3. CASE 21.051, 48 PRINCETON AVENUE, William T. Peck House, c1897 (NORTH ELMWOOD)

24-story, square dwelling, with elaborate turned-post entrance and side porches, and a hip roof pierced by wide, shingled dormers. Peck was the Principal of the Classical Department of the Providence High School.

CONTRIBUTING

185 3960	186 6255		188 6300	S 190 5850	1411111	191 2430	399 4770	193	00008	06
67	63-61	P	55 RINCETO	49 ON AVE		45	39	35	27 32-30	
68	66-64	60	52		4	8	<u> </u>	10	32-30	
158 3982	159 3983	8 157 5400	15	5		53	9.249.593444444	52 200	149 7200 80	
44 8 126 8960	44.50 125 8 4005	127 3600	128 4500	129 4050	9 1/1/1/14	30 050	132 5400	133 3600	134 1200	

Arrow indicates 48 Princeton Avenue.



Arrow indicates project location, looking north.

Applicant/Contractor: Alex Purdue, NEC Solar, 121 Broadcommon Road, Bristol, RI 02809

Owner: Miquel Quezada, 48 Princeton Avenue, Providence, RI 02907

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

the installation of 12 solar panels to the side and rear slopes of the two-bay detached garage.

Issues: The following issues are relevant to this application:

- The modifications as proposed will not be 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) 48 Princeton Avenue is a structure of historical and architectural significance that contribute to the significance of the North Elmwood Hill local historic district, having been recognized as a contributing structure to the Elmwood National Register Historic District. The garage at 48 Princeton Avenue is a secondary structure that may be considered non-contributing in significance;
- 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 being not 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. 48 Princeton Avenue is a structure of historical and architectural significance that contribute to the significance of the North Elmwood Hill local historic district, having been recognized as a contributing structure to the Elmwood National Register Historic District. The garage at 48 Princeton Avenue is a secondary structure that may be considered non-contributing in significance. 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 as the proposed alteration meets Minor Alterations: Solar Energy Systems Guidelines, Section 2, is not visible from the public rights-of-way, is reversible and will not have an adverse effect on the property or district, and the recommendations in the staff report, with staff to review any additional required details.

PROJECT DESCRIPTION:

12x365 REC ALPHA 365AA BLACK (365W) MODULES ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES SYSTEM SIZE: 4.380 kW DC STC SYSTEM SIZE: 2.880 kW AC

EQUIPMENT SUMMARY

- 12 REC ALPHA 365AA BLACK (365W) MODULES
- ENPHASE IQ7-60-2-US MICRO-INVERTERS, 240VAC

DESIGN CR	RITERIA
WIND SPEED	134
EXPOSURE CATEGORY	В
RISK CATEGORY	11
MOUNTING METHOD	ROOF MOUNT
GROUND SNOW LOAD	30

CODE COMPLIANCE

ALL WORK SHALL COMPLY WITH ALL STATE AND LOCAL CODES AND ANY OTHER REGULATING AUTHORITIES WHICH HAVE AUTHORITY OVER ANY PORTION OF THE WORK.

BUILDING CODE:

ALL WORK SHALL COMPLY WITH THE 2015 INTERNATIONAL BUILDING CODE. 2015 INTERNATIONAL RESIDENTIAL CODE.

ELECTRICAL CODE:

ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2020 NATIONAL ELECTRIC CODE.

GENERAL INSTALLATION NOTES

- INSTALLER SHALL ASSUME FULL RESPONSIBILITY AND LIABILITY FOR COMPLIANCE WITH REGULATIONS PER FEDERAL OSHA AND LOCAL REGULATIONS PERTAINING TO WORK PRACTICES, PROTECTION OF WORKERS AND VISITORS TO THE SITE.
- INSTALLER SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AT SITE BEFORE COMMENCING WORK.
- CONTRACTOR SHALL FURNISH ALL MATERIAL EXCEPT AS SPECIFIED IN THE CONTRACT AND/OR THESE DRAWINGS.
- ALL MATERIALS SHALL BE IN NEW AND UNUSED CONDITION.
- MANUFACTURER'S MATERIAL EQUIPMENT, ETC. SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
- THE INSTALLER SHALL BECOME FAMILIAR WITH ALL UTILITY AS-BUILT PLANS AND THE LOCATIONS OF ALL EXISTING UTILITIES, STRUCTURES, PAVEMENT OR IMPROVEMENTS.
- CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND NOTIFY THE OWNER OF DISCREPANCIES REQUIRING FURTHER CLARI FICATION BEFORE PROCEEDING WITH THE WORKS.
- INSTALL ALL ASPECTS OF THIS PROJECT IN ACCORDANCE WITH THE SPECIFICATIONS AND AS NOTED ON DRAWINGS ISSUED FOR CONSTRUCTION.
- CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER 310.0(D)
- WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26
- EXACT CONDUIT RUN LOCATIONS SUBJECT TO CHANGE
- ROOF PENETRATIONS ARE SEALED.
- INVERTER IS LISTED TO UL-1741 "UTILITY INTERACTIVE"

SHEET INDEX

PV-0 **COVER SHEET**

PLOT PLAN WITH ROOF PLAN PV-1

ROOF PLAN WITH MODULES PV-2

PV-2A CIRCUIT LAYOUT

PV-3 ATTACHMENT DETAIL PV-4 ELECTRICAL LINE DIAGRAM

PV-5 WIRING CALCULATIONS

PLACARDS PV-6

EQUIPMENT SPECIFICATIONS PV-7+





PROJECT SITE UPPE 48 Princeton Ave. Providence, Rl... Elmwood Auto Sales LOWER PROVI

PV-0

VICINITY MAP

SCALE: NTS

SCALE: NTS



NEC SOLAR

121 BROADCOMMON RD., BRISTOL, RI 02871

> (401) 644-5692 MA LIC - 369A1 MA HIC - 190394 RI LIC - A004585 RI HIC -39513

REVIS	SIONS	
DESCRIPTION	DATE	REV
		-

Signature with Seal

CUSTOMER INFORMATION

USA

SIDENCE Ш Y EZADA

48 PRINCETON ST PROVIDENCE,, RI 02907

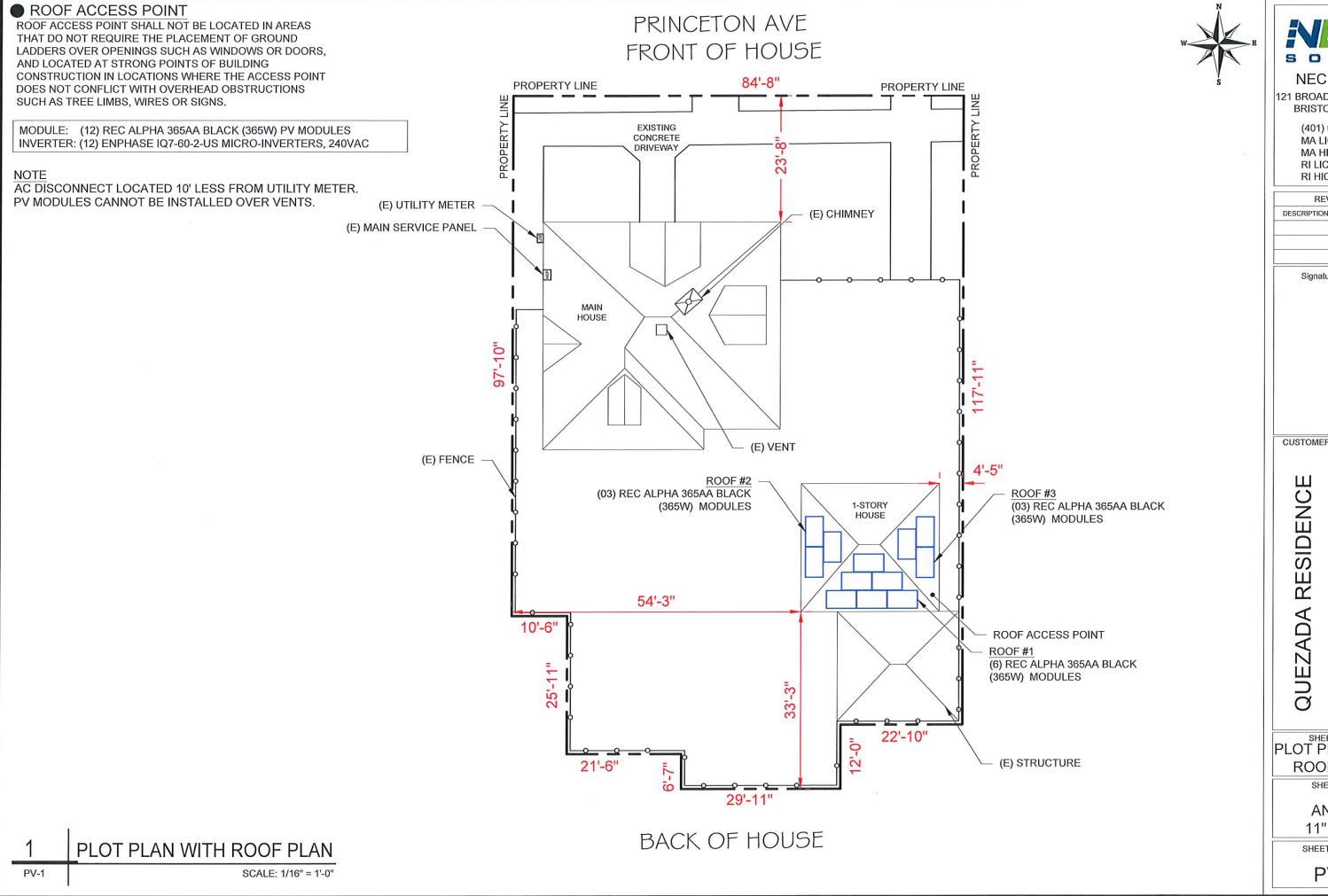
SHEET NAME

COVER SHEET

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER



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CUSTOMER INFORMATION

PLOT PLAN WITH **ROOF PLAN**

48 PRINCETON ST PROVIDENCE,, RI 02907

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 12 MODULES MODULE TYPE = REC ALPHA 365AA BLACK (365W) MODULES MODULE DIMENSIONS = 67.75"x 40.0" = 18.82 SF

MODULE WEIGHT = 42.99 LBS / 19.50 KG.

UNIT WEIGHT OF ARRAY = 2.28 PSF

PV-2

AC DISCONNECT LOCATED 10' LESS FROM UTILITY METER PV MODULES CANNOT BE INSTALLED OVER VENTS

PRINCETON AVE FRONT OF HOUSE

MODULE: (12) REC ALPHA 365AA BLACK (365W) PV MODULES

INVERTER: (12) ENPHASE IQ7-60-2-US MICRO-INVERTERS, 240VAC

3/4" EMT CONDUIT RUN

ROOF #3

TILT - 23°

ROOF #1

RAFTERS

AZIM. - 91°

ROOF #3

(6) REC ALPHA 365AA BLACK

(365W) MODULES

RACKING SYSTEM

(N) SNAPNRACK ULTRA

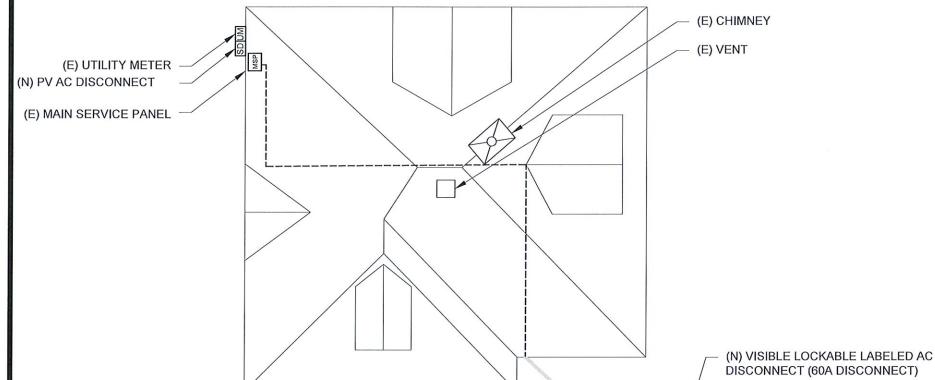
(365W) MODULES

(N) MICRO INVERTER

(03) REC ALPHA 365AA BLACK

(N) SOLADECK

•



1" PVC CONDUIT RUN (N) 22' PVC TREnCH-(N) AC COMBINER BOX ROOF #2 (03) REC ALPHA 365AA BLACK (365W) MODULES (N) 50 - PV ATTACHMENTS @ 48" O.C. ROOF #2 TILT - 23°

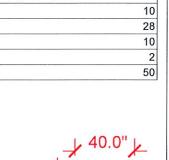
AZIM. - 271°

ROOF #1 TILT - 23° AZIM. - 181° **ROOF PLAN WITH MODULES** BACK OF HOUSE SCALE: 3/32" = 1'-0"

ROOF DESCRIPTION ROOF TYPE COMPOSITE SHINGLE RAFTERS **RAFTERS ROOF ROOF TILT AZIMUTH** SIZE **SPACING** #1 23° 181° 2"x6" 16" o.c. #1 23° 271° 2"x6" 16" o.c. 23° 91° 2"x6" 16" o.c.

ARRA	AREA WI	TH MOUNTI	NG ROOF	AREA
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	MOUNTING ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	6	112.92	188.17	60.01
#1	3	56.46	130.72	43.19
#1	3	56.46	133.27	42.36

RACKING MATER	IAL LIST
RAIL:	10
END CLAMP:	28
MID CLAMP:	10
SPLICE KIT:	2
ATTACHMENT:	50



.75" 67 **REC ALPHA 365AA** BLACK (365W) MODULE

LEGEND

- SERVICE DISCONNECT SD

GW - TESLA POWER GATEWAY

PW - TESLA POWER WALL

UM - UTILITY METER SD - SOLADECK

ACB - AC COMBINER BOX

- AC DISCONNECT MSP - MAIN SERVICE PANEL

- MICRO INVERTER

- CHIMNEY \bowtie

ACD

-VENT (ROOF OBSTRUCTION)

----- - RAIL

- ROOF ATTACHMENT

- RAFTERS

SOLAR

NEC SOLAR 21 BROADCOMMON RD.,

> (401) 644-5692 MA LIC - 369A1 MA HIC - 190394 RI LIC - A004585

RI HIC -39513

BRISTOL, RI 02871

REVIS	IONS	
DESCRIPTION	DATE	REV

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CUSTOMER INFORMATION

RESIDENCE QUEZADA

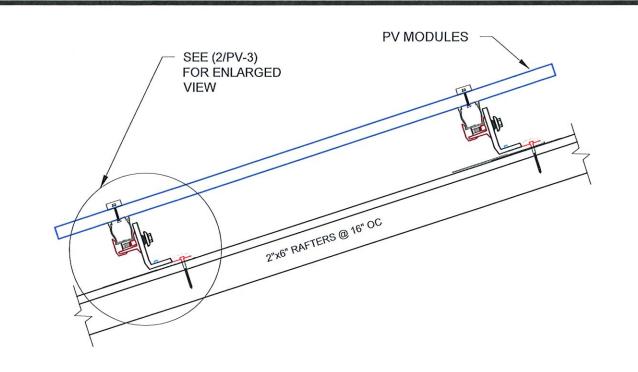
48 PRINCETON ST PROVIDENCE,, RI 02907 USA

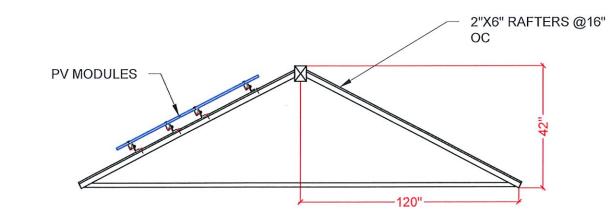
ROOF PLAN WITH MODULES

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER





3	ROOF1	SECTION
PV-3		SCALE: NTS

1 ATTACHMENT DETAIL
PV-3 SCALE: NTS

SNAPNRACK ULTRA MID CLAMP/END CLAMP FOOT ASSEMBLY $\frac{5}{16}$ " S.S. BOLT FLASHING SHIELDS **SNAPNRACK UR 40 ENTIRE ROOF** RAIL, TYP. PENETRATION SNAPNRACK ULTRA MOUNT (E) COMP SHINGLE 1/2" OSB SHEATHING ROOF 5/16"x3" SS LAG BOLT WITH MIN 21/2" THREAD 2"X6" RAFTERS @16" OC EMBEDMENT, SEALED PENETRATION INTO **RAFTERS**

PV MODULE

QUEZADA RESIDENCE
48 PRINCETON ST
PROVIDENCE, RI 02907 USA

NEC SOLAR

121 BROADCOMMON RD.
BRISTOL, RI 02871

(401) 644-5692
MA LIC - 369A1
MA HIC - 190394

RI LIC - A004585

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CUSTOMER INFORMATION

DATE

DESCRIPTION

RI HIC -39513

SHEET NAME ATTACHMENT DETAIL

SHEET SIZE

ANSI B 11" X 17"

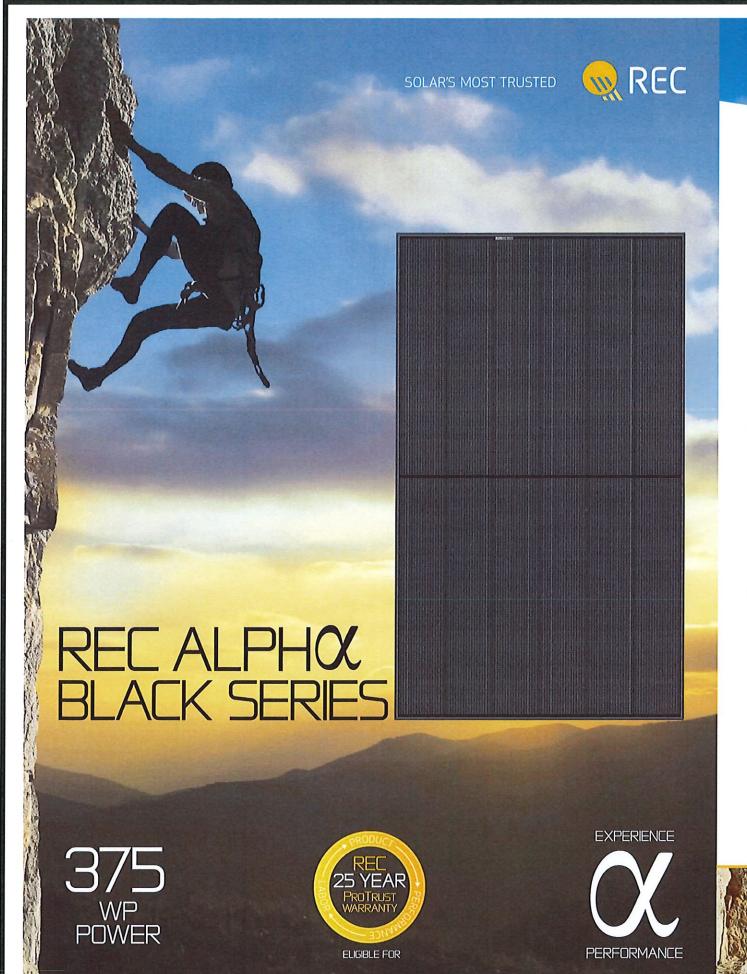
SHEET NUMBER

PV-3

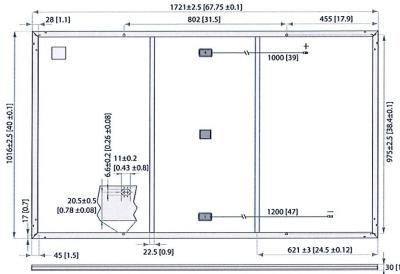
ATTACHMENT DETAIL (enlarged view)

SCALE: NTS

2



REC ALPHA BLACK SERIES PRODUCT DATASHEET



🥊 GENERAL DATA

Measurements in mm [in]

Short Circuit Current - Isc (A)

Cell type:	120 half-cut cells with REC heterojunction cell technology 6 strings of 20 cells in series	Connectors:	Stäubli MC4 PV-KBT4/KST4 (4 mm²) in accordance with IEC 62852 IP68 only when connected
Glass:	3.2 mm solar glass with anti-reflection surface treatment	Cable:	4 mm² solar cable, 1.0 m + 1.2 m in accordance with EN 50618
Backsheet:	Highly resistant polymeric construction (black)	Dimensions:	1721 x 1016 x 30 mm (1.75 m²)
Frame:	Anodized aluminum (black)	Weight:	19.5 kg
Junction box:	3-part, 3 bypass diodes, IP67 rated	Origin:	Made in Singapore

ELECTRICAL DATA Product Code*: RECxxxAA Black 365 375 Power Output - PMAX (Wp) 355 360 370 -0/+5 -0/+5 -0/+5 -0/+5 -0/+5 Watt Class Sorting - (W) Nominal Power Voltage - V NEP (V) 36.7 37.1 37.4 37.8 36.4 9.94 Nominal Power Current - I (A) 9.77 9.82 9.85 9.9 44.2 Open Circuit Voltage - Voc (V) 43.6 43.9 44.0 44.1 10.58 Short Circuit Current - Isc (A) 10.47 10.49 10.52 10.55 Power Density (W/m²) 202.85 205.71 208.57 211.42 214.28 Panel Efficiency (%) 20.6 20.9 21.2 21.4 20.3 Power Output - P_{MAX} (Wp) 274 278 282 286 Nominal Power Voltage - VMPP (V) 35.0 35.2 35.6 8.03 7.89 7.93 7.96 8.00 Nominal Power Current - I_{MEP} (A) Open Circuit Voltage - V_{oc} (V) 41.6 41.1 41.4 41.5 41.6

Values at standard test conditions (STC: air mass AM1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of P_{Nux} , V_{Cx} ,

8.50

CERTIFICATIONS

IEC 61215:2016, IEC 617	30:2016, UL 1703, UL 61730
IEC 62804	PID
IEC 61701	Salt Mist
IEC 62716	Ammonia Resistance
ISO 11925-2	Ignitability (Class E)
IEC 62782	Dynamic Mechanical Load
IEC 61215-2:2016	Hailstone (35mm)
AS4040.2 NCC 2016	Cyclic Wind Load
ISO14001-2004 ISO 0001	2015 OUCAS 10001-2007 IEC 62041









WARRANTY*

Standard	RECI	ProTrust
No	Yes	Yes
All	<25 kW	25-500 kW
20	25	25
25	25	25
0	25	10
98%	98%	98%
0.25%	0.25%	0.25%
92%	92%	92%
	No All 20 25 0 98% 0.25%	No Yes All <25 kW 20 25 25 25 0 25 98% 98% 0.25% 0.25%

MAXIMUM RATINGS

-40+85°C	
1000 V	
4666Pa(475kg/m²)* 7000Pa(713kg/m²)*	
2666 Pa (272 kg/m²)* 4000 Pa (407 kg/m²)*	
25 A	
25 A	

*Calculated using a safety factor of 1.5

TEMPERATURE RATINGS*

TEI-II EIWITORE IWITINGS		
Nominal Module Operating Temperature:	44°C (±2°C)	
Temperature coefficient of P _{MAX} :	-0.26 %/°C	
Temperature coefficient of V _{oc} :	-0.24 %/°C	
Temperature coefficient of I _{sc} :	0.04 %/°C	
'The temperature coefficients state	d are linear values	

LOW LIGHT BEHAVIOUR



EQUIPMENT SPECIFICATION

48 PRINCETON ST PROVIDENCE,, RI 02907

NEC SOLAR 121 BROADCOMMON RD. BRISTOL, RI 02871

(401) 644-5692

MA LIC - 369A1 MA HIC - 190394

RI LIC - A004585 RI HIC -39513 REVISIONS

Signature with Seal

CUSTOMER INFORMATION

QUEZADA RESIDENCE

DATE

DESCRIPTION

SHEET SIZE

ANSI B 11" X 17"

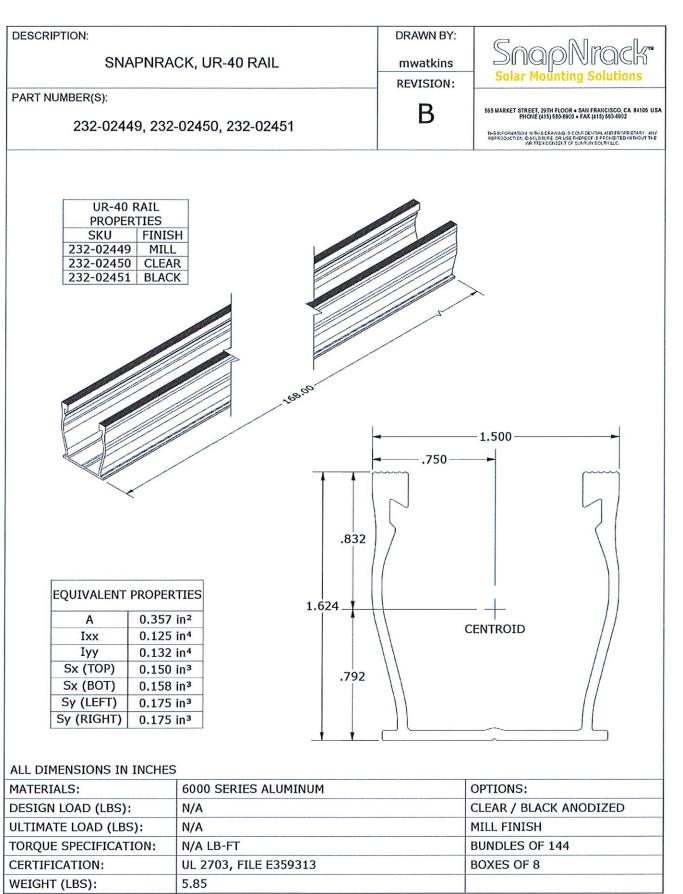
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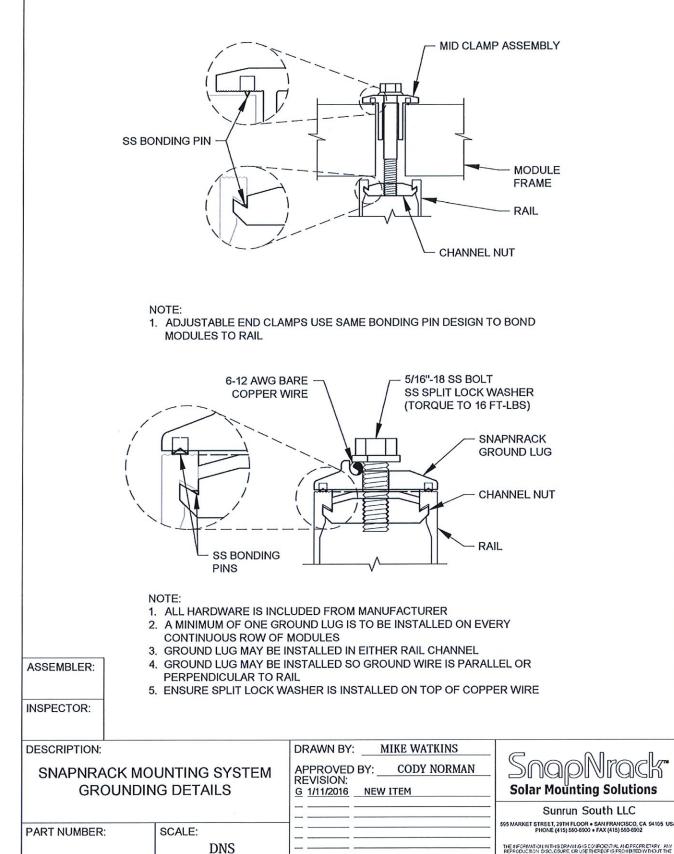
PV-8

REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power in order to facilitate global energy transitions. Committed to quality and innovation, REC offers photovoltaic modules with leading high quality, backed by an exceptional low warranty claims rate of less than 100 ppm. Founded in Norway in 1996, REC employs 2,000 people and has an annual solar panel capacity of 1.8 GW. With over 10 GW installed worldwide, REC is empowering more than 16 million people with clean solar energy, REC Group is a Bluestar Elkem company with headquarters in Norway, operational headquarters in Singapore, and regional bases in North America, Europe, and Asia-Pacific.

8.55

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CUSTOMER INFORMATION

USA

48 PRINCETON ST PROVIDENCE,, RI 02907

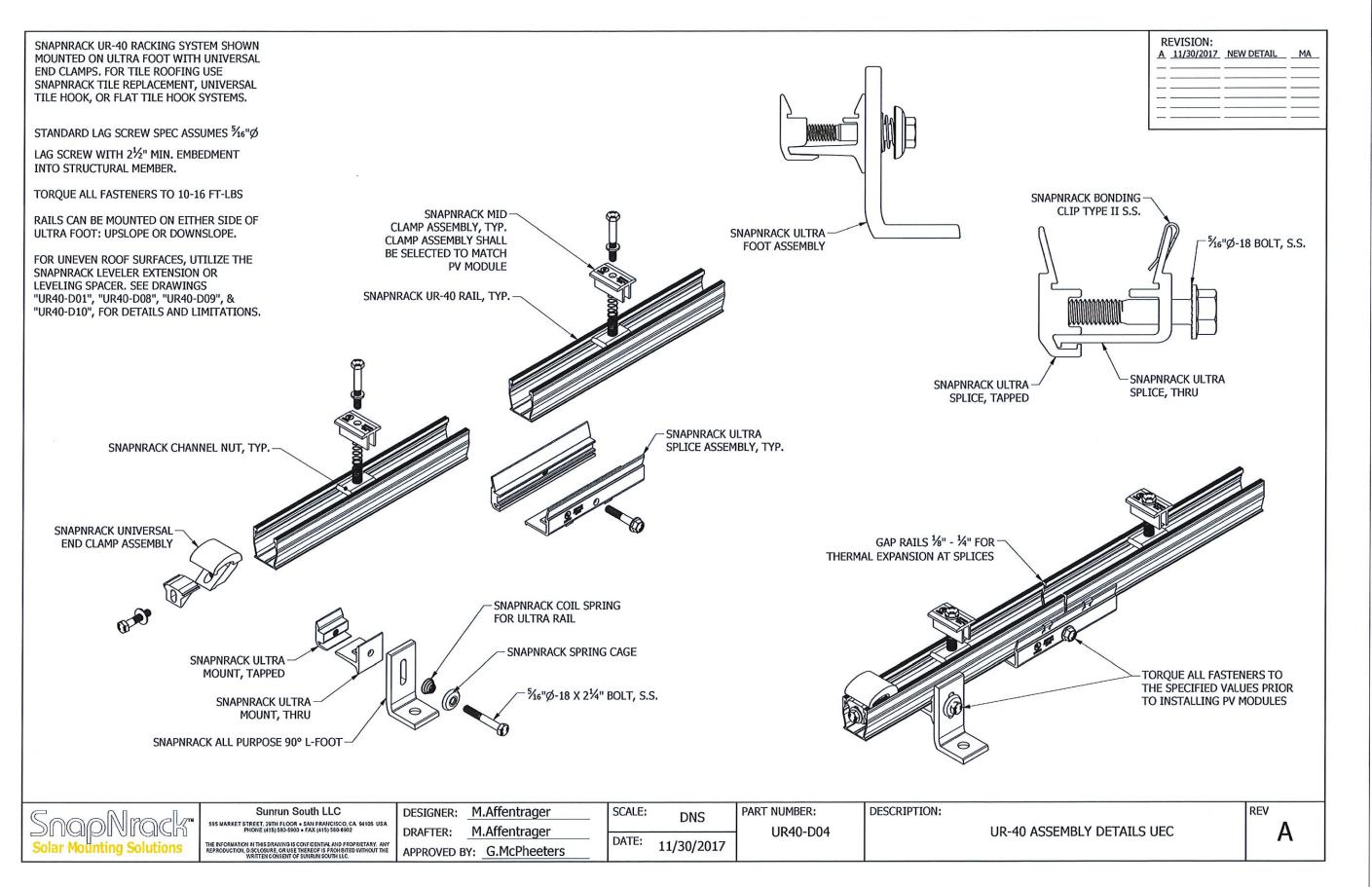
QUEZADA RESIDENCE

SHEET NAME EQUIPMENT SPECIFICATION

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