12/03/2024

[redacted]

Current Renewables Engineering

Subject: Structural Certification for Installation of Residential Solar

Job: [redacted]

Project Address: [redacted] Mabank, TX, 75156

Attn.: To Whom It May Concern

Observation of the condition of the existing framing system was performed by an audit team of roofio, LLC..

After review of the field observation data, structural capacity calculations were performed in accordance with applicable building codes to determine adequacy of the existing roof framing supporting the proposed panel layout. Please see full Structural Calculations report for details regarding calculations performed and limits of scope of work and liability. The design criteria and structural adequacy are summarized below:

Design Criteria

Code: IBC 2018, IRC 2018, IEBC 2018, ASCE 7-16
Risk Category: II
Ult Wind Speed: 115.0 mph
Ground Snow: 5.0 psf
Min Snow Roof: N/A

Signed on: 12/03/2024

Current Renewables Engineering Inc.
Professional Engineer
info@currentrenewableseng.com

Summaries:

Check 1: Shingle roofing supported by 2x4 Truss @ 24 in. OC spacing. The roof is sloped at approximately 18 degrees and has a max beam span of 9.0 ft between supports. Roof is adequate to support the imposed loads. Therefore, no structural upgrades are required.

1760 Chicago Ave Ste J13, Riverside, CA 92507 (951) 405-1733 info@currentrenewableseng.com

CRE Stamped structure / site plans

NEW PHOTOVOLTAIC SYSTEM 6.230 KW DC

[redacted], PAYNE SPRINGS, TX 75156 , USA

-PDF-

GENERAL NOTES

1.1.1 PROJECT NOTES:
1.1.2 THISPHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
1.1.4 GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE MICROINVERTER IN ACCORDANCE WITH NEC 690.41(B)
1.1.5 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4: PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY
1.1.6 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.
1.1.7 ALL INVERTERS, PHOTOVOLTAIC MODULES,PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATIONPER 690.4 (D). SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3].
1.1.8 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

1.2.1 SCOPE OF WORK:
1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ROOF-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT
1.3.1 WORK INCLUDES:
1.3.2 PV RACKING SYSTEM INSTALLATION - IRONRIDGE RAIL: XR10
1.3.3 PV MODULE AND INVERTER INSTALLATION - URE FBM445M7G-BB 445W / SOLAREDGE SE5000H-US / SOLAREDGE POWER OPTIMIZER S500
1.3.4 PV EQUIPMENT ROOF MOUNT
1.3.5 PV SYSTEM WIRING TO A ROOF-MOUNTED JUNCTION BOX
1.3.6 PV LOAD CENTERS (IF INCLUDED)
1.3.7 PV METERING/MONITORING (IF INCLUDED)
1.3.8 PV DISCONNECTS
1.3.9 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
1.3.10 PV FINAL COMMISSIONING
1.3.11 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
1.3.12 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE

PROJECT INFORMATION

OWNER
NAME: [redacted]
PHONE: [redacted]
CONTRACTOR INFORMATION:
CONTRACTOR NAME: [redacted]
CONTRACTOR ADDRESS: [redacted]
CONTRACTOR PHONE: [redacted]

STATE OF TEXAS — LICENSED PROFESSIONAL ENGINEER — [redacted] — Exp: 12/31/2024
Signed on: 12/03/2024

Sample

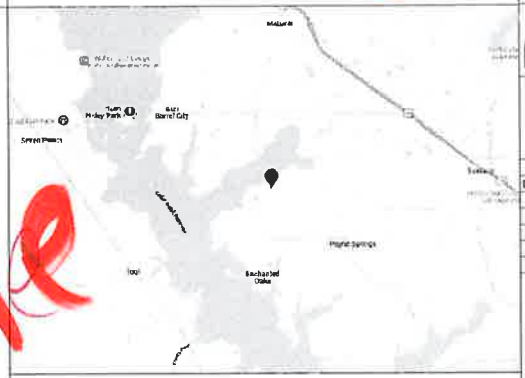
SCOPE OF WORK
SYSTEM SIZE: STC: 14 X 445W = 6.230 KW DC
PTC: 14 X 409.4W = 5.732 KW DC
AC SIZE: 5.000 KW AC
(14) URE: FBM445M7G-BB 445W
(1) SOLAREDGE: SE5000H-US
(14) SOLAREDGE POWER OPTIMIZER S500

ATTACHMENT TYPE: ROOF MOUNT
ROOF MATERIAL: COMP SHINGLE

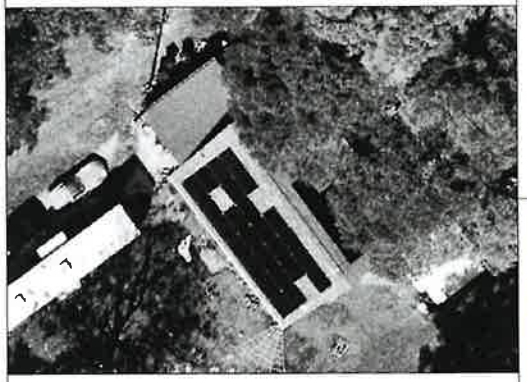
AUTHORITIES HAVING JURISDICTION
BUILDING: CITY PAYNE SPRINGS
ZONING: CITY PAYNE SPRINGS
UTILITY: ONCOR
DESIGN SPECIFICATION
OCCUPANCY: R3/SINGLE FAMILY RESIDENTIAL
CONSTRUCTION TYPE / FIRE RATING: 5-B
GROUND SNOW LOAD: 115 PSF
WIND EXPOSURE: C
WIND SPEED: 5 MPH

APPLICABLE CODES & STANDARDS
2018 International Building Code
2018 International Residential Code
2018 International Fire Code
2018 International Plumbing
2018 International Mechanical Code
2018 International Energy Conservation Code
2018 International Fuel and Gas Code
2018 International Existing Building Code
2018 International Private Sewage Disposal Code
2018 International Property Maintenance Code
2018 International Zoning Code
2018 International Swimming Pool & Spa Code
2018 International Green Construction Code
2018 International Code Council Performance Code for Buildings and Facilities
2017 National Electric Code

VICINITY MAP



SATELLITE VIEW



SHEET INDEX

SIGNATURE WITH SEAL

roofio

[redacted]

REVISIONS

DESCRIPTION	DATE	REV

SITE INFORMATION: [redacted] PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE: 6.230KW

MASTER ELECTRICIAN [redacted]

DATE: 11/27/2024

DESIGNED BY: I. MONTECILLO
DATE: 11/27/2024
REVIEWED BY:
SHEET NAME: COVER PAGE
PAGE #: T-001
REVISION: 0

2.1.1 SITE NOTES:

2.1.2 A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
2.1.3 THE PV MODULESARECONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITHOUT STORAGE BATTERIES.
2.1.4 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
2.1.5 PROPERACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PERSECTION NEC 110.26.
2.1.6 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.

2.2.1 EQUIPMENT LOCATIONS:

2.2.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.
2.2.3 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).
2.2.4 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
2.2.5 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.
2.2.6 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
2.2.7 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.
2.3.1 STRUCTURAL NOTES:

2.3.2 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUSTALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER S INSTRUCTIONS.
2.3.3 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
2.3.4 ROOFTOP PENETRATIONS FOR PV RACEWAY WILLBE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
2.3.5 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.
2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

2.4.1 WIRING & CONDUIT NOTES:

2.4.2 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS AREBASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
2.4.3 CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
2.4.4 VOLTAGE DROP LIMITED TO 1.5%.
2.4.5 DC WIRING LIMITED TO MODULE FOOTPRINT. MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.
2.4.6 AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3- BLUE, YELLOW, ORANGE**, OR OTHER CONVENTION NEUTRAL- WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].

2.5.1 GROUNDING NOTES:

2.5.2 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVISES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
2.5.3 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.
2.5.4 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).
2.5.5 EQUIPMENT GROUNDING CONDUCTORS SHALLBE SIZED ACCORDING TO NEC 690.45 AND MICROINVERTER MANUFACTORERS' INSTRUCTIONS.
2.5.6 EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURERDOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.
2.5.7 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OFA MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
2.5.8 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]
2.5.9 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.
2.5.10 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

2.6.1 DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:
2.6.2 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHENTHE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARECONNECTED TO THE TERMINALS MARKED " LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
2.6.3 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
2.6.4 PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D).
2.6.5 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.
2.6.6 MICROINVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).
2.6.7 IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.

2.7.1 INTERCONNECTION NOTES:

2.7.2 LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)(2)(3)(b)]
2.7.3 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(B)(2)(3)(b)].
2.7.4 THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].
2.7.5 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C).
2.7.6 FEEDER TAP INTERCONECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1)
2.7.7 SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42 2.7.8BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].

SIGNATURE WITH SEAL

roofio

[redacted]

REVISIONS

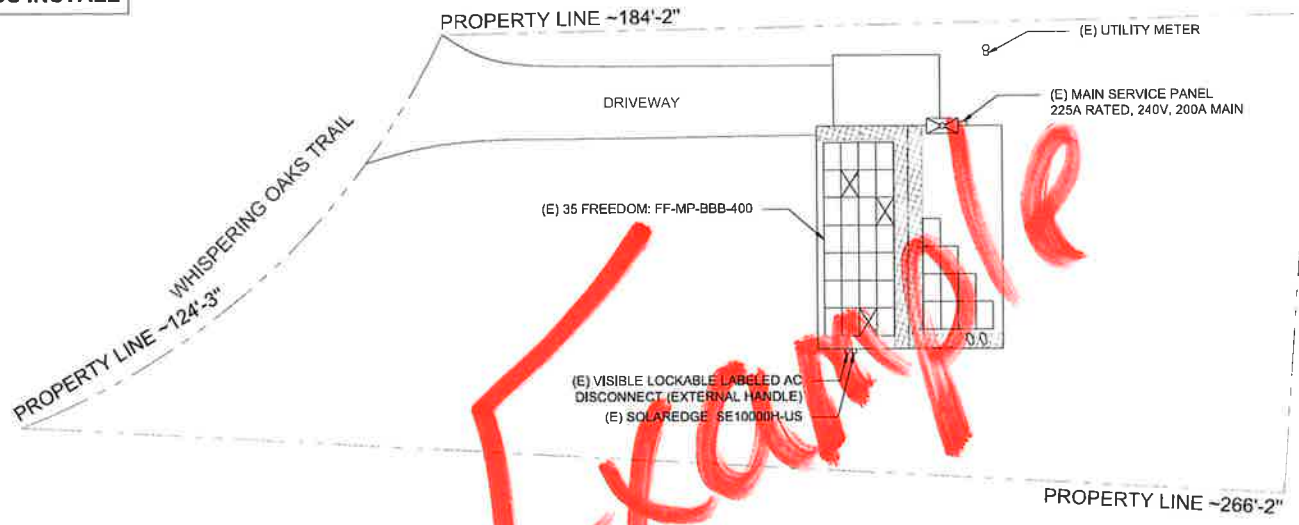
DESCRIPTION	DATE	REV

SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN
[redacted]
DATE: 11/27/2024

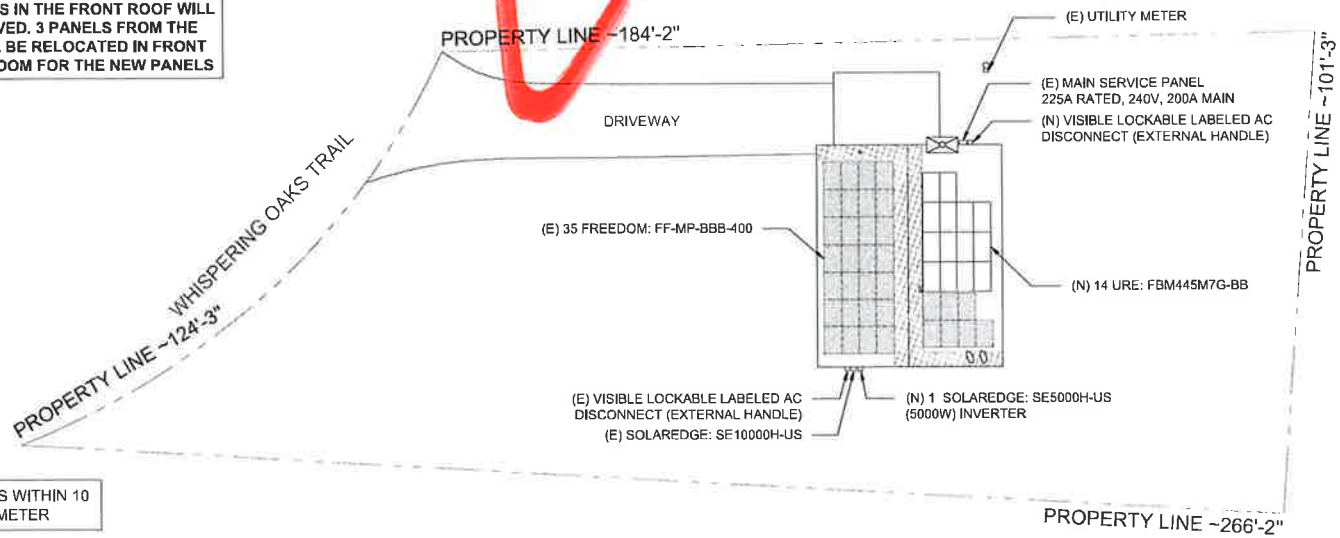
DESIGNED BY: I. MONTECILLO
DATE: 11/27/2024
REVIEWED BY:
SHEET NAME: NOTES
PAGE #: G-001
REVISION: 0

PREVIOUS INSTALL



Example

NOTE: VENTS IN THE FRONT ROOF WILL BE REMOVED. 3 PANELS FROM THE BACK WILL BE RELOCATED IN FRONT TO MAKE ROOM FOR THE NEW PANELS



DISCONNECT IS WITHIN 10 FEET OF METER

ESID #: 1044372000121074 2

LEGEND:

- 3' FIRE SETBACK
- 18" FIRE SETBACK
- LOT
- OBSTRUCTION
- PROPERTY LINE
- CONDUIT RUN
- JB — JUNCTION BOX
- CHIMNEY

STATE OF TEXAS
[redacted]
LICENSED PROFESSIONAL ENGINEER
Exp: 12/31/2024
[redacted]
Signed on: 12/03/2024

SCALE: 1" = 25'

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[redacted]

REVISIONS

DESCRIPTION	DATE	REV

SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN
[redacted]

DATE: 11/27/2024

DESIGNED BY: I. MONTECILLO

DATE: 11/27/2024

REVIEWED BY:

SHEET NAME: SITE PLAN

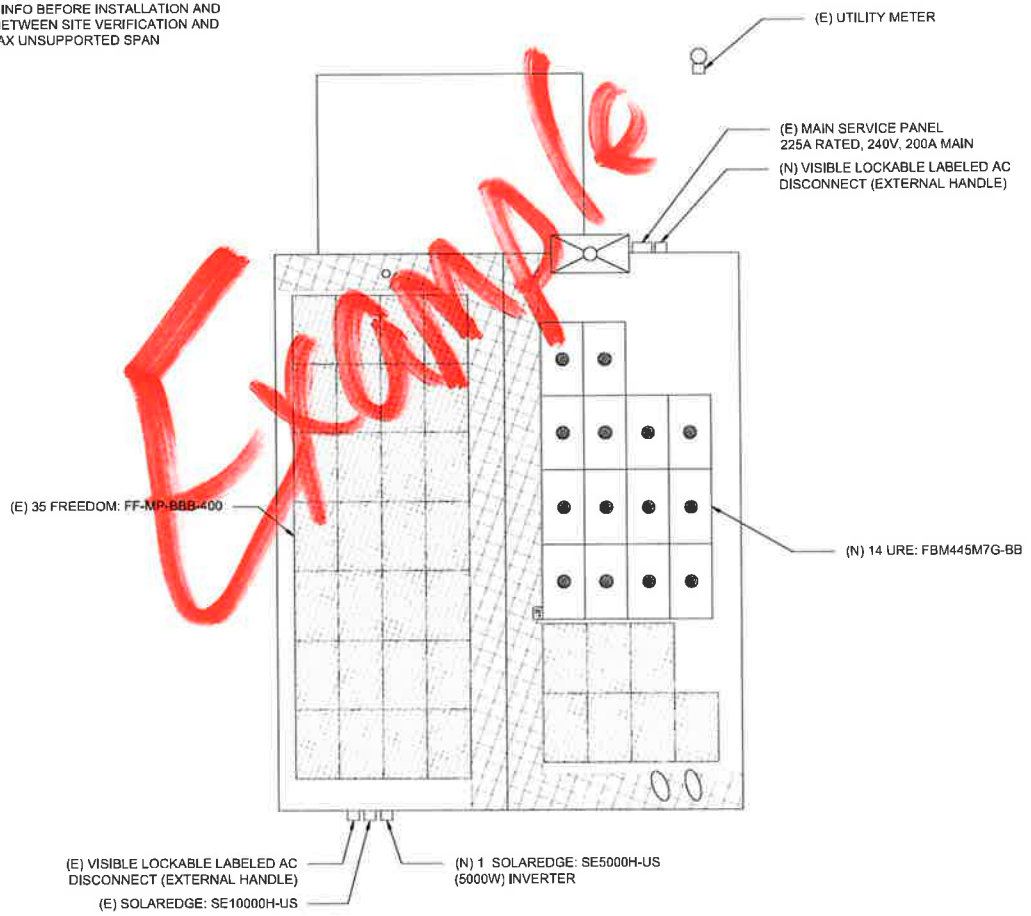
PAGE #: A-101

REVISION: 0

STRUCTURAL NOTES :1. THESE PLANS ARE STAMPED FOR STRUCTURAL CODE COMPLIANCE OF THE ROOF FRAMING SUPPORTING THE PROPOSED PV INSTALLATION ONLY.2. THESE PLANS ARE NOT STAMPED FOR WATER LEAKAGE.3. PV MODULES, RACKING, AND ATTACHMENT COMPONENTS MUST FOLLOW MANUFACTURER GUIDELINES AND REQUIREMENTS.4. PLEASE SEE THE ACCOMPANYING STRUCTURAL CALCULATIONS REPORT FOR ADDITIONAL INFORMATION.5. PRIOR TO COMMENCEMENT OF WORK, THE SOLAR INSTALLER SHALL VERIFY THE ROOF FRAMING INFO BEFORE INSTALLATION AND NOTIFY THE E.O.R. IF THERE IS ANY INCONSISTENCY BETWEEN SITE VERIFICATION AND FOLLOWING: 2x4 TRUSSES @ 24" OC SPACING WITH MAX UNSUPPORTED SPAN EQUAL OR LESS THAN 9 FT.

ROOF SECTION(S)

SECTION	COUNT	AZIMUTH	TILT
ROOF 1	14	53	18



MODULE STRING 1

LEGEND:

- 3' FIRE SETBACK
- 18" FIRE SETBACK
- LOT
- OBSTRUCTION
- PROPERTY LINE
- CONDUIT RUN
- JB JUNCTION BOX
- CHIMNEY

DISCONNECT IS WITHIN 10 FEET OF METER

ESID #: 10443720001210742

STATE OF TEXAS
[redacted]
LICENSED PROFESSIONAL ENGINEER
Exp: 12/31/2024
[redacted]
Signed on: 12/03/2024

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[redacted]

REVISIONS

DESCRIPTION	DATE	REV

SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN
[redacted]
DATE: 11/27/2024

DESIGNED BY: I. MONTECILLO
DATE: 11/27/2024
REVIEWED BY:
SHEET NAME: ELECTRICAL PLAN
PAGE #: A-102
REVISION: 0

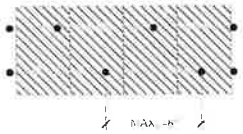
ELECTRICAL PLAN

DRAWING SCALE: 1" = 10'

ROOF SECTION(S)

ROOF 1	ROOF MATERIAL - COMP SHINGLE TRUSS SIZE - 2"X4" TRUSSES O.C. SPACING - 24" O.C.

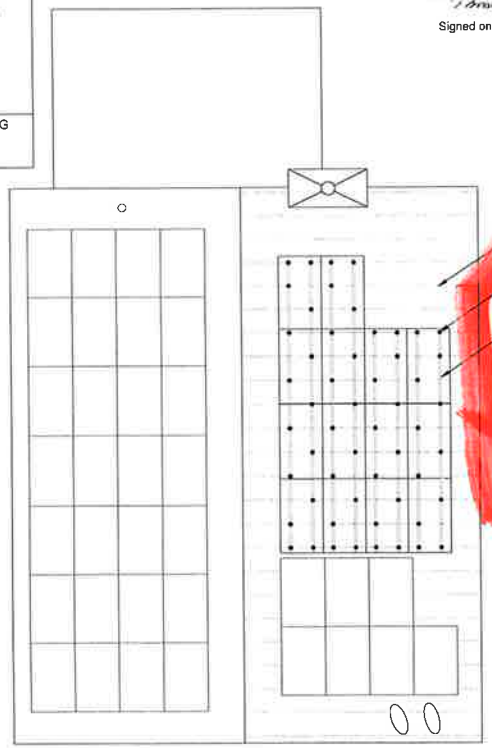
MOUNTING PATTERN SAMPLE



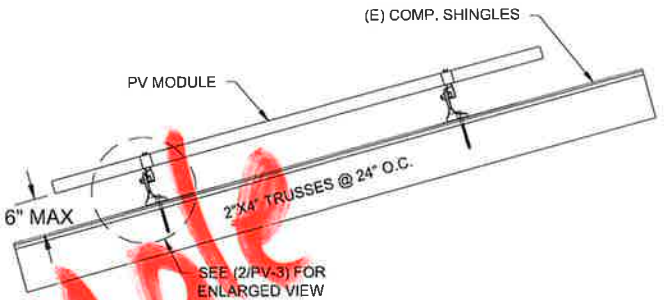
MAXIMUM MOUNT SPACING: 48"

ALL HARDWARE, INCLUDING MOUNTING AND RACKING, TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.

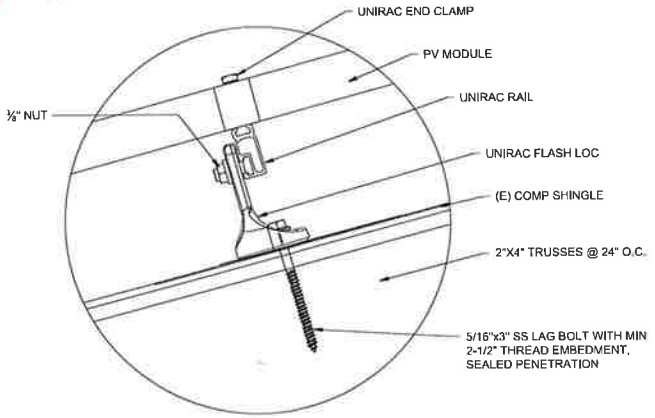
STATE OF TEXAS
[redacted] MOVASSAGHI
LICENSED
PROFESSIONAL ENGINEER
Exp: 12/31/2024
[redacted]
Signed on: 12/03/2024



ROOF #1
AZIMUTH 53°
PITCH 18°



PANELS WILL HAVE A SEPARATION FROM THE ROOF OF NO MORE THAN 6"



Example

SCALE: 1" = 10'

SIGNATURE WITH SEAL

roofio

[redacted]

REVISIONS

DESCRIPTION	DATE	REV

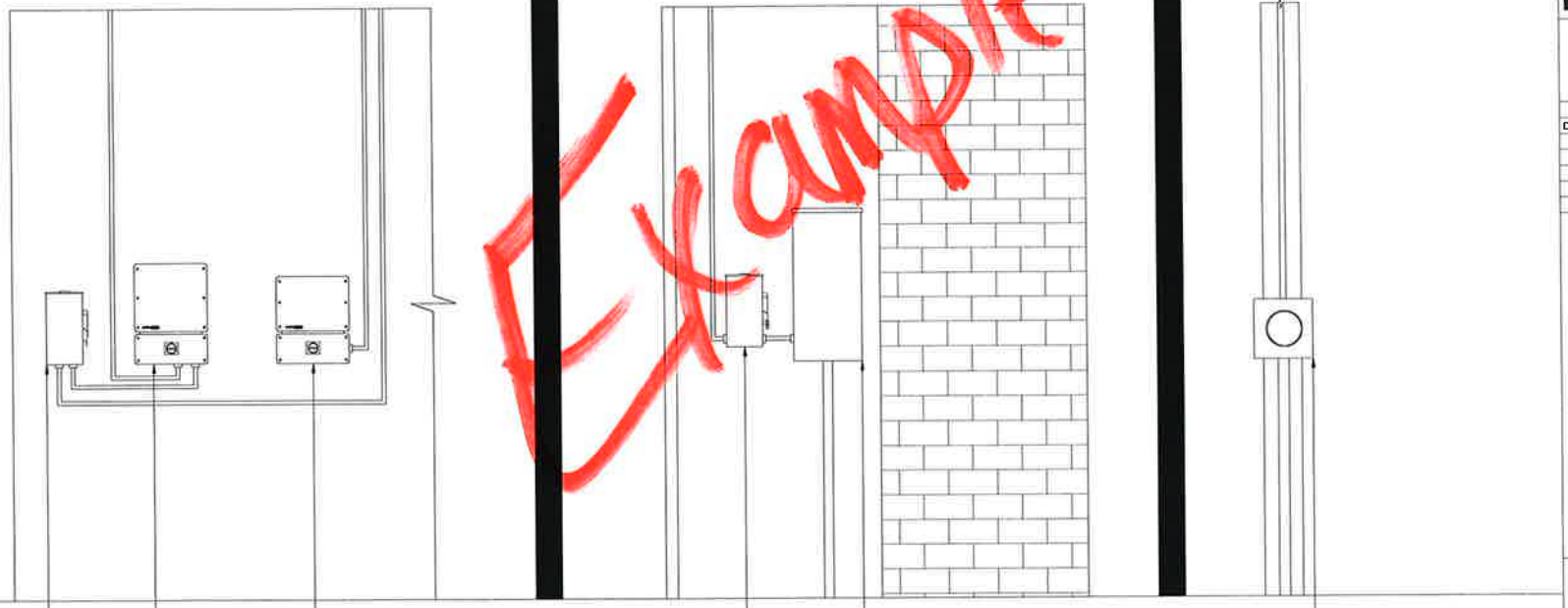
SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN
[redacted]

DATE: 11/27/2024

DESIGNED BY: I. MONTECILLO
DATE: 11/27/2024
REVIEWED BY:
SHEET NAME: ATTACHMENT PLAN
PAGE #: A-103
REVISION: 0

AC DISCONNECT DIMENSIONS:
HEIGHT: 14.88", WIDTH: 7.45", DEPTH: 4.87".
INVERTER DIMENSIONS:
HEIGHT: 17.7", WIDTH: 14.6", DEPTH: 6.8".
EQUIPMENT MOUNTING HEIGHTS: APPROX 4 FEET.
PANEL HEIGHT ON ROOF: 4 INCHES MAX.



(N) 1 SOLAREDGE: SE5000H-US
(5000W) INVERTER (TO BE INSTALLED)

(E) MAIN SERVICE PANEL
225A RATED, 240V, 200A MAIN

(E) UTILITY METER

(E) 1 SOLAREDGE: SE10000H-US

(N) VISIBLE LOCKABLE LABELED
AC DISCONNECT (EXTERNAL HANDLE)
(TO BE INSTALLED)

(E) VISIBLE LOCKABLE LABELED
AC DISCONNECT (EXTERNAL HANDLE)

ELEVATION PLAN

DRAWING SCALE: NTS

SIGNATURE WITH SEAL

roofio

[redacted]

REVISIONS

DESCRIPTION	DATE	REV

SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156

DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN
[redacted]

DATE: 11/27/2024

DESIGNED BY: I. MONTECILLO

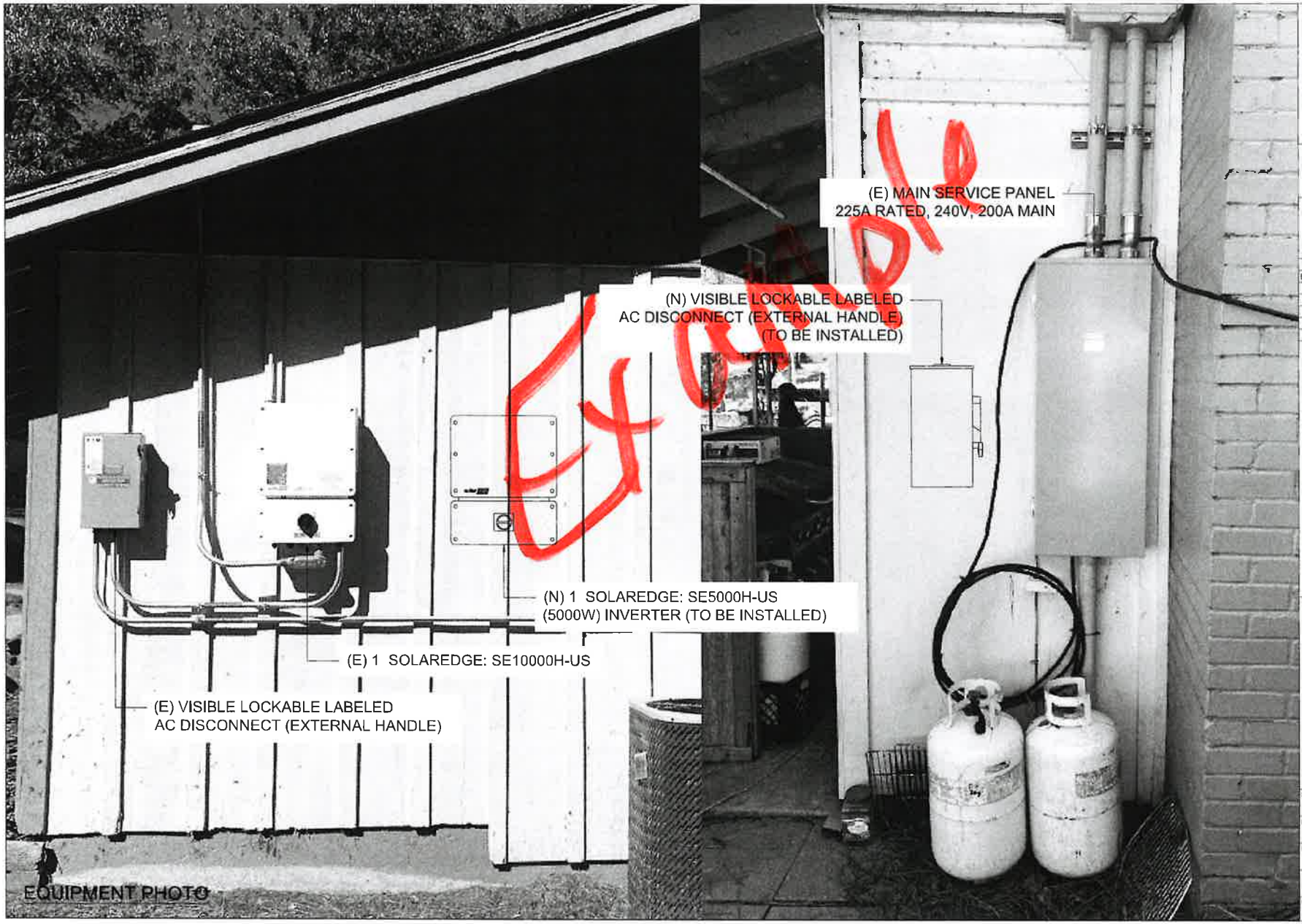
DATE: 11/27/2024

REVIEWED BY:

SHEET NAME: ELEVATION PLAN

PAGE #: A-104

REVISION: 0



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roofio

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SITE INFORMATION:

PAYNE SPRINGS, TX 75156

DC SYSTEM SIZE:
6.230KW

MASTER ELECTRICIAN

DATE: 11/27/2024

DESIGNED BY
I. MONTECILLO

DATE
11/27/2024

REVIEWED BY

SHEET NAME
EQUIPMENT PHOTO

PAGE #
A-105

REVISION
0

EQUIPMENT SCHEDULE

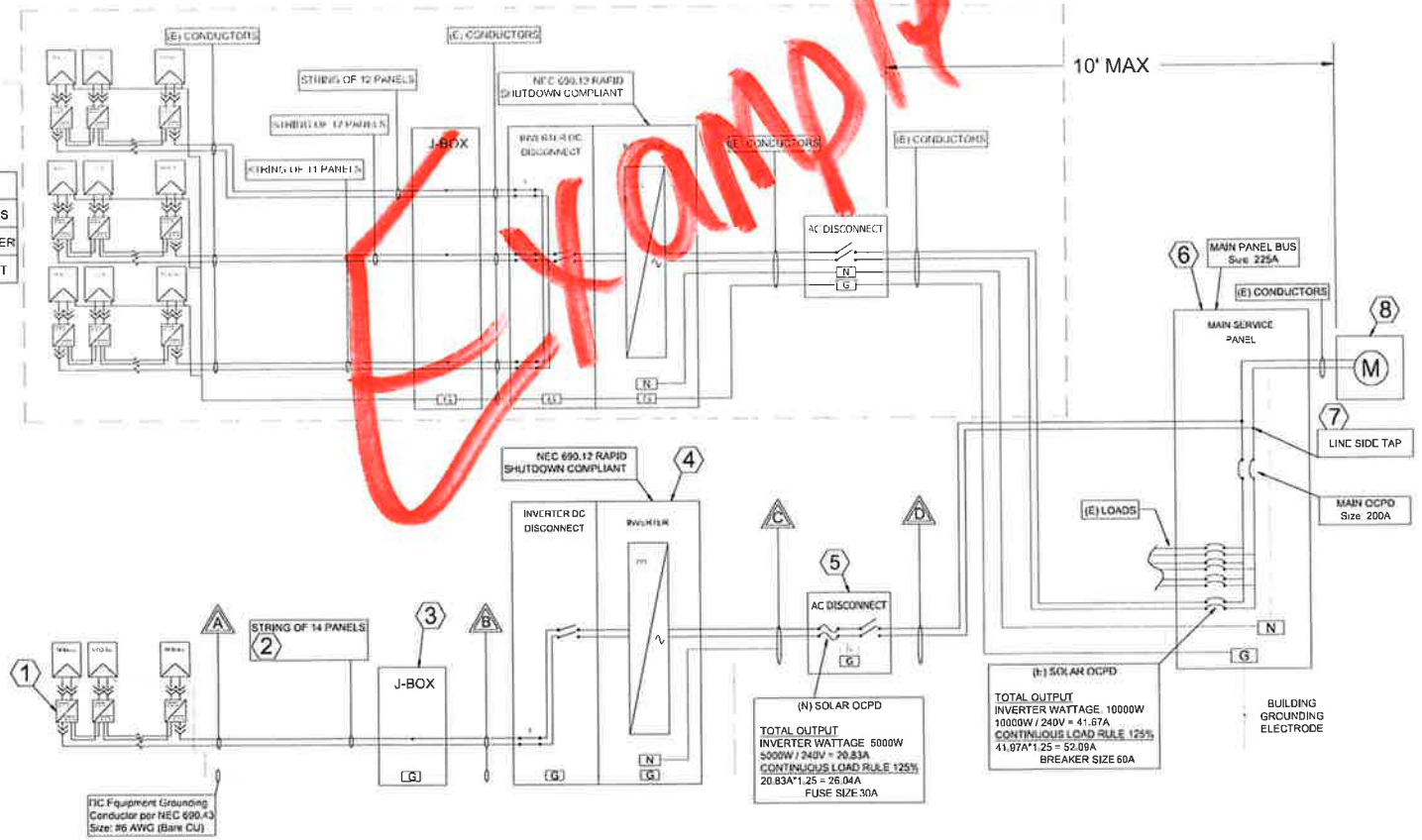
	DESCRIPTION	COMPONENT
1	(N) STRING OF SOLAREDGE POWER OPTIMIZERS	14 SOLAREDGE S500 POWER OPTIMIZERS
2	(N) SOLAR PV MODULES	14 URE FBM445M7G-BB 445W
3	(N) JUNCTION BOX	JUNCTION BOX
4	(N) SOLAREDGE INVERTER	1 SOLAREDGE SE5000H-US
5	(N) VISIBLE LOCKABLE LABELED AC DISCONNECT	60A FUSIBLE AC DISCONNECT WITH 30A FUSES
6	(E) MAIN SERVICE PANEL	225A RATED, 240V, 200A MAIN BREAKER
7	(N) LINE SIDE TAP	LINE SIDE TAP
8	(E) UTILITY METER	METER NUMBER: 195 758 394

ELEC.TAG	CONDUCTOR # OF CURRENT CARRYING CONDUCTORS	WIRE SIZE	TYPE PER CONDUIT	GROUND CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			CONDUIT SIZE	CONDUIT TYPE
A	PV-WIRE			1	AWG #6	BARE COPPER EGC	N/A	FREE AIR
B	2	AWG #10	THWN-2,COPPER	1	AWG #8	THWN-2,COPPER EGC	3/4"	EMT
C	3	AWG #10	THWN-2,COPPER	1	AWG #8	THWN-2,COPPER EGC	3/4"	EMT
D	3	AWG #6	THWN-2,COPPER	1	AWG #8	THWN-2,COPPER EGC	3/4"	EMT

DC SYSTEM SIZE: 6.230 kW DC
AC SYSTEM SIZE: 5.000 kW AC

(14) URE: FBM445M7G-BB 445W
(1) STRING OF 14 MODULES CONNECTED IN SERIES

EXISTING SYSTEM: 14.00 KW DC
(E) 35 FREEDOM: FF-MP-BBB-400 PANELS
(E) 1 SOLAREDGE: SE10000H-US INVERTER
(E) 1 60A NON-FUSIBLE AC DISCONNECT



Example

DISCONNECT IS WITHIN 10 FEET OF METER

ESID #: 10443720001210742

CONTRACTOR LICENSE # 35769 (ELECTRICAL)

SIGNATURE WITH SEAL

roofio

REVISIONS

DESCRIPTION	DATE	REV

SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN

DATE: 11/27/2024

DESIGNED BY: I. MONTECILLO
DATE: 11/27/2024
REVIEWED BY:
SHEET NAME: ELECTRICAL LINE DIAGRAM
PAGE #: E-601
REVISION: 0

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	URE FBM445M7G-BB
VMP	34.80V
IMP	12.79A
VOC	41.90V
ISC	13.48A
TEMP. COEFF. VOC	-0.27%/°C
PTC RATING	409.4W
MODULE DIMENSION	75.12"L x 44.65W x 1.38"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	SOLAREDGE SE5000H-US
NOMINAL AC POWER	5000 W
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	21 A

POWER OPTIMIZER (OPTIMIZER S500)	
MAXIMUM INPUT POWER	500 W
MINIMUM INPUT VOLTAGE	8 W
MAXIMUM INPUT VOLTAGE	60 W
MAXIMUM MODULE ISC	11 W
MAXIMUM OUTPUT CURRENT	15 W

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
0.80	4-6
0.70	7-9
0.50	10-20

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-6°
AMBIENT TEMP (HIGH TEMP 2%)	37°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	59°
CONDUCTOR TEMPERATURE RATE	90°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.27%/°C

DC CONDUCTOR AMPACITY CALCULATIONS: FROM ROOF TOP JUNCTION BOX TO INVERTER

AMBIENT TEMPERATURE ADJUSTMENT FOR EXPOSED CONDUIT
PER NEC 310.15(B)(2)(c): + 22°
EXPECTED WIRE TEMP (°C): 37° + 22° = 59°
TEMP CORRECTION PER TABLE 310.15: 0.71
#OF CURRENT CARRYING CONDUCTORS: 2
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a): 1
CIRCUIT CONDUCTOR SIZE: 10 AWG
CIRCUIT CONDUCTOR AMPACITY: 40 A

DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.15
TEMP CORR. PER NEC TABLE 310.15 X
CONDUIT FILL CORR. PER NEC 310.15(B)(2)(a) X
CIRCUIT CONDUCTOR AMPACITY = 0.71 X 1 X 40 = 28.4A

AC CONDUCTOR AMPACITY CALCULATIONS: FROM INVERTER TO AC DISCONNECT

EXPECTED WIRE TEMP (°C): 37°
TEMP CORRECTION PER NEC TABLE 310.15: 0.91
CIRCUIT CONDUCTOR SIZE: 10 AWG
CIRCUIT CONDUCTOR AMPACITY: 40A
#OF CURRENT CARRYING CONDUCTORS: 3
CONDUIT FILL PER NEC 310.15(B)(2)(a): 1
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(B):
1.25 X OUTPUT CURRENT OF INVERTER
1.25 X 21 = 26.25A

DERATED AMPACITY OF CIRCUIT CONDUCTORS PER NEC TABLE 310.15:
TEMP CORR. PER NEC 310.15 X
CONDUIT FILL CORR. PER NEC 310.15(B)(2)(a) X
CIRCUIT CONDUCTOR AMPACITY =
0.91 X 1.00 X 40 = 36.4A

AC CONDUCTOR AMPACITY CALCULATIONS: FROM AC DISCONNECT TO MSP

EXPECTED WIRE TEMP (°C): 37°
TEMP CORRECTION PER NEC TABLE 310.15: 0.91
CIRCUIT CONDUCTOR SIZE: 6 AWG
CIRCUIT CONDUCTOR AMPACITY: 75A
#OF CURRENT CARRYING CONDUCTORS: 3
CONDUIT FILL PER NEC 310.15(B)(2)(a): 1
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(B):

DERATED AMPACITY OF CIRCUIT CONDUCTORS PER NEC TABLE 310.15:
TEMP CORR. PER NEC 310.15 X
CONDUIT FILL CORR. PER NEC 310.15(B)(2)(a) X
CIRCUIT CONDUCTOR AMPACITY =
0.91 X 1.00 X 75 = 68.25A

SIGNATURE WITH SEAL

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[redacted]

REVISIONS

DESCRIPTION	DATE	REV

SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN

DATE: 11/27/2024

DESIGNED BY: I. MONTECILLO

DATE: 11/27/2024

SHEET NAME: ELECTRICAL CALCULATIONS

PAGE #: E-602

REVISION: 0

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL 1
ON ALL CONDUITS SPACED AT MAX 10FT

! WARNING !
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS.
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 5
AT EACH AC DISCONNECT

! CAUTION ! SOLAR POINT OF INTERCONNECTION

LABEL 9
AT UTILITY METER

PHOTOVOLTAIC AC DISCONNECT SWITCH
RATED OUTPUT CURRENT: 20.83 AMPS
NOMINAL OPERATING VOLTAGE: 240 VOLTS

LABEL 11
AT AC DISCONNECT: ADD LABEL TO INTERIOR OF AC DISCONNECT AS WELL AS THE EXTERIOR.

! CAUTION ! SOLAR ELECTRIC SYSTEM CONNECTED AND ENERGIZED

LABEL 2
AT INVERTER

PHOTOVOLTAIC AC DISCONNECT

LABEL 6
AT EACH AC DISCONNECT

! WARNING !
THE SERVICE METER IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM

LABEL 10
AT UTILITY METER

MAXIMUM VOLTAGE	480	V
MAXIMUM CIRCUIT CURRENT	13.5	A
MAX RATED OUTPUT CURRECT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)	15	A

LABEL 12
AT INVERTER

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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

LABEL 3
AT INVERTER

! WARNING !
DUAL POWER SOURCES
SECOND SOURCE IS PV SYSTEM

LABEL 7
AT MEP

PHOTOVOLTAIC DC DISCONNECT

LABEL 4
AT DC DISCONNECT

! WARNING !
SOLAR SYSTEM CONNECTED AND ENERGIZED

LABEL 8
AT MEP

Example

PV METER

LABEL 13
AT PV METER SOCKET

REVENUE METER

LABEL 14
AT CPS ENERGY REVENUE METER SOCKET

SIGNATURE WITH SEAL

roofio

REVISIONS

DESCRIPTION	DATE	REV

SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN

DATE: 11/27/2024

DESIGNED BY
I. MONTECILLO

DATE
11/27/2024

SHEET NAME
LABELING

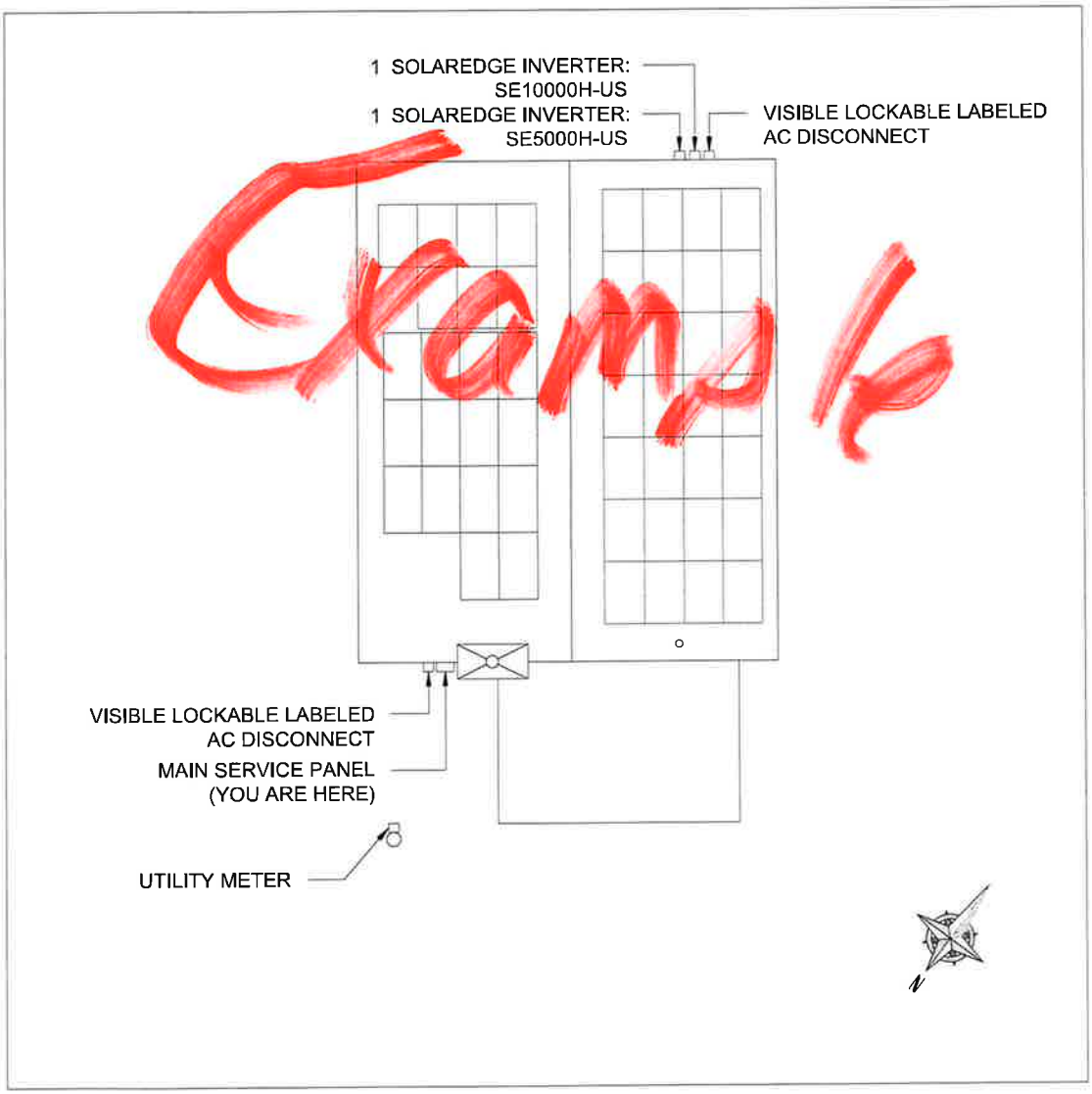
PAGE #
E-603

REVISION
0

CAUTION

CAUTION MULTIPLE SOURCES OF POWER. POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCE(S) WITH DISCONNECTS LOCATED AS SHOWN.

[redacted]



URE

UNITED RENEWABLE ENERGY

FBM445M7G-BB / 120 cells
445 Watt Mono-Crystalline PV Module

URE modules use state-of-the-art cell cutting technology, and advanced module manufacturing experience to provide leading power density and long term reliability.

UL 61730, CE-compliant
Quality Controlled PV-TÜV
SUD IEC 61215:2016,
IEC 61730:2016
Type 1/Class C Fire Rating

Key Features

- At 445 Watts and 20.57% Efficiency URE Solar Panels are Industry Leaders in Output and Efficiency
- 25 Year Output Warranty and 25 Year Product Guarantee
- Super All Black Design with more Uniform Appearance for High Profile Residential Installations
- High Quality Solar Cell Technology allows URE to be a major international exporter to Solar Module manufacturers in the United States and Europe
- Excellent Performance in Low Light and Poor Weather Conditions to Maximize Energy Harvest
- Winner of Taiwan Excellence Award 7 Consecutive Years for Highest Efficiency Module

Example

THE IDEAL SOLUTION FOR:

- Rooftop arrays on residential buildings
- Residential ground mount arrays

UNITED RENEWABLE ENERGY

For more information, please visit us at ***www.ureusa.com***

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UNITED RENEWABLE ENERGY

Electrical Data

Model - STC		FBM440M7G-BB	FBM445M7G-BB	FBM450M7G-BB	FBM455M7G-BB
Maximum Rating Power (Pmax)	[W]	440	445	450	455
Module Efficiency	[%]	20.34	20.57	20.80	21.03
Open Circuit Voltage (Voc)	[V]	41.70	41.90	42.10	42.30
Maximum Power Voltage	[V]	34.60	34.80	35.00	35.20
Short Circuit Current (Isc)	[A]	13.41	13.48	13.56	13.63
Maximum Power Current	[A]	12.72	12.79	12.86	12.93

*Standard Test Condition (STC): Cell Temperature 25 °C, Irradiance 1000 W/m², AM 1.5
*Values without tolerance are typical numbers.Measurement tolerance: ± 3%

Mechanical Data

Item	Specification
Dimensions	1908 mm (L)[1] x 1134 mm (W)[1] x 35 mm (D)[2] / 75.12" (L)[1] x 44.65" (W)[1] x 1.38" (D)[2]
Weight	24.2 kg / 53.35 lbs
Solar Cell	12x10 pieces monocrystalline solar cells series strings
Front Glass	White toughened safety glass, 3.2mm thickness
Cell Encapsulation	EVA (Ethylene-Viny-Acetate)
Back Cover	Black composite film
Frame	Black anodized aluminum profile
Junction Box	IP 68, 3 diodes
Connectors Type	Staubli MC4
Cable	1200mm (cable length can be customized), 4mm²
Package Configuration	31 pcs Per Pallet, 744 pcs per 40' HQ container

[1] : With assembly tolerance of ± 2 mm [± 0.08"]
[2] : With assembly tolerance of ± 0.8 mm [± 0.03"]

Operating Conditions

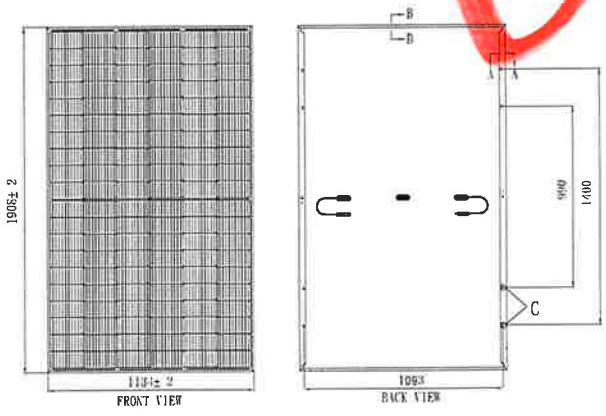
Item	Specification
Mechanical Load	5400 Pa
Maximum System Voltage	1000V
Series Fuse Rating	30 A
Operating Temperature	-40 to 85 °C

Temperature Characteristics

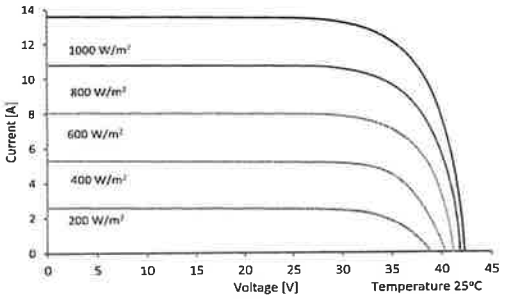
Item	Specification
Nominal Module Operating Temperature	45°C ± 2°C
Temperature Coefficient of Isc	0.048 % / °C
Temperature Coefficient of Voc	-0.27 % / °C
Temperature Coefficient of Pmax	-0.33 % / °C

*Nominal module operating temperature (NMOT): Air mass AM 1.5, irradiance 800W/m², temperature 20°C, windspeed 1 m/s.
*Reduction in efficiency from 1000W/m² to 200W/m² at 25°C: 3.5 ± 2%.

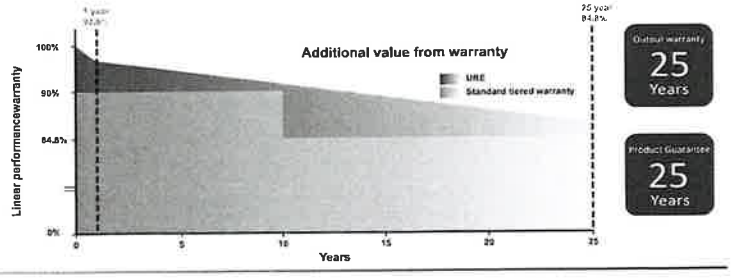
Engineering Drawing (mm)



Dependence on Irradiance



Reliability with Warranty



UNITED RENEWABLE ENERGY

For more information, please visit us at ***www.ureusa.com***

INVERTERS

Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014, NEC 2017 and NEC 2020 per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

solaredge

/ Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4							
OUTPUT								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5[1]							Hz
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A
Power Factor	1, Adjustable - 0.85 to 0.85							
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
INPUT								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380				400			Vdc
Maximum Input Current @240V[2]	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V[2]	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600kΩ Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W

(1) For other regional settings please contact SolarEdge support
(2) A higher current source may be used, the inverter will limit its input current to the values stated

Power Optimizer
For Residential Installations

S440, S500

POWER OPTIMIZER

Example

Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules

* Functionality subject to inverter model and firmware version

solaredge.com

solaredge

/ Power Optimizer

For Residential Installations

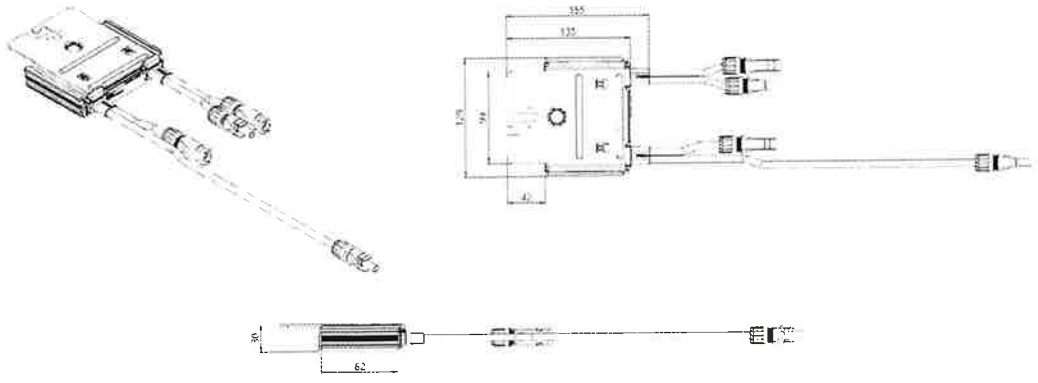
S440, S500

	S440	S500	UNIT
Rated Input DC Power[1]	440	500	W
Absolute Maximum Input Voltage (Voc)	60		Vdc
MPPT Operating Range	8 - 60		Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	12.5	15	Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.6		%
Overvoltage Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	15		Adc
Maximum Output Voltage	60		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1		Vdc
STANDARD COMPLIANCE			
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011		
Safety	IEC62109-1 (class II safety), UL1741		
Material	UL94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 155 x 30		mm
Weight (including cables)	655 / 1.5		gr / lb
Input Connector	MC4[2]		
Input Wire Length	0.1		m
Output Connector	MC4		
Output Wire Length	(+) 2.3, (-) 0.10		m
Operating Temperature Range[3]	-40 to +85		°C
Protection Rating	IP68 / NEMA6P		
Relative Humidity	0 - 100		%

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed
(2) For other connector types please contact SolarEdge
(3) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

PV System Design Using a SolarEdge Inverter		Single Phase HD-Wave	Three Phase	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500	8	16	18	
Maximum String Length (Power Optimizers)		25	50		
Maximum Nominal Power per String[4]		5700	11250[5]	12750[6]	W
Parallel Strings of Different Lengths or Orientations		Yes			

(4) If the inverters rated AC power ≤ maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power. Refer to https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf
(5) For the 230/400V grid it is allowed to install up to 13,500W per string when the maximum power difference between each string is 2,000W
(6) For the 277/480V grid it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W
(7) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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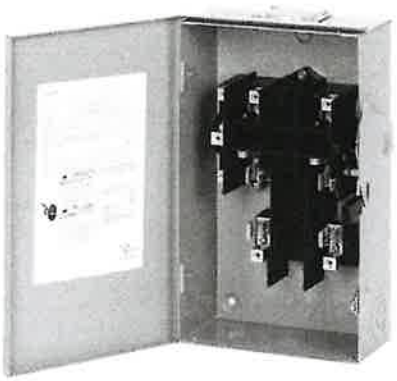


General Duty Cartridge Fuse Safety Switch

DG222NRB

UPC:782113144221

Dimensions:

- **Height:** 7 IN
- **Length:** 6.41 IN
- **Width:** 8.4 IN

Weight:9 LB

Notes: Maximum hp ratings apply only when dual element fuses are used. 3-Phase hp rating shown is a grounded B phase rating, UL listed.

Warranties:

- Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

Specifications:

- **Type:** General Duty/Cartridge Fuse
- **Amperage Rating:** 60A
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Painted galvanized steel
- **Fuse Class Provision:** Class H fuses
- **Fuse Configuration:** Fusible with neutral
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Three-wire
- **Product Category:** General Duty Safety Switch
- **Voltage Rating:** 240V

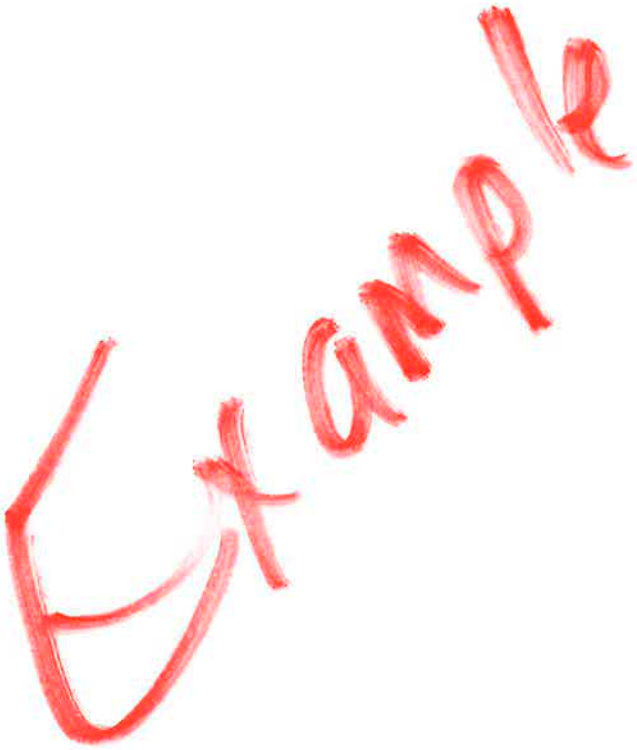
Supporting documents:

- Eatons Volume 2-Commercial Distribution
- Eaton Specification Sheet - DG222NRB

Certifications:

- UL Listed

Product compliance: No Data



FLASH LOC

UNIRAC®

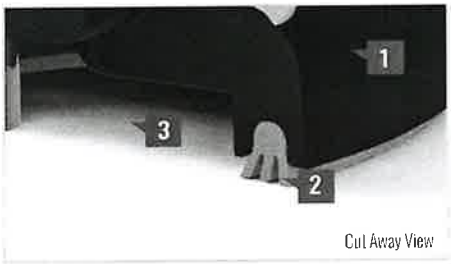
BETTER SOLAR STARTS HERE

FLASHLOC is the ultimate attachment for composition shingle and rolled comp roofs. The all-in-one mount installs fast — no kneeling on hot roofs to install flashing, no prying or cutting shingles, no pulling nails. Simply drive the lag bolt and inject sealant into the base. **FLASH**LOC's patented TRIPLE SEAL technology preserves the roof and protects the penetration with a permanent pressure seal. Kitted with lag bolts, sealant, and hardware for maximum convenience. Don't just divert water, **LOC it out!**

Example

PROTECT THE ROOF

Install a high-strength waterproof attachment without lifting, prying or damaging shingles.



Cut Away View

LOC OUT WATER

With an outer shield 1 contour-conforming gasket 2 and pressurized sealant chamber 3 the Triple-Loc Seal delivers a 100% waperproof connection.

Cut Away View

HIGH-SPEED INSTALL

Simply drive lag bolt and inject sealant into the port 4 to create a permanent pressure seal.

FASTER INSTALLATION. 25-YEAR WARRANTY.

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

FLASH LOC

INSTALLATION GUIDE

UNIRAC

BETTER SOLAR STARTS HERE

PRE-INSTALL

Snap chalk lines for attachment rows. On shingle roofs, snap lines 1-3/4" below upslope edge of shingle course. Locate rafters and mark attachment locations.

At each location, drill a 7/32" pilot hole. Clean roof surface of dirt, debris, snow, and ice. then fill pilot hole with sealant.

NOTE: Space mounts per racking system install specifications. When down pressure is ≥34 psf, span may not exceed 2 ft.

STEP 1: SECURE

Place **FLASH**LOC over pilot hole with lag on down-slope side. Align indicator marks on sides of mount with chalk line. Pass included lag bolt and sealing washer through **FLASH**LOC into pilot hole. Drive lag bolt until mount is held firmly in place.

NOTE: The EPDM in the sealing washer will expand beyond the edge of the metal washer when proper torque is applied.

STEP 2: SEAL

Insert tip of UNIRAC provided sealant into port. Inject until sealant exits both vents.

Continue array installation, attaching rails to mounts with provided T-bolts.

NOTE: When **FLASH**LOC is installed over gap between shingle or tabs or vertical joints, fill gap/joint with sealant between mount and upslope edge of shingle course.

Use only provided sealant.

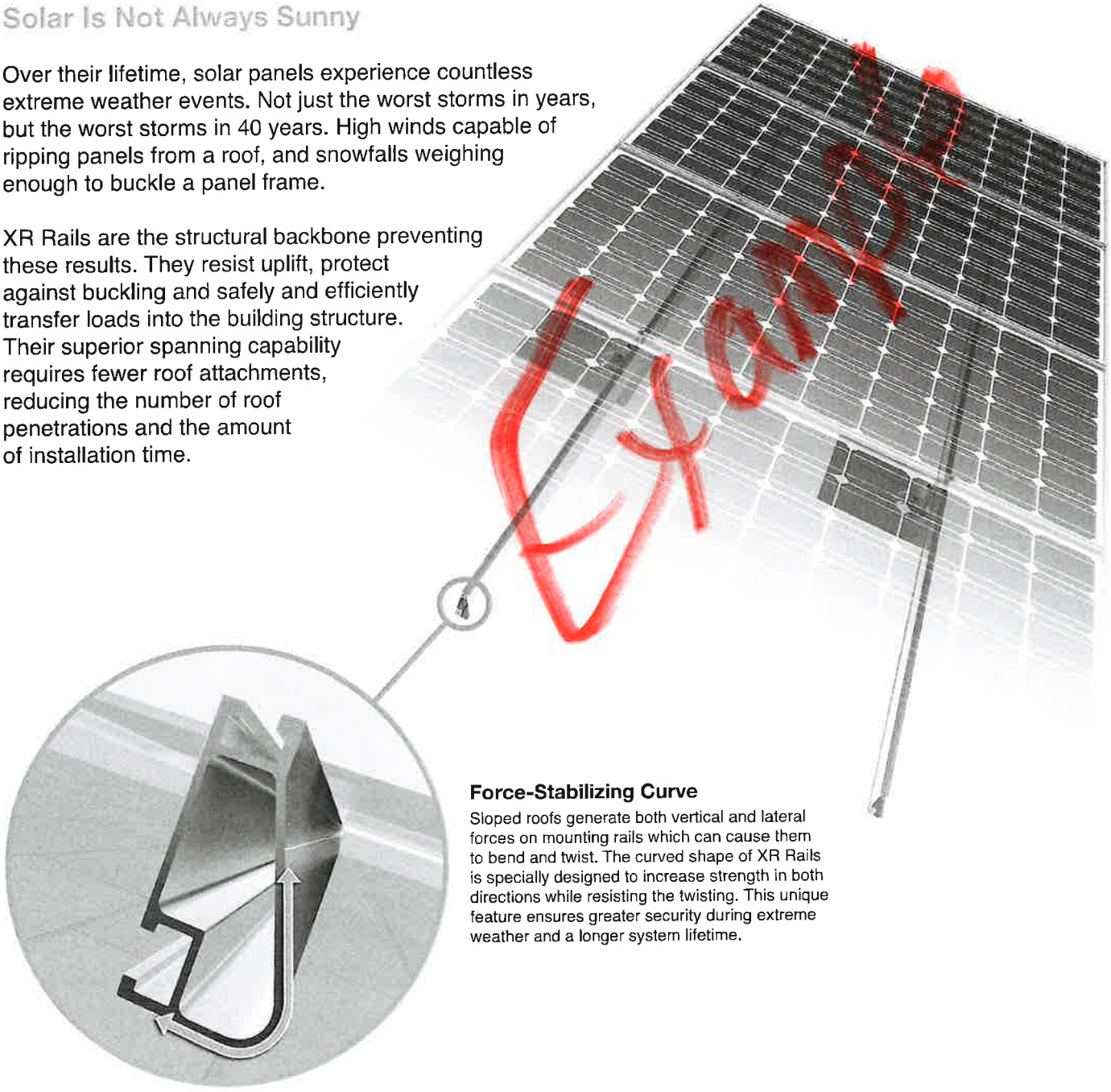
IRONRIDGE

XR Rail Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.

XR10

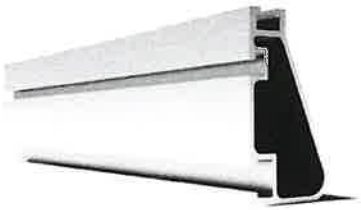
XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available

XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

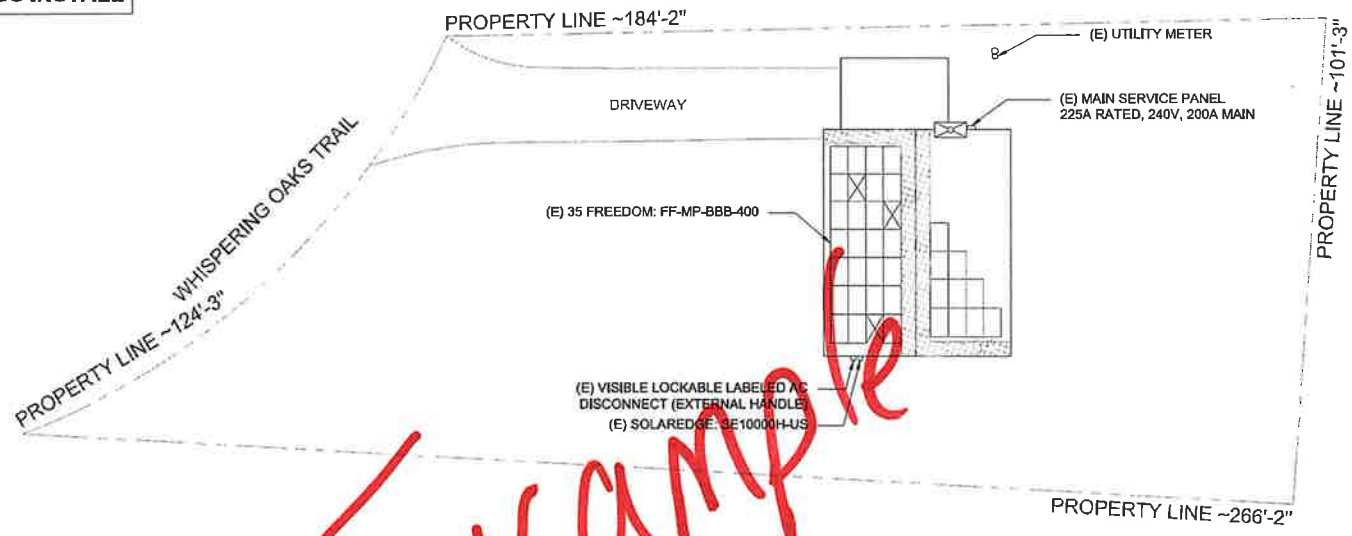
Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance

PREVIOUS INSTALL

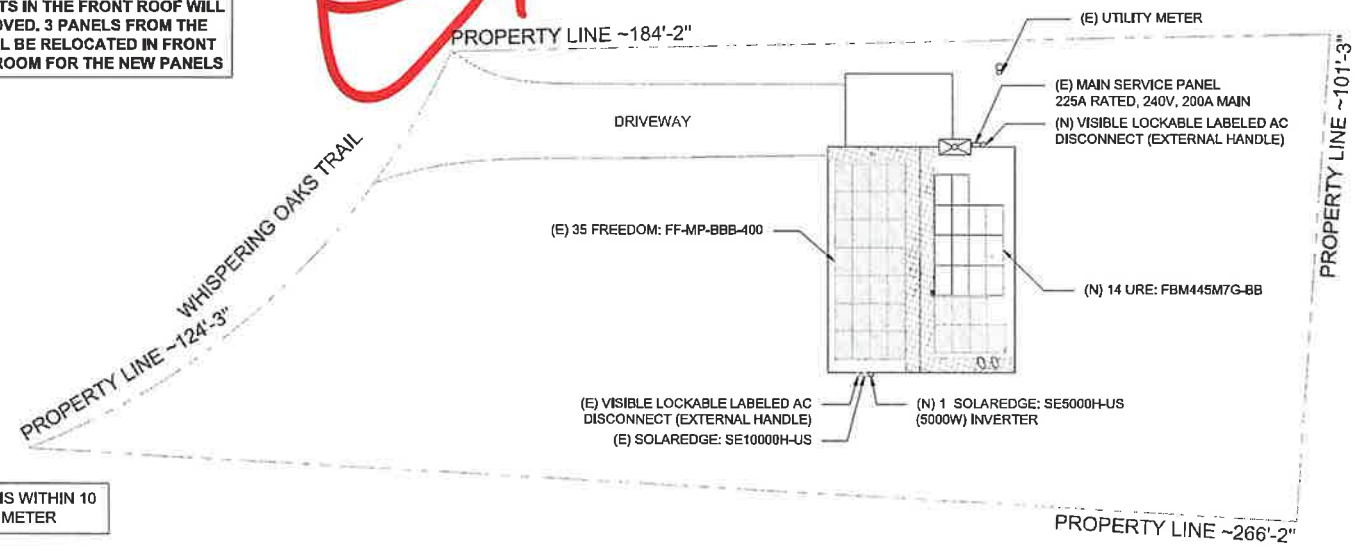


Example

LEGEND:

- 3' FIRE SETBACK
- 18" FIRE SETBACK
- LOT
- OBSTRUCTION
- PROPERTY LINE
- CONDUIT RUN
- JB — JUNCTION BOX
- CHIMNEY

NOTE: VENTS IN THE FRONT ROOF WILL BE REMOVED. 3 PANELS FROM THE BACK WILL BE RELOCATED IN FRONT TO MAKE ROOM FOR THE NEW PANELS



DISCONNECT IS WITHIN 10 FEET OF METER

ESID #: 10443720001210742

STATE OF TEXAS
[redacted]
LICENSED PROFESSIONAL ENGINEER
Exp: 12/31/2024
Signed on: 12/03/2024

SCALE: 1" = 25'

SIGNATURE WITH SEAL

roofio

ROOFIO, LLC
201 COMANCHE CP,
KYLE, TX 78640
(833) 674-7663
LICENSE #: 35769

REVISIONS

DESCRIPTION	DATE	REV

SITE INFORMATION:
[redacted]
PAYNE SPRINGS, TX 75156
DC SYSTEM SIZE:
6.230KW

[redacted]
MASTER ELECTRICIAN
[redacted]

DATE: 11/27/2024

DESIGNED BY: I. MONTECILLO
DATE: 11/27/2024
REVIEWED BY:
SHEET NAME: SITE PLAN
PAGE #: A-101
REVISION: 0

Site Plan