SHEET DESCRIPTION	SHEET
Project Notes	COVER
Site Plans and layouts	PV-1
Roof Mounting layouts	PV-2
Roof Mounting details	PV-2.1
Fire Labels & Equipment	PV-3
Plate equipment location	PV-3.1
Conduit Run & Grounding Details	PV-4
Single Line Diagram & Calculations	PV-5
Manufacture Spec. Sheets	PV-6

#### **GENERAL BUILDING NOTES**

- STRUCTURAL MEMBER LOCATIONS ARE ESTIMATED AND SHOULD BE LOCATED AND VERIFIED AS NECESSARY FOR LAG BOLT OR ANY OTHER TYPE OF PENETRATIONS BY CONTRACTOR.
- 2. SEAL CONNECTION POINTS WITH ROOF GRADE PENETRATIONS ARE SEALED WITH FLASHING ROOF & FLASHING SEALANT, OR ANY OTHER MEAN APPROVED BY THE ATTACHMENT MANUFACTURER.
- PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING. 3.

#### GENERAL ELECTRICAL NOTES

- ALL ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH 2012 STANDARD BUILDING CODE AND NFPA 70, 2017 EDITION, NATIONAL ELECTRICAL CODE (NEC). UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE. 2. WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC ARTICLE 110.26. 3 ALL EQUIPMENT INSTALLED SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) PER NEC ARTICLE 110.3. 4 PV POWER CIRCUIT LABELS SHALL APPEAR ON EVERY SECTION OF THE WIRING SYSTEM THAT IS SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS. 5. ALL WARNING SIGN(S) OR LABEL(S) SHALL COMPLY WITH NEC ARTICLE 110.21 (B). LABEL WARNINGS SHALL ADEQUATELY WARN OF THE HAZARD, LABELS SHALL BE PERMANENTLY 6. AFFIXED TO THE EQUIPMENT, AND LABELS REQUIRED SHALL BE SUITABLE FOR THE ENVIRONMENT. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.8 (D). CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.8 (C). 8. EXACT CONDUIT RUN LOCATIONS SUBJECT TO CHANGE. 9. PROVIDE GROUND ELECTRODE SYSTEM FROM INVERTER TO EXISTING MAIN SERVICE GROUND ELECTRODE. 10. GROUND ELECTRODE CONDUCTOR FROM INVERTER TO GROUND ELECTRODE TO BE MINIMUM PROTECTION OF BARE ARMOR SHEATED CABLE FOR ALL CONDUCTOR SIZES. 11. ALL GROUND CONNECTED TO MAIN SERVICE GROUND IN MAIN SERVICE PANEL 12. 13. INVERTER IS LISTED TO UL-1741 "UTILITY INTERACTIVE" ALL CONDUCTORS SHALL BE 600V, 90°C STANDARD COPPER. 14. ALL CONDUCTORS IN CONDUIT SHALL BE THWN-2. 15. MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2% 16.
- 17. ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.

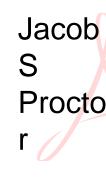
#### **DESIGN DATA**

#### WIND LOADS

- 1. BASIC WIND SPEED 108 MPH. (@ 3 SEC. GUST.)
- 2. RISK CATEGORY
- 3. WIND EXPOSURE CATEGORYC
- 4- "EXPOSURE C" SHALL BE ASSUMED UNLESS THE SITE MEETS
- THE DEFINITION OF ANOTHER TYPE EXPOSURE.

### **APPLICABLE CODES**

-STANDARD BUILDING CODE 2020 -ELECTRICAL CODE, NFPA 70 / NEC 2017

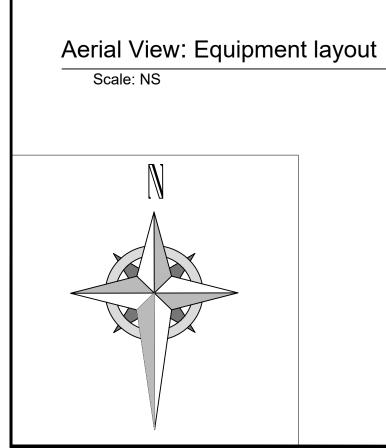


Vector Structural Engineering ha structure with loading from the sola capacity to the metal roofing. The d system, racking connections, and al others. Mechanical, architectural, ar nonstructural aspects of the design Electrical is by others, unless starr

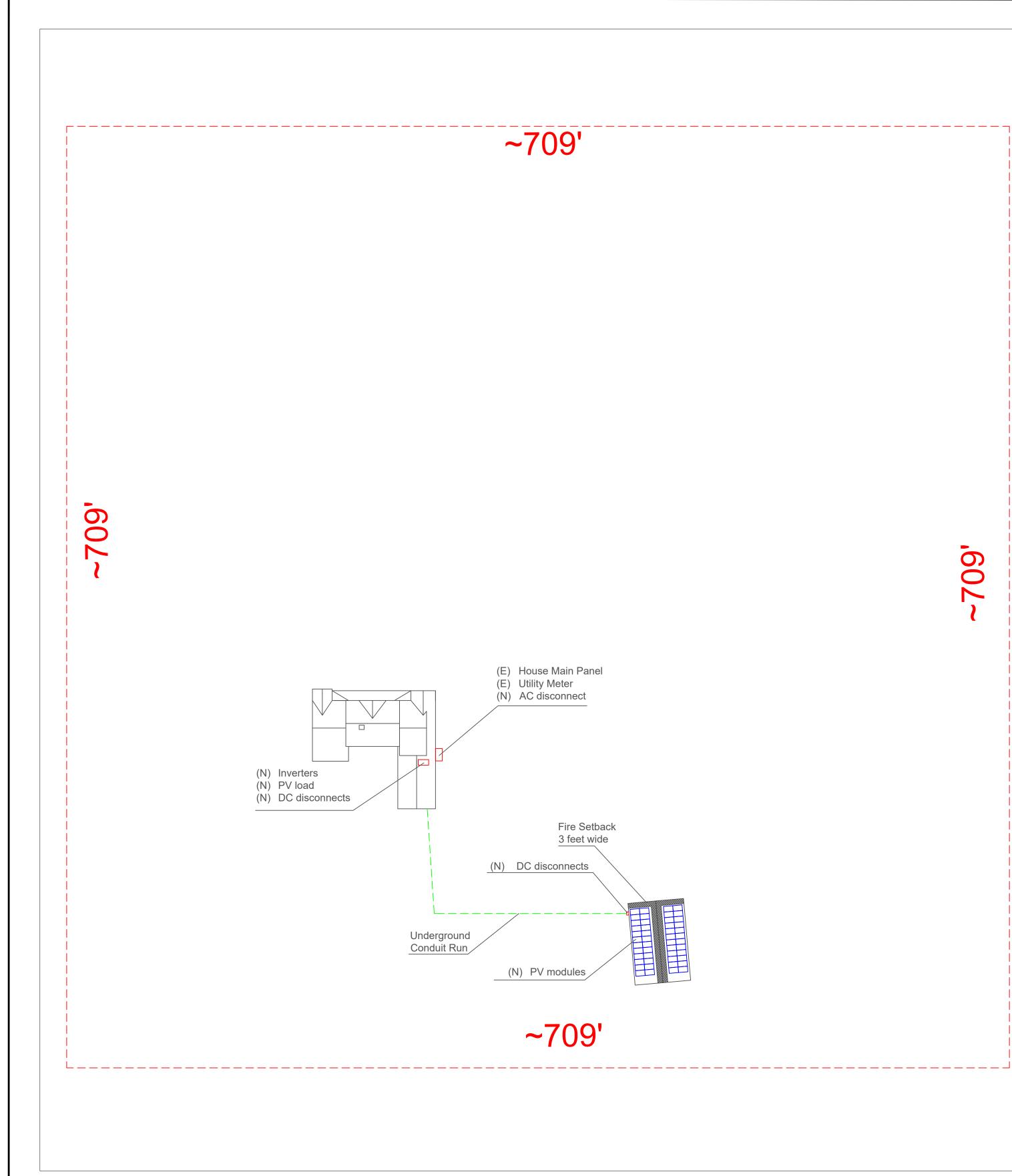


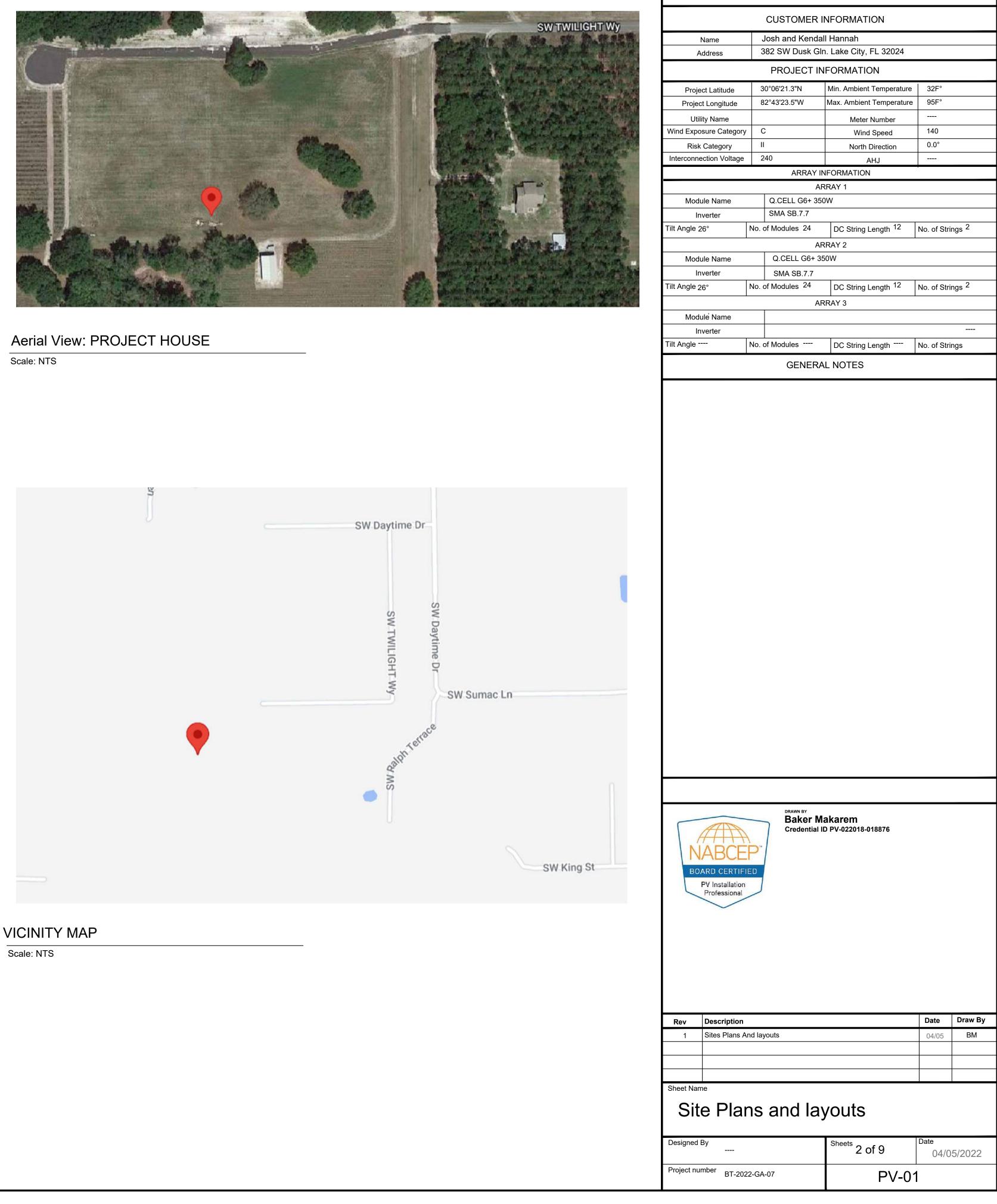
Digitally signed by Jacob S Proctor Date: 2022.04.21 09:37:18 -06'00'	ASI W. GALENA PARK BLVD. STE. 101 PHONE (BCI) 990-1775 WWW.VECTORSE.COM NO. 74277 NO. 74277 NO	
viewed the existing	VSE Project Number: U3996.0007.221	
array and clamps sign of the racking other structural is by d all other	This item has been digitally signed and sealed by Jacob S. Proctor on the date adjacent to the seal. Printed copies of this document are not	
are by others. ed by Dean Levorsen.	considered signed and sealed and the signature must be verified on any electronic copies.	
		Proj
	See detail in	Proje
	structural letter for	Ut
	additional metal	Wind Exp
	roof connection	Ris
	requirements.	Interconr
		Mod
		· · · · ·

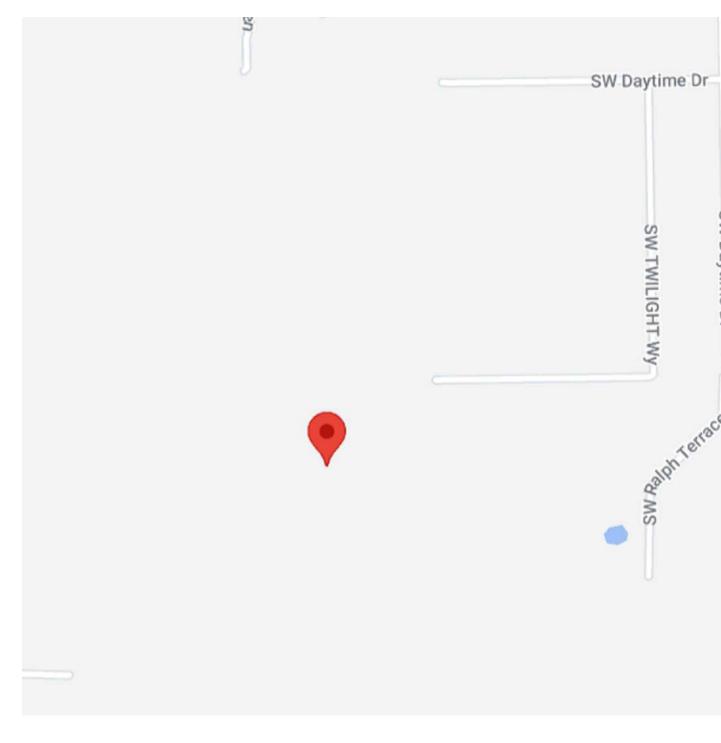
			NFORMATION		
Name Address		losh and Kendall 82 SW Dusk Gln	Hannah . Lake City, FL 32024		
		PROJECT IN	FORMATION		
Project Latitude Project Longitude		30°06'21.3"N 82°43'23.5"W	Min. Ambient Temperature Max. Ambient Temperature	32F° 95F°	
Utility Name			Meter Number		
Wind Exposure Catego Risk Category	, y		Wind Speed North Direction	140 0.0°	
Interconnection Voltag	e 2	240	AHJ		
			IFORMATION		
Module Name		Q.CELL G6+ 35			
Inverter Tilt Angle 26°	No.	SMA SB.7.7 of Modules 24	DC String Length 12	No. of Stri	ngs 2
		AR	RAY 2		•
Module Name		Q.CELL G6+ 35 SMA SB.7.7	50W		
Tilt Angle 26°	No.	of Modules 24	DC String Length <sup>12</sup>	No. of Stri	ngs <sup>2</sup>
Module Name		 AR	RAY 3		
Inverter					
Tilt Angle	No.	of Modules	DC String Length	No. of Stri	ngs
		GENERA	L NOTES		
		DRAWN BY: Baker M Credential I	akarem		
NABC BOARD CERT PV Installati Professiona	on				
Rev Descriptio				Date	Draw By
1 Project Not	es and	information		04/05	BM
Sheet Name Project	Nc	otes			<u> </u>
Designed By			Sheets 1 of 9	Date 04/0	5/2022
Project number BT-2	022-G/	4-07			UILULL
			COVE		



**PROJECT DESCRIPTION:** 48x Q.PEAK DUO G6+ (350W) 2X SMA SB7.7 SYSTEM SIZE: 16.8 KWp DC STC Array Area: ~903 SQ FT

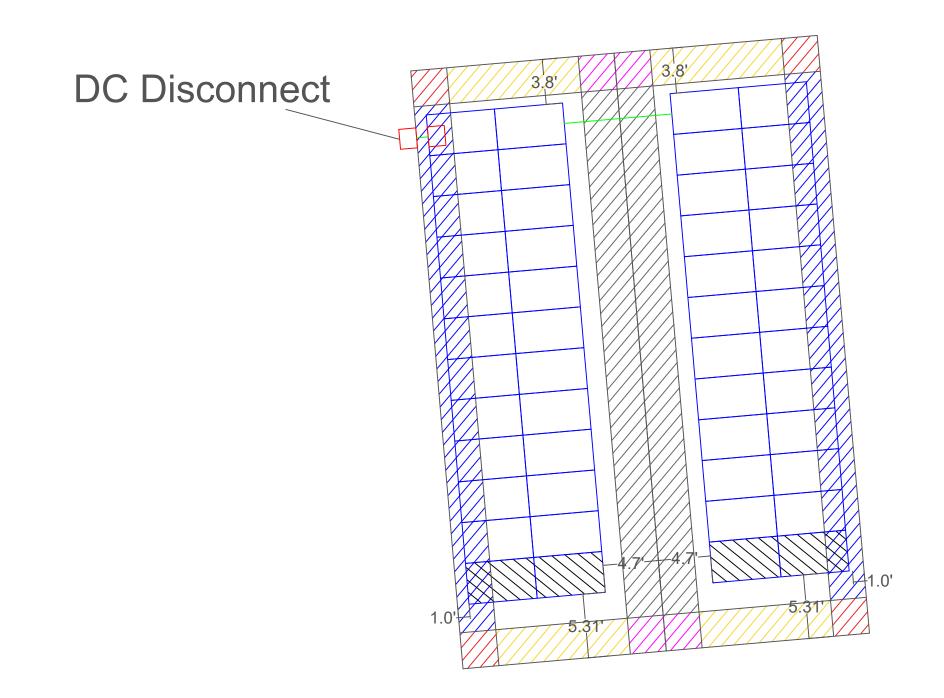




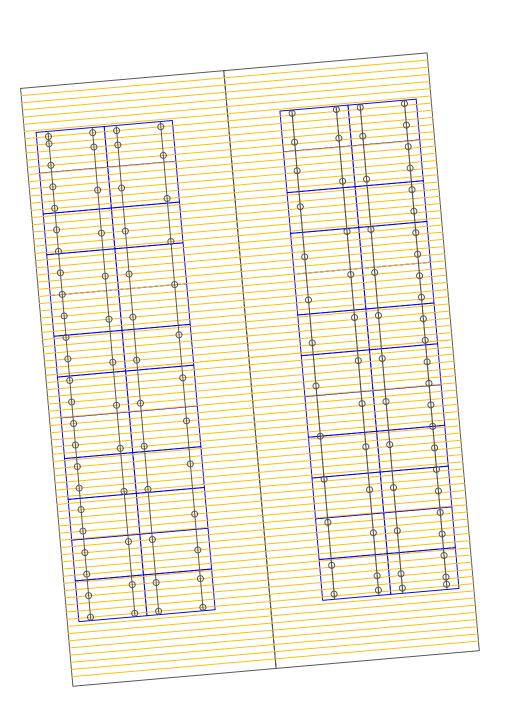


VICINITY MAP

709'

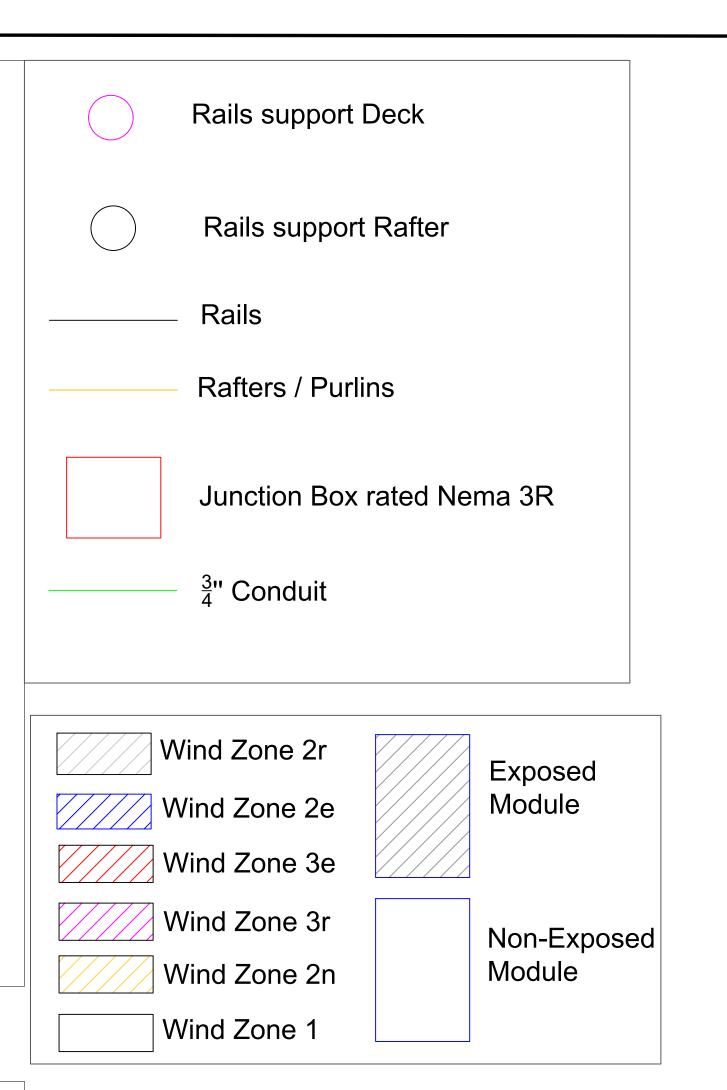


Aerial View: SYSTEM RAIL AND MOUNTING LAYOUT Scale: 1-1/2'=1'-0"



#### Aerial View: SYSTEM RAIL AND MOUNTING LAYOUT

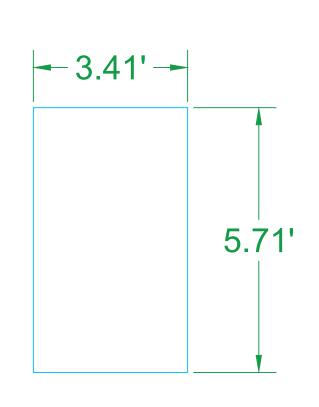
Scale: 1-1/2'=1'-0"



ROOF	MAX VALUES	WIND ZONE 1	WIND ZONE 2e	WIND ZONE 2n
Exposed	Max spam between Attachments	3 Ft	2 Ft	N/A
	Max Cantilever	1 Ft	1 Ft	N/A
Non	Max spam between Attachments	3 Ft	4 Ft	N/A
Exposed	Max Cantilever	1 Ft	1 Ft	N/A

General Notes;

- Existing Residential building is a Metal roof, 7.2"structural box rib.
- Rafters/trusses/ribs At Roof 1 and 2 located each 7.2" inches.
- Equipments must be install as per manufacturer specifications.
- Measurements may vary from drawings. Contractor must verify on site for proper installation.
- Railing System will be SnapNRack ultraRail and S5! Protea Bracket

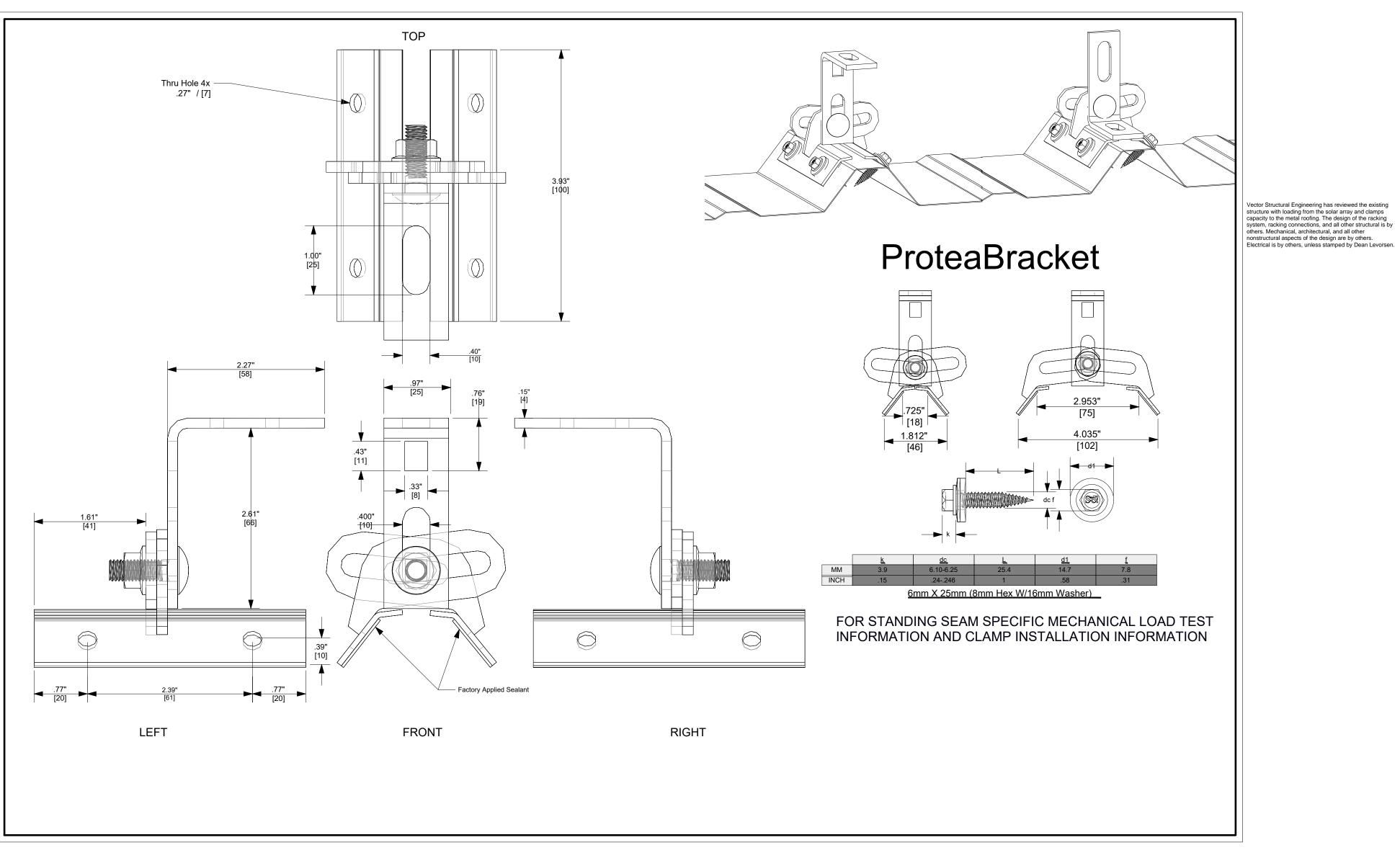


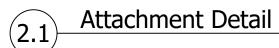
MANUFACTURE:Q.CELL G6+350 (350W) MODULES

Name Address Project Latitude Project Longitude Utility Name nd Exposure Category Risk Category terconnection Voltage Module Name Inverter Angle 26°	Josh and Kenda           382 SW Dusk G           PROJECT II           30°06'21.3"N           82°43'23.5"W           /           C           II           240           ARRAY           Q.CELL G6+ 35	In. Lake City, FL 32024 NFORMATION Min. Ambient Temperature Max. Ambient Temperature Meter Number	
Address Project Latitude Project Longitude Utility Name Ind Exposure Category Risk Category terconnection Voltage Module Name Inverter	382 SW Dusk G PROJECT II 30°06'21.3"N 82°43'23.5"W C II 240 ARRAY Q.CELL G6+ 35	In. Lake City, FL 32024 NFORMATION Min. Ambient Temperature Max. Ambient Temperature Meter Number	
Project Longitude Utility Name nd Exposure Category Risk Category terconnection Voltage Module Name Inverter	30°06'21.3"N 82°43'23.5"W C II 240 ARRAY A Q.CELL G6+ 35	Min. Ambient Temperature Max. Ambient Temperature Meter Number	
Project Longitude Utility Name nd Exposure Category Risk Category terconnection Voltage Module Name Inverter	82°43'23.5"W C II 240 ARRAY A Q.CELL G6+ 35	Max. Ambient Temperature Meter Number	
Utility Name nd Exposure Category Risk Category terconnection Voltage Module Name Inverter	C II 240 ARRAY A Q.CELL G6+ 35	Meter Number	32F°
nd Exposure Category Risk Category terconnection Voltage Module Name Inverter	II 240 ARRAY A Q.CELL G6+ 35		95F°
terconnection Voltage Module Name Inverter	240 ARRAY A Q.CELL G6+ 35	Wind Speed	140
Module Name Inverter	ARRAY A Q.CELL G6+ 35	North Direction	0.0°
Inverter	A Q.CELL G6+ 35		
Inverter		RRAY 1	
	SMA SB.7.7	50W	
	No. of Modules 24	DC String Length <sup>12</sup>	No. of Strings <sup>2</sup>
		RRAY 2	
Module Name Inverter	Q.CELL G6+ 3 SMA SB.7.7	50W	
Angle 26°	No. of Modules <sup>24</sup>	DC String Length <sup>12</sup>	No. of Strings <sup>2</sup>
	A	RRAY 3	
Module Name			
Angle	No. of Modules	DC String Length	No. of Strings
		AL NOTES	-
NABCE BOARD CERTIF PV Installation Professional	Credential P IED	<b>//akarem</b> ID PV-022018-018876	
PV Installation	Baker M Credential		Date Dra
PV Installation Professional	Baker M Credential	ID PV-022018-018876	Date         Dra           04/05         E
PV Installation Professional	ED Baker M Credential	ID PV-022018-018876	
PV Installation       Professional       Rev     Description       1     Roof mountin	ED Baker M Credential	ID PV-022018-018876	
PV Installation       Professional       Rev     Description       1     Roof mountin       1     Roof mountin	ED Baker M Credential	ID PV-022018-018876	
PV Installation       Professional       Rev     Description       1     Roof mountin       1     Roof mountin	ng and accesories layou	ID PV-022018-018876	

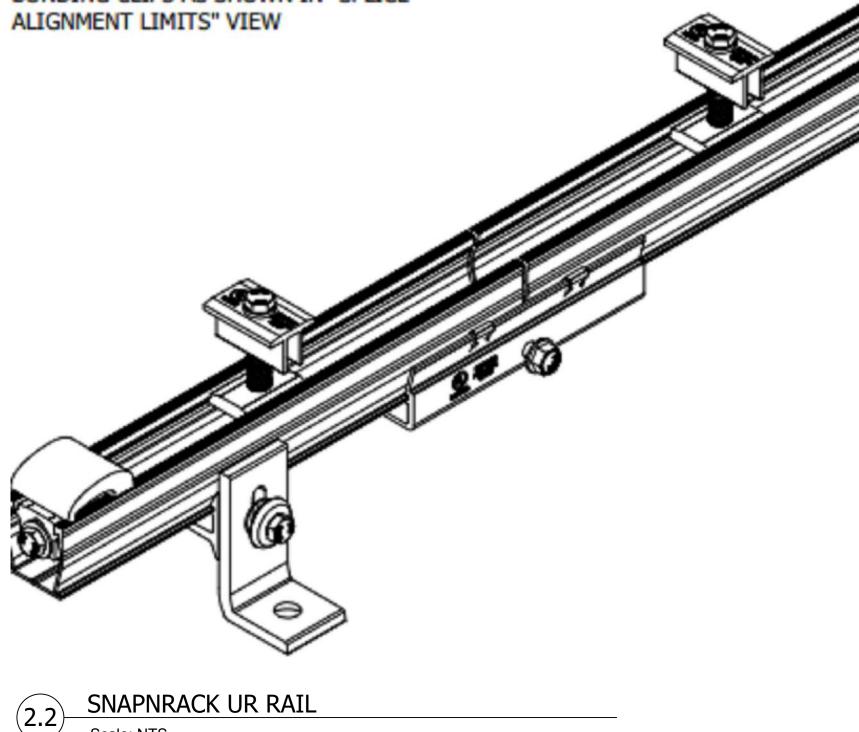


roof connection requirements.



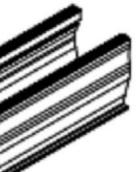


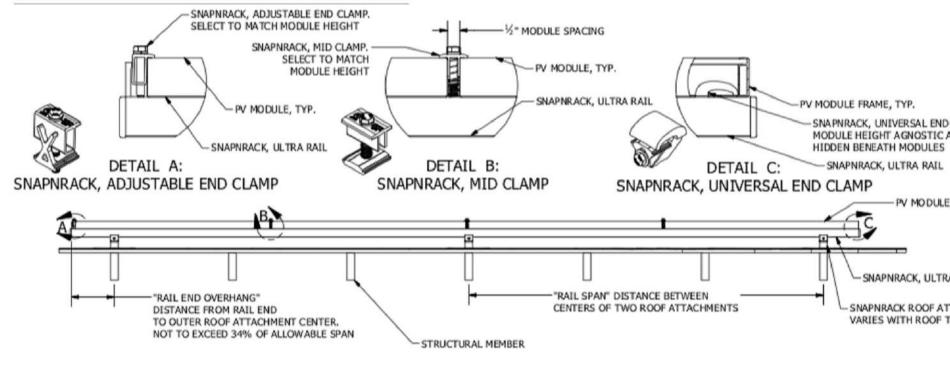
# CENTER SPLICE BETWEEN THE TWO BONDING CLIPS AS SHOWN IN "SPLICE





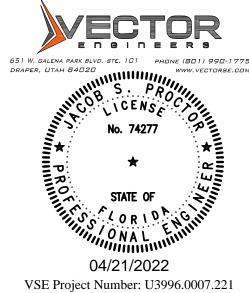
Scale: NTS







SNAPNRACK ACCESORIES DETAIL Scale: NTS



This item has been digitally signed and sealed by Jacob S. Proctor on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

See detail in structural letter for additional metal roof connection requirements.

	CUSTOME	R INFORMA	ΓΙΟΝ		
Name	Josh and Ken				
Address	382 SW Dusk				
			_	. <u></u>	
Project Latitude Project Longitude	30°06'21.3"N 82°43'23.5"W		nt Temperature nt Temperature		
Utility Name		Mete	er Number		
Wind Exposure Category Risk Category	C II		nd Speed	140 0.0°	
Interconnection Voltage	240		AHJ		
		Y INFORMATIO	N		
Module Name	Q.CELL G6+	ARRAY 1 350W			
Inverter	SMA SB.7.7				
Filt Angle 26°	No. of Modules 24		Length <sup>12</sup>	No. of Stri	ngs <sup>2</sup>
Module Name	Q.CELL G6+ 3	ARRAY 2			
Inverter	SMA SB.7.7				
Filt Angle 26°	No. of Modules 24	DC String	Length <sup>12</sup>	No. of Stri	ngs <sup>2</sup>
Module Name		ARRAY 3			
Inverter					
	No. of Modules	DC String	Length	No. of Stri	ngs
	GENE	RAL NOTES			
NABCE BOARD CERTIFIE PV Installation Professional	Credentia	Makarem al ID PV-022018	-018876		
Rev Description	1 details transidas			<b>Date</b>	Draw By
	g details, Ironridge			<b>Date</b> 04/05	Draw By BM
	) details, Ironridge				
1 Roof mounting	g details, Ironridge	nting	details	04/05	
1 Roof mounting			details	04/05	
1 Roof mounting		Sheets	details	04/05	

— SNAPNRACK, UNIVERSAL END CLAMP. MODULE HEIGHT AGNOSTIC AND HIDDEN BENEATH MODULES

- PV MODULE, TYP.

- SNAPNRACK, ULTRA RAIL

SNAPNRACK ROOF ATTACHMENT, VARIES WITH ROOF TYPE

### INVERTER 1 & 2



ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

## 

ELECTRIC SHOCK HAZARD IF GROUND FAULT IS INDICATED ALL NORMALLY GROUNDED CONDUCTORS MAY BE 

MAXIMUM VOLTAGE 450 MAXIMUM CIRCUIT CURRENT 10 MAX. RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED) JUCTION BOX

WARNING DC JUNCTION BOX

WARNING: PHOTOVOLTAIC POWER SOURCE

Conduit From PV to Inverter

WARNING: PHOTOVOLTAIC POWER SOURCE

### PV LOAD

# **WARNING** DUAL POWER SUPPLY SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM



### AC DISCONNECT

PHOTOVOLTAIC SYSTEM AC DISCONNECT 🥼





RATED AC OUTPUT CURRENT 64 A NOMINAL OPERATING AC VOLTAGE 240 V

**WARNING** 

ELECTRIC SHOCK HAZARD

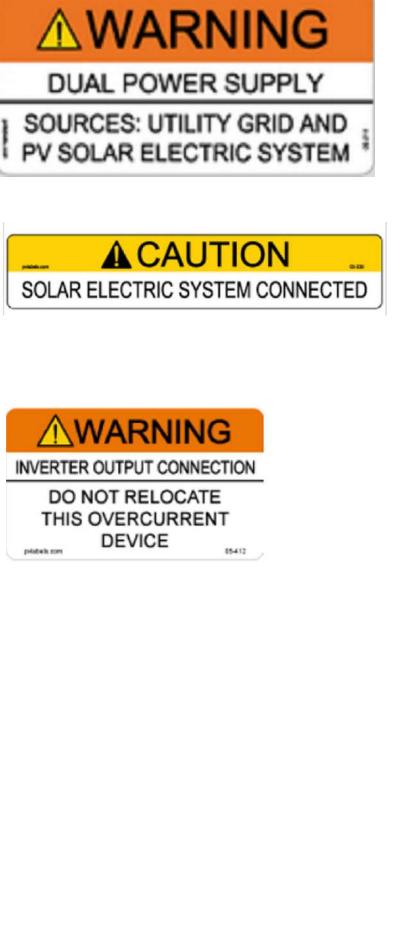
TERMINALS ON THE LINE AND

LOAD SIDES MAY BE ENERGIZED

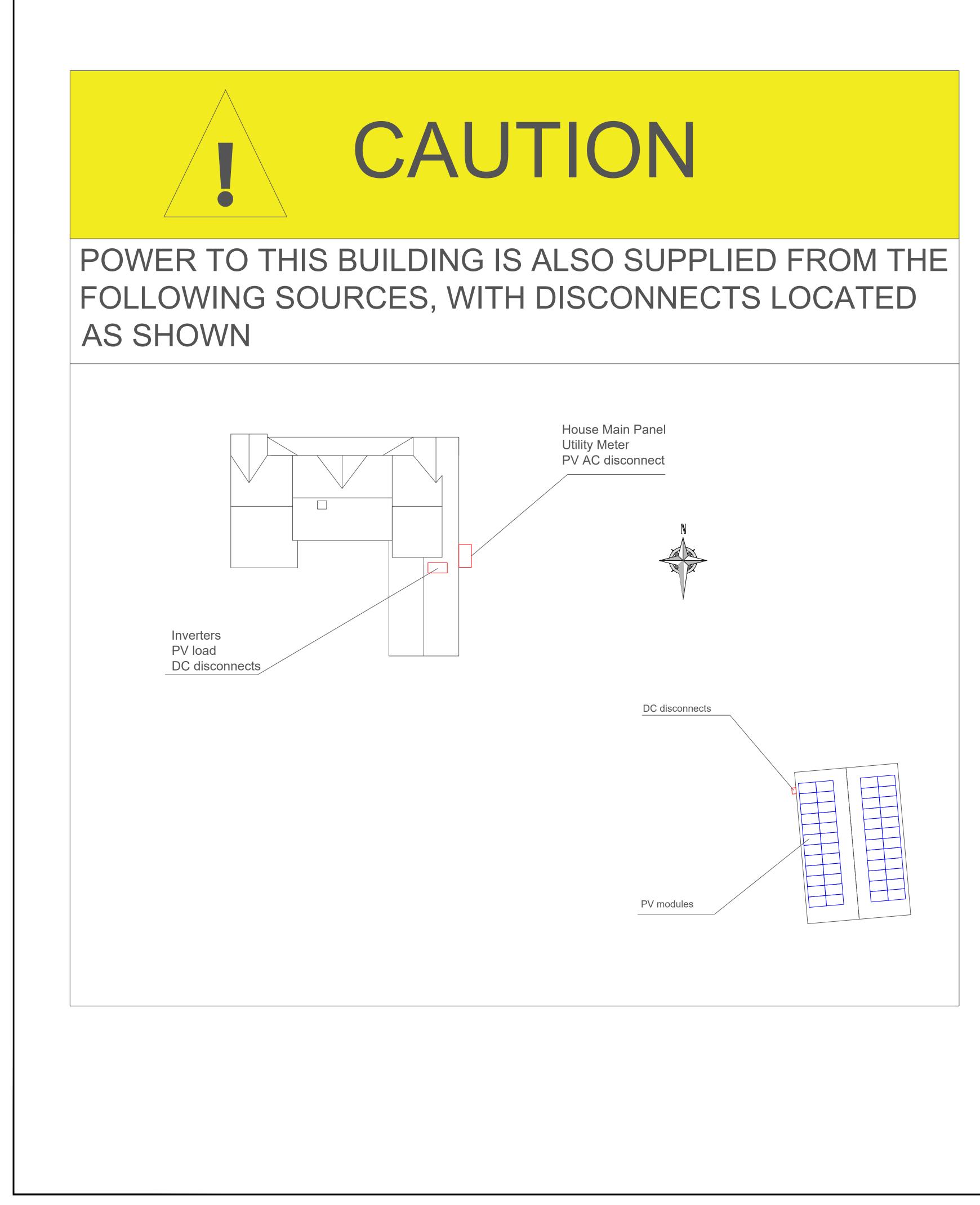
IN THE OPEN POSITION



### POINT OF INTERCONNECTION



	CUSTOMER II	NFORMATION		
Name	Josh and Kendal			
Address		. Lake City, FL 32024		
	PROJECT IN			
Project Latitude Project Longitude	30°06'21.3"N 82°43'23.5"W	Min. Ambient Temperature Max. Ambient Temperature	32F° 95F°	
Utility Name		Meter Number		
Wind Exposure Category Risk Category	C	Wind Speed	140 0.0°	
Interconnection Voltage	240	AHJ		
		IFORMATION RAY 1		
Module Name	Q.CELL G6+ 350			
Inverter Tilt Angle 26° I	SMA SB.7.7 No. of Modules 24	DC String Length <sup>12</sup>	No. of Stri	nas 2
		RAY 2		iigo
Module Name	Q.CELL G6+ 350	W		
Inverter Tilt Angle 26°	SMA SB.7.7 No. of Modules 24	DC String Length <sup>12</sup>	No. of Stri	ngs 2
	AR	RAY 3		
Module Name Inverter				
	No. of Modules	DC String Length	No. of Stri	ngs
	CONTRACTOR	INFORMATION		
Rev Description		and conduite	<b>Date</b> 04/05	Draw By
1 Fire labels and	location in equipments	anu conduits.	0-1/00	BM
Sheet Name				
Fire Labe	els & Equ	lipment		
Designed By		Sheets 5 of 0	Date	
Project number		5 of 9		)5/2022
Project number BT-2022	2-GA-07	PV-03	3	

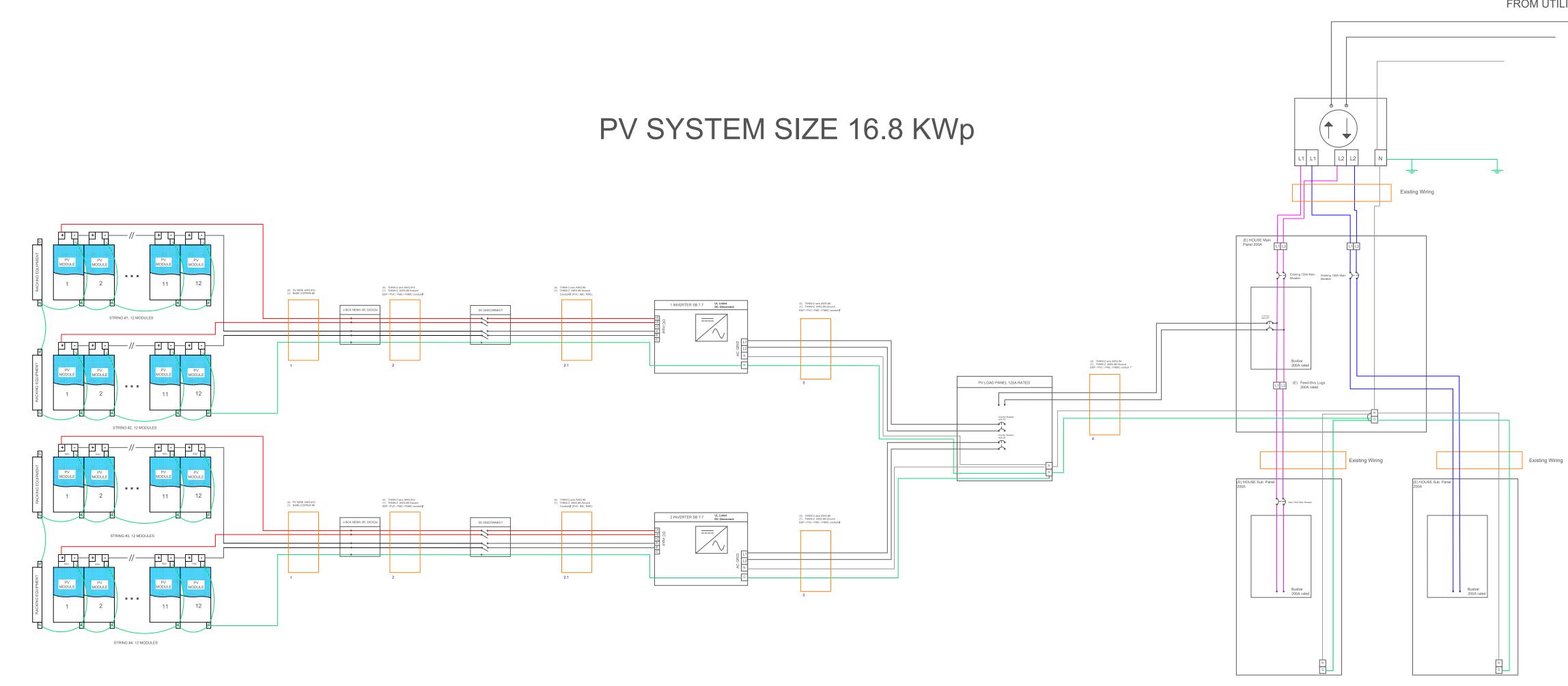


### **GENERAL CONSIDERATIONS**

1.THE PLAQUE SHALL BE METAL OR PLASTIC, WITH ENGRAVED OR MACHINE PRINTED LETTERS, IN CONTRASTING COLOR TO THE PLAQUE. THIS PLAQUE WILL BE ATTACHED BY POP/RIVETS, SCREWS OR OTHER APPROVED FASTENERS.

2. LOCATION OF THE PLAQUES SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT, ACCORDING TO NEC 2017 690.56

		CUSTOMER I	NFORMATION		
Name	J	Josh and Kendal	l Hannah		
Address	3	82 SW Dusk Glr	n. Lake City, FL 32024		
Project Latitude	3	0°06'21.3"N	FORMATION Min. Ambient Temperature	32F°	
Project Longitude		2°43'23.5"W	Max. Ambient Temperature	95F°	
Utility Name Wind Exposure Categor	y C		Meter Number Wind Speed	140	
Risk Category	, II		North Direction	0.0°	
Interconnection Voltage	2	40 ARRAY IN	AHJ		
		AR	RAY 1		
Module Name Inverter		Q.CELL G6+ 35 SMA SB.7.7	50W		
Tilt Angle 26°	No. c	of Modules 24	DC String Length <sup>12</sup>	No. of String	ıs <sup>2</sup>
Module Name		AR Q.CELL G6+ 350	RAY 2		
Inverter	1	SMA SB.7.7			
Tilt Angle 26°	No. c	of Modules <sup>24</sup>	DC String Length <sup>12</sup>	No. of String	s 2
Module Name					
Inverter Tilt Angle	No. (	of Modules	DC String Length	No. of String	
			INFORMATION		5
Rev         Description           1         Fire label plate					Draw E
		location of disconr	nect and power sources	Date         I           04/05         I	Draw E BM



					Wire	e Ampacit	y Calculation			Voltage Dr	op Calcula	ation (%)	
TAG	DESCRIPTION	Conductor size	Ground Conductor	Output Current	Irradiance Current 125%	80% Conductor Ampacity	(Wire Rating)x(Ambient Temp Factor)x	(# Conduct Factor)	Voltage	Length (Feet)	Ω (ohm/KFt)	Voltage Drop	expressed in %
1	PV source Circuit	PV wire #10	Bare Copper #6	10.73A	13.41A	16.77A	40X0.91X1=36.4A	PASS	450V	140	1.24	0.72	PASS
2	PV Source Circuit	THHN wire #10	THHN #8	10.73A	13.41A	16.77A	40X0.91X0.8=29.1A	PASS	450V	30	1.24	0.08	PASS
2.1	PV Source Circuit	THWN-2 #8	THWN-2 #8	10.73A	13.41A	16.77A	55X0.91X0.8=50.05A	PASS	450V	400	0.778	0.74	PASS
3	Inverter AC Circuit	THHN #8	THHN #8	32A	N/A	40A	55X0.91X1=50A	PASS	240V	20	0.778	0.21	PASS
4	Inverter AC Circuit	THHN #4	THHN #8	64A	N/A	80A	55X0.91X1=50A	PASS	240V	40	0.308	0.33	PASS

Max Vmp: 450 Vdc Max Voc: 538 Vdc

PV MODULE ESPE	ECIFICATION
Manufactured	Q.CELL
Model	G6+ 350W
Peak Power	350W
Rated Voltage (Vmp)	34.07 V
Rated Current (Imp)	10.22 A
Short Circuit Current (Isc)	10.73 A
Open Circuit Voltage (Voc)	40.73 V

INVERTER 1 SPECIF	ICATION	
Manufactured	SMA	
Model	SB 7.7	
Max Input Voltage	600 Vdc	
Max Input Curret	18 Adc	
Max DC Input Power	12,320 W	
Nominal Output Voltage	240 V	
Max Output Current	32 A	
Maximun output Power	2000 W	SPS
Max Output Current @120 V	16 A	

#### FROM UTILITY GRID

	CUSTOMER	INFORMATION	
Name	Josh and Kend		
Address		In. Lake City, FL 32024	
Project Latitude	30°06'21.3"N	Min. Ambient Temperature	32F°
Project Longitude	82°43'23.5"W	Max. Ambient Temperature	95F°
Utility Name Wind Exposure Category	С	Meter Number Wind Speed	140
Risk Category		North Direction	0.0°
Interconnection Voltage	240 ARRAY		
		RRAY 1	
Module Name	Q.CELL G6+ 3	50W	
	No. of Modules 24	DC String Length <sup>12</sup>	No. of String
Module Name	Q.CELL G6+ 3		
Inverter Tilt Angle 26°	SMA SB.7.7 No. of Modules 24	DC String Length <sup>12</sup>	No. of String
, in Angie 20 <sup>-</sup>		RRAY 3	IND. OF String
Module Name			
Inverter Tilt Angle	No. of Modules	DC String Length	No. of String
		AL NOTES	
<ul> <li>2ALL CONDUCTORS SH.</li> <li>3WIRING, CONDUIT, AND TO, AND LOCATED AS CL</li> <li>4WORKING CLEARANCE WITH NEC 110.26.</li> <li>5ALL WIRE TERMINATIO</li> <li>6MODULES CONFORM T</li> <li>7CONDUCTORS EXPOSE NEC ARTICLE 300.6 (C) (1</li> <li>8CONDUCTORS EXPOSE</li> </ul>	ALL BE COPPER, RATE O RACEWAYS MOUNTE OSE AS POSSIBLE TO S AROUND ALL NEW A NS SHALL BE APPROP O AND ARE LISTED UN ED TO SUNLIGHT SHAI ) ANDARTICLE 310.10 (	LL BE LISTED AS SUNLIGHT RE	C WET ENVIRO OUTED DIREC VALLEY. UIPMENT SHAI LY VISIBLE SISTANT PER
<ul> <li>2ALL CONDUCTORS SH.</li> <li>3WIRING, CONDUIT, AND TO, AND LOCATED AS CL</li> <li>4WORKING CLEARANCE WITH NEC 110.26.</li> <li>5ALL WIRE TERMINATIO</li> <li>6MODULES CONFORM T</li> <li>7CONDUCTORS EXPOSE NEC ARTICLE 300.6 (C) (1</li> <li>8CONDUCTORS EXPOSE PER NEC ARTICLE 310.10</li> <li>9ALL DC CONDUCTORS EI IN METAL RACEWAY PER N</li> <li>10THE SUM OF ALL PV C THE RATING OF THE SER</li> <li>11 FOR BACKUP SYSTI THE CAPACITY OF THE S</li> </ul>	ALL BE COPPER, RATE O RACEWAYS MOUNTE OSE AS POSSIBLE TO S AROUND ALL NEW A NS SHALL BE APPROP O AND ARE LISTED UN ED TO SUNLIGHT SHAI ) ANDARTICLE 310.10 ( ED TO WET LOCATION ) (C) NTERING THE BUILDING JEC 690.31 OVERCURRENT PROTE VICE. EMS AND BACKUP LOA	ED FOR 600 V AND 90 DEGREE ED ON ROOFTOPS SHALL BE RO THE NEAREST RIDGE, HIP, OR AND EXISTING ELECTRICAL EQ PRIATELY LABELED AND READIL NDER UL 1703.	C WET ENVIRO OUTED DIREC VALLEY. UIPMENT SHA LY VISIBLE SISTANT PER E IN WET LOC NNECT, SHALL SHALL NOT E 2017 710.15(A ATER THAN
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Rev	Description	Date	Draw By
1	Single line Diagram, calculation and equipment performance	04/05	BM
Sheet Nan	ne		

# Single Line Diagram & Calculations

Designed By 	Sheets 8 of 9	Date 04/05/2022
Project number BT-2022-GA-07	PV-04	

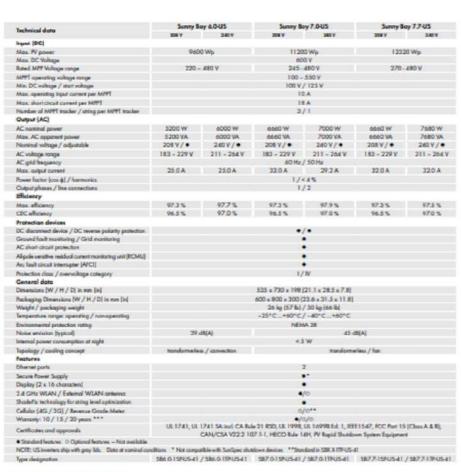






#### SUNNY BOY 3.0-US / 3.8-US / 5.0-US / 6.0-US / 7.0-US / 7.7-US Power with a purpose

The residential PV market is changing rapidly. Your bottom line matters more than ever-so we've designed a superior residential solution to help you decrease costs at every stage of your business operations. The Sunny Boy 3.0-US/3.8-US/5.0-US/6.0-US/7.0-US/7.7-US join the SMA lineup of field-proven solar technology backed by the world's #1 service team. This improved residential solution features ShadeFix, SMA's proprietary technology that optimizes system performance. ShadeFix also provides superior power production with a reduced component count versus competitors, which provides maximum reliability. No other optimized solution generates more power or is as easy as systems featuring. SMA ShadeFix and SunSpec certified devices. Finally, SMA Smart Connected will automatically detect errors and initiate the repair and replacement process so that installers can reduce service calls and save time and money. www.SMA.America.com



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solution on the market.

The SMA Power+ Solution combines legendary SMA inverter performance and SunSpec certified shutdown devices in one cost-effective, comprehensive package. In addition, SMA ShadeFix technology optimizes power production and provides greater reliability than alternatives. This rapid shutdown solution fulfills UL 1741, NEC 2014, and

NEC 2017 requirements and is certified to the power line-based

SunSpec Rapid Shutdown communication signal over DC wires,

making it the most simple and cost-effective rapid shutdown

Visit www.SMA-America.com for more information.



The Right Way!" ProteaBracket<sup>™</sup> A versatile bracket for mounting solar PV to trapezoidal roof profiles ProteaBracket<sup>™</sup> is now made in aluminum. Still the most versatile trapezoidal metal roof attachment solution on the market, the S-5I ProteaBracket Just got better! The bracket features an adjustable attachment base and module attachment ptions to accommodate different roof profile dimensions and mounting options. Our pre-applied EPDM gasket with peel and stick adhesive makes installation a snap, ensuring accurate and secure placement the first time. With no messy sealants, faster Installation, and a weather-proof fit, ProteaBracket Stronger L-Foot™ offers you the most versatile solar attachment solution available. ProteaBracket\* can be used for

> rail mounting or "direct-attach" with S-5! PVKIT"

\*When ProteeBracket is used in conjunction with the 5-5! PWNT, an additional right is required during installation.

- Load-tested for engineered application Corrosion-resistant materials
- up to 3" Peel-and-Stick prevents accidental shifting during installation
- Fully pre-assembled 25-year warranty\*

\*Seewww.S-5.com for details

#### The SnapNrack Ultra Rail is a sleek, lightweight rail solution for mounting solar modules on the roof.

Clamps

Standard

Quality. Innovative. Superior.

SnapNrack Solar Mounting Solutions are engineered to optimize material use and labor resources and improve overall installation quality and safety.

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Unparalleled Wire Management

Ultra Rail, UR-40 Rail System Spans

Wind (mph)

Open rail channel provides room for running

includes Junction Boxes, Universal Wire

wires resulting in a long-lasting quality install Industry best wire management offering

Clamps, MLPE Attachment Kits, and Conduit

System is fully bonded and listed to UL 2703

The Entire System is a Snap to Install New Ultra Rail Mounts include snap-in brackets

provide a clean look to the array edge

and End Clamps customers love

Compatible with all the SnapNrack Mid Clamps

The Largest Span Capabilities of any Light Rail Solution

Universal End Clamps and snap-in End Caps

for attaching rail

This table was prepared in

ASCE 7-10

• Exposure: B

Roof Zone: 1

compliance with applicable

Chapter 30 Wind Loads &

 Module Orientation: Portrait Roof Type: Comp

Visit SnapNrack.com for detaile

span tables and certifications

6 ft Spans

System Span Key

Chapter 7 Snow Loads

Roof Slope: 7 - 27 deg
 Roof Height: 0 - 30 ft

engineering codes and standard Values are based on the follow

#### SnapNrack Module Attachments

e cut flush with the mo	s-all time saver that slips inside the dules and finished with SnapNrack dule Clamps work with Ultra Rail a	End Caps to cr	eate a syst	em with a fl	
	Mid Clar				
-	Description	SKU	MSRP	QTY*	WT
	Bonding Mid Clamp, 30-38mm (1.18-1.49"), Black	242-02053	PISKP	20 EA	3.0 lb
	Bonding Mid Clamp, 30-38mm (1.18-1.49"), Silver	242-02050		20 EA	3.0 lb
	Bonding Mid Clamp, 33-45mm (1.30-1.77"), Black	242-02054		20 EA	3.2 lb
Bonding Mid Clamp, Black	Bonding Mid Clamp, 33-45mm (1.30-1.77"), Silver	242-02051		20 EA	3.2 lb
	Bonding Mid Clamp, 38-51mm (1.49-2.00"), Black	242-02055		20 EA	3.3 lb:
	Bonding Mid Clamp, 38-51mm (1.49-2.00"), Silver	242-02052		20 EA	3.3 lb:
	Bonding Mid Clamp, 49-57mm (1.93-2.24"), Black	242-02057		20 EA	3.4 lb
	Bonding Mid Clamp, 49-57mm (1.93-2.24"), Silver	242-02056		20 EA	3.4 lb
	End Clar	nps 🧹			
	Description	SKU	MSRP	QTY*	WT
and the	Universal End Clamp	242-02215		20 EA	6 lbs
	Bonding Adjustable End Clamp, 30-38mm (1.18-1.49"), Black	242-02067		20 EA	3.6 lb
(D)	Bonding Adjustable End Clamp, 30-38mm (1.18-1.49"), Silver	242-02065		20 EA	3.6 lb
Universal End Clamp	Bonding Adjustable End Clamp, 38-51mm (1.49-2.00"), Black	242-02068		20 EA	3.6 lb
	Bonding Adjustable End Clamp, 38-51mm (1.49-2.00"), Silver	242-02066		20 EA	3.6 lb



	68.5 × 40.6 × 1.26 h (nds	ding frame)		22			
No. Labo	(1/40×1030×32mm)			<b></b>			3127382+++
Weight Front Cover	43.9hs(19.9kg)	tro-strong dist		— n 🖻	+	10.7030-01	+ 11 1
Constanting Constant	0.13 in (3.2 mm) thermally ; with anti-reflection technol	koldt. N.e. alvessig B			Construction of Sector		
Back Cover	Composito film				and the second second		ALAT INCOM
Freme	Black anodiged aluminum					3 V.	
Cull	6 × 20 monocrystal ine Q.	ANTUM point h	afoals				sub-Dam-++
Junction Box	ca 2.09-3.98 × 1.26-3.96 × 0.69-0.71 n(63-101 × 22-80 × 16-18 mm), Protection class (FG7, with bypass diodes				_		
Cable	4 mm² Sciar cable: (+) >45	33in (1150mm)	.(~) >45.3 in(1150m	m)		Ba Daireg	-m.l.l
Contector	Staub I MC4; IP58			-1~1.0*10	1994 - 1992, A <sup>3</sup>	Trus, and	
		1	ELECTRICAL	CHARACTERISTIC	S		
OWER CLASS				340	345	350	355
Power atMPP	RMANICE AT STAN DARD TE	Pue	(W)	B40	345	350	350
_ Short Choult		l <sub>at</sub>		10.08	10.73	10.79	10.84
OpenCircuit			[A] [V]	60.26	40.49	4073	40.98
CurrentatMP		V <sub>iac</sub>	IAI	10.16	10.22	10.27	10.33
Voltage at MP		Vue	[17]	23.45	3476	34.07	34.28
Efficiency		Num 6	[2]	>19.0	8.814	>195	>19.8
	MANCE AT NORMAL OPE			C # Mar	2.00.00	cand	2480
Power atMPP		Pue	IW1	254.5	258.2	261.9	2667
6 Short Olecuit	Ourrant	he	[4]	8.60	8.65	8.09	874
Open Circuity		Var	[14]	37.94	38.17	38.41	38.05
Ourrent at MP		المرا	[A]	8.00	8.04	8.03	8.13
VoitageatMP		View	[14]	31.81	3210	3240	32.60
INTERNET		All departs System All departs so, Full wat	power up to 10 years of nominal power up to his measurement toler starties is according a ty terms of the Q OFL1	with with an	636 805 805 (388-2)(4) (2)	1000 1000	
34692385	-	adies organi dati country	ідинон обусаг неараю	1VH	ormance under low inted	ance conditions in	
		Sides Cright	igenon of your respec	1VH	irmance under low irred conditione (25° C, 1000	iance conditiona in Afren)	
TEMPE RATURE CO	and the second	adivs organization of the second s		tye Typical module per comparison to STC			-0.27
remperature Coeff	licient of I <sub>ste</sub>	a seles organ as country a [%/X	1 +0.04	Typical module per comparison to STC Temperature Coefficie	nt of V <sub>ac</sub>	\$ [%/K]	
remperature Coeff	licient of I <sub>ste</sub>	a (%/x) a (%/x) a (%/x)	] +0.04 ] -0.36	tye Typical module per comparison to STC	nt of V <sub>az</sub> iting Temperature	\$ [%/K]	-0.27 109=54 (43=3°C)
rem PE RATURE CO Immperatura Coeffi Immperatura Coeffi	liciant of I <sub>an</sub> liciant of P <sub>lann</sub>	a (%/x) a (	] +0.04 ] -0.36	Typical module per compension to BTC Temperature Coefficie Nominal Module Open	nt of V <sub>inc</sub> iting Temperature	\$ [%/K]	
rem PE RATURE CO Immparature Coeff Immparature Coeff Missimum System	liciant of I <sub>se</sub> fielant of P <sub>lane</sub> VottegeV <sub>sco</sub> [V]	a (%/x) a (	1 + 0.04 1 - 0.86 ROPERTIES FC	Typical module per comparison to BTC Temperature Coefficie Nominal Module Open OR SYSTEM DESIG	nt of V <sub>ac</sub> ting Temperature IN	\$ [%/K]	109=54 (43=3°C)
remPe Rature Co Temperature Coeff Temperature Coeff Missimum System Missimum Series P	liciant of I <sub>m</sub> liciant of P <sub>lane</sub> VottegeV <sub>nox</sub> [V] Pase Rating [A.DC]	a law organic country	1 +0.06 1 -0.38 ROPERTIES FC 10 (#C/1000(U,)	Typical module peri comparison to NC Temperistane Coefficie Nominal Module Oper OR SYSTEM DESIG P/r module classificati Fire Rating based on Al Perentited Modula Tem	nt of Y <sub>ac</sub> ting Temperature IN N N NS7 UL 61720	\$ [%/K] NMOT [%]	109=54 (43=3°C) Onto I TYPE 2 -40°F up to +185°F
IEMPE RATURE CO Imparatura Coeffi Imparatura Coeffi Maximum System Maximum Series P Max. Design Loed,	licient of I <sub>ere</sub> licient of P <sub>Bare</sub> VottegeV <sub>ACK</sub> [V] Pues Rating [A.D.Q] I, Pash / Pull? [Dat/ft7]	a (%) a (%)	1 + 0.04 1 -0.38 ROPERTIES FC 10 (#Cy1500 (U.) 20	Typical module get Typical module get to emperation to BYC Temperature Coefficie Nominal Module Opera OR SYSTEM DESIC PV module classificatio Fire Rating based on Al	nt of Y <sub>ac</sub> ting Temperature IN N N NS7 UL 61720	\$ [%/K] NMOT [%]	109=54 (43=3°C) Class I TYPE 2
	liciant of I <sub>mi</sub> ficiant of P <sub>Bare</sub> VoltegeV <sub>mi</sub> [V] Vase Retires [A DC] , Pash / Put? [Doi/11] ush / Put? [Doi/11]	a (%) a (%)	) + 0.06 ) -0.38 ROPERTIES FC (0 (#C)/1000(U,) 20 00Pa)/55(2667P4)	Typical module peri comparison to NC Temperistane Coefficie Nominal Module Oper OR SYSTEM DESIG P/r module classificati Fire Rating based on Al Perentited Modula Tem	nt of Y <sub>ac</sub> ting Temperature IN N N NS7 UL 61720	\$ [%/K] NMOT [%]	109=54 (43=3°C) Onto I TYPE 2 -40°F up to +185°F
remPE Rature Coeff Temperature Coeff Temperature Coeff Maximum System Maximum Sariea P Max. Design Load, Max. Tasti ced, Pa "See Institution Mar	liciant of I <sub>mi</sub> ficiant of P <sub>Bare</sub> VoltegeV <sub>mi</sub> [V] Vase Retires [A DC] , Pash / Put? [Doi/11] ush / Put? [Doi/11]	sides copie           country           q           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r           r       <	i) + 0.06 ·) -0.38 ROPERTIES FC 00 (940)/1500(U) 20 00 Pa)/55 (2007 Pa) 0Pa)/54 (4000 Pa)	Typical module peri comparison to BYC Temperature Coefficie Nominar Module Oper OR SYSTEM DESIC PV module classificati Fine Rating based on Al Permitted Mod La Tem on Continuous Duty	nt of Y <sub>ac</sub> ting Temperature IN N N NS7 UL 61720	\$ [%;X] MOT [*]	109=54 (43=3°C) Onto I TYPE 2 -40°F up to +185°F
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Hanvite & CELLE America Inte. 400 Spectrum Center (hrva, Sette 2400, hrvas, CA 02618, USA I TEL +1 949 748 59 061 EMAIL, inquiry@us.groets.com/WEB www.groets.us







SnapNrack 775 Fiero Lane, Ste. 200 San Luis Obispo, CA 93401

TEL: (877) 732-2860

Re: Report # 2017-03227.09 - SnapNrack Ultra Rail Solar Photovoltaic Racking System with UR-40 Rail

PZSE, Inc. - Structural Engineers has provided engineering and span tables for the SnapWrack Ultra Rall Racking System w/ UR-40 Rail, as presented in P2SE Report # 2017-03227.09, "Engineering Certification and Span Tables for the SnapNrack Ultra Rail Solar Photovoltaic Racking System". All information, data, and analysis therein are based on, and comply with, the following building

and typical speci	incations.
ig Codes.	<ol> <li>ASCE/SEI 7-10, Minimum Design Loads for Buildings and Other Structures, by American Society of Civil Engineers</li> </ol>
	2. 2012 International Building Code, by International Code Council, Inc.
	<ol><li>2012 International Residential Code, by International Code Council, Inc.</li></ol>
	<ol> <li>AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES</li> </ol>
	5. Aluminum Design Manual 2010, by The Aluminum Association, Inc.
	<ol> <li>ANSI/AWC NDS-2012, National Design Specification for Wood Construction, by the American Wood Council</li> </ol>

Risk Category II Seismic Design Category = A - E Basic Wind Speed (ultimate) per ASCE 7-10 = 110 mph to 190 mph Ground Snow Load = 0 to 120 (psf)

This letter certifies that the loading criteria and design basis for the SnapNrack Ultra Rail Racking System w/ UR-40 Rail Span Tables are in compliance with the above codes.

If you have any questions on the above, do not hesitate to cal

Prepared by:

DIGITALLY SIGNED ORC

8150 Sierra College Baulevard, Suite 150, Roseville, CA 95661 T 916.961.3960 F 916.961.3965 W www.pzse.com Experience | Integrity | Empowerment

	CUSTOMER II	NFORMATION				
Name Josh and Kendall Hannah						
Address 382 SW Dusk Gln. Lake City, FL 32024						
	PROJECT IN 30°06'21.3"N		32F°			
Project Latitude Project Longitude	82°43'23.5"W	Min. Ambient Temperature Max. Ambient Temperature	95F°			
Utility Name	C	Meter Number				
Wind Exposure Category Risk Category	С II	Wind Speed North Direction	140 0.0°			
Interconnection Voltage	240	AHJ				
		FORMATION RAY 1				
Module Name	Q.CELL G6+ 350 SMA SB.7.7	W				
Inverter Tilt Angle 26°	No. of Modules 24	DC String Length <sup>12</sup>	No. of Strings <sup>2</sup>			
	AR	RAY 2				
Module Name	Q.CELL G6+ 350 SMA SB.7.7	W				
	No. of Modules 24	DC String Length <sup>12</sup>	No. of Strings <sup>2</sup>			
	AR	RAY 3				
Module Name Inverter						
	No. of Modules	DC String Length	No. of Strings			
	GENERAL	NOTES				
Rev     Description       1     Data sheets			Date         Draw By           04/05         BM			
	ufacture	Spec. Shee				
Designed By		9 of 9	Date 04/05/2022			
Project number BT-2022	2-GA-07	PV-05	5			