

# GROUND MOUNT SOLAR PERMIT PACKAGE

## SENEGAL

### 11.000KW DC GRID TIED PHOTOVOLTAIC SYSTEM

#### 54JX+FV8, JOAL FADIOUT, SENEGAL, 23015

SYSTEM SIZE (DC)	: STC: 550 x 20 = 11.000kW DC
	: PTC: 467.5 x 20 = 9kW DC
SYSTEM SIZE (AC)	: 8.800kW AC @ 240V
MODULES	: (20) ASTROENERGY CHSM72M-HC 550W
INVERTERS	: (1) Deye Hybrid: SUN-8K-SG01LP1-US/EU
TILT	: 30°
AZIMUTH	: 147°
ATTACHMENT TYPE	: PSC CONCRETE FOUNDATION ALUMINUM MOUNTING SYSTEM
MAIN SERVICE PANEL	: EXISTING 225 AMPS MSP WITH 200 AMPS MAIN BREAKER ON TOP FED
INTERCONNECTION	: PV BREAKER
OCPD RATING	: 50 AMPS
UTILITY	: SENELEC

STRUCTURAL DESIGN CRITERIA	
WIND SPEED:	105
EXPOSURE CATEGORY	C
RISK CATEGORY	4
GROUND SNOW LOAD	0
ELEVATION	550FT UP TO
SEISMIC DESIGN CATEGORY	NULL
ASCE 7 VERSION	10
HOUSE BUILT	N/A
SCOPE OF WORK	
GRID POWER IS A BACKUP OPTION FOR THE SYSTEM, BUT IT IS NOT DEPENDABLE AND IS ONLY AVAILABLE FOR ROUGHLY EIGHT HOURS PER DAY.	
IT IS INTENDED TO OPERATE AS A 20 M3 UNIT UNDER NORMAL CIRCUMSTANCES, HOWEVER THIS PROJECT MUST BE DESIGNED WITH A CONTINUOUS, ROUND-THE-CLOCK PULLDOWN.	
BATTERIES, WE CALCULATE THAT TEN BATTERIES WILL LAST 1.2 DAYS.	
DAILY PAYLOAD IS ONE TO TWO TONS.	
GOVERNING CODES	
URBAN PLANNING CODE (2023) ENVIRONMENTAL CODE (2023) URBAN PLANNING CODE (LOI N°2023-20) FRENCH ELECTRICAL CODES (NF C 15-100) INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC) FRENCH FIRE SAFETY CODES (CODE DE LA CONSTRUCTION ET DE L'HABITATION)	
ADOPTED BY SENEGAL	

GENERAL NOTES	
1- PER ECOWAS/WAEMU, GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO AT THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, OR IS ONLY METALLIC WATER PIPING, A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8FT GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #10 AWG AND NO GREATER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.	
2- EACH MODULE WILL BE GROUNDED USING AN INTEGRATED GROUND SYSTEM.	
3- EXPOSED NON-CURRENT CARRYING METAL PARTS OF MODULE FRAMES, EQUIPMENTS, AND CONDUCTOR ENCLOSURES SHALL BE GROUNDED REGARDLESS OF VOLTAGE.	
4- PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION ECOWAS/WAEMU.	
5- ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY ECOWAS/WAEMU.	
6- HEIGHT OF INTEGRATED AC/DC DISCONNECT SHALL NOT EXCEED 6'-7" PER ECOWAS/WAEMU	
7- THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE BETWEEN THE GROUNDING ELECTRODE AND THE PANEL (OR INVERTER) IF SMALLER THAN #6 AWG COPPER WIRE PER ECOWAS/WAEMU. THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AT BUSBARS WITHIN LISTED EQUIPMENT PER ECOWAS/WAEMU.	
8- SYSTEM SHALL COMPLY WITH RAPID SHUTDOWN REQUIREMENTS PER ECOWAS/WAEMU	
9- ECOWAS/WAEMU A PLAQUE SHALL BE INSTALLED IN ACCORDANCE	
DRAWING INDEX	
PV-01:	COVER PAGE
PV-02:	SITE PLAN
PV-03:	STRUCTURAL
PV-04:	ELECTRICAL 3LD
PV-05:	WIRE CALCULATION
PV-06:	BILL OF MATERIAL
PV-07:	SINGAGE
PV-08:	PLACARD
PV-8.1+	SPECS

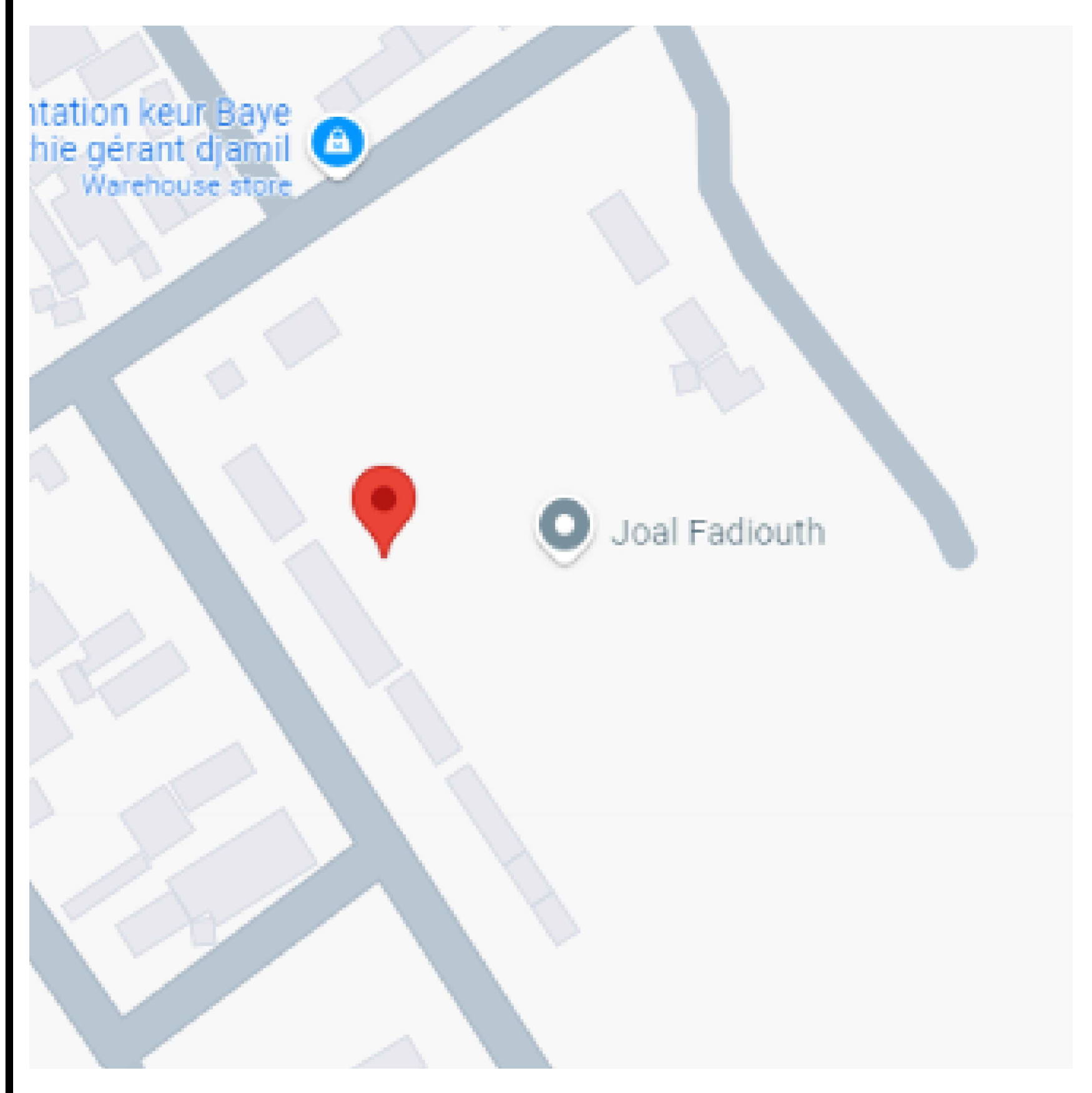
**DESIGN BY:**



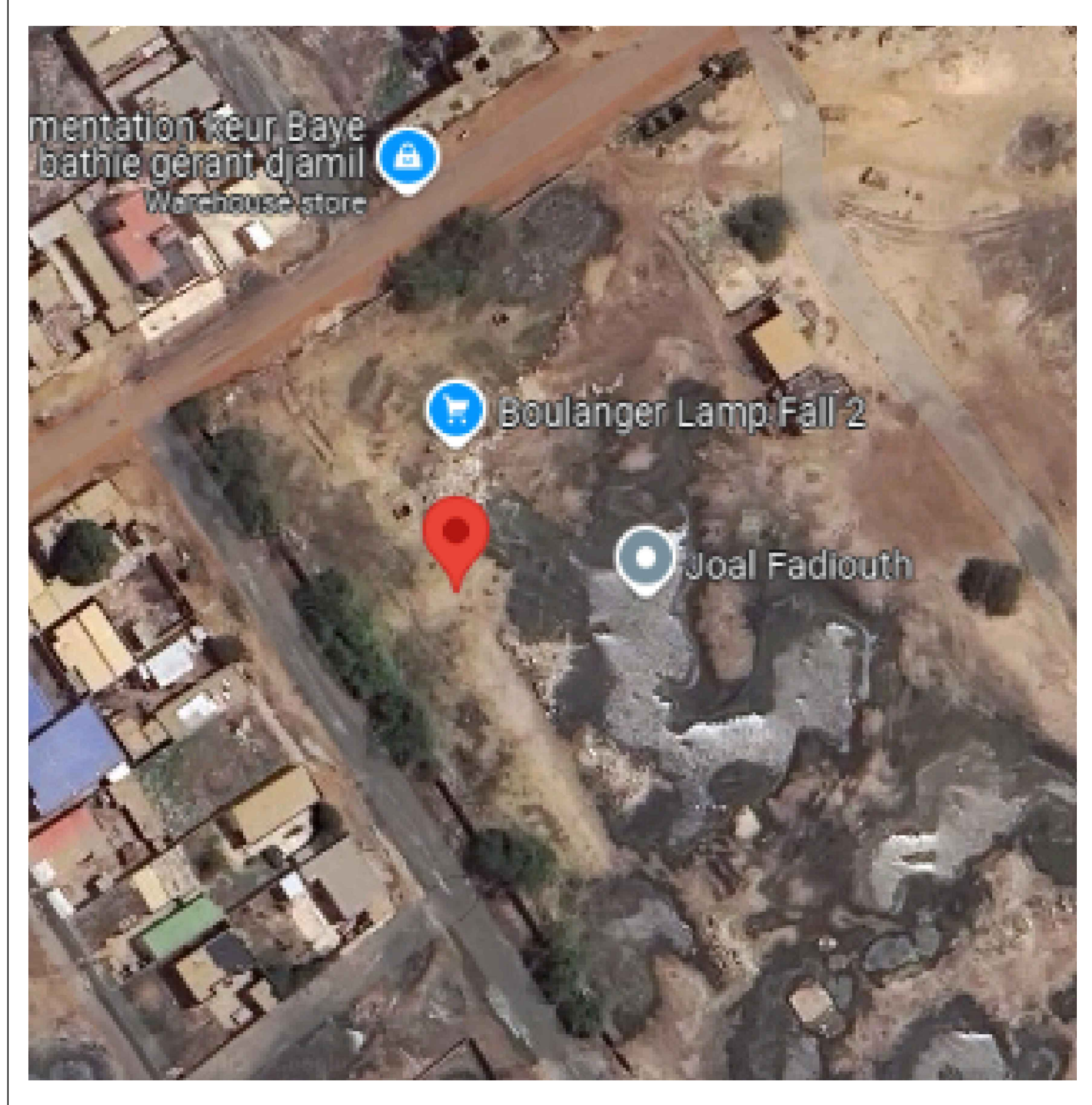
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**CONTRACTOR INFO**

**VICINITY VIEW**  
SCALE : NTS



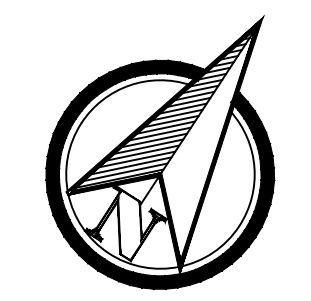
**AERIAL VIEW**  
SCALE : NTS



Rev	Description	Date
A	INITIAL DESIGN	9/11/2024
B	INITIAL DESIGN REV-01	9/20/2024

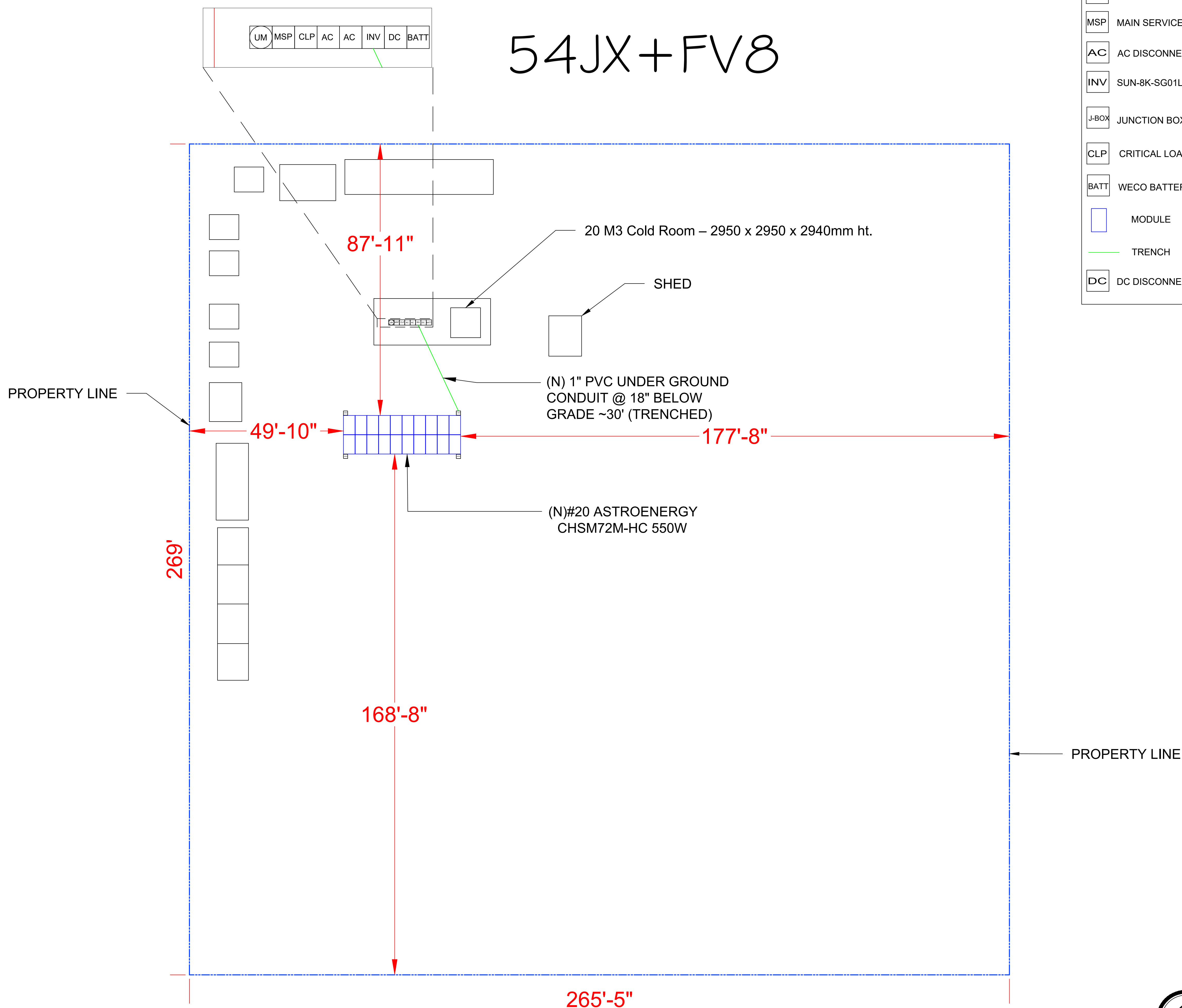
OPPORTUNITY	DAUST SENEGAL
PROJECT #	N/A
DATE DRAWN	9/20/2024
DRAWN BY	SARANSH
SCALE	AS INDICATED
SHEET SIZE	36" X 24" ARCH D
SHEET #	PV-01

TITLE  
**COVER PAGE**



1. PV WIRE SHALL BE USED ON DC RUNS FOR UNGROUNDED/TRANSFORMERLESS INVERTERS.
2. INSTALL CREW TO VERIFY GROUND LOCATION PRIOR TO COMMENCING WORK.
3. EMT CONDUIT ATTACHED USING CONDUIT MOUNTS.

# 54JX + FV8



## LEGEND

- UM UTILITY METER
- MSP MAIN SERVICE PANEL
- AC AC DISCONNECT
- INV SUN-8K-SG01LP1-US/EU
- J-BOX JUNCTION BOX
- CLP CRITICAL LOAD CENTER
- BATT WECO BATTERY2 (10.4 kWh)
- MODULE
- TRENCH
- DC DISCONNECT

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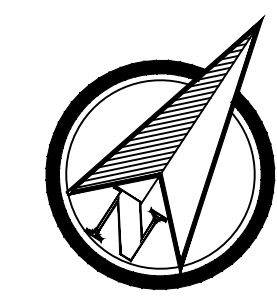
### CONTRACTOR INFO

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A	INITIAL DESIGN	9/11/2024
B	INITIAL DESIGN REV-01	9/20/2024

OPPORTUNITY	DAUST SENEGAL
PROJECT #	N/A
DATE DRAWN	9/20/2024
DRAWN BY	SARANSH
SCALE	AS INDICATED
SHEET SIZE	36" X 24" ARCH D
SHEET #	PV-02

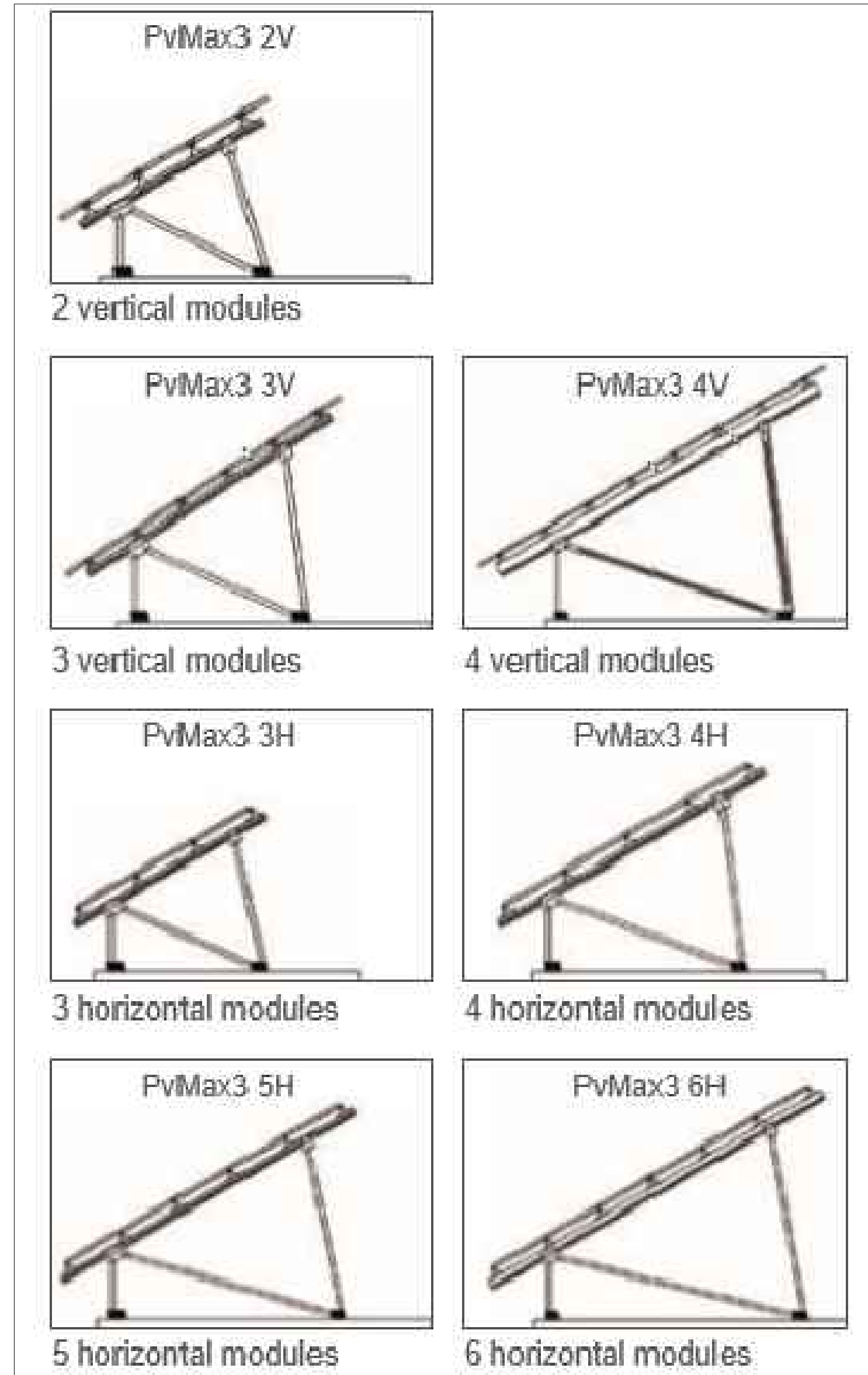
TITLE

SITE PLAN



**1** **SITE PLAN**  
 SCALE: 1/16" = 1'-0"

# PSC CONCRETE FOUNDATION ALUMINUM MOUNTING SYSTEM



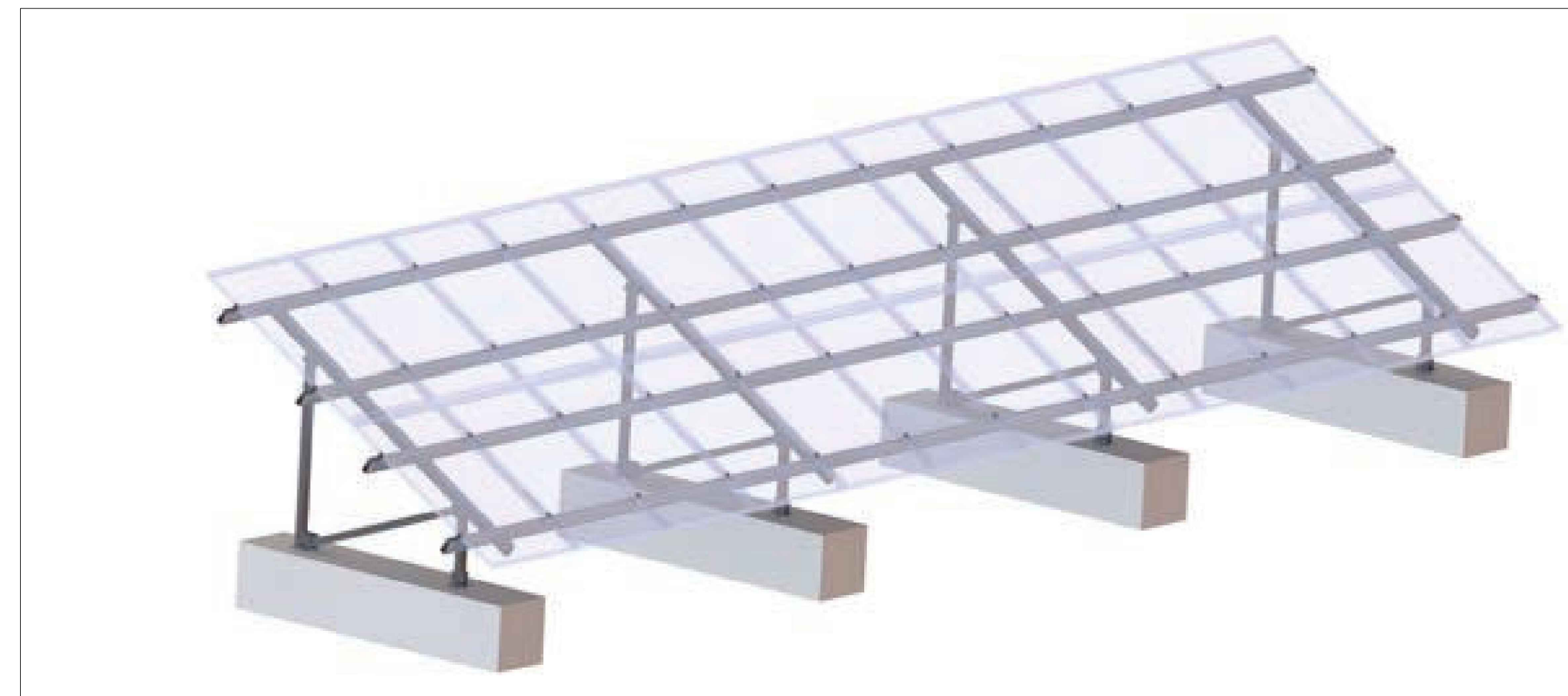
PT concrete foundation system is an efficient solution for installing solar panels on open area.

Ideal for landfill sites, rocky terrain, and residential locations. It is designed specifically for areas with chemically aggressive subsoils when piles and ground screws are not easy or even impossible on such condition.

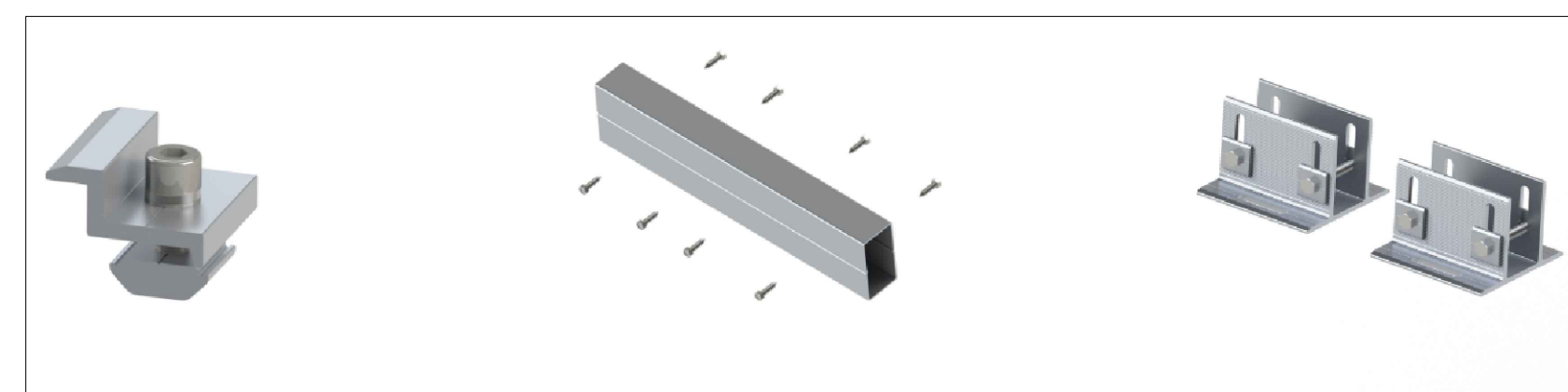
It requires no heavy machinery and no soil surveys. The concrete foundation is flexible designed to withstand any weather condition.

All connection parts are pre-assembled to be easy and fast for installation.

With both aluminum and hot-dip galvanized steel material for selection.



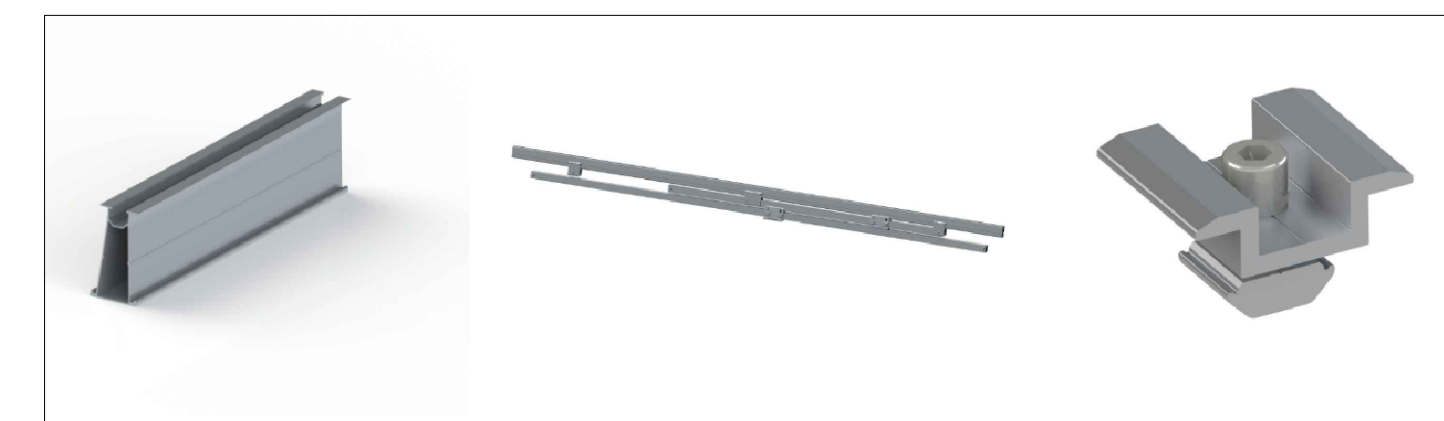
RAIL CLAMP



END CLAMP

RAIL JOINER

BASE



RAIL

PRE-ASSEMBLED PART

MIDDLE CLAMP

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DRAWN BY	SARANSH
SCALE	AS INDICATED
SHEET SIZE	36" X 24" ARCH D
SHEET #	PV-03

TITLE

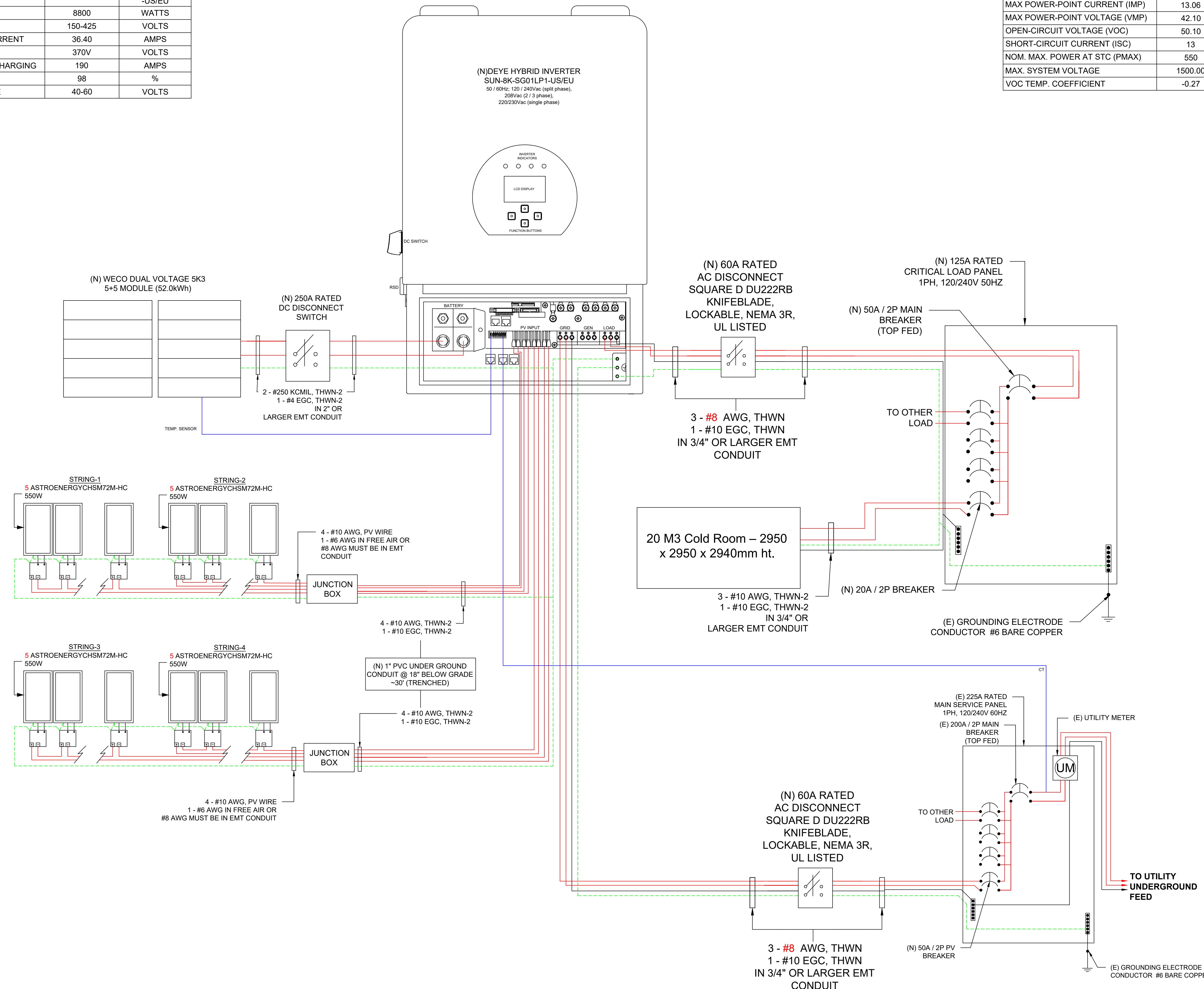
STRUCTURAL

**INVERTER CHARACTERISTICS -**

MANUFACTURER & MODEL	DEYE HYBRID	SUN-8K-SG01LP1-US/EU
MAX OUTPUT POWER	8800	WATTS
MPPT RANGE VOLTAGE	150-425	VOLTS
MAX CONTINUOUS O/P CURRENT	36.40	AMPS
PV INPUT VOLTAGE	370V	VOLTS
BATTERY CHARGING/ DISCHARGING	190	AMPS
MAX EFFICIENCY	98	%
BATTERY VOLTAGE RANGE	40-60	VOLTS

**PV MODULE RATING @ STC**

MANUFACTURER & MODEL	ASTRO 5 SEMI	CHSM72-HC-550W
MAX POWER-POINT CURRENT (IMP)	13.06	AMPS
MAX POWER-POINT VOLTAGE (VMP)	42.10	VOLTS
OPEN-CIRCUIT VOLTAGE (VOC)	50.10	VOLTS
SHORT-CIRCUIT CURRENT (ISC)	13	AMPS
NOM. MAX. POWER AT STC (PMAX)	550	WATTS
MAX. SYSTEM VOLTAGE	1500.00	VOLTS (IEC)
VOC TEMP. COEFFICIENT	-0.27	° %/K



MAX DC CURRENT: I<sub>max</sub> = 1.25 X (MPPT INPUT CURRENT) = 1.25 X 11 = 13.75A  
 MAX AC CURRENT: I<sub>max</sub> = 1.25 X (SUM OF MAX CONTINUOUS OUTPUT CURRENT FROM INVERTERS)  
 = 1.25 X (36.4) = 45.50A

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OPPORTUNITY	DAUST SENEGAL
PROJECT #	N/A
DATE DRAWN	9/20/2024
DRAWN BY	SARANSH
SCALE	AS INDICATED
SHEET SIZE	36" X 24" ARCH D
SHEET #	PV-04

TITLE  
**ELECTRICAL 3LD**

INVERTER CHARACTERISTICS -			PV MODULE RATING @ STC		
MANUFACTURER & MODEL	DEYE HYBRID	SUN-8K-SG01LP1-US/EU	MANUFACTURER & MODEL	ASTRO 5 SEMI	CHSM72-HC-550W
MAX OUTPUT POWER	8800	WATTS	MAX POWER-POINT CURRENT (IMP)	13.06	AMPS
MPPT RANGE VOLTAGE	150-425	VOLTS	MAX POWER-POINT VOLTAGE (VMP)	42.10	VOLTS
MAX CONTINUOUS O/P CURRENT	36.40	AMPS	OPEN-CIRCUIT VOLTAGE (VOC)	50.10	VOLTS
PV INPUT VOLTAGE	370V	VOLTS	SHORT-CIRCUIT CURRENT (ISC)	13	AMPS
BATTERY CHARGING/ DISCHARGING	190	AMPS	NOM. MAX. POWER AT STC (P <sub>MAX</sub> )	550	WATTS
MAX EFFICIENCY	98	%	MAX. SYSTEM VOLTAGE	1500.00	VOLTS (IEC)
BATTERY VOLTAGE RANGE	40-60	VOLTS	VOC TEMP. COEFFICIENT	-0.27	° %/K

MAX DC CURRENT: I<sub>max</sub> = 1.25 X (MPPT INPUT CURRENT) = 1.25 X 22 = 27.5A  
 MAX AC CURRENT: I<sub>max</sub> = 1.25 X (SUM OF MAX CONTINUOUS OUTPUT CURRENT FROM INVERTERS) = 1.25 X (36.4) = 45.50A

WIRE SCHEDULE

RACEWAY #	EQUIPMENT			WIRE LOCATION	CONDUCTOR QTY.	AWG WIRE SIZE	STARTING ALLOWABLE AMPACITY 310.15(B)(16)	TEMPERATURE RATING (°C)	STARTING CURRENT APPLIED TO CONDUCTORS IN RACEWAY	TEMPERATURE CORRECTION FACTOR 310.15(B)(2)(a)	ADJUSTMENT FACTOR FOR MORE THAN 3 CONDUCTORS 310.15(B)(3)(a)	ADJUSTED CONDUCTOR AMPACITY	MAXIMUM CURRENT APPLIED TO CONDUCTORS IN RACEWAY
1	DC	MODULE	TO	OPTIMIZER	FREE-AIR	2	10	40	90°	13.90	1	40.00	17.38
2	DC	OPTIMIZER	TO	JUNCTION BOX	FREE-AIR	2	10	40	90°	11	1	40.00	13.75
3	DC	JUNCTION BOX	TO	INVERTER	TRENCH	4	10	40	90°	11	0.8	32.00	13.75
4	AC	INVERTER	TO	AC DISCONNECT	EXTERIOR WALL	3	8	50	75°	36.4	1	50.00	45.50
5	AC	AC DISCONNECT	TO	POI	EXTERIOR WALL	3	8	50	75°	36.4	1	50.00	45.50
6	DC	INVERTER	TO	BATTERY	EXTERIOR WALL	2	250	255	75°	190	1	255.00	237.50
7	AC	CLP	TO	COLD ROOM	EXTERIOR WALL	3	10	35	75°	7	1	35.00	8.75

NOTE:  
 1. "AUXILIARY GENERATION DISCONNECT"  
 2. "WARNING : ELECTRIC SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION"

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OPPORTUNITY	DAUST SENEGAL
PROJECT #	N/A
DATE DRAWN	9/20/2024
DRAWN BY	SARANSH
SCALE	AS INDICATED
SHEET SIZE	36" X 24" ARCH D
SHEET #	PV-05

TITLE  
 WIRE CALCULATION