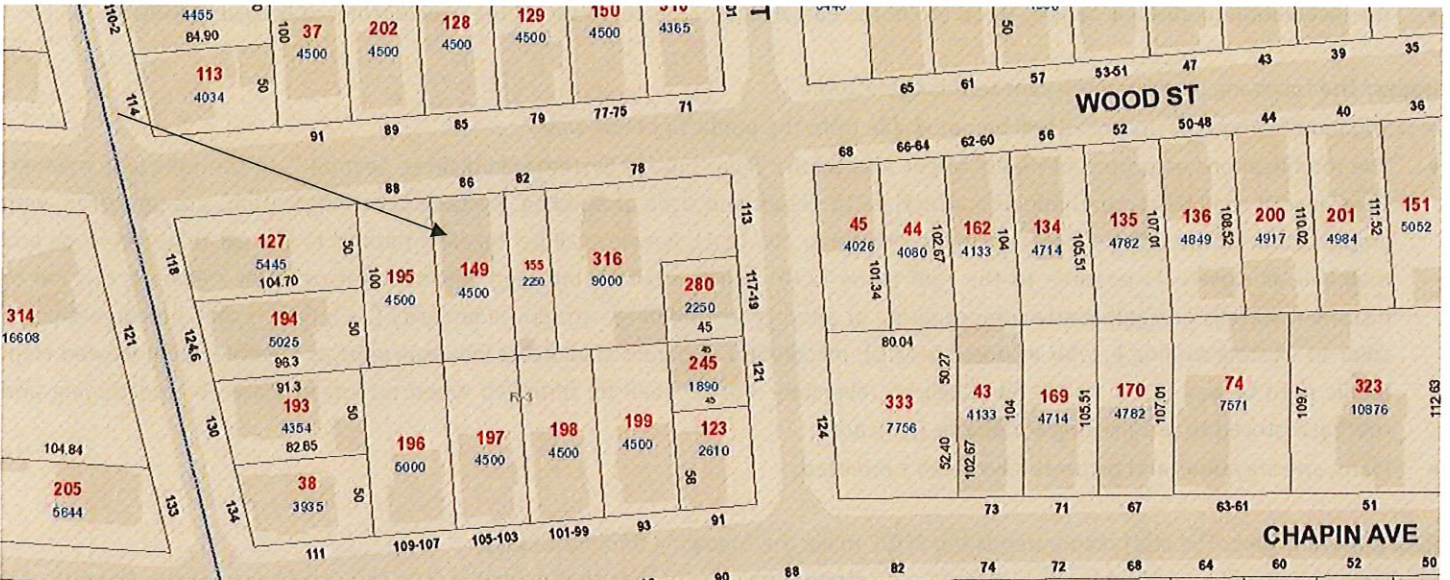


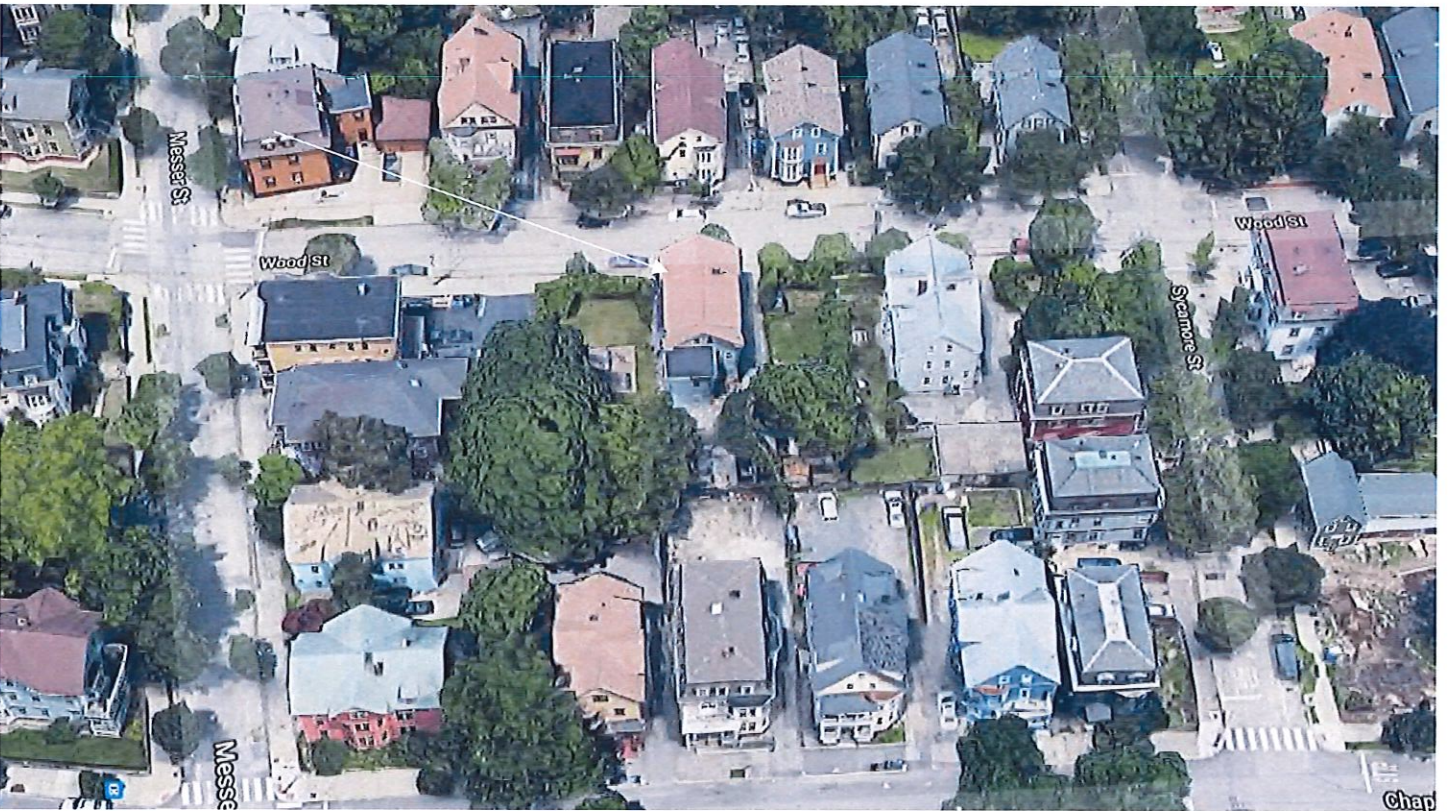
**3. CASE 22.020, 86 WOOD STREET, House, c1870 (ARMORY)**

2½-story; end-gable; house; with 2-story front bay, shed dormer, sidehall entrance under porch, round-arch attic windows, and bracketed trim.

CONTRIBUTING



Arrow indicates 86 Wood 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:** Graziella Giampaoli, 86 Wood Street, Providence, RI 02909

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

- the installation of 20 solar panels, 10 on top of the east dormer, and 10 on top of the west dormer of the gable roof.

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

- The modifications as proposed will be 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) 86 Wood Street is a structure of historical and architectural significance that contributes to the significance of the Armory local historic district having been recognized as a contributing structure to the Broadway/Armory 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. 86 Wood Street is a structure of historical and architectural significance that contributes to the significance of the Armory local historic district having been recognized as a contributing structure to the Broadway/Armory 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, and the recommendations in the staff report, with staff to review any additional required details.

# PHOTOVOLTAIC ROOF MOUNT SYSTEM

20 MODULES-ROOF MOUNTED - 7.20 KWDC, 4.80 KWAC  
86 WOOD ST. APT 2, PROVIDENCE, RI 02909 USA

**SYSTEM SUMMARY:**

- (N) 20 - HANVHA Q-CELLS Q-PEAK DUO BLK G10+ (360W) MODULES
- (N) 20 - ENPHASE ENERGY I07-60-2-US MICRO-INVERTERS
- (N) JUNCTION BOX
- (E) 100A MAIN SERVICE PANEL WITH (E) 100A MAIN BREAKER
- (N) 60A FUSED AC DISCONNECT
- (N) REGGOMTH METER
- (N) ENPHASE IQ COMBINER BOX 3

**DESIGN CRITERIA:**

ROOF TYPE: ASPHALT SHINGLE  
NUMBER OF LAYERS: 01  
ROOF FRAME: 2"x6" RAFTERS @ 32" O.C.  
STORY: TWO STORY  
SNOW LOAD: -35 PSF  
WIND SPEED: 133 MPH  
WIND EXPOSURE: B  
EXPOSURE CATEGORY: II  
COORDINATE: 41.812372, -71.435174

**GOVERNING CODES:**

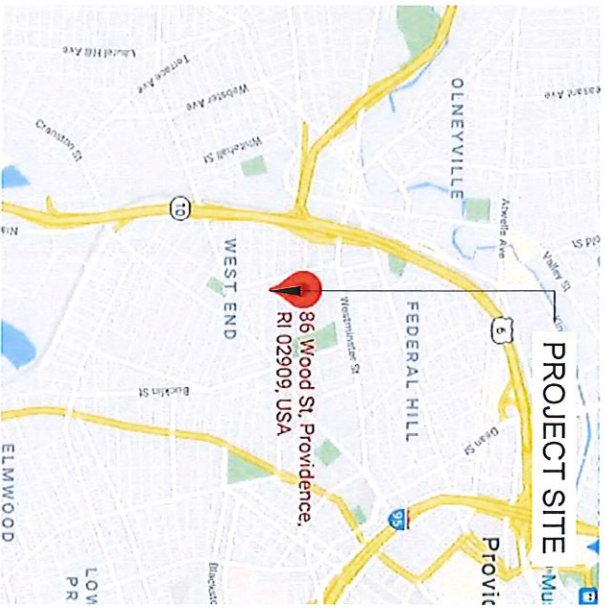
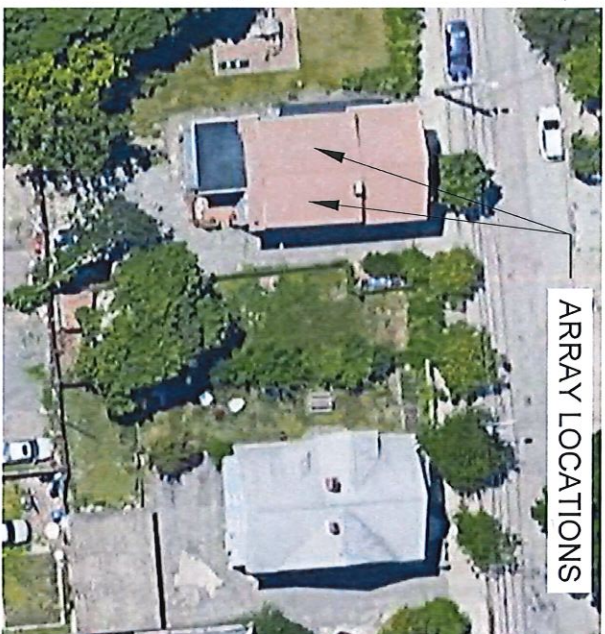
- 2017 NATIONAL ELECTRICAL CODE (NEC)
- 2015 INTERNATIONAL BUILDING CODE (IBC)
- 2015 INTERNATIONAL MECHANICAL CODE (IMC)
- 2015 INTERNATIONAL RESIDENTIAL CODE (IRC)
- 2015 INTERNATIONAL PLUMBING CODE (IPC)

**SHEET INDEX**

PV-0	COVER SHEET
PV-1	SITE PLAN WITH ROOF PLAN
PV-2	ROOF PLAN WITH MODULES
PV-3	ATTACHMENT DETAILS
PV-4	BRANCH LAYOUT
PV-5	ELECTRICAL LINE DIAGRAM
PV-6	ELECTRICAL CALCULATION
PV-7	WARNING LABELS
PV-8	ADDITIONAL NOTES
PV-9+	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 80 250-166 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 A COPPER 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 GROUNDING. 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 5' 7" THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED 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.



1 AERIAL PHOTO  
SCALE: NTS  
PV-0

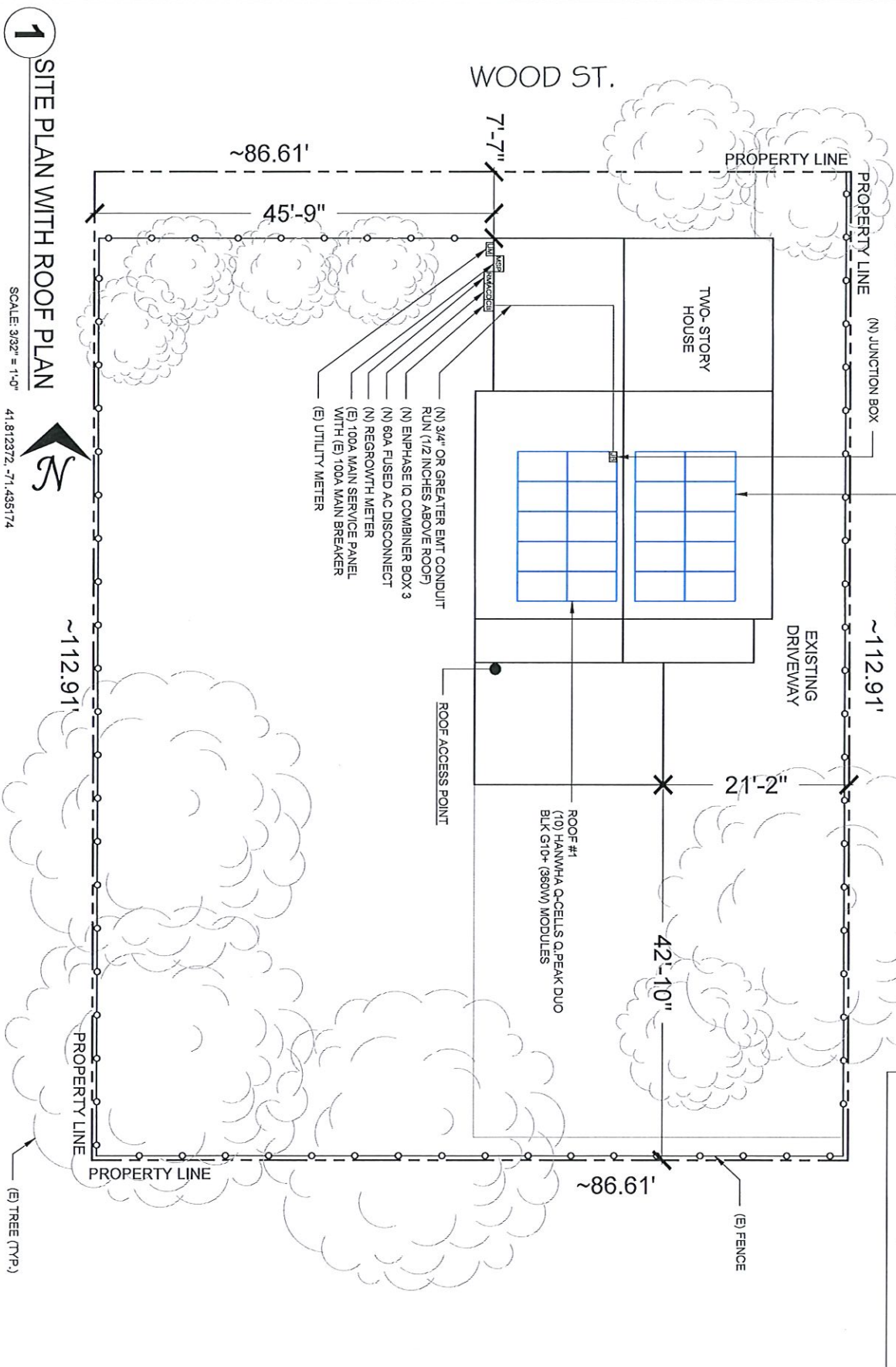
2 VICINITY MAP  
SCALE: NTS  
PV-0



41.812372, -71.435174

	<p>Reviewed and approved Richard Pantel, P.E. Riverside, 11237</p>	<p><b>PROJECT NAME</b> GRAZIELLA GIAMPAOLI 86 WOOD ST. APT 2, PROVIDENCE, RI 02909 USA APN# PROV:M:36L:149 UTILITY: NATIONAL GRID AHJ: CITY OF PROVIDENCE</p>
<p><b>SHEET NAME</b> COVER SHEET</p>		<p><b>SHEET NUMBER</b> PV-0</p>

● 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.



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.

 <p>Richard Pantel Professional Engineer 11237</p>		<p>Richard Pantel Professional Engineer 11237</p>	
<p>Reviewed and approved Richard Pantel, P.E. Riverside, 11237</p>		<p>DESCRIPTION   DATE   REV</p> <p>INITIAL RELEASE   07/08/2021   UN</p>	
<p>PROJECT NAME</p> <p>GRAZIELLA GIAMPAOLI 86 WOOD ST. APT 2, PROVIDENCE, RI 02909 USA APN# PROV:M:36L:149 UTILITY: NATIONAL GRID AHJ: CITY OF PROVIDENCE</p>		<p>SHEET NAME</p> <p>SITE PLAN WITH ROOF PLAN</p> <p>SHEET SIZE</p> <p>ANSI B 11" X 17"</p> <p>SHEET NUMBER</p> <p>PV-1</p>	

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

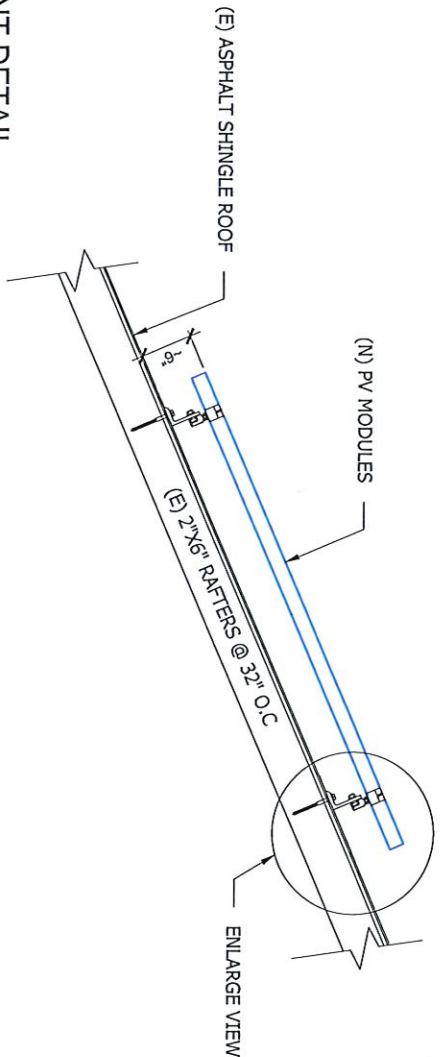


Reviewed and approved  
Richard Pantel, P.E.  
REGISTERED: 11237

DESCRIPTION	DATE	REV
INITIAL RELEASE	07/08/2021	UR

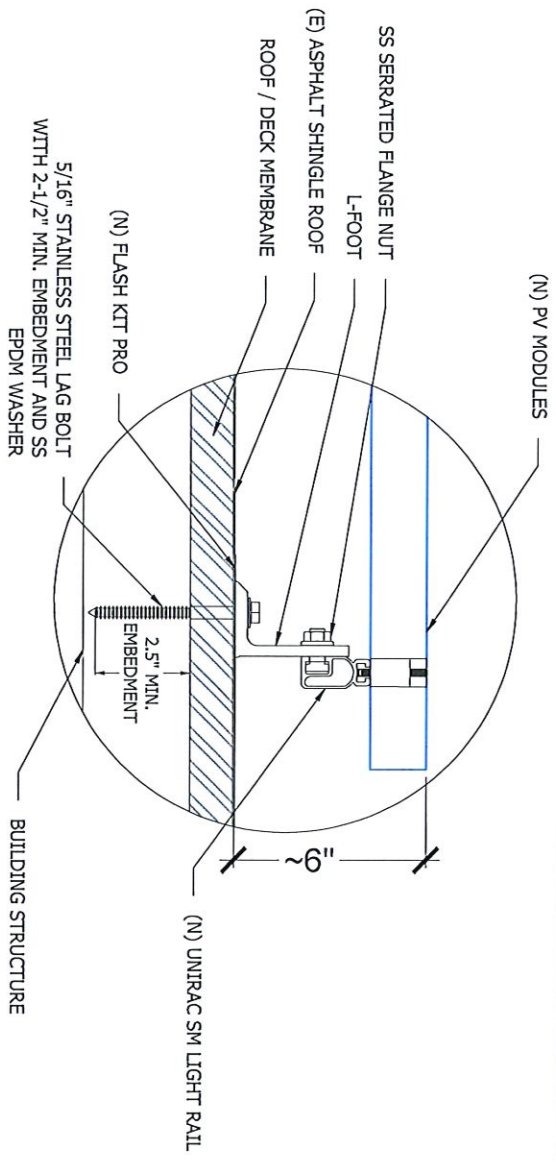
# 1 ATTACHMENT DETAIL

SCALE: NTS



# 2 ATTACHMENT DETAIL (ENLARGED VIEW)

SCALE: NTS



GRAZIELLA GIAMPAOLI  
86 WOOD ST. APT 2,  
PROVIDENCE, RI 02909 USA  
APN# PROV.M:36L:149  
UTILITY: NATIONAL GRID  
AHJ: CITY OF PROVIDENCE

SHEET NAME ATTACHMENT DETAIL
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-3



**PRELIMINARY**

# Q. PEAK DUO BLK-G10+

ENDURING HIGH PERFORMANCE



**BREAKING THE 20% EFFICIENCY BARRIER**  
Q. ANTIUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.

**THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY**  
Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry. The new 'Quality Controlled PV' of the independent certification institute TÜV Rheinland.

**INNOVATIVE ALL-WEATHER TECHNOLOGY**  
Optimal yields, whatever the weather, with excellent low-light and temperature behaviour.

**ENDURING HIGH PERFORMANCE**  
Long-term yield security with Anti LID Technology, Anti PID Technology\*, Hot-Spot Protect and Traceable Quality 'In-Glass'.

**EXTREME WEATHER RATING**  
High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

**A RELIABLE INVESTMENT**  
Includes 25-year product warranty and 25-year linear performance warranty\*.

\*AET Test Conditions according to IEC 61713 G2004-1:2016, method A-1-1:2007(V1.0)M. See also sheet 010 for further information.

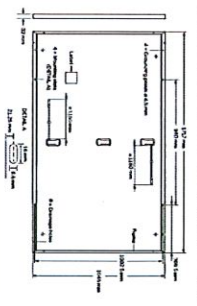
THE IDEAL SOLUTION FOR:  
Business owners  
responsible owners

Engineered in Germany



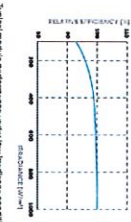
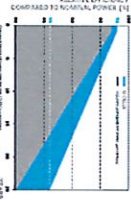
### MECHANICAL SPECIFICATION

Format	1372 mm x 1052 mm x 22 mm (including frame)
Weight	13.9 kg
Front Cover	Highly durable, perforated glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6-1/2 mono-periform Q. ANTIUM Duo Z cell
Junction box	50-100mm x 50-100mm x 45-48 mm Protection class IP67, with bypass diodes
Cable	4mm Solar cable (V) 2120mm, (-) 2120mm
Connector	Shelter MC4 IP68



### ELECTRICAL CHARACTERISTICS

POWER CLASS	340	345	349	370
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS (STC) (POWER TOLERANCE: ±5%/+/-0%)				
Power at STC P <sub>max</sub>	340	345	349	370
Short Circuit Current I <sub>sc</sub>	11.00	11.07	11.04	11.10
Open Circuit Voltage V <sub>oc</sub>	41.11	41.14	41.18	41.24
Current at MP P <sub>max</sub>	10.43	10.47	10.49	10.62
Voltage at MP P <sub>max</sub>	33.76	34.03	34.21	34.84
Efficiency η	20.5	20.8	20.3	20.6
MINIMUM PERFORMANCE AT NORMAL ORIENTING CONDITIONS (NOMOT)				
Power at NMP P <sub>max</sub>	202.6	206.3	209.1	227.6
Short Circuit Current I <sub>sc</sub>	8.64	8.67	8.69	8.92
Open Circuit Voltage V <sub>oc</sub>	30.77	30.80	30.83	30.80
Current at MP P <sub>max</sub>	8.24	8.26	8.26	8.37
Voltage at MP P <sub>max</sub>	32.24	32.48	32.71	33.17



**TEMPERATURE COEFFICIENTS**

Temperature Coefficient of I <sub>sc</sub>	β	1%/K	+0.04	Temperature Coefficient of V <sub>oc</sub>	β	1%/K	-0.27
Temperature Coefficient of P <sub>max</sub>	γ	1%/K	-0.24	Normal Module Operating Temperature	NMOT	°C	43.13

### PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V <sub>max</sub>	MV	1000	PV module classification	Class II
Maximum Reverse Current	I <sub>r</sub>	mA	200	Free Rating based on ANSI/UL 61210	C/TYPE 2
Max. Design Load (Pull/Push)	PNL	3000/2600	Printed Module Temperature on Combined Day		-40°C - +85°C
Max. Test Load (Pull/Push)	PTL	5400/4000			

Qualifications and Certificates

Q. CELL QUALITY CONTROL SYSTEM

Q. CELL CERTIFICATION

Q. CELL PERFORMANCE WARRANTY

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of the product.

Q CELLS G. PEAK DUO BLK-G10+ (Rev. 3.0, 2021-08, Rev.01\_EN)

Engineered in Germany



**RTIP**  
Roof Top Power  
2540 WEST SHORE ROAD  
TEL: (401) 763-0297  
CITY: PROVIDENCE, RI 02909  
EMAIL: sales@rooftoppower.com

**RICHARD PANTEL**  
REGISTERED PROFESSIONAL ENGINEER (RI)

Reviewed and approved  
**Richard Pantel, P.E.**  
RUBEN NO. 11237

DESCRIPTION	DATE	REV
INITIAL RELEASE	07/09/2021	UR

**GRAZIELLA GIAMPAOLI**  
86 WOOD ST. APT 2,  
PROVIDENCE, RI 02909 USA  
APN# PROV.M:36L:149  
UTILITY: NATIONAL GRID  
AHJ: CITY OF PROVIDENCE

SHEET NAME	
SPEC SHEETS	
SHEET SIZE	ANSI B 11" X 17"
SHEET NUMBER	PV-9



Google