

MONTGOMERY COUNTY HISTORIC PRESERVATION COMMISSION
STAFF REPORT

Address:	7224 Carroll Ave., Takoma Park	Meeting Date:	12/4/2019
Resource:	Non-Contributing Resource Takoma Park Historic District	Report Date:	11/27/2019
Applicant:	Depeswar Doley	Public Notice:	11/20/2019
Review:	HAWP	Tax Credit:	n/a
Case Number:	37/03-19GGG	Staff:	Dan Bruechert
Proposal:	Solar Panel Installation		

RECOMMENDATION

Staff recommends that the Historic Preservation Commission **approve** the HAWP application

PROPERTY DESCRIPTION

SIGNIFICANCE: Non-Contributing Resource to the Takoma Park Historic District
STYLE: Commercial
DATE: 1970

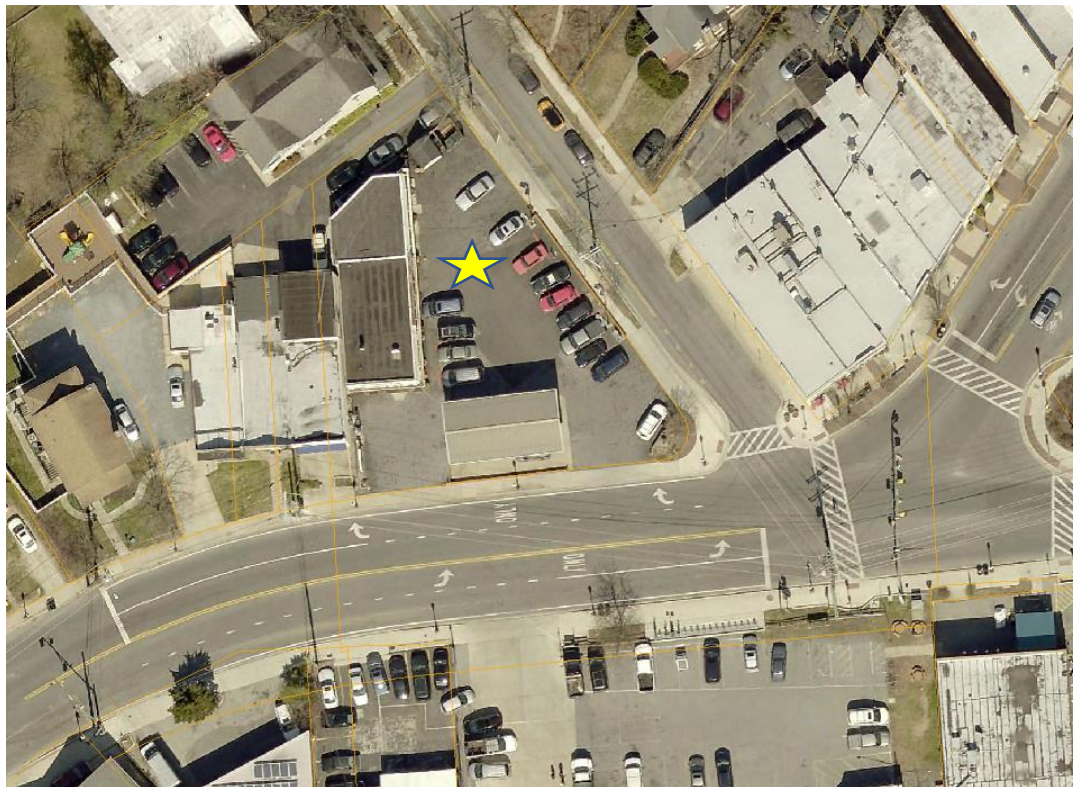


Figure 1: 7224 Carroll is an auto repair shop in Takoma Junction.

PROPOSAL

The applicant proposes to install 36 (thirty-six) solar panels on the existing canopy and an additional 25 (twenty-five) solar panels on the roof.

APPLICABLE GUIDELINES

When reviewing alterations and additions for new construction to Contributing Resources within the Takoma Park Historic District, decisions are guided by the Takoma Park Historic District Design Guidelines (*Design Guidelines*) and Montgomery County Code Chapter 24A (*Chapter 24A*) and the Secretary of the Interior's Standards for Rehabilitation (*The Standards*).

Takoma Park Historic District Design Guidelines

There are two very general, broad planning and design concepts which apply to all categories. These are:

The design review emphasis will be restricted to changes that are at all visible from the public right-of-way, irrespective of landscaping or vegetation (it is expected that the majority of new additions will be reviewed for their impact on the overall district), and,

The importance of assuring that additions and other changes to existing structures act to reinforce and continue existing streetscape, landscape, and building patterns rather than to impair the character of the district.

Non-Contributing/Out-of-Period Resources should receive the most lenient level of design review. Most alterations and additions to Non-Contributing/Out-of-Period Resources should be approved as a matter of course. The only exceptions would be major additions and alterations to the scale and massing of Non-Contributing/Out-of-Period Resources which affect the surrounding streetscape and/or landscape and could impair character of the district as a whole.

Montgomery County Code, Chapter 24A Historic Resources Preservation

(b) The commission shall instruct the director to issue a permit, or issue a permit subject to such conditions as are found to be necessary to insure conformity with the purposes and requirements of this chapter, if it finds that:

- (1) The proposal will not substantially alter the exterior features of an historic site or historic resource within an historic district; or
- (2) The proposal is compatible in character and nature with the historical, archeological, architectural or cultural features of the historic site or the historic district in which an historic resource is located and would not be detrimental thereto or to the achievement of the purposes of this chapter; or
- (6) In balancing the interests of the public in preserving the historic site or historic resource located within an historic district, with the interests of the public from the use and benefit of the alternative proposal, the general public welfare is better served by granting the permit.
- (d) In the case of an application for work on an historic resource located within an historic district, the commission shall be lenient in its judgment of plans for structures of little historical or design significance or for plans involving new construction, unless such plans would seriously impair the historic or architectural value of surrounding historic resources or would impair the character of the historic district. (Ord. No. 9-4, § 1; Ord. No. 11-59.)

Secretary of the Interior's Standards for Rehabilitation

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work

shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportions, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

STAFF DISCUSSION

The applicant proposes to install 36 (thirty-six) solar panels on the existing canopy and an additional 25 (twenty-five) solar panels on the roof of the commercial building.

When first constructed in the 1970s, there was a canopy that covered the gas pumps. At some point, a replacement canopy was installed in the same location. It covers the new EV chargers. The existing canopy is a replacement of the non-historic canopy. The applicant proposes to install 36 (thirty-six) solar panels flat to the roof of the canopy.

In addition to the panels on the canopy, the applicant proposes installing 25 (twenty-five) solar panels on the roof of the service station building. The panels installed on the roof will be tilted up at a 10° angle. The application did not detail the height of the parapet on this building, however, based on aerial photographs it does not appear to be very tall. It is likely the solar panels may be partially visible from the right of way.

Staff finds that the proposed solar panels will not have an impact on the scale or massing of the property and should be approved under the *Design Guidelines*. Additionally, 24A-8(d) directs the HPC to be lenient in the review of proposals to structures that have little architectural or design significance, as is the case with this 1970 gas station. Lastly, Staff would like to recognize that the City of Takoma Park and Montgomery County have issued climate emergencies, determining that it is imperative to restore a safe climate and make strides to eliminate greenhouse gas emissions. Staff finds that under these resolutions, approval of the proposal is additionally supported under 24A-8(b)(6).

STAFF RECOMMENDATION

Staff recommends that the Commission **approve** the HAWP application under the Criteria for Issuance in *Chapter 24A-8(b)(2) and (6) and 24A-8(d)*, having found that the proposal will not substantially alter the exterior features of the historic resource and is compatible in character with the district and the purposes of *Chapter 24A*; and with the *Secretary of the Interior's Standards for Rehabilitation #2, #9, and #10*,

and with the general condition that the applicant shall present the **3 permit sets of drawings, if applicable, to Historic Preservation Commission (HPC) staff for review and stamping** prior to submission for the Montgomery County Department of Permitting Services (DPS) building permits;

and with the general condition that final project design details, not specifically delineated by the Commission, shall be approved by HPC staff or brought back to the Commission as a revised HAWP application at staff's discretion;

and with the general condition that the applicant shall notify the Historic Preservation Staff if they propose to make **any alterations** to the approved plans. Once the work is completed the applicant will contact the staff person assigned to this application at 301-563-3400 or dan.bruechert@montgomeryplanning.org to schedule a follow-up site visit.



HISTORIC PRESERVATION COMMISSION
301/563-3400

DPS - #8

APPLICATION FOR HISTORIC AREA WORK PERMIT

Contact Email: Sarah(a)revolutionsolar.energy Contact Person: Sarah Feit
Daytime Phone No.: 240-593-5892
Tax Account No.: _____
Name of Property Owner: Depeswar Doley Daytime Phone No.: 240-620-3471
Address: 7224 Carroll Avenue, Takoma Park, MD 20912
Street Number City State Zip Code
Contractor: Revolution Solar Phone No.: 443-865-5039
Contractor Registration No.: 101139
Agent for Owner: Matthew Young Daytime Phone No.: 443-865-5039

LOCATION OF BUILDING/PREMISE

House Number: 7224 Street: Carroll Avenue
Town/City: Takoma Park Nearest Cross Street: Giant Avenue
Lot: 12 Block: _____ Subdivision: 0025
Liber: _____ Folio: _____ Parcel: _____

PART ONE: TYPE OF PERMIT ACTION AND USE

1A. CHECK ALL APPLICABLE:

☐ Construct ☐ Extend ☐ Alter/Renovate
☐ Move ☒ Install ☐ Wreck/Raze
☐ Revision ☐ Repair ☐ Reversible

CHECK ALL APPLICABLE:

☐ A/C ☐ Slab ☐ Room Addition ☐ Porch ☐ Deck ☐ Shed
☒ Solar ☐ Fireplace ☐ Woodburning Stove ☐ Single Family
☐ Fence/Wall (complete Section 4) ☐ Other: _____

1B. Construction cost estimate: \$ 167,710

1C. If this is a revision of a previously approved active permit, see Permit # _____

PART TWO: COMPLETE FOR NEW CONSTRUCTION AND EXTEND/ADDITIONS

2A. Type of sewage disposal: 01 ☐ WSSC 02 ☐ Septic 03 ☐ Other: N/A
2B. Type of water supply: 01 ☐ WSSC 02 ☐ Well 03 ☐ Other: N/A

PART THREE: COMPLETE ONLY FOR FENCE/RETAINING WALL

3A. Height _____ feet _____ inches

3B. Indicate whether the fence or retaining wall is to be constructed on one of the following locations:

☐ On party line/property line ☐ Entirely on land of owner ☐ On public right of way/ easement

I hereby certify that I have the authority to make the foregoing application, that the application is correct, and that the construction will comply with plans approved by all agencies listed and I hereby acknowledge and accept this to be a condition for the issuance of this permit.

Matthew Young
Signature of owner or authorized agent

11/11/19
Date

Approved: _____ For Chairperson, Historic Preservation Commission

Disapproved: _____ Signature: _____ Date: _____

Application/Permit No.: _____ Date Filed: _____ Date Issued: _____

**THE FOLLOWING ITEMS MUST BE COMPLETED AND THE
REQUIRED DOCUMENTS MUST ACCOMPANY THIS APPLICATION.**

1. WRITTEN DESCRIPTION OF PROJECT

- a. Description of existing structure(s) and environmental setting, including their historical features and significance:

Installing solar panels on canopy and
main roof of building.

Canopy is standing seam

Main Building is Flat roof

- b. General description of project and its effect on the historic resource(s), the environmental setting, and, where applicable, the historic district:

We are not changing any of the environmental
settings or historic resources. We are not changing
the facades. Flat roof panels will not be
visible to street. Canopy is tall and should
also not impact

✓ **SITE PLAN**

Site and environmental setting, drawn to scale. You may use your plat. Your site plan must include:

- a. the scale, north arrow, and date;
b. dimensions of all existing and proposed structures; and
c. site features such as walkways, driveways, fences, ponds, streams, trash dumpsters, mechanical equipment, and landscaping.

✓ **PLANS AND ELEVATIONS**

You must submit 2 copies of plans and elevations in a format no larger than 11" x 17". Plans on 8 1/2" x 11" paper are preferred.

- a. **Schematic construction plans**, with marked dimensions, indicating location, size and general type of walls, window and door openings, and other fixed features of both the existing resource(s) and the proposed work.
b. **Elevations (facades)**, with marked dimensions, clearly indicating proposed work in relation to existing construction and, when appropriate, context. All materials and fixtures proposed for the exterior must be noted on the elevations drawings. An existing and a proposed elevation drawing of each facade affected by the proposed work is required.

✓ **MATERIALS SPECIFICATIONS**

General description of materials and manufactured items proposed for incorporation in the work of the project. This information may be included on your design drawings.

✓ **PHOTOGRAPHS**

- a. Clearly labeled photographic prints of each facade of existing resource, including details of the affected portions. All labels should be placed on the front of photographs.
b. Clearly label photographic prints of the resource as viewed from the public right-of-way and of the adjoining properties. All labels should be placed on the front of photographs.

N/A 6. **TREE SURVEY**

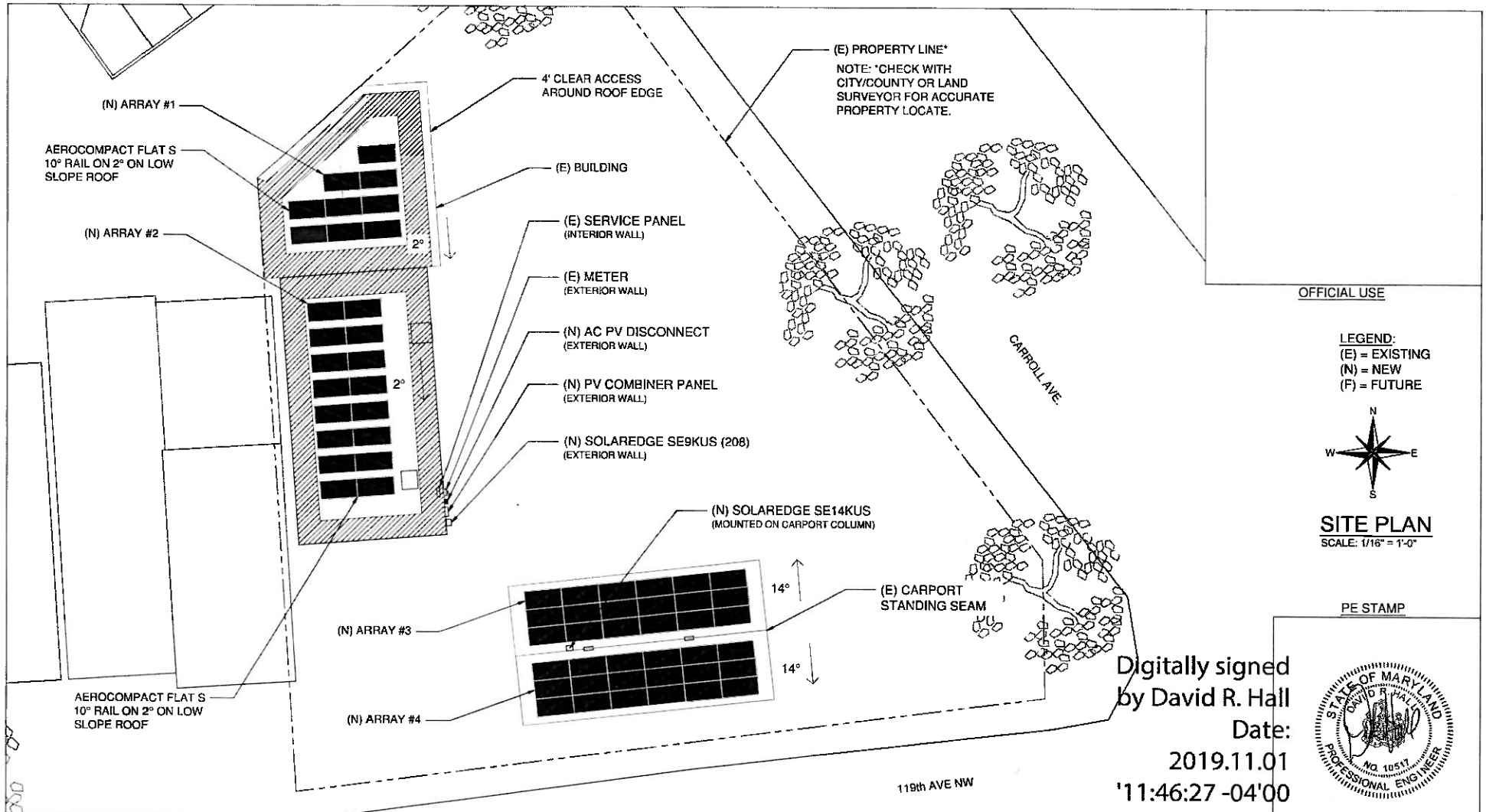
If you are proposing construction adjacent to or within the dripline of any tree 6" or larger in diameter (at approximately 4 feet above the ground), you must file an accurate tree survey identifying the size, location, and species of each tree of at least that dimension.

✓ 7. **ADDRESSES OF ADJACENT AND CONFRONTING PROPERTY OWNERS**

For ALL projects, provide an accurate list of adjacent and confronting property owners (not tenants), including names, addresses, and zip codes. This list should include the owners of all lots or parcels which adjoin the parcel in question, as well as the owner(s) of lot(s) or parcel(s) which lie directly across the street/highway from the parcel in question.

HAWP APPLICATION: MAILING ADDRESSES FOR NOTIFYING
 [Owner, Owner's Agent, Adjacent and Confronting Property Owners]

<p>Owner's mailing address</p> <p>Depeswar Doley 7224 Carroll Avenue Takoma Park, MD 20912</p>	<p>Owner's Agent's mailing address</p> <p>Revolution Solar 10746 Judy Lane Columbia, MD 21044</p>
<p align="center">Adjacent and confronting Property Owners mailing addresses</p>	
<p>6 Grant Avenue Takoma Park, MD 20912</p>	<p>7330 Carroll Avenue Takoma Park, MD 20912</p>
<p>7216 Carroll Avenue Takoma Park, MD 20912</p>	<p>2221 Carroll Avenue Takoma Park, MD 20912</p>



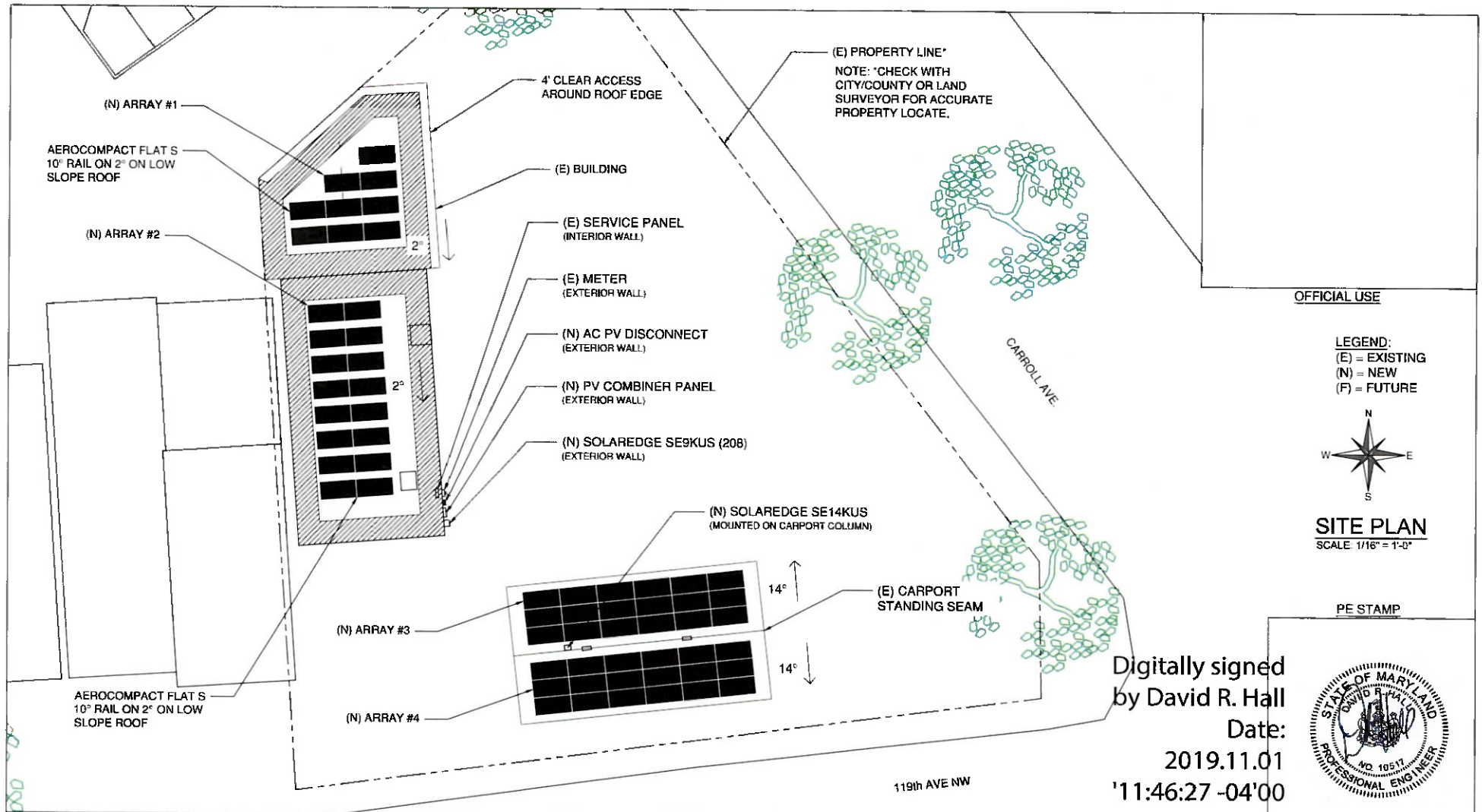
CONTRACTOR
 REVOLUTION SOLAR
 10746 JUDY LANE
 COLUMBIA, MD 21044
 Ph: (443)-865-5039
 Contractor# 101139



RS AUTO INC.
 Residential Building Grid Interactive Solar Installation
 7224 CARROLL AVE, TAKOMA PARK, MD 20912
 Ph: (240) 620-3471

SITE PLAN		Page:
System AC Size @ STC: 23.4 kW System DC Size @ STC: 22.57 kW (61) TRINA TSM-370DE14A(II) PV MODULES & (61) SE P400 POWER OPTIMIZERS (1) SOLAREDGE SE9KUS (208) INVERTER & (1) SOLAREDGE SE 14KUS (208) INVERTER		PV-1
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SITE PLAN



CONTRACTOR

REVOLUTION SOLAR
10746 JUDY LANE
COLUMBIA, MD 21044
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Contractor# 101139



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SITE PLAN

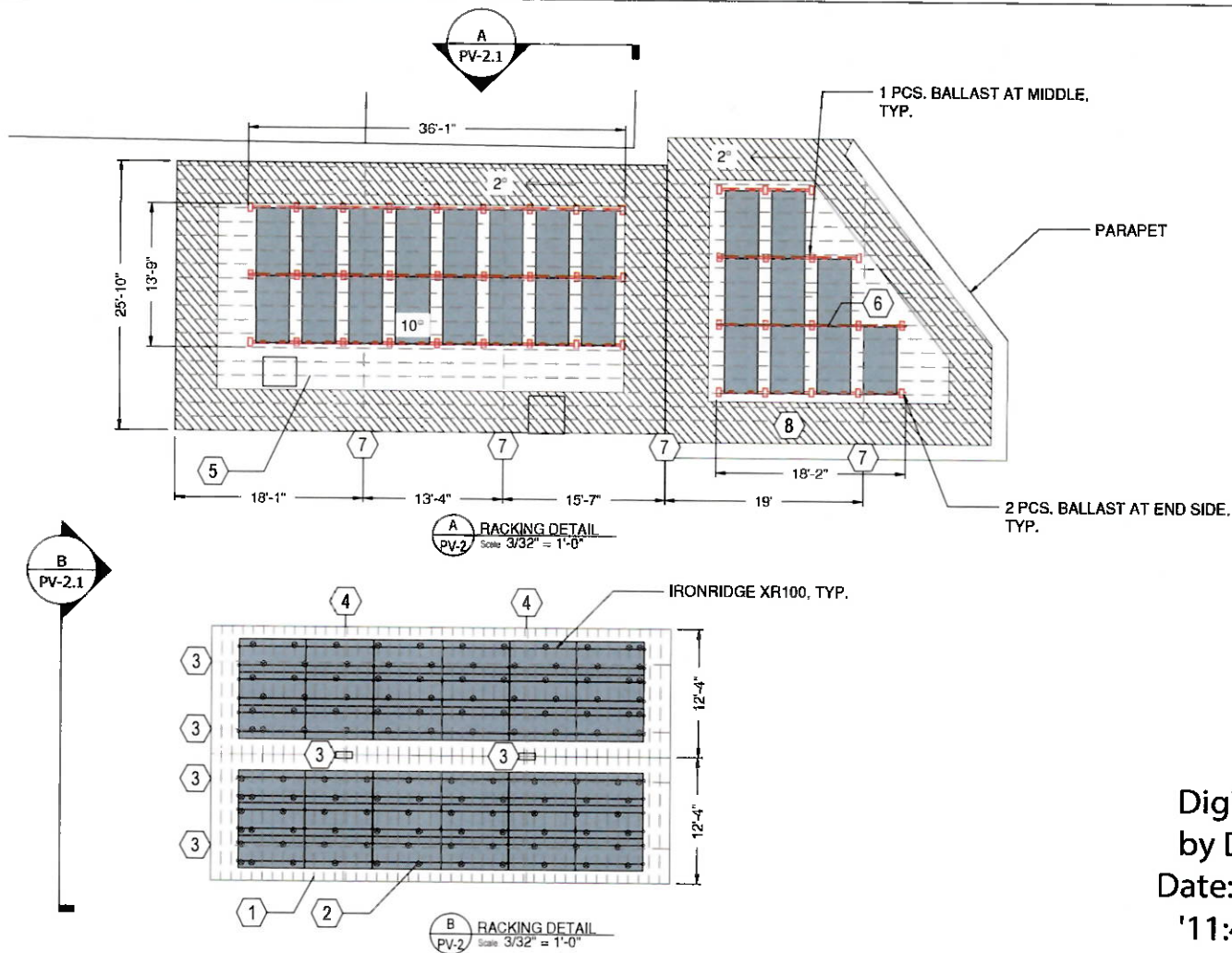
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(1) SOLAREEDGE SE9KUS (208) INVERTER & (1) SOLAREEDGE SE 14KUS (206) INVERTER

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KEYED NOTES:

- 1 STANDING SEA W/ 4" PURLINS ON EXISTING CARPORT.
- 2 ACE CLAMP, TYP. FIELD VERIFY SEMA PROFILE AND SPACING
- 3 6X12 STEEL TUBES
- 4 W 9"x12.5"
- 5 2x12 @ 12" O.C., TYP.
- 6 AEROCOMPACT FLAT S 10° RAIL, TYP.
- 7 16" X 7.25" I-BEAM MID SUPPORT, TYP.
- 8 4'-0" SET BACK, TYP.

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FRAMING PLAN

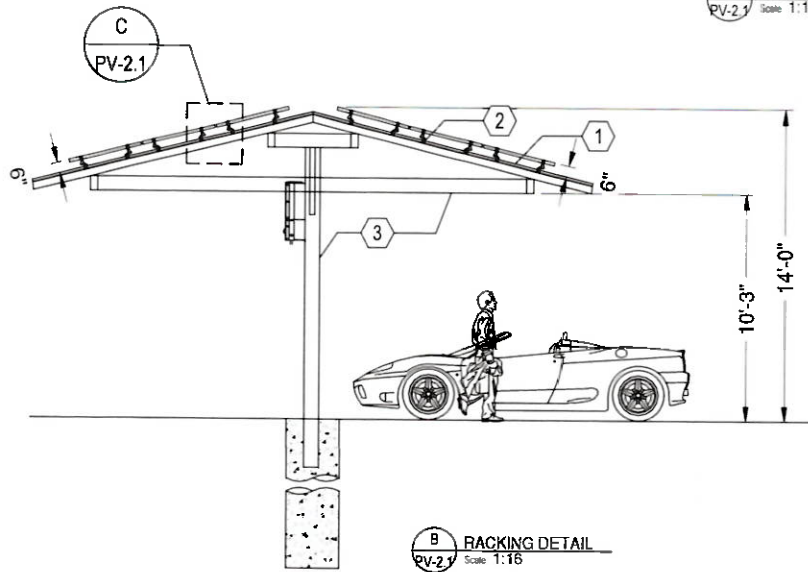
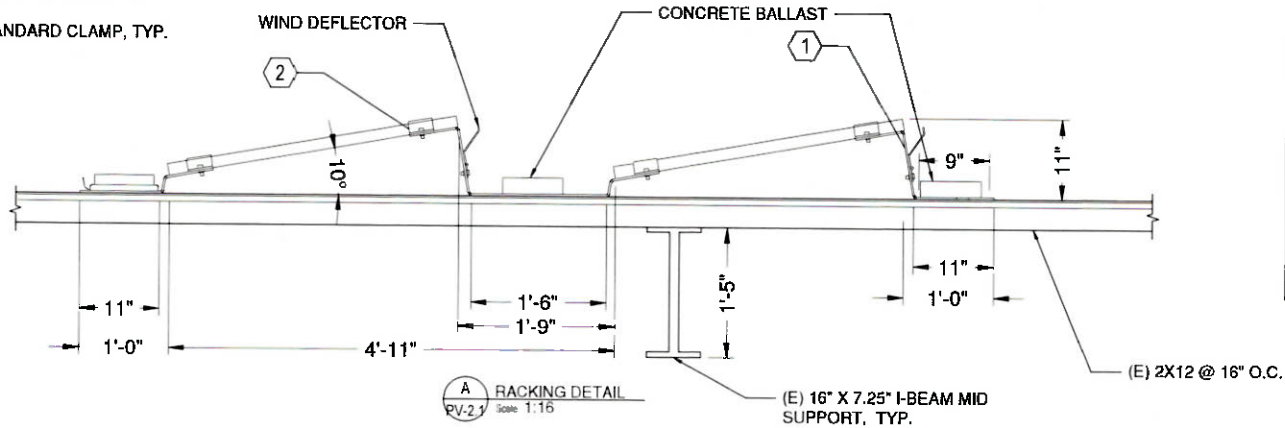
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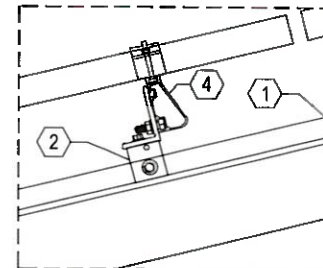
KEYED NOTES:

- ① AEROCOMPACT FLAT S 10° RAIL, TYP.
- ② AEROCOMPACT STANDARD CLAMP, TYP.



KEYED NOTES:

- ① STANDING SEAM ROOF PANEL N EXISTING CARPORT
- ② ACE CLAMP, FIELD VERIFY SEAM PROFILE AND SPACING
- ③ 4X10 STEEL TUBE, 5/8" GAGE
- ④ IRONRIDGE XR100

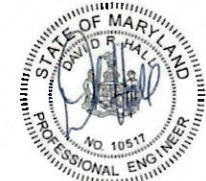


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GENERAL NOTES:

- A. REFER TO STRUCTURAL CALCULATIONS.

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MECHANICAL DETAILS

System AC Size @ STC 23.4 kW System DC Size @ STC 22.57 kW
(51) TRINA TSM-370DE14A(II) PV MODULES & (51) SE P400 POWER OPTIMIZERS
(1) SOLAREEDGE SE9KUS (208) INVERTER & (1) SOLAREEDGE SE 14KUS (208) INVERTER

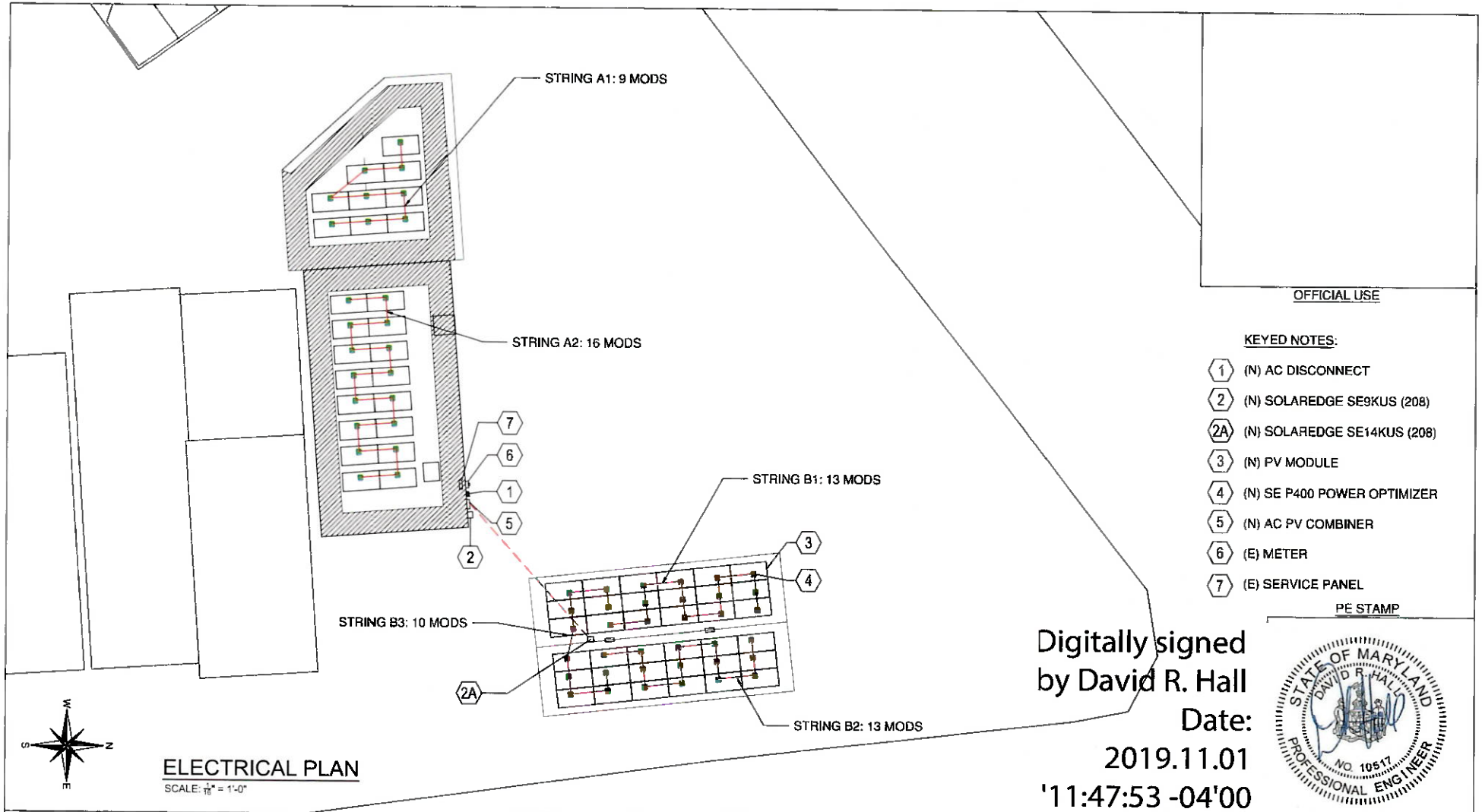
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ELECTRICAL PLAN		Page:
System AC Size @ STC 23.4 kW System DC Size @ STC 22.57 kW		PV-3
(61) TRINA TSM-370DE14A(II) PV MODULES & (61) SE P400 POWER OPTIMIZERS		
(1) SOLAREDGE SE9KUS (208) INVERTER & (1) SOLAREDGE SE 14KUS (208) INVERTER		
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ELECTRICAL NOTES

1. THE OUTPUT VOLTAGE OF THE POWER OPTIMIZERS ARE REGULATED BY THE INVERTER. THEY ARE NOT IMPACTED BY THE NUMBER OF MODULES IN THE STRING. THE CONTINUOUS CURRENT OF A SINGLE STRING IS EQUAL TO THE MAXIMUM OUTPUT CURRENT OF THE OPTIMIZER.
2. THE SOLAR EDGE INVERTER IS EQUIPPED WITH A RAPID SHUTDOWN FEATURE WHICH CONFORMS TO NEC 690.12 (2014), WHICH REQUIRES THAT A RAPID SHUTDOWN FEATURE EXISTS TO DE-ENERGIZE PV SOURCE CIRCUITS FROM ALL SOURCES TO LESS THAN 30 VOLTS WITHIN 10 SECONDS.
3. UNGROUNDED SYSTEM DC CONDUCTORS SHALL BE COLOR-CODED AS FOLLOWS: DC POSITIVE SHALL BE RED (OR MARKED RED) AND DC NEGATIVE SHALL BE BLACK (OR MARKED BLACK).
4. DC VOLTAGE RANGE OF THE ARRAY IS REGULATED BY INVERTER AND WILL BE CONSTANT AT 400V MAX DC VOLTAGE OF THE PV MODULE IS EXPECTED TO BE 53.52V AT -12.3°C (-12.3°C ± 25°C) X 0.25%/°C ± 48.3V ± 53.52V WHICH IS LESS THAN SE P400 POWER OPTIMIZER MAX INPUT VOLTAGE OF 80V.
5. INTEGRATED DC DISCONNECT IS PROVIDED WITH INVERTER. DISCONNECT MUST BE USED FOR USE WITH SOLAR EDGE UL 1741 LISTED STRING INVERTERS.
6. PER MANUFACTURER'S RECOMMENDATIONS FOR SINGLE PHASE 10-11 kW INVERTERS AND FOR THREE-PHASE INVERTERS. USE ONLY COPPER CONDUCTORS RATED FOR A MINIMUM OF 90°C/194°F.

MODULE SPECIFICATIONS	
MAKE AND MODEL	TRINA TSM-370DE 14A(I)
POWER STC	370W
Imp	9.33A
Vmp	39.7V
Voc	48.3V
ISC	9.54A

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS												
CIRCUIT	TYPICAL	CONDUCTOR	CONDUIT	CURRENT CARRYING CAPACITY IN CONDUIT	OCED	EGC	TEMP CORR. FACTOR	CONDUIT FILL FACTOR	CONDUCTOR	MAX. CURRENT (125%)	BASE AMP	DERATED AMP
PV STRING TO JBOX	1	10 AWG PV WIRE CU	FREE AIR	2	NA	8 AWG BARE COPPER	0.87 (40.9°C)	1	15A	18.75A	35A	30.45A
JBOX TO INVERTER	1	10 AWG PV WIRE CU	0.75" DIA EMT	6	NA	10 AWG THHN-2 CU	0.87 (40.9°C)	0.8	15A	18.75A	35A	24.36A
INVERTER B TO PV COMBINER PANEL	1	8 AWG THHN-2 CU	1" DIA EMT	3	35A	8 AWG THHN-2 CU	0.91 (68°C)	1	25A	31A	50A	45.5A
INVERTER A TO PV COMBINER PANEL	1	8 AWG THHN-2 CU	1" DIA EMT	3	50A	8 AWG THHN-2 CU	0.91	1	40A	50A	85A	85A
PV COMBINER PANEL TO INTERCONNECTION	1	2 AWG THHN-2 CU	1.25" DIA EMT	3	90A	4 AWG THHN-2 CU	0.91	1	105A	81A	115A	104.05A
MAX. DC (0.68%) AC VOLTAGE (1.48%)											2.10%	
MAX OPTIMIZER OUTPUT CURRENT LIMITED TO											15 AMPS	

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LINE DIAGRAM

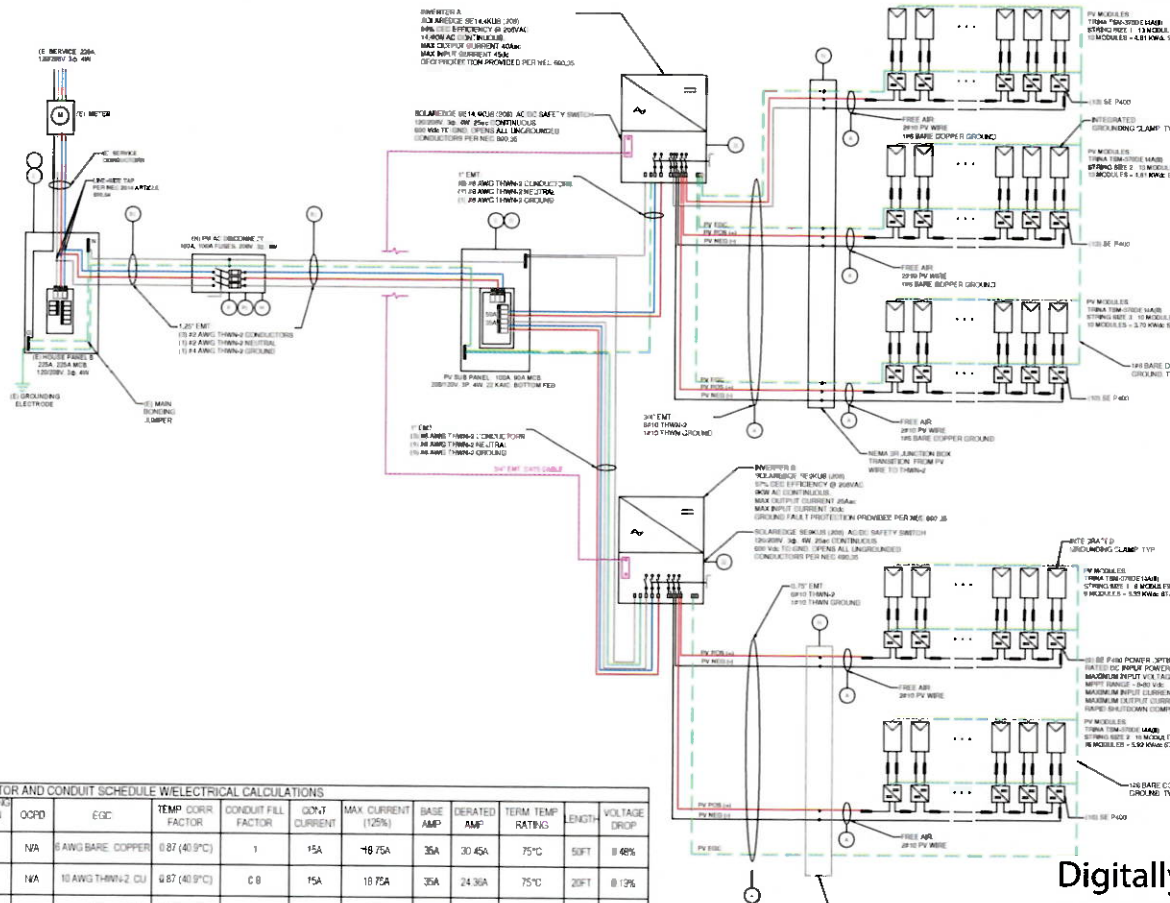
System AC Size @ STC 23.4 kW System DC Size @ STC 22.57 kW
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 (1) SOLAREGE SE8KUS (208) INVERTER & (1) SOLAREGE SE 14KUS (208) INVERTER

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WARNING - PHOTOVOLTAIC POWER SOURCE

LABEL EVERY 10'

CAUTION SOLAR CIRCUIT

LABEL EVERY 10'

WARNING
DUAL POWER SUPPLY
SOURCES: UTILITY GRID AND
SOLAR PHOTOVOLTAIC SYSTEM

REQUIRED BY: NEC 705.12(D)(3)
PLACEMENT: MAIN SERVICE PANEL

**PHOTOVOLTAIC SYSTEM
AC DISCONNECT**

OPERATING AMPS 65A
OPERATING VOLTAGE 208V

LOCATION: MAIN AC DISCONNECT

WARNING
DC JUNCTION BOX
THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE
UNGROUND AND MAY BE ENERGIZED

**PHOTOVOLTAIC SYSTEM
DC DISCONNECT**

RATED MPP CURRENT 33A
RATED MPP VOLTAGE 400V
MAXIMUM SYSTEM VOLTAGE 600V
SHORT CIRCUIT CURRENT 45A

LOCATION: BUILT IN DC DISCONNECT
REQUIRED BY NEC 690.53. ON
SOLAREDGE SE9KUS (208)

**PHOTOVOLTAIC SYSTEM
DC DISCONNECT**

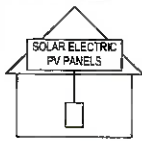
RATED MPP CURRENT 23A
RATED MPP VOLTAGE 400V
MAXIMUM SYSTEM VOLTAGE 500V
SHORT CIRCUIT CURRENT 30A

LOCATION: BUILT IN DC DISCONNECT
REQUIRED BY NEC 690.53. ON
SOLAREDGE SE14.4KUS (208)

**RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM**

NEC 2017 690.12, 690.56(CH1)(a)
**SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN**

TURN RAPID SHUTDOWN
SWITCH TO THE "OFF"
POSITION TO SHUT
DOWN PV SYSTEM AND
REDUCE SHOCK HAZARD
IN THE ARRAY

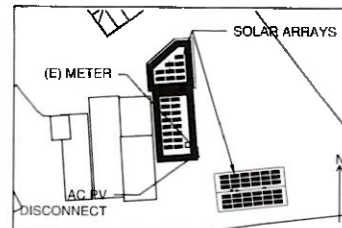


LABEL FOR PV SYSTEMS THAT SHUT DOWN THE
ARRAY AND THE CONDUCTORS LEAVING THE ARRAY

THE LABEL SHALL UTILIZE CAPITALIZED CHARACTERS
WITH A MINIMUM HEIGHT OF 3/8" IN BLACK ON
YELLOW BACKGROUND, AND THE REMAINING
CHARACTERS SHALL BE CAPITALIZED WITH A
MINIMUM HEIGHT OF 3/16" IN BLACK ON WHITE
BACKGROUND.

CAUTION

POWER TO THIS BUILDING IS SUPPLIED FROM THE
FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS
SHOWN:



WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND
LOAD SIDE MAY BE ENERGIZED IN
THE OPEN POSITION

LOCATION: BUILDING MAIN SERVICE PANEL

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LABELS

System AC Size @ STC 23.4 kW System DC Size @ STC 22.57 kW
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Date:
10/28/2019

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Q.PEAK DUO BLK-G5 300-320

Q.ANTUM SOLAR MODULE

The new **Q.PEAK DUO BLK-G5** solar module from Q CELLS impresses with its outstanding visual appearance and particularly high performance on a small surface thanks to the innovative **Q.ANTUM DUO** Technology. Q.ANTUM's world-record-holding cell concept has now been combined with state-of-the-art circuitry half cells and a six-busbar design, thus achieving outstanding performance under real conditions — both with low-intensity solar radiation as well as on hot, clear summer days.



Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY

Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.3%.



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 Technology, Anti PID Technology¹, Hot-Spot Protect and Traceable Quality Tra.Q™.



EXTREME WEATHER RATING

High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa) regarding IEC.



A RELIABLE INVESTMENT

Inclusive 12-year product warranty and 25-year linear performance guarantee².



STATE OF THE ART MODULE TECHNOLOGY

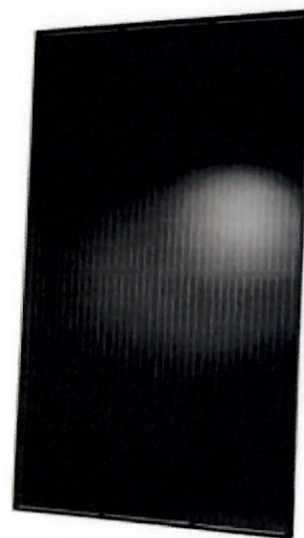
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

THE IDEAL SOLUTION FOR:



Rooftop arrays on residential buildings

Engineered in Germany

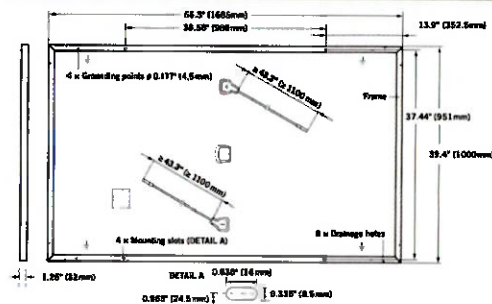


¹ APT test conditions according to IEC/TS 62804-1:2015, method B (~1500V, 168h)

² See data sheet on rear for further information.

MECHANICAL SPECIFICATION

Format	66.3 in × 39.4 in × 1.26 in (including frame) (1685 mm × 1000 mm × 32 mm)
Weight	41.2 lbs (18.7 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 20 monocrystalline Q. ANTUM solar half-cells
Junction box	2.76-3.35 in × 1.97-2.76 in × 0.51-0.83 in (70-85 mm × 50-70 mm × 13-21 mm), decentralized, IP67
Cable	4 mm ² Solar cable: (+) ≥ 43.3 in (1100 mm), (-) ≥ 43.3 in (1100 mm)
Connector	Multi-Contact MC4, IP68

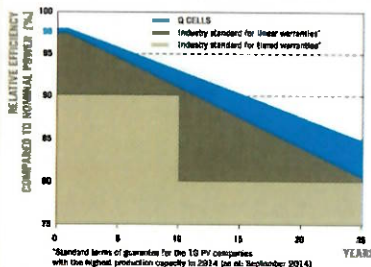


ELECTRICAL CHARACTERISTICS

POWER CLASS				300	305	310	315	320
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5W / -0W)								
Minimum	Power at MPP ¹	P _{MPP}	[W]	300	305	310	315	320
	Short Circuit Current ¹	I _{SC}	[A]	9.72	9.78	9.83	9.89	9.94
	Open Circuit Voltage ¹	V _{OC}	[V]	39.48	39.75	40.02	40.29	40.56
	Current at MPP	I _{MPP}	[A]	9.25	9.31	9.36	9.41	9.47
	Voltage at MPP	V _{MPP}	[V]	32.43	32.78	33.12	33.46	33.80
	Efficiency ¹	η	[%]	≥ 17.8	≥ 18.1	≥ 18.4	≥ 18.7	≥ 19.0
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMD ²								
Minimum	Power at MPP	P _{MPP}	[W]	224.1	227.8	231.6	235.3	239.1
	Short Circuit Current	I _{SC}	[A]	7.83	7.88	7.92	7.97	8.01
	Open Circuit Voltage	V _{OC}	[V]	37.15	37.40	37.66	37.91	38.17
	Current at MPP	I _{MPP}	[A]	7.28	7.32	7.37	7.41	7.45
	Voltage at MPP	V _{MPP}	[V]	30.78	31.11	31.44	31.76	32.08

¹Measurement tolerances P_{MPP} ± 3%; I_{SC}, V_{OC} ± 5% at STC: 1000 W/m², 25 ± 2 °C, AM 1.5 G according to IEC 60904-3 · ²800 W/m², NMOT, spectrum AM 1.5 G

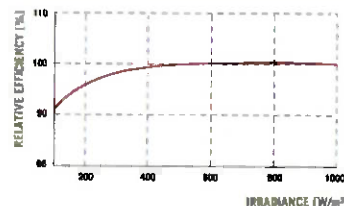
Q CELLS PERFORMANCE WARRANTY



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 organization 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]	-0.28
Temperature Coefficient of P _{MPP}	γ	[%/K]	-0.37	Normal Operating Module Temperature	NMOT	[°F]	109 ± 5.4 (43 ± 3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V _{sys}	[V]	1000 (IEC) / 1000 (UL)	Safety Class	II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating	C (IEC) / TYPE 1 (UL)
Max. Design Load, Push / Pull (UL) ²	[lbs/ft ²]	75 (3600 Pa) / 55 (2667 Pa)	Permitted module temperature on continuous duty	-40 °F up to +185 °F (-40 °C up to +85 °C)
Max. Test Load, Push / Pull (UL) ²	[lbs/ft ²]	113 (5400 Pa) / 84 (4000 Pa)	² see installation manual	

QUALIFICATIONS AND CERTIFICATES

UL 1703; VDE Quality Tested; CE-compliant;
IEC 61215:2016; IEC 61730:2016, Application class A



PACKAGING INFORMATION

Number of Modules per Pallet	32
Number of Pallets per 53' Trailer	30
Number of Pallets per 40' High Cube Container	26
Pallet Dimensions (L × W × H)	69.3 in × 45.3 in × 46.9 in (1760 mm × 1150 mm × 1190 mm)
Pallet Weight	1415 lbs (642 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.

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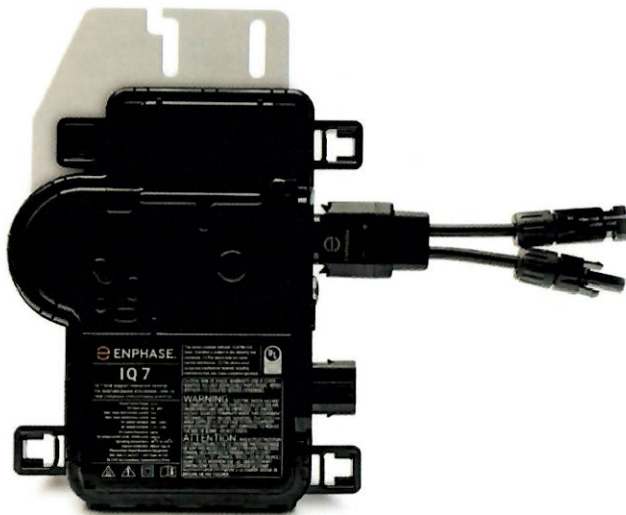
Specifications subject to technical changes © Hanwha Q CELLS Q PEAK DUO BLK-GS_300-320_2018-03_Ren02_NA

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72 cell modules



To learn more about Enphase offerings, visit enphase.com



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)		IQ7-60-2-US		IQ7PLUS-72-2-US	
Commonly used module pairings ¹		235 W - 350 W +		235 W - 440 W +	
Module compatibility		60-cell PV modules only		60-cell and 72-cell PV modules	
Maximum input DC voltage		48 V		60 V	
Peak power tracking voltage		27 V - 37 V		27 V - 45 V	
Operating range		16 V - 48 V		16 V - 60 V	
Min/Max start voltage		22 V / 48 V		22 V / 60 V	
Max DC short circuit current (module Isc)		15 A		15 A	
Overvoltage class DC port		II		II	
DC port backfeed current		0 A		0 A	
PV array configuration		1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit			
OUTPUT DATA (AC)		IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power		250 VA		295 VA	
Maximum continuous output power		240 VA		290 VA	
Nominal (L-L) voltage/range ²		240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current		1.0 A (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)
Nominal frequency		60 Hz		60 Hz	
Extended frequency range		47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles		5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit ³		16 (240 VAC)	13 (208 VAC)	13 (240 VAC)	11 (208 VAC)
Overvoltage class AC port		III		III	
AC port backfeed current		0 A		0 A	
Power factor setting		1.0		1.0	
Power factor (adjustable)		0.85 leading ... 0.85 lagging		0.85 leading ... 0.85 lagging	
EFFICIENCY		@240 V	@208 V	@240 V	@208 V
Peak efficiency		97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency		97.0 %	97.0 %	97.0 %	97.0 %
MECHANICAL DATA					
Ambient temperature range		-40°C to +65°C			
Relative humidity range		4% to 100% (condensing)			
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)		MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)			
Dimensions (WxHxD)		212 mm x 175 mm x 30.2 mm (without bracket)			
Weight		1.08 kg (2.38 lbs)			
Cooling		Natural convection - No fans			
Approved for wet locations		Yes			
Pollution degree		PD3			
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure			
Environmental category / UV exposure rating		NEMA Type 6 / outdoor			
FEATURES					
Communication		Power Line Communication (PLC)			
Monitoring		Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.			
Disconnecting means		The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.			
Compliance		CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.			

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.

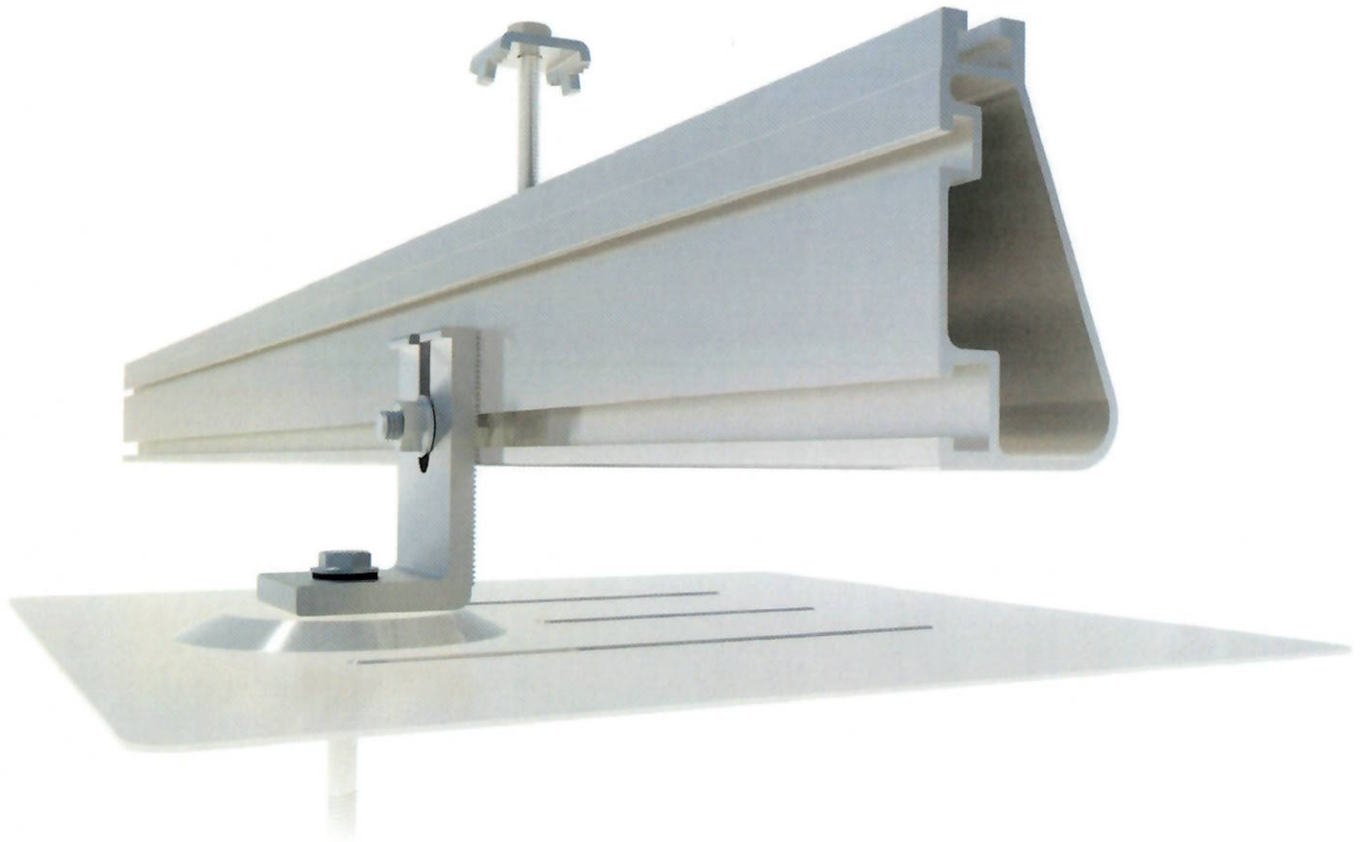
2. Nominal voltage range can be extended beyond nominal if required by the utility.

3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com



Roof Mount System



Built for solar's toughest roofs.

IronRidge builds the strongest roof mounting system in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.



Strength Tested

All components evaluated for superior structural performance.



PE Certified

Pre-stamped engineering letters available in most states.



Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof.



Design Software

Online tool generates a complete bill of materials in minutes.



Integrated Grounding

UL 2703 system eliminates separate module grounding components.



20 Year Warranty

Twice the protection offered by competitors.

XR Rails

XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear & black anod. finish

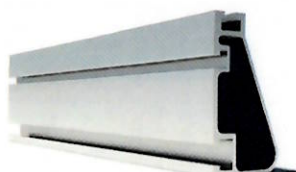
XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear & black anod. finish

XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Internal Splices



All rails use internal splices for seamless connections.

- Self-tapping screws
- Varying versions for rails
- Grounding Straps offered

Attachments

FlashFoot



Anchor, flash, and mount with all-in-one attachments.

- Ships with all hardware
- IBC & IRC compliant
- Certified with XR Rails

Slotted L-Feet



Drop-in design for rapid rail attachment.

- High-friction serrated face
- Heavy-duty profile shape
- Clear & black anod. finish

Standoffs



Raise flush or tilted systems to various heights.

- Works with vent flashing
- Ships pre-assembled
- 4" and 7" Lengths

Tilt Legs



Tilt assembly to desired angle, up to 45 degrees.

- Attaches directly to rail
- Ships with all hardware
- Fixed and adjustable

Clamps & Grounding

End Clamps



Slide in clamps and secure modules at ends of rails.

- Mill finish & black anod.
- Sizes from 1.22" to 2.3"
- Optional Under Clamps

Grounding Mid Clamps



Attach and ground modules in the middle of the rail.

- Parallel bonding T-bolt
- Reusable up to 10 times
- Mill & black stainless

T-Bolt Grounding Lugs



Ground system using the rail's top slot.

- Easy top-slot mounting
- Eliminates pre-drilling
- Swivels in any direction

Accessories



Provide a finished and organized look for rails.

- Snap-in Wire Clips
- Perfected End Caps
- UV-protected polymer

Free Resources



Design Assistant

Go from rough layout to fully engineered system. For free.

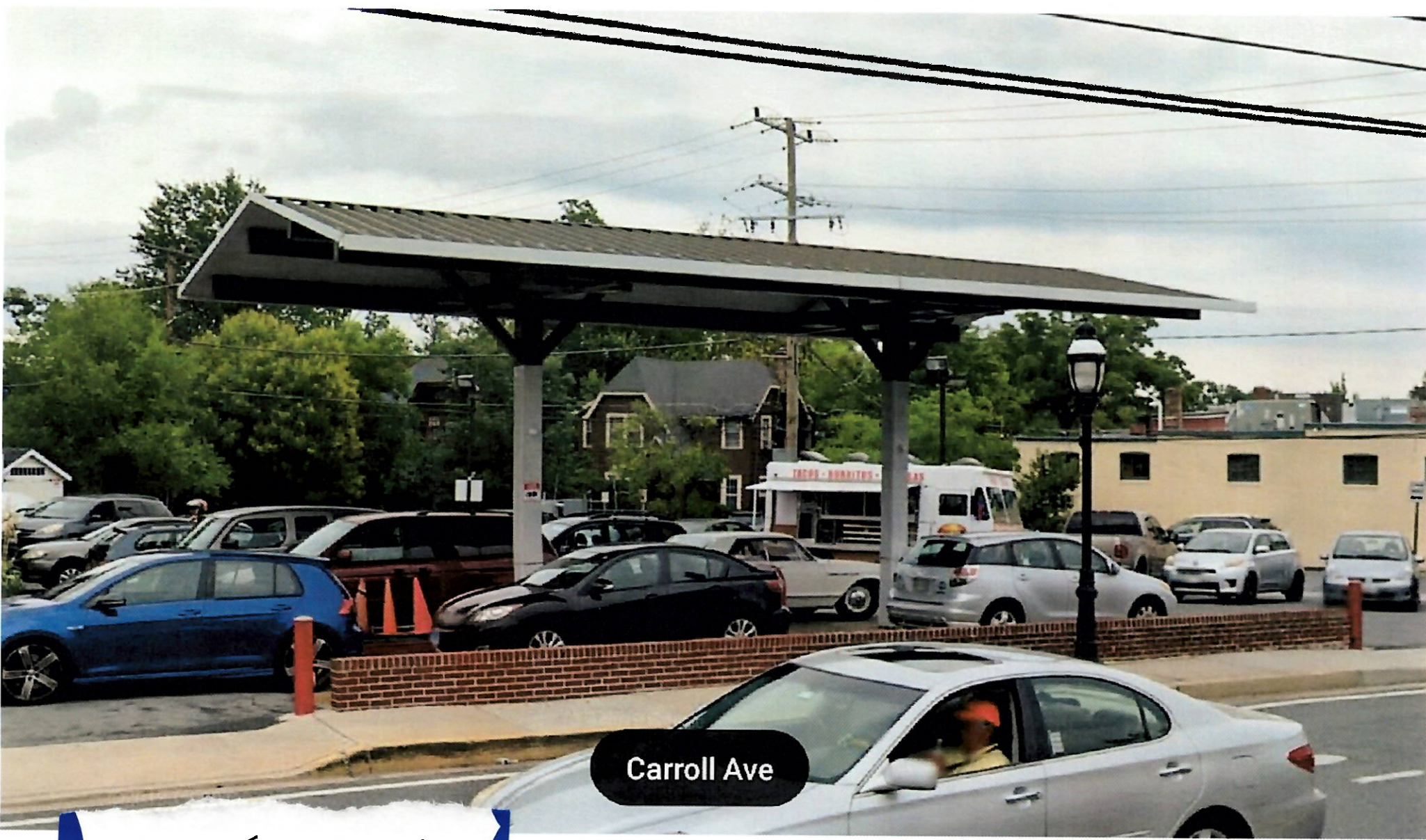
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NABCEP Certified Training

Earn free continuing education credits, while learning more about our systems.

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Carroll Ave

View From South



View from East