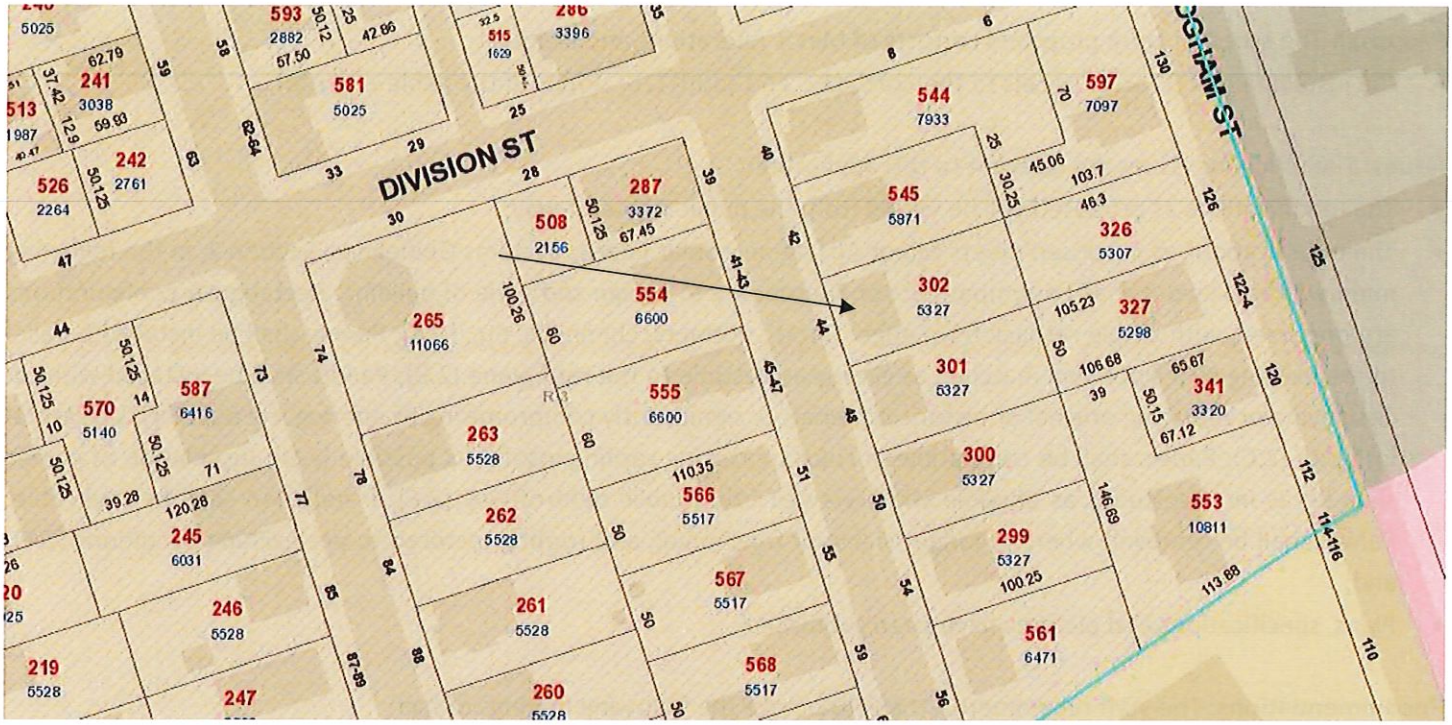
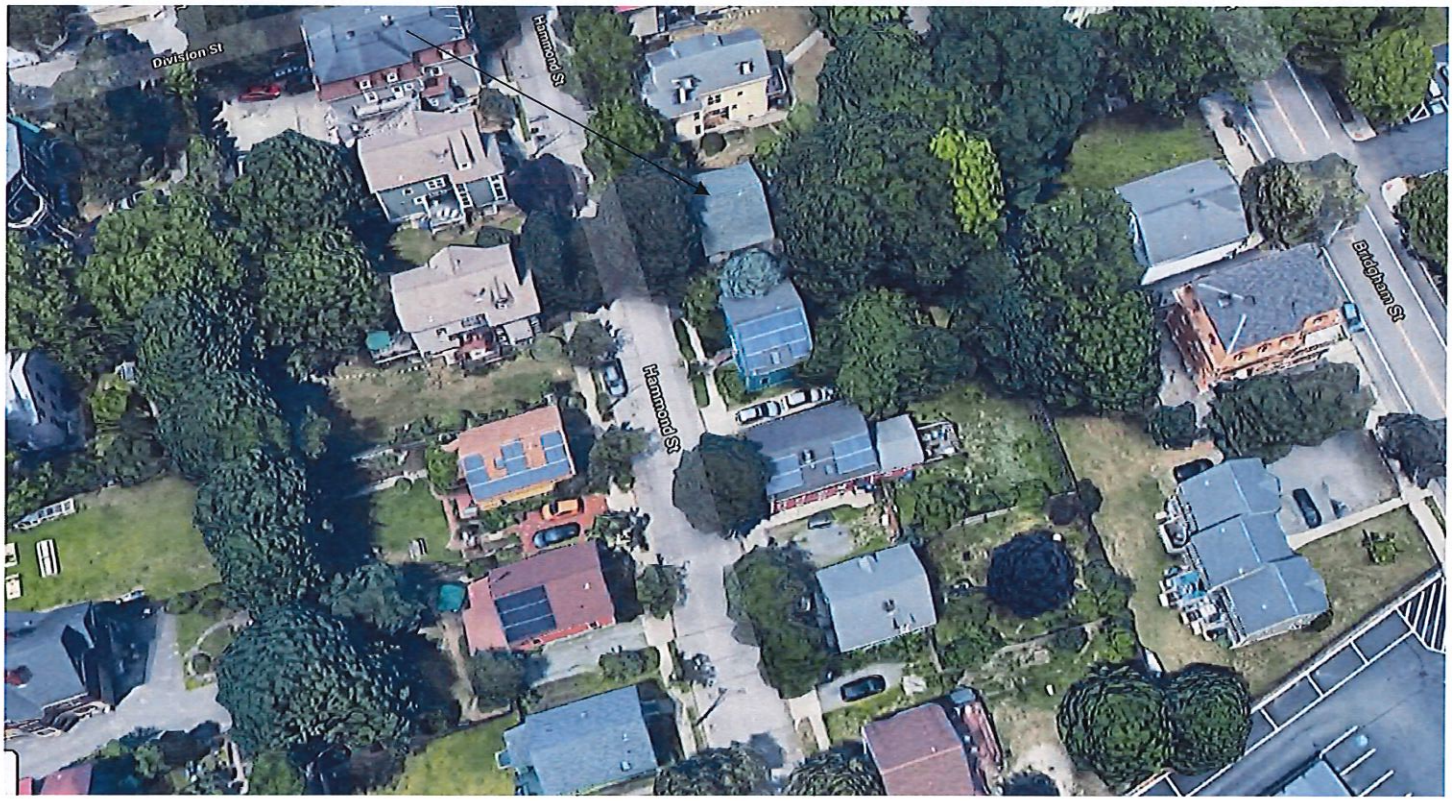
4. CASE 21.124, 44 HAMMOND STREET, House, 1989 (ARMORY)

NON-CONTRIBUTING to Broadway/Armory National Register Historic District



Arrow indicates 44 Hammond Street



Arrow indicates project location, looking north.

AZIMUTH AND TILT ANGLE

	ROOF					
	A	B	C	D	E	F
AZIMUTH	162°	341°				
TILT ANGLE	8/12	8/12				
MODULE COUNT	20	12				
SOLAR ACCESS						
TSFR AVERAGE						
INVERTERS	SOLAR EDGE SE7600H-USRGM	1				
OPTIMIZER	SOLAREDGE P340	32				

MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:	
LONGI LR6-60HPB-315M	32			32	

SHEET INDEX

PV1	TITLE SHEET
PV2	ROOF/SITE PLAN
PV3	ELECTRICAL LINE DIAGRAM / DETAILS
PV3.1 (AS NEEDED)	ELECTRICAL LINE DIAGRAM / DETAILS
PV4	EQUIPMENT LABELS
PV4.1	PLACARD
PV5	ATTACHMENT PLAN
PV6	STRUCTURAL COMPONENTS
PV7	PROPERTY LINES
	STRUCTURAL ENGINEERING CALS (IF REQ.)
	EQUIPMENT DATA SHEETS

APPLICABLE CODES

2017 NATIONAL ELECTRICAL CODE (NFPA 70)
2018 INTERNATIONAL RESIDENTIAL CODE (IRC) AS AMENDED
2019 RHODE ISLAND STATE BUILDING CODE (SBC 2)
2015 INTERNATIONAL BUILDING CODE (IBC) AS AMMENDED

OCCUPANCY & CONSTRUCTION TYPE

OCCUPANCY - R3
CONSTRUCTION - 5B

CONSTRUCTION NOTES

A. A LADDER SHALL BE IN PLACE FOR ANY INSPECTIONS IN COMPLIANCE WITH OSHA REGULATIONS.
B. PV MODULES ARE NON-COMBUSTIBLE IN NATURE.
C. THIS SYSTEM IS A UTILITY INTERACTIVE (GRID CONNECTED) SYSTEM AND DOES NOT HAVE STORAGE BATTERIES (UNLESS SPECIFICALLY INDICATED ON SHEET PV3 & PV3.1).
D. A GROUND ELECTRODE SYSTEM WILL BE PROVIDED IN ACCORDANCE WITH NEC 690.47 & 250.50 - 250.166. GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED WHEN BONDED 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 8FT GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO GREATER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE GROUNDING SYSTEM.
E. EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONNECTION POINTS IDENTIFIED IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
F. THE EXPOSED METALLIC TABS OF THE SOLAREDGE OPTIMIZERS SHALL BE BONDED AND/OR GROUNDED PER NEC 690.43(A) AND THE MANUFACTURERS' INSTRUCTIONS.
G. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER NEC 110.26.
H. ALTERNATE POWER SOURCE PLACARD SHALL BE PLASTIC, ENGRAVED IN A CONTRASTING COLOR (WHITE). THIS PLAQUE WILL BE PERMANENTLY ATTACHED & UV RESISTANT.
I. ALL PLAQUES AND SIGNS WILL BE INSTALLED AS REQUIRED BY 2017 NEC.
J. A SMOKE DETECTOR, APPROVED AND LISTED BY THE STATE FIRE MARSHAL, SHALL BE INSTALLED IN EACH DWELLING WHEN A PERMIT FOR ALTERATIONS, REPAIRS OR ADDITIONS EXCEEDS $1,000.00. A BATTERY POWERED SMOKE DETECTOR SATISFIES THE REQUIREMENTS FOR A SMOKE DETECTOR. APPROVED COMBINED SMOKE ALARMS AND CARBON DIOXIDE ALARMS SHALL BE ACCEPTABLE. A CARBON MONOXIDE DETECTOR SHALL BE INSTALLED IN THE SPECIFIC EXISTING DWELLING UNIT THAT HAVE ATTACHED GARAGES OR FUEL-BURNING APPLIANCES FOR WHICH A PERMIT IS ISSUED FOR ALTERATIONS, REPAIRS OR ADDITIONS EXCEEDING $1,000.00. LISTED SINGLE- OR MULTI-STATION CARBON MONOXIDE ALARMS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS AND ON EVERY LEVEL OF A DWELLING UNIT INCLUDING BASEMENTS. COMBINED SMOKE/CARBON MONOXIDE ALARMS MAY BE USED. THE ALARM SHALL RECEIVE ITS PRIMARY POWER FROM THE BUILDING WIRING EXCEPT IT IS PERMITTED TO BE SOLELY BATTERY OPERATED WHERE REPAIRS OR ALTERATIONS DO NOT RESULT IN THE REMOVAL OF WALL AND CEILING FINISHES OR THERE IS NO ACCESS BY MEANS OF AN ATTIC.
K. 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 AS PER NEC 250-64B. THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AS BUSBARS WITHIN LISTED EQUIPMENT AS PER NEC 250.64C.
L. ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE BUILDING CODE OF THE LOCAL JURISDICTION.
M. PV SYSTEMS CONNECTION IN THE SWITCH GEAR (PANEL) SHALL BE POSITIONED AT THE OPPOSITE END FROM THE INPUT FEEDER LOCATION OR MAIN CIRCUIT LOCATION AS PER NEC 705.12(B)(2)(3)(b).
N. ALL EQUIPMENT SUPPLIED SHALL BE UL LISTED OR LISTED BY A LISTING AGENCY RECOGNIZED BY THE STATE IN WHICH THE SYSTEM IS CONSTRUCTED.
O. AC DISCONNECTS SHALL BE IN COMPLIANCE WITH NEC 690.17.
P. ALL DC CONDUCTORS SHALL BE 90° RATED THHW, THWN-2, USE-2 OR PV WIRE. ALL AC CONDUCTORS SHALL BE 75° RATED THWN WIRE.
Q. THE UTILITY DISCONNECT HAS VISIBLE BLADES, IS LOCKABLE AND IS ACCESSIBLE TO THE UTILITY 24/7.
R. ALL BREAKERS SHALL BE SUITABLE FOR BACKFEED. WHEN BACKFED BREAKER IS THE METHOD OF UTILITY INTERCONNECTION THE BREAKER SHALL NOT READ 'LINE AND LOAD'.
S. COORDINATE ANY POWER OUTAGE WITH LOCAL UTILITY AND PROPERTY OWNER. NOTIFY UTILITY BEFORE ACTIVATION OF PV SYSTEM.
T. CITY BUILDING INSPECTOR SHALL INSPECT ACCESSIBLE STRUCTURAL CONNECTIONS AND THE HOUSE CURRENT SIDE OF THE SYSTEM, ALL OTHER EQUIPMENT SHALL BE UL LISTED AND APPROVED.
U. PHOTOVOLTAIC MODULES SHALL NOT BE INSTALLED OVER ANY ATTIC, PLUMBING OR MECHANICAL VENT. PLUMBING VENTS TO EXTEND A MIN OF 6" ABOVE ROOF OR MODULE. NO BLDG, PLBG OR MECH VENTS TO BE COVERED, OBSTRUCTED OR ROUTED AROUND MODULES.
V. ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER THE OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT A STRONG POINT OF BUILDING CONSTRUCTION. FIELD VERIFY EXACT LOCATION.
W. THE DISCHARGE OF POLLUTANTS TO ANY STORM DRAINAGE SYSTEM IS PROHIBITED. NO SOLID WASTE, PETROLEUM BYPRODUCTS, SOIL PARTICULATE, CONSTRUCTION WASTE MATERIAL OR WASTEWATER GENERATED ON CONSTRUCTION SITE OR BY CONSTRUCTION ACTIVITIES SHALL BE PLACED, CONVEYED OR DISCHARGED INTO THE STREET, GUTTER OR STORM DRAIN SYSTEM.
X. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE AND WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE.
Y. PAINT SURFACE MOUNTED CONDUIT TO MATCH EXISTING STRUCTURE.

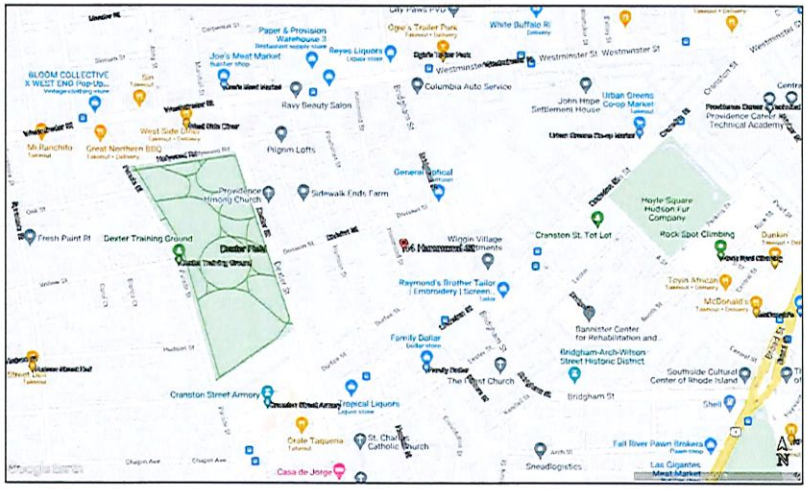
VECTOR ENGINEERS
651 W. GALENA PARK BLVD. STE. 101
DRAPER, UTAH 84020
PHONE (801) 990-1775
WWW.VECTORSE.COM

JACOB S. PROCTOR
No. 13119
REGISTERED PROFESSIONAL ENGINEER

10/05/2021
Firm License Number: PE.00LLC86-COA
VSE Project Number: U1932.3524.211

Vector Structural Engineering has reviewed the existing structure with loading from the solar array and screw connections to the existing framing. The design of the racking system, racking connections, and all other structural is by others. Mechanical, architectural, and all other nonstructural aspects of the design are by others. Electrical is by others, unless stamped by Dean Levorsen.

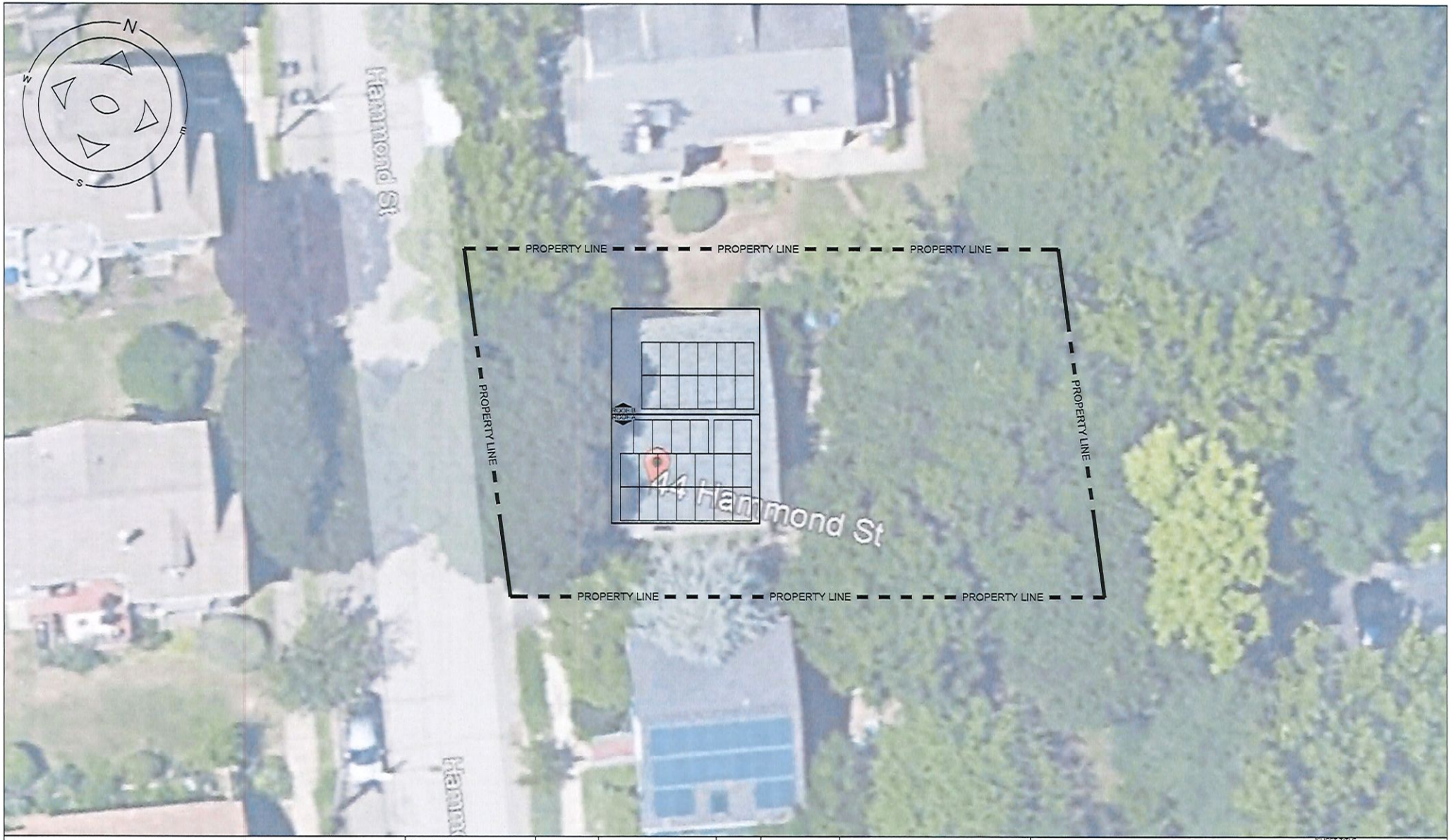
VICINITY MAP



BrightPlanetSolar	BRIGHT PLANET SOLAR 103A MILLBURY ST, AUBURN MA 01501 888-997-4469	SIGNATURE: CONTRACTOR LICENSE: DATE: 10/1/2021 5:21:21 PM	PROJECT #	BPS137598	REV	DATE	DESCRIPTION
			SYSTEM SIZE	10.08kW/DC 7.6kW/AC		—	—
			DATE:	10/1/2021 5:21:21 PM		—	—
			DESIGNER:	T.BICKFORD		—	—

DAVID OMARA
44 HAMMOND ST
PROVIDENCE , RI 02909

SHEET TITLE: TITLE SHEET
SHEET #: PV1



BrightPlanetSolar

BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

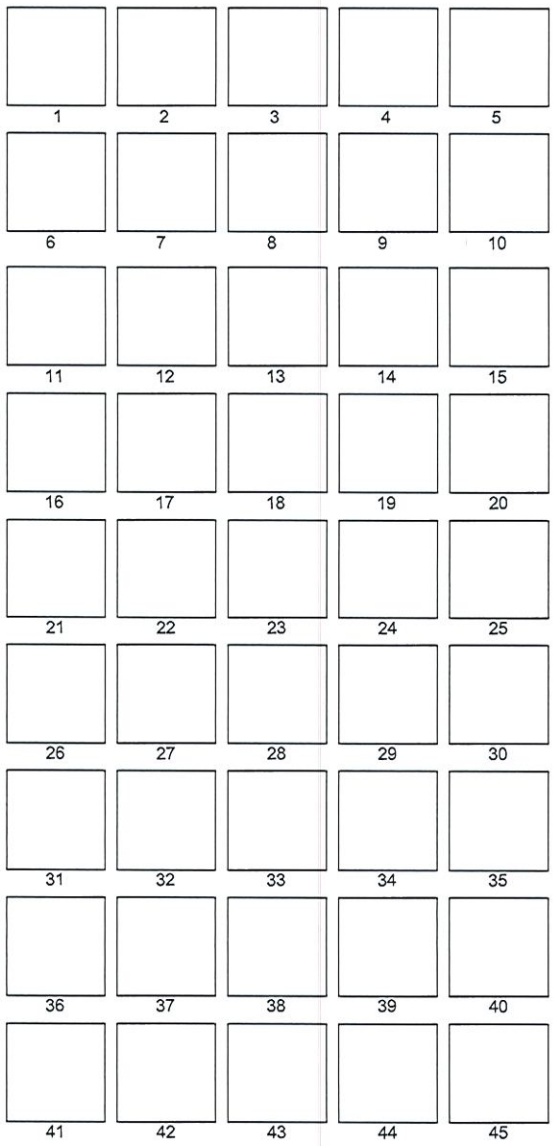
DATE: 10/1/2021 5:21:31 PM

PROJECT #	BPS137598		REV	DATE	DESCRIPTION
SYSTEM SIZE	10.08kW/DC	7.6kW/AC		—	—
DATE:	10/1/2021 5:21:31 PM			—	—
DESIGNER:	T.BICKFORD			—	—

DAVID OMARA
44 HAMMOND ST
PROVIDENCE , RI 02909

SHEET TITLE
PROPERTY LINES

SHEET #
PV7



MAPPING INSTRUCTIONS:

1. REMOVE THE 'SQUARE' OPTIMIZER STICKER AND PLACE NEATLY ON THE APPROPRIATE NUMBERED SPACE.

2. WRITE THE CORRESPONDING NUMBER ON THE APPROPRIATE MODULE WITHIN THE ARRAY.

AZIMUTH AND TILT ANGLE

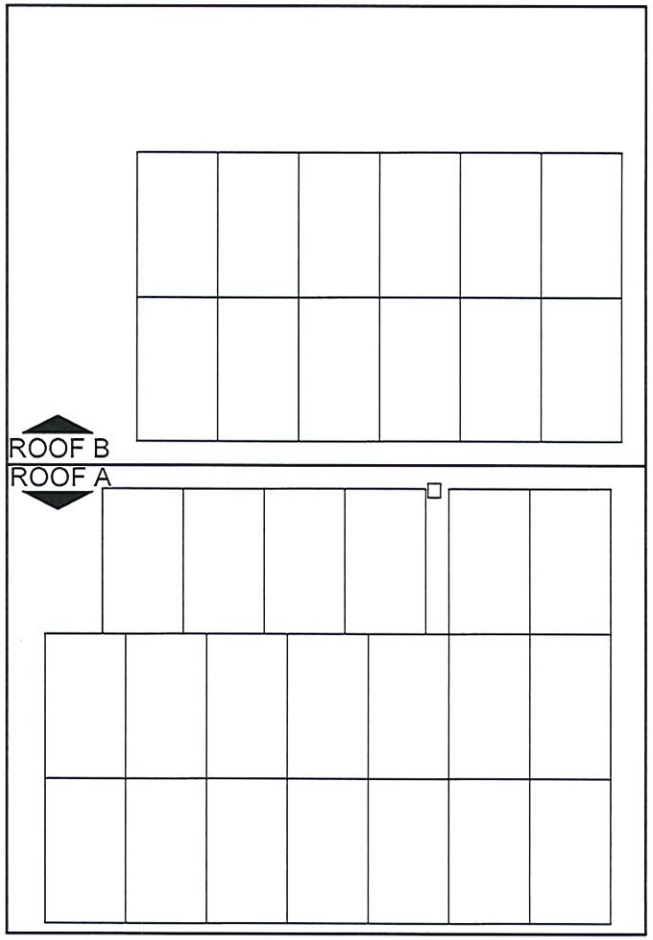
	ROOF					
	A	B	C	D	E	F
AZIMUTH	142°	341°				
TILT ANGLE	8/12	8/12				
MODULE COUNT	20	12				
SOLAR ACCESS						
TSRF AVERAGE						
INVERTERS	SOLAR EDGE SE7600H-US[40]M	1				
OPTIMIZER	SOLAREDGE P340	32				
	MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:	
	LONGI LR5-60HPB-315M	32			32	

INVERTER(S) SERIAL NUMBERS

_____

_____

_____



BRIGHT PLANET SOLAR 103A MILLBURY ST, AUBURN MA 01501 888-997-4469	SIGNATURE:	PROJECT #	BPS137598	REV	DATE	DESCRIPTION
		SYSTEM SIZE	10.08kW/DC 7.6kW/AC		—	—
	CONTRACTOR LICENSE:	DATE:	10/1/2021 5:21:32 PM		—	—
	DATE: 10/1/2021 5:21:32 PM	DESIGNER:	T.BICKFORD		—	—

DAVID OMARA
44 HAMMOND ST
PROVIDENCE , RI 02909

SHEET TITLE: OPTIMIZER TRACKING

SHEET #: PV8

BOM SHEET

ITEM	DESCRIPTION	MANUFACTURER	PART NUMBER	QUANTITY NEEDED	PARTS PULLED	PARTS RECEIVED
		ELECTRICAL EQUIPMENT				
1	SOLAR PV MODULE #1	LONGI LR6-60HPB-315M	LONGI LR6-60HPB-315M	32		
2	INVERTER #1	SOLAR EDGE SE7600H-USRGM	SOLAR EDGE SE7600H-USRGM	1		
3	OPTIMIZER	SOLAREDGE P340		32		
4	AC (UTILITY) DISCONNECT #1	SQUARE D OR EQUAL	D222RB,240V,60A,2P,3R	1		
5	EXISTING MAIN SERVICE PANEL	CHALLENGER				
6	MAIN SERVICE PANEL ADDITIONAL PARTS					
7	NOT USED					
7.1	NOT USED					
7.2	NOT USED					
7.3	NOT USED					
8	REVENUE METER	SOLAR EDGE	US000NNR2	1		
9	MAIN BREAKER	CHALLENGER	100A-2P			
10	PV BREAKER (TIE IN)	CHALLENGER	N/AA-2P	1		
		RACKING/ MOUNTING HARDWARE				
11	STANDOFF (L FEET/HOOKS/SLIDER & MOUNT)			80		
12	FLASHING			80		
13	LAG BOLT			80/160		
14	GROUND LUGS			8		
15	RAIL			24		
16	SPLICES OR SKIRTS			24		
17	OPTIMIZER MOUNT			32		
18	MID CLAMPS			64		
19	END CLAMPS OR RL LINK			32		
20	J BOX			PULL AS NEEDED		
21	ADDITIONAL KITS REQUIRED					

PICKED BY:_____ RECEIVED BY:_____

BrightPlanetSolar
BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE: 10/1/2021 5:21:33 PM

PROJECT #	BPS137598				
SYSTEM SIZE	10.08kW/DC	7.6kW/AC		—	—
DATE:	10/1/2021 5:21:33 PM			—	—
DESIGNER:	T.BICKFORD			—	—

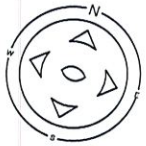
DAVID OMARA
44 HAMMOND ST
PROVIDENCE , RI 02909

SHEET TITLE: BOM SHEET

SHEET #: PV10

AZIMUTH AND TILT ANGLE						
	ROOF					
	A	B	C	D	E	F
AZIMUTH	162°	341°				
TILT ANGLE	8/12	8/12				
MODULE COUNT	20	12				
SOLAR ACCESS						
TSRF AVEREAGE						
INVERTERS	SOLAR EDGE SE7600H-USRGM	1				
OPTIMIZER	SOLAREDGE P340	32				
	MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:	
	LONGI LRG-60HPB-315M	32			32	

SYMBOL LEGEND
□ = MECHANICAL VENT
○ = FLUE / PLUMBING VENT



1 MAIN SERVICE PANEL

2 UTILITY METER

3 AC DISCONNECT

4 NOT USED

5 INVERTER & INTEGRATED DC DISCONNECT

5.1 NOT USED

6 OPTIMIZER (TYPICAL FOR EACH MODULE)

7 JUNCTION BOX ROOF SIZED DETERMINED IN FIELD

8 PV MODULES

9 CONDUIT RUN IS SURFACE MOUNTED (ACTUAL CONDUIT RUNS TO BE DETERMINED IN THE FIELD)

10 NOT USED

0' 5' 10'

VECTOR ENGINEERS
651 W. GALENA PARK BLVD. STE. 101
DRAPER, UTAH 84020
PHONE (801) 990-1775
WWW.VECTORWE.COM

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10/05/2021
Firm License Number: PE.00LLC86-COA
VSE Project Number: U1932.3524.211

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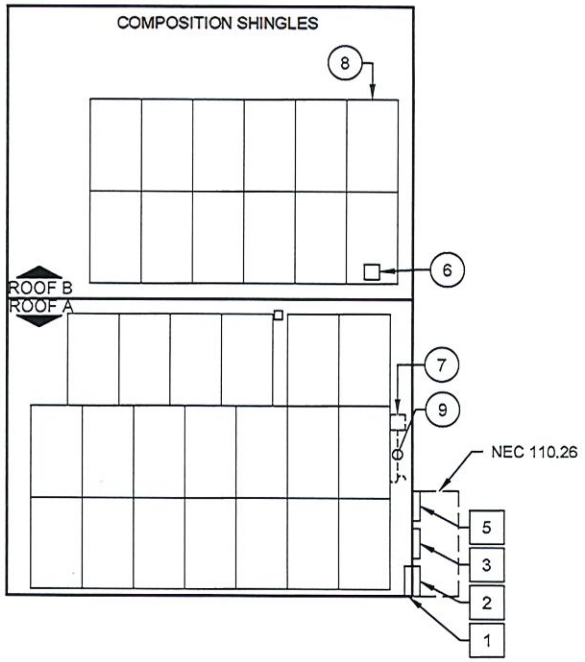
HAMMOND ST



BrightPlanetSolar
BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE: 10/1/2021 5:21:21 PM

PROJECT #	BPS137598				
SYSTEM SIZE	10.08kW/DC	7.6kW/AC			
DATE:	10/1/2021 5:21:21 PM				
DESIGNER:	T.BICKFORD				

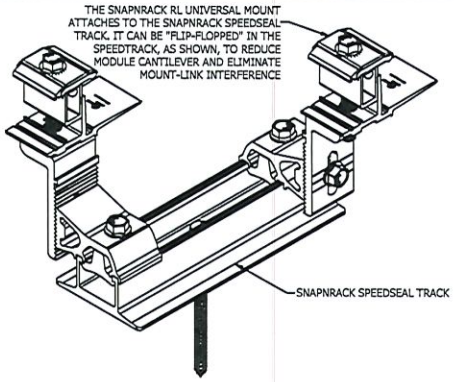
REV	DATE	DESCRIPTION
	—	—
	—	—
	—	—

DAVID OMARA
44 HAMMOND ST
PROVIDENCE , RI 02909

SHEET TITLE: ROOF/SITE PLAN

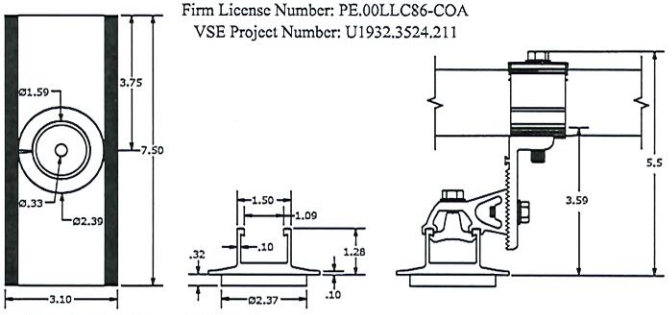
SHEET #: PV2

SNAPNRACK RAILLESS ROOF MOUNT SYSTEM

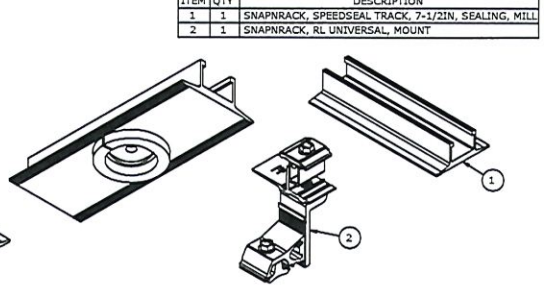


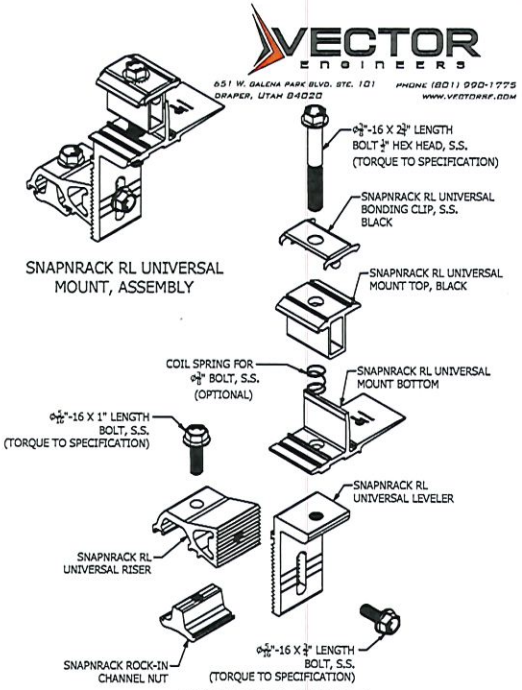
MOUNT "FLIP-FLOP" ABILITY

Firm License Number: PE.00LLC86-COA
VSE Project Number: U1932.3524.211



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	SNAPNRACK, SPEEDSEAL TRACK, 7-1/2IN, SEALING, MILL
2	1	SNAPNRACK, RL UNIVERSAL, MOUNT



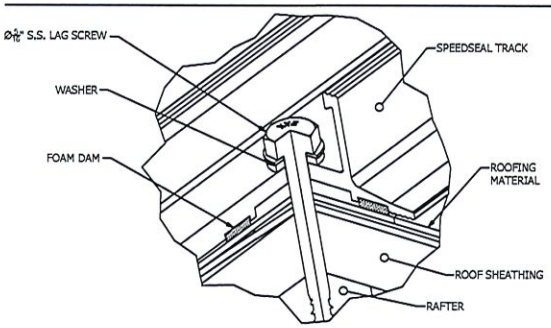


SNAPNRACK RL UNIVERSAL MOUNT, ASSEMBLY

SNAPNRACK RL UNIVERSAL MOUNT, EXPLODED

JACOB S. PROCTOR
No. 13119
REGISTERED PROFESSIONAL ENGINEER

10/05/2021



DETAIL A

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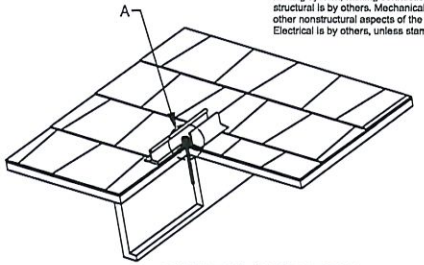
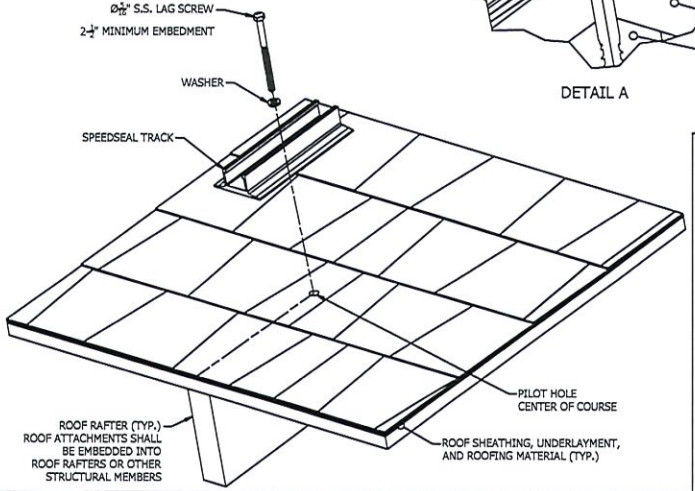
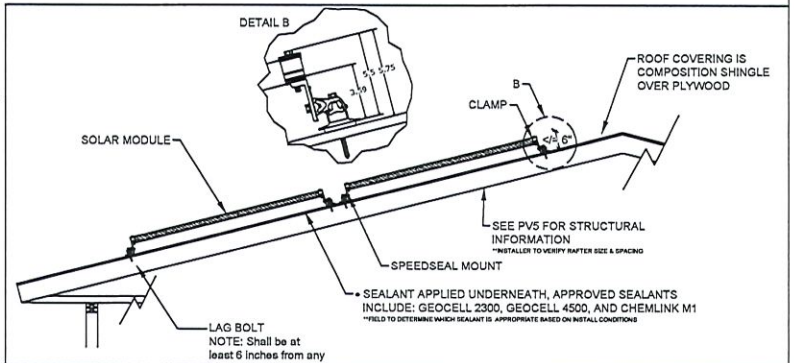


COMPLETED INSTALLATION SECTION VIEW





BrightPlanetSolar

BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE: 10/1/2021 5:21:30 PM

PROJECT #	BPS137598		REV	DATE	DESCRIPTION
SYSTEM SIZE	10.08kW/DC	7.6kW/AC		—	—
DATE:	10/1/2021 5:21:30 PM			—	—
DESIGNER:	T.BICKFORD			—	—

DAVID OMARA
44 HAMMOND ST
PROVIDENCE , RI 02909

SHEET TITLE: STRUCTURAL COMPONENTS

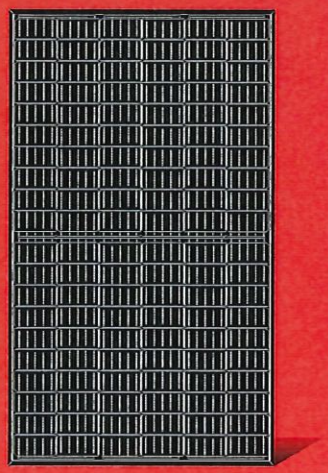
SHEET #: PV6

LR6-60HPB

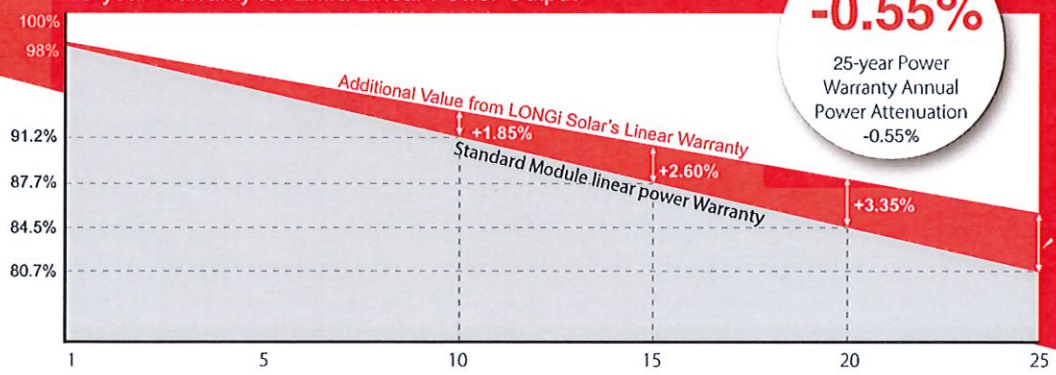
300~320M

Hi-MO 3m (Black)

High Efficiency Low LID Mono PERC with Half-cut Technology



10-year Warranty for Materials and Processing;
25-year Warranty for Extra Linear Power Output



-0.55%
25-year Power Warranty Annual Power Attenuation -0.55%

+4.10%

Complete System and Product Certifications

IEC 61215, IEC61730, UL1703

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 19.1 %)

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

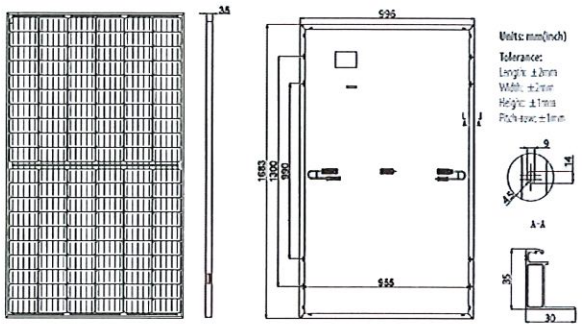
Reduced hot spot risk with optimized electrical design and lower operating current

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

LR6-60HPB 300~320M

Design (mm)



Mechanical Parameters

Cell Orientation: 120 (6×20)

Junction Box: IP67, 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: 18.9kg

Dimension: 1683×996×35mm

Packaging: 30pcs per pallet
180pcs per 20'GP
780pcs per 40'HC

Operating Parameters

Operational Temperature: -40℃ ~ +85℃

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℃

Safety Class: Class II

Fire Rating: UL type 1 or type 2

Electrical Characteristics

Test uncertainty for Pmax: ±3%

Model Number	LR6-60HPB-300M		LR6-60HPB-305M		LR6-60HPB-310M		LR6-60HPB-315M		LR6-60HPB-320M	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	300	222.2	305	225.9	310	229.6	315	233.4	320	237.1
Open Circuit Voltage (Voc/V)	39.8	37.1	40.1	37.4	40.3	37.7	40.6	37.9	40.9	38.2
Short Circuit Current (Isc/A)	9.70	7.82	9.78	7.88	9.86	7.94	9.94	8.01	10.02	8.08
Voltage at Maximum Power (Vmp/V)	32.9	30.4	33.1	30.6	33.3	30.8	33.7	31.1	33.9	31.3
Current at Maximum Power (Imp/A)	9.13	7.32	9.21	7.38	9.30	7.46	9.36	7.50	9.43	7.56
Module Efficiency(%)	17.9		18.2		18.5		18.8		19.1	

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

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

Temperature Ratings (STC)

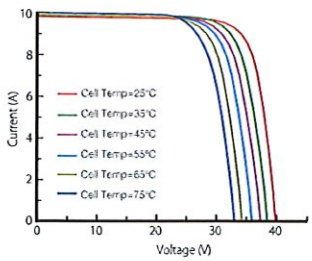
Temperature Coefficient of Isc	+0.057%/℃
Temperature Coefficient of Voc	-0.286%/℃
Temperature Coefficient of Pmax	-0.370%/℃

Mechanical Loading

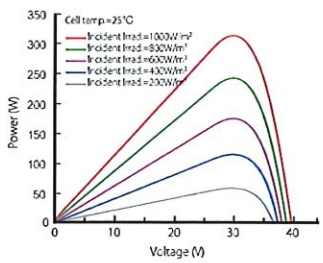
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V Curve

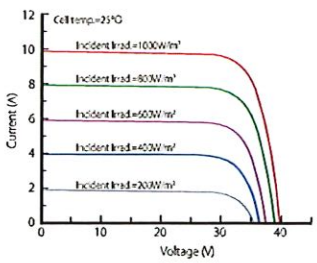
Current-Voltage Curve (LR6-60HPB-310M)



Power-Voltage Curve (LR6-60HPB-310M)



Current-Voltage Curve (LR6-60HPB-310M)



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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