

PATEL RESIDENCE

PHOTOVOLTAIC SYSTEM
2012 NE BLUESTONE DRIVE,
LEE'S SUMMIT, MO 64064 USA

SYSTEM SIZE: 6.15 KW-DC | 4.88 KW-AC
MODULE: (15) VSUN VSUN410-132BMH (410W) MODULES
INVERTER: (15) ENPHASE IQ8M-72-M-US MICRO-INVERTERS

SYSTEM SUMMARY:

- (N) 15 - VSUN VSUN410-132BMH (410W) MODULES
- (N) 15 - ENPHASE IQ8M-72-M-US MICRO-INVERTERS
- (N) JUNCTION BOX
- (E) 200A MAIN SERVICE PANEL WITH (E) 200A MAIN BREAKER
- (N) 30A FUSED AC DISCONNECT
- (N) ENPHASE IQ COMBINER BOX
- (N) PV PRODUCTION METER

DESIGN CRITERIA:

ROOF TYPE: - COMP. SHINGLE
ROOF FRAME: - 2"X6" RAFTER @ 16" O.C.
STORY: - TWO STORY
SNOW LOAD :- 20 PSF
WIND SPEED :- 110 MPH
WIND EXPOSURE:- B
RISK CATEGORY:- II
COORDINATE:- 38.99069, -94.331602

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 THE CONTRACTOR/INSTALLER.
- REFER TO ELECTRICAL DRAWING PV-4 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.
- LOCATED IN AREAS NOT REQUIRING PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS DOORS OR WINDOWS.
- LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES, OR SIGNS.
- DISCONNECT MEANS MUST HAVE DEDICATED CLEAR UNOBSTRUCTED WORKING SPACE NOT LESS THAN 3' DEEP BY 2.5' WIDE TO NOT LESS THAN 6.5' ABOVE WALKABLE SURFACES IN FRONT OF DISTRIBUTION PANEL.
- ALL SOLAR MODULES, EQUIPMENT, AND METALLIC COMPONENTS TO BE BONDED.
- PV ARRAY NOT TO EXCEED HIGHEST POINT OF THE ROOF.
- RAPID SHUTDOWN IS ACTIVATED AT THE INVERTER BY THE AC DISCONNECT.

GOVERNING CODES:

- 2017 NATIONAL ELECTRIC CODE (NEC)
- 2018 INTERNATIONAL BUILDING CODES (IBC)
- 2018 INTERNATIONAL RESIDENTIAL CODE (IRC)
- 2018 INTERNATIONAL FIRE CODE (IFC)
- 2018 INTERNATIONAL PLUMBING CODE (IPC)
- 2018 INTERNATIONAL MECHANICAL CODE (IMC)
- 2018 INTERNATIONAL FUEL GAS CODE (IFGC)

SHEET INDEX

PV-0	COVER SHEET
PV-1	SITE PLAN
PV-2	ROOF PLAN WITH MODULES
PV-2A	BRANCH LAYOUT
PV-3	ATTACHMENT DETAILS
PV-4	ELECTRICAL LINE DIAGRAM WITH CALCULATION
PV-5	PLACARD
PV-6+	SPEC SHEETS



SHINNOVA SOLAR
CONTRACTOR ADDRESS:-
1136 ADAMS STREET,
KANSAS CITY, KS
USA 66103
CONTRACTOR LICENSE:
NO- 2022014055

REVISIONS

DESCRIPTION	DATE	REV	REV BY
INITIAL	09.17.2024	V0	HF

PROJECT NAME & ADDRESS

PATEL RESIDENCE
2012 NE BLUESTONE DRIVE
LEE'S SUMMIT MO 64064 USA
PHONE NO: 361-207-3638
APN: N/A
AHJ: CITY OF LEE'S SUMMIT

DATE: 09.17.2024

SHEET NAME
COVER SHEET

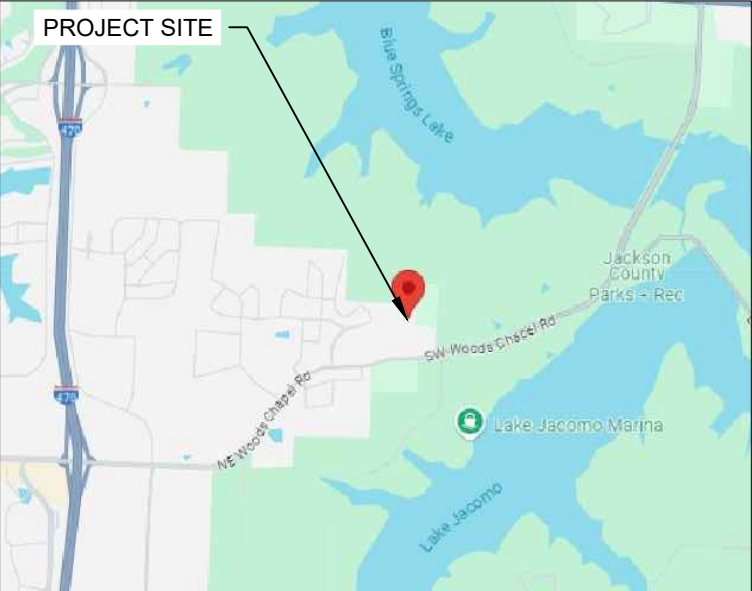
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-0

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
10/07/2024 4:15:11



1
PV-0
HOUSE PHOTO
SCALE: NTS



2
PV-0
VICINITY MAP
SCALE: NTS

● **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, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.

NOTE:
3/4" OR GREATER EMT CONDUIT RUN INSIDE ATTIC

THERE IS NO FENCE OR GATE IN THIS PROPERTY



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SHEET NAME

SITE PLAN

SHEET SIZE

ANSI B

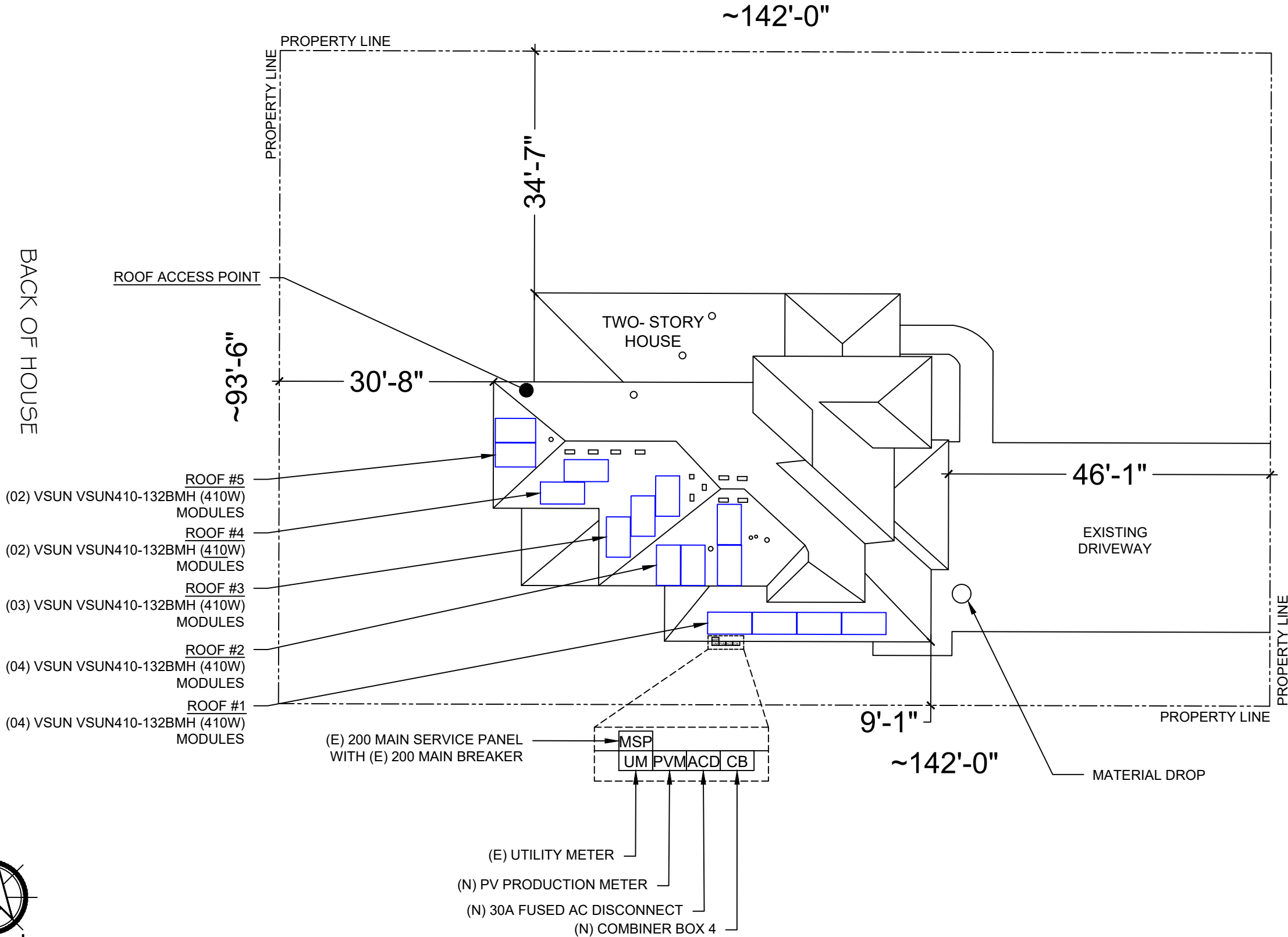
11" X 17"

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

10/07/2024 4:15:12

BACK OF HOUSE

NE BLUESTONE DRIVE
FRONT OF HOUSE



1

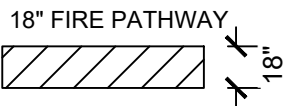
SITE PLAN

PV-1

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

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

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



ROOF DESCRIPTION				
ROOF TYPE			COMP. SHINGLE ROOF	
ROOF	ROOF TILT	AZIMUTH	RAFTER SIZE	RAFTER SPACING
#1	24°	180°	2"X6"	16" O.C.
#2	24°	180°	2"X6"	16" O.C.
#3	24°	180°	2"X6"	16" O.C.
#4	24°	180°	2"X6"	16" O.C.
#5	24°	180°	2"X6"	16" O.C.

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
TOTAL ROOF AREA COVERED BY ARRAY		326.25	2819.52	12

LEGEND	
UM	UTILITY METER
MSP	MAIN SERVICE PANEL
ACD	AC DISCONNECT
CB	COMBINER BOX
JB	JUNCTION BOX
PVM	PRODUCTION METER
	K2-EVEREST CROSSRAIL 44-X
●	ROOF ATTACHMENT
○ □	VENT, ATTIC FAN (ROOF OBSTRUCTION)
---	RAFTER
▨	FIRE PATHWAY

NOTE: 3/4" OR GREATER EMT CONDUIT RUN INSIDE ATTIC

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
RAIL	9	K2-EVEREST CROSSRAIL 44-X RAIL @166"
SPLICE	00	BND SPLICE
MID CLAMP	10	MID CLAMP
END CLAMP	40	END CLAMPS
ATTACHMENT	55	FLEXFOOT2 ATTACHMENTS
GROUNDING LUG	10	GROUND LUG

MODULE TYPE, DIMENSIONS & WEIGHT	
NUMBER OF MODULES:	15 MODULES
MODULE TYPE:	VSUN VSUN410-132BMH (410W)
MODULE WEIGHT:	48.28LBS
MODULE DIMENSIONS:	75.91" X 41.26" X 1.38"
UNIT WEIGHT OF AREA:	2.22 PSF

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	04	87.00	215.66	40.34
#2	04	87.00	238.26	36.52
#3	03	87.00	165.05	52.71
#4	02	87.00	149.75	58.10
#5	02	87.00	93.34	93.21



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SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B

11" X 17"

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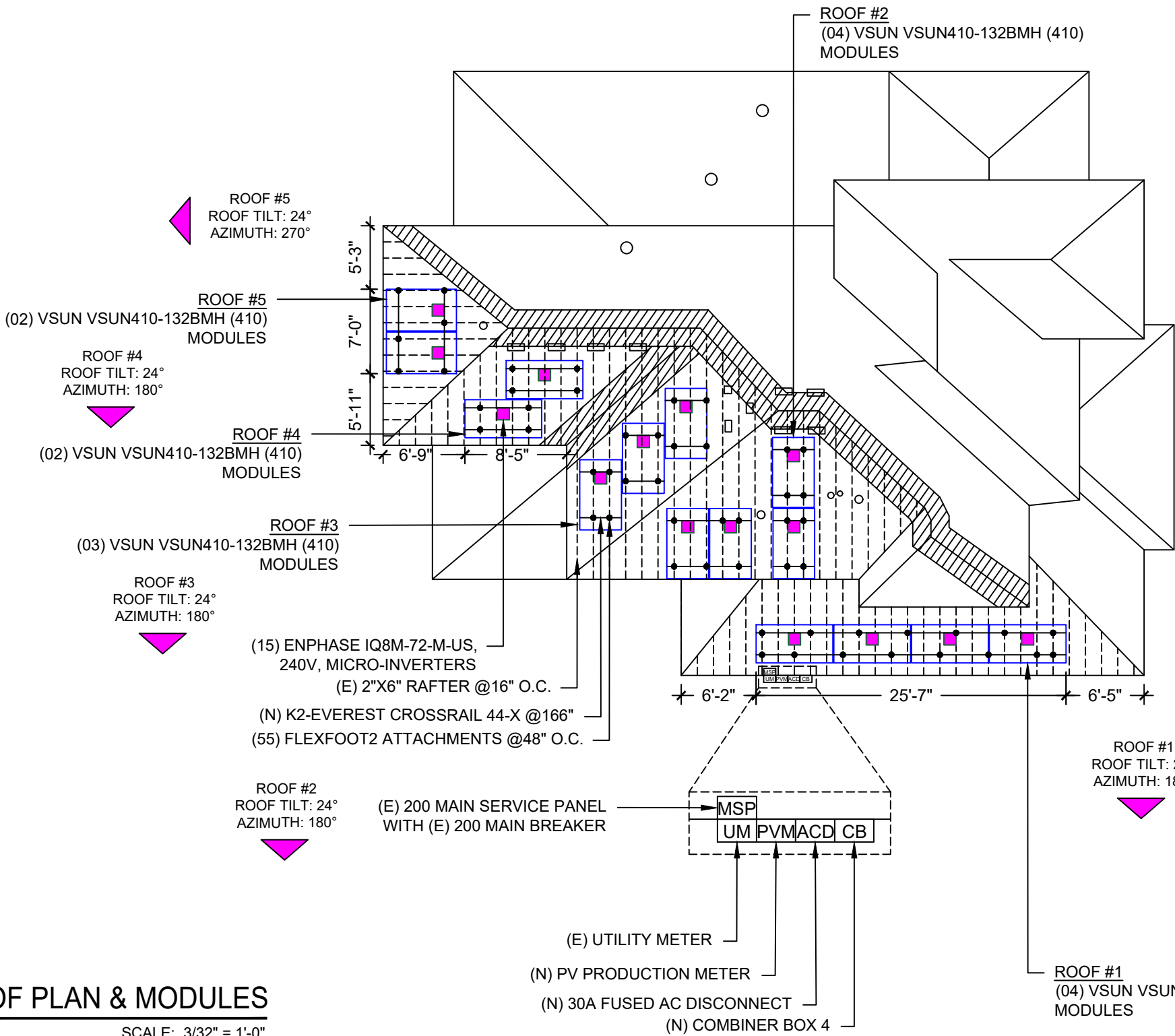


1

ROOF PLAN & MODULES

PV-2

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



- #1 MODULE BRANCH CIRCUIT

- #2 MODULE BRANCH CIRCUIT

18" FIRE PATHWAY

18"



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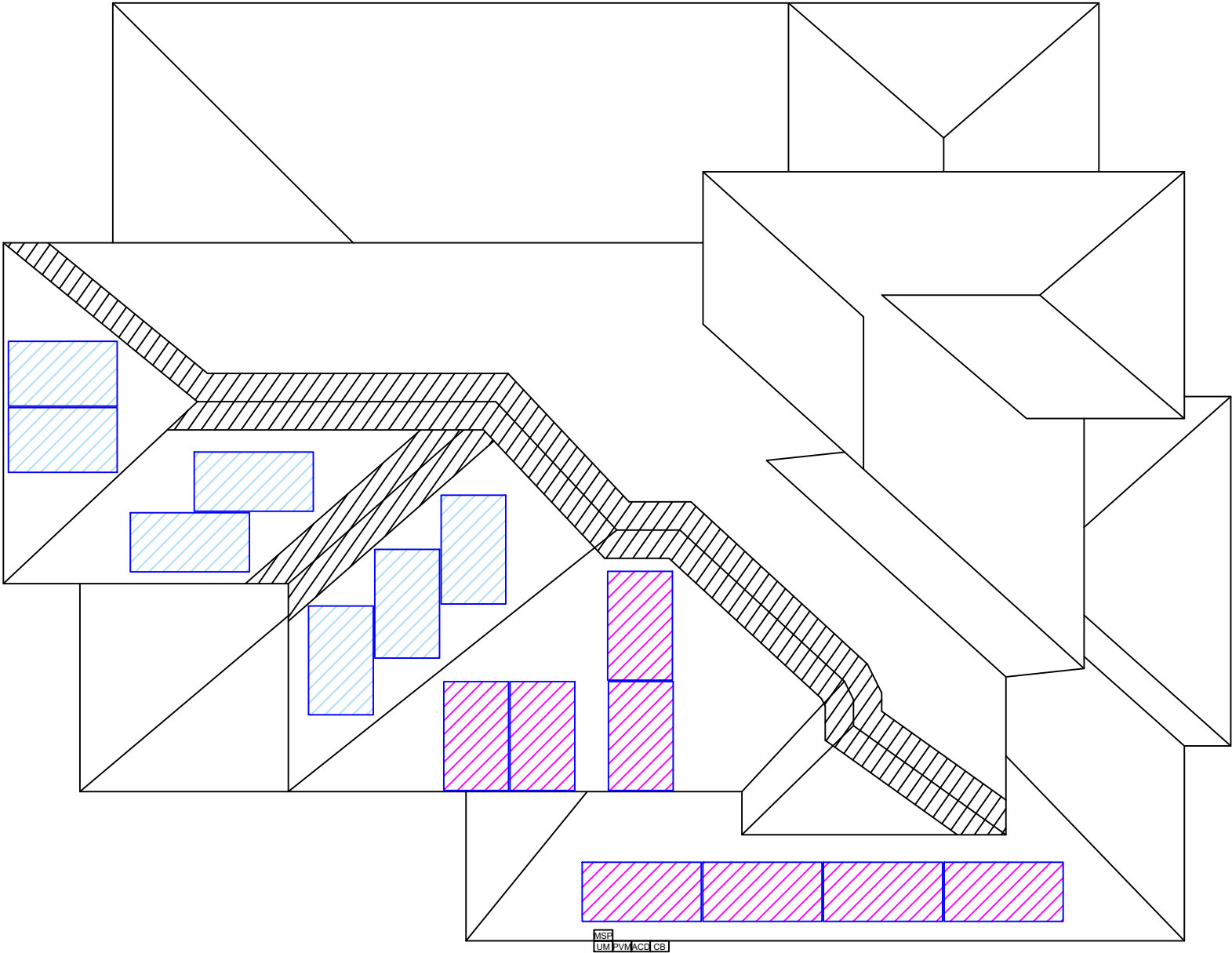
SHEET NAME
BRANCH
LAYOUT

SHEET SIZE
ANSI B

11" X 17"

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

10/07/2024 4:15:12



NE BLUESTONE DRIVE



1

BRANCH LAYOUT

PV-2A

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

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



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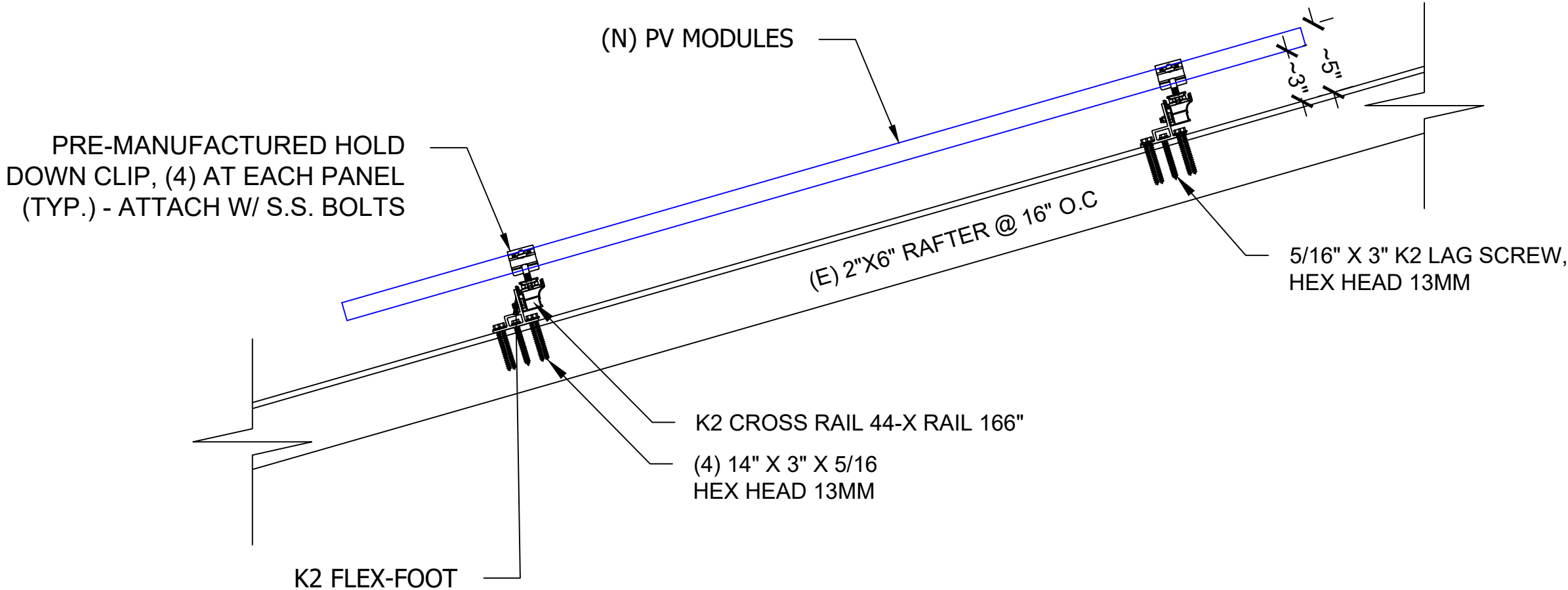
SHEET NAME
ATTACHMENT
DETAILS

SHEET SIZE
ANSI B

11" X 17"

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
PV-3

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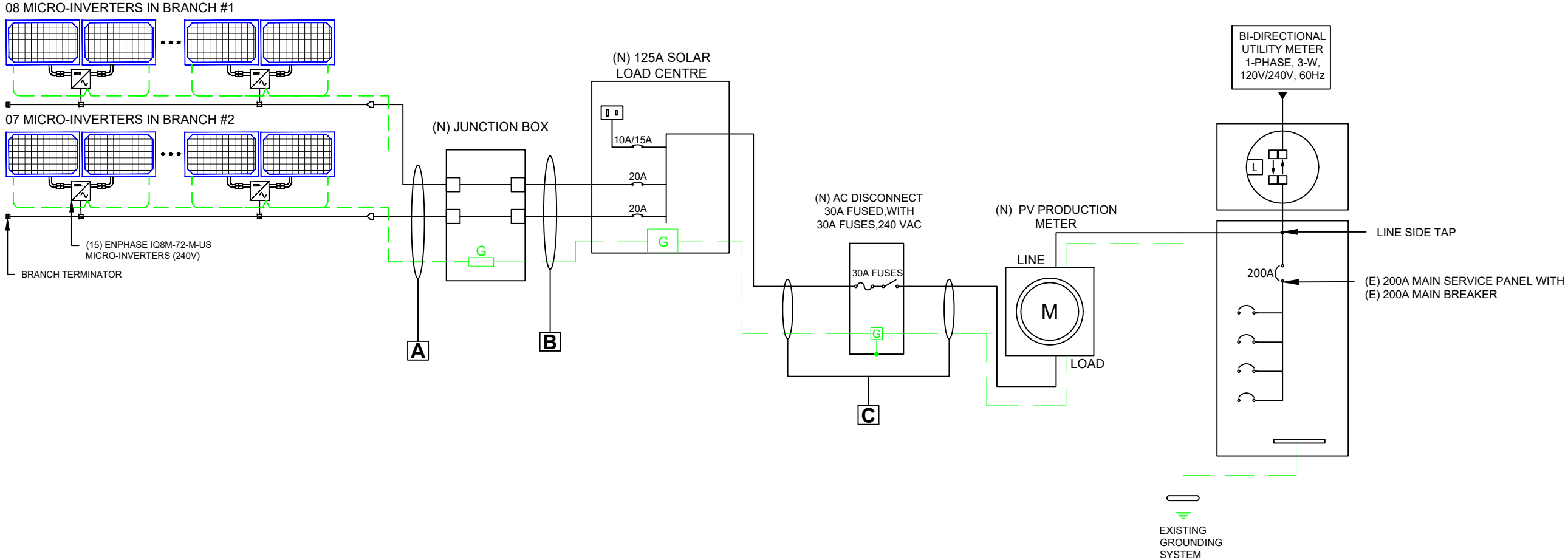


WIRE TAG	CONDUIT	WIRE GAUGE	WIRE QTY	WIRE TYPE	TEMP. RATING	WIRE AMPACITY (A)	TEMP. DERATE	CONDUIT FILL DERATE	DERATED AMPACITY (A)	INVERTER QTY.	DESIGN CURRENT (A)	GROUND SIZE	GROUND WIRE TYPE
A	OPEN AIR	12 AWG	1	TRUNK CABLE	90°C	30	0.96	N/A	28.80	8	10.80	06 AWG	BARE CU GND
B	3/4" EMT	10 AWG	2	THWN-2	90°C	40	0.96	1.0	38.40	8	10.80	10 AWG	THWN-2
C	3/4" EMT	10 AWG	3	THWN	75°C	35	0.94	1.0	32.90	15	20.25	08 AWG	THWN

SOLAR MODULE SPECIFICATIONS						
MANUFACTURER / MODEL #	VMP	IMP	VOC	ISC	TEMPERATURE COEFFICIENT OF Voc	# OF MODULES
VSUN VSUN410-132BMH (410W)	37.40	10.97	45.30	11.50	-0.26%/°C	15
MODULE DIMENSION	75.91" L x 41.26" W x 1.38" D					

INVERTER SPECIFICATIONS			
MANUFACTURER / MODEL#	QTY	NOMINAL OUTPUT VOLTAGE	NOMINAL OUTPUT CURRENT
ENPHASE IQ8M-72-M-US	15	240 VAC	1.35A

SYSTEM SIZE:- (15 x 410W)/1000 = 6.15 kWDC
(15 x 325W)/1000 = 4.88 kWAC



NOTE:
3/4" OR GREATER EMT CONDUIT
RUN INSIDE ATTIC

AMBIENT TEMPERATURE SPECIFICATIONS			
RECORD LOW TEMP	AMBIENT TEMP (HIGH TEMP 2%)	CONDUCTOR TEMPERATURE RATE (ON ROOF)	CONDUCTOR TEMPERATURE RATE (OFF ROOF)
-19°	35°	90°	75°

SERVICE INFO.	
UTILITY PROVIDER:	EVERGY
MAIN SERVICE VOLTAGE:	240V
MAIN PANEL BRAND:	EATON
MAIN SERVICE PANEL:	(E) 200A
MAIN CIRCUIT BREAKER RATING:	(E) 200A
MAIN SERVICE LOCATION:	SOUTH
SERVICE FEED SOURCE:	UNDERGROUND

SHINNOVA
HOME SOLAR

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SHEET NAME
ELECTRICAL &
WIRING CALC.

SHEET SIZE
ANSI B

11" X 17"

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LEE'S SUMMIT, MISSOURI
10/07/2024 4:15:12

1 ELECTRICAL LINE DIAGRAM & WIRING CALC.

PV-4 SCALE: NTS

⚠

WARNING

ELECTRIC SHOCK HAZARD

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

LABEL LOCATION:
AC & DC DISCONNECT AND SUB 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
CEC 690.13(B)

RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM

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

PHOTOVOLTAIC SYSTEM AC DISCONNECT

RATED AC OPERATING CURRENT 20.25 AMPS

AC NOMINAL OPERATING VOLTAGE 240 VOLTS

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

WARNING:PHOTOVOLTAIC
POWER SOURCE

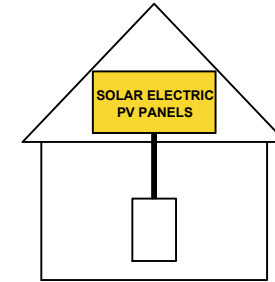
LABEL LOCATION:
CONDUIT, COMBINER BOX
(PER CODE: NEC 690.31(G)(3))

MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT

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

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))

CAUTION !

MULTIPLE SOURCES OF POWER

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN

(N) PV ARRAY

(E) MAIN SERVICE PANEL

(E) UTILITY METER

(N) PRODUCTION METER

(N) COMBINER BOX

(N) AC DISCONNECT

2012 NE BLUESTONE DRIVE



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SHEET NAME
PLACARDS

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VSUN415-132BMH

415W

Highest power output

20.54%

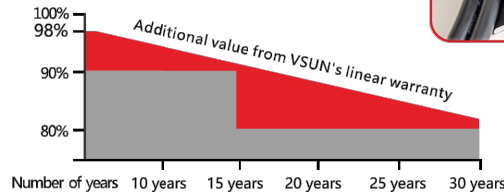
Module efficiency

25years

Material & Workmanship warranty

30years

Linear power output warranty

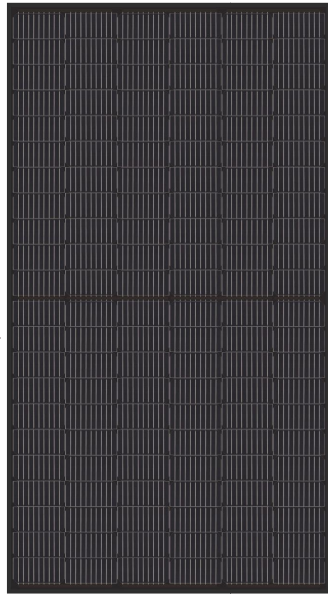


■ VSUN ■ Standard Warranty
Munich RE

Integrated
Wire Management



VSUN415-132BMH VSUN410-132BMH
VSUN405-132BMH VSUN400-132BMH



PERC Cell Technology



Higher output power



Lower risk of micro-crack



Positive tolerance offer



Lower risk of hot spot



Better shading tolerance



IEC61215 IEC61730
UL61730 certificate



Certified for salt/ammonia
corrosion resistance



Lower LCOE

VSUN, a BNEF Tier-1 PV module manufacturer invested by Fuji Solar, has been committed to providing greener, cleaner and more intelligent renewable energy solutions. VSUN is dedicated to bringing reliable, customized and high-efficient products into various markets and customers worldwide.



Engineered in Japan
www.vsun-solar.com

The most reliable energy partner

Electrical Characteristics at Standard Test Conditions(STC)

Module Type	VSUN415-132BMH	VSUN410-132BMH	VSUN405-132BMH	VSUN400-132BMH
Maximum Power - Pmax (W)	415	410	405	400
Open Circuit Voltage - Voc (V)	45.5	45.3	45.1	44.9
Short Circuit Current - Isc (A)	11.57	11.5	11.42	11.35
Maximum Power Voltage - Vmpp (V)	37.6	37.4	37.2	37
Maximum Power Current - Imp (A)	11.04	10.97	10.89	10.82
Module Efficiency	20.54%	20.29%	20.04%	19.80%

Standard Test Conditions (STC): irradiance 1,000 W/m²; AM 1.5; module temperature 25°C. Pmax Sorting : 0~5W. Measuring Tolerance: ±3%.

Remark: Electrical data do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

Electrical Characteristics with different rear side power gain(reference to 410 front)

Pmax (W)	Voc (V)	Isc (A)	Vmpp (V)	Imp (A)	Pmax gain
431	45.3	12.08	37.4	11.52	5%
451	45.3	12.65	37.4	12.07	10%
492	45.4	13.80	37.30	13.16	20%
513	45.4	14.38	37.30	13.71	25%

Temperature Characteristics

NOCT	45°C(±2°C)
Voltage Temperature Coefficient	-0.26%/°C
Current Temperature Coefficient	+0.054%/°C
Power Temperature Coefficient	-0.32%/°C

Maximum Ratings

Maximum System Voltage [V]	1500
Series Fuse Rating [A]	20
Bifaciality	70%±10%

Material Characteristics

Dimensions (L*W*H)	1928 x 1048 x 35mm / 75.91 x 41.26 x 1.38 inches
Weight	21.9kg / 48.28lbs
Frame	Black anodized aluminum profile
Front Glass	AR-Coating toughened glass, 3.2 mm
Cell Encapsulation Back Sheet	EVA or POE
Cells	Transparent black-mesh backsheet
Junction Box	11×12 pieces bifacial monocrystalline solar cells series strings
Cable&Connector Wire Management	IP68, 3 diodes, Cable length 2400 mm, Staubli MC4 connector Wire management system fits 6.1-6.7 mm OD wires including Solaredge and Enphase Cables

Packaging

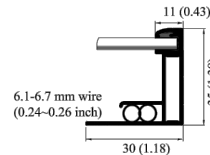
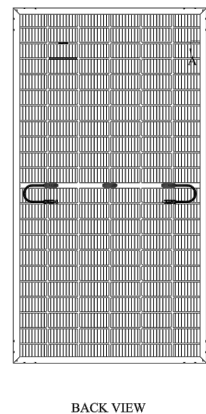
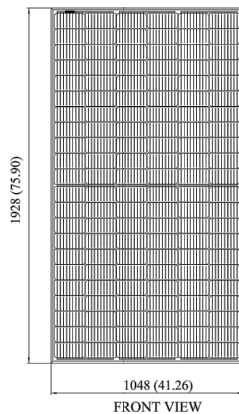
Dimensions (L*W*H)	1950×1125×1181mm
Container 20'	76.77'44.29'46.50 inches
Container 40'	155
Container 40'HC	744

System Design

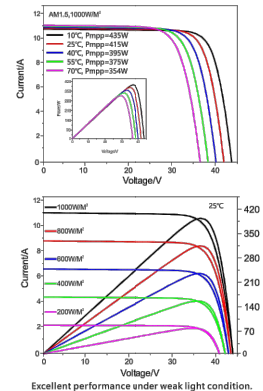
Temperature Range	-40 °C to + 85 °C
Withstanding Hail	Maximum diameter of 25 mm with impact speed of 23 m/s
Maximum Surface Load	5,400 Pa
Application class	class A

Dimensions

Note:mm (inch)



IV-Curves



Revision date: 2022-08-17

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AHJ: CITY OF LEE'S SUMMIT

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SHEET NAME
SPEC. SHEET

SHEET SIZE
ANSI B

11" X 17"

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
10/07/2024 4:15:12



DATA SHEET



IQ8M and IQ8A 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 using advanced 55-nm 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.



Connect PV modules quickly and easily to the IQ8 Series Microinverters that have integrated MC4 connectors.

* Meets UL 1741 only when installed with IQ System Controller 2 or 3.
** IQ8M and IQ8A support split-phase, 240 V installations only.

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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.



IQ8 Series Microinverters are UL Listed as PV rapid shutdown equipment and conform with various regulations when installed according to the manufacturer's instructions.

Easy to install

- Lightweight and compact with plug-and-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, and so on) in the same system.
- 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. An IQ Gateway is required to make these changes during installation.

IQ8MA-MC4-DSH-00205-3.0-EN-US-2024-02-09

IQ8M and IQ8A Microinverters

INPUT DATA (DC)	UNITS	IQ8M-72-M-US	IQ8A-72-M-US
Commonly used module pairings ¹	W	260-460	295-500
Module compatibility		To meet compatibility, PV modules must be within the following 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	30-45	32-45
Operating range	V	16-58	
Minimum/Maximum start voltage	V	22/58	
Maximum input DC voltage	V	60	
Maximum continuous input DC current	A	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 max 20 A per branch circuit	
OUTPUT DATA (AC)	UNITS	IQ8M-72-M-US	IQ8A-72-M-US
Peak output power	VA	330	366
Maximum continuous output power	VA	325	349
Nominal grid voltage (L-L)	V	240, split-phase (L-L), 180°	
Minimum and Maximum grid voltage ²	V	211-264	
Maximum continuous output current	A	1.35	1.45
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 ³		11	
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	%	97.8	97.7
CEC weighted efficiency	%	97.5	97
Nighttime power consumption	mW	21	22
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		Stäubli MC4	
Dimensions (H × W × D)		212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2")	
Weight		1.1 kg (2.43 lbs)	
Cooling		Natural convection-no fans	
Approved for wet locations		Yes	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion-resistant polymeric enclosure	
Environmental category/UV exposure rating		NEMA Type 6/outdoor	

(1) No enforced DC/AC ratio.
(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.

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SHINNOVA SOLAR
CONTRACTOR ADDRESS:-
1136 ADAMS STREET,
KANSAS CITY, KS
USA 66103
CONTRACTOR LICENSE:
NO- 2022014055

REVISIONS

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INITIAL	09.17.2024	V0	HF

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LEE'S SUMMIT MO 64064 USA
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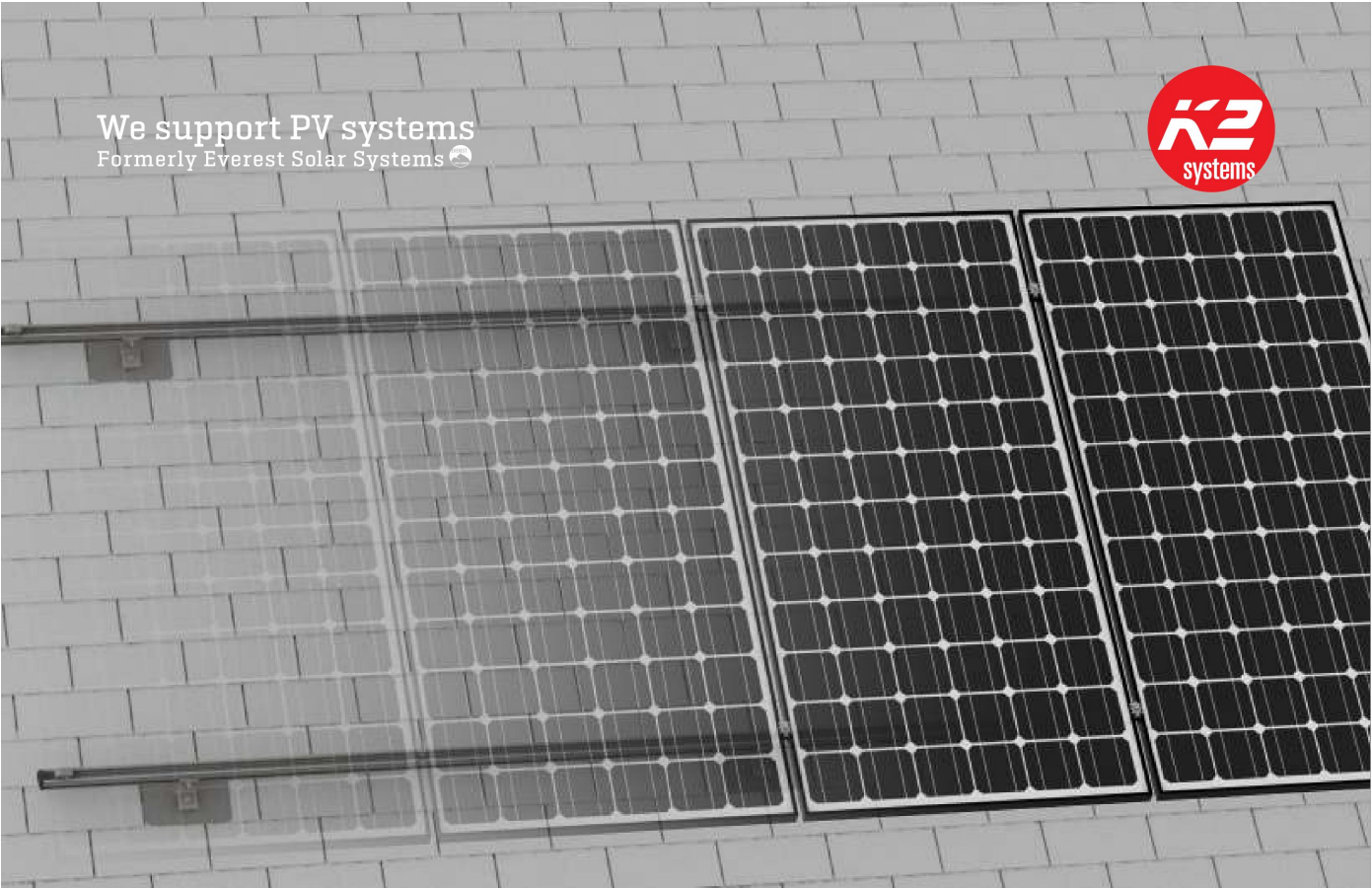
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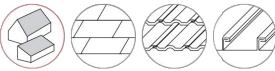
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CrossRail System

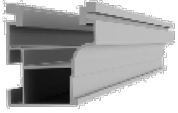
PRODUCT SHEET

- ▶ High quality, German-engineered system for residential and commercial installations
- ▶ 4 rail sizes available to suit all structural conditions
- ▶ Universal components for all rail types
- ▶ Use 2 innovative components to turn this system into Shared Rail or Tilt Up
- ▶ MK3 technology provides highest rail engagement
- ▶ Roof attachments for all roof types
- ▶ 100% code compliant, structural validation for all solar states
- ▶ Fast installation with minimal component count result in low total installed cost



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Components



CrossRail 44-X

Part Number	Description
4000019	CrossRail 44-X, 166", Mill
4000020	CrossRail 44-X, 166", Dark
4000021	CrossRail 44-X, 180", Mill
4000022	CrossRail 44-X, 180", Dark



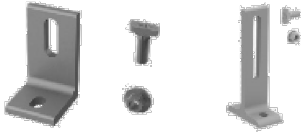
CrossRail 80

Part Number	Description
4000508	CrossRail 80 168" Rail Mill



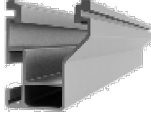
Yeti Clamp

Part Number	Description
4000050-H	Yeti Hidden EC for CR, 13mm Hex Set



L-Foot & T-Foot

Part Number	Description
4000630	L-Foot Slotted Set, Mill
4000631	L-Foot Slotted Set, Dark
4000080	T-Foot X 6" Kit, Mill



CrossRail 48-X

Part Number	Description
4000662	CrossRail 48-X, 166", Mill
4000663	CrossRail 48-X, 166", Dark



CrossRail Mid Clamp

Part Number	Description
4000601-H	CR MC Silver, 30-47mm, Shared RL 30-37mm 13mm Hex
4000602-H	CR MC Dark, 30-47mm, Shared RL 30-37mm 13mm Hex
4000688-H	SR MC Silver, 38-50mm, Shared RL 28-46mm 13mm Hex
4000689-H	SR MC Silver, 38-50mm, Shared RL 28-46mm 13mm Hex



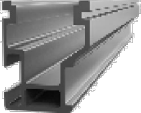
Aluminum End Clamp

Part Number	Description
4005344	CrossRail EC Silver, AL 32-33mm
4005169	CrossRail EC Silver, AL 34-36mm
4005290	CrossRail EC Silver, AL 37-38mm
4005170	CrossRail EC Silver, AL 39-41mm
4005291	CrossRail EC Silver, AL 42-44mm
4005171	CrossRail EC Silver, AL 45-47mm
4005292	CrossRail EC Silver, AL 48mm
4005172	CrossRail EC Silver, AL 49-50mm



Tile Hooks

Part Number	Description
4000034	Flat Tile Hook Set, w/Lags
4001294	Tile Hook 3S Wide Base w/Hardware



CrossRail 48-XL

Part Number	Description
4000695	CrossRail 48-XL, 166", Mill
4000705	CrossRail 48-XL, 166", Dark



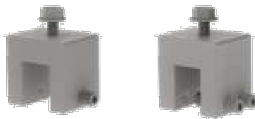
CrossRail End Clamp

Part Number	Description
4000429	CR EC Silver 35-50mm, SR 33-40mm
4000430	CR EC Dark 35-50mm, SR 33-40mm
4000003	SR EC Silver 46-50mm
4000004	SR EC Dark 46-50mm



CrossRail Rail Connector

Part Number	Description
4000051	Rail Connector CR 44-X, Set, Mill
4000052	Rail Connector CR 44-X, Set, Dark
4000385	RailConn CR48-X,48-XL Struct Set, Mill
4000386	RailConn CR48-X,48-XL Struct Set, Dark
4001196	Rail Connector UL 2703 Set, CR80, Mill



Standing Seam PowerClamps

Part Number	Description
4000016	Standing Seam PowerClamp, Mini, Set
4000017	Standing Seam PowerClamp, Standard, Set



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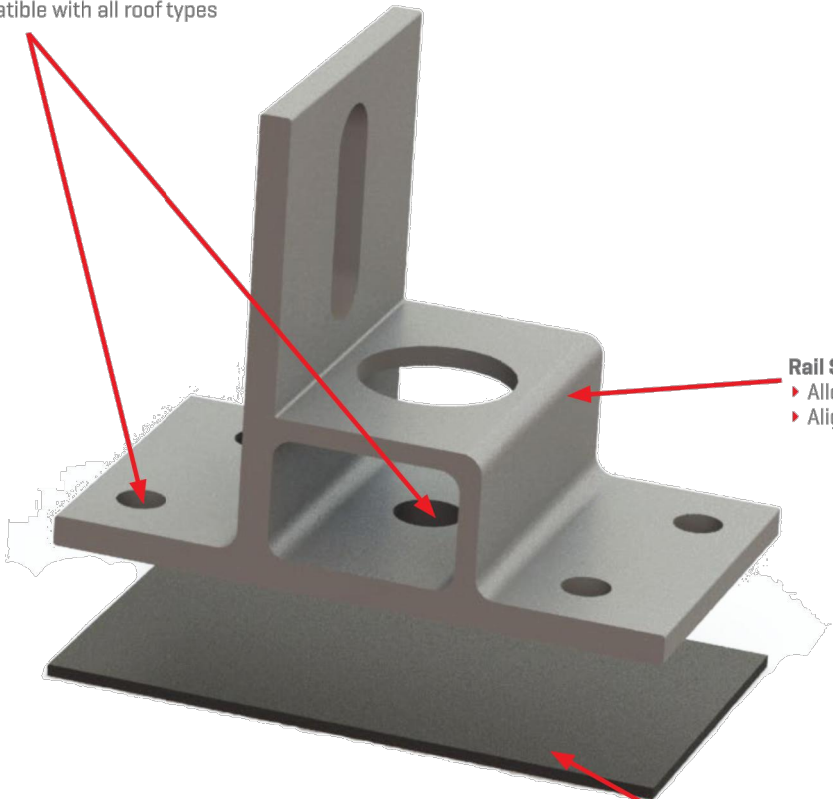
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CONNECTING STRENGTH



Rafter or Deck Attach

- ▶ 4 screws in the corners for deck attach
- ▶ 1 lag screw in the center for rafter attach
- ▶ Compatible with all roof types



Rail Shelf

- ▶ Allows for easier rail support
- ▶ Aligns CrossRail T-Bolt channel

K2 EverSeal

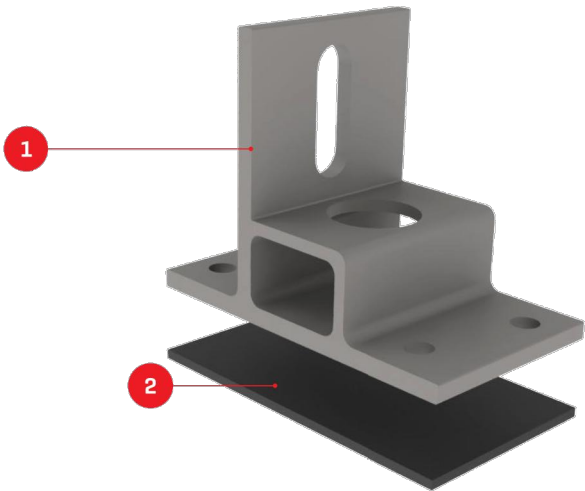
- ▶ Pre-installed butyl flexible flashing
- ▶ 30+ years of proven water sealing technology
- ▶ TAS 100(A) and Wind Driven Rain tested and approved



K2 Flex Foot
TECHNICAL SHEET

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CONNECTING STRENGTH



K2 Flex Foot

TECHNICAL SHEET

Item Number	Description	Part Number
1	K2 Flex Foot	4000718 K2 Flex Foot Kit, Mill w/EverSeal
2	K2 EverSeal	

Technical Data

	K2 Flex Foot
Roof Type	Composition shingle, all flat roofs
Material	Aluminum with stainless steel hardware
Finish	Mill
Roof Connection	[4] M5 x 60 screws to deck or [1] 5/16" lag screw to rafter, 3/8" anchor for concrete
Code Compliance	UL 2703
Compatibility	CrossRail 44-X, 48-X, 48-XL, 80

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