

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>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. 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.</p> <p>PROJECT NARRATIVE - 7150 N 64th PI, Paradise Valley, AZ 85253</p> <p>THIS SOLAR PHOTOVOLTAIC SYSTEM INSTALLATION AT 7150 N 64th PI, Paradise Valley, AZ 85253 CONSISTS OF (23) HANWHA Q.CELLS # Q.PEAK DUO BLK ML-G10+/TS 410 ON THE EXISTING, FIRST STORY FLAT ROOF STRUCTURE. THE FOLLOWING IS A BRIEF BREAKDOWN OF THE MOUNTING PLANES (MP) UTILIZED AS WELL AS THE RESPECTIVE QUANTITY OF ARRAYS AND AZIMUTHS:</p> <p>MP1: (8) PHOTOVOLTAIC MODULES AT 96° AZIMUTH MP2: (15) PHOTOVOLTAIC MODULES AT 230° AZIMUTH</p> <p>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 SIDES OF THE HOME. ALL PARAPETS ARE EXISTING AND ASSUMED TO BE A MAXIMUM OF 18" HIGH. (1) DC-COUPLED TESLA POWERWALL 3 INVERTER WILL BE UTILIZED FOR THE NEW PHOTOVOLTAIC MODULES.</p>

LICENSE
<p>BLDG CL KB-01: ROC243771 ELEC CL K-11: ROC 245450</p>

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



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Sheet 7	STRUCTURAL VIEWS
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Cutsheets Attached	

REV	BY	DATE	COMMENTS
REV A	NAME	DATE	COMMENTS
REV B	NC	10/17/2025	*
*	*	*	*
*	*	*	*
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JOB NUMBER: JB-85216384 00
MOUNTING SYSTEM: ZS Ramp Foot
MODULES: (23) Hanwha Q Cells Q.PEAK DUO BLK ML-G10+/TS 410
INVERTER: Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh

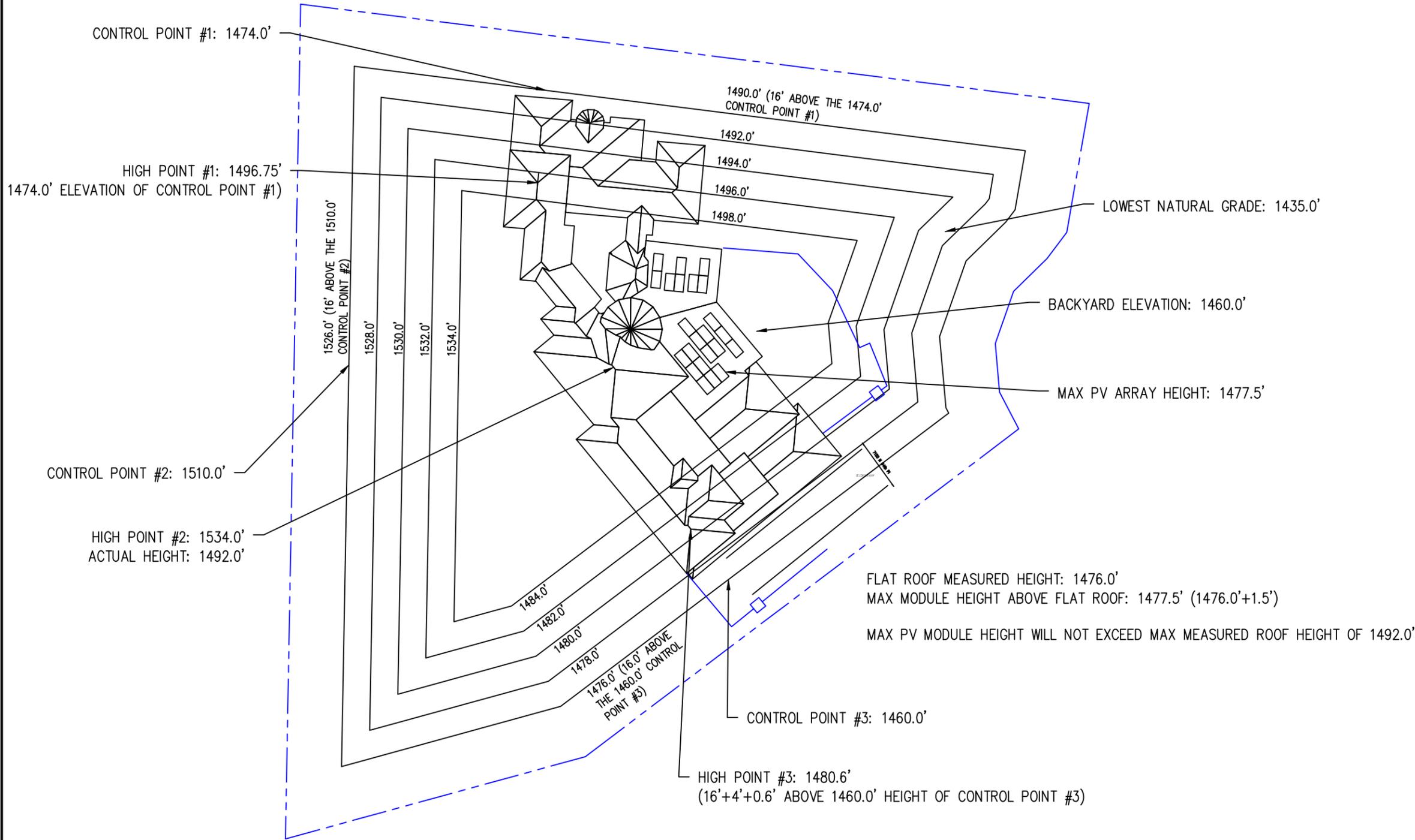
<p>CUSTOMER: Amer Mian 7150 N 64th PI Paradise Valley, AZ 85253</p>

<p>DESCRIPTION: 9.43 KW DC ROOF MOUNT PV ARRAY 11.5 KW (AC NAMEPLATE) PV ARRAY 27 KWH ENERGY STORAGE SYSTEM</p> <p>PAGE NAME: COVER SHEET</p>

<p>DESIGN: Nikolai Cox</p> <p>SHEET: 1 REV: B DATE: 10/17/2025</p>



Parcel #: 174-52-010
 Address: 7150 N 64th Pl, Paradise Valley, AZ 85253
 Jurisdiction: PARADISE VALLEY



PROPERTY PLAN

Scale: 1" = 40'-0"

0 40' 80'

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CUSTOMER:
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4806212808

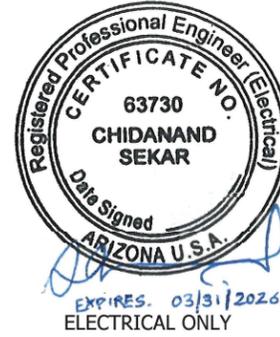
DESCRIPTION:
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PAGE NAME:
PROPERTY PLAN

DESIGN:
Nikolai Cox

SHEET: 2 REV: B DATE: 10/17/2025





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CHIDANAND SEKAR
Date: 2025-10-17
17:12:25 -07:00

MP1	PITCH: 2° (0:12) ARRAY PITCH: 2° (0:12) AZIMUTH: 96 ARRAY AZIMUTH: 96 MATERIAL: MOD BIT STORY: 1 STORY
MP2	PITCH: 3° (1:12) ARRAY PITCH: 3° (1:12) AZIMUTH: 50 ARRAY AZIMUTH: 230 MATERIAL: MOD BIT STORY: 1 STORY

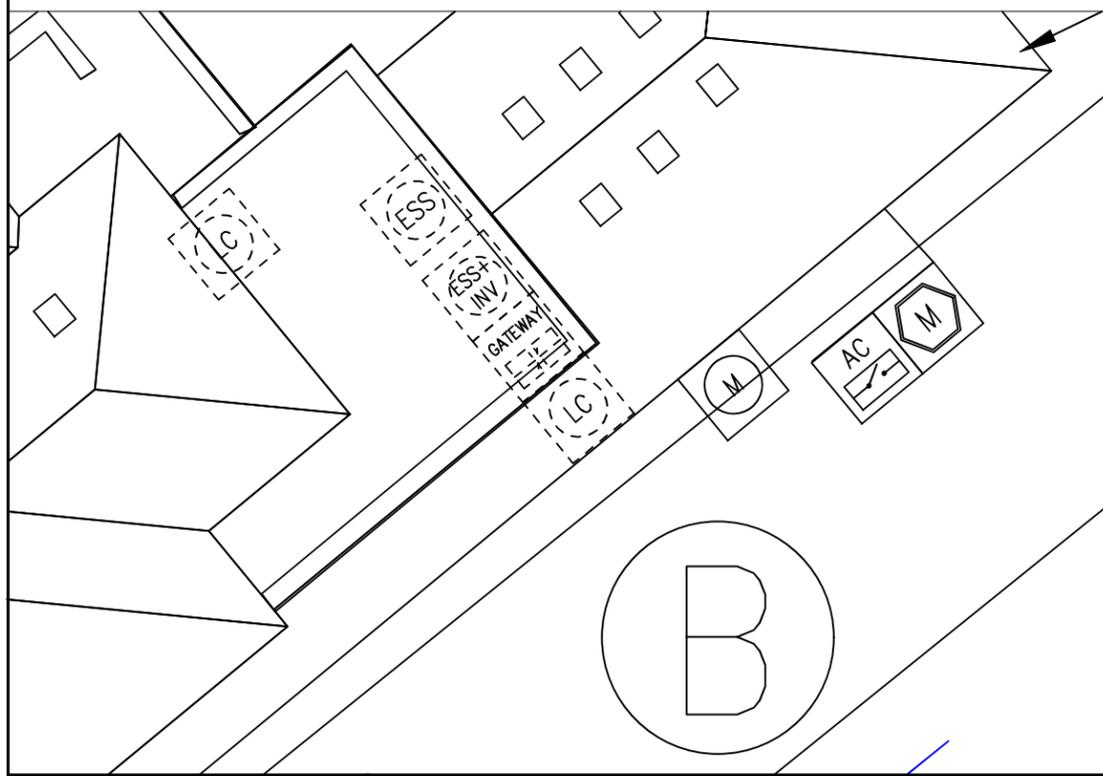
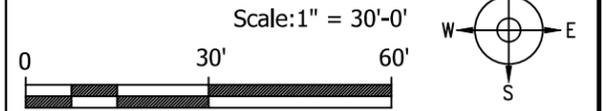
LEGEND

- (E) UTILITY SERVICE METER
- LOAD CENTER
- AC DISCONNECT
- SOLAR / STORAGE PRODUCTION METER
- GATEWAY
- ENERGY STORAGE SYSTEM
- ENERGY STORAGE SYSTEM W/ SOLAR INVERTER

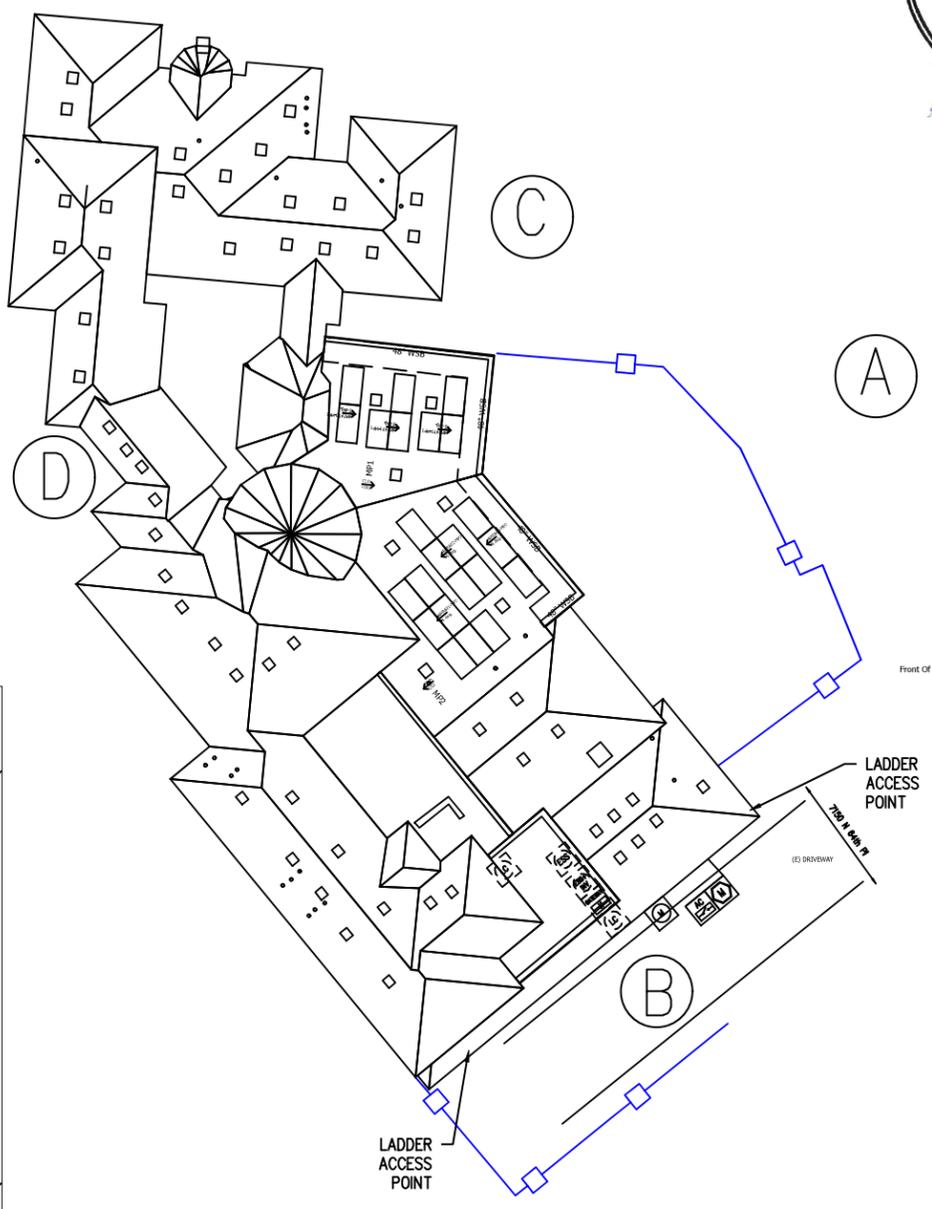
WARNING LABELS PROVIDED AT APPLICABLE EQUIPMENT

- STANDOFF LOCATIONS
- CONDUIT RUN
- GATE/FENCE
- HEAT PRODUCING VENTS ARE RED
- INTERIOR EQUIPMENT / CONDUIT IS DASHED

SITE PLAN



ZOOMED IN SITE VIEW IS NOT TO SCALE



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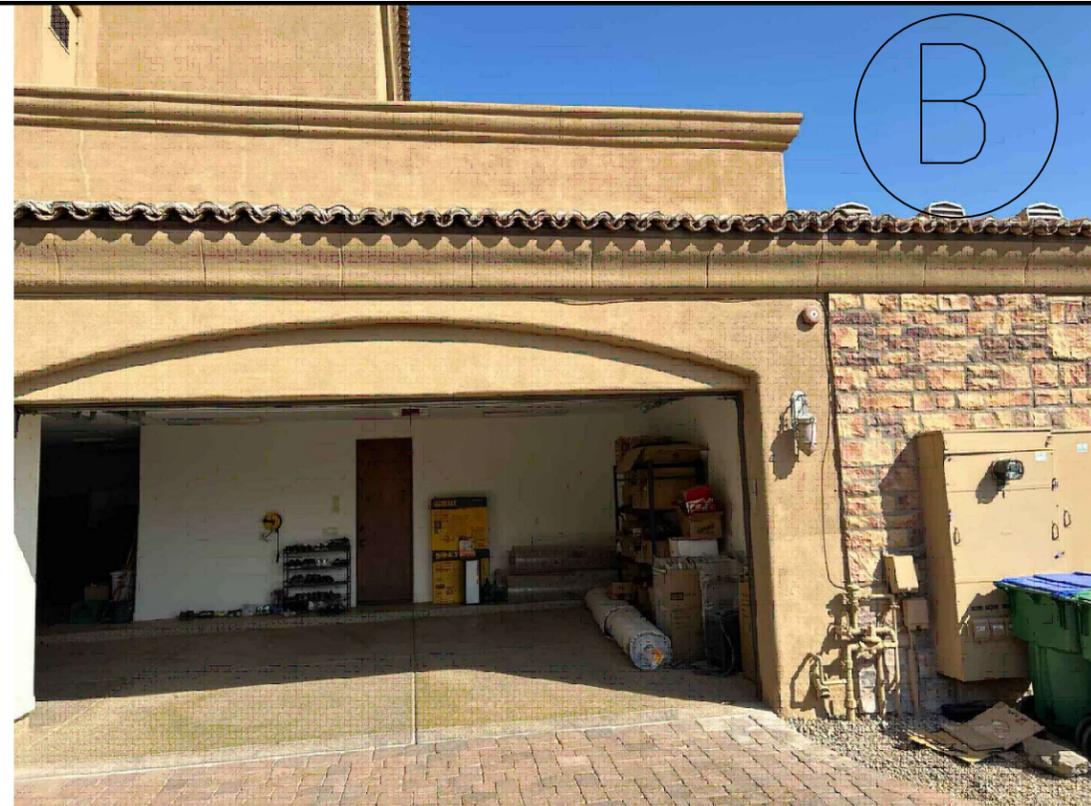
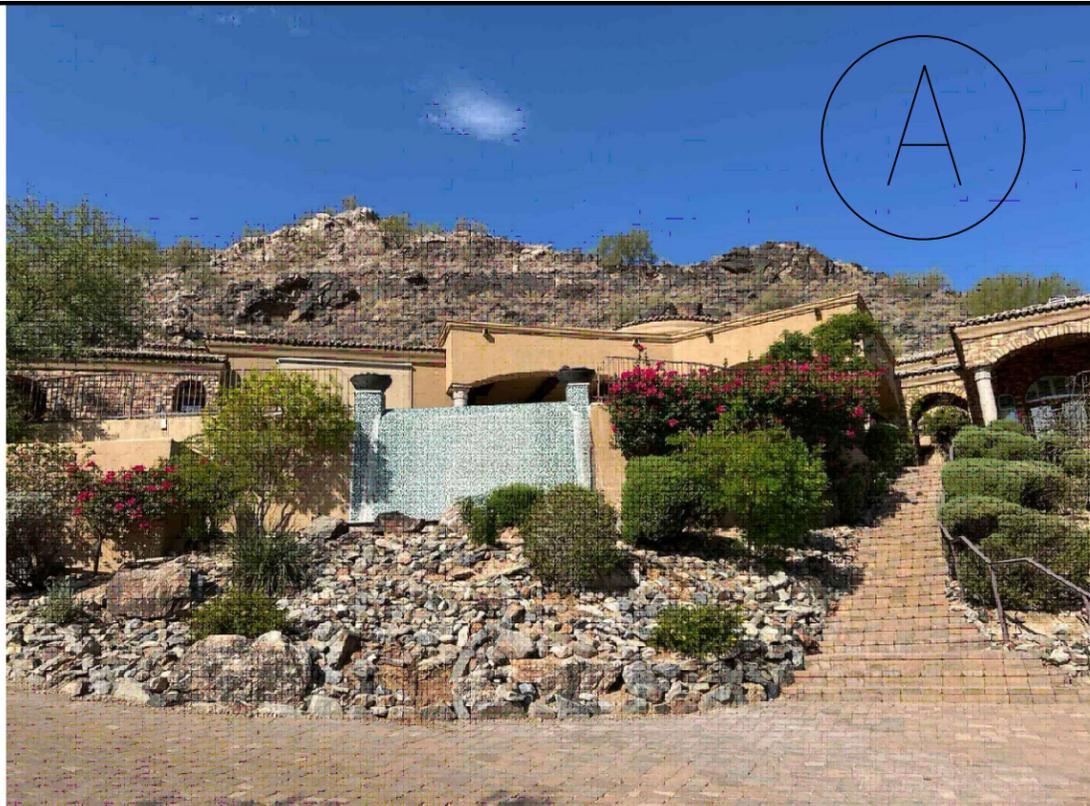
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PAGE NAME:	SITE PLAN

DESIGN:	Nikolai Cox
SHEET:	3
REV:	B
DATE:	10/17/2025





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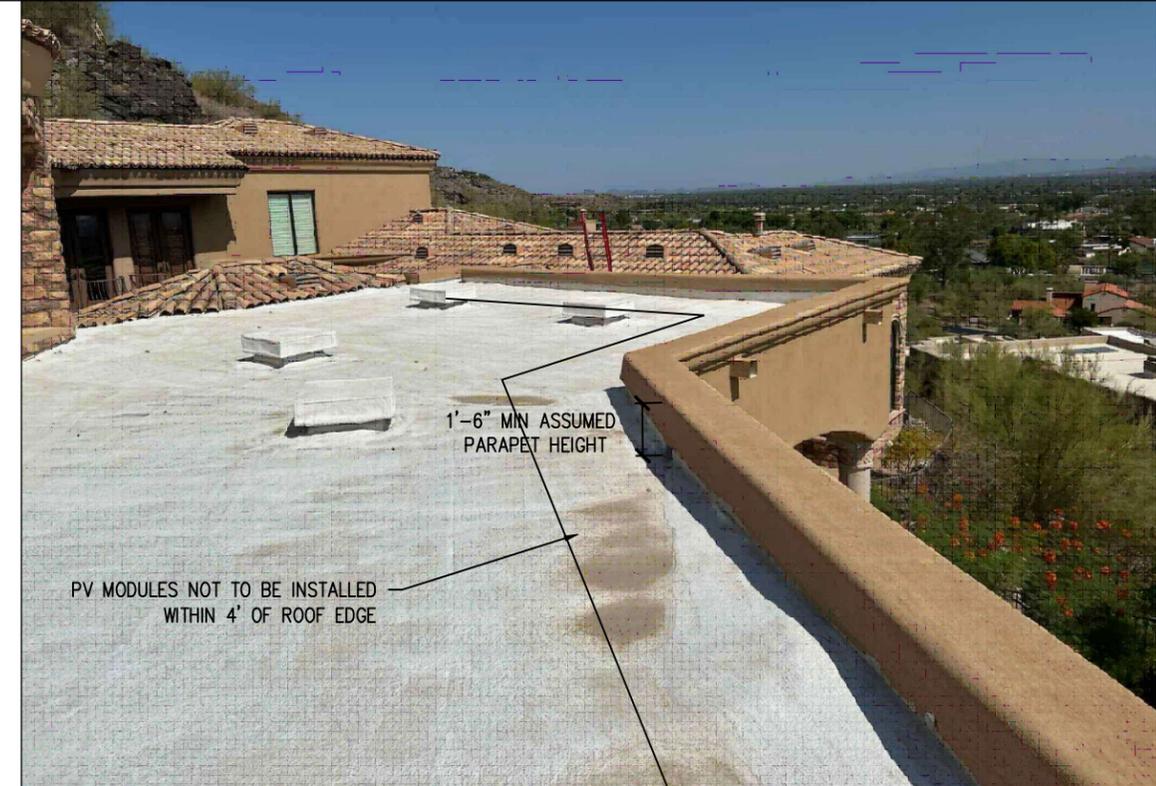
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 PROPERTY PHOTOS

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 Nikolai Cox
 SHEET: 4 REV: B DATE: 10/17/2025

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FLAT ROOF FRAMING INFORMATION

FRAMING: TRUSSES
 TOP CHORD SIZE: 2x4
 TOP CHORD SPACING: 24" O.C.

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

SOLAR MODULES TO BE INSTALLED ON FOAM ROOF
 USING ZS RAMP HARDWARE

EXISTING PARAPET WALLS ARE THE SAME HEIGHT
 AS THE TALLEST PV MODULE ARRAY THAT WILL BE
 INSTALLED ON MP2. SOLAR ARRAYS WILL NOT BE
 VISIBLE.

NOTE: PV METER WILL BE PAINTED TO MATCH THE
 HOUSE
 PAINT COLOR: TAN
 LRV: 65%

SOLAR PANEL COLOR: BLACK WITH BLACK FRAME



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 ROOF PLAN

DESIGN:
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SHEET: 5 REV: B DATE: 10/17/2025

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UPLIFT CALCULATIONS

Jobsite Specific Design Criteria			
Design Code		ASCE 7-10	
Risk Category		II	Table 1.5-1
Ultimate Wind Speed	V-Ult	105	Fig. 1609A
Exposure Category		C	Section 26.7
Ground Snow Load	pg	0	Table 7-1

MP Specific Design Information		
MP Name	MP1	MP2
Roofing	Mod Bit	Mod Bit
Standoff	ZS Ramp Foot	ZS Ramp Foot
Pitch	2	3
SL/RL: PV	0.0	0.0
SL/RL: Non-PV	20.0	20.0
Edge Zone Width	8.7 ft	8.7 ft
Azimuth	96	50
Stories	2	2
Rafter Size/Spacing	2x4 @24" OC	2x4 @24" OC
CJ Size/Spacing	2x4 @24"OC	2x4 @24"OC
Standoff Spacing and Layout		
MP Name	MP1	MP2
Applied Wind Zones ₂	All <input type="checkbox"/>	All <input type="checkbox"/>
Wind Pressure	-9.87	-9.87
Landscape X-Spacing	72	72
Landscape X-Cantilever	24	24
Landscape Y-Spacing	72	72
Landscape Y-Cantilever	24	24
Portrait X-Spacing	48	48
Portrait X-Cantilever	16	16
Portrait Y-Spacing	72	72
Portrait Y-Cantilever	24	24
Layout	Not Staggered	Not Staggered
<p>Notes:</p> <p>1. 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.</p> <p>2. Hatching in Applied Wind Zone rows corresponds to hatching on Site Plan.</p> <p>3. Table lists consistent conservative standoff specifications and layout requirements across all wind zones to comply with the maximum wind pressure of any zone.</p>		

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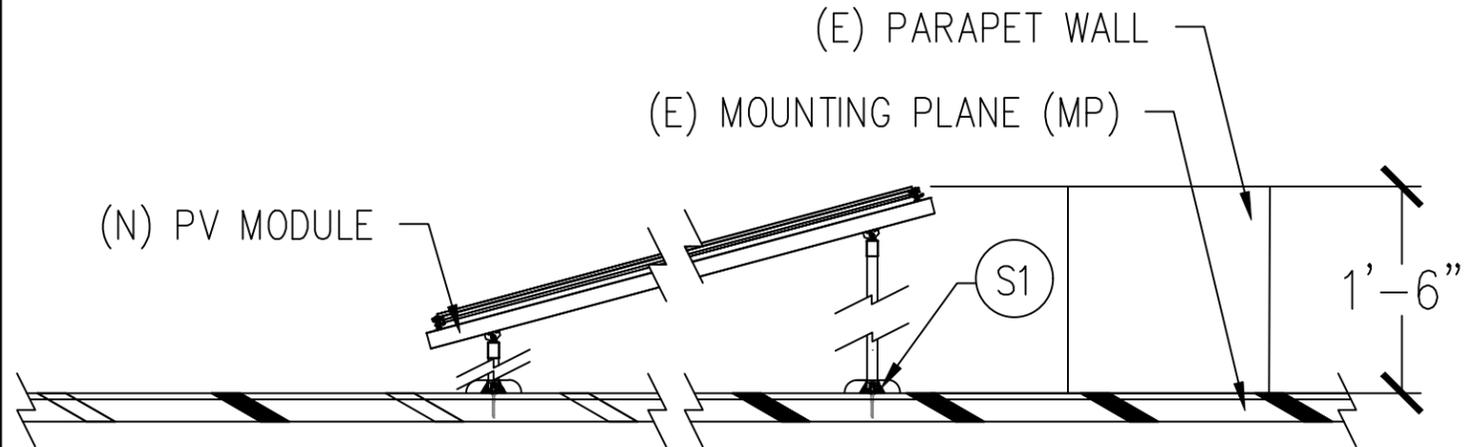
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STRUCTURAL DETAILS & UPLIFT CALCS

DESIGN:
Nikolai Cox

SHEET: 6 REV: B DATE: 10/17/2025

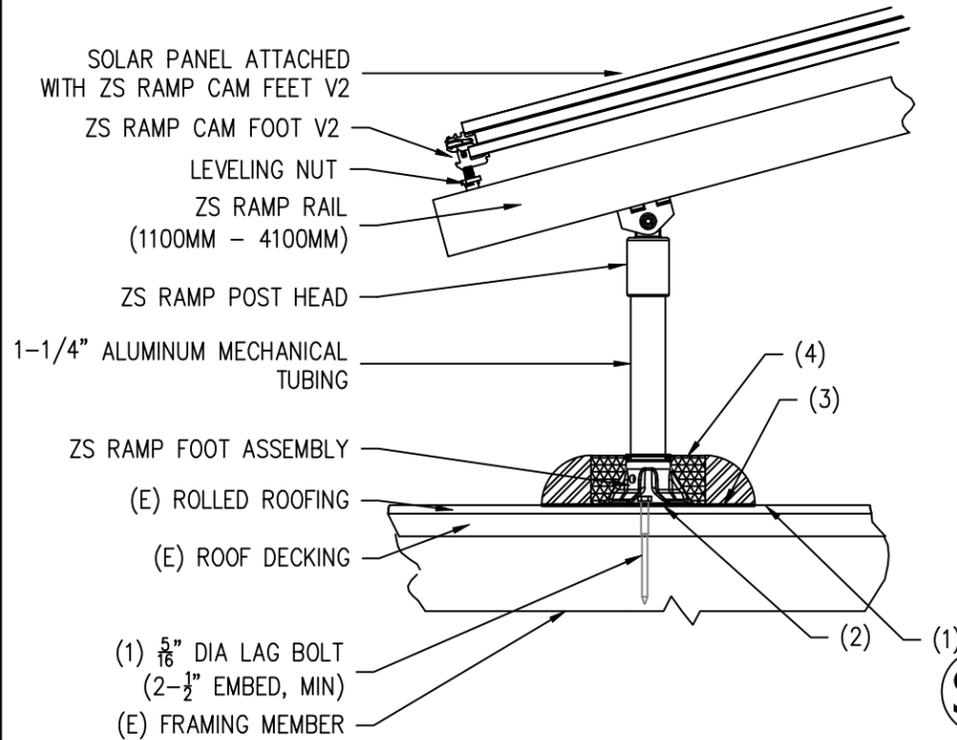


PV MODULES WILL BE INSTALLED 4' FROM ALL ROOF EDGES. DISTANCE FROM (N) PV MODULE TO (E) PARAPET WALL IS NOT TO SCALE



SV TYPICAL PV SIDE VIEW
NTS

S1



- 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'

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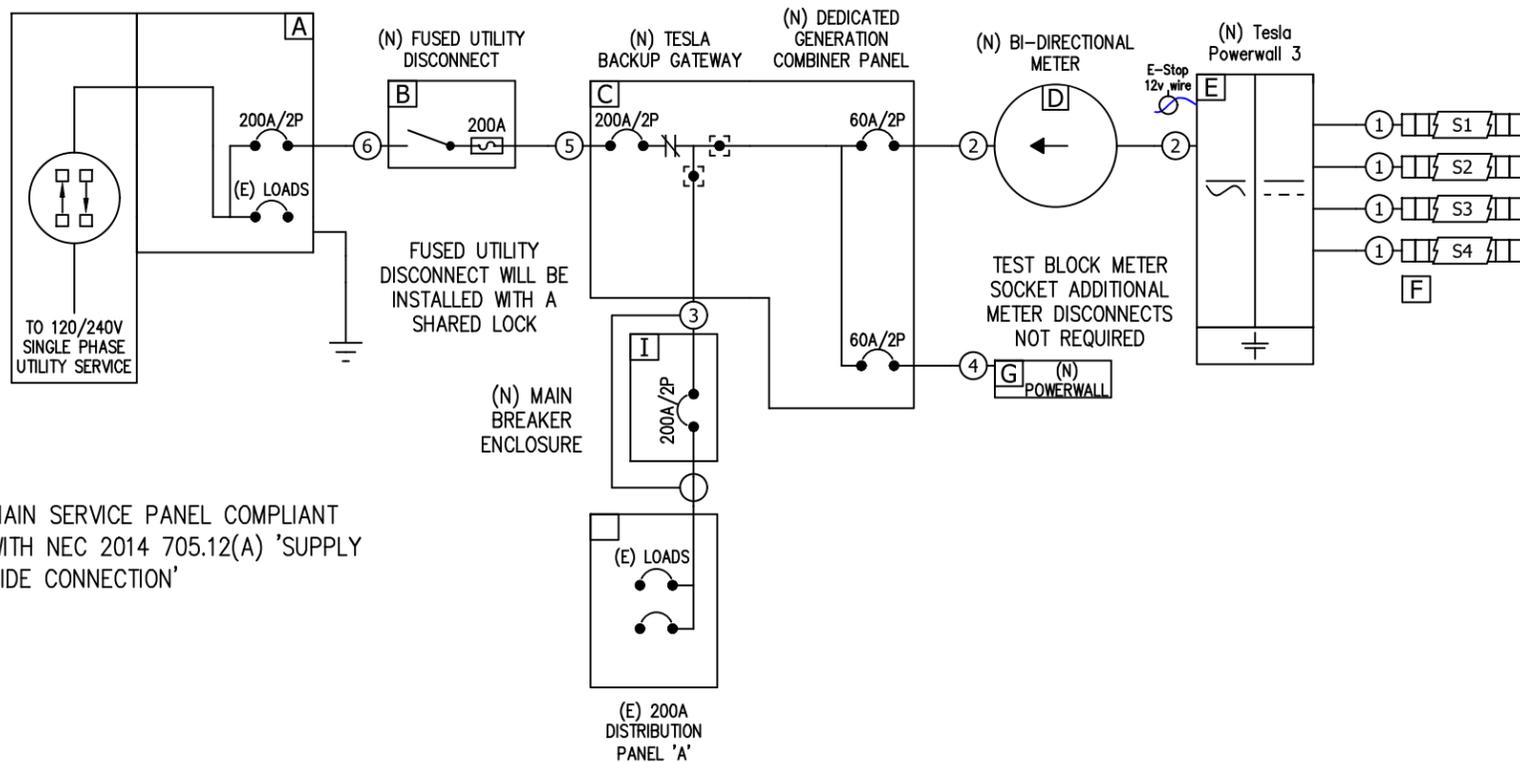
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PAGE NAME: STRUCTURAL VIEWS

DESIGN: Nikolai Cox
SHEET: 7 REV: B DATE: 10/17/2025





MAIN SERVICE PANEL COMPLIANT WITH NEC 2014 705.12(A) 'SUPPLY SIDE CONNECTION'



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Date: 2025-10-17 17:12:25 -07:00

GROUND ROD TO BE PROVIDED IF UFER IS NOT PRESENT.

1. PROPER GROUNDING ESTABLISHED AND NEUTRAL PULLED THROUGH ALL METERING ENCLOSURES REQUIRED BY THE APS INTERCONNECTION REQUIREMENTS.
2. PROPER GROUNDING IS ESTABLISHED TO PROVIDE A SAFE WORKING ENVIRONMENT PER APPLICABLE NEC SECTIONS AT ALL VISUAL OPEN DISCONNECTS REQUIRED BY THE APS INTERCONNECTION REQUIREMENTS.
3. GROUND-NEUTRAL BOND ESTABLISHED IN THE SERVICE DISCONNECT ENCLOSURE PER APPLICABLE NEC SECTIONS.
4. DESIGN OF THIS SYSTEM ARE IN COMPLIANCE WITH ALL APPLICABLE NEC SECTIONS SUBJECT TO THE LATEST NEC AS ADOPTED BY LOCAL AHJ.
5. ALL EQUIPMENT MUST BE UTILIZED IN ACCORDANCE WITH THE MANUFACTURER'S INTENDED USE AND DESIGN SPECIFICATIONS.

NEUTRAL-GROUND BONDING JUMPER WILL BE SIZED IN ACCORDANCE WITH NEC 250.66

GROUND BUSHINGS WILL BE USED ON ALL RMC CONNECTIONS AS REQUIRED

ALL AC EQUIPMENT IS 2P; OPERATING AT 240V

PRODUCTION METER FORM 2S

POWERWALL OCPD IN THE DEDICATED GENERATION COMBINER PANEL WILL INCLUDE LOCKING PROVISIONS PER OSHA LOTO REQUIREMENTS, IF THE DESIGN DEEMS NECESSARY.

	Emergency Stop Button (E-Stop)
	• Rapid Shutdown Initiation Device per Article 690.12(C) of the NEC
	• Disconnecting Means as defined in Article 100 of the NEC

1. CONDUIT RUNS MAY BE CONDENSED DUE TO SITE CONDITIONS AND/OR INSTALLATION EASE. ALL CONDUIT FILL DERATES AND PROPER CALCULATIONS HAVE BEEN COMPLETED PER NEC CHAPTER 9, TABLE 4.
2. SOLAR SHUTDOWN DEVICE TO BE INSTALLED FOR SYSTEM RAPID SHUTDOWN (RSD) IN ACCORDANCE WITH ARTICLE 690 OF THE APPLICABLE NEC.
3. CONDUIT TYPE CAN CHANGE DUE TO SITE CONDITIONS AND WILL FOLLOW THE NEC REQUIREMENTS FOR THAT CONDUIT TYPE.

PARTS			DC CONDUCTOR TABLE							STRING TABLE								
Ref	Qty	Description	Ref	Type	Qty	Size (AWG, Cu)	EGC (AWG, Cu)	Conduit	Isc (ADC)	Imp (ADC)	Product Ref	String Ref	Module per String	MCI per String	Voc* (VDC)	Vmp (VDC)	Mounting Plane	
B	2	Bussmann # LPJ-200SP: Class J Fuse; 200A, 600Vac, must be installed in Heavy Duty disconnect	1	PV Wire	2	#10	#10	3/4" EMT	11.20	10.89	E	S4	8	1	394.49	301.12	MP2	
	1	Eaton # DH224NRKV-00LL: Heavy Duty Disconnect; 200A, 240Vac, Fusible, NEMA 3R, 2P, 3W, for Class J fuses	AC CONDUCTOR TABLE							S3		7	1	345.18	263.48	MP2		
C	2	CUTLER-HAMMER # BR260: Breaker; 60A/2P, 2 Spaces	Ref	Type	Qty	Size (AWG)	Min EGC (AWG, Cu)	Conduit	Length (ft)	Imp (AAC)		Vmp (VAC)	S2	2	1	98.62	75.28	MP1
	1	Eaton # CSR2200N: 200A MB ONLY; 2-Pole, 120V/240V, 25kAIC, Bolt On	2	THWN-2	3	#06 #04	#10	PVC Jacketed MC	1" EMT	5ft		48	240	S1	6	1	295.87	225.84
D	1	Tesla # 1841000-XX-Y: Back-up Gateway 3.0 NA for PW	3	THWN-2	3	#3/0 250 KCMIL	#06	2" PVC	2" PVC	2ft		-	240					
	2	Cooper B-Line 114TB: 100A Meter Socket with Safety Bypass; Ringed,EUSERC,4-Jaw, Single Phase, OH, Surface	4	THWN-2	3	#06 #04	#10	PVC Jacketed MC	1" EMT	2ft		-	240					
E	2	AW CAP; B-Line : Meter Socket Accessory	5	THWN-2	3	#3/0 250 KCMIL	#06	2" PVC	2" PVC	2ft	-	240						
	1	Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh	6	THWN-2	3	#3/0 250 KCMIL	#06	2" PVC	2" PVC	5ft	-	240						
F	4	ASY, MCI-2, 1000V																
G	1	Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh																
H	1	UL 508 Emergency Stop Device - NEMA 4X																
I	1	SQUARE D #Q22200NRB: Enclosure Only,200A Max,Accepts Q Series Breakers																
	1	Square D # QBL22200: 200A Circuit Breaker; MoID #eD # Case, 2-Pole, 240V, 10kAIC																

LICENSE	BLDG CL KB-01: ROC243771 ELEC CL K-11: ROC 245450		
SITE SPECIFICATIONS		MODULE SPECIFICATIONS	
Main Panel Rating	(E) 600A	Hanwha Q Cells Q.PEAK DUO BLK ML-G10+/TS 410: PV Mod, 410W, 385.9PTC, ZEP, Blk Frm, Blk Backsht, MC4, 1kV	
Main Breaker Rating	Multiple Main Breakers (6 or fewer)	Qty	23
General Notes	DC Ungrounded Inverters	Voc	45.37
Panel Number	246-2-OH	Vmp	37.64
Meter Number	1184183	Isc and Imp are in the DC Conductor Table	
Service Entrance	Underground		

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27 KWH ENERGY STORAGE SYSTEM

PAGE NAME:
THREE LINE DIAGRAM

DESIGN:
Nikolai Cox

SHEET: 8 REV: B DATE: 10/17/2025

TESLA

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 INVETRETS 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.

Digitally signed by
CHIDANAND SEKAR
Date: 2025-10-17
17:12:26 -07:00



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JOB NUMBER: JB-85216384 00
 MOUNTING SYSTEM: ZS Ramp Foot
 MODULES: (23) Hanwha Q Cells Q.PEAK DUO BLK ML-G10+/TS 410
 INVERTER: Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh

CUSTOMER:
 Amer Mian
 7150 N 64th Pl
 Paradise Valley, AZ 85253
 4806212808

DESCRIPTION:
 9.43 KW DC ROOF MOUNT PV ARRAY
 11.5 KW (AC NAMEPLATE) PV ARRAY
 27 KWH ENERGY STORAGE SYSTEM
 PAGE NAME:
 TRIANGLE NOTES

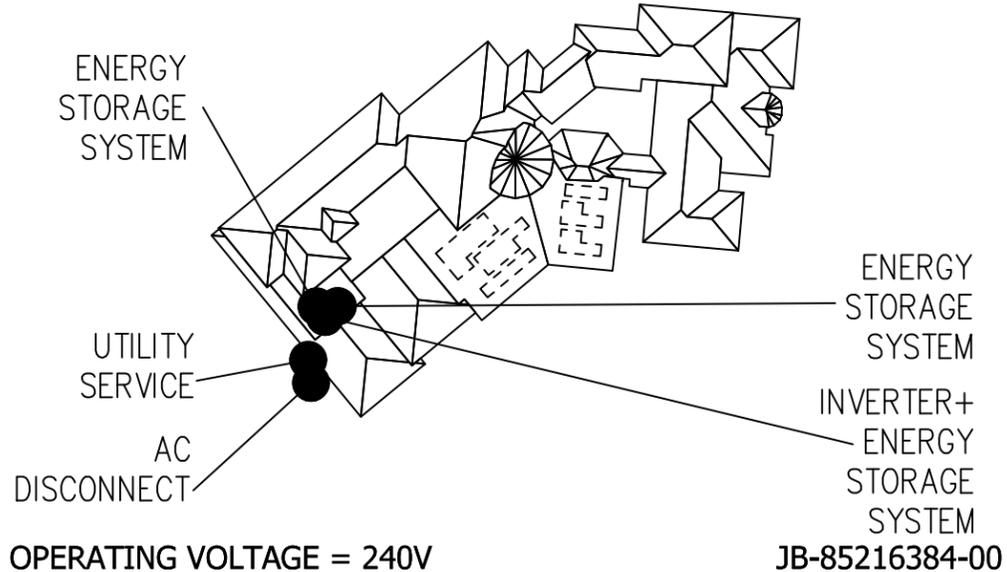
DESIGN:
 Nikolai Cox
 SHEET: 9 REV: B DATE: 10/17/2025



SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF"
POSITION TO SHUT DOWN PV SYSTEM AND REDUCE
SHOCK HAZARD IN THE ARRAY
CAUTION: MULTIPLE SOURCES OF POWER

- Address: 7150 N 64th Pl



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JOB NUMBER: JB-85216384 00

MOUNTING SYSTEM:
ZS Ramp Foot

MODULES:
(23) Hanwha Q Cells Q.PEAK DUO BLK ML-G10+/TS 410

INVERTER:
Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh

CUSTOMER:
Amer Mian
7150 N 64th Pl
Paradise Valley, AZ 85253

4806212808

DESCRIPTION:
9.43 KW DC ROOF MOUNT PV ARRAY
11.5 KW (AC NAMEPLATE) PV ARRAY
27 KWH ENERGY STORAGE SYSTEM

PAGE NAME:
SITE PLAN PLACARD

DESIGN:
Nikolai Cox

SHEET: 10 REV: B DATE: 10/17/2025



WARNING: PHOTOVOLTAIC POWER SOURCE

Label Location:
(C)
Per Code:
2012 IFC

WARNING

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

Label Location:
(AC) (POI)

WARNING

A GENERATION SOURCE IS
CONNECTED TO THE SUPPLY
(UTILITY) SIDE OF THE MAIN
SERVICE DISCONNECT. FOLLOW
PROPER LOCK-OUT/TAG-OUT
PROCEDURES TO ENSURE
THE PHOTOVOLTAIC SYSTEM
UTILITY DISCONNECT SWITCH IS
OPENED PRIOR TO PERFORMING
WORK ON THIS DEVICE

Label Location:
(D)

NOTICE
PV SYSTEM COMBINER PANEL
DO NOT ADD LOADS
TO THIS PANEL

Label Location:
(D) (POI)

WARNING

ELECTRIC SHOCK HAZARD
NO USER SERVICABLE
PARTS INSIDE
CONTACT AUTHORIZED
SERVICER FOR ASSISTANCE

Label Location:
(CB)

CAUTION

SOLAR PV SYSTEM INSTALLED
WHEN POWER IS DISCONNECTED
SOLAR PANELS AND WIRING IN
CONDUIT TO INVERTER MAY
REMAIN ENERGIZED DURING
DAYLIGHT HOURS

Label Location:
(D)

PHOTOVOLTAIC
SYSTEM DEDICATED
KWH METER

Label Location:
(AC)

PV COMBINER BOX
WARNING: ELECTRIC SHOCK
HAZARD

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

DC PHOTOVOLTAIC DISCONNECT

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

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:
CEC 690.13.B

PHOTOVOLTAIC SYSTEM
UTILITY
DISCONNECT SWITCH

Label Location:
(AC)

MAXIMUM POWER-
POINT CURRENT (I_{mp}) A
MAXIMUM POWER-
POINT VOLTAGE (V_{mp}) V
MAXIMUM SYSTEM
VOLTAGE (V_{oc}) V
SHORT-CIRCUIT
CURRENT (I_{sc}) A

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

MAXIMUM AC A
OPERATING CURRENT
MAXIMUM AC V
OPERATING VOLTAGE

PHOTOVOLTAIC POWER
SOURCE BREAKERS
ARE BACKFEEDING

Label Location:
(POI)

AC PHOTOVOLTAIC DISCONNECT

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

CAUTION
DUAL POWER SOURCE
SECOND SOURCE IS
PHOTOVOLTAIC SYSTEM

Label Location:
(POI)
Per Code:
NEC 705.12.B.3

BREAKER HAS
BEEN DE-RATED
PER NEC 690.64(B)(2)

Label Location:
(D)

MAXIMUM AC A
OPERATING CURRENT
MAXIMUM AC V
OPERATING VOLTAGE

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

WARNING

INVERTER OUTPUT
CONNECTION
DO NOT RELOCATE
THIS OVERCURRENT
DEVICE

Label Location:
(POI)
Per Code:
NEC 705.12.B.2.3.4

NOTICE

INVERTER AND DISCONNECT
LOCATED IN GARAGE

Label Location:
(D)

(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:
(MSP)
Per Code:
NEC 705.12(B)(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:
(MSP)
Per Code:
NEC 705.12.B.2.3.c

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

Label Location:
(MSP)
Per Code:
NEC 312.8.A(3)

NOMINAL ESS VOLTAGE: 120/240V
**MAX AVAILABLE SHORT-
CIRCUIT FROM ESS: 32A**
**ARC FAULT CLEARING
TIME FROM ESS: 67ms**
**DATE OF
CALCULATION:**

Label Location:
(MSP)
Per Code:
Per 706.7(D) label to be marked in field

CAUTION
DUAL POWER SOURCE
SECOND SOURCE IS
ENERGY STORAGE SYSTEM

Label Location:
(MSP)
Per Code:
NEC 705.12(B)(3)

**ENERGY STORAGE SYSTEM ON SITE
LOCATED WITHIN LINE OF SIGHT**

Label Location:
(MSP)
Per Code:

**ENERGY STORAGE SYSTEM ON SITE
LOCATED ON ADJACENT WALL**

Label Location:
(MSP)
Per Code:

**ENERGY STORAGE SYSTEM ON SITE
LOCATED ON OPPOSITE WALL**

Label Location:
(MSP)
Per Code:

**ENERGY STORAGE SYSTEM ON SITE
LOCATED INSIDE**

Label Location:
(MSP)
Per Code:

(AC): AC Disconnect
(BLC): Backup Load Center
(MSP): Main Service Panel

Gateway 3

Tesla Gateway 3 controls connection to the grid in a Powerwall system, automatically detecting outages and providing seamless transition to backup power. It provides energy monitoring that is used by Powerwall for solar self-consumption, time-based control, and backup operation.

Performance Specifications

Model Number	1841000-01-y	AC Meter	Revenue accurate (+/- 0.5%)
Nominal Grid Voltage	120/240 V AC	Communication	CAN
Grid Configuration	Split phase	User Interface	Tesla App
Grid Frequency	60 Hz	Backup Transition	Automatic disconnect for seamless backup
Continuous Current Rating	200 A	Overcurrent Protection Device	100-200 A Service entrance rated Eaton CSR, BWH, or BW, or Square D QOM breakers
Maximum Supply Short Circuit Current	22 kA with Square D or Eaton main breaker 25 kA with Eaton main breaker ¹	Internal Panelboard	200 A 8-space/16 circuit breakers Eaton BR, Siemens QP, or Square D HOM breakers rated to 10-125A
IEC Protective Class	Class I	Warranty	10 years
Overvoltage Category	Category IV		

¹Only Eaton CSR or BWH main breakers are 25 kA rated

Environmental Specifications

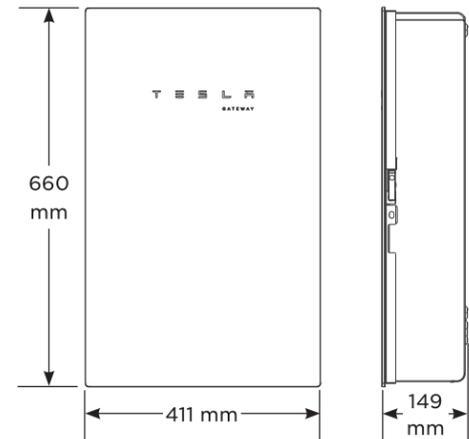
Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

Compliance Information

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 107.1, CSA 22.2 29
Emmissions	FCC Part 15, ICES 003

Mechanical Specifications

Dimensions	660 x 411 x 149 mm (26 x 16 x 6 in)
Weight	16.4 kg (36 lb)
Mounting options	Wall mount



Q.PEAK DUO BLK ML-G10+ SERIES



385-415 Wp | 132 Cells
21.0% Maximum Module Efficiency

MODEL Q.PEAK DUO BLK ML-G10+/TS



Breaking the 21 % efficiency barrier
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.0%.



A reliable investment
Inclusive 25-year product warranty and 25-year linear performance warranty¹.



Enduring high performance
Long-term yield security with Anti LeTID Technology, Anti PID Technology² and Hot-Spot Protect.



Innovative all-weather technology
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.



Zep compatible™ frame design
High-tech black Zep Compatible™ frame, for improved aesthetics, easy installation and increased safety.



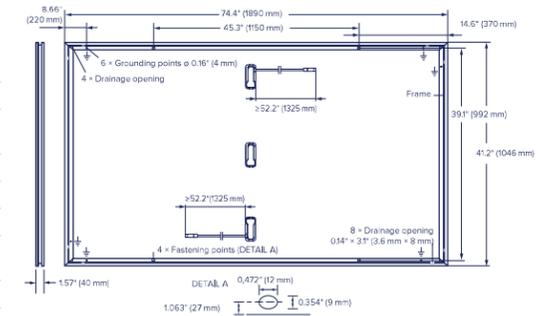
The most thorough testing programme in the industry
Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

¹ See data sheet on rear for further information.
² APT test conditions according to IEC/TS 62804-1:2015, method A (-1500V, 96 h)

Q.PEAK DUO BLK ML-G10+ SERIES

Mechanical Specification

Format	74.4 in × 41.2 in × 1.57 in (including frame) (1890 mm × 1046 mm × 40 mm)
Weight	51.8 lbs (23.5 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm ² Solar cable; (+) ≥ 52.2 in (1325 mm), (-) ≥ 52.2 in (1325 mm)
Connector	Stäubli MCA; IP68



Electrical Characteristics

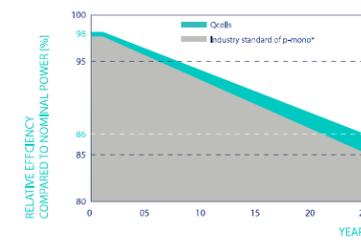
POWER CLASS		385	390	395	400	405	410	415	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5W / -0W)									
Minimum	Power at MPP ¹	P _{MPP} [W]	385	390	395	400	405	410	415
	Short Circuit Current ¹	I _{SC} [A]	11.04	11.07	11.10	11.14	11.17	11.20	11.23
	Open Circuit Voltage ¹	V _{OC} [V]	45.19	45.23	45.27	45.3	45.34	45.37	45.41
	Current at MPP	I _{MPP} [A]	10.59	10.65	10.71	10.77	10.83	10.89	10.95
	Voltage at MPP	V _{MPP} [V]	36.36	36.62	36.88	37.13	37.39	37.64	37.89
	Efficiency ¹	η [%]	≥ 19.5	≥ 19.7	≥ 20.0	≥ 20.2	≥ 20.5	≥ 20.7	≥ 21.0

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT²

Minimum	Power at MPP	P _{MPP} [W]	288.8	292.6	296.3	300.1	303.8	307.6	311.3
	Short Circuit Current	I _{SC} [A]	8.90	8.92	8.95	8.97	9.00	9.03	9.05
	Open Circuit Voltage	V _{OC} [V]	42.62	42.65	42.69	42.72	42.76	42.79	42.83
	Current at MPP	I _{MPP} [A]	8.35	8.41	8.46	8.51	8.57	8.62	8.68
	Voltage at MPP	V _{MPP} [V]	34.59	34.81	35.03	35.25	35.46	35.68	35.89

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

Qcells PERFORMANCE WARRANTY

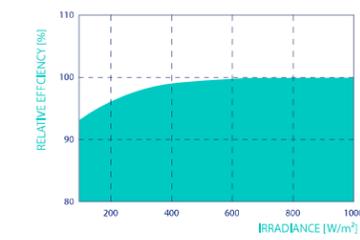


At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I _{SC}	α [% / K]	+0.04	Temperature Coefficient of V _{OC}	β [% / K]	-0.27
Temperature Coefficient of P _{MPP}	γ [% / K]	-0.34	Nominal Module Operating Temperature	NMOT [°F]	109 ± 5.4 (43 ± 3 °C)

Properties for System Design

Maximum System Voltage	V _{sys} [V]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI/UL 61730	TYPE 2
Max. Design Load, Push/Pull ¹	[lbs / ft ²]	85 (4080 Pa) / 85 (4080 Pa)	Permitted Module Temperature on Continuous Duty	-40 °F up to +185 °F (-40 °C up to +85 °C)
Max. Test Load, Push/Pull ¹	[lbs / ft ²]	128 (6120 Pa) / 128 (6120 Pa)		

¹ See Installation Manual

Qualifications and Certificates

UL61730-1 & UL61730-2, CE-compliant, Quality Controlled PV - TÜV Rheinland, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells),



The ideal solution for:



*Contact your Qcells Sales Representative for details regarding the module's eligibility to be Buy American Act (BAA) compliant.

Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.
Hanwha Q CELLS America Inc. 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL hqcc-inquiry@qcells.com | WEB www.qcells.com



Powerwall 3

Power Everything

Powerwall 3 is a fully integrated solar and battery system, designed to accelerate the transition to sustainable energy. Customers can receive whole home backup, cost savings, and energy independence by producing and consuming their own energy while participating in grid services. Once installed, customers can manage their system using the Tesla App to customize system behavior to meet their energy goals.

Powerwall 3 achieves this by supporting up to 20 kW DC of solar and providing up to 11.5 kW AC of continuous power per unit. It has the ability to start heavy loads rated up to 185 LRA, meaning a single unit can support the power needs of most homes. Powerwall 3 Expansions make it easier and more affordable to scale up customers' systems to meet their current or future needs. Powerwall 3 is designed for fast and efficient installations, modular system expansion, and simple connection to any electrical service.



Powerwall 3 Technical Specifications

System Technical Specifications

Model Number	1707000-xx-y			
Nominal Grid Voltage (Input & Output)	120/240 VAC			
Grid Type	Split phase			
Frequency	60 Hz			
Nominal Battery Energy	13.5 kWh AC ₁			
Nominal Output Power (AC)	5.8 kW	7.6 kW	10 kW	11.5 kW
Maximum Apparent Power	5,800 VA	7,600 VA	10,000 VA	11,500 VA
Maximum Continuous Current	24 A	31.7 A	41.7 A	48 A
Overcurrent Protection Device ₂	30 A	40 A	60 A	60 A
Configurable Maximum Continuous Discharge Power Off-Grid (PV Only, -20°C to 25°C)	15.4 kW ₃			
Maximum Continuous Charge Current / Power (Powerwall 3 only)	20.8 A AC / 5 kW			
Maximum Continuous Charge Current / Power (Powerwall 3 with up to (3) Expansion units)	33.3 A AC / 8 kW			
Output Power Factor Rating	0 - 1 (Grid Code configurable)			
Maximum Output Fault Current (1 s)	160 A			
Maximum Short-Circuit Current Rating	10 kA			
Load Start Capability	185 LRA			
Solar to Battery to Home/Grid Efficiency	89% ¹⁴			
Solar to Home/Grid Efficiency	97.5% ⁵			
Power Scalability	Up to 4 Powerwall 3 units supported			
Energy Scalability	Up to 3 Expansion units (for a maximum total of 7 units)			
Supported Islanding Devices	Gateway 3, Backup Switch, Backup Gateway 2			
Connectivity	Wi-Fi (2.4 and 5 GHz), Ethernet, Cellular (LTE/4G _e)			
Hardware Interface	Dry contact relay, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters			
AC Metering	Revenue Grade (+/- 0.5%, ANSI C12.20)			
Protections	Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), PV Rapid Shutdown (RSD) using Tesla Mid-Circuit Interrupters			
Customer Interface	Tesla Mobile App			
Warranty	10 years			

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

² See [Powerwall 3 Installation Manual](#) for fuse requirements if using fuse for overcurrent protection.

³ If enabling the 15.4 kW off-grid maximum continuous discharge power, Powerwall 3 must be installed with an 80 A breaker and appropriately sized conductors.

⁴ Typical solar shifting use case.

⁵ Tested using CEC weighted efficiency methodology.

⁶ The customer is expected to provide internet connectivity for Powerwall 3; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

Powerwall 3 Technical Specifications

Solar Technical Specifications

Maximum Solar STC Input	20 kW
Withstand Voltage	600 V DC
PV DC Input Voltage Range	60 — 550 V DC
PV DC MPPT Voltage Range	60 — 480 V DC
MPPTs	6
Maximum Current per MPPT (I_{mp})	13 A ⁷
Maximum Short Circuit Current per MPPT (I_{sc})	15 A ⁷

⁷Where the DC input current exceeds the MPPT rating, a jumper can be used to combine two MPPTs into a single input to intake DC current up to $26 A I_{MP} / 30 A I_{SC}$.

Environmental Specifications

Operating Temperature	-20°C to 50°C (-4°F to 122°F) ⁸
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	-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 Rating	NEMA 3R
Ingress Rating	IP67 (Battery & Power Electronics) IP55 (Wiring Compartment)
Pollution Rating	PD3
Operating Noise @ 1 m	< 50 db(A) typical < 62 db(A) maximum

⁸Performance may be de-rated at operating temperatures above 40°C (104°F).

Compliance Information

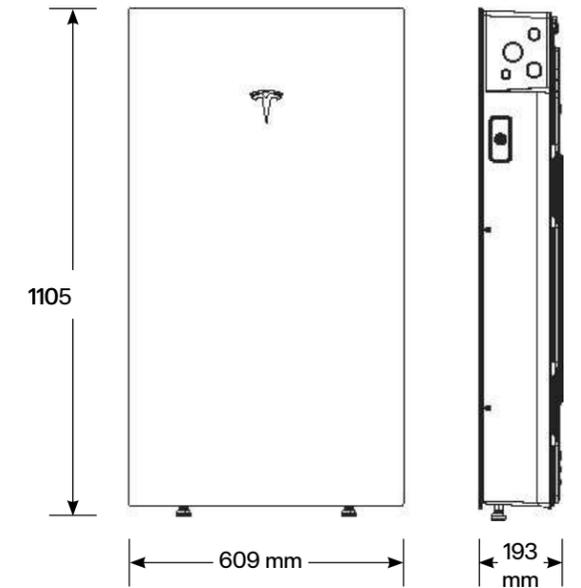
Certifications	UL 1741, UL 9540, UL 9540A, UL 3741, UL 1741 PCS, UL 1741 SA, UL 1741 SB, UL 1973, UL 1699B, UL 1998, CSA C22.2 No. 0.8, CSA C22.2 No. 107.1, CSA C22.2 No. 330, CSA 22.3 No. 9, IEEE 1547, IEEE 1547A, IEEE 1547.1, CA Rule No.21
Grid Connection	United States and Canada
Emissions	FCC Part 15 Class B, ICES 003
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)
Fire Testing	Meets the unit level performance criteria of UL 9540A

Powerwall 3 Technical Specifications

Mechanical Specifications

Dimensions	1105 x 609 x 193 mm (43.5 x 24 x 7.6 in) ⁹
Total Weight of Installed Unit	132 kg (291.2 lb)
Weight of Powerwall 3	124 kg (272.5 lb)
Weight of Glass Front Cover	6.5 kg (14.5 lb)
Weight of Wall Bracket	1.9 kg (4.2 lb)
Mounting Options	Floor or wall mount

⁹These dimensions include the glass front cover being installed on Powerwall 3.



Powerwall 3 Expansion Technical Specifications

Battery Technical Specifications

Model Number	1807000-xx-y
Nominal Battery Energy	13.5 kWh
Voltage Range	52 - 92 V DC ¹¹

¹¹Powerwall 3 Expansion units are connected in parallel and are not field serviceable.

Environmental Specifications

Operating Temperature	-20°C to 50°C (-4°F to 122°F) ¹²
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	-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 Rating	NEMA 3R
Ingress Rating	IP67
Pollution Rating	PD3

¹²Performance may be de-rated at operating temperatures above 40°C (104°F).

Compliance Information

Certifications	UL 1973, UL 9540
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Mechanical Specifications

Dimensions	1105 x 609 x 168 mm (43.5 x 24 x 6.6 in) ¹³	
Total Weight of Wall-Mounted Expansion Unit	118.5 kg (261.2 lb)	
Weight of Expansion Unit	110 kg (242.5 lb)	
Weight of Glass Front Cover	6.5 kg (14.5 lb)	
Weight of Wall Bracket	1.9 kg (4.2 lb)	
Weight of Expansion Accessories	0.7 kg (1.5 lb)	
Mounting Options	Floor or wall mount	
Stacking Capability (Floor Mount Only)	Up to (3) Expansion units behind a Powerwall 3	
Compatibility with Other Systems	Only compatible with Powerwall 3	
Connection to Powerwall 3 or Expansions	Powerwall 3 Expansion harness ¹⁴	

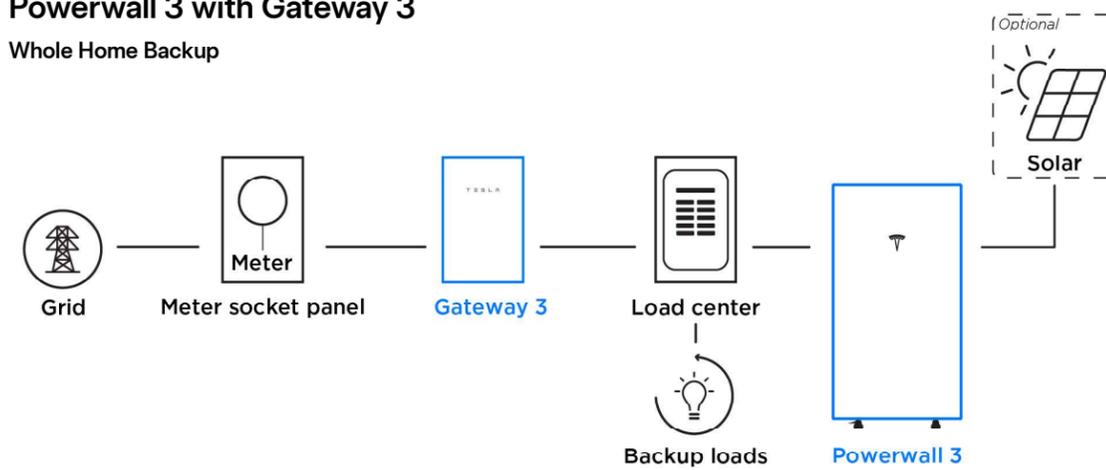
¹³These dimensions include the glass front cover being installed on Powerwall 3 Expansion.

¹⁴The Powerwall 3 Expansion harness is a listed component of the UL 9540 certification.

Powerwall 3 Example System Configurations

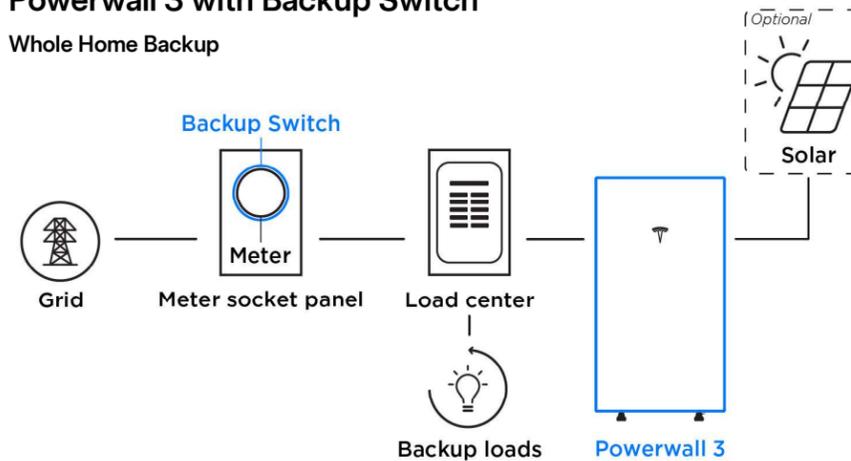
Powerwall 3 with Gateway 3

Whole Home Backup



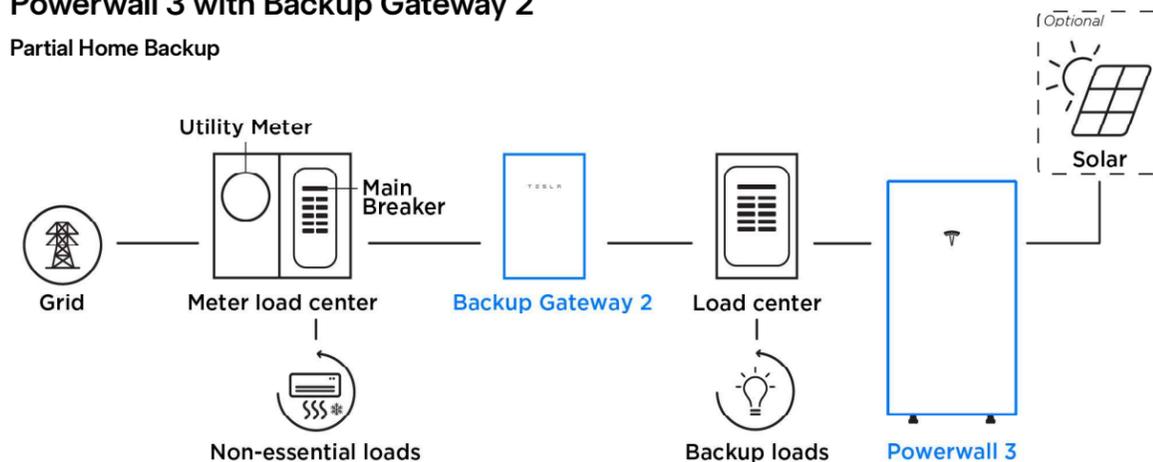
Powerwall 3 with Backup Switch

Whole Home Backup



Powerwall 3 with Backup Gateway 2

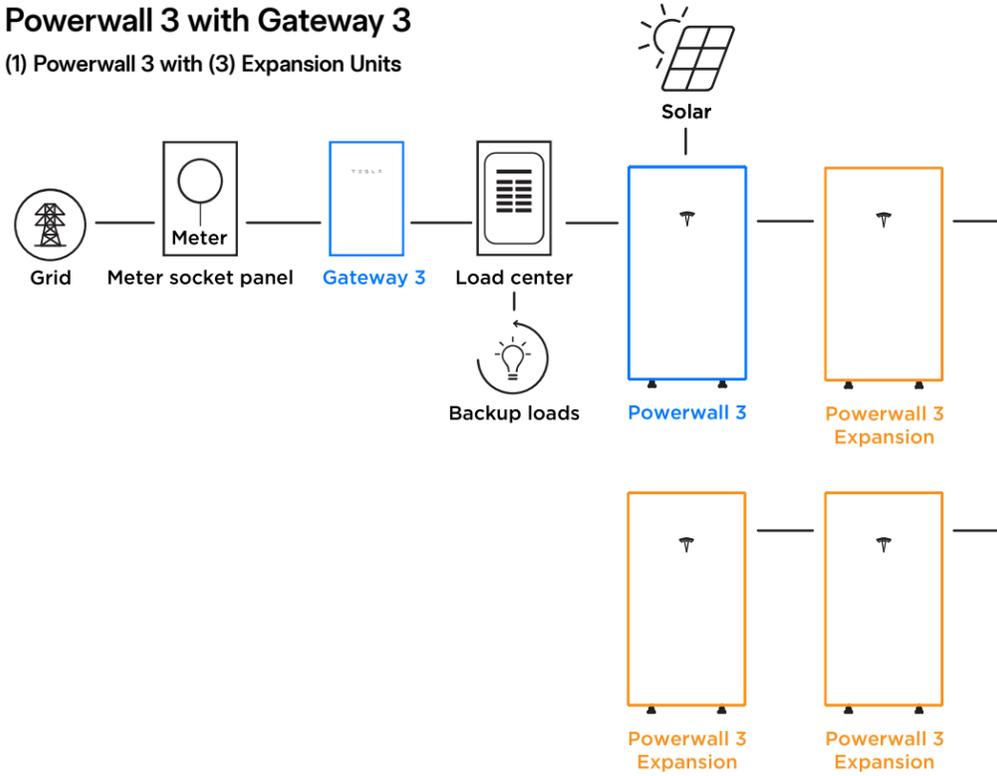
Partial Home Backup



Powerwall 3 Example System Configurations

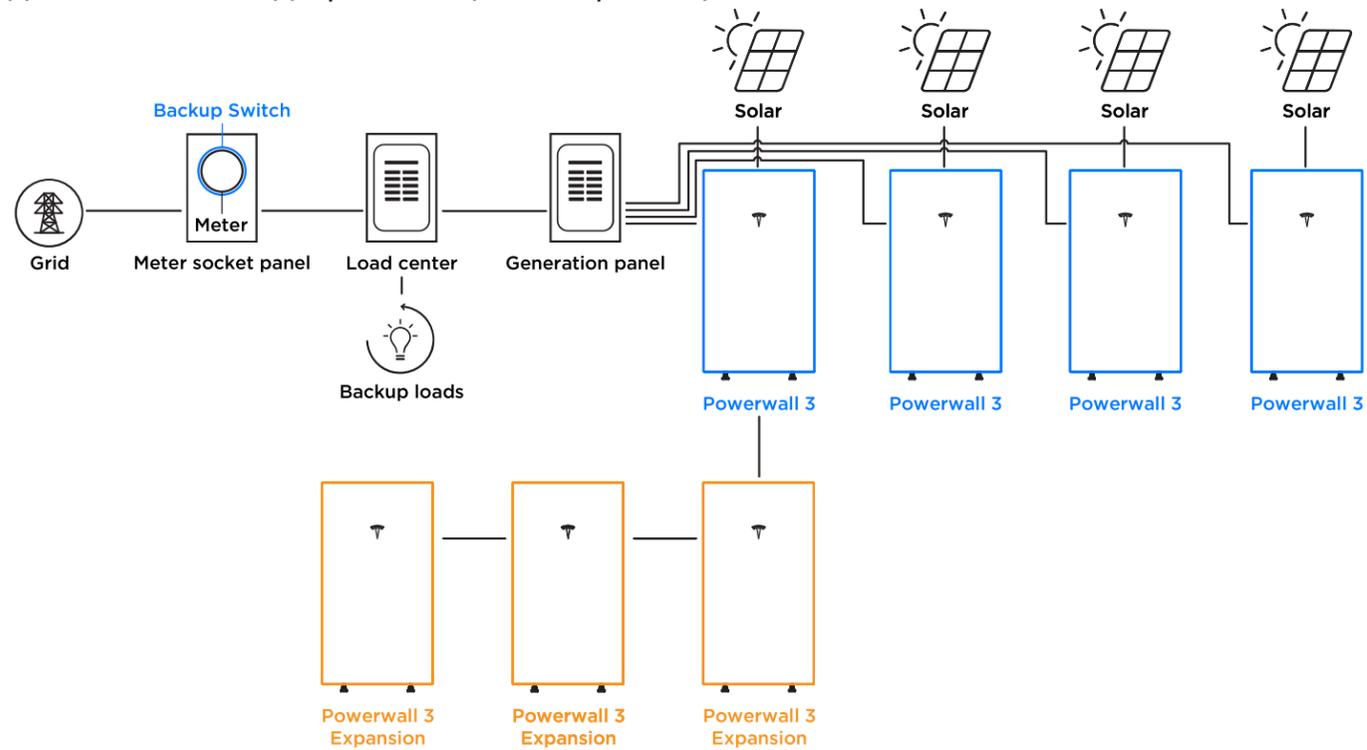
Powerwall 3 with Gateway 3

(1) Powerwall 3 with (3) Expansion Units

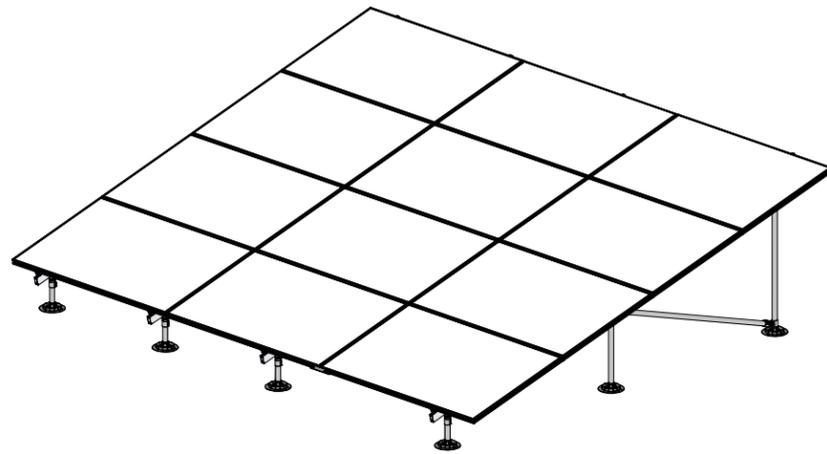


Powerwall 3 with Backup Switch

(4) Powerwall 3 Units with (3) Expansion Units (Maximum System Size)



ZS Ramp
for residential low-slope roofs



ZS Ramp Array



Description

- PV Mounting Solution for Residential Low-Slope Roofs

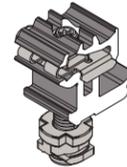
Specifications

- 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

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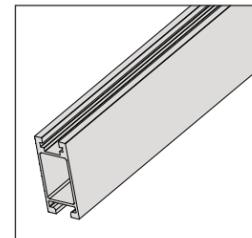
Components

Cam Foot V2



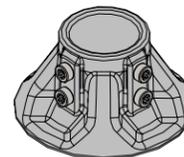
Part No. 850-1564
UL listed to UL 2703

Rail



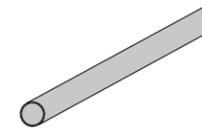
Part No. 850-1568
850-1567
850-1566
and 850-1565
UL listed to UL 2703

Base Foot



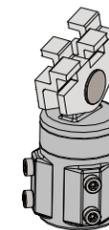
Part No. 850-1563
UL listed to UL 2703

Mechanical Tubing (MT)



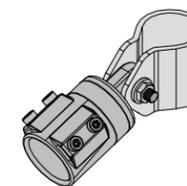
Part No. 850-1583
UL listed to UL 2703
1.51" Outer Diameter

Post Mount



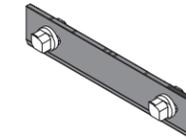
Part No. 850-1561
UL listed to UL 2703

Cross Brace Assembly



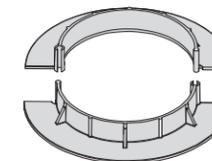
Part No. 850-1636
UL listed to UL 2703

Interlock



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

Sealant Ring



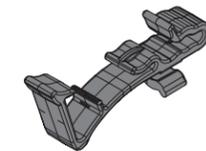
Part No. 850-1638

Splice Assembly, Ramp



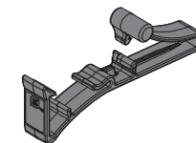
Part No. 850-1635
UL listed to UL 2703

DC Wire Clip



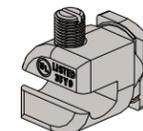
Part No. 850-1509
UL listed to UL 1565

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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MCI WIRING DETAIL

GENERAL NOTES

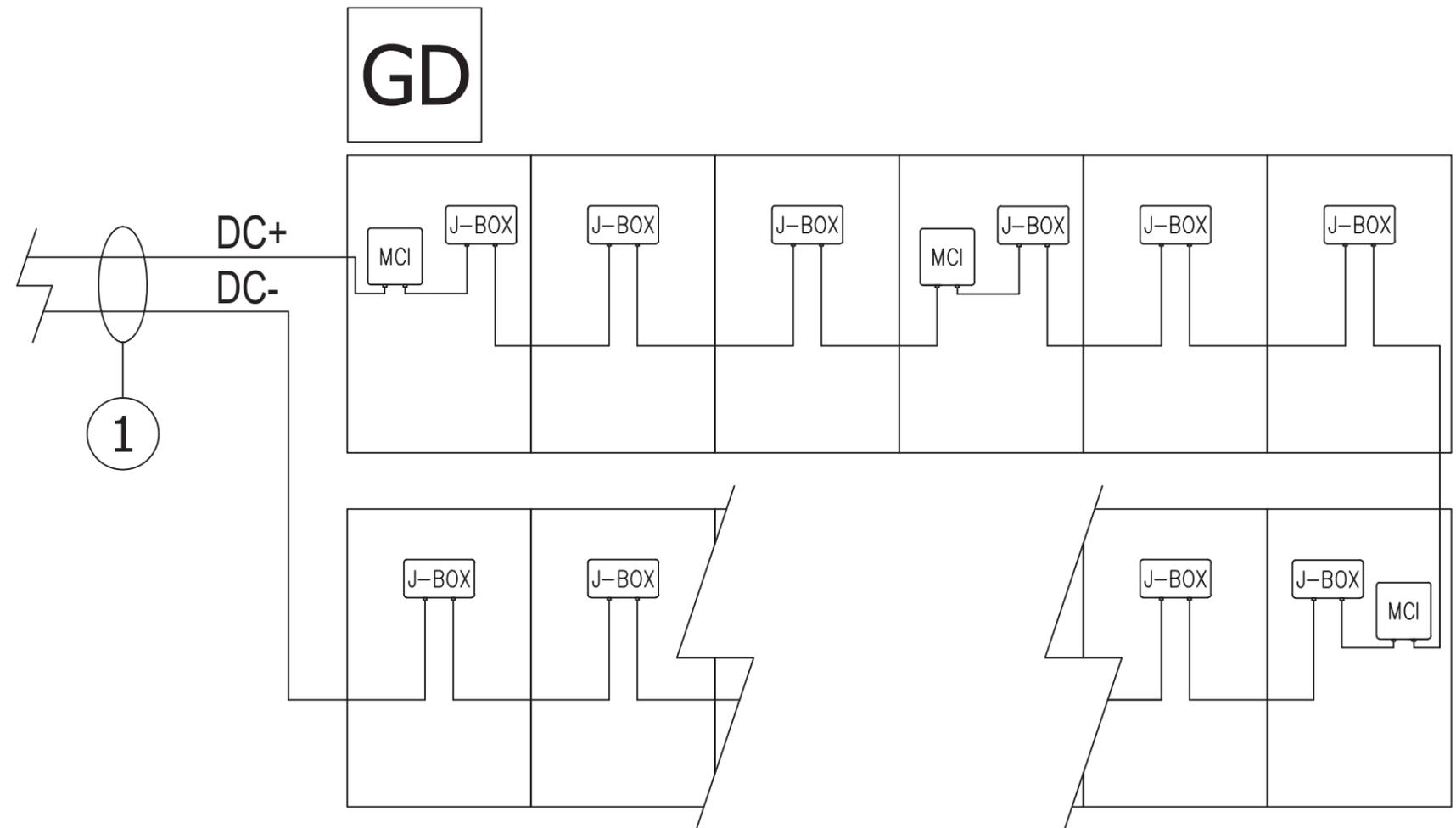
- DRAWING OF STANDARD MCI WIRING DETAIL FOR ANY GIVEN STRING LENGTH
- IF INITIATED, RAPID SHUTDOWN OCCURS WITHIN 30 SECONDS OF ACTIVATION AND LIMITS VOLTAGE ON THE ROOF TO NO GREATER THAN 165V (690.12.B.2.1)
- MID CIRCUIT INTERRUPTER (MCI) IS A UL 1741 PVRSE CERTIFIED RAPID SHUTDOWN DEVICE (RSD)

RETROFIT PV MODULES

- MCIS ARE LOCATED AT ROOF LEVEL, JUST UNDER THE PV MODULES IN ACCORDANCE WITH 690.12 REQUIREMENTS
- THE QUANTITY OF MCIS PER STRING IS DETERMINED BY STRING LENGTH
 - NUMBER OF MODULES BETWEEN MCI UNITS = 0-3
 - MAXIMUM NUMBER OF MODULES PER MCI UNIT = 3
 - MINIMUM NUMBER MCI UNITS = MODULE COUNT/3

*Exception: Tesla (Longi) modules installed in locations where the max Voc for 3 modules at low design temperature exceeds 165V shall be limited to 2 modules between MCIs.

PLEASE REFER TO MCI CUTSHEET AND PVRSA INSERT FOR MORE INFORMATION



① (2)AWG, PV Wire, 600V, Black

DC

Solar Shutdown Device 2 Technical Specifications

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is part of the PV system rapid shutdown (RSD) function in accordance with Article 690 of the applicable NEC. When paired with Powerwall+ or Tesla Solar Inverter, solar array shutdown is initiated by any loss of AC power.

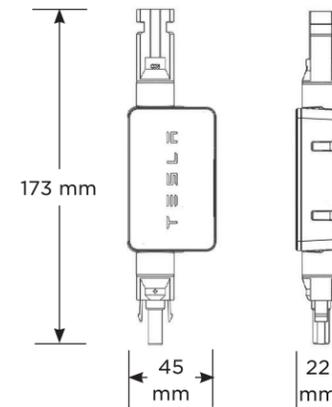
Electrical Specifications	Nominal Input DC Current Rating (I_{MP})	13 A
	Maximum Input Short Circuit Current (I_{SC})	17 A
	Maximum System Voltage (PVHCS)	1000 V DC

RSD Module Performance	Maximum Number of Devices per String	5
	Control	Power Line Excitation
	Passive State	Normally Open
	Maximum Power Consumption	7 W
	Warranty	25 years

Environmental Specifications	Ambient Temperature	-45°C to 70°C (-49°F to 158°F)
	Enclosure Rating	NEMA 4X / IP65

Compliance Information	Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)
	RSD Initiation Method	PV System AC Breaker or Switch
	Compatible Equipment	See Compatibility Table below

Mechanical Specifications	Model Number	MCI-2
	Electrical Connections	MC4 Connector
	Housing	Plastic
	Dimensions	173 x 45 x 22 mm (6.8 x 1.8 x 0.9 in)
	Weight	120 g (0.26 lb)



UL 3741 PV Hazard Control (and PVRSA) Compatibility

Tesla Solar Roof and Tesla/Zep ZS Arrays using the following modules are certified to UL 3741 and UL 1741 PVRSA when installed with Powerwall+ or Tesla Solar Inverter and Solar Shutdown Devices. See [Powerwall+ / Tesla Solar Inverter Rapid Shutdown: Module Selection Based on PV Hazard Control System Listing](#) for guidance on installing other modules.

Brand	Model	Required Solar Shutdown Devices
Tesla	Solar Roof V3	1 Solar Shutdown Device per 10 modules
Tesla	Tesla TxxxS (where xxx = 405 to 450 W, increments of 5) Tesla TxxxH (where xxx = 395 to 415 W, increments of 5)	1 Solar Shutdown Device per 3 modules ¹
Hanwha	Q.PEAK DUO BLK-G5 or Q.PEAK DUO BLK-G6+	1 Solar Shutdown Device per 3 modules

¹Exception: Tesla solar modules installed in locations where the max Voc for three modules at low design temperatures exceeds 165 V shall be limited to two modules between Solar Shutdown Devices.