

Approved 11.29.22

-H.O.

Record Detail * (This section is required.)

Permit Type	Permit Number	Opened Date
Building/Residential/Misc/Solar Panel	B22004322	11/21/2022
Description of Work		
SFD / INSTALL (40) GROUND MOUNTED SOLAR PANELS, 16.00KW		

[check spelling](#)

Address * (This section is required.)

Search Reset Clear Get Parcel & Owner

Street #	Street Name	Street Type	
12457	KONDRUP	DR	
Unit Type	Unit #	X Coordinate	Y Coordinate
-Select--		-76.94494	39.14391
City	State	Zip Code	Primary
FULTON	MD	20759	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
840149	14	3.6	219500	219500	0	RURAL
Legal Description						
LOT 19 3.6056 A[]12457 KONDRUP DR[]BEAUFORT ESTA S1 RSB 15						

[check spelling](#)

Block	Lot	Census Tract	Council Dist	Inspection Dist	Supervisor Dist	Map #	DAP Zone
	19	605102	4				
Plan Area	State Tax Id		Subdivision Name				
	1405431158						
Section	Area		Tax Map				
			45				
Grid	Zoning District		ADC Map				
45-6	RR-DEO		5051-J7				
SDP No.	Final Plan No.		WP File No.				
Record Plat No.	WS Contract No.		FDP No.		Primary		
13702					Yes		
Owner Occupied	Year Built		Historic District				
<input type="radio"/> Yes <input checked="" type="radio"/> No			<input type="radio"/> Yes <input checked="" type="radio"/> No				
Historic District Registry No.	Stat Area		Flood Plain				
	5-15A		<input type="radio"/> Yes <input checked="" type="radio"/> No				
Building No							

Owner * (This section is required.)

Search Reset Clear

Name *

HEALD DONALD L

Address Line 1

12457 Kondrup Drive

Address Line 2

Address Line 3

Mail City	Mail State	Mail Zip Code
Fulton	MD	20759
Phone	Primary	
6095090960	Yes	
E-mail		
Cell Number	Fax Number	

Professionals * (This section is required.)

Search Reset Clear

License # * 08050127353
 License Type * MHIC Co
 Primary Yes

Business Name SOLAR ENERGY WORLD LLC
 First Name GEOFFREY Middle Name Last Name MIRKIN
 Address Line 1 5681 MAIN STREET
 Address Line 2

City ELKRIDGE State MD ZIP Code 21075-0000
 Phone 1 4105792009 Phone 2 Fax 4105791601
 E-mail GMIRKIN@SOLARENERGYWORLD.COM

Applicant * (This section is required.)

Search As Owner As Lic. Prof As Contact

Type * Applicant
 Relationship Applicant
 Primary Yes

First Name Brian MI Last Name Milligan
 Full Name ZACH NEUBAUER
 Organization Name SOLAR ENERGY WORLD
 Street Address 5681 MAIN STREET
 Address Line 2

City ELKRIDGE State MD Zip Code 21075
 Phone 410-220-4738 Cell Fax
 E-mail * bmilligan@SOLARENERGYWORLD.COM

Addtl Info

Est Construction Cost * 37000
 Housing Units * 0
 Number of Buildings * 0
 Public Owned No

Construction Type --Select--

RESIDENTIAL SOLAR PANEL INFO

SOLAR PANEL INFORMATION

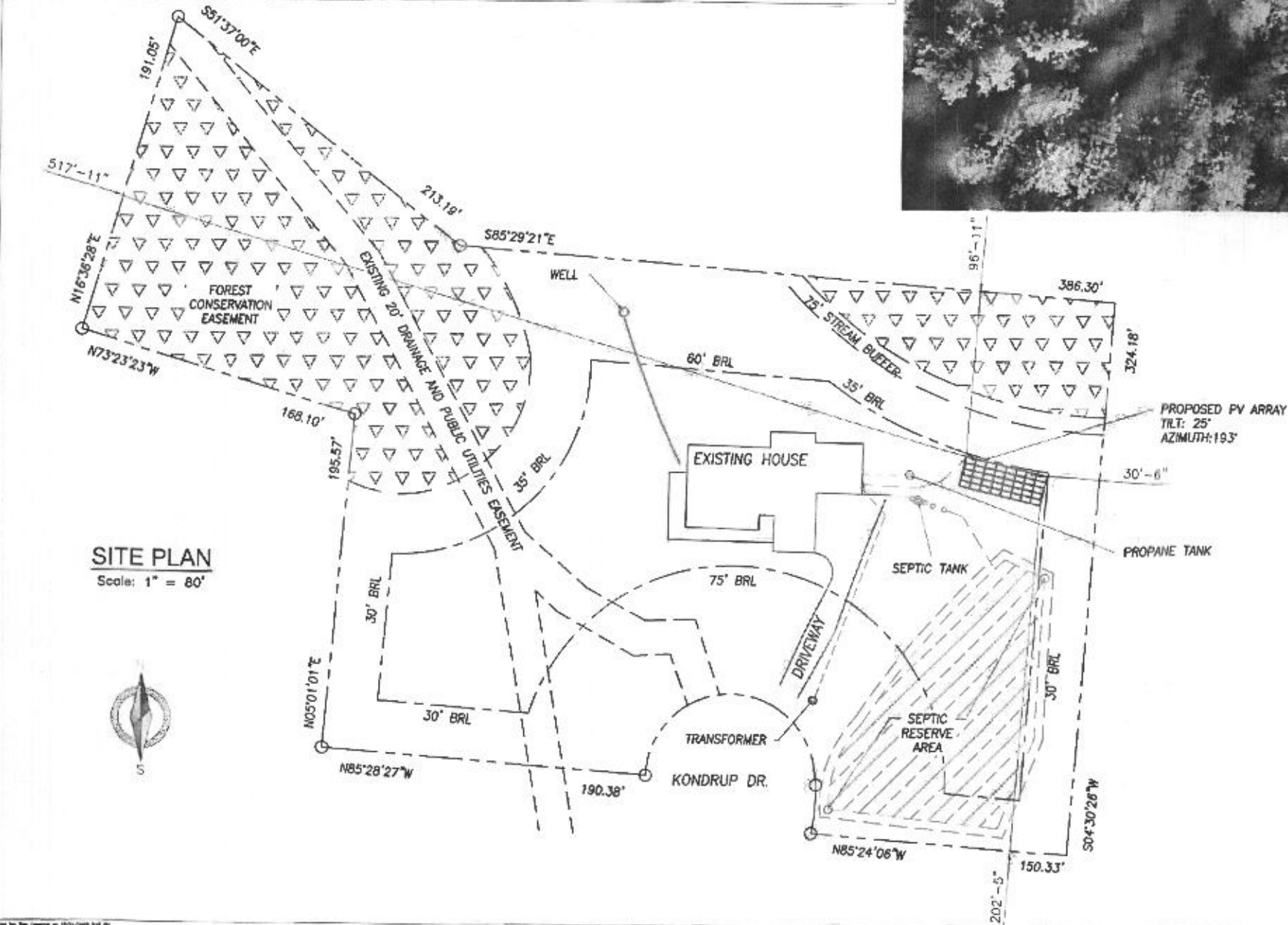
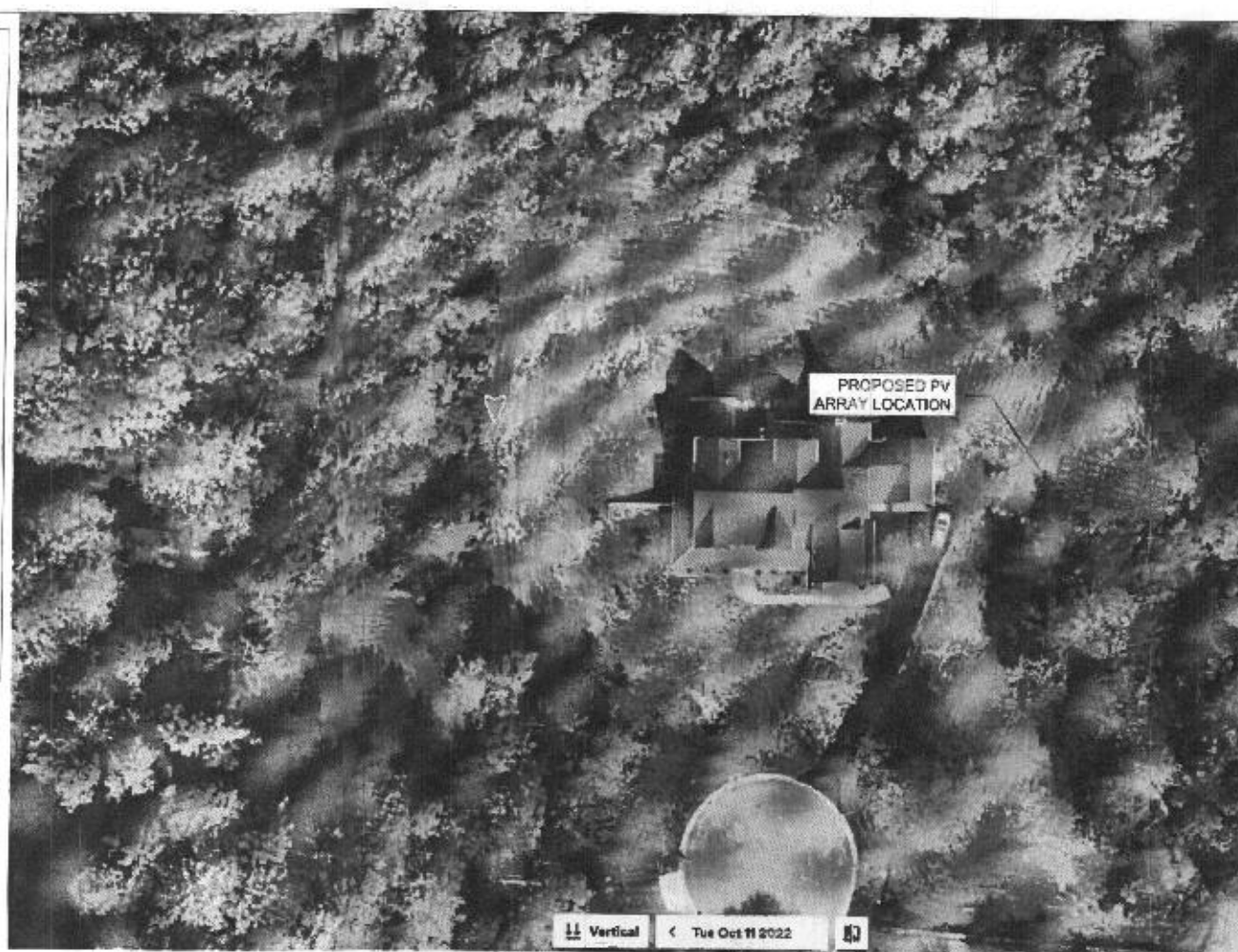
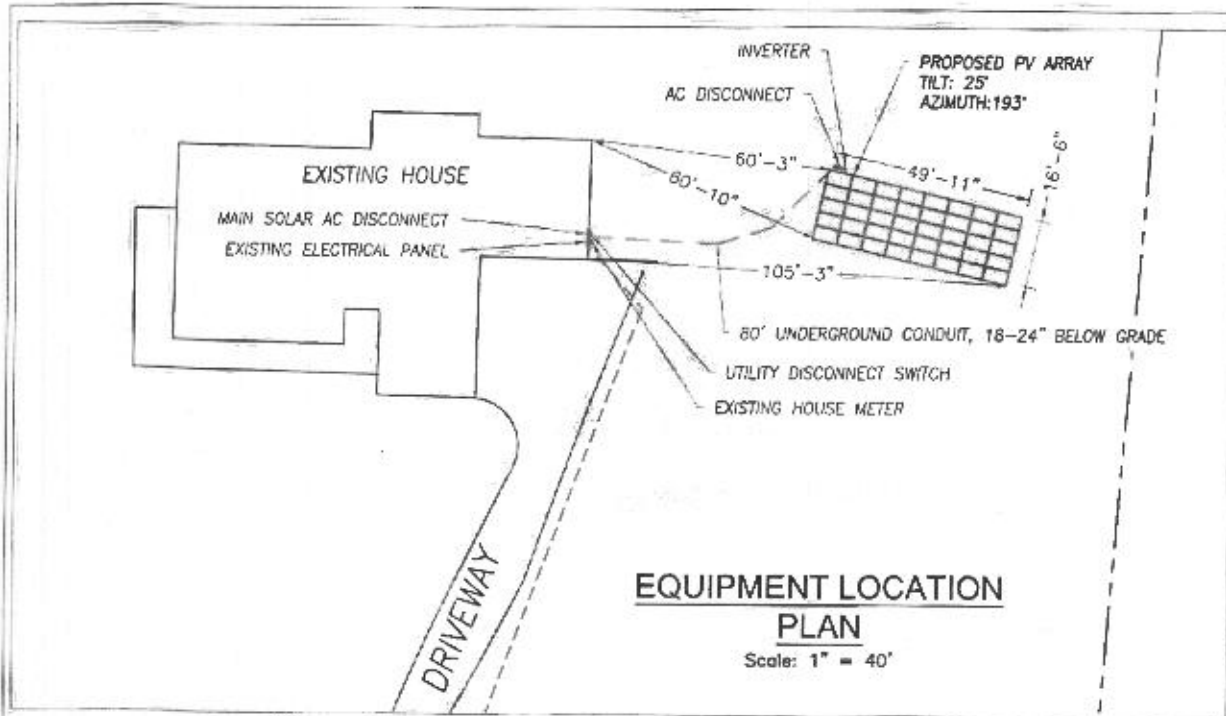
Capital Project-No Fee Yes No
 Type of Installation * Solar Collector - Ground Mount
 Number of Panels * 40
 Water Supply * Private
 Sewage Disposal * Private
 Expiration Date 5/27/2023

Existing Use * SFD
 Sprinkler System * Yes No

PAYMENT INFORMATION

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

Submit Cancel



NOTES:

1. THIS DRAWING IS TO PROVIDE REFERENCE FOR THE INSTALLATION OF GROUND MOUNT PHOTOVOLTAIC ARRAYS.
2. THE SYSTEM SHALL INCLUDE [40] HANWHA Q-CELLS DUO BLK ML-G10+ 400W MODULES [DIMENSIONS: 74.00" (L) x 41.10" (W) x 1.26" (D)] AND WEIGHING 48.50 LBS (PANEL DEAD LOAD = 2.30PSF)
3. THE SOLAR FOUNDATIONS RACKING WILL BE INSTALLED PER MANUFACTURER'S INSTALLATION MANUAL.
4. THE PROPOSED ARRAY SHALL COVER APPROX. 875 SQ.FT. OF 3.6056 AC. PROPERTY.
5. EQUIPMENT LOCATION PLAN IS APPROXIMATE. EXACT LOCATION TO BE VERIFIED WITH INSTALLATION CREW AND HOME OWNER AT THE TIME OF INSTALLATION

General Notes



SolarEnergyWorld
Because Tomorrow Matters
Solar Energy World LLC.
5681 Main Street
Elkridge, MD 21075
(888) 497-3233

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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



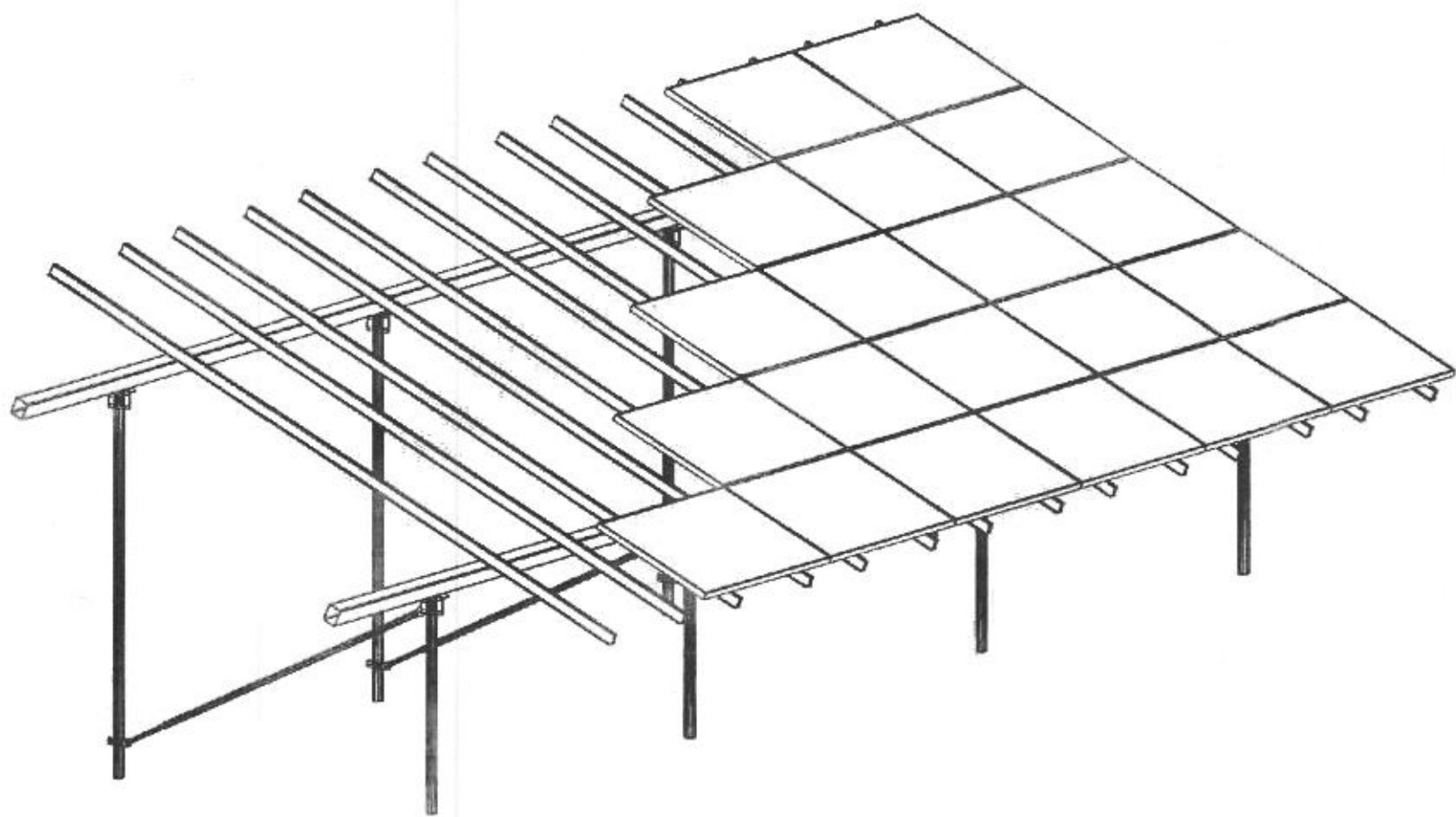
Engineering Review is Limited to Structural Design Only As it Pertains to the SFUSA Array Structure.

Project Name and Address
Donald Heald GM
5Lx8C
12457 Kondrup Dr.
Fulton, MD 20759
MD10930
16.00 kW

Drawn by TML	Sheet A001
Date 04-AUG-2022	
Scale AS NOTED	

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: 40 PSF
 Flat Roof Snow Load: N/A (if applicable)
 Site Contour: <5 Degree Slope

Max. Leg Axial Bearing: 4,430 lbs.
 Max. Leg Uplift: 2,520 lbs.
 Max. Lateral Resistance: 1,850 lbs.
 Top Rail Max. Loading: 122.4 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.

5Lx8C Sub-Array Design Conditions

Front Leg Height: 34 1/2"
 Rear Leg Height: 82"
 North-South Leg Spacing: 102"
 West Span Leg Spacing: 13'-3"
 East Span Leg Spacing: 13'-3"
 Quantity Center Spans: 1
 Center Span Leg Spacing: 13'-0"
 East & West Overhang: 4'-3"
 Overall Beam Length: 48'-0"
 Front Edge Ground Clearance: 24"
 Horizontal Rail Material: 5"x4"x 3/8" HSS
 Top Rail Material: SF Rails
 Qty Rails per Panel: 2
 Top Rail Length: 212"
 Top Rail Center Span: 112 1/2"
 Top Rail Overhangs: 49 3/4"

Array Tilt Angle: 25 Degrees
 Overall Array East-West Dim: 49'-7"
 Number of Modules/Sub-Array: 40
 Number of Sub-Arrays: 1
 Module Columns/Sub-Array: 8
 Number of Module Rows: 5
 Module Orientation: Landscape
 Module Column Spacing: 3 1/8"
 Module Row Spacing: 1 1/8"
 Module Model: Q.PEAK DUO BLK ML-G10+
 Module Size: 41.14" x 73.98"
 Individual Module Rating: 400 watt
 Sub Array Power Rating: 16.00 kw
 Total Power Rating: 16.00 kw

James C Douglas
Digitally signed by James C Douglas
 DN: cn=J, ou=New York,
 o=Clifton Douglas, email=jcd@cliftondouglas.com,
 c=US
 Date: 2022.11.15 17:40:55 -05'00'



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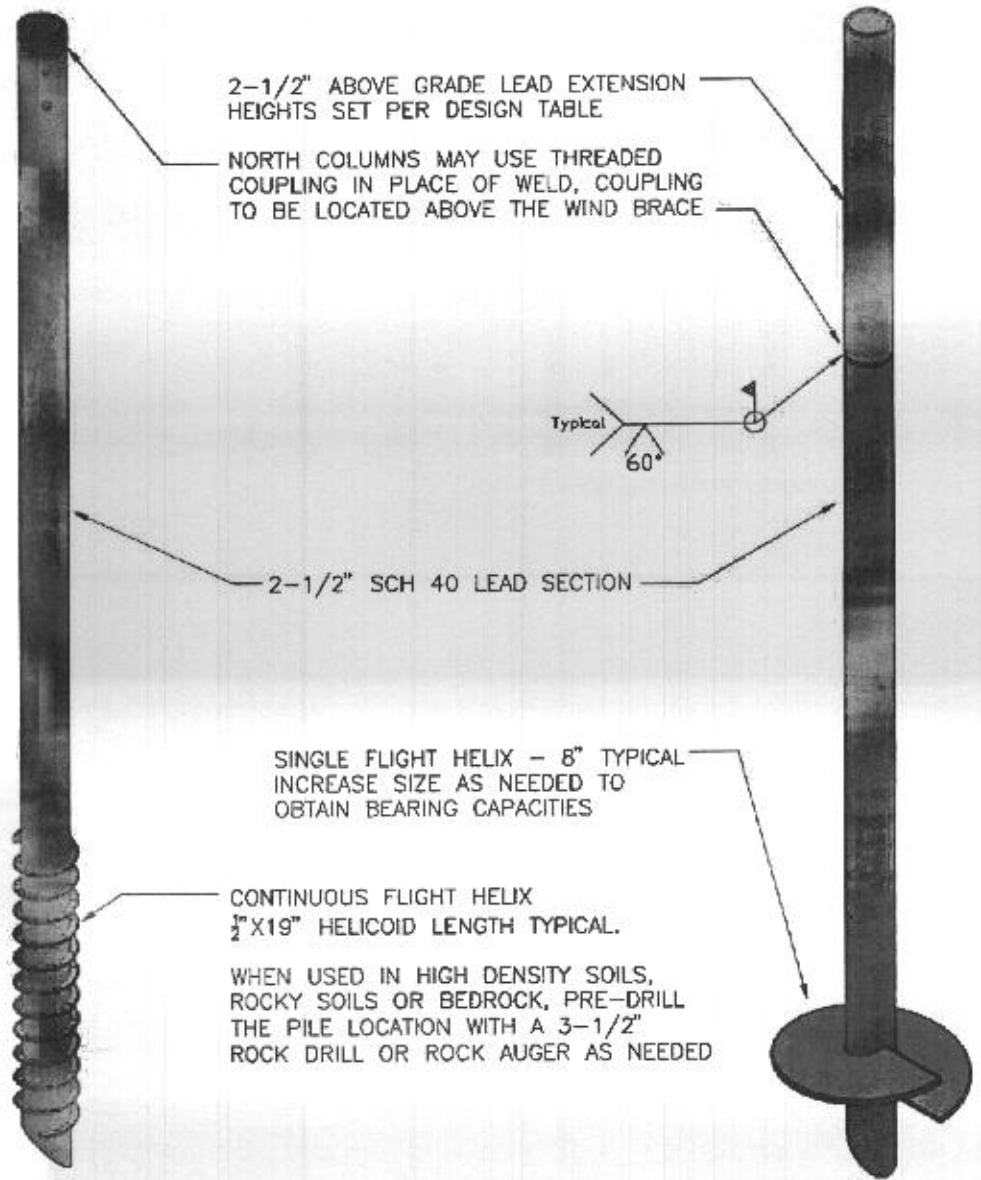
SHEET 1 OF 3			
DATE	REVISION	DRAWN BY:	REVIEW BY:
11/14/2022	ORIGINAL	JB	JD

SOLAR ENERGY WORLD

PROJECT:
HEALD RESIDENCE (MD10930)
 12457 KONDRUP DRIVE
 FULTON, MD 20759

Solar Foundations USA

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



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 PIPE 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=James C Douglas, o=Solar Foundations USA, email=jdouglas@sfusa.com, c=US
Date: 2022.11.15 17:07:34 -0500



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.

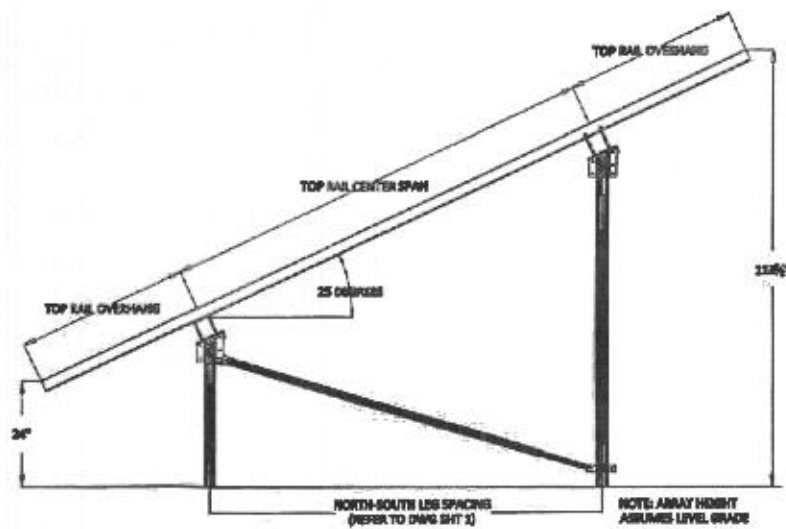
SHEET 3 OF 3			
DATE	REVISION	DRAWN BY:	REVIEW BY:
11/14/2022	ORIGINAL	JB	JD

SOLAR ENERGY WORLD

PROJECT:
HEALD RESIDENCE (MD10930)
12457 KONDRUP DRIVE
FULTON, MD 20759

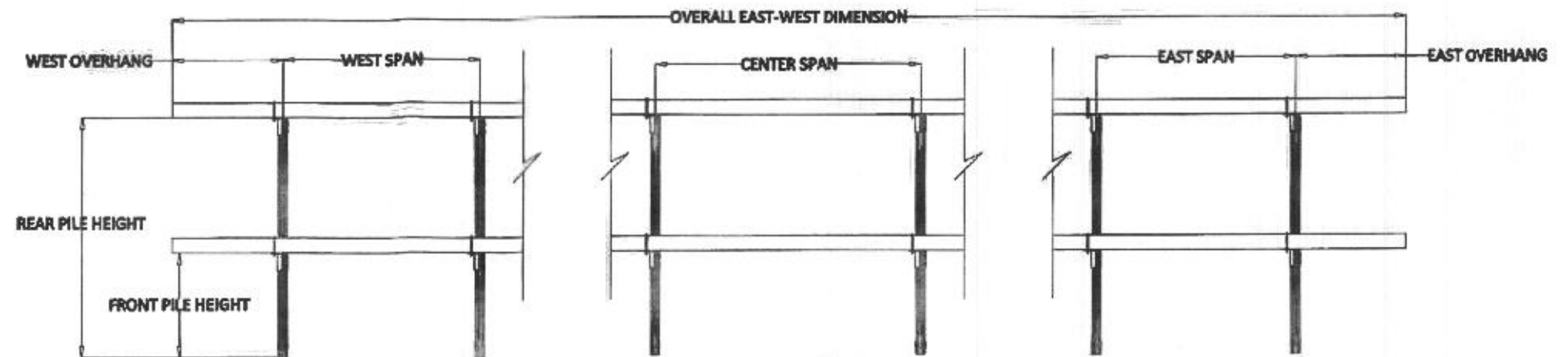
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SIDE ELEVATION

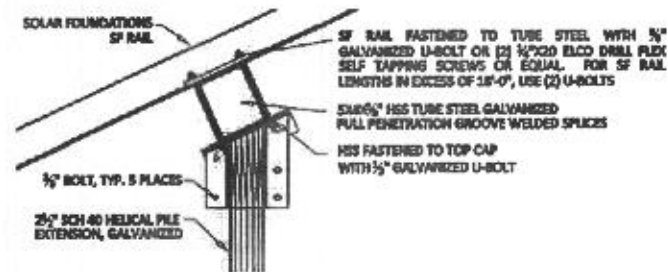
N.T.S.



REFER TO DWG SHEET 1 FOR EAST-WEST PILE SPANS AND FRONT AND REAR PILE HEIGHTS

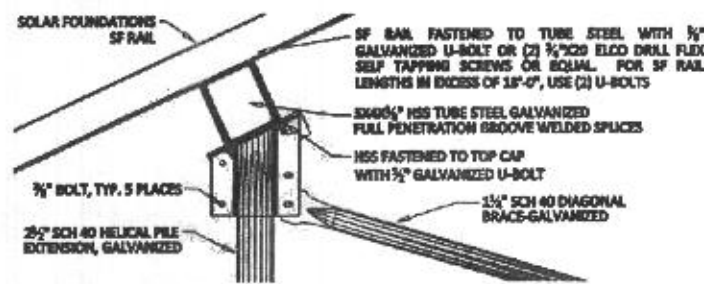
PILE SPACING ELEVATION

N.T.S.



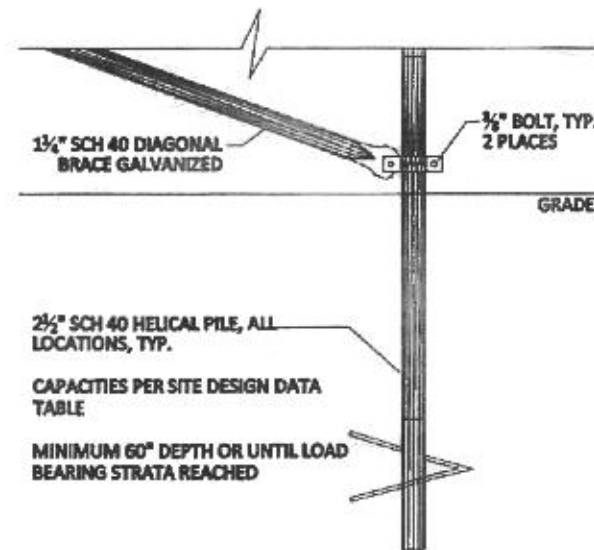
UPPER CAP DETAIL

N.T.S.



LOWER CAP DETAIL

N.T.S.



HELICAL PILE DETAIL

N.T.S.

James C Douglas
Digitally signed by James C Douglas
 DN: cn=JCD, o=JCD, email=JCD@jcd.com, c=US
 2022.11.15 17:47:08 -0500



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SHEET 2 OF 3

DATE	REVISION	DRAWN BY:	REVIEW BY:
11/14/2022	ORIGINAL	JB	JD

SOLAR ENERGY WORLD

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 12457 KONDRUP DRIVE
 FULTON, MD 20759

Solar Foundations USA

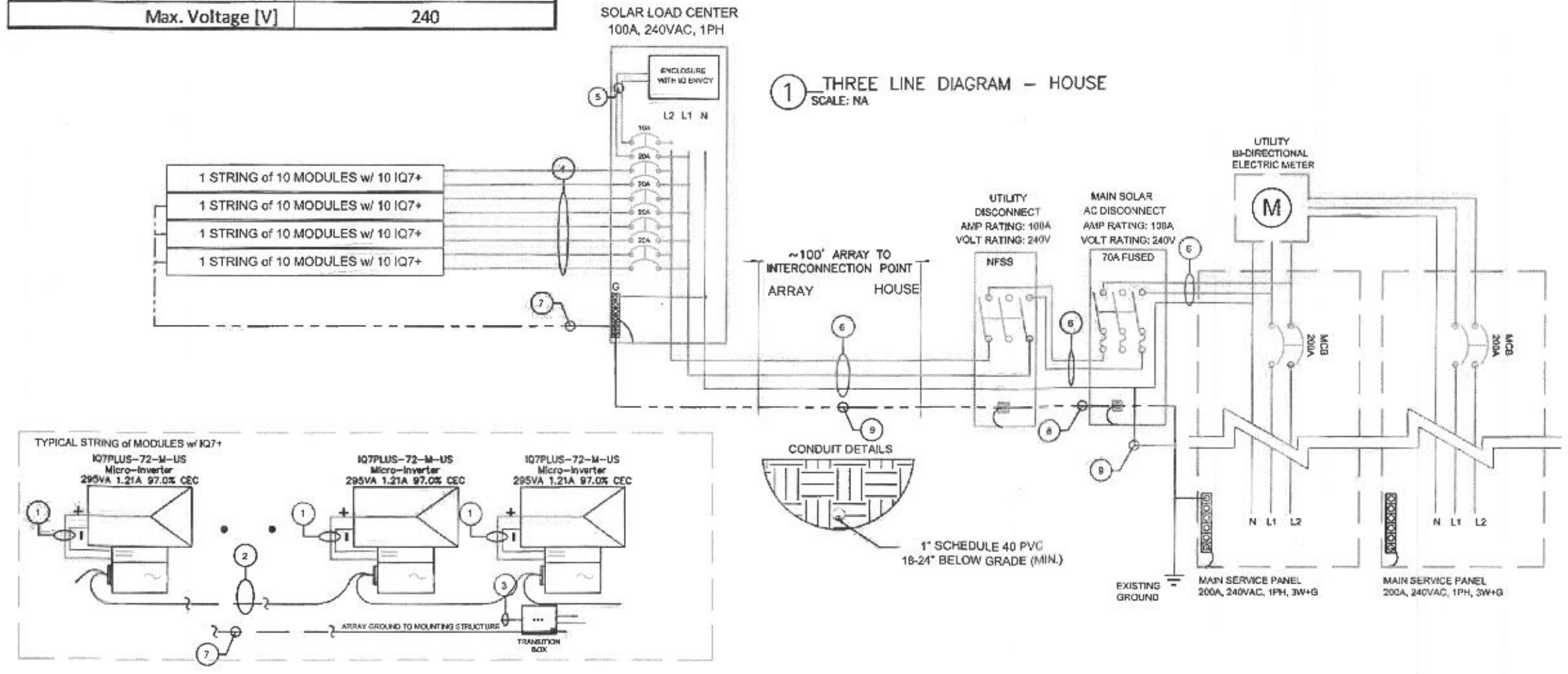
1142 River Road, New Castle, DE 19720 Ph: (855) 738-7200 Fax: (866) 644-5665

MODULE DATA	
Module Manufacturer	Hanwha Q.Cells
Module Model	Q.PEAK Duo BLK ML-G10+ (400)
Power [W]	400
Rated Voltage, Vmp [V]	37.13
Rated Current, Imp [A]	10.77
Open Circuit Voltage, Voc [V]	45.3
Short Circuit Current, Isc [A]	11.14
Max. System Voltage [V]	1000
INVERTER DATA	
Total Microinverters	40
Inverter Manufacturer	enphase
Inverter Model	IQ7+
Max DC Voltage [V]	48
Max Output Power [W]	295
Nominal AC Current [A]	1.21
Nominal AC Voltage [V]	240
Total Current (A)	48.4
ARRAY DETAILS	
No. of Modules per String	10
No. of Strings	4
Array Watts at STC [W]	16000
Max. Voltage [V]	240

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 9 CURRENT-CARRYING CONDUCTORS IN ROOF MOUNTED SUNLIGHT CONDUIT USING THE OUTDOOR TEMPERATURE OF 47°C
 - 12.1. 10AWG CONDUCTOR ARE GENERALLY ACCEPTABLE FOR MODULES WITH AN I_{sc} OF 9.6 AMPS WITH A 15 AMP FUSE.
- Wire sizing for OCPD
 $Ex(I_{sc} \times (1.25 \times \# \text{ of strings in parallel})) = \text{wire ampacity or using NEC 690.8}$

WIRE/CONDUIT SCHEDULE ARRAY			
TAG	DESCRIPTION	WIRE SIZE/TYPE	NOTES
1	Panel to Microinverter	PV Wire (Factory Made)	Integrated
2	Microinverter to Microinverter	Enphase Manufactured Cable	
3	Microinverter to Transition Box	Enphase Manufactured Cable	
4	Transition Box to IQ Combiner	#10 Cu THHN/THWN-2	
5	Envoy to IQ Combiner	#10 Cu THHN/THWN-2	
6	IQ Combiner to Interconnection Point	#8 Cu THHN/THWN-2 in 1" SCH 40 PVC	1.6% Vdrop
7	Equipment Grounding Conductor	#8 Cu Bare Copper Wire	
8	Equipment Grounding Conductor	#8 Cu THHN/THWN-2	
9	Grounding Electrode Conductor	#8 Cu	



General Notes

SolarEnergyWorld
Because Tomorrow Matters
 Solar Energy World LLC.
 5681 Main Street
 Elkridge, MD 21075
 (888) 497-3233

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*STAMPED AND SIGNED FOR STRUCTURES ONLY

Project Name and Address
 Donald Heald GM
 5Lx8C
 12457 Kondrup Dr.
 Fulton, MD 20759
 MD10930
 16.00 kW

<small>Drawn by</small> TML	<small>Sheet</small> E001
<small>Date</small> 04-AUG-2022	
<small>Scale</small> AS NOTED	