's Signature

**OWNER'S AUTHORIZATION**

I **Jacob Styburski** as the owner of the subject premises and have authorized the contractor named above to perform the work under the subject application.

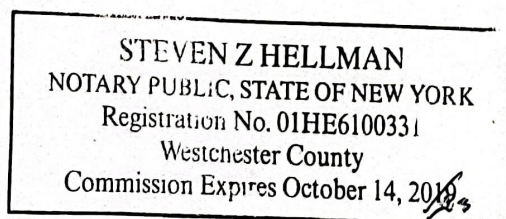
Owner phone number 646-455-8309 Owner email address SOTOZEN@GMAIL.COM

☒ **JACOB STYBURSKI** I hereby acknowledge that it is my responsibility as the **property owner** to ensure that if the permit (if issued) receives a Final Certificate of Approval from the Building Department and further that if a Final Certificate of Approval is not obtained upon completion of the construction, a property violation may be placed on the property for which this permit is being requested.

Sworn to before me this 7 day of Sept of 2021

  
Notary Public / Commission of Deeds

  
Applicant's Signature





VILLAGE OF IRVINGTON  
BUILDING DEPARTMENT  
85 MAIN STREET  
IRVINGTON, NEW YORK 10533  
TEL: (914) 591-8335 • FAX: (914) 591-5870  
Web Site: www.Irvingtonny.gov



## LICENSED PROFESSIONAL AFFIDAVIT for RESIDENTIAL SOLAR SYSTEMS

TO BE SUBMITTED AS PART OF THE PERMIT APPLICATION

### AFFIDAVIT OF ARCHITECT OR ENGINEER

State of New York } ss.:  
County of Westchester }

I the undersigned, under penalty of perjury, do hereby affirm:

1. I am an the (architect)(engineer) duly licensed in the State of New York
2. I am the NYS licensed design professional named in the Application for which a Building Permit for a residential solar system located at 18 Meadowbrook Rd, Irvington, New York 10533.
3. I have inspected the existing building and structure and find that the existing structure with the proposed solar panel installation and connections to the existing roof meet the minimum criteria set forth in;  
Applicable Codes: 2020 Residential Code of New York State  
Design Roof Load: 20 psf live load, 10 psf dead load  
Design Wind Load: 125 mph, 30 psf  
**OR** have proposed additional measures to insure compliance with above.
4. I have reviewed the following submitted drawings and/or manufacture specifications as part of the submission  
List applicable plans with revision dates: Jacob Styburski wStamp (rev date) 08/23/2021  
\_\_\_\_\_  
(rev date) \_\_\_\_\_  
\_\_\_\_\_  
(rev date) \_\_\_\_\_  
\_\_\_\_\_  
(rev date) \_\_\_\_\_  
\_\_\_\_\_  
(rev date) \_\_\_\_\_
5. The plans, drawings and specifications which the Building Permit is requested and listed above, as submitted (a)-were prepared by me or under my supervision, and (b)-to the best of my knowledge comply with the requirements of the Residential Building Code of New York State as adopted by the Village of Irvington, applicable design loads and all other applicable laws, rules and regulations governing building construction.

Signature

James A. Adams, S.E.

(Architect)

(Engineer)

Sworn to before me this  
2nd day of September, 2021.

Notary Public

STEVEN Z HELLMAN  
NOTARY PUBLIC, STATE OF NEW YORK  
Registration No. 01HE6100331  
Westchester County  
Commission Expires October 14, 2019 23





George Latimer  
Westchester County Executive

Westchester  
gov.com

James Marano  
Director, Consumer Protection

**Department of Consumer Protection  
Home Improvement License**

APEX ROOFING LLC  
3221 NORTH DEERFIELD AVENUE  
YORKTOWN HEIGHTS, NY-10598

This license is issued in accordance with Article XVI of the Westchester County Consumer Protection Code and is valid only upon  
presence of the official department seal. Proof of citizenship or immigration status is not required for issuance of this license.  
**NOT FOR FEDERAL PURPOSES**

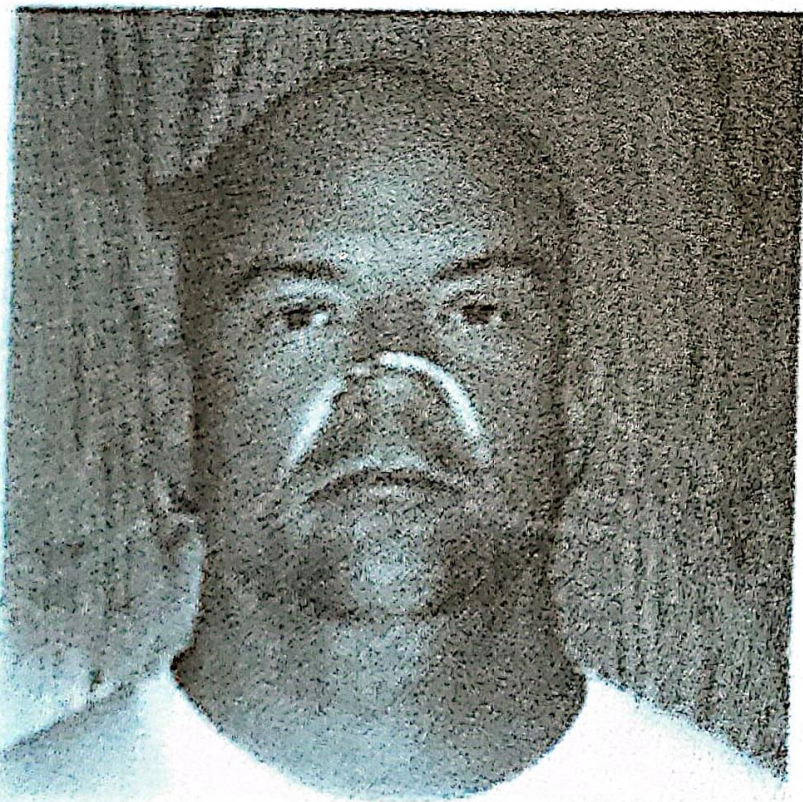
License Number  
VIC-30408411B



Date of Expiration  
03/13/2022



Westchester County Electrical Licensing Board  
Westchester County Consumer Protection  
Master Electrician License 2021



Robert L Kidd

D.O.B: 1/8/1975

Company:

Apex Roofing, LLC

3221 North Deerfield Avenue  
Yorktown Heights, NY 10598

License No. 1801

Expires on:12/31/2021

A handwritten signature in blue ink, appearing to read 'Peter Borducci'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Peter Borducci





# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
08/31/2021

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).

<b>PRODUCER</b> Integrated Brokerage Services, Inc. 303 Sunnyside Blvd Suite 25 Plainview NY 11803		<b>CONTACT NAME:</b> Richard Fenick <b>PHONE (A/C, No, Ext):</b> (516) 997-2900 <b>FAX (A/C, No):</b> (516) 997-2910 <b>E-MAIL ADDRESS:</b> richardf@lbsinsurance.com	
<b>INSURED</b> Apex Roofing LLC, DBA: Seamless Solar 3221 N Deerfield Ave Yorktown Heights NY 10598		<b>INSURER(S) AFFORDING COVERAGE</b> <b>INSURER A:</b> Admiral Insurance Group <b>INSURER B:</b> <b>INSURER C:</b> <b>INSURER D:</b> <b>INSURER E:</b> <b>INSURER F:</b>	
		<b>NAIC #</b> 44318	

**COVERAGES** **CERTIFICATE NUMBER:** CL2183119109 **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
A	<input checked="" type="checkbox"/> <b>COMMERCIAL GENERAL LIABILITY</b> <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PROJECT <input type="checkbox"/> LOC OTHER:			CA00003941202	09/02/2021	09/02/2022	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 Employee Benefits \$
	<input type="checkbox"/> <b>AUTOMOBILE LIABILITY</b> <input type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS ONLY						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
	<input type="checkbox"/> <b>UMBRELLA LIAB</b> <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input type="checkbox"/> RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
	<input type="checkbox"/> <b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below Y/N <input type="checkbox"/> N/A						PER STATUTE <input type="checkbox"/> OTH-ER <input type="checkbox"/> E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$

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

Village of Irvington, 85 Main St, Irvington, NY 10533 included as Additional Insured.

Job Location: 18 Meadowbrook Rd, Irvington, NY 10533

## CERTIFICATE HOLDER

## CANCELLATION

Village of Irvington  
85 Main Street

Irvington

NY 10533

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

*Richard Fenick*

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Workers'  
Compensation  
Board

## CERTIFICATE OF INSURANCE COVERAGE DISABILITY AND PAID FAMILY LEAVE BENEFITS LAW

### PART 1. To be completed by Disability and Paid Family Leave Benefits Carrier or Licensed Insurance Agent of that Carrier

1a. Legal Name & Address of Insured (use street address only) APEX ROOFING, LLC DBA SEAMLESS SOLAR  3221 N DEERFIELD AVE YORKTOWN HEIGHTS, NY 10598  Work Location of Insured (Only required if coverage is specifically limited to certain locations in New York State, i.e., Wrap-Up Policy)	1b. Business Telephone Number of Insured 914-262-3972  1c. Federal Employer Identification Number of Insured or Social Security Number 821204091
2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) Village of Irvington 85 Main Street Irvington, NY 10533	3a. Name of Insurance Carrier ShelterPoint Life Insurance Company  3b. Policy Number of Entity Listed in Box "1a" DBL535933  3c. Policy effective period 06/19/2021 to 06/18/2022

4. Policy provides the following benefits:

- ☒ A. Both disability and paid family leave benefits.  
☐ B. Disability benefits only.  
☐ C. Paid family leave benefits only.

5. Policy covers:

- ☒ A. All of the employer's employees eligible under the NYS Disability and Paid Family Leave Benefits Law.  
☐ B. Only the following class or classes of employer's employees:

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability and/or Paid Family Leave Benefits insurance coverage as described above.

Date Signed 8/30/2021 By   
(Signature of insurance carrier's authorized representative or NYS Licensed Insurance Agent of that insurance carrier)

Telephone Number 516-829-8100 Name and Title Richard White, Chief Executive Officer

**IMPORTANT:** If Boxes 4A and 5A are checked, and this form is signed by the insurance carrier's authorized representative or NYS Licensed Insurance Agent of that carrier, this certificate is COMPLETE. Mail it directly to the certificate holder.

If Box 4B, 4C or 5B is checked, this certificate is NOT COMPLETE for purposes of Section 220, Subd. 8 of the NYS Disability and Paid Family Leave Benefits Law. It must be mailed for completion to the Workers' Compensation Board, Plans Acceptance Unit, PO Box 5200, Binghamton, NY 13902-5200.

### PART 2. To be completed by the NYS Workers' Compensation Board (Only if Box 4C or 5B of Part 1 has been checked)

#### State of New York Workers' Compensation Board

According to information maintained by the NYS Workers' Compensation Board, the above-named employer has complied with the NYS Disability and Paid Family Leave Benefits Law with respect to all of his/her employees.

Date Signed \_\_\_\_\_ By \_\_\_\_\_  
(Signature of Authorized NYS Workers' Compensation Board Employee)

Telephone Number \_\_\_\_\_ Name and Title \_\_\_\_\_

**Please Note:** Only insurance carriers licensed to write NYS disability and paid family leave benefits insurance policies and NYS licensed insurance agents of those insurance carriers are authorized to issue Form DB-120.1. Insurance brokers are NOT authorized to issue this form.

DB-120.1 (10-17)







New York State Insurance Fund

WESTCHESTER ONE, 44 SOUTH BROADWAY, 10TH FLOOR, WHITE PLAINS, NY 10601-4411

| nysif.com

## CERTIFICATE OF WORKERS' COMPENSATION INSURANCE



SCAN TO VALIDATE  
AND SUBSCRIBE

\*\*\*\*\* 821204091  
ALBERT PALANCIA AGENCY INC  
116 MAMARONECK AVE  
PO BOX 26  
MAMARONECK NY 10543

POLICYHOLDER  
APEX ROOFING, LLC.  
D/B/A SEAMLESS SOLAR  
3221 N DEERFIELD AVE  
YORKTOWN HEIGHTS NY 10598

CERTIFICATE HOLDER  
VILLAGE OF IRVINGTON  
85 MAIN STREET  
IRVINGTON NY 10533

POLICY NUMBER	CERTIFICATE NUMBER	POLICY PERIOD	DATE
W2447 768-9	809075	06/20/2021 TO 06/20/2022	8/30/2021

THIS IS TO CERTIFY THAT THE POLICYHOLDER NAMED ABOVE IS INSURED WITH THE NEW YORK STATE INSURANCE FUND UNDER POLICY NO. 2447 768-9, COVERING THE ENTIRE OBLIGATION OF THIS POLICYHOLDER FOR WORKERS' COMPENSATION UNDER THE NEW YORK WORKERS' COMPENSATION LAW WITH RESPECT TO ALL OPERATIONS IN THE STATE OF NEW YORK, EXCEPT AS INDICATED BELOW, AND, WITH RESPECT TO OPERATIONS OUTSIDE OF NEW YORK, TO THE POLICYHOLDER'S REGULAR NEW YORK STATE EMPLOYEES ONLY.

IF YOU WISH TO RECEIVE NOTIFICATIONS REGARDING SAID POLICY, INCLUDING ANY NOTIFICATION OF CANCELLATIONS, OR TO VALIDATE THIS CERTIFICATE, VISIT OUR WEBSITE AT [HTTPS://WWW.NYSIF.COM/CERT/CERTVAL.ASP](https://www.nysif.com/cert/certval.asp). THE NEW YORK STATE INSURANCE FUND IS NOT LIABLE IN THE EVENT OF FAILURE TO GIVE SUCH NOTIFICATIONS.

THIS POLICY DOES NOT COVER THE SOLE PROPRIETOR, PARTNERS AND/OR MEMBERS OF A LIMITED LIABILITY COMPANY.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS NOR INSURANCE COVERAGE UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICY.

NEW YORK STATE INSURANCE FUND

DIRECTOR, INSURANCE FUND UNDERWRITING

VALIDATION NUMBER: 751525006



STRUCTURAL CALCULATIONS FOR PV INSTALLATION

Prepared for



# Solar-Roof-Check

YSP

3000 E. Birch St, Suite 201

Brea CA, 92821

USA

818-939-8098

USER:

Gary Park

COMPANY NAME:

YSP

SRC JOB ID:

30535

JOB REPORT DATE:

2021-08-23/Rev C

JOB NUMBER:

STYBURSKI

JOB NAME:

Styburski, Jacob

JOB ADDRESS:

18 Meadowbrook Road

Irvington, NY 10533



Digitally Signed by

James A. Adams, S.E.

Date: 2021.08.23 14:31:47 -0700

Program Version: 2020-05-08:7

Contact: [Support@Solar-Roof-Check.com](mailto:Support@Solar-Roof-Check.com)

Phone: 844-783-5483



**USER INPUT:**

1. Ceiling Type		:= 1/2 gyp. Bd.
2. Collar Tie Spacing (ft)		:= 0
3. Roof Coverage %		:= 38.93
4. Roof Framing Size		:= 2x6@16
5. Ground Snow (psf)		:= 30
6. Vertical Snow Load on slope (psf)		:= 29.1
7. Lag Screw Diameter (in)	:= d	:= 5/16
8. Lag Screw Embedment (in)	:= e	:= 2.5
9. Overall Span (ft)		:= 30
10. PV Weight (psf)	:= $DL_{pv}$	:= 2.60
11. Rafter Sloped Span (ft)	:= $L_r$	:= 14.25
12. Rail System		:= 2Rail
13. Roofing Type		:= Comp. Shingle
14. Roof Mean Height (ft)	:= h	:= 20
15. Roof Slope (degrees)	:= $\theta$	:= 14
16. Roof Structure Type		:= Truss
17. Sloped Ceiling?		:= No
18. $S_{fh}$ = RF Mount Horizontal Spacing (ft)		:= 4.00
19. $S_{fv}$ = RF Mount Vertical Spacing (ft)		:= 3.00
20. RF Mount Staggered		:= Yes
21. Wind Exposure		:= B
22. Wind Speed (mph)	:= V	:= 125
23. $L_{pv}$ =PV Length (in)		:= 72
24. $W_{pv}$ = PV Width (in)		:= 40
25. Gable, Hip, or Flat/Monoslope		:= Gable Roof
26. Roof Overhangs		:= Yes
27. $S_r$ = Rafter Spacing (ft)		:= 1.33
28. PV Orientation		:= Both
29. Elevation Above Sea Level (ft)	:= Elev	:= 148



---

**FORMULA SYMBOLS:**


---

$TA_{fp}$	:=	Tributary Area to RF Mounts with <b><u>Portrait</u></b> PV Orientation (sf)
$TA_{fl}$	:=	Tributary Area to RF Mounts with <b><u>Landscape</u></b> PV Orientation (sf)
$TA_r$	:=	Tributary Area to Rafters (sf)
$\gamma_{af}$	:=	Pressure Equalization Factor for RF Mounts with <b><u>Portrait</u></b> PV Orientation
$\gamma_{al}$	:=	Pressure Equalization Factor for RF Mounts with <b><u>Landscape</u></b> PV Orientation
$\gamma_{ar}$	:=	Pressure Equalization Factor for Rafters
$P_{1fp}$	:=	Design Wind Pressure to RF Mounts with <b><u>Portrait</u></b> PV Orientation – <b>Zone 1</b> (psf)
$P_{2fp}$	:=	Design Wind Pressure to RF Mounts with <b><u>Portrait</u></b> PV Orientation – <b>Zone 2</b> (psf)
$P_{1fl}$	:=	Design Wind Pressure to RF Mounts with <b><u>Landscape</u></b> PV Orientation – <b>Zone 1</b> (psf)
$P_{2fl}$	:=	Design Wind Pressure to RF Mounts with <b><u>Landscape</u></b> PV Orientation – <b>Zone 2</b> (psf)
$P_{rup}$	:=	Design Wind Pressure <b><u>Up</u></b> to Rafters (psf)
$P_{rdn}$	:=	Design Wind Pressure <b><u>Down</u></b> to Rafters (psf)
$GC_{p1}$	:=	External Pressure Coefficient for RF Mounts – <b>Zone 1</b> (depends on TA Fastener)
$GC_{p2}$	:=	External Pressure Coefficient for RF Mounts – <b>Zone 2</b> (depends on TA Fastener)
$GC_{pup}$	:=	External Pressure Coefficient, <b><u>Wind Up</u></b> for Rafters (depends on $TA_r$ )
$GC_{pdn}$	:=	External Pressure Coefficient, <b><u>Wind Down</u></b> for Rafters (depends on $TA_r$ )
$S$	:=	Snow on Roof (psf)
$S_{fh}$	:=	RF Mount Horizontal Spacing (ft)
$S_{fv}$	:=	RF Mount Vertical Spacing (ft)
$S_r$	:=	Rafter Spacing (ft)
$L_{pv}$	:=	PV Length (ft)
$W_{pv}$	:=	PV Width (ft)
$L_r$	:=	Span of Rafter (ft)
$\gamma_E$	:=	Edge Array Factor



**Dead Loads (DL): = psf**

Roofing		: = 2.20
Ply		: = 1.50
Rafter		: = 1.50
Miscellaneous (Misc)		: = 1.00
Clg. Joists		: = 0.65
Insulation (Insul)		: = 0.50
Ceiling		: = 2.20
<b><u>Flat Ceiling</u></b>	$DL_{tc} = \text{Roofing} + \text{Ply} + \text{Rafter} + \text{Misc (psf)}$	: = 6.20
	$DL_{bc} = \text{Clg.joists} + \text{Insul.} + \text{Ceiling (psf)}$	: = 3.35
	$wDL_{tc} = DL_{tc} \times Sr \text{ (plf)}$	: = 8.27
<b><u>Sloped Ceiling</u></b>	$DL_{tc} = DL_{tc} + \text{Insul.} + \text{Ceiling (psf)}$	: = N/A
	$wDL_{tc} = DL_{tc} \times Sr \text{ (plf)}$	: = N/A

DESIGN CRITERIA	ASCE REFERENCE		
Risk Category II	Table 1.5-1		
Importance Factor	Table 1.5-2	I	: = 1.00
Basic Wind Speed	Fig. 26.5-1b	V	: = 125
Wind Directionality	Table 26.6-1	K <sub>d</sub>	: = 0.85
Exposure Category :	Sect. 26.7.3		: = B
Topographic Factor	Sect. 26.8	K <sub>zt</sub>	: = 1.00
Elevation above Sea Level	Table 26.9-1	K <sub>e</sub>	: = 0.99
Velocity Pressure Exposure Coeff.	Table 26.10-1	K <sub>z</sub>	: = 0.62
Velocity Pressure	Eq. 26.10-1	$q_h = .00256 \times K_z \times K_{zt} \times K_d \times K_e \times V^2$	: = 20.97
Edge Array Factor	Sect. 29.4.4	$\gamma_E \text{ (Zone 1)} = 1.0 \quad \gamma_E \text{ (Zone2)} = 1.5$	
PV Pressure Equalization Factor	Fig. 29.4-8	$\gamma_a$	: = 0.74



---

**RF MOUNT- Wind UP Pressure (Note: Divide TA by 2 for 2 Rail System)**


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**Portrait Orientation:**

<b>ASCE REFERENCE</b>		$TA_{fl} = S_{fh} \times L_{pv}$	<b>:= 12.00</b>
Fig. 29.4-8		$\gamma_a$	<b>:= 0.74</b>
Fig. 30.3-2*	<b>Zone 1:</b>	$GC_{p1}$	<b>:= 2.00</b>
Eq. 29.4-7		$P_{1f} = q_h \times GC_{p1} \times \gamma_E \times \gamma_a$	<b>:= 31.09</b>
Fig. 30.3-2*	<b>Zone 2e:</b>	$GC_{p2e}$	<b>:= 2.50</b>
Eq. 29.4-7		$P_{2ef} = q_h \times GC_{p2e} \times \gamma_E \times \gamma_a$	<b>:= 58.29</b>
Fig. 30.3-2*	<b>Zone 2r:</b>	$GC_{p2r}$	<b>:= 2.89</b>
Eq. 29.4-7		$P_{2rf} = q_h \times GC_{p2r} \times \gamma_E \times \gamma_a$	<b>:= 67.30</b>

**Landscape Orientation:**

<b>ASCE REFERENCE</b>		$TA_{fl} = S_{fh} \times W_{pv}$	<b>:= 6.67</b>
Fig. 29.4-8		$\gamma_a$	<b>:= 0.97</b>
Fig. 30.3-2*	<b>Zone 1:</b>	$GC_{p1}$	<b>:= 2.00</b>
Eq. 29.4-7		$P_{1f} = q_h \times GC_{p1} \times \gamma_E \times \gamma_a$	<b>:= 40.72</b>
Fig. 30.3-2*	<b>Zone 2e:</b>	$GC_{p2e}$	<b>:= 2.50</b>
Eq. 29.4-7		$P_{2ef} = q_h \times GC_{p2e} \times \gamma_E \times \gamma_a$	<b>:= 76.35</b>
Fig. 30.3-2*	<b>Zone 2r:</b>	$GC_{p2r}$	<b>:= 3.00</b>
Eq. 29.4-7		$P_{2rf} = q_h \times GC_{p2r} \times \gamma_E \times \gamma_a$	<b>:= 91.62</b>

**\*NOTE:** For Flat and Monoslope Roofs, refer to Figures 30.3-5A and 30.3-5B



**RAFTERS- Wind UP Pressure**

<b>ASCE REFERENCE</b>	$TA_r = S_{fh} \times L_r$	<b>:= 57.00</b>
Fig. 29.4-8	$\gamma_{ar}$	<b>:= 0.46</b>
Fig. 30.3-2* <b>Zone 1:</b>	$GC_{pup}$	<b>:= 1.02</b>
Eq. 29.4-7	$P_{rup} = q_h \times GC_{pup} \times \gamma_E \times \gamma_a$	<b>:= 16.00</b>

**RAFTERS- Wind DOWN Pressure**

<b>ASCE REFERENCE</b>	$TA_r = S_{fh} \times L_r$	<b>:= 57.00</b>
Fig. 29. 4-8	$\gamma_{ar}$	<b>:= 0.46</b>
Fig 30. 3-2* <b>Zone 1:</b>	$GC_{pdn}$	<b>:= 0.36</b>
Eq. 29.4-7	$P_{rdn} = q_h \times GC_{pdn} \times \gamma_E \times \gamma_a$	<b>:= 16.00</b>

**LOAD COMB. #1: WIND UPLIFT ON RF MOUNTS (0.6DL - 0.6 Wind Up) (Cd = 1.6)**

$t$  = Withdrawal Capacity (lb/inch)  $t$  **:= 235.00**

$W$  = Total Withdrawal Capacity  $W := C_d \times t \times e$   $W$  **:= 940.00**

**ZONE 1**  $P := TA_f \times (0.6 \times P_{1f} - 0.6 \times DL_{pV} \times \cos(\theta \times \text{deg}))$  **:= 205.66**  
 $\% = W \times 100/P_{1f}$  **:= 457.1%**

Code Compliant if % is equal to or more than 100%

**ZONE 2e**  $P := TA_f \times (0.6 \times P_{2ef} - 0.6 \times DL_{pV} \times \cos(\theta \times \text{deg}))$  **:= 401.50**  
 $\% = W \times 100/P_{2ef}$  **:= 234.1%**

Code Compliant if % is equal to or more than 100%

**ZONE 2r**  $P := TA_f \times (0.6 \times P_{2rf} - 0.6 \times DL_{pV} \times \cos(\theta \times \text{deg}))$  **:= 466.42**  
 $\% = W \times 100/P_{2rf}$  **:= 201.5%**

Code Compliant if % is equal to or more than 100%



---

**LOAD COMB. # 2: On Rafters DL RF + DL SOLAR + RF LL (CD=1.25) with LL = 20 psf**


---

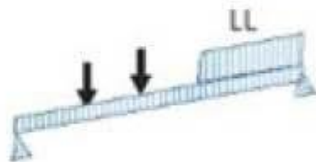
$$W := LL \times S_r \text{ plf} \quad (\text{plf}) \quad := 26.67$$

$$P_{sp} := TA_f \times DL_{PV} \quad := 31.20$$

$$C := \frac{(L - 5.5)}{2} \quad (\text{ft}) \quad := 4.38$$

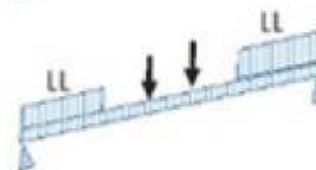
$$M_{DL} := \left( WDL_{tc} \times \frac{L^2}{8} + P_{sp} \times \frac{L}{a} \right) \times \cos(\theta) \quad := 372.77$$

Spans &lt; 10.0 ft



$$M_{LL} := \frac{\left( \left( W \times \frac{3}{2 \times L} \right) \times (2 \times L - 3) \right)^2 \times \cos(\theta)}{2 \times W} \quad := \text{NA}$$

Spans =&gt; 10.0 ft



$$M_{LL} := \frac{\left( (W \times C \times (2 \times L - C) + W \times C^2) \right)^2 \times \cos(\theta)}{2 \times L \times 2 \times W} \quad := 247.63$$

$$M_2 := M_{DL} + M_{LL} \quad (\text{lb-ft}) \quad := 620.40$$

$$S_r := M_2 \times \frac{12}{F_b \times C_{d_{LL}} \times C_{f_x} \times C_r \times C_{LS}} \quad := 1.66$$

$$\% := \frac{S_x}{S_r} \times 100$$

&lt;&lt; If equal to or more than 100% Code Compliant, OK!

$$:= 455.4\%$$

---

**LOAD COMB. #3: On Rafters, Zone 1 DL Rf + DL Solar + Wind Down (Cd = 1.6)**


---

$$P_3 := TA_f \times (0.6 \times P_{rdn} + DL_{PV} \times \cos \theta) \quad := 145.47$$

$$M_3 := \left( WDL_{tc} \times \frac{L^2}{8} \right) \times \cos(\theta \times \text{deg}) + P_3 \times \frac{L}{a} \quad := 1016.54$$

$$S_r := M_3 \times \frac{12}{F_b \times C_{d_{Wind}} \times C_{f_x} \times C_r \times C_{LS}} \quad := 2.12$$

$$\% := \frac{S_x \times 100}{S_r}$$

&lt;&lt; If equal to or more than 100% Code Compliant, OK!

$$:= 355.8\%$$



**LOAD COMB. #4: On Rafters DL Rf + DL Solar + Snow (Cd=1.15)**

$$\begin{aligned}
 S &:= \text{Sloped Roof Snow Load (psf)} &:= 29.11 \\
 P_4 &:= TA_f \times (DL_{PV} \times S) &:= 380.52 \\
 M_4 &:= \left( WDL_{tc} \times \frac{L^2}{8} + P_4 \times \frac{L}{a} \right) \times \cos(\theta) &:= 2266.87 \\
 S_r &:= M_4 \times \frac{12}{Fb \times Cd_{Snow} \times Cf_x \times C_r \times C_{LS}} &:= 6.59 \\
 \% &:= \frac{S_x \times 100}{S_r} << \text{If equal to or more than 100\% code compliant, ok!} &:= 114.7\%
 \end{aligned}$$

**LOAD COMB. #5: On Rafters, Zone 1 DL Rf + DL Solar + .75Wind + .75Snow (Cd=1.6)**

$$\begin{aligned}
 S &:= \text{Sloped Roof Snow Load (psf)} &:= 29.11 \\
 P_5 &:= TA_f \times (DL_{PV} + .75 \times S) \times \cos\theta + TA_f \times 0.75 \times 0.6 \times p_{rdn} &:= 370.88 \\
 M_5 &:= \left( WDL_{tc} \times \frac{L^2}{8} + P_5 \times \frac{L}{a} \right) \times \cos(\theta) &:= 2276.17 \\
 S_r &:= M_5 \times \frac{12}{Fb \times Cd_{Wind} \times Cf_x \times C_r \times C_{LS}} &:= 4.76 \\
 \% &:= \frac{S_x \times 100}{S_r} << \text{If equal to or more than 100\% Code Compliant, OK!} &:= 158.9\%
 \end{aligned}$$

**LOADING COMB. #6: CHECK SEISMIC LOADING: C=COVERAGE ON ROOF**

$$\begin{aligned}
 \text{Existing DL} &:= DL_{Rf} + \text{Walls} \quad \text{Walls} := 5.5 \text{ psf} &:= 15.05 \\
 \text{Proposed DL} &:= \text{Existing DL} + DL_{Solar} \times C &:= 16.06 \\
 \text{Seismic Increase} &:= 100 \times \left( \frac{\text{Proposed DL}}{\text{Existing DL}} \right) - 100 << \text{If equal to or more than 10\% Code Compliant, OK!} &:= 6.7\%
 \end{aligned}$$

**SEISMIC SUMMARY: EXISTING BUILDING PROVISIONS**Section 11B.3- Exceptions:

1. The addition complies with the requirements for new structures.
2. The addition does not increase the seismic force by more than 10%.
3. The addition does not decrease the seismic resistance of any structural element.

**LOAD COMB. #7: On Rafters, ZONE 1 (0.6)(DL RF + DL SOLAR) - WIND UP (CD=1.6)**

$$P_7 := TA_f \times (0.6 \times p_{rup} - 0.6 \times DL_{PV} \times \cos \theta) \quad := \quad 97.04$$

$$M_7 := \left( P_7 \times \frac{L}{a} \right) - wDL_{tc} \times \frac{L^2}{8} \times \cos(\theta \times \text{deg}) \quad := \quad 420.10$$

$$S_r := M_7 \times \frac{12}{Fb \times Cd_{Wind} \times Cf_x \times C_r \times C_{LS}} \quad := \quad 0.88$$

$$\% := \frac{S_x \times 100}{S_r} \quad <<\text{IF EQUAL TO OR MORE THAN 100\% CODE COMPLIANT, OK!} \quad := \quad 860.9\%$$

**LIMITS OF SCOPE OF WORK AND LIABILITY**

Note:

1. Prior to commencement of work, the Solar Installer shall verify that the roof framing sizes, spacing, and spans (between supports), are as noted in these documents. The Engineer of Record must be notified if any discrepancies are discovered, before proceeding.
2. These documents are Stamped for Structural Code compliance of the roof members that support the PV solar system only.
3. These documents are not stamped for rain water leakage prevention.
4. As a precaution, old or wet snow should be removed from the roof, if the snow builds up to 18" or more.
5. Existing deficiencies which are unknown and not observable due to their being concealed inside walls or sandwiched behind gypsum board ceilings at the time of inspection are not included in the scope of work. These calculations are only for the roof framing which supports the new PV modules. These calculations do not include a complete lateral analysis of the building, nor a prediction of the life expectancy of the existing building.



# Appendix

Table 3 represents the maximum Moment ( $M = PL/a$ ) resulting from point loads (RF Mounts), for any spans (L) listed.

$$a = 2.55$$

TABLE 3

The Moment Factor "a" for a 2 Rail System

Length	Staggered		Unstaggered	
	Portrait	Landscape	Portrait	Landscape
L = 4'	4.00	4.00	4.00	2.91
L = 5'	4.00	3.50	3.72	2.50
L = 6'	4.00	3.00	3.43	2.09
L = 7'	3.60	2.84	2.95	1.83
L = 8'	3.20	2.67	2.46	1.56
L = 9'	3.03	2.59	2.34	1.44
L = 10'	2.86	2.50	2.22	1.31
L = 11'	2.77	2.25	2.04	1.19
L = 12'	2.67	2.00	1.85	1.07
L = 13'	2.61	1.88	1.74	0.90
L = 14'	2.55	1.75	1.62	0.92
L = 15'	2.51	1.68	1.50	0.86
L = 16'	2.46	1.60	1.38	0.81
L = 17'	2.43	1.45	1.31	0.76
L = 18'	2.40	1.29	1.23	0.72
L = 19'	2.38	1.24	1.17	0.68
L = 20'	2.35	1.18	1.11	0.65
L = 21'	2.22	1.14	1.06	0.62
L = 22'	2.09	1.10	1.00	0.59

The Moment Factor "a" for a Railless or Shared Rail System

Length	Staggered		Unstaggered	
	Portrait	Landscape	Portrait	Landscape
L = 4'	5.00	5.00	5.00	5.00
L = 5'	5.00	5.00	5.00	5.00
L = 6'	5.00	5.00	5.00	5.00
L = 7'	4.50	4.50	4.50	4.19
L = 8'	4.00	4.00	4.00	3.37
L = 9'	4.00	4.00	4.00	3.12
L = 10'	4.00	4.00	4.00	2.86
L = 11'	4.00	4.00	3.70	2.48
L = 12'	4.00	4.00	3.39	2.09
L = 13'	4.00	3.87	3.35	1.98
L = 14'	4.00	3.73	3.30	1.87
L = 15'	4.00	3.32	2.88	1.78
L = 16'	4.00	2.90	2.46	1.68
L = 17'	4.00	2.74	2.36	1.57
L = 18'	4.00	2.57	2.25	1.45
L = 19'	4.00	2.46	2.18	1.38
L = 20'	4.00	2.35	2.11	1.30
L = 21'	4.00	2.28	2.06	1.25
L = 22'	4.00	2.20	2.00	1.20

## REFERENCES: LATEST EDITION

<u>Duration Factors</u>	<u>Section Modules</u>		<u>Size Form Factor</u>	
$C_{d_{wind}} := 1.6$	$S_x := 7.56$	$S_{2 \times 12} := 31.640$	$C_{f_{2 \times 2}} := 1.5$	$C_{f_{4 \times 4}} := 1.5$
$C_{d_{snow}} := 1.15$	$S_{2 \times 2} := 0.563$	$S_{4 \times 4} := 7.150$	$C_{f_{2 \times 4}} := 1.5$	$C_{f_{4 \times 6}} := 1.3$
$C_{d_{DL}} := 0.9$	$S_{2 \times 4} := 3.063$	$S_{4 \times 6} := 17.650$	$C_{f_{2 \times 6}} := 1.3$	$C_{f_{4 \times 8}} := 1.3$
$C_{d_{LL}} := 1.25$	$S_{2 \times 6} := 7.563$	$S_{4 \times 8} := 30.660$	$C_{f_{2 \times 8}} := 1.2$	$C_{f_{4 \times 10}} := 1.2$
$C_{LS} := 2.00$	$S_{2 \times 8} := 13.140$	$S_{4 \times 10} := 49.900$	$C_{f_{2 \times 10}} := 1.1$	$C_{f_{4 \times 12}} := 1.1$
$F_b := 1200$	$S_{2 \times 10} := 21.390$	$S_{4 \times 12} := 73.800$	$C_{f_{2 \times 12}} := 1.0$	



# SOLAR-ROOF-CHECK THE RLA A RIGOROUS LOAD ANALYSIS

3000 E. Birch Street, Suite 201

Brea, CA 92821

Ph: 844-783-5483

**DATE:** 08-23-2021/Rev C  
**FOR:** YSP  
3000 E. Birch St  
Suite 201  
Brea, CA 92821  
USA

**JOB:** Styburski, Jacob  
18 Meadowbrook Road  
Irvington, NY 10533

To Whom It May Concern

This letter is to certify that we have performed a structural analysis of the existing roof members that are to support photovoltaic panels, as shown on the attached report. The calculations were performed in accordance with the latest editions of IBC, NDS, ASCE/SEI, CBC, and IRC, and the latest edition of the building codes for the state of New York.

Our analysis was based on the following design criteria:

Ground Snow (psf)	30 psf
Sloped Snow (psf), reduced per ASCE, Sect. 7.4	29.11 psf
Basic Wind Speed (mph):	125 mph
Roof Slope:	14 degrees
The PV module orientation:	Both
The maximum horizontal roof mount spacing:	4 ft.
The maximum vertical roof mount spacing:	3 ft.
Staggered roof mounts required?	Yes

Based on this analysis, we can certify that the individual existing roof framing members that support the PV panels; and the individual roof members as described in the attached report; are adequate to support the design loads as required by the various codes. This includes Dead Loads (including the weight of the PV panels), Live Loads, Snow Loads, and Wind Loads, on the roof members that support the PV panels, combined as required in the codes.

If you have any questions on this or need further clarification, please contact us at your convenience.

Sincerely,  
James A. Adams, S.E.



#### NOTE:

1. Prior to commencement of work, the Solar Installer shall verify that the roof framing sizes, spacing, and spans (between supports), are as noted in these plans. The Engineer of Record must be notified if any discrepancies are discovered, before proceeding.
2. These plans are Stamped for Structural Code compliance of the roof members that support the PV solar system only.
3. These plans are not stamped for rain water leakage prevention.
4. As a precaution, old or wet snow should be removed from the roof, if the snow builds up to 18" or more.

**Digitally Signed by**  
**James A. Adams, S.E.**  
**Date: 2021.08.23 14:31:47 -0700**



Date of Report: 08-23-2021/Rev C  
Data Input by: Gary Park  
Contact E-mail: gary@yoursolarplans.com  
Contact Phone: 8447835483

Job Name: Styburski, Jacob  
Job Number: STYBURSKI  
Job Address: 18 Meadowbrook Road  
Irvington, NY 10533

## **ABSTRACT**

This Report is based on Engineering calculations using the input data supplied by the user, listed under Current Input Data. The user input has not been independently reviewed by a licensed Professional Engineer for appropriateness or accuracy, unless Stamped by a P.E. This Report indicates Compliance/Non-Compliance with the reference Codes listed below. The following items have been checked for Code Compliance:

### **- Load Combination #1:**

Wind Uplift on the Standoff attachment to the Roof Framing members: Wind Uplift -  $0.6 * DL \text{ Solar}$

### **- Load Combination #2:**

Supporting Rafter Strength with:  $DL \text{ Rf} + DL \text{ Solar} + \text{Roof Live Load}$

### **- Load Combination #3:**

Supporting Rafter Strength with:  $DL \text{ Rf} + DL \text{ Solar} + \text{Wind Down}$

### **- Load Combination #4: Supporting Rafter**

Strength with:  $DL \text{ Rf} + DL \text{ Solar} + \text{Snow}$

### **- Load Combination #5:**

Supporting Rafter Strength with:  $DL \text{ Rf} + DL \text{ Solar} + .75\text{Wind} + .75\text{Snow}$

### **- Load Combination #6: Check Additional Seismic Load**

### **- Load Combination #7:**

Supporting Rafter Strength with:  
 $\text{Wind Up} - 0.6 * (DL \text{ Rf} + DL \text{ Solar})$

## **Job Information**

Data Input By: Gary Park  
Job Number: STYBURSKI  
Job Name: Styburski, Jacob  
Job Address: 18 Meadowbrook Road  
City, State: Irvington, NY 10533

## **Current Input Data**

Payment Method	Invoice
Roof Type	Truss
Ceiling Type	1/2 gyp. Bd.
Collar Tie Space	0
Coverage %	38.93
Frame Size	2x6@16
Ground Snow (psf)	30
Sloped Roof Snow Load (psf)	29.11
Lag Screw Diam. (in)	5/16
Lag Screw Embed. (in)	2.5
Overall Span (ft)	30
PV Weight (psf)	2.6
PV Module Orientation	Both
Rafter Span (ft)	14.25
Rail System	2Rail
Roof Mean Height (ft)	20
Roof Slope (degrees)	14
Roofing Type	Comp. Shingle
Sloped Ceiling	No
Max. Horizontal Roof Mount(ft)	4
Max. Vertical Roof Mounts (ft)	3
Standoff Staggered	Yes
Wind Exposure	B
Wind Speed (mph)	125



09/08/2021

To whom it concerns:

This letter is to inform you that there will be a meeting on November 27<sup>th</sup>, 2021 to discuss the installation of a rooftop PV system at 18 Meadowbrook Road, Irvington, NY 10533.

Information on the meeting can be found on the Villages website:

<https://www.irvingtonny.gov/139/Architectural-Review-Board>

If you have any question on the project, please feel free to contact me on my cell phone or email.

Best Regards,

Daniel Vitro

DMV EQUITY, INC.

President / Owner

Authorized SunPower Dealer

Cell: 808-218-4169

Email: [daniel@dmvequitysolar.com](mailto:daniel@dmvequitysolar.com)



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PHOTOVOLTAIC ROOF MOUNT SYSTEM

39 MODULES-ROOF MOUNTED - 15.600 kW DC, 13.611 kW AC, 18 MEADOWBROOK ROAD, IRVINGTON, NY 10533

PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	15.600 kW DC 13.611 kW AC
MODULE TYPE & AMOUNT:	(39) SPR-A400-BLK-G-AC
MODULE DIMENSIONS:	(L/W/H) 72.2"/40.0"/1.57"
INVERTER:	(39) SUNPOWER TYPE G / SPWR-A4 (IQ 7AS)
INTERCONNECTION METHOD:	LINE SIDE TAP
UTILITY METER #:	009675372
ACCOUNT #:	51-1702-5250-0003-3

GOVERNING CODES

ADOPTED CONSTRUCTION CODES

- 2020 RESIDENTIAL CODE OF NEW YORK STATE
- 2020 INTERNATIONAL PLUMBING CODE
- 2020 INTERNATIONAL MECHANICAL CODE
- 2020 INTERNATIONAL ENERGY CONSERVATION CODE
- 2020 INTERNATIONAL FIRE CODE
- 2017 NATIONAL ELECTRICAL CODE

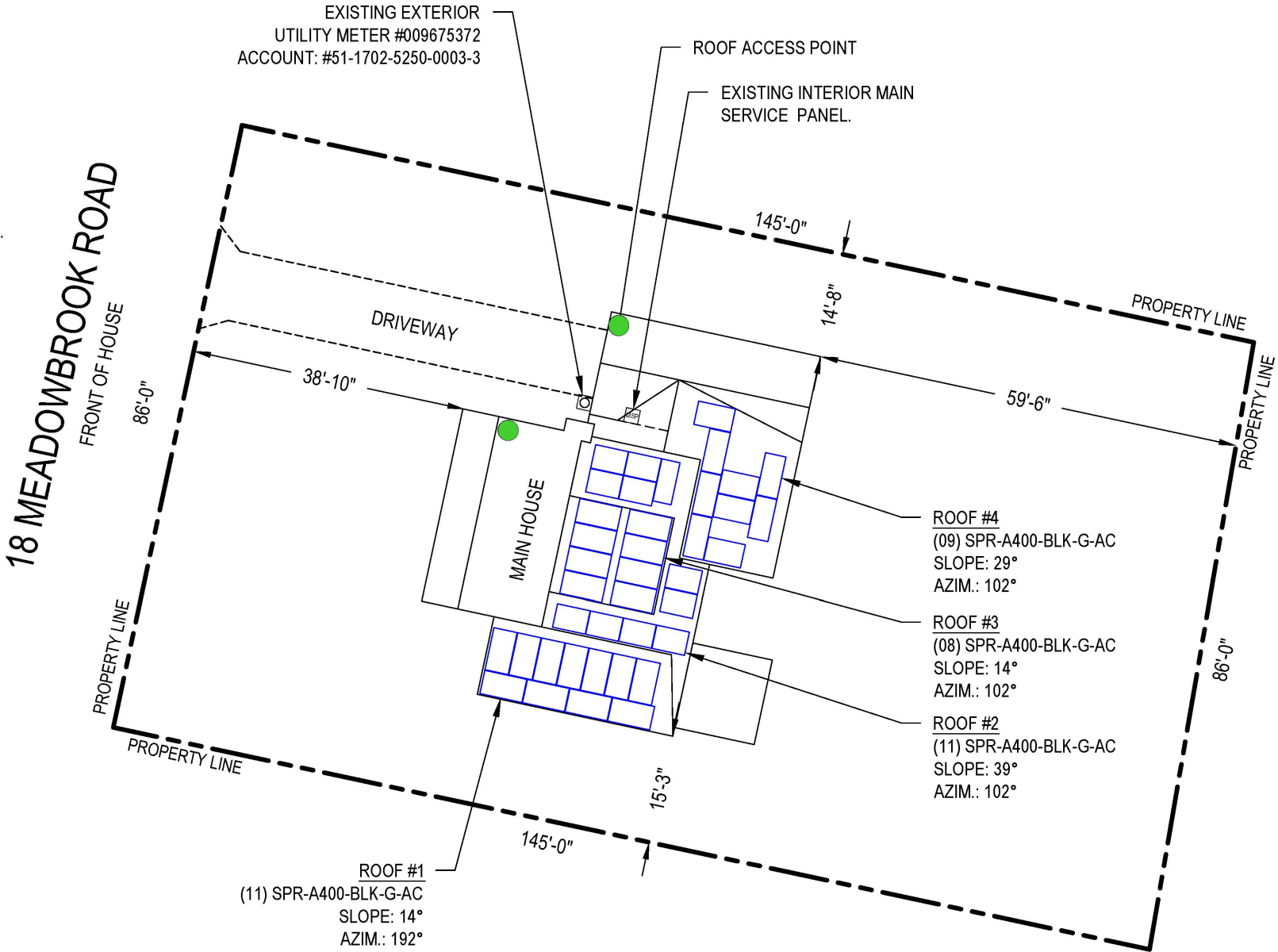
GENERAL NOTES:

- INSTALLATION OF SOLAR PHOTOVOLTAIC SYSTEM SHALL BE IN ACCORDANCE WITH NEC ARTICLE 690, AND ALL OTHER APPLICABLE NEC CODES WHERE NOTED OR EXISTING.
- PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL COMPLY WITH NEC ARTICLE 110.
- ALL CONDUCTORS, INCLUDING THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE IN ACCORDANCE WITH NEC ARTICLE 250.
- THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE; THIS SYSTEM IS UTILITY INTERACTIVE PER UL 1741 AND DOES NOT INCLUDE STORAGE BATTERIES OR OTHER ALTERNATIVE STORAGE SOURCES.
- ALL DC WIRES SHALL BE SIZED ACCORDING TO [NEC 690.8]
- DC CONDUCTORS SHALL BE WITHIN PROTECTED RACEWAYS IN ACCORDANCE WITH [NEC 690.31]
- ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL JURISDICTIONAL BUILDING CODE.
- PV MODULES TO BE RATED UL 1703 CLASS C FIRE RATING OR BETTER.
- ALL EQUIPMENT TO BE CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY.

1 PLOT PLAN

PV 0.0

SCALE: 3/64" = 1'0"

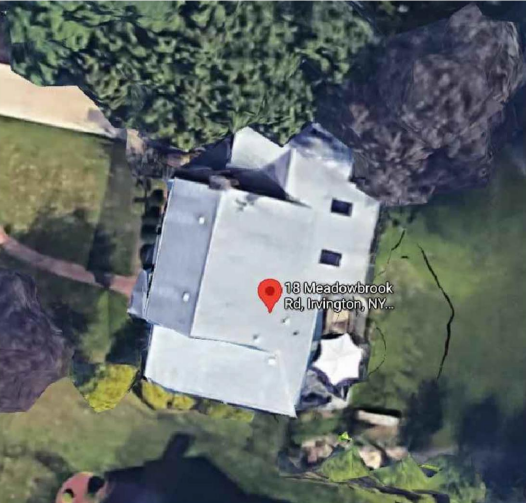


SHEET INDEX:

PV 0.0:	COVER SHEET
PV 1.0:	SITE PLAN
PV 2.0:	ROOF PLAN
S 1.1:	MOUNT DETAILS
E 1.1:	3-LINE DIAGRAM
E 1.2:	NOTES
E 1.3:	WARNING LABELS
DS+	EQUIPMENT SPEC SHEET

● ROOF ACCESS POINT

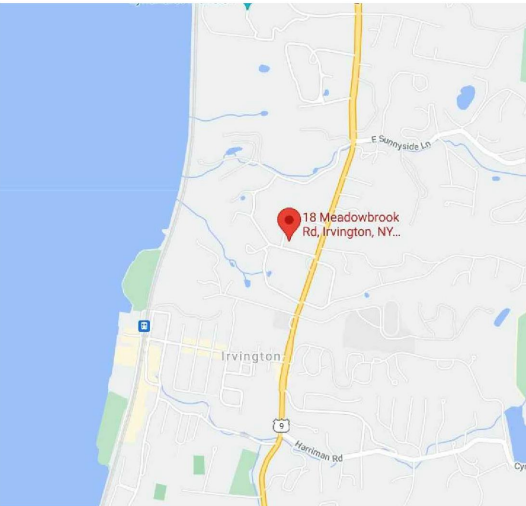
ROOF ACCESS POINT SHALL NOT BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.



2 SATELLITE VIEW

PV 0.0

SCALE: NTS



3 VICINITY MAP

PV 0.0

SCALE: NTS

DMV EQUITY, INC.  
525 ROCKLAND AVE  
MAMARONECK,  
NY 10543  
WC-29935-H17

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COVER SHEET

Sheet Size  
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11" X 17"

Sheet Number  
PV 0.0

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PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE: 15.600 kW DC  
13.611 kW AC  
MODULE TYPE & AMOUNT: (39) SPR-A400-BLK-G-AC  
MODULE DIMENSIONS: (L/W/H) 72.2"/40.0"/1.57"  
INVERTER: (39) SUNPOWER TYPE G / SPWR-A4 (IQ 7AS)

BILL OF MATERIALS		
NUMBER OF MODULES	39	SPR-A400-BLK-G-AC
NUMBER OF INVERTER	39	SUNPOWER TYPE G / SPWR-A4 (IQ 7AS)
SOLAR COMBINER	1	125A SOLAR COMBINER PANEL, 240V
AC DISCONNECT	1	100A FUSIBLE AC DISCONNECT, 80A FUSES, 240V
NUMBER OF ATTACHMENTS	121	SUNPOWER FLASHINGS
RAILS	24	INVISIMOUNT RACKING
RAIL SPLICE	6	SPLICE KIT
MID CLAMPS	44	MID CLAMPS / UFO
END CLAMPS	68	END CLAMPS / STOPPER SLEEVE
GROUNDING LUG	17	GROUNDING LUG



SYSTEM LEGEND

MSP

EXISTING INTERIOR MAIN SERVICE PANEL & POINT OF INTERCONNECTION. TIED TO EXTERIOR UTILITY METER #009675372.

AC

NEW PHOTOVOLTAIC AC DISCONNECT.

39 NEW SPR-A400-BLK-G-AC MODULES WITH INTEGRATED 39 - SUNPOWER TYPE G / SPWR-A4 (IQ 7AS) INVERTERS, MOUNTED ON THE BACK OF EACH MODULES.

C

NEW SOLAR LOAD CENTER

M

NEW PVS6 MONITORING

= FIRE PATHWAY

= ROOF OBSTRUCTIONS

= ATTACHMENT POINTS

= RAFTER

= RACKING SYSTEM

= CONDUIT EXTERIOR RUN

= ROOF TOP JUNCTION BOX

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ROOF SECTIONS

ROOF #01

MODULE - 11  
SLOPE - 14°  
AZIMUTH - 192°  
MATERIAL - COMP. SHINGLE  
RAFTER SIZE & SPACING - 2"x6" @ 16" O.C.

ROOF #02

MODULE - 11  
SLOPE - 39°  
AZIMUTH - 102°  
MATERIAL - COMP. SHINGLE  
RAFTER SIZE & SPACING - 2"x6" @ 16" O.C.

ROOF #03

MODULE - 08  
SLOPE - 14°  
AZIMUTH - 102°  
MATERIAL - COMP. SHINGLE  
RAFTER SIZE & SPACING - 2"x6" @ 16" O.C.

ROOF #04

MODULE - 09  
SLOPE - 29°  
AZIMUTH - 102°  
MATERIAL - COMP. SHINGLE  
RAFTER SIZE & SPACING - 2"x6" @ 16" O.C.

Project Name & Address

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Sheet Name

SITE PLAN

Sheet Size

ANSI B  
11" X 17"

Sheet Number

PV 1.0

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STRING(S)

STRING #1 - 11 MODULES

STRING #2 - 10 MODULES

STRING #3 - 09 MODULES

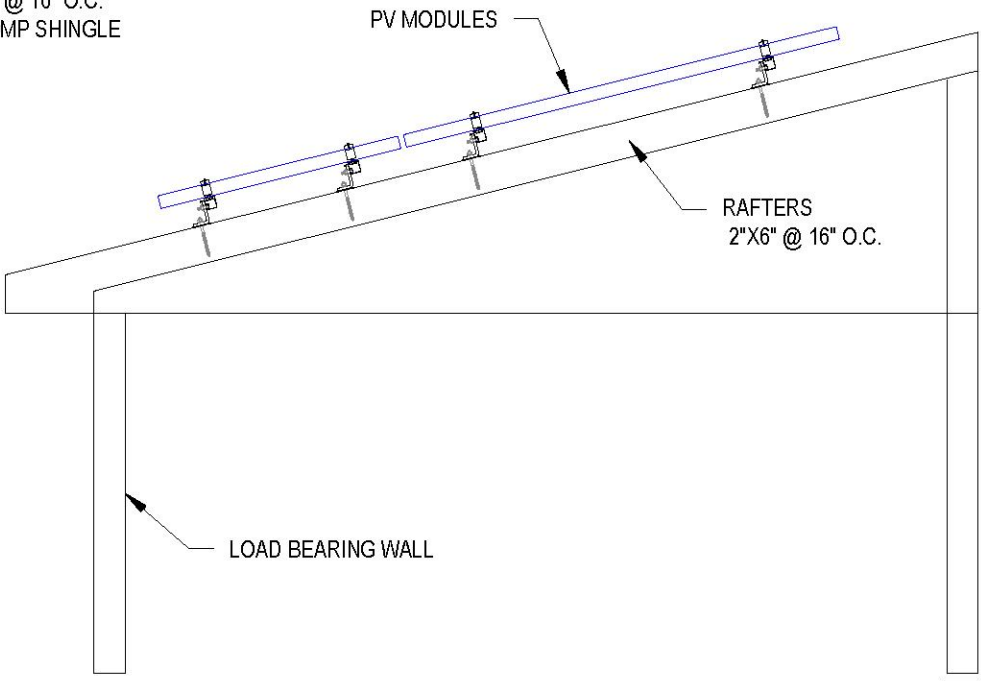
STRING #4 - 09 MODULES

MODULE, ARRAY WEIGHT (LOAD CALC'S)		
Number of Modules	39	
Module Weight	46.5	LBS
Total Module (Array) Weight	1813.50	LBS
Number of Attachment point	121	
Mounting System Weight (Per Module)	1.5	LBS
Mounting System Weight	181.50	LBS
Total System Weight (Module Weight + Mounting System Weight)	1995.00	LBS
Weight at Each Attachment Point (Array Weight / Number of Attachment Point)	14.99	LBS
Module Area (72.2"x40.0")	20.06	SqFt
Total Array Area	782.17	SqFt
Distributed Load (Total System Weight / Total Array Area)	2.39	Per SqFt
Total Roof Area	2009	SqFt
Total Percentage or Roof Covered (Total Array Area / Total Roof Area)*100	38.93%	

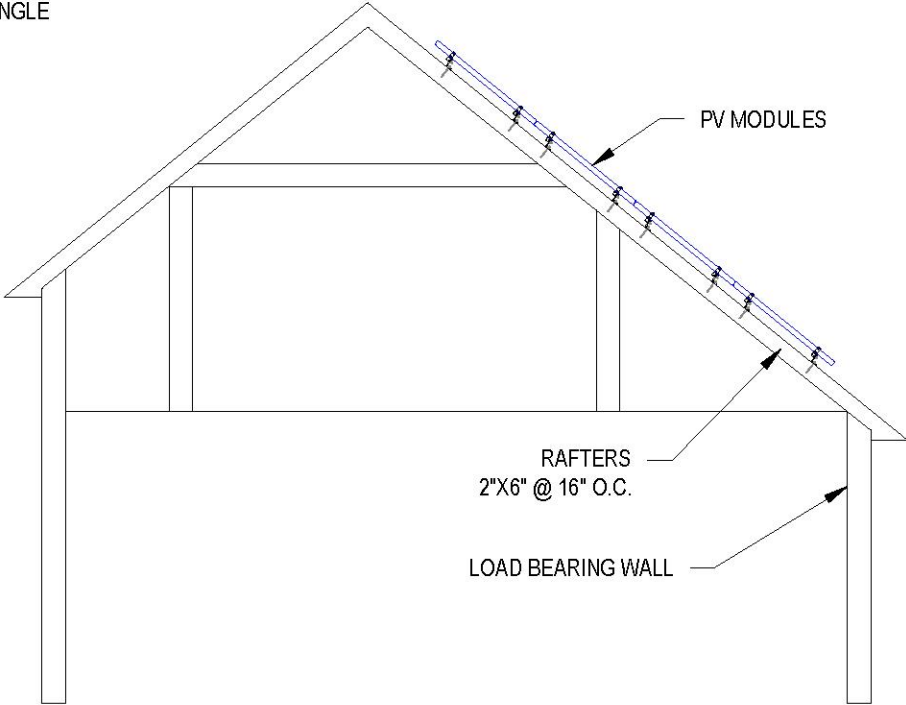




RAFTERS 2"x6" @ 16" O.C.  
ONE LAYER COMP SHINGLE



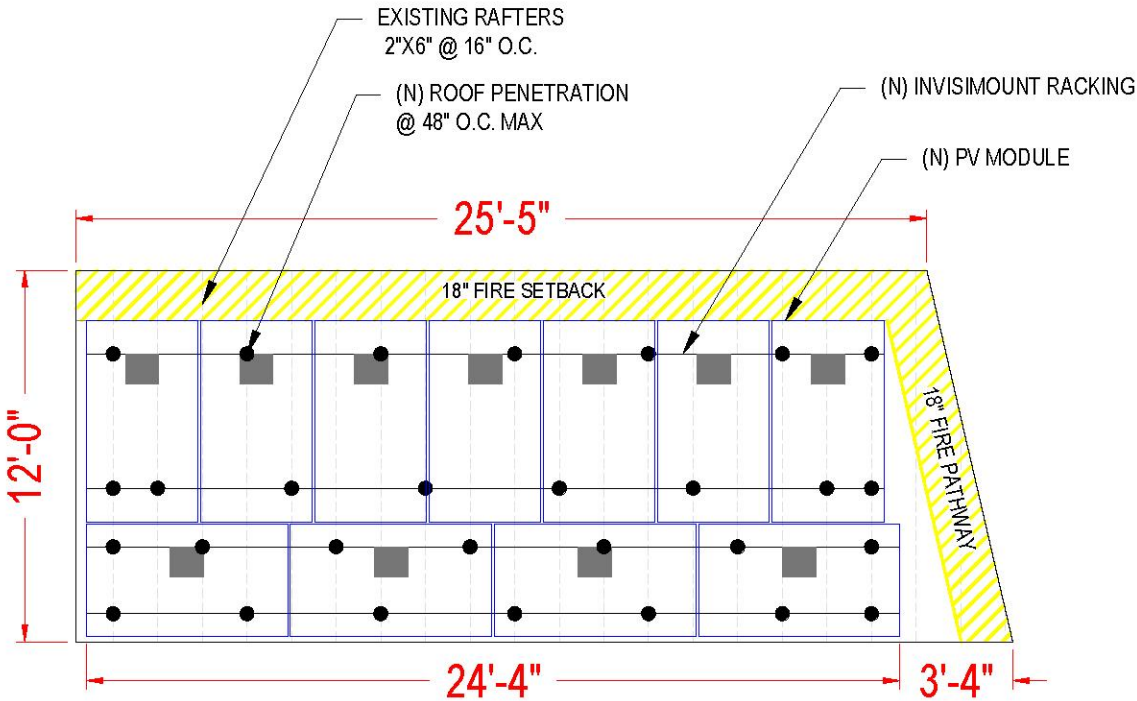
RAFTERS 2"x6" @ 16" O.C.  
ONE LAYER COMP SHINGLE



1 ROOF#1 STRUCTURAL MEMBRANE DETAIL  
PV 2.0 SCALE: NTS

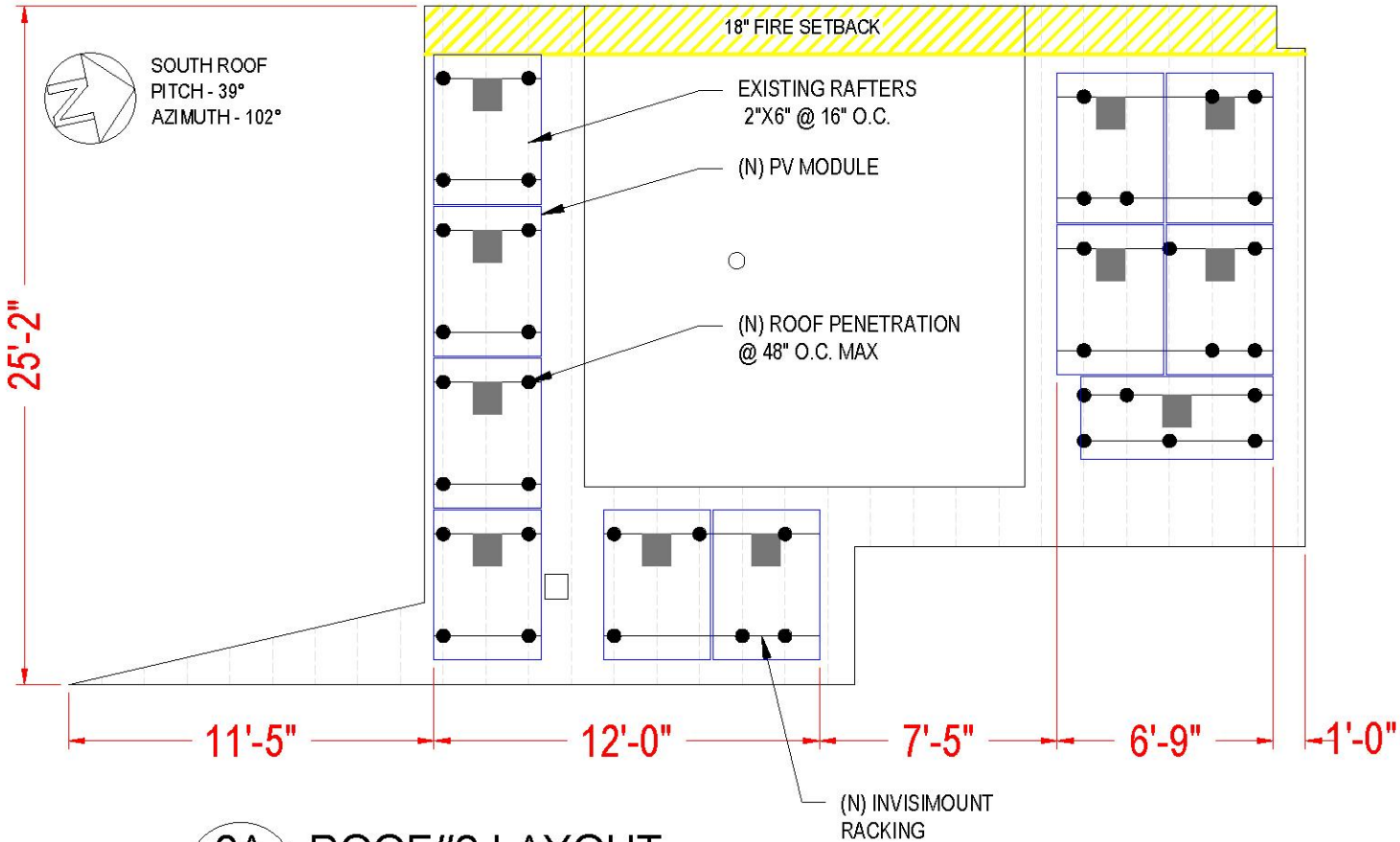
2 ROOF#2 STRUCTURAL MEMBRANE DETAIL  
PV 2.0 SCALE: NTS

SOUTH ROOF  
PITCH - 14°  
AZIMUTH - 192°



1A ROOF#1 LAYOUT  
PV 2.0 SCALE: NTS

SOUTH ROOF  
PITCH - 39°  
AZIMUTH - 102°



2A ROOF#2 LAYOUT  
PV 2.0 SCALE: NTS

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Sheet Name  
ROOF PLAN

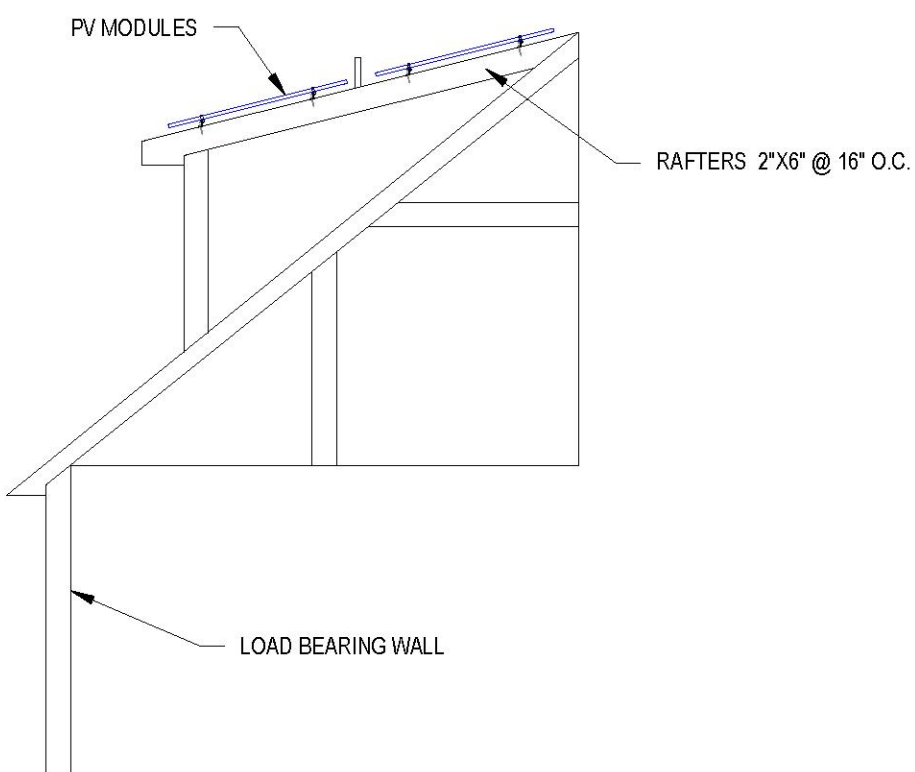
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PV 2.0

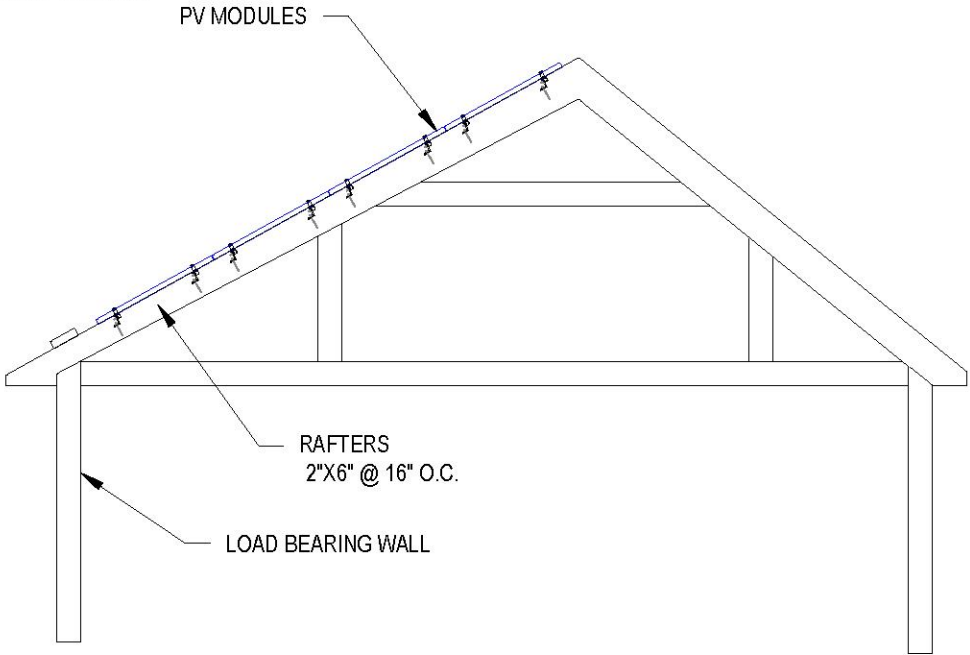
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RAFTERS 2"x6" @ 16" O.C.  
ONE LAYER COMP SHINGLE



RAFTERS 2"x6" @ 16" O.C.  
ONE LAYER COMP SHINGLE

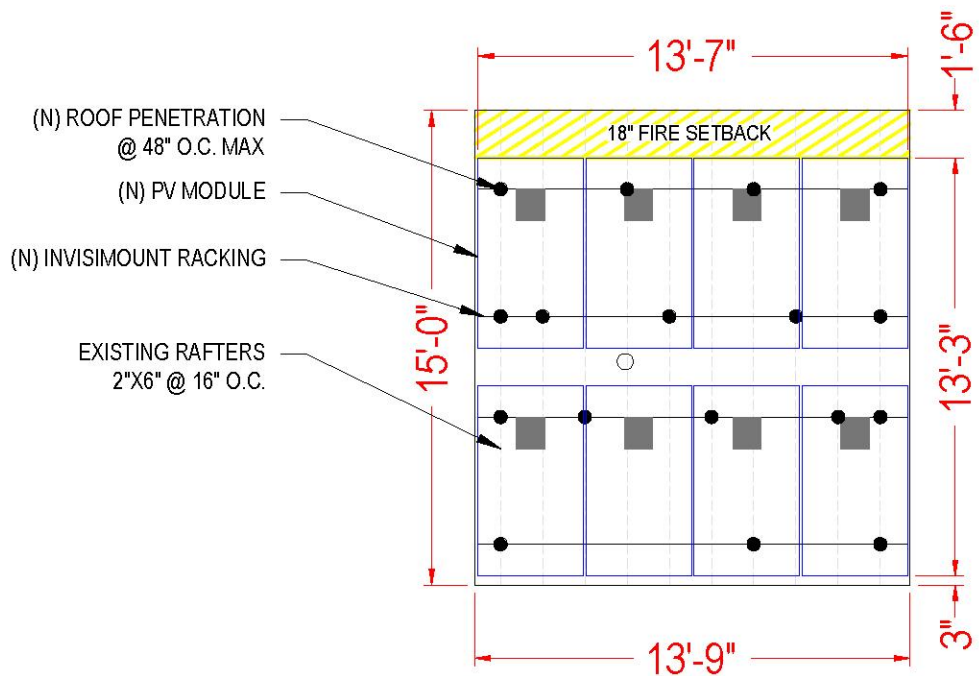


3 ROOF#3 STRUCTURAL MEMBRANE DETAIL  
PV 2.1 SCALE: NTS

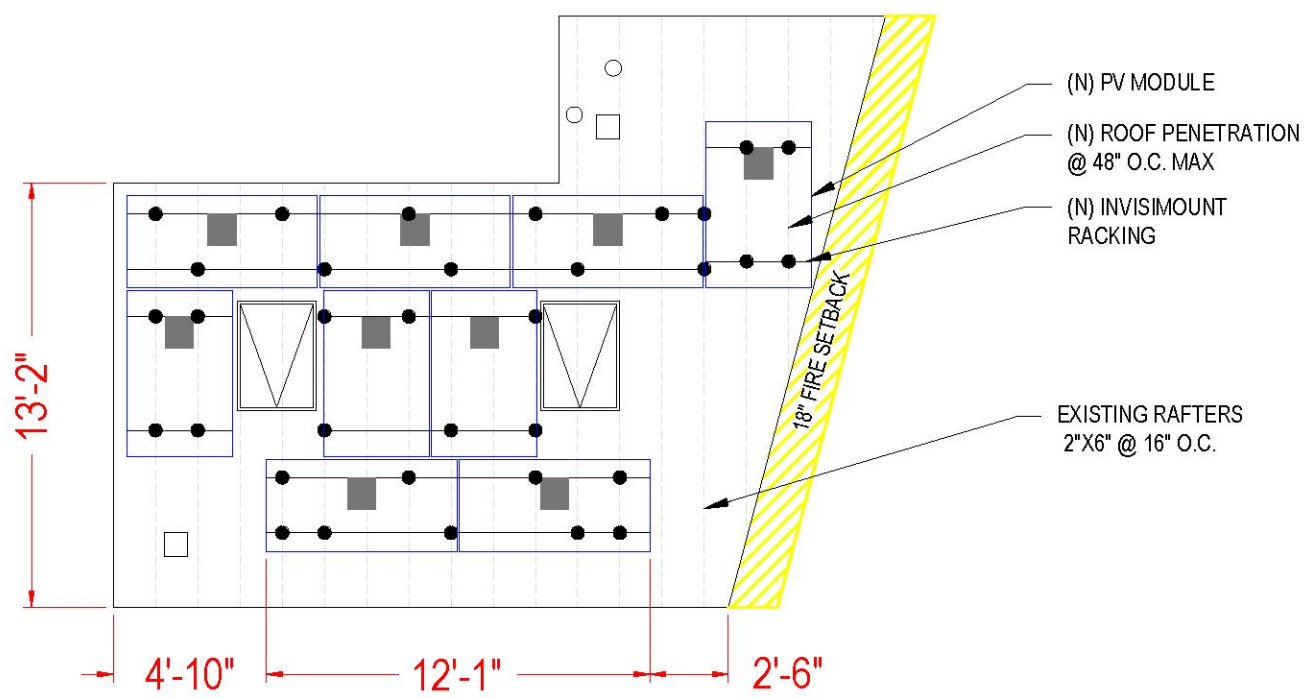
4 ROOF#4 STRUCTURAL MEMBRANE DETAIL  
PV 2.1 SCALE: NTS

SOUTH ROOF  
PITCH - 14°  
AZIMUTH - 102°

SOUTH ROOF  
PITCH - 29°  
AZIMUTH - 102°



3A ROOF 3 LAYOUT  
PV 2.1 SCALE: NTS



4A ROOF#4 LAYOUT  
PV 2.1 SCALE: NTS

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ROOF PLAN

Sheet Size  
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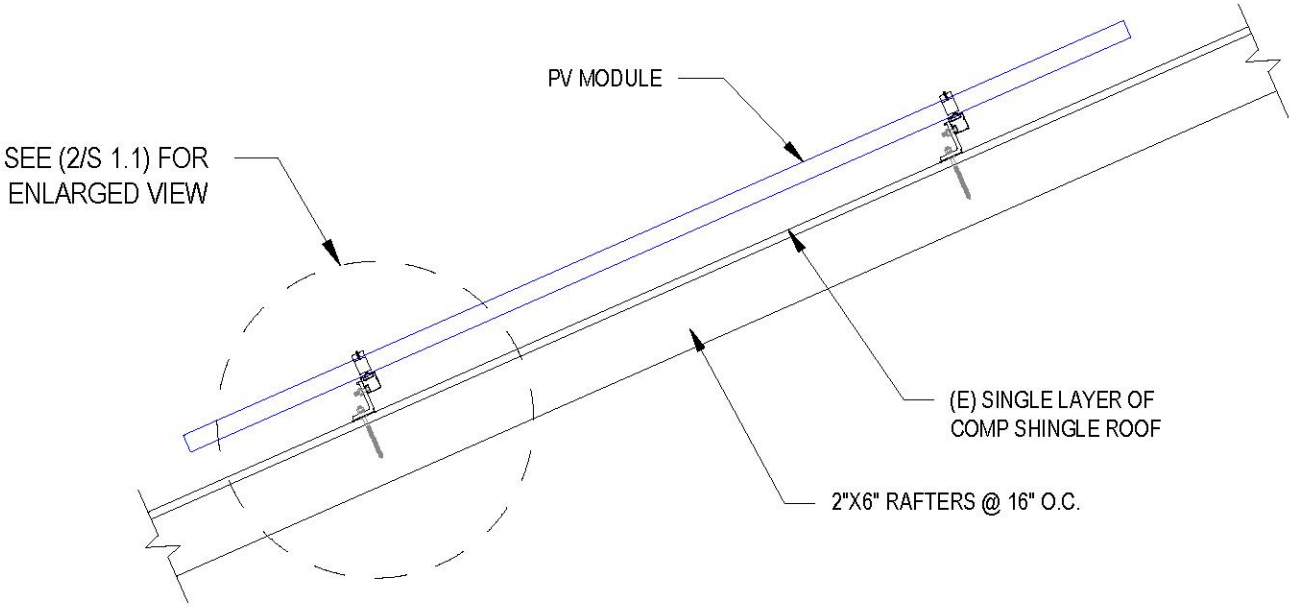
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PV 2.1

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GENERAL STRUCTURAL NOTES:

- 1. THE SOLAR PANELS ARE TO BE MOUNTED TO THE ROOF FRAMING USING THE SUNPOWER INVISIMOUNT RACKING COMPOSITION. THE MOUNTING FEET ARE TO BE SPACED AS SHOWN IN THE DETAILS, AND MUST BE STAGGERED TO ADJACENT FRAMING MEMBERS TO SPREAD OUT THE ADDITIONAL LOAD.
- 2. UNLESS NOTED OTHERWISE, MOUNTING ANCHORS SHALL BE 5/16" LAG SCREWS WITH A MINIMUM OF 2-1/2" PENETRATION INTO ROOF FRAMING.
- 3. THE PROPOSED PV SYSTEM ADDS 2.6 PSF TO THE ROOF FRAMING SYSTEM.
- 4. ROOF LIVE LOAD = 20 PSF TYPICAL, 0 PSF UNDER NEW PV SYSTEM.
- 5. GROUND SNOW LOAD = 30 PSF
- 6. WIND SPEED = 124 MPH
- 7. EXPOSURE CATEGORY = B
- 8. RISK CATEGORY = II



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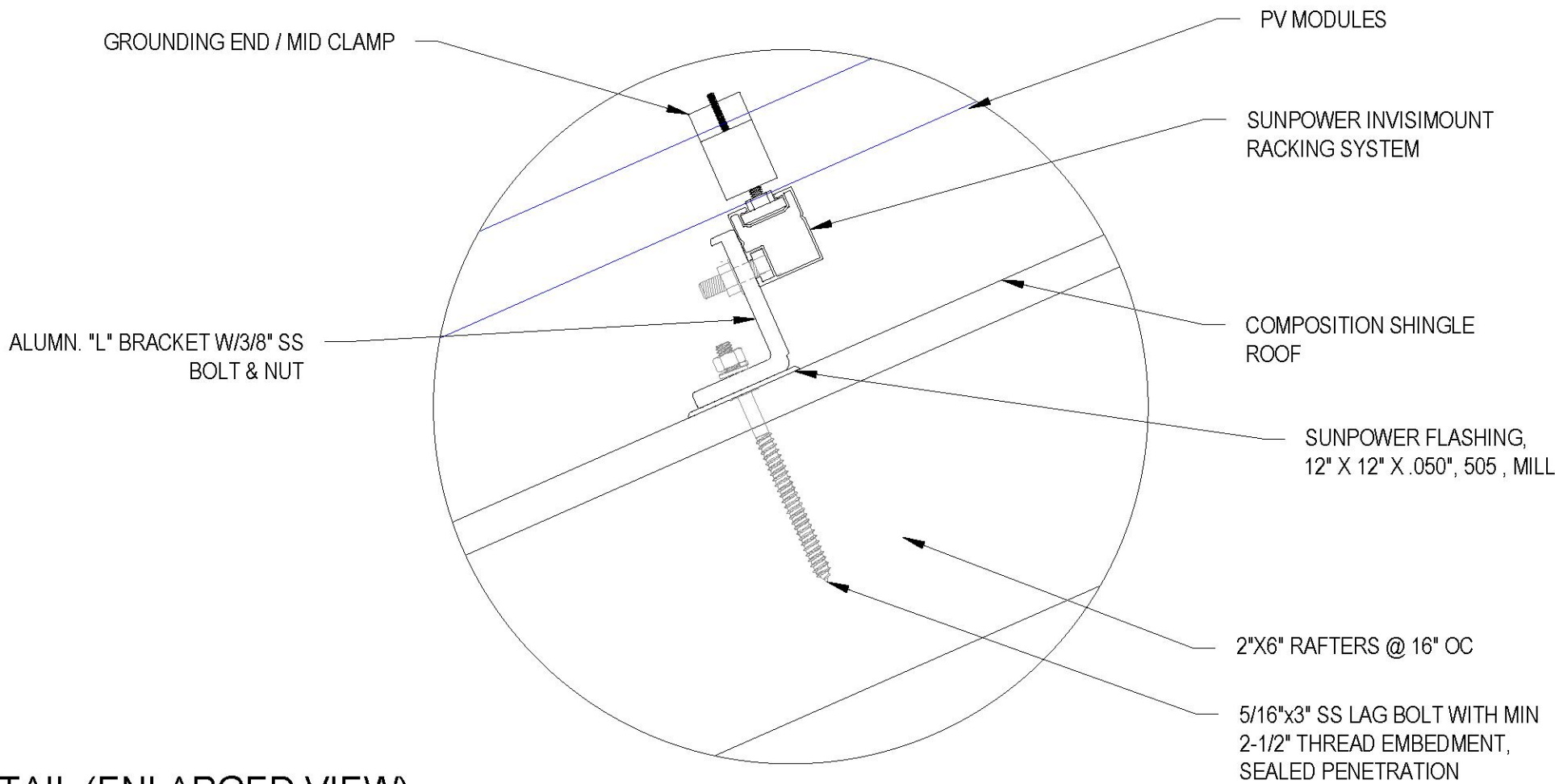
Sheet Name  
MOUNT DETAIL

Sheet Size  
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Sheet Number  
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1 ATTACHMENT DETAIL (SIDE VIEW)  
SCALE: NTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)  
SCALE: NTS



SUNPOWER A400-BLK-G-AC : AC ELECTRICAL DATA		
INVERTER MODEL	SUNPOWER TYPE G / SPWR-A4 (IQ 7AS)	
PEAK OUTPUT POWER	366 VA	
MAX. CONT. OUTPUT POWER	349 VA	
NOMINAL AC VOLTAGE	240 VOLTS	
MAX. AC CURRENT	1.45 AMPS	
MAX. OCPD RATING	20 AMPS	
MAX. PANELS/CIRCUIT	11	

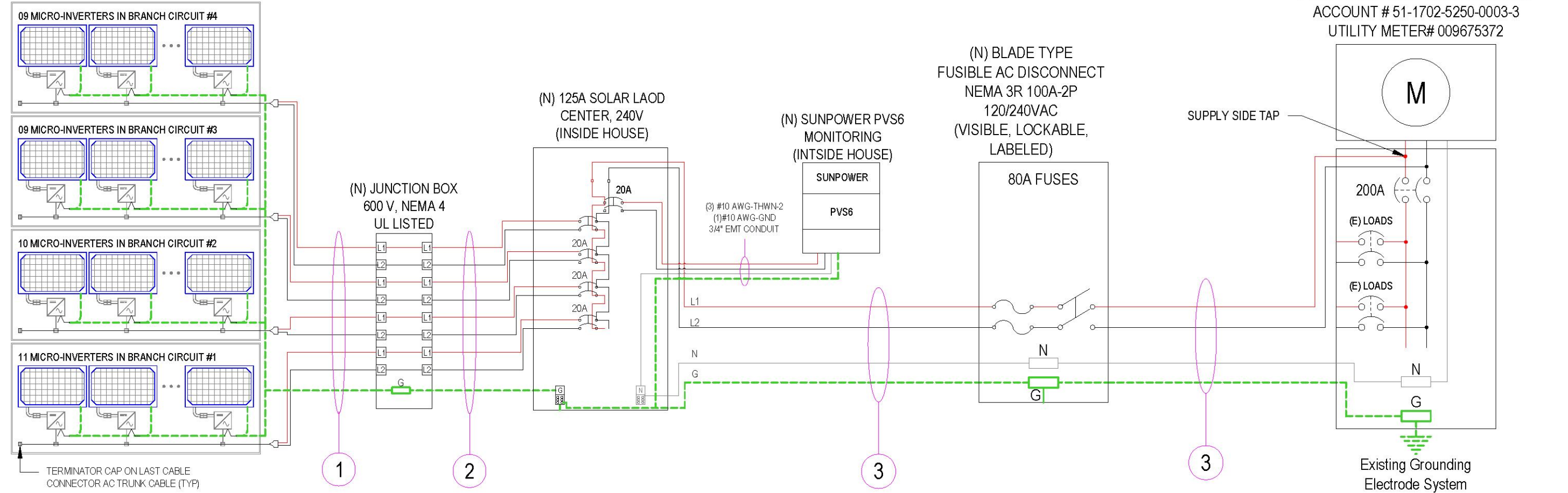
MODULE: (39) SPR-A400-BLK-G-AC  
INVERTER: (39) SUNPOWER TYPE G / SPWR-A4 (IQ 7AS)

THIS PANEL IS FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)		
AC OUTPUT CURRENT	56.55A	
NOMINAL AC VOLTAGE	240V	

120% RULE
BUS BAR RATING X 120% - MAIN BREAKER RATING = MAX. PV OCPD
(200A x 120%) - 200A = 40A

Rooftop conductor ampacities designed in compliance with art. 690.8, Tables 310.15(B)(2)(a), 310.15(B)(3)(a), 310.15(B)(3)(c), 310.15(B)(16), Chapter 9 Table 4, 5, & 9. Location specific temperature obtained from ASHRAE 2017 data tables	
RECORD LOW TEMP	-17°C
AMBIENT TEMP (HIGH TEMP 2%)	32°C
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	54°C
CONDUCTOR TEMPERATURE RATE	90°C

(39) SUNPOWER TYPE G / SPWR-A4 (IQ 7AS)  
240VAC, 1.45A MAX  
CEC WEIGHTED EFFICIENCY 97.0%  
NEMA 4R, UL LISTED, INTERNAL GFDI



WIRE TAG #	MAX PARALLEL DEVICES		C.C RATING		PV CURR. MULT		TOTAL CURR	CONT. CURR X 125%	WIRE SIZE\TYPE\AMP.	WIRE OCP	#C.C.C.	CONDUIT	TEMP DE-RATE:	CONDUIT FILL:		WIRE AMP:	DERATED AMPACITY	MAX. CONT. CURRENT	GND	
①	11	x	1.45	x	N/A	=	15.95A	19.94A	#12\ THWN \ 25A @90°C	20A	8	TRUNK CABLE IN AIR	0.96	x	N/A	x	25A	24.00A	15.95A	#6 AWG
②	11	x	1.45	x	N/A	=	15.95A	19.94A	#10\ THWN \ 35A @75°C	20A	8	3/4" EMT	0.94	x	0.70	x	35A	23.03A	15.95A	#8 AWG
③	39	x	1.45	x	N/A	=	56.55A	70.69A	#4 \ THWN \ 85A @75°C	80A	3	1" EMT	0.94	x	1.00	x	85A	79.90A	56.55A	#8 AWG

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Sheet Name  
3-LINE  
DIAGRAM

Sheet Size  
ANSI B  
11" X 17"

Sheet Number  
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SITE NOTES:

- 1. A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- 2. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
- 3. THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- 4. PROPERACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PERSECTION NEC 110.26.
- 5. ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.

EQUIPMENT LOCATIONS:

- 1. ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.
- 2. WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).
- 3. JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
- 4. ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT. 2.2.6 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
- 5. ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

STRUCTURAL NOTES:

- 1. RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUSTALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S INSTRUCTIONS.
- 2. JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
- 3. ROOFTOP PENETRATIONS FOR PV RACEWAY WILLBE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
- 4. ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER. 2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

WIRING & CONDUIT NOTES:

- 1. ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS AREBASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
- 2. CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
- 3. VOLTAGE DROP LIMITED TO 1.5%.
- 4. DC WIRING LIMITED TO MODULE FOOTPRINT. MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.
- 5. AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3- BLUE, YELLOW, ORANGE\*\*, OR OTHER CONVENTION NEUTRAL- WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].

GROUNDING NOTES:

- 1. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVISES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
- 2. PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.
- 3. METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).
- 4. EQUIPMENT GROUNDING CONDUCTORS SHALLBE SIZED ACCORDING TO NEC 690.45 AND MICROINVERTER MANUFACTORERS' INSTRUCTIONS.
- 5. EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURERDOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.
- 6. THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OFA MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
- 7. GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]
- 8. THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.
- 9. GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:

- 1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHENTHE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARECONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
- 2. DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
- 3. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D).
- 4. ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.
- 5. MICROINVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).
- 6. IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.

INTERCONNECTION NOTES:

- 1. LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)]
- 2. THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(D)(2)(3)].
- 3. THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].
- 4. AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C).
- 5. FEEDER TAP INTERCONECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1)
- 6. SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42 2.7.8BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].

DMV EQUITY, INC.  
525 ROCKLAND AVE  
MAMARONECK,  
NY 10543  
WC-29935-H17

REVISIONS		
Description	Date	Rev
Initial Design	8/23/2021	00

Signature with Seal

Project Name & Address

JACOB STYBURSKI RESIDENCE

18 MEADOWBROOK ROAD,  
IRVINGTON, NY 10533

Sheet Name

NOTES

Sheet Size

ANSI B  
11" X 17"

Sheet Number

E 1.2

Drawn By

PremiumCAD



**⚠ WARNING ⚠**  
ELECTRICAL SHOCK HAZARD  
DO NOT TOUCH TERMINALS.  
TERMINALS ON LINE AND LOAD  
SIDES MAY BE ENERGIZED IN  
THE OPEN POSITION

PER CODE(S): NEC 2017: 690.13(B)

**⚠ WARNING ⚠**  
ELECTRICAL SHOCK HAZARD  
DO NOT TOUCH TERMINALS.  
TERMINALS ON LINE AND LOAD  
SIDES MAY BE ENERGIZED IN  
THE OPEN POSITION

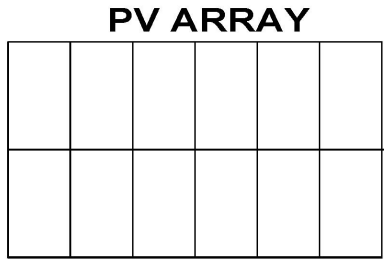
LABEL LOCATION:  
INVERTER(S), AC DISCONNECT(S), AC  
COMBINER PANEL (IF APPLICABLE).  
PER CODE(S): NEC 2017: 690.17(4)

**⚠ WARNING ⚠** DUAL POWER SOURCE  
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

POINT OF INTERCONNECTION  
NEC 705.12(D)(3) & NEC 690.64

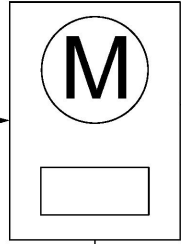
**PHOTOVOLTAIC SYSTEM  
EQUIPPED WITH  
RAPID SHUTDOWN**

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): NEC 2017: ARTICLE 690.56(C)



**WARNING: PHOTOVOLTAIC  
POWER SOURCE**

(PER CODE: NEC 690.31(G)(3)(4) & NEC 690.13(G)(4))



**⚠ WARNING ⚠**  
INVERTER OUTPUT CONNECTION  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE

PER CODE(S): NEC 2017: 705.12(B)(2)(3)(b):

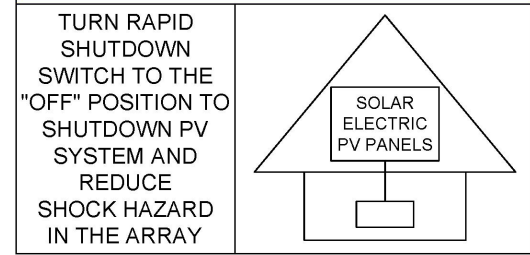
**PHOTOVOLTAIC  
AC DISCONNECT**

(PER CODE: NEC 690.14 (C) (1))

**SOLAR PHOTOVOLTAIC  
SYSTEMS**

(PER CODE: NEC 690)

**SOLAR PV SYSTEM  
EQUIPPED WITH RAPID  
SHUTDOWN**



AT INVERTER [IFC 605.11.3.1(1) & 690.56(C)(1)(a)]

PER CODE: NEC 2017

**SOLAR PHOTOVOLTAIC  
SYSTEMS**

(PER CODE: NEC 690)

**SOLAR PHOTOVOLTAIC  
SYSTEMS**

(PER CODE: NEC 690)

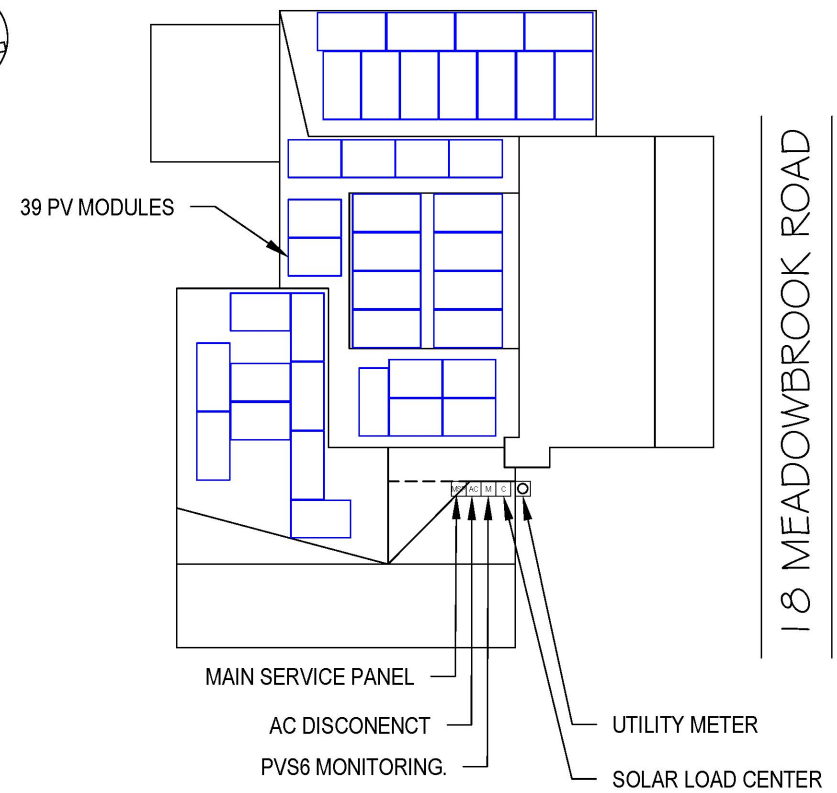
**PHOTOVOLTAIC SYSTEM AC DISCONNECT**  
RATED AC OPERATING CURRENT 56.55 AMPS  
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:  
AC DISCONNECT, POINT OF INTERCONNECTION  
(PER CODE: NEC 690.54)

**CAUTION:**

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE  
FOLLOWING SOURCES WITH DISCONNECT(S) LOCATED AS  
SHOWN.

DANGEROUS VOLTAGE MAY BE PRESENT AT ALL TIMES



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WARNING  
LABELS

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11" X 17"

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E 1.3

Drawn By

**PremiumCAD**





SUNPOWER®

## A-Series A400-BLK | A390-BLK SunPower® Residential AC Module

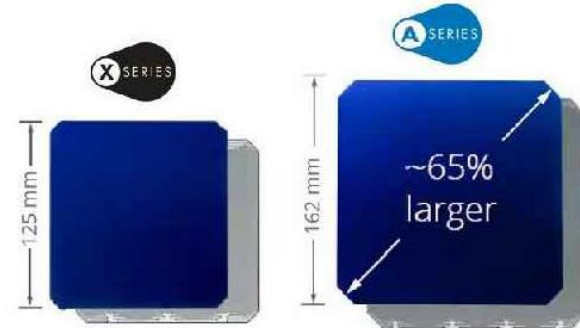
SunPower® Maxeon® Technology

Built specifically for use with the SunPower Equinox™ system, the only fully integrated solution designed, engineered, and warranted by one manufacturer.



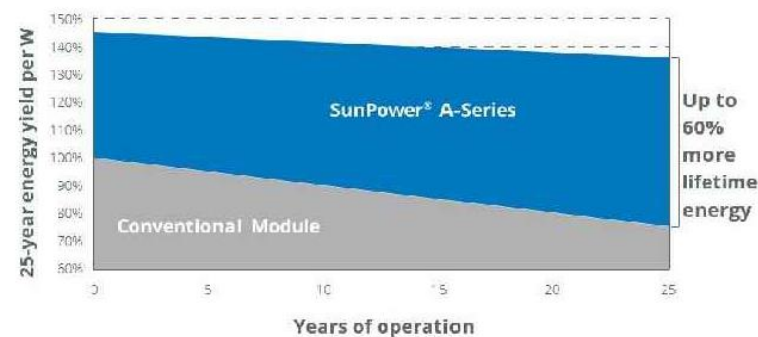
### Highest Power Density Available.

SunPower's new Maxeon® Gen 5 cell is 65% larger than prior generations, delivering the most powerful cell and highest-efficiency module in residential solar. The result is more power per square meter than any commercially available solar.



### Highest Lifetime Energy and Savings.

Designed to deliver 60% more energy over 25 years in real-world conditions like partial shade and high temperatures.<sup>1</sup>



### Best Reliability. Best Warranty.

With more than 25 million modules deployed around the world, SunPower technology is proven to last. That's why we stand behind our module and microinverter with the industry's best 25-year Combined Power and Product Warranty, including the highest Power Warranty in solar.



### Fundamentally Different. And Better.



SunPower® Maxeon® Technology

- Most powerful cell in home solar<sup>2</sup>
- Delivers unmatched reliability<sup>3</sup>
- Patented solid metal foundation prevents breakage and corrosion



Factory-integrated Microinverter (MI)

- Highest-power integrated AC module in solar
- 60% lighter than prior SunPower MIs
- Engineered and calibrated by SunPower for SunPower AC modules

## A-Series: A400-BLK | A390-BLK SunPower® Residential AC Module

AC Electrical Data	
Inverter Model: Type G / SPWR-A4 (IQ 7AS)	@240 VAC
Peak Output Power	366 VA
Max. Continuous Output Power	349 VA
Nom. (L-L) Voltage/Range <sup>2</sup> (V)	240 / 211-264
Max. Continuous Output Current (A)	1.45
Max. Units per 20 A (L-L) Branch Circuit <sup>3</sup>	11
CEC Weighted Efficiency	97.0%
Nom. Frequency	60 Hz
Extended Frequency Range	47-68 Hz
AC Short Circuit Fault Current Over 3 Cycles	5.8 A rms
Overvoltage Class AC Port	III
AC Port Backfeed Current	18 mA
Power Factor Setting	1.0
Power Factor (adjustable)	0.7 lead. / 0.7 lag.

DC Power Data		
	A400-BLK-G-AC	A390-BLK-G-AC
Nom. Power <sup>5</sup> (Phom) W	400	390
Power Tol.	+5/-0%	
Module Efficiency	21.5	20.9
Temp. Coef. (Power)	-0.29%/°C	
Shade Tol.	Integrated module-level max. power point tracking	

Tested Operating Conditions		
Operating Temp.	-40°F to +185°F (-40°C to +85°C)	
Max. Ambient Temp.	122°F (50°C)	
Max. Test Load <sup>7</sup>	Wind: 125 psf, 6000 Pa, 611 kg/m² back Snow: 187 psf, 9000 Pa, 917 kg/m² front	
Design Load	Wind: 75 psf, 3600 Pa, 367 kg/m² back Snow: 125 psf, 6000 Pa, 611 kg/m² front	
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)	

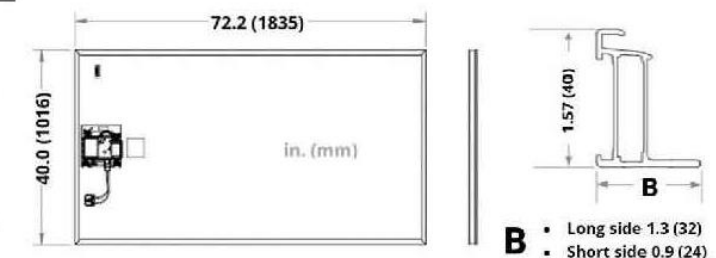
Mechanical Data		
Solar Cells	66 Monocrystalline Maxeon Gen 5	
Front Glass	High-transmission tempered glass with anti-reflective coating	
Environmental Rating	Outdoor rated	
Frame	Class 1 black anodized (highest AAMA rating)	
Weight	46.5 lbs (21.1 kg)	
Recommended Max. Module Spacing	1.3 in. (33 mm)	

Warranties, Certifications, and Compliance	
Warranties	• 25-year limited power warranty • 25-year limited product warranty
Certifications and Compliance	• UL 1703 • UL 1741 / IEEE-1547 • UL 1741 AC Module (Type 2 fire rated) • UL 62109-1 / IEC 62109-2 • FCC Part 15 Class B • IECES-0003 Class B • CAN/CSA-C22.2 NO. 107.1-01 • CA Rule 21 (UL 1741 SA) <sup>6</sup> (Includes Volt/Var and Reactive Power Priority) • UL Listed PV Rapid Shutdown Equipment <sup>6</sup>  Enables installation in accordance with: • NEC 690.6 (AC module) • NEC 690.12 Rapid Shutdown (inside and outside the array) • NEC 690.15 AC Connectors, 690.33(A)-(E)(1)  When used with InvisiMount racking and InvisiMount accessories (UL 2703): • Module grounding and bonding through InvisiMount. • Class A fire rated When used with AC module Q Cables and accessories (UL 6703 and UL 2238) <sup>6</sup> : • Rated for load break disconnect
PID Test	Potential-induced degradation free

- 1 SunPower 415 W, 22.3% efficient, compared to a Conventional Panel on same-sized arrays (260 W, 16% efficient, approx. 1.6 m², 7.9% more energy per watt (based on PVsyst pan files for avg. US climate), 0.5%/yr slower degradation rate (Jordan, et. al. "Robust PV Degradation Methodology and Application," PVSC 2018).
- 2 Based on search of datasheet values from websites of top 10 manufacturers per IHS, as of January 2019.
- 3 #1 rank in "Fraunhofer PV Durability Initiative for Solar Modules: Part 3," PVTech Power Magazine, 2015. Campeau, Z. et al., "SunPower Module Degradation Rate," SunPower white paper, 2013.
- 4 Factory set to 1547a-2014 default settings, CA Rule 21 default settings profile set during commissioning.
- 5 Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25°C), NREL calibration standard: SOMS current, LACCS FF and voltage. All DC voltage is fully contained within the module.
- 6 This product is UL Listed as PVRSE and conforms with NEC 2014 and NEC 2017 690.12; and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors; when installed according to manufacturer's instructions.
- 7 Please read the safety and installation instructions for more information regarding load ratings and mounting configurations.

See [www.sunpower.com/facts](http://www.sunpower.com/facts) for more reference information.

For more details, see extended datasheet: [www.sunpower.com/datasheets](http://www.sunpower.com/datasheets) Specifications included in this datasheet are subject to change without notice.  
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SUNPOWER®  
537616 RevA



# Introducing SunPower Equinox™



## Anatomy of a SunPower Equinox™ System



### Technology designed to work together.

The SunPower Equinox™ system is the only complete home solar system that is designed and built by one company. From highest efficiency panels<sup>1</sup> to Smart Energy software, every component is engineered to work together perfectly—from sun to switch.

[sunpower.com/equinox](http://sunpower.com/equinox)

### More lifetime energy without compromise.

We believe that with an integrated design process, less is more. Which is why we created SunPower Equinox to produce 70% more lifetime energy<sup>2</sup> with 70% fewer visible parts,<sup>3</sup> for the most power without compromising curb appeal.

### Best in class warranty, all from one company.

Only SunPower can offer a complete home solar system that comes with the peace of mind of one comprehensive warranty. With SunPower Equinox, we stand behind every part of your home solar experience.

## Technical Specifications

### What's Included

- High Efficiency AC Panels with factory-integrated Microinverters
- InvisiMount Mounting Hardware
- EnergyLink Monitoring Hardware
- EnergyLink Monitoring Software

### Power Options

- 20% Efficiency, 327 W
- 21% Efficiency, 335 W
- 21% Efficiency, 345 W
- 22% Efficiency, 360 W

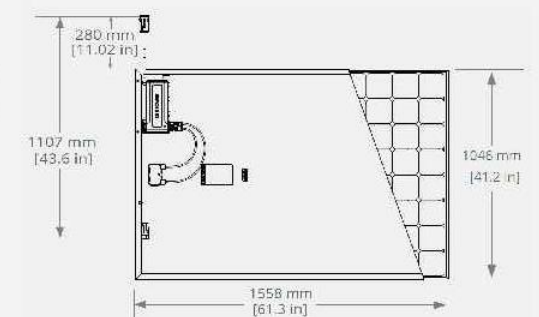
### Warranty

- SunPower Panels: 25 years
- SunPower Microinverters: 25 years
- SunPower InvisiMount Hardware: 25 years
- SunPower Monitoring Hardware: 10 years

### EnergyLink Connectivity

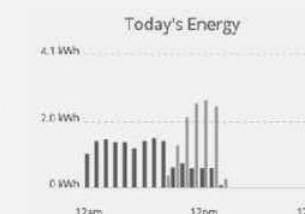
- Hardware Ethernet
- Power Line Communication
- Wi-Fi
- Cellular Backup

### Panel Dimensions



### Software Features

- Real-time access to solar production and home energy usage<sup>1</sup> any day, month, or year
- Insights including energy mix, bill savings, and environmental impact



<sup>1</sup> Extra installation required. Please contact your SunPower dealer for details.

<sup>1</sup> Highest of over 3,200 silicon solar panels, Photon Module Survey, Feb 2014.  
<sup>2</sup> SunPower 345W compared to a Conventional Panel (250W, 15.3% efficient, approx. 1.6 m<sup>2</sup>), 9% more energy per watt, 0.75%/yr slower degradation. BEW/DNV Engineering "SunPower Yield Report," 2013 with CPV Solar Test Lab Report #12063, temp. coef. calculation. Campeau, Z. et al, "SunPower Module Degradation Rate," SunPower white paper, 2013. See [www.sunpowercorp.com/facts](http://www.sunpowercorp.com/facts) for details.  
<sup>3</sup> Analysis of SunPower Equinox™ versus residential solar systems containing conventional panels, string inverters and racking hardware.

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**SUNPOWER**  
EQUINOX™



## PVS6 Installation Instructions

Follow these instructions to install and commission the PV Supervisor 6 (PVS6) to receive monitoring data. **See the *Equinox Installation Guide (#518101)* for the complete Equinox system installation instructions.**

### Kit includes:

- PV Supervisor 6 (PVS6)
- Mounting bracket
- (2) Screws
- (2) Hole plugs
- (2) 100 A Current Transformers (shipped separately)

### You will need:

- Phillips and small flathead screwdriver
- Hardware that supports 6.8 kg (15 lbs) to install the bracket
- RJ45 crimp tool
- Wire cutter and stripper
- Step drill (Optional)
- Laptop with latest Chrome or Firefox version installed
- Ethernet cable
- Your SunPower monitoring website credentials
- (Optional) Customer's Wi-Fi network and password

### Input

208 VAC (L-L) CAT III 50/60 Hz, 0.2 A, 35 W; **OR**  
240 VAC (L-L) from a split-phase three-wire system CAT III, 50/60 Hz, 0.2 A, 35 W.

**Intended Use:** The PVS6 is a datalogger-gateway device used for solar system and home monitoring, metering, and control.

**SUNPOWER®**

77 Rio Robles San Jose CA 95134  
www.sunpower.com 1.408.240.5500

### Routing wire and cable:

- **Fill all openings in the enclosure with components rated NEMA Type 4 or better to maintain the integrity of the enclosure's environmental system.**
- Drill extra openings with step drill (**do not** use screwdriver or hammer).
- Use only the provided conduit openings or drillout locations and never cut holes in the top or sides of the enclosure.
- Never run inverter or Ethernet communication cable in the same conduit as AC wiring.
- CT and AC wiring may be run in the same conduit.
- The max. allowable conduit size for PVS6 is 3/4".

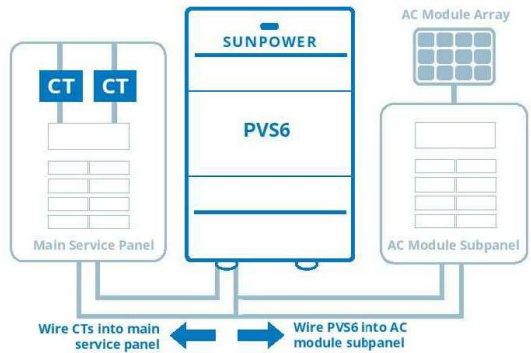
### Environmental Ratings

Pollution Degree 2; -30°C to +60°C operating ambient temp.; 15-95% non-condensing humidity; max. altitude 2000 m; outdoor use; Type 3R enclosure.

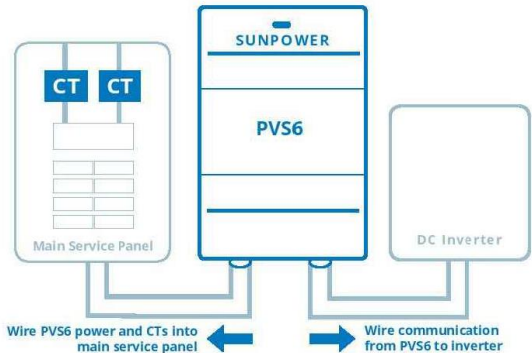
## PVS6 Quick Start Guide

Follow these instructions to install, configure, and commission the PV Supervisor 6 (PVS6) to begin receiving monitoring data. **Refer to the *PVS6 Installation Instructions* on the other side for the complete instructions.**

### PVS6 Connection Diagram: AC Module Site



### PVS6 Connection Diagram: DC Inverter Site



### 1. Mount the PVS6

1. Select an installation location that is not in direct sunlight.
2. Mount the PVS6 bracket to the wall using appropriate hardware for the mounting surface and that can support at least 6.8 kg (15 lbs).
3. Fit the PVS6 onto the bracket until the mounting holes at the bottom are aligned.
4. Use a screwdriver to secure the PVS6 to the bracket using the provided screws. Do not overtighten.

### 2. Wire the PVS6 power

**Danger! Hazardous voltages! Do not power up the system until after you complete Sections 1 through 3.** Accessing the system involves possible contact with potentially lethal voltages and currents. No attempt to access, install, adjust, repair, or test the system should be made by anyone who is not qualified to work on such equipment. Use copper conductors only, with min. 75°C temp. rating.

1. Use a screwdriver—do not use power tools—to prepare the PVS6 for AC wiring:
  - Using a flat-blade screwdriver, carefully bend the PVS6 cover retention tab back to release and then remove the outer cover
  - Remove the lower AC wiring cover
  - Remove the upper AC wiring cover
2. Run power conduit from the service panel to the PVS6. If you use the rear conduit entrances, seal the holes on the bottom of the enclosure with the included hole plugs. Use step drill if you are using rear or center bottom entrances.
3. Connect the PVS6 to either a 15 A (with 14 AWG) or a 20 A (with 12 AWG) UL Listed dedicated dual-pole breaker.  
**Note:** For AC modules, this breaker should be in the same service panel containing the AC module output circuits.
4. Strip wires to 12 mm and land according to the color-coded labels (black wire to **L1**, red wire to **L2**, the white wire to **N**, and green wire to **GND**) in the J2 terminals on the bottom left of the PVS6 board, and then close each locking lever completely.

### 3. Install and wire the consumption CTs

**Danger! Hazardous voltages! Do not power up the system until after you complete Sections 1 through 3.** Accessing the system involves possible contact with potentially lethal voltages and currents. No attempt to access, install, adjust, repair, or test the system should be made by anyone who is not qualified to work on such equipment.

Max. 120/240 VAC split phase, three wire system, Measurement Category III, 0.333 VAC from a current sensor rated to measure max. 50 A.

The SunPower-provided CTs are suitable for use on 200 A conductors. CTs may be labeled "100 A" but this is a calibration reference rating only. You may install CTs in parallel or bundled configurations. **Refer to the *Consumption Meter CT Installation Instructions*.**

1. Turn off all power to the main service panel in which you are installing CTs.
2. Place the CTs in the main service panel, around incoming service conductors, with the side labeled **THIS SIDE TOWARD SOURCE** toward the utility meter and away from the loads. Never install CTs in the utility-designated section of the service panel.
  - Place **L1 CT** (black and white wires) around incoming Line 1 service conductor
  - Place **L2 CT** (red and white wires) around incoming Line 2 service conductor
3. Align the steel core pieces and snap the CTs closed.
4. Route CT wires through conduit to PVS6.
  - **Running CT wires:** You may run CT and AC wiring in the same conduit. Do not run CT wiring and internet communication cables in the same conduit.
  - **Extending CT leads:** Use Class 1 (600 V rated minimum, 16 AWG maximum) twisted-pair instrument cable and appropriate connectors; SunPower recommends the use of silicone-filled insulation displacement connectors (IDC) or telecom crimps; do not use power cables (for example, THWN or Romex) to extend the CT leads.  
**Note:** See *Continental Control Systems: Current Transformer (CT) Wire Extension* guide at: <https://ctsys.com/current-transformer-wire-extension> for suggested wire types.

**If the equipment is used in a manner not specified by SunPower, the protection provided by the equipment may be impaired.**

### Safety & Certifications

#### Safety Instructions

- Installation and field service is to be performed only by qualified, trained personnel with the necessary skills and knowledge to work on this type of electrical device. Field service is limited to the components contained in the lower compartment of the PVS6.
- Perform all electrical installations in accordance with any national and local codes, such as the National Electrical Code (NEC) ANSI/NFPA 70.
  - This enclosure is suitable for use indoors or outdoors (NEMA Type 3R). Operating ambient from -30°C to 60°C.
  - Before connecting power, the PVS6 must be securely mounted to an inside or outside wall following the instructions in this document.
  - For electrical wiring code compliance, connect the PVS6 to a dedicated UL Listed 15 A rated breaker using 14 AWG wiring, or a UL Listed 20 A rated breaker using 12 AWG wiring. The input operating current is less than 0.1 amp with AC nominal voltages of 240 VAC (L1-L2).
  - The PVS6 contains internal transient surge protection for connection to the load side of the service entrance AC service panel (overvoltage category III). For installations in areas at risk of surges generated by high-voltage utilities, industry, or by lightning, it is recommended that a UL Listed external surge protective device also be installed.
  - Do not attempt to repair the PVS6. Tampering with or opening the upper compartment voids the product warranty.
  - Use only UL Listed, double-insulated, XOBA CTs with the PVS6.

#### Safety Certification

- UL Listed to UL 61010 and UL 50 for outdoor use.
- The PVS6 is not a utility meter, disconnect device, or power distribution device.

#### FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:  
(1) This device may not cause harmful interference, and  
(2) This device must accept any interference received, including interference that may cause undesired operation.  
**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

#### IMPORTANT NOTES:

##### Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 25 cm (9.84 in.) between the device and your body.

#### CAUTION:

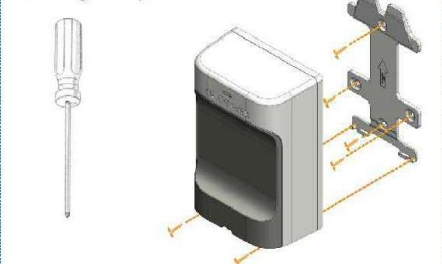
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

### Routing wire and cable:

- **Fill all conduit openings in the enclosure with components rated NEMA Type 4 or better to maintain the integrity of the enclosure's environmental system.**
- Drill extra 0.875" (22 mm) or 1.11" (28 mm) conduit openings, if required, with step drill (**do not** use screwdriver or hammer).
- Use only the provided conduit openings or drillout locations and never cut holes in the top or sides of the enclosure.
- Never run inverter or Ethernet communication cable in the same conduit as AC wiring.
- CT and AC wiring may be run in the same conduit.

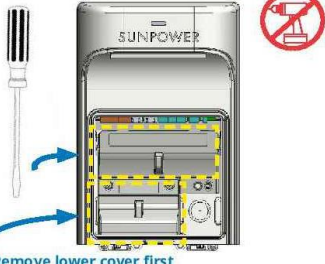
### 1. Mount the PVS6

Mount the PVS6 bracket to the wall using hardware that supports 6.8 kg (15 lb); use Phillips screwdriver to secure the PVS6 to the bracket using the two provided screws.



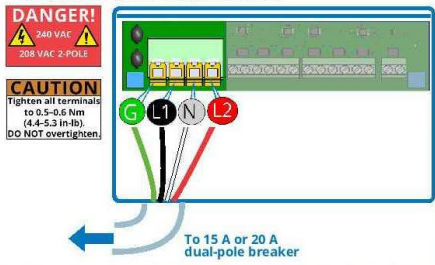
### 2. Remove all PVS6 covers

Use flathead screwdriver to carefully remove the enclosure cover. Use Phillips to remove the AC wiring covers.



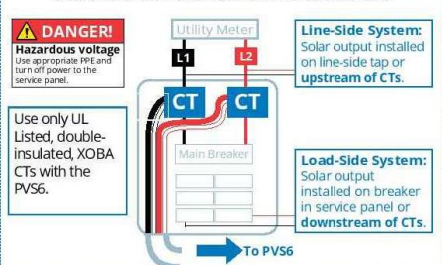
### 3. Wire PVS6 power

Use copper conductors only, with min. 75°C temp. rating. Install a dedicated 240 or 208 VAC circuit. Land wires in J2 terminals: green to GND; black to L1; white to N; and red to L2.



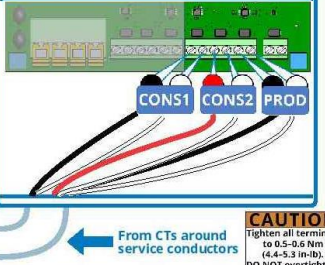
### 4. Install consumption CTs

Refer to Section 3 on the other side for complete CT installation instructions. Place CTs around incoming service conductors: L1 CT (black and white wires) around Line 1 and L2 CT (red and white wires) around Line 2.



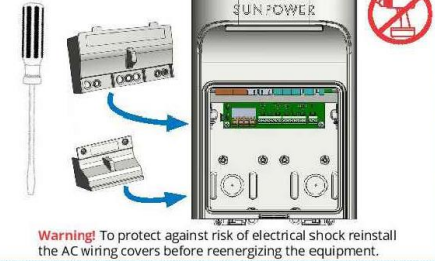
### 5. Wire consumption CTs

Land wires in J3 terminals: L1 CT and L2 CT wires to corresponding CONS L1 and CONS L2.



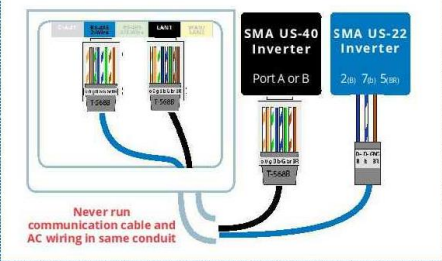
### 6. Replace PVS6 wiring covers

Use screwdriver to replace AC wiring covers over AC power wires.



### 7. Connect DC inverter communication

If DC inverter is installed, connect communication from DC inverter to the PVS6. No additional connection is required for AC modules.



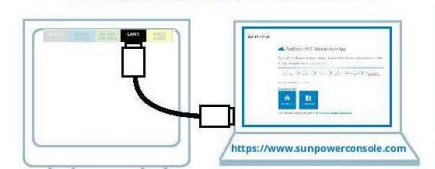
### 8. Connect PVS6 to the internet

Connect to customer's internet with either:

- **Ethernet Cable**  
From PVS6 LAN2 to customer's router (recommended method).
- **Customer's Wi-Fi**  
Connect during commissioning with network and password.

### 9. Commission with PVS Management App

Turn off laptop Wi-Fi, connect Ethernet cable from PVS6 LAN1 to laptop, open latest Chrome or Firefox, type [www.sunpowerconsole.com](https://www.sunpowerconsole.com), and follow instructions.



### 10. Replace PVS6 cover

Snap the enclosure cover onto the PVS6.



- Always open or disconnect circuit from power-distribution system (or service) of building before installing or servicing current transformers (CTs).
- The CTs may not be installed in equipment where they exceed 75% of the wiring space of any cross-sectional area within the equipment.
- Restrict installation of CT in an area where it would block ventilation openings.
- Restrict installation of CT in an area of breaker arc venting.
- Not suitable for Class 2 wiring methods.
- Not intended for connection to Class 2 equipment
- Secure CT, and route conductors so that they do not directly contact live terminals or bus.
- **WARNING!** To reduce the risk of electric shock, always open or disconnect circuit from power-distribution system (or service) of building before installing or servicing CTs.
- For use with UL Listed Energy Monitoring Current Sensors rated for Double Insulation.





SunPower® InvisiMount™ | Residential Mounting System

SunPower® InvisiMount™ | Residential Mounting System

Simple and Fast Installation

- Integrated module-to-rail grounding
- Pre-assembled mid and end clamps
- Levitating mid clamp for easy placement
- Mid clamp width facilitates even module spacing
- Simple, pre-drilled rail splice
- UL 2703 Listed integrated grounding

Flexible Design

- Addresses nearly all sloped residential roofs
- Design in landscape and portrait
- Rails enable easy obstacle management

Customer-Preferred Aesthetics

- #1 module and #1 mounting aesthetics
- Best-in-class system aesthetics
- Premium, low-profile design
- Black anodized components
- Hidden mid clamps and end clamps hardware, and capped, flush rails

Part of Superior System

- Built for use with SunPower DC and AC modules
- Best-in-class system reliability and aesthetics
- Combine with SunPower modules and monitoring app



Elegant Simplicity

SunPower® InvisiMount™ is a SunPower-designed rail-based mounting system. The InvisiMount system addresses residential sloped roofs and combines faster installation time, design flexibility, and superior aesthetics. The InvisiMount product was specifically envisioned and engineered to pair with SunPower modules. The resulting system-level approach will amplify the aesthetic and installation benefits for both homeowners and installers.



[sunpower.com](https://sunpower.com)



InvisiMount Component Images



InvisiMount Component Details		
Component	Material	Weight
Mid Clamp	Black oxide stainless steel A/SI 304	63 g (2.2 oz)
End Clamp	Black anodized aluminum alloy 6063-T6	110 g (3.88 oz)
Rail	Black anodized aluminum alloy 6005-T6	830 g/m (9 oz/ft)
Rail Splice	Aluminum alloy 6005-T5	830 g/m (9 oz/ft)
Ground Lug Assembly	304 stainless (A2-70 bolt; tin-plated copper lug)	106.5 g/m (3.75 oz)
End Cap	Black acetal (POM) copolymer	10.4 g (0.37 oz)

Roof Attachment Hardware Supported by InvisiMount System Design Tool	
Application	<ul style="list-style-type: none"><li>• Composition Shingle Rafter Attachment</li><li>• Composition Shingle Roof Decking Attachment</li><li>• Curved and Flat Tile Roof Attachment</li><li>• Universal Interface for Other Roof Attachments</li></ul>

InvisiMount Operating Conditions	
Temperature	-40° C to 90° C (-40° F to 194° F)
Max. Load	2400 Pa uplift 5400 Pa downforce

InvisiMount Warranties And Certifications	
Warranties	25-year product warranty 5-year finish warranty
Certifications	UL 2703 Listed Class A fire rating when distance between roof surface and bottom of SunPower module frame is ≤ 3.5"

Roof Attachment Hardware Warranties	
Refer to roof attachment hardware manufacturer's documentation	

\*Module frame that is compatible with the InvisiMount system required for hardware interoperability.  
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## Invisimount Span Tables Engineering Summary Letter

The following tables list the allowable spacing of attachment points for the SunPower Invisimount mounting system. Loads on the system were calculated in accordance with ASCE 7-10, using the following parameters:

- Risk Category II
- System weight (including PV modules, rails, attachments, and wiring) = 2.84 psf
- No live load acts on top of the PV modules
- Wind speed & exposure as indicated in the tables
- Roof height and slope as indicated in the tables
- For wind load, topographic factor  $K_{zt} = 1.0$ , and directionality factor  $K_d = 0.85$  per ASCE 7-10 Table 26.6-1
- Wind load coefficients per either wind tunnel testing or ASCE 7-10 Chapter 30 (see notes below tables)
- Ground snow load as indicated in the tables
- For snow loads, thermal factor  $C_t = 1.2$  ("unheated and open air structures"), per ASCE 7-10 Table 7-3
- For snow loads, exposure factor  $C_e = 0.9$  ("fully exposed"), per ASCE 7-10 Table 7-2
- For snow loads, slope factor  $C_s$  is determined per ASCE 7-10 Figure 7-2 assuming the array is an "unobstructed slippery surface" where snow is free to slide off the array
- Seismic short-term spectral acceleration ( $S_s$ ) = 3.0g, maximum, and seismic site class = D, per ASCE 7-10 Section 11.4.2
- Seismic component importance factor  $I_p = 1.0$  per ASCE 7-10 Section 13.1.3; seismic component response factor  $R_p = 1.5$ , and component amplification factor  $a_p = 1.0$ , per ASCE 7-10 Table 13.5-1 and 13.6-1; seismic loads are calculated per ASCE 7-10 Chapters 11 and 13
- Load combinations per ASCE 7-10 Chapter 2

The maximum allowable spans shown in the tables are based on the calculated loads and the capacity of the rail and the attachment, determined by analysis and testing in accordance with IBC 2012/2015 and referenced standards.

- Bending strength of aluminum rails is calculated according to the Aluminum Design Manual 2010 Section 8.3.2.1 (LRFD)
- The strength of attachments to the L foot roof attachment hardware is based on product information from the attachment manufacturer
- The strength of the lag screw in withdrawal and shear is calculated according to the National Design Specification (NDS) for Wood Construction, 2010
- The maximum allowable attachment spacing is calculated by checking the demand/capacity ratios for bending in the rail and tension, compression and shear on attachments for all required load combinations. The reported maximum allowable spacing is the greatest spacing, rounded down to the nearest 2-foot increment, for which the demand/capacity ratios are less than or equal to 1.0.
- These tables do not consider the strength of the supporting roof structure. In areas of low snow load, the weight of the array is often considered to offset the design live load of the roof, since

personnel and equipment cannot be placed on top of the array. It is recommended to stagger attachment points, as shown in Figure 1, to evenly distribute loads to the rafters.

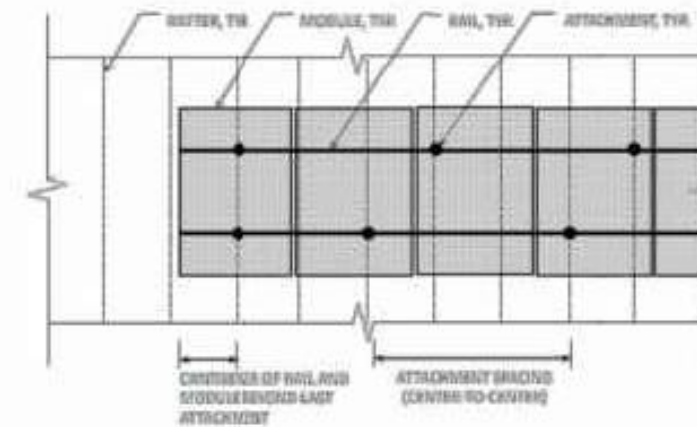


Figure 1

- These tables assume that each module is installed centered over a pair of rails, as shown in Figure 2(a). In cases where one rail is closer to the midpoint of the module, as shown in Figure 2(b), adjustments to the spacing may be required.

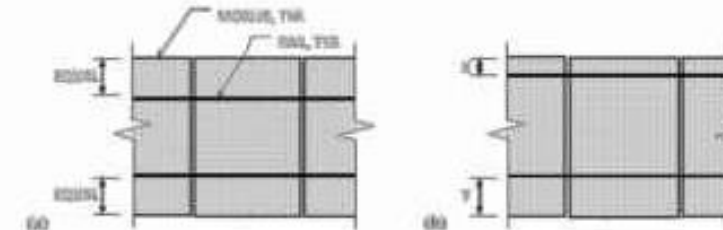


Figure 2

Please contact SunPower for any further technical information which may be required.



4/4/17





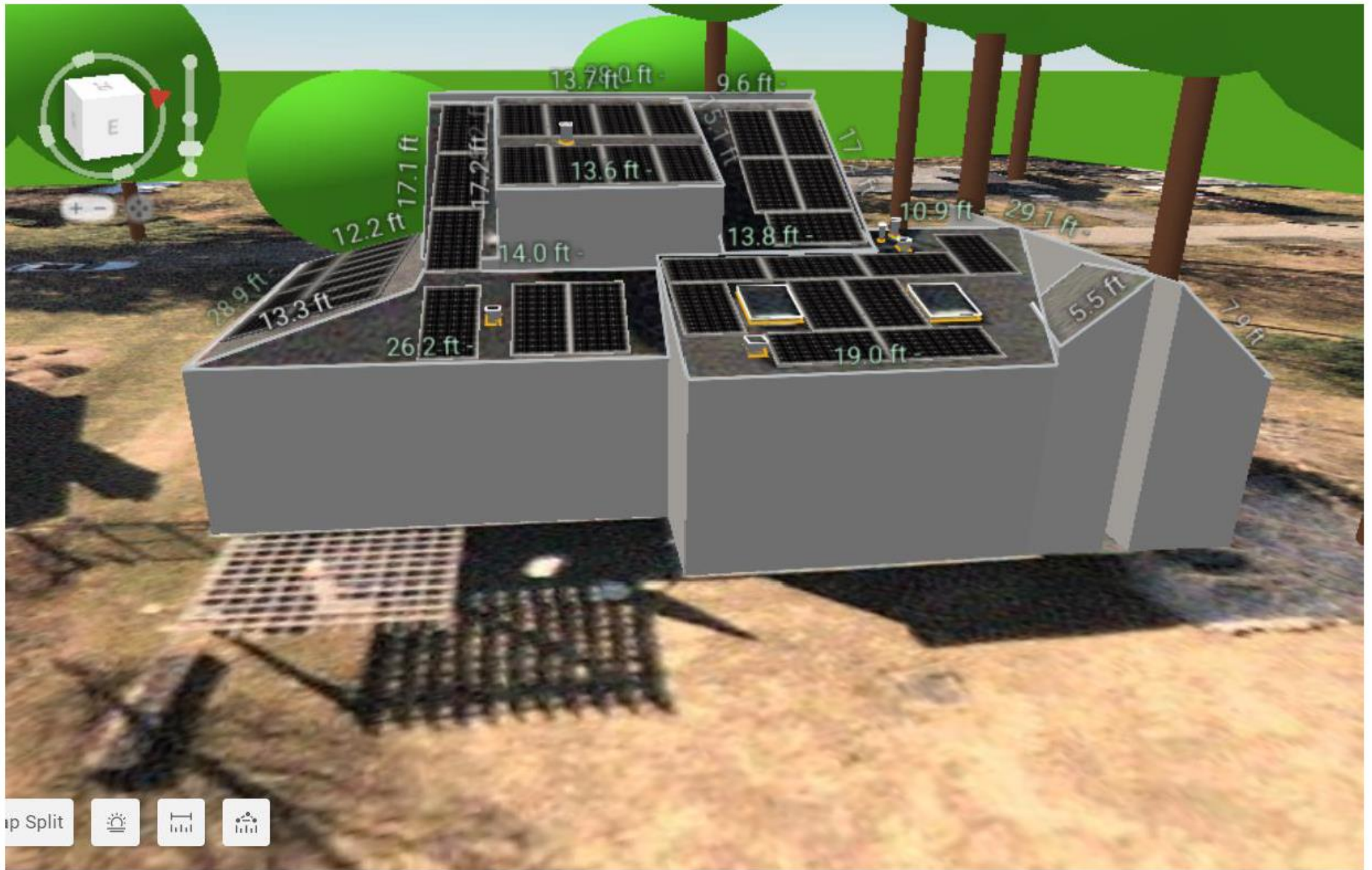


















FLAT ROOF PANELS NOT VISIBLE











SOLAR EXTERIOR  
DISCONNECT