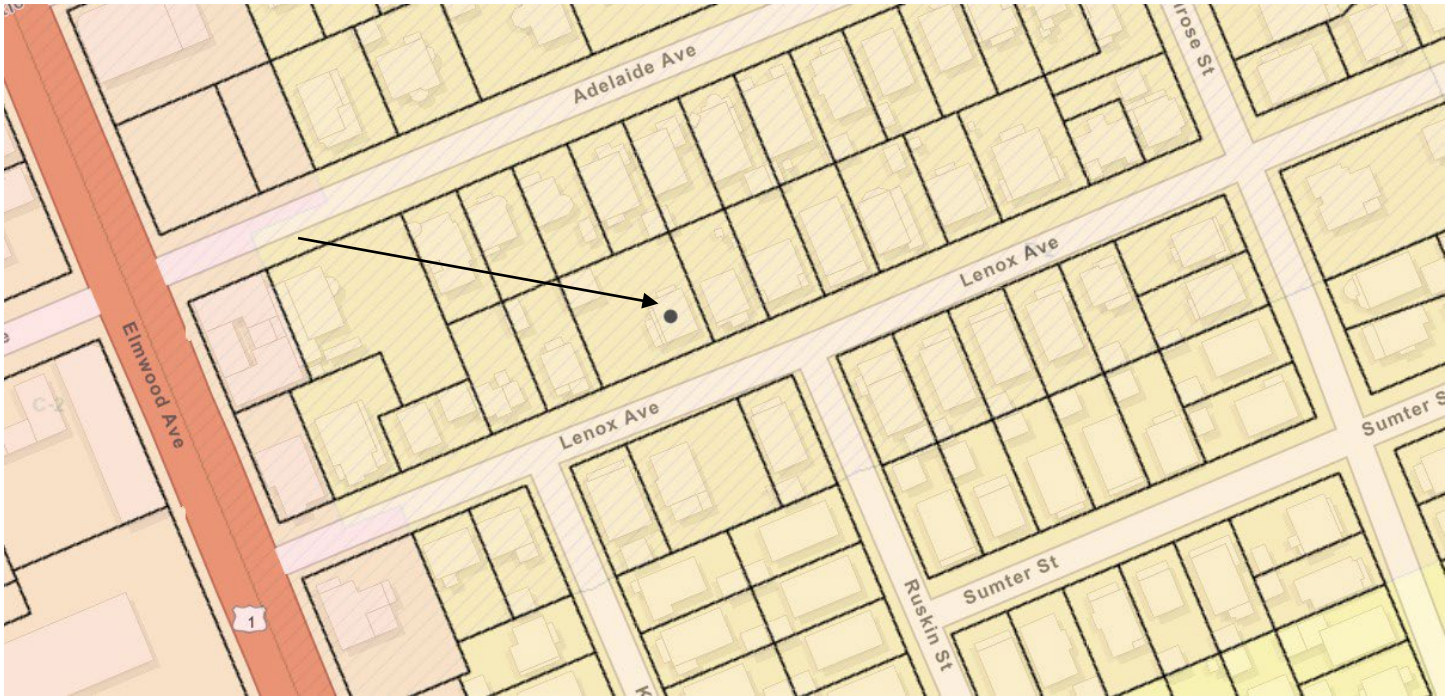
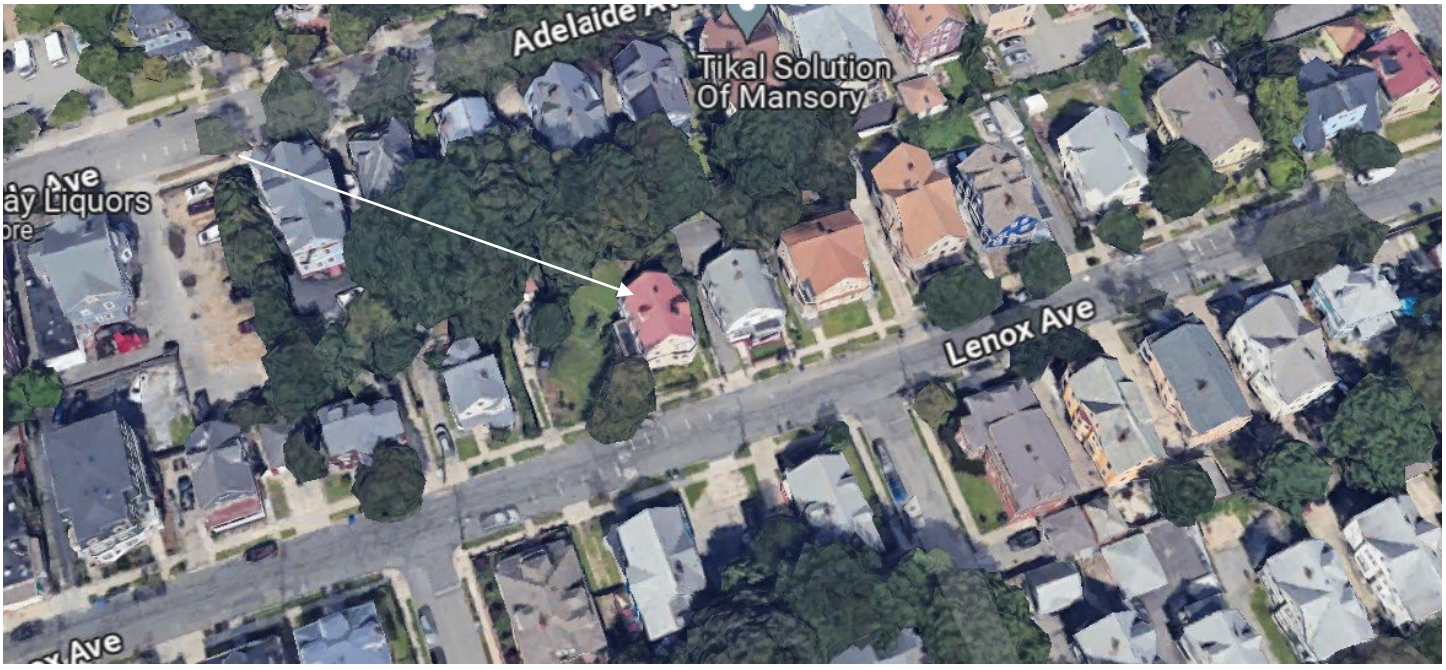
2. CASE 24.074, 225 LENOX AVENUE, House, 1901 (SOUTH ELMWOOD)
CONTRIBUTING



Arrow indicates 225 Lenox Avenue.



Arrow indicates project location, looking north.

Applicant/ Owner: Nicholas Vockerodt, 44 Bainbridge Avenue, Providence, RI 02909
Contractor: Renewable Energy Solutions LLC, 181 Conant St, Unit 3R, Pawtucket, RI 02860

Proposal: The scope of work proposed consists of Minor Alterations and includes:

- Installation of 15 solar panels to the south-west upper slope of the gambrel roof.

Issues: The following issues are relevant to this application:

- The application as submitted will be minimally visible from the public rights-of-way.
- The modifications as proposed meets Minor Alterations: Solar Energy Systems Guidelines, Section 2, in the following manner: Panel layout shall be sympathetic or appropriate to design and scale of building. Rectangular configurations are preferred, with ample setback from edge of roof, dormers, chimneys, etc. (2.A); Panels shall be installed parallel to the existing roof slope and matched as closely as possible to the roof plane (2.B); Panels shall be installed without destroying or replacing original or historic materials or significantly compromising or altering the building's structural integrity (2.C); Panels shall be compatible in color to existing roofing insofar as possible (2.D); Installation of panels shall be as inconspicuous as possible when viewed from public right-of-way (2.E); Installation shall be reversible. Panels shall be removed when no longer viable or functioning and roofing restored to pre-existing conditions (2.F); and,
- Plans, specifications and pictures have been submitted.

Recommendations: The staff recommends the PHDC make the following findings of fact:

a) 225 Lenox Avenue is a structure of historical and architectural significance that contributes to the significance of the South Elmwood local historic district, having been recognized as a potential contributing structure to the Elmwood National Register Historic District;
b) The modifications as proposed meets Minor Alterations: Solar Energy Systems Guidelines, Section 2, and the application is considered complete; and,
c) The work as proposed is in accord with PHDC Standards 8 & 9 as follows: 8) the work will be done so that it does not destroy the historic character of the property or the district as they are not on the primary elevation and will be minimally visible from the public rights-of-way; and, 9) Whenever possible… alterations to structures shall be done in such a manner that if removed in the future, the essential form and integrity of the structure and the site will be unimpaired.

Staff recommends a motion be made stating that: The application is considered complete. 225 Lenox Avenue is a structure of historical and architectural significance that contributes to the significance of the South Elmwood local historic district, having been recognized as a potential contributing structure to the Elmwood National Register Historic District. The Commission grants Final Approval of the proposal as submitted as the proposed alteration is appropriate having determined that the proposed alteration does not destroy the historic character of the property or the district and are historically and architecturally compatible with the property and district. The proposed alteration meets Minor Alterations: Solar Energy Systems Guidelines, Section 2, is reversible and will not have an adverse effect on the property or district as they will be minimally visible from the public rights-of-way (Standards 8 & 9), and the recommendations in the staff report, with staff to review any additional required details.

Shade Report - 225 Lenox Ave, Providence, RI 02907, USA

Customer
Karen Hlynsky

Designer
Alex Perdue

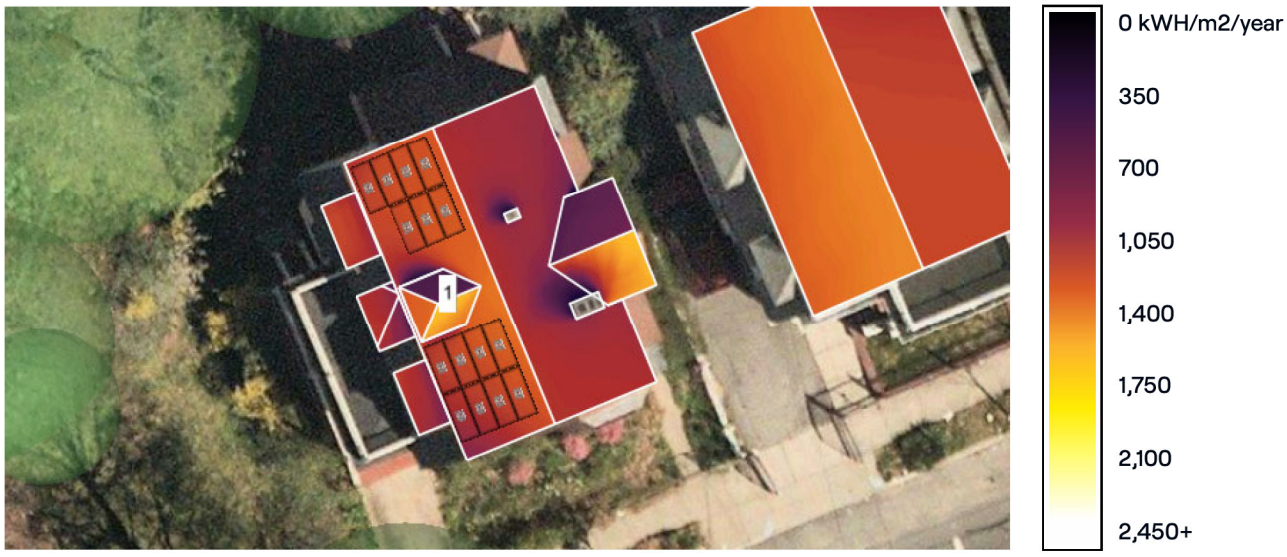
Organization
NEC Solar

Address
225 Lenox Ave, Providence, RI 02907, USA

Coordinates
41.7958412, -71.4234038

Date
7/1/2024

Annual irradiance



Summary

Array ID	Panel count	Azimuth	Pitch	Annual TOF	Annual solar access	Annual TSRF
1	15	248°	45°	84%	80%	67%
				Weighted average by panel count:	80%	67%

Monthly solar access % across arrays

Array ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	66	78	85	85	82	81	82	82	86	82	69	62


NEC-SOLAR.com
866.446.4632
ELECTRIC SOLAR

PHOTOVOLTAIC ROOF MOUNT SYSTEM

15 MODULES-ROOF MOUNTED - 6.450 kW DC, 5.235 kW AC, 225 LENOX AVE, PROVIDENCE, RI 02907

PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	6.450 KW DC 5.235 KW AC
MODULE TYPE & AMOUNT:	(15) REC ALPHA REC 430AA PURE 2 [430W]
MODULE DIMENSIONS:	(L/W/H) 73.40"/40.90"/1.20"
INVERTER:	(15) ENPHASE IQ8A- 72-2-US [240V]
INTERCONNECTION METHOD:	LINE SIDE TAP

GOVERNING CODES

ADOPTED CONSTRUCTION CODES

- 2018 INTERNATIONAL BUILDING CODE, IBC
- 2018 INTERNATIONAL RESIDENTIAL CODE, IRC
- 2020 NATIONAL ELECTRIC CODE

GENERAL NOTES:

a. INSTALLATION OF SOLAR PHOTOVOLTAIC SYSTEM SHALL BE IN ACCORDANCE WITH NEC ARTICLE 690, AND ALL OTHER APPLICABLE NEC CODES WHERE NOTED OR EXISTING.

b. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL COMPLY WITH NEC ARTICLE 110.

c. ALL CONDUCTORS, INCLUDING THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE IN ACCORDANCE WITH NEC ARTICLE 250.

d. 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.

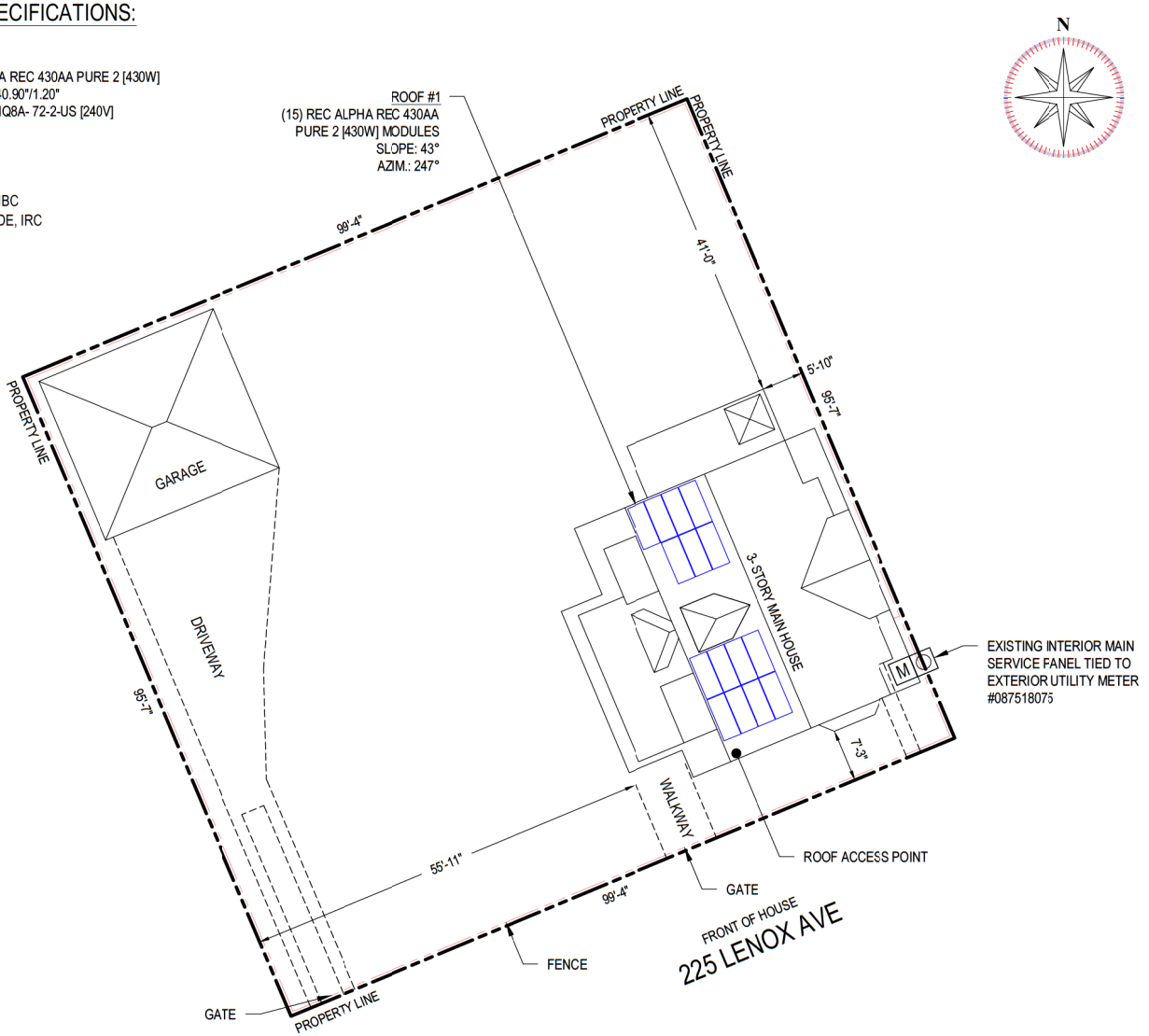
e. ALL DC WIRES SHALL BE SIZED ACCORDING TO [NEC 690.8]

f. DC CONDUCTORS SHALL BE WITHIN PROTECTED RACEWAYS IN ACCORDANCE WITH [NEC 690.31]

g. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL JURISDICTIONAL BUILDING CODE.

h. PV MODULES TO BE RATED UL 1703 CLASS C FIRE RATING OR BETTER.

i ALL EQUIPMENT TO BE CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY.



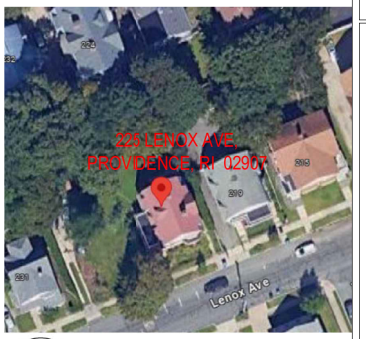
1 PV 0.0 PLOT PLAN

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

SHEET INDEX:

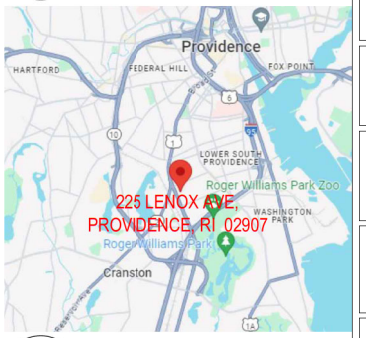
ROOF ACCESS POINT

ROOF ACCESS POINT SHALL NOT BE LOCATED IN AREAS THAT 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 PV 0.0 SATELLITE VIEW

SCALE: NTS



3 PV 0.0 VICINITY MAP

SCALE: NTS

NEC ELECTRIC + SOLAR
121 BROADCOMMON RD.
BRISTOL, RI 02809,
PH#:(401) 644-5692
RI AC4585
MA A20803

REVISIONS

Description	Date	Rev
Initial Design	7/3/2024	00

Signature with Seal

Project Name & Address

KAREN HLYNSKY RESIDENCE
225 LENOX AVE,
PROVIDENCE, RI 02907

Sheet Name

COVER SHEET

Sheet Size

ANSI B
11" X 17"

Sheet Number

PV 0.0

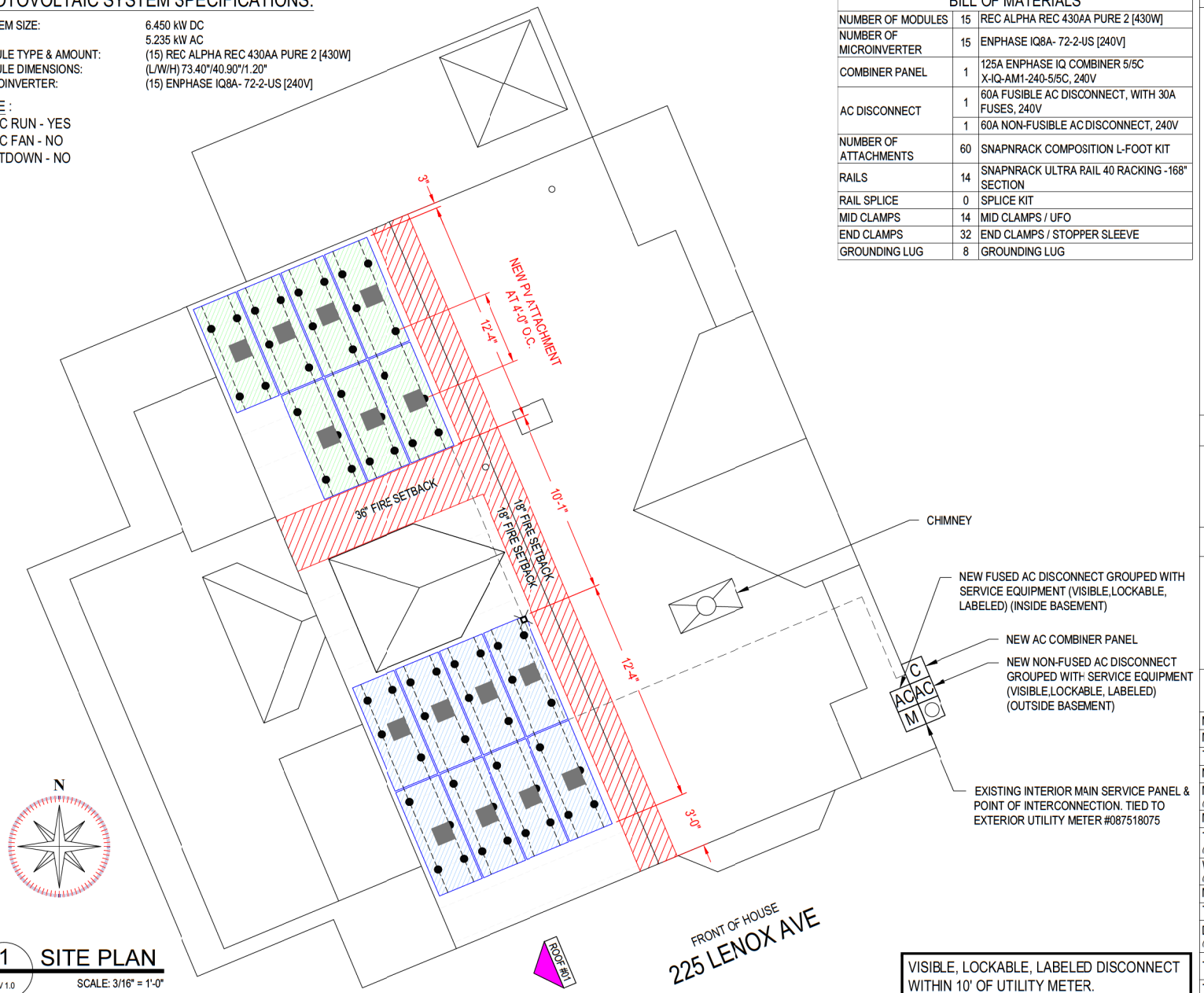
Drawn By

PremiumCAD

PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	6.450 kW DC 5.235 kW AC
MODULE TYPE & AMOUNT:	(15) REC ALPHA REC 430AA PURE 2 [430W]
MODULE DIMENSIONS:	(L/W/H) 73.40"/40.90"/1.20"
MICROINVERTER:	(15) ENPHASE IQ8A- 72-2-US [240V]

NOTE :
ATTIC RUN - YES
ATTIC FAN - NO
SHUTDOWN - NO



1 SITE PLAN
PV 1.0
SCALE: 3/16" = 1'-0"

VISIBLE, LOCKABLE, LABELED DISCONNECT WITHIN 10' OF UTILITY METER.

BILL OF MATERIALS

NUMBER OF MODULES	15	REC ALPHA REC 430AA PURE 2 [430W]
NUMBER OF MICROINVERTER	15	ENPHASE IQ8A- 72-2-US [240V]
COMBINER PANEL	1	125A ENPHASE IQ COMBINER 5/5C X-IQ-AM1-240-5/5C, 240V
AC DISCONNECT	1	60A FUSIBLE AC DISCONNECT, WITH 30A FUSES, 240V
	1	60A NON-FUSIBLE AC DISCONNECT, 240V
NUMBER OF ATTACHMENTS	60	SNAPNRACK COMPOSITION L-FOOT KIT
RAILS	14	SNAPNRACK ULTRA RAIL 40 RACKING -168" SECTION
RAIL SPLICE	0	SPLICE KIT
MID CLAMPS	14	MID CLAMPS / UFO
END CLAMPS	32	END CLAMPS / STOPPER SLEEVE
GROUNDING LUG	8	GROUNDING LUG

SYSTEM LEGEND

- M — EXISTING INTERIOR MAIN SERVICE PANEL & POINT OF INTERCONNECTION. TIED TO EXTERIOR UTILITY METER #087518075
- AC — NEW VISIBLE, LOCKABLE, LABELED FUSIBLE DISCONNECT LOCATED WITHIN 10' FROM THE UTILITY METER (INSIDE BASEMENT).
- AC — NEW VISIBLE, LOCKABLE, LABELED NON- FUSIBLE DISCONNECT LOCATED WITHIN 10' FROM THE UTILITY METER (OUTSIDE BASEMENT).
- C — NEW DEDICATED PV SYSTEM COMBINER PANEL.
- 15 NEW REC ALPHA REC 430AA PURE 2 [430W] MODULES WITH NEW 15 - ENPHASE IQ8A- 72-2-US [240V] MICRO INVERTERS, MOUNTED ON THE BACK OF EACH MODULE.
- = ROOF OBSTRUCTIONS
- = ATTACHMENT POINTS
- = FIRE PATHWAY
- = RAFTER
- = RACKING SYSTEM
- = ATTIC RUN
- = JUNCTION BOX

CIRCUIT(S)

- CIRCUIT #1 - 08 MODULES
- CIRCUIT #2 - 07 MODULES

ROOF SECTIONS

ROOF #01
MODULE - 15
SLOPE - 43°
AZIMUTH - 247°
MATERIAL - COMP. SHINGLE
RAFTER SIZE & SPACING - 2"X6" @ 24" O.C.

MODULE, ARRAY WEIGHT (LOAD CALC'S)

Number of Modules	15	
Module Weight	47.80	LBS
Total Module (Array) Weight	717.00	LBS
Number of Attachment point	60	
Mounting System Weight (Per Module)	1.5	LBS
Mounting System Weight	90.00	LBS
Total System Weight (Module Weight + Mounting System Weight)	807.00	LBS
Weight at Each Attachment Point (Array Weight / Number of Attachment Point)	11.95	LBS
Module Area (73.40"x40.90")	20.85	SqFt
Total Array Area	312.71	SqFt
Distributed Load (Total System Weight / Total Array Area)	2.36	Per SqFt
Total Roof Area	1673	SqFt
Total Percentage of Roof Covered (Total Array Area / Total Roof Area)*100	18.69%	

NEC ELECTRIC + SOLAR
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RI AC4585
MA A20803

REVISIONS

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Initial Design	7/3/2024	00

Signature with Seal

Project Name & Address
KAREN HLYNSKY RESIDENCE
225 LENOX AVE,
PROVIDENCE, RI 02907

Sheet Name
SITE PLAN

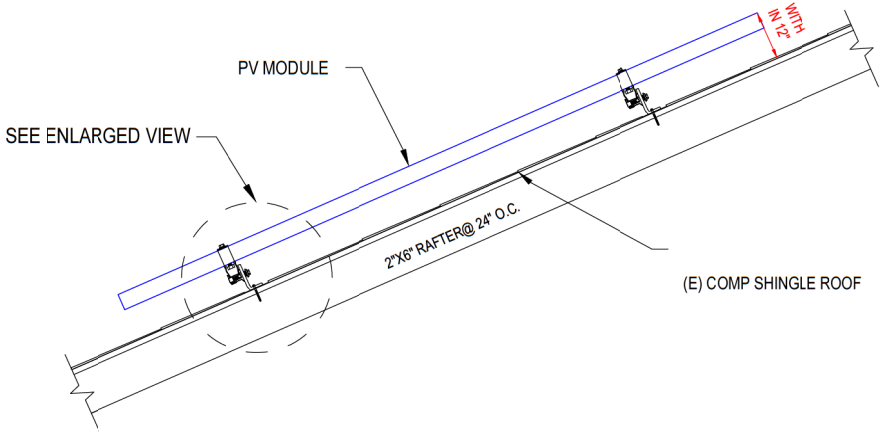
Sheet Size
ANSI B
11" X 17"

Sheet Number
PV 1.0

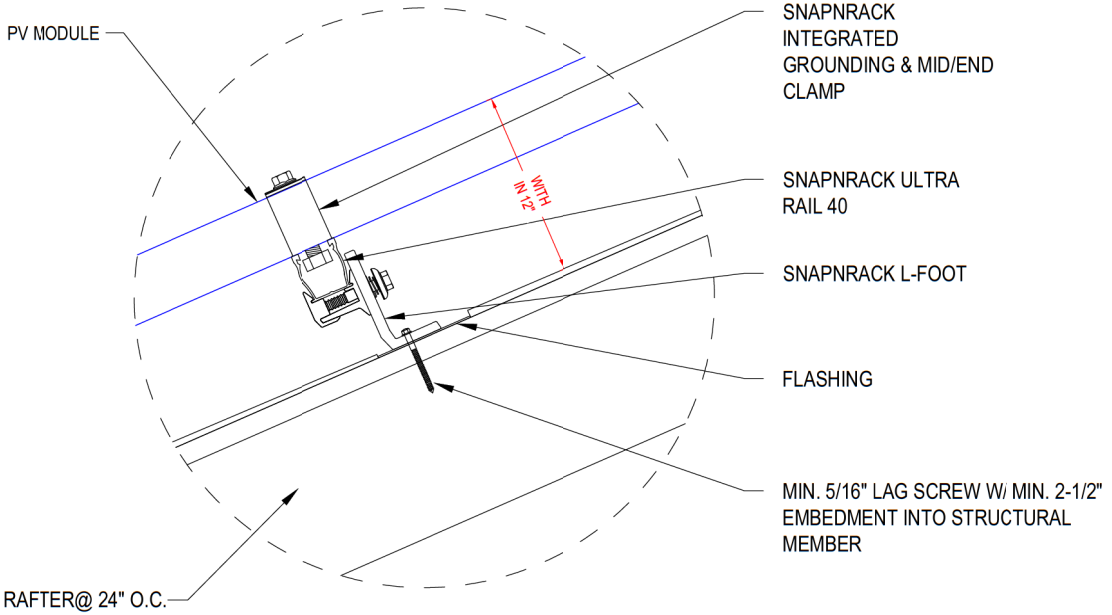
Drawn By
PremiumCAD

GENERAL STRUCTURAL NOTES:

1. THE SOLAR PANELS ARE TO BE MOUNTED TO THE ROOF FRAMING USING THE SNAPNRACK RACKING SYSTEM WITH SNAPNRACK ULTRAFOOT FOOT ASSEMBLY. 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 2.35 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 = 134 MPH
7. EXPOSURE CATEGORY = B
8. RISK CATEGORY = II



1 ATTACHMENT DETAIL (SIDE VIEW)
S 1.1
SCALE: NTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)
S 1.1
SCALE: NTS

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Initial Design	7/3/2024	00

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Project Name & Address
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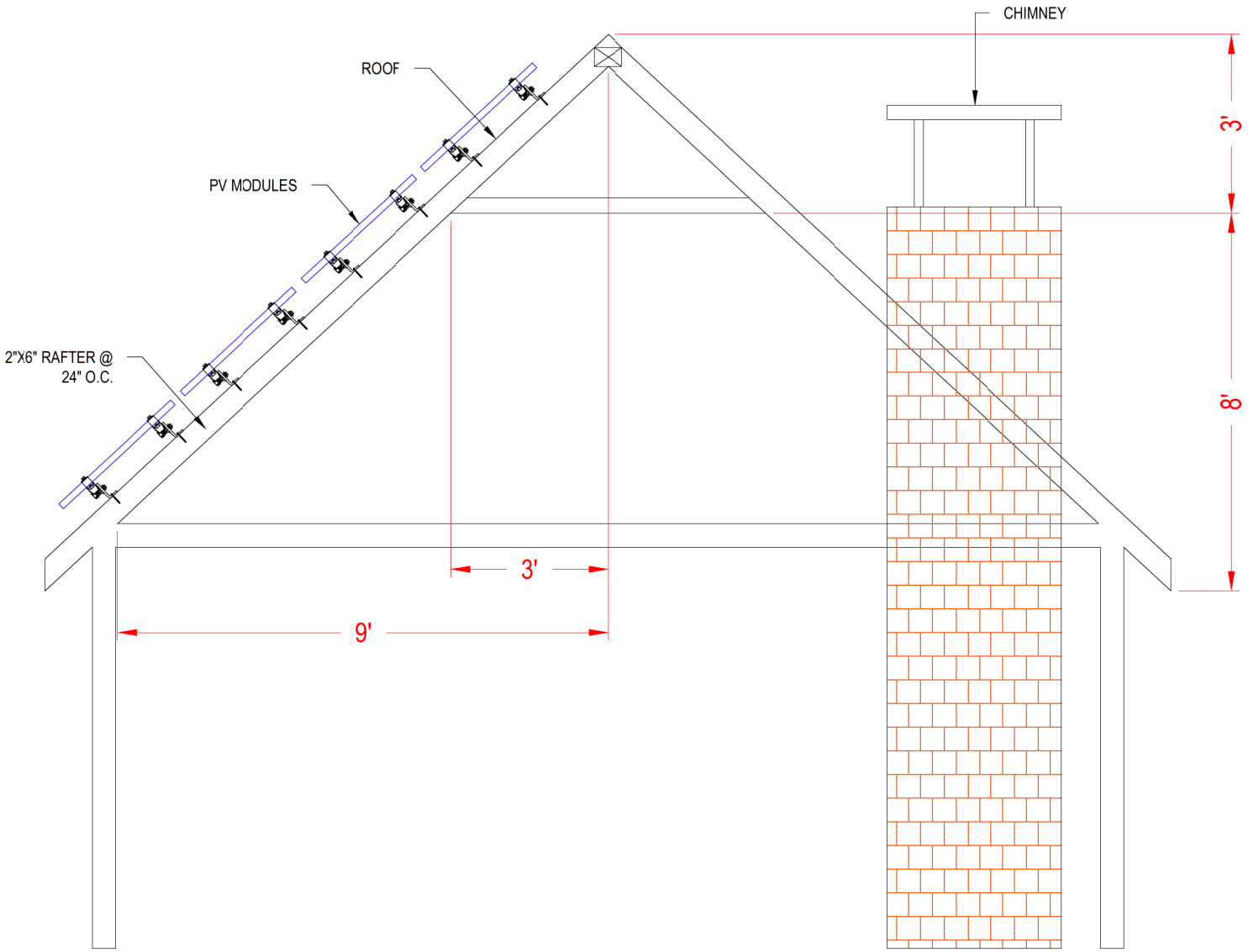
225 LENOX AVE,
PROVIDENCE, RI 02907

Sheet Name
MOUNT DETAILS

Sheet Size
ANSI B
11" X 17"

Sheet Number
S 1.1

Drawn By
PremiumCAD



1 ROOF SECTION #1

S 1.2

SCALE: NTS

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Project Name & Address

KAREN HLYNSKY RESIDENCE
225 LENOX AVE,
PROVIDENCE, RI 02907

Sheet Name
ROOF SECTION DETAILS

Sheet Size
ANSI B
11" X 17"

Sheet Number
S 1.2

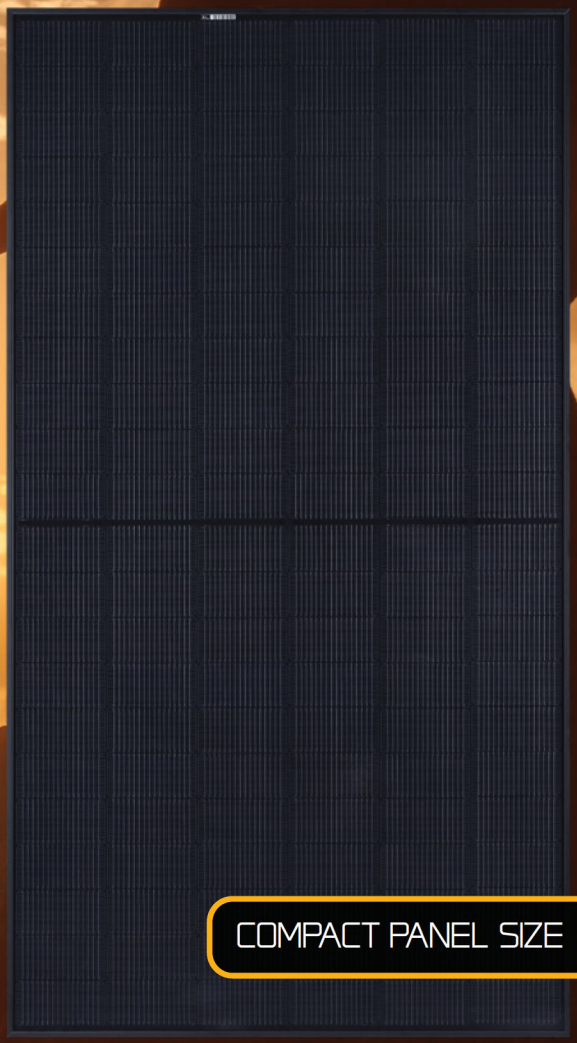
Drawn By
PremiumCAD

SOLAR'S MOST TRUSTED

REC

REC ALPHA®
PURE 2 SERIES

DATASHEET



COMPACT PANEL SIZE

430 W_P

22.2% EFFICIENCY

20.7 W/FT^2

PRODUCT
REC 25 YEAR ProTrust WARRANTY
LABOR
PERFORMANCE

ELIGIBLE

EXPERIENCE α PERFORMANCE

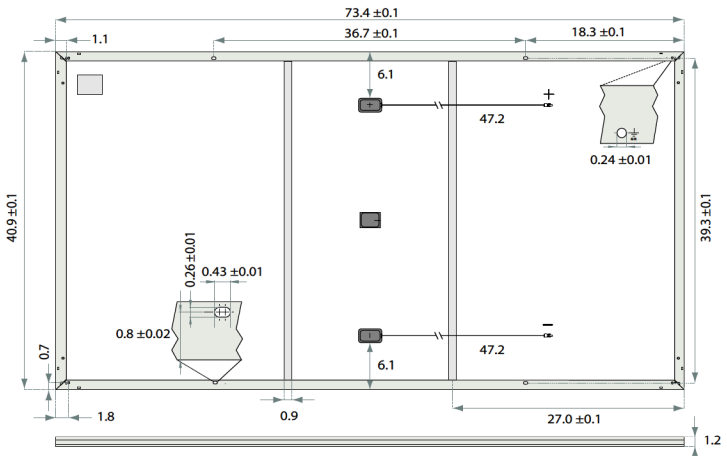
REC ALPHA® PURE 2 SERIES
DATASHEET

REC
SOLAR'S MOST TRUSTED

GENERAL DATA

Cell Type	132 half-cut bifacial REC heterojunction cells, with gapless technology
Glass	0.13 in solar glass with anti-reflective surface treatment in accordance with EN12150
Backsheet	Highly resistant polymer (Black)
Frame	Anodized aluminum (Black)
Junction Box	3-part, 3 bypass diodes, IP68 rated, in accordance with IEC 62790
Connectors	Stäubli MC4 PV-KBT4/KST4 (12AWG) in accordance with IEC 62852, IP68 only when connected
Cable	12 AWG solar cable, 47.2 in + 47.2 in in accordance with EN50618
Dimensions	73.4 x 40.9 x 1.2 in (20.8 ft²)
Weight	47.8 lb
Origin	Made in Singapore

Measurements in inches



ELECTRICAL DATA

PRODUCT CODE*: RECxxxAA Pure 2

STC				
Power Output - P_{max} (W_P)	**400**	**410**	**420**	**430**
Watt Class Sorting - (W)	0/+10	0/+10	0/+10	0/+10
Nominal Power Voltage - V_{MPP} (V)	41.1	41.6	42.2	42.8
Nominal Power Current - I_{MPP} (A)	9.74	9.86	9.96	10.05
Open Circuit Voltage - V_{OC} (V)	48.5	48.8	49.1	49.3
Short Circuit Current - I_{SC} (A)	10.60	10.67	10.74	10.81
Power Density (W/ft²)	19.2	19.7	20.2	20.7
Panel Efficiency (%)	20.6	21.1	21.7	22.2
NMOT				
Power Output - P_{max} (W_P)	304	312	320	327
Nominal Power Voltage - V_{MPP} (V)	38.7	39.2	39.8	40.3
Nominal Power Current - I_{MPP} (A)	7.86	7.96	8.05	8.12
Open Circuit Voltage - V_{OC} (V)	45.7	45.8	46.0	46.2
Short Circuit Current - I_{SC} (A)	8.5	8.62	8.68	8.73

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 77°F (25°C)), based on a production spread with a tolerance of P_{MAX}, V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s)). *Where xxx indicates the nominal power class (P_{MAX}) at STC above.

CERTIFICATIONS

IEC 61215:2021; IEC61730:2016; UL61730	
IEC 62716	Ammonia Resistance
IEC 61701	Salt Mist (SM6)
IEC 61215:2016	Hailstone (35mm)
UL 61730	Fire Type 2
ISO 14001; ISO9001; IEC45001; IEC62941	

Intertek

take e-way
for an easy way

Take-e-way WEEE-compliant scheme

MAXIMUM RATINGS*

Operational Temperature	-40 °F - 185 °F
System Voltage	1000 V
Maximum Test Load (front)	+7000 Pa (146 lb/ft²)
Maximum Test Load (rear)	-4000 Pa (83.4 lb/ft²)
Max Series Fuse Rating	25 A
Max Reverse Current	25 A

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

TEMPERATURE RATINGS*

Nominal Module Operating Temperature	44 °C ± 2°C
Temperature coefficient of P_{max}	-0.24% /K
Temperature coefficient of V_{OC}	-0.24% /K
Temperature coefficient of I_{SC}	0.04% /K

*The temperature coefficients stated are linear values

DELIVERY INFORMATION

Panels per Pallet	33
Panels per 40 ft GP/high cube container	792 (24 Pallets)
Panels per 53 ft truck	858 (26 Pallets)

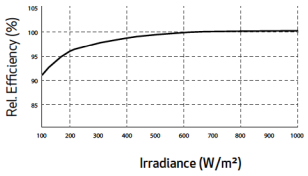
WARRANTY

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

The REC ProTrust Warranty is only available on panels purchased through an REC Certified Solar Professional installer. Warranty conditions apply. See www.recgroup.com for more details

LOW LIGHT BEHAVIOR

Typical low irradiance performance of module at STC:



Available from:

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

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

REC

Specifications subject to change without notice.

Ref: PM-DS-12-06-Rev-3.2 4.2024