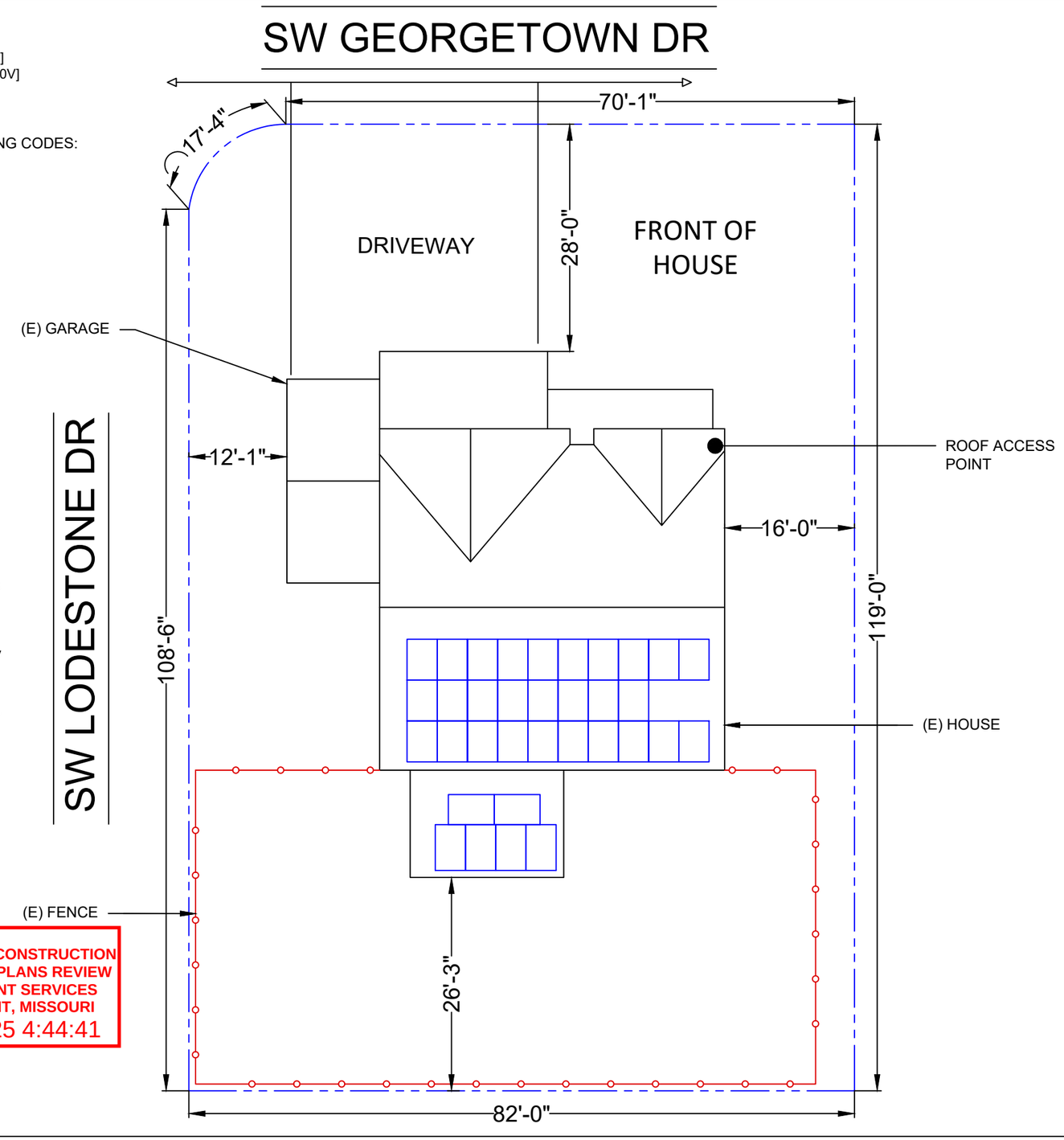
# NEW PHOTOVOLTAIC ROOF MOUNTED SYSTEM - 14.450 KW DC/9.860 KW AC
# 1533 SW GEORGETOWN DR, LEE'S SUMMIT, MO 64082

NEW PV SYSTEM SPECIFICATIONS
SYSTEM SIZE: DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
MODULE: (34) JINKO JKM425N-54HL4-B [425W]
INVERTER: (34) ENPHASE IQ8PLUS-72-2-US [240V]

APPLICABLE CODES
ALL WORK SHALL CONFORM TO THE FOLLOWING CODES:
2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL RESIDENTIAL CODE
2018 INTERNATIONAL FIRE CODE
2017 NATIONAL ELECTRICAL CODE
AS ADOPTED BY CITY OF LEE'S SUMMIT

DESIGN CRITERIA
ROOF SURFACE TYPE: ASPHALT SHINGLES
ROOF FRAMING: 2"X4" TRUSS @ 24" OC
BUILDING STORY: TWO STORY
GROUND SNOW LOAD: 30 PSF
WIND SPEED: 115 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.




N

Andrea Sessler
Digitally signed by Andrea Sessler
DN: CN=Andrea Sessler, OU=Development, OU=LS Users, DC=COLS, DC=LOC
Date: 2025.06.11 16:46:54-05'00'

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
06/11/2025 4:44:41

1 PV-01 PROPERTY PLAN
SCALE:1"-15'-0"

## SHEET INDEX

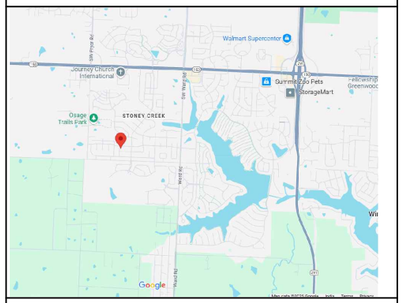


## LEGEND

- PROPERTY LINE
- FENCE LINE

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

## VICINITY MAP




## SATELLITE MAP



**CONTRACTOR**

NATURAL ENERGY SOLUTIONS

501 SW B ST, BENTONVILLE, AR 72712

PHONE - (479) 273-0123
LIC. NO. - 427310323


**PROJECT NAME & ADDRESS**

COREY BURNS
1533 SW GEORGETOWN DR,
LEE'S SUMMIT,
MO 64082

APN #: 69700130800000000
AHJ: CITY OF LEE'S SUMMIT
UTILITY: EVERGY ELECTRIC

**SYSTEM DETAILS**

DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
(34) JINKO JKM425N-54HL4-B [425W]
(34) ENPHASE IQ8PLUS-72-2-US [240V]

**REVISIONS**

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**SHEET TITLE**

**COVER PAGE**

| | |
|---|---|
| DRAWN DATE | 5/27/2025 |
| DRAWN BY | ND |

**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.

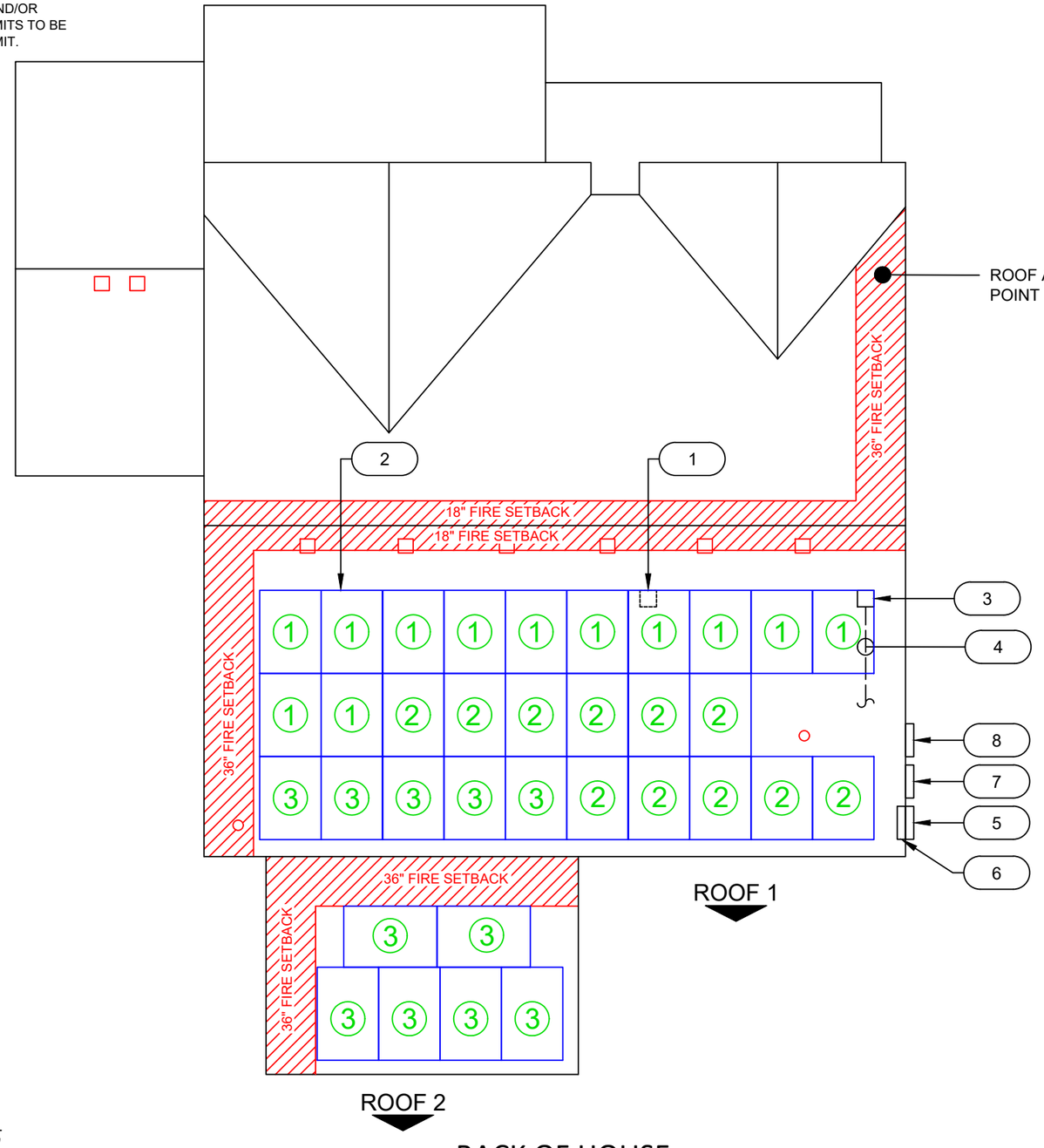
2. STRUCTURES, PATIO COVERS, AND/OR ADDITIONS BUILT WITHOUT PERMITS TO BE RESOLVED BY A SEPARATE PERMIT.

| | |
|---|---|
| PLAN VIEW TOTAL ROOF AREA: | 2618 FT² |
| TOTAL PV ARRAY AREA: | 714.67 FT² |
| TOTAL % OF ROOF COVERED BY PV: | 27.30% |

SW GEORGETOWN DR

FRONT OF HOUSE

SW LODESTONE DR




BACK OF HOUSE

N

1 PV-02 SITE PLAN

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

# LEGEND

36" 18" FIRE SETBACKS

= MECHANICAL VENT

= FLUE / PLUMBING VENT

1 MICROINVERTER (1 PER MODULE)

2 (34) JINKO JKM425N-54HL4-B [425W] 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-MAIN PANEL (UNDERGROUND SERVICE) METER #: 25 118 159

6 (E) MAIN DISTRIBUTION PANEL (INSIDE BASEMENT)

7 AC DISCONNECT AND PV PRODUCTION METER

8 (N) ENPHASE IQ COMBINER BOX 4

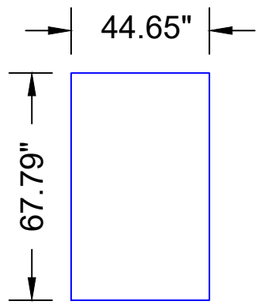
| | | |
|---|---|---|
| ROOF 1 | SLOPE | - 27° |
| | AZIMUTH | - 182° |
| | MODULE QTY | - 28 |
| | TRUSS | - 2"X4" @ 24" O.C. |
| | SURFACE TYPE | - ASPHALT SHINGLES |
| ROOF 2 | SLOPE | - 4° |
| | AZIMUTH | - 182° |
| | MODULE QTY | - 06 |
| | RAFTER | - 2"X4" @ 24" O.C. |
| | SURFACE TYPE | - ASPHALT SHINGLES |

## PV CIRCUITS

1 - MODULE STRING

2 - MODULE STRING

3 - MODULE STRING





**CONTRACTOR**

NATURAL ENERGY SOLUTIONS

501 SW B ST, BENTONVILLE, AR 72712

PHONE - (479) 273-0123

LIC. NO. - 427310323


**PROJECT NAME & ADDRESS**

COREY BURNS
1533 SW GEORGETOWN DR,
LEE'S SUMMIT,
MO 64082

APN #: 69700130800000000
AHJ: CITY OF LEE'S SUMMIT
UTILITY: EVERGY ELECTRIC

**SYSTEM DETAILS**

DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
(34) JINKO JKM425N-54HL4-B [425W]
(34) ENPHASE IQ8PLUS-72-2-US [240V]

**REVISIONS**

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**SHEET TITLE**

**SITE PLAN**

| | |
|---|---|
| DRAWN DATE | 5/27/2025 |
| DRAWN BY | ND |

**SHEET NUMBER**

PV-02

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
06/11/2025 4:44:41

| DISTRIBUTED LOAD CALCULATIONS | |
|---|---|
| MODULE | JINKO JKM425N-54HL4-B [425W] |
| MODULE WEIGHT | 46.3 LBS |
| MODULE DIMENSIONS (L" x W") | 67.79" x 44.65" |
| TOTAL QTY. OF MODULES | 34 |
| TOTAL WEIGHT OF MODULES | 1574.20 LBS |
| TYPE OF RACKING | PEGASUS SKIP RAIL |
| TYPE OF ATTACHMENT | PEGASUS INSTAFLASH |
| DISTRIBUTED WEIGHT OF RACKING | 0.5 PSF |
| TOTAL WEIGHT OF ARRAY | 1931.53 LBS |
| AREA OF MODULE | 21.02 SQFT. |
| TOTAL ARRAY AREA | 714.67 SQFT. |
| DISTRIBUTED LOAD | 2.70 PSF |

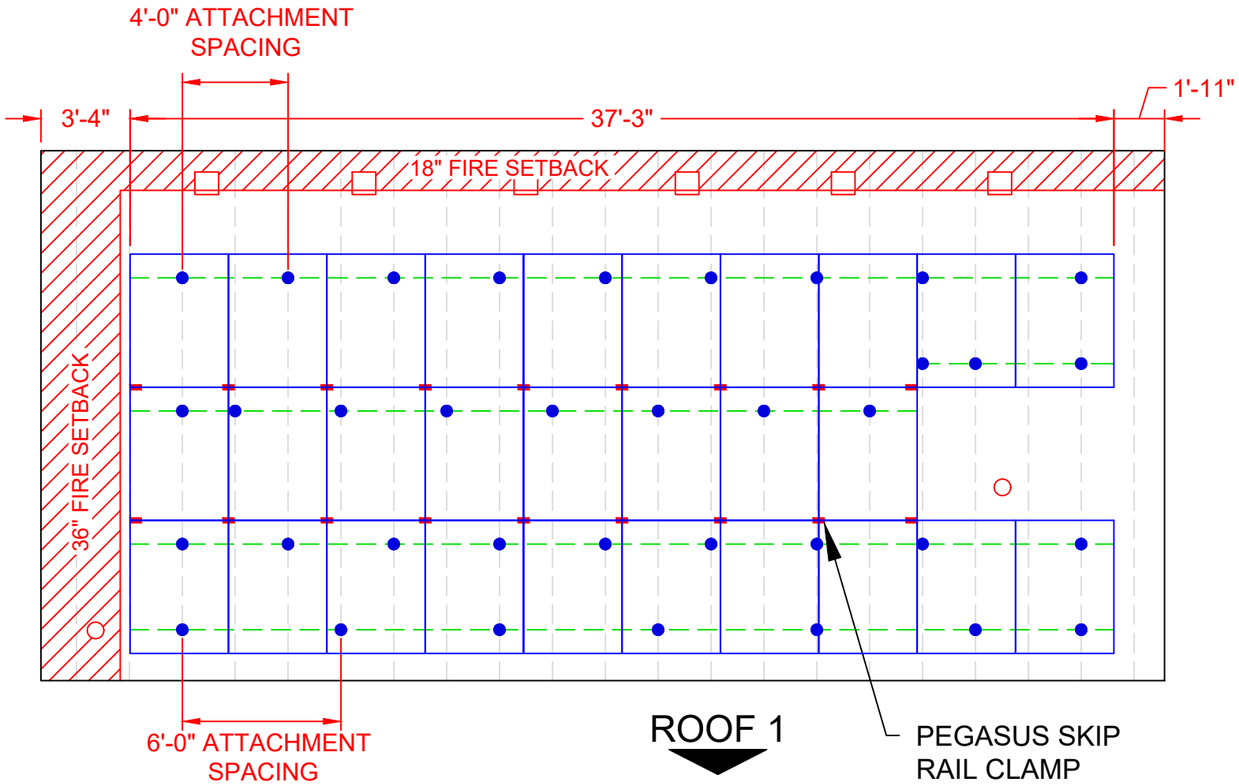
**NOTE:**

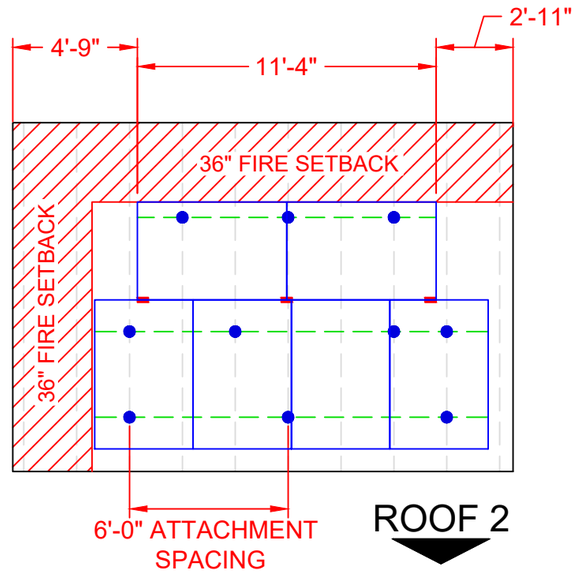
1. CONTRACTOR/INSTALLER TO VERIFY COMPATIBILITY OF ANY BRANDS OR PRODUCTS SUBSTITUTED OR USED AS ALTERNATES WITHIN ANY BRAND-SPECIFIC SYSTEMS. CONTRACTOR SHALL SUPPLY AND PRESENT CERTIFICATES OF COMPATIBILITY TO THE BUILDING OFFICIAL UPON INSPECTION AS NEEDED.
2. REFER TO PV MODULE MANUFACTURER'S INSTALLATION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

## LEGEND

- ATTACHMENT POINTS
- RAIL
- STRUCTURAL MEMBER

| | | |
|---|---|---|
| ROOF 1 | SLOPE | - 27° |
| | AZIMUTH | - 182° |
| | MODULE QTY | - 28 |
| | TRUSS | - 2"X4" @ 24" O.C. |
| | SURFACE TYPE | - ASPHALT SHINGLES |
| ROOF 2 | SLOPE | - 4° |
| | AZIMUTH | - 182° |
| | MODULE QTY | - 06 |
| | TRUSS | - 2"X4" @ 24" O.C. |
| | SURFACE TYPE | - ASPHALT SHINGLES |




1 PV-03 ATTACHMENT PLAN

SCALE: NTS


**CONTRACTOR**

NATURAL ENERGY SOLUTIONS

501 SW B ST, BENTONVILLE, AR 72712

PHONE - (479) 273-0123
LIC. NO. - 427310323


**PROJECT NAME & ADDRESS**

COREY BURNS
1533 SW GEORGETOWN DR,
LEE'S SUMMIT,
MO 64082

APN #: 69700130800000000
AHJ: CITY OF LEE'S SUMMIT
UTILITY: EVERGY ELECTRIC

**SYSTEM DETAILS**

DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
(34) JINKO JKM425N-54HL4-B [425W]
(34) ENPHASE IQ8PLUS-72-2-US [240V]

**REVISIONS**

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

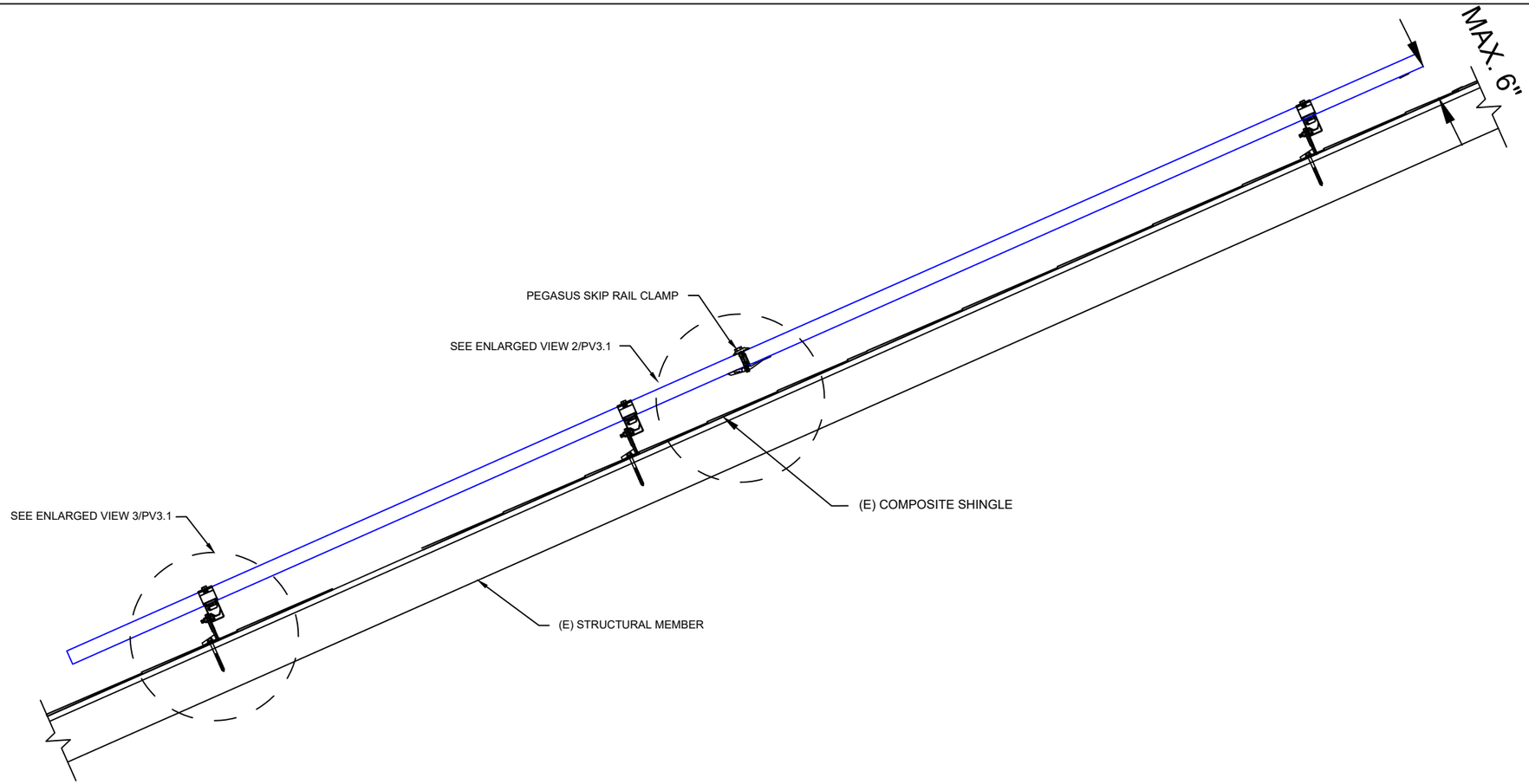
**SHEET TITLE**

**ATTACHMENT PLAN**

| | |
|---|---|
| DRAWN DATE | 5/27/2025 |
| DRAWN BY | ND |

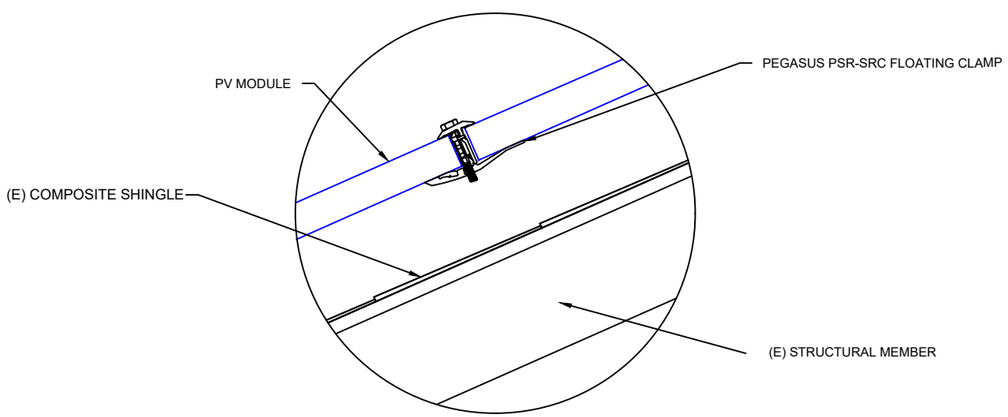
**SHEET NUMBER**

PV-03

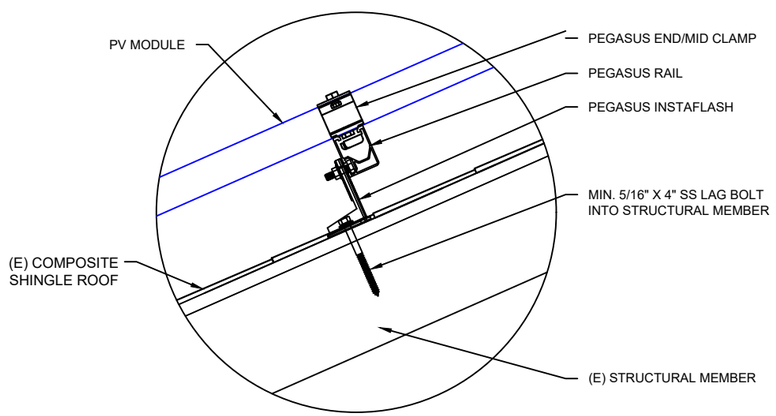



1 PV-03.1 ATTACHMENT DETAIL

Scale: NTS




2 PV-03.1 ENLARGED VIEW




3 PV-03.1 ENLARGED VIEW

**CONTRACTOR**

NATURAL ENERGY SOLUTIONS

501 SW B ST, BENTONVILLE,
AR 72712

PHONE - (479) 273-0123
LIC. NO. - 427310323

**PROJECT NAME & ADDRESS**

COREY BURNS
1533 SW GEORGETOWN DR,
LEE'S SUMMIT,
MO 64082

APN #: 69700130800000000
AHJ: CITY OF LEE'S SUMMIT
UTILITY: EVERGY ELECTRIC

**SYSTEM DETAILS**

DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
(34) JINKO JKM425N-54HL4-B [425W]
(34) ENPHASE IQ8PLUS-72-2-US [240V]

**REVISIONS**

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**SHEET TITLE**

**ATTACHMENT DETAILS**

| | |
|---|---|
| DRAWN DATE | 5/27/2025 |
| DRAWN BY | ND |

**SHEET NUMBER**

PV-3.1

| MICROINVERTER SPECIFICATIONS | |
|---|---|
| MANUFACTURER / MODEL # | ENPHASE IQ8PLUS-72-2-US [240V] |
| INPUT POWER RANGE | 235W-440W |
| MIN/MAX START VOLTAGE | 22V/58V |
| NOMINAL AC VOLTAGE | 240V |
| MAX CONT. OUTPUT CURRENT | 1.21A |
| MAX CONT. OUTPUT POWER | 290W |
| MAX MODULES PER STRING | 13 (13 MICROINVERTERS) |

| SOLAR MODULE SPECIFICATIONS | |
|---|---|
| MANUFACTURER / MODEL # | JINKO JKM425N-54HL4-B [425W] |
| VMP | 32.37V |
| IMP | 13.13A |
| VOC | 38.95V |
| ISC | 13.58A |
| TEMP. COEFF. VOC | -0.25%/°C |

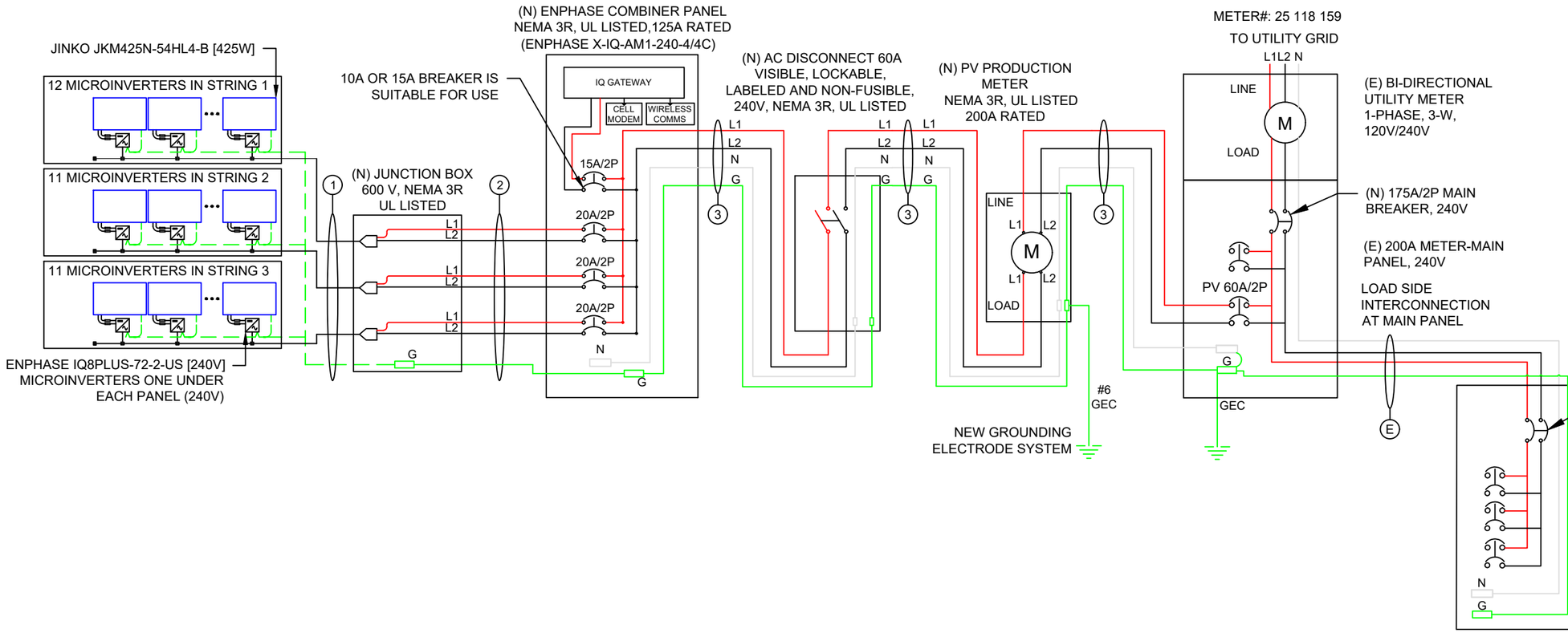
| AMBIENT TEMPERATURE SPECIFICATIONS | |
|---|---|
| RECORD LOW TEMP | -15°C |
| AMBIENT TEMP (HIGH TEMP 2% AVG.) | 34°C |
| MINIMUM CONDUIT HEIGHT BELOW ROOF SURFACE | 18" |

NEW PV SYSTEM SPECIFICATIONS

SYSTEM SIZE: DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
MODULE: (34) JINKO JKM425N-54HL4-B [425W]
INVERTER: (34) ENPHASE IQ8PLUS-72-2-US [240V]

THE MAIN SERVICE BREAKER HAS BEEN DOWNSIZED TO 175A. NO UP-SIZING IS PERMITTED

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




| DESCRIPTION | FORMULA | RESULT |
|---|---|---|
| PV OVERCURRENT PROTECTION NEC 690.9(B) | TOTAL INVERTER OUTPUT CURRENT x 1.25 = (34 x 1.21)A x 1.25 | 51.43A (SELECTED PV BREAKER = 60A) |
| 120% RULE FOR BACKFEED BREAKER NEC 705.12 | BUS BAR RATING x 1.2 - MCB RATING = MAX ALLOWABLE PV BREAKER<br>200A x 1.2 - 175A = 65A | SELECTED PV BREAKER <= MAX ALLOWABLE PV BREAKER<br>60A <= 65A |

| 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 | 6 | 1 | NM-B ROMEX | #12/6 NM-B ROMEX | 30 | 25 | 18.15 | 24.00 | NONE | #12 THHN |
| 2 | 35 | 0.96 | 6 | 1 | 3/4" EMT | #12 THHN | 30 | 25 | 18.15 | 24.00 | NONE | #12 THHN |
| 3 | 35 | 0.96 | 2 | 1 | 3/4" EMT | #6 THHN | 75 | 65 | 51.43 | 72.00 | #6 THHN | #10 THHN |

**CONTRACTOR**

NATURAL ENERGY SOLUTIONS

501 SW B ST, BENTONVILLE, AR 72712

PHONE - (479) 273-0123
LIC. NO. - 427310323

**PROJECT NAME & ADDRESS**

COREY BURNS
1533 SW GEORGETOWN DR,
LEE'S SUMMIT,
MO 64082

APN #: 69700130800000000
AHJ: CITY OF LEE'S SUMMIT
UTILITY: EVERGY ELECTRIC

**SYSTEM DETAILS**

DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
(34) JINKO JKM425N-54HL4-B [425W]
(34) ENPHASE IQ8PLUS-72-2-US [240V]

**REVISIONS**

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**SHEET TITLE**

**ELECTRICAL DIAGRAM**

| | |
|---|---|
| DRAWN DATE | 5/27/2025 |
| DRAWN BY | ND |

**SHEET NUMBER**

PV-04

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
06/11/2025 4:44:41

# 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**

NATURAL ENERGY SOLUTIONS

501 SW B ST, BENTONVILLE, AR 72712

PHONE - (479) 273-0123
LIC. NO. - 427310323


**PROJECT NAME & ADDRESS**

COREY BURNS
1533 SW GEORGETOWN DR,
LEE'S SUMMIT,
MO 64082

APN #: 69700130800000000
AHJ: CITY OF LEE'S SUMMIT
UTILITY: EVERGY ELECTRIC

**SYSTEM DETAILS**

DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
(34) JINKO JKM425N-54HL4-B [425W]
(34) ENPHASE IQ8PLUS-72-2-US [240V]

**REVISIONS**

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**SHEET TITLE**

**NOTES**

| | |
|---|---|
| DRAWN DATE | 5/27/2025 |
| DRAWN BY | ND |

**SHEET NUMBER**

PV-05

**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 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)

**WARNING: PHOTOVOLTAIC POWER SOURCE**

LABEL LOCATION: DC CONDUIT/RACEWAY/CABLE TRAY
PER CODE: NEC 690.31(G)(3-4)

**PHOTOVOLTAIC SYSTEM AC DISCONNECT**

RATED AC OUTPUT CURRENT: 41.14 A
NOMINAL OPERATING AC VOLTAGE: 240 V

LABEL LOCATION: POINT OF INTERCONNECTION
PER CODE: NEC 690.54

**PV SYSTEM**

**DISCONNECT**

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

DO NOT DISCONNECT UNDER LOAD

LABEL LOCATION: MAIN SERVICE DISCONNECT
PER CODE: NEC 690.15(C) & NEC 690.33(E)(2)

**WARNING** DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION: MAIN SERVICE DISCONNECT
PER CODE: NEC 705.12(B)(3-4), NEC 690.59

**WARNING**

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

LABEL LOCATION: POINT OF INTERCONNECTION, COMBINER PANEL
PER CODE: NEC 705.12(B)(2)(3)(c)

**WARNING**

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

LABEL LOCATION: MAIN SERVICE DISCONNECT, POINT OF INTERCONNECTION
PER CODE: 705.12(B)(2)(3)(b)

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

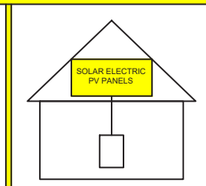
LABEL LOCATION: MAIN SERVICE DISCONNECT, UTILITY METER
PER CODE: NEC 690.13(B)

RAPID SHUTDOWN FOR SOLAR PV SYSTEM

LABEL LOCATION: RSD INITIATION DEVICE, AC DISCONNECT
PER CODE: NEC 690.56(C)(3)

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)(1)(a)

**CAUTION**

PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LABEL LOCATION: MAIN SERVICE DISCONNECT
PER CODE: NEC 690.13(F), NEC 705.12(B)(3-4), NEC 690.59

**PV METER**

LABEL LOCATION: PV METER

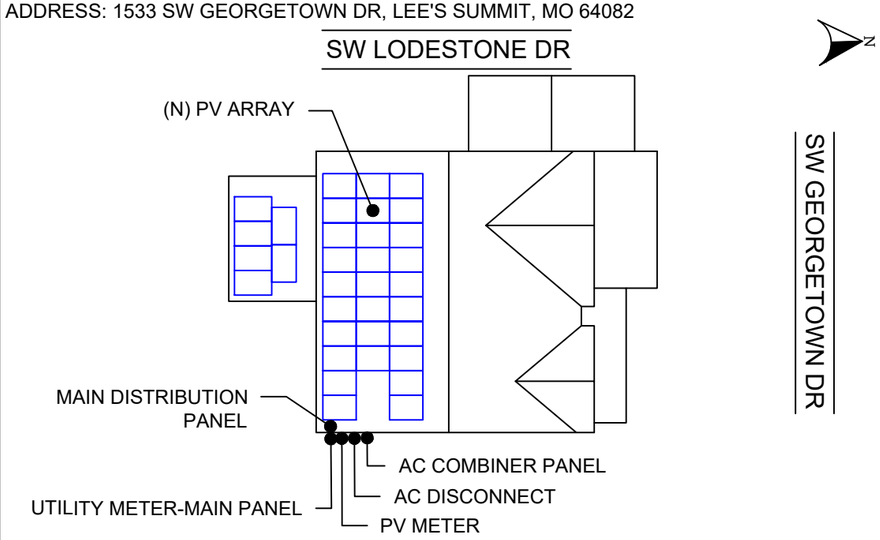
**THE MAIN SERVICE BREAKER HAS BEEN DOWNSIZED TO 175 AMPS. NO UP-SIZING IS PERMITTED.**

LABEL LOCATION: MAIN SERVICE PANEL

# CAUTION

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

ADDRESS: 1533 SW GEORGETOWN DR, LEE'S SUMMIT, MO 64082




**CONTRACTOR**

NATURAL ENERGY SOLUTIONS

501 SW B ST, BENTONVILLE, AR 72712

PHONE - (479) 273-0123
LIC. NO. - 427310323

**PROJECT NAME & ADDRESS**

COREY BURNS
1533 SW GEORGETOWN DR,
LEE'S SUMMIT,
MO 64082

APN #: 69700130800000000
AHJ: CITY OF LEE'S SUMMIT
UTILITY: EVERGY ELECTRIC

**SYSTEM DETAILS**

DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
(34) JINKO JKM425N-54HL4-B [425W]
(34) ENPHASE IQ8PLUS-72-2-US [240V]

**REVISIONS**

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**SHEET TITLE**

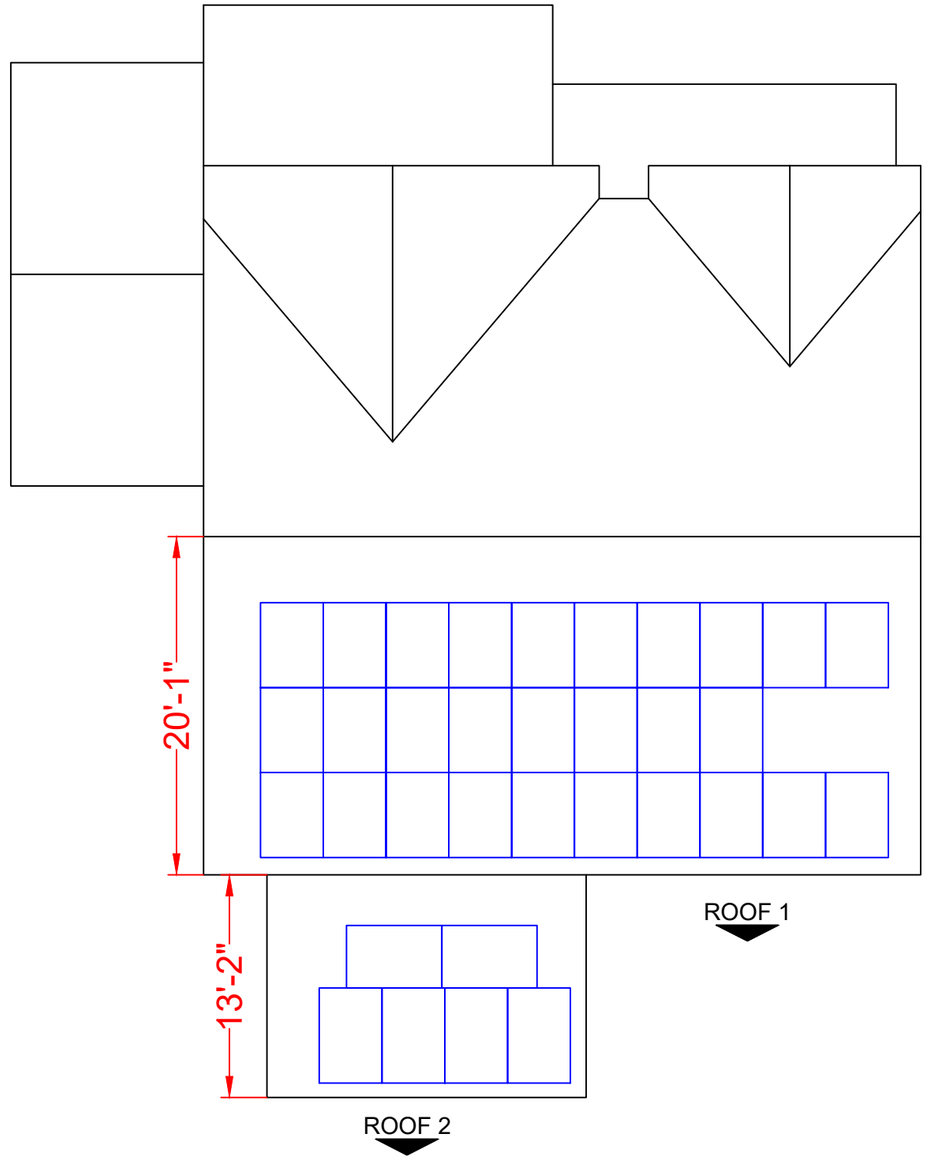
**WARNING LABELS**

| | |
|---|---|
| DRAWN DATE | 5/27/2025 |
| DRAWN BY | ND |

**SHEET NUMBER**

PV-09

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
06/11/2025 4:44:41




**DIMENSIONS ARE 2D (FLAT)

**CONTRACTOR**

NATURAL ENERGY SOLUTIONS

501 SW B ST, BENTONVILLE, AR 72712

PHONE - (479) 273-0123
LIC. NO. - 427310323

**PROJECT NAME & ADDRESS**

COREY BURNS
1533 SW GEORGETOWN DR,
LEE'S SUMMIT,
MO 64082

APN #: 69700130800000000
AHJ: CITY OF LEE'S SUMMIT
UTILITY: EVERGY ELECTRIC

**SYSTEM DETAILS**

DC SIZE: 14.450 KW DC-(STC)
AC SIZE: 9.860 KW AC
(34) JINKO JKM425N-54HL4-B [425W]
(34) ENPHASE IQ8PLUS-72-2-US [240V]

**REVISIONS**

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**SHEET TITLE**

**INSTALLATION RESOURCE**

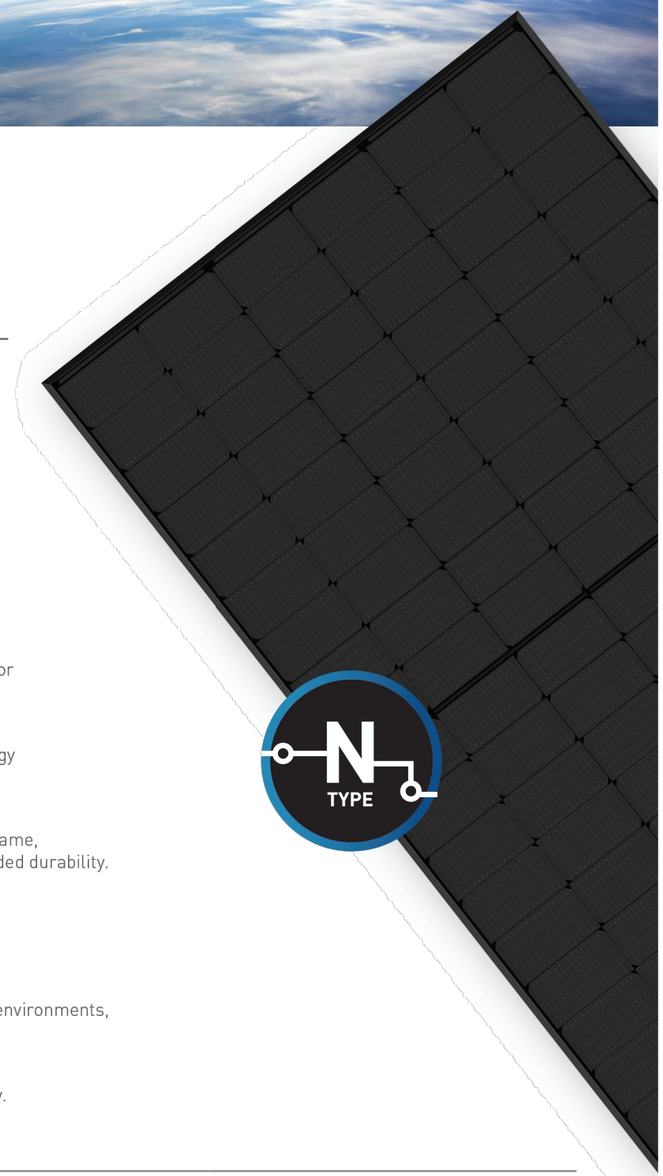
| | |
|---|---|
| DRAWN DATE | 5/27/2025 |
| DRAWN BY | ND |

**SHEET NUMBER**

PV-07

EAGLE MODULES

# THE MOST DEPENDABLE SOLAR PRODUCT




# EAGLE® 54 G6R

## 420-440 WATT • N-TYPE TOPCON

Positive power tolerance of 0~+3%

- NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- Top performance in the strictest 3rd party labs
- Automated manufacturing utilizing artificial intelligence
- Vertically integrated, tight controls on quality
- Premium solar factories in USA, Vietnam, and Malaysia

## KEY FEATURES

**Superior Aesthetics**
Black backsheet and black frame create ideal look for residential applications.

**N-Type Technology**
N-type cells with Jinko's in-house TOPCon technology offers better performance and improved reliability.

**Thick and Tough**
Fire Type 1 rated module engineered with a thick frame, 3.2mm front side glass, and thick backsheet for added durability.

**Shade Tolerant**
Twin array design allows continued performance even with shading by trees or debris.

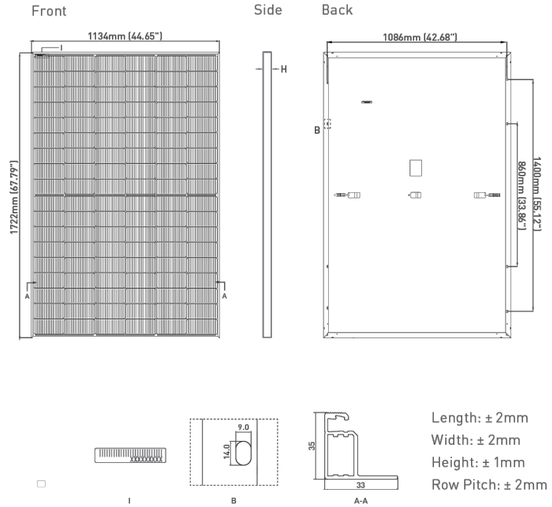
**Protected Against All Environments**
Certified to withstand humidity, heat, rain, marine environments, wind, hailstorms, and packed snow.

**Warranty**
25-year product and 30-year linear power warranty.

- ISO9001:2015 Quality Standards
- ISO14001:2015 Environmental Standards
- IEC61215, IEC61730 certified products
- ISO45001: 2018 Occupational Health & Safety Standards
- UL61730 certified products

BUILDING YOUR TRUST IN SOLAR. WWW.JINKOSOLAR.US

## ENGINEERING DRAWINGS




Length: ± 2mm
Width: ± 2mm
Height: ± 1mm
Row Pitch: ± 2mm

## ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE

Current-Voltage & Power-Voltage Curves (420W)




Temperature Dependence of Isc, Voc, Pmax




## MECHANICAL CHARACTERISTICS

| | |
|---|---|
| No. of Half Cells | 108 (2 x 54) |
| Dimensions | 1722 × 1134 × 35mm (67.79 × 44.65 × 1.38 inch) |
| Weight | 21.0kg (46.3lbs) |
| Front Glass | 3.2mm, Anti-Reflection Coating<br>High Transmission, Low Iron, Tempered Glass |
| Frame | Anodized Aluminum Alloy |
| Junction Box | IP68 Rated |
| Output Cables | 12 AWG, 1400mm (55.12in) or Customized Length |
| Connector | Staubli MC4 |
| Fire Type | Type 1 |
| Pressure Rating | 5400Pa (Snow) & 2400Pa (Wind)* |

*see Supplemental Installation Manual for higher wind pressure rating solutions*

## TEMPERATURE CHARACTERISTICS

| | |
|---|---|
| Temperature Coefficients of Pmax | -0.29%/°C |
| Temperature Coefficients of Voc | -0.25%/°C |
| Temperature Coefficients of Isc | 0.045%/°C |
| Nominal Operating Cell Temperature (NOCT) | 45±2°C |

## MAXIMUM RATINGS

| | |
|---|---|
| Operating Temperature (°C) | -40°C~+85°C |
| Maximum System Voltage | 1000VDC |
| Maximum Series Fuse Rating | 25A |

## PACKAGING CONFIGURATION

(Two pallets = One stack)

31pcs/pallets, 62pcs/stack, 806pcs/40 HQ Container

## WARRANTY

25-year product and 30-year linear power warranty

1st year degradation not to exceed 1%, each subsequent year not to exceed 0.4%, minimum power at year 30 is 87.4% or greater.

## ELECTRICAL CHARACTERISTICS

| Module Type | JKM420N-54HL4-B | | JKM425N-54HL4-B | | JKM430N-54HL4-B | | JKM435N-54HL4-B | | JKM440N-54HL4-B | |
|---|---|---|---|---|---|---|---|---|---|---|
| | STC | NOCT | STC | NOCT | STC | NOCT | STC | NOCT | STC | NOCT |
| Maximum Power (Pmax) | 420Wp | 316Wp | 425Wp | 320Wp | 430Wp | 323Wp | 435Wp | 327Wp | 440Wp | 331Wp |
| Maximum Power Voltage (Vmp) | 32.16V | 29.95V | 32.37V | 30.19V | 32.58V | 30.30V | 32.78V | 30.50V | 32.99V | 30.73V |
| Maximum Power Current (Imp) | 13.06A | 10.55A | 13.13A | 10.60A | 13.20A | 10.66A | 13.27A | 10.72A | 13.34A | 10.77A |
| Open-circuit Voltage (Voc) | 38.74V | 36.80V | 38.95V | 37.00V | 39.16V | 37.20V | 39.36V | 37.39V | 39.57V | 37.59V |
| Short-circuit Current (Isc) | 13.51A | 10.91A | 13.58A | 10.96A | 13.65A | 11.02A | 13.72A | 11.08A | 13.80A | 11.14A |
| Module Efficiency STC (%) | 21.51% | | 21.76% | | 22.02% | | 22.28% | | 22.53% | |

***STC:** Irradiance 1000W/m² Cell Temperature 25°C AM = 1.5
**NOCT:** Irradiance 800W/m² Ambient Temperature 20°C AM = 1.5 Wind Speed 1m/s

*Power measurement tolerance: ±3%

*The company reserves the final right for explanation on any of the information presented hereby. JKM400-420N-54HL4-B-F4-US*

BUILDING YOUR TRUST IN SOLAR. WWW.JINKOSOLAR.US

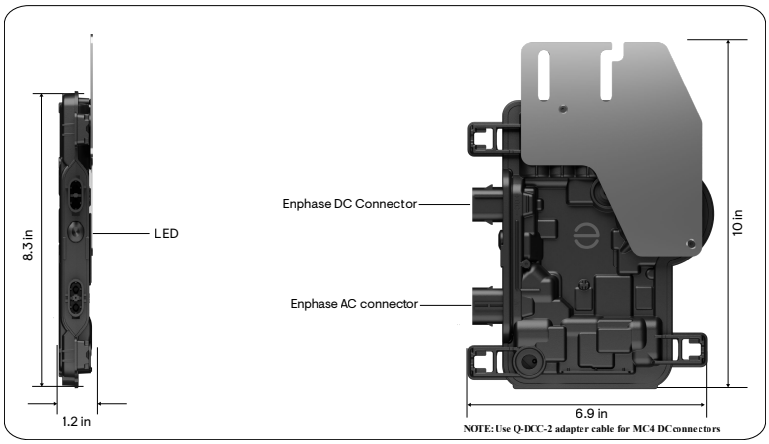
# IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters[1, 2, 3] are the industry's first microgrid-forming[4], software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently.

Enphase 25 year limited warranty

UL CERTIFIED

| Key specifications | IQ8-60-2-US | IQ8PLUS-72-2-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) | |




## 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[4]
- 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 support[5]
- 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.)

[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.

| Input data (DC) | Units | IQ8-60-2-US | IQ8PLUS-72-2-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 a maximum 20 A per branch circuit. | |

| Output data (AC) | Units | IQ8-60-2-US | IQ8PLUS-72-2-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 | IQ8-60-2-US | IQ8PLUS-72-2-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.

| Mechanical data | IQ8-60-2-US | IQ8PLUS-72-2-US |
|---|---|---|
| Relative humidity range | 4% to 100% (condensing) | |
| DC connector type | MC4 | |
| Dimensions (H × W × D) | 212 mm (8.3 in) × 175 mm (6.9 in) × 30.2 mm (1.2 in) | |
| Weight | 1.08 kg (2.38 lb) | |
| 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 | |

| Compliance | IQ8-60-2-US | IQ8PLUS-72-2-US |
|---|---|---|
| Certifications | CA Rule 21 (UL 1741-SA), UL 62109-1, IEEE 1547:2018 (UL 1741-SB 3rd 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, NEC 2020, and NEC 2023 section 690.12 and C22.1-2018 Rule 64-218 rapid shutdown of PV systems, for AC and DC conductors, when installed according to the manufacturer's instructions. | |

Data Sheet
**Enphase Networking**

# Enphase IQ Combiner 4/4C

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


X-IQ-AM1-240-4C

X-IQ-AM1-240-4

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

### Smart

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

### Simple

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

### Reliable

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

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

ENPHASE

## Enphase IQ Combiner 4/4C

| MODEL NUMBER | |
|---|---|
| IQ Combiner 4 (X-IQ-AM1-240-4) | IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat. |
| IQ Combiner 4C (X-IQ-AM1-240-4C) | IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat. |
| **ACCESSORIES AND REPLACEMENT PARTS** | (not included, order separately) |
| Ensemble Communications Kit<br>COMMS-CELLMODEM-M1-06<br>CELLMODEM-M1-06-SP-05<br>CELLMODEM-M1-06-AT-05 | - Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites<br>- 4G based LTE-M1 cellular modem with 5-year Sprint data plan<br>- 4G based LTE-M1 cellular modem with 5-year AT&T data plan |
| Circuit Breakers<br>BRK-10A-2-240V<br>BRK-15A-2-240V<br>BRK-20A-2P-240V<br>BRK-15A-2P-240V-B<br>BRK-20A-2P-240V-B | Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers.<br>Circuit breaker, 2 pole, 10A, Eaton BR210<br>Circuit breaker, 2 pole, 15A, Eaton BR215<br>Circuit breaker, 2 pole, 20A, Eaton BR220<br>Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support<br>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<br>• 60 A breaker branch input: 4 to 1/0 AWG copper conductors<br>• Main lug combined output: 10 to 2/0 AWG copper conductors<br>• Neutral and ground: 14 to 1/0 copper conductors<br>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<br>Production metering: ANSI C12.20 accuracy class 0.5 (PV production)<br>Consumption metering: accuracy class 2.5 |
| Compliance, IQ Gateway | UL 60601-1/CANCSA 22.2 No. 61010-1 |

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



ENPHASE

Data Sheet
**Enphase Q Cable Accessories**
REGION: Americas

# 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

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

ENPHASE.

## 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[1] | 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[1] | 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)[1] | 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.

**TERMINATOR**
Terminator cap for unused cable ends, sold in packs of ten (Q-TERM-10)

**SEALING CAPS**
Sealing caps for unused aggregator and cable connections (Q-BA-CAP-10 and Q-SEAL-10)

**DISCONNECT TOOL**
Plan to use at least one per installation, sold in packs of ten (Q-DISC-10)

**CABLE CLIP**
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**


2020-06-26

ENPHASE.

# CERTIFICATE OF COMPLIANCE

| | | |
|---|---|---|
| **Certificate Number** | 20230825-E341165 | SB |
| **Report Reference** | E341165-20210317 | |
| **Date** | 2023-09-27 | |

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

**This is to certify that representative samples of** Photovoltaic Grid Support Utility Interactive Inverter with Rapid Shutdown Functionality

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

Models IQ8HC-72, IQ8AC-72, IQ8MC-72 may be f/b -2, -5, -E or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters.

Model IQ8X-80 may be f/b -2, -5, -E, or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters

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

**Standard(s) for Safety:** See Page 2

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

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

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

Bruce Mahrenholz, Director North American Certification Program

UL LLC

# CERTIFICATE OF COMPLIANCE

| | | |
|---|---|---|
| **Certificate Number** | 20230825-E341165 | SB |
| **Report Reference** | E341165-20210317 | |
| **Date** | 2023-09-27 | |

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

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements, Standards for Safety:

UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Edition 3, Issue Date 05/19/2023. Including the requirements in UL 1741 Supplement SA and SB.

IEEE 1547, Interconnection and Interoperability of Distributed Energy Resources (DERs) with Associated Electric Power Systems (EPSs) Interfaces, Issue Date 02/15/2018

IEEE 1547.1, IEEE Standard Conformance Test Procedures for Interconnecting Distributed Energy Resources (DERs) with Electric Power Systems (EPSs) Associated Interfaces, Issue Date 03/05/2020.

CSA C22.2 No. 107.1-16, General Use Power Supplies, Edition 4, Issue Date 06/2016

[x] R21: The evaluation to the Standards above provides evidence of compliance to the intent of the existing California Rule 21 Interconnection (references to the past publication of IEEE 1547 standards) and UL1741Table SA1.1 option to use the IEEE 1547.1-2020 and UL1741SB test methods in conjunction with using IEEE 1547-2018 as the SRD under which SA11.2 Normal Ramp Rate is not address. Additional testing was conducted to confirmed compliance to Normal Ramp Rate SA11.2

[ ] 14H (SA): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V1.0, Interconnection Application.

[x] 14H (SB): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V2.0, Interconnection Application.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

PEGASUS SOLAR™
*A Better Day on the Job*

# RAIL SYSTEM

### Instant Bonding
The N-S Bonding Jumper bonds row to row with no tools.

### One Clamp Anywhere
The Multi-Clamp works as mid- or end-clamp, and fits standard 30-40mm frames.

### Lifetime Wire Management
Open rail channel holds and protects wires. Clamps won't pinch wires after tightening.

### Bonding Structural Splice
Connect rails instantly, without tools, interference or limitations.

## Next-Level Solar Mounting

A complete system for hassle-free rooftop installation, from watertight mounts to lifetime wire management.

**Simplicity**
1/2"socket for everything.
One clamp for mid or end.
No tool splicing and bonding.
Easy wire management.

**Code Compliant**
UL 2703 listed
LTR-AE-001-2012 listed
Class A fire rating for any slope
ASCE 7-16 PE Certified

**Premium Aesthetics**
The narrowest panel gap available. Optional Hidden End Clamps and End Caps provide a flush look on the edge of the array.

**Watertight for Life**
Secured on industry-leading Pegasus Mounts, for composite shingle and tile roofs.
Backed by a 25-year warranty.

**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | **www.pegasussolar.com**

PEGASUS SOLAR

# RAIL SYSTEM

### Pegasus Rail
Available in 14′ and 7′ lengths for easy layout and shipping.
Open-channel design holds MC4 connectors, PV wire and trunk cables.
Black and Mill finish

### Pegasus Max Rail
Maximum-strength design.
Meets specifications for high snow-load and hurricane zones.
Black and Mill finish

### Splice and Max Splice
Installs by hand.
Works over mounts.
Structurally connects and bonds rails automatically; UL2703 listed as reusable.

### Dovetail T-bolt
Dovetail shape for extra strength.
Uses ½" socket.

### Multi-Clamp
Fits 30-40mm PV frames, as mid- or end-clamp.
Twist-locks into position; doesn't pinch wires in rail.
Bonds modules to rail; UL2703 listed as reusable

### Hidden End Clamp
Offers premium edge appearance.
Preinstalled pull-tab grips rail edge, allowing easy, one-hand installation.
Tucks away for reuse.

### Ground Lug
Holds 6 or 8 AWG wire.
Mounts on top or side of rail.
Assembled on MLPE Mount.
UL2703 listed as reusable.

### N-S Bonding Jumper
Installs by hand, eliminates row-to-row copper wire.
UL2703 listed as reusable only with Pegasus Rail.

### MLPE Mount
Secures and bonds most micro-inverters and optimizers to rail.
Connectors and wires easily route underneath after installation.
UL2703 listed as reusable.

### Cable Grip
Secures four PV wires or two trunk cables.
Stainless-steel backing provides durable grip.
Eliminates sagging wires.

### Wire Clip
Hand operable.
Holds wires in channel.
Won't slip.

### End Cap and Max End Cap
Fits flush to PV module and hides raw or angled cuts.
Hidden drain quickly clears water from rail.

**Certifications:**
- UL 2703, Edition 1
- LTR-AE-001-2012
- ASCE 7-16 PE certified
- Class A fire rating for any slope roof

**FREE**
PEGASUS SOLAR
**Design Tool**

Quickly calculate the most efficient layout, spans and materials needed to suit your job. Visit the Pegasus Customer Portal. **pegasussolar.com/portal**

| LOAD | | SPAN | | | |
|---|---|---|---|---|---|
| SNOW (PSF) | WIND (MPH) | 32" | 4′ | 6′ | 8′ |
| 0 | 120 | PEGASUS RAIL | PEGASUS RAIL | PEGASUS RAIL | PEGASUS RAIL |
| | 160 | PEGASUS RAIL | PEGASUS RAIL | PEGASUS RAIL | PEGASUS MAX RAIL |
| | 190 | PEGASUS RAIL | PEGASUS RAIL | PEGASUS RAIL | |
| 15 | 140 | PEGASUS RAIL | PEGASUS RAIL | PEGASUS RAIL | |
| | 160 | PEGASUS RAIL | PEGASUS RAIL | PEGASUS RAIL | |
| | 190 | PEGASUS RAIL | PEGASUS RAIL | | |
| 30 | 160 | PEGASUS RAIL | PEGASUS RAIL | PEGASUS RAIL | |
| | 190 | PEGASUS RAIL | PEGASUS RAIL | | |
| 45 | 190 | PEGASUS RAIL | PEGASUS RAIL | | |
| 70 | 190 | PEGASUS RAIL | | | |
| 110 | 190 | PEGASUS RAIL | | | |

For reference only. Spans above are calculated using ASCE 7-16 for a Gable Roof, Exposure Category B, 7-20deg roof angle, 30ft mean roof height with non-exposed modules. For PE certified span tables, visit www.pegasussolar.com/spans.



**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | **www.pegasussolar.com**

PEGASUS

# INSTAFLASH™

**Never Deal With Caulking Again!**
Factory-installed, non-hardening sealant

**Protective Cage**
Prevents sealant from getting on hands or roof. Collapses upon lag installation.

***Before*** **InstaFlash Installed:**
Sealant is contained above roof surface by a protective cage.

***After*** **InstaFlash Installed:**
Sealant is compressed to fill all holes and voids.

## Effortless Lifetime Roof Protection

The non-hardening sealant completely fills any missed pilot holes, shingle rips, voids, or other potential water ingress points under the entire footprint of the 4.6" wide base.

**25-Year Warranty**
Manufactured with advanced materials and coatings to outlast the roof itself

**Code Compliant**
Fully IBC/CBC Code Compliant
Exceeds ASCE 7-16 Standards
FL Cert of Approval FL41396
UL2703 Certified

**Self-Healing**
The proprietary non-hardening sealant will flex and reseal over years of thermal expansion and contraction

**Larger Spans**
The extra-large L-foot and proprietary lag screw result in larger spans between mounts

**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | **www.pegasussolar.com**

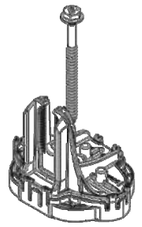
PEGASUS INSTAFLASH™

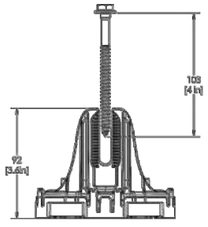
**1**
Drill pilot hole in the center of the rafter using a 7/32" bit.

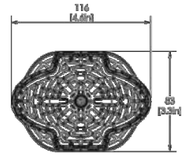
**2**
Place the InstaFlash over the pilot hole. **Note:** the direction of the InstaFlash Down arrows should point down the roof.

**3**
Insert the lag screw through the center hole into the pilot hole.

**4**
Drive the lag until the InstaFlash is fully seated to the roof.






| SPECIFICATIONS | INSTAFLASH KITS | | | | |
|---|---|---|---|---|---|
| | PIF-RB0 | PIF-RBDT | PIF-RBSH | PIF-RM0 | PIF-RMDT |
| Finish | Black | | | Mill | |
| Kit Contents | Black InstaFlash, 5/16" x 4.0" SS Lag | Black InstaFlash, 5/16" x 4.0" SS Lag, Dovetail T-bolt w/ Nut | Black InstaFlash, 5/16" x 4.0" SS Lag, M10 Hex Bolt w/ Nut | Mill Insta-Flash, 5/16" x 4.0" SS Lag | Mill InstaFlash, 5/16" x 4.0" SS Lag, Dovetail T-bolt w/ Nut |
| Attachment Type | Rafter Attached | | | | |
| Roof Type | Sloped Roof: Composition Shingle, Rolled Asphalt \| Flat roof: Modified Bitumen Roof, Built-Up Roof | | | | |
| Sealant Application | Factory Installed | | | | |
| Installation Temperature | 0°F to 170° F | | | | |
| Cure Time | Instantly Waterproof; Non-hardening | | | | |
| Service Temperature | -40°F to 195° F | | | | |
| Certifications | IBC, ASCE/SEI 7-16, FL Cert of Approval FL41396, TAS 100(A), UL2703 | | | | |
| Install Application | Most Railed Systems, Pegasus Tilt Leg Kit | | | | |
| Kit Quantity | 24 | | | | |
| Boxes per Pallet | 36 | | | | |

**SCAN FOR INSTALLATION VIDEO**

**SCAN FOR FREE TRIAL**



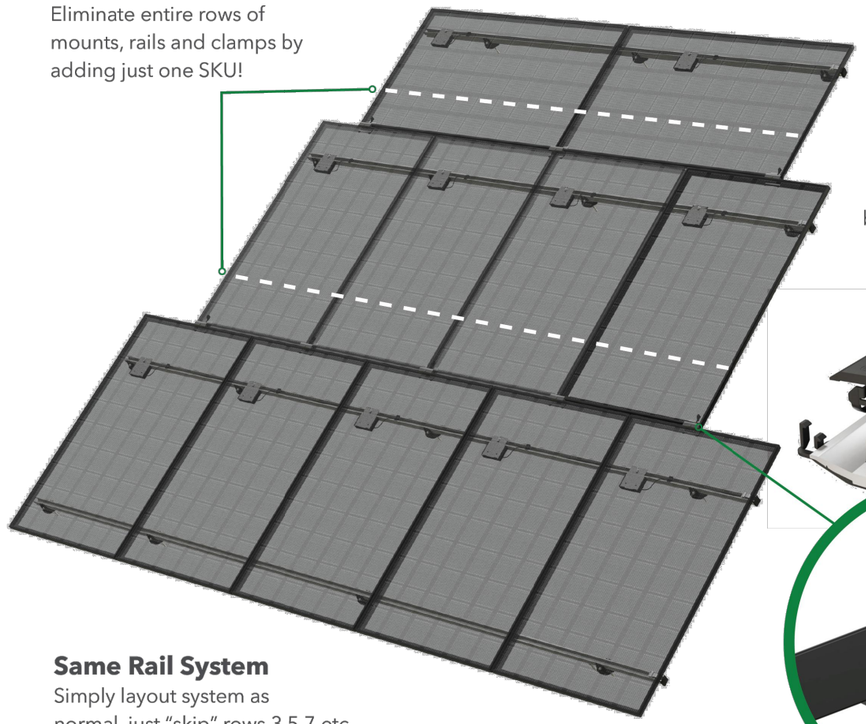
**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | **www.pegasussolar.com**

PEGASUS

# SK•PRAIL

## Skip Rows!

Eliminate entire rows of mounts, rails and clamps by adding just one SKU!



### SkipRail Clamp

Structurally connects and bonds modules row-to-row
Eliminate leveling rails: aligns module rows to be in-plane

### Same Rail System

Simply layout system as normal, just "skip" rows 3,5,7,etc. of attachments, rails, and clamps

## A Revolution in Solar Installations

Lower your costs and provide your crews a faster system by eliminating entire rows of mounts, rails and clamps with just one SKU.

### Dramatically Lower Costs

25% fewer rails and clamps
15% fewer roof penetrations
3500 lbs less per MW to ship, warehouse, pack, and load

### Recruit the Best Crews

Less work = happier crews
300 lbs less per week to haul
Faster install
Auto-levels modules

### Easy to Implement

Minimal to no training
Same layout as standard rail
Same open-channel wire management

### Universal to Any Roof

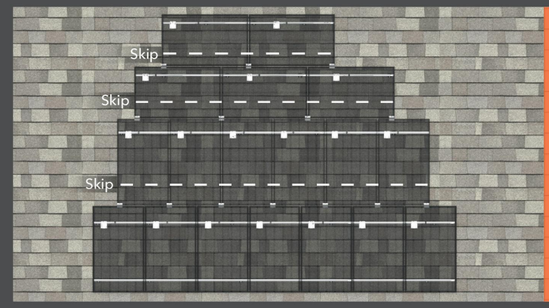
Comp, Tile, Metal, other.
Low slow, steep slopes
Easily work around roof obstructions
Mixed portrait / landscape

**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | **www.pegasussolar.com**

PEGASUS

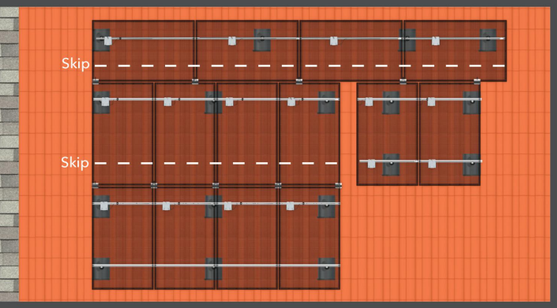
SK•PRAIL

**SkipRail** SAVINGS | 18% fewer attachments • 32% fewer feet of rails
22% fewer pounds to ship & warehouse




Example of Comp Roof Array

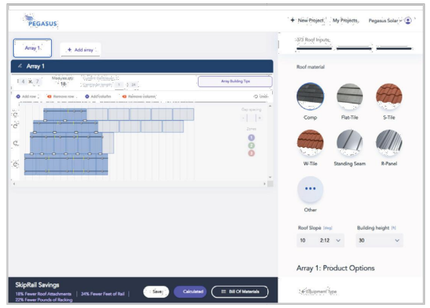
**SkipRail** SAVINGS | 21% fewer attachments • 30% fewer feet of rails
21% fewer pounds to ship & warehouse



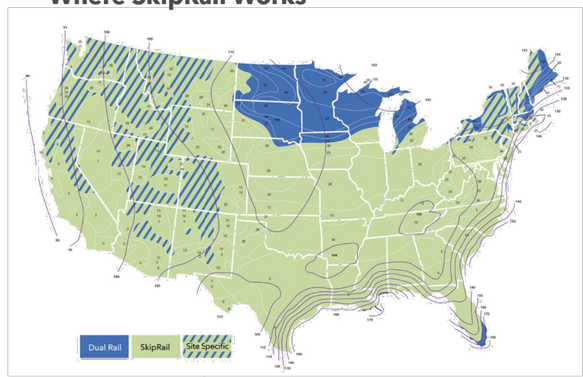

Example of Tile Roof Array

## Free Design Tool:

pegasussolar.com/portal




## Where SkipRail Works




| Specifications | SkipRail Kits | |
|---|---|---|
| SKU | PSR-SRC | PSR-SRCK |
| Type | Floating Clamp | Extra support with Kickstand |
| Finish | Black | |
| PV module frames | 30, 32, 35, 40mm | |
| Certifications | ASCE 7-16, IBC, CBC, UL2703 | |
| Applicable Roof Types | Any | |
| Compatible Rail Systems | Pegasus Rail System | |
| Kit Contents | Pegasus SkipRail Clamp | Pegasus SkipRail Clamp with Kickstand |
| Kit Quantity | 20 | 30 |

SCAN FOR VIDEO

SCAN FOR FREE TRIAL



**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | **www.pegasussolar.com**