ROOF MOUNT PHOTOVOLTAIC SYSTEM

CODES:

THIS PROJECT COMPLIES WITH THE FOLLOWING:
2020 NATIONAL ELECTRICAL CODE
2021 PORTLAND FIRE CODE
2021 OREGON RESIDENTIAL SPECIALTY CODE
2014 OREGON FIRE CODE
AS ADOPTED BY CITY OF PORTLAND (OR)

23-095592 REV01 RS

VICINITY MAP:

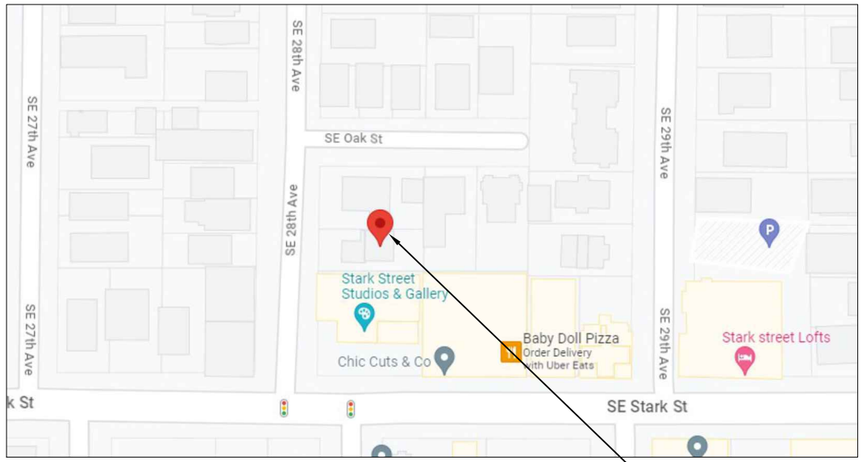


TABLE OF CONTENTS:

CONSTRUCTION NOTES:

CONDUIT AND CONDUCTOR SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.
ALL SOLAR ENERGY SYSTEM EQUIPMENT SHALL BE SCREENED TO THE MAXIMUM EXTENT POSSIBLE AND SHALL BE PAINTED A COLOR SIMILAR TO THE SURFACE UPON WHICH THEY ARE MOUNTED.
MODULES SHALL BE TESTED , LISTED AND INDENTIFIED WITH FIRE CLASSIFICATION IN ACCORDANCE WITH UL 2703. SMOKE AND CARBON MONOXIDE ALARMS ARE REQUIRED PER SECTION R314 AND 315 TO BE VERIFIED AND INSPECTED BY INSPECTOR IN THE FIELD.
DIG ALERT (811) TO BE CONTACTED AND COMPLIANCE WITH EXCAVATION SAFETY PRIOR TO ANY EXCAVATION TAKING PLACE
PHOTOVOLTAIC SYSTEM GROUND WILL BE TIED INTO EXISTING GROUND AT MAIN SERVICE FROM DC DISCONNECT/INVERTER AS PER 2020 NEC SEC 250.166(A).
SOLAR PHOTOVOLTAIC SYSTEM EQUIPMENT WILL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF ART. 690 OF THE 2020 NEC
THE MAIN SERVICE PANEL WILL BE EQUIPPED WITH A GROUND ROD OR UFER
UTILITY COMPANY WILL BE NOTIFIED PRIOR TO ACTIVATION OF THE SOLAR PV SYSTEM
SOLAREDGE OPTIMIZERS ARE LISTED TO IEC 62109-1 (CLASS II SAFETY) AND UL 1741 STANDARDS
INSTALL CREW TO VERIFY ROOF STRUCTURE PRIOR TO COMMENCING WORK. EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNT.

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 7 FT.**

REGISTERED PROFESSIONAL ENGINEER
99680PE
OREGON
MARCH 8, 2022
ROBERT A. LADE

EXPIRES: **12/31/2024**
STAMPED 12/02/2023

CLIENT:
PETER VENKAT SUBAIYA
420 SOUTHEAST 28TH AVENUE, PORTLAND, OR 97214
AHJ: CITY OF PORTLAND (OR)
UTILITY: PGE - PORTLAND GENERAL ELECTRIC
METER: 25336132
APN: R130113
PHONE: (516) 578-4465
EMAIL: SUBAIP@UMICH.EDU

SYSTEM:
SYSTEM SIZE (DC): 20 X 405 = 8.100 kW
SYSTEM SIZE (AC): 6.000 kW @ 240V
MODULES: 20 X REC SOLAR: REC405AA PURE
OPTIMIZERS: 20 X SOLAREDGE S440
INVERTER: SOLAREDGE SE6000H-USRGM
[SI1]

REVISED 12/04/23

NO.	REVISIONS	DATE
1	S.G.	10/31/2023
2	S.G.	11/1/2023
-	-	-

freedom FOREVER
FREEDOM FOREVER LLC
43445 BUSINESS PARK DR #110, TEMECULA, CA 92590
Tel: (800) 385-1075
GREG ALBRIGHT

CONTRACTOR LICENSE:
SUPERVISING MASTER ELECTRICIAN 6576S

SITE LOCATION

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-1

LEGEND:

- CHIMNEY
- PIPE VENT
- MODULES
- CONDUIT
- SETBACK
- AC — AC DISCONNECT
- UM — UTILITY METER
- JB — JUNCTION BOX
- INV — INVERTER
- MSP — MAIN SERVICE PANEL

AC DISCONNECT MUST BE WI "H 10 FEET OF UTILITY METER

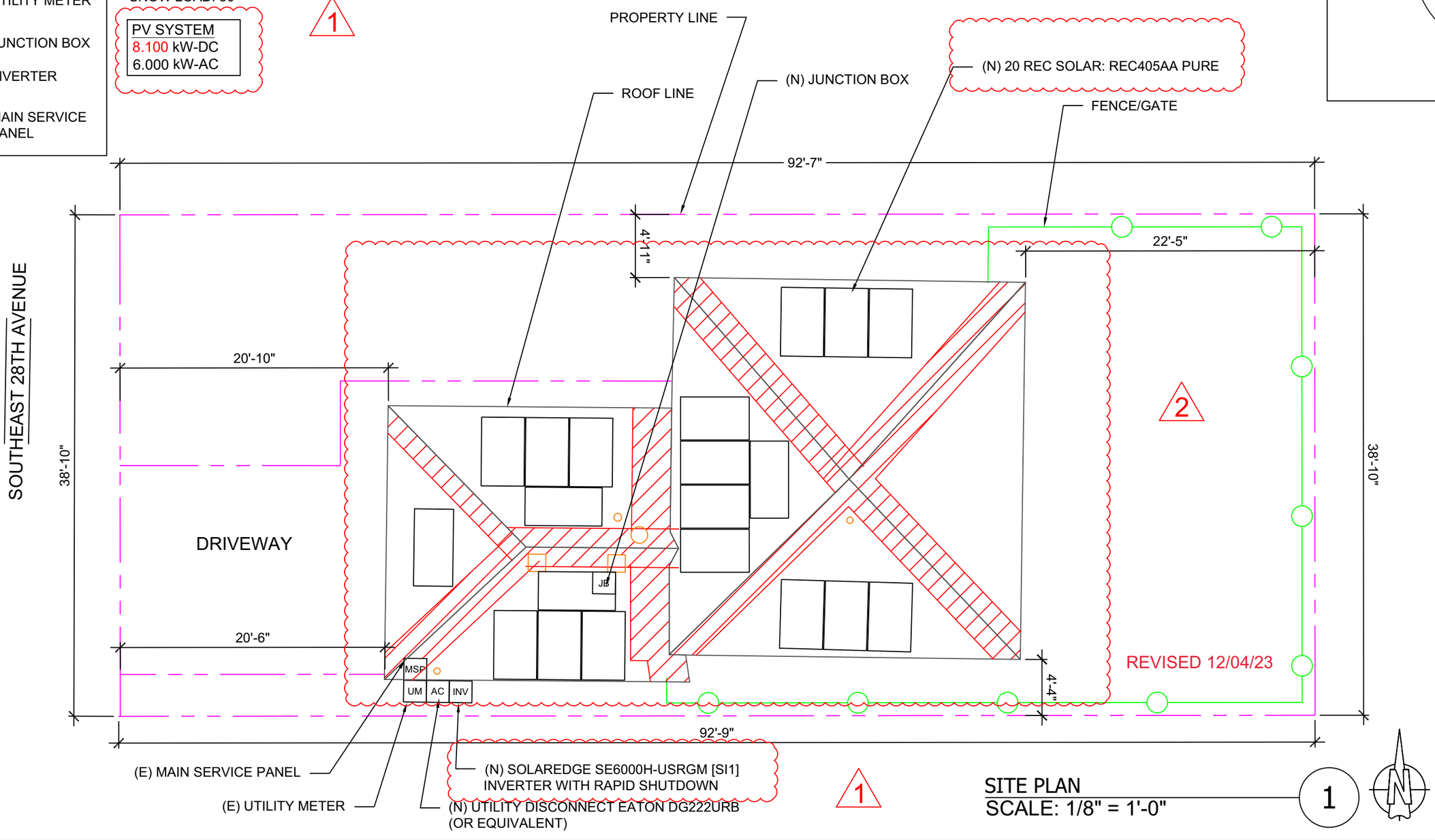
TOTAL ROOF AREA RIDGE SE TBACK CALCS:
TOTAL ROOF AREA: 1413.53 S Q FT
SINGLE MODULE AREA: 19.91 18639 SQ FT
TOTAL NUMBER OF MODULE S: 20
TOTAL AREA OF MODULES: 3 98.30 SQ FT
ROOF COVERAGE: 28.18%
FIRE SPRINKLERS : NO

BOS WILL BE AS CLOSE AS POSSIBLE TO MSP WITHIN 10'

THIS SYSTEM DESIGNED WITH:
WIND SPEED: 100
WIND EXPOSURE: B
SNOW LOAD: 30

PV SYSTEM
8.100 kW-DC
6.000 kW-AC

1



SITE PLAN
SCALE: 1/8" = 1'-0"

1

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JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-2

City Of Portland
REVIEWED FOR CODE COMPLIANCE
Date: 12/05/23
Permit # 23-095592-REV-01-RS

LEGEND:

- CHIMNEY
- PIPE VENT
- MODULES
- CONDUIT
- SETBACK
- AC — AC DISCONNECT
- UM — UTILITY METER
- JB — JUNCTION BOX
- INV — INVERTER
- MSP — MAIN SERVICE PANEL

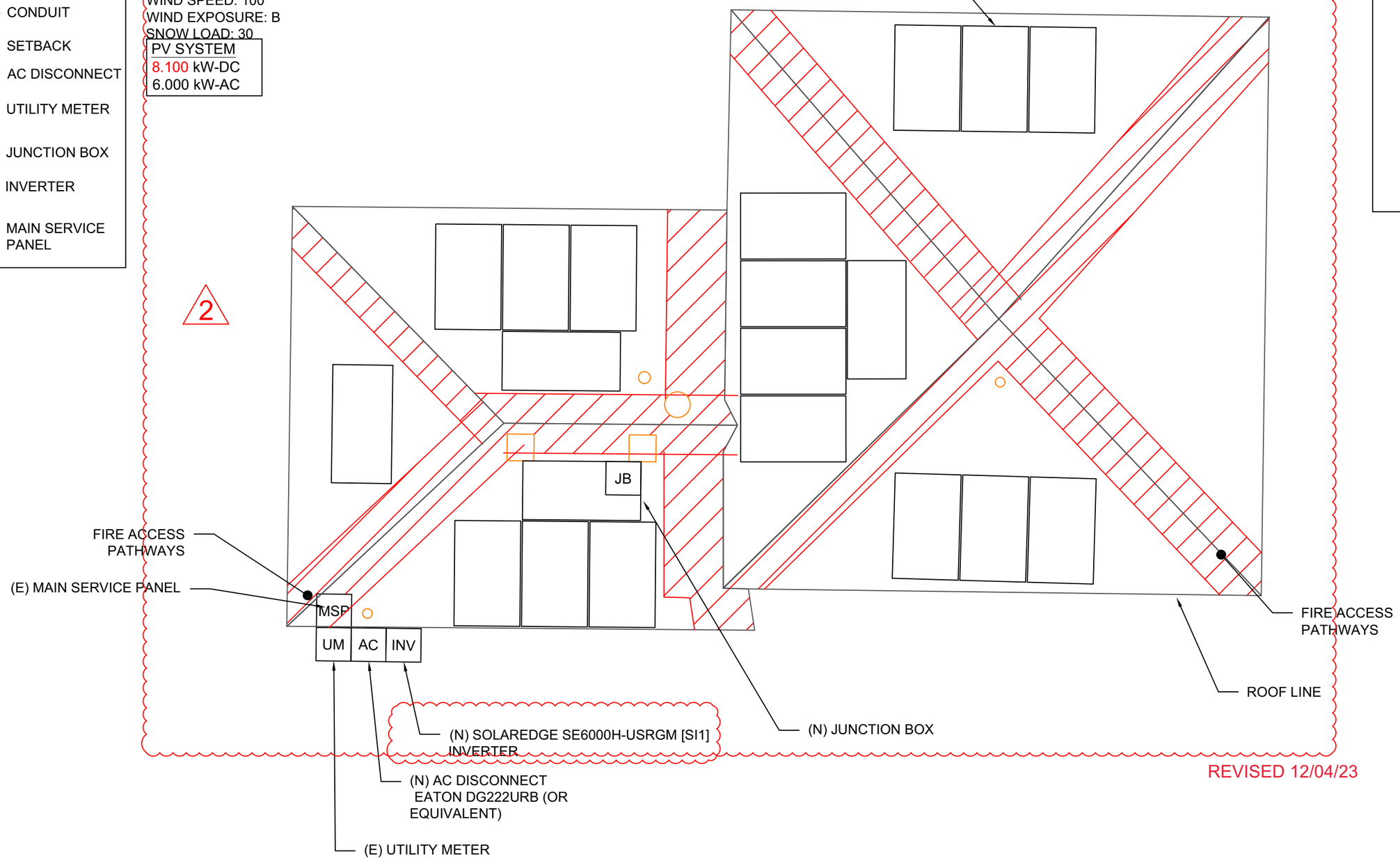
MODIFIED SETBACKS PROPOSED AT RIDGE:
TOTAL ARRAY AREA = 398.30 SF
TOTAL ROOF AREA = 1413.53 SF
TOTAL ARRAY AREA AS A % TO ROOF AREA = 28.18%
28.18% < 33%

BOS WILL BE AS CLOSE AS POSSIBLE TO MSP WITHIN 10'

THIS SYSTEM DESIGNED WITH:
WIND SPEED: 100
WIND EXPOSURE: B
SNOW LOAD: 30

PV SYSTEM
8.100 kW-DC
6.000 kW-AC

TOTAL ROOF AREA: 1413.53 SQ FT
TOTAL ARRAY AREA: 398.30 SQ FT
ARRAY COVERAGE: 28.18%
SYSTEM DISTRIBUTED WEIGHT: 2.26 LBS
ROCKIT COMP SLIDE POINT-LOAD: 11.69 LBS



REVISED 12/04/23

ROOF PLAN
SCALE: 3/16" = 1'-0"
1

NOTES:
1. EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNTS
2. ATTACHED CLAMPS AT 25% FROM THE EDGE AND 50% FROM THE CENTER OF THE MODULES
3. JUNCTION BOX IS MOUNTED TO THE RAIL.

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ROOF AREA: 1413.53 SQ FT

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ROOF PLAN WITH MODULES LAYOUT

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-2A

ROOF DETAILS:

TOTAL ROOF AREA: 1413.53 SQ FT
TOTAL ARRAY AREA: 398.30 SQFT
ARRAY COVERAGE: 28.18%
SYSTEM DISTRIBUTED WEIGHT: 2.26 LBS
ROCKIT COMP SLIDE POINT-LOAD: 11.69 LBS

2

REVISED 12/04/23

ROOF AREA STATEMENT						
ROOF	MODULE QUANTITY	ROOF PITCH	ARRAY PITCH	AZIMUTH	ROOF AREA	ARRAY AREA
ROOF 1	3	27	27	182	201.95 SQ FT	59.74 SQ FT
ROOF 2	5	27	27	279	188.26 SQ FT	99.57 SQ FT
ROOF 3	4	27	27	180	122.29 SQ FT	79.66 SQ FT
ROOF 4	4	27	27	1	217.42 SQ FT	79.66 SQ FT
ROOF 5	3	27	27	0	207.56 SQ FT	59.74 SQ FT
ROOF 6	1	27	27	271	126.42 SQ FT	19.91 SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT
----	----	----	----	----	SQ FT	SQ FT

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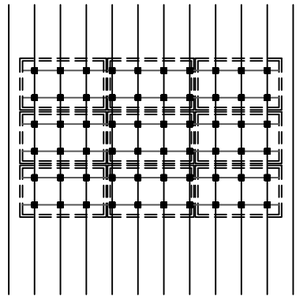
ROOF DETAILS

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-2B

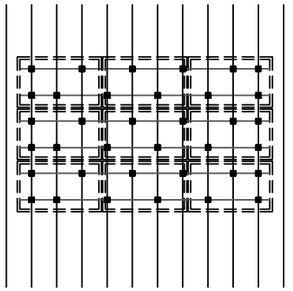
TABLE 1 - ARRAY INSTALLATION

	ROOF PITCH	ROOFING TYPE	ATTACHMENT TYPE	FRAMING TYPE	MAX UNBRACED LENGTH(FT.)	STRUCTURAL ANALYSIS RESULT	PENETRATION PATTERN	MAX ATTACHMENT SPACING (IN.)	MAX RAIL OVERHANG(IN.)
ROOF 1	27	Comp Shingle	Ecofasten RockIt Comp Slide	2x4 @ 24" O.C.	6	PASS PER IEBC	STAGGERED	48	16
ROOF 2	27	Comp Shingle	Ecofasten RockIt Comp Slide	2x4 @ 24" O.C.	6	PASS PER IEBC	STAGGERED	48	16
ROOF 3	27	Comp Shingle	Ecofasten RockIt Comp Slide	2x4 @ 24" O.C.	6	PASS PER IEBC	STAGGERED	48	16
ROOF 4	27	Comp Shingle	Ecofasten RockIt Comp Slide	2x4 @ 24" O.C.	6	PASS PER IEBC	STAGGERED	48	16
ROOF 5	27	Comp Shingle	Ecofasten RockIt Comp Slide	2x4 @ 24" O.C.	6	PASS PER IEBC	STAGGERED	48	16
ROOF 6	27	Comp Shingle	Ecofasten RockIt Comp Slide	2x4 @ 24" O.C.	6	PASS PER IEBC	STAGGERED	48	16

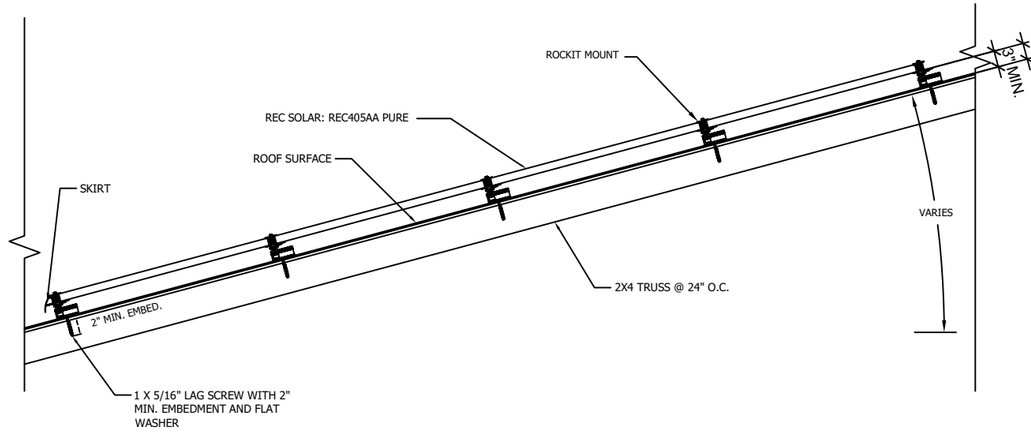
1. CONTRACTOR TO VERIFY FRAMING TYPE AND MAX UNBRACED LENGTH PRIOR TO INSTALLATION. IF THE ABOVE INFORMATION DOES NOT MATCH FIELD CONDITIONS, NOTIFY ENGINEER OF RECORD IMMEDIATELY.
2. WHERE COLLAR TIES OR RAFTER SUPPORTS EXIST, CONTRACTOR SHALL USE RAFTERS WITH COLLAR TIES AS ATTACHMENT POINTS.
3. MAX RAIL OVERHANG APPLICABLE FOR RAILED ATTACHMENT INSTALLATIONS.



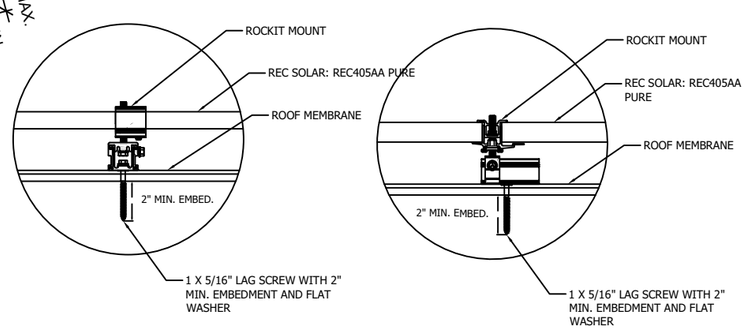
STACKED DETAIL
For Illustration purposes only



STAGGERED DETAIL
For Illustration purposes only



SOLAR PV ARRAY SECTION VIEW
Scale: NTS



ATTACHMENT DETAIL
Scale: NTS

REGISTERED PROFESSIONAL ENGINEER
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OREGON
MARCH 8, 2022
ROBERT A. LADE
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SYSTEM SIZE (AC): 6.000 kW @ 240V
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OPTIMIZERS: 20 X SOLAREDGE S440
INVERTER: SOLAREDGE SE6000H-USRGM [SI1]

REVISED 12/04/23

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freedom FOREVER
FREEDOM FOREVER LLC
43445 BUSINESS PARK DR #110, TEMECULA, CA 92590
Tel: (800) 385-1075
GREG ALBRIGHT

CONTRACTOR LICENSE:
SUPERVISING MASTER ELECTRICIAN 6576S

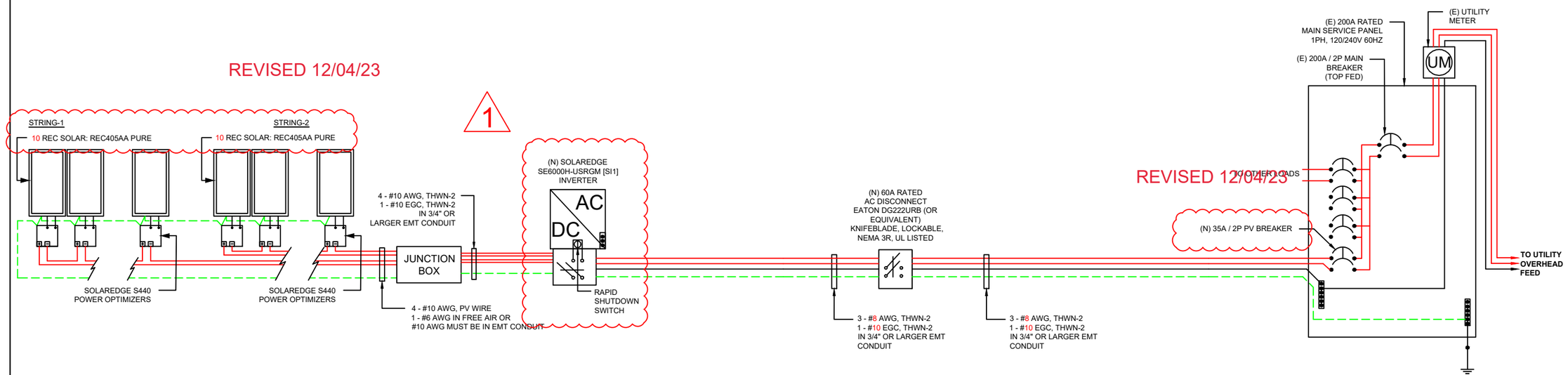
MOUNTING DETAILS

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-3

BACKFEED BREAKER SIZING						
MAX. CONTINUOUS OUTPUT 25.00A @ 240V						
25.00	X	1.25	=	31.25AMPS		35A BREAKER - OK
SEE 705.12 OF 2020 NEC						
200	X	1.20	=	240		
240	-	200	=	40A ALLOWABLE BACKFEED		

PV SYSTEM
8.100 kW-DC
6.000 kW-AC

REVISED 12/04/23



NOTE:
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THREE LINE DIAGRAM

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-4

VOLTAGE DROP CALCULATIONS					
DC					
VOLTAGE (V)	CURRENT (A)	LENGTH (FT)	VOLTAGE DROP (%)	WIRE SIZE	RACEWAY
489.00	18.75	40	0.39%	10	3/4" EMT
AC					
VOLTAGE (V)	CURRENT (A)	LENGTH (FT)	VOLTAGE DROP (%)	WIRE SIZE	RACEWAY
240	31.25	6	0.12%	8	3/4" EMT

NOTE: PER ETO REQUIREMENTS, VOLTAGE DROP CALCULATIONS WILL BE NO GREATER THAN 2%.

WIRE SCHEDULE												
RACEWAY #	EQUIPMENT				CONDUCTOR QTY.	AWG WIRE SIZE	STARTING ALLOWABLE AMPACITY @ 90°C 310.15(B)(16)	STARTING CURRENT APPLIED TO CONDUCTORS IN RACEWAY	TEMPERATURE CORRECTION FACTOR 310.15(B)(2)(a)	ADJUSTMENT FACTOR FOR MORE THAN 3 CONDUCTORS 310.15(B)(3)(a)	ADJUSTED CONDUCTOR AMPACITY @ 90°C	MAXIMUM CURRENT APPLIED TO CONDUCTORS IN RACEWAY
1	DC	MODULE	TO	OPTIMIZER	2	10	40	12.68	1	1	40.00	15.84
2	DC	OPTIMIZER	TO	JUNCTION BOX	2	10	40	15.00	1	1	40.00	18.75
3	DC	JUNCTION BOX	TO	INVERTER	4	10	40	15.00	1	0.8	32.00	18.75
4	AC	INVERTER	TO	AC DISCONNECT	3	8	55	25.00	1	1	55.00	31.25
5	AC	AC DISCONNECT	TO	POI	3	8	55	25.00	1	1	55.00	31.25

REVISED 12/04/23

CONDUCTOR AMPACITY CALCULATIONS IN ACCORDANCE WITH NEC 690.8.

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CONDUCTOR CALCULATIONS

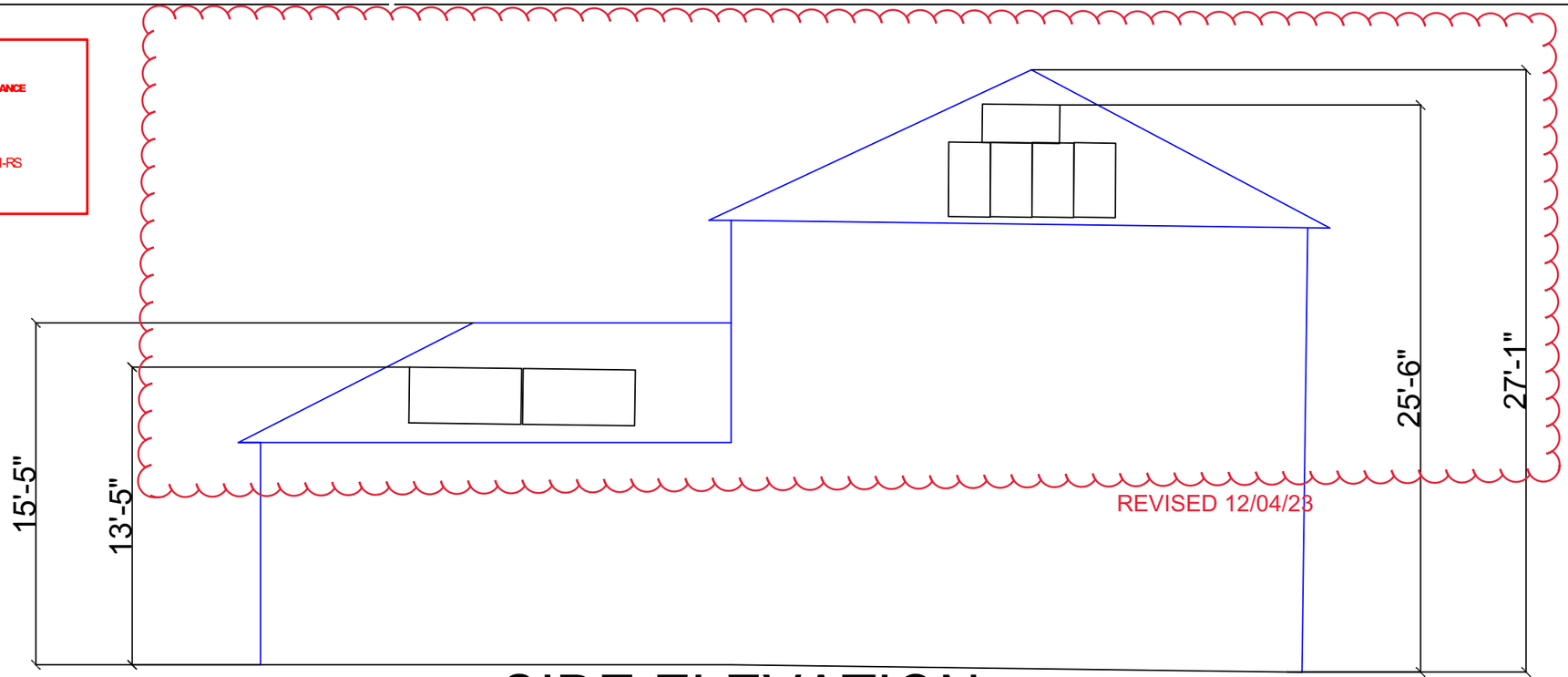
JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-5

City Of Portland

REVIEWED FOR CODE COMPLIANCE

Date: 12/05/23

Permit #: 23-095592-REV-01-RS



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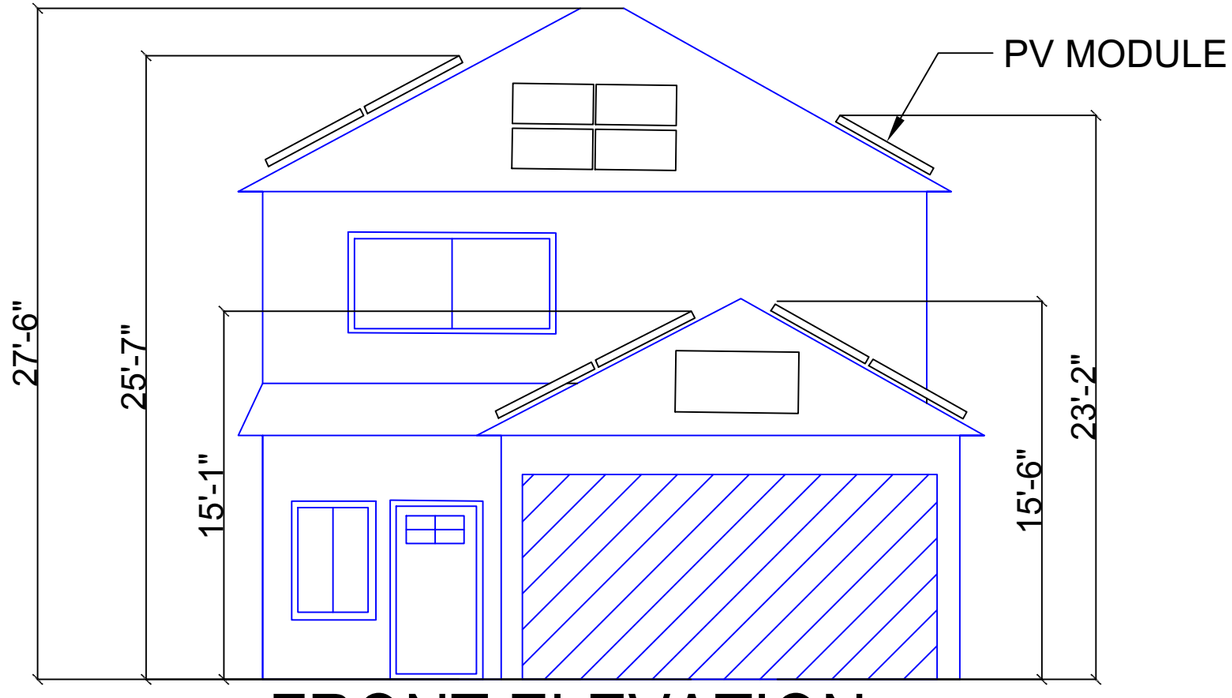
SIDE ELEVATION



FRONT ELEVATION

REGISTERED PROFESSIONAL ENGINEER
99680PE
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BUILDING ELEVATION

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-5C

OCPD SIZES:

35A BREAKER

SERVICE LIST:

NONE

MATERIAL LIST:

QTY.	PART	PART #	DESCRIPTION
20	MODULES	PV-117-405	REC SOLAR: REC405AA PURE
20	OPTIMIZERS	OPT-130-440-2	SOLAREDGE S440 POWER OPTIMIZER - FRAME MOUNTED MODULE ADD-ON
2	JUNCTION BOX	RAC-260-049	600VDC NEMA 3R UL LISTED JUNCTION BOX
2	MOUNTING BRACKET	RAC-211-201	UNIRAC E-BOSS J-BOX MOUNTING BRACKET
4	ELECTRICAL ACCESSORIES	EA-350-326	STAUBLI / MULTI-CONTACT MC4 CONNECTORS (FEMALE)
4	EQUIPMENT ACCESSORIES	EA-350-327	STAUBLI / MULTI-CONTACT MC4 CONNECTORS (MALE)
1	INVERTERS	INV-120-608	SE6000H-US [SI1] RGM 240V INVERTER UL1741 SA CERTIFIED INTEGRATED ARC FAULT PROTECTION AND RAPID SHUTDOWN
1	MONITORING EQUIPMENT	ME-180-502	SOLAREDGE CELL MODEM
1	DISCONNECTS	EE-321-060	60A RATED 240VAC NEMA 3R UL LISTED
77	FITTINGS/ANCHORS	RAC-265-003	ROCKIT COMP SLIDE
82	FOOTINGS	RAC-265-004	"MFG: ECO FASTEN, ROCKIT COMP COUPLING AL BLK, MFG SKU: 2011021"
77	FITTINGS/ANCHORS	RAC-265-002	"MFG: ECO FASTEN, ROCKIT COMP SLIDE AL BLK, MFG SKU: 2011013"
77	FOOTINGS	RAC-265-001	"MFG: ECO FASTEN, GF-1 FLASHING GLV BLK 8X10"", MFG SKU: 3012020"
	FOOTINGS	RAC-265-028	"MFG: ECO FASTEN, SKIRT AL BLK 35MM & 40MM A80, MFG SKU: 2099012"
	FITTINGS/ANCHORS	RAC-265-031	"MFG: ECO FASTEN, SKIRT END CAP PLS 35MM&40MM-A, MFG SKU: 2099035"
20	RAILS	RAC-265-018	"MFG: ECO FASTEN, FRAME MLPE MOUNT SS, MFG SKU: 4011012"
77	FLASHING 1	RAC-265-001	GF-1 FLASHING GLV BLK 8X10

1 REVISED 12/04/23

CLIENT:
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UTILITY: PGE - PORTLAND GENERAL ELECTRIC
METER: 25336132
APN: R130113
PHONE: (516) 578-4465
EMAIL: SUBAIP@UMICH.EDU

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MODULES: 20 X REC SOLAR: REC405AA PURE
OPTIMIZERS: 20 X SOLAREDGE S440
INVERTER: SOLAREDGE SE6000H-USRGM [SI1]

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FREEDOM FOREVER LLC
43445 BUSINESS PARK DR #110, TEMECULA, CA 92590
Tel: (800) 385-1075
GREG ALBRIGHT
CONTRACTOR LICENSE:
SUPERVISING MASTER ELECTRICIAN 6576S

EQUIPMENT & SERVICE LIST

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-6

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

690.13(B)

DO NOT DISCONNECT UNDER LOAD

NEC 690.15 (B) & NEC 690.33(D)(2)

⚠ WARNING

SINGLE 120-VOLT SUPPLY
DO NOT CONNECT
MULTIWIRE BRANCH CIRCUITS

NEC 710.15(C) & 692.9 (C)

⚠ WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

NEC 705.12(D) & NEC 690.59

⚠ WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

NEC 110.27(C) & OSHA 1910.145(F)(7)

⚠ WARNING

ELECTRICAL SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

706.15(C)(4) & 690.13(B)

⚠ WARNING

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

NEC 705.12(B)(3)(3)

⚠ WARNING

THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT

NEC 690.31(E)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

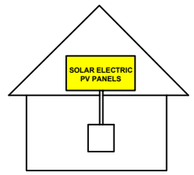
690.56(C)(3)

M

AC

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



IFC 605.11.3.1(1) & 690.56(C)

⚠ CAUTION

PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

NEC 705.12(D) & NEC 690.59

⚠ WARNING

POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE.

NEC 705.12(C) & NEC 690.59

⚠ WARNING

ARC FLASH AND SHOCK HAZARD
APPROPRIATE PPE REQUIRED

24 INCH FLASH HAZARD BOUNDARY
3 CAL/CM^2 FLASH HAZARD AT 18 INCHES
480 VAC SHOCK HAZARD WHEN COVER IS REMOVED
42 INCH LIMITED APPROACH
12 INCH RESTRICTED APPROACH - 500 V CLASS 00 GLOVES
1 INCH PROHIBITED APPROACH - 500 V CLASS 00 GLOVES

LOCATION: 420 SOUTHEAST 28TH AVENUE,PORTLAND, OR 97214

NEC 706.15(C) AND NEC 110.16

PHOTOVOLTAIC AC DISCONNECT

NEC 690.13(B)

PHOTOVOLTAIC AC DISCONNECT

RATED AC OUTPUT CURRENT: 25.00A
NOMINAL OPERATING AC VOLTAGE: 240V

NEC 690.54

INVERTER

SOLAR PV DC CIRCUIT

EVERY 10' ON CONDUIT AND ENCLOSURES
NEC 690.31

PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT AND ENCLOSURES
NEC 690.31(D)(2)

MAXIMUM VOLTAGE	480	V
MAXIMUM CIRCUIT CURRENT	16.5	A
MAX DC-DC CONVERTER OUTPUT CURRENT	15	A

DC

J/B

PHOTOVOLTAIC DC DISCONNECT

NEC 690.13(B)

MAXIMUM DC VOLTAGE OF PV SYSTEM

NEC 690.53

⚠ WARNING

ELECTRICAL SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

706.15(C)(4) & 690.13(B)

⚠ WARNING

ELECTRICAL SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

706.15(C)(4) & 690.13(B)

⚠ WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

NEC 110.27(C) & OSHA 1910.145(F)(7)

ARRAY

NEC 690.31(G)(3) & (4)

NOTES:

1. NEC ARTICLES 690 AND 705 AND IRC SECTION R324 MARKINGS SHOWN HEREON.
2. ALL MARKING SHALL CONSIST OF THE FOLLOWING:
   - A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING.
   - B. RED BACKGROUND COLOR WHITE TEXT AND LINE WORK.
   - C. ARIAL FONT.
3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATIONS SPECIFIED. SIGNAGE CANNOT BE HAND-WRITTEN.
4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH POP-RIVETS OR SCREWS

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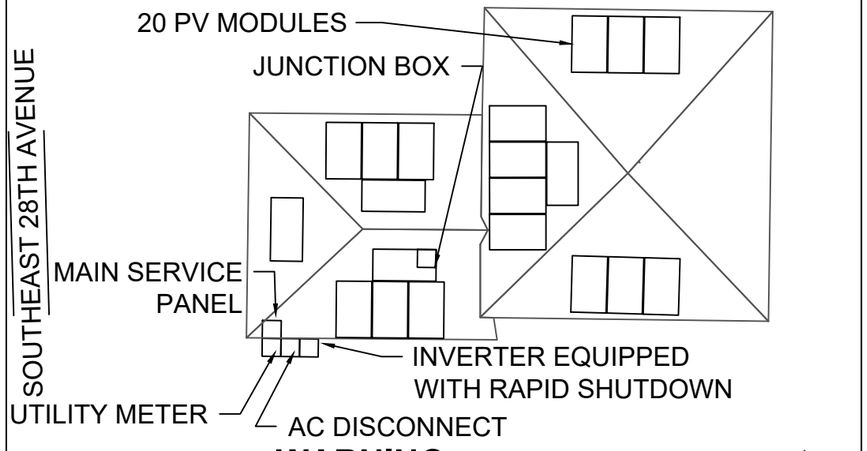
LABELS

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-7

CAUTION:

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



WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

2

REVISED 12/04/23

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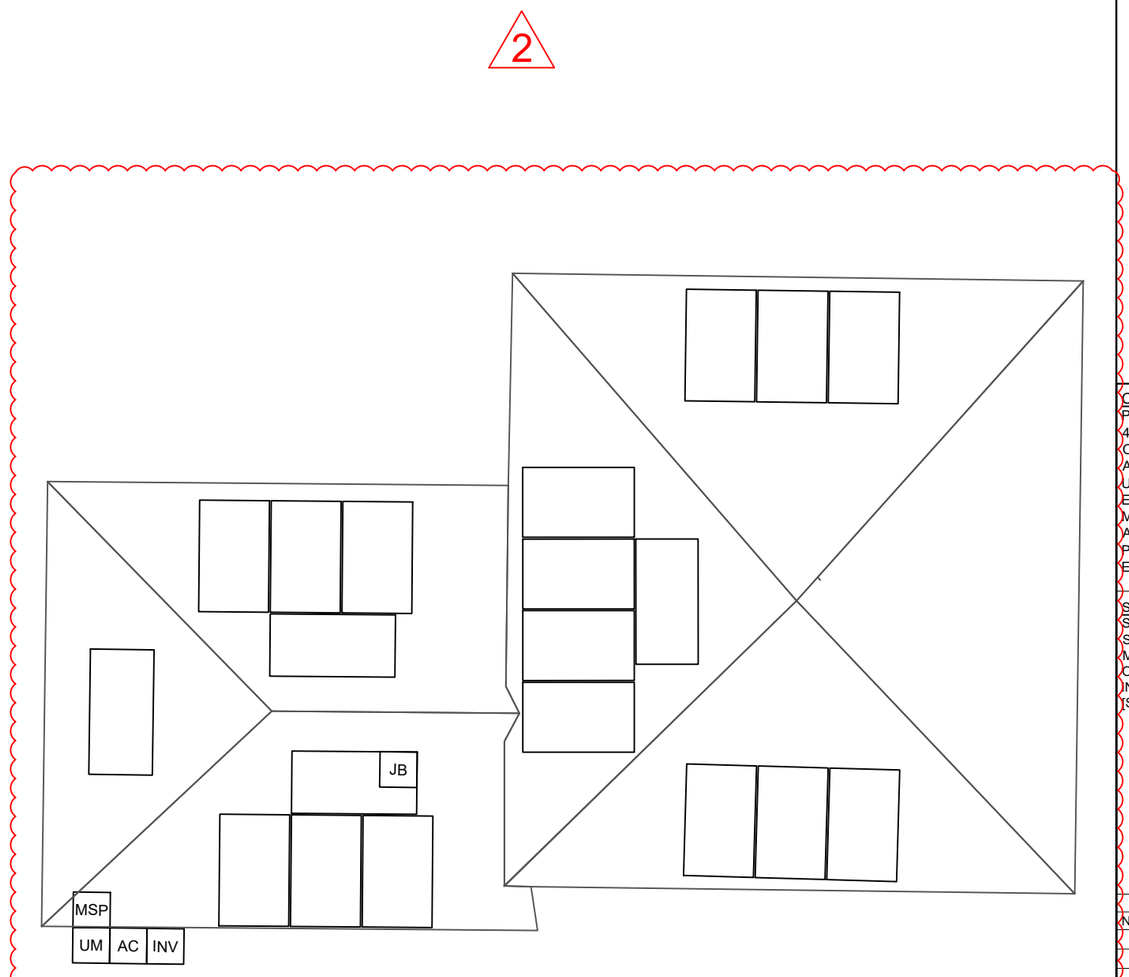
SITE PLACARD

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-7A

SOLAREDGE OPTIMIZER CHART

	1-10	11-20	21-30	31-40	41-50	51-60
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						



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OPTIMIZER CHART

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-8

SAFETY PLAN

INSTRUCTIONS:

1. USE SYMBOLS IN KEY TO MARK UP THIS SHEET.
2. SAFETY PLAN MUST BE MARKED BEFORE JOB STARTS AS PART OF THE PRE-PLAN
3. DOCUMENT ALL ADDITIONAL HAZARDS ON THIS PAGE & MAKE NOTES ON THE JHA SHEET

INCIDENT REPORTING:

INJURIES - CALL INJURY HOTLINE

(855) 400-7233

**If injury is life threatening, call 911 first THEN the Injury Hotline*

NON-INJURIES - USE MOBILE INCIDENT REPORTING
(Auto, Property Damage, Near Miss)

NEAREST OCCUPATIONAL/INDUSTRIAL CLINIC:

NAME: _____

ADDRESS: _____

NEAREST HOSPITAL:

NAME: _____

ADDRESS: _____

SAFETY COACH CONTACT INFORMATION:

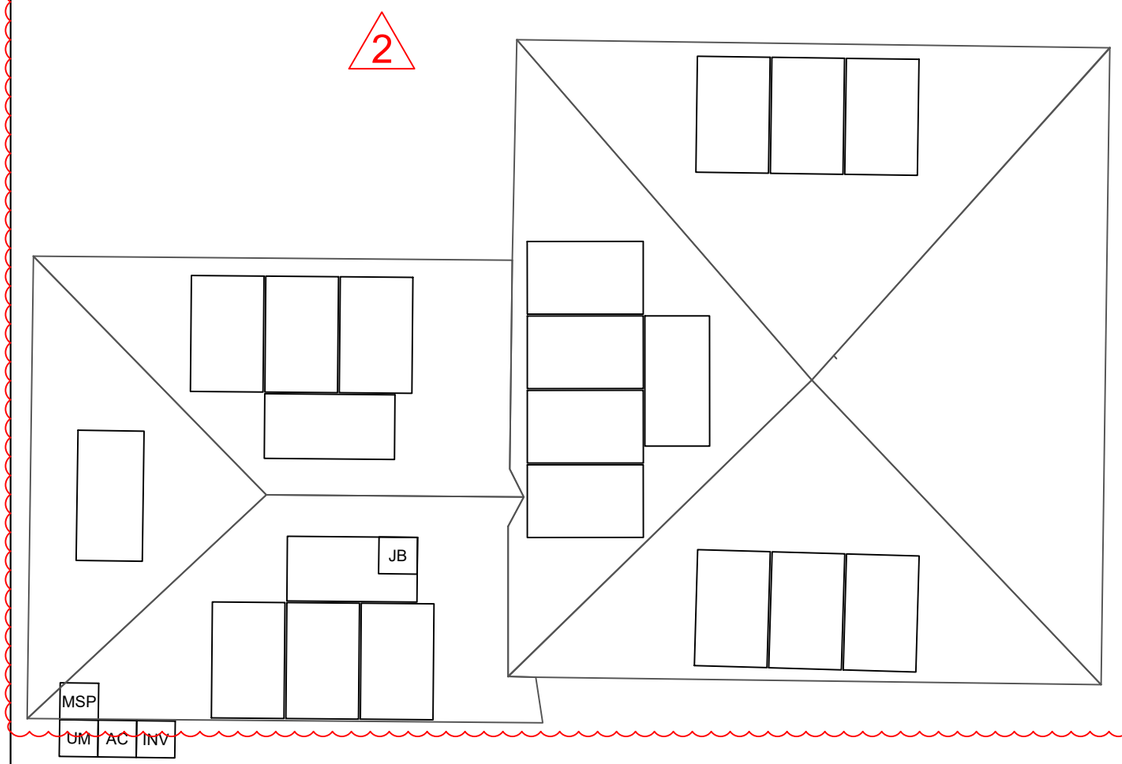
NAME: _____

PHONE NUMBER: _____

ALL EMPLOYEES ON SITE SHALL BE MADE AWARE OF THE SAFETY PLAN AND SIGN INDICATING THAT THEY ARE AWARE OF THE HAZARDS ON-SITE AND THE PLAN FOR WORKING SAFELY.

NAME	SIGNATURE

DATE: _____ TIME: _____



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MARK UP KEY

- (P) PERMANENT ANCHOR
- (T) TEMPORARY ANCHOR
- (IL) INSTALLER LADDER
- (B) JUNCTION / COMBINER BOX
- (S) STUB-OUT
- SKYLIGHT
- NO LADDER ACCESS (STEEP GRADE OR GROUND LEVEL OBSTRUCTIONS)
- RESTRICTED ACCESS
- CONDUIT
- (GAS) GAS SHUT OFF
- (H_2O) WATER SHUT OFF
- (7) SERVICE DROP
- (Z) POWER LINES

BREAK AND WATER LOG

THIS LOG IS TO BE FILLED OUT ANY TIME THE TEMP EXCEEDS **90** DEGREES. THE CREW LEAD AND ROOF LEAD ARE RESPONSIBLE FOR ENSURING THIS IS COMPLETED AND UPLOADED AT THE END OF EVERYDAY WHEN TEMPS EXCEED **90** DEGREES

NAME	0800HRS	0900HRS	1000HRS	1100HRS	1200HRS	1300HRS	1400HRS	1500HRS	1600HRS

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SAFETY PLAN

JOB NO:	DATE:	DESIGNED BY:	SHEET:
368005	11/1/2023	S.G.	PV-9

JOB HAZARD ANALYSIS

Crew leader to fill out all sections below, hold a pre-job safety meeting with all personnel, and upload this completed document and the Safety Plan to Site Capture

Ladder Access
- Ladders must be inspected before each use.
- Extension ladders must be set up on a firm and level surface at a 4-to-1 rise to run angle (or 75 degrees) and the top must be secured to the structure. Extension style ladders placed on uneven, loose or slippery surfaces must additionally have the base firmly anchored or lashed so the base will not slip out.
- Extension ladders must be used with walk-through devices or the ladder must extend 36" above the stepping off point.
- A-frame ladders must only be climbed with the ladder spreader bars locked in the open position; A-frame ladders shall not be climbed while in the closed position (ex, closed and used while leaned against a structure).
- Additional notes:

Mobile Equipment
- Only Qualified operators will operate equipment; operators must maintain a certification on their person for the equipment being operated.
- Type(s) of mobile equipment (Type/Make/Model):
- Qualified operator(s):

Material Handling and Storage
- Materials will be staged/stored in a way that does not present a hazard to client, personnel or public. Materials stored on the roof will be physically protect from failing or sliding off.

Fall Protection
- A site-specific plan for fall prevention and protection is required prior to starting work and must remain onsite at all times until work is complete; a fall rescue plan must be outlined and discussed among the crew prior to work start.
- First-person-Up (FPU) must install their anchor and connect before any other task, including installing other anchors. The Last-Person-Down (LPD) must be the only person on a roof uninstalling fall protection.
- FPCP (name and title):
- FPU and LPD (name and title):

Electrical Safety
- The Electrical Qualified Person (EQP) is required onsite to perform electrical work.
- All electrical work will be performed with equipment in an electrically safe condition (de-energized) unless approval has been granted prior to work.
- Service drops and overhead electrical hazards will be indentified and protected from contact, as neccessary.
- EQP (name and tile):

Public Protection
- The safety of the Client and Public must be maintained at all times.
- The Client and the Public shall be prevented from entering the work zone through the use of barriers and/or signage, as required.
- Company, Client and Public property shall be protected from falling objects.
- Pets (including dogs) shall be secured by their owners prior to work start.
- The Client should not leave pets, family members, or others in charge or care of Employees, Contractors, or Temporary Workers.
- Crew leader responsible for communication with the client:
- Client and public is excluded from work area by barricades (N/A, Yes, No):

Training and Pre-Job Safety Briefing
- All employees onsite shall be made aware of the specific hazards of this project and review this HJA during a pre-job briefing, and their signature indicates awareness of site conditions and the plan to eliminate any hazards identified prior to and during the project.

- Crew leader (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):

Airborne Contaminants:
- Asbestos-containing (Transite) piping (ACP) - Do not disturb (move, drill, cut fracture, etc.)
- Asbestos-containing thermal insulation (ACI) and Asbestos-containing duct wrapping (ACW) - do not disturb, no attic or crawlspace access is allowed if work to be performed could cause exposure to personnel, client or public.
- If yes, list specific tasks and protection in place:

Weather and Environment
- The site supervisor shall forecast the weather conditions at the job site, prior to crew arrival, in order to mitigate any hazards associated with inclement weather (heat, cold, wind, rain, etc.)
- The site supervisor will utilized a portable wind meter (anemometer) to verify actual onsite wind conditions, by checking at the ground and on any elevated work surface (ex, rooftop) prior to work start, at midday and prior to solar panel staging on a roof.
- Elevated work involving the moving or maneuvering of solar panels shall cease at 25mph (sustained wind) until wind subsides.
- Forecasted weather maximum temp (degrees f):

Heat Related Illness Prevention
- Employees shall have access to potable drinking water that is fresh, pure, and suitably cool. The water shall be located as close as practicable to the areas where employees are working. Water shall be supplied in sufficient quantity at the beginning of the work shift to provide at least one quart per employee per hour for drinking for the entire shift. Employees may begin the shift with smaller quantities of water if they identify the location and have effective means for replenishment during the shift to allow employees to drink on quart or more per hour. The frequent drinking of water shall be encouraged.
- Shade shall be present when temperature exceeds 80 degrees Fahrenheit. When the outdoor temperature in the work exceeds 80 degrees Fahrenheit, employees shall have and maintain one or more areas with shade at all times.
- New employees must be acclimatized. New employees will be monitored by their Crew Leader (site supervisor) for the first two (2) weeks of employment or longer when necessary.
- Employees will be allowed and encouraged to implement scheduled breaks during each shift. Employees must take cool-down breaks in the shade any time they feel the need to do so to protect them from overheating. Supervisors are REQUIRED to allow employees any break period they need during high heat conditions.
- Cool Vests are encouraged for all employees at all times during periods of high heat.
- Identify the location of the closet Occupational/Industrial Clinic or Hospital in case a crew member becomes ill.

What is the specific plan to provide and replenish sufficient water for all employees on site?
- If offsite replenish is necessary, where will you go to replenish water (location/address):
- Who will replenish the drinking water (name):

Restroom facilities
- Employees shall have access to restroom facilities with hand-washing stations. Use of onsite restroom is at the client's discretion (location is annotated below). If client does not give permission, location of suitable restroom facilities with hand-washing stations offsite will be provided. The onsite supervisor will identify location and make arrangements to ensure all employees have access at any point.
- Restroom facilities will be (circle one): Onsite - Offsite
- If Offsite, add location name and address:

Incident Reporting Procedure
- Contact your Site Supervisor
  - Name:
  - Phone:
- Contact your Manager
  - Name:
  - Phone:
- Contact your Site Supervisor
  - Name:
  - Phone:

With: Your full name, phone number, office location, brief description of what happen and when.

NOTE ADDITIONAL HAZARDS NOT ADDRESSED ABOVE
(add as many as necessary by using additional sheets)

Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:

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SAFETY PLAN

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