May 6, 2021

Town of North Castle
17 Bedford Road
Armonk, NY 10504

Re: 121 Lafayette Avenue, White Plains, NY 10603-1602

To Whom It May Concern,

This is to authorize Janet E. Glover to act on my behalf with respect to filling of an application for a Planning Board, ARB, permit approval for a solar system on the roof of 121 Lafayette Avenue, White Plains, NY 10603.

Very truly yours,

Michael D Bellantoni

GHES GREEN HYBRID ENERGY SOLUTIONS

Inexhaustible Energy Solutions for the 21st Century

May 7, 2021

Town of North Castle
Planning Board
17 Bedford Road
Armonk, NY 10504Redding, CT 06875

Re: Michael Bellantoni, Inc.
121 Lafayette Avenue
White Plains, NY 10603-1602

To Whom It May Concern,

Per the attached plans, a 32.68 Kw DC (28.8 Kw AC) is proposed to be installed on the roof of an office building located at the above captioned address. The system will consist of 50 Hanwha Q-Peak 430W solar panels on the flat roof and a solar awning on the south side of the building consisting of 26 Hanwha Q-Peak 430W solar panels with 2 Solar Edge 14.4Kw AC inverters. The building has a flat roof and the 50 solar panels will not be visible from the street.

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

## I. IDENTIFICATION OF PROPERTY OWNER, APPLICANT AND PROFESSIONAL REPRESENTATIVES

Name of Property Owner: Michael Bellantoni, Inc.

Mailing Address: 124 Lafayette Ave White Plains, NY 10603-160

Telephone: 914-948-6468 Fax: _____ e-mail michael.b@mbplanta

Name of Applicant (if different): Janet E. Glover

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

Telephone: 9142999552 Fax: 914-761-4674 e-mail eglover@ghessolar.c

Interest of Applicant, if other than Property Owner:
Representative of Property Owner

ls 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, PE

Address: 1266 Rahway Avenue, Westfield, NJ 07090

Telephone: 646-632-7738 Fax: _____ e-mail enthusllc@gmail.c

Name of Other Professional: Green Hybrid Energy Solutions, Inc.

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

Telephone: 914-299-9552 Fax: 914-761-4674 e-mail eglover@ghessolar.com

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 Flower Date: 5/6/21

Signature of Property Owner: Michael Bellantoni Date: 5/6/21

MUST HAVE BOTH SIGNATURES

## II. IDENTIFICATION OF SUBJECT PROPERTY

Street Address: 121 Lafayette Ave, White Plains NY 10603-1602

Location (in relation to nearest intersecting street):

_____ feet (north, south, east or west) of _____

Abutting Street(s): _____

Tax Map Designation (NEW): Section 122.12 Block 1 Lot 39

Tax Map Designation (OLD): Section _____ Block _____ Lot _____

Zoning District: _____ Total Land Area _____

Land Area in North Castle Only (if different) _____

Fire District(s) _____ School District(s) _____

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 ✓ 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 ✓ 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 ✓ 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 ✓ 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 ✓ Yes (adjacent) _____ Yes (within 500 feet) _____

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

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

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

SBL 122.12 - 1 - 2

## III. DESCRIPTION OF PROPOSED DEVELOPMENT

Proposed Use: No Change

Gross Floor Area: Existing _____ S.F. Proposed _____ 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 _____ C.Y. Fill _____ C.Y.

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

Areas of special flood hazard? No ✓ 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 ✓ 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 ✓ 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 ✓ 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**

Michael Bellantoni, Inc.

Name of Action or Project:
121 Lafayette Avenue, White Plains, NY 10603-1602

Project Location (describe, and attach a location map):
Section 122.12 Block 1 Lot 39

Brief Description of Proposed Action:
Installation of a 32.68 Kw DC (28.8 kw AC) solar photovoltaic system on the roof of 121 Lafayette Avenue, White Plains, NY 10603. The system will consist of 76 430W solar panels and 2 14.4 Kw inverters on a racking system

| Name of Applicant or Sponsor: | Telephone: 914-948-6468 |
|---|---|
| Michael Bellantoni, Inc | E-Mail: michael.b@mblandscape.com |

Address:
121 Lafayette Avenue

| City/PO: | State: | Zip Code: |
|---|---|---|
| White Plains | NY | 10603-1602 |

| | 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 government Agency? If Yes, list agency(s) name and permit or approval: Town of North Castle | ☐ | ☑ |

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

4. Check all land uses that occur on, are adjoining or 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? | ☐ | ☑ |

| | NO | YES |
|---|---|---|
| 7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? | | |
| If Yes, identify: _____ | ☑ | ☐ |

| | NO | YES |
|---|---|---|
| 8. a. Will the proposed action result in a substantial increase in traffic above present levels? | ☑ | ☐ |
| b. Are public transportation services available at or near the site of the proposed action? | ☐ | ☑ |
| c. Are any pedestrian accommodations or bicycle routes available on or near the site of the proposed action? | ☐ | ☑ |

| | NO | YES |
|---|---|---|
| 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: _____ _____ | ☑ | ☐ |

| | NO | YES |
|---|---|---|
| 10. Will the proposed action connect to an existing public/private water supply? | | |
| If No, describe method for providing potable water: _____ _____ | ☑ | ☐ |

| | NO | YES |
|---|---|---|
| 11. Will the proposed action connect to existing wastewater utilities? | | |
| If No, describe method for providing wastewater treatment: _____ _____ | ☑ | ☐ |

| | NO | YES |
|---|---|---|
| 12. a. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places? | ☑ | ☐ |
| b. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory? | ☑ | ☐ |

| | NO | YES |
|---|---|---|
| 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 plan? | ☑ | ☐ |
| 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? | ☐ | ☐ |
| b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? | ☐ | ☐ |
| If Yes, briefly describe: | | |
| 18. Does the proposed action include construction or other activities that would result in the impoundment of water or other liquids (e.g., retention pond, waste lagoon, dam)? | ☑ | ☐ |
| If Yes, explain the purpose and size of the impoundment: | | |
| 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: | | |
| 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: | | |

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

Applicant/sponsor name: Michael Bellantoni, Inc. Date: 5/6/21

Signature: Michael Bellantoni Title: Gen

PRINT FORM

1266 Rahway Avenue, Westfield, NJ 07090

Enthink Engineering LLC

enthinkllc@gmail.com (646) 632-7738

May 7, 2021

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

Re: Michael Bellantoni, Inc.
121 Lafayette Avenue
White Plains, NY 10603

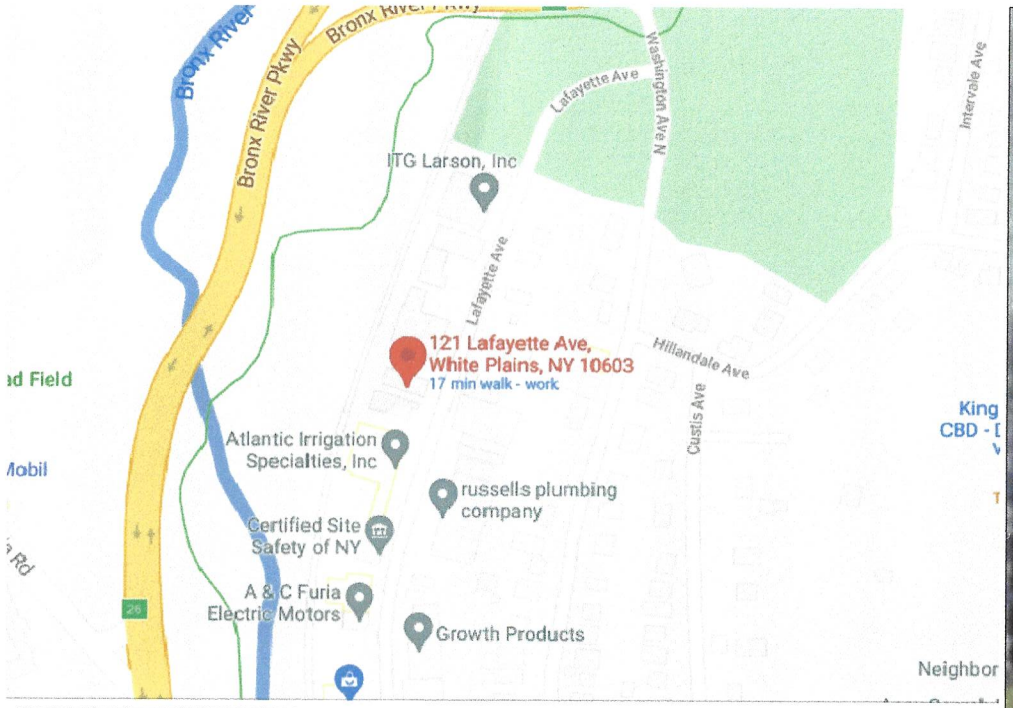
To Whom It May Concern,

The existing roof structure of the above captioned property is made of EPDM membrane roof, asphalt, insulation board, q-decking, 24" steel i-beam w/truss spaced 10" oc. will support the additional load of the solar panels of 4.59 PSF under the required loads of 125 MPH wind speed, and 30 PSF ground snow load without additional structural supports.

I have determined that the installation will meet the requirements of the 2020 IECC, 2020 NYS Uniform Code Supplement, NYS Energy Construction Code 2020, NEC 2018, IBC 2018 and 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)
-197 Degree Orientation
-5 Degree tilt
-Unirac RM5
-38 Modules

(Array 2)
-197 Degree Orientation
-5 Degree tilt
-Unirac RM5
-12 Modules

(Array 3)
-197 Degree Orientation
-30 Degree tilt
-Sunmodo Awning
-26 Modules


## Project Data

| | |
|---|---|
| Applicable Codes: | IECC - 2020<br>Uniform Code Supplement - 2020<br>NYS Energy Construction Code - 2020<br>NEC - 2018<br>IBC - 2018 |
| Building Use: | Commercial Offices (brick and steel construction) |
| Module: | Hanwha Q-Cell Q.Peak Duo L-G8 430w module (76) |
| Racking: | Unirac RM5 Ballasted / Sunmodo Awning |
| Inverter(s): | SolarEdge 14.4kw Inverter (2) |
| Optimizers: | SolarEdge p850w Optimizer (38) |
| System Rating: | 32.68 kw DC - STC |

## Building Information

| | |
|---|---|
| Use Group: | B-1 |
| Construction Class: | II-B |
| Roof Height: | 25' |
| Number of Stories: | 2 |
| Roof Area: | 3,215 sqf |

## Roof Loads

| | |
|---|---|
| Ground Snow Load (psf) | 30 |
| Wind Load (mph) | 125 |
| Solar Array (psf) | 4.59 psf |

| Item Description | Proposed Design Value | Prescriptive Value/Citation | Supporting Documentation |
|---|---|---|---|
| Installation 50 430w modules mounted on Unirac RM5 ballasted trays and 26 modules to be mounted on south face of bldg as an awning installation. Supporting equipment to be mounted on northeast exterior or wall of building. | Maintain existing roof integrity with integration of 32.68kw photovoltaic installation and supporting equipment coinciding with all national and local regulatory requirements set forth by the concerned AHJ. | -Unirac RM5 ballasted trays<br>-EPDM slipsheet<br>-32lb concrete block ballast<br>-Windscreen on leading edge of array<br>-Solar awning on south face of bldg | 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.

## Michael Bellantoni, Inc.

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.

-EPDM membrane roof, insulation board, q-decking, 24" steel i-beam w/ truss spaced 10' oc

-Unirac RM5 Ballasted trays w/ EPDM slipsheets

-Sunmodo solar awning with lag bolts into brick exterior

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.

GHES GREEN HYBRID ENERGY SOLUTIONS

Contractor:

Green Hybrid Energy Solutions

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

Project:

121 Lafayette Avenue, White Plains, New York 10603

Owner/Applicant

Engineering Approval:

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

Section: 122.12
Block: 1
Lot: 39

D.O.B. Stamp

Sheet Title:

Installation Overview

Solar Engineering

Sheet Size: Arch D

Drawn: GMJ | Approved: -

Date: Apr 10, 2021

Sheet Number: A 1.1

Sheet 1 of 12

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

- 14.4kW SolarEdge Inverter (northeast exterior of bldg)
- 14.4kW SolarEdge Inverter (northeast exterior of bldg)
- Combiner Panel (northeast exterior of bldg)
- Solar Production Meter (northeast exterior of bldg)
- 100a AC Disconnect Non-Fusible (northeast exterior of bldg)
- 200a Main Panel (northeast interior of bldg)
- Existing Utility Meter (northeast exterior of bldg)

6' x 6'
ladder access from parking lot

Array 1

Array 2

94'-7 5/16"

34'-5 1/16"

34'-8 1/16"

66'-5 7/8"

28'-1 7/16"

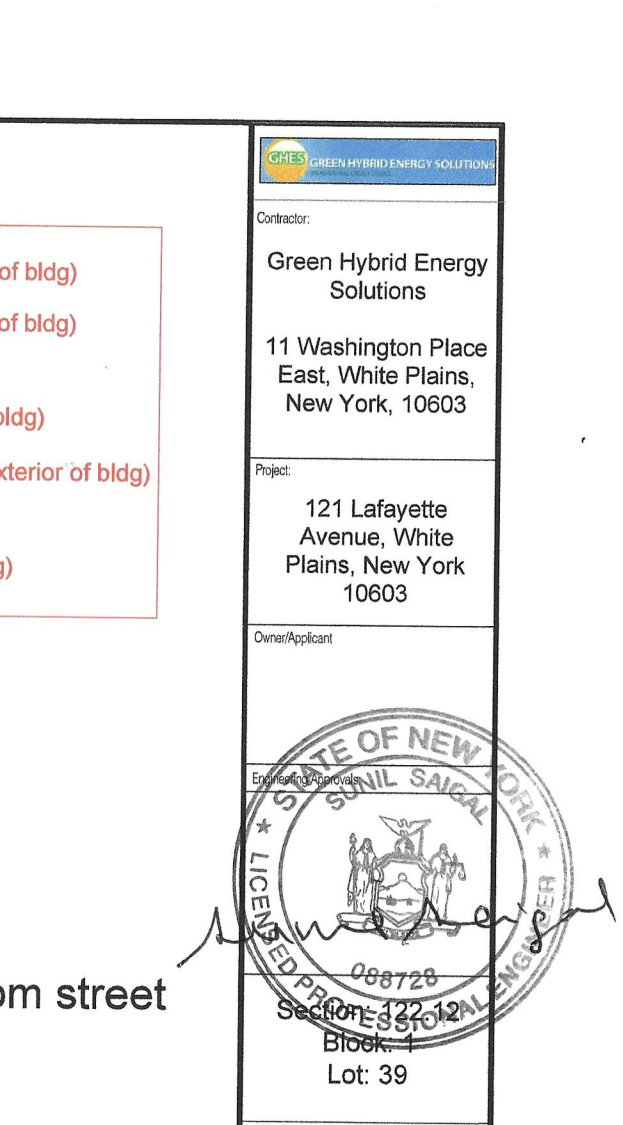
89'-6 7/8"

Array 3

6' x 6'
ladder access from street

Awning at final installation to be less than 36" from face of building

6' x 6'
ladder access from driveway



Contractor:

Green Hybrid Energy Solutions

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

Project:

121 Lafayette Avenue, White Plains, New York 10603

Owner/Applicant

Engineering/Approvals




Section: 122.12
Block: 1
Lot: 39

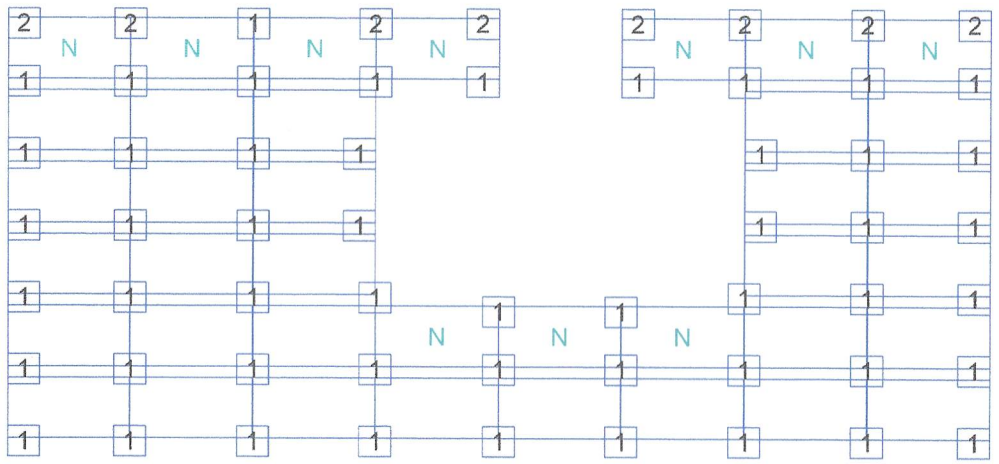
D.O.B. Stamp

Sheet Title:

Site Plan

Solar Engineering

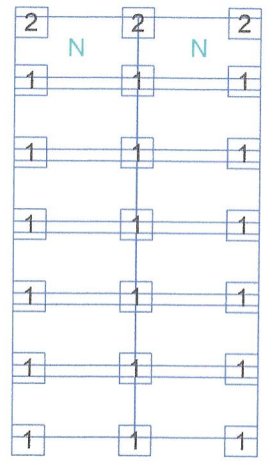
| | |
|---|---|
| Sheet Size: | Arch D |
| Drawn: GMJ | Approved: - |
| Date: | Apr 10, 2021 |
| Sheet Number: | A 1.2 |
| Sheet | 2 OF 12 |



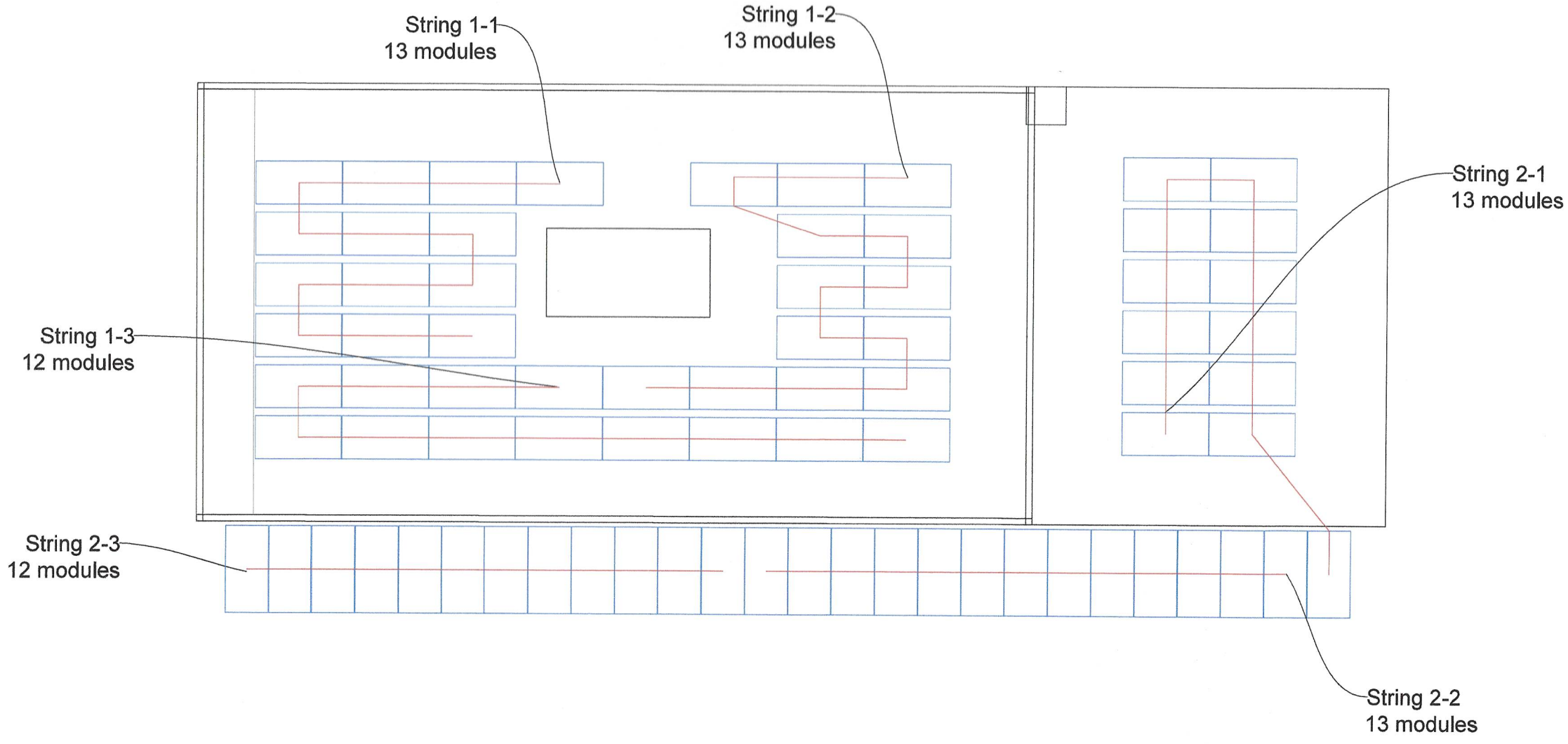
| ENGINEERING REPORT | |
|---|---|
| Plan review | |
| AVERAGE PSF | 4.46 psf |
| TOTAL NUMBER OF MODULES | 38 |
| TOTAL KW | 16.34 KW |
| TOTAL AREA | ~1072 ft² |
| TOTAL WEIGHT ON ROOF | 4774 lbs |
| RACKING WEIGHT | 536 lbs |
| MODULE WEIGHT | 2094 lbs |
| BALLAST WEIGHT | 2144 lbs |
| MAX BAY LOAD (DEAD) | 105 lbs |

Array 1

| ENGINEERING REPORT | |
|---|---|
| Plan review | |
| AVERAGE PSF | 4.84 psf |
| TOTAL NUMBER OF MODULES | 12 |
| TOTAL KW | 5.16 KW |
| TOTAL AREA | ~333 ft² |
| TOTAL WEIGHT ON ROOF | 1612 lbs |
| RACKING WEIGHT | 182 lbs |
| MODULE WEIGHT | 661 lbs |
| BALLAST WEIGHT | 768 lbs |
| MAX BAY LOAD (DEAD) | 105 lbs |



Array 2




Contractor:

Green Hybrid Energy Solutions

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

Project:

121 Lafayette Avenue, White Plains, New York 10603

Owner/Applicant

Engineering Approvals:

STATE OF NEW YORK
SUNIL SAIGAL
088728
LICENSED PROFESSIONAL ENGINEER

Section: 122.12
Block: 1
Lot: 39

D.O.B. Stamp

Sheet Title:

**Stringing + Ballast**

Solar Engineering

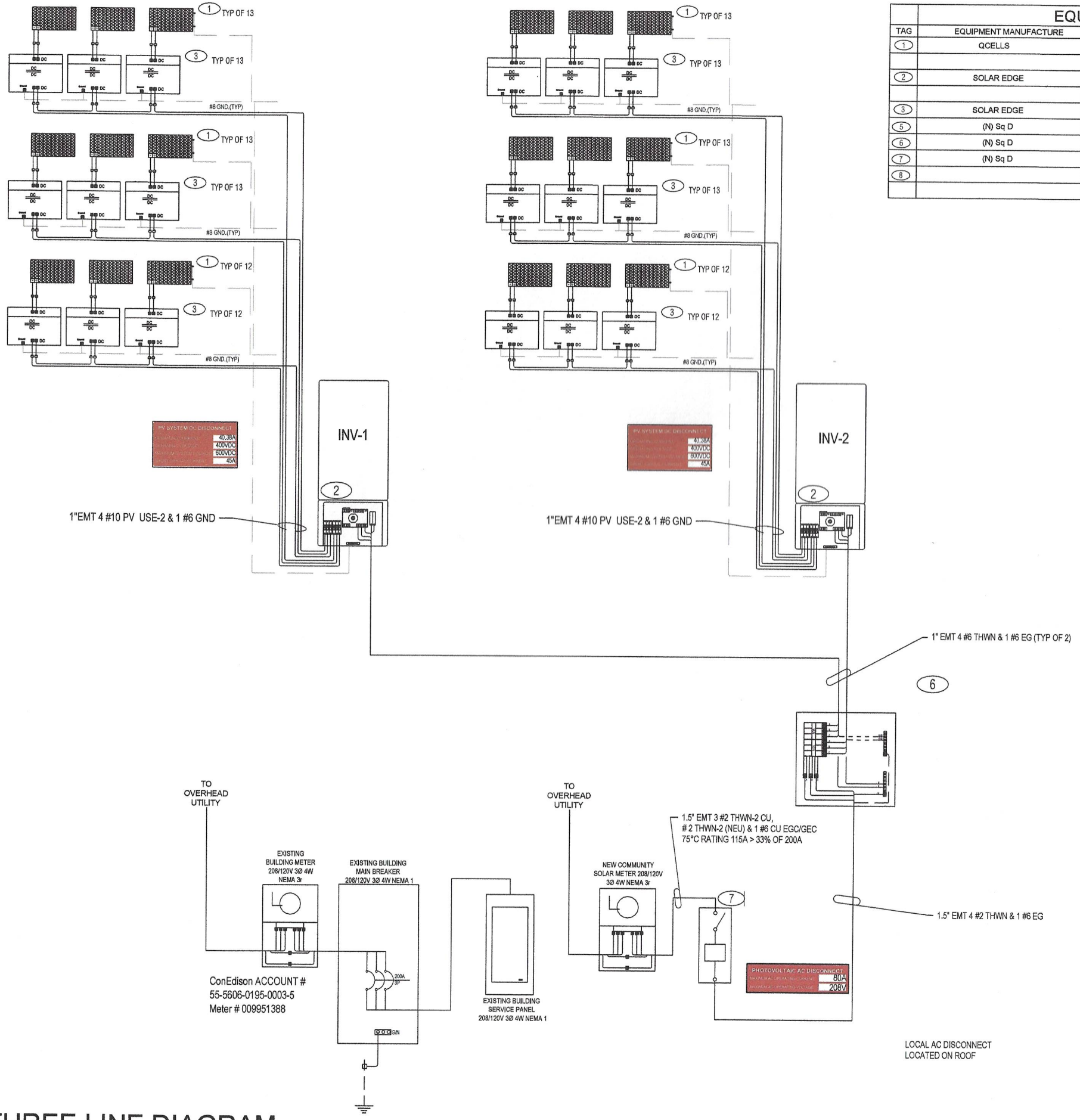
Sheet Size: Arch D

Drawn: GMJ | Approved: -

Date: Apr 10, 2021

Sheet Number: A 1.3

Sheet 3 OF 12




## EQUIPMENT SCHEDULE

| TAG | EQUIPMENT MANUFACTURE | EQUIPMENT DESCRIPTION | MODEL |
|---|---|---|---|
| 1 | QCELLS | 430W 72 CELL SOLAR MODULE | Q.PEAK DUO L-G8. 2 430 |
| | | | |
| 2 | SOLAR EDGE | 14.4KW INVERTER AFCI w/DISCO | SE14.4K-US |
| | | | |
| 3 | SOLAR EDGE | 485W OPTIMIZER | P485 |
| 5 | (N) Sq D | 400AS/300AF FUSIBLE DISCO 89L | H3635RB OR EQUAL |
| 6 | (N) Sq D | 125A AC COMBINER | 208/120V 3Ø 4W 125A 12 CIR LOAD CENTER |
| 7 | (N) Sq D | 100A NON-FUSIBLE DISCONNECT | H363URB OR EQUAL |
| 8 | | | |
| | | | |

**General Notes**

ELECTRICAL INFORMATION
UTILITY COMPANY: CONEDISON
UTILITY INTERACTIVE SYSTEM
UNGROUNDED
SYSTEM SIZE: 32.68 kW DC
MODULES:
QCELLS 430W QTY: 76 MODULES

INVERTERS:
SOLAR EDGE SE14.4K-US (208 VOLTS) QTY:2

MOUNTING SYSTEM: BALLASTED RACKING
ARRAY TILT: 5 DEG AZIMUTH: 200 DEG

SERVICE VOLTAGE: 208/120 VOLTS, 3Ø, 4W
MAIN SERVICE AMPERAGE: 200 AMP

STATE OF NEW YORK
JAMIE SAMUEL GLOVER
LICENSED PROFESSIONAL ENGINEER
088728
Exclusive Plan and Stamp

GHES GREEN HYBRID ENERGY SOLUTIONS
156 Woodbrook Road
White Plains, NY 10605

Jamie Glover
State License #

Date

| No. | Revision/Issue | Date |
|---|---|---|
| △ | | |

THREE LINE DIAGRAM

Project Name and Location:
32.68 KW DC STC 28.8 KW AC
COMMERCIAL SOLAR FOR
Michael Bellantoni, Inc.
121 Lafayette Ave
White Plains, NY

| Project No. | Sheet |
|---|---|
| 2021-0425-2 | PV-1.0 |
| Date 5/11/2021 | R-0 |
| Scale AS NOTED | |

1 THREE LINE DIAGRAM
SCALE: NTS

ORIGNIAL DWG SIZE
0 1" 2"

## Module Specifications

| | | | | | |
|---|---|---|---|---|---|
| Module Manufacturer: | QCELLS | STC Watts | 430 | VOC Temp Coefficient | -0.270% / C |
| Module Model: | Q.PEAK DUO L-G8.2 430 | | | | |
| Mounting Type | Roof | VOC | 49.33 vdc | Coldest Day VOC | 56.12 vdc |
| Correction Factor | Mfg Listed | VMP | 37.6 vdc | Warmest Day VMP | 32.73 vdc |
| Temperature Scale | Celsius | Imp | 10.83 A | OPTIMIZER NORMAL VOLTAGE | 400 vdc |
| Local Temperature Range | -26 THRU 38 | Isc | 10.31 A | | |

| String | P485 OPT/ STRING | Current Per String | VMAX | Wire Size | Ohms/M' | Wire Length One Way | Total Ohms | E=IxR VD | %VD |
|---|---|---|---|---|---|---|---|---|---|
| String 1-1 | 13 | 13.98 | 400 | **#10** | 1.24 | 150 | 0.372 | 5.199 | 1.300% |
| String 1-2 | 13 | 13.98 | 400 | **#10** | 1.24 | 120 | 0.2976 | 4.159 | 1.040% |
| String 1-3 | 12 | 12.90 | 400 | **#10** | 1.24 | 120 | 0.2976 | 3.839 | 0.960% |
| | 38 | 40.85 | | | | | | | |
| | | | | | | | | | |
| String 2-1 | 13 | 13.98 | 400 | **#10** | 1.24 | 120 | 0.2976 | 4.159 | 1.040% |
| String 2-2 | 13 | 13.98 | 400 | **#10** | 1.24 | 140 | 0.3472 | 4.852 | 1.213% |
| String 2-3 | 12 | 12.90 | 400 | **#10** | 1.24 | 140 | 0.3472 | 4.479 | 1.120% |
| | 38 | 40.85 | | | | | | | |
| Total Modules | 76 | 32.68 | kw | | | | | | |

### 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=1.73KxLxI/CM | Voltage | %Vd | FEEDER |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 80 | 12.9 | **#2** | **1** | CU | 66360 | 0.2690 | 208 | 0.129% | LOCAL DISCO-POC |
| 40 | 80 | 12.9 | **#2** | **1** | CU | 66360 | 1.0762 | 208 | 0.517% | AC COMBINER-DISCO |
| 10 | 40 | 12.9 | **#6** | **1** | CU | 26240 | 0.3402 | 208 | 0.164% | INVERTER #1 |
| 10 | 40 | 12.9 | **#6** | **1** | CU | 26240 | 0.3402 | 208 | 0.164% | INVERTER #2 |

### DC VOLTAGE

PV MODULE Vmp 49.33 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 =1.1377%
1.1377 X (PV MODULE Voc AT 25°C) = 56.12 VDC
MAXIMUM DC VOLTAGE = 1 X (56.12) = 56.12 VDC

### PV SOURCE CIRCUIT (DC COMBINER) NOT USED

TOTAL DC CURRENT =14A TIMES 1.25 X1.25 21.9 A
TEMPERATURE CORRECTION FACTOR FOR 55°C AMBIENT = 0.87
CORRECTED AMPACITY (FOR #10 AWG)=40 A X 0.87= 34.8 A > 21.9 A

### AC COMBINER OUTPUT CIRCUIT

MAX CONTINUOUS CURRENT = 80 A
AC COMBINER CIRCUIT OVER CURRENT PROTECTION = 100 A FUSE
80% OF OVER CURRENT PROTECTION RATING = 80 A
OUTPUT CIRCUIT CONTINUOUS CURRENT = 80 A < 80 A
COMBINED INVERTER OUTPUT TO DISCONNECT =1 SETS #2 THWN-2, 90°C RATED
TEMPERATURE CORRECTION FACTOR FOR 41°C AMBIENT = 0.87
CORRECTED AMPACITY =130 X 0.87 X 1 = 113.1 A > 80 A

### PV SOURCE CIRCUIT (OPTIMIZER STRINGS)

PV MODULE Isc = 10.31 A
PV MODULE Imp= 10.83A
# OF MODULES IN LARGEST OPTIMIZER STRING = 13
MAX Isc = ( 13 X 430 W)/400v X (1.25 X 1.25) = 21.8 A
DUAL COATED PV WIRE, 105°/90°C RATED
TEMPERATURE CORRECTION FACTOR FOR 55°C AMBIENT = 0.87
CORRECTED AMPACITY (FOR #10 AWG)= 40A X 0.87 = 34.8 A > 21.8 A

### INVERTER #1-2 OUTPUT CIRCUIT

MAX CONTINUOUS CURRENT = 40 A
INVERTER OUTPUT CIRCUIT OVER CURRENT PROTECTION = 50 A CB
80% OF OVER CURRENT PROTECTION RATING = 40 A
OUTPUT CIRCUIT CONTINUOUS CURRENT = 40 A < 40 A
INVERTER OUTPUT WIRING TO AC COMBINER PANEL=#6 THWN-2, 90°C RATED
TEMPERATURE CORRECTION FACTOR FOR 41°C AMBIENT=0.87
CORRECTED AMPACITY =75 X 0.87 X 1 = 65.25 A > 40 A

**General Notes**

Engineer Firm and Stamp:

STATE OF NEW YORK
JAMES MICHAEL SAIGH
088728
LICENSED PROFESSIONAL ENGINEER


GHES GREEN HYBRID ENERGY SOLUTIONS
156 Woodbrook Road
White Plains, NY 10805

Jamie Glover
State License #
Date


| No. | Revision/Issue | Date |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| △ | | |

SINGLE LINE CALCULATIONS

Project Name and Location:
32.68 KW DC STC 28.8 KW AC
COMMERCIAL SOLAR FOR
Michael Bellantoni, Inc.
121 Lafayette Ave
White Plains, NY

| Project No. | Sheet |
|---|---|
| 2021-0425-2 | PV-1.1 |
| Date: 5/11/2021 | R-0 |
| Scale: AS NOTED | |

## 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"

GHES GREEN HYBRID ENERGY SOLUTIONS

Contractor:

Green Hybrid Energy Solutions

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

Project:

121 Lafayette Avenue, White Plains, New York 10603

Owner/Applicant

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

Engineering Approvals:

Section: 122.12
Block: 1
Lot: 39

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Sheet Title:

PV Labels

Solar Engineering

Sheet Size: Arch D

Drawn: GMJ | Approved: -

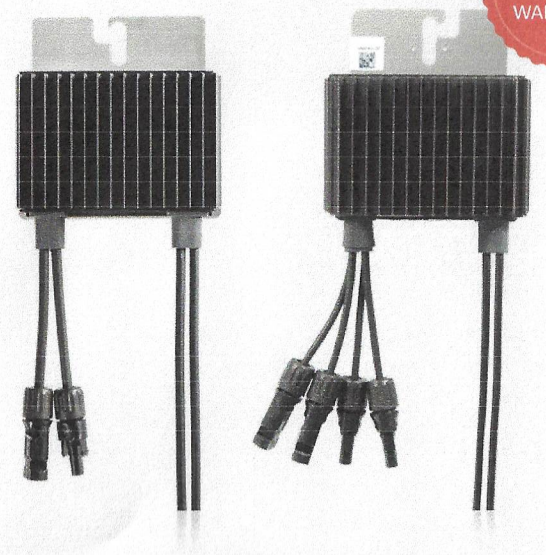
Date: Apr 10, 2021

Sheet Number: B 1.3

Sheet 6 OF 12

# Power Optimizer
## For North America
P730 / P801 / P850 / P950 / P800p

25 YEAR WARRANTY



POWER OPTIMIZER

## PV power optimization at the module-level
### The most cost effective solution for commercial and large field installations

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Balance of System cost reduction; 50% less cables, fuses and combiner boxes, over 2x longer string lengths possible
- Fast installation with a single bolt
- Advanced maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Use with two PV modules connected in series or in parallel

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# / Power Optimizer For North America
## P730 / P801 / P850 / P950 / P800p

| Optimizer Model (Typical Module Compatibility) | P730 (for 2 x 72-cell PV modules) | P801 (for 2 x 72-cell PV modules) | P850 (for 2x high power or bi-facial modules) | P950 (for 2x high power or bi-facial modules) | P800p (for 2x 96-cell 5 PV modules) | |
|---|---|---|---|---|---|---|
| **INPUT** | | | | | | |
| Rated Input DC Power[1] | 730 | 800 | 850 | 950 | 800 | W |
| Connection Method | Single input for series connected modules | | | | Dual input for independently connected modules[2] | |
| Absolute Maximum Input Voltage (Voc at lowest temperature) | 125 | | | | 83 | Vdc |
| MPPT Operating Range | 12.5 - 105 | | | | 12.5 - 83 | Vdc |
| Maximum Short Circuit Current per input (Isc) | 11 | 11.75 | 12.5 | | 7 | Adc |
| Maximum DC Input Current per input | 13.75 | 14.65 | 15.6 | | 8.75 | Adc |
| Maximum Efficiency | 99.5 | | | | | % |
| Weighted Efficiency | 98.6 | | | | | % |
| Overvoltage Category | II | | | | | |
| **OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)** | | | | | | |
| Maximum Output Current | 15 | | 18 | | | Adc |
| Maximum Output Voltage | 85 | | | | | Vdc |
| **OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)** | | | | | | |
| Safety Output Voltage per Power Optimizer | 1 ± 0.1 | | | | | Vdc |
| **STANDARD COMPLIANCE** | | | | | | |
| Photovoltaic Rapid Shutdown System | NEC 2014 & NEC2020 | | | | NEC 2014, 2017[3] & NEC2020 | |
| EMC | FCC Part15 Class A, IEC61000-6-2, IEC61000-6-3 | | | | | |
| Safety | IEC62109-1 (class II safety), UL1741 | | | | | |
| Material | UL94 V-0, UV Resistant | | | | | |
| RoHS | Yes | | | | | |
| **INSTALLATION SPECIFICATIONS** | | | | | | |
| Compatible SolarEdge Inverters | Three phase inverters | | | | | |
| Maximum Allowed System Voltage | 1000 | | | | | Vdc |
| Dimensions (W x L x H) | 129 x 153 x 49.5 / 5.1 x 6 x 1.9 | | 129 x 162 x 59 / 5.1 x 6.4 x 2.3 | | 129 x 168 x 59 / 5.1 x 6.6 x 2.3 | mm / in |
| Weight | 933 / 2.05 | | 1064 / 2.34 | | | gr / lb |
| Input Connector | MC4[4] | | | | | |
| Input Wire Length | 0.16 / 0.52 | 0.16 / 0.52 , 1.3 / 4.27 | 0.16 / 0.52, 1.6 / 5.24[5] | 1.3 / 4.26 | 0.16 / 0.52 | m / ft |
| Output Wire Type / Connector | Double Insulated / MC4 | | | | | |
| Output Wire Length | 2.1 / 6.9[6] | 2.2 / 7.22 | 2.1 / 6.9[6] | 2.2 / 7.2 | 2.1 / 6.9[6] | m / ft |
| Operating Temperature Range[7] | -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 optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed.
(2) In a case of odd number of PV modules in one string it is allowed to install one P730/P801/P850/P800p/P950 power optimizer connected to one PV module. When connecting a single module to the P800p seal the unused input connectors with the supplied pair of seals
(3) NEC 2017 requires max combined input voltage be not more than 80V
(4) For other connector types please refer to: https://www.solaredge.com/sites/default/files/optimizer-input-connector-compatibility.pdf
(5) Longer inputs wire length are available for use with split junction box modules. (For 1.6m/5.24ft order P850-xxxYxxY. For 1.3m/4.27ft order P801-xxxxXxxX)
(6) When using the P850 with longer input option (1.6m/5.24ft), the output wire length is 2.2m/7.2ft
(7) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

| PV System Design Using a Solaredge Inverter[8] | | Three Phase for 208V Grid | | Three Phase for 277/480V Grid | | | |
|---|---|---|---|---|---|---|---|
| Compatible Power Optimizers | | P730/P801[9] | P850/P800p[9] | P730/P801 | P850/P800p | P950 | |
| Minimum String Length | Power Optimizers | 8 | | 14 | | | |
| | PV Modules | 16 | | 27 | | | |
| Maximum String Length | Power Optimizers | 30 | | 30 | | | |
| | PV Modules | 60 | | 60 | | | |
| Maximum Power per String | | 6000[10] | 7200[10] | 12750[11] | 15300[11] | | W |
| Parallel Strings of Different Lengths or Orientations | | Yes | | | | | |

(8) P730/P801 can be mixed in one string, and P850/P800p/P950 can also be mixed in one string. It is not allowed to mix P730/P801 with P850/P800p/P950, nor is it allowed to mix P730-P950 with P320-P505 in one string
(9) P730/P801/P850/P800p design with three phase 208V inverters is limited. Use the SolarEdge Designer for verification
(10) For 208V grid: with P730/P801 it is allowed to install up to 7,200W per string and with P850/P800p it is allowed to install up to 8,400W per string when the maximum power difference between each string is 1,000W
(11) For the 277/480V grid: With P730/P801 up to 15,000W per string may be installed, with P850/P800p up to 17,550W and with P950 up to 20,300W per string may be installed when the maximum power difference between each string is 2,000W
For the P950, minimum three strings are required for SE33.3K and SE40K inverters



Intertek RoHS

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Project:
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Owner/Applicant

Engineer of Record:
STATE OF NEW YORK SUNIL SAIGAL LICENSED PROFESSIONAL ENGINEER 088728

Section: 122.12
Block: 1
Lot: 39

D.O.B. Stamp

Sheet Title: SolarEdge Optimizer Data Sheet

Solar Engineering

Sheet Size: Arch D
Drawn: GMJ
Approved: -
Date: Apr 10, 2021
Sheet Number: C 1.1
Sheet 7 OF 12

# Three Phase Inverters for the 120/208V Grid
## for North America

SE14.4KUS / SE17.3KUS

INVERTERS


12-20 YEAR WARRANTY

### The best choice for SolarEdge enabled systems

- Specifically designed to work with power optimizers
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for superior efficiency (97.5%) and longer strings
- Built-in type 2 DC and AC Surge Protection, to better withstand lightning events
- Small, lightest in its class, and easy to install outdoors or indoors on provided bracket
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- Built-in module-level monitoring with Ethernet, wireless or cellular communication for full system visibility
- Integrated Safety Switch
- UL1741 SA certified, for CPUC Rule 21 grid compliance

solaredge.com

solaredge

# Three Phase Inverters for the 120/208V Grid(1)
## for North America

SE14.4KUS / SE17.3KUS

| MODEL NUMBER | SE14.4KUS | SE17.3KUS | |
|---|---|---|---|
| APPLICABLE TO INVERTERS WITH PART NUMBER | SEXXK-USX2IXXXX | | |
| **OUTPUT** | | | |
| Rated AC Power Output | 14400 | 17300 | W |
| Maximum apparent AC output power | 14400 | 17300 | VA |
| AC Output Line Connections | 3W + PE, 4W + PE | | |
| AC Output Voltage Minimum-Nominal-Maximum(2) (L-N) | 105-120-132.5 | | Vac |
| AC Output Voltage Minimum-Nominal-Maximum(2) (L-L) | 183-208-229 | | Vac |
| AC Frequency Min-Nom-Max(2) | 59.3 - 60 - 60.5 | | Hz |
| Continuous Output Current (per Phase) | 40 | 48.25 | Aac |
| GFDI Threshold | 1 | | A |
| Utility Monitoring, Islanding Protection, Country Configurable Set Points | Yes | | |
| THD | ≤ 3 | | % |
| Power Factor Range | +/- 0.85 to 1 | | |
| **INPUT** | | | |
| Maximum DC Power (Module STC) | 21600 | 26000 | W |
| Transformer-less, Ungrounded | Yes | | |
| Maximum Input Voltage DC+ to DC- | 600 | | Vdc |
| Nominal Input Voltage DC+ to DC- | 400 | | Vdc |
| Maximum Input Current | 40 | 48.25 | Adc |
| Maximum Input Short Circuit Current | 55 | | Adc |
| Reverse-Polarity Protection | Yes | | |
| Ground-Fault Isolation Detection | 167kΩ Sensitivity(3) | | |
| CEC Weighted Efficiency | 97.5 | | % |
| Night-time Power Consumption | < 4 | | W |
| **ADDITIONAL FEATURES** | | | |
| Supported Communication Interfaces | 2 x RS485, Ethernet, Cellular (optional) | | |
| Inverter Commissioning | With the SetApp mobile application using built-in Wi-Fi access point for local connection | | |
| Rapid Shutdown | NEC2014, NEC2017 and NEC2020 compliant/certified | | |
| RS485 Surge Protection Plug-in | Supplied with the inverter, Built-in | | |
| AC, DC Surge Protection | Type II, field replaceable, Built-in | | |
| DC Fuses (Single Pole) | 25A, Built-in | | |
| Smart Energy Management | Export Limitation | | |
| **DC SAFETY SWITCH** | | | |
| DC Disconnect | Integrated | | |
| **STANDARD COMPLIANCE** | | | |
| Safety | UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07 | | |
| Grid Connection Standards | IEEE1547, Rule 21, Rule 14 (HI) | | |
| Emissions | FCC part15 class A | | |
| **INSTALLATION SPECIFICATIONS** | | | |
| AC output conduit size /AWG range | ¾" or 1" / 6 - 10 AWG | | |
| DC input conduit size / AWG range | ¾" or 1" / 6 - 12 AWG | | |
| Number of DC inputs pairs | 4 | | |
| Dimensions with Safety Switch (H x W x D) | 31.8 x 12.5 x 11.8 / 808 x 317 x 300 | | in / mm |
| Weight with Safety Switch | 78.2 / 35.5 | | lb / kg |
| Cooling | Fans (user replaceable) | | |
| Noise | < 62 | | dBA |
| Operating Temperature Range | -40 to +140 / -40 to +60(4) | | °F / °C |
| Protection Rating | NEMA 3R | | |
| Mounting | Bracket provided | | |

(1) For 277/480V inverters refer to: https://www.solaredge.com/sites/default/files/se-three-phase-us-inverter-277-480V-setapp-datasheet.pdf
(2) For other regional settings please contact SolarEdge support
(3) Where permitted by local regulations
(4) For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf



CE

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Date: Apr 10, 2021
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Sheet 8 OF 12

powered by Q.ANTUM DUO

# Q.PEAK DUO L-G8

## 415-430

ENDURING HIGH PERFORMANCE

### Q.ANTUM TECHNOLOGY: LOW LEVELISED COST OF ELECTRICITY
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 20.3%.

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

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

### EXTREME WEATHER RATING
High-tech aluminium alloy frame, certified for high snow (5400Pa) and wind loads (2400Pa).

### A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance warranty[2].

### STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative 12-busbar design with Q.ANTUM Technology.

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

### THE IDEAL SOLUTION FOR:

Rooftop arrays on commercial / industrial buildings

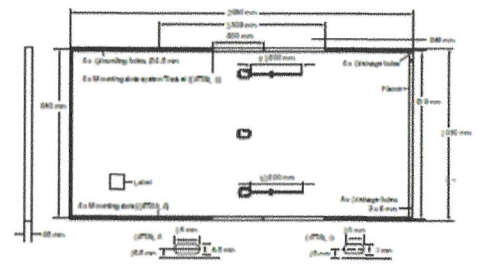
Ground-mounted solar power plants

Engineered in Germany

Q CELLS

## MECHANICAL SPECIFICATION

| | |
|---|---|
| Format | 2080 mm × 1030 mm × 35 mm (including frame) |
| Weight | 24.5 kg |
| Front Cover | 3.2 mm thermally pre-stressed glass with anti-reflection technology |
| Back Cover | Composite film |
| Frame | Anodised aluminium |
| Cell | 6 × 24 monocrystalline Q.ANTUM solar half cells |
| Junction box | 53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes |
| Cable | 4 mm² Solar cable; (+) ≥ 1400 mm, (-) ≥ 1400 mm |
| Connector | Stäubli MC4, Hanwha Q CELLS HQC4, Amphenol UTX, Renhe 05-6, Tongling TL-Cable01S, JMTHY JM601; IP68 or Friends PV2e; IP67 |

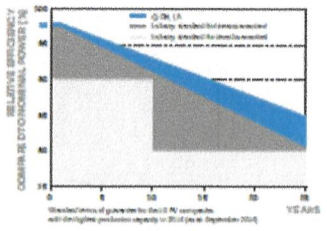


## ELECTRICAL CHARACTERISTICS

| POWER CLASS | | | 415 | 420 | 425 | 430 |
|---|---|---|---|---|---|---|
| MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5W / −0W) | | | | | | |
| Minimum | Power at MPP | $P_{MPP}$ [W] | 415 | 420 | 425 | 430 |
| | Short Circuit Current[2] | $I_{SC}$ [A] | 10.69 | 10.74 | 10.78 | 10.83 |
| | Open Circuit Voltage[2] | $V_{OC}$ [V] | 48.59 | 48.84 | 49.09 | 49.33 |
| | Current at MPP | $I_{MPP}$ [A] | 10.18 | 10.22 | 10.27 | 10.31 |
| | Voltage at MPP | $V_{MPP}$ [V] | 40.77 | 41.08 | 41.39 | 41.70 |
| | Efficiency[3] | η [%] | ≥19.4 | ≥19.6 | ≥19.8 | ≥20.1 |
| MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[1] | | | | | | |
| Minimum | Power at MPP | $P_{MPP}$ [W] | 310.8 | 314.5 | 318.3 | 322.0 |
| | Short Circuit Current | $I_{SC}$ [A] | 8.61 | 8.65 | 8.69 | 8.72 |
| | Open Circuit Voltage | $V_{OC}$ [V] | 45.82 | 46.05 | 46.29 | 46.52 |
| | Current at MPP | $I_{MPP}$ [A] | 8.01 | 8.05 | 8.08 | 8.12 |
| | Voltage at MPP | $V_{MPP}$ [V] | 38.79 | 39.09 | 39.38 | 39.67 |

[1] Measurement tolerances $P_{MPP}$ ±3%; $I_{SC}$; $V_{OC}$ ±5% at STC: 1000W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2] 800W/m², NMOT, spectrum AM 1.5

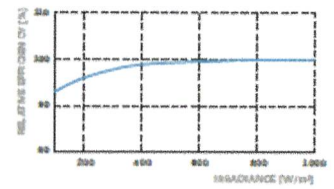
### Q CELLS PERFORMANCE WARRANTY




At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 93.1% of nominal power up to 10 years. At least 85% of nominal power up to 25 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, 1000W/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] | −0.35 | Nominal Module Operating Temperature | NMOT | [°C] | 43±3 |

### PROPERTIES FOR SYSTEM DESIGN

| | | | | | |
|---|---|---|---|---|---|
| Maximum System Voltage | $V_{SYS}$ | [V] | 1000 (IEC)/1000 (UL) | PV module classification | Class II |
| Maximum Reverse Current | $I_R$ | [A] | 20 | Fire Rating based on ANSI / UL 1703 | C/ TYPE 2 |
| Max. Design Load, Push / Pull | | [Pa] | 3600/1600 | Permitted Module Temperature on Continuous Duty | −40°C - +85°C |
| Max. Test Load, Push / Pull | | [Pa] | 5400/2400 | | |

### QUALIFICATIONS AND CERTIFICATES

IEC 61215:2016; IEC 61730:2016;
This data sheet complies with DIN SN 50380.

### PACKAGING INFORMATION

| | |
|---|---|
| Number of Modules per Pallet | 30 |
| Number of Pallets per Trailer (24t) | 24 |
| Number of Pallets per 40' HC-Container (26t) | 22 |
| Pallet Dimensions (L × W × H) | 2131 × 1130 × 1200 mm |
| Pallet Weight | 788 kg |

**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 GmbH**
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Engineered in Germany

Q CELLS

GHES GREEN HYBRID ENERGY SOLUTIONS

Contractor:

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

Project:

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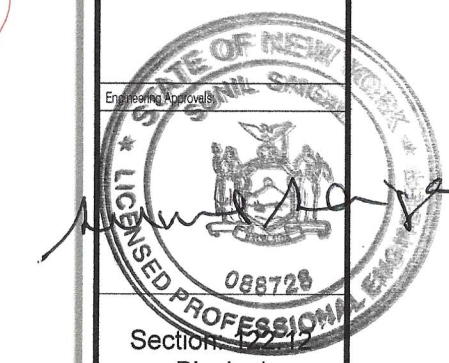
Engineering Approval:




Section: 52.19
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Solar Engineering

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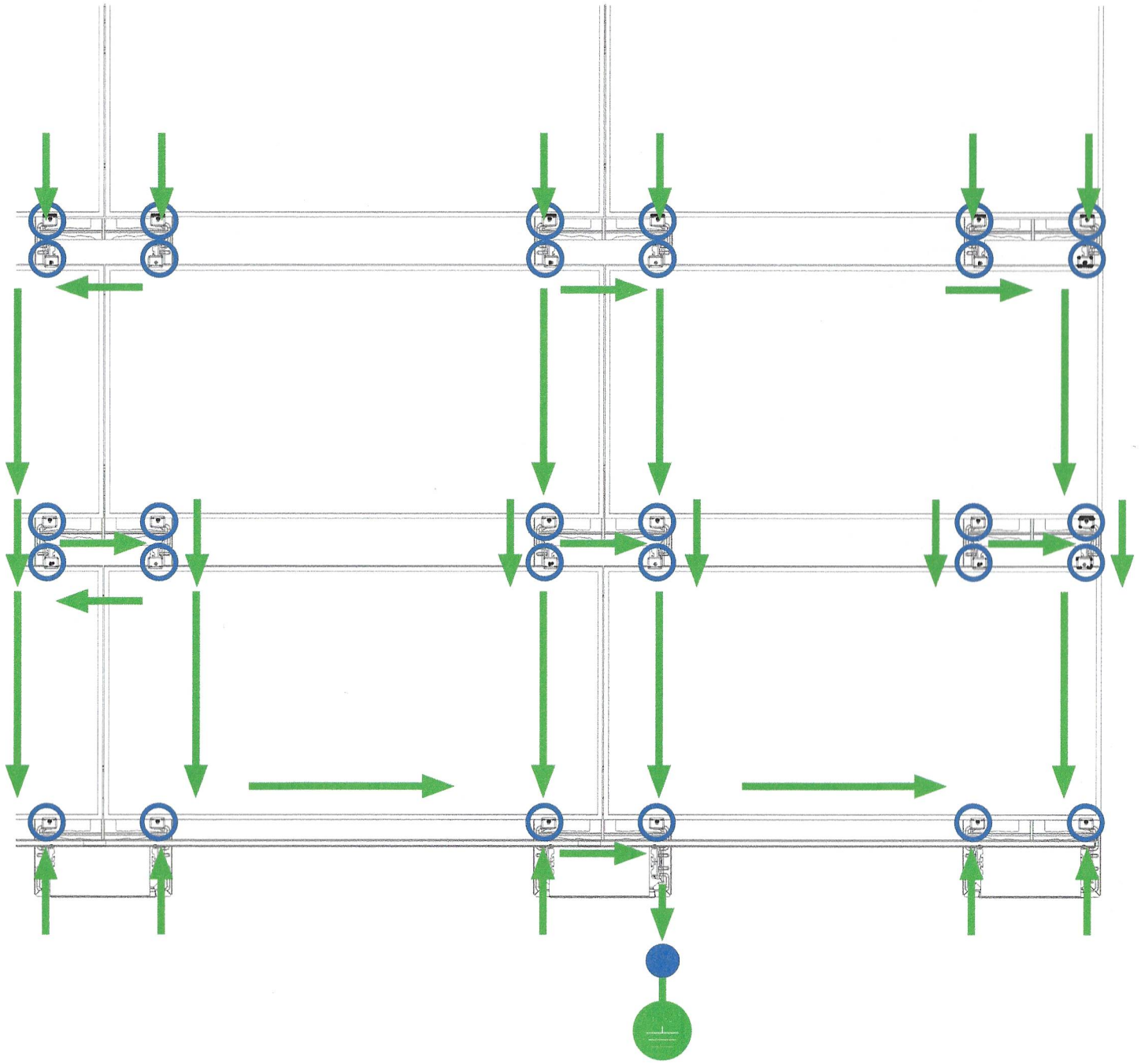
# RM5

## BONDING & GROUNDING ELECTRICAL DIAGRAM

INSTALLATION GUIDE | 12 PAGE



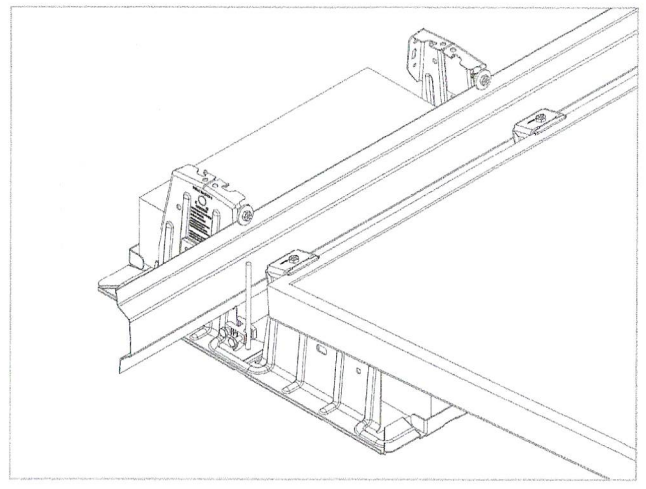
Fault Current Ground Path

Ground Lug

Grounding Clip & Bolt

Min. 10 AWG Copper Wire

Module Frame
Module Bay w/ Grounding Clips



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Contractor:

Green Hybrid Energy Solutions

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Engineering Approval:

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088728
LICENSED PROFESSIONAL ENGINEER

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# RM5

# TOOLS & SPECIFICATIONS | 1

## TECHNICAL DATA SHEET | PAGE

### 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:

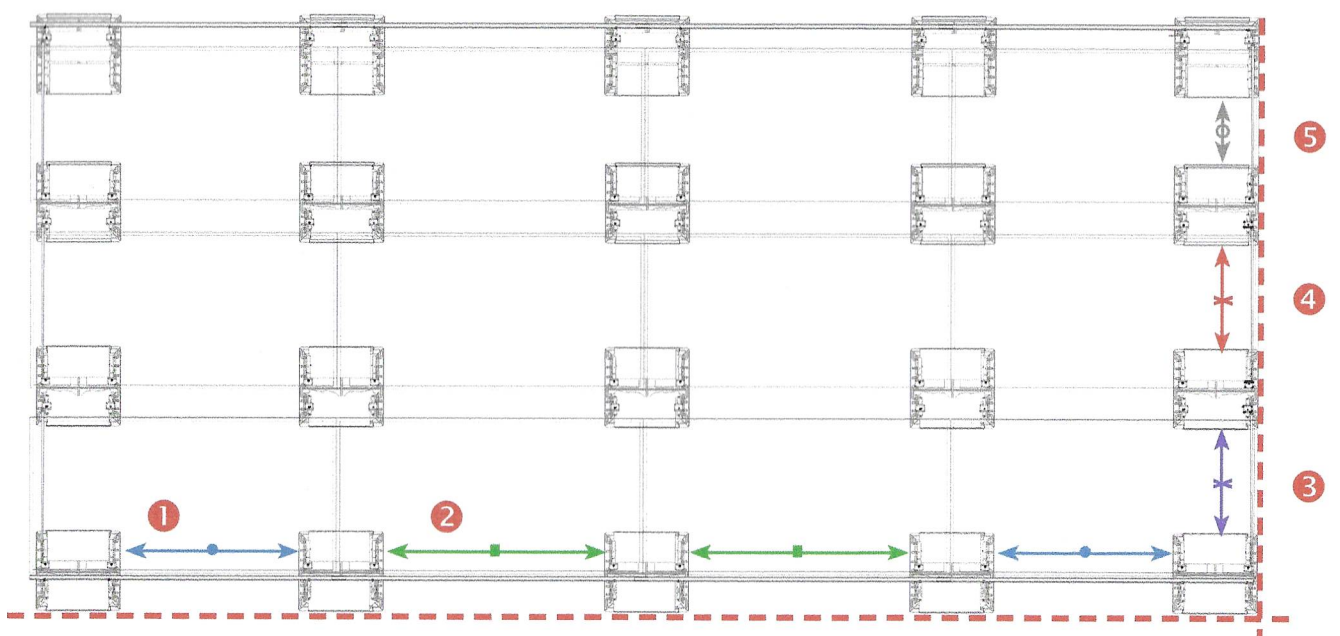
- ¼-20 X 2 ½" Hex Head Bolt - Module Clamps
- ¼-20 X 1" Hex Head Bolt - Wind Deflectors
- ¼-20 Stainless Steel U-Nuts
- ¼" Flat Washer 1 ½" O.D.

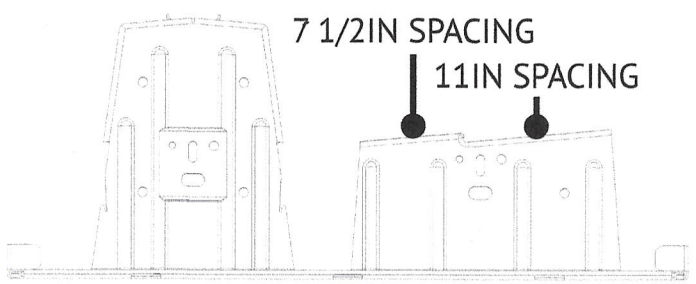
### SAFETY:

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

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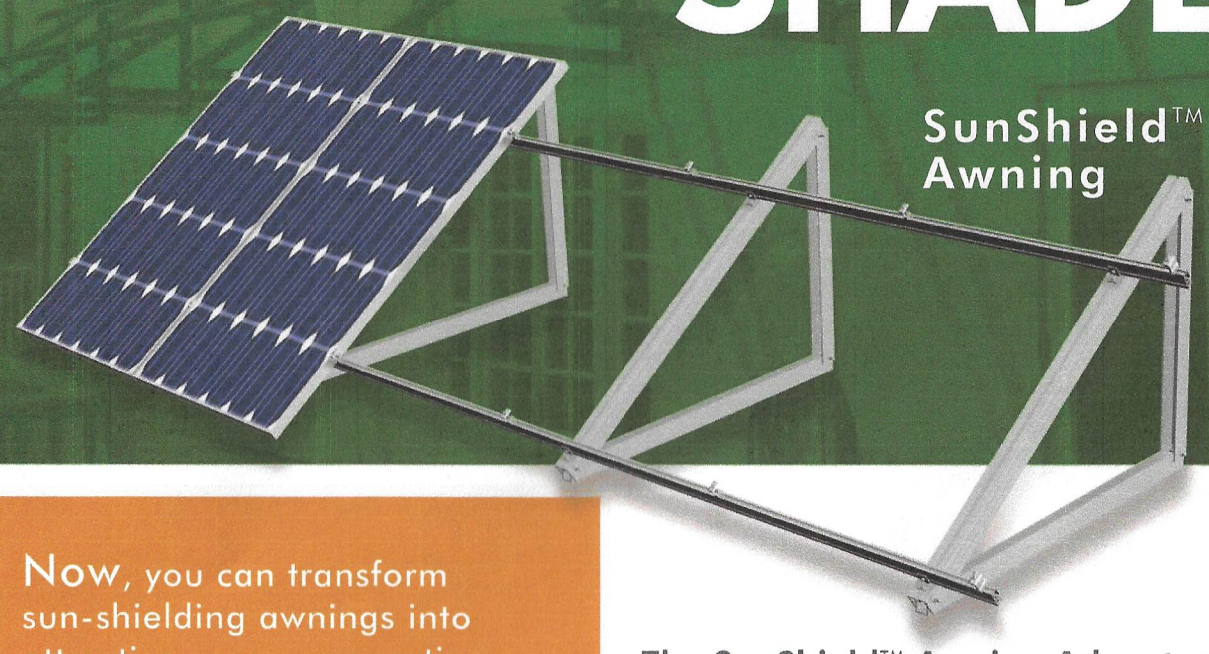
SUNMODO

# POWER FROM THE SHADE




Now, you can transform sun-shielding awnings into attractive power-generating systems!

Solar racking innovator SunModo proudly introduces the SunShield™ Awning System – the next big solar application. The easy-to-install solar system does double duty, protecting your building and people from intense heat, while at the same time generating valued solar electricity.

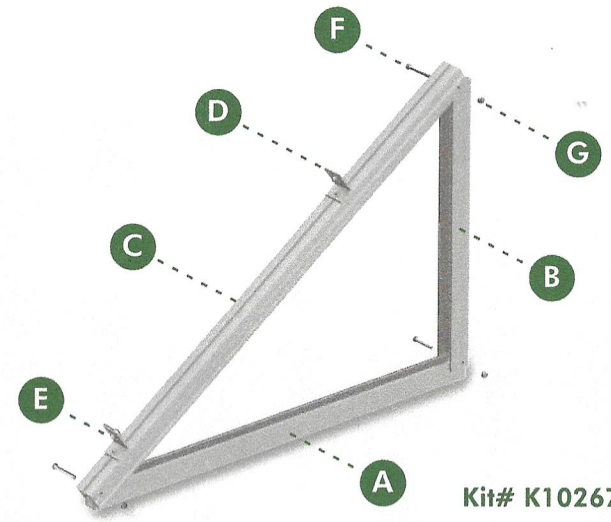
## The SunShield™ Awning Advantage

- ✓ Folded triangular design for easy installation.
- ✓ Provide valuable shade for windows or structure below.
- ✓ Exceptional resistance to corrosion and wear.
- ✓ Minimal assembly required.
- ✓ Open the awning industry to 30 percent tax credit.

## Key Features of SunShield™ Awning

SUNMODO

The SunModo SunShield™ Awning System can be affixed to the side of any building or home, using our durable triangular aluminum frame as structural trusses. The triangle frame is shipped folded and flat; and expands to an ideal 35-degree sun-catching angle. Easily supports 60- and 72-cell solar panels in portrait orientation.




Kit# K10267-002

| Part | Description | Qty |
|---|---|---|
| A A20258-047 | Folded Horizontal Rail, Length=47.4" | 1 |
| B A20257-032 | Folded Vertical Rail, Length=31.5" | 1 |
| C A20257-057 | Folded Triangular Rail, Length=57" | 1 |
| D A20277-001 | L Foot | 2 |
| E B20007-002 | T-Bolt 3/8 - 16 x 1.0, 304 Stainless Steel | 4 |
| F B15018-013 | Hex Cap Screw 3/8 - 16 x 3 | 3 |
| G B15003-001 | Flange Nut 3/8 - 16 | 7 |

## Technical Data

| | |
|---|---|
| **Application** | Awning |
| **Material** | High grade aliminum, 304 stainless steel hardware |
| **Finish** | Clear or black anodized |
| **Rail length** | 31.5 x 47.4 x 57 inches |
| **Module orientation** | Portrait (Landscape requires modification) |
| **Tilt angle** | 35 degrees |
| **Warranty** | 20 years |
| **System Components** | Folded triangular frame, L feet, T bolts, Hex cap screws, Flange nuts |

**SunModo, Corp.** Vancouver, WA., USA • www.sunmodo.com • 360.844.0048 • info@sunmodo.com

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