IN RE:	*	BEFORE THE
UNIVERSITY OF MARYLAND MEDICAL SYSTEM CORP.	*	ANNE ARUNDEL COUNTY
	*	OFFICE OF ADMINISTRATIVE
	*	HEARINGS
	*	Case No: 2024-0045-V

***** *** ******* *** *****

SUPPLEMENT TO VARIANCE PETITION

Petitioner, University of Maryland Medical System Corporation ("UMMS") is seeking a variance from the bulk regulations of the Anne Arundel County Zoning Regulations to allow an "accessory structure" in the front yard of the subject parcel. This variance is necessary to allow canopy solar panels over an existing parking lot to provide energy to the UMMS structure on site. In the absence of this variance, Petitioner will be unable to construct canopy solar over the existing parking lot to the front of the Property, which will undermine the viability of the project as a whole and generate insufficient energy to justify the project.

Canopy solar provides a higher and better use for the UMMS parking lots than empty asphalt. In the absence of these canopies, the asphalt will absorb and disperse heat, which has adverse impacts for the surrounding area and UMMS employees. Solar canopies serve a dual purpose of providing clean energy while also diminishing the adverse impacts of overheated asphalt.

Due to the nature of solar canopies and the benefits derived from green energy, Petitioner submits that there are exceptional circumstances other than financial considerations that prompt the need for this variance to avoid practical difficulties or unnecessary hardship and to enable the Petitioner to develop the lot.

Petitioner's request is also in compliance with the criteria under AAZR § 18-16-305(c):

(1) the variance is the minimum variance necessary to afford relief;

Petitioner is seeking a variance from the bulk regulation prohibiting accessory structures in the front yard of the lot. Petitioner has evaluated alternative locations for the proposed solar panels; however, existing shade and tree cover prevent viable solar from being located in these areas. Petitioner complies with all other bulk regulations applicable to the site. The requested variance is the minimum necessary to afford relief.

(2) the granting of the variance will not:

(i) alter the essential character of the neighborhood or district in which the lot is located;

The subject Property is located in a commercial neighborhood surrounding by office uses. The solar canopies, if allowed pursuant to this variance, will not alter the essential character of the neighborhood or commercial district in which the lot is located.

(ii) substantially impair the appropriate use or development of adjacent property;

The proposed solar canopies will not impact the appropriate use or development of adjacent properties.

(iii) reduce forest cover in the limited development and resource conservation areas of the critical area;

Not applicable.

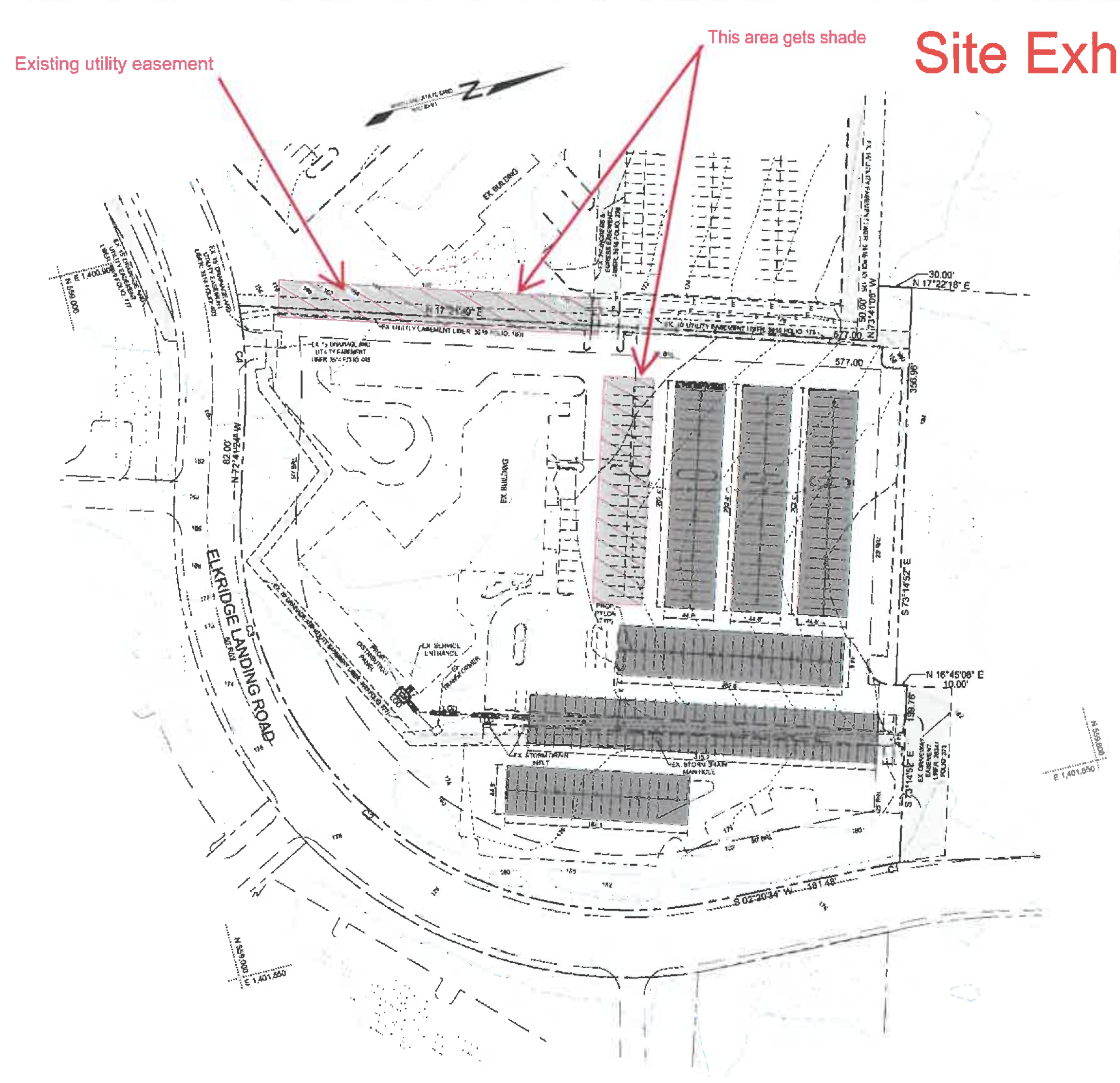
(iv) be contrary to acceptable clearing and replanting practices required for development in the critical area or a bog protection area; nor

Not applicable.

(v) be detrimental to the public welfare.

Quite to the contrary, as stated above this variance will substantially contribute to the public welfare by providing clean energy to the property owner and diminish the harmful impacts of over-heated asphalt parking.

Site Exhibit UMMS 920



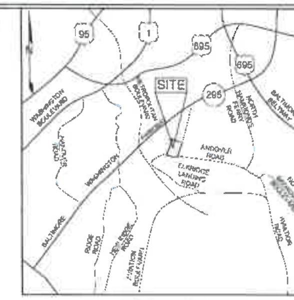
PLAN VIEW

LEGEND

EXISTING UTILITY POLE
EXISTING ELECTRIC
EXISTING COMMUNICATIONS

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING	CHORD
C1	830.00'	14.68'	1°20'03"	7.34'	S 03°00'57" W	14.68'
C2	350.00'	407.32'	66°40'46"	230.28'	S 35°40'58" W	384.72'
C3	350.00'	234.46'	[illegible]	121.82'	S 68°12'41" W	230.48'
C4	405.00'	92.61'	13°06'15"	46.51'	N 79°14'26" W	92.41'

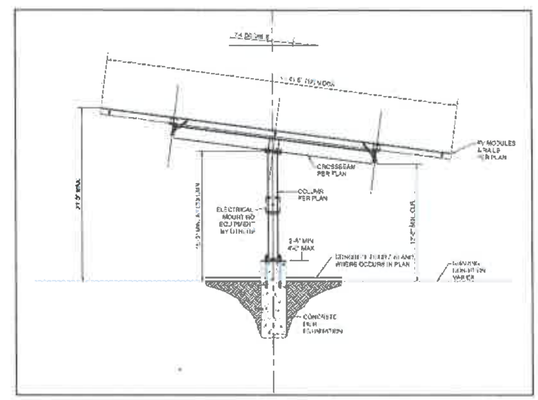


VICINITY MAP

SCALE: 1"=2000'

GENERAL NOTES

1. SUBJECT PROPERTY ZONED W 1
2. TOTAL AREA OF PROPERTY = 8.54 ACRES±
3. PROPERTY ADDRESS: 920 ELKRIDGE LANDING ROAD, LINTHICUM MARYLAND 21090
4. DEED REFERENCE: LIBER 26341 FOLIO 249
5. PREVIOUS ANNE ARUNDEL COUNTY FILE NUMBERS: PLAT #17072
6. THE BOUNDARY SHOWN HERE ON IS BASED ON A BOUNDARY SURVEY PREFORMED BY SCG LAND SURVEYING IN JUNE OF 2023
7. THE TOPOGRAPHY SHOWN WITHIN THE DEVELOPMENT AREA IS BASED ON A TOPOGRAPHIC SURVEY PREFORMED BY SCG LAND SURVEYING IN JUNE OF 2023. TOPOGRAPHY OUTSIDE OF THE AREA OF DEVELOPMENT IS BASED ANNE ARUNDEL COUNTY GIS.
8. THE LOTS SHOWN HEREON COMPLY WITH THE MINIMUM OWNERSHIP, WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT
9. PUBLIC WATER AND SEWER WILL BE USED WITHIN THIS SITE.
10. EXISTING BUILDING FOOTPRINT: 27,228 SF
11. SOLAR CAR PORT TOTAL FOOTPRINT: 86,930 SF
12. SITE LIMIT OF DISTURBANCE:
    SOLAR PYLON = 7.08MSF X 34 PYLONS = 240.33MSF
    3' WIDE TRENCH FOR UTILITY INSTALATION = 367.60SF
    1 TRANSFORMER PAD = 10SF
    TOTAL LIMIT OF DISTURBANCE = 240.33 + 367.60 + 10 = 672.02SF
12. ELECTRICAL DESIGN BY: PARASOL STRUCTURES



SOLAR CARPORT DETAIL

NOT TO SCALE

GRAPHIC SCALE

1 INCH = 50 FEET

DEVELOPER

CI RENEWABLES

OWNER

UNIVERSITY OF MARYLAND MEDICAL SYSTEM CORPORATION

SITE PLAN

UMMS SOLAR 2

920 ELKRIDGE LANDING ROAD

TAX MAP 3 GRID 12 — PARCEL 154

1ST ELECTION DISTRICT — ANNE ARUNDEL COUNTY, MARYLAND

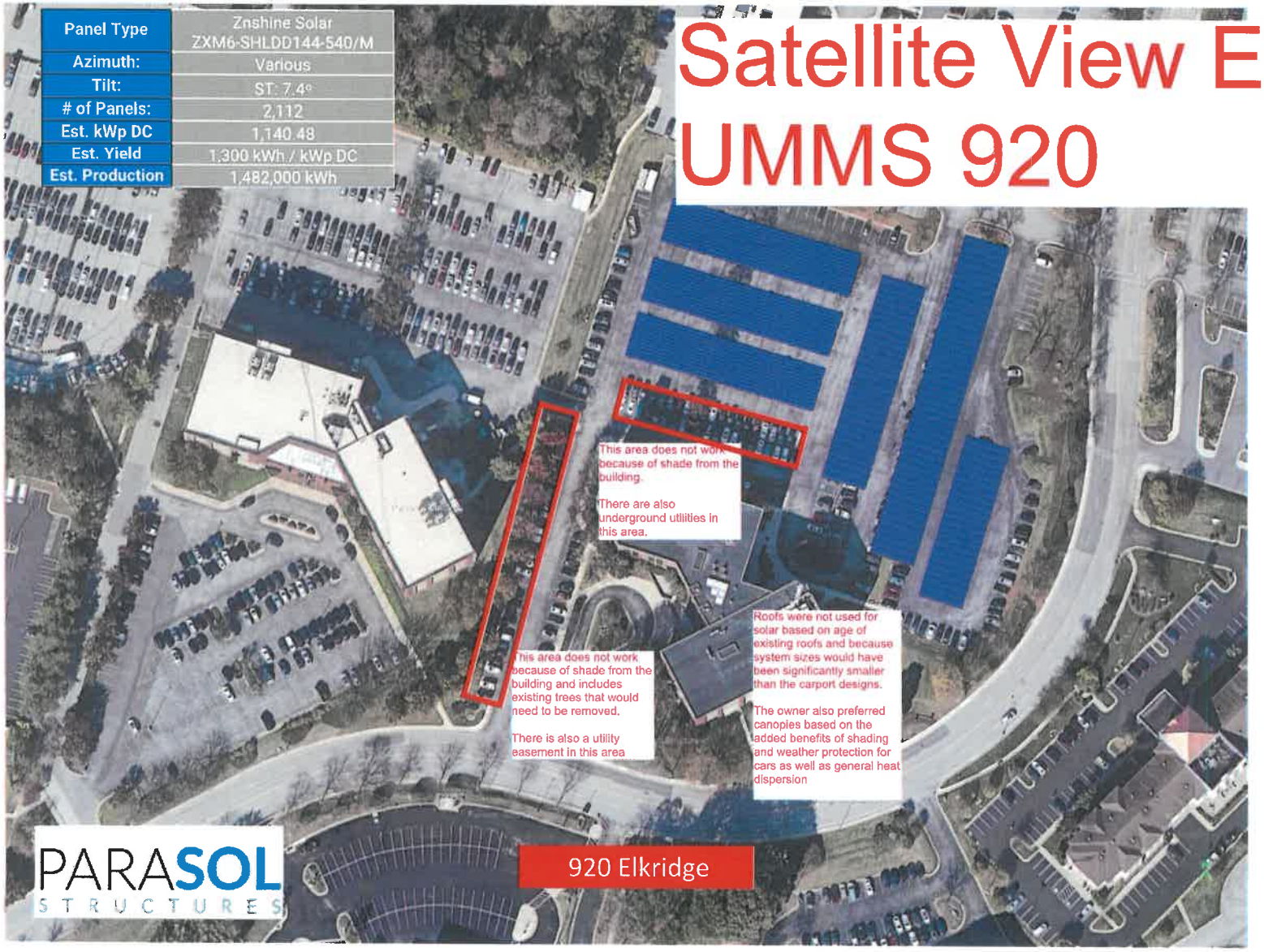
SILL ENGINEERING GROUP, LLC

SCALE: AS SHOWN

DATE: MARCH 10, 2024

Satellite View Exhibit
UMMS 920

Panel Type	Znshine Solar ZXM6-SHLDD144-540/M
Azimuth:	Various
Tilt:	ST: 7.4°
# of Panels:	2,112
Est. kWp DC	1,140.48
Est. Yield	1,300 kWh / kWp DC
Est. Production	1,482,000 kWh



PARASOL STRUCTURES

RENEWABLES

CLIENT: CI RENEWABLES
CARPORT: PARASOL CARPORT ST
LOCATION: UNIVERSITY OF MARYLAND MEDICAL CENTER
920 ELKRIDGE LANDING RD
LINTHICUM HEIGHTS, MD 21090

GENERAL NOTES:

1. Result of easement reports and underground utilities may affect final placement of solar arrays.
2. Conflicting trees and other obstructions will have to be removed, trimmed, or relocated
3. Detailed analysis of the effect of shade on arrays has not been performed.
4. Soil analysis has not been performed
5. It is assumed that the site is not in a flood plain.
6. Structural Analysis of the Garage has not been performed

Additional Views UMMS 900 and 920

OFFICE OF PLANNING AND ZONING

CONFIRMATION OF PRE-FILE

PRE-FILE #: 2023-0055-P
DATE: 11/30/2023
OPZ STAFF: Joan A. Jenkins
Hala Flores (I&P)

APPLICANT/REPRESENTATIVE: Zach Sill

EMAIL: zach@sillengineering.com

SITE LOCATION: 920 Elkridge Landing Rd, Linthicum Heights, MD 21090 **LOT SIZE:** 6.55 acres

ZONING: W1 **CA DESIGNATION:** n/a **BMA:** n/a **or BUFFER:** n/a **APPLICATION TYPE:** Variance

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Description:
The applicant proposes to construct carports with solar panels above throughout an existing paved parking lot that is used as accessory parking for the office building on 920 Elkridge Landing Rd.

COMMENTS

I & P Engineering: The applicant needs to show the limit of disturbance for the work and explain how the carport solar panel systems will be constructed. Will the parking lot be reconstructed? If the parking lot is being reconstructed and the LOD is more than 5000 SF and/or more than 1000 SF of imperviousness is being created, then this project needs to go through the SDP process. Disturbance is counted when earth is disturbed in any way or full depth pavement is replaced.

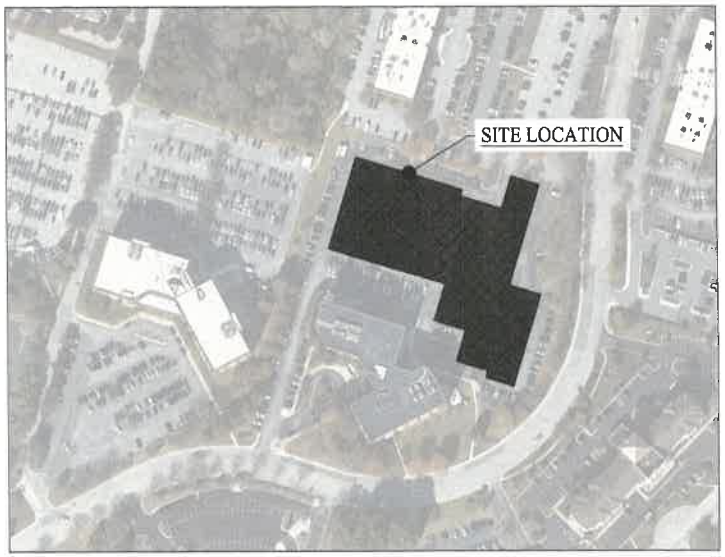
The **Zoning Administration Section** supports solar energy generating systems in principle. However, the applicant is advised that, in order for a variance to be granted, the applicant must demonstrate and the Administrative Hearing Officer must find that the proposal complies with all of the variance standards provided under Section 18-16-305 of the Anne Arundel County Zoning Ordinance.

INFORMATION FOR THE APPLICANT

Section 18-16-301 (c) Burden of Proof. The applicant has the burden of proof, including the burden of going forward with the production of evidence and the burden of persuasion, on all questions of fact. The burden of persuasion is by a preponderance of the evidence.
A variance to the requirements of the County's Critical Area Program may only be granted if the Administrative Hearing Officer makes affirmative findings that the applicant has addressed all the requirements outlined in Article 18-16-305. Comments made on this form are intended to provide guidance and are not intended to represent support or approval of the variance request.

UMMS PARASOL
920 ELKRIDGE PV
DC SIZE: 1186.8KW; AC SIZE: 950KW

920 ELKRIDGE LANDING RD
LINTHICUM HEIGHTS, MD 21090



SITE LOCATION
LATITUDE 39°12'07"N
LONGITUDE 76°41'10"W

PRELIMINARY
NOT FOR CONSTRUCTION

KUPPER
AMBLER YARDS
300 BROOKSIDE AVE, BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-5970

CI RENEWABLES

UMMS PARASOL - 920 ELKRIDGE
920 ELKRIDGE LANDING RD, LINTHICUM HEIGHTS, MD 21090

A	ISSUE FOR INTERCONNECTION	07/17/2023	EMJ	RK
B	ISSUE FOR INTERCONNECTION	07/19/2023	EMJ	PAP
C	ISSUE FOR CIVIL REVIEW	08/01/2023	EMJ	RK
D	ISSUE FOR 30% REVIEW	09/08/2023	EMJ	RK
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

406-22 | AS NOTED

PROJECT COVER SHEET

COVER

ELECTRICAL ABBREVIATIONS

(E)	EXISTING TO REMAIN	JB	JUNCTION BOX
(ED)	EXISTING TO BE DEMOLISHED	JW	JACKET WATER
(ER)	EXISTING TO BE RELOCATED	JWH	JACKET WATER HEATER
(N)	NEW	JWP	JACKET WATER PUMP
(RL)	EXISTING SHOWN RELOCATED	K	KILO, THOUSANDS
A	AMP, AMPERES	LC	LIGHTING CONTROL
A/C	AIR CONDITIONER	LFM	LIQUIDTIGHT FLEXIBLE METAL
AC	AIR COMPRESSOR	LOP	LUBE OIL PUMP
AF	AMPERE FRAME	LP	LIGHTING PANEL
AFF	ABOVE FINISHED FLOOR	LSIG	LONG, SHORT, INSTANTANEOUS AND GROUND FAULT TRIP FUNCTIONS
AFG	ABOVE FINISHED GRADE	LTG	LIGHTING
AG, A/G	ABOVE GROUND	LTNG	LIGHTNING
AIC	AMPERES INTERRUPTING CAPACITY	LV	LOW VOLTAGE (600V OR LESS)
AT	AMPERE TRIP	LVP	LOW VOLTAGE PANEL
ATS	AUTOMATIC TRANSFER SWITCH	M	MEGA, MILLIONS
BAS	BUILDING AUTOMATION SYSTEM	MAX	MAXIMUM
BC	BATTERY CHARGER	MC	MECHANICAL EQUIPMENT
BK	BREAKER	MCB	MAIN CIRCUIT BREAKER
BOC	BOTTOM OF CABINET	MCBKR	MAIN CIRCUIT BREAKER
BP	BY-PASS	MCC	MOTOR CONTROL CENTER
BR	BATTERY RACK	MCOV	MAXIMUM CONTINUOUS OPERATING VOLTAGE
BTU	BRITISH THERMAL UNIT	MCP	MOTOR CIRCUIT PROTECTOR
C	CONDUIT	MDP	MAIN DISTRIBUTION PANEL
CAB	CABINET	MDSB	MAIN DISTRIBUTION SWITCHBOARD
CB, C/B	CIRCUIT BREAKER	MDSW	MAIN DISTRIBUTION SWITCHGEAR
CIC	CONTROL INTERFACE CABINET	MH	MANHOLE
CKT	CIRCUIT	MIN	MINIMUM
CLG	CEILING	MLO	MAIN LUGS ONLY
CMU	CONCRETE MASONRY UNIT	MM	MULTI-MODE (FIBER OPTIC CABLE)
CONTN	CONTINUATION	MST	MOTOR STARTER
CP	CONTROL PANEL	MV	MEDIUM VOLTAGE (5000V-15000V)
CPS	CONTINUOUS POWER SYSTEMS	N	NEUTRAL
CT	CURRENT TRANSFORMER	NC	NORMALLY CLOSE
DEG	DEGREE	NEC	NATIONAL ELECTRICAL CODE
DIST	DISTRIBUTION	NFPA	NATIONAL FIRE PROTECTION AGENCY
DOL	DIRECT ON LINE, ACROSS THE LINE, LINE VOLTAGE	NGR	NEUTRAL GROUNDING RESISTOR
DP	DISTRIBUTION PANEL	NIC	NOT IN CONTRACT
DTT	DIRECT TRANSFER TRIP	NL	NIGHT LIGHT
DWG	DRAWING	NO	NORMALLY OPEN
EBH	ELECTRIC BASEBOARD HEAT	NO.	NUMBER
EC	ELECTRICAL CONTRACTOR	NTS	NOT TO SCALE
ECC	ETHERNET COMMUNICATIONS CABINET	OH, O/H	OVERHEAD
EE	ELECTRICAL EQUIPMENT	P	POLE(S), PHASE(S)
EF	EXHAUST FAN	PC	POWER CENTER
EHU	ELECTRIC HEAT UNIT	PLOP	PRE-LUBE OIL PUMP
ELEC	ELECTRICAL	PNL	PANEL, PANELBOARD
EMCP	ELECTRONIC MODULAR CONTROL PANEL	PP	POWER PANEL
EMERG	EMERGENCY	PRI	PRIMARY
EMT	ELECTRICAL METALLIC TUBING	PT	POWER TRANSFORMER
EOI		PVC	POLYETHYLENE VINYL CHLORIDE
EPC	ENGINEER PROCURE CONSTRUCT	REC	RECESSED
EPO	EMERGENCY POWER OFF	RECEPT	RECEPTACLE
EQ	EQUAL	RGS	RIGID GALVANIZED STEEL
ESCR	EMERGENCY STOP CONTROL RELAY	RM	ROOM
FA	FIRE ALARM	RP	RECEPTACLE PANEL
FD	FERRIS (CAST IRON) DEEP BOX (W/ HUB)	SA	SURGE ARRESTER
FDR	FEEDER	S/N	SOLID NEUTRAL
FDT	FUEL DAY TANK	SEC	SECONDARY
FIXT	FIXTURE	SF	SUPPLY FAN
FS	FERRIS (CAST IRON) SHALLOW BOX (W/ HUB)	SIS	SYNTHETIC INSULATED SWITCHBOARD (WIRE)
FU	FUSE	SPEC	SPECIFICATIONS
FVNR	FULL VOLTAGE NON-REVERSING	STP	SHIELDED TWISTED PAIR
FVR	FULL VOLTAGE REVERSING	STR	STARTER
G, GEN	GENERATOR	STT	SHIELDED TWISTED TRIPLET
GND	GROUND	SW	SWITCH
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	SWBD	SWITCHBOARD
GFI	GROUND FAULT INTERRUPTER (5 MA)	SWGR	SWITCHGEAR
GFP	GROUND FAULT INTERRUPTER (30 MA)	T/M	THERMAL MAGNETIC
GSU	STEP UP	TDR	TIME DELAY RELAY
GV	GAS VALVE	TYP	TYPICAL
GYP	GYPSUM BOARD	UG, U/G	UNDERGROUND
HH	HAND HOLE	UON	UNLESS OTHERWISE NOTED
HOA	HAND-OFF-AUTOMATIC	UPS	UNINTERRUPTIBLE POWER SOURCE
HP	HORSEPOWER	V	VOLTS
HT	HEAT TRACE	VA	VOLT-AMPERE
HTR	HEATER	VFD	VARIABLE FREQUENCY DRIVE
HV	HIGH VOLTAGE (ABOVE 15000V)	W	WATT(S), WIRE(S)
HVP	HIGH VOLTAGE PANEL	W/	WITH
HX	HEAT EXCHANGER	W/O	WITHOUT
HZ	HERTZ	WP	WEATHERPROOF
		XFMR	TRANSFORMER
		XP	EXPLOSION PROOF

LOW VOLTAGE COLOR CODE

AC	208/120V	480/277V	120/240V	MEDIUM VOLTAGE
PHASE A	BLACK	BROWN	BLACK	1 STRIPE
PHASE B	RED	ORANGE	BLACK	2 STRIPES
PHASE C	BLUE	YELLOW	...	3 STRIPES
NEUTRAL	WHITE	GRAY	WHITE	
GROUND	GREEN	GREEN	GREEN	
2000VDC	2-WIRE GROUNDED	2-WIRE UNGROUNDED		
SUPPLY	RED	RED		
RETURN	—	BLACK		
GROUNDED RETURN	WHITE	—		
EQUIPMENT GROUND	GREEN	GREEN		
125VDC	2-WIRE GROUNDED	2-WIRE UNGROUNDED		
SUPPLY	ORANGE	ORANGE		
RETURN	—	GRAY		
GROUNDED RETURN	WHITE	—		
EQUIPMENT GROUND	GREEN	GREEN		

SINGLE LINE DIAGRAM

- TRANSFORMER
- CIRCUIT BREAKER 100 AF - INDICATES AMPERE FRAME / 100 AT - INDICATES AMP TRIP
- CURRENT LIMITING CIRCUIT BREAKER
- THERMAL OVERLOAD
- DISCONNECT DEVICE FOR DRAWOUT EQUIPMENT
- NON-FUSED SWITCH
- FUSE
- FUSED SWITCH
- LIGHTNING ARRESTOR
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- POTENTIAL TRANSFORMER WITH FUSE
- STOP BUTTON MOMENTARY CONTACT
- START BUTTON MOMENTARY CONTACT
- GROUND CONNECTION
- BATTERY
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- METER
- GENERATOR
- TRANSFER SWITCH
- AMMETER
- AMMETER SWITCH
- VOLTMETER
- VOLTMETER SWITCH
- KIRK KEY INTERLOCK
- WATTHOUR METER
- C/B WITH SHUNT TRIP
- DELTA CONNECTION
- GROUNDED WYE CONNECTION
- CONTACTOR
- RELAY
- POWER FACTOR CORRECTION CAPACITOR
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSION
- INDICATING LAMP
- ELECTRIC POLE
- POINT OF CONNECTION TO EXISTING EQUIPMENT.
- POINT OF DISCONNECTION TO EXISTING EQUIPMENT.
- FT-1 — TEST SWITCH BLOCK
- SCTB — CT SHORTING BLOCKS

POWER DISTRIBUTION

- 208/120 VOLT PANELBOARD
- TRANSFORMER
- JUNCTION BOX
- NON-FUSED DISCONNECT SWITCH
- ENCLOSED CIRCUIT BREAKER
- FUSED DISCONNECT SWITCH
- SELECTOR SWITCH
  HOA = HAND-OFF-AUTO
- MAGNETIC MOTOR STARTER
- COMBINATION MAGNETIC MOTOR STARTER AND DISCONNECT SWITCH
- MOTOR HORSEPOWER AS INDICATED
- HOMERUN TO PANEL (DESCRIPTION ON LOW VOLTAGE CIRCUITRY)
- CONCEALED WIRING IN WALL OR CEILING
- CONCEALED WIRING IN OR UNDER FLOOR SLAB OR ACCESS FLOOR
- CONDUIT SEAL
- EXPOSED WIRING
- UNDERGROUND WIRING
- CONDUIT DOWN
- CONDUIT UP
- EQUIPMENT DESIGNATION
- REFER TO KEY NOTES
- UPPER CASE LETTER INDICATES CONTINUATION LINE
- 20A DUPLEX RECEPTACLE OUTLET

DEVICE NUMBERS AND ACRONYMS

15 - SPEED - OR FREQUENCY, MATCHING DEVICE
21 - DISTANCE RELAY
24 - VOLTS PER HERTZ RELAY
25 - SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
26 - THERMAL DEVICE, "O" INDICATES OIL TEMPERATURE
27 - UNDERVOLTAGE RELAY
32 - DIRECTIONAL POWER RELAY (REVERSE)
33 - POSITION SWITCH
38 - BEARING PROTECTIVE DEVICE
40 - FIELD (OVER/UNDER EXCITATION) RELAY
41 - FIELD CIRCUIT BREAKER
43 - MANUAL TRANSFER OR SELECTOR DEVICE
46 - REVERSE-PHASE OR NEGATIVE SEQUENCE CURRENT RELAY
47 - PHASE-SEQUENCE OR PHASE-BALANCE VOLTAGE RELAY
49 - THERMAL RELAY
50 - INSTANTANEOUS OVERCURRENT RELAY, "BF" INDICATES BREAKER FAILURE PROTECTION
51 - INVERSE TIME OVERCURRENT RELAY, "G" INDICATES GROUND OVERCURRENT, "V" INDICATES VOLTAGE RESTRAINT
52 - AC CIRCUIT BREAKER
59 - OVERVOLTAGE RELAY
59N - ZERO SEQUENCE GROUND OVERVOLTAGE
63 - PRESSURE SWITCH, "X" INDICATES TRANSFORMER TANK PRESSURE
67 - AC DIRECTIONAL OVERCURRENT RELAY
71 - LIQUID LEVEL SWITCH
80 - FLOW SWITCH
81 - FREQUENCY RELAY, "O" INDICATES OVER FREQUENCY "U" INDICATES UNDER FREQUENCY
86 - LOCKOUT RELAY
87 - DIFFERENTIAL PROTECTIVE RELAY, "G" INDICATES GENERATOR DIFFERENTIAL
88 - AUXILIARY MOTOR OR MOTOR GENERATOR
92 - VOLTAGE AND POWER DIRECTIONAL RELAY
95 - FOR SPECIFIC APPLICATIONS NOT OF THE ABOVE
96 - FOR SPECIFIC APPLICATIONS NOT OF THE ABOVE
97 - FOR SPECIFIC APPLICATIONS NOT OF THE ABOVE
98 - FOR SPECIFIC APPLICATIONS NOT OF THE ABOVE
99 - FOR SPECIFIC APPLICATIONS NOT OF THE ABOVE
AFD - ARC FLASH DETECTOR
CLK - CLOCK OR TIMING SOURCE
DDR - DYNAMIC DISTURBANCE RECORDER
DFR - DIGITAL FAULT RECORDER
ENV - ENVIRONMENTAL DATA
HIZ - HIGH IMPEDANCE FAULT DETECTOR
HMI - HUMAN MACHINE INTERFACE
HST - HISTORIAN
LGC - SCHEME LOGIC
MET - SUBSTATION METERING
PDC - PHASOR DATA CONCENTRATOR
PMU - PHASOR MEASUREMENT UNIT
PQM - POWER QUALITY MONITOR
RIO - REMOTE INPUT/OUTPUT DEVICE
RTU - REMOTE TERMINAL UNIT/DATA CONCENTRATOR
SER - SEQUENCE OF EVENTS RECORDER
TCM - TRIP CIRCUIT MONITOR
SOTF - SWITCH ON TO FAULT

FEEDER DESIGNATION

CONTROL FEEDER DESIGNATION

CG - A; 1 . . .

CONTROLS GROUP — GROUP — SEQUENCE

POWER FEEDER DESIGNATIONS

FDR - F ###

POWER FEEDER — SEQUENCE

LINE TYPES

(light line)	"LIGHT" LINES AND SYMBOLS INDICATE EXISTING
(bold line)	"BOLD LINES" AND SYMBOLS INDICATE NEW WORK
(bold dashed line)	"BOLD DASHED LINES" AND SYMBOLS INDICATE DEMOLITION WORK OR UNDERGROUND WORK

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

811 Know what's below.

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM
Call before you dig.

ELECTRICAL GENERAL NOTES

1. FOR EXACT LOCATIONS OF ALL EQUIPMENT REFER TO CIVIL SITE PLANS.
2. ENTIRE INSTALLATION, INCLUDING MATERIALS, EQUIPMENT AND WORKMANSHIP, SHALL CONFORM WITH THE LATEST LOCAL ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE (NEC 2017), WITH ALL APPLICABLE LAWS, LOCAL CODES AND REGULATIONS AND REGULATORY BODIES HAVING JURISDICTION OVER THIS WORK, INCLUDING NJUCC.
3. ENTIRE SITE SHALL BE ENCLOSED BY FENCE AND ONLY ACCESSIBLE BY QUALIFIED PERSONNEL.
4. ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN NEMA 3R ENCLOSURE, UNLESS NOTED OTHERWISE.
5. ELECTRICAL CONTRACTOR SHALL EXAMINE THE DRAWINGS OF ALL TRADES AND COORDINATE THEIR WORK TO AVOID INTERFERENCE WITH STRUCTURE.
6. ALL PV ELECTRICAL WIRING UNLESS OTHERWISE NOTED SHALL BE 2,000V-90°C PV WIRE.
7. THE E.C. SHALL PROVIDE SHOP DRAWINGS FOR ALL ELECTRICAL EQUIPMENT AND COMPONENTS THEY PROVIDE. PROVIDE ELECTRONIC PDF SETS OF DRAWINGS TO THE ENGINEER.
8. THE WORD "PROVIDE" AS USED WITHIN THESE CONTRACT DOCUMENTS SHALL MEAN TO: "PROVIDE AND INSTALL".
9. OBTAIN ALL REQUIRED STATE AND LOCAL MUNICIPALITY/CITY PERMITS FOR ALL ELECTRICAL WORK.
10. ALL NEW ELECTRICAL MATERIAL AND EQUIPMENT SHALL BE LISTED BY THE UNDERWRITERS' LABORATORIES, INC (UL) AND BEAR THE UL LABEL.
11. ELECTRICAL RACEWAY CONNECTIONS TO VIBRATING EQUIPMENT AND MACHINERY SUCH AS MOTORS, TRANSFORMERS, ETC. SHALL BE MADE WITH FLEXIBLE METAL CONDUIT.
12. PROVIDE GROUNDING IN ACCORDANCE WITH NEC ARTICLES 250 AND 690. ALL GROUNDING WIRE, LUGS, FEEDER AND BUS SHALL BE COPPER. ALL BRANCH CIRCUIT WIRING SHALL CONTAIN A COPPER GROUNDING WIRE. NO FLEXIBLE METAL CONDUIT OF ANY KIND SHALL BE USED AS THE EQUIPMENT GROUNDING CONDUCTOR.
13. PROVIDE PLASTIC EMBOSSED IDENTIFICATION PLATES ON ALL ELECTRICAL EQUIPMENT INCLUDED IN THIS PROJECT AND EQUIPMENT FURNISHED BY OTHERS. ATTACH WITH SUITABLE ADHESIVE. PROVIDE IDENTIFICATION FOR ALL TRANSFORMERS, DISCONNECTS, CIRCUIT BREAKERS, COMBINER BOXES, JUNCTION BOXES, PANELS, ETC.
14. DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A RECORD SET OF INSTALLATION PRINTS. THE CONTRACTOR SHALL NEATLY AND CLEARLY RECORD ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS. AT THE COMPLETION OF WORK, THE CONTRACTOR SHALL RETURN THE MARKED PRINTS WITH ALL INFORMATION MAINTAINED DURING CONSTRUCTION TO THE ENGINEER FOR SUBMISSION TO THE OWNER.
15. KUPPER ENGINEERING, LLC. INCORPORATES COMMERCIALLY MANUFACTURED ITEM(S) OR COMPONENT(S) IN THE PREPARATION OF THIS PLAN, AND RELIES UPON THE MANUFACTURER'S STATED OR IDENTIFIED SPECIFICATIONS AND PROPERTIES IN THE PREPARATION OF THIS PLAN. KUPPER ENGINEERING, LLC. HAS NOT UNDERTAKEN ANY INDEPENDENT EXAMINATION, TESTING OR ANALYSIS TO VERIFY THE MANUFACTURERS' SPECIFICATIONS OR PROPERTIES FOR ANY ITEM OR COMPONENT. (KUPPER ENGINEERING, LLC. MAKES NO REPRESENTATIONS OR WARRANTIES AS TO THE ACCURACY OF THE SPECIFICATIONS OR PROPERTIES ASSOCIATED WITH ANY ITEM OR COMPONENT UTILIZED IN THIS PLAN.)
16. KUPPER ENGINEERING, LLC. HAS RELIED UPON INFORMATION PROVIDED TO IT BY OTHERS IN PREPARATION OF THESE PLANS. THIS INFORMATION HAS BEEN USED IN THE DEVELOPMENT OF THESE PLANS. KUPPER ENGINEERING, LLC. SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF THIS INFORMATION; NOR FIELD CHANGES DURING INSTALLATION AND CONSTRUCTION.

ELECTRICAL DRAWING LIST

DRAWING NUMBER	DRAWING NAME	ISSUE FOR INTERCONNECTION	ISSUE FOR INTERCONNECTION	ISSUE FOR CIVIL REVIEW	ISSUE FOR 30% REVIEW	ISSUE FOR 90% PROGRESS						
COVER	PROJECT COVER SHEET				●	●						
E0.01	ELECTRICAL LEGEND, NOTES AND ABBREVIATIONS				●	●						
E0.50	ELECTRICAL PV OVERALL SITE PLAN	●	●	●	●	●						
E2.01	ELECTRICAL CONDUIT ROUTING PLAN - POWER			●	●	●						
E2.02	ELECTRICAL CONDUIT ROUTING PLAN - CONTROLS					●						
E2.03	ELECTRICAL GROUNDING PLAN					●						
E2.04	ELECTRICAL PV WIRING PLAN - CARPORT 01, 02, & 03					●						
E2.05	ELECTRICAL PV WIRING PLAN - CARPORT 04, 05, & 06					●						
E3.01	ELECTRICAL SCHEDULES					●						
E4.01	ELECTRICAL SINGLE LINE DIAGRAM	●	●	●	●	●						
E5.01	ELECTRICAL DETAILS - 1				●	●						
E5.02	ELECTRICAL DETAILS - 2				●	●						
E5.03	ELECTRICAL DETAILS - 3				●	●						
E5.04	ELECTRICAL DETAILS - 4				●	●						
E5.05	ELECTRICAL DETAILS - 5				●	●						

DRAWING NUMBER DESCRIPTION

E 2 . 0 1

DISCIPLINE — SERIES — NUMBER OF SHEET

DISCIPLINE	SERIES	FLOOR (FOR PLANS)	SHEET No.
E ELECTRICAL EC ELECTRICAL CONTROLS FP FIRE PROTECTION M MECHANICAL P PLUMBING PF PLUMBING/FIRE PROTECTION S STRUCTURAL	0 LEGEND/SITE 1 DEMOLITION 2 PLANS 3 SCHEDULES 4 SCHEMATICS DIAGRAMS 5 DETAILS 6 CEILING/LIGHTING 7 SPECIFICATIONS	1,2,3, ETC. FLOOR No. 0 BELOW GRADE B BASEMENT R ROOF	CONSECUTIVELY NUMBERED FOR EACH SERIES

PRELIMINARY
NOT FOR CONSTRUCTION

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CI RENEWABLES

UMMS PARASOL - 920 ELKRIDGE

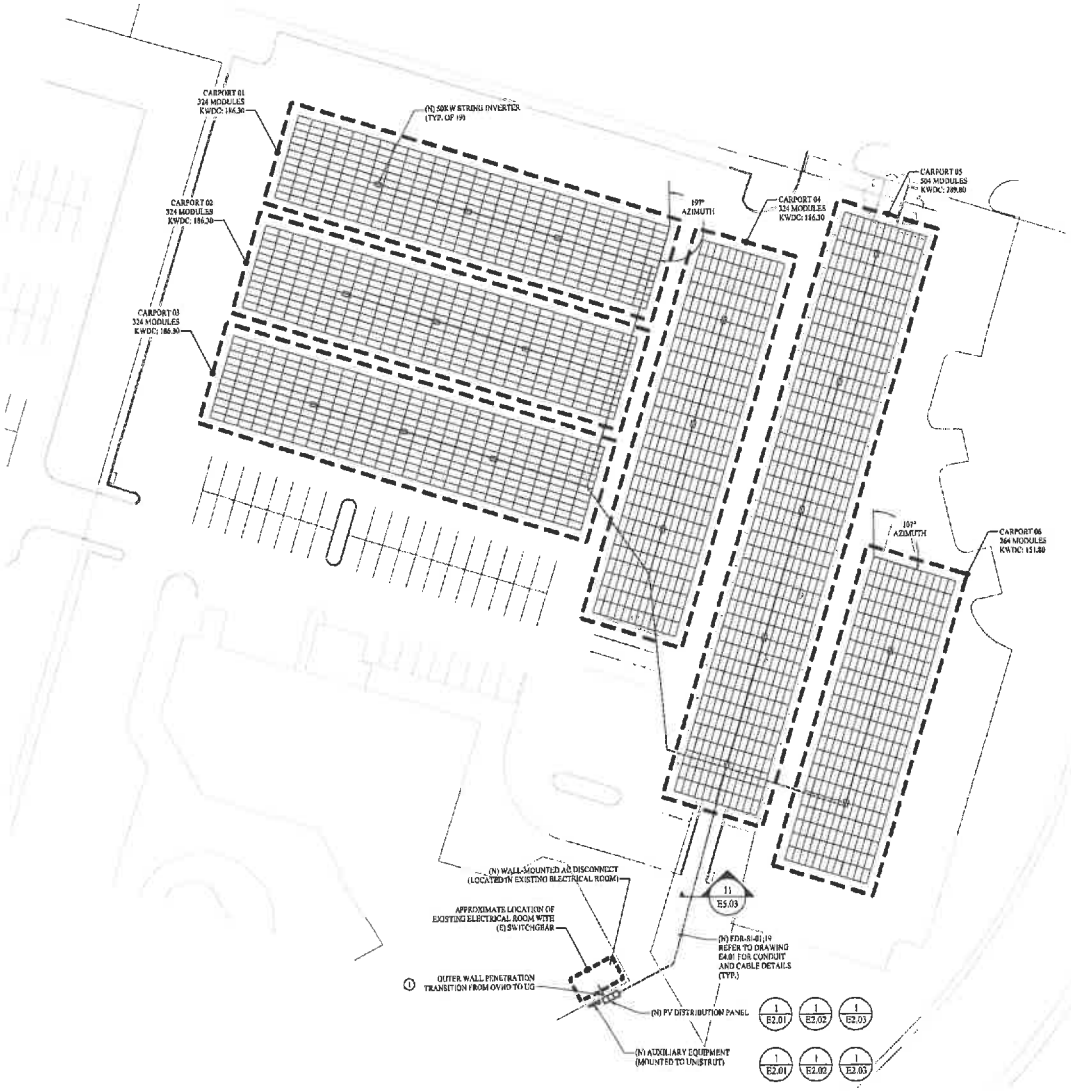
920 ELKRIDGE LANDING RD,
LINTHICUM HEIGHTS, MD 21090

A	ISSUE FOR INTERCONNECTION	07/12/2023	EMJ	RK
B	ISSUE FOR INTERCONNECTION	07/19/2023	EMJ	PAP
C	ISSUE FOR CIVIL REVIEW	08/01/2023	EMJ	RK
D	ISSUE FOR 30% REVIEW	09/08/2023	EMJ	RK
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

406-22 | AS NOTED

ELECTRICAL LEGENDS, NOTES AND ABBREVIATIONS

E0.01



1 ELECTRICAL SITE PLAN
SCALE: 1" = 30'-0"

SHEET NOTES:

1. REFER TO E2.01 FOR ADDITIONAL POWER AND E2.02 FOR CONTROL CONDUIT ROUTING AND WIRING REQUIREMENTS.
2. REFER TO E3.01 AND E4.01 FOR ADDITIONAL CONDUIT AND WIRING REQUIREMENTS.
3. E.C. SHALL PROVIDE ADDITIONAL HANDHOLES WHERE REQUIRED. SIZE ALL HANDHOLES PER NEC.
4. CONDUIT ROUTING LAYOUTS ARE GENERIC AND DO NOT REPRESENT ALL CONDUITS REQUIRED IN SCOPE OF WORK. MAJOR CONDUIT ROUTES ARE SHOWN TO PROVIDE COORDINATION BETWEEN TRADES AND TO LOCATE CONDUIT ENTRANCE POINTS. IN GENERAL, THESE ENTRANCE POINTS TO EQUIPMENT SHALL BE FOLLOWED TO PREVENT SHEARING OF CONDUITS FROM PAD SETTLEMENTS.
5. DRAWINGS DO NOT REPRESENT EXACT END LOCATION OF WIRING AND CONDUIT. WIRING AND CONDUIT SHALL BE PROVIDED AS REQUIRED TO EXTEND TO THE FINAL TERMINAL BLOCK DESTINATIONS. E.C. SHALL COORDINATE WITH EACH MANUFACTURER'S SHOP DRAWINGS.
6. COORDINATE CONDUIT ENTRY LOCATION WITH EQUIPMENT MANUFACTURER.
7. SPARE CONDUIT SHALL STUB UP INSIDE SECTION OF EQUIPMENT AND CAPPED. PROVIDE PULL STRING, PRE-PULLED AND TIED AT BOTH ENDS.
8. COORDINATE WITH EXISTING UNDERGROUND PIPING AND ELECTRICAL CONDUITS. E.C. SHALL HIRE A SITE UTILITY LOCATOR TO IDENTIFY ALL UNDERGROUND INTERFERENCES. HAND DIG IN AREAS WITH EXISTING UTILITIES.
9. E.C. SHALL COORDINATE EXACT LOCATION OF OVERHEAD CONDUIT ROUTING IN FIELD. PROVIDE JUNCTIONS BOXES AS REQUIRED, SIZE PER NEC.

KEY NOTES:

1. CONTRACTOR SHALL CONSULT WITH OWNER TO DETERMINE CONDUIT ROUTE IN FIELD, THROUGH BUILDING.

SYSTEM SPECS	
DC SYSTEM SIZE	1186.8KW
AC SYSTEM SIZE	950.00KW
MODULE MODEL	ZNSHINE ZXM7-UHLDD144
MODULE RATING	575W
MODULE QUANTITY	2064
INVERTER MODEL	SOLECTRIA: PVI-50TL-480
STRING SIZE	16/17
INVERTER QUANTITY	19
TOTAL # OF STRINGS	127
AZIMUTH	197°/107°
TILT - RACKING	7.4° - CARPORT

GRAPHIC SCALE

PRELIMINARY
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CI RENEWABLES

UMMS PARASOL - 920 ELKRIDGE

920 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

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C	ISSUE FOR CIVIL REVIEW	08/08/2023	EJJ / RK
D	ISSUE FOR 50% REVIEW	09/05/2023	EJJ / RK
E	ISSUE FOR 90% PROGRESS	10/17/2023	EJJ / PAP

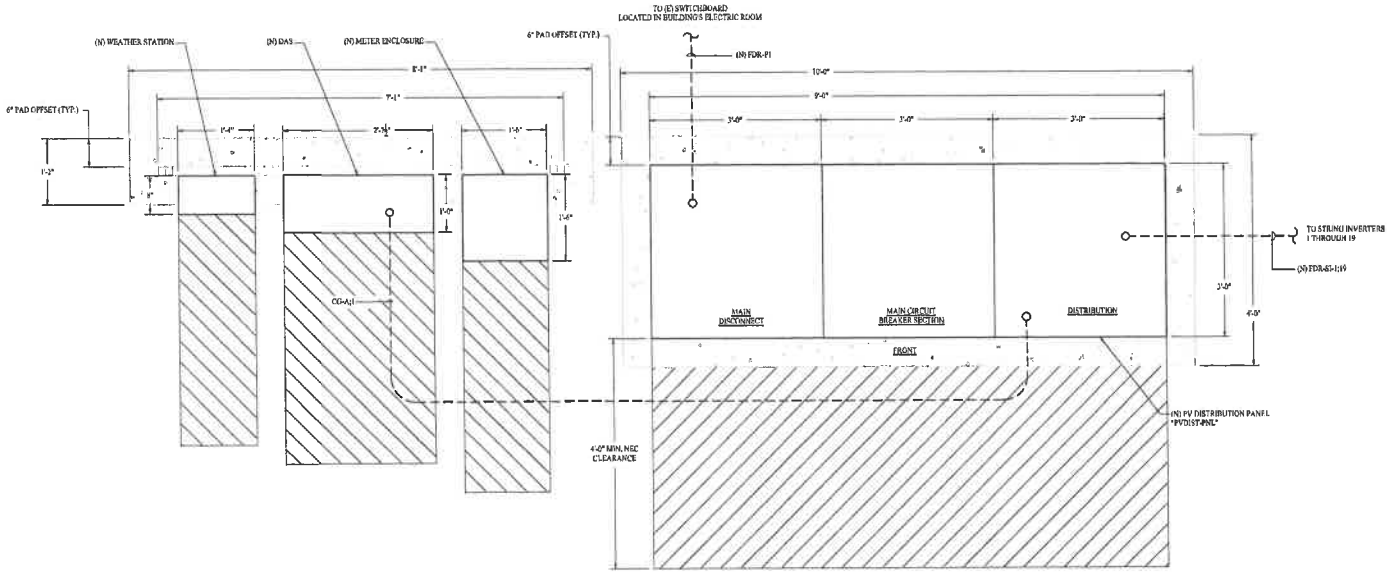
406-22 | AS NOTED

ELECTRICAL SITE PLAN

E0.50

SHEET NOTES:

1. REFER TO DRAWING E4.01 FOR SINGLE LINE DIAGRAM.
2. CONDUIT ROUTING LAYOUTS ARE GENERIC AND DO NOT REPRESENT ALL CONDUITS REQUIRED IN SCOPE OF WORK. MAJOR CONDUIT ROUTES ARE SHOWN TO PROVIDE COORDINATION BETWEEN TRADES AND TO LOCATE CONDUIT ENTRANCE POINTS. IN GENERAL, THESE ENTRANCE POINTS TO EQUIPMENT SHALL BE FOLLOWED TO PREVENT SHEARING OF CONDUITS FROM PAD SETTLEMENTS.
3. DRAWINGS DO NOT REPRESENT EXACT END LOCATION OF WIRING AND CONDUIT. WIRING AND CONDUIT SHALL BE PROVIDED AS REQUIRED TO EXTEND TO THE FINAL TERMINAL BLOCK DESTINATIONS. E.C. SHALL COORDINATE WITH EACH MANUFACTURER'S SHOP DRAWINGS.
4. COORDINATE CONDUIT ENTRY LOCATION WITH EQUIPMENT MANUFACTURER.
5. ANY EXISTING CURB, MACADAM, EXISTING STORM SEWER, VEGETATION OR UNDERGROUND AND ABOVE GROUND STRUCTURE DAMAGED DURING THE COURSE OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
6. FINAL PAD DESIGN BY STRUCTURAL ENGINEER.



1 ELECTRICAL CONDUIT ROUTING PLAN - POWER
SCALE: 1" = 1'-0"

GRAPHIC SCALE

PRELIMINARY
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D	ISSUE FOR 30% REVIEW	09/08/2023	EMJ / RK
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ / PAP

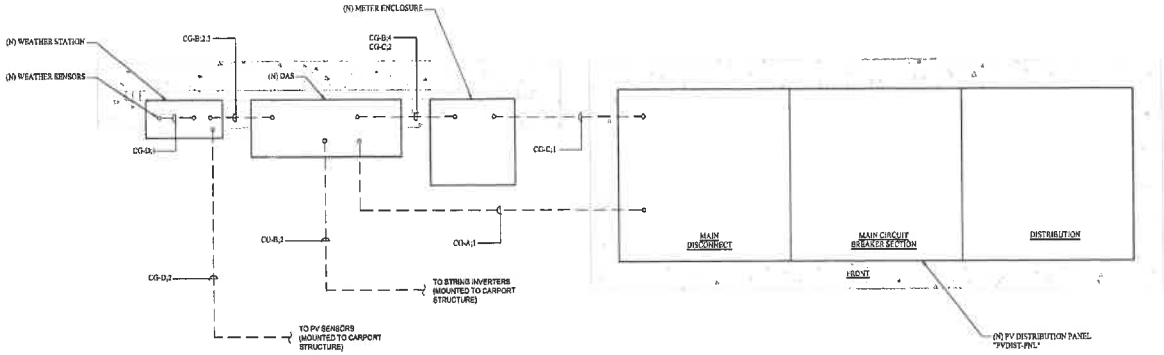
406-22 | AS NOTED

ELECTRICAL CONDUIT ROUTING PLAN - POWER

E2.01

SHEET NOTES:

1. REFER TO DRAWING E2.01 FOR SHEET AND KEY NOTES.



1 ELECTRICAL CONDUIT ROUTING PLAN - CONTROLS
SCALE: 1" = 1'-0"

NORTH

ELECTRICAL CONTROL-CONDUIT & WIRING SCHEDULE

CONDUIT GROUP NO.	FROM	TO	CONDUIT #	CONDUIT	DESCRIPTION	BELOW GRADE-BG OVERHEAD-OH	VOLTAGE	WIRING	NOTES
CG-A	PV DIST. PANEL	DAS	1	1"	POWER	BG/OH	120VAC	(2) #12 AWG CU + (1) #12 AWG CU GND	120VAC POWER
CG-B	DAS	STRING INVERTERS	1	2"	MONITORING	BG	LV	RS-485	DAISY CHAINED INVERTERS
		WEATHER STATION	2	3/4"	POWER	BG	LV	(2) #20 AWG CU	WEATHER STATION POWER
		WEATHER STATION	3	3/4"	COMMUNICATIONS	BG	LV	RS-485	WEATHER STATION COMMUNICATIONS
		METER ENCLOSURE	4	1"	POWER	BG/OH	120VAC	(2) #12 AWG CU + (1) #12 AWG CU GND	120VAC POWER
CG-C	METER ENCLOSURE	PV DIST. PANEL	1	1-1/4"	MONITORING	BG/OH	LV	(11) #12 AWG CU	CU/PV WIRING (METER)
		DAS	2	2"	MONITORING	BG	LV	CAT5	METER DATA
CG-D	WEATHER STATION	AMBIENT TEMPERATURE SENSOR	1	1"	COMMUNICATIONS	OH	LV	INCLUDED WITH SENSOR	AMBIENT TEMPERATURE SENSOR
		POA/REAR-POA/DOM SENSORS	2	1"	COMMUNICATIONS	BG	LV	INCLUDED WITH SENSOR	POA/DOM SENSOR WITHIN 100 FEET

2 ELECTRICAL CONTROLS SCHEDULE
SCALE: NTS

GRAPHIC SCALE

PRELIMINARY
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E	ISSUE FOR 90% PROGRESS	11/15/2023	DMJ / PAP

406-22 | AS NOTED

ELECTRICAL CONDUIT ROUTING PLAN - CONTROLS

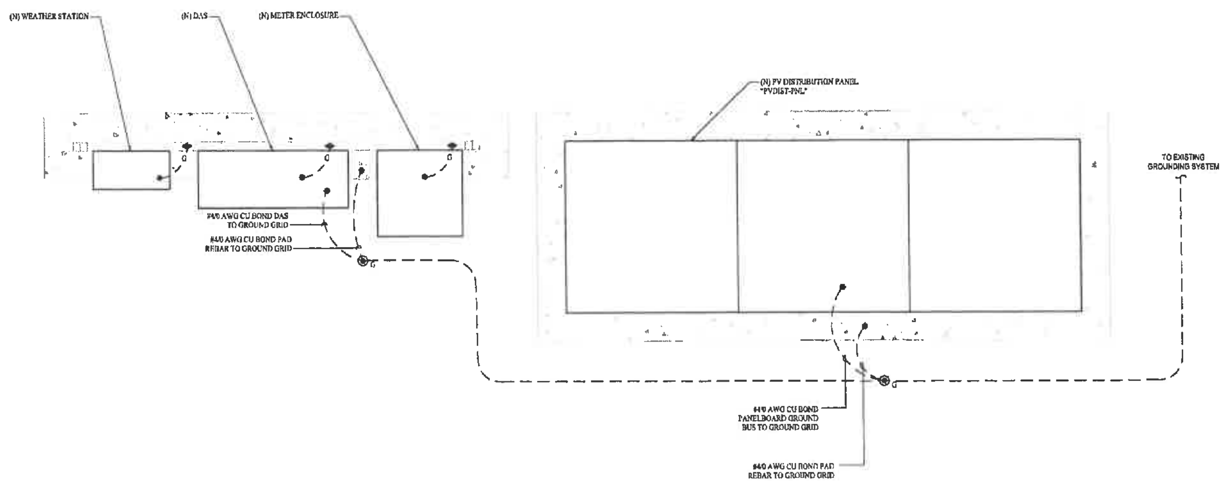
E2.02

GROUNDING LEGEND

Symbol	Description
———	#4/0, 19-STRAND BARE SOFT DRAWN COPPER CONDUCTOR.
◉ G	3/4" x 10' COPPER CLAD GROUND ROD WITH MECHANICAL CONNECTIONS.
◎ G	3/4" x 10' COPPER CLAD GROUND RODS WITH GROUND ROD COUPLER AND MECHANICAL CONNECTIONS IN TEST WELL.
— G —	#6, SOFT DRAWN STRANDED COPPER CONDUCTOR FOR THE CONNECTION OF EQUIPMENT.

SHEET NOTES:

1. DRAWINGS DOES NOT INCORPORATE ALL BONDING CONNECTIONS. THIS IS A GUIDE ONLY. E.C. SHALL BOND ALL EQUIPMENT FOR SAFE TOUCH POTENTIALS AND (MIN.) ACCORDING TO NEC.
2. ALL ENCLOSURES SHALL BE BONDED.
3. ALL CONCRETE EQUIPMENT PADS SHALL BE BONDED PER DETAIL 7/E3.01.
4. GROUND RESISTANCE AT EQUIPMENT PADS SHALL BE 5 OHMS OR LESS TO GROUND. CONTRACTOR SHALL ADD ADDITIONAL GROUND RODS AND UNDERGROUND COPPER TO ACHIEVE THESE RESULTS. TESTING REPORTS SHALL BE PROVIDED TO THE EOR TO CONFIRM GROUNDING MEETS IEEE STANDARDS.
5. GROUND RESISTANCE AT POLES SHALL BE 10 OHMS OR LESS TO GROUND. CONTRACTOR SHALL ADD ADDITIONAL GROUND RODS AND UNDERGROUND COPPER TO ACHIEVE THESE RESULTS. TESTING REPORTS SHALL BE PROVIDED TO THE EOR TO CONFIRM GROUNDING MEETS IEEE STANDARDS.
6. GROUNDING CONNECTORS SHALL BE EITHER IRREVERSIBLE COMPRESSION OR EXOTHERMIC WELD UNLESS OTHERWISE NOTED.



1 ELECTRICAL GROUNDING PLAN
SCALE: 1" = 1'-0"

NORTH

GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

Kupper ENGINEERING, LLC AN AEP-LUNDH ENGINEERING CO.
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CI RENEWABLES

UMMS PARASOL - 920 ELKRIDGE

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D	ISSUE FOR 30% REVIEW	09/08/2023	EMJ	RK
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

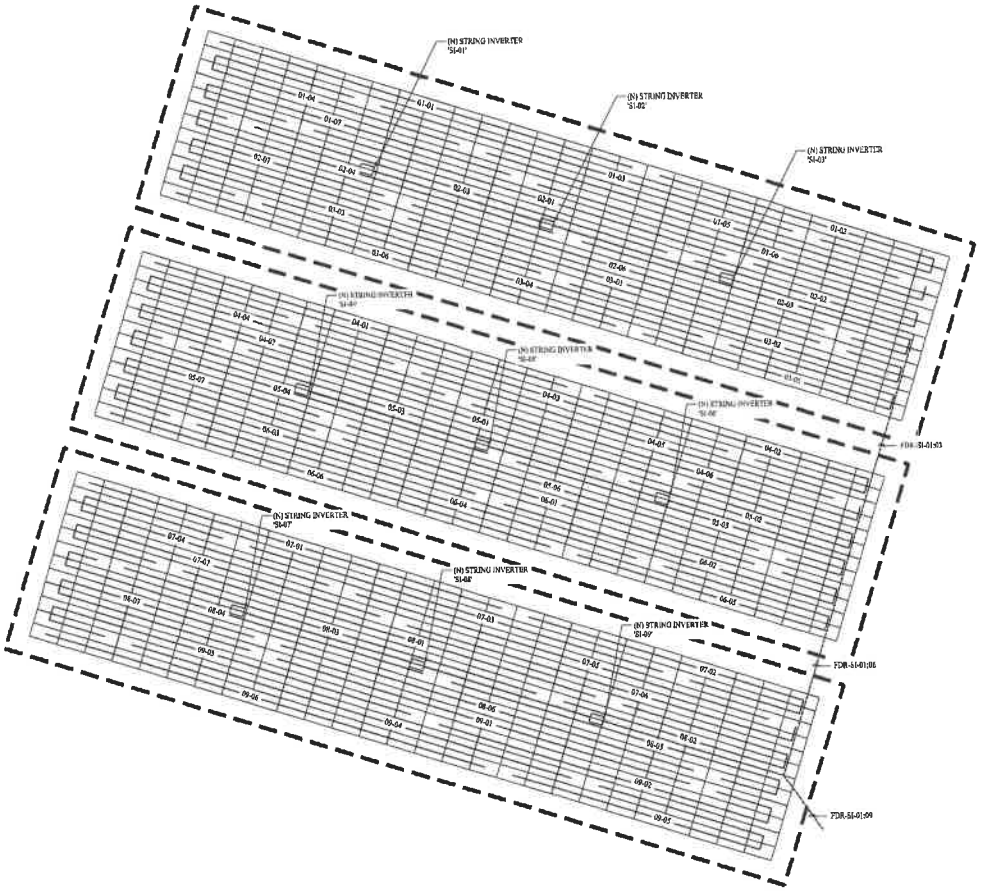
406-22 | AS NOTED

ELECTRICAL GROUNDING PLAN

E2.03

SHEET NOTES:

1. REFER TO DRAWINGS E2.01 FOR ADDITIONAL POWER AND E2.02 FOR CONTROL CONDUIT ROUTING AND WIRING REQUIREMENTS.
2. REFER TO DRAWING E4.01 FOR SINGLE LINE DIAGRAM.



1 ELECTRICAL PV WIRING DIAGRAM - CARPORTS 01, 02, & 03
SCALE: 1" = 15'-0"

STRING NOMENCLATURE
01-01
STRING #
INVERTER #

STRING FEEDER NOMENCLATURE
FDR-01-01
FEEDER
STRING #
INVERTER #

STRING INVERTER NOMENCLATURE
INV-01
STRING INVERTER
INVERTER #

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CI RENEWABLES

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B	ISSUE FOR INTERCONNECTION	07/19/2023	PAP
C	ISSUE FOR CIVIL REVIEW	08/07/2023	RK
D	ISSUE FOR 30% REVIEW	09/08/2023	RK
E	ISSUE FOR 90% PROGRESS	11/17/2023	PAP

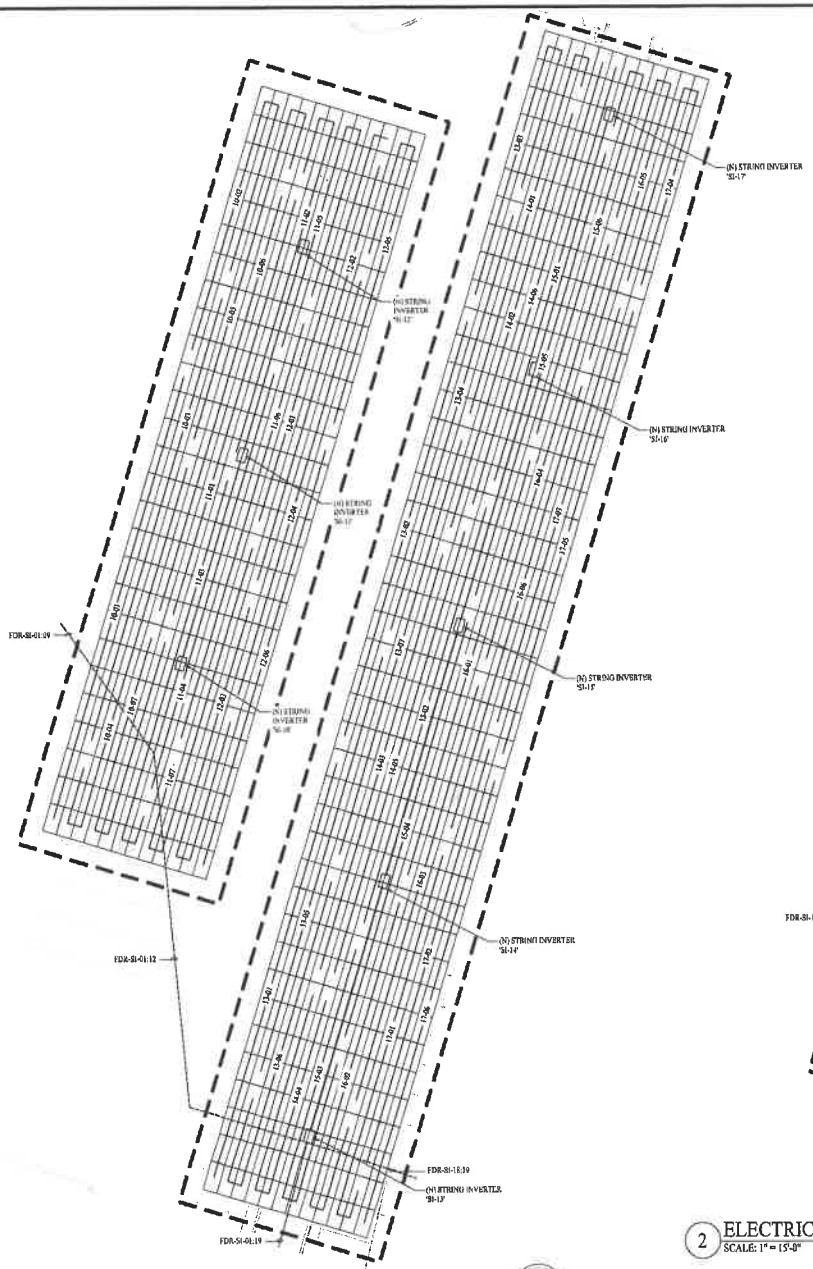
406-22 | AS NOTED

ELECTRICAL PV WIRING DIAGRAM - CARPORTS 01, 02, & 03

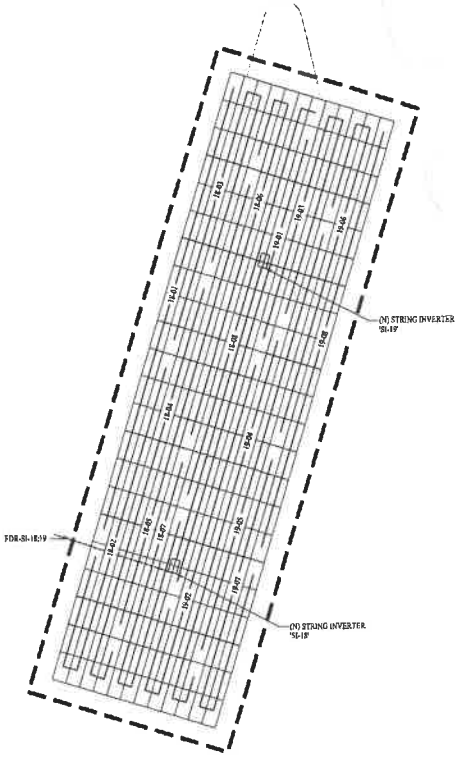
E2.04

SHEET NOTES:

1. REFER TO DRAWING E2.04 FOR SHEET AND KEY NOTES.



1 ELECTRICAL PV WIRING DIAGRAM - CARPORTS 04 & 05
SCALE: 1" = 15'-0"



2 ELECTRICAL PV WIRING DIAGRAM - CARPORT 06
SCALE: 1" = 15'-0"

STRING NOMENCLATURE
01-01
STRING #
INVERTER #

STRING FEEDER NOMENCLATURE
FDR-01-01
FEEDER
STRING #
INVERTER #

STRING INVERTER NOMENCLATURE
INV-01
STRING INVERTER
INVERTER #

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RENEWABLES

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D	ISSUE FOR 30% REVIEW	09/05/2023	EMJ	RK
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

406-22 | AS NOTED

ELECTRICAL PV WIRING DIAGRAM - CARPORTS 04, 05, & 06

E2.05

STC MODULE SPECS	
MAKE/MODEL: ZNSHINE: ZXM7-UHLDD144 STC	
MODULE POWER (W)	575
MODULE Vmp (V)	42.60
MODULE Voc (V)	51.30
MODULE Imp (A)	13.50
MODULE Isc (A)	14.29
MODULE Voc Temperature Coefficient (%/C)	-0.25
MODULE Vmp Temperature Coefficient (%/C)	-0.30
BSTC MODULE SPECS	
MAKE/MODEL: ZNSHINE: ZXM7-UHLDD144 BSTC	
MODULE POWER (W)	719
MODULE Vmp (V)	42.70
MODULE Voc (V)	51.40
MODULE Imp (A)	16.83
MODULE Isc (A)	17.92

STC STRING SPECS	
MODULES PER STRING	17
STRING POWER (W)	9,775
NOMINAL STRING Vmp (V)	724.20
STRING Voc (V)	872.10
STRING Imp (A)	13.50
STRING Isc (A)	14.29
MAX CIRCUIT CURRENT (A)	17.86
MIN STRING OCPD RATING (A)	22.33
CORRECTED MAX STRING Voc (V)	956.91
CORRECTED MIN STRING VOLTAGE (V)	654.89
STC STRING SPECS	
MODULES PER STRING	16
STRING POWER (W)	9,200
NOMINAL STRING Vmp (V)	681.60
STRING Voc (V)	820.80
STRING Imp (A)	13.50
STRING Isc (A)	14.29
MAX CIRCUIT CURRENT (A)	17.86
MIN STRING OCPD RATING (A)	22.33
CORRECTED MAX STRING Voc (V)	900.65
CORRECTED MIN STRING VOLTAGE (V)	616.37

BSTC STRING SPECS	
MODULES PER STRING	17
STRING POWER (W)	12,223
NOMINAL STRING Vmp (V)	725.90
STRING Voc (V)	873.80
STRING Imp (A)	16.83
STRING Isc (A)	17.82
MAX CIRCUIT CURRENT (A)	22.28
MIN STRING OCPD RATING (A)	27.84
FUSE RATING (A)	30.00
CORRECTED MAX STRING Voc (V)	959.78
CORRECTED MIN STRING VOLTAGE (V)	656.43
BSTC STRING SPECS	
MODULES PER STRING	16
STRING POWER (W)	11,504
NOMINAL STRING Vmp (V)	683.20
STRING Voc (V)	823.40
STRING Imp (A)	16.83
STRING Isc (A)	17.82
MAX CIRCUIT CURRENT (A)	22.28
MIN STRING OCPD RATING (A)	27.84
FUSE RATING (A)	30.00
CORRECTED MAX STRING Voc (V)	903.38
CORRECTED MIN STRING VOLTAGE (V)	617.82

INVERTER SPECS	
MAKE/MODEL: Solectria: PVI-50TL-480	
INVERTER POWER (KW)	50
MAX DC CURRENT Isc (A)	204
MAX DC VOLTAGE (V)	1000
MPPT VOLTAGE RANGE (V)	200-950
NOMINAL PHASE-TO-PHASE VOLTAGE (V)	480
NOMINAL AC POWER (KW)	50
MAX OUTPUT CURRENT (A)	66.2

SITE CONDITIONS	
METRO STATION	BALTIMORE-WASHINGTON, MD, USA (WMO: 724060)
EXTREME ANNUAL LOW TEMP (°C)	-13.9
AVERAGE HIGH AMBIENT TEMP (°C)	36.9
TILT (°)	24
SYSTEM SPECS	
DC CAPACITY (KW)	1186.80
AC CAPACITY (KVA)	950.00
TOTAL NUMBER OF MODULES	2064
TOTAL NUMBER OF STRINGS	127

1 PV SYSTEM RATINGS
NOT TO SCALE

STRING INVERTER TAG	FEEDER TAG	MODULE NAMEPLATE (W)	TOTAL No. OF MODULES	No. OF 16 MOD STRINGS	No. OF 17 MOD STRINGS	STC SHORT CIRCUIT CURRENT Isc (A)	BSTC SHORT CIRCUIT CURRENT Isc (A)	STC RATED MAXIMUM POWER-POINT CURRENT Imp (A)	BSTC RATED MAXIMUM POWER-POINT CURRENT Imp (A)	RATED MAXIMUM POWER-POINT VOLTAGE Vmp (V)	MAXIMUM PV VOLTAGE (V)	MAXIMUM PV CURRENT (A)	TOTAL DC POWER (KW)	INVERTER KW	DC:AC RATIO	NOMINAL AC OUTPUT CURRENT (A)	MAXIMUM OUTPUT CURRENT x1.25 (A)	AC OCPD RATING (A)	THWN-2 CABLE SIZE (90 DEG) CABLE SIZE	AMPACITY (A) (60°)	CONDUIT SIZE (ACTL 40 PVC)	CONDUIT FILL %	FEEDER DISTANCE (FT)	AC V-DROP (%)
SI-1-1	FDR-SI-1-1	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	600	2.23%
SI-1-2	FDR-SI-1-2	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	550	2.50%
SI-1-3	FDR-SI-1-3	575	100	2	4	85.74	106.92	81.00	100.98	681.60	1000	153.65	57.50	50	1.15	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	500	2.29%
SI-1-4	FDR-SI-1-4	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	540	2.45%
SI-1-5	FDR-SI-1-5	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	450	2.23%
SI-1-6	FDR-SI-1-6	575	100	2	4	85.74	106.92	81.00	100.98	681.60	1000	153.65	57.50	50	1.15	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	443	2.02%
SI-1-7	FDR-SI-1-7	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	480	2.18%
SI-1-8	FDR-SI-1-8	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	430	1.95%
SI-1-9	FDR-SI-1-9	575	100	2	4	85.74	106.92	81.00	100.98	681.60	1000	153.65	57.50	50	1.15	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	385	1.75%
SI-1-10	FDR-SI-1-10	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	300	1.36%
SI-1-11	FDR-SI-1-11	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	355	1.61%
SI-1-12	FDR-SI-1-12	575	100	2	4	85.74	106.92	81.00	100.98	681.60	1000	153.65	57.50	50	1.15	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	415	1.88%
SI-1-13	FDR-SI-1-13	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	165.93	64.40	50	1.29	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	155	0.70%
SI-1-14	FDR-SI-1-14	575	98	4	2	85.74	106.92	81.00	100.98	681.60	1000	153.65	56.35	50	1.13	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	225	1.02%
SI-1-15	FDR-SI-1-15	575	98	4	3	85.74	106.92	81.00	100.98	681.60	1000	153.65	56.35	50	1.13	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	290	1.32%
SI-1-16	FDR-SI-1-16	575	98	4	3	85.74	106.92	81.00	100.98	681.60	1000	153.65	56.35	50	1.13	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	360	1.63%
SI-1-17	FDR-SI-1-17	575	98	4	3	85.74	106.92	81.00	100.98	681.60	1000	153.65	56.35	50	1.13	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	430	1.95%
SI-1-18	FDR-SI-1-18	575	133	5	5	114.33	142.56	108.00	134.64	681.60	1000	178.20	76.48	50	1.53	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	220	1.00%
SI-1-19	FDR-SI-1-19	575	121	5	3	114.33	142.56	108.00	134.64	681.60	1000	178.20	72.33	50	1.31	66.2	83	90	(4) #2 AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	200	1.36%
																						AVERAGE:	373	1.69%

2 INVERTER SCHEDULE
NOT TO SCALE

AC FEEDER SCHEDULE										
FEEDER TAG	FROM EQUIPMENT	TO EQUIPMENT	FLA (A)	NOMINAL VOLTAGE Vmp (V)	CABLE SIZE	CABLE TEMPERATURE RATING (C°)	AMPACITY (A)	CONDUIT SIZE (ACTL 40 PVC)	CONDUIT FILL %	LENGTH (FT)	AC V-DROP %
FDR-1	(E) SWGR	PV DIST. PNL	1267.4	480	(4) SETS OF (4) 500 KCMIL CU + (1) #3/0 AWG CU GND	75	1520	4"	23.6%	15	0.08%

3 AC FEEDER SCHEDULE
NOT TO SCALE

WORST CASE DC VOLTAGE DROP				
NUMBER OF MODULES	VMP (V)	IMP (A)	LENGTH (FT)	DC V-DROP %
16	681.60	13.50	200	1.01%

4 WORST CASE DC VOLTAGE DROP
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

AMBLER YARDS
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RENEWABLES

UMMS PARASOL - 920 ELKRIDGE

920 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

A	ISSUE FOR INTERCONNECTION	07/12/2023	EMJ / RK
B	ISSUE FOR INTERCONNECTION	07/19/2023	EMJ / PAP
C	ISSUE FOR CIVIL REVIEW	08/01/2023	EMJ / RK
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E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ / PAP

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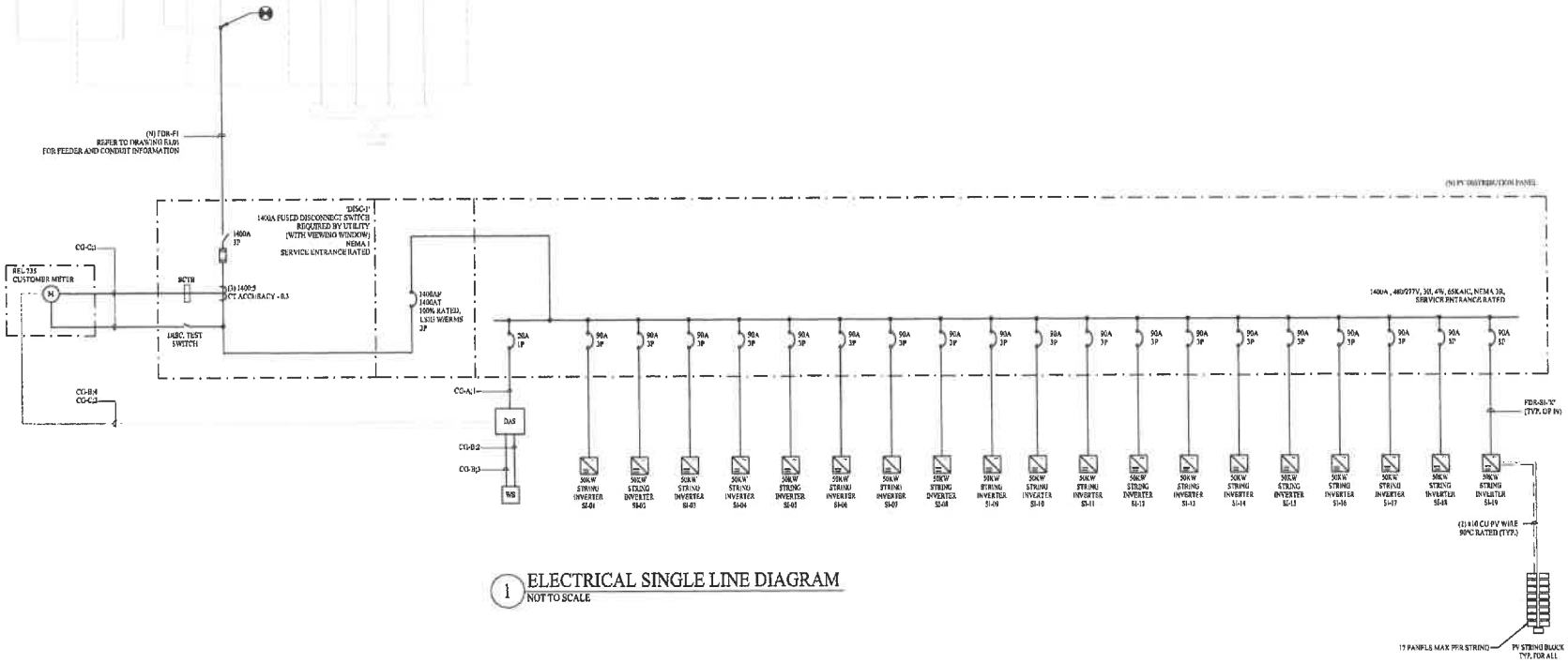
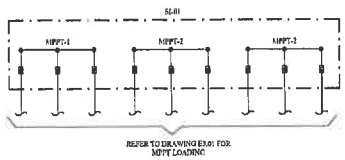
ELECTRICAL SCHEDULES

E3.01



1 ELECTRICAL SINGLE LINE DIAGRAM
NOT TO SCALE



NOTES:
1. ALL MODULES LOADED INTO AN MPPT MUST SHARE THE SAME TILTS, AZIMUTHS, AND STRING SIZES.

2 MPPT CONFIGURATIONS
NOT TO SCALE

INVERTER IEEE SETTINGS		
PROTECTION FUNCTION	PICK UP	MAXIMUM TIME (SEC) AT WHICH BEFORE CESSATION OF CURRENT TO THE SIMULATED UTILITY
27-2	≤ 0.45VNOM	0.16
27-1	0.45VNOM < V ≤ 0.70VNOM	10
59-1	1.1VNOM ≤ V < 1.20VNOM	2
59-2	≥ 1.20VNOM	0.16
81U-2	56.5Hz	0.16
81U-1	58.5Hz	300
81O-1	61.2Hz	0.16
81O-2	62.0Hz	300

* DER TO TRIP WITHIN 2 SECONDS WHEN GPS UTILITY SOURCE IS NOT PRESENT

3 INVERTER SETTINGS
NOT TO SCALE

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CI RENEWABLES

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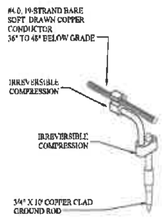
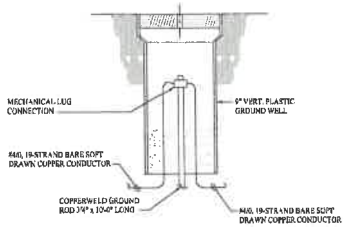
ELECTRICAL SINGLE LINE DIAGRAM

E4.01

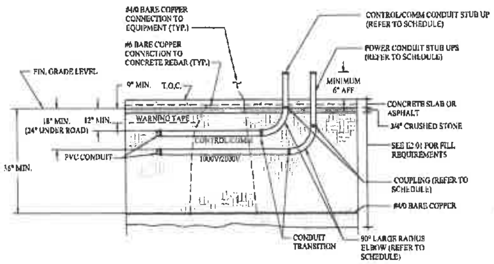
SCHEDULE OF CONDUIT STUB-UPS		
ITEM	STUB-UP IN ENCLOSURE	STUB-UP EXPOSED OPEN AREA
CONDUIT	PVC SCH. 40	PVC SCH. 80
LARGE RADIUS ELBOW	PVC SCH. 40	PVC SCH. 40



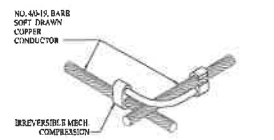
1 GROUND WIRE TO GROUND ROD CONNECTION
NOT TO SCALE



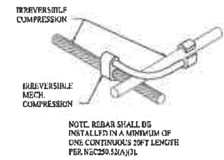
2 GROUND WELL TEST STATION DETAIL
NOT TO SCALE



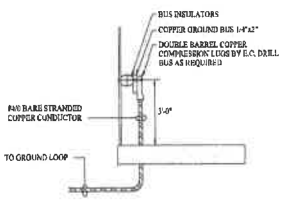
3 TYPICAL GROUND FILL AND CONDUIT STUB UP DETAIL (OUTDOORS)
NOT TO SCALE (FROST LINE: 36" BELOW FINISHED FLOOR AND LESS)



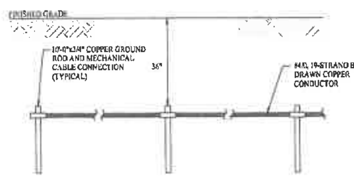
4 TYP. GROUND MECHANICAL CONNECTION DETAIL
NOT TO SCALE



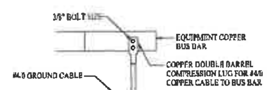
5 GROUND WIRE TO REBAR CONNECTION
NOT TO SCALE



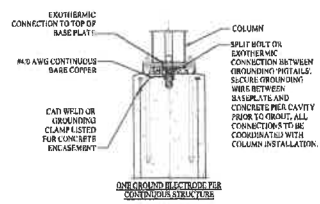
6 GROUND BUS CONNECTION DETAIL
NOT TO SCALE



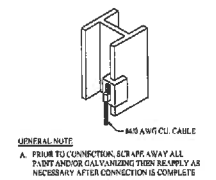
7 GROUND GRID CONNECTION DETAIL
NOT TO SCALE



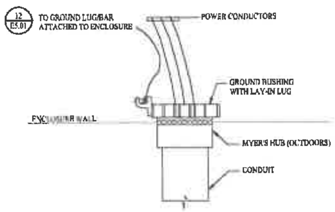
8 TYP. CABLE TO GROUND BUS DETAIL
NOT TO SCALE



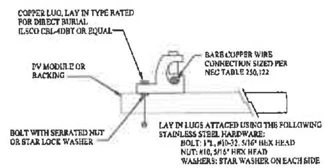
9 TYP. ARRAY COLUMN GROUNDING DETAIL
NOT TO SCALE



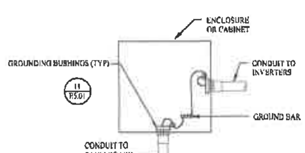
10 TYPICAL BONDING TO STEEL CONNECTION DETAIL
NOT TO SCALE



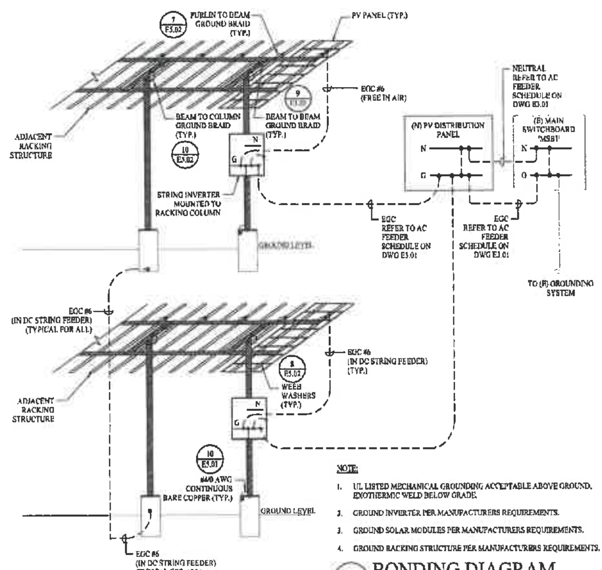
11 MYER'S HUB GROUNDING DETAIL
NOT TO SCALE



12 GROUND LUG DETAIL
NOT TO SCALE



13 PULL BOX / TROUGH GROUNDING DETAIL (METALLIC CONDUITS)
NOT TO SCALE



NOTE:
1. UL LISTED MECHANICAL GROUNDING ACCEPTABLE ABOVE GROUND, EXOTHERMIC WELD BELOW GRADE.
2. GROUND INVERTER PER MANUFACTURERS REQUIREMENTS.
3. GROUND SOLAR MODULES PER MANUFACTURERS REQUIREMENTS.
4. GROUND RACKING STRUCTURE PER MANUFACTURERS REQUIREMENTS.

14 BONDING DIAGRAM
SCALE: NOT TO SCALE

GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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CI RENEWABLES

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920 ELKRIDGE LANDING RD, LINTHICUM HEIGHTS, MD 21090

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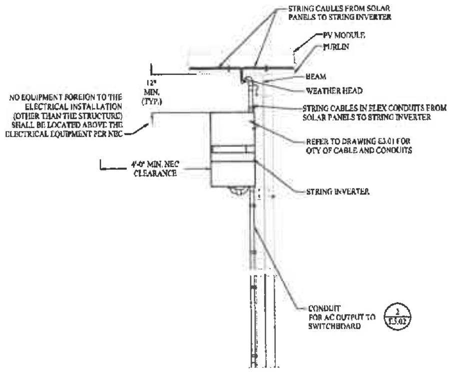
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

406-22 | AS NOTED

ELECTRICAL DETAILS - 1

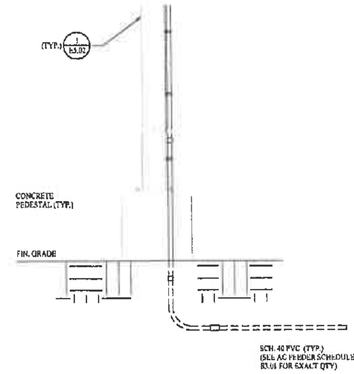
E5.01



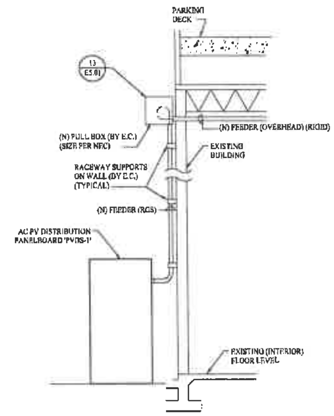
NOTES:

1. UNLESS OTHERWISE NOTED WIRE LOOM SHALL BE USED AT ANY POINT WHERE PV CONDUCTORS CROSS SHARP EDGES.
2. E.C. SHALL NEATLY TIE WRAP AND SECURE HOMERUNS FROM PANELS TO STRING INVERTER. CARE SHALL BE TAKEN TO PROTECT HOMERUNS FROM SHARP EDGES THAT COULD DAMAGE CONDUCTORS.
3. REFER TO RBI STRUCTURAL DRAWINGS FOR EXACT DETAILS AND ADDITIONAL STRUCTURAL INFORMATIONS.
4. IN-LINE FUSES SHALL NOT BE LOCATED ON THE DOWNWARD PORTION OF THE DRIP LEG.

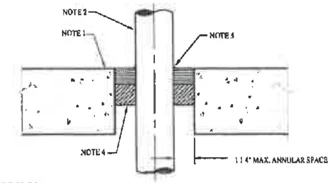
1 STRING INVERTER MOUNTING DETAILS
NOT TO SCALE



2 CONDUIT TRANSITION DETAIL
NOT TO SCALE



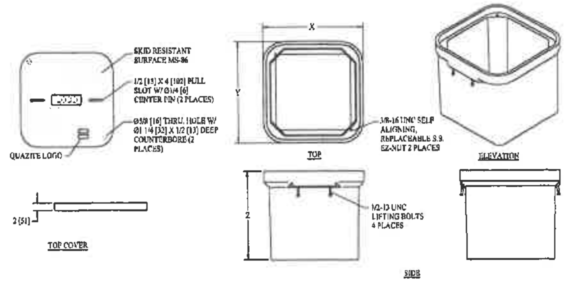
3 CONDUIT BLDG ENTRY DETAIL
NOT TO SCALE



NOTES:

1. FLOOR OR WALL ASSEMBLY: MINIMUM 3-1/4" THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE.
2. METALLIC PIPE: NOMINAL 4" DIAMETER (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE, RIGID STEEL CONDUIT OR STEEL EMT. MAXIMUM ONE STEEL PIPE, CONDUIT OR EMT PER OPENING, CENTERED IN OPENING. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MAXIMUM 3/4". PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.
3. PACKING MATERIAL: (OPTIONAL, NOT SHOWN) - LOOSE CERAMIC (ALUMINA SILICA) FIBER TIGHTLY-PACKED INTO ANNULAR SPACE BETWEEN THE PIPE OR CONDUIT AND THE SIDES OF THE THROUGH OPENING. WHEN USED IN FLOORS, A MINIMUM 1-1/2" THICKNESS OF FIBER IS REQUIRED WITH ITS TOP SURFACE RECESSED MINIMUM 1-1/2" BELOW TOP SURFACE OF FLOOR. WHEN USED IN WALLS, ENTIRE ANNULAR SPACE TO BE FILLED WITH TIGHTLY-PACKED FIBER EXCEPT FOR A MINIMUM 1/2" DEPTH AT EACH SURFACE OF THE WALL.
4. FILL, VOID OR CAVITY MATERIALS - PUTTY: PUTTY MATERIAL THAT IS KNEADED AND PACKED TIGHTLY INTO ANNULAR SPACE. IN FLOORS, A MINIMUM 1" THICKNESS OF FILL MATERIAL SHALL BE INSTALLED SUCH THAT ITS TOP SURFACE IS RECESSED 1" BELOW TOP SURFACE OF FLOOR. WHEN OPTIONAL PACKING MATERIAL (ITEM 3) IS USED IN FLOORS, A MINIMUM 1" THICKNESS OF FILL MATERIAL SHALL BE INSTALLED SUCH THAT ITS TOP SURFACE IS RECESSED 1/2" BELOW TOP SURFACE OF FLOORS. IN WALLS, A MINIMUM 1" THICKNESS OF FILL MATERIAL SHALL BE INSTALLED SUCH THAT ITS SURFACES ARE RECESSED MINIMUM 1" FROM BOTH SURFACES OF WALL. WHEN OPTIONAL PACKING MATERIAL IS USED IN WALLS, A MINIMUM 1/2" THICKNESS OF ILL MATERIAL IS REQUIRED ON EACH SIDE OF WALL WITH THE SURFACE OF THE FILL MATERIAL FLUSH WITH EACH SURFACE OF THE WALL.
5. FIRE BARRIER CAULK "3M" CP 25WB OR EQUIVALENT SHALL BE USED. THE FIRE RATING OF THE CAULK IS BASED ON THE WET INSTALLED DEPTH. PENETRATION FIRESTOP SHALL COMPLY WITH UL THROUGH-PENETRATION FIRESTOP SYSTEM NO. 319 PER ASTME E 814 (ANSI/UL 1479) FIRE TEST.

4 PENETRATION FIRE-STOP FOR METAL CONDUIT THROUGH CONCRETE WALL
SCALE: NOT TO SCALE



5 TYPICAL HANDHOLE DETAIL
NOT TO SCALE

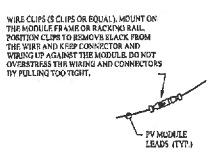
HAND HOLE SCHEDULE

HANDHOLE DESIGNATION TYPE	WIDTH (X)	LENGTH (Y)	DEPTH (Z)	DESCRIPTION	COVER ENGRAVING
A	36"	36"	18"-24"	PULL BOX FOR POWER OR COMMUNICATIONS	ELECTRIC OR COMMUNICATIONS
B	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	PULL BOX FOR 480V POWER OR COMMUNICATIONS	ELECTRIC OR COMMUNICATIONS
C	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	36"-48"	PULL BOX FOR 15KV POWER	ELECTRIC POWER

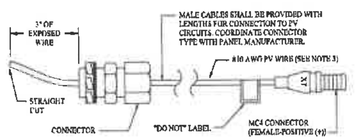
NOTES:

1. ALL HANDHOLES SHALL BE INSTALLED AT DEPTH TO SIT FLUSH WITH FINAL GRADE. DEPTH TO VARY BETWEEN 18"-24" AS REQUIRED. MINIMUM SIZE HANDHOLES ARE SHOWN, PROVIDE LARGER BOXES AS REQUIRED.
2. ALL HANDHOLES SHALL BE UL LISTED AND BE SUITABLE FOR TIER 15 LOADING. FOR AREAS OF DELIBERATE HEAVY VEHICLE TRAFFIC, HANDHOLES SHALL BE SUITABLE FOR H-20 LOADING.
3. ALL HANDHOLES SHALL BE EQUAL TO QUAZITE SERIES PG OR APPROVED EQUAL.
4. ALL HANDHOLES SHALL BE GASKETED, PRECAST CONCRETE OR POLYMER COMPOSITE SPLICE BOXES SUITABLE FOR POWER AND CONTROL WIRING. PROVIDE ALL HANDHOLES WITH BASES AND STAINLESS STEEL HEX BOLTS.

6 HANDHOLE SCHEDULE
NOT TO SCALE



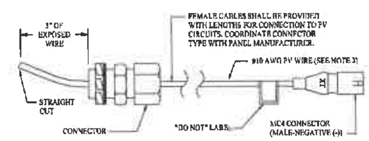
7 TYPICAL PV WIRING CLIP
NOT TO SCALE



NOTES:

1. DETAIL IS SHOWN FOR REFERENCE ONLY. INTERCONNECT WIRING SHALL BE PRE-MADE, FURNISHED, AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
2. FOR TROUBLE SHOOTING AND IDENTIFICATION PURPOSES IN EACH INVERTER LABEL EACH CONDUCTOR AS FOLLOWS: "INVERTER NUMBER #" & "STRING NUMBER". LABELS SHALL BE FUNGUS INERT, CABLE WRAP TYPE, GENERATED WITH PORTABLE LABEL MAKER.
3. CONDUCTORS SHALL BE PV COPPER CONDUCTORS, XLPE INSULATION, 2000V - 90° C RATED, AND SUNLIGHT RESISTANT.

8 INTERCONNECT WIRING TYPICAL MALE CABLE ASSEMBLY
NOT TO SCALE



NOTES:

1. DETAIL IS SHOWN FOR REFERENCE ONLY. INTERCONNECT WIRING SHALL BE PRE-MADE, FURNISHED, AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
2. FOR TROUBLE SHOOTING AND IDENTIFICATION PURPOSES IN EACH COMBINER AND JUNCTION BOXES, LABEL EACH CONDUCTOR AS FOLLOWS: "COMBINER BOX #" & "CIRCUIT NUMBER". LABELS SHALL BE FUNGUS INERT, CABLE WRAP TYPE, GENERATED WITH PORTABLE LABEL MAKER.
3. CONDUCTORS SHALL BE PV COPPER CONDUCTORS, XLPE INSULATION, 2000V - 90° C RATED, AND SUNLIGHT RESISTANT.

9 INTERCONNECT WIRING TYPICAL FEMALE CABLE ASSEMBLY
NOT TO SCALE

GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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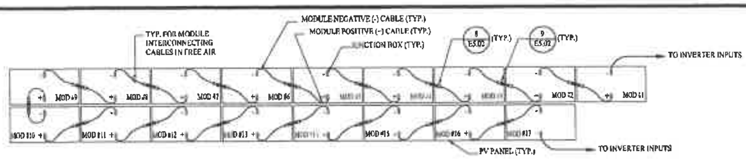
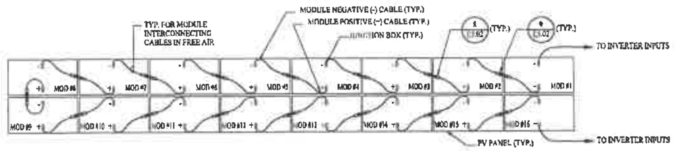
ELECTRICAL DETAILS - 2

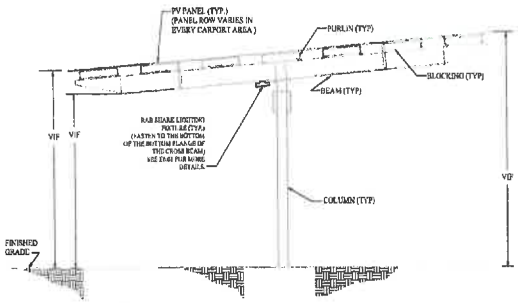
E5.02



1 TYPICAL STRING WIRING (17 MODULES)
NOT TO SCALE

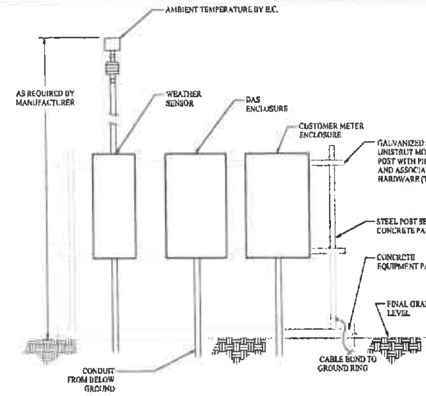


1 TYPICAL STRING WIRING (17 MODULES)
NOT TO SCALE



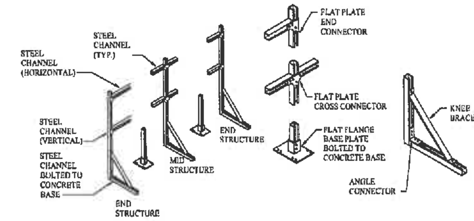
NOTE:
1. REFER TO STRUCTURAL DRAWINGS FOR STRUCTURAL MEMBERS, DIMENSIONS, HEIGHT AND ADDITIONAL PV ARRAY AND LIGHTING FIXTURE MOUNTING INFORMATIONS.
2. LIGHTING FIXTURES WILL BE POWERED USING EXISTING SOURCE CIRCUITS.

4 LIGHTING FIXTURE MOUNTING DETAILS (FOR REFERENCE ONLY)
NOT TO SCALE

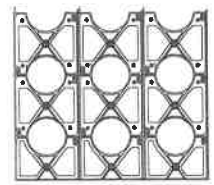


NOTE:
COORDINATE ALL WEATHER INSTRUMENTS INSTALLATION DETAILS (HEIGHT, LOCATION, ORIENTATION) PRIOR TO INSTALLATION.

2 AUXILIARY EQUIPMENT DETAIL
NOT TO SCALE



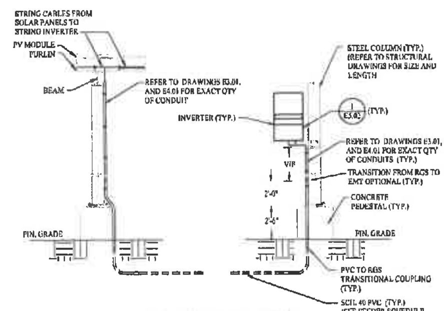
3 TYP. MISC. PANEL STEEL SUPPORTS
NOT TO SCALE



PVC SPACER NOTES:

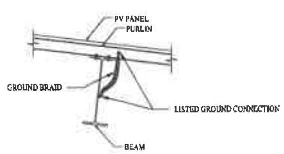
1. PROVIDE PVC SPACERS IN CONFIGURATIONS AS REQUIRED BY CONDUIT RUNS. PROVIDE MINIMUM 3" BASE ON BOTTOM SPACER. PROVIDE MINIMUM 3" BETWEEN CONDUITS.
2. CONDUIT SPACERS SHALL BE INSTALLED EVERY 7'-0" OR PER MANUFACTURER'S RECOMMENDATIONS.
3. PROVIDE PVC SPACERS BY CARLON PRODUCTS "HI-IMPACT SPACERS" OR APPROVED EQUAL "WUNPEECE SPACERS" BY UNDERGROUND DEVICES.
4. SPACER DETAIL IS SHOWN FOR REFERENCE ONLY. DIMENSIONS SHOWN DO NOT INDICATE SPACER REQUIREMENTS. COORDINATE SPACERS ACTUAL DIMENSION WITH MANUFACTURER.

5 PVC SPACER U/G DETAIL
NOT TO SCALE

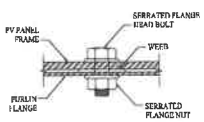


NOTE: DO NOT MOUNT CONDUIT ON SIDE OF FOUNDATION FACING PARKING.

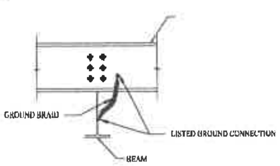
6 TYP. UNDERGROUND JUMPER DETAIL
NOT TO SCALE



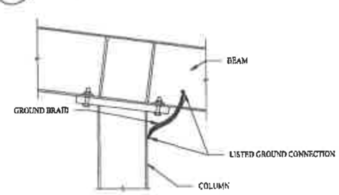
7 PURLIN TO BEAM BONDING DETAIL
NOT TO SCALE



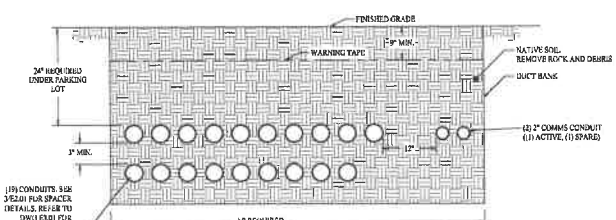
8 PV PANEL TO PURLIN BONDING DETAIL
NOT TO SCALE



9 BEAM TO BEAM BONDING DETAIL
NOT TO SCALE



10 BEAM TO COLUMN BONDING DETAIL
NOT TO SCALE



11 DUCT BANK DETAIL
NOT TO SCALE

GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

AMBLER YARDS
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CI RENEWABLES

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920 ELKRIDGE LANDING RD, LINTHICUM HEIGHTS, MD 21090

A	ISSUE FOR INTERCONNECTION	07/12/2023	EMJ	RK
B	ISSUE FOR INTERCONNECTION	07/19/2023	EMJ	PAP
C	ISSUE FOR CIVIL REVIEW	08/01/2023	EMJ	RK
D	ISSUE FOR 30% REVIEW	09/08/2023	EMJ	RK
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

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ELECTRICAL DETAILS - 3

DRAWING
E5.03

RECOMBINER

RECOMBINER RCB-#-#	
RATED MAXIMUM POWER-POINT CURRENT Imp	(REFER TO DWG E3.01) A
RATED MAXIMUM POWER-POINT VOLTAGE Vmp	(REFER TO DWG E3.01) V
MAXIMUM PV VOLTAGE	(REFER TO DWG E3.01) V
MAXIMUM PV CURRENT	(REFER TO DWG E3.01) A

WHITE LETTERING ON RED BACKGROUND

NOTES:
1. PROVIDE AND INSTALL WARNING LABELS ON ALL RECOMBINERS PER NEC 690.53 REQUIREMENTS.

INVERTER DC SECTION

INVERTER INV-#-##	
RATED MAXIMUM POWER-POINT CURRENT Imp	(REFER TO DWG E3.01) A
RATED MAXIMUM POWER-POINT VOLTAGE Vmp	(REFER TO DWG E3.01) V
MAXIMUM PV VOLTAGE	(REFER TO DWG E3.01) V
MAXIMUM PV CURRENT	(REFER TO DWG E3.01) A

WHITE LETTERING ON RED BACKGROUND

NOTES:
1. PROVIDE AND INSTALL WARNING LABELS ON ALL INVERTERS PER NEC 690.53 REQUIREMENTS.

PV POWER SOURCE

NOTES:
1. DIRECT CURRENT (DC) CIRCUITS. ALL INTERIOR AND EXTERIOR DC CONDUITS, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, AND JUNCTION BOXES ASSOCIATED WITH THE PV SYSTEM SHALL BE MARKED TO ALERT INDIVIDUALS THAT DC POWER IS PRESENT. THE MARKING SHALL BE PLACED EVERY TEN (10) FEET OR FRACTION THEREOF, AT TURNS AND ABOVE AND BELOW PENETRATIONS, AND JUNCTION BOXES. THE MARKING SHALL CONTAIN THE TEXT "PV POWER SOURCE" IN CAPITAL LETTERS A MINIMUM OF 3/8 INCHES IN HEIGHT WITH WHITE LETTERS ON A RED BACKGROUND. THE MATERIALS USED FOR MARKING SHALL BE REFLECTIVE AND WEATHER RESISTANT IN ACCORDANCE WITH UL 969 THAT IS SUITABLE FOR THE ENVIRONMENT.

1000 VOLTS DC

NOTES:
1. PROVIDE AND INSTALL LABELS AT ALL CONDUIT RUNS FROM STRINGS TO INVERTER PER NEC REQUIREMENTS.

480/277 VOLTS AC

NOTES:
1. PROVIDE AND INSTALL LABELS AT ALL 480/277VAC BUSWAYS PER NEC REQUIREMENTS.

SIGNAGE NOTES:

1. SIGNAGE SHALL BE WEATHER RESISTANT. UL 696 SHALL BE USED AS A STANDARD FOR WEATHER RATINGS.
2. PROVIDE PERMANENT PLACARDS AS REQUIRED BY NEC ARTICLE 690 VI MARKING.
3. PROVIDE PLACARDS ON INVERTERS PERTAINING TO GROUND FAULTS PER NEC ARTICLE 690.5 (C).
4. PROVIDE PERMANENT PLACARDS FOR DISCONNECTS AS REQUIRED BY NEC 690.14 (C) (2).
5. PROVIDE PLACARDS ON ALL INVERTERS PER NEC ARTICLE 690.17.

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

NOTES:
1. PROVIDE AND INSTALL WARNING LABELS ON ALL INVERTERS PER NEC 690.5(C) REQUIREMENTS.

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

NOTES:
1. PROVIDE AND INSTALL WARNING LABELS ON ALL DISCONNECTING MEANS PER NEC 690.17 REQUIREMENTS.

DANGER
HIGH VOLTAGE
KEEP OUT

NOTES:
1. PROVIDE AND INSTALL WARNING LABELS ON ALL ENCLOSURES CONTAINING EXPOSED LIVE PARTS OR EXPOSED CONDUCTORS OPERATING AT OVER 600 VOLTS NEC 110.34(C).

SERVICE DISCONNECT

NOTES:
1. PROVIDE AND INSTALL LABELS ON ALL SERVICE DISCONNECTS PER REQUIREMENTS OF NEC230.70(B).

DAS

DATA ACQUISITION SYSTEM FOR SOLAR PHOTOVOLTAIC SYSTEM

NOTES:
1. PROVIDE AND INSTALL LABELS ON ALL WEATHER STATIONS AND MONITORING ENCLOSURES.

PHOTOVOLTAIC GENERATION METER

NOTES:
1. PHOTOVOLTAIC GENERATION METER GENERIC LABEL 1 PER METER

1 EQUIPMENT SIGNAGE DETAILS
NOT TO SCALE

WARNING

Arc Flash and Shock Risk
Appropriate PPE Required

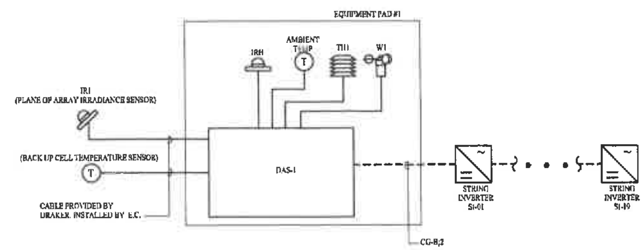
FLASH PROTECTION | SHOCK PROTECTION

BUS: XFMR BUS T1

3 GENERAL ARC FLASH LABEL
NOT TO SCALE

SHEET NOTES:

1. SIGNAGE SHALL BE WEATHER RESISTANT. UL 696 SHALL BE USED AS A STANDARD FOR WEATHER RATINGS.
2. PROVIDE PERMANENT PLACARDS AS REQUIRED BY NEC ARTICLE 690 VI MARKING.
3. PROVIDE PLACARDS ON INVERTERS PERTAINING TO GROUND FAULTS PER NEC ARTICLE 690.5 (C).
2. PROVIDE PERMANENT PLACARDS FOR DISCONNECTS AS REQUIRED BY NEC 690.14 (C) (2).
3. PROVIDE PLACARDS ON ALL INVERTERS AND COMBINER BOXES PER NEC ARTICLE 690.17.
4. DIRECT CURRENT (DC) CIRCUITS. ALL INTERIOR AND EXTERIOR DC CONDUITS, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, AND JUNCTION BOXES ASSOCIATED WITH THE PV SYSTEM SHALL BE MARKED TO ALERT INDIVIDUALS THAT DC POWER IS PRESENT. THE MARKING SHALL BE PLACED EVERY TEN (10) FEET OR FRACTION THEREOF, AT TURNS AND ABOVE AND BELOW PENETRATIONS, AND ON ALL DC COMBINER AND JUNCTION BOXES. THE MARKING SHALL CONTAIN THE TEXT "CAUTION: PV CIRCUIT ENERGIZED" IN CAPITAL LETTERS A MINIMUM OF 3/8 INCHES IN HEIGHT WITH WHITE LETTERS ON A RED BACKGROUND. THE MATERIALS USED FOR MARKING SHALL BE REFLECTIVE AND WEATHER RESISTANT IN ACCORDANCE WITH UL 969 THAT IS SUITABLE FOR THE ENVIRONMENT.



NOTES:

1. REFER TO EQUIPMENT MANUFACTURER INSTALLATION MANUALS FOR INSTALLATION AND WIRING REQUIREMENTS.
2. REFER TO WEATHER STATION INSTALLATION MANUAL FOR INSTALLATION, WIRING AND MOUNTING OF SENSORS.
3. INSTRUMENTS SHALL BE LOCATED AT CENTER OF ARRAY.

0 1"
GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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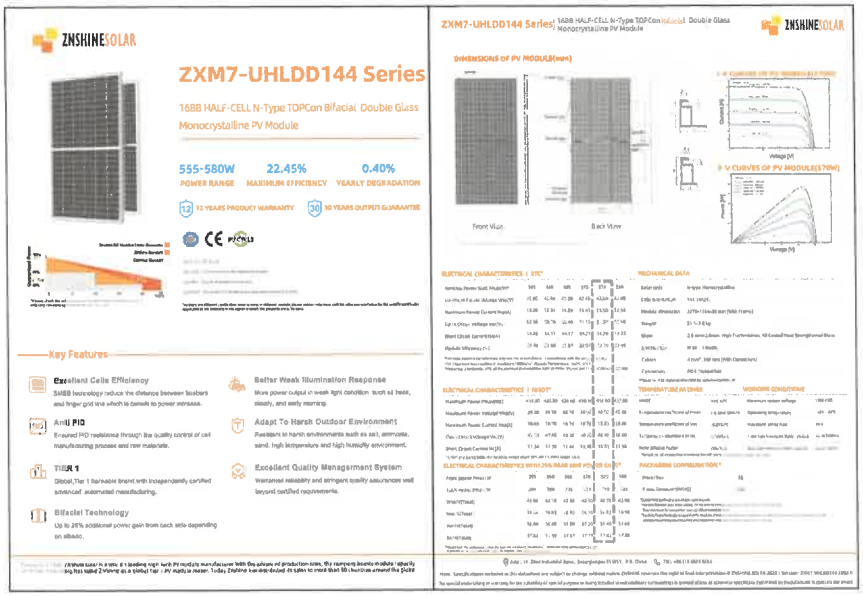
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

406-22 | AS NOTED

ELECTRICAL DETAILS - 4

E5.04



1 MODULE CUTSHEET
NOT TO SCALE

2 INVERTER CUTSHEET
NOT TO SCALE

GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ / PAP

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ELECTRICAL DETAILS - 5

E5.05