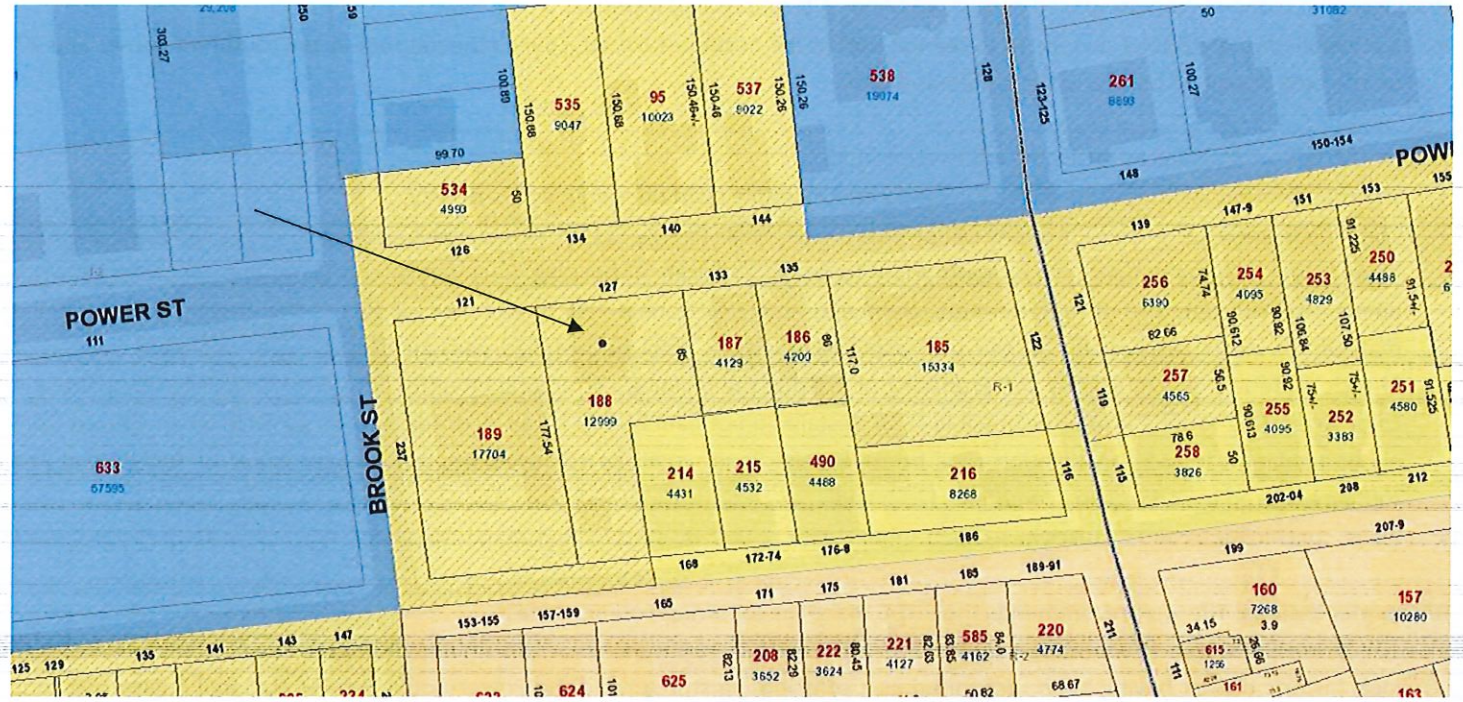
4. CASE 22. 039, 127 POWER STREET, John A. Townsend House, 1839 (COLLEGE HILL)
2 ½ stories, Greek Revival style, clapboarded, gable-end to the street, later additions.
CONTRIBUTING



Arrow indicates 127 Power Street.

Arrow indicates project location, looking north.

Applicant/Contractor: Hyrum K Bond, Roof Top Power, 275 W Natick Rd, Ste 800, Warwick, RI 02886
Owner: Anton Nicholas, 127 Power Street, Providence, RI 02906

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

- the installation of 38 solar panels, 14 to the flat roof at the northeast corner, four to the flat roof at the southeast corner and 20 on the east slope and dormer of the gable-end roof.

Issues: The following issues are relevant to this application:

- The modifications as proposed will be minimally-to-not 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) 127 Power Street is a structure of historical and architectural significance that contributes to the significance of the College Hill local historic district having been recognized as a contributing structure to the Power-Cooke Streets 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 will be minimally-to-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. 127 Power Street is a structure of historical and architectural significance that contributes to the significance of the College Hill local historic district having been recognized as a contributing structure to the Power-Cooke Streets 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 as 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-to-not 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.

PHOTOVOLTAIC ROOF MOUNT SYSTEM

38 MODULES-ROOF MOUNTED - 13.87 kWDC, 9.12 kWAC

127 POWER ST, PROVIDENCE, RI 02906 USA

SYSTEM SUMMARY:

(N) 38 - REC SOLAR REC365NP2 BLACK (365W) MODULES
(N) 38 - ENPHASE ENERGY IQ7-60-2-US MICRO-INVERTERS
(N) JUNCTION BOX
(E) 200A MAIN SERVICE PANEL WITH (E) 200A MAIN BREAKER
(N) 60A FUSED AC DISCONNECT
(N) REGROWTH METER
(N) ENPHASE IQ COMBINER BOX 3

DESIGN CRITERIA:

ROOF TYPE: - COMP SHINGLE & ROLLED COMP
NUMBER OF LAYERS: - 01
ROOF FRAME: - 3"X5" RAFTERS @ 28" O.C.
STORY: - TWO STORY
SNOW LOAD : - 30 PSF
WIND SPEED :- 133 MPH
WIND EXPOSURE:- B
EXPOSURE CATEGORY:- II
COORDINATE: 41.822992, -71.398104

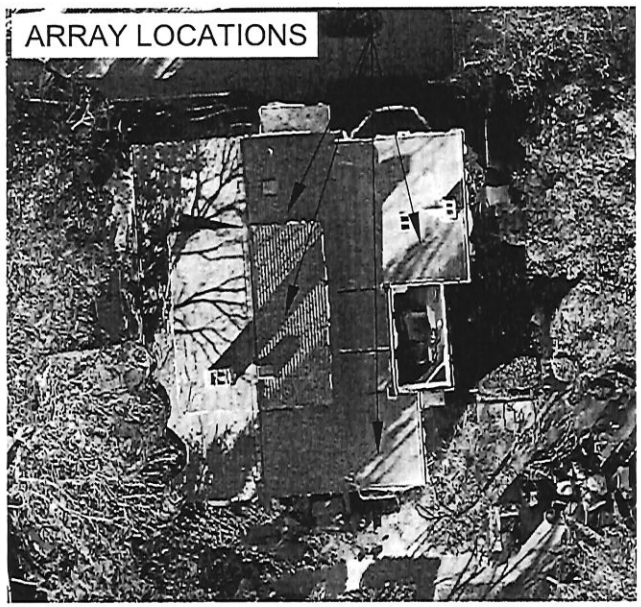
GOVERNING CODES:

2017 NATIONAL ELECTRICAL CODE (NEC)
2015 INTERNATIONAL BUILDING CODE (IBC)
2015 INTERNATIONAL MECHANICAL CODE (IMC)
2015 INTERNATIONAL RESIDENTIAL CODE (IRC)
2015 INTERNATIONAL PLUMBING CODE (IPC)

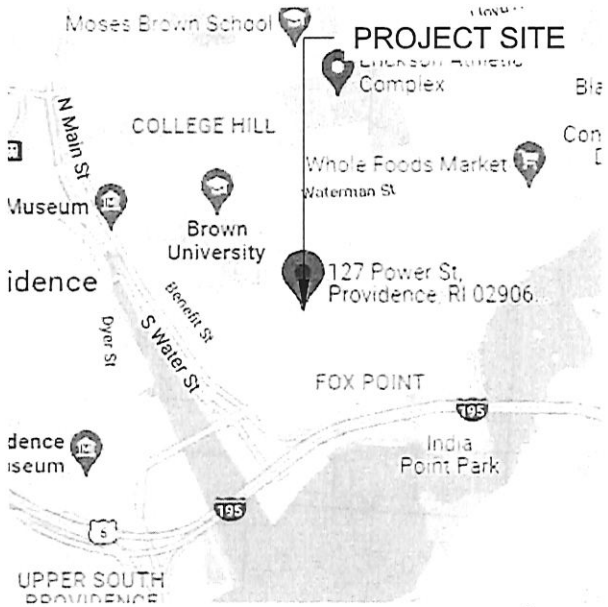
SHEET INDEX

CONSTRUCTION NOTE:

A LADDER SHALL BE IN PLACE FOR INSPECTION
THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY GRID INTERACTIVE SYSTEM
A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH NEC 690-47 AND 250-50 THROUGH 60 250-166 SHALL BE PROVIDED PER NEC, GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO AT THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, OR IS ONLY METALLIC WATER PIPING, A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO GREATER THAN #8 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE OR A COMPLETE GROUND.
EACH MODULE WILL BE GROUNDED USING THE SUPPLIED GROUNDING POINTS IDENTIFIED BY THE MANUFACTURER.
EXPOSED NON-CURRENT CARRYING METAL PARTS OF MODULE FRAMES, EQUIPMENT, AND CONDUCTOR ENCLOSURES SHALL BE GROUNDED, REGARDLESS OF VOLTAGE.
PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED
ALL SIGNAGE WILL BE INSTALLED AS REQUIRED BY AND 2017 NEC.
HEIGHT OF INTEGRATED AC/DC DISCONNECT SHALL NOT EXCEED 6' 7" THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE BETWEEN THE GROUNDING ELECTRODE AND THE PANEL (OR INVERTER) IF SMALLER THAN #6 AWG COPPER WIRE. THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AT BUSBARS WITHIN LISTED EQUIPMENT.
ALL EXTERIOR CONDUIT SHALL BE PAINTED TO MATCH ADJACENT SURFACES.
THE PV CONNECTION IN THE PANEL BOARD SHALL BE POSITIONED AT THE OPPOSITE (LOAD) END FROM THE INPUT FEEDER LOCATION OR MAIN CIRCUIT LOCATION.
SITE CONDITIONS SHALL PREVAIL IF NO SCALE IS GIVEN.
DRAWINGS ARE NOT NECESSARILY TO SCALE. ALL DIMENSIONS SHALL BE VERIFIED BY SUBCONTRACTOR UPON COMMENCEMENT OF CONSTRUCTION.



1 | AERIAL PHOTO
PV-0 | SCALE: NTS



2 | VICINITY MAP
PV-0 | SCALE: NTS

41.822992, -71.398104

RTP
Rooftop Power
ROOF TOP POWER
2980 WEST SHORE ROAD
WARWICK, RI, 02886
TEL: (833) 787-7697
LIC#: A-004027
EMAIL:design@rooftoppowerco.com

RICHARD PANTEL
11237
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Reviewed and approved
Richard Pantel, P.E.
RI Lic. No. 11237

VERSION DESCRIPTION	DATE	REV
INITIAL RELEASE	01/25/2022	UR

Richard Pantel
Digitally signed by Richard Pantel
DN: c=US, o=TECTONICORP INC, dnQualifier=A014100000017ED0DCBFCA00007095, cn=Richard Pantel
Date: 2022.02.15 10:15:27 -05'00'

PROJECT NAME

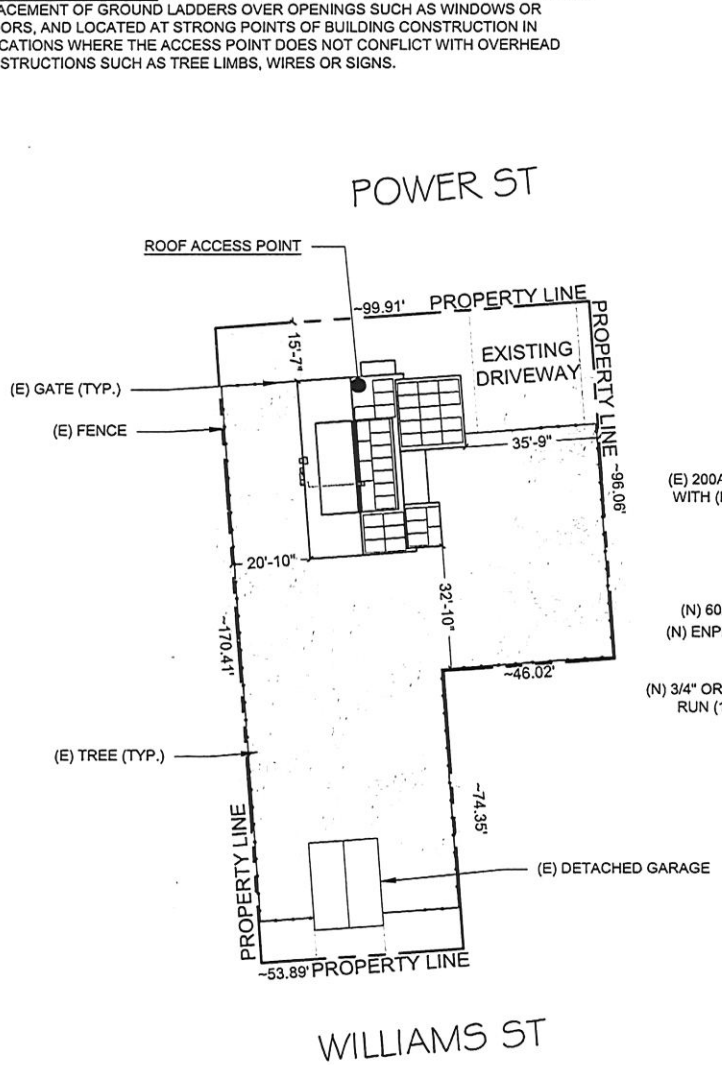
ANTON NICHOLAS
127 POWER ST,
PROVIDENCE, RI 02906 USA
APN# PROVM:16L:188
UTILITY: NATIONAL GRID
AHJ: CITY OF PROVIDENCE

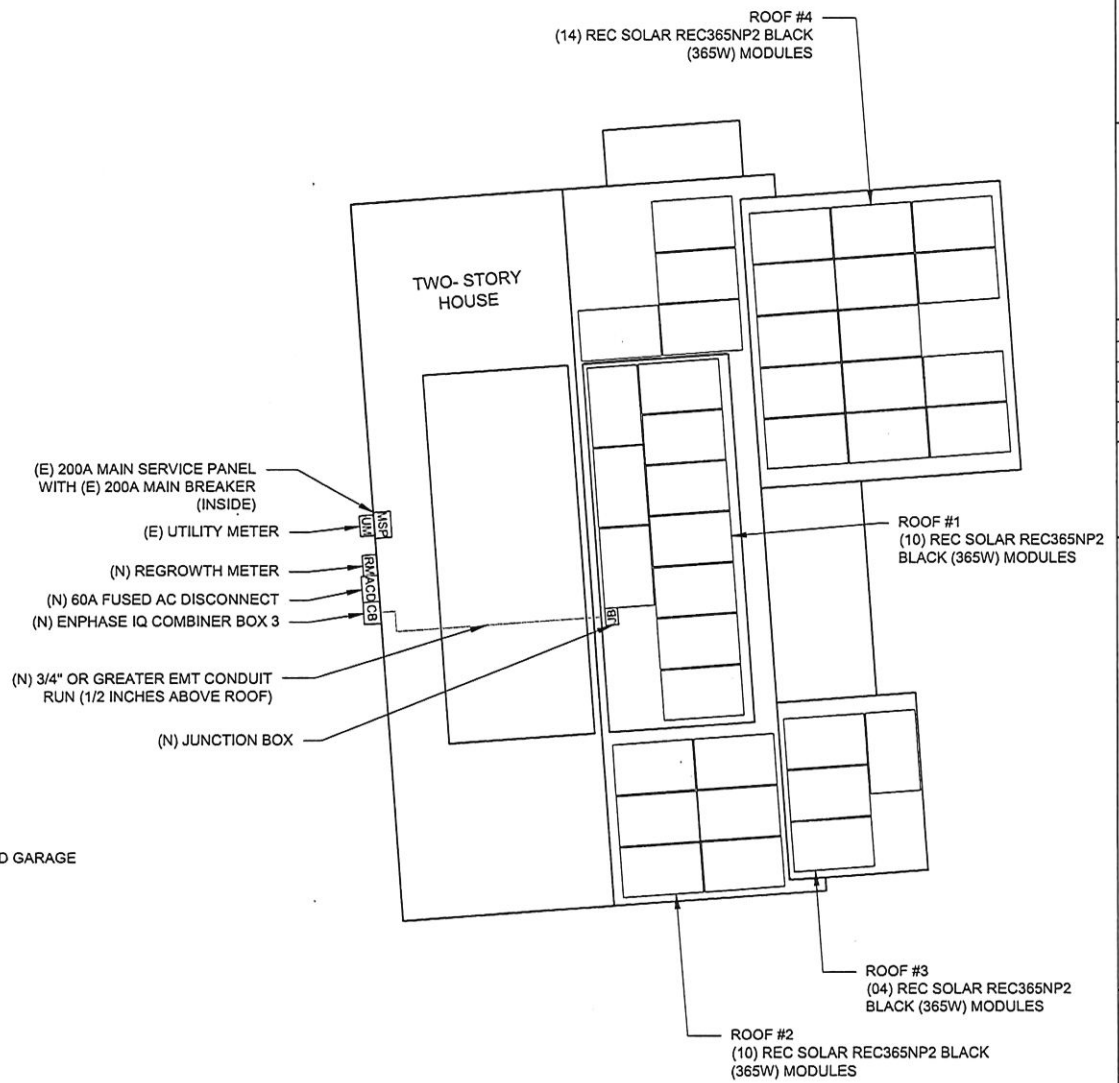
SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-0

● **ROOF ACCESS POINT** SHALL 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.





1 SITE PLAN WITH ROOF PLAN
SCALE: 1/32" = 1'-0"
41.822992, -71.398104

1A ENLARGE VIEW
SCALE: 1/8" = 1'-0"

NOTE:
A. ALL ELECTRICAL EQUIPMENT, INVERTERS, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.

RTP Rooftop Power
ROOF TOP POWER
2080 WEST SHORE ROAD
WARWICK, RI, 02886
TEL: (833) 787-7607
LIC#: A-004027
EMAIL:design@rooftoppowerco.com

RICHARD PANTEL
No. 11237
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Reviewed and approved
Richard Pantel, P.E.
RI Lic. No. 11237

DESCRIPTION	DATE	REV
INITIAL RELEASE	01/25/2022	UR

PROJECT NAME
ANTON NICHOLAS
127 POWER ST,
PROVIDENCE, RI 02906 USA
APN# PROVM:16L:188
UTILITY: NATIONAL GRID
AHJ: CITY OF PROVIDENCE

SHEET NAME
SITE PLAN WITH ROOF PLAN

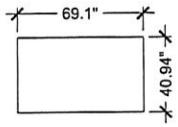
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 38 MODULES
MODULE TYPE = REC SOLAR REC365NP2 BLACK (365W) MODULES
MODULE WEIGHT = 44.0 LBS / 20.0 KG.
MODULE DIMENSIONS = 69.1"X 40.94" = 19.65 SF
UNIT WEIGHT OF ARRAY = 2.24 PSF
DISTRIBUTED DEAD LOAD = 2.66 PSF
AVERAGE ROOF POINT DEAD LOAD = 17.42 LBS
TOTAL SYSTEM WEIGHT: 1020.10 LBS
"AVERAGE ROOF HEIGHT" (GROUND TO EAVE) = ~25 FT.

PHOTOVOLTAIC MODULES
REC SOLAR REC365NP2 BLACK (365W)



BILL OF MATERIALS (ROOF#1&2)

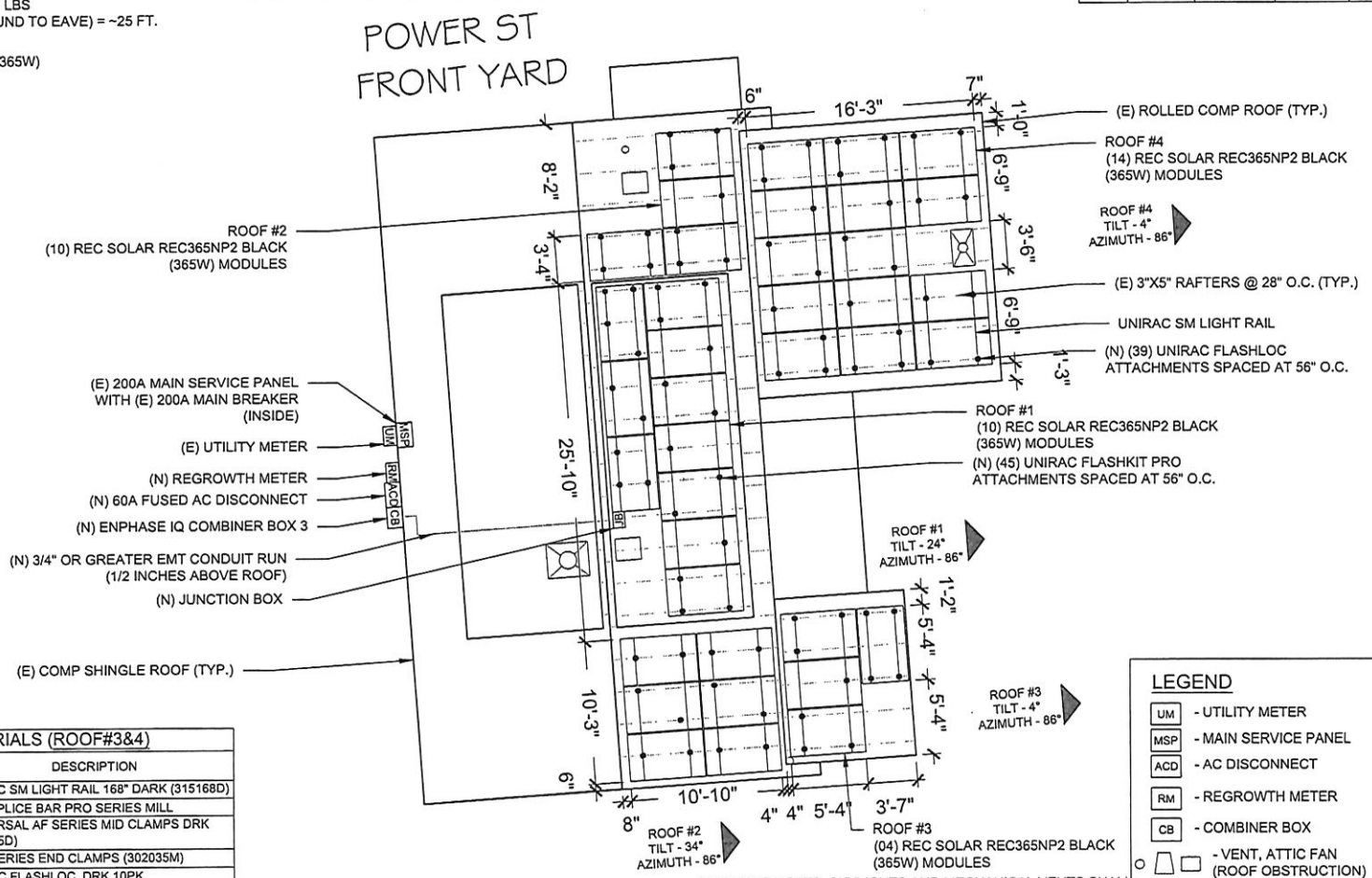
EQUIPMENT	QTY	DESCRIPTION
RAIL	14	UNIRAC SM LIGHT RAIL 168" DARK (315168D)
SPLICE	04	BND SPLICE BAR PRO SERIES MILL
MID CLAMP	28	UNIVERSAL AF SERIES MID CLAMPS DRK (302045D)
END CLAMP	24	PRO SERIES END CLAMPS (302035M)
FLASHING	45	UNIRAC FLASHKIT PRO ,DRK 10PK
GROUNDING LUG	06	ILSCO LAY IN LUG (GBL4DBT)

ARRAY AREA & ROOF AREA CALC'S

ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	10	196.46	287.48	68.34
#2	10	196.46	394.19	49.84
#3	04	78.58	130.84	60.06
#4	14	275.04	358.03	76.82

ROOF DESCRIPTION

ROOF	ROOF TYPE: ROOF TILT	ROOF TYPE: AZIMUTH	COMP SHINGLE & ROLLED COMP ROOF: RAFTERS SIZE	COMP SHINGLE & ROLLED COMP ROOF: RAFTERS SPACING
#1	24°	86°	3"x5"	28" O.C.
#2	34°	86°	3"x5"	28" O.C.
#3	4°	86°	3"x5"	28" O.C.
#4	4°	86°	3"x5"	28" O.C.



- PLUMBING VENTS, SKYLIGHTS AND MECHANICAL VENTS SHALL NOT BE COVERED, MOVED, RE-ROUTED OR RE-LOCATED.

NOTE: ACTUAL ROOF CONDITIONS AND RAFTERS (OR SEAM) LOCATIONS MAY VARY. INSTALL PER MANUFACTURER(S) INSTALLATION GUIDELINES AND ENGINEERED SPANS FOR ATTACHMENTS

LEGEND

- UM - UTILITY METER
- MSP - MAIN SERVICE PANEL
- ACD - AC DISCONNECT
- RM - REGROWTH METER
- CB - COMBINER BOX
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- ROOF ATTACHMENT
- RAFTERS
- CONDUIT
- CHIMNEY

BILL OF MATERIALS (ROOF#3&4)

EQUIPMENT	QTY	DESCRIPTION
RAIL	11	UNIRAC SM LIGHT RAIL 168" DARK (315168D)
SPLICE	04	BND SPLICE BAR PRO SERIES MILL
MID CLAMP	24	UNIVERSAL AF SERIES MID CLAMPS DRK (302045D)
END CLAMP	24	PRO SERIES END CLAMPS (302035M)
FLASHING	39	UNIRAC FLASHLOC ,DRK 10PK
GROUNDING LUG	06	ILSCO LAY IN LUG (GBL4DBT)

1 ROOF PLAN WITH MODULES

SCALE: 1/8" = 1'-0"

N

41.822992, -71.398104

RTP
Rooftop Power
ROOF TOP POWER
2880 WEST SHORE ROAD
WARWICK, RI, 02886
TEL: (833) 787-7697
LIC#: A-004027
EMAIL:design@rooftoppowerco.com

RICHARD PANTEL
No. 11237
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Reviewed and approved
Richard Pantel, P.E.
RI Lic. No. 11237

DESCRIPTION	DATE	REV
INITIAL RELEASE	01/25/2022	UR

PROJECT NAME

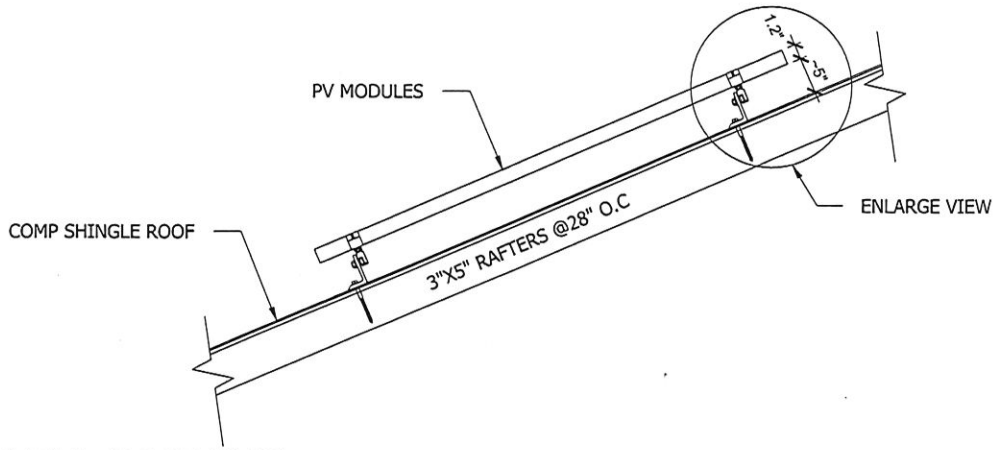
ANTON NICHOLAS
127 POWER ST,
PROVIDENCE, RI 02906 USA
APN# PROVM:16L:188
UTILITY: NATIONAL GRID
AHJ: CITY OF PROVIDENCE

SHEET NAME
ROOF PLAN WITH MODULES

SHEET SIZE
ANSI B
11" X 17"

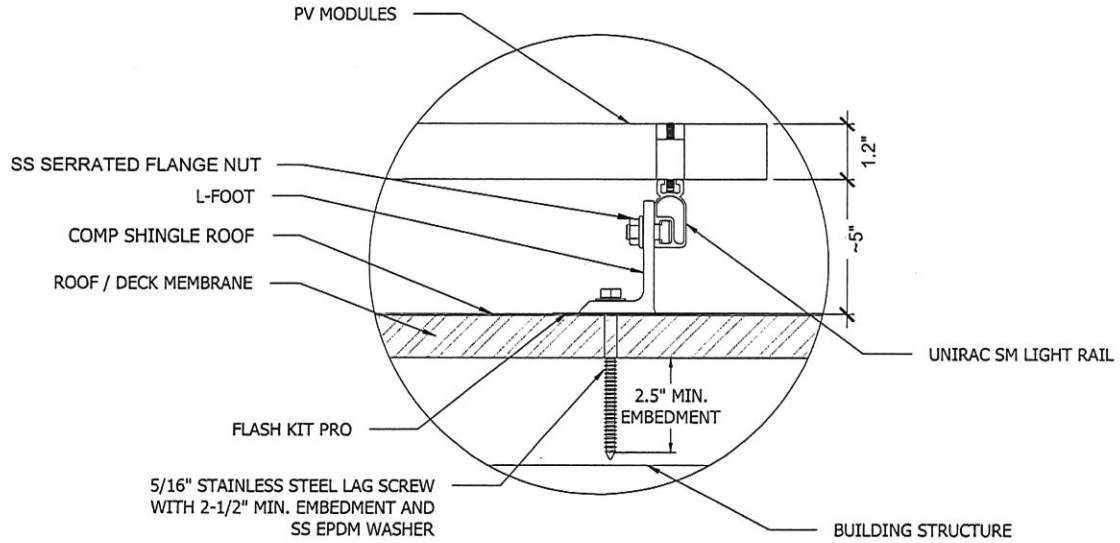
SHEET NUMBER
PV-2

NOTE: ACTUAL ROOF CONDITIONS AND RAFTERS (OR SEAM) LOCATIONS MAY VARY. INSTALL PER MANUFACTURER(S) INSTALLATION GUIDELINES AND ENGINEERED SPANS FOR ATTACHMENTS



1 ATTACHMENT DETAIL (ROOF #1&2)

SCALE: NTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)

SCALE: NTS

RTP
Rooftop Power
ROOF TOP POWER
2980 WEST SHORE ROAD
WARWICK, RI, 02886
TEL: (833) 787-7697
LIC#: A-004027
EMAIL:design@rooftoppowerco.com

RICHARD PANTEL
No. 11237
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Reviewed and approved
Richard Pantel, P.E.
RI Lic. No. 11237

DESCRIPTION	DATE	REV
INITIAL RELEASE	01/25/2022	UR

PROJECT NAME

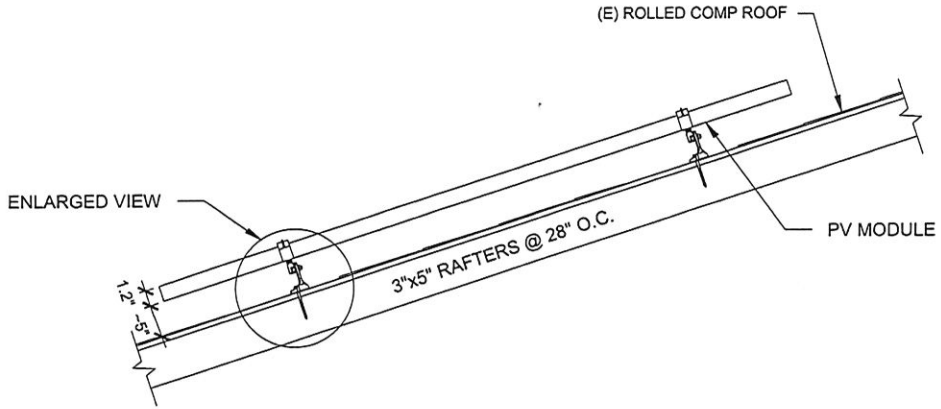
ANTON NICHOLAS
127 POWER ST,
PROVIDENCE, RI 02906 USA
APN# PROVM:16L:188
UTILITY: NATIONAL GRID
AHJ: CITY OF PROVIDENCE

SHEET NAME
ATTACHMENT DETAIL

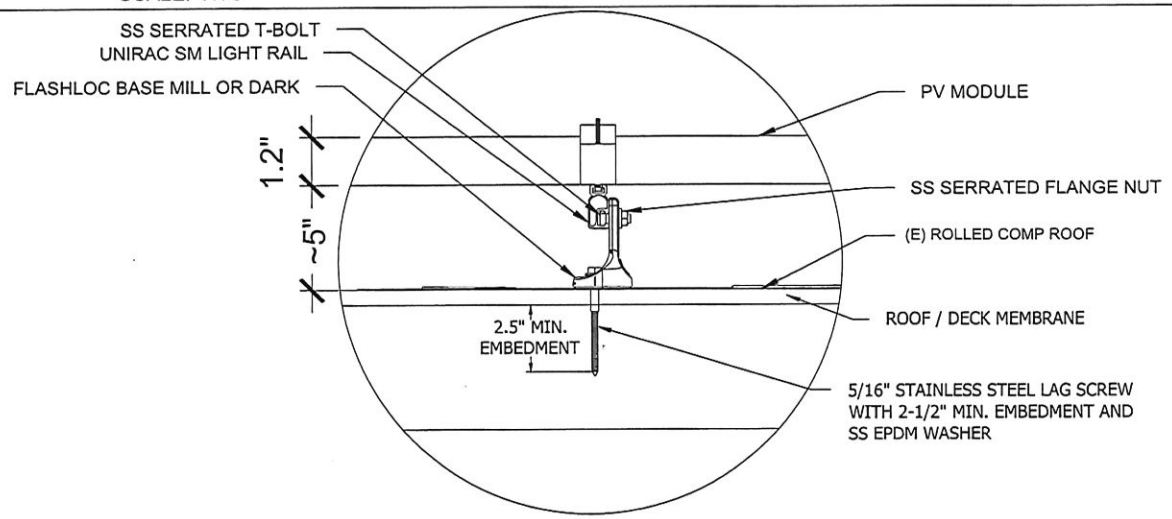
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

NOTE: ACTUAL ROOF CONDITIONS AND RAFTERS (OR SEAM) LOCATIONS MAY VARY. INSTALL PER MANUFACTURER(S) INSTALLATION GUIDELINES AND ENGINEERED SPANS FOR ATTACHMENTS



1 ATTACHMENT DETAIL (ROOF #3&4)
SCALE: NTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)
SCALE: NTS

ROOF TOP POWER
2980 WEST SHORE ROAD
WARWICK, RI, 02886
TEL: (833) 767-7697
LIC#: A-004027
EMAIL:design@rooftoppowerco.com

RICHARD PANTEL
11237
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Reviewed and approved
Richard Pantel, P.E.
RI Lic. No. 11237

DESCRIPTION	DATE	REV
INITIAL RELEASE	01/25/2022	UR

PROJECT NAME

ANTON NICHOLAS
127 POWER ST,
PROVIDENCE, RI 02906 USA
APN# PROVM:16L:188
UTILITY: NATIONAL GRID
AHJ: CITY OF PROVIDENCE

SHEET NAME
ATTACHMENT DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3A

SOLAR'S MOST TRUSTED REC

REC N-PEAK 2 BLACK SERIES

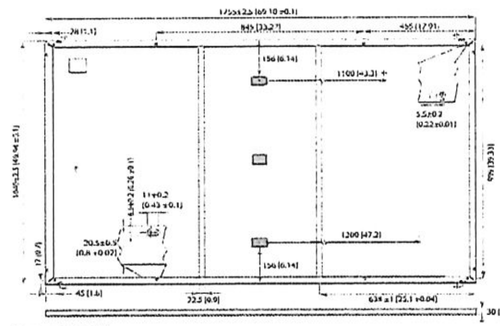
PREMIUM FULL BLACKMONO N-TYPE SOLAR PANELS

- MONO N-TYPE: THE MOST EFFICIENT C-SI TECHNOLOGY
- NO LIGHT INDUCED DEGRADATION
- SUPER-STRONG FRAME UP TO 7000 PA SNOW LOAD
- FLEXIBLE INSTALLATION OPTIONS
- FEATURING REC'S PIONEERING TWIN DESIGN
- HIGH POWER FOR 25 YEARS

370 WP POWER

REC 25 YEAR PROTRUST WARRANTY — PRODUCT · PERFORMANCE · LABOR — ELIGIBLE

REC N-PEAK 2 BLACK SERIES



Measurements in mm [in]

GENERAL DATA	
Cell type:	120 half-cut mono c-Si n-type cells 6 strings of 20 cells in series
Glass:	3.2 mm solar glass with anti-reflection surface treatment
Backsheet:	Highly resistant polymeric construction (black)
Frame:	Anodized aluminum (black) with silver support bars
Junction box:	3-part, 3 bypass diodes, IP68 rated in accordance with IEC 62790
Cable:	4 mm² solar cable, 1.1 m + 1.2 m in accordance with EN 50618
Connectors:	Stäubli MC4 PV-KBT4/KST4 (4 mm²) in accordance with IEC 62852 IP68 only when connected
Origin:	Made in Singapore

MECHANICAL DATA	
Dimensions:	1755 x 1040 x 30 mm
Area:	1.83 m²
Weight:	20.0 kg

ELECTRICAL DATA @ STC	Product code*: RECxxxNP2 Black				
Nominal Power - P_{MPP} (Wp)	350	355	360	365	370
Watt Class Sorting - (W)	0/+5	0/+5	0/-5	0/+5	0/+5
Nominal Power Voltage - V_{MPP} (V)	33.1	33.5	33.9	34.3	34.7
Nominal Power Current - I_{MPP} (A)	10.57	10.60	10.62	10.65	10.68
Open Circuit Voltage - V_{OC} (V)	40.6	40.7	40.8	40.9	41.1
Short Circuit Current - I_{SC} (A)	11.22	11.27	11.31	11.36	11.41
Panel Efficiency (%)	19.1	19.4	19.7	20.0	20.3

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of P_{MPP}, V_{OC} & I_{SC} ±3% within one watt class. *Where xxx indicates the nominal power class (P_{MPP}) at STC above.

ELECTRICAL DATA @ NMOT	Product code*: RECxxxNP2 Black				
Nominal Power - P_{MPP} (Wp)	264	268	272	276	280
Nominal Power Voltage - V_{MPP} (V)	31.0	31.3	31.7	32.1	32.5
Nominal Power Current - I_{MPP} (A)	8.54	8.56	8.58	8.60	8.63
Open Circuit Voltage - V_{OC} (V)	38.0	38.1	38.2	38.2	38.4
Short Circuit Current - I_{SC} (A)	9.06	9.10	9.13	9.18	9.22

Nominal module operating temperature (NMOT, air mass AM 1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s). *Where xxx indicates the nominal power class (P_{MPP}) at STC above.

MAXIMUM RATINGS	
Operational temperature:	-40 ... +85°C
Maximum system voltage:	1000 V
Maximum test load (front):	+7000 Pa (713 kg/m²)*
Maximum test load (rear):	-4000 Pa (407 kg/m²)*
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	44.3°C (±2°C)
Temperature coefficient of P_{MAX}	-0.34 %/°C
Temperature coefficient of V_{OC}	-0.26 %/°C
Temperature coefficient of I_{SC}	0.04 %/°C

*The temperature coefficients stated are linear values

CERTIFICATIONS

IEC 61215:2016, IEC 61730:2016, 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)

ISO 14001:2004, ISO 9001:2015, OHSAS 18001:2007, IEC 62941

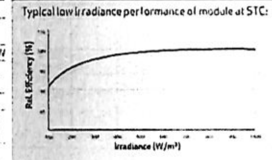
take e-way

WARRANTY	Standard	REC ProTrust	
Installed by an REC Certified Solar Professional	No	Yes	Yes
System Size	Any	≤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%

See warranty documents for details. Some conditions apply.

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



Specifications subject to change without notice

Ref: PM-DS-11-05-Rev-C 11.21

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 www.recgroup.com

RTP Rooftop Power
ROOF TOP POWER
2980 WEST SHORE ROAD
WARWICK, RI, 02886
TEL: (833) 787-7697
LIC#: A-004027
EMAIL: design@rooftoppowerco.com

RICHARD PANTEL 11237 REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Reviewed and approved
Richard Pantel, P.E.
RI Lic. No. 11237

DESCRIPTION	DATE	REV
INITIAL RELEASE	01/25/2022	UR

PROJECT NAME

ANTON NICHOLAS
127 POWER ST,
PROVIDENCE, RI 02906 USA
APN# PROVM:16L:188
UTILITY: NATIONAL GRID
AHJ: CITY OF PROVIDENCE

SHEET NAME: SPEC SHEETS

SHEET SIZE: ANSI B 11" X 17"

SHEET NUMBER: PV-10