2023 VA IVY LANDFILL
PV DESIGN

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 13209

PROJECT SUMMARY	
SITE ADDRESS	4576 DICK WOODS ROAD, CHARLOTTESVILLE, VA 22903
TAX NUMBER	07300-00-00-02800
GPS COORDINATES	N: 43°4'0.122" E: -76°13'28.042"
PARCEL AREA	300.59 ACRES
UTILITY NAME	DOMINION ENERGY
DEVELOPER NAME	SUN TRIBE EPC INC.
DEVELOPER ADDRESS	107 5TH STREET SOUTHEAST, CHARLOTTESVILLE, VA 22902
ELECTRICAL ENGINEER OF RECORD (EOR) NAME	STUART BAILEY, LABELLA ASSOCIATES
ELECTRICAL EOR ADDRESS	300 STATE ST., ROCHESTER, NY 14614

PROJECT SITE INFORMATION		
CODES AND STANDARDS	ELECTRICAL CODE APPLIED	NATIONAL ELECTRIC CODE 2017
	FIRE CODE APPLIED	NFPA 70
	SYSTEM DESIGN VOLTAGE	34.5 KV
	ASHRAE LOCATION	STAUNTON, VA
	ASHRAE 169 - MAX TEMPERATURE (0.4%)	37 °C
	ASHRAE 169 - MAX TEMPERATURE (2.0%)	34 °C
	ASHRAE MINIMUM TEMPERATURE	-17 °C
POWER OUTPUT	DC OUTPUT POWER	4.298 MW
	AC OUTPUT POWER	3.00 MW
	DC/AC RATIO	1.433
SOLAR MODULE	MANUFACTURER	HANWHA QCELLS
	MODEL	Q.PEAK DUO XL-G11S.3/BFG 595
	POWER	595W
	CELLS	156
	FRAME	ANODIZED ALUMINUM
SOLAR INVERTER	MANUFACTURER	YASAKAWA SOLECTRIA
	MODEL	XGI 1500-250/250-600
	CEC EFFICIENCY	98.50%
	MAX VOLTAGE	600 VDC
	MAX POWER OPERATING VOLTAGE RANGE	860-1450 VDC
	MAX DC SHORT CIRCUIT CURRENT	296.7 A
	MAX POWER OUTPUT (KVA)	250 KVA
	MAX POWER OUTPUT (KW)	250 KW
	AC VOLTAGE	600V
DESIGN VALUES	STRING SIZE	24
	MODULE QTY	7,224
	STRING QTY	301
	INVERTER QTY	12
	STRING RATED ISC	13.77 A
	STRING RATED MAX ISC x1.25	17.21 A
	STRING RATED IMPP	13.17 A

ELECTRICAL DRAWING INDEX

SUN TRIBE SOLAR EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902
PROJECT NO: 2230001
MAY 2023

LaBella
Powered by partnership.
300 State Street, Suite 201
Rochester, NY 14614
585-454-6110
labellapc.com

ISSUED FOR 30% REVIEW
MAY 2023

SUN TRIBE EPC INC.
PROJECT NO: 2230001

VA IVY LANDFILL - PV DESIGN
4576 DICK WOODS ROAD, CHARLOTTESVILLE,
VA 22903

SYMBOL LIST

- EXISTING UTILITY DISTRIBUTION CIRCUIT
- NEW OVERHEAD LINE
- NEW UNDERGROUND ELECTRICAL TRENCH
- EXISTING POLE TO REMAIN
- NEW POLE
- GROUND ROD LOCATION. REFER TO SHEET E-505 AND E-703 FOR DETAILS
- STRING INVERTER
- DC COMBINER BOX

GENERAL ELECTRICAL NOTES

1. THE INVERTER FOR THE PROPOSED SOLAR ELECTRIC SYSTEM MUST BE IDENTIFIED AND LISTED FOR USE IN SOLAR PHOTOVOLTAIC SYSTEMS. ALL SOURCE CIRCUITS MUST HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION FOR TESTING (SUCH AS AN ACCESSIBLE TERMINAL BLOCK OR DISCONNECT) AND ISOLATION.
2. INVERTERS MUST BE EQUIPPED WITH DC GROUND FAULT PROTECTION TO REDUCE FIRE HAZARDS.
3. ALL DISCONNECTING COMBINERS, PULL/SPLICE BOXES, AND ENCLOSURES MUST BE LISTED AND LABELED FOR ITS PURPOSE.
4. ALL METALLIC CONDUIT FITTINGS MUST INCLUDE INTERNAL OR EXTERNAL BONDING TO ENSURE CONTINUITY, INCLUDING METALLIC EXPANSION FITTINGS.
5. ANY METAL SHAVINGS RESULTING FROM SITE WORK MUST BE CLEANED FROM ENCLOSURE INTERIORS, TOP SURFACES OF ENCLOSURE, ROOF SURFACE, AND ANY ADDITIONAL AREAS WHERE OXIDATION OR CONDUCTIVE METAL SHAVINGS MAY CAUSE RUST, ELECTRICAL SHORT CIRCUIT OR OTHER DAMAGE.

WIRING AND WIRING METHODS

1. ALL WIRING METHODS AND INSTALLATION PRACTICES MUST CONFORM TO THE NATIONAL ELECTRIC CODE, LOCAL STATE CODES, AND OTHER APPLICABLE LOCAL CODES.
2. EXPOSED PV SOLAR MODULE WIRING WILL BE 2000 PV WIRE, 90ºC, WET RATED AND UV RESISTANT.
3. ALL FREE-AIR CABLES, SUCH AS MODULE LEADS MUST BE SECURED WITHIN 12" OF CONNECTION POINTS, AND EVERY 24" THEREAFTER, BY A STAINLESS STEEL OR PLASTIC-COATED STAINLESS STEEL CLIP OR TRAY. THE USE OF PLASTIC ZIP TIES IS NOT AN APPROVED METHOD TO SUPPORT OR ATTACH WIRE TO A STRUCTURE. PLASTIC ZIP TIES ARE ONLY PERMITTED FOR SUPPLEMENTAL GROUPING OR BUNDLING OF CONDUCTORS INSIDE OF EQUIPMENT. PV-SPECIFIC STAINLESS STEEL CLIPS AND VINYL JACKETED STEEL CABLE TIES OR AN APPROVED EQUAL ARE ALLOWED FOR USE IN THIS APPLICATION.
4. WIRE COLOR SPECIFICATIONS:
   A. 120 TO 208VAC WIRING:
      I. PHASE : (A) BLACK, (B) RED, (C) BLUE
      II. NEUTRAL: WHITE OR GREY
   B. 600VAC CLASS WIRING (300 TO 600VAC):
      I. PHASE: (A) BROWN, (B) ORANGE, (C) YELLOW
      II. NEUTRAL: WHITE OR GREY
   C. EXPOSED EXTERIOR DC WIRING, 600VDC TO 1500VDC
      I. POSITIVE (NON-ISOLATED): BLACK
      II. NEGATIVE (NON-ISOLATED): BLACK W/ WHITE MARKINGS AT TERMINATIONS
      III. POSITIVE (ISOLATED): BLACK W/ RED MARKINGS AT TERMINATIONS
      IV. NEGATIVE (ISOLATED): BLACK
5. COLORED PHASE MARKINGS MUST BE MADE WITH HOT OR COLD SHRINK TUBING, AT LEAST 12" LONG.
6. STRING AND COMBINER CABLE LABELS IN EXTERIOR LOCATIONS MUST BE RATED FOR EXTERIOR USE AND PROTECTED BY SHRINK TUBING.
7. PV STRING HOME RUNS MUST BE LABELED ON BOTH ENDS, AT ARRAY AND AT COMBINER.
8. COMBINER OUTPUT CONDUCTORS MUST BE LABELED AT BOTH ENDS, AT COMBINER AND AT DISCONNECT.
9. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT IS SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SUPPORTS MUST BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 54 INCHES APART (NEC 350.30) MUST BE APPROPRIATELY BONDED.
10. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM MUST NOT BE CONTAINED IN THE SAME RACEWAY, CABLE TRAY, CABLE, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTING AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER.
11. UNLESS MARKED AS UV RESISTANT, PVC IS NOT APPROVED FOR INSTALLATION IN LOCATIONS SUBJECTED TO DIRECT SUNLIGHT.
12. LONG STRAIGHT EXPOSED METAL CONDUIT (RMC, GRC, EMT) RUNS, 100 FEET OR MORE, MUST HAVE EXPANSION FITTINGS INSTALLED PER NEC 300.7(B). EXPANSION FITTINGS MUST ALSO BE USED WHEN CONDUIT SPANS A ROOF EXPANSION JOINT.
13. FUSES AND WIRES SUBJECT TO TRANSFORMER INRUSH CURRENT MUST BE SIZED ACCORDINGLY.
14. RMC, IMC OR EMT CONDUIT, USE 20 MIL PIPE WRAP TAPE HALF-LAPPED FROM 6" PAST TRANSITION POINT ON PVC TO 6" ABOVE GROUND ON METALLIC CONDUIT. AN EXPANSION JOINT MUST BE USED IN THE TRANSITION TO ABOVE GROUND CONDUIT WHEN REQUIRED BY NEC 300 5(J).
15. CONDUITS LONGER THAN 200 FT WITH NEGATIVE SLOPE TOWARD ELECTRICAL EQUIPMENT MUST HAVE A PULL BOX OR VAULT ADJACENT TO THE ENTRY POINT INTO THE ELECTRICAL EQUIPMENT.
16. WHEN TRANSITIONING FROM FREE AIR TO CONDUCTORS IN CONDUIT A LISTED STRAIN RELIEF FITTING MUST BE USED TO SUPPORT CONDUCTORS. CONDUIT DUCT SEAL MAY BE USED TO PREVENT MOISTURE INGRESS.
17. L AND T CONDUIT BODIES ARE NOT APPROVED FOR DC SYSTEMS OR INVERTER OUTPUT CIRCUITS.
18. ALL AC AND DC COPPER TERMINATIONS MUST HAVE AN ANTI-OXIDANT COMPOUND, KOPR-SHIELD OR EQUIVALENT APPLIED.
19. MEGGER TESTING MUST BE PERFORMED AND DOCUMENTED AT 1000 VDC FOR ALL AC CIRCUITS 600V OR BELOW AND DC CIRCUITS 600V OR BELOW. MEGGER TESTING WILL BE PERFORMED AT 1500 VDC FOR DC CIRCUITS IN 1000 VDC SYSTEMS, AND 2500 VDC FOR DC CIRCUITS IN 1500 VDC SYSTEMS. DO NOT MEGGER THE PV MODULES AS HIGH VOLTAGES CAN DAMAGE PV MODULES.
20. CONTINUITY TESTING TO BE PERFORMED AND DOCUMENTED ON ALL INSTALLED DC AND AC POWER CABLES.
21. CONDUIT BENDS MUST NOT DAMAGE THE RACEWAY OR SIGNIFICANTLY CHANGE THE INTERNAL DIAMETER OF RACEWAY PER TABLE 2 OF THE NEC.
22. SUPPORT CONDUCTORS IN VERTICAL CONDUITS IN ACCORDANCE WITH THE REQUIREMENTS OF NEC 300 19.
23. TORQUE ALL ELECTRICAL CONNECTORS PER DEVICE LISTING, OR MANUFACTURERS RECOMMENDATIONS CONNECTORS MUST BE MARKED WITH PERMANENT MARKING PAINT AFTER TORQUEING.
24. ALL BARE CU WIRES MUST BE INSTALLED IN A MANNER THAT PROTECTS THEM FROM CONTACT WITH DISSIMILAR METALS, PARTICULARLY ALUMINUM.
25. SPLICES AND CONNECTORS MUST BE INSULATED AND WILL REQUIRE PROJECT ENGINEER APPROVAL. ELECTRICAL TAPE ALONE IS NOT SUITABLE AS THE ONLY INSULATION MEANS. FOLLOW MANUFACTURERS INSTRUCTIONS FOR INSTALLATION, AND APPLICATION OF INSULATING PRODUCT.
26. SPLICES MUST BE AVOIDED WHEREVER POSSIBLE. WHEN NECESSARY DUE TO SPOOL-LENGTH LIMITATIONS, SPLICES MUST BE MADE IN AN ENCLOSURE, PULL BOX OR HAND-HOLE BOX, AND MUST NOT BE BURIED, MADE INSIDE CONDUIT, OR BE OTHERWISE INACCESSIBLE.
27. ALL LV AC WIRING WILL BE TYPE THWN-2 RATED AT 90ºC. XHHW-2 IS AN APPROVED ALTERNATE. THIS NOTE WILL BE SUPERCEDED BY ANY INVERTER SPECIFICATIONS REQUIRING LV AC WIRE TO MEET HIGHER VOLTAGE OR INSULATION STANDARDS.
28. USE MEYERS-TYPE HUBS LISTED TO PROVIDE MOISTURE PROTECTION FOR CONDUIT ENTRANCES IN ALL APPLICABLE LOCATIONS AS REQUIRED BY NEC 314.15.
29. PROTECT WIRE FROM SHARP EDGES WITH UV RATED SPIRAL WRAP, EDGE-GUARD, OR SPLIT LOOM.
30. MODULE LEAD CONNECTORS MUST BE INSTALLED SUCH THAT THEY ARE EASILY ACCESSIBLE AND PROTECTED FROM EXPOSURE TO DIRECT SUNLIGHT OR RAIN. THEY MUST NOT BE INSTALLED WITHIN TUBING, CONDUIT OR MODULE GAPS, OR IN DIRECT CONTACT WITH THE MODULE BACKSHEET.
31. STRING SOURCE CIRCUIT WIRING MUST BE SUPPORTED ADEQUATELY IN LENGTHS NOT TO EXCEED 24". THE MODULE TO MODULE INTERCONNECTION LEADS MUST BE SUPPORTED AT A MINIMUM OF 12" FROM THE J-BOX AND THE MODULE TO MODULE CONNECTION POINT.
32. MODULE TO SOURCE CIRCUIT CONNECTORS MUST BE OF THE SAME MAKE AND MODEL AS THE MODULE TO MODULE CONNECTORS. THE CONNECTION TO SOURCE CIRCUITS MUST BE PER THE MODULE MANUFACTURER AND CONNECTOR MANUFACTURER INSTRUCTIONS. CONTRACTOR TO VERIFY THAT THE STRING CONDUCTOR DIAMETER IS COMPATIBLE WITH THE STRING CIRCUIT HOME-RUN CONNECTORS.
33. ALL EMT MUST USE LISTED AND APPROVED RAIN TIGHT FITTINGS WHEN INSTALLED OUTDOORS OR IN A WET LOCATION.

ALUMINUM CONDUCTOR INSTALLATION NOTES

1. MINIMUM WIRE SIZE FOR CURRENT CARRYING ALUMINUM CONDUCTORS IS 1/0 STRANDED, COMPACT ELECTRICAL GRADE AA-8000 SERIES ALLOY.
2. ALUMINUM POWER CABLE, WIRE CONNECTORS, AND INSULATING AND CODING TAPE MANUFACTURERS SHALL BE APPROVED BY OWNER PRIOR TO USAGE.
3. WHERE BOLTED CONNECTIONS ARE NOT POSSIBLE, MECHANICAL SCREW STYLE LUGS AND TERMINATIONS ARE APPROVED ONLY WHEN USED IN CONJUNCTION WITH A LISTED COPPER PIGTAIL COMPRESSION ADAPTOR (SOLID CORE PIN ADAPTERS ARE NOT ALLOWED).
4. USE OF A "ONE-SHOT" CRIMPER OR "DIE-LESS CRIMPERS" WILL NOT BE ALLOWED.
5. TERMINAL CONNECTIONS TO BE MADE PER GUIDELINES BELOW. CONNECTION HARDWARE RATINGS TO MEET OR EXCEED MAXIMUM VOLTAGE OF THE SYSTEM.
   A. MUST BE PRE-FILLED WITH OXIDE INHIBITOR.
   B. WIRE STRIPPING AND BRUSHING OF CONDUCTOR IN ACCORDANCE WITH VENDOR SPECS IS REQUIRED IMMEDIATELY PRIOR TO LUG INSTALLATION
   C. OXIDE INHIBITOR MUST BE APPLIED TO EXPOSED CONDUCTOR IMMEDIATELY AFTER STRIPPING AND BRUSHING AND IMMEDIATELY PRIOR TO INSTALLATION OF THE LUG.
   D. USE COMPRESSION TOOL LISTED FOR USE WITH SELECTED COMPRESSION CONNECTOR.
   E. A MINIMUM 9" LENGTH OF COLD OR HEAT SHRINK WITH A VOLTAGE RATING EQUAL TO OR EXCEEDING THE CONDUCTOR RATING MUST BE APPLIED TO COVER THE CONNECTION BETWEEN CRIMP AND THE CONDUCTOR BEGINNING AT THE STRAIGHT SECTION OF THE CRIMP.
   F. ALL CONNECTORS AND CORRESPONDING CRIMPING TOOLS MUST BE LISTED FOR THE APPLICATION.
6. INSULATING AND COLOR CODING MARKINGS MUST BE HOT OR COLD SHRINK TUBING.
7. FOR ALUMINUM MV CONDUCTORS, WHERE USED, THE GUIDELINES IN THIS SECTION PLUS GENERAL REQUIREMENTS FOR MV CONDUCTOR INSTALLATION APPLY.
8. DIRECT LANDING OF ALUMINUM CONDUCTORS IS ONLY ALLOWED TO BREAKERS WHICH ARE SPECIFICALLY RATED FOR ALUMINUM CONDUCTORS.

GROUNDING NOTES

SEE ELECTRICAL DIAGRAM AND ELECTRICAL DETAILS FOR MORE GROUNDING INFORMATION.

1. GROUND RESISTANCE TESTING TO BE PERORMED AND DOCUMENTED AT ALL EQUIPMENT (INVERTERS, COMBINER BOXES, DISCONNECTS, ETC...) AND AT THE RACKING SYSTEM (MINIMUM OF 10 LOCATIONS PER 5MW SITE, EVENLY DISTRIBUTED THROUGHOUT THE FIELD). MAXIMUM MEASURED RESISTANCE NOT TO EXCEED 0.25 OHMS.
2. EQUIPMENT GROUNDING CONDUCTORS AND SYSTEM GROUNDING CONDUCTORS WILL HAVE AS SHORT A DISTANCE TO GROUND AS POSSIBLE AND A MINIMUM NUMBER OF TURNS.
3. NON-CURRENT CARRYING METAL PARTS WILL BE CHECKED FOR PROPER GROUNDING. NOTE THAT TERMINAL LUGS BOLTED ON A FINISHED ENCLOSURE SURFACE MAY BE INSULATED BECAUSE OF PAINT/FINISH. PAINT/FINISH AT POINT OF CONTACT MUST BE PROPERLY REMOVED.
4. RACKING COMPONENTS AND STRUCTURAL SUPPORTS MUST BE ELECTRICALLY BONDED.
5. MODULES MUST BE GROUNDED WITH EQUIPMENT GROUNDING METHODS APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE, INCLUDING THE USE OF UL 2703 LISTED RACKING SYSTEMS.
6. THE CONNECTION TO THE MODULE MUST BE ARRANGED SUCH THAT REMOVAL OF A MODULE OR A PANEL FROM THE PHOTOVOLTAIC SOURCE CIRCUIT DOES NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER PHOTOVOLTAIC SOURCE CIRCUIT.
7. WHERE USED, LAY-IN GROUND LUGS SHALL BE RATED FOR DIRECT BURIAL (DB RATED).
8. ALL METALLIC RACEWAYS AND ENCLOSURES REQUIRE A PHYSICAL CONNECTION TO THE GROUNDING ELECTRODE CONDUCTOR (GEC) CONTAINED WITHIN.

DISCONNECTING MEANS NOTES

1. MEANS MUST BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER EXISTING CONDUCTORS.
2. ALL CIRCUIT BREAKERS INSTALLED THAT ARE SUBJECT TO REVERSE POWER FLOW MUST BE LISTED AND LABELED AS BACKFEED COMPATIBLE.
3. THE GROUNDED CONDUCTOR MAY HAVE A BOLTED OR TERMINAL DISCONNECTING MEANS TO ALLOW MAINTENANCE OR TROUBLESHOOTING BY QUALIFIED PERSONNEL.
4. UNLESS A DISCONNECT IS SERVICING A SUPPLY-SIDE CONNECTION, THE DISCONNECTING MEANS IS NOT REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH NEC 690.17.
5. EQUIPMENT SUCH AS PHOTOVOLTAIC SOURCE CIRCUITS, OVERCURRENT DEVICES, AND BLOCKING DIODES ARE PERMITTED ON THE PHOTOVOLTAIC SIDE OF THE PHOTOVOLTAIC DISCONNECTING MEANS.
6. PROVIDE MEANS TO DISCONNECT EQUIPMENT SUCH AS INVERTERS, BATTERIES, CHARGE CONTROLLERS, AND ANY OTHER ENERGY SOURCES FROM ALL UNGROUNDED CONDUCTORS. IF THE EQUIPMENT IS ENERGIZED FROM MORE THAN ONE SOURCE, THE DISCONNECTING MEANS MUST BE GROUPED AND IDENTIFIED.
7. A SINGLE DISCONNECTING MEANS IS PERMITTED FOR THE COMBINED AC OUTPUT OF ONE OR MORE INVERTERS IN AN INTERACTIVE SYSTEM, PROVIDED EACH INVERTER ASSOCIATED WITH THE DISCONNECT HAS ITS OWN INTERNAL AC DISCONNECT, AND THAT THE COMMON DISCONNECTING MEANS IS READILY ACCESSIBLE FROM THE SAME LOCATION AS THE INVERTERS.
8. PROVIDE MEANS TO DISCONNECT FUSES FROM ALL SOURCES OF SUPPLY IF THE FUSE IS ENERGIZED FROM BOTH DIRECTIONS SUCH A FUSE IN A PHOTOVOLTAIC SOURCE CIRCUIT SHALL BE CAPABLE OF BEING DISCONNECTED INDEPENDENTLY OF FUSES IN OTHER PHOTOVOLTAIC SOURCE CIRCUITS.
9. ALL DISCONNECTS AND COMBINERS MUST BE SECURED FROM UNAUTHORIZED AND UNQUALIFIED PERSONNEL BY EITHER LOCK OR LOCATION.

DAMAGE PROTECTION

1. ENCLOSURES MUST BE SECURED TO EQUIPMENT RACKS IN ACCORDANCE WITH THE DESIGN DOCUMENTS, AND MUST BE SECURED IN SUCH A WAY AS TO PREVENT ENCLOSURE MOVEMENT OR SLIDING.
2. ALL NEMA 4 BOXES MUST BE EQUIPPED WITH LISTED DRAIN PLUGS INSTALLED TO ALLOW WATER TO DRAIN ANY MODIFICATION TO AS-MANUFACTURED EQUIPMENT SHOULD BE DONE IN SUCH A WAY AS TO MAINTAIN ALL LISTED RATINGS.
3. ALL NEMA 3 BOXES MUST BE EQUIPPED WITH A WEEP HOLE OR LISTED DRAIN PLUGS INSTALLED TO ALLOW WATER TO DRAIN.
4. ALL OUTDOOR ENCLOSURES REQUIRE AN APPROVED MEANS OF DRAINAGE AND VENTILATION.
5. ALL ELECTRICAL CONDUIT, EQUIPMENT AND COMPONENTS MUST BE ADEQUATELY PROTECTED FROM DAMAGE AND VANDALISM BY THE USE OF BOLLARDS, SHIELDS, GUARDS OR OTHER ACCEPTABLE MEANS.

LaBella
Powered by partnership.

300 State Street, Suite 201
Rochester, NY 14614
585-454-6110

labellapc.com

SUN TRIBE EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

NO:	DATE:	DESCRIPTION:
1.	05/23/2023	30% DESIGN

REVISIONS

PROJECT NUMBER: 2230001

DRAWN BY: SJP

REVIEWED BY: SB

ISSUED FOR: 30% DESIGN

DATE: MAY 2023

DRAWING NAME: ELECTRICAL NOTES

DRAWING NUMBER: E-050

GENERAL NOTES:

A. APPROXIMATE LOCATIONS OF ALL MEDIUM VOLTAGE EQUIPMENT SHOWN FOR PURPOSES OF INTERCONNECT APPLICATION. STRING INVERTER AND COMBINER BOX LOCATIONS NOT SHOWN.

B. CUSTOMER OWNED OVERHEAD LINE POLES ARE SPACED AT LEAST 50'-0" APART.

SYMBOL LIST

Symbol	Description
—OE——OE—	OVERHEAD DISTRIBUTION CIRCUIT
—CAB—	NEW CABLE/MESSENGER WIRE ROUTING
— P —— P —	PV POWER CABLING REFER TO SHEET E502
—CU—	COPPER GROUNDING CONDUCTOR
●—CAB—●	NEW STRING JUMPER CABLE
●	NEW UTILITY POLE
----------	STRINGING PATH
INV-x ☒	PV INVERTER
⊗	GROUND ROD LOCATION. REFER TO SHEET E707 FOR GROUNDING SYSTEM DETAILS.
◉	GROUNDING ELECTRODE TEST WELL
# CB #	DC COMBINER BOX

LEGEND

STRING NAMING CONVENTION: STR -X-Y-Z (X = ARRAY SECTION, Y = INVERTER ADDRESS, Z = STRING ADDRESS)

INVERTER

DC COMBINER

SITE DATA

SYSTEM PRODUCTION SUMMARY

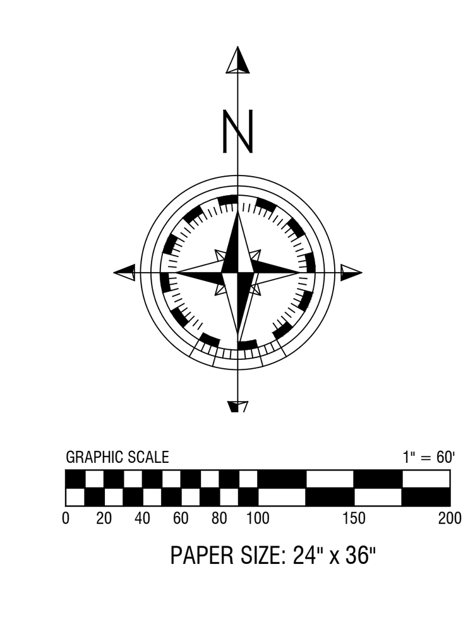
AC PLANT PEAK PRODUCTION:	4.298 MW
DC PLANT PEAK PRODUCTION:	3.00 MW
DC/AC POWER RATIO:	1.432

INTERCONNECTING UTILITY INFORMATION

UTILITY:	DOMINION ENERGY
SUBSTATION:	
CIRCUIT:	
LINE VOLTAGE:	34.5 KV

EQUIPMENT SUMMARY

SOLAR PV MODULE, TYPE I	
MANUFACTURER:	HANWHA QCELLS
MODEL:	Q.PEAK DUO XL-G11S.3/BFG
NOMINAL MAX. DC POWER:	595 W
VOLTAGE (STC), VOC, VMPP:	53.63 V, 45.18 V
CURRENT (STC), ISC, IMPP:	13.77 A, 13.17 A
STRING SIZE (TYPICAL):	24 MODULES
TOTAL PV MODULE TYPE I QTY.:	7224
SOLAR INVERTER	
MANUFACTURER:	YASKAWA SOLECTRIA
MODEL:	XGI 1500 250/250-600
NOMINAL MAX. AC POWER:	250KW / 250 KVA
NOMINAL AC VOLTAGE:	600 V
MAX. AC CURRENT:	240.6 A
TOTAL INVERTER QTY.:	12



LaBella
Powered by partnership.
300 State Street, Suite 201
Rochester, NY 14614
585-454-6110
labellapc.com

SUN TRIBE EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

NO:	DATE:	DESCRIPTION:
1.	05/23/2023	30% DESIGN

REVISIONS

PROJECT NUMBER: 2230001

DRAWN BY: SJP

REVIEWED BY: SB

ISSUED FOR: 30% DESIGN

DATE: MAY 2023

DRAWING NAME: **OVERALL SITE LAYOUT**

DRAWING NUMBER: **E100**

Date & Time: 01/20/2023 10:00AM By: Paranjape, Shaunak
Path: J:\Sun Tribe EPC LLC\2230001 - Ivy Landfill Solar Design Services\06_Drawings\Electrical\E100 -Sun Tribe EPC LLC - Ivy Landfill Solar Array- Site Layout.dwg

1 E101 SITE LAYOUT
1"=60'-0"

Date & Time: 01/20/2023 10:00AM By: Paraniape, Shaunak
Path: J:\Sun Tribe EPC LLC\2230001 - Ivy Landfill Solar Design Services\06_Drawings\Electrical\E100_Sun Tribe EPC LLC - Ivy Landfill Solar Array - Site Layout.dwg

GENERAL NOTES:

A. APPROXIMATE LOCATIONS OF ALL MEDIUM VOLTAGE EQUIPMENT SHOWN FOR PURPOSES OF INTERCONNECT APPLICATION. STRING INVERTER AND COMBINER BOX LOCATIONS NOT SHOWN.

B. CUSTOMER OWNED OVERHEAD LINE POLES ARE SPACED AT LEAST 50'-0" APART.

SYMBOL LIST

- OHC — OHC — OVERHEAD DISTRIBUTION CIRCUIT
- CAB — CAB — NEW CABLE/MESSENGER WIRE ROUTING
- P — P — PV POWER CABLING REFER TO SHEET E502
- CU — CU — COPPER GROUNDING CONDUCTOR
- CAB — CAB — NEW STRING JUMPER CABLE
- NEW UTILITY POLE
- STRINGING PATH
- INV-x — PV INVERTER
- GROUND ROD LOCATION. REFER TO SHEET E707 FOR GROUNDING SYSTEM DETAILS.
- GROUNDING ELECTRODE TEST WELL
- CB # — DC COMBINER BOX

LEGEND

STRING NAMING CONVENTION: STR X-Y-Z
- X: INVERTER ADDRESS
- Y: STRING ADDRESS
- Z: ARRAY SECTION

- INVERTER
- DC COMBINER

SITE DATA	
SYSTEM PRODUCTION SUMMARY	
AC PLANT PEAK PRODUCTION:	4.298 MW
DC PLANT PEAK PRODUCTION:	3.00 MW
DC/AC POWER RATIO:	1.432
INTERCONNECTING UTILITY INFORMATION	
UTILITY:	DOMINION ENERGY
SUBSTATION:	
CIRCUIT:	
LINE VOLTAGE:	34.5 KV
EQUIPMENT SUMMARY	
SOLAR PV MODULE, TYPE I	
MANUFACTURER:	HANWHA QCELLS
MODEL:	Q.PEAK DUO XL-G11S.3/BFG
NOMINAL MAX. DC POWER:	595 W
VOLTAGE (STC), VOC, VMPP:	53.63 V, 45.18 V
CURRENT (STC), ISC, IMPP:	13.77 A, 13.17 A
STRING SIZE (TYPICAL):	24 MODULES
TOTAL PV MODULE TYPE I QTY.:	7224
SOLAR INVERTER	
MANUFACTURER:	YASKAWA SOLECTRIA
MODEL:	XGI 1500 250/250-600
NOMINAL MAX. AC POWER:	250KW / 250 KVA
NOMINAL AC VOLTAGE:	600 V
MAX. AC CURRENT:	240.6 A
TOTAL INVERTER QTY.:	12

SITE COORDINATES:
43.292308, -73.568246

GRAPHIC SCALE 1" = 60'
0 20 40 60 80 100 150 200

PAPER SIZE: 24" x 36"

LaBella
Powered by partnership.
300 State Street, Suite 201
Rochester, NY 14614
585-454-6110
labellapc.com

SUN TRIBE EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

NO:	DATE:	DESCRIPTION:
1.	05/23/2023	30% DESIGN

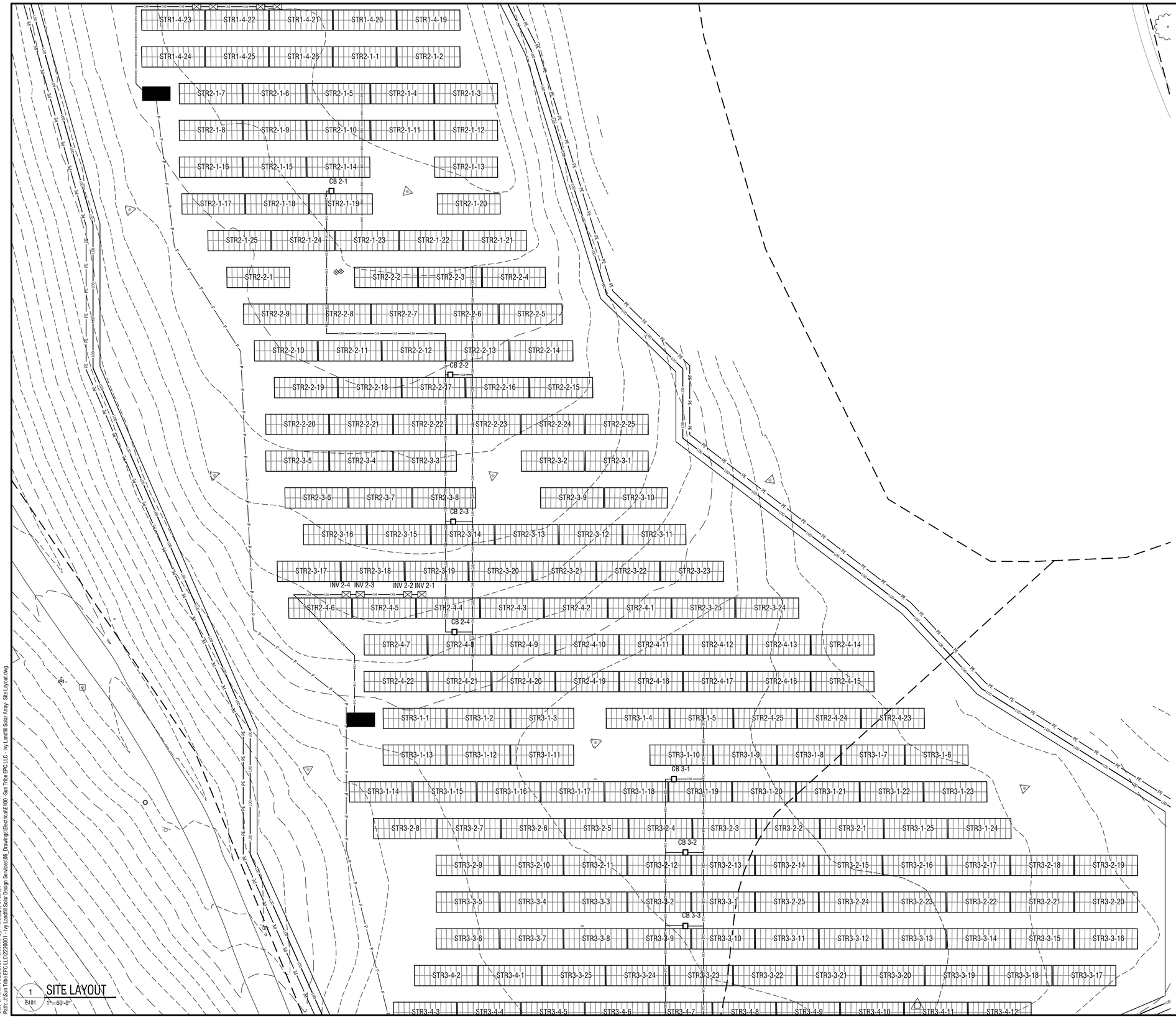
REVISIONS

PROJECT NUMBER: 2230001
DRAWN BY: SJP
REVIEWED BY: SB
ISSUED FOR: 30% DESIGN
DATE: MAY 2023
DRAWING NAME:

NORTH ARRAY LAYOUT

DRAWING NUMBER:

E101



1 E101 SITE LAYOUT
1" = 60'-0"

Date & Time: 01/26/2023 10:00AM By: Paralgider, Shaunak
Path: J:\Sun Tribe EPC LLC\2230001 - Ivy Landfill Solar Design Services\06_Drawings\Electrical\E100_Sun Tribe EPC LLC - Ivy Landfill Solar Array- Site Layout.dwg

GENERAL NOTES:

A. APPROXIMATE LOCATIONS OF ALL MEDIUM VOLTAGE EQUIPMENT SHOWN FOR PURPOSES OF INTERCONNECT APPLICATION. STRING INVERTER AND COMBINER BOX LOCATIONS NOT SHOWN.

B. CUSTOMER OWNED OVERHEAD LINE POLES ARE SPACED AT LEAST 50'-0" APART.

SYMBOL LIST

- OVERHEAD DISTRIBUTION CIRCUIT
- NEW CABLE/MESSENGER WIRE ROUTING
- PV POWER CABLING REFER TO SHEET E502
- COPPER GROUNDING CONDUCTOR
- NEW STRING JUMPER CABLE
- NEW UTILITY POLE
- STRINGING PATH
- INV-x — PV INVERTER
- GROUND ROD LOCATION. REFER TO SHEET E707 FOR GROUNDING SYSTEM DETAILS.
- GROUNDING ELECTRODE TEST WELL
- CB # — DC COMBINER BOX

LEGEND

STRING NAMING CONVENTION: STR X-Y-Z (X: INVERTER ADDRESS; Y: STRING ADDRESS; Z: ARRAY SECTION)

- INVERTER
- DC COMBINER

SITE DATA

SYSTEM PRODUCTION SUMMARY	
AC PLANT PEAK PRODUCTION:	4.298 MW
DC PLANT PEAK PRODUCTION:	3.00 MW
DC/AC POWER RATIO:	1.432

INTERCONNECTING UTILITY INFORMATION	
UTILITY:	DOMINION ENERGY
SUBSTATION:	
CIRCUIT:	
LINE VOLTAGE:	34.5 KV

EQUIPMENT SUMMARY	
SOLAR PV MODULE, TYPE I	
MANUFACTURER:	HANWHA QCELLS
MODEL:	Q.PEAK DUO XL-G11S.3/BFG
NOMINAL MAX. DC POWER:	595 W
VOLTAGE (STC), VOC, VMPP:	53.63 V, 45.18 V
CURRENT (STC), ISC, IMPP:	13.77 A, 13.17 A
STRING SIZE (TYPICAL):	24 MODULES
TOTAL PV MODULE TYPE I QTY.:	7224
SOLAR INVERTER	
MANUFACTURER:	YASKAWA SOLECTRIA
MODEL:	XGI 1500 250/250-600
NOMINAL MAX. AC POWER:	250KW / 250 KVA
NOMINAL AC VOLTAGE:	600 V
MAX. AC CURRENT:	240.6 A
TOTAL INVERTER QTY.:	12

N

SITE COORDINATES:
43.292308, -73.568246

GRAPHIC SCALE 1" = 60'
0 20 40 60 80 100 150 200

PAPER SIZE: 24" x 36"

LaBella
Powered by partnership.

300 State Street, Suite 201
Rochester, NY 14614
585-454-6110

labellapc.com

SUN TRIBE EPC LLC

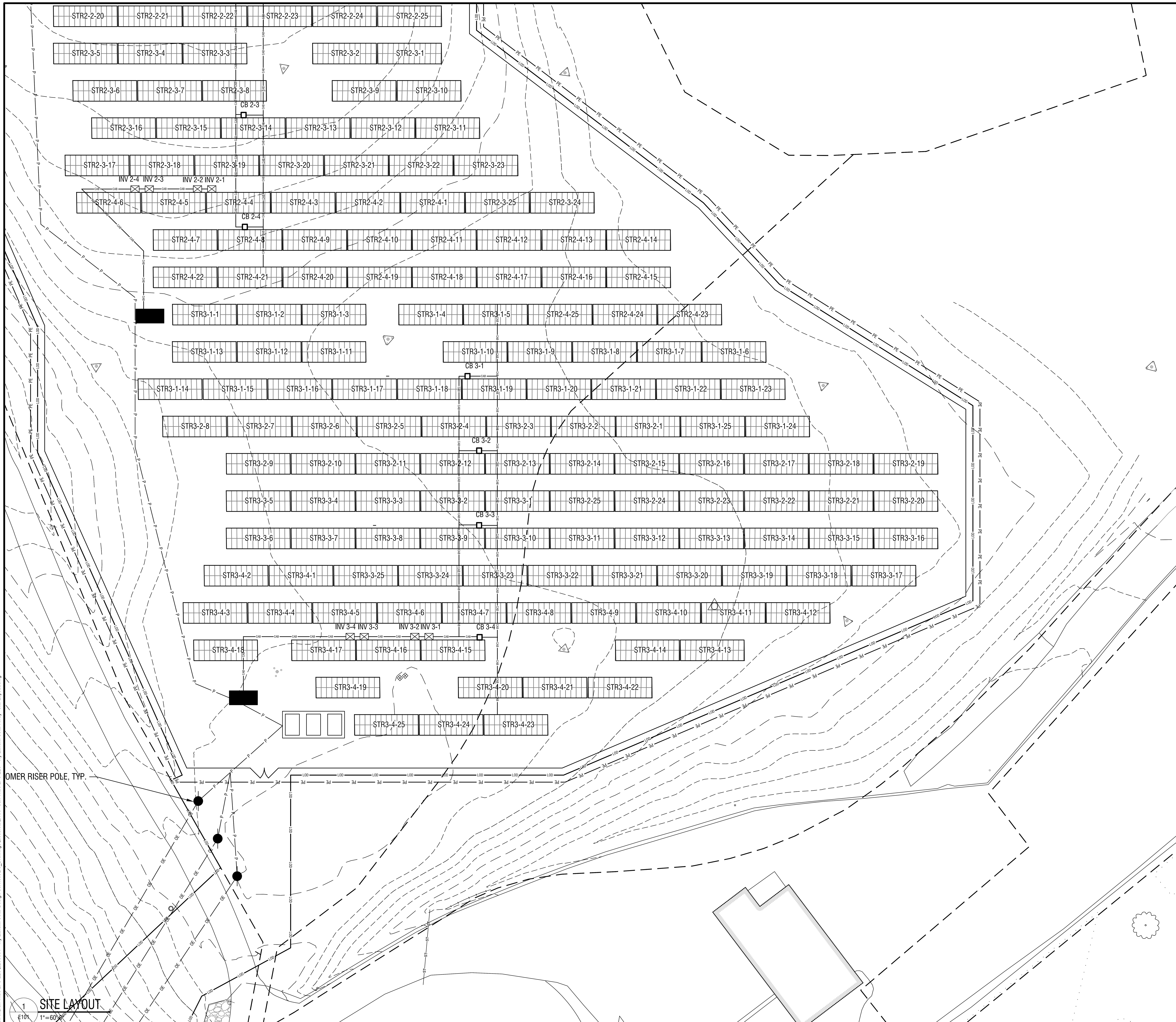
107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

NO:	DATE:	DESCRIPTION:
1.	05/23/2023	30% DESIGN
REVISIONS		

PROJECT NUMBER: 2230001
DRAWN BY: SJP
REVIEWED BY: SB
ISSUED FOR: 30% DESIGN
DATE: MAY 2023
DRAWING NAME: SOUTH LAYOUT
DRAWING NUMBER: E102



1 E101 SITE LAYOUT
1"=60'-0"

Date & Time: 01/20/2023 10:00AM By: Paranjape, Shaunak
Path: J:\Sun Tribe EPC LLC\2230001 - Ivy Landfill Solar Design Services\06_Drawings\Electrical\E100 -Sun Tribe EPC LLC - Ivy Landfill Solar Array- Site Layout.dwg

GENERAL NOTES:

A. APPROXIMATE LOCATIONS OF ALL MEDIUM VOLTAGE EQUIPMENT SHOWN FOR PURPOSES OF INTERCONNECT APPLICATION. STRING INVERTER AND COMBINER BOX LOCATIONS NOT SHOWN.

B. CUSTOMER OWNED OVERHEAD LINE POLES ARE SPACED AT LEAST 50'-0" APART.

SYMBOL LIST

- OE — OE: OVERHEAD DISTRIBUTION CIRCUIT
- CAB — CAB: NEW CABLE/MESSENGER WIRE ROUTING
- P — P: PV POWER CABLING REFER TO SHEET E502
- CU — CU: COPPER GROUNDING CONDUCTOR
- CAB: NEW STRING JUMPER CABLE
- NEW UTILITY POLE
- STRINGING PATH
- INV-x: PV INVERTER
- GROUND ROD LOCATION. REFER TO SHEET E707 FOR GROUNDING SYSTEM DETAILS.
- GROUNDING ELECTRODE TEST WELL
- # CB #: DC COMBINER BOX

LEGEND

STRING NAMING CONVENTION: STR -X-Y-Z (X: ARRAY SECTION; Y: INVERTER ADDRESS; Z: STRING ADDRESS)

- INVERTER
- DC COMBINER

SITE DATA

SYSTEM PRODUCTION SUMMARY	
AC PLANT PEAK PRODUCTION:	4.298 MW
DC PLANT PEAK PRODUCTION:	3.00 MW
DC/AC POWER RATIO:	1.432
INTERCONNECTING UTILITY INFORMATION	
UTILITY:	DOMINION ENERGY
SUBSTATION:	
CIRCUIT:	
LINE VOLTAGE:	34.5 KV
EQUIPMENT SUMMARY	
SOLAR PV MODULE, TYPE I	
MANUFACTURER:	HANWHA QCELLS
MODEL:	Q.PEAK DUO XL-G11S.3/BFG
NOMINAL MAX. DC POWER:	595 W
VOLTAGE (STC), VOC, VMPP:	53.63 V, 45.18 V
CURRENT (STC), ISC, IMPP:	13.77 A, 13.17 A
STRING SIZE (TYPICAL):	24 MODULES
TOTAL PV MODULE TYPE I QTY.:	7224
SOLAR INVERTER	
MANUFACTURER:	YASKAWA SOLECTRIA
MODEL:	XGI 1500 250/250-600
NOMINAL MAX. AC POWER:	250KW / 250 KVA
NOMINAL AC VOLTAGE:	600 V
MAX. AC CURRENT:	240.6 A
TOTAL INVERTER QTY.:	12

N

SITE COORDINATES:
43.292308, -73.568246

GRAPHIC SCALE 1" = 60'
0 20 40 60 80 100 150 200
PAPER SIZE: 24" x 36"

LaBella
Powered by partnership.

300 State Street, Suite 201
Rochester, NY 14614
585-454-6110

labellapc.com

SUN TRIBE EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

NO:	DATE:	DESCRIPTION:
1.	05/23/2023	30% DESIGN

REVISIONS

PROJECT NUMBER: 2230001

DRAWN BY: SJP

REVIEWED BY: SB

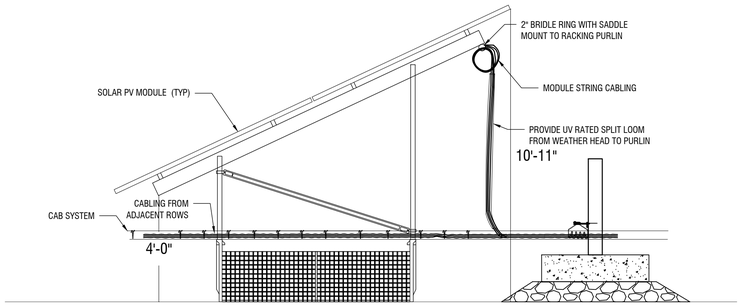
ISSUED FOR: 30% DESIGN

DATE: MAY 2023

DRAWING NAME: **SOUTH LAYOUT**

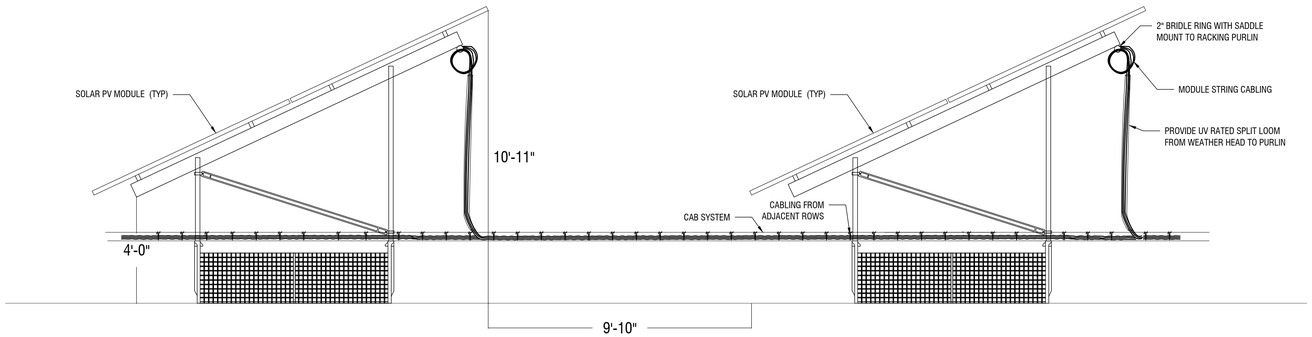
DRAWING NUMBER: **E102**

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION



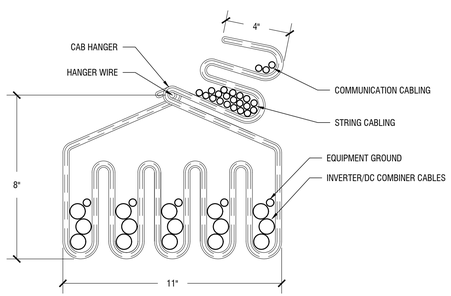
1 E-502 TYPICAL ROW WITHOUT EQUIPMENT DETAIL

N.T.S.



2 E-502 TYPICAL N-S RUN BETWEEN TWO ROWS

N.T.S.

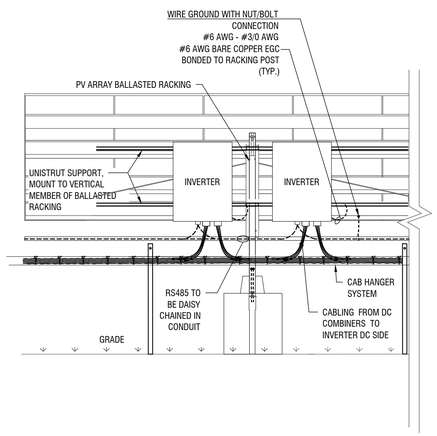


DETAIL NOTES:

1. MAXIMUM BUNDLE SIZE FOR AC FEEDERS IS 3 CURRENT CARRYING CONDUCTORS.
2. MAXIMUM BUNDLE SIZE FOR DC STRING CABLES IS 20 CURRENT CARRYING CONDUCTORS.
3. SEPARATION OF BUNDLE TYPE MUST BE MAINTAINED. AC, DC, COMMUNICATION CONDUCTORS MUST ALL BE IN THEIR RESPECTIVE CAB HANGER SECTIONS.

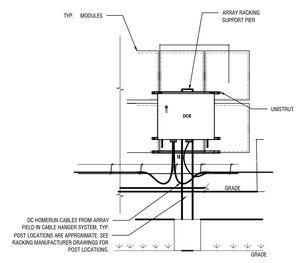
3 E-502 TYPICAL HANGER WITH CONDUCTOR BUNDLES

N.T.S.



4 E-502 TYPICAL INVERTER RACKING DETAIL

N.T.S.



5 E-502 TYPICAL STAND-ALONE DC COMBINER RACKING DETAIL

N.T.S.

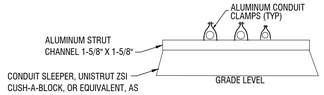
GENERAL NOTES:

1. MODULE AND COMBINER BOX RACKING DIAGRAMMATIC ONLY. REFER TO RACKING MANUFACTURER DRAWINGS FOR ACTUAL DIMENSIONS, CONFIGURATION, AND MODULE TILTS.
2. INSTALL STRING WIRING PER TYPICAL STRING WIRING DETAIL ON MODULE DETAILS SHEET. REFER TO ELECTRICAL SITE PLANS AND THREE LINE FOR COMBINER BOX ASSIGNMENTS.
3. ALL LOOSE CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH WEATHER-TIGHT FITTINGS WITH STRAIN RELIEF.
4. ALL CONDUIT ENCASED CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH INSULATING BUSHINGS OR DUCT SEAL COMPOUND.
5. THE USE OF PLASTIC ZIP TIES IS NOT AN APPROVED METHOD TO SUPPORT OR ATTACH WIRE IN OUTDOOR APPLICATIONS. PLASTIC ZIP TIES ARE ONLY PERMITTED FOR SUPPLEMENTAL GROUPING OR BUNDLING OF CONDUCTORS INSIDE OF EQUIPMENT. PV-SPECIFIC STAINLESS STEEL CLIPS AND VINYL JACKETED STEEL CABLE TIES (HEYCO SUNBUNDLER) OR AN APPROVED EQUAL ARE ALLOWED FOR USE IN THIS APPLICATION.
6. PROTECT WIRE FROM SHARP EDGES WITH UV RATED SPIRAL WRAP, EDGE-GUARD, OR SPLIT LOOM.
7. SEAL ALL WEATHER HEADS WITH DUCT SEAL COMPOUND OR SPRAY FOAM TO A DEPTH OF 2" WITHIN CAVITY.
8. REFER TO GROUNDING DETAILS SHEET FOR ADDITIONAL GROUNDING INFORMATION.
9. NO SELF TAPPING SCREWS MAY BE USED TO ELECTRICALLY BOND TO GROUND BETWEEN RACKING OR MODULE STRUCTURES.
10. ROUTE AND SUPPORT CABLING ON RACKING PER RACKING MANUFACTURER RECOMMENDATIONS.
11. PROVIDE TEMPORARY 1" STEEL PLATES OVER CABLE TRENCHES AT ALL VEHICLE CROSSING DURING CONSTRUCTION.
12. LONG STRAIGHT EXPOSED METAL CONDUIT (RMC, GRC, EMT) RUNS, 100 FEET OR MORE, MUST HAVE EXPANSION FITTINGS INSTALLED PER NEC 300.7(B)

SYMBOL LIST

————	DC CABLE (+)
- - - - - - - - - -	DC CABLE (-)

PROVIDE EXPANSION JOINTS BETWEEN CONDUIT SECTIONS AS NEEDED TO COMPENSATE FOR THERMAL EXPANSION, DEFLECTION, AND CONTRACTION.



6 E-502 ABOVE-GRADE CONDUIT INSTALLATION DETAIL

N.T.S

LaBella Powered by partnership.

300 State Street, Suite 201
Rochester, NY 14614
585-454-6110

labellapc.com

SUN TRIBE EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

1.	05/23/2023	30% DESIGN
NO:	DATE:	DESCRIPTION:

REVISIONS

PROJECT NUMBER: 2230001

DRAWN BY: SJP

REVIEWED BY: SB

ISSUED FOR: 30% DESIGN

DATE: MAY 2023

DRAWING NAME:

RACKING & CABLING DETAILS

DRAWING NUMBER:

E502

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

PV SOURCE CIRCUIT CONNECTORS MUST BE IDENTICAL TO MAKE AND MODEL AS THE MODULE CONNECTORS. THE CONNECTION TO SOURCE CIRCUITS MUST BE PER THE MODULE AND CONNECTOR MANUFACTURER INSTRUCTIONS. CONNECTORS LISTED AS "COMPATIBLE" BUT NOT IDENTICAL SHALL NOT BE ACCEPTED. CONTRACTOR TO VERIFY THAT THE SOURCE CIRCUIT CONDUCTOR DIAMETER IS COMPATIBLE WITH THE CONNECTOR USED.

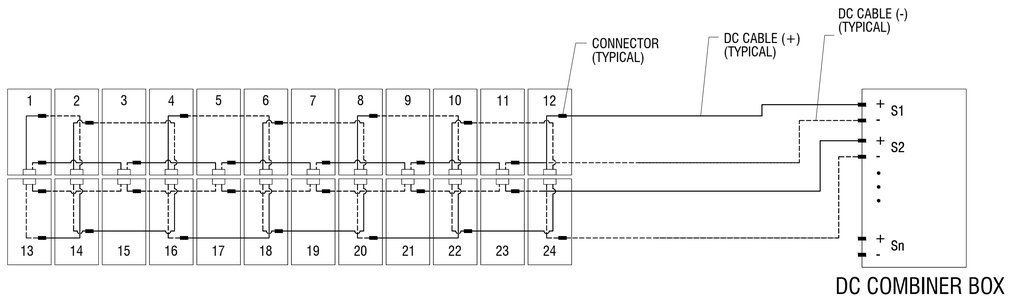
SUBMITTALS REQUIRED FOR PV SOURCE CIRCUIT CONNECTORS FROM ELECTRICAL CONTRACTOR FOR REVIEW AND APPROVAL BY NEXTERA PROJECT ENGINEER PRIOR TO PURCHASE.

GENERAL NOTES:

1. MODULE AND COMBINER BOX RACKING DIAGRAMMATIC ONLY. REFER TO RACKING MANUFACTURER DRAWINGS FOR ACTUAL DIMENSIONS, CONFIGURATION, AND MODULE TILTS.
2. INSTALL STRING WIRING PER TYPICAL STRING WIRING DETAIL ON MODULE DETAILS SHEET. REFER TO ELECTRICAL SITE PLANS AND THREE LINE FOR COMBINER BOX ASSIGNMENTS.
3. ALL LOOSE CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH WEATHER-TIGHT FITTINGS WITH STRAIN RELIEF.
4. ALL CONDUIT ENCASED CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH INSULATING BUSHINGS OR DUCT SEAL COMPOUND.
5. THE USE OF PLASTIC ZIP TIES IS NOT AN APPROVED METHOD TO SUPPORT OR ATTACH WIRE IN OUTDOOR APPLICATIONS. PLASTIC ZIP TIES ARE ONLY PERMITTED FOR SUPPLEMENTAL GROUPING OR BUNDLING OF CONDUCTORS INSIDE OF EQUIPMENT. PV-SPECIFIC STAINLESS STEEL CLIPS AND VINYL JACKETED STEEL CABLE TIES (HEYCO SUNBUNDLER) OR AN APPROVED EQUAL ARE ALLOWED FOR USE IN THIS APPLICATION.
6. PROTECT WIRE FROM SHARP EDGES WITH UV RATED SPIRAL WRAP, EDGE-GUARD, OR SPLIT LOOM.
7. SEAL ALL WEATHER HEADS WITH DUCT SEAL COMPOUND OR SPRAY FOAM TO A DEPTH OF 2" WITHIN CAVITY.
8. REFER TO GROUNDING DETAILS SHEET FOR ADDITIONAL GROUNDING INFORMATION.
9. NO SELF TAPPING SCREWS MAY BE USED TO ELECTRICALLY BOND TO GROUND BETWEEN RACKING OR MODULE STRUCTURES.
10. ROUTE AND SUPPORT CABLING ON RACKING PER RACKING MANUFACTURER RECOMMENDATIONS.
11. LONG STRAIGHT EXPOSED METAL CONDUIT (RMC, GRC, EMT) RUNS, 100 FEET OR MORE, MUST HAVE EXPANSION FITTINGS INSTALLED PER NEC 300.7(B)

SYMBOL LIST

————	DC CABLE (+)
- - - - - - - - - -	DC CABLE (-)



1 / E-503 TYPICAL 595W MODULES STRING WIRING DETAIL (24 MODULE STRING)
NOT TO SCALE

LaBella Powered by partnership.

300 State Street, Suite 201
Rochester, NY 14614
585-454-6110

labellapc.com

SUN TRIBE EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

NO:	DATE:	DESCRIPTION:
1.	05/23/2023	30% DESIGN

REVISIONS

PROJECT NUMBER: 2230001

DRAWN BY: SJP

REVIEWED BY: SB

ISSUED FOR: 30% DESIGN

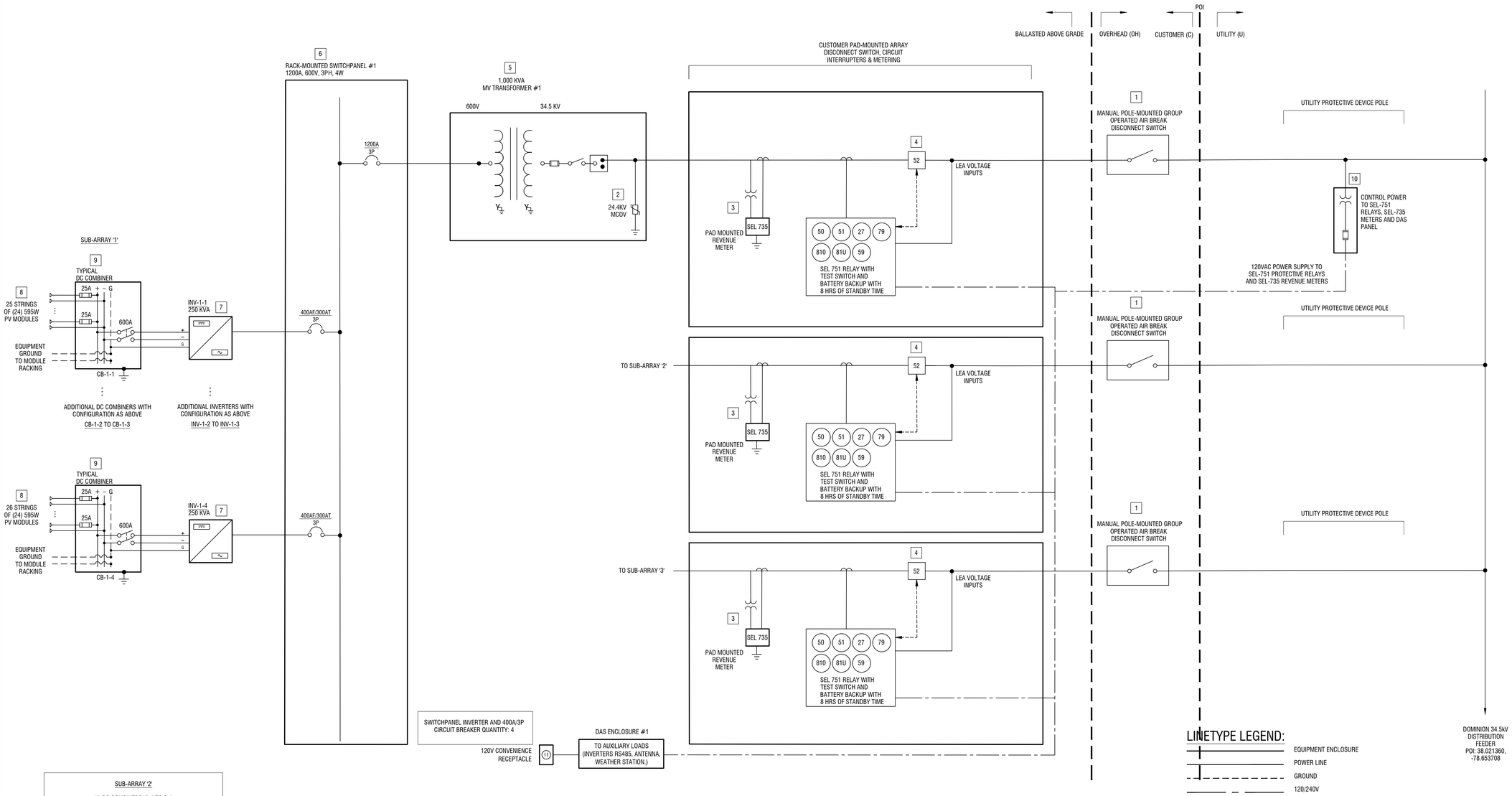
DATE: MAY 2023

DRAWING NAME:

RACKING & CABLING DETAILS

DRAWING NUMBER:

E502



SUB-ARRAY '2':

(4) DC COMBINERS: 2-1 TO 2-4.
EACH COMBINER:
CB-2-1 TO CB-2-4: 25 STRINGS OF (24) 595W PV MODULES.

(4) 250KVA INVERTERS: 2-1 TO 2-4.
EACH INVERTER COMPRISES (2) DC INPUTS - CB 2-X-1 AND 2-X-2.

SWITCH PANEL '2': 1200A, 600V, 3PH 4W.
(1) 1200A 3-POLE LSI OUTPUT BREAKER,
(4) 400AF/300AT 3-POLE INPUT BREAKER

SUB-ARRAY '3':

(4) DC COMBINERS: 3-1 TO 3-4.
EACH COMBINER:
CB-3-1 TO CB-3-4: 25 STRINGS OF (24) 595W PV MODULES.

(4) 250KVA INVERTERS: 3-1 TO 3-4.
EACH INVERTER COMPRISES (2) DC INPUTS - CB 3-X-1 AND 3-X-2.

SWITCH PANEL '3': 1200A, 600V, 3PH 4W.
(1) 1200A 3-POLE LSI OUTPUT BREAKER,
(4) 400AF/300AT 3-POLE INPUT BREAKER

EQUIPMENT SCHEDULE

KEY	QTY	DESCRIPTION	MANUF.	PN	RATINGS	NOTES	OWNER U / C	CLASS MV/LV
1	3	UTILITY MAIN DISCONNECT SWITCH	TBD	TBD	35KV, 630A 65KAIC, 200kV BIL	POLE MOUNTED LOAD BREAK DISCONNECT SWITCH: MANUAL, GROUP OPERATED, AIR BREAK, VISIBLE OPEN, LOCKABLE WITH 24/7 ACCESS. CUSTOMER OWNED AND INSTALLED. CUSTOMER AND UTILITY OPERATED.	C	MV
2	3	LOAD BREAK SWITCH	G&W	PNI41-396-12-12L-A	38KV, 630A, 150KV BIL, 25KA INTERRUPT RATING	NEMA 4 PADLOCKABLE PAD-MOUNTED FRONT-ACCESS LINEAR VACUUM INTERRUPTER WITH VISIBLE BREAK.	C	MV
3	3	REVENUE METERING EQUIPMENT	SEL	735	CT RATING - 100:5; PT RATING - 175:1	175:1 EXTENDED RANGE HIGH ACCURACY POTENTIAL TRANSFORMERS, 200KV BIL 0.15 ACCURACY CLASS THROUGH Y, 1000VA THERMAL BURDEN, 100:5 HIGH ACCURACY CURRENT TRANSFORMERS, CLASS 0.15 @ B0.2 PAD MOUNTED. UTILITY GRADE. CUSTOMER INSTALLED AND OPERATED.	U	MV
4	3	MV CIRCUIT BREAKER	G&W	PNI41-396-12-12L-A	38KV, 630A, 150KV BIL, 12.5KA INTERRUPT RATING	NEMA 4 PADLOCKABLE PAD-MOUNTED FRONT-ACCESS SF6 CIRCUIT BREAKER WITH EXTERNAL CONTROL CABINET. CABINET TO INCLUDE SEL-751 PROTECTIVE RELAY AND 8-HR BATTERY BACKUP, CONTROL VOLTAGE SENSORS, COOLING FAN AND CONVENIENCE OUTLET.	C	MV
5	1	MV STEP-UP TRANSFORMER	TBD	TBD	%Z: 5.75 X/R: 8 PRI: 35KV WYE-G SEC: 600V WYE-G	CLASS 27KV, 24.4KV MCOV ELBOW SURGE ARRESTERS MOUNTED EXTERNALLY IN HV CABINET SECTION.	C	MV/LV
6	3	RACK-MOUNTED SWITCHPANEL	SCHNEIDER ELECTRIC	TBD	1200A, 600V, 3PH, 4W, WITH 1200A MCB	PV AC SERVICE ENTRANCE SWITCHGEAR. MAX SURGE CURRENT RATING 200KA PER PHASE. ENCLOSURE NEMA 3R RATED.	C	LV
7	8	PV INVERTER	SOLECTRIA	XGI 1500-250/250-600	AC 250KW, 240.6A, 600V	INVERTERS ARE UL1741 LISTED, IEEE1547 COMPLIANT, RATED TO 1500 VDC. THE INVERTERS HAVE INTEGRAL, MANUAL DC DISCONNECTING MEANS. THE INVERTER IS EQUIPPED WITH UL1741 APPROVED GROUND FAULT DETECTION DEVICE THAT MEETS NFPA 70 ARTICLE 250.122 REQUIREMENTS FOR EQUIPMENT GROUNDING.	C	LV
8	7,224	SOLAR MODULE	HANWHA QCELL	QPEAK DUO XL-G11S.3 595/BFG	595W Imp 13.17A Vmp 45.18V Isc: 13.77A Voc: 53.63V	MODULES ARE UL1703 LISTED, RATED TO 1500 VDC. EACH MODULE INCLUDES OUTDOOR RATED QUICK CONNECTS FOR MODULE INTERCONNECTION. DO NOT REMOVE THE QUICK CONNECTS, OTHERWISE THE MODULE WARRANTY AND UL LISTING MAY BE INVALIDATED. QUICK CONNECTS SHALL COMPLY WITH NFPA 70 ARTICLE 690.33(C).	C	LV
9	12	DC DISCONNECT COMBINER	TERRASMART	CSFT600-24-25-N4	24 INPUTS WITH 25A FUSES 1 - POSITIVE OUTPUT 1 - NEGATIVE OUTUPT 600A 2-POLE LOAD-BREAK DISCONNECT 1500VDC SURGE PROTECTION	UL-1741 LISTED NEMA-4 ENCLOSURE WITH 24 POSITIVE/NEGATIVE INPUTS.	C	LV
10	1	CONTROL POWER TRANSFORMER	TBD	TBD	15KV-120/240VAC 104:1	2E PROTECTIVE FUSE	C	MV

LaBella
Powered by partnership.

300 State Street, Suite 201
Rochester, NY 14614
585-454-6110

labellapc.com

SUN TRIBE EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

NO:	DATE:	DESCRIPTION:
1.	05/23/2023	30% DESIGN

REVISIONS

PROJECT NUMBER: 2230001

DRAWN BY: SJP

REVIEWED BY: SB

ISSUED FOR: 30% DESIGN

DATE: MAY 2023

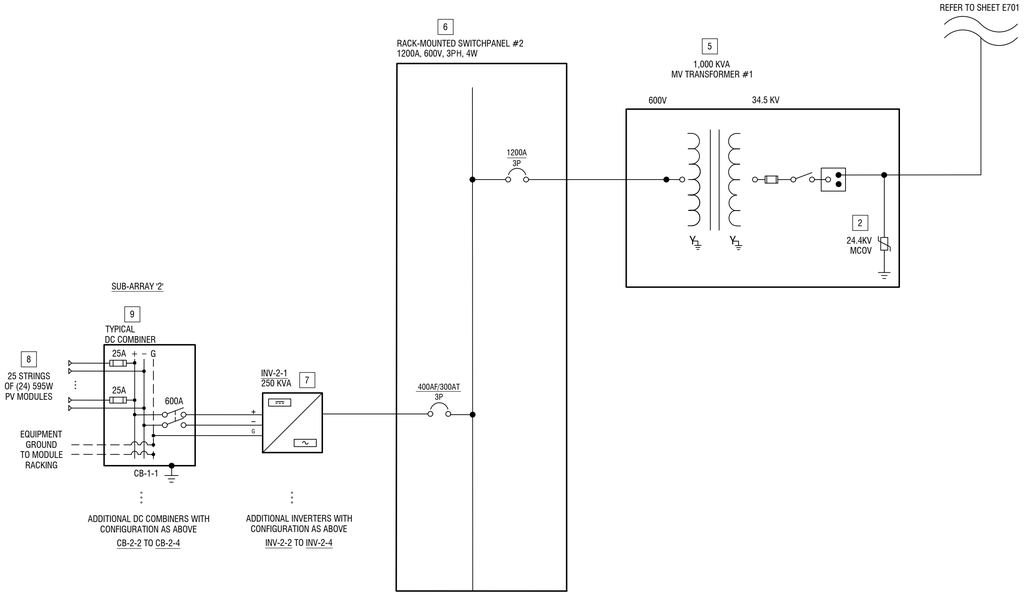
DRAWING NAME:

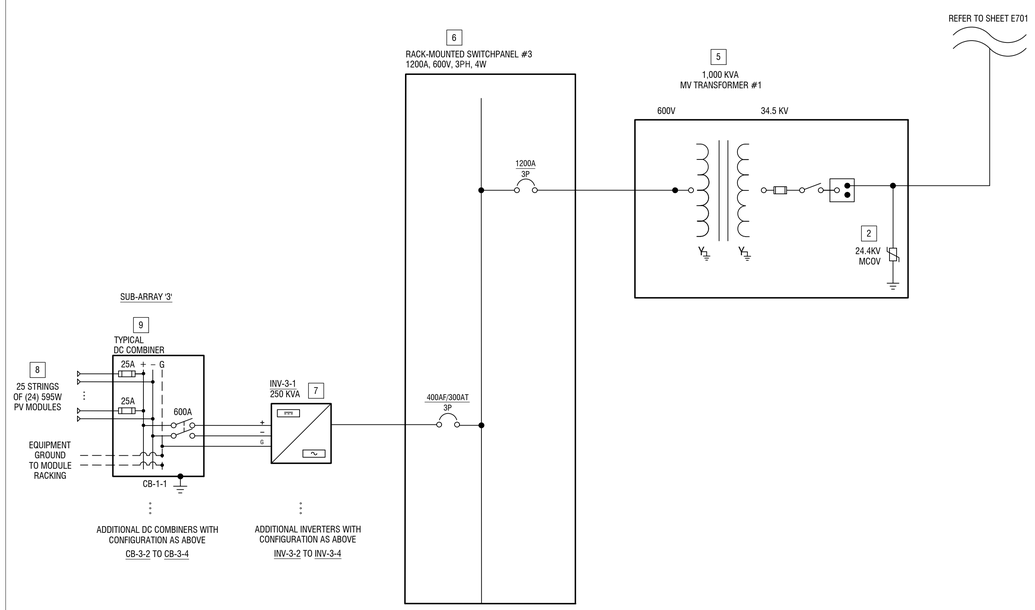
ONE LINE DIAGRAM
ARRAY 1

DRAWING NUMBER:

E701

Date & Time: 01/20/2023 10:00AM By: Paraniape, Shaunak
Path: J:\Sun Tribe EPC LLC\2230001 - Ivy Landfill Solar Design Services\06_Drawings\Electrical\E701 702 - Sun Tribe EPC LLC - Ivy Landfill Solar Array - One Line Diagram.dwg





EQUIPMENT SCHEDULE

KEY	QTY	DESCRIPTION	MANUF.	PN	RATINGS	NOTES	OWNER U / C	CLASS MV/LV
1	3	UTILITY MAIN DISCONNECT SWITCH	TBD	TBD	35KV, 630A 65KAIC, 200kV BIL	POLE MOUNTED LOAD BREAK DISCONNECT SWITCH: MANUAL, GROUP OPERATED, AIR BREAK, VISIBLE OPEN, LOCKABLE WITH 24/7 ACCESS. CUSTOMER OWNED AND INSTALLED. CUSTOMER AND UTILITY OPERATED.	C	MV
2	3	LOAD BREAK SWITCH	G&W	PNI41-396-12-12L-A	38KV, 630A, 150KV BIL, 25KA INTERRUPT RATING	NEMA 4 PADLOCKABLE PAD-MOUNTED FRONT-ACCESS LINEAR VACUUM INTERRUPTER WITH VISIBLE BREAK.	C	MV
3	3	REVENUE METERING EQUIPMENT	SEL	735	CT RATING - 100:5; PT RATING - 175:1	175:1 EXTENDED RANGE HIGH ACCURACY POTENTIAL TRANSFORMERS, 200KV BIL 0.15 ACCURACY CLASS THROUGH Y, 1000VA THERMAL BURDEN, 100:5 HIGH ACCURACY CURRENT TRANSFORMERS, CLASS 0.15 @ 80.2 PAD MOUNTED. UTILITY GRADE. CUSTOMER INSTALLED AND OPERATED.	U	MV
4	3	MV CIRCUIT BREAKER	G&W	PNI41-396-12-12L-A	38KV, 630A, 150KV BIL, 12.5KA INTERRUPT RATING	NEMA 4 PADLOCKABLE PAD-MOUNTED FRONT-ACCESS SF6 CIRCUIT BREAKER WITH EXTERNAL CONTROL CABINET. CABINET TO INCLUDE SEL-751 PROTECTIVE RELAY AND 8-HR BATTERY BACKUP, CONTROL VOLTAGE SENSORS, COOLING FAN AND CONVENIENCE OUTLET.	C	MV
5	1	MV STEP-UP TRANSFORMER	TBD	TBD	%Z: 5.75 X/R: 8 PRI: 35KV WYE-G SEC: 600V WYE-G	CLASS 27KV, 24.4KV MCOV ELBOW SURGE ARRESTERS MOUNTED EXTERNALLY IN HV CABINET SECTION.	C	MV/LV
6	3	RACK-MOUNTED SWITCHPANEL	SCHNEIDER ELECTRIC	TBD	1200A, 600V, 3PH, 4W, WITH 1200A MCB	PV AC SERVICE ENTRANCE SWITCHGEAR. MAX SURGE CURRENT RATING 200KA PER PHASE. ENCLOSURE NEMA 3R RATED.	C	LV
7	8	PV INVERTER	SOLECTRIA	XGI 1500-250/250-600	AC 250KW, 240.6A, 600V	INVERTERS ARE UL1741 LISTED, IEEE1547 COMPLIANT, RATED TO 1500 VDC. THE INVERTERS HAVE INTEGRAL, MANUAL DC DISCONNECTING MEANS. THE INVERTER IS EQUIPPED WITH UL1741 APPROVED GROUND FAULT DETECTION DEVICE THAT MEETS NFPA 70 ARTICLE 250.122 REQUIREMENTS FOR EQUIPMENT GROUNDING.	C	LV
8	7,224	SOLAR MODULE	HANWHA QCELL	QPEAK DUO XL-G11S.3 595/BFG	595W Imp 13.17A Vmp 45.18V Isc: 13.77A Voc: 53.63V	MODULES ARE UL1703 LISTED, RATED TO 1500 VDC. EACH MODULE INCLUDES OUTDOOR RATED QUICK CONNECTS FOR MODULE INTERCONNECTION. DO NOT REMOVE THE QUICK CONNECTS, OTHERWISE THE MODULE WARRANTY AND UL LISTING MAY BE INVALIDATED. QUICK CONNECTS SHALL COMPLY WITH NFPA 70 ARTICLE 690.33(C).	C	LV
9	12	DC DISCONNECT COMBINER	TERRASMART	CSFT600-24-25-N4	24 INPUTS WITH 25A FUSES 1 - POSITIVE OUTPUT 1 - NEGATIVE OUTUPT 600A 2-POLE LOAD-BREAK DISCONNECT 1500VDC SURGE PROTECTION	UL-1741 LISTED NEMA-4 ENCLOSURE WITH 24 POSITIVE/NEGATIVE INPUTS.	C	LV
10	1	CONTROL POWER TRANSFORMER	TBD	TBD	15KV-120/240VAC 104:1	2E PROTECTIVE FUSE	C	MV

EQUIPMENT SCHEDULE

KEY	QTY	DESCRIPTION	MANUF.	PN	RATINGS	NOTES	OWNER U / C	CLASS MV/LV
1	3	UTILITY MAIN DISCONNECT SWITCH	TBD	TBD	35KV, 630A 65KAIC, 200kV BIL	POLE MOUNTED LOAD BREAK DISCONNECT SWITCH: MANUAL, GROUP OPERATED, AIR BREAK, VISIBLE OPEN, LOCKABLE WITH 24/7 ACCESS. CUSTOMER OWNED AND INSTALLED. CUSTOMER AND UTILITY OPERATED.	C	MV
2	3	LOAD BREAK SWITCH	G&W	PNI41-396-12-12L-A	38KV, 630A, 150KV BIL, 25KA INTERRUPT RATING	NEMA 4 PADLOCKABLE PAD-MOUNTED FRONT-ACCESS LINEAR VACUUM INTERRUPTER WITH VISIBLE BREAK.	C	MV
3	3	REVENUE METERING EQUIPMENT	SEL	735	CT RATING - 100:5; PT RATING - 175:1	175:1 EXTENDED RANGE HIGH ACCURACY POTENTIAL TRANSFORMERS, 200KV BIL 0.15 ACCURACY CLASS THROUGH Y, 1000VA THERMAL BURDEN, 100:5 HIGH ACCURACY CURRENT TRANSFORMERS, CLASS 0.15 @ 80.2 PAD MOUNTED. UTILITY GRADE. CUSTOMER INSTALLED AND OPERATED.	U	MV
4	3	MV CIRCUIT BREAKER	G&W	PNI41-396-12-12L-A	38KV, 630A, 150KV BIL, 12.5KA INTERRUPT RATING	NEMA 4 PADLOCKABLE PAD-MOUNTED FRONT-ACCESS SF6 CIRCUIT BREAKER WITH EXTERNAL CONTROL CABINET. CABINET TO INCLUDE SEL-751 PROTECTIVE RELAY AND 8-HR BATTERY BACKUP, CONTROL VOLTAGE SENSORS, COOLING FAN AND CONVENIENCE OUTLET.	C	MV
5	1	MV STEP-UP TRANSFORMER	TBD	TBD	%Z: 5.75 X/R: 8 PRI: 35KV WYE-G SEC: 600V WYE-G	CLASS 27KV, 24.4KV MCOV ELBOW SURGE ARRESTERS MOUNTED EXTERNALLY IN HV CABINET SECTION.	C	MV/LV
6	3	RACK-MOUNTED SWITCHPANEL	SCHNEIDER ELECTRIC	TBD	1200A, 600V, 3PH, 4W, WITH 1200A MCB	PV AC SERVICE ENTRANCE SWITCHGEAR. MAX SURGE CURRENT RATING 200KA PER PHASE. ENCLOSURE NEMA 3R RATED.	C	LV
7	8	PV INVERTER	SOLECTRIA	XGI 1500-250/250-600	AC 250KW, 240.6A, 600V	INVERTERS ARE UL1741 LISTED, IEEE1547 COMPLIANT, RATED TO 1500 VDC. THE INVERTERS HAVE INTEGRAL, MANUAL DC DISCONNECTING MEANS. THE INVERTER IS EQUIPPED WITH UL1741 APPROVED GROUND FAULT DETECTION DEVICE THAT MEETS NFPA 70 ARTICLE 250.122 REQUIREMENTS FOR EQUIPMENT GROUNDING.	C	LV
8	7,224	SOLAR MODULE	HANWHA QCELL	QPEAK DUO XL-G11S.3 595/BFG	595W Imp 13.17A Vmp 45.18V Isc: 13.77A Voc: 53.63V	MODULES ARE UL1703 LISTED, RATED TO 1500 VDC. EACH MODULE INCLUDES OUTDOOR RATED QUICK CONNECTS FOR MODULE INTERCONNECTION. DO NOT REMOVE THE QUICK CONNECTS, OTHERWISE THE MODULE WARRANTY AND UL LISTING MAY BE INVALIDATED. QUICK CONNECTS SHALL COMPLY WITH NFPA 70 ARTICLE 690.33(C).	C	LV
9	12	DC DISCONNECT COMBINER	TERRASMART	CSFT600-24-25-N4	24 INPUTS WITH 25A FUSES 1 - POSITIVE OUTPUT 1 - NEGATIVE OUTUPT 600A 2-POLE LOAD-BREAK DISCONNECT 1500VDC SURGE PROTECTION	UL-1741 LISTED NEMA-4 ENCLOSURE WITH 24 POSITIVE/NEGATIVE INPUTS.	C	LV
10	1	CONTROL POWER TRANSFORMER	TBD	TBD	15KV-120/240VAC 104:1	2E PROTECTIVE FUSE	C	MV

LaBella
Powered by partnership.

300 State Street, Suite 201
Rochester, NY 14614
585-454-6110

labellapc.com

SUN TRIBE EPC LLC

107 5TH STREET SOUTHEAST,
CHARLOTTESVILLE, VA 22902

IVY LANDFILL SOLAR ARRAY

4576 DICK WOODS ROAD
CHARLOTTESVILLE, VA 22903
COUNTY OF ALBERMARLE

NO:	DATE:	DESCRIPTION:
1.	05/23/2023	30% DESIGN
REVISIONS		

PROJECT NUMBER: 2230001

DRAWN BY: SJP

REVIEWED BY: SB

ISSUED FOR: 30% DESIGN

DATE: MAY 2023

DRAWING NAME: ONE LINE DIAGRAM

DRAWING NUMBER: E704