TOWN OF NORTH CASTLE

WESTCHESTER COUNTY
17 Bedford Road
Armonk, New York 10504-1898

PLANNING DEPARTMENT
Adam R. Kaufman, AICP
Director of Planning

Telephone: (914) 273-3542
Fax: (914) 273-3554
www.northcastleny.com

Application for Site Development Plan Approval

Application Name

Westchester Jewish Community Services

I. IDENTIFICATION OF PROPERTY OWNER, APPLICANT AND PROFESSIONAL REPRESENTATIVES

Name of Property Owner: Westchester Community Services

Mailing Address: 845 North Broadway, White Plains, NY 10603

Telephone: (914) 848-8100 Fax: (914) 761-5367 e-mail Sdiamond@wjcs.com

Name of Applicant (if different): Green Hybrid Energy Solutions, INc- Janet E. Glover

Address of Applicant: 11 Washington Place East, White Plains, NY 10603

Telephone: (914) 299-9552 Fax: (914) 949-4904 e-mail eglover@ghessolar.com

Interest of Applicant, if other than Property Owner:
Solar Installer

Is the Applicant (if different from the property owner) a Contract Vendee?

Yes	No
☒	☐

If yes, please submit affidavit sating such. If no, application cannot be reviewed by Planning Board

Name of Professional Preparing Site Plan:
Sunil Saigal - Enthink Engineering, LLC

Address: 1266 Rahway Ave, Westfield, NJ 07090

Telephone: (646) 632-7738 Fax: _____ e-mail enthinkllc@gmail.com

Name of Other Professional: _____

Address: _____

Telephone: _____ Fax: _____ e-mail _____

Name of Attorney (if any): _____

Address: _____

Telephone: _____ Fax: _____ e-mail _____

Applicant Acknowledgement

By making this application, the undersigned Applicant agrees to permit Town officials and their designated representatives to conduct on-site inspections in connection with the review of this application.

The Applicant also agrees to pay all expenses for the cost of professional review services required for this application.

It is further acknowledged by the Applicant that all bills for the professional review services shall be mailed to the Applicant, unless the Town is notified in writing by the Applicant at the time of initial submission of the application that such mailings should be sent to a designated representative instead.

Signature of Applicant: Janet E Glover Date: _____

Signature of Property Owner: _____ Date: 2/23/23

MUST HAVE BOTH SIGNATURES

II. IDENTIFICATION OF SUBJECT PROPERTY

Street Address: 845 North Broadway, White Plains, NY 10603

Location (in relation to nearest intersecting street):

350 feet (north, ~~south, east or west~~) of Washington Place East

Abutting Street(s): _____

Tax Map Designation (NEW): Section_____Block_____Lot_____

Tax Map Designation (OLD): Section 122.18 Block 4 Lot 28

Zoning District: CB Total Land Area _____

Land Area in North Castle Only (if different) _____

Fire District(s) White Plains, Valhalla School District(s) Valhalla

Is any portion of subject property abutting or located within five hundred (500) feet of the following:

The boundary of any city, town or village?
No x Yes (adjacent) _____ Yes (within 500 feet) _____
If yes, please identify name(s): _____

The boundary of any existing or proposed County or State park or any other recreation area?
No x Yes (adjacent) _____ Yes (within 500 feet) _____

The right-of-way of any existing or proposed County or State parkway, thruway, expressway, road or highway?
No x Yes (adjacent) _____ Yes (within 500 feet) _____

The existing or proposed right-of-way of any stream or drainage channel owned by the County or for which the County has established channel lines?
No x Yes (adjacent) _____ Yes (within 500 feet) _____

The existing or proposed boundary of any county or State owned land on which a public building or institution is situated?
No x Yes (adjacent) _____ Yes (within 500 feet) _____

The boundary of a farm operation located in an agricultural district?
No x Yes (adjacent) _____ Yes (within 500 feet) _____

Does the Property Owner or Applicant have an interest in any abutting property?
No x Yes _____

If yes, please identify the tax map designation of that property:

_____

III. DESCRIPTION OF PROPOSED DEVELOPMENT

Proposed Use: Commercial Offices

Gross Floor Area: Existing 10,660 S.F. Proposed Same S.F.

Proposed Floor Area Breakdown:

Retail _____S.F.; Office _____S.F.;

Industrial _____ S.F.; Institutional _____S.F.;

Other Nonresidential _____S.F.; Residential _____ S.F.;

Number of Dwelling Units: _____

Number of Parking Spaces: Existing _____ Required _____ Proposed _____

Number of Loading Spaces: Existing _____ Required _____ Proposed _____

Earthwork Balance: Cut 0 C.Y. Fill 0 C.Y.

Will Development on the subject property involve any of the following:

Areas of special flood hazard? No x Yes _____
(If yes, application for a Development Permit pursuant to Chapter 177 of the North Castle Town Code may also be required)

Trees with a diameter at breast height (DBH) of 8" or greater?

No x Yes _____
(If yes, application for a Tree Removal Permit pursuant to Chapter 308 of the North Castle Town Code may also be required.)

Town-regulated wetlands? No x Yes _____
(If yes, application for a Town Wetlands Permit pursuant to Chapter 340 of the North Castle Town Code may also be required.)

State-regulated wetlands? No x Yes _____
(If yes, application for a State Wetlands Permit may also be required.)

Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

Part 1 - Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 - Project and Sponsor Information

Name of Action or Project:
Westchester Jewish Community Services

Project Location (describe, and attach a location map):
845 North Broadway, White Plains, NY 10603

Brief Description of Proposed Action:
Installation of a 85.54kW DC (50kW AC) solar photovoltaic system on the roof. The system will consist of 73 Hanwha 485w panels, and 92 Znshine 545w panels with one SolarEdge 50kW inverter on a racking system.

Name of Applicant or Sponsor:	Telephone: (914) 848-8100
Westchester Jewish Community Services- Seth Diamond	E-Mail: sdiamond@wjcs.com

Address:
845 North Broadway

City/PO:	State:	Zip Code:
White Plains	NY	10603

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☒	☐
2. Does the proposed action require a permit, approval or funding from any other governmental Agency? If Yes, list agency(s) name and permit or approval: North Castle Building Department	☐	☒

3.a. Total acreage of the site of the proposed action? N/A acres
b. Total acreage to be physically disturbed? N/A acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? N/A acres

4. Check all land uses that occur on, adjoining and near the proposed action.
☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☒ Commercial ☒ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____
☐ Parkland

	NO	YES	N/A
5. Is the proposed action,			
a. A permitted use under the zoning regulations?	☐	☒	☐
b. Consistent with the adopted comprehensive plan?	☐	☒	☐

	NO	YES
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☒
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☒	☐
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☒	☐
b. Are public transportation service(s) available at or near the site of the proposed action?	☐	☒
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☐	☒
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies: _____	☐	☒
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: NA	☒	☐
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: NA	x	☐
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☒	☐
b. Is the proposed action located in an archeological sensitive area?	☒	☐
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☒	☐
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody? If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____	☒	☐

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:

☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☐ Early mid-successional

☐ Wetland ☒ Urban ☒ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☒	☐
16. Is the project site located in the 100 year flood plain?	☒	☐
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes, a. Will storm water discharges flow to adjacent properties? ☐ NO ☐ YES	☒	☐
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☐ NO ☐ YES		

	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size: _____	X	
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe: _____	X	
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe: _____	X	

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: Seth Diamond Westchester Jewish Community Services Date: 2/20/23

Signature: _____

PRINT FORM

TOWN OF NORTH CASTLE
WESTCHESTER COUNTY
17 Bedford Road
Armonk, New York 10504-1898

PLANNING DEPARTMENT
Adam R. Kaufman, AICP
Director of Planning

Telephone: (914) 273-3542
Fax: (914) 273-3554
www.northcastleny.com

PLANNING BOARD SCHEDULE OF ESCROW ACCOUNT DEPOSITS

Type of Application Deposit*	Amount of Initial Escrow Account
Concept Study	$500.00
Site Plan Waiver for Change of Use	$500.00
Site Development Plan for:	
Multifamily Developments	$3,000.00 plus $100.00 per proposed dwelling unit
Commercial Developments	$3,000.00 plus $50.00 for each required parking space
1 or 2 Family Projects	$2,000.00
Special Use Permit	$2,000.00 plus $50.00 for each required parking space
Subdivision:	
Lot Line Change resulting in no new lots	$1,500.00
All Others	$3,000.00 plus $200.00 per proposed new lot in excess of two (2)
Preparation or Review of Environmental Impact Statement	$15,000.00

* If a proposed action involves multiple approvals, a single escrow account will be established. The total amount of the initial deposit shall be the sum of the individual amounts indicated. When the balance in such escrow account is reduced to one-third (1/3) of its initial amount, the applicant shall deposit additional funds into such account to restore its balance to the amount of the initial deposit.

Janet E Glover — 2/17/23

Applicant Signature — Date:

GHES GREEN HYBRID ENERGY SOLUTIONS

Inexhaustible Energy Solutions for the 21st Century

February 17, 2023

Town of North Castle
Planning Board
17 Bedford Road
Armonk, NY 10504

Re: Westchester Jewish Community Services
845 North Broadway
White Plains, NY 10603-1602

To Whom It May Concern,

Per the attached plans, a 85.54kW DC (50kW AC) is proposed to be installed on the roof of a commercial office building located at the above captioned address. The system will consist of 73 Hanwha, 485W solar panels; and 92 Znshine 545w panels, with 1 Solar Edge 50KW inverter. The building has a flat roof and the panels will not be visible from the street.

Very truly yours,

Janet E. Glover, Owner/COO
Green Hybrid Energy Solutions, Inc.

11 Washington Place East White Plains, New York 10603
(844) SOLAR-NOW

jglover@ghessolar.com
914-539-5984

eglover@ghessolar.com
914-299-9552

Office 914-949-4900
FAX 914-949-4904

GHES GREEN HYBRID ENERGY SOLUTIONS

Inexhaustible Energy Solutions for the 21st Century

February 17, 2023

Town of North Castle
Planning Board
17 Bedford Road
Armonk, NY 10504

Re: Westchester Jewish Community Services
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White Plains, NY 10603-1602

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Very truly yours,

Janet E. Glover

Janet E. Glover, Owner/COO
Green Hybrid Energy Solutions, Inc.

11 Washington Place East White Plains, New York 10603
(844) SOLAR-NOW

jglover@ghessolar.com
914-539-5984

eglover@ghessolar.com
914-299-9552

Office 914-949-4900
FAX 914-949-4904

1266 Rahway Avenue, Westfield, NJ 07090

Enthink Engineering LLC

enthinkllc@gmail.com (646) 632-7738

January 11, 2023

Town of North Castle
Building Department
15 Bedford Road
Armonk, NY 10504

Re: 845 North Broadway
White Plains, NY 10603

To Whom it May Concern,

The existing roof structure of the above captioned property which is wood frame. There are 2 structures on the building

Array 1

10" Steel trusses 24" OC with a TPO membrane decking material running the length of the building

Array 2, 3, 4

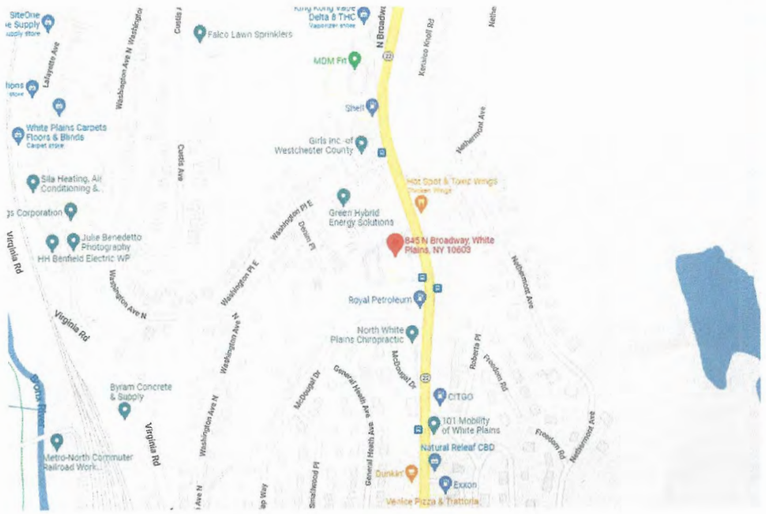
Wood frame construction. 2" x 8" wood rafters, 18 " oc , ¾" tongue and groove wood roof floor, supported by 3, 14" I beams running the length of the building

The roof will have a new white TPO membrane. The roofs will accommodate the additional load of the solar system at 4.26PSF under 115 MPH wind speeds and 30 PSF snow load without additional structural supports.

I have determined that the installation will meet the requirements of the 2020 NYS Energy Conservation Construction Code, 2020 NYS Residential Code, 2020 NYS Fire Code, NYS Existing Building Code, 2017 NEC and The Town of North Castle building codes, when installed in accordance with the manufacturer's instructions.

If you have any further questions or require addition information, feel free to contact me.

Very truly yours,



Location Map

Sheet Index

(Array 1)
-165 Degree Orientation
-5 Degree tilt
-RM5
-46 Modules

(Array 2)
-165 Degree Orientation
-5 Degree tilt
-RM5
-46 Modules

(Array 3)
-165 Degree Orientation
-5 Degree tilt
-RM5
-60 Modules

(Array 4)
-165 Degree Orientation
-5 Degree tilt
-RM5
-13 Modules

Project Data

Applicable Codes:

NYS Energy Conservation Code - 2020
NYS Building Code - 2020
NEC - 2017
City of White Plains Building Codes

Building Use:	Religious Commercial (metal framed, brick exterior)
Module:	Hanwha Q-Cell 485w module (73) Znshine 545w module (92)
Racking:	Unirac RM5 Ballasted Pans (242)
Inverter(s):	SolarEdge 50kw Inverter (1)
Optimizers:	SolarEdge 1201w Optimizer (83)
System Rating:	85.54 kw DC - STC

Building Information

Use Group:	A-3
Construction Class:	II-C
Roof Height:	35'
Number of Stories:	3
Roof Area:	10,660 sqf

Roof Loads

Ground Snow Load (psf)	30
Wind Load Load (mph)	115
Solar Array (psf)	4.26 psf

Item Description	Proposed Design Value	Prescriptive Value/Citation	Supporting Documentation
Installation 73 485w modules mounted on ballasted racking and 92 545w modules mounted on ballasted racking Supporting equipment to be mounted on south exterior wall of parapet wall.	Maintain existing roof integrity with integration of 85.45kw photovoltaic installation and supporting equipment coinciding with all national and local regulatory requirements set forth by the concerned AHJ.	- Unirac RM5 ballasted 5° racking with TPO slipsheets underneath pans	C-100 Datasheets

No new construction has been proposed. PV system is to be mounted on existing roof structure. The existing roof is structurally sound and stable and will support the proposed solar array with no modification necessary.

Any commercial or residential activity of this structure will remain uninterrupted during construction. No work shall be performed that affects egress fire safety, rated assemblies, occupant health, excessive noise or structural integrity.

WJCS White Plains

The existing roof structure has been evaluated for the proposed solar load requirements and was determined to be of sufficient structural capacity for the following method of installation.
Array - 1
(Wood frame construction - TPO membrane roof - ballasted pans - 10" steel truss spaced 24" oc - running the length of the building)
Array 2, 3, 4
(Wood frame construction - TPO membrane roof - ballasted pans - 2x8 rafters spaced 18" oc - 3 central 14" I-beams running the length of the building)

It is a violation of the law for any person unless they are acting under the direction of a licensed professional engineer to alter any item in any way. If an item bearing the seal of an engineer is altered, the altering engineer shall affix to the item their seal and the notation "altered by" followed by their signature and specific description of the alteration.

Contractor:

Green Hybrid Energy Solutions

11 Washington Place East, White Plains, New York, 10603

Project:

WJCS White Plains

845 North Broadway White Plains, New York 10603

Owner/Applicant

Engineering Approvals:

SUNIL SAIGAL
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW YORK

SECT 78.72-2-12
BLOCK: 4
LOT: 28

D.O.B. Stamp

Sheet Title:

Installation Overview

Solar Engineering

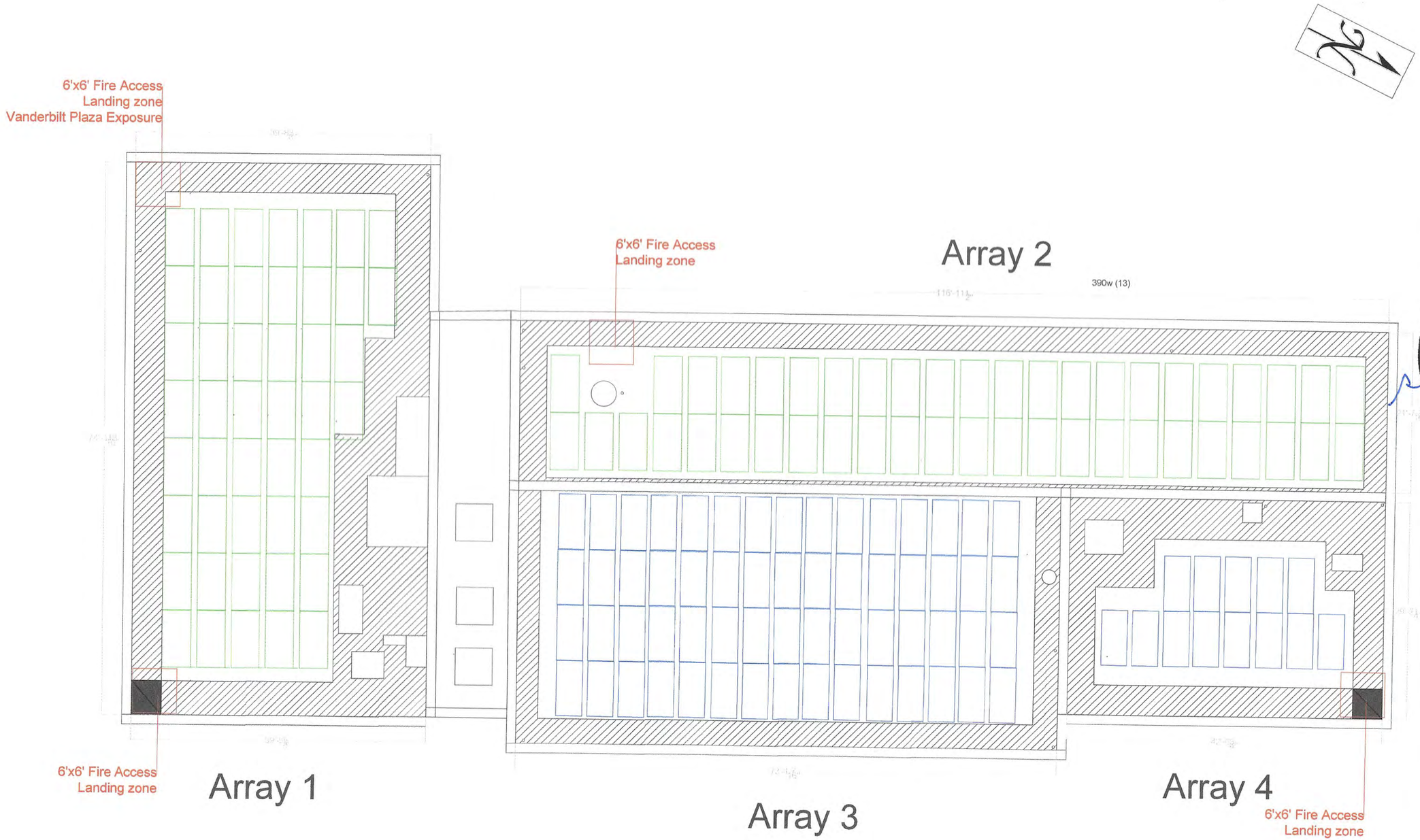
Sheet Size: Arch D

Drawn: GMJ | Approved: -

Date: Jan 1, 2023

Sheet Number: A 1.1

Sheet 1 of 11



4' perimeter fire access from outside parapet and roof access bulkheads

Contractor:

Green Hybrid Energy Solutions

11 Washington Place East, White Plains, New York, 10603

Project:

WJCS White Plains

845 North Broadway White Plains, New York 10603

Owner/Applicant

STATE OF NEW YORK
SUNIL SAIGAL
088728
LICENSED PROFESSIONAL ENGINEER

Engineering

SECT: 122.12
BLOCK: 4
LOT: 28

D.O.B. Stamp

Sheet Title:

Site Plan

Solar Engineering

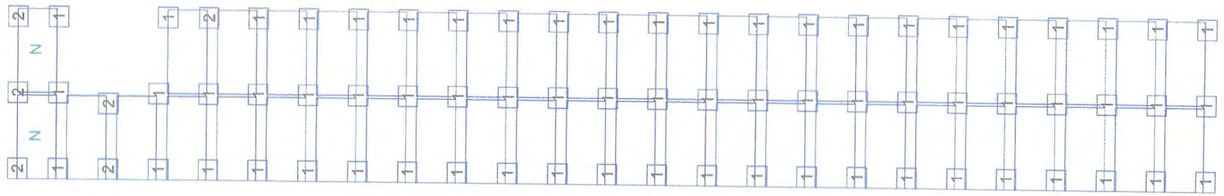
Sheet Size: Arch D

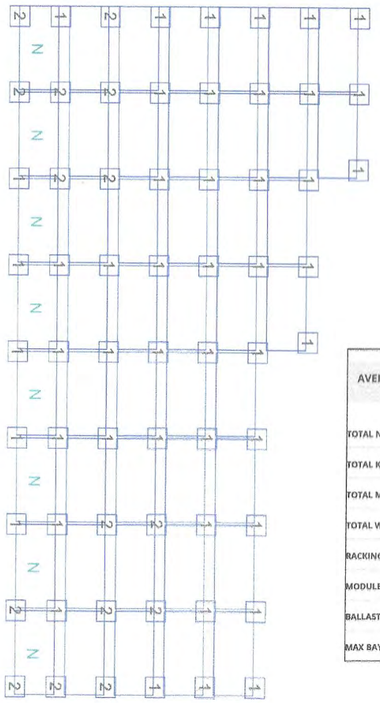
Drawn: GMJ | Approved: -

Date: Jan 1, 2023

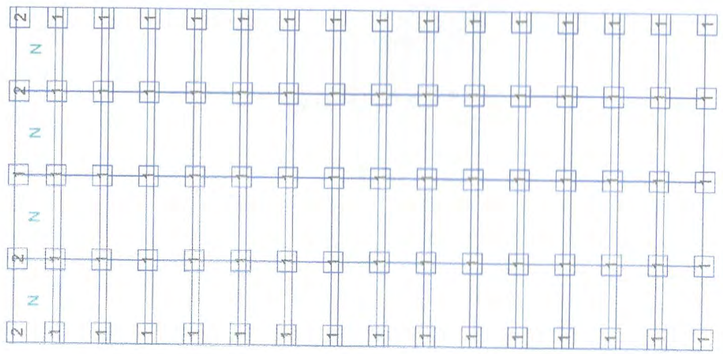
Sheet Number: A 1.2

Sheet 2 OF 11



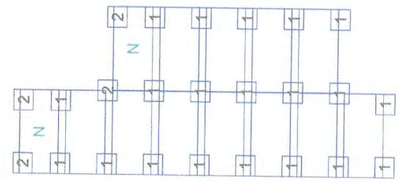


AVERAGE PSF	3.91 psf
TOTAL NUMBER OF MODULES	46
TOTAL KW	25.07 KW
TOTAL MODULE AREA	~1515 ft²
TOTAL WEIGHT ON ROOF	5917 lbs
RACKING WEIGHT	563 lbs
MODULE WEIGHT	2890 lbs
BALLAST WEIGHT	2464 lbs
MAX BAY LOAD (DEAD)	135 lbs



AVERAGE PSF	4.07 psf
TOTAL NUMBER OF MODULES	60
TOTAL KW	29.10 KW
TOTAL MODULE AREA	~1775 ft²
TOTAL WEIGHT ON ROOF	7225 lbs
RACKING WEIGHT	685 lbs
MODULE WEIGHT	3852 lbs
BALLAST WEIGHT	2688 lbs
MAX BAY LOAD (DEAD)	111 lbs

AVERAGE PSF	4.05 psf
TOTAL NUMBER OF MODULES	46
TOTAL KW	25.07 KW
TOTAL MODULE AREA	~1499 ft²
TOTAL WEIGHT ON ROOF	6070 lbs
RACKING WEIGHT	620 lbs
MODULE WEIGHT	2890 lbs
BALLAST WEIGHT	2560 lbs
MAX BAY LOAD (DEAD)	111 lbs



AVERAGE PSF	5.01 psf
TOTAL NUMBER OF MODULES	13
TOTAL KW	6.30 KW
TOTAL MODULE AREA	~387 ft²
TOTAL WEIGHT ON ROOF	1940 lbs
RACKING WEIGHT	210 lbs
MODULE WEIGHT	835 lbs
BALLAST WEIGHT	896 lbs
MAX BAY LOAD (DEAD)	124 lbs

Contractor:

Green Hybrid Energy Solutions

11 Washington Place East, White Plains, New York, 10603

Project:

WJCS White Plains

845 North Broadway White Plains, New York 10603

Owner/Applicant

STATE OF NEW YORK ★ SUNIL SAIGAL ★ LICENSED PROFESSIONAL ENGINEER 088728

Engineering Approval

D.O.B. Stamp

Sheet Title:

Ballast Layout

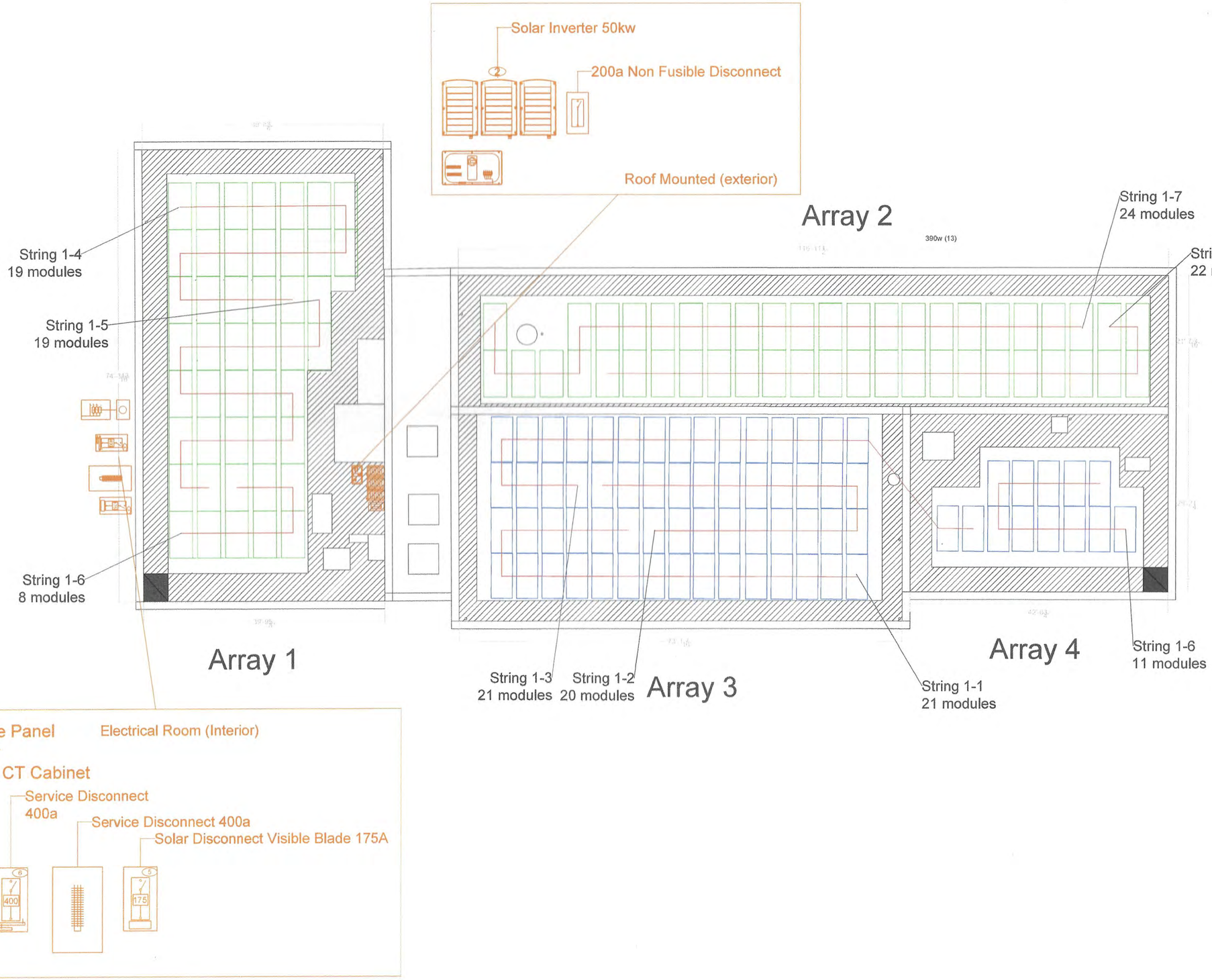
Solar Engineering

Sheet Size: Arch D

Drawn: GMJ | Approved: -

Date: Jan 1, 2023

Sheet Number: A 1.3



Contractor:

Green Hybrid Energy Solutions

11 Washington Place East, White Plains, New York, 10603

Project:

WJCS White Plains

845 North Broadway White Plains, New York 10603

Owner/Applicant:

STATE OF NEW YORK
SUNIL SAIGAL
Engineer
088728
LICENSED PROFESSIONAL ENGINEER

SECT: 122.12
BLOCK: 4
LOT: 28

D.O.B. Stamp

Sheet Title:

PV Stringing + Equipment

Solar Engineering

Sheet Size: Arch D

Drawn: GMJ | Approved: -

Date: Jan 1, 2023

Sheet Number: B 1.2

Sheet 5 OF 11

Module Specifications 1					
Module Manufacturer:	ZnShine Solar	STC Watts	545	VOC Temp Coefficient	-0.290% / C
Module Model:	ZXM7-SHLDD144-545/M				
Mounting Type	Roof	VOC	44.8 vdc	Coldest Day VOC	51.43 vdc
Correction Factor	Mfg Listed	VMP	36.6 vdc	Warmest Day VMP	31.51 vdc
Temperature Scale	Celsius	Imp	13.83 A	OPTIMIZER NORMAL VOLTAGE	400 vdc
Local Temperature Range	-26 THRU 38	Isc	13.07 A		

Module Specifications 1B					
Module Manufacturer:	QCELLS	STC Watts	485	VOC Temp Coefficient	-0.270% / C
Module Model:	Q.PEAK DUO XL-G10.2 485				
Mounting Type	Roof	VOC	53.64 vdc	Coldest Day VOC	61.03 vdc
Correction Factor	Mfg Listed	VMP	37.6 vdc	Warmest Day VMP	32.73 vdc
Temperature Scale	Celsius	Imp	11.29 A	OPTIMIZER NORMAL VOLTAGE	400 vdc
Local Temperature Range	41.7 THRU 30.4	Isc	10.76 A		

String	Modules / STRING	Optim/ String P1101	Current Per String	VMAX	Wire Size	Ohms/M'	Wire Length One Way	Total Ohms	E=IxR VD	%VD
CENTER										
String 1-1 (485w)	21	11	25.46	400	#10	1.24	150	0.372	9.472	2.368%
String 1-2 (485w)	20	10	24.25	400	#10	1.24	120	0.2976	7.217	1.804%
String 1-3 (485w)	21	11	25.46	400	#10	1.24	120	0.2976	7.578	1.894%
LEFT										
String 1-4	19	10	25.89	400	#10	1.24	120	0.2976	7.704	1.926%
String 1-5	19	10	25.89	400	#10	1.24	140	0.3472	8.988	2.247%
String 1-6	8	4	10.90	400	#10	1.24	120	0.2976	3.244	0.811%
String 1-6 (485w)	11	6	13.34	400	#10	1.24	120	0.2976	3.969	0.992%
RIGHT										
String 1-7	24	12	32.70	400	#10	1.24	120	0.2976	9.732	2.433%
String 1-8	22	11	29.98	400	#10	1.24	140	0.3472	10.407	2.602%
OPERATING CURRENT / MODULES	165	85	213.86							
Total Modules/Optimizers	165	85			85.545	KW				

CON ED ACCT # 55-5606-0144-1501-5
METER # 0099985201

NOTES:

1. Existing Service has a 400A Main Disconnect and 400A Fuses. 120% of 400=480A. 400A fuse + 175 Solar Breaker = 575A>480A. Make a tap in existing Service Disconnect for Solar POC.

AC Voltage Drop Calculations									
Length one way (L)	Current (I)	K Cu=12.9 Al=21.2	Wire Size & Typw SIZE	# SETS	TYPE	CM	Vd=1.73KxIxl/CM	Voltage	%Vd	FEEDER
20	139.5	21.2	#300	1	AL	300000	0.3411	208	0.164%	AC COMBINER
150	139.5	21.2	#300	1	AL	300000	2.5582	208	1.230%	INVERTER #1

DC VOLTAGE

PV MODULE Vmp 50 VDC STC
PV MODULE Voc 41.7 VDC STC
MAXIMUM PV MODULES PER STRING = 1
CORRECTION FACTOR PER NEC 690.7 (A) FOR-26°C =1.1479%
1.1479 X (PV MODULE Voc AT 25°C) = 57.4 VDC
MAXIMUM DC VOLTAGE = 1 X (57.4) = 57.4 VDC

COMBINED AC OUTPUT CIRCUIT

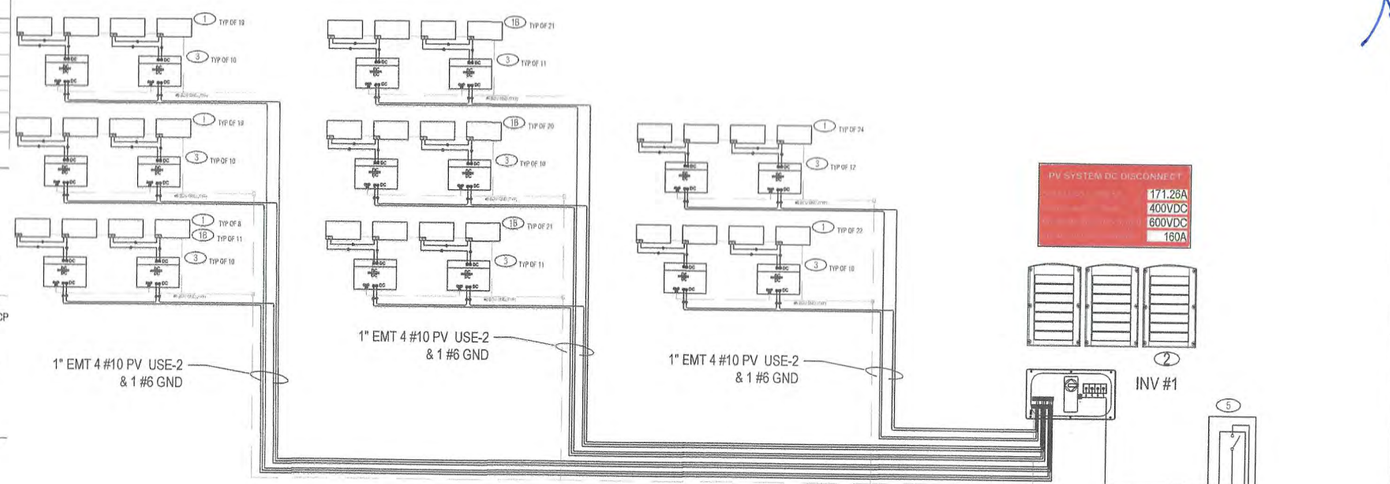
MAX CONTINUOUS CURRENT = 139.5 A
INVERTER OUTPUT CIRCUIT OVER CURRENT PROTECTION = 195 A OCPD
80% OF OVER CURRENT PROTECTION RATING = 156 A
OUTPUT CIRCUIT CONTINUOUS CURRENT = 139.5 A < 156 A
INVERTER OUTPUT WIRING TO AC COMBINER PANEL=1 SET(s) #300 XHHW-2, 90°C RATED
TEMPERATURE CORRECTION FACTOR FOR 41°C AMBIENT=0.87
CORRECTED AMPACITY =260 X 0.87 X 1 = 226.2 A > 139.5 A

PV SOURCE CIRCUIT (OPTIMIZER STRINGS)

PV MODULE Isc = 13.07 A
PV MODULE Imp= 13.83A
OF MODULES IN LARGEST OPTIMIZER STRING = 21
MAX Isc = (21 X 485 W)/400v X (1.25 X 1.25) = 39.7 A
DUAL COATED PV WIRE, 105°/90°C RATED
TEMPERATURE CORRECTION FACTOR FOR 55°C AMBIENT = 0.76
CORRECTED AMPACITY (FOR #10 AWG)= 40A X 0.76 = 30.4 A > 39.7 A

INVERTER #1 OUTPUT CIRCUIT

MAX CONTINUOUS CURRENT = 139.5 A
INVERTER OUTPUT CIRCUIT OVER CURRENT PROTECTION = 180 A OCP
80% OF OVER CURRENT PROTECTION RATING = 144 A
OUTPUT CIRCUIT CONTINUOUS CURRENT = 139.5 A < 144 A
INVERTER OUTPUT WIRING TO AC COMBINER PANEL=1 SET(s) #300 XHHW-2, 90°C RATED
TEMPERATURE CORRECTION FACTOR FOR 41°C AMBIENT=0.87
CORRECTED AMPACITY =40 X 0.76 X 30.4 = A > 139.5 A



EQUIPMENT SCHEDULE			
TAG	EQUIPMENT MANUFACTURE	EQUIPMENT DESCRIPTION	MODEL
1	ZNSHINE	545W 144 CELL SOLAR MODULE	ZXM7-SHLDD144 545
1B	QCELLS	485W 156 CELL SOLAR MODULE	QPEAK DUO XL G10.3 485
2	SOLAR EDGE	50KW 3Ø INVERTER	SE50KUS
2B			
3	SOLAR EDGE	1201W DUAL OPTIMIZER	P1201
4	EATON	200AS/275AF FUSIBLE DISCONNECT	**DG224FRB** OR EQUAL
5	EATON	200AS NF FUSIBLE DISCONNECT	**DG224URB** OR EQUAL
6			
7	EXISTING	400A SERVICE DISCONNECT	EXISTING

1 AND 3 LINE DIAGRAM
SCALE: NTS

ORIGNIAL DWG SIZE

General Notes

ELECTRICAL INFORMATION
UTILITY COMPANY: CON ED UTILITY
INTERACTIVE SYSTEM UNGROUNDED
SYSTEM SIZE: 85.545 kW DC STC
MODULES:
Q CELLS 485W QTY: 73 MODULES
ZNSHINE 545W QTY: 92 MODULES
INVERTERS:
SOLAR EDGE SE50K-US (208 VOLTS) QTY:1
MOUNTING SYSTEM: BALLASTED RACKING
ARRAY TILT: 5 DEG AZIMUTH: 189 DEG

SERVICE VOLTAGE: 208/120 VOLTS, 3Ø, 4W
MAIN SERVICE AMPERAGE: 400 A MFS

STATE OF NEW YORK
SUNIL SAIGAL
088726
LICENSED PROFESSIONAL ENGINEER

GHES GREEN HYBRID ENERGY SOLUTIONS
11 Washington Place East
White Plains, NY 10603

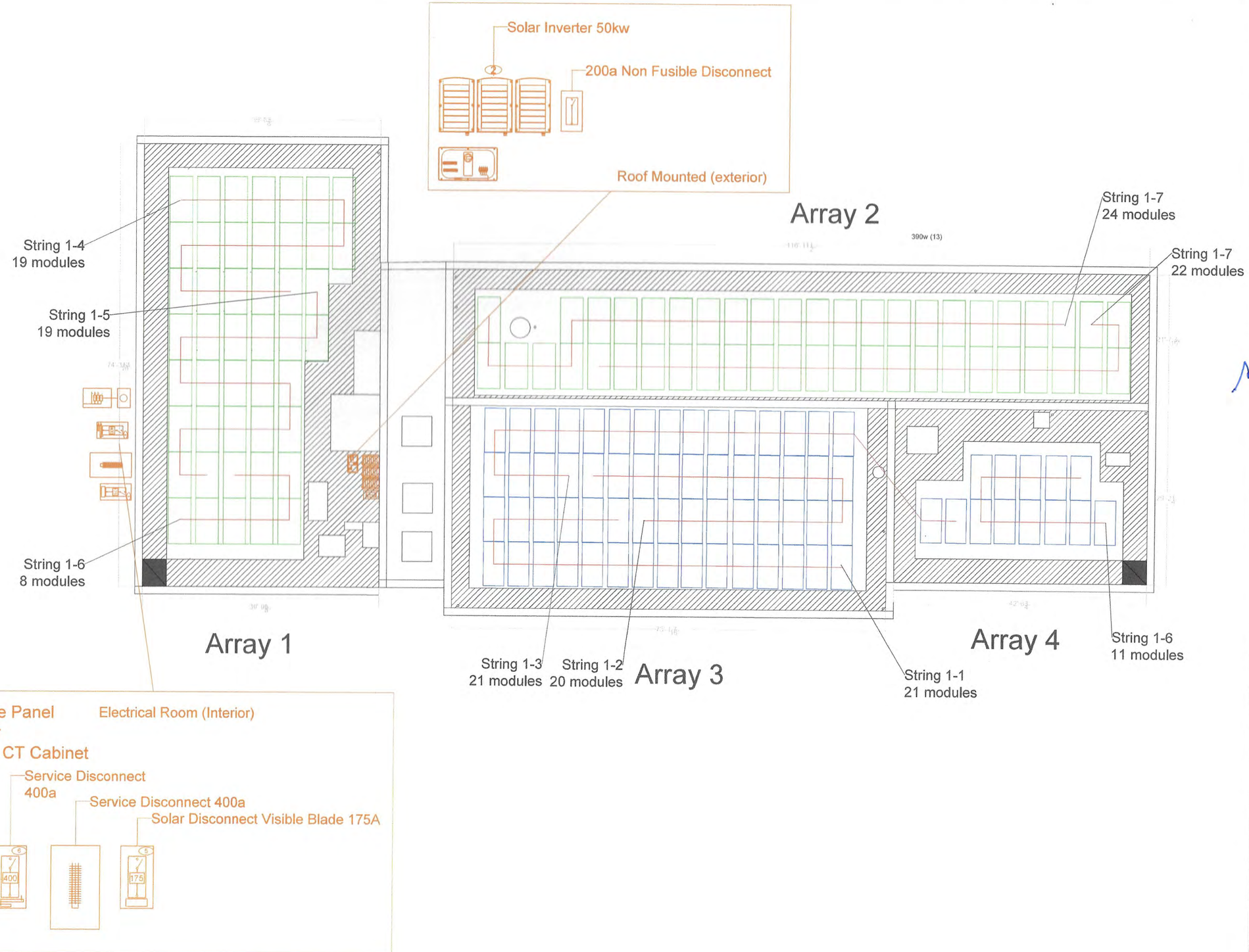
Jamie Glover
State License #
Date

No.	Revision/Issue	Date
△		

1 & 3 LINE DIAGRAM

Project Name and Location:
85.545KW DC STC 50KW AC
COMMERCIAL SOLAR FOR
Westchester Jewish Community Services
845 N Broadway
White Plains, NY 10603

Project No.	Sheet
2019-0618	PV-1.0
Date 1/6/2023	R-0
Scale AS NOTED	



Contractor:

Green Hybrid Energy Solutions

11 Washington Place East, White Plains, New York, 10603

Project:

WJCS White Plains

845 North Broadway White Plains, New York 10603

Owner/Applicant

STATE OF NEW YORK
SUNIL SAIGAL
LICENSED PROFESSIONAL ENGINEER
088728

Engineering Approval:

SECT: 122.12
BLOCK: 4
LOT: 28

D.O.B. Stamp

Sheet Title:

PV Stringing + Equipment

Solar Engineering

Sheet Size: Arch D

Drawn: GMJ | Approved: -

Date: Jan 1, 2023

Sheet Number: B 1.2

Sheet 5 OF 11

A

WARNING: PHOTOVOLTAIC POWER SOURCE

5¾" X 1⅛"

G

⚠ WARNING

ELECTRIC SHOCK HAZARD

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

PHOTOVOLTAIC MODULES PRODUCE DC VOLTAGE WHENEVER THEY ARE EXPOSED TO SUNLIGHT

4" X 3"

H

⚠ WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

4" X 2"

C

PHOTOVOLTAIC SYSTEM
⚠ DC DISCONNECT ⚠

OPERATING VOLTAGE		VDC
OPERATING CURRENT		AMPS
MAX SYSTEM VOLTAGE		VDC
SHORT CIRCUIT CURRENT		AMPS
CHARGE CONTROLLER MAX		AMPS

4" x 3"

D

⚠ WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

4" X 2"

F

⚠ WARNING

ELECTRIC SHOCK HAZARD

IF GROUND FAULT IS INDICATED ALL NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED

4" X 3"

I

PHOTOVOLTAIC SYSTEM
⚠ AC DISCONNECT ⚠

OPERATING VOLTAGE		VOLTS
OPERATING CURRENT		AMPS

4" x 2"

E

PV SOLAR BREAKER

DO NOT RELOCATE THIS OVERCURRENT DEVICE

2" X 1"

B

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

5.25" X 1.8"

J

CAUTION: AC SOLAR VOLTAGE

5¾" X 1⅛"

Contractor:

Green Hybrid Energy Solutions

11 Washington Place East, White Plains, New York, 10603

Project:

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845 North Broadway White Plains, New York 10603

Owner/Applicant

Engineer's Seal and Approvals

STATE OF NEW YORK ★ LICENSED PROFESSIONAL ENGINEER ★ SUNIL SAIGAL 088728

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Sheet Title:

PV Labels

Solar Engineering

Sheet Size: Arch D

Drawn: GMJ | Approved: -

Date: Jan 1, 2023

Sheet Number: B 1.3

Sheet 6 OF 11

Power Optimizer

For North America

S1201

25 YEAR WARRANTY

POWER OPTIMIZER

SolarEdge's most advanced, cost-effective Power Optimizer for commercial and large field installations

- **Greater Energy Yields**
  - High efficiency (99.5%) with module-level MPPT, for maximized system energy production and revenue, and fast project ROI
  - Supports high power and bifacial PV modules, and high string current for more power per string.
- **Maximum Protection with Built-In Safety**
  - Designed to automatically reduce high DC voltage to touch-safe levels, upon grid/inverter shutdown, with SafeDC™
  - Includes SolarEdge Sense Connect, allowing continuous monitoring to detect overheating due to installation issues or connector-level wear and tear
- **Lower BoS Costs**
  - Flexible system design enables maximum space utilization and up to 2x longer string lengths, 50% less cables, fuses and combiner boxes
  - Supports connection of two PV modules in series with easy cable management and fast installation times
- **Simpler O&M**
  - Module-level system monitoring enabling pinpointed fault detection and remote, time-saving troubleshooting

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Power Optimizer

For North America

S1201

	S1201	Units
INPUT		
Rated Input DC Power(1)	1200	W
Absolute Maximum Input Voltage (Voc)	125	Vdc
MPPT Operating Range	12.5 – 105	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	15	Adc
Maximum Efficiency	99.5	%
Weighted Efficiency	98.8	%
Overvoltage Category	II	
OUTPUT DURING OPERATION		
Maximum Output Current	20	Adc
Maximum Output Voltage	80	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)		
Safety Output Voltage per Power Optimizer	1	Vdc
STANDARD COMPLIANCE		
Photovoltaic Rapid Shutdown System	Compliant with NEC 2014, 2017, 2020	
EMC	FCC Part15, IEC 61000-6-2, and IEC 61000-6-3	
Safety	IEC62109-1 (class II safety), UL1741, UL3741	
Material	UL94 V-0, UV Resistant	
RoHS	Yes	
Fire Safety	VDE-AR-E 2100-712:2013-05	
INSTALLATION SPECIFICATIONS		
Maximum Allowed System Voltage	1000	Vdc
Dimensions (W x L x H)	129 x 155 x 59 / 5.08 x 6.10 x 2.32	mm / in
Weight	1106 / 2.4	gr / lb
Input Connector	MC4(2)	
Input Wire Length	1.6 / 5.25(3)	m / ft
Output Connector	MC4	
Output Wire Length	(+) 5.3 (-) 0.10 / (+) 17.38, (-) 0.32	m / ft
Operating Temperature Range(4)	-40 to +85 / -40 to +185	°C / °F
Protection Rating	IP68 / NEMA6P	
Relative Humidity	0 – 100	%

(1) Rated power of the module at STC will not exceed the power optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.
(2) For other connector types please contact SolarEdge.
(3) The Sense Connect feature is only enabled on the output cable connectors.
(4) For ambient temperatures above +65°C / +149°F power de-rating is applied.

PV System Design Using a SolarEdge Inverter(5)(6)(7)		208V Grid SE10K	208V Grid SE17.3K*	277/480V Grid SE20K, SE30K	277/480V Grid SE40K*	
Compatible Power Optimizers		S1201				
Minimum String Length	Power Optimizers	8	10	15	15	
	PV Modules	15	19	29	29	
Maximum String Length	Power Optimizers	30	30	30	30	
	PV Modules	60	60	60	60	
Maximum Continuous Power per String		8000	9800	17000	17000	W
Maximum Allowed Connected Power per String(7)		1 string – 9200	1 string – 11000	1 string – 19250	2 strings or less – 19250	W
		2 strings or more – 10600	2 strings or more – 13000	2 strings or more – 23000	3 strings or more – 23000	
Parallel Strings of Different Lengths or Orientations		Yes				
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers				

*The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter.
(5) S1201 cannot be mixed with any other Power Optimizers models in the same string.
(6) For each string, a Power Optimizer may be connected to a single PV module if 1) each Power Optimizer is connected to a single PV module or 2) it is the only Power Optimizer connected to a single PV module in the string.
(7) To connect more STC power per string, design your project using SolarEdge Designer.

CE RoHS

Contractor:

Green Hybrid Energy Solutions

11 Washington Place East, White Plains, New York, 10603

Project:

WJCS White Plains

845 North Broadway White Plains, New York 10603

Owner/Applicant

STATE OF NEW YORK SUNIL SAIGAL Engineer's Signature 088728 LICENSED PROFESSIONAL ENGINEER

SECT: 122.12
BLOCK: 4
LOT: 28

D.O.B. Stamp

Sheet Title: SolarEdge Optimizer Data Sheet

Solar Engineering

Sheet Size: Arch D

Drawn: GMJ | Approved: -

Date: Jan 1, 2023

Sheet Number: C 1.1

INVERTERS

Three Phase Inverter with Synergy Technology

SE50K / SE55K / SE82.8K

Specifically designed to work with power optimizers

- Easy two-person installation – each unit mounted separately, equipped with cables for simple connection between units
- Balance of System and labor reduction compared to using multiple smaller string inverters
- Independent operation of each unit enables higher uptime and easy serviceability
- No wasted ground area: wall/rail mounted or horizontally mounted under the modules (10˚inclination)
- Built-in module-level monitoring with Ethernet or cellular GSM
- Fixed voltage inverter for superior efficiency (98.3%) and longer strings
- Integrated Connection Unit with optional integrated DC Safety Switch – eliminates the need for external DC isolators
- Built-in RS485 Surge Protection, to better withstand lightning events
- Advanced safety features - integrated arc fault protection and optional rapid shutdown

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Three Phase Inverter with Synergy Technology

SE50K / SE55K / SE82.8K

	SE50K[1]	SE55K	SE82.8K	
OUTPUT				
Rated AC Power Output	50000[2]	55200	82800	VA
Maximum AC Power Output	50000[2]	55200	82800	VA
AC Output Voltage — Line to Line / Line to Neutral (Nominal)	380/220 ; 400/230			Vac
AC Output Voltage — Line to Line Range / Line to Neutral Range	304 - 437 / 176 - 253 ; 320 - 460 /184 - 264.5			Vac
AC Frequency	50/60 ± 5			Hz
Maximum Continuous Output Current (per Phase) @Vac,nom	76	80	120	A
Grids Supported — Three Phase	3 / N / PE (WYE with Neutral)			V
Maximum Residual Current Injection	250 per unit[3]			mA
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes			
INPUT				
Maximum DC Power (Module STC), Inverter / Unit	67500 / 33750	74520 / 37260	111750 / 37250	W
Transformer-less, Ungrounded	Yes			
Maximum Input Voltage	1000			Vdc
Nominal DC Input Voltage	750			Vdc
Maximum Input Current	2 x 37	2 x 40	3 x 40	Adc
Reverse-Polarity Protection	Yes			
Ground-Fault Isolation Detection	350kΩ Sensitivity per Unit [4]			
Maximum Inverter Efficiency	98.3			%
European Weighted Efficiency	98			%
Nighttime Power Consumption	< 12			W
ADDITIONAL FEATURES				
Supported Communication Interfaces[5]	RS485, Ethernet, GSM plug-in (optional)			
RS485 Surge Protection	Built-in			
Rapid Shutdown	Optional[6] (Automatic upon AC Grid Disconnect)			
CONNECTION UNIT				
DC Disconnect (optional)	1000V / 2 x 40A	1000V / 3 x 40A		
STANDARD COMPLIANCE				
Safety	IEC-62109, AS3100			
Grid Connection Standards[7]	VDE-AR-N-4105, G99, AS-4777,EN 50438 , CEI-021,VDE 0126-1-1, CEI-016, BDEW			
Emissions	IEC61000-6-2, IEC61000-6-3 , IEC61000-3-11, IEC61000-3-12			
RoHS	Yes			
INSTALLATION SPECIFICATIONS				
Number of Units	2	3		
AC Output Cable	Cable gland — diameter 22-32; PE gland diameter 10-16	Cable gland — diameter 30-38; PE gland diameter 10-16		mm
DC Input[8]	6 strings, 4-10mm2 DC wire, gland outer diameter 5-10mm / 3 MC4 pairs per unit	9 strings, 4-10mm2 DC wire, gland outer diameter 5-10mm / 3 MC4 pairs per unit		
AC Output Wire	Aluminum or Copper; L, N: Up to 70, PE: Up to 35	Aluminum or Copper; L, N: Up to 95, PE: Up to 50		mm^2
Dimensions (H x W x D)	Primary Unit: 940 x 315 x 260; Secondary Unit: 540 x 315 x 260			mm
Weight	Primary Unit: 48; Secondary Unit: 45			kg
Operating Temperature Range	-40 to +60[9]			˚C
Cooling	Fan (user replaceable)			
Noise	< 60			dBA
Protection Rating	IP65 — Outdoor and Indoor			
Mounting	Bracket provided			

(1) Available in some countries. Refer to: https://www.solaredge.com/sites/default/files/se_inverters_supported_countries.pdf
(2) 49990 in the UK
(3) If an external RCD is required, its trip value must be ≥ 300mA per unit (≥ 600mA for SE50K/SE55K; ≥ 900mA for SE82.8K)
(4) Where permitted by local regulations
(5) Refer to Datasheets -> Communications category on Downloads page for specifications of optional communication options: http://www.solaredge.com/groups/support/downloads
(6) Inverter with rapid shutdown part number: SExxK-RWRxxxxxx; Available for SE55K and SE82.8K
(7) For all standards refer to Certifications category on Downloads page: http://www.solaredge.com/groups/support/downloads
(8) The DC input type, MC4 or glands, and DC switch depends on the part number ordered. Inverter with glands and DC switch P/N: SExxK-xx0P0BNG4, inverter with glands and without DC switch P/N: SExxKxx 0P0BNA4, inverter with MC4 and with DC switch P/N: SExxK-xx0P0BNU4, inverter with MC4 and without DC switch P/N: SExxK-xx0P0BNY4
(9) For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note.pdf

CE RoHS

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STATE OF NEW YORK
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Sheet Title:
SolarEdge Inverter Data Sheet

Solar Engineering

Sheet Size: Arch D
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Date: Jan 1, 2023
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Sheet 8 OF 11

powered by Q.ANTUM DUO Z

Q.PEAK DUO XL-G10.3 / BFG

475-490

BIFACIAL DOUBLE GLASS MODULE
WITH EXCELLENT RELIABILITY
AND ADDITIONAL YIELD

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2021

Q CELLS Yield Security

BIFACIAL ENERGY YIELD GAIN OF UP TO 20 %
Bifacial Q.ANTUM solar cells with zero gap cell layout make efficient use of light shining on the module rear-side for radically improved LCOE.

LOW ELECTRICITY GENERATION COSTS
Q.ANTUM DUO Z combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology for higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 21.4 %.

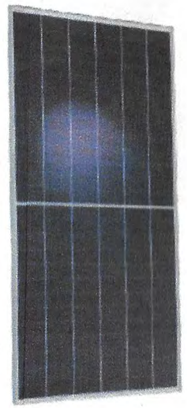
INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behavior.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID and Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

FRAME FOR VERSATILE MOUNTING OPTIONS
High-tech aluminum alloy frame protects from damage, enables use of a wide range of mounting structures and is certified regarding IEC for high snow (5400 Pa) and wind loads (2400 Pa).

A RELIABLE INVESTMENT
Double glass module design enables extended lifetime with 12-year product warranty and improved 30-year performance warranty[2].

[1] APT test conditions according to IEC/TS 62804-1:2015 method B (-1500V, 168 h) including post treatment according to IEC 61215-1-1 Ed. 2.0 (CD)
[2] See data sheet on rear for further information.



THE IDEAL SOLUTION FOR:

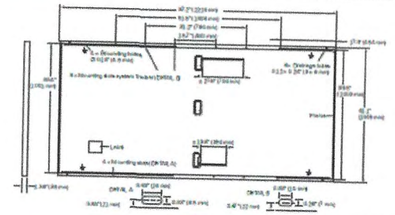
Ground-mounted solar power plants

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	87.2 in × 41.1 in × 1.38 in (including frame) (2216 mm × 1045 mm × 35 mm)
Weight	64.2 lbs (29.1 kg)
Front Cover	0.08 in (2.0 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	0.08 in (2.0 mm) semi-tempered glass
Frame	Anodized aluminum
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 27.6 in (700 mm), (-) ≥ 13.8 in (350 mm)
Connector	Stäubli MC4, Stäubli MC4-Evo2, Hanwha Q CELLS HQC4, IP68



ELECTRICAL CHARACTERISTICS

POWER CLASS			475		480		485		490	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] AND BSTC[2] (POWER TOLERANCE +5 W / −0 W)				BSTC[2]		BSTC[2]		BSTC[2]		BSTC[2]
Minimum — Power at MPP[3]	P_{MPP}	[W]	475	519.6	480	525.0	485	530.5	490	536.0
Minimum — Short Circuit Current[3]	I_{SC}	[A]	11.08	12.12	11.12	12.17	11.16	12.21	11.20	12.26
Minimum — Open Circuit Voltage[3]	V_{OC}	[V]	53.15	53.34	53.39	53.58	53.63	53.82	53.86	54.06
Minimum — Current at MPP	I_{MPP}	[A]	10.56	11.54	10.59	11.58	10.63	11.63	10.67	11.67
Minimum — Voltage at MPP	V_{MPP}	[V]	45.03	45.02	45.33	45.32	45.63	45.62	45.93	45.92
Minimum — Efficiency[3]	η	[%]	≥ 20.5	≥ 22.4	≥ 20.7	≥ 22.7	≥ 20.9	≥ 22.9	≥ 21.2	≥ 23.1

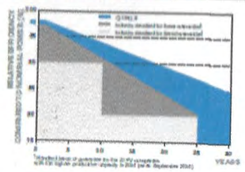
Bifaciality of P_{MPP} and I_{SC}: 70 % ± 5 % • Bifaciality given for rear side irradiation on top of STC (front side) • According to IEC 60904-1-2

[1] Measurement tolerances P_{MPP} ± 3 %; I_{SC}; V_{OC} ± 5 % at STC: 1000 W/m²; [2] at BSTC: 1000 W/m² + φ × 135 W/m², φ = 70 % ± 5 %, 25 ± 2 °C; AM 1.5 according to IEC 60904-3

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[1]								
Minimum — Power at MPP	P_{MPP}	[W]	357.6	361.4	365.1	368.9		
Minimum — Short Circuit Current	I_{SC}	[A]	8.92	8.96	8.99	9.02		
Minimum — Open Circuit Voltage	V_{OC}	[V]	50.27	50.49	50.72	50.95		
Minimum — Current at MPP	I_{MPP}	[A]	8.30	8.34	8.37	8.40		
Minimum — Voltage at MPP	V_{MPP}	[V]	43.06	43.35	43.63	43.92		

[1] 800 W/m², NMOT, spectrum AM 1.5

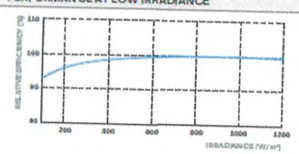
Q CELLS PERFORMANCE WARRANTY



At least 98 % of nominal power during first year. Thereafter max. 0.45 % degradation per year. At least 93.55 % of nominal power up to 10 years. At least 84.95 % of nominal power up to 30 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²)

TEMPERATURE COEFFICIENTS								
Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27	
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°F]	108 ± 5.4 (42 ± 3 °C)	

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 29[4]
Max. Design Load, Push / Pull[3]	[lbs/ft²]	75 (3800 Pa) / 33 (1600 Pa)	Permitted Module Temperature on Continuous Duty	−40 °F up to +185 °F (−40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]	[lbs/ft²]	113 (5400 Pa) / 50 (2400 Pa)		

[3] See Installation Manual

[4] New Type is similar to Type 3 but with metallic frame

QUALIFICATIONS AND CERTIFICATES

UL 61730, CE-compliant, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells). Certification in process

PACKAGING INFORMATION

Horizontal packaging	89.4 in 2270 mm	43.1 in 1095 mm	47.6 in 1210 mm	1975 lbs 896 kg	20 pallets	20 pallets	29 modules	

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS America Inc.
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | **TEL** +1 949 748 59 96 | **EMAIL** inquiry@us.q-cells.com | **WEB** www.q-cells.us

Contractor:
Green Hybrid Energy Solutions
11 Washington Place East, White Plains, New York, 10603

Project:
WJCS White Plains
845 North Broadway White Plains, New York 10603

Owner/Applicant

STATE OF NEW YORK · SUNIL SAIGAL · 088728 · LICENSED PROFESSIONAL ENGINEER

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Module Data Sheet

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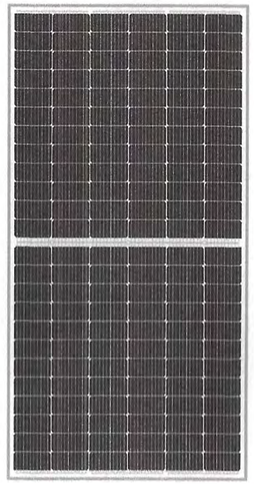
ZXM7-SPDB144 Series

Znshinesolar 10BB HALF-CELL Bifacial
Monocrystalline PERC PV Module

ZNSHINESOLAR

520W | 525W | 530W | 535W | 540W | 545W



Excellent cells efficiency

MBB technology decreases the distance between bus bars and finger grid line which is benefit to power increase.

Better Weak Illumination Response

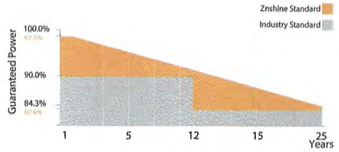
More power output in weak light condition, such as haze, cloudy, and morning

Anti PID

Limited power degradation caused by PID effect is guaranteed under strict testing condition for mass production

High wind and snow resistance

■ 5400 Pa snow load ■ 2400 Pa wind load



25 years power warranty

After 25years our solar panel keeps at least 80% of its initial power output

12 years product warranty
25 years output warranty

0.55% Annual Degradation over 25 years

Higher lifetime Power Yield

2.5% first year degradation,0.55% linear degradation

Founded in 1988, ZNShine solar is a world's leading high-tech PV module manufacturer. With the state-of-the-art production lines, the company boasts module capacity of 6GW. Bloomberg has listed ZNShine as a global Tier 1 PV module maker. Today Znshine has distributed its sales to more than 60 countries around the globe.

www.znshinesolar.com

ZXM7-SPDB144 Series | Znshinesolar 10BB HALF-CELL Bifacial Monocrystalline PERC PV Module

ZNSHINESOLAR

ELECTRICAL CHARACTERISTICS | STC*

Nominal Power Watt Pmax(W)*	520	525	530	535	540	545
Power Output Tolerance Pmax(%)	0~+3	0~+3	0~+3	0~+3	0~+3	0~+3
Maximum Power Voltage Vmp(V)	40.70	40.90	41.10	41.30	41.50	41.70
Maximum Power Current Imp(A)	12.79	12.85	12.91	12.96	13.02	13.07
Open Circuit Voltage Voc(V)	49.00	49.20	49.40	49.60	49.80	50.00
Short Circuit Current Isc(A)	13.53	13.59	13.65	13.71	13.77	13.83
Module Efficiency (%)	20.34	20.54	20.74	20.93	21.13	21.32

*STC (Standard Test Condition): Irradiance 1000W/m², Module Temperature 25℃, AM 1.5
*Measuring tolerance: ±3%

ELECTRICAL CHARACTERISTICS | NMOT*

Maximum Power Pmax(Wp)	388.80	392.70	396.40	399.90	403.60	406.80
Maximum Power Voltage Vmpp(V)	37.90	38.00	38.20	38.40	38.50	38.80
Maximum Power Current Impp(A)	10.26	10.33	10.38	10.42	10.47	10.49
Open Circuit Voltage Voc(V)	45.80	46.00	46.20	46.30	46.50	46.70
Short Circuit Current Isc(A)	10.93	10.98	11.02	11.07	11.12	11.17

*NMOT(Nominal module operating temperature):irradiance 800W/m²,Ambient Temperature 20℃,AM 1.5,Wind Speed 1m/s

ELECTRICAL CHARACTERISTICS WITH 25% REAR SIDE POWER GAIN

Front power Pmax/W	520	525	530	535	540	545
Total power Pmax/W	650	656	663	669	675	681
Vmp/V(Total)	40.80	41.00	41.20	41.40	41.60	41.80
Imp/A(Total)	15.93	16.01	16.08	16.15	16.23	16.30
Voc/V(Total)	49.10	49.30	49.50	49.70	49.90	50.10
Isc/A(Total)	16.87	16.95	17.02	17.10	17.17	17.25

MECHANICAL DATA

Solar cells	Mono PERC
Cells orientation	144 (6×24)
Module dimension	2256×1133×40 mm(With Frame)
Weight	28.5 kg
Glass	3.2mm, High Transmission, AR Coated Tempered Glass
Junction box	IP 68, 3 diodes
Cables	4 mm² ,350 mm
Connectors	MC4-compatible

TEMPERATURE RATINGS

NMOT	44℃ ±2℃
Temperature coefficient of Pmax	-0.35%/℃
Temperature coefficient of Voc	-0.29%/℃
Temperature coefficient of Isc	0.05%/℃
Refer.Bifacial Factor	70±5%

WORKING CONDITIONS

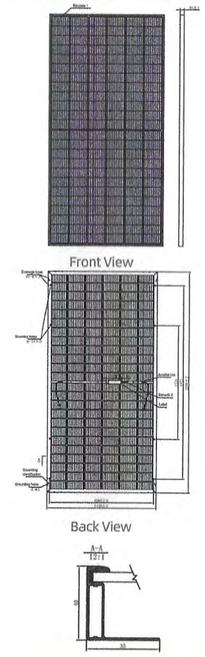
Maximum system voltage	1500 V DC
Operating temperature	-40℃~+85℃
Maximum series fuse	30 A
Maximum load(snow/wind)	5400 Pa / 2400 Pa

*Do not connect Fuse in Combiner Box with two or more strings in parallel connection
*Remark:Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

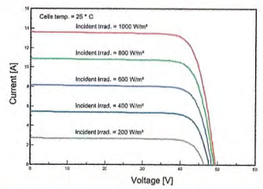
PACKAGING CONFIGURATION

Piece/Box	27
Piece/Container(40'HQ)	540
Piece/Container(with additional small package)	/

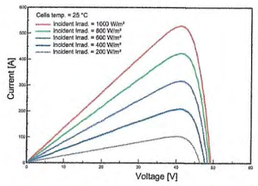
DIMENSIONS(MM)



I-V CURVES OF PV MODULE(530W)



P-V CURVES OF PV MODULE(530W)



Add : 1#, Zhixi Industrial Zone, Jintanjiangsu 213251, P.R. China Tel: +86 519 6822 0233 E-mail: info@znshinesolar.com

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Project:
WJCS White Plains
845 North Broadway White Plains, New York 10603

Owner/Applicant

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RM5

TOOLS & SPECIFICATIONS | 1 PAGE

TECHNICAL DATA SHEET

TECHNICAL SPECIFICATIONS:

Material Types: 16G ASTM A653 GR50 Steel
G235 Galvanization

Hardware: Stainless Steel

Bonding and Grounding: UL2703 Listed Continuous Bonding Path.

TOOLS REQUIRED OR RECOMMENDED FOR LAYOUT, ATTACHMENTS & INSTALLATION:

- Drill **(Do Not Use An Impact Driver)**
- 7/16" Socket
- Torque Wrench
- Tape Measure
- Chalk Reel
- Optional Spacers (See Diagram - Page Right)

GENERAL HARDWARE:

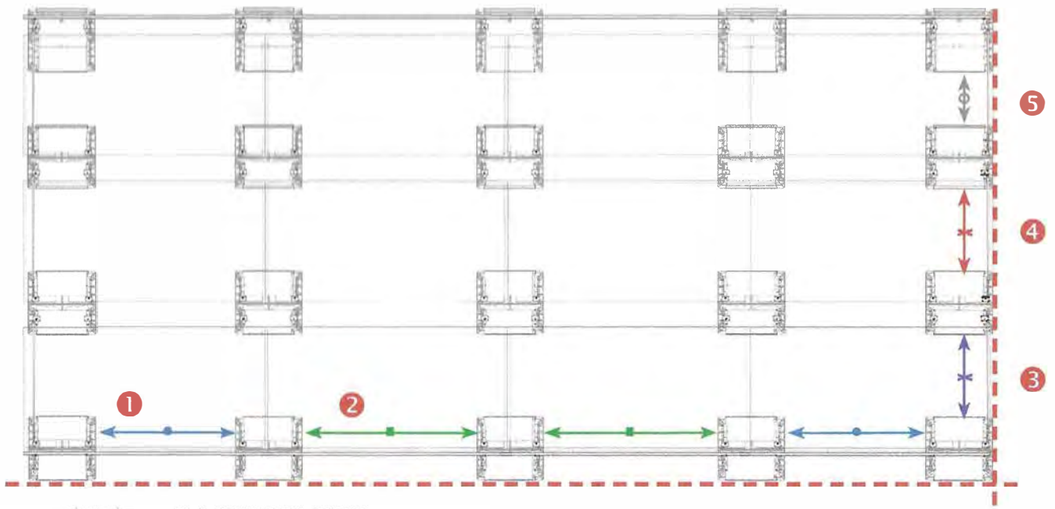
- ¼-20 X 2 ½" Hex Head Bolt - Module Clamps
- ¼-20 X 1" Hex Head Bolt - Wind Deflectors
- ¼-20 Stainless Steel U-Nuts
- ¼" Flat Washer 1 ½" O.D.

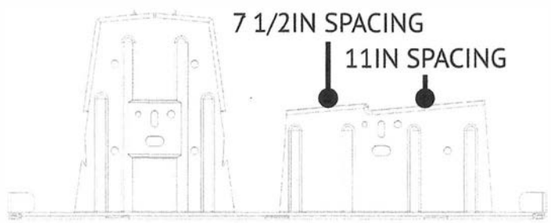
SAFETY:

All applicable OSHA safety guidelines should be observed when working on a PV installation job site. The installation and handling of PV solar modules, electrical installation and PV racking systems involves handling components with potentially sharp metal edges. Rules regarding the use of gloves and other personal protective equipment should be observed.

LAYOUT ASSISTANCE TOOL:

Module Dimensions:		RM5	Module location:	Spacing Equations (in Inches):	
				For 7.5" inter-row option:	For 11" inter-row option:
Module Length (ML) =		1	Perimeter Column Spacing =	ML+(G/2)-32.04"	
Module Width (MW) =		2	Interior Column Spacing =	ML+G-21.36"	
Prefered module gap? (1/4" - 1" is permissible)		3	South Row Spacing =	(MW x 0.996) - 12.79"	(MW x 0.996) - 12.79"
		4	Row Spacing =	(MW x 0.996) - 12.79"	(MW x 0.996) - 9.25"
East/West Module Gap (G) =		5	North Row Spacing =	(MW x 0.996) - 21.97"	(MW x 0.996) - 18.46"





MODULE ROW SPACING OPTIONS

SPACERS - OPTIONAL

PERIMETER COLUMN SPACER
COLUMN SPACER
SOUTH ROW SPACER
ROW SPACER
NORTH ROW SPACER

GREEN HYBRID ENERGY SOLUTIONS

Contractor:

Green Hybrid Energy Solutions

11 Washington Place East, White Plains, New York, 10603

Project:

845 North Broadway White Plains, New York 10603

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