

NEW PHOTOVOLTAIC ROOF MOUNTED SYSTEM - 17.600 KW DC/12.760 KW AC  
118 NW AMBERSHAM DR, LEES SUMMIT, MO 64081

NEW PV SYSTEM SPECIFICATIONS  
SYSTEM SIZE: DC SIZE: 17.600 KW DC-(STC)  
AC SIZE: 12.760 KW AC  
MODULE: (44) REC SOLAR REC400NP3 BLACK  
INVERTER: (44) ENPHASE IQ8PLUS-72-2-US (240V)

APPLICABLE CODES  
ALL WORK SHALL CONFORM TO THE FOLLOWING CODES:  
2021 INTERNATIONAL BUILDING CODE  
2021 INTERNATIONAL RESIDENTIAL CODE  
2021 INTERNATIONAL EXISTING BUILDING CODE  
2021 INTERNATIONAL FIRE CODE  
2020 NATIONAL ELECTRICAL CODE  
AS ADOPTED BY CITY OF LEES SUMMIT

DESIGN CRITERIA  
ROOF SURFACE TYPE: COMPOSITE SHINGLE  
ROOF FRAMING: 2"X6" RAFTER @ 24" OC  
BUILDING STORY: TWO STORY  
GROUND SNOW LOAD: 30 PSF  
WIND SPEED: 109 MPH  
WIND EXPOSURE: B  
RISK CATEGORY: II

PROJECT NOTES  
1.1.1 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE RELEVANT YEAR OF THE NATIONAL ELECTRIC CODE (NEC), ALL MANUFACTURER'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.  
1.1.2 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND THE PV SYSTEM MUST BE INSPECTED PRIOR TO OPERATION  
1.1.3 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC AND OTHER GOVERNING CODES  
1.1.4 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

SCOPE OF WORK  
1.2.1 CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM. THE CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTION OF EXISTING ONSITE CONDITIONS TO DESIGN, SPECIFY, AND INSTALL THE ROOF-MOUNTED PHOTOVOLTAIC SYSTEM DETAILED IN THIS DOCUMENT

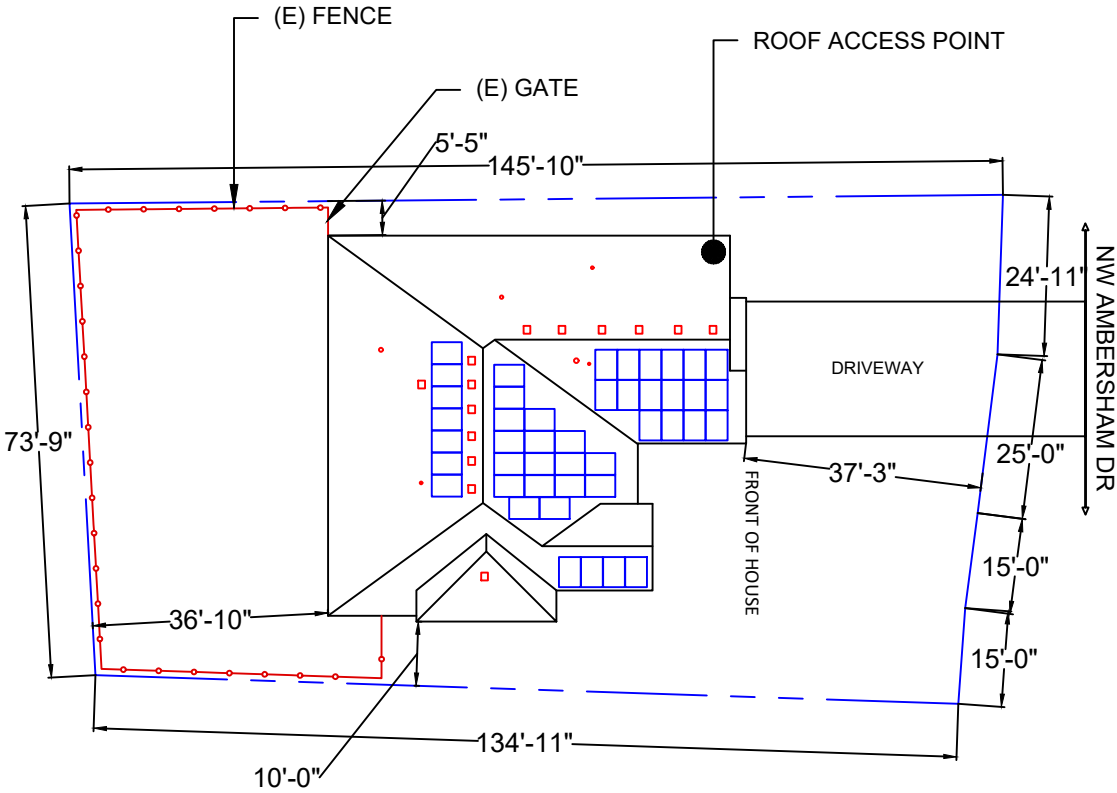


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PV-01

PROPERTY PLAN


SCALE:1"-30'-0"



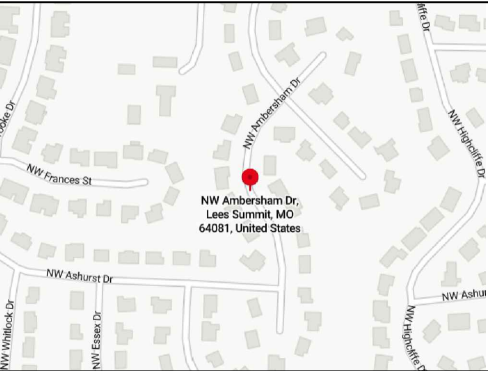
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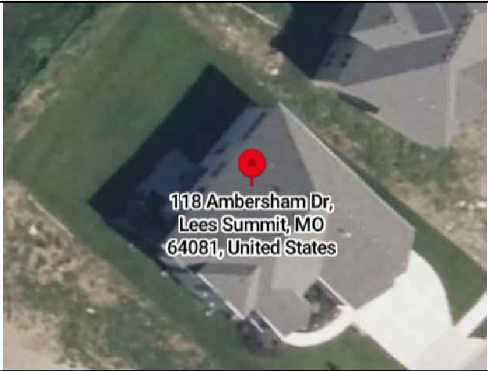
LEGEND

	- PROPERTY LINE
	- FENCE LINE

VICINITY MAP



SATELLITE MAP



CONTRACTOR



THE SOLAR GUYS

6114 MO-9, PARKVILLE,  
MISSOURI 64152

PHONE - (816) 708-5556

PROJECT NAME & ADDRESS

WILLIAM DRAISEY

118 NW AMBERSHAM DR,  
LEES SUMMIT, MO 64081

APN #: 62240230800000000  
AHJ: CITY OF LEES SUMMIT  
UTILITY: EVERGY - MO METRO  
(KCPLC)

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REVISIONS

REV	DESCRIPTION	DATE

SHEET TITLE

COVER PAGE

DRAWN DATE	9/15/2023
DRAWN BY	AM

SHEET NUMBER

PV-01

- NOTES:**
1. 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. STRUCTURES, PATIO COVERS, AND/OR ADDITIONS BUILT WITHOUT PERMITS TO BE RESOLVED BY A SEPARATE PERMIT.

PLAN VIEW TOTAL ROOF AREA: 3400.56 FT<sup>2</sup>  
TOTAL PV ARRAY AREA: 934.79 FT<sup>2</sup>  
TOTAL % OF ROOF COVERED BY PV: 27.49%

LEGEND

- 36" 18" FIRE SETBACKS
- = MECHANICAL VENT
- = FLUE / PLUMBING VENT
- = FENCE LINE
- 1 MICROINVERTER (1 PER MODULE)
- 2 (44) REC SOLAR REC400NP3 BLACK MODULES WITH ENPHASE IQ8PLUS-72-2-US (240V) UNDER EACH MODULE
- 3 (N) JUNCTION BOX (NEMA 3R)
- 4 CONDUIT RUN; SURFACE MOUNTED (ACTUAL CONDUIT RUNS TO BE DETERMINED IN FIELD)
- 5 (E) UTILITY METER (UNDERGROUND SERVICE)
- 6 MAIN SERVICE PANEL (INSIDE HOUSE)
- 7 (N) VISIBLE-OPEN, LOCKABLE, LABELED AND NON-FUSED AC DISCONNECT (UTILITY BLADE HANDLE)
- 8 (N) ENPHASE IQ COMBINER BOX 4

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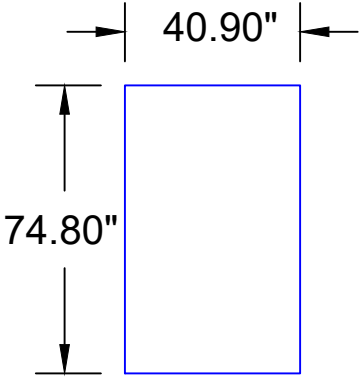
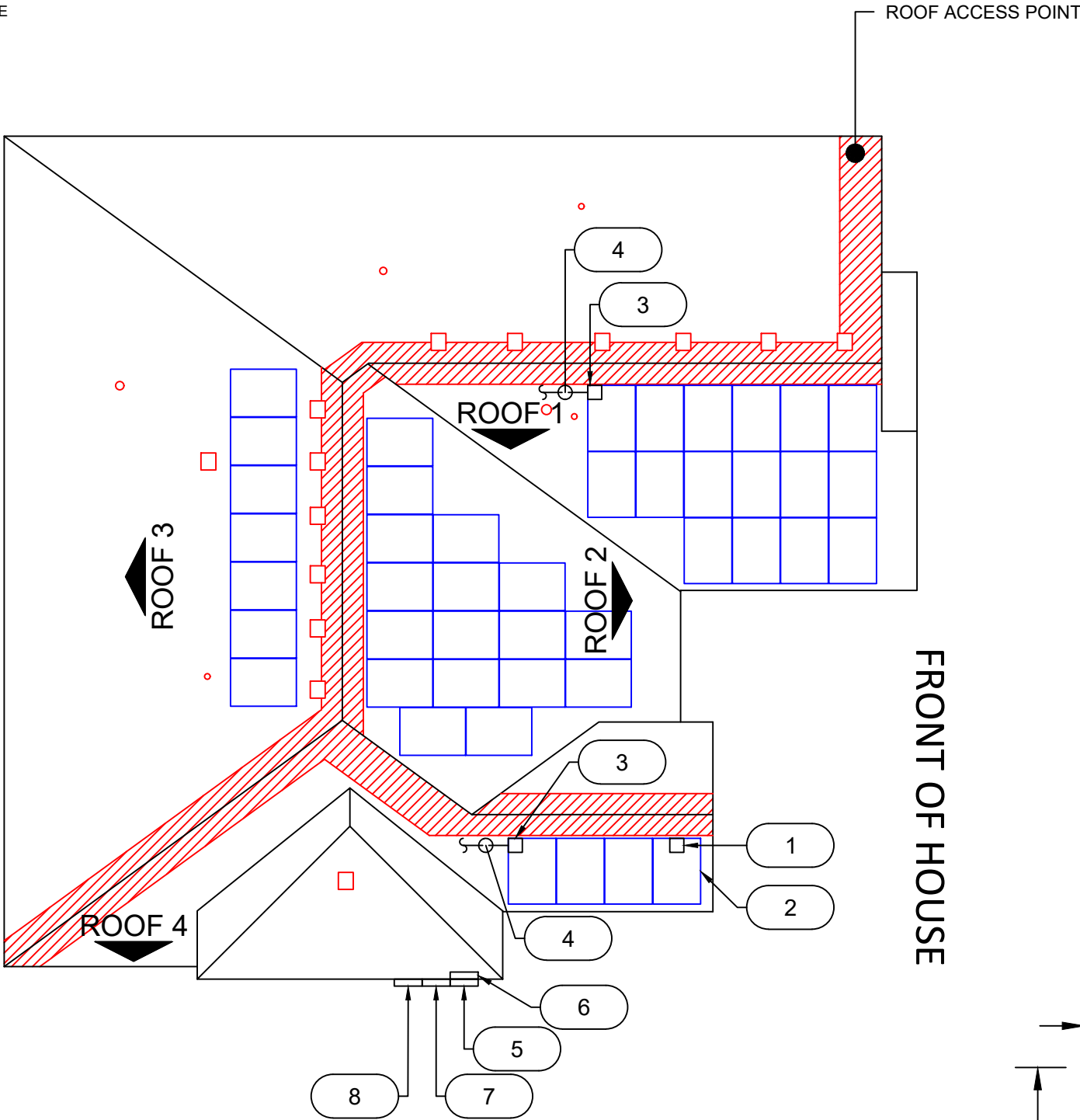
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SITE PLAN

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SHEET NUMBER

PV-02



ROOF 1	SLOPE	- 40°
	AZIMUTH	- 220°
	MODULE QTY	- 16
	RAFTER	- 2"X6" @ 24" O.C.
	SURFACE TYPE	- COMPOSITE SHINGLE
ROOF 2	SLOPE	- 40°
	AZIMUTH	- 130°
	MODULE QTY	- 17
	RAFTER	- 2"X6" @ 24" O.C.
ROOF 3	SLOPE	- 40°
	AZIMUTH	- 310°
	MODULE QTY	- 07
	RAFTER	- 2"X6" @ 24" O.C.
ROOF 4	SLOPE	- 40°
	AZIMUTH	- 220°
	MODULE QTY	- 04
	RAFTER	- 2"X6" @ 24" O.C.
	SURFACE TYPE	- COMPOSITE SHINGLE



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PV-02

SITE PLAN

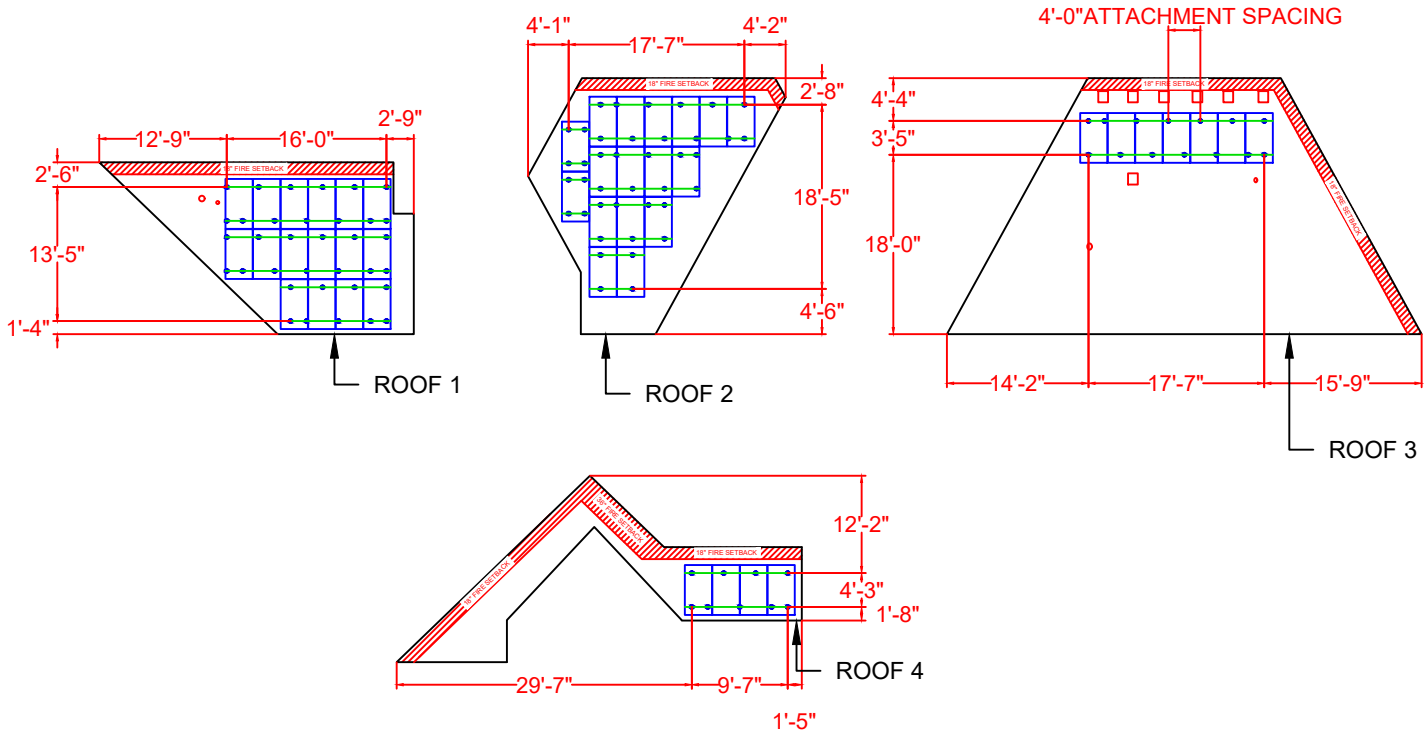
SCALE:3/32" = 1'-0"

DISTRIBUTED LOAD CALCULATIONS	
MODULE	REC SOLAR REC400NP3 BLACK
MODULE WEIGHT	48.00 LBS
MODULE DIMENSIONS (L" x W")	74.80" x 40.90"
TOTAL QTY. OF MODULES	44
TOTAL WEIGHT OF MODULES	2112.00 LBS
TYPE OF RACKING	IRONRIDGE XR-10 RAIL
TYPE OF ATTACHMENT	SUNMODO NANOMOUNT (DECKING)
DISTRIBUTED WEIGHT OF RACKING	0.5 PSF
TOTAL WEIGHT OF ARRAY	2579.40 LBS
AREA OF MODULE	21.25 SQFT.
TOTAL ARRAY AREA	934.79 SQFT.
DISTRIBUTED LOAD	2.76 PSF

- NOTE:**
- CONTRACTOR/INSTALLER TO VERIFY COMPATIBILITY OF ANY BRANDS OR PRODUCTS SUBSTITUTED OR USED AS ALTERNATES WITHIN ANY BRAND-SPECIFIC SYSTEMS. CONTRACTOR SHALL SUPPLY AND PRESENT CERTIFICATES OF COMPATIBILITY TO THE BUILDING OFFICIAL UPON INSPECTION AS NEEDED.
  - REFER TO PV MODULE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR RAIL SPACING SPECIFICATIONS

LEGEND

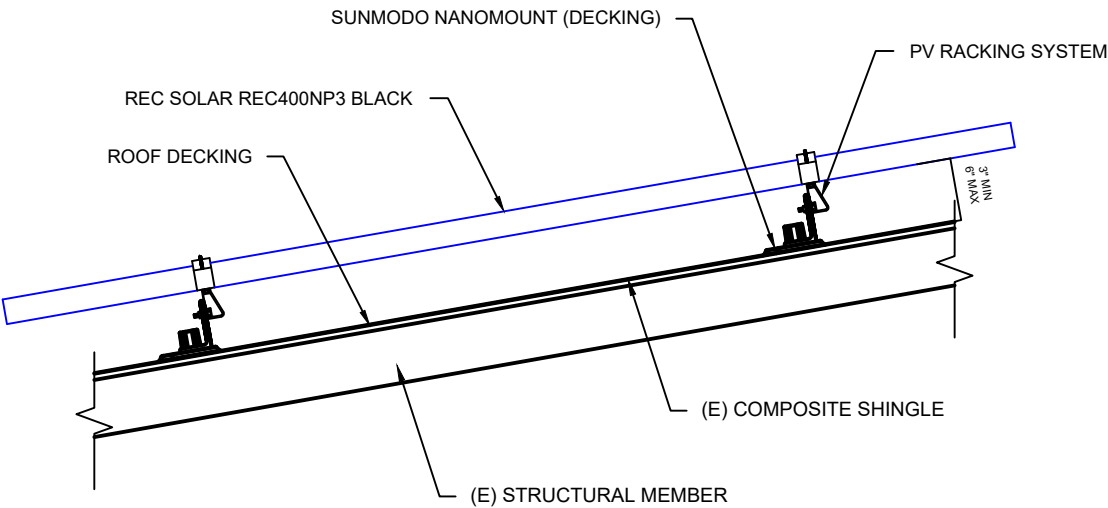
- ATTACHMENT POINTS
- RAIL
- STRUCTURAL MEMBER



ROOF 1	SLOPE - 40° AZIMUTH - 220° MODULE QTY - 16 RAFTER - 2"X6" @ 24" O.C. SURFACE TYPE - COMPOSITE SHINGLE
ROOF 2	SLOPE - 40° AZIMUTH - 130° MODULE QTY - 17 RAFTER - 2"X6" @ 24" O.C. SURFACE TYPE - COMPOSITE SHINGLE
ROOF 3	SLOPE - 40° AZIMUTH - 310° MODULE QTY - 07 RAFTER - 2"X6" @ 24" O.C. SURFACE TYPE - COMPOSITE SHINGLE
ROOF 4	SLOPE - 40° AZIMUTH - 220° MODULE QTY - 04 RAFTER - 2"X6" @ 24" O.C. SURFACE TYPE - COMPOSITE SHINGLE

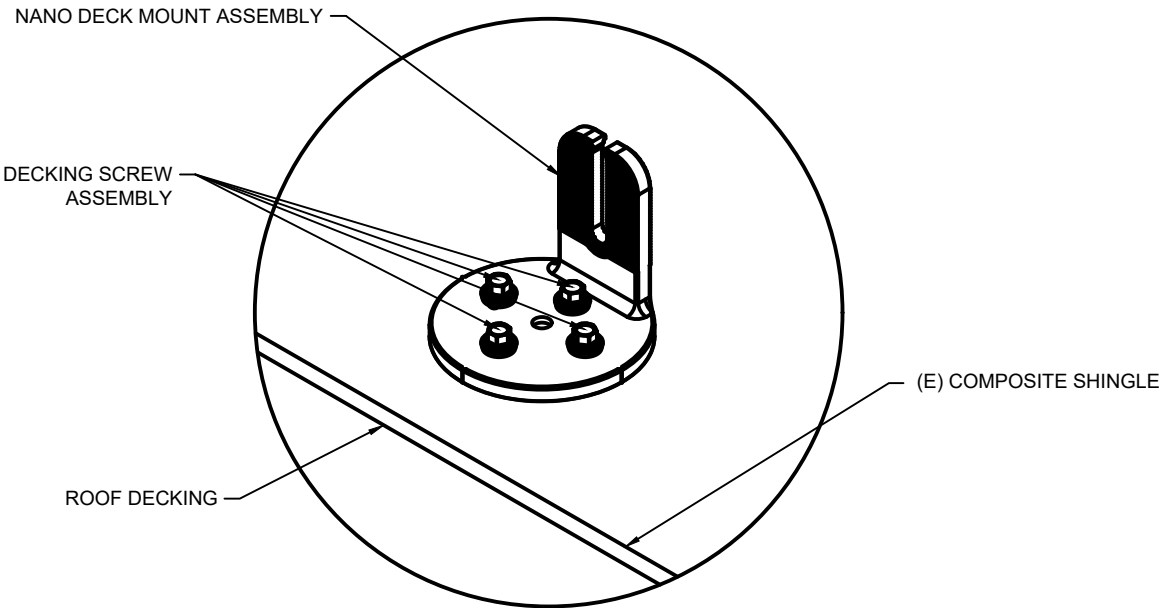
1.0 TYPICAL ATTACHMENT PLAN (PORTRAIT)

PV-03 SCALE: NTS



2 ATTACHMENT DETAIL

PV-03 Scale: NTS



3 ENLARGED VIEW

PV-03 Scale: NTS

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SHEET TITLE  
ATTACHMENT PLAN  
& DETAILS

DRAWN DATE 9/15/2023

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SHEET NUMBER

PV-03

MICROINVERTER SPECIFICATIONS		SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	ENPHASE IQ8PLUS-72-2-US (240V)	MANUFACTURER / MODEL #	REC SOLAR REC400NP3 BLACK
INPUT POWER RANGE	235W-440W	VMP	37.6V
MIN/MAX START VOLTAGE	22V/58V	IMP	10.64A
NOMINAL AC VOLTAGE	240V	VOC	45.0V
MAX CONT. OUTPUT CURRENT	1.21A	ISC	11.39A
MAX CONT. OUTPUT POWER	290W	TEMP. COEFF. VOC	-0.26%/°C
MAX MODULES PER STRING	13 (13 MICROINVERTERS)		

AMBIENT TEMPERATURE SPECIFICATIONS	
RECORD LOW TEMP	-20°C
AMBIENT TEMP (HIGH TEMP 2% AVG.)	35°C
MINIMUM CONDUIT HEIGHT ABOVE ROOF SURFACE	7/8"

CONTRACTOR

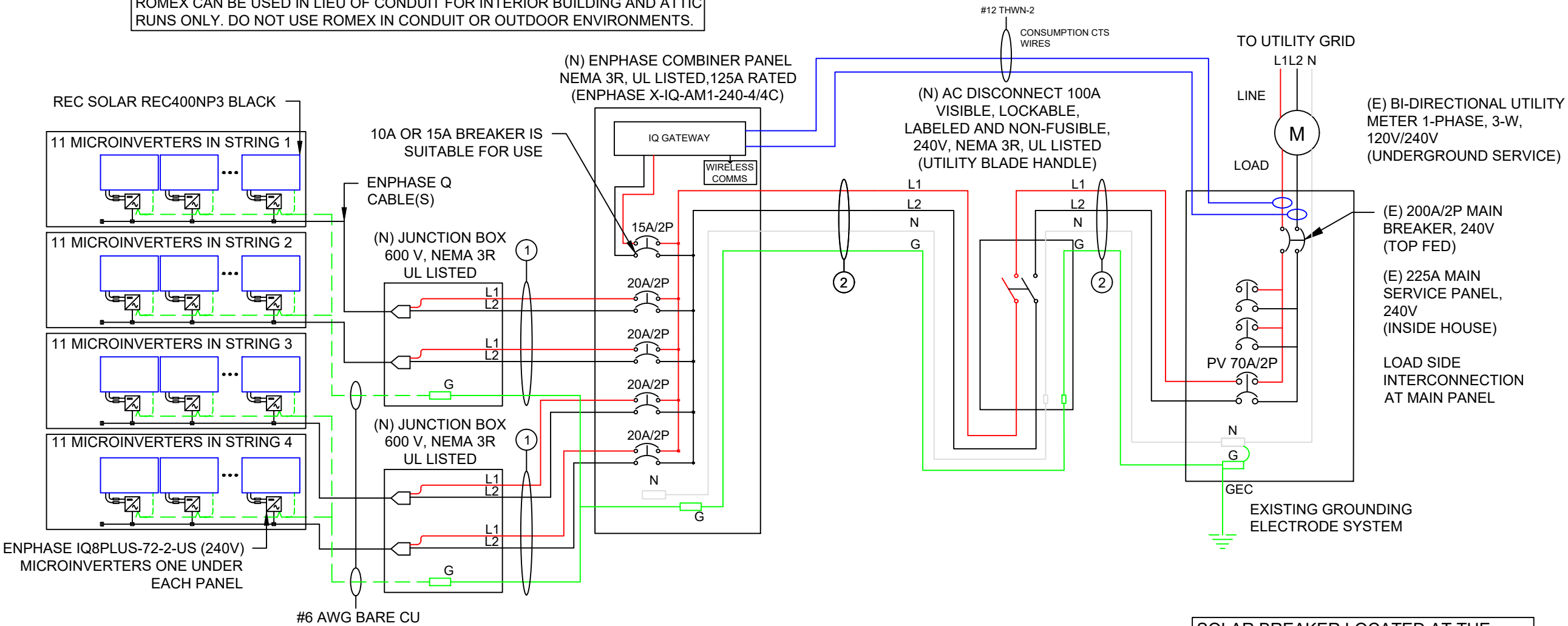


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ROMEX CAN BE USED IN LIEU OF CONDUIT FOR INTERIOR BUILDING AND ATTIC RUNS ONLY. DO NOT USE ROMEX IN CONDUIT OR OUTDOOR ENVIRONMENTS.



SOLAR BREAKER LOCATED AT THE  
FURTHEST END OF BUSBAR FROM THE  
MAIN BREAKER OR FEEDER UNIT

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SHEET TITLE  
ELECTRICAL  
DIAGRAM

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PV-04

DESCRIPTION					FORMULA					RESULT		
PV OVERCURRENT PROTECTION NEC 690.9(B)					TOTAL INVERTER OUTPUT CURRENT x 1.25 = (44 x 1.21)A x 1.25					66.55A (SELECTED PV BREAKER = 70A)		
120% RULE FOR BACKFEED BREAKER NEC 705.12					BUS BAR RATING x 1.2 - MCB RATING = MAX ALLOWABLE PV BREAKER 225A x 1.2 - 200A = 70A					SELECTED PV BREAKER <= MAX ALLOWABLE PV BREAKER 70A <= 70A		
WIRE ID	EXPECTED WIRE TEMP (°C)	TEMP DERATE (90 °C)	QTY OF CURRENT CARRYING CONDUCTORS	CONDUIT FILL DERATE	MINIMUM CONDUIT SIZE (TBD ON SITE)	WIRE GAUGE & TYPE	CONDUCTOR AMPACITY @ 90°C (A)	CONDUCTOR AMPACITY @ 75°C (A)	REQUIRED CIRCUIT CONDUCTOR AMPACITY (A)	ADJUSTED CONDUCTOR AMPACITY @ 90 °C (A)	NEUTRAL CONDUCTOR SIZE & TYPE	GROUND WIRE SIZE & TYPE
1	35	0.96	4	0.8	3/4" METAL	#10 USE-2	35	30	16.64	26.88	NONE	#10 USE-2
2	35	0.96	2	1	1" METAL	#3 USE-2	85	75	66.55	81.60	#3 USE-2	#8 USE-2

# GENERAL NOTES

## SITE NOTES

- 2.1.1 A LADDER WILL BE IN PLACE FOR INSPECTION IN ACCORDANCE WITH OSHA REGULATIONS.
- 2.1.2 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
- 2.1.3 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- 2.1.4 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED IN ACCORDANCE WITH SECTION NEC 110.26.
- 2.1.5 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

- 2.2.1 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS IN ACCORDANCE WITH NEC 110.26.
- 2.2.2 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).
- 2.2.3 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES IN ACCORDANCE WITH NEC 690.34.
- 2.2.4 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.
- 2.2.5 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL IN ACCORDANCE WITH NEC APPLICABLE CODES.
- 2.2.6 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

## STRUCTURAL NOTES

- 2.3.1 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED IN ACCORDANCE WITH THE CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, IN ACCORDANCE WITH RAIL MANUFACTURER'S INSTALLATION PRACTICES.
- 2.3.2 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
- 2.3.3 ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
- 2.3.4 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER OR PROFESSIONAL ENGINEERING GUIDANCE.
- 2.3.5 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

## WIRING & CONDUIT NOTES

- 2.4.1 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
- 2.4.2 CONDUCTORS SIZED IN ACCORDANCE WITH THE NEC
- 2.4.3 AC CONDUCTORS TO BE COLORED OR MARKED PER NEC
- 2.4.4 LISTED OR LABELED EQUIPMENT SHALL BE INSTALLED AND USED IN ACCORDANCE WITH ANY INSTRUCTIONS INCLUDED IN THE LISTING OR LABELING PER NEC

## GROUNDING NOTES

- 2.5.1 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
- 2.5.2 PV EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH NEC 690.43 AND NEC TABLE 250.122.
- 2.5.3 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORDANCE WITH NEC 250.134 AND 250.136(A).
- 2.5.4 EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH NEC 690.45 AND INVERTER MANUFACTURER'S INSTALLATION PRACTICES
- 2.5.5 EACH MODULE WILL BE GROUNDED AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ.
- 2.5.6 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
- 2.5.7 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER PER NEC 250.119
- 2.5.8 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 IN ACCORDANCE WITH NEC 250, NEC 690.47 AND THE AHJ.
- 2.5.9 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

## DISCONNECTION AND OVERCURRENT PROTECTION NOTES

- 2.6.1 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
- 2.6.2 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
- 2.6.3 PV SYSTEM CIRCUITS INSTALLED ON OR IN HABITABLE BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12
- 2.6.4 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.
- 2.6.5 INVERTER ON-GRID BRANCHES SHALL BE CONNECTED TO A SINGLE BREAKER OR GROUPED FUSE DISCONNECT(S) IN ACCORDANCE WITH NEC 110.3(B).
- 2.6.6 IF REQUIRED BY THE AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION IN ACCORDANCE WITH NEC 690.11 AND UL1699B.

## INTERCONNECTION NOTES

- 2.7.1 LOAD SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH NEC 705.12.
- 2.7.2 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120 PERCENT OF BUSBAR RATING PER NEC 705.12.
- 2.7.3 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 IN ACCORDANCE WITH NEC 705.12.
- 2.7.4 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT PROTECTION DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE MAIN OVERCURRENT PROTECTION DEVICE MAY BE EXCLUDED IN ACCORDANCE WITH NEC 705.12.
- 2.7.5 FEEDER TAP INTERCONNECTION (LOAD SIDE) IN ACCORDANCE WITH NEC 705.12.
- 2.7.6 SUPPLY SIDE TAP INTERCONNECTION IN ACCORDANCE WITH TO NEC 705.12 WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42.
- 2.7.7 BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING PER NEC 705.12.

## CONTRACTOR



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REV	DESCRIPTION	DATE

## SHEET TITLE

## NOTES

DRAWN DATE	9/15/2023
DRAWN BY	AM

## SHEET NUMBER

PV-05

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WARNING

ELECTRICAL SHOCK HAZARD

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

LABEL LOCATION: COMBINER PANEL, AC  
DISCONNECT, POINT OF INTERCONNECTION  
PER CODE: NEC 706.15(C)(4), NEC 690.13(B)

⚠

WARNING

TURN OFF PHOTOVOLTAIC AC  
DISCONNECT PRIOR TO  
WORKING INSIDE PANEL

LABEL LOCATION: COMBINER PANEL(S), MAIN SERVICE DISCONNECT  
PER CODE: NEC 110.27(C), OSHA 1910.145(f)(7)

PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION: DC CONDUIT/RACEWAYS  
PER CODE: NEC 690.31(D)(2)

SOLAR PV DC CIRCUIT

LABEL LOCATION: DC CONDUIT/RACEWAYS  
PER CODE: NEC 690.31(D)(2)

PHOTOVOLTAIC SYSTEM AC DISCONNECT

RATED AC OUTPUT CURRENT: 53.24 A

NOMINAL OPERATING AC VOLTAGE: 240 V

LABEL LOCATION: AC DISCONNECT/POINT OF INTERCONNECTION  
PER CODE: NEC 690.54

⚠

WARNING

DUAL POWER SOURCE  
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION: MAIN SERVICE DISCONNECT, PRODUCTION/NET METER  
PER CODE: NEC 690.59, 705.12(C)

PV SYSTEM

DISCONNECT

LABEL LOCATION: AC DISCONNECT  
PER CODE: NEC 690.13(B)

⚠

WARNING

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

LABEL LOCATION: AC DISCONNECT  
PER CODE: NEC 705.12(B)(3)(3)

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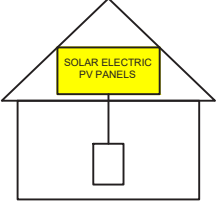
WARNING

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

LABEL LOCATION: POINT OF INTERCONNECTION  
PER CODE: NEC 705.12(B)(3)(2)

SOLAR PV SYSTEM EQUIPPED  
WITH RAPID SHUTDOWN

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



LABEL LOCATION: MAIN SERVICE DISCONNECT  
PER CODE: NEC 690.56(C)

MAIN PHOTOVOLTAIC  
SYSTEM DISCONNECT

LABEL LOCATION: MAIN SERVICE DISCONNECT, UTILITY METER  
PER CODE: NEC 690.13(B)

RAPID SHUTDOWN FOR  
SOLAR PV SYSTEM

LABEL LOCATION: RSD INITIATION DEVICE, AC DISCONNECT  
PER CODE: NEC 690.56(C)(2)

⚠

CAUTION

PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LABEL LOCATION: MAIN SERVICE DISCONNECT  
PER CODE: NEC 705.12(D), NEC 690.59

DO NOT DISCONNECT  
UNDER LOAD

LABEL LOCATION: MAIN SERVICE DISCONNECT  
PER CODE: NEC 690.15(B) & NEC 690.33(D)(2)

MAXIMUM DC VOLTAGE

OF PV SYSTEM

LABEL LOCATION: DC DISCONNECT/INVERTER/PV DIST.  
EQUIPMENT  
PER CODE: NEC 690.53

⚠

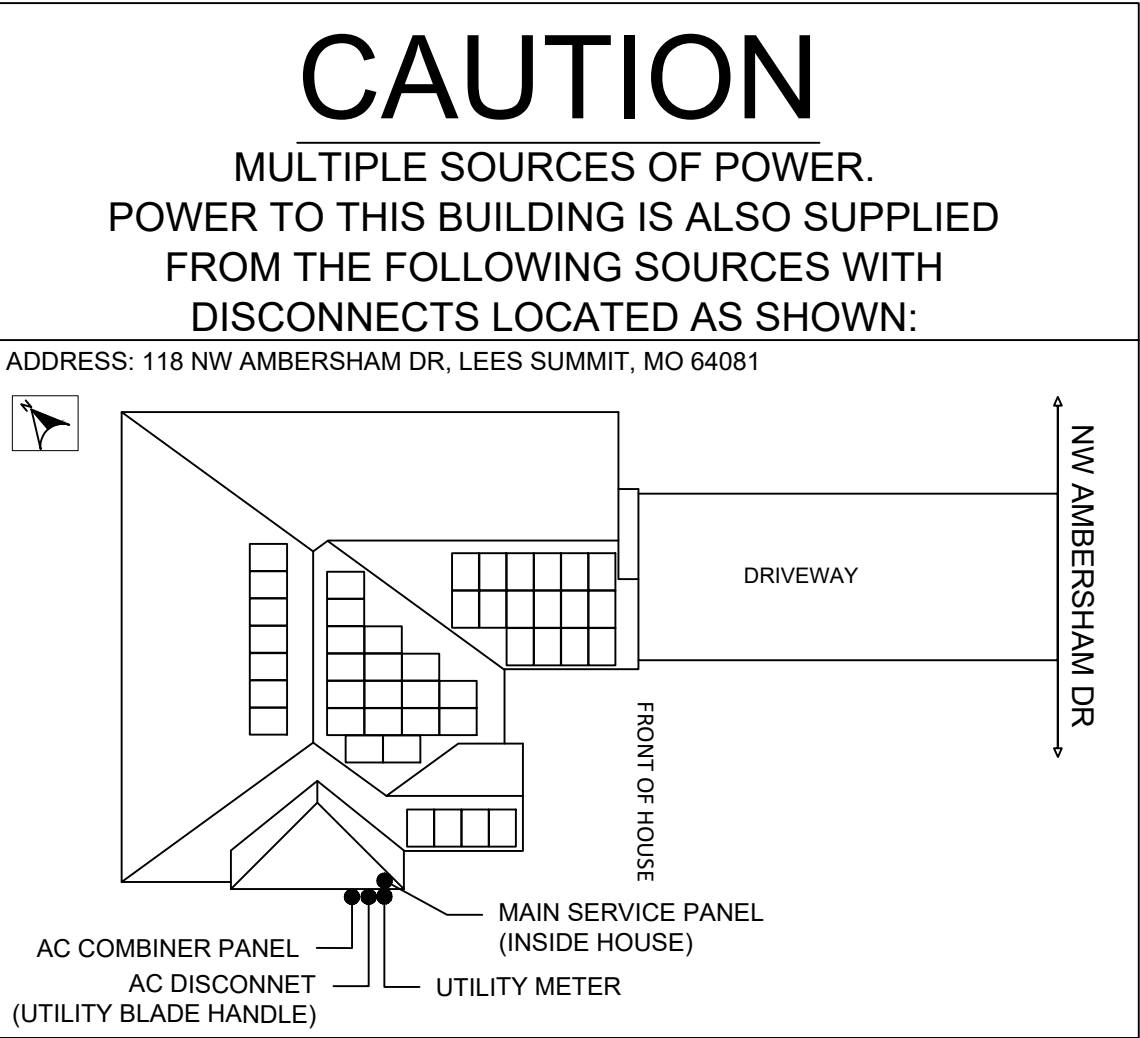
WARNING

ELECTRICAL SHOCK HAZARD

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

DC VOLTAGE IS ALWAYS PRESENT WHEN  
SOLAR MODULES ARE EXPOSED TO SUNLIGHT

LABEL LOCATION: DC DISCONNECT  
PER CODE: NEC 690.13(B)



CONTRACTOR



THE SOLAR GUYS

6114 MO-9, PARKVILLE,  
MISSOURI 64152

PHONE - (816) 708-5556

PROJECT NAME & ADDRESS

WILLIAM DRAISEY

118 NW AMBERSHAM DR,  
LEES SUMMIT, MO 64081

APN #: 62240230800000000  
AHJ: CITY OF LEES SUMMIT  
UTILITY: EVERGY - MO METRO  
(KCPLC)

SYSTEM DETAILS

DC SIZE: 17.600 KW DC-(STC)  
AC SIZE: 12.760 KW AC  
(44) REC SOLAR REC400NP3 BLACK  
(44) ENPHASE IQ8PLUS-72-2-US (240V)

REVISIONS

REV	DESCRIPTION	DATE

SHEET TITLE  
WARNING LABELS

DRAWN DATE 9/15/2023

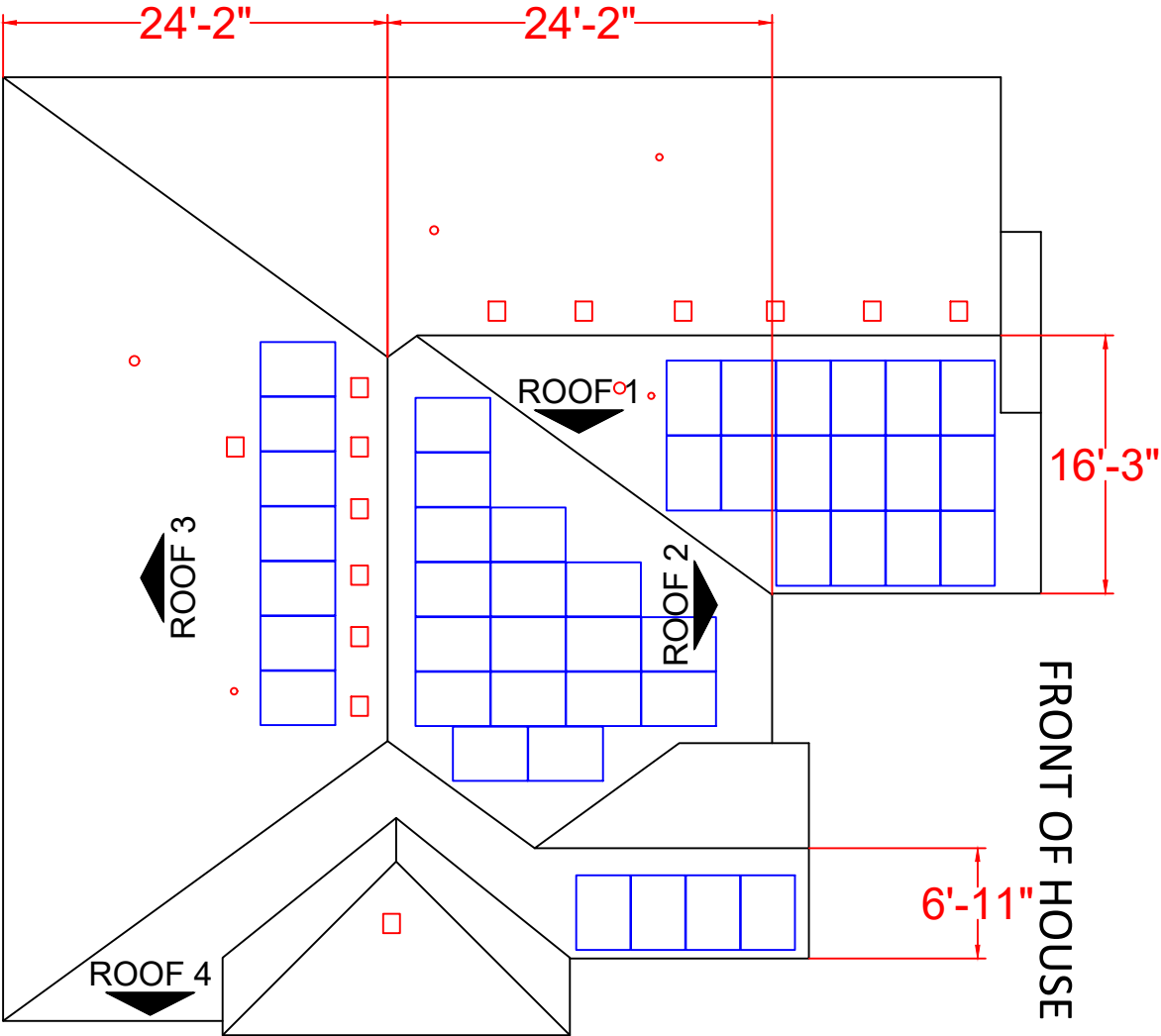
DRAWN BY AM

SHEET NUMBER

PV-06


	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

REFERENCE ONLY



\*\*DIMENSIONS ARE 2D (FLAT)

**CONTRACTOR**



THE SOLAR GUYS

6114 MO-9, PARKVILLE,  
MISSOURI 64152

PHONE - (816) 708-5556

**PROJECT NAME & ADDRESS**

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REVISIONS		
REV	DESCRIPTION	DATE

**SHEET TITLE**

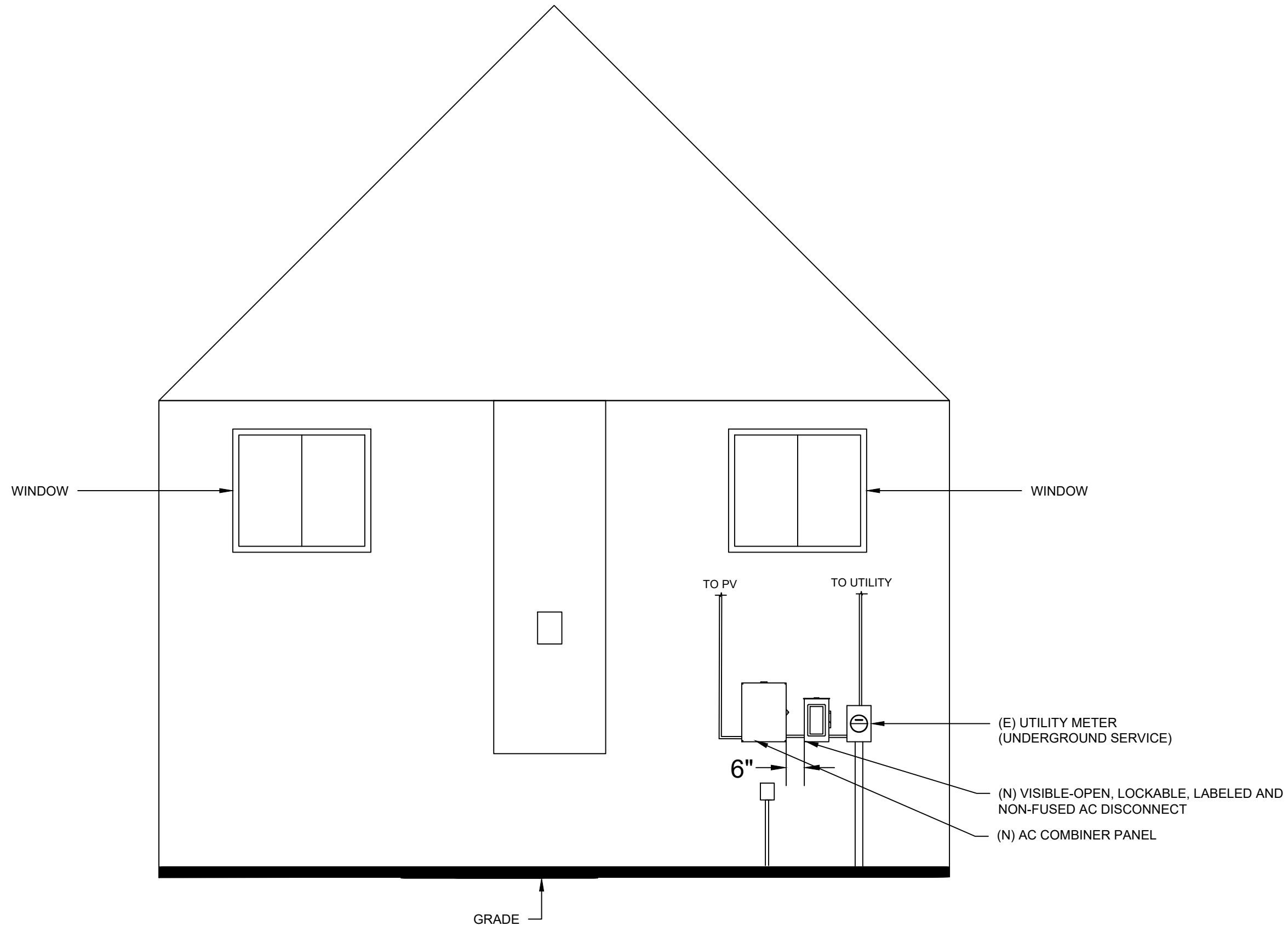
**INSTALLATION**

**RESOURCE**

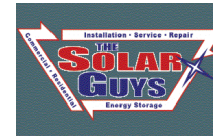
DRAWN DATE	9/15/2023
DRAWN BY	AM

**SHEET NUMBER**

**PV-07**



CONTRACTOR



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MISSOURI 64152

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PROJECT NAME & ADDRESS

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118 NW AMBERSHAM DR,  
LEES SUMMIT, MO 64081

APN #: 62240230800000000

AHJ: CITY OF LEES SUMMIT

UTILITY: EVERGY - MO METRO  
(KCPLC)

SYSTEM DETAILS

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(44) REC SOLAR REC400NP3 BLACK  
(44) ENPHASE IQ8PLUS-72-2-US (240V)

REVISIONS

REV	DESCRIPTION	DATE

SHEET TITLE

ELECTRICAL EQUIPMENT  
ELEVATION

DRAWN DATE	9/15/2023
DRAWN BY	AM

SHEET NUMBER

PV-08



1  
PV-01

ELECTRICAL EQUIPMENT ELEVATION

SCALE:NTS

# REC N-PEAK 3 BLACK SERIES

## PREMIUM FULL BLACK MONO N-TYPE SOLAR PANELS



MONO N-TYPE: THE MOST EFFICIENT C-SI TECHNOLOGY



NO LIGHT INDUCED DEGRADATION



SUPER-STRONG FRAME UP TO 7000 PA SNOW LOAD



FLEXIBLE INSTALLATION OPTIONS



FEATURING REC'S PIONEERING TWIN DESIGN

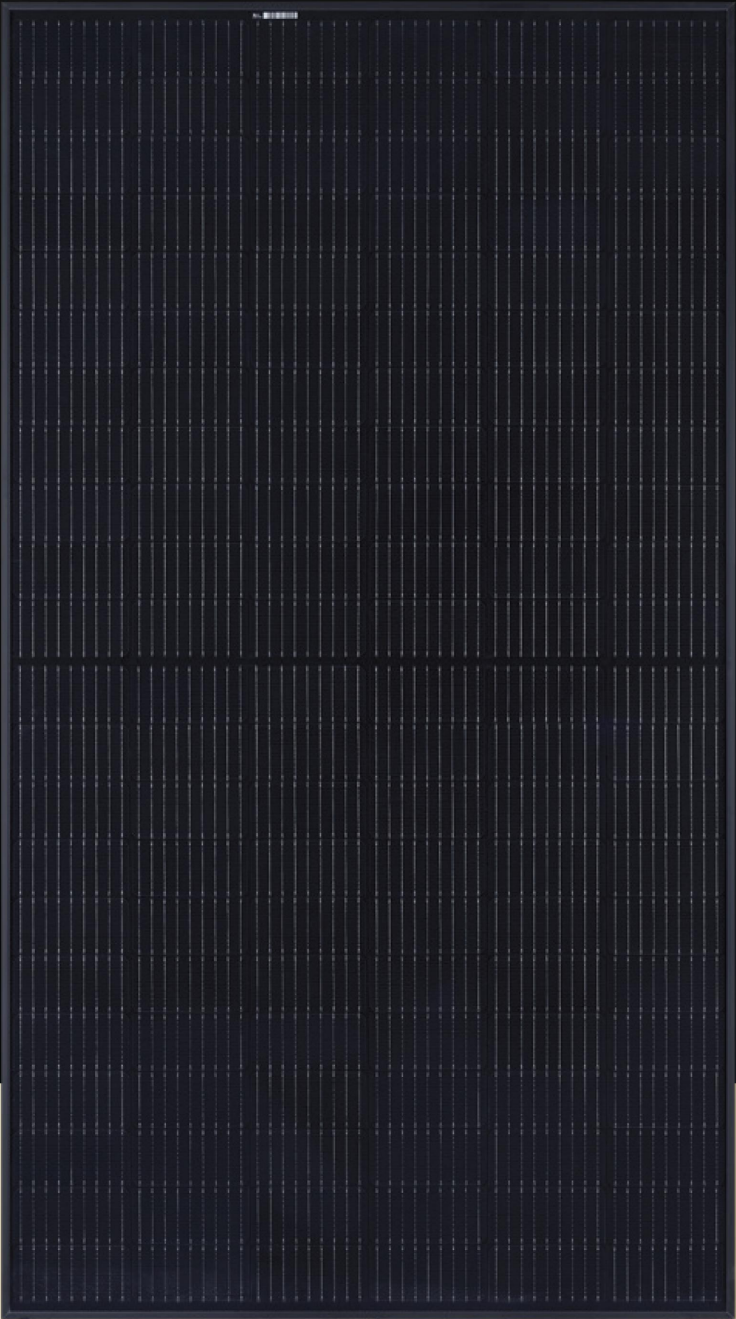


BIFACIAL CELLS CAN PRODUCE ENERGY FROM BOTH SIDES

400  
WP  
POWER



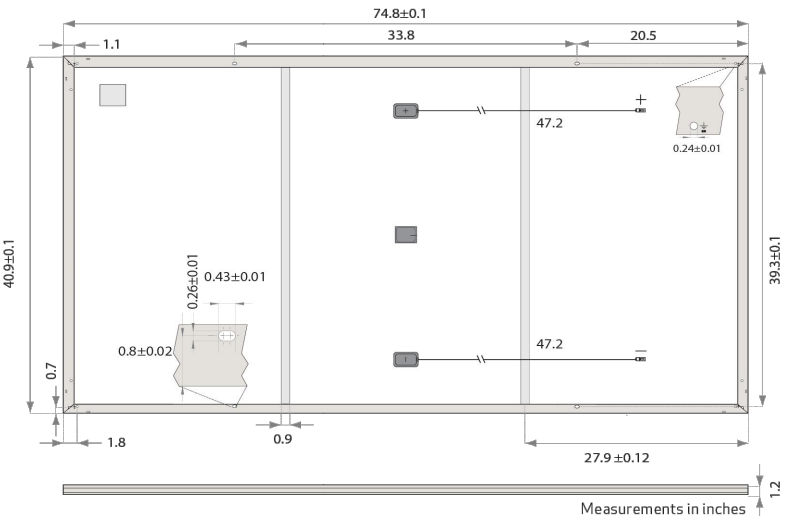
SOLAR'S MOST TRUSTED



SOLAR'S MOST TRUSTED

## REC N-PEAK 3 BLACK SERIES PRODUCT SPECIFICATIONS

GENERAL DATA	
Cell type:	132 half-cut mono c-Si n-type cells 6 strings of 22 cells in series
Glass:	0.13 in solar glass with anti-reflective surface treatment in accordance with EN12150
Backsheet:	Highly resistant polymer (black)
Frame:	Anodized aluminum (black) with silver support bars
Junction box:	3-part, 3 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790
Connectors:	Stäubli MC4 PV-KBT4/KST4 (12 AWG) in accordance with IEC 62852, IP68 only when connected
Cable:	12 AWG PV wire, 47.2 + 47.2 in in accordance with EN 50618
Dimensions:	74.8 x 40.9 x 1.2 in (19.7 sq-ft)
Weight:	48.0 lbs
Origin:	Made in Singapore



ELECTRICAL DATA		Product Code*: RECxxxNP3 Black	
STC	Power Output - P <sub>MAX</sub> (Wp)	390	400
	Watt Class Sorting - (W)	0/+10	0/+10
	Nominal Power Voltage - V <sub>MPP</sub> (V)	36.8	37.6
	Nominal Power Current - I <sub>MPP</sub> (A)	10.60	10.64
	Open Circuit Voltage - V <sub>OC</sub> (V)	44.8	45.0
	Short Circuit Current - I <sub>SC</sub> (A)	11.31	11.39
	Panel Efficiency (%)	19.5	20.3
NMOT	Power Output - P <sub>MAX</sub> (Wp)	295	302
	Nominal Power Voltage - V <sub>MPP</sub> (V)	34.4	35.2
	Nominal Power Current - I <sub>MPP</sub> (A)	8.56	8.59
	Open Circuit Voltage - V <sub>OC</sub> (V)	41.9	42.1
Short Circuit Current - I <sub>SC</sub> (A)		9.13	9.20

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of P<sub>MAX</sub>, V<sub>OC</sub> & I<sub>SC</sub> ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s). \* Where xxx indicates the nominal power class (P<sub>MAX</sub>) at STC above.

MAXIMUM RATINGS	
Operational temperature:	-40 ... +185°F
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)	

WARRANTY			
		Standard	REC ProTrust
Installed by an REC Certified Solar Professional	No	Yes	Yes
System Size	All	≤25 kW	25-50 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%

The REC ProTrust Warranty is only available on panels purchased through an REC Certified Solar Professional installer. Warranty conditions apply. See [www.recgroup.com](http://www.recgroup.com) for more details.

CERTIFICATIONS	
IEC 61215:2016, IEC 61730:2016, UL 61730	
IEC 62804	PID
IEC 61701	Salt Mist
IEC 62716	Ammonia Resistance
UL 61730	Fire Type Class 2
UL 790	Fire Class Type C
IEC 62782	Dynamic Mechanical Load
IEC 61215-2:2016	Hailstone (1.37in)
ISO 14001, ISO 9001, IEC 45001, IEC 62941	

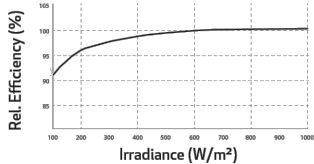


TEMPERATURE RATINGS*	
Nominal Module Operating Temperature:	44.3°C (±2°C)
Temperature coefficient of P <sub>MAX</sub> :	-0.34 %/°C
Temperature coefficient of V <sub>OC</sub> :	-0.26 %/°C
Temperature coefficient of I <sub>SC</sub> :	0.04 %/°C

\*The temperature coefficients stated are linear values

DELIVERY INFORMATION	
Panels per pallet:	33
Panels per 40 ft GP/high cube container:	792 (24 pallets)
Panels per 53 ft truck:	TBD

LOW LIGHT BEHAVIOUR	
Typical low irradiance performance of module at STC:	



Available from:

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.

REC Solar PTE. LTD.  
20 Tuas South Ave. 14  
Singapore 637312  
[post@recgroup.com](mailto:post@recgroup.com)





# 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.



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.



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 3<sup>rd</sup> Ed.)

### 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 <sup>1</sup>	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 <sub>sc</sub>	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 <sup>2</sup>	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 <sup>3</sup>		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 3 <sup>rd</sup> Ed.), 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.

# Enphase IQ Combiner 4/4C

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



To learn more about Enphase offerings, visit [enphase.com](https://enphase.com)

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



## 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
Envoy breaker	10A or 15A rating GE/Siemens/Eaton 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](https://enphase.com)

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# Enphase Q Cable Accessories

The **Enphase Q Cable™** and accessories are part of the latest generation Enphase IQ System™. These accessories provide simplicity, reliability, and faster installation times.



### Enphase Q Cable

- Two-wire, double-insulated Enphase Q Cable is 50% lighter than the previous generation Enphase cable
- New cable numbering and plug and play connectors speed up installation and simplify wire management
- Link connectors eliminate cable waste





### Field-Wireable Connectors

- Easily connect Q cables on the roof without complex wiring
- Make connections from any open connector and center feed any section of cable within branch limits
- Available in male and female connector types

## Enphase Q Cable Accessories

CONDUCTOR SPECIFICATIONS				
Certification	UL3003 (raw cable), UL 9703 (cable assemblies), DG cable			
Flame test rating	FT4			
Compliance	RoHS, OIL RES I, CE, UV Resistant, combined UL for Canada and United States			
Conductor type	THHN/THWN-2 dry/wet			
Disconnecting means	The AC and DC bulkhead connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.			
Q CABLE TYPES / ORDERING OPTIONS				
Connectorized Models	Size / Max Nominal Voltage	Connector Spacing	PV Module Orientation	Connector Count per Box
Q-12-10-240	12 AWG / 277 VAC	1.3 m (4.2 ft)	Portrait	240
Q-12-17-240	12 AWG / 277 VAC	2.0 m (6.5 ft)	Landscape (60-cell)	240
Q-12-20-200	12 AWG / 277 VAC	2.3 m (7.5 ft)	Landscape (72-cell)	200
ENPHASE Q CABLE ACCESSORIES				
Name	Model Number	Description		
Raw Q Cable	Q-12-RAW-300	300 meters of 12 AWG cable with no connectors		
Field-wireable connector (male)	Q-CONN-10M	Make connections from any open connector		
Field-wireable connector (female)	Q-CONN-10F	Make connections from any Q Cable open connector		
Cable Clip	Q-CLIP-100	Used to fasten cabling to the racking or to secure looped cabling		
Disconnect tool	Q-DISC-10	Disconnect tool for Q Cable connectors, DC connectors, and AC module mount		
Q Cable sealing caps (female)	Q-SEAL-10	One needed to cover each unused connector on the cabling		
Terminator	Q-TERM-10	Terminator cap for unused cable ends		
Enphase EN4 to MC4 adaptor <sup>1</sup>	ECA-EN4-S22	Connect PV module using MC4 connectors to IQ micros with EN4 (TE PV4-S SOLARLOK). 150mm/5.9" to MC4.		
Enphase EN4 non-terminated adaptor <sup>1</sup>	ECA-EN4-FW	For field wiring of UL certified DC connectors. EN4 (TE PV4-S SOLARLOK) to non-terminated cable. 150mm/5.9"		
Enphase EN4 to MC4 adaptor (long) <sup>1</sup>	ECA-EN4-S22-L	Longer adapter cable for EN4 (TE PV4-S SOLARLOK) to MC4. Use with split cell modules or PV modules with short DC cable. 600mm/23.6"		
Replacement DC Adaptor (MC4)	Q-DCC-2	DC adaptor to MC4 (max voltage 100 VDC)		
Replacement DC Adaptor (UTX)	Q-DCC-5	DC adaptor to UTX (max voltage 100 VDC)		

1. Qualified per UL subject 9703.

	<b>TERMINATOR</b> Terminator cap for unused cable ends, sold in packs of ten (Q-TERM-10)		<b>SEALING CAPS</b> Sealing caps for unused aggregator and cable connections (Q-BA-CAP-10 and Q-SEAL-10)
	<b>DISCONNECT TOOL</b> Plan to use at least one per installation, sold in packs of ten (Q-DISC-10)		<b>CABLE CLIP</b> Used to fasten cabling to the racking or to secure looped cabling, sold in packs of one hundred (Q-CLIP-100)

To learn more about Enphase offerings, visit [enphase.com](https://enphase.com)

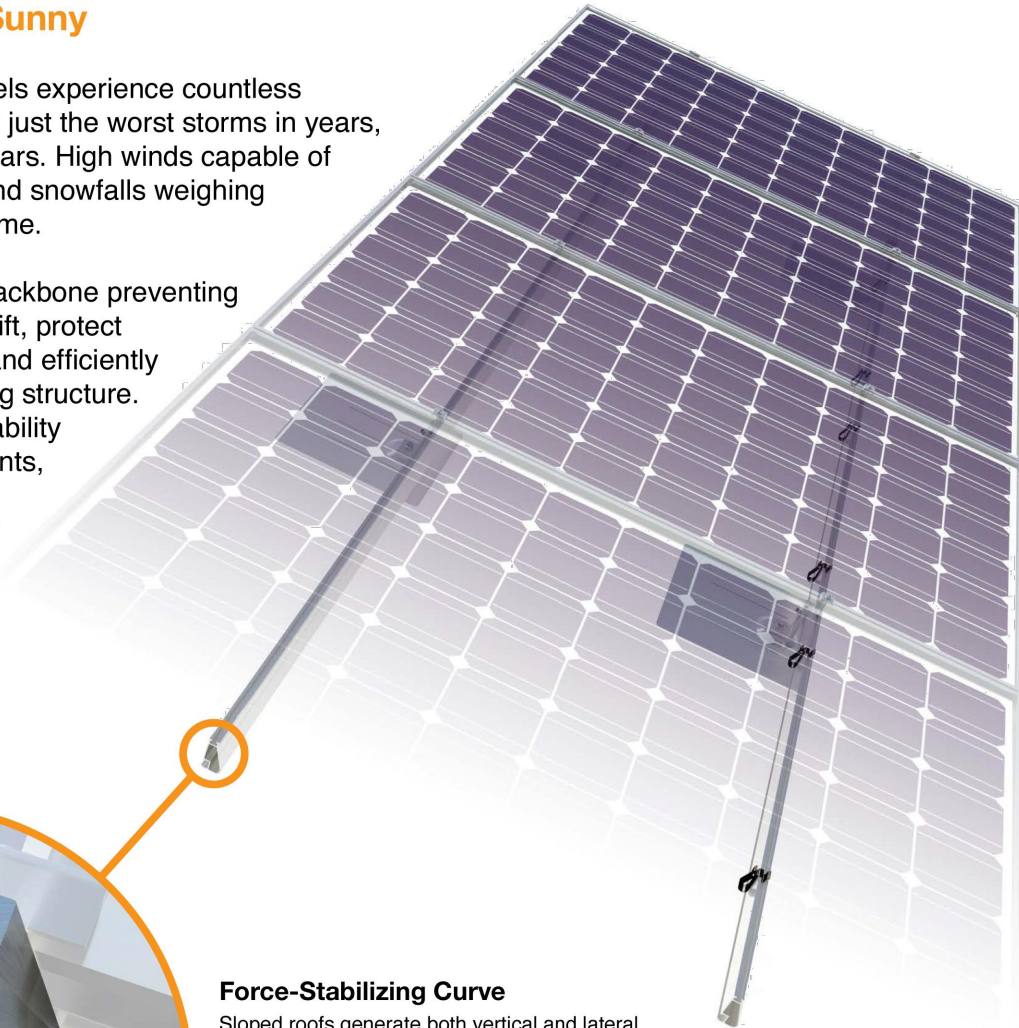
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2020-06-26

## XR Rail Family

### Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



#### Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

#### Compatible with Flat & Pitched Roofs



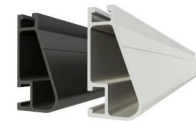
XR Rails are compatible with FlashFoot and other pitched roof attachments.



IronRidge offers a range of tilt leg options for flat roof mounting applications.

#### Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



## XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



**XR10**

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

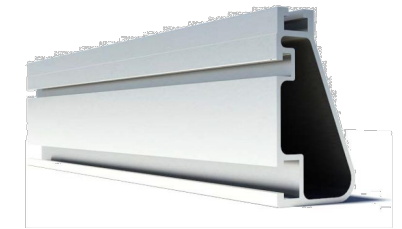
- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available



**XR100**

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



**XR1000**

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

### Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit [IronRidge.com](http://IronRidge.com) for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

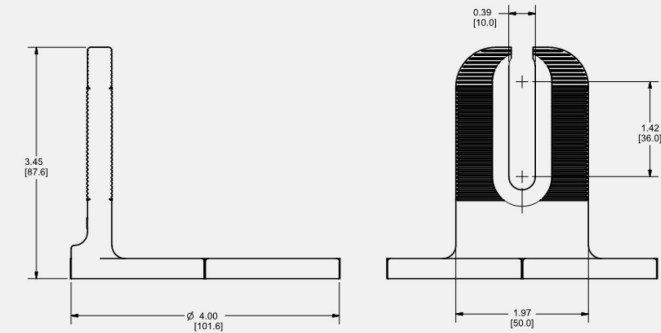


Cut Sheet

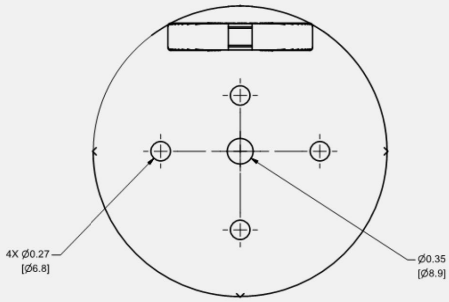
NanoMount



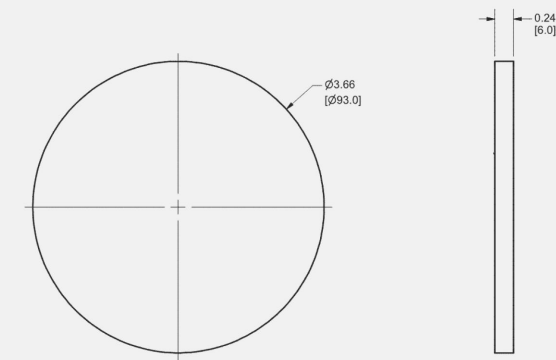
NanoMount



Material: Aluminum  
Finish: Black Powder Coating



NanoMount Gasket



Material: USWR Gasket with Adhesive

D10214-V003  
Dimensions shown are inches (and millimeters)  
Details are subject to change without notice



Cut Sheet

NanoMount Lag Bolt



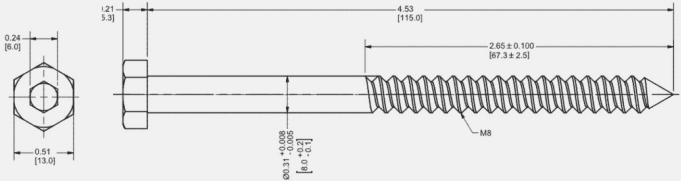
NanoMount Decking Screw



Part Number	Description
K50049-BK1	Lag Bolt Assembly <ul style="list-style-type: none"><li>Hex Lag Bolt M8X1 15, DIN 571, 304S</li><li>Sealing Washer .33 ID X .75 X .157</li></ul>
K50055-BK1	Decking Screw Assembly <ul style="list-style-type: none"><li>Self-Tapping Screw, #6.3 X 76</li><li>Sealing Washer .26ID X .50X .125</li></ul>

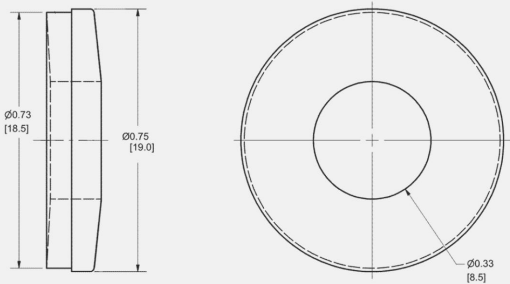
Lag Bolt Assembly

1. Hex Lag Bolt M8X1 15, DIN 571, 304



Material: Stainless Steel  
Finish: Clear

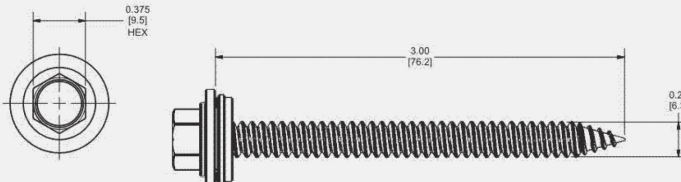
2 Sealing Washer .33ID X.75X.157



Material: EPDM + Stainless Steel

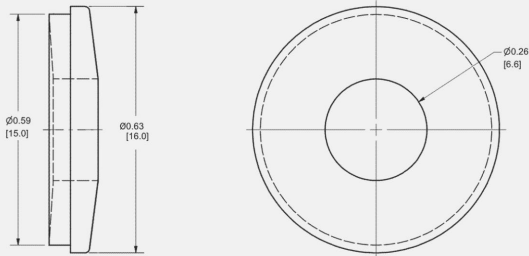
Decking Screw Assembly

1. Self-Tapping Screw, #6.3 X 76



Material: Stain  
Finish: Clear

2. Sealing Washer .26ID X .50X .125



Material: EPDM + Stainless Steel

D10214-V003  
Dimensions shown are inches (and millimeters)  
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