

① PROJECT LOCATION
N.T.S.



② BIRDS EYE VIEW
N.T.S.

SOLAR ENERGY PROJECT AT THE RESIDENCE

CUSTOMER ADDRESS	----
REVISION NUMBER	Roof Mount Example.dwg

NJ APPLICABLE CODES & STANDARDS

IRCNJ 2018 – BUILDING
R324.6.2.2
NFPA 70 – FIRE
NEC 2017 – ELECTRICAL
IMC 2018 – MECHANICAL
IBC 2018 – WIND & SNOW LOADS
ASCE – 7-10 & 7-16

TABLE OF CONTENTS

Sheet	Title
T1	COVER SHEET
A1	ROOF ARRAY LAYOUT
S1	MODULE ATTACHMENT DETAIL AND LOADS
E1	ELECTRICAL DIAGRAM
E2	ELECTRICAL GROUNDING DETAIL
E3	ELECTRICAL LABELING
R1	SOLAR PANEL ELECTRICAL DATASHEET
R2	INVERTER ELECTRICAL DATASHEET
B1	CREW'S ASBUILT

REV	DATE	DESCRIPTION
0	12/14/22	ISSUED FOR PERMIT SET

RPC Contractor

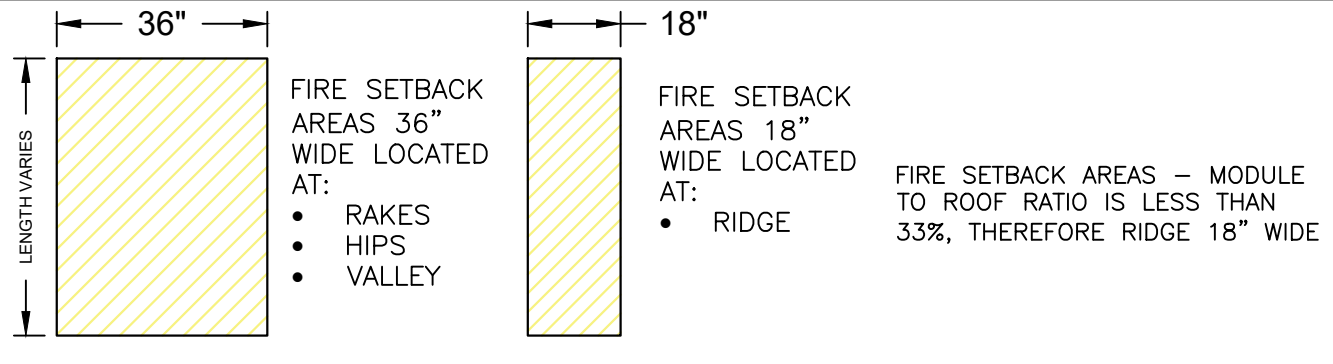
Structural Engineer:

11" x 17" DRAWN BY: PA
 AN PROJECT # 9074
 CUSTOMER PROJECT # 1977
 DATE December 17, 2022

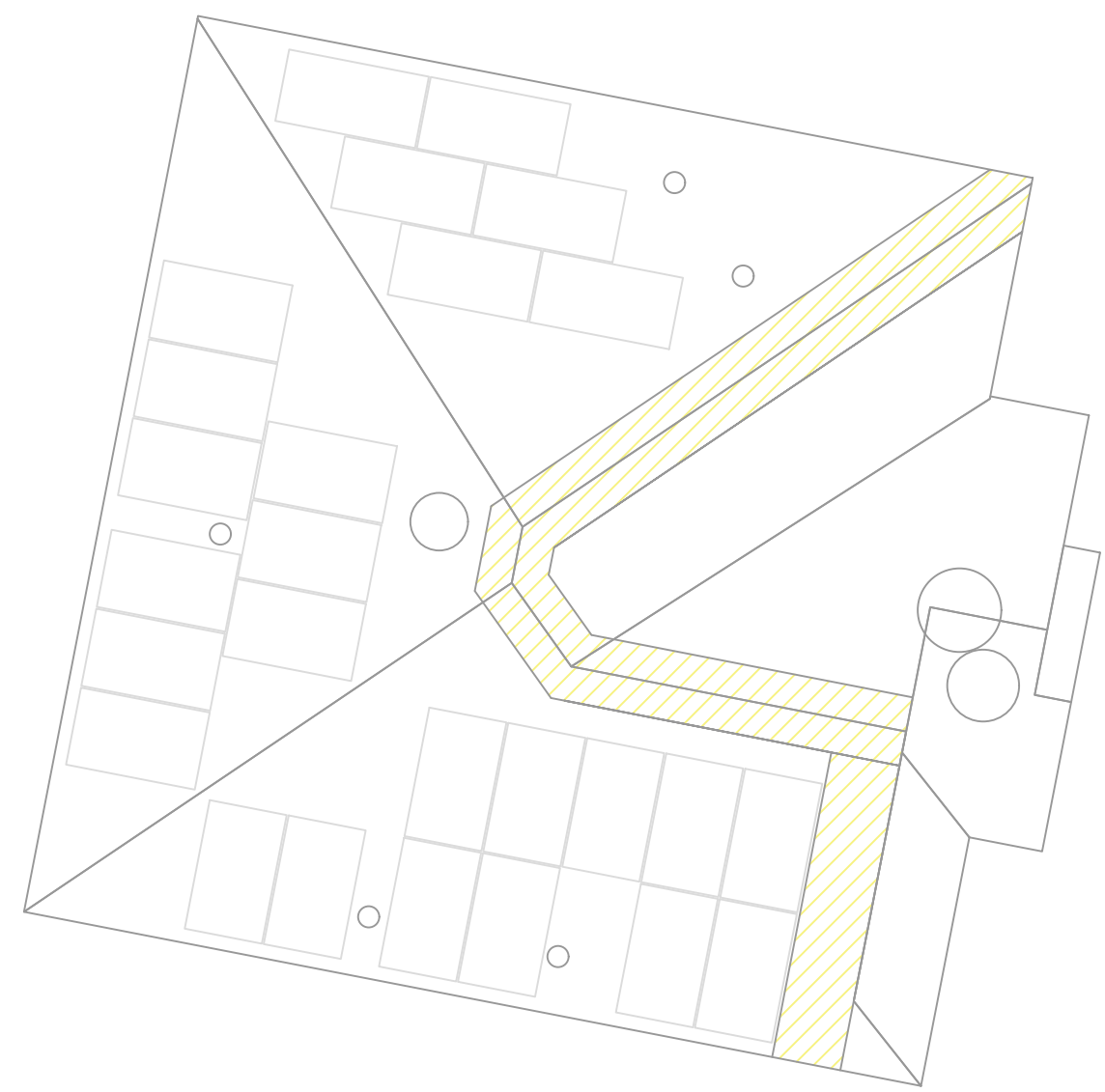
PROJECT NAME & ADDRESS: RESIDENCE

DRAWING TITLE: COVER PAGE
 DWG. NAME & REV#
 Roof Mount Example.dwg

SHEET: T1



① ARRAY LAYOUT VIEW
 1 1/2" = 1'-0"



Address
 315 Quince Ave
 Galloway, NJ 08205, USA

Coordinates
 (39.476302, -74.548548)

Date
 14 December 2022



Summary

Array	Panel Count	Azimuth (deg.)	Pitch (deg.)	Annual TOF (%)	Annual Solar Access (%)	Annual TSRF (%)
1	11	191	23	98	100	98
2	6	11	22	67	100	67
3	9	281	23	80	100	80

REV	DATE	DESCRIPTION
0	12/14/22	ISSUED FOR PERMIT SET

RPC Contractor

Structural Engineer:

11" x 17" DRAWN BY: PA

PROJECT NAME & ADDRESS: RESIDENCE

AK PROJECT # 9074

CUSTOMER PROJECT # 1977

DATE December 17, 2022

DRAWING TITLE: ARRAY LAYOUT

DWG. NAME & REV#

Roof Mount Example.dwg

SHEET: A1

DWELLING INFORMATION

SINGLE FAMILY RESIDENTIAL

ROOF INFORMATION

MATERIAL TYPE:
Asphalt Shingles

ROOF STRUCTURE:
2" x 10" Rafters

O.C. Spacing: 16"

DESIGN REQUIREMENTS

Meets or exceeds 125mph wind zones
Meets or exceeds 30 PSF snow load

RACKING INFORMATION

MANUFACTURE & MODEL NUMBER:
Sunpower-InvisiMount

SOLAR PANEL INFORMATION

MANUFACTURE:
SunPower SPR U-400-BLK-W-DC

SOLAR PANEL DEAD WEIGHT CALCULATION

1. A TYPICAL SOLAR PANEL CONSISTS OF FOUR (4) SOLAR MODULES AND ONE ROOF MOUNTING SYSTEM. THE MOUNTING SYSTEM HAS SIX (6) POINTS OF CONTACT WITH THE ROOF.

2. PANEL WEIGHT CALCULATION:

SOLAR MODULE WEIGHT = 42.1 LBS.
MOUNTING SYSTEM WEIGHT = 15 LBS.
TOTAL PANEL WEIGHT = (4 X 42.1) + 15 = 183.4 LBS.

3. POINT LOAD CALCULATION:

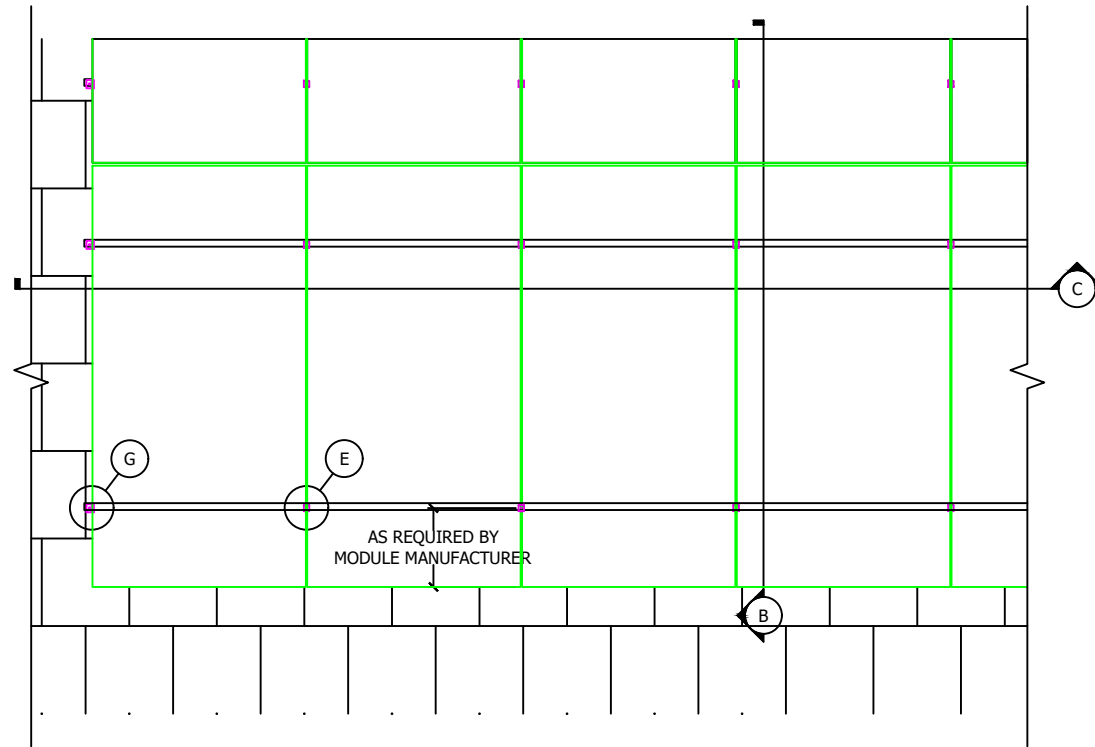
POINT LOAD = $\frac{\text{TOTAL PANEL WEIGHT}}{\text{NUMBER OF POINTS OF SUPPORT}}$
= $\frac{183.4 \text{ LBS.}}{6 \text{ SUPPORTS}}$ = 30.6 LBS.

4. DISTRIBUTED LOAD CALCULATION:

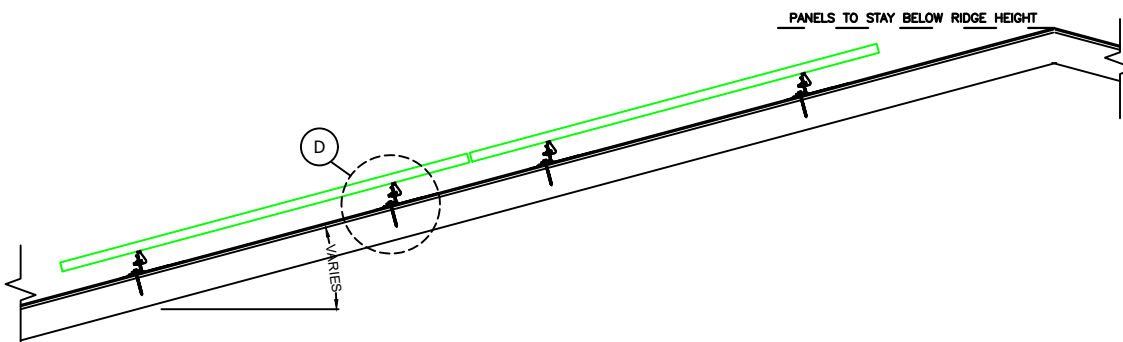
SOLAR MODULE AREA = 38.98" X 64.96" = 17.58 FT²
TOTAL SOLAR MODULE AREA = 4 X 17.58 = 70.33 FT²
INTER-MODULE SPACING = 1.0"
TOTAL SPACING AREA = 3 X 1.0" X 64.96" = 1.35 FT²
(3 SPACES BETWEEN 4 MODULES)

DISTRIBUTED LOAD = $\frac{\text{TOTAL PANEL WEIGHT}}{\text{TOTAL PANEL AREA}}$
= $\frac{183.4 \text{ LBS}}{70.33 \text{ FT}^2}$

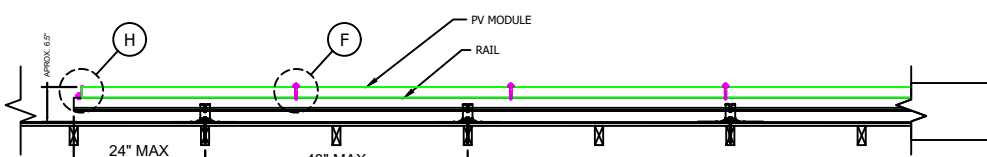
SOLAR PANEL DEAD WEIGHT = **2.6 LBS/FT²**



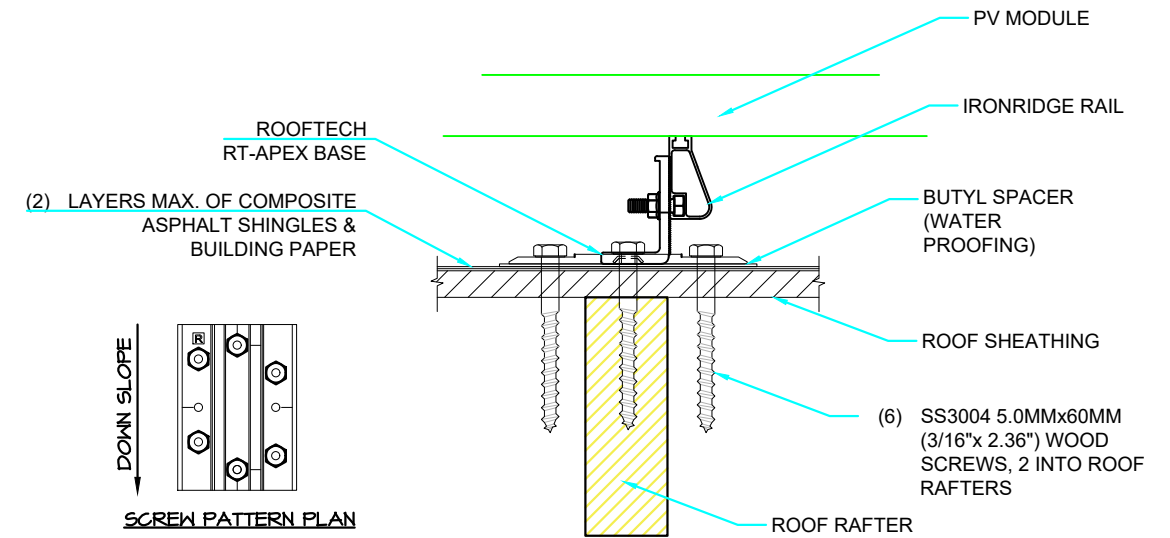
A PLAN VIEW, FLUSH MOUNT ON PITCHED ROOF Scale: 1" = 1'-0"



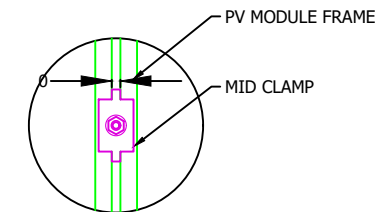
B SIDE VIEW, FLUSH MOUNT ON PITCHED ROOF Scale: 1" = 1'-0"



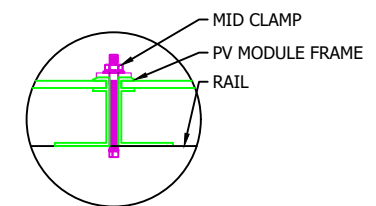
C FRONT VIEW, FLUSH MOUNT ON PITCHED ROOF Scale: 1" = 1'-0"



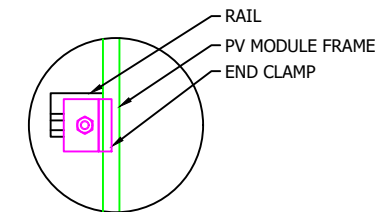
A PLAN VIEW, FLUSH MOUNT ON PITCHED ROOF Scale: 1" = 1'-0"



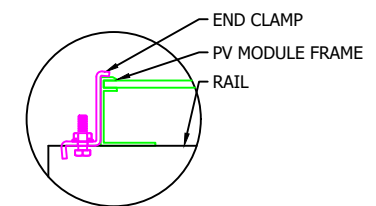
E DETAIL, MID CLAMP PLAN



F DETAIL, MID CLAMP FRONT



G DETAIL, END CLAMP PLAN



H DETAIL, END CLAMP FRONT

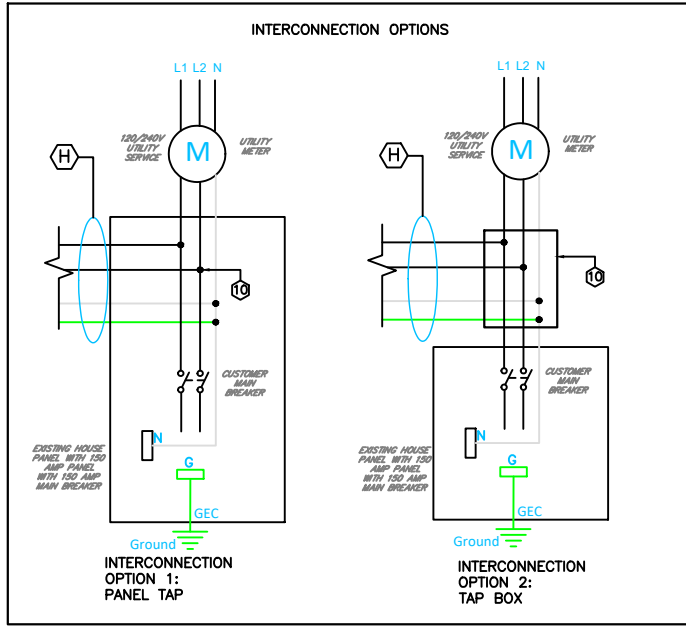
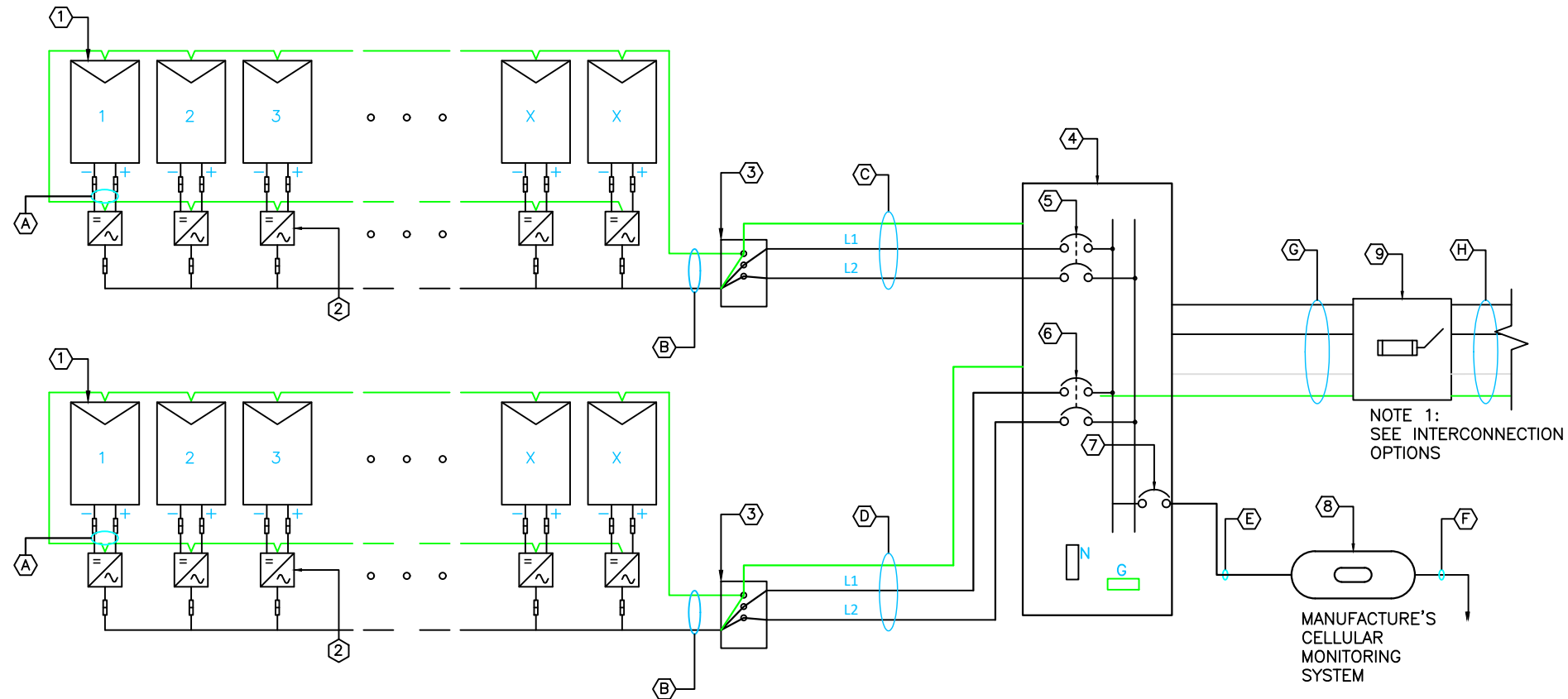
REV	DATE	DESCRIPTION
0	12/14/22	ISSUED FOR PERMIT SET

RPC Contractor	Structural Engineer:
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11" x 17"	DRAWN BY: PA	PROJECT NAME & ADDRESS:
AK PROJECT # 9074		RESIDENCE
CUSTOMER PROJECT # 1977		
DATE December 17, 2022		

DRAWING TITLE:	STRUCTURAL & RACKING
DWG. NAME & REV#	Roof Mount Example.dwg

SHEET:	S1
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NOTE 1:
SEE INTERCONNECTION
OPTIONS

MANUFACTURE'S
CELLULAR
MONITORING
SYSTEM

EQUIPMENT DESIGNATIONS

ITEM	DESCRIPTION	DETAIL	REMARKS
1	PV MODULE	WAAREE WSMDI-400	400 DC WATTS PER 26 TOTAL 10,400 DC KW
2	MICRO INVERTER	ENPHASE IQ 7PLUS-72-2-US UNGROUNDED	26 TOTAL MICRO INVERTERS TOTAL 7,540 AC WATTS
3	JUNCTION BOX NON-FUSED	STRING J BOX FOR ROOF PENTRATION	SOLAR DECK - BRANCH CIRCUIT OUTPUT EMT INSIDE
4	AC COMBINER PANEL	ENPHASE X-IQ-AM1-240-4 IQ COMBINER 4 BOX	125 AMP PANEL 2P BREAKER SPACES 4
5	BRANCH CIRCUIT #1 BREAKER SIZE	20 Amp FOR 13 MICRO INVERTERS	2 Pole, 10 Ka, 240V MAX PER BRANCH
6	BRANCH CIRCUIT #2 BREAKER SIZE	20 Amp FOR 13 MICRO INVERTERS	
7	CONVINIENCE BREAKER FOR COM. DEVICE	10 or 15 AMP	2 Pole, 10 Ka, 240V
8	COMMUNICATION DEVICE	ENPHASE ENVOY	240V, COMMUNICATION PORT IS AVAILABLE FOR UTILITY'S USE.
9	AC DISCONNECT	SQD - D222NRB, NEMA 3R	60 AMP DISC. FUSED AT 40 AMP
10	MAIN PANEL TAP OR TAPBOX	12"x12" BOX - W/TAP CONNECTOR OR ILSCO-IPC KUP-L-TAP	PER NEC 690.64

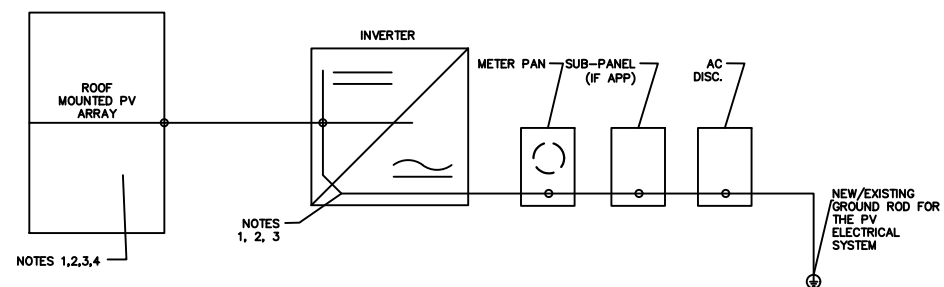
WIRING SCHEDULE

ITEM	DESCRIPTION	FILL	SIZE	TYPE	MINIMUM CONDUIT	CONDUIT TYPE	MAT.	V DROP	EGC	NOTES	APPROX. DISTANCES
A	PV SOURCE CIRCUIT	NA	10 AWG	PV WIRE	FREE AIR	NA	CU	<1%	10 AWG		
B	INVERTER MANUFACTURE CABLE	3	12 AWG	THWN-2	FREE AIR	NA	CU	<1%	12 AWG		12' TO JUNCTION BOX
C	AC OUTPUT CIRCUIT FROM JUNCTION BOX	3	10 AWG	THHN	1/2"	PVC	CU	<1%	10 AWG	MAX WIRE RUN 80 FEET	40' TO LOAD CENTER
D	AC OUTPUT CIRCUIT FROM JUNCTION BOX	3	10 AWG	THHN	1/2"	PVC	CU	<1%	10 AWG	MAX WIRE RUN 80 FEET	40' TO LOAD CENTER
E	COMMUNICATION DEVICE CIRCUIT	2	14 AWG	THHN	FREE AIR	NA	CU	<1%	14 AWG	LOCATED IN SOLAR LOAD CENTER	
F	PATCH CABLE TO NETWORK ROUTER	NA	NA	NA	NA	NA	CU	NA	NA		
G	SOLAR AC LOAD CENTER, AC OUTPUT CIRCUIT	4	8 AWG	THHN	3/4"	PVC	CU	<1%	10 AWG		10' TO DISCONNECT
H	SOLAR AC DISCONNECT OUTPUT CIRCUIT	4	6 AWG	THHN	3/4"	PVC	CU	<1%	8 AWG		10' TO INTERCONNECTION

Inverter		PV Panel Characteristics										
Module Compatibility	Panel	Panel	Ambient	Lowest	Temp	Temp	Temp	NEC	Panel	Panel		
60 Cell or 72 Cell	Volts DC	Volts DC	Temp	Ambient	Coeff	Coeff	Coeff	Multiplier	Max Power	Short Ckt		
MAX DC INPUT WATT	Open	MPP	STC	Temp.	Pmpp	Voc	Isc		Amps	Amps		
440	Ckt		°C	°C	%/°C	%/°C	%/°C		(Imp)	(Isc)		
Inverter	MAX Amps	Max Power										
ENPHASE IQ 7PLUS-72-2-US	1.21	290	45.22	38	25	-16	-0.365	-0.285	0.055	1.2	9.14	10.54

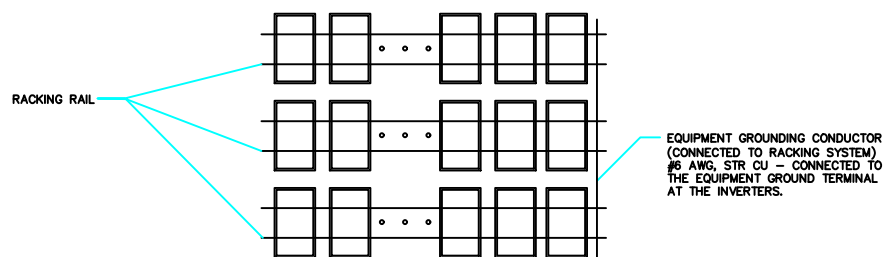
NEC LABELING	
POINT OF INTERCONNECTION	
RATED AC OUTPUT CURRENT (AMPS)	31.46
NOMINAL OPERATING VOLTAGE	240 V

REV	DATE	DESCRIPTION	IPC Contractor	Structural Engineer:	11' x 17'	DRAWN BY: PA	PROJECT NAME & ADDRESS:	DRAWING TITLE:	SHEET:
0	12/14/22	ISSUED FOR PERMIT SET			AK PROJECT # 9074		RESIDENCE	ELECTRICAL DIAGRAM	E1
					CUSTOMER PROJECT # 1977			DWG. NAME & REV#	
					DATE December 17, 2022			Roof Mount Example.dwg	

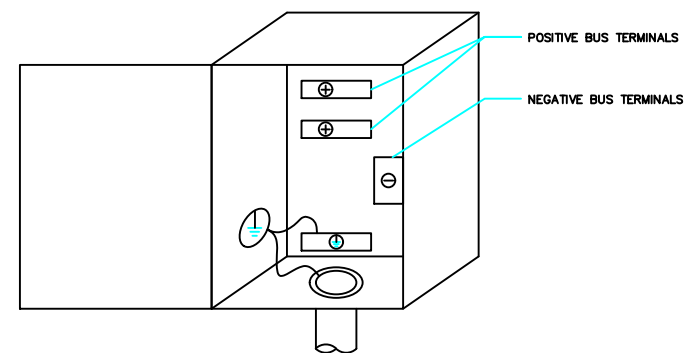


- NOTES:**
- 1.) EQUIPMENT GROUNDING CONDUCTOR SHALL BE SIZED PER NEC BY THE ELECTRICAL CONTRACTOR.
 - 2.) ALL GROUND CONNECTIONS SHALL BE MADE WITH IRREVERSIBLE CRIMP AND ARE UL APPROVED GROUND LUGS.
 - 3.) DO NOT BOND TOGETHER ARRAYS SERVING DIFFERENT COMBINER BOXES.
 - 4.) RACKING SHALL BE BONDED AND SHALL BE SIZED BY THE ELECTRICAL CONTRACTOR.

1 OVERALL GROUNDING DETAIL
N.T.S.



3 ARRAY GROUNDING SCHEME
N.T.S.



2 TYPICAL EQUIPMENT GROUNDING DETAIL
N.T.S.

4. GROUND THE SYSTEM

Building authorities require proper grounding in order to mitigate the risk of accidental shocks and system fires.

IronRidge's UL 2703 Listed Flush Mount System effectively bonds modules directly to XR Rails, which eliminates the need for separate grounding hardware. System grounding can be achieved with one ground lug per row of modules connected to a code compliant ground conductor.

Microinverter and Power Optimizer Compatibility

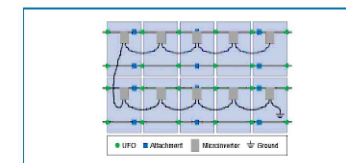
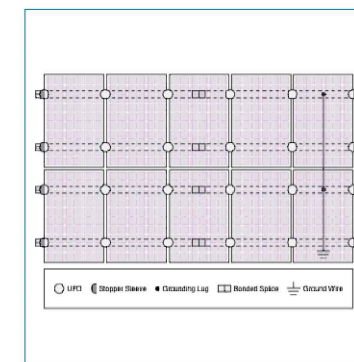
If you are using microinverters or power optimizers in your system, select the Microinverter Kit in the "Accessories" section in Design Assistant. The following devices have been tested and/or evaluated to bond to IronRidge XR Rails:

- Enphase - M250-72, M250-80, M215-80, C250-72, S230, S280
- Sunton - M1G40, M1G300, G320, G640
- SolarEdge - P300, P920, P400, P405, P600, P700, P730, P800p, P800s

Enphase Microinverters

Using approved Enphase microinverters (M- and C-Series) that have an internal ground provides equipment grounding for the IronRidge Flush Mount System. This eliminates the need for grounding lugs and field-installed equipment grounding conductors.

If you are using such Enphase microinverters to ground your system, you will need to remove Grounding Lugs from your project's Bill of Materials in Design Assistant.



4 IRONRIDGE MANUFACTURE GROUNDING DETAIL
N.T.S.

REV	DATE	DESCRIPTION
0	12/14/22	ISSUED FOR PERMIT SET

RPC Contractor	
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Structural Engineer:	
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11" x 17"	DRAWN BY: PA
AK PROJECT # 9074	
CUSTOMER PROJECT # 1977	
DATE December 17, 2022	

PROJECT NAME & ADDRESS:	RESIDENCE

DRAWING TITLE:	GROUNDING DETAIL
DWG. NAME & REV#	Roof Mount Example.dwg

SHEET:	E2
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MAIN SERVICE PANEL

NEC 690.13 (B), 705.10, 705.12 (B)(2)(3)(b)&(c)
OUTSIDE DOOR LABELS

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

WARNING:
ELECTRIC SHOCK HAZARD. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

CAUTION
SOLAR ELECTRIC SYSTEM CONNECTED

INSIDE OF MAIN SERVICE PANEL

WARNING:
DUAL POWER SUPPLY SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

INSIDE FOR SOLAR BREAKER, IF APP.

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

INSIDE FOR SOLAR BREAKER, IF APP.

DO NOT RELOCATE THIS OVERCURRENT DEVICE

INSIDE NEAR SOLAR BREAKER, IF APP.

PHOTOVOLTAIC SOLAR BREAKER

SOLAR CONDUIT

INSIDE CONDUIT LABEL 1 PER 10FT. PER NEC 690.31 (G3-4) REFLECTIVE

WARNING: PHOTOVOLTAIC POWER SOURCE

OUTSIDE CONDUIT LABEL 1 PER 10FT. PER NEC 690.31 (G)(3)

CAUTION SOLAR CIRCUIT

SOLAR JUNCTION BOX

ON AC JUNCTION BOX PER NEC 690.31 (B)

CAUTION SOLAR CIRCUIT

ON AC PULL BOX

CAUTION PV OUPUT CIRCUIT

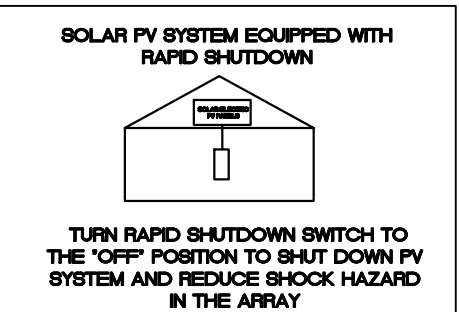
AC DISCONNECT

NEC 690.4(B), 690.13(B), 690.54
ON AC DISCONNECT

PHOTOVOLTAIC AC DISCONNECT

RATED AC OUTPUT CURRENT	XX AMPS
NOMINAL OPERATING AC VOLTAGE	XXXVAC

WARNING:
ELECTRIC SHOCK HAZARD. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.



AC COMBINER SOLAR LOAD CENTER

NEC 690.31 (B), 690.13 (B), 705.10, 705.12 (B)(2)(3)(b)&(c)
OUTSIDE OF SOLAR LOAD CENTER

WARNING:
ELECTRIC SHOCK HAZARD. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

INSIDE OF SOLAR LOAD CENTER

WARNING:
DUAL POWER SUPPLY SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

INSIDE LOAD CENTER FOR SOLAR BREAKER

PHOTOVOLTAIC SOLAR BREAKER

INSIDE LOAD CENTER NEAR SOLAR BREAKER

DO NOT RELOCATE THIS OVERCURRENT DEVICE

1 LABELS

N.T.S.

NOTES

1. ALL LABELING SHALL COMPLY WITH REQUIREMENTS OF NEC 690 AND UL.
2. TEXT SIZE SHALL BE CONFIRMED BY THE CONTRACTOR BUT IN NO CASE TEXT SHALL BE SMALLER THAN 3/8" HIGH.
3. ELECTRICAL CONTRACTOR SHALL VERIFY WORDING & DATA LISTED ON ALL SIGNS AND PLACARDS.

REV	DATE	DESCRIPTION	RPC Contractor	Structural Engineer:	11" x 17"	DRAWN BY: PA	PROJECT NAME & ADDRESS:	DRAWING TITLE:	SHEET:
					AS PROJECT # 9074		RESIDENCE	NEC LABELING	(E3)
					CUSTOMER PROJECT # 1977			DWG. NAME & REV#	
0	12/14/22	ISSUED FOR PERMIT SET			DATE December 17, 2022			Roof Mount Example.dwg	

ARKA SERIES

WSMDi-395 to WSMDi-415

WAAREE®
One with the Sun



Highest reliability & enhanced crack tolerant 9BB module



Better performance under all climatic conditions



Split junction box



Reduced power losses up to 1/4 times



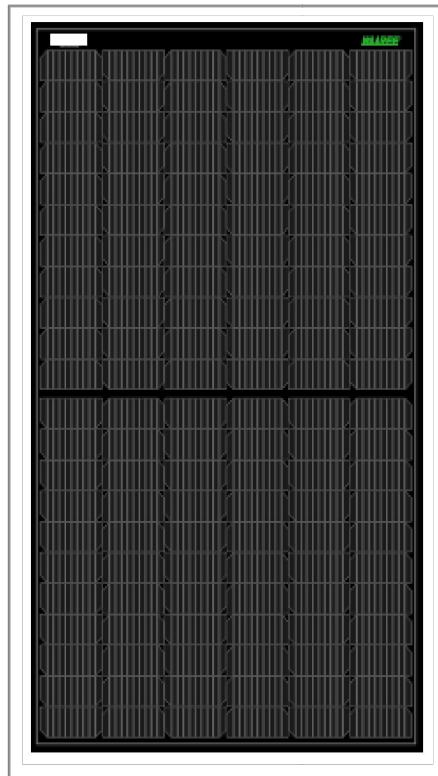
PID resistant with long term reliability



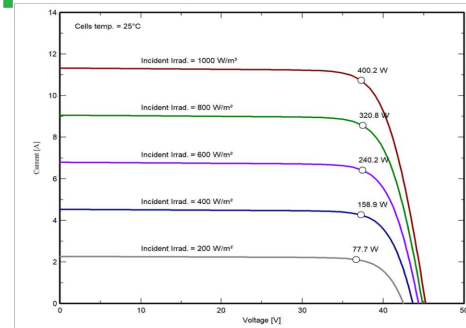
Sustain heavy wind & snow loads (2400 pa & 5400 pa)



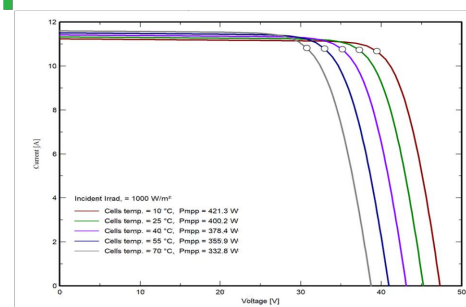
M6 Mono PERC cells



I-V VARIATION WITH IRRADIANCE



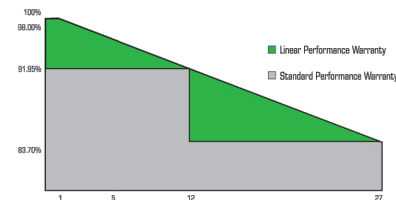
I-V VARIATION WITH TEMPERATURE



The Graphs are for reference purpose only. Please consult Waaree technical team for further clarifications.

INTERNATIONAL & NATIONAL CERTIFICATIONS

IEC 61215 | IEC 61730 | UL61730
IEC TS 62804-1



ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018
Independent assessment of factories by BLACK & VEATCH

www.waaree.com

ARKA SERIES

WSMDi-395 to WSMDi-415

WAAREE®
One with the Sun

ELECTRICAL CHARACTERISTICS

Models	Pmax (W)		Vmp (V)		Imp (A)		Isc (A)		Voc (V)		Module Eff. (%)
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	
WSMD-395	395	296.8	37.77	34.70	10.47	8.55	11.24	9.08	45.00	42.10	19.78
WSMD-400	400	300.6	38.00	34.90	10.54	8.62	11.32	9.14	45.22	42.30	20.03
WSMD-405	405	304.4	38.22	35.10	10.61	8.68	11.40	9.21	45.44	42.50	20.28
WSMD-410	410	308.2	38.44	35.30	10.68	8.74	11.48	9.27	45.66	42.70	20.53
WSMD-415	415	312.1	38.66	35.40	10.75	8.81	11.57	9.34	45.88	42.90	20.78

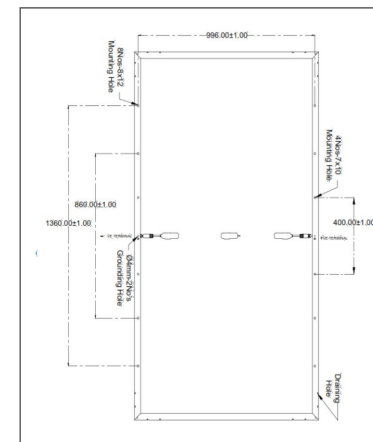
*Standard Test Conditions (STC) - 1000 W/m² irradiance, Air Mass 1.5 and 25°C cell temperature. Nominal Operating Cell Temperature (NOCT) - 800 W/m² irradiance, Air Mass 1.5, Ambient temperature 20°C and Wind speed 1 m/s. Average power reduction of 4.5% at 200 W/m² as per IEC 60904-1. Measuring Uncertainty ± 3%.

System Voltage	1500 V	Series Fuse Rating	22 A
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MECHANICAL CHARACTERISTICS

Length x Width x Thickness (L x W x T)	1924 mm (L) x 1038 mm (W) x 35 mm (T)
Weight	22 kgs
Solar Cells per Module (Units) / Arrangement	132 cells / (11x6 11x6)
Solar Cell Type & Size	Mono PERC, 83 x 166 mm
Front Glass	3.2 mm Low Iron and Tempered glass with ARC coating
Encapsulate	PID Free & UV Resistant
Junction Box (Protection degree/ Material)	IP68 / Weatherproof PPO
Cable & Connector (Protection degree / Type)	IP68 rated / Staubli MC4 Connector
Cable cross - section & Length	4 mm ² & 1200mm
Frame	Anodized Aluminium Alloy, Anodization thickness ≥15 micron
Fire rating	Type 2

DESIGN SPECIFICATIONS



12 Years Product Warranty • 27 Years Power Output Warranty

- The electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.
- Refer installation Manual instructions & Waaree warranty statement for terms & conditions.
- Waaree Reserves the right to change the specifications without prior notice.

THERMAL CHARACTERISTICS

Temperature coefficient of Current (Isc), α (%/°C)	0.055
Temperature coefficient of Voltage (Voc), β (%/°C)	-0.285
Temperature coefficient of Power (Pm), γ (%/°C)	-0.365
NOCT (°C)	43 ± 2
Operating temperature range (°C)	-40 to 85

Waaree Energies Ltd. is amongst the top Solar Energy Companies and has the country's largest Solar PV Module manufacturing capacity of 5 GW. In addition, it is committed to provide top notch EPC services, project development, rooftop solutions, solar water pumps and also in an Independent Power Producer. Waaree has its presence in over 325+ locations nationally and 68 countries globally.

*If you need specific product certificates, and if module installations are to deviate from our guidance specified in our installation manual, please contact your local Waaree sales and technical representatives.

www.waaree.com

WEL/E&PD/395-415/132/MP/HC/CMZ/01/27.07.2022

REV	DATE	DESCRIPTION
0	12/14/22	ISSUED FOR PERMIT SET

IPC Contractor	
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Structural Engineer:	
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11' x 17'	DRAWN BY: PA	PROJECT NAME & ADDRESS:
AK PROJECT # 9074		RESIDENCE
CUSTOMER PROJECT # 1977		---
DATE December 17, 2022		---

DRAWING TITLE:	PANEL DATA SHEET
DWG. NAME & REV#	Roof Mount Example.dwg

SHEET:	(R1)
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Data Sheet
Enphase Networking

Enphase IQ Combiner 4/4C X-IQ-AM1-240-4 X-IQ-AM1-240-4C



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 cabinet 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
• Ten-year labor reimbursement program coverage included for both the IQ Combiner 4/4C
• UL listed



Data Sheet
Enphase Microinverters
Region: AMERICAS

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready Enphase IQ 7 Micro™ and Enphase IQ 7+ Micro™ dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Gateway™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.

Easy to Install
• Lightweight and simple
• Faster installation with improved, lighter two-wire cabling
• Built to rapid shutdown compliance (NEC 2014 & 2017)

Productive and Reliable
• Optimized for high-powered 60-cell and 72-cell modules
• More than a million hours of testing
• Class II double-insulated enclosure
• UL listed

Smart Grid Ready
• Complies with advanced grid support, voltage and frequency ride-through requirements
• Remotely updates to respond to changing grid requirements
• Configurable for varying grid profiles
• Meets CA Rule 21 (UL 1741-BA)
* The IQ 7+ Micro is required to support 72-cell modules.



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US / IQ7-60-B-US	IQ7PLUS-72-2-US / IQ7PLUS-72-B-US
Commonly used module pairings¹	235 W - 350 W +	235 W - 440 W +
Module compatibility	60-cell PV modules only	60-cell and 72-cell PV modules
Maximum input DC voltage	48 V	60 V
Peak power tracking voltage	27 V - 37 V	27 V - 45 V
Operating range	16 V - 48 V	15 V - 60 V
Min/Max start voltage	22 V / 48 V	22 V / 60 V
Max DC short circuit current (module Isc)	15 A	15 A
Overvoltage class DC port	II	II
DC port backfeed current	0 A	0 A
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)	IQ 7 Microinverter	IQ 7+ Microinverter
Peak output power	250 VA	295 VA
Maximum continuous output power	240 VA	290 VA
Nominal (L-L) voltage/range²	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A (240 V)	1.15 A (208 V)
Nominal frequency	60 Hz	60 Hz
Extended frequency range	47 - 68 Hz	47 - 68 Hz
AC short circuit fault current over 3 cycles	5.8 Arms	5.8 Arms
Maximum units per 20 A (L-L) branch circuit³	16 (240 VAC)	13 (208 VAC)
Overvoltage class AC port	III	III
AC port backfeed current	0 A	0 A
Power factor setting	1.0	1.0
Power factor (adjustable)	0.85 leading ... 0.85 lagging	0.85 leading ... 0.85 lagging
EFFICIENCY	@240 V	@208 V
Peak efficiency	97.6 %	97.6 %
CEC weighted efficiency	97.0 %	97.0 %

MECHANICAL DATA	
Ambient temperature range	-40°C to +65°C
Relative humidity range	4% to 100% (condensing)
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)
Connector type (IQ7-60-B-US & IQ7PLUS-72-B-US)	Friends PV2 (MC4 Intermateable). Adaptors for modules with MC4 or UTX connectors: - PV2 to MC4: order ECA-S20-S22 - PV2 to UTX: order ECA-S20-S25
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)
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
Environmental category / UV exposure rating	NEMA Type 6 / outdoor

FEATURES	
Communication	Power Line Communication (PLC)
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Gateway.
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.
Compliance	CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEEE1547, 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 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.

- No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.
- Nominal voltage range can be extended beyond nominal if required by the utility.
- Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

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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-M1-05 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.

ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption metering 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)

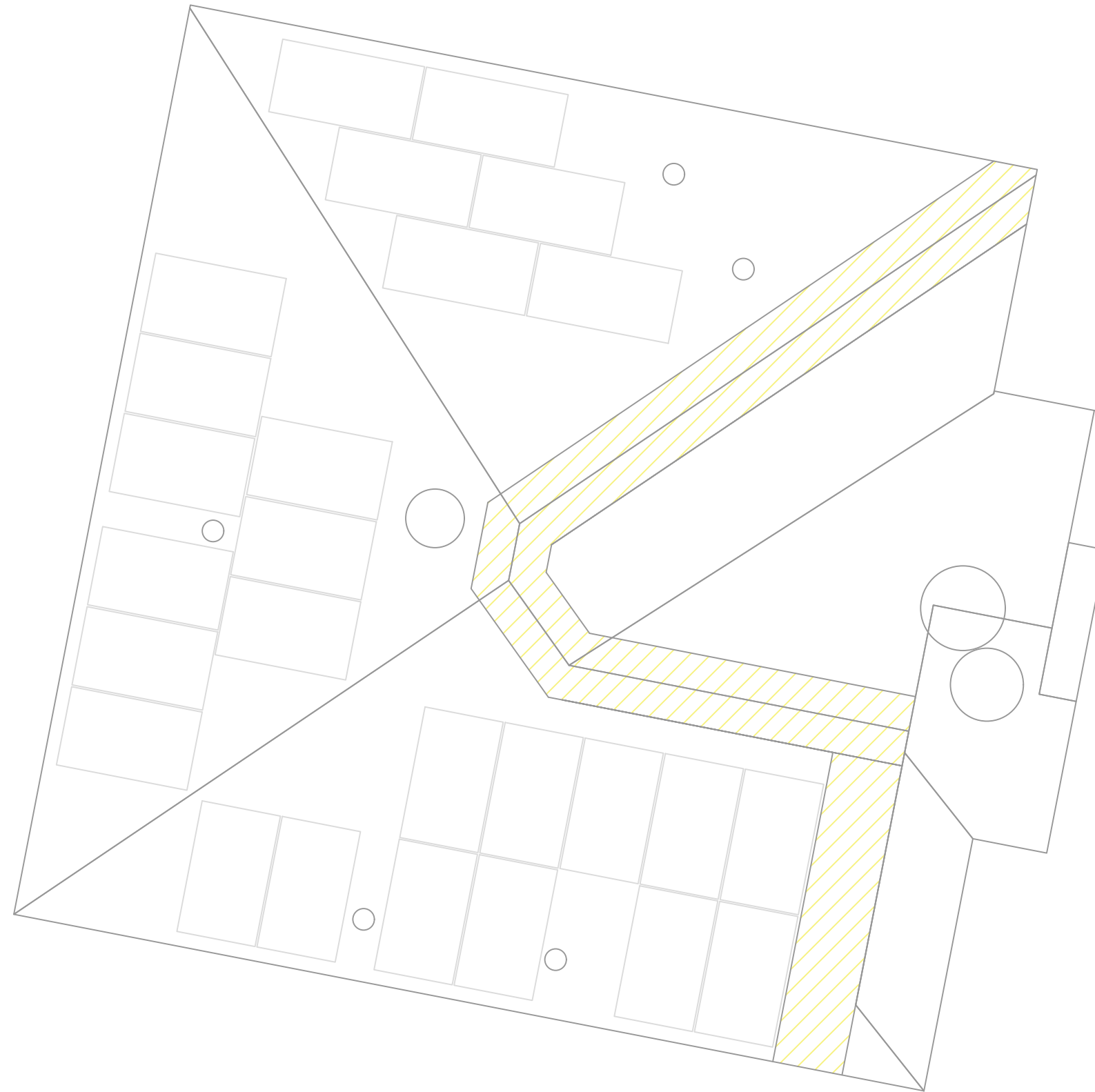
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5e (or Cat 6) UTP Ethernet cable (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

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REV	DATE	DESCRIPTION	IPC Contractor	Structural Engineer:	11' x 17' DRAWN BY: PA AS PROJECT # 9074 CUSTOMER PROJECT # 1977 DATE December 17, 2022	PROJECT NAME & ADDRESS: RESIDENCE ----- -----	DRAWING TITLE: INV. DATA SHEET DWG. NAME & REV# Roof Mount Example.dwg	SHEET: R2
0	12/14/22	ISSUED FOR PERMIT SET						



REV	DATE	DESCRIPTION
0	12/14/22	ISSUED FOR PERMIT SET

RPC Contractor

Structural Engineer:

11' x 17"
 DRAWN BY: PA
 AS PROJECT # 9074
 CUSTOMER PROJECT # 1977
 DATE December 17, 2022

PROJECT NAME & ADDRESS:
 RESIDENCE

DRAWING TITLE:
 AS-BUILT STRING CONFIGURATION
 DWG. NAME & REV#
 Roof Mount Example.dwg

SHEET:
 (B1)