

IN RE:	*	BEFORE THE
UNIVERSITY OF MARYLAND MEDICAL SYSTEM CORP.	*	ANNE ARUNDEL COUNTY
	*	OFFICE OF ADMINISTRATIVE
	*	HEARINGS
	*	Case No: 2024-0044-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.

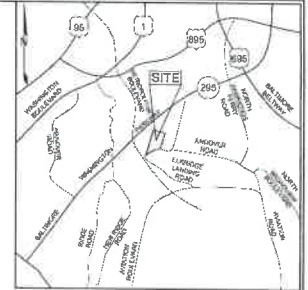
Quite to the contrary, as stated above this variance will substantially contribute to the public welfare by providing clean energy to the property owner and diminish the harmful impacts of over-heated asphalt parking.

Site Exhibit UMMS 900

This area has an existing ingress/egress drive easement, which complicates the allowance of canopies based on elevations.

LEGEND

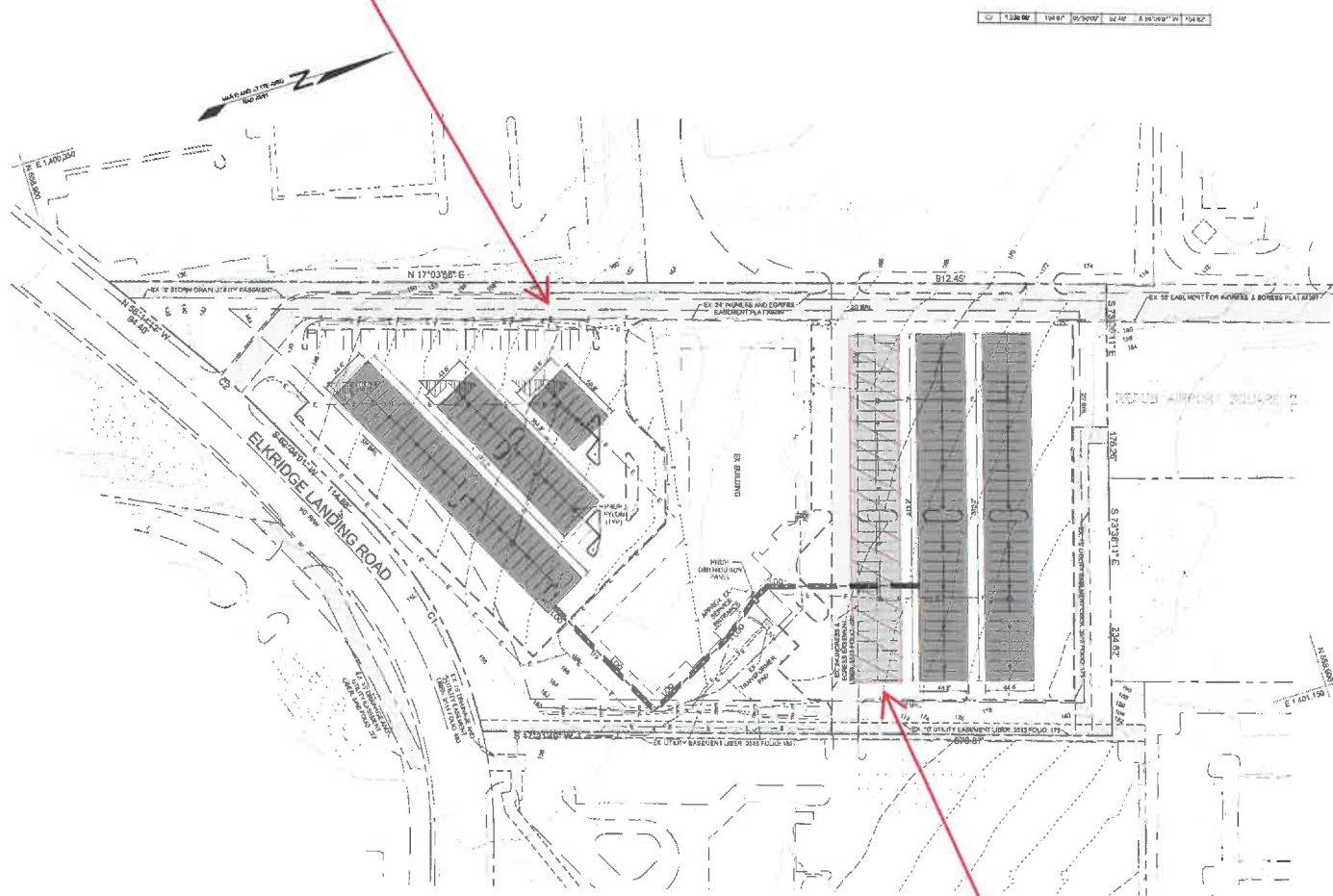
- EXISTING HOVOR (15.0' DIA.)
- AREA
- EXISTING WALL
- EXISTING FLOORING
- EXISTING COMMUNICATIONS
- EXISTING GFI POLE (SEE SCHEDULE)
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE



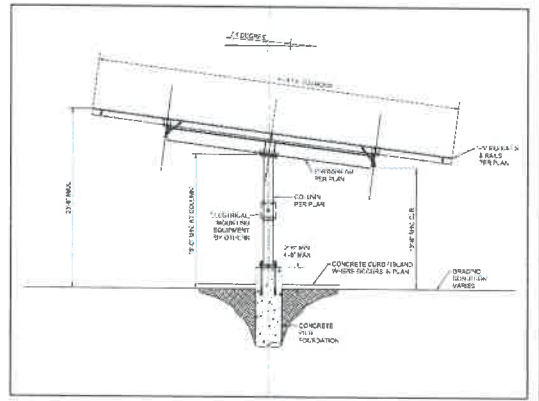
VICINITY MAP
SCALE: 1"=200'

GENERAL NOTES

1. SUBJECT PROPERTY ZONED AS R-1
2. EXISTING AREA OF IMPROVEMENTS - 4.86 ACRES
3. PROPERTY ADDRESS SEE ELKRIDGE LANDING ROAD, LINTHICUM MARYLAND 21086
4. OWNER REFERENCE - 2008 BAYVIEW ROAD
5. PROJECTOR ANNE ARUNDEL COUNTY FILE NUMBER: JAL-2008-PLA-0047
6. THE SECONDARY SHOWING IS BASED ON A TOPOGRAPHY SURVEY PERFORMED BY ECG LAND SURVEYING IN JUNE OF 2003
7. THIS EASEMENT IS BASED WITHIN THE DEVELOPMENT AREA IS BASED ON A TOPOGRAPHY SURVEY PERFORMED BY ECG LAND SURVEYING IN JUNE OF 2003
8. THE LOT'S SHOWN HEREON CORRELATE WITH THE ORIGINAL 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 FOOTPRINTS SHALL BE AS SHOWN
11. SOLAR CARPORT TOTAL FOOTPRINT: 80,000 SF
12. SEE LITERATURE FOR USE
13. ELECTRICAL DESIGN BY: PARASOL PROJECTS



PLAN VIEW
SCALE: 1"=40'



SOLAR CARPORT DETAIL
NOT TO SCALE

*NOTE: NOTHING TO BE PROVIDED UNDER PANELS

This area does not work because the building creates shade. There are also underground utilities that could be problematic.

SITE PLAN	
UMMS SOLAR 1	
900 ELKRIDGE LANDING ROAD	
TAX MAP 63 GRID 12	PARCEL 31, LOT 1
18TH ELECTION DISTRICT	ANNE ARUNDEL COUNTY, MARYLAND
	DRAWN BY: ES CHECKED BY: JS DATE: MARCH 3, 2023 PROJECT # 23-027 SHEET # 1
DEVELOPER GREENABLES 140 BEECHMOUNT BLVD SUITE 208 ANNAPOLIS, MARYLAND 21403 (410) 261-7070 WWW.GREENABLESMD.COM	OWNER UNIVERSITY OF MARYLAND MEDICAL SYSTEM CORPORATION 200 PEARL STREET, SUITE 1000 ANNAPOLIS, MARYLAND 21403



GRAPHIC SCALE
1"=20'
(IN FEET)
1"=40'
(IN FEET)

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Satellite View Exhibit UMMS 900



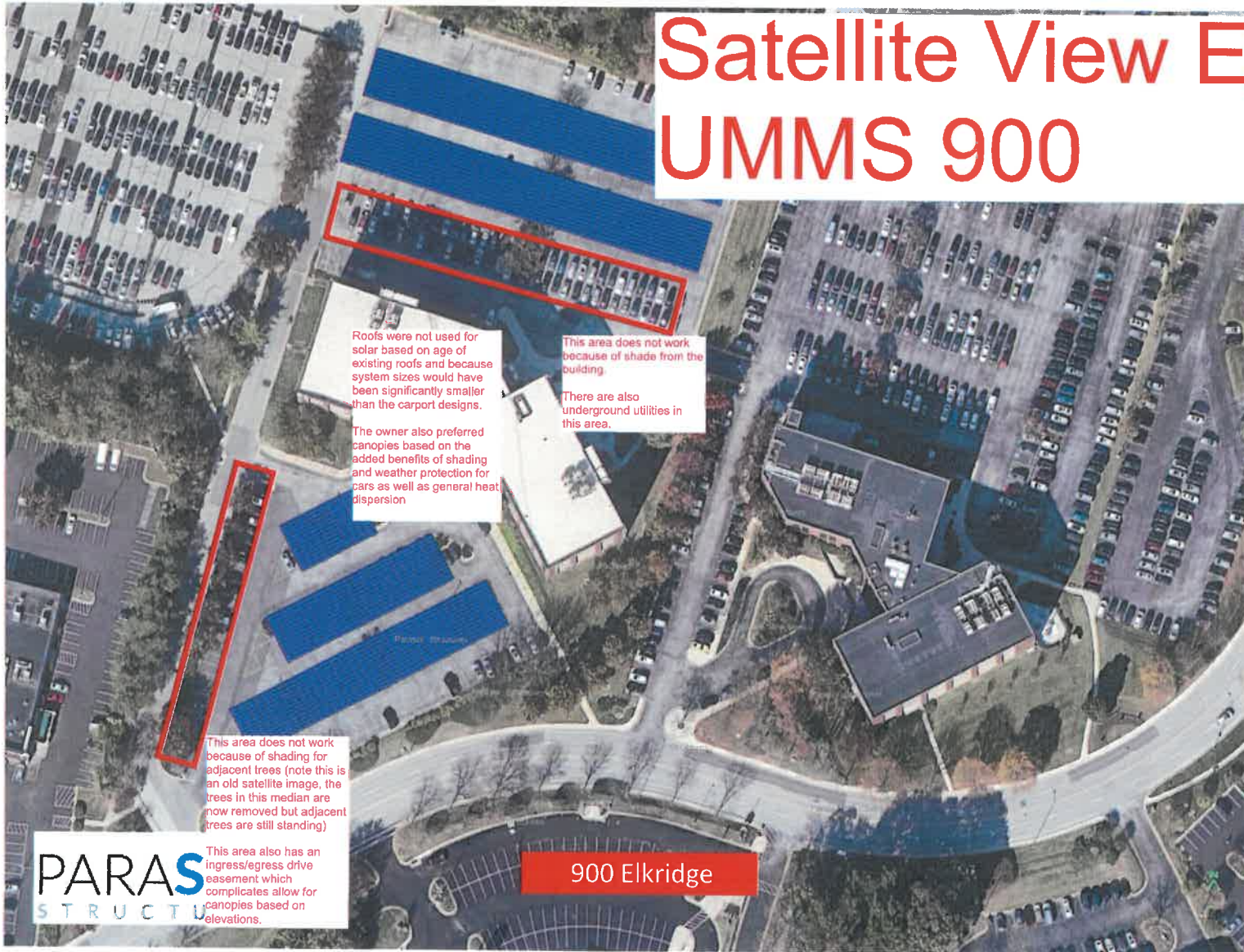
CLIENT: CI RENEWABLES
CARPORT: PARASOL CARPORT ST
LOCATION: UNIVERSITY OF MARYLAND MEDICAL CENTER
900 ELKRIDGE LANDING RD
LINTHICUM HEIGHTS, MD 21090



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

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Roofs were not used for solar based on age of existing roofs and because system sizes would have been significantly smaller than the carport designs.

The owner also preferred the canopies based on the added benefits of shading and weather protection for cars as well as general heat dispersion

This area does not work because of shade from the building.

There are also underground utilities in this area.

This area does not work because of shading for adjacent trees (note this is an old satellite image, the trees in this median are now removed but adjacent trees are still standing)

This area also has an ingress/egress drive easement which complicates allow for canopies based on elevations.

900 Elkrige

PARASOL
STRUCTURES

Additional Views UMMS 900 and 920





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

SHEET NOTES:

1. REFER TO E0.1 FOR ADDITIONAL POWER AND LEAD FOR CONTROL CONDUIT ROUTING AND WIRING REQUIREMENTS.
2. REFER TO E0.1 AND E0.1A FOR ADDITIONAL CONDUIT AND WIRING REQUIREMENTS.
3. E.C. SHALL PROVIDE ADDITIONAL HANDHOLES WHEN 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. STABE CONDUIT SHALL STUR UP OVER SECTION OF EQUIPMENT AND CAPPED. PROVIDE TIE STRONG PANELED AND TIED AT BOTH ENDS.
8. COORDINATE WITH EXISTING UNDERGROUND PIPING AND ELECTRICAL CONDUITS. E.C. SHALL HAVE A SITE UTILITY LOCATOR TO IDENTIFY ALL UNDERGROUND INTERFERENCES. MARK EXD IN AREAS WITH EXISTING UTILITIES.
9. E.C. SHALL COORDINATE EXACT LOCATION OF OVERHEAD CONDUIT ROUTING IN FIELD. PROVIDE FUNCTIONS BOXES AS REQUIRED. SIZE PER NEC.

KEY NOTES:

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

SYSTEM SPECS	
DC SYSTEM SIZE	1041.60KW
AC SYSTEM SIZE	850.00KW
MODULE MODEL	250WING-200M-1U1L1D1144
MODULE RATING	575W
MODULE QUANTITY	1812
INVERTER MODEL	SCA-CENTRAL-PV1-50T-L460
STRING SIZE	16017
INVERTER QUANTITY	17
TOTAL # OF STRINGS	113
AZIMUTH	187°15.9"
TILT - BACKING	7.4° - CARPORT



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**UMMS PARASOL -
900 ELKCRIDGE**

900 ELKCRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

DATE	BY	REVISION
07/12/2023	EM	ISSUE FOR INFORMATION
07/12/2023	EM	ISSUE FOR PERMIT
08/07/2023	EM	ISSUE FOR CIVIL REVIEW
08/22/2023	EM	ISSUE FOR SMC REVIEW
11/15/2023	EM	ISSUE FOR SMC PROGRESS

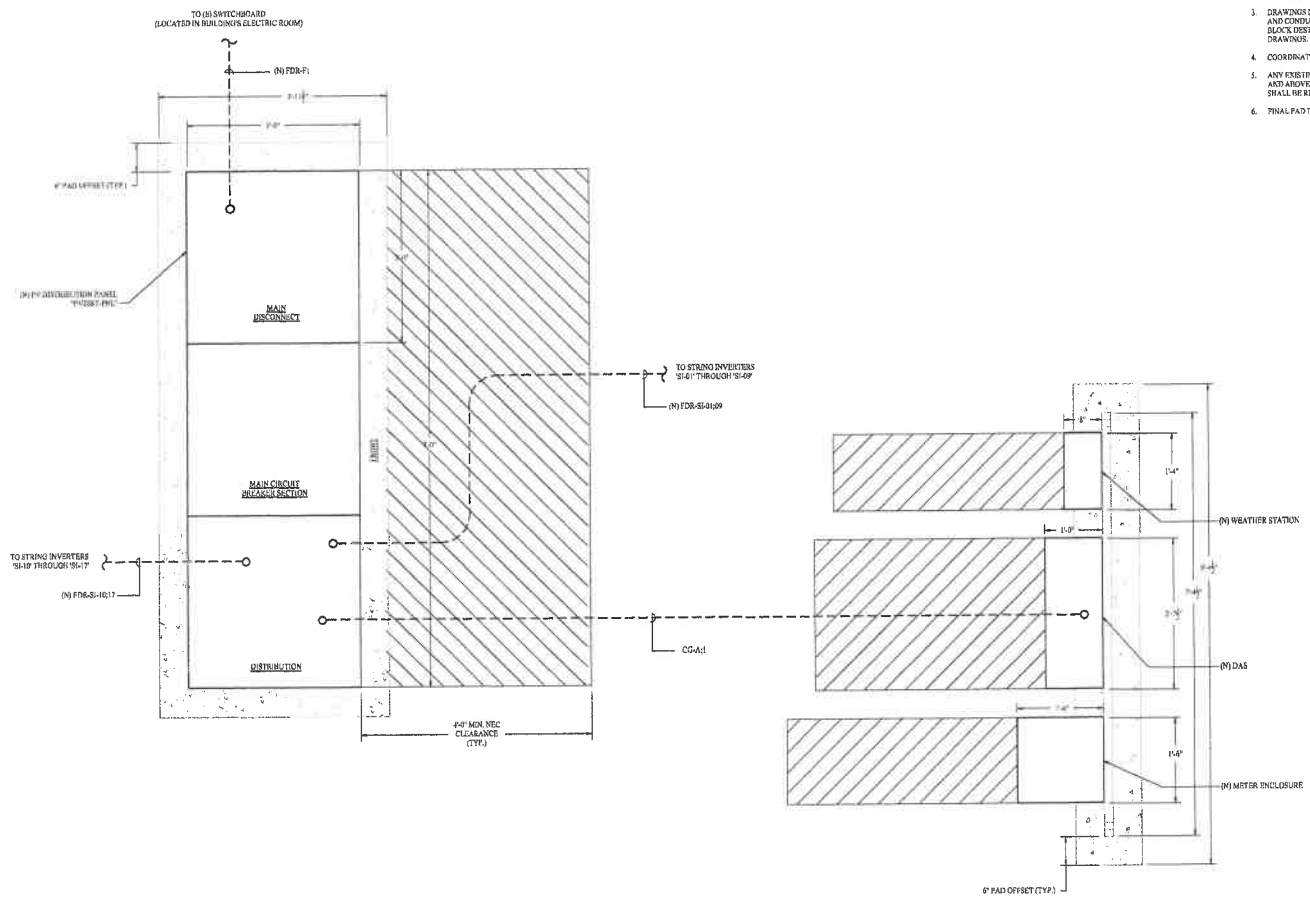
405-22 AS NOTED

**ELECTRICAL
SITE PLAN**

E0.50

**PRELIMINARY
NOT FOR CONSTRUCTION**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AUTHORITIES.



SHEET NOTES:

- REFER TO DRAWING B441 FOR SINGLE LINE DIAGRAM.
- CONDUIT ROUTING LAYOUTS ARE GENERAL AND DO NOT REPRESENT ALL CONDUITS REQUIRED IN RESPECT OF WIRING. 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 SEPARATING OF CONDUITS FROM PAD SETTLEMENTS.
- DRAWINGS DO NOT REPRESENT EXACT END LOCATION OF WIRING AND CONDUIT. WIRING AND CONDUIT SHALL BE PROVIDED AS REQUIRED TO AXONS TO THE FINAL TERMINAL BLOCK DESTINATION, E.C. SHALL COORDINATE WITH EACH MANUFACTURER'S SHOP DRAWINGS.
- COORDINATE CONDUIT ENTRY LOCATION WITH EQUIPMENT MANUFACTURERS.
- ANY EXISTING CURB, MALCADAM, EXISTING STORM SEWER, VEGETATION OR UNDERGROUND AND ABOVE GROUND STRUCTURE DAMAGED DURING THE COURSE OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSES.
- FINAL PAD DESIGN BY STRUCTURAL ENGINEER.

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



PRELIMINARY
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Design & Plan Fee



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UMMS PARASOL -
900 ELK RIDGE

900 ELK RIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

NO.	DATE	BY	CHK	DESCRIPTION
1	08/14/2023	EMT	RLK	ISSUE FOR INTERCONNECTION
2	08/14/2023	EMT	RLK	ISSUE FOR CONSTRUCTION
3	08/14/2023	EMT	RLK	ISSUE FOR CIVIL REVIEW
4	08/14/2023	EMT	RLK	ISSUE FOR 50% PROGRESS
5	11/15/2023	EMT	RLK	ISSUE FOR 90% PROGRESS

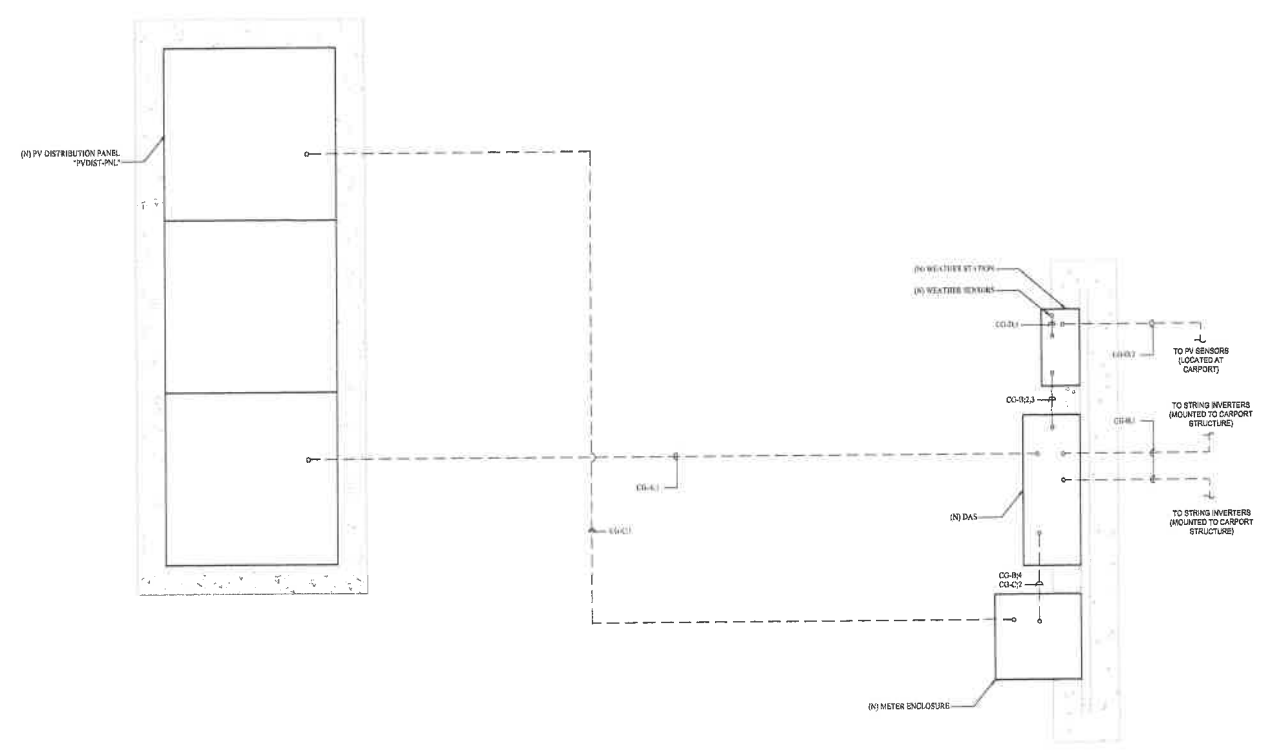
405-22 AS NOTED

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"



CONDUIT GROUP NO.	FROM	TO	CONDUIT #	CONDUIT	DESCRIPTION	RELATIVE COORDINATES (X-Y-HEAD-4-5)	VOLTAGE	WIRING	NOTES
CG-1	PV-DIST-PANEL	DAS	1	1"	POWER	BG-08	120VAC	(2) #12 AWG CU + (1) #12 AWG CU GND	120VAC POWER
CG-2	DAS	STRING INVERTERS	1	2"	MONITORING	BG	LV	RS-485	DATA EXCHANGE INVERTERS
		WEATHER STATION	2	3/4"	POWER	BG	LV	(2) #12 AWG CU	WEATHER STATION POWER
		WEATHER STATION	3	3/4"	COMMUNICATIONS	BG	LV	RS-485	WEATHER STATION COMMUNICATIONS
		METER ENCLOSURE	4	1"	POWER	BG-08	120VAC	(2) #12 AWG CU + (1) #12 AWG CU GND	120VAC POWER
CG-3	METER ENCLOSURE	PV-DIST-PANEL	1	1-1/4"	MONITORING	BG-08	LV	(1) #12 AWG CU	DATA EXCHANGE INVERTERS
		DAS	2	2"	MONITORING	BG	LV	CATS	METER DATA
CG-4	WEATHER STATION	AMBIENT TEMPERATURE SENSOR	1	1"	COMMUNICATIONS	OH	LV	INCLUDED WITH SENSOR	AMBIENT TEMPERATURE SENSOR
		POWERSUPPLY-BUS-SENSORS	2	1"	COMMUNICATIONS	PO	LV	INCLUDED WITH SENSOR	POWERSUPPLY-BUS-SENSORS WITHIN 150 FEET

2 ELECTRICAL CONTROLS SCHEDULE
SCALE: NTS

0' 1" 2" 3" 4" 5" 6" 7" 8" 9" 10"
GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

Designs & Planning

KUDDER
ENGINEERS & ARCHITECTS
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TELEPHONE 215-684-6970

CI
RENEWABLES

**UMMS PARASOL -
900 ELKRIDGE**

900 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

DATE	BY	CHK	APP	DESCRIPTION
07/20/2023	J. PARASOL	J. PARASOL	J. PARASOL	ISSUE FOR CONSTRUCTION
07/20/2023	J. PARASOL	J. PARASOL	J. PARASOL	ISSUE FOR CONSTRUCTION
07/20/2023	J. PARASOL	J. PARASOL	J. PARASOL	ISSUE FOR CONSTRUCTION
07/20/2023	J. PARASOL	J. PARASOL	J. PARASOL	ISSUE FOR CONSTRUCTION

405-22 AS NOTED

**ELECTRICAL
CONDUIT ROUTING
PLAN - CONTROLS**

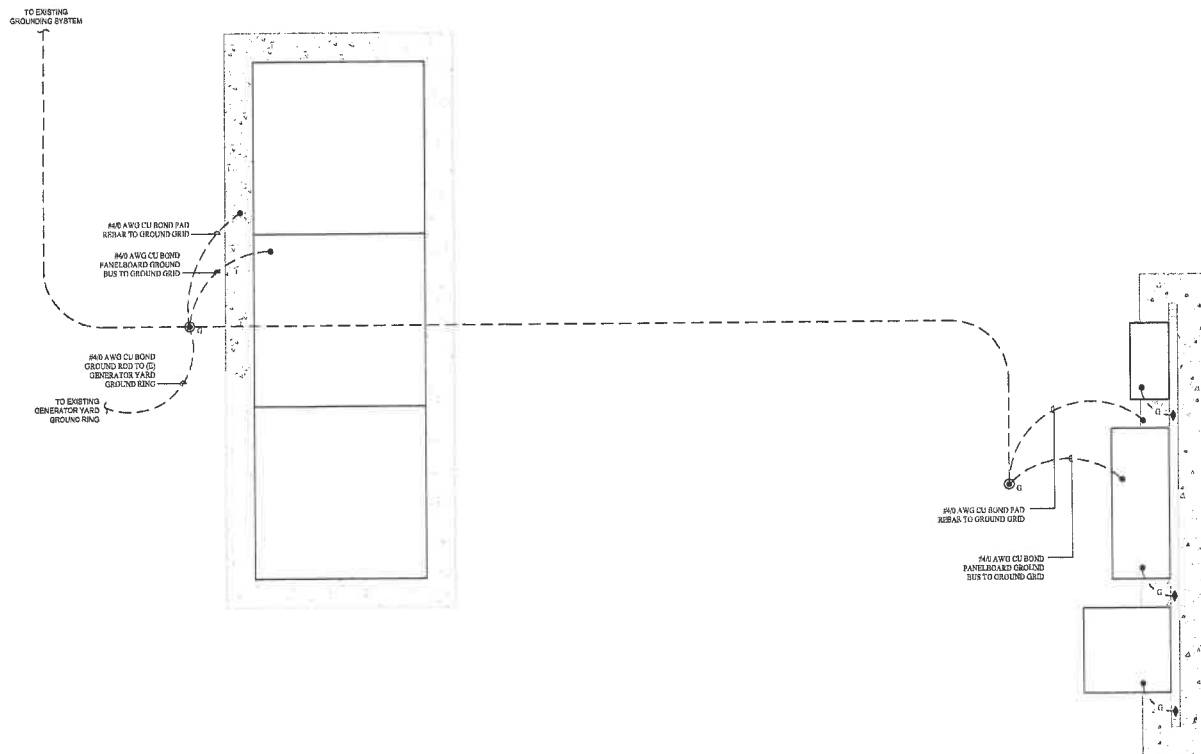
E2.02

GROUNDING LEGEND

- 1/2" 19-STRAND BARE SOFT DRAWN COPPER CONDUCTOR.
- ⊙ 3/4" x 19 COPPER CLAD GROUND ROD WITH MECHANICAL CONNECTIONS.
- ⊙ 3/4" x 19 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.G. SHALL BOND ALL EQUIPMENT FOR SAFE TOUCH POTENTIALS AND SHUNT ACCORDING TO NTC.
2. ALL ENCLOSURES SHALL BE BONDED.
3. ALL CONCRETE EQUIPMENT PITS SHALL BE BONDED PER DETAIL T-25.
4. GROUND RESISTANCE AT EQUIPMENT PITS 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 SOK 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 SOK 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"



0 1 2 3 4 5 6 7 8 9 10
GRAPHIC SCALE

PRELIMINARY
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UMMS PARASOL -
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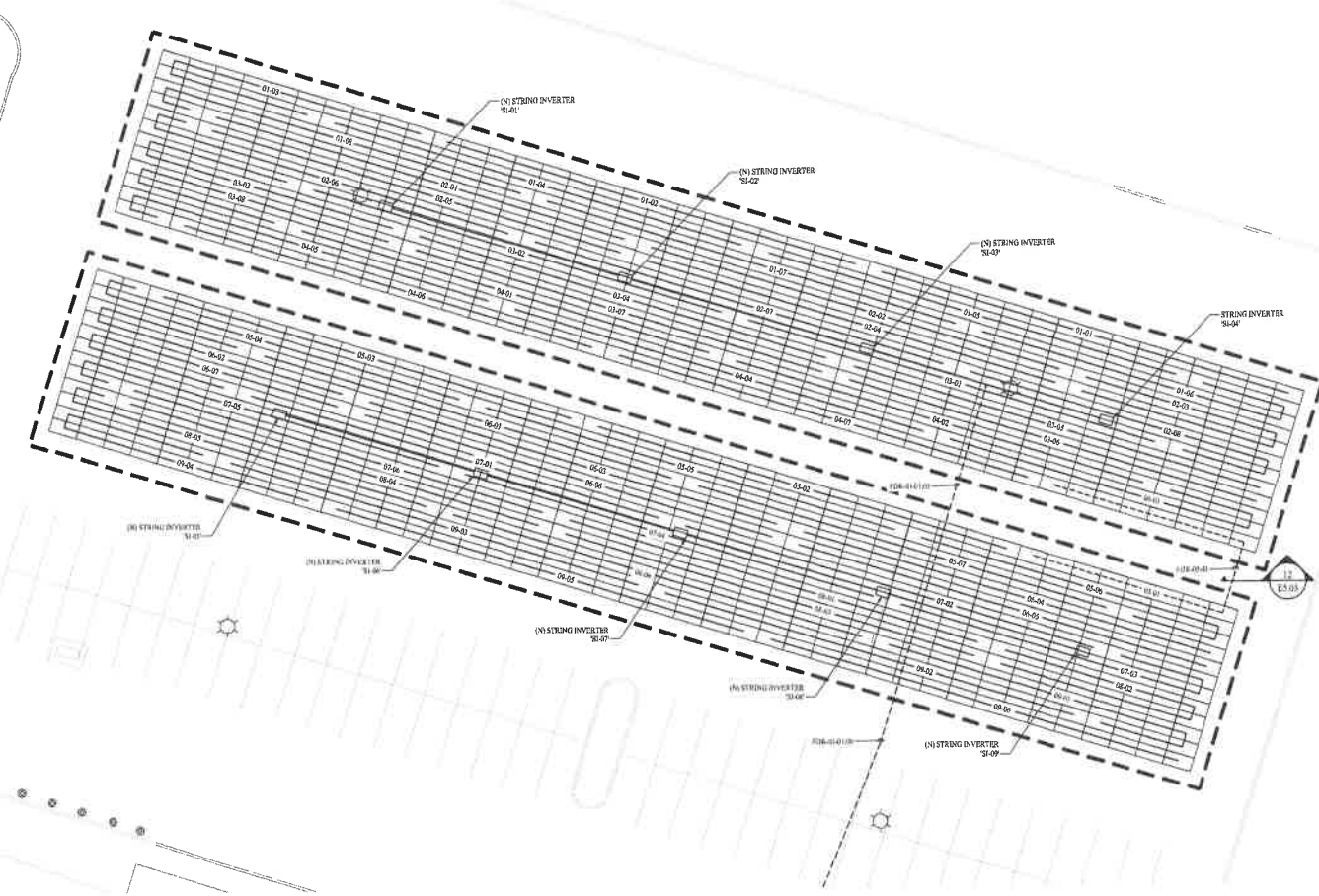
NO.	DATE	DESCRIPTION	BY	CHKD.
A	07/20/2013	ISSUE FOR INTERCONNECTION	PM	RE
B	07/20/2013	ISSUE FOR INTERCONNECTION	PM	RE
C	08/22/2013	ISSUE FOR CIVIL REVIEW	PM	RE
D	08/22/2013	ISSUE FOR 9000 PROGRESS	PM	RE
E	11/15/2013	ISSUE FOR 9000 PROGRESS	PM	RE

405-22 AS NOTED

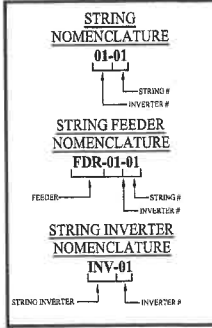
ELECTRICAL GROUNDING PLAN

E2.03

- SHEET NOTES:**
1. REFER TO DRAWINGS E2.01 FOR ADDITIONAL POWER AND E2.02 FOR CONTROL CORDUIT ROUTING AND WIRING REQUIREMENTS.
 2. REFER TO DRAWING E4.01 FOR SINGLE LINE DIAGRAM



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



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UMMS PARASOL -
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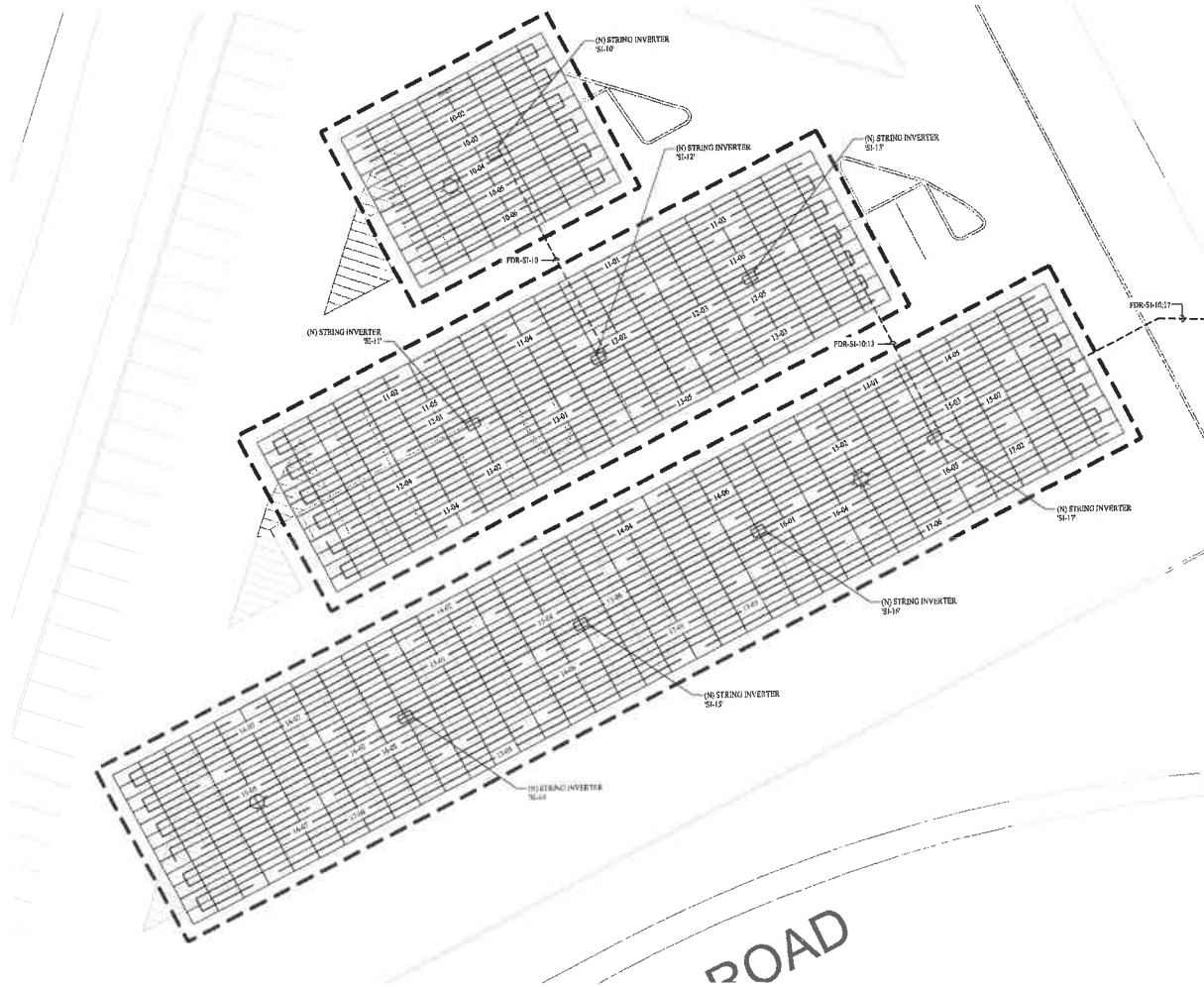
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2	01/02/2023	JMM	PAL	ISSUE FOR INTERCONNECTION
3	01/03/2023	JMM	PAL	ISSUE FOR CIVIL REVIEW
4	01/04/2023	JMM	PAL	ISSUE FOR TAKE REVIEW
5	01/05/2023	JMM	PAL	ISSUE FOR TAKE REVIEW
6	01/06/2023	JMM	PAL	ISSUE FOR TAKE REVIEW
7	01/07/2023	JMM	PAL	ISSUE FOR TAKE REVIEW
8	01/08/2023	JMM	PAL	ISSUE FOR TAKE REVIEW
9	01/09/2023	JMM	PAL	ISSUE FOR TAKE REVIEW
10	01/10/2023	JMM	PAL	ISSUE FOR TAKE REVIEW

405-22 AS NOTED

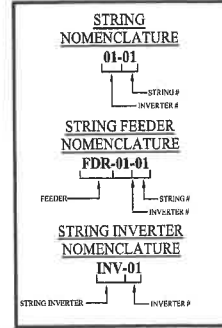
ELECTRICAL PV WIRING DIAGRAM - CARPORTS 01 & 02

E2.04

SHEET NOTES:
 1. REFER TO DRAWINGS E2.04 FOR SHEET AND KEY NOTES.



1 ELECTRICAL PV WIRING DIAGRAM - CARPORTS 03, 04, & 05
 SCALE: 1" = 15'-0"



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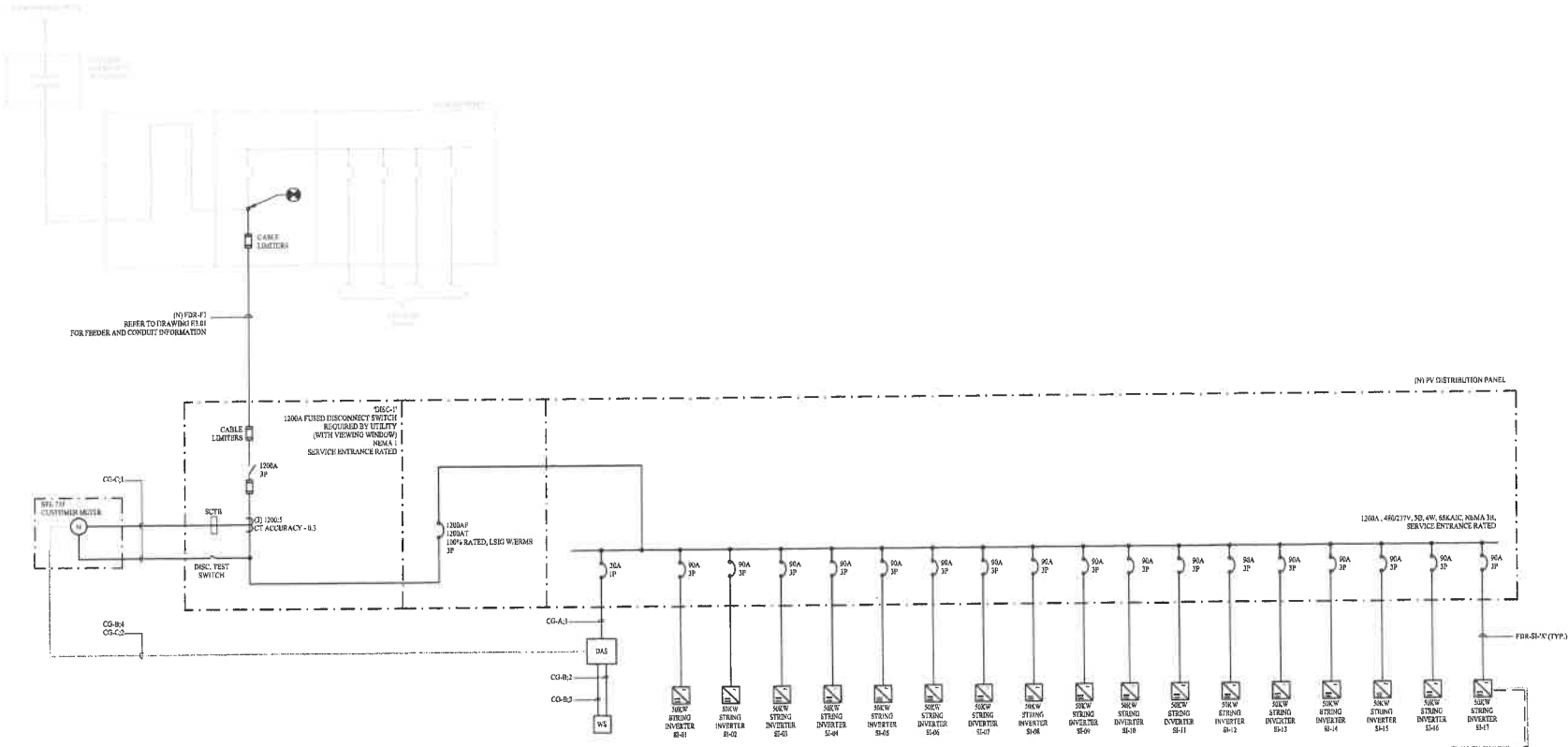
**UMMS PARASOL -
 900 ELKBRIDGE**
 900 ELKBRIDGE LANDING RD.
 LANTHICUM HEIGHTS, MD 21090

REV.	DATE	DESCRIPTION	BY	CHK
A	01/12/2013	INTERCONNECTION	EMJ	RL
B	01/16/2013	ISSUE FOR INTERCONNECTION	EMJ	PAF
C	03/01/2013	ISSUE FOR CIVIL REVIEW	EMJ	RL
D	08/26/2013	ISSUE FOR 50% REVIEW	EMJ	RL
E	11/15/2013	ISSUE FOR 90% PROGRESS	EMJ	PAF

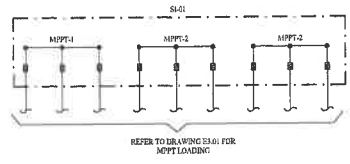
405-22 AS NOTED

ELECTRICAL
 PV WIRING DIAGRAM -
 CARPORTS 03, 04, & 05

E2.05



1 ELECTRICAL SINGLE LINE DIAGRAM
NOT TO SCALE



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

2 MPPT CONFIGURATIONS
NOT TO SCALE

INVERTER IEEE SETTINGS		
PROTECTION FUNCTION	PICK UP	MAXIMUM TIME (SEC) AT 60Hz BEFORE CENSATION OF CURRENT TO THE SIMULATED UTILITY
27-2	≤ 0.45VNOM	0.15
27-1	0.45VNOM < V ≤ 0.70VNOM	10
58-1	1.1VNOM ≤ V < 1.25VNOM	2
58-2	≥ 1.25VNOM	0.15
81U-2	≤ 5.5Hz	0.15
81U-1	5.5-5Hz	300
81O-1	61.2Hz	0.15
81O-2	62.0Hz	300

* CLR TO TRIP WITHIN 2 SECONDS WHEN EPS UTILITY SOURCE IS NOT PRESENT

3 INVERTER SETTINGS
NOT TO SCALE

PRELIMINARY
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UMMS PARASOL -
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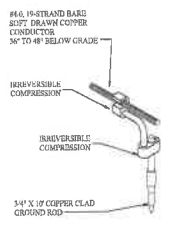
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02/02/23	02/02/23	ISSUE FOR FINAL REVIEW	PAW	PAW
03/02/23	03/02/23	ISSUE FOR 50% REVIEW	PAW	PAW
04/02/23	04/02/23	ISSUE FOR 90% PROGRESS	PAW	PAW
05/02/23	05/02/23	ISSUE FOR 100% PROGRESS	PAW	PAW

405-22 AS NOTED

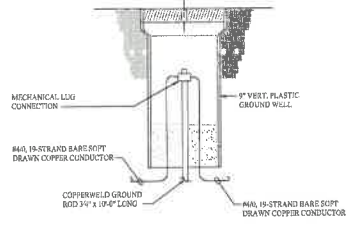
ELECTRICAL
SINGLE LINE DIAGRAM

DRAWING #2

E4.01

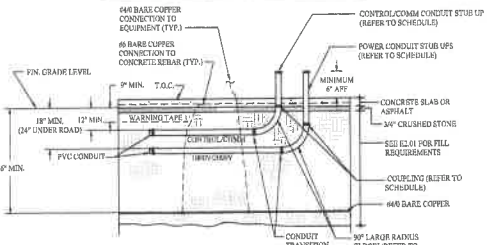


1 GROUND WIRE TO GROUND ROD CONNECTION
NOT TO SCALE

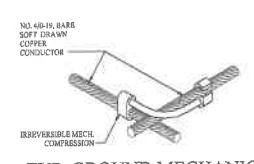


2 GROUND WELL TEST STATION DETAIL
NOT TO SCALE

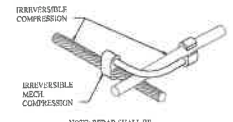
SCHEDULE OF CONDUIT SIZES		
ITEM	SETUP IN ENCLOSURES	RTU-UP EXPOSED OPEN AREA
CONDUIT	PVC SCL 40	PVC SCL 40
LARGE RADII ELBOW	PVC SCL 40	PVC SCL 40



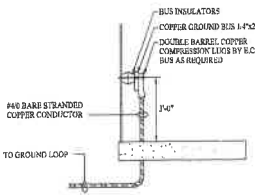
3 TYPICAL GROUND FILL AND CONDUIT STUB UP DETAIL (OUTDOORS)
NOT TO SCALE (FROST LINE 36\"/>



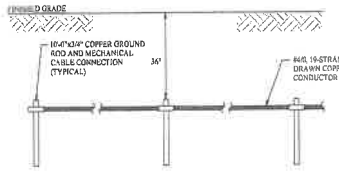
4 TYP. GROUND MECHANICAL CONNECTION DETAIL
NOT TO SCALE



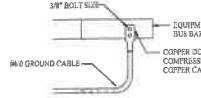
5 GROUND WIRE TO REBAR CONNECTION
NOT TO SCALE



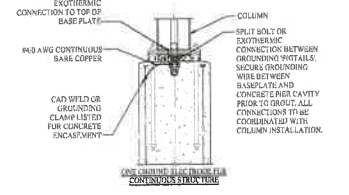
6 GROUND BUS CONNECTION DETAIL
NOT TO SCALE



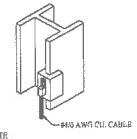
7 GROUND GRID CONNECTION DETAIL
NOT TO SCALE



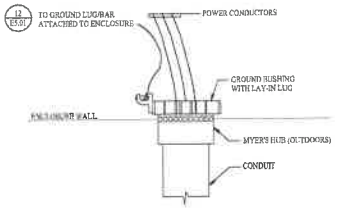
8 TYP. CABLE TO GROUND BUS DETAIL
NOT TO SCALE



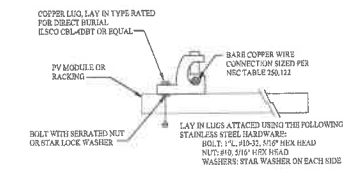
9 TYP. ARRAY COLUMN GROUNDING DETAIL
NOT TO SCALE



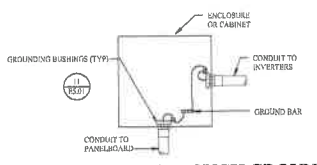
10 TYPICAL BONDING TO STEEL CONNECTION DETAIL
NOT TO SCALE



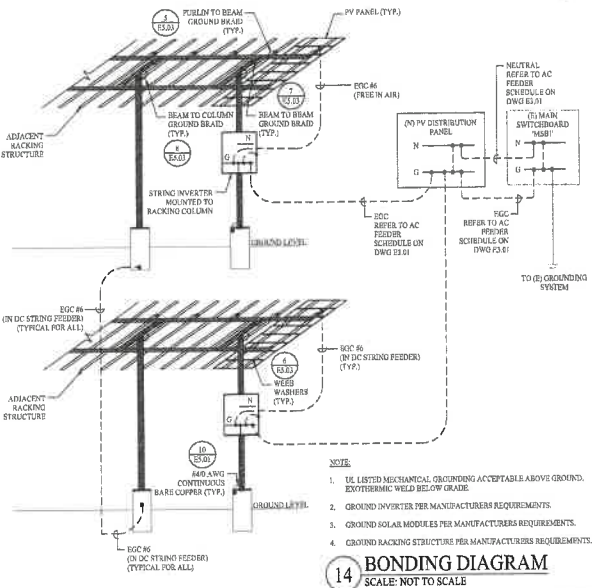
11 MYER'S HUB GROUNDING DETAIL
NOT TO SCALE



12 GROUND LUG DETAIL
NOT TO SCALE



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



14 BONDING DIAGRAM
SCALE: NOT TO SCALE

- NOTE:
- USE LISTED MECHANICAL GROUNDING ACCEPTABLE ABOVE GROUND, EXOTHERMIC WELD BELOW GROUND.
 - GROUND INVERTER PER MANUFACTURER'S REQUIREMENTS.
 - GROUND SOLAR MODULES PER MANUFACTURER'S REQUIREMENTS.
 - GROUND RACKING STRUCTURE PER MANUFACTURER'S REQUIREMENTS.

PRELIMINARY
NOT FOR CONSTRUCTION



AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-6970



UMMS PARASOL -
900 ELK RIDGE

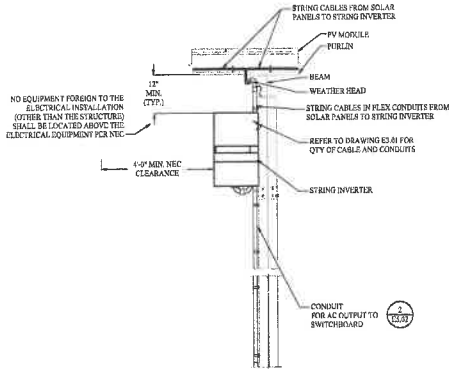
900 ELK RIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

NO.	DATE	BY	CHK.	DESCRIPTION
A		UMMS	ELK	ISSUE FOR INTERCONNECTION
B		UMMS	ELK	ISSUE FOR INTERCONNECTION
C		UMMS	ELK	ISSUE FOR CABLE NEW
D		UMMS	ELK	ISSUE FOR 90% PROGRESS
E		UMMS	ELK	ISSUE FOR 90% PROGRESS

405-22 AS NOTED

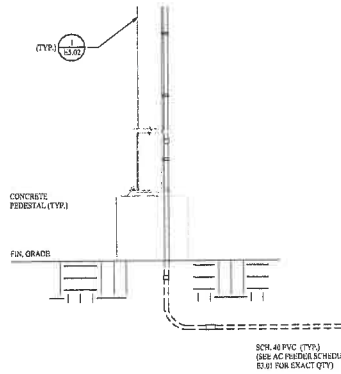
ELECTRICAL
DETAILS - 1

E5.01

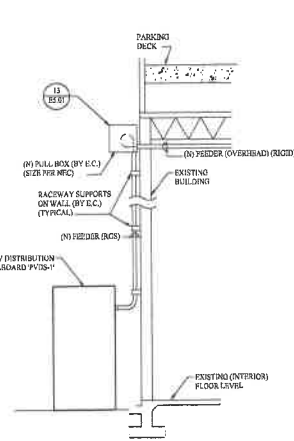


- NOTES:**
- UNLESS OTHERWISE NOTED WIRE LOOM SHALL BE USED AT ANY POINT WHERE PV CONDUCTORS CROSS HAZARD BARRIERS.
 - E.C. SHALL VERIFY THE SPACED AND SECURE FROM THE PANELS TO STRING INVERTER. CABLE SHALL BE TAKEN TO PROTECT FROM DAMAGING FROM SLIP EDGES THAT COULD DAMAGE CONDUCTORS.
 - REFER TO E31 STRUCTURAL DRAWINGS FOR EXACT DETAILS AND ADDITIONAL STRUCTURAL INFORMATIONS.
 - INSULATED PIPES SHALL NOT BE LOCATED ON THE DOWNWARD PORTION OF THE DRIP LEG.

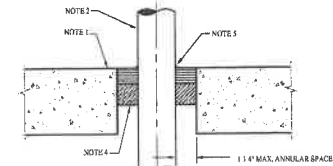
1 STRING INVERTER MOUNTING DETAILS
NOT TO SCALE



2 CONDUIT TRANSITION DETAIL
NOT TO SCALE

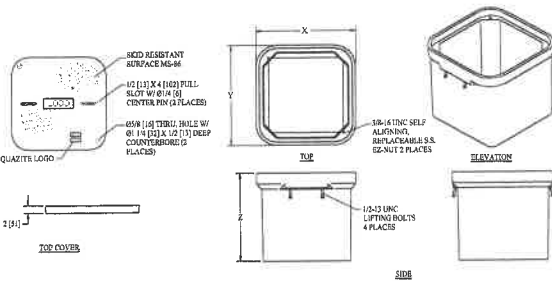


3 CONDUIT BLDG ENTRY DETAIL
NOT TO SCALE



- NOTES:**
- FLOOR OR WALL ASSEMBLY, MINIMUM 5-1/4" THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE.
 - METALLIC PIPE: NOMINAL 4" DIAMETER (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE. RIGID STEEL CONDUIT OR STEEL BUT, MANDATORY ONE STEEL PIPE, CONDUIT OR ENTRY PIPE, OPENING COVERED IN GRINDING, THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MAXIMUM 3/4". PIPE, CONDUIT OR TUBING TO BE FULLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.
 - PACKING MATERIAL (OPTIONAL, NOT SHOWN) - LOOSE CELLULAR (ALUMINA SILICA) FIBER TIGHTLY PACKED INTO ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND THE SIDES OF THE THROUGH OPENING. WHEN USED IN FLOORS, A MINIMUM 1/4" THICKNESS OF FIBER IS REQUIRED WITH ITS TOP SURFACE RECESSED MINIMUM 1/4" BELOW TOP SURFACE OF FLOOR. WHEN USED IN WALLS, FIBER ANNULAR SPACE TO BE FILLED WITH TIGHTLY PACKED FIBER EXCEPT FOR A MINIMUM 1/2" BEATS AT EACH SURFACE OF THE WALL.
 - FILL VOID OR CAVITY MATERIALS - PUTTY. PUTTY MATERIAL THAT IS EXTENDED 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 1/2" BELOW TOP SURFACE OF FLOOR. IN WALLS, A MINIMUM 1" THICKNESS OF FILL MATERIAL SHALL BE INSTALLED SUCH THAT ITS SURFACES ARE RECESSED MINIMUM 1/2" FROM BOTH SURFACES OF WALL. WHEN OPTIONAL PACKING MATERIAL IS USED IN WALLS, A MINIMUM 1/2" THICKNESS OF FILL MATERIAL IS REQUIRED ON EACH SIDE OF WALL WITH THE SURFACE OF THE FILL MATERIAL FLUSH WITH EACH SURFACE OF THE WALL.
 - FIRE BARRIER CAULK 1/2" x 1/2" x 2 1/2" OR EQUIVALENT SHALL BE USED. THE FIRE RATING OF THE CAULK IS BASED ON THE NET INSTALLED DEPTH. PENETRATION FIBER STOP SHALL COMPLY WITH UL FIRE PROTECTION DIVISION FIRE STOP SYSTEM NO. 111 FIBER, 457MB E 814 (ANNUAL 1400) FIBER 1787.

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

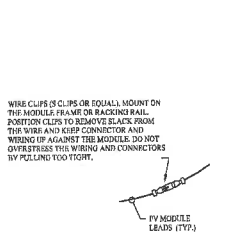


5 TYPICAL HANDHOLE DETAIL
NOT TO SCALE

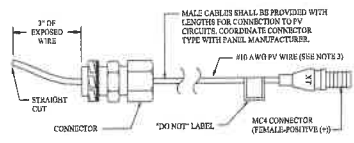
HAND HOLE SCHEDULE					
HANDHOLE DESIGNATION	WIDTH (X)	LENGTH (Y)	DEPTH (Z)	DESCRIPTION	COVER ENGRAVING
(A)	36"	36"	18"±3"	PULL BOX FOR POWER OR COMMUNICATIONS	ELECTRIC OR COMMUNICATIONS
(B)	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	PULL BOX FOR 48V POWER OR COMMUNICATIONS	ELECTRIC OR COMMUNICATIONS
(C)	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	PULL BOX FOR 150V POWER	ELECTRIC POWER

6 HANDHOLE SCHEDULE
NOT TO SCALE

- NOTES:**
- ALL HANDHOLES SHALL BE INSTALLED AT DEPTH TO 3" FLUSH WITH FINAL GRADE. DEPTH TO VARY BETWEEN 18"±3" AS REQUIRED. MINIMUM SIZE HANDHOLES ARE SHOWN. PROVIDE LARGER SIZES AS REQUIRED.
 - ALL HANDHOLES SHALL BE UNLIT AND BE SUITABLE FOR THEIR LOADING. FOR AREAS OF UNSUITABLE HEAVY VEHICLE TRAFFIC, HANDHOLES SHALL BE SUITABLE FOR 1000 LB LOADING.
 - ALL HANDHOLES SHALL BE EQUAL TO QUARTZITE SERIES PER UL APPROVED SQA.
 - ALL HANDHOLES SHALL BE GASKETED PRECAST CONCRETE OR POLYMER COMPOSITE SPALL BOXES SUITABLE FOR POWER AND CONTROL WIRING. PROVIDE ALL HANDHOLES WITH BASES AND STAINLESS STEEL HEX BOLTS.

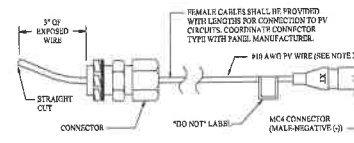


3 TYPICAL PV WIRING CLIP
NOT TO SCALE



- NOTES:**
- DETAIL IS SHOWN FOR REFERENCE ONLY. INTERCONNECT WIRING SHALL BE PRE-MADE, FURNISHED, AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
 - FOR TROUBLE SHOOTING AND IDENTIFICATION PURPOSES IN EACH WIREBATH LABEL EACH CONDUCTOR AS FOLLOWS: INVERTER NUMBER, # "STRING" NUMBER, LABELS SHALL BE FINGERPRINT CABLE WRAP TYPE, GENERATED WITH PORTABLE LABEL MAKER. CONDUCTORS SHALL BE PV COPPER CONDUCTORS, XLPE INSULATION, 200V, 90° C RATED, AND SUNLIGHT RESISTANT.

8 INTERCONNECT WIRING TYPICAL MALE CABLE ASSEMBLY
NOT TO SCALE



- NOTES:**
- DETAIL IS SHOWN FOR REFERENCE ONLY. INTERCONNECT WIRING SHALL BE PRE-MADE, FURNISHED, AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
 - FOR TROUBLE SHOOTING AND IDENTIFICATION PURPOSES IN EACH CONDUIT AND JUNCTION BOXES, LABEL EACH CONDUCTOR AS FOLLOWS: CONDUIT BOX # & "CIRCUIT" NUMBER. LABELS SHALL BE FINGERPRINT CABLE WRAP TYPE, GENERATED WITH PORTABLE LABEL MAKER.
 - CONDUCTORS SHALL BE PV COPPER CONDUCTORS, XLPE INSULATION, 200V, 90° C RATED, AND SUNLIGHT RESISTANT.

9 INTERCONNECT WIRING TYPICAL FEMALE CABLE ASSEMBLY
NOT TO SCALE

AMBLEM YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-6970

**UMMS PARASOL -
900 ELKRIDGE**

900 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

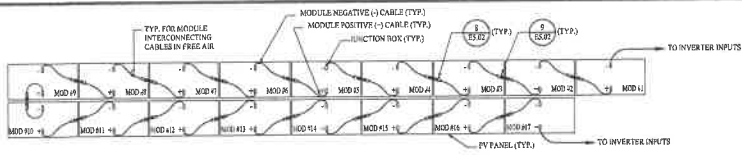
REV	DATE	DESCRIPTION
1	01/20/23	ISSUE FOR INTERCONNECTION
2	01/20/23	ISSUE FOR INTERCONNECTION
3	01/20/23	ISSUE FOR ONE LINE WIRING
4	01/20/23	ISSUE FOR ONE LINE WIRING
5	01/20/23	ISSUE FOR ONE LINE WIRING
6	01/20/23	ISSUE FOR ONE LINE WIRING
7	01/20/23	ISSUE FOR ONE LINE WIRING
8	01/20/23	ISSUE FOR ONE LINE WIRING
9	01/20/23	ISSUE FOR ONE LINE WIRING
10	01/20/23	ISSUE FOR ONE LINE WIRING

405-22
AS NOTED

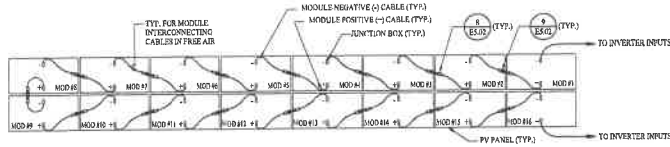
ELECTRICAL
DETAILS - 2

PRELIMINARY
NOT FOR CONSTRUCTION

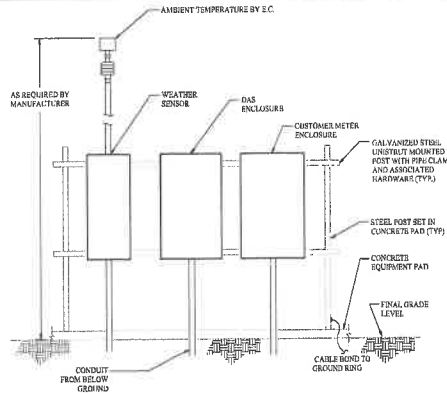
E5.02



1 TYPICAL STRING WIRING (17 MODULES)
NOT TO SCALE

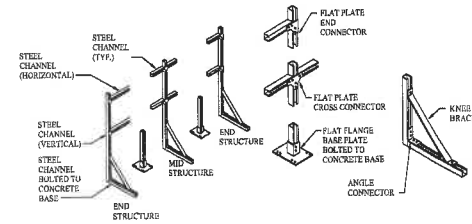


1A TYPICAL STRING WIRING (17 MODULES)
NOT TO SCALE

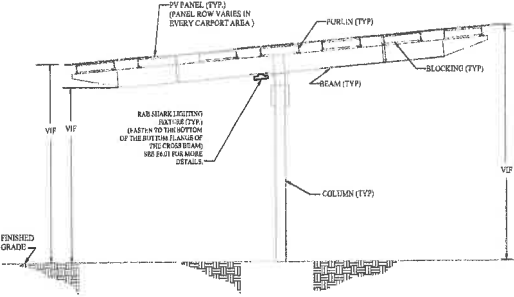


NOTE: COORDINATE ALL WEATHER INSTRUMENTS INSTALLATION DETAILS (HEIGHT, LOCATION, ORIENTATION) PRIOR TO INSTALLATION.

2 AUXILIARY EQUIPMENT DETAIL
NOT TO SCALE

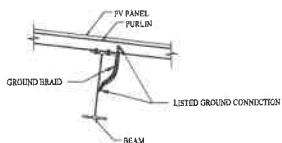


3 TYP. MISC. PANEL STEEL SUPPORTS
NOT TO SCALE

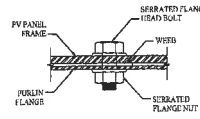


NOTE: REFER TO STRUCTURAL DRAWINGS FOR STRUCTURAL MEMBERS, DIMENSIONS, HEIGHT AND ADDITIONAL PV ARRAY AND LIGHTING FIXTURE MOUNTING INFORMATION. LIGHTING FIXTURES WILL BE PROVIDED WITH LISTED GROUND CONNECTIONS.

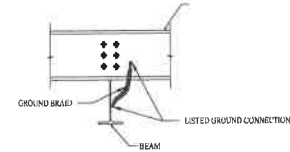
4 LIGHTING FIXTURE MOUNTING DETAILS (FOR REFERENCE ONLY)
NOT TO SCALE



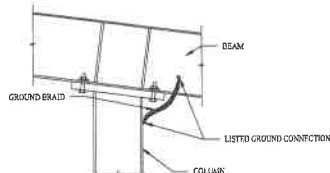
5 PURLIN TO BEAM BONDING DETAIL
NOT TO SCALE



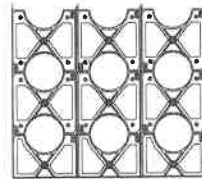
6 PV PANEL TO PURLIN BONDING DETAIL
NOT TO SCALE



7 BEAM TO BEAM BONDING DETAIL
NOT TO SCALE



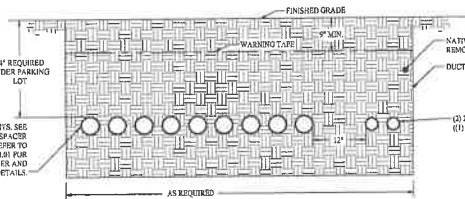
8 BEAM TO COLUMN BONDING DETAIL
NOT TO SCALE



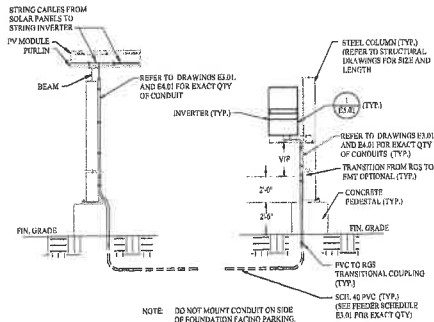
PVC SPACER NOTES:

1. PROVIDE PVC SPACERS IN CONFIGURATIONS AS REQUIRED BY CONDUIT SIZES. PROVIDE MINIMUM 3" BATH ON BOTTOM SPACER. PROVIDE MINIMUM 2" BETWEEN CONDUITS.
2. CONDUIT SPACERS SHALL BE INSTALLED EVERY 7'-0" OR PER MANUFACTURER'S RECOMMENDATIONS.
3. PROVIDE PVC SPACERS BY CARLON PRODUCTS "IMPACT SPACERS" OR APPROVED EQUAL "MANUPOUSE 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.

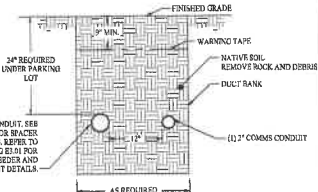
9 PVC SPACER U/G DETAIL
NOT TO SCALE



11 WORST CASE AC DUCT BANK DETAIL
NOT TO SCALE



10 TYP. UNDERGROUND JUMPER DETAIL
NOT TO SCALE



12 WORST CASE DC DUCT BANK DETAIL
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 15002
TELEPHONE 215-634-5970

**UMMS PARASOL -
900 ELK RIDGE**

900 ELK RIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

REV	DATE	BY	CHK	DESCRIPTION
01/22/2023	EMJ	PKP	PKP	A. ISSUE FOR INTERCONNECTION
02/09/2023	EMJ	PKP	PKP	B. ISSUE FOR INTERCONNECTION
03/08/2023	EMJ	PKP	PKP	C. ISSUE FOR CIVIL REVIEW
04/26/2023	EMJ	PKP	PKP	D. ISSUE FOR SPA REVIEW
05/15/2023	EMJ	PKP	PKP	E. ISSUE FOR SPA PROGRESS

405-22 AS NOTED

ELECTRICAL
DETAILS - 3

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 690.5 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 690.5 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-169 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 480/277V AC BUSWAYS PER NEC REQUIREMENTS.

SIGNAGE NOTES:

- SIGNAGE SHALL BE WEATHER RESISTANT, UL-96 SHALL BE USED AS A STANDARD FOR WEATHER RATINGS.
- PROVIDE PERMANENT PLACARDS AS REQUIRED BY NEC ARTICLE 690 V1 MARKING.
- PROVIDE PLACARDS ON INVERTERS PERTAINING TO GROUND FAULTS PER NEC ARTICLE 690.5 (C).
- PROVIDE PERMANENT PLACARDS FOR DISCONNECTS AS REQUIRED BY NEC 690.14 (C) (1).
- 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 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 PER NEC 110.34(C).

SERVICE DISCONNECT

NOTES:
 1. PROVIDE AND INSTALL LABELS ON ALL SERVICE DISCONNECTS PER REQUIREMENTS OF NEC 240.36(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

WARNING
 Arc Flash and Shock Risk
 Appropriate PPE Required

FLASH PROTECTION: Flash Risk of 20 to 100 cal/cm²
 Min Arc Rating: 2 to 4 cal/cm²
 Min Protection: Category 1 PPE
 Min Cloth: 2
 PPE: Arc-rated shirt & pants - electrical coveralls or equivalent and full face shield

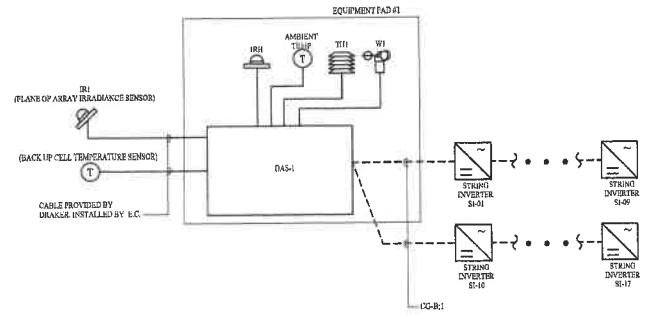
SHOCK PROTECTION: Shock Risk: severe to fatal
 Limited Approach: 60" (5')
 Restricted Approach: 36" (3')

DU: S. XFMR BUS T1

3 GENERAL ARC FLASH LABEL
 NOT TO SCALE

SHEET NOTES:

- SIGNAGE SHALL BE WEATHER RESISTANT, UL-96 SHALL BE USED AS A STANDARD FOR WEATHER RATINGS.
- PROVIDE PERMANENT PLACARDS AS REQUIRED BY NEC ARTICLE 690 V1 MARKING.
- PROVIDE PLACARDS ON INVERTERS PERTAINING TO GROUND FAULTS PER NEC ARTICLE 690.5 (C).
- PROVIDE PERMANENT PLACARDS FOR DISCONNECTS AS REQUIRED BY NEC 690.14 (C) (1).
- PROVIDE PLACARDS ON ALL INVERTERS AND COMBINER BOXES PER NEC ARTICLE 690.17.
- 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: DC 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-169 THAT IS SUITABLE FOR THE ENVIRONMENT.



NOTES:

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

1 EQUIPMENT SIGNAGE DETAILS
 NOT TO SCALE

PRELIMINARY
 NOT FOR CONSTRUCTION



AMBLER YARDS
 300 BROOKSIDE AVE. BLDG #14
 AMBLER, PA 19002
 TELEPHONE 215-894-8970



**UMMS PARASOL -
 900 ELK RIDGE**


900 ELK RIDGE LANDING RD.
 LINTHICUM HEIGHTS, MD 21090

NO.	DATE	BY	REVISION
1	07/11/2023	EMT	ISSUE FOR INTERCONNECTION
2	08/14/2023	EMT	ISSUE FOR PERMITTING
3	08/14/2023	EMT	ISSUE FOR CITY REVIEW
4	08/14/2023	EMT	ISSUE FOR P&E REVIEW
5	11/15/2023	EMT	ISSUE FOR O&M PROGRESS

405-22 AS NOTED


ELECTRICAL
 DETAILS - 4

E5.04



XZM7-UHLDD144 Series


1688 HALF-CELL N-Type TOPCon Bifacial Double Glass
Monocrystalline PV Module



555-580W **22.45%** **0.40%**


POWER RANGE MAXIMUM EFFICIENCY YEARLY DEGRADATION

12 YEARS PRODUCT WARRANTY **30 YEARS** OUTPUT GUARANTEE



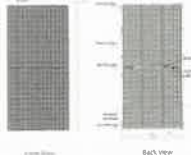
Key Features

<p>Excellent Cells Efficiency Bifacial technology reduces the distance between busbars and finger pitch, which is benefit to power increase.</p> <p>Anti PID Optimized PID resistance through the quality control of cell manufacturing process and raw materials.</p> <p>TIGER 1 Class-TIGER 1 technology based with independently certified advanced automated manufacturing.</p> <p>Bifacial Technology Up to 32% additional power gain from back side depending on irradiance.</p>	<p>Better Weak Illumination Response More power output in weak light condition, such as haze, cloudy, and early morning.</p> <p>Adapt To Harsh Outdoor Environment Optimized to harsh environments such as salt, ammonia, acid, high temperature and high humidity environment.</p> <p>Excellent Quality Management System Rigorous quality control and stringent quality assurance with beyond certified requirements.</p>
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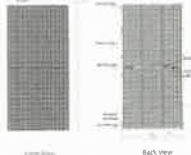


XZM7-UHLDD144 Series

1688 HALF-CELL N-Type TOPCon Bifacial Double Glass
Monocrystalline PV Module

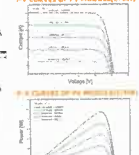


DIMENSIONS OF PV MODULE (mm)



Front View Back View

I-V CURVES OF PV MODULE (170W)



170W 170W 170W

ELECTRICAL CHARACTERISTICS 1 SUN*					
Module Power (W)	170	166	162	158	154
Module Power Range (W)	170	166	162	158	154
Maximum Power Current (mA)	8.10	8.20	8.30	8.40	8.50
Maximum Power Voltage (V)	20.97	20.54	20.11	19.68	19.25
Short-Circuit Current (mA)	9.60	9.50	9.40	9.30	9.20
Open-Circuit Voltage (V)	24.80	24.50	24.20	23.90	23.60
Module Efficiency (%)	22.45	22.30	22.15	22.00	21.85

ELECTRICAL CHARACTERISTICS 1 SUN**	
Parameter	Value
Module Power (W)	166
Maximum Power Current (mA)	8.30
Maximum Power Voltage (V)	20.11
Short-Circuit Current (mA)	9.40
Open-Circuit Voltage (V)	24.20
Module Efficiency (%)	22.15

ZSHINE SOLAR is a leading solar panel manufacturer with over 10 years of experience in the industry. We are committed to providing high-quality, reliable solar panels that meet the needs of our customers. Our products are designed for durability and performance, and we have a proven track record of successful installations. We are proud to be a member of the ZSHINE SOLAR family, and we look forward to serving you for many years to come.



KUPPER ENGINEERING, LLC
INTEGRATED ELECTRICAL ENGINEERING

AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-8970



CI RENEWABLES

UMMS PARASOL - 900 ELK RIDGE

900 ELK RIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090



PVI 50TL & PVI 60TL

3-Phase Transformerless Commercial String Inverters



Features

- Transformerless (TL) topology
- High efficiency up to 98.2%
- 120V AC input
- 208V AC output
- Surge protection
- Power factor correction
- 3-Phase output
- 40A output current
- 40A output current
- 3-Phase output

Options

- DC disconnect
- Remote monitoring

*Maximum efficiency 98.2% PVI 50TL and PVI 60TL are grid-tied 3-phase transformerless inverter designed for grid-tied, rooftop and canopy array and can be installed in 0-90 degree. The PVI 50TL inverter is the best choice for the most effective and safe grid. They are compatible with AC and DC disconnect, three MPPTs, a 15-position string combiner, canopy magnetism, service termination, surge and various protection features. Contact SOLECTRIA Solar for more details. DC disconnect, surge protector, and wind speed monitoring.




PVI 50TL & PVI 60TL Specifications

Parameter	PVI 50TL	PVI 60TL
Max. AC Input Power	2080W	2760W
Max. AC Input Current	10A	13A
Max. AC Input Voltage	208V	208V
Max. AC Output Power	1900W	2600W
Max. AC Output Current	9.5A	12.5A
Max. AC Output Voltage	208V	208V
Max. DC Input Power	2080W	2760W
Max. DC Input Current	10A	13A
Max. DC Input Voltage	208V	208V
Max. DC Output Power	1900W	2600W
Max. DC Output Current	9.5A	12.5A
Max. DC Output Voltage	208V	208V
Efficiency	98.2%	98.2%
Power Factor	0.98	0.98
Surge Protection	Yes	Yes
Power Factor Correction	Yes	Yes
3-Phase Output	Yes	Yes
40A Output Current	Yes	Yes
Remote Monitoring	Yes	Yes

2 INVERTER CUTSHEET
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK	DESCRIPTION
001	01/20/2023	AM	PK	ISSUE FOR INTERCONNECTION
002	01/20/2023	AM	PK	ISSUE FOR PERMIT CONSTRUCTION
003	01/20/2023	AM	PK	ISSUE FOR PERMIT REVIEW
004	01/20/2023	AM	PK	ISSUE FOR 90% PROGRESS
005	01/20/2023	AM	PK	ISSUE FOR 100% PROGRESS

405-22

AS NOTED

ELECTRICAL DETAILS - 5

E5.05

GEN - GENERAL SITE CONSTRUCTION NOTES

1. PRIOR TO THE START OF CONSTRUCTION, THE SITE CONTRACTOR SHALL VERIFY THE EXACT LOCATION, SIZE AND DIMENSION OF ALL UTILITIES IN AREA WHERE WORK IS TO BE PERFORMED. SUBCONTRACTOR AND/OR PARASOL ASSUMES NEITHER THE RESPONSIBILITY FOR THE LOCATION OF ENCASED AND/OR HIDDEN UTILITIES SHOWN NOR THE LACK THEREOF.
2. ANY DISCREPANCIES IN REFERENCE, COORDINATES, ELEVATIONS, EXISTING DIMENSIONS, AND DETAILS SHALL BE BROUGHT TO THE ATTENTION OF PARASOL AND/OR OWNER'S REPRESENTATIVES BEFORE PROCEEDING WITH WORK.
3. ALL WORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE MOST RECENT LOCAL AND NATIONAL CONSTRUCTION STANDARDS AND BUILDING CODES.
4. IN INSTANCES WHERE THE A/E PROVIDES NO DETAILED SPECIFICATIONS, THE MATERIALS AND METHODS OF CONSTRUCTION SHALL MEET AND CONFORM TO THE REQUIREMENTS OF LOCAL CODES AND UFG REQUIREMENTS.
5. THE CONTRACTOR SHALL VERIFY ALL INFORMATION PERTAINING TO EXISTING CONDITIONS BY ACTUAL MEASUREMENT AND OBSERVATION AT THE SITE. ALL DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE SHOWN IN THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE ENGINEER OF RECORD AND PARASOL PRIOR TO FABRICATION.

GEN - COORDINATION NOTES

1. PARASOL ANTICIPATES THAT THE TOPS OF ALL EXISTING CONCRETE PIERS AND WALLS SHALL BE AT ELEVATIONS SPECIFIED HEREIN.
2. INSTALLATION ERRORS IN PRECAST CONSTRUCTION ARE TO BE CORRECTED BY THE GENERAL CONTRACTOR PRIOR TO THE ARRIVAL OF THE ERECTION CREW AND PRIOR TO THE ERECTION OF THE STRUCTURE.
3. ANY EXISTING UTILITY FINDINGS THAT CONFLICT WITH THE RECORD OF KNOWN CONDITIONS SHALL BE REPORTED TO PARASOL AND/OR THE OWNER'S REPRESENTATIVE.

STEEL FABRICATION NOTES

1. ALL STEEL FABRICATED FOR THIS PROJECT IS ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (A.E.S.S.)
2. PURLINS ARE TO BE FINISHED AS FOLLOWS:
 - A. HOT DIP GALVANIZING G80 PER ASTM 833
3. COLUMNS AND CROSSBEAMS ARE TO BE FINISHED AS FOLLOWS:
 - A. HOT DIP GALVANIZING PER ASTM 123
4. NUTS, BOLTS & WASHERS
 - A. HOT DIP GALVANIZING PER ASTM 153
5. FOR TOUCH UP AND CLEANING
 - A. USE SOLVENTS OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL (SSPC)
 - B. WIRE BRUSH CLEAN WITH SOLVENTS RECOMMENDED BY FINISH MANUFACTURER AND TOUCH-UP WITH SAME FINISH SYSTEMS DESCRIBED ABOVE.

COLD WEATHER NOTES

1. IN COLD WEATHER CONDITIONS PLEASE NOTE THAT COMPLETION OF SOME TEMPERATURE DEPENDENT WORK MAY BE DELAYED UNTIL TEMPERATURES REACH 45 DEGREES F AND RISING. THIS WORK MAY INCLUDE:
 - A. BASE PLATE GROUTING
 - B. PARGING
 - C. LINE STRIPING
 - D. TOUCH-UP PAINTING



3 SAMPLE PROJECT IMAGE
N.T.S.

SHEET NUMBER	SHEET NAME	REV. REVISION PROCESS	REV. REVISION PROCESS	REV. REVISION PROCESS	REV. REVISION PROCESS
PCV-1000	PROJECT LOCATION & DRAWING LIST				
PCV-1001	SITE PLAN - PV LAYOUT				
PCV-1002	SITE PLAN - FOUNDATION				
PCV-1003	CANOPY DETAILS				
PCV-1004	TYP. FOUNDATION DETAILS				
TOTAL # SHEETS: 5					

PARASOL
PROJECT # 230111

kpff
Kemp & Partners
ARCHITECTS
PROJECT # 23010000

DESIGN'S STUDIO

457 FOR CONSTRUCTION

30% DESIGN PROGRESS 08/10/23

PROJECT TITLE: UMMS-1
DATE: 08/10/23
PROJECT ADDRESS: 900 ELKRIDGE DRIVE
PROJECT LOCATION & DRAWING LIST

DESIGNED BY: PARASOL
CHECKED BY: KPF
CREATED BY: KPF
APPROVED BY: KPF
GRAPHIC SCALE: 1" = 100'
SCALE: 1" = 100'
OVERALL: PV-1000
PROJECT NUMBER: 23010000
ALL RIGHTS RESERVED

ZXM7-UHLLD144 Series
144W HALF-CELL N-TYPE TOPCON B-SIDE Double Glass Monocrystalline PERC PV Module

555-580W 22.45% 0.40%

POWER RANGE MAXIMUM EFFICIENCY TEMPERATURE DEGRADATION

12 YEARS PRODUCT WARRANTY 30 YEAR ELECTRICAL WARRANTY

CE, ISO 9001, ISO 14001

Key Features:

- Excellent Cells Efficiency: High performance monocrystalline silicon double surface, anti-reflection coating, and high quality silicon wafer.
- Anti PID: Superior PID resistance through the quality control and manufacturing process and test methods.
- TSR 1: Solar cell 120% higher than the industry standard.
- Robust Packaging: High quality materials and advanced manufacturing process.
- Weather Resistant: High quality materials and advanced manufacturing process.
- Lighter Weight: High quality materials and advanced manufacturing process.
- Easy Installation: High quality materials and advanced manufacturing process.

TECHNICAL DATA

Parameter	Value
Rated Power (P _{max})	555W, 560W, 565W, 570W, 575W, 580W
Rated Voltage (V _{mp})	31.5V, 32.0V, 32.5V, 33.0V, 33.5V, 34.0V
Rated Current (I _{mp})	17.6A, 17.8A, 18.0A, 18.2A, 18.4A, 18.6A
Open Circuit Voltage (V _{oc})	38.5V, 39.0V, 39.5V, 40.0V, 40.5V, 41.0V
Short Circuit Current (I _{sc})	19.5A, 19.8A, 20.1A, 20.4A, 20.7A, 21.0A
Maximum Power Point (P _{max})	555W, 560W, 565W, 570W, 575W, 580W
Temperature Coefficient (P _{max})	-0.40%/°C
Temperature Coefficient (V _{oc})	-2.10%/°C
Temperature Coefficient (I _{sc})	0.05%/°C

PHYSICAL DATA

Parameter	Value
Module Dimensions (L x W x H)	1780mm x 1039mm x 35mm
Weight	18.5kg
Number of Cells	144
Cell Type	Half-cell, N-type TOPCON
Cell Size	182mm x 99mm
Cell Pitch	2mm
Cell Spacing	0.5mm
Cell Orientation	Vertical
Cell Color	Black
Cell Material	Monocrystalline Silicon
Cell Thickness	180µm
Cell Surface Treatment	PERC
Cell Backsheet	ETFE
Cell Encapsulation	EVA
Cell Frame	Aluminum
Cell Mounting	Standard
Cell Certification	CE, ISO 9001, ISO 14001

2 PV PANEL SPECIFICATION N.T.S.



1 PROJECT LOCATION MAP N.T.S.



PV SCHEDULE				
CANOPY	MATERIAL	WATTAGE	QTY	SYSTEM SIZE (KW)
A01	ZNSHINE SOLAR ZNM74JHLD144	575	504	285.80
A02	ZNSHINE SOLAR ZNM74JHLD144	575	504	289.80
A03	ZNSHINE SOLAR ZNM74JHLD144	575	96	55.20
A04	ZNSHINE SOLAR ZNM74JHLD144	575	204	151.80
A05	ZNSHINE SOLAR ZNM74JHLD144	575	444	255.30
TOTAL:			1,812	1,041.90



PARASOL
www.parasol.com

PRODUCTION # 23015
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PROJ. NO. 2300000
CONTRACT NO.

30% DESIGN PROGRESS
09/10/23

30% DESIGN PROGRESS
09/10/23

PROJECT TITLE
UMMS-1

DATE
09/10/23

SCALE 1" = 100'

DESIGNED BY: KPP

PROVIDED BY: KPP

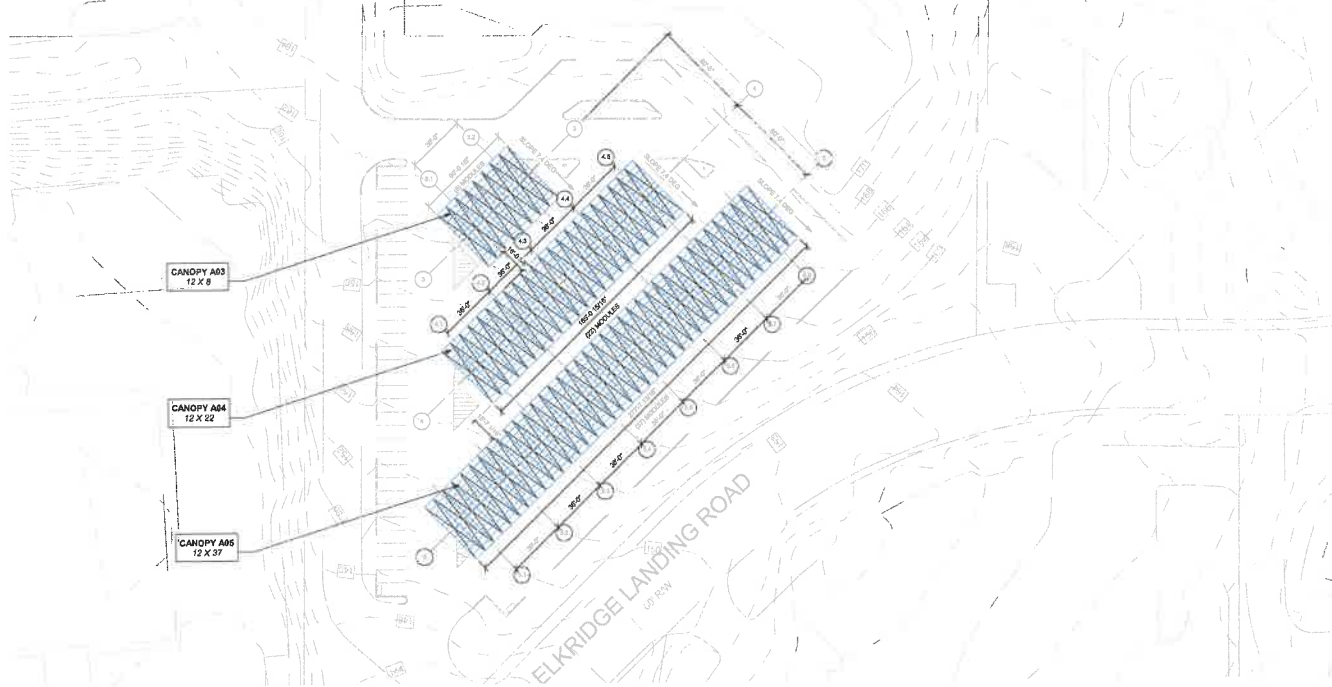
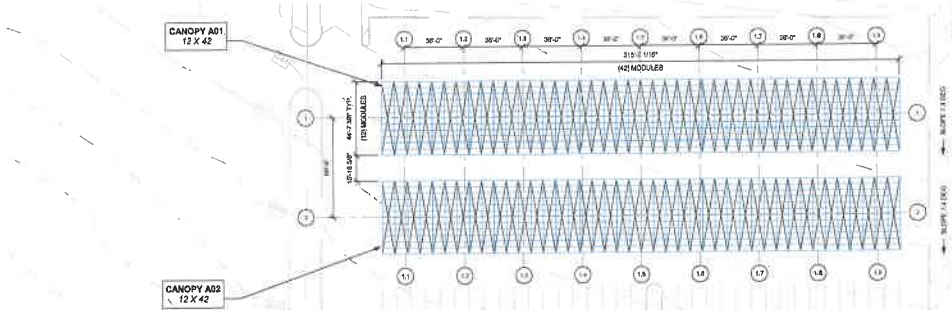
DATE: 09/10/23

SCALE: 1" = 100'

PROJECT: PV-1-100

DATE: 09/10/23

SCALE: 1" = 100'



1 SITE PLAN - PV LAYOUT
1" = 30'

PV-1-100

FOUNDATION SCHEDULE			
CANOPY	MARK	TYPE	QTY
A01	F-36.14	FOUNDATION (DRILLED PIER)	9
A02	F-36.14	FOUNDATION (DRILLED PIER)	9
A03	F-36.14	FOUNDATION (DRILLED PIER)	2
A04	F-36.14	FOUNDATION (DRILLED PIER)	5
A05	F-36.14	FOUNDATION (DRILLED PIER)	8
TOTAL:			33



PARASOL
1415 14th St NW
 Atlanta, GA 30309
 404.525.0000

PROJECT # 2311
10/20/22 - 11/20/22
 11/20/22 - 12/20/22
 12/20/22 - 01/20/23
 01/20/23 - 02/20/23
 02/20/23 - 03/20/23
 03/20/23 - 04/20/23
 04/20/23 - 05/20/23
 05/20/23 - 06/20/23
 06/20/23 - 07/20/23
 07/20/23 - 08/20/23
 08/20/23 - 09/20/23
 09/20/23 - 10/20/23
 10/20/23 - 11/20/23
 11/20/23 - 12/20/23



PROJECT # 2311
 08/10/23

30% DESIGN PROGRESS

NOT FOR CONSTRUCTION

30% DESIGN PROGRESS
 08/10/23

PROJECT TITLE
 LUMAS-1
 PROJECT ADDRESS
 1415 14th St NW
 ATLANTA, GA 30309
 SHEET NO. PV-1-101

DATE
 08/10/23

SCALE
 1" = 10'

DATE
 08/10/23

DATE
 08/10/23

DATE
 08/10/23

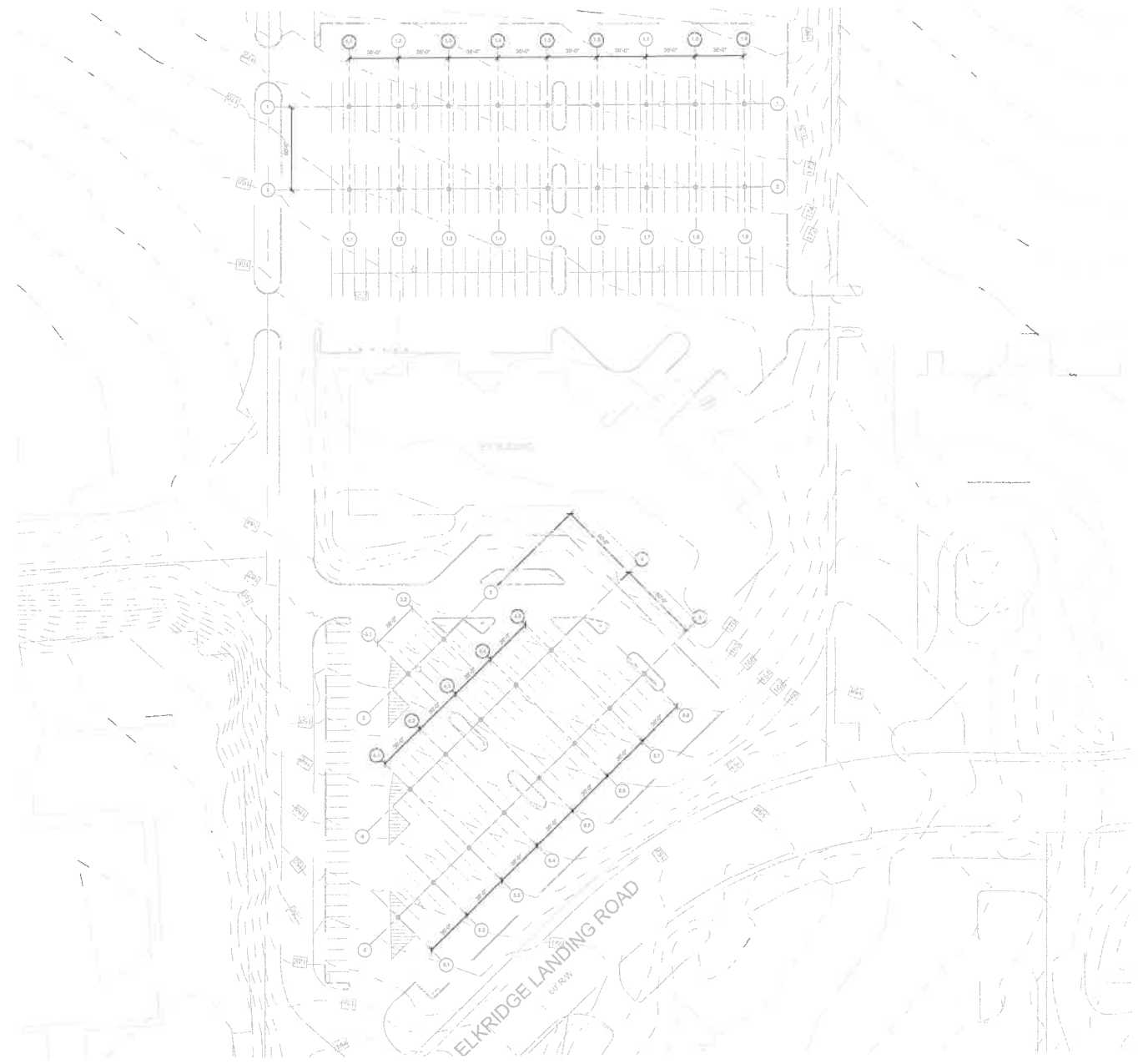
DATE
 08/10/23

DATE
 08/10/23

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 08/10/23

DATE
 08/10/23

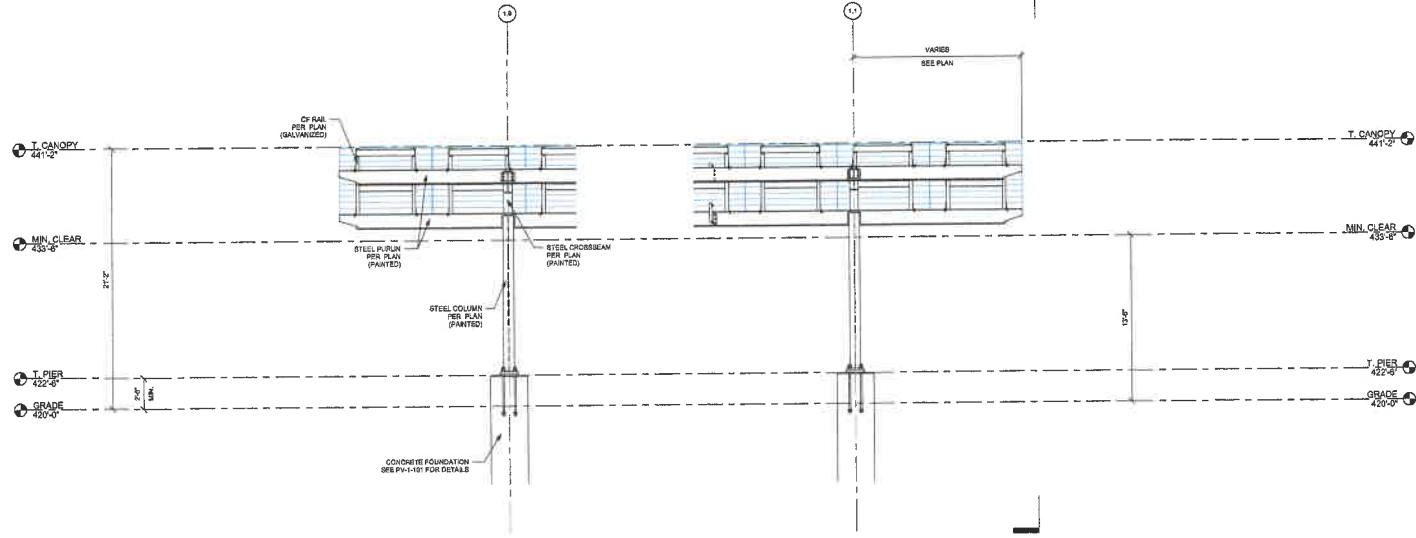
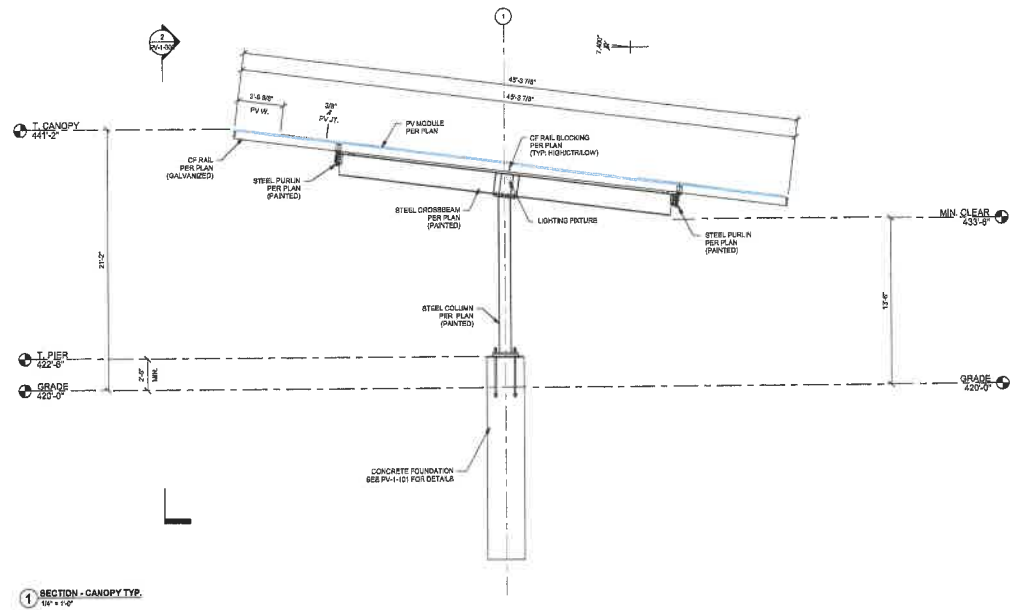
DATE
 08/10/23



1 SITE PLAN - FOUNDATION
 PV-1-101

PV-1-101

NOTE:
SIZES SHOWN ARE PRELIMINARY AND SUBJECT
TO CHANGE AS DESIGN PROGRESSES.



CI
 RENEWABLES

PARASOL
 12345 MAIN ST.
 WESTPORT, NY 12998
 518-888-1234

PROJECT # 23456
 DATE 08/10/23

PREPARED BY: [Name]
 CHECKED BY: [Name]
 DESIGNED BY: [Name]
 APPROVED BY: [Name]

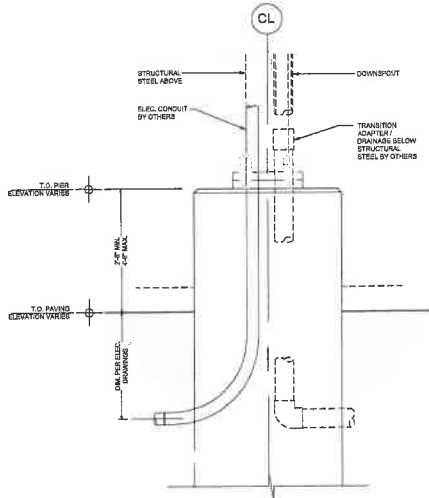
30% DESIGN PROGRESS
 08/10/23

DATE
 DRAWN BY
 CHECKED BY
 DESIGNED BY
 APPROVED BY

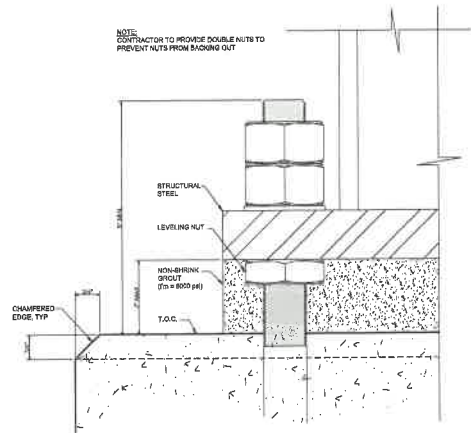
SCALE 1/4" = 1'-0"

DRAWN BY: [Name]
 CHECKED BY: [Name]
 DESIGNED BY: [Name]
 APPROVED BY: [Name]

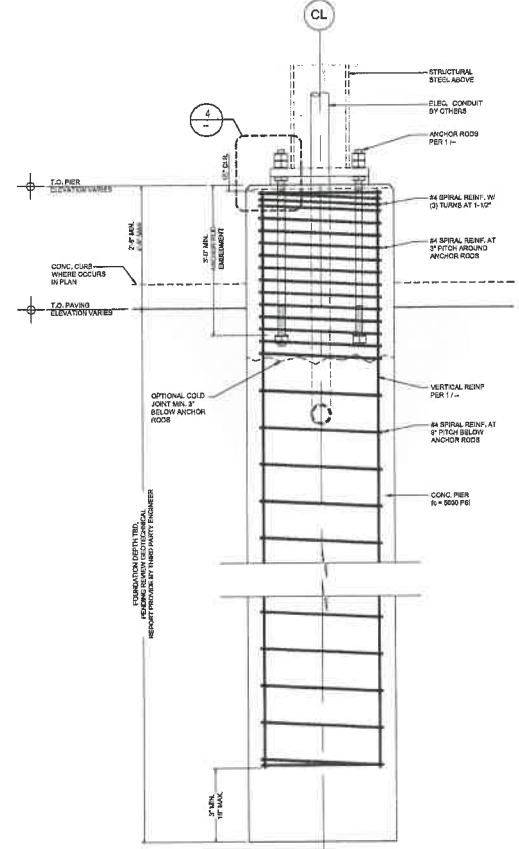
PV-1-300



5 DETAILS AT ELEC. CONDUIT (REFERENCE ONLY)
SCALE: 1/4" = 1'-0"



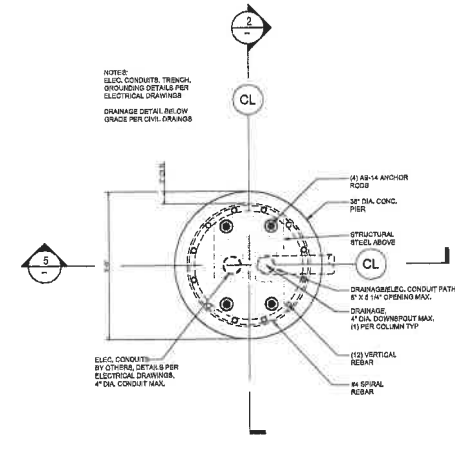
4 TYP. DETAIL AT COLUMN BASE
SCALE: 1/4" = 1'-0"



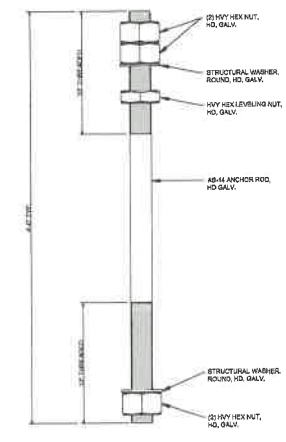
2 TYP. FOUNDATION ELEVATION
SCALE: 1/4" = 1'-0"

FOUNDATION TYPE	ARRAY	FOUNDATION DIAMETER	FOUNDATION EMBEDMENT DEPTH	ANCHOR ROD EMBEDMENT DEPTH	NOTES
F1	C8 - C10	3'-0"	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

FOUNDATION SCHEDULE
SCALE: N/A



1 TYP. FOUNDATION PLAN
SCALE: 1/4" = 1'-0"



3 ANCHOR ROD
SCALE: 1/4" = 1'-0"

NOTE: ELEC. CONDUITS, TRENCH GROUNTING DETAILS PER ELECTRICAL DRAWINGS. DRAINAGE DETAIL BELOW GRADE PER CIVIL DRAWINGS.

NOTE: CONTRACTOR TO PROVIDE DOUBLE NUTS TO PREVENT NUTS FROM BACKING OUT.

CI RENEWABLES
PARASOL
 400 W. 10th St. • BOZEMAN, MT 59717
 www.parasolrenewables.com

PROJECT # 2021-0001
 DRAWING NO. PV-1-400
 DATE 08/10/23

30% DESIGN PROGRESS
 08/10/23

DESIGNED BY: KPF
 CHECKED BY: KPF
 APPROVED BY: KPF
 DRAWING SHEET NO. 47 OF 50

PV-1-400
 FOUNDATION DETAILS



OFFICE OF PLANNING AND ZONING

CONFIRMATION OF PRE-FILE (2023-0054-P)

DATE OF MEETING: 12/1/2023

P&Z STAFF: Sara Anzelmo, Hala Flores

APPLICANT/REPRESENTATIVE: Zack Sill, Sill Engineering EMAIL: zach@sillengineering.com

SITE LOCATION: 900 Elkridge Landing Road, Linthicum Heights LOT SIZE: 6.65 ac ZONING: W1

CA DESIGNATION: N/A BMA: N/A or BUFFER: N/A APPLICATION TYPE: Zoning Variance

The applicant is requesting a variance in connection with multiple proposed solar carport structures located at 900 Elkridge Landing. From the applicant’s letter: “Based on our coordination with our engineering team, Sill Engineering Group, it is our understanding that Carport structures with solar panels would be considered accessory structures/use and that accessory structures in a W1 District must be set back 25 feet from the side and rear lot lines and may not be located in the front yard. Per section 18-16-305 we are requesting a variance to allow [three] carport structures to be located within the “front yard” which is the front parking lot of this building. We are meeting all other setback requirements. The proposed solar structure is shown to be installed over existing parking lot areas and provides benefits for both green power and covered parking for vehicles. The request for variance to include “front yard” installation is so that the total solar provided can be maximized and not just limited to the back side of the building.”

COMMENTS

The **Office of Inspections & Permits, Engineering Division** notes that the applicant will need 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 [Site Development Plan] process. Disturbance is counted when earth is disturbed in any way or full depth pavement is replaced.

The **Development Division, Regional Team** reviewed the proposal and offered no comment.

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 18-16-201 (b) Pre-filing meeting required. Before filing an application for a variance, special exception, or to change a zoning district, to change or remove a critical area classification, or for a variance in the critical area or bog protection area, an applicant shall meet with the Office of Planning and Zoning to review a pre-file concept plan or an administrative site plan. For single lot properties, the owner shall prepare a simple site plan as a basis for determining what can be done under the provisions of this Code to avoid the need for a variance.

*** A preliminary plan checklist is required for development impacting environmentally sensitive areas and for all new single-family dwellings. A stormwater management plan that satisfies the requirements of the County Procedures Manual is required for development impacting environmentally sensitive areas OR disturbing 5,000 square feet or more. State mandates require a developer of land provide SWM to control new development runoff from the start of the development process.

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.