

PHOTOVOLTAIC ROOF MOUNT SYSTEM

21 MODULES-ROOF MOUNTED - 9.240 kWDC, 6.090 kWAC
2333 SW OLD PORT RD, LEE'S SUMMIT, MO 64082, USA



816 SOLAR PRO
7817 TROOST AVE, KANSAS CITY,
MISSOURI 64131, USA
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SYSTEM SUMMARY
(N) 21 - SILFAB SOLAR SIL-440 QD (440W) MODULES
(N) 21 - ENPHASE ENERGY IQ8PLUS-72-M-US MICRO-INVERTERS
(N) JUNCTION BOX
(N) ENPHASE IQ COMBINER BOX 5 (X-IQ-AM1-240-5)
(E) 225A MAIN SERVICE PANEL WITH (E) 200A MAIN BREAKER
(N) 60A FUSED LOCKABLE FUSED AC DISCONNECT WITH 40A FUSES
(N) PV PRODUCTION METER

INTERCONNECTION METHOD : LINE SIDE TAP

DESIGN CRITERIA
ROOF TYPE: ASPHALT SHINGLE
ROOF FRAME: 2"X6" RAFTERS + DIAGONAL BRACING
+COLLAR TIES@ 16" O.C
NUMBER OF LAYERS: 1
STORY: THREE STORY
SNOW LOAD: 20 PSF
WIND SPEED: 90 MPH
WIND EXPOSURE: C
RISK CATEGORY: II
COORDINATE: 38.881750, -94.427614

GOVERNING CODES:
2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL FUEL GAS CODE
2018 INTERNATIONAL RESIDENTIAL CODE
2018 INTERNATIONAL FIRE CODE
2017 NATIONAL ELECTRICAL CODE

SHEET INDEX

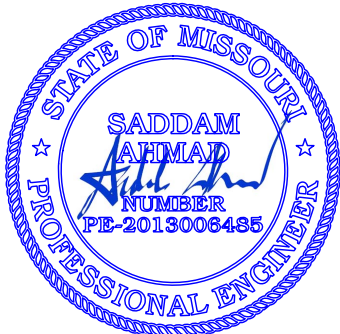
PV-0	COVER SHEET
PV-1	SITE PLAN WITH ROOF PLAN
PV-2	ROOF PLAN WITH MODULES
PV-3	ATTACHMENT DETAIL
PV-3.1	EQUIPMENT ELEVATION
PV-4	ELECTRICAL LINE DIAGRAM WITH WIRE CALCULATION
PV-5	WARNING LABELS & PLACARD
PV-6+	EQUIPMENT SPEC SHEETS

GENERAL NOTES

- THE CONTRACTOR/INSTALLER OF THE SOLAR PV SYSTEM OVER EXISTING ROOF SHALL CONFORM TO OSHA REQUIREMENTS DURING THE CONSTRUCTION PHASE. JOB SAFETY AND CONSTRUCTION PROCEDURES ARE THE SOLE RESPONSIBILITY OF TH CONTRACTOR/INSTALLER.
- REFER TO ELECTRICAL DRAWING PV-5 FOR PANEL DETAILED INFORMATION.
- IN CASE OF CONFLICT BETWEEN STRUCTURAL DRAWINGS AND ELECTRICAL DRAWINGS, THE MOST RIGID REQUIREMENTS SHALL GOVERN.
- THE CONTRACTOR/INSTALLER SHALL VERIFY ALL EXISTING BUILDING INFORMATION SHOWN (DIMENSIONS, ROOF TOP PROJECTIONS, ETC.) AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATIONS OF PV SYSTEM.
- THE CONTRACTOR/INSTALLER SHALL VERIFY AND COORDINATE EXISTING OPENINGS, ROOF TOP UNITS, VENT PIPES, ETC. SHOWN ON DRAWINGS. IF THERE IS A DISCREPANCY BETWEEN DRAWINGS, IT IS THE CONTRACTORS/INSTALLER'S RESPONSIBILITY TO NOTIFY ENGINEER PRIOR TO PERFORMING THE WORK.
- ALL CONSTRUCTION IS TO BE PERFORMED IN STRICT CONFORMANCE WITH ALL APPLICABLE TOWN, COUNTY & STATE REGULATIONS AND/OR ANY OTHER GOVERNING BODIES.
- DO NOT SCALE THESE DRAWINGS, USE DIMENSIONS. CONTRACTOR MUST CONDUCT ROOF SURVEY TO VERIFY DIMENSIONS SHOWN ON PLAN PRIOR TO INSTALLATION. IF THERE IS A DISCREPANCY IT IS CONTRACTOR/INSTALLER'S RESPONSIBILITY TO NOTIFY THE ENGINEER IMMEDIATELY.

ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE



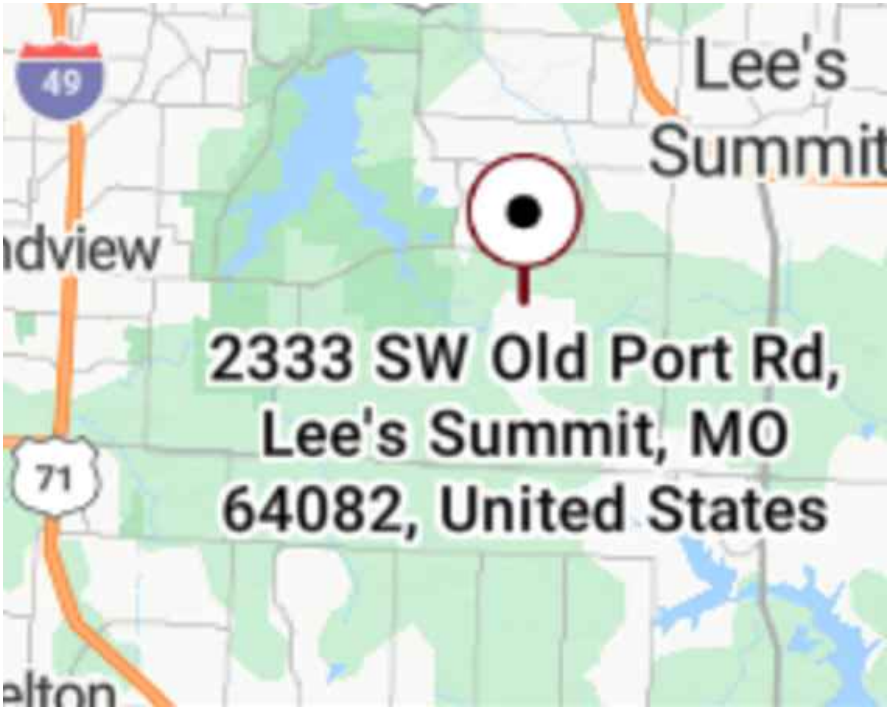
02-OCT-2025

RELEASE FOR CONSTRUCTION
AS NOTED FOR PLAN REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI

10/07/2025



1 AERIAL PHOTO
PV-0 SCALE: NTS



2 VICINITY MAP
PV-0 SCALE: NTS



VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	10-01-2025	UR

PROJECT NAME

NANCY BOGUT
2333 SW OLD PORT RD,
LEE'S SUMMIT, MO 64082, USA
UTILITY: EVERGY METRO
APN: 6922005030000000
AHJ: CITY OF LEE'S SUMMIT

SHEET NAME

COVER SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-0

● ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT 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.

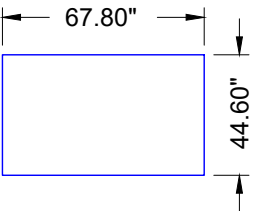
NOTE:
A. ALL ELECTRICAL EQUIPMENT, INVERTERS/COMBINER, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.

NOTE: • 3/4" OR GREATER IMC, RMC, FMC, LFMC, PVC, HDPE, NUCC, RTRC, LFNC, FMT, ENT OR EMT CONDUIT RUN EXPOSED CONDUIT RUN SHALL BE MIN. 7/8" ABOVE ROOF. * ROMEX RUN INSIDE ATTIC

NOTE: THE LOCKABLE AC DISCONNECT SHOULD BE INSTALLED WITHIN 10 FEET AND WITHIN SIGHT OF THE METER

SW OLD PORT RD

PHOTOVOLTAIC MODULES
SILFAB SOLAR SIL-440 QD (440W)





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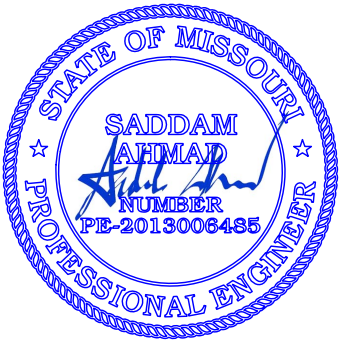
SITE PLAN WITH
ROOF PLAN

SHEET SIZE

ANSI B
11" X 17"

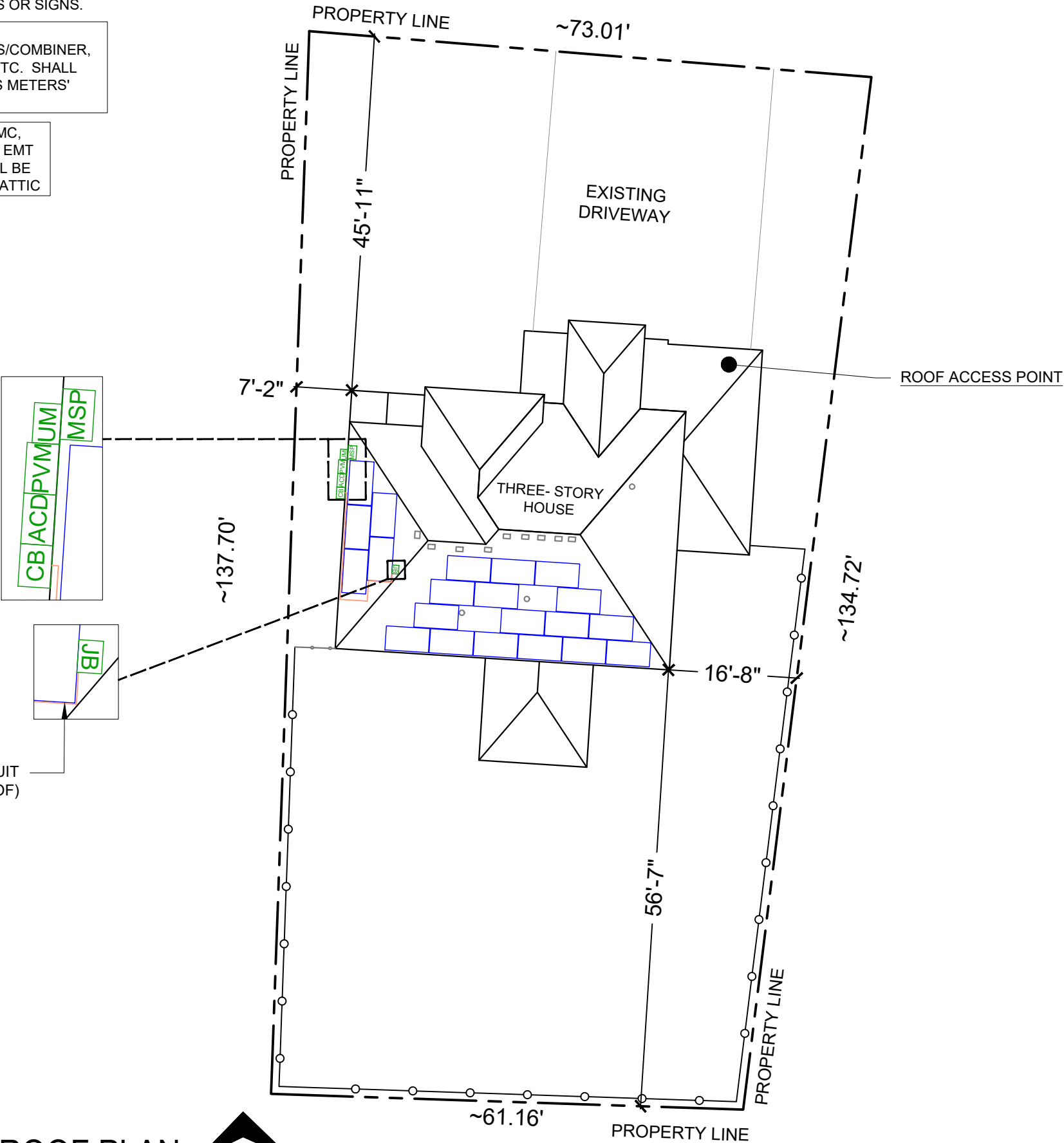
RELEASE FOR CONSTRUCTION
SHEET NUMBER
AS NOTED FOR REVIEW
DEVELOPMENT SERVICES
PV-1
LEE'S SUMMIT, MISSOURI

10/07/2025



02-OCT-2025

LEGEND	
	JUNCTION BOX
	UTILITY METER
	PV PRODUCTION METER
	LOCKABLE FUSED AC DISCONNECT
	MAIN SERVICE PANEL
	ENPHASE IQ COMBINER BOX 5
	FENCE
	GATE
	PROPERTY LINE
	CONDUIT
	VENT, ATTIC FAN (ROOF OBSTRUCTION)



(N) 3/4" OR GREATER EMT CONDUIT
RUN (7/8 INCHES ABOVE ROOF)

1 SITE PLAN WITH ROOF PLAN

SCALE: 1/16" = 1'-0"

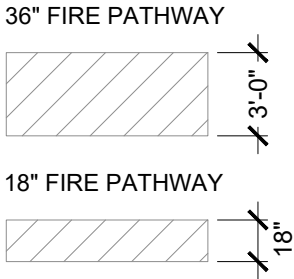


MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 21 MODULES
MODULE TYPE = SILFAB SOLAR SIL-440 QD (440W) MODULES
MODULE WEIGHT = 46.3 LBS / 21.0 KG
MODULE DIMENSIONS = 67.8" X 44.6" = 21.0 SF
UNIT WEIGHT OF ARRAY = 2.2 PSF

ARRAY AREA & ROOF AREA CALC'S		
AREA OF NEW ARRAY (Sq. Ft.)	AREA OF ROOF(PLAN VIEW) (Sq. Ft.)	TOTAL ROOF AREA COVERED BY ARRAY %
440.98	2107.46	20.92
20.92%	ROOF AREA (ARRAY <33% of ROOF AREA)	

ROOF DESCRIPTION					
ROOF TYPE			ASPHALT SHINGLE		
ROOF	# OF MODULES	ROOF TILT	AZIMUTH	RAFTERS + DIAGONAL BRACING +COLLAR TIES SIZE	RAFTERS + DIAGONAL BRACING +COLLAR TIES SPACING
#1	16	33°	184°	2" X 6"	16" O.C
#2	5	33°	274°	2" X 6"	16" O.C



(N) 3/4" OR GREATER EMT CONDUIT RUN (7/8 INCHES ABOVE ROOF)

NOTE:
A. ALL ELECTRICAL EQUIPMENT, INVERTERS/COMBINER, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.

NOTE: ○ 3/4" OR GREATER IMC, RMC, FMC, LFMC, PVC, HDPE, NUCC, RTRC, LFNC, FMT, ENT OR EMT CONDUIT RUN EXPOSED CONDUIT RUN SHALL BE MIN. 7/8" ABOVE ROOF. * ROMEX RUN INSIDE ATTIC

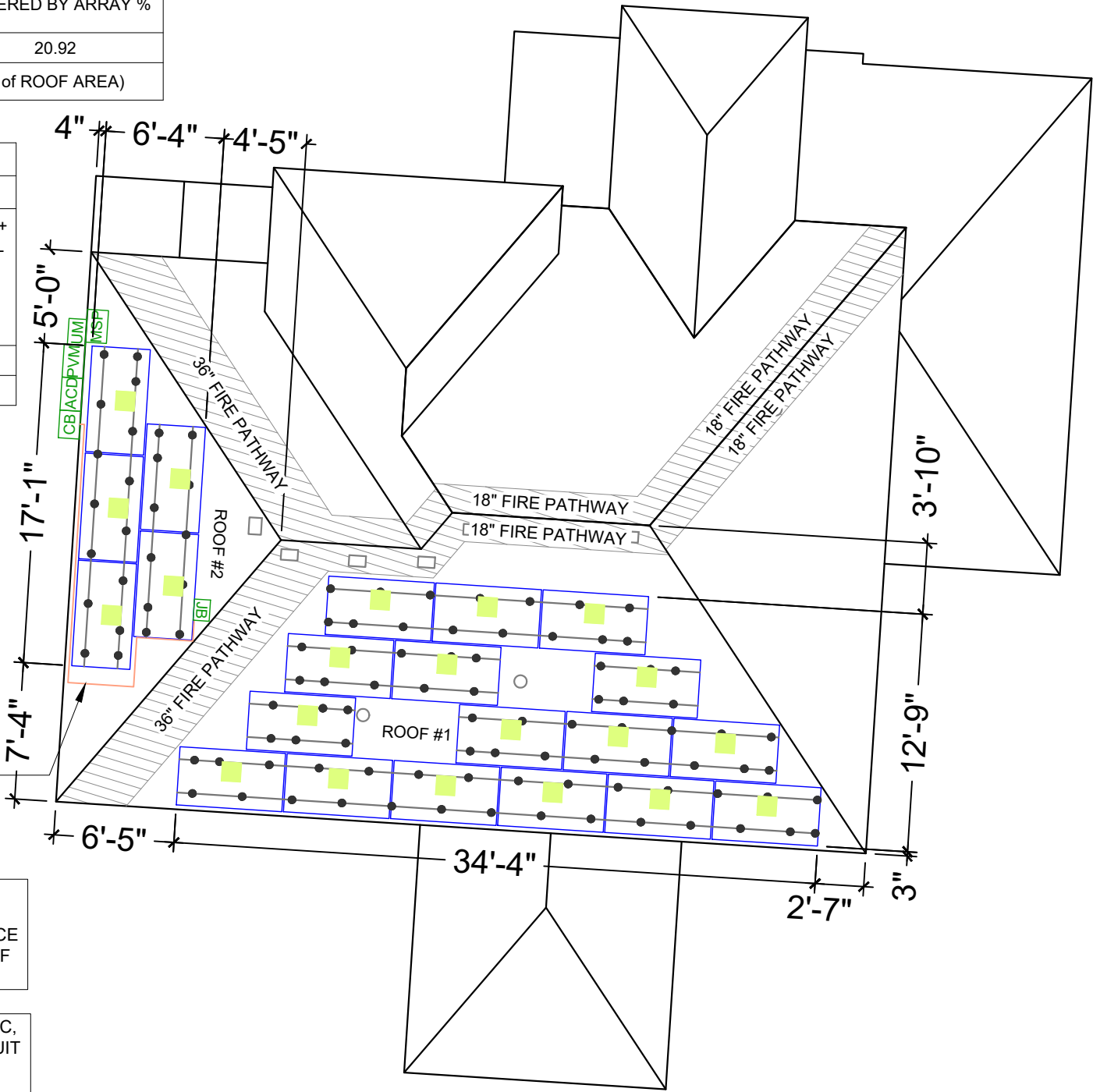
PLUMBING VENTS, SKYLIGHTS AND MECHANICAL VENTS SHALL NOT BE COVERED, MOVED, RE-ROUTED OR RE-LOCATED.

1 ROOF PLAN WITH MODULES

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



SW OLD PORT RD
FRONT YARD

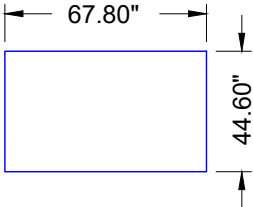


REAR YARD

NOTE: ACTUAL ROOF CONDITIONS AND RAFTERS (OR SEAM) LOCATIONS MAY VARY. INSTALL PER MANUFACTURER(S) INSTALLATION GUIDELINES AND ENGINEERED SPANS FOR ATTACHMENTS

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
RAIL	21	SUNMODO SMR100 RAIL
RAIL SPLICE	10	SUNMODO SMR 100 RAIL SPLICE
MID CLAMP	26	MODULE MID CLAMP
ATTACHMENT	106	SUNMODO NANO MOUNT (DECK MOUNT)
END CLAMP	32	MODULE END CLAMP
MLPE & GROUNDING	8	GROUND LUG

PHOTOVOLTAIC MODULES
SILFAB SOLAR SIL-440 QD (440W)



LEGEND	
JB	JUNCTION BOX
UM	UTILITY METER
PVM	PV PRODUCTION METER
ACD	LOCKABLE FUSED AC DISCONNECT
MSP	MAIN SERVICE PANEL
CB	ENPHASE IQ COMBINER BOX 5
	ENPHASE ENERGY IQ8PLUS-72-M-US MICRO INVERTER
	CONDUIT
	SUNMODO SMR100 RAIL
	ROOF ATTACHMENT SUNMODO NANO MOUNT @32" O.C (DECK MOUNT)
	VENT, ATTIC FAN (ROOF OBSTRUCTION)

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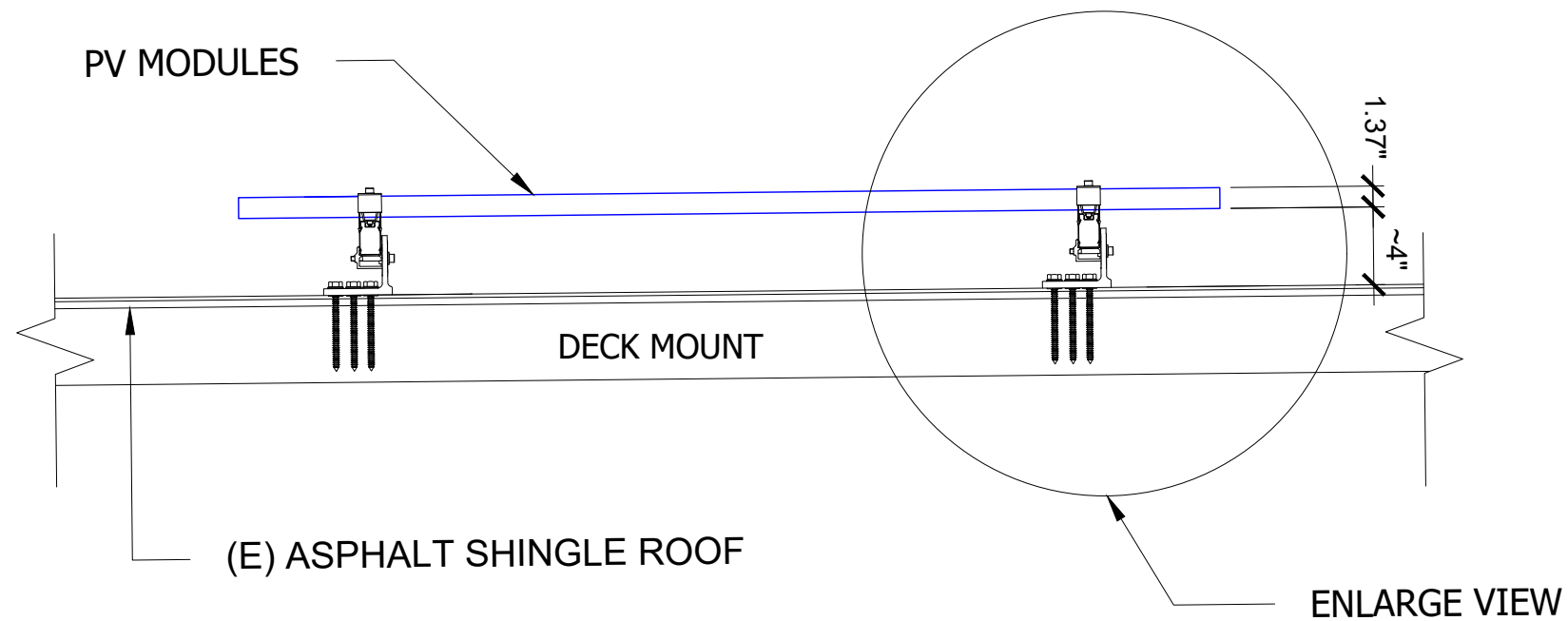
SHEET NAME

ROOF PLAN WITH
MODULES

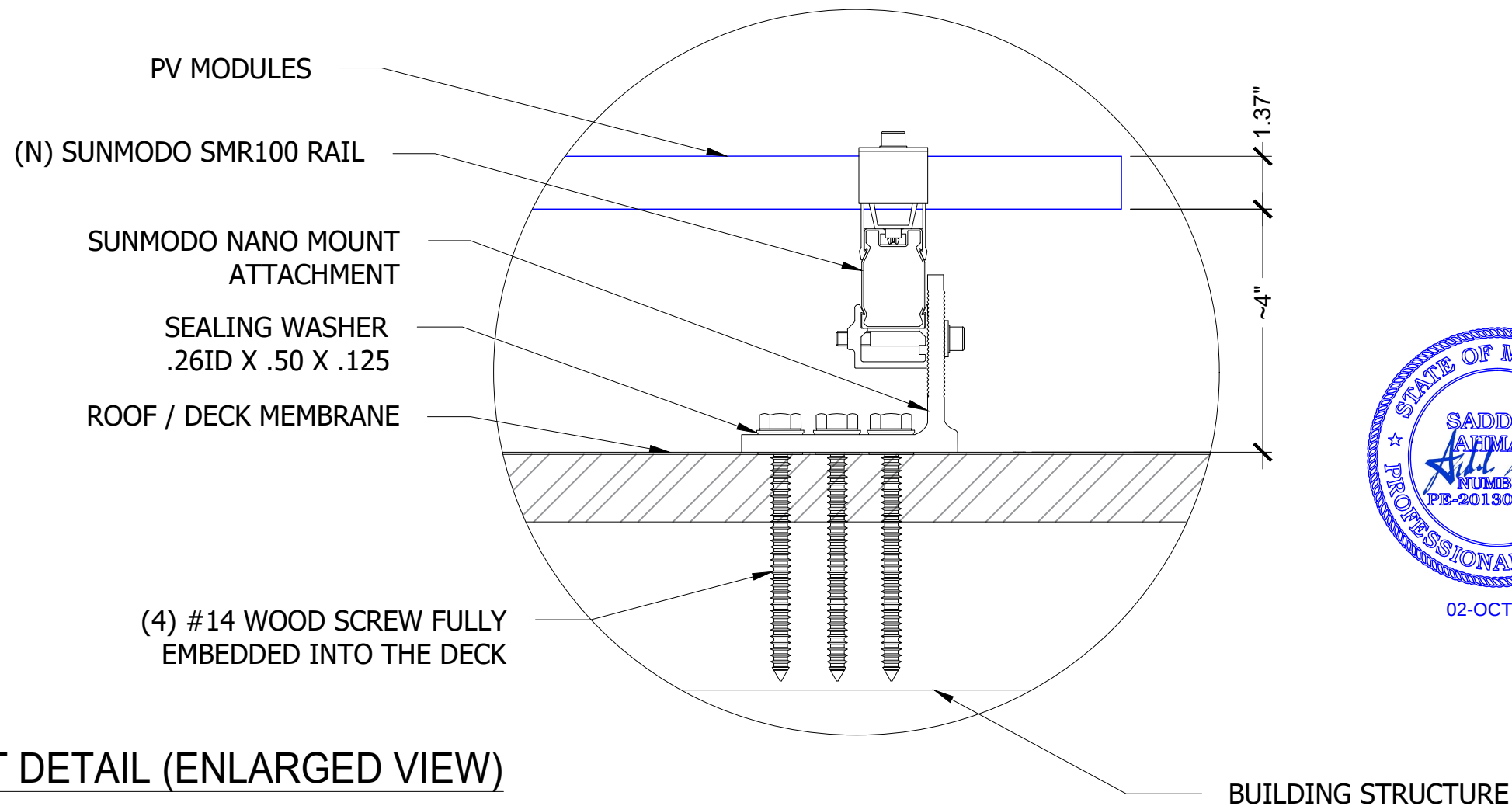
SHEET SIZE

ANSI B
11" X 17"

RELEASE FOR CONSTRUCTION
SHEET NUMBER
PV-2
10/07/2025



1 ATTACHMENT DETAIL
SCALE: NTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)
SCALE: NTS



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SHEET NAME

ATTACHMENT
DETAIL

SHEET SIZE

ANSI B
11" X 17"

RELEASE FOR CONSTRUCTION
SHEET NUMBER
PV-3
10/07/2025

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10-01-2025	UR

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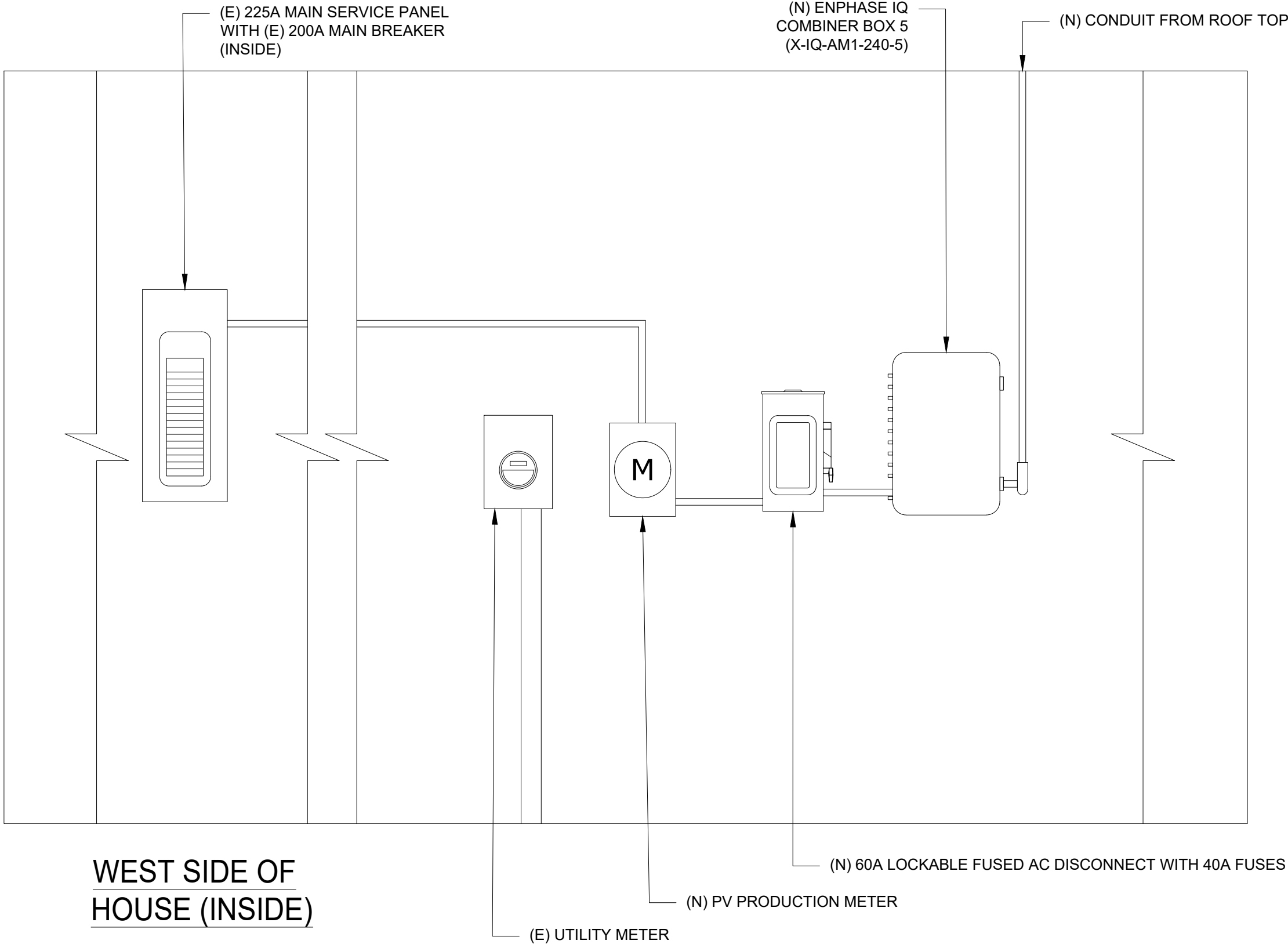
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UTILITY: EVERGY METRO
APN: 6922005030000000
AHJ: CITY OF LEE'S SUMMIT

SHEET NAME
EQUIPMENT
ELEVATION

SHEET SIZE
ANSI B
11" X 17"

RELEASE FOR CONSTRUCTION
AS SHOWN IN REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
PV-3.1

10/07/2025



WEST SIDE OF
HOUSE (INSIDE)

WEST SIDE OF HOUSE

AMBIENT TEMPERATURE SPECIFICATIONS				
RECORD LOW TEMPERATURE	AMBIENT TEMP (HIGH TEMP 2%)	CONDUIT HEIGHT	CONDUCTOR TEMPERATURE RATE (ON ROOF)	CONDUCTOR TEMPERATURE RATE (OFF ROOF)
-19°	35°	7/8"	90°	75°

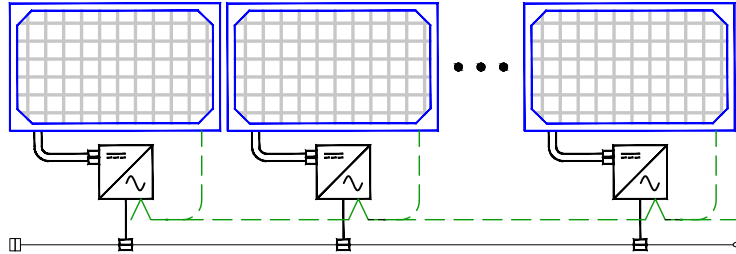
SOLAR MODULE SPECIFICATIONS						
MANUFACTURER / MODEL #	VMP (V)	IMP (A)	VOC (V)	ISC (A)	TEMPERATURE COEFFICIENT OF Voc	QUANTITY OF MODULES
SILFAB SOLAR SIL-440 QD (440W)	33.41	13.17	38.97	14.22	-0.24%/°C	21
MODULE DIMENSIONS	67.8"L x44.6"W x1.37"D					

INVERTER SPECIFICATIONS			
MANUFACTURER / MODEL #	QUANTITY	NOMINAL OUTPUT VOLTAGE	NOMINAL OUTPUT CURRENT
ENPHASE ENERGY IQ8PLUS-72-M-US	21	240VAC	1.21A

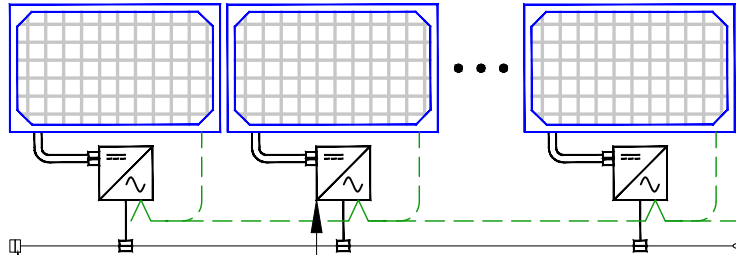
SYSTEM SIZE: 21 x 440W = 9.240 kWDC
SYSTEM SIZE: 21 X 290W = 6.090 KWAC

SERVICE FEED SOURCE: UNDERGROUND

11 MICRO-INVERTERS IN BRANCH CIRCUIT #1

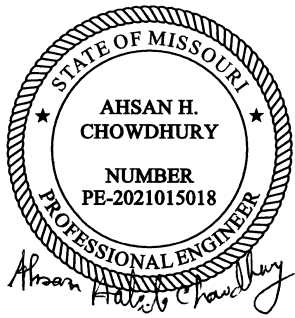


10 MICRO-INVERTERS IN BRANCH CIRCUIT #2



ENPHASE ENERGY IQ8PLUS-72-M-US
MICRO-INVERTERS

TERMINATOR CAP ON LAST CABLE
CONNECTOR IQ- CABLE (TYP)



2-OCT-2025

NOTE:
3/4" OR GREATER EMT CONDUIT RUN (7/8" ABOVE ROOF SURFACE)

NOTE: "LOAD" ON THE BOTTOM OF THE PV METER IS FOR
PV GENERATION. "LINE" ON THE TOP OF THE PV METER IS
FOR THE UTILITY.

WIRE TAG	CONDUIT	WIRE QTY	WIRE GAUGE	WIRE TYPE	TEMP. RATING	WIRE AMPACITY (A)	TEMP. DERATE	CONDUIT FILL DERATE	DERATED AMPACITY (A)	INVERTER QTY	NOC (A)	NEC	DESIGN CURRENT (A)	GROUND SIZE	GROUND WIRE TYPE
A	OPEN AIR	2	12 AWG	IQ-CABLES	90°C	30	0.96	-	28.8	11	1.21	1.25	16.64	6 AWG	BARE CU GND
B	3/4" EMT	4+G	10 AWG	THWN-2	90°C	40	0.96	0.8	30.72	11	1.21	1.25	16.64	10 AWG	THWN-2
C	3/4" EMT	3+G	8 AWG	THWN	75°C	50	0.94	1	47.0	21	1.21	1.25	31.76	10 AWG	THWN
D	3/4" EMT	3+G	6 AWG	THWN	75°C	65	0.94	1	61.1	21	1.21	1.25	31.76	8 AWG	THWN

(N) JUNCTION BOX
(NEMA 3R)

(N) ENPHASE IQ
COMBINER BOX 5
(X-IQ-AM1-240-5)

(N) 60A LOCKABLE
FUSED AC
DISCONNECT
WITH 40A FUSES

(N) PV PRODUCTION METER

BI-DIRECTIONAL
UTILITY METER
1-PHASE, 3-W,
120V/240V, 60Hz

EXISTING WIRES

(N) LINE SIDE TAP

(E) 225A MAIN
SERVICE PANEL
WITH (E) 200A
MAIN BREAKER
(TOP FED)



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SHEET NAME
**ELECTRICAL LINE
DIAGRAM WITH WIRE
CALCULATION**

SHEET SIZE

**ANSI B
11" X 17"**

RELEASE FOR CONSTRUCTION
AS NOTED FOR REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI

10/07/2025

1 ELECTRICAL LINE DIAGRAM WITH CALCULATION

SCALE: NTS

WARNING

ELECTRIC SHOCK HAZARD

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

LABEL LOCATION:
MAIN PANEL
(PER CODE: NEC 690.13(B))

WARNING

DUAL POWER SOURCE

SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
MAIN SERVICE PANEL & NET METER
(PER CODE: NEC 705.12(D)(3), NEC
705.12(B)(3-4) & NEC 690.59)

PHOTOVOLTAIC

AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT
NEC 690.13(B)

RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM

LABEL LOCATION:
RAPID SHUTDOWN
(PER CODE: NEC 690.56(C)(3))

MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT

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

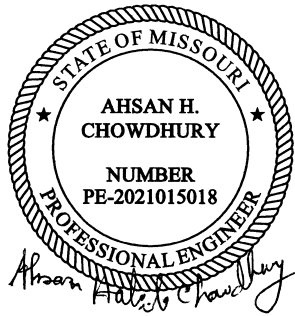
WARNING:PHOTOVOLTAIC
POWER SOURCE

LABEL LOCATION:
CONDUIT, COMBINER BOX
(PER CODE: NEC 690.31(G)(3))

PHOTOVOLTAIC SYSTEM AC DISCONNECT

RATED AC OPERATING CURRENT 25.41 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:
AC DISCONNECT & COMBINER BOX
(PER CODE: NEC690.54)

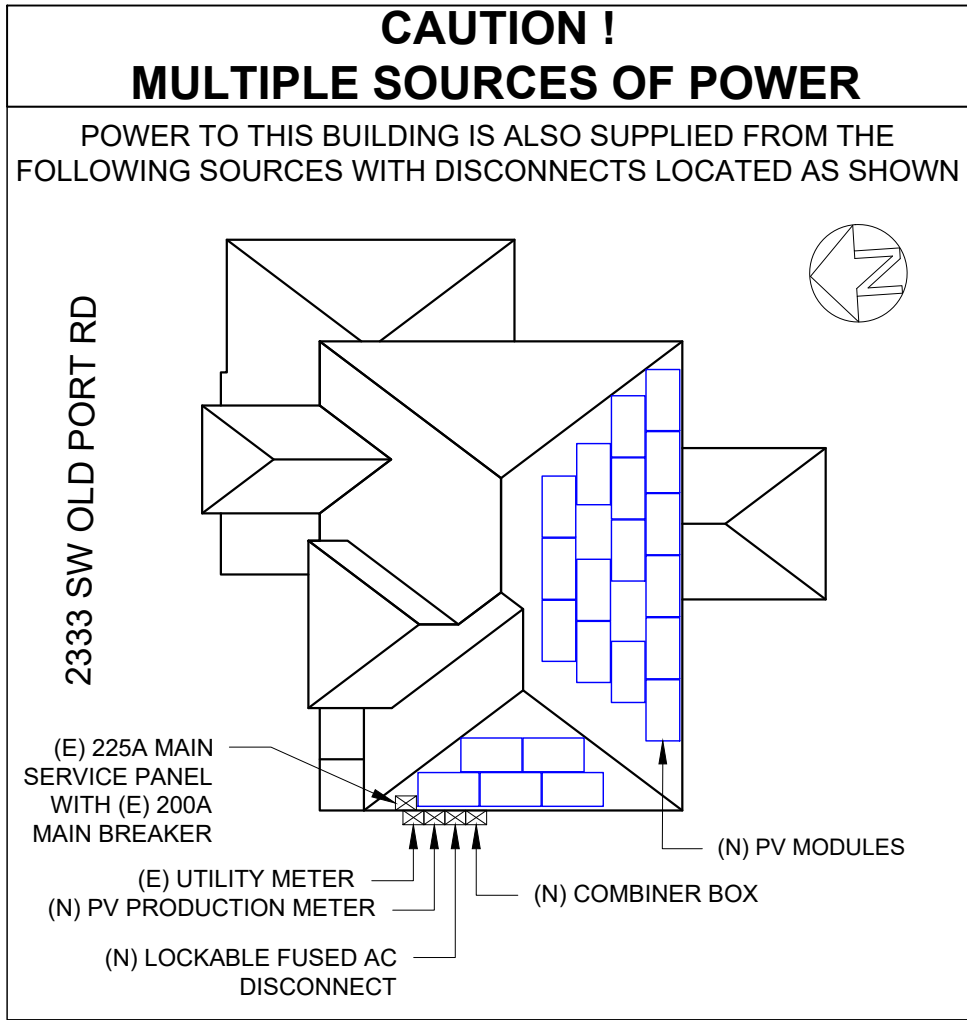


2-OCT-2025

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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

LABEL LOCATION:
AC DISCONNECT, DC DISCONNECT, POINT OF
INTERCONNECTION
(PER CODE: 605.11.3.1(1) & 690.56(C)(1)(a))



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SHEET NAME
WARNING LABELS &
PLACARD

SHEET SIZE
ANSI B
11" X 17"

RELEASE FOR CONSTRUCTION

SHEET NUMBER

PV-5

10/07/2025

SILFAB PRIME NTC

SIL-440 QD



SILFAB SOLAR®

NEXT-GENERATION N-TYPE CELL TECHNOLOGY

Improved Shade Tolerance

Improved Low-Light Performance

Increased Performance in High Temperatures

Enhanced Durability

Reduced Degradation Rate

25-Year Product Warranty/
30-Year Performance Warranty



SILFABSOLAR.COM



ELECTRICAL SPECIFICATIONS		440	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	440	328.0
Maximum power voltage (Vpmax)	V	33.41	31.17
Maximum power current (Ipmax)	A	13.17	10.52
Open circuit voltage (Voc)	V	38.97	36.64
Short circuit current (Isc)	A	14.22	11.44
Module efficiency	%	22.6%	
Maximum system voltage (VDC)	V		1000
Series fuse rating	A		25
Power Tolerance	Wp		0 to +10

Measurement conditions: STC 1000 W/m² • AM 1.5 • Temperature 25 °C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ≤ 3%
Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by 0 to +10 W.

MECHANICAL PROPERTIES / COMPONENTS	METRIC	IMPERIAL
Module weight	21 kg ± 0.2 kg	46.3 lbs ± 0.4 lbs
Dimensions (H x L x D)	1721 mm x 1133 mm x 35 mm	67.8 in x 44.6 in x 1.37 in
Maximum surface load (wind/snow)*	4000 Pa rear load / 5400 Pa front load	83.5 lb/ft² rear load / 112.8 lb/ft² front load
Hail impact resistance	ø 25 mm at 83 km/h	ø 1 in at 51.6 mph
Cells	108 Half cells - N-Type Silicon solar cell 182 mm x 91 mm	108 Half cells - N-Type Silicon solar cell 7.16 in x 3.58 in
Glass	3.2 mm high transmittance, tempered, antireflective coating	0.126 in high transmittance, tempered, antireflective coating
Cables and connectors (refer to installation manual)	1350 mm, ø 5.7 mm, MC4 from Staubli	53.1 in, ø 0.22 in (12 AWG), MC4 from Staubli
Backsheet	High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet	
Frame	Anodized aluminum (Black)	
Junction Box	UL 3730 Certified, IEC 62790 Certified, IP68 rated, 3 diodes	

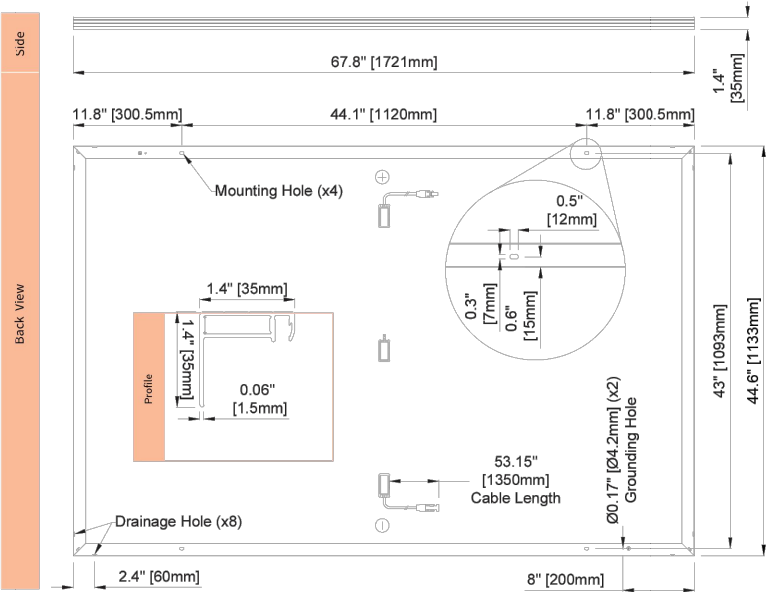
TEMPERATURE RATINGS		WARRANTIES	
Temperature Coefficient Isc	0.04 %/°C	Module product workmanship warranty	25 years**
Temperature Coefficient Voc	-0.24 %/°C	Linear power performance guarantee	30 years
Temperature Coefficient Pmax	-0.29 %/°C		≥ 98% end 1st yr ≥ 94.7% end 12th yr ≥ 90.8% end 25th yr ≥ 89.3% end 30th yr
NOCT (± 2 °C)	45 °C		
Operating temperature	-40/+85 °C		

CERTIFICATIONS		SHIPPING SPECS	
Product	UL 61215, UL 61730, CSA C22.2#61730, IEC 61215, IEC 61730, IEC 61701 (Salt Mist Corrosion), IEC 62716 (Ammonia Corrosion), CEC Listed, UL Fire Rating: Type 2	Modules Per Pallet:	26 or 26 (California)
		Pallets Per Truck	32 or 30 (California)
Factory	ISO9001:2015	Modules Per Truck	832 or 780 (California)

* ⚠ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.
** 12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at silfabsolar.com.
PAN files generated from 3rd party performance data are available for download at: silfabsolar.com/downloads.

Side

Back View



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VERSION		
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2333 SW OLD PORT RD,
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UTILITY: EVERGY METRO
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AHJ: CITY OF LEE'S SUMMIT

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
14" X 17"

RELEASE FOR CONSTRUCTION

SHEET NUMBER

AS-BUILT REVIEW

DEVELOPMENT SERVICES

PV-6

LEE'S SUMMIT, MISSOURI

10/07/2025

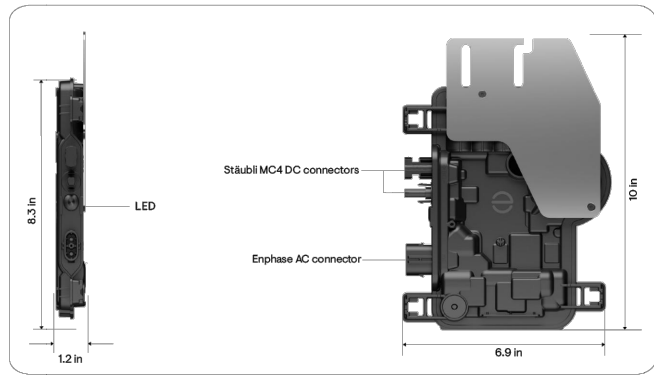


IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters^{1,2,3} are the industry's first microgrid-forming⁴, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently.



Key specifications	IQ8-60-M-US	IQ8PLUS-72-M-US
Peak output power	245 VA	300 VA
Nominal grid voltage (L-L)	240 V, split-phase (L-L), 180°	
Nominal frequency	60 Hz	60 Hz
CEC weighted efficiency	97%	97%
Maximum input DC voltage	50 V	60 V
MPPT voltage range	27–37 V	27–45 V
Maximum module I _{sc}	20 A	20 A
Ambient temperature range	–40°C to 60°C (–40°F to 140°F)	



¹ IQ8 Series Microinverters can be added to existing IQ7 systems on the same IQ Gateway only in the following grid-tied configurations: Solar Only or Solar + Battery (IQ Battery 3T/10T and IQ Battery 5P) without backup.
² IQ7 Series Microinverters cannot be added to a site with existing IQ8 Series Microinverters on the same gateway. Mixed system of IQ7 and IQ8 will not support IQ8-specific PCS features and grid-forming capabilities.
³ IQ Microinverters ship with default settings that meet North America's IEEE 1547 interconnection standard requirements. Region-specific adjustments may be requested by an Authority Having Jurisdiction (AHJ) or utility representative, according to the IEEE 1547 interconnection standard. Use an IQ Gateway to make these changes during installation.
⁴ Meets UL 1741 only when installed with IQ System Controller 2 or 3.
⁵ IQ8 and IQ8+ support split-phase, 240 V installations only.

Simple

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

Reliable

- Produce power even when the grid is down
- More than one million cumulative hours of testing
- Industry-leading limited warranty of up to 25 years
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Compliant with the latest advanced grid support⁵
- 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 3rd Ed.)

Input data (DC)	Units	IQ8-60-M-US	IQ8PLUS-72-M-US
Commonly used module pairings ⁶	W	235–350	235–440
Module compatibility	–	To meet compatibility, PV modules must be within maximum input DC voltage and maximum module I _{sc} . Module compatibility can be checked at https://enphase.com/installers/microinverters/calculator .	
MPPT voltage range	V	27–37	27–45
Operating range	V	16–48	16–58
Minimum/Maximum start voltage	V	22/48	22/58
Maximum input DC voltage	V	50	60
Maximum continuous input DC current	A	10	12
Maximum input DC short-circuit current	A	25	
Maximum module I _{sc}	A	20	
Overvoltage class DC port	–	II	
DC port backfeed current	mA	0	
PV array configuration	–	Ungrounded array; no additional DC side protection required; AC side protection requires maximum 20 A per branch circuit.	

Output data (AC)	Units	IQ8-60-M-US	IQ8PLUS-72-M-US
Peak output power	VA	245	300
Maximum continuous output power	VA	240	290
Nominal grid voltage (L-L)	V	240, split-phase (L-L), 180°	
Minimum and Maximum grid voltage ⁷	V	211–264	
Maximum continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	47–68	
AC short-circuit fault current over three cycles	Arms	2	
Maximum units per 20 A (L-L) branch circuit ⁸	–	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	
Nighttime power consumption	mW	23	25
Mechanical data		IQ8-60-M-US	IQ8PLUS-72-M-US
Ambient temperature range		–40°C to 60°C (–40°F to 140°F)	

⁶ No enforced DC/AC ratio.
⁷ Nominal voltage range can be extended beyond nominal if required by the utility.
⁸ Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.



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PV-7
LEE'S SUMMIT, MISSOURI

10/07/2025



DATA SHEET



X-IQ-AM1-240-5-HDK
X-IQ-AM1-240-5C-HDK
X-IQ-AM1-240-5
X-IQ-AM1-240-5C

IQ Combiner 5/5C

The IQ Combiner 5/5C consolidates interconnection equipment into a single enclosure and streamlines IQ Series Microinverters and IQ Gateway installation by providing a consistent, pre-wired solution for residential applications. IQ Combiner 5/5C uses wired control communication and is compatible with IQ System Controller 3/3G and IQ Battery 5P.

The IQ Combiner 5/5C, IQ Series Microinverters, IQ System Controller 3/3G, and IQ Battery 5P provide a complete grid-agnostic Enphase Energy System.



IQ Series Microinverters
The high-powered smart grid-ready IQ Series Microinverters (IQ6, IQ7, and IQ8 Series) simplify the installation process.



IQ System Controller 3/3G
Provides microgrid interconnection device (MID) functionality by automatically detecting grid failures and seamlessly transitioning the home energy system from grid power to backup power.



IQ Battery 5P
Fully integrated AC battery system. Includes six field-replaceable IQ8D-BAT Microinverters.



IQ Load Controller
Helps prioritize essential appliances during a grid outage to optimize energy consumption and prolong battery life.



5-year limited warranty



*For country-specific warranty information, see the <https://enphase.com/installers/resources/warranty> page.

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Smart

- Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect (CELLMODEM-M1-06-SP-05), only with IQ Combiner 5C
- Supports flexible networking: Wi-Fi, Ethernet, or cellular
- Provides production metering (revenue grade) and consumption monitoring

Easy to install

- Mounts to one stud with centered brackets
- Supports bottom, back, and side conduit entries
- Supports up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV branch circuits
- Factory installed hold-down kit
- Bluetooth-based Wi-Fi provisioning for easy Wi-Fi setup

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- 5-year limited warranty
- 2-year labor reimbursement program coverage included for IQ Combiner SKUs*
- UL1741 Listed

IQ Combiner 5/5C

MODEL NUMBER

IQ Combiner 5
(X-IQ-AM1-240-5/ X-IQ-AM1-240-5-HDK)

IQ Combiner 5 with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes a silver solar shield to deflect heat. IQ-AM1-240-5-HDK includes a factory installed hold-down kit compatible with all the circuit breakers mentioned in the **Accessories and Replacement Parts** section.

IQ Combiner 5C
(X-IQ-AM1-240-5C / X-IQ-AM1-240-5C-HDK)

IQ Combiner 5C with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05)¹. Includes a silver solar shield to deflect heat. IQ-AM1-240-5C-HDK includes a factory installed hold-down kit compatible with all the circuit breakers mentioned in the **Accessories and Replacement Parts** section.

WHAT'S IN THE BOX

IQ Gateway printed circuit board	IQ Gateway is the platform for total energy management for comprehensive, remote maintenance, and management of the Enphase Energy System
Busbar	80 A busbar with support for one IQ Gateway breaker and four 20 A breakers for installing IQ Series Microinverters and IQ Battery 5P
IQ Gateway breaker	Circuit breaker, 2-pole, 10 A/15 A
Production CT	Pre-wired revenue-grade solid-core CT, accurate up to ±0.5%
Consumption CT	Two consumption metering clamp CTs, shipped with the box, accurate up to ±2.5%
IQ Battery CT	One battery metering clamp CT, shipped with the box, accurate up to ±2.5%
CTRL board	Control board for wired communication with IQ System Controller 3/3G and the IQ Battery 5P
Enphase Mobile Connect (only with IQ Combiner 5C)	4G-based LTE-M1 cellular modem (CELLMODEM-M1-06-SP-05) with a 5-year T-Mobile data plan
Accessories kit	Spare control headers for the COMMS-KIT-2 board

ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)

CELLMODEM-M1-06-SP-05	4G-based LTE-M1 cellular modem with a 5-year T-Mobile data plan
CELLMODEM-M1-06-AT-05	4G-based LTE-M1 cellular modem with a 5-year AT&T data plan
Circuit breakers (off-the-shelf)	Supports Eaton BR2XX, Siemens Q2XX, and GE/ABB THQL21XX Series circuit breakers (XX represents 10, 15, 20, 30, 40, 50, or 60). Also supports Eaton BR220B, BR230B, and BR240B circuit breakers compatible with the hold-down kit.
Circuit breakers (provided by Enphase)	BRK-10A-2-240V, BRK-15A-2-240V, BRK-20A-2P-240V, BRK-15A-2P-240V-B, and BRK-20A-2P-240V-B (more details in the "Accessories" section)
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 5/5C
XA-ENV2-PCBA-5	IQ Gateway replacement printed circuit board (PCB) for IQ Combiner 5/5C
X-IQ-NA-HD-125A	Hold-down kit compatible with Eaton BR-B Series circuit breakers (with screws). Not required for X-IQ-AM1-240-5-HDK/X-IQ-AM1-240-5C-HDK.
XA-COMMS2-PCBA-5	Replacement COMMS-KIT-2 printed circuit board (PCB) for IQ Combiner 5/5C

ELECTRICAL SPECIFICATIONS

Rating	80 A
System voltage and frequency	120/240 VAC or 120/208 VAC, 60 Hz
Busbar rating	125 A
Fault current rating	10 kAIC
Maximum continuous current rating (input from PV/storage)	64 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR, Siemens Q, or GE/ABB THQL Series distributed generation (DG) breakers only (not included)
Maximum total branch circuit breaker rating (input)	80 A of distributed generation/95 A with IQ Gateway breaker included
IQ Gateway breaker	10 A or 15 A rating GE/Siemens/Eaton included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway

¹ A plug-and-play industrial-grade cell modem for systems of up to 60 microinverters. Available in the United States, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.

IQC-5-5C-DSH-00007-6.0-EN-US-2024-09-30

IQC-5-5C-DSH-00007-6.0-EN-US-2024-09-30



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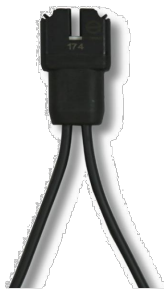
RELEASE FOR CONSTRUCTION
SHEET NUMBER
PV-8
DESIGN SERVICES
LEE'S SUMMIT, MISSOURI

10/07/2025



Enphase IQ Cable accessories

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



Enphase IQ Cable

- Two-wire, double-insulated Enphase IQ 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



IQ Field Wireable Connectors

- Easily connect IQ 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 IQ Cable accessories



CONDUCTOR SPECIFICATIONS			
Certification	UL 3003 (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.		
IQ CABLE TYPES/ORDERING OPTIONS			
Connectorized models	Size/Maximum nominal voltage	Connector spacing	Connector count per box
Q-12-10-240	12 AWG/277 VAC	1.3 m (4.2 ft)	240
Q-12-12-240	12 AWG/277 VAC	1.5 m (4.9 ft)	240
Q-12-17-240	12 AWG/277 VAC	2.0 m (6.5 ft)	240
Q-12-18-240	12 AWG/277 VAC	2.1 m (6.9 ft)	240
Q-12-20-200	12 AWG/277 VAC	2.3 m (7.5 ft)	200
Q-12-22-200	12 AWG/277 VAC	2.5 m (8.2 ft)	200
Q-12-25-200	12 AWG/277 VAC	2.8 m (9.1 ft)	200
ENPHASE IQ CABLE ACCESSORIES			
Name	Model number	Description	
IQ Raw Cable	Q-12-RAW-300	300 meters of 12 AWG cable with no connectors	
IQ Field Wireable Connector (male)	Q-CONN-10M	Make connections from any open connector	
IQ Field Wireable Connector (female)	Q-CONN-10F	Make connections from any IQ Cable open connector	
IQ Cable Clip	Q-CLIP-100	Used to fasten cabling to the racking or to secure looped cabling	
IQ Disconnect Tool	Q-DISC-10	IQ Disconnect tool for IQ Cable connectors, DC connectors, and AC module mount	
IQ Sealing Caps (female)	Q-SEAL-10	One needed to cover each unused connector on the cabling	
IQ Terminator	Q-TERM-10	IQ Terminator for unused cable ends	
Enphase EN4 to MC4 adapter (150 mm) ¹	ECA-EN4-S22	Connect PV module using MC4 connectors to IQ Microinverters with EN4 (TE PV4-S SOLARLOK) 150 mm/5.9" to MC4	
Enphase EN4 to MC4 adapter (1000 mm) ²	ECA-EN4-S22-10-12	Connect PV module using MC4 connectors to IQ Microinverters with EN4 (TE PV4-S SOLARLOK) 1000 mm/39.4" to MC4	
Enphase EN4 to MC4 adapter (1800 mm) ²	ECA-EN4-S22-18-12	Connect PV module using MC4 connectors to IQ Microinverters with EN4 (TE PV4-S SOLARLOK) 1800 mm/70.9" to MC4	
Enphase EN4 to non-terminated extension cable ³	ECA-EN4-FW-12	For field wiring of UL-certified DC connectors. EN4 to non-terminated cable, 150 mm/5.9"	
Enphase EN4 non-terminated adapter ¹	ECA-EN4-FW	For field wiring of UL-certified DC connectors. EN4 (TE PV4-S SOLARLOK) to non-terminated cable 150 mm/5.9"	
Enphase EN4 to MC4 adapter (600 mm) ³	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 600 mm/23.6"	
Enphase EN4 to MC4 adapter (57 mm) ²	ECA-EN4-S22-12	Connect PV module using MC4 connectors to IQ Microinverters with EN4 (TE PV4-SSOLARLOK) 57mm/2.24" to MC4	
Enphase EN4 to non-terminated extension cable (1000 mm) ³	ECA-EN4-FW-10-12	For field wiring of UL-certified DC connectors. EN4 to non-terminated cable, 1000 mm/39.4"	
Replacement DC adapter (MC4) ²	Q-DCC-2	DC adapter to MC4 (max voltage 100 VDC)	
Replacement DC adapter (UTX) ¹	Q-DCC-5	DC adapter to UTX (max voltage 100 VDC)	
Replacement DC adapter (MC4) IQ8P Microinverters ²	Q-DCC-2-P	DC Adapter to MC4 (max voltage 100 VDC) for IQ8P Microinverter	
Enphase MC4 to non-terminated extension cable (1000 mm) ³	ECA-S22-FW-12	For field wiring of UL-certified DC connectors. MC4 to non-terminated cable, 1000 mm/39.4"	
Enphase MC4 to MC4 extention cable (1000 mm) ²	ECA-S22-S22-10-12	MC4 to MC4 extension cable to connect PV module to DC adapter (MC4) or IQ Microinverters with MC4, 1000 mm/39.4"	



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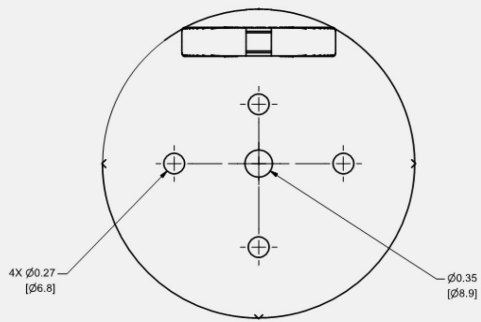
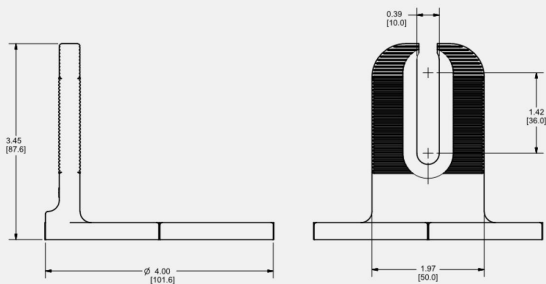
NanoMount®



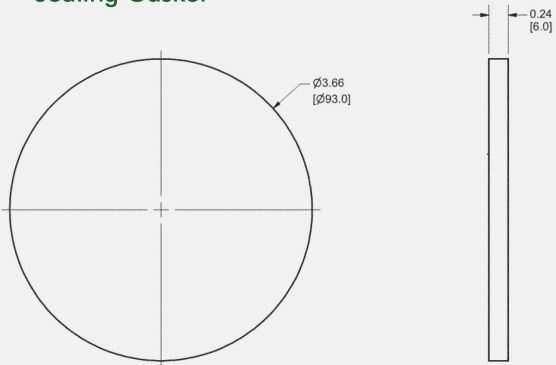
Part Number	Description
K50063-BK1	NanoMount® - NanoMount - Sealing Gasket

See Published data for allowable loads. Care should be taken to avoid concentrated loads during installation.

NanoMount®



Sealing Gasket



Material: Aluminum and Neoprene

Dimensions shown are inches (and millimeters)

Details are subject to change without notice



Lag Bolt Assembly



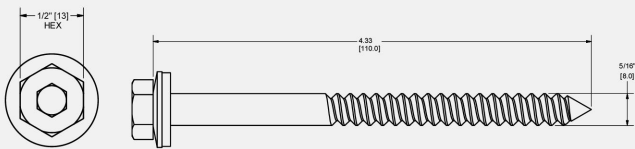
Decking Screw Assembly



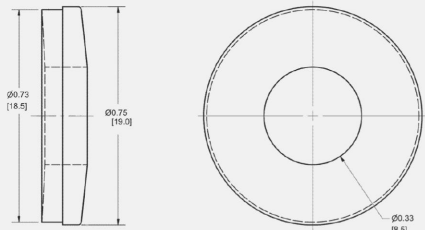
Item No.	Part Number	Description
1	K50049-BK1	Lag Bolt Assembly - M8X110 Hex Head Lag Bolt - Sealing Washer
2	K50055-BK2	Decking Screw Assembly #14 X 3" Self-Tapping Screw - Sealing Washer

Cut Sheet

1. M8X110 Hex Head Lag Bolt

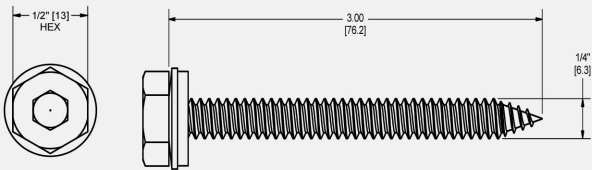


Sealing Washer

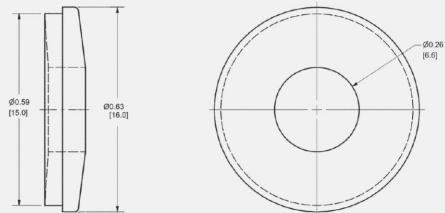


Material: Stainless Steel and EPDM

2. #14 X 3" Self-Tapping Screw



Sealing Washer



Material: Stainless Steel and EPDM

Dimensions shown are inches (and millimeters)

Details are subject to change without notice



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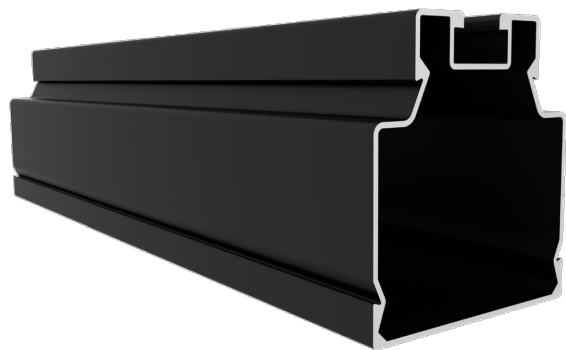
10/07/2025



SMR100 Rail



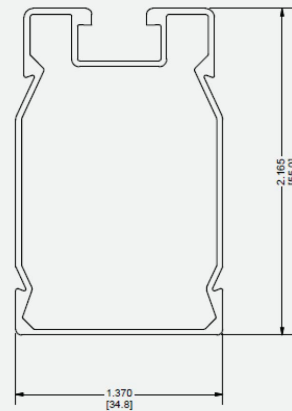
SMR200 Rail



Part Number	Description
A20422-168-BK	SMR100 Rail, Black Anodized, 168"
A20431-168-BK	SMR200 Rail, Black Anodized, 168"
A20440-BK1	SMR100 Rail End Cap, Black
A20440-BK2	SMR200 Rail End Cap, Black

Cut Sheet

SMR100 Rail



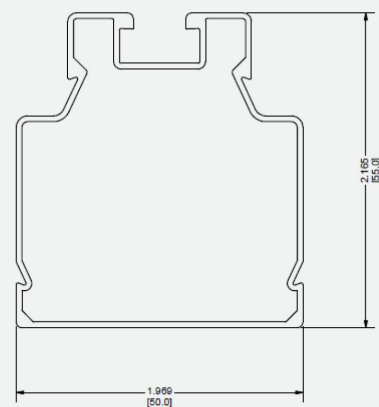
Mechanical Properties

Material: 6005-T5 Aluminum
Weight: 0.4126 lbs/ft (0.614 kg/m)
Ultimate Tensile Strength: 37.7 ksi (260 MPa)
Yield Strength: 34.8 ksi (240 MPa)

Section Properties

Sx: 0.196 in³ (3.21 cm³)
Sy: 0.146 in³ (2.39 cm³)
Area (X-section): 0.352 in² (2.27 cm²)

SMR200 Rail



Mechanical Properties

Material: 6005-T5 Aluminum
Weight: 0.453 lbs/ft (0.626 kg/m)
Ultimate Tensile Strength: 37.7 ksi (260 MPa)
Yield Strength: 34.8 ksi (240 MPa)

Section Properties

Sx: 0.223 in³ (3.74 cm³)
Sy: 0.189 in³ (3.10 cm³)
Area (X-section): 0.388 in² (1.22 cm²)

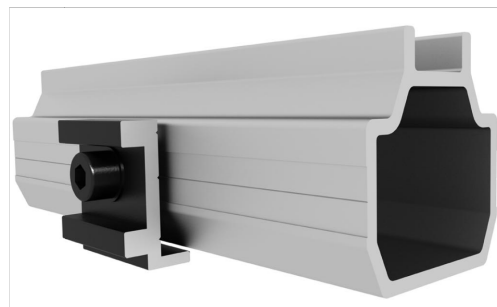
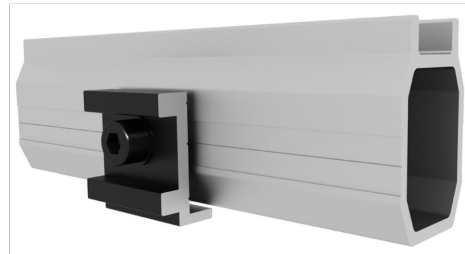
D10225-V001

Dimensions shown are inches (and millimeters)

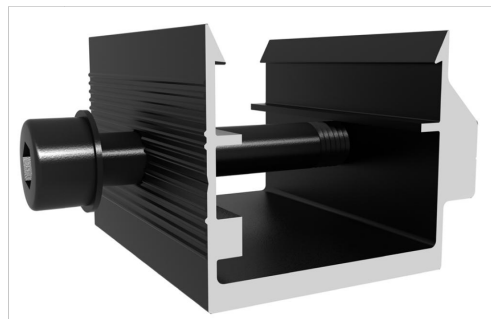
Details are subject to change without notice



SMR Rail Splices



L-Foot Adaptors

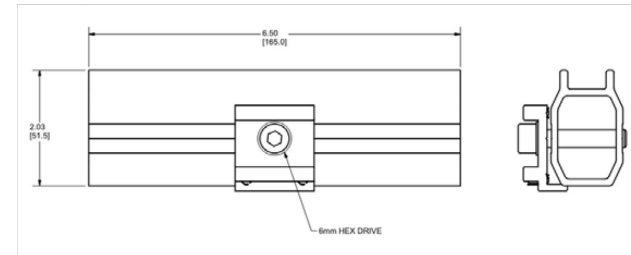


Part Number	Description
K10421-BK1	SMR100 Structural Bonding Rail Splice
K10427-BK1	SMR200 Structural Bonding Rail Splice
K10433-BK1	SMR100 L-Foot Adaptor
K10434-BK1	SMR200 L-Foot Adaptor

Cut Sheet

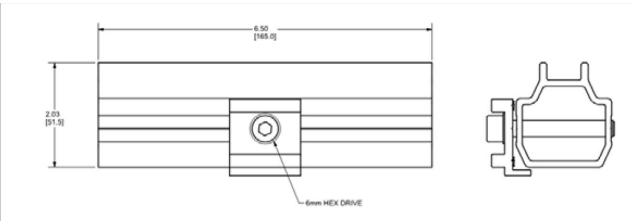
SMR100 Bonding Rail Splice

Material: Aluminum



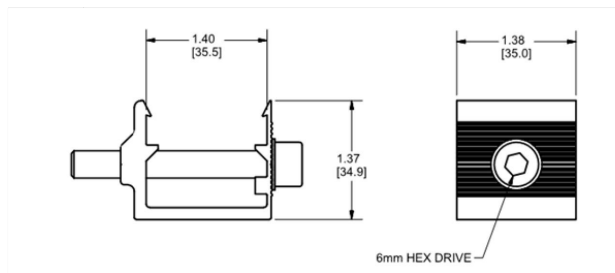
SMR200 Bonding Rail Splice

Material: Aluminum



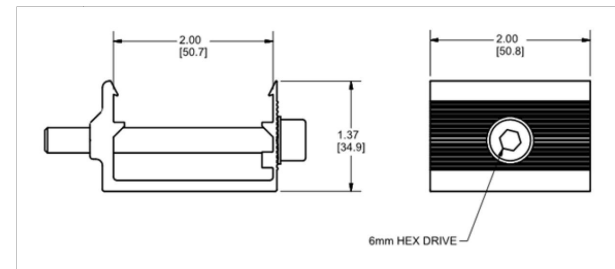
SMR 100 L-Foot Adaptor

Material: Aluminum



SMR 200 L-Foot Adaptor

Material: Aluminum



D10225-V001

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VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	10-01-2025	UR

PROJECT NAME

NANCY BOGUT
2333 SW OLD PORT RD,
LEE'S SUMMIT, MO 64082, USA
UTILITY: EVERGY METRO
APN: 6922005030000000
AHJ: CITY OF LEE'S SUMMIT

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
11" X 17"

RELEASE FOR CONSTRUCTION

SHEET NUMBER

AS-BUILT REVIEW

DEVELOPMENT SERVICES

LEE'S SUMMIT, MISSOURI

10/07/2025



Pop-On Mid Clamp



Pop-On End Clamp



Shared Rail Mid/End Clamp

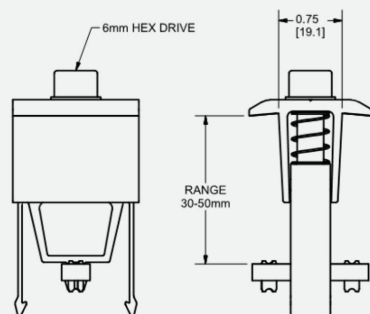


Part Number	Description
K10417-BK1	Pop-On Bonding Mid Clamp, Black
K10418-BK1	Pop-On End Clamp, Black
K10419-BK1	Shared Rail Bonding Mid Clamp, Black
K10420-BK1	Shared Rail End Clamp, Black

Cut Sheet

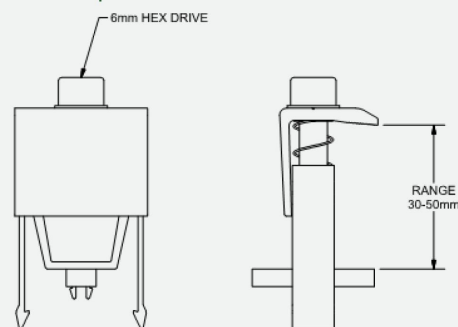
Pop-On Bonding Mid Clamp

Material: Aluminum



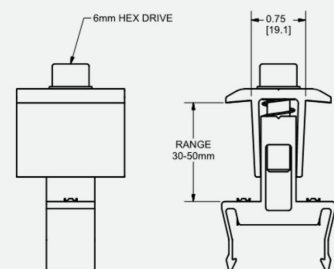
Pop-On End Clamp

Material: Aluminum



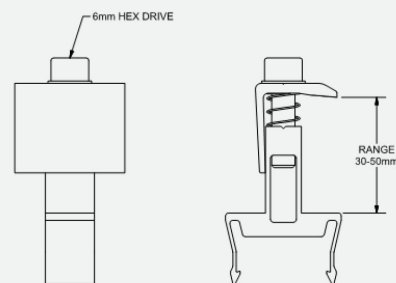
Shared Rail Bonding Mid Clamp

Material: Aluminum



Shared Rail End Clamp

Material: Aluminum



D10225-V001

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SunDock Rail-Free Accessories



Parts Description:
Top Mount Cable Clip



Parts Description:
Side Mount Cable Clip



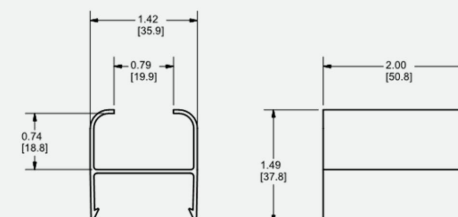
Parts Description:
Microinverter Mount

Part Number	Description
A20408-001	Top Mount Cable Clip
A20427-BK1	Side Mount Cable Clip (SMR100)
A20434-BK1	Side Mount Cable Clip (SMR200)
K50052-001	Microinverter Mount Kit

Cut Sheet

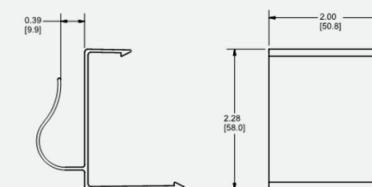
Top Mount Cable Clip

Material: Aluminum



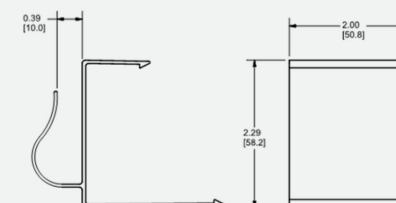
Side Mount Cable Clip (SMR100)

Material: Aluminum



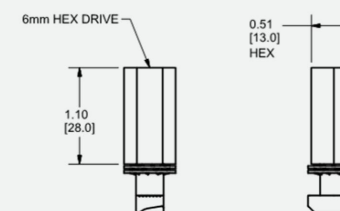
Side Mount Cable Clip (SMR200)

Material: Aluminum



Microinverter Mount

Material: Aluminum



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