PHOTOVOLTAIC ROOF MOUNT SYSTEM

22 MODULES-ROOF MOUNTED - 8.910 kW DC, 6.380 kW AC, 256 HOPE ST, BRISTOL, RI 02809

PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	8.910 KW DC 6.380 KW AC
MODULE TYPE & AMOUNT:	(22) REC405AA PURE BLACK 405W
MODULE DIMENSIONS:	(L/W/H) 71.7"/40"/1.2"
INVERTER:	(22) ENPHASE IQ8PLUS-72-2-US [240V]
INTERCONNECTION METHOD:	LOAD SIDE TAP

GOVERNING CODES

ADOPTED CONSTRUCTION CODES

- 2018 INTERNATIONAL BUILDING CODE, IBC
- 2018 INTERNATIONAL RESIDENTIAL CODE, IRC
- 2020 NATIONAL ELECTRIC CODE

GENERAL NOTES:

a. INSTALLATION OF SOLAR PHOTOVOLTAIC SYSTEM SHALL BE IN ACCORDANCE WITH NEC ARTICLE 690, AND ALL OTHER APPLICABLE NEC CODES WHERE NOTED OR EXISTING.

b. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL COMPLY WITH NEC ARTICLE 110.

c. ALL CONDUCTORS, INCLUDING THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE IN ACCORDANCE WITH NEC ARTICLE 250.

d. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE; THIS SYSTEM IS UTILITY INTERACTIVE PER UL 1741 AND DOES NOT INCLUDE STORAGE BATTERIES OR OTHER ALTERNATIVE STORAGE SOURCES.

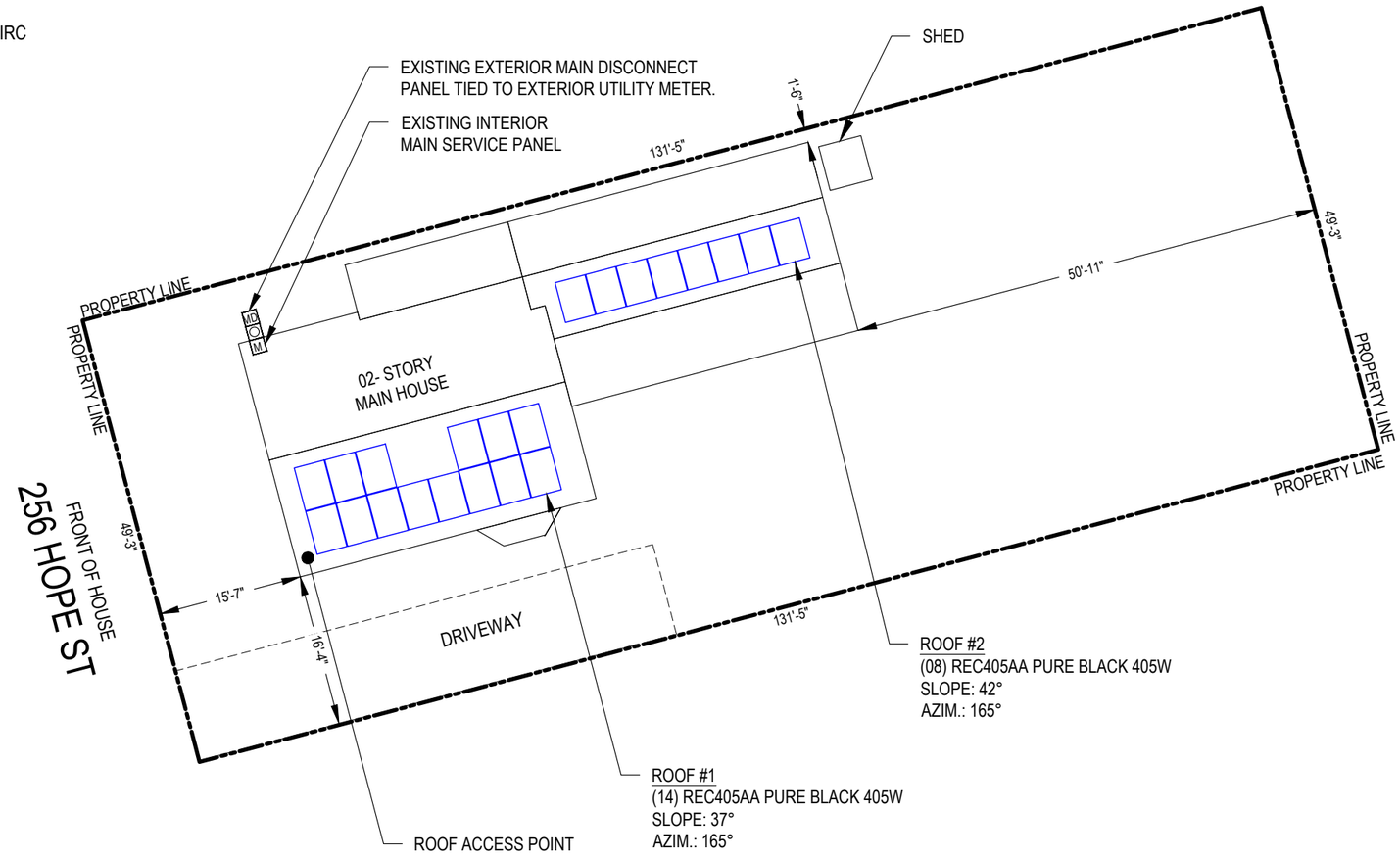
e. ALL DC WIRES SHALL BE SIZED ACCORDING TO [NEC 690.8]

f. DC CONDUCTORS SHALL BE WITHIN PROTECTED RACEWAYS IN ACCORDANCE WITH [NEC 690.31]

g. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL JURISDICTIONAL BUILDING CODE.

h. PV MODULES TO BE RATED UL 1703 CLASS C FIRE RATING OR BETTER.

i. ALL EQUIPMENT TO BE CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY.

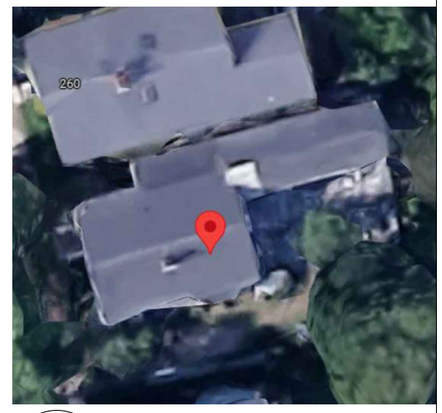


1 PLOT PLAN
PV 0.0
SCALE: 1/16" = 1'

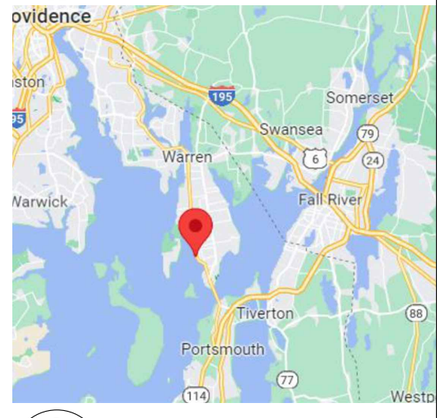
SHEET INDEX:

ROOF ACCESS POINT

ROOF ACCESS POINT SHALL NOT BE LOCATED IN AREAS THAT 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.



2 SATELLITE VIEW
PV 0.0
SCALE: NTS



3 VICINITY MAP
PV 0.0
SCALE: NTS

NEC SOLAR
121 BROADCOMMON RD.
BRISTOL, RI 02809,
PH#:(401) 644-5692
RI AC4585
MA A20803

REVISIONS

Description	Date	Rev
Revision	11/8/2023	01

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Project Name & Address

PHILIP ELMER RESIDENCE
256 HOPE ST,
BRISTOL, RI 02809
APN NO.: BRISM15L17

Sheet Name
COVER SHEET

Sheet Size
ANSI B
11" X 17"

Sheet Number
PV 0.0

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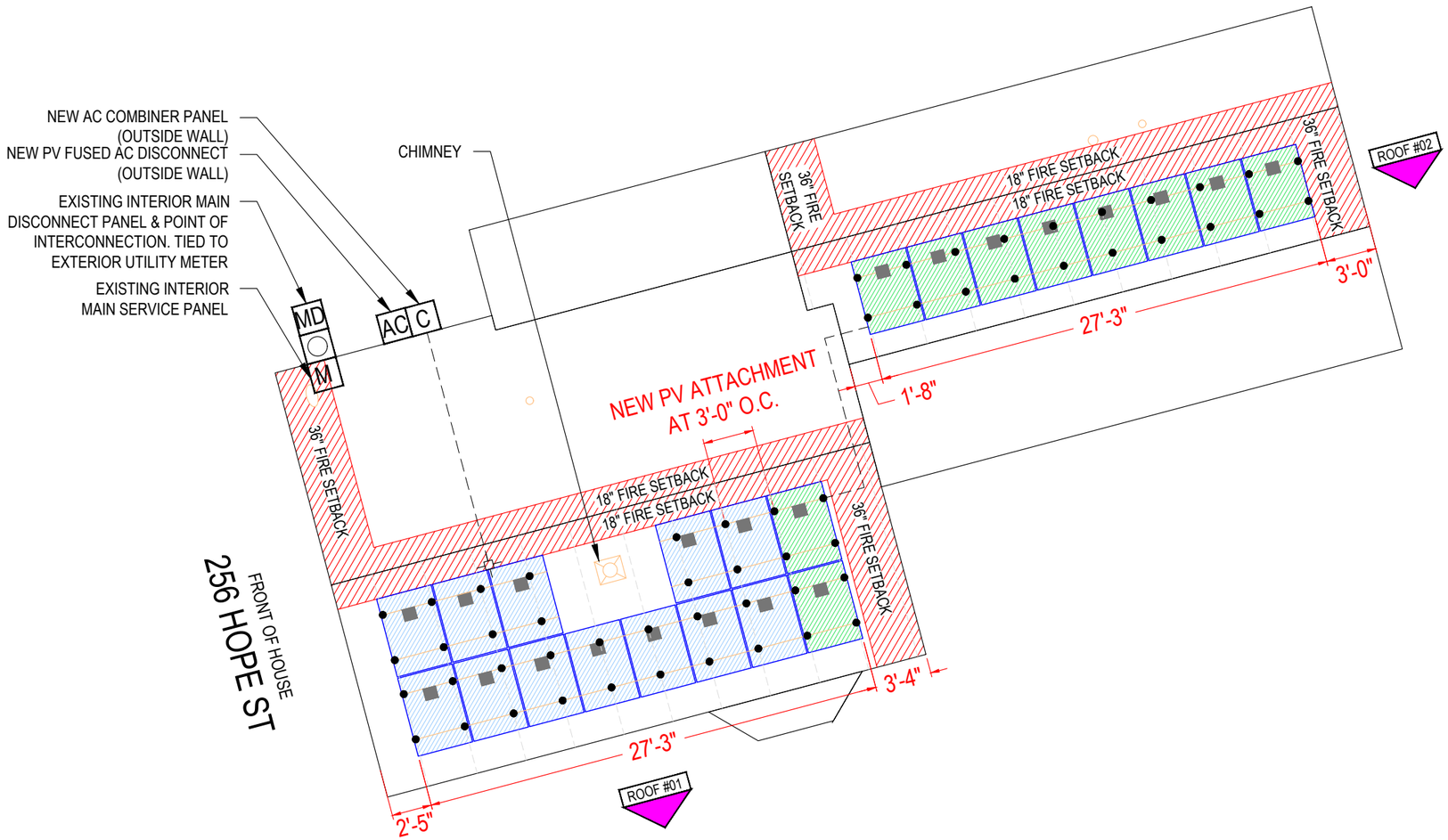
PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	8.91 kW DC 6.38 kW AC
MODULE TYPE & AMOUNT:	(22) REC405AA PURE BLACK 405W
MODULE DIMENSIONS:	(L/W/H) 71.7"/40"/1.2"
INVERTER:	(22) ENPHASE IQ8PLUS-72-2-US [240V]

VISIBLE, LOCKABLE, LABELED DISCONNECT WITHIN 10' OF UTILITY METER

BILL OF MATERIALS		
NUMBER OF MODULES	22	REC405AA PURE BLACK 405W
NUMBER OF MICROINVERTER	22	ENPHASE IQ8PLUS-72-2-US [240V]
COMBINER PANEL	1	125A ENPHASE IQ COMBINER 4/4C X-IQ-AM1-240-4/4C, 240V
AC DISCONNECT	1	60A FUSIBLE AC DISCONNECT, 40A FUSES, 240V
NUMBER OF ATTACHMENTS	56	SNAPNRACK COMPOSITION L-FOOT KIT
RAILS	11	SNAPNRACK ULTRA RAIL 40 RACKING -168" SECTION
RAIL SPLICE	4	SPLICE KIT
MID CLAMPS	36	MID CLAMPS / UFO
END CLAMPS	16	END CLAMPS / STOPPER SLEEVE
GROUNDING LUG	4	GROUNDING LUG



SYSTEM LEGEND

- MD — EXISTING INTERIOR MAIN DISCONNECT PANEL & POINT OF INTERCONNECTION. TIED TO EXTERIOR UTILITY METER
- M — EXISTING INTERIOR MAIN SERVICE PANEL
- AC — NEW VISIBLE, LOCKABLE, LABELED DISCONNECT LOCATED WITHIN 10' FROM THE UTILITY METER
- C — NEW DEDICATED PV SYSTEM COMBINER PANEL.
- 22 NEW REC405AA PURE BLACK 405W MODULES WITH NEW 22 - ENPHASE IQ8PLUS-72-2-US [240V] INVERTERS, MOUNTED ON THE BACK OF EACH MODULES.
- = FIRE PATHWAY
- = ROOF OBSTRUCTIONS
- = ATTACHMENT POINTS
- = RAFTER
- = RACKING SYSTEM
- = ATTIC RUN
- = CONDUIT ROOF TOP JUNCTION BOX

ROOF SECTIONS

ROOF #01
MODULE - 14
SLOPE - 37°
AZIMUTH - 165°
MATERIAL - COMP. SHINGLE
RAFTER SIZE & SPACING -3-1/2"X4" @ 36" O.C.

ROOF #02
MODULE - 08
SLOPE - 42°
AZIMUTH - 165°
MATERIAL - COMP. SHINGLE
RAFTER SIZE & SPACING -3-1/2"X4" @ 36" O.C.

CIRCUIT(S)

- CIRCUIT #1 - 11 MODULES
- CIRCUIT #2 - 11 MODULES

MODULE, ARRAY WEIGHT (LOAD CALC'S)

Number of Modules	22	
Module Weight	45	LBS
Total Module (Array) Weight	990.00	LBS
Number of Attachment point	56	
Mounting System Weight *(Per Module)*	1.5	LBS
Mounting System Weight	84.00	LBS
Total System Weight *(Module Weight + Mounting System Weight)*	1074.00	LBS
Weight at Each Attachment Point *(Array Weight / Number of Attachment Point)*	17.68	LBS
Module Area (71.7"x40")	19.92	SqFt
Total Array Area	438.17	SqFt
Distributed Load *(Total System Weight / Total Array Area)*	2.33	Per SqFt
Total Roof Area	1684	SqFt
Total Percentage or Roof Covered *Total Array Area / Total Roof Area)*100*	26.02%	

N

1 SITE PLAN
PV 1.0
SCALE: 1/8" = 1'-0"

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Sheet Name
SITE PLAN

Sheet Size
ANSI B
11" X 17"

Sheet Number
PV 1.0

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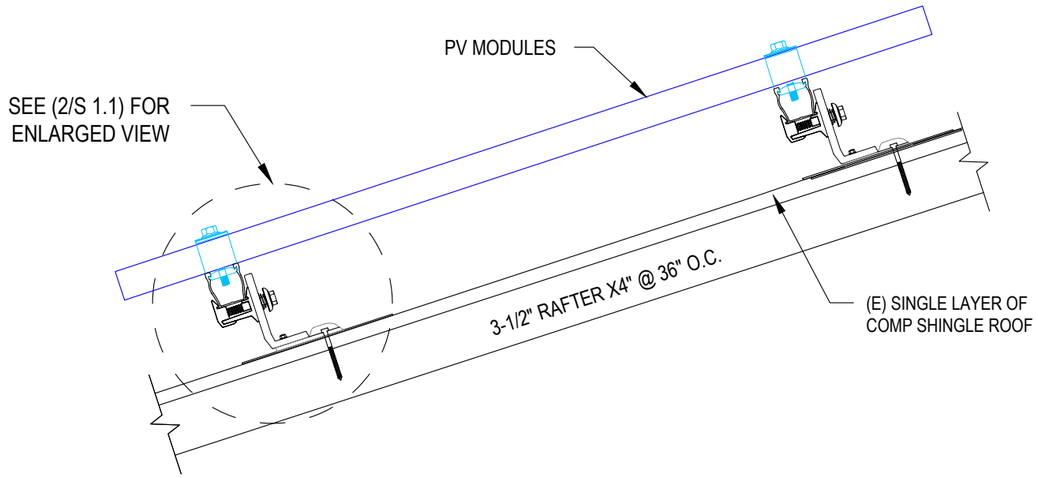
GENERAL STRUCTURAL NOTES:

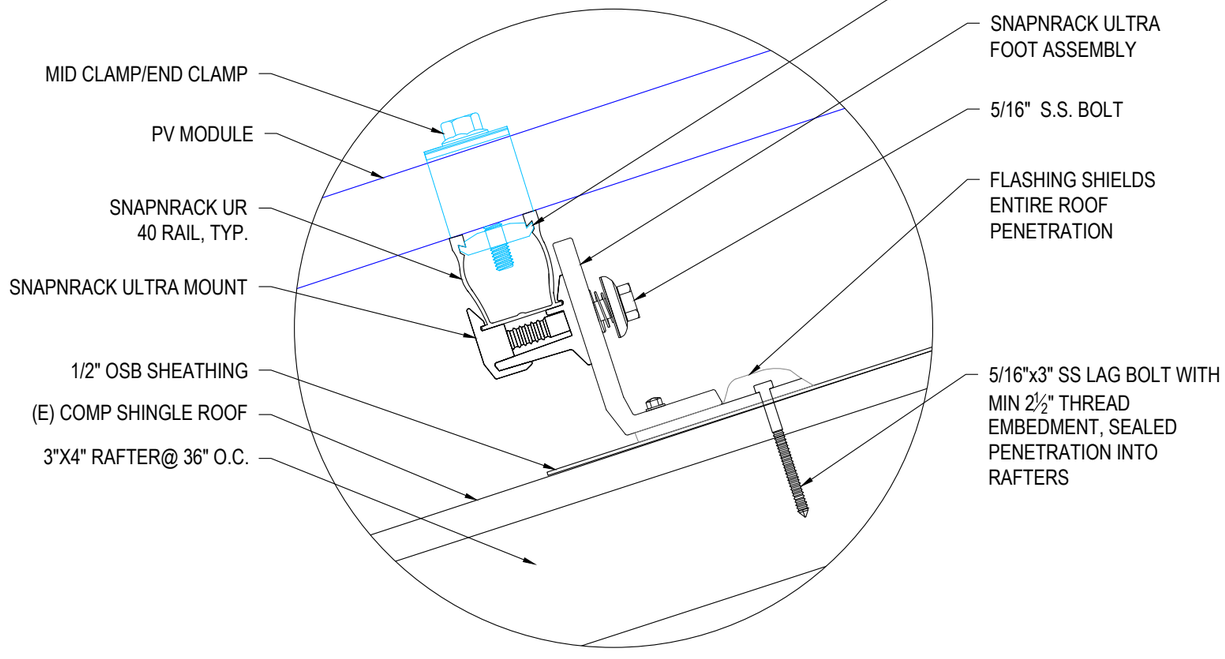
1. THE SOLAR PANELS ARE TO BE MOUNTED TO THE ROOF FRAMING USING THE SNAPNRACK RACKING SYSTEM WITH SNAPNRACK ULTRAFOOT ASSEMBLY. THE MOUNTING FEET ARE TO BE SPACED AS SHOWN IN THE DETAILS, AND MUST BE STAGGERED TO ADJACENT FRAMING MEMBERS TO SPREAD OUT THE ADDITIONAL LOAD.
2. UNLESS NOTED OTHERWISE, MOUNTING ANCHORS SHALL BE 5/16" LAG SCREWS WITH A MINIMUM OF 2-1/2" PENETRATION INTO ROOF FRAMING.
3. THE PROPOSED PV SYSTEM ADDS 2.6 PSF TO THE ROOF FRAMING SYSTEM.
4. ROOF LIVE LOAD = 20 PSF TYPICAL, 0 PSF UNDER NEW PV SYSTEM.
5. GROUND SNOW LOAD = 30 PSF
6. WIND SPEED = 137 MPH
7. EXPOSURE CATEGORY = B
8. RISK CATEGORY = II



1 ATTACHMENT DETAIL (SIDE VIEW)

S 1.1

SCALE: NTS

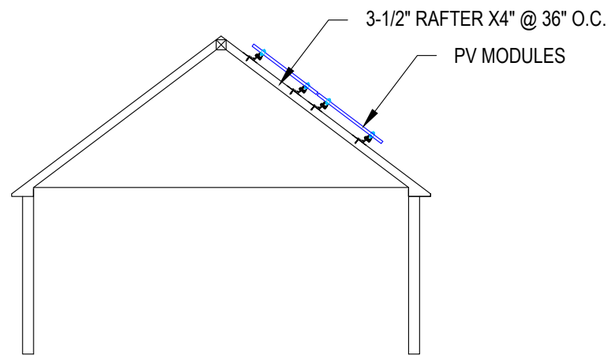


2 ATTACHMENT DETAIL (ENLARGED VIEW)

S 1.1

SCALE: NTS

ROOF #1

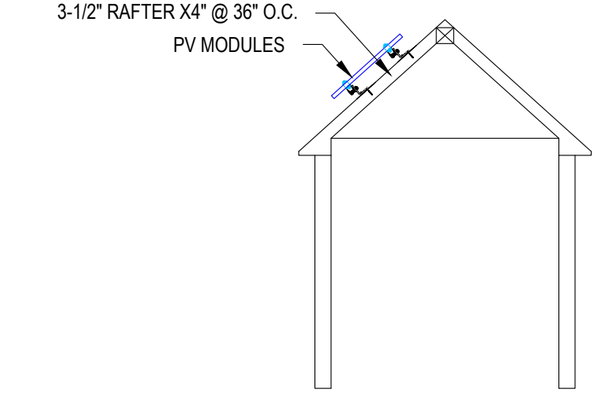


1 ROOF SECTION #1

S 1.1

SCALE: NTS

ROOF #2



2 ROOF SECTION #2

S 1.1

SCALE: NTS

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MOUNT DETAILS & ROOF SECTION

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Rooftop conductor ampacities designed in compliance with art. 690.8, Tables 310.15(B)(2)(a), 310.15(B)(3)(a), 310.15(B)(3)(c), 310.15(B)(16), Chapter 9 Table 4, 5, & 9. Location specific temperature obtained from ASHRAE 2017 data tables

RECORD LOW TEMP	-17°
AMBIENT TEMP (HIGH TEMP 2%)	32°C
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	54°C
CONDUCTOR TEMPERATURE RATE	90°C

VISIBLE, LOCKABLE, LABELED DISCONNECT WITHIN 10' OF UTILITY METER

ENPHASE Q CABLE TO BE ATTACHED TO RAIL MIN. 3-1/2" ABOVE ROOF SURFACE

PV MODULE RATING @ STC	
MANUFACTURER	REC405AA PURE BLACK 405W
MAX. POWER-POINT CURRENT (IMP)	9.56 AMPS
MAX. POWER-POINT VOLTAGE (VMP)	42.4 VOLTS
OPEN-CIRCUIT VOLTAGE (VOC)	48.9 VOLTS
SHORT-CIRCUIT CURRENT (ISC)	10.14 AMPS
NOM. MAX. POWER AT STC (PMAX)	405 WATT
MAX. SYSTEM VOLTAGE	1000V
VOC TEMPERATURE COEFFICIENT	-0.24 %/°C

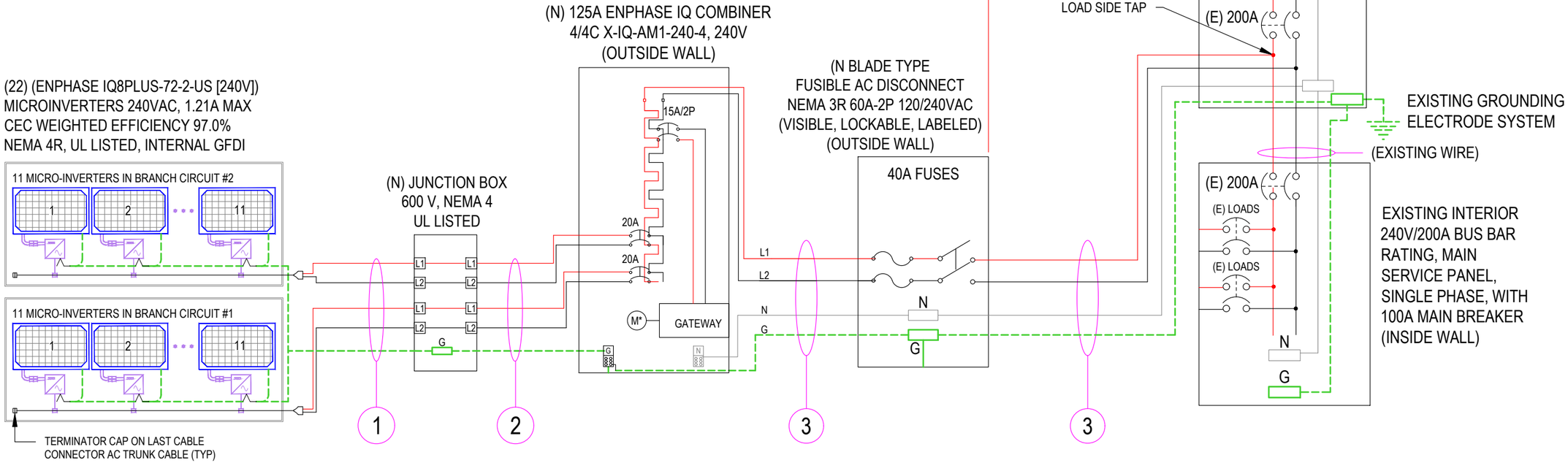
INVERTER SPECIFICATIONS	
MANUFACTURER	ENPHASE IQ8PLUS-72-2-US [240V]
MAX. DC VOLT RATING	60 VOLTS
MAX. POWER AT 40 C	290 WATTS
NOMINAL AC VOLTAGE	240 VOLTS
MAX. AC CURRENT	1.21 AMPS
MAX. OCPD RATING	20 AMPS
MAX. PANELS/CIRCUIT	13
SHORT CIRCUIT CURRENT	15 AMPS

MODULE: (22) REC405AA PURE BLACK 405W
INVERTER: (22) ENPHASE IQ8PLUS-72-2-US [240V]

THIS PANEL IS FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)	
AC OUTPUT CURRENT	26.62A
NOMINAL AC VOLTAGE	240V

POINT OF INTERCONNECTION, LOAD SIDE TAP
EXISTING EXTERIOR 240V/200A RATING,
METER MAIN COMBO PANEL, SINGLE
PHASE, WITH A 200A MAIN BREAKER
UTILITY COMPANY - 05660098
UTILITY SERVICE: 100A OVERHEAD

(22) (ENPHASE IQ8PLUS-72-2-US [240V])
MICROINVERTERS 240VAC, 1.21A MAX
CEC WEIGHTED EFFICIENCY 97.0%
NEMA 4R, UL LISTED, INTERNAL GFDI



WIRE TAG #	WIRE FROM - -	CONDUIT	WIRE QTY	WIRE GAUGE:	WIRE RATING	TEMP RATING:	WIRE AMP	TEMP DE-RATE:	CONDUIT FILL:	WIRE OCP:	INVERTER QTY:	NOC:	NEC:	STRING AMPS	GRND SIZE	GRND WIRE TYPE
1	ARRAY TO JUNCTION BOX	TRUNK CABLE	4	#12	THWN-2	90°	30A x	0.96 x	N/A	= 28.80A	11	x 1.21A x	1.25 =	16.64A	#8	SBC
2	JUNCTION BOX TO COMBINER PANEL	1" PVC SCH 80	4	#10	THHN	90°	40A x	0.76 x	0.80	= 24.32A	11	x 1.21A x	1.25 =	16.64A	#8	THHN
3	COMBINER PANEL TO ACD	1" PVC SCH 80	3	#8	THHN	75°	50A x	0.94 x	1.00	= 47.00A	22	x 1.21A x	1.25 =	33.28A	#8	THHN
4	ACD TO MSP	1" PVC SCH 80	3	#6	THHN	75°	65A x	0.94 x	1.00	= 61.10A	22	x 1.21A x	1.25 =	33.28A	#8	THHN

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PHILIP ELMER RESIDENCE
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APN NO.: BRISM15L17

Sheet Name
3-LINE DIAGRAM

Sheet Size
ANSI B
11" X 17"

Sheet Number
E 1.1

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SITE NOTES:

1. A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
2. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
3. THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
4. PROPERACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PERSECTION NEC 110.26.
5. ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.

EQUIPMENT LOCATIONS:

1. ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.
2. WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).
3. JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
4. ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT. 2.2.6 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
5. ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

STRUCTURAL NOTES:

1. RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUSTALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S INSTRUCTIONS.
2. JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
3. ROOFTOP PENETRATIONS FOR PV RACEWAY WILLBE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
4. ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER. 2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

WIRING & CONDUIT NOTES:

1. ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS AREBASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
2. CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
3. VOLTAGE DROP LIMITED TO 1.5%.
4. DC WIRING LIMITED TO MODULE FOOTPRINT. MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.
5. AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3- BLUE, YELLOW, ORANGE**, OR OTHER CONVENTION NEUTRAL- WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].

GROUNDING NOTES:

1. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVISES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
2. PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.
3. METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).
4. EQUIPMENT GROUNDING CONDUCTORS SHALLBE SIZED ACCORDING TO NEC 690.45 AND MICROINVERTER MANUFACTORERS' INSTRUCTIONS.
5. EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURERDOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.
6. THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OFA MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
7. GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]
8. THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.
9. GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:

1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHENTHE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARECONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
2. DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D).
4. ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.
5. MICROINVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).
6. IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.

INTERCONNECTION NOTES:

1. LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)]
2. THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(D)(2)(3)].
3. THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].
4. AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C).
5. FEEDER TAP INTERCONECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1)
6. SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42 2.7.8BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].

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NOTES

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E 1.2

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⚠WARNING

ELECTRICAL SHOCK HAZARD

TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION:
WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A WARNING SIGN SHALL BE MOUNTED ON OR ADJACENT TO THE DISCONNECTING MEANS.
PER CODE(S): NEC 2020:
NEC 706.15(C)(4) and NEC 690.13(B)

⚠WARNING

THIS EQUIPMENT FED BY MULTIPLE SOURCES, TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

LABEL LOCATION:
PERMANENT WARNING LABELS SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT, AC DISCONNECT
NEC: 2020, PER CODE: 705.12(B)(3)(3)

M

⚠WARNING
POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE.

LABEL LOCATION:
MAIN SERVICE DISCONNECT
NEC: 2020, 705.12(B)(3)(2)

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

LABEL LOCATION: MAIN SERVICE DISCONNECT, NEC 2020, 690.13(B)

A
C

PHOTOVOLTAIC
AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT, NEC: 2020, (NEC 690.13(B)

⚠WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
PRODUCTION / NET METER (BI-DIRECTIONAL)
NEC: 2020
NEC 690.59, 705.12(D)(3)

PHOTOVOLTAIC SYSTEM AC DISCONNECT
RATED AC OPERATING CURRENT 26.62 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
NEC: 2020
(PER CODE: NEC 690.54)

⚠WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

POINT OF INTERCONNECTION
NEC 705.12(D)(3) & NEC 690.64

COMBINER BOX

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY

SOLAR ELECTRIC PV PANELS

AT INVERTER [IFC 605.11.3.1(1) & 690.56(C)]
PER CODE: NEC 2020

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

LABEL LOCATION:
UTILITY SERVICE ENTRANCE/METER, INVERTER/DC DISCONNECT IF REQUIRED BY LOCAL AHJ, OR OTHER LOCATIONS AS REQUIRED BY LOCAL AHJ.
PER CODE(S): NEC 2020: ARTICLE 690.56(C)

PHOTOVOLTAIC
DC DISCONNECT

LABEL LOCATION:
DC DISCONNECT
(NEC 690.13(B)

PV ARRAY

J/B

SOLAR PHOTOVOLTAIC SYSTEMS

(PER CODE: NEC 690)

SOLAR PHOTOVOLTAIC SYSTEMS

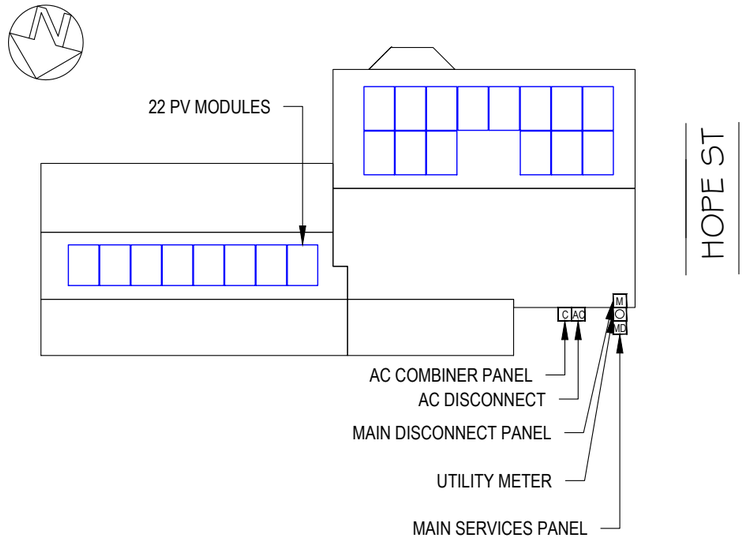
(PER CODE: NEC 690)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION :
EXPOSED RACEWAY, CABLE TRAYS, JUNCTION BOX
NEC: 2020, PER CODE: NEC 690.31(D)(2)

CAUTION:

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECT(S) LOCATED AS SHOWN.
DANGEROUS VOLTAGE MAY BE PRESENT AT ALL TIMES



NEC SOLAR
121 BROADCOMMON RD.
BRISTOL, RI 02809,
PH#:(401) 644-5692
RI AC4585
MA A20803

REVISIONS

Description	Date	Rev
Revision	11/8/2023	01

Signature with Seal

Project Name & Address

PHILIP ELMER RESIDENCE
256 HOPE ST,
BRISTOL, RI 02809
APN NO.: BRISM15L17

Sheet Name
WARNING LABELS

Sheet Size
ANSI B
11" X 17"

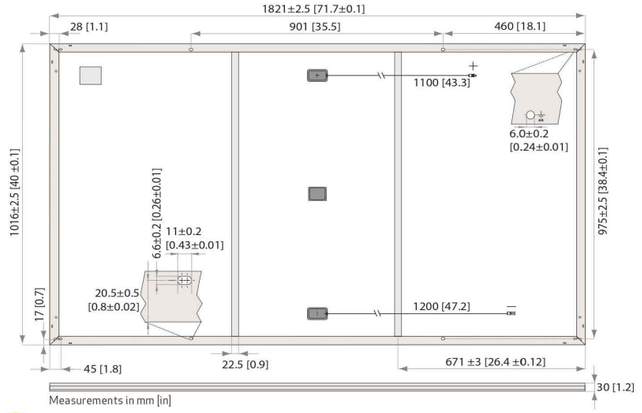
Sheet Number
E 1.3

Drawn By
PremiumCAD

SOLAR'S MOST TRUSTED

REC ALPHA PURE BLACK SERIES > PRODUCT SPECIFICATIONS

PRODUCT SPECIFICATIONS



Measurements in mm [in]

GENERAL DATA

Cell type:	132 half-cut REC heterojunction cells with lead-free, gapless technology 6 strings of 22 cells in series	Connectors:	Stäubli MC4PV-KBT4/KST4, 12 AWG (4mm²) in accordance with IEC 62852 IP68 only when connected
Glass:	0.13 in (3.2 mm) solar glass with anti-reflection surface treatment	Cable:	12 AWG (4mm²) PV wire, 43+47 in (1.1+1.2m) accordance with EN 50618
Backsheet:	Highly resistant polymer (black)	Dimensions:	71.7 x 40 x 1.2 in (1821 x 1016 x 30 mm)
Frame:	Anodized aluminum (black)	Weight:	45 lbs (20.5 kg)
Junction box:	3-part, 3 bypass diodes, IP67 rated in accordance with IEC 62790	Origin:	Made in Singapore

ELECTRICAL DATA

Product Code*: RECxxxAA Pure Black

STC					
Power Output - P_{MAX} (Wp)	385	390	395	400	405
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V_{MPP} (V)	41.2	41.5	41.8	42.1	42.4
Nominal Power Current - I_{MPP} (A)	9.35	9.40	9.45	9.51	9.56
Open Circuit Voltage - V_{OC} (V)	48.5	48.6	48.7	48.8	48.9
Short Circuit Current - I_{SC} (A)	9.99	10.03	10.07	10.10	10.14
Power Density (W/sq ft)	19.3	19.6	19.8	20.1	20.3
Panel Efficiency (%)	20.8	21.1	21.3	21.6	21.9
NMOT					
Power Output - P_{MAX} (Wp)	293	297	301	305	309
Nominal Power Voltage - V_{MPP} (V)	38.8	39.1	39.4	39.7	40.0
Nominal Power Current - I_{MPP} (A)	7.55	7.59	7.63	7.68	7.72
Open Circuit Voltage - V_{OC} (V)	45.7	45.8	45.9	46.0	46.1
Short Circuit Current - I_{SC} (A)	8.07	8.10	8.13	8.16	8.19

Values at standard test conditions (STC: air mass AM 1.5, irradiance 10.75 W/sq ft (1000 W/m²), temperature 77°F (25°C), based on a production spread with a tolerance of P_{MAX}, V_{OC} & I_{SC}: ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s). * Where xxx indicates the nominal power class (P_{MAX}) at STC above.

CERTIFICATIONS

IEC 61215:2016, IEC 61730:2016, UL 61730 (Pending)

ISO 14001:2004, ISO 9001:2015, OHSAS 18001:2007, IEC 62941

WARRANTY

	Standard	REC ProTrust	
Installed by an REC Certified Solar Professional	No	Yes	Yes
System Size	All	≤25 kW	25-500 kW
Product Warranty (yrs)	20	25	25
Power Warranty (yrs)	25	25	25
Labor Warranty (yrs)	0	25	10
Power in Year 1	98%	98%	98%
Annual Degradation	0.25%	0.25%	0.25%
Power in Year 25	92%	92%	92%

See warranty documents for details. Conditions apply

MAXIMUM RATINGS

Operational temperature:	-40 ... +185°F (-40 ... +85°C)
Maximum system voltage:	1000 V
Maximum test load (front):	+7000 Pa (146 lbs/sq ft)*
Maximum test load (rear):	-4000 Pa (83.5 lbs/sq ft)*
Max series fuse rating:	25 A
Max reverse current:	25 A

* See installation manual for mounting instructions. Design load = Test load / 1.5 (safety factor)

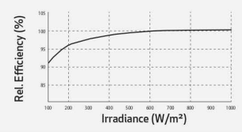
TEMPERATURE RATINGS*

Nominal Module Operating Temperature:	44°C (±2°C)
Temperature coefficient of P_{MAX}:	-0.26 %/°C
Temperature coefficient of V_{OC}:	-0.24 %/°C
Temperature coefficient of I_{SC}:	0.04 %/°C

*The temperature coefficients stated are linear values

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



Specifications subject to change without notice.

Ref: PM-DS-12-01-Rev-A 03.21

Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.

www.recgroup.com

ENPHASE

DATA SHEET

IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has superfast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.

Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the IQ Battery, IQ Gateway, and the Enphase App monitoring and analysis software.

Enphase 25 year limited warranty

IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.

Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.

CERTIFIED SAFETY

IQ8 Series Microinverters are UL listed as PV Rapid Shutdown Equipment and conform with various regulations, when installed according to manufacturer's instructions.

*Only when installed with IQ System Controller 2, meets UL 1741.
**IQ8 and IQ8Plus support split-phase, 240V installations only.

Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produce power even when the grid is down*
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid support**
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547:2018 (UL 1741-SB)

Note:

IQ8 Microinverters cannot be mixed together with previous generations of Enphase microinverters (IQ7 Series, IQ6 Series, etc) in the same system.

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings[1]	W	235 – 350	235 – 440
Module compatibility		60-cell / 120 half-cell	54-cell / 108 half-cell, 60-cell / 120 half-cell, 66-cell / 132 half-cell and 72-cell / 144 half-cell
MPPT voltage range	V	27 – 37	27 – 45
Operating range	V	16 – 48	16 – 58
Min. / Max. start voltage	V	22 / 48	22 / 58
Max. input DC voltage	V	50	60
Max. continuous input DC current	A	10	12
Max. input DC short-circuit current	A	25	
Max. module I_{sc}	A	20	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
PV array configuration		1 x 1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Peak output power	VA	245	300
Max. continuous output power	VA	240	290
Nominal (L-L) voltage / range[2]	V	240 / 211 – 264	
Max. continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	47 – 68	
AC short circuit fault current over 3 cycles	Arms	2	
Max. units per 20 A (L-L) branch circuit[3]		16	13
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.7	
CEC weighted efficiency	%	97	
Night-time power consumption	mW	60	

MECHANICAL DATA	
Ambient temperature range	-40°C to +60°C (-40°F to +140°F)
Relative humidity range	4% to 100% (condensing)
DC Connector type	MC4
Dimensions (H x W x D)	212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection – no fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environ. category / UV exposure rating	NEMA Type 6 / outdoor

COMPLIANCE	
Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, IEEE 1547:2018 (UL 1741-SB), FCC Part 15 Class B, ICES-0003 Class B, CAN / CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shutdown Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.

(1) Pairing PV modules with wattage above the limit may result in additional clipping losses. See the compatibility calculator at https://link.enphase.com/module-compatibility. (2) Nominal voltage range can be extended beyond nominal if required by the utility. (3) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-12A-DS-0067-02-EN-US-2022-12-02

Data Sheet
Enphase Networking

Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4
X-IQ-AM1-240-4C

X-IQ-AM1-240-4C

X-IQ-AM1-240-4

The **Enphase IQ Combiner 4/4C** with Enphase IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure and streamlines IQ microinverters and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.

Smart

- Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ Combiner 4C
- Includes solar shield to match Enphase IQ Battery aesthetics and deflect heat
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

Simple

- Centered mounting brackets support single stud mounting
- Supports bottom, back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed

LISTED

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
ACCESSORIES AND REPLACEMENT PARTS	(not included, order separately)
Ensemble Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
COMPLIANCE	
Compliance, IQ Combiner	UL 1741, CAN/CSA C22.2 No. 107.1, 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

CERTIFICATE OF COMPLIANCE

Certificate Number	20211109-E341165
Report Reference	E341165-20210317
Issue Date	2021-11-09

Issued to: Enphase Energy Inc.
1420 N. McDowell Blvd. Petaluma, CA 94954-6515

This is to certify that representative samples of Grid Support, Utility Interactive Supporting Energy Storage, Multimode, Bi-directional Microinverters

Models IQ8-60, IQ8PLUS-72, IQ8M-72, IQ8A-72, IQ8H-208-72, IQ8H-240-72, may be f/b -2, -5, -E, or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters.

Has been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: See Page 2

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

This *Certificate of Compliance* is provided as a courtesy to help our customers communicate product compliance information, as documented in our UL Follow-Up Services procedure. This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark shall be considered as being UL Certified and covered under UL's Follow-Up Services. Look for the UL Certification Mark on the product.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	20211109-E341165
Report Reference	E341165-20210317
Issue Date	2021-11-09

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Standards for Safety:

UL 62109-1, STANDARD FOR SAFETY OF POWER CONVERTERS FOR USE IN PHOTOVOLTAIC POWER SYSTEMS - PART 1: GENERAL REQUIREMENTS, Edition 1, Revision Date 04/30/2019

IEC 62109-2, SAFETY OF POWER CONVERTERS FOR USE IN PHOTOVOLTAIC POWER SYSTEMS - PART 2: PARTICULAR REQUIREMENTS FOR INVERTERS, Edition 1, Issue Date 06/2011

UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Edition 2, Revision Date 06/10/2021, including the requirements in UL 1741 Supplement SA, sections as noted in the Technical considerations.

IEEE 1547, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.

IEEE 1547.1, IEEE Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.

CSA C22.2 No. 62109-1, Safety of Power Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements, Edition 1, Issue Date 07/2016

CSA C22.2 No. 62109-2, Safety of Power Converters for Use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters, Edition 1, Issue Date 07/2016

Bruce Mahrenholz, Director North American Certification Program

UL LLC

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SNAPNRACK UR-40 RACKING SYSTEM SHOWN MOUNTED ON ULTRA FOOT WITH UNIVERSAL END CLAMPS. FOR TILE ROOFING USE SNAPNRACK TILE REPLACEMENT, UNIVERSAL TILE HOOK, OR FLAT TILE HOOK SYSTEMS.

STANDARD LAG SCREW SPEC ASSUMES $\frac{5}{16}$"Ø

LAG SCREW WITH 2½" MIN. EMBEDMENT INTO STRUCTURAL MEMBER.

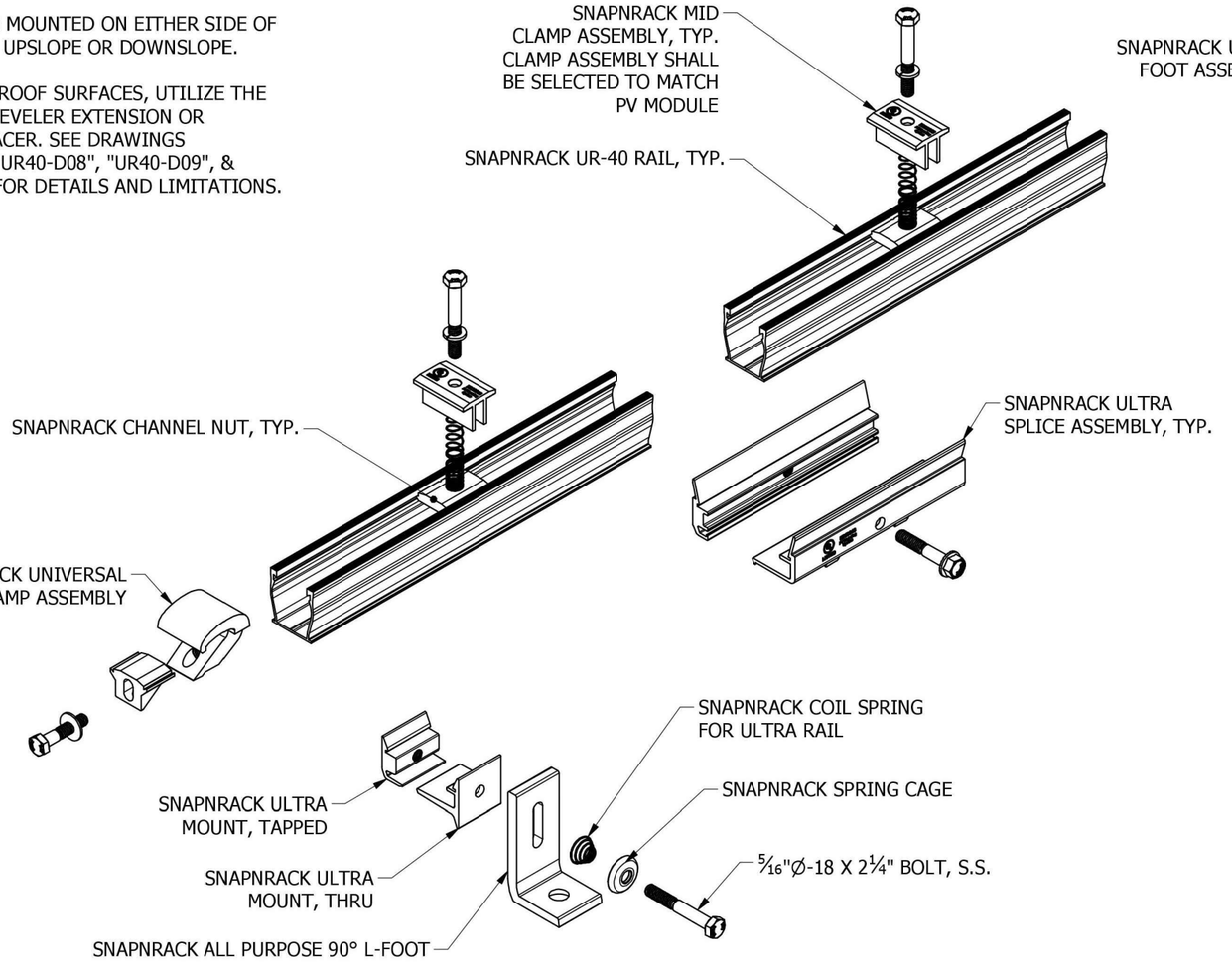
TORQUE ALL FASTENERS TO 10-16 FT-LBS

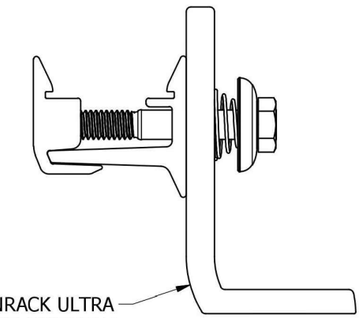
RAILS CAN BE MOUNTED ON EITHER SIDE OF ULTRA FOOT: UPSLOPE OR DOWNSLOPE.

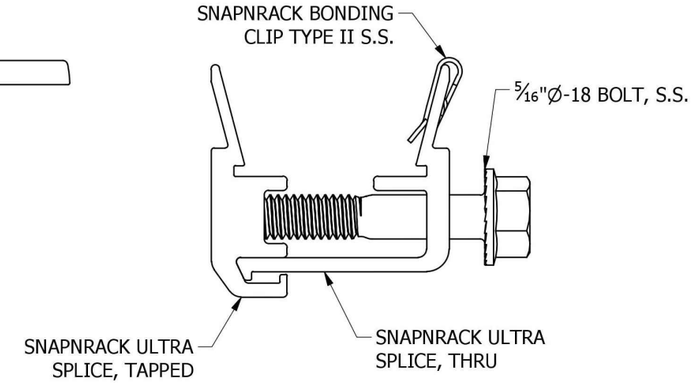
FOR UNEVEN ROOF SURFACES, UTILIZE THE SNAPNRACK LEVELER EXTENSION OR LEVELING SPACER. SEE DRAWINGS "UR40-D01", "UR40-D08", "UR40-D09", & "UR40-D10", FOR DETAILS AND LIMITATIONS.

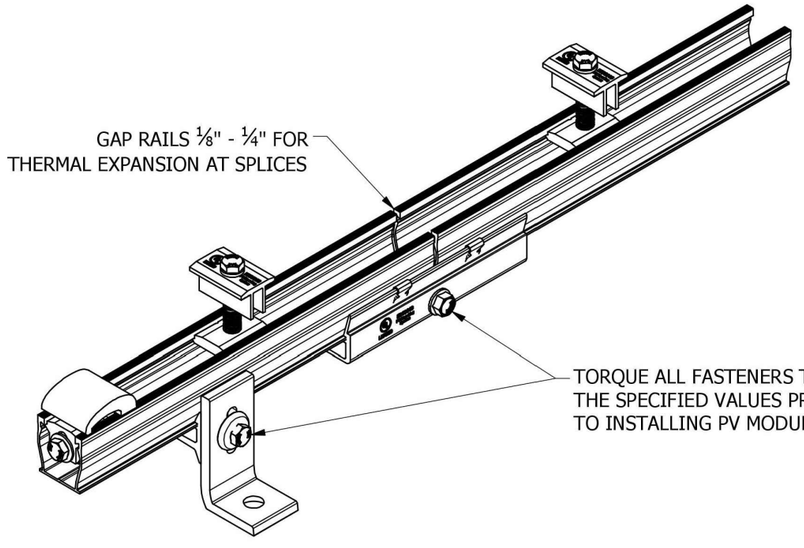
REVISION:

A	11/30/2017	NEW DETAIL	MA









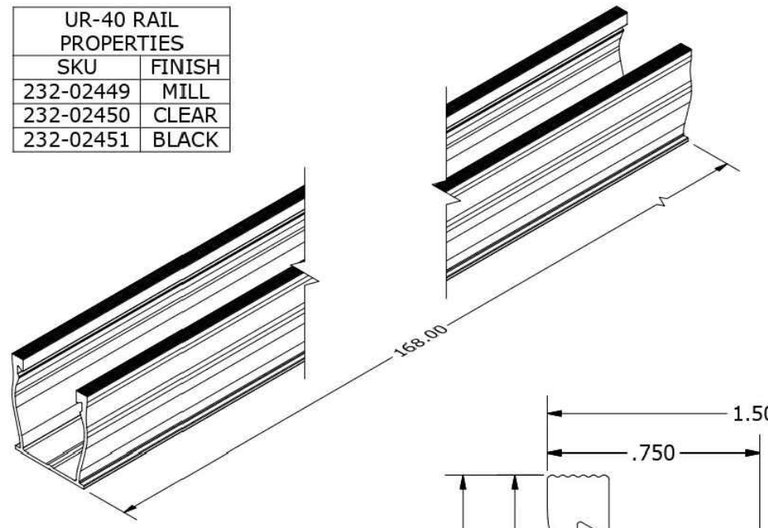
SnapNrack™ Solar Mounting Solutions

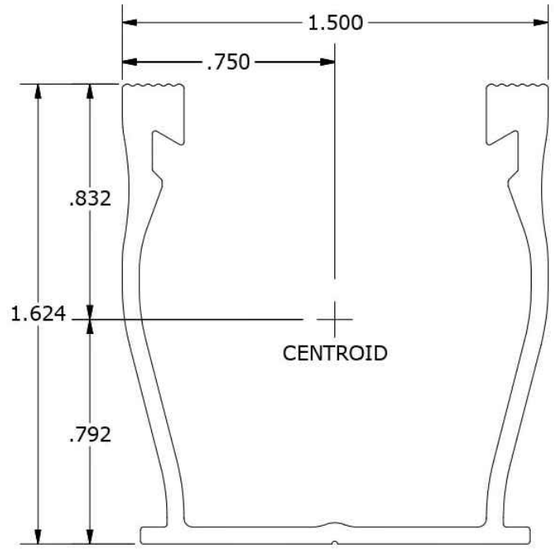
Sunrun South LLC
595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902

DESIGNER: M.Affentrager DRAFTER: M.Affentrager APPROVED BY: G.McPheeters	SCALE: DNS DATE: 11/30/2017	PART NUMBER: UR40-D04	DESCRIPTION: UR-40 ASSEMBLY DETAILS UEC	REV A

DESCRIPTION:	DRAWN BY:	SnapNrack™ Solar Mounting Solutions
SNAPNRACK, UR-40 RAIL	mwatkins	
PART NUMBER(S):	REVISION:	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902
232-02449, 232-02450, 232-02451	B	THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.

UR-40 RAIL PROPERTIES	
SKU	FINISH
232-02449	MILL
232-02450	CLEAR
232-02451	BLACK



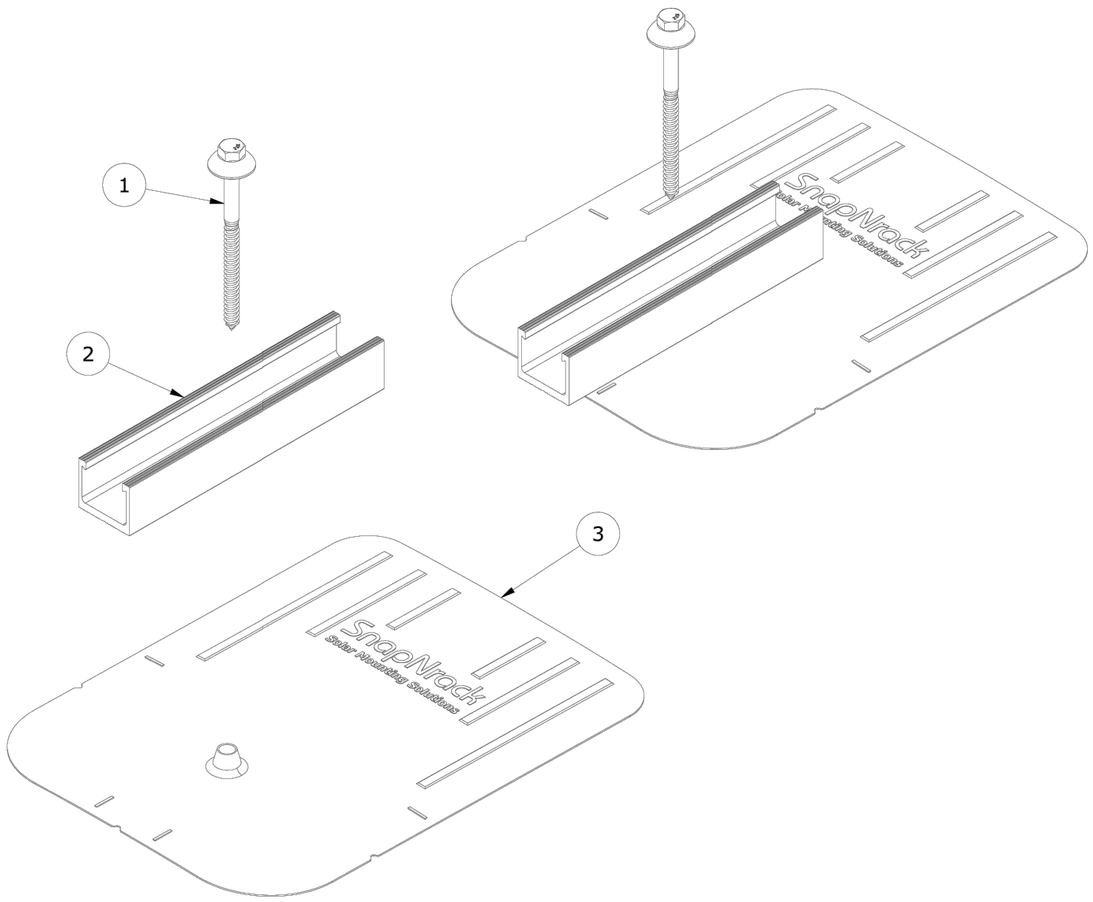


EQUIVALENT PROPERTIES	
A	0.357 in²
Ixx	0.125 in⁴
Iyy	0.132 in⁴
Sx (TOP)	0.150 in³
Sx (BOT)	0.158 in³
Sy (LEFT)	0.175 in³
Sy (RIGHT)	0.175 in³

ALL DIMENSIONS IN INCHES

MATERIALS:	6000 SERIES ALUMINUM	OPTIONS:
DESIGN LOAD (LBS):	N/A	CLEAR / BLACK ANODIZED
ULTIMATE LOAD (LBS):	N/A	MILL FINISH
TORQUE SPECIFICATION:	N/A LB-FT	BUNDLES OF 144
CERTIFICATION:	UL 2703, FILE E359313	BOXES OF 8
WEIGHT (LBS):	5.85	

DESCRIPTION:	DRAWN BY:	
SNAPNRACK, COMP FLASH TRACK KIT	mwatkins	SnapNrack™ Solar Mounting Solutions
PART NUMBER(S):	REVISION:	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902
SEE BELOW	B	THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	242-92266	SNAPNRACK, UMBRELLA LAG, TYPE 3, 4IN, SS
2	1	232-04060	SNAPNRACK, FLASH TRACK PRC, CONE HOLE, 7-1/2IN, BLACK
3	1	232-01375, 232-01376	SNAPNRACK, COMP FLASHING, 9IN X 12IN, SILVER / BLACK ALUM

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL, RUBBER
DESIGN LOAD (LBS):	306 UP, 372 DOWN, 253 SIDE (LANDSCAPE)
ULTIMATE LOAD (LBS):	N/A
TORQUE SPECIFICATION:	N/A LB-FT
CERTIFICATION:	UL 2703, FILE E359313
WEIGHT (LBS):	0.83 - 1.06

DESCRIPTION:	DRAWN BY:	
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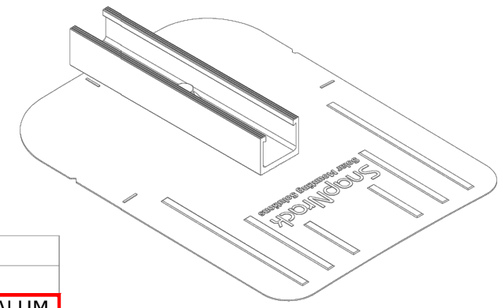
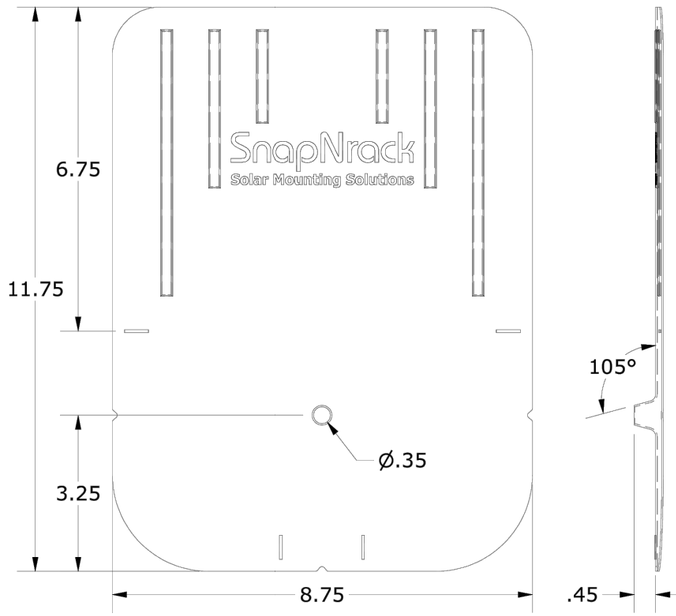
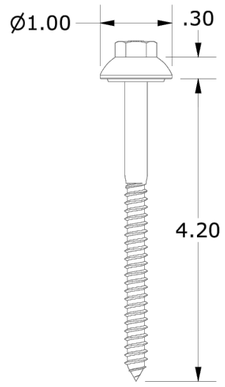
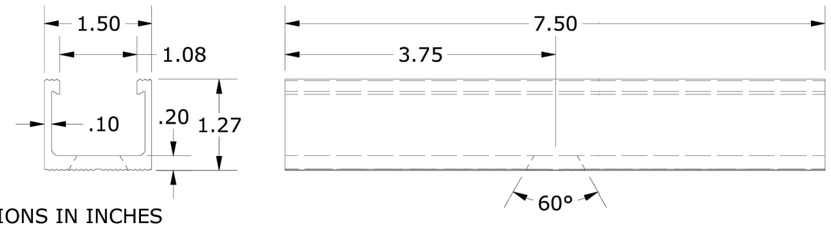


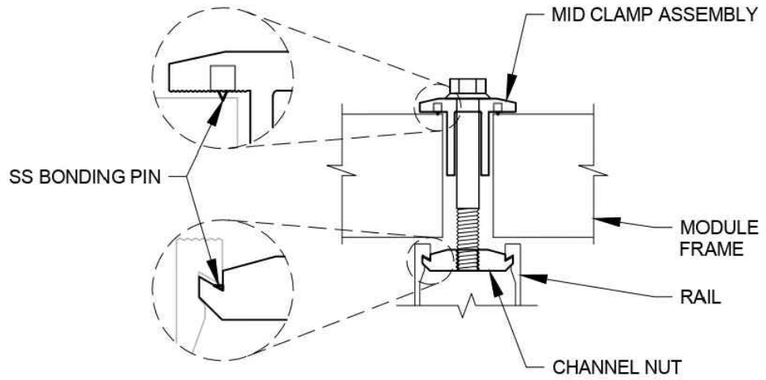
COMP FLASHING PROPERTIES	
SKU	DESCRIPTION
232-01375	COMP FLASHING, 9" X 12", BLACK ALUM
232-01376	COMP FLASHING, 9" X 12", SILVER ALUM



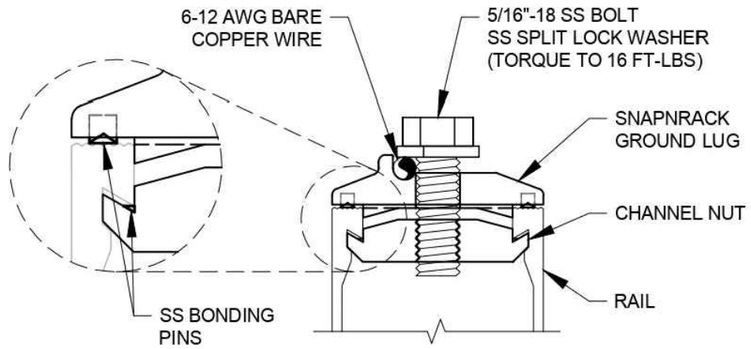




ALL DIMENSIONS IN INCHES



NOTE:
1. ADJUSTABLE END CLAMPS USE SAME BONDING PIN DESIGN TO BOND MODULES TO RAIL



NOTE:
1. ALL HARDWARE IS INCLUDED FROM MANUFACTURER
2. A MINIMUM OF ONE GROUND LUG IS TO BE INSTALLED ON EVERY CONTINUOUS ROW OF MODULES
3. GROUND LUG MAY BE INSTALLED IN EITHER RAIL CHANNEL
4. GROUND LUG MAY BE INSTALLED SO GROUND WIRE IS PARALLEL OR PERPENDICULAR TO RAIL
5. ENSURE SPLIT LOCK WASHER IS INSTALLED ON TOP OF COPPER WIRE

ASSEMBLER:	
INSPECTOR:	
DESCRIPTION: SNAPNRACK MOUNTING SYSTEM GROUNDING DETAILS	DRAWN BY: MIKE WATKINS APPROVED BY: CODY NORMAN REVISION: G 1/11/2016 NEW ITEM
PART NUMBER:	SCALE: DNS

SnapNrack™ Solar Mounting Solutions

Sunrun South LLC
595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902

SnapNrack UL 2703 Fire Classification

March 2019

As of January 1st, 2015 many jurisdictions are now enforcing codes based upon updates to the International Building Code (IBC) and UL Standards 1703 (modules) and 2703 (mounting systems). The language included in the 2012 IBC requires that the combination of roof mounted solar modules and racking components is to be considered a system (IBC Section 1509.7.2). Additionally, it requires that this system shall meet or exceed the fire classification of the roof assembly.

The objective is to ensure that the PV system does not adversely affect the fire rating of the roof. Roof surface fire ratings are classified either A, B, or C; Class A being the most resistant to the spread of flame.

Since the physical characteristics of the PV module (material, thickness of glass, etc) also potentially affect how a fire will act, modules are now tested and assigned a "type" based upon these characteristics and spread of flame test results. There are 15 total module types, Types 1, 2 and 3 represent differences in the module composition and Types 4 – 15 are the same module compositions as Types 1 – 3 with differing fire test performance.

SnapNrack Series 100, Ultra Rail and RL systems have been Certified for a Class A fire rating with Type 1 and Type 2 modules, in accordance with the standards set forth in UL1703/2703 and IBC 2012. In order to maintain this classification, the SnapNrack mounting systems must be installed per the UL-approved Installation Manuals. Because the test was conducted with the modules at 5 inches from the roof surface (worst case scenario), there is no restriction to the standoff height.

Attachment 1 is the SnapNrack QIMS File which is accessed through the UL Online Certification Directory, or available here: SnapNrack QIMS File.