OWNER & DESIGN TEAM INFORMATION

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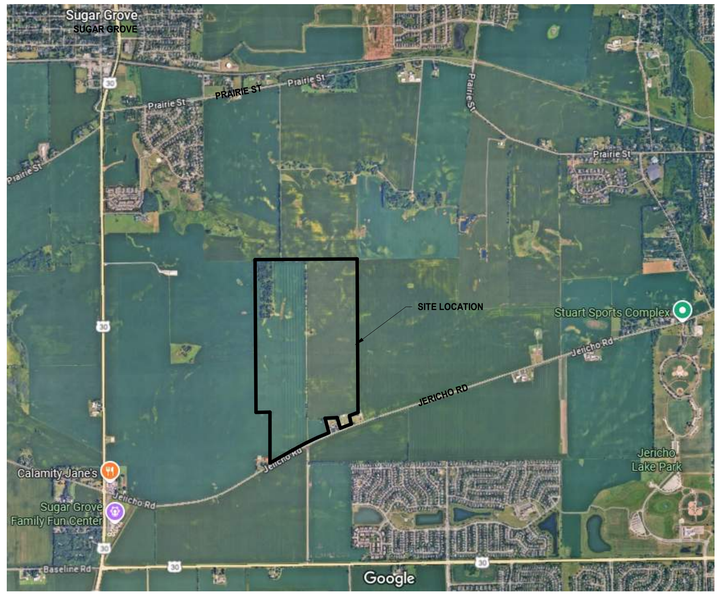
ORCHARD SOLAR

KANE COUNTY, IL 60554
ELECTRICAL ENGINEERING PLANS



DESIGN CODES AND STANDARDS

NFPA 70 - 2014	-	NATIONAL ELECTRICAL CODE (NEC)
NFPA 70E - 2014	-	STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE
IBC 2015	-	INTERNATIONAL BUILDING CODE
IFC 2015	-	INTERNATIONAL FIRE CODE ILLINOIS URBAN MANUAL
AIMA	-	AGRICULTURAL IMPACT MITIGATION AGREEMENT

DRAWING INDEX

SHEET #	NAME	ISSUANCE	DATE
PV-001	TITLE SHEET	30% DESIGN SET	09/17/2025
PV-002	SYMBOLS & ABBREVATIONS	30% DESIGN SET	09/17/2025
PV-003	GENERAL NOTES	30% DESIGN SET	09/17/2025
PV-101	SITE PLAN	30% DESIGN SET	09/17/2025
PV-201	SOLAR LAYOUT SYSTEM -1	30% DESIGN SET	09/17/2025
PV-202	SOLAR LAYOUT SYSTEM-2	30% DESIGN SET	09/17/2025
PV-203	SOLAR LAYOUT SYSTEM-3	30% DESIGN SET	09/17/2025
PV-301	SINGLE LINE DIAGRAM - SYSTEM-1	30% DESIGN SET	09/17/2025
PV-302	SINGLE LINE DIAGRAM - SYSTEM-2	30% DESIGN SET	09/17/2025
PV-303	SINGLE LINE DIAGRAM - SYSTEM-3	30% DESIGN SET	09/17/2025
PV-304	SCHEDULES	30% DESIGN SET	09/17/2025
PV-401	DETAILS (1 of 3)	30% DESIGN SET	09/17/2025
PV-402	DETAILS (2 of 3)	30% DESIGN SET	09/17/2025
PV-403	DETAILS (3 OF 3)	30% DESIGN SET	09/17/2025
PV-501	SIGNAGE	30% DESIGN SET	09/17/2025
PV-601	EQUIPMENT SPEC SHEETS	30% DESIGN SET	09/17/2025

PROJECT INFORMATION

THREE (3) COMMUNITY SOLAR FACILITIES ARE PLANNED FOR DEVELOPMENT ON THE PROPERTY
- COMBINED TOTAL CAPACITY (DC) - **21.102 MWDC**
- COMBINED TOTAL CAPACITY (AC) - **15 MWAC**
- CAPACITY PER SYSTEM (DC) - **7.034 MWDC**
- CAPACITY PER SYSTEM (AC) - **5 MWAC**
- LOCATED WITHIN AN AREA CURRENTLY USED FOR AGRICULTURE.

PROJECT OVERVIEW
TOTAL PROPERTY AREA - ~279.08 ACRES
SOLAR FOOTPRINT - ~81.84 ACRES

INTERCONNECTION
ALL SYSTEMS WILL CONNECT TO COMED'S DISTRIBUTION GRID

ABP / ILLINOIS SHINES
SYSTEM 3 WILL BE DEVELOPED UNDER THE ILLINOIS POWER AGENCY'S 2022 LONG-TERM RENEWABLE RESOURCES PROCUREMENT PLAN (ILLINOIS SHINES)

NON-ABP / ILLINOIS SHINES
SYSTEMS 1 AND 2 WILL FOLLOW THE SAME DESIGN AND CONSTRUCTION APPROACH BUT ARE NOT ENROLLED IN THE ILLINOIS SHINES PROGRAM

POST-CONSTRUCTION LAND USE
NON SOLAR AREAS OUTSIDE OF FENCE LINE WILL CONTINUE TO BE FARMED. AFTER SOLAR PANEL ARE IN PLACE, THE PROJECT WILL BE LANDSCAPED AS NATIVE PRAIRIE AND POLLINATOR HABITAT.

SYSTEM INFORMATION

SITE COMBINED SIZE - DC	SITE COMBINED SIZE - AC
21112 kW	15000 kW

INVERTERS

POWER	QTY	MANUFACTURER	MODEL	AC VOLTAGE	DC VOLTAGE
250 kW	60	SOLECTRIA	XGI 1500-250	600 V	1500 V

MODULES & STRINGS

SIZE	MANUFACTURER	MODEL	QTY	STRING SIZE	APPROX. # OF STRINGS
540 W	WAAREE	Bi-55-540	39096	24	1629

TRANSFORMERS

QTY	kVA (EACH)	SECONDARY VOLTAGE	PRIMARY VOLTAGE (POI)
6	2500	600 V	34500 V

RACKING

GCR	PITCH	RACKING TYPE	MODULE ORIENTATION
43.9	17' - 9"	SINGLE AXIS TRACKER	POTRAIT

WEATHER INFO

ASHRAE 0.4% AVG HIGH TEMP	ASHRAE MIN EXTREME TEMP	ASHRAE WEATHER STATION
32.5°C	-26.5°C	AURORA MUNICPAL, IL, WMO:744655

IMPORTANT! CALL BEFORE YOU DIG

CONTRACTOR SHALL CONTACT THE FOLLOWING ORGANIZATIONS BEFORE STARTING ANY CONSTRUCTION ACTIVITIES TO OBTAIN UTILITY INFORMATION AND HAVE EXISTING UTILITIES LOCATED IN THE FIELD. CONSTRUCTION ACTIVITIES WITHIN ANY GIVEN AREA MAY NOT PROCEED UNTIL THAT AREA HAS BEEN CHECKED AND MARKED FOR UTILITIES BY ALL APPROPRIATE ORGANIZATIONS.

* JULIE JULIEBEFOREYOUDIG.COM
* AHJ's BUILDING & ZONING DEPARTMENT

CONTRACTOR SHALL CONTACT THE FOLLOWING ORGANIZATIONS AT LEAST TWO (2) WORKING DAYS BEFORE STARTING ANY CONSTRUCTION ACTIVITIES TO ARRANGE FOR CONSTRUCTION INSPECTIONS. THE CONTRACTOR SHALL ALSO MAKE ARRANGEMENTS AND PROVIDE NOTIFICATIONS FOR INSPECTIONS DURING THE COURSE OF CONSTRUCTION AS REQUIRED BY THE AHJ's BUILDING & ZONING DEPARTMENT.

MUNICIPALITY APPROVAL STAMP

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MAINE 04021
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sme-engineers.com

PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:
TITLE SHEET

PROJECT #:
IW-101

SHEET:
PV-001

ONE-LINE DIAGRAM SYMBOLS

SYMBOLS	DESCRIPTION
PANEL NAME / AMPS / VOLTS	POWER DISTRIBUTION PANELBOARD
CONTROL PANEL / VOLTS	CONTROL PANEL
MCC XX / AMPS / VOLTS	MOTOR CONTROL CENTER
	CAPACITOR
	FUSE
	GROUND SYMBOL
	LOW VOLTAGE CIRCUIT BREAKER <1500V AC/DC
	MED. VOLTAGE CIRCUIT BREAKER Fxxx — DENOTES FEEDER BREAKER Uxxx — DENOTES UTILITY BREAKER Txxx — DENOTES TRANSFORMER BREAKER Gxxx — DENOTES GENERATOR BREAKER BTxx — DENOTES BUS TIE BREAKER "XX" DENOTES BUSSES BEND TIED
	NORMALLY OPEN DISC0NNECT SWITCH
	NORMALLY OPEN FUSED DISCONNECT
	SEPARABLE DISCONNECTS, DRAWOUTS
	NORMALLY CLOSED CONTACT
CC	CLOSE CIRCUIT
TC	TRIP CIRCUIT
	TRANSFORMER WITH DELTA/WYE WIRING CONVENTION
	TRANSFORMER WITH WYE/WYE WIRING CONVENTION
	AC WIRING
M	MOTOR OUTLET› HORSEPOWER AS NOTED
	MOTOR STARTER
	RELAY
VFI	MEDIUM VOLTAGE VACUUM FAULT INTERRUPTER
PR	PHASE RELAY
CAP TRIP	CAPACITOR TRIP
	UTILITY POLE
SW	SWITCHGEAR
	TRANSFORMER
M	PRIMARY METER
R	RECLOSER
	SOLAR PANEL
	OPTIMIZER
	INVERTER

SYMBOLS	DESCRIPTION
	POTENTIAL TRANSFORMER POTENTIAL TRANSFORMER, # = NUMBER OF PTs POTENTIAL TRANSFORMERS WITH POLARITY MARKS
	CURRENT TRANSFORMER CURRENT TRANSFORMER, # = NUMBER OF CTs CURRENT TRANSFORMERS WITH POLARITY MARKS
	BUSHING TYPE CURRENT TRANSFORMERS
SP AF AT	CIRCUIT BREAKER WITH THERMAL OVERLOAD AF = FRAME AMP RATING AT = AMP TRIP RATING
SP AF AT	CIRCUIT BREAKER WITH MAGNETIC OVERLOAD AF = FRAME AMP RATING AT = AMP TRIP RATING
AF AT	DRAWOUT CIRCUIT BREAKER AF = FRAME AMP RATING AT = AMP TRIP RATING
A	FUSED DISCONNECT AT = AMP RATING
A	FUSED CUT-OUT DISCONNECT AT = AMP RATING
52	POWER CIRCUIT BREAKER WITH OVERCURRENT PROTECTION
# 79	RECLOSER # = A FOR AIR ---A--- KV 0 FOR OIL ---A INT CAP V FOR VACUUM ---W BIL G FOR GAS MFR - TYPE
	TEST SWITCH (CURRENT SHORTING)
	TEST SWITCH (POTENTIAL OR ISOLATION)
	GROUND / GROUND ROD / GROUND W/GROUND ROD
	GROUND TEST WELL WITH GROUND ROD

NOTE: ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT.

ELECTRICAL ABBREVIATIONS

ABBREV	DESCRIPTION
A	AMPERE
AC	ALTERNATING CURRENT
A/C	AIR CONDITIONING
ACL	ACROSS THE LINE
ACS	AUXILIARY CONTACTS
AF	FUSED AMPS
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITYHAVING JURISDICTI0N
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AIC	AMPERES INTERRUPTING CAPACTY
AL	ALUMINUM
ALM	ALARM
AMP	AMPERE
ANN	ANNUNCIAT0R
A0	ANALOG OUTPUT
ARCH	ARCHITECT, ARCHITECTURAL
AS	SWITCH AMPS
AT	AMPS TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
BAL	BALLAST
BAS	BUILDING AUTOMATION SYSTEM
BFC	BELOW FINISHED CEILING
BGB	BUILDING GROUND BOX
BHP	BRAKE HORSEPOWER
BMNT	BASEMENT
BPS	BOLTED PRESSURE SWITCH
BR	BRANCH
BRKR	BREAKER
C	CONDUIT
CAB	CABINET
CAP	CAPACITY
CATV	CABLE TELEOSON
CB	CIRCUIT BREAKER
CCT	CIRCUIT
CCTV	CLOSED CIRCUIT TELEVISI0N
CEC	CHICAGO ELECTRIC CODE
CLG	CEILING
CLO	CLOSET
CMB	COMBINER BOX
CO	CARBON MONOXIDE DETECTOR
COAX	COAXIAL
COMED	COMMON WEALTH EDISON COMPANY
CONN	CONNECTION
CONV	CONVENIENCE
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
CU	COPPER
C.U.	COEFFICIENT OF UTILIZATION
CUH	CABINET UNIT HEATER
DC	DIRECT CURRENT
DGR	DUPLEX GROUNDED RECEPTACLE
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRBUTION
DER.	DISTRBUTED ENERGY RESOURCES
DIV	DIVISION
DN	DOWN
DO	DRAWOUT
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DS	DISCONNECT SWITCH
DT	DUST TIGHT
DWG	DRAWING
E	EXISTING TO REMAIN
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELEC	ELECTRIC
EM	EMERGENCY
EMT	ELECTRIC METALLIC TUBING
EP	EXPLOSION PROOF
EPO	EMERGENCY POWER OFF DEVICE
EQ	EQUAL
EQUIP	EQUIPMENT
ER	EXISTING TO BE RELOCATED
EUR	ELECTRIC UNIT HEATER
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EX	EXISTING
F	FUSE
F&I	FURNISH AND INSTALL
FA	FIRE ALARM

ABBREV	DESCRIPTION
FAAP	FIRE ALARM ANNUNCIAT0R PANEL
FACP	FIRE ALARM CONTROL PANEL
FB	FLOORBOX
FBO	FURNISHED BY OTHERS
FCU	FAN COIL UNIT
FDC	FIRE DEPARTMENT CONNECTION
FDR	FEEDER
FIXT	FIXTURE
FLA	FULL LOAD AMPS
FLR	FLOOR
FLUOR	FLUORESCENT
FPB	FAN POWERED BOX
FPC	FIRE PUMP CONTROLLER
F.S.	FUSED SWITCH
FT	FOOT/FEET
FU	FUSE
FVNR	FULL VOLTAGE, NON REVERSING (MAGNETIC STARTER)
G	GROUND
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GHW	GALVANIZED HEAVY STEEL CONDUIT
GRS	GALVANIZED RIGID STEEL CONDUIT
H	HEIGHT-MOUNTED ABOVE COUNTER
HOA	HAND-OFF-AUTO
HP	HORSE POWER
HPS	HIGH PRESSURE SODIUM
HR	HOUR
HV	HIGH VOLTAGE
HZ	HERTZ
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
IMC	INTERMEDIATE STEEL CONDUIT
IN	INCH(ES)
INC	INCANDESCENT
INV	INVERTER
JB	JUNCTION BOX
JPC	JOCKEY PUMP CONTROLLER
KCMIL	THOUSAND CIRCULAR MILS WIRE CROSS SECTION AREA
KO	KNOCKOUT
KVA	KILOVOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT-HOUR
LB	POUND
LCP	LIGHTING CONTROL PANEL
LL	LOW LIMIT RELAY
LS	LOUD SPEAKER
LTG	LIGHTING
LV	LOW VOLTAGE
M	MOTOR
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MAXIMUM CIRCUIT PROTECTION
MDF	MAIN DISTRIBUTION FRAME
MECH	MECHANICAL
MED	MEDIUM
MERC	MERCURY VAPOR
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINMUM
MLO	MAIN LUGS ONLY
MOCP	MAX OVER CURRENT PROTECTION
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MTR	MOTOR
MV	MULTI-VAPOR
N	NEUTRAL
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRCAL MANUFACTURER'S ASSOCIATION
NEUT	NEUTRAL
NF	NON-FUSED
NIC	NOT IN CONRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE

ABBREV	DESCRIPTION
O/H	OVERHEAD
OL	OVERLOAD
OPT	OPTIMIZER
P	POLE
PA	PUBLIC ADDRESS
PB	PULL BOX
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
PR	PAIR
PRI	PRIMARY
PROT	PROTECTION/PROTECTIVE
PRV	POWER ROOF VENTILATOR
PT	POTENTIAL TRANSFORMER
PWR	POWER
R	RESISTANCE
RC	REMOTE CONTROL
RECP	RECEPTACLE
REQ'D	REQUIRED
RLP	RELAY LIGHTING PANEL
RT	RAINTIGHT
S	SWITCH
SC	SHORT CIRCUIT
SE	SWITCH EMERGENCY
SEC	SECONDARY
SF	SQUARE FOOT/FEET
SGR	SINGLE GROUNDED RECEPTACLE
SP	SINGLE POLE
SPD	SURGE PROTECTIVE DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SPEC	SPECIFICATION
SPKR	SPEAKER
SPO	SPECIAL PURPOSE OUTLET
SPST	SINGLE POLE SINGLE THROW
SQ FT	SQUARE FOOT/FEET
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
SYS	SYSTEM
TTC	TERMINAL CABINET
TCP	TEMP. CONTROL PANEL
TEL	TELEPHONE
TEL CL	TELEPHONE CLOSET
TEMP	TEMPERATURE
TERM	TERMINAL
TL	TWIST LOCK
TR	TRANSFORMER RATING (e.g. TOROIDAL)
TTC	TELEPHONE TERMINAL CABINET
TV	TELEVISION
TX	TRANSMISSION TRANSFORMER
TYP.	TYPICAL
UC	UNDER COUNTER
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SOURCE
V	VOLT
VA	VOLT—AMPERE
VDC	DC VOLTAGE
VDT	VIDEO DISPLAY TERMINAL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VIF	VERIFY IN FIELD
VOL	VOLUME
VP	VAPOR PROOF
VT	VAPOR TIGHT
W	WATT
W/	WITH
WP	WEATHERPROOF
WT	WATER TIGHT
XFMR	TRANSFORMER
XR	EXISTING TO BE REMOVED
XRL	EXISTING TO BE RELOCATED
30cd	"30cd" INDICATES VISUAL STROBE LIGHT CANDELA

MUNICIPALITY APPROVAL STAMP

CLIENT:
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PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:
SYMBOLS & ABBREVATIONS

PROJECT #:
IW-101

SHEET:
PV-002

GENERAL NOTES

1. **THE CONTRACTOR SHALL:**
   - A. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND TOOLS REQUIRED FOR THE COMPLETE EXECUTION OF THE ELECTRICAL WORK AS SHOWN ON THE DRAWINGS.
   - B. PROVIDE ALL ADDITIONAL WORK NOT SPECIFICALLY SHOWN OR SPECIFIED YET REQUIRED TO ENSURE PROPER AND COMPLETE OPERATION OF ALL SYSTEMS, TO SATISFY THE DESIGN INTENT, AND TO COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS.
   - C. ENSURE ALL LABOR IS PERFORMED BY EXPERIENCED PERSONS OF THE PROPER TRADE. ALL WORKMANSHIP SHALL BE FIRST CLASS, AND SHALL BE IN COMPLIANCE WITH THE SPECIFIC REQUIREMENTS OF THE CONTRACT DRAWINGS, AS WELL AS ALL APPLICABLE SAFETY CODES AND ‘STANDARDS.
   - D. NOTIFY THE ENGINEER IN WRITING OF ALL DRAWING DISCREPANCIES PRIOR TO SUBMISSION OF BIDS.
   - E. PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE CODES INDICATED ON PV-001, AS WELL AS THE FOLLOWING:
     - a. ALL LOCAL CODES, ORDINANCES, REGULATIONS;
     - b. THE AUTHORITY HAVING JURISDICTION.
   - F. ENSURE ALL MATERIALS PROVIDED ARE NEW, FREE OF DEFECTS, AND ARE UL LISTED FOR THE INTENDED APPLICATION. ALL ELECTRICAL MATERIALS, INSTALLATION AND SYSTEMS SHALL MEET THE REQUIREMENTS OF THE FOLLOWING STANDARDS, INCLUDING THE LATEST ADDENDA AND AMENDMENTS:
     - a. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
     - b. ELECTRONIC INDUSTRY ASSOCIATION (EIA)
     - c. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
     - d. NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, (NECA)
     - e. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)
     - f. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
     - g. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
     - h. TELECOMMUNICATION INDUSTRY ASSOCIATION (TIA)
     - i. UNDERWRITER'S LABORATORIES, INC. (UL)
   - G. ENSURE THE ELECTRICAL DRAWINGS ARE NOT TO BE SCALED. CONTRACTOR SHALL TAKE MEASUREMENTS AND MAKE LAYOUTS AS REQUIRED FOR THE PROPER INSTALLATION AND COMPLETION OF THE WORK WHERE SPECIFIC DETAILS AND DIMENSIONS ARE NOT SHOWN ON THE DRAWINGS.
   - H. OBTAIN ALL NECESSARY PERMITS, ARRANGE ALL REQUIRED INSPECTIONS, AND PAY ALL FEES AND CHARGES INCIDENTAL THERE TO.
   - I. INSPECT SITE FOR FIELD VERIFICATION OF ALL ASPECTS OF THE PROJECT PRIOR TO BIDDING. SUBMISSION OF A BID CONSTITUTES ACCEPTANCE OF FIELD CONDITIONS.
   - J. INSTALL WORK AS REQUIRED TO FIT STRUCTURE, AVOID OBSTRUCTIONS, AVOID OR PROVIDE PROTECTION IN AREAS SUBJECT TO DAMAGE, RETAIN CLEARANCE, HEADROOM, OPENINGS AND PASSAGEWAYS.
   - K. INSTALL ALL MATERIALS AND EQUIPMENT AND COMPLETE ALL WORK IN A NEAT AND WORKMANLIKE MANNER, AND IN ACCORDANCE WITH BEST-IN-CLASS MODERN METHODS AND PRACTICES. ANY MATERIALS INSTALLED WHICH DO NOT PRESENT AN ORDERLY AND REASONABLY NEAT AND/OR WORKMANLIKE APPEARANCE, OR DO NOT ALLOW ADEQUATE SPACE FOR MAINTENANCE, SHALL BE REMOVED AND REPLACED WHEN SO DIRECTED BY THE ENGINEER.
   - L. COMMISSION EACH ITEM OF EQUIPMENT IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS; OR WHERE NOTED UNDER EQUIPMENT SPECIFICATION. COMMISSIONING SHALL BE PERFORMED BY QUALIFIED MANUFACTURER'S REPRESENTATIVE.
   - M. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC IN NATURE AND INDICATE THE GENERAL ARRANGEMENT OF CIRCUITS AND OUTLETS, LOCATION OF SWITCHES, PANELBOARDS, CONDUITS, AND OTHER WORK. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATIONS PRIOR TO INSTALLATION OF WORK.
   - N. THE ELECTRICAL CIRCUITS, COMPONENTS, AND CONTROLS ARE SELECTED AND SIZED FOR THE EQUIPMENT SPECIFIED AND OR SHOWN. IF SUBSTITUTIONS AND/OR EQUIVALENT EQUIPMENT ARE FURNISHED, IT SHALL BE THE RESPONSIBILITIES OF ALL PARTIES CONCERNED, INVOLVED IN AND FURNISHING THE SUBSTITUTE AND/OR EQUIVALENT EQUIPMENT TO VERIFY AND COMPARE THE ELECTRICAL CHARACTERISTICS OF THAT FURNISHED TO THAT SHOWN.
   - O. FIELD COORDINATE EXACT ELECTRICAL CONNECTION POINTS TO EQUIPMENT PRIOR TO ROUGH IN OF ELECTRICAL COMPONENTS.
   - P. FIELD COORDINATE EXACT ROUTING OF CONDUIT. SPECIFIED CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY.
   - Q. FURNISH AND INSTALL ALL RACEWAYS, BOXES, ENCLOSURES, AND CABINETS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
   - R. FURNISH AND INSTALL ALL CHANNEL AND ANGLE SUPPORTING SYSTEMS, HANGERS, ANCHORS, SLEEVES, BRACKETS, FABRICATED ITEMS, AND HARDWARE AS REQUIRED TO PROVIDE SECURE SUPPORT, PER NATIONAL ELECTRICAL CODE. SEE STRUCTURAL DRAWINGS FOR FOUNDATIONS AND EQUIPMENT SUPPORT AND RACKS.
   - S. ALL CONNECTIONS OF DISSIMILAR METALS SHALL BE MADE TO MINIMIZE GALVANIC ACTION, CORROSION OR ELECTROLYSIS. ALL CONNECTORS, CONNECTION HARDWARE, CONDUCTORS, AND CONNECTION METHODS SHALL ENSURE THAT METALS IN DIRECT CONTACT ARE GALVANICALLY COMPATIBLE.
   - T. AFTER INSTALLATION OF ALL CONDUCTORS, CONTRACTOR SHALL COMPLETELY SEAL OFF ALL CONDUIT ENDS TO PREVENT THE POSSIBILITY OF ANY MOISTURE FROM ENTERING ANY ELECTRICAL ENCLOSURE. ALL USED AND UNUSED OPENINGS IN ALL EQUIPMENT, BOXES, AND ENCLOSURES SHALL BE SEALED WEATHERTIGHT WITH A MATERIAL THAT WILL ALSO PREVENT INSECT INCURSION.

2. **SUBMITTALS:**
   - 1. CONTRACTOR SHALL SUBMIT MANUFACTURER CUT SHEETS AND CATALOG DATA FOR ALL MATERIALS,
     - A. CLEARLY INDICATING THE SPECIFIC PART OR PRODUCT CATALOG NUMBER(S) TO BE USED. ITEMS REQUIRING SIGNIFICANT LEAD TIME SHOULD BE SUBMITTED AS SOON AS POSSIBLE. ELECTRONICALLY SUBMIT 1 COPY OF ALL REQUESTED INFORMATION TO THE ENGINEER, NEATLY INDEXED PER CATEGORY, FOR THE FOLLOWING ITEMS:
     - B. SWITCHBOARDS, PANELBOARDS, AC DISCONNECT SWITCHES.
     - C. CONDUIT, RACEWAYS, WIREWAYS, ENCLOSURES, BOXES, FITTINGS, SUPPORTS AND HARDWARE. CONDUCTORS, BOTH DC AND AC.
     - D. LICHT FIXTURES, RECEPTACLES, SWITCHES AND ASSOCIATED ACCESSORIES.
     - E. PHOTOVOLTAIC INVERTERS AND ASSOCIATED CONTROL SYSTEMS.
     - F. PHOTOVOLTAIC MODULES.
     - G. DC PHOTOVOLTAIC COMBINER BOXES, SPLICE BOXES AND DISCONNECT SWITCHES.
     - H. METERING AND COMMUNICATIONS EQUIPMENT.
   - 2. FOR ALL OWNER-FURNISHED EQUIPMENT, CONTRACTOR SHALL SUBMIT A COPY OF ALL INSTALLATION, COMMISSIONING AND PROGRAMMING DATA AND/OR SETTINGS, INCLUDING PASSWORD AND LOGIN DATA. CONTRACTOR SHALL ELECTRONICALLY SUBMIT A COPY TO THE ENGINEER.

3. **MODULES:**
   - A. CONTRACTOR SHALL RECEIVE, INSPECT, UNLOAD AND INSTALL ALL SOLAR PHOTOVOLTAIC MODULES. ALL MODULES DAMAGED DURING SHIPPING SHALL BE REFUSED AND SHALL NOT BE INSTALLED. COORDINATE SPECIFIC SCOPE REQUIREMENTS DURING BIDDING.
   - B. MODULES SHALL BE INSTALLED, SECURED, AND MECHANICALLY GROUNDED TO THE RACKING SYSTEM AND EACH OTHER PER THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS AND PER UL LISTING TO ENSURE ELECTRICAL CONTINUITY.
   - C. CONTRACTOR SHALL NOT PLACE ANY TOOLS, EQUIPMENT OR OTHER WEIGHT (INCLUDING BODYWEIGHT) ON THE SURFACE PORTION OF ANY MODULE. CONTRACTOR SHALL PROMPTLY REPORT MODULE DAMAGE, INCLUDING MICRO-FRACTURES, AND SHALL IMMEDIATELY REPLACE THE DAMAGED MODULE WITH A NEW, UNDAMAGED MODULE AT CONTRACTOR'S EXPENSE.

4. **INVERTERS:**
   - A. CONTRACTOR SHALL RECEIVE, UNLOAD AND INSTALL ALL INVERTERS, ASSOCIATED ACCESSORIES. COORDINATE SPECIFIC SCOPE REQUIREMENTS DURING BIDDING.
   - B. INVERTERS SHALL BE NEW, UTILITY GRADE, FROM A REPUTABLE MANUFACTURER, AND SHALL BE SPECIFICALLY DESIGNED FOR GRID-TIED PHOTOVOLTAIC INSTALLATIONS.
   - C. INVERTERS SHALL MEET THE FOLLOWING MINIMUM STANDARDS: UL 1741 SA STANDARD FOR INVERTERS,CONVERTERS, CONTROLLERS AND INTERCONNECTION SYSTEM EQUIPMENT FOR USE WITH DISTRIBUTED ENERGY RESOURCES. IEEE 929-2000 - RECOMMENDED PRACTICE FOR UTILITY INTERFACE OF PHOTOVOLTAIC (PV) SYSTEMS.
   - D. COORDINATE SPECIFIC SCOPE REQUIREMENTS DURING BIDDING.
   - E. INVERTERS SHALL BE INSTALLED, SECURED, WIRED, TESTED AND GROUNDED PER THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
   - F. CONTRACTOR SHALL CONFIGURE ALL INVERTER PROTECTION AND COMMUNICATIONS SETTINGS IN COMPLIANCE WITH LOCAL UTILITY STANDARDS, AHJ REQUIREMENTS, AND SHALL COORDINATE WITH OWNER'S REPRESENTATIVE TO PROVIDE MONITORING ACCESS.

5. **ENCLOSURES:**
   - A. ALL ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE SPECIFIED AND INSTALLED IN ACCORDANCE WITH NEMA STANDARDS AND TYPE NUMBER AND SHALL BE SUITABLE FOR THE LOCATION CONDITIONS.
   - B. ALL EXTERIOR ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE MINIMUM TYPE NEMA 3R OR 4. THIS SHALL INCLUDE BUT NOT BE LIMITED TO SWITCHBOARDS, DISTRIBUTION PANELS, CONTROL CABINETS, PULL BOXES, JUNCTION BOXES, DISCONNECT SWITCHES, COMBINER BOXES, WIREWAYS, ETC.
   - C. ALL ENCLOSURES SHALL BE PROVIDED WITH PADLOCKING PROVISIONS OR EQUIVALENT.
   - D. ALL SOLAR PHOTOVOLTAIC MODULES AND OTHER MATERIALS ENCLOSURES, INCLUDING LARCE CONTRACTOR INSTALLED ELECTRICAL EQUIPMENT (INCLUDING SWITCHBOARDS, DISTRIBUTION PANELS, CONTROL CABINETS, PULL BOXES, JUNCTIONS BOXES, COMBINER BOXES, AND INVERTERS) SHALL BE ENTIRELY LOCATED AT OR ABOVE THE EQUIPMENT ELEVATION SHOWN, UNLESS OTHERWISE APPROVED BY OWNER. CONTRACTOR SHALL PROVIDE SAFE EGRESS IN COMPLIANCE WITH OSHA AND CUSTOMER STANDARDS TO ALLOW FOR ACCESS TO SUCH EQUIPMENT ENCLOSURES FOR OPERATIONS AND MAINTENANCE RESPONSIBILITIES. SUCH EGRESS FEATURES SHALL INCLUDE BUT NOT BE LIMITED TO STAIRS, LADDERS, HANDRAILS, TIE-OFF POINTS, ETC.

6. **AC SYSTEM WIRING:**
   - A. ALL CONDUCTORS, LUGS AND CABLE ACCESSORIES SHALL BE NRTL LISTED TO APPLICABLE UL STANDARDS.
   - B. ALL LOW VOLTAGE AC WIRING SHALL UTILIZE COPPER CONDUCTORS WITH INSULATION AND INSULATION LEVELS AS NOTED ON THE PLANS.
   - C. ALL AC WIRING RATING TO BE AS PER THE AC CABLE SCHEDULE ON THE PLANS.
   - D. ALL MEDIUM VOLTAGE AC WIRE SHALL BE ALUMINUM 15KV, MV105, 13370, 100% CONCENTRIC COPPER NEUTRAL, TRXLPE OR EPR OR URD RATED FOR DIRECT BURIAL BELOW GROUND AND INSTALLED IN PVC80 CONDUIT WHEN BURIED IN TRENCH AND ACSR OR MAC BARE OVERHEAD ON POLES. REFER TO PLANS FOR SPECIFIC DETAILS IF AN UNDERGOUND CABLE RUN IS TO BE CONCRETE ENCASED.
   - E. ALL CONDUCTORS INSTALLED BELOW THE EQUIPMENT ELEVATION (AND THEREFORE INCLUDES CONDUCTORS BELOW GRADE) MUST BE LISTED FOR USE IN WET LOCATIONS (PER NEC AND UL DEFINITIONS, INCLUDING SUBMERSION), AND BE OF A CORROSION RESISTANT DESIGN. ALL UNDERGROUND WIRING SHALL BE IN PVC80 CONDUIT AND BE CONCRETE ENCASED WHERE SPECIFIED ON THE PLANS.
   - F. ALL CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH CURRENT NEC CODE REQUIREMENTS.
   - G. CONDUCTORS SHALL HAVE INTEGRAL COLORING OR COLORED HEAT SHRINK SLEEVE AT ALL TERMINATIONS TO INDICATE GROUNDED CONDUCTORS, EQUIPMENT GROUNDING CONDUCTORS, AND AC PHASE CONDUCTORS. COLOR CODING SHALL BE AS FOLLOWS:

	800/462V	600/347V	480/277V	208/120V
PHASE A	BROWN	BLACK	BROWN	BLACK
PHASE B	ORANGE	RED	ORANGE	RED
PHASE C	YELLOW	BLUE	YELLOW	BLUE
NEUTRAL	GRAY	GRAY	GRAY	WHITE
GROUND	GREEN OR BARE			

   - H. ALL LUGS AND CONNECTORS SHALL BE 90C RATED, UL LISTED AND DESIGNATED FOR USE WITH THE CONDUCTOR BEING CONNECTED.
   - I. LUGS AND CONNECTORS USED TO TRANSITION FROM COPPER TO ALUMINUM WIRE SHALL BE LISTED AND RATED FOR SUCH USE. APPLY ANTI-OXIDANT COATING MATERIAL TO ALL ALUMINUM TERMINATIONS.
   - J. ALL AC POWER CONDUCTOR TERMINATIONS SHALL BE IRREVERSIBLE, DOUBLE CRIMP, LONG BARREL, TWO BOLT COMPRESSION TYPE LUGS RATED AT 90C AND APPROVED BY THE EQUIPMENT MANUFACTURER OR SUPPLIER. WHERE NOT POSSIBLE, SINGLE BOLT COMPRESSION LUGS MAY BE USED. MECHANICAL SET SCREW TERMINATIONS ARE APPROVED FOR EQUIPMENT TERMINATIONS WITH FACTORY INSTALLED MECHANICAL LUGS. ALL CRIMPED CONNECTIONS MUST BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. COAT CONDUCTOR WITH DIELECTRIC GREASE PRIOR TO CRIMPING.
   - K. PROVIDE A MAXIMUM OF TWO STACKABLE COMPRESSION LUGS WHEN MORE THAN ONE COMPRESSION LUC NEEDS TO BE TERMINATED AT A SINGLE SET OF BUS BAR HOLES.
   - L. NO SPLICING OF ANY WIRES WITHOUT WRITTEN CONSENT OF OWNER. ALL UNDERGROUND WIRING SHALL BE CONTINUOUS WITHOUT SPLICES.
   - M. ALL SINGLE PHASE POWER CIRCUITS SHALL HAVE A DEDICATED NEUTRAL.
   - N. CLASS 1 AND CLASS 2 CONTROL CIRCUITS SHALL BE TYPE THHN/THWN, INSTALLED IN RACEWAY.
   - O. TERMINAL SCREW TORQUE SPECS PER MANUFACTURER TO BE FOLLOWED AND WITNESSED BY QA.

7. **DC SYSTEM WIRING:**
   - A. ALL CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH CURRENT NEC CODE REQUIREMENTS, INCLUDING TEMPERATURE RATING, AND OWNER SPECIFIED VOLTAGE DROP.
   - B. ALL CONDUCTORS INSTALLED BELOW THE EQUIPMENT ELEVATION (AND THEREFORE INCLUDES CONDUCTORS BELOW GRADE) MUST BE LISTED FOR USE IN WET LOCATIONS (PER NEC AND UL DEFINITIONS, INCLUDING SUBMERSION), AND BE OF A CORROSION RESISTANT DESIGN.
   - C. ALL DC STRING AND STRING TO INVERTERS, CONDUCTORS AND CABLES SHALL BE COPPER TYPE "PV-2", 2000VDC, 90'C (WET OR DRY), W RESISTANT, COPPER WIRE, UL 4703. DC CONDUCTORS FROM DC BOXES TO INVERTERS SHALL BE ALUMINUM.
   - D. FURNISH STRANDED WIRE FOR SIZES # 12 AND LARGER UNLESS OTHERWISE NOTED. MINIMUM CONDUCTOR SIZE SHALL BE AWG # 12. ALL STRING WIRE SHALL BE MINIMUM # 10 AWG.
   - E. ALL WIRES AND CABLE SHALL HAVE UV RESISTANT AND OUTDOOR RATED WRAP-AROUND LAMINATING VINYL MACHINE PRINTED ID LABELS OR OTHER APPROVED LABELING METHOD INDICATING DESIGNATION AND POLARITY. CONDUCTORS SHALL HAVE INTEGRAL COLORING OR A COLORED OUTDOOR RATED HEAT SHRINK SLEEVE AT ALL TERMINATIONS TO INDICATE GROUNDED CONDUCTORS, EQUIPMENT GROUNDING CONDUCTORS AND CURRENT-CARRYING CONDUCTORS, PER NEC REQUIREMENTS AND INDUSTRY STANDARDS. COLOR CODINC SHALL BE AS FOLLOWS:
     - a. PV POSITIVE (+): RED
     - b. PV NEGATIVE (-): BLACK
     - c. GROUND: GREEN WITH STRIPE OR BARE
   - F. SERIES STRING CONNECTIONS BETWEEN SOLAR PHOTOVOLTAIC MODULES SHALL BE VIA FACTORY-SUPPLIED TYPE "MC4" QUICK CONNECT CONNECTORS. FIELD INSTALLED QUICK CONNECT CONNECTORS SHALL BE OF THE SAME MAKE AND MODEL AS THOSE FACTORY SUPPLIED WITH THE MODULES. ALL MODULE CONNECTORS SHALL BE UL LISTED, NEC 690 COMPLIANT, LATCHING TYPE WITH POSITIVE LATCHING INDICATOR. CONNECTORS SHALL BE POLARIZED SUCH THAT POSITIVE AND NEGATIVE TERMINALS ARE NOT INTERCHANGEABLE.
   - G. STRING WIRING SHALL BE RATED FOR DIRECT SUNLIGHT EXPOSURE. STRING WIRING SHALL BE PROPERLY SUPPORTED TO RACK AND/OR MODULE FRAMES USING STAINLESS STEEL PV CABLE CUPS, AND/OR OTHER OWNER-APPROVED WIRE MANAGEMENT METHOD. NYLON CABLE TIES SHALL NOT BE ALLOWED. PV CABLE CLIPS AND WIRE MANAGEMENT METHOD MUST BE APPROVED BY OWNER BEFORE INSTALLATION. ALL CABLES SHALL BE SECURED MINIMUM 24" ON CENTER AND 6" AT EACH END WHEN CHANCING DIRECTION. NO CABLE SHALL BE ALLOWED TO TOUCH THE SURFACE OF THE GROUND.
   - H. RUN WIRING UNDERNEATH MODULE FRAMES, ALONG THE TRACKER TABLE FRAMING.
   - I. STRING WIRING SHALL ENTER ENCLOSURES THROUGH CONDUIT, CORD GRIPS, OR OTHER APPROVED METHOD THAT WILL PROPERLY SEAL THE PENETRATION AND UPHOLD THE WEATHERPROOF RATING OF THE ENCLOSURE OR BOX.
   - J. ON PROJECTS WITH COMBINERS, COMBINER OUTPUT FEEDERS SHALL BE ALUMINUM, WITH THERMOSET XLPE INSULATION AND JACKET MATERIALS, NON-THERMOPLASTIC INSULATION. CABLE SHALL BE 2000V RATED, WET LOCATION, 90 C OR BETTER.
   - K. ALL POWER CONDUCTOR TERMINATIONS SHALL BE IRREVERSIBLE, DOUBLE CRIMP, LONG BARREL, TWO BOLT COMPRESSION TYPE LUGS RATED AT 90C WHERE APPROVED BY THE EQUIPMENT MANUFACTURER OR SUPPLIER. WHERE NOT POSSIBLE, SINGLE BOLT COMPRESSION LUGS MAY BE USED. MECHANICAL SET SCREW TERMINATIONS ARE APPROVED FOR COMBINER BOX TERMINATIONS ONLY. ALL CRIMPED CONNECTIONS MUST BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
   - L. ALL CONTROL AND INSTRUMENTATION CONDUCTORS SHALL BE TERMINATED BY CONTRACTOR.
   - M. ALL LUGS AND CONNECTORS SHALL BE 90C RATED, UL LISTED AND DESIGNATED FOR USE WITH THE CONDUCTOR BEING CONNECTED.
   - N. NO SPLICING OF ANY WIRES SHALL BE PERFORMED WITHOUT WRITTEN CONSENT FROM OWNER.
   - O. TERMINAL SCREW TORQUE SPECS PER MANUFACTURER TO BE FOLLOWED AND WITNESSED BY QA.
   - P. ALL DC WIRING INSTALLED BELOW GRADE SHALL BE RATED SUITABLE FOR DIRECT BURIAL IN PVC80 CONDUIT AND BE CONCRETE ENCASED BELOW VEHICULAR TRAVELED SURFACES.

NOTE:
THESE SPECIFICATIONS ARE PROVIDED FOR GENERAL INSTALLATION AND EQUIPMENT REQUIREMENTS. REFER TO OWNER SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. SHOULD THERE BE ANY CONFLICTS BETWEEN THE SPECIFICATIONS HEREIN AND THAT OF THE OWNER, THE OWNER SPECIFICATIONS SHALL TAKE PRECEDENCE.

8. **GROUNDING:**
   - A. MODULE EQUIPMENT GROUNDING CONNECTION SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S CUIDELINES AND APPLICABLE LISTINGS. MODULE FRAME GROUNDING HARDWARE SHALL BE LISTED TO ULJ70J AND SPECIFIED BY MODULE MANUFACTURER AS ACCEPTABLE FOR USE WITH THE MODULE MODEL. WEEBS WILL BE CONSIDERED AN ACCEPTABLE MEANS OF GROUNDING BUT THEIR USE MUST BE AN APPROVED USE BY THE APPLICABLE MANUFACTURER(S). MANUFACTURER'S APPROVAL LETTER FOR THE SPECIFIC CASE MUST BE PROVIDED TO OWNER AND APPROVED BY OWNER, OTHERWISE A CONTINUOUS GROUND LOOP MUST BE INSTALLED.
   - B. METHODS THAT GROUND MODULE FRAMES BY UTILIZING THE RACKING AS THE GROUNDING MEANS SHALL BE LISTED TO UL 3703.
   - C. ALL BRANCH AND FEEDER CIRCUITS SHALL CONTAIN A GROUNDING CONDUCTOR, UNLESS OTHERWISE NOTED, AND BE SIZED AND BONDED IN ACCORDANCE WITH NEC ART. 250.
   - D. UNLESS OTHERWISE NOTED, CROUNDING CONDUCTORS SHALL BE COPPER. EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSULATED WITH GREEN-COLORED INSULATION. UNDERGROUND CONDUCTORS SHALL BE BARE, TINNED, AND STRANDED. USE ONLY COPPER CONDUCTORS FOR BOTH INSULATED AND BARE GROUNDING CONDUCTORS IN DIRECT CONTACT WITH EARTH, CONCRETE, MASONRY, CRUSHED STONE AND SIMILAR MATERIALS. IN RACEWAYS, USE INSULATED EQUIPMENT GROUNDING CONDUCTORS. EXPOSED BARE EQUIPMENT GROUNDING CONDUCTORS WILL BE MINIMUM 6 AWG COPPER.
   - E. INSTALL INSULATED EQUIPMENT CROUNDINC CONDUCTORS WITH CIRCUIT CONDUCTORS FOR THE FOLLOWINC ITEMS, IN ADDITION TO THOSE REQUIRED BY NEC: FEEDERS AND BRANCH CIRCUITS; RECEPTACLE CIRCUITS; SINGLE-PHASE MOTOR AND APPLIANCE BRANCH CIRCUITS; THREE-PHASE MOTOR AND APPLIANCE BRANCH CIRCUITS; FLEXIBLE RACEWAY RUNS.
   - F. ALL NON-CURRENT CARRYING EXPOSED METAL PARTS OF SYSTEM JUNCTION BOXES, EQUIPMENT, MODULE FRAMES, SUPPORT RACKING, INVERTER CASES AND APPLIANCES IN THE ENTIRE ELECTRICAL SYSTEM THAT MAY BE ACCIDENTALLY ENERGIZED SHALL BE GROUNDED PER NEC 690.43 AND 690.45 AND SIZED PER 250.122.
   - G. GROUND LUGS SHALL BE MECHANICAL AND ACCEPTABLE FOR COPPER CONDUCTOR TERMINATION. LUGS SHALL BE SELECTED SO AS TO PREVENT GALVANIC CORROSION AND DISSIMILAR THERMAL EXPANSION OF LUGS AND CONDUCTORS.
   - H. TIN-PLATED COPPER LAY-IN GROUND LUGS OR CONDUIT GROUND CLAMPS SHALL BE PROVIDED FOR ALL METALLIC CONDUIT CARRYING POWER CONDUCTORS. SUCH MEANS OF GROUNDING SHALL NOT BE REQUIRED FOR METALLIC CONDUIT CARRYING COMMUNICATION CONDUCTORS.
   - I. ALL GROUND LUGS NOT INSTALLED IN AN ENCLOSURE MUST BE UL LISTED FOR DIRECT BURIAL.
   - J. ALL EQUIPMENT GROUNDING CONDUCTORS (EGC) AND GROUNDING ELECTRODE CONDUCTORS (CEC) SHALL BE SIZED IN ACCORDANCE WITH THE PROPER SECTIONS OF THE NEC.
   - K. METALLIC CONDUIT CONTAINING A GROUNDING ELECTRODE CONDUCTOR MUST BE BONDED AT BOTH ENDS.
   - L. ALL INVERTERS AND INTERCONNECTION SWITCHBOARDS SHALL UTILIZE A GROUNDING ELECTRODE SYSTEM CONSISTING OF A GROUND RINC/CRID SIZED AND INSTALLED TO COMPLY WITH NEC AND IEEE STANDARDS. IF THE APPLICABLE GOVERNMENTAL AUTHORITY REQUIRES A GROUNDING CONDUCTOR TO BE EXTENDED FROM THE GROUND GRID TO THE EXISTING BUILDING STRUCTURE, SUCH WORK WILL BE INCLUDED IN SCOPE AT NO EXTRA COST TO OWNER.
   - M. EQUIPMENT GROUNDING CONDUCTORS SHALL BE ROUTED WITH ALL CIRCUIT AND PHASE CONDUCTORS.
   - N. ALL BELOW GRADE CONNECTIONS SHALL BE EXOTHERMICALLY WELDED AND UL LISTED FOR DIRECT BURIAL APPLICATIONS.
   - O. GROUND RODS, IF REQUIRED, SHALL BE SECTIONAL COPPER-CLAD STEEL, 3/4" IN DIAMETER BY 10' DRIVEN VERTICALLY.
   - P. PROVIDE MECHANICAL CONNECTIONS FOR CONNECTIONS TO STRUCTURAL STEEL AND FOR UNDERGROUND CONNECTIONS.
   - Q. ALL EXPOSED GROUND CONNECTIONS TO EQUIPMENT SHALL BE CABLE LUGS WITH BOLTED/MECHANICAL ATTACHMENTS.
   - R. USE INSULATED COPPER EQUIPMENT GROUNDING CONDUCTORS FOR GROUNDING RACKING SYSTEMS WHEN ALUMINUM RACKING IS USED. BOND TO RACKING WITH CU-AL RATED LUGS PER RACKING MANUFACTURER'S REQUIREMENTS.
   - S. INSTALL CU INSULATED BONDING JUMPERS BETWEEN ADJACENT RACKS PER MANUFACTURERS GROUNDING AND INSTALLATION DETAILS.
   - T. GROUNDING SCREWS SHOULD BE THREAD-FORMING OR HOT DIPPED, NOT THREAD CUTTING.

9. **CONDUCTOR PROTECTION:**
   - A. ALL ABOVE GROUND AC CABLES SHALL BE PROTECTED IN CONDUIT OR CABLE TRAYS OR INSTALLED IN A CAB SYSTEM, AS NOTED ON THE PLANS.
   - B. PULL AND JUNCTION BOXES SHALL BE PROVIDED WHERE REQUIRED TO FACILITATE THE INSTALLATION OF WIRING. BENDS IN CONDUITS BETWEEN PULL BOXES SHALL NOT EXCEED THE EQUIVALENT OF FOUR 90 DEGREE BENDS.
   - C. CONDUITS REQUIRING FIELD CUTTING SHALL BE CUT SQUARE AND DE-BURRED. CONDUIT END BELLS OR BUSHINGS SHALL BE PROVIDED TO PREVENT CABLE DAMAGE.
   - D. BENDS IN CONDUITS SHALL NOT DAMACE RACEWAYS OR SIGNIFICANTLY CHANCE THE INTERNAL DIAMETER OF RACEWAYS (NO KINKS).
   - E. COMMUNICATIONS WIRING SHALL BE RUN IN SEPARATE CONDUITS FROM POWER CIRCUIT WIRING.
   - F. ALL AC BRANCH CIRCUIT WIRE SHALL BE INSTALLED IN RACEWAY, UNLESS OTHERWISE NOTED. MINIMUM SIZE SHALL BE 3/4".
   - G. ALL EXPOSED CONDUITS INSTALLED IN EXTERIOR LOCATIONS SHALL BE RCSC SCH 40.
   - H. RACEWAYS SHALL BE SUPPORTED BY APPROVED TYPES OF GALVANIZED SUPPORTS. USE STAINLESS STEEL HARDWARE AND CONDUIT STRAPS OUTDOORS. PAINT ALL EXPOSED MATERIALS TO MATCH EXISTING COLORS.
   - I. JOB CUT THREADS SHALL BE GIVEN A COAT OF RUST RESISTANT PAINT SUCH AS ZINC CHROMATE OR EQUAL.
   - J. WIRE TERMINATIONS AND SPLICES SHALL BE COMPLETED WITH THE APPROPRIATE UL LISTED HEAVY DUTY RATCHETING TYPE JAWS AND INTERCHANGEABLE DIES FOR PROPER CRIMPING OF TERMINALS. TERMINALS SHALL BE UN-INSULATED TYPE AND CORRECTLY SIZED FOR THE WIRE USED.
   - K. BLOCKS AND TERMINAL LUGS SHALL BE LISTED FOR THE APPROPRIATE CONDUCTOR MATERIAL.
   - L. AFTER INSTALLATION OF CONDUCTORS, ALL RACEWAYS SHALL BE SEALED WITH DUCTSEAL.
   - M. INSTALL MAGNETIC WARNING TAPE ABOVE ALL BURIED WIRE.

10. **MONITORING:**
    ALL THE CONTRACTOR SHALL:
    - A. FURNISH AND INSTALL ALL COMMUNICATIONS DEVICES NECESSARY TO BRING ALL PV SYSTEM DATA TO THE OWNER'S IT EQUIPMENT RACK. FINAL SYSTEM CONNECTIVITY TO BE DETERMINED BY OWNER.
    - B. FURNISH AND INSTALL AN RS485, 2C#16, SHIELDED, TWISTED PAIR CABLE BETWEEN EACH INVERTER AND A SYSTEM COMMUNICATIONS GATEWAY. (GATEWAY TO BE COMPATIBLE WITH SUPPLIED INVERTERS). GROUND SHIELD PER INVERTER MANUFACTURER'S REQUIREMENTS. OR INSTALL OWNER FURNISHED AC-POWER LINE CARRIER (AC-PLC) PER INVERTER MANUFACTURER'S REQUIREMENTS.
    - C. CONNECT COMMUNICATIONS GATEWAY ETHERNET OUTPUT TO OWNERS I-AN SWITCH, IF AVAILABLE. ETHERNET CABLE SHALL HAVE RJ45 CONNECTORS AT EACH END. ETHERNET CABLE SHALL BE CONSISTENT WITH OWNERS LAN (CAT5e OR CAT6).

11. **MISCELLANEOUS:**
    - A. ALL EXTERIOR MOUNTING HARDWARE USED SHALL BE STAINLESS STEEL, SIZED PER SYSTEM MANUFACTURER'S RECOMMENDATIONS. USE ANTI-SEIZE FOR EACH CONNECTION.
    - B. PANELBOARDS SHALL BE FULLY RATED TO INTERRUPT SYMMETRICAL SHORT-CIRCUIT CURRENT AVAILABLE AT TERMINALS. PANELBOARDS SHALL UTILIZE CIRCUIT-BREAKER TYPE OCPD's AND ALL PHASE AND GROUND BUSSES SHALL BE COPPER.
    - C. UNLESS OTHERWISE NOTED, ALL ENCLOSURES FOR OUTDOOR EQUIPMENT SHALL BE NEMA 3R OR 4 RATED ENCLOSURES. ENCLOSURES FOR INDOOR EQUIPMENT SHALL BE NEMA I RATED.
    - D. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL SPOILS FROM THE PROJECT SITE. CONTRACTOR SHALL PROVIDE DUMPSTERS OR OTHER CONTAINERS AS REQUIRED, AND SHALL COORDINATE LOCATIONS AND PICKUP SCHEDULES WITH THE OWNER TO MINIMIZE INTERRUPTION.

12. **COMMISSIONING:**
    - A. CONTRACTOR SHALL PERFORM START-UP AND COMMISSIONING UPON COMPLETION OF INSTALLATION OF THE FACILITY. TO SUCCESSFULLY COMMISSION THE FACILITY, CONTRACTOR MUST ENSURE A COMPLETE INSTALLATION, APPROPRIATE CONFIGURATION, AND MUST DEMONSTRATE THAT THE FACILITY PERFORMS IN ITS FULL, PROPER OPERATING CONDITION. CONTRACTOR SHALL RECORD ALL MEASURED DATA AND PROVIDE OWNER AND ENGINEER WITH A DETAILED REPORT RECARDINC ANY ISSUES THAT CONTRACTOR DISCOVERS DURING SUCH PERFORMANCE TESTING.
    - B. PROVIDE FINAL CLEANUP AND CONDUCT FIELD TESTS AFTER INSTALLATION OF ALL ELECTRICAL WORK. ADJUST ITEMS TO THE SATISFACTION OF THE OWNER AND ENGINEER. LEAVE ALL EQUIPMENT INTERIORS CLEAN AND FREE FROM CONSTRUCTION DEBRIS. NEATLY DRESS ALL WIRING, AND RE-TICHTEN ALL TERMINATIONS PER MANUFACTURERS' RECOMMENDATIONS.
    - C. AS A CONDITION OF ACHIEVING SUBSTANTIAL COMPLETION, CONTRACTOR SHALL COMPLETE ALL ITEMS IDENTIFIED IN THE PUNCHLIST. PUNCHLIST SHALL BE PREPARED BY OWNER AND OWNER'S ENGINEER.

REQUEST FOR INFORMATION:

UNLESS SPECIFIED DIFFERENTLY IN THE CONTRACT DOCUMENTS:

ALL QUESTIONS OR REQUESTS FOR INFORMATION (RFI) SHALL BE SUBMITTED IN WRITING DIRECTLY TO OWNER. PLEASE INCLUDE: I) DATE; 2) THE PROJECT NAME; 3) FIRM NAME; 4) YOUR NAME ; 5) DRAWING NUMBER, DATE AND REVISION NUMBER AND/OR SPECIFICATION SECTION REFERENCE; AND 6) ADEQUATE SPACE FOR REPLY. OWNER WILL REFER ALL ENGINEERINC RFIs TO THE PRIME CONSULTANT AS DETERMINED BY OWNER.

UNDOCUMENTED PHONE CALLS SHALL NOT BE USED AS A BASIS FOR ANY FUTURE CONTRACTOR CLAIMS.

13. **WIRING AND WIRING METHODS:**
    - A. IF APPLICABLE, PV MODULES SHALL FOLLOW SKIP STRINGING WITH TYP. WIRE MANAGEMENT PRACTICES. ALL CONNECTORS SHALL BE MANUFACTURER & ENGINEER APPROVED.
    - B. HOMERUNS FROM THE STRINGS BACK TO THE DC COMBINERS, AND FROM THE COMBINERS BACK TO THE INVERTERS, SHALL BE SIZED AS NOTED ON THE PLANS. ALL HOMERUNS SHALL BE MIN. #10 AWC. PROVIDE #10 AWG GREEN GROUNDING CONDUCTOR WITH EACH STRING. NO STRING CABLE LENGTH (ROUND-TRIP) SHALL EXCEED 1000'.

14. **UTILITY COORDINATION:**
    - A. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ITS WORK WITH THE OWNER AND UTILITY.
    - B. IT WILL BE NECESSARY FOR THE UTILITY TO INSTALL REVENUE METERING AND UTILITY RELAYING AND RECLOSER. THE CONTRACTOR SHALL COORDINATE ITS WORK WITH THE UTILITY AND OWNER. OVERHEAD POLE MOUNTED WIRING WILL BE NECESSARY TO ACCOMMODATE THE CONNECTION OF THE SOLAR SYSTEM TO THE GRID AT THE DESIGNATED POI
    - C. FURNISH OVERHEAD WIRE TO MATCH UTILITY CABLE IN TYPE AND SIZE.
    - D. PULL LINE TENSION TO UTILITY REQUIREMENTS AND INSTALL GUYING AS DETAILED ON THE PLANS.
    - E. INSTALL ALL OVERHEAD W EQUIPMENT TO MANUFACTURER'S REQUIREMENTS. AS NOTED ON THE PLANS AND TO UTILITY REQUIREMENTS. SET RELAYS AND RECLOSERS

15. **MARKING OR LABELING:**
    - A. SHALL COMPLY WITH NEC.
    - B. FOR LOW VOLTAGE AC AND ALL DC MAIN DISCONNECTS, PROVIDE LABELS
      - a. WARNING
      - b. ELECTRIC SHOCK HAZARD
      - c. DO NOT TOUCH TERMINALS
      - d. TERMINALS ON BOTH THE LINE AND LOAD SIDES
      - e. MAY BE ENERGIZED IN THE OPEN POSITION
    - C. FOR MAIN AC DISCONNECT, ALSO PROVIDE THE FOLLOWING LABEL:
      - a. PLACE THIS SWITCH IN THE
      - b. "OFF" POSITION TO SHUTDOWN PV
      - c. SYSTEM AND REDUCE SHOCK HAZARD
      - d. IN THE ARRAY.
    - D. FOR NEW AC COMBINER AND OCPD PANELS, PROVIDE LABEL:
      - a. WARNING
      - b. MULTIPLE POWER SOURCES

16. **EQUIPMENT:** ALL MAJOR EQUIPMENT SHALL BE AS INDICATED BY THE OWNER.

MUNICIPALITY APPROVAL STAMP

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PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:
GENERAL NOTES

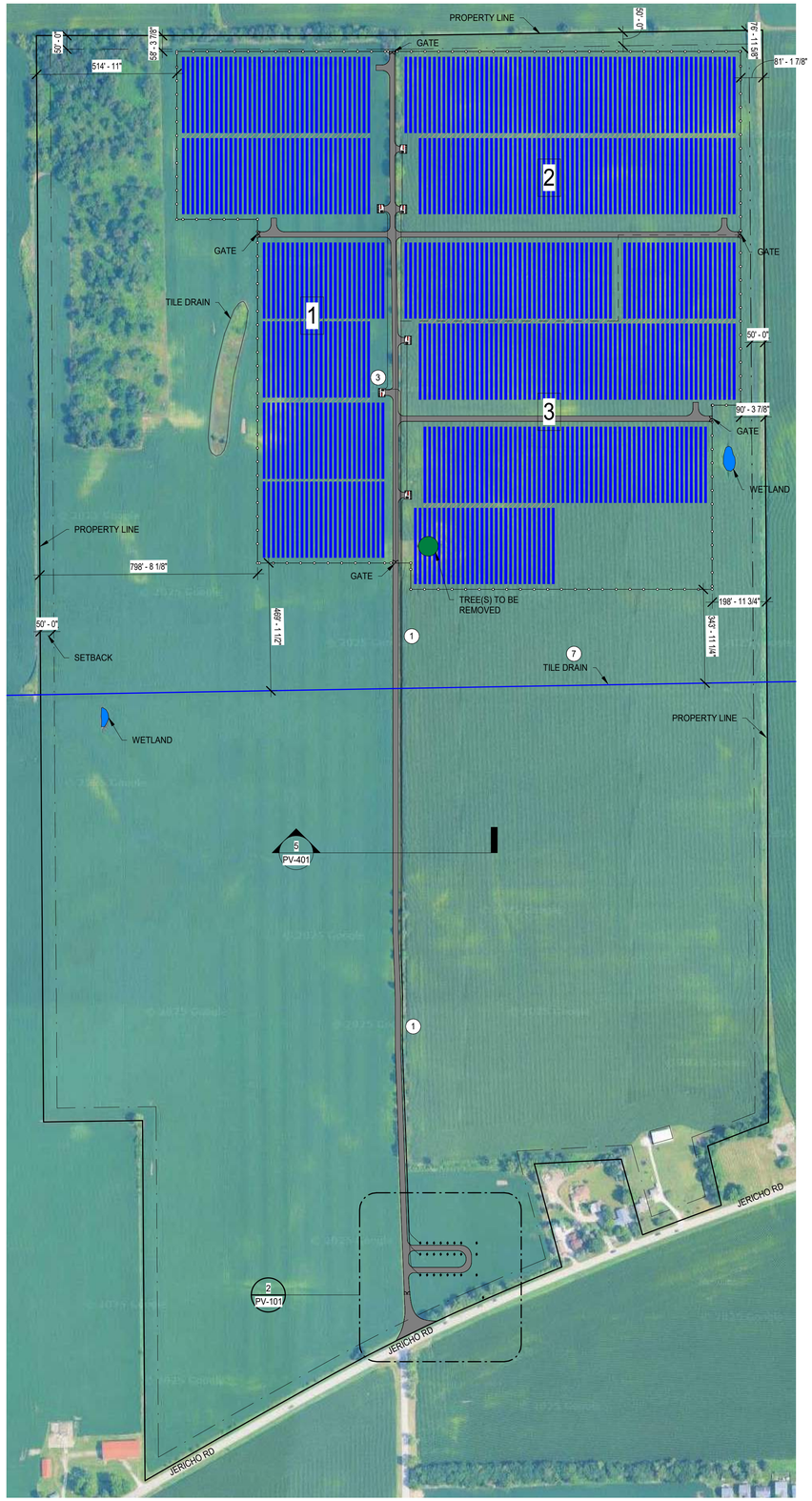
PROJECT #:
IW-101

SHEET:
PV-003

GENERAL NOTE

1. FENCING AND ACCESS ROADS ARE SHOWN FOR REFERENCE AND COORDINATION ONLY. REFER TO CIVIL DWG FOR FINAL DESIGN.
2. WETLAND, TILE DRAIN, AND OTHER SITE ENVIRNOMENTAL RELATED ASPECTS ARE SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO OWNER PROVIDED STUDIES AND SURVEYES FOR EXACT INFORMATION.

2 ENLARGED POI PLAN
SCALE: 1" = 60'-0"

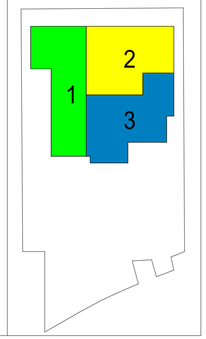


1 SITE PLAN
SCALE: 1" = 250'-0"

KEY NOTES

#	
1	MAINTAIN 6' FROM THE EDGE OF THE ROAD TO THE FIRST CONDUIT. PROVIDE A BUFFER ZONE OF 3' STARTING FROM THE LAST CONDUIT IN THE DIRECTION AWAY FROM THE ROAD.
2	TYP. MIN. CLEARANCE FOR ALL POLES WITH EQUIPMENT.
3	EQUIPMENT YARD TYP. OF ALL.
4	POLE LAYOUT, EQUIPMENT AND ARRANGEMENT IS TYP. FOR EACH SYSTEM
5	UTILITY POLE. SIZE, SPEC. AND SPACING TO BE DETERMINED BY THE UTILITY. WORK TO BE UNDERTAKEN BY THE UTILITY; SHOWN FOR INFORMATION PUPOSES ONLY.
6	ALL POLES ARE TO BE 60' TALL AND CLASS 1.
7	APPROX. LOCATION SHOWN FOR REFERENCE ONLY. REFER TO FINAL TILE DRAIN SURVEY.

KEYPLAN



MUNICIPALITY APPROVAL STAMP

CLIENT:
CLEAN FIELD POWER
211 ISLAND RD,
MAHWAH, NJ 07430

CONTRACTOR:
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NAPERVILLE, IL 60565
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PROFESSIONAL DESIGN FIRM # 184.008367-0002

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SME SEVEE & MAHER ENGINEERS
4 BLANCHARD ROAD,
PO BOX 85A, CUMBERLAND
MAINE 04021
207-829-5016
sme-engineers.com

PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:
SITE PLAN

PROJECT #:
IW-101

SHEET:
PV-101

GENERAL NOTE

1. FENCING AND ACCESS ROADS ARE SHOWN FOR REFERENCE AND COORDINATION ONLY. REFER TO CIVIL DWG FOR FINAL DESIGN.
2. WETLAND, TILE DRAIN, AND OTHER SITE ENVIRNOMENTAL RELATED ASPECTS ARE SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO OWNER PROVIDED STUDIES AND SURVEYES FOR EXACT INFORMATION.

SYSTEM SIZE - DC	SYSTEM SIZE - AC
7037 kW	5000 kW

INVERTERS

POWER	QTY	MANUFACTURER	MODEL	AC VOLTAGE	DC VOLTAGE
250 kW	20	SOLECTRIA	XGI 1500-250	600 V	1500 V

MODULES & STRINGS

SIZE	MANUFACTURER	MODEL	QTY	STRING SIZE	APPROX. # OF STRINGS
540 W	WAAREE	Bi-55-540	13032	24	543

TRANSFORMERS

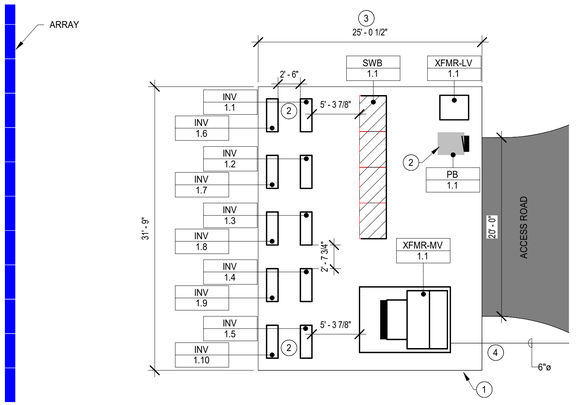
		SECONDARY		PRIMARY	
QTY	kVA (EACH)	SECONDARY VOLTAGE	WINDINGS	PRIMARY VOLTAGE (POI)	WINDINGS
2	2500	600 V	WYE	34500 V	DELTA

RACKING

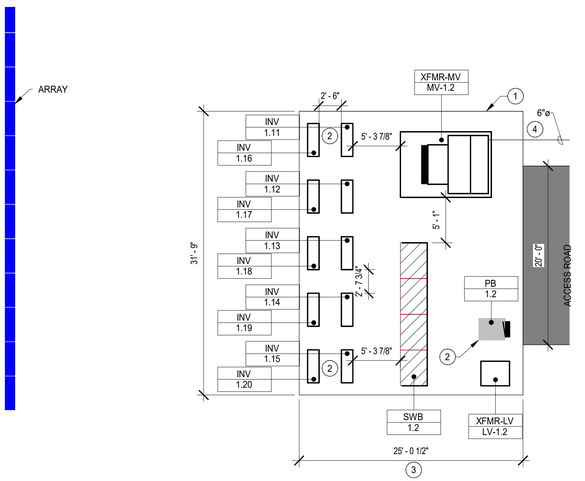
GCR	PITCH	RACKING TYPE	MODULE ORIENTATION
43.9	17" - 9"	SINGLE AXIS TRACKER	POTRAIT

(#) KEY NOTES

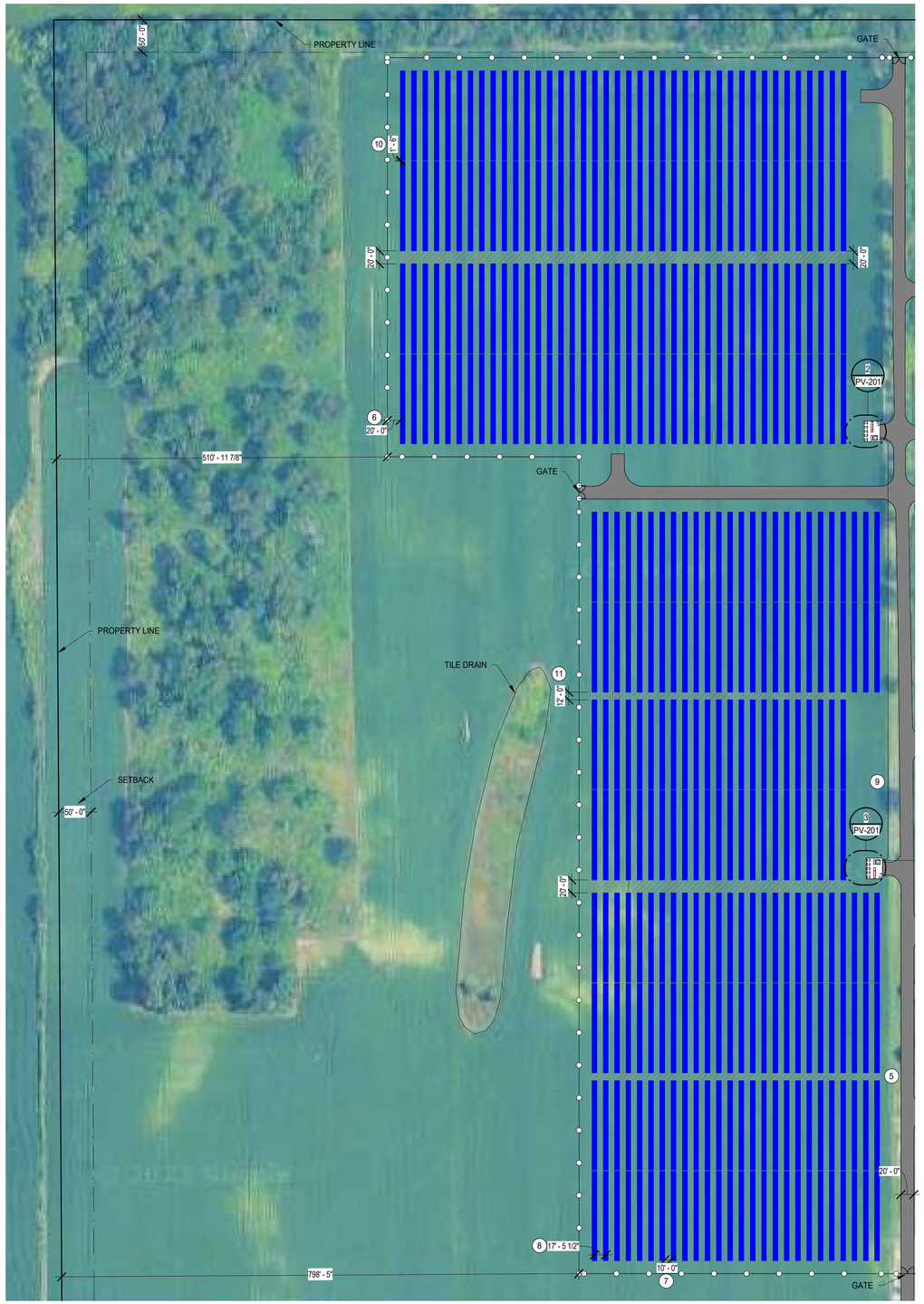
1. STRUCTURAL FOUNDATION PAD FOR THE SOLAR AND ELECTRICAL EQUIPMENT.
2. INSTALL EQUIPMENT ON STRUCTURAL SUPPORT. REFER TO MANUFACTURER. INSTRUCTIONS.
3. MAINTAIN CLEARANCES SHOWN. TYP. OF ALL DIMENSIONS LISTED.
4. MIN. COVER: 36" FROM FINISHED GRADE TO TOP OF CONDUIT.
5. MAINTAIN 6' FROM THE EDGE OF THE ROAD TO THE FIRST CONDUIT. PROVIDE A BUFFER ZONE OF 3' STARTING FROM THE LAST CONDUIT IN THE DIRECTION AWAY FROM THE ROAD.
6. TYP. DISTANCE FROM FENCE TO ALL PANELS UNLESS NOTED OTHERWISE
7. ROW TO ROW SPACING.
8. ROW PITCH.
9. MV CONDUIT FROM THE SOLAR SYSTEMS. MAINTAIN MIN. 36" COVER FROM GRADE TO TOP OF CONDUIT. REFER TO DETAIL.
10. CLEARNANCE PROVIDED FOR TRACKER MOTOR INSTALLATION. TYPICAL OF ALL ARRAYS. RACKING DESIGN TO FINALIZE EXACT REQUIREMENTS.
11. ALL AISLEWAYS ARE TO BE TYPICAL TO THIS DIMENSION UNLESS STATED OTHERWISE.



2 EQUIPMENT YARD - 1.1
SCALE: 1/8" = 1'-0"



3 EQUIPMENT YARD - 1.2
SCALE: 1/8" = 1'-0"



1 SOLAR LAYOUT SYSTEM -1
SCALE: 1" = 100'-0"

MUNICIPALITY APPROVAL STAMP

CLIENT:
CLEAN FIELD POWER
211 ISLAND RD,
MAHWAH, NJ 07430

CONTRACTOR:
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NAPERVILLE, IL 60565
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ELECTRICAL ENGINEER:
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PROFESSIONAL DESIGN FIRM # 184.008367-0002

CIVIL ENGINEER:
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207-829-5016
sme-engineers.com

PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

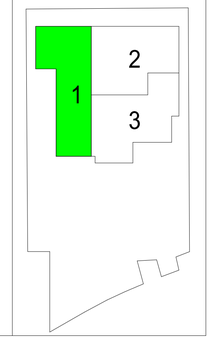
DATE: 09/12/2025

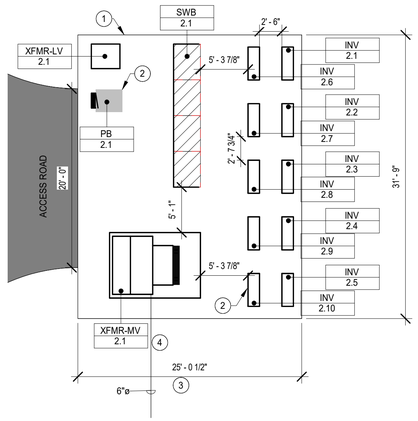
TITLE:
SOLAR LAYOUT SYSTEM -1

PROJECT #:
IW-101

SHEET:
PV-201

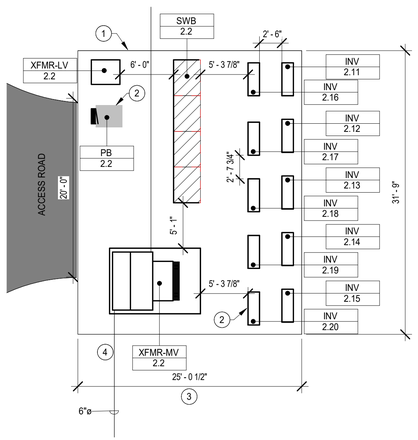
KEYPLAN





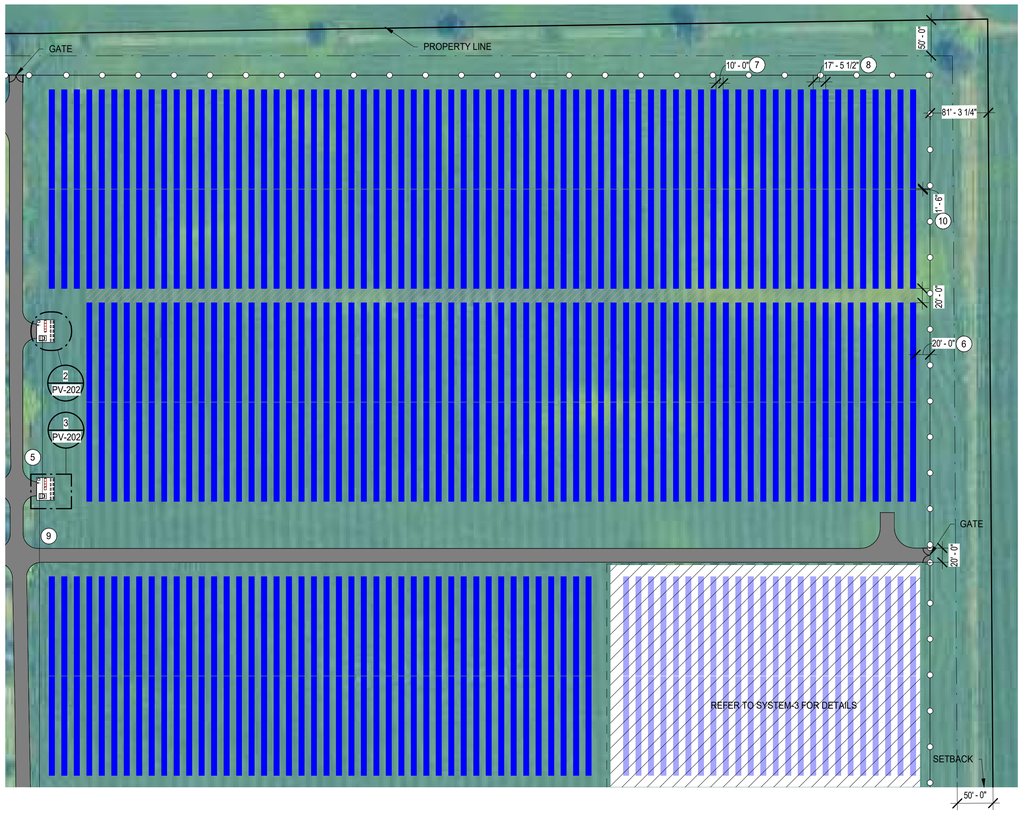
2 EQUIPMENT YARD - 2.1

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



3 EQUIPMENT YARD - 2.2

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



1 SOLAR LAYOUT SYSTEM - 2

SCALE: 1" = 100'-0"

GENERAL NOTE

1. FENCING AND ACCESS ROADS ARE SHOWN FOR REFERENCE AND COORDINATION ONLY. REFER TO CIVIL DWG FOR FINAL DESIGN.
2. WETLAND, TILE DRAIN, AND OTHER SITE ENVIRNOMENTAL RELATED ASPECTS ARE SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO OWNER PROVIDED STUDIES AND SURVEYES FOR EXACT INFORMATION.

SYSTEM SIZE - DC	SYSTEM SIZE - AC
7037 kW	5000 kW

INVERTERS

POWER	QTY	MANUFACTURER	MODEL	AC VOLTAGE	DC VOLTAGE
250 kW	20	SOLECTRIA	XGI 1500-250	600 V	1500 V

MODULES & STRINGS

SIZE	MANUFACTURER	MODEL	QTY	STRING SIZE	APPROX. # OF STRINGS
540 W	WAAREE	Bi-55-540	13032	24	543

TRANSFORMERS

		SECONDARY		PRIMARY	
QTY	kVA (EACH)	SECONDARY VOLTAGE	WINDINGS	PRIMARY VOLTAGE (POI)	WINDINGS
2	2500	600 V	WYE	34500 V	DELTA

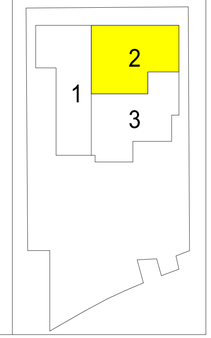
RACKING

GCR	PITCH	RACKING TYPE	MODULE ORIENTATION
43.9	17° - 9"	SINGLE AXIS TRACKER	POTRAIT

KEY NOTES

#	
1	STRUCTURAL FOUNDATION PAD FOR THE SOLAR AND ELECTRICAL EQUIPMENT.
2	INSTALL EQUIPMENT ON STRUCTURAL SUPPORT. REFER TO MANUFACTURER. INSTRUCTIONS.
3	MAINTAIN CLEARANCES SHOWN TYP. OF ALL DIMENSIONS LISTED.
4	MIN. COVER: 36" FROM FINISHED GRADE TO TOPT OF CONDUIT.
5	MAINTAIN 6' FROM THE EDGE OF THE ROAD TO THE FIRST CONDUIT. PROVIDE A BUFFER ZONE OF 3' STARTING FROM THE LAST CONDUIT IN THE DIRECTION AWAY FROM THE ROAD.
6	TYP. DISTANCE FROM FENCE TO ALL PANELS UNLESS NOTED OTHERWISE
7	ROW TO ROW SPACING.
8	ROW PITCH.
9	MV CONDUIT FROM THE SOLAR SYSTEMS. MAINTAIN MIN. 36" COVER FROM GRADE TO TOP OF CONDUIT. REFER TO DETAIL.
10	CLEARNANCE PROVIDED FOR TRACKER MOTOR INSTALLATION. TYPICAL OF ALL ARRAYS. RACKING DESIGN TO FINALIZE EXACT REQUIREMENTS.

KEYPLAN



MUNICIPALITY APPROVAL STAMP

CLIENT:

CLEAN FIELD POWER

211 ISLAND RD,
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CONTRACTOR:

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PROFESSIONAL DESIGN FIRM #
184.008367-0002

CIVIL ENGINEER:

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DESIGN FIRM NO. 184.008857-0002

SME SEVEE & MAHER ENGINEERS

4 BLANCHARD ROAD,
PO BOX 85A, CUMBERLAND
MAINE 04021
207-829-5016
sme-engineers.com

PROJECT NAME:

ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE
COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:

NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:

SOLAR LAYOUT SYSTEM-2

PROJECT #:

IW-101

SHEET:

PV-202

GENERAL NOTE

1. FENCING AND ACCESS ROADS ARE SHOWN FOR REFERENCE AND COORDINATION ONLY. REFER TO CIVIL DWG FOR FINAL DESIGN.
2. WETLAND, TILE DRAIN, AND OTHER SITE ENVIRNOMENTAL RELATED ASPECTS ARE SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO OWNER PROVIDED STUDIES AND SURVEYES FOR EXACT INFORMATION.

SYSTEM SIZE - DC	SYSTEM SIZE - AC
7037 kW	5000 kW

INVERTERS

POWER	QTY	MANUFACTURER	MODEL	AC VOLTAGE	DC VOLTAGE
250 kW	20	SOLECTRIA	XGI 1500-250	600 V	1500 V

MODULES & STRINGS

SIZE	MANUFACTURER	MODEL	QTY	STRING SIZE	APPROX. # OF STRINGS
540 W	WAAREE	Bi-55-540	13032	24	543

TRANSFORMERS

		SECONDARY		PRIMARY	
QTY	kVA (EACH)	SECONDARY VOLTAGE	WINDINGS	PRIMARY VOLTAGE (POI)	WINDINGS
2	2500	600 V	WYE	34500 V	DELTA

RACKING

GCR	PITCH	RACKING TYPE	MODULE ORIENTATION
43.9	17' - 9"	SINGLE AXIS TRACKER	POTRAIT

(#) KEY NOTES

1	STRUCTURAL FOUNDATION PAD FOR THE SOLAR AND ELECTRICAL EQUIPMENT.
2	INSTALL EQUIPMENT ON STRUCTURAL SUPPORT. REFER TO MANUFACTURER. INSTRUCTIONS.
3	MAINTAIN CLEARANCES SHOW TYP. OF ALL DIMENSIONS LISTED.
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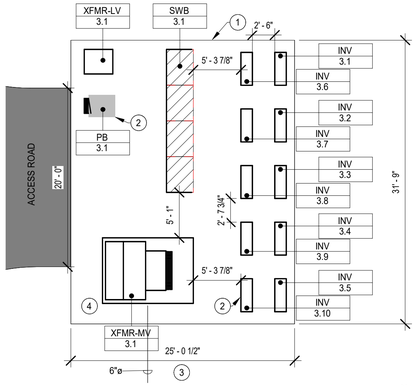
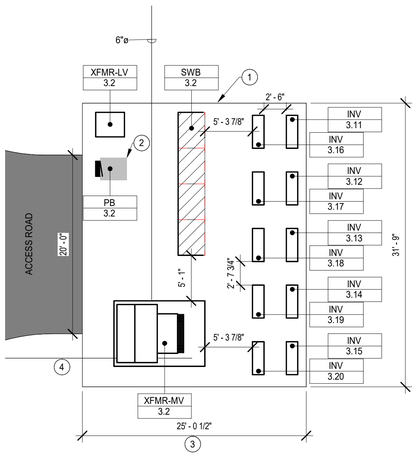
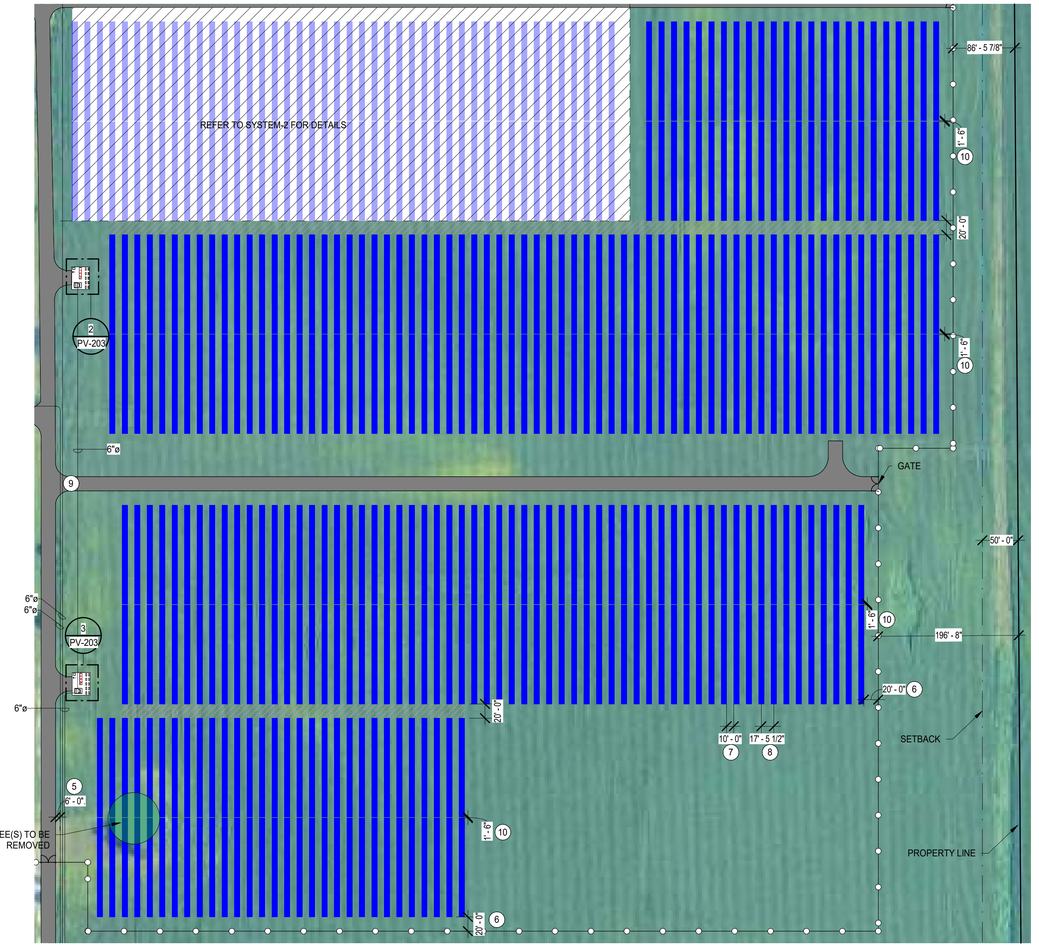


2 EQUIPMENT YARD - 3.1
SCALE: 1/8" = 1'-0"



3 EQUIPMENT YARD - 3.2
SCALE: 1/8" = 1'-0"



1 SOLAR LAYOUT SYSTEM - 3
SCALE: 1" = 100'-0"

MUNICIPALITY APPROVAL STAMP

CLIENT:
CLEAN FIELD POWER
211 ISLAND RD,
MAHWAH, NJ 07430

CONTRACTOR:
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ELECTRICAL ENGINEER:
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PROFESSIONAL DESIGN FIRM # 184.008367-0002

CIVIL ENGINEER:
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rwalker@bonoconsulting.com
DESIGN FIRM NO. 184.008857-0002

SME SEVEE & MAHER ENGINEERS
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PO BOX 85A, CUMBERLAND
MAINE 04021
207-829-5016
sme-engineers.com

PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

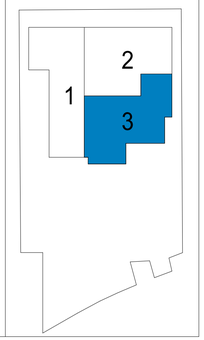
DATE: 09/12/2025

TITLE:
SOLAR LAYOUT SYSTEM-3

PROJECT #:
IW-101

SHEET:
PV-203

KEYPLAN



SYSTEM SIZE - DC	SYSTEM SIZE - AC
7037 kW	5000 kW

INVERTERS

POWER	QTY	MANUFACTURER	MODEL	AC VOLTAGE	DC VOLTAGE
250 kW	20	SOLECTRIA	XGI 1500-250	600 V	1500 V

MODULES & STRINGS

SIZE	MANUFACTURER	MODEL	QTY	STRING SIZE	APPROX. # OF STRINGS
540 W	WAAREE	Bi-55-540	13032	24	543

TRANSFORMERS

		SECONDARY		PRIMARY	
QTY	kVA (EACH)	SECONDARY VOLTAGE	WINDINGS	PRIMARY VOLTAGE (POI)	WINDINGS
2	2500	600 V	WYE	34500 V	DELTA

RELAY SEL-651R SETTINGS

ANSI	PICKUP		RELAY CLEAR TIME	TOTAL CLEARING TIME
	NOMINAL L-L VOLTAGE (KV): 35kV RATED CURRENT (A) 83.7A : 231.5 A VT RATIO: 166:1 10,000:1 CT RATIO: 200:1			
#	PICKUP	PRIMARY PICKUP	SECONARY PICKUP	CYCLES : SECONDS)	CYCLES : SECONDS)
27-1	50%	17,500 VAC	60.9 VAC	63 : 1.05	66 : 1.1
27-2	88%	30,800 VAC	107.1 VAC	117 : 1.95	120 : 2
59-1	110%	38,500 VAC	133.9 VAC	117 : 1.95	120 : 2
59-2	120%	42,000 VAC	146.1 VAC	66 : 0.11	9.6 : 0.16
59N	20%	7,000 VAC	24.35 VAC	27 : 0.45	30 : 0.5
50	1400%	1,171.24 A	5.856 A	INSTANTANEOUS	
51	125%	114.78 A	0.574 A	TD. 2U4 CURVE	
51G	20%	153.10 A	0.765 A	TD. 2U4 CURVE	
	FREQUENCY				
81U-1	56.5Hz			6.6 : 0.11	9.6 : 0.16
81U-2	58.5Hz			17997 : 299.5	18000 : 300
610-1	61.2Hz			17997 : 299.5	18000 : 300
810-2	62Hz			6.6 : 0.11	9.6 : 0.16

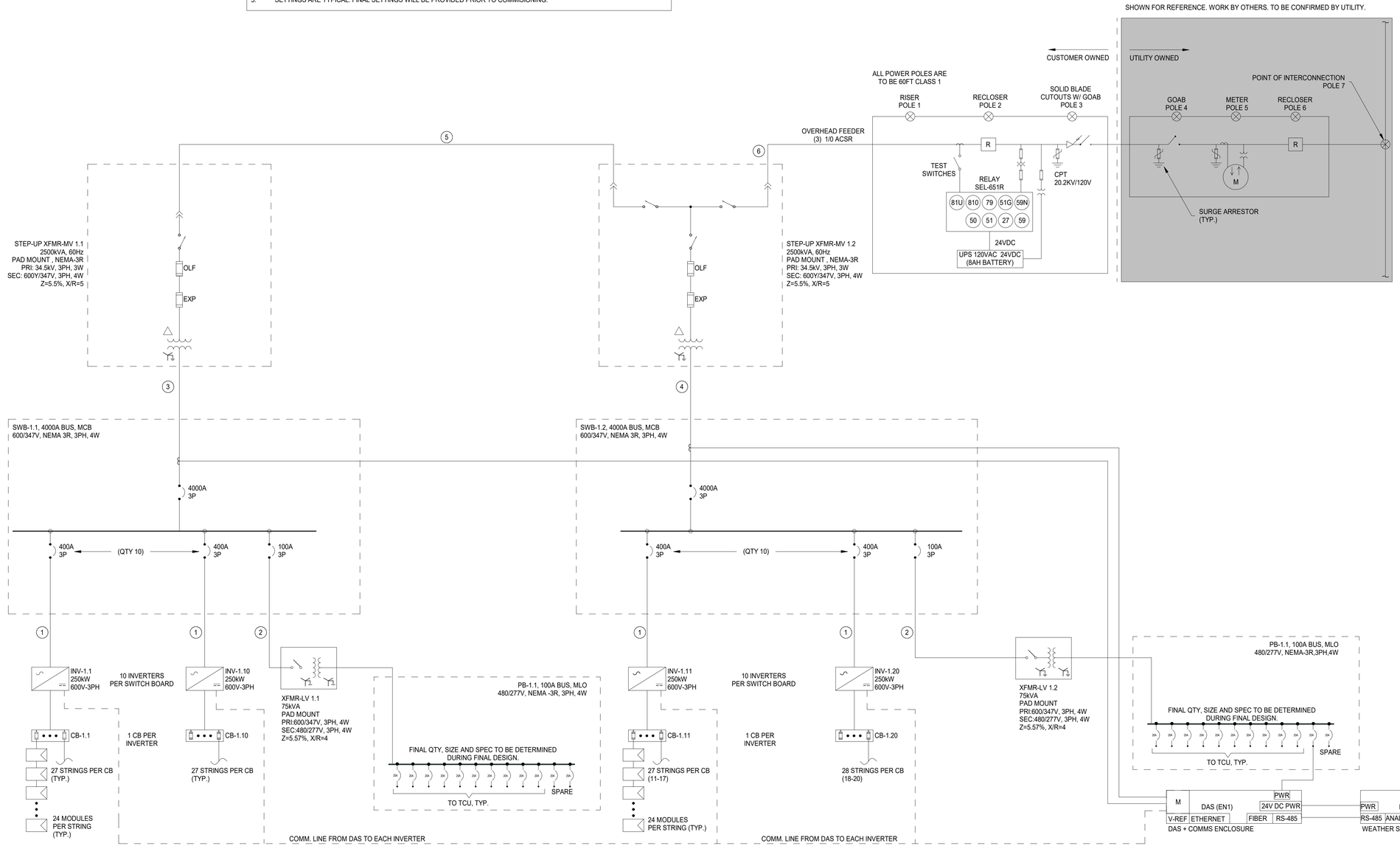
RELAY NOTES:
1. TOTAL CLEARING TIME INCLUDES AN ESTIMATED 3 CYCLES OPENING TIME (0.05 SEC).
2. THE TRIP CIRCUIT IS POWERED BY 24 VDC SOURCE.
3. THE RELAY WILL TRIP THE CUSTOMER RECLOSER WITHIN 2-SEC ON LOSS OF DC POWER, HARDWARE FAULT, AND PROGRAM FAULT.
4. AUTO-RESTORATION (79) ELEMENT IS ENABLED FOR VOLTAGE AND FREQUENCY EVENTS ONLY. THE DER. WILL NOT CONNECT OR RETURN TO SERVICE FOLLOWING A TRIP UNTILL HEALTH VOLTAGE AND FREQUENCY HAVE BEEN MAINTAINED FOR A MIN. 5 MINUTES. TRIPS ON OVERCURRENT ARE REQUIRED TO BE MANUALLY CLOSED.
5. SETTINGS ARE TYPICAL. FINAL SETTINGS WILL BE PROVIDED PRIOR TO COMMISIONING.

AC CABLING SCHEDULE

TAG	FROM	TO	Power, W	Operating Voltage, V	Running Current, A	Current w/ 25% Protection, A	Cable Length, ft	Adjusted Current, A*	Parallel Sets	Resistance (R) (Ohms / 1000ft)	Final Conductor Size (AL)	Ground Wire (Cu)	Voltage Drop, %	Voltage Drop, Dvac	Conduit Type	Conduit Size (in)
1	INVs	SBs	250,000	600	240.57	300.71	75	391.55	1	0.031	750 KCMIL	1/0 AWG	0.26%	1.58	PVC SCH40	3.50
2	SWBs	XFMR-LVs	75,000	600	72.17	90.21	75	117.47	1	0.2	1/0 AWG	8 AWG	0.52	3.09	PVC SCH40	1.5
3	SWB 1.1	XFMR-MV 1.1	2,500,000	600	2405.70	3007.12	50	3915.52	12	0.0037	600 KCMIL	1/0 AWG	0.21%	1.25	PVC SCH40	3.5
4	SWB 1.2	XFMR-MV 1.2	2,500,000	600	2405.70	3007.12	50	3915.52	12	0.0037	600 KCMIL	1/0 AWG	0.21%	1.25	PVC SCH40	3.5
5	XFMR-MV 1.1	XFMR-MV 1.2	2,500,000	34,500	41.84	52.03	750	68.10	1	0.116	1/0 AWG	8 AWG	0.083%	28.6	PVC SCH80	6
6	XFMR-MV 1.2	OVERHEAD	5,000,000	34,500	83.68	104.60	3600	136.19	1	0.16	2/0 AWG	6 AWG	0.651%	224.5	PVC SCH80	6

NOTES:
1. ALL CONDUCTORS ALUMINUM UNLESS NOTED; STRANDED, COMPACT, ASTM COMPLIANT.
2. 600V FEEDERS: AL XHHW-2, 90 °C WET/DRY, AMPACITIES PER NEC 310.15.
3. MV 34.5 KV FEEDERS: AL SHIELDED CABLE, MV-105 XLPE/EPR, CONCENTRIC NEUTRAL OR TAPE SHIELD, PER ICEA/NEMA.
4. TERMINATIONS/SPLICES: IEEE 48/404 LISTED, COLD/HEAT SHRINK, AL-RATED LUGS WITH OXIDE INHIBITOR.
5. INSTALL PER NEC; MIN BEND RADIUS PER MFR.; BURIAL/CONDUIT PER NEC 300.5.

*ADJUSTMENT BASED ON TEMPERATURE CORRECTION FACTOR AND CONDUIT FILL COEFFICIENT



MUNICIPALITY APPROVAL STAMP

CLIENT:
CLEAN FIELD POWER
211 ISLAND RD,
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CONTRACTOR:
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PROFESSIONAL DESIGN FIRM # 184.008367-0002

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PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:
SINGLE LINE DIAGRAM - SYSTEM-1

PROJECT #:
IW-101

SHEET:
PV-301

SYSTEM SIZE - DC	SYSTEM SIZE - AC
7037 kW	5000 kW

INVERTERS

POWER	QTY	MANUFACTURER	MODEL	AC VOLTAGE	DC VOLTAGE
250 kW	20	SOLECTRIA	XGI 1500-250	600 V	1500 V

MODULES & STRINGS

SIZE	MANUFACTURER	MODEL	QTY	STRING SIZE	APPROX. # OF STRINGS
540 W	WAAREE	Bi-55-540	13032	24	543

TRANSFORMERS

		SECONDARY		PRIMARY	
QTY	kVA (EACH)	SECONDARY VOLTAGE	WINDINGS	PRIMARY VOLTAGE (POI)	WINDINGS
2	2500	600 V	WYE	34500 V	DELTA

RELAY SEL-651R SETTINGS

ANSI	PICKUP			RELAY CLEAR TIME	TOTAL CLEARING TIME
	NOMINAL L-L VOLTAGE (KV): 35kV RATED CURRENT (A) 83.7A : 231.5 A VT RATIO: 166:1 10,000:1 CT RATIO: 200:1				
#	PICKUP	PRIMARY PICKUP	SECONARY PICKUP	CYCLES : SECONDS)	CYCLES : SECONDS)
27-1	50%	17,500 VAC	60.9 VAC	63 : 1.05	66 : 1.1
27-2	88%	30,800 VAC	107.1 VAC	117 : 1.95	120 : 2
59-1	110%	38,500 VAC	133.9 VAC	117 : 1.95	120 : 2
59-2	120%	42,000 VAC	146.1 VAC	66 : 0.11	9.6 : 0.16
59N	20%	7,000 VAC	24.35 VAC	27 : 0.45	30 : 0.5
50	1400%	1,171.24 A	5.856 A	INSTANTANEOUS	
51	125%	114.78 A	0.574 A	TD. 2U4 CURVE	
51G	20%	153.10 A	0.765 A	TD. 2U4 CURVE	
	FREQUENCY				
81U-1	56.5Hz			6.6 : 0.11	9.6 : 0.16
81U-2	58.5Hz			17997 : 299.5	18000 : 300
610-1	61.2Hz			17997 : 299.5	18000 : 300
810-2	62Hz			6.6 : 0.11	9.6 : 0.16

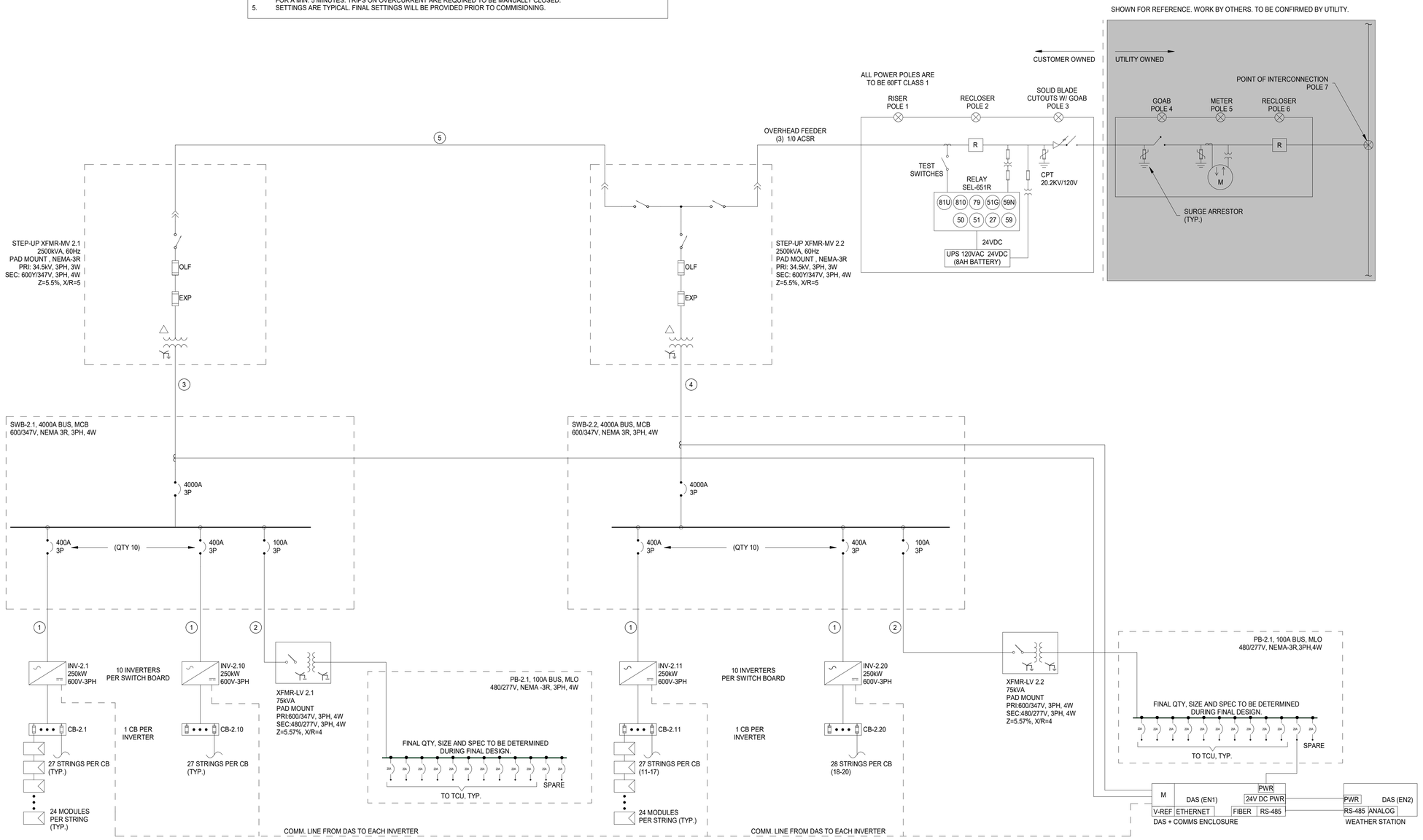
RELAY NOTES:
1. TOTAL CLEARING TIME INCLUDES AN ESTIMATED 3 CYCLES OPENING TIME (0.05 SEC).
2. THE TRIP CIRCUIT IS POWERED BY 24 VDC SOURCE.
3. THE RELAY WILL TRIP THE CUSTOMER RECLOSER WITHIN 2-SEC ON LOSS OF DC POWER, HARDWARE FAULT, AND PROGRAM FAULT.
4. AUTO-RESTORATION (79) ELEMENT IS ENABLED FOR VOLTAGE AND FREQUENCY EVENTS ONLY. THE DER. WILL NOT CONNECT OR RETURN TO SERVICE FOLLOWING A TRIP UNTILL HEALTH VOLTAGE AND FREQUENCY HAVE BEEN MAINTAINED FOR A MIN. 5 MINUTES. TRIPS ON OVERCURRENT ARE REQUIRED TO BE MANUALLY CLOSED.
5. SETTINGS ARE TYPICAL. FINAL SETTINGS WILL BE PROVIDED PRIOR TO COMMISIONING.

AC CABLING SCHEDULE

TAG	FROM	TO	Power, W	Operating Voltage, V	Running Current, A	Current w/ 25% Protection, A	Cable Length, ft	Adjusted Current, A*	Parallel Sets	Resistance (R) (Ohms / 1000ft)	Final Conductor Size (AL)	Ground Wire (Cu)	Voltage Drop, %	Voltage Drop, Dvac	Conduit Type	Conduit Size (in.)
1	INVs	SBs	250,000	600	240.57	300.71	75	391.55	1	0.031	750 KCMIL	1/0 AWG	0.26%	1.58	PVC SCH40	3.50
2	SWBs	XFMR-LVs	75,000	600	72.17	90.21	75	117.47	1	0.2	1/0 AWG	8 AWG	0.52	3.09	PVC SCH40	1.5
3	SWB 2.1	XFMR-MV 2.1	2,500,000	600	2405.70	3007.12	50	3915.52	12	0.0037	600 KCMIL	1/0 AWG	0.21%	1.25	PVC SCH40	3.5
4	SWB 2.2	XFMR-MV 2.2	2,500,000	600	2405.70	3007.12	50	3915.52	12	0.0037	600 KCMIL	1/0 AWG	0.21%	1.25	PVC SCH40	3.5
5	XFMR-MV 2.1	XFMR-MV 2.2	2,500,000	34,500	41.84	52.03	300	68.10	1	0.116	1/0 AWG	8 AWG	0.033%	11.5	PVC SCH80	6
6	XFMR-MV 2.2	OVERHEAD	5,000,000	34,500	83.68	104.60	4200	136.19	1	0.16	2/0 AWG	6 AWG	0.759%	261.9	PVC SCH80	6

NOTES:
1. ALL CONDUCTORS ALUMINUM UNLESS NOTED; STRANDED, COMPACT, ASTM COMPLIANT.
2. 600V FEEDERS: AL XHHW-2, 90 °C WET/DRY, AMPACITIES PER NEC 310.15.
3. MV 34.5 KV FEEDERS: AL SHIELDED CABLE, MV-105 XLPE/EPR, CONCENTRIC NEUTRAL OR TAPE SHIELD, PER ICEA/NEMA.
4. TERMINATIONS/SPLICES: IEEE 48/404 LISTED, COLD/HEAT SHRINK, AL-RATED LUGS WITH OXIDE INHIBITOR.
5. INSTALL PER NEC; MIN BEND RADIUS PER MFR.; BURIAL/CONDUIT PER NEC 300.5.

*ADJUSTMENT BASED ON TEMPERATURE CORRECTION FACTOR AND CONDUIT FILL COEFFICIENT



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PROJECT NAME:
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LOCATION:
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SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:
SINGLE LINE DIAGRAM - SYSTEM-2

PROJECT #:
IW-101

SHEET:
PV-302

SYSTEM SIZE - DC	SYSTEM SIZE - AC
7037 kW	5000 kW

INVERTERS

POWER	QTY	MANUFACTURER	MODEL	AC VOLTAGE	DC VOLTAGE
250 kW	20	SOLECTRIA	XGI 1500-250	600 V	1500 V

MODULES & STRINGS

SIZE	MANUFACTURER	MODEL	QTY	STRING SIZE	APPROX. # OF STRINGS
540 W	WAAREE	Bi-55-540	13032	24	543

TRANSFORMERS

		SECONDARY		PRIMARY	
QTY	kVA (EACH)	SECONDARY VOLTAGE	WINDINGS	PRIMARY VOLTAGE (POI)	WINDINGS
2	2500	600 V	WYE	34500 V	DELTA

RELAY SEL-651R SETTINGS

ANSI	PICKUP			RELAY CLEAR TIME	TOTAL CLEARING TIME
	NOMINAL L-L VOLTAGE (KV): 35kV RATED CURRENT (A) 83.7A : 231.5 A VT RATIO: 166:1 10,000:1 CT RATIO: 200:1				
#	PICKUP	PRIMARY PICKUP	SECONARY PICKUP	CYCLES : SECONDS)	CYCLES : SECONDS)
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59-1	110%	38,500 VAC	133.9 VAC	117 : 1.95	120 : 2
59-2	120%	42,000 VAC	146.1 VAC	66 : 0.11	9.6 : 0.16
59N	20%	7,000 VAC	24.35 VAC	27 : 0.45	30 : 0.5
50	1400%	1,171.24 A	5.856 A	INSTANTANEOUS	
51	125%	114.78 A	0.574 A	TD. 2U4 CURVE	
51G	20%	153.10 A	0.765 A	TD. 2U4 CURVE	
FREQUENCY					
81U-1	56.5Hz			6.6 : 0.11	9.6 : 0.16
81U-2	58.5Hz			17997 : 299.5	18000 : 300
610-1	61.2Hz			17997 : 299.5	18000 : 300
810-2	62Hz			6.6 : 0.11	9.6 : 0.16

RELAY NOTES:
1. TOTAL CLEARING TIME INCLUDES AN ESTIMATED 3 CYCLES OPENING TIME (0.05 SEC).
2. THE TRIP CIRCUIT IS POWERED BY 24 VDC SOURCE.
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4. AUTO-RESTORATION (79) ELEMENT IS ENABLED FOR VOLTAGE AND FREQUENCY EVENTS ONLY. THE DER. WILL NOT CONNECT OR RETURN TO SERVICE FOLLOWING A TRIP UNTILL HEALTH VOLTAGE AND FREQUENCY HAVE BEEN MAINTAINED FOR A MIN. 5 MINUTES. TRIPS ON OVERCURRENT ARE REQUIRED TO BE MANUALLY CLOSED.
5. SETTINGS ARE TYPICAL. FINAL SETTINGS WILL BE PROVIDED PRIOR TO COMMISIONING.

AC CABLING SCHEDULE

TAG	FROM	TO	Power, W	Operating Voltage, V	Running Current, A	Current w/ 25% Protection, A	Cable Length, ft	Adjusted Current, A*	Parallel Sets	Resistance (R) (Ohms / 1000ft)	Final Conductor Size (AL)	Ground Wire (Cu)	Voltage Drop, %	Voltage Drop, Dvac	Conduit Type	Conduit Size (in.)
1	INVs	SBs	250,000	600	240.57	300.71	75	391.55	1	0.031	750 KCMIL	1/0 AWG	0.26%	1.58	PVC SCH40	3.50
2	SWBs	XFMR-LVs	75,000	600	72.17	90.21	75	117.47	1	0.2	1/0 AWG	8 AWG	0.52	3.09	PVC SCH40	1.5
3	SWB 3.1	XFMR-MV 3.1	2,500,000	600	2405.70	3007.12	50	3915.52	12	0.0037	600 KCMIL	1/0 AWG	0.21%	1.25	PVC SCH40	3.5
4	SWB 3.2	XFMR-MV 3.2	2,500,000	600	2405.70	3007.12	50	3915.52	12	0.0037	600 KCMIL	1/0 AWG	0.21%	1.25	PVC SCH40	3.5
5	XFMR-MV 3.1	XFMR-MV 3.2	2,500,000	34,500	41.84	52.03	650	68.10	1	0.116	1/0 AWG	8 AWG	0.072%	24.8	PVC SCH80	6
6	XFMR-MV 3.2	OVERHEAD	5,000,000	34,500	83.68	104.60	3000	136.19	1	0.16	2/0 AWG	6 AWG	0.542%	187.1	PVC SCH80	6

NOTES:
1. ALL CONDUCTORS ALUMINUM UNLESS NOTED; STRANDED, COMPACT, ASTM COMPLIANT.
2. 600V FEEDERS: AL XHHW-2, 90 °C WET/DRY, AMPACITIES PER NEC 310.15.
3. MV 34.5 KV FEEDERS: AL SHIELDED CABLE, MV-105 XLPE/EPR, CONCENTRIC NEUTRAL OR TAPE SHIELD, PER ICEA/NEMA.
4. TERMINATIONS/SPLICES: IEEE 48/404 LISTED, COLD/HEAT SHRINK, AL-RATED LUGS WITH OXIDE INHIBITOR.
5. INSTALL PER NEC; MIN BEND RADIUS PER MFR.; BURIAL/CONDUIT PER NEC 300.5.

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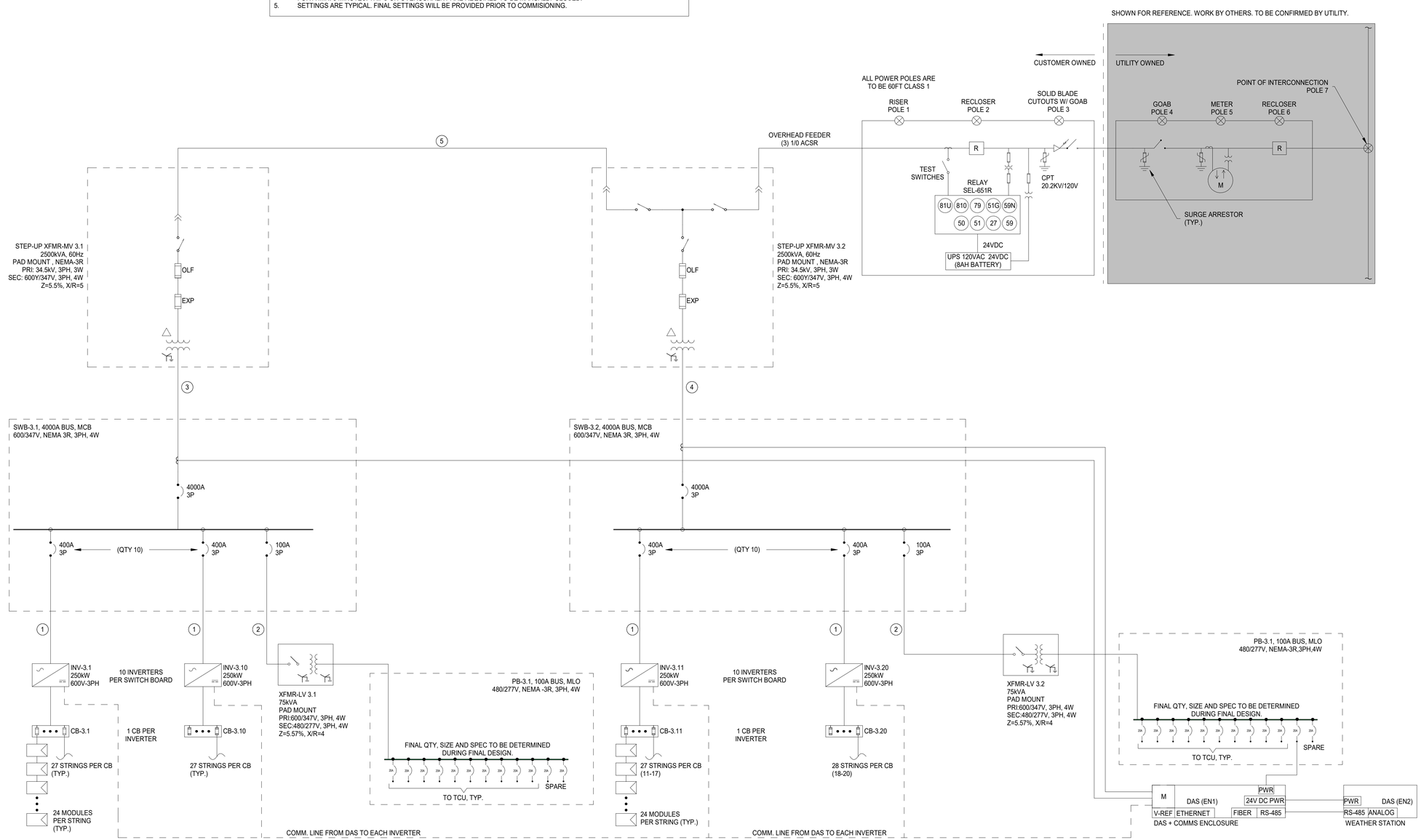

MUNICIPALITY APPROVAL STAMP

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PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:
SINGLE LINE DIAGRAM - SYSTEM-3

PROJECT #:
IW-101

SHEET:
PV-303

INVERTER SCHEDULE (OWNER PROCURED)

					DC INPUT							AC OUTPUT											
TAG	SYSTEM	QUANTITY	MFR.	MODEL #	MAX RATED PV POWER (kW)	MAX INPUT VOLTS (VDC)	MIN INPUT VOLTS (VDC)	OPERATING VOLATGE RANGE	NO OF MPPT TRACKERS	MAX. DC/AC RATIO	MAX RATED PV SHORT CIRCUIT CURRENT(A)	MAX OUTPUT POWER (kW)	OUTPUT VOLATGE (V)	MAX OUTPUT CURRENT I_{MAX}(A)	I_{MAX} (A) x 1.25	OCPD (A)	FAULT CURRENT CONTRIBUTION (1 CYCLE RMS)	NOMINAL OUTPUT FREQUENCY (HZ)	POWER FACTOR (UNITY DEFAULT)	TOTAL HARMONIC DISTORTION (THD)	INV EFFICIENCY CEC %	DEPTH (in)	WIDTH (in)	HEIGHT (in)	WEIGHT (lb)
INV 1.1 - 1.20	1	20	SOLECTRIA	XGI 1500-250 SERIES	500	1500	860	860-1450	1	2	800	250	600	240.6	300.75	400	390	60	+/- 0.80 ADJUSTABLE	< 3%	98.5	15.4	44.3	29.5	290
INV 2.1 - 2.20	2	20	SOLECTRIA	XGI 1500-250 SERIES	500	1500	860	860-1450	1	2	800	250	600	240.6	300.75	400	390	60	+/- 0.80 ADJUSTABLE	< 3%	98.5	15.4	44.3	29.5	290
INV 3.1 - 3.20	3	20	SOLECTRIA	XGI 1500-250 SERIES	500	1500	860	860-1450	1	2	800	250	600	240.6	300.75	400	390	60	+/- 0.80 ADJUSTABLE	< 3%	98.5	15.4	44.3	29.5	290
TOTAL		60																							

NOTES:
1. INV SHALL BE NRTL LISTED TO UL 1741 SA/SB AND COMPLY WITH IEEE 1547-2018.
2. INV SHALL APPEAR ON THE APPLICABLE CEC OR UTILITY APPROVED EQUIPMENT LIST.
3. INC SHALL HAVE MAX DC INPUT RATING SUITABLE FOR 1,500 VDC ARRAYS AND AC OUTPUT RATINGS PER PROJECT DESIGN.
4. INV SHALL BE RATED NEMA 3R/4 OR IP54 MIN FOR OUTDOOR INSTALLATION.
5. USE UTILITY-APPROVED COMMUNICATION PROTOCOLS FOR MONITORING AND CONTROL.

PHOTOVOLTAIC (PV) MODULE SCHEDULE (OWNER PROCURED)

TAG	QUANTITY	MFR.	MODEL #	RATED POWER @ STC P_{MAX} (W)	OPEN CIRCUIT VOLTAGE V_{OC}(V)	MAX POWER VOLTAGE V_{MP}(V)	SHORT CIRCUIT CURRENT I_{SC}(A)	MAX POWER CURRENT I_{MP} (A)	MAX SERIES FUSE RATING (A)	MODULE EFFICIENCY (%)	TEMPERATURE COEFICIENT OF V_{OC} (%/°C)	LENGTH (in)	WIDTH (in)	THICKNESS (in)	WEIGHT (lb)	# OF CELLS half cell	MAX SYSTEM VOLTAGE MODULE RATING (V)
MODULES	39,096	WAAREE	BI-55-540	540	49.61	41.75	13.83	12.95	25	20.98	-0.33	89.45	44.60	1.38	71.65	144	1500

NOTES:
1. MODULES SHALL BE NRTL-LISTED TO UL 61730-1/-2, APPLICATION CLASS A; FIRE TYPE PER NAMEPLATE.
2. MODULES SHALL BE IEC 61215
3. USE UL 2703 LISTED RACKING/BONDING HARDWARE APPROVED FOR THE MODULE.

TRANSFORMER SCHEDULE

									PRIMARY				SECONDARY					
TAG	SYSTEM	QTY.	MFR.	MODEL #	POWER RATING (kVA)	FREQUENCY (HZ)	MOUNTING	ENCLOSURE	VOLTAGE	PHASE	WIRE	WINDING	VOLTAGE	PHASE	WIRE	WINDING	IMPEDENCE (Z)	X/R RATIO
XFMR MV-1.1,1.2	1	2	TBD	TBD	2500	60	PAD	NEMA-3R	34.5kV	3	3	DELTA	600Y/347V	3	4	WYE	5.5%	5
XFMR MV-2.1,2.2	2	2	TBD	TBD	2500	60	PAD	NEMA-3R	34.5kV	3	3	DELTA	600Y/347V	3	4	WYE	5.5%	5
XFMR MV-3.1,3.2	3	2	TBD	TBD	2500	60	PAD	NEMA-3R	34.5kV	3	3	DELTA	600Y/347V	3	4	WYE	5.5%	5
XFMR LV-1.1,1.2	1	2	TBD	TBD	40	60	PAD	NEMA-3R	600V/346V	3	4	WYE	480Y/277V	3	4	WYE	5.57%	4
XFMR LV-2.1,2.2	2	2	TBD	TBD	40	60	PAD	NEMA-3R	600V/346V	3	4	WYE	480Y/277V	3	4	WYE	5.57%	4
XFMR LV-3.1,3.2	3	2	TBD	TBD	40	60	PAD	NEMA-3R	600V/346V	3	4	WYE	480Y/277V	3	4	WYE	5.57%	4
TOTAL		12																

NOTES:
1. TRANSFORMER SHALL BE NRTL-LISTED, DESIGNED AND TESTED TO IEEE C57 AND DOE EFFICIENCY STANDARDS.
2. TRANSFORMER SHALL BE ONAN COOLED, WITH TEMPERATURE RISE PER ANSI/IEEE C57 LIMITS.
3. TRANSFORMER SHALL INCLUDE 65 KV BIL FOR SCEONDARY AND 150 KV BIL FOR PRIMARY MINIMUM.
4. TRANSFORMER SHALL BE PROVIDED WITH DE-ENERGIZED TAP CHANGER (±2.5%, 2 STEPS EACH SIDE) ON THE PRIMARY WINDING.
5. TRANSFORMER SHALL BE LIQUID-FILLED (BIODEGRADABLE MINERAL OIL) IN NEMA 3R PAD-MOUNT ENCLOSURE, WITH TAMPER-PROOF CONSTRUCTION AND DEAD-FRONT HV TERMINATIONS.
6. TRANSFORMER SHALL INCLUDE CURRENT TRANSFORMERS, TEMPERATURE SENSORS, AND PROVISIONS FOR PROTECTIVE RELAYING AS REQUIRED.

SWITCHBOARD SCHEDULE

TAG	QUANTITY	MFR.	MODEL #	BUS RATING (A)	MCB RATING (A)	VOLTAGE (V)	ENCLOSURE	PHASE (ø)	WIRE (W)
SWB-1.1,1.2	2	TBD	TBD	4000	4000	600/347	NEMA-3R	3	4
SWB-2.1,2.2	2	TBD	TBD	4000	4000	600/347	NEMA-3R	3	4
SWB-3.1,3.2	2	TBD	TBD	4000	4000	600/347	NEMA-3R	3	4
TOTAL	6								

NOTES:
1. SWITCHBOARDS SHALL BE NRTL-LISTED TO UL 1558 (SWITCHGEAR >600 V) OR UL 891 (SWITCHBOARDS ≤600 V) AS APPLICABLE.
2. SWITCHBOARDS SHALL BE RATED FOR SYSTEM VOLTAGE AND AVAILABLE FAULT CURRENT, WITH BUS BRACING PER ANSI C37 STANDARDS.
3. SWITCHBOARDS SHALL HAVE COPPER OR ALUMINUM BUS, FULLY INSULATED AND SILVER-PLATED AT JOINTS, WITH PROVISIONS FOR GROUND BUS.
4. SWITCHBOARDS SHALL BE NEMA 3R OUTDOOR RATED WITH PAD-MOUNT/TAMPER-RESISTANT ENCLOSURE UNLESS OTHERWISE SHOWN.
5. SWITCHBOARDS SHALL INCLUDE MAIN AND FEEDER PROTECTIVE DEVICES AS SCHEDULED, WITH ELECTRONIC TRIP UNITS SETTABLE TO PROJECT COORDINATION.

PANELBOARD SCHEDULE

TAG	QUANTITY	MFR.	MODEL #	BUS RATING (A)	VOLTAGE (V)	ENCLOSURE	PHASE (ø)	WIRE (W)
PB-1.1,1.2	2	TBD	TBD	100	480/277	NEMA-3R	3	4
PB-2.2,2.2	2	TBD	TBD	100	480/277	NEMA-3R	3	4
PB-3.1,3.2	2	TBD	TBD	100	480/277	NEMA-3R	3	4
TOTAL	6							

NOTES:
1. PANELBOARDS SHALL BE NRTL-LISTED TO UL 67.
2. PANELBOARDS SHALL BE RATED FOR 600 V MAXIMUM, WITH BUS AND BREAKERS SIZED FOR SYSTEM VOLTAGE AND AVAILABLE FAULT CURRENT.
3. PANELBOARDS SHALL BE NEMA 3R OUTDOOR RATED UNLESS OTHERWISE NOTED, WITH COPPER OR ALUMINUM BUS AND FULL-SIZED EQUIPMENT GROUND BUS.

MUNICIPALITY APPROVAL STAMP

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sme-engineers.com

PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

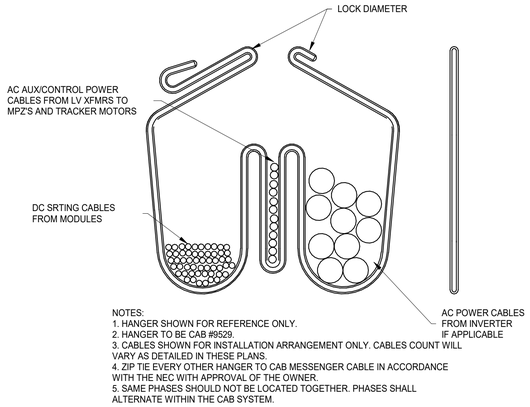
SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

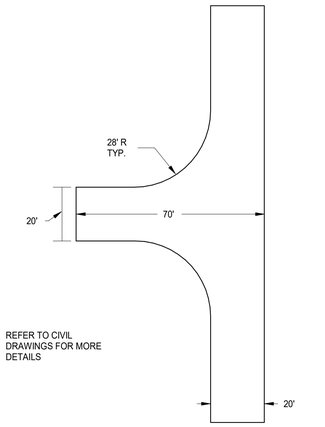
TITLE:
SCHEDULES

PROJECT #:
IW-101

SHEET:
PV-304



7 CAB CABLE SUPPORT DETAIL
N.T.S.



4 RACKING DETAIL
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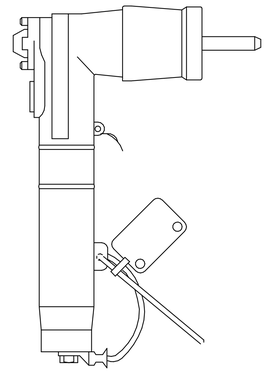
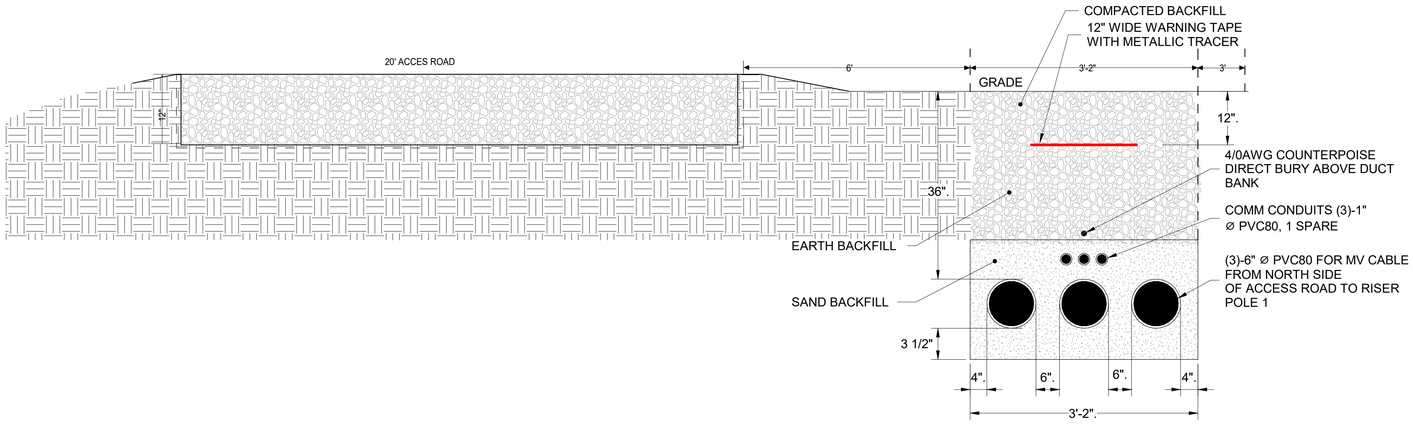
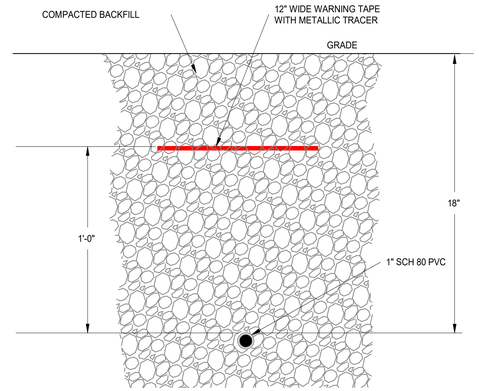


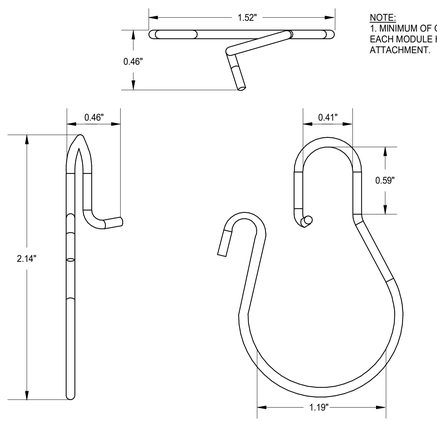
1 TYP. ESA ELBOW SURGE ARRESTER
N.T.S.



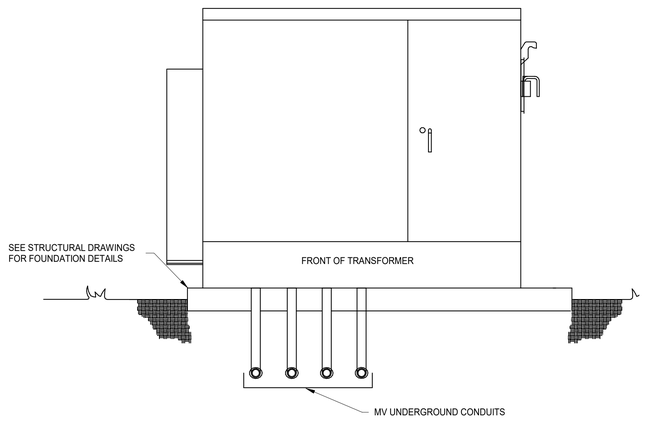
5 CONDUIT MV DUCT BANK DETAILS - SAND BACKFILL
N.T.S.



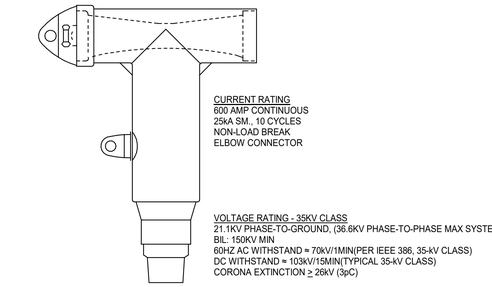
2 DIERCT BURIED DATA CONDUIT DETAIL
N.T.S.



8 CAB CABLE SUPPORT DETAIL
N.T.S.



6 TRANSFORMER WIRING DETAILS
N.T.S.



NOTES:
1. ADD SURGE ARRESTERS AT ALL 35 KV CLASS DEAD FRONT ELBOW TERMINATIONS AT PAD-MOUNTED SWITCHGEAR AND TRANSFORMERS. USE A T-BODY ARRESTER; INSTALL REDUCER PLUG AS REQUIRED BY THE ARRESTER MODEL.
2. ALL ELBOW TERMINATIONS SHALL INCLUDE INTEGRAL CAPACITIVE VOLTAGE TEST POINTS.
3. USE FOR ALL 600 A, 35 KV CLASS DEAD FRONT TERMINATIONS LOCATED AT PAD-MOUNT TRANSFORMER AND MV SWITCHGEAR.
4. ELASTIMOLD 39-SERIES (OR EQUAL BY HUBBELL/CHARDON/3M/TE) SUITABLE FOR 35 KV, CABLE SHIELD TYPE (JCN/LC/TS) AND INSULATION LEVEL (100%/133%).
5. CONTRACTOR SHALL VERIFY CATALOG NUMBERS FOR CABLE SIZE, INSULATION LEVEL, AND SHIELD TYPE.

3 600A DEADFRONT ELBOW DETAILS
N.T.S.

MUNICIPALITY APPROVAL STAMP

CLIENT:
CLEAN FIELD POWER
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PROFESSIONAL DESIGN FIRM # 184.008367-0002

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rwalker@bonoconsulting.com
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SME SEVEE & MAHER ENGINEERS
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PROJECT NAME:
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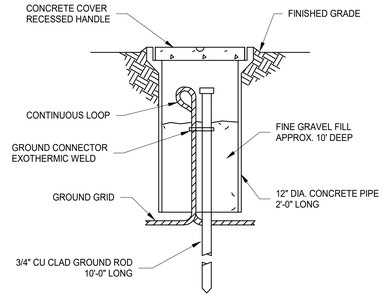
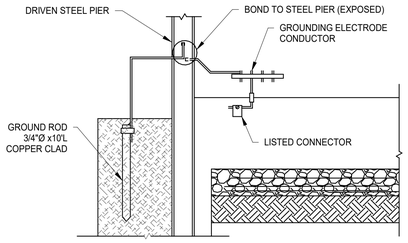
DETAILS (1 of 3)

PROJECT #:
IW-101

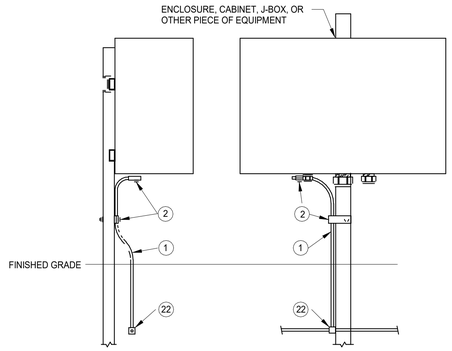
SHEET:
PV-401



11 GROUNDING TEST WELLS
N.T.S.

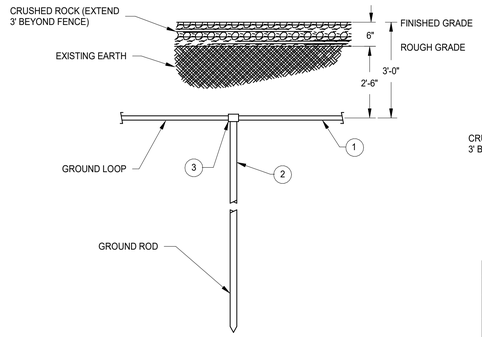


10 GROUNDING BOND TO STRUCTURAL STEELS AT TRACKER PIERS
N.T.S.



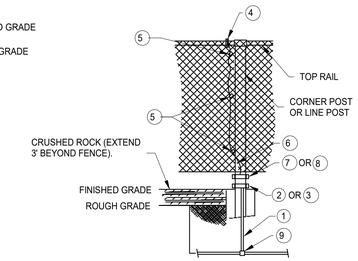
ITEM	DESCRIPTION
1	WIRE, BARE CU, #8 SOLID CU
2	CONNECTOR, CLAMP, #8 SOLID CU, CABLE TO FLAT, 1 BOLT
22	GROUND WIRE TO GROUND ROD CLAMP EXOTHERMIC WELD

7 GROUNDING ENCLOSURE
N.T.S.



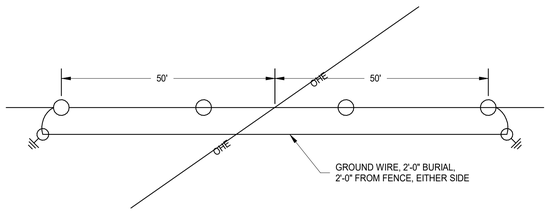
ITEM	DESCRIPTION
1	WIRE, BARE CU, #4/0 AWG SD 7 STR
2	GROUND ROD, CU-CLAD STEEL 3/4" DIA x 10'-0"
3	GROUND WIRE TO GROUND ROD CLAMP EXOTHERMIC WELD

4 GROUNDING ROD
N.T.S.

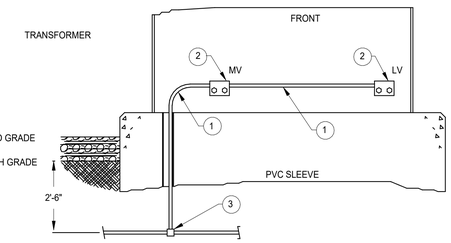


ITEM	DESCRIPTION
1	WIRE, BARE CU, #4/0 AWG SD 7 STR
2	FENCE POST GROUND CLAMP, CORNER POST-2.875" OD PIPE, #4/0 AWG WIRE BURNDY TYPE GD
3	FENCE POST GROUND CLAMP, LINE POST-2.375" OD PIPE, 4/0 AWG WIRE BURNDY TYPE GD
4	GROUND CLAMP, FENCE TOP RAIL-1.625" OD PIPE, 2 SOL TO 250 MCM
5	TAP CONNECTOR, SPLIT BOLT TYPE, BRONZE, #2 AWG
6	GROUND WIRE, STEEL, 0.25" DIA., 7 STR
7	FENCE POST GROUND CLAMP, CORNER POST - 2.875" OD PIPE, #4-#2/0 AWG CONDUCTOR BURNDY TPE GD
8	FENCE POST GROUND CLAMP, LINE POST - 2.375" OD PIPE, #4-#2/0 AWG CONDUCTOR BURNDY TPE GD
9	GROUND WIRE TO GROUND WIRE EXOTHERMIC WELD

1 GROUND FENCE POST
N.T.S.

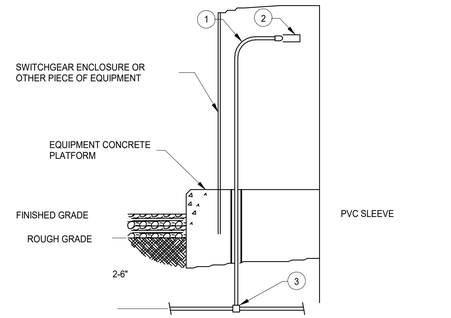


12 FENCE GROUNDING AT OVERHEAD POWER LINES
N.T.S.



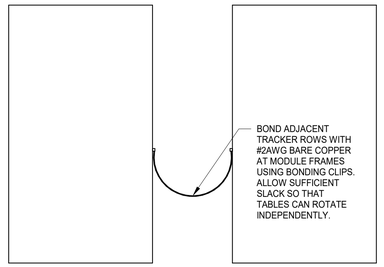
ITEM	DESCRIPTION
1	WIRE, BARE CU, 4/0 SD 7 STR
2	CONNECTOR, CLAMP, 4/0 STR CU, CABLE TO FLAT, 2 BOLT
3	GROUND WIRE TO GROUND ROD CLAMP EXOTHERMIC WELD

8 GROUNDING FOR TRANSFORMER
N.T.S.



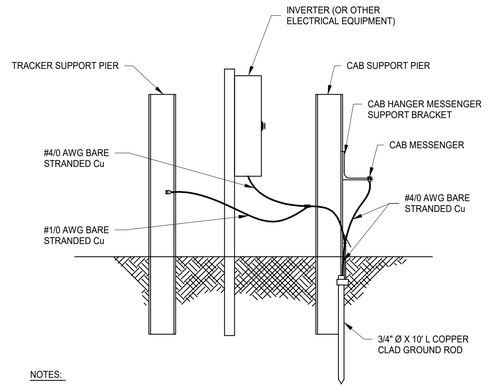
ITEM	DESCRIPTION
1	WIRE, BARE CU, #4/0 AWG SD 7 STR
2	CONNECTOR, COMPRESSION, 4/0 STR CU, CABLE TO FLAT, 2 HOLE, BURNDY CAT. YGHA28-2N
3	EXOTHERMIC WELD

5 SWB GROUND
N.T.S.



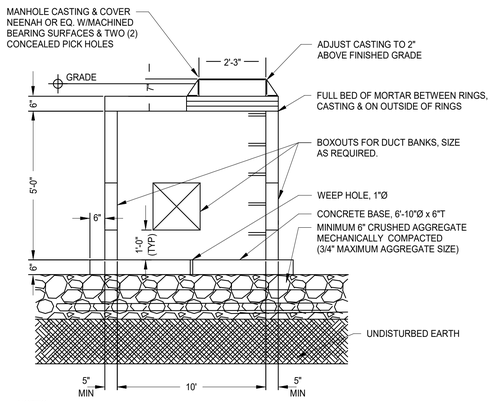
NOTES:
1. GROUND EACH TRACKER ROW PER MFR'S REQUIREMENTS.
2. BOND EACH TABLE IN A TRACKER ROW TO EACH OTHER TO MAKE A COMPLETE ROW BONDED TOGETHER AND TO GROUND

2 BONDING ADJACENT TRACKER ROW
N.T.S.



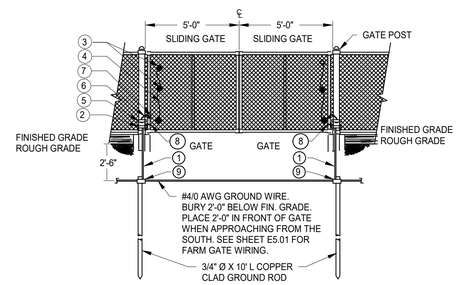
NOTES:
1. GROUND EACH TRACKER ROW PER MANUFACTURE'S REQUIREMENTS.
2. BOND EACH TABLE IN A TRACKER ROW TO EACH OTHER TO MAKE A COMPLETE ROW BONDED TOGETHER AND TO GROUND
3. GROUND FENCE AT ALL GATE OPENINGS.
4. GROUND FENCE MINIMUM OF 50 FEET EITHER SIDE OF OVERHEAS POWER LINE CROSSING.

13 GROUNDING AT TRACKER ROW
N.T.S.



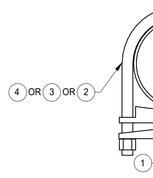
NOTES:
1. ALL JOINTS BETWEEN SECTIONS SHALL HAVE "O" RING RUBBER GASKETS.
2. MANHOLE STEPS, NEENAH R-1981-J OR EQUAL, 16" O.C. ALUMINUM STEPS APPROVED.
3. SEE PLAN FOR CONDUIT INFORMATION.
4. ALL MANHOLES TO BE HS20 RATED.

9 MANHOLE DETAIL
N.T.S.



ITEM	DESCRIPTION
1	WIRE, BARE CU, #4/0 AWG SD 7 STR
2	FENCE POST GROUND CLAMP, GATE POST-4" OD PIPE, #4/0 WIRE
3	TAP CONNECTOR, SPLIT BOLT TYPE, BRONZE, #2 AWG
4	GROUND WIRE, STEEL, 0.25" DIA., 7 STR
5	FENCE POST GROUND CLAMP, GATE POST-4" OD PIPE, 2" COPPER BRAID
6	COPPER BRAID, 1.5" X 8" WITH 3/8" STUD HOLE, 2 HOLE TERMINALS EACH END
7	GROUND CLAMP, GATE POST-1.875" OD PIPE, 2" COPPER BRAID
8	GROUND CLAMP, GATE POST-1.875" OD PIPE, #4-#2/0 CONDUCTOR
9	GROUND WIRE TO GROUND WIRE EXOTHERMIC WELD

6 GROUNDING MAIN ACCESS FENCE GATE
N.T.S.



ITEM	DESCRIPTION
1	WIRE, BARE CU, #4/0 AWG SD 7 STR
2	FENCE POST GROUND CLAMP, CORNER POST-2.875" OD PIPE, #4/0 AWG WIRE
3	FENCE POST GROUND CLAMP, LINE POST-2.375" OD PIPE, #4/0 AWG WIRE
4	FENCE POST GROUND CLAMP, GATE POST-3.5" OD PIPE, #4/0 AWG WIRE

3 GROUND FENCE POST
N.T.S.

MUNICIPALITY APPROVAL STAMP

CLIENT:
CLEAN FIELD POWER
211 ISLAND RD,
MAHWAH, NJ 07430

CONTRACTOR:
INWAVE RENEWABLES
NAPERVILLE, IL 60565
contact@inwavere.com

ELECTRICAL ENGINEER:
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IE DESIGN PLLC
ELK GROVE VILLAGE, IL 60007
contact@iedesignco.com
PROFESSIONAL DESIGN FIRM # 184.008367-0002

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SME SEVEE & MAHER ENGINEERS
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MAINE 04021
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PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE
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ISSUE #	ISSUED FOR:	DATE
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DETAILS (2 of 3)

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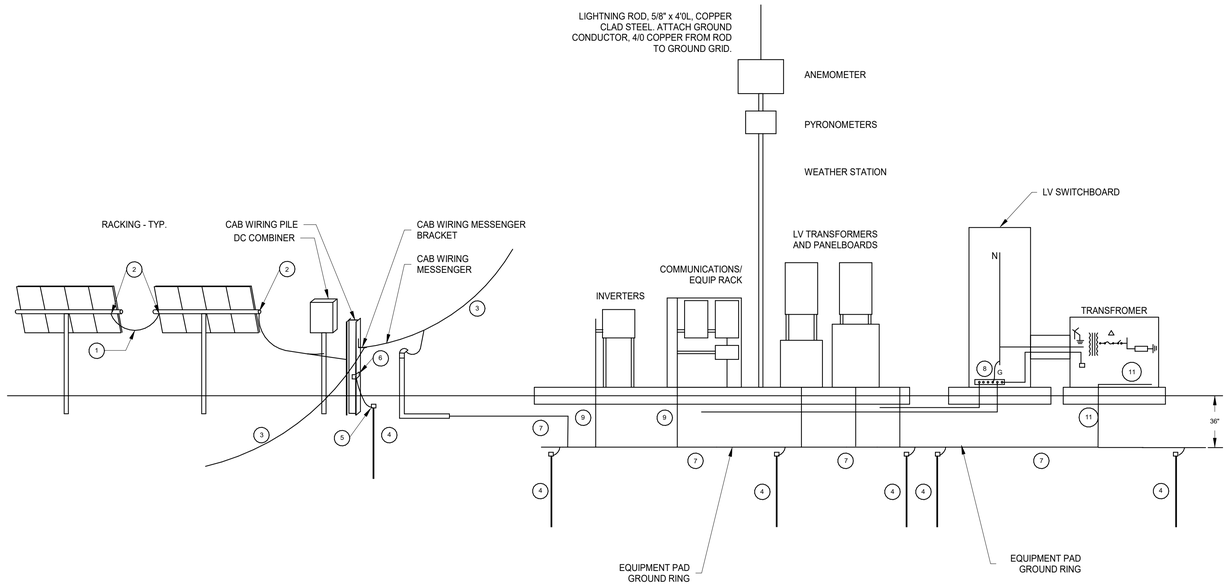
IW-101

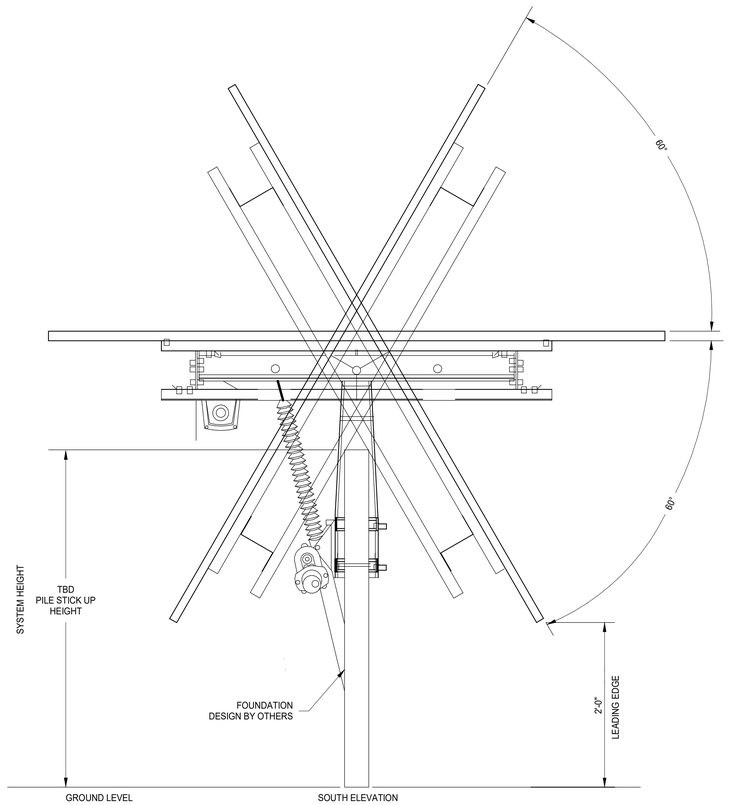
SHEET:
PV-402

GROUNDING SCHEDULE

ID#	ITEM	USE	NOTES
1	#6 BARE COPPER	RACKING TABLE BONDING JUMPER	CONNECT TO ADJACENT MODULE FRAMES AT TABLE GAP
2	WEEB-LUG-6.7, BURNDY	MODULE GROUND LUG	ATTACH TO MODULE FRAMES AT TABLE GAPS FOR BONDING JUMPER. USE ONLY AS LISTED WITH RACKING/MODULE
3	CAB MESSENGER, COPPERWELD COPPER-COPPER CLAD STEEL COMPOSITE 40% EHS7X0985, TYPE K	ABOVE GROUND ARRAY CABLE SUPPORT MANAGEMENT	TO BE USED AS PART OF AN INTEGRATED GROUINDING SYSTEM
4	3/4"Ø x 10'L COPPER CLAD GROUND ROD	SYSTEM GROUNDING	ATTACH GROUND CABLES WITH COMPRESSION LUGS ONLY. INSTALL FLUSH/BELOW GRADE. IF R>25 ADD SECOND ROD >= 6 FT AWAY
5	CABLE TO 3/4"Ø ROD COMPRESSION GROUND LUG, BURNDY YGLR29C34	CONNECT GROUND LEAD TO ROD	SIZE AS REQUIRED FOR GROUND CABLE
6	BURNDY GCS29HEX, CONSTRICTOR GROUND CLAMP TO STEEL CONNECTOR	CONNECT STEEL BEAMS TO GROUND SYSTEM	
7	4/0 BARE COPPER STRANDED GROUND WIRE		36" BELOW FINISHED GRADE
8	AC COMBINER GROUND BAR	MAIN SYSTEM GROUNDING BAR	
9	4/0 BARE STRANDED COPPER		
10	#4 COPPER CLAD ALUMINUM	INVERTER GROUND TO SYSTEM GROUND (EGC)	
11	4/0 BARE STRANDED COPPER	TRANSFORMER AND SYSTEM GROUND (GEC)	BOND TRANSFORMER NEUTRAL TO GROUND AT LV SWITCHBOARD



1 GROUNDING SINGLE LINE DIAGRAM
N.T.S.



1. DIMENSIONS SHOWN AT SYSTEM MAX. HEIGHT WITH LEADING EDGE OF MODULE AT 24" AT MAX. TILT OF 60°. IN NO CASE IS LEADING EDGE OF MODULE TO BE LESS THAN 12" FROM FINISHED GRADE AT FULL TILT OF 60°.
2. DIMENSIONS ARE FOR REFERENCE ONLY. SEE ACTUAL PROJECT DESIGN BY MFR. FOR FINAL DIMENSIONS FOR THIS PROJECT.

2 RACKING DETAIL TYP.
N.T.S.

MUNICIPALITY APPROVAL STAMP

CLIENT:
CLEAN FIELD POWER
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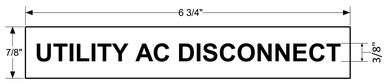
PROJECT #:
IW-101

SHEET:
PV-403

1



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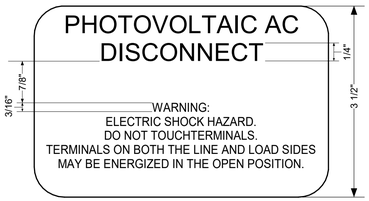
3

4

5



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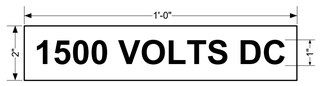

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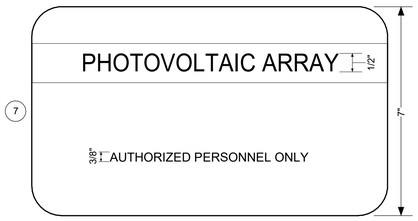

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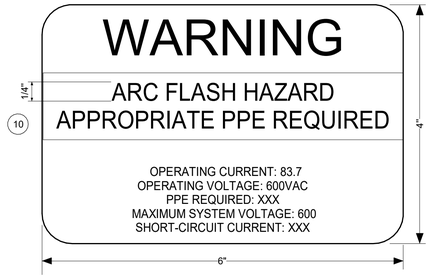
9

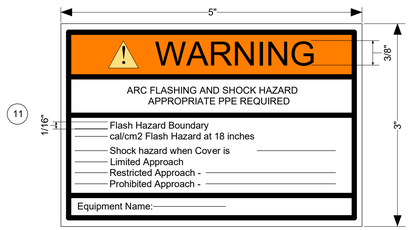
10



LABEL AND MARKINGS LEGEND

1. LABEL FOR UTILITY AC DISCONNECT; 1 PER AC DISCONNECT
2. INVERTER IDENTIFICATION LABEL TO BE PLACED ON EACH STRING INVERTER
3. LABEL FOR SYSTEM OWNER'S KWH GENERATION METER; 1 PER OWNER METER
4. LABEL FOR REQUIRED UTILITY METER SOCKET; 1 PER UTILITY METER
5. PHOTOVOLTAIC AC DISCONNECT GENERIC WARNING LABEL APPLIED TO ALL AC DISCONNECTS
6. AT LV SWITCHBOARD AND INVERTER RUNS.
7. LABEL FOR SECURITY FENCE; SPACED EVERY 150 FEET AROUND PERIMETER OF ARRAY
8. CT WIRING WARNING LABEL TO BE PLACED ON OUTSIDE OF EACH CT METERING BOX.
9. ROW DESIGNATION LABEL TO BE PLACED ON THE END OF EACH ROW FACING THE ROAD
10. ARC FLASH LABEL TO BE PLACED ON EACH INVERTER.
11. ARC FLASH WARNING LABEL. TO BE PLACED ON ALL ELECTRICAL EQUIPMENT COVERS AS REQUIRED BY NFPA 70 AND NFPA 7OE.
12. TO BE PLACED ON EACH INVERTER. OPERATING AND MAXIMUM VOLTAGES AND CURRENTS TO BE VERIFIED BASED ON LOCATION.
13. TO BE PLACED ON SITE FENCE AND FENCE GATES. SPACED 100' APART OR AS REQUIRED BY LOCAL CODE.
14. TO BE PLACED ON TRANSFORMERS AT EQUIPMENT PAD.
15. TO BE PLACED ON FENCE IN CONJUNCTION WITH SIGN 13.
16. LOCATE ON SECURITY FENCE AT EACH CORNER AND ENTRY GATE.

11



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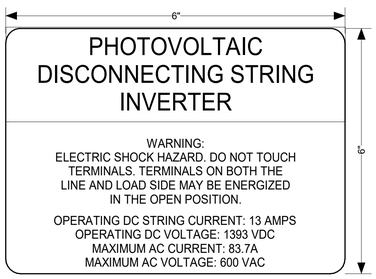

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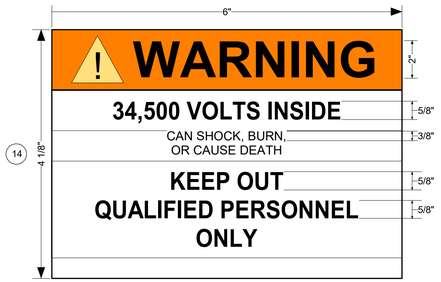

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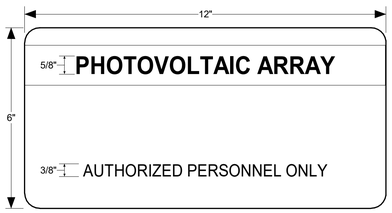

MUNICIPALITY APPROVAL STAMP

CLIENT:
CLEAN FIELD POWER
211 ISLAND RD,
MAHWAH, NJ 07430

CONTRACTOR:
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NAPERVILLE, IL 60565
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IE DESIGN PLLC
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PROFESSIONAL DESIGN FIRM # 184.008367-0002

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PROJECT NAME:
ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:
NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:
SIGNAGE

PROJECT #:
IW-101

SHEET:
PV-501

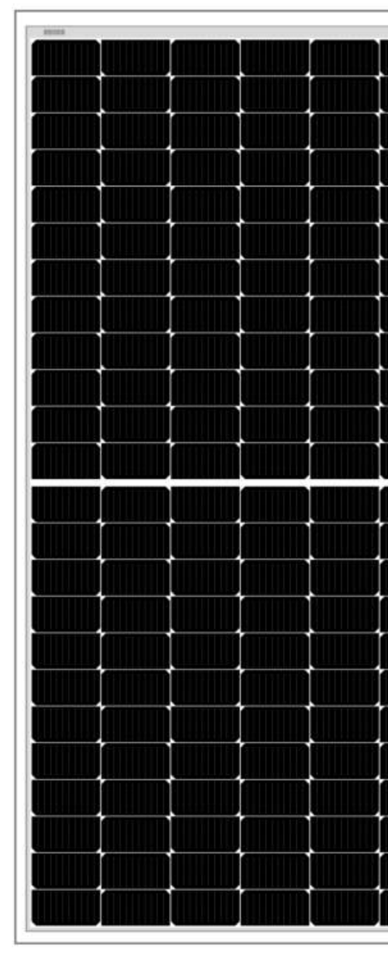
AHNAY SERIES

Bi-55-520 to Bi-55-550

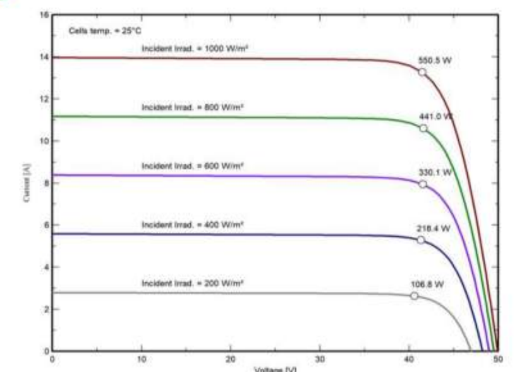
Framed Dual Glass Bifacial Module

WAAREE
One with the Sun

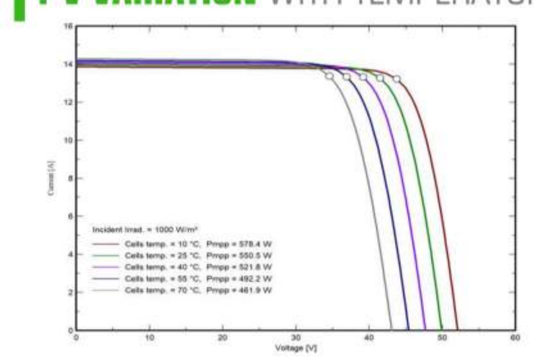
- Highest reliability & enhanced crack tolerant MBB module
- Sustain heavy snow & wind loads (5400 Pa & 2400 Pa)
- Highly efficient Mono PERC M10 cells
- Best in class thermal coefficients
- Highest commercial gains, lower LCOE
- Split junction box improve heat dissipation
- Increase shade tolerance



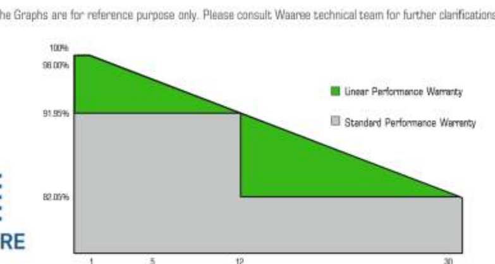
I-V VARIATION WITH IRRADIANCE



I-V VARIATION WITH TEMPERATURE



The Graphs are for reference purpose only. Please consult Waaree technical team for further clarifications.



TIER 1 Bloomberg | IEC | UL | PV CYCLE | Munich RE

ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018
Independent assessment of factories by BLACK & VEATCH

www.waaree.com

AHNAY SERIES

Bi-55-520 to Bi-55-550

Framed Dual Glass Bifacial Module

WAAREE
One with the Sun

ELECTRICAL CHARACTERISTICS

Models	Pmax (W)		Vmp (V)		Imp (A)		Isc (A)		Voc (V)		Module Eff. (%)
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	
Bi-55-520	520	391.9	41.14	37.70	12.65	10.34	13.55	10.94	49.01	46.00	20.20
Bi-55-525	525	395.6	41.29	37.90	12.73	10.40	13.63	11.00	49.16	46.10	20.39
Bi-55-530	530	399.2	41.45	38.00	12.80	10.45	13.69	11.05	49.31	46.20	20.59
Bi-55-535	535	403.1	41.60	38.20	12.88	10.51	13.76	11.11	49.46	46.40	20.78
Bi-55-540	540	406.7	41.75	38.40	12.95	10.56	13.83	11.16	49.61	46.50	20.98
Bi-55-545	545	410.4	41.90	38.50	13.02	10.62	13.90	11.22	49.76	46.70	21.17
Bi-55-550	550	414.1	42.03	38.80	13.08	10.68	13.96	11.27	49.91	46.80	21.36

*Standard Test Conditions (STC) - 1000 W/m² irradiance, Air Mass 1.5 and 25°C cell temperature. Nominal Operating Cell Temperature (NOCT) - 800 W/m² irradiance, Air Mass 1.5, Ambient temperature 20°C and Wind speed 1 m/s. Average power reduction of 4.5% at 200 W/m² as per IEC 60904-1. Measuring Uncertainty ± 3%.

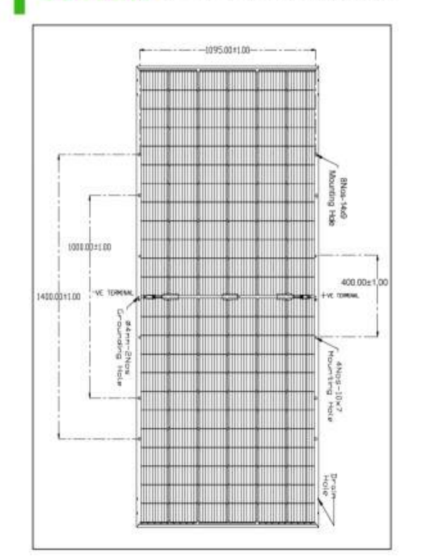
System Voltage	1500 V	Series Fuse Rating	25 A

BI-FACIAL OUTPUT - BACKSIDE POWER GAIN*

		Bi-55-520	Bi-55-525	Bi-55-530	Bi-55-535	Bi-55-540	Bi-55-545	Bi-55-550
15%	Power Output (W)	598	604	610	615	621	627	632
	Module Efficiency (%)	23.23%	23.45%	23.68%	23.90%	24.12%	24.35%	24.56%
20%	Power Output (W)	624	630	636	642	648	654	660
	Module Efficiency (%)	24.24%	24.47%	24.71%	24.94%	25.17%	25.41%	25.63%
25%	Power Output (W)	650	656	663	669	675	681	687
	Module Efficiency (%)	25.25%	25.49%	25.74%	25.98%	26.22%	26.46%	26.70%
30%	Power Output (W)	676	683	689	696	702	709	715
	Module Efficiency (%)	26.26%	26.51%	26.77%	27.02%	27.27%	27.52%	27.77%

*The bifacial gains are dependant on the power plant design and location

DESIGN SPECIFICATIONS



THERMAL CHARACTERISTICS

Temperature coefficient of Current (Isc), α (%/°C)	0.06
Temperature coefficient of Voltage (Voc), β (%/°C)	-0.33
Temperature coefficient of Power (Pm), γ (%/°C)	-0.39
NOCT (°C)	43 ± 2
Operating temperature range (°C)	-40 to 85
Bifaciality Factor (%)	70 ± 10

MECHANICAL CHARACTERISTICS

Length x Width x Thickness (L x W x T)	2272 mm (L) x 1133 mm (W) x 35 mm (T)
Weight	32.5 kgs
Solar Cells per Module (Units) / Arrangement	144 cells / (12x6 || 12x6)
Solar Cell Type & Size	ES Foundry Mono PERC Bifacial, 91x182 mm
Front Glass (Material / Thickness)	2 mm Low Iron HTAR semi-tempered glass
Back Glass (Material / Thickness)	2 mm Low Iron Printed semi-tempered glass
Encapsulate	PID free & UV Resistant
Junction Box (Protection degree / Material)	IP68 / Weatherproof PPO
Cable & Connector (Protection degree / Type)	IP68 rated / MC4 compatible
Cable cross - section & Length	4 mm² & 500mm

Waaree Energies Ltd. is amongst the top Solar Energy Companies and has the country's largest Solar PV Module manufacturing capacity of 12 GW. In addition, it is committed to provide top notch EPC services, project development, rooftop solutions, solar water pumps and also in an Independent Power Producer. Waaree has its presence in over 350+ locations nationally and 68 countries globally.

12 Years Product Warranty • 30 Years Power Output Warranty

- The electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.
- Refer installation Manual instructions & Waaree warranty statement for terms & conditions.
- Waaree Reserves the right to change the specifications without prior notice.

www.waaree.com

WEL/E&PD/520-550/144/MPB/HC/CMZ 223/08.10.2024

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 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.

MADE IN THE USA With U.S. and Global Components

YASKAWA SOLECTRIA SOLAR

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	XGI 1500 175-480	
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		237.3 A	207.6 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 (∑Isc 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%					
	Grid Connection Type	3-Ph + N/GND					
Efficiency	Peak Efficiency	99.0%					
	CEC Average Efficiency	98.5%					
	Tare Loss	<1 W					
Temperature	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%					
	Operating Altitude	9,840 ft (3 km)					
Communications	Advanced Graphical User Interface	WiFi					
	Communication Interface	Ethernet					
	Third-Party Monitoring Protocol	SunSpec Modbus TCP/IP					
	Web-Based Monitoring	Optional					
	Firmware Updates	Remote and Local					
Testing & Certifications	Safety Listings & Certifications	UL 1741, IEEE 1547, UL 1998, UL 1699b Photovoltaic Arc-Fault Circuit Protection Certified					
	Advanced Grid Support Functionality	Rule 21, UL 1741SB					
	Testing Agency	ETL					
	FCC Compliance	FCC Part 15 (Subpart B, Class A)					
Warranty	Standard and Options	5 Years Standard; Option for 10 Years					
Enclosure	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, IEC IP66, Type 3R, Polyester Powder-Coated Aluminum					

ETL LISTED

IT'S PERSONAL

YASKAWA SOLECTRIA SOLAR

MUNICIPALITY APPROVAL STAMP

CLIENT:

CLEAN FIELD POWER

211 ISLAND RD,
MAHWAH, NJ 07430

CONTRACTOR:

INWAVE RENEWABLES

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PROFESSIONAL DESIGN FIRM #
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CIVIL ENGINEER:

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DESIGN FIRM NO. 184.008857-0002

SME SEVEE & MAHER ENGINEERS

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207-829-5016
sme-engineers.com

PROJECT NAME:

ORCHARD SOLAR

LOCATION:
41°44'24.6"N 88°25'26.8"W
SUGAR GROVE, KANE COUNTY, IL 60554

ISSUE #	ISSUED FOR:	DATE
1	30% DESIGN SET	09/17/2025

SEAL:

NOT FOR CONSTRUCTION

DATE: 09/12/2025

TITLE:

EQUIPMENT SPEC SHEETS

PROJECT #:

IW-101

SHEET:

PV-601