

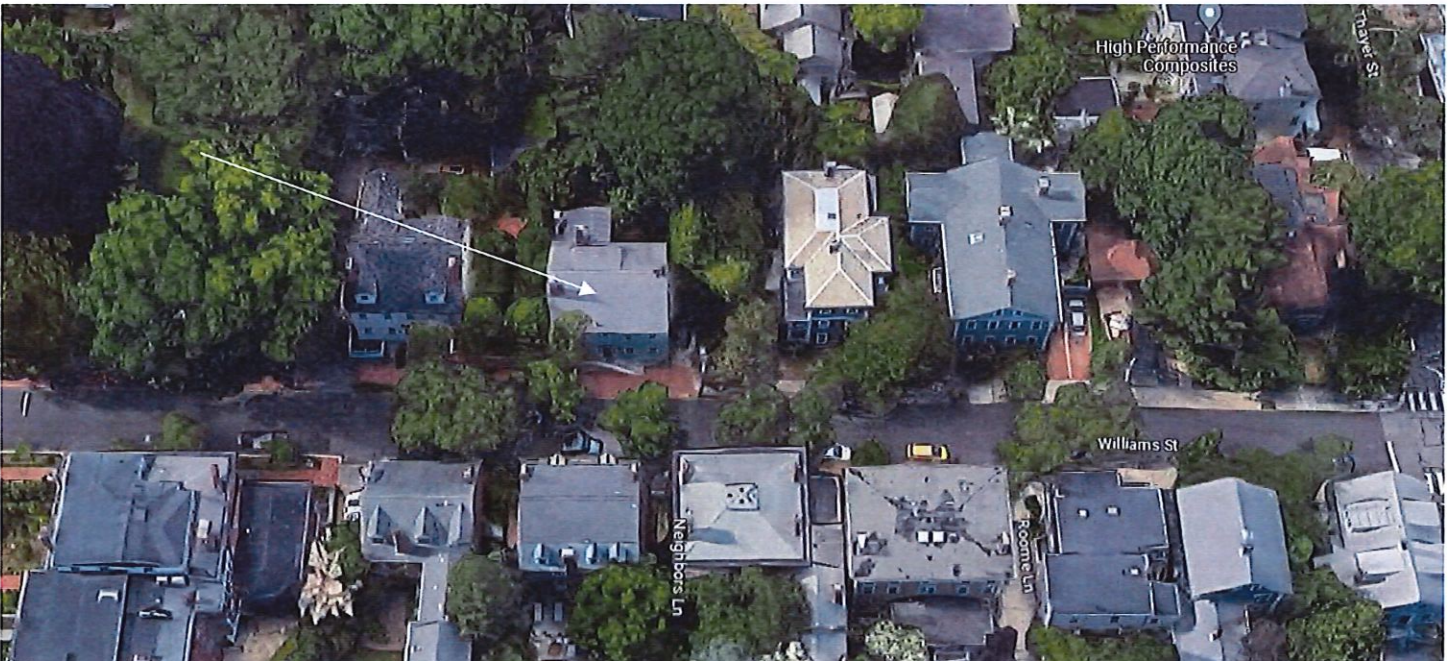
**PROJECT REVIEW**

**1. CASE 23.072, 92 WILLIAMS STREET, Caleb Roffe House, 1824 (COLLEGE HILL)**

Federal; 2½-stories, clapboard, gable roof; Five-bay facade; central capped doorway reached by a double flight of wooden steps.  
CONTRIBUTING



Arrow indicates 92 Williams Street.



Arrow indicates project location, looking north.

**Applicant/Contractor:** Rooftop Power, Dan Fisher, 275 West Natick Rd, Suite 800, Warwick, RI 02886

**Owner:** David Keefe, 92 Williams Street, Providence, RI 02906

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

- the installation of 10 solar panels to the front (South) slope of the side-gable roof.

**Issues:** The following issues are relevant to this application:

- At the June 26<sup>th</sup> meeting the matter was continued. The Commission expressed concerns that the array would be visible from the public rights-of-way. Discussed roof color. The roof has been replaced recently in a gray. Some debate over actual color installed. This was unfortunate, if the roof was a charcoal color it would have assisted in camouflaging the panels. Questions about efficiency of an array that was located on the rear dormer and slope. Requested that the applicants confirm the roof color and provide an evaluation as to the validity of an array on the rear slope of the property, with the applicant to appear with the requested materials at a subsequent meeting. The applicant agreed;
- Due to the narrowness of Williams Street, the height of the subject property and that the subject property and adjoining properties are built to the front lot line, it is Staff's opinion that the array as proposed will be minimally visible from the public rights-of-way;
- Staff recommends the three panels at the western side be moved as much as possible to the east to decrease possible visibility;
- 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) 72 Williams 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 College Hill National Historic Landmarks 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 not be 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. 72 Williams 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 College Hill National Historic Landmarks 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 are not on the primary elevation and 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.

# PHOTOVOLTAIC ROOF MOUNT SYSTEM

10 MODULES-ROOF MOUNTED - 3.95 KWDC, 2.90 KWAC  
 92 WILLIAMS ST APT 1, PROVIDENCE, RI 02906 USA

## SYSTEM SUMMARY:

- (N) 10 - JA SOLAR JAK54S31-395NMR (395W) MODULES
- (N) 10 - ENPHASE ENERGY IQBPPLUS-722-US MICRO-INVERTERS
- (N) JUNCTION BOX
- (E) 200A MAIN SERVICE PANEL WITH (E) 200A MAIN BREAKER
- (N) 60A FUSED AC DISCONNECT
- (E) 30A NON-FUSED AC DISCONNECT
- (N) ENPHASE IQ COMBINER BOX 4

## DESIGN CRITERIA:

- ROOF TYPE: - COMP SHINGLE
- NUMBER OF LAYERS: - 01
- STORY: - TWO STORY
- SNOW LOAD: - 30 PSF
- WIND SPEED: - 125 MPH
- WIND EXPOSURE: - B
- RISK CATEGORY: - II
- COORDINATE: - 41.822439 -71.401054

## GOVERNING CODES:

- 2020 NATIONAL ELECTRICAL CODE (NEC)
- 2018 INTERNATIONAL BUILDING CODE (IBC)
- 2018 INTERNATIONAL MECHANICAL CODE (IMC)
- 2018 INTERNATIONAL RESIDENTIAL CODE (IRC)
- 2018 INTERNATIONAL PLUMBING CODE (IPC)

## SHEET INDEX

- PV-0 COVER SHEET
- PV-1 SITE PLAN WITH ROOF PLAN
- PV-2 ROOF PLAN WITH MODULES
- PV-3 ATTACHMENT DETAILS
- PV-4 ELECTRICAL LINE DIAGRAM
- PV-5 WARNING LABEL
- PV-6+ EQUIPMENT SPEC SHEETS

## 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 GROUNDING 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 2020 NEC.
  - THE HEIGHT OF INTEGRATED ACDC DISCONNECT SHALL NOT EXCEED 6' 7" FROM PHYSICAL DAMAGE BETWEEN THE GROUNDING ELECTRODE AND THE PANEL (OR INVERTER) IF SMALLER THAN #8 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.
- ### ELECTRICAL NOTES
- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
  - ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
  - WIRING CONDUIT AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
  - WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
  - DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULLY APPLICABLE CODES AND STANDARDS.
  - WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
  - ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
  - MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL. PER THE GROUNDING CLIP MANUFACTURERS INSTRUCTION.
  - MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEBB LUG OR LISCO GEL-ADHT LAY-IN LUG.
  - THE POLARITY OF THE GROUNDING CONDUCTORS IS NEGATIVE



1 AERIAL PHOTO  
 SCALE: NTS



2 VICINITY MAP  
 SCALE: NTS



**IRTP**  
 RICHARD PANTAL  
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 WAWATUCK, RI 02888  
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**RICHARD PANTAL**  
 LICENSED PROFESSIONAL ENGINEER  
 11297  
 RICHARD PANTAL, P.E.  
 RICHARD PANTAL, P.E.  
 DESIGN DATE: 11/28/23  
 INITIAL RELEASE: 04/07/2025

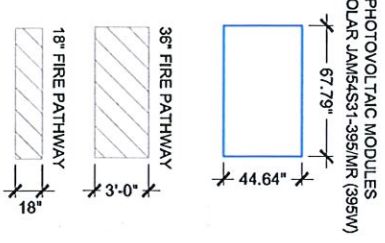
Reviewed and approved  
 Richard Pantal, P.E.  
 PROJECT NAME  
 92 WILLIAMS ST APT 1, PROVIDENCE, RI 02906 USA  
 APN# PROV16L203  
 UTILITY: RHODE ISLAND ENERGY  
 AHJ: CITY OF PROVIDENCE

SHEET NAME  
 COVER SHEET  
 SHEET SIZE  
 ANSIB  
 11" X 17"  
 SHEET NUMBER  
 PV-0

DAVID J KEEFE  
 92 WILLIAMS ST APT 1,  
 PROVIDENCE, RI 02906 USA  
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**MODULE TYPE, DIMENSIONS & WEIGHT**

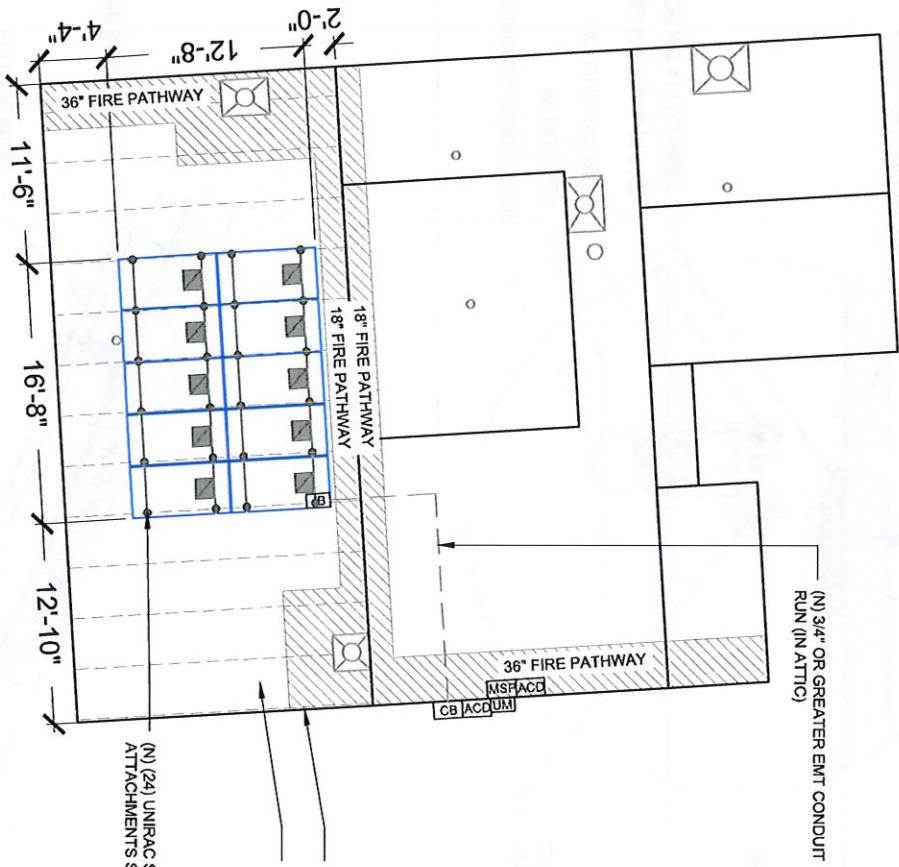
NUMBER OF MODULES = 10 MODULES  
 MODULE TYPE = JA SOLAR JAMS4531-395IMR (395W) MODULES  
 MODULE WEIGHT = 47.39 LBS / 21.5 KG.  
 MODULE DIMENSIONS = 67.79" X 44.64" = 21.01 SF  
 UNIT WEIGHT OF ARRAY = 2.26 PSF  
 DISTRIBUTED DEAD LOAD = 2.51 PSF  
 AVERAGE ROOF POINT DEAD LOAD = 21.96 LBS  
 TOTAL SYSTEM WEIGHT: 527.00 LBS  
 \*AVERAGE ROOF HEIGHT\* (GROUND TO EAVE) = -25 FT.



ARRAY AREA & ROOF AREA CALC'S		
AREA OF NEW ARRAY (Sq. Ft.)	AREA OF ROOF (PLAN VIEW) (Sq. Ft.)	TOTAL ROOF AREA COVERED BY ARRAY %
210.15	1995.64	10.53%
10.53%	ROOF AREA (ARRAY <33% OF ROOF AREA)	

ARRAY DESCRIPTION			
ROOF TYPE	COMP SHINGLE ROOF	RASTERS	RASTERS SPACING
ARRAY #	10	RASTERS SIZE	38" O.C.
ARRAY TILT	30°	RASTERS SPACING	47x5"
ARRAY AZIMUTH	177°		

REAR YARD



BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
RAIL	6	UNIRAC NXT UMOUNT RAIL 188" DRK
RAIL SPULGE	4	NXT UMOUNT RAIL SPULGE
UNIVERSAL CLAMP	24	NXT UMOUNT COMBO CLAMP -DRK
ROOF ATTACHMENTS	24	UNIRAC STRONGHOLD
ACCESSORIES	8	ACCESSORIES
MLPE & GROUNDING	12	NXT UMOUNT MLPE & LUG CLAMP

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



41.822439, -71.401054

**1 ROOF PLAN WITH MODULES**

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

FRONT YARD  
WILLIAMS ST

ARRAY #1  
TILT - 30°  
AZIMUTH - 177°

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

LEGEND	
UM	UTILITY METER
MS	MAIN SERVICE PANEL
ACD	FUSED AC DISCONNECT
ACD	NON-FUSED AC DISCONNECT
CB	ENPHASE IQ COMBINER 4
JB	JUNCTION BOX
RAIL	RAIL
CONDUIT	CONDUIT
MI	MICRO-INVERTER
RA	ROOF ATTACHMENT @ 38" O.C.
VF	VENT, ATTIC FAN (ROOF OBSTRUCTION)
CH	CHIMNEY
RF	RAFTERS

PROJECT NAME  
DAVID J KEEFE  
92 WILLIAMS ST APT 1,  
PROVIDENCE, RI 02906 USA  
APN# PROV16L203  
UTILITY: RHODE ISLAND ENERGY  
AHJ: CITY OF PROVIDENCE

Reviewed and approved  
Richard Pantel, P.E.  
RICHARD PANTEL  
PROVIDENCE, RI 02906  
TEL: (401) 787-7827  
LIC# A004027

ROOF TOP OWNER  
275 WAWMUCK RD, 02966  
TEL: (401) 787-7827  
LIC# A004027

SHEET NAME  
ROOF PLAN WITH  
MODULES

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-2

Harvest the Sunshine



**Mono**  
405 W-MBB  
Half-cell Black Module  
JAM54S31 380-405/MR/1500V

**Introduction**  
Assembled with 100% BESS cells, the half-cell configuration of the module offers the advantages of higher power output, better temperature-dependent performance, reduced shading effect on the array generation, lower risk of hot spot, as well as enhanced behavior for mechanical loading.

**Higher output power**

**Less shading and lower resistive loss**

**Lower LCOE**

**Better mechanical loading tolerance**

**Superior Warranty**

• 12-year product warranty  
• 25-year linear power output warranty



**Comprehensive Certificates**

- IEC 61715, IEC 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems

**JASOLAR**

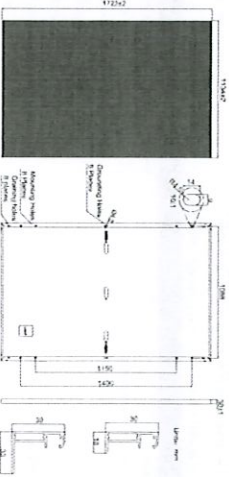
Specifications subject to technical changes and those JASOLAR reserves the right to change without notice.  
www.jasolar.com  
11000 S. 10th Street, Suite 100, Phoenix, AZ 85042, USA



JASOLAR

JAM54S31 380-405/MR/1500V

**MECHANICAL DIAGRAMS**



**SPECIFICATIONS**

Cell	Mono
Weight	13.5kg ± 21.5kg
Dimensions	1722mm × 1142mm × 33.1mm
Cable Cross Section Size	4mm <sup>2</sup> (IEC) / 12AWG (UL)
No. of cells	162 (6 × 18)
Junction Box	IP65, 3 Sides
Connector	Stable MC4 C102
Cable Length (including Straps)	CD Size: CD 2 110.55
Country of Manufacturer	China/Vietnam
Frame Class	2 Bar or 3 Bar

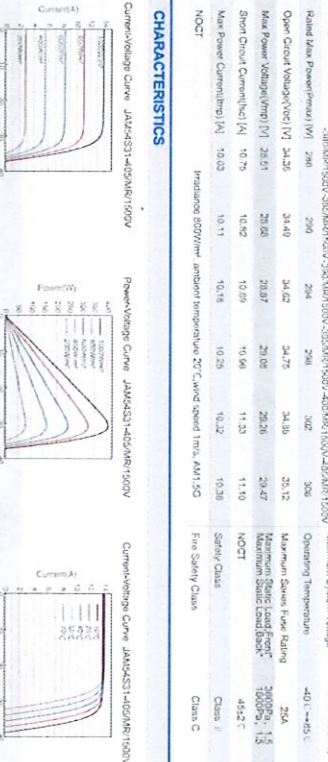
**ELECTRICAL PARAMETERS AT STC**

TYPE	JAM54S31-380/MR/1500V	JAM54S31-405/MR/1500V	JAM54S31-380/MR/1520V	JAM54S31-405/MR/1520V
Rated Maximum Power (P <sub>max</sub> ) [W]	380	380	390	405
Open Circuit Voltage (V <sub>oc</sub> ) [V]	36.58	36.71	36.65	37.23
Maximum Power Voltage (V <sub>mp</sub> ) [V]	30.28	30.46	30.64	31.21
Short Circuit Current (I <sub>sc</sub> ) [A]	13.44	13.22	13.61	13.87
Maximum Power Current (I <sub>mp</sub> ) [A]	12.65	12.64	12.75	12.90
Module Efficiency [%]	19.5	19.7	20.0	20.7
Power Tolerance	0 ~ ±5W			
Temperature Coefficient of P <sub>max</sub> [1/°C]	-0.54W/°C			
Temperature Coefficient of V <sub>oc</sub> [1/°C]	-0.275V/°C			
Temperature Coefficient of I <sub>sc</sub> [1/°C]	+0.26A/°C			

**Electrical Parameters at NOCT**

TYPE	JAM54S31-380/MR/1500V	JAM54S31-405/MR/1500V	JAM54S31-380/MR/1520V	JAM54S31-405/MR/1520V
Rated Max Power (P <sub>max</sub> ) [W]	298	294	302	308
Open Circuit Voltage (V <sub>oc</sub> ) [V]	34.49	34.62	34.75	35.12
Max Power Voltage (V <sub>mp</sub> ) [V]	28.88	28.87	29.05	29.47
Short Circuit Current (I <sub>sc</sub> ) [A]	10.75	10.89	10.96	11.19
Max Power Current (I <sub>mp</sub> ) [A]	10.11	10.16	10.26	10.38

**CHARACTERISTICS**



**OPERATING CONDITIONS**

Operating Temperature	-40°C ~ +85°C
Maximum System Voltage	1500V DC (IEC)
Maximum System Fuse Rating	25A
Maximum Static Load Point	3000Pa, 1.5
NOCT	45±0.5°C
Safety Class	Class II
Fire Safety Class	Class C

**Premium Cells, Premium Modules**

Version No.: Global EV 20220229A

**TRTP**  
ROOF TOP POWER  
275 WAREHOUSES, 800 STORES  
TEL: (833) 787-7887  
LIC# A-000027  
EMAIL: sales@rooftoppower.com

**RICHARD PAVTEL**  
11237  
PROFESSIONAL ENGINEER  
(004)

Reviewed and approved  
Richard Pavtel, P.E.  
029091-RP-17-11237  
INITIAL RELEASE 04/07/2023 UR

PROJECT NAME

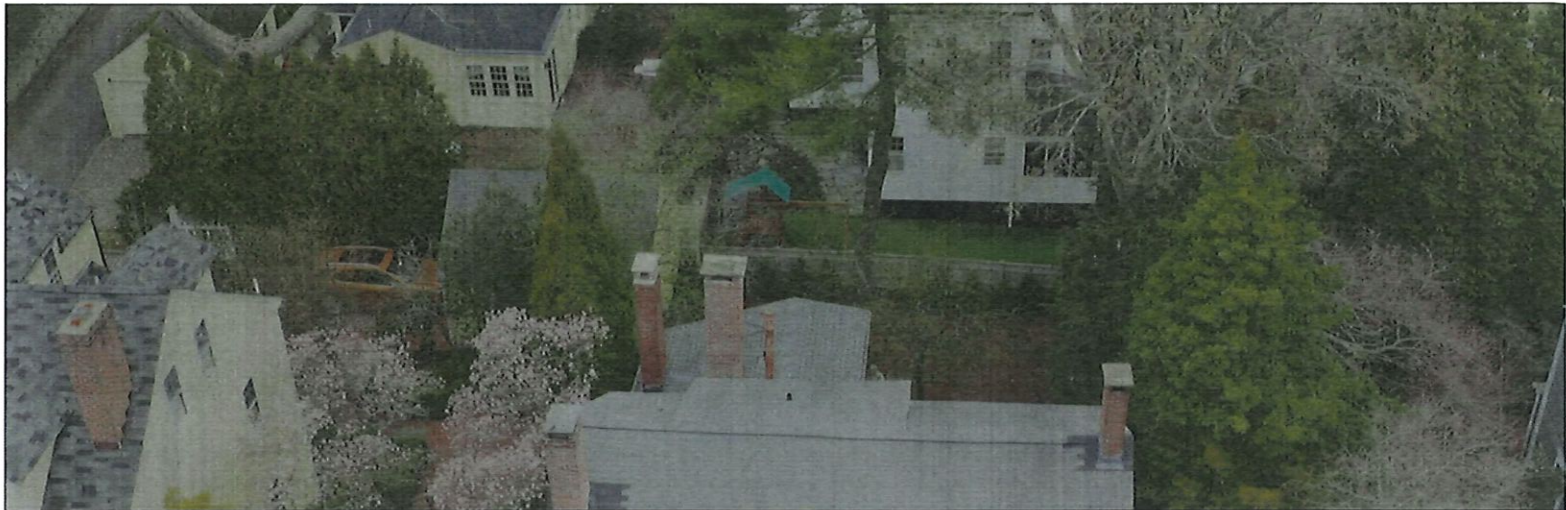
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AHJ: CITY OF PROVIDENCE

SHEET NAME

SPEC SHEETS

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-6



## Rooftop Power

Name: Dan Fisher  
Email: dfisher@rooftoppowerco.com

Prepared For:

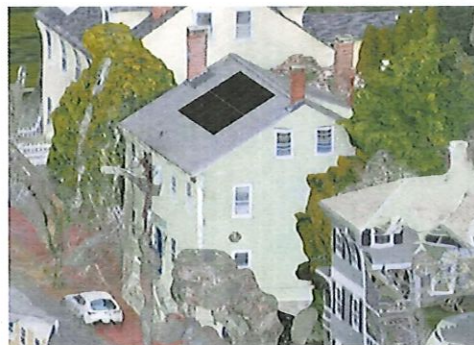
92 Williams Street,  
Providence, Rhode Island  
02906, United States

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## PV System Info

Size: 3.950kW DC STC - Annual Production: 0kWh

- Offset: 0%



[GO TO 3D MODEL OF DESIGN](#)



92

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833-RTP-POWR  
SOLAR-ROOFING



Google