

PERMIT NUMBER: B 22001542

DATE ACCEPTED:



### RESIDENTIAL BUILDING PERMIT APPLICATION

HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES, AND PERMITS

3430 COURT HOUSE DRIVE, ELLICOTT CITY, MD 21043 - PHONE: (410) 313-2455 OPTION #4  
www.howardcountymd.gov

#### BUILDING SITE ADDRESS REQUIRED

Street Address: 7475 Mink Hollow Road		Unit:
City: Highland	State: MD	Zip Code: 20777
Subdivision/Village/Complex Name:		SDP/WP/BA #:
Lot:	Tax Map:	Parcel:
Grading Permit #:		

#### DESCRIPTION OF WORK REQUIRED

Existing Use: SFD	Proposed Use: SFD	Estimated Cost: \$ 83,695.00
Trade Work to Be Completed (Separate Permits Required): <input type="checkbox"/> Mechanical (HVACR) <input type="checkbox"/> Electrical <input type="checkbox"/> Plumbing <input type="checkbox"/> None		
36 Roof mounted solar Panels and 54 Ground mounted solar Panels		

#### PROPERTY OWNER INFORMATION REQUIRED

Owner(s) Name(s) (As it appears on tax records): Christopher Sanders	Primary Residence: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Owner's Street Address: 7475 Mink Hollow Road	
City: Highland	State: MD
Phone: 301-955-6055	Email: cksanders1@gmail.com
	Zip Code: 20777

#### APPLICANT NAME REQUIRED - INDIVIDUAL WHO SIGNS THIS APPLICATION

Business Name: Sunlight To The Rescue, LLC	Contact Name: Jean Yves Dalle
Street Address: 10014 Colesville Road, Suite B	
City: Silver Spring	State: MD
Phone: 301-792-7574	Email: ydalle@sunlighttotherescue.com
	Zip Code: 20901

#### CONTRACTOR INFORMATION REQUIRED

Business Name: Sunlight To The Rescue, LLC	License #: 113392
Licensee's Name: Jean Yves Dalle	
Street Address: 10014 Colesville Road Suite B	
City: Silver Spring	State: MD
Phone: 301-792-7574	Email: info@sunlighttotherescue.com
	Zip Code: 20901

#### ARCHITECT/ENGINEER INFORMATION INDIVIDUAL WHO SIGNED PLANS, IF APPLICABLE

Business Name: Optimize Engineering Co	Name: Richard B. Gordon
Street Address: P.O. Box 264	
City: Farmville	State: VA
Phone: 434-547-6230	Email: richardg@comcast.net
	Zip Code: 23001

#### BUILDING CHARACTERISTICS REQUIRED

Primary Structure: <input type="checkbox"/> SF Dwelling <input type="checkbox"/> SF Townhouse <input type="checkbox"/> SF Duplex <input type="checkbox"/> Mobile Home <input type="checkbox"/> Multi-Family Dwelling (MF*)	Condo: <input type="checkbox"/> Yes <input type="checkbox"/> No
Utilities: <input type="checkbox"/> Electric <input type="checkbox"/> Gas	Water Supply: <input type="checkbox"/> Public <input checked="" type="checkbox"/> Private (Well)
Heating System: <input type="checkbox"/> Electric <input type="checkbox"/> Natural Gas <input type="checkbox"/> Propane <input type="checkbox"/> Other:	Sewage Disposal: <input type="checkbox"/> Public <input checked="" type="checkbox"/> Private (Septic)
Sprinkler System: <input type="checkbox"/> NFPA 13 <input type="checkbox"/> NFPA 13R <input type="checkbox"/> NFPA 13D <input type="checkbox"/> None	Roadside Tree Project: <input type="checkbox"/> No <input type="checkbox"/> Yes: #
Fire Alarm System: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Voice Evac	

#### ADDITIONAL RESIDENTIAL INFORMATION (PLEASE SELECT/COMPLETE ALL THAT APPLY)

Model Name & Options:				
# of Bedrooms (SF):	# of efficiency units (MF*):	# of 1 BR (MF*):	# of 2 BR (MF*):	# of 3 BR (MF*):
# Rooms:	# Full Baths:	# Half Baths:	# Fireplaces:	
Garage/Carport Info: <input type="checkbox"/> Attached Garage <input type="checkbox"/> Detached Garage <input type="checkbox"/> Integral Garage <input type="checkbox"/> Carport <input type="checkbox"/> None				
Basement/Foundation Info: <input type="checkbox"/> Slab on Grade <input type="checkbox"/> Post & Pier <input type="checkbox"/> Unfinished Basement <input type="checkbox"/> Finished Basement: <input type="checkbox"/> Full or <input type="checkbox"/> Partial				
1st FI Width:	1st FI Depth:	2nd FI Width:	2nd FI Depth:	Bsmt Width:
Energy Method: <input type="checkbox"/> Prescriptive <input type="checkbox"/> Performance <input type="checkbox"/> UA Alternative <input type="checkbox"/> ERI		Gross Area:	sq ft	Occupiable Area:
		sq ft		

#### AGREEMENT/ DISCALIMER REQUIRED

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

APPLICANT'S ORIGINAL SIGNATURE: *Jean Yves Dalle* DATE SIGNED: 4/14/2022

#### FOR OFFICE USE ONLY

CHECKS PAYABLE TO: DIRECTOR OF FINANCE OF HOWARD COUNTY

AGENCIES REQUIRED/APPROVALS:				
<input checked="" type="checkbox"/> PR	<input checked="" type="checkbox"/> DPZ	<input checked="" type="checkbox"/> DED	<input checked="" type="checkbox"/> Health <i>4-21-22</i>	<input type="checkbox"/> SHA <input type="checkbox"/> CID
SUBMITTAL FEES: \$5500	PAYMENT: <i>ck # 623</i>	ACCEPTED BY: <i>MP</i>		

**GENERAL NOTES**

- 1.1.1 **PROJECT NOTES:**
- 1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
- 1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
- 1.1.4 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4: **PV MODULES:** UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE **INVERTERS:** UL 1741 CERTIFIED, IEEE 1547, 929, 519 **COMBINER BOX(ES):** UL 1703 OR UL 1741 ACCESSORY
- 1.1.5 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.
- 1.1.6 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4 (D). SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3].
- 1.1.7 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

- 1.2.1 **SCOPE OF WORK:**
- 1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE GROUND MOUNT ARRAY PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT.

- 1.3.1 **WORK INCLUDES:**
- 1.3.2 PV ATTACHMENTS - QUICK MOUNT PV QMLM: L-MOUNT, UNIRAC GFT
- 1.3.3 PV RACKING SYSTEM INSTALLATION - IRONRIDGE XR-100
- 1.3.4 PV MODULE AND INVERTER INSTALLATION - TALESUN TP660P-270W / SOL-ARK 12K-P / LEGACY HIGH PERFORMANCE BATTERY 27A, 48V
- 1.3.5 PV EQUIPMENT GROUNDING
- 1.3.6 PV LOAD CENTERS (IF INCLUDED)
- 1.3.7 PV METERING/MONITORING (IF INCLUDED)
- 1.3.8 PV DISCONNECTS
- 1.3.9 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
- 1.3.10 PV FINAL COMMISSIONING
- 1.3.11 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
- 1.3.12 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE
- 1.3.13 TRENCHING (IF NECESSARY)

**SCOPE OF WORK**  
 SYSTEM SIZE: STC: 90 X 270W = 24.300KW  
 PTC: 90 X 245.5W = 21.804KW DC  
 (90) TALESUN TP660P-270W  
 (2) SOL-ARK 12K-P  
 (4) LEGACY HIGH PERFORMANCE BATTERY 27A, 48V

ATTACHMENT TYPE: QUICK MOUNT PV QMLM: L-MOUNT, UNIRAC GFT

MSP UPGRADE: NO

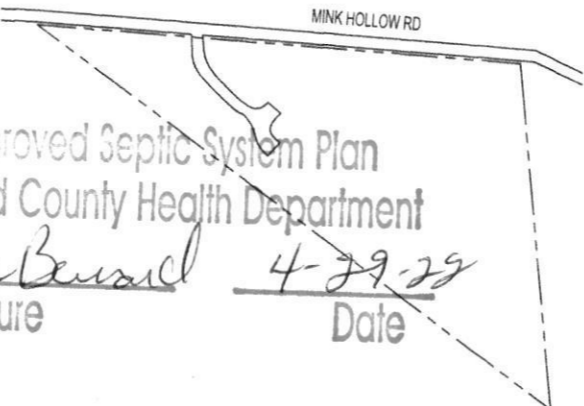
# NEW PV SYSTEM: 24.300 kWp

## SANDERS RESIDENCE

7475 MINK HOLLOW RD  
 HIGHLAND, MD 20777  
 ASSESSOR'S #: 05360285

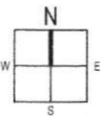


**01 AERIAL PHOTO**  
 NOT TO SCALE



Approved Septic System Plan  
 Howard County Health Department  
*Dana Bussard* 4-29-22  
 Signature Date

**02 PLAT MAP**  
 NOT TO SCALE



**SHEET LIST TABLE**

SHEET NUMBER	SHEET TITLE
T-001	COVER PAGE
G-001	NOTES
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A-102	ELECTRICAL PLAN
A-103	SOLAR ATTACHMENT PLAN
A-104	SOLAR ATTACHMENT PLAN
E-601	LINE DIAGRAM
E-602	DESIGN TABLES
E-603	PLACARDS
S-501 - S-504	ASSEMBLY DETAILS
R-001	RESOURCE DOCUMENT
R-002	RESOURCE DOCUMENT
R-003	RESOURCE DOCUMENT
R-004	RESOURCE DOCUMENT
R-005	RESOURCE DOCUMENT
R-006	RESOURCE DOCUMENT
R-007	RESOURCE DOCUMENT
R-008	RESOURCE DOCUMENT

**PROJECT INFORMATION**

**OWNER**  
 NAME: HIGHLAND MARYLAND

**PROJECT MANAGER**  
 NAME: JEAN-YVES DALLE  
 PHONE: 3017927541

**CONTRACTOR**  
 NAME: SUNLIGHT-TO-THE RESCUE, LLC  
 PHONE: (240) 641-5054

**AUTHORITIES HAVING JURISDICTION**  
 BUILDING: HOWARD COUNTY  
 ZONING: HOWARD COUNTY  
 UTILITY:

**DESIGN SPECIFICATIONS**  
 OCCUPANCY: II  
 CONSTRUCTION: SINGLE-FAMILY  
 ZONING: RESIDENTIAL  
 GROUND SNOW LOAD: 25 PSF  
 WIND EXPOSURE: C  
 WIND SPEED: 115 MPH

**APPLICABLE CODES & STANDARDS**  
 BUILDING: IBC 2021 IRC 2021  
 ELECTRICAL: NEC 2021  
 FIRE: IFC 2015



**CONTRACTOR**

SUNLIGHT-TO-THE RESCUE, LLC  
 PHONE: (240) 641-5054  
 ADDRESS: 10014 COLESVILLE ROAD, SUITE B SILVER SPRING, MD 20901

LIC. NO.: MHIC#134380  
 HIC. NO.:  
 ELE. NO.:  
UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 24.300 kWp

## SANDERS RESIDENCE

7475 MINK HOLLOW RD  
 HIGHLAND, MD 20777  
 APN: 05360285

**ENGINEER OF RECORD**



**COVER PAGE**

DATE: 04.08.2022  
 DESIGN BY: I.P.  
 CHECKED BY: M.M.

REVISIONS

**T-001.00**  
 (SHEET 1)

**2.1.1 SITE NOTES:**  
 2.1.2 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH STORAGE BATTERIES.  
 2.1.3 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING OR MECHANICAL.  
 2.1.4 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION NEC 110.26.

**2.2.1 EQUIPMENT LOCATIONS**  
 2.2.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.  
 2.2.3 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).  
 2.2.3 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.  
 2.2.4 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.  
 2.2.5 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.  
 2.2.6 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.  
 2.2.7 SOLAR ARRAY LOCATION SHALL BE ADJUSTED ACCORDINGLY TO MEET LOCAL SETBACK REQUIREMENTS.

**2.3.1 STRUCTURAL NOTES:**  
 2.3.2 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAIL MANUFACTURER'S INSTRUCTIONS.  
 2.3.3 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IT SHALL BE SEALED PER LOCAL REQUIREMENTS.  
 2.3.5 ALL PV RELATED ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.

**2.4.1 GROUNDING NOTES:**  
 2.4.2 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.  
 2.4.3 AS IN CONVENTIONAL PV SYSTEMS, UNGROUNDED PV SYSTEMS REQUIRE AN EQUIPMENT GROUNDING CONDUCTOR. ALL METAL ELECTRICAL EQUIPMENT AND STRUCTURAL COMPONENTS BONDED TO GROUND, IN ACCORDANCE WITH 250.134 OR 250.136(A). ONLY THE DC CONDUCTORS ARE UNGROUNDED.  
 2.4.4 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.  
 2.4.5 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURE CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).  
 2.4.6 EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.  
 2.4.7 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.  
 2.4.8 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119].  
 2.4.9 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.  
 2.4.10 ACCORDING TO NEC 690.47 (C)(3), UNGROUNDED SYSTEMS INVERTER MAY SIZE DC GEC ACCORDING TO EGC REQUIREMENTS OF NEC 250.122. HOWEVER, DC GEC TO BE UNSPLICED OR IRREVERSIBLY SPLICED.  
 2.4.11 IN UNGROUNDED INVERTERS, GROUND FAULT PROTECTION IS PROVIDED BY "ISOLATION MONITOR INTERRUPTER," AND GROUND FAULT DETECTION PERFORMED BY "RESIDUAL-CURRENT DETECTOR."

**INTERCONNECTION NOTES:**  
 2.5.1 LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 2.7.9 690.64 (B)]  
 2.5.2 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(D)(2)(3)].  
 2.5.3 PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(D)(2)(3)].  
 2.5.4 AT MULTIPLE INVERTERS OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (D)(2)(3)(C).  
 2.5.5 FEEDER TAP INTERCONNECTION (LOAD SIDE) ACCORDING TO NEC 705.12 (D)(2)(1)  
 2.5.6 SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42  
 2.5.8 BACKFEEDING BREAKER FOR UTILITY-INTERACTIVE INVERTER OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (D)(5)].

**DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:**  
 2.6.1 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).  
 2.6.2 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH.  
 2.6.4 BOTH POSITIVE AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED. THEREFORE BOTH MUST OPEN WHERE A DISCONNECT IS REQUIRED, ACCORDING TO NEC 690.13.  
 2.6.5 DC DISCONNECT INTEGRATED INTO DC COMBINER OR INSTALLED WITHIN 6 FT, ACCORDING TO NEC 690.15 (C).  
 2.6.6 RAPID SHUTDOWN OF ENERGIZED CONDUCTORS BEYOND 10 FT OF PV ARRAY OR 5 FT INSIDE A BUILDING WITHIN 10 SECONDS. CONTROLLED CONDUCTORS ≤30V AND ≤240VA [NEC 690.12]. LOCATION OF LABEL ACCORDING TO AHJ.  
 2.6.7 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.  
 2.6.8 BOTH POSITIVE AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED. THEREFORE BOTH REQUIRE OVER-CURRENT PROTECTION, ACCORDING TO NEC 240.21. (SEE EXCEPTION IN NEC 690.9)  
 2.6.9 IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL 1699B.

**WIRING & CONDUIT NOTES:**  
 2.7.1 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE.  
 2.7.2 CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.  
 2.7.3 ALL CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.  
 2.7.4 EXPOSED UNGROUNDED PV SOURCE AND OUTPUT CIRCUITS SHALL USE WIRE LISTED AND IDENTIFIED AS PHOTOVOLTAIC (PV) WIRE [690.35 (D)]. PV MODULES WIRE LEADS SHALL BE LISTED FOR USE WITH UNGROUNDED SYSTEMS, ACCORDING TO NEC 690.35 (D)(3).  
 2.7.5 PV WIRE BLACK WIRE MAY BE FIELD-MARKED WHITE [NEC 200.6 (A)(6)].  
 2.7.6 MODULE WIRING SHALL BE LOCATED AND SECURED UNDER THE ARRAY.  
 2.7.7 ACCORDING TO NEC 200.7, UNGROUNDED SYSTEMS DC CONDUCTORS COLORED OR MARKED AS FOLLOWS:  
 DC POSITIVE- RED, OR OTHER COLOR EXCLUDING WHITE, GRAY AND GREEN  
 DC NEGATIVE- BLACK, OR OTHER COLOR EXCLUDING WHITE, GRAY AND GREEN  
 2.7.8 AC CONDUCTORS COLORED OR MARKED AS FOLLOWS:  
 PHASE A OR L1- BLACK  
 PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE  
 PHASE C OR L3- BLUE, YELLOW, ORANGE, OR OTHER CONVENTION  
 NEUTRAL- WHITE OR GRAY

TO BE MARKED ORANGE [NEC 110.15].  
 ELECTRICAL WIRES IN TRENCH SHALL BE AT LEAST 18IN. BELOW GRADE (RESIDENTIAL).

\* IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE



**CONTRACTOR**

SUNLIGHT-TO-THE RESCUE, LLC  
 PHONE: (240) 641-5054  
 ADDRESS: 10014 COLESVILLE ROAD, SUITE B SILVER SPRING, MD 20901

LIC. NO.: MHC#134380  
 HIC. NO.:  
 ELE. NO.:

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NEW PV SYSTEM: 24.300 kWp

**SANDERS RESIDENCE**

7475 MINK HOLLOW RD  
 HIGHLAND, MD 20777  
 APN: 05360285

**ENGINEER OF RECORD**

03.30.2022



Richard B. Gordon, P.E.  
 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. MD. P.E. License No. 37741, Expiration Date: 07.09.2023

DocuSigned by:  
 Richard B Gordon  
 48B2A31113464DB  
 Richard B Gordon

3/30/2022

PAPER SIZE: 11" x 17" (ANSI B)

**NOTES**

DATE: 03.29.2022

DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**G-001.00**  
 (SHEET 2)

### GENERAL NOTES

1. FIELD VERIFY ALL MEASUREMENTS
2. ITEMS BELOW MAY NOT BE ON THIS PAGE



#### CONTRACTOR

SUNLIGHT-TO-THE-RESCUE, LLC

PHONE: (240) 641-5054

ADDRESS: 10014 COLESVILLE ROAD,  
SUITE B  
SILVER SPRING, MD 20901

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NEW PV SYSTEM: 24.300 kWp

## SANDERS RESIDENCE

7475 MINK HOLLOW RD  
HIGHLAND, MD 20777  
APN: 05360285

#### ENGINEER OF RECORD



PAPER SIZE: 11" x 17" (ANSI B)

#### SITE PLAN

DATE: 04.08.2022

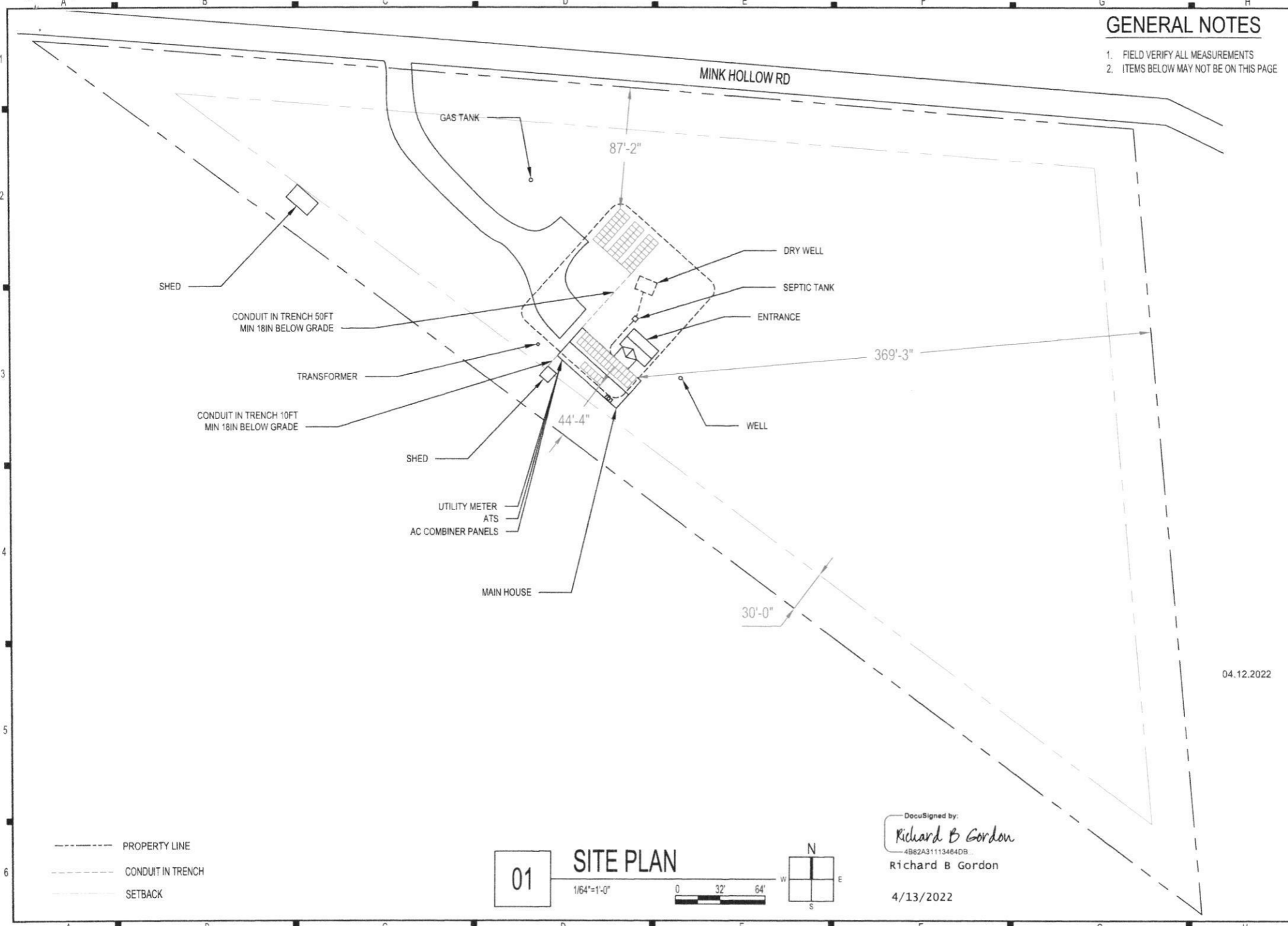
DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

# A-101.00

(SHEET 3)

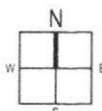
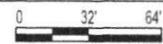


- PROPERTY LINE
- CONDUIT IN TRENCH
- SETBACK

01

### SITE PLAN

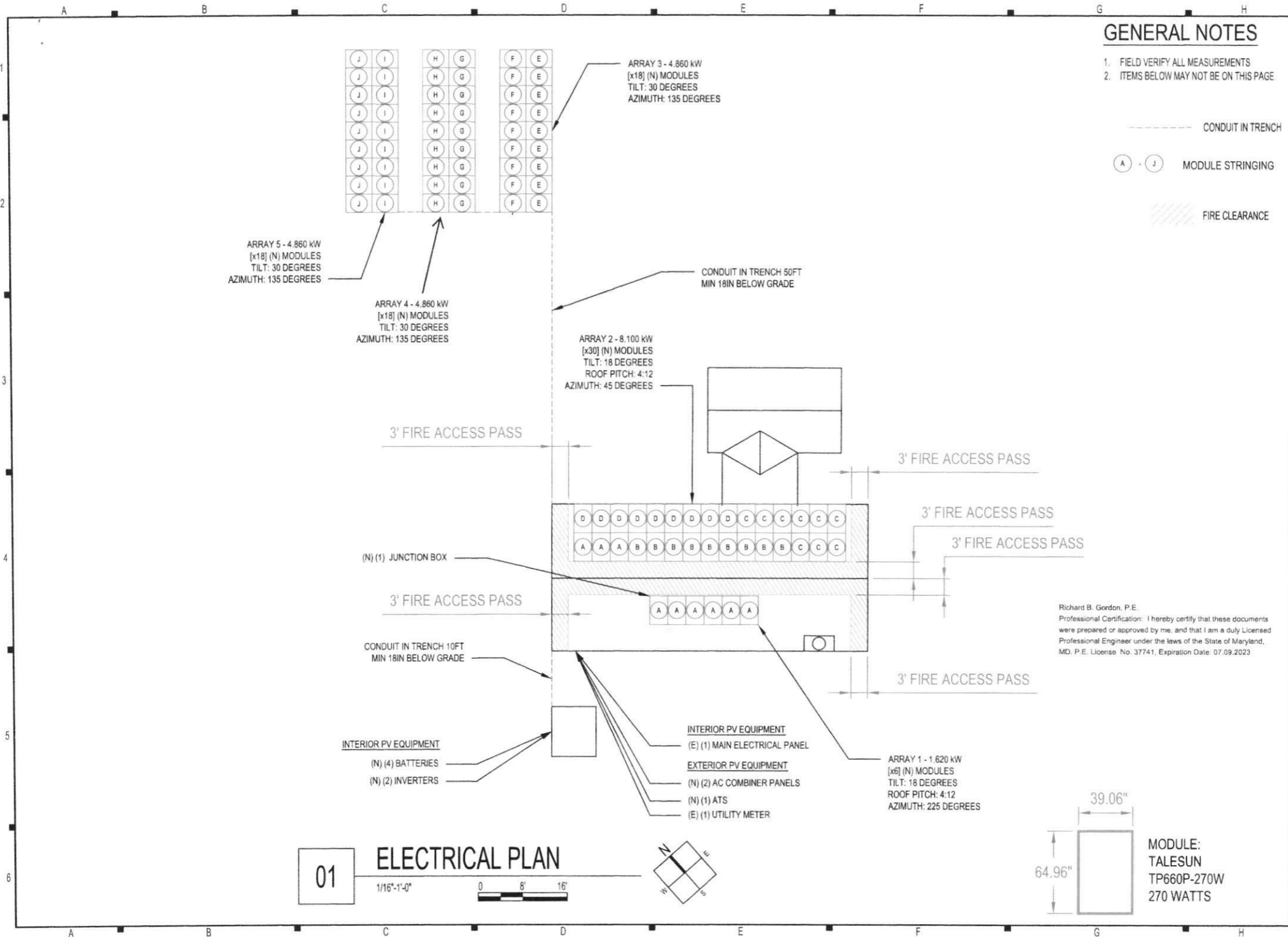
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DocuSigned by:  
*Richard B Gordon*  
4B82A31113464DB  
Richard B Gordon

4/13/2022

04.12.2022



**CONTRACTOR**

SUNLIGHT-TO-THE-RESCUE, LLC

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SILVER SPRING, MD 20901

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**ENGINEER OF RECORD**

03.30.2022



PAPER SIZE: 11" x 17" (ANSI B)

**ELECTRICAL PLAN**

DATE: 03.29.2022

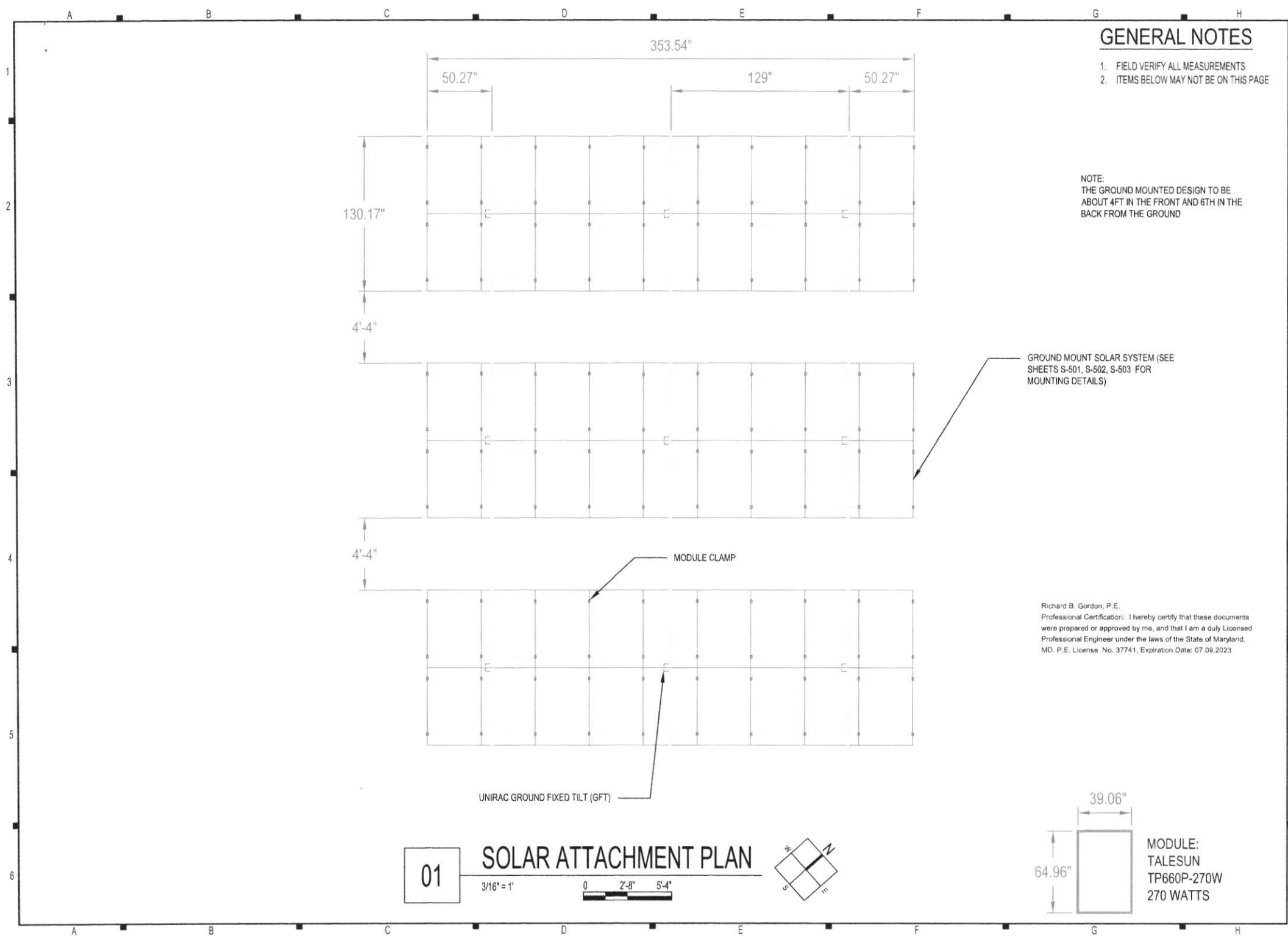
DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**A-102.00**

(SHEET 4)



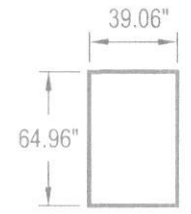
**GENERAL NOTES**

1. FIELD VERIFY ALL MEASUREMENTS
2. ITEMS BELOW MAY NOT BE ON THIS PAGE

NOTE:  
THE GROUND MOUNTED DESIGN TO BE ABOUT 4FT IN THE FRONT AND 6TH IN THE BACK FROM THE GROUND

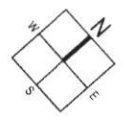
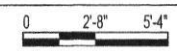
GROUND MOUNT SOLAR SYSTEM (SEE SHEETS S-501, S-502, S-503 FOR MOUNTING DETAILS)

Richard B. Gordon, P.E.  
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, MD, P.E. License No. 37741, Expiration Date: 07.09.2023



MODULE:  
TALESUN  
TP660P-270W  
270 WATTS

**01 SOLAR ATTACHMENT PLAN**  
3/16" = 1'



**CONTRACTOR**

SUNLIGHT-TO-THE RESCUE, LLC

PHONE: (240) 641-5054  
ADDRESS: 10014 COLESVILLE ROAD,  
SUITE B  
SILVER SPRING, MD 20901

LIC. NO.: MHIC#134380  
HIC. NO.:  
ELE. NO.:

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 24.300 kWp

**SANDERS RESIDENCE**

7475 MINK HOLLOW RD  
HIGHLAND, MD 20777  
APN: 05360285

**ENGINEER OF RECORD**

03.30.2022



PAPER SIZE: 11" x 17" (ANSI B)

**SOLAR ATTACHMENT PLAN**

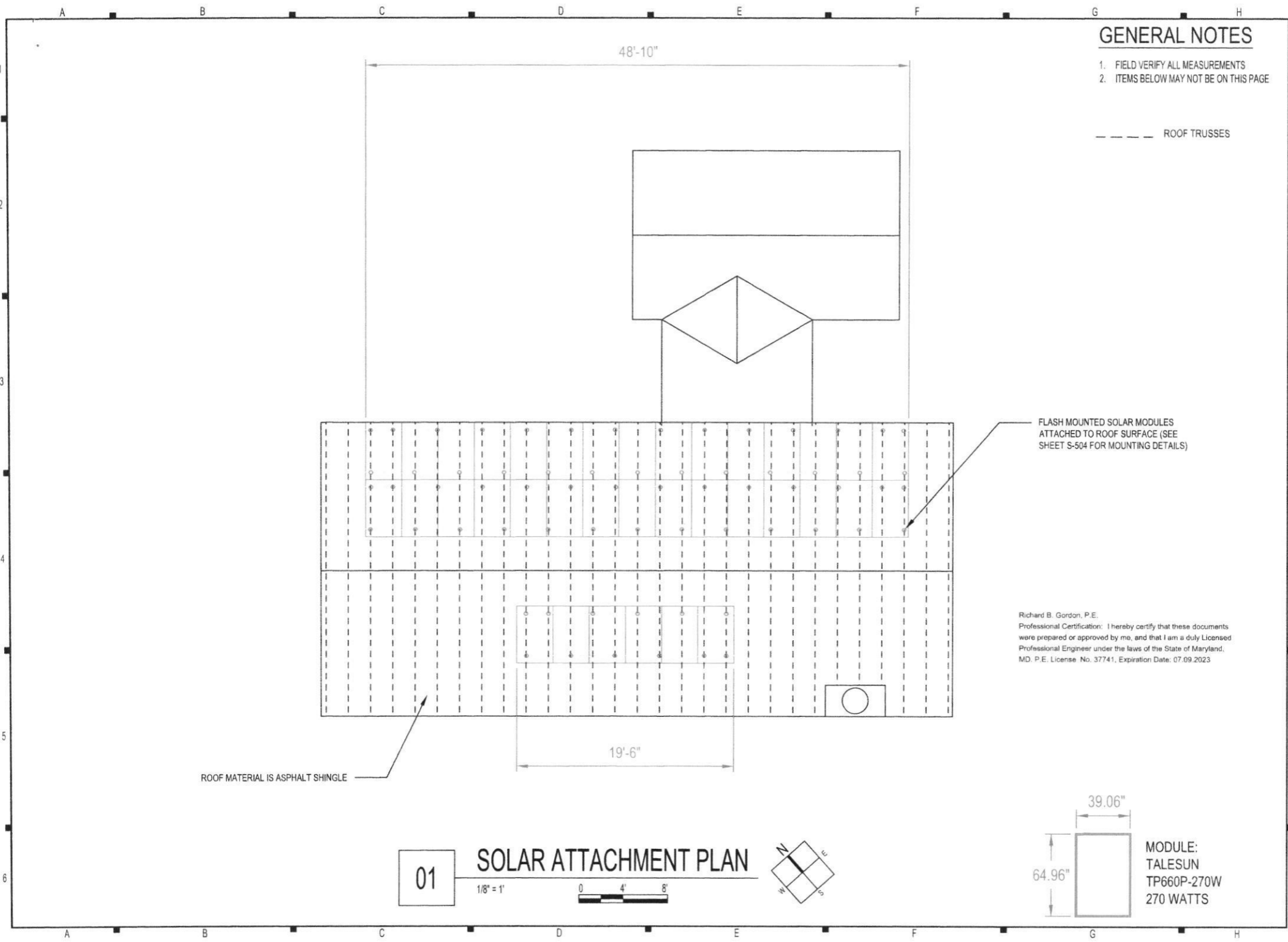
DATE: 03.29.2022

DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**A-103.00**  
(SHEET 5)



**GENERAL NOTES**

1. FIELD VERIFY ALL MEASUREMENTS
2. ITEMS BELOW MAY NOT BE ON THIS PAGE

--- ROOF TRUSSES

FLASH MOUNTED SOLAR MODULES ATTACHED TO ROOF SURFACE (SEE SHEET S-504 FOR MOUNTING DETAILS)

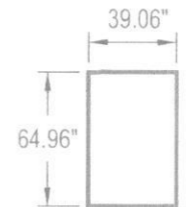
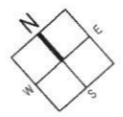
Richard B. Gordon, P.E.  
 Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, MD, P.E. License No. 37741, Expiration Date: 07.09.2023

ROOF MATERIAL IS ASPHALT SHINGLE

01

**SOLAR ATTACHMENT PLAN**

1/8" = 1'  
 0 4' 8'



MODULE:  
 TALESUN  
 TP660P-270W  
 270 WATTS



**CONTRACTOR**

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NEW PV SYSTEM: 24.300 kWp

**SANDERS RESIDENCE**

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 HIGHLAND, MD 20777  
 APN: 05360285

**ENGINEER OF RECORD**

03.30.2022



PAPER SIZE: 11" x 17" (ANSI B)

**SOLAR ATTACHMENT PLAN**

DATE: 03.29.2022

DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**A-104.00**  
 (SHEET 6)



SYSTEM SUMMARY				
	INVERTER #1		INVERTER #2	
	MPPT #1	MPPT #2	MPPT #1	MPPT #2
MODULES IN SERIES	2X9	2X9	3X9	3X9
ARRAY VMP	281.7V	281.7V	281.7V	281.7V
ARRAY IMP	17.26A	17.26A	25.89A	25.89A
ARRAY VOC	346.5V	346.5V	346.5V	346.5V
ARRAY MAX VOC	391.9V	391.9V	391.9V	391.9V
ARRAY ISC	18.18W	18.18W	27.27A	27.27A
ARRAY STC POWER	9,720W		14,580W	
ARRAY PTC POWER	8,838W		13,257W	
MAX AC CURRENT	40A		40A	
MAX AC POWER	12,000W		12,000W	
DERATED (CEC) AC POWER	8,484W		12,000W	
ARRAY STC POWER			24,300W	
ARRAY PTC POWER			22,095W	
MAX AC CURRENT			80A	
MAX AC POWER			24,000W	
DERATED (CEC) AC POWER			20,484W	

MODULES										
REF.	QTY.	MAKE AND MODEL	PMAX	PTC	ISC	IMP	VOC	VMP	TEMP. COEFF. OF VOC	FUSE RATING
PM1-90	90	TALESUN TP660P-270W	270W	245.5W	9.09A	6.63A	38.5V	31.3V	-0.119V/°C (-0.31%/°C)	15A

INVERTERS										
REF.	QTY.	MAKE AND MODEL	AC VOLTAGE	GROUND	OC PD RATING	RATED POWER	MAX OUTPUT CURRENT	MAX INPUT CURRENT	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY
I1-2	2	SOL-ARK 12K-P	240V	FLOATING	50A	12000W	40A	2x20A	500V	96.0%

ASHRAE EXTREME LOW	-17.3°C (0.9°F), SOURCE: BALTIMORE-WASHINGTON (39.17°; -76.68°)
ASHRAE 2% HIGH	35°C (95°F), SOURCE: BALTIMORE-WASHINGTON (39.17°; -76.68°)

Richard B. Gordon, P.E.  
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.  
M.D. P. E. License No. 37741, Expiration Date: 07.09.2023

CONTRACTOR TO VERIFY QUANTITIES PRIOR TO ORDERING

BILL OF MATERIALS							
CATEGORY	MAKE	MODEL NUMBER	REF	QTY	UNIT	QTY/UNIT	DESCRIPTION
MODULE	TALESUN	TP660P-270W	PM1-90	90	PIECES	1	TALESUN TP660P-270W 270W 60 CELLS, POLYCRYSTALLINE SILICON
INVERTER	SOL-ARK	12K-P	I1-2	2	PIECES	1	SOL-ARK 12K-P 12000W INVERTER
BATTERY	LEGACY	HIGH PERFORMANCE BATTERIES 27A, 48 V	BB1-2	2	PIECES	1	LEGACY HIGH PERFORMANCE BATTERIES 27A, 48 V
AC COMBINER PANEL		GEN-AC-PANEL	EP1-2	2	PIECES	1	AC SUBPANEL
WIRING		GEN-10-AWG-PV-WIRE-CU	WR1	900	FEET	1	10 AWG PV WIRE, COPPER (POSITIVE AND NEGATIVE)
WIRING		GEN-6-AWG-BARE-CU	WR1	450	FEET	1	6 AWG BARE, COPPER (GROUND)
WIRING		GEN-10-AWG-THWN-2-CU-RD	WR2	80	FEET	1	10 AWG THWN-2, COPPER, RED (POSITIVE)
WIRING		GEN-10-AWG-THWN-2-CU-BLK	WR2	80	FEET	1	10 AWG THWN-2, COPPER, BLACK (NEGATIVE)
WIRING		GEN-10-AWG-THWN-2-CU-GR	WR2-4	90	FEET	1	10 AWG THWN-2, COPPER, GREEN (GROUND)
WIRING		GEN-8-AWG-THWN-2-CU-RD	WR3	300	FEET	1	8 AWG THWN-2, COPPER, RED (POSITIVE)
WIRING		GEN-8-AWG-THWN-2-CU-BLK	WR3	300	FEET	1	8 AWG THWN-2, COPPER, BLACK (NEGATIVE)
WIRING		GEN-8-AWG-THWN-2-CU-GR	WR6	60	FEET	1	8 AWG THWN-2, COPPER, GREEN (GROUND)
WIRING		GEN-6-AWG-THWN-2-CU-RD	WR5,7	30	FEET	1	6 AWG THWN-2, COPPER, RED (LINE 1)
WIRING		GEN-6-AWG-THWN-2-CU-BLK	WR4	40	FEET	1	6 AWG THWN-2, COPPER, BLACK (LINE 2)
WIRING		GEN-6-AWG-THWN-2-CU-WH	WR4	40	FEET	1	6 AWG THWN-2, COPPER, WHITE (NEUTRAL)
WIRING		GEN-6-AWG-THWN-2-CU-GR	WR4	40	FEET	1	6 AWG THWN-2, COPPER, GREEN (GROUND)
WIRING		GEN-2-AWG-THWN-2-CU-RD	WR6	20	FEET	1	2 AWG THWN-2, COPPER, RED (LINE 1)
WIRING		GEN-2-AWG-THWN-2-CU-BLK	WR6	20	FEET	1	2 AWG THWN-2, COPPER, BLACK (LINE 2)
WIRING		GEN-2-AWG-THWN-2-CU-WH	WR6	20	FEET	1	2 AWG THWN-2, COPPER, WHITE (NEUTRAL)
WIRING		GEN-3/0-AWG-THWN-2-CU-RD	WR5,7	30	FEET	1	3/0 AWG THWN-2, COPPER, RED (LINE 1)
WIRING		GEN-3/0-AWG-THWN-2-CU-BLK	WR5,7	30	FEET	1	3/0 AWG THWN-2, COPPER, BLACK (LINE 2)
WIRING		GEN-3/0-AWG-THWN-2-CU-WH	WR5,7	30	FEET	1	3/0 AWG THWN-2, COPPER, WHITE (NEUTRAL)
WIREWAY		GEN-EMT-0.75" DIA	WW2	40	FEET	1	EMT CONDUIT, 0.75" DIA
WIREWAY		GEN-EMT-1.25" DIA	WW6	20	FEET	1	EMT CONDUIT, 1.25" DIA
WIREWAY		GEN-EMT-2" DIA	WW5,7	30	FEET	1	EMT CONDUIT, 2" DIA
WIREWAY		GEN-PVC-40-1" DIA	WW2-4	100	FEET	1	PVC-40 CONDUIT, 1" DIA
TRANSITION BOX	GENERIC MANUFACTURER	GEN-AWB-TB-4-4X	JB1	1	PIECE	1	TRANSITION/PASS-THROUGH BOX, WITH 4 TERMINAL BLOCKS



**CONTRACTOR**

SUNLIGHT-TO-THE RESCUE, LLC

PHONE: (240) 641-5054  
ADDRESS: 10014 COLESVILLE ROAD,  
SUITE B  
SILVER SPRING, MD 20901

LIC. NO.: MHIC#134380  
HIC. NO.:  
ELE. NO.:

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 24.300 kWp

**SANDERS RESIDENCE**

7475 MINK HOLLOW RD  
HIGHLAND, MD 20777  
APN: 05360285

**ENGINEER OF RECORD**

03.30.2022



PAPER SIZE: 11" x 17" (ANSI B)

**DESIGN TABLES**

DATE: 03.29.2022

DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**E-602.00**

(SHEET 8)

**LABELING NOTES**

- 1.1 LABELING REQUIREMENTS BASED ON THE 2014 NATIONAL ELECTRICAL CODE, INTERNATIONAL FIRE CODE 605.11, OSHA STANDARD 1910.145, ANSI Z535
- 1.2 MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
- 1.3 LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
- 1.4 LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8" AND PERMANENTLY AFFIXED.
- 1.5 ALERTING WORDS TO BE COLOR CODED. "DANGER" WILL HAVE RED BACKGROUND; "WARNING" WILL HAVE ORANGE BACKGROUND; "CAUTION" WILL HAVE YELLOW BACKGROUND. [ANSI Z535]

**WARNING**  
ELECTRICAL SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

**PLACARD 1**  
AT EACH JUNCTION, COMBINER, DISCONNECT AND DEVICE WHERE ENERGIZED UNGROUNDED CONDUCTORS MAY BE EXPOSED DURING SERVICE (3" X 4"). [NEC 690.35(F)]

**WARNING**  
ELECTRICAL SHOCK HAZARD

DO NOT TOUCH TERMINALS TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

**LABEL 2**  
AT EACH DISCONNECTING MEANS FOR PHOTOVOLTAIC EQUIPMENT (3" X 4"). [NEC 690.17]

**PHOTOVOLTAIC SYSTEM AC DISCONNECT**

RATED AC OUTPUT CURRENT **80** A  
NOMINAL OPERATING AC VOLTAGE **240** V

**LABEL 3**  
AT POINT OF INTERCONNECTION, MARKED AT DISCONNECTING MEANS (2" X 4"). [NEC 690.54]

**PHOTOVOLTAIC SOLAR AC DISCONNECT**

**LABEL 4**  
AT EACH AC DISCONNECTING MEANS (1" X 4"). [NEC 690.13(B)]

**PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

**LABEL 5**  
AT RAPID SHUTDOWN SWITCH (5 1/4" X 2"). [NEC 690.56(C)].

**PHOTOVOLTAIC SOLAR DC DISCONNECT**

**LABEL 6**  
AT EACH DC DISCONNECTING MEANS (1" X 4"). [NEC 690.13(B)]

**WARNING**  
THREE POWER SUPPLY SOURCES: UTILITY GRID, BATTERY AND PV SOLAR ELECTRIC SYSTEM

**LABEL 7**  
AT POINT OF INTERCONNECTION (2 3/4" X 1 5/8"). [NEC 705.12(D)(3)]

**WARNING**  
SOLAR ELECTRIC CIRCUIT BREAKER IS BACKFED

**LABEL 8**  
AT POINT OF INTERCONNECTION (2" X 1"). [NEC 705.12(D)(3)]

**WARNING**  
ELECTRICAL SHOCK HAZARD

**DO NOT RELOCATE THIS OVERCURRENT DEVICE**

**LABEL 9**  
AT POINT OF INTERCONNECTION OVERCURRENT DEVICE (2" X 4"). [NEC 705.12(D)(2)]

**INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED PHOTOVOLTAIC SYSTEM DISCONNECT LOCATED WEST SIDE OF THE HOUSE**

**DIRECTORY**  
PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT IN THE SAME LOCATION (5 3/4" X 1 1/8"). [NEC 690.56(B)]

WHERE THE INVERTERS ARE REMOTELY LOCATED FROM EACH OTHER, A DIRECTORY IN ACCORDANCE WITH 705.10 SHALL BE INSTALLED AT EACH DC PV SYSTEM DISCONNECTING MEANS, AT EACH AC DISCONNECTING MEANS, AND AT THE MAIN SERVICE DISCONNECTING MEANS SHOWING THE LOCATION OF ALL AC AND DC PV SYSTEM DISCONNECTING MEANS IN THE BUILDING. [NEC 690.4(H)]

**WARNING: PHOTOVOLTAIC POWER SOURCE**

**LABEL 10**  
AT EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10 FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS (5 3/4" X 1 1/8"). [NEC 690.31(G)]  
LETTERS AT LEAST 3/8 INCH; WHITE ON RED BACKGROUND; REFLECTIVE [IFC 605.11.1.1]

**PHOTOVOLTAIC SYSTEM DC DISCONNECT**

RATED MPP CURRENT **17.26** AMPS  
RATED MPP VOLTAGE **281.7** VOLTS  
MAX SYSTEM VOLTAGE **18.18** VDC  
MAX CIRCUIT CURRENT **391.6** AMPS

**LABEL 11**  
AT EACH DC DISCONNECTING MEANS (3" X 4"). [NEC 690.53]

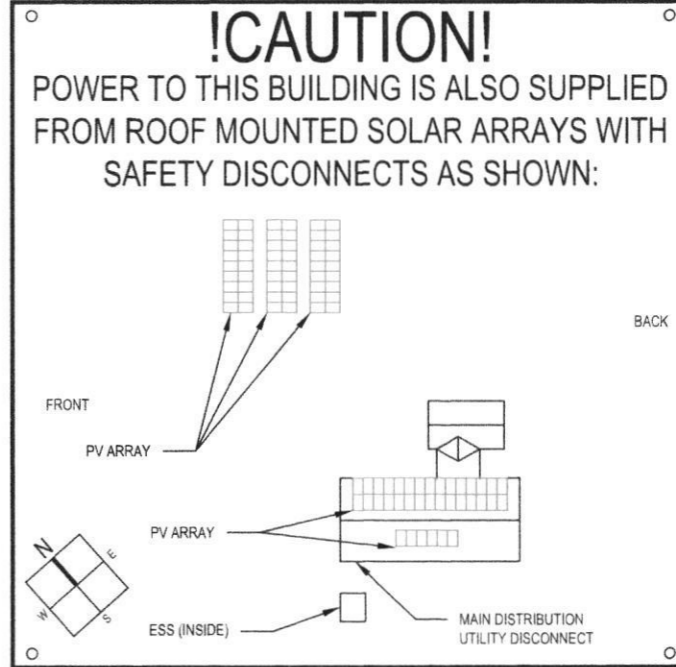
**PHOTOVOLTAIC SYSTEM DC DISCONNECT**

RATED MPP CURRENT **25.89** AMPS  
RATED MPP VOLTAGE **281.7** VOLTS  
MAX SYSTEM VOLTAGE **27.27** VDC  
MAX CIRCUIT CURRENT **391.6** AMPS

**LABEL 12**  
AT EACH DC DISCONNECTING MEANS (3" X 4"). [NEC 690.53]

**CAUTION**  
SOLAR ELECTRIC SYSTEM CONNECTED

**LABEL 13**  
AT UTILITY METER (5 3/4" X 1 1/8"). [NEC 690.56(B)]



Richard B. Gordon, P.E.  
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, MD, P.E. License No. 37741, Expiration Date: 07.09.2023



**CONTRACTOR**

SUNLIGHT-TO-THE RESCUE, LLC

PHONE: (240) 641-5054  
ADDRESS: 10014 COLESVILLE ROAD, SUITE B  
SILVER SPRING, MD 20901

LIC. NO.: MHIC#134380  
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ELE. NO.:

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NEW PV SYSTEM: 24.300 kWp

**SANDERS RESIDENCE**

7475 MINK HOLLOW RD  
HIGHLAND, MD 20777  
APN: 05360285

**ENGINEER OF RECORD**

03.30.2022



PAPER SIZE: 11" x 17" (ANSI B)

**PLACARDS**

DATE: 03.29.2022

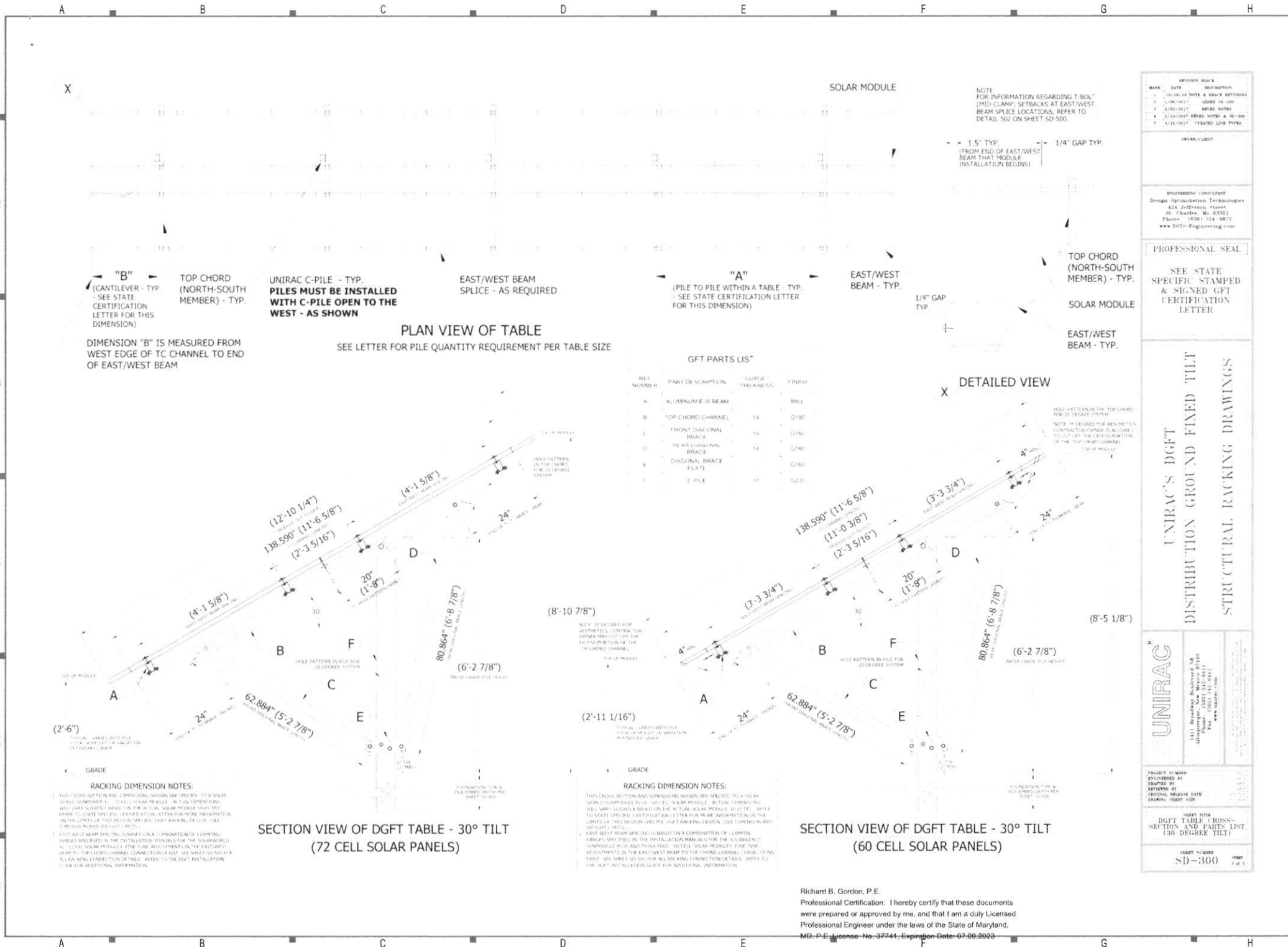
DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**E-603.00**

(SHEET 9)



**CONTRACTOR**

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 HIGHLAND, MD 20777  
 APN: 05360285

**ENGINEER OF RECORD**

03.30.2022



PAPER SIZE: 11" x 17" (ANSI B)

**ASSEMBLY DETAILS**

DATE: 03.29.2022

DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**S-501.00**  
 (SHEET 10)

Richard B. Gorton, P.E.  
 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, MD P.E. License No. 37744, Expiration Date: 07-09-2023



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NEW PV SYSTEM: 24.300 kWp

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7475 MINK HOLLOW RD, HIGHLAND, MD 20777, APN: 05360285

ENGINEER OF RECORD

03.30.2022



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ASSEMBLY DETAILS

DATE: 03.29.2022

DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

S-502.00 (SHEET 11)

REVISION BLOCK table with columns: MARK, DATE, DESCRIPTION

UNIRAC/CLUST

ENGINEERING CONSULTANT: Design Optimization Technologies, 424 Jefferson Street, N. Charles, Md. 21031

PROFESSIONAL SEAL: SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

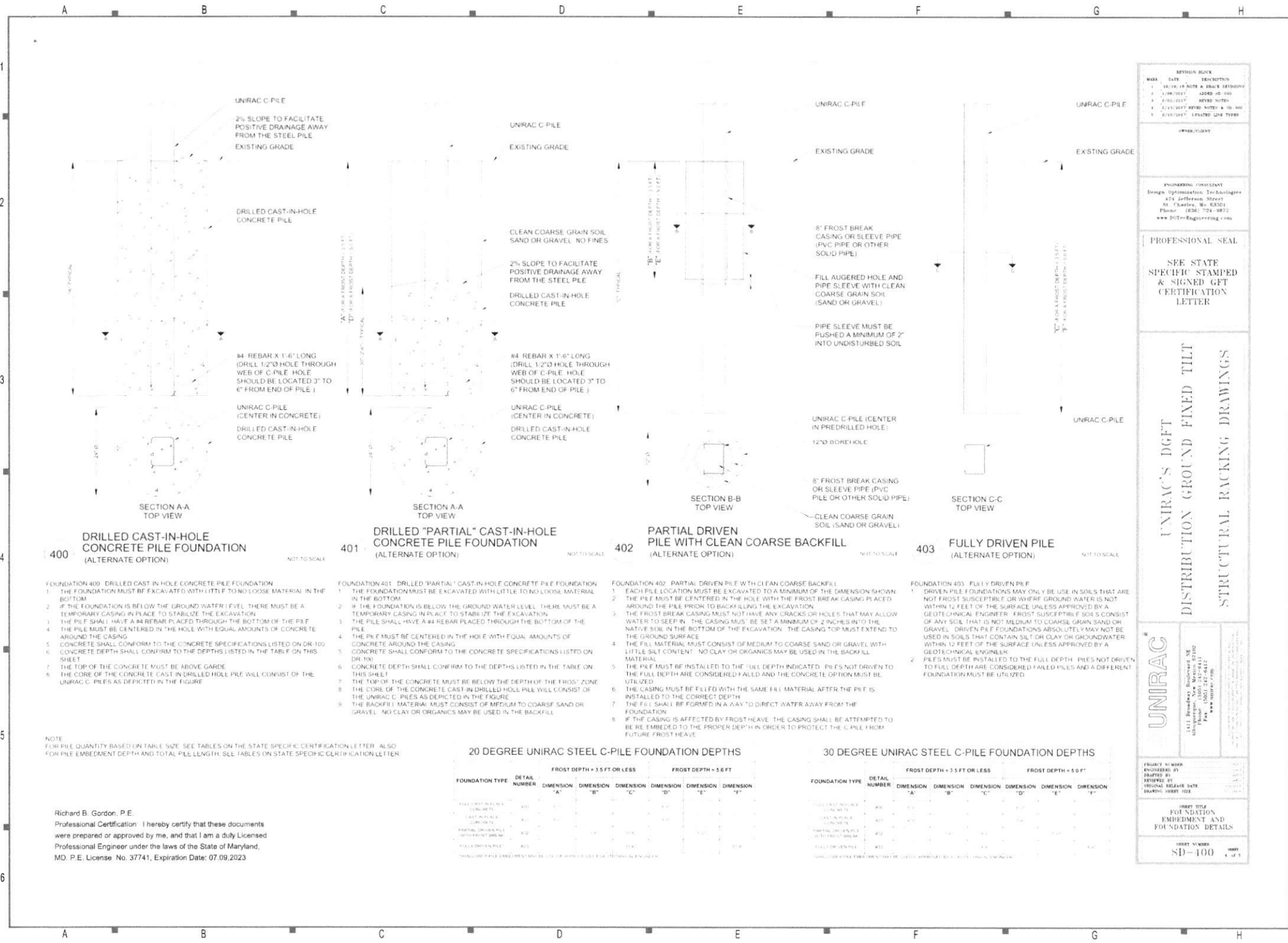
UNIRAC'S DGFT DISTRIBUTION GROUND FINED TILT STRUCTURAL RACKING DRAWINGS

UNIRAC logo and contact information: 1111 Elmwood, Columbia, MD 21046

PROJECT NUMBER, ENGINEERED BY, DRAFTED BY, ORIGINAL RELEASE DATE, DRAWING SHEET SIZE

SHEET TITLE: FOUNDATION EMBEDMENT AND FOUNDATION DETAILS

SHEET NUMBER: SD-400, SHEET 4 of 1



400 DRILLED CAST-IN-HOLE CONCRETE PILE FOUNDATION (ALTERNATE OPTION) NOT TO SCALE

401 DRILLED "PARTIAL" CAST-IN-HOLE CONCRETE PILE FOUNDATION (ALTERNATE OPTION) NOT TO SCALE

402 PARTIAL DRIVEN PILE WITH CLEAN COARSE BACKFILL (ALTERNATE OPTION) NOT TO SCALE

403 FULLY DRIVEN PILE (ALTERNATE OPTION) NOT TO SCALE

FOUNDATION 400: DRILLED CAST-IN-HOLE CONCRETE PILE FOUNDATION. 1. THE FOUNDATION MUST BE EXCAVATED WITH LITTLE TO NO LOOSE MATERIAL IN THE BOTTOM...

FOUNDATION 401: DRILLED "PARTIAL" CAST-IN-HOLE CONCRETE PILE FOUNDATION. 1. THE FOUNDATION MUST BE EXCAVATED WITH LITTLE TO NO LOOSE MATERIAL IN THE BOTTOM...

FOUNDATION 402: PARTIAL DRIVEN PILE WITH CLEAN COARSE BACKFILL. 1. EACH PILE LOCATION MUST BE EXCAVATED TO A MINIMUM OF THE DIMENSION SHOWN...

FOUNDATION 403: FULLY DRIVEN PILE. 1. DRIVEN PILE FOUNDATIONS MAY ONLY BE USED IN SOILS THAT ARE NOT FROST SUSCEPTIBLE...

NOTE: FOR PILE QUANTITY BASED ON TABLE SIZE. SEE TABLES ON THE STATE SPECIFIC CERTIFICATION LETTER. ALSO FOR PILE EMBEDMENT DEPTH AND TOTAL PILE LENGTH. SEE TABLES ON STATE SPECIFIC CERTIFICATION LETTER.

20 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

Table with columns: FOUNDATION TYPE, DETAIL NUMBER, DIMENSION "A", DIMENSION "B", DIMENSION "C", DIMENSION "D", DIMENSION "E", DIMENSION "F". Rows include Full Cast-In-Hole, Partial Cast-In-Hole, Partial Driven Pile, Fully Driven Pile.

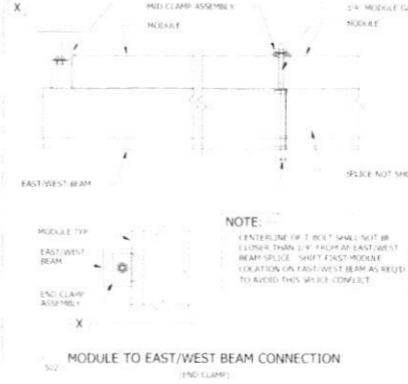
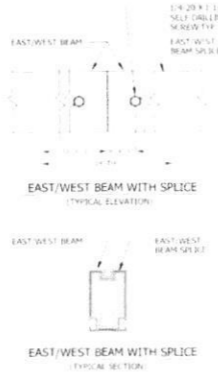
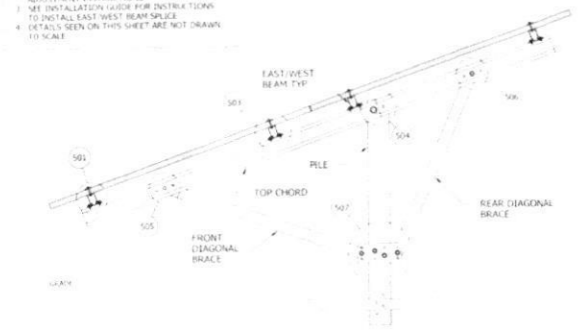
30 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

Table with columns: FOUNDATION TYPE, DETAIL NUMBER, DIMENSION "A", DIMENSION "B", DIMENSION "C", DIMENSION "D", DIMENSION "E", DIMENSION "F". Rows include Full Cast-In-Hole, Partial Cast-In-Hole, Partial Driven Pile, Fully Driven Pile.

Richard B. Gordon, P.E. 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, MD. P.E. License No. 37741, Expiration Date: 07.09.2023

**RACKING DETAIL NOTES:**

1. SEE INSTALLATION GUIDE FOR PILE FOUNDATIONS ADJUSTMENT INSTRUCTIONS.
2. SEE INSTALLATION GUIDE FOR CONNECTION ADJUSTMENT INSTRUCTIONS.
3. SEE INSTALLATION GUIDE FOR INSTRUCTIONS TO INSTALL EAST/WEST BEAM SPLICE.
4. DETAILS SHOWN ON THIS SHEET ARE NOT DRAWN TO SCALE.



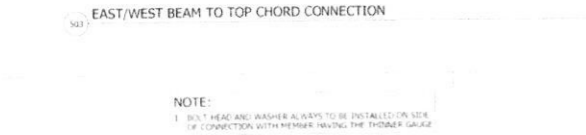
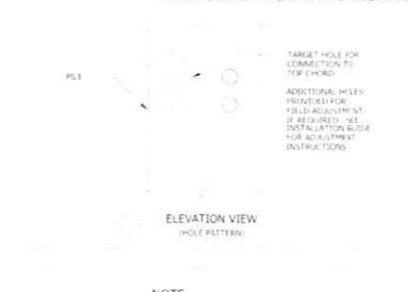
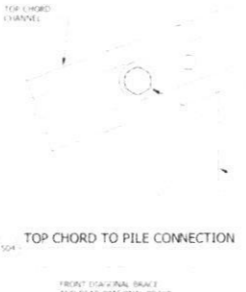
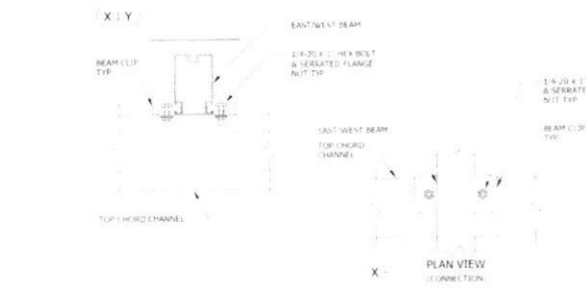
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1	10/10/2022	DRAWING
2	1/18/2023	ADD IN PERMITS
3	1/18/2023	REVISED NOTES
4	2/13/2023	REVISED NOTES & CD NO.
5	3/15/2023	ISSUING LINE ITEMS

OWNER/CLIENT

PROFESSIONAL CONSULTANT  
Design Optimization Technologies  
424 Jefferson Street  
NE, Clinton, MD 20705  
Phone: (410) 724-9822  
www.DOT-Engineering.com

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER



UNIRAC'S DGFT DISTRIBUTION GROUND FIXED TILT STRUCTURAL RACKING DRAWINGS

**UNIRAC**

1111 Broadhead Boulevard SE  
Arlington, VA 22202-5700  
Phone: (561) 242-9412  
Fax: (561) 242-9412  
www.unirac.com

PROJECT NUMBER: UNRAC-2022-001  
DRAWN BY: J. SANDERS  
CHECKED BY: M.M.  
DATE: 03.29.2022

PROJECT TITLE: RACKING DETAILS

DWG NUMBER: SD-500



**CONTRACTOR**

SUNLIGHT-TO-THE RESCUE, LLC

PHONE: (240) 641-5054  
ADDRESS: 10014 COLESVILLE ROAD, SUITE B  
SILVER SPRING, MD 20901

LIC. NO.: MHIC#134380  
HIC. NO.:  
ELE. NO.:

NEW PV SYSTEM: 24.300 kWp

**SANDERS RESIDENCE**

7475 MINK HOLLOW RD  
HIGHLAND, MD 20777  
APN: 05360285

**ENGINEER OF RECORD**

03.30.2022



PAPER SIZE: 11" x 17" (ANSI B)

**ASSEMBLY DETAILS**

DATE: 03.29.2022  
DESIGN BY: J.P.  
CHECKED BY: M.M.  
REVISIONS

**S-503.00**  
(SHEET 12)

Richard B. Gordon, P.E.  
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, MD P.E. License No. 37741, Expiration Date: 07.09.2023

## GENERAL NOTES

1. FIELD VERIFY ALL MEASUREMENTS

## SHEET KEYNOTES

1. ROOF MATERIAL: ASPHALT SHINGLE
2. ROOF STRUCTURE: TRUSS
3. ATTACHMENT TYPE: QUICK MOUNT PV QMLM: L - MOUNT
4. MODULE MANUFACTURER: TALESUN
5. MODULE MODEL: TP660P-270W
6. MODULE LENGTH: 64.96"
7. MODULE WIDTH: 39.06"
8. MODULE WEIGHT: 48.5 LBS.
9. SEE SHEET A-104 FOR DIMENSION(S)
10. MIN. FIRE OFFSET: 3' FROM RIDGE/RAKE, 18" FROM HIP/S/VALLEYS
11. TRUSS SPACING: 24 IN. O.C.
12. RAFTER SIZE: 2X4 IN. NOMINAL
13. LAG BOLT DIAMETER: 5/16 IN.
14. LAG BOLT EMBEDMENT: 3-1/2" IN.
15. TOTAL # OF ATTACHMENTS: 66
16. TOTAL AREA: 634.33 SQ. FT.
17. TOTAL WEIGHT: 1905.36 LBS.
18. WEIGHT PER ATTACHMENT: 28.87 LBS.
19. DISTRIBUTED LOAD: 3 PSF
20. MAX. HORIZONTAL STANDOFF: 48 IN.
21. MAX. VERTICAL STANDOFF: IN ACCORDANCE WITH MODULE MANUFACTURER'S INSTRUCTIONS.
22. STANDOFF STAGGERING: YES
23. RAIL MANUFACTURER (OR EQUIV.): IRONRIDGE
24. RAIL MODEL (OR EQUIVALENT): XR-100
25. RAIL WEIGHT: 0.68 PLF.
26. MAX. TRUSS SPAN: N/A
27. MODULE CLEARANCE: 3 IN. MIN., 6 IN. MAX.

Richard B. Gordon, P.E.  
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, MD. P.E. License No. 37741, Expiration Date: 07.09.2023



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NEW PV SYSTEM: 24.300 kWp

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HIGHLAND, MD 20777  
APN: 05360285

### ENGINEER OF RECORD

03.30.2022



PAPER SIZE: 11" x 17" (ANSI B)

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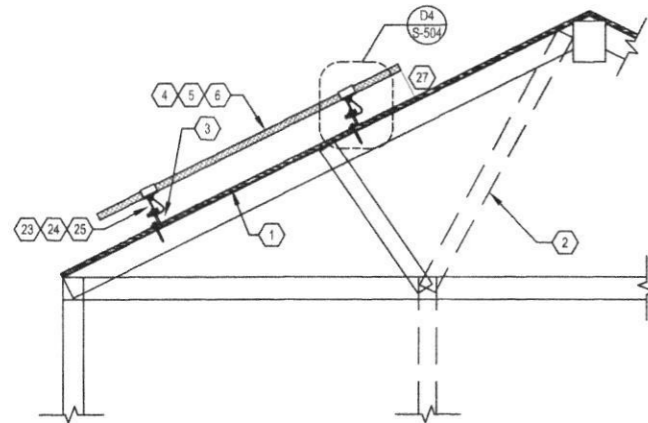
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CHECKED BY: M.M.

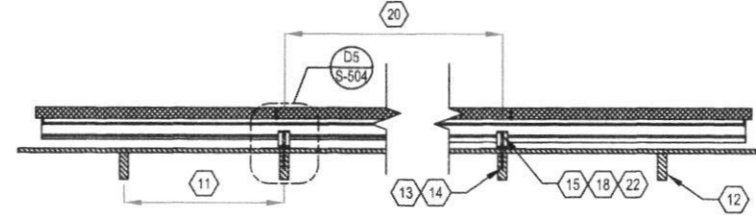
REVISIONS

S-504.00

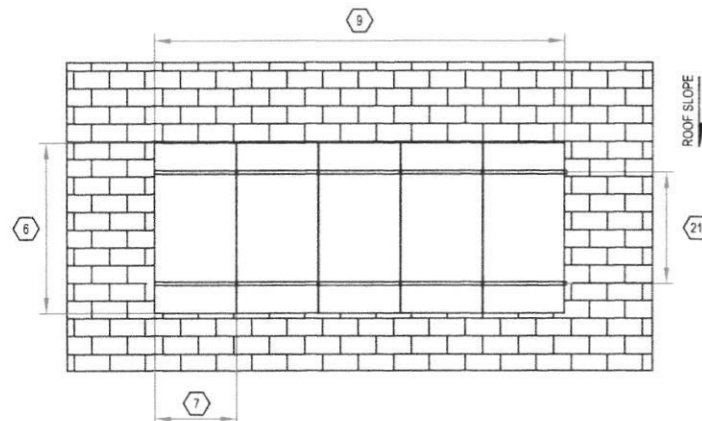
(SHEET 13)



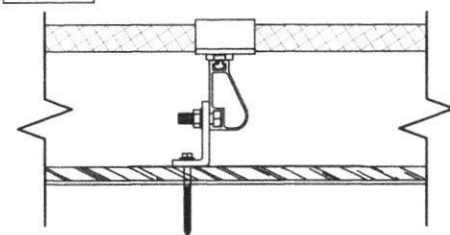
**D1** RACKING DETAIL (TRANSVERSE)  
NOT TO SCALE



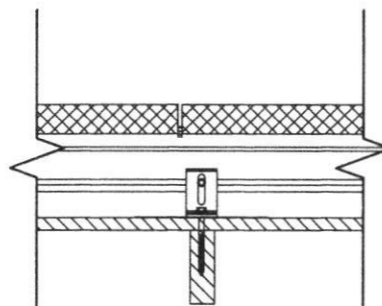
**D2** RACKING DETAIL (LONGITUDINAL)  
NOT TO SCALE



**D3** RACKING DETAIL (TOP)  
NOT TO SCALE



**D4** DETAIL (TRANSVERSE)  
NOT TO SCALE



**D5** DETAIL (LONGITUDINAL)  
NOT TO SCALE



**KEY FEATURES**

- Maximize limited space
- Excellent Anti-PID performance
- Highly reliable due to stringent quality control
- Certified to withstand the most challenging environmental conditions
- IP68 junction box
- Lower temperature coefficients

**ABOUT TALESUN SOLAR**

**SYSTEM & PRODUCT CERTIFICATES**



**QUALITY WARRANTY**



**PERFORMANCE WARRANTY**



**ELECTRICAL PARAMETERS**

Performance at STC (Power Loss:  $\pm 1\%$ )

Parameter	Value	Unit
Maximum Power	265	W
Open Circuit Voltage	37.5	V
Short Circuit Current	7.1	A
Maximum Power Voltage	31.5	V
Maximum Power Current	8.4	A
Temperature Coefficient (P <sub>max</sub> )	-0.45	%/°C
Temperature Coefficient (V <sub>oc</sub> )	-0.25	%/°C
Temperature Coefficient (I <sub>sc</sub> )	0.005	%/°C

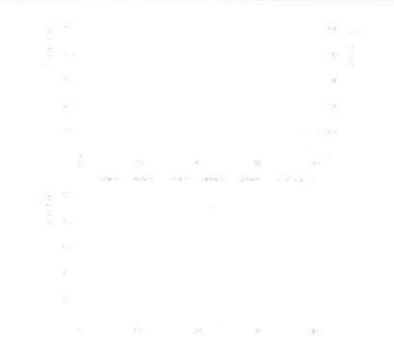
Performance at NOCT

Parameter	Value	Unit
Maximum Power	255	W
Open Circuit Voltage	37.5	V
Short Circuit Current	7.1	A
Maximum Power Voltage	31.5	V
Maximum Power Current	8.4	A

**MECHANICAL SPECIFICATION**

Module Size: 1650mm x 990mm x 35mm  
 Weight: 18.5kg  
 Junction Box: IP68  
 Cable Length: 1000mm  
 Cable Type: PV1-F  
 Mounting Holes: 4  
 Mounting Hole Spacing: 150mm  
 Mounting Hole Diameter: 4.5mm  
 Glass Thickness: 3.2mm  
 Glass Type: Tempered  
 Backsheet: TPT  
 Encapsulation: EVA  
 Cell Type: Polycrystalline  
 Cell Size: 156.75mm x 156.75mm  
 Cell Count: 60  
 Cell Connection: Series  
 Cell Efficiency: 18.2%

**I-V CURVE**



**OPERATING CONDITIONS**

Operating Temperature: -40°C to 85°C  
 Storage Temperature: -40°C to 125°C  
 Humidity: 0% to 100%  
 Wind Speed: 24m/s  
 Snow Load: 5kN/m²  
 Ice Load: 5kN/m²  
 Salt Crystallization: 5g/m²

**TECHNICAL DRAWINGS**



**TEMPERATURE COEFFICIENT**

Temperature Coefficient (P<sub>max</sub>): -0.45%/°C  
 Temperature Coefficient (V<sub>oc</sub>): -0.25%/°C  
 Temperature Coefficient (I<sub>sc</sub>): 0.005%/°C



**CONTRACTOR**

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**ENGINEER OF RECORD**

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**RESOURCE DOCUMENT**

DATE: 03.29.2022

DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**R-001.00**

(SHEET 14)

TALESUN



TALESUN



**Sol-Ark  
12K-P  
Spec Sheet**



Solar Input Power 12000W	
Max Allowed PV Power	6500W + 6500W = 13000W
Max PV Power Delivered to Battery & AC Outputs	12000W
Max DC Voltage (Voc)	500V @ 18A, 450V @ 20A
MPPT Voltage Range	150-425V
Starting Voltage	125V
Number of MPPT	2
Max Solar Strings Per MPPT	2
Max DC Current per MPPT (Self Limiting)	20A
Max AC Coupled Input (Micro/String Inverters)	9600W

AC Output Power 9kW On-Grid & Off-Grid	
Connections	120/240/208V Split Phase
Continuous AC Power to Grid (On-Grid)	9000W 37.5A L (240V)
Continuous AC Power to Load (Off-Grid)	9000W 37.5A L (240V)
Surge AC Power 10sec (Load)	16,000VA L L (240V)
Surge AC Power 100ms (Load)	25,000VA L L (240V)
Parallel Stacking	Yes
Frequency	60/50Hz
Continuous AC Power with Grid or Generator (Pass-through Power)	15120W 63A L L (240V) 7560W 63A L N (120V)
CEC Efficiency	96.5% (Peak 97.5%)
Idle Consumption Typical - No Load	60W
Sell Back Power Modes	Limited to Household/Fully Grid-Tied
Design (DC to AC)	Transformerless DC
Response Time (Grid-Tied to Off-Grid)	4ms
Power Factor	+/- 0.9 - 1.0

Battery (optional) Output Power 9000W	
Type	Lead-Acid or Li-Ion
Nominal DC Input	48V
Capacity	50 - 9900Ah
Voltage Range	43.0 - 63.0V
Continuous Battery Charging Output	185A
Charging Curve	3 Stage w/ Equalization
Grid to Batt Charging Efficiency	96.0%
External Temperature Sensor	Included
Current Shunt for Accurate % SOC	Integrated
External Gen-Start Based on Voltage or %SOC	Integrated
Communication to Lithium Battery	CanBus & RS485

General	
Dimensions (H x W x D)	30.0" x 18.3" x 10.0"
Weight	78 lbs
Enclosure	NEMA 3R
Ambient Temperature	-25.55°C, >45°C Derating
Installation Style	Wall Mounted
Wi-Fi & LAN Communication	Included
Standard Warranty (verified by HALT Testing)	10 Years

Protections & Certifications	
Electronics Certified Safety by SGS Labs to NEC & UL Specs - NEC 690.4B & NEC 705.4/6	Yes
Grid Sell Back - UL1741 2010/2018, IEEE E1547a 2003/2014, FCC 15 Class B, UL1741SA, CA Rule 21, HECO Rule 14H	Yes
PV DC Disconnect Switch - NEC 240.15	Integrated
Ground Fault Detection - NEC 690.5	Integrated
PV Rapid Shutdown Control - NEC 690.12	Integrated
PV Arc Fault Detection - NEC 690.11	Integrated
PV Input Lightning Protection	Integrated
PV String Input Reverse Polarity Protection	Integrated
AC Output Breakers - 63A	Integrated
250A Battery Breaker / Disconnect	Integrated
Surge Protection	DC Type II / AC Type II



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REVISIONS

**R-002.00**

(SHEET 15)

# LEGACY® High Performance Battery



While other batteries claim to maintain 80% capacity over the life of the product, that's only half the story. In the material handling industry, performance rules. When it comes to performance — the working power you need for the long haul — the Legacy® High Performance battery is unsurpassed.

If you looked inside a Legacy® High Performance Battery and compared it to other industrial batteries, you could easily see significant design differences for yourself.

The positive plate of a Legacy® High Performance battery features the industry's most conductive grid structure. That means there is less resistance to flow of current — and more power produced within the grid. With advanced engineering technology, the positive active material is "locked" to the grid for increased performance at all levels, especially at high current discharges.

With this higher capacity over the life of the plate, you'll notice more power to the load, cooler battery operation and lower maintenance costs. The advantages of premium-quality materials and engineering know-how are built into every Legacy® High Performance battery to give you the most effective capacity and voltage for the long run. In fact, other batteries may cost less initially, but the Legacy® High Performance battery can outrun them over time — and keep on running — to give you the best possible return on your investment.

LEGACY® High Performance Battery

**LEGACY® High Performance Battery**



## LEGACY® HIGH PERFORMANCE BATTERY

The Legacy® High Performance battery ensures high voltage through its high performance plate design, without using a "hot" corrosive concentration of acid. At the same time, it provides consistent, durable capacity through amply pasted positive plates with a cool electrolyte that is selected for long life and continued performance. The Legacy High Performance battery provides excellent conductivity, especially during peak demand.

### Full 5-year Warranty

- Assures battery will be free of manufacturer defects for 5 years or 1,500 cycles

### Flip-Top Vent Caps for Easy Watering

- Safe, easy, convenient operation
- Save time and money
- Eliminate lost vent caps
- Water level indicator (basket) for more accurate filling procedures



### Quick-Connect Cables – Optional

- Make cable replacement as simple as turning a bolt
- Reduce downtime
- Environmentally friendly

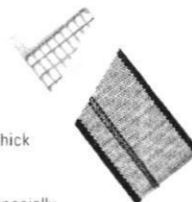


### Premium Douglas Tray Coating

- Electrostatic, baked-on epoxy on tray withstands corrosion and the roughest working conditions
- Reduces voltage tracking and shorts
- Saves maintenance on lift truck roller compartments

### High Performance Plate Design

- Long life through heavy, thick plates that resist corrosion
- Excellent conductivity, especially during peak demand, with more lead
- Solid, pore-free casting for extended life and durability
- Paste-lock design assures most reliable performance



### Low Maintenance Lead Alloy

- Reduces gassing during charge cycle
- Reduces maintenance costs
- Decreases water loss
- Extends battery life

### Five-Fold Plate Insulation System

- Vertical fiberglass strands; woven glass mat; compressions mat; rigid perforated PVC shell; and sleeved separator
- Assures dependable performance for many years under the toughest conditions

DOUGLAS LEGACY® High Performance Battery



**DOUGLAS BATTERY**

Douglas Battery, 1255 Creekshire Way, Suite 221, Winston-Salem, NC 27103  
1-800-211-3684 Visit our website @ [www.douglasbattery.com](http://www.douglasbattery.com)



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**LEGACY® High Performance Battery**



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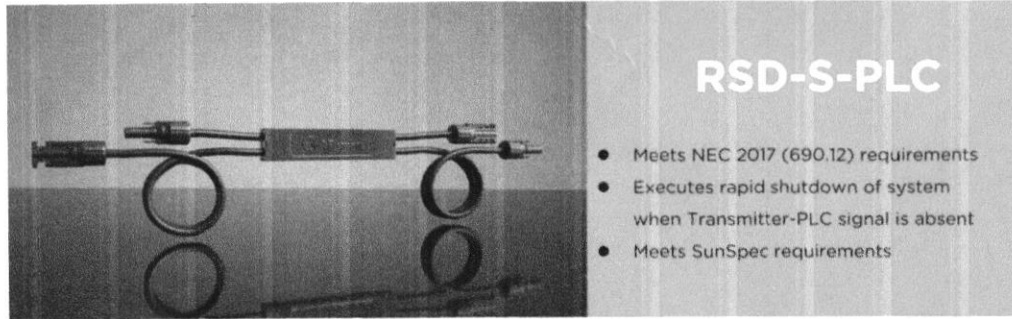
REVISIONS

**R-003.00**

(SHEET 16)



Raising the bar in innovative DC MLPE solar power systems



**RSD-S-PLC Technical Data**

Model	RSD-S-PLC
Input Data (DC)	
Input Operating Voltage Range	8-80V
Maximum Cont. Input Current (Imax)	15A
Output Data (DC)	
Output Operating Voltage Range	8-80V
Maximum System Voltage	1000V/1500V
Mechanical Data	
Operating Ambient Temperature Range	-40 °F to +185 °F (-40 °C to + 85 °C)
Dimensions (without cable&connectors)	5" x 1.2" x 0.6"(129 mm x 30 mm x 16 mm)
Cable Length	Input 250mm/Output 1200mm or Customize
Module Connector	MC4 or MC4 Compatible
Enclosure Rating	Type 6P / IP68
Over Temperature Protection	Yes
Features & Compliance	
Communication	PLC
Safety Compliance	NEC 2017 (690.12); UL1741; CSA C22.2 No. 330-17; IEC/EN62109-1; 2PFG2305
EMC Compliance	FCC Part15: ICES-003; IEC/EN61000-6-1/-2/-3/-4

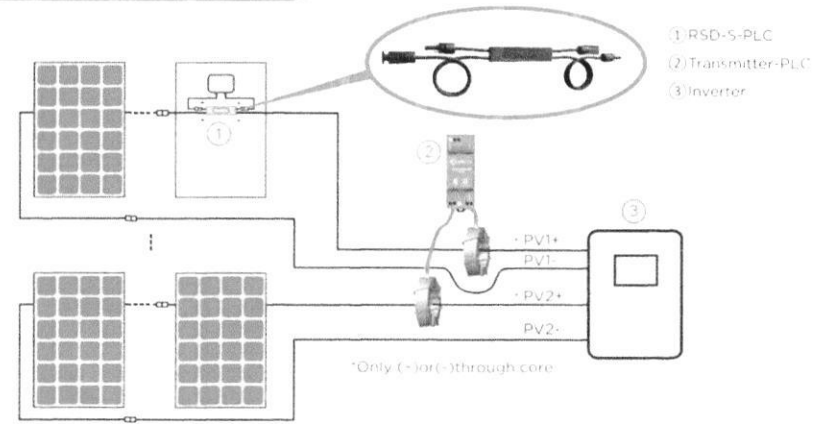
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Rev1.3 2020-08-10

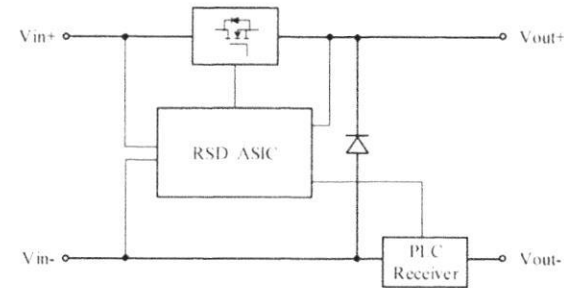


RSD-S-PLC meets SunSpec requirements, maintaining normal function by continually receiving a heart-beat signal from the APsmart Transmitter. The RSD executes rapid system shutdown when Transmitter signal is absent. Users can manually execute rapid shutdown using Transmitter breaker switch.

**RSD-S-PLC Wiring Diagram**



**Working Schematic Diagram**



**ORDERING INFORMATION**

405002	1500V UL/1000V TUV, 1.2m cable, MC4
405001	1000V UL/TUV, 1.2m cable, MC4 compatible
405003	1500V UL/TUV, 1.2m cable, MC4-Evo2



19925 Stevens Creek Blvd Suite 100, Cupertino, CA 95014  
+1 737-218-8486 | info@APsmartGlobal.com | APsmartGlobal.com



Rev1.3 2020-08-10



**CONTRACTOR**

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DESIGN BY: I.P.

CHECKED BY: M.M.

REVISIONS

**R-004.00**  
(SHEET 17)

# GROUND FIXED TILT



**GROUND FIXED TILT (GFT)** has evolved from more than 12 years of experience meeting a variety of project requirements. A synergy of steel components and aluminum parts deliver performance with the lowest system cost. Installation savings are captured through efficiently engineered components, optional pre-assembled parts and integrated bonding for optimized construction sequencing. GFT delivers engineered cost savings to meet your project needs.



## SCALABLE TO ANY SIZE PROJECT

LESS STEPS • FEWER PARTS • BEST SERVICE • QUALITY PROVIDER

# GROUND FIXED TILT



## SCALABLE TO ANY SIZE PROJECT

### ALUMINUM BEAMS WITH MAXIMUM ADJUSTABILITY

East-West aluminum beams include a top mounting slot to accommodate a variety of module sizes without customizing a design for your project. Attachment to North-South top chords is simple and quick with slots yielding maximum construction tolerances throughout the array. A series of pre-drilled holes on the foundation channel and steel top chord ease the assembly process with fewer tools and less labor.

## ENGINEERED COST SAVINGS

### PRE-ASSEMBLY & WIRE MANAGEMENT

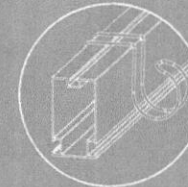
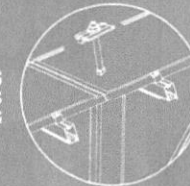
When project optimization outweighs component costs, Unirac will pre-assemble the top mounting clamps, shifting part of the installation process to our factory and saving labor steps on the job site. Wire management simply snaps anywhere onto the aluminum beam, holding bundles of wire up to 2 inches in diameter.

## PROJECT SUPPORT SERVICES

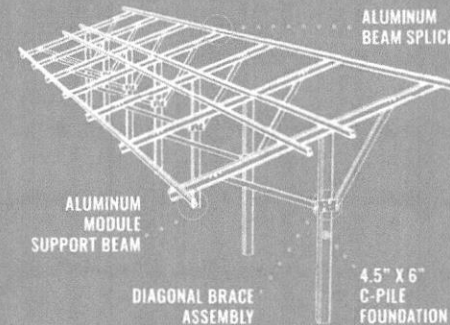
### DESIGN & QUOTATION ASSISTANCE

Every project receives standard drawings and calculations to get permitting and system installation. We provide top notch project management services including design & quotation assistance, site specific construction drawings and 3rd party structural design documentation.

TOP MOUNTING  
MODULE CLAMPS  
W/ INTEGRATED BONDING



SNAP-ON  
WIRE MANAGEMENT



ALUMINUM  
BEAM SPLICE

ALUMINUM  
MODULE  
SUPPORT BEAM

DIAGONAL BRACE  
ASSEMBLY

4.5" X 6"  
C-PILE  
FOUNDATION



## UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT



### ON-TIME DELIVERY

No waiting. Our goal is simple: consistently deliver solutions and services correctly, efficiently and dependably to exceed your expectations. Our world class operations provide a 99% on time delivery to help you meet your commitment dates.



### CERTIFIED QUALITY PROVIDER

Unirac is the only PV mounting vendor with ISO certifications for 9001:2008, 14001:2004 and OHSAS 18001:2007 which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and our commitment to first class business practices.



### BANKABLE WARRANTY

Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are receiving products of exceptional quality. GFT is covered by a 20 year manufacturing warranty on all parts.

PROTECT YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN



### CONTRACTOR

SUNLIGHT-TO-THE RESCUE, LLC

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NEW PV SYSTEM: 24.300 kWp

## SANDERS RESIDENCE

7475 MINK HOLLOW RD  
HIGHLAND, MD 20777  
APN: 05360285

### ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

### RESOURCE DOCUMENT

DATE: 03.29.2022

DESIGN BY: LP.

CHECKED BY: M.M.

REVISIONS

R-005.00

(SHEET 18)

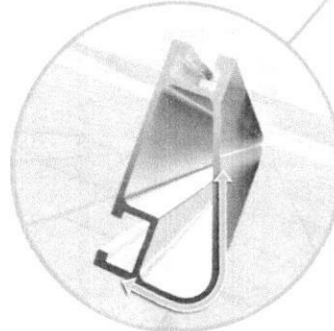
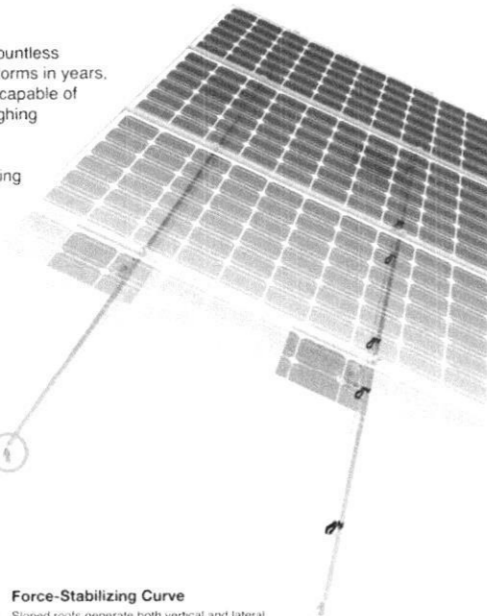




**Solar Is Not Always Sunny**

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



**Force-Stabilizing Curve**  
Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

**Compatible with Flat & Pitched Roofs**

XR Rails are compatible with FlashFoot and other pitched roof attachments. IronRidge offers a range of tilt leg options for flat roof mounting applications.

**Corrosion-Resistant Materials**

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Tech Brief

**XR Rail Family**

**XR Rail Family**

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



**XR10**

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available



**XR100**

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



**XR1000**

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

**Rail Selection**

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5'-4"	6'	8'	10'	12'
None	100						
	120						
	140	XR10		XR100		XR1000	
10-20	100						
	120						
	140						
30	100						
	120						
	140						
40	100						
	120						
	140						
50-70	160						
	180						
80-90	160						
	180						

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**CONTRACTOR**

SUNLIGHT-TO-THE-RESCUE, LLC

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HIC. NO.:  
ELE. NO.:

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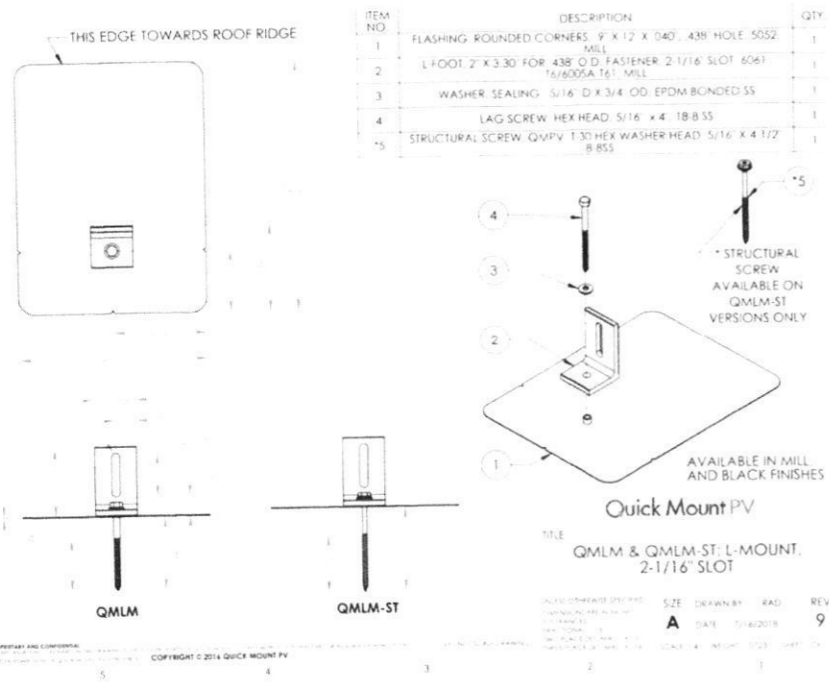
REVISIONS

**R-007.00**

(SHEET 20)

# L-Mount | QMLM / QMLM-ST

Elevated Water Seal Technology®



## L-Mount Installation Instructions

**Installation Tools Required:** tape measure, roofing bar, chalk line, stud finder, caulking gun, sealant compatible with roofing materials, drill with 7/32" or 1/8" bit, drill or impact gun with 1/2" socket.

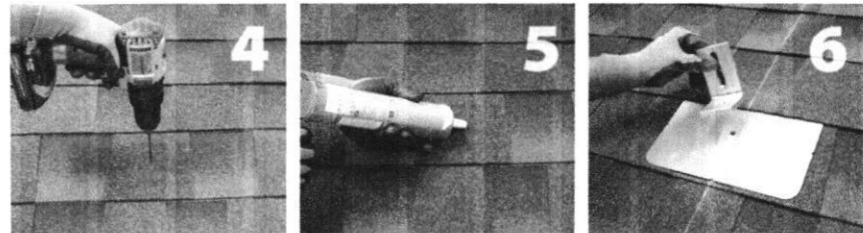
**WARNING:** Quick Mount PV products are NOT designed for and should NOT be used to anchor fall protection equipment.



1. Locate, choose, and mark centers of rafters to be mounted. Select the courses of shingles where mounts will be placed.

2. Carefully lift composition roof shingle with roofing bar, just above placement of mount. Remove nails, as required and backfill holes with approved sealant. See "Proper Flashing Placement" on next page.

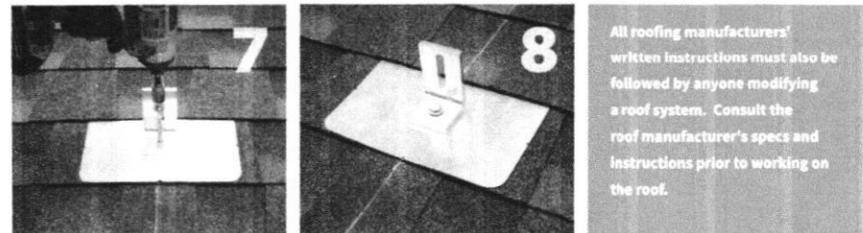
3. Insert flashing between 1st and 2nd course. Slide up so top edge of flashing is at least 1/2" higher than the butt edge of the 3rd course and lower flashing edge is above the butt edge of 1st course. Mark center for drilling.



4. If attaching with lag bolt, use a 1/2" bit (Lag). Use a 3/8" bit (ST) for attaching with the structural screw. Drill pilot hole into roof and rafter, taking care to drill square to the roof. Do not use mount as a drill guide. Drill a 2" deep hole into rafter.

5. Clean off any sawdust, and fill hole with sealant compatible with roofing materials.

6. Place L foot onto elevated flute, and rotate L foot to desired orientation.



7. Prepare lag bolt or structural screw with sealing washer. Using a 1/2" socket on an impact gun, drive prepared lag bolt through L foot until L foot can no longer easily rotate. **DO NOT over-torque.** NOTE: Structural screw can be driven with T-30 hex head bit.

8. You are now ready for the rack of your choice. Follow all the directions of the rack manufacturer as well as the module manufacturer. NOTE: Make sure top of L Foot makes solid contact with racking.

All roofing manufacturers' written instructions must also be followed by anyone modifying a roof system. Consult the roof manufacturer's specs and instructions prior to working on the roof.

BI 7.2.3.44

Jul 2018 Rev 4

Jul 2018 Rev 4



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REVISIONS

R-008.00

(SHEET 21)