

ABBREVIATIONS	ELECTRICAL NOTES	JURISDICTION NOTES	
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	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 MULTI-WIRE 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.	PV ARRAY IN COMPLIANCE WITH OPEN SPACE CRITERIA.  1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.  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) 3. FOLLOW MANUFACTURERS SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS. 4. WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS.  <b>PROJECT NARRATIVE:</b>  This solar photovoltaic system installation at 5921 E Cheney Dr consists of 24 modules on two arrays facing south with an azimuth of 190 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 home view. All parapets are existing and both arrays will be at or below the level of the parapets. One inverter will be used and it will be located in the garage. Two Tesla Powerwalls will also be installed in the garage for energy storage. The photovoltaic meter and additional panels on the exterior of the home will be painted to match the color of the home.	

LICENSE
BLDG CL KB-01: ROC243771 ELEC CL K-11: ROC 245450
MODULE GROUNDING METHOD: ZEP SOLAR
AHJ: Paradise Valley  UTILITY: Arizona Public Service Company

GENERAL NOTES
1. ALL WORK SHALL COMPLY WITH THE 2015 IBC AND 2006 IRC. 2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2014 NATIONAL ELECTRIC CODE.



INDEX	
Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Sheet 8 Sheet 9 Sheet 10 Cutsheets Attached	COVER SHEET PROPERTY PLAN SITE PLAN STRUCTURAL DETAILS & UPLIFT CALCS BUILDING ELEVATION THREE LINE DIAGRAM TRIANGLE NOTES ONE LINE DIAGRAM PROPERTY IMAGES MODULE IMAGES

REV BY DATE COMMENTS			
REV A	HB	12/14/2017	ELECTRICAL/APS UPDATES
*	*	*	*
*	*	*	*
*	*	*	*
*	*	*	*

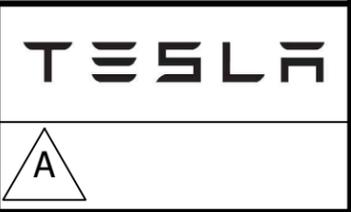
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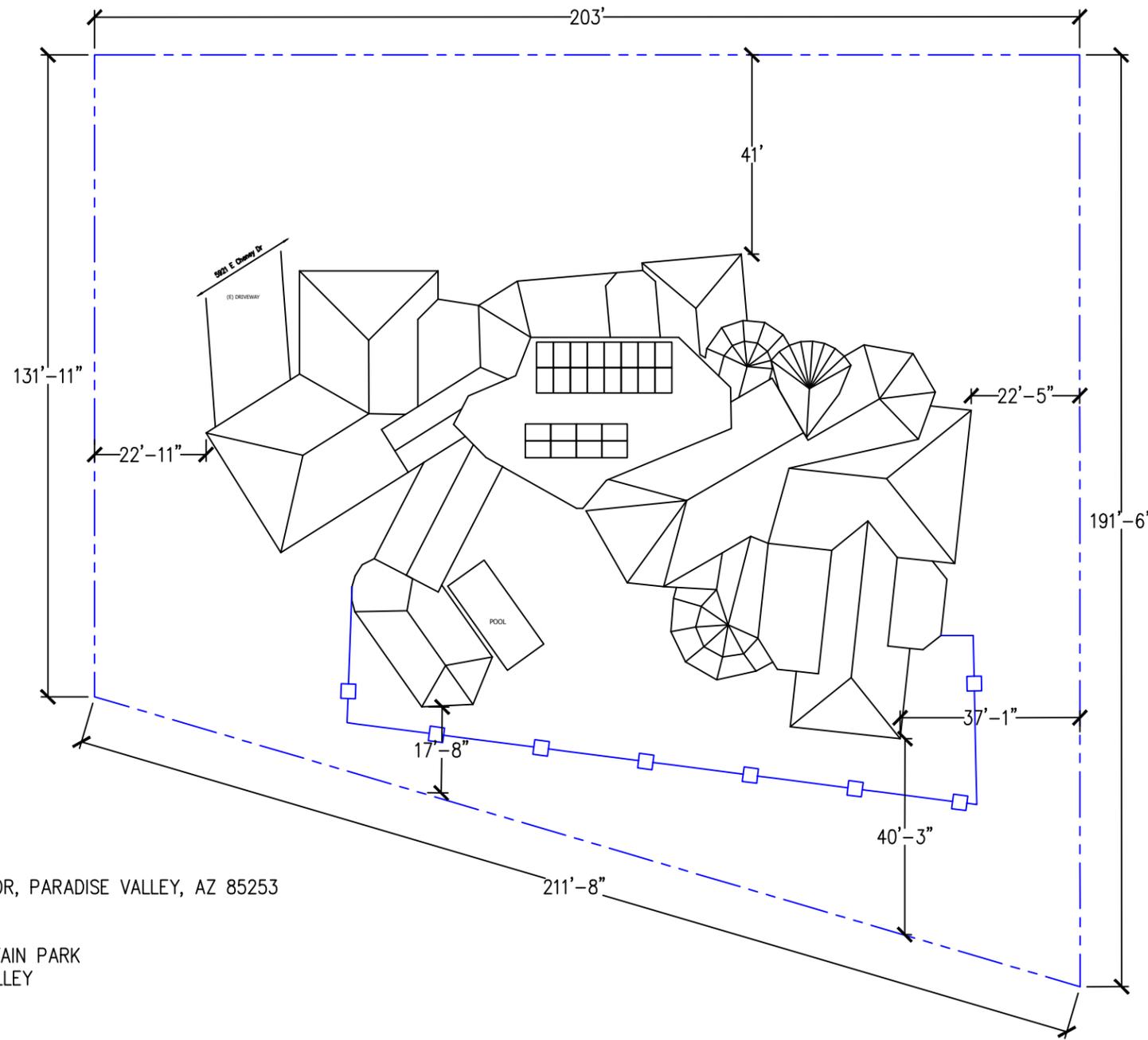
JOB NUMBER: JB-8528160 00
MOUNTING SYSTEM: ZS Ramp Foot
MODULES: SolarCity Standard #SC325
INVERTER: (24) Delta # Solivia 6.6 TL

PREMISE OWNER: WILLIAM FOSTER 5921 E CHENEY DR PARADISE VALLEY, AZ 85253
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DESCRIPTION: 7.8 KW DC ROOF MOUNT PV ARRAY 6.6 KW (AC NAMEPLATE) PV ARRAY  PAGE NAME: 27.0 kWh ENERGY STORAGE SYSTEM COVER SHEET
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DESIGN: Colby West  SHEET: 1 a 1/31/2018
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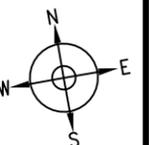




ADDRESS: 5921 E CHENEY DR, PARADISE VALLEY, AZ 85253  
 LOT #: 153  
 ZONING: R-43  
 SUBDIVISION: MUMMY MOUNTAIN PARK  
 JURISDICTION: PARADISE VALLEY

**PROPERTY PLAN**

Scale: 1" = 30'-0"



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 PROPERTY PLAN

DESIGN:  
 Colby West  
 SHEET: 2  
 REV: a  
 DATE: 1/31/2018



SYSTEM UTILITY DISCONNECT

CUSTOMER DISCONNECT SWITCH

BACKUP GATEWAY

PV SYSTEM PRODUCTION METER

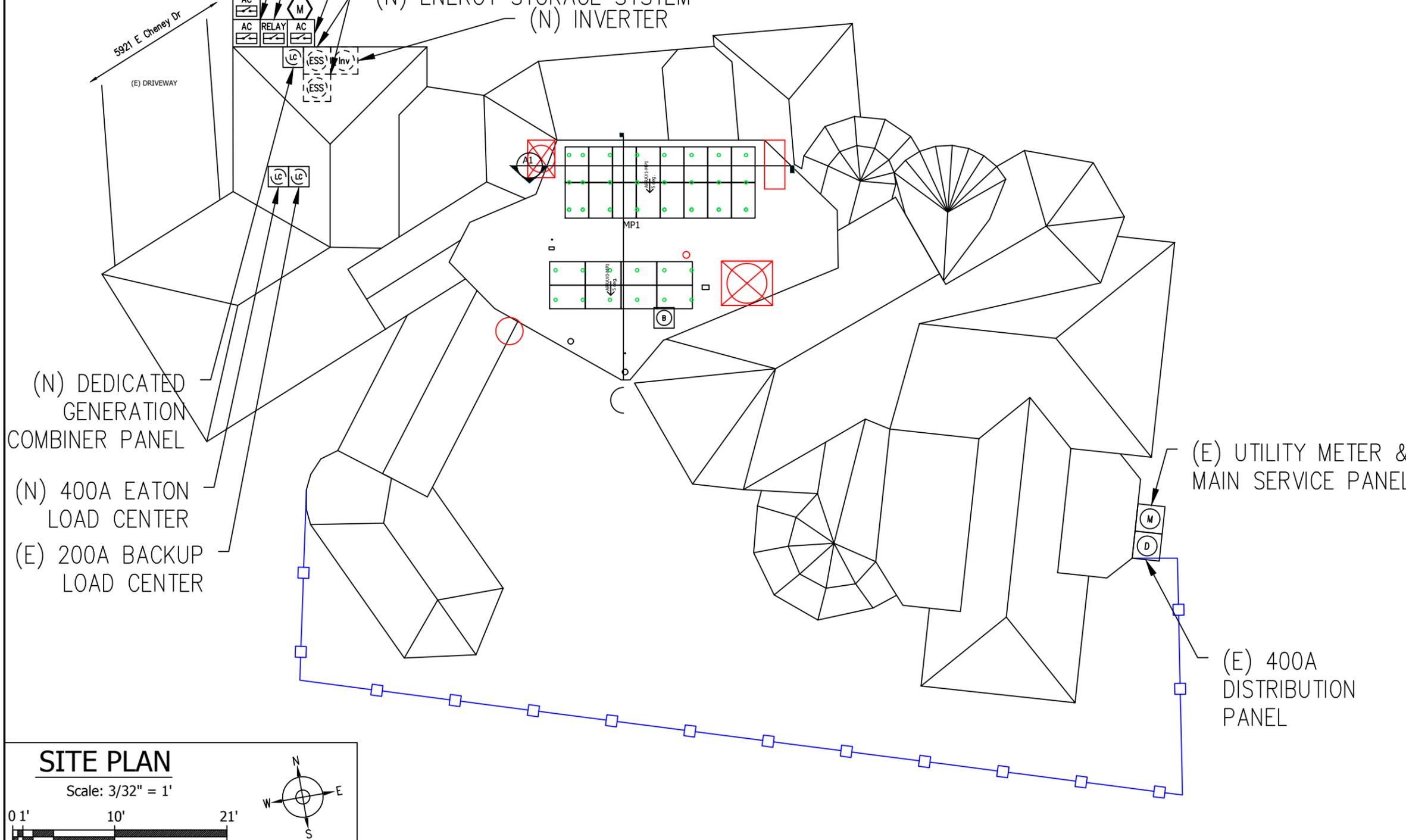
PV SYSTEM METER DISCONNECT

(N) ENERGY STORAGE SYSTEM

(N) INVERTER

NOTE: PHOTOVOLTAIC METER WILL BE PAINTED TO MATCH THE HOUSE.

MP1 PITCH: 2 AZIMUTH: 190 MATERIAL: Mod Bit ARRAY PITCH: 2 ARRAY AZIMUTH: 190 STORY: 2 Stories

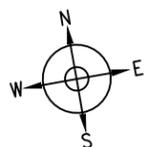
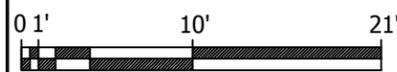


LEGEND

- (M) (E) UTILITY METER & WARNING LABEL
(Inv) INVERTER W/ INTEGRATED DC DISCO & WARNING LABELS
RELAY AUTOMATIC RELAY
DC DC DISCONNECT & WARNING LABELS
AC AC DISCONNECT & WARNING LABELS
(B) DC JUNCTION/COMBINER BOX & LABELS
(ESS) ENERGY STORAGE SYSTEM FOR STAND ALONE OPERATION
(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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PREMISE OWNER: WILLIAM FOSTER 5921 E CHENEY DR PARADISE VALLEY, AZ 85253

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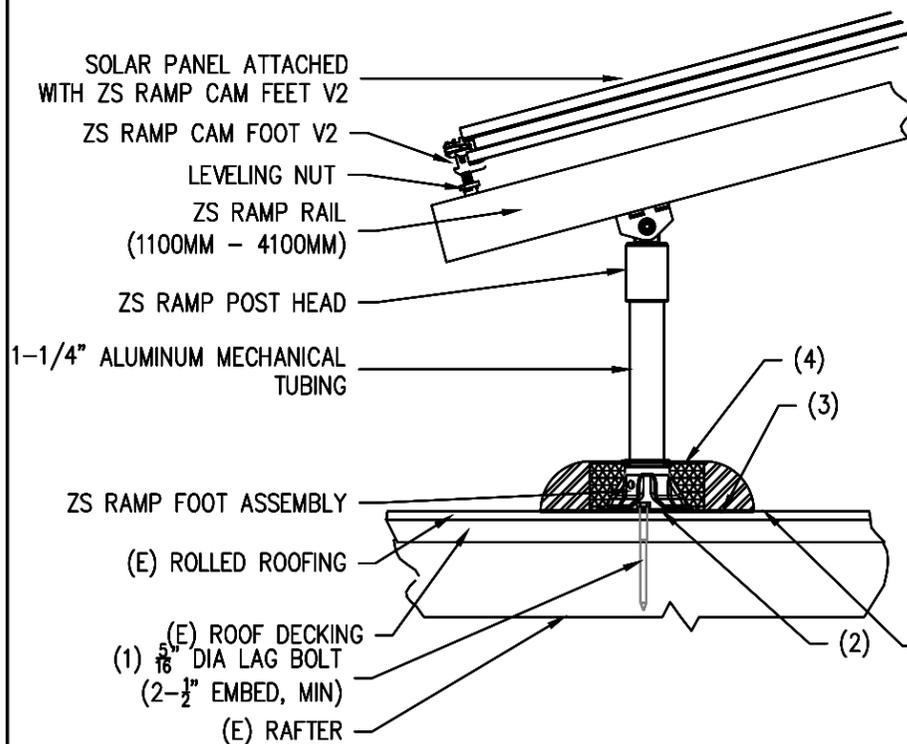
PAGE NAME: 27.0 kWh ENERGY STORAGE SYSTEM SITE PLAN

DESIGN: Colby West

SHEET: 3 REV: a DATE: 1/31/2018



# UPLIFT CALCULATIONS



- 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 CHEMCURB AND AROUND PENETRATION.
  - (4) 1 PART POURABLE SEALANT.

**(S1) STANDOFF**  
 Scale: 1 1/2" = 1'

01.31.2018  
 Version #72.1  
 Job# 8528160

## DESIGN SUMMARY

Jobsite Specific Design Criteria			
Design Code		ASCE 7-10	
Importance Factor	I	1.0	
Ultimate Wind Speed	V-Ult	115 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	Built Up / Modified Roofing	
	Standoff	ZS Ramp Foot	
	Pitch	2°	
	SL/RL: PV		
	SL/RL: Non-PV	20.0 psf	

Standoff Spacing and Layout			
	MP Name	MP1	
Landscape	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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PAGE NAME: 27.0 kWh ENERGY STORAGE SYSTEM  
 STRUCTURAL DETAILS & UPLIFT CALCS

DESIGN:  
 Colby West

SHEET: 4    REV:    DATE: 1/31/2018



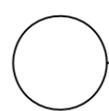
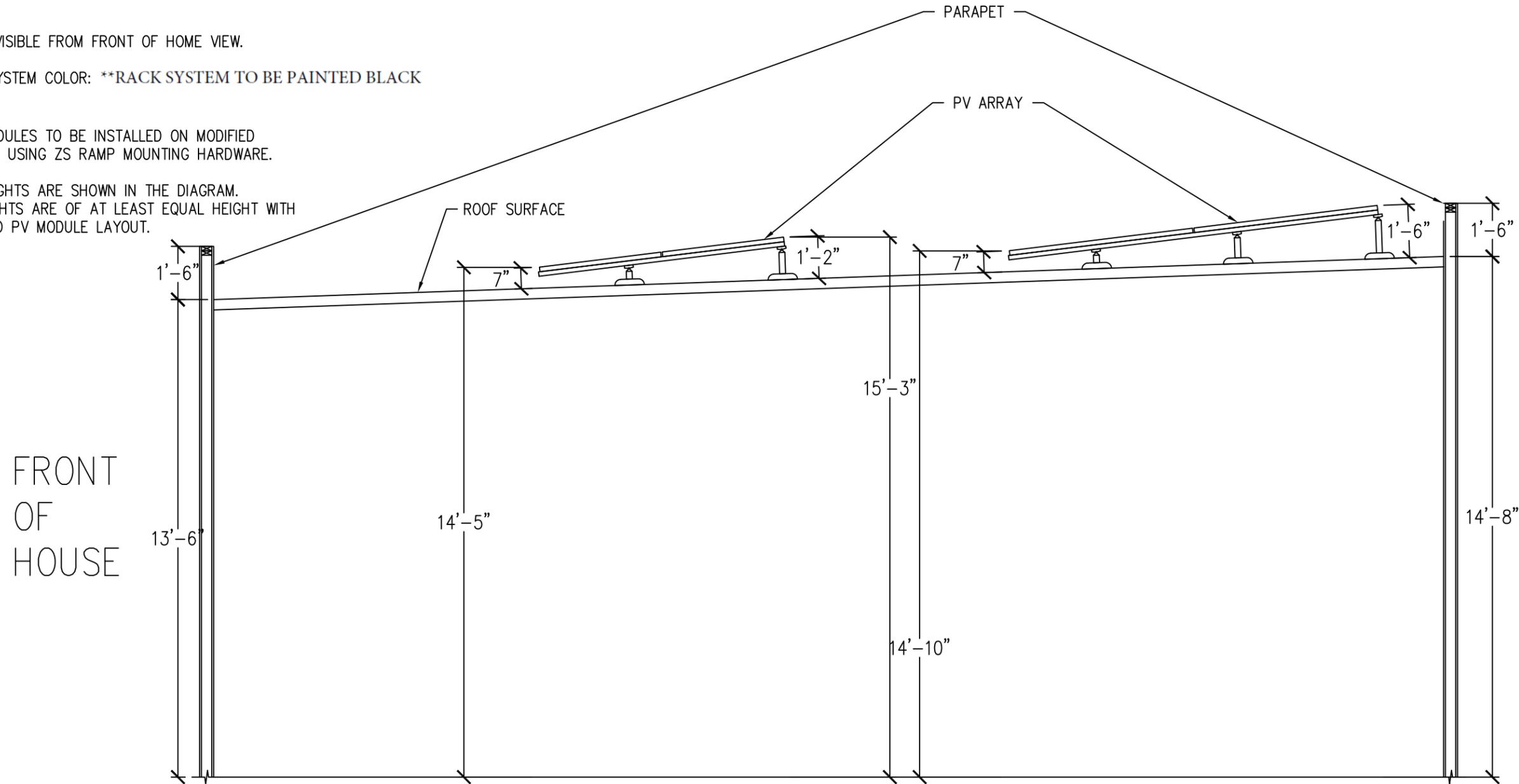
NOTE: PHOTOVOLTAIC METER WILL BE PAINTED TO MATCH THE HOUSE.

PANELS NOT VISIBLE FROM FRONT OF HOME VIEW.

NOTE RACK SYSTEM COLOR: \*\*RACK SYSTEM TO BE PAINTED BLACK

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

RELEVANT HEIGHTS ARE SHOWN IN THE DIAGRAM. PARAPET HEIGHTS ARE OF AT LEAST EQUAL HEIGHT WITH THE PROPOSED PV MODULE LAYOUT.



**SIDE VIEW OF ARRAYS**

SCALE: NTS

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PAGE NAME: 27.0 kWh ENERGY STORAGE SYSTEM BUILDING ELEVATION

DESIGN:  
Colby West

SHEET: 5 REV: a DATE: 1/31/2018





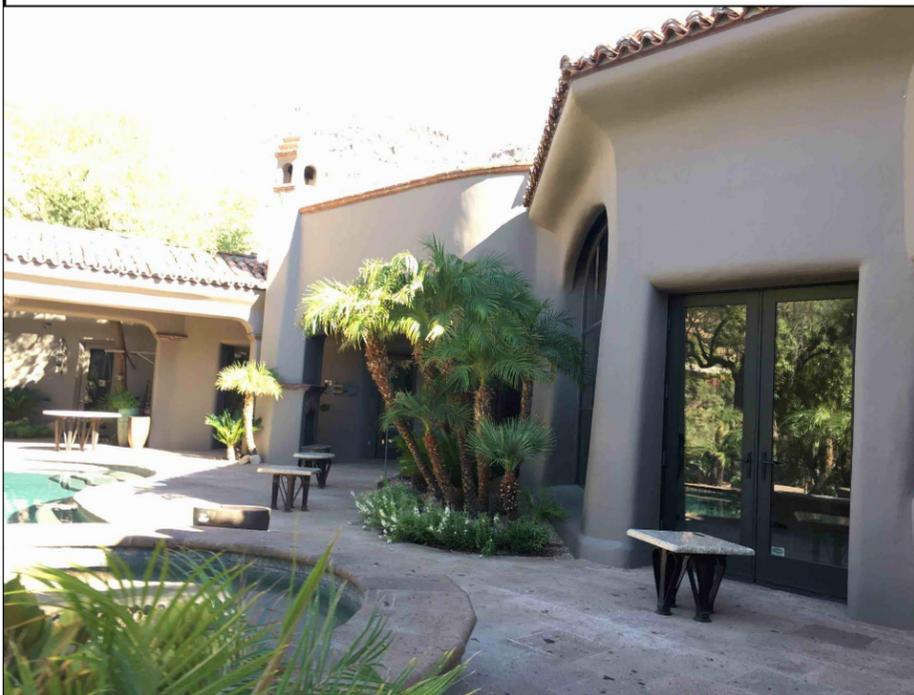
AERIAL IMAGE OF HOME



HOME VIEW FROM LOCATION X



HOME VIEW FROM LOCATION Y



HOME VIEW FROM LOCATION Z

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 PROPERTY IMAGES

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BLACK FRAME, SOLAR CELLS, AND BACKSHEET  
 (SEE CUTSHEET FOR SPECS)



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MODULE IMAGES

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Colby West

SHEET: REV: DATE:  
10 a 1/31/2018

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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



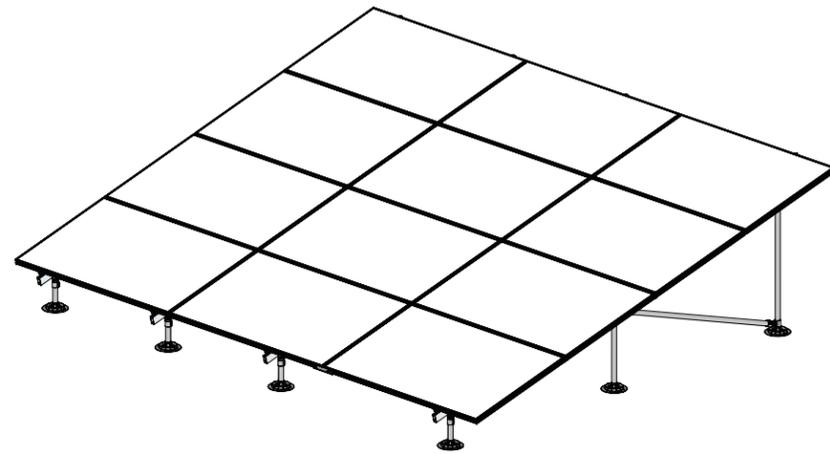
## Delta Solar Inverters Datasheet for SolarCity

	SOLIVIA 3.0 TL	SOLIVIA 3.8 TL	SOLIVIA 5.2 TL	SOLIVIA 6.6 TL	SOLIVIA 7.6 TL
<b>INPUT (DC)</b>					
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		
<b>OUTPUT (AC)</b>					
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				
<b>GENERAL SPECIFICATION</b>					
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				
<b>MECHANICAL DESIGN</b>					
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				
<b>STANDARDS / DIRECTIVES</b>					
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				
<b>WARRANTY</b>					
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

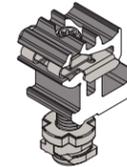
**Specifications**

- 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.

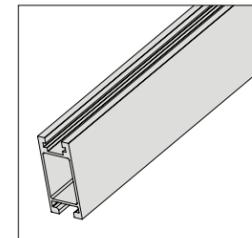
**Components**

**Cam Foot V2**



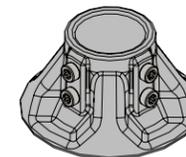
Part No. 850-1564  
UL listed to UL 2703

**Rail**



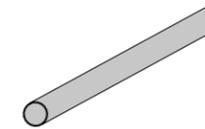
Part No. 850-1568  
850-1567  
850-1566  
and 850-1565  
UL listed to UL 2703

**Base Foot**



Part No. 850-1563  
UL listed to UL 2703

**Mechanical Tubing (MT)**



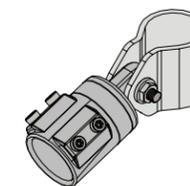
Part No. 850-1583  
UL listed to UL 2703  
1.51" Outer Diameter

**Post Mount**



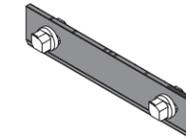
Part No. 850-1561  
UL listed to UL 2703

**Cross Brace Assembly**



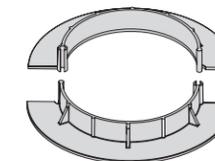
Part No. 850-1636  
UL listed to UL 2703

**Interlock**



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

**Sealant Ring**



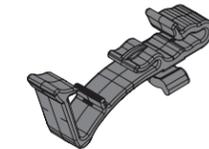
Part No. 850-1638

**Splice Assembly, Ramp**



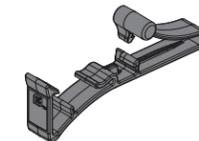
Part No. 850-1635  
UL listed to UL 2703

**DC Wire Clip**



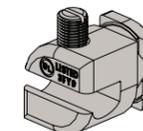
Part No. 850-1509  
UL listed to UL 1565

**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

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.

## POWERWALL

Tesla Powerwall is a fully-integrated AC battery system for residential or light commercial use. Its rechargeable lithium-ion battery pack provides energy storage for solar self-consumption, load shifting, and backup.

Powerwall's electrical interface provides a simple connection to any home or building. Its revolutionary compact design achieves market-leading energy density and is easy to install, enabling owners to quickly realize the benefits of reliable, clean power.



### PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	120/240 V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Total Energy <sup>1</sup>	14 kWh
Usable Energy <sup>1</sup>	13.5 kWh
Real Power, max continuous	5 kW (charge and discharge)
Real Power, peak (10s)	7 kW (discharge only)
Apparent Power, max continuous	5.8 kVA (charge and discharge)
Apparent Power, peak (10s)	7.2 kVA (discharge only)
Maximum Supply Fault Current	10 kA
Maximum Output Fault Current	32 A
Overcurrent Protection Device	30 A
Imbalance for Split-Phase Loads	100%
Power Factor Output Range	+/- 1.0 adjustable
Power Factor Range (full-rated power)	+/- 0.85
Internal Battery DC Voltage	50 V
Round Trip Efficiency <sup>1,2</sup>	90%
Warranty	10 years

<sup>1</sup>Values provided for 25°C (77°F), 3.3 kW charge/discharge power.

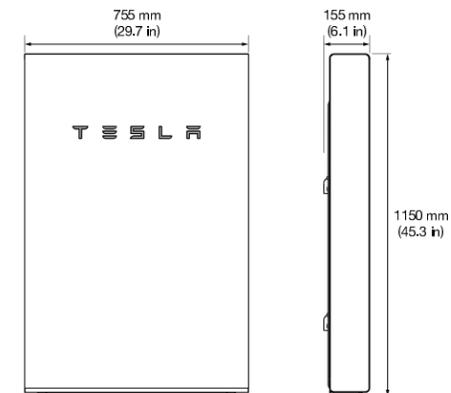
<sup>2</sup>AC to battery to AC, at beginning of life.

### COMPLIANCE INFORMATION

Certifications	UL 1642, UL 1741, UL 1973, UL 9540, UN 38.3
Grid Connection	Worldwide Compatibility
Emissions	FCC Part 15 Class B, ICES 003
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)

### MECHANICAL SPECIFICATIONS

Dimensions	1150 mm x 755 mm x 155 mm (45.3 in x 29.7 in x 6.1 in)
Weight	125 kg (276 lbs)
Mounting options	Floor or wall mount



### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Storage Conditions	-20°C to 30°C (-4°F to 86°F) Up to 95% RH, non-condensing State of Energy (SoE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R
Ingress Rating	IP67 (Battery & Power Electronics) IP56 (Wiring Compartment)
Wet Location Rating	Yes
Pollution Degree Rating	PD3
Noise Level @ 1m	< 40 dBA at 30°C (86°F)

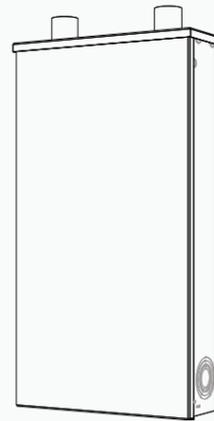
## POWER WALL

### Backup Gateway

The Backup Gateway for Tesla Powerwall provides energy management and monitoring for solar self-consumption, load shifting, and whole-home or partial-home backup.

The Backup Gateway controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a circuit breaker, the Backup Gateway can be installed at the service entrance.

The Backup Gateway communicates directly with Powerwall, allowing you to monitor home energy use and manage backup energy reserves from any mobile device with the Tesla app.



### PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	230 V, 120/240 V
Feed-In Type	Single & Split Phase
Grid Frequency	50 and 60 Hz
Disconnect Current	200 A
Maximum Input Short Circuit Current	10 kA
Overcurrent Protection Device <sup>1</sup>	100–200 A; Service Entrance Rated
Overvoltage Category	Category III
AC Meter	Revenue grade (+/- 1%)
Connectivity	Ethernet, Cellular (3G), Wi-Fi
User Interface	Tesla App
Operating Modes	Support for solar self-consumption, load shifting, and backup
Backup Operation	Automatic disconnect for seamless backup transition
Modularity	Supports up to 10 AC-coupled Powerwalls
Warranty	10 years

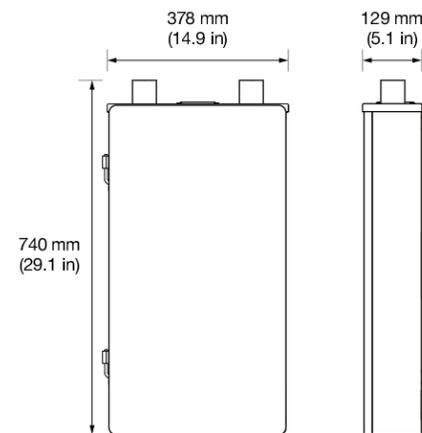
<sup>1</sup>Circuit breaker required for installation at service entrance.

### COMPLIANCE INFORMATION

Certifications	UL 1642, UL 1741, IEC 62109-1, CSA C22.2.107.1
Grid Connection	Worldwide Compatibility
Emissions	FCC Part 15 Class B, ICES 003, IEC 61000-6-3, EN 55024, EN 301489-1, EN 301489-7, EN 301489-17
Environmental	RoHS Directive 2011/65/EU, WEEE Directive 2012/19/EU, Battery Directive 2006/66/EC, REACH Regulation
Seismic	AC156, IEEE 693-2005 (high)

### MECHANICAL SPECIFICATIONS

Dimensions	740 mm x 378 mm x 129 mm (29.1 in x 14.9 in x 5.1 in)
Weight	16.4 kg (36 lbs)
Mounting options	Wall mount



### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R
Ingress Rating	IP44

More power,  
less panels.



With a sunlight to electricity conversion efficiency of over 19.4% the panel ranks amongst the highest in the industry. That means our panels can harvest more energy from the sun, which means it takes fewer of our panels to power your home. Plus, they generate more power output during the hottest times of the day, even in warmer climates.

- More power per panel**  
Our 325W panel generates 20% more power than a standard 270W panel.
- More energy every year**  
More yearly energy (kWh) compared to other panels as they perform better in the heat.
- Outstanding durability**  
With more than 20 additional tests performed beyond what is currently mandated, these panels far exceed industry standards.
- More layers, more power**  
Manufactured by Panasonic for SolarCity, the panel uses Heterojunction cell technology, which adds a layer of thin film silicon on top of high efficiency crystalline silicon.
- Leading warranty**  
Our panels rank among the best in warranty coverage, with workmanship that extends to 15 years.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

ELECTRICAL DATA

Max. power (Pmax) [W]	325
Max. power voltage (Vmp) [V]	57.6
Max. power current (Imp) [A]	5.65
Open circuit voltage (Voc) [V]	69.6
Short circuit current (Isc) [A]	6.03
Max. over current rating [A]	15
Power tolerance [%]*	+5/-0
Max. system voltage [V]	600
Solar Panel efficiency [%]	19.4

Note: Standard Test Conditions: Air mass 1.5; Irradiance = 1000W/m<sup>2</sup>; cell temp. 25°C  
\*Maximum power at delivery. For limited warranty conditions, please check our limited warranty document.

TEMPERATURE CHARACTERISTICS

Temperature (NOCT) [°C]	44.0
Temp. coefficient of Pmax [%/°C]	-0.29
Temp. coefficient of Voc [%/°C]	-0.25
Temp. coefficient of Isc [%/°C]	0.03

AT NOCT (NORMAL OPERATING CONDITIONS)

Max. power (Pmax) [W]	246.0
Max. power voltage (Vmp) [V]	54.2
Max. power current (Imp) [A]	4.54
Open circuit voltage (Voc) [V]	66.0
Short circuit current (Isc) [A]	4.85

Note: Normal Operating Cell Temp.: Air mass 1.5; Irradiance = 800W/m<sup>2</sup>  
Air temperature 20°C; wind speed 1 m/s

AT LOW IRRADIANCE (20%)

Max. power (Pmax) [W]	62.0
Max. power voltage (Vmp) [V]	55.7
Max. power current (Imp) [A]	1.11
Open circuit voltage (Voc) [V]	65.1
Short circuit current (Isc) [A]	1.21

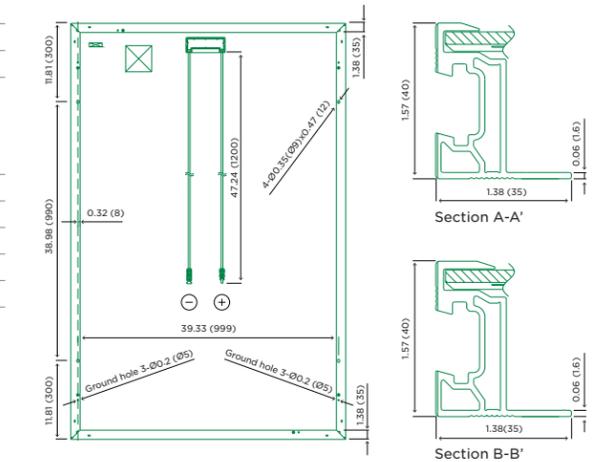
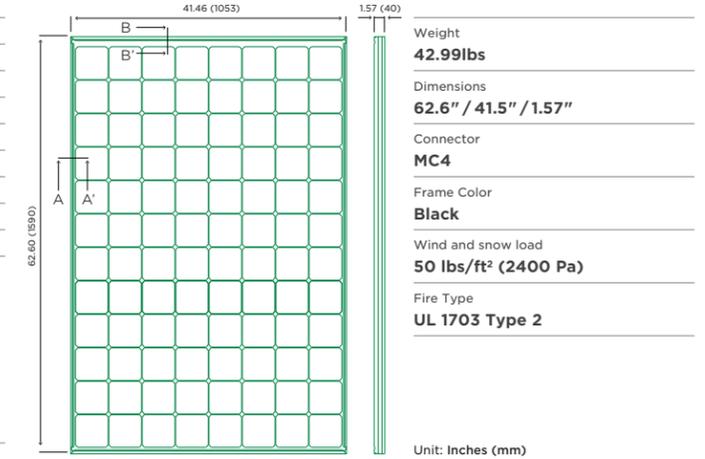
Note: Low irradiance: Air mass 1.5; Irradiance = 200W/m<sup>2</sup>; cell temp. = 25°C<sub>cv</sub>

<b>LIMITED WARRANTY</b>	Power output:	10 years (90% of Pmin)
		25 years (80% of Pmin)
	Workmanship:	15 years

<b>MATERIALS</b>	Cell material:	5 inch photovoltaic cells
	Glass material:	AR coated tempered glass
	Frame materials:	Black anodized aluminium
	Connectors type:	MC4

**CAUTION!** Please read the installation manual carefully before using the products.

MECHANICAL DATA



DEPENDENCE ON IRRADIANCE

