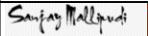


DIRECTORY OF PLAN PAGES	
PV1	PROJECT INFORMATION
PV-2A	SITE PLAN (GENERAL)
PV-2B	SITE PLAN (DETAILED)
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PV-3B	
PV-3C	
PV4	PLACARDS
PV-5A	ATTACHMENT PLAN
PV-5B	SITE SPECIFIC IRON RIDGE DESIGN REPORT
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PV-5D	
PV-6A	IRON RIDGE QUICKMOUNT HUG DATASHEET
PV-6B	IRON RIDGE QUICKMOUNT HUG CUTSHEET
PV7	RACKING DATASHEET
PV8	PV MODULE DATASHEET
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PV-10A	STATE OF CALIFORNIA RACKING ENGINEERING LETTER
PV-10B	IRON RIDGE XR-100 SPAN TABLE (GABLE ROOF FLUSH MOUNT)
PV11	GROUNDING DETAILS (IRON RIDGE RACKING)
PV12	TESLA POWERWALL 3 DATASHEET
PV13	TESLA BACKUP GATEWAY 2 DATASHEET
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PV15	SERVICE ENTRANCE SECTION (SES) DATASHEET
PV16	UTILITY AC DISCONNECT DATASHEET

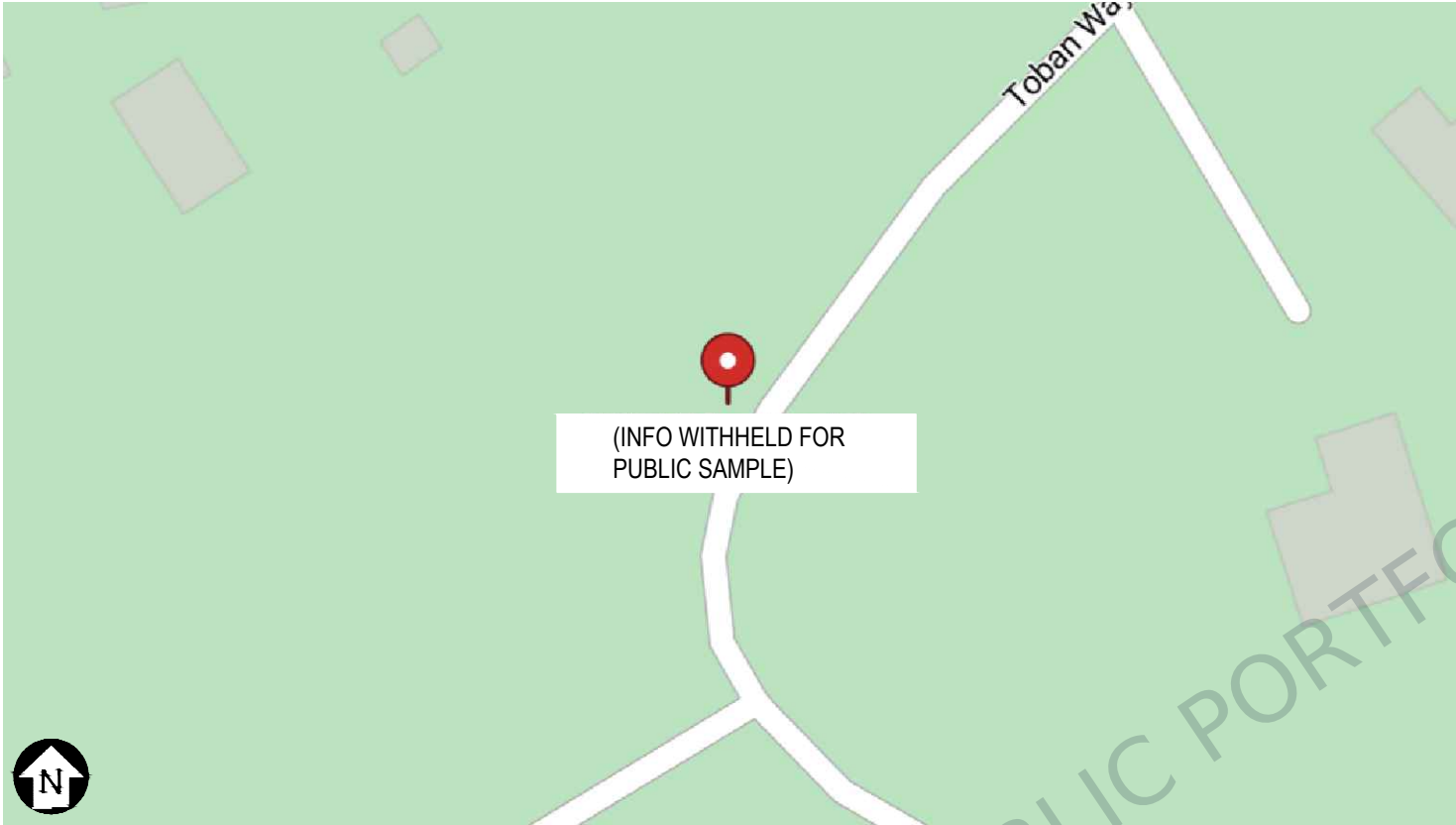
PROJECT DETAILS	
PROPERTY OWNER	(INFO WITHHELD FOR PUBLIC SAMPLE)
PROPERTY ADDRESS	(INFO WITHHELD FOR PUBLIC SAMPLE)
APN	(INFO WITHHELD FOR PUBLIC SAMPLE)
OWNER PHONE	(INFO WITHHELD FOR PUBLIC SAMPLE)
OWNER EMAIL	(INFO WITHHELD FOR PUBLIC SAMPLE)
AHJ	TUOLUMNE COUNTY
ZONING	RESIDENTIAL
CONST. TYPE	ROOF-MOUNTED PHOTOVOLTAIC ARRAY
OBSERVED CODES	2022 CALIFORNIA BUILDING CODE, TITLE 24, PART 2, VOL. 1 & 2 2022 CALIFORNIA RESIDENTIAL CODE, TITLE 24, PART 2.5 2022 CALIFORNIA ELECTRICAL CODE, TITLE 24, PART 3 2022 CALIFORNIA MECHANICAL CODE, TITLE 24, PART 4 2022 CALIFORNIA PLUMBING CODE, TITLE 24, PART 5 2022 CALIFORNIA ENERGY CODE, TITLE 24, PART 6 2022 CALIFORNIA FIRE CODE, TITLE 24, PART 9
STRUCT. METHOD	ASCE7-16

OWNER-BUILDER INFORMATION	
OWNER-BUILDER	(INFO WITHHELD FOR PUBLIC SAMPLE)
ADDRESS	(INFO WITHHELD FOR PUBLIC SAMPLE)
PHONE	(INFO WITHHELD FOR PUBLIC SAMPLE)
EMAIL	(INFO WITHHELD FOR PUBLIC SAMPLE)
OWNER-BUILDER 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	

SYSTEM DETAILS	
DC RATING OF SYSTEM	20,090W
TOTAL COMBINED AC OUTPUT CURRENT	96A
BATTERY / STRING INVERTER	(2) TESLA POWERWALL 3
SOLAR SHUTDOWN DEVICE	(18) TESLA MCI-1
MODULE	(49) PANASONIC EVPV410HK

SITE SPECIFICATIONS	
UTILITY SERVICE	120 / 240VAC, 1-Ø, 3-WIRE
SERVICE ENTRANCE SECTION (SES)	400A RATED BUSBAR
MODEL: SIEMENS MC3042B1400SCS	(2) X 200A / 2P MAIN BREAKER
ASHRAE EXTREME ANNUAL MEAN MINIMUM DENSITY DRY BULB TEMP.	-3°C
ASHRAE 2% ANNUAL DRY DENSITY BULB TEMP.	37°C
BASIC WIND SPEED	95 MPH
GROUND SNOW LOAD	120 PSF
WIND EXPOSURE CATEGORY	C
SEISMIC DESIGN CATEGORY	D
RISK CATEGORY	II

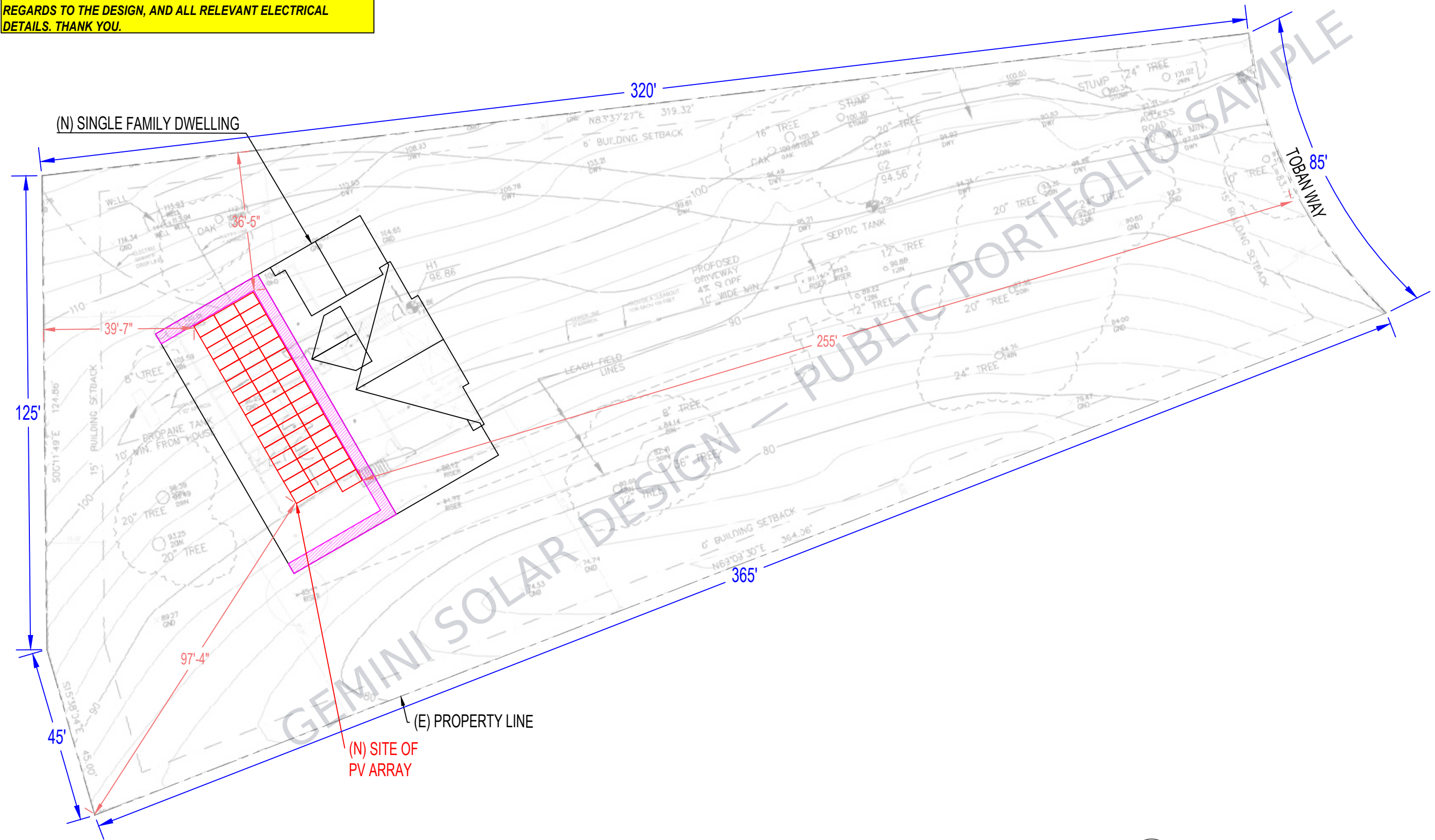


CONSTRUCTION NOTES	
1	CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO INITIATING CONSTRUCTION.
2	CONTRACTOR SHALL REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
3	ALL EQUIPMENT SHALL BE LISTED BY THE U.L. (OR EQUAL) AND LISTED FOR ITS SPECIFIC APPLICATION.
4	ALL 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 CEC SECTION 110.26.

SCOPE OF WORK DESCRIPTION
THE PROPOSED SYSTEM IS A ROOF MOUNTED PHOTOVOLTAIC ARRAY UTILIZING DC STRING INVERTERS. THE PHOTOVOLTAIC (PV) SYSTEM IS TO BE INSTALLED ON THE RESIDENTIAL ZONED PROPERTY IN UNINCORPORATED TUOLUMNE COUNTY, CALIFORNIA.
THIS PROPOSED SCOPE OF WORK AT THIS TIME WILL INCLUDE AC-COUPLED STORAGE BATTERIES IN A PARTIAL HOME BATTERY-BACKUP APPLICATION.
THE ENERGY PRODUCED BY THE PV SYSTEM SHALL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ON-SITE ELECTRICAL EQUIPMENT VIA A LOAD-SIDE POINT OF INTERCONNECTION.

OWNER-BUILDER	
NAME: (INFO WITHHELD)	
PHONE: (INFO WITHHELD)	
CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING SET IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED IN FULL OR IN PART TO ANYONE EXCEPT THOSE INVOLVED IN THE DESIGN AND INSTALLATION OF THE PV SYSTEM REPRESENTED IN THIS PLAN.	
NEW GRID-TIED SYSTEM 20.09KW W/ AC-COUPLED BATTERY-BACKUP (PARTIAL-HOME BACKUP APPLICATION)	(INFO WITHHELD FOR PUBLIC SAMPLE)
	(INFO WITHHELD FOR PUBLIC SAMPLE)
PROJECT INFO	
PROJECT NO: GSD-20241021-189334	
DRAWN BY: SCM	
DATE: 10/21/2024	
PV-1	

NOTE TO PLAN REVIEWER:
SHEET PV-2A REPRESENTS A GENERAL SITE PLAN DEPICTING THE RELEVANT ELEMENTS OF THE PARCEL, AND THE SETBACKS FROM THE PROPOSED PV ARRAY TO THE PROPERTY LINES. THIS HAS BEEN DONE BECAUSE THE LOT LINES ARE RATHER LARGE, AND THE RESULTING SCALING MAKES THE READABILITY DIFFICULT. PLEASE REFER TO SHEET PV-2B FOR A DETAILED SITE PLAN WITH REGARDS TO THE DESIGN, AND ALL RELEVANT ELECTRICAL DETAILS. THANK YOU.



OWNER-BUILDER	
NAME: (INFO WITHHELD)	
PHONE: (INFO WITHHELD)	
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NEW GRID-TIED SYSTEM 20.09KW W/ AC-COUPLED BATTERY-BACKUP (PARTIAL-HOME BACKUP APPLICATION)	
(INFO WITHHELD FOR PUBLIC SAMPLE)	
SITE PLAN	
PROJECT NO: GSD-20241021-189334 DRAWN BY: SCM DATE: 10/21/2024	
PV-2A	



POWERWALL 3 (LEADER UNIT)

- 1 STRING OF 8 MODULES (PANASONIC EVPV410HK)
- 1 STRING OF 8 MODULES (PANASONIC EVPV410HK)
- 1 STRING OF 8 MODULES (PANASONIC EVPV410HK)

POWERWALL 3 (FOLLOWER UNIT)

- 1 STRING OF 8 MODULES (PANASONIC EVPV410HK)
- 1 STRING OF 8 MODULES (PANASONIC EVPV410HK)
- 1 STRING OF 9 MODULES (PANASONIC EVPV410HK)

(N) NEMA 3R JUNCTION BOX (LOC. ON ROOF)
THIS JUNCTION BOX SHALL TRANSITION THE (3)
DC STRING CIRCUITS INTO 0.75" DIA. EMT CONDUIT
RAN WITHIN THE INTERIOR OF THE STRUCTURE

(N) TESLA POWERWALL 3 (LEADER UNIT)
(LOC. IN CRAWL SPACE, BASEMENT)

(N) TESLA POWERWALL 3 (FOLLOWER UNIT)
(LOC. IN CRAWL SPACE, BASEMENT)

(N) 125A SOLAR-ONLY LOAD CENTER
120 / 240VAC - 1 ϕ - 3W - NEMA 3R, MLO
(LOC. IN CRAWL SPACE, BASEMENT)

(N) TESLA BACKUP GATEWAY 2
(LOC. IN CRAWL SPACE, BASEMENT)

(N) BATTERY SYSTEM DISCONNECT (DS1)
MODEL: EATON DG224URK
200A RATED GENERAL DUTY UNIT
1 ϕ , 3-WIRE, 2-POLE, NON-FUSIBLE, 240VAC
*DISCONNECT SHALL BE A VISIBLE, LOCKABLE,
KNIFE SWITCH DISCONNECT AS PER UTILITY*
(LOC. ON EXTERIOR, ADJACENT TO METER / MAIN)

(N) METER / MAIN COMBINATION SERVICE ENTRANCE
DEVICE RATING: 400A MAX, 120 / 240VAC, 1 ϕ , 3-WIRE
METER SOCKET RATING: 400A MAX, 320A CONTINUOUS
(2) X 200A / 2P MAIN BREAKERS, NEMA 3R RATED
SUITABLE FOR USE AS SERVICE EQUIPMENT
MODEL: SIEMENS MC3042B1400SCS
(LOC. ON EXTERIOR)

(N) BACKED UP LOADS PANEL
200A RATED BUSBAR
200A / 2P MAIN BREAKER
120 / 240VAC, 1 ϕ , 3-WIRE, NEMA 1
(LOC. INTERIOR OF BASEMENT)
**THIS LOAD CENTER IS TO BE CONNECTED
TO THE TESLA BACKUP GATEWAY 2 FOR A
PARTIAL-HOME BACKUP APPLICATION**

(N) NEMA 3R JUNCTION BOX (LOC. ON ROOF)
THIS JUNCTION BOX SHALL TRANSITION THE (3)
DC STRING CIRCUITS INTO 0.75" DIA. EMT CONDUIT
RAN WITHIN THE INTERIOR OF THE STRUCTURE

SITE PLAN NOTES

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

OWNER-BUILDER

NAME: (INFO WITHHELD)

PHONE: (INFO WITHHELD)

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REPRESENTED IN THIS PLAN.

NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

SITE PLAN

PROJECT NO: GSD-20241021-189334

DRAWN BY: SCM

DATE: 10/21/2024

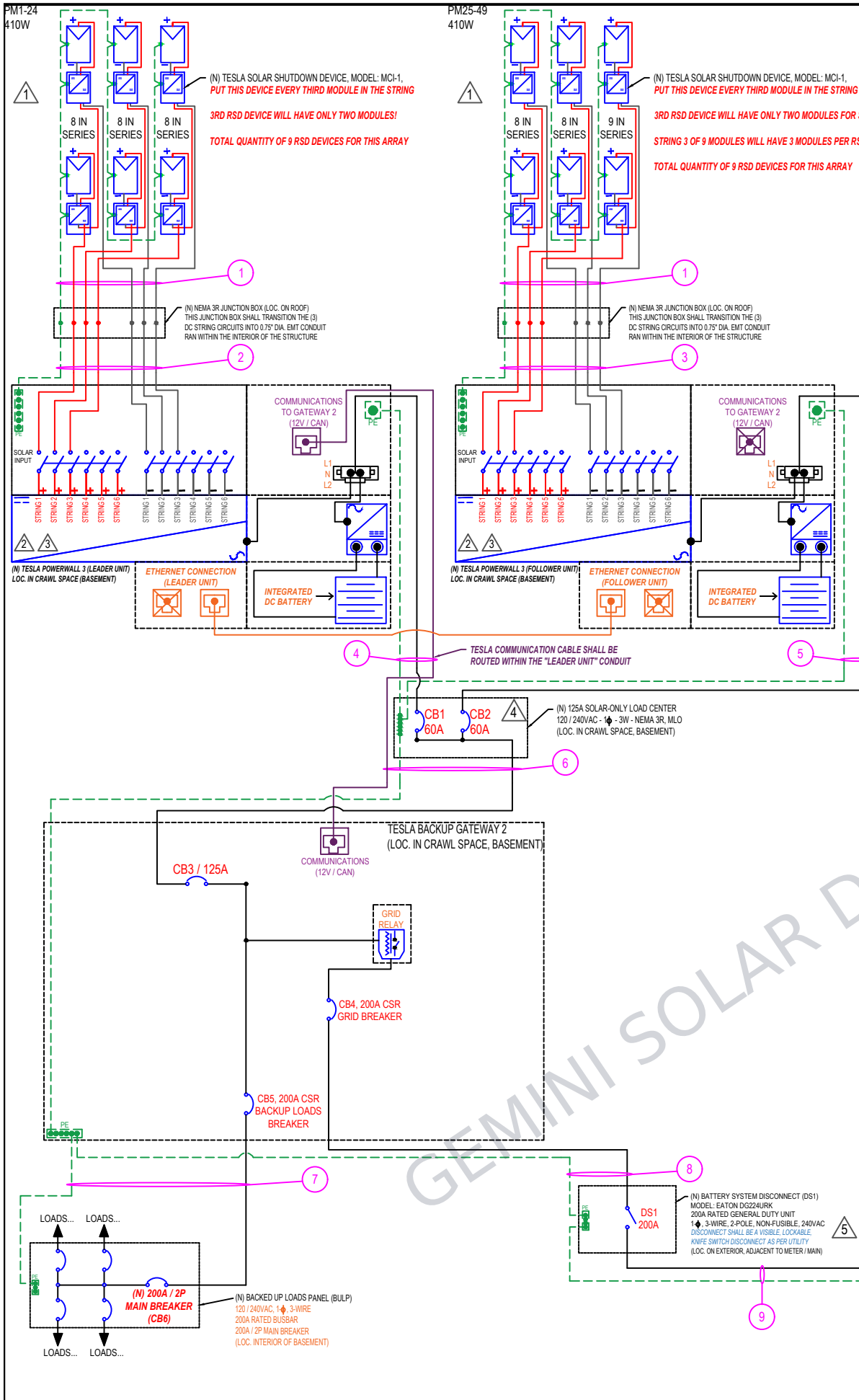
PV-2B

A SITE PLAN (DETAILED)
PV-2B SCALE: 1" = 10'

36" FIRE PATHWAY AS PER CFC

(N) PV ARRAY
240° AZIMUTH, 8:12 PITCH
(49) PANASONIC EVPV410HK
(18) TESLA MCI-1 (MODULE LEVEL RAPID SHUTDOWN, CEC 690.12)

(N) SINGLE FAMILY DWELLING



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.

OWNER-BUILDER	
NAME: (INFO WITHHELD)	
PHONE: (INFO WITHHELD)	
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NEW GRID-TIED SYSTEM 20.09KW W/ AC-COUPLED BATTERY-BACKUP (PARTIAL-HOME BACKUP APPLICATION)	
(INFO WITHHELD FOR PUBLIC SAMPLE)	
SINGLE-LINE DIAGRAM	
PROJECT NO: GSD-20241021-189334	
DRAWN BY: SCM	
DATE: 10/21/2024	
PV-3A	

PHOTOVOLTAIC MODULE										
REF.	TYP.	MODULE			STC POWER	ISC	IMP	VOC	VMP	FUSE RATING
PM1-49	49	PANASONIC EVPV410HK			410W	10.35A	9.61A	49.0V	42.7V	25A
STRING INVERTER										
TYP.	INVERTER	MAXIMUM CONTINUOUS CURRENT	AC VOLTAGE	MAXIMUM SOLAR STC INPUT	PV DC MPPT VOLTAGE RANGE	MPPTs	MAXIMUM CURRENT PER MPPT (IMP)	NOMINAL BATTERY ENERGY	POWER SCALABILITY	SOLAR TO HOME/GRID EFFICIENCY
2	TESLA POWERWALL 3	48A	240VAC	20,000W	60 - 480 VDC	6	13A	13.5 KWH AC	UP TO 4 PW3 UNITS	97.5%
SOLAR SHUTDOWN DEVICE										
TYP.	MODEL	NOMINAL INPUT DC CURRENT RATING (IMP)	MAXIMUM INPUT SHORT CIRCUIT CURRENT (ISC)	MAXIMUM SYSTEM VOLTAGE	MAXIMUM NUMBER OF DEVICES PER STRING	CONTROL			CERTIFICATIONS	
18	TESLA MCI-1	12A	19A	600VDC	5	POWER LINE EXCITATION			UL 1741 PVRSE, UL 3741, PVRSA	

SYSTEM SUMMARY (POWERWALL 3, UNIT #1)	
ARRAY STC POWER	9,840W
ARRAY CIRCUITS	1 X 8 (MPPT #1) 1 X 8 (MPPT #2) 1 X 8 (MPPT #3)
ARRAY VMP @ STC (25°C)	342VDC (MPPT #1) 342VDC (MPPT #2) 342VDC (MPPT #3)
ARRAY VOC @ STC (25°C)	392VDC (MPPT #1) 392VDC (MPPT #2) 392VDC (MPPT #3)
MAXIMUM ARRAY VOC @ MIN. TEMP (-7°C)	418VDC (MPPT #1) 418VDC (MPPT #2) 418VDC (MPPT #3)
ARRAY INPUT CURRENT @ STC	9.61A (MPPT #1) 9.61A (MPPT #2) 9.61A (MPPT #3)
CONTINUOUS AC OUTPUT CURRENT	48A @ 240VAC

SYSTEM SUMMARY (POWERWALL 3, UNIT #2)	
ARRAY STC POWER	10,250W
ARRAY CIRCUITS	1 X 8 (MPPT #1) 1 X 8 (MPPT #2) 1 X 9 (MPPT #3)
ARRAY VMP @ STC (25°C)	342VDC (MPPT #1) 342VDC (MPPT #2) 384VDC (MPPT #3)
ARRAY VOC @ STC (25°C)	392VDC (MPPT #1) 392VDC (MPPT #2) 441VDC (MPPT #3)
MAXIMUM ARRAY VOC @ MIN. TEMP (-7°C)	418VDC (MPPT #1) 418VDC (MPPT #2) 471VDC (MPPT #3)
ARRAY INPUT CURRENT @ STC	9.61A (MPPT #1) 9.61A (MPPT #2) 9.61A (MPPT #3)
CONTINUOUS AC OUTPUT CURRENT	48A @ 240VAC

SCHEMATIC NOTES	
1	MAXIMUM STRING VOLTAGE OF ARRAY AT DESIGN LOW TEMPERATURE OF -3°C WOULD BE 471VDC.
2	INTEGRATED DC DISCONNECT IS PROVIDED WITH INVERTER. DISCONNECT IS LISTED FOR USE WITH TESLA UL 1741 LISTED STRING INVERTERS.
3	PHOTOVOLTAIC OUTPUT STRINGS ARE COMBINED INSIDE THE INVERTERS' DC INTEGRATED DISCONNECT.
4	OUTPUT OF (2) TWO TESLA POWERWALL 3 OUTPUT CIRCUITS SHALL BE BACKFED INTO A 125A MLO LOAD CENTER FOR COMBINATION PURPOSES. PLEASE SEE THE OCPD SCHEDULE FOR THE BREAKER SIZES FOR EACH OUTPUT CIRCUIT, RESPECTIVELY.
5	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 120A / 240VAC
2	ALL BATTERY BREAKERS TO BE SECURED UTILIZING APPROVED HOLD DOWNS

AC DISCONNECT SCHEDULE				
REF.	POLES	CURRENT RATING	FUSIBLE	MAX. VOLTAGE
BATTERY SYSTEM DISCONNECT (DS1), KNIFE DISCONNECT MODEL: EATON DG224URK	2	200A	NO	240VAC

OCPD SCHEDULE				
REF.	TYP.	POLES	CURRENT RATING	MAX. VOLTAGE
CB1 (CIRCUIT BREAKER, TESLA POWERWALL 3)	1	2	60A	240VAC
CB2 (CIRCUIT BREAKER, TESLA POWERWALL 3)	1	2	60A	240VAC
CB3 (COMBINED CIRCUIT, 2x TESLA POWERWALL 3)	1	2	125A	240VAC
CB4 (GRID BREAKER, TESLA BACKUP GATEWAY 2)	1	2	200A	240VAC
CB5 (BACKUP LOADS BREAKER, TESLA BACKUP GATEWAY 2)	1	2	200A	240VAC
CB6 (MAIN CIRCUIT BREAKER, 200A BACKED UP LOADS PANEL)	1	2	200A	240VAC
CB7 (MAIN CIRCUIT BREAKER, METER / MAIN SERVICE COMBO)	1	2	200A	240VAC
CB8 (MAIN CIRCUIT BREAKER, METER / MAIN SERVICE COMBO)	1	2	200A	240VAC

OWNER-BUILDER
NAME: (INFO WITHHELD)
PHONE: (INFO WITHHELD)

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20241021-189334
DRAWN BY: SCM
DATE: 10/21/2024

PV-3B

CONDUCTOR SCHEDULE WITH CEC ELECTRICAL CALCULATIONS																
ID	TYP	DESCRIPTION	CONDUCTOR	CONDUIT	NO. OF CURRENT CARRYING CNDRS. IN CNDT.	FILL %	RATED AMPS	OCPD	EGC	TEMP. CORR. FACTOR @ 90°C TEMP. RATING	FILL ADJ. FACTOR	CONT. CURRENT	MAX. CURRENT	TERMINAL RATING CHECK (ASSUME 75°C) SHALL EXCEED 1.25X CONT. CURRENT	BASE AMPACITY @ 90°C TEMP. RATING	CONDITIONS OF USE (COU) @ 90°C TEMP. RATING
1	6	DC CIRCUIT: SERIES STRING OUTPUT TO JUNCTION BOX	12 AWG PV WIRE COPPER	FREE AIR	N/A	N/A	10.35A (I_sc)	N/A	6 AWG BARE COPPER	0.71 (59°C)	1.0	12.94A (I_sc)	16.18A (I_sc)	25A ≥ 16.18A PASS	40A (IN FREE AIR)	28.4A (IN FREE AIR)
2	1	DC CIRCUIT (TRANSITIONED): JUNCTION BOX TO TESLA POWERWALL 3 (LEADER UNIT)	10 AWG THWN-2 COPPER	0.75" DIA. EMT	6 3 X DC(+) 3 X DC(-)	27.8%	10.35A (I_sc)	INTEGRATED DC DISCONNECT WITHIN INVERTER	10 AWG THWN-2 COPPER	0.71 (59°C)	0.8	12.94A (I_sc)	16.18A (I_sc)	35A ≥ 16.18A PASS	40A (IN CONDUIT)	22.72A (IN CONDUIT)
3	1	DC CIRCUIT (TRANSITIONED): JUNCTION BOX TO TESLA POWERWALL 3 (FOLLOWER UNIT)	10 AWG THWN-2 COPPER	0.75" DIA. EMT	6 3 X DC(+) 3 X DC(-)	27.8%	10.35A (I_sc)	INTEGRATED DC DISCONNECT WITHIN INVERTER	10 AWG THWN-2 COPPER	0.71 (59°C)	0.8	12.94A (I_sc)	16.18A (I_sc)	35A ≥ 16.18A PASS	40A (IN CONDUIT)	22.72A (IN CONDUIT)
4	1	TESLA POWERWALL 3 (LEADER UNIT) OUTPUT: TESLA POWERWALL 3 (LEADER UNIT) TO 125A SOLAR-ONLY LOAD CENTER	6 AWG THWN-2 COPPER	0.75" DIA. EMT	3 (L1, L2, N) X 1	32.6%	48A	60A / 2P (CB1)	10 AWG THWN-2 COPPER	0.91 (37°C)	1.0	48A	60A	65A ≥ 60A PASS	75A (IN CONDUIT)	68.25A (IN CONDUIT)
5	1	TESLA POWERWALL 3 (FOLLOWER UNIT) OUTPUT: TESLA POWERWALL 3 (FOLLOWER UNIT) TO 125A SOLAR-ONLY LOAD CENTER	6 AWG THWN-2 COPPER	0.75" DIA. EMT	3 (L1, L2, N) X 1	32.6%	48A	60A / 2P (CB2)	10 AWG THWN-2 COPPER	0.91 (37°C)	1.0	48A	60A	65A ≥ 60A PASS	75A (IN CONDUIT)	68.25A (IN CONDUIT)
6	1	COMBINED OUTPUT OF STRING INVERTERS: 125A SOLAR-ONLY LOAD CENTER TO TESLA BACKUP GATEWAY 2	1 AWG THWN-2 COPPER	1.25" DIA. EMT	3 (L1, L2, N) X 1	34.6%	96A	125A / 2P (CB3)	6 AWG THWN-2 COPPER	0.91 (37°C)	1.0	96A	120A	130A ≥ 120A PASS	150A (IN CONDUIT)	136.5A (IN CONDUIT)
7	1	200A BACKED-UP LOADS PANEL OUTPUT: 200A BACKED-UP LOADS PANEL TO TESLA BACKUP GATEWAY 2	3/0 AWG THWN-2 COPPER (L1 & L2) 1/0 AWG THWN-2 COPPER (NEUTRAL)	2.00" DIA. EMT	3 (L1, L2, N) X 1	23.0%	200A MAX. OUTPUT	200A / 2P (CB5) LOAD BREAKER 200A / 2P (CB6) MAIN BREAKER WITHIN BACKED UP LOADS PANELBOARD	6 AWG THWN-2 COPPER	0.91 (37°C)	1.0	200A MAX. OUTPUT	200A MAX. OUTPUT	200A ≥ 200A PASS	225A (IN CONDUIT)	204.75A (IN CONDUIT)
8	1	TESLA BACKUP GATEWAY 2 INPUT: BATTERY SYSTEM DISCONNECT (DS1) TO TESLA BACKUP GATEWAY 2	3/0 AWG THWN-2 COPPER (L1 & L2) 1/0 AWG THWN-2 COPPER (NEUTRAL)	2.00" DIA. EMT	3 (L1, L2, N) X 1	23.0%	200A MAX. OUTPUT	200A / 2P (CB4) GRID BREAKER 200A / 2P (DS1)	6 AWG THWN-2 COPPER	0.91 (37°C)	1.0	200A MAX. OUTPUT	200A MAX. OUTPUT	200A ≥ 200A PASS	225A (IN CONDUIT)	204.75A (IN CONDUIT)
9	1	BATTERY SYSTEM DISCONNECT (DS1) OUTPUT: BATTERY SYSTEM DISCONNECT (DS1) TO 200A CIRCUIT BREAKER LOCATED WITHIN METER / MAIN COMBINATION SERVICE ENTRANCE (LOAD-SIDE POINT OF INTERCONNECTION VIA DOUBLE POLE MAIN CIRCUIT BREAKER)	3/0 AWG THWN-2 COPPER (L1 & L2) 1/0 AWG THWN-2 COPPER (NEUTRAL)	2.00" DIA. EMT	3 (L1, L2, N) X 1	23.0%	200A MAX. OUTPUT	200A / 2P (CB7) MAIN BREAKER WITHIN METER / MAIN SERVICE ENTRANCE	6 AWG THWN-2 COPPER	0.91 (37°C)	1.0	200A MAX. OUTPUT	200A MAX. OUTPUT	200A ≥ 200A PASS	225A (IN CONDUIT)	204.75A (IN CONDUIT)
ALL CONDUCTORS, OCPD SIZES AND TYPES SPECIFIED ACCORDING TO CEC ARTICLES 690.8(A)(1), CEC ARTICLE 240, AND CEC ARTICLE 690.7.																

OWNER-BUILDER
NAME: (INFO WITHHELD)
PHONE: (INFO WITHHELD)

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20241021-189334
DRAWN BY: SCM
DATE: 10/21/2024

A

PV-3C

SINGLE-LINE DIAGRAM
SCALE: N/A

PV-3C

OVERALL SYSTEM
RATED AC CURRENT

PHOTOVOLTAIC SYSTEM
AC DISCONNECT

OPERATING CURRENT 96 AMPS
OPERATING VOLTAGE 240 VOLTS

CEC 690.14(C)(2) & CEC 690.54

! WARNING

DUAL POWER SUPPLY

⚡

SECOND SOURCE
IS PHOTOVOLTAIC
SYSTEM

NET METER

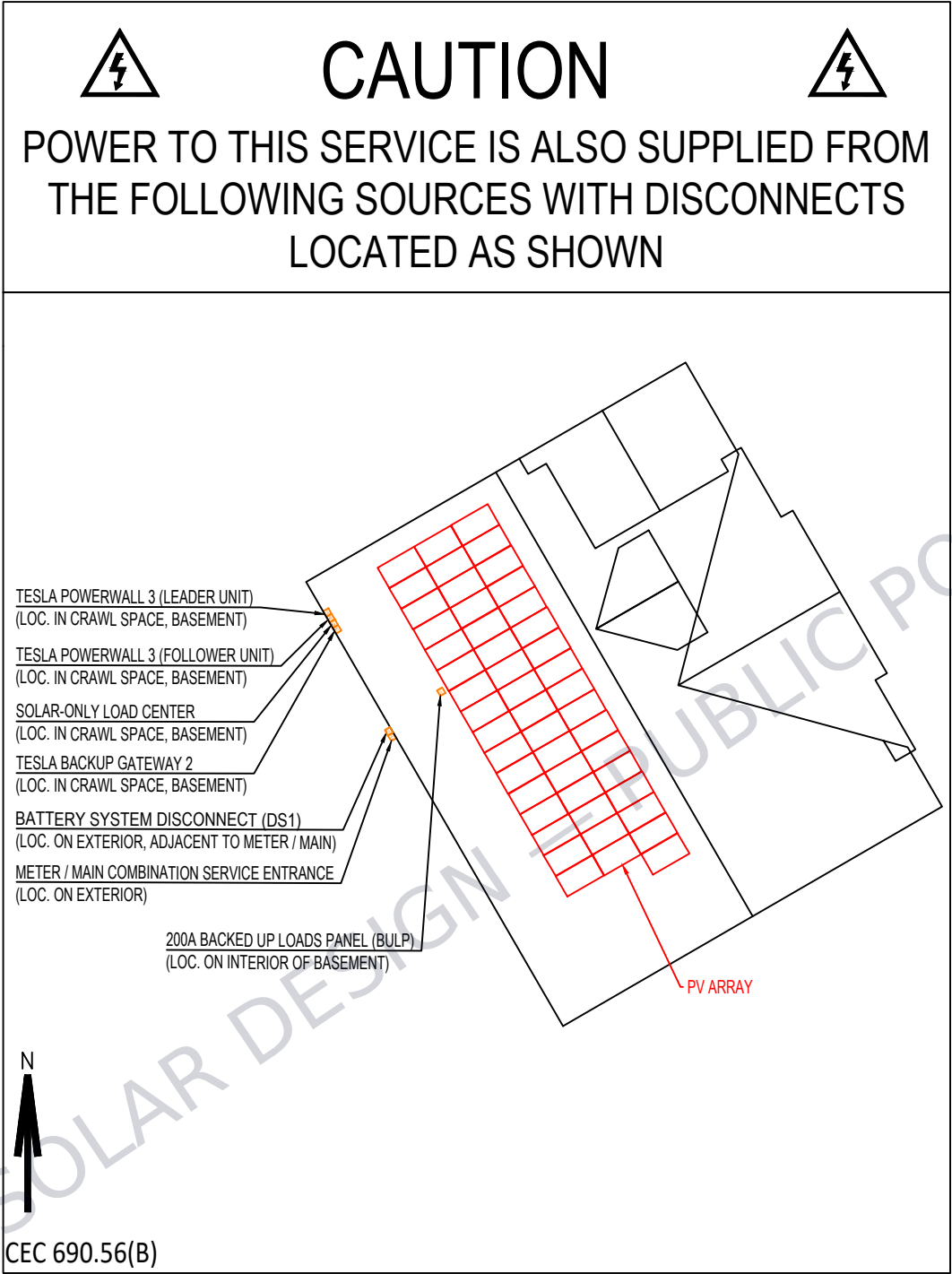
SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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

⚠

SOLAR ELECTRIC
PV PANELS

SITE OVERVIEW



⚠ WARNING ⚠

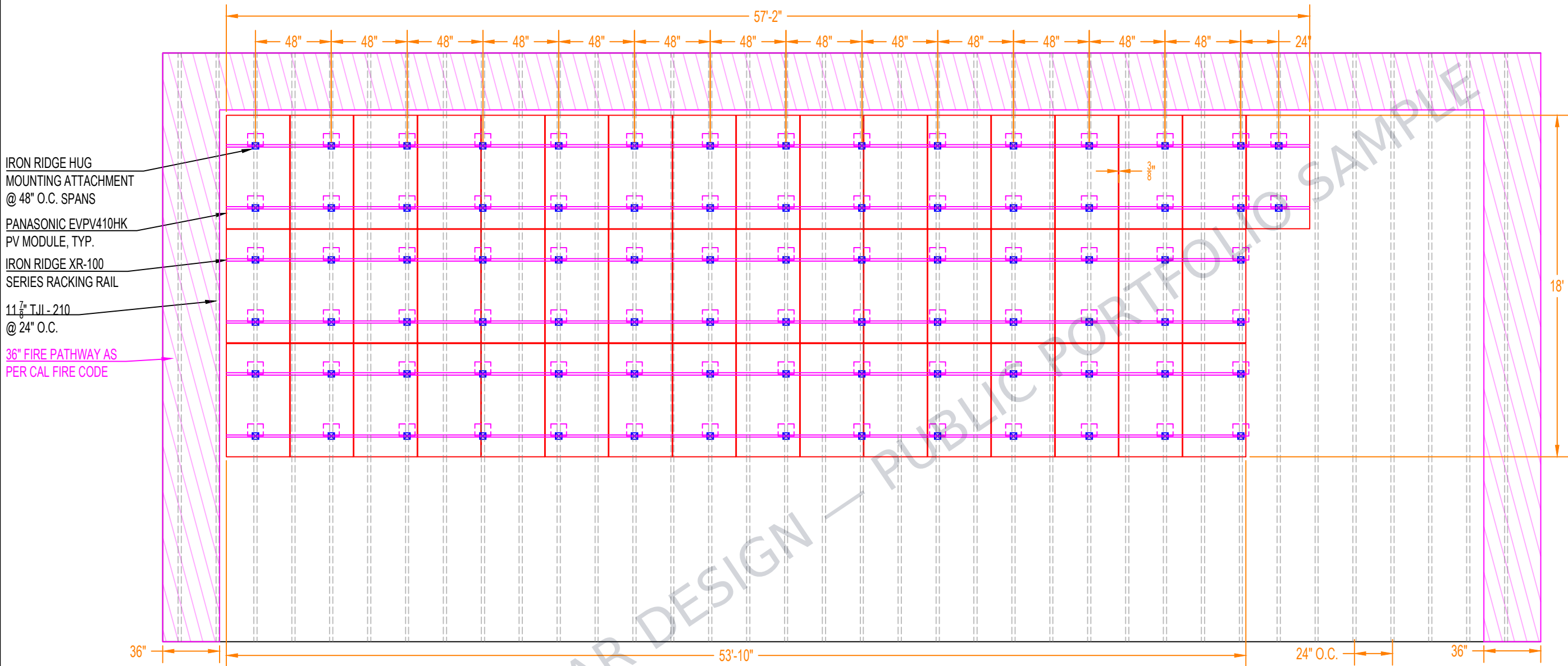
TRIPLE POWER SUPPLY
SOURCES: UTILITY GRID AND
PV SOLAR ELECTRIC SYSTEM AND
ENERGY STORAGE SYSTEM (ESS)

CURRENT OF BATTERY SYSTEM 96A
VOLTAGE OF BATTERY SYSTEM 240VAC

⚠ WARNING ⚠

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

OWNER-BUILDER	
NAME: (INFO WITHHELD)	
PHONE: (INFO WITHHELD)	
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NEW GRID-TIED SYSTEM 20.09KW W/ AC-COUPLED BATTERY-BACKUP (PARTIAL-HOME BACKUP APPLICATION)	(INFO WITHHELD FOR PUBLIC SAMPLE)
PLACARDS	
PROJECT NO: GSD-20241021-189334	
DRAWN BY: SCM	
DATE: 10/21/2024	
PV-4	



ROOF INFORMATION	
ROOF TYPE	COMPOSITE SHINGLE
PITCH	8:12
TJI JOIST SPACING	24" O.C.
TJI JOIST DIMENSIONS	11 7/8" TJI - 210
LAYOUT SPECIFICATIONS	
NUMBER OF MODULES	49
AREA	976 SQ. FT
AZIMUTH	240°
TOTAL WEIGHT OF ARRAY	2,539.4 LBS
DEAD LOAD	2.60 PSF

LOCAL DESIGN CRITERIA	
WIND EXPOSURE CATEGORY	C
SEISMIC DESIGN CATEGORY	D
RISK CATEGORY	II
BASIC WIND SPEED	95 MPH
GROUND SNOW LOAD	120 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-10 FOR A STRUCTURAL CERTIFICATION LETTER FOR THE IRON RIDGE FLUSH MOUNT SYSTEM. LETTER IS STAMPED BY A STATE OF CALIFORNIA REGISTERED PROFESSIONAL ENGINEER (PE).
5	PLEASE SEE SHEETS PV-5B, PV-5C, AND PV-5D FOR A SITE-SPECIFIC IRON RIDGE DESIGN REPORT FOR THIS PHOTOVOLTAIC ARRAY.

OWNER-BUILDER
NAME: (INFO WITHHELD)
PHONE: (INFO WITHHELD)

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

ATTACHMENT PLAN

PROJECT NO: GSD-20241021-189334
DRAWN BY: SCM
DATE: 10/21/2024

PV-5A

Project Details

Name		Date	12/31/2025
Location		Total modules	49
Module	Panasonic: EVPV400HK (30mm)	Total watts	19,600
Dimensions	Dimensions: 71.69" x 40.0" x 1.18" (1821.0mm x 1016.0mm x 30.0mm)	Attachments	86
ASCE	7-16	Rails per row	2



System Weight	
Total system weight	2,539.4 lbs
Weight/attachment	29.5 lbs
Racking weight	325.1 lbs
Distributed weight	2.6 psf

Load Assumptions	
Wind exposure	C
Wind speed	95 mph
Ground snow load	120 psf
Attachment spacing portrait	4.0'
Site Elevation	4621.0 ft
S _{ps}	0.397

Roof Information			
Roof Material Family	Comp Shingle	Roof material	Comp Shingle
Risk category	II	Roof attachment	Halo UltraGrip (Rafter attached)
		Staggered attachments	No
Attachment hardware	Square		
Roof shape	Gable		
Specific gravity	0.42		

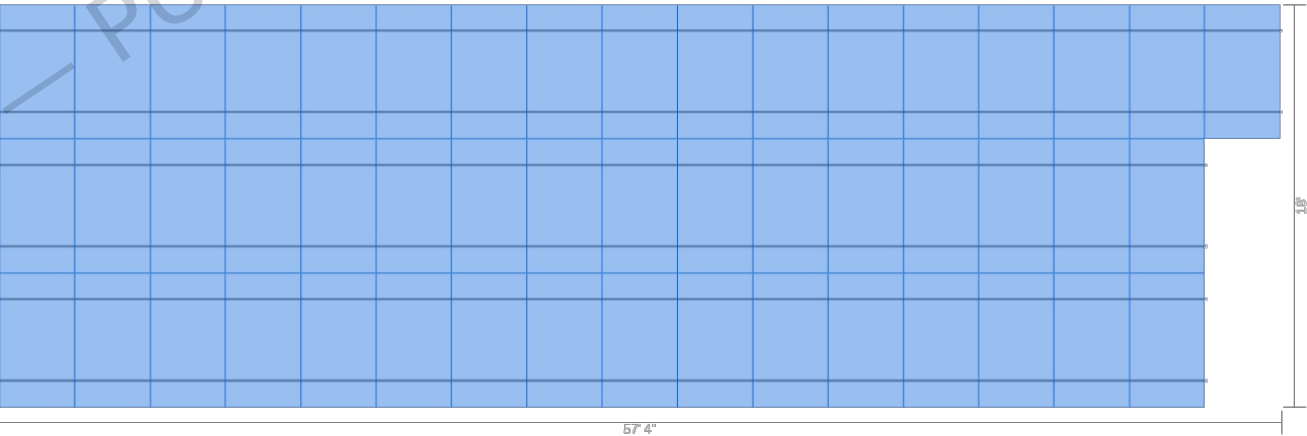
Roof Plane A

Height	30 ft	Slope	33 °	Rafter spacing	24 in
--------	-------	-------	------	----------------	-------

Roof Plane A: Roof Section 1

Details		Weights
Panels: 49	Provided rail: 350' [2 x 84", 24 x 168"]	Total weight: 2,539.4 lbs
Rail orientation: East-West	Attachments: 86	Weight/attachment: 29.5 lbs
Panel orientation: Portrait	Splices: 20	Total Area: 989.0 sq ft
Entry type: Graphical	Clamps: 92	Distributed weight: 2.6 psf

Diagram



Segments									
Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps	
A	17	57' 4"	57' 4"	8"	126' [2 x 84", 8 x 168"]	30	8	32	
B	16	54'	54'	1'	112' [8 x 168"]	28	6	30	
Row segment totals (x 2) →					224' [16 x 168"]	56	12	60	

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

IR DESIGN REPORT

PROJECT NO: GSD-20241021-189334
DRAWN BY: SCM
DATE: 10/21/2024

PV-5B

Span Details XR100 - Portrait

Zone	Module Position	Max span	Max cantilever
Zone 1/2e/2r	Normal	4' 6"	1' 10"
Zone 2n/3r	Normal	4' 6"	1' 10"
Zone 3e	Normal	4' 6"	1' 10"

Reaction Forces XR100 - Portrait

Zone	Module Position	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (lbs)	Lateral Perp (lbs)
Zone 1/2e/2r	Normal	9.7	434	130	282	44
Zone 2n/3r	Normal	11.5	434	149	282	44
Zone 3e	Normal	14.2	434	190	282	44

Attachment Span Details Halo UltraGrip (Rafter attached) - Portrait

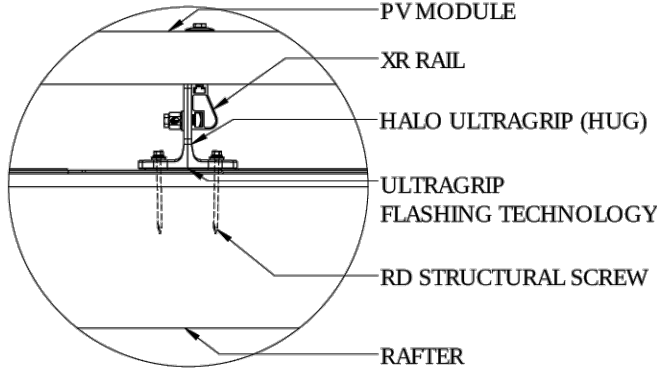
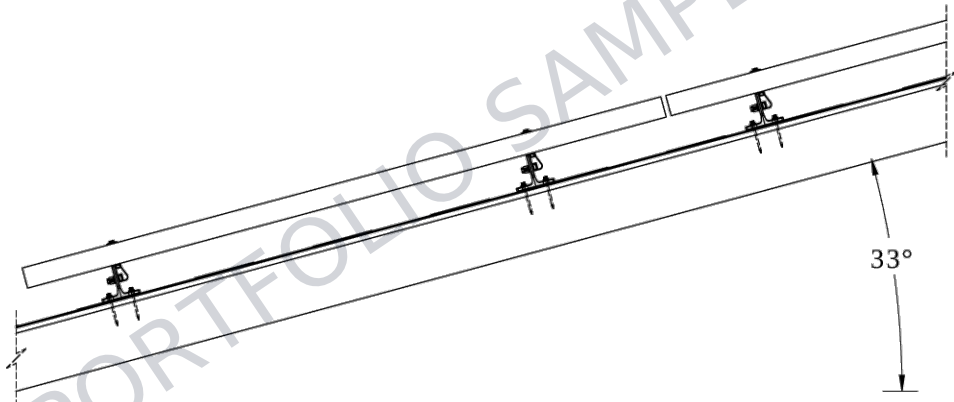
Zone	Module Position	Max attachment span
Zone 1/2e/2r	Normal	4' 6"
Zone 2n/3r	Normal	4' 6"
Zone 3e	Normal	4' 6"

*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Portrait

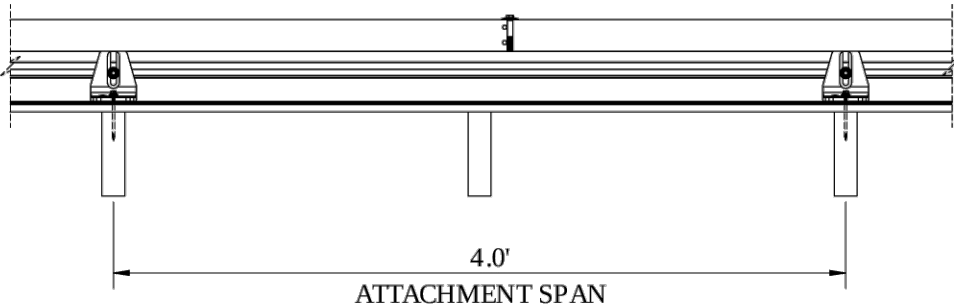
Zone	Module Position	Max attachment span
Zone 1/2e/2r	Normal	1' 8"
Zone 2n/3r	Normal	1' 8"
Zone 3e	Normal	1' 8"

* Based on minimum 7/16" sheathing thickness

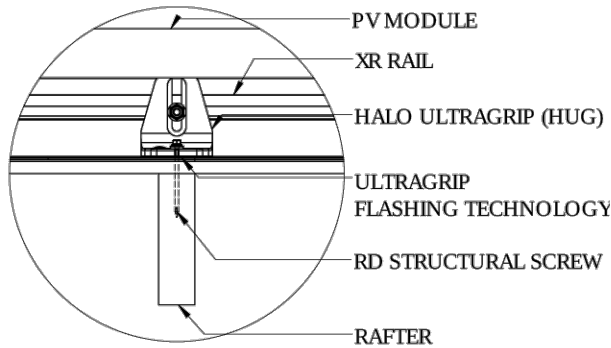
Side View (portrait)



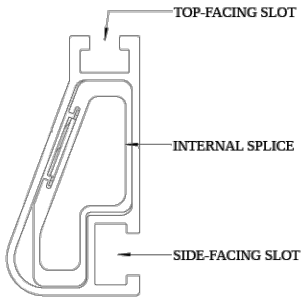
Front View (portrait)



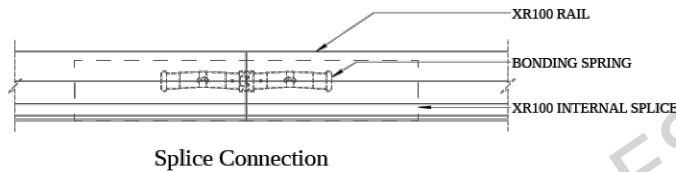
Front View (portrait)



Splice Details

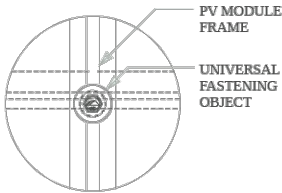


XR100

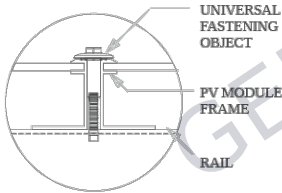


Splice Connection

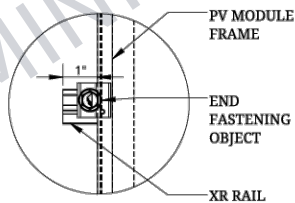
Clamp Detail



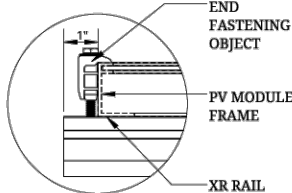
Mid Clamp, Plan



Mid Clamp, Front



End Clamp, Plan



End Clamp, Front

Bill of Materials

Part	Spares	Total Qty
Rails & Splices		
XR-100-168A XR100, Rail 168" Clear * 1 x 168" rail to be cut on-site into 84" sections.	0	25
XR100-BOSS-01-M1 Bonded Splice, XR100	0	20
Clamps & Grounding		
UFO-CL-01-A1 Universal Module Clamp, Clear	0	92
UFO-END-01-A1 End Fastening Object (End Clamp, 30-40mm), Mill	0	12
XR-LUG-03-A1 Grounding Lug, Low Profile	0	3
Attachments		
QM-HUG-01-M1 Halo UltraGrip, Mill	0	86
HW-RD1430-01-M1 RD Structural Screw, 3.0L * Add desired additional screws by adjusting spares column.	0	172
BHW-SQ-02-A1 Square-Bolt Bonding Hardware	0	86

OWNER-BUILDER

NAME: (INFO WITHHELD)

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

IR DESIGN REPORT

PROJECT NO: GSD-20241021-189334

DRAWN BY: SCM

DATE: 10/21/2024

PV-5D



Tech Brief



The Respect Your Roof Deserves

When integrating with a home, solar attachments must be dependable for the lifetime of the rooftop. Due to recent innovations, many asphalt shingles have bonded courses. A mount that protects without the need to pry shingles can really speed things up.

Halo UltraGrip™ (HUG™) is here to respect the roof. Its Halo is a cast-aluminum barrier that encases the UltraGrip, our industrial-grade, foam-and-mastic seal. This allows HUG to accelerate the installation process and provide the utmost in waterproofing protection. Give your roof a HUG.™



UltraGrip™ Seal Technology

HUG UltraGrip utilizes a state-of-the-art seal design that uses a unique, foam-and-mastic combination. The foam-backed adhesive provides an entirely new flashing system that conforms and adheres to every nook and cranny of composition shingles, filling gaps and shingle step-downs (up to 1/8" in height).

Multi-Tiered Waterproofing

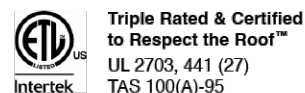
HUG utilizes a multi-tiered stack of components to provide revolutionary waterproofing protection. The Halo cast-aluminum, raised-perimeter foundation surrounds the UltraGrip base—a foam-backed mastic seal combination that prevents water intrusion by adhering and sealing with the shingle surface.

Halo UltraGrip™ is part of the QuickMount® product line.



Rafter & Deck Mounting Options

Mount HUG to the roof rafters, the roof deck, or both with our custom-engineered RD (rafter-or-deck) Structural Screw. The RD Structural Screw anchors HUG to the roof with an EPDM sealing washer, completing the stack of waterproofing barriers. See backside for more installation information.



Adaptive, Rafter-Friendly Installation



Hit the rafter? Good to go!

When you find a rafter, you can move on. Only 2 RD Structural Screws are needed.



Miss the rafter? Try it again.

Place another screw to the left or right. If rafter is found, install 3rd and final screw.



Still no luck? Install the rest.

If more than 3 screws miss the rafter, secure six screws to deck mount it.

Trusted Strength & Less Hassle



25-Year Warranty
Product guaranteed free of impairing defects.

Structural capacities of HUG™ were reviewed in many load directions, with racking rail running cross-slope or up-slope in relation to roof pitch.

For further details, see the HUG certification letters for attaching to rafters and decking.

IronRidge designed the HUG, in combination with the RD Structural Screw to streamline installs, which means the following:

- No prying shingles
- No roof nail interference
- No pilot holes necessary
- No sealant (in most cases)
- No butyl shims needed

Attachment Loading

The rafter-mounted HUG has been tested and rated to support 1004 (lbs) of uplift and 368 (lbs) of lateral load.

Structural Design

Parts are designed and certified for compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings

HUG passed both the UL 441 Section 27 "Rain Test" and TAS 100(A)-95 "Wind Driven Rain Test" by Intertek.

UL 2703 System

Systems conform to UL 2703 mechanical and bonding requirements. See Flush Mount Manual for more info.

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OWNER-BUILDER

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W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

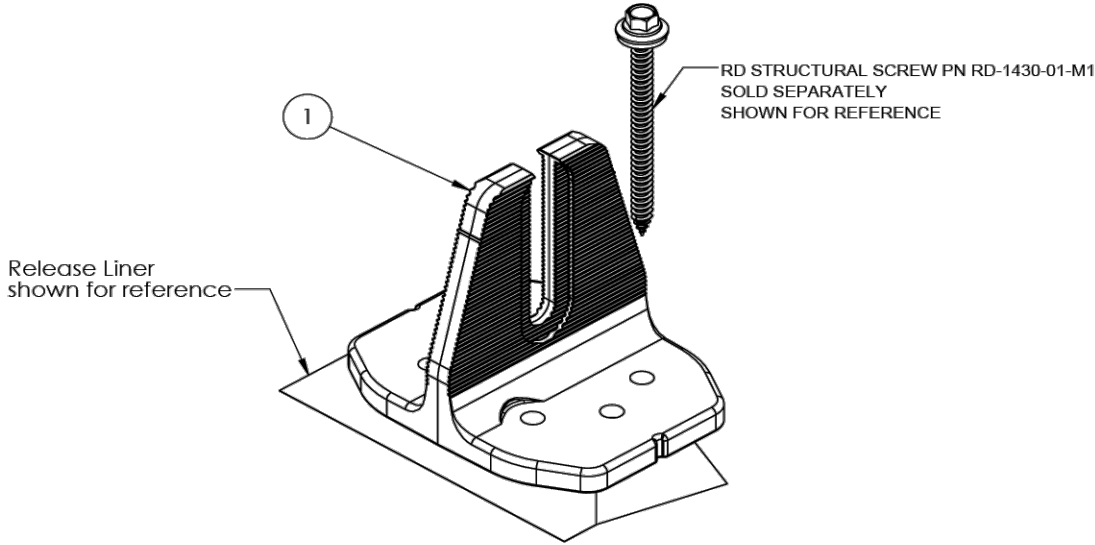
MOUNTING DETAIL

PROJECT NO: GSD-20241021-189334

DRAWN BY: SCM

DATE: 10/21/2024

PV-6A



Release Liner
shown for reference

RD STRUCTURAL SCREW PN RD-1430-01-M1
SOLD SEPARATELY
SHOWN FOR REFERENCE

1

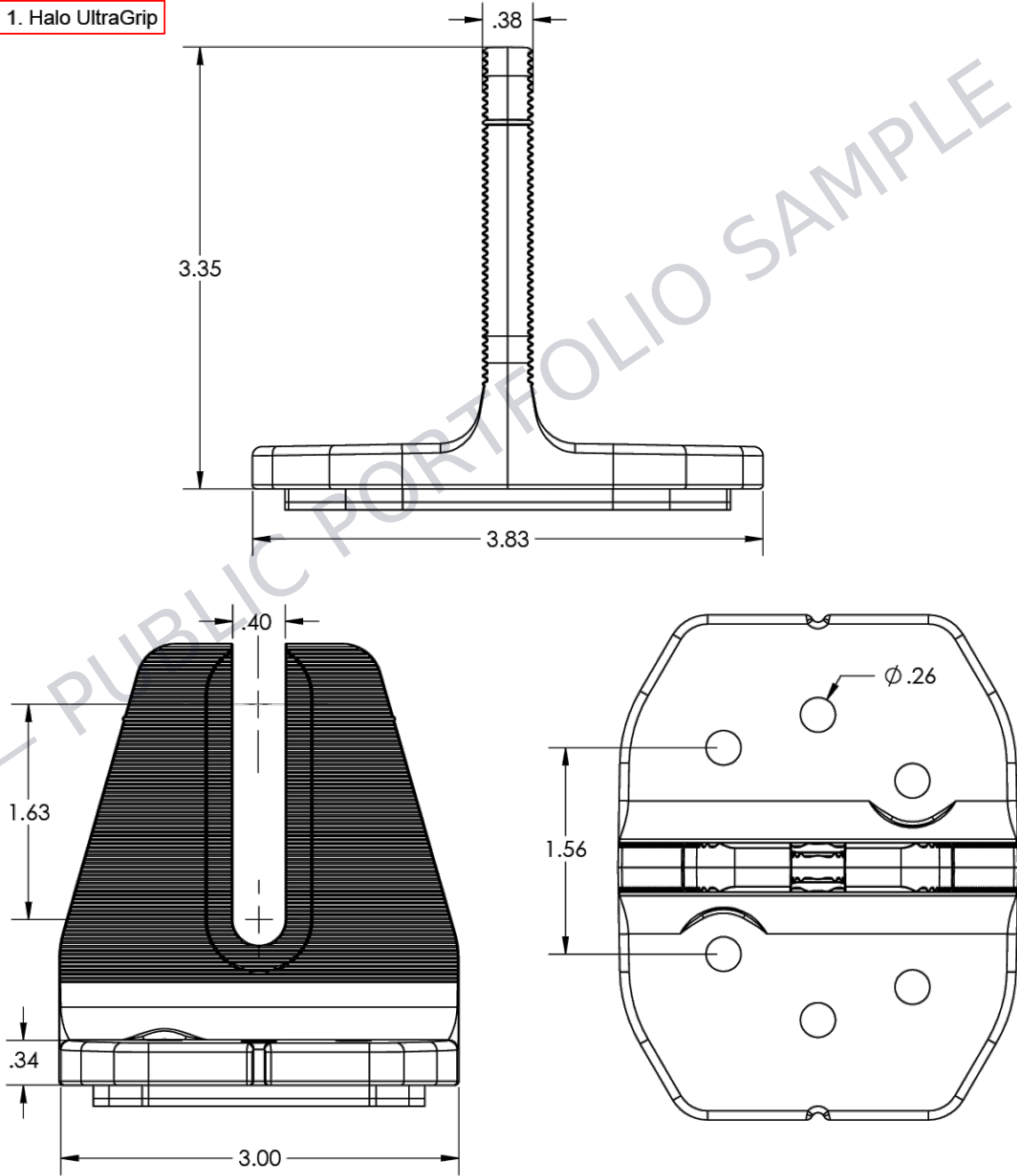
ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

PART NUMBER	DESCRIPTION
QM-HUG-01-M1	Halo UltraGrip - Mill
QM-HUG-01-B1	Halo UltraGrip - Black

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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

1. Halo UltraGrip



3.35

.38

3.83

.40

1.63

.34

3.00

1.56

Ø .26

Property	Value
Material	300 Series Aluminium
Finish	Mill or Black

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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

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MOUNTING DETAIL

PROJECT NO: GSD-20241021-189334
DRAWN BY: SCM
DATE: 10/21/2024

PV-6B



Flush Mount System

Datasheet



Built for solar's toughest roofs.

IronRidge builds the strongest mounting system for pitched roofs in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.

Strength Tested

All components evaluated for superior structural performance.

Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof.

UL 2703 Listed System

Entire system and components meet 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.

XR Rails ☺

XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear and black finish

XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear and black finish

XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Bonded Splices

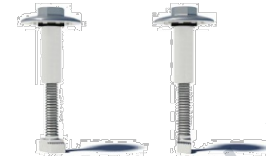


All rails use internal splices for seamless connections.

- Self-drilling screws
- Varying versions for rails
- Forms secure bonding

Clamps & Grounding ☺

UFOs



Universal Fastening Objects bond modules to rails.

- Fully assembled & lubed
- Single, universal size
- Clear and black finish

Stopper Sleeves



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

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

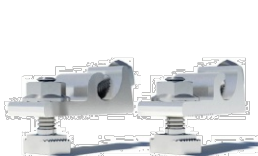
CAMO



Bond modules to rails while staying completely hidden.

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

Grounding Lugs



Connect arrays to equipment ground.

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

Attachments ☺

FlashFoot2



Flash and mount XR Rails with superior waterproofing.

- Twist-on Cap eases install
- Wind-driven rain tested
- Mill and black finish

Conduit Mount



Flash and mount conduit, strut, or junction boxes.

- Twist-on Cap eases install
- Wind-driven rain tested
- Secures 3/4" or 1" conduit

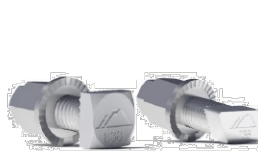
Slotted L-Feet



Drop-in design for rapid rail attachment.

- Secure rail connections
- Slot for vertical adjusting
- Clear and black finish

Bonding Hardware



Bond and attach XR Rails to roof attachments.

- T & Square Bolt options
- Nut uses 7/16" socket
- Assembled and lubricated

Resources



Design Assistant

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

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



NABCEP Certified Training

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

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

OWNER-BUILDER
NAME: (INFO WITHHELD)
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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

RACKING DATASHEET

PROJECT NO: GSD-20241021-189334
DRAWN BY: SCM
DATE: 10/21/2024

PV-7

EVERVOLT®

EVERVOLT® SOLAR MODULE BLACK SERIES

Panasonic

EVERVOLT®

EVERVOLT® SOLAR MODULE BLACK SERIES

Panasonic

410HK/400HK

410HK/400HK

The Panasonic Advantage



Higher Module Efficiency

Superior module efficiency of 22.2% and 21.6%, respectively, allows maximum power production with less roof space. Offering clean aesthetics and one of the industry's lowest annual degradation rates, power output of at least 92% is guaranteed after 25 years.



EVERVOLT AllGuard, AllGuard and TripleGuard 25-Year Warranty

A long-term warranty is only as reliable as the company behind it. EVERVOLT AllGuard, AllGuard and TripleGuard 25-year warranties cover EVERVOLT® panels for performance, product, parts and labor¹ for 25 years. Whether in year three or year 25, your Panasonic warranty will be there when you need it.



High Efficiency in High Temperatures

Produce more energy throughout the day even on the hottest days in the warmest climates. EVERVOLT® solar panels outperform others when temperatures rise due to our industry-leading 0.26%/°C temperature coefficient.



Heterojunction Cell Technology with Gapless Connections

Half-cut cells with heterojunction technology with gapcell connections minimizes electron loss, maximizes conversion efficiency, and produces considerably higher power output over conventional panels.



Durability & Quality Assurance

N-type cells result in minimal Low Induced degradation (LID) and Potential Induced degradation (PID), which supports reliability and longevity. As a solar pioneer for over 40 years, Panasonic EVERVOLT® solar panels are backed by innovation, experience and a brand you can trust.



Improved Performance When Shaded

Continuous power production in shaded areas for greater energy yields and output. More sunlight absorption means more clean power to your home.



ELECTRICAL SPECIFICATIONS

Model	EV PV410HK	EV PV400HK
Rated Power (P _{max}) ¹	410W	400W
Maximum Power Voltage (V _{pm})	42.2V	41.4V
Maximum Power Current (I _{pm})	9.72A	9.67A
Open Circuit Voltage (V _{oc})	49.4V	48.8V
Short Circuit Current (I _{sc})	10.42A	10.40A
Temperature Coefficient (P _{max})	-0.26 %/°C	
Temperature Coefficient (V _{oc})	-0.24 %/°C	
Temperature Coefficient (I _{sc})	0.04 %/°C	
NOCT	44°C (±2°C)	
CEC PTC Rating	390.8W	381.0W
Module Efficiency	22.2%	21.6%
Power Density	20.6 W/ft²	20.1 W/ft²
Maximum System Voltage	1000V	
Maximum Series Fuse	25 A	
Watt Class Sorting	-0/+10W	

MECHANICAL SPECIFICATIONS

Junction Box	3-part, 3 bypass diodes, IP68 rated in accordance with IEC 62790
Connector Type	Stäubli MC4 PV-KBT4/KST4 (4 mm²) in accordance with IEC 62852 only when connected
Cable Size / Type	12AWG(4mm²) PV Wire, 43in + 47in in accordance with EN 50618
Max Snow Load (+) ²	146 psf (7000 Pa)*
Max Wind Load (-) ²	83.5 psf (4000 Pa)*
Dimensions LxWxH	71.7 x 40.0 x 1.2 in (1821 x 1016 x 30 mm)
Weight	45.0 lbs (20.5kg)
Pallet Dimensions LxWxH	74 x 41.5 x 47.5 in
Quantity per Pallet / Pallet Weight	33 pcs/ 1620 lbs.(735kg)
Quantity per 40' Container	792 pcs

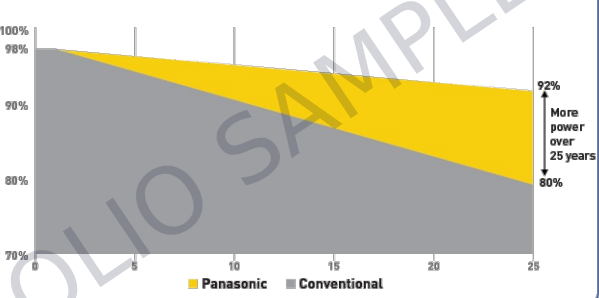
*Test Load. Design Load should be multiplied by two thirds.

OPERATING CONDITIONS AND SAFETY RATINGS

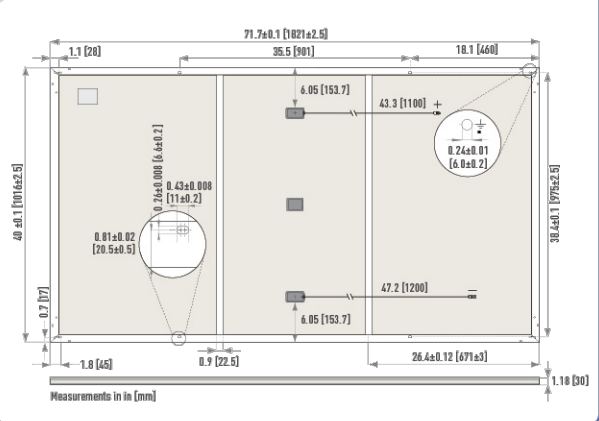
Certifications	IEC61215-2:2016 (Hailstone 35mm)
	Fire Type 2 (UL 61730)
	Salt Mist (IEC 61701)
	PID (IEC 62804)
	Ammonia Resistance (IEC 62716)
Operating Temperature	Lead-free acc. to RoHS EU 863/2015 (IEC 62321)
	-40°F to 185°F [-40°C to 85°C]
	25 Yrs Workmanship and Power Output (Linear)***
	98%
	0.25%
Limited Warranty	
Power Output in Year 1	
Annual Degradation	
Power Output in Year 25	92%

NOTE: Values at standard test conditions (STC: air mass AM1.5 irradiance 1000W/m², temperature 25°C).
* Maximum power at delivery. For guarantee conditions, please check our guarantee document.
** Equipment must be installed by a Panasonic Authorized, Premium, or Elite installer for the twenty-five (25) year Limited Labor Warranty included in the EVERVOLT AllGuard, AllGuard and TripleGuard warranty too apply.
*** Refer to installation manual for detailed mechanical loading information
*** 1st year 98%, after 2nd year 0.25% annual degradation to year 25.

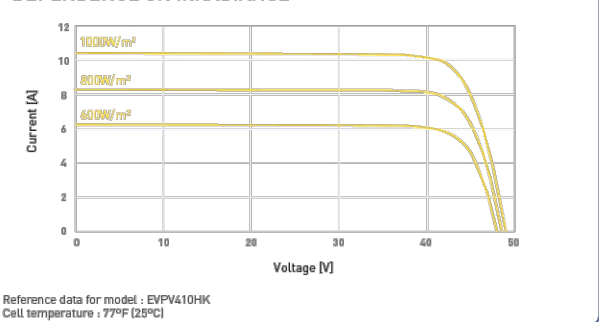
PERFORMANCE WARRANTY



DIMENSIONS



DEPENDENCE ON IRRADIANCE



NOTE: Specifications and information above may change without notice.
CAUTION! Please read the installation manual carefully before using the products.
Used electrical and electronic products must not be mixed with general household waste. For proper treatment, recovery and recycling of old products, please take them to applicable collection points in accordance with your national legislation.

Panasonic

Panasonic Eco Systems North America
Two Riverfront Plaza, Newark, NJ 07102
panasonicsolar@us.panasonic.com
na.panasonic.com/us/solar

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RS23098DS-R2

Panasonic

Panasonic Eco Systems North America
Two Riverfront Plaza, Newark, NJ 07102
panasonicsolar@us.panasonic.com
na.panasonic.com/us/solar

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RS23098DS-R2

OWNER-BUILDER

NAME: (INFO WITHHELD)

PHONE: (INFO WITHHELD)

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

MODULE DATASHEET

PROJECT NO: GSD-20241021-189334

DRAWN BY: SCM

DATE: 10/21/2024

PV-8

1 PV MODULE DATASHEET
PV-8 SCALE: NTS



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:

IronRidge, Inc.
1495 Zephyr Ave.
Hayward, CA 94544
USA

Product Description:

Flush Mount System with XR Rails.

Ratings & Principle Characteristics:

Fire Class Resistance Rating:
-Flush Mount (Symmetrical). Class A Fire Rated for Low Slope applications when using Type 1, 2 and 3, listed photovoltaic modules. Class A Fire Rated for Steep Slope applications with Type1, 2 and 3, listed photovoltaic modules. Tested with a 5" gap (distance between the bottom the module frame and the roof covering), per the standard this system can be installed at any gap allowed by the manufacturers installation instructions. No perimeter guarding is required. This rating is applicable with any IronRidge or 3'rd party roof anchor.

Models:

IronRidge Flush Mount with XR Rails

Brand Name:

IronRidge Flush Mount

Relevant Standards:

UL 2703 (Section 15.2 and 15.3) Standard for Safety Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels, First Edition dated Jan. 28, 2015 Referencing UL1703 Third Edition dated Nov. 18, 2014, (Section 31.2) Standard for Safety for Flat-Plate Photovoltaic Modules and Panels.

Verification Issuing Office:

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

Date of Tests:

08/27/2014 to 03/17/2015

Test Report Number(s):

101769343MID-001r1, 101769343MID-001a, 101915978MID-001 & 101999492MID-001ar1-cr1.

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: Chris Zimbrich
Title: Technician II, Fire Resistance

Reviewed by: Chad Naggs
Title: Technician I, Fire Resistance

Signature:
Date: 05/25/2016

Signature:
Date: 05/25/2016

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)



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.

Tech Brief

Class A Fire Rating

Fire Testing Process

Test Setup

Solar Modules

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

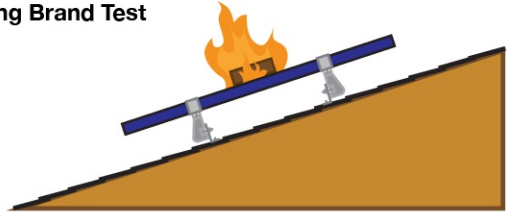
Mounting System

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

Roof Covering

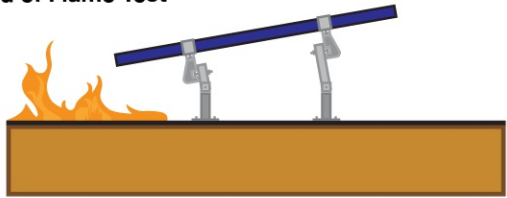
Roof covering products are given a Fire Class Rating of A, B or C based on their tested fire resistance.

Burning Brand Test



A burning wooden block is placed on module as a fan blows at 12 mph. Flame cannot be seen on underside of roof within 90 minutes.

Spread of Flame Test



Flame at southern edge of roof is aimed up the roof as a fan blows at 12 mph. The flame cannot spread 6 feet or more in 10 minutes.

OWNER-BUILDER
NAME: (INFO WITHHELD)
PHONE: (INFO WITHHELD)

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

CLASS A FIRE RATING

PROJECT NO: GSD-20241021-189334

DRAWN BY: SCM

DATE: 10/21/2024

PV-9



CLASS A FIRE RATING DATASHEET
SCALE: NTS



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



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

Attn: Sean McDonald, CEO, IronRidge Inc.
Date: November 16th, 2022
Re: Structural Certification and Span Tables for the IronRidge Flush Mount System

This letter addresses the structural performance and code compliance of IronRidge’s Flush Mount System. The contents of the letter shall be read in its entirety before applying to any project design. The Flush Mount System is a proprietary rooftop mounting system used to support photovoltaic (PV) modules installed in portrait or landscape orientation and set parallel to the underlying roof surface. PV modules are supported by extruded aluminum XR Rails and secured to the rails with IronRidge mounting clamps. The XR Rails are side mounted to a selected roof attachment with 3/8” stainless steel bonding hardware and then attached directly to the roof structure or to a stanchion that is fastened to the underlying roof structure. Assembly details of a typical Flush Mount installation and its core components are shown in Exhibit EX-0015.

The IronRidge Flush Mount System is 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)
- 2021 International Building Code (IBC-2021)
- 2022 California Building Code (CBC-2022)
- 2020 Aluminum Design Manual (ADM-2020)
- Report SEAOC (Structural Engineer Association of California) PV2-2017 Wind Design for Solar Arrays

The tables included in this letter provide the maximum allowable spans of XR Rails in the Flush Mount System for the respective loads and configurations listed, covering wind exposure categories B, C, & D, roof zones provided in ASCE 7-16 for gable & hip roof profiles, and roof slopes of 8° to 45°. The tabulated spans are applicable when the following conditions are met:

1. *Span* is the distance between two adjacent roof attachment points (measured at the center of the attachment fastener).
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.
3. The underlying roof slope, measured between the roof surface and horizontal plane, is 8° to 45°.
4. The *mean roof height*, defined as the average of the roof eave height and the roof ridge height measured from grade, does not exceed 30 feet.
5. A clearance from the underside of the array to the roof surface of 2” minimum shall be provided and the height of the array, the distance from the module top surface to the roof surface (defined as h_2), shall not exceed 10”.
6. Module length and area shall not exceed the maximum values listed on the respective span tables.
7. All Flush Mount components shall be installed in a professional workmanlike manner per IronRidge’s *Flush Mount Installation Manual* and other applicable standards for the general roof construction practice.

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. This letter certifies the IronRidge products referenced within this document and provides no determination of the project specific conditions including site loads, building profile, & roof zones, which remain the responsibility of the installer or system designer.

Sincerely,



Gang Xuan, SE
Senior Structural Engineer

Digitally signed
by Gang Xuan
Date: 2022.11.18
10:58:00 -08'00'



OWNER-BUILDER	
NAME: (INFO WITHHELD)	
PHONE: (INFO WITHHELD)	
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NEW GRID-TIED SYSTEM 20.09KW W/ AC-COUPLED BATTERY-BACKUP (PARTIAL-HOME BACKUP APPLICATION)	(INFO WITHHELD FOR PUBLIC SAMPLE)
ENGINEERING LETTER	
PROJECT NO: GSD-20241021-189334	
DRAWN BY: SCM	
DATE: 10/21/2024	
PV-10A	

Rail: XR100		Gable Roof Flush Mount System Span Table (inches) - Portrait or Landscape Installation Max Module Length: 80", Max Module SF: 24 SF Exposure C																																												
Wind Speed (mph)	Roof Slope (deg.)	Ground Snow: 0 psf			10 psf			20 psf			30 psf			40 psf			50 psf			60 psf			70 psf*			80 psf*			90 psf*			100 psf*			110 psf*			120 psf*			Exposed Mod.			Edge Mod.		
		Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3			
90 mph	8-20	123	123	112	102	102	102	86	86	86	84	84	84	75	75	75	68	68	68	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	124	96	85	84	72	65
	21-27	121	121	121	99	99	99	84	84	84	83	83	83	76	76	76	69	69	69	64	64	64	59	59	59	56	56	56	53	53	53	50	50	50	48	48	48	48	48	48	121	103	97	96	78	73
	28-45	117	117	117	98	98	98	83	83	83	82	82	82	76	76	76	72	72	72	67	67	67	64	64	64	59	59	59	56	56	56	53	53	53	51	51	51	49	49	49	117	109	97	92	84	76
95 mph	8-20	123	117	104	102	102	102	86	86	86	84	84	84	75	75	75	68	68	68	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	113	88	79	78	67	61
	21-27	121	121	119	99	99	99	84	84	84	83	83	83	76	76	76	69	69	69	64	64	64	59	59	59	56	56	56	53	53	53	50	50	50	48	48	48	48	48	48	120	97	90	90	74	69
	28-45	117	117	114	98	98	98	83	83	83	82	82	82	76	76	76	72	72	72	67	67	67	64	64	64	59	59	59	56	56	56	53	53	53	51	51	51	49	49	49	116	103	91	87	80	72
100 mph	8-20	123	109	97	102	102	97	86	86	86	84	84	84	75	75	75	68	68	68	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	105	83	73	73	64	56
	21-27	121	117	110	99	99	99	84	84	84	83	83	83	76	76	76	69	69	69	64	64	64	59	59	59	56	56	56	53	53	53	50	50	50	48	48	48	48	48	48	113	91	84	85	72	65
	28-45	117	117	108	98	98	98	83	83	83	82	82	82	76	76	76	72	72	72	67	67	67	64	64	64	59	59	59	56	56	56	53	53	53	51	51	51	49	49	49	109	97	86	83	76	68
105 mph	8-20	123	102	91	102	102	91	86	86	86	84	84	84	75	75	75	68	68	68	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	96	77	69	72	60	49
	21-27	121	110	103	99	99	99	84	84	84	83	83	83	76	76	76	69	69	69	64	64	64	59	59	59	56	56	56	53	53	53	50	50	50	48	48	48	48	48	48	106	85	79	81	66	61
	28-45	117	115	103	98	98	98	83	83	83	82	82	82	76	76	76	72	72	72	67	67	67	64	64	64	59	59	59	56	56	56	53	53	53	51	51	51	49	49	49	103	92	81	78	72	65
110 mph	8-20	123	96	85	102	96	85	86	86	86	84	84	84	75	75	75	68	68	68	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	90	73	65	67	55	44
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	28-45	117	109	98	98	98	98	83	83	83	82	82	82	76	76	76	72	72	72	67	67	67	64	64	64	59	59	59	56	56	56	53	53	53	51	51	51	49	49	49	98	87	77	75	69	61
115 mph	8-20	116	90	80	102	90	80	86	86	86	84	84	84	75	75	75	68	68	68	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	83	69	61	64	49	38
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	28-45	117	104	92	98	98	92	83	83	83	82	82	82	76	76	76	72	72	72	67	67	67	64	64	64	59	59	59	56	56	56	53	53	53	51	51	51	49	49	49	92	83	73	72	66	58
120 mph	8-20	108	85	76	102	85	76	86	85	76	84	84	84	76	75	75	68	68	68	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	77	65	56	61	44	35
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	28-45	112	99	88	98	98	88	83	83	83	82	82	82	76	76	76	72	72	72	67	67	67	64	64	64	59	59	59	56	56	56	53	53	53	51	51	51	49	49	49	88	79	69	68	64	55
130 mph	8-20	96	76	68	96	76	68	86	76	68	84	76	68	75	75	68	68	68	68	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	69	58	41	54	36	30
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140 mph	8-20	84	69	64	84	69	64	84	69	64	84	69	64	75	69	64	68	68	64	64	64	64	58	58	58	55	55	55	52	52	52	49	49	49	48	48	48	45	45	45	64	44	33	48	32	25
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	28-45	93	83	74	93	83	74	83	83	74	82	82	74	76	76	74	72	72	72	67	67	67	64	64	64	59	59	59	56	56	56	53	53	53	51	51	51	49	49	49	72	66	58	58	49	37
150 mph	8-20	74	64	51	74	64	51	74	64	51	74	64	51	74	64	51	68	64	51	64	64	51	58	58	51	55	55	51	52	52	51	49	49	49	48	48	48	45	45	45	59	35	29	40	27	22
	21-27	88	72	64	88	72	64	84	72	64	83	72	64	76	72	64	69	69	64	64	64	64	59	59	59	56	56	56																		



UFO Family of Components

Tech Brief

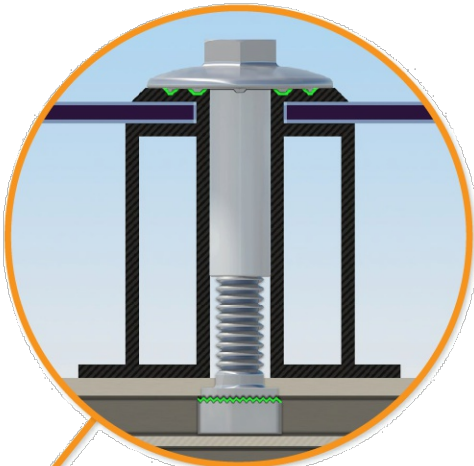
Simplified Grounding for Every Application

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.



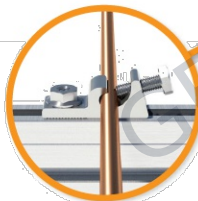
Stopper Sleeve
The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.



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.

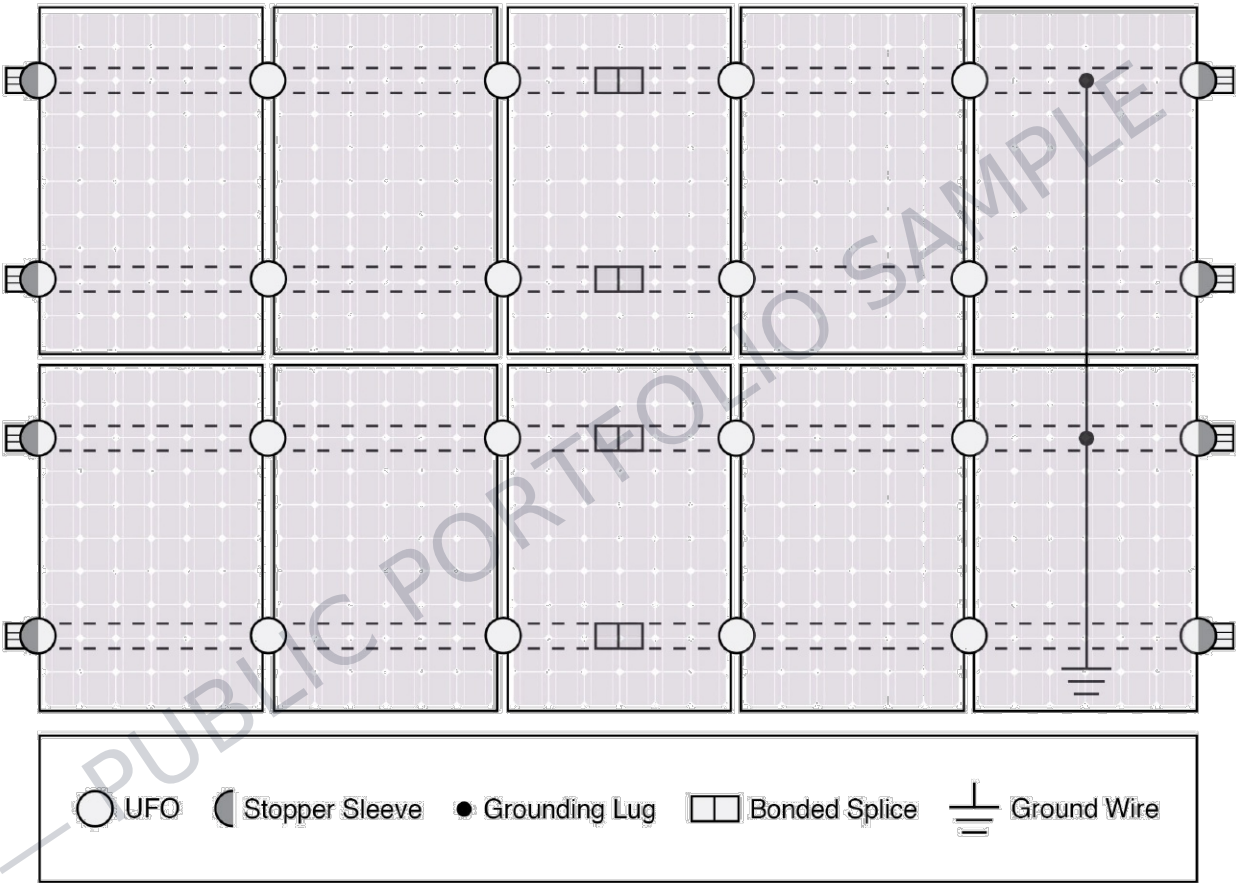


Grounding Lug
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



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.		

Tech Brief

OWNER-BUILDER

NAME: (INFO WITHHELD)

PHONE: (INFO WITHHELD)

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

GROUNDING DETAILS

PROJECT NO: GSD-20241021-189334

DRAWN BY: SCM

DATE: 10/21/2024

PV-11

Powerwall 3 Technical Specifications

System Technical Specifications	Model Number	1707000-xx-y
	Nominal Grid Voltage (Input & Output)	120/240 VAC
	Grid Type	Split phase
	Frequency	60 Hz
	Overcurrent Protection Device	60 A
	Solar to Battery to Home/Grid Efficiency	89% ¹²
	Solar to Home/Grid Efficiency	97.5% ³
	Supported Islanding Devices	Gateway 3, Backup Switch, Backup Gateway 2
	Connectivity	Wi-Fi (2.4 and 5 GHz), Dual-port switched Ethernet, Cellular (LTE/4G ⁴)
	Hardware Interface	Dry contact relay, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters
Solar Technical Specifications	AC Metering	Revenue Grade (+/- 0.5%)
	Protections	Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), PV Rapid Shutdown (RSD) using Tesla Mid-Circuit Interrupters
	Customer Interface	Tesla Mobile App
	Warranty	10 years

Solar Technical Specifications	Maximum Solar STC Input	20 kW
	Withstand Voltage	600 V DC
	PV DC Input Voltage Range	60 — 550 V DC
	PV DC MPPT Voltage Range	60 — 480 V DC
	MPPTs	6
	Maximum Current per MPPT (I _{mp})	13 A ⁵
	Maximum Short Circuit Current per MPPT (I _{sc})	15 A ⁵

Battery Technical Specifications	Nominal Battery Energy	13.5 kWh AC ²
	Maximum Continuous Discharge Power	11.5 kW AC
	Maximum Continuous Charge Power	5 kW AC
	Output Power Factor Rating	0 - 1 (Grid Code configurable)
	Maximum Continuous Current	48 A
	Maximum Output Fault Current	10 kA
	Load Start Capability (1 s)	185 A LRA
	Power Scalability	Up to 4 Powerwall 3 units supported

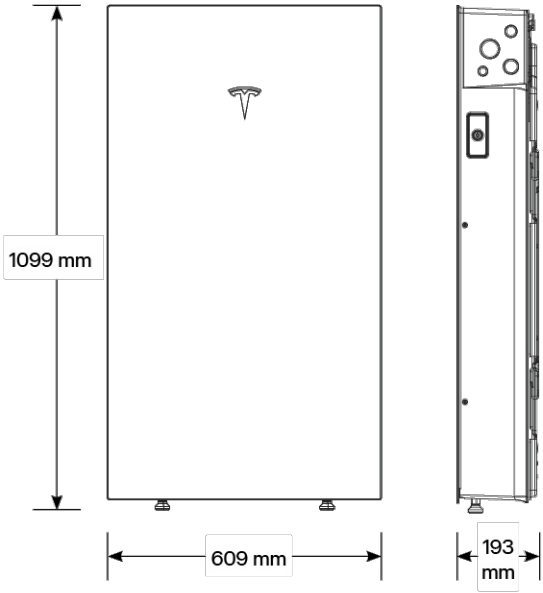
¹Typical solar shifting use case.
²Values provided for 25°C (77°F), at beginning of life. 3.3 kW charge/discharge power.
³Tested using CEC weighted efficiency methodology.
⁴The customer is expected to provide internet connectivity for Powerwall 3; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.
⁵Where the DC input current exceeds the MPPT rating, a jumper can be used to combine two MPPTs into a single input to intake DC current up to 26 A I_{MP} / 30 A I_{SC}.

Powerwall 3 Technical Specifications

Environmental Specifications	Operating Temperature	−20°C to 50°C (−4°F to 122°F) ⁶
	Operating Humidity (RH)	Up to 100%, condensing
	Storage Temperature	−20°C to 30°C (−4°F to 86°F), up to 95% RH, non-condensing, State of Energy (SOE): 25% initial
	Maximum Elevation	3000 m (9843 ft)
	Environment	Indoor and outdoor rated
	Enclosure Rating	NEMA 3R
	Ingress Rating	IP67 (Battery & Power Electronics) IP45 (Wiring Compartment)
	Pollution Rating	PD3
	Operating Noise @ 1 m	<50 db(A) typical <62 db(A) maximum
	⁶ Performance may be de-rated at operating temperatures above 40°C (104°F).	

Compliance Information	Certifications	UL 1642, UL 1699B, UL 1741, UL 1741 SA, UL 1741 SB, UL 1741 PCS, UL 3741, UL 1973, UL 1998, UL 9540, IEEE 1547-2018, IEEE 1547.1, UN 38.3
	Grid Connection	United States
	Emissions	FCC Part 15 Class B
	Environmental	RoHS Directive 2011/65/EU
	Seismic	AC156, IEEE 693-2005 (high)
	Fire Testing	Meets the unit level performance criteria of UL 9540A

Mechanical Specifications	Dimensions	1099 x 609 x 193 mm (43.25 x 24 x 7.6 in)
	Weight	130 kg (287 lb)
	Mounting Options	Floor or wall mount



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NAME: (INFO WITHHELD)
PHONE: (INFO WITHHELD)

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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
(PARTIAL-HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

POWERWALL 3

PROJECT NO: GSD-20241021-189334
DRAWN BY: SCM
DATE: 10/21/2024

PV-12

Backup Gateway 2

Backup Gateway 2 controls connection to the grid when paired with Powerwall 3, automatically detecting outages and providing seamless transition to backup power. Backup Gateway 2 also provides energy metering for solar self-consumption, time-based control, and backup operation.

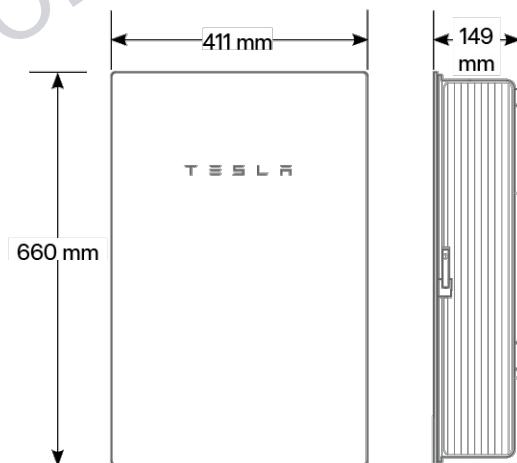
In this system configuration, Powerwall 3 acts as the Site Controller, with the Backup Gateway 2 Site Controller disabled.

Performance Specifications	Model Number	1232100-xx-y	User Interface	Tesla App
	AC Voltage (Nominal)	120/240 V	Operating Modes	Support for solar self-consumption, time-based control, and backup
	Feed-in Type	Split phase		
	Grid Frequency	60 Hz	Backup Transition	Automatic disconnect for seamless backup
	Current Rating	200 A	Modularity	Supports up to 10 AC-coupled Powerwalls
	Maximum Supply Short Circuit Current	10 kA ¹¹		
	Overcurrent Protection Device	100 - 200 A, Service entrance rated ⁹	Optional Internal Panelboard	200 A 6-space / 12 circuit breakers Siemens QP or Square D HOM breakers rated 10 - 80A or Eaton BR breakers rated 10 - 125A
	Overvoltage Category	Category IV		
	Internal Primary AC Meter	Revenue accurate (+/- 0.2%)	Warranty	10 years
	Internal Auxiliary AC Meter	Revenue accurate (+/- 2%)		
	Primary Connectivity	Ethernet, Wi-Fi		¹¹ When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.
Secondary Connectivity	Cellular (3G, LTE/4G) ¹²		¹² Cellular connectivity subject to network operator service coverage and signal strength.	

Environmental Specifications	Operating Temperature	–20°C to 50°C (–4°F to 122°F)
	Operating Humidity (RH)	Up to 100%, condensing
	Maximum Elevation	3000 m (9843 ft)
	Environment	Indoor and outdoor rated
	Enclosure Type	NEMA 3R

Compliance Information	Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 0.19, CSA 22.2 205
	Emissions	FCC Part 15, ICES 003

Mechanical Specifications	Dimensions	660 x 411 x 149 mm (26 x 16 x 6 in)
	Weight	20.4 kg (45 lb)
	Mounting options	Wall mount, Semi-flush mount



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NEW GRID-TIED SYSTEM 20.09KW
W/ AC-COUPLED BATTERY-BACKUP
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(INFO WITHHELD FOR PUBLIC SAMPLE)

BACKUP GATEWAY 2

PROJECT NO: GSD-20241021-189334

DRAWN BY: SCM

DATE: 10/21/2024

PV-13

Solar Shutdown Device Technical Specifications

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is part of the PV system rapid shutdown (RSD) function in accordance with Article 690 of the applicable NEC. When paired with Powerwall 3, solar array shutdown is initiated by any loss of AC power.

Electrical Specifications	Model	MCI-1	MCI-2
	Nominal Input DC Current Rating (I_{MP})	13 A	13 A
	Maximum Input Short Circuit Current (I_{SC})	19 A	17 A
	Maximum System Voltage (PVHCS)	600 V DC	1000 V DC ⁷
⁷ Maximum System Voltage is limited by Powerwall to 600 V DC.			

RSD Module Performance	Maximum Number of Devices per String	5	5
	Control	Power Line Excitation	Power Line Excitation
	Passive State	Normally Open	Normally Open
	Maximum Power Consumption	7 W	7 W
	Warranty	25 years	25 years

Environmental Specifications	Operating Temperature	-40°C to 50°C (-40°F to 122°F)	-45°C to 70°C (-49°F to 158°F)
	Storage Temperature	-30°C to 70°C (-22°F to 158°F)	-30°C to 70°C (-22°F to 158°F)
	Enclosure Rating	NEMA 4X / IP65	NEMA 4X / IP65

Mechanical Specifications	Electrical Connections	MC4 Connector	MC4 Connector
	Housing	Plastic	Plastic
	Dimensions	125 x 150 x 22 mm (5 x 6 x 1 in)	173 x 45 x 22 mm (6.8 x 1.8 x 1 in)
	Weight	350 g (0.77 lb)	120 g (0.26 lb)
	Mounting Options	ZEP Home Run Clip M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw	Wire Clip

Compliance Information	Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)
	RSD Initiation Method	External System Shutdown Switch or Powerwall 3 Enable Switch

UL 3741 PV Hazard Control (and PVRSA) Compatibility	See Powerwall 3 Installation Manual
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NEW GRID-TIED SYSTEM 20.09KW
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RAPID SHUTDOWN

PROJECT NO: GSD-20241021-189334

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DATE: 10/21/2024

PV-14

SIEMENS

Rainproof Combination Metering

Catalog Number

MC3042B1400SCS

Class CTL Panelboard

Device Rating: 400 Amp, Max; 120/240 Volts ~, 1 phase, 3 wire

Meter Socket Rating: 400 Amp Max. 320 Amp Continuous

For installation by Qualified Person in accordance with all local electrical codes and/or the National Electrical Code.®

Suitable Only For Use As Service Equipment
For Overhead/Underground Service
Terminals Suitable for 60°/75° C Copper or Aluminum Conductor

Unused neutral branch terminals may be used to terminate equipment grounding wires in the combinations indicated for equipment ground bar terminals.

General Information:
Circuit breaker trip position is indicated by handle position midway between ON and OFF. To reset, move handle to OFF position then turn ON.

Line Terminals:
Provisions for UL listed one or two hole NEMA mounting terminals.
Compression terminals to #750 kcmil, single conductor, ILSCO type ACL or 2ACL.
Installation Tool : THOMAS & BETTS # TBM8 for #10-350kcmil(AL), #8-500kcmil(CU) TBM8-750M-1 for #8-750kcmil(CU/AL)

Tightening Torques:
5/16" Nuts(1/2" Drive).....130-140 in-lbs
3/8" Nuts(9/16" Drive).....240-260 in-lbs
1/2" Nuts(3/4"Drive)490-540 in-lbs

Test By-Pass Nut
Torque 35-40 in-lbs

Accessories:	
Filler Plate	QF3 or ECQF3
200 Amp Main Breaker	QN2200RH
150 Amp Main Breaker	QN2150RH
Flush Rail Kit	ECFRK2
Mechanical Interlock	ECQML12
Standby Interlock Kit	ECSBPK05
Standby Interlock Kit	ECSBPK07
LUG #6-350 kcmil	SUK350TA
LUG #2-600 kcmil	SUK600TA
LUG 500-1000 kcmil	SUK1000TA
LUG KIT #2-2/0	ECLK2125
LUG KIT #8-2/0	ECLK2150
LUG KIT #2-300kcmil(200A MAX)	ECLK2250

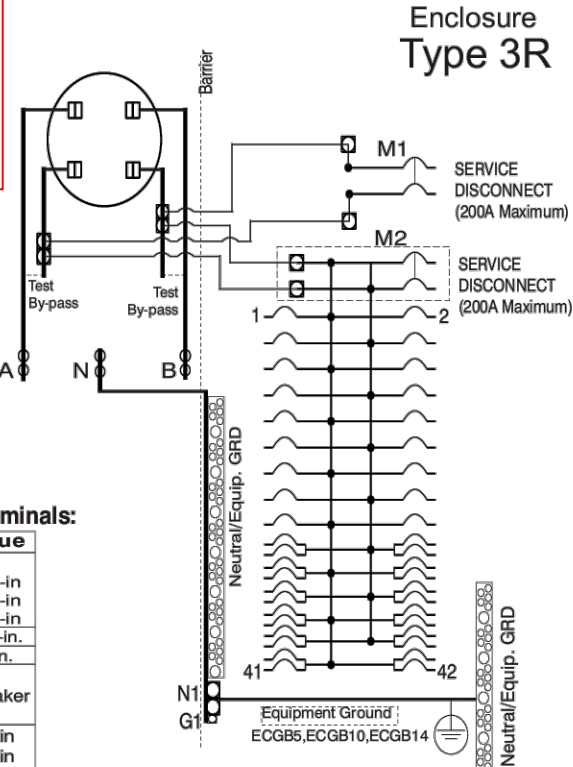
Short Circuit Current Rating (Watt-hour Meter not included in short circuit rating)
This panelboard has a short circuit current rating of 22,000 Amps RMS symmetrical, 120/240 V~. The actual rating is dependent on the service disconnects and branch breakers installed in this panelboard. The correct Service disconnects, branch circuit breakers and main/branch breaker series combinations to be used for various short circuit current levels are listed in the tabulation below. Any circuit breaker installed, replaced, or added in this panelboard must be manufactured by Siemens and must be of the correct type as indicated in the tabulations below.

PANELBOARD SERVICE DISCONNECT M2 **	BRANCH BREAKER	SERVICE DISCONNECT M1	Then the maximum short circuit current rating in RMS symmetrical Amperes, 120/240 Vac is:
When the installed panelboard service disconnect is a Siemens Type	And the branch breakers installed are Siemens Type	And the second installed service disconnect is a Siemens Type	
QNRH	QP, QT, QPH, HQP, QPF, QPHF, QAF, QAFH, QE, QEH, QNR, QNRH, QG	QP, QNR	10,000
	QP, QT, QPH, HQP, QPF, QPHF, QAF, QAFH, QE, QEH, QNRH	QPH, QNRH	22,000
** The factory installed main is Type QNRH			

Siemens Energy & Automation, Inc. Alpharetta, Georgia U.S.A.

MANUFACTURING DATE: J2 4099902 REV. E

Important Do not spray or allow any petroleum based chemicals, solvents, or paint to contact interior components.
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Load, Neutral and Ground* Terminals:

Terminal	Wire Size	Torque
A, B, N		
SUK350TA	(2) #6-350kcmil	275 lb-in
SUK600TA	#2-600kcmil	375 lb-in
SUK1000TA	500-1000kcmil	500 lb-in
N1	300 Kcmil - #4	250 lb-in.
G1	2/0 - #14	50 lb-in.
Branch Breaker Terminals	See Markings on Breaker	
Neutral Bar	#10 - #14 CU	35 lb-in
Ground Bar	#10 - #12 AL	35 lb-in
(1/0-14)	#8	40 lb-in
	1/0 - #6	45 lb-in
Neutral Bar	#10 - #14 CU	20 lb-in
Ground Bar	#10 - #12 AL	20 lb-in
(6-14)	#8	25 lb-in
	#6	35 lb-in

* Only Equipment Ground Terminals may use more than one wire per terminal.

Ground Terminal Size	Wire Range	Torque
1/0-#14	(2 or 3) #12-14 CU,	35 lb-in
	(2 or 3) #10-12 AL,	35 lb-in
	(2) #10 CU	35 lb-in
	(3) #10 CU	50 lb-in
#6-#14	(2) #12-14 CU,	20 lb-in
	(2) #12AL	20 lb-in
#4-#14 (ECGB)	(1, 2 or 3) #14,	20 lb-in
	(1 or 2) #12-#10	20 lb-in
	#8	25 lb-in
	#6-#4	35 lb-in

If hub is required, use the catalog numbers listed below:
Trade size (in) Catalog number
HD Type Hub (Top and Bottom Endwall) (Top Hub Opening Available Only On Surface Mounted Devices)
2" EC56854
2 1/2" EC56855
3" EC56856
3 1/2" EC56857
4" EC56858
Closure Plate EC56933S

WARNING:
Removal of meter does not de-energize circuit when By-Pass provided.

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METER / MAIN COMBO

PROJECT NO: GSD-20241021-189334
DRAWN BY: SCM
DATE: 10/21/2024

1 SERVICE ENTRANCE SECTION (SES) DATASHEET
PV-15 SCALE: NTS

PV-15

Specifications

Eaton DG224URK

Catalog Number: DG224URK

Eaton General duty non-fusible safety switch, single-throw, 200 A, NEMA 3R, Rainproof, Painted galvanized steel, Two-pole, Two-wire, 240 V

General specifications

Product Name	Catalog Number
Eaton general duty non-fusible safety switch	DG224URK
	UPC
	786685234816
Product Length/Depth	Product Height
11.25 in	25.5 in
Product Width	Product Weight
16 in	55 lb
Warranty	Compliances
Eaton Selling Policy 25-000, one (1) year NEC 230.62 (C) Compliant Barrier from the date of installation of the	
Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.	Certifications
	UL Listed
	Catalog Notes
	WARNING! Switch is not approved for service entrance unless a neutral kit is installed.

Physical Attributes

- Enclosure
 - NEMA 3R
- Enclosure material
 - Painted galvanized steel
- Fuse configuration
 - Non-fusible
- Number Of Poles
 - Two-pole
- Number of wires
 - 2
- Type
 - Non-fusible, single-throw

Performance Ratings

- Amperage Rating
 - 200A
- Voltage rating
 - 240V

Miscellaneous

- Product Category
 - General duty safety switch

Resources

- Multimedia
 - Switching Devices Flex Center
 - Double Up on Safety
- Specifications and datasheets
 - Eaton Specification Sheet - DG224URK
- Warranty guides
 - Selling Policy 25-000 - Distribution and Control Products and Services



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(INFO WITHHELD FOR PUBLIC SAMPLE)

AC DISCONNECT

PROJECT NO: GSD-20241021-189334

DRAWN BY: SCM

DATE: 10/21/2024

1

PV-16

UTILITY AC DISCONNECT DATASHEET

SCALE: NTS