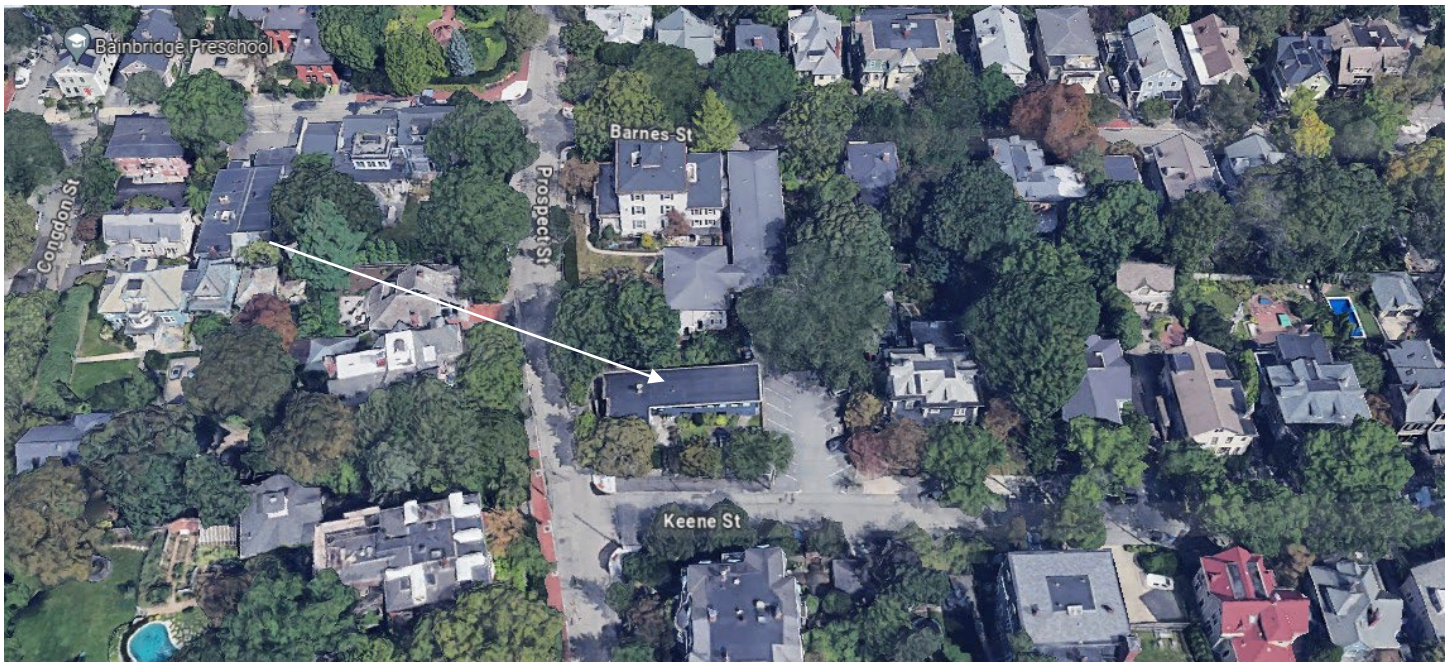
2. CASE 24.101, 2 KEENE STREET, House, ca. 1960 (COLLEGE HILL)

Contemporary; 1-2 stories L-plan with sloping flat roof; brick and vertical sheathing; multiple windows north and south; enclosed east and west; fine stone wall and landscaping.

CONTRIBUTING

Arrow indicates 2 Keene Street.



Arrow indicates project location, looking north.

Applicant/Contractor: Robin Klein, BrightOps, 1451 Grafton Street, Worcester, MA 01604
Owner: Eric Huban, 2 Keene Street, Providence, RI 02906

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

- installation of 34 solar panels to the sloped roofs.

Issues: The following issues are relevant to this application:

- The application as submitted will be 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) 2 Keene 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 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 the structure is a contemporary structure and the introduction of solar panels can be interpreted as an acceptable evolution in the property's architectural evolution; 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. 2 Keene 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 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. 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 the property is a contemporary structure and the introduction of solar panels is interpreted as an acceptable evolution in the property's architectural evolution, (Standards 8 & 9), and the recommendations in the staff report, with staff to review any additional required details.

SHEET INDEX

PV1	TITLE SHEET
PV2 (+PV2.1 AS NEEDED)	ROOF/SITE PLAN
PV3 (+ PV3.1 AS NEEDED)	ELECTRICAL LINE DIAGRAM / DETAILS
PV4	EQUIPMENT LABELS
PV4.1	PLACARD
PV5	ATTACHMENT PLAN
PV6	STRUCTURAL COMPONENTS
PV7	PROPERTY LINES
PV8-PV10	INSTALL DOCUMENTS
	STRUCTURAL ENGINEERING CALCS (IF REQ.)
	EQUIPMENT DATA SHEETS

OCCUPANCY & CONSTRUCTION TYPE

OCCUPANCY - R3

CONSTRUCTION - 5B

APPLICABLE CODES

2020 NATIONAL ELECTRICAL CODE (NFPA 70)

2021 INTERNATIONAL RESIDENTIAL CODE (IRC) AS AMENDED

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 2020 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)(3)(2).
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 690.13.
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.

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WELLS L. HOLMES
No. 13066
REGISTERED PROFESSIONAL ENGINEER
STRUCTURAL

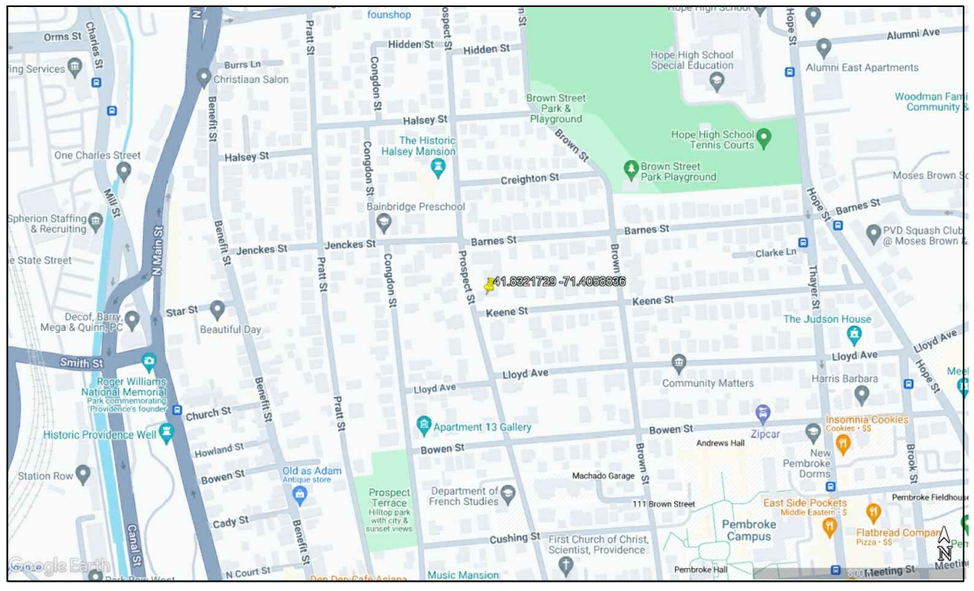
07/01/2024

Firm License Number: PE.00LLC86-COA

VSE Project Number: U1932.0034.241

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:	PROJECT #	BPS352269	REV	DATE / DESCRIPTION
			SYSTEM SIZE	13.6kW/DC 10kW/AC		---
			DATE:	8/8/2024 11:40:52 AM		---
		CONTRACTOR LICENSE:	DESIGNER:	ISAI RIVAS		---
		DATE:				---

ERIC HUBAN
2 KEENE ST
PROVIDENCE, RI 02906

TITLE SHEET

PV1

AZIMUTH AND TILT ANGLE						
	ROOF					
	ROOF A:	ROOF B:	ROOF C:	ROOF D:	ROOF E:	ROOF F:
AZIMUTH	262°					
TILT ANGLE	9.46°					
MODULE COUNT	34					
SOLAR ACCESS						
TSFR AVEREAGE						
INVERTERS	SOLAR EDGE SE10000H - USRGM	1				
OPTIMIZERS	SOLAREDGE S440	34				
	MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:	
	HANWHA Q-CELLS Q.PEAK DUO BLK ML-G10.a+ 400	34			34	

ROOF CALCULATIONS:

TOTAL AREA OF ARRAY(S) = 718.76 SQ. FT.
TOTAL AREA OF ROOF = 2316 SQ. FT.
% OF TOTAL ROOF COVERED = 31.0%
TOTAL WEIGHT OF ARRAY(S) = 1649.00

ROOF PITCH 9.46 DEGREES (2/12) OR LESS,
FIRE CODE SETBACKS NOT REQUIRED

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

1 MAIN SERVICE PANEL

2 UTILITY METER

3 AC DISCONNECT

4 NOT USED

4.1 NOT USED

5 INVERTER & INTEGRATED DC DISCONNECT

5.1 NOT USED

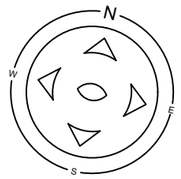
6 OPTIMIZER (TYPICAL FOR EACH MODULE)

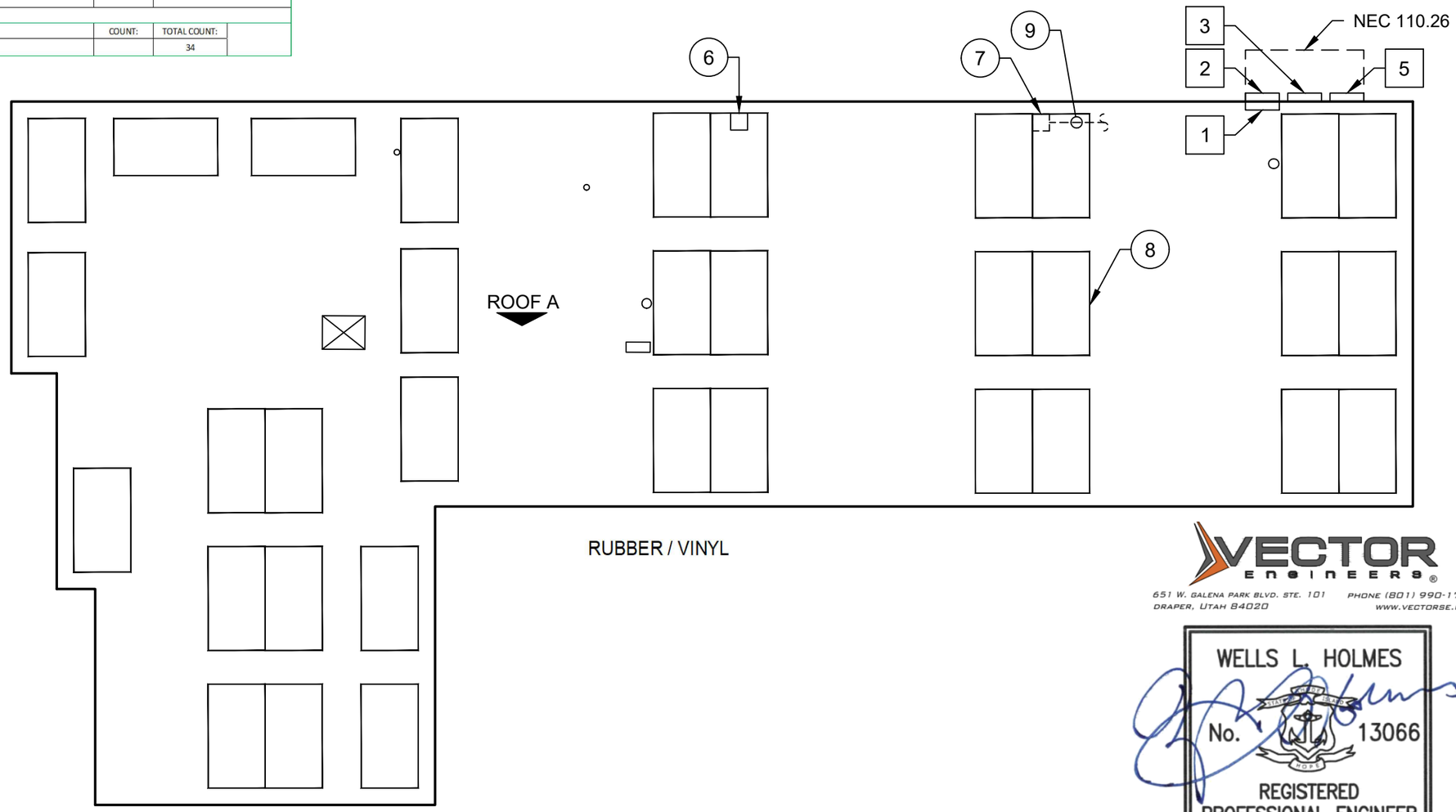
7 JUNCTION BOX ON ROOF (SIZE DETERMINED IN FIELD)

8 PV MODULES

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

10 NOT USED





0' 5' 10'

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No. 13066
REGISTERED PROFESSIONAL ENGINEER
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Firm License Number: PE.00LLC86-COA
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888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

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ROOF/SITE PLAN

PV2

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ELECTRICAL ONLY

DEAN P. LEVORSEN
No. 13576
REGISTERED
PROFESSIONAL ENGINEER
ELECTRICAL

07/01/2024

Firm License Number: PE.00LLC86-COA
VSE Project Number: U1932.0034.241

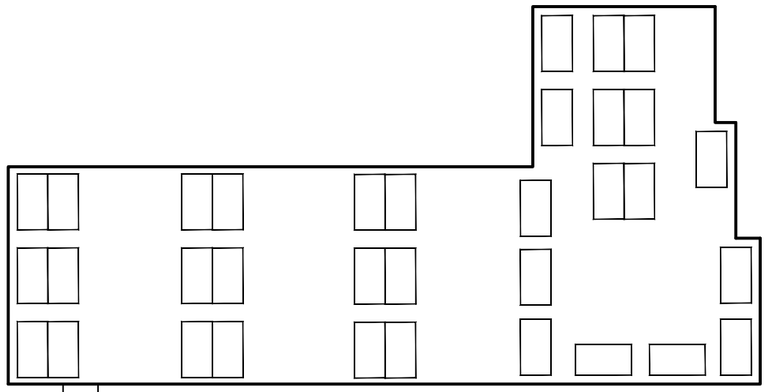
The contractor must notify Vector Structural Engineering, LLC, should discrepancies between the as-built electrical system and what is shown on the permit plans be found. Vector Structural Engineering shall be notified of any changes from the approved design before installation. Vector Structural Engineering assumes no responsibility for improper installation of the solar system.

12 PLACARD

CAUTION:

MULTIPLE SOURCES OF POWER

KEENE ST



UTILITY METERING

SOLAR INVERTER & DC DISCONNECT

UTILITY AC DISCONNECT

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

SIGNATURE:

CONTRACTOR LICENSE:

DATE:

PROJECT #	BPS352269				
SYSTEM SIZE	13.6kW/DC	10kW/AC			
DATE:	8/8/2024 11:41:04 AM				
DESIGNER:	ISAI RIVAS				

REV	DATE	DESCRIPTION

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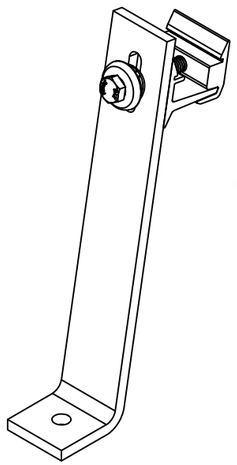
PROVIDENCE, RI 02906

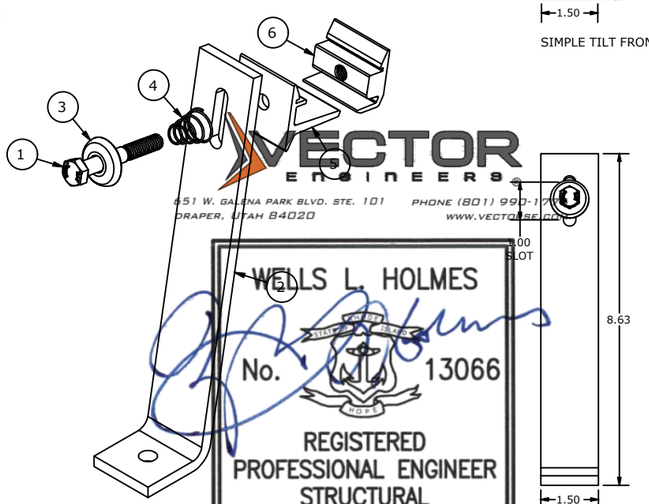
PLACARD

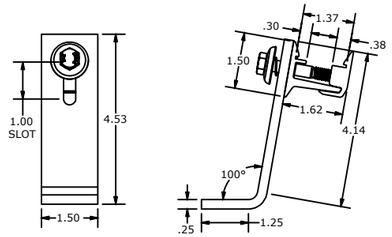
PV4.1

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	5/16IN-18 X 2-1/4IN SS HCS BOLT
2	1	SNAPNRACK, TILT LEG PLUS PRC
3	1	SNAPNRACK, ULTRA RAIL MOUNT SPRING CAGE, 6061-T6 AL
4	1	SNAPNRACK, ULTRA RAIL MOUNT SPRING, SS
5	1	SNAPNRACK, ULTRA RAIL MOUNT THRU PRC, CLEAR
6	1	SNAPNRACK, ULTRA RAIL MOUNT TAPPED PRC, CLEAR

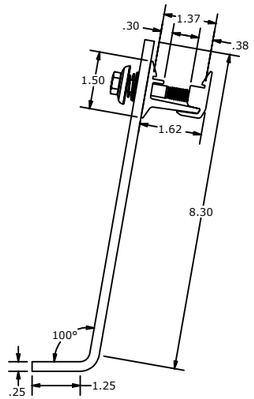
TILT KIT PROPERTIES	
SKU	DESCRIPTION
242-03215	SIMPLE TILT BACK LEG, PORTRAIT, 10°
242-03216	SIMPLE TILT BACK LEG, LANDSCAPE, 10°
242-03217	SIMPLE TILT FRONT, 10°







SIMPLE TILT FRONT LEG



SIMPLE TILT BACK LEG

NOTE: ALSO KNOWN AS TILT LEG PLUS
ALL DIMENSIONS IN INCHES

07/01/2024

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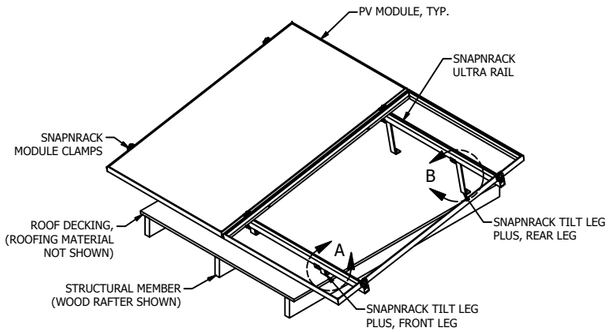
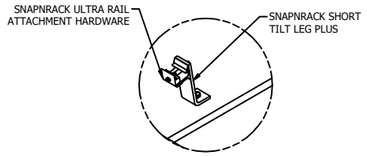
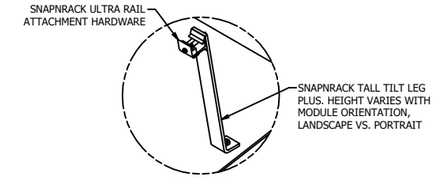
Vector Structural Engineering has reviewed the existing structure with loading from the solar array and screw



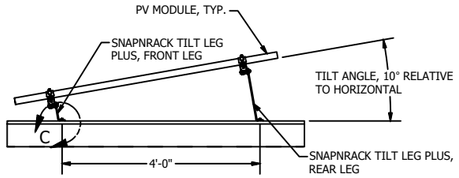
FIXED TILT, INSTALLED



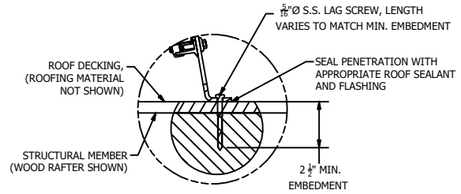
DETAIL A
TILT LEG PLUS, FRONT LEG
(RAIL HIDDEN)



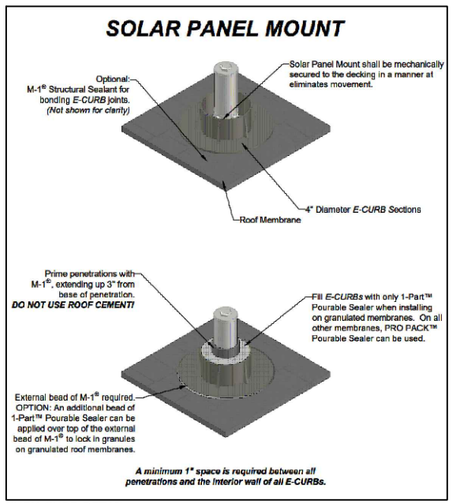
DETAIL B
TILT LEG PLUS, REAR LEG
(RAIL HIDDEN)



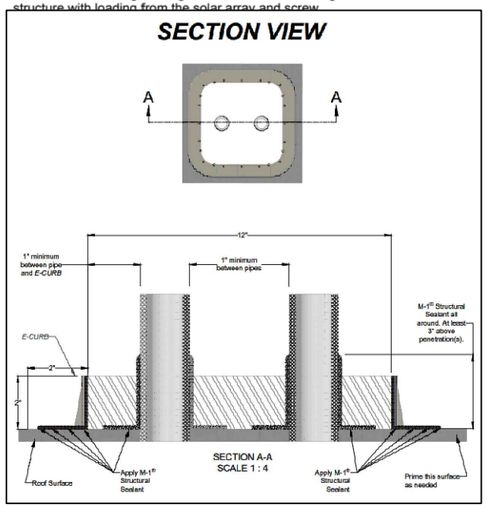
TILT ANGLE
FLAT ROOF ONLY

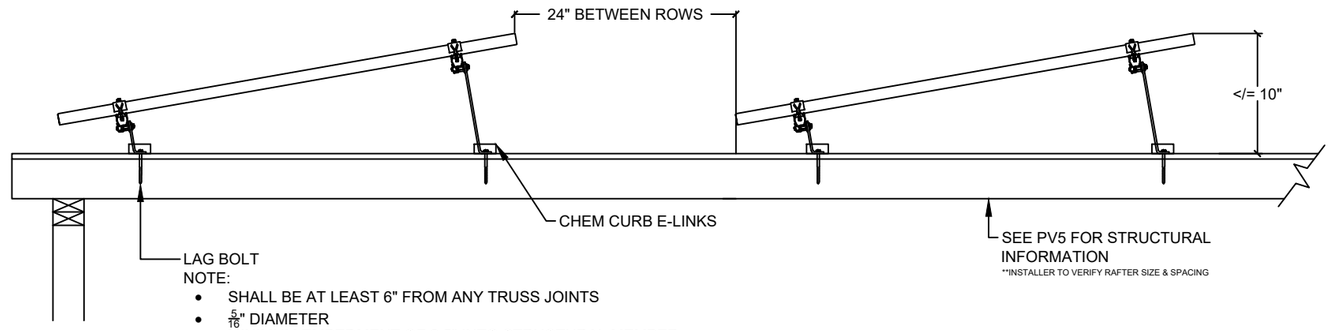


DETAIL C
PENETRATION DETAIL:
WOOD MEMBER



CHEM CURB DETAIL





NOTE:
- SHALL BE AT LEAST 6" FROM ANY TRUSS JOINTS
- $\frac{5}{16}$" DIAMETER
- MINIMUM EMBEDMENT OF 2.5" INTO STRUCTURAL MEMBER

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888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE:

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DESIGNER:	ISAI RIVAS			---	

ERIC HUBAN
2 KEENE ST
PROVIDENCE, RI 02906

STRUCTURAL COMPONENTS

PV6

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AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE:

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ERIC HUBAN
2 KEENE ST
PROVIDENCE, RI 02906

PROPERTY LINES

PV7