

Approved 11.9.22

-401

Menu Save Reset Cancel Help

Record Detail \* (This section is required.)

Permit Type	Permit Number	Opened Date
Building/Residential/Misc/Solar Panel	B22004143	11/04/2022
Description of Work		
SFD/ INSTALL (54) GROUND MOUNT SOLAR PANELS, 19.71 KW		

[check spelling](#)

Address \* (This section is required.)

Search	Reset	Clear	Get Parcel & Owner
Street #	Street Name	Street Type	
15500	WOODBINE MORGAN	RD	
Unit Type	Unit #	X Coordinate	Y Coordinate
-Select--		-77.0514	39.35696
City	State	Zip Code	Primary
WOODBINE	MD	21797	Yes

Parcel \* (This section is required.)

Search	Reset	Clear	Get Address & Owner			
GIS ID *	Parcel	Parcel Area	Land Value	Improved Value	Exemption Value	Plan Area
830104	45	3.72	210400	693000	482600	RURAL
Legal Description						
IMPSLOT 2 3.7278 A[ ]15500 WOODBINE MORGAN RD[ ]ECHO ESTATES						

[check spelling](#)

Block	Lot	Census Tract	Council Dist	Inspection Dist	Supervisor Dist	Map #	DAP Zone
	2	604001	5				
Plan Area	State Tax Id	Subdivision Name					
	1404353102	ECHO ESTATES					
Section	Area	Tax Map					
		3					
Grid	Zoning District	ADC Map					
3-20	RC-DEO	4692-B3					
SDP No.	Final Plan No.	WP File No.					
Record Plat No.	WS Contract No.	FDP No.	Primary				
10278			Yes				
Owner Occupied	Year Built	Historic District					
<input type="radio"/> Yes <input type="radio"/> No	1995	<input type="radio"/> Yes <input checked="" type="radio"/> No					
Historic District Registry No.	Stat Area	Flood Plain					
	4-02	<input type="radio"/> Yes <input checked="" type="radio"/> No					
Building No							

Owner \* (This section is required.)

Search	Reset	Clear
Name *		
SPENCER, CORI & ROBERT		
Address Line 1		
15500 WOODBINE MORGAN RD		
Address Line 2		
Address Line 3		
Mail City	Mail State	Mail Zip Code
WOODBINE	MD	21797
Phone	Primary	
301-252-9624	Yes	
E-mail		
Cell Number	Fax Number	

Professionals \* (This section is required.)

Search	Reset	Clear	
License # *	Business Name		
08050127353	SOLAR ENERGY WORLD LLC		
License Type *	First Name	Middle Name	Last Name
MHIC Co	✓ GEOFFREY		MIRKIN
Primary	Address Line 1		
Yes	✓ 5681 MAIN STREET		
	Address Line 2		
	City	State	ZIP Code
	ELKRIDGE	MD	21075-0000
	Phone 1	Phone 2	Fax
	4105792009		4105791601
	E-mail		
	GMIRKIN@SOLARENERGYWORLD.COM		

Applicant \* (This section is required.)

Search	As Owner	As Lic. Prof	As Contact
Type *	First Name	MI	Last Name
Applicant	✓ Ryan		Doyle
Relationship	Full Name		
Applicant	✓ ZACH NEUBAUER		
Primary	Organization Name		
Yes	SOLAR ENERGY WORLD		
	Street Address		
	5681 MAIN STREET		
	Address Line 2		
	City	State	Zip Code
	ELKRIDGE	MD	21075
	Phone	Cell	Fax
	410-579-5167		
	E-mail *		
	permitting@SOLARENERGYWORLD.COM		

Addtl Info

Est Construction Cost *	Housing Units *	Number of Buildings *	Public Owned
45000	0	0	No
Construction Type			
--Select--			

RESIDENTIAL SOLAR PANEL INFO

SOLAR PANEL INFORMATION					
Capital Project-No Fee	Type of Installation *	Number of Panels *	Water Supply *	Sewage Disposal *	Expiration Date
<input type="radio"/> Yes <input checked="" type="radio"/> No	Solar Collector - Ground Mount	54	Private	Private	5/7/2023
Existing Use *	Sprinkler System *				
SFD	<input type="radio"/> Yes <input checked="" type="radio"/> No				

PAYMENT INFORMATION

Check 1	Payee 1	Check 2	Payee 2	SAP Doc No	SAP Entered

Submit Cancel

General Notes



**SolarEnergyWorld**  
Because Tomorrow Matters  
Solar Energy World LLC  
5681 Main Street  
Elkridge, MD 21075  
(888) 487-3233

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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. 400027, Expiration Date 3/15/23.

**James C Douglas**



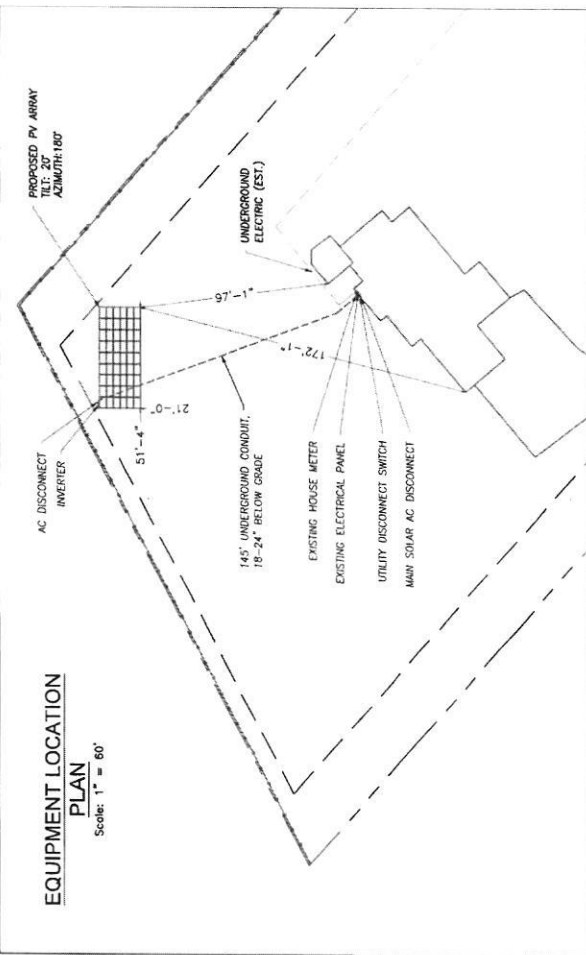
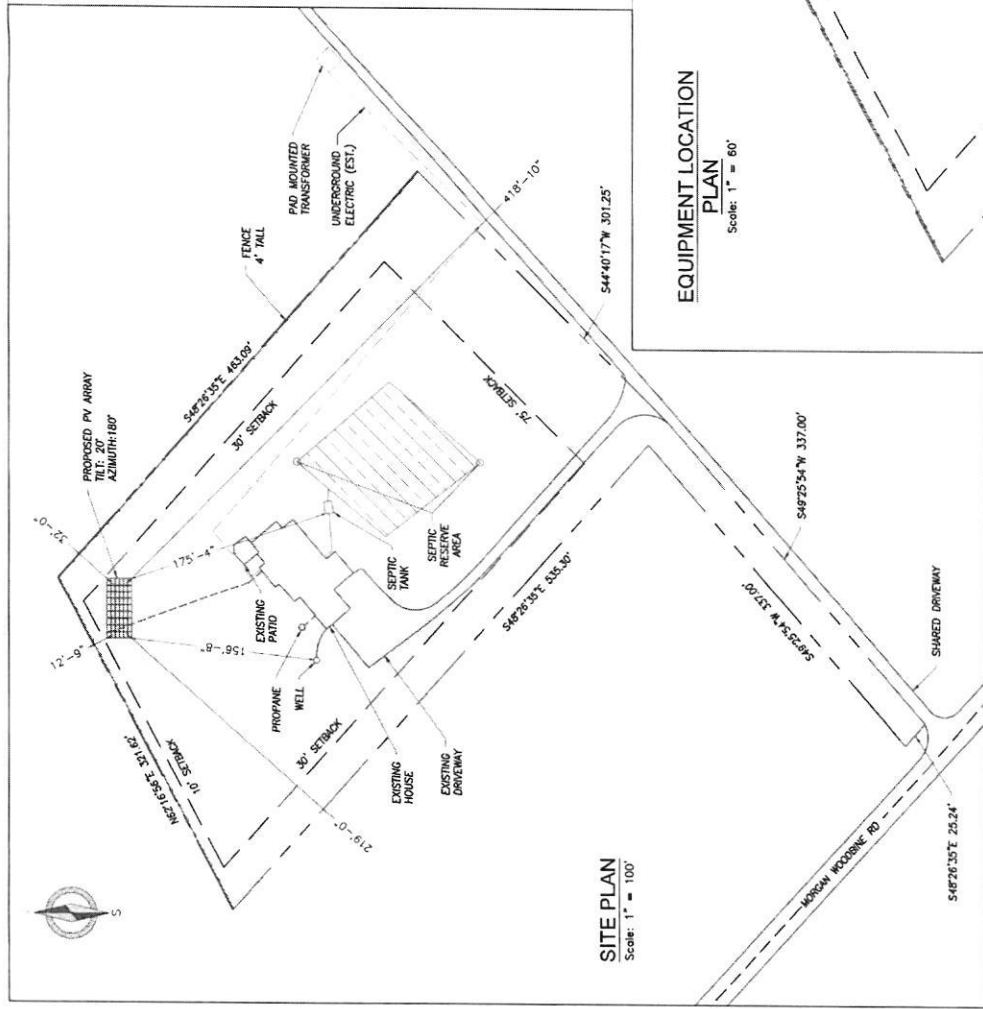
Engineering Review is Limited to Structural Design Only As it Pertains to the SFUSA Array Structure.

Project Name and Address

Cort & Robert Spencer GM  
6LX9C  
15500 Woodbine Morgan Rd  
Woodbine, MD 21797  
MD12223  
19.71 KW

Drawn by  
**J. Mountain**  
Date  
09-SEP-2022  
Scale  
AS NOTED

**A001**

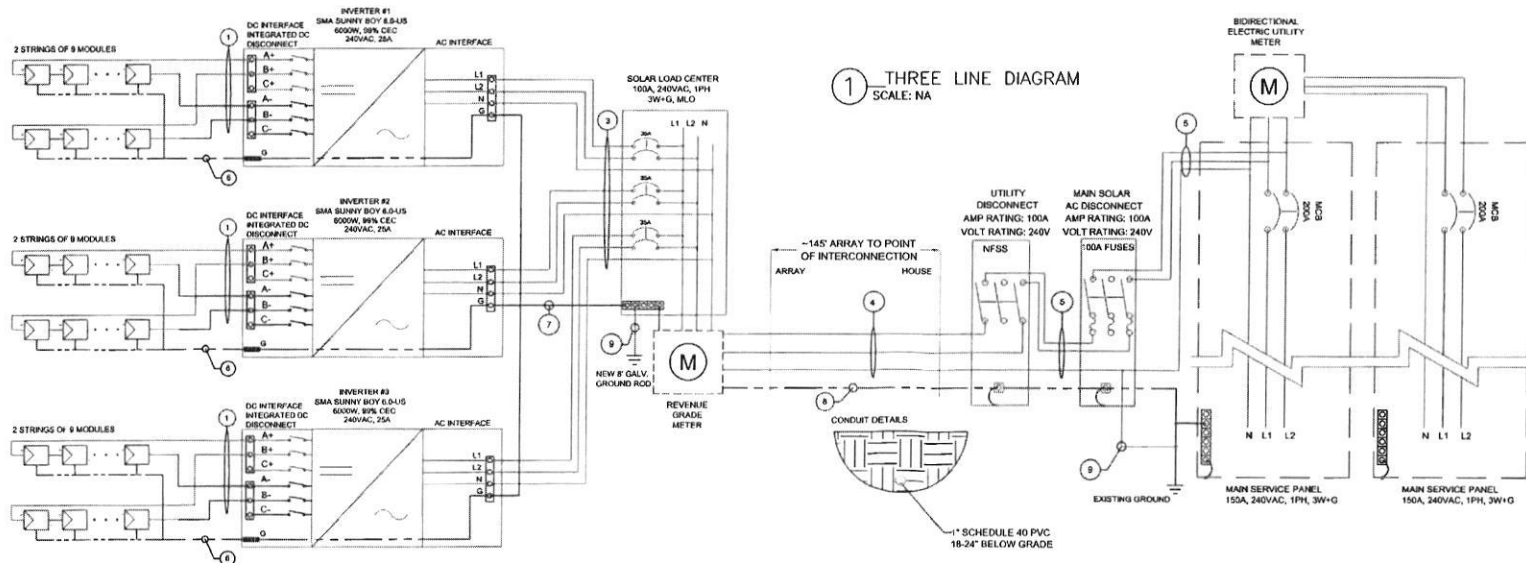


- NOTES:**
- THIS DRAWING IS TO PROVIDE REFERENCE FOR THE INSTALLATION OF GROUND MOUNT PHOTOVOLTAIC ARRAYS.
  - THE SYSTEM SHALL INCLUDE [54] HANWHA Q-CELLS DUO BLK-610+ 365W MODULES (DIMENSIONS: 67.60" (L) x 41.14" (W) x 1.26" (D)) AND WEIGHING 43.9 LBS (PANEL DEAD LOAD = 2.27PSF)
  - THE SOLAR FOUNDATIONS BACKING WILL BE INSTALLED PER MANUFACTURER'S INSTALLATION MANUAL.
  - THE PROPOSED ARRAY SHALL COVER APPROX. 1078 SQ.FT. OF 3.720 AC. PROPERTY.
  - EQUIPMENT LOCATION PLAN IS APPROXIMATE. EXACT LOCATION TO BE VERIFIED WITH INSTALLATION CREW AND HOME OWNER AT THE TIME OF INSTALLATION.

# GENERAL ELECTRICAL NOTES: NEC2017

- EQUIPMENT USED SHALL BE NEW, UNLESS OTHERWISE NOTED.
- EQUIPMENT USED SHALL BE UL LISTED, UNLESS OTHERWISE NOTED.
- EQUIPMENT SHALL BE INSTALLED PROVIDING ADEQUATE PHYSICAL WORKING SPACE AROUND THE EQUIPMENT AND SHALL COMPLY WITH NEC.
- COPPER CONDUCTORS SHALL BE USED AND SHALL HAVE INSULATION RATING 600V, 90°C, UNLESS OTHERWISE NOTED.
- CONDUCTORS SHALL BE SIZED IN ACCORDANCE TO NEC. CONDUCTORS AMPACITY SHALL BE DE-RATED FOR TEMPERATURE INCREASE, CONDUIT FILL AND VOLTAGE DROP.
- ALL CONDUCTORS, EXCEPT PV WIRE, SHALL BE INSTALLED IN APPROVED CONDUITS OR RACEWAY. CONDUITS SHALL BE ADEQUATELY SUPPORTED AS PER NEC.
- AC DISCONNECT SHOWN IS REQUIRED IF THE UTILITY REQUIRES VISIBLE-BLADE SWITCH.
- EXPOSED NON-CURRENT CARRYING METAL PARTS SHALL BE GROUNDED AS PER NEC.
- LINE SIDE INTER-CONNECTION SHALL COMPLY WITH NEC
- SMS MONITORING SYSTEM AND ITS CONNECTION SHOWN IS OPTIONAL. IF USED, REFER TO SMS INSTALLATION MANUAL FOR WIRING METHODS AND OPERATION PROCEDURE.
- ASHRAE FUNDAMENTAL OUTDOOR DESIGN TEMPERATURES DO NOT EXCEED 47°C IN THE U.S. (PHOENIX, AZ or PALM SPRINGS, CA)
- FOR LESS THAN 8 CURRENT-CARRYING CONDUCTORS IN ROOF MOUNTED SUNLIGHT CONDUIT USING THE OUTDOOR TEMPERATURE OF 47°C
- 10AWG CONDUCTOR ARE GENERALLY ACCEPTABLE FOR MODULES WITH AN Isc OF 9.6 AMPS WITH A 15 AMP FUSE.
- Wire sizing for OCPD
- Ex(Isc)(1.25)(1.25)(# of strings in parallel) = wire ampacity or using NEC690.8

WIRE/CONDUIT SCHEDULE ARRAY			
TAG	DESCRIPTION	WIRE SIZE/TYPE	NOTES
1	Module to DC Disconnect	#10 PV WIRE 2KV RATED	
2	DC Disconnect to Inverter	Integrated to Inverter	
3	Inverter to Solar Load Center	#3 Cu THHN/THWN-2 in 1" PVC	Vdrop=2.13%
4	Solar Load Center to Utility Disconnect	#3 Cu THHN/THWN-2	
5	Utility Disconnect to Interconnection Point	#3 Cu THHN/THWN-2 in EMT	
6	Equipment Grounding Conductor	#8 Bare Cu	
7	Equipment Grounding Conductor	#8 Cu THHN/THWN-2	
8	Equipment Grounding Conductor	#8 Cu THHN/THWN-2	
9	Grounding Electrode Conductor	#6 Cu	



MODULE DATA	
Module Manufacturer	Hanwha Q.Cells
Module Model	Q.PEAK Duo BLK-G10+ (365)
Power [W]	365
Rated Voltage, Vmp [V]	34.58
Rated Current, Imp [A]	10.56
Open Circuit Voltage, Voc [V]	41.21
Short Circuit Current, Isc [A]	11.07
Max. System Voltage [V]	1000
INVERTER DATA	
Inverter #	3
Inverter Manufacturer	SMA
Inverter Model	SB6.0
Max DC Voltage [V]	550
Max Output Power [W]	6000
Nominal AC Current [A]	25
Nominal AC Voltage [V]	240
Total AC Current [A]	75
ARRAY DETAILS	
No. of Modules per String	9
No. of Strings	2
Array Watts at STC [W]	6570
Max. Voltage [V]	411
690.53 Label Info. - DC PV POWER SOURCE	
Rated MPP Current [A]	10.56
Rated MPP Voltage [V]	287
Max. System Voltage [V]	411
Max. Source Circuit Current [A]	13.8

## General Notes



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 Elkridge, MD 21075  
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\*STAMPED AND SIGNED FOR STRUCTURES ONLY

Project Name and Address

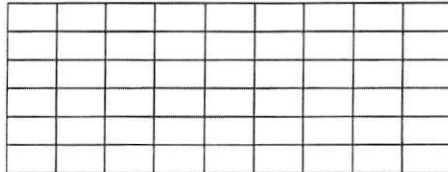
Cori & Robert Spencer GM  
 6Lx9C  
 15500 Woodbine Morgan Rd  
 Woodbine, MD 21797  
 MD12223  
 19.71 kW

Drawn by  
 J. Mountain

Date  
 09-SEP-2022

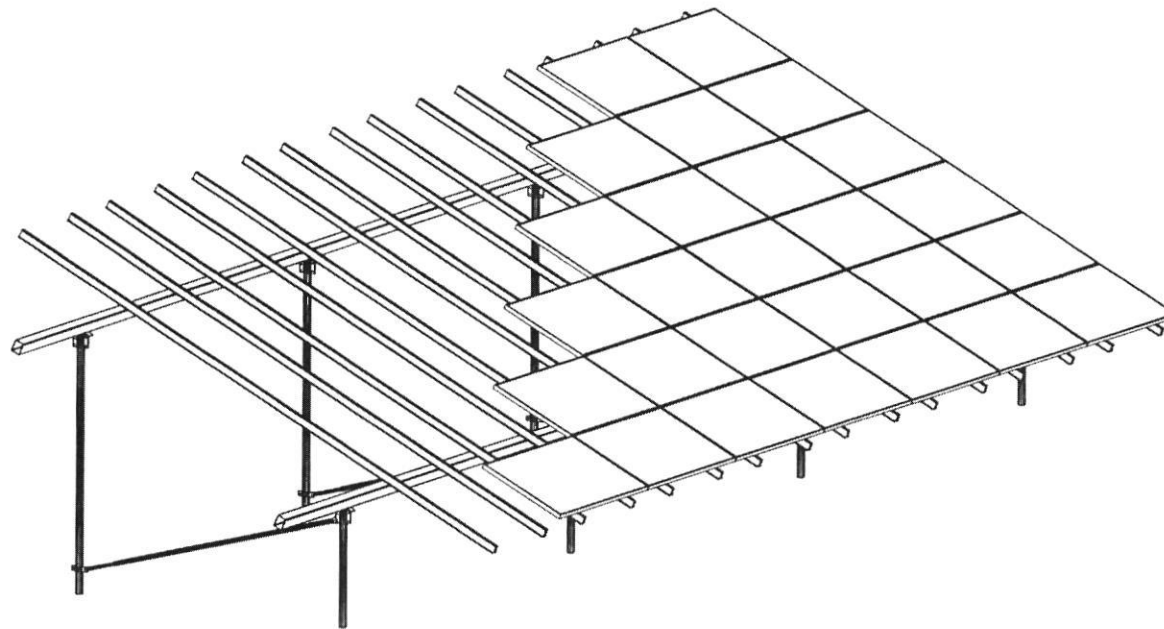
Scale  
 AS NOTED

**E001**



# PLAN VIEW

N.T.S.



## Site Design Conditions

Basic Wind Speed: 115 MPH  
(Risk Category II)  
Basic Wind Speed: 105 MPH  
(Risk Category I)  
Exposure Category: C  
Ground Snow Load: 0 PSF  
Flat Roof Snow Load: N/A  
(if applicable)  
Site Contour: <5 Degree Slope

Max. Leg Axial Bearing: 5,270 lbs.  
Max. Leg Uplift: 2,630 lbs.  
Max. Lateral Resistance: 1,630 lbs.  
Top Rail Max. Loading: 111.1 plf  
Helical Pile Depth: 60" Min  
Lateral Resistance Plate Size: Not Req'd

All design work has been performed in accordance with the Howard County Building Code including, but not limited to, the 2021 International Building Code with Amendments per Section 3.101.

Net design pressures were calculated in accordance with ASCE 7-16 section 27.3.2, "Open Buildings with Monoslope, Pitched, or Troughed Roofs". All load cases were evaluated in determining the limiting design conditions. The data table above provides the results for the limiting load case. Maximum leg reaction forces represent the highest load condition seen by any leg in the structure. All legs in the structure are designed to meet the maximum load conditions.

## 6Lx9C Sub-Array Design Conditions

Front Leg Height: 28 1/2"  
Rear Leg Height: 77"  
North-South Leg Spacing: 13 3/8"  
West Span Leg Spacing: 13'-6"  
East Span Leg Spacing: 13'-6"  
Quantity Center Spans: 1  
Center Span Leg Spacing: 13'-6"  
East & West Overhang: 4'-3"  
Overall Beam Length: 49'-0"  
Front Edge Ground Clearance: 20"  
Horizontal Rail Material: 5"x4"x1/2" HSS  
Top Rail Material: SF Rails  
Qty Rails per Panel: 2  
Top Rail Length: 254"  
Top Rail Center Span: 142"  
Top Rail Overhangs: 56"

Array Tilt Angle: 20 Degrees  
Overall Array East-West Dirn: 50'-11"  
Number of Modules/Sub-Array: 54  
Number of Sub-Arrays: 1  
Module Columns/Sub-Array: 9  
Number of Module Rows: 6  
Module Orientation: Landscape  
Module Column Spacing: 1"  
Module Row Spacing: 1"  
Module Model: Q.PEAK DUO BLK-G10+  
Module Size: 41.14" x 67.60"  
Individual Module Rating: 365 watt  
Sub Array Power Rating: 19.71 kw  
Total Power Rating: 19.71 kw

James C  
Douglas

Digitally signed by James C Douglas  
DN: cn=J. C. Douglas, o=James C Douglas, email=jcdouglas@jcdouglas.com, c=US  
Date: 2022.10.24 14:00:00 -0400



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## SHEET 1 OF 3

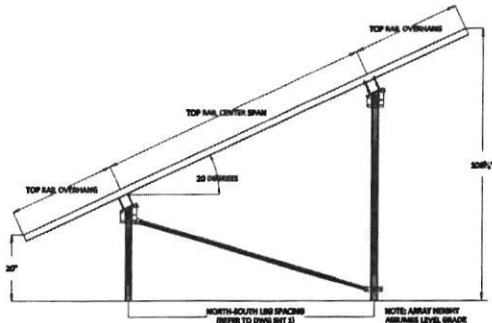
## SOLAR ENERGY WORLD

PROJECT:  
SPENCER RESIDENCE  
15500 WOODBINE MORGAN ROAD  
WOODBINE, MD 21797

## Solar Foundations USA

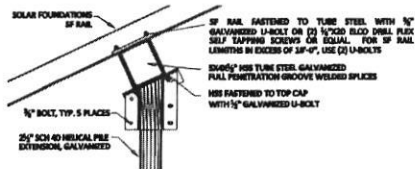
1142 River Road, New Castle, DE 19720 Ph: (855) 738-7200 Fax: (866) 644-5665

Date	Revision	Drawn By:	Review By:
10/24/2022	Original	JB	JD



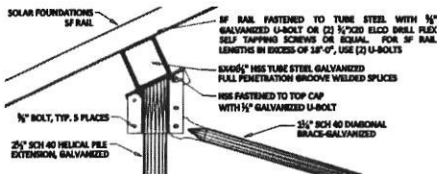
**SIDE ELEVATION**

N.T.S.



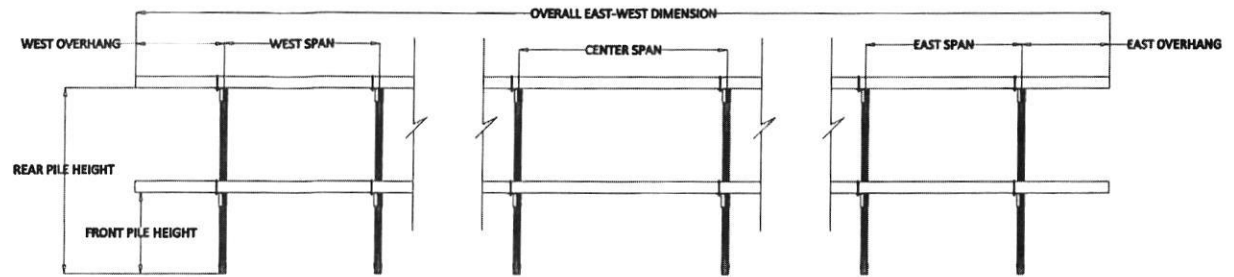
**UPPER CAP DETAIL**

N.T.S.



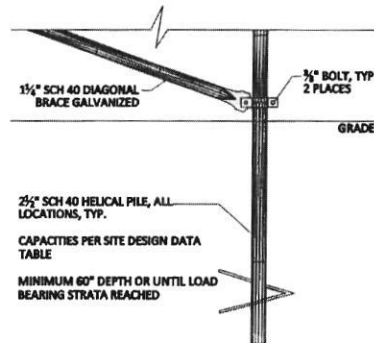
**LOWER CAP DETAIL**

N.T.S.



**PILE SPACING ELEVATION**

N.T.S.



**HELICAL PILE DETAIL**

N.T.S.

James C  
Douglas

Digitally signed by James C. Douglas  
DN: c=US, o=New York,  
ou=James C. Douglas, email=JCD@JCDENGINEERING.COM,  
serial=1000, date=2023.03.15 14:11:11 -0400



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. 40027, Expiration Date: 3/15/23.

**SHEET 2 OF 3**

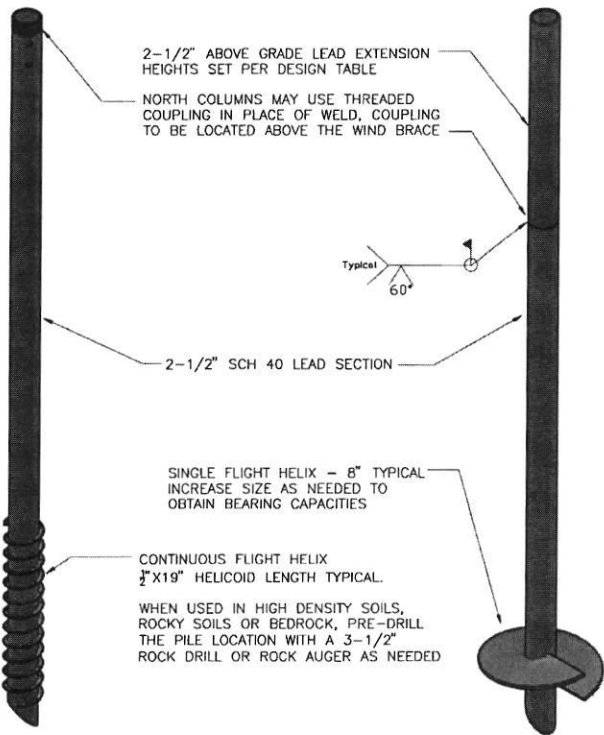
**SOLAR ENERGY WORLD**

**PROJECT:**  
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WOODBINE, MD 21797

**Solar Foundations USA**

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DATE	REVISION	DRAWN BY:	REVIEW BY:
10/24/2022	ORIGINAL	JB	JD



**HELICAL PILE DETAIL**  
N.T.S.

**SPECIFICATION REQUIREMENTS:**

THE FOLLOWING MATERIAL SPECIFICATION REQUIREMENTS PERTAIN TO THE FABRICATION OF THE SOLAR FOUNDATIONS USA GROUND MOUNT SOLAR SUPPORT STRUCTURE AS INDICATED ON THESE DRAWINGS.

1. SOLAR FOUNDATION ALUMINUM RAILS SHALL CONFORM TO ASTM B221.
2. STRUCTURAL STEEL TUBING SHALL BE ASTM A500 HIGH YIELD (60 KSI).
3. STEEL PIPE FOR PILES SHALL CONFORM TO ASTM A500 GRADE C.
4. STEEL PILE EXTENSIONS SHALL BE ASTM A53 GRADE B.
5. STEEL PIPE FOR DIAGONAL BRACING SHALL BE ASTM A53 GRADE A.
6. FABRICATED STEEL PLATE FOR COLUMN CAP ASSEMBLIES, BRACING CLAMPS, ETC. SHALL BE ASTM A36 OR A1011.
7. STEEL BOLTS FOR CAP FASTENERS SHALL CONFORM TO SAE J429 GRADE 5. ALL OTHER BOLTS SHALL CONFORM TO SAE J429 GRADE 5 OR BETTER.
8. STEEL U-BOLTS SHALL CONFORM TO ASTM 1018.
9. USS FLAT STEEL WASHERS SHALL CONFORM TO ASTM F844 AND NUTS FOR STEEL CONNECTIONS SHALL CONFORM TO ASTM A563 GRADE A.
10. ALL FIELD WELDING SHALL CONFORM TO AWS D1.1/D1.1M - STRUCTURAL WELDING CODE REQUIREMENTS.
11. ALL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A123 OR A153 AFTER ALL FABRICATION HAS BEEN COMPLETED.

**INSTALLATION REQUIREMENTS:**

1. THE MINIMUM AVERAGE INSTALLATION TORQUE REQUIRED TO OBTAIN THE REQUIRED INDICATED CAPACITIES AND THE MINIMUM INSTALLATION DEPTH SHOWN ON THE PLANS SHALL BE SATISFIED PRIOR TO TERMINATION OF THE INSTALLATION. THE INSTALLATION TORQUE SHALL BE AN AVERAGE OF THE INSTALLATION TORQUES INDICATED DURING THE LAST 1 FOOT OF INSTALLATION.
2. THE TORSIONAL STRENGTH RATING OF THE TORQUE ANCHOR SHALL NOT BE EXCEEDED DURING THE INSTALLATION. IF THE TORSIONAL STRENGTH LIMIT OF THE ANCHOR HAS BEEN REACHED, BUT THE ANCHOR HAS NOT REACHED THE TARGET DEPTH, PERFORM THE FOLLOWING:
  - 2.1. IF THE TORSIONAL STRENGTH LIMIT IS ACHIEVED PRIOR TO REACHING THE TARGET DEPTH, THE INSTALLATION MAY BE ACCEPTABLE IF REVIEWED AND APPROVED BY THE ENGINEER.
  - 2.2. THE INSTALLER MAY REMOVE THE TORQUE ANCHOR AND INSTALL A NEW ONE WITH SMALLER DIAMETER HELICAL PLATE.
  - 2.3. IF USING A CONTINUOUS FLIGHT PILE, PRE-DRILL THE PILE LOCATION WITH A 3-1/2" ROCK AUGER OR 3-5/8" ROCK DRILL AS NEEDED.
3. IF THE TARGET DEPTH IS ACHIEVED, BUT THE TORSIONAL REQUIREMENT HAS NOT BEEN MET THE INSTALLER MAY DO ONE OF THE FOLLOWING:
  - 3.1. INSTALL THE TORQUE ANCHOR DEEPER TO OBTAIN THE REQUIRED CAPACITY
  - 3.2. REMOVE THE TORQUE ANCHOR AND INSTALL A NEW ONE WITH A LARGER DIAMETER HELICAL PLATE OR ONE WITH MULTIPLE HELICAL PLATES.
  - 3.3. REDUCE THE LOAD CAPACITY ON THE INDIVIDUAL TORQUE ANCHOR BY PROVIDING ADDITIONAL TORQUE ANCHORS AT A REDUCED SPACING.

James C  
Douglas

Digitally signed by James C Douglas  
DN: cn=J.C. Douglas, ou=Solar Foundations USA, email=jcdouglas@sfusa.com, c=US  
Date: 2022.10.24 14:13:42 -0400



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. 40027, Expiration Date: 3/15/23.

**SHEET 3 OF 3**

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WOODBINE, MD 21797

**Solar Foundations USA**

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DATE	REVISION	DRAWN BY:	REVIEW BY:
10/24/2022	ORIGINAL	JB	JD