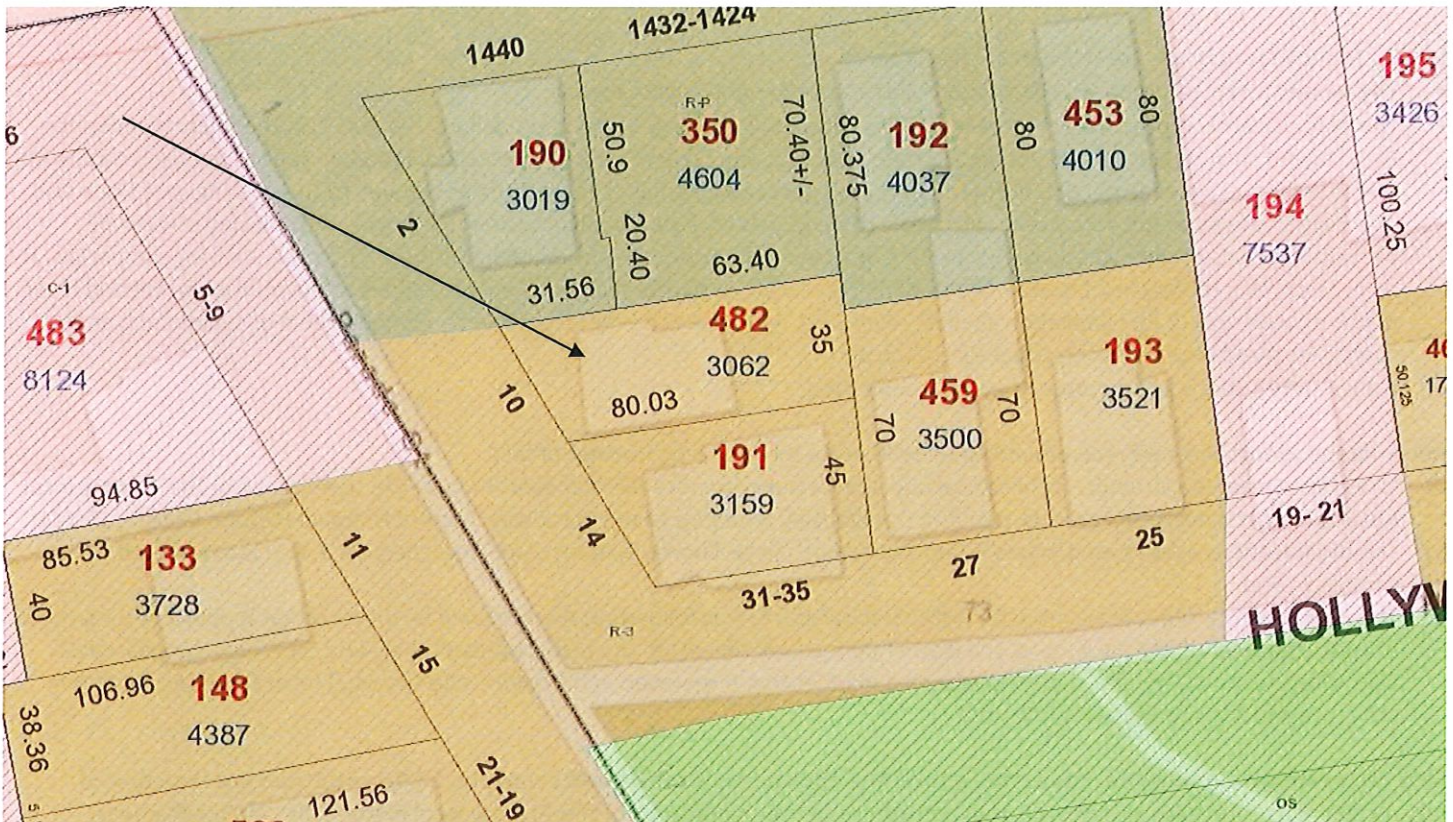
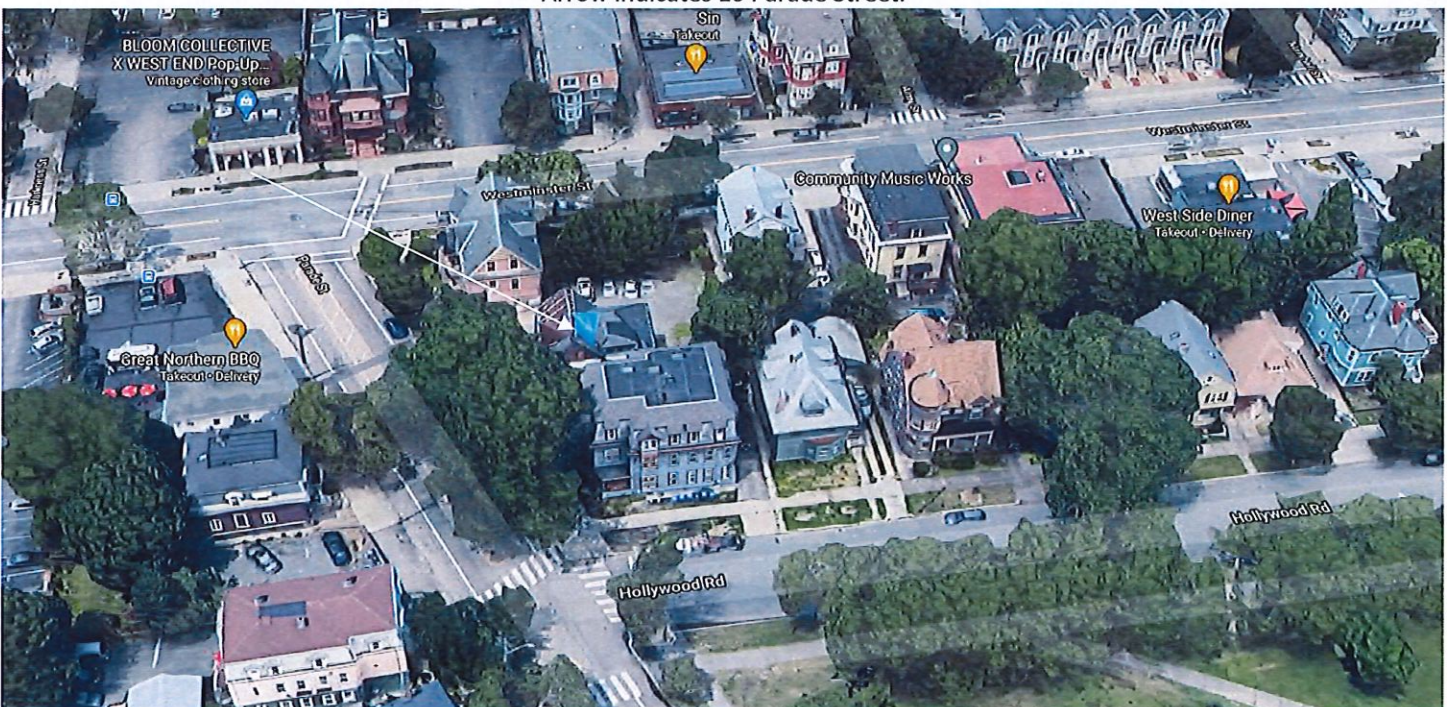


2. CASE 21.032, 10 PARADE STREET, House, c1900 (ARMORY)

2½-story; cross-gable; clapboard-and-patterned-shingle house; with molded window caps, and full Doric entry porch sheltering central entry and surmounted by oriel.
CONTRIBUTING



Arrow indicates 10 Parade Street.



Arrow indicates project location.

Applicant/Contractor: Matthew Markham, Freedom Forever RI LLC, 135 Robert Treat Paine Dr, Taunton, MA 02780
Owner: Richard Jardon, 10 Parade Street, Providence, RI 02909

Proposal: The scope of work proposed consists of Minor Alterations and includes the installation of 8 solar panels to the south slope of the rear ell's 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) 10 Parade Street is a structure of historical and architectural significance that contribute to the significance of the Armory local historic district, having been recognized as a contributing structure to the Broadway/Armory National Historic Register District;
- b) The modifications as proposed meets Minor Alterations: Solar Energy Systems Guidelines, Section 2, and 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. 10 Parade Street is a structure of historical and architectural significance that contribute to the significance of the Armory local historic district, having been recognized as a contributing structure to the Broadway/Armory National Historic Register 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 minimally-to-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.

PHOTOVOLTAIC SYSTEM

PV SYSTEM SUMMARY: 2.800 KW

RESIDENTIAL PHOTOVOLTAIC SYSTEM

SYSTEM SIZE (DC)	: STC: 8 X 350 = 2800W DC
	: PTC: 8 X 326.8 = 2614W DC
SYSTEM SIZE (AC)	: 3000W AC @ 240V
MODULES	: 8 X LONGI SOLAR: LR4-60HPB-350M
OPTIMIZERS	: 8 X SOLAR EDGE: P405
INVERTER	: SOLAR EDGE: SE3000H-USRGM [S11]
TILT	: 15°
AZIMUTH	: 169°
ROOF	: COMPOSITION SHINGLE
RAFTER/TRUSS SIZE	: 2X8 RAFTER @ 16" O.C.
ATTACHMENT TYPE	: UNIRAC: SFM INFINITY MICRORAIL WITH UNIRAC SFM INFINITY RAIL-LESS
MAIN SERVICE PANEL	: EXISTING 100 AMPS MSP WITH (E) 100 AMPS MAIN
INTERCONNECTION	: BREAKER N END FED
OCPD RATING	: LINE SIDE TAP
	: 20 AMPS
UTILITY	: NATIONAL GRID - RI

TABLE OF CONTENTS

PV-1	SITE LOCATION AND HOUSE AERIAL VIEW
PV-2	SITE PLAN
PV-2A	ROOF PLAN WITH MODULES LAYOUT
PV-3	MOUNTING DETAILS
PV-4	THREE LINE DIAGRAM
PV-5	EXISTING SERVICE PANEL
PV-6	NOTES AND EQUIPMENT LIST
PV-7	LABELS
PV-7A	SITE PLACARD
PV-8	OPTIMIZER CHART
PV-9 & 10	SAFETY PLAN

CITY NOTES:

THIS PROJECT COMPLIES WITH THE FOLLOWING:
 2019 RHODE ISLAND BUILDING CODE (RIBC)
 2019 RHODE ISLAND RESIDENTIAL CODE (RIRC)
 2019 RHODE ISLAND FIRE CODE (RIFC)
 2019 RHODE ISLAND PLUMBING CODE
 2019 RHODE ISLAND MECHANICAL CODE
 2019 RHODE ISLAND ENERGY CODE
 2019 RHODE ISLAND ADMINISTRATIVE CODE
 2019 RHODE ISLAND ELECTRICAL CODE (RIEC)
 AS ADOPTED BY **CITY OF PROVIDENCE**

CONDUIT AND CONDUCTOR SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.

ALL SOLAR ENERGY SYSTEM EQUIPMENT SHALL BE SCREENED TO THE MAXIMUM EXTENT POSSIBLE AND SHALL BE PAINTED A COLOR SIMILAR TO THE SURFACE UPON WHICH THEY ARE MOUNTED.

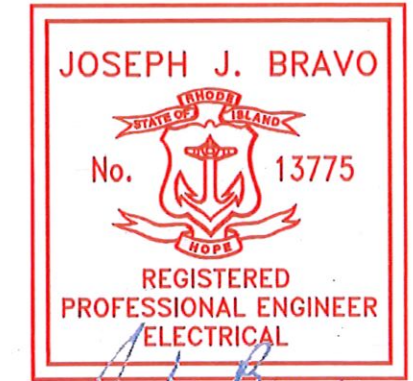
MODULES SHALL BE TESTED, LISTED AND IDENTIFIED WITH FIRE CLASSIFICATION IN ACCORDANCE WITH UL 2703. SMOKE AND CARBON MONOXIDE ALARMS ARE REQUIRED PER SECTION R314 AND 315 TO BE VERIFIED AND INSPECTED BY INSPECTOR IN THE FIELD.

INSTALLATION NOTES:

PV WIRE SHALL BE USED ON DC RUNS FOR UNGROUNDED /TRANSFORMERLESS INVERTERS.

DIG ALERT (811) TO BE CONTACTED AND COMPLIANCE WITH EXCAVATION SAFETY PRIOR TO ANY EXCAVATION TAKING PLACE

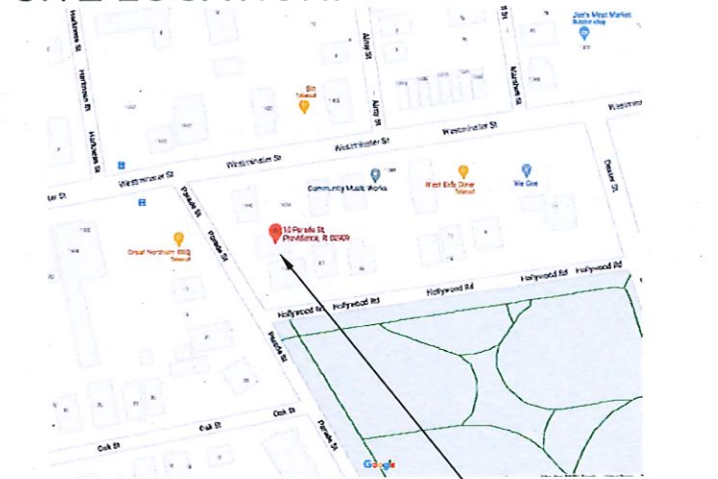
INSTALL CREW TO VERIFY ROOF STRUCTURE PRIOR TO COMMENCING WORK. EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNT.



Joseph Bravo

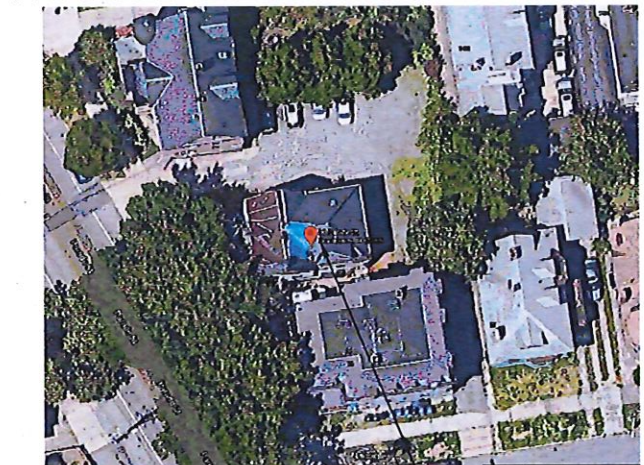
Digitally signed by Joseph Bravo
 Date: 2021.03.04 13:13:27 -07'00'
 03-04-2021 EXP. 06-30-2021

SITE LOCATION:



SITE LOCATION

HOUSE AERIAL VIEW:



MODULE LOCATION

CLIENT:

RICK JARDON
 10 PARADE ST.,
 PROVIDENCE, RI 02909

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE: 3/2/2021
 DESIGN BY: GREG
 JOB NO.: F075881

TITLE: SITE LOCATION AND HOUSE AERIAL VIEW

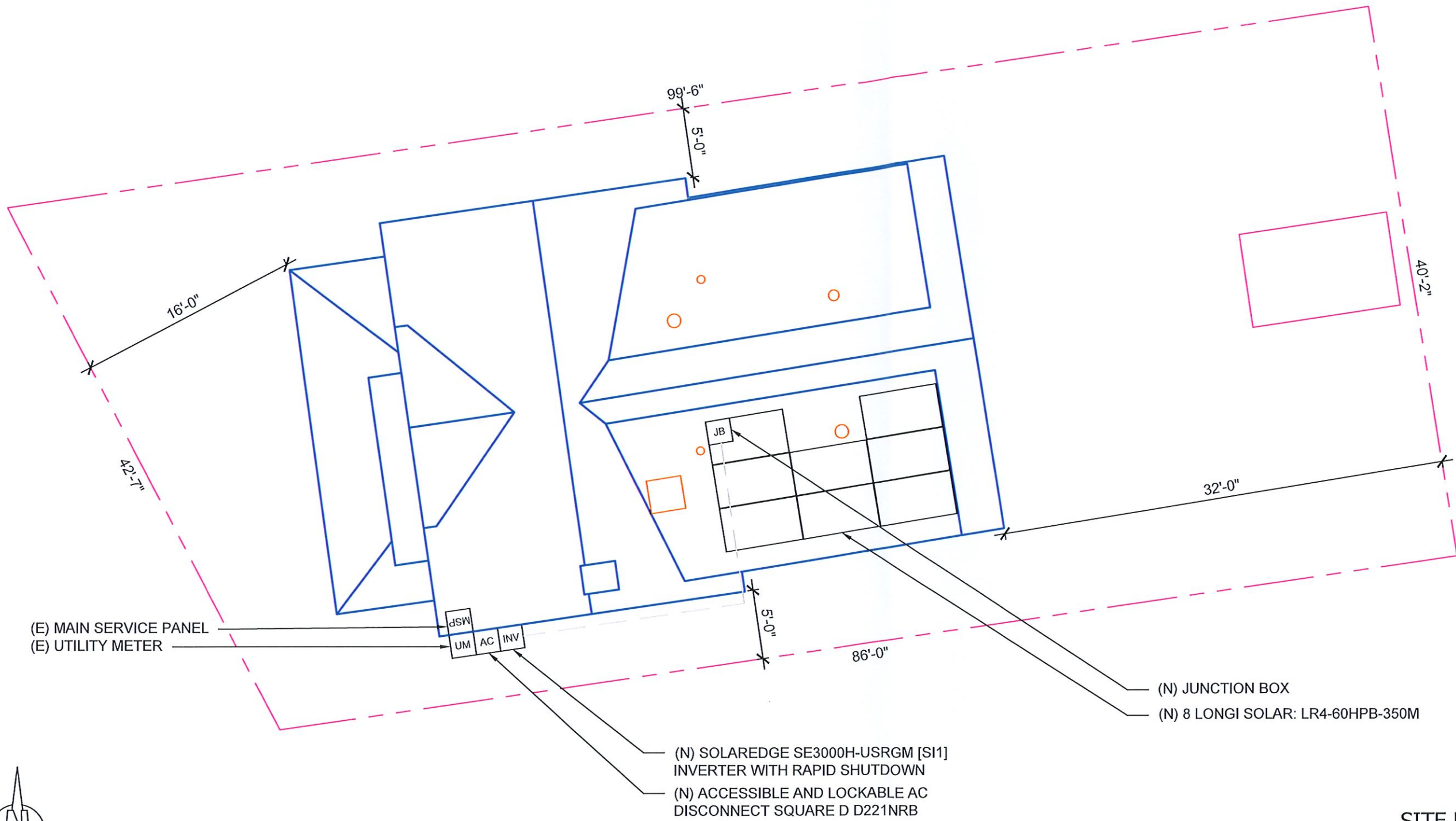
SHEET:

PV-1

ROOF AREA : 1717.29 SQ FT

PV SYSTEM
 2.800 kW-DC
 3.000 kW-AC

YURIANTO YURIANTO RI
 No. 13098
 REGISTERED
 PROFESSIONAL ENGINEER
 (CIVIL)
 By Yuri at 12:37:53 PM, 3/4/2021
 (Structural Aspects Only)



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

1

freedom
 FOREVER
 FREEDOM FOREVER RHODE ISLAND LLC
 135 ROBERT TREAT PAINE DR., TAUNTON, MA 02780
 Tel: (800) 385-1075

ELECTRICAL CONTRACTOR NO.:
 EB01838900 ELECTRICAL
 CONTRACTOR AC005036; RENEWABLE
 ENERGY PROFESSIONAL CERTIFICATE
 REPC-199; GENERAL CONTRACTOR
 GC-44187
 MATTHEW MARKHAM

CLIENT:
RICK JARDON
 10 PARADE ST.,
 PROVIDENCE, RI 02909

REVISIONS:		
DESCRIPTION	DATE	REVISION

DATE: 3/2/2021
 DESIGN BY: GREG
 JOB NO.: F075881

TITLE:
 SITE PLAN

SHEET:
 PV-2


ROOF AREA : 1717.29 SQ FT

PV SYSTEM
 2.800 KW-DC
 3.000 KW-AC

ROOF AREA STATEMENT							
ROOF	MODULES QTY	PITCH	AZIMUTH	ROOF AREA	ARRAY AREA	ARRAY COVERAGE %	SYSTEM DISTRIBUTED WEIGHT
1	8	15°	169°	299.45 SQ FT	144.40 SQ FT	8.41%	2.31 PSF

RI

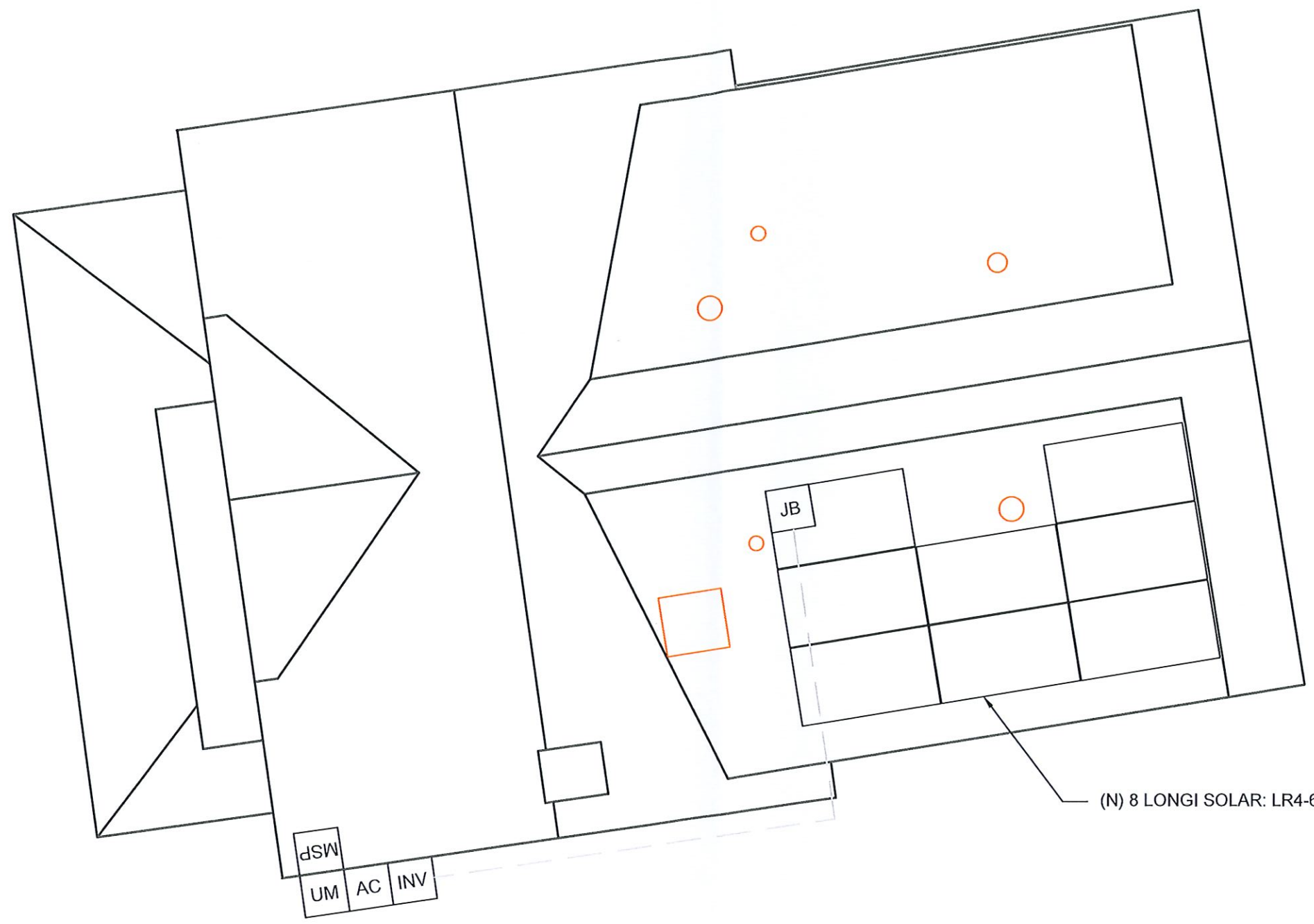
YURIANTO YURIANTO



No. 13098

REGISTERED
PROFESSIONAL ENGINEER
(CIVIL)

By Yuri at 12:37:56 PM, 3/4/2021
(Structural Aspects Only)



LEGEND:

	OBSTRUCTION
	PIPE VENT
	MODULES
	CONDUIT
	SETBACK
	AC DISCONNECT
	MAIN SERVICE PANEL
	JUNCTION BOX
	INVERTER
	PRODUCTION METER

- NOTES:
- EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNTS
 - ATTACHED CLAMPS AT 25% FROM THE EDGE AND 50% FROM THE CENTER OF THE MODULES
 - JUNCTION BOX IS MOUNTED TO THE RAIL.



ROOF PLAN
 SCALE: 3/16" = 1'-0"

1



FREEDOM FOREVER RHODE ISLAND LLC
 135 ROBERT TREAT PAINE DR., TAUNTON, MA 02780
 Tel: (800) 385-1075

ELECTRICAL CONTRACTOR NO: EB01838900 ELECTRICAL CONTRACTOR AC005036; RENEWABLE ENERGY PROFESSIONAL CERTIFICATE REPC-199; GENERAL CONTRACTOR GC-44187
 MATTHEW MARKHAM


CLIENT:
RICK JARDON
 10 PARADE ST.,
 PROVIDENCE, RI 02909

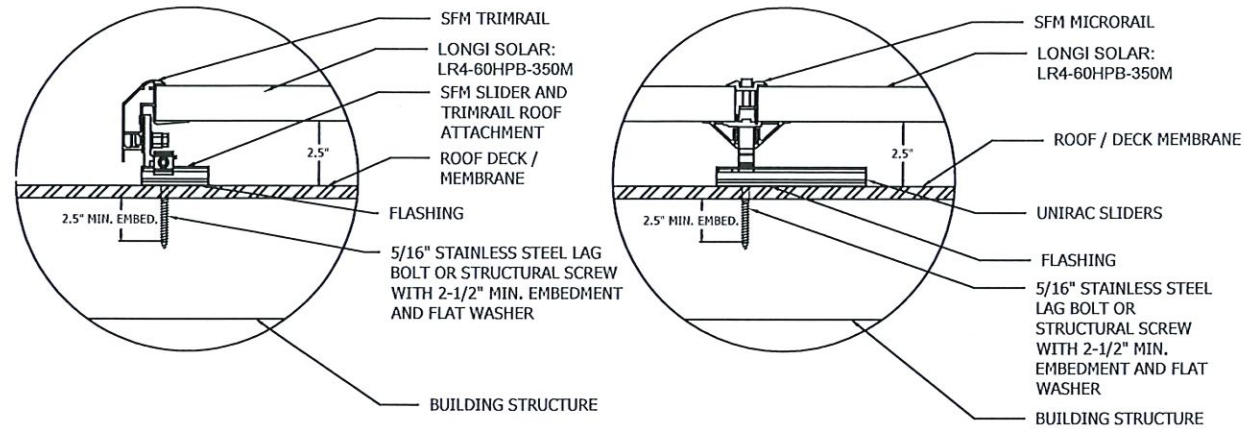
REVISIONS:

DESCRIPTION	DATE	REVISION

DATE: 3/2/2021
 DESIGN BY: GREG
 JOB NO.: F075881

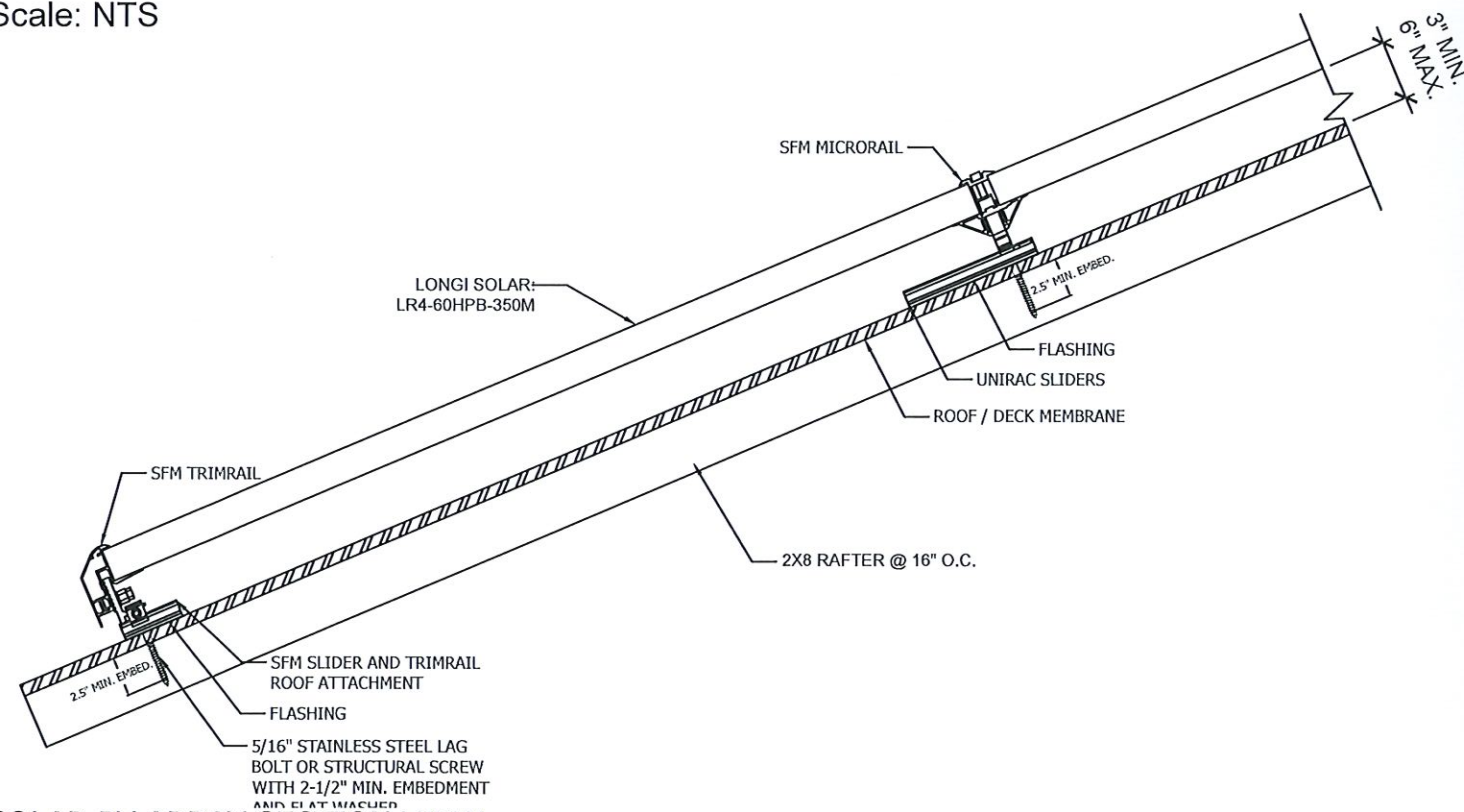
TITLE:
**ROOF PLAN W/
 MODULES LAYOUT**

SHEET:
PV-2A



ATTACHMENT DETAIL

Scale: NTS



SOLAR PV ARRAY SECTION VIEW

Scale: NTS

LEGEND

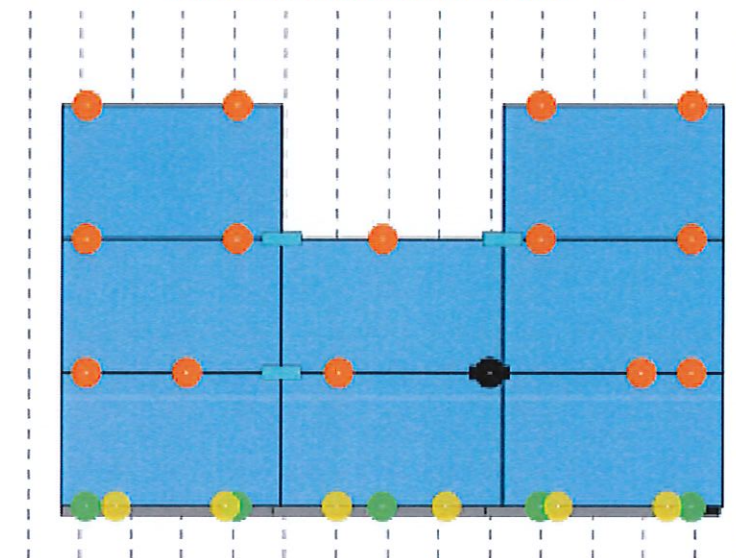
Module (Roof Zones)

- Zone 1
- Zone 2
- Zone 3

SFM Components

- SFM Microrail 2"
- SFM Splice 6.5"
- SFM Attached Splice 8"
- SFM Trim Attachment
- SFM Trim Univ Clip
- Full Trim Section
- Cut Trim Section

MAX ATTACHMENT SPAN - 4'



ELECTRICAL CONTRACTOR NO: EB01838900 ELECTRICAL CONTRACTOR AC005036; RENEWABLE ENERGY PROFESSIONAL CERTIFICATE REPC-199; GENERAL CONTRACTOR GC-44187

MATTHEW MARKHAM



CLIENT:

RICK JARDON

10 PARADE ST.,
PROVIDENCE, RI 02909

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE: 3/2/2021

DESIGN BY: GREG

JOB NO.: F075881

TITLE:

**MOUNTING
DETAILS**

SHEET:

PV-3

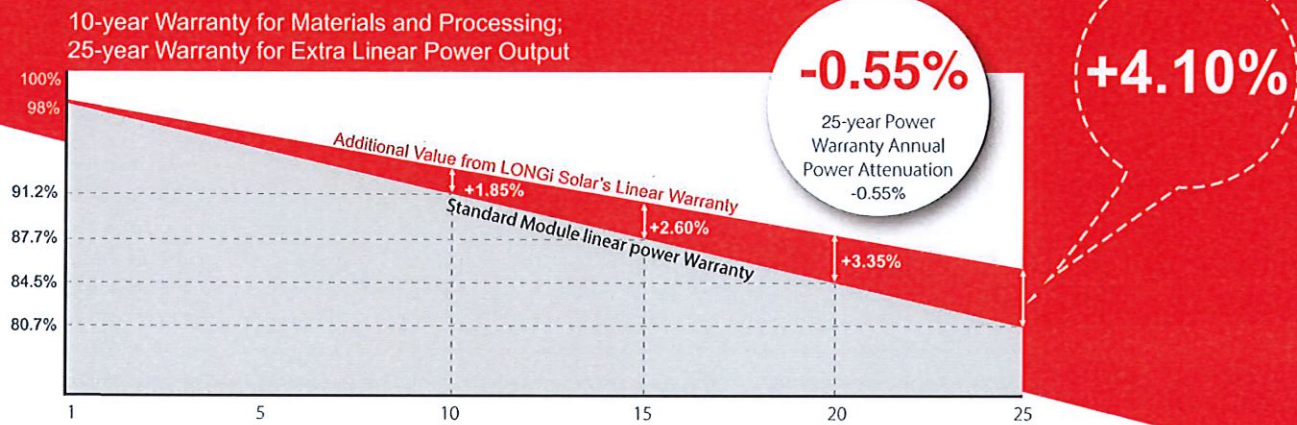
LR4-60HPB 345~365M

Hi-MO 4m
NEW



*Both 6BB & 9BB are available

**High Efficiency
Low LID Mono PERC with
Half-cut Technology**



Complete System and Product Certifications

IEC 61215, IEC61730, UL61730
ISO 9001:2008: ISO Quality Management System
ISO 14001: 2004: ISO Environment Management System
TS62941: Guideline for module design qualification and type approval
OHSAS 18001: 2007 Occupational Health and Safety



* Specifications subject to technical changes and tests. LONGI Solar reserves the right of interpretation.

Positive power tolerance (0 ~ +5W) guaranteed

High module conversion efficiency (up to 20%)

Slower power degradation enabled by Low LID Mono PERC technology: first year <2%, 0.55% year 2-25

Solid PID resistance ensured by solar cell process optimization and careful module BOM selection

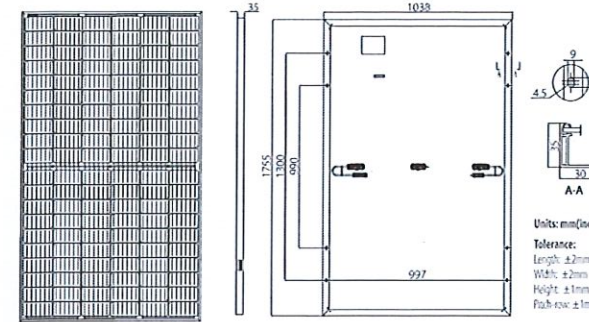
Reduced resistive loss with lower operating current

Higher energy yield with lower operating temperature

Reduced hot spot risk with optimized electrical design and lower operating current

LR4-60HPB 345~365M

Design (mm)



Mechanical Parameters

Cell Orientation: 120 (6x20)
Junction Box: IP68, three diodes
Output Cable: 4mm², 300mm in length, length can be customized
Glass: Single glass
3.2mm coated tempered glass
Frame: Anodized aluminum alloy frame
Weight: 19.5kg
Dimension: 1755x1038x35mm
Packaging: 30pcs per pallet
180pcs per 20'GP
780pcs per 40'HC

Operating Parameters

Operational Temperature: -40 C ~ +85 C
Power Output Tolerance: 0 ~ +5 W
Voc and Isc Tolerance: ±3%
Maximum System Voltage: DC1000V (IEC/UL)
Maximum Series Fuse Rating: 20A
Nominal Operating Cell Temperature: 45±2 C
Safety Class: Class II
Fire Rating: UL type 1 or 2

Electrical Characteristics

Test uncertainty for Pmax: ±3%

Model Number	LR4-60HPB-345M		LR4-60HPB-350M		LR4-60HPB-355M		LR4-60HPB-360M		LR4-60HPB-365M	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Testing Condition										
Maximum Power (Pmax/W)	345	255.6	350	259.3	355	263.0	360	266.7	365	270.4
Open Circuit Voltage (Voc/V)	40.2	37.5	40.4	37.7	40.6	37.9	40.8	38.1	41.0	38.3
Short Circuit Current (Isc/A)	11.06	8.92	11.16	8.99	11.25	9.06	11.33	9.13	11.41	9.20
Voltage at Maximum Power (Vmp/V)	34.2	31.6	34.4	31.8	34.6	32.0	34.8	32.1	35.0	32.3
Current at Maximum Power (Imp/A)	10.09	8.09	10.18	8.16	10.27	8.23	10.35	8.30	10.43	8.36
Module Efficiency(%)	18.9		19.2		19.5		19.8		20.0	

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25 C, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20 C, Spectra at AM1.5, Wind at 1m/S

Temperature Ratings (STC)

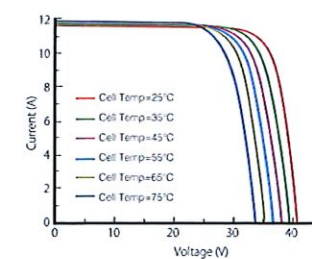
Temperature Coefficient of Isc: +0.057%/C
Temperature Coefficient of Voc: -0.286%/C
Temperature Coefficient of Pmax: -0.370%/C

Mechanical Loading

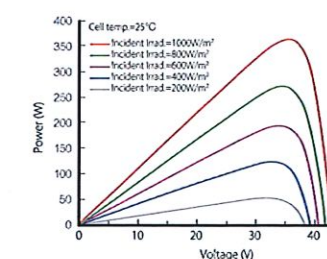
Front Side Maximum Static Loading: 5400Pa
Rear Side Maximum Static Loading: 2400Pa
Hailstone Test: 25mm Hailstone at the speed of 23m/s

I-V Curve

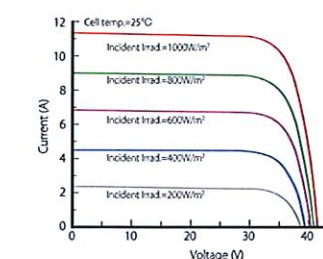
Current-Voltage Curve (LR4-60HPB-360M)



Power-Voltage Curve (LR4-60HPB-360M)



Current-Voltage Curve (LR4-60HPB-360M)



LONGI

Room 801, Tower 3, Lujiazui Financial Plaza, No.826 Century Avenue, Pudong Shanghai, 200120, China
Tel: +86-21-80162606 E-mail: module@longi-silicon.com Facebook: www.facebook.com/LONGI Solar

Note: Due to continuous technical innovation, R&D and improvement, technical data above mentioned may be of modification accordingly. LONGI have the sole right to make such modification at anytime without further notice; Demanding party shall request for the latest datasheet for such as contract need, and make it a consisting and binding part of lawful documentation duly signed by both parties.

LONGI

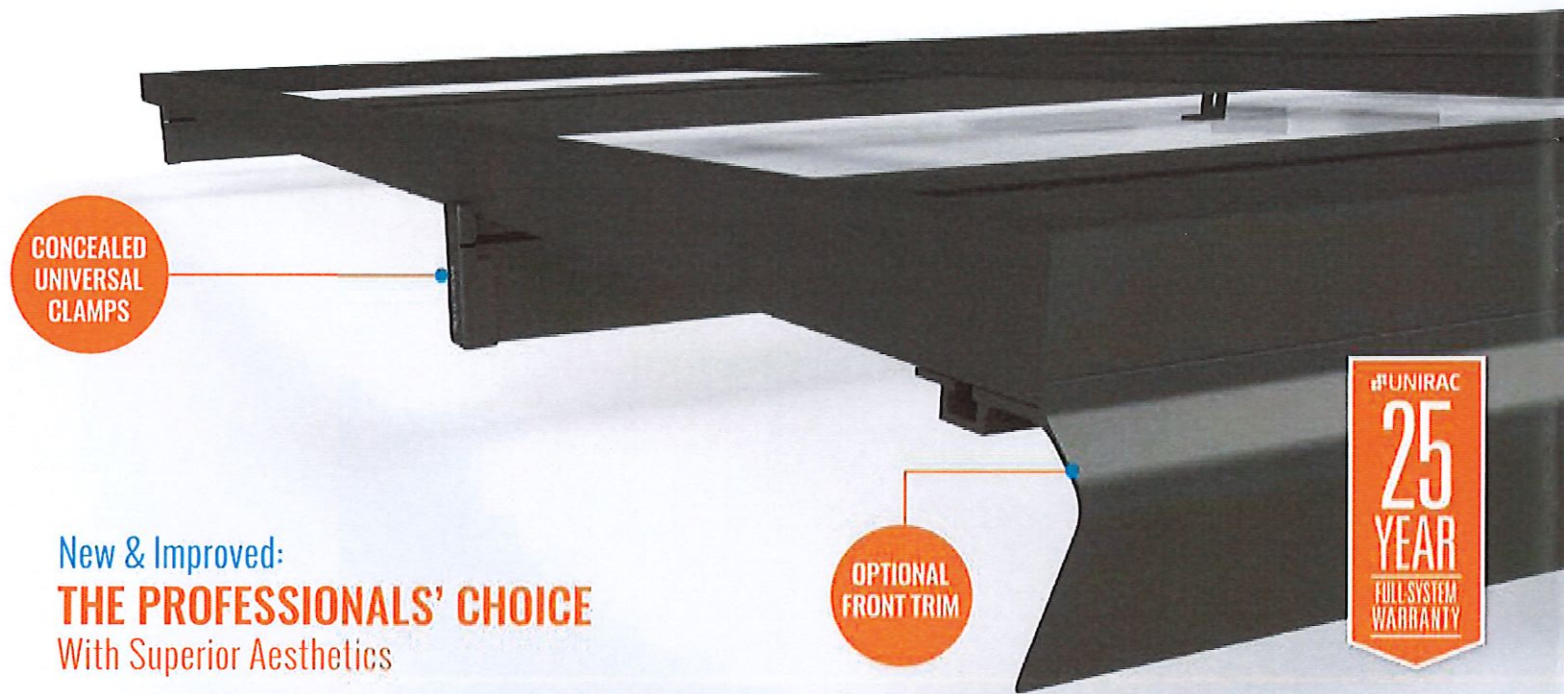
Room 801, Tower 3, Lujiazui Financial Plaza, No.826 Century Avenue, Pudong Shanghai, 200120, China
Tel: +86-21-80162606 E-mail: module@longi-silicon.com Facebook: www.facebook.com/LONGI Solar

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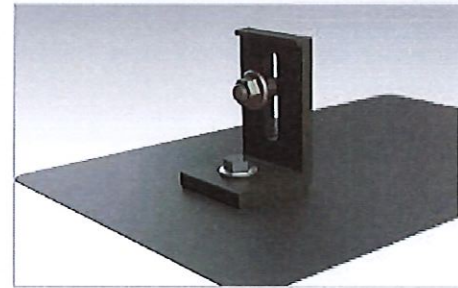
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SOLARMOUNT is the professionals' choice for residential PV mounting applications. Every aspect of the system is designed for an easier, faster installation experience. SOLARMOUNT is a complete solution with revolutionary universal clamps, FLASHKIT PRO, full system UL 2703 certification and 25-year warranty. Not only is SOLARMOUNT easy to install, but best-in-class aesthetics make it the most attractive on any block!



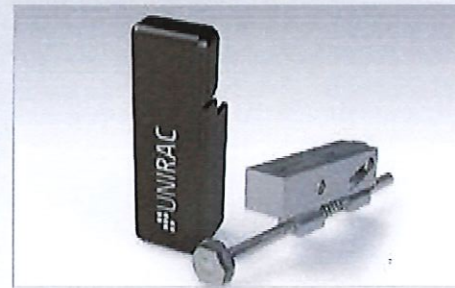
New & Improved:
THE PROFESSIONALS' CHOICE
With Superior Aesthetics



NOW FEATURING FLASHKIT PRO
The Complete Roof Attachment Solution
FEATURING EcoFasten Solar[®] TECHNOLOGY



NOW WITH UNIVERSAL MIDCLAMPS
Accommodates 30mm-51mm module frames
One tool, one-person installs are here!



REVOLUTIONARY NEW ENDCLAMPS
Concealed design and included End Caps

THE PROFESSIONALS' CHOICE FOR RESIDENTIAL RACKING

BEST INSTALLATION EXPERIENCE • CURB APPEAL • COMPLETE SOLUTION • UNIRAC SUPPORT

SOLARMOUNT



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TRUST THE INDUSTRY'S BEST DESIGN TOOL

Start the design process for every project in our U-Builder on line design tool. It's a great way to save time and money.

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Quickly set modules flush to the roof on steep pitched roofs. Orient a large variety of modules in Portrait or Landscape. Tilt the system up on flat or low slope roofs. Components available in mill, clear, and dark finishes to optimize your design financials and aesthetics.

BETTER RESULTS

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Trust Unirac to help you minimize both system and labor costs from the time the job is quoted to the time your teams get off the roof. Faster installs. Less Waste. More Profits.

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WORK WITH THE INDUSTRIES MOST EXPERIENCED TEAM

Professional support for professional installers and designers. You have access to our technical support and training groups. Whatever your support needs, we've got you covered. Visit Unirac.com/solarmount for more information.



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UNMATCHED EXPERIENCE	CERTIFIED QUALITY	ENGINEERING EXCELLENCE	BANKABLE WARRANTY	DESIGN TOOLS	PERMIT DOCUMENTATION
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Unirac's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

CERTIFIED QUALITY PROVIDER

Unirac is the only PV mounting vendor with ISO certifications for 9001:2008, 14001:2004 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

BANKABLE WARRANTY

Don't leave your project to chance. Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are providing products of exceptional quality. SOLARMOUNT is covered by a 25 year limited product warranty and a 5 year limited finish warranty.

ENHANCE YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN

FUB2016MAY16 - PRINTED UPDATE