

# ROOFTOP PHOTOVOLTAIC SYSTEM WITH PARTIAL LOAD BATTERY BACKUP

## SCOPE OF PV SYSTEM:

SYSTEM SIZE (DC)	: <b>7.40 kW</b> PTC: 20 X 352.73 = 7054.60W DC
SYSTEM SIZE (AC)	: 20 X 352.73 X 99% = 6984.05W AC
MODULES	: 20 X PANASONIC EVPV 370
INVERTER	: 1 X SOLAREEDGE SE7600H-US(240) INVERTER
OPTIMIZERS	: 20 X SOLAREEDGE OPTIMIZER P370
MAIN SERVICE PANEL	: EXISTING 225 AMPS MSP WITH 200 AMPS MAIN UNDER GROUND FED
INTERCONNECTION	: TIED TO NEW PV BREAKER IN MSP
OCPD RATING	: 40 AMPS
STRINGING	: 2 STRINGS OF 10 MODULES

## SCOPE OF ENERGY STORAGE SYSTEM:

SYSTEM SIZE	: 13.5 kWh
GATEWAY	: 1XTESLA BACKUP GATEWAY 2
BATTERY	: 1XTESLA POWERWALL 2
ESS DISCONENCT SWITCH	: 1XIMO ROTARY ACTUATOR SWITCH
LOAD CENTER	: 1X125A BACKUP LOAD CENTER

## CITY NOTES:

THIS PROJECT COMPLIES WITH THE FOLLOWING:  
 2019 CALIFORNIA BUILDING CODE (CBC)  
 2019 CALIFORNIA RESIDENTIAL CODE (CRC)  
 2019 CALIFORNIA ELECTRICAL CODE (CEC)  
 2019 CALIFORNIA MECHANICAL CODE (CMC)  
 2019 CALIFORNIA PLUMBING CODE (CPC)  
 2019 CALIFORNIA FIRE CODE (CFC)  
 2019 INTERNATIONAL BUILDING CODE (IBC)  
 2019 INTERNATIONAL RESIDENTIAL CODE (IRC)  
 2019 CALIFORNIA ENERGY CODE (CEC)  
 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE (CGBSC)  
 2020 GLENDALE BUILDING AND SAFETY CODE (GBSC)  
 2017 NATIONAL ELECTRICAL CODE (NEC)  
AS ADOPTED BY CITY OF GLENDALE

CONSTRUCTION TYPE = VB  
 OCCUPANCY GROUP = R3  
 HIGH FIRE ZONE = NO  
 FIRE SPRINKLERS = NO  
 NUMBER OF STORIES = 2 STORIES  
 APN # XXXXXXXX

ALL SOLAR ENERGY SYSTEM EQUIPMENT SHALL BE SCREENED TO THE MAXIMUM EXTENT POSSIBLE

MODULES SHALL BE TESTED, LISTED AND IDENTIFIED WITH FIRE CLASSIFICATION IN ACCORDANCE WITH UL 1703. THE FIRE CLASSIFICATION SHALL COMPLY WITH TABLE 1505.1 OF THE CALIFORNIA BUILDING CODE BASED ON THE TYPE OF CONSTRUCTION OF THE BUILDING. CRC SECTION R902.4

SMOKE AND CARBON MONOXIDE ALARMS ARE REQUIRED PER CRC SECTION R314 AND 315 TO BE VERIFIED AND INSPECTED BY INSPECTOR IN THE FIELD.

## NOTES:

COLD WATER PIPE SHALL BE PART OF GROUND ELECTRODE SYSTEM AND BOND WILL BE MADE NOT MORE THAN 5 FT FROM THE POINT OF ENTRANCE TO THE BUILDING. PER ART 250.68(C)(1). ALL ELECTRICAL WORK SHALL BE DESIGNED PER 2020 CITY OF LOS ANGELES ELECTRICAL CODE, 2019 CALIFORNIA ELECTRICAL CODE, AND 2020 NATIONAL ELECTRIC CODE. 110.2 APPROVAL: ALL ELECTRICAL EQUIPMENT SHALL BE LABELED, LISTED, OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCREDITED BY THE UNITED STATES OCCUPATIONAL SAFETY HEALTH ADMINISTRATION. DC CONDUCTORS IN ATTIC MUST BE IN METALLIC RACEWAY 18" BELOW ROOF SURFACE. BUILDING PERMITS: THE HOME OWNER AND CONTRACTOR COMPLETED THE ATTACHED AFFIDAVIT. ALL ELECTRICAL WORK SHALL BE DESIGNED PER ELECTRICAL CODE, AND 2020 NATIONAL ELECTRICAL CODE AND 2019 BUILDING ENERGY EFFICIENCY STANDARDS. 110.2 APPROVAL: ALL ELECTRICAL EQUIPMENT SHALL BE LABELED, LISTED OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCREDITED BY THE UNITED STATES OCCUPATIONAL SAFETY HEALTH ADMINISTRATION. ALL PLAN, SPECIFICATIONS, CALCULATIONS, AND/OR REPORTS SHALL BEAR THE SIGNATURE AND THE SEAL OR STAMP OF THE PERSON PREPARING THE DOCUMENTS. WET SIGNED, STAMPED, OR ELECTRONIC SIGNATURES ARE ALL ACCEPTABLE.

## SITE LOCATION:



SITE LOCATION

## HOUSE AERIAL VIEW:



MODULE LOCATION

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CLIENT:

GLENDALE, CA 91206

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE:

12/03/2021

DESIGN BY:

TMG

JOB NO.:

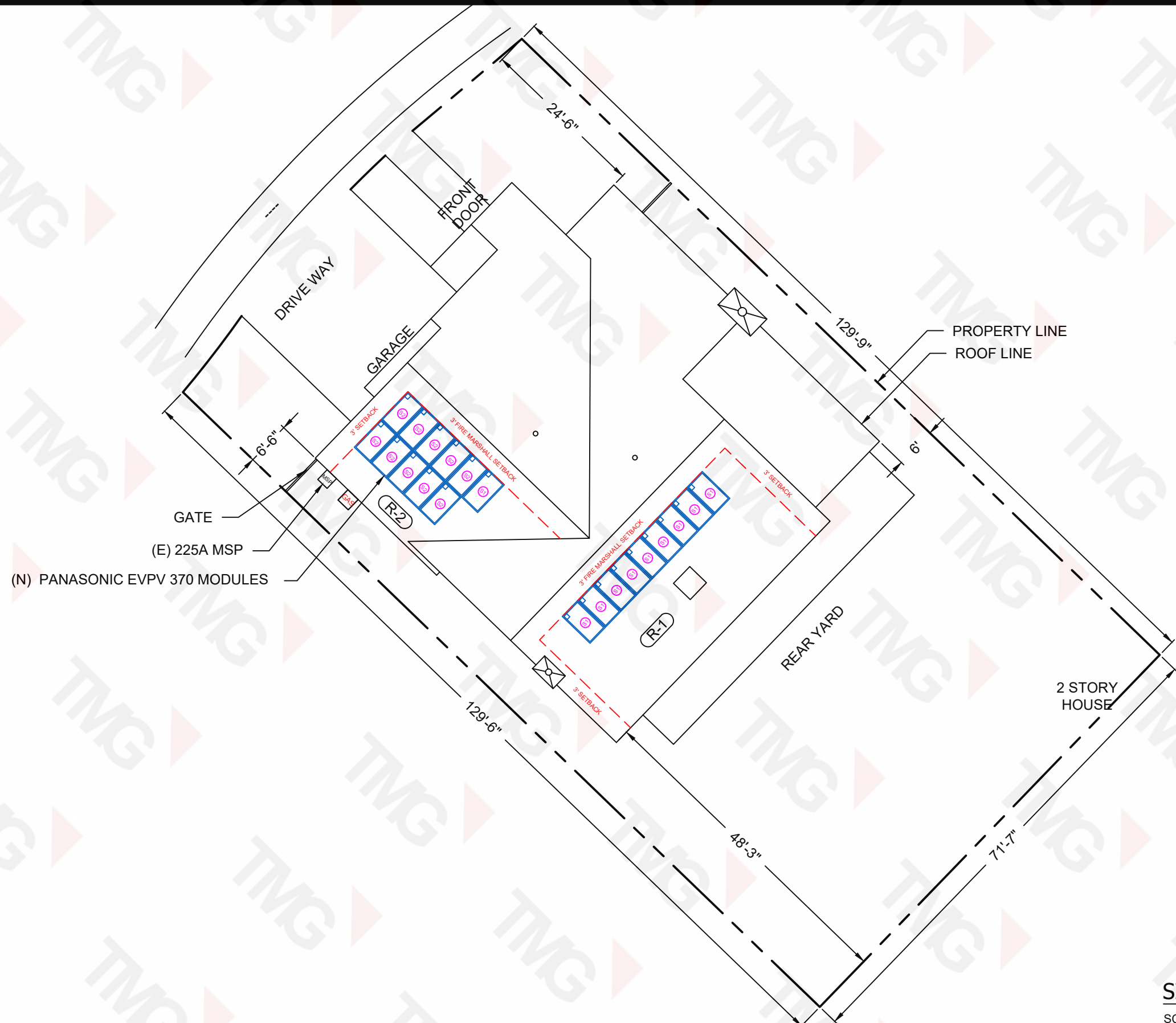
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TITLE:

SITE LOCATION AND HOUSE AERIAL VIEW

SHEET:

PV-1

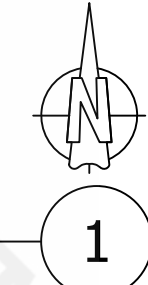


GATE  
 (E) 225A MSP  
 (N) PANASONIC EVPV 370 MODULES

PROPERTY LINE  
 ROOF LINE

2 STORY HOUSE

SITE PLAN  
 SCALE: 1/16" = 1'-0"



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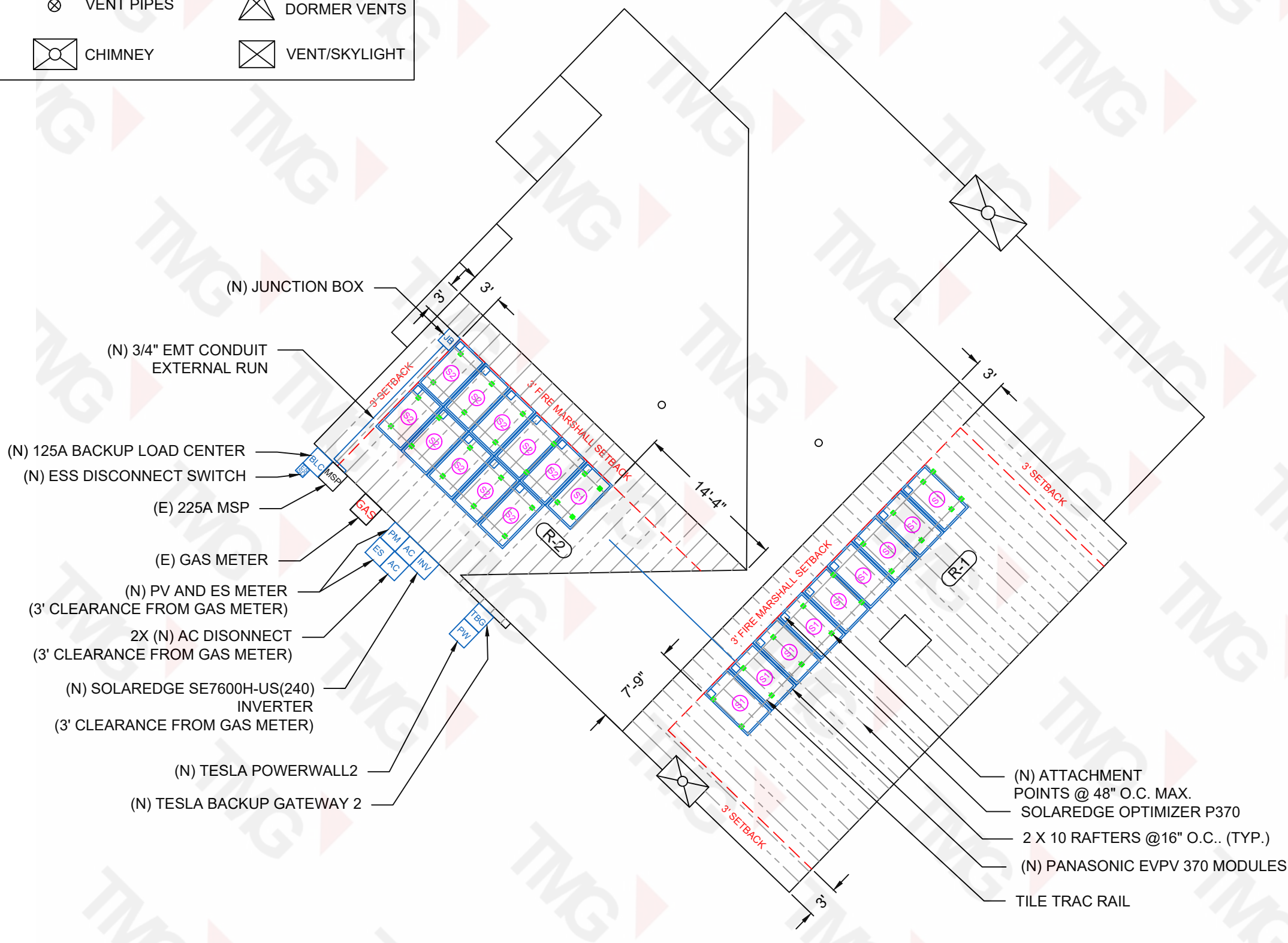
TITLE:  
 SITE PLAN

SHEET:  
 PV-2

**LEGEND:**

- ⊗ VENT PIPES
- ⊗ CHIMNEY
- △ DORMER VENTS
- ⊗ VENT/SKYLIGHT

A 36-INCH WIDE PATHWAY SHALL BE PROVIDED TO THE EMERGENCY ESCAPE AND RESCUE OPENING



**ROOF PLAN WITH MODULES LAYOUT**

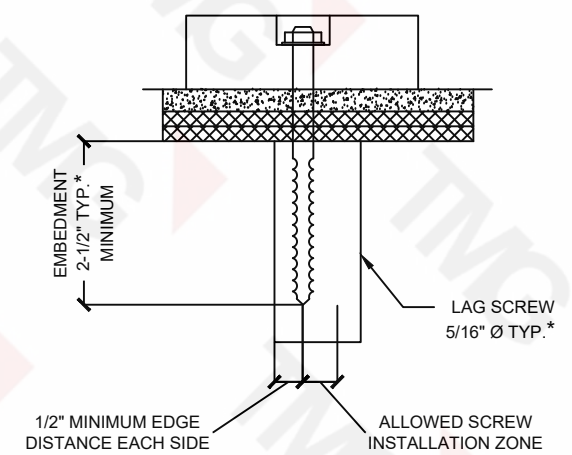
SCALE: 3/32" = 1'-0"

**ROOF AND MOUNTING DETAILS**

ROOF TYPE : CLAY TILE  
 ATTACHMENT TYPE : FAST JACK WITH TILE TRAC RAIL

**ROOF AREA STATEMENT**

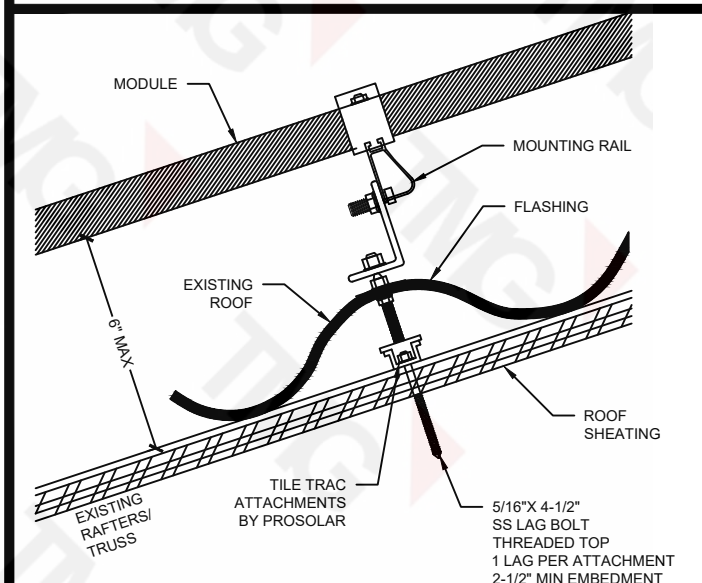
ROOF	MOD .QTY	AZIMUTH	TILT	ROOF FACE AREA	ARRAY AREA
(R-1)	9	134°	18°	959.79 SQ. FT	166.36 SQ. FT
(R-2)	11	224°	18°	533.87 SQ. FT	202.96 SQ. FT



\* EMBEDMENT DEPTH & LAG SCREW SIZE SHOWN IS TYPICAL UNLESS OTHER FASTENER REQUIREMENTS ARE SPECIFIED BY SOLAR SUPPORT COMPONENT MANUFACTURER

**ENLARGED DETAIL**

2



**ATTACHMENT DETAIL**

1

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TITLE:

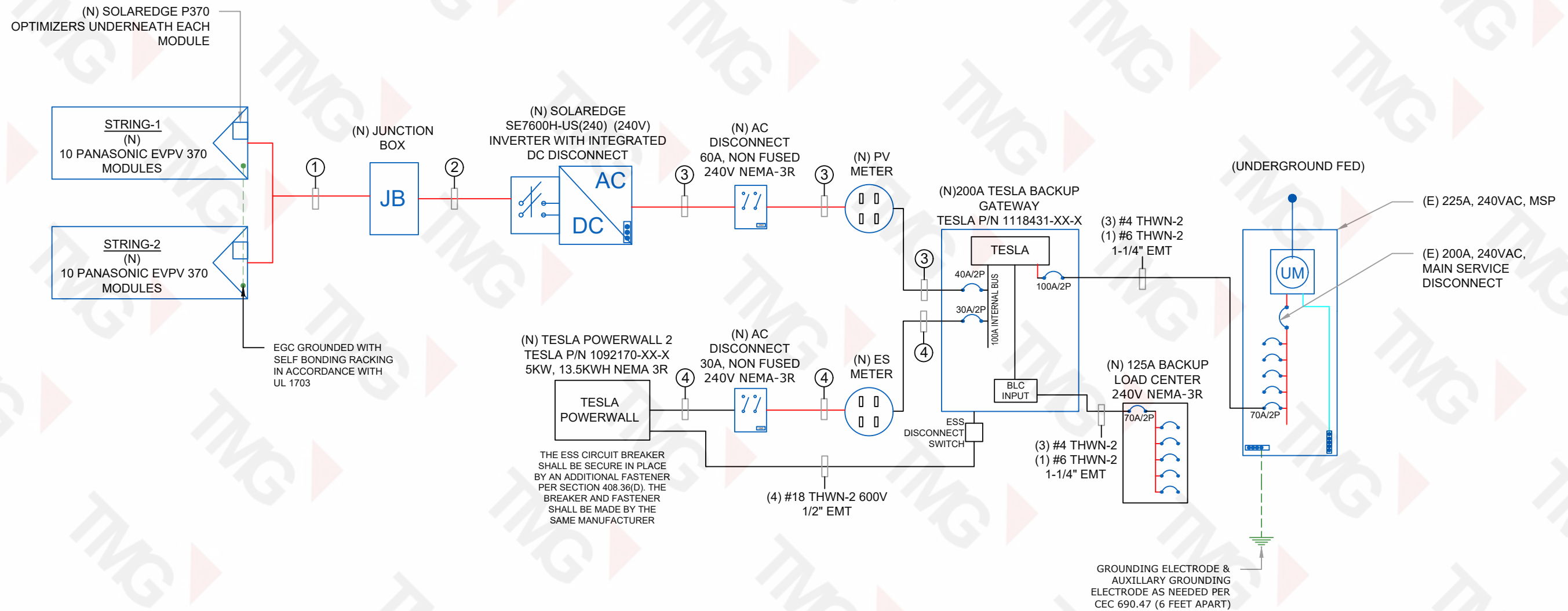
ROOF PLAN WITH MODULES LAYOUT

SHEET:

PV-2A

WIRE TAG #	CONDUIT	WIRE QTY	WIRE GAUGE	WIRE TYPE	TEMP RATING	WIRE AMP	TEMP DE-RATE	CONDUIT FILL	WIRE OCP	TERMINAL 75°C RATING	STRING WATTAGE / OPERATING VOLTAGE	STRING AMPS X NEC	MAX AMPS	MAX. SYS VOLTAGE	GRND SIZE	GRND WIRE TYPE
①	Open Air	2	10	PV Wire	90°C	40 X 0.96 X 1 =		38.4		35	3700 / 400 =	9.25 X 1.25 =	11.56	480	#6	SBC
②	3/4" EMT	2	10	THWN-2	90°C	40 X 0.96 X 1 =		38.4		35	3700 / 400 =	9.25 X 1.25 =	11.56	480	#8	THWN-2
③	3/4" EMT	3	8	THWN-2	90°C	55 X 0.96 X 1 =		52.8		50	-----	32.0 X 1.25 =	40.00	240	#8	THWN-2
④	3/4" EMT	3	10	THWN-2	90°C	40 X 0.96 X 1 =		38.4		35				240	#8	THWN-2

BACKFEED CALCULATION  
 225 X 1.2 = 270 AMPS  
 270 - 200 = 70A MAX. BACKFEED



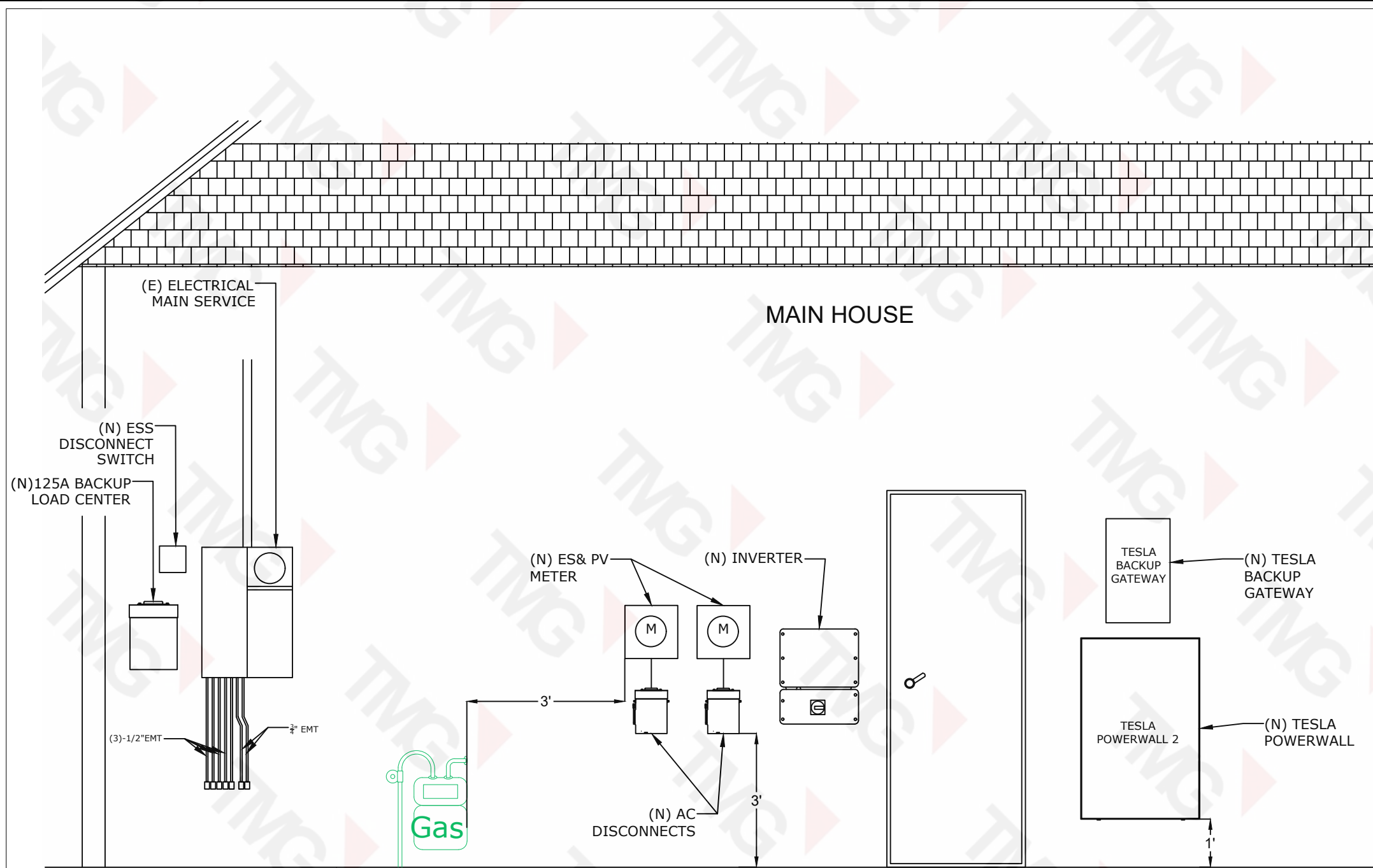
SINGLE LINE DIAGRAM  
 SCALE: NTS

1

CLIENT:  GLENDALE, CA 91206	REVISIONS:	DATE:	12/03/2021	TITLE:	ELECTRICAL LINE DIAGRAM	SHEET:  PV-3
	DESCRIPTION	DATE	REVISION	DESIGN BY: TMG		
				JOB NO.:	----	

# ELECTRICAL EQUIP. ELEVATION

# MATERIAL LIST



QTY	EQUIPMENT	DESCRIPTION
20	PANASONIC EVPV 370 SOLAR MODULES	OPEN CIRCUIT VOLTAGE (Voc) : 44.1V MAX. POWER VOLTAGE (Vmp) : 37.7V SHORT CIRCUIT CURRENT (Isc) : 10.42A MAX. POWER CURRENT (Imp) : 9.81A PTC RATING : 352.73V
20	OPTIMIZER SOLAREEDGE OPTIMIZER P370	RATED INPUT DC POWER : 370W MPPT OPERATING RANGE : 8-48VDC MAX. OUTPUT CURRENT : 11ADC WEIGHTED EFFICIENCY : 98.8%
1	SOLAREEDGE SE7600H-US INVERTER WITH INTEGRATED DISCONNECT EQUIPPED WITH RAPID SHUTDOWN	MAX. DC INPUT VOLTAGE : 480V MAX. DC INPUT CURRENT : 23A MAX. AC OUTPUT VOLTAGE RANGE : 211-264V MAX. AC OUTPUT CURRENT : 32A AC POWER OUPUT : 7600W CEC EFFICIENCY : 99.0%
1	JUNCTION BOX	600VDC, NEMA 3R, UL LISTED
1	BREAKER	1X 40A/2P, 1X30A/2P, 2X70A/2P, 1X100A/2P 240V
2	DISCONNECT	60 & 30A NON FUSED AC DISCONNECT
2	METER	GWP PV METER & ES METER
40	ATTACHMENTS	FAST JACK
10	RAIL	TILE TRAC RAIL-162"
34	CLAMP	MID CLAMPS
12	CLAMP	END CLAMPS
70'	CONDUIT	3/4" EMT CONDUIT
1	GATEWAY	TESLA BACKUP GATEWAY 2 - TESLA P/N 1118431-XX-X
1	BATTERY	TESLA POWERWALL 2 - TESLA P/N 1092170-XX-X
1	ESS DISCONNECT	IMO ROTARYACTUATOR SWITCH, 16A/4P
1	LOAD CENTER	125A LOAD CENTER, 240V NEMA-3R

CLIENT:

GLENDAL, CA 91206

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12/03/2021

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JOB NO.:

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TITLE:

ELEC. CALCULATION,  
ELEC. ELEVATION &  
MATERIAL LIST

SHEET:

PV-4

**LABELS:**

**LABELS SPECIFICATION:**

1. ALL CAPITAL LETTERS
  2. MINIMUM 3/8" LETTER HEIGHT
  3. ARIAL OR SIMILAR, NON-BOLD
  4. WHITE LETTERING IN RED BACKGROUND
  5. WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (DURABLE ADHESIVE MATERIALS MUST MEET THIS REQUIREMENT
  6. ALL SIGNS SHOULD BE REFLECTIVE
- DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE TO BE INSTALLED AT INVERTER PER NEC 690.53

OPERATING CURRENT: 13.97 ADC  
 OPERATING VOLTAGE: 400 VDC  
 SHORT-CIRCUIT CURRENT: 15 ADC  
 MAX SYSTEM VOLTAGE: 480 VDC

DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE TO BE INSTALLED AT AC DISCONNECT PER NEC 690.54

AC OUTPUT CURRENT: 32A  
 NOMINAL OPERATING AC VOLTAGE: 240V

TO BE LOCATED AT MAIN SERVICE PANEL:

**CAUTION:**  
 SOLAR ELECTRIC SYSTEM CONNECTED

DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION; TO BE INSTALLED AT DISCONNECTING MEANS PER NEC 2017 690.17

**WARNING**  
 ELECTRIC SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION.

INVERTER OUTPUT CONNECTION TO BE INSTALLED AT MAIN SERVICE PANEL PER NEC 2017 705.12 (D)(7)

**WARNING**  
 INVERTER OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE

MARKING SHOULD BE PLACED ON ALL INTERIOR AND EXTERIOR PV CONDUIT, RACEWAYS, ENCLOSURES, AND CABLE ASSEMBLIES, EVERY 10 FEET, AT TURNS AND ABOVE AND/OR BELOW PENETRATIONS AND ALL PV COMBINER AND JUNCTION BOXES.

**CAUTION:**  
 SOLAR CIRCUIT

TO BE LOCATED NEXT TO REMOTE DISCONNECT:

**CAUTION**  
 SOLAR CIRCUIT DISCONNECT

GROUND-FAULT DETECTION AND INTERRUPTION; TO BE INSTALLED AT INVERTER PER NEC 2017 690.5 (C)

**WARNING**  
 ELECTRIC SHOCK HAZARD IF A GROUND FAULT IS INDICATED, NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED

**CAUTION**  
 TRI POWER SOURCE SECOND SOURCE IS AC BATTERY THIRD SOURCE IS PHOTOVOLTAIC SYSTEM

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

DISCONNECTION MEANS; TO BE INSTALLED AT ALL AC AND DC DISCONNECTS RESPECTIVELY PER NEC 2017 690.14(C)(2)

SOLAR AC DISCONNECT

SOLAR DC DISCONNECT

PHOTOVOLTAIC POWER SOURCE SHALL BE LABELED WITH THE FOLLOWING WARNING AT EACH JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED. UNGROUNDED CIRCUITS MAY BE EXPOSED DURING SERVICE PER NEC690.35(F)

**WARNING**  
 ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

WARNING: MULTIPLE POWER SOURCES  
 UTILITY POWER @ 240/120VAC, 225AMPS  
 PV POWER @ 240VAC, 32 AMPS

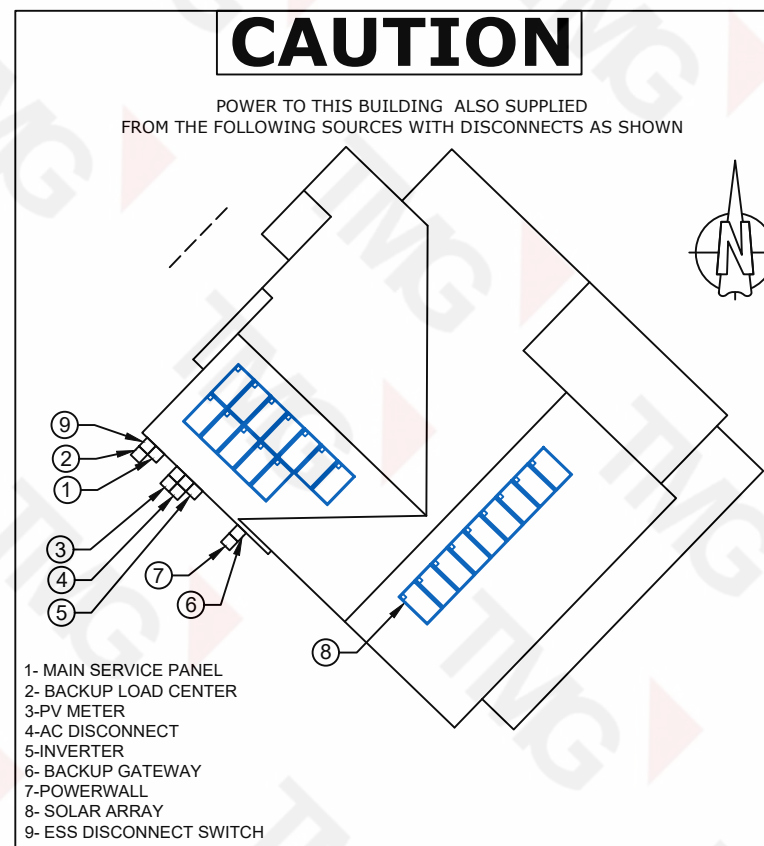
**PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN**  
 PER NEC2017/CEC2019 690.56

**PHOTOVOLTAIC AC DISCONNECT**  
 RATED AC OUTPUT CURRENT: 32 A  
 NOMINAL OPERATING AC VOLTAGE: 240 V

**GENERATION CIRCUIT LOAD**  
 RATED AC OUTPUT CURRENT: 62 A  
 NOMINAL OPERATING AC VOLTAGE: 240 V

**DIRECTORY PLACARD**

CEC 705.12 REQUIRES A PERMANENT PLAQUE OR DIRECTORY DENOTING ALL ELECTRIC POWER SOURCE ON OR IN THE PREMISES OR RAPID FIRE SHUTDOWN EQUIPMENT



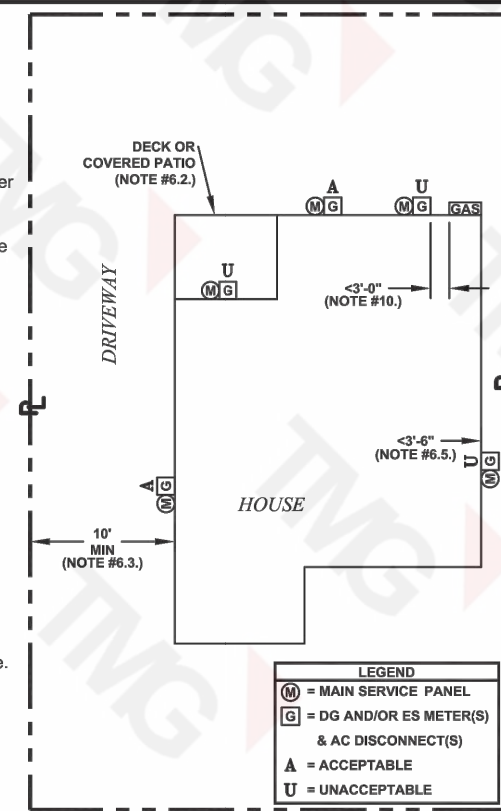
**ENERGY STORAGE SYSTEM DISCONNECT**  
 NOMINAL VOLTAGE 240 VAC  
 MAX AVAILABLE ISC 32 AAC  
 ISC CLEAR TIME 67 MS  
 DATE 1/8/2022

LABEL FOR ESS DISCONNECT

CLIENT:  GLENDALE, CA 91206	REVISIONS:			DATE:	12/03/2021	TITLE:  LABELS	SHEET:  PV-5
	DESCRIPTION	DATE	REVISION	DESIGN BY:	TMG		
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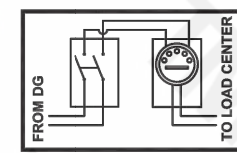
## D.E.R.S.

1. These requirements are not intended to be comprehensive. Refer to the GWP Electrical Service Requirements (ESR) for complete requirements.
2. All Distributed Generation (DG) systems require a utility DG meter and AC disconnect. All Distributed Generation + Storage (DG+S) systems require a utility Energy Storage (ES) meter and AC disconnect.
3. Project shall incorporate DER-DWG-001 into the DG plans by printing the DERS onto a page with your company title block and inserting the page into the DG plans for permitting.
4. Project's Single Line shall be drawn per the "TYP. SINGLE LINE" depicted below.
5. Contact GWP at 818-548-3921 to request a utility Service Spot drawing if:
  - 5.1. DG meter and AC disconnect cannot be installed per these requirements.
  - 5.2. Property is commercial or multi-residential.
  - 5.3. DG circuit breaker is to be installed on a load center located inside a building.
  - 5.4. Existing Main Service Panel (MSP) has no load center.
  - 5.5. MSP will be upgraded or replaced.
  - 5.6. DG+S design does not match ESR, DER-DWG-004, -005, -006, or -007.
6. DG & ES meter sockets and AC disconnects shall:
  - 6.1. Be installed within 10' and in line-of-sight of the MSP.
  - 6.2. Be installed in a location compliant with ESR, MTR-105.
  - 6.3. Not be installed in a driveway, unless the drivable space is a minimum of 10'-0" wide.
  - 6.4. Maintain a 10" min. clearance from center-line of meter to any side obstruction (e.g. MSP, wall, inverter, etc.). See ESR, MTR-DWG-006 for additional requirements.
  - 6.5. Maintain a 3'x3' clear and level work space measured from the front face of equipment.
  - 6.6. Not be installed above objects protruding more than 6" from wall (e.g. hose bib).
7. DG & ES meter sockets shall be 120/240V, 1Ø, 3-wire, ring-type, and 4-clip.
  - 7.1. Install a permanent placard indicating "Battery Backup Meter" on ES meter.
8. Utility AC disconnects shall be:
  - 8.1. Installed within 24" of the applicable meter socket (DG or ES).
  - 8.2. Installed so the operating handle is no higher than 6'-7" from grade when the handle is in the highest position.
  - 8.3. Fused or blade-type. A viewing window is not required; unless specified by GWP.
9. Down-sizing of the service Main Disconnect and the sizing of the DG circuit breaker is the sole jurisdiction of Building & Safety (B&S), Section of Community Development Department.
  - 9.1. Call 818-548-2122 to request a meter unlock "for repairs" to down-size Main.
10. A 36" minimum radial clearance is required from the centerline of the gas meter regulator to any electrical panel/conduit. An 18" minimum horizontal clearance is required from any gas pipe to any electrical panel/conduit.
11. If ES is installed, solar contractor is responsible for coordinating a date/time for GWP, B&S, and solar contractor to meet simultaneously at the site. Call 818-548-4830 to request a final B&S inspection and 818-548-2122 to request a functionality test from GWP.
12. GWP will install the DG and/or ES meter(s) within 7-10 working days after receiving all City inspection releases.
13. After the DG and/or ES meter(s) is installed, the customer will receive Permit to Operate (PTO) from GWP Solar Solutions group, phone# 818-548-2750. DER system shall not be energized until PTO is granted.

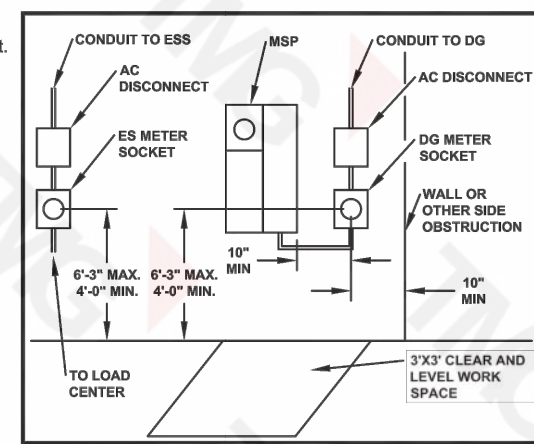


TYP. SITE PLAN

LEGEND	
(M)	= MAIN SERVICE PANEL
(G)	= DG AND/OR ES METER(S) & AC DISCONNECT(S)
(A)	= ACCEPTABLE
(U)	= UNACCEPTABLE



TYP. SINGLE LINE



TYP. ELEVATION PLAN

DATE	REV.	DESCRIPTION	BY	CHK'D	APP.
12/10/19	2	REVISED GAS METER CLEARANCES AND MINOR EDITORIAL REVISIONS	CC	VG	DRH

	<b>CITY OF GLENDALE WATER &amp; POWER</b> REV. NO. 2 DATE 10/17/18 DRAWN BY: CC APPROVED: DH	<b>DISTRIBUTED ENERGY RESOURCES                  SPECIFICATIONS (DERS) – RESIDENTIAL</b>	DER-DWG-001 PAGE 1 of 1
	<b>SERVICE PLANNING</b>		

CLIENT:  <p style="text-align: center;">GLENDALE, CA 91206</p>	REVISIONS: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">DESCRIPTION</th> <th style="width: 20%;">DATE</th> <th style="width: 20%;">REVISION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	DESCRIPTION	DATE	REVISION										DATE: 12/03/2021  DESIGN BY: TMG  JOB NO.: ----	TITLE:  <p style="text-align: center;">LABELS</p>	SHEET:  <p style="text-align: center;">PV-5.1</p>
DESCRIPTION	DATE	REVISION														



CLIENT:

GLENDALE, CA 91206

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DESCRIPTION	DATE	REVISION

DATE:

12/03/2021

DESIGN BY:

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JOB NO.:

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TITLE:

MSP PHOTO

SHEET:

PV-5.2



The Panasonic Advantage

**Higher Module Efficiency**  
Superior module efficiency of 21.2% and 20.6%, respectively, allows maximum power production with less roof space. With one of the industry's lowest annual degradation rates, power output of at least 92% is guaranteed after 25 years.

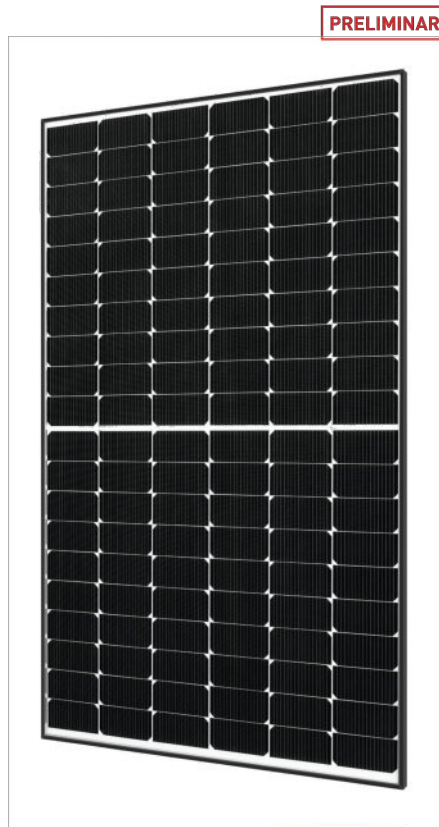
**TripleGuard 25-Year Warranty<sup>1</sup>**  
A long-term warranty is only as reliable as the company behind it. TripleGuard covers EverVolt panels for performance, product, parts and labor for 25 years. Whether in year three or year 25, your Panasonic warranty will be there when you need it.

**High Efficiency in High Temperatures**  
Produce more energy throughout the day even on the hottest days in the warmest climates. EverVolt solar panels outperform others when temperatures rise due to our industry-leading 0.26%/°C temperature coefficient.

**Heterojunction Cell Technology**  
Half-cut cells with heterojunction technology minimizes electron loss, maximizes conversion efficiency, and produces considerably higher power output over conventional panels.

**Durability & Quality Assurance**  
N-type cells result in minimal Low Induced degradation (LID) and Potential Induced degradation (PID), which supports reliability and longevity. As a solar pioneer for over 40 years, Panasonic EverVolt solar panels are backed by innovation, experience and a brand you can trust.

**Improved Performance When Shaded**  
Continuous power production in shaded areas for greater energy yields and output. More sunlight absorption means more clean power to your home.



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na.panasonic.com/us/solar

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Specifications are subject to change without notice  
RS200104DS-r13

PRELIMINARY

ELECTRICAL SPECIFICATIONS

Model	EVPV370	EVPV360
Rated Power (Pmax) <sup>1</sup>	370W	360W
Maximum Power Voltage (Vpm)	37.7V	37.0V
Maximum Power Current (Ipm)	9.81	9.72
Open Circuit Voltage (Voc)	44.1	44.0
Short Circuit Current (Isc)	10.42	10.37
Temperature Coefficient (Pmax)	-0.26 %/°C	
Temperature Coefficient (Voc)	-0.24 %/°C	
Temperature Coefficient (Isc)	0.04 %/°C	
NOCT	44°C (±2°C)	
CEC PTC Rating	TBD	TBD
Module Efficiency	21.2%	20.6%
Maximum System Voltage	1000V	
Maximum Series Fuse	25 A	
Watt Class Sorting	-0/+5	

MECHANICAL SPECIFICATIONS

Junction Box	3-part, 3 bypass diodes, IP67 rated in accordance with IEC 62790
Connector Type	Stäubli MC4 PV-KBT4/KST4 (4 mm <sup>2</sup> ) in accordance with IEC 62852 IP68 only when connected
Cable Size / Type	4 mm <sup>2</sup> solar cable, 1.0 m + 1.2 m in accordance with EN 50618
Max Snow Load (+) <sup>2</sup>	146 psf (7000 Pa)*
Max Wind Load (-) <sup>2</sup>	83 psf (4000 Pa)*
Dimensions LxWxH	67.8 x 40.0 x 1.2 in (1721 x 1016 x 30 mm)
Weight	43.0 lbs (19.5 kg)
Pallet Dimensions LxWxH	70 x 42 x 48 in
Quantity per Pallet / Pallet Weight	33 pcs./1512 lbs. (686 kg)
Quantity per 40' Container	858 pcs

\*Test Load. Design Load should be multiplied by two thirds.

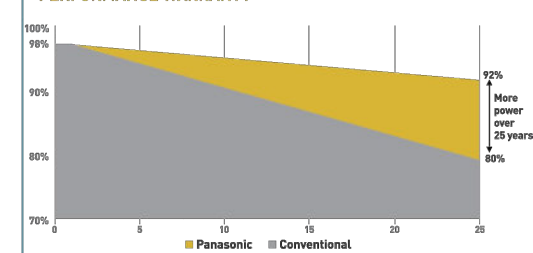
OPERATING CONDITIONS AND SAFETY RATINGS

Certifications	IEC 61215:2016, IEC 61730:2016, UL 1703, UL 61733, IEC 62804 (PID), IEC 61701 (Salt Mist), IEC 62716 (Ammonia Resistance), ISO 11925-2 (Ignitability Class EI), UNI 8457/9174 (Ignitability Class 1), IEC 62782 (Dynamic Mechanical Load), IEC 61215-2:2016 (Hailstone 35mm), AS4040.2 NCC 2016 (Cyclic Wind Load)
Operating Temperature	-40°F to 185°F [-40°C to 85°C]
Limited Warranty	25' Yrs Workmanship and Power Output (Linear)**
Power Output in Year 1	98%
Annual Degradation	0.25%
Power Output in Year 25	92%

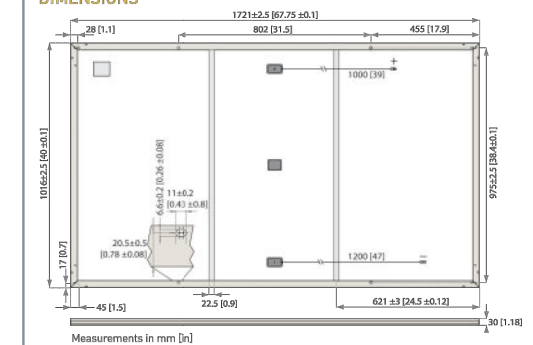
NOTE: Values at standard test conditions (STC: air mass AM1.5 irradiance 1000W/m<sup>2</sup>, temperature 25°C) based on production spread with a tolerance at Pmax, Voc & Isc ±5% within one watt class.  
\* Maximum power at delivery. For guarantee conditions, please check our guarantee document.  
\*\* Installation need to be registered through our website www.panasonicusahitwarranty.com within 60 days in order to receive twenty-five (25) year Product workmanship. Otherwise, Product Workmanship will be only fifteen (15) years.  
† Equipment must be installed by a Panasonic Authorized, Premium, or Elite installer and registered at www.panasonicusahitwarranty.com within 60 days in order to receive twenty-five (25) year TripleGuard warranty.  
‡ Refer to installation manual for detailed mechanical loading information  
\*\*\* 1st year 98%, after 2nd year 0.25% annual degradation to year 25.

Panasonic Life Solutions Company of America  
Two Riverfront Plaza, Newark, NJ 07102  
panasonicHIT@us.panasonic.com  
na.panasonic.com/us/solar

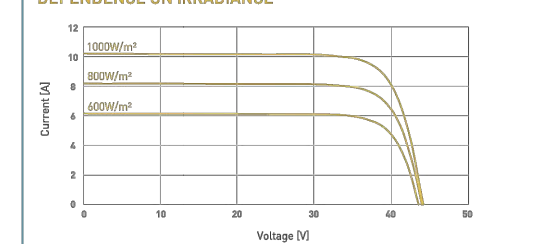
PERFORMANCE WARRANTY



DIMENSIONS



DEPENDENCE ON IRRADIANCE



Reference data for model: EVPV360  
Cell temperature: 77°F (25°C)



NOTE: Specifications and information above may change without notice.  
CAUTION! Please read the installation manual carefully before using the products.  
Used electrical and electronic products must not be mixed with general household waste. For proper treatment, recovery and recycling of old products, please take them to applicable collection points in accordance with your national legislation.

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Specifications are subject to change without notice  
RS200104DS-r13

CLIENT:	GLLENDALE, CA 91206		
REVISIONS:	DESCRIPTION	DATE	REVISION
DATE:	12/03/2021		
DESIGN BY:	TMG		
JOB NO.:	----		

DATE:	12/03/2021		
DESIGN BY:	TMG		
JOB NO.:	----		

TITLE:	DATA SHEET: MODULE		
SHEET:	PV-6		



# Single Phase Inverters for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	
<b>OUTPUT</b>						
Rated AC Power Output	3000	3800	5000	6000	7600	VA
Max. AC Power Output	3000	3800	5000	6000	7600	VA
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	-	✓	-	-	Vac
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5 <sup>(1)</sup>					Hz
Maximum Continuous Output Current 208V	-	-	24	-	-	A
Maximum Continuous Output Current 240V	12.5	16	21	25	32	A
GFDI Threshold	1					A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes					
<b>INPUT</b>						
Maximum DC Power	4650	5900	7750	9300	11800	W
Transformer-less, Ungrounded	Yes					
Maximum Input Voltage	480					Vdc
Nominal DC Input Voltage	380				400	Vdc
Maximum Input Current 208V <sup>(2)</sup>	-	-	13.5	-	-	Adc
Maximum Input Current 240V <sup>(2)</sup>	8.5	10.5	13.5	16.5	20	Adc
Max. Input Short Circuit Current	45					Adc
Reverse-Polarity Protection	Yes					
Ground-Fault Isolation Detection	600ka Sensitivity					
Maximum Inverter Efficiency	99		99.2			%
CEC Weighted Efficiency	99					%
Nighttime Power Consumption	< 2.5					W
<b>ADDITIONAL FEATURES</b>						
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)					
Revenue Grade Data, ANSI C12.20	Optional <sup>(3)</sup>					
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect					
<b>STANDARD COMPLIANCE</b>						
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07					
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)					
Emissions	FCC Part 15 Class B					
<b>INSTALLATION SPECIFICATIONS</b>						
AC Output Conduit Size / AWG Range	0.75-1" Conduit / 14-6 AWG					
DC Input Conduit Size / # of Strings / AWG Range	0.75-1" Conduit / 1-2 strings / 14-6 AWG					
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174					in / mm
Weight with Safety Switch	22 / 10		25.1 / 11.4		26.2 / 11.9	lb / kg
Noise	< 25				< 50	dBA
Cooling	Natural Convection				Natural convection and internal fan (user replaceable)	
Operating Temperature Range	-13 to +140 / -25 to +60 <sup>(4)</sup> (-40°F / -40°C option) <sup>(5)</sup>					°F / °C
Protection Rating	NEMA 3R (Inverter with Safety Switch)					

<sup>(1)</sup> For other regional settings please contact SolarEdge support  
<sup>(2)</sup> A higher current source may be used; the inverter will limit its input current to the values stated  
<sup>(3)</sup> Revenue grade inverter P/N: SExxxH-US000NNC2  
<sup>(4)</sup> Power de-rating from 50°C  
<sup>(5)</sup> -40 version P/N: SExxxH-US000NNU4



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CLIENT:

GLENDAL, CA 91206

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE:

12/03/2021

DESIGN BY:

TMG

JOB NO.:

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TITLE:

DATA SHEET:  
INVERTER

SHEET:

PV-7

# Power Optimizer

P370 / P401 / P404 / P405 / P485 / P500 / P505

POWER OPTIMIZER

25  
JAAR  
GARANTIE



## Vermogensoptimalisatie op paneelniveau

- Speciaal ontworpen om te werken met SolarEdge omvormers
- Tot 25% meer opbrengst
- Superieur rendement (99,5%)
- Verhelpt elk verlies dat ontstaat door 'mismatch', variërend van producttoleranties tot schaduwvorming
- Flexibel systeemontwerp voor optimaal gebruik van de beschikbare ruimte
- Snelle montage door één enkele bevestiging
- Geavanceerd onderhoud dankzij monitoring op paneelniveau
- Spanningsafschakeling op paneelniveau voor de veiligheid van installateurs en brandweer

solaredge.com

**solaredge**

## / Power Optimizer

P370 / P401 / P404 / P405 / P485 / P500 / P505

Optimizer model (geschikte paneeltypen)	P370 (hoog vermogen 60/72- cels panelen)	P401 (hoog vermogen 60/72- cels panelen)	P404 (60/72- cels panelen, korte strings)	P405 (hoge spanning panelen)	P485 (hoge spanning panelen)	P500 (96-cels panelen)	P505 (panelen met hoge stromen)	
<b>INGANG</b>								
Nominale DC-ingangsvermogen <sup>(1)</sup>	370	400	405	405	485	500	505	W
Absolute maximale ingangsspanning (Voc bij laagste temperatuur)	60		80	125		80	83	Vdc
MPPT-werkbereik	8 - 60		12,5 - 80	12,5 - 105		8 - 80	12,5-83	Vdc
Maximale kortsluitstroom (Isc)	11	11,75		11		10,1	14	Adc
Maximaal rendement				99,5				%
EU rendement				98,8				%
Overspanningscategorie				II				
<b>UITGANG TIJDENS GEBRUIK (POWER OPTIMIZER IS AANGESLOTEN OP WERKENDE SOLAREEDGE OMFORMER)</b>								
Maximale uitgangsstroom				15				Adc
Maximale uitgangsspanning	60			85		60	85	Vdc
<b>UITGANG TIJDENS STAND-BY (POWER OPTIMIZER IS LOSGEKOPPELD VAN OMFORMER OF OMFORMER IS UIT)</b>								
Veilige uitgangsspanning per power optimizer				1 ± 0,1				Vdc
<b>NORM- EN REGELGEVING</b>								
EMC	FCC deel 15 klasse B, IEC61000-6-2, IEC61000-6-3							
Veiligheidseisen	IEC62109-1 (klasse II veiligheid), UL1741							
RoHS	Ja							
Brandveiligheid	VDE-AR-E 2100-712:2013-05							
<b>INSTALLATIE SPECIFICATIES</b>								
Maximale toegestane systeemspanning				1.000				Vdc
Afmetingen (B x L x H)	129 x 153 x 27,5	129 x 153 x 29,5	129 x 89 x 42,5	129 x 90 x 49,5		129 x 153 x 33,5	129 x 162 x 59	mm
Gewicht (inclusief kabels)	630	655	775	845		750	1.064	gr
Ingangconnector	MC4 <sup>(2)</sup>			Enkele of dubbele MC4 <sup>(2)(3)</sup>		MC4 <sup>(2)</sup>		
Lengte ingangskabels				0,16				m
Uitgangconnector				MC4				
Lengte uitgangskabels				1,2				m
Bedrijfstemperatuur				-40 - +85				°C
Beschermingsklasse				IP68				
Relatieve vochtigheid				0 - 100				%

(1) Het nominale vermogen van de module bij STC zal de optimizer "Nominale ingangsvermogen DC" niet overschrijden. Panelen met een vermogenstolerantie tot + 5% zijn toegestaan.  
 (2) Neem contact op met SolarEdge indien u een ander type connectoren wilt gebruiken.  
 (3) Gebruik de P485 met dual input voor aansluiting van twee panelen parallel op de ingang van de optimizer. In het geval van een oneven aantal panelen in één string, wordt het installeren van één P485 dual-versie power optimizer aangesloten op één paneel ondersteund. Wanneer u een enkel paneel aansluit, sluit u de ongebruikte ingangconnectoren af met de meegeleverde set afdichtingen.

PV-SYSTEEMONTWERP MET EEN SOLAREEDGE OMFORMER <sup>(5)(6)</sup>	1-FASE HD-WAVE	1-FASE	3-FASE	3-FASE VOOR 277/480V NETWERK	
Minimale stringlengte (power optimizers)	P370, P401, P500	8	16	18	
	P404, P405, P505	6	14 (13 met SE3K)	14	
Maximale stringlengte (power optimizers)		25	50	50	
Maximaal vermogen per string		5,700	5,250	11,250 <sup>(7)</sup>	12,750 <sup>(8)</sup>
Parallele strings van ongelijke lengtes of oriëntaties	Ja				

(5) Het is niet toegestaan om P404/P405/P485/P505 in dezelfde string te plaatsen als de P370/P401/P500/P600/P650/P730/P801/P800p/P850/P950.  
 (6) Voor SE15K en groter moet het minimum DC vermogen 11kW zijn.  
 (7) Voor het 230/480V-net: het is toegestaan om tot 13.500W per string te installeren wanneer het maximale vermogensverschil tussen elke string 2.000W bedraagt.  
 (8) Voor het 277/480V-net: het is toegestaan om tot 15.000W per string te installeren wanneer het maximale vermogensverschil tussen elke string 2.000W bedraagt.

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CE

CLIENT:

GLENDALE, CA 91206

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE:

12/03/2021

DESIGN BY:

TMG

JOB NO.:

----

TITLE:

DATA SHEET:  
OPTIMIZER

SHEET:

PV-8

CLIENT:  
Professional Solar Products, Inc.  
1551 S. Rose Ave., Oxnard, CA 93033  
Tel: 805-486-4700

**Subject: Static load test results for the following:**

Mounting System	Min Rail Height (in.)	Max Span (in.)	Maximum Frame Length* (in.)	Maximum Frame Width* (in.)	Load (lbs/ft <sup>2</sup> )	Equivalent Wind Speed (mph)**
RoofTrac®	1-1/2	48	65 (77**)	40	55	135 (115**)

**TEST SETUP (as shown in attached drawing detail):** Three modules, as specified above, were bolted to 1.5" tall Professional Solar Products (PSP) patented RoofTrac® support rails using an assembly of 5/16" Stainless Steel (SS) bolts, SS lock washers and proprietary aluminum clamps and inserts. The RoofTrac® support rail was attached to the PSP RoofTrac® structural attachment device with a 3/8" SS nut and SS washer at six attachment points. The setup was attached to 2"x6" wooden rafters using 5/16" x 3-1/2" lag bolts. The attachment spans consisted of 48" front to rear with structural attachments spaced 48" on center.

**TEST PROCEDURE (as shown in attached drawing detail):** The test set up was top loaded to above specified load. The setup remained loaded for an approximate period of 30 minutes. The maximum deflection and any signs of permanent deformation were recorded. The test setup was then inverted and loaded to simulate the uplift condition. The test set up was re-loaded to above specified load. The setup remained loaded for an approximate period of 30 minutes. The maximum deflection and any signs of permanent deformation were recorded.

**TEST RESULTS:**  
The maximum top load deflection was recorded at 0.469", with no permanent deformation.  
The maximum uplift deflection was recorded at 0.313", with no permanent deformation.

This document certifies the RoofTrac® mounting system used with modules, as specified above, withstand the stated static pressure load, equivalent to the stated wind speeds\*\*. The mounting system performed as expected.

Sincerely,

James R. Vinci, S.E.

This engineering report verifies that Vinci & Associates has provided independent observation for load testing as described in this report. The results of this load test reflect actual deflection values and are generally accepted as the industry standard for testing module mounting systems. Vinci & Associates does not field check installations or verify that the mounting system is installed as described in this engineering report.

**Structural attachment:** Lag bolt attachment should be installed using the proper pilot hole for optimum strength. A 5/16" lag bolt requires a 3/16" pilot hole. It is the responsibility of the installer to insure a proper attachment is made to the structural member of the roof. Failure to securely attach to the roof structure may result in damage to equipment, personal injury or property damage. The proposed racking system may be installed on any roof up to a maximum of 24 foot above grade without further analysis. Racking can be installed at any location on the roof. Racking shall be installed into a roof member or blocking with a 5/16" diameter screw at each Fast-jack location. Screws shall have minimum of 2 1/2" penetration into framing member for zone 1&2, and a minimum of 3" penetration into framing member for zone 3. (Zone 3 is defined as the approximately 4'-0" square at each corner of the roof)

This office does not express an opinion as to the load bearing characteristics of the structure the mounting system/modules are being installed on.

ICC accredited laboratory tested structural attachments manufactured by Professional Solar Products (including FastJack®, TileTrac®, and FoamJack®) can be interchanged with this system.

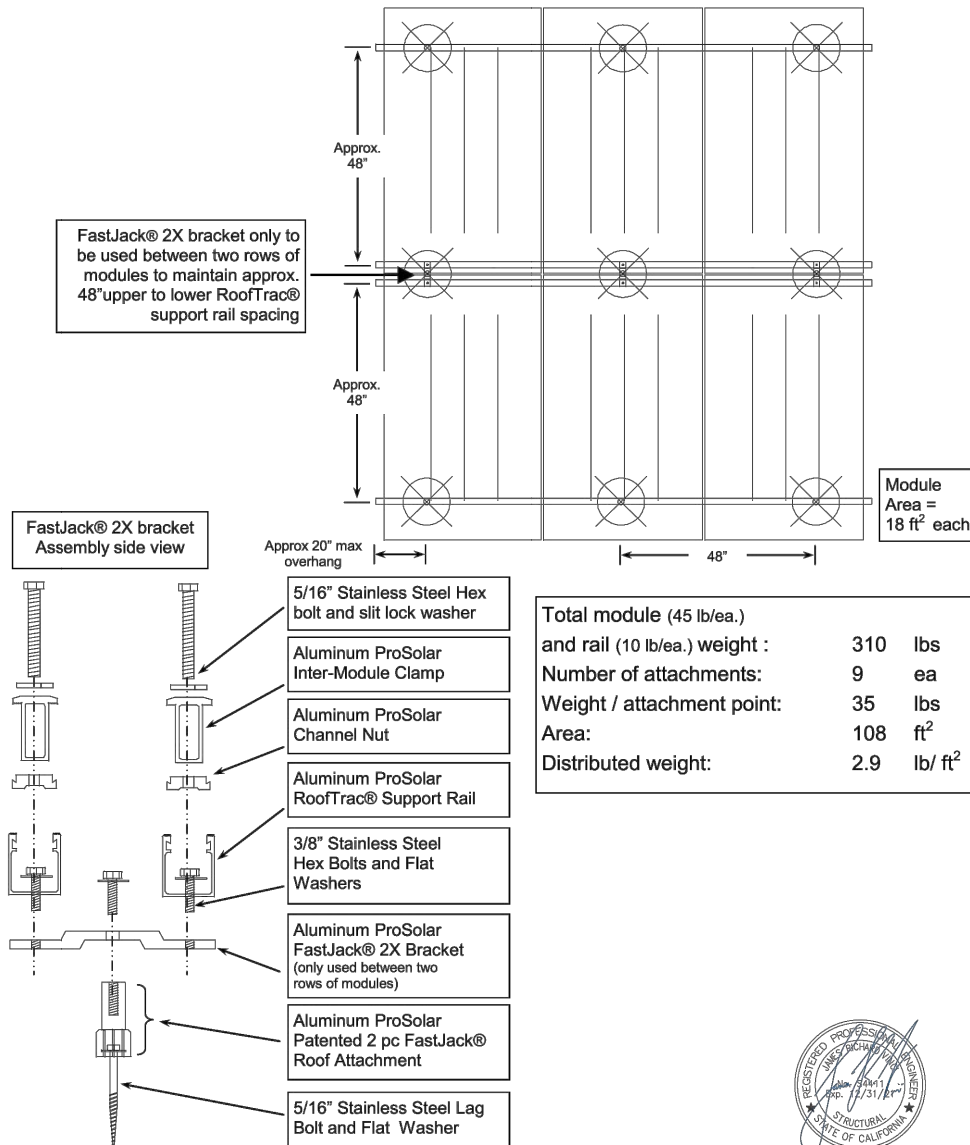
Check with local building department or AHJ for site specific requirements.

\*Modules measuring within stated specifications and tested to UL1703, or equivalent, are included in this engineering.

\*\*Wind loading values relative to defined load values using wind load exposure and gust factor coefficient "exposure C" as defined in the 2018(IBC) / 2019 (CBC) / ASCE7-16. For 77" x 40" module, equivalent wind speed derated to 115 mph.

\*\*\* Module tested: 64.6" x 39.1" x 1.8" (shrp)

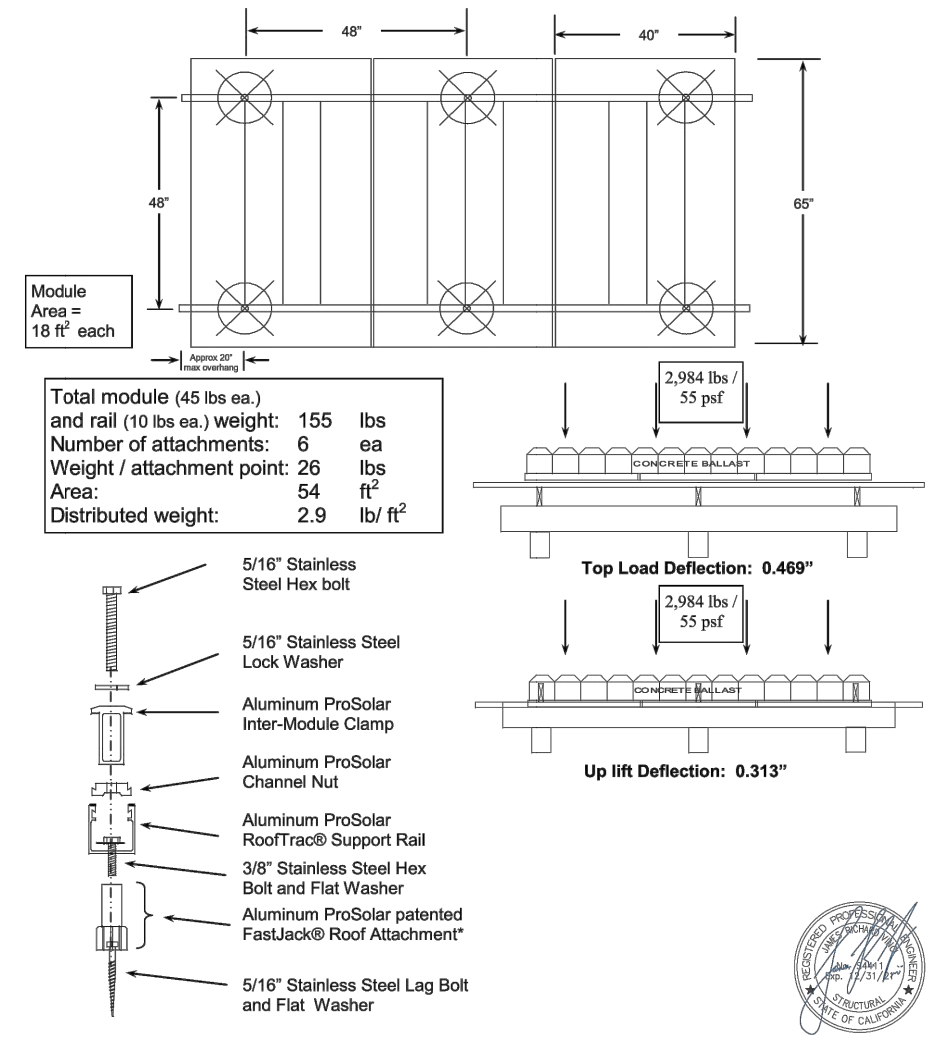
\*\*\*\* Est. snow load rating of 30 lb/ft<sup>2</sup> based on 1.5 safety factor. (20 lb/ft<sup>2</sup> for 77" x 40" module)



\*Lab tested structural attachments manufactured by Professional Solar Products (including FastJack®, TileTrac®, and FoamJack®) can be interchanged with this system.  
\*\*Check span suitability with AHJ as necessary

Professional Solar Products RoofTrac® Patent# 6,360,491  
Photovoltaic mounting system

**RoofTrac®  
Solar Modules  
Static load test**



\*Lab tested structural attachments manufactured by Professional Solar Products (including FastJack®, TileTrac®, and FoamJack®) can be interchanged with this system.

Professional Solar Products RoofTrac® Patent# 6,360,491  
Photovoltaic mounting system

**RoofTrac®  
Solar Modules  
Static load test**

CLIENT:

GLENDALE, CA 91206

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE:

12/03/2021

DESIGN BY:

TMG

JOB NO.:

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TITLE:

DATA SHEET

SHEET:

PV-9



CLIENT: Professional Solar Products  
1551 S. Rose  
Oxnard, CA 93033  
Attn: Ignacio Coral

Test Report No: RJ0729P-1

Date: August 2, 2010

SUBJECT: Uplift and Side Lateral Load Tests on Two TileTrac® Roof Attachment Assemblies.

SAMPLE ID: The following test material was submitted and identified by the Client:

- 1) One uplift load test assembly consisting of one 3/8-inch diameter by 6-inch long stainless steel threaded rod, one TileTrac® Roof Attachment and one 5/16-inch diameter by 3 1/2-inch long lag bolt and washer fastened into a simulated roof member. A detailed drawing of the test assembly is provided in the appendix of this report.
- 2) One side lateral test assembly consisting of three 3/8-inch diameter by 6-inch long stainless steel threaded rods, three TileTrac® Roof Attachments and three 5/16-inch diameter by 3 1/2-inch long lag bolts and washers fastened into simulated roof members. A detailed drawing of the test assembly is provided in the appendix of this report.

DATE OF RECEIPT: Samples were received on May 15, 2010.

TESTING PERIOD: May 28, 2010.

AUTHORIZATION: Signed QAI Job Ticket dated May 19, 2010.

TEST PROCEDURES: Testing was conducted following client specified test procedures. See page 2 of this report for detailed test procedures.

TEST RESULTS: See page 2 of this report for detailed test results.

Prepared By

*Larry Burmer*  
Larry Burmer  
Project Specialist

Signed for and on behalf of  
QAI Laboratories Inc.

*Andrew Tan*  
Andrew Tan, P.E.  
Manager, Construction Materials

Page 1 of 3

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WWW.QAI.ORG  
info@qai.org

**UPLIFT LOAD TEST**

**Test Procedure:** The test assembly was mounted to the base of an Instron Tension/Compression Machine. A vertical (uplift) load was applied to the 3/8-inch diameter by 6-inch long stainless steel threaded rod attached to the moveable crosshead of the Tension/Compression Machine. The load was applied at a constant rate of 0.2-inch per minute until failure.

**Test Results:** At a test load of 1,100 pounds, the 5/16-inch diameter by 3 1/2-inch long lag bolt pulled out of the 2 x 4 wood stud.

**SIDE LATERAL LOAD TEST**

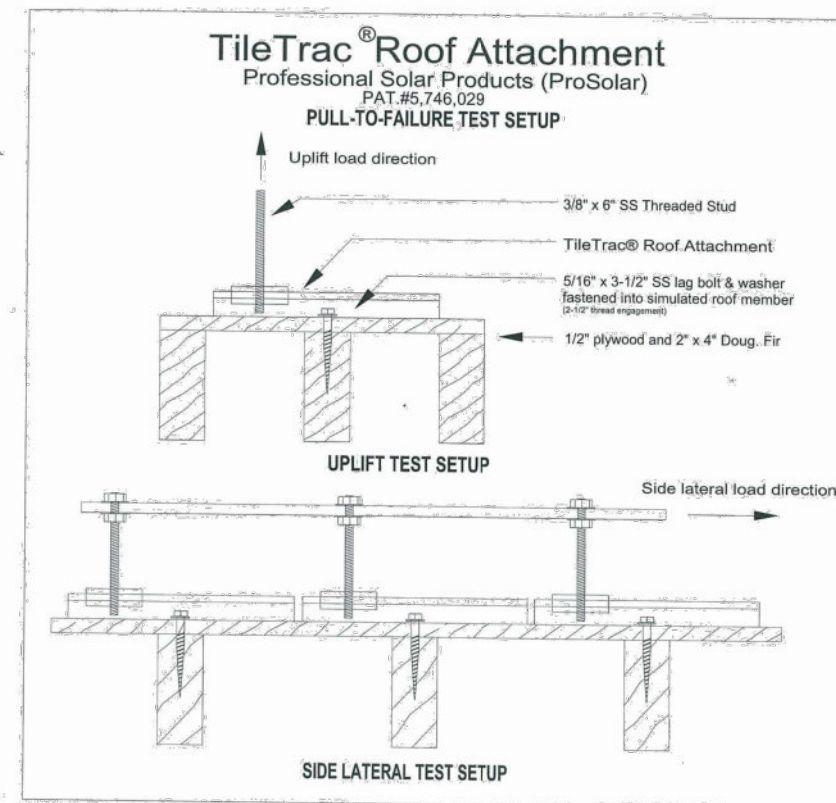
**Test Procedure:** The test assembly was mounted to the base of an Instron Tension/Compression Machine. A horizontal (side lateral) load was applied to the end of a 2-inch wide by 1/2-inch thick steel bar which was attached to the top of the three 3/8-inch diameter by 6-inch long stainless steel threaded rods. The load was applied at a constant rate of 0.2-inch per minute until failure.

**Test Results:** At a test load of 4,500 pounds, the aluminum brackets holding the 3/8-inch diameter by 6-inch long stainless steel threaded rods in place on the TileTrac® Roof Attachments began to slip and dig into the aluminum channels.

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**APPENDIX**



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CLIENT:

GLENDALE, CA 91206

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE:

12/03/2021

DESIGN BY:

TMG

JOB NO.:

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TITLE:

DATA SHEET

SHEET:

PV-10

**VINCI & ASSOCIATES**

Structural Engineers

CLIENT:  
Professional Solar Products, Inc.  
1551 S. Rose Ave., Oxnard, CA 93033  
Tel: 805-486-4700

**Subject: Static load test results for the ProSolar® sloped roof mount:**

Mounting System	Min Rail Height	Max rail span	Test Load	Wind exposure (ASCE 7-16)	Roof zone**	ASCE 7-16 Wind Speed rating**
RoofTrac®	2"	72"	30 lb/ft²	A, B, C	All roof zones	120 mph

**TEST SETUP** (as shown in attached drawing detail): Modules\* were bolted to 2" tall Professional Solar Products (PSP) UL2703 RoofTrac® support rails using an assembly of 5/16" Stainless Steel (SS) bolts, SS lock washers and proprietary PSP aluminum clamps and RoofTrac® channel nuts. The RoofTrac® support rail was attached to the PSP RoofTrac® structural attachment device with 3/8" SS hardware at four attachment points. The setup was attached to 2"x6" wooden rafters using 5/16" x 3-1/2" lag bolts. The attachment spans consisted of 48" front to rear with structural attachments spaced 72" on center.

**TEST PROCEDURE** (as shown in attached drawing detail): The test set up was top loaded to above specified load per UL2703 loading guidelines (Intertek report reference: 104601549LAX). The setup remained under load for an approximate period of 30 minutes per UL2703. Any signs of permanent deformation were recorded. The test setup was then inverted and loaded to simulate the wind uplift condition. The test set up was re-loaded to above specified load. The setup remained under load for an approximate period of 30 minutes. Any signs of permanent deformation were noted.

**TEST RESULTS:**

The maximum top load resulted in no permanent deformation.  
The maximum uplift load resulted in no permanent deformation.

This document certifies the RoofTrac® mounting system withstands the stated static pressure load, equivalent to the stated wind speeds\*\*. The mounting system performed as expected.

Sincerely,

James R. Vinci, S.E.

This engineering report verifies that Vinci & Associates accepts and verifies the findings outlined in the Testing Report 100779407LAX-003, dated May 19, 2021. The results of this load test reflect actual deflection values and are generally accepted as the industry standard for testing module mounting systems. Vinci & Associates does not field check installations or verify that the mounting system is installed as described in this engineering report.

**Structural attachment:** Lag bolt attachment should be installed using the proper pilot hole for optimum strength. A 5/16" lag bolt requires a 3/16" pilot hole. It is the responsibility of the installer to ensure a proper attachment is made to the structural member of the roof. Failure to securely attach to the roof structure may result in damage to equipment, personal injury or property damage. The proposed racking system may be installed on any roof up to a maximum of 24 feet above grade without further analysis. Racking shall be installed into a roof member or blocking with a 5/16" diameter screw at each Fast-jack location. Screws shall have minimum of 2 1/4" penetration into framing member for zone 1&2(n/e/r), and a minimum of 3" penetration into framing member for zone 3(e/r). (Zone 3 is defined as the approximately 4'-0" square at each corner of the roof)

This office/report does not express an opinion as to the load bearing characteristics of the structure the mounting system/modules are being installed on.

ICC accredited laboratory tested structural attachments manufactured by Professional Solar Products (including, but not limited to FastJack®, TileTrac®, and FoamJack®) can be interchanged with this system. Any rail splice used shall be manufactured by PSP. As tested, 2.0 splice located anywhere along rail except cantilever. Limit spliced rail run to approx. 45 ft. for expansion/contraction

Check with local building department or AHJ for site specific requirements.

\*Modules tested to UL1703, or equivalent, up to 23 ft² are included in this engineering.

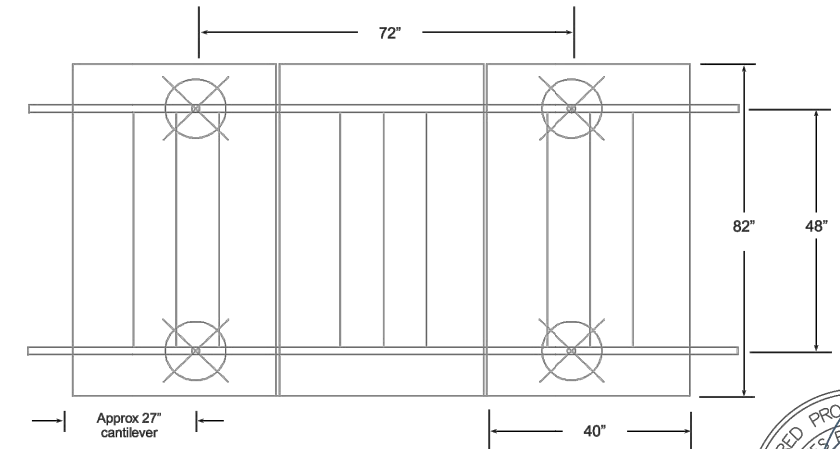
\*\*Wind loading values relative to defined load values using wind load exposure and gust factor coefficient "exposure C" as defined in the 2018(IBC) / 2019(CBC) / ASCE 7-16. Est. snow load rating of 15 lb/ft² based on 2.0 safety factor.



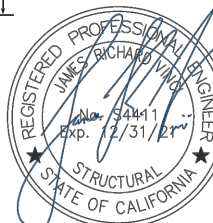
175 E. Wilbur Rd, Suite 103

Thousand Oaks, CA 91360

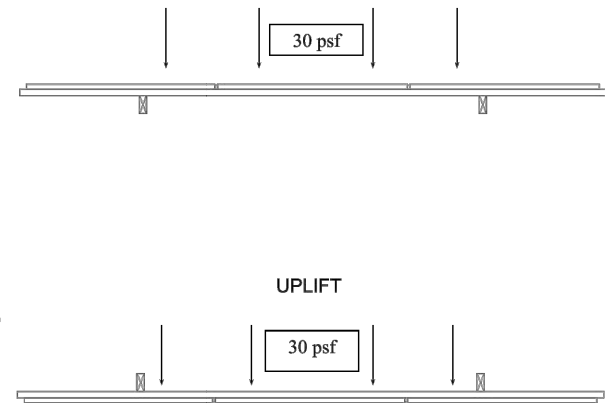
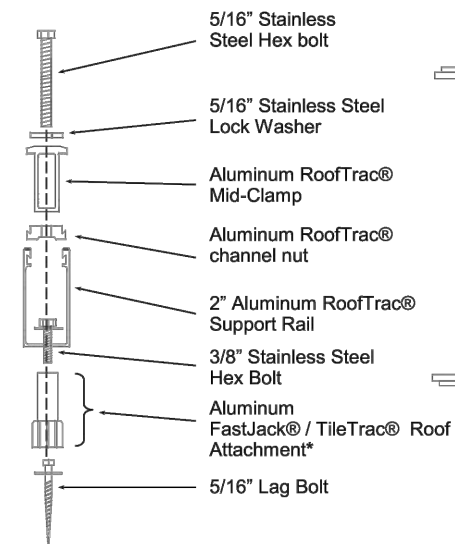
RT 2.0 Page 1 of 2



Total module (45 lbs ea.)	
and rail (12 lbs ea.) weight:	159 lbs
Number of attachments:	4 ea
Weight / attachment point:	40 lbs
Area: (3 modules)	69 ft²
Distributed weight:	2.3 lb/ ft²



DOWNLOAD



Professional Solar Products RoofTrac®  
Photovoltaic mounting system

**RoofTrac®**  
Solar Modules  
Static load test illustration

RT 2.0 Page 2 of 2

CLIENT:

GLENDAL, CA 91206

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE:

12/03/2021

DESIGN BY:

TMG

JOB NO.:

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TITLE:

DATA SHEET

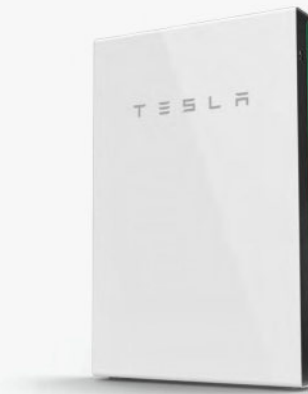
SHEET:

PV-11

## 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, time-based control, 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	14 kWh
Usable Energy	13.5 kWh
Real Power, max continuous	5 kW (charge and discharge)
Real Power, peak (10 s, off-grid/backup)	7 kW (charge and discharge)
Apparent Power, max continuous	5.8 kVA (charge and discharge)
Apparent Power, peak (10 s, off-grid/backup)	7.2 kVA (charge and discharge)
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>3</sup>	90%
Warranty	10 years

<sup>1</sup>Values provided for 25°C (77°F), 3.3 kW charge/discharge power.  
<sup>2</sup>In Backup mode, grid charge power is limited to 3.3 kW.  
<sup>3</sup>AC to battery to AC, at beginning of life.

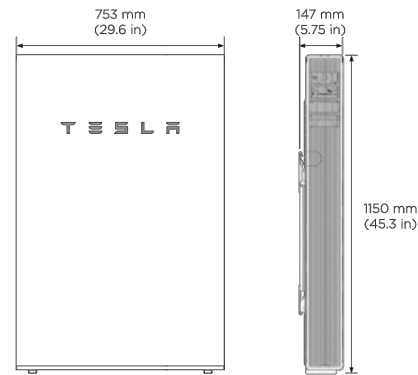
### COMPLIANCE INFORMATION

Certifications	UL 1642, UL 1741, UL 1973, UL 9540, IEEE 1547, 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 <sup>1</sup>	1150 mm x 755 mm x 147 mm (45.3 in x 29.6 in x 5.75 in)
Weight <sup>1</sup>	114 kg (251.3 lbs)
Mounting options	Floor or wall mount

<sup>1</sup>Dimensions and weight differ slightly if manufactured before March 2019. Contact Tesla for additional information.



### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Recommended Temperature	0°C to 30°C (32°F to 86°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)

TESLA

TESLA.COM/ENERGY

## POWERWALL

### Backup Gateway 2

The Backup Gateway 2 for Tesla Powerwall provides energy management and monitoring for solar self-consumption, time-based control, and backup.

The Backup Gateway 2 controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a main circuit breaker, the Backup Gateway 2 can be installed at the service entrance. When the optional internal panelboard is installed, the Backup Gateway 2 can also function as a load center.

The Backup Gateway 2 communicates directly with Powerwall, allowing you to monitor energy use and manage backup energy reserves from any mobile device with the Tesla app.



### PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	120/240V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Current Rating	200 A
Maximum Input Short Circuit Current	10 kA <sup>1</sup>
Overcurrent Protection Device	100-200A; Service Entrance Rated <sup>1</sup>
Overvoltage Category	Category IV
AC Meter	Revenue accurate (+/- 0.2 %)
Primary Connectivity	Ethernet, Wi-Fi
Secondary Connectivity	Cellular (3G, LTE/4G) <sup>2</sup>
User Interface	Tesla App
Operating Modes	Support for solar self-consumption, time-based control, and backup
Backup Transition	Automatic disconnect for seamless backup
Modularity	Supports up to 10 AC-coupled Powerwalls
Optional Internal Panelboard	200A 6-space / 12 circuit Eaton BR Circuit Breakers
Warranty	10 years

<sup>1</sup>When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.  
<sup>2</sup>The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

### COMPLIANCE INFORMATION

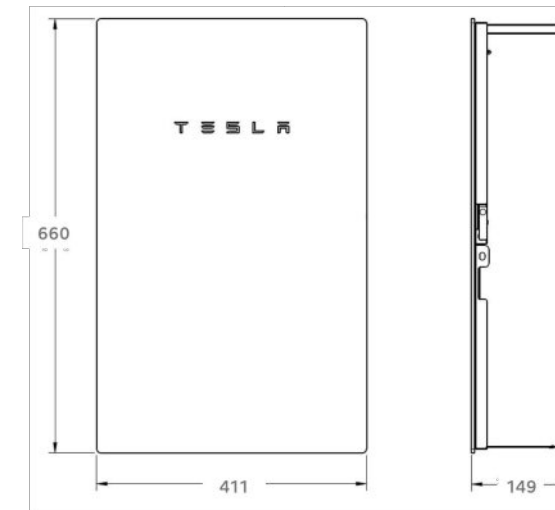
Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS CSA 22.2 0.19, CSA 22.2 205
Emissions	FCC Part 15, ICES 003

TESLA

NA 2020-05-23

### MECHANICAL SPECIFICATIONS

Dimensions	660 mm x 411 mm x 149 mm (26 in x 16 in x 6 in)
Weight	20.4 kg (45 lb)
Mounting options	Wall mount, Semi-flush 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

TESLA

TESLA.COM/ENERGY

CLIENT:

GLENDALE, CA 91206

REVISIONS:

DESCRIPTION	DATE	REVISION

DATE:

12/03/2021

DESIGN BY:

TMG

JOB NO.:

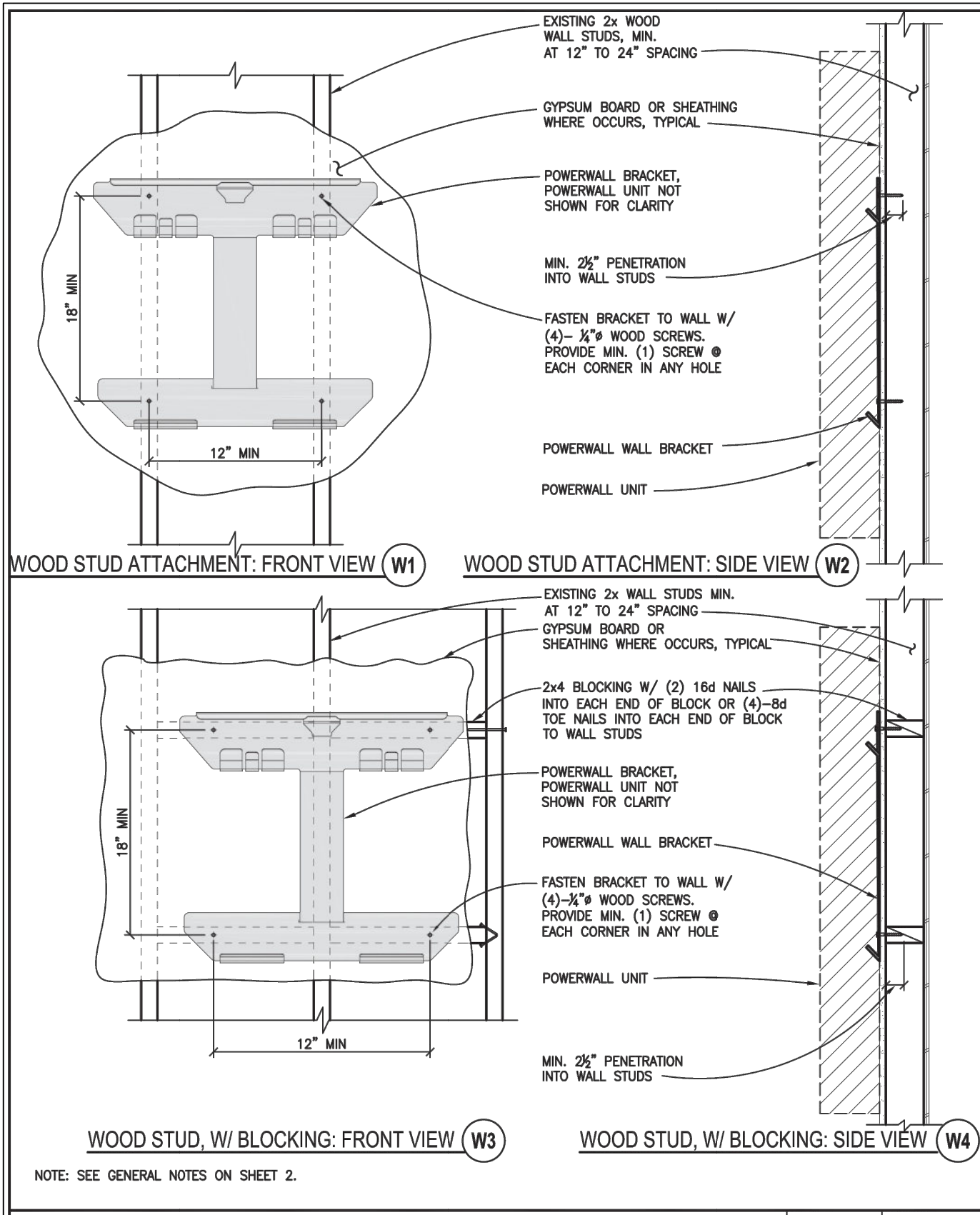
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DATA SHEET

SHEET:

PV-12



NOTE: SEE GENERAL NOTES ON SHEET 2.

## Rotary Actuator Switch - Lockable Off in Plastic Enclosure

- Rotary Actuator Switch
- Lockable Off - Safe-Lock
- Self-Extinguishing Plastic Enclosure
- M25 Cable Gland Entry Option
- NEMA Type 3R
- IP66



DC21A IEC60947-3				UL Ratings UL508I				Poles in series	No. of Strings	Weight Kg./pcs.	Part Number	Contact Configuration
600V	800V	1000V	1500V	350V	500V	600V	1000V					
16A	16A	9A	3A	16A	16A	16A	-	2	1	0.43	SI16 PEL64R 2	
25A	20A	11A	4A	20A	20A	20A	-	2	1	0.43	SI25 PEL64R 2	
32A	23A	13A	5A	25A	25A	25A	-	2	1	0.43	SI32 PEL64R 2	
40A	30A	20A	6A	40A	40A	40A	16A	2	1	1.59	SI40 PEL64R 2	
55A	45A	36A*	8A	55A	55A	55A	20A	2	1	1.59	SI55 PEL64R 2	
29A	16A	9A	3A	29A	29A	21A	-	2	1	0.49	SI16 PEL64R 2H	
45A	20A	11A	4A	45A	38A	23A	-	2	1	0.49	SI25 PEL64R 2H	
50A	23A	13A	5A	58A	40A	25A	-	2	1	0.49	SI32 PEL64R 2H	
64A	30A	20A	6A	72A	53A	42A	22A	2	1	1.74	SI40 PEL64R 2H	
80A	45A	25A	8A	85A	66A	55A	25A	2	1	1.74	SI55 PEL64R 2H	
16A	16A	9A	3A	16A	16A	16A	-	2	2	0.46	SI16 PEL64R 4	
25A	20A	11A	4A	20A	20A	20A	-	2	2	0.46	SI25 PEL64R 4	
32A	23A	13A	5A	25A	25A	25A	-	2	2	0.46	SI32 PEL64R 4	
40A	30A	20A	6A	40A	40A	40A	16A	2	2	1.67	SI40 PEL64R 4	
55A	45A	36A*	8A	55A	55A	55A	20A	2	2	1.67	SI55 PEL64R 4	
16A	16A	16A	16A	16A	16A	16A	-	4	1	0.47	SI16 PEL64R 4S	
25A	25A	25A	20A	25A	25A	25A	-	4	1	0.47	SI25 PEL64R 4S	
32A	32A	32A	23A	32A	32A	32A	-	4	1	0.47	SI32 PEL64R 4S	
40A	40A	40A	30A	40A	40A	40A	40A	4	1	1.70	SI40 PEL64R 4S	
55A	55A	55A	40A	55A	55A	55A	55A	4	1	1.70	SI55 PEL64R 4S	
16A	16A	9A	3A	16A	16A	16A	-	2	3	1.53	SI16 PEL64R 6	
25A	20A	11A	4A	20A	20A	20A	-	2	3	1.53	SI25 PEL64R 6	
32A	23A	13A	5A	25A	25A	25A	-	2	3	1.53	SI32 PEL64R 6	
16A	16A	9A	3A	16A	16A	16A	-	2	4	1.58	SI16 PEL64R 8	
25A	20A	11A	4A	20A	20A	20A	-	2	4	1.58	SI25 PEL64R 8	
32A	23A	13A	5A	25A	25A	25A	-	2	4	1.58	SI32 PEL64R 8	
29A	29A	29A	16A	29A	29A	29A	-	4	1	1.63	SI16 PEL64R 4H	
45A	45A	45A*	20A	45A	45A	45A	-	4	1	1.63	SI25 PEL64R 4H	
58A	58A*	58A*	23A	58A	58A	50A	-	4	1	1.63	SI32 PEL64R 4H	

4T / 4B configuration also available. For ratings refer to 4S configuration. (See page 17)  
\* DC21B

CLIENT:

GLENDALE, CA 91206

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DESCRIPTION	DATE	REVISION

DATE:

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DATA SHEET

SHEET:

PV-13