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PROJECT DETAILS	
PROPERTY OWNER	SAMPLE OWNER
PROPERTY ADDRESS	123 SAMPLE STREET SAMPLE CITY, USA
PARCEL NUMBER	0531205046
AHJ	CLEARCREEK TOWNSHIP (WARREN COUNTY)
ZONING	RESIDENTIAL
CONST. TYPE	GROUND-MOUNTED PHOTOVOLTAIC ARRAY
UTILITY COMPANY	DUKE ENERGY
OBSERVED CODES	<i>RCO (RESIDENTIAL CODE OF OHIO) 1, 2, 3 FAMILY 2019.</i> <i>OBC (OHIO BUILDING CODE) - 2024</i> <i>NEC (NATIONAL ELECTRICAL CODE) - 2024</i> <i>OFC (OHIO FIRE CODE) - 2017</i> <i>OSHA 29 CFR 1910.269</i> <i>UNDERWRITERS LABORATORIES (UL) STANDARDS</i>
STRUCT. METHOD	<i>ASCE7-16</i>

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	<i>Sanjay Mallapaty</i>

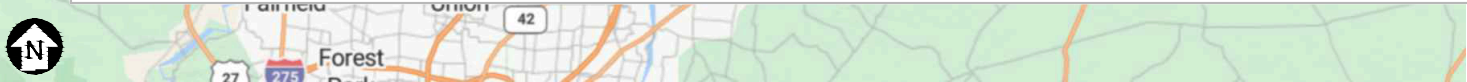
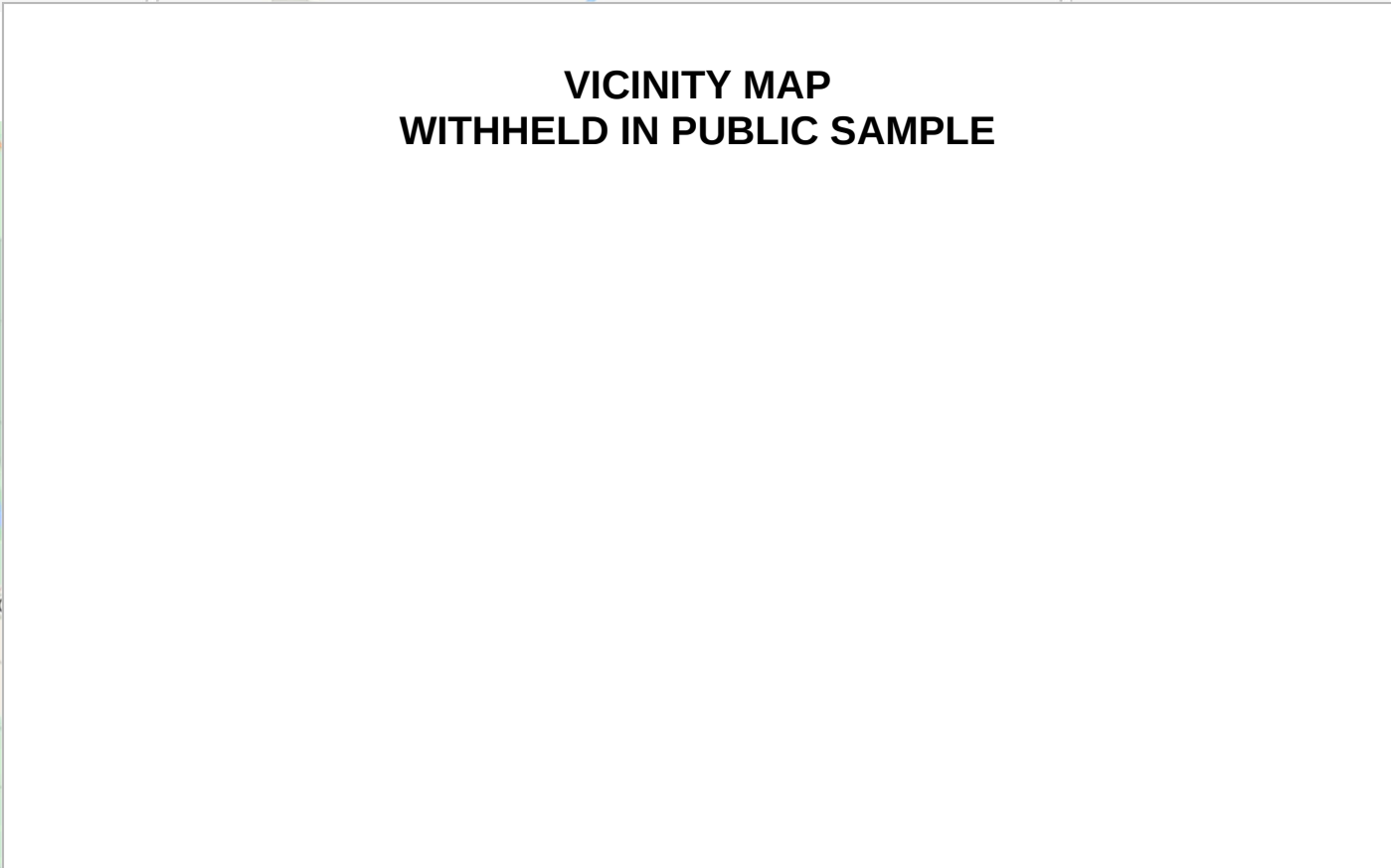
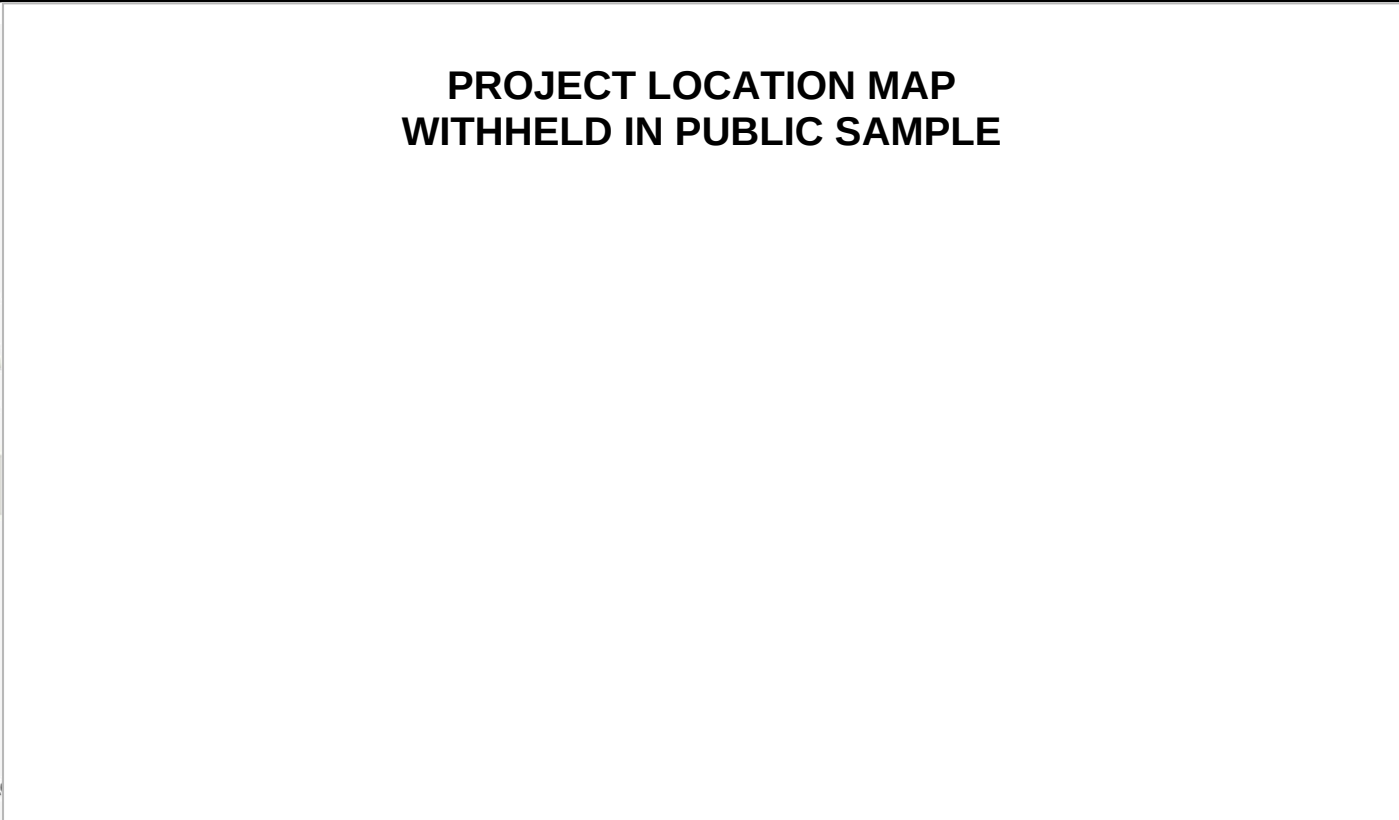
SYSTEM DETAILS (SUB-SYSTEM #1)	
DC RATING OF SYSTEM	22,680W
MAX. CONTINUOUS OUTPUT CURRENT	66.7A @ 240VAC
HYBRID INVERTER	(1) EG4 FLEXBOSS 21 (IV-16000-HYB-AW-FX-00)
SOLAR MODULE	(36) SEG SOLAR SEG-630-BTZ-BG
BATTERY MODULE	(2) EG4@ 14.3KWH POWERPRO WALLMOUNT ALL WEATHER BATTERY
STANDBY GENERATOR	(1) GENERAC GUARDIAN SERIES 22KW, MODEL: G007042-10 / G007043-10
PROJECT TYPE	GRID-TIED WITH DC-COUPLED BATTERY STORAGE & STANDBY GENERATOR

SYSTEM DETAILS (SUB-SYSTEM #2)	
DC RATING OF SYSTEM	22,680W
MAX. CONTINUOUS OUTPUT CURRENT	66.7A @ 240VAC
HYBRID INVERTER	(1) EG4 FLEXBOSS 21 (IV-16000-HYB-AW-FX-00)
SOLAR MODULE	(36) SEG SOLAR SEG-630-BTZ-BG
BATTERY MODULE	(2) EG4@ 14.3KWH POWERPRO WALLMOUNT ALL WEATHER BATTERY
STANDBY GENERATOR	(1) GENERAC GUARDIAN SERIES 22KW, MODEL: G007042-10 / G007043-10
PROJECT TYPE	GRID-TIED WITH DC-COUPLED BATTERY STORAGE & STANDBY GENERATOR

SITE SPECIFICATIONS	
UTILITY SERVICE	CL320, 120 / 240VAC, 1-Ø, 3-WIRE
LOAD CENTER (TYP. OF 2) (LOC. INTERIOR OF SINGLE FAMILY DWELLING)	200A RATED BUSBAR MAIN LUG ONLY
ASHRAE EXTREME ANNUAL MEAN MINIMUM DENSITY DRY BULB TEMP.	-15°C
ASHRAE 2% ANNUAL DRY DENSITY BULB TEMP.	33°C

PROJECT LOCATION MAP WITHHELD IN PUBLIC SAMPLE

VICINITY MAP WITHHELD IN PUBLIC SAMPLE



2 LOCALE
PV-1 SCALE: NTS

CONSTRUCTION NOTES

1	CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO INITIATING CONSTRUCTION.
2	CONTRACTOR SHALL REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
3	ALL EQUIPMENT SHALL BE LISTED BY THE U.L. (OR EQUAL) AND LISTED FOR ITS SPECIFIC APPLICATION.
4	ALL EQUIPMENT SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
5	ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6	ACCESS TO ELECTRICAL COMPONENTS OVER 150 VOLTS TO GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
7	ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 VOLTS AND 90°C WET ENVIRONMENT, UNLESS OTHERWISE NOTED.
8	WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
9	PV MODULES FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER G.E.C. PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
10	PV MODULES RACKING RAIL SHALL BE BONDED TO BARE COPPER G.E.C VIA WEEB LUG, 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. THE PHOTOVOLTAIC (PV) SYSTEM IS TO BE INSTALLED ON THE RESIDENTIAL ZONED PROPERTY IN CLEARCREEK TOWNSHIP, WARREN COUNTY, OHIO. THE ENERGY PRODUCED BY THE PV SYSTEM SHALL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ON-SITE ELECTRICAL EQUIPMENT.

THIS PROJECT WILL INCLUDE DC-COUPLED STORAGE BATTERIES AND A STANDBY GENERATOR BACKUP SOLUTION, EMPLOYED IN A WHOLE-HOME BACKUP

ENGINEERING STAMP
WITHHELD IN PUBLIC SAMPLE

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.

GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

PROJECT INFO

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

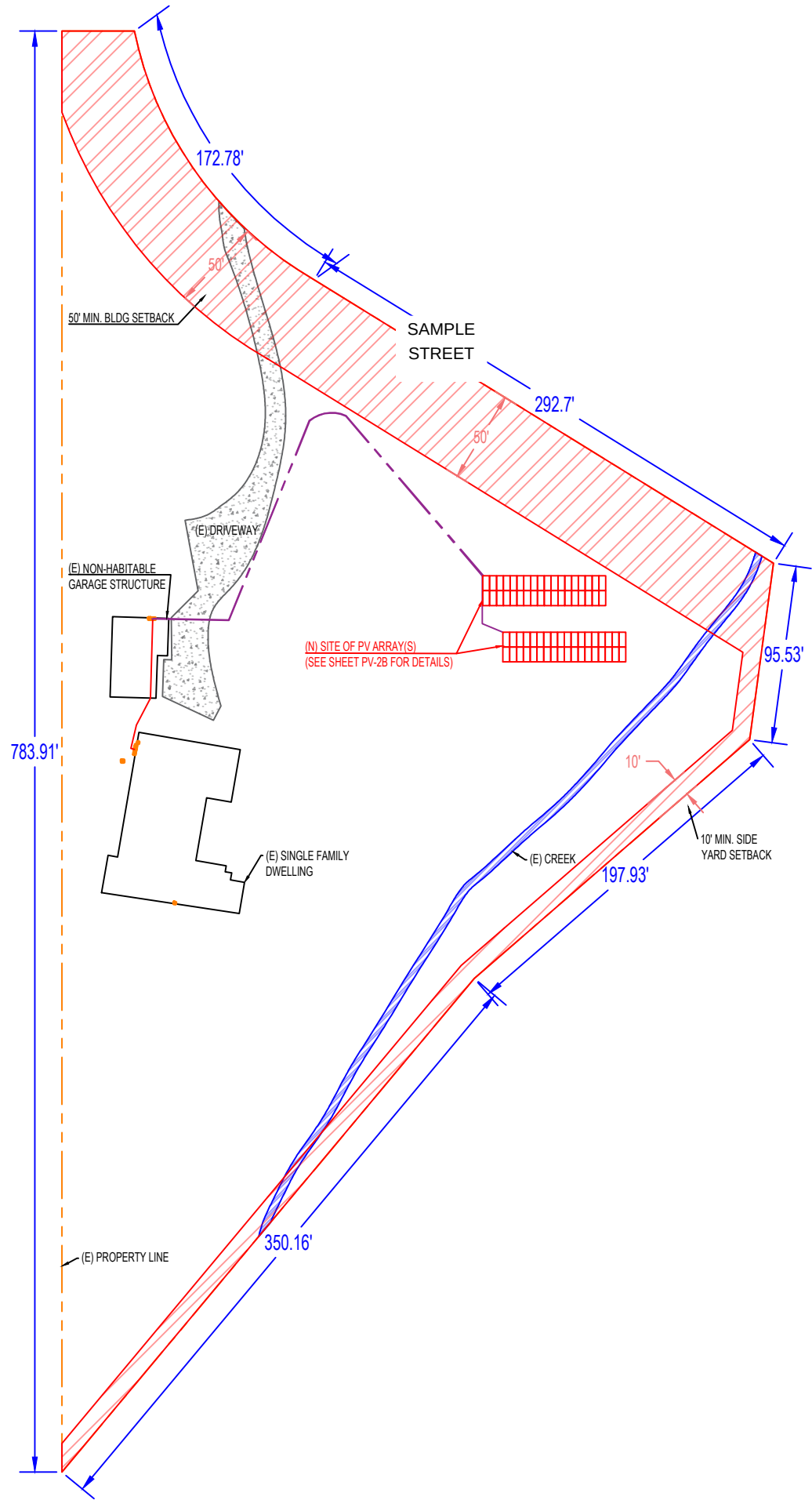
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PV-1

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

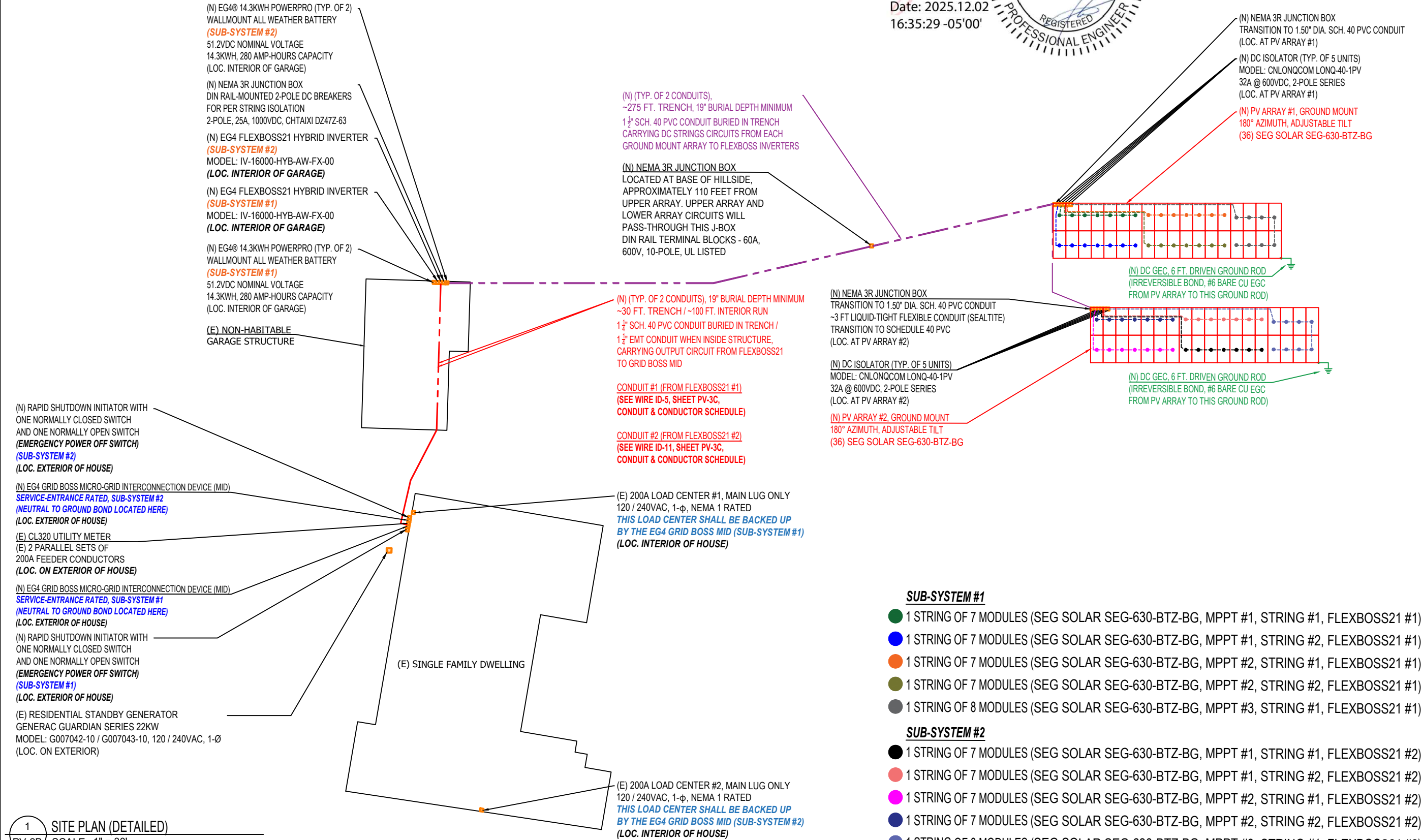
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E Pino

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GEMINI SOLAR DESIGN	
SAMPLE PROJECT	
CONTACT: ON FILE	
PROJECT INFO WITHHELD	
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GRID-TIED SOLAR SYSTEM 45.36kW	
SAMPLE RESIDENCE PROJECT ADDRESS WITHHELD UNITED STATES	
SITE PLAN	
PROJECT NO: GSD-SAMPLE	
DRAWN BY: GSD	
DATE: SAMPLE	
PV-2A	

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	DC CONDUCTORS EITHER DO NOT ENTER BUILDING OR ARE RUN IN METALLIC RACEWAYS OR ENCLOSURES TO THE FIRST ACCESSIBLE DC DISCONNECTING MEANS PER NEC ARTICLE 690.1(E)
4	ARRAYS SHALL BE INSTALLED IN A WAY THAT ENSURES THAT PV SOURCE CONDUCTORS SHALL NOT BE READILY ACCESSIBLE.
5	UNDERGROUND PVC CONDUIT SHALL BE BURIED AT 19" MINIMUM DEPTH, WARNING TAPE 12" ABOVE.
6	VERIFY UNDERGROUND UTILITIES PRIOR TO EXCAVATION.



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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

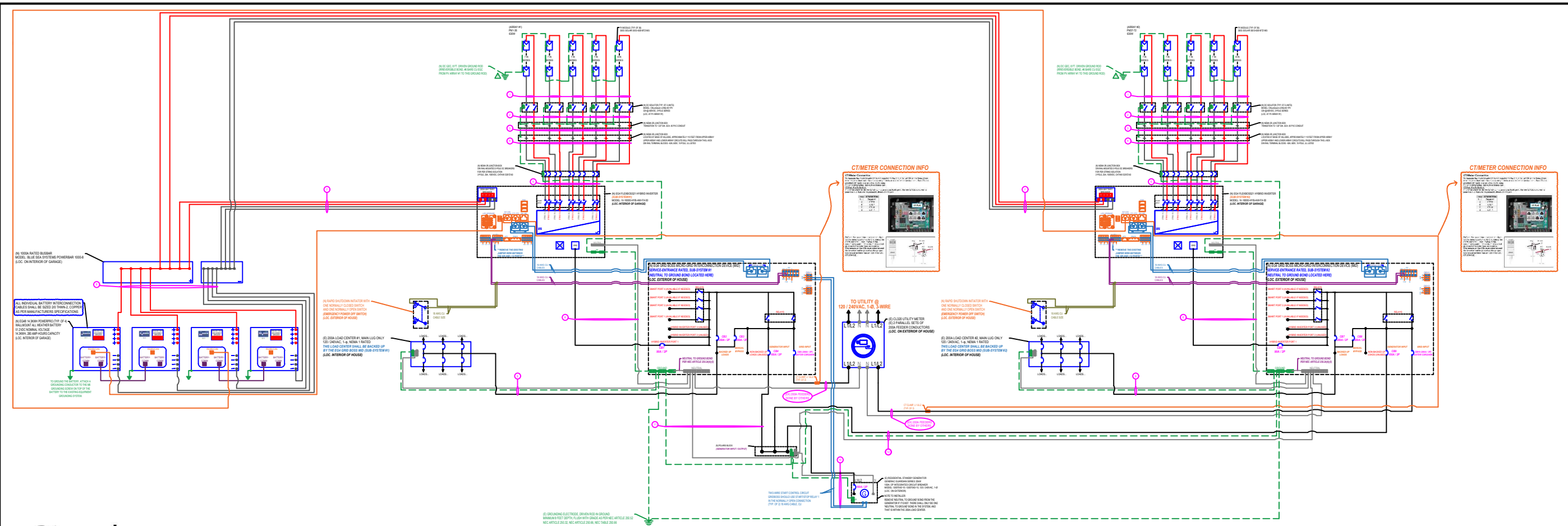
SITE PLAN

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-2B



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STATE OF OHIO
RICARDO E. PINO
E-89906
REGISTERED PROFESSIONAL ENGINEER

SYSTEM SUMMARY (SUB-SYSTEM #1)	
ARRAY STC POWER	22,680W
ARRAY CIRCUITS	2 X 7 (MPPT #1) 2 X 7 (MPPT #2) 1 X 8 (MPPT #3)
ARRAY VMP @ STC (25°C)	333.9VDC (MPPT #1) 333.9VDC (MPPT #2) 381.6VDC (MPPT #3)
ARRAY VOC @ STC (25°C)	399.5VDC (MPPT #1) 399.5VDC (MPPT #2) 456.6VDC (MPPT #3)
MAXIMUM ARRAY VOC @ MIN. TEMP (-15°C)	439.6VDC (MPPT #1) 439.6VDC (MPPT #2) 502.3VDC (MPPT #3)
ARRAY I_MP @ STC (SELF-LIMITING OVER 26A FOR MPPT 1 & 2, 15A FOR MPPT 3)	26.42A (MPPT #1) 26.42A (MPPT #2) 13.21A (MPPT #3)
ARRAY I_SC (MAX) (MAXIMUM INPUT OF 31A FOR MPPT 1 & 2, 19A FOR MPPT 3)	27.72A (MPPT #1) 27.72A (MPPT #2) 13.86A (MPPT #3)

SYSTEM SUMMARY (SUB-SYSTEM #2)	
ARRAY STC POWER	22,680W
ARRAY CIRCUITS	2 X 7 (MPPT #1) 2 X 7 (MPPT #2) 1 X 8 (MPPT #3)
ARRAY VMP @ STC (25°C)	333.9VDC (MPPT #1) 333.9VDC (MPPT #2) 381.6VDC (MPPT #3)
ARRAY VOC @ STC (25°C)	399.5VDC (MPPT #1) 399.5VDC (MPPT #2) 456.6VDC (MPPT #3)
MAXIMUM ARRAY VOC @ MIN. TEMP (-15°C)	439.6VDC (MPPT #1) 439.6VDC (MPPT #2) 502.3VDC (MPPT #3)
ARRAY I_MP @ STC (SELF-LIMITING OVER 26A FOR MPPT 1 & 2, 15A FOR MPPT 3)	26.42A (MPPT #1) 26.42A (MPPT #2) 13.21A (MPPT #3)
ARRAY I_SC (MAX) (MAXIMUM INPUT OF 31A FOR MPPT 1 & 2, 19A FOR MPPT 3)	27.72A (MPPT #1) 27.72A (MPPT #2) 13.86A (MPPT #3)

SYSTEM SUMMARY (TOTAL AGGREGATE SYSTEM)	
TOTAL COMBINED ARRAY STC POWER	45,360W
TOTAL COMBINED CONTINUOUS AC OUTPUT CURRENT	133.34A @ 240VAC

SCHEMATIC NOTES	
	NEC 690.47(D) REQUIRES THAT GROUND ELECTRODES BE INSTALLED AT THE LOCATION OF ALL GROUND-MOUNTED ARRAYS AND SIZED IN ACCORDANCE WITH NEC 250.166. THE SEPARATE GROUND ELECTRODE SHALL BE SIZED AT #6.

PLEASE SEE SHEET PV-3B FOR THE EQUIPMENT SPECIFICATIONS, AND OCPD / DISCONNECT SCHEDULES,

PLEASE SEE SHEET PV-3C FOR THE WIRE & CONDUCTOR SCHEDULE.

SEPARATE SHEETS WERE CREATED DUE TO SPACE LIMITATIONS.

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

THREE-LINE DIAGRAM

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-3A

PHOTOVOLTAIC MODULE									
REF.	TYP.	MODULE		STC POWER	ISC	IMP	VOC	VMP	FUSE RATING
PM1-72	72	SEG SOLAR SEG-630-BTZ-BG		630W	13.86A	13.21A	57.08V	47.70V	30A

HYBRID INVERTER									
TYP.	HYBRID INVERTER	MPPT OPERATING VOLTAGE RANGE	NUMBER OF MPPT/ MAX SOLAR STRINGS PER MPPT	MAX. USABLE INPUT CURRENT (I_MP) PER MPPT	MAX DC VOLTAGE (V_OC)	NOMINAL POWER OUTPUT	BACKUP/UPS AC OUTPUT DATA (PEAK POWER)	MAX. EFFICIENCY @ PV TO GRID	RAPID SHUTDOWN COMPLIANT AS PER NEC 690.12
2	EG4 FLEXBOSS 21 (IV-16000-HYB-AW-FX-00)	120-440VDC	3 MPPT IN TOTAL 2 STRINGS (MPPT 1 & 2) 1 STRING (MPPT 3)	26A / 26A / 15A	600VDC	16,000W @ 240VAC	24KW (.5 SEC) 18KW (1 SEC) 15KW (6 MIN) 13.2KW (12 MIN)	97%	YES

BATTERY MODULE									
TYP.	BATTERY	CHEMISTRY	NOMINAL VOLTAGE	CAPACITY	TOTAL ENERGY CAPACITY	COMMUNICATION PROTOCOL	CHARGING CURRENT	DISCHARGING CURRENT	LOW DC CUTOFF
4	EG4® 14.3KWH POWERPRO WALLMOUNT ALL WEATHER BATTERY	LiFePO4	51.2VDC (48VDC)	280AH	14.3KWH @ 25C, 100% STATE OF CHARGE	RS485/CAN	100/140/200A MAX. CONTINUOUS	200A MAX. CONTINUOUS	44.8VDC

STANDBY GENERATOR						
TYP.	GENERATOR	MAXIMUM CONTINUOUS LOAD CURRENT		MAXIMUM CONTINUOUS POWER CAPACITY (LP)	MAIN LINE CIRCUIT BREAKER	ENGINE
1	GENERAC GUARDIAN SERIES 22KW MODEL: G007042-10 / G007043-10	91.7A @ 240VAC		22kW	100A	GENERAC G-FORCE 1000 SERIES

DC DISCONNECT SCHEDULE			
REF.	TYPE	SWITCHING CONFIGURATION	CURRENT RATING & VOLTAGE RATING
DC ISOLATOR (TYP. OF 10 UNITS) MODEL: CNLonQcom LONQ-40-1PV	ROTARY ACTUATOR SWITCH	2-POLE SERIES	32A @ 600VDC

OCPD SCHEDULE				
REF.	TYPE OF OCPD	POLES	CURRENT RATING	RATED VOLTAGE
CB1 (HYBRID INVERTER, BACKFED CIRCUIT BREAKER)	CIRCUIT BREAKER	2	90A	240VAC
CB2 (BACKED UP LOADS, GRID BOSS, MAIN BREAKER)	CIRCUIT BREAKER	2	200A	240VAC
CB3 (MANUAL BYPASS, GRID BOSS, MAIN BREAKER)	CIRCUIT BREAKER	2	200A	240VAC
CB4 (GENERATOR INTPUT, GRID BOSS)	CIRCUIT BREAKER	2	100A	240VAC
CB5 (GRID INPUT, GRID BOSS, MAIN BREAKER)	CIRCUIT BREAKER	2	200A	240VAC
CB6 (HYBRID INVERTER, BACKFED CIRCUIT BREAKER)	CIRCUIT BREAKER	2	90A	240VAC
CB7 (BACKED UP LOADS, GRID BOSS, MAIN BREAKER)	CIRCUIT BREAKER	2	200A	240VAC
CB8 (MANUAL BYPASS, GRID BOSS, MAIN BREAKER)	CIRCUIT BREAKER	2	200A	240VAC
CB9 (GENERATOR INPUT, GRID BOSS)	CIRCUIT BREAKER	2	100A	240VAC
CB10 (GRID INPUT, GRID BOSS, MAIN BREAKER)	CIRCUIT BREAKER	2	200A	240VAC

Ricardo E Pino

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

THREE-LINE DIAGRAM

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-3B

CONDUCTOR SCHEDULE WITH NEC ELECTRICAL CALCULATIONS																	
ID	TYP	DESCRIPTION	CONDUCTOR	CONDUIT	NO. OF CURRENT CARRYING CNDRS. IN CNDT.	FILL %	RATED AMPS	OCPD	EGC	TEMP. CORR. FACTOR @ 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	10	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO DC ISOLATOR(S)	12 AWG PV WIRE COPPER	FREE AIR	N/A	N/A	13.86A (I_sc) - PER STRING	32A @ 600VDC DC ISOLATOR, 2-POLE SERIES	6 AWG BARE COPPER (BOND TO GROUND ROD)	0.96 (33°C)	1.0	17.33A (I_sc) - PER STRING	21.66A (I_sc) - PER STRING	35A ≥ 21.66A PASS	40A (IN FREE AIR)	40A (IN FREE AIR)	
2	10	PV SOURCE CIRCUIT (TRANSTIONED): DC ISOLATOR(S) TO JUNCTION BOX	10 AWG PV WIRE COPPER	PV WIRE IN FREE AIR, MC4 CONNECTORS	N/A	N/A	13.86A (I_sc) - PER STRING	N/A	10 AWG THWN-2 COPPER	0.96 (33°C)	1.0	17.33A (I_sc) - PER STRING	21.66A (I_sc) - PER STRING	35A ≥ 21.66A PASS	40A (IN FREE AIR)	40A (IN FREE AIR)	
3	2	PV SOURCE CIRCUIT (TRANSTIONED): JUNCTION BOX TO JUNCTION BOX	8 AWG THWN-2 COPPER	1 1⁄2" DIA. SCH. 40 PVC (RAN IN UNDERGROUND TRENCH, 19" MINIMUM BURIAL DEPTH)	10 5 X (DC +) 5 X (DC -)	19.5%	13.86A (I_sc) - PER STRING	N/A	10 AWG THWN-2 COPPER	0.96 (33°C)	0.5	17.33A (I_sc) - PER STRING	21.66A (I_sc) - PER STRING	50A ≥ 21.66A PASS	55A (IN CONDUIT)	27.5A (IN CONDUIT)	
4	1	PV SOURCE CIRCUIT (TRANSTIONED): JUNCTION BOX TO JUNCTION BOX	8 AWG THWN-2 COPPER	1 1⁄2" DIA. SCH. 40 PVC (RAN IN UNDERGROUND TRENCH, 19" MINIMUM BURIAL DEPTH)	10 5 X (DC +) 5 X (DC -)	19.5%	13.86A (I_sc) - PER STRING	DIN RAIL MOUNTED CIRCUIT BREAKER	10 AWG THWN-2 COPPER	0.96 (33°C)	0.5	17.33A (I_sc) - PER STRING	21.66A (I_sc) - PER STRING	50A ≥ 21.66A PASS	55A (IN CONDUIT)	27.5A (IN CONDUIT)	
5	1	PV SOURCE CIRCUIT (TRANSTIONED): JUNCTION BOX TO HYBRID INVERTER	8 AWG THWN-2 COPPER	1 1⁄2" DIA. SCH. 40 PVC (RAN IN UNDERGROUND TRENCH, 19" MINIMUM BURIAL DEPTH)	10 5 X (DC +) 5 X (DC -)	19.5%	13.86A (I_sc) - PER STRING	INTEGRATED DC DISCONNECT WITHIN HYBRID INVERTER	10 AWG THWN-2 COPPER	0.96 (33°C)	0.5	17.33A (I_sc) - PER STRING	21.66A (I_sc) - PER STRING	50A ≥ 21.66A PASS	55A (IN CONDUIT)	27.5A (IN CONDUIT)	
6	4	OUTPUT OF BATTERY: BATTERY TO BUSBAR (+ / -)	2/0 AWG THWN-2 COPPER	2.00" DIA. EMT	4 2 X (DC +) 2 X (DC -)	26.5%	200A (MAXIMUM CONTINUOUS BATTERY CHARGING / DISCHARGING OUTPUT)	N/A	TO GROUND THE BATTERY, ATTACH A GROUNDING CONDUCTOR TO THE M6 GROUNDING SCREW ON TOP OF THE BATTERY TO THE EXISTING EQUIPMENT GROUNDING SYSTEM.	0.96 (33°C)	0.8	200A (MAXIMUM CONTINUOUS BATTERY CHARGING / DISCHARGING OUTPUT)	200A (MAXIMUM CONTINUOUS BATTERY CHARGING / DISCHARGING OUTPUT)	350A ≥ 200A PASS	390A (IN CONDUIT)	312A (IN CONDUIT)	
7	2	COMBINED BATTERY BANK OUTPUT: COMBINED BATTERY BANK TO HYBRID INVERTER	2 PARALLEL SETS OF 2/0 AWG THWN-2 COPPER	2.00" DIA. EMT	4 2 X (DC +) 2 X (DC -)	26.5%	200A (MAXIMUM CONTINUOUS BATTERY CHARGING / DISCHARGING OUTPUT)	(300A BREAKER) INTEGRATED BATTERY DISCONNECT WITHIN HYBRID INVERTER	TO GROUND THE BATTERY, ATTACH A GROUNDING CONDUCTOR TO THE M6 GROUNDING SCREW ON TOP OF THE BATTERY TO THE EXISTING EQUIPMENT GROUNDING SYSTEM.	0.96 (33°C)	0.8	200A (MAXIMUM CONTINUOUS BATTERY CHARGING / DISCHARGING OUTPUT)	200A (MAXIMUM CONTINUOUS BATTERY CHARGING / DISCHARGING OUTPUT)	350A ≥ 200A PASS	390A (IN CONDUIT)	312A (IN CONDUIT)	
8	2	HYBRID INVERTER OUTPUT: HYBRID INVERTER ("GRID" TERMINAL) TO GRID BOSS	3 AWG THWN-2 COPPER	1 1⁄2" DIA. SCH. 40 PVC (IN TRENCH) (RAN IN ~30 FT. TRENCH, 19" MINIMUM BURIAL DEPTH) 1 1⁄2" DIA. EMT (IN GARAGE)	3 1 X (L1, L2, N)	22.7%	66.7A	90A / 2P (WITHIN GRID BOSS)	8 AWG THWN-2 COPPER	0.96 (33°C)	1.0	66.7A	83.38A	100A ≥ 83.38A PASS	110A (IN CONDUIT)	110A (IN CONDUIT)	
9	2	200A LOAD CENTER OUTPUT (BACKED UP LOADS): 200A LOAD CENTER (BACKED UP LOADS) TO GRID BOSS	3/0 AWG THWN-2 COPPER	2.00" DIA. EMT	3 1 X (L1, L2, N)	25.5%	200A MAXIMUM OUTPUT	200A / 2P (WITHIN GRID BOSS)	6 AWG THWN-2 COPPER	0.96 (33°C)	1.0	200A MAXIMUM OUTPUT	200A MAXIMUM OUTPUT	200A ≥ 200A PASS	225A (IN CONDUIT)	225A (IN CONDUIT)	
10	1	22 kW STANDBY GENERATOR TO POLARIS BLOCK	3 AWG THWN-2 COPPER	1 1⁄2" DIA. SCH. 40 PVC (RAN IN UNDERGROUND TRENCH, 19" MINIMUM BURIAL DEPTH)	3 1 X (L1, L2, N)	22.7%	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	N/A	8 AWG THWN-2 COPPER	0.96 (33°C)	1.0	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	100A ≥ 91.7A PASS	110A (IN CONDUIT)	110A (IN CONDUIT)	
11	1	OUTPUT OF POLARIS BLOCK: POLARIS BLOCK TO GRID BOSS (SUB-SYSTEM #1)	3 AWG THWN-2 COPPER	1 1⁄2" DIA. SCH. 40 PVC (RAN IN UNDERGROUND TRENCH, 19" MINIMUM BURIAL DEPTH)	3 1 X (L1, L2, N)	22.7%	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	100A / 2P	8 AWG THWN-2 COPPER	0.96 (33°C)	1.0	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	100A ≥ 91.7A PASS	110A (IN CONDUIT)	110A (IN CONDUIT)	
12	1	OUTPUT OF POLARIS BLOCK: POLARIS BLOCK TO GRID BOSS (SUB-SYSTEM #2)	3 AWG THWN-2 COPPER	1 1⁄2" DIA. SCH. 40 PVC (RAN IN UNDERGROUND TRENCH, 19" MINIMUM BURIAL DEPTH)	3 1 X (L1, L2, N)	22.7%	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	100A / 2P	8 AWG THWN-2 COPPER	0.96 (33°C)	1.0	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	91.7A (MAXIMUM GENERATOR OUTPUT CURRENT)	100A ≥ 91.7A PASS	110A (IN CONDUIT)	110A (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.																	

Ricardo E Pino

Digitally signed by Ricardo E Pino

Date: 2025.12.02 16:35:29 -05'00'

STATE OF OHIO

RICARDO E. PINO

E-89906

REGISTERED PROFESSIONAL ENGINEER

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.

GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

THREE-LINE DIAGRAM

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-3C

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

HYBRID INVERTER

4 HYBRID INVERTER
NEC 690.53

PHOTOVOLTAIC SYSTEM
DC DISCONNECT

RATED MPP VOLTAGE 381.6 VDC
RATED MPP CURRENT 26.42 / 26.42 / 13.21 A
(MPPT #1 / #2 / #3)
MAX SYSTEM VOLTAGE 502.3 VDC

6 HYBRID INVERTER

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

NEC 690.35(F)

8 HYBRID INVERTER

SOLAR INVERTER
MAXIMUM RATING

OPERATING CURRENT 66.67 AMPS
OPERATING VOLTAGE 240 VAC

NEC 690.54

2 JUNCTION BOX

**⚠ DO NOT
DISCONNECT
UNDER LOAD ⚠**

NEC 690.16(B)

5 HYBRID INVERTER

SOLAR DC DISCONNECT

NEC 690.13(B)

7 HYBRID INVERTER

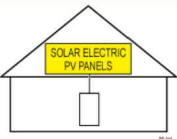
⚠ WARNING ⚠
ELECTRIC SHOCK HAZARD
IF GROUND FAULT IS INDICATED
ALL NORMALLY GROUNDED
CONDUCTORS MAY BE
UNGROUNDED AND ENERGIZED

NEC 690.5(C)

9 HYBRID INVERTER

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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



RACEWAYS

10 RACEWAYS, CABLES PER 10 FT.

⚠ WARNING ⚠
PHOTOVOLTAIC
POWER SOURCE

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

200A LOAD CENTER
("BACKED UP LOADS PANEL")

11 200A LOAD CENTER ("BACKED UP LOADS PANEL")

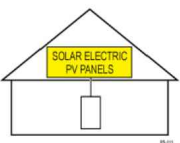
⚠ WARNING ⚠
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH THE LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

NEC 690.17.4

12 200A LOAD CENTER ("BACKED UP LOADS PANEL")

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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



14 200A LOAD CENTER ("BACKED UP LOADS PANEL")

BATTERY
BACKED UP
ELECTRICAL
PANEL

13 200A LOAD CENTER ("BACKED UP LOADS PANEL")

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

NEC 690.56(B)

BATTERY BANK

15 BATTERY BANK

⚠ MAIN BATTERY ⚠
SYSTEM
DISCONNECT

ESS RAPID SHUTDOWN SWITCH

16 ESS RAPID SHUTDOWN SWITCH

⚠ MAIN BATTERY ⚠
SYSTEM
DISCONNECT

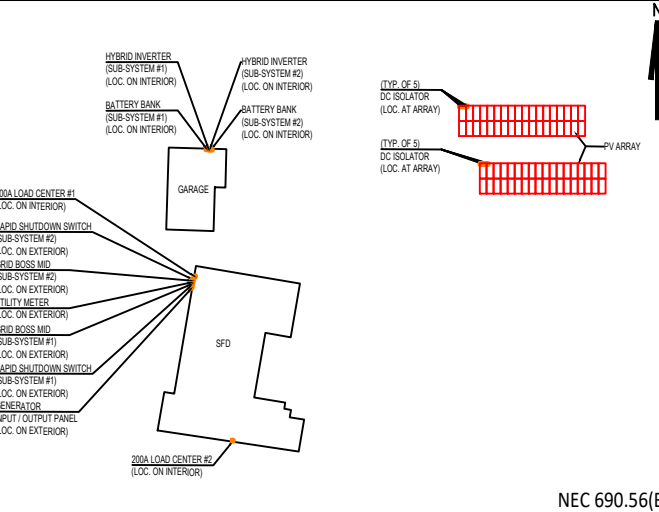
17 ESS RAPID SHUTDOWN SWITCH

⚠ WARNING ⚠
BATTERY SYSTEM RAPID
SHUTDOWN SWITCH. TURN
DIAL TO OFF POSITION TO
SHUTDOWN ESS

DIRECTORY PLACARD

18 DIRECTORY PLACARD

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



NEC 690.56(B)

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

PLACARDS

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-4A

SIGNAGE REQUIREMENTS

1	ALL PLACARDS AND SIGNAGE REQUIRED BY THE NEC (NATIONAL ELECTRICAL CODE) – 2024, AND ANY OTHER STATE CODES OR LOCAL ORDINANCES WILL BE INSTALLED AS REQUIRED.
2	RED BACKGROUND
3	WHITE LETTERING
4	MINIMUM 3/8" LETTER HEIGHT
5	ALL CAPITAL LETTERS
6	ARIAL OR SIMILAR FONT
7	WEATHER RESISTANT MATERIAL, PER UL 969

1

PLACARDS (SUB-SYSTEM #1)

PV-4A SCALE: NTS

Ricardo
E Pino

Digitally signed
by Ricardo E Pino
Date: 2025.12.02
16:35:29 -05'00'



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

HYBRID INVERTER

4 HYBRID INVERTER
NEC 690.53

PHOTOVOLTAIC SYSTEM
DC DISCONNECT

RATED MPP VOLTAGE 381.6 VDC
RATED MPP CURRENT 26.42 / 26.42 / 13.21 A
(MPPT #1 / #2 / #3)
MAX SYSTEM VOLTAGE 502.3 VDC

6 HYBRID INVERTER

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

NEC 690.35(F)

8 HYBRID INVERTER

SOLAR INVERTER
MAXIMUM RATING

OPERATING CURRENT 66.67 AMPS
OPERATING VOLTAGE 240 VAC

NEC 690.54

2 JUNCTION BOX

**⚠ DO NOT
DISCONNECT
UNDER LOAD ⚠**

NEC 690.16(B)

5 HYBRID INVERTER

SOLAR DC DISCONNECT

NEC 690.13(B)

7 HYBRID INVERTER

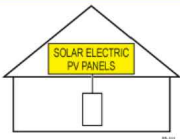
⚠ WARNING ⚠
ELECTRIC SHOCK HAZARD
IF GROUND FAULT IS INDICATED
ALL NORMALLY GROUNDED
CONDUCTORS MAY BE
UNGROUNDED AND ENERGIZED

NEC 690.5(C)

9 HYBRID INVERTER

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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



RACEWAYS

10 RACEWAYS, CABLES PER 10 FT.

⚠ WARNING ⚠
PHOTOVOLTAIC
POWER SOURCE

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

200A LOAD CENTER
("BACKED UP LOADS PANEL")

11 200A LOAD CENTER ("BACKED UP LOADS PANEL")

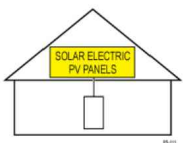
⚠ WARNING ⚠
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH THE LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

NEC 690.17.4

12 200A LOAD CENTER ("BACKED UP LOADS PANEL")

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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



13 200A LOAD CENTER ("BACKED UP LOADS PANEL")

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

NEC 690.56(B)

14 200A LOAD CENTER ("BACKED UP LOADS PANEL")

BATTERY
BACKED UP
ELECTRICAL
PANEL

BATTERY BANK

15 BATTERY BANK

⚠ MAIN BATTERY ⚠
SYSTEM
DISCONNECT

ESS RAPID SHUTDOWN SWITCH

16 ESS RAPID SHUTDOWN SWITCH

⚠ MAIN BATTERY ⚠
SYSTEM
DISCONNECT

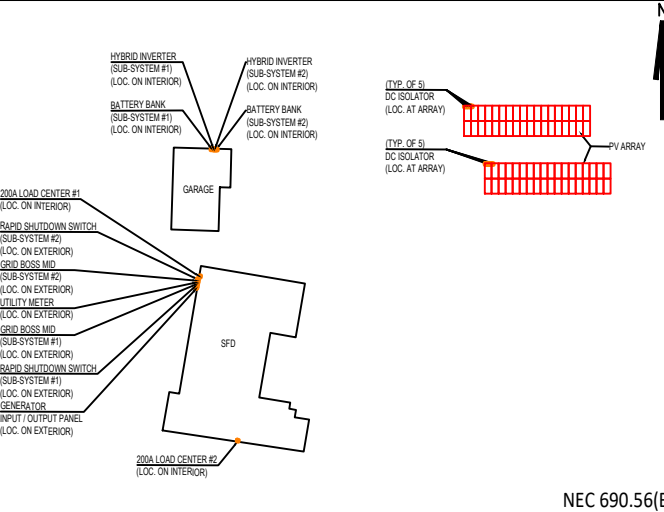
17 ESS RAPID SHUTDOWN SWITCH

⚠ WARNING ⚠
BATTERY SYSTEM RAPID
SHUTDOWN SWITCH. TURN
DIAL TO OFF POSITION TO
SHUTDOWN ESS

DIRECTORY PLACARD

18 DIRECTORY PLACARD

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



NEC 690.56(B)

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

PLACARDS

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-4B

SIGNAGE REQUIREMENTS

1	ALL PLACARDS AND SIGNAGE REQUIRED BY THE NEC (NATIONAL ELECTRICAL CODE) – 2024, AND ANY OTHER STATE CODES OR LOCAL ORDINANCES WILL BE INSTALLED AS REQUIRED.
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7	WEATHER RESISTANT MATERIAL, PER UL 969

Ricardo
E Pino

Digitally signed
by Ricardo E Pino
Date: 2025.12.02
16:35:29 -05'00'



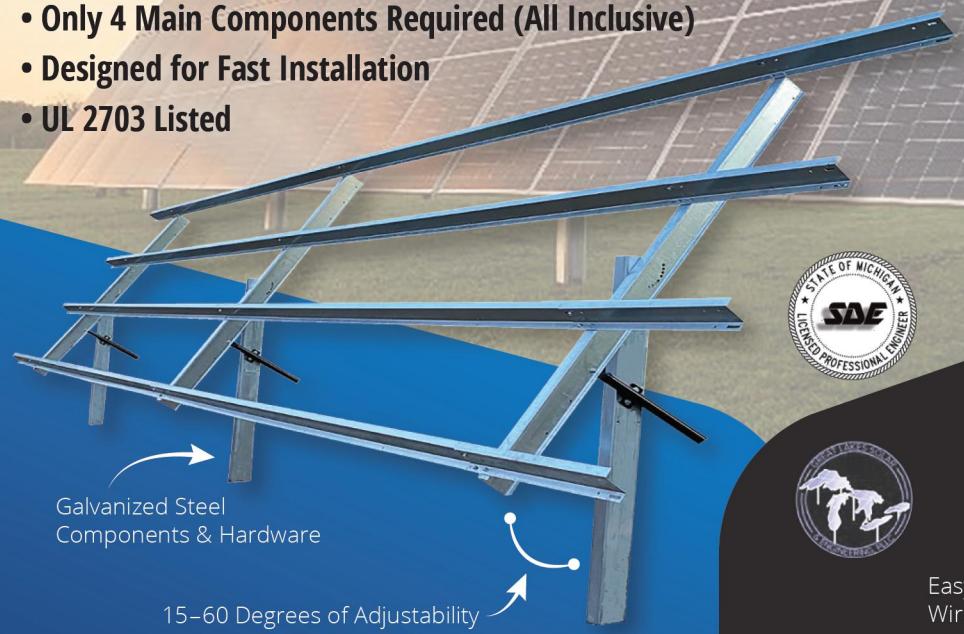
1 PLACARDS (SUB-SYSTEM #2)
PV-4B SCALE: NTS



SKY-RACK 2.0 Ground Mount

*"A Cost-Effective Fixed Tilt or
Season Adjustable System"*

- Average Lead Time is 7 Business Days For Projects Under 3MW
- Only 4 Main Components Required (All Inclusive)
- Designed for Fast Installation
- UL 2703 Listed



Galvanized Steel
Components & Hardware

15-60 Degrees of Adjustability

In 2020, **Sinclair Designs & Engineering** introduced the SKY-RACK 2.0 Ground Mount System (Fixed Tilt & Season Adjustable). This product was designed for heavy snow areas. During the winter months, 60 Degrees is an optimal angle for production and snow shedding. This cantilevered design distributes the loads better and offers superior aesthetics.

Since the pandemic began, we manufactured and delivered over 150 Megawatts to support residential and commercial installations across the country. Our average lead time is 10 business days for projects under 3 Megawatts. We also provide Solar Carports, ballasted roof mounts, and Dual Axis Tracking Pole Mount Systems.



Easy to Install Vinyl
Wire Management Extrusion

"The COVID pandemic presented us with a unique opportunity." A large majority of US Solar racking suppliers outsource manufacturing, so they were challenged with extended lead times and material shortages. EPC's were looking for alternate solutions to get product faster.

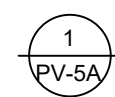
"That's when our phones started ringing. Customers needed our short lead times; and are now repeat buyers because of our quality and customer service. We manufacture product in house and answer the phones when you call."



www.sinclair-designs.com



877-517-0311



SKY-RACK 2.0 GROUND MOUNT ADJUSTABLE SYSTEM DATASHEET
SCALE: NTS

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

RACKING DATASHEET

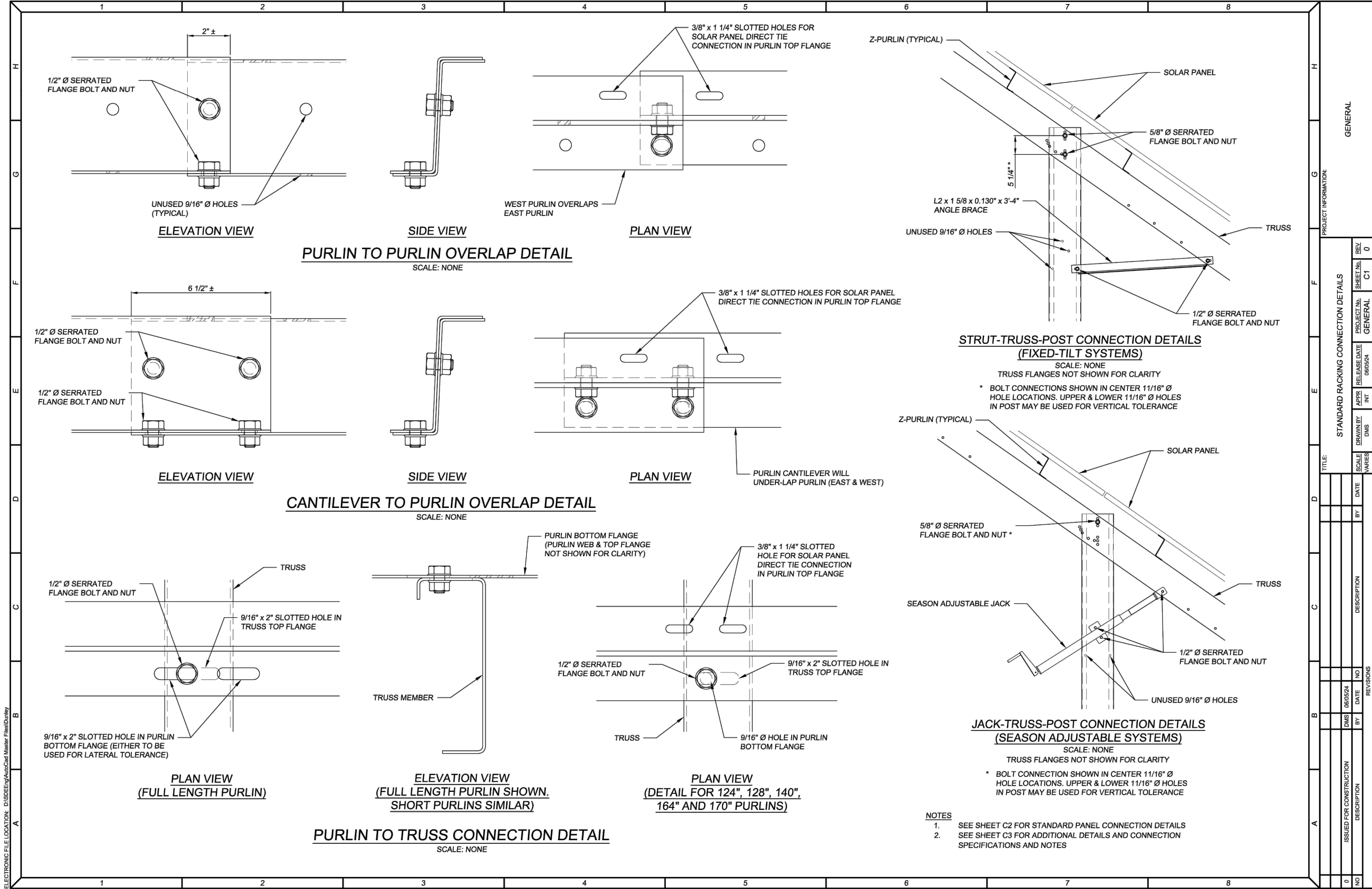
PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-5A

ELECTRONIC FILE LOCATION: D:\SDE\Eng\AutoCad Master Files\Drawings



PROJECT INFORMATION:									
GENERAL									
STANDARD RACKING CONNECTION DETAILS									
TITLE:		SCALE:	DRAWN BY:	APPR:	RELEASE DATE:	PROJECT No:	SHEET No:	REV:	
VARIABLES:		DATE:	DMS:	INT:	06/05/24	GENERAL	C1	0	
REVISIONS									
NO	NO	DATE	BY	DESCRIPTION					
0	ISSUED FOR CONSTRUCTION	06/05/24	DMS						

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

CONNECTION DETAILS

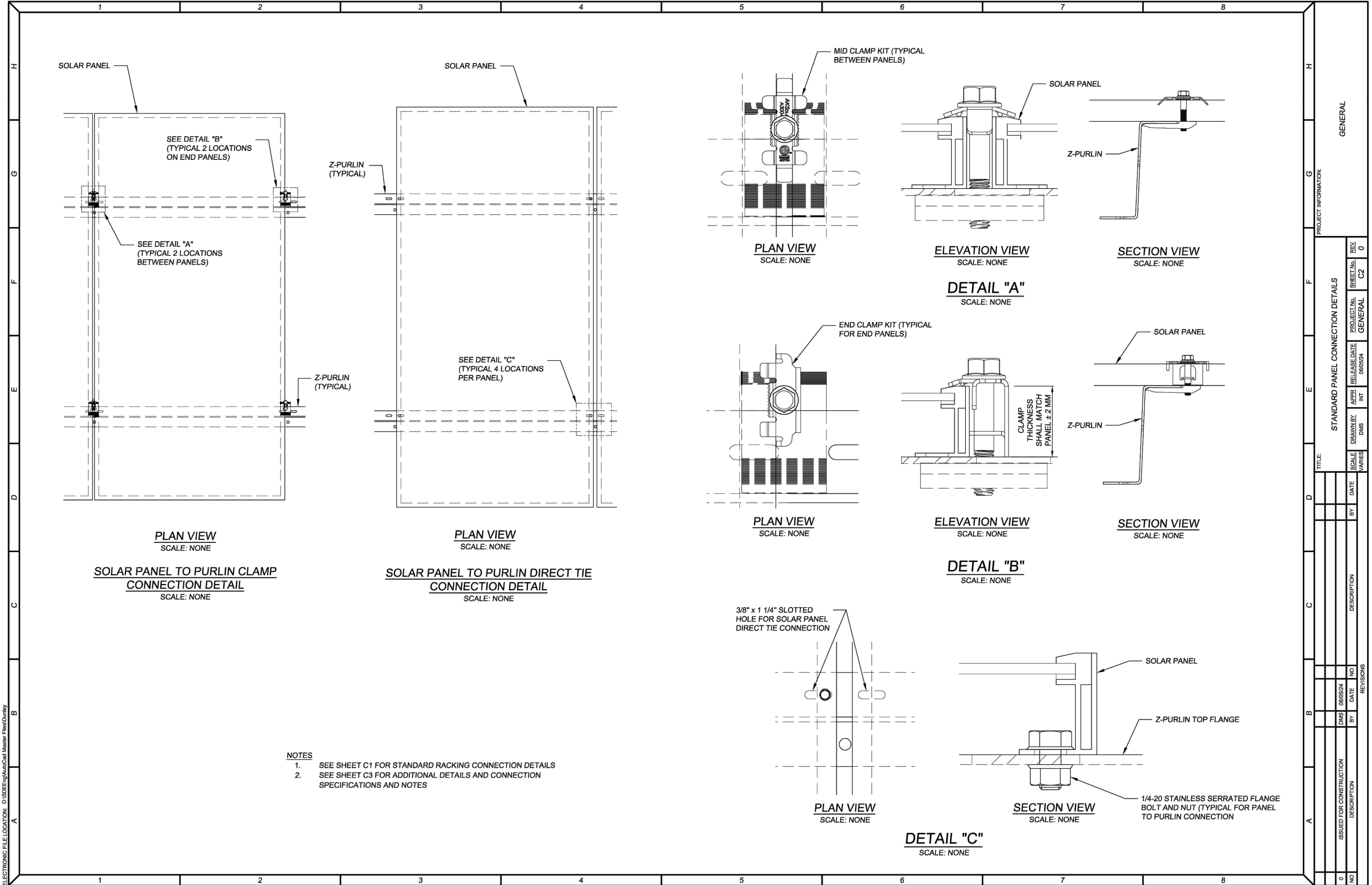
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DRAWN BY: GSD

DATE: SAMPLE

PV-5B

ELECTRONIC FILE LOCATION: D:\SDEng\AutoCad Master Files\Drawings



GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

CONNECTION DETAILS

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

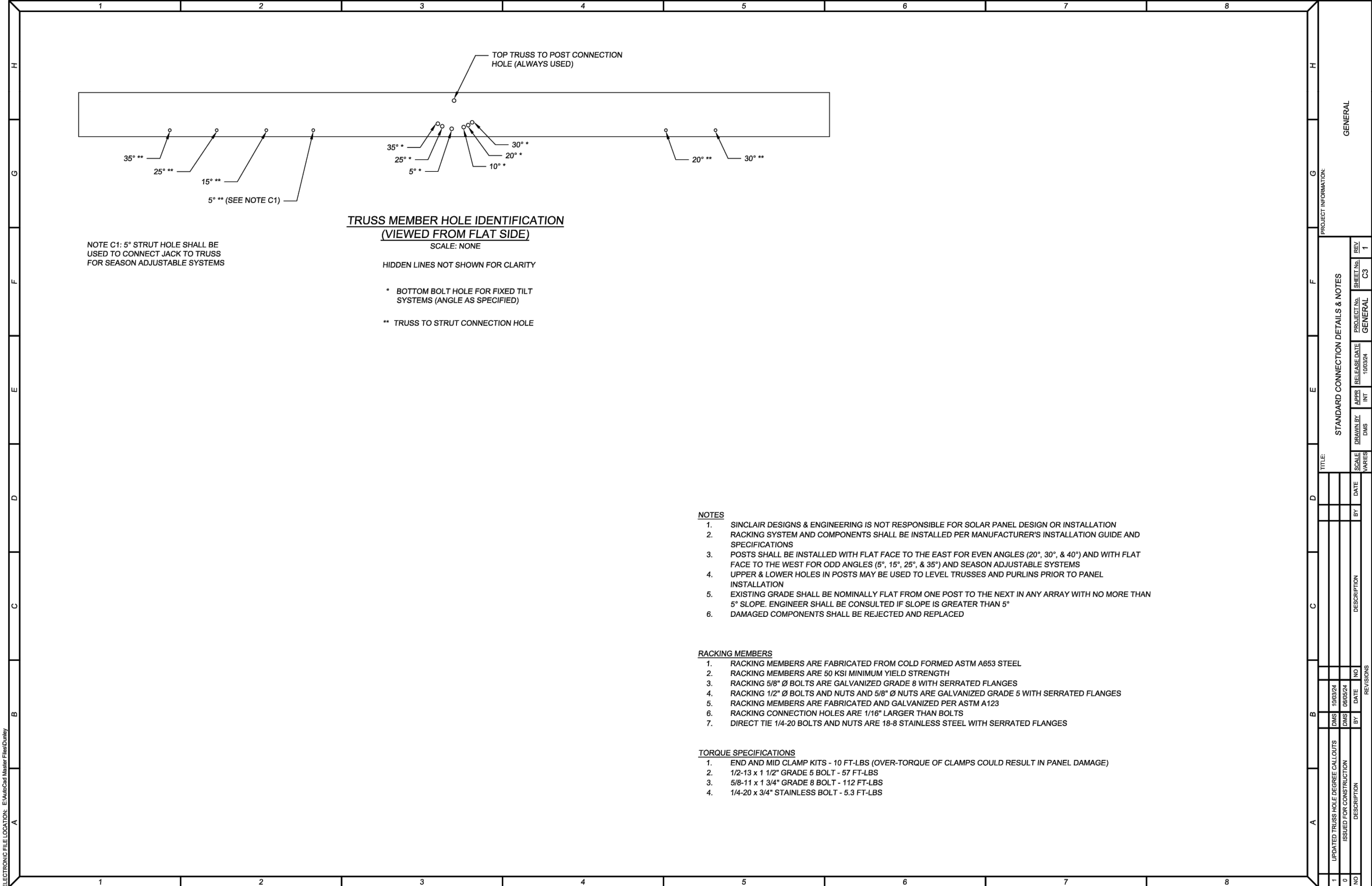
DATE: SAMPLE

PV-5C

1 SKY-RACK 2.0 MOUNTING & CONNECTION DETAILS
PV-5C SCALE: NTS

PLOT DATE/TIME: 6/7/2024 11:41 AM FILE NAME: Connection Details - DMS.dwg

ELECTRONIC FILE LOCATION: E:\AutoCad Master Files\Dunley



GEMINI SOLAR DESIGN

SAMPLE PROJECT
CONTACT: ON FILE
PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW
SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

CONNECTION DETAILS

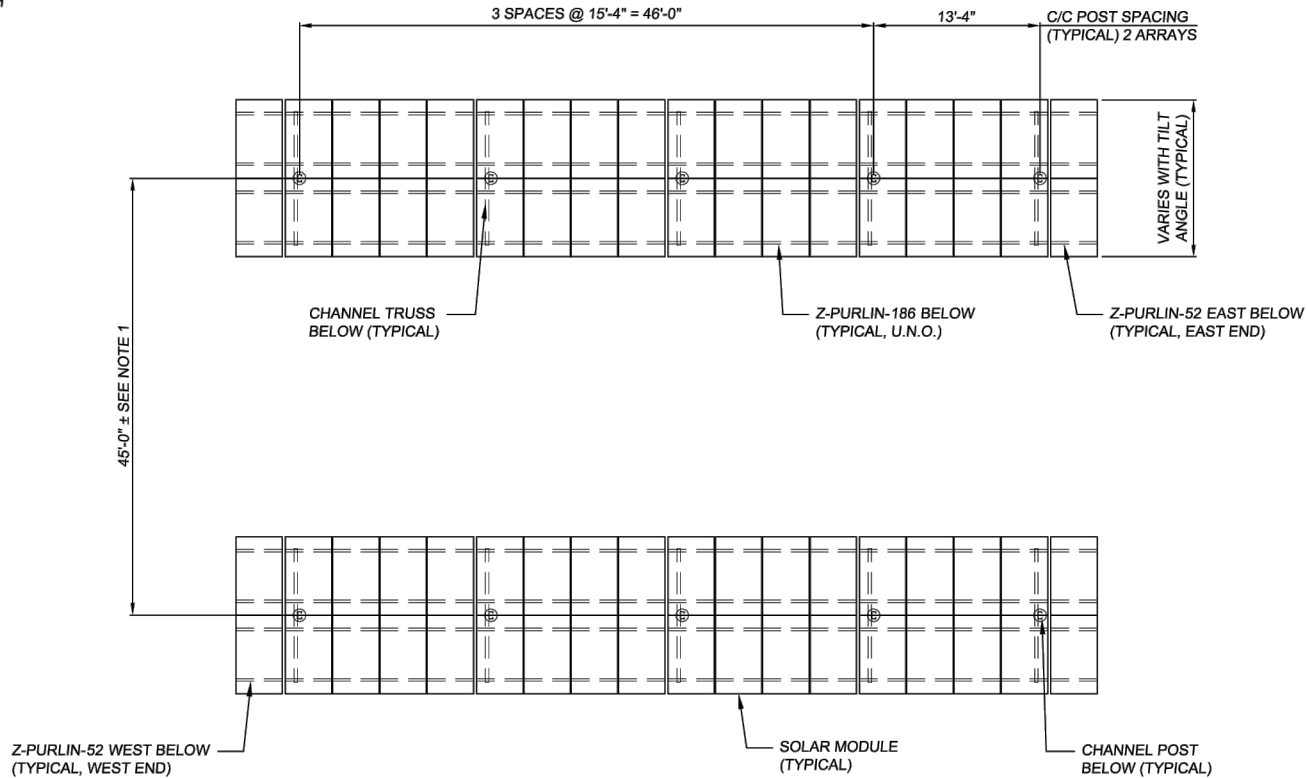
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DRAWN BY: GSD
DATE: SAMPLE

PV-5D

ELECTRONIC FILE LOCATION: \\S&B-eng\ASBEE\New Projects\351110-11 Cable Stringer (DWG)

PROJECT NORTH

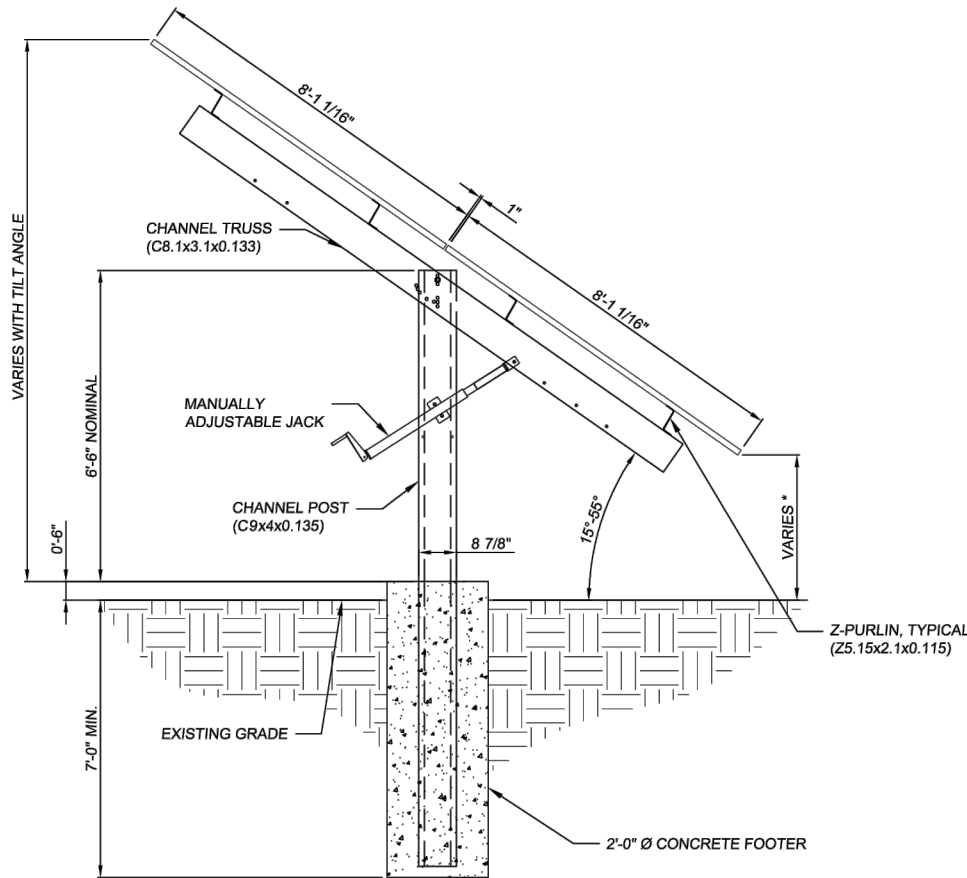
45'-0" ± SEE NOTE 1



RACKING PLAN VIEW
SCALE: NONE
TOTAL MODULE COUNT: 72

NOTES

1. C/C POST DIMENSION AS SHOWN MAY BE FIELD MODIFIED; HOWEVER, CONSIDERATION SHOULD BE GIVEN TO SHADING
2. WEST FACING POST SHOWN IN RACKING SIDE ELEVATION VIEW. EAST FACING POST SIMILAR
3. U.N.O. INDICATES UNLESS NOTED OTHERWISE
4. BOTTOM OF POST SHALL BE NO MORE THAN 2'-0" ABOVE BOTTOM OF CONCRETE FOUNDATION
5. FOUNDATION BORINGS SHALL BE MADE INTO UNDISTURBED SOIL
6. ALL CONCRETE SHALL BE AIR ENTRAINED (5% TO 8%), HAVE A 3 1/2" TO 4 1/2" SLUMP, AND OBTAIN A MINIMUM COMPRESSIVE STRENGTH (f_c) OF 4,000 PSI AT 28 DAYS
7. SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S INSTALLATION GUIDE AND SPECIFICATIONS
8. DRAINAGE SHALL BE DIVERTED AWAY FROM POSTS. POSTS SHALL NOT BE INSTALLED IN SWALES, DRAINAGE AREAS, OR WHERE WATER MAY BE ALLOWED TO FLOW OR STAND
9. EXISTING GRADE SHALL BE NOMINALLY FLAT WITH NO MORE THAN 5° SLOPE
10. DAMAGED COMPONENTS SHALL BE REJECTED AND REPLACED
11. 55 DEGREES (FROM HORIZONTAL) SHALL BE THE MAXIMUM TILT IN THE WINTER AND 15 DEGREES (FROM HORIZONTAL) SHALL BE THE MINIMUM TILT IN THE SUMMER. THE SYSTEM SHALL BE ADJUSTED THROUGHOUT THE YEAR BETWEEN THESE TWO TILT ANGLES
12. SEE SHEETS C1 THROUGH C3 FOR STANDARD CONNECTION DETAILS AND NOTES



RACKING SIDE ELEVATION VIEW
SCALE: NONE

TRUSS TOP AND BOTTOM FLANGES
NOT SHOWN FOR CLARITY

* APPROX. 0'-10" @ 55 DEGREES
APPROX. 5'-5" @ 15 DEGREES

BILL OF MATERIALS

QUANTITY	SDE ITEM	COMPONENT	COMPONENT WEIGHT (LBS)	TOTALS (LBS)
10	9x4 C-CHANNEL-144	POST	95	950
10	TRUSS-DIRECT TIE	TRUSS	75	750
10	SA-JACK	MANUALLY ADJUSTABLE JACK	15	150
32	Z-PURLIN-186	PURLIN	54	1728
8	Z-PURLIN-52 EAST	PURLIN CANTILEVER	16	128
8	Z-PURLIN-52 WEST	PURLIN CANTILEVER	16	128
10	ASSEMBLY HARDWARE KIT	ASSEMBLY BOLTS / NUTS	NA	-
288	5/16-18 x 3/4 STAINLESS SERRATED FLANGE BOLT	ATTACHMENT HARDWARE	NA	-
288	5/16-18 STAINLESS SERRATED FLANGE NUT	ATTACHMENT HARDWARE	NA	-
		WEIGHT DOES NOT INCLUDE HARDWARE OR CLAMPS	TOTAL WEIGHT (LBS)	3834

CALEB STRINGER

PROJECT INFORMATION:

RACKING DETAILS

TITLE:

DATE

DESCRIPTION

NO

DATE

BY

DESCRIPTION

NO

DATE

BY

DESCRIPTION

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

RACKING DETAILS

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE



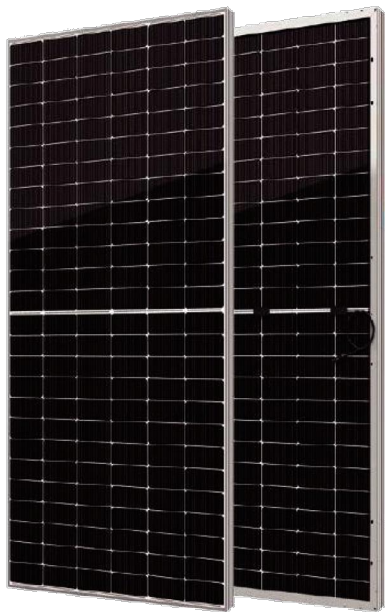
www.segsolar.com



YUKON N Series

Half-Cell N-Type Bifacial Module

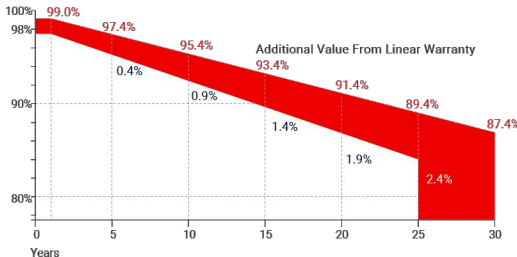
625-640Wp | 22.90%
Module Power Output | Max Efficiency



Key Features

- High module conversion efficiency
- Better temperature coefficient
- Super multi busbar technology
- Low attenuation long warranty
- Superior load capacity
- Higher bifacially
- USA based liability insurance
- Houston, Texas based company

Warranty



15 Years
Guarantee on product material and workmanship

30 Years
Linear power output warranty

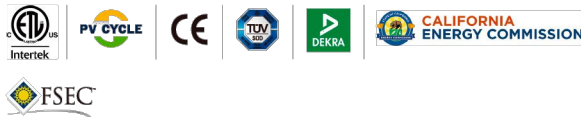
Product Certification

IEC61215:2016; IEC 61730:2016; UL61215; UL61730

IEC62804	PID
IEC61701	Salt Mist
IEC62716	Ammonia Resistance
IEC60068	Dust and Sand
IEC61215	Hailstone

Fire Type (UL61730): Type 29

ISO14001:2015; ISO9001:2015; ISO45001:2018



About SEG Solar

Founded in 2016, SEG is a leading vertically integrated PV manufacturer headquartered in Houston, Texas, U.S., and is dedicated to delivering reliable and cost-effective solar modules to the utility, commercial and residential markets. By the end of 2023, SEG has shipped over 5 GW of solar modules worldwide. The company is expected to exceed a production capacity of 5.5 GW by the end of 2024.



Download Datasheet



YUKON N Series SEG-XXX-BTZ-BG-156Cells

Electrical Characteristics

Module Type	SEG-625-BTZ-BG			SEG-630-BTZ-BG			SEG-635-BTZ-BG			SEG-640-BTZ-BG		
	Front STC	Front NOCT	Back STC	Front STC	Front NOCT	Back STC	Front STC	Front NOCT	Back STC	Front STC	Front NOCT	Back STC
Maximum Power -Pmp(Wp)*	625	471	500	630	475	504	635	479	508	640	483	512
Open Circuit Voltage -Voc(V)	56.95	54.10	56.93	57.08	54.22	57.06	57.21	54.34	57.19	57.34	54.46	57.32
Short Circuit Current -Isc(A)	13.80	11.14	11.04	13.86	11.19	11.09	13.92	11.24	11.14	13.98	11.29	11.19
Maximum Power Voltage -Vmp(V)	47.54	44.69	47.52	47.70	44.83	47.68	47.86	45.02	47.84	48.02	45.18	48.00
Maximum Power Current -Imp(A)	13.15	10.54	10.52	13.21	10.59	10.57	13.27	10.64	10.62	13.33	10.69	10.67
Module Efficiency(%)	22.36			22.54			22.72			22.90		
Power Tolerance(W)	(0, +4.99)											
Maximum System Voltage	1500V DC											
Maximum Series Fuse Rating	30 A											
Bifaciality	80±10%											

STC: Irradiance 1000 W/m² module temperature 25°C AM=1.5

NOCT: Irradiance 800W/m² ambient temperature 20°C module temperature 45°C wind speed: 1m/s

*Measuring tolerance: ±3%

Mechanical Specifications

External Dimension	2465 x 1134 x 30 mm
Weight	34.0 kg
Solar Cells	N-Type 182 x 91 mm(156 pcs)
Front Glass	2.0 mm AR coating semi-tempered glass
Back Glass	2.0 mm Semi-tempered glass
Frame	Anodized aluminium alloy
Junction Box	IP68 / 3 diodes
Connector Type	PV-C002-xy / MC4
Cable Type	12 AWG PV Wire(UL)
Cable Length	Portrait: 400 mm(+) / 200 mm(-) Landscape: 1200 mm(+) / 1200 mm(-) or customized length
Mechanical Load(Front)	5400 Pa / 113 psf*
Mechanical Load(Rear)	2400 Pa / 50 psf*

*Refer to SEG installation manual for details

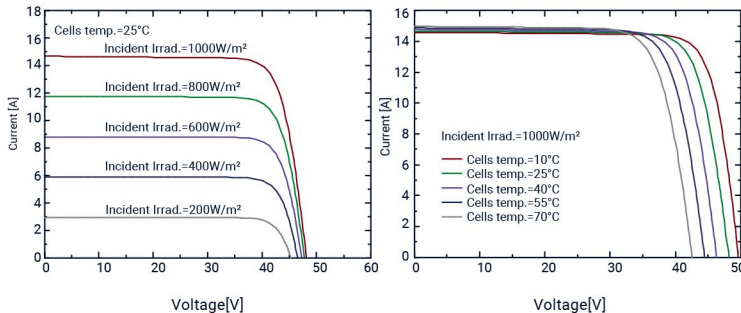
Temperature Characteristics

Pmax Temperature Coefficient	-0.30 %/°C
Voc Temperature Coefficient	-0.25 %/°C
Isc Temperature Coefficient	+0.046 %/°C
Operating Temperature	-40~+85 °C
Nominal Operating Cell Temperature (NOCT)	45±2 °C

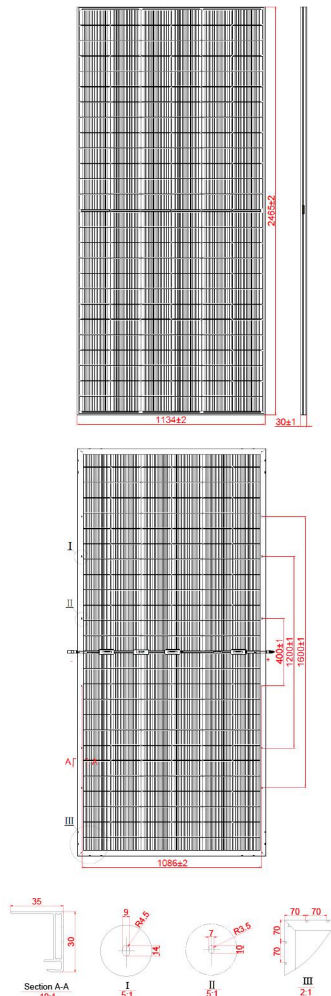
Packing Configuration

Container	20'GP	40'HQ
Pieces per Pallet	36	36
Pallets per Container	4	16
Pieces per Container	144	576

I-V Curve



Technical Drawing



*Refer to SEG installation manual for details

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.

GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

MODULE DATASHEET

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

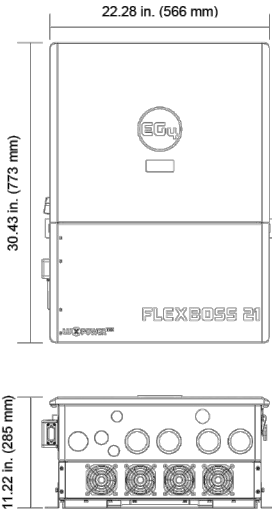
DATE: SAMPLE

PV-6

1 PV MODULE DATASHEET
PV-6 SCALE: NTS

www.segsolar.com

Specifications subject to technical changes SEG_DS_EN_2024V3.0 © Copyright 2024 SEG Solar



EG4® FLEXBOSS21 HYBRID INVERTER

The EG4 FlexBOSS21 is a versatile 48V split-phase, hybrid inverter/charger that offers the same dependable power as the 18kPV with enhanced flexibility. Powerful enough to start a 5-ton AC unit, the FlexBOSS21 supports up to 21kW of PV input. Capable of paralleling up to 16 units together, the FlexBOSS21 has an impressive total output of 560kW. Able to provide 16kW of continuous output power with PV & battery, and up to 12kW continuous output by using battery alone. Three individual MPPTs give users optimal control over their solar needs, while the updated EG4 monitoring software allows for convenient total remote management, complete with mobile notifications and remote setting. Seamless interaction with the EG4 GridBOSS gives users control over the entire Energy Storage System (ESS).

HIGH
FREQUENCY
SPLIT-PHASE
DESIGN

10-YEAR
WARRANTY

REMOTE
ADJUSTMENT
VIA EG4
SOFTWARE

ALL-IN-ONE HYBRID INVERTER

Capable of running entirely off grid, using grid electricity, and selling power back to the grid.

UP TO 600VDC INPUT

The extra high voltage enables lower cable sizing for the 3 MPPTs and a maximum recommended PV input of 24kW, eliminating the need for a combiner box.

PLUG-IN WI-FI DEVICE

Enables wireless connection between our monitoring platform and the FlexBOSS21 through the EG4® app or EG4 Monitor system for remote system management.

CLOSED-LOOP COMMUNICATIONS

Able to communicate with EG4 48V batteries and other battery brands. A battery firmware update is required for closed-loop communications with LifePower4 batteries.

RAPID SHUTDOWN

The FlexBOSS21 is CSA C22.2#330:2017 and NEC 690.12 ready with its built-in RSD capabilities.

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VERSION 1.1.1 | INFORMATION SUBJECT TO CHANGE WITHOUT NOTICE.
MODEL#: IV-16000-HYB-AW-FX-00



EG4 ELECTRONICS

TECHNICAL SPECIFICATIONS

AC INPUT DATA			
NOMINAL AC VOLTAGE	120/240VAC; 120/208VAC (L1/L2/N required)		
FREQUENCY	60 Hz (Default) 50 Hz		
MAX. AC CURRENT	50A @ 240V 57.7A @ 208V		
MAX. AC INPUT POWER	12kW		
MAX. AC BYPASS	90A		
AC GRID OUTPUT DATA			
MAX. OUTPUT CURRENT	66.7A		
OUTPUT VOLTAGE	120/240VAC; 120/208VAC (L1/L2/N required)		
OPERATING VOLTAGE RANGE	180 – 270VAC		
NOMINAL POWER OUTPUT	w/ PV: 16000W @240V 13800kW @208V w/ out PV: 12000W @240V 12000W @208V		
OUTPUT FREQUENCY	60 Hz (Default) 50 Hz		
POWER FACTOR	.99 @ Full Load		
REACTIVE POWER ADJUST RANGE	(-0.8) – (+0.8) Leading Adjustable		
THD @FULL LOAD	<5%		
TRANSFER TIME	20ms (Default), 10ms (Configurable) Parallel – 20ms		
BACKUP/UPS AC OUTPUT DATA			
RATED OUTPUT CURRENT (240 208VAC)	50A 57.7A		
NOMINAL OUTPUT VOLTAGE	120/240 120/208 VAC		
RATED OUTPUT POWER	12kW @ 240VAC 12kW @ 208VAC		
PEAK POWER	24kW (.5 sec)	18kW (1 sec)	15kW (6 min) 13.2kW (12 min)
OPERATING FREQUENCY	60 Hz (Default) 50 Hz		
THDV (TOTAL HARMONIC DISTORTION VOLTAGE)	<5%		
TRANSFER TIME	20ms (Default), 10ms (Configurable), 20ms (Parallel)		
PV INPUT DATA			
NUMBER OF MPPTS	3		
INPUTS PER MPPT	2 (MPPT 1) 2 (MPPT 2) 1 (MPPT 3)		
MAX. USABLE INPUT CURRENT	26A (MPPT 1) 26A (MPPT 2) 15A (MPPT 3)		
MAX. SHORT CIRCUIT INPUT CURRENT	31A (MPPT 1) 31A (MPPT 2) 19A (MPPT 3)		
DC INPUT VOLTAGE RANGE	100 – 600VDC		
UNIT START-UP VOLTAGE	100VDC		
MPPT OPERATING VOLTAGE RANGE	120 – 440VDC		
NOMINAL MPPT VOLTAGE	380VDC		
MAX. UTILIZED SOLAR POWER	21kW		
MAX. RECOMMENDED SOLAR INPUT	25kW		
EFFICIENCY			
CEC	96.9%		
MAX. EFFICIENCY (PV TO GRID)	97%		
MAX. EFFICIENCY (BATTERY TO GRID)	94%		
MAX. EFFICIENCY (PV TO BATTERY)	94.5%		
IDLE CONSUMPTION (NORMAL) (STANDBY MODE)	<80W <60W		

EG4 ELECTRONICS

BATTERY DATA	
COMPATIBLE BATTERY TYPES	Lead-acid/ Lithium
MAX. CHARGE/DISCHARGE POWER	12000W
NOMINAL VOLTAGE	48VDC
VOLTAGE RANGE	40 – 60 VDC
RECOMMENDED BATTERY CAPACITY PER INVERTER	>300Ah
GENERAL DATA	
MAX. UNITS IN PARALLEL	16
PRODUCT DIMENSIONS (H×W×D)	30.43 × 22.28 × 11.22 in. (750 × 520 × 285 mm)
UNIT WEIGHT	88 lbs. (52 kg)
DESIGN TOPOLOGY	High Frequency – Transformerless
RELATIVE HUMIDITY	0 – 100%
OPERATING ALTITUDE	<6561 ft (<2000 m)
OPERATING AMBIENT TEMPERATURE RANGE	-13° – 140°F (-25° – 60°C)
STORAGE AMBIENT TEMPERATURE RANGE	-13° – 140°F (-25° – 60°C)
NOISE EMISSION (TYPICAL)	<50dB @ 3 ft
COMMUNICATION INTERFACE	RS485/Wi-Fi/CAN
STANDARD WARRANTY	10-year standard warranty*
OUTDOOR RATING	NEMA 4X
SAFETY FEATURES	Integrated DC disconnect, Reverse polarity protection, Output over-voltage protection varistor, Output over current protection, Ground fault monitoring, Grid monitoring, Pole sensitive leakage current monitoring unit, AFCI, RSD
STANDARDS AND CERTIFICATIONS	
UL1741, SA, SB, PCS CRD	
California Rule 21 Phase I, II, III	
Arc-Fault Circuit Interrupter (AFCI) NEC 2020:690.11/UL1699B	
Ground Fault Monitoring (GFDI) NEC 2020:690.41(B)	
CSA 22.2.107.1:2016 Ed. 4	
CSA 22.2.330:2017 Ed. 1	
IEEE 1547.1:2020; IEEE 1547:2018	
Hawaii Rule 14H [HECO SRD IEEE 1547.1-2020 Ed. 2]	
Rapid Shutdown (RSD) NEC 2020:690.12	
FCC Part 15, Class B (PENDING)	

*See EG4 Warranty Registration for terms and conditions

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

INVERTER DATASHEET

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-7A

CERTIFICATE OF COMPLIANCE



This certificate confirms the model(s) for the product listed are in compliance and authorized to bear the Certification Mark(s) shown below when made in accordance with the conditions set forth in the Certification Agreement and Listing Report.

EG4 Electronics LLC

Address: 1130 Como Street South Sulphur Springs, TX 75482

Country: USA

Report Issuing Office: Intertek Testing Services Shenzhen Limited Guangzhou Branch

Control Number: 5028091, 5025969 Authorized by: *Jordan Holbert*
for L. Matthew Snyder, Certification Manager

VALID LISTING MARKS



This Certificate of Compliance is for the exclusive use of Intertek's Client and is provided pursuant to the Certification Agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the Agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the Agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the Agreement and in this Certificate. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the Agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667

Standard(s):	Grid Support Utility Interactive Equipment - Supplement SA to UL 1741:2021 Ed.3 - Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3 (Supplement SA)]
	Grid Support Utility Interactive Inverters and Converters Based Upon IEEE 1547:2018 & IEEE 1547.1:2020 - Supplement SB to UL 1741:2021 Ed.3 - Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3 (Supplement SB)]
	Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed

Certificate for Report: 240726072GZU-002

Page 1 of 2

Certificate Issued: November 8, 2024

CERTIFICATE OF COMPLIANCE



	Energy Resources [UL 1741:2021 Ed.3] Power Conversion Equipment (R2021) [CSA C22.2#107.1:2016 Ed.4] Photovoltaic Rapid Shutdown Systems (R2022) [CSA C22.2#330:2017 Ed.1] IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces [IEEE 1547:2018] IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces [IEEE 1547.1:2020] Hawaiian Electric IEEE 1547.1-2020 Standard Source Requirements Document Version 2.0 [HECO SRDIEEE-1547.1:2020 Ed.2.0]
Product:	Grid Support Hybrid inverter
Brand Name:	EG4 ELECTRONICS
Models:	IV-16000-HYB-AW-FX-, may be followed by 00-99

Certificate for Report: 240726072GZU-002

Page 2 of 2

Certificate Issued: November 8, 2024

1
PV-7B
EG4 FLEXBOSS21 HYBRID INVERTER (UL CERTIFICATION)
SCALE: NTS

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

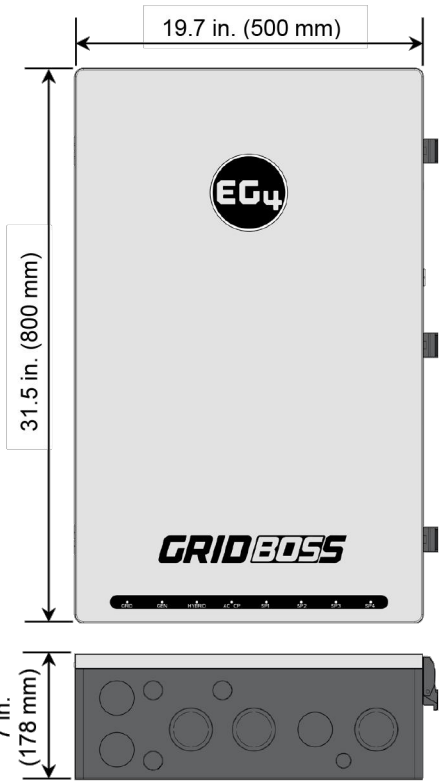
INVERTER UL CERT.

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-7B



EG4® GRID BOSS

MICRO-GRID INTERCONNECTION DEVICE (MID)

The EG4 GridBOSS Micro-Grid Interconnection Device (MID) simplifies Energy Storage Systems (ESS) by consolidating multiple components into a single, innovative unit. It replaces traditional elements such as the point of common connection, back-fed breakers, feeder taps, tap breakers, supply-side taps, transfer switches, and dedicated combiner panels for grid-in, grid-out, and generator input. As a versatile solution, the GridBOSS serves as the service entrance equipment* when paired with the utility meter, providing a single point of connection for utilities, hybrid inverters, generators, smart loads, and AC-coupled inverters.

200A SERVICE
ENTRANCE*

4 CONFIGURABLE
SMART PORTS

INTEGRATED
GENERATOR SUPPORT

CENTRALIZED ESS CONTROL

Provides a single point of connection for utility, hybrid inverters, generators, smart loads, and AC-coupled inverters.

REDUCED ESS COMPLEXITY

Replaces up to 10 components with one unit, including point of common connection, back-fed breakers, feeder taps, feeder tap breakers, supply side taps & breakers, transfer switches, and dedicated combiner panels for grid-in, load/EPS, and generator input.

SERVICE ENTRANCE RATED

200 Amp service entrance with a 22 kAIC main breaker, acts as service entrance equipment in conjunction with a utility meter and a 200A Eaton braker (CSR25K).

REMOTE MONITORING

Enable remote monitoring, configuration, and firmware updates through the EG4 mobile app or online monitoring system.

SMART PORTS

Includes load shedding, which disconnects loads during low battery voltage and reconnects on high voltage. Power shedding connects loads when at full SOC and PV flow and disconnects on low SOC or PV loss.

*When used with an Eaton 200A main breaker (model CSR25K).

EG4 ELECTRONICS

TECHNICAL SPECIFICATIONS

GRID	
NOMINAL AC VOLTAGE	120/240VAC (L1/L2/N required)
FREQUENCY	60 Hz
MAXIMUM CURRENT	200A
SERVICE ENTRANCE RATED	22kAIC with 200A Eaton breaker (model: (CSR2200N) CSR25K)
GENERATOR	
NOMINAL VOLTAGE	120/240VAC (L1/L2/N required)
FREQUENCY	60 Hz
MAXIMUM CURRENT	125A
NON-BACKUP	
NOMINAL VOLTAGE	120/240VAC (L1/L2/N required)
FREQUENCY	60 Hz
MAXIMUM CURRENT	200A
BACKUP	
NOMINAL VOLTAGE	120/240VAC (L1/L2/N required)
FREQUENCY	60 Hz
MAXIMUM CURRENT	200A
HYBRID	
NUMBER OF PORTS	3
NOMINAL VOLTAGE	120/240VAC (L1/L2/N required)
FREQUENCY	60 Hz
MAXIMUM CURRENT PER PORT	70A*
SUPPORTED INVERTERS**	EG4® 12kPV, 18kPV, & FlexBOSS21
SMART PORTS	
NUMBER OF PORTS	4
NOMINAL VOLTAGE	120/240VAC (L1/L2/N required)
FREQUENCY	60 Hz
MAXIMUM CURRENT PER PORT	1: 125A 2: 80A 3: 60A 4: 60A
GENERAL DATA	
COMMUNICATION INTERFACE	RS485/Wi-Fi/CAN
INTERNAL BUS RATING	350A
INTERNAL FUSE RATING	315A
OPERATING ALTITUDE	<6561 ft (<2000 m)
RELATIVE HUMIDITY	0 – 100%
OUTDOOR RATING	NEMA 3R
OPERATING AMBIENT TEMPERATURE RANGE	-40°F – 140°F (-40°C – 60°C)
PRODUCT DIMENSIONS (H×W×D)	31.5×19.7×7 in (800×500×178 mm)
UNIT WEIGHT	55 lbs. (25 kg)
STANDARD WARRANTY	10-year standard warranty
STANDARDS AND CERTIFICATIONS	
UL1741, UL67, UL869A***	
FCC PART 15, CLASS B (PENDING)	
*Install a properly sized breaker based on the connected inverter: 50A - 12kPV; 70A - 18kPV; 90A - FlexBOSS21.	
**Third party inverters are not supported and cannot be connected to the hybrid ports.	
***When used with an Eaton 200A main breaker (model (CSR2200N) CSR25K).	

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

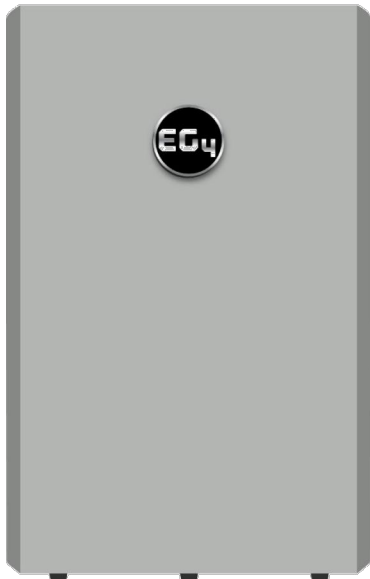
EG4 GRID BOSS

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-8



EG4 ELECTRONICS

POWERPRO
WALLMOUNT
ALL WEATHER
LITHIUM BATTERY

The PowerPro WallMount All Weather 280Ah batteries are ideal for low-voltage residential outdoor energy storage system (ESS) applications. The batteries use lithium iron phosphate cells with the highest safety performance and an intelligent Battery Management System (BMS) that can monitor and record the voltage of each cell along with the current, voltage, and temperature of the module in real-time. The BMS also contains a passive balance function and an advanced battery control method, both of which improve the performance of the battery pack.

BUILT-IN
200A BMS

INTEGRATED
600A BUSBARS

82.6MWh
LIFETIME
PRODUCTION*

10 YEAR
WARRANTY
>8000 CYCLES @
80% DOD

ON-BOARD LCD TOUCH SCREEN

Easy to see BMS monitoring, and selectable closed-loop communications with EG4, Schneider, Sol-Ark, Victron, Growatt, Megarevo, Luxpower, and Deye inverters.

DUAL ON-BOARD FIRE ARRESTORS

Offer fail-safe protection against thermal runaway.

WEATHER-TIGHT QUICK CONNECTS

Included battery cables with outdoor rated connectors allowing for fast, safe, and reliable battery connections.

INTEGRATED SELF-HEATING FEATURE

Heats the battery when the ambient temperature is low. A key feature for outdoor Lithium battery cell operations.

INTEGRATED BUSBARS

The battery design comes manufactured with 600A internal busbars with multiple terminals (4 positive & 4 negative) eliminating the need for external busbars when paralleling batteries and/or multiple inverters.

INNOVATIVE EMERGENCY STOP FUNCTION

The optional ESS disconnect can shut down all batteries and inverters (if equipped with rapid shut down capability) with the press of a button.

THE PERFECT PARTNER TO THE EG4 18kPV

The optional conduit box mates up directly to the connection ports of the inverter allowing a sleek and efficient installation. For other inverters or stand-alone battery installation, the conduit box plugs should be installed.



SCAN FOR UPDATED
DOCUMENTS



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VER. 1.1 | INFORMATION SUBJECT TO CHANGE WITHOUT NOTICE.
MODEL #: WPower-16/280-AW

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www.eg4electronics.com



EG4 POWERPRO WALLMOUNT ALL WEATHER BATTERY DATASHEET
SCALE: NTS



GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
PROJECT ADDRESS WITHHELD
UNITED STATES

BATTERY MODULE

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-9A

CERTIFICATE OF COMPLIANCE



This certificate confirms the model(s) for the product listed are in compliance and authorized to bear the Certification Mark(s) shown below when made in accordance with the conditions set forth in the Certification Agreement and Listing Report.

EG4 Electronics LLC

Address: 1130 Como Street South Sulphur Springs, TX 75482

Country: USA

Report Issuing Office: Intertek Testing Services Shenzhen Limited Guangzhou Branch

Control Number: 5026744 Authorized by: Jordan Holbert for L. Matthew Snyder, Certification Manager

VALID LISTING MARKS



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Intertek Testing Services NA Inc. 545 East Algonquin Road, Arlington Heights, IL 60005 Telephone 800-345-3851 or 847-439-5667

Standard(s):	Energy Storage Systems and Equipment [ANSI/CAN/UL 9540:2023 Ed.3]
Product:	Energy Storage Systems UL listing for my proposed configuration 3x PowerPro batteries plus 1x 18K Hybrid inverter
Brand Name:	EG4 ELECTRONICS
Models:	PP-16/280A1-18K1-AWLL, PP-16/280A2-18K1-AWLL, PP-16/280A3-18K1-AWLL, PP-16/280A2-18K2- AWLL, PP-16/280A3-18K2-AWLL

EG4 ELECTRONICS

ESS 9540 Detailed Configuration Requirements - (1) 18kPV w/ (1-3) WM 280Ah LL Refer to ETL UL9540 Certificate Of Compliance for Report 231018014GZU-001

	SKU	PP-16/280A1-18K1-AWLL	PP-16/280A2-18K1-AWLL	PP-16/280A3-18K1-AWLL
Description	→	One unit of 18kPV Hybrid Inverter with one 48V 280Ah WallMount battery	One unit of 18kPV Hybrid Inverter with two 48V 280Ah WallMount batteries	One unit of 18kPV Hybrid Inverter with three 48V 280Ah WallMount batteries
EG4 18kPV-12LV	EG4HYB12K00V1	1	1	1
PP-16/280Ah 51.2V	EG4LL48V100AODWMB	1	2	3
EG4 Conduit Box	EG4SP1WMBNCNDBX	1	2	3
EG4 Paralleling Kit	EG4SPWMBCOMMABLE	0	1	2
Max Cont. Output Power	→	12kW	12kW	12kW
Energy Capacity	→	14.3kWh	28.6kWh	42.9kWh

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GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE PROJECT ADDRESS WITHHELD UNITED STATES

BATTERY UL CERT.

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-9B

Function Introduction

Lonqi New Energy Technology has developed LONQ-40 DC series new energy disconnect switches through years of dedicated research on the operation of new energy systems at home and abroad and the needs of customers.

Product Features

- Quickly isolate circuits to ensure the safety of electricity consumption.
- Maximum rated voltage DC 1500V, maximum current 32A.
- Waterproof to IP66 for outdoor use.
- PV connectors are plug-and-play, with mounting holes reserved at the top and bottom of the housing, no need to destroy the housing by drilling, fast installation.

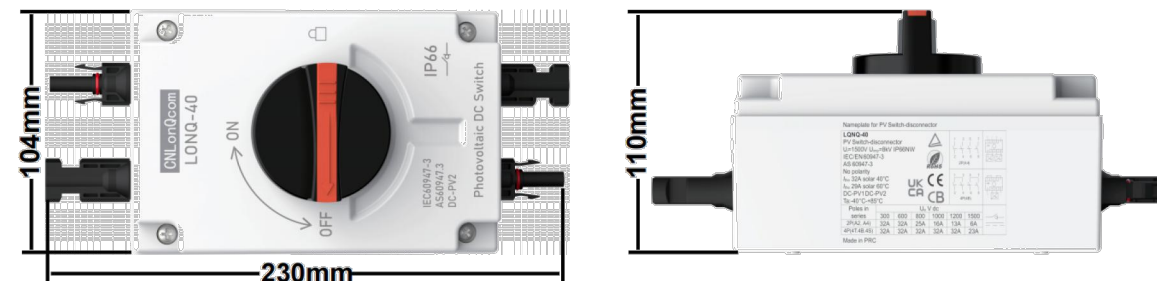
Model Name Meaning

LONQ → ① 40 → ② 1PV → ③ ① CNLonQcom brand abbreviation ② Design No. ③ 1String, 1 input 1 output

Certification



Main Technical Parameter



Technical Data						
Model	LONQ-40-1PV					
Type	PV DC Disconnect Isolator Switch					
String	1 input 1 output					
Rated Current In(A)	32	32	32	32	32	23
Rated Working Voltage Ue (V)	300	600	800	1000	1200	1500
Rated Insulation Voltage Ui (V)	1500V					
Pole	4					
Rated Impulse Withstand Voltage Uimp (kV)	8					
Short-Time Withstand Current Icw (kA)	1					
Wiring Mode	No polarity, top in and bottom out or bottom in and top out					
Standard	IEC/EN60947-3 GB/T 14048.3					
Insolation Feature	Yes					
Levels of Protection	IP66					
Housing Material	PC					
Conductor Material	Copper					
Quality Certificate	TUV、CE、CB、UKCA、AZ、CCC、ISO9001、ROHS					
Mechanical Life (times)	20000					
Electrical Life (times)	6000					
Knob Positions	OFF at 9 hr, ON at 12 hr					
Operating Temperature	-40℃ to +85℃					
Humidity	95%					
Altitude	2000m					
Installation	Wall Mounting					

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GRID-TIED SOLAR SYSTEM 45.36kW

SAMPLE RESIDENCE
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UNITED STATES

DC ISOLATOR

PROJECT NO: GSD-SAMPLE

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PV-10

20/22/24 kW

- INCLUDES:
- True Power™ Electrical Technology
 - Two-line multilingual digital LCD Evolution™ controller (English/Spanish/French/Portuguese)
 - 200 amp service rated transfer switch available
 - Electronic governor
 - Standard Wi-Fi® connectivity
 - System status & maintenance interval LED indicators
 - Sound attenuated enclosure
 - Flexible fuel line connector
 - Natural gas or LP gas operation
 - 5 Year limited warranty
 - Listed and labeled for installation as close as 18 in (457 mm) to a structure.*
**Must be located away from doors, windows, and fresh air intakes and in accordance with local codes.*

GENERAC®

GUARDIAN® SERIES

Residential Standby Generators

Air-Cooled Gas Engine

Standby Power Rating

G007038-1, G007039-1, G007038-3, G007039-3 (Aluminum - Bisque) - 20 kW 60 Hz
G007042-10, G007042-11, G007043-10, G007043-11 (Aluminum - Bisque) - 22 kW 60 Hz
G007209-10, G007210-10 (Aluminum - Bisque) - 24 kW 60 Hz



Product shown with optional fascia kit



Note: ETL or CUL certification only applies to unbundled units and units packaged with limited circuit switches. Units packaged with the Smart Switch are ETL or UL certified in the USA only.

FEATURES

- **INNOVATIVE ENGINE DESIGN & RIGOROUS TESTING** are at the heart of Generac's success in providing the most reliable generators possible. Generac's G-Force engine lineup offers added peace of mind and reliability for when it's needed the most. The G-Force series engines are purpose built and designed to handle the rigors of extended run times in high temperatures and extreme operating conditions.

○ **TRUE POWER™ ELECTRICAL TECHNOLOGY:** Superior harmonics and sine wave form produce less than 5% Total Harmonic Distortion for utility quality power. This allows confident operation of sensitive electronic equipment and micro-chip based appliances, such as variable speed HVAC systems.

○ **TEST CRITERIA:**

✓ **PROTOTYPE TESTED**

✓ **SYSTEM TORSIONAL TESTED**

✓ **NEMA MG1-22 EVALUATION**

✓ **MOTOR STARTING ABILITY**

○ **MOBILE LINK® CONNECTIVITY:** FREE with select Guardian Series Home standby generators, Mobile Link Wi-Fi allows users to monitor generator status from anywhere in the world using a smartphone, tablet, or PC. Easily access information such as the current operating status and maintenance alerts. Users can connect an account to an authorized service dealer for fast, friendly, and proactive service. With Mobile Link, users are taken care of before the next power outage.

○ **SOLID-STATE, FREQUENCY COMPENSATED VOLTAGE REGULATION:** This state-of-the-art power maximizing regulation system is standard on all Generac models. It provides optimized FAST RESPONSE to changing load conditions and MAXIMUM MOTOR STARTING CAPABILITY by electronically torque-matching the surge loads to the engine. Digital voltage regulation at ±1%.

○ **SINGLE SOURCE SERVICE RESPONSE** from Generac's extensive dealer network provides parts and service know-how for the entire unit, from the engine to the smallest electronic component.

○ **GENERAC TRANSFER SWITCHES:** Long life and reliability are synonymous with GENERAC POWER SYSTEMS. One reason for this confidence is that the GENERAC product line is offered with its own transfer systems and controls for total system compatibility.



20/22/24 kW

1 of 6

20/22/24 kW

4 of 6

20/22/24 kW

Generator

Model	G007038-1 G007039-1 (20 kW)	G007042-10 G007043-10 (22 kW)	G007038-3 G007039-3 (20 kW)	G007042-11 G007043-11 (22 kW)	G007209-10 G007210-10 (24 kW)
Rated maximum continuous power capacity (LP)	20,000 Watts*	22,000 Watts*	20,000 Watts*	22,000 Watts*	24,000 Watts*
Rated maximum continuous power capacity (NG)	18,000 Watts*	19,500 Watts*	18,000 Watts*	19,500 Watts*	21,000 Watts*
Rated voltage	240				
Rated maximum continuous load current – 240 volts (LP/NG)	83.3 / 75.0	91.7 / 81.3	83.3 / 75.0	91.7 / 81.3	100 / 87.5
Total Harmonic Distortion	Less than 5%				
Main line circuit breaker	90 amp	100 amp	90 amp	100 amp	100 amp
Phase	1				
Number of rotor poles	2				
Rated AC frequency	60 Hz				
Power factor	1.0				
Battery requirement (not included)	12 Volts; Group 26R 540 CCA minimum or Group 35AGM 650 CCA minimum				
Unit weight (lb / kg)	448 / 203	466 / 211	436 / 198	445 / 202	455 / 206
Dimensions (L x W x H) in / cm	48 x 25 x 29 / 121.9 x 63.5 x 73.7				
Sound output in dB(A) at 23 ft (7 m) with generator operating at normal load**	67	67	67	67	67
Sound output in dB(A) at 23 ft (7 m) with generator in Quiet-Test™ low-speed exercise mode**	55	57	55	57	57
Exercise duration	5 min				

Engine

Engine type	GENERAC G-Force 1000 Series				
Number of cylinders	2				
Displacement	999 cc				
Cylinder block	Aluminum w/ cast iron sleeve				
Valve arrangement	Overhead valve				
Ignition system	Solid-state w/ magneto				
Governor system	Electronic				
Compression ratio	9.5:1				
Starter	12 VDC				
Oil capacity including filter	Approx. 1.9 qt / 1.8 L				
Operating rpm	3,600				
Fuel consumption					
Natural gas	ft³/hr (m³/hr)				
1/2 Load	204 (5.78)	228 (6.46)	164 (4.64)	203 (5.75)	
Full Load	301 (8.52)	327 (9.26)	287 (8.13)	306 (8.66)	
Liquid propane	ft³/hr (gal/hr) [L/hr]				
1/2 Load	87 (2.37) [8.99]	92 (2.53) [9.57]	86 (2.36) [8.95]	92 (2.53) [9.57]	
Full Load	130 (3.56) [13.48]	142 (3.90) [14.77]	136 (3.74) [14.15]	142 (3.90) [14.77]	

Note: **Fuel pipe must be sized for full load.** Required fuel pressure to generator fuel inlet at all load ranges - 3.5–7 in water column (0.87–1.74 kPa) for NG, 10–12 in water column (2.49–2.99 kPa) for LP gas. For BTU content, multiply ft³/hr x 2500 (LP) or m³/hr x 1000 (NG). For Megajoule content, multiply m³/hr x 93.15 (LP) or m³/hr x 37.26 (NG).

Controls

Two-line plain text multilingual LCD	Simple user interface for ease of operation.
Mode buttons: AUTO	Automatic start on utility failure. Weekly, Bi-weekly, or Monthly selectable exerciser.
MANUAL	Start with starter control, unit stays on. If utility fails, transfer to load takes place.
OFF	Stops unit. Power is removed. Control and charger still operate.
Ready to Run/Maintenance messages	Standard
Engine run hours indication	Standard
Programmable start delay between 2–1500 seconds	Standard (programmable by dealer only)
Utility Voltage Loss/Return to Utility adjustable (brownout setting)	From 140–171 V / 190–216 V
Future Set Capable Exerciser/Exercise Set Error warning	Standard
Run/Alarm/Maintenance logs	50 events each
Engine start sequence	Cyclic cranking: 16 sec on, 7 rest (90 sec maximum duration).
Starter lock-out	Starter cannot re-engage until 5 sec after engine has stopped.
Smart Battery Charger	Standard
Charger Fault/Missing AC warning	Standard
Low Battery/Battery Problem Protection and Battery Condition indication	Standard
Automatic Voltage Regulation with Over and Under Voltage Protection	Standard
Under-Frequency/Overload/Stepper Overcurrent Protection	Standard
Safety Fused/Fuse Problem Protection	Standard
Automatic Low Oil Pressure/High Oil Temperature Shutdown	Standard
Overcrank/Overspeed (@ 72 Hz)/rpm Sense Loss Shutdown	Standard
High Engine Temperature Shutdown	Standard
Internal Fault/Incorrect Wiring protection	Standard
Common external fault capability	Standard
Field upgradable firmware	Standard

Rating definitions - Optional Standby: Applicable for supplying backup power for the duration of the utility power outage with correct maintenance performed. No overload capability is available for this rating. (All ratings in accordance with BS5514, ISO3046, UL2200, and DIN6271).

* Maximum kilovolt amps and current are subject to and limited by such factors as fuel BTU/megajoule content, ambient temperature, altitude, engine power and condition, etc. Maximum power decreases approximately 3.5% for each 1,000 ft (304.8 m) above sea level; and also will decrease approximately 1% for each 10 °F (6 °C) above 60 °F (16 °C).

** Sound levels are taken from the front of the generator. Sound levels taken from other sides of the generator may be higher depending on installation parameters.

GEMINI SOLAR DESIGN

SAMPLE PROJECT

CONTACT: ON FILE

PROJECT INFO WITHHELD

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SAMPLE RESIDENCE

PROJECT ADDRESS WITHHELD

UNITED STATES

STANDBY GENERATOR

PROJECT NO: GSD-SAMPLE

DRAWN BY: GSD

DATE: SAMPLE

PV-11