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PROJECT DETAILS	
PROPERTY NAME	SAMPLE COMMUNITY FACILITY
PROPERTY OWNER	SAMPLE PROPERTY OWNER
PROPERTY ADDRESS	123 SAMPLE STREET SAMPLE CITY, USA
PARCEL NO.	SAMPLE-PARCEL
AHJ	CITY OF SAMPLE CITY
ZONING	CHURCH / WELFARE / RELIG SRVC
CONST. TYPE	GROUND-MOUNTED PHOTOVOLTAIC ARRAY
OBSERVED CODES	2023 NATIONAL ELECTRICAL CODE (NEC) 2021 WASHINGTON ADMINISTRATIVE CODE (WAC) 2021 WASHINGTON STATE ENERGY CODE - RESIDENTIAL 2021 INTERNATIONAL CODES REVISED CODE OF WASHINGTON (RCW) WASHINGTON BUILDING CODE & STATE AMENDMENTS APPLICABLE CITY CODE WHEN PRESENT OSHA 29 CFR 1910.269 UNDERWRITERS LABORATORIES (UL) STANDARDS
STRUCT. METHOD	ASCE7-16

CONTRACTOR INFORMATION	
CONTRACTOR	SAMPLE SOLAR CONTRACTOR, LLC.
LICENSE NO.	SAMPLE-000000
ADDRESS	100 BUSINESS PARKWAY SAMPLE CITY, USA
PHONE	(000) 000-0000
CONTRACTOR SIGNATURE	

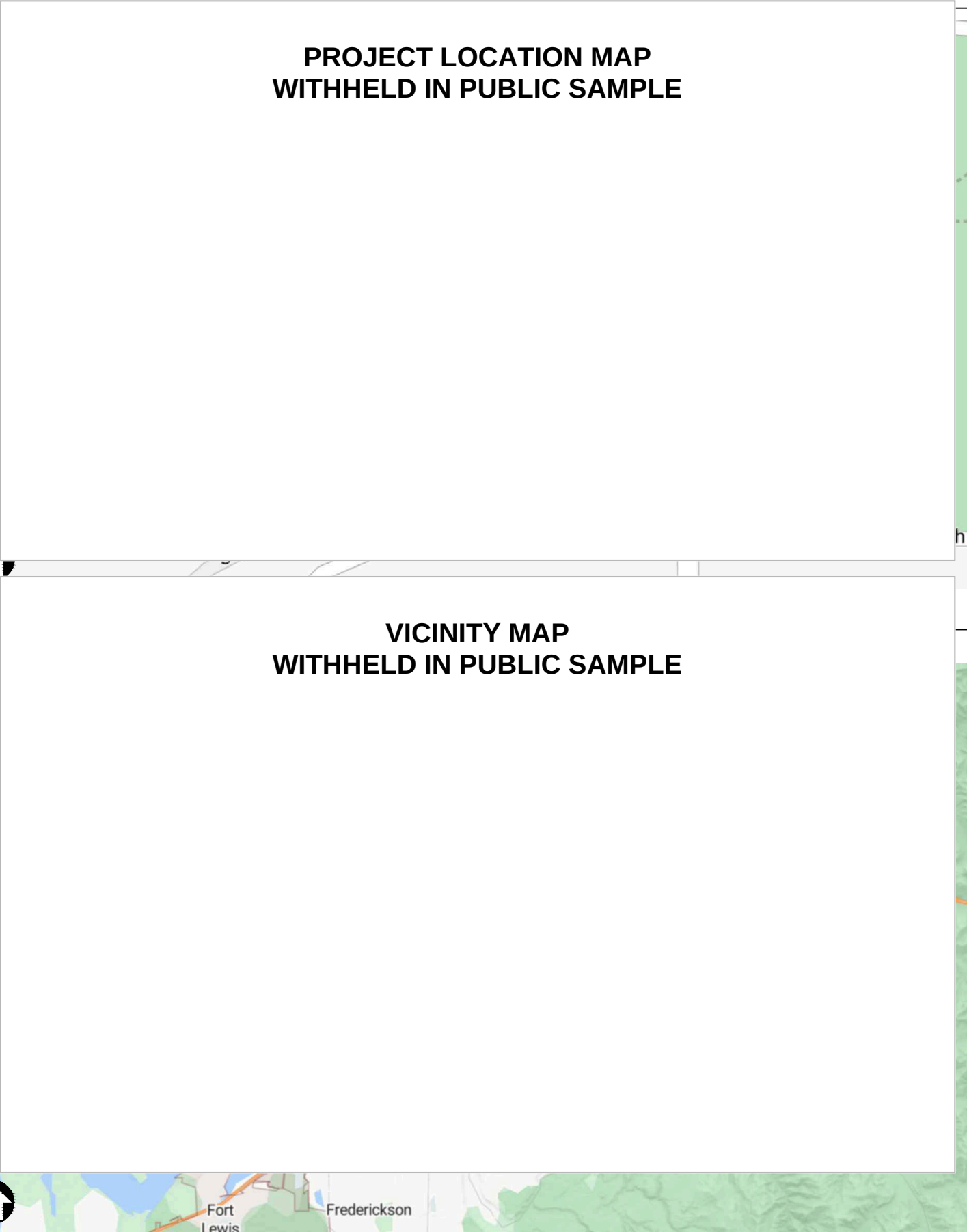
PLAN DESIGNER INFORMATION	
COMPANY	GEMINI SOLAR DESIGN, LLC.
NAME	GSD DESIGN TEAM
ADDRESS	GEMINISOLARDESIGN.COM NATIONWIDE DESIGN SERVICES
PHONE	(000) 000-0000
PLAN DESIGNER SIGNATURE	Sanjay Mallapragada

SYSTEM DETAILS	
DC RATING OF SYSTEM	48,720W
AC OUTPUT CURRENT	48A @ 480VAC
STRING INVERTER	(2) SMA SUNNY TRIPOWER X 20-US (STP 20-US-60)
MODULE	(84) AUXIN SOLAR AXN10M580W
INTERCONNECTION	LOAD-SIDE BACKFED CIRCUIT BREAKER

SITE SPECIFICATIONS	
UTILITY SERVICE	480Y / 277V, 3-Ø, 4-WIRE
MAIN SWITCHBOARD	600A RATED BUSBAR 600A / 3P MAIN BREAKER
ASHRAE EXTREME ANNUAL MEAN MINIMUM DENSITY DRY BULB TEMP.	-7°C
ASHRAE 2% ANNUAL DRY DENSITY BULB TEMP.	29°C
DESIGN WIND SPEED	95 MPH
DESIGN SNOW LOAD	30 PSF
WIND EXPOSURE CATEGORY	B
RISK CATEGORY	II

PROJECT LOCATION MAP
WITHHELD IN PUBLIC SAMPLE

VICINITY MAP
WITHHELD IN PUBLIC SAMPLE



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

SCOPE OF WORK DESCRIPTION	
THE PROPOSED SYSTEM IS A GROUND-MOUNTED PHOTOVOLTAIC ARRAY UTILIZING STRING INVERTERS. THE PHOTOVOLTAIC (PV) SYSTEM IS TO BE INSTALLED ON THE "CHURCH / WELFARE / RELIG SRVC" ZONED PROPERTY IN THE CITY OF SAMPLE CITY KING COUNTY, 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 BACKFED CIRCUIT BREAKER POINT OF INTERCONNECTION . THIS PROJECT DOES NOT INCLUDE STORAGE BATTERIES.	

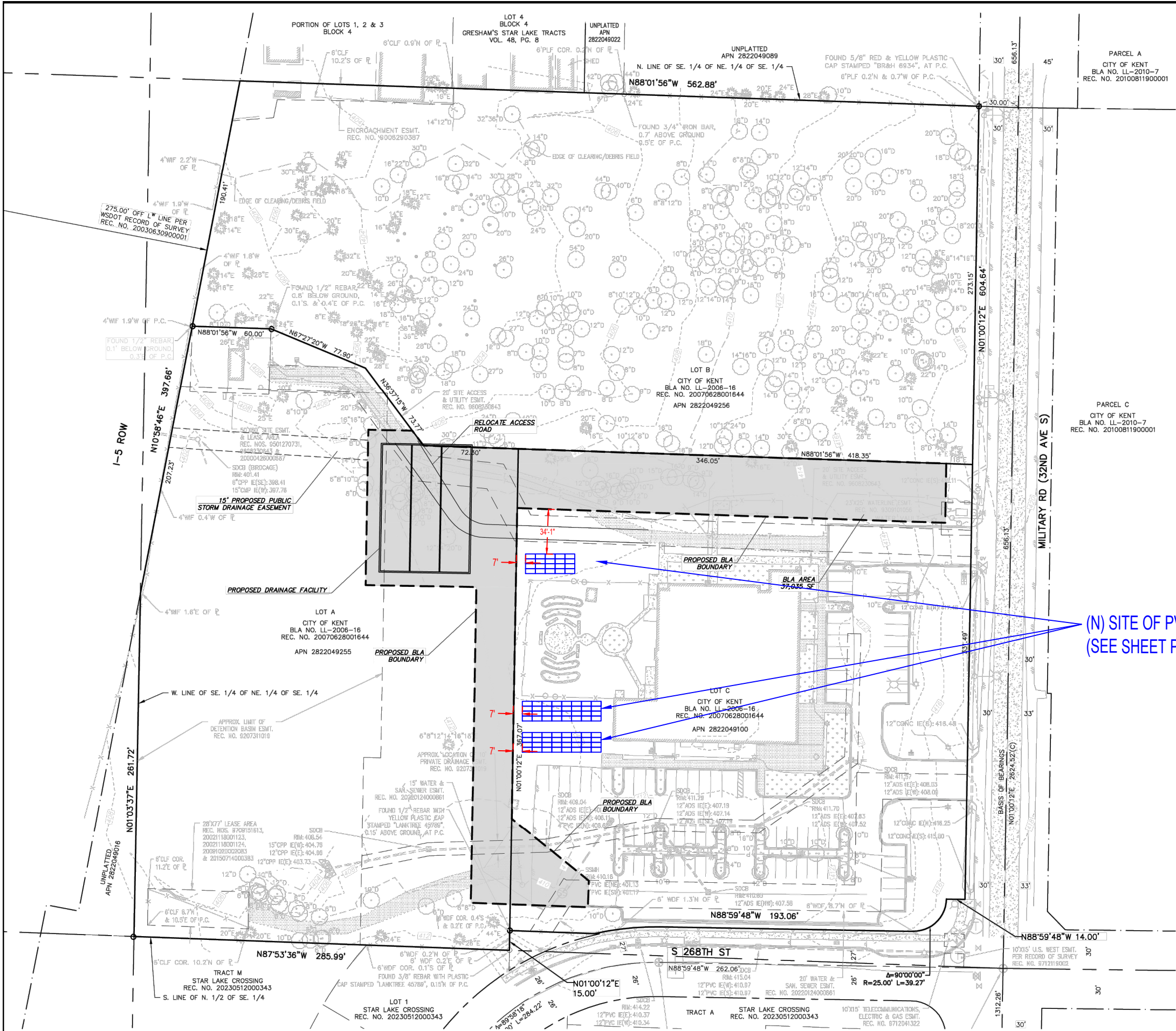
GEMINI SOLAR DESIGN

SAMPLE PROJECT
CONTACT: ON FILE
PROJECT INFO WITHHELD
CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING SET IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED IN FULL OR IN PART TO ANYONE EXCEPT THOSE INVOLVED IN THE DESIGN AND INSTALLATION OF THE PV SYSTEM REPRESENTED IN THIS PLAN.

NEW GRID-TIED SYSTEM 48.72kW	SAMPLE COMMUNITY FACILITY PROJECT ADDRESS WITHHELD UNITED STATES
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PROJECT INFO
PROJECT NO: GSD-SAMPLE
DRAWN BY: GSD
DATE: SAMPLE



A SITE PLAN (GENERAL)
PV-2A SCALE: 1" = 80'

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

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NEW GRID-TIED SYSTEM 48.72KW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

SITE PLAN

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-2A



- 1 STRING OF 12 MODULES, MPPT #1, INPUT #1, INV. #1 (SMA SUNNY TRIPOWER X 20-US)
- 1 STRING OF 12 MODULES, MPPT #1, INPUT #2, INV. #1 (SMA SUNNY TRIPOWER X 20-US)
- 1 STRING OF 8 MODULES, MPPT #2, INPUT #1, INV. #1 (SMA SUNNY TRIPOWER X 20-US)
- 1 STRING OF 12 MODULES, MPPT #3, INPUT #1, INV. #1 (SMA SUNNY TRIPOWER X 20-US)
- 1 STRING OF 10 MODULES, MPPT #1, INPUT #1, INV. #2 (SMA SUNNY TRIPOWER X 20-US)
- 1 STRING OF 10 MODULES, MPPT #1, INPUT #2, INV. #2 (SMA SUNNY TRIPOWER X 20-US)
- 1 STRING OF 10 MODULES, MPPT #2, INPUT #1, INV. #2 (SMA SUNNY TRIPOWER X 20-US)
- 1 STRING OF 10 MODULES, MPPT #2, INPUT #2, INV. #2 (SMA SUNNY TRIPOWER X 20-US)

(N) 2.00" SCH. 40 PVC CONDUIT BURIED UNDERGROUND
CARRYING DC CONDUCTORS, 24" BURIAL DEPTH MINIMUM

(QNTY. 16) 8 AWG 1000VDC PV WIRE, CU (DC + / DC -)
(QNTY. 1) 10 AWG 1000VDC PV WIRE, CU (GROUND)

(N) DC GEC, 8 FT. DRIVEN GROUND ROD
(IRREVERSIBLE BOND, #6 BARE CU EGC
FROM PV ARRAY TO THIS GROUND ROD)

(N) PV ARRAY #3 (GROUND MOUNT)
180° AZIMUTH, 20° TILT ON FLAT GRADE
(20) AUXIN SOLAR AXN10M580W

(N) DC DISCONNECT (ARRAY #3)
NEMA 3R ENCLOSURE WITH DIN RAIL
DC MINIATURE CIRCUIT BREAKER (TYP. OF 2)
2-POLE, 1000VDC, 30A RATED
(LOC. AT GROUND MOUNT ARRAY #3)

(N) NEMA 3R JUNCTION BOX #3
#8 1000VDC PV WIRE CONDUCTORS
RAN INSIDE 2" DIA. SCH. 40 CONDUIT

(N) STRING INVERTER (TYP. OF 2 UNITS)
MODEL: SMA SUNNY TRIPOWER X 20-US (STP 20-US-50)
(LOC. ON EXTERIOR)

(N) 100A SOLAR-ONLY LOAD CENTER
480Y / 277VAC - 3Φ - 4 WIRE - NEMA 3R - MLO
(1) X 30A / 3P, BACKFED BREAKER, INVERTER #1
(1) X 30A / 3P, BACKFED BREAKER, INVERTER #2
(LOC. ON EXTERIOR)

(N) UTILITY AC DISCONNECT (DS1)
60A RATED, 3Φ, 4-WIRE, 3-POLE, 480VAC RATED
NON-FUSIBLE, GENERAL DUTY UNIT, NEMA 3R RATED
*DISCONNECT SHALL BE A VISIBLE BREAK TYPE IN A METAL ENCLOSURE
LOCKABLE IN AN OPEN (DE-ENERGIZED) POSITION BY A PADLOCK*
(LOC. ON EXTERIOR)

(E) UTILITY METER
(LOC. ON EXTERIOR)

(E) MAIN SWITCHBOARD
480Y / 277VAC, 3Φ, 4-WIRE
600A RATED BUSBAR
600A / 3P MAIN BREAKER
*(N) LOAD-SIDE INTERCONNECTION
TO BE ACHIEVED VIA 60A / 3P BACKFED
SOLAR CIRCUIT BREAKER*
(LOC. ON INTERIOR)

(N) 2.00" SCH. 40 PVC CONDUIT BURIED UNDERGROUND
CARRYING DC CONDUCTORS, 24" BURIAL DEPTH MINIMUM

(QNTY. 12) 8 AWG 1000VDC PV WIRE, CU (DC + / DC -)
(QNTY. 1) 10 AWG 1000VDC PV WIRE, CU (GROUND)

(N) NEMA 3R JUNCTION BOX #2
#8 1000VDC PV WIRE CONDUCTORS
RAN INSIDE 2" DIA. SCH. 40 CONDUIT

(N) DC DISCONNECT (ARRAY #2)
NEMA 3R ENCLOSURE WITH DIN RAIL
DC MINIATURE CIRCUIT BREAKER (TYP. OF 3)
2-POLE, 1000VDC, 30A RATED
(LOC. AT GROUND MOUNT ARRAY #2)

(N) PV ARRAY #2 (GROUND MOUNT)
180° AZIMUTH, 20° TILT ON FLAT GRADE
(32) AUXIN SOLAR AXN10M580W

(N) 2.00" SCH. 40 PVC CONDUIT BURIED UNDERGROUND
CARRYING DC CONDUCTORS, 24" BURIAL DEPTH MINIMUM

(QNTY. 6) 8 AWG 1000VDC PV WIRE, CU (DC + / DC -)
(QNTY. 1) 10 AWG 1000VDC PV WIRE, CU (GROUND)

(N) NEMA 3R JUNCTION BOX #1
#8 1000VDC PV WIRE CONDUCTORS
RAN INSIDE 2" DIA. SCH. 40 CONDUIT

(N) DC DISCONNECT (ARRAY #1)
NEMA 3R ENCLOSURE WITH DIN RAIL
DC MINIATURE CIRCUIT BREAKER (TYP. OF 3)
2-POLE, 1000VDC, 30A RATED
(LOC. AT GROUND MOUNT ARRAY #1)

(N) PV ARRAY #1 (GROUND MOUNT)
180° AZIMUTH, 20° TILT ON FLAT GRADE
(32) AUXIN SOLAR AXN10M580W

(E) "CHURCH / WELFARE / RELIG SRVC"
ZONED STRUCTURE

SITE PLAN NOTES

- CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 319.0(D).
- CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.8(C).
- ARRAYS SHALL BE INSTALLED IN A WAY THAT ENSURES THAT PV SOURCE CONDUCTORS SHALL NOT BE READILY ACCESSIBLE.
- UNDERGROUND PVC CONDUIT SHALL BE BURIED AT 24" MINIMUM DEPTH, WARNING TAPE 12" ABOVE.
- VERIFY UNDERGROUND UTILITIES PRIOR TO EXCAVATION.

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

SITE PLAN

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-2B

A SITE PLAN (DETAILED)
PV-2B SCALE: 1" = 30'

PV MODULE								
REF.	TYP.	MODULE	STC POWER	ISC	IMP	VOC	VMP	SERIES FUSE RATING
PM1-84	84	AUXIN SOLAR AXN10M580W	580W	13.76A	13.03A	51.55V	44.53V	30A

STRING INVERTER										
REF.	TYP.	INVERTER	TRANSFORMERLESS	AC VOLTAGE	INVERTER OCPD SIZE	MAX OUTPUT POWER	MAX. CONTINUOUS OUTPUT CURRENT	MAX INPUT CURRENT PER MPPT CHANNEL (Imp / Isc)	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY
11 & 12	2	SMA SUNNY TRIPOWER X 20-US (STP 20-US-50)	YES	480VAC	30A	20,000W	24A @ 480VAC	24A / 37.5A	1000VDC	98%

SYSTEM SUMMARY		
	INVERTER #1	INVERTER #2
ARRAY STC POWER	25,520W	23,200W
ARRAY CIRCUITS	2 X 12 (MPPT #1) 1 X 8 (MPPT #2) 1 X 12 (MPPT #3)	2 X 10 (MPPT #1) 2 X 10 (MPPT #2)
ARRAY VMP @ STC (25°C)	534.36VDC (MPPT #1) 356.24VDC (MPPT #2) 534.36VDC (MPPT #3)	445.3VDC (MPPT #1) 445.3VDC (MPPT #2)
ARRAY VOC @ STC (25°C)	618.6VDC (MPPT #1) 412.4VDC (MPPT #2) 618.6VDC (MPPT #3)	515.5VDC (MPPT #1) 515.5VDC (MPPT #2)
MAXIMUM ARRAY VOC @ MIN. TEMP (-7°C)	668.16VDC (MPPT #1) 445.44VDC (MPPT #2) 668.16VDC (MPPT #3)	556.8VDC (MPPT #1) 556.8VDC (MPPT #2)
MAXIMUM ARRAY OPERATING CURRENT (Imp) @ STC	26.06A (MPPT #1) 13.03A (MPPT #2) 13.03A (MPPT #3)	26.06A (MPPT #1) 26.06A (MPPT #2)
MAXIMUM ARRAY SHORT CIRCUIT CURRENT (Isc) @ STC	27.52A (MPPT #1) 13.76A (MPPT #2) 13.76A (MPPT #3)	27.52A (MPPT #1) 27.52A (MPPT #2)
CONTINUOUS AC OUTPUT CURRENT	24A @ 480VAC	24A @ 480VAC
CONTINUOUS AC POWER OUTPUT	20,000W	20,000W
TOTAL ARRAY STC POWER	48,720W	
TOTAL COMBINED CONTINUOUS AC OUTPUT CURRENT	48A @ 480VAC	
TOTAL COMBINED CONTINUOUS AC POWER OUTPUT	40,000W	

UTILITY AC DISCONNECT SCHEDULE			
REF.	POLES	CURRENT RATING	RATED VOLTAGE
UTILITY AC DISCONNECT (DS1), NEMA 3R RATED 3-POLE KNIFE TYPE (NON-FUSIBLE), GENERAL DUTY UNIT	3	60A	480VAC

OCPD SCHEDULE				
REF.	TYP.	POLES	CURRENT RATING	RATED VOLTAGE
CB1 (DC CIRCUIT BREAKER, SOLAR CIRCUIT)	1	2	30A	1000VDC
CB2 (DC CIRCUIT BREAKER, SOLAR CIRCUIT)	1	2	30A	1000VDC
CB3 (DC CIRCUIT BREAKER, SOLAR CIRCUIT)	1	2	30A	1000VDC
CB4 (DC CIRCUIT BREAKER, SOLAR CIRCUIT)	1	2	30A	1000VDC
CB5 (DC CIRCUIT BREAKER, SOLAR CIRCUIT)	1	2	30A	1000VDC
CB6 (DC CIRCUIT BREAKER, SOLAR CIRCUIT)	1	2	30A	1000VDC
CB7 (DC CIRCUIT BREAKER, SOLAR CIRCUIT)	1	2	30A	1000VDC
CB8 (DC CIRCUIT BREAKER, SOLAR CIRCUIT)	1	2	30A	1000VDC
CB9 (BACKFED SOLAR BREAKER, INVERTER #1)	1	3	30A	480VAC
CB10 (BACKFED SOLAR BREAKER, INVERTER #2)	1	3	30A	480VAC
CB11 (BACKFED SOLAR BREAKER, COMBINED CIRCUIT)	1	3	60A	480VAC

GEMINI SOLAR DESIGN

SAMPLE PROJECT

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-3B

CONDUCTOR SCHEDULE WITH NEC ELECTRICAL CALCULATIONS (DC PORTION)																	GEMINI SOLAR DESIGN		
ID	TYP	DESCRIPTION	CONDUCTOR	CONDUIT	NO. OF CURRENT CARRYING CNDRS. IN CNDT.	FILL %	RATED AMPS	OCPD	EGC	TEMP. CORR. FACTOR @ 90°C TEMP. RATING	FILL ADJ. FACTOR	CONT. CURRENT	MAX. CURRENT	TERMINAL RATING CHECK (ASSUME 75°C) SHALL EXCEED 1.25X CONT. CURRENT	BASE AMPACITY @ 90°C TEMP. RATING	CONDITIONS OF USE (COU) @ 90°C TEMP. RATING			
1	3	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO DC DISCONNECT (ARRAY #1)	12 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	FREE AIR	N/A	N/A	13.76A (Isc) - PER STRING	30A / 2P (CB1) 30A / 2P (CB2) 30A / 2P (CB3)	6 AWG BARE, COPPER (BOND TO GROUND ROD) 10 AWG PV WIRE, COPPER (RATED FOR 1000VDC) (RAN IN TRENCH)	1.0 (29°C) (GROUND-LEVEL CONDITION)	1.0	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	40A > 21.47A PASS	40A (IN FREE AIR)	40A (IN FREE AIR)			
2	1	PV SOURCE CIRCUIT (TRANSITIONED): DC DISCONNECT (ARRAY #1) TO JUNCTION BOX #1	8 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	2" DIA. SCH. 40 PVC	6 3 X (DC +) 3 X (DC -) 3 DC CIRCUITS TO BE RAN IN THIS PVC CONDUIT	14.9%	13.76A (Isc) - PER STRING	N/A	10 AWG PV WIRE, COPPER (RATED FOR 1000VDC)	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.8	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	55A > 21.47A PASS	55A (IN CONDUIT)	44A (IN CONDUIT)			
3	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX #1 TO JUNCTION BOX #2	8 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	2" DIA. SCH. 40 PVC (24" BURIAL DEPTH)	6 3 X (DC +) 3 X (DC -) 3 DC CIRCUITS TO BE RAN IN THIS PVC CONDUIT	14.9%	13.76A (Isc) - PER STRING	N/A	10 AWG PV WIRE, COPPER (RATED FOR 1000VDC)	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.8	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	55A > 21.47A PASS	55A (IN CONDUIT)	44A (IN CONDUIT)			
4	3	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO DC DISCONNECT (ARRAY #2)	12 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	FREE AIR	N/A	N/A	13.76A (Isc) - PER STRING	30A / 2P (CB4) 30A / 2P (CB5) 30A / 2P (CB6)	6 AWG BARE, COPPER (BOND TO GROUND ROD) 10 AWG PV WIRE, COPPER (RATED FOR 1000VDC) (RAN IN TRENCH)	1.0 (29°C) (GROUND-LEVEL CONDITION)	1.0	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	40A > 21.47A PASS	40A (IN FREE AIR)	40A (IN FREE AIR)			
5	1	PV SOURCE CIRCUIT (TRANSITIONED): DC DISCONNECT (ARRAY #2) TO JUNCTION BOX #2	8 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	2" DIA. SCH. 40 PVC	6 3 X (DC +) 3 X (DC -) 3 DC CIRCUITS TO BE RAN IN THIS PVC CONDUIT	14.9%	13.76A (Isc) - PER STRING	N/A	10 AWG PV WIRE, COPPER (RATED FOR 1000VDC)	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.8	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	55A > 21.47A PASS	55A (IN CONDUIT)	44A (IN CONDUIT)			
6	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX #2 TO JUNCTION BOX #3	8 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	2" DIA. SCH. 40 PVC (24" BURIAL DEPTH)	12 6 X (DC +) 6 X (DC -) 6 DC CIRCUITS TO BE RAN IN THIS PVC CONDUIT	29.8%	13.76A (Isc) - PER STRING	N/A	10 AWG PV WIRE, COPPER (RATED FOR 1000VDC)	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.5	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	55A > 21.47A PASS	55A (IN CONDUIT)	27.5A (IN CONDUIT)			
7	2	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO DC DISCONNECT (ARRAY #3)	12 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	FREE AIR	N/A	N/A	13.76A (Isc) - PER STRING	30A / 2P (CB7) 30A / 2P (CB8)	6 AWG BARE, COPPER (BOND TO GROUND ROD) 10 AWG PV WIRE, COPPER (RATED FOR 1000VDC) (RAN IN TRENCH)	1.0 (29°C) (GROUND-LEVEL CONDITION)	1.0	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	40A > 21.47A PASS	40A (IN FREE AIR)	40A (IN FREE AIR)			
8	1	PV SOURCE CIRCUIT (TRANSITIONED): DC DISCONNECT (ARRAY #3) TO JUNCTION BOX #3	8 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	2" DIA. SCH. 40 PVC	4 2 X (DC +) 2 X (DC -) 2 DC CIRCUITS TO BE RAN IN THIS PVC CONDUIT	10.0%	13.76A (Isc) - PER STRING	N/A	6 AWG BARE, COPPER (BOND TO GROUND ROD) 10 AWG PV WIRE, COPPER (RATED FOR 1000VDC) (RAN IN TRENCH)	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.8	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	55A > 21.47A PASS	55A (IN CONDUIT)	44A (IN CONDUIT)			
9	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX #3 TO INVERTER #1 / INVERTER #2	8 AWG PV WIRE COPPER <i>(RATED FOR 1000VDC)</i>	2" DIA. SCH. 40 PVC (24" BURIAL DEPTH)	16 8 X (DC +) 8 X (DC -) 8 DC CIRCUITS TO BE RAN IN THIS PVC CONDUIT	39.7%	13.76A (Isc) - PER STRING	INTEGRATED DC DISCONNECT WITHIN STRING INVERTER	10 AWG PV WIRE, COPPER (RATED FOR 1000VDC)	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.5	17.2A (Isc) - PER STRING	21.47A (Isc) PER STRING	55A > 21.47A PASS	55A (IN CONDUIT)	27.5A (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.																			
																	SAMPLE PROJECT		
																	CONTACT: ON FILE		
																	PROJECT INFO WITHHELD		
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																	NEW GRID-TIED SYSTEM 48.72kW	SAMPLE COMMUNITY FACILITY PROJECT ADDRESS WITHHELD UNITED STATES	
																	SINGLE-LINE DIAGRAM		
																	PROJECT NO: GSD-SAMPLE		
																	DRAWN BY: GSD		
																	DATE: SAMPLE		
																	PV-3C		

CONDUCTOR SCHEDULE WITH NEC ELECTRICAL CALCULATIONS (AC PORTION)																	GEMINI SOLAR DESIGN	
ID	TYP	DESCRIPTION	CONDUCTOR	CONDUIT	NO. OF CURRENT CARRYING CNDRS. IN CNDT.	FILL %	RATED AMPS	OCPD	EGC	TEMP. CORR. FACTOR @ 90°C TEMP. RATING	FILL ADJ. FACTOR	CONT. CURRENT	MAX. CURRENT	TERMINAL RATING CHECK (ASSUME 75°C) SHALL EXCEED 1.25X CONT. CURRENT	BASE AMPACITY @ 90°C TEMP. RATING	CONDITIONS OF USE (COU) @ 90°C TEMP. RATING		
10	1	INVERTER #1 OUTPUT: INVERTER #1 TO 100A SOLAR-ONLY LOAD CENTER	10 AWG THWN-2 COPPER	0.75" DIA. EMT	4 (L1, L2, L3, N) X 1	19.9%	24A (I1)	30A / 3P (CB9)	10 AWG THWN-2 COPPER	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.8	24A (I1)	30A (I1)	35A > 30A PASS	40A (IN CONDUIT)	32A (IN CONDUIT)		
11	1	INVERTER #2 OUTPUT: INVERTER #2 TO 100A SOLAR-ONLY LOAD CENTER	10 AWG THWN-2 COPPER	0.75" DIA. EMT	4 (L1, L2, L3, N) X 1	19.9%	24A (I2)	30A / 3P (CB10)	10 AWG THWN-2 COPPER	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.8	24A (I2)	30A (I2)	35A > 30A PASS	40A (IN CONDUIT)	32A (IN CONDUIT)		
12	1	COMBINED OUTPUT OF INVERTERS: 100A SOLAR-ONLY LOAD CENTER TO UTILITY AC DISCONNECT (DS1)	6 AWG THWN-2 COPPER	1" DIA. EMT	4 (L1, L2, L3, N) X 1	26.0%	48A	60A / 3P (DS1)	10 AWG THWN-2 COPPER	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.8	48A	60A	65A > 60A PASS	75A (IN CONDUIT)	60A (IN CONDUIT)		
13	1	UTILITY AC DISCONNECT (DS2) OUTPUT: UTILITY AC DISCONNECT (DS2) TO METER / 600A MAIN SWITCHBOARD (LOAD-SIDE POINT OF CONNECTION VIA 3-POLE BACKFED CIRCUIT BREAKER)	6 AWG THWN-2 COPPER	1" DIA. EMT	4 (L1, L2, L3, N) X 1	26.0%	48A	60A / 3P (CB11)	10 AWG THWN-2 COPPER	1.0 (29°C) (GROUND-LEVEL CONDITION)	0.8	48A	60A	65A > 60A PASS	75A (IN CONDUIT)	60A (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.																		
																	SINGLE-LINE DIAGRAM	
																	PROJECT NO: GSD-SAMPLE	
																	DRAWN BY: GSD	
																	DATE: SAMPLE	
																	PV-3D	

OVERALL SYSTEM RATED AC CURRENT

PHOTOVOLTAIC SYSTEM AC DISCONNECT

OPERATING CURRENT 48 AMPS
OPERATING VOLTAGE 480 VOLTS

NEC 690.14(C)(2) & NEC 690.54

⚠ WARNING ⚠

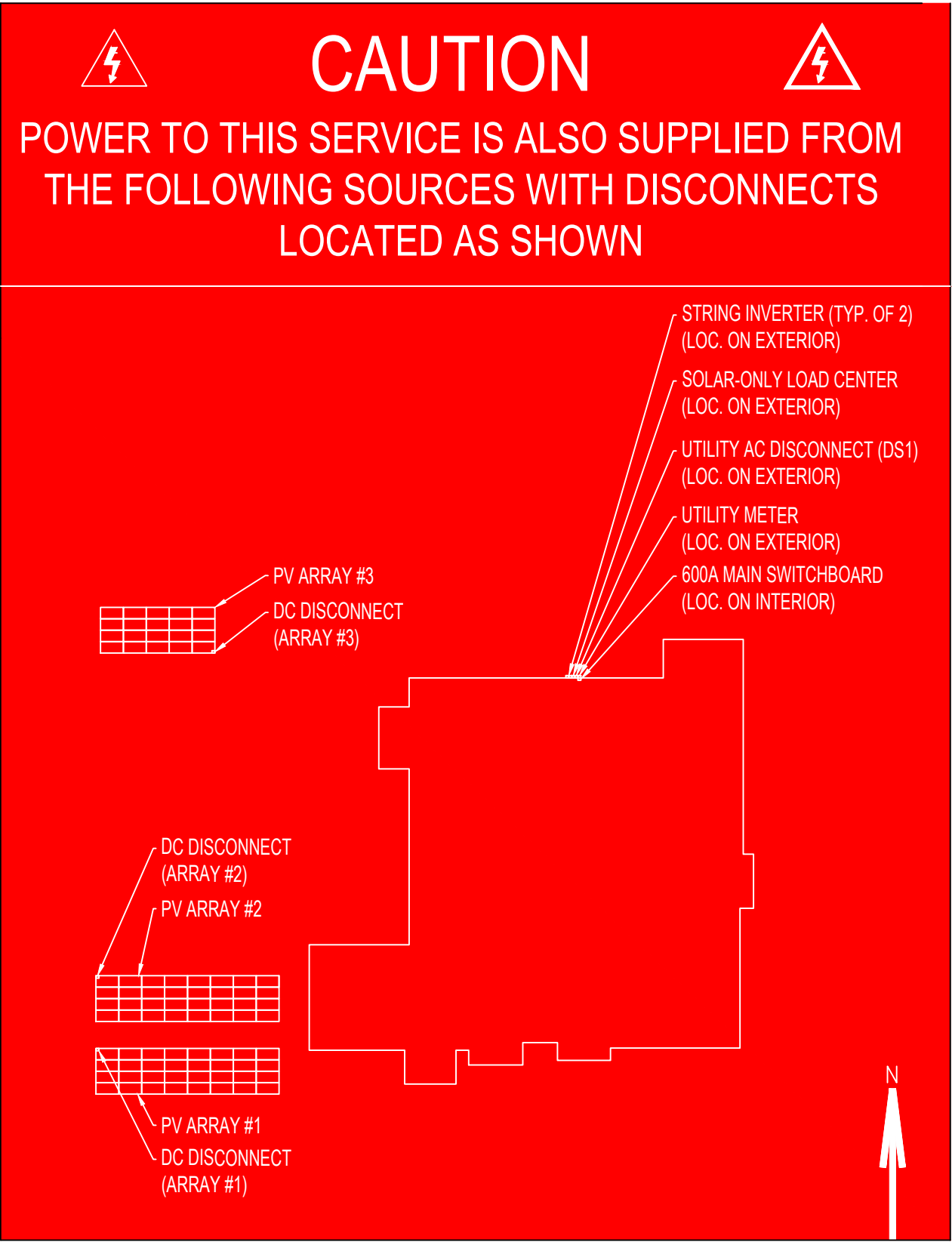
DUAL POWER SUPPLY
SOURCES: UTILITY GRID AND
PV SOLAR ELECTRIC SYSTEM

NET METER

pviabels.com

03-364

SITE OVERVIEW



GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

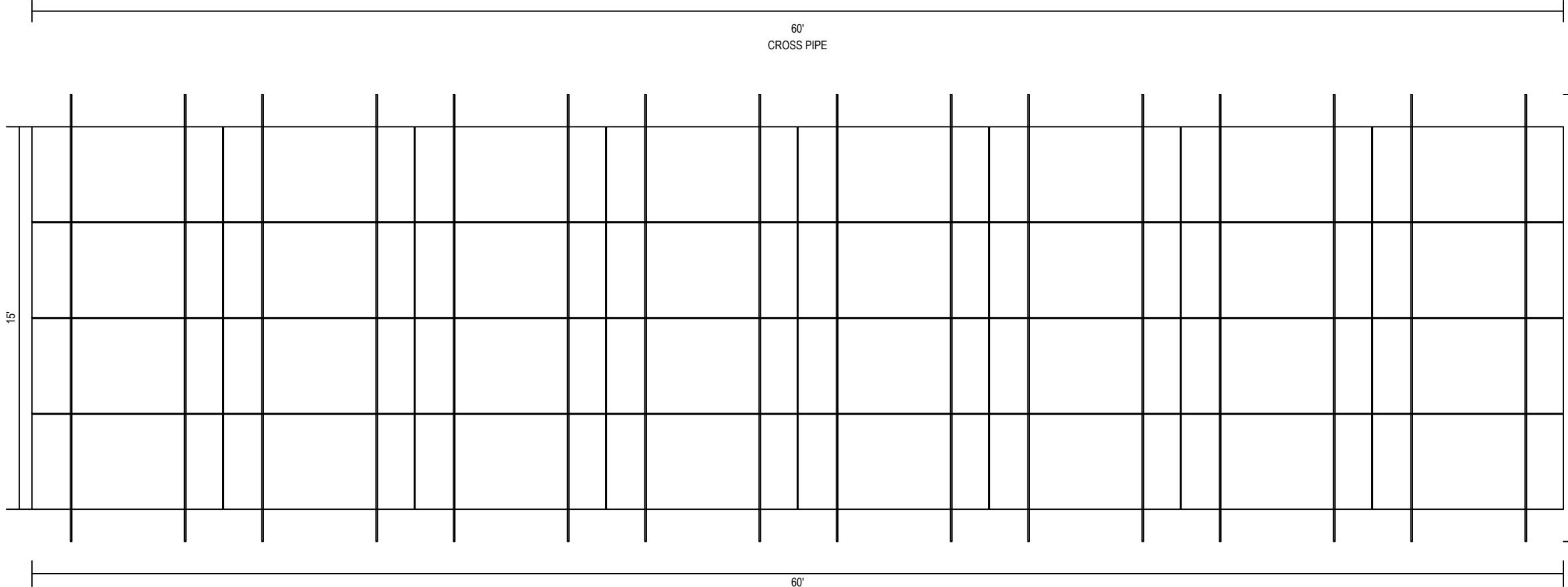
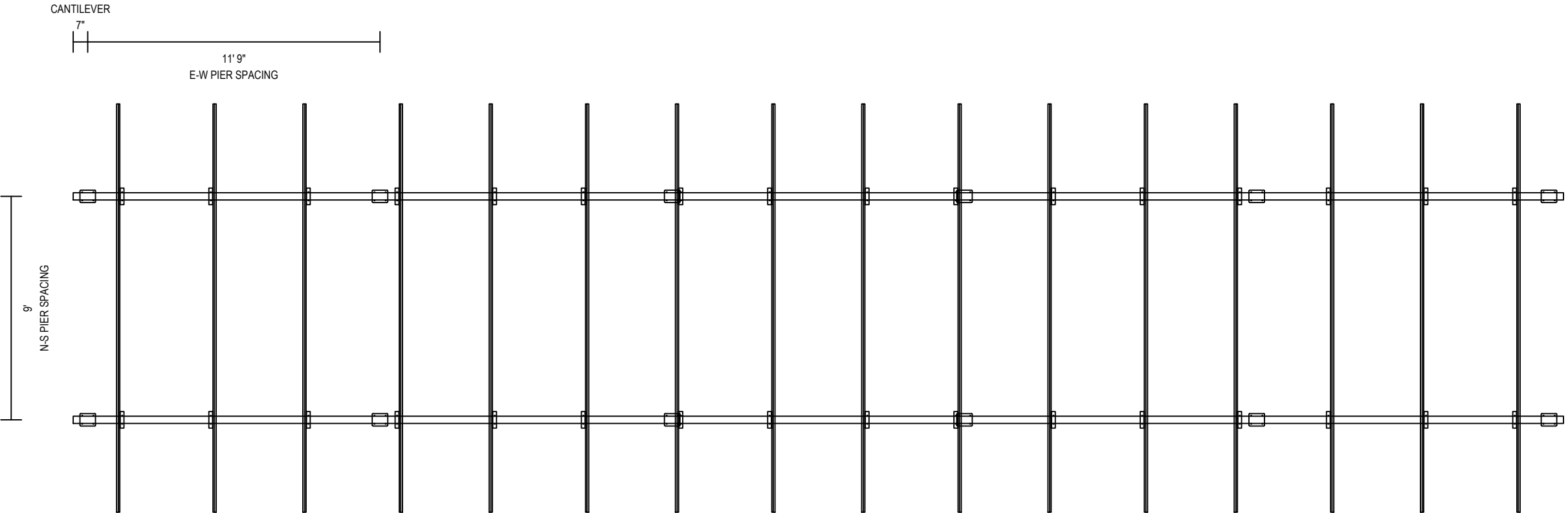
PLACARDS

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-4



GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

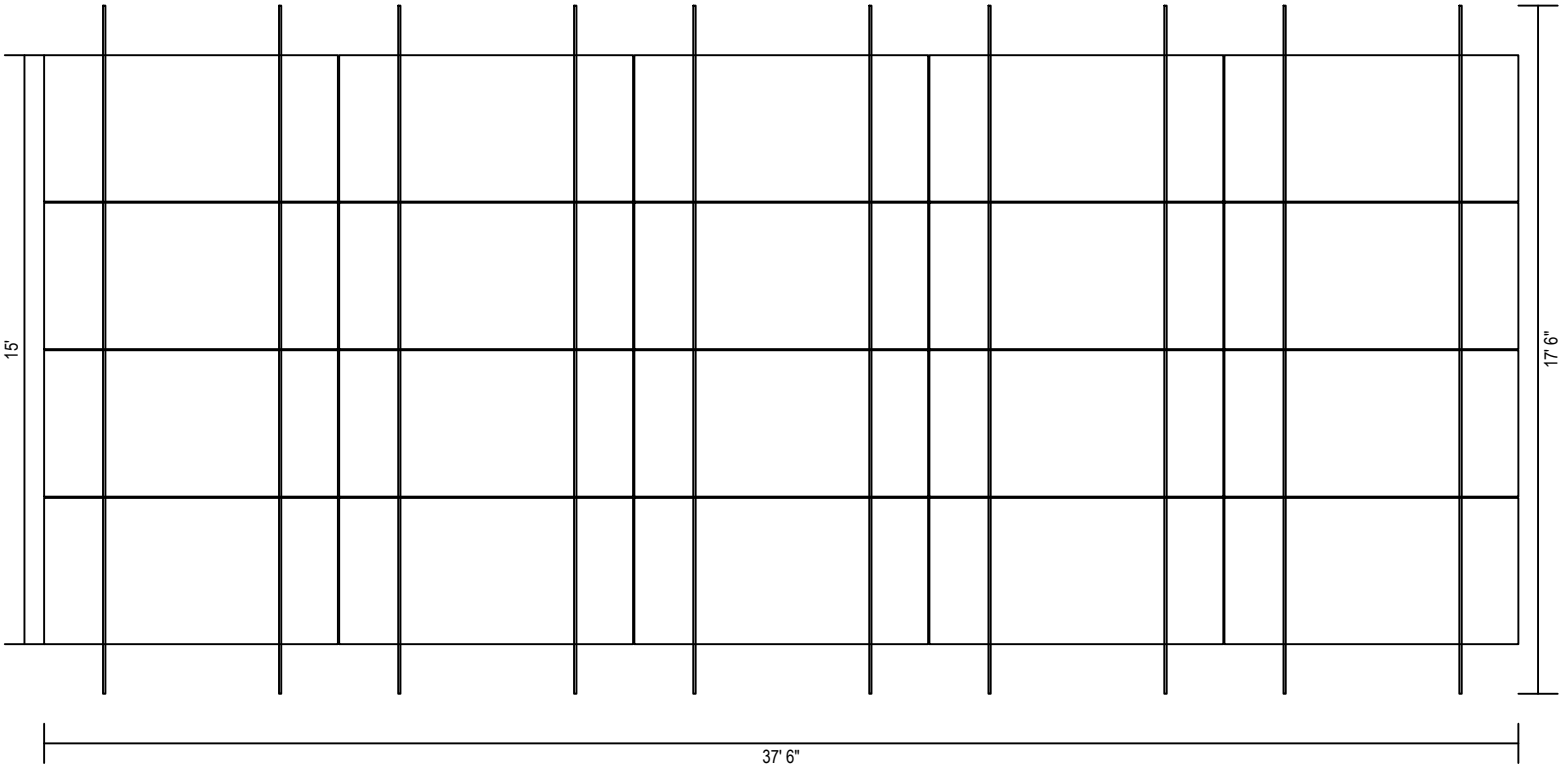
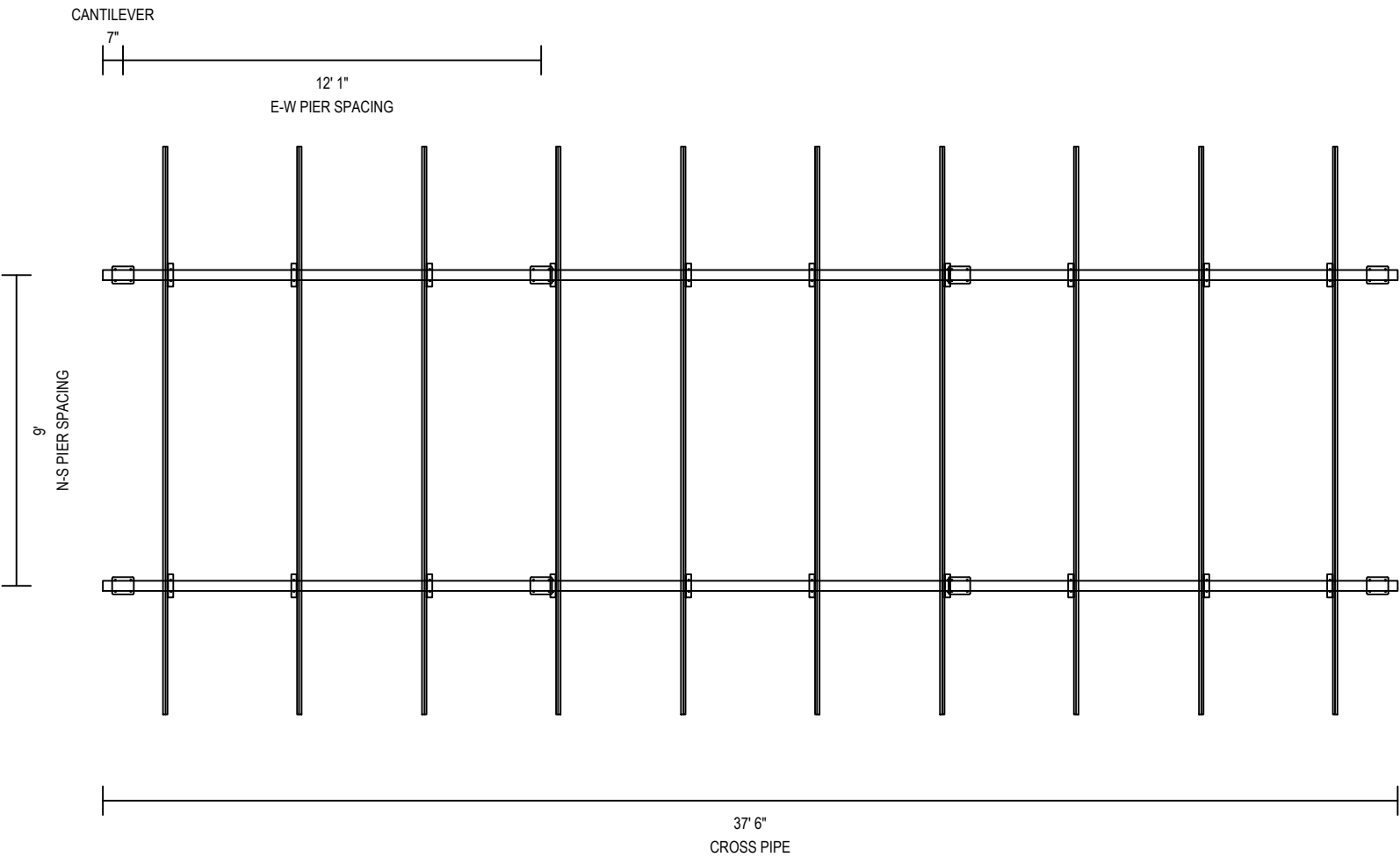
FOUNDATION PLAN

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-5A



1 FOUNDATION PLAN (ARRAY #3)
PV-5C SCALE: 1" = 5'

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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REPRESENTED IN THIS PLAN.

NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

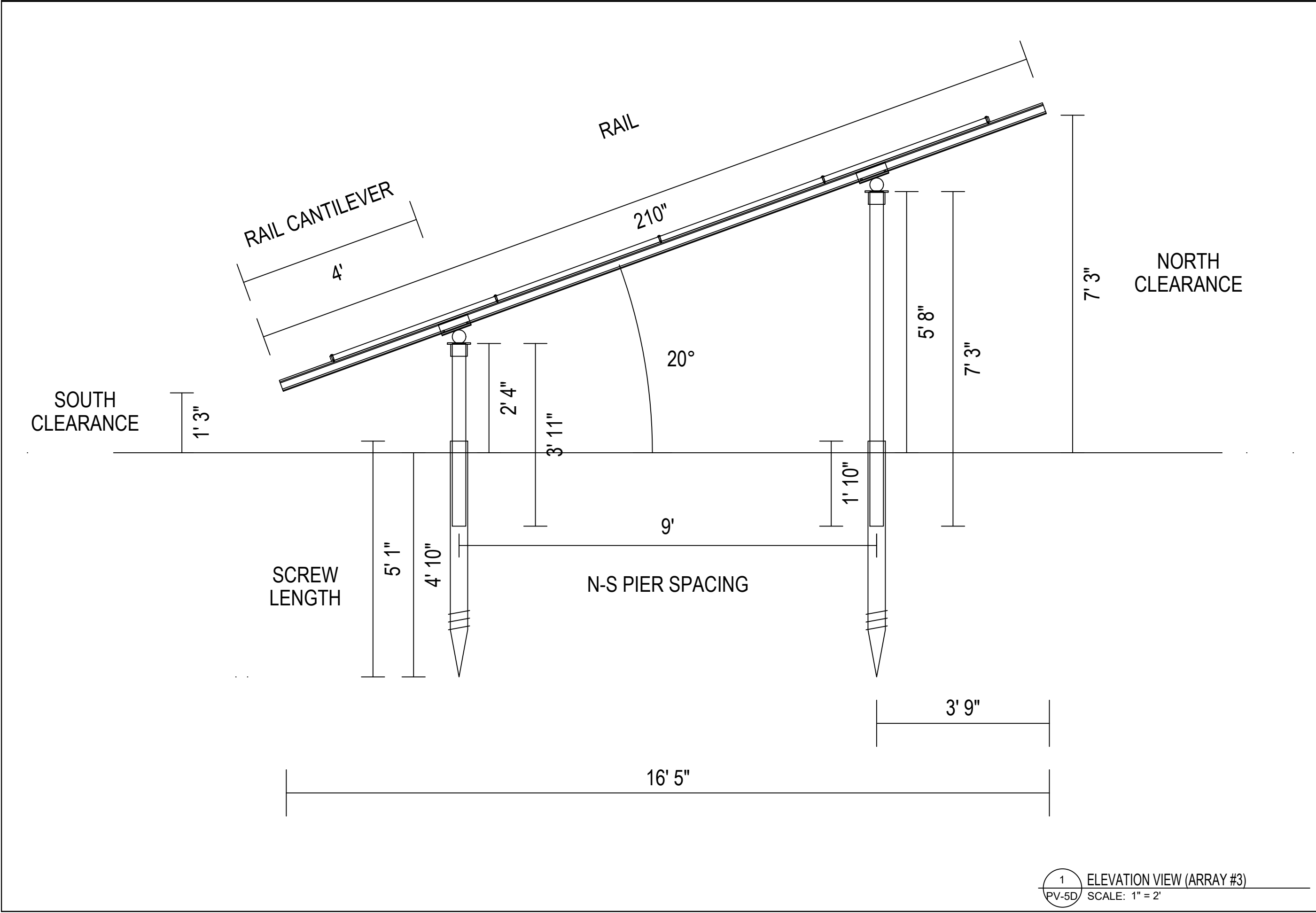
FOUNDATION PLAN

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-5C



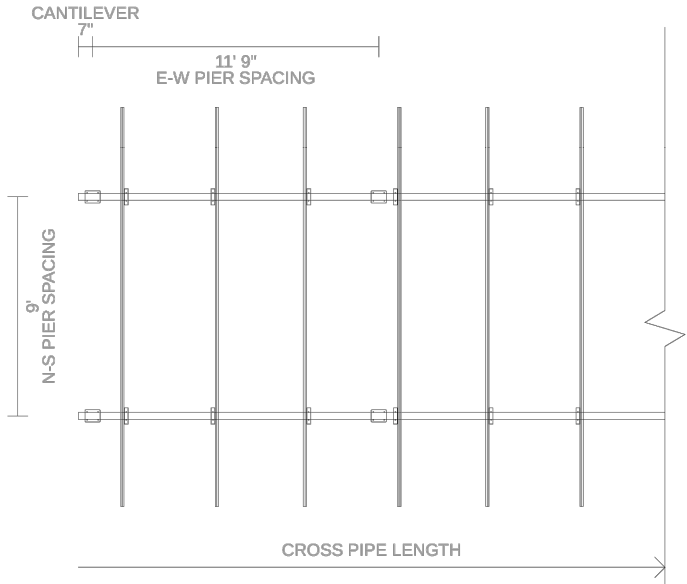
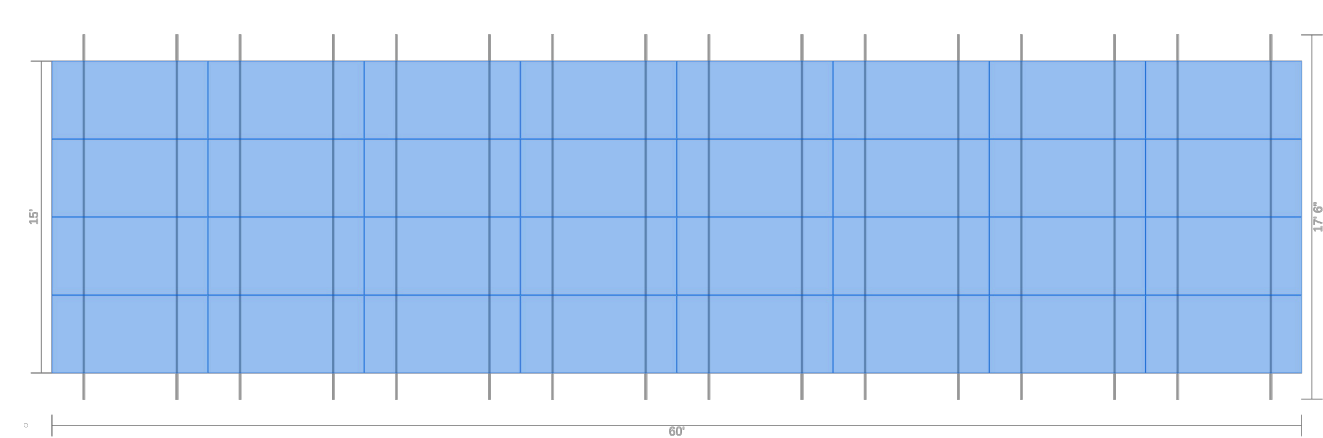
GEMINI SOLAR DESIGN	
CONFIDENTIAL	
SAMPLE PROJECT	
CONTACT: ON FILE	
PROJECT INFO WITHHELD	
CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING SET IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED IN FULL OR IN PART TO ANYONE EXCEPT THOSE INVOLVED IN THE DESIGN AND INSTALLATION OF THE PV SYSTEM REPRESENTED IN THIS PLAN.	
NEW GRID-TIED SYSTEM 48.72kW	SAMPLE COMMUNITY FACILITY PROJECT ADDRESS WITHHELD UNITED STATES
ELEVATION VIEW	
PROJECT NO: GSD-SAMPLE	
DRAWN BY: GSD	
DATE: SAMPLE	
PV-5D	

Project Details			
Name	2751 Mullarkey	Date	08/05/2026
Location	26715 Military Road South, Kent, WA 98032	ASCE code	7.16
Total modules	84	Wind speed	95 mph
Module	Auxin Solar: AXN10M585W (35mm)	Snow load	30 psf
Dimensions	89.69" x 44.65" x 1.38" (2278.0mm x 1134.0mm x 35.0mm)	Wind exposure	B
Module weight	63.63lbs (28.86kg)		
Total watts	49,140	Piers	32
Inter sub-array spacing	340.0" Calculated using solar azimuth of -42.47° and solar elevation of 7.62° at 9AM (America/Los_Angeles) on the winter solstice.		



Substructure & Foundation			
Tilt	20°	South facing grade	0°
Pipe/tubing diameter	3"	Soil class	2 - 5
Foundation type	Ground screws	Screw length	61" (1550mm)
Freeze thaw depth		Hex head set screws / Screw	3

Sub array #1					
Rows	4	Columns	8	# Arrays	2
Area	60' (EW) × 15' 2" (NS)	Rail type	XR1000	Diagonal bracing	no
E/W spacing	11' 9"	Rail cantilever	4'	Pipe cantilever	7"
Piers/array	12	Total south piers	12 (3' 11")	Total north piers	12 (7' 3")
Total cross pipes	4 (60')	Total pipe length	373' 10"		
Shear	596 lbs	Moment	1,489 ft-lbs	Uplift	-965 lbs



GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

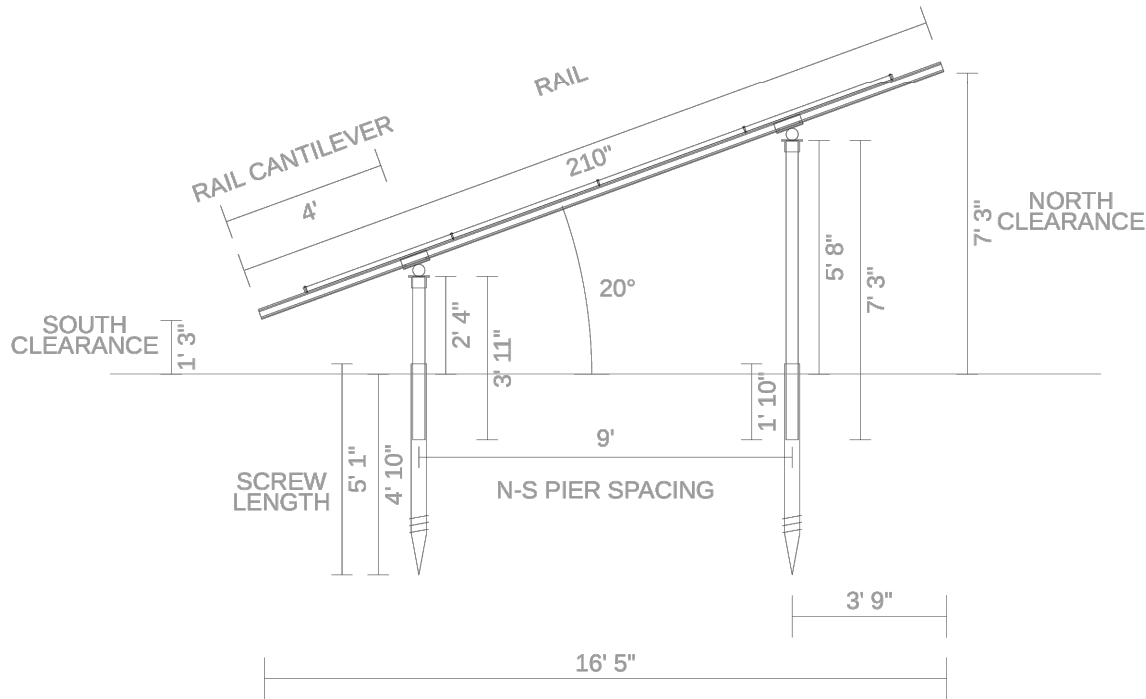
SITE-SPECIFIC REPORT

PROJECT NO: GSD-SAMPLE

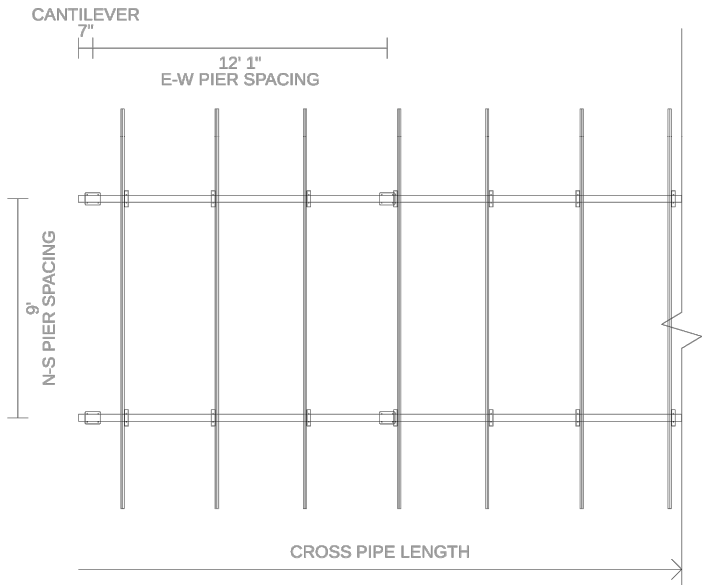
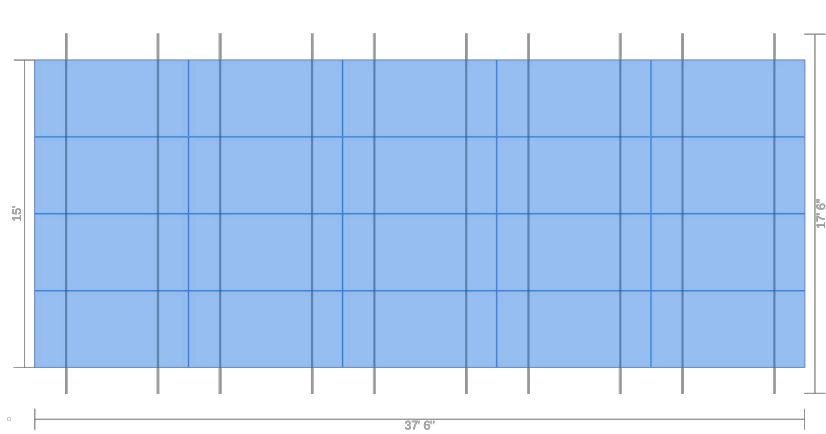
DRAWN BY: GSD

DATE: SAMPLE

PV-5E



Sub array #2					
Rows	4	Columns	5	# Arrays	1
Area	37' 6" (EW) × 15' 2" (NS)	Rail type	XR1000	Diagonal bracing	no
E/W spacing	12' 1"	Rail cantilever	4'	Pipe cantilever	7"
Piers/array	8	Total south piers	4 (3' 11")	Total north piers	4 (7' 3")
Total cross pipes	2 (37' 6")	Total pipe length	119' 7"		
Shear	596 lbs	Moment	1,489 ft-lbs	Uplift	-965 lbs



GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

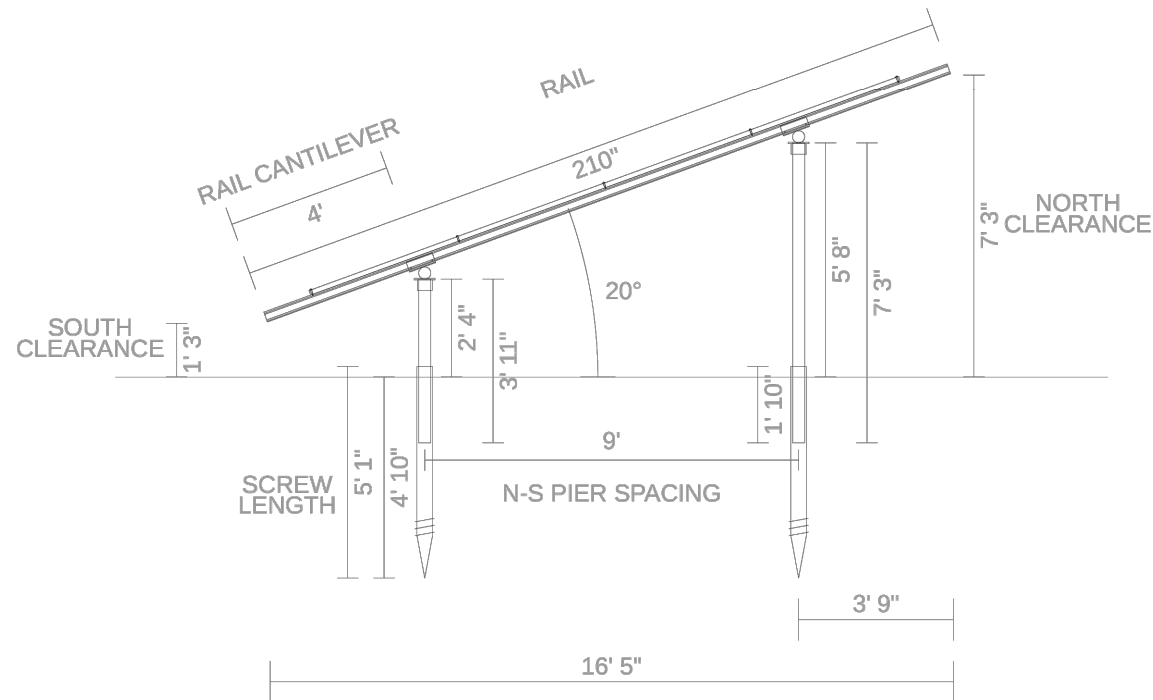
SITE-SPECIFIC REPORT

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

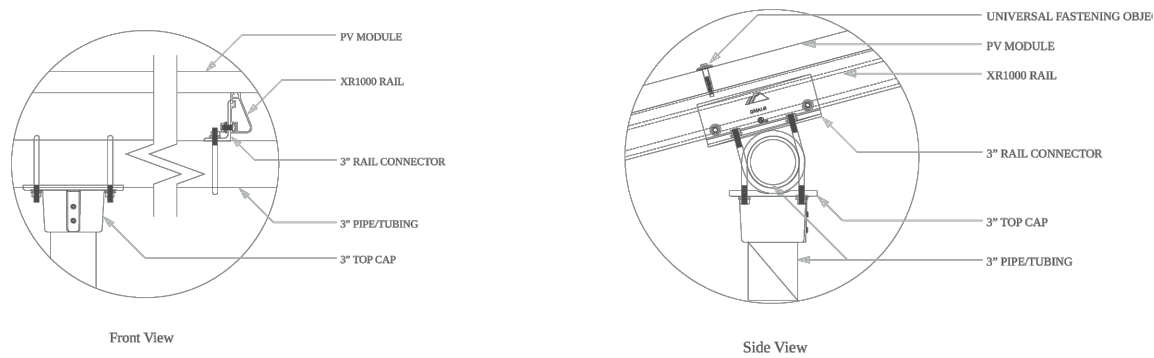
DATE: SAMPLE

PV-5F

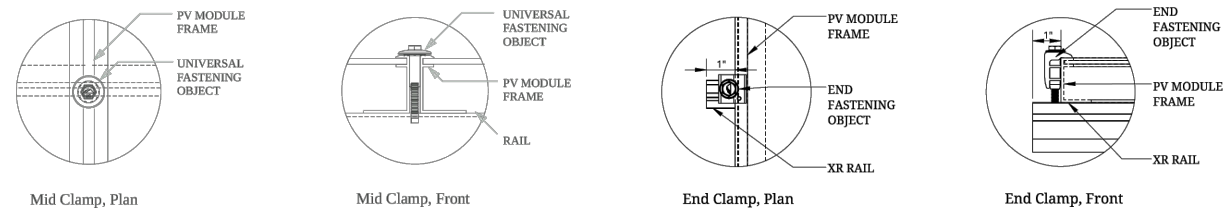


Pipe Fitting Detail

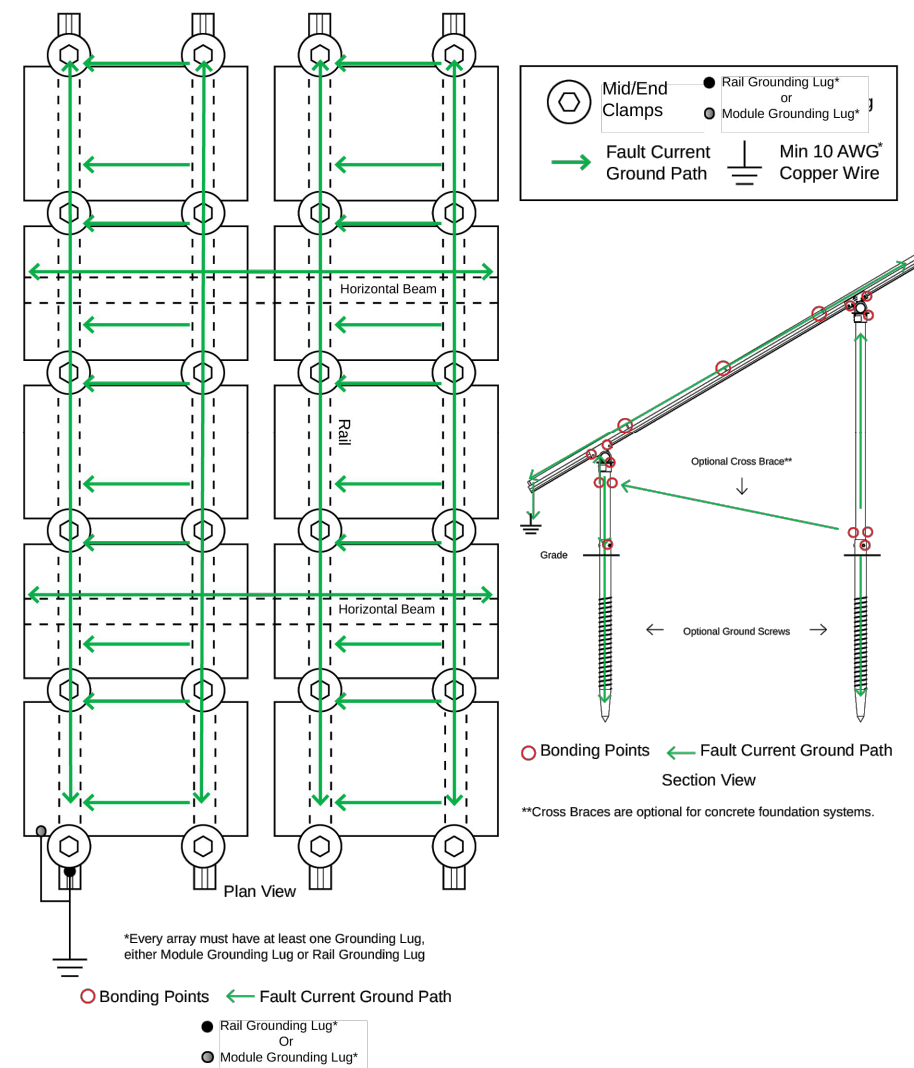
XR1000 Rail



Clamp Detail



Grounding Diagram



GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72kW

**SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES**

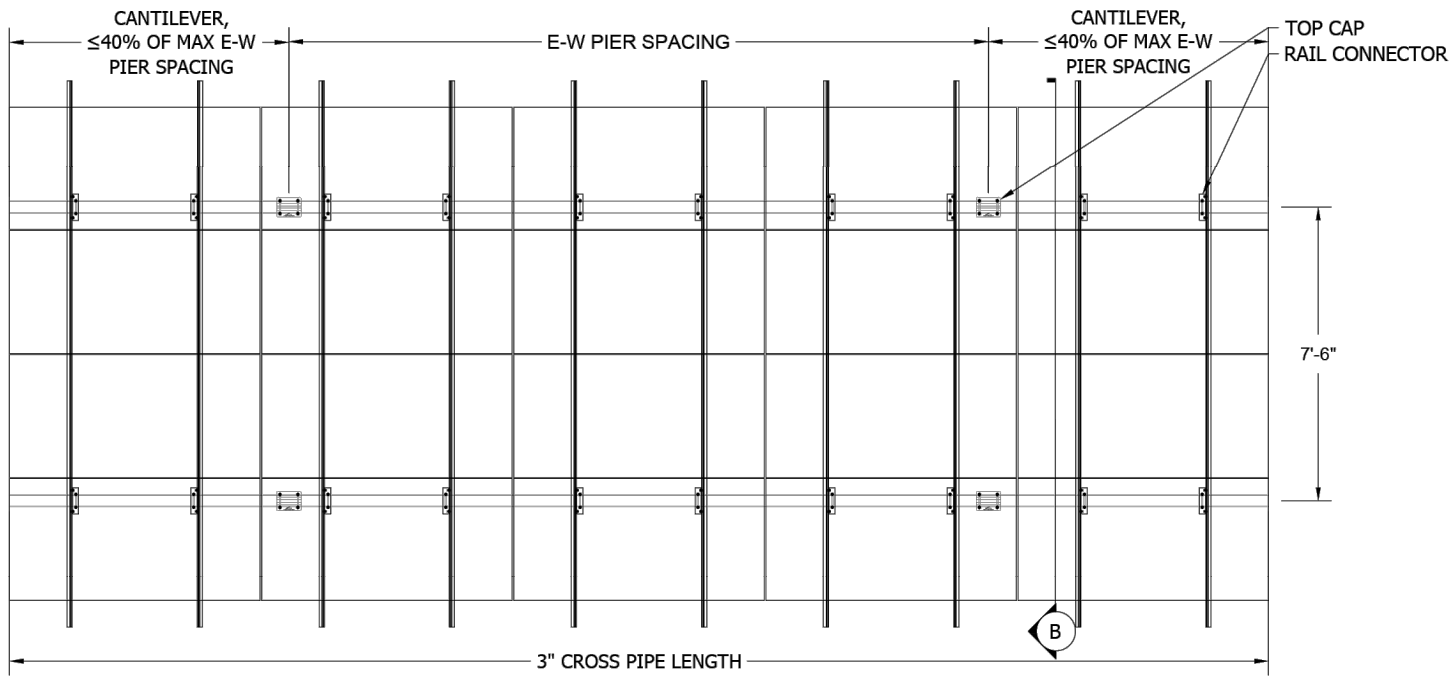
SITE-SPECIFIC REPORT

PROJECT NO: GSD-SAMPLE

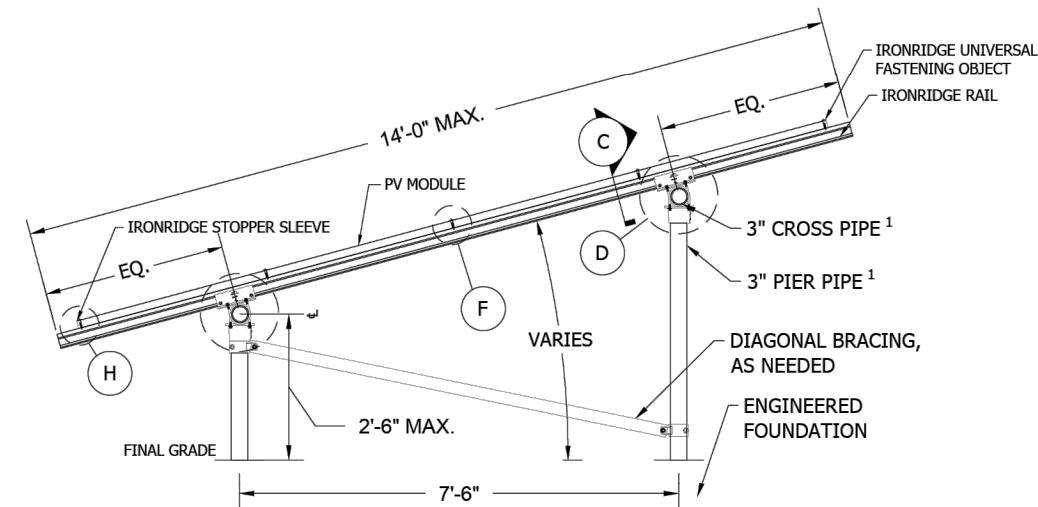
DRAWN BY: GSD

DATE: SAMPLE

PV-5G

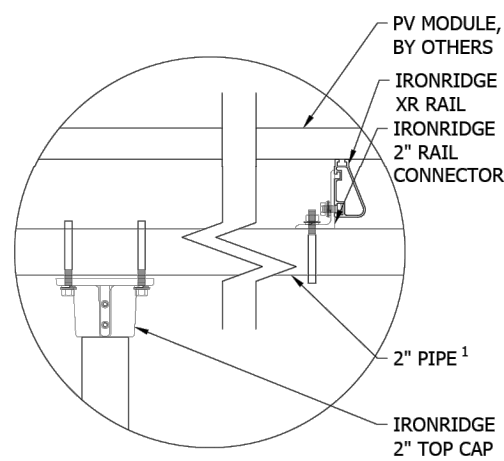


A 4-UP - PV SYSTEM PLAN DETAIL
Scale: 1/2"=1'-0"

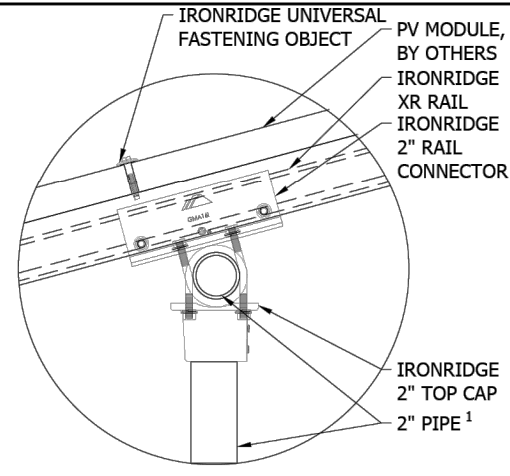


B 4-UP - PV SYSTEM SIDE SECTION
Scale: 3/4"=1'-0"

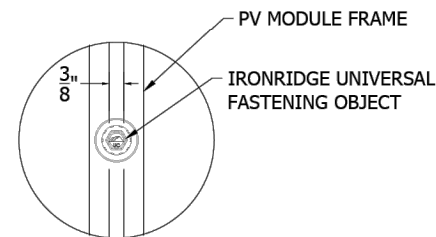
1. SCHEDULE 40 PIPE OR ALLIED MECHANICAL TUBING (8GA WALL THICKNESS)



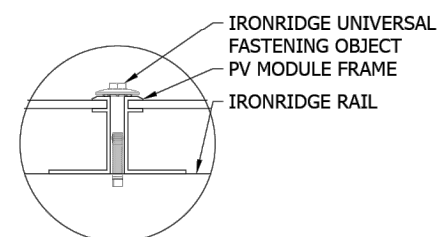
C PIPE FITTINGS DETAIL
3"=1'-0"



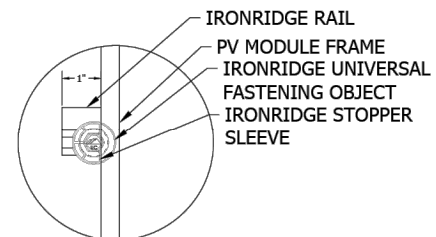
D PIPE FITTINGS DETAIL
3"=1'-0"



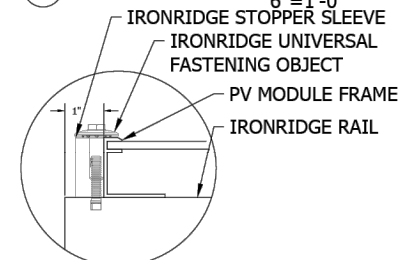
E DETAIL, MID CLAMP PLAN
6"=1'-0"



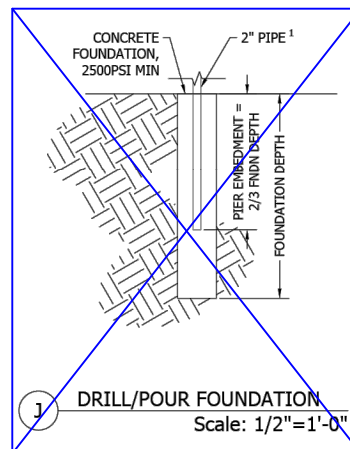
F DETAIL, MID CLAMP FRONT
6"=1'-0"



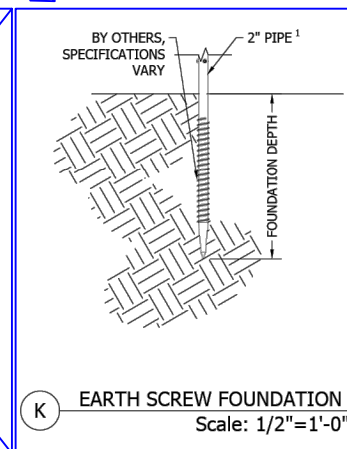
G DETAIL, END CLAMP (UFO) PLAN
6"=1'-0"



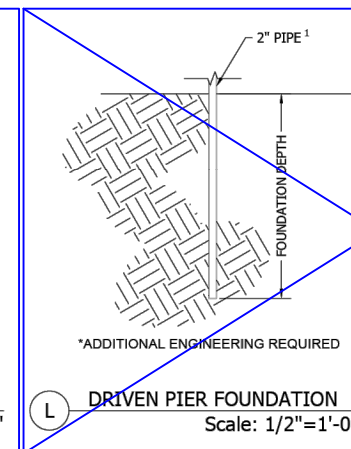
H DETAIL, END CLAMP (UFO) FRONT
6"=1'-0"



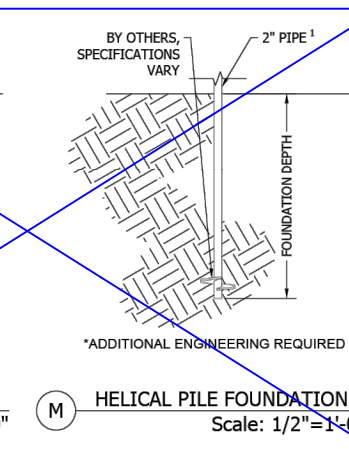
J DRILL/POUR FOUNDATION
Scale: 1/2"=1'-0"



K EARTH SCREW FOUNDATION
Scale: 1/2"=1'-0"



L DRIVEN PIER FOUNDATION
Scale: 1/2"=1'-0"



M HELICAL PILE FOUNDATION
Scale: 1/2"=1'-0"



IRONRIDGE	GROUND MOUNT SYSTEM
CLIENT NAME	PROJECT NAME
	PROJECT ADDRESS
	SYSTEM KW DC

WIND SPEED, MPH	72-CELL, GENERIC
SNOW LOAD, PSF	MODULE WDC
EXPOSURE CAT	MODULE QTY
RISK CAT	



REV	DESCRIPTION	DATE

PV SYSTEM DETAILS
4-UP 3" (UFO)

JOB NO.	2.09 GM
ISSUE DATE	JUNE 2018
SHEET NO.	IR 5.0
SHEET SIZE	24X36

GEMINI SOLAR DESIGN

SAMPLE PROJECT
CONTACT: ON FILE
PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72KW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

RACKING DETAILS

PROJECT NO: GSD-SAMPLE
DRAWN BY: GSD
DATE: SAMPLE



Ground Mount System

Datasheet



Mount on all terrains, in no time.

The IronRidge Ground Mount System combines our XR1000 rails with locally-sourced steel pipes, or mechanical tubing, to create a cost-effective structure capable of handling any site or terrain challenge.

Installation is simple with only a few structural components and no drilling, welding, or heavy machinery required. In addition, the system works with a variety of foundation options, including concrete piers and driven piles.



Rugged Construction

Engineered steel and aluminum components ensure durability.



Simple Assembly

Just a few simple components and no heavy equipment.



Flexible Architecture

Multiple foundation and array configuration options.



PE Certified

Pre-stamped engineering letters available in most states.



Design Software

Online tool generates engineering values and bill of materials.



20 Year Warranty

Twice the protection offered by competitors.



360° Product Tour
Visit ironridge.com

Substructure

Top Caps



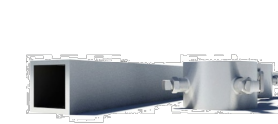
Connect vertical and cross pipes.

Rail Connectors



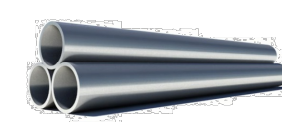
Attach Rail Assembly to horizontal pipes.

Diagonal Braces



Optional Brace provides additional support.

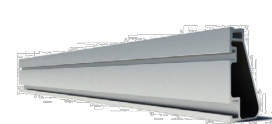
Cross Pipe & Piers



Steel pipes or mechanical tubing for substructure.

Rail Assembly

XR1000 Rails



Curved rails increase spanning capabilities.

Top-Down Clamps



Secure modules to rails and substructure.

Under Clamps



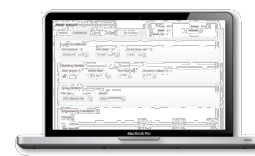
Alternative clamps for pre-attaching modules to rails.

Accessories



Wire Clips and End Caps provide a finished look.

Resources



Design Assistant

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

Go to ironridge.com/gm



NABCEP Certified Training

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

Go to ironridge.com/training

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PV-7

RACKING DATASHEET
SCALE: N/A

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

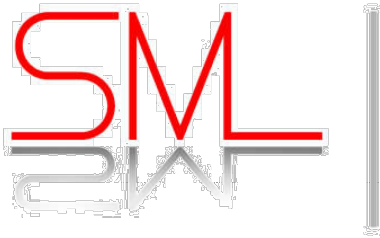
RACKING DATASHEET

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-7



Consulting Structural &
Forensic Engineers

3600 E University Dr, Suite 1400, Phoenix, AZ 85034
(602) 438-2500 www.smleng.com

IronRidge
28357 Industrial Boulevard
Hayward, CA 94545

April 16, 2024
Page 1 of 28

Attn: Mr. Sean McDonald, CEO, IronRidge Inc.

Subject: Ground Mounting System with Ground Screws – Structural Analysis – 5 Module (XR1000)

Dear Sir:

We have analyzed the subject ground mounted structure and determined that it is in compliance with the applicable sections of the following Reference Documents:

Codes: ASCE/SEI 7-10 & 7-16 Min. Design Loads for Buildings & Other Structures
International Building Code, 2015, 2018 & 2021 Editions
Other: AC428, Acceptance Criteria for Modular Framing Systems Used to Support PV
Modules, dated Effective November 1, 2012 by ICC-ES
CTL Thompson Testing Report No. 1572 (Rev.1), dated March 16, 2023
CTL Thompson Testing Report No. 1574 (Rev.0), dated November 20, 2020
American Ground Screw, Inc. ESR-4226
Aluminum Design Manual, 2015 & 2020 Editions
IronRidge Exhibit EX-0022 (See Attached)

The structure is a simple column (pier) and beam (cross pipe) system. The piers & cross pipes are ASTM A53 Grade B standard weight (schedule 40) steel pipes or Allied Mechanical Tubing. Please refer to Exhibit EX-0022 for approved pipe geometry and material properties. The tops of the piers are connected in the E-W direction by the cross pipes which cantilever over and extend past the end piers. The cross pipes are connected by proprietary IronRidge XR1000 Rails spanning up and down the slope which cantilever over and extend past the top and bottom cross pipes. There are typically two rails per column of modules. The modules are clamped to the rails by the IronRidge Module Mounting Clamps as shown in the attached Exhibit.

Gravity loads are transferred to the piers and ground screws by the rails and cross pipes acting as simple beams. For lateral loads the system is a cantilever structure. The effect of seismic loads (for all design categories A-F) have been determined to be less than the effect due to wind loads in all load conditions and combinations.

The pier spacing in the N-S direction is 9'-0". The pier spacing in the E-W direction is selected from load tables determined by the structural design for the specified slope, wind load, and snow load. The governing criteria for the pier spacing is either the spanning capacity of the cross pipes or the cantilever capacity of the pier. Simplified Load Tables 1A-L & 2A-L are included herein for reference.

SML - Consulting Structural & Forensic Engineers

IronRidge
Mr. Sean McDonald
Ground Mounting System with Ground Screws – Structural Analysis – 5 Module (XR1000)

April 16, 2024
Page 28 of 28

Ground Screw Notes:

1. 2" Schedule 40 Pipe Compatible with:

	American Ground Screw Model 3 76mm x 3(+) mm (N76)	Krinner North America KSF G76
Screw Diameter:	2.99"	2.99"
Sleeve Diameter:	2.375"	2.375"
Minimum Screw Length:	51" or 63"	51" or 63"

2. 3" Schedule 40 Pipe Compatible with:

	American Ground Screw Model 3 102mm x 3.75(+) mm (N102)	Krinner North America KSF G114
Screw Diameter:	4.016"	4.488"
Sleeve Diameter:	3.5"	3.5"
Minimum Screw Length:	63"	63"

3. Tested Soil Class 4 Soil Properties: Friction Angle = 28-32 (deg), Total Unit Weight = 120-130pcf
4. Tested Soil Class 5 Soil Properties: Cohesion = 1000-2000psf, Total Unit Weight = 120-130pcf
5. Snow Load = 0 psf – tabulated values are conservative for Snow Loads > 0 psf
6. Soil classification is to be determined and verified by the end user of this certification letter.

The analysis assumes that the array, including the connections and associated hardware, are installed in a workmanlike manner in accordance with the IronRidge Ground Mount Installation Manual, the American Ground Screw Installation Manual, the Krinner Foundations Systems Installation Manual, and generally accepted standards of construction practice. Verification of PV Module capacity to support the loads associated with the given array shall be the responsibility of the Contractor or Owner and not IronRidge or SML.

Please feel free to contact me at your convenience if you have any questions.

Respectfully yours,



Andrew J. Huseman, P.E.
Principal

Jesse Light, S.E., P.E.
Principal / President / Sr. Structural Engineer

SML - Consulting Structural & Forensic Engineers
- 28 -



STATE OF WASHINGTON ENGINEERING LETTER (IRON RIDGE RACKING)
SCALE: N/A

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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NEW GRID-TIED SYSTEM 48.72KW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

ENGINEERING LETTER

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-8



UFO Family of Components

Tech Brief

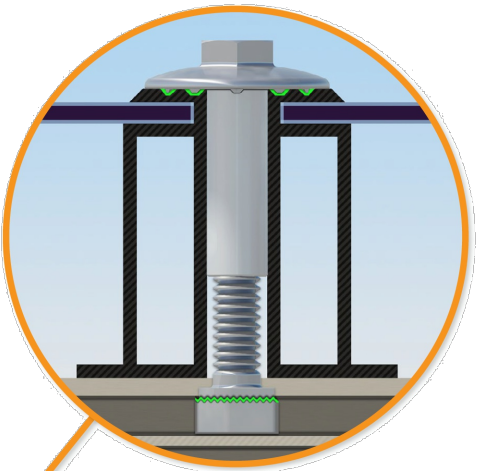
Simplified Grounding for Every Application

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

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



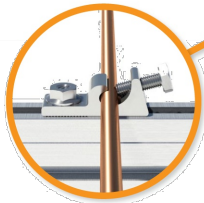
Stopper Sleeve
The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.



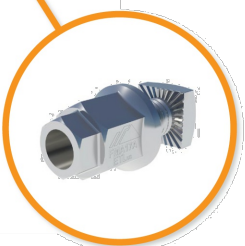
Universal Fastening Object (UFO)
The UFO securely bonds solar modules to XR Rails. It comes assembled and lubricated, and can fit a wide range of module heights.



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

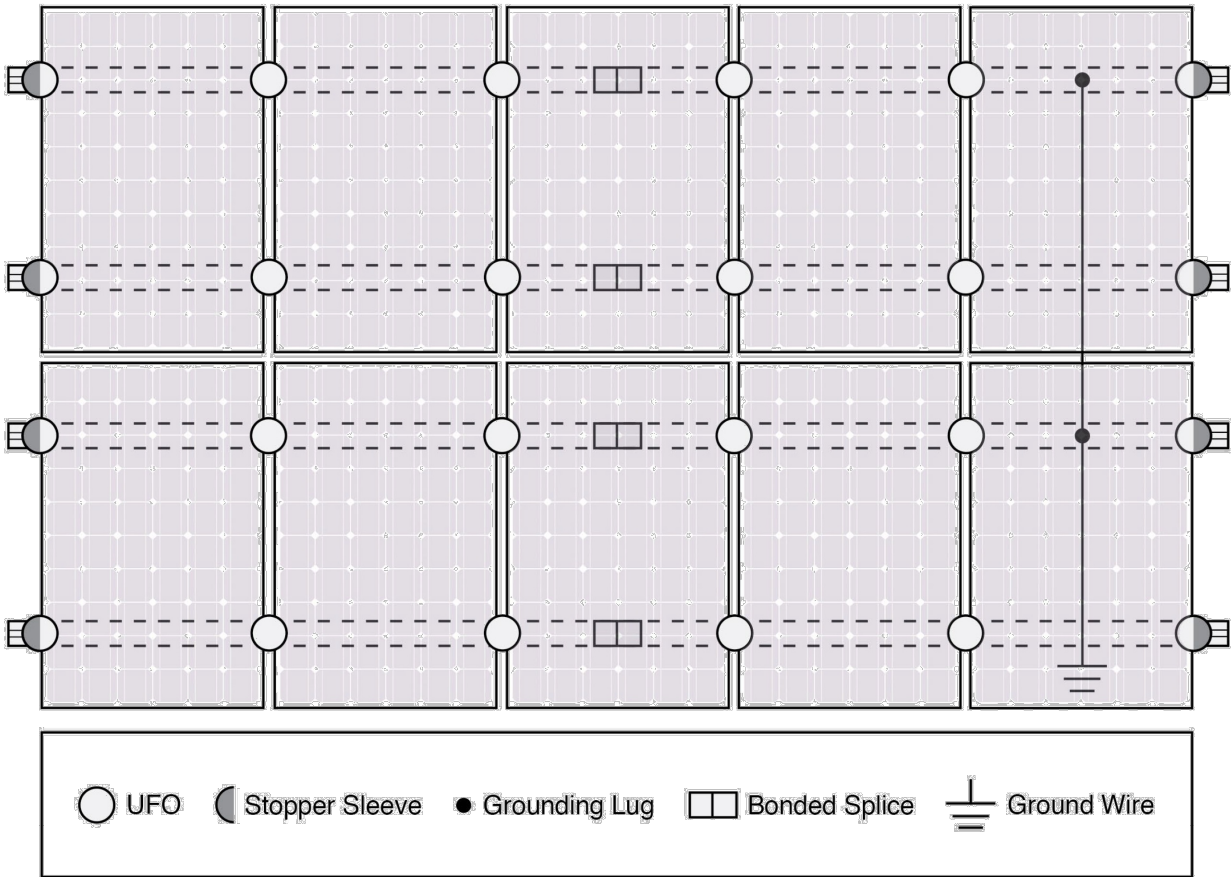


Grounding Lug
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



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

System Diagram



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

UL Certification

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

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

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

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

Tech Brief

GEMINI SOLAR DESIGN

SAMPLE PROJECT

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

GROUNDING DETAILS

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-9

M144SG-580W

Framed Mono-facial High Efficiency N-type

Model Name	AXN10M565W	AXN10M570W	AXN10M575W	AXN10M580W
Maximum Power (+3%)	565	570	575	580
Voc (V)	51.08	51.26	51.37	51.55
Isc (A)	13.71	13.73	13.74	13.76
Vmp (V)	43.72	43.99	44.26	44.53
Imp (A)	12.93	12.97	13.00	13.03
Module Efficiency (%)	21.7%	21.9%	22.0%	22.2%

Series Fuse Rating 30A
Junction Box Protection IP68
Maximum System Voltage VDC1500
Operating Temperature -40°C to 85°C
Module type Framed Mono-Facial Single Glass
Connector type Staubli EVO-2Aⁱ
Cable length 12AWG 1200mmⁱⁱ
Maximum snow/wind load 5400Pa(snow)/5400Pa(wind)
Certification/Fire Type UL61730; UL1703 Fire Type 1

i) Amphenol connectors available upon request, ii) Cable length may be customized

22.2% efficiency

Exceptional PID resistance

Excellent low light performance

Linear power degradation

2x POE for extra moisture protection

35mm frame thickness

High wind load tested

2x Electro-luminescence

Positive power tolerance

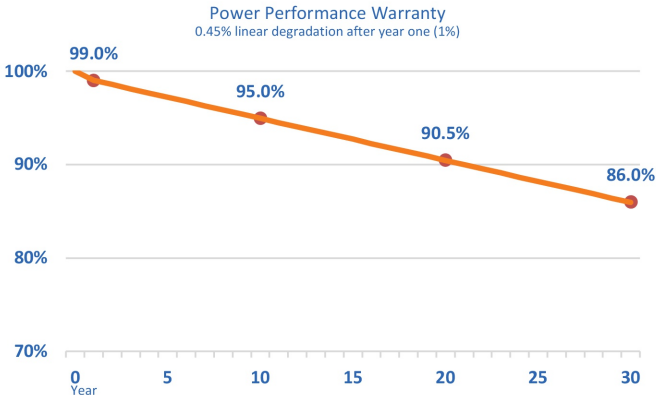
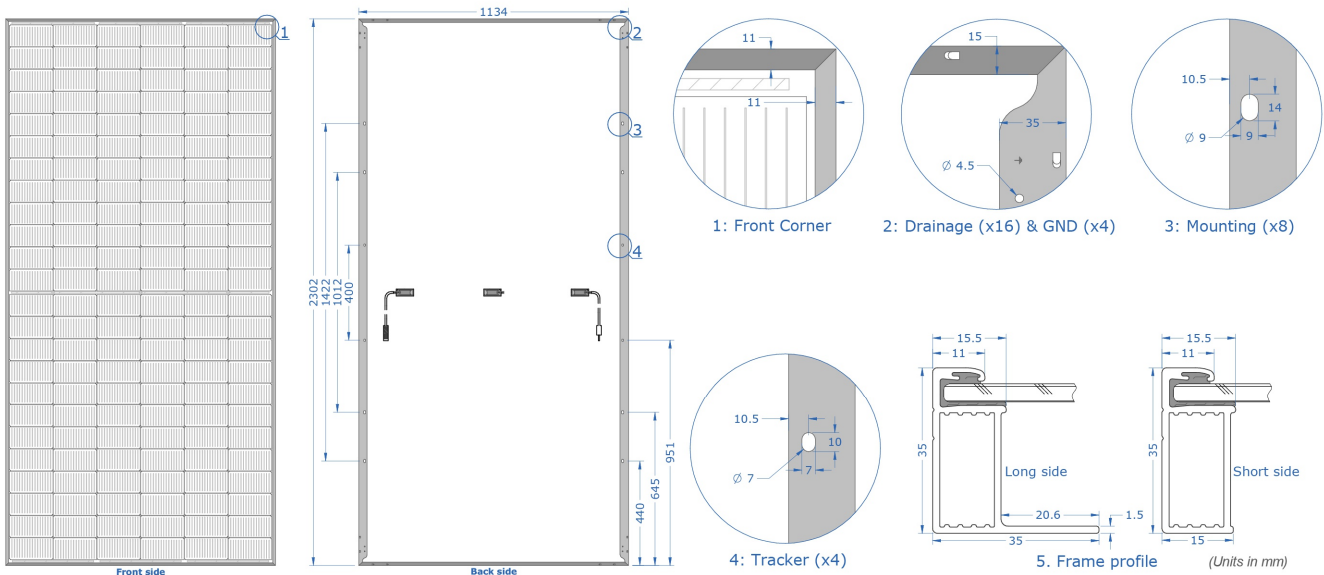
1.2m cable

1500 VDC

30 years power output warranty

25 years product guarantee

Additional certification upon request



Mechanical Characteristics			
Frame	Anodized Aluminum (Silver and Black)		
Solar Panel	63.63 lbs/28.86 kg 90.63" x 44.65" x 1.38" 2302mm x 1134mm x 35mm		
Shipping Pallet	33 pcs per pallet 2193 lbs/995 kgs 94.65" x 48.66" x 50.47" 2404mm x 1236mm x 1282mm		
Container	19 pallets (627 pcs) per 53'		
Temperature Coefficients		Standard Test Conditions (STC)	
NOCT	45 °C	Irradiance	1000W/m ²
Isc/Voc (per °C)	+0.05%/-0.25%	Module Temperature	25 °C
Pmax (per °C)	-0.29%	AM	1.50
Specifications subject to change without notice			

Auxin Solar, 6835 Via Del Oro, San Jose, CA 95119, USA
+1 408 225-4380 (office)
salesusa@auxinsolar.com
www.auxinsolar.com



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GEMINI SOLAR DESIGN

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

MODULE DATASHEET

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-10

SUNNY TRIPOWER X 20-US / 25-US / 30-US
powered by ennexOS



Integrated system manager

- Monitoring and control for up to 5 inverters (max. 150 kVA)
- Remote access with Sunny Portal powered by ennexOS
- SMA Dynamic Power Control

Enhanced safety

- Integrated SunSpec PLC signal for module-level shutdown
- Advanced DC AFCI arc-fault protection
- Optional DC type 2 and type 1+2 surge protection

Maximum yields

- Three MPP trackers for flexible array design
- SMA ShadeFix string level optimization
- Intelligent string performance monitoring and I-V curve diagnostics

Smart monitoring, control, service

- SMA Smart Connected proactive monitoring and service solution
- SMA ennexOS cross-sector energy management platform
- Centerpiece of the proven SMA Energy System Business

SUNNY TRIPOWER X 20-US / 25-US / 30-US

Integrated intelligence for future-proof system design

Sunny Tripower X is the new innovative inverter solution for commercial PV systems. Providing three MPP trackers with SMA ShadeFix string optimization technology for optimal PV array design flexibility and maximum energy yields. SMA's proven integrated rapid shutdown support and reliable DC AFCI arc-fault protection ensure enhanced system safety. And now with the new integrated System Manager, powered by SMA's ennexOS cross-sector energy management platform, Sunny Tripower X becomes the centerpiece of the SMA Energy System Business for comprehensive commercial energy systems now and in the future.

Technical Data*	Sunny Tripower X 20-US	Sunny Tripower X 25-US	Sunny Tripower X 30-US
Input (DC)			
Maximum PV array power	30000 Wp	37500 Wp	45000 Wp
Maximum input voltage		1000 V	
MPP voltage range	345 V to 800 V	430 V to 800 V	515 V to 800 V
Minimum input voltage / initial input voltage		150 V / 188 V	
Maximum operating input current / short-circuit current per MPP tracker		24 A / 37.5 A	
Number of independent MPP trackers / string inputs per MPP tracker		3 / 2	
Output (AC)			
Nominal output power	20000 W	25000 W	30000 W
Maximum apparent power	20000 VA	25000 VA	30000 VA
Nominal AC voltage		480 V / 277 V	
AC voltage range		244 V to 305 V	
Rated grid frequency / range		60 Hz / 50 Hz to 66 Hz	
Maximum output current	24 A	30 A	36 A
Power factor at rated power / adjustable displacement		1 / 0.0 overexcited to 0.0 underexcited	
Output phasess / line connection		3 / 3-[N]-PE	
Harmonics (THD)		< 3 %	
Efficiency			
CEC efficiency	98 %	98.5 %	98.5 %
Protection and safety features			
Load rated DC disconnect		•	
Ground fault monitoring / grid monitoring		• / •	
DC reverse polarity protection / AC short-circuit protection		• / •	
All-pole sensitive residual-current monitoring unit		•	
Protection class / overvoltage category		I / III	
DC AFCI arc-fault protection		•	
SunSpec PLC signal for rapid shutdown		•	
DC surge protection type 2 / DC surge arrester type 1+2		○ / ○	
DC terminal cover for conduit connection		○	
General data			
Dimensions (W/H/D)		728 mm / 762 mm / 266 mm (28.7 in / 30 in / 10.5 in)	
Device Weight		35 kg / 77 lbs	
Operating temperature range		-25°C to +60°C (-13°F to +140°F)	
Noise emission (typical)		59 dB(A)	
Topology / cooling concept		Transformerless / OptiCool (forced convection, variable speed fans)	
Enclosure protection rating		Type 4 (as per UL 50E)	
Maximum permissible value for relative humidity (non-condensing)		100 %	
Features / functions / accessories			
Mounting type		Vertical rack / wall mount to 15° from horizontal	
DC connection / AC connection		Amphenol H4 Plus / spring-cage terminal	
LED indicators (status / fault / communication)		•	
Network interfaces: Ethernet / WLAN / RS485		• (2 ports) / • / ○	
Data protocols: SMA Modbus / SunSpec Modbus / Speedwire		• / • / •	
Multi-function relay / Extension module slot / Digital inputs		• / • / • (6 inputs)	
SMA ShadeFix string level optimization		•	
Intelligent string performance monitoring / I-V curve diagnostics		• / •	
Integrated Plant Control / Q on Demand 24/7		• / •	
SMA Smart Connected (proactive monitoring and service support)		•	
Warranty: 10 / 15 / 20 years		• / ○ / ○	
Certificates and approvals (pending)			
Certificates and approvals		UL 62109-1, UL 1699B Ed. 1, CAN/CSA 22.2 No. 62109-1:16 / 62109-2:16, PV Rapid Shutdown System Equipment in accordance with UL1741:2021	
FCC compliance		FCC Part 15 Class A & B	
Grid interconnection standards		UL 1741 SB, IEEE 1547:2018, compliance to SRDs: CA Rule 21, HECO Rule 14H, ISO-NE	
Integrated system manager			
Maximum number of supported inverters / energy meters		5 / 1	
Maximum system power PV inverters (nominal AC power)		150 kVA	
Centralized commissioning of all devices in the system		•	
Remote parameterization of SMA devices		• (via Sunny Portal powered by ennexOS)	
SMA Dynamic Power Control (e.g. zero export / Volt-VAR)		○	
Type designation	STP 20-US-50	STP 25-US-50	STP 30-US-50
• Standard features ○ Optional — Not available Data in nominal conditions Last revision: 09/2022 *Preliminary technical data, subject to change			
Accessories			
SMA Data Manager M EDMM-US-10	DC terminal cover DC-TERM-COVER	SMA RS485 Module MD.485-US-40	SMA Sensor Module MD.SEN-US-40
			DC Surge Protection Kits T2: DC_SPD_KIT6-10 T1+2: DC_SPD_KIT7_T1T2

Toll Free +1 888 4 SMA USA
www.SMA-America.com

SMA America, LLC

GEMINI SOLAR DESIGN

SAMPLE PROJECT

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NEW GRID-TIED SYSTEM 48.72KW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

INVERTER DATASHEET

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-11A

CERTIFICATE OF COMPLIANCE

Certificate Number 20230612-E210376
Report Reference E210376-20230612
Issue Date 2023-06-12

Issued to: SMA Solar Technology AG
Sonnenallee 1
34266 Niestetal GERMANY

This is to certify that
representative samples of
STATIC INVERTERS, CONVERTERS AND
ACCESSORIES FOR USE IN INDEPENDENT POWER
SYSTEMS

Permanently-connected, utility Interactive, 3-phase inverter,
Models: STP 30-US-50, STP 25-US-50 and STP 20-US-50.
(which are intended for DC input from photovoltaic
modules)

Have been investigated by UL in accordance with the
Standard(s) indicated on this Certificate.


Bruce Mahrenholz, Director North American Certification Program
UL LLC

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CERTIFICATE OF COMPLIANCE

Certificate Number 20230612-E210376
Report Reference E210376-20230612
Issue Date 2023-06-12

Standard(s) for Safety:

UL1741 Standard for Safety for Inverters, Converters,
Controllers and Interconnection System Equipment for Use
With Distributed Energy Resources.

UL 62109-1, Safety of power converters for use in
photovoltaic power systems – Part 1: General requirements

IEEE 1547, IEEE Standard for Interconnecting Distributed
Resources with Electric Power Systems.

IEEE 1547.1, IEEE Standard for Conformance Test
Procedures for Equipment Interconnecting Distributed
Resources with Electric Power Systems.

CSA C22.2 No. 62109-1 Safety of power converters for use
in photovoltaic power systems - Part 1: General
requirements.

CSA C22.2 No. 62109-2 Safety of power converters for use
in photovoltaic power systems - Part 2: Particular
requirements for inverters.

Additional Information: See the UL Online Certifications Directory at
www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's
Certification and Follow-Up Service.

The UL Recognized Component Mark generally consists of the manufacturer's identification and catalog
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Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products
that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark:
, may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is
required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual
recognitions.


Bruce Mahrenholz, Director North American Certification Program
UL LLC

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GEMINI SOLAR DESIGN

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NEW GRID-TIED SYSTEM 48.72kW

SAMPLE COMMUNITY FACILITY
PROJECT ADDRESS WITHHELD
UNITED STATES

INVERTER UL LISTING

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-11B