



LEADING THE WAY
Structural Engineering Firm
NC License No. C-2499

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Cary, North Carolina 27513
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E-mail: rbittler@rbengineering.com

Mr. Evan McNeil

October 24, 2022

Yes! Solar Solutions of the Triangle

E-mail: emcneil@yessolarsolutions.com

Subject: Roof mounted solar panels – Keisler Residence
251 Skycroft Drive
Sanford, North Carolina 27332

File No.: RB-228463

Dear Evan:

RB Engineering, Inc. is pleased to provide the following summary engineering letter concerning the subject project. The existing roof system is constructed with braced 2x6 timber rafters at 16 inches on center, an OSB roof deck and a composition asphalt shingle roof. We have reviewed the proposed solar layout and have structurally evaluated the additional proposed roof loading with the following conclusions:

- The total surface area of the new proposed solar array (29 PV modules) is approximately 570 SF. The solar panel installation has been evaluated for an ultimate design wind speed of 115 mph.
- The subject roof mounted PV system attachment method is structurally adequate to transfer the design uplift loads in accordance with the 2018 North Carolina residential building code.
- The existing roof system is structurally adequate to transfer the applicable design loads - including the additional or modified design loading (dead, wind and snow loads) due to the proposed solar panel installation - in accordance with the 2018 North Carolina residential building code.

Our services were provided in accordance with the standard of practice for structural engineering and within the limits imposed by scope, schedule, and budget. If you have any questions or if I can be of further assistance to you on this project, please contact me at (919) 677-9662.

Respectfully submitted,

Ron Bittler, PE
President / Structural Engineer
RB Engineering, Inc.

Ron
Bittler,
PE

Digitally signed by
Ron Bittler, PE
DN: cn=Ron Bittler,
PE, o, ou,
email=rbittler@rb
engineering.com
Date: 2022.10.24
14:42:01 -04'00'



PHOTOVOLTAIC ROOF MOUNT SYSTEM

29 MODULES-ROOF MOUNTED - 10.585 kWDC, 8.410 kWAC
251 SKYCROFT DRIVE, SANFORD, NC 27332, USA



202 NORTH DIXON AVENUE,
CARY, NC 27513 USA
PHONE: 919-804-1490
LICENSE: 67356

SYSTEM SUMMARY:

- (N) 29 - REC REC365NP2BLACK (365W) MODULES
- (N) 29 - ENPHASE ENERGY IQ8PLUS-72-2-US INVERTER
- (N) JUNCTION BOX
- (E) 200A METER MAIN WITH (E) 200A HOT BUS PANEL
- (N) 60A NON FUSED , AC DISCONNECT 240 VAC

INTERCONNECTION METHOD - BACK FEED

DESIGN CRITERIA:

- ROOF TYPE: - ASPHALT SHINGLE
- NUMBER OF LAYERS: - 01
- ROOF FRAME: - 2"X6" TRUSSES @16" O.C.
- STORY: - TWO STORY
- SNOW LOAD : - 15 PSF
- WIND SPEED :- 115 MPH
- WIND EXPOSURE:- B
- RISK CATEGORY:- II

GOVERNING CODES:

- THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODE
- 2018 NORTH CAROLINA RESIDENTIAL CODE
- 2018 NORTH CAROLINA ENERGY CONSERVATION CODE
- 2018 NORTH CAROLINA ADMINISTRATIVE CODE
- 2018 NORTH CAROLINA BUILDING CODE
- 2009 ICC ANSI A117.1, ACCESSIBLE AND USABLE BUILDINGS
- 2018 NORTH CAROLINA PLUMBING CODE
- 2018 NORTH CAROLINA MECHANICAL CODE
- 2018 NORTH CAROLINA FUEL GAS CODE
- 2017 NATIONAL ELECTRICAL CODE

SHEET INDEX

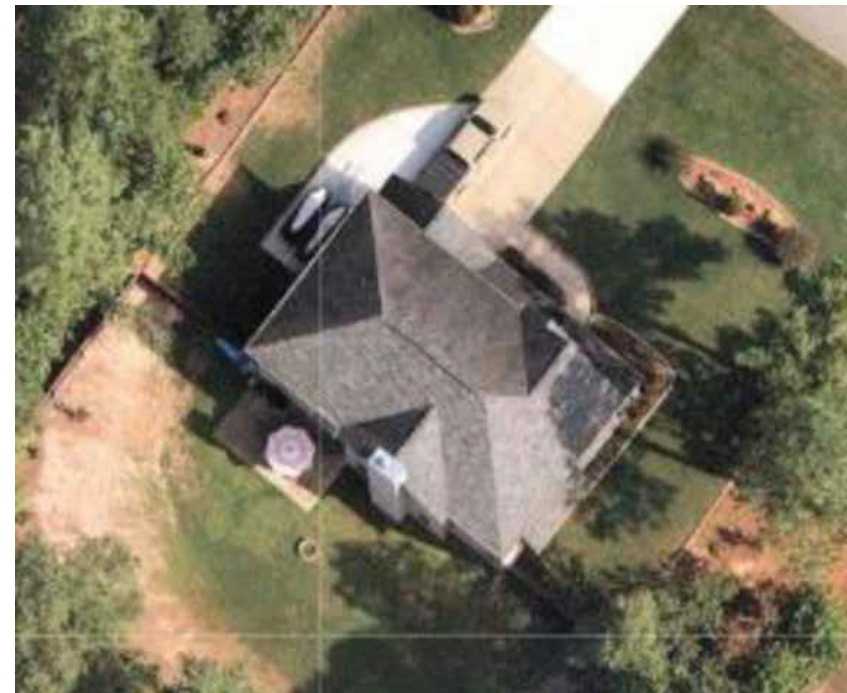
PV-0	COVER SHEET
PV-1	SITE PLAN WITH ROOF PLAN
PV-2	ROOF PLAN WITH MODULES
PV-3	ATTACHMENT DETAILS
PV-4	ELECTRICAL LINE DIAGRAM WITH CALCULATION
PV-5	PLACARD & WARNING LABELS
PV-6+	EQUIPMENT SPEC SHEETS

GENERAL NOTES

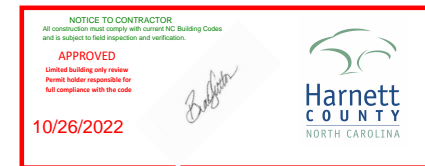
- THE CONTRACTOR/INSTALLER OF THE SOLAR PV SYSTEM OVER EXISTING ROOF SHALL CONFORM TO OSHA REQUIREMENTS DURING THE CONSTRUCTION PHASE. JOB SAFETY AND CONSTRUCTION PROCEDURES ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR/INSTALLER.
- REFER TO ELECTRICAL DRAWING PV-4 FOR PANEL DETAILED INFORMATION.
- IN 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.

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 & 75 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 E.G.C. VIA WEEB LUG OR ILSKO GBL-4DBT LAY-IN LUG.
- THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE

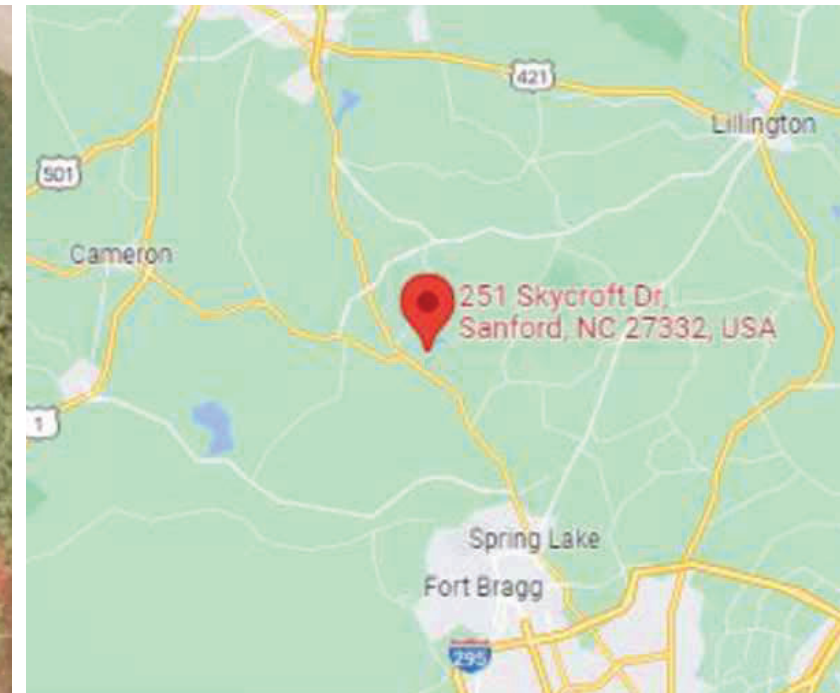


1 | AERIAL PHOTO
PV-0 | SCALE: NTS



STRUCTURAL REVIEW PROVIDED BY:
RONALD P. BITTLER, PE
RB ENGINEERING, INC. (C-2499)
168 QUADE DRIVE
CARY, NC 27513
919-677-9662
PROJECT #RB-228463

Ron Bittler, PE
Digitally signed by Ron Bittler, PE
DN: cn=Ron Bittler, PE, o=RB Engineering, c=US
Date: 2022.10.24 14:44:34 -04'00'



2 | VICINITY MAP
PV-0 | SCALE: NTS



STRUCTURAL 10.24.2022

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	10/13/2022	UR

PROJECT NAME

KEISLER RESIDENCE
251 SKYCROFT DRIVE,
SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME

COVER SHEET

SHEET SIZE

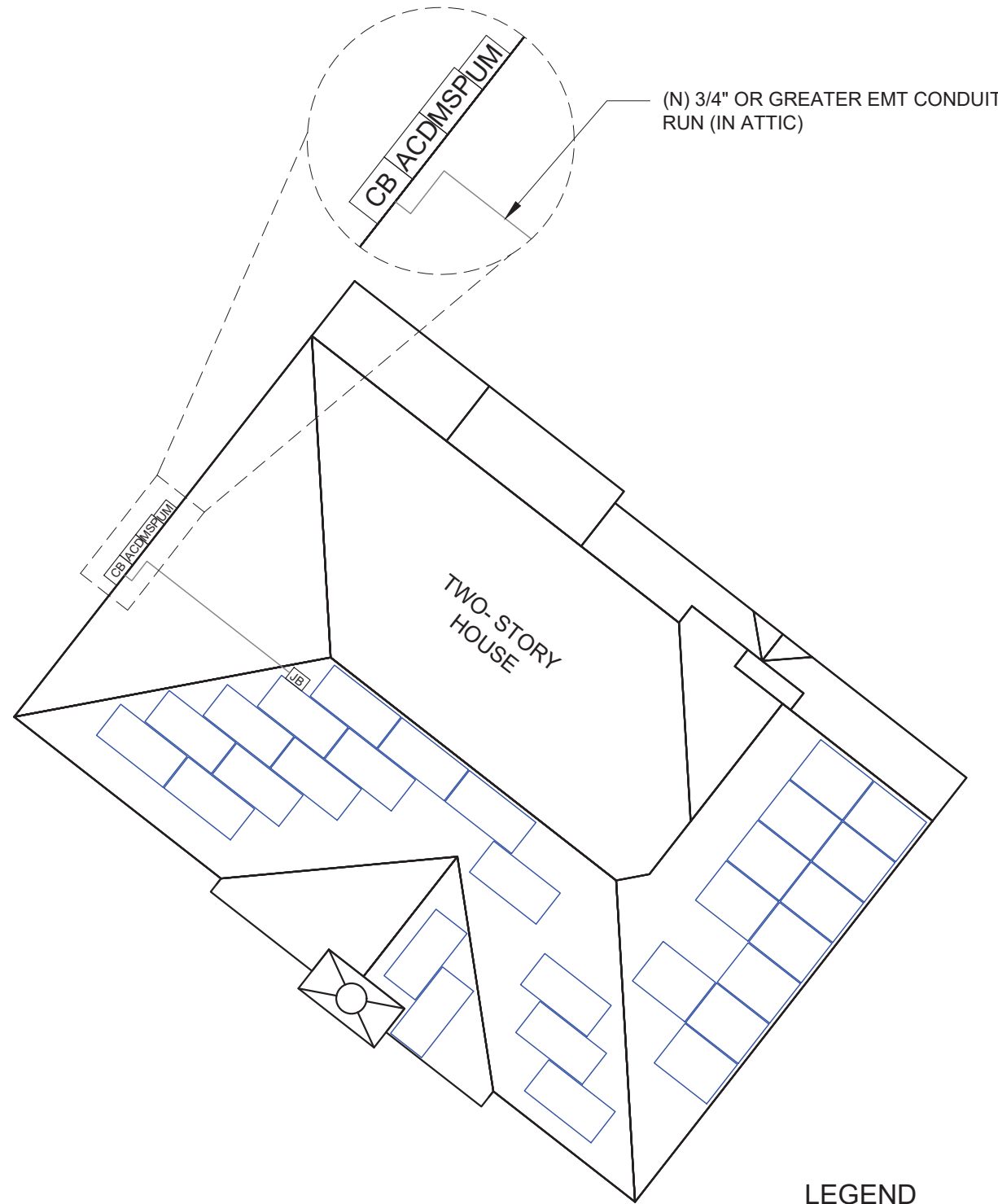
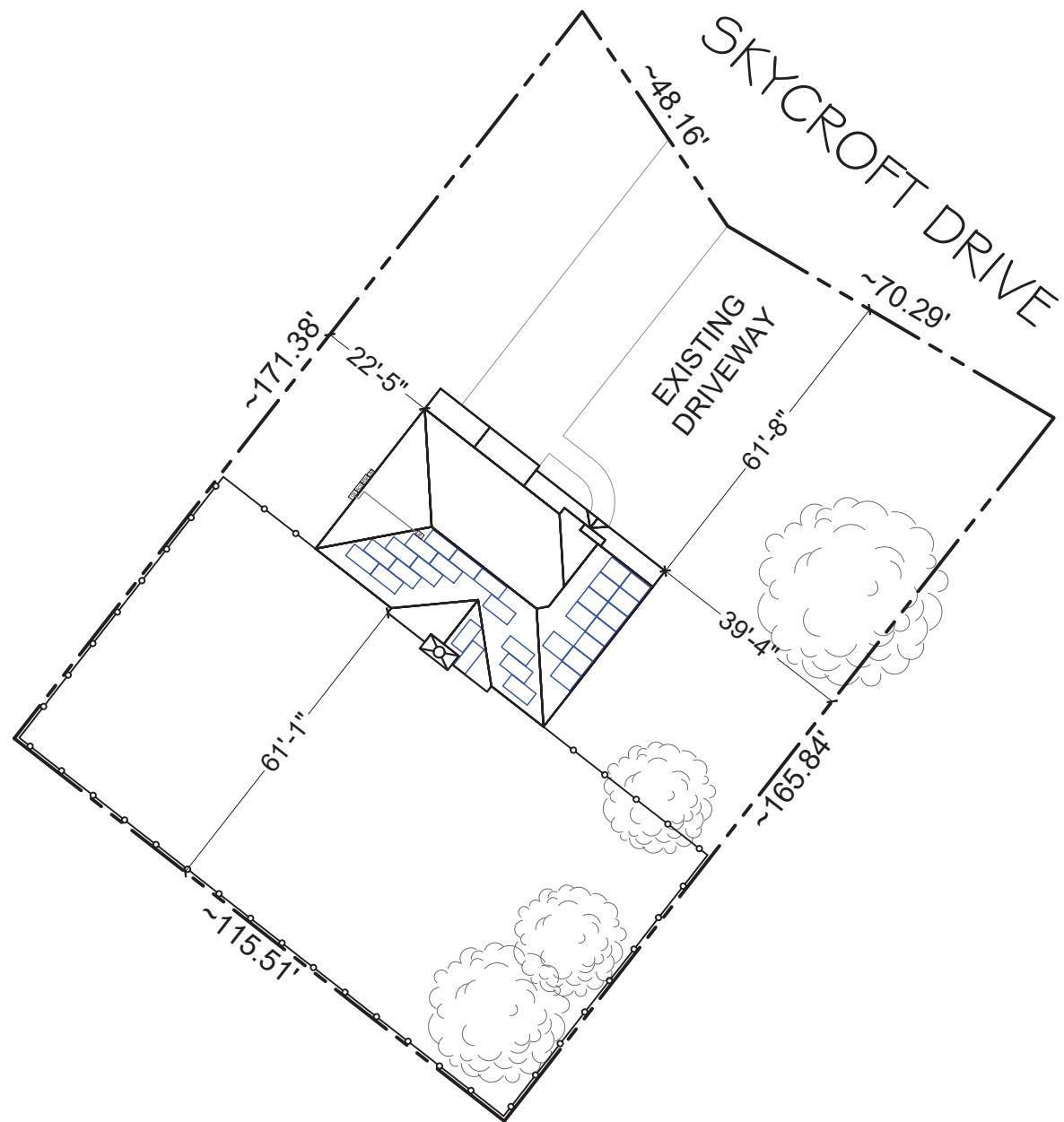
ANSI B
11" X 17"

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



LEGEND

UM	UTILITY METER
MSP	MAIN SERVICE PANEL
ACD	AC DISCONNECT
CB	ENPHASE IQ COMBINER 4
JB	JUNCTION BOX
—●—	FENCE
---	CONDUIT
—x—	GATE
—	PROPERTY LINE
☉	TREES

YES SOLAR SOLUTIONS
 202 NORTH DIXON AVENUE,
 CARY, NC 27513 USA
 PHONE: 919-804-1490
 LICENSE: 67356

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 KEISLER RESIDENCE
 251 SKYCROFT DRIVE,
 SANFORD, NC 27332, USA
 APN# 176491
 UTILITY: CENTRAL EMC
 AHJ: HARNETT COUNTY

1 SITE PLAN WITH ROOF PLAN
 SCALE: 1/32" = 1'

1A ENLARGE VIEW
 SCALE: NTS

SHEET NAME
 SITE PLAN WITH ROOF PLAN
SHEET SIZE
 ANSI B
 11" X 17"
SHEET NUMBER
 PV-1

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 29 MODULES
 MODULE TYPE = REC REC365NP2BLACK (365W) MODULES
 MODULE WEIGHT = 44 LBS / 20.0 KG.
 MODULE DIMENSIONS = 69.10" X 40.94" = 19.65 SF
 UNIT WEIGHT OF ARRAY = 2.24 PSF

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

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

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
RAIL	20	SNAPRACK UR40 RAIL 168"
SPLICE	04	ULTRA RAIL SPLICE
MID CLAMP	30	SNR BONDING MID CLAMP, 30-38MM (1.19-1.49IN), BLACK
END CLAMP	56	SNR UNIVERSAL END CLAMP
ATTACHMENT	95	SNAPRACK FLASHED L FOOT
GROUNDING LUG	14	GROUNDING LUG

ROOF DESCRIPTION					
ROOF TYPE				ASPHALT SHINGLE ROOF	
ROOF	# OF MODULES	ROOF TILT	AZIMUTH	TRUSSES SIZE	TRUSSES SPACING
#1	12	38°	127°	2"x6"	16" O.C.
#2	15	38°	217°	2"x6"	16" O.C.
#3	02	38°	217°	2"x6"	16" O.C.

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 %
569.72	2037.78	28%
28%	ROOF AREA (ARRAY <33% OF ROOF AREA)	



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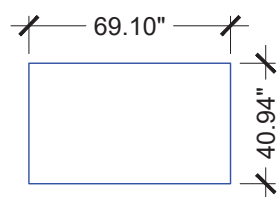
PROJECT NAME
KEISLER RESIDENCE
 251 SKYCROFT DRIVE,
 SANFORD, NC 27332, USA
 APN# 176491
 UTILITY: CENTRAL EMC
 AHJ: HARNETT COUNTY

SHEET NAME
ROOF PLAN WITH MODULES

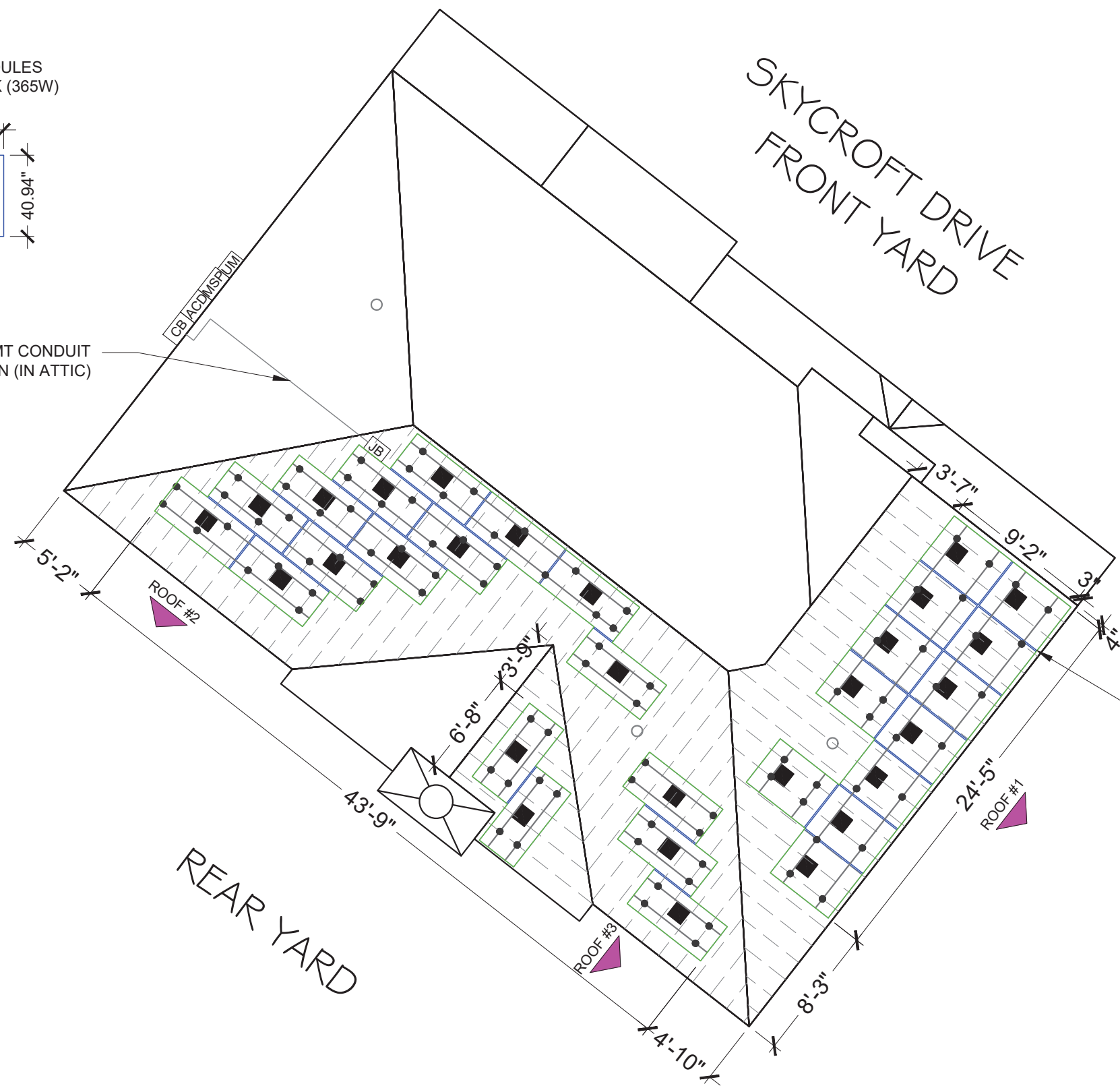
SHEET SIZE
ANSI B
 11" X 17"

SHEET NUMBER
PV-2

PHOTOVOLTAIC MODULES
 REC REC365NP2BLACK (365W)



(N) 3/4" OR GREATER EMT CONDUIT RUN (IN ATTIC)



CRITTER GUARDS

LEGEND	
UM	UTILITY METER
MSP	MAIN SERVICE PANEL
ACD	AC DISCONNECT
CB	ENPHASE IQ COMBINER 4
JB	JUNCTION BOX
—	SNAPRACK UR40 RAIL
—	CONDUIT
■	MICRO-INVERTER
●	ROOF ATTACHMENT @ 48" O.C.
○ □	VENT, ATTIC FAN (ROOF OBSTRUCTION)
----	TRUSSES

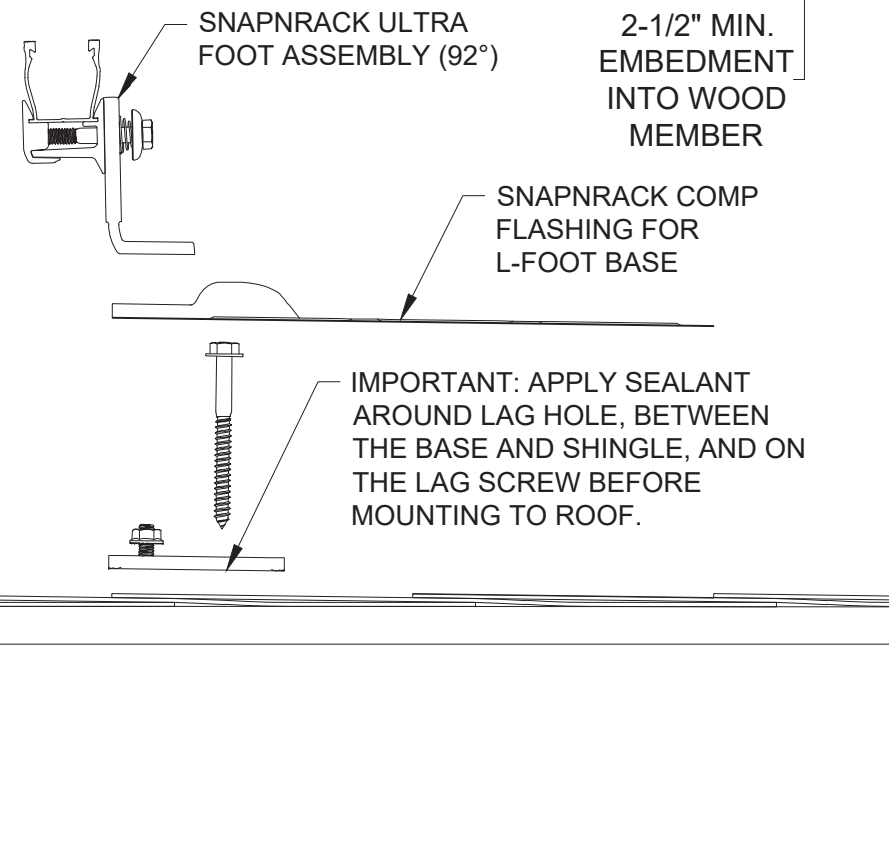
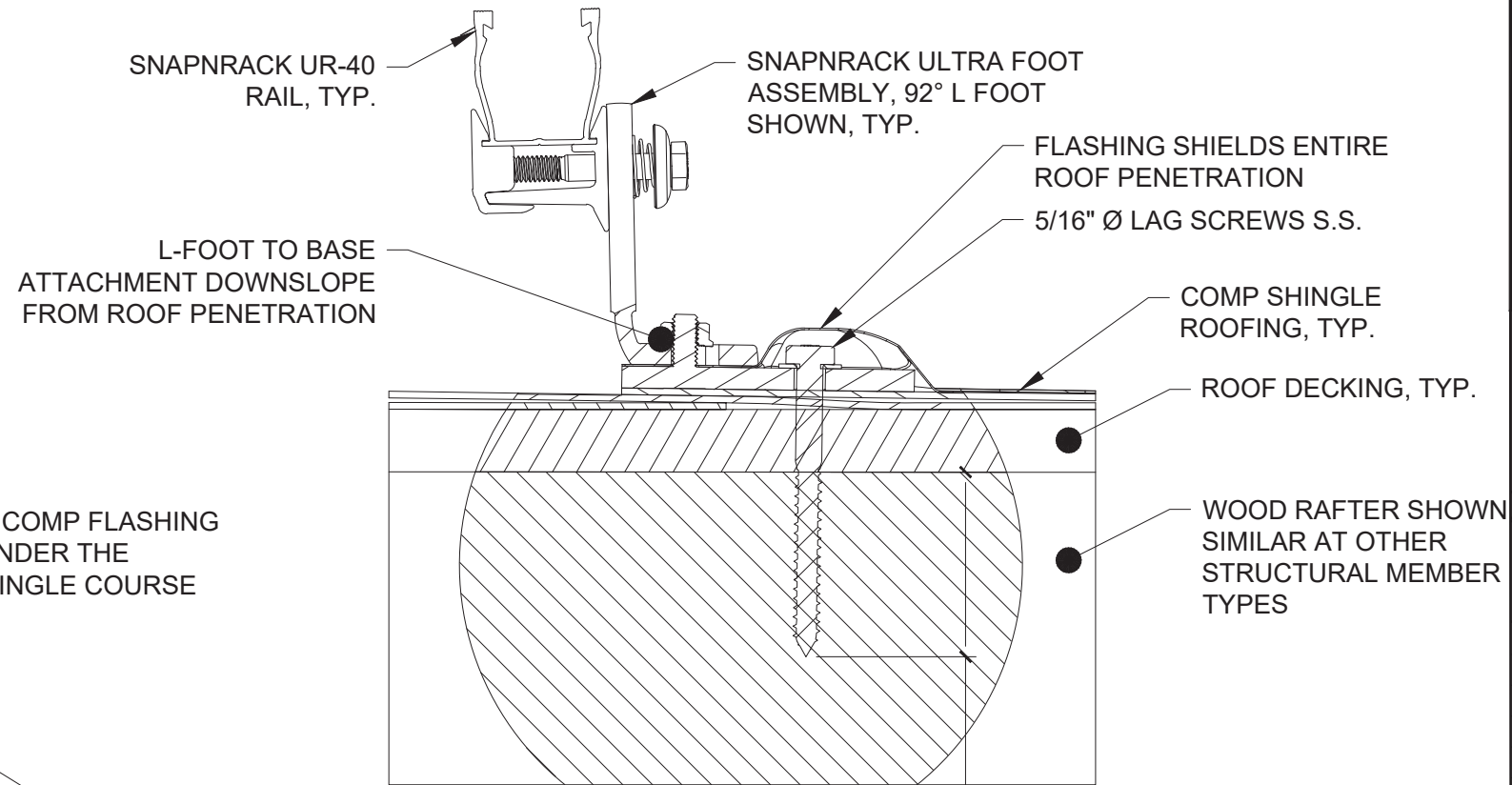
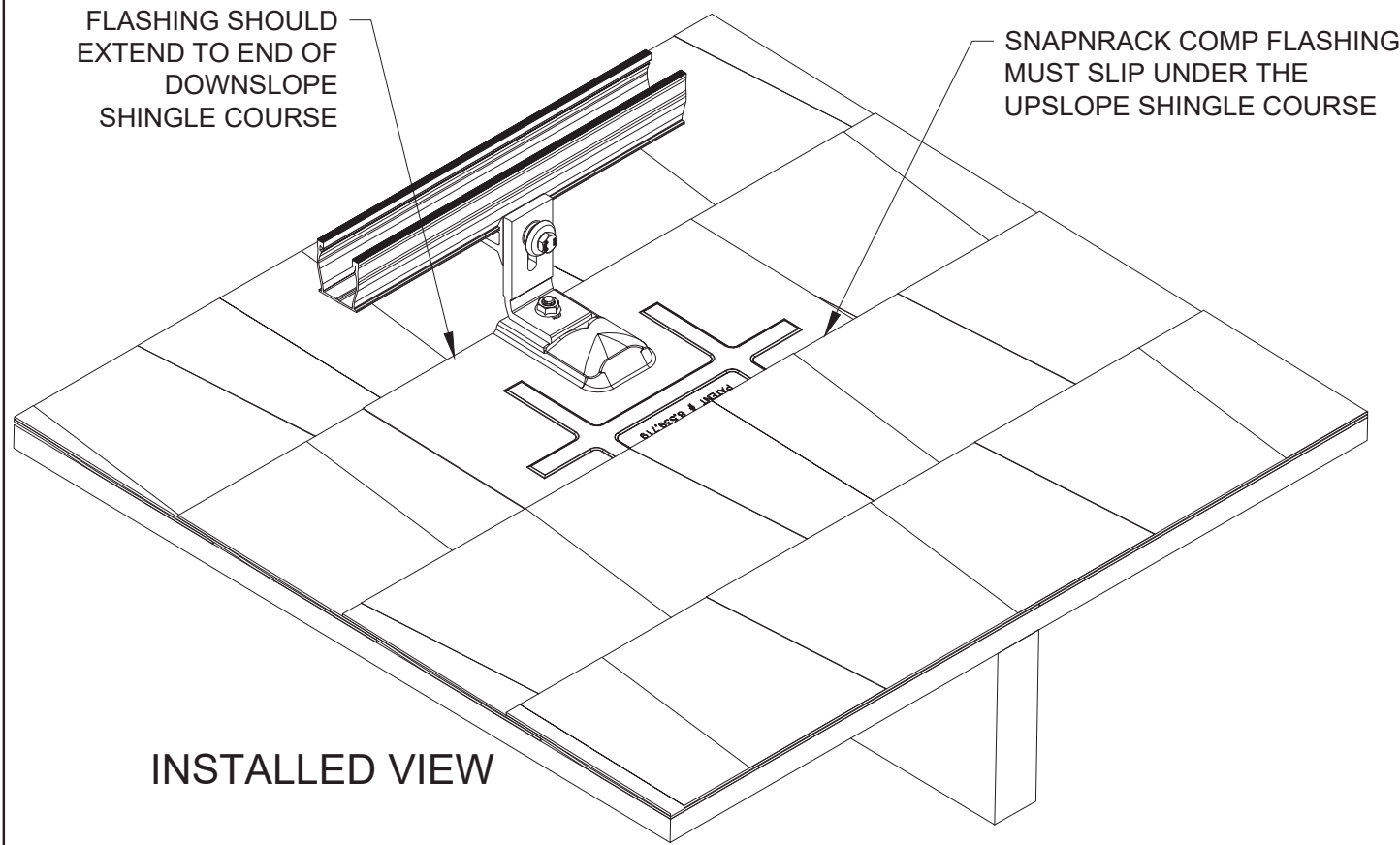
1 ROOF PLAN WITH MODULES
 SCALE: 1/8" = 1'-0"



**SNAPNRACK UR-40 PENETRATION
DETAIL FOR COMP FLASHED L-FOOT
ON BASE**

5/16"Ø LAG SCREW MUST EMBED A
MINIMUM OF 2-1/2" INTO THE ROOF
STRUCTURAL MEMBER.

FOR LEVELING DETAILS, PLEASE SEE
SNAPNRACK DETAIL DRAWING
"UR40-D01, L-FOOT LEVELING".



10.24.2022

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KEISLER RESIDENCE
251 SKYCROFT DRIVE,
SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME
ATTACHMENT
DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

UR40-PEN-D02: UR-40 PENETRATION DETAIL, FLASHED L-FOOT

SOLAR MODULE SPECIFICATIONS

MANUFACTURER / MODEL #	VMP	IMP	VOC	ISC	TEMPERATURE COEFFICIENT OF Voc	# OF MODULES
REC REC365NP2BLACK (365W)	34.3	10.65	40.9	11.36	-0.26%/°C	29
MODULE DIMENSION	69.10" L x 40.94" W x 1.2" D					

AMBIENT TEMPERATURE SPECIFICATIONS

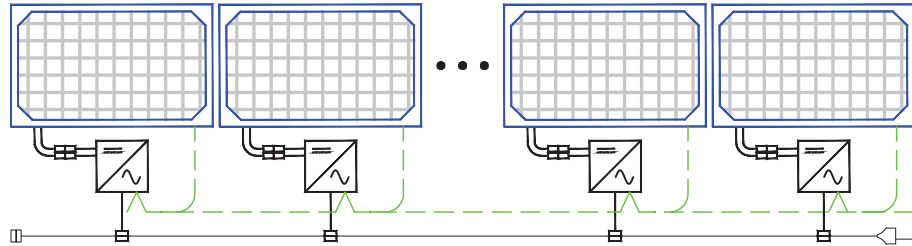
RECORD LOW TEMP	AMBIENT TEMP (HIGH TEMP 2%)	CONDUIT HEIGHT	CONDUCTOR TEMPERATURE RATE (ON ROOF)	CONDUCTOR TEMPERATURE RATE (OFF ROOF)
-10°	35°	IN ATTIC	90°	75°

INVERTER SPECIFICATIONS

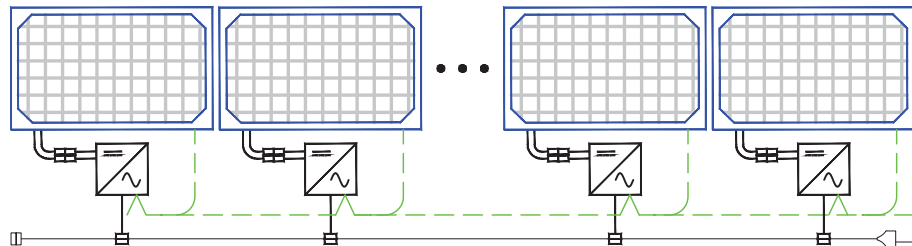
MANUFACTURER / MODEL #	QUANTITY	NOMINAL OUTPUT VOLTAGE	NOMINAL OUTPUT CURRENT
ENPHASE ENERGY IQ8PLUS-72-2-US (290W)	29	240 VAC	1.21A

SYSTEM SIZE:- 29 x 365W = 10.585 kWDC
SYSTEM SIZE:- 29 x 290VA = 8.410 kWAC

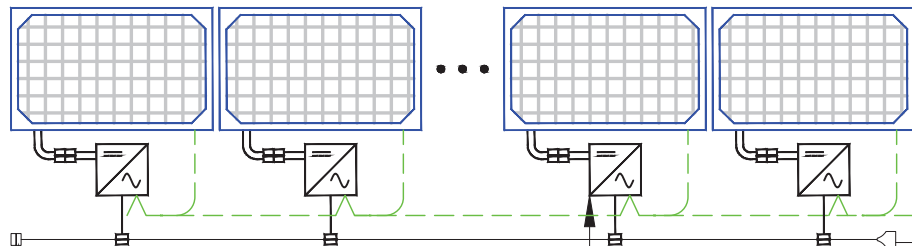
10 MICRO-INVERTERS IN BRANCH CIRCUIT #1



07 MICRO-INVERTERS IN BRANCH CIRCUIT #2

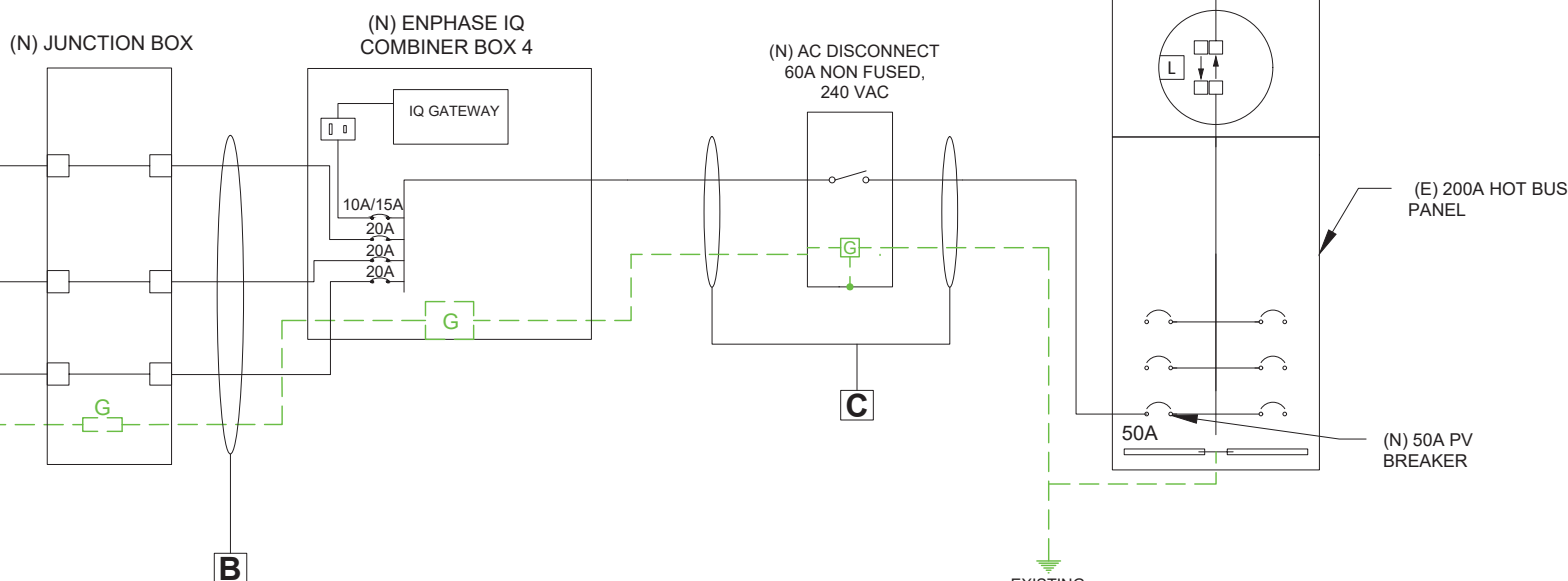


12 MICRO-INVERTERS IN BRANCH CIRCUIT #3



INTERCONNECTION METHOD PER 705.12(B)23XB).
THE SUM OF THE AMPERE RATINGS OF ALL OVERCURRENT DEVICES ON PANELBOARDS, BOTH LOAD AND SUPPLY DEVICES, EXCLUDING THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR, SHALL NOT EXCEED THE AMPACITY OF THE BUSBAR. THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED THE RATING OF THE BUSBAR

TERMINATOR CAP ON LAST CABLE CONNECTOR AC TRUNK CABLE (TYP)
ENPHASE ENERGY IQ8PLUS-72-2-US, 240V, MICRO-INVERTERS



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)	Design Current (A)	Ground Size	Ground Wire Type
A	OPEN AIR	3	12 AWG	Q Cable	90°C	30	0.96	1.0	28.80	12	1.21	14.52	06 AWG	BARE CU
B	3/4" EMT	6	10 AWG	THWN-2/NM-B CABLES WHERE RUN INDOOR	90°C	30	0.96	0.80	23.04	12	1.21	14.52	10 AWG	THWN-2
C	3/4" EMT	3	8 AWG	THWN	75°C	50	0.94	1.0	47.00	29	1.21	35.09	10 AWG	THWN

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251 SKYCROFT DRIVE,
SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME ELECTRICAL LINE DIAGRAM
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-4

⚠ 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
ELECTRIC SHOCK HAZARD
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION
DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

LABEL LOCATION:
DC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC 690.13(B))

WARNING
ELECTRIC SHOCK HAZARD
IF GROUND FAULT IS INDICATED ALL NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED

LABEL LOCATION:
AC & DC DISCONNECT AND SUB PANEL
(PER CODE: NEC 690.41(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 SYSTEM AC DISCONNECT
RATED AC OPERATING CURRENT 35.09 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

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

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

LABEL LOCATION:
SERVICE PANEL IF SUM OF BREAKERS EXCEEDS PANEL RATING
(PER CODE: NEC 705.12 (B)(2)(3)(b))

WARNING:PHOTOVOLTAIC POWER SOURCE

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

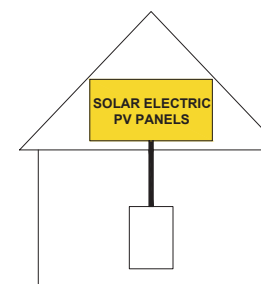
MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

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

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

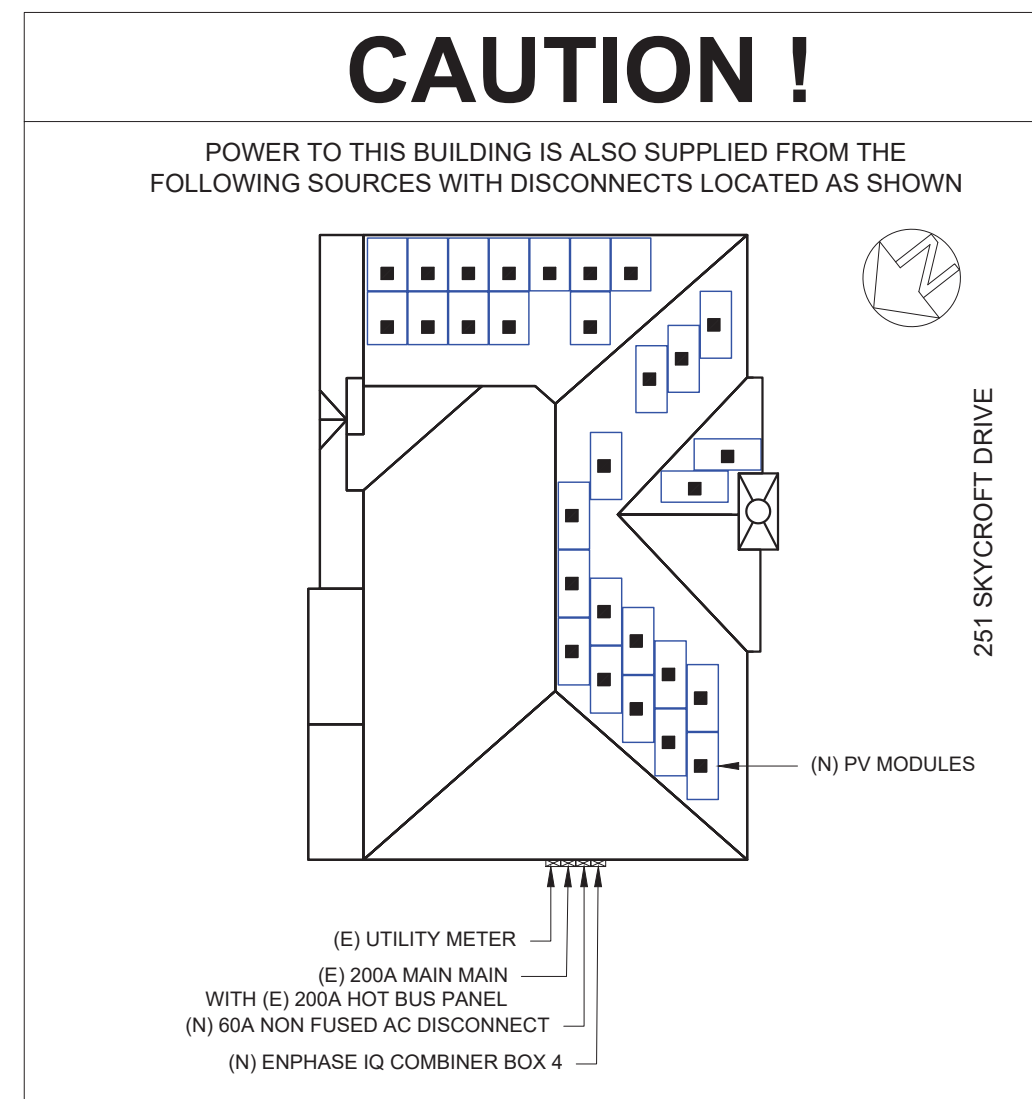
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY



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

⚠ WARNING
THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT

LABEL LOCATION:
INVERTER
(PER CODE: NEC 690.31(I))



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SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME
PLACARDS & WARNING LABELS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

REC N-PEAK 2 BLACK SERIES

PREMIUM FULL BLACK MONO N-TYPE SOLAR PANELS



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



NO LIGHT INDUCED DEGRADATION



SUPER-STRONG FRAME UP TO 7000 PA SNOW LOAD



FLEXIBLE INSTALLATION OPTIONS



FEATURING REC'S PIONEERING TWIN DESIGN



HIGH POWER FOR 25 YEARS

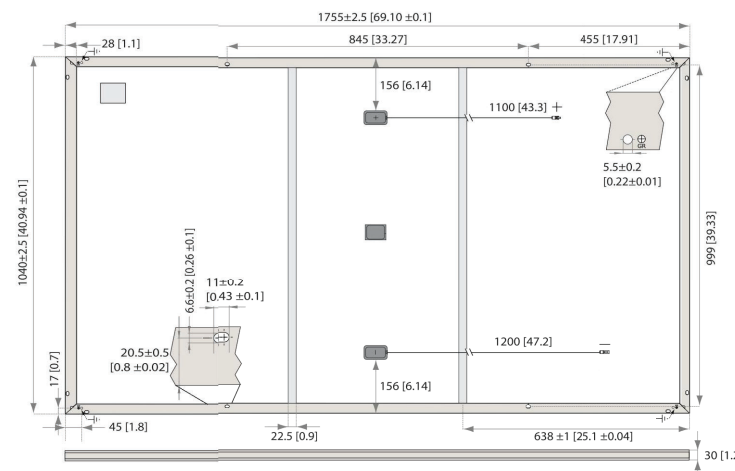
370 WP POWER



SOLAR'S MOST TRUSTED



REC N-PEAK 2 BLACK SERIES



Measurements in mm [in]

ELECTRICAL DATA @ STC		Product code*: RECxxxNP2 Black			
Nominal Power - P _{MAX} (Wp)		355	360	365	370
Watt Class Sorting - (W)		0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V _{MPP} (V)		33.5	33.9	34.3	34.7
Nominal Power Current - I _{MPP} (A)		10.60	10.62	10.65	10.68
Open Circuit Voltage - V _{OC} (V)		40.7	40.8	40.9	41.1
Short Circuit Current - I _{SC} (A)		11.27	11.31	11.36	11.41
Panel Efficiency (%)		19.4	19.7	20.0	20.3

Values at standard test conditions (STC: air mass AM1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of P_{MAX}, V_{OC} & I_{SC} ±3% within one watt class. * Where xxx indicates the nominal power class (P_{MAX}) at STC above.

ELECTRICAL DATA @ NOCT		Product code*: RECxxxNP2 Black			
Nominal Power - P _{MAX} (Wp)		268	272	276	280
Nominal Power Voltage - V _{MPP} (V)		31.3	31.7	32.1	32.5
Nominal Power Current - I _{MPP} (A)		8.56	8.58	8.60	8.63
Open Circuit Voltage - V _{OC} (V)		38.1	38.2	38.2	38.4
Short Circuit Current - I _{SC} (A)		9.10	9.13	9.18	9.22

Nominal operating cell temperature (NOCT: air mass AM1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s). *Where xxx indicates the nominal power class (P_{MAX}) at STC above.

CERTIFICATIONS	
IEC 61215:2016, IEC 61730:2016, UL 61730 (Pending)	
ISO 14001:2004, ISO 9001:2015, OHSAS 18001:2007, IEC 62941	



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

See warranty documents for details. Some conditions apply.

GENERAL DATA	
Cell type:	120 half-cut mono c-Si n-type cells 6 strings of 20 cells in series
Glass:	0.13" (3.2 mm) solar glass with anti-reflection surface treatment
Backsheet:	Highly resistant polymeric construction (black)
Frame:	Anodized aluminum (black)
Junction box:	3-part, 3 bypass diodes, IP68 rated in accordance with IEC 62790
Cable:	12 AWG (4 mm ²) PV wire, 43 + 47" (1.1 m + 1.2 m) in accordance with EN 50618
Connectors:	Stäubli MC4 PV-KBT4/KST4, 12 AWG (4 mm ²) in accordance with IEC 62852 IP68 only when connected
Origin:	Made in Singapore

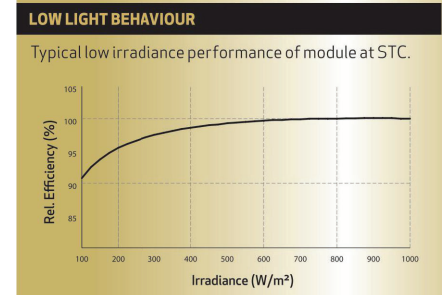
MECHANICAL DATA	
Dimensions:	69.1 x 40.94 x 1.2 in (1755 x 1040 x 30 mm)
Area:	19.70 sq ft (1.83 m ²)
Weight:	44.0 lbs (20.0 kg)

MAXIMUM RATINGS	
Operational temperature:	-40 ... +85°C
Maximum system voltage:	1000 V
Maximum test load (front):	+7000 Pa (146 psf) [*]
Maximum test load (rear):	-4000 Pa (83.5 psf) [*]
Max series fuse rating:	25 A
Max reverse current:	25 A

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

TEMPERATURE RATINGS *	
Nominal Operating Cell Temperature:	44.3°C (+2°C)
Temperature coefficient of P _{MAX} :	-0.34 %/°C
Temperature coefficient of V _{OC} :	-0.26 %/°C
Temperature coefficient of I _{SC} :	0.04 %/°C

^{*}The temperature coefficients stated are linear values



Specifications subject to change without notice.

Ref: PM-DS-11-05-Rev-A-07-21



202 NORTH DIXON AVENUE,
CARY, NC 27513 USA
PHONE: 919-804-1490
LICENSE: 67356

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/13/2022	UR

PROJECT NAME
KEISLER RESIDENCE
251 SKYCROFT DRIVE,
SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME	SPEC SHEETS
SHEET SIZE	ANSI B 11" X 17"
SHEET NUMBER	PV-6

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



www.recgroup.com



DATA SHEET



IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast 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 Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.



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



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



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

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IQ8SP-DS-0002-01-EN-US-2022-03-17

Easy to install

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

High productivity and reliability

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

Microgrid-forming

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

* Only when installed with IQ System Controller 2, meets UL 1741.

** IQ8 and IQ8Plus supports split phase, 240V installations only.

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings ¹	W	235 - 350	235 - 440
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell
MPPT voltage range	V	27 - 37	29 - 45
Operating range	V	25 - 48	25 - 58
Min/max start voltage	V	30 / 48	30 / 58
Max input DC voltage	V	50	60
Max DC current ² [module Isc]	A	15	
Overvoltage class DCport		II	
DC port backfeed current	mA	0	
PV array configurator		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Peak output power	VA	245	300
Max continuous output power	VA	240	290
Nominal (L-L) voltage, range ³	V	240 / 211 - 204	
Max continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 - 68	
AC short circuit fault current over 3 cycles	Arms	2	
Max units per 20 A (L-L) branch circuit ⁴		16	13
Total harmonic distortion		<5%	
Overvoltage class ACport		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	%	97.5	97.6
CEC weighted efficiency	%	97	97
Night-time power consumption	mW	60	
MECHANICAL DATA			
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)	
Relative humidity range		4% to 100% (condensing)	
DC Connector type		MC4	
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection - no fans	
Approved for wet locations		Yes	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure	
Environ. category / UV exposure rating		NEMA Type 6 / outdoor	
COMPLIANCE			
Certifications		CA Rule 21 (UL 1741-SA), UL 62103-1, UL1741/IEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 1071-01	
		This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.	

(1) No enforced DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility>

(2) Maximum continuous input DC current is 10.6A (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-DS-0002-01-EN-US-2022-03-17



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VERSION

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KEISLER RESIDENCE
251 SKYCROFT DRIVE,
SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-7

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



To learn more about Enphase offerings, visit enphase.com

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

Smart

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

Simple

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

Reliable

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

Enphase IQ Combiner 4/4C

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

To learn more about Enphase offerings, visit enphase.com

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LICENSE: 67356

VERSION

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PROJECT NAME

KEISLER RESIDENCE
251 SKYCROFT DRIVE,
SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-8

Enphase Q Cable Accessories

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



Enphase Q Cable

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

Field-Wireable Connectors

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

Enphase Q Cable Accessories

CONDUCTOR SPECIFICATIONS

Certification	UL3003 (raw cable), UL 9703 (cable assemblies), DG cable
Flame test rating	FT4
Compliance	RoHS, OIL RES I, CE, UV Resistant, combined UL for Canada and United States
Conductor type	THHN/THWN-2 dry/wet
Disconnecting means	The AC and DC bulkhead connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.





Q CABLE TYPES / ORDERING OPTIONS

Connectorized Models	Size / Max Nominal Voltage	Connector Spacing	PV Module Orientation	Connector Count per Box
Q-12-10-240	12 AWG / 277 VAC	1.3 m (4.2 ft)	Portrait	240
Q-12-17-240	12 AWG / 277 VAC	2.0 m (6.5 ft)	Landscape (60-cell)	240
Q-12-20-200	12 AWG / 277 VAC	2.3 m (7.5 ft)	Landscape (72-cell)	200

ENPHASE Q CABLE ACCESSORIES

Name	Model Number	Description
Raw Q Cable	Q-12-RAW-300	300 meters of 12 AWG cable with no connectors
Field-wireable connector (male)	Q-CONN-10M	Make connections from any open connector
Field-wireable connector (female)	Q-CONN-10F	Make connections from any Q Cable open connector
Cable Clip	Q-CLIP-100	Used to fasten cabling to the racking or to secure looped cabling
Disconnect tool	Q-DISC-10	Disconnect tool for Q Cable connectors, DC connectors, and AC module mount
Q Cable sealing caps (female)	Q-SEAL-10	One needed to cover each unused connector on the cabling
Terminator	Q-TERM-10	Terminator cap for unused cable ends
Enphase EN4 to MC4 adaptor 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

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PROJECT NAME

KEISLER RESIDENCE
 251 SKYCROFT DRIVE,
 SANFORD, NC 27332, USA
 APN# 176491
 UTILITY: CENTRAL EMC
 AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-9

L Foot Mounts

snapnrack.com

L Foot Mounts

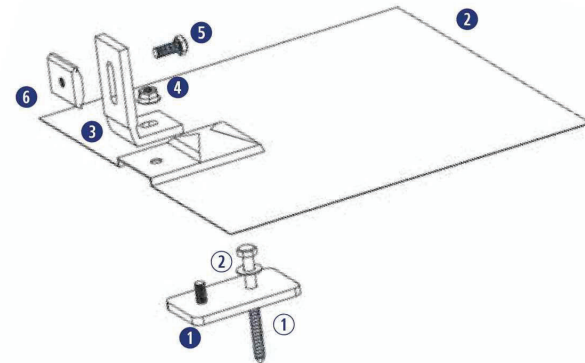
snapnrack.com

Required Tools

- Hammer or Stud Finder
- Roof Marking Crayon
- Drill with 3/16" Pilot Drill Bit
- Roof Sealant
- Torque Wrench
- Socket Wrench
- 1/2" Socket

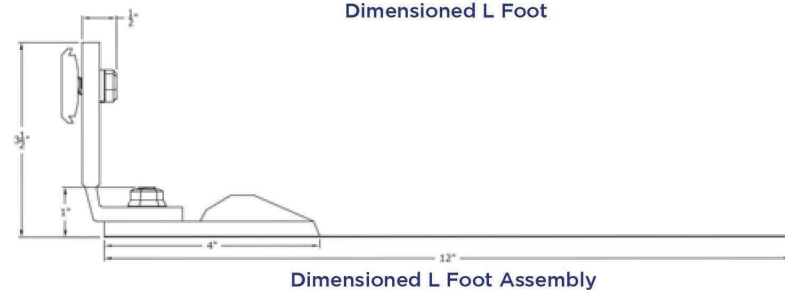
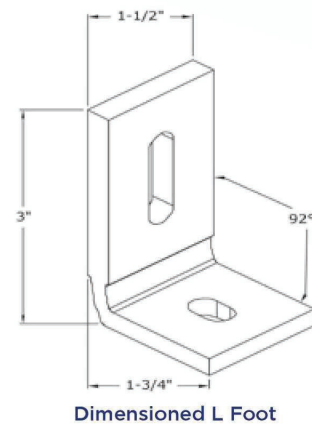
Materials Included - L Foot Flashing Kit

- ① (1) SnapNrack L Foot Base
- ② (1) SnapNrack L Foot Flashing
- ③ (1) SnapNrack Composition L Foot
- ④ (1) 5/16"-18 SS Flange Hex Nut
- ⑤ (1) 5/16"-18 X 1-1/4" SS Flange Bolt
- ⑥ (1) SnapNrack Channel Nut



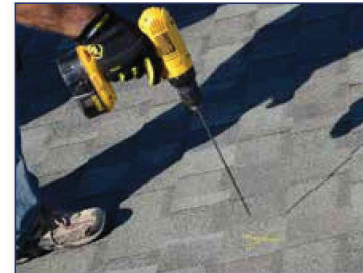
Other Materials Required

- ① (1) 5/16" Lag Screw
- ② (1) 5/16" Washer



Application Note:
Install on composition shingle roofs.

INSTALLATION INSTRUCTIONS



1) Using roof attachment locations drawn during system layout, drill a pilot hole through the roofing material into the roof framing member.

Install Note:
Ensure the lag screws will be installed in a solid portion of the roof framing member.

If the roof framing member is not found then seal the pilot hole immediately with roofing sealant.



4) Pry up shingles with a breaker bar and install flashing underneath shingle course above installed base, position flashing so base stud extends through hole in bottom edge of flashing.

Install Note:
Ensure flashing extends minimum (2) courses above base, and does not overhang bottom edge of shingle course.

Apply a horseshoe of sealant under flashing to direct water away from penetration.



2) Apply roofing sealant to the bottom of the base and directly onto the lag screw to ensure a water tight seal.

Install Note:
The L Foot can be attached in any orientation.



3) Attach the L Foot Base with a 5/16" lag screw, drive lag screw for minimum 2.5" embedment into the roof framing member.

Best Practice:
If using an impact driver, finish tightening lag screw with a hand wrench to prevent L Foot Base from rotating.



5) Place the L Foot on the base stud over the flashing and tighten the flange nut over the L Foot, torque to 10+ ft-lbs.



6) If necessary, adjust the vertical face of the L Foot with the "live hinge" feature and adjust angle of L Foot so that the vertical face is perpendicular to the roof surface.



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SHEET NAME

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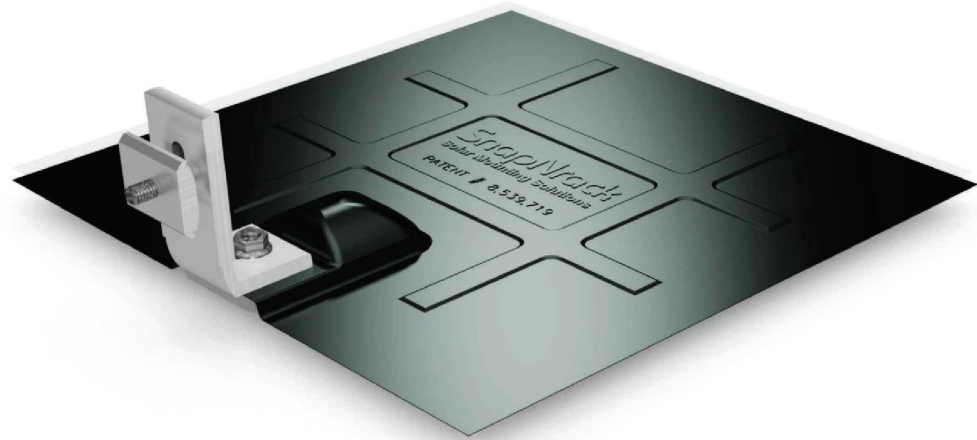
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

SnapNrack Series 100 Flashed L Foot Kit

is an industry-leading, weatherproof solution for attaching to composition shingle roofs. The Flashed L Foot provides a fully flashed method for mounting the SnapNrack Series 100 system. The combination of Series 100 and the Flashed L foot is guaranteed to improve labor times and ensure the highest quality install possible.

Flashed L Foot



Reliable & Weatherproof Roof Attachment



Cutting of shingles not required



Preassembled, snap-in hardware reduces installation time



Single tool installation, using a standard 1/2" socket



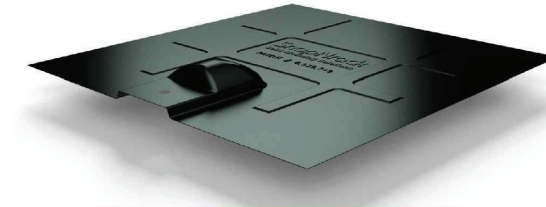
Included in Series 100 UL 2703 Listing

Start Installing the Flashed L Foot Today

RESOURCES snapnrack.com/resources
DESIGN snapnrack.com/configurator
WHERE TO BUY snapnrack.com/where-to-buy

Flashing

- Available in black galvanized steel or aluminum for enhanced corrosion resistance
- L Foot is attaches to bottom edge of flashing, removing the need for shingle cutting
- Innovative stamped features provide increased rigidity

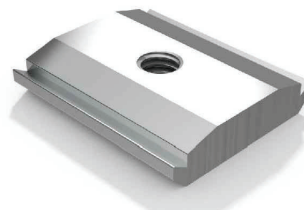
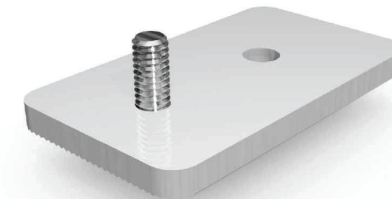


L Foot

- Engineered for maximum adjustability with the ability to orient in any direction
- Vertical adjustability up to 3" using available spacers

L Foot Base

- Provides a long lasting watertight seal over the life of the system that does not rely on rubber (elastomeric seals) that will degrade over time
- Easily installs with off-the-shelf lag screws



Channel Nut

- Provides snap-in installation to the rail channel with no drilling required
- Wide range of adjustability due to sliding ability in rail prior to final tightening

Quality. Performance. Innovation.

SnapNrack solutions are focused on simplifying the installation experience through intuitive products and the best wire management in the industry.



877-732-2860 www.snapnrack.com contact@snapnrack.com

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VERSION		
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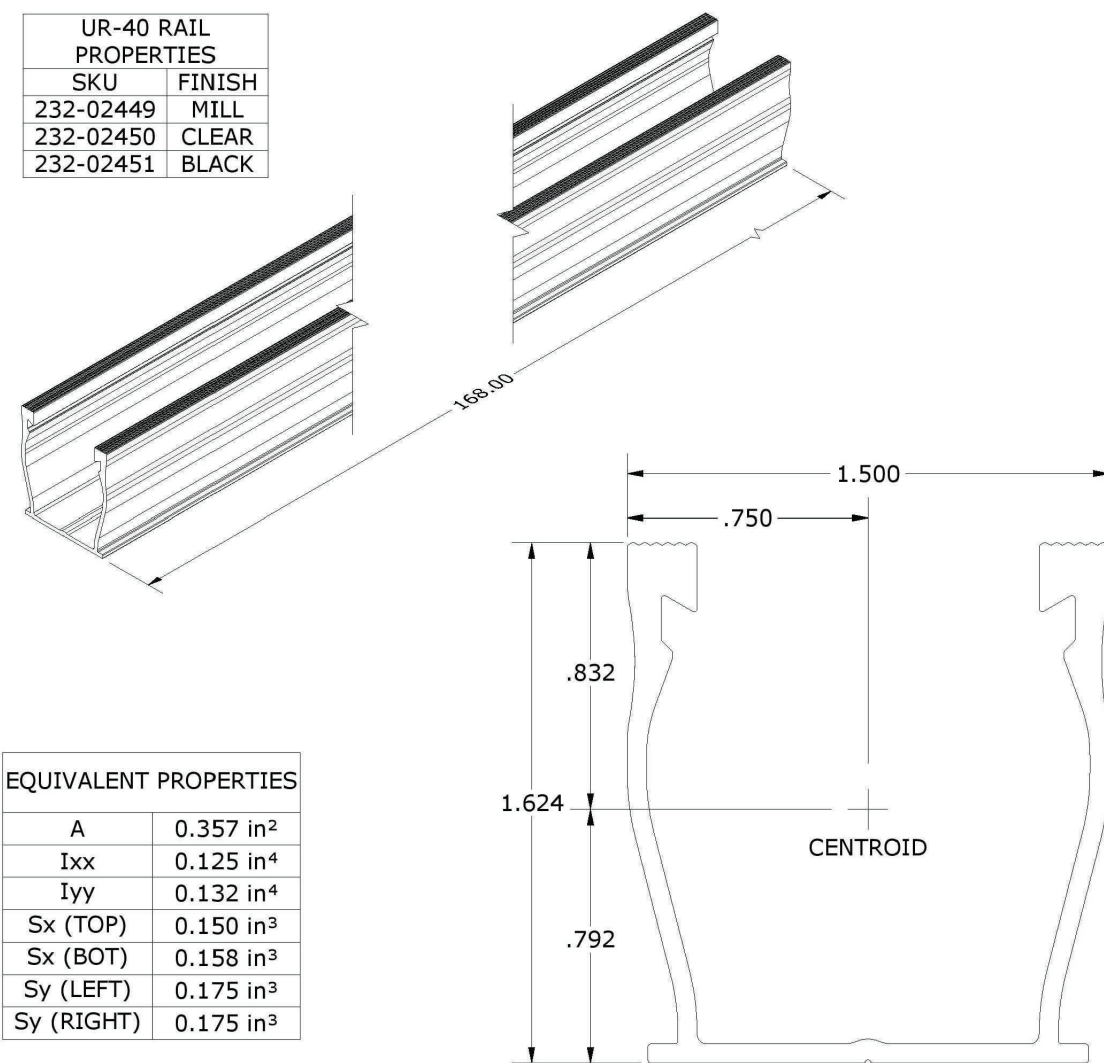
SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

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

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

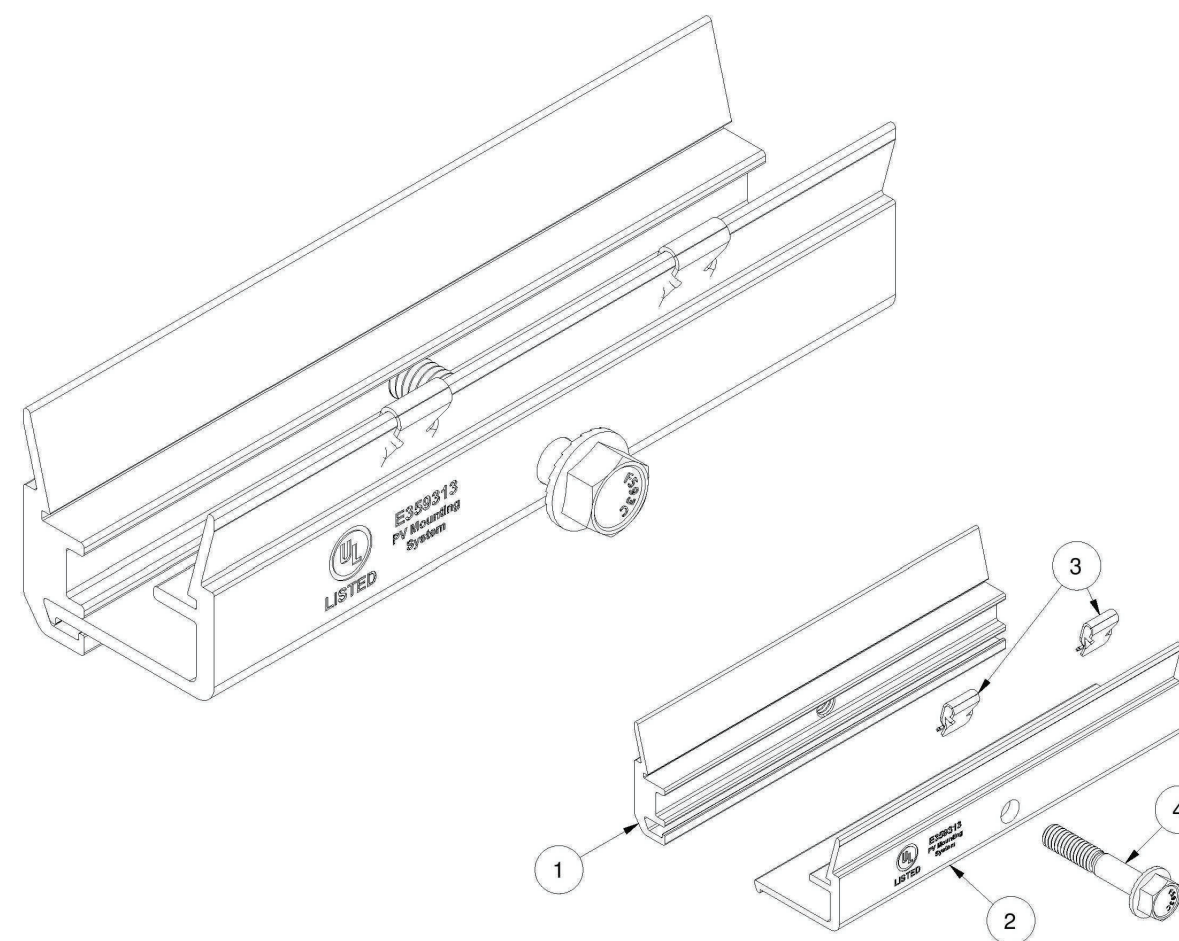


EQUIVALENT PROPERTIES	
A	0.357 in ²
I _{xx}	0.125 in ⁴
I _{yy}	0.132 in ⁴
S _x (TOP)	0.150 in ³
S _x (BOT)	0.158 in ³
S _y (LEFT)	0.175 in ³
S _y (RIGHT)	0.175 in ³

ALL DIMENSIONS IN INCHES

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

DESCRIPTION: SNAPNRACK, ULTRA RAIL SPLICE	DRAWN BY: mwatkins	 <small>595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902</small> <small>THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.</small>
PART NUMBER(S): 242-01213, 242-01214	REVISION: A	



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	SNAPNRACK ULTRA RAIL SPLICE TAPPED PRC, CLEAR
2	1	SNAPNRACK ULTRA RAIL SPLICE THRU PRC, CLEAR
3	2	SNAPNRACK, SNAPLINK BONDING CLIP, TYPE 2, STEEL
4	1	BOLT, FLANGE, SERRATED, 5/16IN-18 X 1-3/4IN, SS

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL	OPTIONS:	
DESIGN LOAD (LBS):	N/A	CLEAR / BLACK ANODIZED	
ULTIMATE LOAD (LBS):	N/A		
TORQUE SPECIFICATION:	12 LB-FT		
CERTIFICATION:	UL 2703, FILE E359313		
WEIGHT (LBS):	0.52		

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/13/2022	UR

PROJECT NAME

KEISLER RESIDENCE
251 SKYCROFT DRIVE,
SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

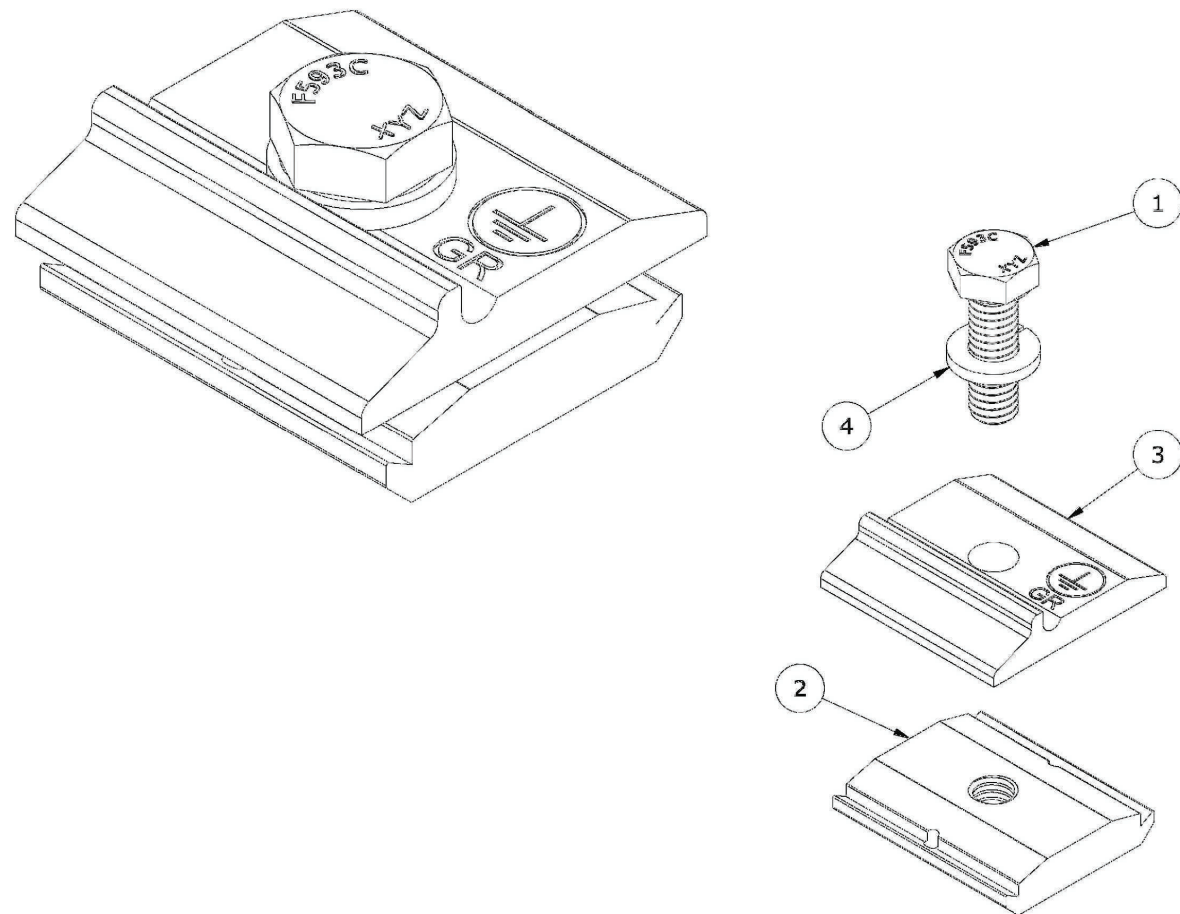
ANSI B
11" X 17"

SHEET NUMBER

PV-12

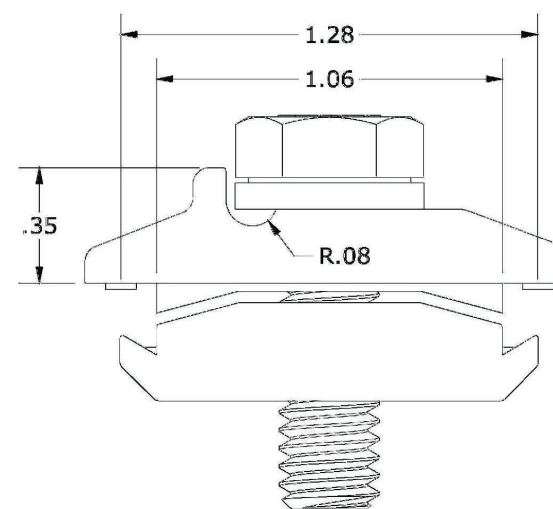
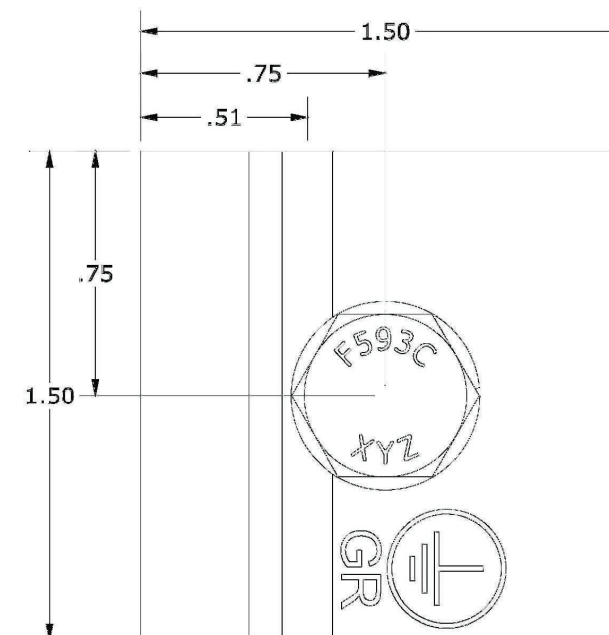
DESCRIPTION: SNAPRACK, GROUND LUG	DRAWN BY: D.Ryan	 <small>595 MARKET STREET, 28TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 553-5900 • FAX (415) 553-5902</small> <small>THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.</small>
PART NUMBER(S): 242-02101	REVISION: A	

DESCRIPTION: SNAPRACK, GROUND LUG	DRAWN BY: D.Ryan	 <small>595 MARKET STREET, 28TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 553-5900 • FAX (415) 553-5902</small> <small>THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.</small>
PART NUMBER(S): 242-02101	REVISION: A	



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	BOLT, HEX CAP, 5/16IN-18 X 1IN, SS
2	1	SNAPNRACK, BONDING CHANNEL NUT
3	1	SNAPNRACK, GROUND LUG R PRC
4	1	5/16IN SS SPLIT LOCK WASHER

MATERIALS:	TIN-PLATED ALUMINUM, STAINLESS STEEL	OPTIONS:
DESIGN LOAD (LBS):	N/A	
ULTIMATE LOAD (LBS):	N/A	
TORQUE SPECIFICATION:	16 LB-FT	
CERTIFICATION:	UL 467 & UL 2703, FILE E359313	
WEIGHT (LBS):	0.13	



ALL DIMENSIONS IN INCHES

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/13/2022	UR

PROJECT NAME
KEISLER RESIDENCE
251 SKYCROFT DRIVE,
SANFORD, NC 27332, USA
APN# 176491
UTILITY: CENTRAL EMC
AHJ: HARNETT COUNTY

SHEET NAME	SPEC SHEETS
SHEET SIZE	ANSI B 11" X 17"

SHEET NUMBER	PV-13
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