Building Permit Application

Howard County Maryland
Department of Inspections, Licenses and Permits
3430 Court House Drive
Permits: 410-313-2455
www.howardcountymd.gov

Date Received: REVISED

Permit No.: B20002180

Building Address: ~~1799 Hennington Road~~ 1825 SAND HILL ROAD
City: Marriottsville State: MD Zip Code: 21104
Suite/Apt. # Unit 1 SDP/WP/BA #: SDP-20-050
Subdivision: 3rd Election District
Lot: Tax Map: 10 Parcel: 18
BLOCK 19
Existing Use: ZONED RR-DEO EXISTING FIELD
Proposed Use: SOLAR PANEL FARM
Estimated Construction Cost: $ $ 1,600,00
Description of Work: Construct Ground Mount solar System of 1,900 MW AC w/ 6,129 Solar Panels. Unoccupied Facility
Occupant/Tenant Name: Nautilus Solar
Was tenant space previously occupied? ☐ Yes ☑ No
Contact Name: Sean Rooney
Address: 396 Springfield Avenue 2ND FL
City: Summit State: NJ Zip Code: 07901
Phone: 908-795-3046 Fax:
Email: sean@nautilussolar.com

Property Owner's Name: AUSTIN E HOFFMAN
Address: 1730 Henryton Road
City: Marriottsville State: MD Zip Code: 21104
Phone: 410-442-1831 Fax:
Email:

Applicant's Name & Mailing Address, (If other than stated herein)
Applicant's Name: Frank T. Buccieri
Address: 6701 Democracy Blvd Suite 300
City: Bethesda State: MD Zip Code: 20817
Phone: 301-331-7471 Fax:
Email: frank.buccieri@comcast.net

Contractor Company: MB Haynes Corp
Contact Person: Frank Buccieri
Address: 6701 Democracy Blvd Suite 300
City: Bethesda State: MD Zip Code: 20817
License No. : 153591 60
Phone: 301-331-7471 Fax:
Email: frank.buccieri@comcast.net

Engineer/Architect Company: Avca Engineers
Responsible Design Prof.: Kevin Leary
Address: 242 Old New Brunswick Road
City: Piscataway State: NJ Zip Code: 08854
Phone: 732-465-1002 Fax:
Email: kleary@avcagroup.com

Commercial Building Characteristics	*Residential Building Characteristics*
Height: 12 Ft	☐ SF Dwelling ☐ SF Townhouse
No. of stories: 1	**Depth** **Width**
Gross area, sq. ft./floor: 3.3 Acre	1st floor:
	2nd floor:
Area of construction (sq. ft.): 3.3 Acre	Basement:
	☐ Finished Basement
Use group:	☐ Unfinished Basement
	☐ Crawl Space
Construction type:	☐ Slab on Grade
☐ Reinforced Concrete	No. of Bedrooms:
☑ Structural Steel	***Multi-family Dwelling***
☐ Masonry	No. of efficiency units:
☐ Wood Frame	No. of 1 BR units:
☐ State Certified Modular	No. of 2 BR units:
	No. of 3 BR units:
	Other Structure:
	Dimensions:
➢ **Roadside Tree Project Permit**	Footings:
☐Yes ☐No	Roof:
Roadside Tree Project Permit #	☐ State Certified Modular
	☐ Manufactured Home

Utilities	
Electric: ☑ Yes ☐ No	
Gas: ☐ Yes ☑ No	
Water Supply	
☐ Public NO	
☐ Private	
Sewage Disposal	
☐ Public NO	
☐ Private	
Heating System	
☐ Electric ☐ Oil	
☐ Natural Gas ☐ Propane Gas	
☐ Other: NO	
Sprinkler System:	
☐ Yes ☑ No	
NO	
Grading Permit Number:	
Building Shell Permit Number:	

THE UNDERSIGNED HEREBY CERTIFIES AND AGREES AS FOLLOWS: (1) THAT HE/SHE IS AUTHORIZED TO MAKE THIS APPLICATION; (2) THAT THE INFORMATION IS CORRECT; (3) THAT HE/SHE WILL COMPLY WITH ALL REGULATIONS OF HOWARD COUNTY WHICH ARE APPLICABLE THERETO; (4) THAT HE/SHE WILL PERFORM NO WORK ON THE ABOVE REFERENCED PROPERTY NOT SPECIFICALLY DESCRIBED IN THIS APPLICATION; (5) THAT HE/SHE GRANTS COUNTY OFFICIALS THE RIGHT TO ENTER ONTO THIS PROPERTY FOR THE PURPOSE OF INSPECTING THE WORK PERMITTED AND POSTING NOTICES.

Applicant's Signature — *Print Name* FRANK BUCCIERI

Email Address frank.buccieri@comcast.net — *Date* JULY 1, 2020 7:40

Title/Company CONSTRUCTION MANAGER

Checks Payable to: **DIRECTOR OF FINANCE OF HOWARD COUNTY**

PLEASE WRITE NEATLY & LEGIBLY

-FOR OFFICE USE ONLY-

AGENCY	DATE	SIGNATURE OF APPROVAL
State Highways		
Building Officials		
PSZA (Zoning)		
PSZA (Engineering)		
Health	8/6/2020	

Is Sediment Control approval required for issuance? ☐ Yes ☐ No
☐ CONTINGENCY CONSTRUCTION START

DPZ SETBACK INFORMATION	
Front:	
Rear:	
Side:	
Side St.:	
All minimum setbacks met?	☐ Yes ☐No
Is Entrance Permit Required?	☐ Yes ☐No
Historic District?	☐ Yes ☐No
Lot Coverage for New Town Zone:	
SDP/Red-line approval date:	

Filing Fee	$
Permit Fee	$
Tech Fee	$
Excise Tax	$
PSFS	$
Guaranty Fund	$
Add'l per Fee	$
Total Fees	$
Sub- Total Paid	$
Balance Due	$
Check	#

Distribution of Copies: **White: Building Officials** **Green: PSZA,Zoning** **Yellow: PSZA,Engineering** **Pink: Health** **Gold: SHA**

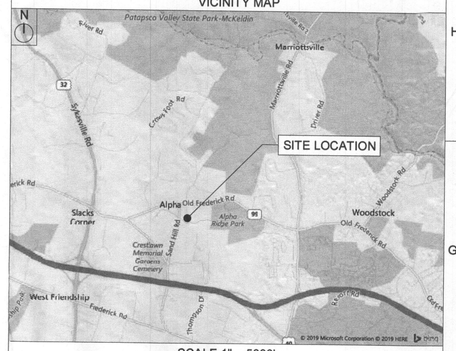
ELECTRICAL PLAN

HENRYTON ROAD - CSG

SOLAR POWER GENERATION FACILITY

1825 SAND HILL ROAD,
MARRIOTTSVILLE, MD 21104

VICINITY MAP



SCALE 1" = 5000'

PROJECT SPECIFICATIONS DESIGN SUMMARY TABLE HENRYTON ROAD	
SYSTEM SIZE (AC)	1.900 MW
SYSTEM SIZE (DC)	2.288 MW
DC/AC RATIO	1.194
MEDIUM VOLTAGE TRANSFORMER	2,000 KVA
RACKING SYSTEM	SOLAR FLEXRACK
STRING SIZE	27
STRING COUNT	227
INVERTER(S)	CHINT-SCA 125KW
INVERTER QUANTITY	16
MODULE MAKE	HELIENE
MODULE MODEL	370-72M
MODULE STC RATING	370W
MODULE QUANTITY	6,129
RACK CONFIGURATION	(1) HIGH IN PORTRAIT
MODULE ORIENTATION	PORTRAIT
TILT ANGLE	+/-55°
GROUND COVERAGE RATIO	49.17%
AZIMUTH	180°
LATTITUDE	39.321007
LONGITUDE	-76.925859
CODE CYCLE	2017

PROJECT DEVELOPER
NAUTILUS SOLAR ENERGY, LLC
396 SPRINGFIELD AVE
2ND FLOOR
SUMMIT, NJ 07901
(908) 795-3040

PROJECT EPC
SOLAMERICA ENERGY SERVICES, LLC
PEACHTREE PALISADES
1819 PEACHTREE RD., SUITE 100
ATLANTA GEORGIA 30309
PETER CORBETT
(404) 351-8175
FRANK BUCCERI
(201) 331-7471

ELECTRICAL ENGINEER
AVOCA ENGINEERS & ARCHITECTS, LLC
242 OLD NEW BRUNSWICK ROAD
PISCATAWAY, NEW JERSEY 08854
(732) 465-1002
KEVIN LEARY, PE
LIC. NO. 43259

CIVIL ENGINEER
ROBERT H. VOGEL ENGINEERING, INC.
3300 N. RIDGE ROAD, SUITE 110
ELLICOT CITY, MD 21043
(410) 461-7666
ROBERT H. VOGEL, PE
PE NO. 16193

AUTHORITY HAVING JURISDICTION (AHJ)
HOWARD COUNTY DEPT. OF INSPECTION & PERMITS
GEORGE HOWARD BLDG
3430 COURT HOUSE DRIVE
ELLICOTT CITY, MD 21043
(410) 313-2455

DESIGN CRITERIA
1. INTERNATIONAL BUILDING CODE, 2018 EDITION
2. NATIONAL ELECTRICAL CODE (NFPA 70), 2017 EDITION, WITH HOWARD COUNTY AMENDMENTS
3. 115 MPH WIND - EXPOSURE C
4. 25 PSF GROUND SNOW LOAD

PROJECT DESCRIPTION
THE PROJECT CONSISTS OF THE FOLLOWING:

1. INSTALLATION OF THE SOLAR PV MODULES AND GROUND MOUNTING SYSTEM ON OPEN LAND.
2. INSTALLATION OF DC CABLES, CONDUITS AND DISCONNECTS.
3. INSTALLATION OF THE DC TO AC INVERTERS ON INDIVIDUAL GALVANIZED BACKBOARDS NEXT TO SOLAR FLEXRACK SINGLE AXIS TRACKER SYSTEM.
4. INSTALLATION OF THE INTERCONNECTION WITH BALTIMORE GAS AND ELECTRIC. INCLUDING CONDUIT AND WIRE.
5. INSTALLATION OF A PERIMETER FENCE.

GENERAL NOTES
1. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, CONDITIONS AND BRING TO THE ENGINEER'S ATTENTION ANY DISCREPANCY OBSERVED IMMEDIATELY.
2. THE CONTRACTOR SHALL COORDINATE OBTAINING ALL REQUIRED PERMITS.
3. ALL DRAWINGS NOTES, & SPECIFICATIONS ARE COMPLIMENTARY, ANY WORK SHOWN OR REFERRED TO ON ANY ONE DRAWINGS SHALL BE PROVIDED AS THOUGH SHOWN ON ALL RELATED DRAWINGS. IN THE EVENT OF A CONFLICT, THE CONTRACTOR SHALL VERIFY WITH THE ENGINEER.
4. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY CHANGES AND DEVIATION OF APPROVED PLANS NOT AUTHORIZED BY THE ARCHITECT, ENGINEER AND/OR OWNER.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING, SHORING AND PROTECTING ALL WORK DURING CONSTRUCTION AGAINST DAMAGE, BREAKAGE, COLLAPSE, DISTORTIONS AND MISALIGNMENT. SUCH TEMPORARY BRACING AND SHORING SHALL REMAIN IN-PLACE UNTIL PERMANENT CONSTRUCTION HAS BEEN COMPLETED.
6. THE CONTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS INCLUDING SAFETY.
7. FOR DETAILED NOTES SEE E-002.

B20080

RECEIVED
JUL 20 2020
LICENSES & PERMITS DIVISION

DRAWING SCHEDULE

DWG.NO.	DRAWING TITLE	REV
E-001	COVER SHEET	8
E-002	GENERAL NOTES	8
E-101	GENERAL SITE OVERVIEW	8
E-201	AC ONE LINE DIAGRAM	8
E-202	TRACKER SYSTEM POWER	8
E-211	DC ONE LINE DIAGRAM	8
E-221	CONDUCTOR SCHEDULES	8
E-222	CONDUCTOR SCHEDULES	8
E-301	MONITORING SYSTEM	8
E-401	CABLE AND CIRCUIT LAYOUT	8
E-402	CABLE AND CIRCUIT LAYOUT	8
E-403	CABLE AND CIRCUIT LAYOUT	8
E-411	TRACKER POWER SITE PLAN	8
E-501	TRANSFORMER LAYOUT	8
E-502	EQUIPMENT WORKING SPACE	8
E-511	SWITCHGEAR DETAILS	8
E-521	CONDUIT AND WIRE MANAGEMENT 1 OF 2	8
E-531	CONDUIT AND WIRE MANAGEMENT 2 OF 2	8
E-541	TRENCH DETAILS	8
E-551	MISCELLANEOUS DETAILS	8
E-601	GENERAL GROUNDING	8
E-602	STRUCTURE GROUNDING	8
E-603	MV EQUIPMENT GROUNDING	8
E-604	FENCE GROUNDING	8
E-701	MV SITE PLAN AND TRENCH	8
E-801	LABELS AND SIGNAGE 1 OF 2	8
E-811	LABELS AND SIGNAGE 2 OF 2	8
E-901	SPEC SHEETS	8

America ENERGY
1819 Peachtree Rd. NE - Suite 100
Atlanta, GA 30309 (404) 351-8175

SEAL

PERMIT DRAWING - NOT RELEASED FOR CONSTRUCTION

CERTIFICATION

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO.43259, EXPIRATION DATE: JANUARY 15, 2021.

CONSULTANT

AVOCA ENGINEERS & ARCHITECTS
242 OLD NEW BRUNSWICK ROAD PISCATAWAY NJ 08854
PHONE (732) 465-1002 FAX (732) 465-1005
MARYLAND ENGINEERING FIRM REGISTRATION NO. 49488

REVISIONS

NO.	DATE	DESCRIPTION
2	12/04/19	REVISED FENCE LINE BETWEEN PHASE I AND II
3	12/20/19	REISSUED FOR PERMIT
4	12/30/19	PROJECT NAME CHANGE ONLY
5	02/14/20	REVISED PER COMMENTS, ADDED AC TRACKER POWER
6	03/23/20	REVISED TRACKER MANUFACTURER
7	05/29/20	ISSUED FOR PERMIT
8	06/17/20	REVISED GRAVEL TURN AROUND AREAS

PLT STAMP: KLEARY 6/17/2020 5:31 PM E-901 COVER SHEET.DWG

PROJECT: 19-BU-118

HENRYTON ROAD CSG SOLAR PROJECT

1825 SAND HILL ROAD, MARRIOTTSVILLE, MD 21104

DATE:	10/01/19
DRAWN BY:	K.M.
CHECKED BY:	K.L.

COVER SHEET

E-001

GENERAL NOTES

ELECTRICAL NOTES FOR NEW PHOTOVOLTAIC SYSTEM:

1. THIS PROPOSED SOLAR ELECTRIC SYSTEM IS INTENDED TO OPERATE IN PARALLEL WITH POWER RECEIVED FROM THE UTILITY SERVICE PROVIDER.
2. THE INVERTER FOR THE PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE IDENTIFIED FOR USE IN SOLAR PHOTOVOLTAIC SYSTEMS. ALL EQUIPMENT SHALL BE UL APPROVED.
3. THIS SYSTEM IS INTENDED TO CONNECT TO THE EXISTING FACILITY POWER SYSTEM AT A SINGLE POINT, POINT OF COMMON COUPLING (POCC). THIS CONNECTION SHALL BE IN COMPLIANCE WITH THE NEC ARTICLE 705.12 "POINT OF CONNECTION".
4. ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION FOR TESTING AND ISOLATION.
5. ALL DISCONNECTING COMBINERS SHALL BE SECURED FROM UNAUTHORIZED/UNQUALIFIED PERSONNEL BY LOCK OR LOCATION.
6. ALL DISCONNECTING COMBINERS, PULL/SPLICE BOXES, AND ENCLOSURES SHALL BE LISTED FOR ITS PURPOSE.
7. EQUIPMENT SHALL BE INSTALLED IN A SECURE AREA. INVERTER PERFORMANCE MAY BE AFFECTED IF INSTALLED IN DIRECT SUNLIGHT.
8. CONDUITS AND CABLES SHALL NOT ENTER THE TOP OF ANY OUTDOOR ENCLOSURE WITHOUT WRITTEN APPROVAL FROM AVOCA PROJECT ENGINEER.

WIRING AND WIRING METHODS:

ALL WIRING METHODS AND INSTALLATION PRACTICES SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LOCAL STATE CODES, AND OTHER APPLICABLE LOCAL CODES.

1. EXPOSED PV SOLAR MODULE WIRING WILL BE PV WIRE OR APPROVED EQUIVALENT, 90 DEGREE C, WET RATED AND UV RESISTANT. ALL EXPOSED CABLES, SUCH AS MODULE LEADS SHALL BE SECURED WITH MECHANICAL OR OTHER APPROVED SUN-LIGHT RESISTANT MEANS. THE USE OF PLASTIC ZIP TIES IS NOT AN APPROVED METHOD TO SUPPORT OR ATTACH WIRE TO A STRUCTURE.
2. WIRE COLOR SPECIFICATIONS:

	AC CONDUCTORS	
	277 / 480 volt	120 / 208 volt
Phase A	BROWN	BLACK
Phase B	ORANGE	RED
Phase C	YELLOW	BLUE
Grounded Conductor	GRAY or WHITE	WHITE
Grounded Conductor	GREEN or BARE	GREEN or BARE
Grounding Electrode Conductor	GREEN W/ ORANGE	GREEN W/ ORANGE
	DC CONDUCTORS	
	DC Ungrounded	
Ungrounded (+) Conductor	(+) FROM MODULE RED wire or Black wire with RED markings	
Ungrounded (-) Conductor	(-) FROM MODULE **BLACK** wire with no markings (NEC 2017)	
Grounding Conductor	GREEN or BARE	

3. PV STRING HOME RUNS SHALL BE LABELED ON BOTH ENDS, AT ARRAY AND AT COMBINER. COMBINER OUTPUT CONDUCTORS SHALL BE LABELED AT BOTH ENDS, AT COMBINER AND AT DISCONNECT.
4. LIQUID TIGHT FLEXIBLE METAL CONDUIT IS GENERALLY SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 36 INCHES APART (NEC 350.30).
5. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM SHALL 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.
6. UNLESS MARKED AS UV RESISTANT, PVC IS NOT APPROVED FOR INSTALLATION IN LOCATIONS SUBJECTED TO DIRECT SUNLIGHT AND SHALL NOT BE EMPLOYED IN ANY SUCH LOCATION.
7. LONG STRAIGHT EXPOSED CONDUIT RUNS, 100 FEET OR MORE, SHALL HAVE EXPANSION FITTINGS INSTALLED PER NEC 300.7(B). EXPANSION FITTINGS SHALL ALSO BE USED WHEN CONDUIT SPANS AN EXPANSION JOINT.
8. FUSES AND WIRES SUBJECT TO TRANSFORMER INRUSH CURRENT SHALL BE SIZED ACCORDINGLY.
9. ALL D.C. MATERIALS SHALL BE UL LISTED FOR 1500V DC. DC EQUIPMENT RATED TO 600V MAY BE USED WITH THE WRITTEN PERMISSION OF AVOCA ENGINEERING.
10. WHEN TRANSITIONING UNDERGROUND PVC CONDUIT TO ABOVE GROUND 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 SHALL BE USED IN THE TRANSITION TO ABOVE GROUND CONDUIT WHERE REQUIRED BY NEC 300.5(J).
11. ANY METAL SHAVINGS RESULTING FROM SITE WORK SHALL 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.
12. CONDUITS LONGER THAN 200' WITH NEGATIVE SLOPE TOWARD ELECTRICAL EQUIPMENT SHALL HAVE A PULL BOX OR VAULT ADJACENT TO THE ENTRY POINT INTO THE ELECTRICAL EQUIPMENT.
13. WHEN TRANSITIONING FROM FREE AIR TO CONDUCTORS IN CONDUIT, A LISTED FITTING SHALL BE USED TO PREVENT THE ENTRY OF MOISTURE.
14. METALLIC L AND T CONDUIT BODIES SHALL NOT BE USED.
15. ALL COPPER TERMINATION AC AND DC SHALL HAVE KOPR-SHIELD OR EQUIVALENT APPLIED.
16. MEGGER TESTING SHALL BE PERFORMED AT 1000 VDC FOR ALL AC CIRCUITS 480 V OR BELOW AND DC CIRCUITS 600 V OR BELOW. MEGGER TESTING WILL BE PERFORMED AT 2500 VDC FOR DC CIRCUITS IN 1500 VDC SYSTEMS. A MINIMUM OF 250 MEGAOHMS RESISTANCE TO GROUND IS REQUIRED. DO NOT MEGGER THE SOLAR MODULES AS THEY WILL LIKELY DAMAGE THEIR INTERNAL DIODES.
17. BENDS SHALL NOT DAMAGE THE RACEWAY OR SIGNIFICANTLY CHANGE THE INTERNAL DIAMETER OF RACEWAY.
18. SUPPORT CONDUCTORS IN VERTICAL CONDUITS IN ACCORDANCE WITH THE REQUIREMENTS OF NEC 300.19.
19. CONNECTORS TO BE TORQUED PER DEVICE LISTING, OR MANUFACTURERS RECOMMENDATIONS. CONNECTORS ARE TO BE MARKED WITH PERMANENT MARKING PAINT, AFTER TORQUEING.
20. ALL BARE CU WIRES SHALL BE INSTALLED TO NOT COME INTO CONTACT WITH DISSIMILAR METALS .
21. SPLICES/CONNECTORS SHALL BE INSULATED AND WILL REQUIRE PROJECT ENGINEER APPROVAL. UL LISTED ELECTRICAL TAPE ALONE IS NOT SUITABLE AS THE ONLY INSULATION MEANS. FOLLOW MANUFACTURERS INSTRUCTIONS FOR INSTALLATION, AND APPLICATION OF INSULATING PRODUCT.
22. ALL LV AC WIRING SHALL BE TYPE THWN-2 RATED AT 90 DEGREES C. 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.
23. USE MEYERS(OR APP EQU)HUB LISTED TO PROVIDE MOISTURE PROTECTION FOR CONDUIT ENTRANCES IN ALL APPLICABLE LOCATIONS AS REQUIRED BY NEC 314.15.

GENERAL NOTES (CONT.)

24. PROTECT WIRE FROM SHARP EDGES WITH UV RATED SPIRAL WRAP, EDGE-GUARD, OR SPLIT LOOM.
25. MODULE LEAD CONNECTORS SHALL BE INSTALLED SUCH THAT THEY ARE EASILY ACCESSIBLE AND PROTECTED FROM EXPOSURE TO DIRECT SUNLIGHT OR RAIN. THEY SHALL NOT BE INSTALLED WITHIN TUBING, CONDUIT OR MODULE GAPS.
26. THE STRING SOURCE CIRCUIT WIRING NEEDS TO BE SUPPORTED ADEQUATELY IN LENGTHS NOT TO EXCEED 24". THE MODULE TO MODULE INTERCONNECTION LEADS NEED TO BE SUPPORTED AT A MINIMUM OF 12" FROM THE J-BOX AND THE MODULE TO MODULE CONNECTION POINT.
27. POLARIS TAPS AND BLOCKS ARE NOT TO BE USED TO CONNECT CURRENT CARRYING CONDUCTORS.
28. 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. REFER TO MANUFACTURER INSTALLATION MANUAL FOR THE SPECIFIC MODULES INSTALLED FOR THE PROPER CONNECTORS AND TOOLS NECESSARY FOR A COMPATIBLE AND CORRECT INSTALLATION.
29. ALL PENETRATION OF ALL ELECTRICAL EQUIPMENT (AC AND DC BOTH NEW AND OLD) TO BE DONE ON THE BOTTOM OR SIDE. NO TOP PENETRATIONS. IF TOP PENETRATIONS CANNOT BE AVOIDED, A DRIP LOOP ON THE WIRING MUST B DONE.
30. ALL WIRE MANAGEMENT TO BE DONE WITH STAINLESS STEEL HEYCO CLIPS OR ZIP TIES (HEYCO SUNBUNDLER)

DAMAGE PROTECTION:

1. THE ELECTRICAL CONTRACTOR SHALL CONSIDER THE WEATHERING OF EQUIPMENT OVER TIME AND ELIMINATE THE POSSIBILITY OF DEGRADATION DUE TO CORROSION, WATER ENTRY AND UV EXPOSURE. AS A RESULT, THE USE OF UNISTRUT OR SIMILAR MOUNTING SYSTEMS IS REQUIRED TO MOUNT ENCLOSURES, PULL BOXES, LOAD CENTERS, FUSE BOXES, OR OTHER EQUIPMENT.
2. ALL NEMA 4 BOXES SHALL 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 SHALL 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.
6. ALL CIRCUIT BREAKERS INSTALLED THAT ARE SUBJECT TO REVERSE POWER FLOW SHALL BE LISTED AND LABELED AS BACKFEED COMPATIBLE.
7. ALL EQUIPMENT MOUNTING HARDWARE SHOULD BE HOT DIP GALVANIZED OR STAINLESS STEEL.
8. MINIMUM EQUIPMENT/TROUGH HEIGHT ABOVE GRADE SHALL BE 3 FEET.
9. RGS SHALL BE INSTALLED FOR ALL CONDUIT WITHIN 3 FEET OF GRADE, AND INCLUDING ALL STUB-UP TRANSITIONS FROM BELOW-GROUND TO ABOVE-GROUND.

ALUMINUM CONDUCTOR INSTALLATION NOTES:

1. MINIMUM WIRE SIZE FOR CURRENT CARRYING CONDUCTORS WHEN IMPLEMENTING ALUMINUM AS A CONDUCTOR SHALL BE 1/0 AWG STRANDED, COMPACT ELECTRICAL GRADE AA-8000 SERIES ALLOY.
2. ALUMINUM POWER CABLE, WIRE CONNECTORS, AND INSULATING AND CODING TAPE MANUFACTURERS SHALL BE APPROVED BY AVOCA 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. COMPRESSION STYLE LUGS AND TERMINATIONS SHALL BE RATED FOR THE MAXIMUM DC and AC VOLTAGE OF THE SYSTEM.
   - 5.1. MUST BE PRE-FILLED WITH OXIDE INHIBITOR.
   - 5.2. WIRE STRIPPING AND BRUSHING OF CONDUCTOR IN ACCORDANCE WITH VENDOR SPECS IS REQUIRED IMMEDIATELY PRIOR TO LUG INSTALLATION.
   - 5.3. OXIDE INHIBITOR MUST BE APPLIED TO EXPOSED CONDUCTOR IMMEDIATELY AFTER STRIPPING AND BRUSHING AND IMMEDIATELY PRIOR TO INSTALLATION OF THE LUG.
   - 5.4. USE COMPRESSION TOOL LISTED FOR USE WITH SELECTED COMPRESSION CONNECTOR.
   - 5.5. A MINIMUM 9" LENGTH OF COLD OR HEAT SHRINK WITH A VOLTAGE RATING EQUAL TO THE CONDUCTOR SHALL BE APPLIED TO COVER THE CONNECTION BETWEEN CRIMP AND THE CONDUCTOR BEGINNING AT THE STRAIGHT SECTION OF THE CRIMP.
   - 5.6. ALL CONNECTORS AND CORRESPONDING CRIMPING TOOLS SHALL BE UL LISTED FOR THEIR SPECIFIC APPLICATION.
6. INSULATING AND COLOR CODING TAPE SHALL BE PREMIUM GRADE PRESSURE SENSITIVE VINYL, HEAT/COLD/MOISTURE/SUNLIGHT/ RESISTANT. INSULATING TAPE SHALL BE BLACK AND COLOR CODING TAPE SHALL BE FADE RESISTANT.
7. FOR ALUMINUM MV CONDUCTORS, WHERE USED, THE GUIDELINES IN THIS SECTION PLUS GENERAL REQUIREMENTS FOR MV CONDUCTOR INSTALLATION SHALL APPLY.
8. DIRECT LANDING OF ALUMINUM CONDUCTORS IS ONLY ALLOWED TO BREAKERS WHICH ARE SPECIFICALLY RATED FOR ALUMINUM CONDUCTORS.

GROUNDING:

SEE ELECTRICAL DIAGRAM AND ELECTRICAL DETAILS FOR MORE GROUNDING INFORMATION.

1. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS WILL BE USED FOR SYSTEM GROUNDING (NEC 690.42) (REFERENCED TO THE SAME POINT).
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 SHALL BE CHECKED FOR PROPER GROUNDING; NOTING THAT TERMINAL LUGS BOLTED ON AN ENCLOSURE'S FINISHED SURFACE MAY BE INSULATED BECAUSE OF PAINT/FINISH. PAINT/FINISH AT POINT OF CONTACT SHALL BE PROPERLY REMOVED.
4. RACKING COMPONENTS AND STRUCTURAL SUPPORTS MUST BE ELECTRICALLY BONDED TOGETHER BY AN ACCEPTABLE MEANS.
5. MODULES SHALL BE GROUNDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
6. THE CONNECTION TO THE MODULE OR PANEL OF THIS PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE SO ARRANGED THAT REMOVAL OF A MODULE OR A PANEL FROM THE PHOTOVOLTAIC SOURCE CIRCUIT DOES NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER PHOTOVOLTAIC SOURCE CIRCUIT. SETS OF MODULES INTERCONNECTED AS SYSTEMS RATED AT 50 VOLTS OR LESSWITH OR WITHOUT BLOCKING DIODES, AND HAVING A SINGLE OVER CURRENT DEVICE SHALL BE CONSIDERED AS A SINGLE SOURCE CIRCUIT.
7. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
8. ALL GROUNDING CONNECTIONS SHALL BE RATED FOR DIRECT BURIAL (DB RATED) , CONTRACTOR IS TO SUPPLY DOCUMENTATION PROVING THIS DURING PRODUCT SUBMITTALS
9. ALL EQUIPMENT GROUNDING CONDUCTORS INSTALLED SHOULD BE COPPER ONLY.

GROUND FAULT PROTECTION:

1. PHOTOVOLTAIC INVERTERS SHALL BE EQUIPPED WITH D.C. GROUND FAULT PROTECTION TO REDUCE FIRE HAZARDS. INVERTERS ARE ALSO EQUIPPED WITH ANTI-ISLANDING CIRCUITRY.

DISCONNECTING MEANS:

1. MEANS SHALL BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER EXISTING CONDUCTORS.

GENERAL NOTES (CONT.)

2. WHERE A CIRCUIT GROUNDING CONNECTION IS NOT DESIGNED TO BE AUTOMATICALLY INTERRUPTED AS PART OF THE GROUND-FAULT PROTECTION SYSTEM REQUIRED BY SECTION 690-5, A SWITCH OR CIRCUIT BREAKER USED AS A DISCONNECTING MEANS SHALL NOT HAVE A POLE IN THE GROUNDED CONDUCTOR.
3. THE GROUNDED CONDUCTOR MAY HAVE A BOLTED OR TERMINAL DISCONNECTING MEANS TO ALLOW MAINTENANCE OR TROUBLESHOOTING BY QUALIFIED PERSONNEL.
4. UNLESS DISCONNECT IS SERVICING A LINE-SIDE TAP, THE DISCONNECTING MEANS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH SECTION 690-17.
5. EQUIPMENT SUCH AS PHOTOVOLTAIC SOURCE CIRCUITS, OVER CURRENT DEVICES, AND BLOCKING DIODES SHALL BE PERMITTED ON THE PHOTOVOLTAIC SIDE OF THE PHOTOVOLTAIC DISCONNECTING MEANS.
6. MEANS SHALL BE PROVIDED TO DISCONNECT EQUIPMENT SUCH AS INVERTERS, BATTERIES, CHARGE CONTROLLERS, AND THE LIKE FROM ALL UNGROUNDED CONDUCTORS OF ALL SOURCES. IF THE EQUIPMENT IS ENERGIZED FROM MORE THAN ONE SOURCE, THE DISCONNECTING MEANS SHALL BE GROUPED AND IDENTIFIED.
7. A SINGLE DISCONNECTING MEANS SHALL BE PERMITTED FOR THE COMBINED A.C. OUTPUT OF ONE OR MORE INVERTERS IN AN INTERACTIVE SYSTEM - PROVIDED EACH INVERTER ASSOCIATED WITH THE DISCONNECT HAS ITS OWN INTERNAL AC DISCONNECT.
8. DISCONNECTING MEANS SHALL BE PROVIDED TO DISCONNECT A FUSE FROM ALL SOURCES OF SUPPLY IF THE FUSE IS ENERGIZED FROM BOTH DIRECTIONS AND IS ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS. 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 SHALL BE SECURED FROM UNAUTHORIZED AND UNQUALIFIED PERSONNEL BY EITHER LOCK OR LOCATION.

REQUIRED SAFETY SIGNS AND LABELS:

REQUIRED SAFETY SIGNS AND LABELS SHALL BE ETCHED PLACARDS PERMANENTLY ATTACHED BY ADHESIVE, OR OTHER MECHANICAL MEANS. LABELS SHALL COMPLY WITH ARTICLE 690 OF THE NEC OR OTHER APPLICABLE STATE AND LOCAL CODES. SEE LABELS AND MARKING PAGE FOR MORE INFORMATION.

WEAR PERSONAL PROTECTIVE EQUIPMENT(PPE) APPROPRIATE FOR THE HAZARD: INSULATED GLOVES WITH PROTECTORS, INSULATED MATS AND TOOLS.

1. ANY SWITCH, FUSES, OR CIRCUIT BREAKERS THAT CAN BE ENERGIZED IN EITHER DIRECTION SHALL BE LABELED AS FOLLOWS:

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

2. THIS PHOTOVOLTAIC SYSTEM WILL BE EQUIPPED WITH DC DISCONNECTING COMBINERS WHICH WILL BE LABELED AS FOLLOWS:

   PHOTOVOLTAIC
   DISCONNECTING COMBINERS

3. THIS PHOTOVOLTAIC SYSTEM WILL BE EQUIPPED WITH AN A.C. DISCONNECT WHICH WILL BE LABELED AS FOLLOWS:

   PHOTOVOLTAIC
   DISCONNECTING MEANS
   A.C. DISCONNECT

4. A MARKING SPECIFYING THE PHOTOVOLTAIC POWER SOURCE RATED AS FOLLOWS SHALL BE PROVIDED AT AN ACCESSIBLE LOCATION AT THE DISCONNECTION MEANS FOR THE POWER SOURCE:

   OPERATING CURRENT
   OPERATING VOLTAGE
   MAXIMUM SYSTEM VOLTAGE
   SHORT CIRCUIT CURRENT
   COMBINER

MARKINGS:

1. ALL INTERACTIVE SYSTEM POINTS OF INTERCONNECTION WITH OTHER SOURCES SHALL BE MARKED AT AN ACCESSIBLE LOCATION AT THE DISCONNECTION MEANS.
2. A PERMANENT ETCHED PLAQUE OR DIRECTORY SHALL BE PROVIDED IDENTIFYING THE LOCATION OF THE SERVICE DISCONNECTION MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTION MEANS, IF NOT LOCATED AT THE SAME LOCATION.
3. ALL REQUIRED EQUIPMENT SHALL BE UL LISTED AND LABELED ACCORDINGLY.

GENERAL MEDIUM VOLTAGE NOTES:

1. ELBOWS, BUSHINGS, AND TEST CAPS MUST BE CLEAN AND PROPERLY LUBRICATED.
2. POWER CABLE, ELBOW, AND M.V. TERMINATION DRAINS SHALL BE INSTALLED IN A MANNER THAT WILL ALLOW FOR THE REMOVAL, STANDING OFF, AND/OR LANDING OF ELBOWS WITH MINIMUM BENDING RADIUS PER NEC 300.34.
3. TAPE SHIELD ADAPTER KITS ARE TO BE USED WITH POWER CABLE THAT HAS TAPE SHIELDING.
4. THE MEDIUM-VOLTAGE SYSTEM IS DESIGNED TO BE A 3-PHASE, 3-WIRE PLUS GROUND, EFFECTIVELY GROUNDED SYSTEM WHETHER CONNECTED TO THE UTILITY OR ISOLATED FROM IT.
5. ALL MEDIUM VOLTAGE WORK SHALL COMPLY WITH THE LATEST EDITION OF ANSI C2 - NATIONAL ELECTRICAL SAFETY CODE (NESC)
6. MEDIUM VOLTAGE CABLES:
   - 6.1. WHERE MEDIUM VOLTAGE CABLES ARE INSTALLED ALONG ACCESS ROADS, THEY SHALL BE DIRECT BURIED.
7. SHOP DRAWINGS SHALL BE SUBMITTED FOR ENGINEER REVIEW AND APPROVED PRIOR TO FABRICATION OR INSTALLATION OF THE FOLLOWING EQUIPMENT.
   - 7.1. MEDIUM VOLTAGE EQUIPMENT TO INCLUDE:
     - MEDIUM VOLTAGE CABLE
     - MEDIUM VOLTAGE SWITCHGEAR/SECTIONALIZING CABINET
     - MV SWITCH
   - 7.2. LOW VOLTAGE EQUIPMENT TO INCLUDE:
     - DRY TYPE DISTRIBUTION (REX) TRANSFORMER
     - DC COMBINER BOXES
     - DC DISCONNECT SWITCH
     - LOW VOLTAGE AC BREAKER
     - LOW VOLTAGE PANELBOARDS
   - 7.3. CONTRACTOR (TESTING AGENCY) TO PERFORM ACCEPTANCE TESTING PER ANSI/NETA ATS-2013.
8. ALL EQUIPMENT INCLUDING SWITCHGEAR, SECTIONALIZING CABINETS, TRANSFORMERS, ETC. SHALL BE LABELED ON THE FRONT EXTERIOR TO CORRESPOND TO THE IDENTIFICATION SHOWN ON THE DRAWINGS WITH OUTDOOR, REFLECTIVE, ADHESIVE LABELS, BLACK ON YELLOW, MINIMUM 2 INCH HIGH LETTERS.
9. ALL MEDIUM VOLTAGE CABLES SHALL BE LABELED AT EACH END, AT AN ACCESSIBLE POINT INSIDE EQUIPMENT ENCLOSURE, WITH CIRCUIT AND PHASE IDENTIFICATION CORRESPONDING TO THE DRAWINGS. LABELS SHALL BE ENGRAVED AND FILLED STAINLESS STEEL, OR TWO-COLOR ENGRAVED PHENOLIC, SECURED WITH UV-RESISTANT WIRE TIES. LABELS SHALL BE VISIBLE FROM OUTSIDE THE ENCLOSURE WITHOUT REACHING INSIDE OR MOVING CABLES.
10. ARRANGE PHASES IN SWITCHGEAR, SECTIONALIZING CABINETS, ETC., A-B-C FROM LEFT TO RIGHT OR TOP TO BOTTOM AS VIEWED FROM THE FRONT.
11. VERIFY UTILITY PHASE SEQUENCE AND COORDINATE INSTALLATION OF FEEDER CONDUCTORS TO PROVIDE CORRECT PHASE SEQUENCE AT INVERTER SIDE OF STEP-UP TRANSFORMERS.
12. PROVIDE ARC FLASH HAZARD WARNING LABELS COMPLYING WITH ANSI Z535.4 ON ALL EQUIPMENT. LABELS SHALL BE APPLIED ON BOTH INSIDE AND OUTSIDE DOORS OR BARRIERS OF OUTDOOR EQUIPMENT.
13. ALL EQUIPMENT LABELING SHALL COMPLY WITH AVOCA REQUIREMENTS.

GENERAL NOTES (CONT.)

14. EQUIPMENT AND COMPONENTS SHALL BE LISTED AND LABELED BY A NATIONALLY-RECOGNIZED TESTING LABORATORY (NRTL) SUCH AS UL OR ETL, WHERE SUCH LISTING IS AVAILABLE FOR THE APPLICATION.
15. PROVIDE DANGER, WARNING, AND CAUTION LABELS AS REQUIRED BY NESC, OR OSHA STANDARDS ON EQUIPMENT ENCLOSURES, DOORS, ACCESS PLATES, AND BARRIERS AND LABEL ALL MEDIUM VOLTAGE EQUIPMENT WITH THE OPERATING VOLTAGE.

CONDUITS AND DUCTBANKS:

1. CONDUITS FOR DIRECT-BURIAL OR CONCRETE ENCASEMENT SHALL BE SCHEDULE 40 PVC.
2. ALL MEDIUM VOLTAGE CONDUITS SHALL HAVE MINIMUM 60 INCH RADIUS SWEEPS EXCEPT 36 INCH MINIMUM RADIUS IS REQUIRED FOR VERTICAL SWEEPS UP TO EQUIPMENT.
3. MAINTAIN MINIMUM 6 INCHES OF SPACING HORIZONTALLY AND VERTICALLY AT CROSSINGS BETWEEN MEDIUM VOLTAGE CONDUITS OR DUCTBANKS AND LOW-VOLTAGE OR COMMUNICATIONS CONDUITS.
4. MAINTAIN MINIMUM 4 FOOT SPACING BETWEEN MEDIUM VOLTAGE CONDUCTORS AND POWER CIRCUITS OF OTHER SYSTEMS WHEN RUN PARALLEL FOR DISTANCES OF OVER 10 PERCENT OF THE RUN OF EITHER CIRCUIT UNLESS THE DUCTBANK SECTIONS INDICATE CLOSER SPACINGS WHICH HAVE BEEN CONSIDERED IN AMPACITY CALCULATIONS.
5. MAINTAIN ALL CONDUIT ENTRIES TO EQUIPMENT WITHIN MANUFACTURER'S DESIGNATED CONDUIT ENTRY SPACE AND ARRANGE CONDUITS TO PERMIT THE MOST DIRECT ROUTING OF CABLES TO TERMINALS AND TO ALLOW ADEQUATE SLACK FOR DISCONNECTION AND PARKING OF LOADBREAK AND DEADBREAK ELBOW CONNECTORS.
6. TOPS OF CONDUIT SHALL BE A MINIMUM OF 4 INCHES ABOVE THE CONCRETE PAD OR GRAVEL BEDDING TO PREVENT INGRESS OF WATER. SEAL ALL CONDUITS TO PREVENT TRANSMISSION OF HUMID AIR BETWEEN INTERIOR AND EXTERIOR OF EQUIPMENT.
7. ALL CONDUITS ENTERING EQUIPMENT TO BE EQUIPPED WITH BELL ENDS TO PREVENT ABRASION.

CONDUCTORS:

1. COMPLETELY INSTALL ALL CONDUIT RUNS AND BACKFILL DUCTBANKS BEFORE PULLING CABLE. PULL A FLEXIBLE MANDREL AND BRUSH THROUGH EACH CONDUIT AFTER INSTALLATION. INSTALL A ¼" DIAMETER NYLON PULL ROPE IN ALL SPARE CONDUITS.
2. MEDIUM VOLTAGE CONDUCTORS SHALL BE PULLED USING DIRECT CONNECTION OF PULLING EYES TO THE CONDUCTORS OF EACH CABLE IN THE CIRCUIT OR BY INDIVIDUAL KELLEMS GRIPS APPLIED TO EACH CABLE OF THE CIRCUIT OVER THE INSULATION WITH THE TAPE SHIELDING REMOVED. USE OF KELLEMS GRIPS OVER THE OUTER JACKET OF THE CONDUCTOR OR OVER THE SHIELDING TAPE IS NOT PERMITTED.
3. INSTALL HANDHOLES AS REQUIRED TO MINIMIZE MAXIMUM ALLOWABLE CABLE TENSION PER CABLE MANUFACTURER WHEN PULLING CABLES.
4. SPLICES ARE NOT PERMITTED IN POWER OR CONTROL CONDUCTORS UNLESS INDICATED ON THE DRAWINGS OR APPROVED IN ADVANCE OF INSTALLATION BY ENGINEER AND OWNER.
5. WHERE CONDUCTORS OF DIFFERENT CIRCUITS PASS THROUGH THE SAME MANHOLE, HANDHOLE OR PULLBOX, COVER THE CONDUCTORS OF EACH CIRCUIT WITH ARC-PROOF TAPE, 3M SCOTCH 77 OR EQUIVALENT, SPIRAL WRAPPED HALF-LAPPED AND HELD IN PLACE WITH REVERSE WRAPPED GLASS FIBER TAPE.
6. TERMINATE ALL CONTROL WIRING BETWEEN PIECES OF EQUIPMENT ON FIELD WIRING TERMINAL BOARDS. LABEL ALL CONTROL WIRES WITH TERMINAL BOARD AND TERMINAL NUMBER IDENTIFICATION AT BOTH ENDS.
7. ALL MECHANICAL CONNECTIONS OTHER THAN ELBOW CONNECTORS SHALL BE MADE USING UL-LISTED TIN-PLATED COPPER CIRCUMFERENTIAL COMPRESSION LUGS. LUGS SHALL BE LONG-BARREL WITH NEMA TWO-HOLE DRILLING, BURNDY HYLUG MODEL YAZ OR EQUIVALENT CONNECTED WITH HIGH-STRENGTH SILICON BRONZE BUS BOLTS, NUTS AND LOCK WASHERS. LUGS TO MATCH CONDUCTOR TYPE.
8. VERIFY PROPER TORQUE OF ALL BOLTED CONNECTIONS USING A CALIBRATED TORQUE WRENCH AND MARK EACH BOLT HEAD TO INDICATE VERIFICATION IS COMPLETE.
9. CLEAN AND LUBRICATE ALL LOADBREAK AND DEADBREAK BUSHING SURFACES PER MANUFACTURER'S INSTRUCTIONS BEFORE FINAL CONNECTION.
10. MOUNT FAULT INDICATORS SUCH THAT INDICATOR WINDOW IS READILY VISIBLE WITHOUT THE NEED TO ENTER THE CABLE COMPARTMENT OR MOVE CONDUCTORS OR OTHER COMPONENTS. LABEL FAULT INDICATORS WITH CIRCUIT IDENTIFICATION USING ENGRAVED PHENOLIC LABEL.

EQUIPMENT:

1. EQUIPMENT AND COMPONENTS SHALL BE LISTED AND LABELED BY A NATIONALLY-RECOGNIZED TESTING LABORATORY (NRTL) SUCH AS UL OR ETL, WHERE SUCH LISTING IS AVAILABLE FOR THE APPLICATION.
2. PROVIDE DANGER, WARNING, AND CAUTION LABELS AS REQUIRED BY NESC, OR OSHA STANDARDS ON EQUIPMENT ENCLOSURES, DOORS, ACCESS PLATES, AND BARRIERS AND LABEL ALL MEDIUM VOLTAGE EQUIPMENT WITH THE OPERATING VOLTAGE.
3. DOORS PROVIDING ACCESS TO PARTS NORMALLY ENERGIZED AT OVER 600V SHALL BE PADLOCKABLE CLOSED. REMOVABLE PANELS PROVIDING ACCESS TO PARTS NORMALLY ENERGIZED AT OVER 600V SHALL REQUIRE TOOLS FOR REMOVAL OR BE PADLOCKABLE CLOSED.
4. MEDIUM VOLTAGE EQUIPMENT INSTALLED OUTSIDE OF FENCES WHERE ACCESSIBLE TO THE PUBLIC SHALL COMPLY WITH NESC REQUIREMENTS FOR TAMPER-PROOF CONSTRUCTION.
5. EQUIPMENT SHALL BE ANCHORED TO CONCRETE PADS OR FOUNDATIONS PER MANUFACTURER'S INSTRUCTIONS USING GALAVANIZED STEEL ANCHOR BOLTS EMBEDDED IN PAD OR WITH 6 INCH DEEP EPOXY ANCHOR BOLTS. ANCHOR BOLT SIZE PER MANUFACTURER RECOMMENDATION.
6. ALL OPENINGS INTO EQUIPMENT SHALL BE SEALED WITH GALVANIZED STEEL PLATE OR SCREEN TO PREVENT ENTRY OF INSECTS AND RODENTS.
7. CAULK ALONG BOTTOM PERIMETER OF EQUIPMENT MOUNTED ON CONCRETE PADS TO PREVENT WATER ENTRY BETWEEN BOTTOM OF ENCLOSURE AND TOP OF CONCRETE SLAB.
8. PROVIDE 12 INCHES OF CLASS 5 GRAVEL DRAINAGE BEDDING IN THE BOTTOM OF ALL BOTTOM CONDUIT ENTRIES TO OPEN CABLE COMPARTMENTS.
9. ALL CONDUCTORS SHALL BE ROUTED TO MAINTAIN ACCESS TO INDICATORS, VALVES, SAMPLE PORTS, SWITCHES, TAP CHANGES, FUSE WELLS, AND OTHER COMPONENTS AND ACCESSORES REQUIRING OPERATOR ACCESS.
10. PLACE MICARTA NAMEPLATES WITH MINIMUM 3/4" HIGH LETTERS FOR DISTRIBUTION EQUIPMENT SWITCHGEAR, INVERTERS, TRANSFORMERS, ETC.
11. PROVIDE NEMA 4 ENCLOSURE WHERE AVAILABLE FOR EXTERIOR DC AND LV EQUIPMENT. PROVIDE NEMA 3R ENCLOSURES WHERE NEMA 4 IS NOT AVAILABLE.
12. INSTALL BOLLARDS AS REQUIRED.

TRANSFORMERS:

1. TRANSFORMERS SHALL BE SECURELY BOLTED TO THE EQUIPMENT PAD AND MADE LEVEL. ANY GAPS BETWEEN THE PAD AND BASE OF THE TRANSFORMER MUST BE SEALED.
2. PROPER TORQUE SHALL BE APPLIED TO ALL BUSHINGS AS INDICATED.
3. PROPER LABELING REQUIRED FOR: TRANSFORMER, POWER CABLES, HIGH VOLTAGE COMPARTMENT (STATEMENT OF VOLTAGE), AND TRANSFORMER DOORS (DANGER WARNING).
4. NEMA DRILLED LONG BARREL COMPRESSION LUGS TO BE USED FOR THE LOW VOLTAGE WIRE.
5. PENTA-BOLTS ARE TO BE USED ON BOTH SETS OF DOORS.

GENERAL NOTES (CONT.)

6. ALL CONDUCTORS SHALL BE ROUTED TO MAINTAIN ACCESS TO INDICATORS, VALVES, SAMPLE PORTS, SWITCHES, TAP CHANGES, FUSE WELLS, AND OTHER COMPONENTS AND ACCESSORIES REQUIRING OPERATOR ACCESS.
7. LV WIRE SHALL BE ROUTED TO ALLOW ACCESS TO OIL DRAIN VALVE AND OIL SAMPLE PORT.
8. VERIFY THE FOLLOWING:
   - 8.1. FACTORY WIRING DIAGRAM IS ACCURATE
   - 8.2. TRANSFORMER IS LEVEL
   - 8.3. MEDIUM & LOW VOLTAGE CONDUITS ARE SEPARATED AND UNDER THEIR OWN COMPARTMENT
   - 8.4. LOW VOLTAGE WIRE ARE ROUTED SO THAT THERE IS ACCESS TO THE OIL DRAIN VALVE AND OIL SAMPLE PORT
   - 8.5. LOCK OR CONICAL NUTS
   - 8.6. HARDWARE IS THE PROPER LENGTH
9. PROVIDE PADLOCKS ON THE DOORS.
10. PROVIDE 12" OF CLASS 5 GRAVEL DRAINAGE BEDDING UNDER THE GROUND SLEEVE.

FIELD ACCEPTANCE TESTING:

1. CONTRACTOR SHALL PROVIDE FIELD ACCEPTANCE TESTING IN ACCORDANCE WITH ANSI/NETA ATS-2013. THE FOLLOWING EQUIPMENT SHALL BE FIELD TESTED:
   - 1.1. MV STEP-UP TRANSFORMER
   - 1.2. AC COLLECTOR SWITCHBOARD
   - 1.3. PRIMARY METERING CTS AND PTS
   - 1.4. RECLOSER AND RECLOSER CONTROLLER (SEL-651R2)
   - 1.5. MV CABLES
   - 1.6. LV CABLES
   - 1.7. GROUND GRID
2. WRITTEN FIELD ACCEPTANCE TEST REPORTS SHALL BE FURNISHED TO THE ENGINEER.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	SYSTEM OR EQUIPMENT GROUND
(3)	POTENTIAL TRANSFORMER - NUMBER DENOTES QUANTITY
(3)	CURRENT TRANSFORMER - NUMBER DENOTES QUANTITY
	TRANSFORMER
	DRAW OUT ELEMENT OR BUSHING INSERT
	POLE MOUNTED FUSED CUTOUT SWITCH
	MOLDED CASE CIRCUIT BREAKER
	TRANSFORMER BAY-O-NET FUSE
XXA	FUSE WHERE "XX" DENOTES SIZE
	DISCONNECT SWITCH
	TRANSFORMER SWITCH
	POLE MOUNTED GROUP OPERATED AIR BREAK SWITCH
	MEDIUM VOLTAGE SURGE ARRESTER
	RECLOSER
M	METER
	GROUND ROD
----	UNDERGROUND WIRING OR CONDUIT
#	PROTECTIVE RELAY - NUMBER DENOTES IEEE DEVICE FUNCTION
POCC	POINT OF COMMON COUPLING
POI	POINT OF INTERCONNECTION
POD	POINT OF DELIVERY
MCOV	MAXIMUM CIRCUIT OVER VOLTAGE
CPT	CONTROL POWER TRANSFORMER
EGC	EQUIPMENT GROUNDING CONDUCTOR
GEC	GROUNDING ELECTRODE CONDUCTOR
GFPD	GROUND FAULT PROTECTION DEVICE
	SITE FENCE
	EXISTING UTILITY POLE
	NEW WOOD POLE
#P1	UTILITY POLE AND POLE NUMBER
	GUY WIRE

solAmerica® ENERGY
1819 Peachtree Rd. NE - Suite 100
Atlanta, GA 30309 (404) 351-8175

SEAL
STATE OF MARYLAND · KEVIN LEARY · 43259 · PROFESSIONAL ENGINEER · 06/17/2020

PERMIT DRAWING - NOT RELEASED FOR CONSTRUCTION

CERTIFICATION

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO.43259, EXPIRATION DATE: JANUARY 15, 2021.

CONSULTANT
AVOCA ENGINEERS & ARCHITECTS
242 OLD NEW BRUNSWICK ROAD PISCATAWAY NJ 08854
PHONE (732) 465-1002 FAX (732) 465-1005
MARYLAND ENGINEERING FIRM REGISTRATION NO. 49489

REVISIONS

NO.	DATE	DESCRIPTION
2	12/04/19	REVISED FENCE LINE BETWEEN PHASE I AND II
3	12/20/19	REISSUED FOR PERMIT
4	12/30/19	PROJECT NAME CHANGE ONLY
5	02/14/20	REVISED PER COMMENTS, ADDED AC TRACKER POWER
6	03/23/20	REVISED TRACKER MANUFACTURER
7	05/20/20	ISSUED FOR PERMIT
8	06/17/20	REVISED GRAVEL TURN-AROUND AREAS

PLT STAMP KLEARY 6/17/2020 5:31 PM E-002 ELECTRICAL NOTES.DWG

PROJECT: 19-BU-118

HENRYTON ROAD CSG SOLAR PROJECT
1825 SAND HILL ROAD, MARRIOTTSVILLE, MD 21104

RECEIVED
JUL 20 2020
LICENSES & PERMITS DIVISION

DATE:	10/01/19
DRAWN BY:	K.M.
CHECKED BY:	K.L.

GENERAL NOTES

E-002

GENERAL SITE OVERVIEW

1 / E-101

0 50' 100'
SCALE: 1" = 50'

PROJECT SPECIFICATIONS DESIGN SUMMARY TABLE
HENRYTON ROAD

SYSTEM SIZE (AC)	1.900 MW
SYSTEM SIZE (DC)	2.268 MW
DC/AC RATIO	1.194
MEDIUM VOLTAGE TRANSFORMER	2,000 KVA
RACKING SYSTEM	SOLAR FLEXRACK
STRING SIZE	27
STRING COUNT	227
INVERTER(S)	CHINT-SCA 125KW
INVERTER QUANTITY	16
MODULE MAKE	HELIENE
MODULE MODEL	370-72M
MODULE STC RATING	370W
MODULE QUANTITY	6,129
RACK CONFIGURATION	(1) HIGH IN PORTRAIT
MODULE ORIENTATION	PORTRAIT
TILT ANGLE	+/-55°
GROUND COVERAGE RATIO	49.17%
AZIMUTH	180°
LATTITUDE	39.321007
LONGITUDE	-76.925859
CODE CYCLE	2017

Approved
B20002180
R1E 8/6/2020

EXISTING CONDITIONS		NEW CONDITIONS	
100 YR FLOODPLAIN	— 100 — 100 —	BASIN AREA	
BUILDING SETBACK		CONCRETE EQUIPMENT PAD	
EDGE OF PAVEMENT		GRAVEL ACCESS ROAD	
EXISTING EASEMENT	— ESMT — ESMT —	LIMITS OF DISTURBANCE	— LoD — LoD —
EXISTING FENCE	— X — X —	PROJECT AREA	
EXISTING ELECTRICAL	— OHE — OHE —	EASEMENT	
EXISTING TREELINE LEFT		OVERHEAD ELECTRICAL	— OHE — OHE —
JURISDICTIONAL DITCH		UNDERGROUND ELECTRICAL	— UGE — UGE —
JURISDICTIONAL RIPARIAN BUFFER - 50'		SECURITY FENCE	
JURISDICTIONAL STREAM		SILT FENCE	— SF — SF —
JURISDICTIONAL WETLAND		VEGETATIVE BUFFER	
MAJOR CONTOURS			
MINOR CONTOURS			
PROPERTY BOUNDARY			
PROPERTY (ADJOINER)			
RAILROAD			
RIGHT-OF-WAY			
STREET CENTERLINE			
STRUCTURES			

RECEIVED
JUL 20 2020
LICENSES & PERMITS DIVISION

NORTH
N

GRAPHIC SCALE
0 50' 100'
SCALE: 1" = 50'

SolAmerica® ENERGY
1819 Peachtree Rd. NE - Suite 100
Atlanta, GA 30309 (404) 351-8175

SEAL
STATE OF MARYLAND
KEVIN LEARY
43259
PROFESSIONAL ENGINEER
06/17/2020

PERMIT DRAWING - NOT RELEASED FOR CONSTRUCTION

CERTIFICATION

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO.43259, EXPIRATION DATE: JANUARY 15, 2021.

CONSULTANT

AVOCA ENGINEERS & ARCHITECTS
242 OLD NEW BRUNSWICK ROAD PISCATAWAY NJ 08854
PHONE (732) 465-1002 FAX (732) 465-1005
MARYLAND ENGINEERING FIRM REGISTRATION NO. 49489

REVISIONS

NO.	DATE	DESCRIPTION
2	12/04/19	REVISED FENCE LINE BETWEEN PHASE I AND II
3	12/20/19	REISSUED FOR PERMIT
4	12/30/19	PROJECT NAME CHANGE ONLY
5	02/14/20	REVISED PER COMMENTS, ADDED AC TRACKER POWER
6	03/23/20	REVISED TRACKER MANUFACTURER
7	05/20/20	ISSUED FOR PERMIT
8	06/17/20	REVISED GRAVEL TURN-AROUND AREAS

PLT STAMP KLEARY 6/17/2020 5:32 PM E-101 GENERAL SITE OVERVIEW.DWG

PROJECT: 19-BU-118

HENRYTON ROAD CSG SOLAR PROJECT

1825 SAND HILL ROAD,
MARRIOTTSVILLE, MD 21104

DATE:	10/01/19
DRAWN BY:	EG
CHECKED BY:	K.L.

GENERAL SITE OVERVIEW

E-101