



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 MULTIWIRE 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 style="text-align: center;">VICINITY MAP</p>  <p style="text-align: center;">MAP/USGS, U.S. Geological Survey, USDA Farm Service Agency</p>																									
<p style="text-align: center;">LICENSE</p>	<p style="text-align: center;">GENERAL NOTES</p> <p>1. ALL WORK SHALL COMPLY WITH THE 2009 IBC AND 2009 IRC. 2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2008 NATIONAL ELECTRIC CODE.</p>	<p style="text-align: center;">INDEX</p> <p>Sheet 1 COVER SHEET Sheet 2 SITE PLAN Sheet 3 STRUCTURAL VIEWS Sheet 4 UPLIFT CALCULATIONS Sheet 5 THREE LINE DIAGRAM Cutsheets Attached</p> <table border="1" data-bbox="2442 1554 3039 1739"> <thead> <tr> <th>REV</th> <th>BY</th> <th>DATE</th> <th>COMMENTS</th> </tr> </thead> <tbody> <tr> <td>REV A</td> <td>NAME</td> <td>DATE</td> <td>COMMENTS</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> <tr> <td>*</td> <td>*</td> <td>*</td> <td>*</td> </tr> </tbody> </table>		REV	BY	DATE	COMMENTS	REV A	NAME	DATE	COMMENTS	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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<p>CONFIDENTIAL - THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.</p>	<p>JOB NUMBER: JB-173967 00</p> <p>MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert</p> <p>MODULES: (28) SolarCity Standard #SC325</p> <p>INVERTER: Delta # Solivia 7.6 TL</p>	<p>CUSTOMER: DEREK STILES 345 RIVIERA ST MOUNT WOLF, PA 17347</p>	<p>DESCRIPTION: 9.1 KW PV ARRAY 13.5 KWH ENERGY STORAGE SYSTEM</p> <p>PAGE NAME: COVER SHEET</p>	<p>DESIGN: Ryan Duncan</p> <p>SHEET: 1 REV: DATE: 3/4/2018</p>																							

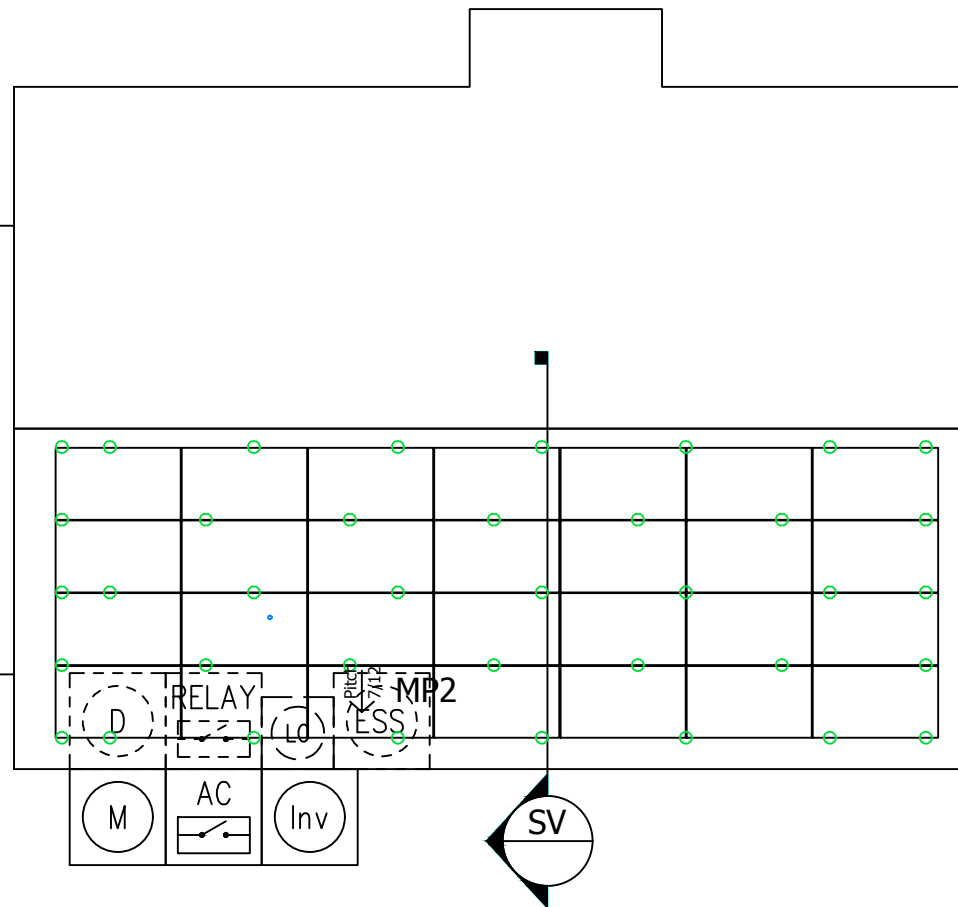
Riviera St

Lynne Dr

Front Of House

345 Riviera St

(E) DRIVEWAY



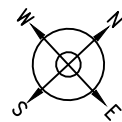
MP2	PITCH: 30	ARRAY PITCH: 30
	AZIMUTH: 133	ARRAY AZIMUTH: 133
	MATERIAL: Comp Shingle	STORY: 2 Stories

LEGEND

- (E) UTILITY METER & WARNING LABEL
- INVERTER W/ INTEGRATED DC DISCO & WARNING LABELS
- AUTOMATIC RELAY
- DC DISCONNECT & WARNING LABELS
- AC DISCONNECT & WARNING LABELS
- DC JUNCTION/COMBINER BOX & LABELS
- ENERGY STORAGE SYSTEM FOR STAND ALONE OPERATION
- DISTRIBUTION PANEL & LABELS
- LOAD CENTER & WARNING LABELS
- DEDICATED PV SYSTEM METER
- 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: 1/8" = 1'



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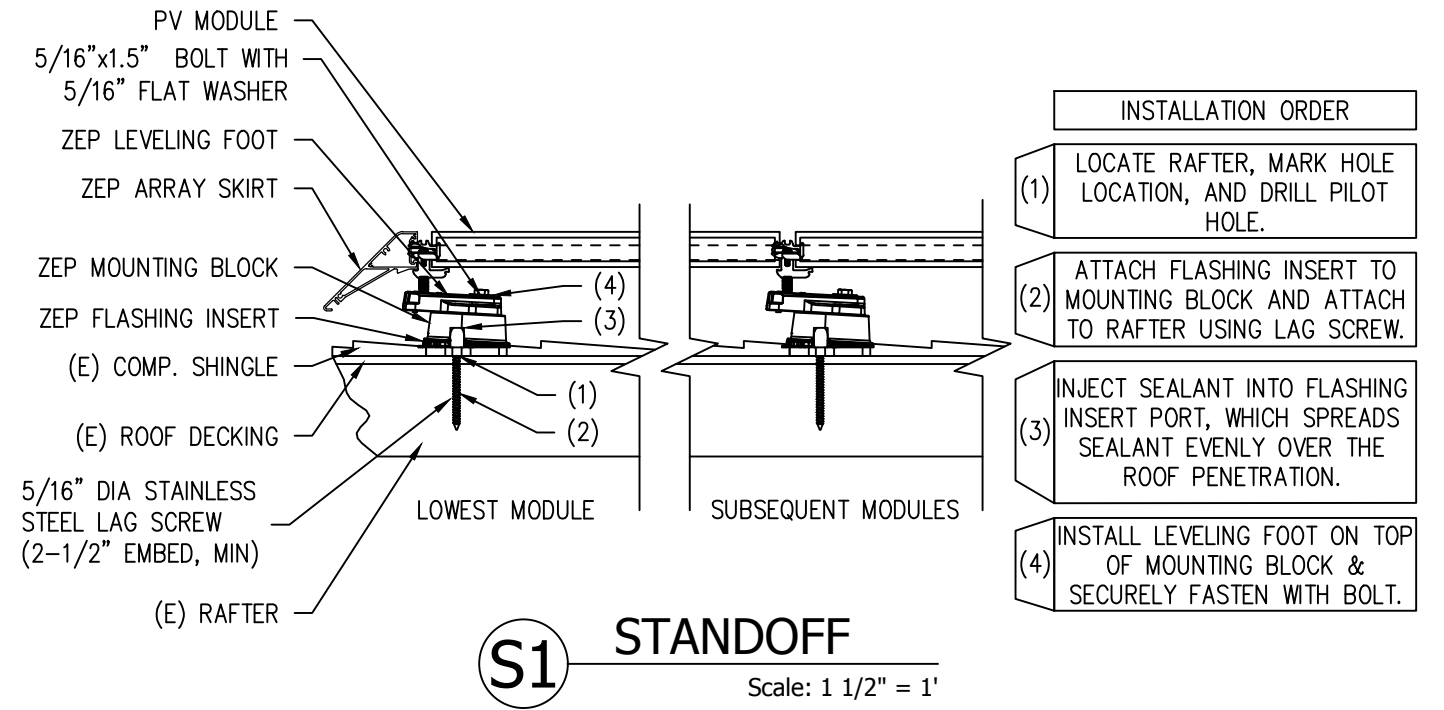
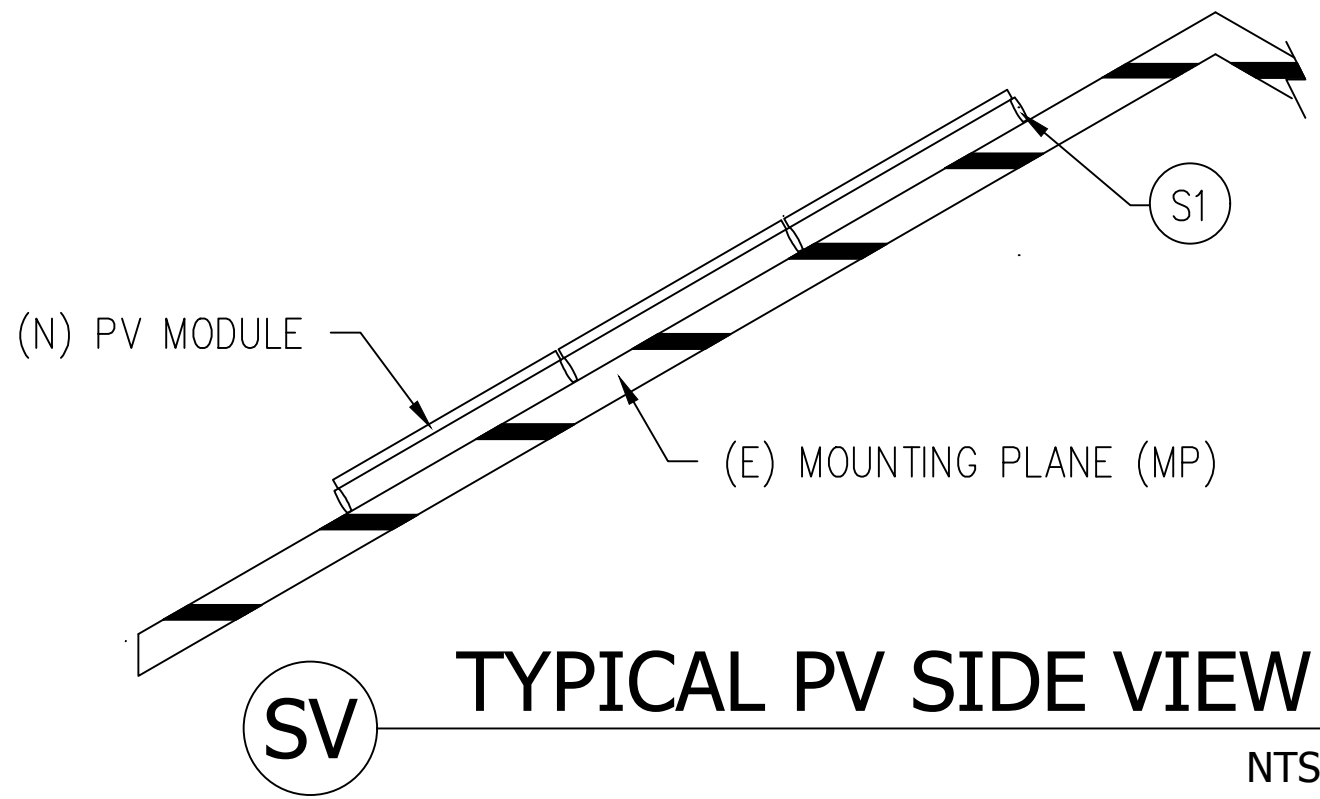
DESCRIPTION:
9.1 KW PV ARRAY
13.5 KWH ENERGY STORAGE SYSTEM

PAGE NAME:
SITE PLAN

DESIGN:
Ryan Duncan

SHEET: 2 REV: DATE: 3/4/2018





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PAGE NAME:
STRUCTURAL VIEWS

DESIGN:
Ryan Duncan

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

TESLA

03.04.2018
Version #72.1
Job# 173967

DESIGN SUMMARY

Jobsite Specific Design Criteria			
Design Code		ASCE 7-05	
Importance Factor	I	1.0	Table 6-1
Basic Wind Speed	V	90 mph	Fig. 6-1
Exposure Category		C	Section 6.5.6.3
Ground Snow Load	pg	25.0 psf	ASCE Table 7-1

MP Specific Design Information			
MP Name	MP2		
Roofing	Comp Roof		
Standoff	Comp Mount SRV		
Pitch	30°		
SL/RL: PV	11.7 psf		
SL/RL: Non-PV	17.5 psf		

Standoff Spacing and Layout			
MP Name	MP2		
X-Spacing	72"		
X-Cantilever	24"		
Y-Spacing	41"		
Y-Cantilever	NA		
X-Spacing	48"		
X-Cantilever	21"		
Y-Spacing	62"		
Y-Cantilever	NA		
Layout	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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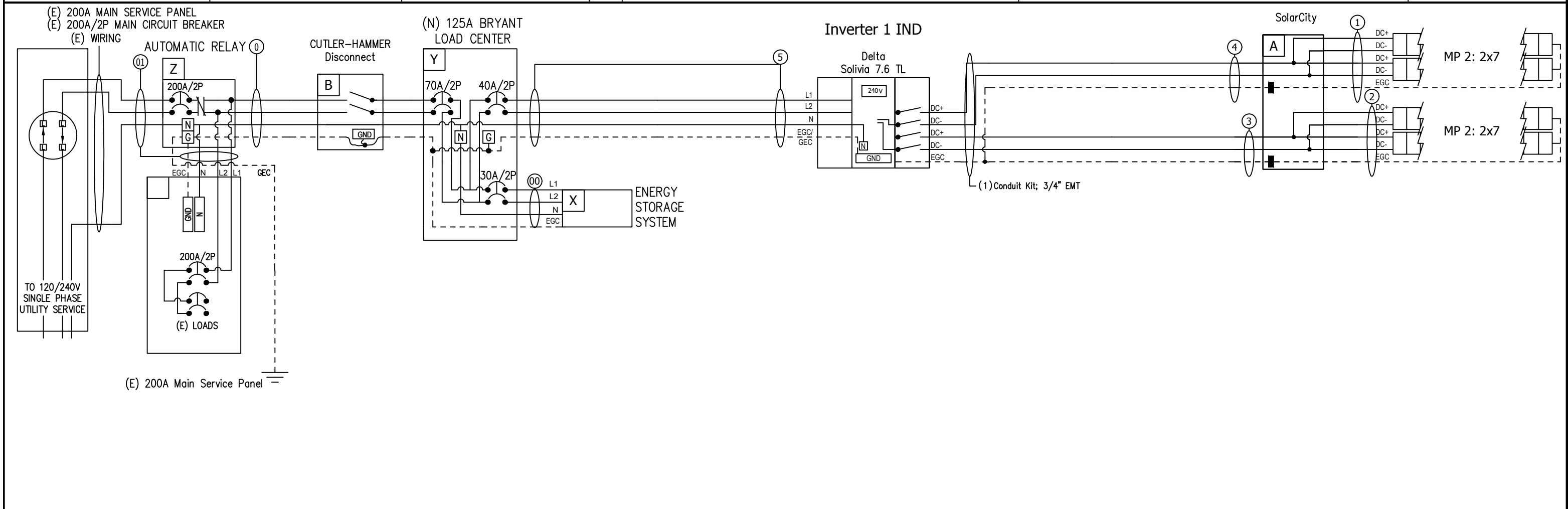
PAGE NAME:
UPLIFT CALCULATIONS

DESIGN:
Ryan Duncan

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

TESLA

GROUND SPECS	MAIN PANEL SPECS	GENERAL NOTES	INVERTER SPECS	MODULE SPECS	LICENSE
BOND (N) #8 GEC TO (N) GROUND ROD AT PANEL WITH IRREVERSIBLE CRIMP	Panel Number: BR3040B200 Meter Number: 5000816101 Underground Service Entrance	Inv 1: DC Ungrounded	INV 1 - (1) Delta # Solivia 7.6 TL LABEL: A Inverter; 7600W, 240V/208V, 97.5%/97.5%, Zigbee, PLC INV 2 INV 3	(28) SolarCity Standard #SC325 PV Module; 325W, 306.5 PTC, 40MM, Blk Frm, Wht Backsheet, MC4, 600V Voc: 69.6 Vpmax: 57.6 Isc AND Imp ARE SHOWN IN THE DC STRINGS IDENTIFIER	ZEP,



Voc* = MAX VOC AT MIN TEMP

POI Z	(1) Ground Rod 5/8" x 8", Copper (1) Tesla # 1118431-00-J BACK-UP GATEWAY; for ACPW2.0, ASY, NA with 3G w/ Antenna, PW2.0, 10kA SCCR (1) Siemens # EQ8695/MBK200A Circuit Breaker MBK 200A/2P, 22kAIC	X Y	(1) Tesla # 1108567-00-E-ST AC POWERWALL 5.8kVA; Home Energy Storage, 13.5KWH, Stackable, PW2.0 (1) CUTLER-HAMMER # BR230 Breaker; 30A/2P, 2 Spaces (1) CUTLER-HAMMER # BR240 Breaker; 40A/2P, 2 Spaces (1) BRYANT # BR816L125RP Load Center; 125A, 120/240V, NEMA 3R (1) CUTLER-HAMMER # BR270 Breaker; 70A/2P, 2 Spaces	AC	A	(1) SolarCity # 4J; 4 STRING JUNCTION BOX UNFUSED, GROUNDED, Black DC	
0 01	(1) AWG #8, THWN-2, Black (1) AWG #8, THWN-2, Red (1) AWG #8, THWN-2, White (1) AWG #8, THWN-2, Green EGC/GEC (3) AWG #2/0, THWN-2, Black (1) AWG #4, THWN-2, GREEN Cu, Stranded; 1 (1) Conduit Kit; 1-1/2" EMT	B 5 00	(1) CUTLER-HAMMER # DG223URB Disconnect; 100A, 240Vac, Non-Fusible, NEMA 3R (1) CUTLER-HAMMER # DG100NB Ground/Neutral Kit; 60-100A, General Duty (DG) (1) AWG #8, THWN-2, Black (1) AWG #8, THWN-2, Red (1) AWG #10, THWN-2, White NEUTRAL Vmp = 240 VAC Imp = 31.7 AAC (1) AWG #8, THWN-2, Green EGC/GEC (1) AWG #10, THWN-2, Black (1) AWG #10, THWN-2, Red (1) AWG #10, THWN-2, White NEUTRAL (1) AWG #10, THWN-2, Green EGC (1) Conduit Kit; 3/4" EMT	3 4	(1) AWG #10, THWN-2, Black Voc* = 535.92VDC Isc = 12.06 ADC (1) AWG #10, THWN-2, Red Vmp = 403.2 VDC Imp = 11.3 ADC (1) AWG #10, THHN/THWN-2, Green EGC - (1) Conduit Kit; 3/4" EMT (1) AWG #10, THWN-2, Black Voc* = 535.92VDC Isc = 12.06 ADC (1) AWG #10, THWN-2, Red Vmp = 403.2 VDC Imp = 11.3 ADC (1) AWG #10, THHN/THWN-2, Green EGC - (1) Conduit Kit; 3/4" EMT	1 2	(4) AWG #10, PV Wire, 600V, Black Voc* = 535.92VDC Isc = 6.03 ADC (1) AWG #10, Solid Bare Copper EGC Vmp = 403.2 VDC Imp = 5.65 ADC (4) AWG #10, PV Wire, 600V, Black Voc* = 535.92VDC Isc = 6.03 ADC (1) AWG #10, Solid Bare Copper EGC Vmp = 403.2 VDC Imp = 5.65 ADC

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DESCRIPTION: 9.1 KW PV ARRAY
13.5 KWH ENERGY STORAGE SYSTEM
PAGE NAME: THREE LINE DIAGRAM

DESIGN: Ryan Duncan
SHEET: 5 REV: DATE: 3/4/2018



ELECTRICAL CALCULATIONS

Panel Schedule

Load	Breaker

NEC 220.83 - Residential Load Calculation

Version 3.0

NEC 220.83(B) "Existing Dwelling Unit. ... to determine if the existing service ... is of sufficient capacity ... The following percentages shall be used for existing ... loads ... First 8 kVA of load at 100%, Remainder of load at 40%

NEC 220.83(B)(1) General lighting and general-use receptacles at ... 3 volt-amperes/ft² as determined by 220.12.

	Sq Ft	VA
Floor Area (3VA/sq ft)	*	*

NEC 220.83(B)(2) 1500 VA for each 2-wire, 20-ampere small-appliance branch circuit and each laundry branch circuit covered in 210.11(C)(1) and (C)(2).

	Qty	VA
Small Appliance Circuits	*	*
Laundry Circuits	1	1500
Bathroom Circuits	1	1500

NEC 220.83(B)(3) All appliances ... Ranges, wall-mounted ovens, counter-mounted cooking units ... Clothes dryers that are not connected to the laundry branch circuit ... [and] water heaters"

	Breaker	VA

Total General Load (non-A/C load) * VA

First 8 kVA of load at 100%	8000
Remainder of load at 40%	*

General Calculated Load (non-A/C load) * VA

NEC 220.83(B) The larger connected load of air-conditioning or space-heating, but not both, shall be used ... [at] 100 Percent of Load

	Breaker	VA
Sum of A/C Equipment		
Sum of Electric Furnaces		

Max Heating and Air-Conditioning load * VA

Total Load

Sum of General Calculated Load & Heating and A/C Load	* VA
	* A

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ELECTRICAL LOAD CALCULATIONS

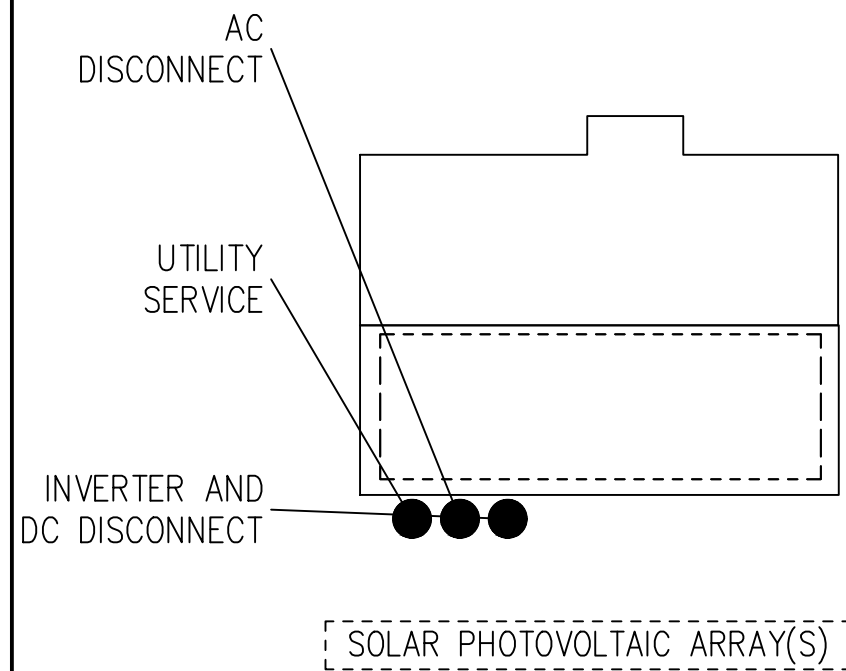
DESIGN:
Ryan Duncan

SHEET: REV: DATE:
oadCalcs3/4/2018

CAUTION

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

- Address: 345 Riviera St



PHOTOVOLTAIC BACK-FED CIRCUIT BREAKER IN MAIN ELECTRICAL PANEL IS AN A/C DISCONNECT PER NEC 690.17

OPERATING VOLTAGE = 240V

JB-173967-00

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PAGE NAME:
SITE PLAN PLACARD

DESIGN:
Ryan Duncan

SHEET: 6 REV: DATE:
3/4/2018

TESLA

WARNING: PHOTOVOLTAIC POWER SOURCE

Label Location:
(C)(CB)(JB)
Per Code:
NEC 690.31.G.3

PHOTOVOLTAIC DC
DISCONNECT

Label Location:
(DC) (INV)
Per Code:
NEC 690.14.C.2

WARNING

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

Label Location:
(AC)(POI)
Per Code:
NEC 690.17.E

WARNING

ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE
UNGROUND AND
MAY BE ENERGIZED

Label Location:
(DC) (INV)
Per Code:
NEC 690.35(F)
TO BE USED WHEN
INVERTER IS
UNGROUND

MAXIMUM POWER-
POINT CURRENT (Imp) A
MAXIMUM POWER-
POINT VOLTAGE (Vmp) V
MAXIMUM SYSTEM
VOLTAGE (Voc) V
SHORT-CIRCUIT
CURRENT (Isc) A

Label Location:
(DC) (INV)
Per Code:
NEC 690.53

PHOTOVOLTAIC POINT OF
INTERCONNECTION
WARNING: ELECTRIC SHOCK
HAZARD. DO NOT TOUCH
TERMINALS. TERMINALS ON
BOTH THE LINE AND LOAD SIDE
MAY BE ENERGIZED IN THE OPEN
POSITION. FOR SERVICE
DE-ENERGIZE BOTH SOURCE
AND MAIN BREAKER.
PV POWER SOURCE

Label Location:
(POI)
Per Code:
NEC 690.17.4; NEC 690.54

MAXIMUM AC A
OPERATING CURRENT
MAXIMUM AC V
OPERATING VOLTAGE

WARNING

ELECTRIC SHOCK HAZARD
IF A GROUND FAULT IS INDICATED
NORMALLY GROUND
CONDUCTORS MAY BE
UNGROUND AND ENERGIZED

Label Location:
(DC) (INV)
Per Code:
NEC 690.5(C)

CAUTION

DUAL POWER SOURCE
SECOND SOURCE IS
PHOTOVOLTAIC SYSTEM

Label Location:
(POI)
Per Code:
NEC 690.64.B.4

WARNING

ELECTRICAL SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION
DC VOLTAGE IS
ALWAYS PRESENT WHEN
SOLAR MODULES ARE
EXPOSED TO SUNLIGHT

Label Location:
(DC) (CB)
Per Code:
NEC 690.17(4)

CAUTION

PHOTOVOLTAIC SYSTEM
CIRCUIT IS BACKFED

Label Location:
(D) (POI)
Per Code:
NEC 690.64.B.4

WARNING

INVERTER OUTPUT
CONNECTION
DO NOT RELOCATE
THIS OVERCURRENT
DEVICE

Label Location:
(POI)
Per Code:
NEC 690.64.B.7

PHOTOVOLTAIC AC
DISCONNECT

Label Location:
(AC) (POI)
Per Code:
NEC 690.14.C.2

MAXIMUM AC A
OPERATING CURRENT
MAXIMUM AC V
OPERATING VOLTAGE

Label Location:
(AC) (POI)
Per Code:
NEC 690.54

(AC): AC Disconnect
(C): Conduit
(CB): Combiner Box
(D): Distribution Panel
(DC): DC Disconnect
(IC): Interior Run Conduit
(INV): Inverter With Integrated DC Disconnect
(LC): Load Center
(M): Utility Meter
(POI): Point of Interconnection

BACKUP LOAD CENTER

Label Location:
(BLC)
Per Code:
NEC 408.4

CAUTION
TRI POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM
THIRD SOURCE IS ENERGY STORAGE SYSTEM

Label Location:
(MP)
Per Code:
NEC 705.12.D.3

CAUTION
DO NOT ADD NEW LOADS

Label Location:
(BLC)
Per Code:
NEC 220

WARNING

THIS EQUIPMENT FED BY
MULTIPLE SOURCES. TOTAL
RATING OF ALL OVER CURRENT
DEVICES, EXCLUDING MAIN
SUPPLY OVERCURRENT DEVICE,
SHALL NOT EXCEED AMPACITY
OF BUSBAR.

Label Location:
(MP)
Per Code:
NEC 705.12.D.2.3.c

CAUTION
THIS PANEL HAS SPLICED FEED-
THROUGH CONDUCTORS.
LOCATION OF DISCONNECT AT ENERGY
STORAGE BACKUP LOAD PANEL

Label Location:
(MP)
Per Code:
NEC 312.8(3)

ENERGY STORAGE SYSTEM
MAX OPERATING DC VOLTAGE
EQUALIZATION VOLTAGE
GROUND CONDUCTOR

Label Location:
(MP)
Per Code:
NEC 705.12.D.2.3.c

CAUTION
DUAL POWER SOURCE
SECOND SOURCE IS
ENERGY STORAGE SYSTEM

Label Location:
(MP)
Per Code:
NEC 705.12.D.3

ENERGY STORAGE SYSTEM ON SITE
LOCATED WITHIN LINE OF SIGHT

Label Location:
(MP)
Per Code:

ENERGY STORAGE SYSTEM ON SITE
LOCATED ON ADJACENT WALL

Label Location:
(MP)
Per Code:

ENERGY STORAGE SYSTEM ON SITE
LOCATED ON OPPOSITE WALL

Label Location:
(MP)
Per Code:

ENERGY STORAGE SYSTEM ON SITE
LOCATED INSIDE

Label Location:
(MP)
Per Code:

(AC): AC Disconnect
(BLC): Backup Load Center
(MP): Main Panel

Label Set



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



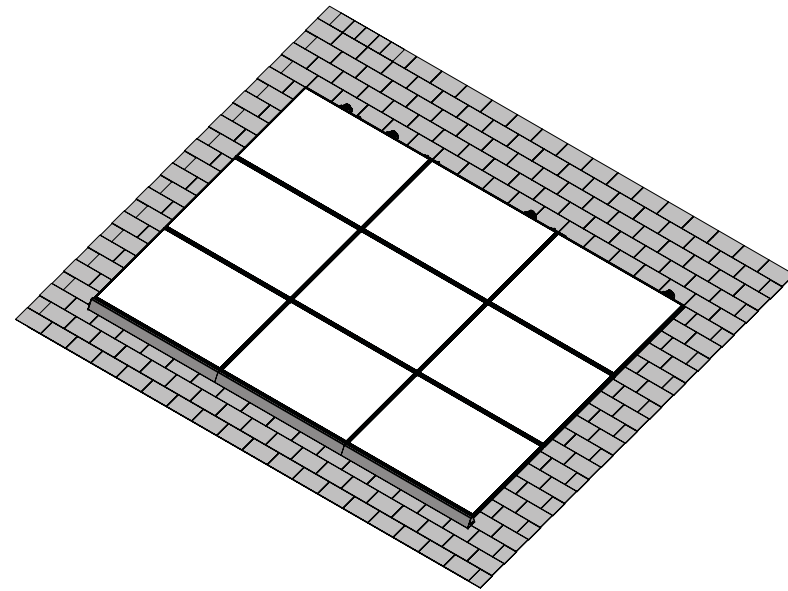
Delta Solar Inverters Datasheet for SolarCity

	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 Comp
for composition shingle roofs



Description

- PV mounting solution for composition shingle roofs
- Works with all Zep Compatible Modules
- Auto bonding UL-listed hardware creates structural and electrical bond
- ZS Comp has a UL 1703 Class "A" Fire Rating when installed using modules from any manufacturer certified as "Type 1" or "Type 2"

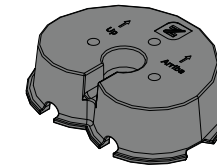
Specifications

- Designed for pitched roofs
- Installs in portrait and landscape orientations
- ZS Comp supports module wind uplift and snow load pressures to 50 psf per UL 2703
- Wind tunnel report to ASCE 7-05 and 7-10 standards
- ZS Comp grounding products are UL listed to UL 2703 and UL 467
- ZS Comp bonding products are UL listed to UL 2703
- Engineered for spans up to 72" and cantilevers up to 24"
- Zep wire management products listed to UL 1565 for wire positioning devices

zepsolar.com

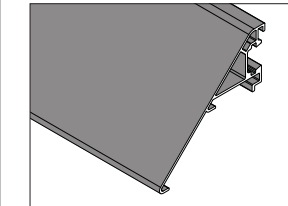
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Components



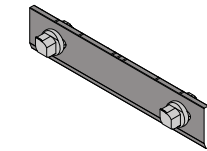
Mounting Block

Part No. 850-1633
Listed to UL 2703



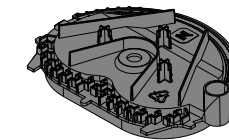
Array Skirt

Part No. 850-1608 or 500-0113
Listed to UL 2703



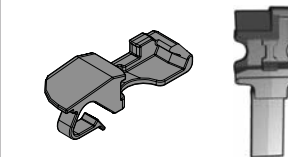
Interlock

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



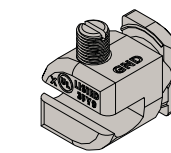
Flashing Insert

Part No. 850-1628
Listed to UL 2703



Grip

Part No. 850-1606 or 850-1421
Listed to UL 2703



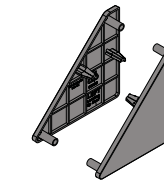
Ground Zep V2

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



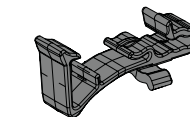
Captured Washer Lag

Part No. 850-1631-001
850-1631-002
850-1631-003
850-1631-004



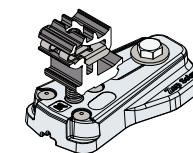
End Cap

Part No.
(L) 850-1586 or 850-1460
(R) 850-1588 or 850-1467



DC Wire Clip

Part No. 850-1509
Listed to UL 1565



Leveling Foot

Part No. 850-1397
Listed to UL 2703

zepsolar.com

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 ZepSolar'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 ¹	14 kWh
Usable Energy ¹	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 ^{1,2}	90%
Warranty	10 years

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

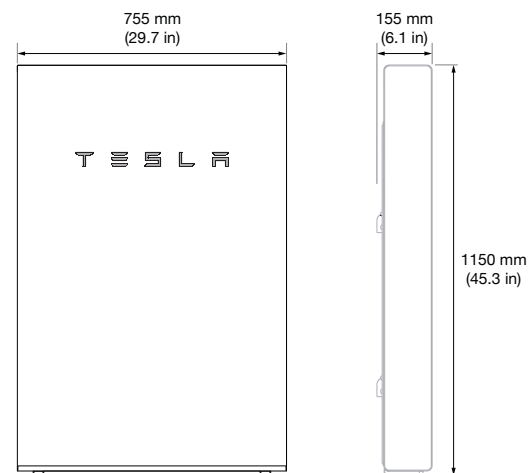
²AC to battery to AC, at beginning of life.

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
Noise Level @ 1m	< 40 dBA at 30°C (86°F)

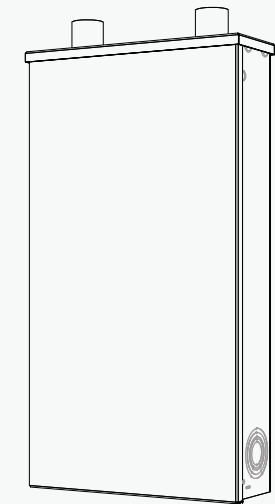
POWERWALL

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 ¹	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

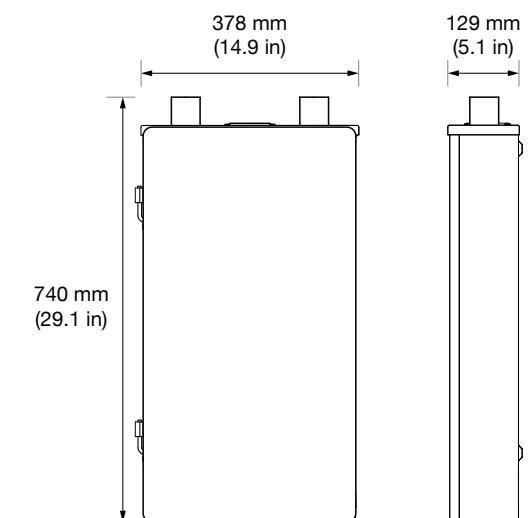
¹Circuit breaker required for installation at service entrance.

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/m²; 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/m²
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

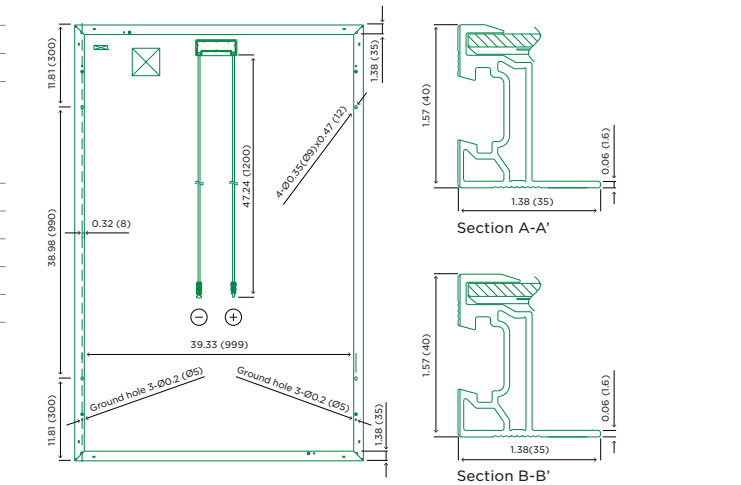
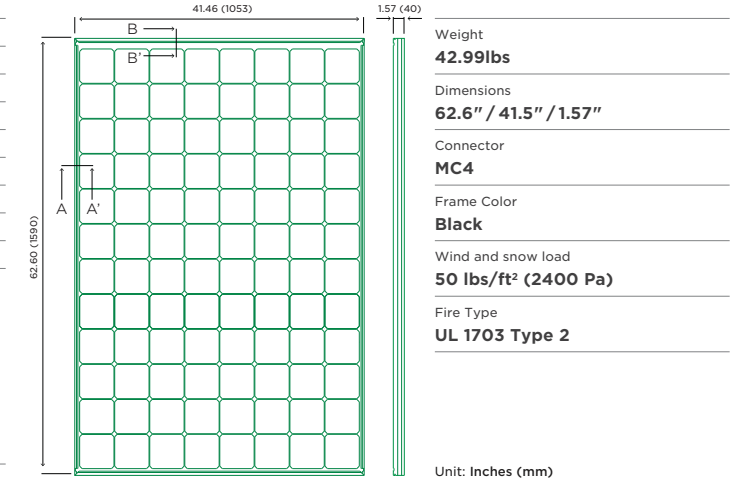
Note: Low irradiance: Air mass 1.5; Irradiance = 200W/m²; cell temp. = 25°C_{cv}

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

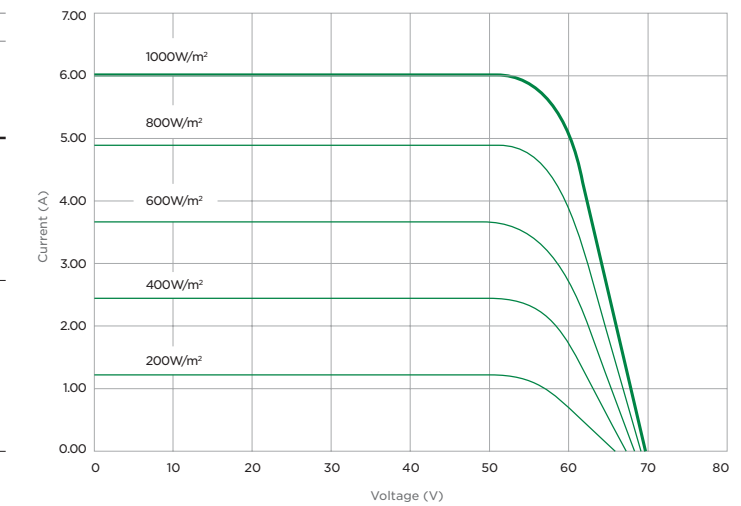
MATERIALS	Cell material:	5 inch photovoltaic cells
	Glass material:	AR coated tempered glass
	Frame materials:	Black anodized aluminium
	Connectors type:	MC4

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

MECHANICAL DATA

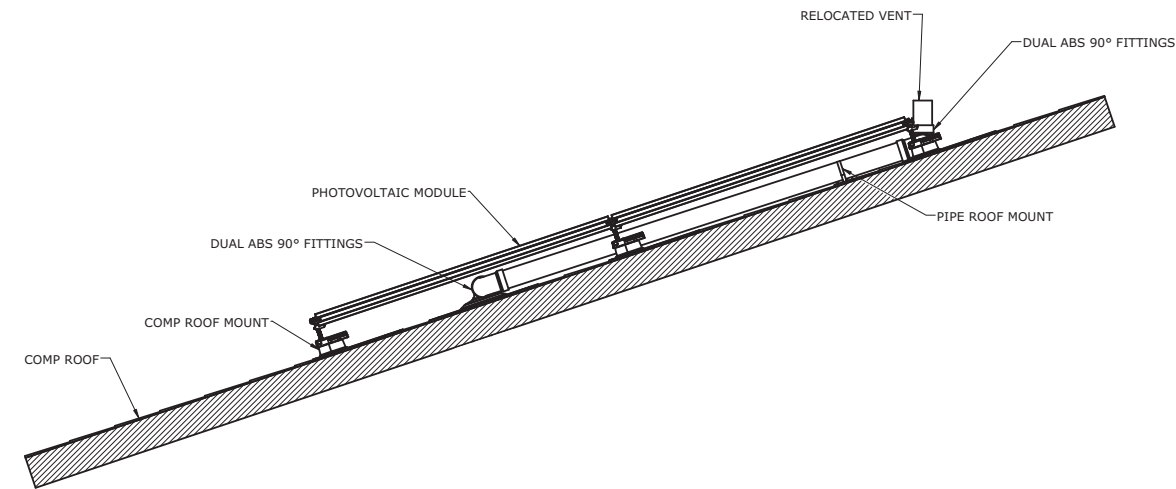


DEPENDENCE ON IRRADIANCE



DWV Re-route

for composition shingle roofs



DWV Re-route Construction Detail



The **DWV Re-route** is a vent pipe solution compatible with ABS or PVC plumbing on residential composition roofs.

DWV Re-route is made of standard, off-the-shelf ABS material.