

Approval of submitted plans is not an approval of omissions or oversight by this office or noncompliance with any applicable regulations of local government. The contractor is responsible for making sure that the building complies with all applicable building codes and regulations of the local government.

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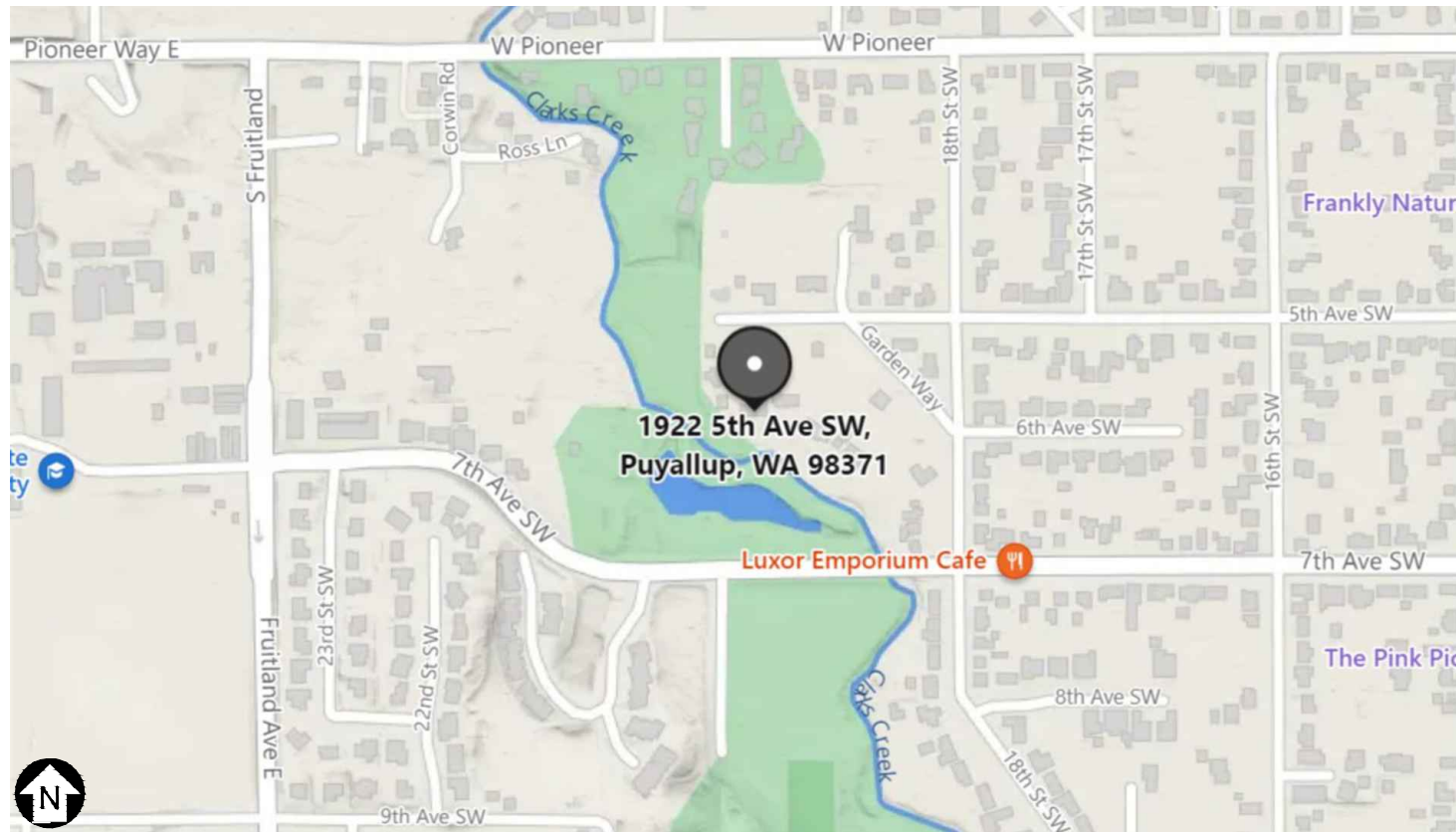
PROJECT DETAILS	
PROPERTY OWNER	JEFF STROBL
PROPERTY ADDRESS	1922 5TH AVE SW PUYALLUP, WA 98371
AHJ	CITY OF PUYALLUP
ZONING	RESIDENTIAL
CONST. TYPE	FLUSH ROOF-MOUNTED PHOTOVOLTAIC ARRAY
OBSERVED CODES	2020 NATIONAL ELECTRICAL CODE (NEC) 2018 WASHINGTON ADMINISTRATIVE CODE (WAC) 2018 WASHINGTON STATE ENERGY CODE - RESIDENTIAL 2018 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	SOLTERRA GLOBAL, LLC.
LICENSE NO.	SOLTEGL838BS
ADDRESS	2909 1ST AVENUE S SEATTLE, WA 98134
PHONE	(425) 921-0457
CONTRACTOR SIGNATURE	

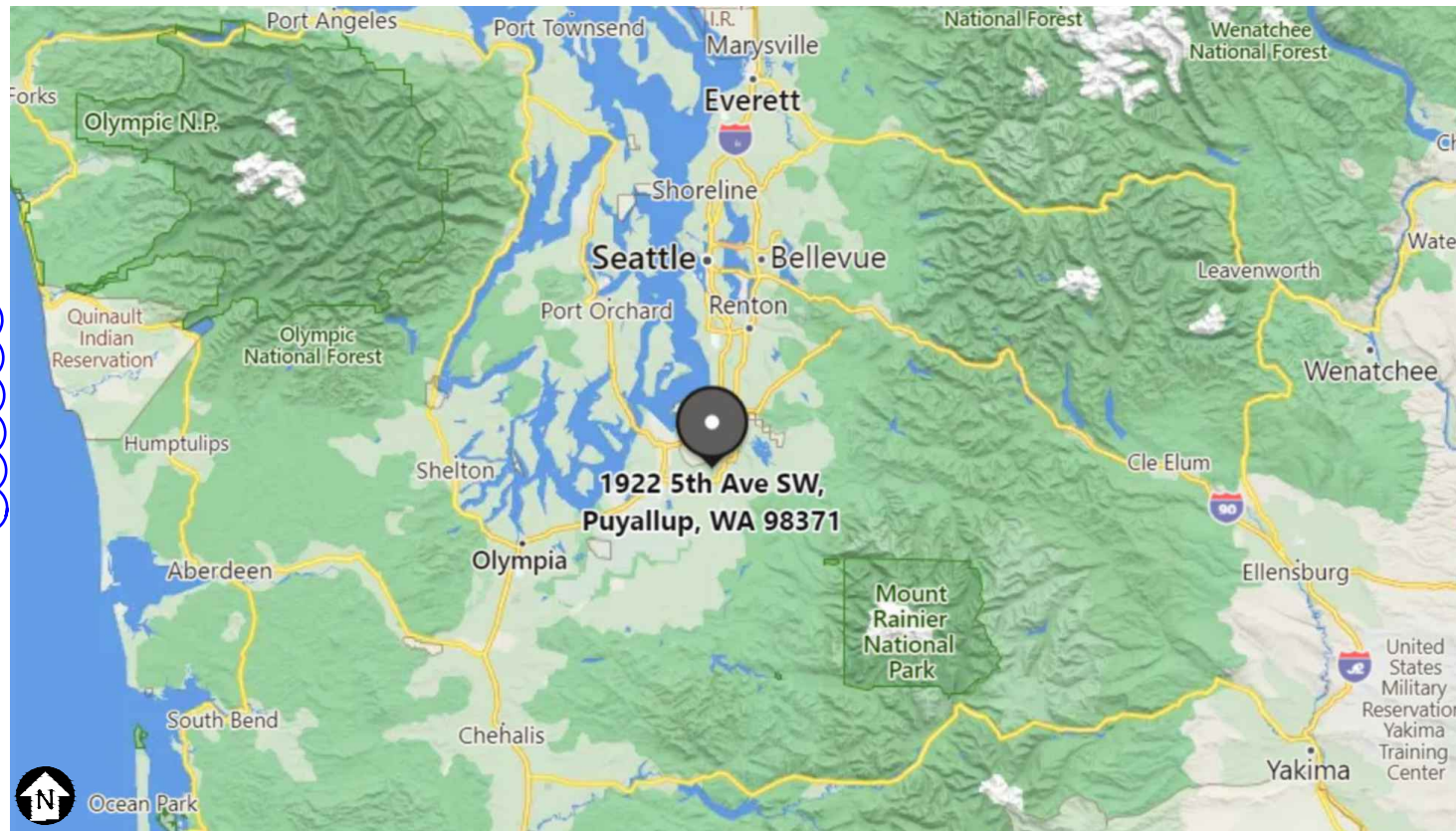
PLAN DESIGNER INFORMATION	
COMPANY	GEMINI SOLAR DESIGN, LLC.
NAME	SANJAY CHRISTOPHER MALLIPUDI
ADDRESS	2575 OLD ARCATA ROAD BAYSIDE, CA 95524
PHONE	(609) 802-5743
PLAN DESIGNER SIGNATURE	<i>Sanjay Mallipudi</i>

SYSTEM DETAILS	
DC RATING OF SYSTEM	12.555W
AC OUTPUT CURRENT	44.95A
MICROINVERTER	(31) ENPHASE IQ8A-72-2-US
MODULE	(31) REC SOLAR REC405AA PURE
BRANCH CONFIGURATION	2 BRANCHES OF 10 MICROINVERTERS 1 BRANCH OF 11 MICROINVERTERS
INTERCONNECTION	LOAD-SIDE TAP

SITE SPECIFICATIONS	
UTILITY SERVICE	120 / 240VAC, 1-Ø, 3W
MAIN SERVICE PANEL	200A RATED BUSBAR 200A / 2P MAIN BREAKER
ASHRAE EXTREME ANNUAL MEAN MINIMUM DENSITY DRY BULB TEMP.	-10°C
ASHRAE 2% ANNUAL DRY DENSITY BULB TEMP.	29°C
DESIGN WIND SPEED	110 MPH
DESIGN SNOW LOAD	15 PSF
WIND EXPOSURE CATEGORY	B
RISK CATEGORY	II



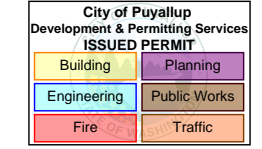
1 PLOT
SCALE: NTS



2 LOCALE
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, ILSKO 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 ROOF MOUNTED PHOTOVOLTAIC ARRAY UTILIZING MICROINVERTERS. THE PHOTOVOLTAIC (PV) SYSTEM IS TO BE INSTALLED ON THE RESIDENTIAL ZONED PROPERTY IN THE CITY OF PUYALLUP, WASHINGTON. 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 TAP POINT OF INTERCONNECTION. THIS PROJECT DOES NOT INCLUDE STORAGE BATTERIES.	



FULL SIZED LEDGIBLE COLOR PLANS ARE REQUIRED TO BE PROVIDED BY THE PERMITTEE ON SITE FOR ALL INSPECTIONS MIN. PLAN SIZE 11 X 17

SOLTERRA GLOBAL, LLC. PHONE: (206) 462-1103 LICENSE NO. SOLTEGL838BS	
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 12.555kW

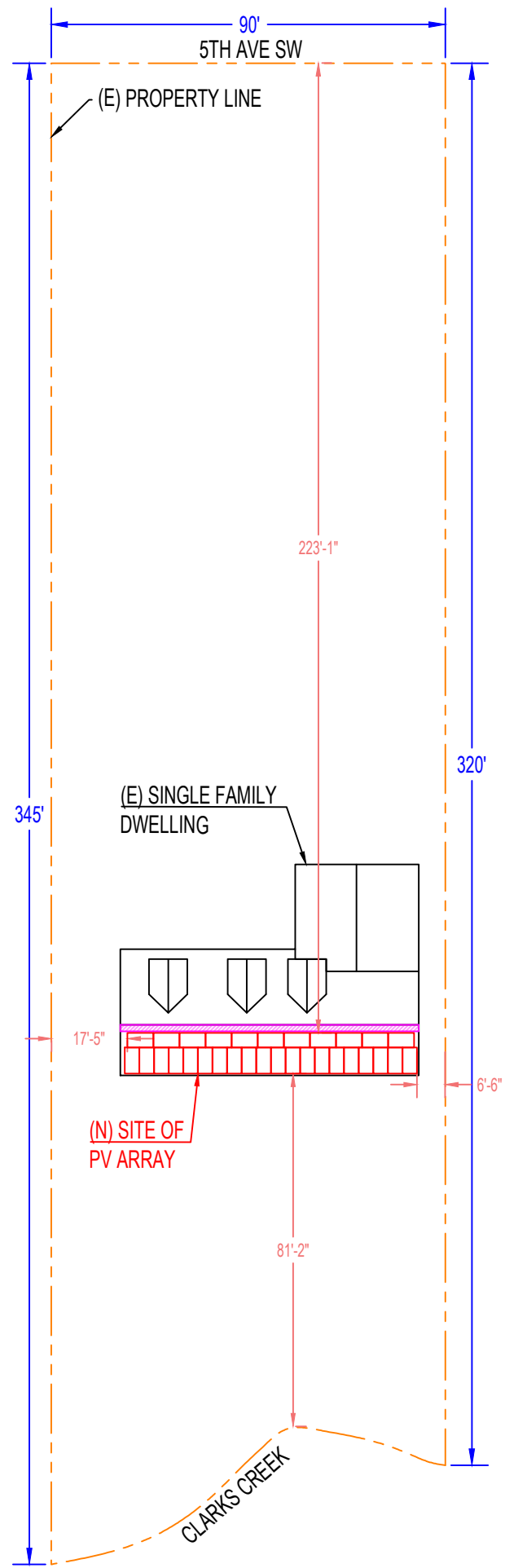
 STROBL RESIDENCE
 1922 5TH AVE SW
 PUYALLUP, WA 98371

City of Puyallup
 Building
 REVIEWED
 FOR
 COMPLIANCE

DLeahy
 11/07/2022
 6:47:24 AM

PROJECT INFO	
PROJECT NO:	GSD-20221010-181220
DRAWN BY:	SCM
DATE:	10/31/2022

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 GENSET, AND
 ALL RELEVANT ELECTRICAL DETAILS. THANK YOU.

A SITE PLAN (GENERAL)
 PV-2A SCALE: 1" = 35'

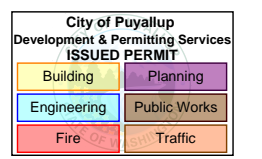


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NEW GRID-TIED SYSTEM 12.555kW

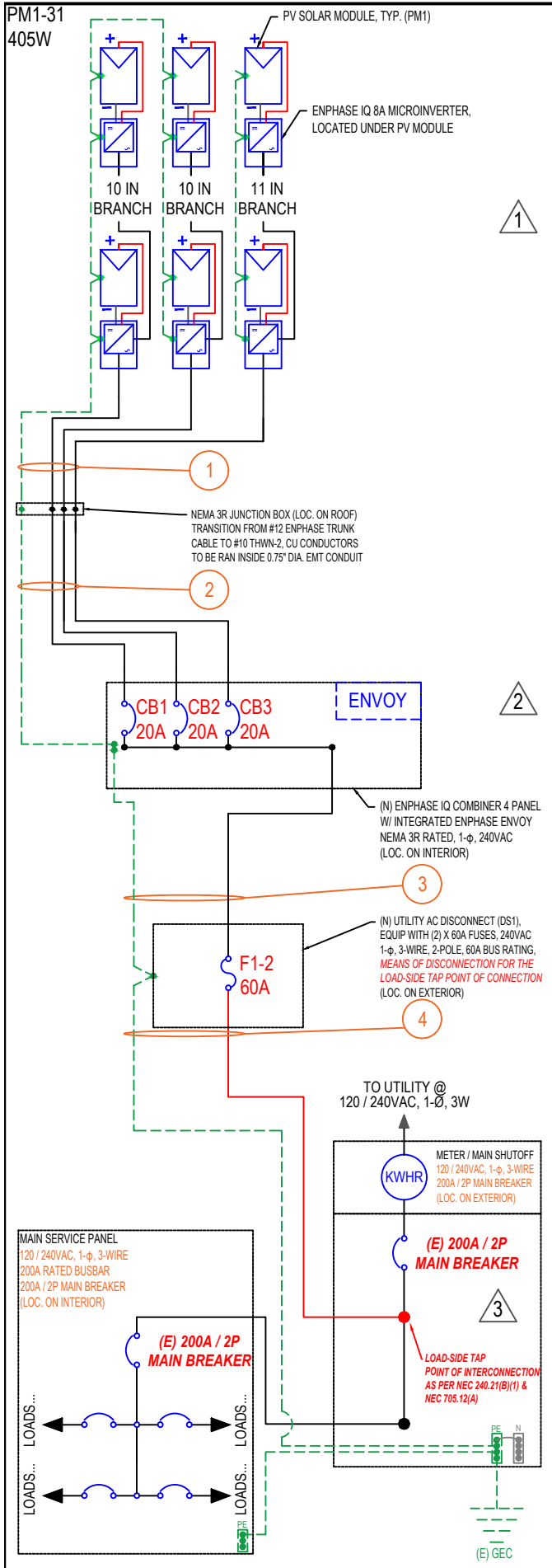
STROBL RESIDENCE
 1922 5TH AVE SW
 PUYALLUP, WA 98371



SITE PLAN

PROJECT NO: GSD-20221010-181220
 DRAWN BY: SCM
 DATE: 10/31/2022

PV-2A



PV MODULE									
REF.	TYP.	MODULE	STC POWER	PTC POWER	ISC	IMP	VOC	VMP	SERIES FUSE RATING
PM1-31	31	REC SOLAR REC405AA PURE	405W	385.9W	10.3A	9.56A	48.9V	42.4V	25A

MICROINVERTER										
REF.	TYP.	MICROINVERTER	GROUND	AC VOLTAGE	MAX OCPD SIZE	MAX OUTPUT POWER (CONTINUOUS)	MAX AC CURRENT	MAX INPUT CURRENT	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY
I1-31	31	ENPHASE IQ8A-72-2-US	INTEGRATED	240VAC	20A	349W	1.45A	15A	60VDC	97%

SYSTEM SUMMARY			
	BRANCH #1	BRANCH #2	BRANCH #3
INVERTERS PER BRANCH	10	10	11
MAX AC CURRENT	14.5A	14.5A	15.95A
MAX AC OUTPUT POWER	3,490W	3,490W	3,839W
ARRAY STC POWER	12,555W		
ARRAY PTC POWER	11,962W		
TOTAL MAX AC CURRENT	44.95A		
DERATED AC POWER OUTPUT	10,819W		

SCHEMATIC NOTES

⚠ THE FIRST AC CONNECTOR IN EACH MICROINVERTER BRANCH CIRCUIT IS SUITABLE AS A DISCONNECTING MEANS.

⚠ OUTPUT OF (3) THREE MICROINVERTER BRANCH CIRCUITS SHALL BE BACKFED INTO A ENPHASE IQ COMBINER 4 SUBPANEL. PLEASE SEE THE OCPD SCHEDULE FOR THE BREAKER SIZES FOR EACH BRANCH CIRCUIT, RESPECTIVELY.

⚠ LOAD-SIDE TAP POINT OF INTERCONNECTION SHALL TAKE PLACE AS PER NEC 240.21(B)(1) & NEC 705.12(A). LENGTH OF TAP CONDUCTORS SHALL NOT EXCEED 10 FEET.

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
F1-2 (AC UTILITY DISCONNECT FUSES)	2	N/A	60A	240VAC

DISCONNECT SCHEDULE				
REF.	FUSIBLE	POLES	CURRENT RATING	MAX. VOLTAGE
UTILITY DISCONNECT (DS1)	YES	2	60A	240VAC

CONDUCTOR SCHEDULE WITH NEC ELECTRICAL CALCULATIONS																
ID	TYP	DESCRIPTION	CONDUCTOR	CONDUIT	NO. OF CURRENT CARRYING CNDRS. IN CNDT.	FILL %	RATED AMPS	OCPD	EGC	TEMP. CORR. FACTOR @ 75°C TEMP. RATING	FILL ADJ. FACTOR	CONT. CURRENT	MAX. CURRENT	75°C TERMINAL RATING CHECK SHALL EXCEED 1.25X CONT. CURRENT	BASE AMPACITY @ 75°C TEMP. RATING	CONDITIONS OF USE (COU) @ 75°C TEMP. RATING
1	3	MICROINVERTER OUTPUT: MICROINVERTER TO JUNCTION BOX	12 AWG THWN-2 COPPER	FREE AIR (DIRECT HOMERUN TO J-BOX LOCATED UNDER PV MODULE)	N/A	N/A	14.5A (BRANCH #1) 14.5A (BRANCH #2) 15.95A (BRANCH #3)	N/A	6 AWG BARE COPPER	0.76 (51°C)	1.0	14.5A (BRANCH #1) 14.5A (BRANCH #2) 15.95A (BRANCH #3)	18.13A (BRANCH #1) 18.13A (BRANCH #2) 19.94A (BRANCH #3)	25A > 19.94A PASS	40A (IN FREE AIR)	30.4A (IN FREE AIR)
2	1	MICROINVERTER OUTPUT (TRANSITIONED): JUNCTION BOX TO IQ COMBINER 4 PANEL	10 AWG THWN-2 COPPER	0.75" DIA. EMT	6 (L1, L2) X 3	27.8%	14.5A (BRANCH #1) 14.5A (BRANCH #2) 15.95A (BRANCH #3)	20A (CB1) 20A (CB2) 20A (CB3)	10 AWG THWN-2 COPPER	0.76 (51°C)	0.8	14.5A (BRANCH #1) 14.5A (BRANCH #2) 15.95A (BRANCH #3)	18.13A (BRANCH #1) 18.13A (BRANCH #2) 19.94A (BRANCH #3)	35A > 19.94A PASS	35A (IN CONDUIT)	21.28A (IN CONDUIT)
3	1	COMBINED OUTPUT OF MICROINVERTERS: ENPHASE IQ COMBINER 4 TO UTILITY DISCONNECT (DS1)	6 AWG THWN-2 COPPER	0.75" DIA. EMT	3 (L1, L2, N) X 1	32.6%	44.95A	60A (F1-2) 60A (DS1)	10 AWG THWN-2 COPPER	1.0 (29°C)	1.0	44.95A	56.18A	65A > 56.18A PASS	65A (IN CONDUIT)	65A (IN CONDUIT)
4	1	UTILITY DISCONNECT (DS1) OUTPUT: UTILITY DISCONNECT (DS1) TO LOAD-SIDE TAP P.O.C. (TO BE MADE AS PER NEC 240.21(B)(1) & NEC 705.12(A))	6 AWG THWN-2 COPPER	0.75" DIA. SCH. 40 PVC	3 (L1, L2, N) X 1	40.0%	44.95A	N/A	6 AWG THWN-2 COPPER	1.0 (29°C)	1.0	44.95A	56.18A	65A > 56.18A PASS	65A (IN CONDUIT)	65A (IN CONDUIT)

ALL CONDUCTORS, OCPD SIZES AND TYPES SPECIFIED ACCORDING TO NEC ARTICLES 690.8(A)(1), NEC ARTICLE 240, AND NEC ARTICLE 690.7.



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LICENSE NO. SOLTEGL838BS

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NEW GRID-TIED SYSTEM 12,555kW

STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building Planning
Engineering Public Works
Fire Traffic

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20221010-181220
DRAWN BY: SCM
DATE: 10/31/2022

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

PV-3

OVERALL SYSTEM RATED AC CURRENT

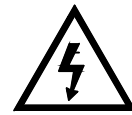
1 OVERALL SYSTEM RATED AC CURRENT

PHOTOVOLTAIC SYSTEM AC DISCONNECT

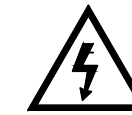
OPERATING CURRENT **44.95** AMPS
 OPERATING VOLTAGE **240** VOLTS

NEC 690.14(C)(2) & NEC 690.54

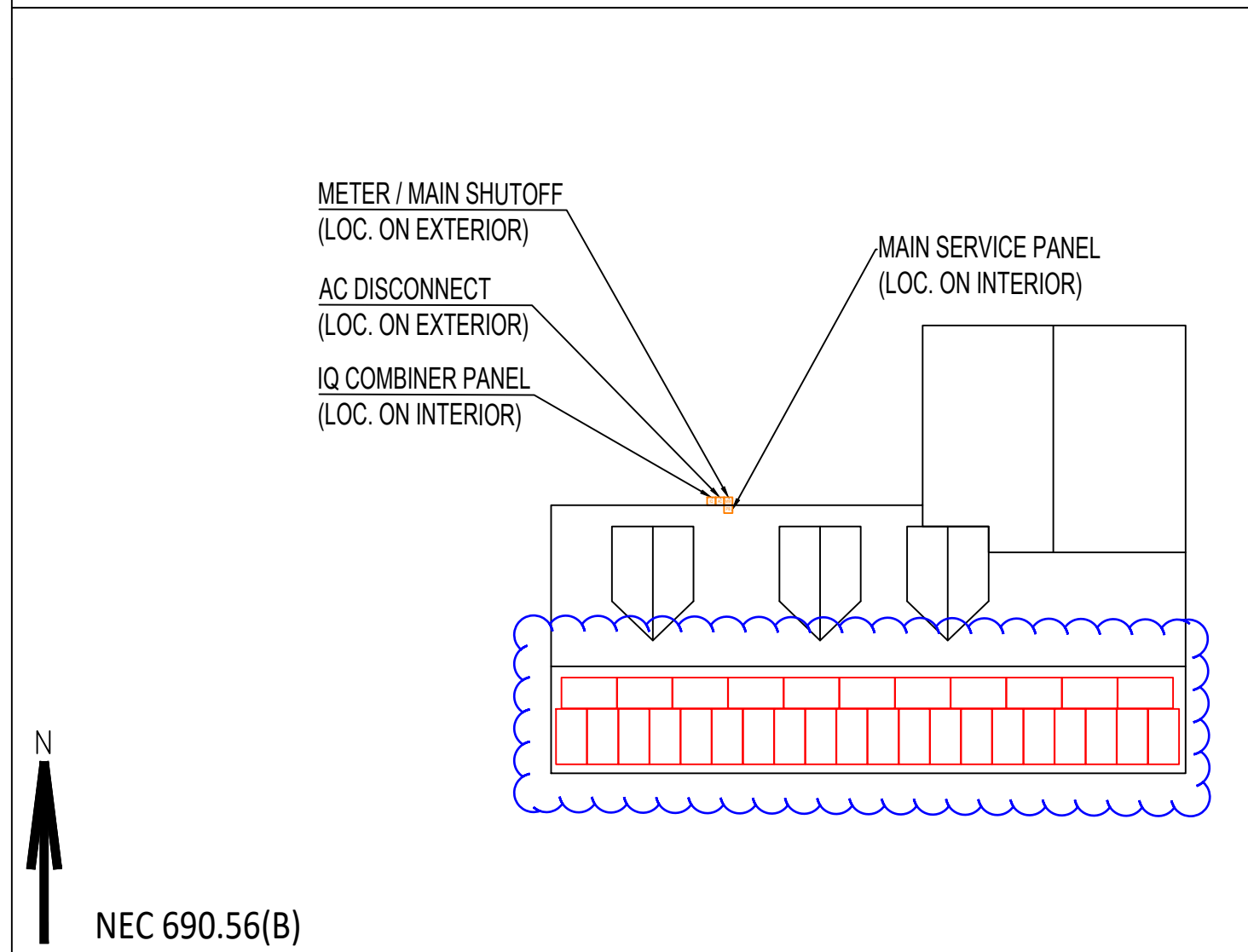
SITE OVERVIEW



CAUTION



POWER TO THIS SERVICE IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN

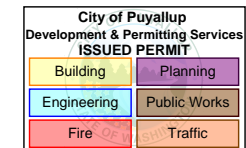


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NEW GRID-TIED SYSTEM 12.555kW

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 1922 5TH AVE SW
 PUYALLUP, WA 98371



PLACARDS

PROJECT NO: GSD-20221010-181220
 DRAWN BY: SCM
 DATE: 10/31/2022

PV-4

1 PLACARDS
 PV-4 SCALE: N/A

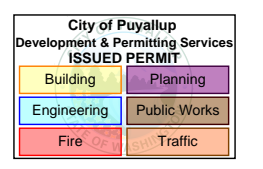


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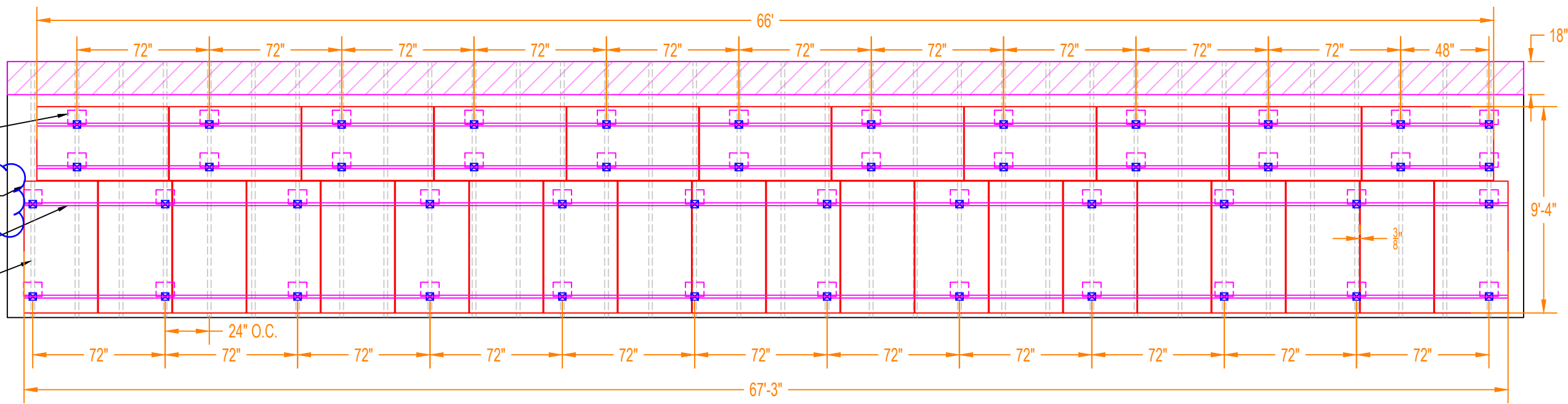
STROBL RESIDENCE
 1922 5TH AVE SW
 PUYALLUP, WA 98371



ATTACHMENT PLAN

PROJECT NO: GSD-20221010-181220
 DRAWN BY: SCM
 DATE: 10/31/2022

PV-5



- IRON RIDGE FLASHFOOT2 MOUNTING ATTACHMENT @ 72" O.C. SPANS
- REC SOLAR REC405AA PURE PV MODULE, TYP.
- IRON RIDGE XR-100 SERIES RACKING RAIL
- 2" X 4" RAFTER @ 24" O.C.

ROOF INFORMATION	
ROOF TYPE	COMPOSITE SHINGLE
PITCH	6:12
RAFTER SPACING	24" O.C.
RAFTER DIMENSIONS	2" X 4"

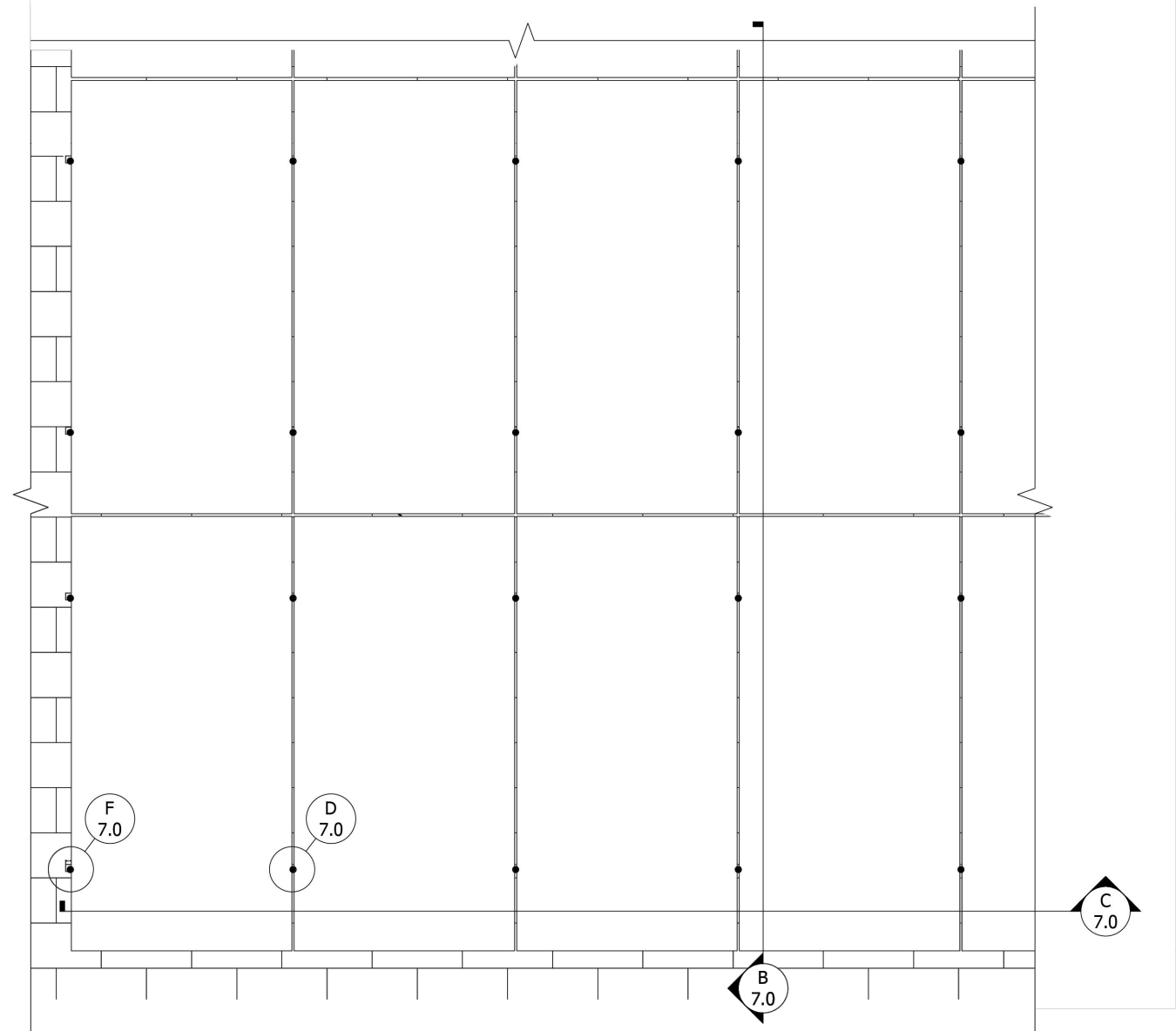
LAYOUT SPECIFICATIONS	
NUMBER OF MODULES	31
AREA	618 SQ. FT
AZIMUTH	180°

STRUCTURAL CALCULATIONS	
WIND EXPOSURE CATEGORY	B
RISK CATEGORY	II
DESIGN WIND SPEED	110 MPH
DESIGN SNOW LOAD	15 PSF

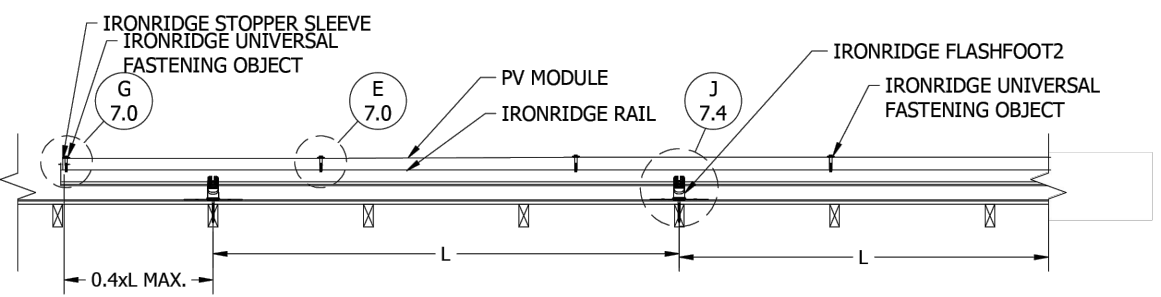
PV MODULES AND IRON RACKING SYSTEM HAVE A CLASS A FIRE RATING CLASSIFICATION.

- | 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, PV-6B, AND PV-6C FOR DETAILS REGARDING THE MOUNTING ATTACHMENT TO BE USED, THE FLASHING TO BE USED, AS WELL AS THE RELEVANT INSTALLATION INSTRUCTIONS. |
| 4 | PLEASE SEE SHEET PV-11 FOR A STRUCTURAL CERTIFICATION LETTER FOR THE IRON RIDGE FLUSH MOUNT SYSTEM. LETTER IS STAMPED BY A STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER (PE). |

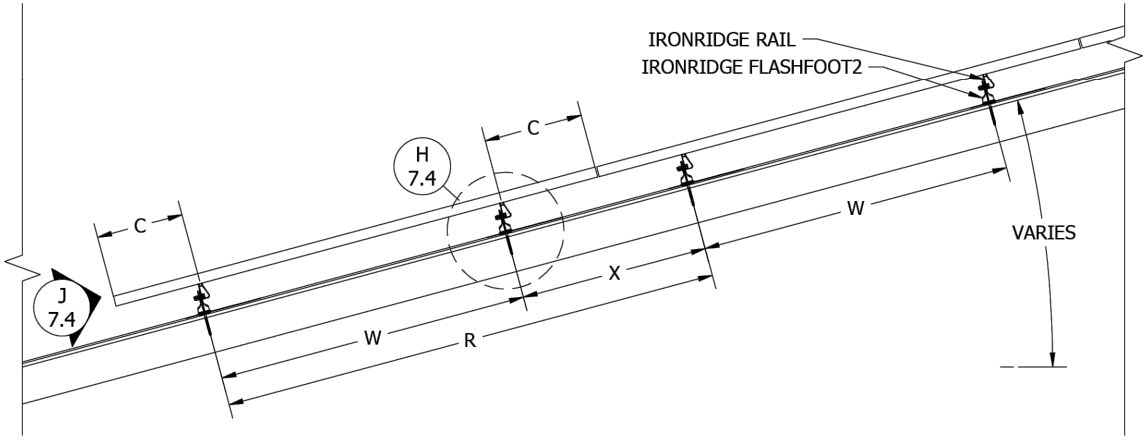
1 ATTACHMENT PLAN
 PV-5 SCALE: 1" = 5'-6"



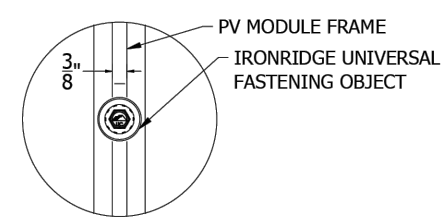
A PLAN VIEW, FLASHFOOT2 MOUNT, PORTRAIT MODULE
Scale: 1"=1'-0"



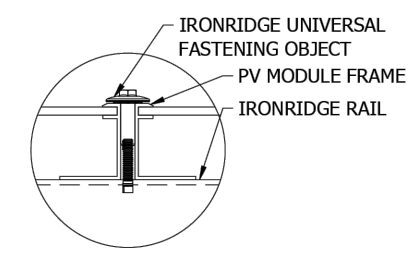
C FRONT VIEW, FLASHFOOT2 MOUNT, PORTRAIT MODULE
Scale: 1"=1'-0"



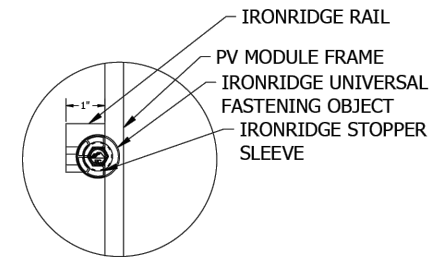
B SIDE VIEW, FLASHFOOT2 MOUNT, PORTRAIT MODULE
Scale: 1"=1'-0"



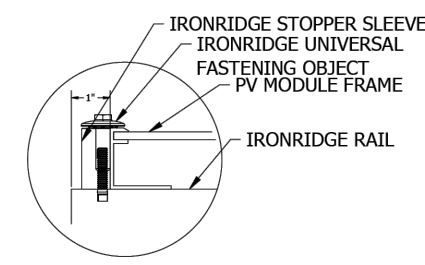
D DETAIL, MID CLAMP PLAN
Scale: 6"=1'-0"



E DETAIL, MID CLAMP FRONT
Scale: 6"=1'-0"



F DETAIL, END CLAMP (UFO) PLAN
Scale: 6"=1'-0"



G DETAIL, END CLAMP (UFO) FRONT
Scale: 6"=1'-0"

IRONRIDGE
1485 ZEPHYR AVE, HAYWARD, CA 94544
800.227.9523 IRONRIDGE.COM

CLIENT NAME	IRONRIDGE
PROJECT NAME	SLOPED ROOF MOUNT SYSTEM
PROJECT ADDRESS	
SYSTEM KW/DC	

WIND SPEED, MPH	
SNOW LOAD, PSF	
EXPOSURE CAT	
RISK CAT	
MODULE TYPE	72-CELL, GENERIC
MODULE W/DC	
MODULE QTY	

NOT FOR CONSTRUCTION

REVISION HISTORY	REV	DESCRIPTION	DATE

JOB NO.	3.1 SR
ISSUE DATE	DEC 2018
PROJECT NO.	IR 7.0
SHEET NO.	24X36

SHEET NAME
SLOPED ROOF PV SYSTEM DETAILS: FLASHFOOT2 (UFO)

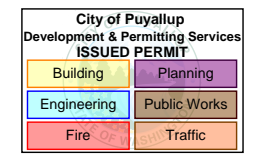


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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371



MOUNTING DETAIL

PROJECT NO: GSD-20221010-181220
DRAWN BY: SCM
DATE: 10/31/2022

PV-6A

1 IRON RIDGE FLASHFOOT2 MOUNTING DETAILS
PV-6A SCALE: NTS

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NEW GRID-TIED SYSTEM 12.555kW
 STROBL RESIDENCE
 1922 5TH AVE SW
 PUYALLUP, WA 98371

City of Puyallup
 Development & Permitting Services
 ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

MOUNTING DETAIL

PROJECT NO: GSD-20221010-181220
 DRAWN BY: SCM
 DATE: 10/31/2022

PV-6B

IRONRIDGE
 1465 ZEPHYR AVE. HAYWARD, CA 94544
 800.227.9523 IRONRIDGE.COM

CLIENT NAME	IRONRIDGE
PROJECT NAME	SLOPED ROOF MOUNT SYSTEM
PROJECT ADDRESS	
SYSTEM KW/DC	

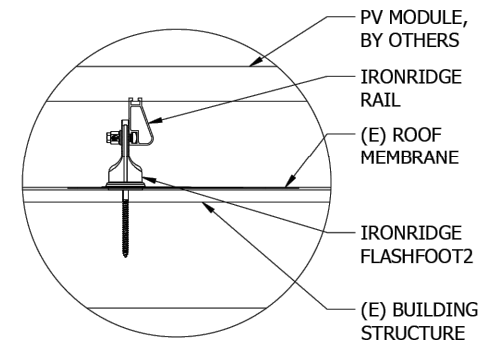
WIND SPEED, MPH	
SNOW LOAD, PSF	
EXPOSURE CAT	
RISK CAT	
MODULE TYPE	72-CELL, GENERIC
MODULE W/DC	
MODULE QTY	

APPROVAL STATUS
 NOT FOR CONSTRUCTION

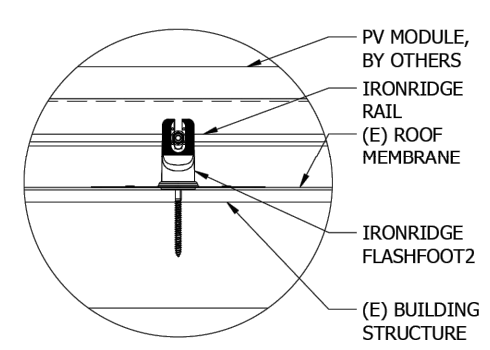
REV	DESCRIPTION	DATE

SHEET NAME
 SLOPED ROOF PV SYSTEM DETAILS: FLASHFOOT2

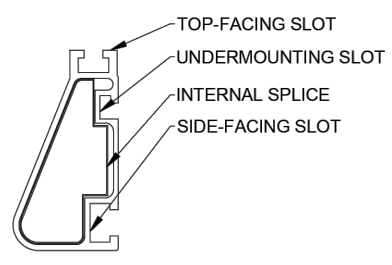
JOB NO.	3.1 SR
ISSUE DATE	DEC 2018
SHEET NO.	IR 7.4
SHEET SIZE	24X36



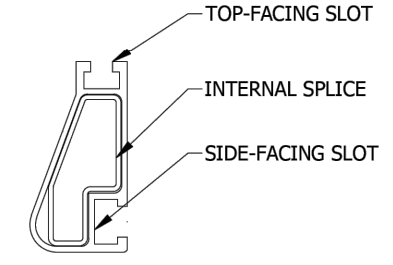
H FLASHFOOT2 DETAIL
 Scale: 3"=1'-0"



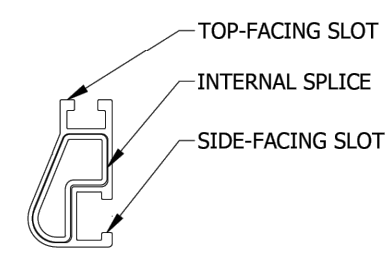
J FLASHFOOT2 DETAIL
 Scale: 3"=1'-0"



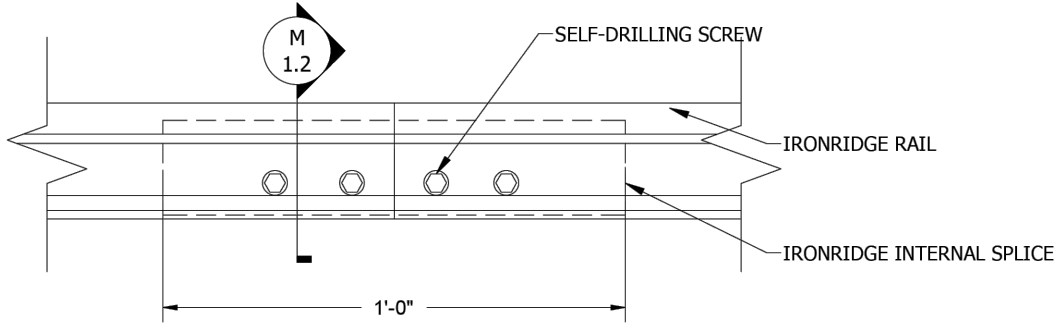
M DETAIL, SPLICE, XR1000
 1'-0"=1'-0"



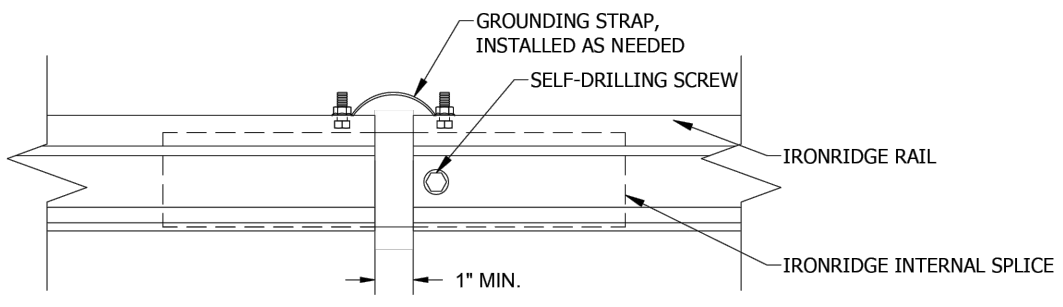
N DETAIL, SPLICE, XR100
 1'-0"=1'-0"



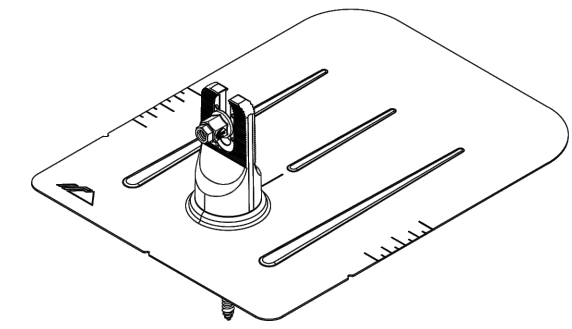
O DETAIL, SPLICE, XR10
 1'-0"=1'-0"



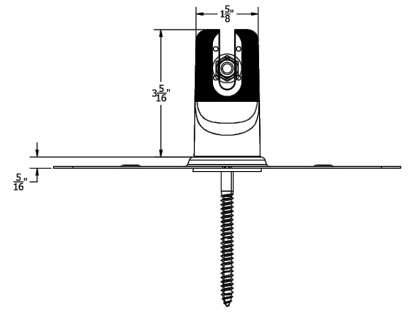
K DETAIL, SPLICE CONNECTION, XR1000
 6"=1'-0"



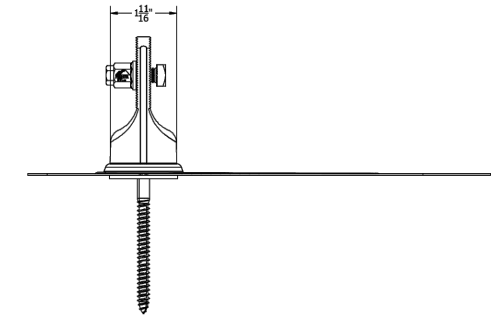
L DETAIL, EXPANSION JOINT CONNECTION, XR1000
 6"=1'-0"



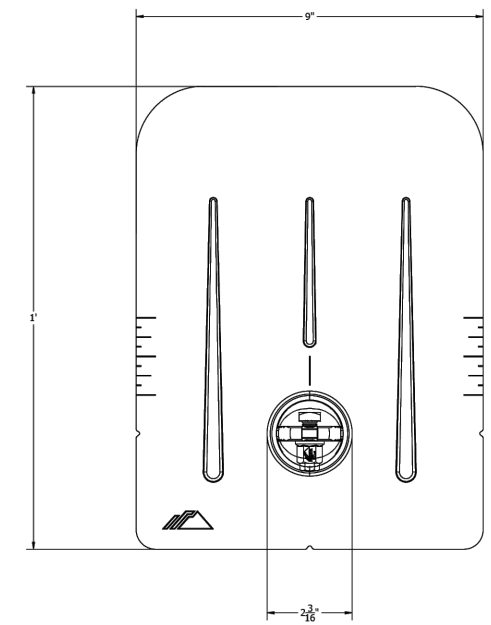
Q IRONRIDGE FLASHFOOT2



R IRONRIDGE FLASHFOOT2, FRONT VIEW



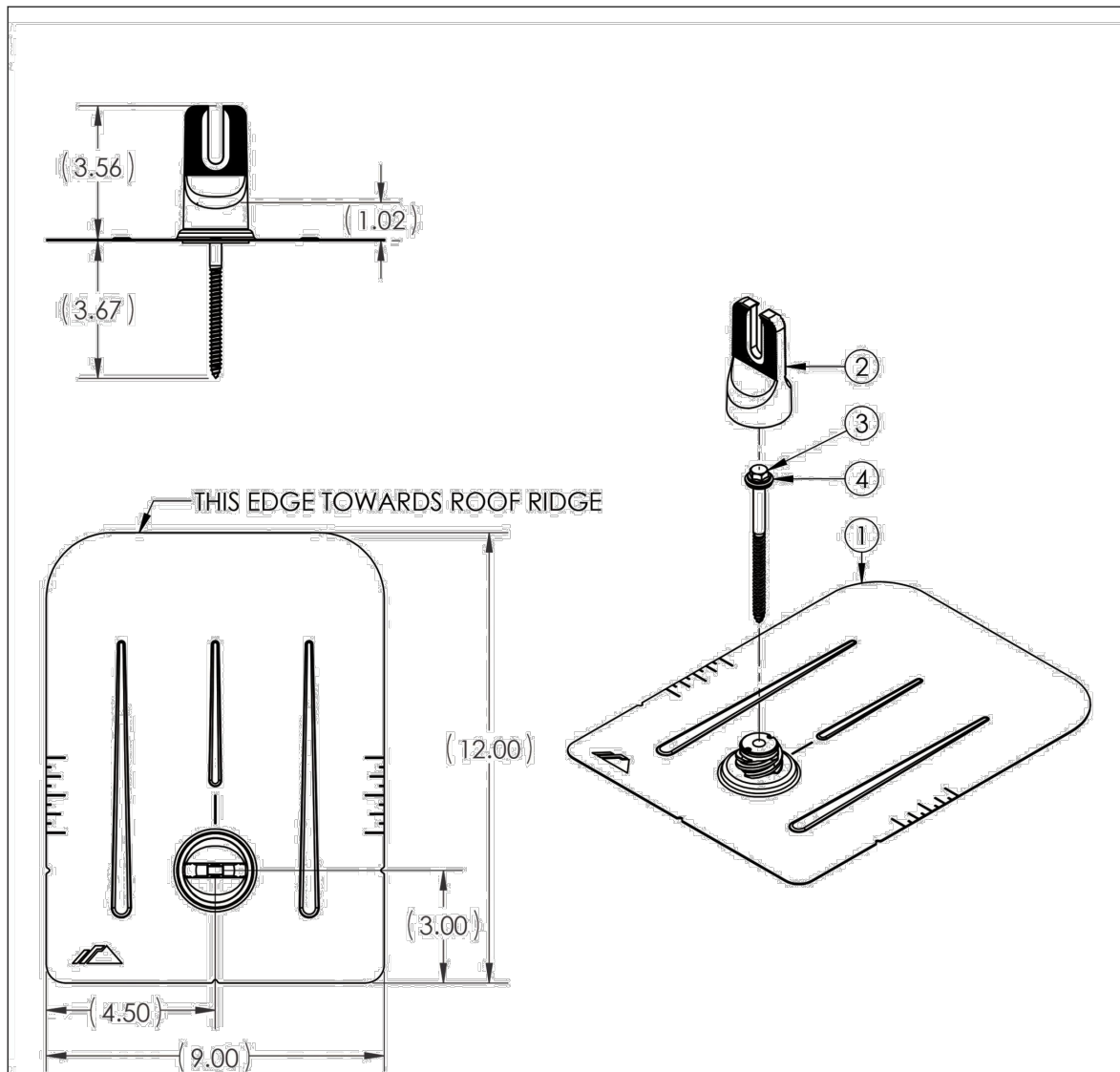
P IRONRIDGE FLASHFOOT2, SIDE VIEW



S IRONRIDGE FLASHFOOT2, PLAN VIEW



FlashFoot2



NO.	DESCRIPTION
1	ASSY, FLASHING, MILL OR BLACK
2	ASSY, CAP, MILL OR BLACK
3	BOLT LAG 5/16 X 4.75"
4	WASHER, EPDM BACKED

KIT, FLASHFOOT2[®]

SCALE: 1/4" = 1'-0" DO NOT SCALE DRAWING

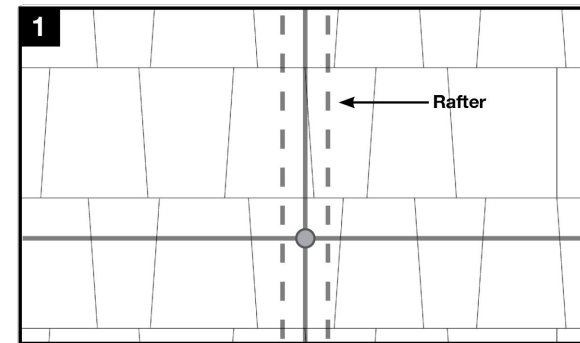
WEIGHT: 0.88 lbs SHEET 1 OF 3

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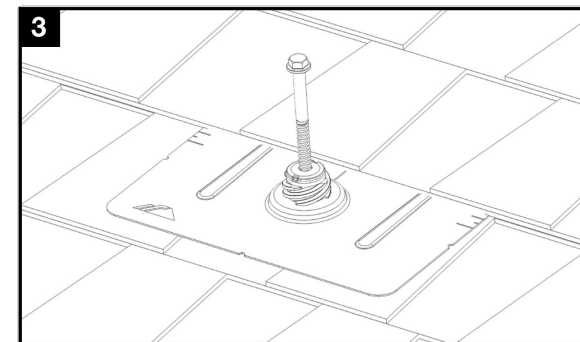
FM-FF2-MAN REV 1.20

Installation

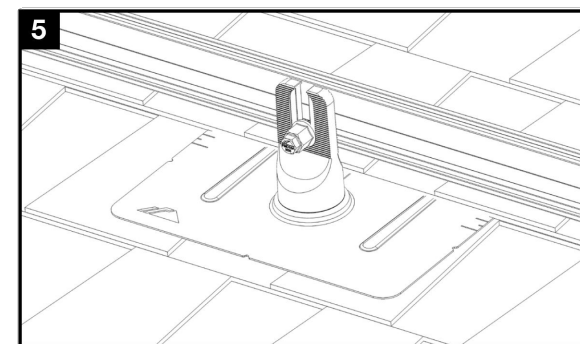
Tools Required: tape measure, chalk line, stud finder, roofing bar, caulking gun, driver with 1/4" bit and 7/16" hex socket.



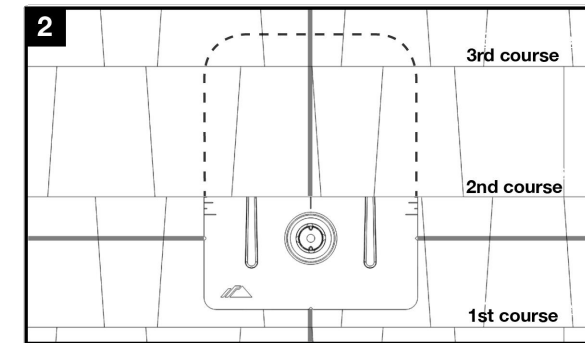
Locate rafters and snap vertical and horizontal lines to mark flashing locations. Drill 1/4" pilot holes, then fill with roofing manufacturer's approved sealant.



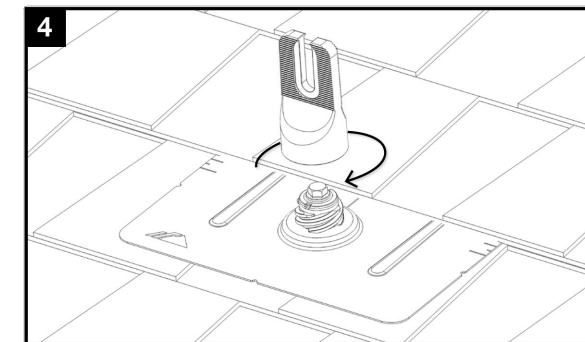
Line up pilot hole with flashing hole and insert lag bolt with bonded washer through flashing. Tighten lag bolt until fully seated.



Attach rails to either side of the open slot using bonding hardware. Level rail at desired height, then torque to 250 in-lbs (21 ft-lbs).



Slide flashing, between 1st and 2nd course, so the top is at least 3/4" above the edge of the 3rd course and the bottom is above the edge of the 1st course.



Place Cap onto flashing in desired orientation for E/W or N/S rails and rotate 180 degrees. FlashFoot 2 is now installed and ready for IronRidge XR Rails.

Structural Certification

Designed and Certified for Compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings

Water Sealing Tested to UL 441 Section 27 "Rain Test" and TAS 100-95 "Wind Driven Rain Test" by Intertek. Ratings applicable for composition shingle roofs having slopes between 2:12 and 12:12. Tested and evaluated without sealant. Any roofing manufacturer approved sealant is allowed.

UL 2703

Conforms to UL 2703 Mechanical and Bonding Requirements. See IronRidge Flush Mount Installation Manual for full ratings.



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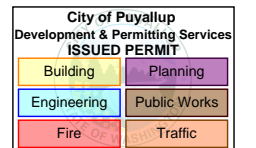
PHONE: (206) 462-1103

LICENSE NO. SOLTEGL838BS

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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371



INSTALLATION

PROJECT NO: GSD-20221010-181220

DRAWN BY: SCM

DATE: 10/31/2022

PV-6C

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FM-FF2-MAN REV 1.20



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.

PE Certified
 Pre-stamped engineering letters available in most states.

Class A Fire Rating
 Certified to maintain the fire resistance rating of the existing roof.

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

UL 2703 Listed System
 Entire system and components meet newest effective UL 2703 standard.

25-Year Warranty
 Products guaranteed to be free of impairing defects.

XR Rails

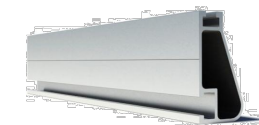
XR10 Rail



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

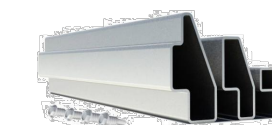
XR1000 Rail



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

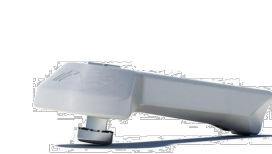
Stopper Sleeves



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

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

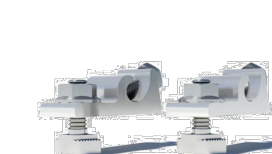
CAMO



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

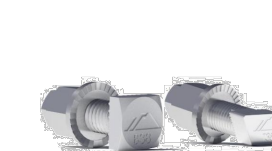
Slotted L-Feet



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

NABCEP Certified Training
 Earn free continuing education credits, while learning more about our systems.
 Go to IronRidge.com/training

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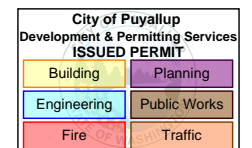
Datasheet

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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
 1922 5TH AVE SW
 PUYALLUP, WA 98371



RACKING DATASHEET

PROJECT NO: GSD-20221010-181220
 DRAWN BY: SCM
 DATE: 10/31/2022

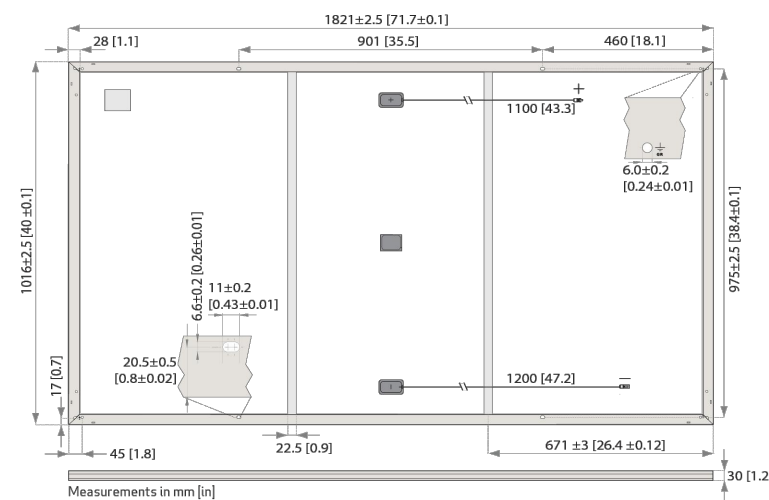
PV-7

SOLAR'S MOST TRUSTED



REC ALPHA PURE BLACK SERIES > PRODUCT SPECIFICATIONS

PRODUCT SPECIFICATIONS



GENERAL DATA

Cell type:	132 half-cut REC heterojunction cells with lead-free, gapless technology 6 strings of 22 cells in series	Connectors:	Stäubli MC4 PV-KBT4/KST4, 12 AWG (4 mm ²) in accordance with IEC 62852 IP68 only when connected
Glass:	0.13 in (3.2 mm) solar glass with anti-reflection surface treatment	Cable:	12 AWG (4 mm ²) PV wire, 43+47 in (11+12 m) in accordance with EN 50618
Backsheet:	Highly resistant polymer (black)	Dimensions:	71.7 x 40 x 1.2 in (1821 x 1016 x 30 mm)
Frame:	Anodized aluminum (black)	Weight:	45 lbs (20.5 kg)
Junction box:	3-part, 3 bypass diodes, IP67 rated in accordance with IEC 62790	Origin:	Made in Singapore

ELECTRICAL DATA

	Product Code*: RECxxxAA Pure Black				
Power Output - P _{MAX} (Wp)	385	390	395	400	405
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V _{MPP} (V)	41.2	41.5	41.8	42.1	42.4
Nominal Power Current - I _{MPP} (A)	9.35	9.40	9.45	9.51	9.56
Open Circuit Voltage - V _{OC} (V)	48.5	48.6	48.7	48.8	48.9
Short Circuit Current - I _{SC} (A)	9.99	10.03	10.07	10.10	10.14
Power Density (W/sq ft)	19.3	19.6	19.8	20.1	20.3
Panel Efficiency (%)	20.8	21.1	21.3	21.6	21.9
Power Output - P _{MAX} (Wp)	293	297	301	305	309
Nominal Power Voltage - V _{MPP} (V)	38.8	39.1	39.4	39.7	40.0
Nominal Power Current - I _{MPP} (A)	7.55	7.59	7.63	7.68	7.72
Open Circuit Voltage - V _{OC} (V)	45.7	45.8	45.9	46.0	46.1
Short Circuit Current - I _{SC} (A)	8.07	8.10	8.13	8.16	8.19

Values at standard test conditions (STC: air mass AM1.5, irradiance 1075 W/sq ft (1000 W/m²), temperature 77°F (25°C) based on a production spread with a tolerance of P_{MAX}, V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m², temperature 68°F (20°C), wind speed 3.3 ft/s (1 m/s). * Where xxx indicates the nominal power class (P_{MAX}) at STC above.

CERTIFICATIONS

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

WARRANTY

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

See warranty documents for details. Conditions apply

MAXIMUM RATINGS

Operational temperature: -40 ... +185°F (-40 ... +85°C)
Maximum system voltage: 1000 V
Maximum test load (front): +7000 Pa (146 lbs/sq ft)
Maximum test load (rear): -4000 Pa (83.5 lbs/sq ft)
Max series fuse rating: 25 A
Max reverse current: 25 A

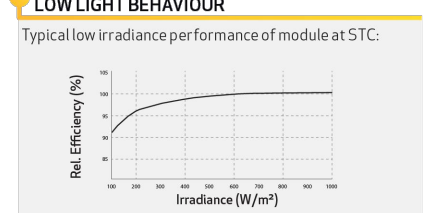
* See installation manual for mounting instructions.
Design load = Test load / 1.5 (safety factor)

TEMPERATURE RATINGS*

Nominal Module Operating Temperature: 44°C (±2°C)
Temperature coefficient of P_{MAX}: -0.26%/°C
Temperature coefficient of V_{OC}: -0.24%/°C
Temperature coefficient of I_{SC}: 0.04%/°C

* The temperature coefficients stated are linear values

LOW LIGHT BEHAVIOUR

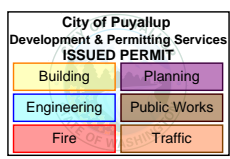


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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371



MODULE DATASHEET

PROJECT NO: GSD-20221010-181220
DRAWN BY: SCM
DATE: 10/31/2022

PV-8

REC ALPHA[®] PURE BLACK SERIES
PRODUCT SPECIFICATIONS

400 WP
20.3 W/FT²



REVISIONS TO ORIGINAL PERMIT PRSOL20221607

1 PV MODULE DATASHEET
PV-8 SCALE: NTS



Specifications subject to change without notice. Ref: PM-DS-12-01-Rev-A 03.21



IQ8M and IQ8A Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



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



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



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



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

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IQ8MA-DS-0003-01-EN-US-2022-03-17

Easy to install

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

High productivity and reliability

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

Microgrid-forming

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

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

** IQ8M and IQ8A supports split phase, 240V installations only.

IQ8M and IQ8A Microinverters

INPUT DATA (DC)		IQ8M-72-2-US	IQ8A-72-2-US
Commonly used module pairings ¹	W	260 – 460	295 – 500
Module compatibility		60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell	
MPPT voltage range	V	33 – 45	36 – 45
Operating range	V	25 – 58	
Min/max start voltage	V	30 / 58	
Max input DC voltage	V	60	
Max DC current ² [module Isc]	A	15	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)		IQ8M-72-2-US	IQ8A-72-2-US
Peak output power	VA	330	366
Max continuous output power	VA	325	349
Nominal (L-L) voltage/range ³	V	240 / 211 – 264	
Max continuous output current	A	1.35	1.45
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 – 68	
AC short circuit fault current over 3 cycles	Arms	2	
Max units per 20 A (L-L) branch circuit ⁴		11	
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.6	97.6
CEC weighted efficiency	%	97	97.5
Night-time power consumption	mW	60	
MECHANICAL DATA			
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)	
Relative humidity range		4% to 100% (condensing)	
DC Connector type		MC4	
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection – no fans	
Approved for wet locations		Yes	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure	
Environ. category / UV exposure rating		NEMA Type 6 / outdoor	
COMPLIANCE			
Certifications		CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEE1547, 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 Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.	

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

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

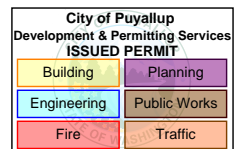
IQ8MA-DS-0003-01-EN-US-2022-03-17

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STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371



INVERTER DATASHEET

PROJECT NO: GSD-20221010-181220

DRAWN BY: SCM

DATE: 10/31/2022



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:	<u>Fire Class Resistance Rating:</u> -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	Reviewed by:	Chad Naggs
Title:	Technician II, Fire Resistance	Title:	Technician I, Fire Resistance
Signature:		Signature:	
Date:	05/25/2016	Date:	05/25/2016

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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

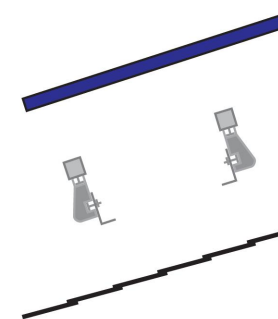
Fire Testing Process

Test Setup

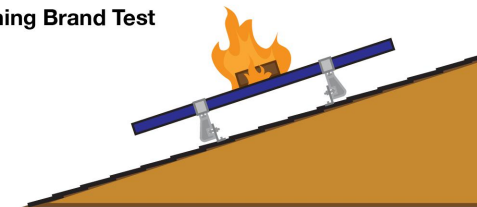
Solar Modules
Solar modules are given a Type classification based on their materials and construction.

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.

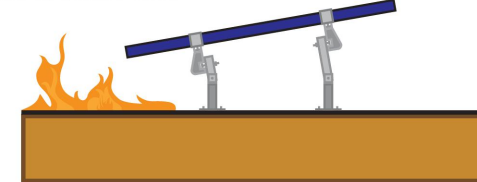


Burning Brand Test



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.

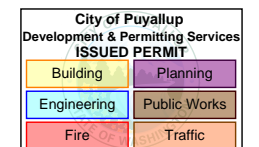


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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371



CLASS A FIRE RATING

PROJECT NO: GSD-20221010-181220

DRAWN BY: SCM

DATE: 10/31/2022

PV-10



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

Attn: Corey Geiger, COO, IronRidge Inc.

Date: September 7th, 2021

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)
- 2018 International Building Code (IBC-2018)
- 2018 Washington State Building Code
- 2015 Aluminum Design Manual (ADM-2015)
- 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:

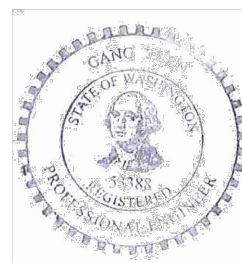
1. *Span* is the distance between two adjacent roof attachment points (measured at the center of the attachment fastener).
2. Each module shall be supported by 2 rails (2 rail system) or 3 rails (3 rail system). Spans are calculated based on 2 rail systems, and conservatively deemed acceptable for 3 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.



28357 Industrial Blvd.
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,



2021.09.07

15:55:03

-07'00'

Gang Xuan, PE
Senior Structural Engineer



SOL TERRA GLOBAL, LLC.

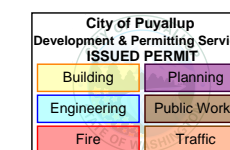
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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371



ENGINEERING LETTER

PROJECT NO: GSD-20221010-181220

DRAWN BY: SCM

DATE: 10/31/2022

PV-11

1 STATE OF WASHINGTON ENGINEERING LETTER (RACKING)
PV-11 SCALE: NTS



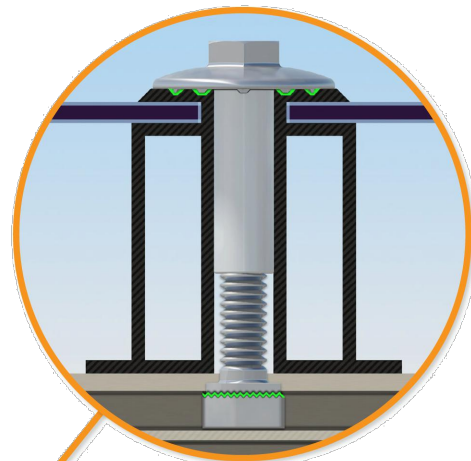
UFO Family of Components

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.

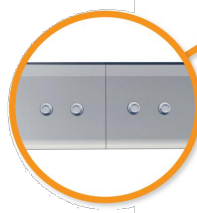
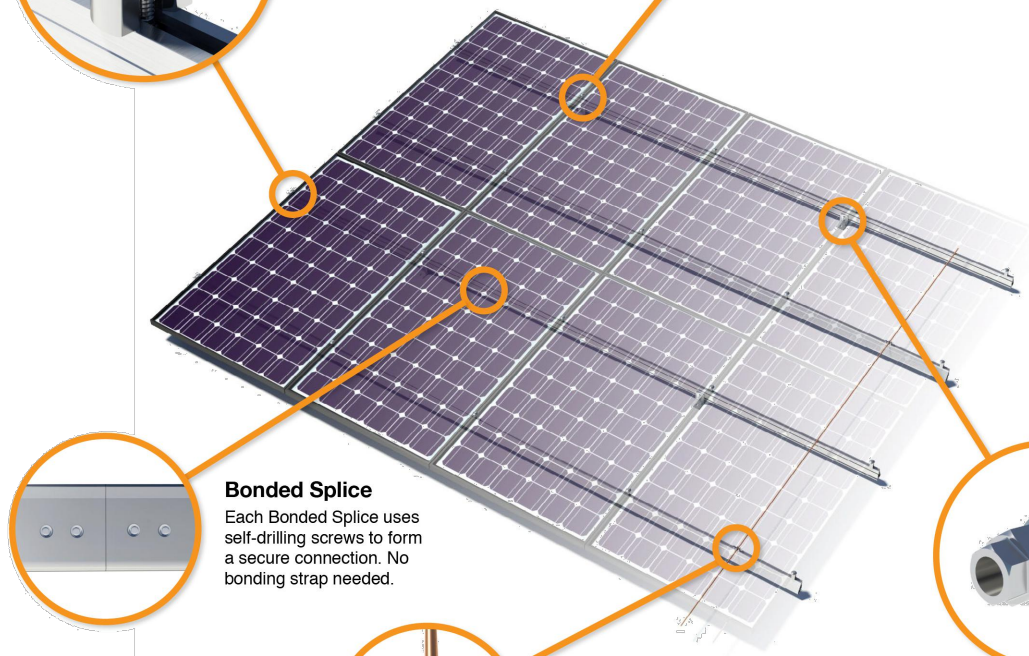
UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



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.



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



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

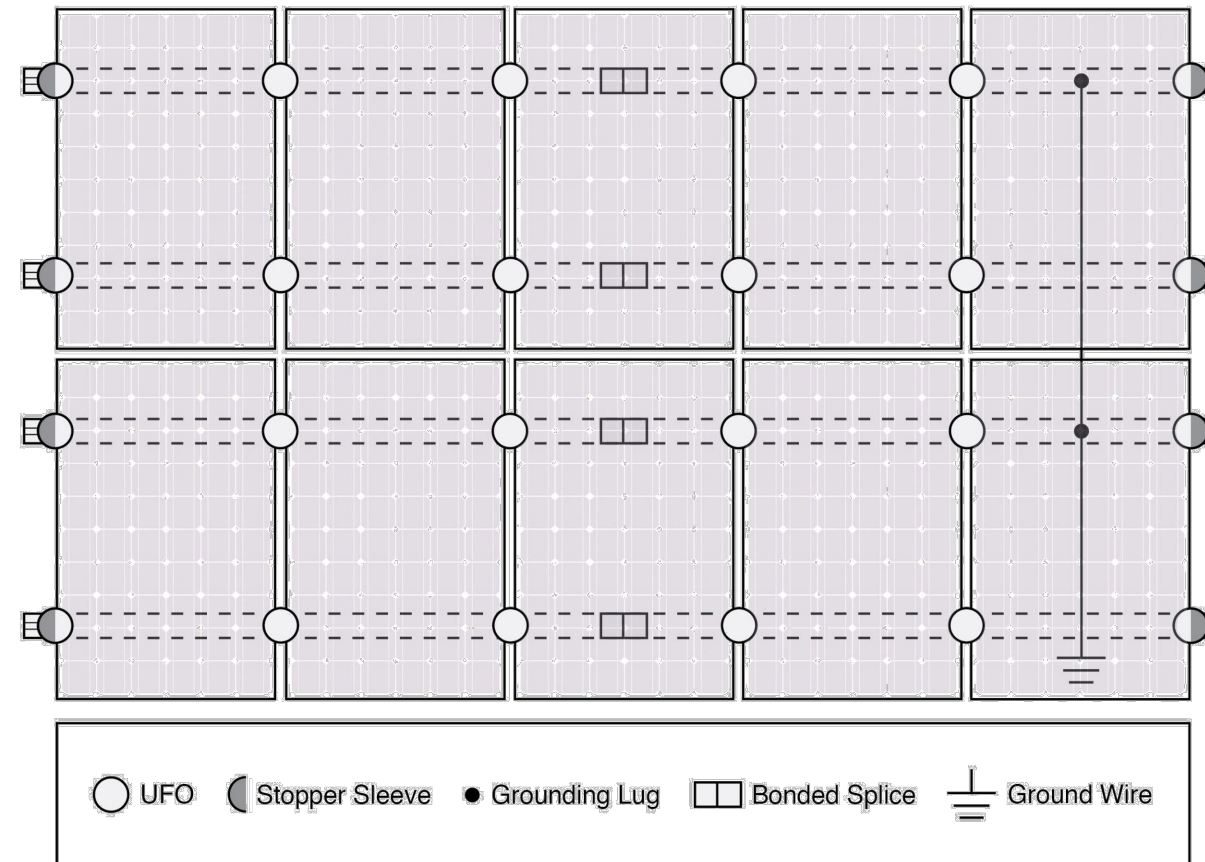


Grounding Lug
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



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

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.		

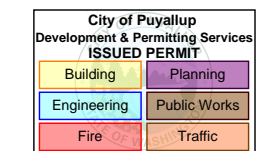


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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
 1922 5TH AVE SW
 PUYALLUP, WA 98371



GROUNDING DETAILS

PROJECT NO: GSD-20221010-181220
 DRAWN BY: SCM
 DATE: 10/31/2022

PV-12

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.

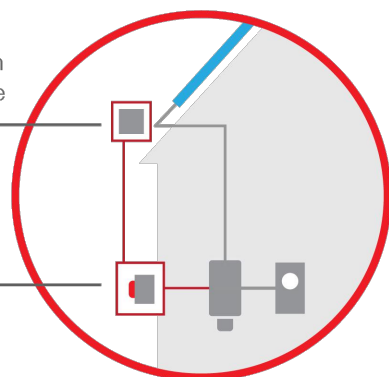
Specialized Rapid Shutdown electrical box installed on the roof within 10 feet of array.

Work around.

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

Work around.

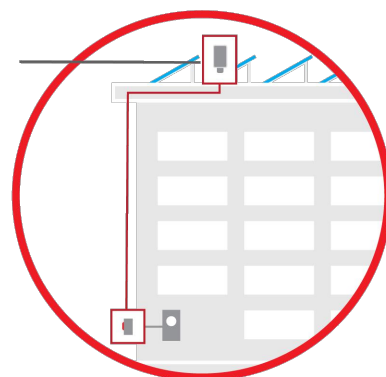
Extra conduit in installation.



Residential String Inverter

Work around.

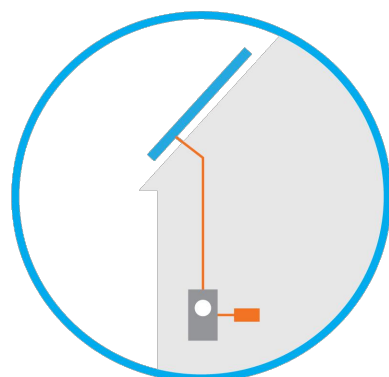
String inverter installed on roof, a hostile environment that string inverters are not built to live in.



Commercial String Inverter

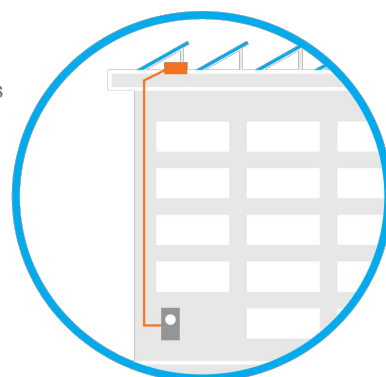
Enphase comes standard with rapid shutdown capability

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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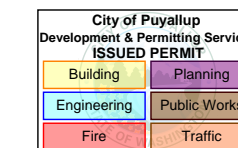
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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371



RAPID SHUTDOWN

PROJECT NO: GSD-20221010-181220

DRAWN BY: SCM

DATE: 10/31/2022

1 RAPID SHUTDOWN DATASHEET
PV-13 SCALE: NTS

PV-13

Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4

X-IQ-AM1-240-4C



To learn more about Enphase offerings, visit enphase.com

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

Smart

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

Simple

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

Reliable

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



Enphase IQ Combiner 4/4C

MODEL NUMBER

IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.

ACCESSORIES AND REPLACEMENT PARTS (not included, order separately)

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

ELECTRICAL SPECIFICATIONS

Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Envoy breaker	10A or 15A rating GE/Siemens/Eaton included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers

MECHANICAL DATA

Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)

INTERNET CONNECTION OPTIONS

Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)

COMPLIANCE

Compliance, IQ Combiner	UL 1741, CAN/CSA C22.2 No. 107.1, 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit enphase.com

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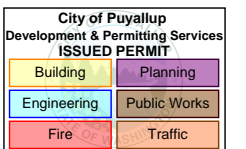


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NEW GRID-TIED SYSTEM 12.555kW

STROBL RESIDENCE
1922 5TH AVE SW
PUYALLUP, WA 98371



IQ COMBINER 4

PROJECT NO: GSD-20221010-181220

DRAWN BY: SCM

DATE: 10/31/2022

PV-14