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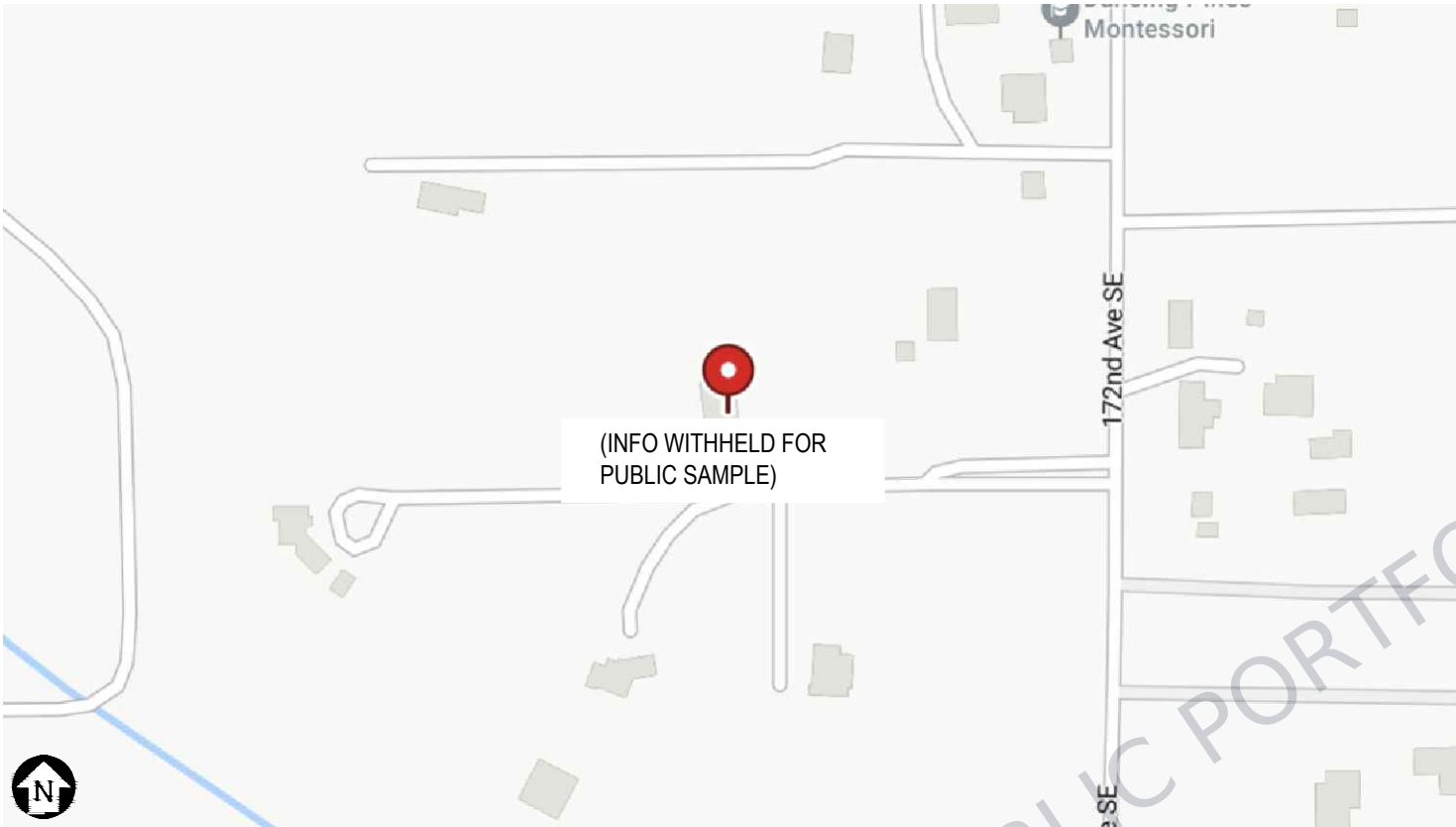
PROJECT DETAILS	
PROPERTY OWNER	(INFO WITHHELD FOR PUBLIC SAMPLE)
PROPERTY ADDRESS	(INFO WITHHELD FOR PUBLIC SAMPLE)
AHJ	(INFO WITHHELD FOR PUBLIC SAMPLE)
ZONING	RESIDENTIAL
CONST. TYPE	TILT-UP MOUNTED PHOTOVOLTAIC ARRAY
OBSERVED CODES	2023 NATIONAL ELECTRICAL CODE (NEC) 2021 WASHINGTON ADMINISTRATIVE CODE (WAC) 2021 WASHINGTON STATE ENERGY CODE - RESIDENTIAL 2021 INTERNATIONAL CODES REVISED CODE OF WASHINGTON (RCW) WASHINGTON BUILDING CODE & STATE AMENDMENTS APPLICABLE CITY CODE WHEN PRESENT OSHA 29 CFR 1910.269 UNDERWRITERS LABORATORIES (UL) STANDARDS
STRUCT. METHOD	ASCE7-16

CONTRACTOR INFORMATION	
CONTRACTOR	(INFO WITHHELD FOR PUBLIC SAMPLE)
LICENSE NO.	(INFO WITHHELD FOR PUBLIC SAMPLE)
ADDRESS	(INFO WITHHELD FOR PUBLIC SAMPLE)
PHONE	(INFO WITHHELD FOR PUBLIC SAMPLE)
CONTRACTOR SIGNATURE	

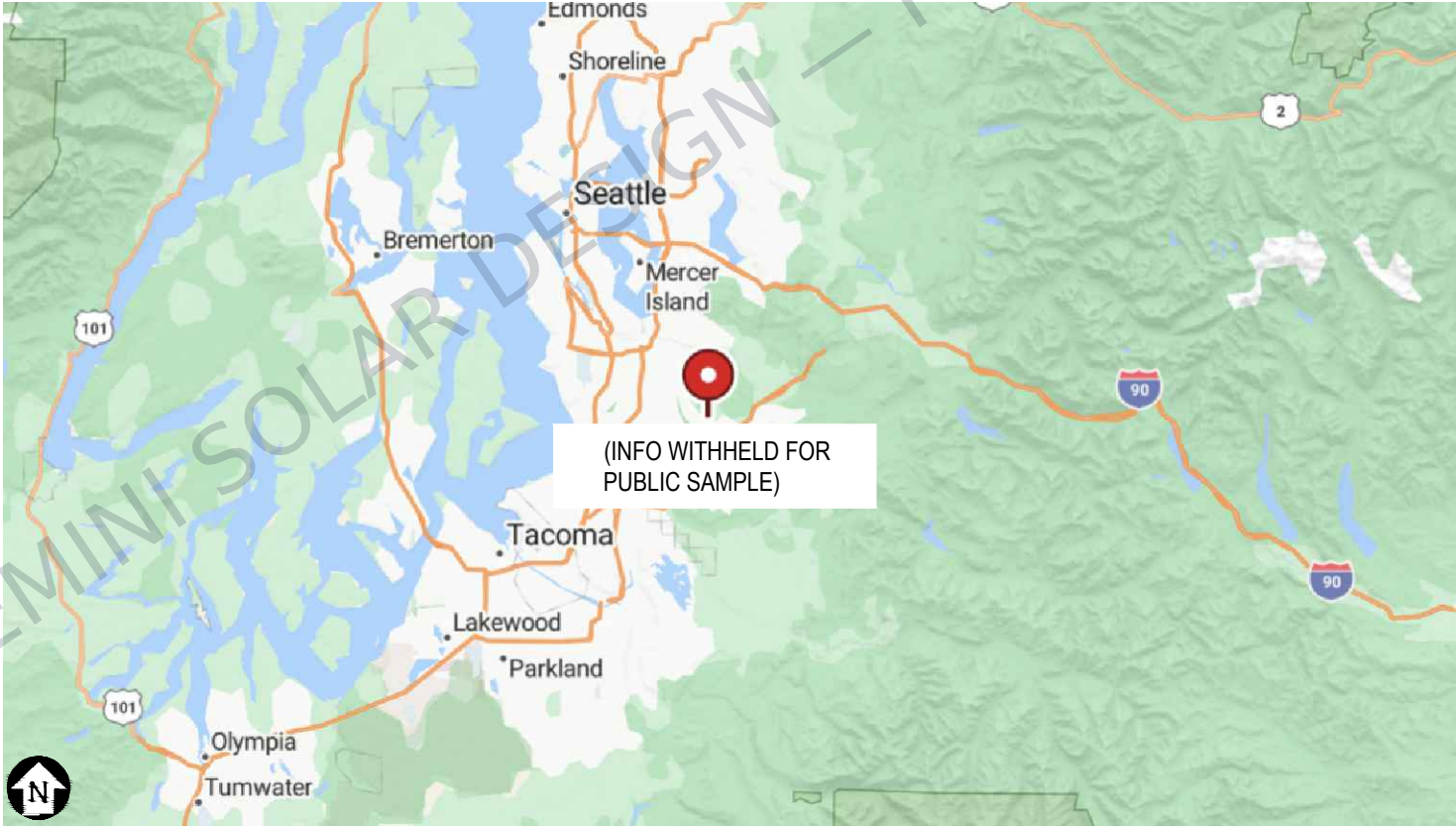
PLAN DESIGNER INFORMATION	
COMPANY	GEMINI SOLAR DESIGN, LLC.
NAME	SANJAY CHRISTOPHER MALLIPUDI
ADDRESS	495 HOWARD HEIGHTS ROAD FRESHWATER, CA 95503
PHONE	(609) 802-5743
PLAN DESIGNER SIGNATURE	Sanjay Mallipudi

SYSTEM DETAILS	
DC RATING OF SYSTEM	15,840W
AC OUTPUT CURRENT	47.88A @ 240VAC
PV MODULE	(36) SILFAB SOLAR SIL-440 OD
MICROINVERTER	(36) ENPHASE IQ8MC-72-M-US
BRANCH CONFIGURATION	3 BRANCHES OF 12 MICROINVERTERS
BATTERY	(1) FRANKLINWH aPOWER 2

SITE SPECIFICATIONS	
UTILITY SERVICE	120 / 240VAC, 1-Ø, 3-WIRE
MAIN SERVICE PANEL	200A RATED BUSBAR 200A / 2P MAIN BREAKER
ASHRAE EXTREME ANNUAL MEAN MINIMUM DENSITY DRY BULB TEMP.	-7°C
ASHRAE 2% ANNUAL DRY DENSITY BULB TEMP.	29°C
DESIGN WIND SPEED	110 MPH
DESIGN SNOW LOAD	25 PSF
WIND EXPOSURE CATEGORY	B
RISK CATEGORY	II



1 PLOT
PV-1 SCALE: NTS



2 LOCALE
PV-1 SCALE: NTS

CONSTRUCTION NOTES	
1	CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO INITIATING CONSTRUCTION.
2	CONTRACTOR SHALL REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
3	ALL EQUIPMENT SHALL BE LISTED BY THE U.L. (OR EQUAL) AND LISTED FOR ITS SPECIFIC APPLICATION.
4	ALL EQUIPMENT SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
5	ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6	ACCESS TO ELECTRICAL COMPONENTS OVER 150 VOLTS TO GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
7	ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 VOLTS AND 90°C WET ENVIRONMENT, UNLESS OTHERWISE NOTED.
8	WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
9	PV MODULES FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER G.E.C. PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
10	PV MODULES RACKING RAIL SHALL BE BONDED TO BARE COPPER G.E.C VIA WEEB LUG, ILSCO GBL-4DBT LAY-IN LUG, OR EQUIVALENT LISTED LUG.
11	GROUNDING ELECTRODE CONDUCTOR (G.E.C) SHALL BE CONTINUOUS AND/OR IRREVERSIBLY SPLICED
12	ALL JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION.
13	WORKING SPACE AROUND ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC SECTION 110.26.

SCOPE OF WORK DESCRIPTION	
THE PROPOSED SYSTEM IS A TILT-UP ROOF MOUNTED PHOTOVOLTAIC ARRAY UTILIZING ENPHASE MICROINVERTERS. THE PHOTOVOLTAIC (PV) SYSTEM IS TO BE INSTALLED ON THE RESIDENTIAL ZONED PROPERTY IN THE CITY OF KENT, KING COUNTY, WASHINGTON.	
THE SCOPE OF WORK AT THIS TIME WILL ALSO INCLUDE ADDING AN AC-COUPLED STORAGE BATTERY IN A WHOLE HOME BATTERY-BACKUP APPLICATION. THE COMBINED AC OUTPUT OF THE PROPOSED MICROINVERTER SYSTEM WILL BE AC-COUPLED TO THE NEW FRANKLINWH aGATE X.	
THE ENERGY PRODUCED BY THE PV SYSTEM SHALL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ON-SITE ELECTRICAL EQUIPMENT.	

(LOGO WITHHELD FOR SAMPLE)

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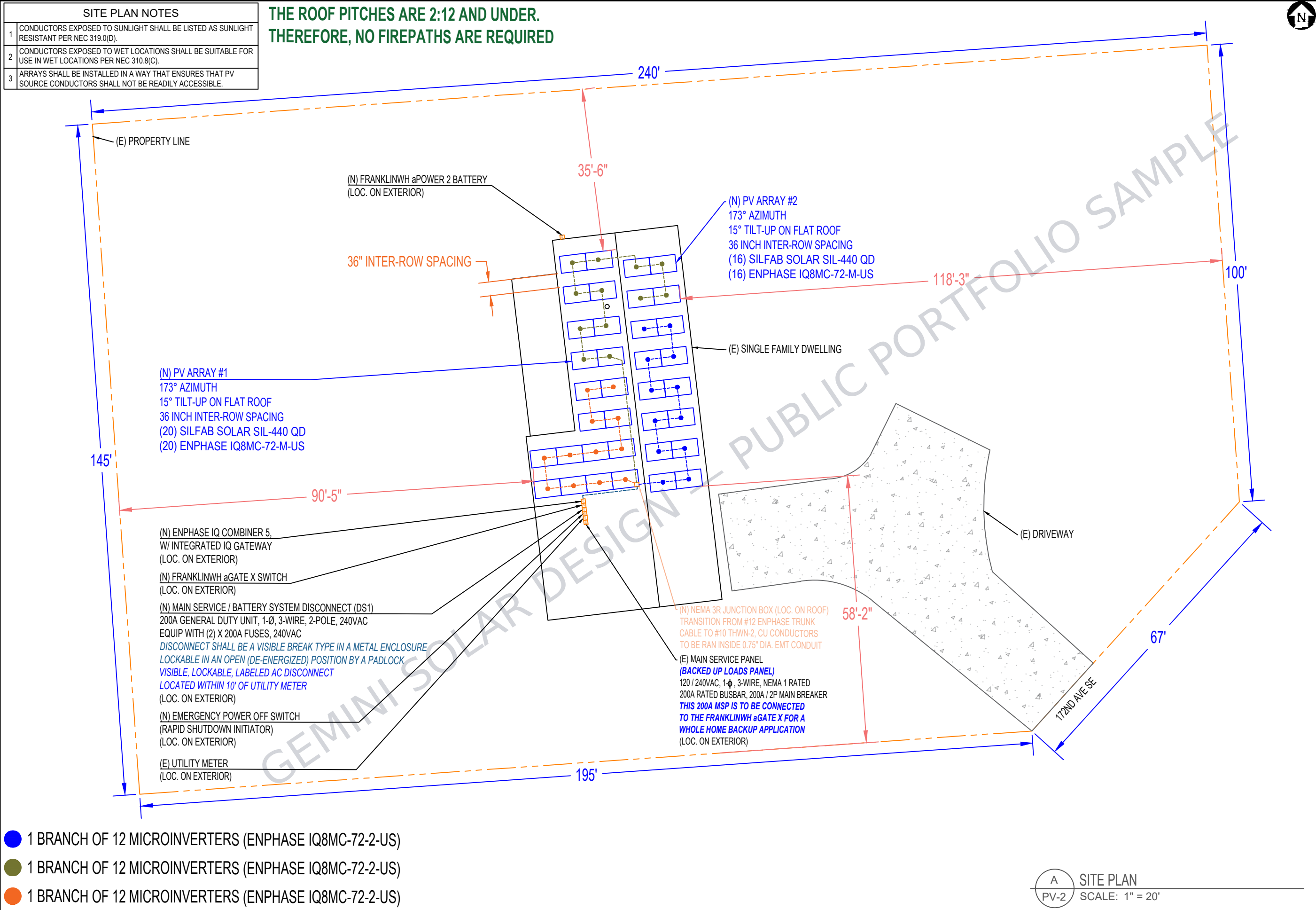
AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

PROJECT INFO	
PROJECT NO: GSD-20260615-SCM	
DRAWN BY: SCM	
DATE: 6/15/2026	
PV-1	

SITE PLAN NOTES	
1	CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 319.0(D).
2	CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.8(C).
3	ARRAYS SHALL BE INSTALLED IN A WAY THAT ENSURES THAT PV SOURCE CONDUCTORS SHALL NOT BE READILY ACCESSIBLE.

THE ROOF PITCHES ARE 2:12 AND UNDER.
THEREFORE, NO FIREPATHS ARE REQUIRED



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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

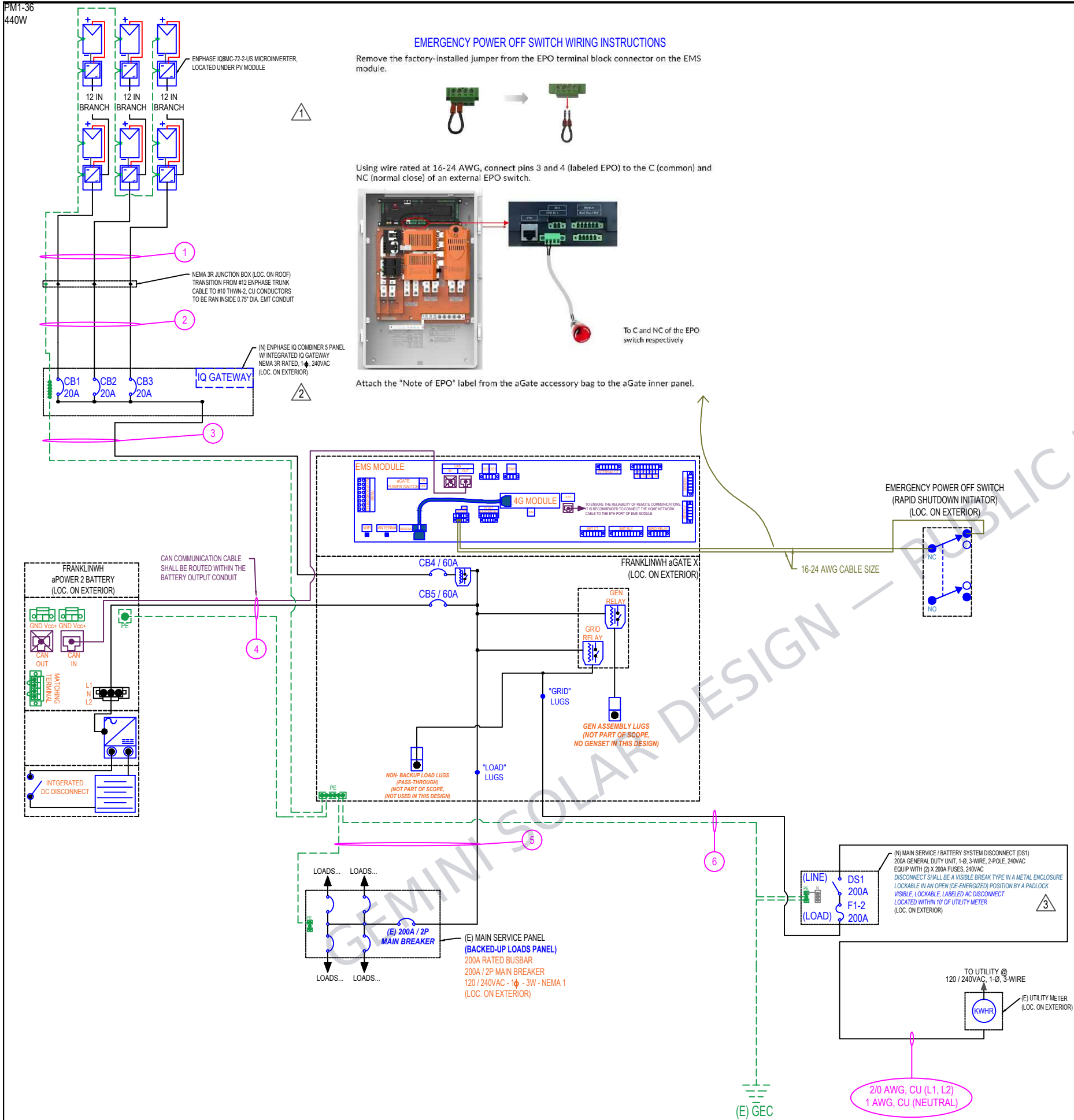
(INFO WITHHELD FOR PUBLIC SAMPLE)

SITE PLAN

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-2

PM1-36
440W



PLEASE FIND ALL RELEVANT TABLES,
SYSTEM DETAILS, AND DISCONNECT /
OCPD SCHEDULES ON SHEET PV-3B.

PLEASE FIND THE CORRESPONDING WIRE
& CONDUCTOR SCHEDULE ON SHEET PV-3C.

SEPARATE SHEETS WERE CREATED
DUE TO SPACE LIMITATIONS.

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-3A

A SINGLE-LINE DIAGRAM
PV-3A SCALE: N/A

PV MODULE								
REF.	TYP.	MODULE	STC POWER	ISC	IMP	VOC	VMP	SERIES FUSE RATING
PM1-36	36	SILFAB SOLAR SIL-440 QD	440W	14.22A	13.17A	38.97V	33.41V	25A

MICROINVERTER										
REF.	TYP.	MICROINVERTER	GROUND	AC VOLTAGE	MAX OCPD SIZE	MAX OUTPUT POWER (CONTINUOUS)	MAX AC CURRENT	MAX. CONTINUOUS INPUT DC CURRENT	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY
I1-36	36	ENPHASE IQ8MC-72-M-US	INTEGRATED	240VAC	20A	320W	1.33A	14A	60VDC	97%

SYSTEM SUMMARY			
	BRANCH #1	BRANCH #2	BRANCH #3
INVERTERS PER BRANCH	12	12	12
MAX AC CURRENT	15.96A	15.96A	15.96A
MAX AC OUTPUT POWER	3,840W	3,840W	3,840W
ARRAY STC POWER	15,840W		
TOTAL MAX AC CURRENT	47.88A		
TOTAL MAX AC POWER	11,520W		

SCHEMATIC NOTES	
①	THE FIRST AC CONNECTOR IN EACH MICROINVERTER BRANCH CIRCUIT IS SUITABLE AS A DISCONNECTING MEANS.
②	OUTPUT OF (3) THREE MICROINVERTER BRANCH CIRCUITS SHALL BE BACKFED INTO A ENPHASE IQ COMBINER 5 PANEL FOR COMBINATION PURPOSES. PLEASE SEE THE OCPD SCHEDULE FOR THE BREAKER SIZES FOR EACH BRANCH CIRCUIT, RESPECTIVELY.
③	THE AC DISCONNECT SHALL BE A VISIBLE, LOCKABLE, KNIFE SWITCH DISCONNECT AS PER THE UTILITY.

OTHER DESIGN NOTES	
1	LARGEST BACKED UP BREAKER IS < OR = TO 60A / 240VAC
2	ALL BATTERY BREAKERS TO BE SECURED UTILIZING APPROVED HOLD DOWNS

AC DISCONNECT SCHEDULE			
REF.	POLES	CURRENT RATING	MAX. VOLTAGE
MAIN SERVICE / BATTERY SYSTEM DISCONNECT (DS1) 2-POLE KNIFE TYPE (FUSIBLE), GENERAL DUTY UNIT	2	200A	240VAC

OCPD SCHEDULE				
REF.	TYP.	POLES	CURRENT RATING	MAX. VOLTAGE
CB1 (ENPHASE BRANCH CIRCUIT)	1	2	20A	240VAC
CB2 (ENPHASE BRANCH CIRCUIT)	1	2	20A	240VAC
CB3 (ENPHASE BRANCH CIRCUIT)	1	2	20A	240VAC
CB4 (CIRCUIT BREAKER, AC-COUPLED SOLAR)	1	2	60A	240VAC
CB5 (CIRCUIT BREAKER, AC-COUPLED BATTERY)	1	2	60A	240VAC
F1-2 (FUSES FOR BATTERY SYSTEM DISCONNECT, DS1)	2	N/A	200A	240VAC

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-3B

OVERALL SYSTEM
RATED AC CURRENT

PHOTOVOLTAIC SYSTEM
AC DISCONNECT

OPERATING CURRENT 47.88 AMPS
OPERATING VOLTAGE 240 VOLTS

NEC 690.14(C)(2) & NEC 690.54

NET METER

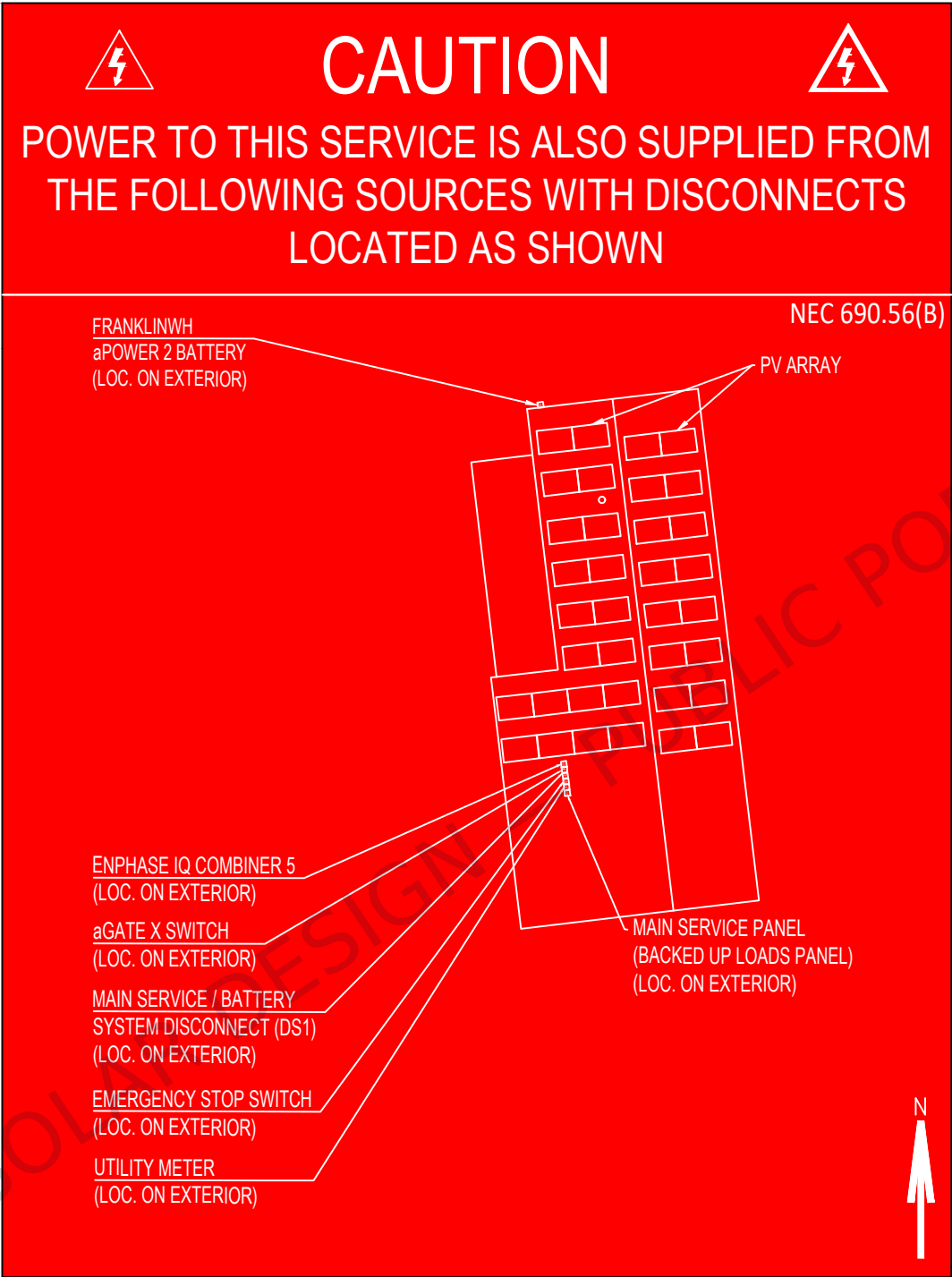
pviabels.com 03-364

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH
TO THE "OFF" POSITION
TO SHUT DOWN CONDUCTORS
OUTSIDE THE ARRAY
CONDUCTORS WITHIN
THE ARRAY REMAIN
ENERGIZED IN SUNLIGHT

05-113

SITE OVERVIEW



RAPID SHUTDOWN
SWITCH FOR
SOLAR PV SYSTEM

pviabels.com 07-316

WARNING

TRIPLE POWER SUPPLY
SOURCES: UTILITY GRID AND
PV SOLAR ELECTRIC SYSTEM AND
ENERGY STORAGE SYSTEM (ESS)

CURRENT OF BATTERY SYSTEM 48A
VOLTAGE OF BATTERY SYSTEM 240VAC

WARNING

BATTERY SYSTEM RAPID
SHUTDOWN SWITCH. TURN
DIAL TO OFF POSITION TO
SHUTDOWN ESS

WARNING

SOLAR / BATTERY SYSTEM DISCONNECT
PULL HANDLE DOWN TO MANUALLY
DISCONNECT FROM GRID POWER

(LOGO WITHHELD FOR SAMPLE)

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

PLACARDS

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-4

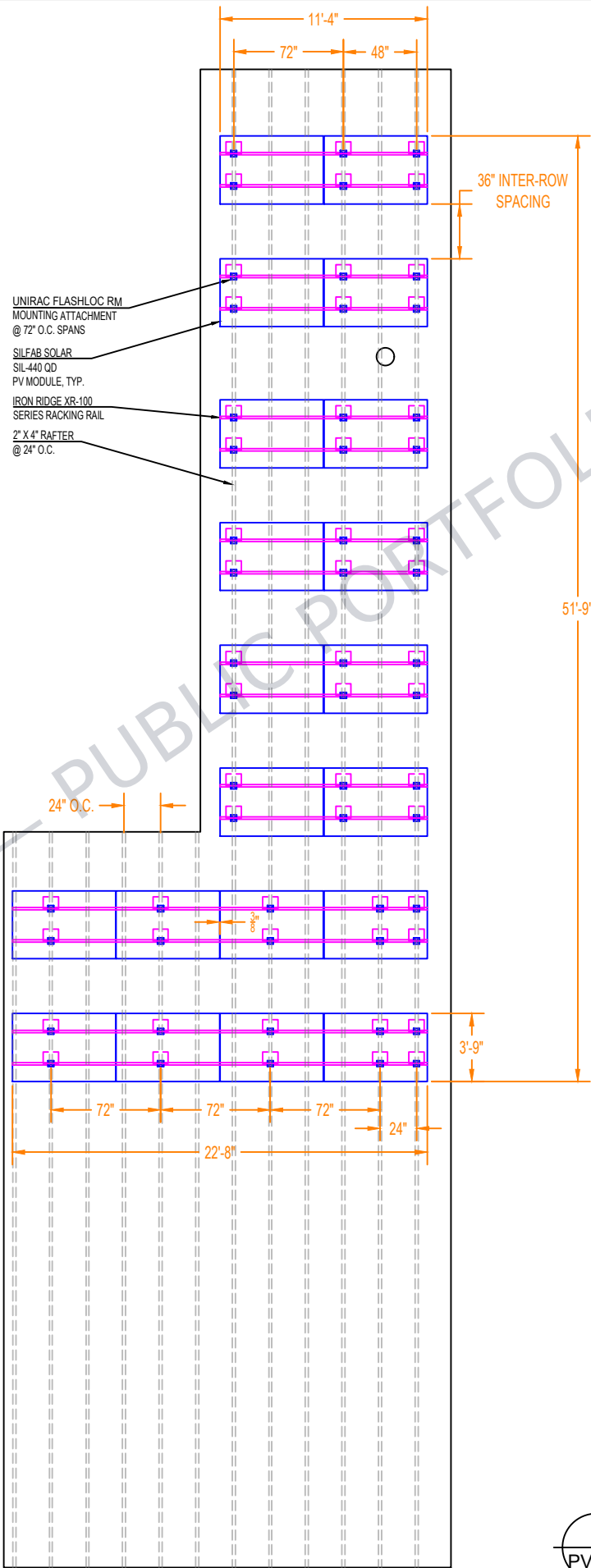
ROOF INFORMATION	
ROOF TYPE	MEMBRANE / TORCHDOWN
PITCH	FLAT
RAFTER SPACING	24" O.C.
RAFTER DIMENSIONS	2" X 4"

LAYOUT SPECIFICATIONS	
NUMBER OF MODULES	20
TILT-UP ANGLE OF ARRAY	15°
MODULE INTER-ROW SPACING	36 INCHES
AREA	412.1 SQ. FT
AZIMUTH	173°
TOTAL WEIGHT OF ARRAY	1,166.1 LBS
DEAD LOAD	2.83 PSF

LOCAL DESIGN CRITERIA	
WIND EXPOSURE CATEGORY	B
RISK CATEGORY	II
DESIGN WIND SPEED	110 MPH
DESIGN SNOW LOAD	25 PSF

PV MODULES AND IRON RACKING SYSTEM HAVE A CLASS A FIRE RATING CLASSIFICATION.

ATTACHMENT PLAN NOTES	
1	ROOF MEMBERS AND PENETRATIONS TO BE DETERMINED IN THE FIELD.
2	THE SOLAR PHOTOVOLTAIC INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
3	PLEASE SEE SHEETS PV-6A AND PV-6B FOR DETAILS REGARDING THE MOUNTING ATTACHMENT TO BE USED, THE FLASHING TO BE USED, AS WELL AS THE RELEVANT CUTSHEETS.
4	PLEASE SEE SHEET PV-12 FOR A STRUCTURAL CERTIFICATION LETTER FOR THE IRON RIDGE TILT-UP MOUNT SYSTEM. LETTER IS STAMPED BY A STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER (PE).



1 ATTACHMENT PLAN (ARRAY #1)
PV-5A SCALE: 1" = 9'

(LOGO WITHHELD FOR SAMPLE)

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

ATTACHMENT PLAN

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PV-5A

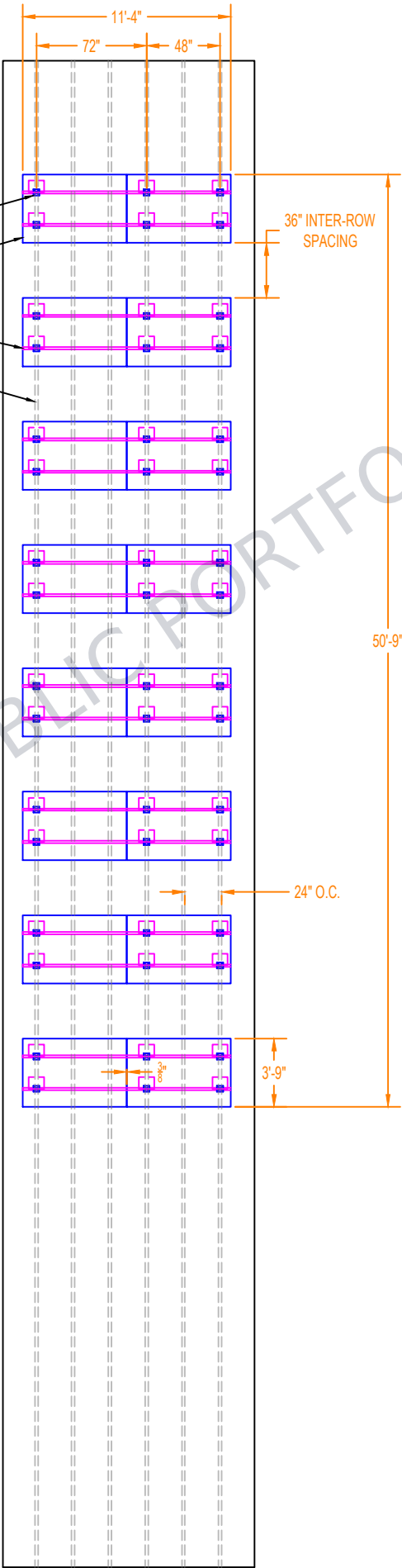
ROOF INFORMATION	
ROOF TYPE	MEMBRANE / TORCHDOWN
PITCH	FLAT
RAFTER SPACING	24" O.C.
RAFTER DIMENSIONS	2" X 4"

LAYOUT SPECIFICATIONS	
NUMBER OF MODULES	16
TILT-UP ANGLE OF ARRAY	15°
MODULE INTER-ROW SPACING	36 INCHES
AREA	329.7 SQ. FT
AZIMUTH	173°
TOTAL WEIGHT OF ARRAY	932.8 LBS
DEAD LOAD	2.83 PSF

LOCAL DESIGN CRITERIA	
WIND EXPOSURE CATEGORY	B
RISK CATEGORY	II
DESIGN WIND SPEED	110 MPH
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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

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ATTACHMENT PLAN

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-5B

FLASHLOC™ RM

THE STRONGEST ATTACHMENT FOR EVERY FLAT ROOF



Unirac's **FLASHLOC™ RM** is a lightweight, durable, powder-coated cast aluminum roof attachment solution that provides fast, easy installation and helps save labor cost. **FLASHLOC™ RM** is compatible with most roofing materials and is applicable for almost all solar racking form factors. Rigorous mechanical, sealing, and ease-of-install testing has been successfully completed for assurance of long-term reliability.

FEATURES

- FLASHLOC™ Technology – no more membrane SKUs or heat welding
- Works for all roof types – see Chemlink M-1's compatibility for details
 - Labor and attachment savings
 - Industry-leading install time
 - 6,600-lb. uplift offset (ultimate)
 - Includes 8 fastener holes
 - Attachment can accommodate roofing screw sizes #12 - #15
 - 25-year warranty

PRODUCT SPECIFICATIONS

- 7.5" diameter X 0.94" height
- Included hardware: 1 preassembled bolt and washer
- Chemlink M-1 and 1-Part included in kit

PART NUMBER	DESCRIPTION	PACK SIZE
310999	FLASHLOC RM KIT	10

*Check with your local distributor for finalized pricing.

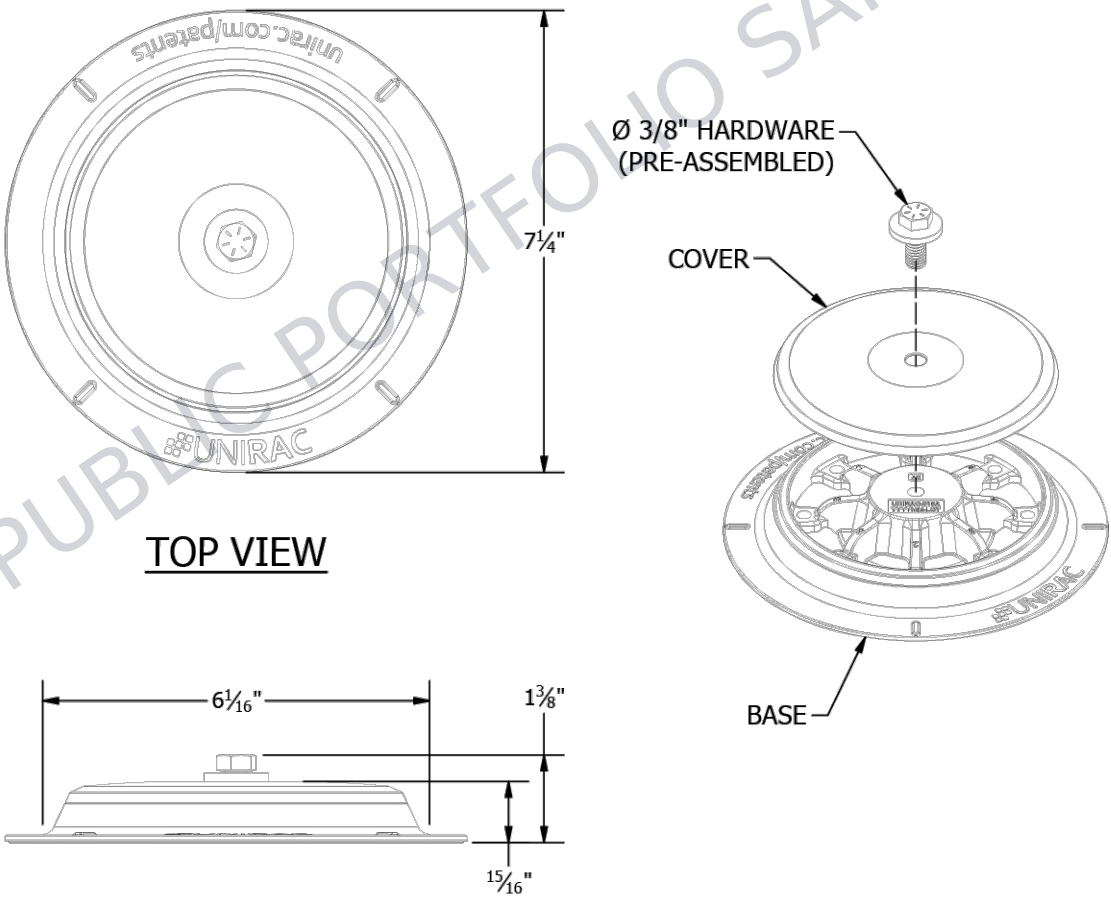


FASTER INSTALLATION. 25-YEAR WARRANTY.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702



- NOTES:
1. ATTACHMENT CAN ACCOMMODATE ROOFING SCREW SIZES #12 - #15. FASTENER SIZE, LENGTH, AND QUANTITY TO BE SELECTED BY STRUCTURAL ENGINEER OF RECORD WHEN DESIGNING FOR THE SPECIFIC PROJECT CONSTRUCTION AND CAPACITY.
 2. REFER TO THE UNIRAC INSTALLATION GUIDE FOR PROPER USE OF CHEM LINK M1 AND ONE-PART SEALANTS FOR WATER TIGHT INSTALLATION.



PART # TABLE	
P/N	DESCRIPTION
310999	FLASHLOC RM KIT

ULTIMATE TEST LOAD (WITH 8 ROOF FASTENERS)	
UPLIFT ULTIMATE CAPACITY	6,670 lbs.
SHEAR ULTIMATE CAPACITY	5,760 lbs.

1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	RM
DRAWING TYPE:	ASSEMBLY DETAIL
DESCRIPTION:	FLASHLOC RM KIT
REVISION DATE:	6/26/2020

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL
PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

RMF-A01

SHEET

(LOGO WITHHELD FOR SAMPLE)

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

UNIRAC FLASHLOC RM

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-6A

FLASHLOC™ RM

THE STRONGEST ATTACHMENT FOR EVERY FLAT ROOF



FLASHLOC™ RM

INSTALLATION GUIDE



Unirac's **FLASHLOC™ RM** is a lightweight, durable, powder-coated cast aluminum roof attachment solution that provides fast, easy installation and helps save labor cost. **FLASHLOC™ RM** is compatible with most roofing materials and is applicable for almost all solar racking form factors. Rigorous mechanical, sealing, and ease-of-install testing has been successfully completed for assurance of long-term reliability.

FEATURES

FLASHLOC™ Technology – no more membrane SKUs or heat welding

- Works for all roof types – see Chemlink M-1's compatibility for details
- Labor and attachment savings
- Industry-leading install time
- 6,600-lb. uplift offset (ultimate)
- Includes 8 fastener holes
- Attachment can accommodate roofing screw sizes #12 - #15
- 25-year warranty

PRODUCT SPECIFICATIONS

- 7.5" diameter X 0.94" height
- Included hardware: 1 preassembled bolt and washer
- Chemlink M-1 and 1-Part included in kit

PART NUMBER	DESCRIPTION	PACK SIZE
310999	FLASHLOC RM KIT	10

*Check with your local distributor for finalized pricing.



UNIRAC
25
YEAR
FULL-SYSTEM
WARRANTY

STEP 1



CLEAN SURFACE & MARK LOCATION

STEP 2



APPLY CHEMLINK M1 SEALANT

STEP 3



SECURE ATTACHMENT

STEP 4



FILL WITH CHEMLINK 1-PART & PLACE CAP

STEP ONE CLEAN SURFACE AND MARK LOCATION

-**IMPORTANT:** Thoroughly clean roof surface with isopropyl alcohol or denatured alcohol. Bonding surfaces should be clean, dry and free of dirt or contamination. Remove all previously applied caulk, mastic or other contaminants with a wire brush. Brush away all gravel or loose granules.

-Mark center point locations on the roof. **NOTE:** We recommend locating Flashloc RM after your equipment has been installed or layout is confirmed.

STEP TWO APPLY M1 SEALANT

-Apply a 5/16" bead of Chemlink M1 sealant to the entire bottom perimeter AND to the bottom of each bolt location to be used. Tool M1 sealant bead to form a smooth surface along the entire bottom perimeter. Refer to Chemlinks application guidelines with temperatures below 40 degrees F.

-**IMPORTANT:** CHEMLINK TPO PRIMER MUST BE USED ON TPO SINGLE-PLY ROOF SUBSTRATES MEMBRANES PRIOR TO INSTALLATION.

STEP THREE SECURE ATTACHMENT

- Align mount using alignment marks on roof and base. Using fasteners specified by your P.E. of record, securely fasten attachment to the roof. Drive screws down until the base is firmly attached to the roof and the M1 sealant expands beyond the outer perimeter of the base.

- Tool M1 sealant bead around entire perimeter to form a smooth fillet. **TIP:** Use caution to avoid over-torquing the screws.

STEP FOUR FILL BASE WITH CHEMLINK 1-PART

-Completely fill base with Chemlink 1-Part sealant. Sealant must completely cover all screw heads. Do NOT overfill.

- Place cap on base and secure racking to mount with Unirac provided 3/8" hardware or other 3/8"-16 threaded hardware as specified by the P.E. of record.

-**IMPORTANT:** To ensure robust sealing over the life of the product, the maximum allowed gap between attachment kit strut and the top surface of the flat roof attachment is 1/16".

FASTER INSTALLATION. 25-YEAR WARRANTY.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

UNIRAC FLASHLOC RM

PROJECT NO: GSD-20260615-SCM

DRAWN BY: SCM

DATE: 6/15/2026

PV-6B



Datasheet

Tilt Mount System



Trust your system at every angle.

The IronRidge Tilt Mount System supports a wide range of solar module tilting angles, while also resisting the extreme wind and snow forces experienced over a building's lifetime.

Every component has been carefully engineered and rigorously tested, and the entire system uses only aluminum and stainless steel materials to resist corrosion.



Roof Friendly

Lightweight and compatible with industry-standard attachments.



Strength Tested

All components evaluated for superior structural performance.



UL 2703 Listed System

Meets newest effective UL 2703 standard.



PE Certified

Pre-stamped engineering letters available in most states.



Design Assistant

Online software makes it simple to create, share, and price projects.



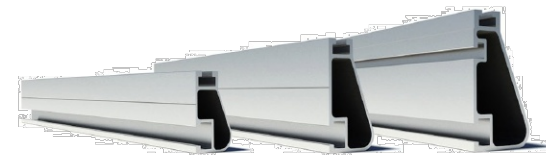
25-Year Warranty

Products guaranteed to be free of impairing defects.

Datasheet

XR Rails & Tilt Legs

XR Rails



Attach directly to Tilt Legs. Available in three targeted sizes to support specific wind and snow loads.

- Unique curved profile
- Spanning capabilities up to 12'
- Clear and black finish

Tilt Legs



Tilt assembly to desired angle, up to 30 degrees. Kits include South and North Tilt Leg and all hardware.

- Available in multiple lengths for a wide angle range
- Assembled South Tilt Legs include angle indicators
- Legs are electrically bonded to rails

Grounding Clamps

UFOs



Universal Fastening Objects secure and bond modules to rails.

- Fully assembled and lubricated
- Single, universal size
- Clear and black finish

Stopper Sleeves



Snap onto the UFO to transform into a bonded end clamp.

- Bonds modules to rails
- Sized to match modules
- Clear and black finish

CAMO



Bond modules to rails while staying completely hidden.

- Universal end-cam clamp
- Tool-less installation
- Fully assembled

Accessories

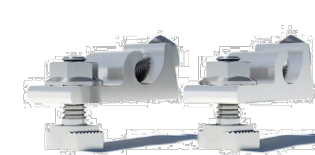
BOSS™ Bonded Splices



Bonded Structural Splices connect and bond XR Rails together.

- Integrated bonding
- No tools or hardware
- Self-centering stop tab

Grounding Lugs



Connects Tilt Mount system to equipment ground.

- Low profile
- Single tool installation
- Mounts in any direction

Ends Caps & Wire Clips



Provide a finished look and organize electrical wires.

- Simple snap-in installations
- Clips hold up to ten 5mm wires
- UV-stabilized polymer

Resources



Design Assistant

Go from rough layout to fully engineered system. For free.

Go to IronRidge.com/design



NABCEP Certified Training

Earn free continuing education credits, while learning more about our systems.

Go to IronRidge.com/training

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RACKING DATASHEET (TILT-UP MOUNT)
SCALE: NTS

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

RACKING DATSHEET

PROJECT NO: GSD-20260615-SCM

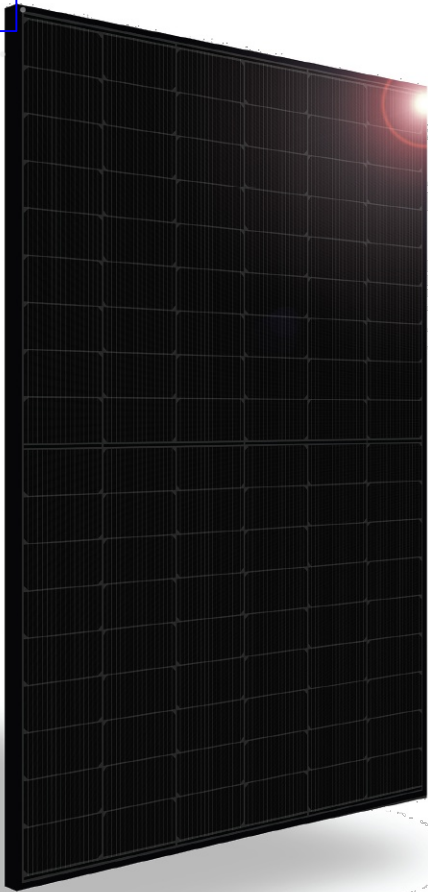
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DATE: 6/15/2026

PV-7

SILFAB PRIME NTC

SIL-440 QD



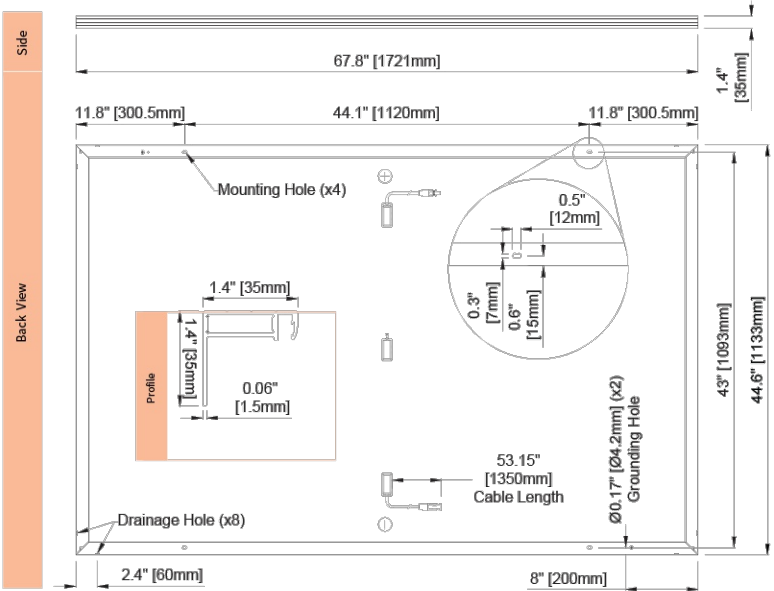
NEXT-GENERATION N-TYPE CELL TECHNOLOGY

- Improved Shade Tolerance
- Improved Low-Light Performance
- Increased Performance in High Temperatures
- Enhanced Durability
- Reduced Degradation Rate
- 25-Year Product Warranty/ 30-Year Performance Warranty



ELECTRICAL SPECIFICATIONS		440	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	440	328.0
Maximum power voltage (Vpmax)	V	33.41	31.17
Maximum power current (Ipmax)	A	13.17	10.52
Open circuit voltage (Voc)	V	38.97	36.64
Short circuit current (Isc)	A	14.22	11.44
Module efficiency	%	22.6%	
Maximum system voltage (VDC)	V	1000	
Series fuse rating	A	25	
Power Tolerance	Wp	0 to +10	
Measurement conditions: STC 1000 W/m² • AM 1.5 • Temperature 25 °C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ± 3% Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by 0 to +10 W.			
MECHANICAL PROPERTIES / COMPONENTS		METRIC	IMPERIAL
Module weight		21 kg ± 0.2 kg	46.3 lbs ± 0.4 lbs
Dimensions (H x L x D)		1721 mm x 1133 mm x 35 mm	67.8 in x 44.6 in x 1.37 in
Maximum surface load (wind/snow)*		4000 Pa rear load / 5400 Pa front load	83.5 lb/ft² rear load / 112.8 lb/ft² front load
Hail impact resistance		ø 25 mm at 83 km/h	ø 1 in at 51.6 mph
Cells		108 Half cells - N-Type Silicon solar cell 182 mm x 91 mm	108 Half cells - N-Type Silicon solar cell 7.16 in x 3.58 in
Glass		3.2 mm high transmittance, tempered, antireflective coating	0.126 in high transmittance, tempered, antireflective coating
Cables and connectors (refer to installation manual)		1350 mm, ø 5.7 mm, MC4 from Staubli	53.1 in, ø 0.22 in (12 AWG), MC4 from Staubli
Backsheet		High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet	
Frame		Anodized aluminum (Black)	
Junction Box		UL 3730 Certified, IEC 62790 Certified, IP68 rated, 3 diodes	
TEMPERATURE RATINGS		WARRANTIES	
Temperature Coefficient Isc	0.04 %/°C	Module product workmanship warranty	25 years**
Temperature Coefficient Voc	-0.24 %/°C	Linear power performance guarantee	30 years
Temperature Coefficient Pmax	-0.29 %/°C		≥ 98% end 1st yr ≥ 94.7% end 12th yr ≥ 90.8% end 25th yr ≥ 89.3% end 30th yr
NOCT (± 2 °C)	45 °C		
Operating temperature	-40/+85 °C		
CERTIFICATIONS		SHIPPING SPECS	
Product	UL 61215, UL 61730, CSA C22.2#61730, IEC 61215, IEC 61730, IEC 61701 (Salt Mist Corrosion), IEC 62716 (Ammonia Corrosion), CEC Listed, UL Fire Rating: Type 2	Modules Per Pallet:	26 or 26 (California)
		Pallets Per Truck	32 or 30 (California)
Factory	ISO9001:2015	Modules Per Truck	832 or 780 (California)

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



SILFAB SOLAR INC.

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Burlington WA 98233 USA
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info@silfab.com
SILFABSOLAR.COM

7149 Logistics Lane
Fort Mill SC 29715 USA
T +1 839.400.4338

240 Courtneypark Drive East
Mississauga ON L5T 2Y3 Canada
T +1 905.255.2501
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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

MODULE DATASHEET

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-8



IQ8MC Microinverter

Our newest IQ8 Series 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 55-nm technology with high-speed digital logic and has superfast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the IQ Battery, IQ Gateway, and the Enphase App monitoring and analysis software.



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

*Meets UL 1741 only when installed with IQ System Controller 2 or 3.

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



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

Easy to install

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

High productivity and reliability

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

Microgrid-forming

- Complies with the latest advanced grid support
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547:2018 (UL 1741-SB)

NOTE:

- IQ8 Microinverters cannot be mixed together with previous generations of Enphase microinverters (IQ7 Series, IQ6 Series, and so on) in the same system.
- IQ Microinverters ship with default settings that meet North America’s IEEE 1547 interconnection standard requirements. Region-specific adjustments may be requested by an Authority Having Jurisdiction (AHJ) or utility representative. An IQ Gateway is required to make these changes during installation.

IQ8MC-MC4-DSH-00049-4.0-EN-US-2024-02-09

IQ8MC Microinverter

INPUT DATA (DC)		UNITS	IQ8MC-72-M-US			
Commonly used module pairings ¹		W	260–460			
Module compatibility		—	To meet compatibility, PV modules must be within the following max. input DC voltage and max. module I _{sc} . Module compatibility can be checked at https://enphase.com/installers/microinverters/calculator .			
MPPT voltage range		V	25–45			
Operating range		V	18–58			
Min./Max. start voltage		V	22/58			
Max. input DC voltage		V	60			
Max. continuous operating DC current		A	14			
Max. input DC short-circuit current		A	25			
Max. module I _{sc}		A	20			
Overvoltage class DC port		—	II			
DC port backfeed current		mA	0			
PV array configuration		—	Ungrounded array; no additional DC side protection required; AC side protection requires max 20 A per branch circuit			
OUTPUT DATA (AC)		UNITS	IQ8MC-72-M-US @240 VAC		IQ8MC-72-M-US @208 VAC	
Peak output power		VA	330		315	
Max. continuous output power		VA	320		310	
Nominal grid voltage (L-L)		V	240, split-phase (L-L), 180°		208, single-phase (L-L), 120°	
Min./Max. grid voltage ²		V	211–264		183–229	
Max. continuous output current		A	1.33		1.49	
Nominal frequency		Hz	60			
Extended frequency range		Hz	47–68			
AC short circuit fault current over three cycles		A _{rms}	2.70			
Max. units per 20 A (L-L) branch circuit ³		—	12		10	
Total harmonic distortion		%	<5			
Overvoltage class AC port		—	III			
AC port backfeed current		mA	18			
Power factor setting		—	1.0			
Grid-tied power factor (adjustable)		—	0.85 leading ... 0.85 lagging			
Peak efficiency		%	97.4		97.2	
CEC weighted efficiency		%	97.0		96.5	
Nighttime power consumption		mW	33		25	
MECHANICAL DATA			UNITS			
Ambient temperature range			–40°C to 65°C (–40°F to 149°F)			
Relative humidity range			4% to 100% (condensing)			
DC connector type			Stäubli MC4			
Dimensions (H × W × D); Weight			212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2"); 1.1 kg (2.43 lbs)			
Cooling			Natural convection – no fans			
Approved for wet locations; Pollution degree			Yes; 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 62109-1, IEEE 1547:2018 (UL 1741-SB), 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.				

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

IQ8MC-MC4-DSH-00049-4.0-EN-US-2024-02-09

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

INVERTER DATASHEET

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-9



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

IQ Combiner 5/5C

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

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



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



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



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



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



5-year limited warranty



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

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Smart

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

Easy to install

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

Reliable

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

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

MODEL NUMBER

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

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

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

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

WHAT'S IN THE BOX

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

ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)

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

ELECTRICAL SPECIFICATIONS

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

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

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

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

IQ COMBINER 5

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-10



Tech Brief

Class A Fire Rating

Background

All roofing products are tested and classified for their ability to resist fire.

Recently, these fire resistance standards were expanded to include solar equipment as part of the roof system. Specifically, this requires the modules, mounting hardware and roof covering to be tested together as a system to ensure they achieve the same fire rating as the original roof covering.

These new requirements are being adopted throughout the country in 2016.

IronRidge Certification

IronRidge was the first company to receive a Class A Fire Rating—the highest possible rating—from Intertek Group plc., a Nationally Recognized Testing Laboratory.

IronRidge Flush Mount and Tilt Mount Systems were tested on sloped and flat roofs in accordance with the new UL 1703 & UL 2703 test standards. The testing evaluated the system’s ability to resist flame spread, burning material and structural damage to the roof.

Refer to the table below to determine the requirements for achieving a Class A Fire Rating on your next project.

System	Roof Slope	Module	Fire Rating*
Flush Mount 	Any Slope	Type 1, 2, & 3	Class A
Tilt Mount 	≤ 6 Degrees	Type 1, 2, & 3	Class A

*Class A rated PV systems can be installed on Class A, B, and C roofs.

Fire Testing Process

Test Setup

Solar Modules

Solar modules are given a Type classification based on their materials and construction.

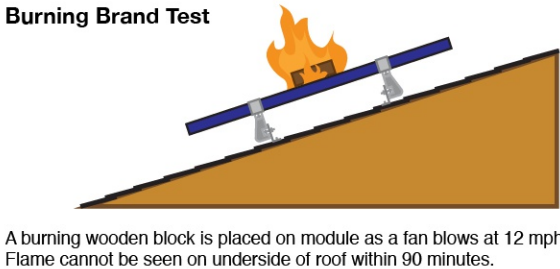
Mounting System

Mounting is tested as part of a system that includes type-tested modules and fire-rated roof covering.

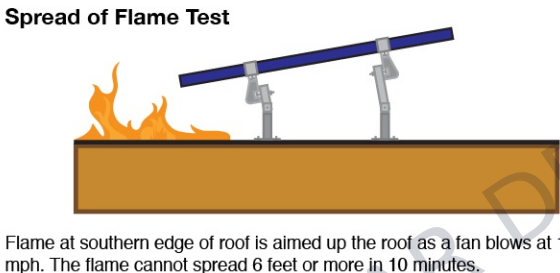
Roof Covering

Roof covering products are given a Fire Class Rating of A, B or C based on their tested fire resistance.

Burning Brand Test



Spread of Flame Test



8431 Murphy Drive
Middleton, WI 53562 USA
Telephone: 608.836.4400
Facsimile: 608.831.9279
www.intertek.com

Test Verification of Conformity

In the basis of the tests undertaken, the sample(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

Applicant Name & Address:

Enstall US, Inc.
41 West Putnam Avenue, Suite 303
Greenwich, CT 06830-5300
USA
Tilt Mount System with XR Rails.

Product Description:

Ratings & Principle Characteristics:

Fire Class Resistance Rating:
-Tilt Mount (Asymmetrical). Class A Fire Rated for Low Slope applications when using Type 1, 2 3, 13, 19, 25,29 and 38 listed photovoltaic modules. Class A Fire Rated for Steep Slope applications with Type 1 and 2, listed photovoltaic modules. “Angle of tilt allowed by the system is any greater than or equal to 1° and specified in the installation instructions. This system was evaluated with a 5” gap between the bottom of the module and the roof’s surface. Per UL 2703 this product can be installed with any gap stated in the manufacturer’s installation instructions. No perimeter guard is required. Installed with components per IronRidge installation manual and as reviewed by Intertek Engineering Evaluation 102241487MID-001.1. This rating is applicable with any 3rd party roof attachment with similar construction and material.

Models:

IronRidge Tilt Mount with XR Rails

Brand Name:

IronRidge Tilt Mount

Relevant Standards:

UL 2703 (2023) Standard for Safety Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels, Referencing UL61730-2, Standard for Safety Photovoltaic Module Safety Qualification – Part 2: Requirements for Testing.

Verification Issuing Office:

Intertek Testing Services NA, Inc.
8431 Murphy Drive
Middleton, WI 53562

Date of Tests:

Tests: 08/27/2014 to 03/17/2015; Evaluations: 08/19/2015

Test Report Number(s):

101769343MID-001r1, 101769343MID-001a, 101915978MID-001, 101999492MID-001ar1-cr1 & 102241487MID-001.1 (Evaluation for South Tilt Leg Assembly) 105499394MID-008 PEV

Revised Date:

1/5/24 changed the word anchor to attachment.

This verification is part of the full test report(s) and should be read in conjunction with them. This report does not automatically imply product certification.

Completed by:

Brian Brunson
Operations Manager, Middleton

Signature:

Date:

1/5/24

Reviewed by:

Chad Naggs
Technical Team Lead, Fire Resistance

Signature:

Date:

1/5/24

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

GFT-OP-11a (24-MAR-2014)



CLASS A FIRE RATING DATASHEET (TILT-UP MOUNT)
SCALE: NTS

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

CLASS A FIRE RATING

PROJECT NO: GSD-20260615-SCM

DRAWN BY: SCM

DATE: 6/15/2026

PV-11



Attn: Corey Geiger, COO, IronRidge Inc.
Date: July 7th, 2021

Re: Structural Certification and Span Tables for IronRidge Flat Roof Systems

The letter is to certify the structural performance and code compliance of IronRidge’s rooftop photovoltaic (PV) mounting systems installed onto flat or low slope roofs with the slope not exceeding 7 degrees from the horizontal. The two IronRidge’s proprietary rooftop systems certified in this letter include Flush Mount System applied when modules are set parallel to the flat or low slope roofs, and Tilt Mount System which accommodates module tilts ranging from 4 degrees to 30 degrees relative to the roof surface. Both systems are capable supporting PV modules installed in a portrait or landscape orientation. The typical assembly details and core components of the respective system are provided in Exhibit EX-0008.

The IronRidge Flat Roof Systems as depicted above are designed and certified to the structural requirements of the reference standards listed below, for the load conditions and configurations tabulated in the attached span tables.

- ASCE/SEI 7-16 Minimum Design Loads for Buildings and Other Structures (ASCE 7-16)
- 2018 International Building Code (IBC-2018)
- 2018 Washington State Building Code
- 2015 Aluminum Design Manual (ADM-2015)

The span tables included in this letter provide the maximum allowable spans of XR Rails used in the Tilt Mount and Flush Mount Systems used onto flat or low slope roofs for the respective loads and configurations listed, covering wind exposure categories B, C, & D, and roof zones 1, 2 & 3. The span tables are applicable given that the following conditions are met:

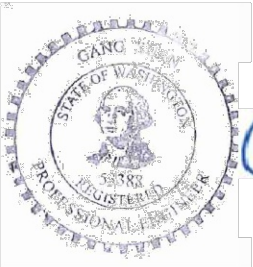
1. *Span* is the distance between two adjacent roof attachment points (measured at the center of the attachment fastener or the group of fasteners).
2. Each module shall be supported by 2 rails (2 rail system) or 3 rails (3 rail system). Spans are calculated based on 2 rail systems, and conservatively deemed acceptable for 3 rail systems. The 3 rail systems are only applicable to the Flat Roof Flush Mount system.
3. The underlying roof slope is 7 degrees or less relative to horizontal and the maximum module tilt (the angle between module and roof surface) is 30 degrees or less.
4. The *building height*, defined as the roof eave height measured from grade, does not exceed 60 feet.
5. A maximum array to roof clearance at the leading edge of the module (h_1) and the rear edge of the module (h_2) is 2 feet and 4 feet, respectively. The distance is measured from top of module to top of roof surface.
6. Module length and area shall not exceed the maximum values listed on the respective span tables.
7. All IronRidge components shall be installed in a professional workmanlike manner per IronRidge’s *Tilt Mount and Flush Mount installation manuals* and other applicable standards for general roof construction practice.



28357 Industrial Boulevard
Hayward, CA 94545
1-800-227-9523
IronRidge.com

The span tables provided in this letter are certified based on the structural performance of IronRidge XR Rails only with no consideration of the structural adequacy of the chosen roof attachments, PV modules, or the underlying roof supporting members. It is the responsibility of the installer or system designer to verify the structural capacity and adequacy of the aforementioned system components in regards to the applied or resultant loads of any chosen array configuration.

Sincerely,



Gang Xuan, PE
Senior Structural Engineer

2021.07.14
15:03:29
-07'00'

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

ENGINEERING LETTER

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-12



UFO Family of Components

Tech Brief

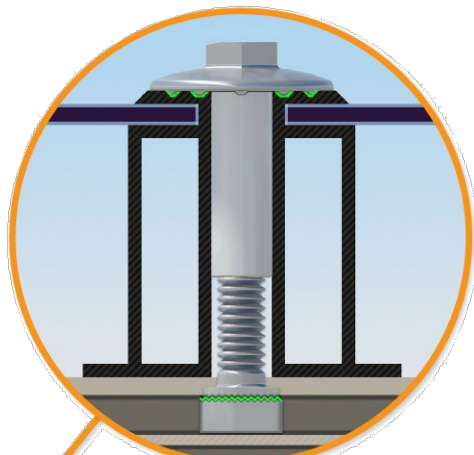
Simplified Grounding for Every Application

The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



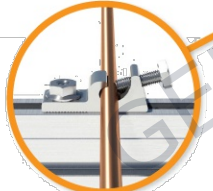
Stopper Sleeve
The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.



Universal Fastening Object (UFO)
The UFO securely bonds solar modules to XR Rails. It comes assembled and lubricated, and can fit a wide range of module heights.



Bonded Splice
Each Bonded Splice uses self-drilling screws to form a secure connection. No bonding strap needed.

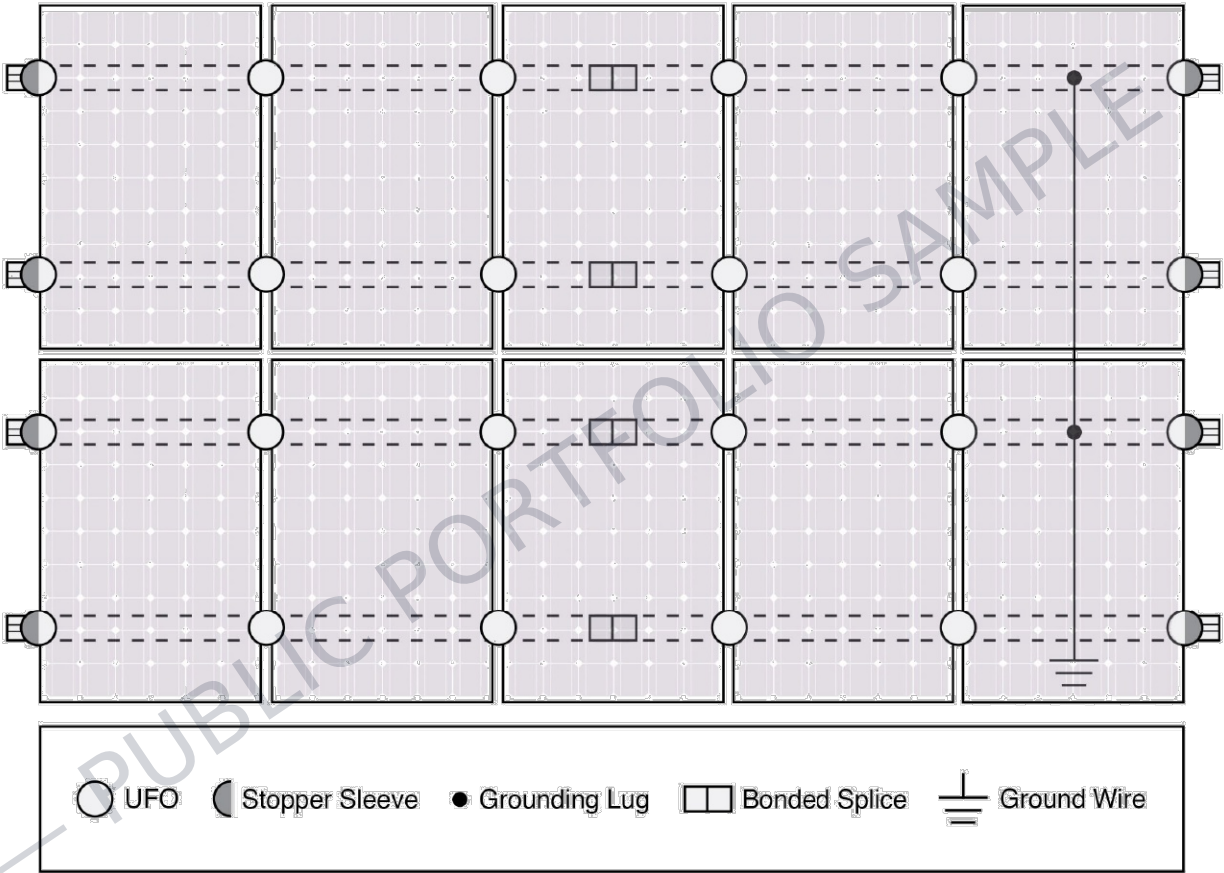


Grounding Lug
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



Bonded Attachments
The bonding bolt attaches and bonds the L-foot to the rail. It is installed with the same socket as the rest of the system.

System Diagram



Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

UL Certification

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to [IronRidge.com/UFO](https://www.ironridge.com/UFO)

Cross-System Compatibility			
Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails	✓	✓	XR1000 Only
UFO/Stopper	✓	✓	✓
Bonded Splice	✓	✓	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Enphase - M250-72, M250-60, M215-60, C250-72 Darfon - MIG240, MIG300, G320, G640 SolarEdge - P300, P320, P400, P405, P600, P700, P730		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list.		

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

GROUNDING DETAILS

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-13

Rapid shutdown is built-in

The 2014 and 2017 editions of the National Electrical Code (NEC 2014/NEC 2017) added new rapid shutdown requirements for PV systems installed on buildings. Enphase Microinverters fully meet rapid shutdown requirements in the new code without the need to install any additional electrical equipment.

What's new in Section 690.12?
NEC 2014/2017, Section 690.12 applies to PV conductors over 10 feet from the PV array and requires that the conductors power down to 30 volts and 240 volt-amperes within 10 seconds of rapid shutdown initiation.

String inverters require work arounds for rapid shutdown

Work around.

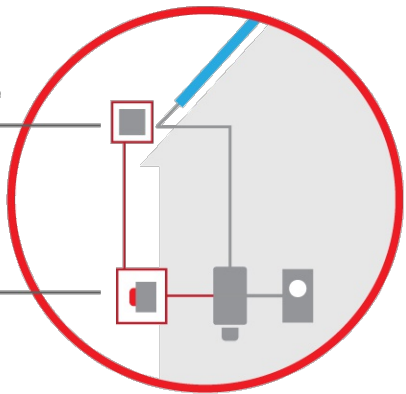
Specialized Rapid Shutdown electrical box installed on the roof within 10 feet of array.

Work around.

Shutoff switch that is easily accessible to first responders on the ground.

Work around.

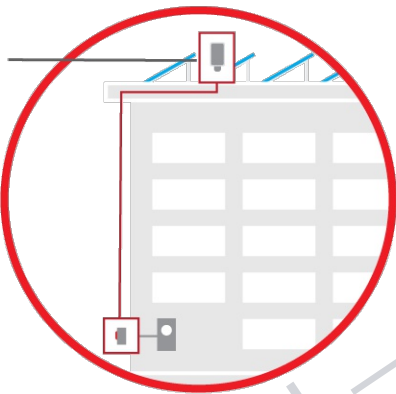
Extra conduit in installation.



Residential String Inverter

Work around.

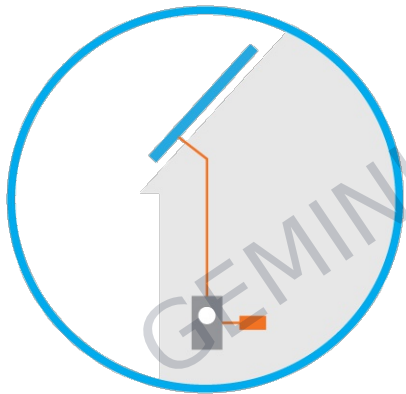
String inverter installed on roof, a hostile environment that string inverters are not built to live in.



Commercial String Inverter

Enphase comes standard with rapid shutdown capability

All Enphase microinverters, even those that were previously installed, inherently meet rapid shutdown requirements, no additional equipment or workarounds needed



Residential Microinverter

Enphase microinverters can safely shut down automatically, leaving only low-voltage DC electricity isolated to the PV module



Commercial Microinverter

To learn more, visit enphase.com



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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

RAPID SHUTDOWN

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-14

aGate

Intelligent energy management system

The aGate serves as the controller for all home power sources by interconnecting solar, grid, batteries, and a standby generator to supply electricity to the home. It seamlessly transitions the home supply from grid power to backup power so that always-on appliances, such as the refrigerator and network router, will not be affected when the grid goes down.

The aGate can be installed at the service entrance, connected to the main load center, or used as a load center.



Robust

- ✓ Micro-grid interconnect device (MID)
- ✓ EMS Integrated PV and grid metering
- ✓ UL1741 certified PCS function & 280A busbar to avoid Main Panel Upgrades
- ✓ 12-year limited warranty



Flexible

- ✓ Compatible with micro and string solar inverter
- ✓ Indoor and outdoor / wall-mounted



Hassle-free

- ✓ Precise control of electricity usage through Smart Circuits Module
- ✓ Standby generator integration via generator module
- ✓ Remarkable black start function ensures battery charge after a prolonged outage or extended trip
- ✓ Vehicle to loads (V2L) function to power essential home appliances during an emergency
- ✓ Commissioning through the aGate Wifi hotspot or Bluetooth



Easy installation

- ✓ Built-in design Smart Circuits and Generator Modules
- ✓ Conduit entry options from the bottom, left, or right



DATASHEET

PERFORMANCE SPECIFICATIONS

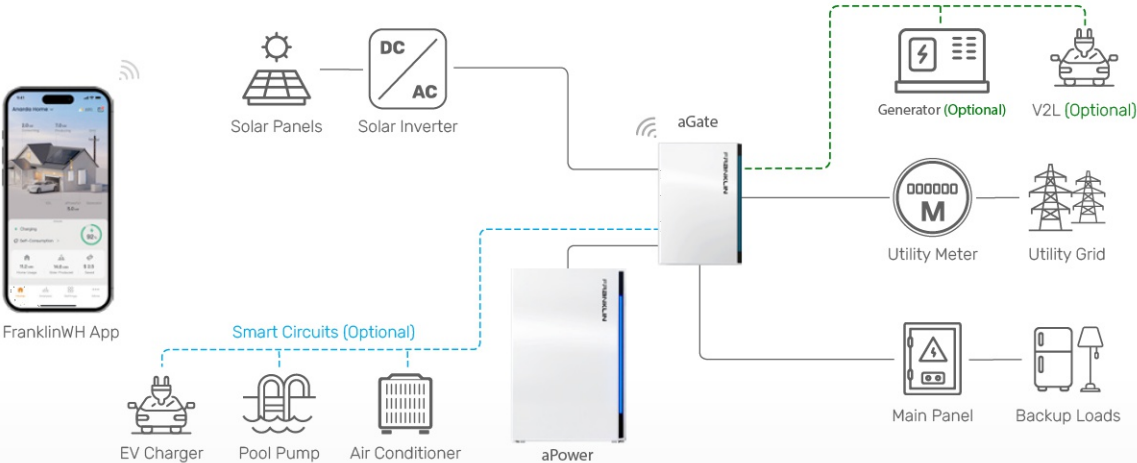
Model Number	aGate X
Coupling	AC-coupled
Nominal AC Voltage	120 / 208 V, 120 / 240 V, 60 Hz
Phase	2 W+N+PE
aPower Over Current Protection Device	125 A Max
Solar Input Over Current Protection Device	80 A Max
Backup Load Port Over Current Protection Device	200 A Max
Generator Over Current Protection Device ¹	200 A Max
Smart Circuits Over Current Protection Device ²	Opt. a 1 × 80 A Max @ 208 V / 240 V & 1 × 50 A Max @ 208 V / 240 V Opt. b 1 × 80 A Max @ 208 V / 240 V & 2 × 50 A Max @ 120 V
Maximum Supply Fault Current	22 kA
Busbar Rating	280 A
Work Modes	Self-Consumption, Time of Use, Emergency Backup
Communications	Ethernet / 4G / Wifi / Bluetooth
User Interface	FranklinWH App
Warranty	12-year limited

COMPLIANCE INFORMATION

Certifications	UL 1741, UL 1741 PCS, UL 67, UL 869A, UL 916, CAN / CSA C22.2 No. 107.1-16, CSA C22.2 No. 29, CSA C22.2 No. 0.19
Seismic	AC 156, OSHPD, IEEE 693-2005 (high)
Environmental	California Proposition 65 RoHS Directive 2011 / EU
Emissions	FCC Part 15 Class B, ICES 003

Franklin Home Power Solution

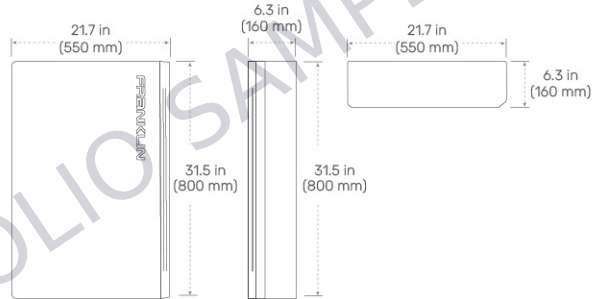
Whole Home Backup



Address: 1731 Technology Dr., Suite 530 San Jose, CA 95110 Telephone: +1 888-837-2655 Email: info@franklinwh.com Website: www.franklinwh.com
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MECHANICAL SPECIFICATIONS

Dimensions (H × W × D)	31.5 in × 21.7 in × 6.3 in (800 mm × 550 mm × 160 mm)
Weight	38.6 lb (17.5 kg)
Mounting	Wall mount



1. Generator Module is optional.
2. Smart Circuit Module is optional.

ENVIRONMENTAL SPECIFICATIONS

Enclosure Type	NEMA 3R
Operating Temperature	-4°F to 122°F (-20°C to 50°C)
Operating Humidity (RH)	Up to 100% RH, condensing
Altitude	Maximum 9,843 ft (3,000 m)
Environment	Indoor and outdoor rated

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

aGATE X DATASHEET

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-15

FRANKLINWH

aPower 2

AC-coupled battery

Store solar generated power while the sun is shining. Use the stored energy when needed to lower electric bills. Run heavy loads such as air conditioners and water heaters as usual even during grid outages. Provide homeowner peace of mind by fully charging before severe weather events.

The system is off-grid ready, designed to operate independently from the main power grid to deliver reliable energy in any situation.

- ✓ 10 kW continuous / 15 kW peak for 10s
- ✓ 8 kW charge power
- ✓ 15 kWh AC¹ per unit, up to 225 kWh (15 units) per aGate
- ✓ 60 MWh warranty throughput



PERFORMANCE SPECIFICATIONS

SKU	APR-10K15V2-US				
Model Number	aPower X-20				
Battery Chemistry	Lithium Iron Phosphate (LFP)				
Usable System Energy	15 kWh AC ¹ per unit, up to 15 units per aGate				
Aggregate Throughput	60 MWh				
Real Power (charge)	8 kW continuous				
Nominal Output Power (AC)	2.5 kW	5 kW	6.7 kW	8.4 kW	10 kW ²
Maximum Apparent Power	2.9 kVA	5.8 kVA	7.7 kVA	9.6 kVA	11.5 kVA
Maximum Continuous Current	12 A	24 A	32 A	40 A	48 A
Nominal AC Voltage	120 / 240 V, 120 / 208 V (single phase), 60 Hz				
Coupling	AC-coupled				
Phase	2 W+N+PE				
Round Trip Efficiency	90% ¹				
Maximum Short-Circuit Current Rating	10 kA				
Load Start Capability	Up to a 5-ton air conditioner				
Work Modes	Self-Consumption				
	Time of Use				
	Emergency Backup				
Noise Emission	30 dB(A) Typical / 40 dB(A) Maximum				
Flood Resistance	Up to 29" from the aPower 2 base				
User Interface	FranklinWH App				
Warranty	15 years ³				

COMPLIANCE INFORMATION

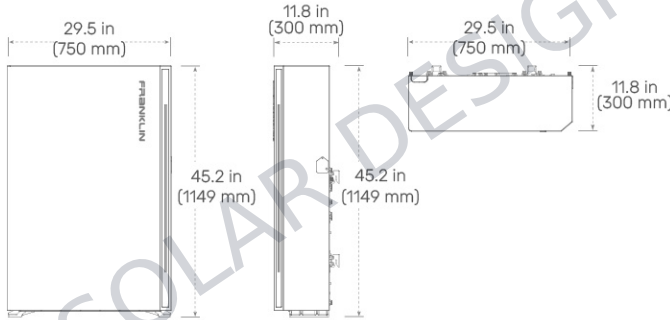
Certifications	UL 9540, UL 9540A, UL 1973, UL 1741, UL1741 SB, UL 1741 PCS, UL 60730-1:2016, IEEE 1547, IEEE 1547.1, UN 38.3, CSA C22.2 No. 107.1:16
Seismic	AC 156, OSHPD, IEEE 693-2005 (high)
Environmental	California Proposition 65 RoHS Directive 2011 / EU
Emissions	FCC Part 15 Class B, ICES 003

- At beginning of life, 3 kW charge/discharge power, 77 °F (25 °C).
- Refer to the installation manual and commissioning guide for proper wire and OCPD sizes.
- For more details, please refer to the FranklinWH System Limited Warranty for End Users available in the Documentation Center on the FranklinWH website.

WWW.FRANKLINWH.COM

MECHANICAL SPECIFICATIONS

Dimensions (H x W x D)	45.2 in x 29.5 in x 11.8 in (1149 mm x 750 mm x 300 mm)
Weight, aPower 2 Complete	357 lb. (162 kg)
Weight, without Cover	335 lb.(152 kg)
Weight, Cover	22 lb. (10 kg)
Mounting	Wall or floor mount
Cooling	Natural air-cooled design



ENVIRONMENTAL SPECIFICATIONS

Enclosure Type	Type 3R
Ingress Protection	IP56 (Wiring) IP67 (Battery Pack & Inverter)
Operating Temperature	-4 °F to 122 °F (-20 °C to 50 °C) Operates up to 131 °F (55 °C) at 5kW derated output
Operating Humidity (RH)	Up to 100% RH, condensing
Altitude	Maximum 9,843 ft (3,000 m)
Environment	Indoor and outdoor rated

Compatibility Notice: At launch, the aPower 2 is compatible with the aGate 1.3 only. Compatibility with earlier aGate and aPower versions is anticipated in Q2 2025.

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

aPOWER 2 DATASHEET

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-16

UL 9540A Compliance and Installation Guidance for the Franklin Whole Home System

The purpose of this document is to demonstrate how the FranklinWH aPower 2¹ (Model: aPower X-20), the energy storage component of the FranklinWH System, fulfills the standardized testing approach and performance criteria specified in the 4th edition (2019) of UL 9540A and thereby allowed exceptions to otherwise restricted installation.

FranklinWH provides an AC-coupled home energy management and battery storage system compatible with grid-tied PV inverters. The aPower 2 employs the safer Lithium Iron Phosphate (LFP) cell chemistry from Tier 1 manufacturers, ensuring both safety and reliability. The system operates within a normal temperature range of -4° F to 131° F and incorporates superior thermal management for optimal system performance. Its design includes a low-voltage battery bus architecture, coupled with robust management systems for battery, energy conversion, energy safety, as well as cloud monitoring and control².

Key takeaways and installation guidance recommendations:

- FranklinWH has met the testing standards of UL 9540A (4th ed.) for residential use indoor and outdoor, wall- or ground-mounted ESS.
- The FranklinWH aPower 2 product passed the UL 9540A unit-level test. The surface and target unit temperatures were below the limits, and no ignition events were observed during and after the completion of the test. Explosion or deflagration hazards of vented gas were not observed.
- The FranklinWH batteries incorporates prismatic Lithium Iron Phosphate-based cell chemistry (LFP)
- The aPower 2 is suitable for indoor (non-habitable) and outdoor residential installations as defined in the 2021 IRC Section R328.4 and NFPA 2020 Chapter 15 (15.6). The aPower 2 shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.
- If a battery cell's temperature rises beyond the threshold, the battery management system disconnects the battery from the power electronics and commands it to shut off to prevent continued energy transfer to or from the battery.
- The internal wires are 24 AWG and Teflon coated to meet UL 1332 requirements. They have a 94V-0 flame retardant rating making them high-temperature, flame, corrosion, oil, strong acid and alkali, high pressure, and strong oxidizing agent resistant.

- Based on the test results, along with the standard FranklinWH installation guidance provided in the installation manual, a few additional recommendations include:
 - The aPower 2 qualifies for reduced indoor unit clearances (the exception from code mentioned 36" spacing requirements) to at least 4" for three aPower 2 units, as tested. (Code reference: NFPA 2020 15.5)
 - Automatic sprinkler systems or other methods of automatic fire suppression may not be required for the installation of aPower 2 units per compliance with the UL 9540A unit-level performance criteria. (Code reference: NFPA 2020 4.4.4.3)
 - Ventilation requirements may not be needed since the aPower 2 does not release any toxic gases during charging, discharging or normal use conditions (Code reference: NFPA 2020 15.11)
 - Use of fire cabinets can be excluded for indoor installations (Code reference: NFPA 2020 4.1.4.3)
 - Fire suppression or ventilation systems will not be required for outdoor installations. The aPower 2 is rated for both indoors and outdoors installations. Please refer to the installation guide for more information on installation locations.

Always consult with your local Authority Having Jurisdiction (AHJ), building/fire department and ensure each FranklinWH ESS is installed in compliance with local regulations and fire codes. Please note that installation guidance for lithium energy storage systems may vary from one AHJ to another. Additionally, some installations may require fire detection equipment to be installed alongside the battery, depending on the local AHJ's requirements. Our team is available to collaborate with local AHJs to ensure safety and compliance of FranklinWH installations, as these remain our top priorities.

For further inquiries or UL 9540A test-related information, please do not hesitate to contact the FranklinWH product team at engineering@franklinwh.com.

¹ aPower2 is a marketing name. Product model is aPower X-20 in the aPower family, following the Xyyy format, where "y" in the model name may be A-Z, 0-9, symbol "-" or blank. There is no technical difference between the models.

² This tech brief is based on the reports from UL 9540A testing performed by CSA International Certification Co., Ltd. Kunshan Branch (Project: 80226105, Master contract: 301950), UL 9540 (project: 80211057) by CSA Group and UL 1741 by CSA Group (also supplemental SA and SB, project: 80226105).

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AC-COUPLED GRID-TIED SYSTEM
W/ AC-COUPLED BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

UL 9540A COMPLIANCE

PROJECT NO: GSD-20260615-SCM
DRAWN BY: SCM
DATE: 6/15/2026

PV-17