FINDINGS AND RECOMMENDATION
OFFICE OF PLANNING AND ZONING
ANNE ARUNDEL COUNTY, MARYLAND

APPLICANT: University of Maryland Medical System Corporation

ASSESSMENT DISTRICT: 5

CASE NUMBER: 2024-0044-V

COUNCIL DISTRICT: 1

HEARING DATE: May 9, 2024

PREPARED BY: Jennifer Lechner
Planner

REQUEST

The applicant is requesting a variance to allow an accessory structure (solar carport) in the front yard of a nonwaterfront lot and with less setbacks than required on property located at 900 Elkridge Landing Road in Linthicum Heights.

LOCATION AND DESCRIPTION OF SITE

The subject site consists of approximately 6.65 acres of land and is located with frontage on the north side of Elkridge Landing Road. It is identified as Lot 1 of Parcel 31 in Grid 12 on Tax Map 3 in the Airport Square II subdivision. The property is zoned W1 – Industrial Park District. The current zoning was adopted by the comprehensive zoning for Council District 1, effective July 10, 2011. The property is not located within the Chesapeake Bay Critical Area. It is currently improved with a four-story office building and associated facilities.

PROPOSAL

The applicants propose to install five (5) carport canopy solar arrays over the existing parking lot on their property.

REQUESTED VARIANCES

§ 18-2-204(b) of the Anne Arundel County Zoning Ordinance provides that an accessory structure may not be located in the front yard of a nonwaterfront lot.

> The three (3) southernmost carport canopy solar arrays (44.6’ x 59.9’, 44.6’ x 164.8’, and 44.6’ x 277.2’) will be located in the front yard, necessitating a variance.

A review of the bulk regulations for development within the W1 District reveals that a setback variance is not required.

FINDINGS

The subject property is irregular in shape and exceeds the minimum lot size of 40,000 square feet and the minimum lot width of 150 feet for lots in the W1 District. A review of the 2024 County

aerial photography shows that the general area consists of various commercial buildings with associated parking lots.

The applicants' letter explains that the requested variance will help achieve their renewable energy goals, as well as provide parking cover for vehicles. Without the use of the front parking lot, the applicant argues that the viability of the project as a whole would be undermined and would generate insufficient energy to justify the project. Their letter, supplement and site exhibits explain that they have evaluated alternative locations for the proposed solar panels, and found that the existing shade and tree cover, underground utilities, and age of the existing roof prevent viable solar from being located in those areas. In addition, to the age of the roof, the applicant asserts that the system sizes on the roof would have been significantly smaller than the carport designs. The applicant is willing to add or relocate building signage as necessary to ensure the building can be located by the public.

The applicant has also indicated that the canopies are preferred over roof mounted arrays, and serve a dual purpose of providing clean energy while also diminishing the adverse impacts of overheated asphalt. The applicant further believes that the solar canopies will not alter the essential character of the neighborhood or district as the subject property is located in a commercial neighborhood surrounded by office uses.

Agency Comments

The **Health Department** notes that the property is served by public water and sewer facilities, and has no objection to the above-referenced request.

The **Development Division** defers to the Zoning Division regarding the requested variance.

Variance Criteria

For the granting of a zoning variance, a determination must be made as to whether, because of certain unique physical conditions peculiar to or inherent in the particular lot or because of exceptional circumstances other than financial considerations, strict implementation of the Code would result in practical difficulties or an unnecessary hardship. The need sufficient to justify a variance must be substantial and urgent and not merely for the convenience of the applicant.

In this particular case, the subject property is oversized with respect to the minimum lot width and area requirements of the Code. The applicant is already offered the opportunity to locate a sizable solar array in the rear yard and intends to do so. The applicant in this instance simply seeks to maximize the areas of solar arrays on the subject property.

The granting of the variance would not alter the essential character of the neighborhood or district in which the lot is located, would not substantially impair the appropriate use or development of adjacent property, nor would it be detrimental to the public welfare. A landscape buffer could be provided to screen the carports along the road.

RECOMMENDATION

Based upon the standards set forth in § 18-16-305 of the Code under which a variance may be granted, this Office recommends ***approval*** of a zoning variance to § 18-2-204(b) to allow (3) three carport solar arrays in the front yard of a nonwaterfront lot.

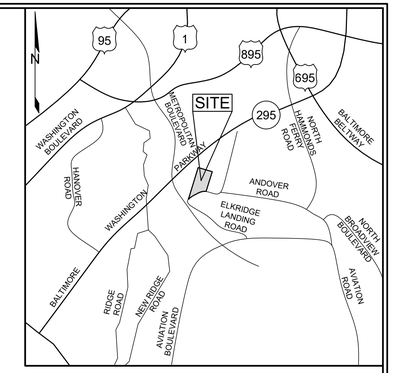
DISCLAIMER: This recommendation does not constitute a building permit. In order for the applicant(s) to construct the structure(s) as proposed, the applicant(s) shall apply for and obtain the necessary building permits and obtain any other approvals required to perform the work described herein. This includes but is not limited to verifying the legal status of the lot, resolving adequacy of public facilities, and demonstrating compliance with environmental site design criteria.

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING	CHORD
C1	405.01'	117.05'	34°14'20"	30.91'	S 78°10'32" W	224.90'
C2	1,030.00'	104.87'	05°50'00"	52.48'	S 59°09'01" W	104.82'

LEGEND

- EXISTING CONTOUR (FIELD RUN) — 382
- EXISTING CONTOUR (GIS) — 382
- PROPOSED CONTOUR — 382
- EXISTING SPOT ELEVATION — 382.3
- PROPOSED SPOT ELEVATION — +82.53
- DIRECTION OF FLOW
- PROPOSED SOLAR CAR PORT AREA
- EXISTING WATER
- EXISTING ELECTRIC — E
- EXISTING COMMUNICATIONS — T
- EXISTING LIGHT POLE TO BE REOMVED
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE

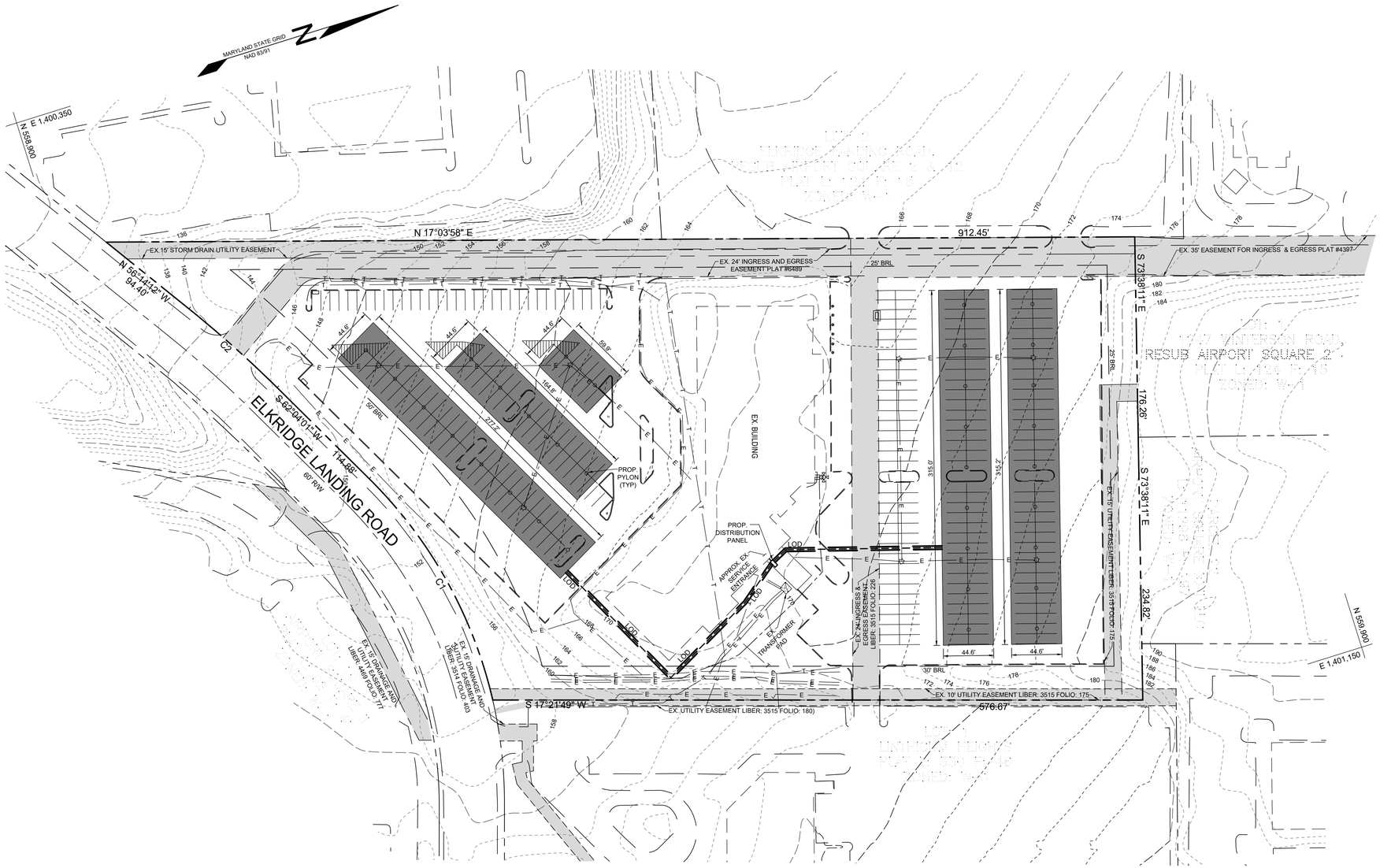


VICINITY MAP

SCALE: 1"=2000'

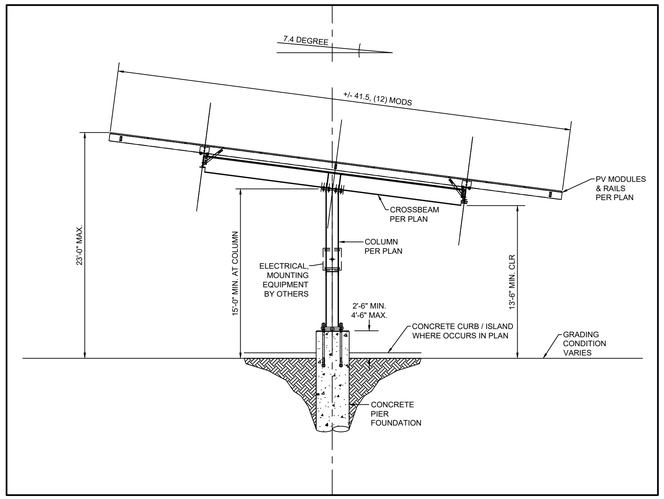
GENERAL NOTES

1. SUBJECT PROPERTY ZONED W-1
2. TOTAL AREA OF PROPERTY = 6.65 ACRES±
3. PROPERTY ADDRESS: 900 ELKRIDGE LANDING ROAD, LINTHICUM MARYLAND 21090
4. DEED REFERENCE: LIBER: 30457 FOLIO: 498
5. PREVIOUS ANNE ARUNDEL COUNTY FILE NUMBERS: PLAT #6489, PLAT #4397
6. THE BOUNDARY SHOWN HERE ON IS BASED ON A BOUNDARY SURVEY PREFORMED BY SEG LAND SURVEYING IN JUNE OF 2023.
7. THE TOPOGRAPHY SHOWN WITHIN THE DEVELOPMENT AREA IS BASED ON A TOPOGRAPHIC SURVEY PREFORMED BY SEG 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 (GIS): 29,474 SF
11. SOLAR CAR PORT TOTAL FOOTPRINT: 50,568 SF
12. SITE LIMIT OF DISTURBANCE:
    SOLAR PYLON = 7.0686SF X 34 PYLONS = 240.33SF
    3' WIDE TRENCH FOR UTILITY INSTALATION = 1,210SF
    1 TRANSFORMER PAD = 19SF
    TOTAL SITE DISTURNACE = 240.33 + 1,210 + 19 = 1,469.33SF
13. ELECTRICAL DESIGN BY: PARASOL STRUCTURES



PLAN VIEW

SCALE: 1" = 50'



SOLAR CARPORT DETAIL

NOT TO SCALE

NOTE: LIGHTING TO BE PROVIDED UNDER PANELS

N 558,900
E 1,401,150

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 INCH = 50 FEET

DEVELOPER

CI RENEWABLES
1340 SMITH AVENUE, SUITE 200
BALTIMORE, MARYLAND 21209
C/O WALTER SERAFYN
WALTER.SERAFYN@CIRENEWCOM

OWNER

UNIVERSITY OF MARYLAND MEDICAL SYSTEM CORPORATION
250 WEST PRATT STREET, SUITE 1400
BALTIMORE, MARYLAND 21090

SITE PLAN

UMMS SOLAR 1

900 ELKRIDGE LANDING ROAD

TAX MAP 03 GRID 12 — PARCEL 31, LOT 1
1ST ELECTION DISTRICT — ANNE ARUNDEL COUNTY, MARYLAND

SILL ENGINEERING GROUP, LLC
16005 Frederick Road, 2nd Floor
Woodbine, Maryland 21797
Phone: 443.325.5076
Fax: 410.696.2022
Email: info@sillengineering.com
Civil Engineering for Land Development

DESIGN BY:	PS
DRAWN BY:	ZS
CHECKED BY:	PS
SCALE:	AS SHOWN
DATE:	MARCH 15, 2024
PROJECT #:	23-007
SHEET #:	1 of 1

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32025, EXPIRATION DATE JUNE 20, 2025

March 25, 2024

Anne Arundel County: Office of Planning and Zoning
2664 Riva Dr #170
Annapolis, MD 21401

RE: Letter of Explanation 900 Elkridge Landing – Accessory Structure Variance for Carport Solar Structure; Case 2024-0044-V

To Whom It May Concern:

We are submitting this Letter of Explanation as a request for variance in connection with our Prefile for a solar carport structure located at 900 Elkridge Landing. Based on review 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 to section 18-16-305 we are requesting a variance to allow 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.

Our goal is to help the building owner, University of Maryland Medical System (UMMS), achieve their renewable energy goals; and this project both helps achieve this as well as providing parking cover for vehicles. The proposed solar structure is shown to be installed exclusively over existing parking lot areas that are already impervious surfaces so that there is minimal disturbance of vegetated areas. Based on the layout of the building in this location, approximately 50% of the available parking area for solar is located in what is considered the "front yard" of the building. In order to provide a project large enough for UMMS to have a viable system that will help meet their renewable goals, the use of the "front yard" is needed.

If there are any concerns regarding the structure blocking building identification, our team is willing to work with UMMS to add or relocate building signage as necessary to ensure the building can be located by the public.

1340 Smith Avenue, Suite 200 • Baltimore, MD 21209 • 443-461-5905
www.cirenew.com

Full plans including dimensions, layout, height of structures, setbacks, etc. are included in this prefiling package. We believe that this variance meets the requirements of section 18-16-305.

Should there be any questions, please contact me at eric.metcalf@cirenew.com or 443-462-2650.

Very truly yours,
CI Renewables

Eric Metcalf
Vice President - Construction

Cc: Walter Serafyn (CIR)
Sill Engineering Group

1340 Smith Avenue, Suite 200 • Baltimore, MD 21209 • 443-461-5905
www.cirenew.com

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

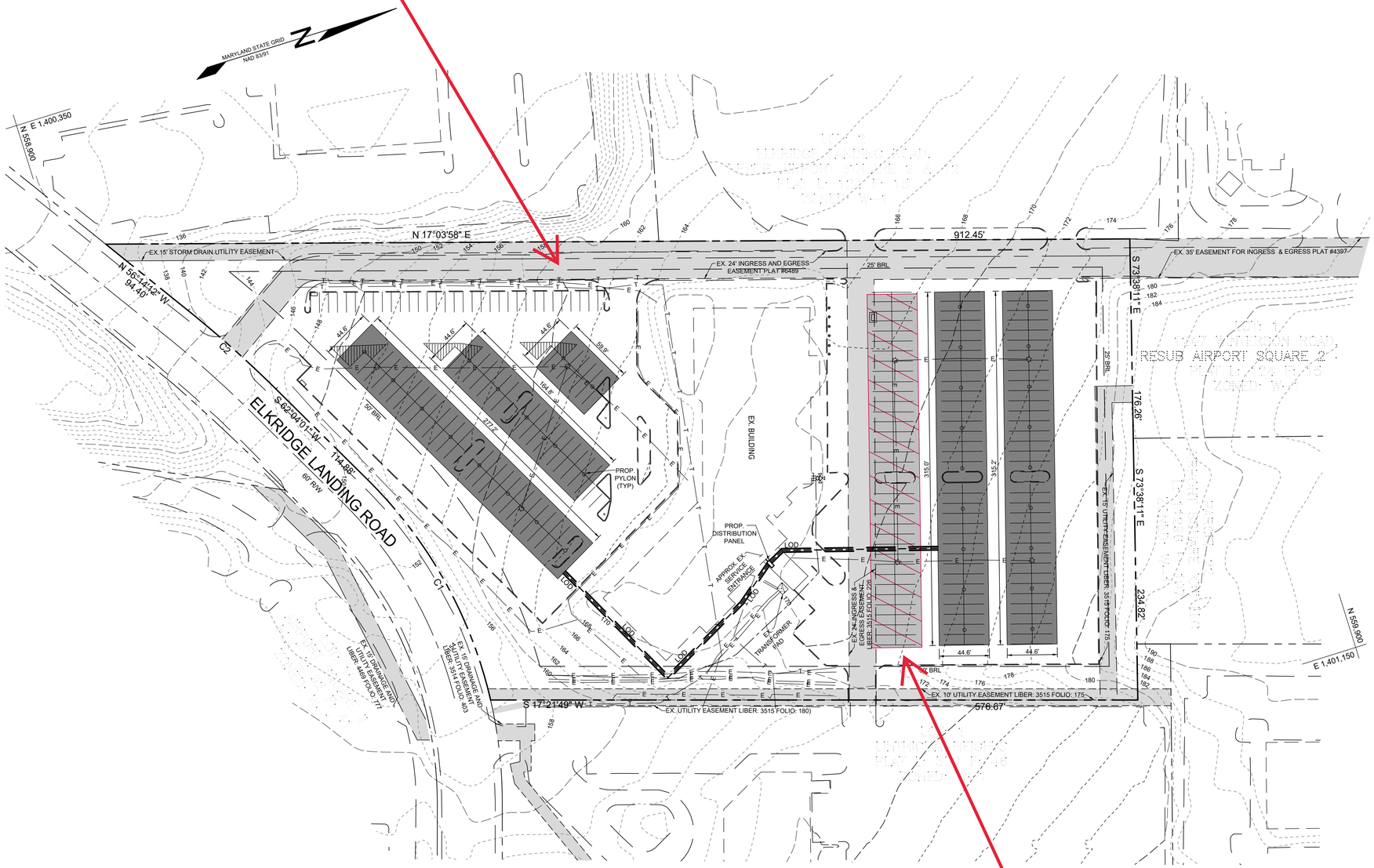
Not applicable.

(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.



PLAN VIEW
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C2	1,030.00'	104.87'	05°50'00"	52.48'	S 59°09'01" W	104.82'

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

LEGEND

- EXISTING CONTOUR (FIELD RUN) — 382
- 382
- 382
- 382.3 + 82.53
- AREA
- EXISTING WATER
- EXISTING ELECTRIC — E —
- EXISTING COMMUNICATIONS — T —
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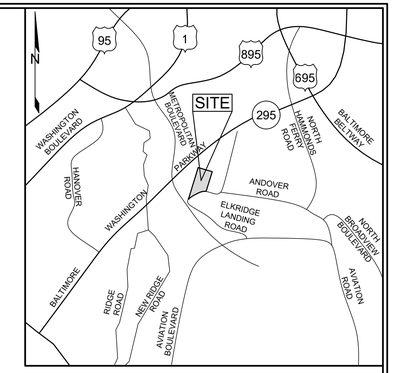

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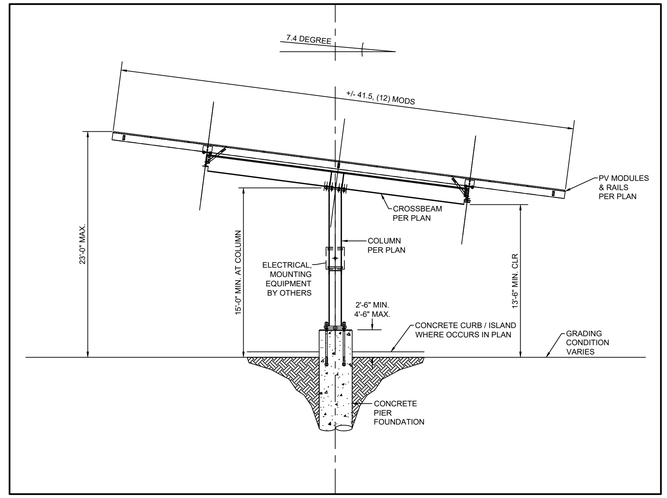

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NOTE: LIGHTING TO BE PROVIDED UNDER PANELS

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 INCH = 50 FEET

DEVELOPER
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1340 SMITH AVENUE, SUITE 200
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C/O WALTER SERAFYN
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SITE PLAN

UMMS SOLAR 1

900 ELKRIDGE LANDING ROAD

TAX MAP 03 GRID 12 — PARCEL 31, LOT 1
1ST ELECTION DISTRICT — ANNE ARUNDEL COUNTY, MARYLAND

SILL ENGINEERING GROUP, LLC
16005 Frederick Road, 2nd Floor
Woodbine, Maryland 21797
Phone: 443.325.5076
Fax: 410.696.2022
Email: info@sillengineering.com
Civil Engineering for Land Development

DESIGN BY: PS
DRAWN BY: ZS
CHECKED BY: PS
SCALE: AS SHOWN
DATE: MARCH 15, 2024
PROJECT #: 23-007
SHEET #: 1 of 1

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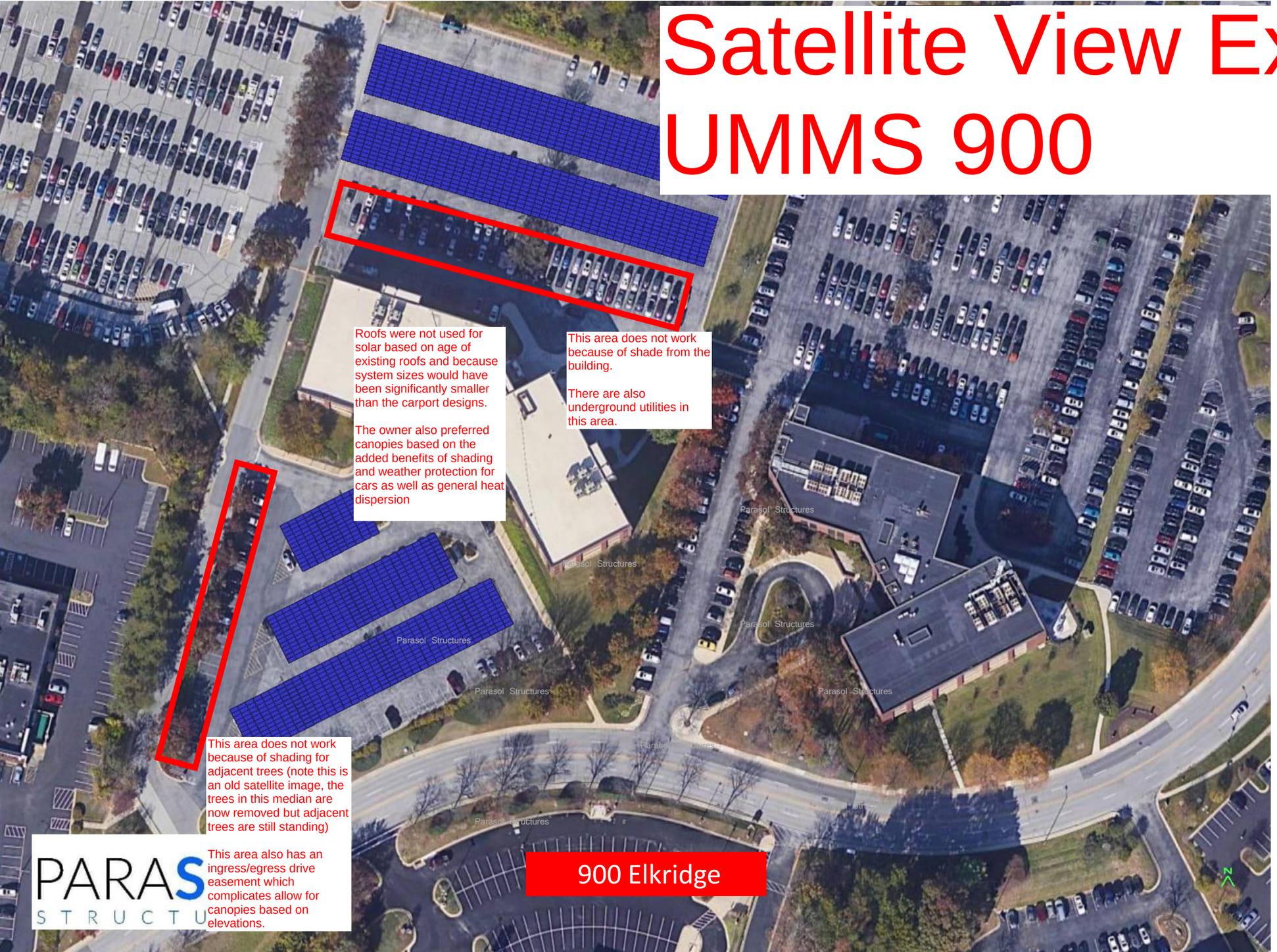
Satellite View Exhibit
UMMS 900



RENEWABLES

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

Additional Views UMMS 900 and 920

GSN - 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 AHJ PROVIDES NO DETAILED SPECIFICATIONS, THE MATERIALS AND METHODS OF CONSTRUCTION SHALL MEET AND CONFORM TO THE REQUIREMENTS OF LOCAL CODES AND UFC 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.

GSN - 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.

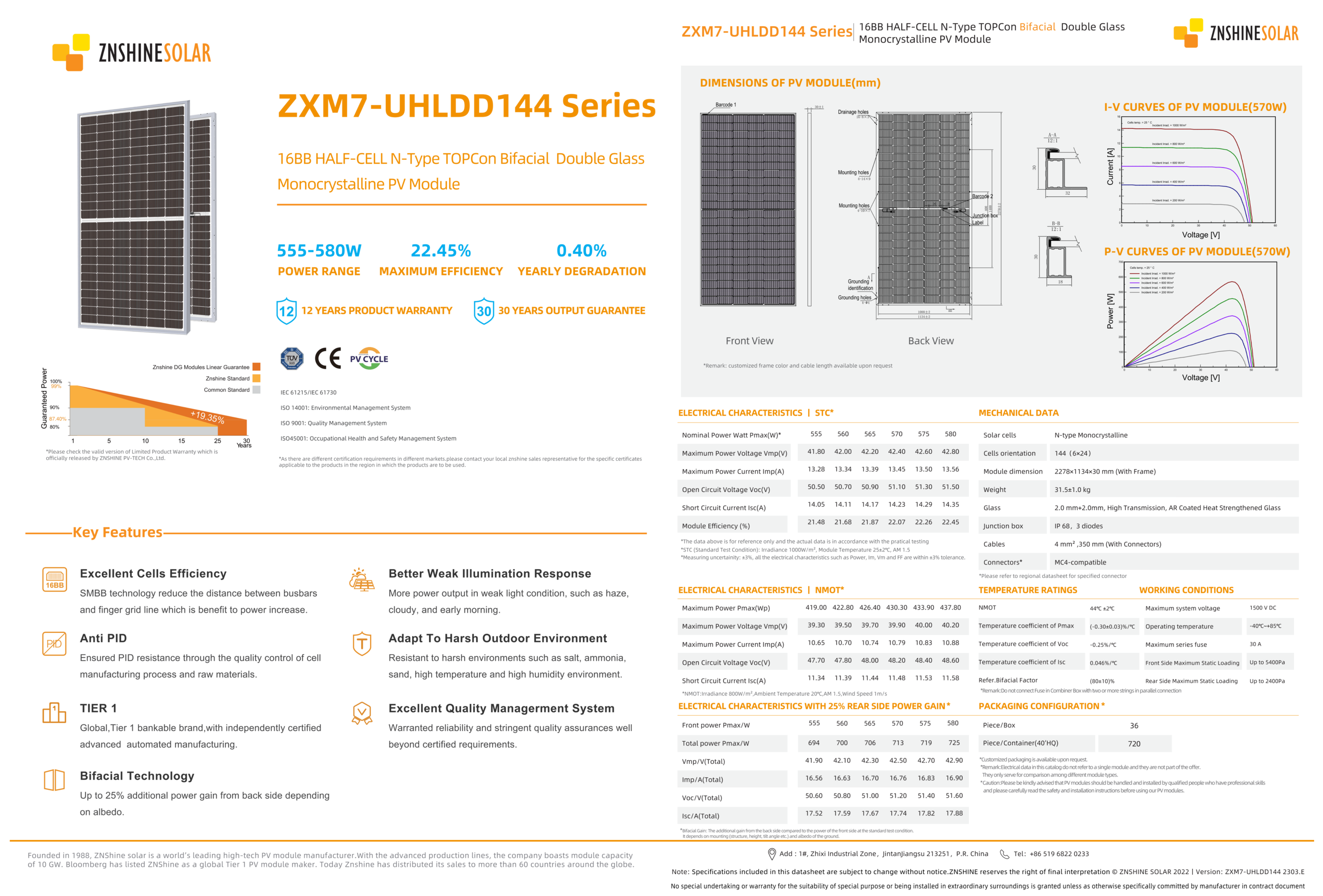
STEEL FABRICATION NOTES

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 G90 PER ASTM 653
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

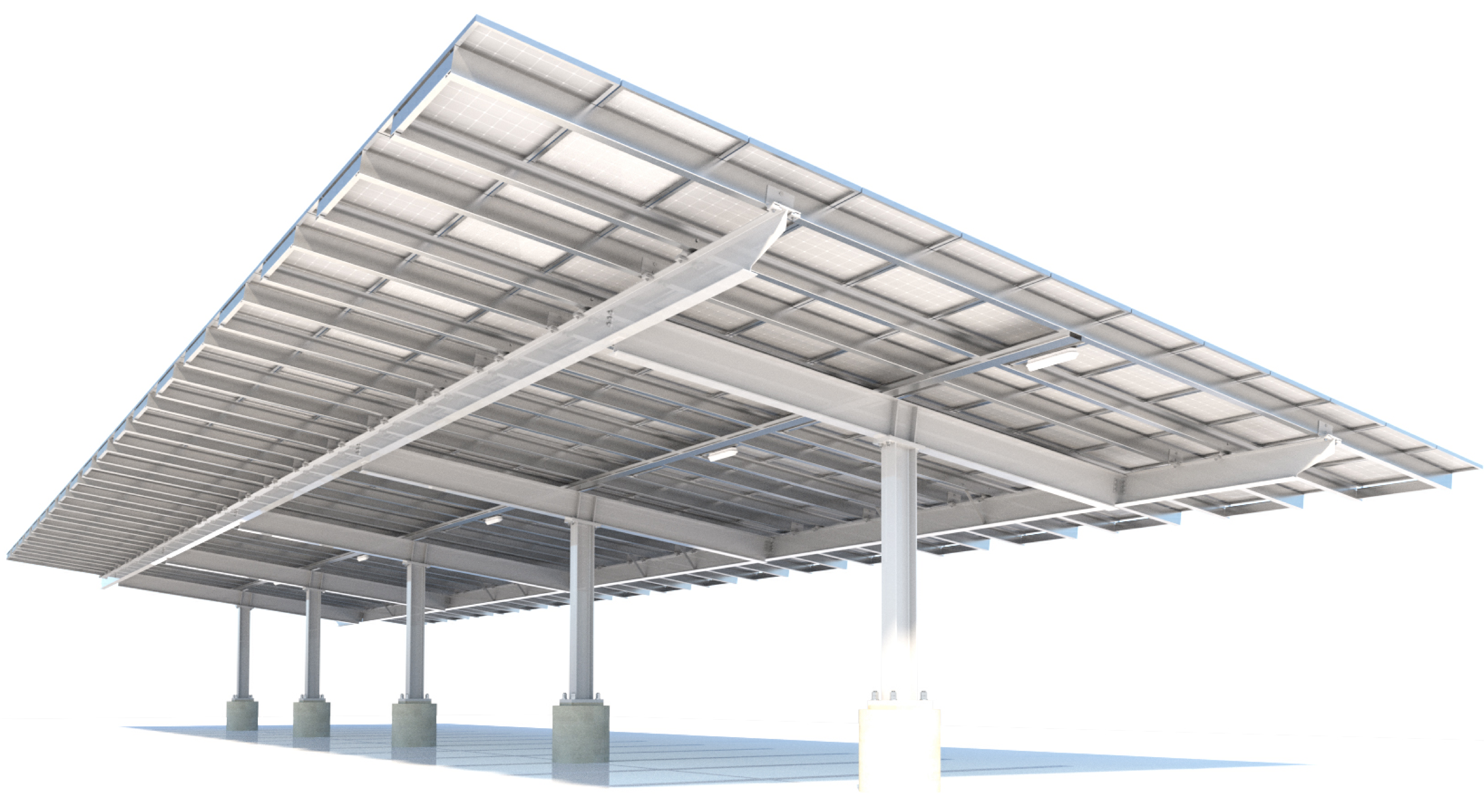
SHEET NUMBER	SHEET NAME	30% DESIGN PROGRESS	60% DESIGN PROGRESS	90% DESIGN PROGRESS	IFP DESIGN PROGRESS
PV-1-000	PROJECT LOCATION & DRAWING LIST	•			
PV-1-100	SITE PLAN - PV LAYOUT	•			
PV-1-101	SITE PLAN - FOUNDATION	•			
PV-1-300	CANOPY SECTIONS	•			
PV-1-400	TYP. FOUNDATION DETAILS	•			
TOTAL # SHEETS: 5					



2 PV PANEL SPECIFICATION
N.T.S.

1 PROJECT LOCATION MAP
N.T.S.

N E S W



3 SAMPLE PROJECT IMAGE
N.T.S.

CI RENEWABLES

PARASOL STRUCTURES
NEW YORK BOSTON
WWW.PARASOLSTRUCTURES.COM

PROJECT # :23011

kpff
Consulting Engineers
3131 Camino Del Rio North, Suite 1080
San Diego, California 92108
(619) 521-8500 Fax (619) 521-8591

KPFF Job # : 0000000

ENGINEER'S STAMP

NOT FOR CONSTRUCTION

30% DESIGN PROGRESS
08/10/23

ISSUED SET / REVISIONS

SYM	DESCRIPTION	DATE
1	30% DESIGN PROGRESS	08/10/23

PROJECT TITLE
UMMS-1

PROJECT ADDRESS
900 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

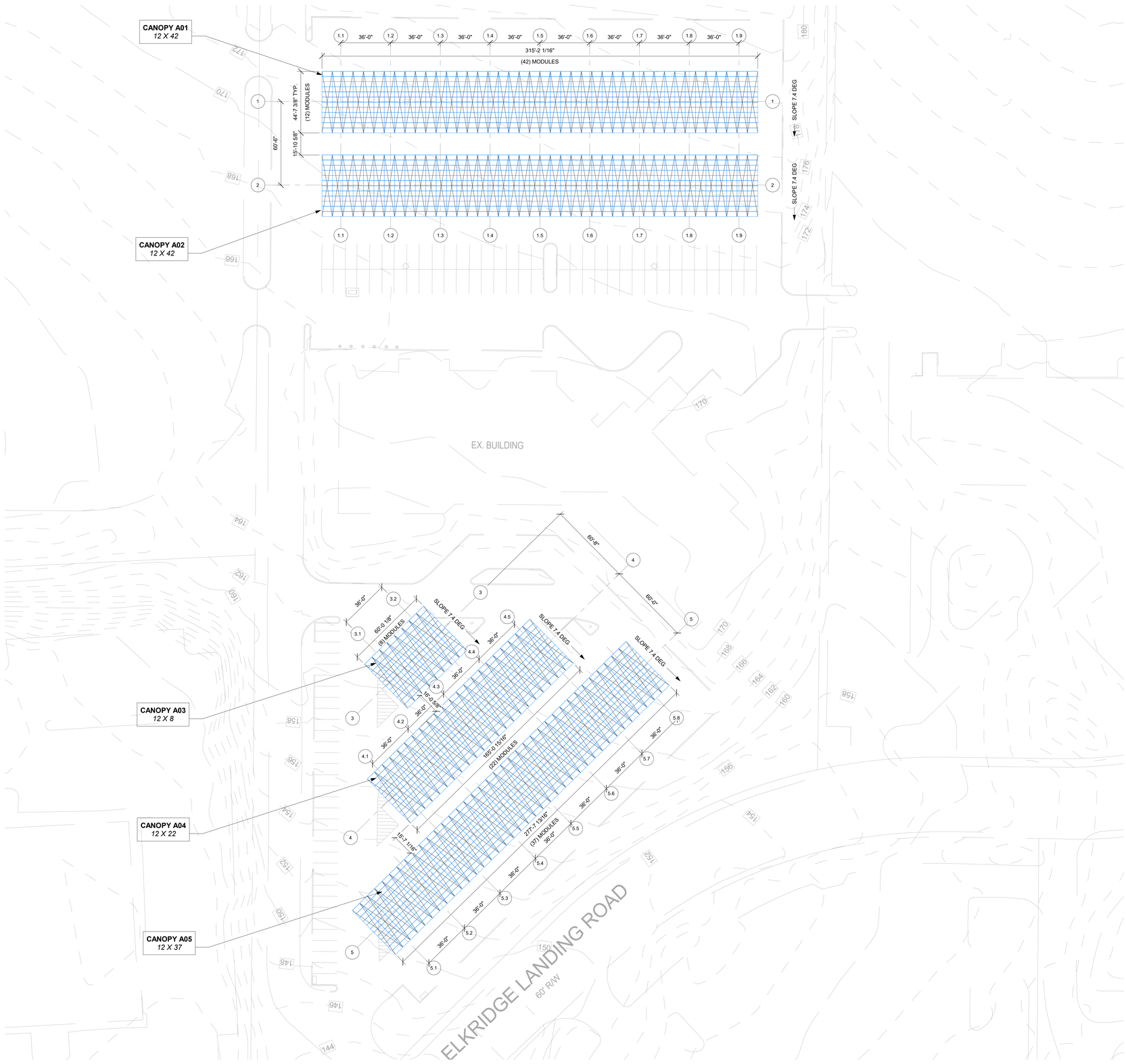
SHEET TITLE
PROJECT LOCATION & DRAWING LIST

DESIGNED BY : PARASOL
DRAWN BY: ZR
CHECKED BY : KPFF
APPROVED BY : KPFF
ORIGINAL SHEET SIZE : 42" x 30"

SCALE
0 1/2" 1"
IF BAR IS NOT ONE INCH, DRAWING IS NOT TO SCALE

DWG NO.
PV-1-000

PV SCHEDULE				
CANOPY	MATERIAL	WATTAGE	QTY	SYSTEM SIZE (kWp)
A01	ZNSHINE SOLAR ZXM7-UHLDD144	575	504	289.80
A02	ZNSHINE SOLAR ZXM7-UHLDD144	575	504	289.80
A03	ZNSHINE SOLAR ZXM7-UHLDD144	575	96	55.20
A04	ZNSHINE SOLAR ZXM7-UHLDD144	575	264	151.80
A05	ZNSHINE SOLAR ZXM7-UHLDD144	575	444	255.30
		TOTAL:	1,812	1,041.90



1 SITE PLAN - PV LAYOUT
1" = 30'-0"

CI RENEWABLES

PARASOL STRUCTURES
NEW YORK BOSTON
WWW.PARASOLSTRUCTURES.COM

PROJECT # :23011

kpff
Consulting Engineers
3121 Cambria Del Rio North, Suite 1900
Baltimore, Maryland 21224
(410) 567-0000 Fax (410) 567-0001

KPFF Job # : 0000000

ENGINEER'S STAMP

NOT FOR CONSTRUCTION

30% DESIGN PROGRESS 08/10/23

ISSUED SET / REVISIONS

SYM	DESCRIPTION	DATE
-	30% DESIGN PROGRESS	08/10/23

PROJECT TITLE
UMMS-1

PROJECT ADDRESS
6000 ELKRIDGE LANDING RD
LINTHICUM HEIGHTS, MD 21090

SHEET TITLE
SITE PLAN - PV LAYOUT

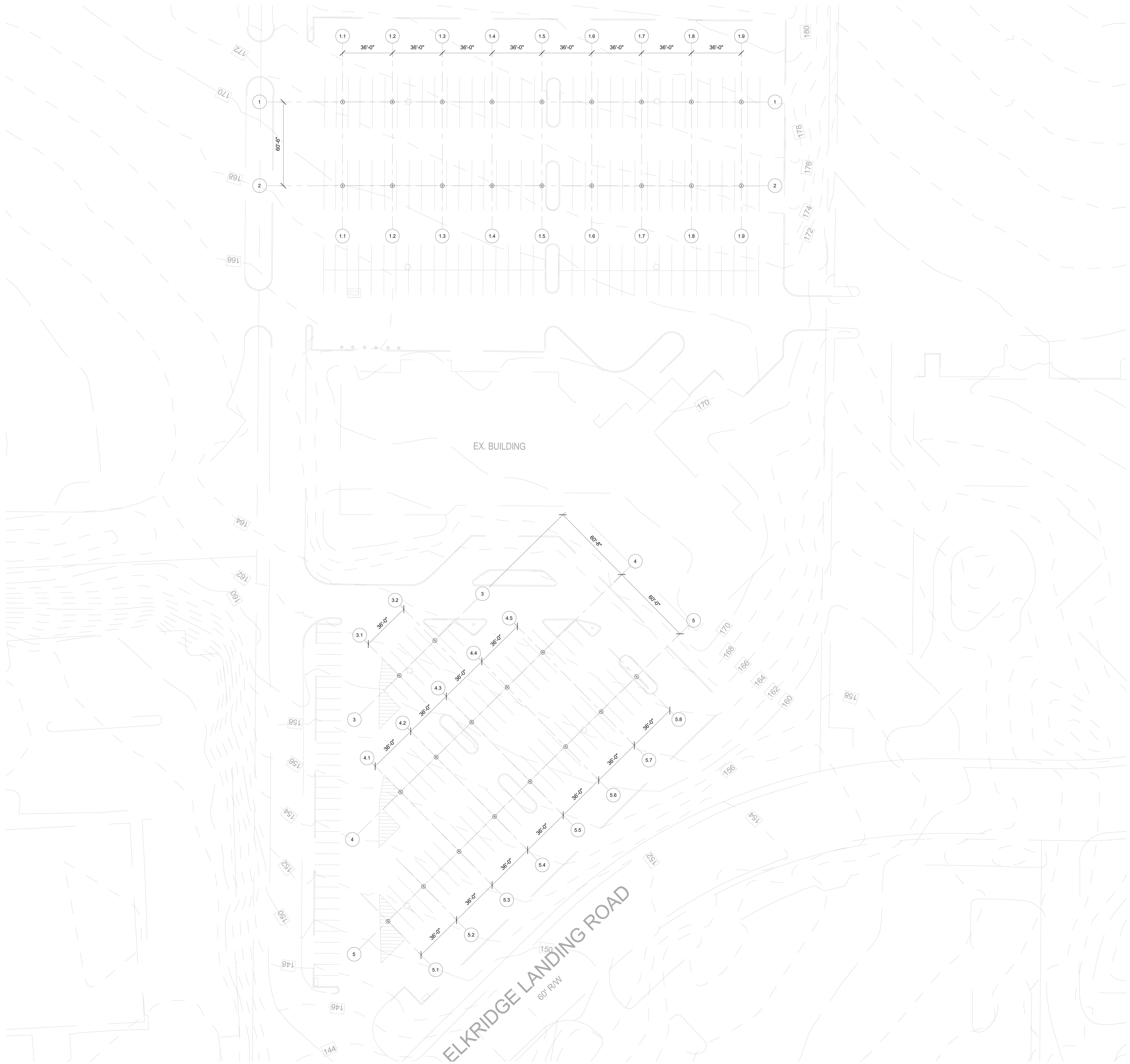
DESIGNED BY : PARASOL
DRAWN BY: ZR
CHECKED BY : KPFF
APPROVED BY : KPFF
ORIGINAL SHEET SIZE : 42" x 30"

SCALE
0 1/2" 1"
IF NOT 1/2" THEN DRAWING IS NOT TO SCALE

DWG.NO.
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



1 **SITE PLAN - FOUNDATION**
1" = 30'-0"

RENEWABLES

PARASOL STRUCTURES
NEW YORK BOSTON
WWW.PARASOLSTRUCTURES.COM

PROJECT # :23011

kpff
Consulting Engineers
3131 Camino Del Rio North, Suite 1080
San Diego, California 92108
(619) 521-8500 Fax (619) 521-8591

KPFF Job # : 0000000

ENGINEER'S STAMP

NOT FOR CONSTRUCTION

30% DESIGN PROGRESS
08/10/23

PROJECT TITLE
UMMS-1

PROJECT ADDRESS
900 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

SHEET TITLE
SITE PLAN - FOUNDATION

ISSUED SET / REVISIONS

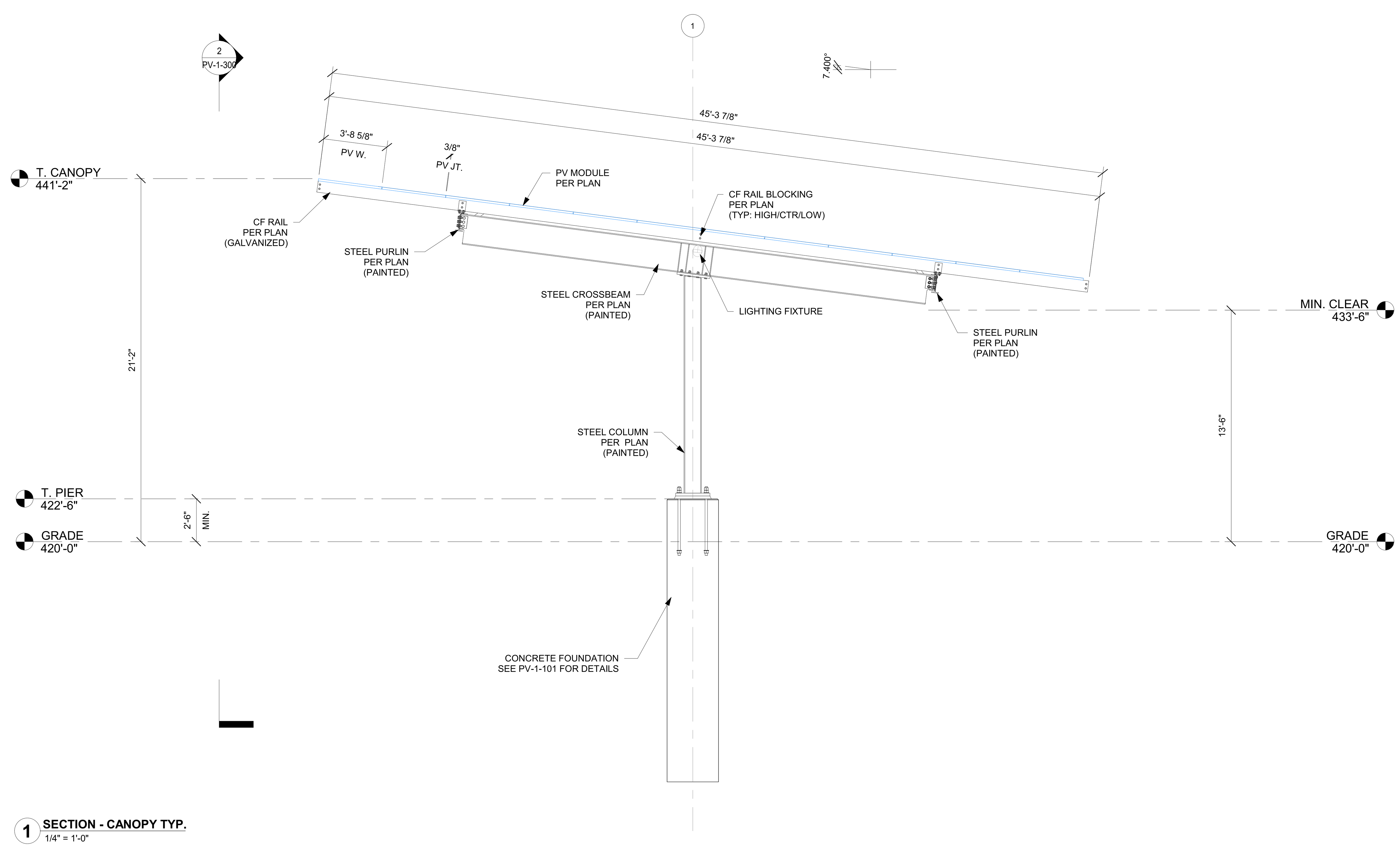
SYM	DESCRIPTION	DATE
1	30% DESIGN PROGRESS	08/10/23

DESIGNED BY : PARASOL
DRAWN BY: ZR
CHECKED BY : KPFF
APPROVED BY : KPFF
ORIGINAL SHEET SIZE : 42" x 30"

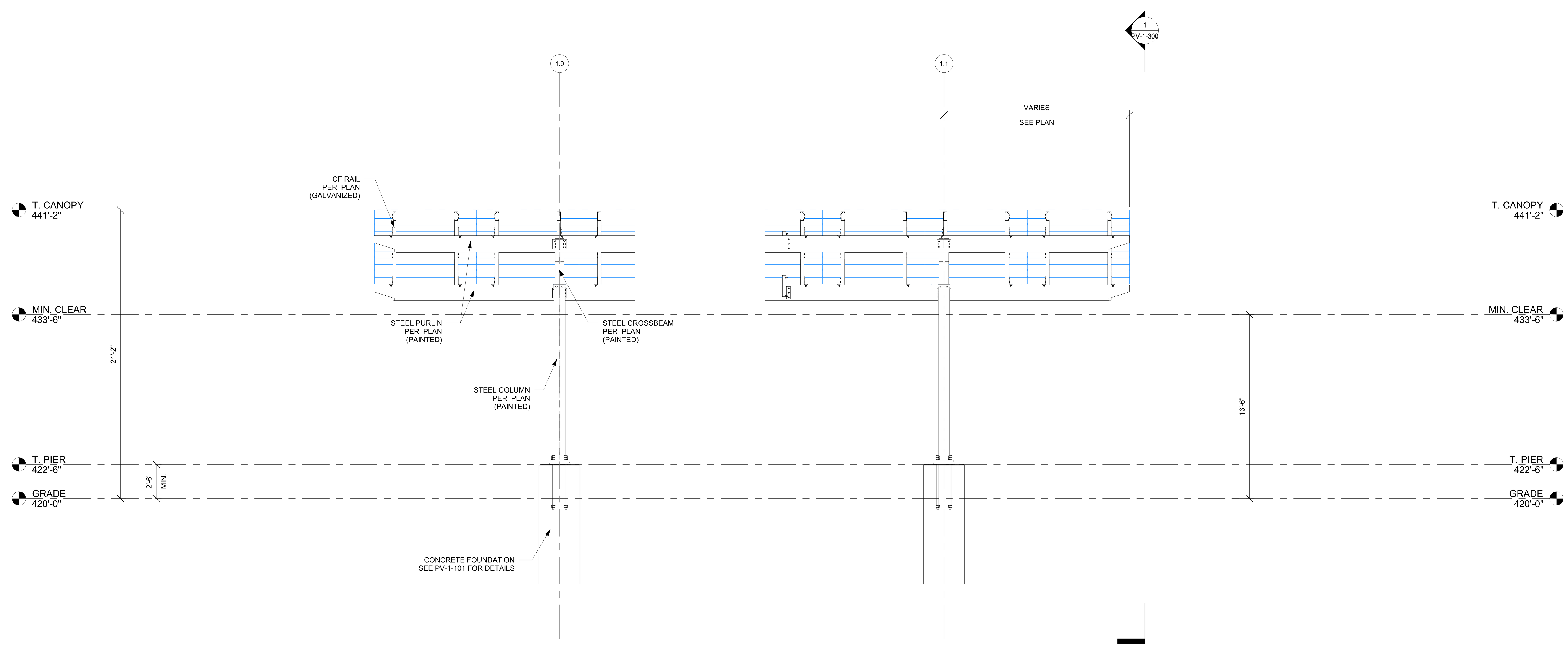
SCALE
0 1/2" 1"
IF BAR IS NOT ONE INCH, DRAWING IS NOT TO SCALE

DWG NO.
PV-1-101

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



1 **SECTION - CANOPY TYP.**
1/4" = 1'-0"



2 **SECTION - CANOPY TYP.**
1/4" = 1'-0"

CI RENEWABLES

PARASOL STRUCTURES
NEW YORK BOSTON
WWW.PARASOLSTRUCTURES.COM

PROJECT # : 23011

kpff
Consulting Engineers

KPFF Job # : 0000000

ENGINEER'S STAMP

NOT FOR CONSTRUCTION

30% DESIGN PROGRESS
08/10/23

PROJECT TITLE
UMMS-1

PROJECT ADDRESS
900 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

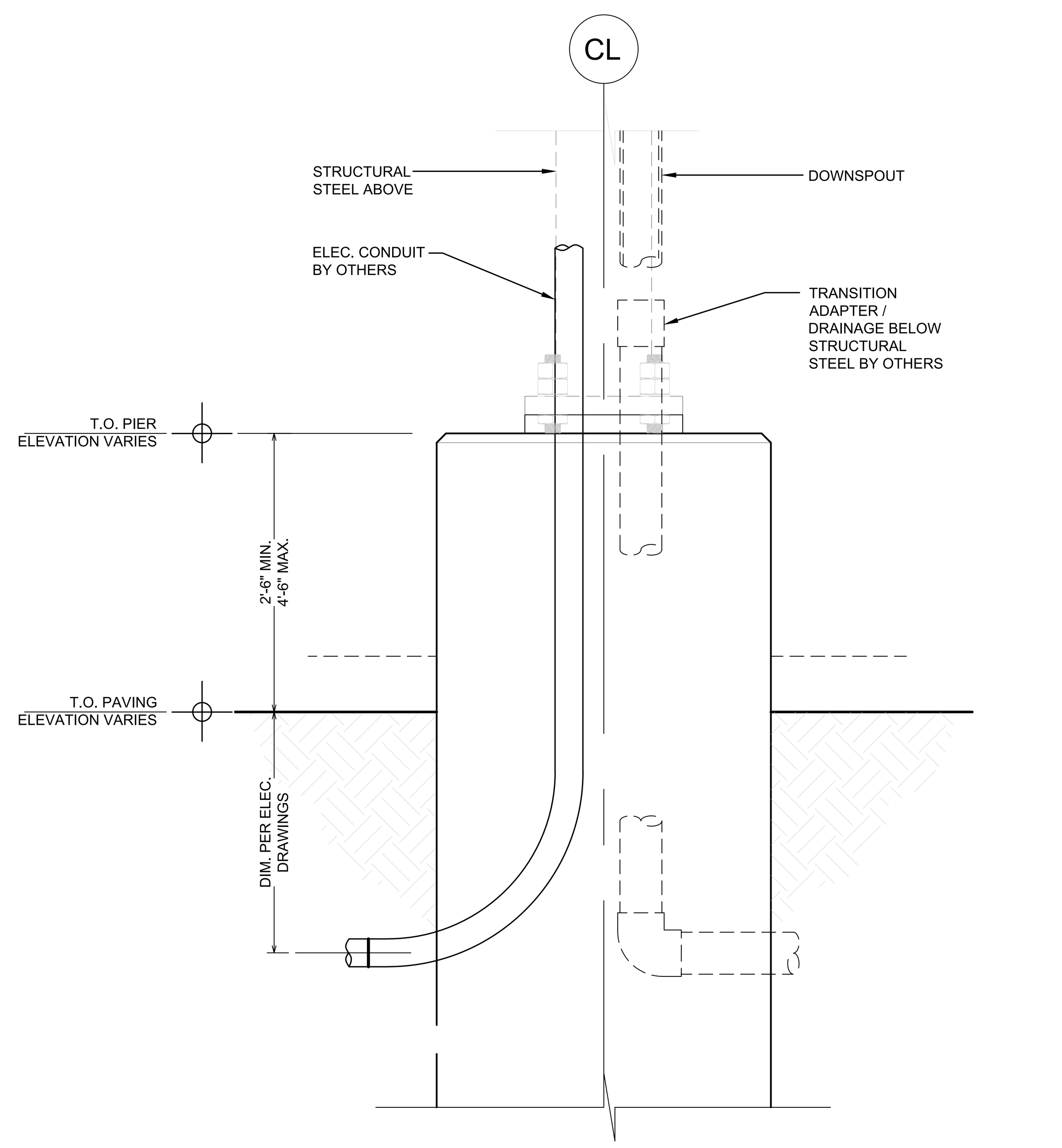
SHEET TITLE
CANOPY SECTIONS

ISSUED SET / REVISIONS

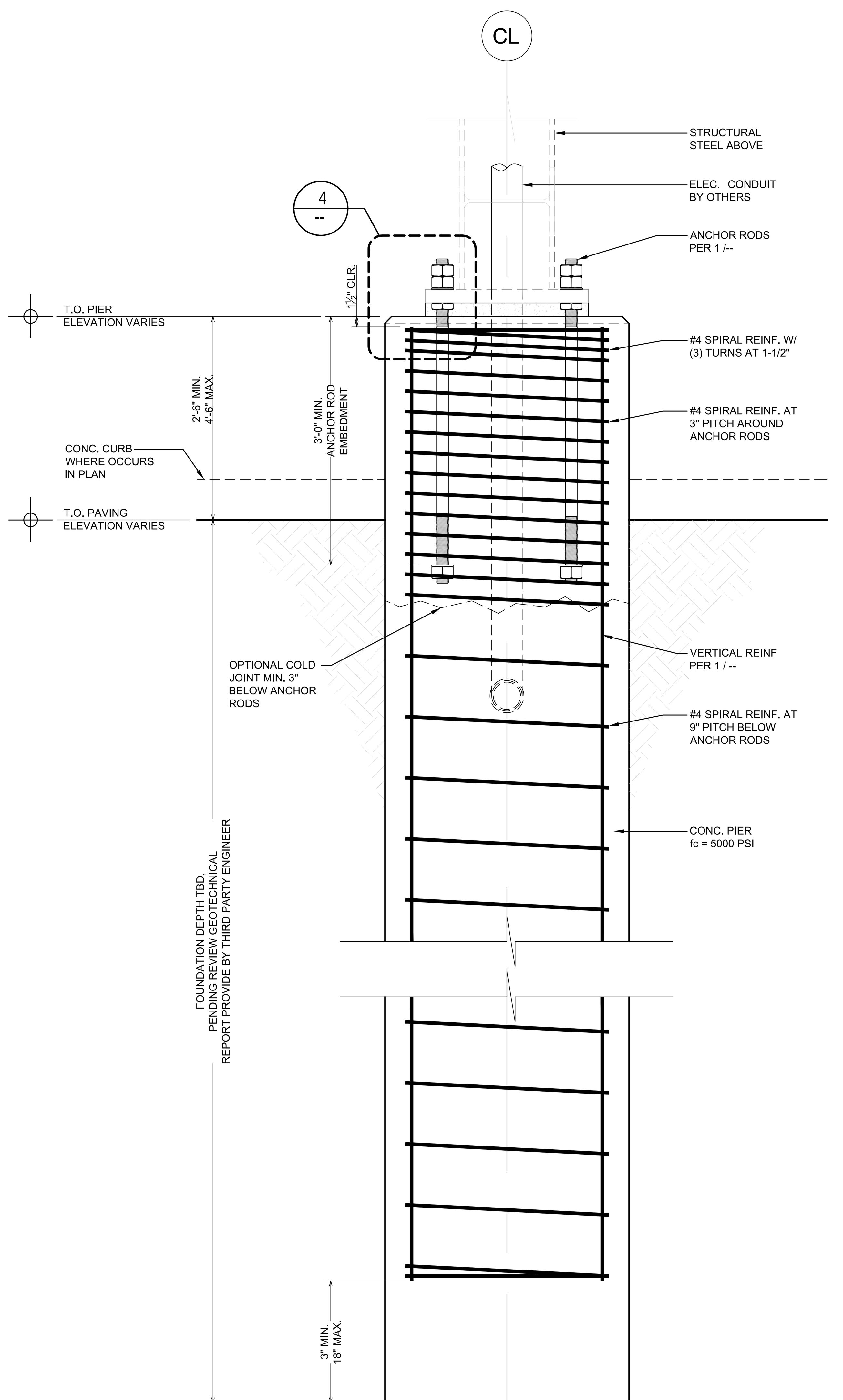
SYM	DESCRIPTION	DATE
1	30% DESIGN PROGRESS	08/10/23

DESIGNED BY : PARASOL
DRAWN BY: ZR
CHECKED BY : KPFF
APPROVED BY : KPFF
ORIGINAL SHEET SIZE : 42" x 30"
SCALE
0 1/2" 1"

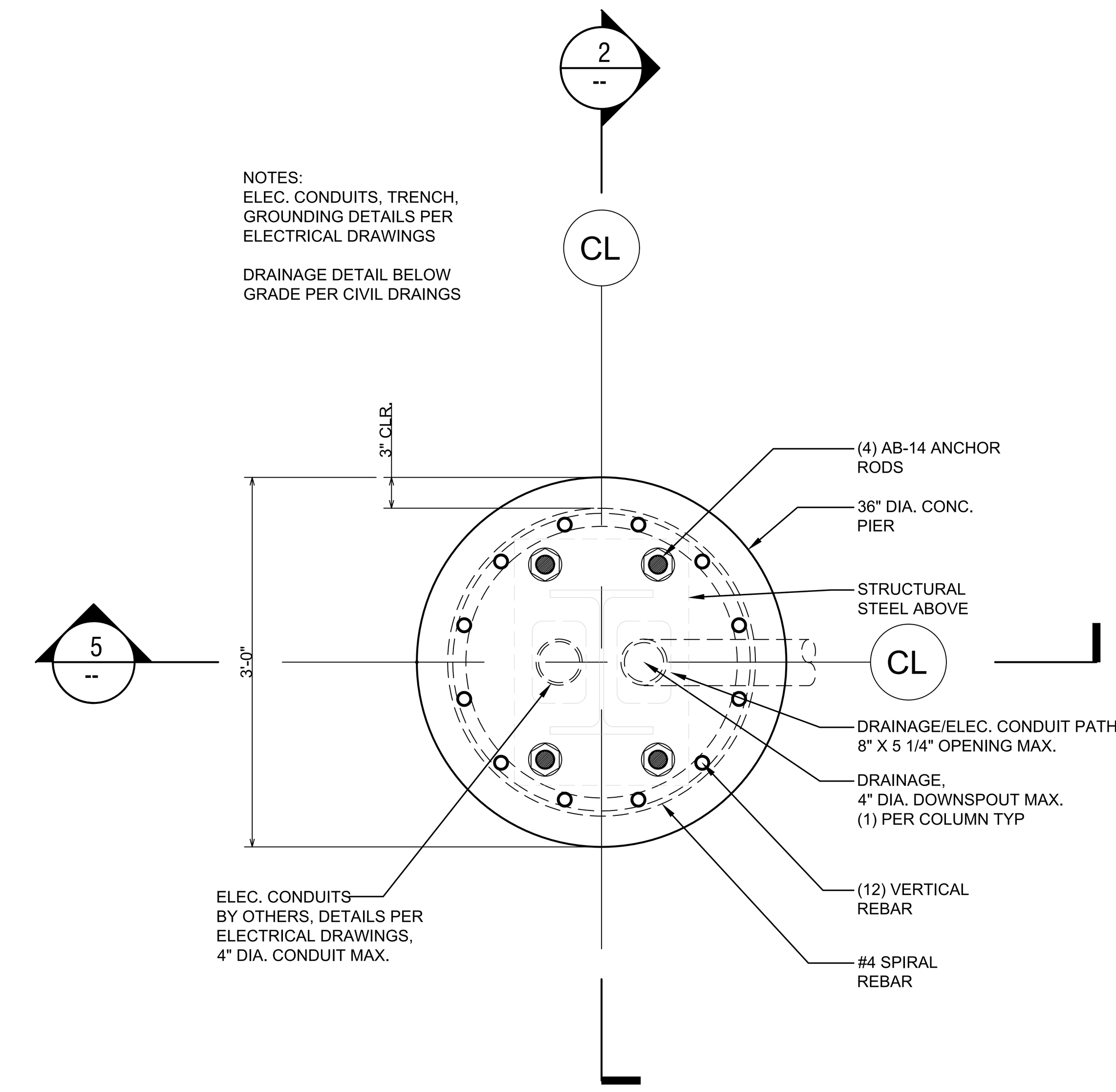
DWG NO.
PV-1-300



5 **DETAILS AT ELEC. CONDUIT (REFERENCE ONLY)**
SCALE: N.T.S.

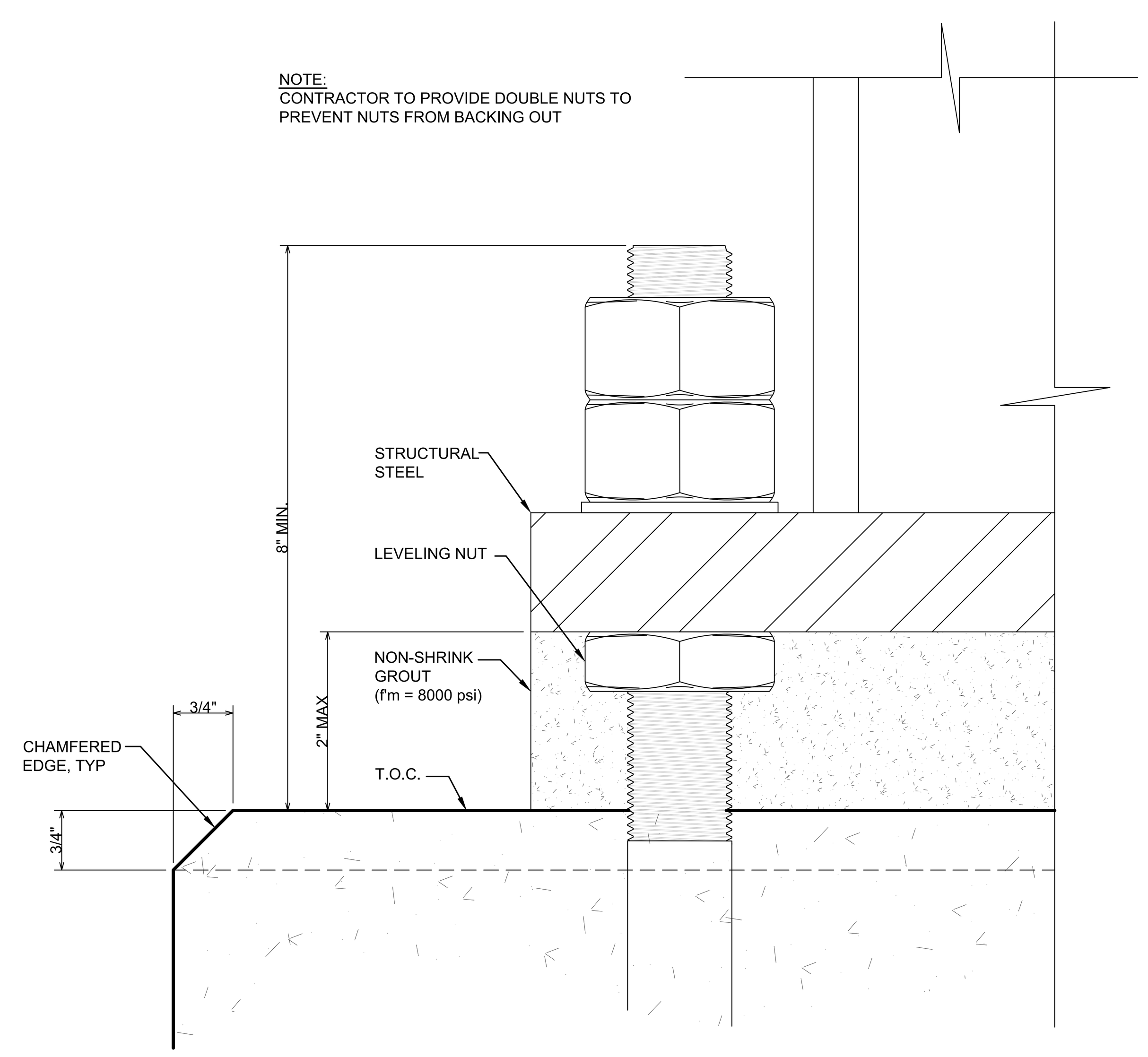


2 **TYP. FOUNDATION ELEVATION**
SCALE: N.T.S.



1 **TYP. FOUNDATION PLAN**
SCALE: N.T.S.

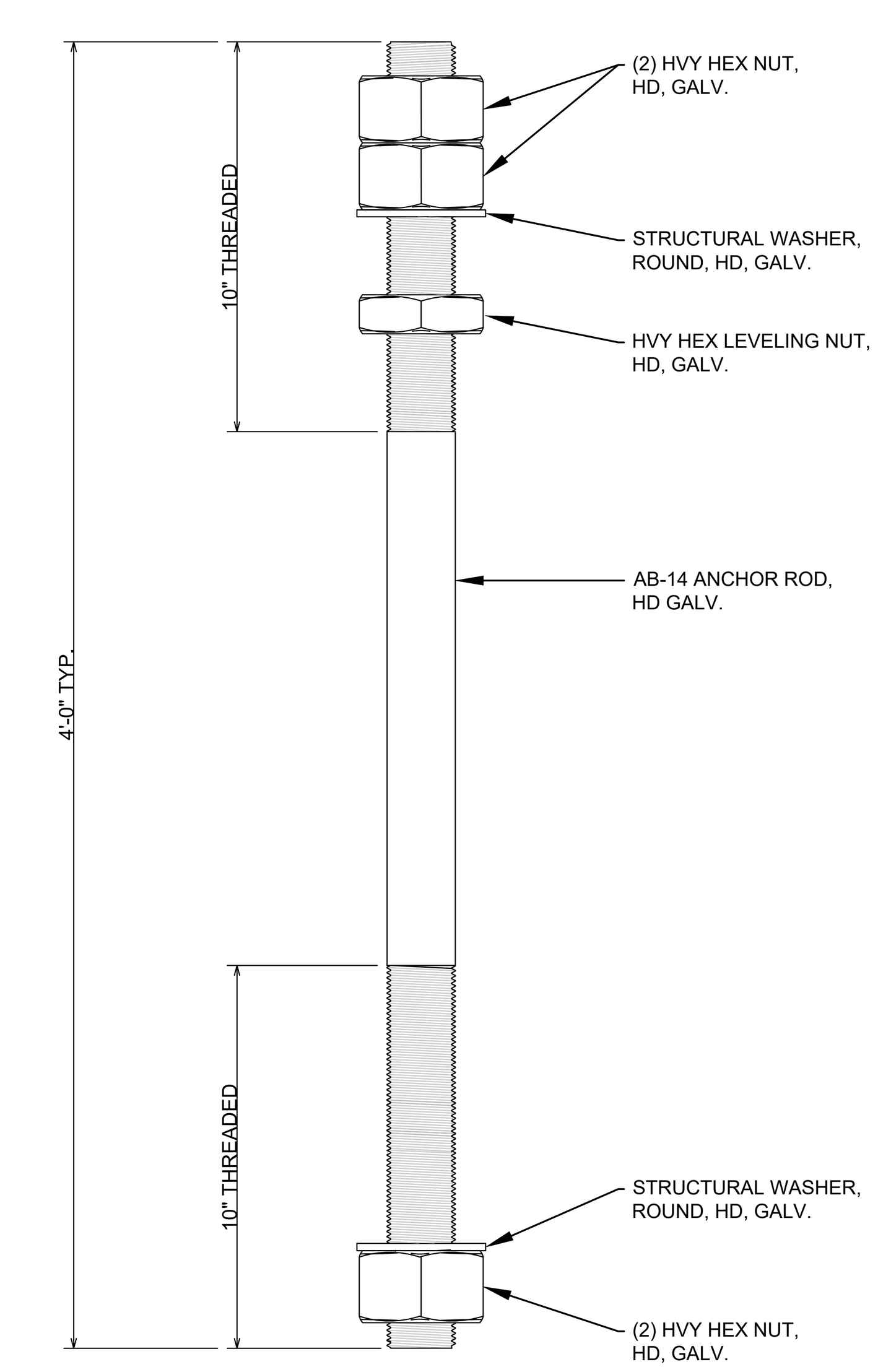
NOTE:
CONTRACTOR TO PROVIDE DOUBLE NUTS TO PREVENT NUTS FROM BACKING OUT



4 **TYP.DETAIL AT COLUMN BASE**
SCALE: N.T.S

FOUNDATION TYPE	ARRAY	FOUNDATION DIAMETER	FOUNDATION EMBEDMENT DEPTH	ANCHOR ROD EMBEDMENT DEPTH	NOTES
F1	C6 - C10	3'-0"	--	--	--
-	--	--	--	--	--
-	--	--	--	--	--
-	--	--	--	--	--

- **FOUNDATION SCEDULE**
SCALE: N.T.S.



3 **ANCHOR ROD**
SCALE: N.T.S.

CI RENEWABLES

PARASOL STRUCTURES
NEW YORK BOSTON
WWW.PARASOLSTRUCTURES.COM

PROJECT # : 23011

kpff
Consulting Engineers

KPFF Job # : 0000000

ENGINEER'S STAMP

NOT FOR CONSTRUCTION

30% DESIGN PROGRESS
08/10/23

PROJECT TITLE
UMMS-1

PROJECT ADDRESS
900 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

SHEET TITLE
TYP. FOUNDATION DETAILS

ISSUED SET / REVISIONS

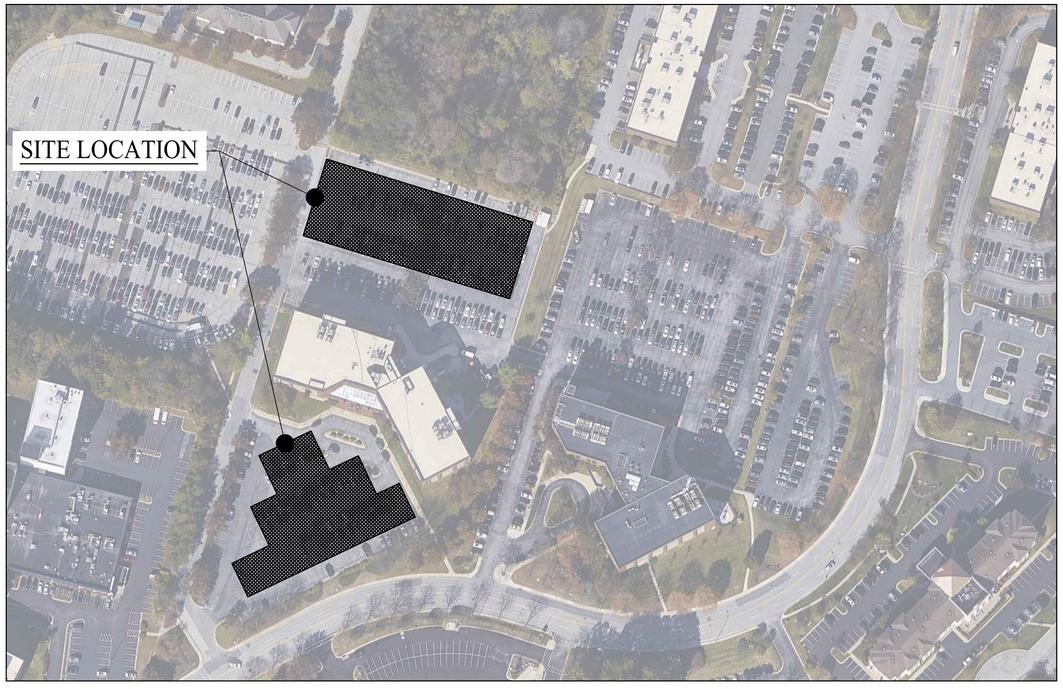
SYM	DESCRIPTION	DATE
1	30% DESIGN PROGRESS	08/10/23

DESIGNED BY : PARASOL
DRAWN BY : ZR
CHECKED BY : KPFF
APPROVED BY : KPFF
ORIGINAL SHEET SIZE : 42" x 30"
SCALE
0 1/2" 1"

DWG NO.
PV-1-400

UMMS PARASOL
900 ELKRIDGE PV
DC SIZE: 1041.9KW; AC SIZE: 850KW

900 ELKRIDGE LANDING RD
LINTHICUM HEIGHTS, MD 21090



SITE LOCATION

LATITUDE 39°12'08"N
LONGITUDE 76°41'15"W

0 1" GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

KUPPER ENGINEERING, LLC
AN ASPLUNDH ENGINEERING CO.
AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-5970

CI RENEWABLES

UMMS PARASOL - 900 ELKRIDGE

900 ELKRIDGE LANDING RD,
LINTHICUM HEIGHTS, MD 21090

REV.	DESCRIPTION:	DATE:	BY:	CHK:
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

PROJECT NO: 405-22

SCALE: AS NOTED

PROJECT COVER SHEET

DRAWING NO:

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)
CONT'N	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	MEDUIM 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 (CL)
- 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 (M)
- GENERATOR
- TRANSFER SWITCH
- AMMETER (A)
- AMMETER SWITCH (AS)
- VOLTMETER (V)
- VOLTMETER SWITCH (VS)
- KIRK KEY INTERLOCK (K)
- WATTHOUR METER (WH)
- C/B WITH SHUNT TRIP
- DELTA CONNECTION
- GROUNDED WYE CONNECTION
- CONTACTOR (C)
- RELAY (R)
- POWER FACTOR CORRECTION CAPACITOR
- TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)
- INDICATING LAMP
- ELECTRIC POLE
- POINT OF CONNECTION TO EXISTING EQUIPMENT.
- POINT OF DISCONNECTION TO EXISTING EQUIPMENT.
- TEST SWITCH BLOCK (FT-1)
- CT SHORTING BLOCKS (SCTB)

POWER DISTRIBUTION

- 208/120 VOLT PANELBOARD
- TRANSFORMER (T)
- JUNCTION BOX (J)
- NON-FUSED DISCONNECT SWITCH
- ENCLOSED CIRCUIT BREAKER (CB)
- FUSED DISCONNECT SWITCH
- SELECTOR SWITCH HOA = HAND-OFF-AUTO
- MAGNETIC MOTOR STARTER
- COMBINATION MAGNETIC MOTOR STARTER AND DISCONNECT SWITCH
- MOTOR HORSEPOWER AS INDICATED (M)
- 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 (PE 1)
- REFER TO KEY NOTES (5)
- UPPER CASE LETTER INDICATES CONTINUATION LINE (A)
- 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, "Q" 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" LINES AND SYMBOLS INDICATE EXISTING
- "BOLD LINES" AND SYMBOLS INDICATE NEW WORK
- "BOLD DASHED LINES" AND SYMBOLS INDICATE DEMOLITION WORK OR UNDERGROUND WORK

811 Know what's below. Call before you dig.

PROTECT YOURSELF

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

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

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 07/12/2023	ISSUE FOR INTERCONNECTION 07/19/2023	ISSUE FOR CIVIL REVIEW 08/01/2023	ISSUE FOR 30% REVIEW 09/08/2023	ISSUE FOR 90% PROGRESS 11/15/2023						
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					●						
E2.05	ELECTRICAL PV WIRING PLAN - CARPORT 03, 04, & 05					●						
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

Douglas E Wilson, PE

Kupper ENGINEERING, LLC AN ASPLUNDH ENGINEERING CO.

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

CI RENEWABLES

UMMS PARASOL - 900 ELKRIDGE

900 ELKRIDGE LANDING RD, LINTHICUM HEIGHTS, MD 21090

REV:	DESCRIPTION:	DATE:	BY:	CHK:
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

PROJECT NO: 405-22

SCALE: AS NOTED

ELECTRICAL LEGENDS, NOTES AND ABBREVIATIONS

DRAWING NO: 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	1041.90KW
AC SYSTEM SIZE	850.00KW
MODULE MODEL	ZNSHINE: ZXM7-UHLDD144
MODULE RATING	575W
MODULE QUANTITY	1812
INVERTER MODEL	SOLECTRIA: PVI-50TL-480
STRING SIZE	16/17
INVERTER QUANTITY	17
TOTAL # OF STRINGS	112
AZIMUTH	197°/155°
TILT - RACKING	7.4° - CARPORT

0 1"
GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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CI RENEWABLES

UMMS PARASOL - 900 ELKRIDGE

900 ELKRIDGE LANDING RD,
LINTHICUM HEIGHTS, MD 21090

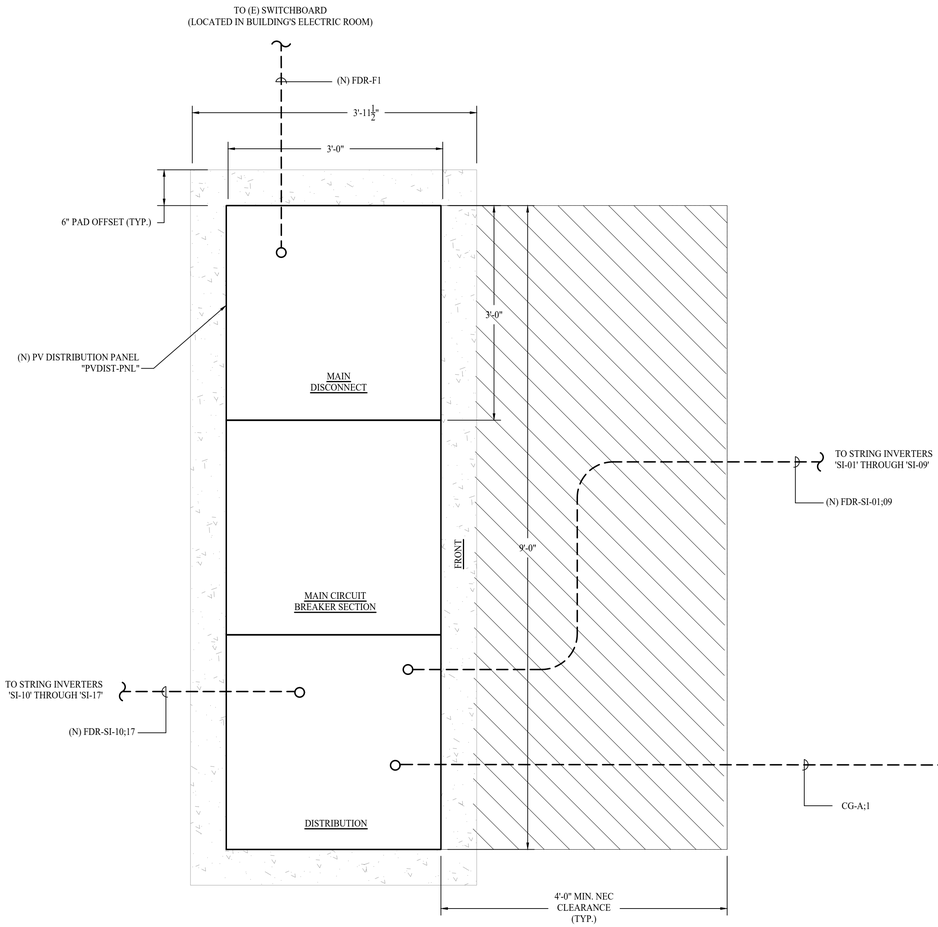
DATE:	BY:	CHK:
07/12/2023	EMJ	RK
07/19/2023	EMJ	PAP
08/01/2023	EMJ	RK
09/08/2023	EMJ	RK
11/15/2023	EMJ	PAP

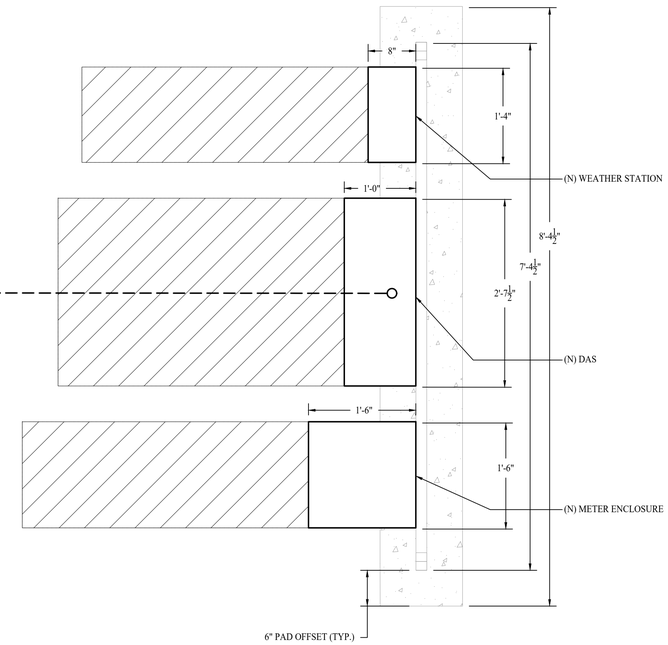
DAY:	DESCRIPTION:
A	ISSUE FOR INTERCONNECTION
B	ISSUE FOR INTERCONNECTION
C	ISSUE FOR CIVIL REVIEW
D	ISSUE FOR 30% REVIEW
E	ISSUE FOR 90% PROGRESS

PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL
SITE PLAN

DRAWING NO:
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"

NORTH

0 1"
GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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CI RENEWABLES

UMMS PARASOL -
900 ELKRIDGE

900 ELKRIDGE LANDING RD,
LINTHICUM HEIGHTS, MD 21090

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

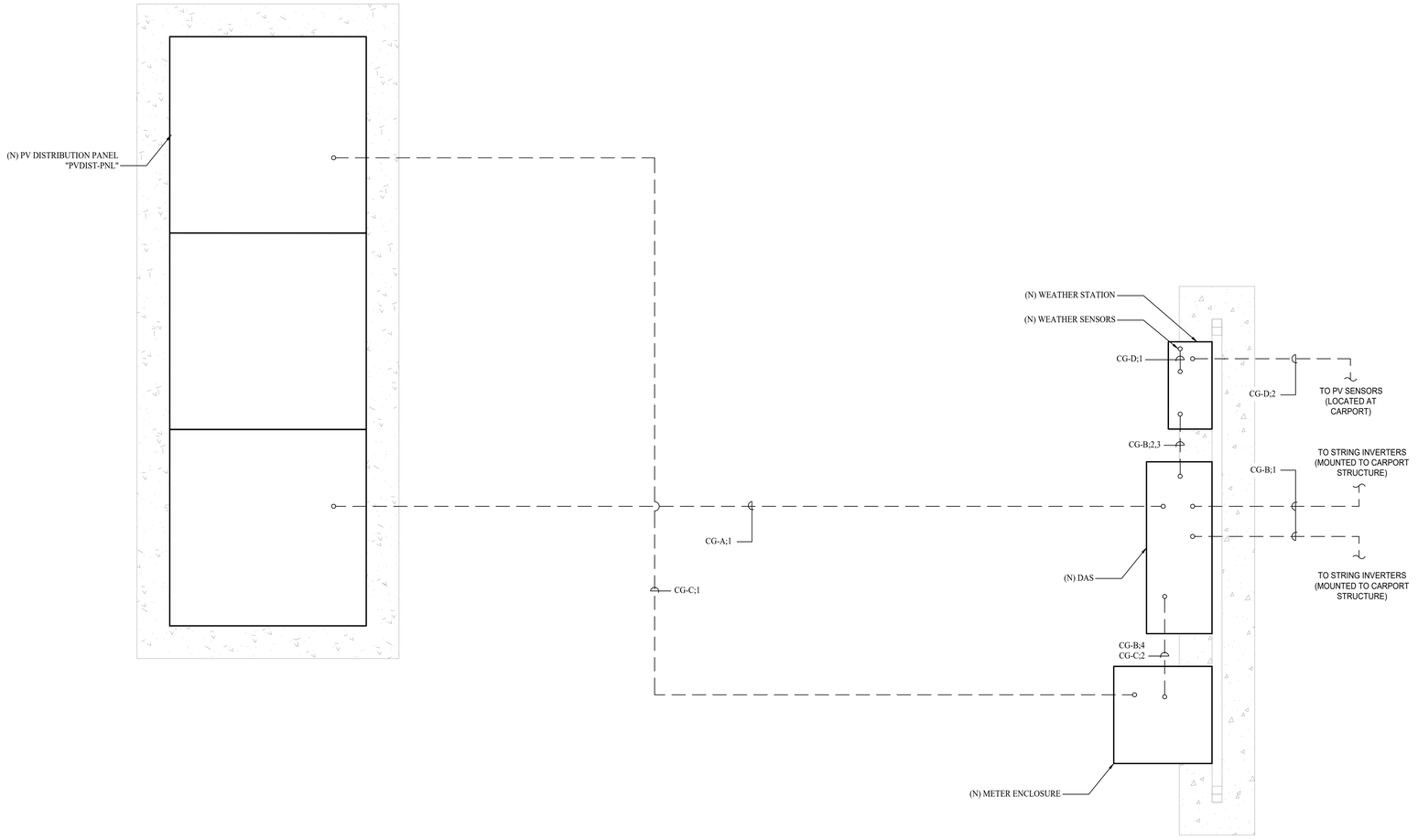
PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL CONDUIT ROUTING PLAN - POWER

DRAWING NO: 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	CT/PT 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/BOM SENSORS	2	1"	COMMUNICATIONS	BG	LV	INCLUDED WITH SENSOR	POA/BOM SENSOR WITHIN 150 FEET

2 ELECTRICAL CONTROLS SCHEDULE

SCALE: NTS

0 1"
GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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CI RENEWABLES

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

PROJECT NO: 405-22

SCALE: AS NOTED

ELECTRICAL CONDUIT ROUTING PLAN - CONTROLS

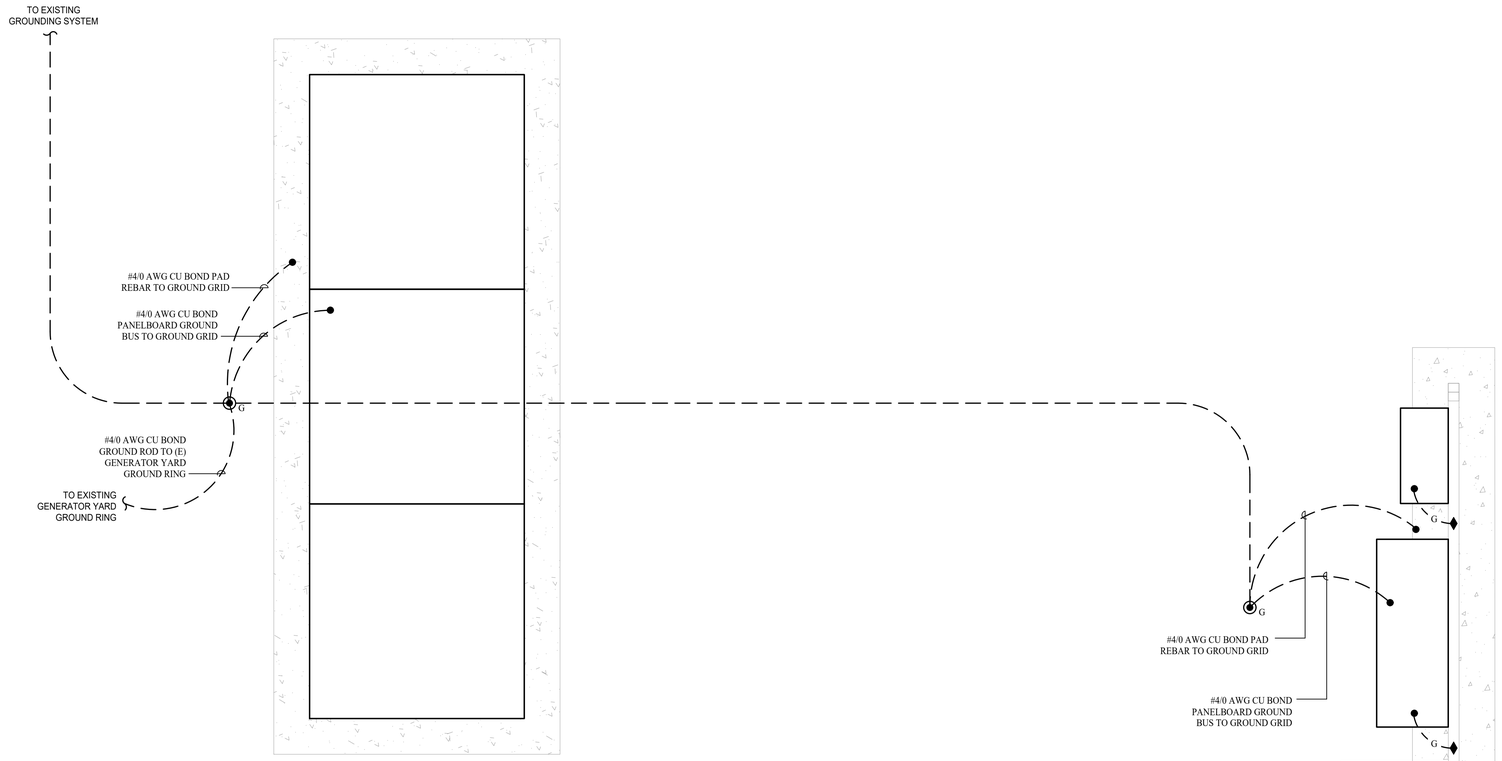
DRAWING NO: E2.02

GROUNDING LEGEND

———	#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/E5.01.
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

0 1"
GRAPHIC SCALE

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

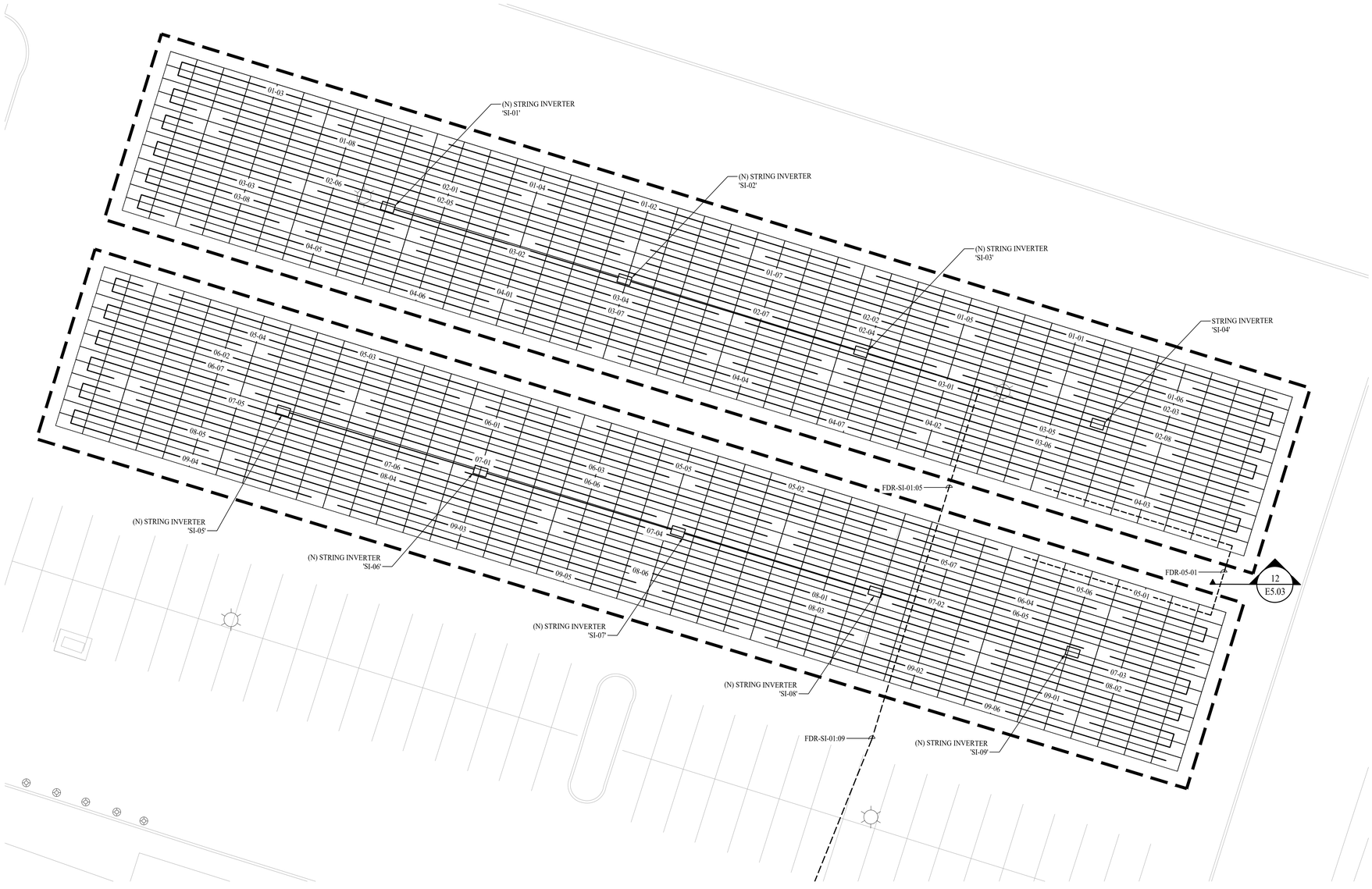
PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL GROUNDING PLAN

DRAWING NO: 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
SCALE: 1" = 15'-0"

NORTH

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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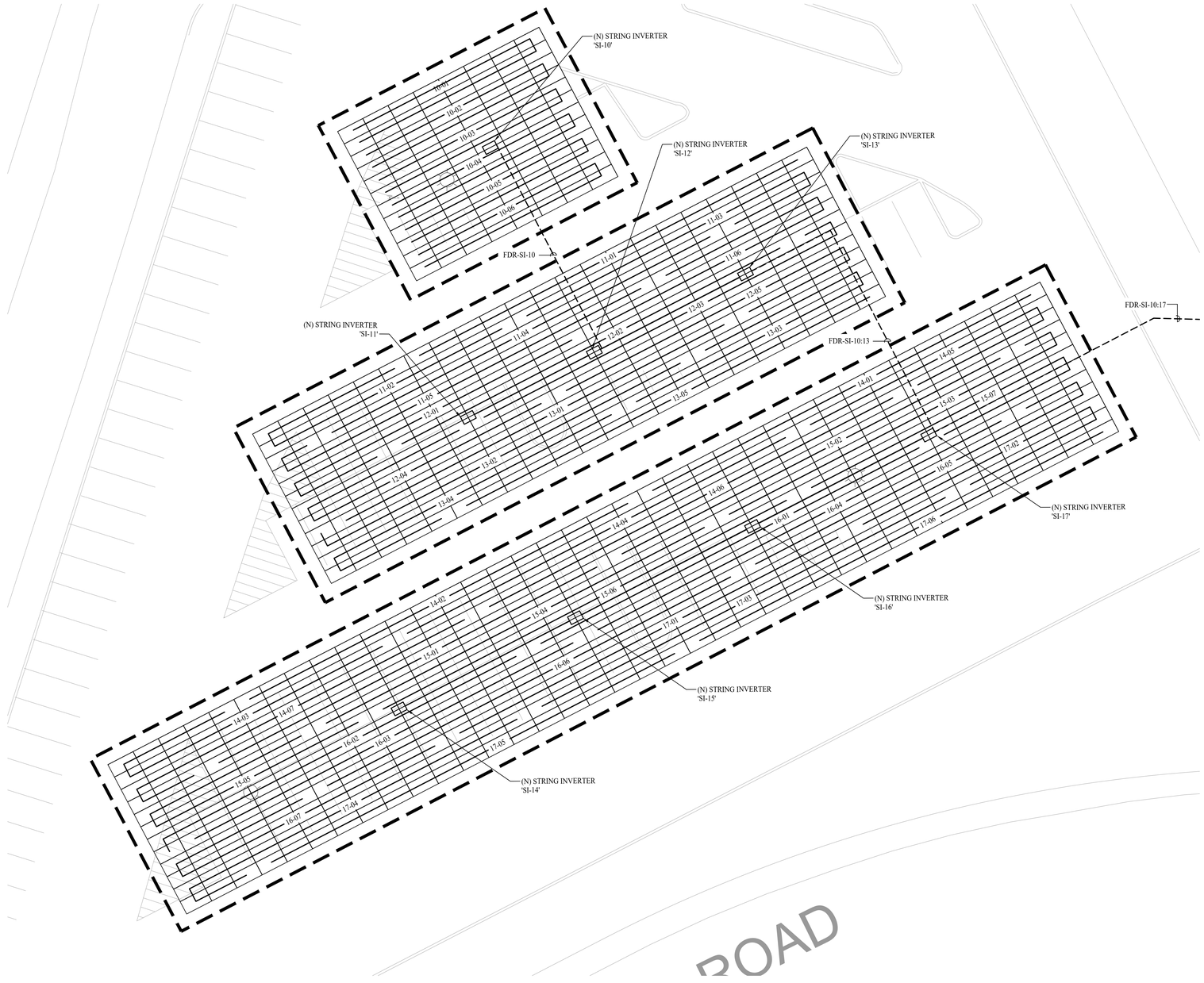
PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL PV WIRING DIAGRAM - CARPORTS 01 & 02

DRAWING NO: 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"

NORTH

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

PROJECT NO: 405-22
SCALE: AS NOTED

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

DRAWING NO:
E2.05

MODULE SPECS STC	
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)	-0.3
MODULE SPECS BSTC	
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)	17.82

STRING SPECS STC	
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
STRING SPECS STC	
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)	900.62
CORRECTED MIN STRING VOLTAGE (V)	616.37

STRING SPECS BSTC	
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)	958.78
CORRECTED MIN STRING VOLTAGE (V)	656.43
STRING SPECS BSTC	
MODULES PER STRING	16
STRING POWER (W)	11,504
NOMINAL STRING Vmp (V)	683.20
STRING Voc (V)	822.40
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)	902.38
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	
METEO STATION	BALTIMORE-WASHINGTON, MD, USA (WMO: 724060)
EXTREME ANNUAL LOW TEMP (°C)	-13.9
AVERAGE HIGH AMBIENT TEMP (°C)	36.9
TILT (°)	7.4
SYSTEM SPECS	
DC CAPACITY (kW)	1041.90
AC CAPACITY (KVA)	850.00
TOTAL NUMBER OF MODULES	1812
TOTAL NUMBER OF STRINGS	112

1 PV SYSTEM RATINGS
NOT TO SCALE

STRING INVERTER TAG	FEEDER TAG	INVERTER KW	MODULE NAMEPLATE (W)	TOTAL No. OF MODULES	No. OF 16 MODULE STRINGS	No. OF 17 MODULE 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)	TOTAL DC POWER (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 (SCH. 40 PVC)	CONDUIT FILL %	FEEDER DISTANCE (FT)	AC V-DROP (%)
SI-01	FDR-SI-01	50	575	128	8	0	114.32	142.56	108.00	134.64	681.60	1000	73.60	1.47	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	420	1.91%
SI-02	FDR-SI-02	50	575	128	8	0	114.32	142.56	108.00	134.64	681.60	1000	73.60	1.47	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	355	1.61%
SI-03	FDR-SI-03	50	575	128	8	0	114.32	142.56	108.00	134.64	681.60	1000	73.60	1.47	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	285	1.29%
SI-04	FDR-SI-04	50	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	64.40	1.29	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	285	1.29%
SI-05	FDR-SI-05	50	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	64.40	1.29	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	370	1.68%
SI-06	FDR-SI-06	50	575	112	7	0	100.03	124.74	94.50	117.81	681.60	1000	64.40	1.29	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	320	1.45%
SI-07	FDR-SI-07	50	575	96	6	0	85.74	106.92	81.00	100.98	681.60	1000	55.20	1.10	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	260	1.18%
SI-08	FDR-SI-08	50	575	96	6	0	85.74	106.92	81.00	100.98	681.60	1000	55.20	1.10	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	205	0.93%
SI-09	FDR-SI-09	50	575	96	6	0	85.74	106.92	81.00	100.98	681.60	1000	55.20	1.10	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	240	1.09%
SI-10	FDR-SI-10	50	575	96	6	0	85.74	106.92	81.00	100.98	681.60	1000	55.20	1.10	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	520	2.36%
SI-11	FDR-SI-11	50	575	98	4	2	85.74	106.92	81.00	100.98	681.60	1000	56.35	1.13	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	500	2.27%
SI-12	FDR-SI-12	50	575	83	2	3	71.45	89.10	67.50	84.15	681.60	1000	47.73	0.95	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	465	2.11%
SI-13	FDR-SI-13	50	575	83	2	3	71.45	89.10	67.50	84.15	681.60	1000	47.73	0.95	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	420	1.91%
SI-14	FDR-SI-14	50	575	114	5	2	100.03	124.74	94.50	117.81	681.60	1000	65.55	1.31	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	495	2.25%
SI-15	FDR-SI-15	50	575	114	5	2	100.03	124.74	94.50	117.81	681.60	1000	65.55	1.31	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	440	2.00%
SI-16	FDR-SI-16	50	575	116	3	4	100.03	124.74	94.50	117.81	681.60	1000	66.70	1.33	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	390	1.77%
SI-17	FDR-SI-17	50	575	100	2	4	85.74	106.92	81.00	100.98	681.60	1000	57.50	1.15	66.20	83	90	(4) #2AWG CU + (1) #8 AWG CU GND	95	1-1/2"	18.75%	335	1.52%
																					AVERAGE:	358	1.63%

2 INVERTER SCHEDULE
NOT TO SCALE

ARRAY	FEEDER TAG	STRING SHORT CIRCUIT CURRENT (Isc) (A)	MAXIMUM PV CIRCUIT CURRENT (A) (NEC 2017 690.8 (A)(1) and (2))	MINIMUM CONDUCTOR AMPACITY (A) (NEC 2017 690.9(B))	OVERCURRENT DEVICE (FUSE) RATING (A) (NEC 2017 TABLE 240.6(A))	No. OF STRINGS PER CONDUIT	No. OF CU CONDUCTORS WITH (1) #6 AWG CU	AMPACITY (A) (90°) (NEC 2017 TABLE 310.15 (B)(16))	CONDUIT SIZE (EMT)	AMPACITY DERATING FACTOR (NEC 2017 TABLE 310.15 (B)(3)(a))	CALCULATED CONDUCTOR AMAPACITY (NEC 2017 TABLE 310.15 (B)(3)(a))
2	FDR-05-01:01	14.29	17.9	22.3	30.00	1	(2) #10 AWG	40	1-1/4"	1	40.0

3 DC JUMPER 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 (SCH. 40 PVC)	CONDUIT FILL %	LENGTH (FT)	AC V-DROP %
FDR-1	(E) SWGR	PV DIST. PANEL	1125.4	480	(3) SETS OF (4) 600 KCMIL CU + (1) #3/0 AWG CU GND	75	1260	4" EACH	28.3%	15	0.05%

4 AC FEEDER SCHEDULE
NOT TO SCALE

WORST CASE DC VOLTAGE DROP				
NUMBER OF MODULES	VMP (V)	IMP (A)	LENGTH (FT)	DC V-DROP %
17	681.60	13.50	350	1.77%

5 WORST CASE DC VOLTAGE DROP
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

Kupper ENGINEERING, LLC AN ASPLUNDH ENGINEERING CO.
AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-5970

CI RENEWABLES

UMMS PARASOL - 900 ELKRIDGE

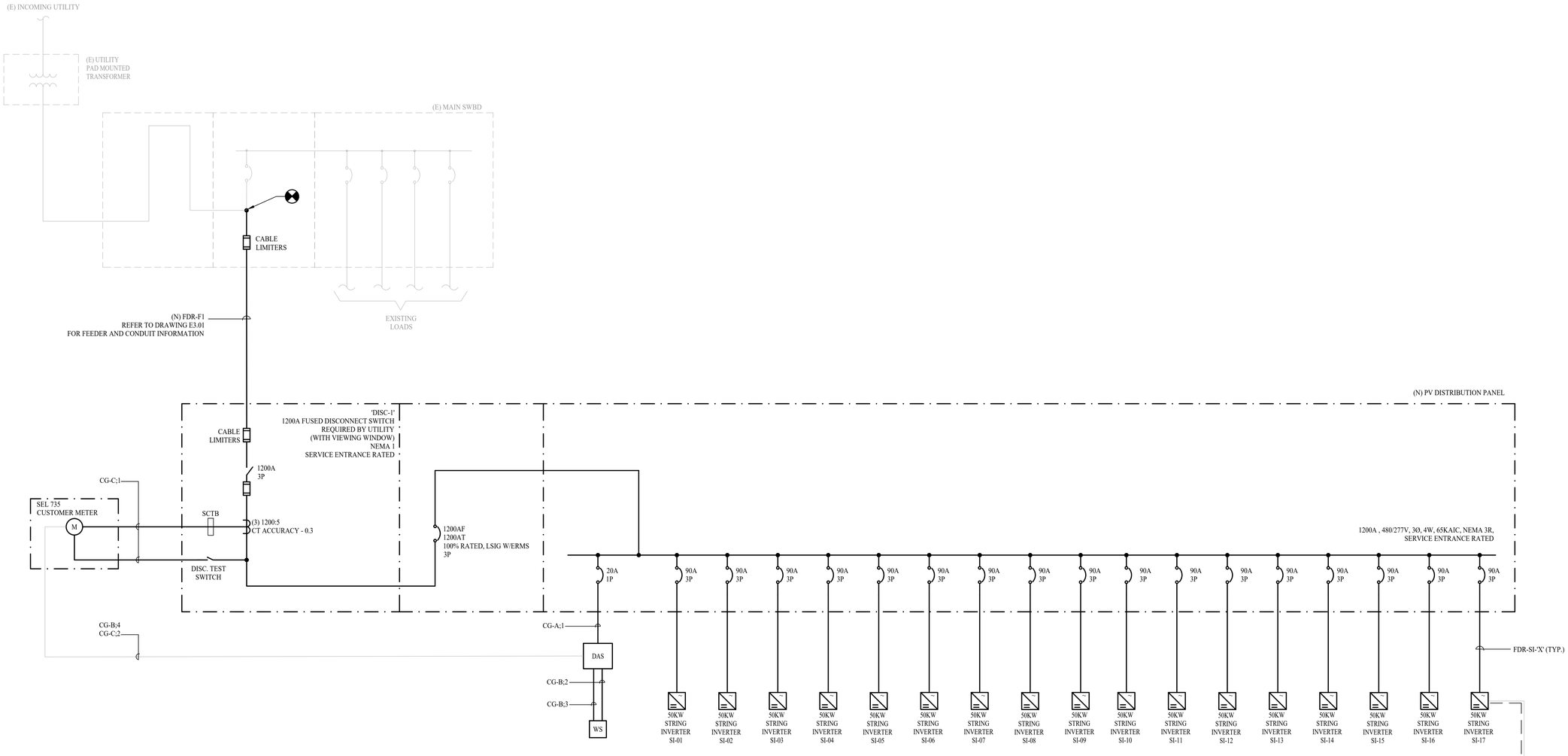
900 ELKRIDGE LANDING RD, LINTHICUM HEIGHTS, MD 21090

REV:	DESCRIPTION:	DATE:	BY:	CHK:
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

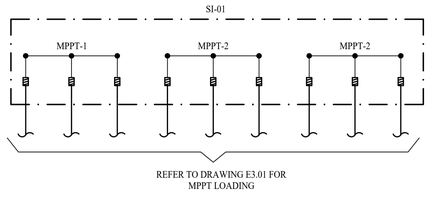
PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL SCHEDULES

DRAWING NO: 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 60Hz BEFORE CENSATION 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 EPS UTILITY SOURCE IS NOT PRESENT		

3 INVERTER SETTINGS
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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CI RENEWABLES

UMMS PARASOL - 900 ELKRIDGE

900 ELKRIDGE LANDING RD,
LINTHICUM HEIGHTS, MD 21090

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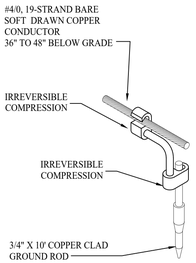
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

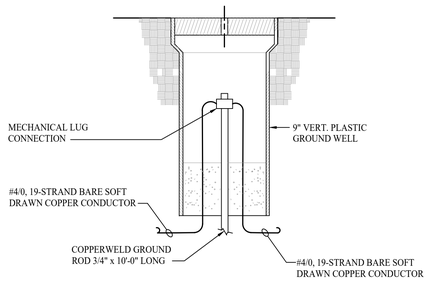
PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL
SINGLE LINE DIAGRAM

DRAWING NO: E4.01

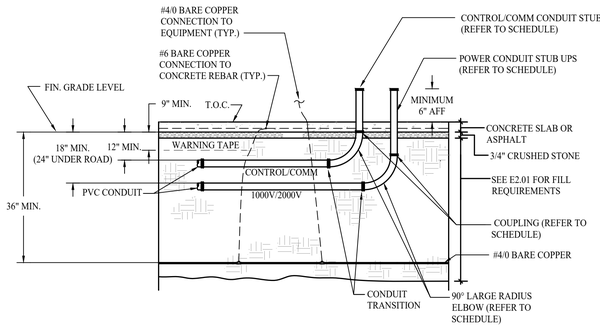


GROUND WIRE TO GROUND ROD CONNECTION
1 NOT TO SCALE

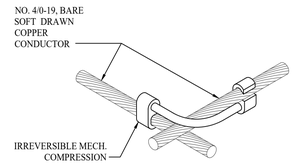


GROUND WELL TEST STATION DETAIL
2 NOT TO SCALE

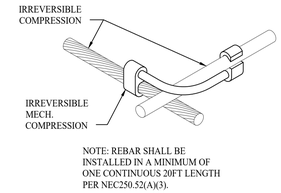
SCHEDULE OF CONDUIT STUB-UPS		
ITEM	STUB-UP IN ENCLOSURE	STUB-UP EXPOSED OPEN AREA
CONDUIT	PVC SCH. 40	PVC SCH. 80
LARGE RADIUS ELBOW	PVC SCH. 40	PVC SCH. 40



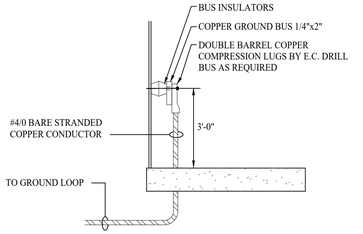
TYPICAL GROUND FILL AND CONDUIT STUB UP DETAIL (OUTDOORS)
3 NOT TO SCALE (FROST LINE: 36" BELOW FINISHED FLOOR AND LESS)



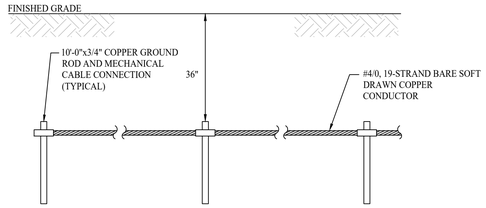
TYP. GROUND MECHANICAL CONNECTION DETAIL
4 NOT TO SCALE



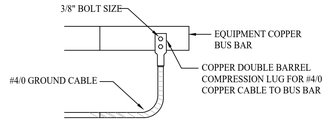
GROUND WIRE TO REBAR CONNECTION
5 NOT TO SCALE



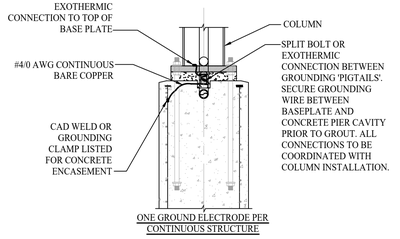
GROUND BUS CONNECTION DETAIL
6 NOT TO SCALE



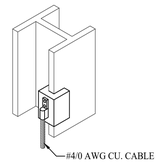
GROUND GRID CONNECTION DETAIL
7 NOT TO SCALE



TYP. CABLE TO GROUND BUS DETAIL
8 NOT TO SCALE



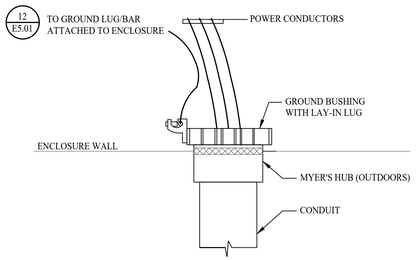
TYP. ARRAY COLUMN GROUNDING DETAIL
9 NOT TO SCALE



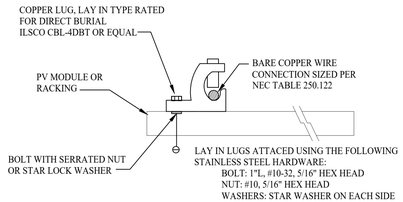
GENERAL NOTE

A. PRIOR TO CONNECTION, SCRAPE AWAY ALL PAINT AND/OR GALVANIZING THEN REAPPLY AS NECESSARY AFTER CONNECTION IS COMPLETE

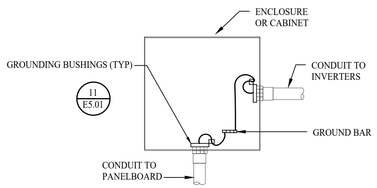
TYPICAL BONDING TO STEEL CONNECTION DETAIL
10 NOT TO SCALE



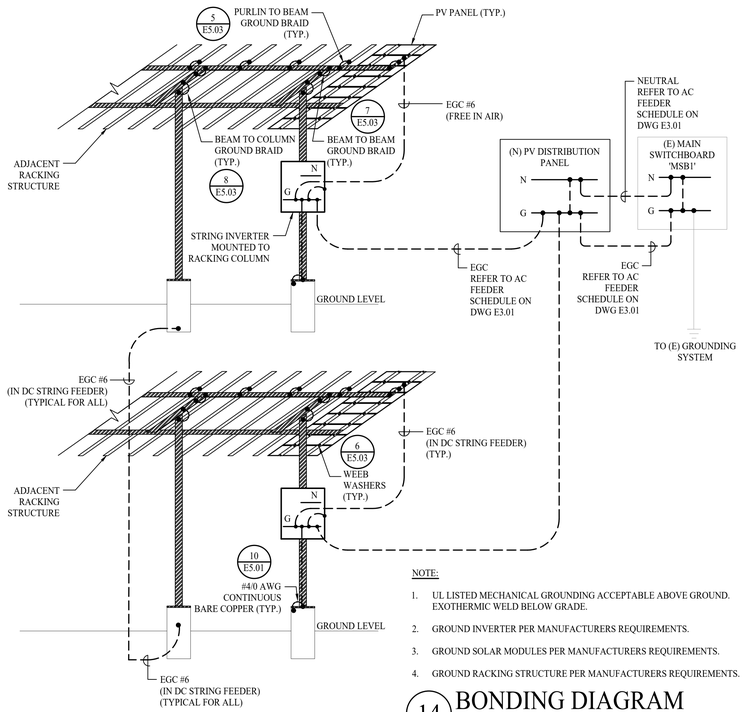
MYER'S HUB GROUNDING DETAIL
11 NOT TO SCALE



GROUND LUG DETAIL
12 NOT TO SCALE



PULL BOX / TROUGH GROUNDING DETAIL (METALLIC CONDUITS)
13 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.

BONDING DIAGRAM
14 SCALE: NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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CI RENEWABLES

UMMS PARASOL - 900 ELKRIDGE

900 ELKRIDGE LANDING RD, LINTHICUM HEIGHTS, MD 21090

REV'S	DESCRIPTION:	DATE:	BY:	CHK:
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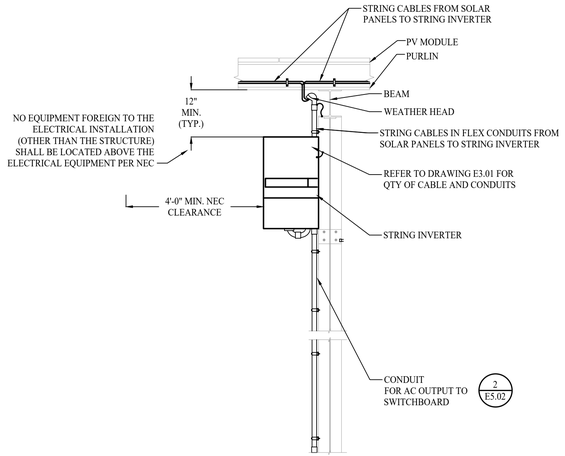
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

PROJECT NO: 405-22

SCALE: AS NOTED

ELECTRICAL DETAILS - 1

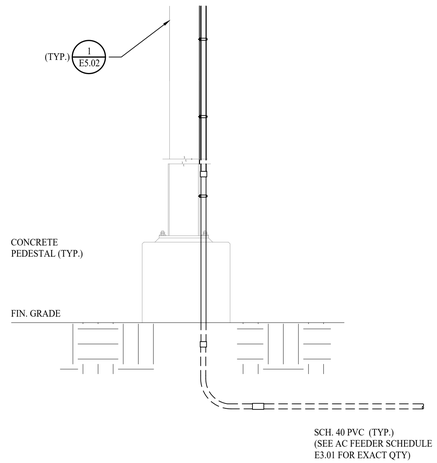
DRAWING NO: E5.01



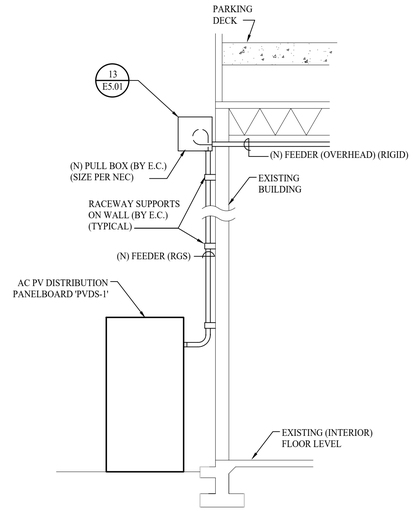
NOTES:

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.

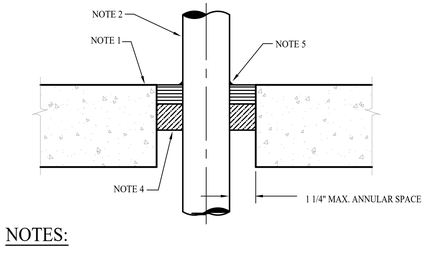
1 STRING INVERTER MOUNTING DETAILS
NOT TO SCALE



2 CONDUIT TRANSITION DETAIL
NOT TO SCALE



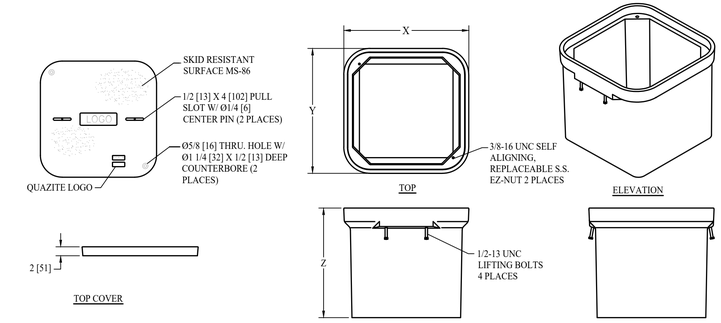
3 CONDUIT BLDG ENTRY DETAIL
NOT TO SCALE



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 B14 (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

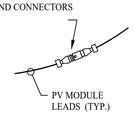
HAND HOLE SCHEDULE					
HANDHOLE DESIGNATION TYPE	WIDTH (X)	LENGTH (Y)	DEPTH (Z)	DESCRIPTION	COVER ENGRAVING
A	36"	36"	18"-24"	PULL BOX FOR POWER OR COMMUNICATIONS	ELECTRIC OR COMMUNICATIONS
B	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	SIZE PER NEC (MIN 48")	PULL BOX FOR 480V POWER OR COMMUNICATIONS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

NOTES:

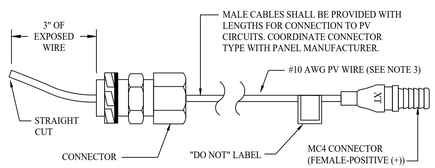
1. ALL HANDHOLES SHALL BE INSTALLED AT DEPTH TO SIT FLUSH WITH FINAL GRADE. DEPTH TO VARY BETWEEN 18"-24" AS REQUIRED. MINIMUM SIZE HANDHOLES ARE SHOWN, PROVIDE LARGER BOXES AS REQUIRED.
2. ALL HANDHOLES SHALL BE UL LISTED AND BE SUITABLE FOR TIER 15 LOADING. FOR AREAS OF DELIBERATE HEAVY VEHICLE TRAFFIC, 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

WIRE CLIPS (S CLIPS OR EQUAL). MOUNT ON THE MODULE FRAME OR RACKING RAIL. POSITION CLIPS TO REMOVE SLACK FROM THE WIRE AND KEEP CONNECTOR AND WIRING UP AGAINST THE MODULE. DO NOT OVERSTRESS THE WIRING AND CONNECTORS BY PULLING TOO TIGHT.



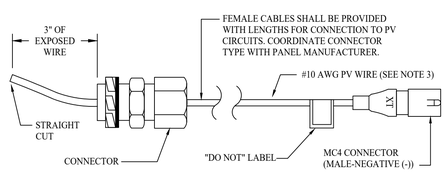
3 TYPICAL PV WIRING CLIP
NOT TO SCALE



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.

INTERCONNECT WIRING TYPICAL MALE CABLE ASSEMBLY
8
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.

INTERCONNECT WIRING TYPICAL FEMALE CABLE ASSEMBLY
9
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

Kupper ENGINEERING, LLC AN ASPLUNDH ENGINEERING CO.
AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-5970

CI RENEWABLES

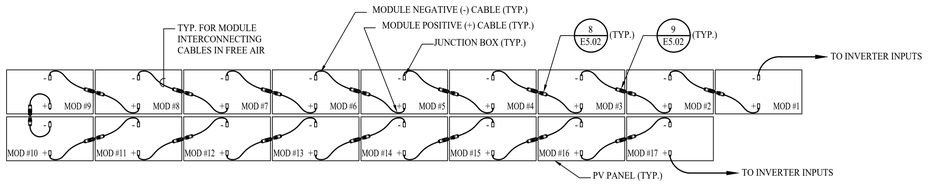
UMMS PARASOL - 900 ELKRIDGE
900 ELKRIDGE LANDING RD, LINTHICUM HEIGHTS, MD 21090

REV	DESCRIPTION:	DATE:	BY:	CHK:
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

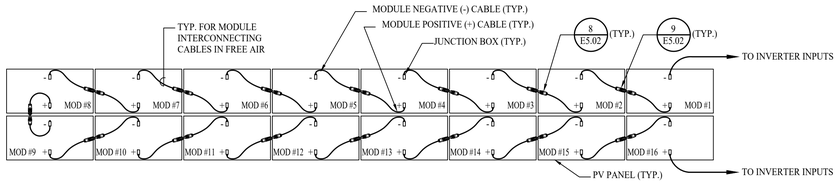
PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL DETAILS - 2

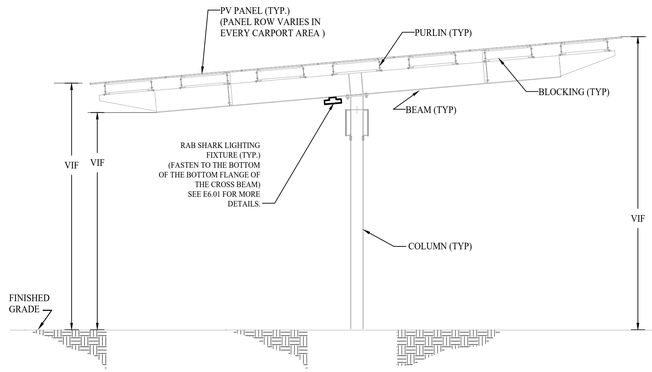
DRAWING NO: E5.02



1 TYPICAL STRING WIRING (17 MODULES)
NOT TO SCALE

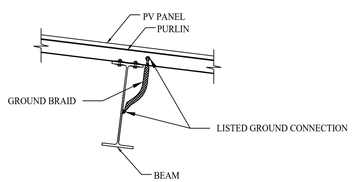


1A TYPICAL STRING WIRING (17 MODULES)
NOT TO SCALE

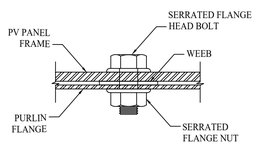


NOTE:
1. REFER TO STRUCTURAL DRAWINGS FOR STRUCTURAL MEMBERS, DIMENSIONS, HEIGHT AND ADDITIONAL PV ARRAY AND LIGHTING FIXTURE MOUNTING INFORMATIONS.
2. LIGHTING FIXTURES WILL BE POWERED USING EXISTING SOURCE CIRCUITS.

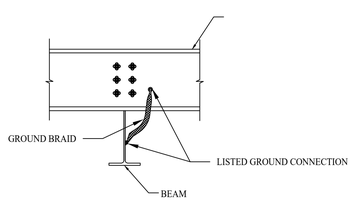
4 LIGHTING FIXTURE MOUNTING DETAILS (FOR REFERENCE ONLY)
NOT TO SCALE



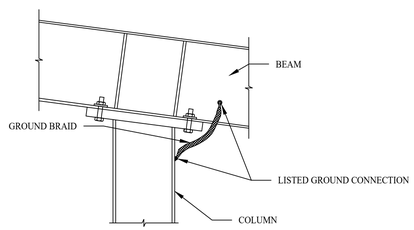
PURLIN TO BEAM BONDING DETAIL
5 NOT TO SCALE



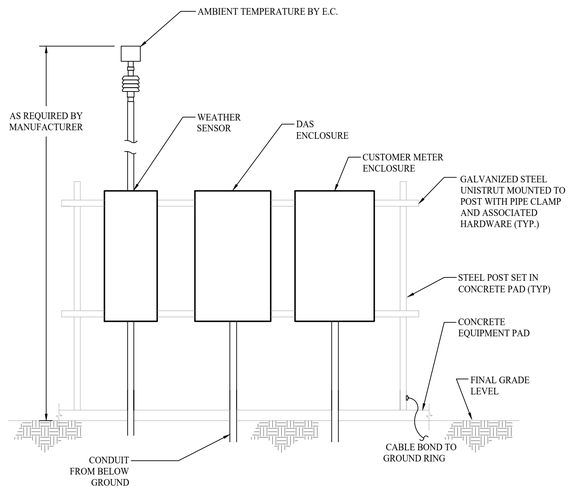
PV PANEL TO PURLIN BONDING DETAIL
6 NOT TO SCALE



BEAM TO BEAM BONDING DETAIL
7 NOT TO SCALE

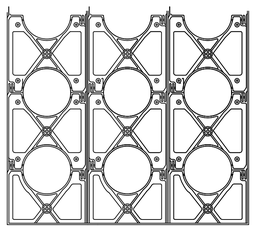


BEAM TO COLUMN BONDING DETAIL
8 NOT TO SCALE



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

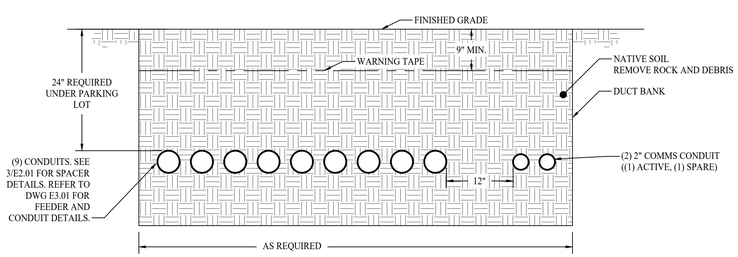
2 AUXILIARY EQUIPMENT DETAIL
NOT TO SCALE



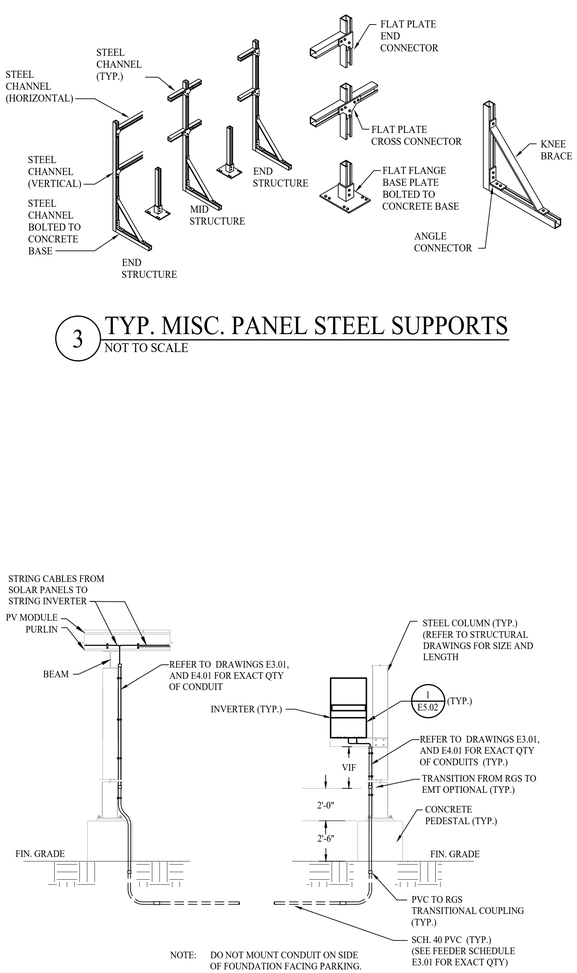
PVC SPACER NOTES:

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 "WUNPECEE 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



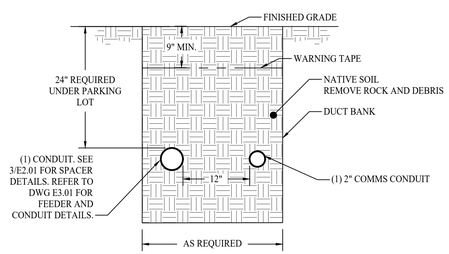
11 WORST CASE AC DUCT BANK DETAIL
NOT TO SCALE



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

10 TYP. UNDERGROUND JUMPER DETAIL
NOT TO SCALE

3 TYP. MISC. PANEL STEEL SUPPORTS
NOT TO SCALE



WORST CASE DC DUCT BANK DETAIL
12 NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

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AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
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E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL DETAILS - 3

DRAWING NO: 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
Flash Risk at 36 in
Min. Arc Rating: 6.2 cal/cm^2
Flash Protection Boundary: 196 in
Glove Class: 2
PPE:
Arcrated shirt & pants + arc-rated coverall + arc-rated arc flash suit

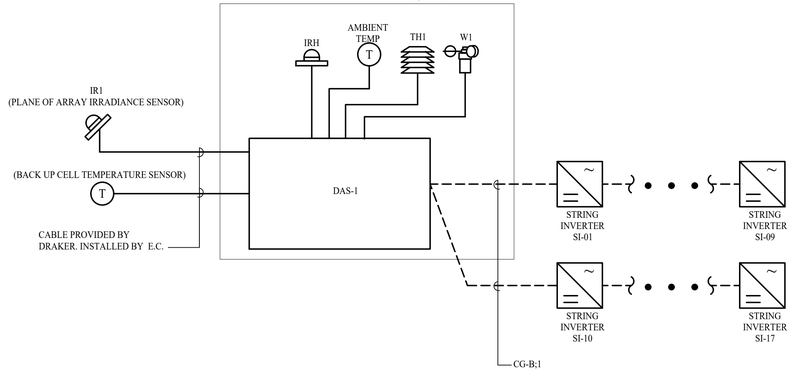
SHOCK PROTECTION
Shock Risk when cover is removed 12470 VAC
Limited Approach 60 in
Restricted Approach 26 in
03/01/16

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.

PRELIMINARY
NOT FOR CONSTRUCTION

Kupper ENGINEERING, LLC AN ASPLUNDH ENGINEERING CO.
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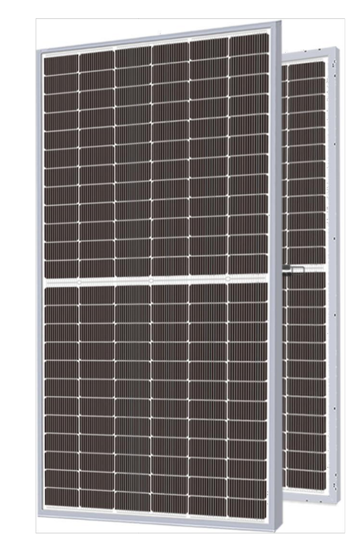
E	ISSUE FOR 90% PROGRESS	11/15/2023	EMJ	PAP

PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL DETAILS - 4

DRAWING NO: E5.04

ZNSHINESOLAR

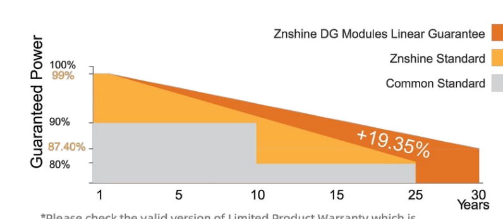


ZXM7-UHLDD144 Series

16BB 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



*Please check the valid version of Limited Product Warranty which is officially released by ZNSHINE PV-TECH Co.,Ltd.

IEC 61215/IEC 61730
ISO 14001: Environmental Management System
ISO 9001: Quality Management System
ISO45001: Occupational Health and Safety Management System

*As there are different certification requirements in different markets.please contact your local znshine sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

Key Features

Excellent Cells Efficiency
SMBB technology reduce the distance between busbars and finger grid line which is benefit to power increase.

Better Weak Illumination Response
More power output in weak light condition, such as haze, cloudy, and early morning.

Anti PID
Ensured PID resistance through the quality control of cell manufacturing process and raw materials.

Adapt To Harsh Outdoor Environment
Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity environment.

TIER 1
Global,Tier 1 bankable brand,with independently certified advanced automated manufacturing.

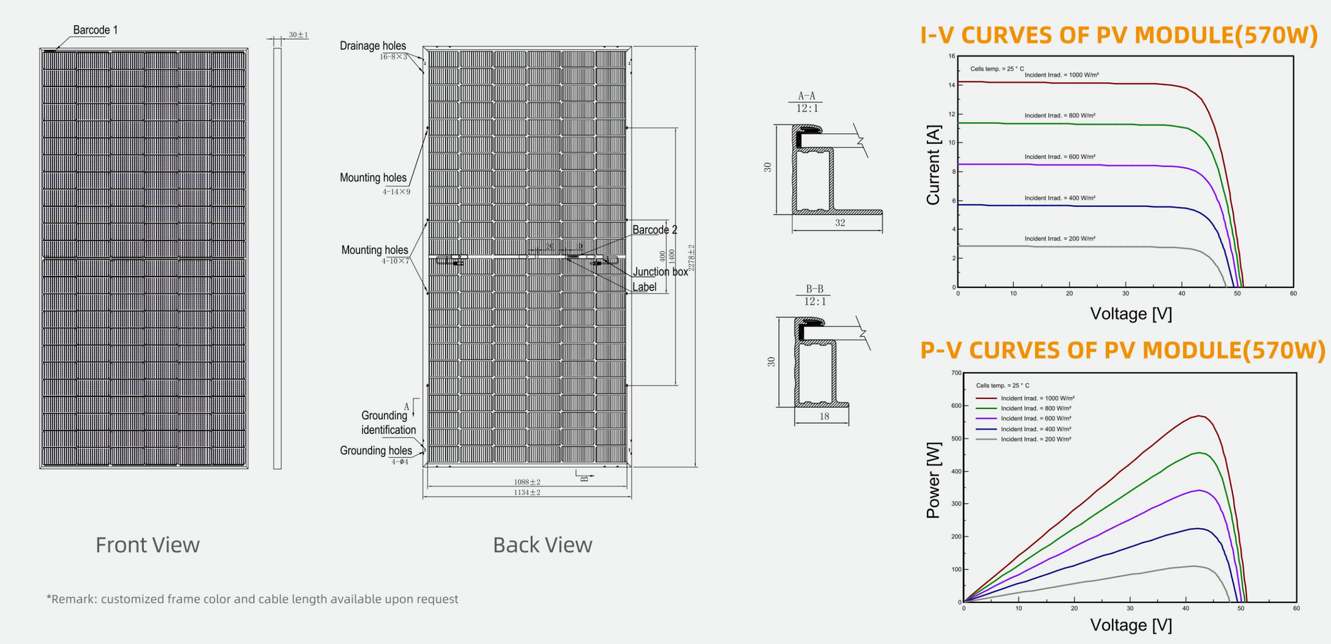
Excellent Quality Managerment System
Warranted reliability and stringent quality assurances well beyond certified requirements.

Bifacial Technology
Up to 25% additional power gain from back side depending on albedo.

Founded in 1988, ZNShine solar is a world's leading high-tech PV module manufacturer.With the advanced production lines, the company boasts module capacity of 10 GW. Bloomberg has listed ZNShine as a global Tier 1 PV module maker. Today Znshine has distributed its sales to more than 60 countries around the globe.

ZXM7-UHLDD144 Series | 16BB HALF-CELL N-Type TOPCon Bifacial Double Glass Monocrystalline PV Module — ZNSHINESOLAR

DIMENSIONS OF PV MODULE(mm)



*Remark: customized frame color and cable length available upon request

ELECTRICAL CHARACTERISTICS | STC*

Nominal Power Watt Pmax(W)*	555	560	565	570	575	580
Maximum Power Voltage Vmp(V)	41.80	42.00	42.20	42.40	42.60	42.80
Maximum Power Current Imp(A)	13.28	13.34	13.39	13.45	13.50	13.56
Open Circuit Voltage Voc(V)	50.50	50.70	50.90	51.10	51.30	51.50
Short Circuit Current Isc(A)	14.05	14.11	14.17	14.23	14.29	14.35
Module Efficiency (%)	21.48	21.68	21.87	22.07	22.26	22.45

*The data above is for reference only and the actual data is in accordance with the pratical testing
*STC (Standard Test Condition): Irradiance 1000W/m², Module Temperature 25±2℃, AM 1.5
*Measuring uncertainity: ±3%, all the electrical characteristics such as Power, Im, Vm and FF are within ±3% tolerance.

MECHANICAL DATA

Solar cells	N-type Monocrystalline
Cells orientation	144（6×24）
Module dimension	2278×1134×30 mm (With Frame)
Weight	31.5±1.0 kg
Glass	2.0 mm+2.0mm, High Transmission, AR Coated Heat Strengthened Glass
Junction box	IP 68，3 diodes
Cables	4 mm² ,350 mm (With Connectors)
Connectors*	MC4-compatible

*Please refer to regional datasheet for specified connector

ELECTRICAL CHARACTERISTICS | NMOT*

Maximum Power Pmax(Wp)	419.00	422.80	426.40	430.30	433.90	437.80
Maximum Power Voltage Vmp(V)	39.30	39.50	39.70	39.90	40.00	40.20
Maximum Power Current Imp(A)	10.65	10.70	10.74	10.79	10.83	10.88
Open Circuit Voltage Voc(V)	47.70	47.80	48.00	48.20	48.40	48.60
Short Circuit Current Isc(A)	11.34	11.39	11.44	11.48	11.53	11.58

*NMOT:Irradiance 800W/m²,Ambient Temperature 20℃,AM 1.5,Wind Speed 1m/s

TEMPERATURE RATINGS / WORKING CONDITIONS

NMOT	44℃ ±2℃	Maximum system voltage	1500 V DC
Temperature coefficient of Pmax	(-0.30±0.03)%/℃	Operating temperature	-40℃~+85℃
Temperature coefficient of Voc	-0.25%/℃	Maximum series fuse	30 A
Temperature coefficient of Isc	0.046%/℃	Front Side Maximum Static Loading	Up to 5400Pa
Refer.Bifacial Factor	(80±10)%	Rear Side Maximum Static Loading	Up to 2400Pa

*Remark:Do not connect Fuse in Combiner Box with two or more strings in parallel connection

ELECTRICAL CHARACTERISTICS WITH 25% REAR SIDE POWER GAIN*

Front power Pmax/W	555	560	565	570	575	580
Total power Pmax/W	694	700	706	713	719	725
Vmp/V(Total)	41.90	42.10	42.30	42.50	42.70	42.90
Imp/A(Total)	16.56	16.63	16.70	16.76	16.83	16.90
Voc/V(Total)	50.60	50.80	51.00	51.20	51.40	51.60
Isc/A(Total)	17.52	17.59	17.67	17.74	17.82	17.88

*Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

PACKAGING CONFIGURATION *

Piece/Box	36
Piece/Container(40'HQ)	720

*Customized packaging is available upon request.
*Remark:Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.
*Caution:Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

Add : 1#, Zhixi Industrial Zone，JintanJiangsu 213251，P.R. China Tel: +86 519 6822 0233

Note: Specifications included in this datasheet are subject to change without notice.ZNSHINE reserves the right of final interpretation © ZNSHINE SOLAR 2022 | Version: ZXM7-UHLDD144 2303.E

No special undertaking or warranty for the suitability of special purpose or being installed in extraordinary surroundings is granted unless as otherwise specifically committed by manufacturer in contract document

1 MODULE CUTSHEET
NOT TO SCALE

YASKAWA

PVI 50TL & PVI 60TL

3-Ph Transformerless Commercial String Inverters

Features

- Integrated arc fault protection
- Compliant with UL 1741SA
- 3 MPPTs with 5 inputs each
- Integrated DC and AC disconnects
- AC terminals compatible with copper and aluminum conductors
- Modbus communications
- Internal data logger
- 0 - 90° installation orientation
- Remote firmware upgrades
- Remote diagnostics
- Compatible with certain MLPE for module-level rapid shutdown*

Options

- H4 wiring box
- Shade cover
- DC fuse bypass
- Web-based monitoring

Yaskawa Solectria Solar's PVI 50TL and PVI 60TL are grid-tied, transformerless three-phase inverters designed for ground mount, rooftop and carport arrays and can be installed from 0 - 90 degrees. The PVI 50/60TL inverters are the most reliable, efficient and cost effective in their class. They come standard with AC and DC disconnects, three MPPTs, a 15-position string combiner, remote diagnostics, remote firmware upgrades and various protection features. Options include H4 wiring box, shade cover, DC combiner fuse bypass, and web-based monitoring.

SOLECTRIA SOLAR

PVI 50TL & PVI 60TL

Specifications

	PVI 50TL	PVI 60TL
DC Input		
Absolute Maximum Input Voltage	1000 VDC	1000 VDC
Maximum Power Input Voltage Range (MPPT)	480-850 VDC	540-850 VDC
Operating Voltage Range (MPPT)	200-950 VDC	200-950 VDC
Maximum Operating Input Current	108 A (36 A per MPPT)	114 A (38 A per MPPT)
Number of MPP Trackers	3	3
Maximum Available PV Current (Isc x 1.25)	204 A (68 A per MPPT)	204 A (68 A per MPPT)
Maximum PV Power	75 kW (30 kW per MPPT)	90 kW (33 kW per MPPT)
Start Voltage	330 V	330 V
AC Output		
Nominal Output Voltage	480 VAC, 3-Ph/PE/N	480 VAC, 3-Ph/PE/N
AC Voltage Range (Standard)	-12/+10%	-12/+10%
PF=1.00 - Real/Apparent Power/Output Current	50 kW / 50 kVA / 60.2 A	60 kW / 60 kVA / 72.3 A
PF=+/-0.91 - Real/Apparent Power/Output Current	50 kW / 55 kVA / 66.2 A	60 kW / 66 kVA / 79.4 A
Nominal Output Frequency	60 Hz	60 Hz
Output Frequency Range	57-63 Hz	57-63 Hz
Power Factor	Unity, >0.99 (Adjustable 0.8 leading to 0.8 lagging)	Unity, >0.99 (Adjustable 0.8 leading to 0.8 lagging)
Fault Current Contribution (1 Cycle RMS)	55 A	55 A
Total Harmonic Distortion (THD) @ Rated Load	<3%	<3%
Recommended OCPD Device	90 A	100 A
AC Surge Protection	Type II MOV, 1240Vc, 15kA Itm (8/20μ)	
Efficiency		
Peak Efficiency	99.0%	99.0%
CEC Efficiency	98.5%	98.5%
Tare Loss	< 2 W	< 2 W
Integrated String Combiner		
Fused Inputs	15 Fused Positions (5 Positions per MPPT) 15 A Standard (20, 25, 30 A accepted)**	
Temperature		
Ambient Temperature Range	-22°F to +140°F (-30°C to +60°C); Derating occurs over +122°F (+50°C)	
Storage Temperature Range	No low temp minimum to +158°F (+70°C)	
Relative Humidity (non-condensing)	0-95%	
Operating Altitude	13,123 ft (4,000 m) Derating occurs from 9,842.5 ft (3,000 m)	
Communications		
Data Logger Hardware	Standard, Internal	
SolrenView Web-Based Monitoring Service	Optional	
Revenue Grade Metering	Optional, External	
Communication Interface	RS-485 Modbus RTU	
Remote Firmware Upgrades	Standard	
Remote Diagnostics	Standard	
Features & Protections		
Arc-Fault	Standard	
Smart Grid Features	L/HVRT, L/HFRT, Volt-Var, Frequency-Watt and Volt-Watt, Soft-Start, Soft-Step	
Testing & Certifications		
Safety Listings & Certifications	UL 1741SA-2016, UL1699B, CSA-C22.2 #107.1, IEEE1547a-2014	
Advanced Grid Support Functionality	Rule 21, UL 1741SA	
Testing Agency	ETL	
FCC Compliance	FCC Part 15	
Warranty		
Standard Limited Warranty	10 Years	
Enclosure		
Acoustic Noise Rating	< 60 dBA @ 1 m at room temperature	
AC/DC Disconnect	Standard, fully-integrated	
Mounting Angle***	0-90° from horizontal (vertical, angled, flat)	
Dimensions (H x W x D)	39.4 in. x 23.6 in. x 10.2 in (1,000 mm x 600 mm x 260 mm)	
Weight	Inverter: 123.5 lbs (56 kg); Wiring Box: 33 lbs (15 kg)	
Enclosure Rating and Finish	Type 4X; Polyester Powder Coated Aluminum	

***Please inquire about compatible Module-Level Power Electronics (MLPE)**
****Yaskawa Solectria Solar does not supply optional fuses sizes**
*****Shade cover accessory required for installation of 75° or less**

SOLECTRIA SOLAR

Yaskawa Solectria Solar
360 Merrimack Street
Lawrence, MA 01843
solectria.com
1-978-683-9700
inverters@solectria.com
DOCR-070642-P | November 2018
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YASKAWA

2 INVERTER CUTSHEET
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

Kupper ENGINEERING, LLC
AN ASPLUNDH ENGINEERING CO.
AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-5970

CI RENEWABLES

UMMS PARASOL - 900 ELKRIDGE
900 ELKRIDGE LANDING RD.
LINTHICUM HEIGHTS, MD 21090

REV.	DESCRIPTION:	DATE:	BY:	CHK:
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

PROJECT NO: 405-22
SCALE: AS NOTED

ELECTRICAL DETAILS - 5

DRAWING NO: E5.05

ANNE ARUNDEL COUNTY
MARYLAND
DEPARTMENT OF HEALTH

J. Howard Beard Health Services Building
3 Harry S. Truman Parkway
Annapolis, Maryland 21401
Phone: 410-222-7095 Fax: 410-222-7294
Maryland Relay (TTY): 711
www.aahealth.org

Tonii Gedin, RN, DNP
Health Officer

MEMORANDUM

TO: Sadé Medina, Zoning Applications
Planning and Zoning Department, MS-6301

FROM: Brian Chew, Program Manager
Bureau of Environmental Health

DATE: March 25, 2024

RE: University of Maryland Med System Corp.
900 Elkridge Landing Road
Linthicum Heights, MD 21090

NUMBER: 2024-0044-V

SUBJECT: Variance/Special Exception/Rezoning

The Health Department has reviewed the above referenced variance to allow an accessory structure (solar carport) in the front yard of a nonwaterfront lot and with less setbacks than required.

The Health Department has reviewed the above-referenced request. The property is served by public water and sewer facilities. The Health Department has no objection to the above-referenced request.

If you have further questions or comments, please contact Brian Chew at 410-222-7413.

cc: Sterling Seay

ANNE ARUNDEL COUNTY
MARYLAND
Office of Planning and Zoning

Jenny B. Dempsey
Planning and Zoning Officer

MEMORANDUM

TO: Sterling Seay, Planning Administrator, Zoning Division

FROM: Dan Beverungen, Planner, Regional Team

VIA: Courtney Wilson, Planning Administrator, Regional Team

SUBJECT: 900 Elkridge Landing Road, Linthicum Heights, 20190
2024-0044-V

DATE: March 20, 2024

This memorandum is in response to the Zoning Division request for comments regarding a variance to the provisions of Article 18-2-204 to allow for the placement of an accessory structure in the front yard of a non-waterfront lot. While the Development Division defers to the Zoning Division regarding whether the application complies with the requisite criteria for the granting of these applications, as stated in Article 18, Title 16 of County Code, the following is offered:

1. The proposed development will be subject to Preliminary and Site Development Plan requirements found in Article 17, Title 4 of County Code. A comprehensive review of the proposed development will occur during the Site Development Plan review process. Prior to the initiation of the development review process, the applicant is encouraged to contact the Regional Team to determine if the application may be eligible for procedural relief.
2. The proposed development is subject to compliance with the Landscape Manual. In accordance with Section III(F), the portion of the site impacted by the proposed alterations shall conform to the standards of the Landscape Manual. A review for compliance with the Landscape Manual will occur with the review of the required Landscape Plans during the development review process.

900 Elkridge Landing Rd

Legend

Foundation

Addressing

Parcels

Parcels - Annapolis City

0 250 500 ft

This map is a user generated static output from an Internet mapping site and is for reference only.
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Nearmap

Notes

February 2024