

ABBREVIATIONS	ELECTRICAL NOTES	JURISDICTION NOTES																				
<p>A AMPERE AC ALTERNATING CURRENT BLDG BUILDING CONC CONCRETE DC DIRECT CURRENT EGC EQUIPMENT GROUNDING CONDUCTOR (E) EXISTING EMT ELECTRICAL METALLIC TUBING FSB FIRE SET-BACK GALV GALVANIZED GEC GROUNDING ELECTRODE CONDUCTOR GND GROUND HDG HOT DIPPED GALVANIZED I CURRENT Imp CURRENT AT MAX POWER Isc SHORT CIRCUIT CURRENT kVA KILOVOLT AMPERE kW KILOWATT LBW LOAD BEARING WALL MIN MINIMUM (N) NEW NEUT NEUTRAL NTS NOT TO SCALE OC ON CENTER PL PROPERTY LINE POI POINT OF INTERCONNECTION PV PHOTOVOLTAIC SCH SCHEDULE S STAINLESS STEEL STC STANDARD TESTING CONDITIONS TYP TYPICAL UPS UNINTERRUPTIBLE POWER SUPPLY V VOLT Vmp VOLTAGE AT MAX POWER Voc VOLTAGE AT OPEN CIRCUIT W WATT 3R NEMA 3R, RAIN TIGHT</p>	<p>1. THIS SYSTEM IS GRID-INTERTIED VIA A UL-LISTED POWER-CONDITIONING INVERTER. 2. A NATIONALLY - RECOGNIZED TESTING LABORATORY SHALL LIST ALL EQUIPMENT IN COMPLIANCE WITH ART. 110.3. 3. WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A SIGN WILL BE PROVIDED WARNING OF THE HAZARDS PER ART. 690.17. 4. EACH UNGROUNDED CONDUCTOR OF THE MULTIWIRED BRANCH CIRCUIT WILL BE IDENTIFIED BY PHASE AND SYSTEM PER ART. 210.5. 5. CIRCUITS OVER 250V TO GROUND SHALL COMPLY WITH ART. 250.97, 250.92(B). 6. DC CONDUCTORS EITHER DO NOT ENTER BUILDING OR ARE RUN IN METALLIC RACEWAYS OR ENCLOSURES TO THE FIRST ACCESSIBLE DC DISCONNECTING MEANS PER ART. 690.31(E). 7. ALL WIRES SHALL BE PROVIDED WITH STRAIN RELIEF AT ALL ENTRY INTO BOXES AS REQUIRED BY UL LISTING. 8. MODULE FRAMES SHALL BE GROUNDED AT THE UL - LISTED LOCATION PROVIDED BY THE MANUFACTURER USING UL LISTED GROUNDING HARDWARE. 9. MODULE FRAMES, RAIL, AND POSTS SHALL BE BONDED WITH EQUIPMENT GROUND CONDUCTORS.</p>	<p>PV ARRAY IN COMPLIANCE WITH OPEN SPACE CRITERIA.</p> <p>1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.</p> <p>2. GROUND WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW FOR PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690.4(C)</p> <p>3. FOLLOW MANUFACTURERS SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.</p> <p>4. WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS.</p> <p>Project narrative – 6515 E. MEADOWLARK LN.</p> <p>This solar photovoltaic system installation at 6515 E. Meadowlark Ln. consists of 49 modules on two arrays facing southwest with an azimuth of 223 degrees. The ZS ramp mounting hardware will be used and will be painted black to match the module frames. Panels will not be visible from the front or side of the home. All parapets are existing and both arrays will be at or below the level of the parapets. A new main service panel will be installed. Two inverters will be used and installed next to the main service panel. The photovoltaic meter, AC disconnect, new main service panel, and load center will be painted to match the color of the home (tan, 35% LRV).</p>																				
<p>LICENSE</p> <p>BLDG CL KB-01: ROC243771 ELEC CL K-11: ROC 245450</p> <p>MODULE GROUNDING METHOD: ZEP SOLAR</p> <p>AHJ: Paradise Valley</p> <p>UTILITY: Arizona Public Service Company</p>	<p>GENERAL NOTES</p> <p>1. ALL WORK SHALL COMPLY WITH THE 2015 IBC AND 2006 IRC. 2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2014 NATIONAL ELECTRIC CODE.</p>	<p>VICINITY MAP</p>  <p>INDEX</p> <p>Sheet 1 COVER SHEET Sheet 2 PROPERTY PLAN Sheet 3 SITE PLAN Sheet 4 STRUCTURAL DETAILS & UPLIFT CALCS Sheet 5 STRUCTURAL VIEWS Sheet 6 THREE LINE DIAGRAM Sheet 7 TRIANGLE NOTES Sheet 8 ELECTRICAL CALCULATIONS Cutsheets Attached</p> <table border="1"> <thead> <tr> <th>REV</th> <th>BY</th> <th>DATE</th> <th>COMMENTS</th> </tr> </thead> <tbody> <tr> <td>* * *</td> <td>* * *</td> <td>* * *</td> <td>* * *</td> </tr> <tr> <td>* * *</td> <td>* * *</td> <td>* * *</td> <td>* * *</td> </tr> <tr> <td>* * *</td> <td>* * *</td> <td>* * *</td> <td>* * *</td> </tr> <tr> <td>* * *</td> <td>* * *</td> <td>* * *</td> <td>* * *</td> </tr> </tbody> </table>	REV	BY	DATE	COMMENTS	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
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JOB NUMBER: JB-8528403 00

MOUNTING SYSTEM: ZS Ramp Foot

MODULES: (49) HANWHA Q CELLS #Q.PEAK G4.1/SC305

INVERTER: Multiple Inverters

CUSTOMER: MATTHEW BENNETT
6515 E MEADOWLARK LN
PARADISE VALLEY, AZ 85253

DESCRIPTION: 14.945 kW DC ROOF MOUNT PV ARRAY
12.8 KW (AC NAMEPLATE) PV ARRAY

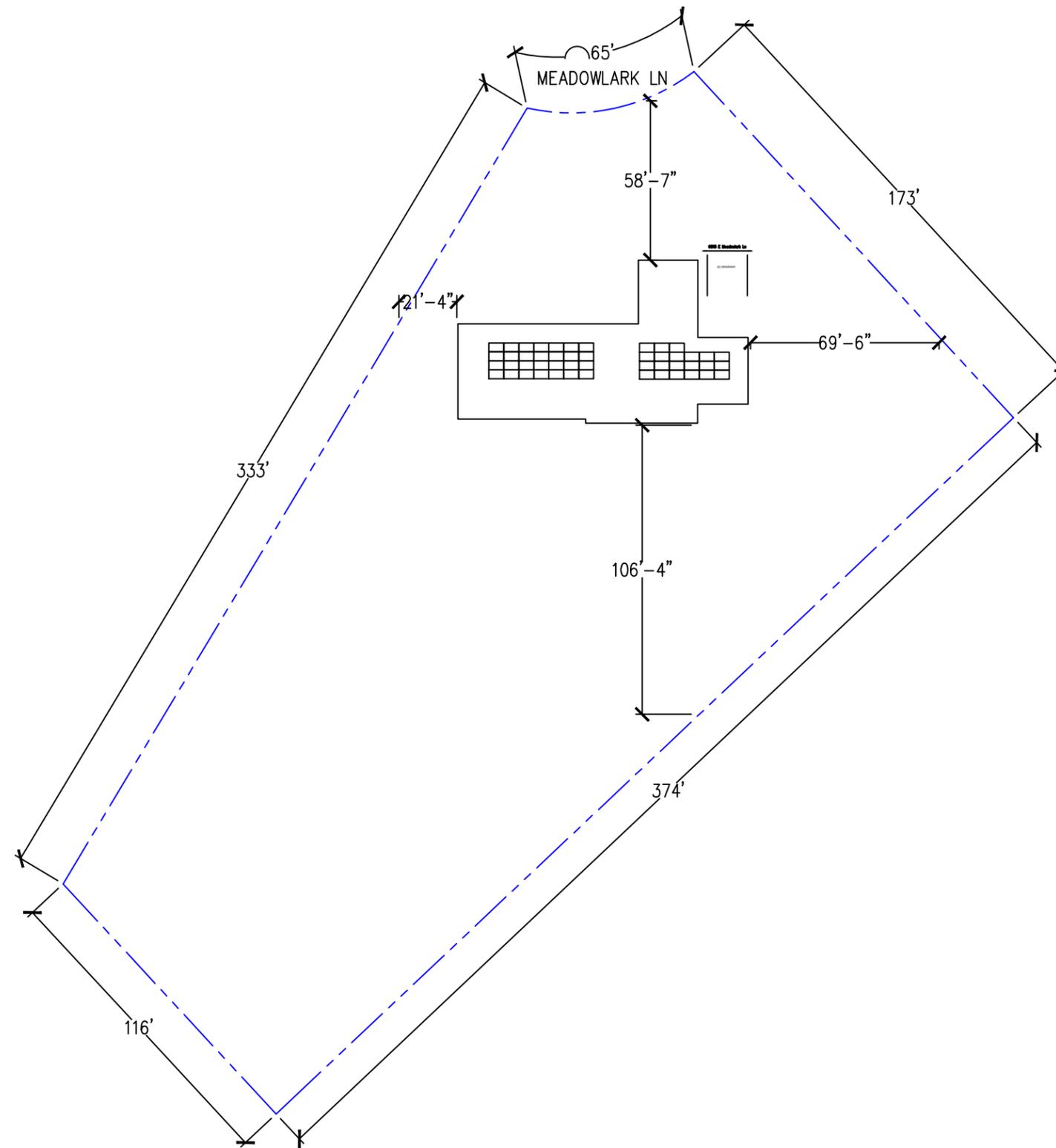
PAGE NAME: COVER SHEET

DESIGN: Brian Zeiger

SHEET: 1 REV: A DATE: 3/30/2018

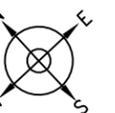


APN: 17451028



PROPERTY PLAN

Scale: 1" = 50'-0"



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SHEET: 2 REV: A DATE: 3/30/2018



ROOF FRAMING IS MANUFACTURED TRUSS
SPACED AT 24" OC
2x4 TOP AND BOTTOM CHORD

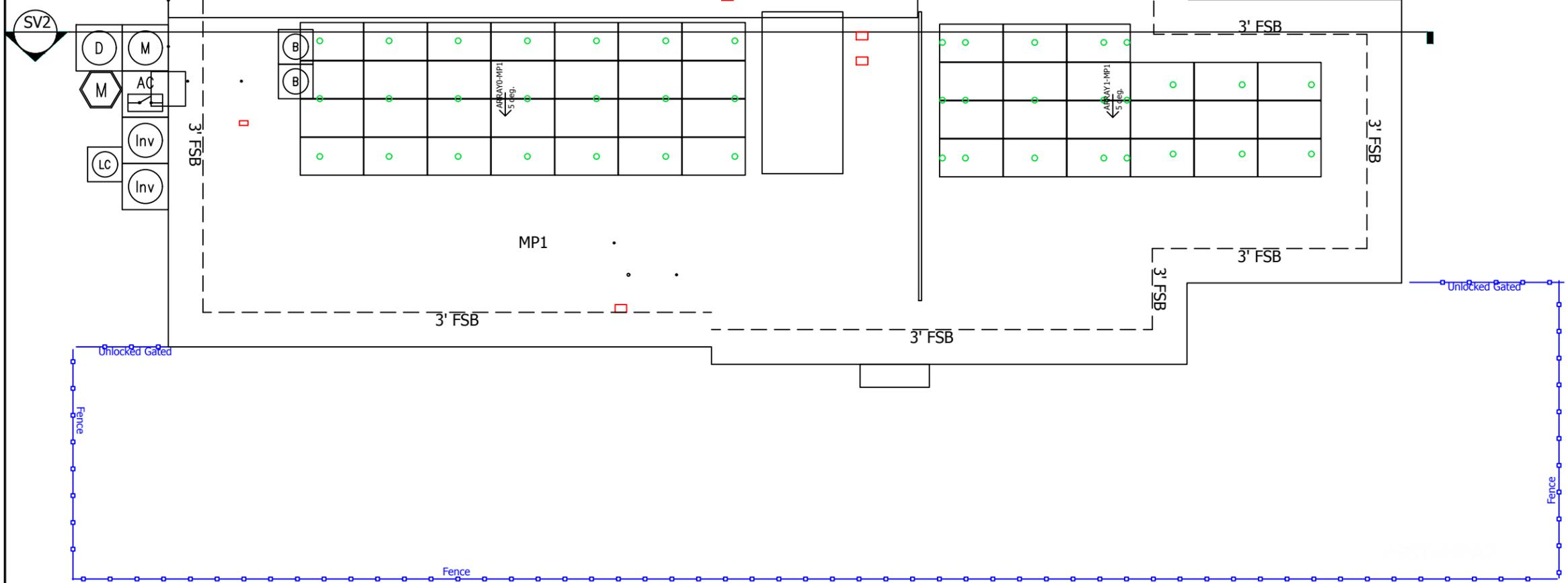
NEW MAIN PANEL, PV METER, AC DISCONNECT, AND LOAD CENTER TO BE PAINTED TO MATCH THE COLOR OF THE HOME

Front Of House

6515 E Meadowlark Ln

(E) DRIVEWAY

ROOF ACCESS POINT



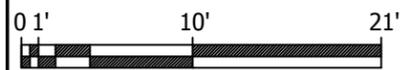
MP1	PITCH: 2 AZIMUTH: 223 MATERIAL: Foam	ARRAY PITCH: 5 ARRAY AZIMUTH: 223 STORY: 1 Story
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LEGEND

- M (E) UTILITY METER & WARNING LABEL
- Inv INVERTER W/ INTEGRATED DC DISCO & WARNING LABELS
- DC DC DISCONNECT & WARNING LABELS
- AC AC DISCONNECT & WARNING LABELS
- B DC JUNCTION/COMBINER BOX & LABELS
- D DISTRIBUTION PANEL & LABELS
- LC LOAD CENTER & WARNING LABELS
- M DEDICATED PV SYSTEM METER
- RSD RAPID SHUTDOWN
- STANDOFF LOCATIONS
- CONDUIT RUN ON EXTERIOR
- - - CONDUIT RUN ON INTERIOR
- GATE/FENCE
- HEAT PRODUCING VENTS ARE RED
- INTERIOR EQUIPMENT IS DASHED

SITE PLAN

Scale: 3/32" = 1'



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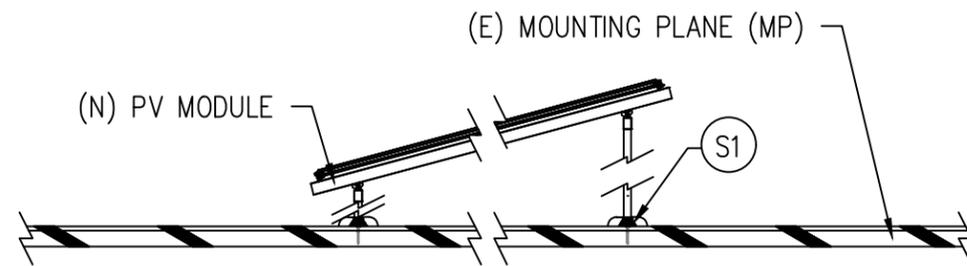
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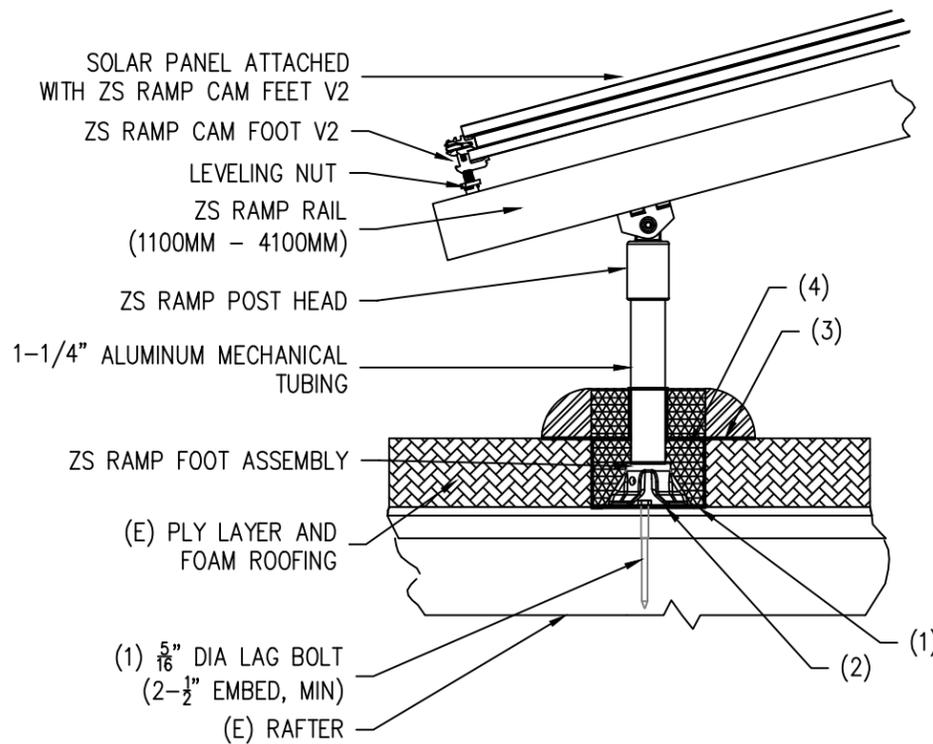
DESIGN: Brian Zeiger
SHEET: 3 REV: A DATE: 3/30/2018



UPLIFT CALCULATIONS



SV TYPICAL PV SIDE VIEW
NTS



- INSTALLATION ORDER**
- (1) CLEAN ROOF DECK.
 - (2) APPLY M1 SEALANT BENEATH FOOT ASSEMBLY AND ON PIPE CONNECTION TO FOOT ASSEMBLY. MOUNT FOOT WITH LAG, INSTALL VERTICAL PIPE, AND POST HEAD.
 - (3) M-1 STRUCTURAL SEALANT AT BASE OF SEALING RINGS AND AROUND PENETRATION.
 - (4) 1 PART POURABLE SEALANT.

S1 STANDOFF
Scale: 1 1/2" = 1'

DESIGN SUMMARY

03.30.2018
Version #72.1
Job# 8528403

Jobsite Specific Design Criteria			
Design Code		ASCE 7-10	
Importance Factor	I	1.0	
Ultimate Wind Speed	V-Ult	110 mph	Fig. 1609A
Exposure Category		C	Section 26.7
Ground Snow Load	pg		ASCE Table 7-1

MP Specific Design Information			
Design Info	MP Name	MP1	
	Roofing	Build Up / Modified Roofing	
	Standoff	ZS Ramp Foot	
	Pitch	2°	
	SL/RLL: PV		
SL/RLL: Non-PV	20.0 psf		

Standoff Spacing and Layout			
Landscape	MP Name	MP1	
	X-Spacing	72"	
	X-Cantilever	24"	
	Y-Spacing	72"	
	Y-Cantilever	24"	
	Portrait	X-Spacing	48"
X-Cantilever		21"	
Y-Spacing		72"	
Y-Cantilever		24"	
Layout	Not-Staggered		

X and Y are maximums that are always relative to the structure framing that supports the PV. X is across rafters and Y is along rafters.

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STRUCTURAL DETAILS & UPLIFT CALCS

DESIGN:
Brian Zeiger

SHEET: 4 REV: A DATE: 3/30/2018

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ADDITIONAL NOTES:

- 1 NUMBERS IN PARENTHESIS REFER TO LABELS SHOWN ON THE CUTSHEET PAGE.
- 2 EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
- 3 BI-DIRECTIONAL UTILITY METER TO BE INSTALLED BY UTILITY COMPANY (WHEN REQUIRED)
- 4 LISTING AGENCY NAMES AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B). INVERTER GROUND-FAULT PROTECTION IS IN COMPLIANCE W/ ART. 690.5 & UL 1741.
- 5 METALLIC CONDUIT SHALL BE USED WITHIN BUILDING PER NEC 690.31(E).
- 6 LABELS (1)"PHOTOVOLTAIC POINT OF INTERCONNECTION WARNING! ELECTRIC SHOCK HAZARD!" AND (13) "BREAKERS ARE BACKFED" SHOULD BE PLACED AT THE POINT OF INTERCONNECTION PER NEC 705.10 AND PER NEC690.64(B)(5). LABEL WITH THE MAXIMUM AC OUTPUT OPERATING CURRENT AND THE OPERATING VOLTAGE PER NEC 690.54.
- 7 LABEL (12) "PV SYSTEM UTILITY DISCONNECT SWITCH" SHOULD BE PLACED ON THE PV SYSTEM UTILITY DISCONNECT SWITCH. SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE VISIBLE BLADE AND ACCESSIBLE PER UTILITY REQUIREMENTS AND CONFORM TO NEC 705.22.
- 8 LABELS (5) "PHOTOVOLTAIC DC DISCONNECT WARNING! ELECTRIC SHOCK HAZARD!" SHOULD BE PLACED ON THE PV SYSTEM DC DISCONNECT SWITCH PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.53. SWITCH TO BE LOCKED PER NEC 690.7(D).
- 9 LABEL (11)"PV SYSTEM DEDICATED kWh METER" SHOULD BE PLACED ON THE PV SYSTEM DEDICATED kWh METER. METER ENCLOSURE AND SOCKET PROVIDED AND INSTALLED BY CUSTOMER PER APS ESRM. METER PROVIDED BY CUSTOMER (AS REQUIRED).
- 10 LABEL (4) "ELECTRIC SHOCK HAZARD...." SHOULD BE PLACED ON ALL AC DISCONNECTING MEANS SUCH AS DISCONNECTS, LOAD CENTERS PER NEC 690.17.
- 11 LABEL (5)"DC DISCONNECT" SHOULD BE PLACED ON ALL DC DISCONNECTING MEANS SUCH AS FUSED COMBINERS, DISCONNECTS, AND INVETRERS PER NEC 690.17.
- 12 LABELS (9)"PV COMBINER BOX WARNING: ELECTRIC SHOCK HAZARD" AND (10)"LOADS NOT TO BE ADDED TO THIS PANEL" SHOULD BE PLACED ON ALL DEDICATED PV SYSTEM AC COMBINERS.
- 13 LABELS (14) "BREAKER HAS BEEN DE-RATED PER NEC 690.64(B)(2)" SHOULD BE PLACED AT ANY LOAD CENTERS OR ELECTRICAL PANELS WHERE THE MAIN BREAKER HAS BEEN DE-RATED.
- 14 LABEL (15) "WARNING - A GENERATION SOURCE IS CONNECTED TO THE SUPPLY...." SHALL BE PLACED AT THE MAIN SERVICE DISCONNECT WHENEVER A SUPPLY SIDE TAP IS USED TO INTERCONNECT THE PV SYSTEM.
- 15 USE-2/RHW-2 IS SUNLIGHT RESISTENT.
- 16 ALL CONDUCTORS WILL BE COPPER.
- 17 GEC TO BE INSTALLED AS REQ. BY MANUFACTURER INSTRUCTIONS AND NEC 690.47.
- 18 LABEL (2) "WARNING - INVERTER OUTPUT CONNECTION; DO NOT RELOCATE THIS OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR" PER NEC 705.12(D)(2).
- 19 GROUNDING BUSHINGS AT EVERY ENTRY AND EXIT POINT TO ENCLOSURES WITH RMC.
- 20 A PLACARD OR DIRECTORY IS INSTALLED AT THE SERVICE ENTRANCE WITH EXPLICIT DIRECTIONS TO THE LOCATION OF THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH AS REQUIRED BY APS. PLACARD TO BE INSTALLED PER NEC 705.10.
- 21 SUPPLY SIDE CONNECTION IS INSTALLED PER NEC 230, APS ESRM, AND APS INTERCONNECTION REQUIREMENTS. LABEL "PHOTOVOLTAIC SYSTEM SERVICE DISCONNECT SWITCH". SWITCH COVER TO BE LOCKED AT ALL TIMES.
- 22 SUPPLY SIDE CONNECTION IS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. DOCUMENTATION IS INCLUDED WITH THE APS INTERCONNECTION APPLICATION. ENSURE UL LISTED CONNECTORS.
- 23 NEUTRAL-GROUND BONDING JUMPER WILL BE SIZED IN ACCORDANCE WITH NEC 250.66
- 24 LOAD SIDE TAP IS INSTALLED PER NEC 240.24(B), AND APS REQUIREMENTS. LABEL "PV CUSTOMER DISCONNECT SWITCH". SWITCH COVER TO BE LOCKED AT ALL TIMES.
- 25 LOAD SIDE TAP IS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. DOCUMENTATION IS INCLUDED WITH THE APS INTERCONNECTION APPLICATION.
- 26 LABEL "WARNING: THIS SUB-PANEL FED FROM MULTI POWER PRODUCTION SOURCES".
- 27 INVERTER TO BE LISTED TO UL 1741.
- 28 GROUND FAULT PROTECTION PROVIDED IN DC/AC INVERTER.
- 29 OPTIONAL CRITICAL LOAD SUB-PANEL ON THE OUTPUT OF THE INVERTER IN USE [NOTE: A SEPARATE PV SYSTEM UTILITY DISCONNECT SWITCH WILL BE REQUIRED ON THE INVERTER OUTPUT FEEDING THE CRITICAL LOAD SUB-PANEL WHERE THE UTILITY DOES NOT HAVE 24HR UNRESTRICTED ACCESS TO THE CRITICAL LOAD SUB-PANEL.]
- 30 OPTIONAL INVERTER GENERATOR INPUT (GEN IN) NOT USED [NOTE: IF A BACKUP GENERATOR IS CONNECTED TO THE INVERTER, THEN A SEPARATE DISCONNECT SWITCH AND METER/METER SOCKET WILL BE REQUIRED ON THE GENERATOR OUTPUT SUBJECT TO APS REVIEW/APPROVAL.]
- 31 LABEL SES "WARNING: MULTI POWER PRODUCTION SOURCES INTERCONNECTED TO THIS ELECTRICAL SERVICE."
- 32 PV SYSTEM UTILITY DISCONNECT SWITCH IS REQUIRED IF CRITICAL LOADS SUB-PANEL IS NOT ACCESSIBLE BY APS.
- 33 A PERMANENT PLAQUE OR DIRECTORY DENOTING LOCATION OF PV SYSTEM UTILITY DISCONNECT SWITCH OR LOCATION OF ACCESSIBLE CRITICAL LOADS SUB-PANEL SHALL BE REQUIRED AT CRITICAL LOADS SUB-PANEL METER.

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 TRIANGLE NOTES

DESIGN:
 Brian Zeiger

SHEET: 6 REV: A DATE: 3/30/2018



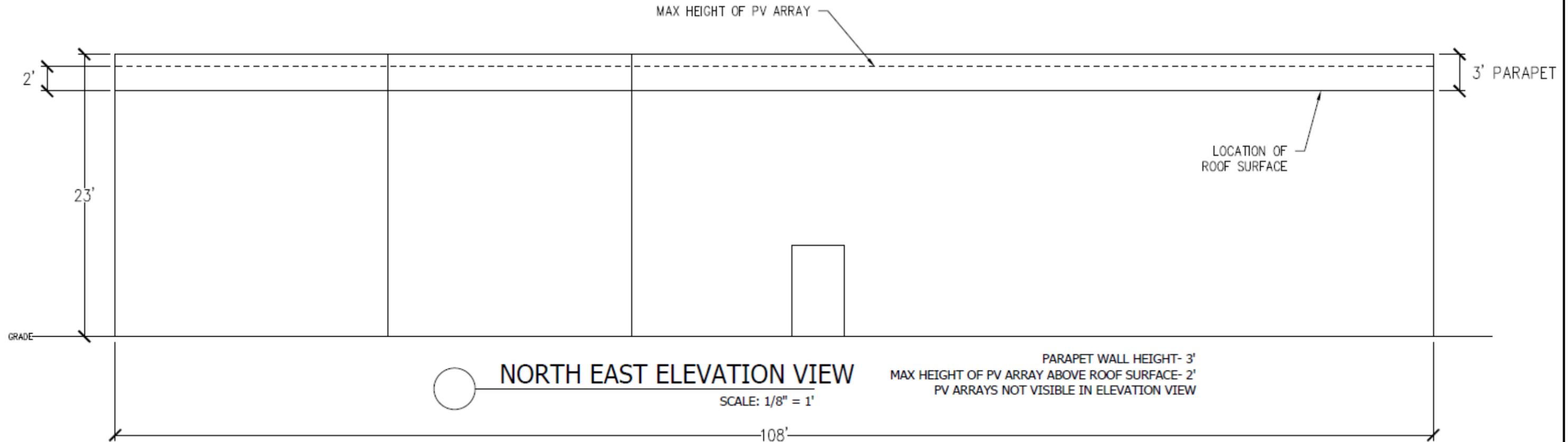
PANELS NOT VISIBLE FROM FRONT OF HOME VIEW
 RACK SYSTEM COLOR: **BLACK**

SOLAR MODULES TO BE INSTALLED ON MODIFIED BITUMEN
 ROOF USING ZS RAMP MOUNTING HARDWARE

SOLAR ARRAYS WILL NOT BE VISIBLE IN ELEVATION VIEWS
 ALL PARPET WALL HEIGHTS ARE GREATER THAN
 MAX ARRAY HEIGHT FROM ROOF SURFACE—
 SEE NOTE IN ELEVATION VIEW

NOTE: PHOTOVOLTAIC METER WILL BE PAINTED TO MATCH THE HOUSE
 PAINT COLOR: TAN
 LRV: 35%

SOLAR PANEL FRAME COLOR: BLACK



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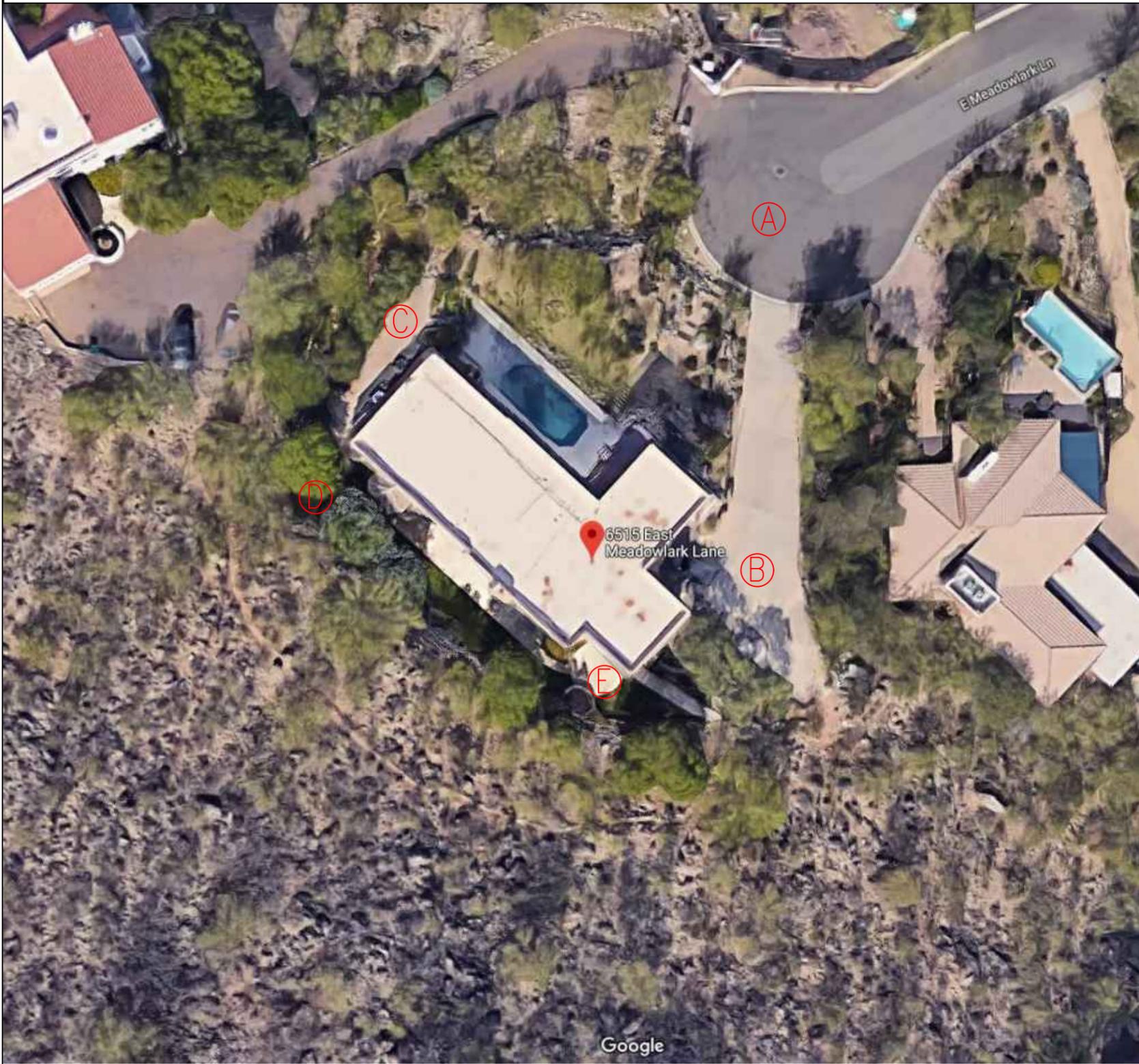
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AERIAL VIEW OF HOME-- LETTERING CORRESPONDS WITH LOCATIONS OF PROPERTY PHOTOS



LOCATION A



LOCATION B



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LOCATION C



LOCATION D



LOCATION E



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Solar Inverters

Transformerless (TL): 3.8 kW, 5.2 kW, 6.6 kW, 7.6 kW

- Wide Operating Voltage Range: 85 ~ 550V
- Wide Operating Temperature Range: -13 ~ 158°F (-25 ~ 70°C)
- High CEC Efficiency: 97.5%
- Integrated AFCI (Arc Fault Circuit Interruption)
- NEMA 4X plus Salt Mist Corrosion Protection
- Natural Convection Cooling
- Dual MPPT (5.2kW / 6.6kW / 7.6kW)
- Compact and Lightweight
- UL 1741 / IEEE 1547 / IEEE 1547.1 / CEC Listed /UL 1699B(Type 1) / NEC 690.11



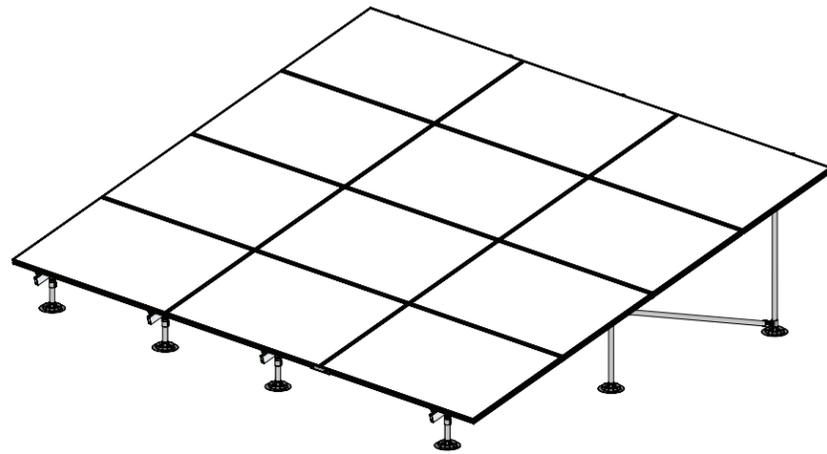
Delta Solar Inverters Datasheet for SolarCity

	SOLIVIA 3.0 TL	SOLIVIA 3.8 TL	SOLIVIA 5.2 TL	SOLIVIA 6.6 TL	SOLIVIA 7.6 TL
INPUT (DC)					
Max. System Voltage	600 V				
Nominal Voltage	380 V				
Operating Voltage Range	85 ~ 550 V				
Full Power MPPT Range	200 - 500 V				
Max. Usable Current	18.0 A	20.0 A	20.0 A per MPP tracker		
Max. Short Circuit Current @ STC	25.0 A per MPP tracker				
Max. Allowable Imbalance Power	-		4200 W	5000 W	5600 W
Allowed DC Loading Ratio	1.5				
DC Disconnect	Internal				
MPP Tracker	1		2		
Total Input Strings Available	2		4		
OUTPUT (AC)					
Nominal Power	3000 W	3800 W	5200 W	6600 W	7600 W
Max. Continuous Power	3000 W @ 208 V / 3000 W @ 240 V	3300 W @ 208 V / 3800 W @ 240 V	5200 W @ 208 V / 5200 W @ 240 V	6600 W @ 208 V / 6600 W @ 240 V	6600 W @ 208 V / 7600 W @ 240 V
Voltage Range	183 ~ 228 V @ 208 V / 211 ~ 264 V @ 240 V				
Nominal Current	14.4 A @ 208 V / 12.5 A @ 240 V	15.8 A @ 208 V / 15.8 A @ 240 V	24.0 A @ 208 V / 21.6 A @ 240 V	31.7 A @ 208 V / 27.5 A @ 240 V	31.7 A @ 208 V / 31.7 A @ 240 V
Nominal Frequency	60 Hz				
Frequency Range	59.3 ~ 60.5 Hz				
Adjustable Frequency Range	57.0 ~ 63.0 Hz				
Night Consumption	< 1.5 W				
Total Harmonic Distortion @ Nominal Power	< 3%				
Power Factor @ Nominal Power	> 0.99				
Adjustable Power Factor Range	0.85i ~ 0.85c				
Acoustic Noise Emission	<50 db(A) @ 1m				
GENERAL SPECIFICATION					
Max. Efficiency	98%				
CEC Efficiency	97.5% @ 208V / 97.5% @ 240V				
Operating Temperature Range	-13 ~ 158°F (-25~70°C) derating above 122°F (50°C)				
Storage Temperature Range	-40 ~ 185°F (-40 ~ 85°C)				
Humidity	0 ~ 100%				
Max. Operating Altitude	2000m above sea level				
MECHANICAL DESIGN					
Size L x W x D inches (L x W x D mm)	19.5 x 15.8 x 8.5 in (495 x 401 x 216 mm)		26.8 x 15.8 x 8.5 in (680 x 401 x 216 mm)		
Weight	43.0 lbs (19.5 kg)		65.0 lbs (29.5 kg)		
Cooling	Natural Convection				
AC Connectors	Spring terminals in connection box				
Compatible Wiring Gauge in AC	AWG 12 ~ AWG 6 Copper (According to NEC 310.15)				
DC Connectors	2 pairs of spring terminals in connection box		4 pairs of spring terminals in connection box		
Compatible Wiring Gauge in DC	AWG 12 ~ AWG 6 Copper (According to NEC 690.8)				
Communication Interface	ZigBee				
Display	3 LEDs, 4-Line LCD				
Enclosure Material	Diecast Aluminum				
STANDARDS / DIRECTIVES					
Enclosure Protection Rating	NEMA 4X, IEC 60068-2-11 Salt mist				
Safety	UL 1741 Second Edition, CSA C22.2 No.107.1-01				
SW Approval	UL 1998				
Ground-Fault Protection	NEC 690.35, UL 1741 CRD				
Anti-Islanding Protection	IEEE 1547, IEEE 1547.1				
EMC	FCC part 15 Class B				
AFCI	UL 1699B (Type 1), NEC 690.11				
PV Rapid Shutdown	UL 1741 CRD PVRSS, NEC 690.12 (with SMART RSS)				
Integrated Meter	ANSI C12.1 (meet 1% Accuracy)				
Regulation of Grid Support	California Rule 21, HECO Compliant, IEEE1547				
WARRANTY					
Standard Warranty	10 years				

Delta Products Corporation, Inc.
 46101 Fremont Blvd.
 Fremont, CA 94538
 Sales Email: inverter.sales@deltaww.com
 Support Email: inverter.support@deltaww.com
 Sales Hotline: +1-877-440-5851 or +1-626-369-8021
 Support Hotline: +1-877-442-4832
 Support (Intl.): +1-626-369-8019
 Monday to Friday from 7 am to 5 pm PST (apart from Holidays)



ZS Ramp
for residential low-slope roofs



ZS Ramp Array



Description

- PV Mounting Solution for Residential Low-Slope Roofs

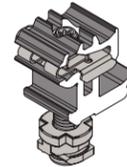
Specifications

- Tilt Angle: 0-15 degrees
- Designed for low slope roofs
- Corrosion resistant materials (Aluminum, Stainless Steel)
- ZS Ramp has a UL 1703 Class "A" system level fire rating when installed with modules from any manufacturer with a Type 1 or Type 2 fire classification.
- UL listed to UL 2703

This document does not create any express warranty by Zep Solar or about its products or services. Zep Solar's sole warranty is contained in the written product warranty for each product. The end-user documentation shipped with Zep Solar's products constitutes the sole specifications referred to in the product warranty. The customer is solely responsible for verifying the suitability of Zep Solar's products for each use. Specifications are subject to change without notice. Patents and Apps: zspats.com.

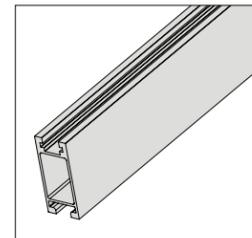
Components

Cam Foot V2



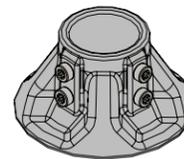
Part No. 850-1564
UL listed to UL 2703

Rail



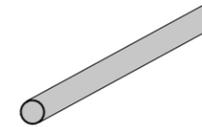
Part No. 850-1568
850-1567
850-1566
and 850-1565
UL listed to UL 2703

Base Foot



Part No. 850-1563
UL listed to UL 2703

Mechanical Tubing (MT)



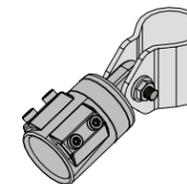
Part No. 850-1583
UL listed to UL 2703
1.51" Outer Diameter

Post Mount



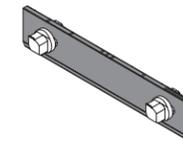
Part No. 850-1561
UL listed to UL 2703

Cross Brace Assembly



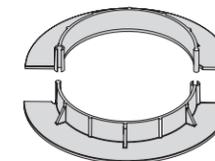
Part No. 850-1636
UL listed to UL 2703

Interlock



Part No. 850-1388 or 850-1613
UL listed to UL 2703

Sealant Ring



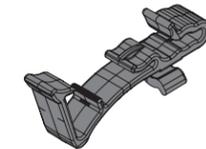
Part No. 850-1638

Splice Assembly, Ramp



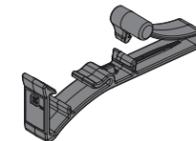
Part No. 850-1635
UL listed to UL 2703

DC Wire Clip



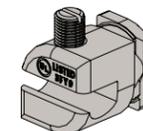
Part No. 850-1509
UL listed to UL 1565

Home Run Wire Clip



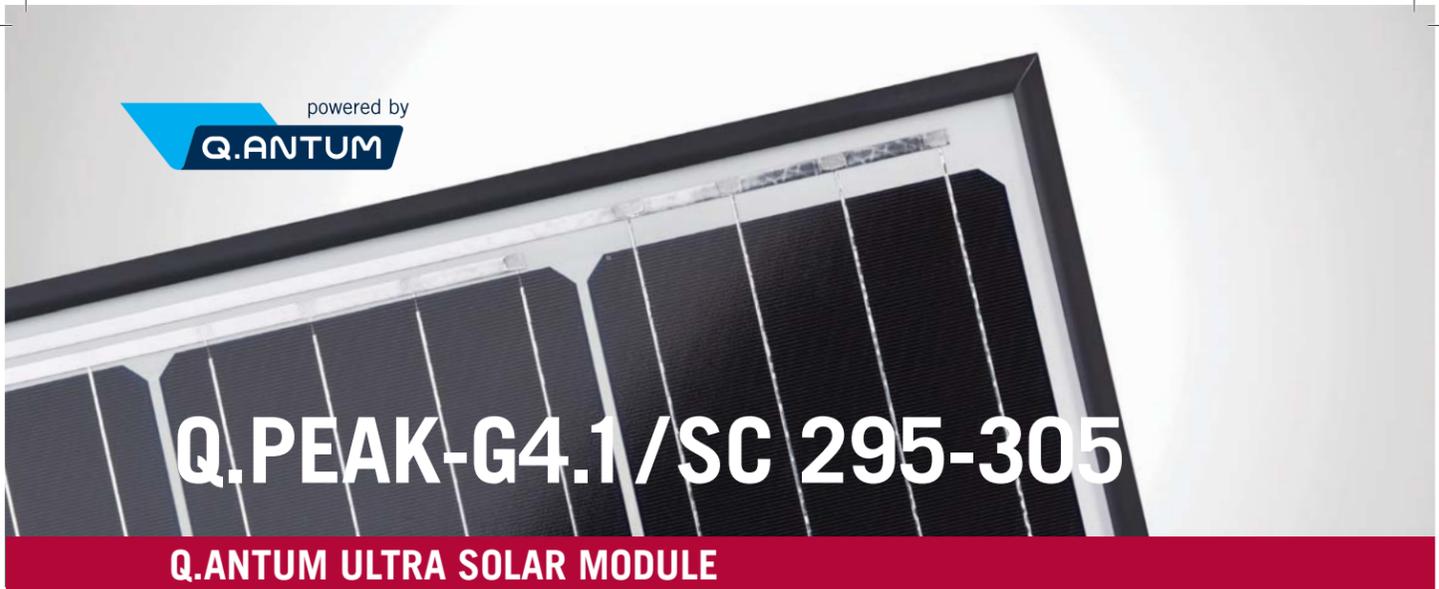
Part No. 850-1510
UL listed to UL 1565

Ground Zep



Part No. 850-1511
UL listed to UL 467 and
UL 2703

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The new high-performance module **Q.PEAK-G4.1/SC** is the ideal solution for all applications thanks to its innovative cell technology **Q.ANTUM ULTRA** and a black **Zep Compatible™** frame design for improved aesthetics, easy installation and increased safety. The world-record cell design was developed to achieve the best performance under real conditions – even with low radiation intensity and on clear, hot summer days.



LOW ELECTRICITY GENERATION COSTS

Higher yield per surface area and lower BOS costs thanks to higher power classes and an efficiency rate of up to 18.6%.



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



A RELIABLE INVESTMENT

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



THE IDEAL SOLUTION FOR:



Engineered in **Germany**

¹ APT test conditions: Cells at -1500V against grounded, with conductive metal foil covered module surface, 25 °C, 168h
² See data sheet on rear for further information.



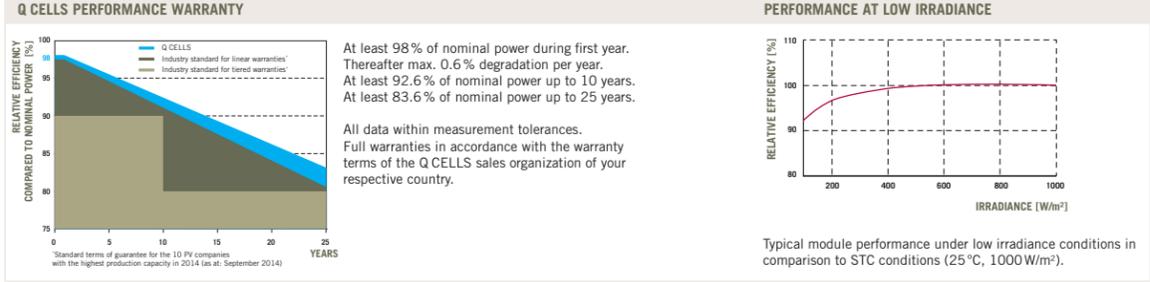
MECHANICAL SPECIFICATION

Format	65.7 in x 39.4 in x 1.57 in (including frame) (1670 mm x 1000 mm x 40 mm)
Weight	44.09 lbs (20.0 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 x 10 monocrystalline Q.ANTUM ULTRA solar cells
Junction box	2.60-3.03 in x 4.37-3.54 in x 0.59-0.75 in (66-77 mm x 111-90 mm x 15-19 mm), Protection class IP67, with bypass diodes
Cable	4 mm ² Solar cable; (+) 47.24 in (1200 mm), (-) 47.24 in (1200 mm)
Connector	Multi-Contact MC4, IP68

ELECTRICAL CHARACTERISTICS

POWER CLASS	295	300	305	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC¹ (POWER TOLERANCE +5 W / -0 W)				
Power at MPP²	P _{MPP} [W]	295	300	305
Short Circuit Current*	I _{SC} [A]	9.70	9.77	9.84
Open Circuit Voltage*	V _{OC} [V]	39.48	39.76	40.05
Current at MPP*	I _{MPP} [A]	9.17	9.26	9.35
Voltage at MPP*	V _{MPP} [V]	32.19	32.41	32.62
Efficiency²	η [%]	≥ 17.7	≥ 18.0	≥ 18.3
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NOC³				
Power at MPP²	P _{MPP} [W]	218.1	221.8	225.5
Short Circuit Current*	I _{SC} [A]	7.82	7.88	7.94
Open Circuit Voltage*	V _{OC} [V]	36.92	37.19	37.46
Current at MPP*	I _{MPP} [A]	7.20	7.27	7.35
Voltage at MPP*	V _{MPP} [V]	30.30	30.49	30.67

¹1000 W/m², 25 °C, spectrum AM 1.5 G ² Measurement tolerances STC ± 3 %; NOC ± 5 % ³ 800 W/m², NOCT, spectrum AM 1.5 G * typical values, actual values may differ



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]	-0.39	Normal Operating Cell Temperature	NOCT [°F]	113 ± 5.4 (45 ± 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)
Design load, push (UL)²	[lbs/ft ²]	75 (3600 Pa)	Permitted module temperature on continuous duty	-40 °F up to +185 °F (-40 °C up to +85 °C)
Design load, pull (UL)²	[lbs/ft ²]	55.6 (2666 Pa)	² see installation manual	

QUALIFICATIONS AND CERTIFICATES	PACKAGING INFORMATION	
UL 1703; CE-compliant; IEC 61215 (Ed.2); IEC 61730 (Ed.1) application class A	Number of Modules per Pallet	26
	Number of Pallets per 53' Container	32
	Number of Pallets per 40' Container	26
	Pallet Dimensions (L x W x H)	68.7 in x 45.3 in x 46.1 in (1745 mm x 1150 mm x 1170 mm)
	Pallet Weight	1254 lbs (569 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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