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PROJECT DETAILS	
PROPERTY OWNER	SAMPLE COMMERCIAL PV PROJECT
PROPERTY ADDRESS	100 SAMPLE PROJECT WAY SAMPLE CITY, USA
MAIN CONTACT PERSON	SAMPLE PROJECT MANAGER
MAIN CONTACT COMPANY	SAMPLE SOLAR CONTRACTOR, LLC.
MAIN CONTACT PHONE	(000) 000-0000
MAIN CONTACT EMAIL	PROJECTS@SAMPLECONTRACTOR.COM
MAIN CONTACT ADDRESS	100 BUSINESS PARKWAY SAMPLE CITY, USA
ACCOUNT NUMBER	SAMPLE-ACCOUNT
CONSTRUCTION TYPE	ROOF-MOUNTED CARPORT PHOTOVOLTAIC ARRAY
OBSERVED CODES	2018 INTERNATIONAL RESIDENTIAL CODE (IRC) AMENDMENTS 2018 INTERNATIONAL BUILDING CODE (IBC) AMENDMENTS 2018 INTERNATIONAL FIRE CODE (IFC) AMENDMENTS 2018 INTERNATIONAL MECHANICAL CODE (IMC) AMENDMENTS 2018 INTERNATIONAL PLUMBING CODE (IPC) AMENDMENTS 2018 INTERNATIONAL FUEL GAS CODE (IFGC) AMENDMENTS 2018 INTERNATIONAL ENERGY CONSERVATION CODE (IECC) AMENDMENTS 2018 INTERNATIONAL EXISTING BUILDING CODE (IEBC) AMENDMENTS 2017 NATIONAL ELECTRIC CODE (NEC) AMENDMENTS

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 Mallapudi

TOTAL SYSTEM SUMMARY	
DC RATING OF SYSTEM	943,200W
AC OUTPUT CURRENT	962.4A @ 480VAC
MAXIMUM CONTINUOUS	800,000W
AC POWER OUTPUT	
STRING INVERTER	(TYP. OF 4) SOLECTRIA XGI 1500 INVERTER MODEL: XGI 1500 200/200-480
SOLAR MODULE	(TYP. OF 1310) TALESUN SOLAR BIPRO TM8G66M-720
INTERCONNECTION	LINE-SIDE TAP

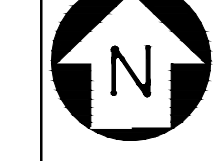
SITE SPECIFICATIONS	
UTILITY SERVICE	277Y / 480VAC, 3-Ø, 4-WIRE
MAIN DISTRIBUTION PANEL (PNL "MSB/SES")	3000A RATED BUSBAR 3000A / 3P MAIN CIRCUIT BREAKER (65KAIC MIN.)
ASHRAE EXTREME ANNUAL MEAN MINIMUM DENSITY DRY BULB TEMP.	2°C
ASHRAE 2% ANNUAL DRY DENSITY BULB TEMP.	43°C



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 DC CONDUCTORS SHALL BE COPPER, RATED FOR AT LEAST 1500 VOLTS MINIMUM, 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 COMBINATION OF (TYP. OF 5) ROOF-MOUNTED CARPORT PHOTOVOLTAIC ARRAYS. THE ENERGY PRODUCED BY THE PV SYSTEM SHALL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ON-SITE ELECTRICAL EQUIPMENT VIA A LINE-SIDE POINT OF INTERCONNECTION.	
THIS PROJECT DOES NOT INCLUDE STORAGE BATTERIES.	
THIS PROJECT DOES INCLUDE (TYP. OF 2) EXISTING STANDBY GENERATORS THAT ARE ELECTRICALLY ISOLATED FROM THE PHOTOVOLTAIC SYSTEM.	

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

A
PV-2A

SITE PLAN (MAXIMUM EXTENTS)
SCALE: 1" = 360'-0"

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SITE PLAN NOTES	
1	CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 319.0(D).
2	CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.8(C).
3	ARRAYS SHALL BE INSTALLED IN A WAY THAT ENSURES THAT PV SOURCE CONDUCTORS SHALL NOT BE READILY ACCESSIBLE.
4	UNDERGROUND PVC CONDUIT SHALL BE BURIED AT 19" MINIMUM DEPTH, WARNING TAPE 12" ABOVE.
5	VERIFY UNDERGROUND UTILITIES PRIOR TO EXCAVATION.

(N) CARPORT STRUCTURE #3
270° AZIMUTH, 7° PITCH
(280) TALESUN SOLAR
BIPRO TM8G66M-720

(N) AUXILIARY DC GEC AS
PER NEC SECTION 690.47(D)
(LOC. AT CARPORT STRUCTURE)

(N) AUXILIARY DC GEC AS
PER NEC SECTION 690.47(D)
(LOC. AT CARPORT STRUCTURE)

(N) CARPORT STRUCTURE #2
270° AZIMUTH, 7° PITCH
(255) TALESUN SOLAR
BIPRO TM8G66M-720

(N) CARPORT STRUCTURE #1
180° AZIMUTH, 7° PITCH
(265) TALESUN SOLAR
BIPRO TM8G66M-720

(N) AUXILIARY DC GEC AS
PER NEC SECTION 690.47(D)
(LOC. AT CARPORT STRUCTURE)

(N) UTILITY AC DISCONNECT (DS1)
(PV AC DISCONNECT / SERVICE-RATED FUSIBLE SWITCH)
TYPE: FUSED SAFETY SWITCH, HEAVY-DUTY UNIT
VOLTAGE: 480 VAC, 3-Ø, 3W (NO NEUTRAL), 60 HZ, POLES: 3-POLE
AMP RATING: 1600A CONTINUOUS, FUSING: (3) × 1600A FUSES (ONE PER PHASE)
OCPD FUNCTION: FINAL PV OCPD FOR LINE-SIDE TAP POINT OF INTERCONNECTION
SCCR: 65 KAIC MINIMUM AT 480 VAC (WITH SPECIFIED FUSES)
ENCLOSURE: NEMA 3R RATED
SWITCH DUTY: SERVICE-RATED / SUITABLE FOR USE AS SERVICE EQUIPMENT (SUSE)
ACCESSORIES: VISIBLE BLADE, LOCKABLE HANDLE (ON/OFF), PADLOCK PROVISIONS

NOTES: BONDING/NEUTRAL: NO NEUTRAL SWITCHING; EQUIPMENT GROUNDING PER NEC 250; NOT A SEPARATELY DERIVED SYSTEM.
FUSES: PROVIDE MANUFACTURER/SERIES FUSE COORDINATION TO ACHIEVE STATED SCCR AND UTILITY REQUIREMENTS.
LINE-SIDE TAP: DISCONNECT LOCATED AT / NEAR POI AS REQUIRED BY AHJ / UTILITY; ACCESSIBLE, LOCKABLE, AND LABELED "PV AC DISCONNECT."
(LOC. EXTERIOR OF BUILDING)

(EX.) PNL MSB/SES, 3-Ø, 4-WIRE, 277/480VAC
(EX.) 3000A MAIN CIRCUIT BREAKER, 65KAIC (MIN.)
(LOC. INTERIOR OF BUILDING)

(N) LINE-SIDE TAP POINT OF INTERCONNECTION
AS PER NEC 240.21(B)(1) & NEC 705.11
(SHALL TAKE PLACE WITHIN THIS ENCLOSURE)

MOVE EXISTING EMERGENCY GENSET #1 AND #2 TO THIS LOCATION
SPECS ON EXISTING GENSETS: 1,000KW, 277/480VAC, 3-Ø, 4-WIRE, 1500A MCB

(N) AUXILIARY DC GEC AS
PER NEC SECTION 690.47(D)
(LOC. AT CARPORT STRUCTURE)

(N) AUXILIARY DC GEC AS
PER NEC SECTION 690.47(D)
(LOC. AT CARPORT STRUCTURE)

(N) CARPORT STRUCTURE #4
270° AZIMUTH, 7° PITCH
(255) TALESUN SOLAR
BIPRO TM8G66M-720

(N) CARPORT STRUCTURE #5
270° AZIMUTH, 7° PITCH
(255) TALESUN SOLAR
BIPRO TM8G66M-720

(NEW)
(TYP. OF 5 PARALLEL SETS)
4.00" DIA. SCH. 40 PVC CONDUIT,
18" BURIAL DEPTH, ~1017 FT. LENGTH
EACH CONDUIT CONTAINS
1000 MCM THHN / THWN-2, COPPER (L1, L2, L3)
4/0 AWG THWN-2, COPPER (EGC)
OVERSIZED TO KEEP VOLTAGE DROP AT 2%
CARRYING TOTAL COMBINED AC OUTPUT TO FUSED UTILITY AC DISCONNECT (DS1)

(N) SOLECTRIA XGI 1500 PV COMBINER (TYP. OF 5 UNITS)
MODEL: CR1500-16P-32S-400, POSITIVE POLE FUSED ONLY
16 FUSE POSITIONS, 32A DC FUSES, STEEL NEMA TYPE 4
400A RATED DC DISCONNECT (320A CONTINUOUS)
UL 1741 LISTED, UNGROUNDED PV SOURCE CIRCUITS ONLY
(LOC. INTERIOR OF BUILDING)

(N) SOLECTRIA XGI 1500 INVERTER (TYP. OF 4 UNITS)
MODEL: XGI 1500 200/200-480, UL 1741 LISTED
INVERTERS ARE ALL MOUNTED ON THE SOLECTRIA® XGI 1500 POWER RACK
(LOC. INTERIOR OF BUILDING)

(N) PV AC COMBINER SWITCHBOARD
SERVICE/RATING: 277/480 VAC, 3Ø, 4W (WYE), 60 HZ, BUS: 1600A COPPER BUS (MIN), 100% RATED
MAIN: MLO (MAIN LUGS ONLY), ENCLOSURE: NEMA 1 (INDOOR)
SHORT-CIRCUIT RATING: 65 KAIC (MINIMUM) AT 480 VAC
NEUTRAL: NO NEUTRAL BUS PROVIDED. SYSTEM INSTALLED AS 3Ø, 3-WIRE (NO NEUTRAL REQUIRED).
GROUND: EQUIPMENT GROUND BUS PROVIDED
FEEDERS/INPUTS: (4) INVERTER OUTPUT CIRCUITS, 480 VAC, 3-Ø (SEE INVERTER OCPD SCHEDULE)
LUGS: MECHANICAL LUGS SIZED FOR (5) FEEDER SETS (FINAL PER CONDUCTOR SIZE / QTY)
NOTES: ALL BUSSING AND TERMINATIONS RATED FOR PV BACKFEED AND CONTINUOUS DUTY. NO UTILITY SOURCE.
NOT SUITABLE FOR USE AS SERVICE EQUIPMENT, NEUTRAL TO GROUND BAR IS UNBONDED
TORQUE PER MANUFACTURER; TERMINATIONS RATED 75°C UNLESS NOTED OTHERWISE
(LOC. INTERIOR OF BUILDING)

(N) BUILDING

PATH FOR DC TRENCHING
PLEASE SEE CONDUCTOR SCHEDULE FOR DETAILS (SHEET PV-3C)

A
PV-2B
SITE PLAN (DETAILED)
SCALE: 1" = 40'-0"

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR

CONTRACTOR, LLC.
LICENSE: SAMPLE-000000
PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

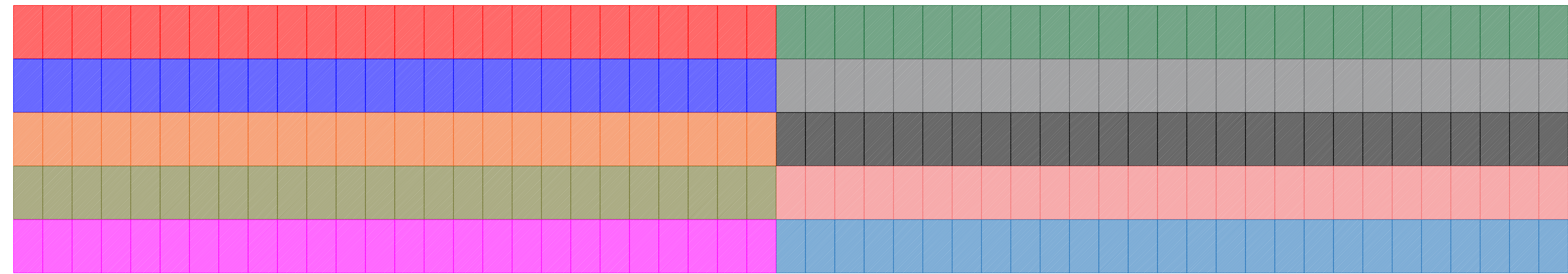
PROJECT ADDRESS WITHHELD
UNITED STATES

ENGINEERING REVIEW
ON FILE
PUBLIC SAMPLE

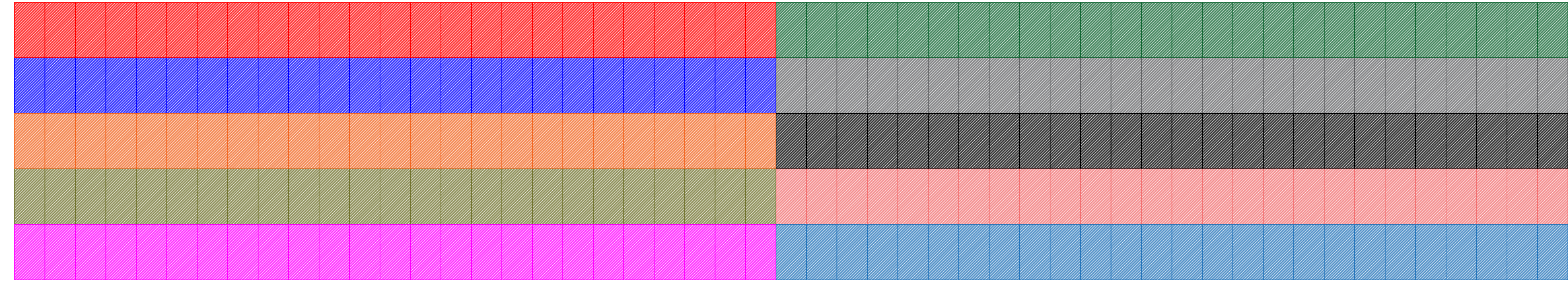
PROJECT INFO

SHEET SIZE: ARCH E
PROJECT NO: GSD-SAMPLE
DRAWN BY: GSD
DATE: SAMPLE

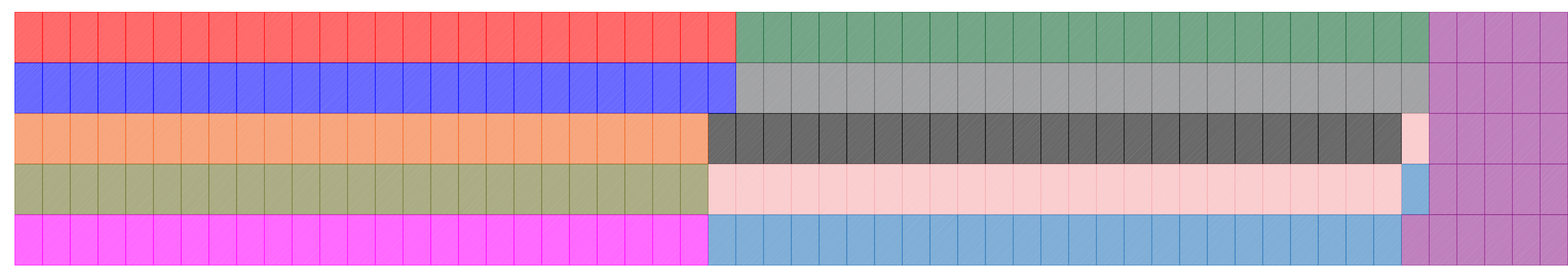
PV-2B



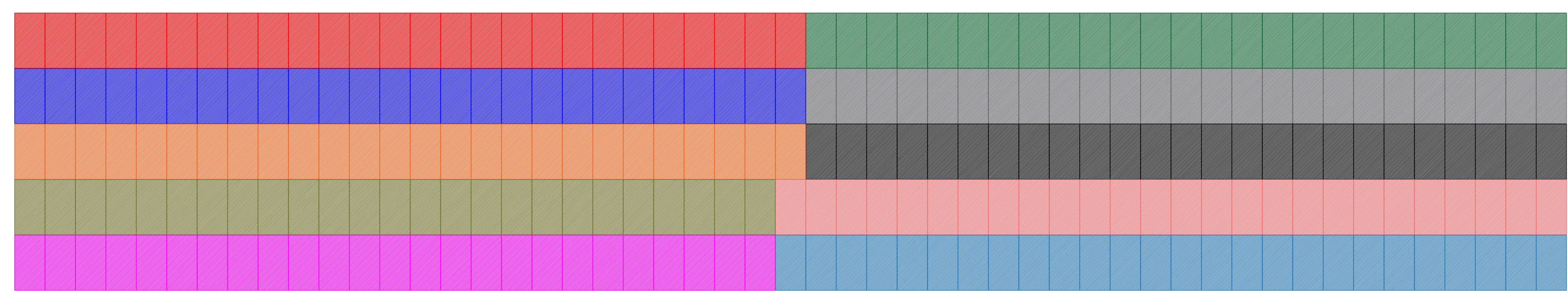
A STRINGING CONFIGURATION (CANOPY #1)
PV-2C SCALE: N/A



B STRINGING CONFIGURATION (CANOPY #2)
PV-2C SCALE: N/A



C STRINGING CONFIGURATION (CANOPY #3)
PV-2C SCALE: N/A



D STRINGING CONFIGURATION (CANOPY #4)
PV-2C SCALE: N/A

- 1 STRING OF 26 MODULES (TALESUN SOLAR BIPRO TM8G66M-720)
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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR

CONTRACTOR, LLC.
LICENSE: SAMPLE-000000
PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

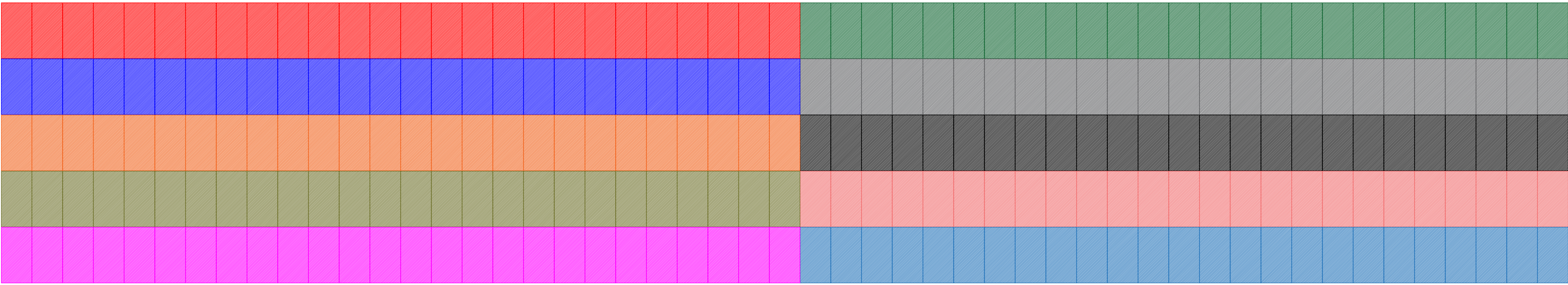
PROJECT ADDRESS WITHHELD
UNITED STATES

ENGINEERING REVIEW
ON FILE
PUBLIC SAMPLE

PROJECT INFO

SHEET SIZE: ARCH E
PROJECT NO: GSD-SAMPLE
DRAWN BY: GSD
DATE: SAMPLE

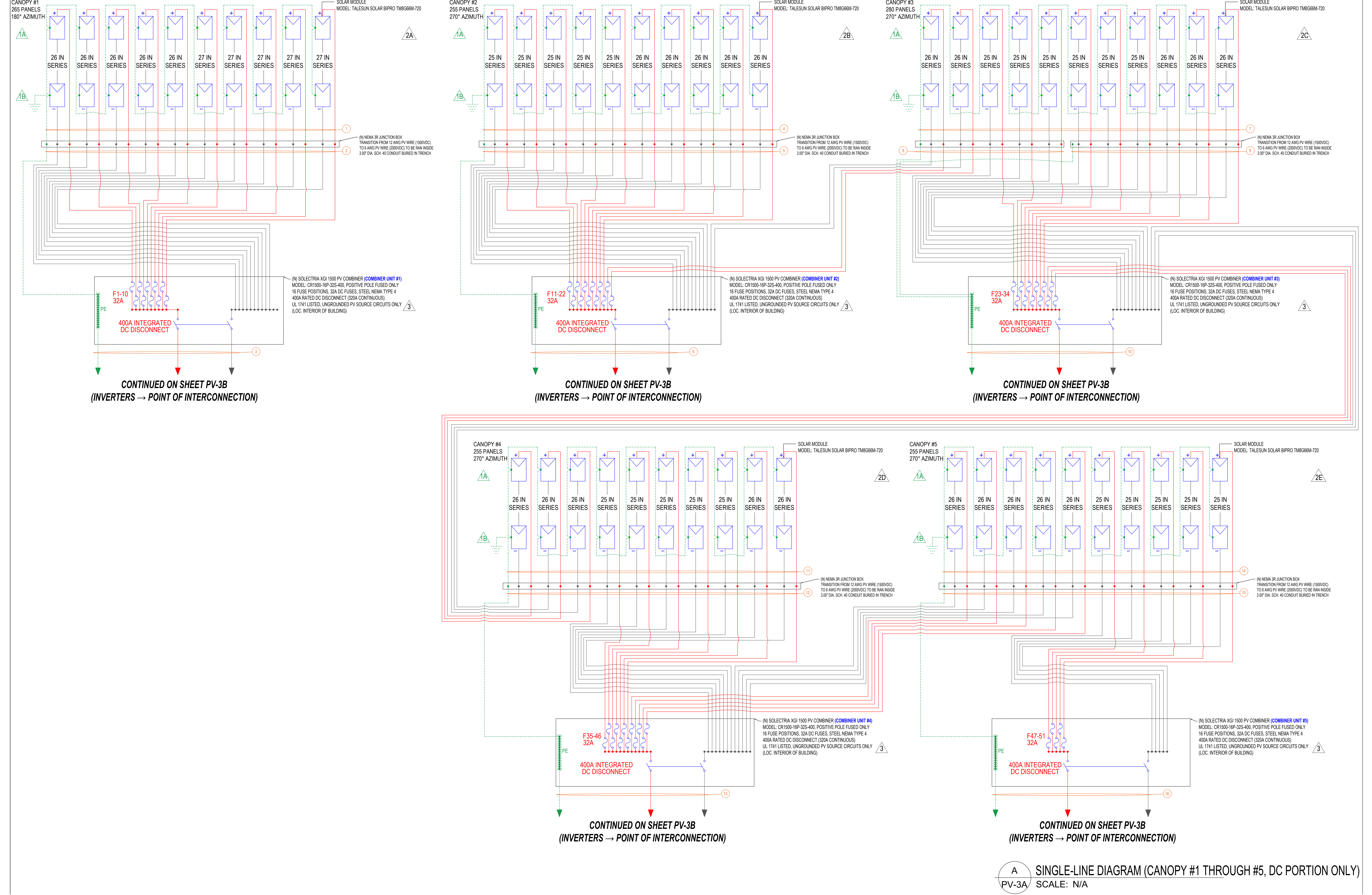
PV-2C



A STRINGING CONFIGURATION (CANOPY #5)
PV-2D SCALE: N/A

- 1 STRING OF 26 MODULES (TALESUN SOLAR BIPRO TM8G66M-720)
- 1 STRING OF 26 MODULES (TALESUN SOLAR BIPRO TM8G66M-720)
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PV-3B

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TO ANYONE EXCEPT THOSE INVOLVED IN THE
DESIGN AND INSTALLATION OF THE PV
SYSTEM
REPRESENTED IN THIS PLAN.

GEMINI SOLAR DESIGN

PROJECT INFO WITHHELD

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

PV-3C

CONDUCTOR SCHEDULE WITH NEC ELECTRICAL CALCULATIONS (DC PORTION)																
CANOPY #1																
ID	TYP	DESCRIPTION	CONDUCTOR	CONDUIT	NO. OF CURRENT CARRYING CONDUCTORS IN CONDUIT	FILL %	RATED AMPS (USE I_{SC} OF PV MODULE)	OCPD	EGC	TEMP. CORR. FACTOR @ 90°C TEMP. RATING	FILL ADJ. FACTOR	CONTINUOUS CURRENT (USE I_{SC} * 1.25 FOR DC STRING CIRCUIT) (USE MAX OUTPUT CONTINUOUS CURRENT FOR AC CIRCUIT)	MAXIMUM CURRENT (USE I_{SC} * 1.56 FOR DC STRING CIRCUIT OCPD SIZING) (USE MAX OUTPUT CONTINUOUS CURRENT * 1.25 FOR AC OCPD SIZING)	TERMINAL RATING CHECK @ 75°C TEMP. RATING SHALL EXCEED 1.25X CONT. CURRENT	BASE AMPACITY @ 90°C TEMP. RATING	CONDITIONS OF USE (COU) @ 90°C TEMP. RATING
1	10	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO JUNCTION BOX	12 AWG PV WIRE COPPER (RATED FOR 1500VDC)	FREE AIR	N/A	N/A	20.34A (I _{sc})	N/A	6 AWG BARE COPPER	0.87 (43°C)	1.0	25.43A (I _{sc})	31.79A (I _{sc})	35A > 31.79A PASS	40A (IN FREE AIR)	34.8A (IN FREE AIR)
2	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX TO COMBINER UNIT #1	6 AWG PV WIRE COPPER (RATED FOR 2000VDC)	3" DIA. SCH. 40 PVC (10 DC STRINGS IN CONDUIT, BURIED IN TRENCH)	20 10 X DC (+) 10 X DC (-)	27.1%	20.34A (I _{sc})	32A (F1-10) (POSITIVE CONDUCTORS FUSED ONLY)	10 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	0.5	25.43A (I _{sc})	31.79A (I _{sc})	65A > 31.79A PASS	75A (IN CONDUIT)	32.62A (IN CONDUIT)
3	1	OUTPUT OF COMBINER UNIT #1: COMBINER UNIT #1 TO STRING INVERTER #1	400 MCM PV WIRE COPPER (RATED FOR 2000VDC)	2 ½" DIA. EMT	2 1 X DC (+) 1 X DC (-)	25.4%	203.4A (I _{sc})	INTEGRATED DC DISCONNECT WITHIN STRING INVERTER	3 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	1.0	254.25A (I _{sc})	317.82A (I _{sc})	335A > 317.82A PASS	380A (IN CONDUIT)	330.6A (IN CONDUIT)
CANOPY #2																
4	10	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO JUNCTION BOX	12 AWG PV WIRE COPPER (RATED FOR 1500VDC)	FREE AIR	N/A	N/A	20.34A (I _{sc})	N/A	6 AWG BARE COPPER	0.87 (43°C)	1.0	25.43A (I _{sc})	31.79A (I _{sc})	35A > 31.79A PASS	40A (IN FREE AIR)	34.8A (IN FREE AIR)
5	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX TO COMBINER UNIT #2	6 AWG PV WIRE COPPER (RATED FOR 2000VDC)	3" DIA. SCH. 40 PVC (10 DC STRINGS IN CONDUIT, BURIED IN TRENCH)	20 10 X DC (+) 10 X DC (-)	27.1%	20.34A (I _{sc})	32A (F11-20) (POSITIVE CONDUCTORS FUSED ONLY)	10 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	0.5	25.43A (I _{sc})	31.79A (I _{sc})	65A > 31.79A PASS	75A (IN CONDUIT)	32.62A (IN CONDUIT)
6	1	OUTPUT OF COMBINER UNIT #2: COMBINER UNIT #2 TO STRING INVERTER #2	600 MCM PV WIRE COPPER (RATED FOR 2000VDC)	2 ½" DIA. EMT	2 1 X DC (+) 1 X DC (-)	38.7%	244.08A (I _{sc})	INTEGRATED DC DISCONNECT WITHIN STRING INVERTER	3 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	1.0	305.1A (I _{sc})	381.38A (I _{sc})	420A > 381.38A PASS	475A (IN CONDUIT)	413.25A (IN CONDUIT)
CANOPY #3																
7	11	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO JUNCTION BOX	12 AWG PV WIRE COPPER (RATED FOR 1500VDC)	FREE AIR	N/A	N/A	20.34A (I _{sc})	N/A	6 AWG BARE COPPER	0.87 (43°C)	1.0	25.43A (I _{sc})	31.79A (I _{sc})	35A > 31.79A PASS	40A (IN FREE AIR)	34.8A (IN FREE AIR)
8	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX TO COMBINER UNIT #2 / COMBINER UNIT #3	6 AWG PV WIRE COPPER (RATED FOR 2000VDC)	3" DIA. SCH. 40 PVC (5 DC STRINGS IN CONDUIT, BURIED IN TRENCH)	10 5 X DC (+) 5 X DC (-)	14.0%	20.34A (I _{sc})	32A (F21-25) (POSITIVE CONDUCTORS FUSED ONLY)	10 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	0.5	25.43A (I _{sc})	31.79A (I _{sc})	65A > 31.79A PASS	75A (IN CONDUIT)	32.62A (IN CONDUIT)
9	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX TO COMBINER UNIT #3	6 AWG PV WIRE COPPER (RATED FOR 2000VDC)	3" DIA. SCH. 40 PVC (6 DC STRINGS IN CONDUIT, BURIED IN TRENCH)	12 6 X DC (+) 6 X DC (-)	16.6%	20.34A (I _{sc})	32A (F26-31) (POSITIVE CONDUCTORS FUSED ONLY)	10 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	0.5	25.43A (I _{sc})	31.79A (I _{sc})	65A > 31.79A PASS	75A (IN CONDUIT)	32.62A (IN CONDUIT)
10	1	OUTPUT OF COMBINER UNIT #3: COMBINER UNIT #3 TO STRING INVERTER #3	600 MCM PV WIRE COPPER (RATED FOR 2000VDC)	2 ½" DIA. EMT	2 1 X DC (+) 1 X DC (-)	38.7%	244.08A (I _{sc})	INTEGRATED DC DISCONNECT WITHIN STRING INVERTER	3 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	1.0	305.1A (I _{sc})	381.38A (I _{sc})	420A > 381.38A PASS	475A (IN CONDUIT)	413.25A (IN CONDUIT)
CANOPY #4																
11	10	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO JUNCTION BOX	12 AWG PV WIRE COPPER (RATED FOR 1500VDC)	FREE AIR	N/A	N/A	20.34A (I _{sc})	N/A	6 AWG BARE COPPER	0.87 (43°C)	1.0	25.43A (I _{sc})	31.79A (I _{sc})	35A > 31.79A PASS	40A (IN FREE AIR)	34.8A (IN FREE AIR)
12	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX TO COMBINER UNIT #3 / COMBINER UNIT #4	6 AWG PV WIRE COPPER (RATED FOR 2000VDC)	3" DIA. SCH. 40 PVC (10 DC STRINGS IN CONDUIT, BURIED IN TRENCH)	20 10 X DC (+) 10 X DC (-)	27.1%	20.34A (I _{sc})	32A (F32-41) (POSITIVE CONDUCTORS FUSED ONLY)	10 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	0.5	25.43A (I _{sc})	31.79A (I _{sc})	65A > 31.79A PASS	75A (IN CONDUIT)	32.62A (IN CONDUIT)
13	1	OUTPUT OF COMBINER UNIT #4: COMBINER UNIT #4 TO STRING INVERTER #4	600 MCM PV WIRE COPPER (RATED FOR 2000VDC)	2 ½" DIA. EMT	2 1 X DC (+) 1 X DC (-)	38.7%	244.08A (I _{sc})	INTEGRATED DC DISCONNECT WITHIN STRING INVERTER	3 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	1.0	305.1A (I _{sc})	381.38A (I _{sc})	420A > 381.38A PASS	475A (IN CONDUIT)	413.25A (IN CONDUIT)
CANOPY #5																
14	10	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO JUNCTION BOX	12 AWG PV WIRE COPPER (RATED FOR 1500VDC)	FREE AIR	N/A	N/A	20.34A (I _{sc})	N/A	6 AWG BARE COPPER	0.87 (43°C)	1.0	25.43A (I _{sc})	31.79A (I _{sc})	35A > 31.79A PASS	40A (IN FREE AIR)	34.8A (IN FREE AIR)
15	1	PV SOURCE CIRCUIT (TRANSITIONED): JUNCTION BOX TO COMBINER UNIT #4 / COMBINER UNIT #5	6 AWG PV WIRE COPPER (RATED FOR 2000VDC)	3" DIA. SCH. 40 PVC (10 DC STRINGS IN CONDUIT, BURIED IN TRENCH)	20 10 X DC (+) 10 X DC (-)	27.1%	20.34A (I _{sc})	32A (F42-51) (POSITIVE CONDUCTORS FUSED ONLY)	10 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	0.5	25.43A (I _{sc})	31.79A (I _{sc})	65A > 31.79A PASS	75A (IN CONDUIT)	32.62A (IN CONDUIT)
16	1	OUTPUT OF COMBINER UNIT #5: COMBINER UNIT #5 TO STRING INVERTER #4	2/0 AWG PV WIRE COPPER (RATED FOR 2000VDC)	1 ½" DIA. EMT	2 1 X DC (+) 1 X DC (-)	36.1%	101.7A (I _{sc})	INTEGRATED DC DISCONNECT WITHIN STRING INVERTER	3 AWG PV WIRE COPPER (RATED FOR 2000VDC)	0.87 (43°C)	1.0	127.13A (I _{sc})	158.91A (I _{sc})	175A > 158.91A PASS	195A (IN CONDUIT)	169.65A (IN CONDUIT)

CONDUCTOR SCHEDULE WITH NEC ELECTRICAL CALCULATIONS (AC PORTION)																	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.	
ID	TYP	DESCRIPTION	CONDUCTOR	CONDUIT	NO. OF CURRENT CARRYING CONDUCTORS IN CONDUIT	FILL %	RATED AMPS	OCPD	EGC	TEMP. CORR. FACTOR @ 90°C TEMP. RATING	FILL ADJ. FACTOR	MAXIMUM OUTPUT CONTINUOUS CURRENT	MAXIMUM OUTPUT CONTINUOUS CURRENT OCPD SIZING CALCULATION (USE MAX OUTPUT CONTINUOUS CURRENT * 1.25 FOR AC OCPD SIZING)	TERMINAL RATING CHECK @ 75°C TEMP. RATING SHALL EXCEED 1.25X CONT. CURRENT	BASE AMPACITY @ 90°C TEMP. RATING	CONDITIONS OF USE (COU) @ 90°C TEMP. RATING	GEMINI SOLAR DESIGN SAMPLE PROJECT CONTACT: ON FILE PROJECT INFO WITHHELD SAMPLE SOLAR CONTRACTOR, LLC. LICENSE: SAMPLE-000000 PHONE: (000) 000-0000	
17	1	OUTPUT OF STRING INVERTER #1: STRING INVERTER #1 TO PV AC COMBINER SWITCHBOARD	500 MCM THHN / THWN-2 COPPER	2 ½" DIA. EMT	3 (L1, L2, L3) X 1 INVERTER DOES NOT REQUIRE A NEUTRAL	37.9%	240.6A	350A / 3P (CB1)	3 AWG THWN-2 COPPER	0.87 (43°C)	1.0	240.6A	300.75A	380A > 300.75A PASS	430A (IN CONDUIT)	374.1A (IN CONDUIT)		
18	1	OUTPUT OF STRING INVERTER #2: STRING INVERTER #2 TO PV AC COMBINER SWITCHBOARD	500 MCM THHN / THWN-2 COPPER	2 ½" DIA. EMT	3 (L1, L2, L3) X 1 INVERTER DOES NOT REQUIRE A NEUTRAL	37.9%	240.6A	350A / 3P (CB2)	3 AWG THWN-2 COPPER	0.87 (43°C)	1.0	240.6A	300.75A	380A > 300.75A PASS	430A (IN CONDUIT)	374.1A (IN CONDUIT)		
19	1	OUTPUT OF STRING INVERTER #3: STRING INVERTER #3 TO PV AC COMBINER SWITCHBOARD	500 MCM THHN / THWN-2 COPPER	2 ½" DIA. EMT	3 (L1, L2, L3) X 1 INVERTER DOES NOT REQUIRE A NEUTRAL	37.9%	240.6A	350A / 3P (CB3)	3 AWG THWN-2 COPPER	0.87 (43°C)	1.0	240.6A	300.75A	380A > 300.75A PASS	430A (IN CONDUIT)	374.1A (IN CONDUIT)		
20	1	OUTPUT OF STRING INVERTER #4: STRING INVERTER #4 TO PV AC COMBINER SWITCHBOARD	500 MCM THHN / THWN-2 COPPER	2 ½" DIA. EMT	3 (L1, L2, L3) X 1 INVERTER DOES NOT REQUIRE A NEUTRAL	37.9%	240.6A	350A / 3P (CB4)	3 AWG THWN-2 COPPER	0.87 (43°C)	1.0	240.6A	300.75A	380A > 300.75A PASS	430A (IN CONDUIT)	374.1A (IN CONDUIT)		
21	1	COMBINED OUTPUT OF PV AC COMBINER SWITCHBOARD: PV AC COMBINER SWITCHBOARD TO UTILITY AC DISCONNECT (DS1)	5 PARALLEL SETS OF: 1000 MCM THHN / THWN-2 COPPER (OVERSIZED TO KEEP VOLTAGE DROP AT 2%)	(TYP. OF 5) 4" DIA. SCH. 40 PVC (BURIED IN TRENCH)	3 (L1, L2, L3) X 1 INVERTER DOES NOT REQUIRE A NEUTRAL	34.8%	962.4A	1600A (F52-54)	4/0 AWG THWN-2 COPPER (RAN IN EACH CONDUIT)	0.87 (43°C)	1.0	962.4A	1203A	2725A > 1203A PASS	3075A (IN CONDUIT)	2675.25A (IN CONDUIT)		
22	1	OUTPUT OF UTILITY AC DISCONNECT (DS1): UTILITY AC DISCONNECT (DS1) TO LINE-SIDE TAP P.O.C. (TO BE MADE AS PER NEC 240.21(B)(1) & NEC 705.11)	4 PARALLEL SETS OF: 500 MCM THHN / THWN-2 COPPER	(TYP. OF 4) 3" DIA. EMT	3 (L1, L2, L3) X 1 INVERTER DOES NOT REQUIRE A NEUTRAL	27.7%	962.4A	N/A	4/0 AWG THWN-2 COPPER (SHALL BE RAN OUTSIDE OF CONDUIT, BOND TO EXISTING GROUNDING ELECTRODE SYSTEM)	0.87 (43°C)	1.0	962.4A	1203A	1520A > 1203A PASS	1720A (IN CONDUIT)	1496.4A (IN CONDUIT)		
																	NEW GRID-TIED SYSTEM 943.20kW DC SAMPLE COMMERCIAL PV PROJECT PROJECT ADDRESS WITHHELD UNITED STATES	
																	ENGINEERING REVIEW ON FILE PUBLIC SAMPLE	
																	CONDUCTOR SCHEDULE (AC)	
																	PROJECT INFO SHEET SIZE: ARCH E PROJECT NO: GSD-SAMPLE DRAWN BY: GSD DATE: SAMPLE	
																	PV-3D	

Conductor Specifications (DC PV Wire + AC THHN/THWN-2) — Cross-Referenced to Conductor Schedule

DC — PV Wire (2000VDC XLP/XLPE)								
Schedule ID(s)	Run Description (per plan)	Conductor (per schedule)	Voltage Rating	Insulation / Type	Temp Rating	Strand Count (per datasheet)	Datasheet Source Used	Notes
1,4,7,11,14	PV source circuit: string output → junction box	12 AWG Cu PV Wire	1500VDC (design) / specify 2000V PV Wire acceptable	UL 4703 PV Wire, XLPE (XLP) insulation	-40°C to 90°C wet/dry (per datasheet)	Treat as module source-circuit conductor	Treat as module source-circuit conductor	Treat as module source-circuit conductor
2,5,8,9,12,15	PV source circuit transitioned: junction box → combiner(s)	6 AWG Cu PV Wire (+/-) + 10 AWG Cu PV Wire (EGC)	2000VDC	UL 4703 PV Wire, XLPE (XLP) insulation	-40°C to 90°C wet/dry (per datasheet)	6 AWG: 7 strands; 10 AWG: 19 strands	Southwire PV Wire XLP 2kV (Rev 4, 7/31/2018)	Installed in PVC per plans
16	Output of combiner unit #5: combiner → inverter #4	2/0 AWG Cu PV Wire (+/-) + 3 AWG Cu PV Wire (EGC)	2000VDC	UL 4703 PV Wire, XLPE (XLP) insulation	-40°C to 90°C wet/dry (per datasheet)	2/0 AWG: 19 strands; 3 AWG: 7 strands	Encore Wire Type PV 2kV sheet (Last Edit 7/2/2024)	3 AWG not present on provided Southwire 2-page PDF; filled from alternate UL 4703 PV-wire datasheet
3	Output of combiner unit #1: combiner → inverter #1	400 kcmil Cu PV Wire (+/-) + 3 AWG Cu PV Wire (EGC)	2000VDC	UL 4703 PV Wire, XLPE (XLPE) insulation	-40°C to 90°C wet/dry (per datasheet)	400 kcmil: 37 strands; 3 AWG: 7 strands	Encore Wire Type PV 2kV sheet (Last Edit 7/2/2024)	400 kcmil CU & 3 AWG not present on provided Southwire 2-page PDF; filled from alternate UL 4703 PV-wire datasheet
6,10,13	Output of combiner units: combiner → inverter	600 kcmil Cu PV Wire (+/-) + 3 AWG Cu PV Wire (EGC)	2000VDC	UL 4703 PV Wire, XLPE (XLPE) insulation	-40°C to 90°C wet/dry (per datasheet)	600 kcmil: 61 strands; 3 AWG: 7 strands	Encore Wire Type PV 2kV sheet (Last Edit 7/2/2024)	600 kcmil CU & 3 AWG not present on provided Southwire 2-page PDF; filled from alternate UL 4703 PV-wire datasheet

AC — THHN/THWN-2 (600V)								
Schedule ID(s)	Run Description (per plan)	Conductor (per schedule)	Voltage Rating	Insulation / Type	Temp Rating	Strand Count (per manufacturer table)	Source	Notes
17–20	Inverter output → PV AC combiner switchboard	500 kcmil Cu THHN/THWN-2 (L1,L2,L3) + 3 AWG Cu THWN-2 (EGC)	600V	THHN/THWN-2 (PVC insulation / nylon jacket)	90°C wet/dry	500 kcmil: 37 strands; 3 AWG: 19 strands	Cerrowire THHN/THWN-2 sheet (Rev 12/2023)	No neutral per design; raceway per plans
21	PV AC combiner switchboard → Utility AC disconnect (DS1)	5 parallel sets of 1000 kcmil Cu THHN/THWN-2 (L1,L2,L3) + 4/0 AWG Cu THWN-2 (EGC in each conduit)	600V	THHN/THWN-2 (PVC insulation / nylon jacket)	90°C wet/dry	1000 kcmil: 61 strands; 4/0 AWG Cu: 19 strands	Cerrowire THHN/THWN-2 sheet (Rev 12/2023)	Oversized for 2% voltage drop; raceway per plans
22	DS1 → Line-side tap POC	4 parallel sets of 500 kcmil Cu THHN/THWN-2 (L1,L2,L3) + 4/0 AWG Cu THWN-2 (EGC outside conduit)	600V	THHN/THWN-2 (PVC insulation / nylon jacket)	90°C wet/dry	500 kcmil: 37 strands; 4/0 AWG Cu: 19 strands	Cerrowire THHN/THWN-2 sheet (Rev 12/2023)	EGC bonded to existing grounding electrode system per plans

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR CONTRACTOR, LLC.

LICENSE: SAMPLE-0000000

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

CONDUCTOR SPECIFICATIONS

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-3F

AC Voltage Drop — NEC Chapter 9 Table 9 (3ϕ, 60 Hz, 75°C) — Parallel Sets

Inputs (blue cells are user-editable)		
System voltage (VLL)	480	V
Design current (I)	962.4	A
Power factor (PF)	0.95	
One-way length	1017	ft
Parallel sets (N) — design choice	5	sets
Max voltage drop (target)	2.0%	fraction (2% = 0.02)
Table 9 R (Cu, PVC) @75°C	0.015	Ω/kft
Table 9 X (PVC) @75°C	0.037	Ω/kft
Conductor	1000 MCM, CU	
Calculations (formulas shown; based on Table 9 R & X and 3ϕ voltage-drop equation)		
sin(θ) = SQRT(1-PF^2)	0.3122	
Length (kft) = ft / 1000	1.017	kft
Ze (Ω/kft) = R*PF + X*sin(θ)	0.02580	Ω/kft
VD (one set) = √3*I*Ze*L(kft)	43.74	V
%VD (one set) = VD/VLL	9.11%	
VD target (V) = target%*VLL	9.60	V
Sets recommended = CEILING(required*(1+margin))	5	sets
VD with N (design choice)	8.75	V
%VD with N (design choice)	1.82%	

Quick Sensitivity (same inputs; varies N only)					
N (sets)		VD (V)	%VD	Meets 2%?	
1		43.74	9.11%	NO	
2		21.87	4.56%	NO	
3		14.58	3.04%	NO	
4		10.94	2.28%	NO	
5		8.75	1.82%	YES	
6		7.29	1.52%	YES	
7		6.25	1.30%	YES	
8		5.47	1.14%	YES	
9		4.86	1.01%	YES	
10		4.37	0.91%	YES	
11		3.98	0.83%	YES	
12		3.65	0.76%	YES	

Notes/Assumptions:

- Table 9 values used are for three single conductors in one conduit, 3ϕ, 60 Hz, 75°C.
- Each parallel set is assumed to be in its own PVC conduit with L1/L2/L3 + EGC; equal lengths and equal current sharing.

DC Voltage Drop Calculation

Operating Current (Imp) [A] 17.44

Operating Voltage (Vmp) [Vdc] 1115.1

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR CONTRACTOR, LLC.

LICENSE: SAMPLE-000000

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

VOLTAGE DROP CALCULATIONS

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-3G

Electrical Construction / Installation Specifications

Project: 943.20kW DC / 800.00kW AC Solar Photovoltaic System

Prepared by: GeminiSolarDesign, LLC.

GENERAL NOTES

- Provide all labor, materials, equipment, tools, supervision, and services necessary for a complete and operational 943.20kW DC PV system.
- Point of Interconnection (POI) shall be achieved via a Line-Side Tap within the Existing 3000A Main Switchboard.
- All work shall comply with NEC 2020, IEEE 1547, UL standards, local AHJ requirements, and utility interconnection requirements.
- Installation shall be neat and workmanlike per NEC 110.12.
- Contractor shall be responsible for coordination with structural, civil, and utility representatives.
- Contractor is responsible for having the arc flash assessment study performed.**

ELECTRICAL POWER CONDUCTORS AND CABLES

- Copper conductors unless otherwise indicated.
- THHN/THWN-2 for AC systems, 90°C rated.
- 2000V PV Wire for DC source circuits, sunlight resistant, Cross-linked Polyethylene (XLPE) insulation
- Parallel conductors shall be equal length, same termination points, and installed in separate conduits (3 CCC per raceway).
- Pull tension shall not exceed manufacturer limits; use pulling lubricant and cable supports for long runs (>1000 ft).
- Voltage drop shall not exceed 2% on feeders unless otherwise indicated.
- All conductor sizing shall reflect 125% continuous loading and applicable temperature correction factors.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- Equipment grounding conductors sized per NEC 250.122.
- Each parallel conduit shall include full-size EGC (e.g., 4/0 AWG CU where specified).
- Bond all metallic raceways and equipment enclosures.
- Connect PV system grounding to existing service grounding electrode system.
- Supplemental grounding electrodes only if required by IID or AHJ.

WIRING DEVICES AND DISCONNECTS

- Provide UL-listed AC and DC disconnects as shown on drawings.
- Fused Utility AC Disconnect shall be externally operable and lockable in open position.
- Provide 1600A fused utility AC disconnect, UL-listed, service-rated.
- Provide manufacturer multi-lug kits rated for number of parallel sets indicated.
- Torque all terminations per manufacturer torque tables and document verification.
- Fuses sized per design continuous current x 1.25, consistent with NEC 690 and 705.

INVERTERS

- Inverters shall be UL 1741 SA compliant and IEEE 1547 certified.
- DC input limits shall not exceed manufacturer maximum current (272.1A DC per MPPT where applicable).
- Install per manufacturer clearance requirements and NEC 110.26 working space.
- Program power factor and grid settings per IID approval letter.
- Segregate AC and DC conduit entries.

PHOTOVOLTAIC ARRAY

- Install modules per manufacturer installation instructions.
- Torque module clamps to specified values.
- Bond modules using listed bonding hardware.
- Carport wiring in EMT below canopy shall account for temperature correction (43°C max ambient; 0.87 correction factor per NEC 2020 Table 310.16).
- Secure conductors at ≤4.5 ft intervals; no resting conductors on canopy steel.

PV COMBINERS AND DC DISTRIBUTION

- CR1500 series combiners (or approved equal) rated 1500VDC minimum.
- Combiner boxes shall be UL-listed and rated for the DC operating system voltage.
- String fuses sized per 1.56 multiplier where required for DC source circuits.
- Verify total Isc per combiner does not exceed manufacturer bus rating.
- Label all input circuits and verify torque on all terminations.

COMMISSIONING AND TESTING

- Perform insulation resistance testing on feeders.
- Verify phase rotation and proper torque on all terminations.
- Provide startup documentation and commissioning report.
- Conduct infrared scan under load after energization.
- Coordinate IID witness test and provide commissioning report.

IDENTIFICATION FOR ELECTRICAL SYSTEMS

- Provide NEC 690-compliant labeling including rapid shutdown, AC/DC disconnects, and directory plaques.
- Install engraved phenolic or UV-rated vinyl placards suitable for outdoor exposure.

- Arc-flash warning labels at 1600A fused disconnect and 3000A switchboard.
 - CB1 thru CB4 (350-amp combiner circuit breakers) should also be included in the arc flash assessment study.**

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GEMINI SOLAR DESIGN	
SAMPLE PROJECT CONTACT: ON FILE PROJECT INFO WITHHELD	
SAMPLE SOLAR CONTRACTOR, LLC. LICENSE: SAMPLE-000000 PHONE: (000) 000-0000	
NEW GRID-TIED SYSTEM 943.20kW DC	SAMPLE COMMERCIAL PV PROJECT PROJECT ADDRESS WITHHELD UNITED STATES
ENGINEERING REVIEW ON FILE PUBLIC SAMPLE	
ELECTRICAL INSTALLATION SPECS	
PROJECT INFO SHEET SIZE: ARCH E PROJECT NO: GSD-SAMPLE DRAWN BY: GSD DATE: SAMPLE	
PV-3H	

Bill of Materials (DC Portion)										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.		
Item	Quantity	Manufacturer / Model	Specification	Voltage Rating	Enclosure	Notes						
PV Modules		1310 Talesun Solar BIPRO TM8G66M-720	720W class monocrystalline module, bi-facial 16 fuse positions, 32A fused, 400A DC disconnect (320A continuous), UL 1741 listed	1500Vdc	N/A	Total modules across canopy						
PV Combiner		5 Solectria CR1500-16P-32S-400		1500Vdc	NEMA 4	Positive pole fused only, interior location						
String Inverter		4 Solectria XGI 1500 200/200-480	String inverter, 480V 3Ø output, UL 1741 listed	1500Vdc input / 480Vac output	NEMA 3R	Interior mounted Outdoor rated junction box with grounding provisions						
String Transition Junction Box		6 NEMA 3R Junction Box	Transition from 12 AWG PV wire to 6 AWG PV wire DC rated PV fuse for combiner positions	1500–2000Vdc	NEMA 3R							
PV String Fuses		51 32A DC PV Fuse	Positive Conductor Only	1500Vdc	N/A	Order +10% spare recommended						
PV Wire - String Home Runs	Per Plan Lengths	12 AWG Cu PV Wire	Free air, DC String Source Circuit	1500Vdc	N/A	From module strings to transition JB						
PV Wire - Transition Conductors	Per Plan Lengths	6 AWG Cu PV Wire / 2/0 AWG Cu PV Wire / 400 MCM Cu PV Wire /	Underground in PVC conduit	2000Vdc	N/A	JB to combiner runs						
Combiner Output Conductors		5 600 MCM Cu PV Wire	2 conductors per run (+/-), EMT interior routing	2000Vdc	N/A	Per schedule sizes: 400kcmil, 600kcmil, 2/0 AWG						
Underground Conduit	Per Plan	3" Sch 40 PVC 1 1/2" EMT	Buried raceway for DC circuits	N/A	N/A	Trench installation						
Interior EMT Conduit	Per Plan	2 1/2" EMT 3 AWG Cu PV Wire 6 AWG Cu PV Wire	Combiner output raceways to inverter	N/A	N/A	Interior installation						
DC Equipment Ground Conductors	Per Plan	10 AWG Cu PV Wire	EGC for PV circuits per schedule	N/A	N/A	Per NEC 2020 and plans						
Bill of Materials (AC Portion)												
Item	Quantity	Manufacturer / Model	Specification	Voltage	SCCR / AIC	Enclosure	Notes	This Model or Equivalent	NEW GRID-TIED SYSTEM 943.20kW DC SAMPLE COMMERCIAL PV PROJECT PROJECT ADDRESS WITHHELD UNITED STATES			
PV AC Combiner Switchboard		1 1600A MLO Switchboard	277/480V, 3Ø, 4W, 1600A Cu bus minimum, 100% rated MLO	480Vac	65kAIC minimum	NEMA 1	4 inverter inputs, 3Ø 3W (no neutral per design), separate ground bus	Yes				
Inverter Output Breakers		4 350A 3-Pole Breaker	Breaker for each inverter output	480Vac	65kAIC minimum	Installed in switchboard	CB1–CB4	Yes				
Utility AC Disconnect (DS1)		1 1600A Fused Safety Switch	Service rated, SUSE, visible blade, lockable handle	480Vac, 3-Ø	65kAIC with specified fuses	NEMA 3R	Labeled Utility AC Disconnect, Not a Separately Derived System	Yes				
Utility AC Disconnect (DS1) Fuses		3 1600A Fuses 3x500 kcmil Cu THHN/THWN-2 (L1, L2, L3)	One per phase	480Vac	Match SCCR requirements	N/A		Yes				
Inverter AC Output Feeders		4 + 3 AWG EGC 3x1000 kcmil Cu THHN/THWN-2 (L1, L2, L3)	2 1/2" EMT per feeder	480Vac	N/A	EMT	No neutral per design	Yes				
Switchboard to DS1 Feeder		5 + 4/0 AWG CU EGC 3x500 kcmil Cu THHN/THWN-2 (L1, L2, L3)	Parallel sets in 4" Sch 40 PVC	480Vac	N/A	PVC Underground	Oversized to keep this circuit under 2% voltage drop	Yes				
DS1 to Point of Interconnection Feeder		4 + 4/0 AWG CU EGC	Parallel sets in 3" EMT	480Vac	N/A	EMT	EGC bonded to existing GES	Yes				
ENGINEERING REVIEW												
ON FILE												
PUBLIC SAMPLE												
BILL OF MATERIALS												
PROJECT INFO												
SHEET SIZE: ARCH E												
PROJECT NO: GSD-SAMPLE												
DRAWN BY: GSD												
DATE: SAMPLE												

ARC FLASH HAZARD ASSESSMENT STUDY

943.20kW DC / 800.00kW AC
Photovoltaic System – Electrical Safety Study Requirement

This document defines the engineering requirements for performing a comprehensive Arc Flash Hazard Assessment for the proposed 943.20kW DC photovoltaic (PV) power generation system. The assessment shall evaluate arc flash hazards associated with the electrical distribution system, determine incident energy exposure levels, and establish protective measures and labeling requirements for personnel working on or near energized electrical equipment.

1. Project Electrical System Overview

The photovoltaic generation system consists of the following primary electrical components:

- Total DC Array Capacity: approximately 943.20kW DC
- Four (4) utility interactive string inverters (Solectria XGI 1500 class or equivalent)
- DC collection circuits utilizing 2000VDC rated PV Wire
- Inverter AC output circuits operating at 480 VAC, 3-Ø
- PV AC combiner switchboard rated 277/480 VAC, 3Ø, copper bus rated 1600A minimum
- Aggregation of inverter outputs through multiple parallel feeder sets
- Service level fused disconnect equipment and facility electrical distribution interconnection
- Utility point of common coupling (PCC) with the facility electrical system The AC collection system aggregates inverter outputs and delivers power to the facility service equipment at 480 VAC. Due to the presence of both utility and inverter sources, electrical faults may be supplied from multiple directions within the system.

2. Major Equipment Subject to Arc Flash Evaluation

Equipment	Voltage Level	Description
PV AC Combiner Switchboard	480 VAC	Receives inverter outputs; 1600A copper bus
Inverter Output Feeders	480 VAC	Parallel feeder sets from (4) string inverters
Service Disconnect Equipment	480 VAC	Service rated fused disconnect equipment
Main Distribution Equipment	480 VAC	Utility and PV combined fault contribution
Point of Common Coupling	480 VAC	Interconnection between PV system and grid

3. Applicable Codes and Standards

ADDENDUM – ARC FLASH STUDY SCOPE
EXPANSION

Paralleling Switchgear Inclusion Requirement

In accordance with project electrical safety review comments, the arc flash hazard assessment shall also include evaluation of the PV generation paralleling switchgear associated with the photovoltaic system interconnection.

The paralleling switchgear shall be evaluated as part of the overall electrical power distribution system for purposes of short circuit analysis, protective device coordination, and arc flash incident energy calculations.

The arc flash assessment shall therefore include the following additional equipment: • PV generation paralleling switchgear / interconnection switchgear • Bus structures, breaker compartments, and feeder sections within the paralleling switchgear • Incoming inverter aggregated feeders connected to the switchgear • Outgoing feeders connecting the switchgear to the facility service equipment or point of common coupling

Arc flash incident energy, arc flash boundary distance, and PPE requirements shall be determined for all accessible energized compartments within the paralleling switchgear in accordance with IEEE 1584 (2018) and NFPA 70E.

Arc flash warning labels shall be applied to the paralleling switchgear equipment in the same manner as other evaluated electrical equipment including switchboards, service disconnects, and distribution equipment.

The Arc Flash Hazard Assessment shall comply with the following applicable industry standards: • OSHA 29 CFR 1910 Subpart S – electrical safety requirements for worker protection • NFPA 70E – Electrical Safety in the Workplace (arc flash risk assessment requirements) • IEEE 1584 2018 – Guide for Performing Arc Flash Hazard Calculations • NFPA 70 (National Electrical Code) Article 110.16 – arc flash hazard warning labeling requirements

4. PV System Arc Flash Risk Considerations

Large scale photovoltaic systems introduce several conditions that increase arc flash risk:

Utility Fault Current Contribution

The utility supply typically provides the dominant short circuit current contribution at the point of common coupling and may significantly increase available fault current at service equipment.

Parallel Inverter Contribution

While individual string inverters limit fault current output, multiple inverters operating in parallel can sustain fault conditions and increase incident energy exposure duration.

Multiple Electrical Energy Sources

The electrical system includes both utility and photovoltaic sources, resulting in bidirectional fault current contribution paths within the distribution system.

Maintenance Exposure

Personnel may be exposed during inverter servicing, breaker operations, switchboard maintenance, and troubleshooting activities on energized equipment.

5. Arc Flash Study Methodology

The arc flash hazard analysis shall be performed by a qualified electrical engineer using industry recognized power system analysis software such as SKM PowerTools, ETAP, or EasyPower. The study shall include the following engineering analyses: • Collection of electrical system data including conductor sizes, lengths, transformer impedances, and protective device ratings

- Acquisition of available utility short circuit current data at the point of common coupling
- Development of a detailed electrical system model based on the project one line diagram
- Short circuit analysis to determine available fault current at major equipment locations
- Protective device coordination review to evaluate fault clearing times
- Arc flash incident energy calculations performed using IEEE 1584 2018 methodology

6. Required Engineering Deliverables

The completed arc flash study shall provide the following deliverables:

- Electrical system model used for power system analysis
- Updated one line diagram reflecting the final system configuration
- Short circuit study report
- Protective device coordination curves

- Arc flash incident energy calculations expressed in cal/cm²
- Arc flash boundary distances
- Personal protective equipment (PPE) category determination per NFPA 70E
- Arc flash hazard warning label specifications for field installation

7. Equipment Labeling Requirements

Arc flash warning labels shall be installed on all applicable electrical equipment including:

- PV AC combiner switchboard
- Service disconnect equipment
- Distribution switchboards and panelboards

Labels shall identify incident energy or PPE category, arc flash boundary distance, nominal system voltage, and equipment identification in accordance with NEC Article 110.16 and NFPA 70E.

8. Implementation Requirements Prior to Commissioning

The Arc Flash Hazard Assessment shall be completed prior to final system commissioning and energization of the photovoltaic system. Arc flash labels shall be installed on all applicable equipment before the system is placed into operation. All electrical work on energized equipment shall follow NFPA 70E safe work practices and PPE requirements established by the completed arc flash study.

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR
CONTRACTOR, LLC.

LICENSE: SAMPLE-000000

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

ARC FLASH ASSESSMENT

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-4A

JUNCTION BOX

1 JUNCTION BOX

⚠ WARNING ⚠
ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF
THIS PHOTOVOLTAIC SYSTEM
ARE UNGROUNDED AND
MAY BE ENERGIZED

NEC 690.35(F)

3 JUNCTION BOX

⚠ WARNING ⚠
PHOTOVOLTAIC
POWER SOURCE

NEC 690.35

2 JUNCTION BOX

**⚠ DO NOT
DISCONNECT
UNDER LOAD ⚠**

NEC 690.16(B)

12 RACEWAYS, CABLES PER 10 FT.

⚠ WARNING ⚠
PHOTOVOLTAIC
POWER SOURCE

NEC 690.31(E)(3),(4)

FUSED AC DISCONNECT (DS1)

13 FUSED AC DISCONNECT (DS1)

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

NEC 690.17.4

14 FUSED AC DISCONNECT (DS1)

PHOTOVOLTAIC SYSTEM
AC DISCONNECT
OPERATING CURRENT **962.4** AMPS
OPERATING VOLTAGE **480** VOLTS

NEC 690.54

15 FUSED AC DISCONNECT (DS1)

⚠ WARNING ⚠
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

NEC 705.12(D)(7)

MAIN DISTRIBUTION PANEL (PNL "MSB/SES")

16 MAIN DISTRIBUTION PANEL (PNL "MSB/SES")

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

NEC 690.56(B)

17 MAIN DISTRIBUTION PANEL (PNL "MSB/SES")

THIS ELECTRIC SYSTEM
IS ALSO SERVED BY A
PHOTOVOLTAIC SYSTEM

NEC 705.12(D)(4)

SOLAR-ONLY LOAD CENTER

18 EACH INVERTER BACKFED CIRCUIT (TYP. OF 4)

PHOTOVOLTAIC SYSTEM
AC DISCONNECT
OPERATING CURRENT **240.6** AMPS
OPERATING VOLTAGE **480** VOLTS

NEC 690.14(C)(2) & NEC 690.54

19 SOLAR-ONLY LOAD CENTER

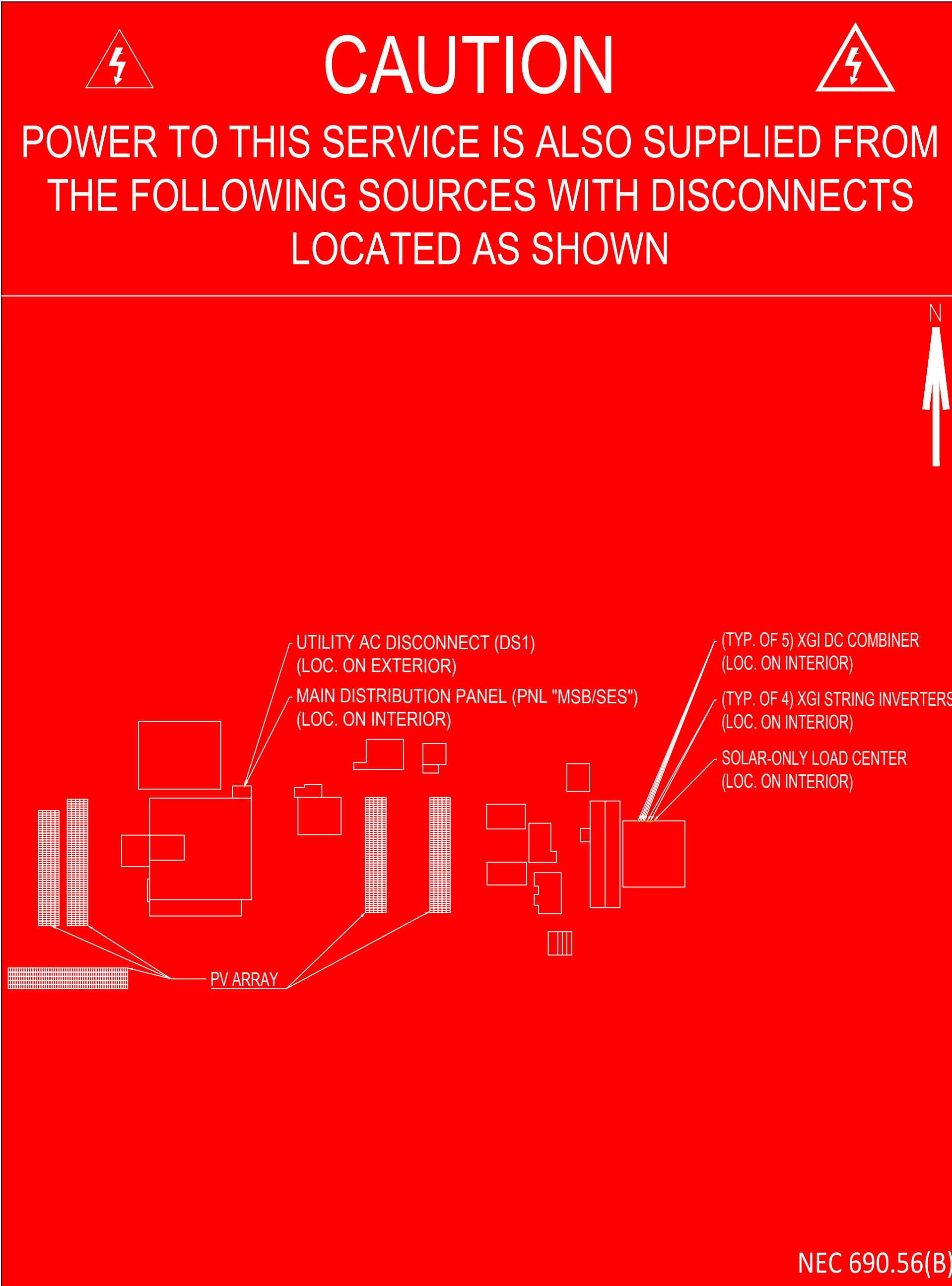
⚠ WARNING ⚠
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

NEC 705.12(D)(7)

20 SOLAR-ONLY LOAD CENTER

⚠ WARNING ⚠
SOLAR ELECTRIC BREAKER IS BACKFED

SITE OVERVIEW



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PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

PLACARDS

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

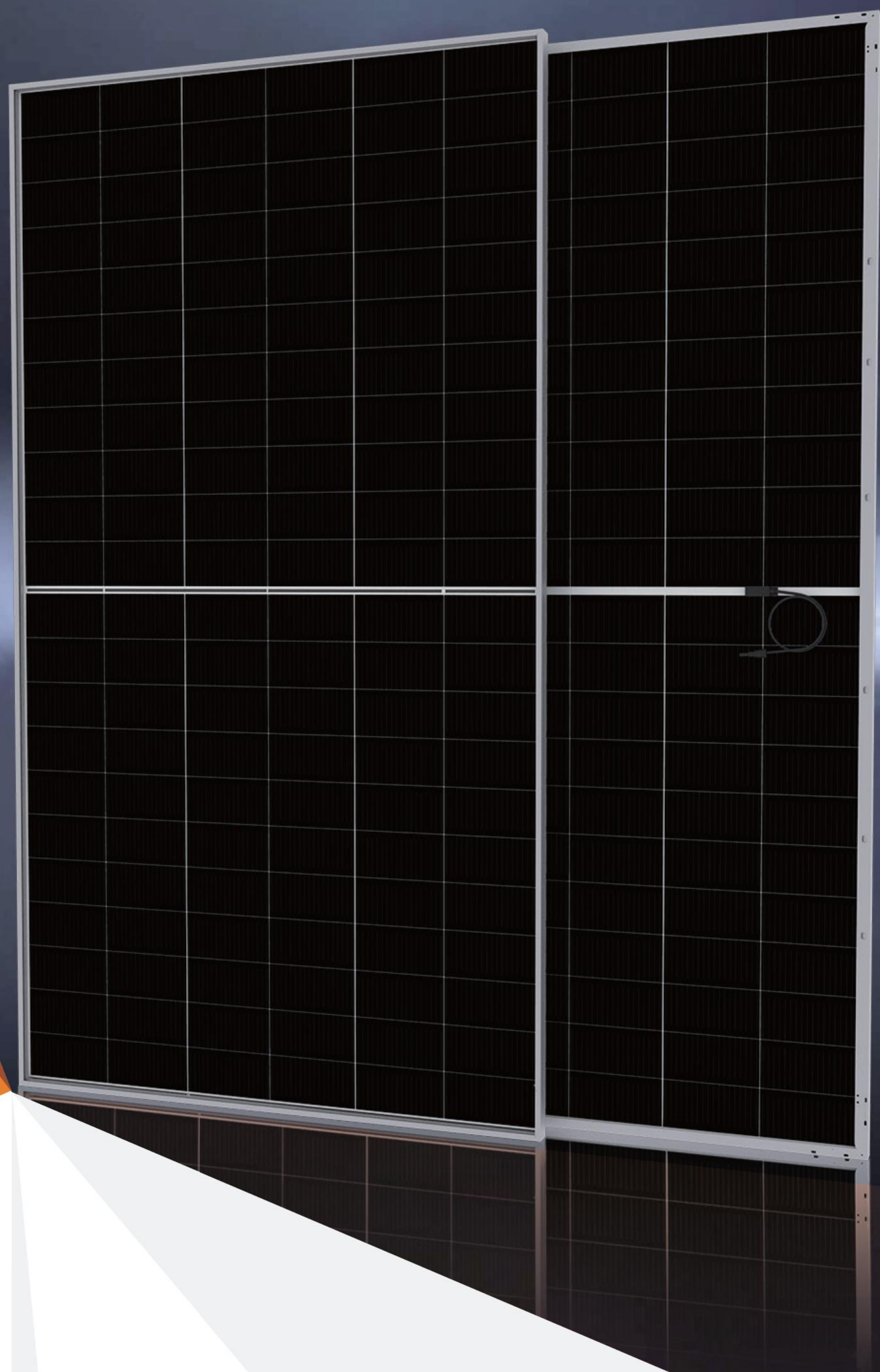
PV-4B



BIPRO

TM8G66M 132-cell

705 - 725W
Bifacial Dual Glass
18BB Half-cut N-type

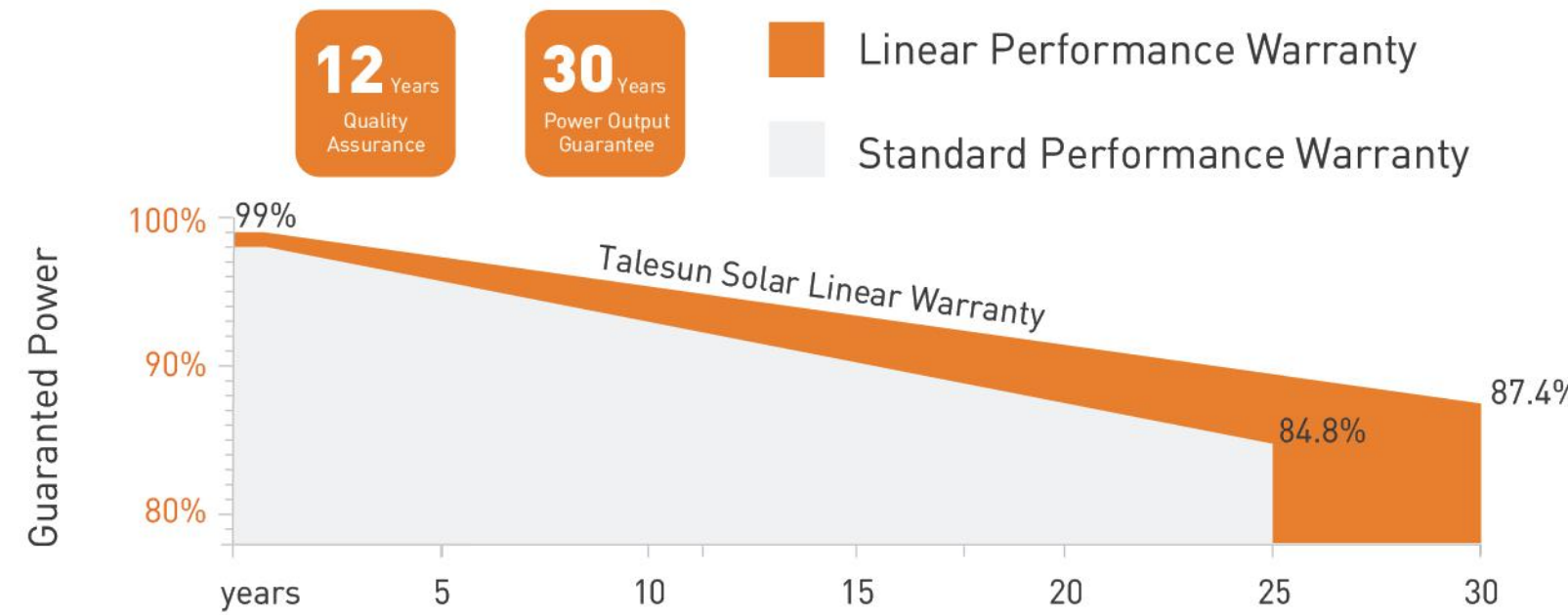


SYSTEM & PRODUCT CERTIFICATES

- IEC 61215 / IEC 61730 / UL 61730
- ISO 9001: 2015 Quality Management System
- ISO 14001: 2015 Environment Management System
- ISO 45001: 2018 Occupational Health and Safety Management Systems



PERFORMANCE WARRANTY



KEY FEATURES



18BB Half-cut Cell Technology

Lower LID/LeTID degradation and better low light performance
Attenuation $\leq 1\%$ (1st year) / $\leq 0.4\%$ (Linear)



Industry Leading High Yield

Bifacial N-type cell technology,
Dual-sided power generation gain from back side depending on albedo, significantly reduce LCOE



Excellent Anti-PID Performance

192 hours Anti-PID test



Wider Application

No water-permeability and high wear-resistance,
can be widely used in high-humid, windy and dusty area



IP68 Junction Box

High waterproof level

www.talesun.com

marketing.hq@talesun.com

* GL-EN-Version 2025.05.15

ELECTRICAL CHARACTERISTICS

Testing Condition	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum Power (Pmax/W)	705	540	710	543	715	547	720	551	725	555
Operating Voltage (Vmpp/V)	40.70	38.30	40.90	38.50	41.10	38.70	41.30	38.80	41.50	39.00
Operating Current (Impp/A)	17.33	14.08	17.36	14.12	17.40	14.14	17.44	14.19	17.47	14.23
Open-Circuit Voltage (Voc/V)	48.80	46.30	49.00	46.50	49.20	46.70	49.40	46.90	49.60	47.10
Short-Circuit Current (Isc/A)	18.36	14.80	18.40	14.83	18.44	14.86	18.49	14.90	18.53	14.94
Module Efficiency (%)	22.70		22.90		23.00		23.20		23.30	

STC: Irradiance 1000W/m², Spectra at AM1.5, Module Temperature 25℃. Power output tolerance: 0~+5W, Test uncertainty for Pmax: $\pm 3\%$
NMOT: Irradiance 800W/m², Spectra at AM1.5, Ambient Temperature 20℃, Wind speed 1m/s

REAR SIDE POWER GAIN(REFERENCE TO 705W FRONT)

Pmax gain	5%	10%	15%	20%	25%
Pmax/W	740	776	811	846	881
Vmpp/V	40.70	40.70	40.70	40.70	40.70
Impp/A	18.20	19.06	19.93	20.80	21.66
Voc/V	48.80	48.80	48.80	48.80	48.80
Isc/A	19.28	20.20	21.11	22.03	22.95

MECHANICAL CHARACTERISTICS

Cell Type	N-type Mono-Crystallin (18Busbar)
No. of Cells	132pcs in series (6*22)
Module Dimensions	2384*1303*33mm (93.86*51.30*1.30inches)
Weight	38.5kg (84.88lbs.)
Front Glass	2.0mm AR Coating Semi-tempered Glass
Back Glass	2.0mm Glazed Semi-tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68, 3 Bypass Diodes
Output Cables	4mm ² (IEC), 12AWG(UL) 350(+),280(-)mm in Length or Customized Length
Connectors	MC4/MC4-EVO2A/Others

APPLICATION CONDITIONS

Maximum System Voltage	1500V/DC
Operating Temperature	-40℃~+85℃
Maximun Series Fuse	35A
Safety Protection Class	Class II
Mechanical Load*	Front side 5400Pa, Back side 2400Pa
Refer. Bifaciality Factor	80% $\pm$ 5%

*Refer to the installation manual for details

TEMPERATURE CHARACTERISTICS

Temperature Coefficient of Pmax	-0.29%/℃
Temperature Coefficient of Voc	-0.24%/℃
Temperature Coefficient of Isc	+0.043%/℃
Nominal Module Operating Temperature(NMOT)	43 $\pm$ 2℃

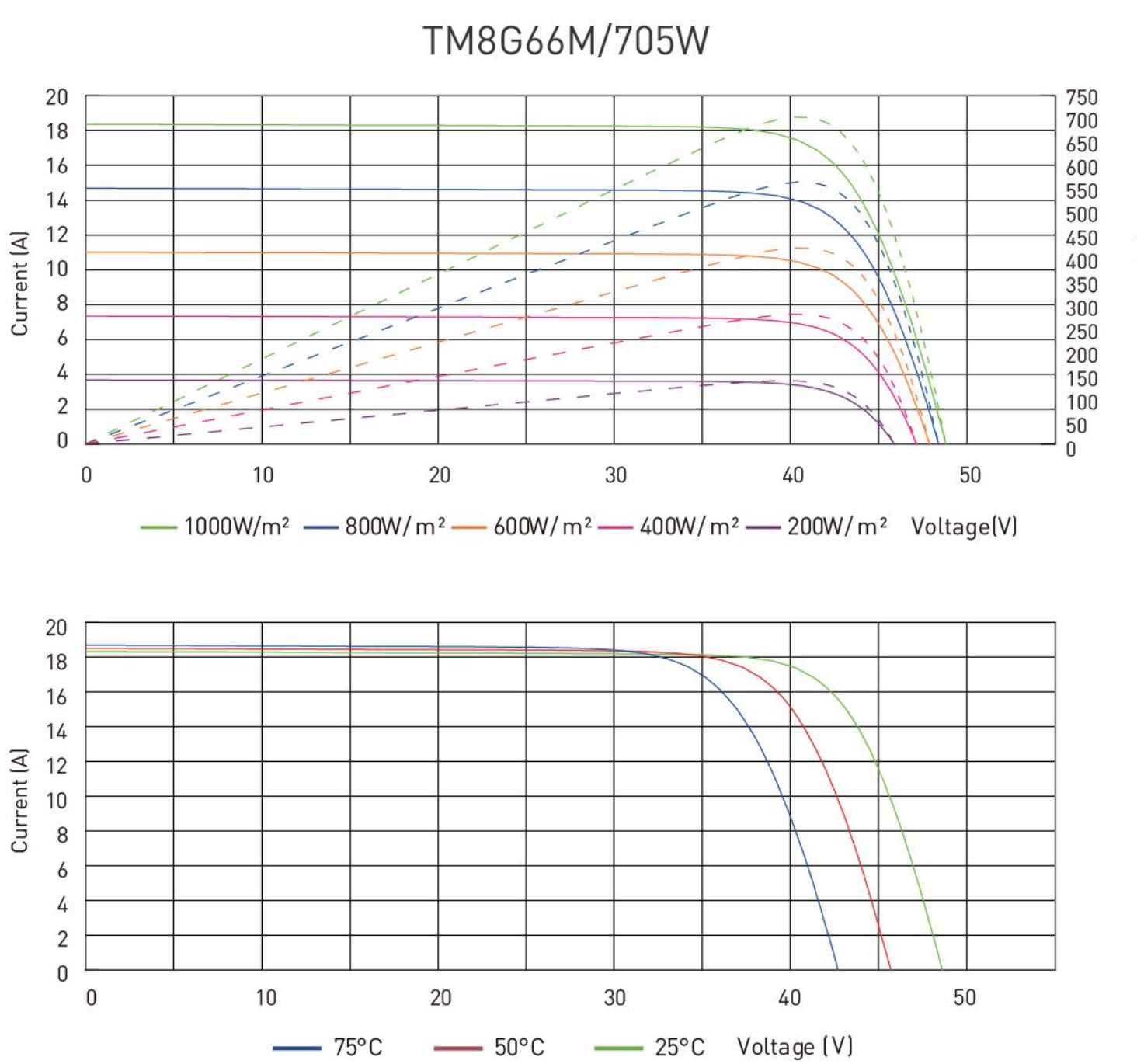
PACKING CONFIGURATION

Pieces Per Pallet	33	33(USA)
Pieces Per Container(40'HQ)	594	495

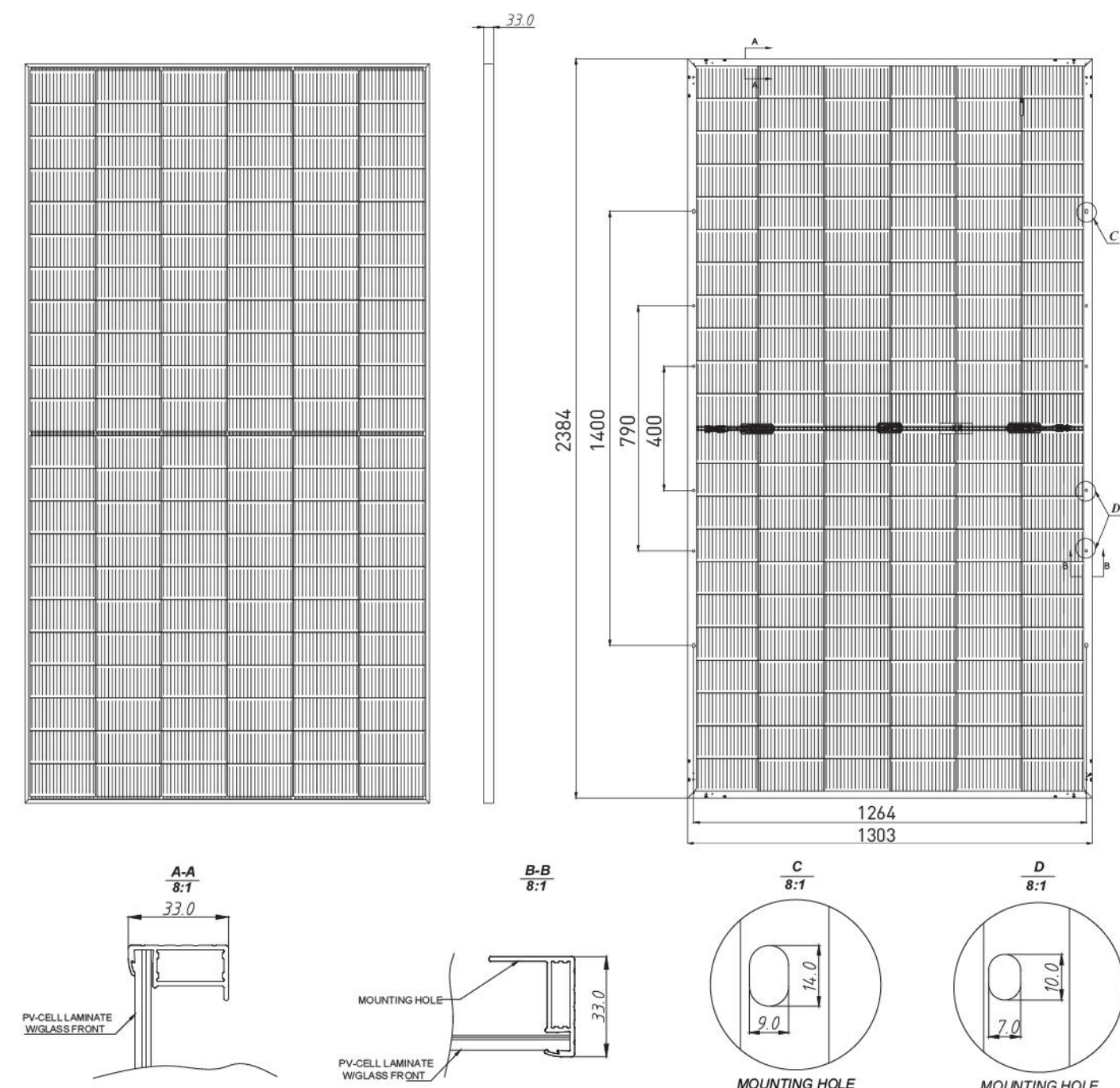


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Electrical Performance



TECHNICAL DRAWINGS



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GEMINI SOLAR DESIGN

SAMPLE PROJECT

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NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

PV MODULE DATASHEET

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-5

SOLECTRIA® XGI 1500-250 SERIES

PREMIUM 3-PHASE TRANSFORMERLESS
UTILITY-SCALE INVERTERS

FEATURES

- NEW and MORE POWERFUL!
- XGI 1500-250/250-600
- XGI 1500-225-600 (Selectable: 225kW/225kVA or 225kW/250kVA)
- XGI 1500-200/200-480
- XGI 1500-175-480 (Selectable: 175kW/175kVA or 175kW/200kVA)
- Industry-leading maximum DC/AC Ratio of 2.0
- Accepts two input PV Output Circuits, with no overcurrent protection required
- Made in the USA with global components
- Buy American Act (BAA) compliant
- 99.0% peak efficiency
- Flexible solution for distributed and centralized system architecture
- Advanced grid-support functionality Rule 21/UL1741SB
- Robust, dependable and built to last
- Lowest O&M and installation costs
- Access all inverters on site via WiFi from one location
- Remote diagnostics and firmware upgrades
- SunSpec Modbus Certified

OPTIONS

- PV Source Circuit Combiners
- Web-based monitoring
- Extended warranty



YASKAWA
SOLECTRIA SOLAR

Yaskawa Solectria Solar 1-978-683-9700 | Email: sales@solectria.com | solectria.com
Document No. FL.XGI1500.04 | 11/26/2025 | © 2021 Yaskawa America, Inc.

Yaskawa Solectria Solar is pleased to introduce its most powerful XGI 1500 inverters, with the XGI 1500-250 models at 600 Vac, and the XGI 1500-200 models for 480 Vac service.



The XGI 1500-250 and XGI 1500-200 feature SiC technology, high power and high efficiency that places them at the top end of the utility-scale string inverters in the market.

Yaskawa Solectria Solar designs all XGI 1500 utility-scale string inverters for high reliability and builds them with the highest quality components -- selected, tested and proven to last beyond their warranty. The XGI 1500 inverters provide advanced grid-support functionality and meet the latest IEEE 1547 and UL 1741 standards for safety.

The XGI 1500 inverters provide ideal solutions for ground-mounted utility-scale PV systems, with models available for service connections at 600 Vac and 480 Vac. Designed and engineered in Lawrence, MA, the SOLECTRIA XGI inverters are assembled and tested at Yaskawa America's facilities in Buffalo Grove, IL. The XGI 1500 inverters are Made in the USA with global components, and are compliant with the Buy American Act.

SOLECTRIA® XGI 1500-250 SERIES TECHNICAL DATA

SPECIFICATIONS

Product Specification		XGI 1500 Inverter Model			
		XGI 1500 250/250-600	XGI 1500 225-600		XGI 1500 200/200-480
DC Input	Absolute Maximum Input Voltage	1500 VDC			
	Maximum Power Voltage Range (MPPT)	860-1250 VDC		750-1250 VDC	
	Operating Voltage Range (MPPT)	860-1450 VDC		750-1450 VDC	
	Number of MPP Trackers	1 MPPT			
	Maximum Operating Input Current	296.7 A	267 A	272.1 A	238.1 A
	Maximum Operating PV Power	255 kW	230 kW	204 kW	179 kW
	Maximum DC/AC Ratio Max Rated PV Power	2.0 500 kW	2.22 500 kW	2.5 500 kW	2.86 500 kW
	Max Rated PV Short-Circuit Current (ΣIsc x 1.25)	800 A			
AC Output	Nominal Output Voltage	600 VAC, 3-Phase		480 VAC, 3-Phase	
	AC Voltage Range	-12% to +10%			
	Continuous Real Output Power	250 kW	225 kW	200 kW	175 kW
	Continuous Apparent Output Power (kVA)	250	250 225	200	200 175
	Maximum Output Current (A _{RMS})	240.6	XGI 1500- 225/225: 216.5 225/250: 240.6	240.6	XGI 1500- 175/175: 210.5 175/200: 240.6
	Fault Current Contribution (1 cycle RMS)	390 A	390 A 351 A	312 A	312 A 273 A
	Conductor Compatibility	600 kcmil max, Cu or Alum, 1 or 2 conductors with lugs			
	Nominal Output Frequency	60 Hz			
	Power Factor (Unity default)	+/- 0.80 Adjustable			
	Total Harmonic Distortion (THD) @ Rated Load	< 3%			
Efficiency	Grid Connection Type	3-Ph + N/GND			
	Peak Efficiency	99.0%			
	CEC Average Efficiency	98.5%			
Temperature	Tare Loss	<1 W			
	Ambient Temperature Range	-40°F to 140°F (-40°C to 60°C)			
	De-Rating Temperature	113°F (45°C)	127°F (53°C)	113°F (45°C)	131°F (55°C)
	Storage Temperature Range	-40°F to 167°F (-40°C to 75°C)			
	Relative Humidity (non-condensing)	0 - 95%			
Communications	Operating Altitude	9,840 ft (3 km)			
	Advanced Graphical User Interface	WiFi			
	Communication Interface	Ethernet			
	Third-Party Monitoring Protocol	SunSpec Modbus TCP/IP			
	Web-Based Monitoring	Optional			
Testing & Certifications	Firmware Updates	Remote and Local			
	Safety Listings & Certifications	UL 1741, IEEE 1547, UL 1699b Photovoltaic Arc-Fault Circuit Protection Certified			
	Advanced Grid Support Functionality	Rule 21, UL 1741SB			
Warranty	Testing Agency	ETL			
	FCC Compliance	FCC Part 15 (Subpart B, Class A)			
Enclosure	Standard and Options	5 Years Standard; Option for 10 Years			
	Acoustic Noise Rating	73 dBA @ 1 m ; 67dBA @ 3 m			
	DC Disconnect	Integrated 2-Pole 400 A DC Disconnect			
	Mounting Angle	Vertical only			
	Dimensions	Height: 29.5 in. (750 mm) Width: 44.3 in. (1125 mm) Depth: 15.4 in. (390 mm)			
	Weight	290 lbs (131.5 kg)			
	Enclosure Rating and Finish	NEMA 4X and IEC IP66, Polyester Powder-Coated Aluminum			



YASKAWA
SOLECTRIA SOLAR

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Document No. FL.XGI1500.04 | 11/26/2025 | © 2021 Yaskawa America, Inc.

IT'S PERSONAL

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.

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR
CONTRACTOR, LLC.

LICENSE: SAMPLE-000000

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

STRING INVERTER DATASHEET

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-6A

Certificate



Certificate no.

US 72226018 01

License Holder:

Solectria Renewables LLC
360 Merrimack Street, Bldg. 9, 2nd
Lawrence MA 01843
USA

Manufacturing Plant:

Yaskawa America Inc
1067 Johnson Drive
Buffalo Grove IL 60089
USA

Test report no.: USA-LHUS22OTAY 001

Client Reference: Thomas Shanahan

Tested to: UL 1741:2010 R2.18

Certified Product: Grid Support Utility Interactive Inverter

License Fee - Units

Model Designation:

1) XGI 1500-125/125-UL; 2) XGI 1500-125/150-UL;
3) XGI 1500-150/166-UL; 4) XGI 1500-166/166-UL;
5) XGI 1500-125/125-3S; 6) XGI 1500-166/166-3S;
7) XGI 1500-125/125-UL-A; 8) XGI 1500-125/150-UL-A;
9) XGI 1500-150/166-UL-A; 10) XGI 1500-166/166-UL-A;
11) XGI 1500 250/250-600; 12) XGI 1500 225-600;
13) XGI 1500 200/200-480; 14) XGI 1500 175-480

Rated Voltage: DC 1500V max.

Operating Voltage Range: 1) -12) DC 860-1450V;
13)-14) DC 750-1450V

contd.

Appendix: 1, 1-40

Licensed Test mark:



**Date of Issue
(day/mo/yr)**

10/06/2022

TUV Rheinland of North America, Inc., 295 Foster Street, Suite 100, Littleton, MA 01460, Tel +1 (978) 266 9500, Fax +1 (978) 266-9992

Certificate



Certificate no.

US 72226018 04

License Holder:

Solectria Renewables LLC
360 Merrimack Street, Bldg. 9, 2nd
Lawrence MA 01843
USA

Manufacturing Plant:

Yaskawa America Inc
1067 Johnson Drive
Buffalo Grove IL 60089
USA

Test report no.: USA-LHUS22OTAY 003

Client Reference: Thomas Shanahan

Tested to: UL 1741:2021

Certified Product: Grid Support Utility Interactive Inverter

License Fee - Units

Change:

Upgrade of standard for all models: see above

Special Remarks: Also evaluated to:

- 1) UL 1741 Edition 3 Supplement SB for grid interactive functions and IEEE 1547-2018 and IEEE 1547.1-2020
 - IEEE1547.1-2020: Normal Operating Performance B;
 - Abnormal Operating Performance III
- 2) UL 1741 Edition 3 Supplement SB for interoperability
 - IEEE 1547-2018 and IEEE 1547.1-2020:

Using SunSpec Modbus protocol

Appendix: 1, 1-40

Licensed Test mark:



**Date of Issue
(day/mo/yr)**

30/01/2023

TUV Rheinland of North America, Inc., 295 Foster Street, Suite 100, Littleton, MA 01460, Tel +1 (978) 266 9500, Fax +1 (978) 266-9992

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

**SAMPLE SOLAR
CONTRACTOR, LLC.**

LICENSE: SAMPLE-000000

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

INVERTER UL CERTIFICATE

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-6B



Conformity Letter

Number: MS-0009914,
Attachment 1
Revision: 0
Effective date: 06/21/2019

Solectria Renewables LLC
360 Merrimack Street, Bldg. 9, 2nd Floor,
Lawrence, MA 01843
USA

2023-02-07

Report Number: US22J6JX.002
Project Number: P00621900
Equipment Type: Grid Support Utility Interactive Inverter

Inverter Model(s): XGI 1500-125/125-UL; XGI 1500-125/150-UL; XGI 1500-150/166-UL;
XGI 1500-166/166-UL; XGI 1500-125/125-3S; XGI 1500-166/166-3S;
XGI 1500-125/125-UL-A; XGI 1500-125/150-UL-A;
XGI 1500-150/166-UL-A; XGI 1500-166/166-UL-A;
XGI 1500 250/250-600; XGI 1500 225-600; XGI 1500 200/200-480;
XGI 1500 175-480

Dear Mr. Thomas Shanahan,

Based on the evaluations undertaken, the model(s) of the below product have been found to comply with the requirements of the below referenced specifications.

Nationally Recognized Testing Laboratory (NRTL)	TUV Rheinland of North America, Inc.
NRTL Issuing Office Address	1279 Quarry Lane, Suite A, Pleasanton, CA 94566
Applicant Name	Solectria Renewables LLC
Applicant Address	360 Merrimack Street, Bldg. 9, 2nd Floor, Lawrence, MA 01843 USA
Inverter Model Numbers	XGI 1500-125/125-UL; XGI 1500-125/150-UL; XGI 1500-150/166-UL; XGI 1500-166/166-UL; XGI 1500-125/125-3S; XGI 1500-166/166-3S; XGI 1500-125/125-UL-A; XGI 1500-125/150-UL-A; XGI 1500-150/166-UL-A; XGI 1500-166/166-UL-A; XGI 1500 250/250-600; XGI 1500 225-600; XGI 1500 200/200-480; XGI 1500 175-480
Software/Firmware Version	MCU1 .out file Checksum: 621b8ce1 MCU2 .out file Checksum: b7ac946a

TUV Rheinland of North America, Inc. Pleasanton Office

1279 Quarry Lane, Suite A, Pleasanton, CA 94566

Tel: (925) 249-9123
Fax: (925) 249-9124
Web: www.us.tuv.com

TUV Rheinland of North America, Inc. North American Headquarters

12 Commerce Road Newtown, CT 06470

Tel: +1 (203) 426-0888
Fax: +1 (203) 426-4009

Email: info@tuv.com
Web: www.tuv.com



Conformity Letter

Number: MS-0009914,
Attachment 1
Revision: 0
Effective date: 06/21/2019

Standard(s)	UL 1741:2010 R2.18: Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources UL 1741 Supplement SA, Feb. 15, 2018– GRID SUPPORT UTILITY INTERACTIVE EQUIPMENT
Source Requirements Document	IEEE 1547:2003 - IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems IEEE 1547.1-2005 - IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces Electric Rule No. 21 Generating Distribution System Hawaii Rule No. 14H Interconnection of Distributed Generating Facilities with the Company’s Distribution System HECO SRD-UL-1741-SA-V 1.1
Date of Test(s)	N/A
Reference reports	This document shall be read together with US22OTAY.001
Reference certificate	This document shall be read together with US72226018

The following tests have been completed according to UL 1741SA.

Clause Number	Description
SA8	Anti-Islanding Protection
SA9	Low and High Voltage Ride-Through
SA10	Low and High Frequency Ride-Through
SA11	Normal Ramp Rates and Soft-Start Ramp Rates
SA12	Specified Power Factor
SA13	Volt/Var Mode
SA14	Frequency-Watt
SA15	Volt-Watt
SA17*	Disable Permit Service
SA18*	Limit Active Power
HECO SRD Part IIA	Reactive Power Capabilities
Note:*Models that are not tested: XGI 1500 250/250-600; XGI 1500 225-600; XGI 1500 200/200-480; XGI 1500 175-480.	

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR CONTRACTOR, LLC.

LICENSE: SAMPLE-000000

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

RULE 21 CONFORMITY

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-6C

SOLECTRIA® XGI 1500 POWER RACK

1.0 - 2 MWAC FACTORY INTEGRATED AND TESTED

The Solectria® XGI 1500 Power Rack is the most robust, scalable building-block for state-of-the-art multi-MW solar plants.



Based around the Solectria XGI 1500 utility-scale string inverters, the Power Rack is designed for high reliability, rapid deployment, and built to the highest standards of quality.

The modular design provides multiple independent MPPT zones per megawatt for improved power-point tracking and improves system up time with a simplified maintenance plan.

The XGI 1500 inverters provide advanced grid-support functionality and boast a true peak efficiency above 99%. The XGI 1500 inverters are the most powerful 1500V string inverters in the PV market. Designed and engineered in Lawrence, MA , the new Solectria Power Rack features the XGI 1500 utility-scale string inverters that are Made in the USA with global components and compliant with the Buy American Act.

FEATURES

- Racks designed for up to four, six or eight XGI 1500 utility-scale string inverters, achieving up to 2 MWac in total, pre-mounted and pre-wired on a custom-fabricated strut-based galvanized steel rack
- Fused AC combiner for the output from the XGI 1500 inverters, with a load-break AC disconnect switch
- Pre-assembled and pre-wired AC and communications cabling
- Designed for rapid deployment
- Scalable alternative to central inverters with convenient access for maintenance and service
- True 99.0% peak efficiency
- Advanced grid-support functionality Rule21/UL1741SA
- Lowest O&M and installation costs
- Access all inverters on site via WiFi from one location
- Remote diagnostics and firmware upgrades
- XGI 1500 utility-scale string inverters are Made in the USA with global components and Buy American Act (BAA) compliant

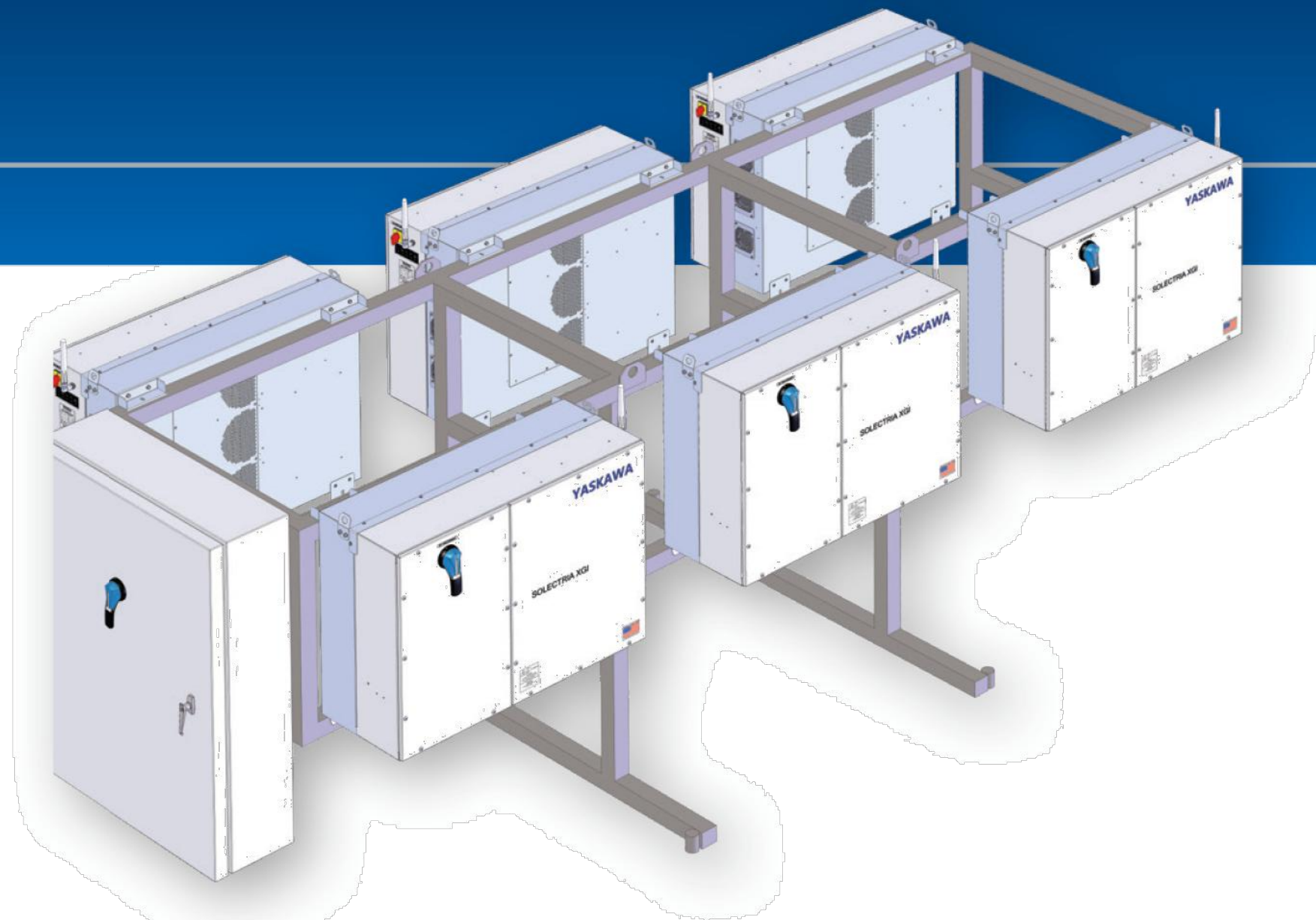
OPTIONS

- PV Source Circuit Combiners: 16, 20, 24, 26, 28 position
- Configurations available using XGI 1500 models at 600 Vac (250 kW and 225 kW), and at 480 Vac (200 kW and 175 kW)
- Web-based monitoring
- Extended Warranty

SOLECTRIA® XGI 1500 POWER RACK TECHNICAL DATA

DESIGN DETAILS

SOLECTRIA POWER RACK	
Inverters	POWER RACK™ models designed for four, six or eight XGI 1500 inverters, for flexibility in overall rating. The flagship POWER RACKs use the XGI 1500-250/250-600 for overall ratings of 1MW, 1.5MW and 2MW. Options to use any other XGI 1500 models at 600Vac (225kW, 166kW, 150kW, and 125kW) or 480Vac (200kW and 175kW).
AC Combiner	AC Combiner with fused terminations for XGI 1500 inverter AC output and a load-break disconnect for bussed AC output. Does not include GFP equipment; available as an option. Consult Yaskawa Solectria Solar for further details.
Rack	Custom fabricated, rugged strut-based galvanized steel rack.
Factory Assembly, Test & Quality Control	XGI 1500 inverters and AC Combiner secured to the POWER RACK™; AC output wiring run from the inverters to the AC Combiner, communications wiring run between the inverters. Tested in the factory to ensure the POWER RACK™ is ready to go in the field.



SOLECTRIA POWER RACK WEIGHT SPECIFICATIONS			
Mo del	Inverter Model	Inverter Quantity	Est. Rack Total Weight (lb) *
XGI-1500-166-PRU-6	XGI 1500-166/166	6	4100
XGI-1500-xxx-PRU-4	XGI 1500-xxx	4	3000
XGI-1500-xxx-PRU-5	(where xxx can be: 175, 200, 225, or 250)	5	3900
XGI-1500-xxx-PRU-6		6	4200
XGI-1500-xxx-PRU-7		7	4900
XGI-1500-xxx-PRU-8		8	5200

* Includes rack, inverters, AC combiner, and all factory wiring and fittings

SPECIFICATIONS

Specification Data		POWER RACK MODELS				
		XGI 1500-250-PR4	XGI 1500-250-PR5	XGI 1500-250-PR6	XGI 1500-250-PR7	XGI 1500-250-PR8
Configuration	Number of Inverters and Inverter Model	(4) XGI 1500-250 SERIES*	(5) XGI 1500-250 SERIES*	(6) XGI 1500-250 SERIES*	(7) XGI 1500-250 SERIES*	(8) XGI 1500-250 SERIES*
	DC Input to Inverters (field wired)	See SOLECTRIA® XGI 1500 PV COMBINERS datasheet for details on all PV Combiner models				
	AC Connections	Inverter Output Circuits factory-wired to the AC Combiner; Combined AC output available for field wiring				
DC Input (All specifications are per inverter)	Absolute Max DC Input Voltage	1500 Vdc				
	Full Power Voltage Range (MPPT)	860 Vdc - 1250 Vdc				
	Operating Voltage Range (MPPT)	860 Vdc - 1450 Vdc				
	Number of MPP Trackers	Single MPPT Zone				
	Max Operating PV Current	296.7 Adc (per XGI 1500-250/250-600 Inverter)				
	Max Operating PV Power	255 kWdc (per XGI 1500-250/250-600 Inverter)				
	Max DC/AC Ratio Max Rated PV Power	2.0 500 kWdc (per XGI 1500-250/250-600 Inverter)				
AC Output (All specifications are for the combined AC output)	Max Rated PV Short-Circuit Current (Σ Isc x 1.25)	800 Adc (per XGI 1500-250/250-600 Inverter)				
	Nominal AC Output Voltage (Range)	600 Vac, 3-Phase (-12% to +10%)				
	Continuous Real AC Output Power	1 MWac total	1.25 MWac total	1.5 MWac total	1.75 MWac total	2.0 MWac total
	Continuous Apparent Output Power	1 MVA total	1.25 MVA total	1.5 MVA total	1.75 MVA total	2.0 MVA total
	Maximum AC Output Current	962.4 A total	1,203 A total	1,444 A total	1,684 A total	1,925 A total
	Nominal Operating AC Frequency	60 Hz				
	Power Factor Adjustable Range (Unity default)	+/- 0.80 Adjustable				
	Total Harmonic Distortion (THD) @ Rated Power	< 5%				
	Grid Connection Type	3-Ph + N/GND				
	Fault Current Contribution (1 cycle RMS)	144 A (per XGI 1500-250/250-600 Inverter)				
		*All specifications in these columns are based on the XGI 1500-250/250-600. Consult SOLECTRIA for more information and specifications for the PowerRack™ using other XGI 1500-250 series inverter models (XGI 1500-225-600, XGI 1500-200/200-480, XGI 1500-175-480)				

IT'S PERSONAL

YASKAWA
SOLECTRIA SOLAR

Yaskawa Solectria Solar 1-978-683-9700 | Email: sales@solectria.com | solectria.com
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YASKAWA
SOLECTRIA SOLAR

Yaskawa Solectria Solar 1-978-683-9700 | Email: sales@solectria.com | solectria.com
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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR
CONTRACTOR, LLC.

LICENSE: SAMPLE-000000

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

POWER RACK DATASHEET

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-7

SOLECTRIA® XGI 1500 PV COMBINERS

INCREASED DESIGN FLEXIBILITY FOR SOLECTRIA XGI 1500 INVERTERS

FEATURES

- Designed for use with SOLECTRIA XGI 1500 inverters
- Models with a 250 A DC disconnect switch:
 - Remote Combiner, with both polarities fused
 - Remote Combiner, with positive polarity fused
 - Remote Combiner, with positive polarity fused and fused output
 - Attached Combiner, with both polarities fused
 - 250 A DC disconnect switch
- Models with a 400 A DC disconnect switch:
 - Remote Combiner, with positive polarity fused
 - Remote Combiner, with positive polarity fused and fused output
 - 400 A DC disconnect switch
- 16, 20, 24 and 28 fuse positions
- Fuse options: 20 A, 25 A, 30 A, 32 A (not all fuse size options available for all models; see technical specs)
- Surge arrestor, both polarities (see technical specs)
- Made in the USA with global components
- Buy American Act (BAA) compliant



YASKAWA SOLECTRIA SOLAR

Yaskawa Solectria Solar offers its 1500 V Combiners for exclusive use with SOLECTRIA XGI 1500 inverters

Yaskawa Solectria Solar's 1500 V Combiners feature the highest quality and durability in the industry today. The Combiners match the XGI 1500 Inverters in quality and appearance, and satisfy the National Electrical Code for systems with ungrounded PV source circuits.

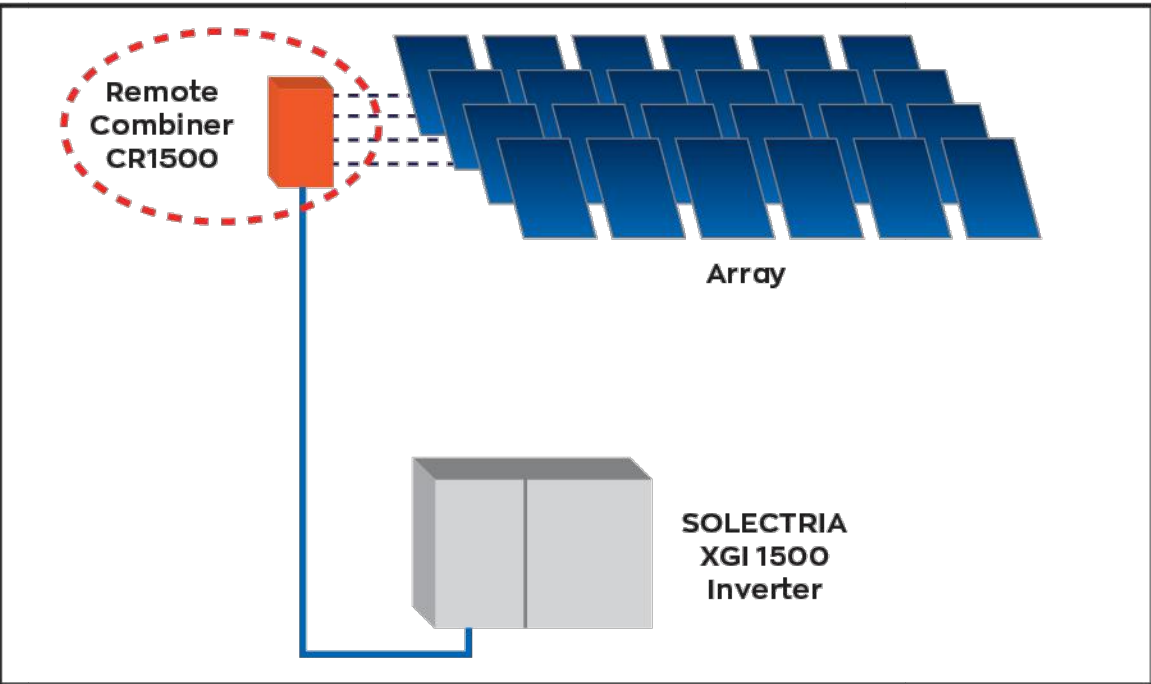
The 1500 V Attachable Combiner is designed to mate to the XGI 1500-166 family of inverters. This combiner has fuses on the positive and negative poles, and a 250A disconnect switch.

The 1500 V Remote Combiners come in three versions for the XGI 1500 inverters, providing flexibility to meet different code and project requirements. Models are available with both polarities fused, or just the positive polarity fused. The newest models also include a fused output, to take advantage of the maximum current calculation using NEC 690.8(A)(2).

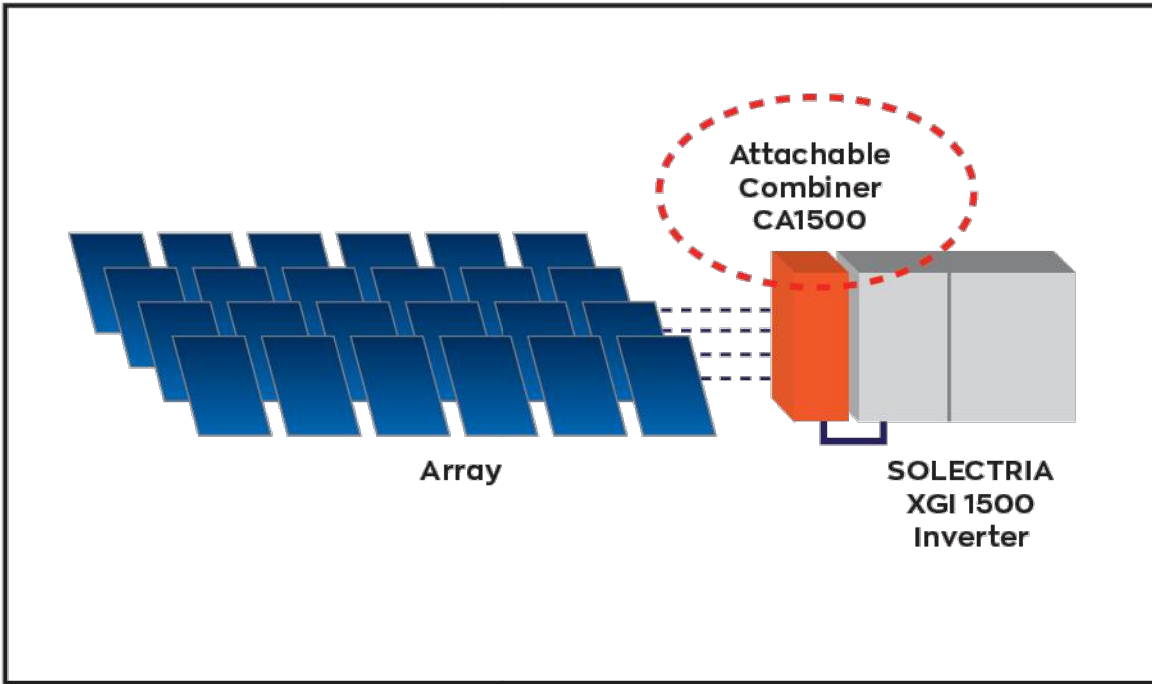
Yaskawa Solectria Solar provides a full line of Remote Combiners, with models featuring a 250 A disconnect switch, and additional models with a 400 A disconnect switch, for compatibility with all XGI 1500-166 series and XGI 1500-250 series inverters.

All Yaskawa Solectria Solar XGI Inverters and Combiners are Made in the USA, with global components, and are compliant with the Buy American Act.

CENTRALIZED OR CLUSTERED PV SYSTEM



DISTRIBUTED PV SYSTEM



SOLECTRIA® XGI 1500 PV COMBINERS TECHNICAL DATA

SPECIFICATIONS

Specification		MODELS WITH 250 A DISCONNECT SWITCH				MODELS WITH 400 A DISCONNECT SWITCH		
		ATTACHABLE COMBINER * BOTH POLES FUSED	REMOTE COMBINER BOTH POLES FUSED	REMOTE COMBINER POS. POLE FUSED	REMOTE COMBINER POS. POLE FUSED OUTPUT FUSED	REMOTE COMBINER POS. POLE FUSED	REMOTE COMBINER POS. POLE FUSED OUTPUT FUSED	
Model Format		CA1500-xx-yy(S)	CR1500-xx-yy(S)	CR1500-xxP-yy(S)	CR1500-xxP-yyF-250S	CR1500-xxP-yyS-400	CR1500-xxP-yyF-400S	
		xx = # source circuits / yy = fuse rating (Amps) / (S): optional surge protection / S: Standard surge protection / P: positive fuse only 250S: Standard surge protection, 250 A DC switch and 315 A output fuse / 400S: Standard surge protection, 400 A DC switch and 450 A output fuse 400: 400 A DC disconnect switch / * Attachable Combiner only compatible with XGI 1500-166 series inverters.						
Fuse Configuration		BOTH Poles Fused		POSITIVE Pole Fused	POSITIVE Pole Fused OUTPUT Fused	POSITIVE Pole Fused	POSITIVE Pole Fused OUTPUT Fused	
Input Wire Compatibility		14 - 4 AWG, PV-Rated, Copper Wire Only			14 - 6 AWG, PV-Rated, Copper Wire Only		14 - 4 AWG, PV-Rated, Copper Wire Only	14 - 6 AWG, PV-Rated, Copper Wire Only
Maximum Output Wire Compatibility		Compression Lug Required, Cu or Aluminum Conductors						
		1 or 2 Conductors at 500 kcmil			1 or 2 Conductors at 600 kcmil	1 Conductor at 750 kcmil 2 Conductor at 500 kcmil	1 or 2 Conductors at 600 kcmil	
Maximum Voltage		1500 VDC						
DC Disconnect		DC Disconnect Located on XGI 1500 Inverter	2-Pole Integrated DC Disconnect Positive and Negative Poles Switched					
DC Disconnect Current Rating		250 A				400 A		
Input PV Source Circuit Configuration		Ungrounded PV Source Circuits Only						
Temperature Range		-40°F to 122°F (-40°C to +50°C)			-40°F to 140°F (-40°C to +60°C)	-40°F to 122°F (-40°C to +50°C)	-40°F to 140°F (-40°C to +60°C)	
Mounting Positions		Attaches to Inverter Structure, Vertical Orientation	Indoor, Outdoor, Wall Array Structure, Vertical, Horizontal, or Angled					
Safety Certification and Listing		UL 1741 / Intertek			UL 1741 / TUV	UL 1741 / Intertek	UL 1741 / TUV	
Standard Warranty		5 Years						
Overall Dimensions	Height	29.5 in. (750 mm)	29.5 in. (750 mm)	30.0 in. (762 mm)				
	Width	15 in. (380 mm)	18.1 in. (460 mm)	24.0 in. (610 mm)				
	Depth	10.6 in. (260 mm)	11 in. (280 mm)	8.0 in. (203 mm)				
Enclosure Material and Rating		Polyester Powder Coated Aluminum NEMA Type 4			Polyester Powder Coated Steel NEMA Type 4			
Weight		Approximately 45 lb (varies by model)			Approximately 80 lb (varies by model)			
Surge Protection		Optional, Protects Positive and Negative Poles			Standard, Protects Positive and Negative Poles			
Fuse Options		MODELS WITH 250 A DISCONNECT SWITCH				MODELS WITH 400 A DISCONNECT SWITCH		
# Fuse Positions	16	20 A / 25 A		20 A / 25 A / 30 A / 32 A		20 A / 25 A / 30 A / 32 A		
	20	20 A / 25 A			20 A / 25 A / 30 A / 32 A			
	24	20 A				20 A / 25 A / 30 A / 32 A		
	26	20 A		N/A		N/A		
	28	20 A			20 A / 25 A / 30 A / 32 A			
Output Fuse Rating		N/A			315 A	N/A	450 A	



All models of the XGI 1500 Combiners are Recognized Components, designed and listed exclusively for use with the Solectria XGI 1500 inverters. The XGI 1500 Combiners are not to be used with any other solar inverter.

YASKAWA SOLECTRIA SOLAR

Yaskawa Solectria Solar 1-978-683-9700 | Email: sales@solectria.com | solectria.com Document No. FL.XGI1500C.01 | 11/18/2024 | © 2021 Yaskawa America, Inc.



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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

SAMPLE SOLAR CONTRACTOR, LLC.

LICENSE: SAMPLE-000000

PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE

PUBLIC SAMPLE

PV COMBINER DATASHEET

PROJECT INFO

SHEET SIZE: ARCH E

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-8A

PV WIRE

2kV PV Wire. Stranded Bare Copper Conductors. XLP Insulation. -40C to 90C Wet or Dry. Rated VW-1* Sunlight Resitance and Direct Burial.



Image not to scale. See Table 1 for Dimensions

CONSTRUCTION:

Conductors:

7, 37, & 61 Strands:
Class A, Compressed Concentric-Lay, Stranded Copper Conductors per ASTM B3, B8 (or B33 for Tinned Copper Construction)

19 Strand:
19 Wire Combination Unilay, Stranded Soft Drawn Bare Copper Conductors per ASTM B3, B787 (or B33 for Tinned Copper Construction)

Insulation: Cross-Linked Polyethylene (XLPE)

APPLICATIONS AND FEATURES:

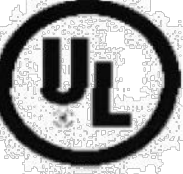
Southwire Photovoltaic Wire is intended for use in solar power applications. Rated 90°C for Exposed or concealed wiring in wet or dry locations. Rate for Direct Burial.

SPECIFICATIONS:

- ASTM B3, B8, B33, B787
- UL 4703 - Type Photovoltaic Wire
- UL 44 - TYPE RHW-2

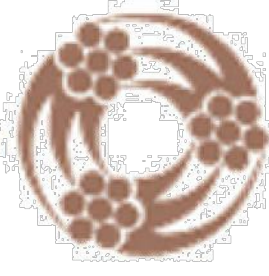
SAMPLE PRINT LEGEND:

SOUTHWIRE E316464 #P# (UL) PV WIRE 14 AWG (2.08 mm2) CU 2000V 90(D)C WET OR DRY -40(D)C SUN RES DIRECT BURIAL OR RHW-2 2000V ---RoHS (DD/MM/YYYY) SEQUENTIAL FOOTAGE MARKS



Southwire Company, LLC | One Southwire Drive, Carrollton, GA 30119 | www.southwire.com

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Southwire®

OEMCS2016150 DATE: 7/31/2018 Rev:4

PV WIRE

TABLE 1 - WEIGHTS & MEASUREMENTS

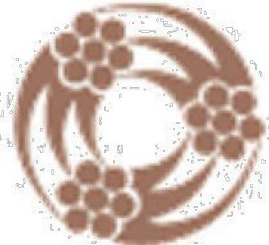
Stock Code	Cond. Size (AWG)	No. of Strands	Insulation Thickness (inches)	Nominal OD (inches)	Nominal Weight (Lbs/Mft)	Color	Metal (CU/STC)	Ampacity** (Amps) in Free Air
597961xx	14	19	0.075	0.224	30	BLK	CU	15
597962xx	14	19	0.075	0.224	30	WHT	CU	15
597959xx	14	19	0.075	0.224	30	BLK	STC	15
597960xx	14	19	0.075	0.224	30	WHT	STC	15
597958xx	12	19	0.075	0.243	30	BLK	CU	20
596376xx	12	19	0.075	0.243	40	WHT	CU	20
596377xx	12	19	0.075	0.243	40	RED	CU	20
597957xx	12	19	0.075	0.243	40	BLK	STC	20
*568807xx	12	19	0.075	0.243	42	BLK	STC	20
597956xx	12	19	0.075	0.243	40	WHT	STC	20
579962xx	10	19	0.075	0.263	52	BLK	CU	30
*568110xx	10	19	0.075	0.263	57	BLK	CU	30
583665xx	10	19	0.075	0.263	52	WHT	CU	30
583687xx	10	19	0.075	0.263	52	RED	CU	30
582083xx	10	19	0.075	0.263	52	RED	STC	30
583664xx	8	7	0.085	0.313	80	WHT	CU	80
580608xx	8	7	0.085	0.313	80	BLK	STC	80
582082xx	8	7	0.085	0.313	80	RED	STC	80
*569037xx	8	19	0.085	0.313	80	BLK	CU	80
*585080xx	8	19	0.085	0.313	80	WHITE	CU	80
*589110xx	8	19	0.085	0.313	80	RED	CU	80
593338xx	8	19	0.085	0.313	80	WHITE	STC	80
*679967xx	8	19	0.085	0.313	80	RED	STC	80
*599132xx	6	19	0.085	0.349	112	BLACK	STC	105
*569040xx	4	19	0.085	0.396	166	BLACK	CU	140
*592661xx	4	19	0.085	0.396	166	BLACK	STC	140
*569041xx	2	19	0.085	0.456	251	BLACK	CU	190
*5690421xx	1	19	0.105	0.531	321	BLACK	CU	220
569043xx	1/0	19	0.105	0.570	394	BLACK	CU	260
569044xx	2/0	19	0.105	0.614	485	BLACK	CU	300
569045xx	3/0	19	0.105	0.664	604	BLACK	CU	350
569047xx	4/0	19	0.105	0.723	746	BLACK	CU	405
590138xx	350	37	0.120	0.904	1215	BLACK	CU	570
578324xx	500	37	0.120	1.033	1700	BLACK	CU	700
588931xx	750	61	0.135	1.241	2527	BLACK	CU	885

All dimensions are nominal and subject to normal manufacturing tolerances
*VW-1 Rated Product
**Based on 2017 NEC® Table 310.15(B)(17) for single conductor temperature rating of 90C and ambient temperature of 30C. 14 -10 AWG are based on NEC® article 240.240.4(D) for overcurrent Protection.



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OEMCS2016150 DATE: 7/31/2018 Rev:4

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE
PROJECT INFO WITHHELD

SAMPLE SOLAR CONTRACTOR, LLC.

LICENSE: SAMPLE-000000
PHONE: (000) 000-0000

NEW GRID-TIED SYSTEM 943.20kW DC

SAMPLE COMMERCIAL PV PROJECT

PROJECT ADDRESS WITHHELD

UNITED STATES

ENGINEERING REVIEW

ON FILE
PUBLIC SAMPLE

2000VDC PV WIRE DATASHEET

PROJECT INFO

SHEET SIZE: ARCH E
PROJECT NO: GSD-SAMPLE
DRAWN BY: GSD
DATE: SAMPLE