Mid Cambridge Neighborhood Conservation District Commission

Cambridge Historical Commission, 831 Massachusetts Ave., 2nd Fl., Cambridge, MA 02139
Telephone: 617-349-4683 TTY: 617-349-6112 histncds@cambridgema.gov
www.cambridgema.gov/Historic/DistrictsHistoricProperties/MidCambridgeNCD

APPLICATION FOR CERTIFICATE

Section I:

1. The undersigned hereby applies to the Mid Cambridge Neighborhood Conservation District Commission for a Certificate of (check type of certificate): ☒ Appropriateness, ☐ Nonapplicability, or ☐ Hardship, in accordance with Ch. 2.78 of the Municipal Code and the order establishing the district.

2. Address of property: 3 Leonard Ave, Cambridge, Massachusetts

3. Describe the proposed alteration(s), construction, or demolition in the space provided below: (An additional page can be attached, if necessary).

   Installing rooftop railed solar PV of 2.87 KW and 7 modules. No ESS installation.

Name of Property Owner of Record: Tatyana Raphael

Mailing Address: 3 Leonard Ave Cambridge, MA 02139

Telephone/Fax: 617-916-7887 **E-mail:** tatyanaraphael@gmail.com

Signature of Property Owner of Record*: Tatyana Raphael

(Required field; application will not be considered complete without property owner's signature)
*I have read the application in full and certify that the information contained herein is true and accurate to the best of my knowledge and belief.

Name of proponent, if not record owner: Momentum Solar

Mailing Address: 50 D'Angelo Dr. Suite 3 Marlborough, MA 01752

Telephone/Fax: 774-318-0950 **E-mail:** permitsma@momentumsolar.com

(for office use only):

Date Application Received: _____ **Case Number:** _____ **Hearing Date:** _____

Type of Certificate Issued: _____ **Date Issued:** _____

Section II:

Is property listed on the National Register of Historic Places? ____ Publicly owned? _____
Current Zoning District: _____ Current Use: _____

Section III:

Will this project require: variance_____ special permit _____

If yes, nature of zoning relief sought: setbacks _____ FAR _____ use _____

height _____ parking _____ other (explain) _____

Section IV (Complete any portions that apply to proposed scope of work):

New Construction or Additions:

_____ floor area of existing structures on the lot

_____ amount of floor area (gross square feet) of proposed construction

_____ percentage increase in total floor area after construction

_____ total area of lot in square feet

_____ percentage of total lot area covered after construction

Demolition:

_____ amount of floor area (gross square feet) of proposed demolition

_____ floor area of existing structure

_____ percentage decrease in total floor area after demolition

Alterations:
Does the proposed work include (check all that apply):

_____ enclosure or removal of decorative elements (including cornice, fascia, soffit, bay, porch, hood, cornerboard, window sash, or window or door casing);

_____ increase or reduction of window or door size;

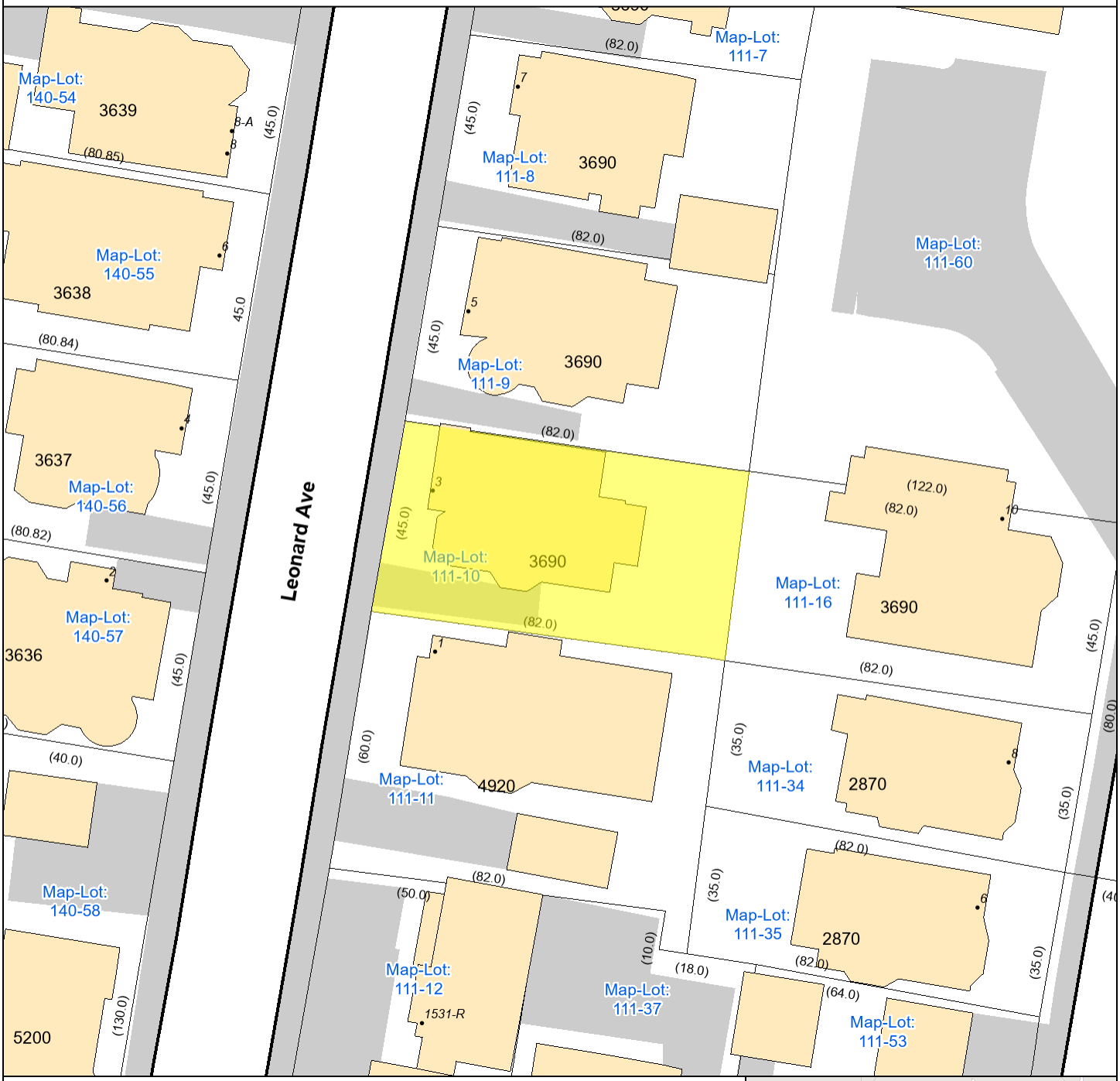
_____ relocation of windows or doors;

_____change in slope, pitch, or configuration of roof;

_____ removal of original or historic roofing material.

City of Cambridge

June 11, 2024



City of Cambridge
Massachusetts

1" = 35 ft

All data is provided for graphic representation only. The City of Cambridge expressly disclaims all warranties of any type, expressed or implied, including, but not limited to, any warranty as to the accuracy of the data, merchantability, or fitness for a particular purpose.

www.cambridgema.gov/gis

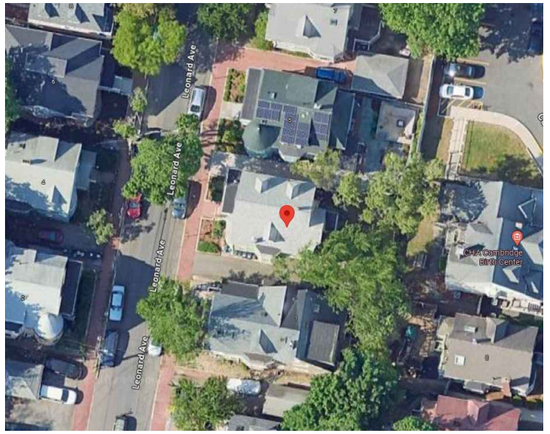
- Addresse
- Rail
- Building Footprints
- Parcels

Paved Surfaces

- Paved Roads
- Bridges
- Unpaved Roads
- Unpaved Parking
- Sidewalks
- Driveways
- Alleys
- Other Paved Surface
- Public Footpath

PLAN KEY	
PV-1	COVER PAGE
PV-2	PANEL LAYOUT
PV-3	ELECTRICAL
PV-4	EQUIPMENT LABELS

VICINITY MAP

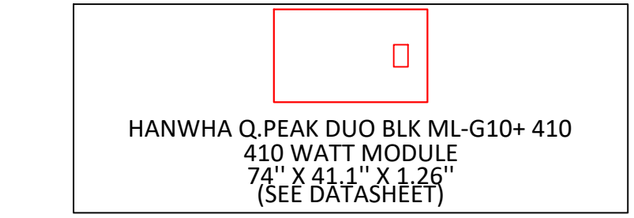


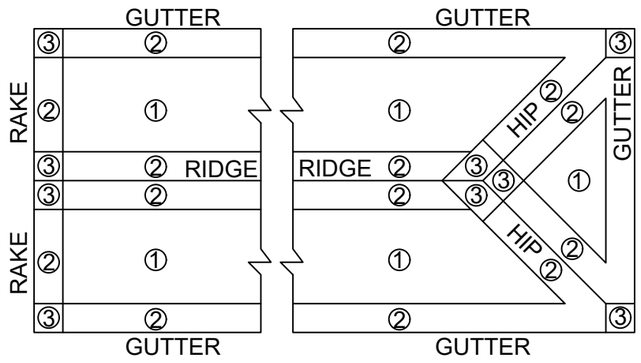
SYSTEM INFORMATION	
MODULE	HANWHA Q.PEAK DUO BLK ML-G10+ 410
INVERTER	ENPHASE IQ7PLUS-72-2-US
RACKING	UNIRAC NXT HORIZON 2-RAIL SYSTEM
SYSTEM SIZE (DC)	2.87 KW
LOCATION	42.3750015,-71.1055570

1. ALL WIND DESIGN CRITERIA ARE FOR LOW SLOPE ROOFS, GABLE AND HIP ROOFS CONSIDERED FROM AN ANGLE OF MIN. 9.5 ° ($\frac{2}{12}$) TO MAX. 45° ($\frac{12}{12}$) NOT TO EXCEED 30' MEAN ROOF HEIGHT ATTACHED WITH FASTENERS AS SPECIFIED BY THE MANUFACTURER.
2. SPAN TABLES ARE DERIVED FROM MECHANICAL LOAD TESTS PERFORMED BY THE MANUFACTURERS INDEPENDENT TESTING AGENCIES ON BEHALF OF THE MANUFACTURER.
3. ROOF SEALANTS SHALL CONFORM TO ASTMC920 AND ASTM 6511
4. ALL ATTACHMENTS SHALL BE INSTALLED IN STRICT COMPLIANCE WITH MANUFACTURERS PRINTED INSTRUCTIONS.

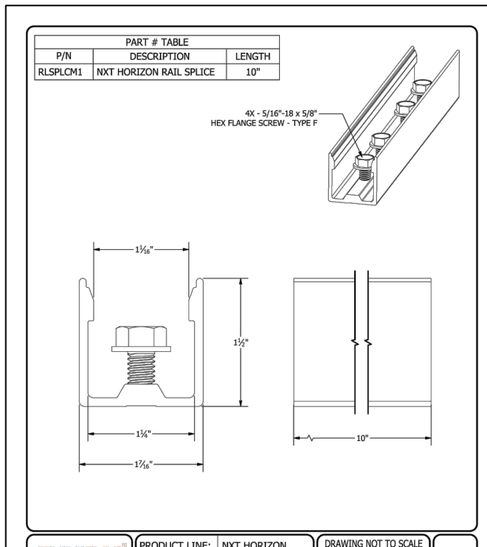
FASTENER:
REFER TO STRUCTURAL CERTIFICATION LETTER FOR ALL STRUCTURAL INFORMATION OF EXISTING BUILDING STRUCTURE.

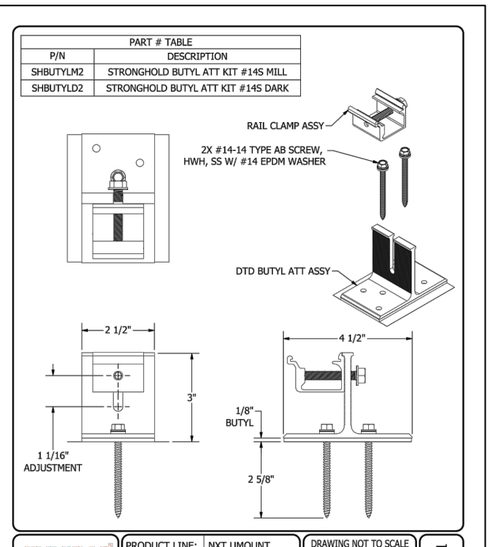
ATTACHMENT SPACING NOT EXCEED MANUFACTURERS SPECIFICATIONS FOR WIND LOADS AS PER ASCE 07-10. RISK CATEGORY II TOPOGRAPHIC EFFECTS B,C, & D AND ROOF WIND ZONES 1,2,& 3. ROOF ZONES 2 & 3 ARE WITHIN 48" OF ANY OUTER EDGE, HIP, RIDGE, OR GUTTER LINE FOR STRUCTURES 30'- 0" OR LESS MEAN ROOF HEIGHT.





ROOF WIND ZONES AS PER IRC R301.2(7)
ROOF ZONES 2 & 3 ARE 48" FROM OUTTER ROOF EDGES, RIDGES, HIPS, RAKES, AND GUTTER EDGES FOR STRUCTURES BELOW 30'-0" MEAN ROOF HT.





GENERAL NOTES:

THIS PV SYSTEM DESIGN COMPLIES THE NPF1-2021 EDITION WITH MASSACHUSETTS AMENDMENTS 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE AND 527 11.12.3.2.3, 527 CMR11.12.3.2.4 AND 527 CMR 52.9

BILL OF MATERIALS	
NON SH MODULES	7
SH MODULES	0
INVERTERS	7
L-FOOT ATTACHMENT W/ UNIRAC NXT	26
ENPHASE COMBINER BOX	1
60A AC FUSIBLE DISCONNECT	1
35A FUSES	2
125A LINE TAPS	2
171" RAIL	4

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PRO CUSTOM SOLAR LLC D.B.A. MOMENTUM SOLAR
3096 HAMILTON BLVD. BUILDING B
SOUTH PLAINFIELD, NJ 07080
(732) 902-6224
MOMENTUMSOLAR.COM

PROFESSIONAL ENGINEERING

MICHAEL REZK, P.E. MA LICENSE # 58210 (732)-902-6224
3096B HAMILTON BLVD SOUTH PLAINFIELD, NJ 07080
ENGINEERING LETTER ATTACHED HAS SPECIFICATIONS FOR WIND AND LOAD CALCULATIONS FOR SOLAR INSTALLATION SPANS & ATTACHMENTS TO MEET LOCAL AND STATE BUILDING CODE COMPLIANCE. WARNING THAT IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL, TO ALTER AN ITEM IN ANY WAY.

6/3/2024

CUSTOMER INFORMATION

TATYANA RAPHAEL - MS152133
3 LEONARD AVE
CAMBRIDGE, MA 02139
(617) 916-7887

UTILITY: EVERSOURCE
UTILITY ACCT #: 11564070479
UTILITY METER #: 7056628

PV SYSTEM INFORMATION

SYSTEM SIZE (DC): 2.87 KW
SYSTEM DESIGN CAPACITY (AC):2.03 KVA
7 MODULES: HANWHA Q.PEAK DUO BLK ML-G10+ 410
(SAFE HARBOR MODULES: 0)

7 INVERTERS: ENPHASE IQ7PLUS-72-2-US

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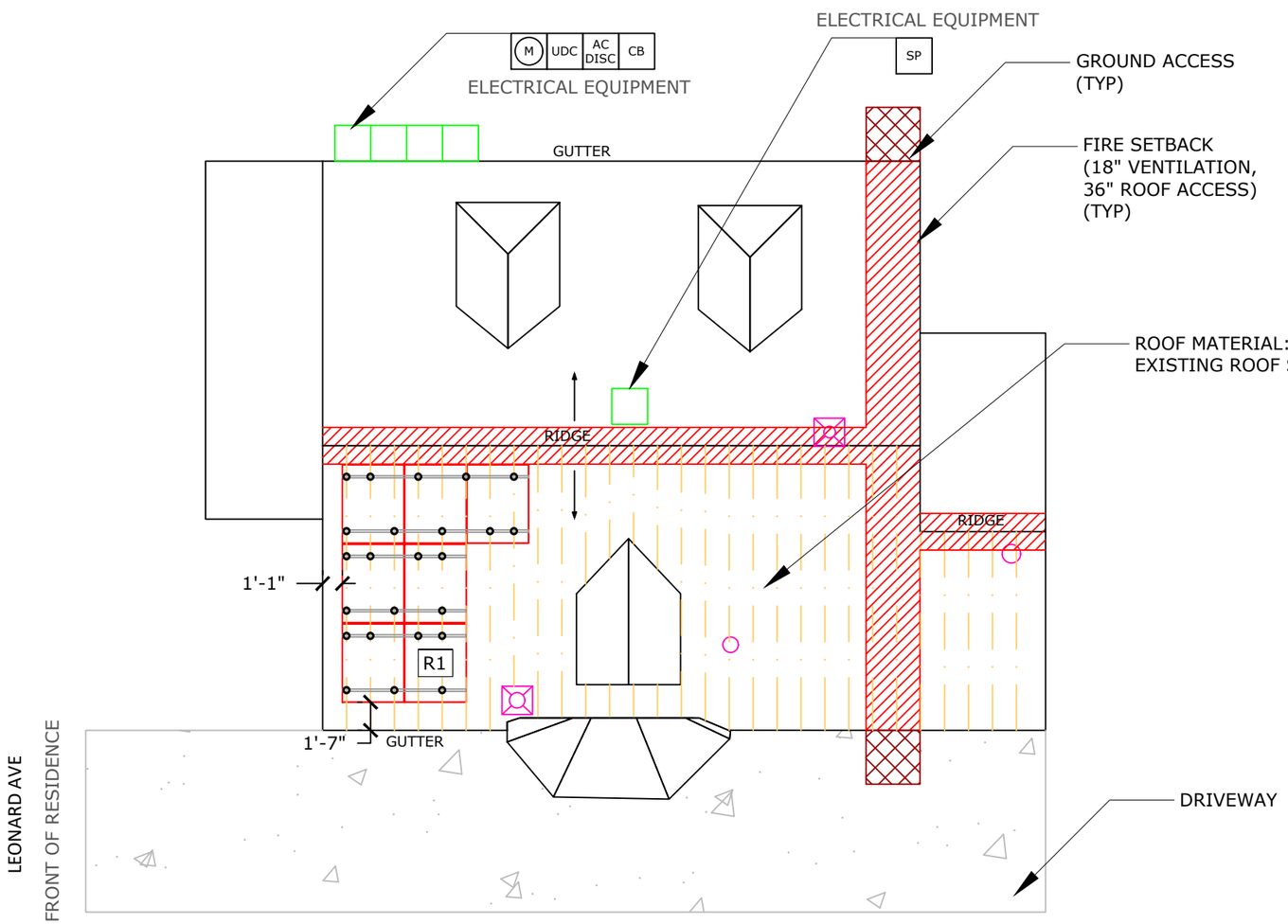
COVER PAGE

PV-1

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

ROOF	MODULE COUNT	TILT	AZIMUTH	SHADING	LANDSCAPE MAX SPAN (ROOF AREA 1/2/3)	PORTRAIT MAX SPAN (ROOF AREA 1/2/3)
R1	7	45°	189°	73%	48 /48 /48	48 /48 /48



NOTE:
1. ROOF COVERING MATERIAL IS COMPOSED OF ASPHALT SHINGLES
2. THE CLAMPING MAX SPACING IS 48" O.C

TOTAL SQUARE FOOTAGE OF ROOF: 1830 SQFT
SQUARE FOOTAGE OF SOLAR ARRAY:147.85 SQFT
PERCENTAGE OF SOLAR ROOF COVERAGE: 8.08%
18" RIDGE SETBACK SHALL BE REQUIRED

SYMBOL LEGEND

MSP	MAIN SERVICE PANEL	TAP BOX	TAP BOX
SP	SUB-PANEL	PF	PRODUCTION METER
M	UTILITY METER		CHIMNEY
AC DISC	AC DISCONNECT		SKYLIGHT
UDC	UTILITY DISCONNECT		FAN
LC	LOAD CENTER		SATELLITE DISH
N3R	NEMA 3R BOX W/ ENVOY-S		FIRE SETBACKS
CB	COMBINER BOX		GROUND ACCESS
ATS	AUTOMATIC TRANSFER SWITCH		PITCH DIRECTION
MTS	MANUAL TRANSFER SWITCH		MODULE

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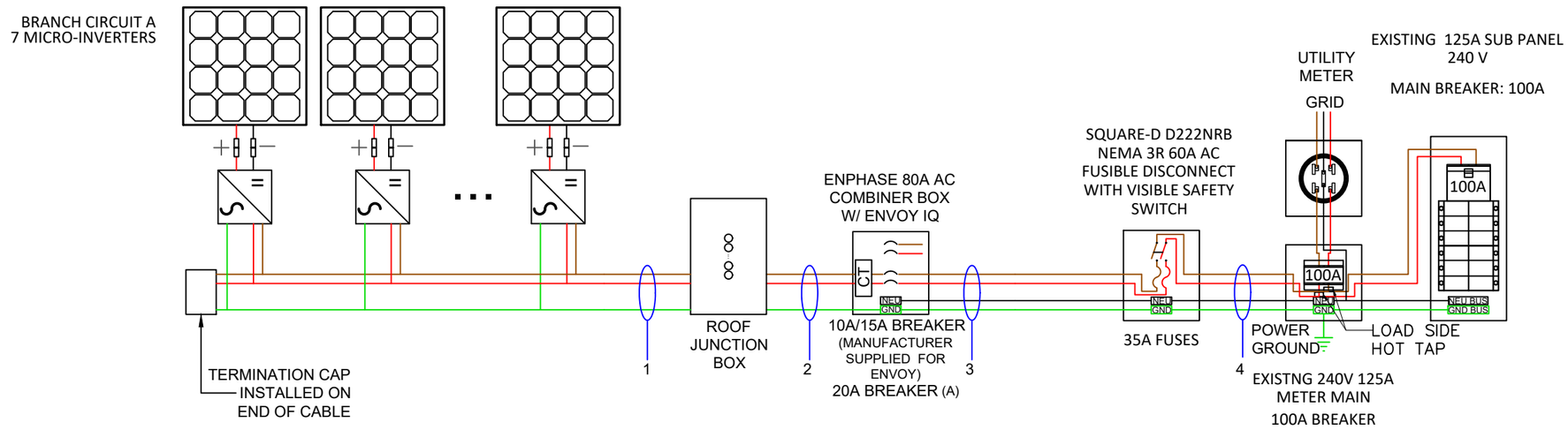
PANEL LAYOUT

PV-2

7 HANWHA Q.PEAK DUO BLK ML-G10+ 410 410W MODULES PAIRED WITH

7 ENPHASE IQ7PLUS-72-2-US MICRO-INVERTERS



TEMPERATURE DERATE FACTOR BASED ON 32°C

ELECTRICAL NOTES:

1. ALL CALCULATIONS FOR VOC, VMAX, IMP AND ISC HAVE BEEN CALCULATED USING THE MANUFACTURED STRING CALCULATOR BASED ON ASHRAE 2% HIGH AND EXTREME MINIMUM TEMPERATURE COEFFICIENTS.
2. THE ENTIRE ARRAY IS BONDED ACCORDING TO 690.43(A) THROUGH (D) WITH 250.134 OR 250.136.
3. SYSTEM IS CONSIDERED AN AC MODULE SYSTEM. NO DC CONDUCTORS ARE PRESENT IN CONDUIT, COMBINER, JUNCTION BOX, DISCONNECT AND COMPLIES WITH 690.6 - NO DC DISCONNECT AND ASSOCIATED DC CABLING ARE REQUIRED.
4. SYSTEM COMPLIES WITH 690.12 RAPID SHUTDOWN AND ASSOCIATED LABELING AS PER 690.56(C). AC VOLTAGE AND SYSTEM OPERATING CURRENT SHALL BE PROVIDED AS PER 690.51.
5. CONDUCTORS IN CONDUIT ARE AC CONDUCTORS - BRANCH CIRCUITS. AND NOT PV SOURCE CIRCUITS. 690.6.
6. ALL GROUNDING SHALL COMPLY WITH 690.47(A) IN THAT THE AC MODULES WILL COMPLY WITH 250.64.
7. NO TERMINALS WILL BE ENERGIZED IN THE OPEN POSITION IN THIS AC MODULE SYSTEM - 690.13(B), 690.6.
8. THIS SYSTEM COMPLIES WITH 2023 MASSACHUSETTS ELECTRICAL CODE.
9. WHERE APPLICABLE: INTERCONNECTION SHALL COMPLY WITH 705.11(A) THROUGH (E) AND 750.12(A) THROUGH (E)
10. BRANCH CIRCUIT CALCULATION FOR WIRE TAG 1 DISPLAYS THE LARGEST BRANCH CIRCUIT IN SYSTEM. OTHER BRANCH CIRCUITS WILL HAVE LOWER DESIGN CURRENT THAN THE ONE SHOWN.
11. ALL CONDUCTORS ARE SIZED BASED ON 2023 MASSACHUSETTS ELECTRICAL CODE ARTICLE 310.
12. ALL EQUIPMENT TERMINAL IS RATED AT 75°C.
13. INVERTER NOC (NOMINAL OPEN CURRENT) OBTAINED FROM EQUIPMENT DATASHEET

Wire Tag	Conduit	Wire Qty	Wire Gauge	Wire Type	Temp. Rating	Wire Ampacity (A)	Temp. Derate	Conduit Fill Derate	Derated Ampacity (A)	Inverter Qty	NOC (A)	NEC Correction	Design Current (A)	Ground Size	Ground Wire Type
1	OPEN AIR	2	12 AWG	Trunk Cable	90°C	30	0.96	1	28.80	7	1.21	1.25	10.59	12 AWG	Trunk Cable
2	3/4" EMT	2	10 AWG	THWN-2	90°C	40	0.96	1	38.40	7	1.21	1.25	10.59	08 AWG	THWN-2
3	3/4" EMT	3	06 AWG	THWN-2	75°C	65	0.96	1	62.40	7	1.21	1.25	10.59	08 AWG	THWN-2
4	3/4" EMT	3	06 AWG	THWN-2	75°C	65	0.96	1	62.40	7	1.21	1.25	10.59	08 AWG	THWN-2

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COMMONWEALTH OF MASSACHUSETTS
MINA A MAKAR
ELECTRICAL
No. 58030
PROFESSIONAL ENGINEER

6/3/2024

ELECTRICIAN

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JEFFREY MARINELLO
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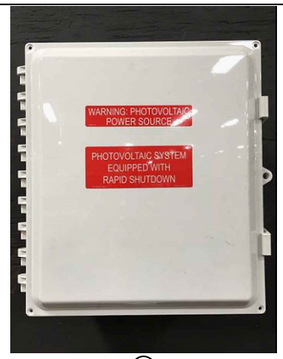
ELECTRICAL

PV-3

TAG	LABEL	QUANTITY	LOCATION	NOTE
Ⓐ	CAUTION AC SOLAR VOLTAGE	12	AC CONDUITS	1 AT EVERY SEPARATION BY ENCLOSURES / WALLS / PARTITIONS / CEILINGS / FLOORS OR NO MORE THAN 10'
Ⓑ	WARNING: PHOTOVOLTAIC POWER SOURCE PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN	1	COMBINER BOX	1 AT ANY COMBINER BOX
Ⓒ	WARNING ELECTRICAL SHOCK HAZARD TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION	1	JUNCTION BOX	1 AT ANY JUNCTION BOX
Ⓓ	PHOTOVOLTAIC SYSTEM AC DISCONNECT RATED AC OUTPUT CURRENT 8.47 A NOMINAL OPERATING AC VOLTAGE 240 V PHOTOVOLTAIC AC DISCONNECT WARNING ELECTRICAL SHOCK HAZARD TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM	1	AC DISCONNECT	1 OF EACH AT FUSED AC DISCONNECT COMPLETE VOLTAGE AND CURRENT VALUES ON DISCONNECT LABEL
Ⓔ	PV METER	1	PV METER SOCKET	1 AT PV METER SOCKET AND ONE DIRECTORY PLACARD
Ⓕ	WARNING DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM REVENUE METER	1	UTILITY METER	1 AT UTILITY METER AND ONE DIRECTORY PLACARD
Ⓖ	SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY WARNING DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM WARNING ELECTRICAL SHOCK HAZARD TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION	1	INTERCONNECTION POINT	1 OF EACH AT BUILDING INTERCONNECTION POINT AND ONE DIRECTORY PLACARD
	WARNING POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE	1	BACKFEED PANEL	

EXAMPLES

Ⓐ



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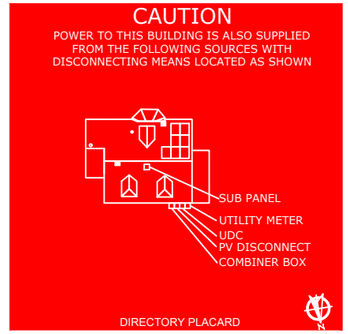
Ⓖ BACKFEED



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EQUIPMENT LABELS

PV-4