

APPLICABLE CODES & STANDARDS

2022 CALIFORNIA BUILDING CODE  
2022 CALIFORNIA RESIDENTIAL CODE  
2022 CALIFORNIA ELECTRICAL CODE  
2022 CALIFORNIA FIRE CODE  
2022 CALIFORNIA MECHANICAL CODE  
2022 CALIFORNIA GREEN CODE  
2022 CALIFORNIA PLUMBING CODE  
2022 CALIFORNIA ENERGY CODE  
ANY YORBA LINDA CITY MUNICIPAL CODES & AMENDMENTS

GENERAL NOTES

- A. THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE CALIFORNIA ELECTRIC CODE (CEC) ARTICLE 690, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
- B. ALL EQUIPMENT SHALL BE LISTED AND LABELED BY A NATIONALLY RECOGNIZED ELECTRICAL TESTING LABORATORY AND SHALL BE INSTALLED PER ITS LISTING REQUIREMENTS AND MANUFACTURER'S INSTRUCTIONS.
- C. THE PV SYSTEM WILL BE INTERCONNECTED AND OPERATED IN PARALLEL WITH THE UTILITY ELECTRICAL GRID PER THE REQUIREMENTS OF THE UTILITY AND APPLICABLE CODES.
- D. CONTRACTORS SHALL BE PRESENT DURING ALL INSPECTIONS.
- E. A LADDER SHALL BE PROVIDED AND SECURED TO THE STRUCTURE AT THE APPROVED ROOF ACCESS POINT WITH A CAL OSHA APPROVED DEVICE DURING ALL INSPECTIONS.
- F. THE ROOF ACCESS POINT REQUIRING A LADDER SHALL NOT BE LOCATED OVER A WINDOW, DOOR OR LOCATED WHERE IT CONFLICTS WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS [CRC 324.7.1].
- G. THE PV SYSTEM IS DESIGNED IN COMPLIANCE WITH CEC 690.12 (RAPID SHUTDOWN); IDENTIFICATION OF POWER SOURCE RAPID SHUTDOWN AND LABELING SHALL BE IN ACCORDANCE WITH CEC 690.56(C).
- H. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED [CEC 110.26].
- I. POWER PRODUCTION SYSTEMS, AND ALL ASSOCIATED WIRING AND INTERCONNECTIONS OPERATING IN PARALLEL WITH A PRIMARY POWER SOURCE SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [CEC 690.4(C), 705.8].

SMOKE AND CARBON MONOXIDE

- A. SMOKE ALARMS AND CARBON MONOXIDE ALARMS ARE REQUIRED TO BE RETROFITTED ONTO THE EXISTING DWELLING AS PER THE 2022 CRC. THESE SMOKE ALARMS ARE REQUIRED TO BE IN ALL BEDROOMS, OUTSIDE EACH BEDROOM, AND AT LEAST ONE ON EACH FLOOR OF THE HOUSE. CARBON MONOXIDE ALARMS ARE REQUIRED TO BE RETROFITTED OUTSIDE EACH BEDROOM AND AT LEAST ONE ON EACH FLOOR OF THE HOUSE. (CRC 314.315)
- B. SMOKE ALARMS AND CARBON MONOXIDE ALARMS ARE REQUIRED PER CRC SECTIONS 314 AND 315 TO BE VERIFIED AND INSPECTED BY THE INSPECTOR IN THE FIELD.

NOTES TO INSTALLER

- A. NOTIFY SERVING UTILITY PRIOR TO ACTIVATION OF PV SYSTEM; APPROVAL FROM BOTH THE LOCAL JURISDICTION AND THE UTILITY IS REQUIRED PRIOR TO INTERCONNECTION.
- B. DIG ALERT (811) IS TO BE CONTACTED AND COMPLIANCE WITH EXCAVATION SAFETY IN ACCORDANCE WITH GOVERNMENT CODE 4216 WILL BE FOLLOWED PRIOR TO ANY EXCAVATION TAKING PLACE.
- C. APPLICATIONS FOR WHICH NO PERMIT IS ISSUED WITHIN 180 DAYS FOLLOWING THE DATE OF APPLICATION SHALL AUTOMATICALLY EXPIRE. (95.7 YLMC)
- D. EVERY PERMIT ISSUED SHALL BECOME INVALID UNLESS WORK AUTHORIZED IS COMMENCED WITHIN 180 DAYS, A SUCCESSFUL INSPECTION IS NOT OBTAINED WITHIN 180 DAYS, OR IF WORK IS SUSPENDED OR ABANDONED FOR A PERIOD OF 180 DAYS. PERMITS WHICH AHVE BECAME INVALID SHALL PAY A RENEWAL FEE OF 50% OF THE ORIGINAL PERMIT FEE AMOUNT WHEN THE PERMIT HAS BEEN EXPIRED FOR UP TO ONE (1) YEAR. WHEN A PERMIT HAS BEEN EXPIRED FOR A PERIOD IN EXCESS OF ONE (1) YEAR, THE RENEWAL FEE SHALL BE 100% OF THE ORIGINAL PERMIT FEE. (95.7 YLMC)
- E. THE CONTRACTOR SHALL PROVIDE A WRITTEN LETTER TO THE BUILDING INSPECTOR STATING THAT ALL STRUCTURAL CONNECTIONS AND SOLAR PANEL ARRAYS HAVE BEEN INSTALLED PER THE APPROVED PLANS.

(N) PV SYSTEM FOR THONEY RESIDENCE | 5525 BLUE RIDGE DR, YORBA LINDA, CA 92887  
SYSTEM SIZE: 25.760 kW DC (STC-DC) | 24.327 kW (CEC-AC) | 22.800 kW AC (INVERTER)

AERIAL IMAGE



SCOPE OF WORK:

INSTALLATION OF NEW PV SYSTEM: 25.760 kW DC (STC-DC) | 24.327 kW (CEC-AC) | 22.800 kW AC (INVERTER)  
INSTALLATION OF NEW BATTERY BACKUP: (3) POWERWALL 3 W/ (2) POWERWALL 3 EXPANSION UNITS (13.5 KWH EACH)

SYSTEM COMPONENTS

MODULE: (56) REC SOLAR REC460AA PURE-RX  
OPTIMIZER/RSD: SOLAREEDGE S500  
INVERTER/BATTERY: (2) SOLAREEDGE SE11400H-US  
MOUNT: IRONRIDGE GROUND MOUNT  
RAILING: IRONRIDGE XR 1000  
MSP UPGRADE: NO

PROJECT INFORMATION

AUTHORITIES HAVING JURISDICTION  
AHJ: YORBA LINDA CITY  
UTILITY: SCE

DESIGN SPECIFICATIONS

OCCUPANCY: R-3/U  
CONSTRUCTION: V-B  
ZONING: RESIDENTIAL  
SNOW LOAD: 0  
WIND EXPOSURE: C  
WIND SPEED: 95 MPH  
ROOF SURFACE: N/A  
PV COVERAGE: 1255.08  
OF STORIES: TWO  
FIRE SPRINKLERS: NO

BATTERY BACKUP DETAILS

(3) POWERWALL 3 (AC COUPLED)  
(2) POWERWALL 3 EXPANSION UNIT (DC COUPLED)

ESS UNIT CAPACITY (KWH/UNIT): 13.5 KWH / UNIT  
TOTAL ENERGY CAPACITY IN KWH: 67.50 KWH  
LOCATION OF ALL ESS UNITS: OUTDOOR WALLS  
BATTERY BACKUP TYPE: PARTIAL HOUSE

ADDITIONAL NOTES

NO SEPTIC ON SITE

ALL WORK SHALL COMPLY WITH APPLICABLE, LOCAL, MUNICIPAL CODES, AND TO MANUFACTURERS' LISTINGS AND INSTALLATION INSTRUCTIONS.

SHEET LIST TABLE

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REVISIONS SEE RESPONSE LETTER FOR DETAILS

	05.07.25	UPDATED EQUIPMENT DETAIL
	06.27.25	AHJ CORRECTIONS
	08.12.25	AHJ CORRECTIONS

ENGINEER OF RECORD



INFINITY SOLAR  
TLP ELECTRIC INTEGRATIONS, INC.  
749 N MAIN ST.  
ORANGE, CA 92868  
PHONE: (714) 880-8089  
LIC NO.: C10 - 824287  
TIM POLUJANCEWICZ

NEW PV SYSTEM  
25.760 kW DC (STC-DC) | 24.327 kW (CEC-AC)  
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DESIGNED BY SOLAR DEPLOYED, LLC.  
931 10TH ST #114, MODESTO, CA 95354  
209-671-2001 | HELLO@SOLARDEPLOYED.COM

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DRAWN BY:	AJV	CHECKED BY:	AB
PAPER:	11X17 (ANSI B)	DATE:	8/12/2025

SHEET NAME: COVER SHEET	SHEET NO.: PV.01A
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BATTERY INSTALLATION REQUIREMENTS

[R328.2] EQUIPMENT LISTINGS. ENERGY STORAGE SYSTEMS (ESS) SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 9540.

[R328.3] INSTALLATION. ESS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND THEIR LISTING.

[R328.3.1] SPACING. INDIVIDUAL UNITS SHALL BE SEPARATED FROM EACH OTHER BY NOT LESS THAN 3 FEET (914 MM) EXCEPT WHERE SMALLER SEPARATION DISTANCES ARE DOCUMENTED TO BE ADEQUATE BASED ON LARGE-SCALE FIRE TESTING COMPLYING WITH SECTION 1207.1.5 OF THE CALIFORNIA FIRE CODE.

[R328.4] LOCATIONS. ESS SHALL BE INSTALLED ONLY IN THE FOLLOWING LOCATIONS:

- 1. DETACHED GARAGES AND DETACHED ACCESSORY STRUCTURES.
- 2. ATTACHED GARAGES SEPARATED FROM THE DWELLING UNIT LIVING SPACE IN ACCORDANCE WITH SECTION R302.6.
- 3. OUTDOORS OR ON THE EXTERIOR SIDE OF EXTERIOR WALLS LOCATED NOT LESS THAN 3 FEET (914 MM) FROM DOORS AND WINDOWS DIRECTLY ENTERING THE DWELLING UNIT.
- 4. ENCLOSED UTILITY CLOSETS, BASEMENTS, STORAGE OR UTILITY SPACES WITHIN DWELLING UNITS WITH FINISHED OR NONCOMBUSTIBLE WALLS AND CEILINGS. WALLS AND CEILINGS OF UNFINISHED WOOD-FRAMED CONSTRUCTION SHALL BE PROVIDED WITH NOT LESS THAN 5/8-INCH (15.9 MM) TYPE X GYPSUM WALLBOARD.

ESS SHALL NOT BE INSTALLED IN SLEEPING ROOMS, OR CLOSETS OR SPACES OPENING DIRECTLY INTO SLEEPING ROOMS OR IN HABITABLE SPACES OF DWELLING UNITS.

R328.6 ELECTRICAL INSTALLATION. ESS SHALL BE INSTALLED IN ACCORDANCE WITH THE CEC AND LOCAL ELECTRICAL CODE REQUIREMENTS. INVERTERS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 1741 OR PROVIDED AS PART OF THE UL 9540 LISTING. SYSTEMS CONNECTED TO THE UTILITY GRID SHALL USE INVERTERS LISTED FOR UTILITY INTERACTION.

R328.7 FIRE DETECTION. ROOMS AND AREAS WITHIN DWELLING UNITS, BASEMENTS AND ATTACHED GARAGES IN WHICH ESS ARE INSTALLED SHALL BE PROTECTED BY SMOKE ALARMS IN ACCORDANCE WITH SECTION R314. A HEAT DETECTOR, LISTED AND INTERCONNECTED TO THE SMOKE ALARMS, SHALL BE INSTALLED IN LOCATIONS WITHIN DWELLING UNITS AND ATTACHED GARAGES WHERE SMOKE ALARMS CANNOT BE INSTALLED BASED ON THEIR LISTING.

[SFM] ESS INSTALLED IN GROUP R-3 AND TOWNHOMES SHALL COMPLY WITH THE FOLLOWING:

- 1. ROOMS AND AREAS WITHIN DWELLINGS UNITS, SLEEPING UNITS, BASEMENTS AND ATTACHED GARAGES IN WHICH ESS ARE INSTALLED SHALL BE PROTECTED BY SMOKE ALARMS IN ACCORDANCE WITH SECTION R314.
- 2. A LISTED HEAT ALARM INTERCONNECTED TO THE SMOKE ALARMS SHALL BE INSTALLED IN LOCATIONS WITHIN DWELLING UNITS, SLEEPING UNITS AND ATTACHED GARAGES WHERE SMOKE ALARMS CANNOT BE INSTALLED BASED ON THEIR LISTING.

R328.8 PROTECTION FROM IMPACT. ESS INSTALLED IN A LOCATION SUBJECT TO VEHICLE DAMAGE IN ACCORDANCE WITH SECTION R328.8.1 OR R328.8.2 SHALL BE PROVIDED WITH IMPACT PROTECTION IN ACCORDANCE WITH SECTION R328.8.3.

R328.8.1 GARAGES. WHERE AN ESS IS INSTALLED IN THE NORMAL DRIVING PATH OF VEHICLE TRAVEL WITHIN A GARAGE, IMPACT PROTECTION COMPLYING WITH SECTION 1207.11.7.3 SHALL BE PROVIDED. THE NORMAL DRIVING PATH IS A SPACE BETWEEN THE GARAGE VEHICLE OPENING AND THE INTERIOR FACE OF THE BACK WALL TO A HEIGHT OF 48 INCHES (1219 MM) ABOVE THE FINISHED FLOOR. THE WIDTH OF THE NORMAL DRIVING PATH SHALL BE EQUAL TO THE WIDTH OF THE GARAGE DOOR OPENING. IMPACT PROTECTION SHALL ALSO BE PROVIDED FOR ESS INSTALLED AT EITHER OF THE FOLLOWING LOCATIONS (SEE FIGURE R328.8.1):

- 1. ON THE INTERIOR FACE OF THE BACK WALL AND LOCATED WITHIN 36 INCHES (914 MM) TO THE LEFT OR TO THE RIGHT OF THE NORMAL DRIVING PATH.
- 2. ON THE INTERIOR FACE OF A SIDE WALL AND LOCATED WITHIN 24 INCHES (609 MM) FROM THE BACK WALL AND 36 INCHES (914 MM) OF THE NORMAL DRIVING PATH.

EXCEPTION: WHERE THE CLEAR HEIGHT OF THE VEHICLE GARAGE OPENING IS 7 FEET 6 INCHES (2286 MM) OR LESS, ESS INSTALLED NOT LESS THAN 36 INCHES (914 MM) ABOVE FINISHED FLOOR ARE NOT SUBJECT TO VEHICLE IMPACT PROTECTION REQUIREMENTS.

R328.8.2 OTHER LOCATIONS SUBJECT TO VEHICLE IMPACT. WHERE AN ESS IS INSTALLED IN A LOCATION OTHER THAN AS DEFINED IN SECTION R328.8.1, AND IS SUBJECT TO VEHICLE DAMAGE, IMPACT PROTECTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION R328.8.3.

R328.8.3 IMPACT PROTECTION OPTIONS. WHERE ESS IS REQUIRED TO BE PROTECTED FROM IMPACT IN ACCORDANCE WITH SECTION R328.8.1 OR R328.8.2, SUCH PROTECTION SHALL COMPLY WITH ONE OF THE FOLLOWING:

- 1. BOLLARDS CONSTRUCTED IN ACCORDANCE WITH ONE OF THE FOLLOWING:
  - 1.1. MINIMUM 48 INCHES (1219 MM) IN LENGTH BY 3 INCHES (76 MM) IN DIAMETER SCHEDULE 80 STEEL PIPE EMBEDDED IN A CONCRETE PIER NOT LESS THAN 12 INCHES (304 MM) DEEP AND 6 INCHES (152 MM) IN DIAMETER, WITH AT LEAST 36 INCHES (914 MM) OF PIPE EXPOSED, FILLED WITH CONCRETE AND SPACED AT A MAXIMUM INTERVAL OF 5 FEET (1524 MM). EACH BOLLARD SHALL BE LOCATED NOT LESS THAN 6 INCHES (152 MM) FROM AN ESS.
  - 1.2. MINIMUM 36 INCHES (914 MM) IN HEIGHT BY 3 INCHES (76 MM) IN DIAMETER SCHEDULE 80 STEEL PIPE FULLY WELDED TO A MINIMUM 8-INCH (203 MM) BY 1/4-INCH (6.4 MM) THICK STEEL PLATE AND BOLTED TO A CONCRETE FLOOR BY MEANS OF 41/2 INCH (13 MM) CONCRETE ANCHORS WITH 3-INCH (76 MM) MINIMUM EMBEDMENT. SPACING SHALL BE NOT GREATER THAN 60 INCHES (1524 MM), AND EACH BOLLARD SHALL BE LOCATED NOT LESS THAN 6 INCHES (152 MM) FROM THE ESS.
  - 1.3. PRE-MANUFACTURED STEEL PIPE BOLLARDS SHALL BE FILLED WITH CONCRETE AND ANCHORED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, WITH SPACING NOT GREATER THAN 60 INCHES (1524 MM), AND EACH BOLLARD SHALL BE LOCATED NOT LESS THAN 6 INCHES (152 MM) FROM THE ESS.
- 2. WHEEL BARRIERS CONSTRUCTED IN ACCORDANCE WITH ONE OF THE FOLLOWING:
  - 2.1. FOUR INCHES (102 MM) IN HEIGHT BY 5 INCHES (127 MM) IN WIDTH BY 70 INCHES (1778 MM) IN LENGTH WHEEL BARRIER MADE OF CONCRETE OR POLYMER, ANCHORED TO THE CONCRETE FLOOR NOT LESS THAN EVERY 36 INCHES (914 MM) AND LOCATED NOT LESS THAN 54 INCHES (1372 MM) FROM THE ESS. MINIMUM 31/2-INCH (89 MM) DIAMETER CONCRETE ANCHORS WITH A 3-INCH (76 MM) EMBEDMENT PER BARRIER SHALL BE USED. SPACING BETWEEN BARRIERS SHALL BE NO GREATER THAN 36 INCHES (914 MM).
  - 2.2. PRE-MANUFACTURED WHEEL BARRIERS SHALL BE ANCHORED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 3. APPROVED METHOD DESIGNED TO RESIST A 2000-LB. (8899 NEWTONS) IMPACT IN THE DIRECTION OF TRAVEL AT 24 INCHES (608 MM) ABOVE GRADE.

ADDITIONAL NOTES

ENGINEER OF RECORD



INFINITY SOLAR  
TLP ELECTRIC INTEGRATIONS, INC.  
749 N MAIN ST.  
ORANGE, CA 92868  
PHONE: (714) 880-8089  
LIC NO.: C10 - 824287  
TIM POLUJANCEWICZ

NEW PV SYSTEM  
25.760 kW DC (STC-DC) | 24.327 kW (CEC-AC)

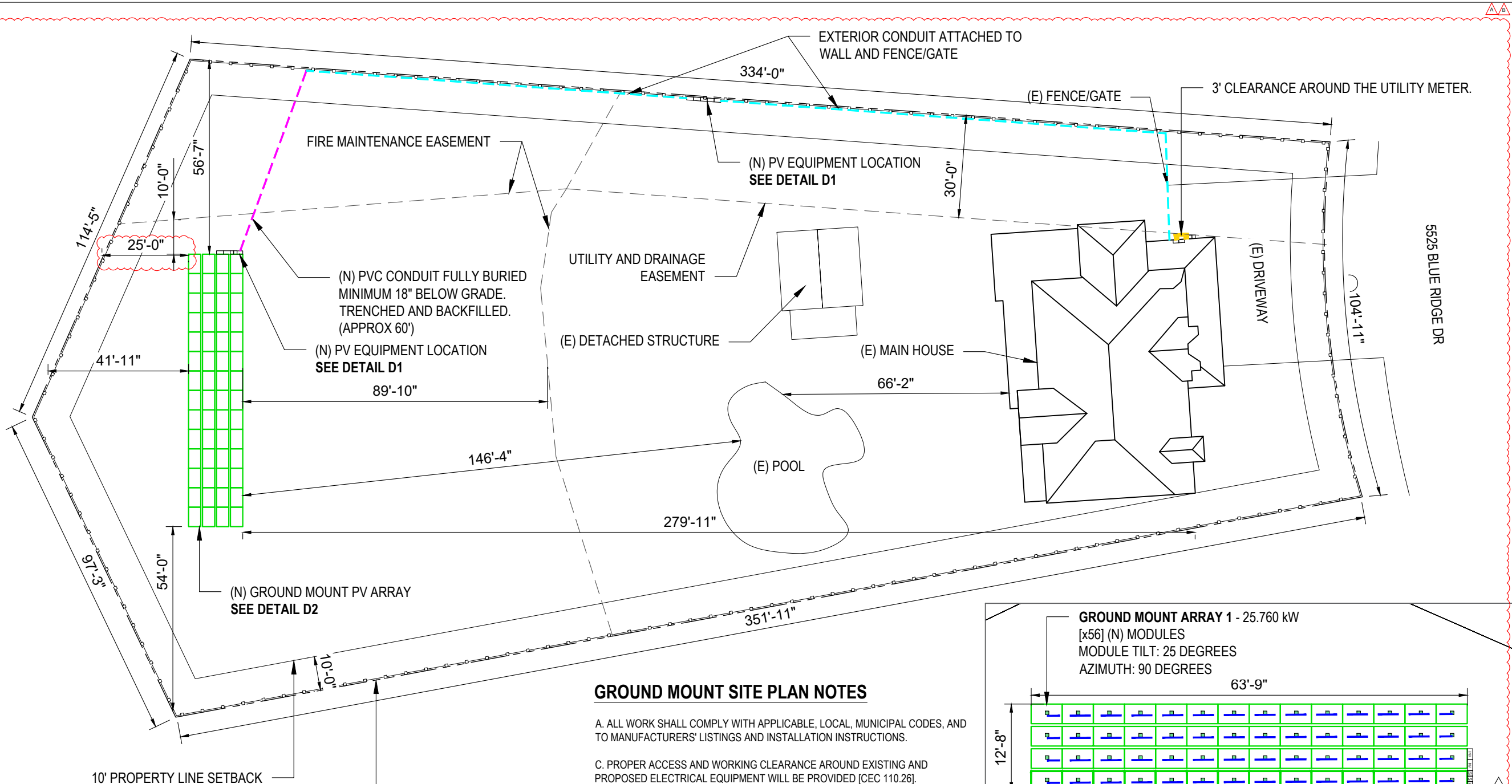
SHANE THONEY  
5525 BLUE RIDGE DR,  
YORBA LINDA, CA 92887  
APN: 32911119

DESIGNED BY SOLAR DEPLOYED, LLC.  
931 10TH ST #114, MODESTO, CA 95354  
209-671-2001 | HELLO@SOLARDEPLOYED.COM

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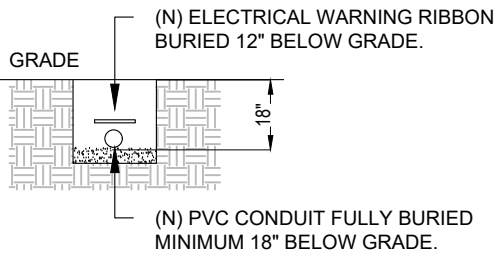
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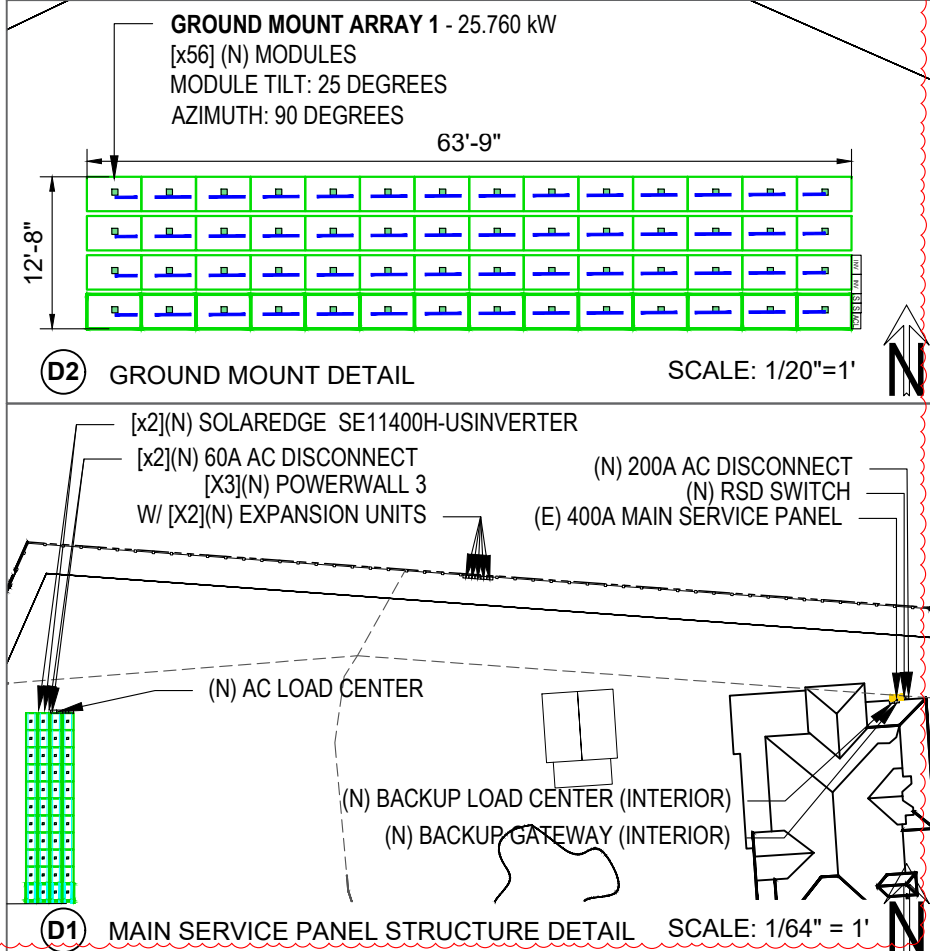


**GROUND MOUNT SITE PLAN NOTES**

- A. ALL WORK SHALL COMPLY WITH APPLICABLE, LOCAL, MUNICIPAL CODES, AND TO MANUFACTURERS' LISTINGS AND INSTALLATION INSTRUCTIONS.
- C. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED [CEC 110.26].
- D. ALL EQUIPMENT SHALL BE LISTED AND ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED.
- E. MESH PROTECTION REQUIRED ON UNDERSIDE OF ARRAY, SECURED WITH CLIPS PER 690.31(A). TWP 1/4" MESH (SMOOTH AND NON-ABRASIVE)
- F. TRENCHING DETAIL (NTS):



- G. EQUIPMENT LISTINGS AND CERTIFICATIONS ARE AS FOLLOWS:
- MODULES ARE LISTED UNDER UL61370-1 & UL61370-2
  - INVERTER IS LISTED UNDER UL1741
  - RACKING IS LISTED UNDER UL2703
  - RACKING SYSTEMS IN COMBINATION WITH TYPE 1 OR 2 MODULES, ARE CLASS A FIRE RATED.



**LEGEND KEY**

	MODULE BRANCHING
	TRENCHING
	EXTERIOR CONDUIT
	PROPERTY SETBACK
	PROPERTY LINE
	COMBO METER/MAIN
	INVERTER
	AC DISCONNECT
	SUB PANEL
	BACKUP LOADCENTER
	IQ COMBINER
	BATTERY BANK
	AGATE
	BATTERY BANK
	OPTIMIZER/RSD/MICROINVERTER

**PV MODULE DETAIL**

	REC SOLAR
	REC460AA PURE-RX
	460 WATTS
	68.03" H X 47.44" L X 1.2" D
	WEIGHT: 51.59 LBS

**ENGINEER OF RECORD**



**INFINITY SOLAR**  
TLP ELECTRIC INTEGRATIONS, INC.  
749 N MAIN ST.  
ORANGE, CA 92868  
PHONE: (714) 880-8089  
LIC NO.: C10 - 824287  
TIM POLUJANCEWICZ

**NEW PV SYSTEM**  
25.760 kW DC (STC-DC) | 24.327 kW (CEC-AC)  
**SHANE THONEY**  
5525 BLUE RIDGE DR,  
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APN: 32911119

DESIGNED BY **SOLAR DEPLOYED, LLC.**  
931 10TH ST #114, MODESTO, CA 95354  
209-671-2001 | HELLO@SOLARDEPLOYED.COM

DESIGN LEAD:	T.M.	SIGNATURE:	
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PAPER:	11X17 (ANSI B)	DATE:	8/12/2025
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# GROUND MOUNT STRUCTURAL NOTES

## MODULE INFORMATION

- 1 PV MODULE: REC SOLAR REC460AA PURE-RX  
2 DIMENSIONS: 68.03 IN. L x 47.44 IN. W x 1.2 IN. D  
3 WEIGHT: 51.59 LBS.  
4 MODULE TILT: 25°

## GROUND MOUNT DETAILS

- 5 FOUNDATION/ANCHOR TYPE: CYLINDER COLUMNS  
IN CONCRETE  
6 TOTAL # OF SCREW: 18  
7 MAX. EAST/WEST PIER SPACING: 8 FT. - 0 IN.  
8 NORTH/SOUTH PIER SPACING: 6 FT. - 0 IN.  
9 MINIMUM FOOTING DEPTH: 42 IN.  
10 COLUMN WIDTH: 12 IN.  
11 FRONT GROUND CLEARANCE: 1 FT. to 4 FT.  
12 REAR GROUND CLEARANCE: 1 FT. to 4 FT.

## RACKING & RAILING

- 14 RACKING SYSTEM: IRONRIDGE GROUND MOUNT  
15 RAILING: IRONRIDGE XR1000  
16 RAILING WEIGHT: 1.022 PLF.  
17 MAX. CANTILEVER: ≤40% OF MAX E-W PIER SPACING

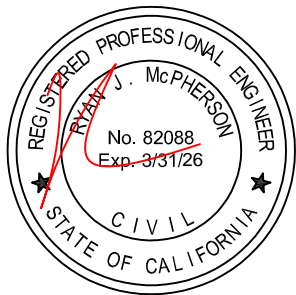
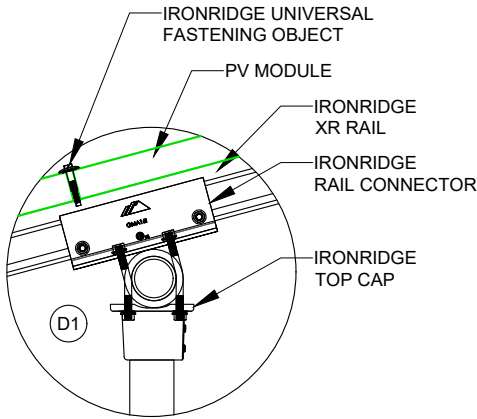
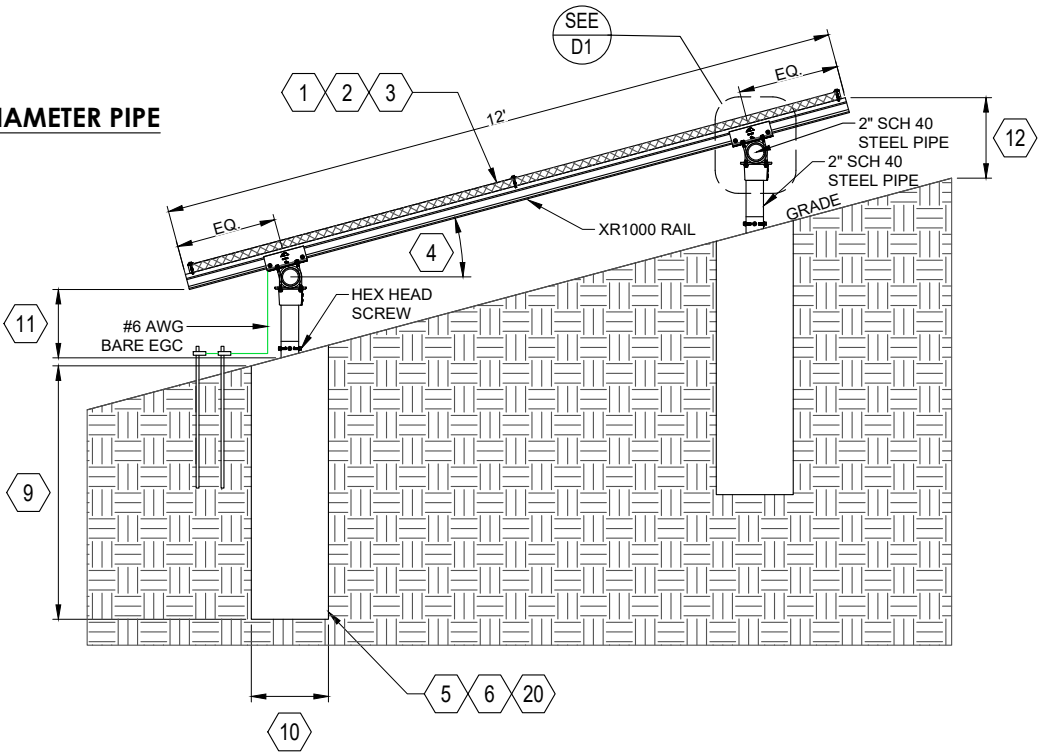
## LOAD CALCULATIONS

- 18 APPROX. INSTALLATION AREA: 1255.08 SQ. FT  
19 TOTAL SYSTEM WEIGHT: 3152.24 LBS.  
20 DISTRIBUTED LOAD: 2.51 PSF.  
21 WEIGHT PER FOUNDATION: 262.69 LBS

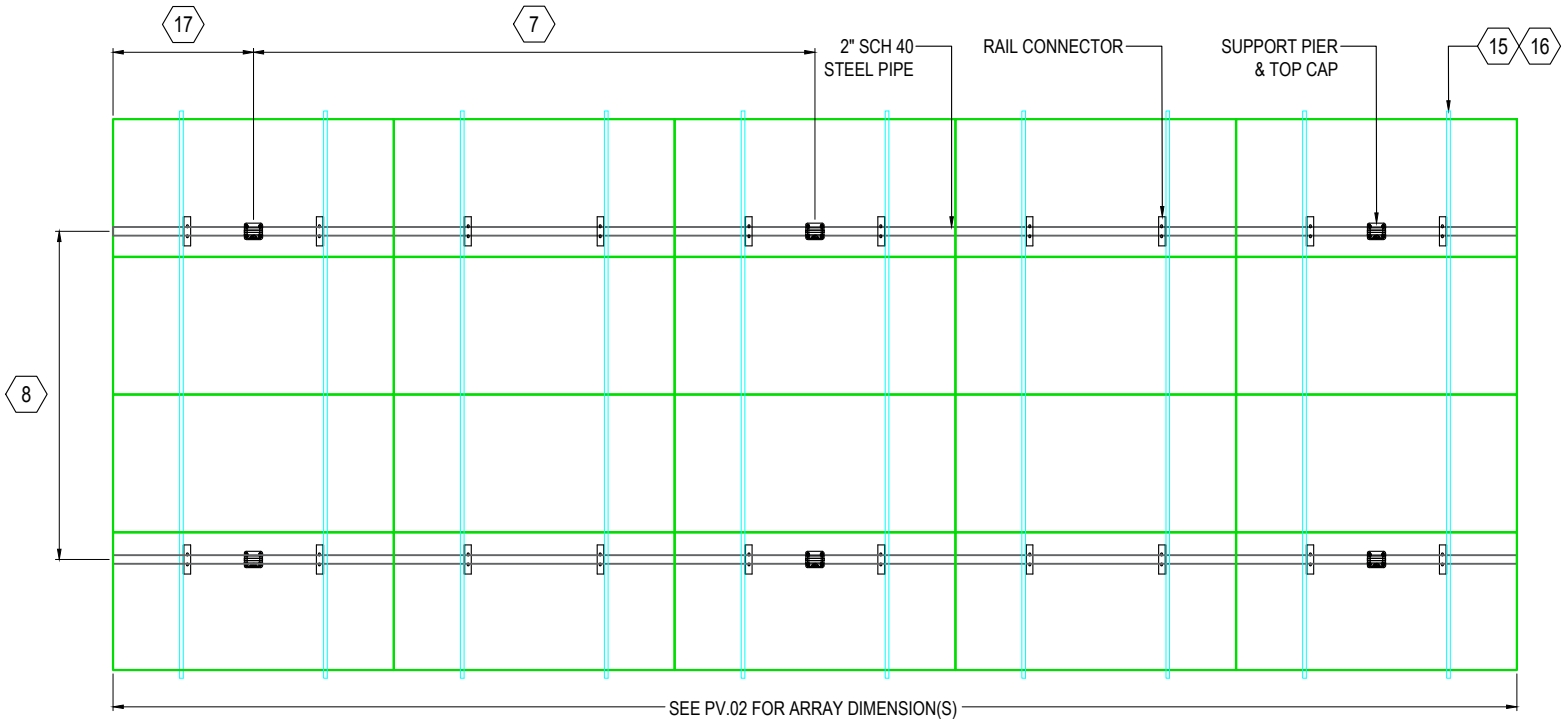
## NOTES

- A. RACKING LOADING CALCULATIONS WERE PERFORMED FOR ASCE 7-10 WIND SPEEDS @ 95 MPH.  
B. 0 PSF SNOW LOAD AND FOR C EXPOSURE CATEGORIES AND ASCE 7-10 SEISMIC DESIGN CATEGORY C.

**NOTE:**  
**2 INCH DIAMETER PIPE**



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## STRUCTURAL NOTES

A. ALL HARDWARE, INCLUDING MOUNTING AND RACKING, TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.

B. ALL PV RELATED RACKING ATTACHMENTS WILL BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER; FINAL ATTACHMENT LOCATIONS MAY BE ADJUSTED IN THE FIELD AS NECESSARY.

C. ROOFTOP PENETRATIONS PERTAINING TO SOLAR RACKING WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALNT PER CODE BY A LICENSED CONTRACTOR.

D. MAXIMUM VERTICAL STANDOFF BETWEEN RAILS & MAXIMUM RAIL CANTILEVER PER MANUFACTURER'S INSTALLATION INSTRUCTIONS

## ENGINEER OF RECORD



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DRAWN BY: AJV CHECKED BY: AB

PAPER: 11X17 (ANSI B) DATE: 8/12/2025

SHEET NAME: **STRUCTURAL PLAN** SHEET NO.: **PV.03**



5525 BLUE RIDGE DR, YORBA LINDA, CA 92887

## PV SYSTEM ELECTRICAL SPECIFICATIONS AND CALCULATIONS

### SYSTEM SUMMARY

SYSTEM SIZE (STC-DC): **25.760 kW**  
SYSTEM SIZE (CEC-AC): **24.327 kW**  
INVERTER RATED POWER (AC): **22.80 kW**

### OVERCURRENT CALCULATION

COMBINED INVERTER OUTPUT: **95.00A**  
MAX PV CURRENT (125%): **118.75A**

### MODULE SPECS

#### (56) REC SOLAR REC460AA PURE-RX

RATED POWER (P<sub>MAX</sub>) (W) 460W  
RATED POWER (P<sub>TC</sub>) (W) 438.8W  
SHORT CIRCUIT CURRENT (I<sub>SC</sub>) (A) 8.88A  
MAXIMUM POWER CURRENT (I<sub>MP</sub>) (A) 8.38A  
OPEN CIRCUIT VOLTAGE (V<sub>OC</sub>) (V) 65.3V  
MAXIMUM POWER VOLTAGE (V<sub>MP</sub>) (V) 54.9V  
TEMP. COEFF. OF V<sub>OC</sub> (%/C) -0.24 %/C

### OPTIMIZER/RSD SPECS

#### (56) SOLAREEDGE S500

RATED INPUT (W) 500W  
RATED INPUT I<sub>SC</sub> (A) 15A  
MAX DC (V) 60V  
RATED OUTPUT (A) 15A  
WEIGHTED EFFICIENCY 98.6%

**SOLAREEDGE S500 PROVIDE MODULE-LEVEL  
RAPID SHUTDOWN & ARE 690.12 COMPLIANT.**

### INVERTER SPECS

#### (2) SOLAREEDGE SE11400H-US [240V] [SI1-SB]

RATED POWER (W) 11400W  
MAX INPUT (A) 30.5A  
MAX INPUT (V) 480V  
MAX OUTPUT (A) 47.5A  
MAX OUTPUT 125% (A) 59.38A  
MAX OCPD (A) 60A  
EFFICIENCY (CEC) 0.99%

### BATTERY DETAILS

#### (5) POWERWALL 3

PER UNIT CAPACITY 13.5 KWH  
TOTAL CAPACITY 67.50 KWH

#### ESS OUTPUT CALCULATION

38.40A X 1.25 = 48.00A PER UNIT  
48.00A X 3 BATTERIES = 144.00A

**MAX PV + ESS OUTPUT (125%):**  
144.00A + 118.75A (PV): 262.75A

**MAX BACKFEED (120% RULE):**  
200A < 262.75A (**PCS REQUIRED**)  
**PCS PLACARD SETTING:** 65A

### WEATHER STATION

FULLERTON MUNICIPAL  
EXTREME LOW TEMP.: 2°C  
2% HIGH TEMP. 31°C

TEMP. DERATE FACTOR: 0.94

### WIRE TABLE AND CONDUIT NOTES

A. ROOFTOP TEMPERATURE CORRECTION  
FACTOR REFLECTS REQUIRED MIN. 7/8"  
CONDUIT HEIGHT FROM ROOF.

B. ALL CONDUCTORS SHALL BE COPPER AND  
RATED A MINIMUM OF 90°C; ALL TERMINALS  
SHALL BE RATED A MINIMUM OF 75°C.

C. ALL NEW WIRES ARE THWN-2 COPPER  
UNLESS OTHERWISE NOTED.

D. NEUTRAL WIRE SIZE TO MATCH  
CONDUCTOR RATING WHERE NEUTRAL IS  
APPLICABLE.

**SEE DESIGN CALCULATIONS PAGE FOR  
ADDITIONAL NOTES AND DETAILS**

### ENGINEER OF RECORD



**INFINITY SOLAR**  
TLP ELECTRIC INTEGRATIONS, INC.  
749 N MAIN ST.  
ORANGE, CA 92868  
PHONE: (714) 880-8089  
LIC NO.: C10 - 824287  
TIM POLUJANCEWICZ

**NEW PV SYSTEM**  
25.760 kW DC (STC-DC) | 24.327 kW (CEC-AC)  
**SHANE THONEY**  
5525 BLUE RIDGE DR,  
YORBA LINDA, CA 92887  
APN: 32911119

DESIGNED BY **SOLAR DEPLOYED, LLC.**  
931 10TH ST #114, MODESTO, CA 95354  
209-671-2001 | HELLO@SOLARDEPLOYED.COM

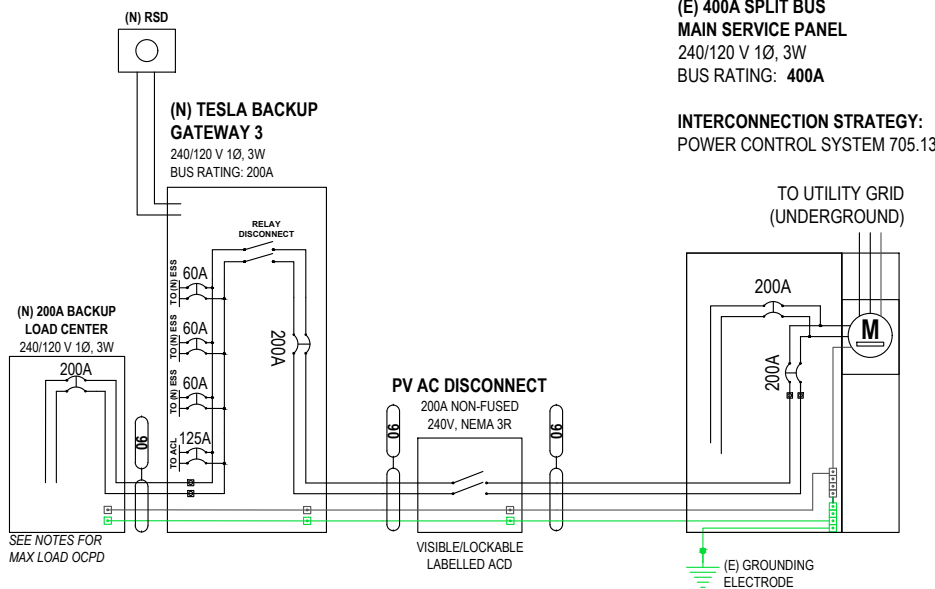
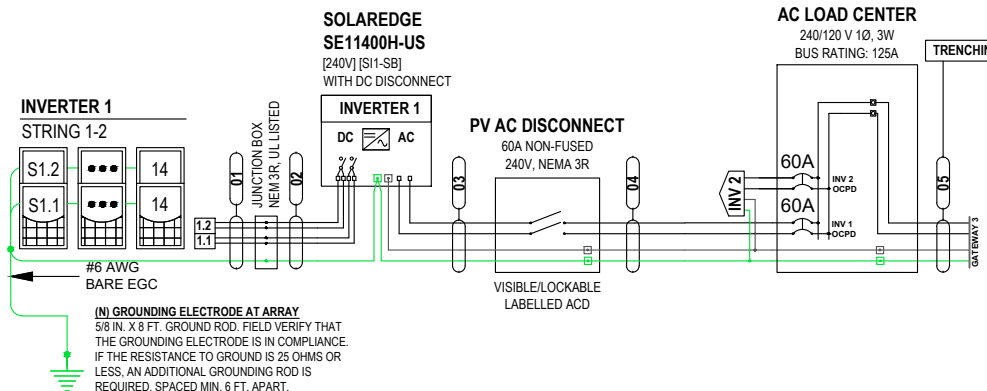
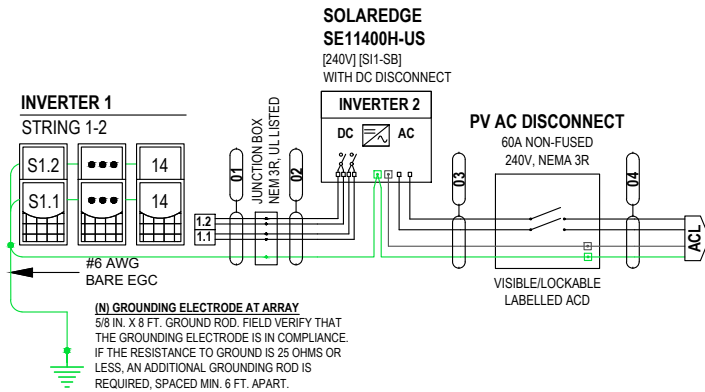
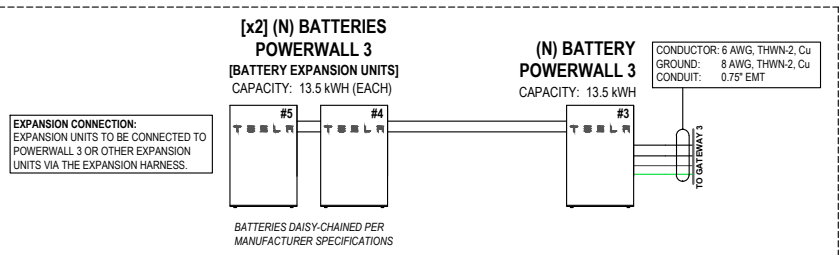
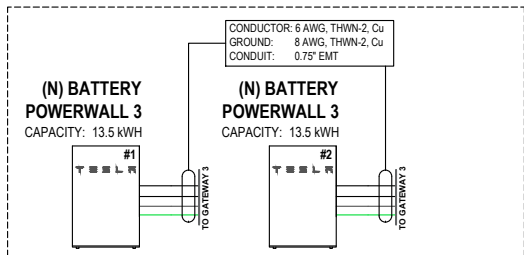
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DRAWN BY:	AJV	CHECKED BY:	AB
PAPER:	11X17 (ANSI B)	DATE:	8/12/2025
SHEET NAME:	LINE DIAGRAM		SHEET NO.: PV.04

## CONDUIT AND WIRE SCHEDULE

ID	CONDUCTOR	GROUND	CONDUIT	CURRENT CARRYING CONDUCTORS IN CONDUIT	CONT. CURRENT	125% MAX. CURRENT	MIN. OCPD	TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	BASE AMP. @ 90°C	DERATED 90°C AMP.	TERMINAL TEMP. RATING	TERMINAL AMP RATING
01	10 AWG PV WIRE, Cu	6 AWG BARE, Cu	FREE AIR	N/A	15A	18.75A	N/A	0.94 (31°C)	1	55A	51.70A	75°C	55A
02	10 AWG THWN-2, Cu	8 AWG, THWN-2, Cu	0.75" EMT	4 (2 PER STRING)	15A	18.75A	N/A	0.94 (31°C)	0.8	40A	30.08A	75°C	35A
03	6 AWG THWN-2, Cu	8 AWG, THWN-2, Cu	0.75" EMT	3	47.50A	59.38A	N/A	0.94 (31°C)	1	75A	70.50A	75°C	65A
04	6 AWG THWN-2, Cu	8 AWG, THWN-2, Cu	0.75" EMT	3	47.50A	59.38A	60A	0.94 (31°C)	1	75A	70.50A	75°C	65A
05	1 AWG THWN-2, Cu	6 AWG, THWN-2, Cu	1" PVC SCH 80	3	95.00A	118.75A	125A	0.94 (31°C)	1	145A	136.30A	75°C	130A
06	2/0 AWG THWN-2, Cu	4 AWG, THWN-2, Cu	2" EMT	3	160A PCS	200A	200A	0.94 (31°C)	1	195A	183.30A	75°C	175A

### BATTERY BACKUP NOTES

A. PRODUCERS STORAGE DEVICE(S) WILL NOT CAUSE THE HOST LOAD TO  
EXCEED ITS NORMAL PEAK DEMAND. NORMAL PEAK DEMAND IS DEFINED  
AS THE HIGHEST AMOUNT OF POWER REQUIRED FROM THE DISTRIBUTION  
SYSTEM BY PRODUCERS COMPLETE FACILITIES WITHOUT THE INFLUENCE  
OR USE OF THE ENERGY STORAGE DEVICE(S).



5525 BLUE RIDGE DR, YORBA LINDA, CA 92887

PV SYSTEM ELECTRICAL SPECIFICATIONS AND CALCULATIONS

SYSTEM SUMMARY	MODULE SPECS	OPTIMIZER/RSD SPECS	INVERTER SPECS
SYSTEM SIZE (STC-DC): SYSTEM SIZE (CEC-AC): INVERTER RATED POWER (AC):	<b>(56) REC SOLAR REC460AA PURE-RX</b>  RATED POWER (P <sub>MAX</sub> ) (W) RATED POWER (P <sub>TC</sub> ) (W) SHORT CIRCUIT CURRENT (I <sub>SC</sub> ) (A) MAXIMUM POWER CURRENT (I <sub>MP</sub> ) (A) OPEN CIRCUIT VOLTAGE (V <sub>OC</sub> ) (V) MAXIMUM POWER VOLATGE (V <sub>MP</sub> ) (V) TEMP. COEFF. OF V <sub>OC</sub> (%/C)	<b>(56) SOLAREEDGE S500</b>  RATED INPUT (W) RATED INPUT I <sub>SC</sub> (A) MAX DC (V) RATED OUTPUT (A) WEIGHTED EFFICIENCY  <div>SOLAREEDGE S500 PROVIDE MODULE-LEVEL RAPID SHUTDOWN &amp; ARE 690.12 COMPLIANT.</div>	<b>(2) SOLAREEDGE SE11400H-US</b> [240V] [SI1-SB]  RATED POWER (W) MAX INPUT (A) MAX INPUT (V) MAX OUTPUT (A) MAX OUTPUT 125% (A) MAX OCPD (A) EFFICIENCY (CEC)
25.760 kW 24.327 kW 22.80 kW	460W 438.8W 8.88A 8.38A 65.3V 54.9V -0.24 %/C	500W 15A 60V 15A 98.6%	11400W 30.5A 480V 47.5A 59.38A 60A 0.99%
OVERCURRENT CALCULATION			
COMBINED INVERTER OUTPUT: MAX PV CURRENT (125%):	95.00A 118.75A		

CONDUIT AND WIRE SCHEDULE

ID	CONDUCTOR	GROUND	CONDUIT	CURRENT CARRYING CONDUCTORS IN CONDUIT	CONT. CURRENT	125% MAX. CURRENT	MIN. OCPD	TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	BASE AMP. @ 90°C	DERATED 90°C AMP.	TERMINAL TEMP. RATING	TERMINAL AMP RATING
01	10 AWG PV WIRE, Cu	6 AWG BARE, Cu	FREE AIR	N/A	15A	18.75A	N/A	0.94 (31°C)	1	55A	51.70A	75°C	55A
02	10 AWG THWN-2, Cu	8 AWG, THWN-2, Cu	0.75" EMT	4 (2 PER STRING)	15A	18.75A	N/A	0.94 (31°C)	0.8	40A	30.08A	75°C	35A
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06	2/0 AWG THWN-2, Cu	4 AWG, THWN-2, Cu	2" EMT	3	160A PCS	200A	200A	0.94 (31°C)	1	195A	183.30A	75°C	175A

WEATHER STATION: FULLERTON MUNICIPAL [ASHRAE EXTREME LOW TEMP.:2°C | ASHRAE 2% HIGH TEMP. 31°C]  
ROOFTOP TEMPERATURE CORRECTION FACTOR REFLECTS REQUIRED MIN. 7/8" CONDUIT HEIGHT FROM ROOF  
ALL CONDUCTORS SHALL BE COPPER AND RATED A MINIMUM OF 90°C; ALL TERMINALS SHALL BE RATED A MINIMUM OF 75°C.

ELECTRICAL & CONDUIT NOTES

A. MAIN PANEL UPGRADES. A TYPE 1 OR TYPE 2 SURGE PROTECTION DEVICE SHALL BE INSTALLED FOR THE NEW MSP EITHER AS AN INTEGRAL PART OF THE SERVICE EQUIPMENT OR LOCATED IMMEDIATELY ADJACENT THERETO. [CEC 230.67]

B. ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND CONDUCTOR SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENT AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.

C. CONDUIT RACEWAYS SHALL BE PROVIDED WITH EXPANSION FITTINGS TO COMPENSATE FOR THERMAL EXPANSION AND CONTRACTION. [CEC 110 (B) AND 110.14 (D)]

D. PROVIDE PULL BOXES AND/OR EXPANSION OR DEFLECTION FITTINGS FOR THE ROOFTOP CONDUITS TO ACCOMMODATE THERMAL EXPANSION AND CONTRACTION. [CEC 300.7(B)]

E. ALL CONDUCTORS AND CONDUITS ON THE ROOF SHALL BE INSTALLED A MINIMUM DISTANCE ABOVE THE ROOF TO THE BOTTOM OF THE RACEWAY OR CABLE OF 7/8" IN. (INCLUDING CABLES UNDERNEATH MODULES AND RACKING).

F. ALL CONDUCTORS IN EXPOSED OUTDOOR LOCATIONS SHALL BE LISTED AND IDENTIFIED FOR USE IN DIRECT SUNLIGHT AND FOR THE APPLICATION. [CEC 690.31(C) THROUGH (F), 310.10(D)]

G. EXPOSED CONDUCTORS WITHIN THE PV ARRAY SHALL BE PV WIRE/CABLE, OR TYPE USE-2, OR TYPE RHW-2 (UL 4703 & 854 LISTED) [CEC 690.31(C)(1)]

H. ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL BE RAIN TIGHT AND APPROVED FOR USE IN WET LOCATIONS. (CEC 314.15)

I. DC WIRING INSIDE A BUILDING MUST BE IN METAL RACEWAYS, METAL-CLAD CABLE, OR METAL ENCLOSURES. [CEC 690.31(D)]

J. EQUIPMENT GROUNDING CONDUCTOR (EGC) SMALLER THAN #6-AWG SHALL BE PROTECTED FROM PHYSICAL DAMAGE BY AN IDENTIFIED RACEWAY OR CABLE ARMOR, UNLESS INSTALLED WITHIN HOLLOW SPACES OF THE FRAMING MEMBERS OF BUILDINGS OR STRUCTURES AND WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [CEC 250.120(C)]

K. CABLES/WIRES THAT ARE SUBJECT TO PHYSICAL DAMAGE, SUCH AS THOSE NOT LOCATED UNDER THE MODULES, MUST BE PROTECTED. [CEC 300.4]

L. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.

ADDITIONAL NOTES

ENGINEER OF RECORD



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749 N MAIN ST.  
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PHONE: (714) 880-8089  
LIC NO.: C10 - 824287  
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*[Signature]*

NEW PV SYSTEM  
25.760 kW DC (STC-DC) | 24.327 kW (CEC-AC)

SHANE THONEY  
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APN: 32911119

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PAPER:	11X17 (ANSI B)	DATE:	8/12/2025

SHEET NAME: DESIGN CALCULATIONS	SHEET NO.: PV.05
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01

**⚠ WARNING**

**ELECTRIC SHOCK HAZARD**

**TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION**

**CODE REFERENCE:** CEC 690.5(C)  
**LOCATION:** PLACE ON **ALL** DISCONNECTING MEANS WHERE ENERGIZED IN AN OPEN POSITION

02

**⚠ WARNING**

**POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE**

**CODE REFERENCE:** CEC 705.12(B)(3)(2)  
**LOCATION:** AT P.O.C. TO SERVICE DISTRIBUTION EQUIPMENT (I.E. MAIN PANEL **AND** SUB PANEL IF APPLICABLE)

03

**⚠ WARNING**

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

**CODE REFERENCE:** CEC 705.12(B)(3)(3)  
**LOCATION:** AT P.O.C. TO SERVICE DISTRIBUTION EQUIPMENT (I.E. MAIN PANEL **AND** SUB PANEL IF APPLICABLE)

04

**⚠ WARNING DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM**

**CODE REFERENCE:** CEC 690.64(B)(4)  
**LOCATION:** ALL EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTORS SUPPLIED FROM MULTIPLE SOURCES

05

PHOTOVOLTAIC POWER SOURCE

**CODE REFERENCE:** CEC 690.31(D)(2)  
**LOCATION:** AT EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS; SPACED A MAX. 10 FT SECTIONS OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.

**FORMAT**

1. WHITE LETTERING ON A RED BACKGROUND
2. MINIMUM 3/8 INCHES LETTER HEIGHT
3. ALL LETTERS SHALL BE CAPITALIZED
4. ARIAL OR SIMILAR FONT (NON-BOLD)

**MATERIAL**

REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (USE UL-969 AS STANDARD FOR WEATHER RATING). DURABLE ADHESIVE MATERIALS.

06

**DC DISCONNECT**  
**DC PHOTOVOLTAIC POWER SOURCE**

MAXIMUM SYSTEM VOLTAGE: 480 VDC  
MAXIMUM CIRCUIT CURRENT: 30.5 AMPS  
MAX RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-DC CONVERTER (IF INSTALLED) 15 AMPS

**CODE REFERENCE:** CEC 690.53  
**LOCATION:** AT EACH DC DISCONNECT MEANS (**INVERTER 1**)

07

**AC DISCONNECT**  
**AC PHOTOVOLTAIC POWER SOURCE**

MAX AC OPERATING CURRENT: 47.5A MAX  
AC OPERATING VOLTAGE: 240 VAC

**CODE REFERENCE:** CEC 690.54  
**LOCATION:** AT P.O.C. TO SERVICE DISTRIBUTION EQUIPMENT (I.E. MAIN PANEL **AND** SUB PANEL IF APPLICABLE)

08

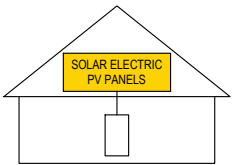
**PHOTOVOLTAIC AC DISCONNECT**

**CODE REFERENCE:** CEC 690.13(B)  
**LOCATION:** AT P.O.C. TO SERVICE DISTRIBUTION EQUIPMENT / AC DISCONNECTS / BREAKERS

09

**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



**CODE REFERENCE:** CEC 690.56  
**LOCATION:** SIGN TO BE LOCATED ON OR NO MORE THAN 3 FT AWAY FROM SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATION OF ALL IDENTIFIED RAPID SHUTDOWN SWITCHES IF NOT AT THE SAME LOCATION.

10

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

**CODE REFERENCE:** CEC 690.56 (C)(2)  
**LOCATION:** TO BE LOCATED ON OR NO MORE THAN 3 FT AWAY FROM RSD INITIATION DEVICE

**BATTERY BACKUP PLACARDS**

**ENERGY STORAGE SYSTEM DISCONNECT**

**CODE REFERENCE:** CEC 706.15(C)  
**LOCATION:** ON ACCESSIBLE ESS DISCONNECT

**BACKUP LOAD CENTER**

**CODE REFERENCE:** CEC 408.4  
**LOCATION:** PLACE ON BACKUP LOAD CENTER

**CAUTION**

DO NOT ADD NEW LOADS

**CODE REFERENCE:** CEC 220  
**LOCATION:** PLACE ON BACKUP LOAD CENTER

**CAUTION**

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

**CODE REFERENCE:** CEC 312.8(3)  
**LOCATION:** PLACE ON MAIN PANEL IF POINT OF INTERCONNECTION IS SUPPLY SIDE

**WARNING: THIS SENSOR IS PART OF POWER CONTROL SYSTEM. DO NOT REMOVE. REPLACE ONLY WITH SAME TYPE AND RATING.**

**LOCATION:** NEAR THE INSTALLATION OF ANY NEURIO CTS

NOMINAL ESS AC VOLTAGE: 240 VAC  
MAXIMUM ESS DC VOLTAGE: N/A  
AVAILABLE FAULT CURRENT DERIVED FROM THE ESS: 20 kA  
DATE CALCULATION PERFORMED: 8/12/2025

**CODE REFERENCE:** CEC 706.15(C)  
**LOCATION:** ON ACCESSIBLE ESS DISCONNECT

**⚠ WARNING**

FUEL CELL POWER SYSTEM CONTAINS ENERGY STORAGE DEVICES

**CODE REFERENCE:** CEC 692.56  
**LOCATION:** ON ACCESSIBLE ESS DISCONNECT

**CAUTION**

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

**CODE REFERENCE:** CEC 705.12(B)(3)  
**LOCATION:** PLACE ON MAIN PANEL IF PV SYSTEM IS ALSO CONNECTED TO PANEL

PCS CONTROLLED CURRENT SETTINGS: ~~65~~ A  
THE MAXIMUM OUTPUT CURRENT FROM THIS SYSTEM TOWARDS THE MAIN PANEL IS CONTROLLED ELECTRONICALLY. REFER TO THE MANUFACTURER'S INSTRUCTION FOR MORE INFORMATION.

**LOCATION:** AT P.O.C. TO SERVICE DISTRIBUTION EQUIPMENT (I.E. MAIN PANEL **AND** SUB PANEL IF APPLICABLE)

ADDITIONAL NOTES

ENGINEER OF RECORD



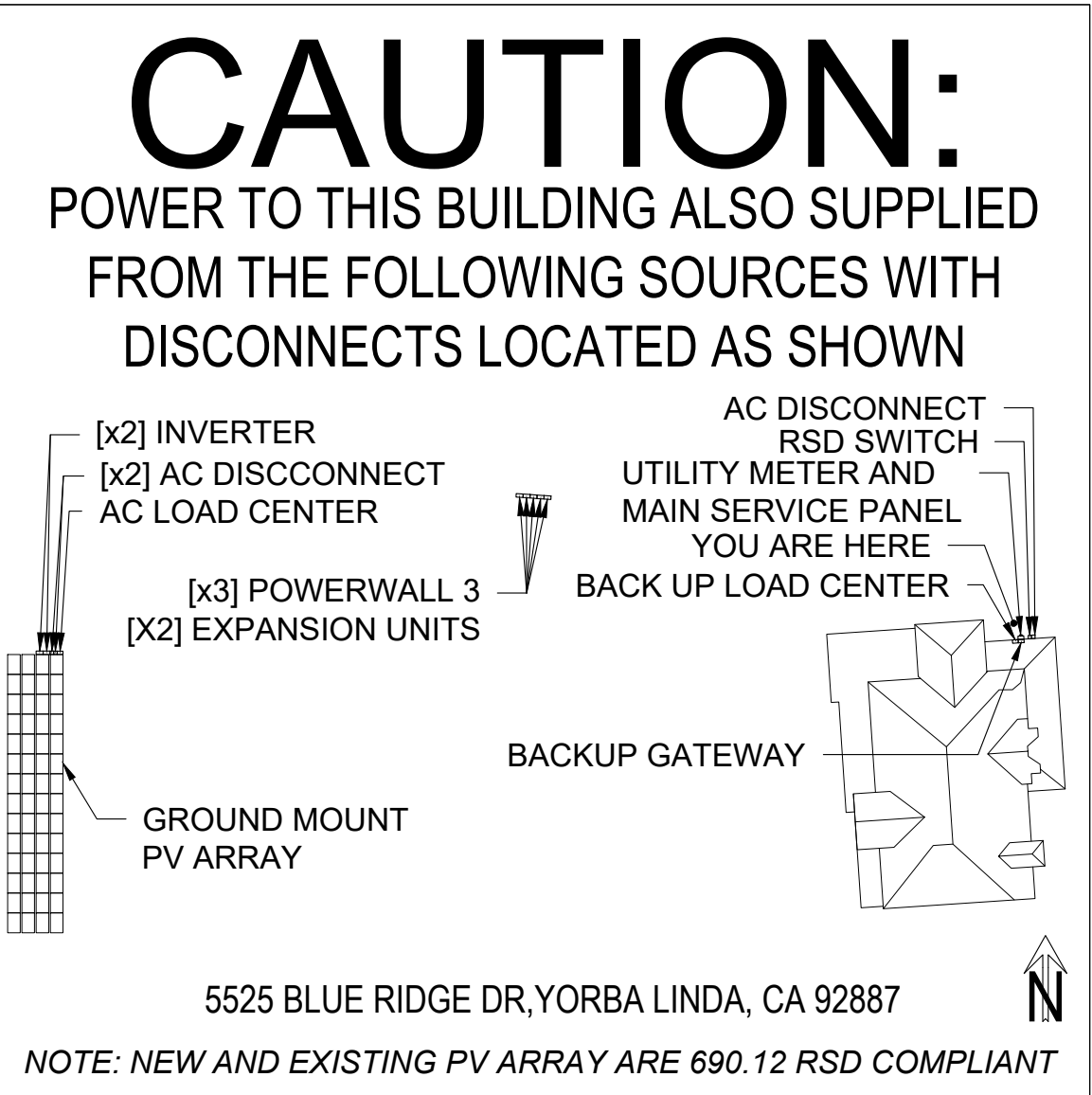
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**NEW PV SYSTEM**  
25.760 kW DC (STC-DC) | 24.327 kW (CEC-AC)  
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PAPER:	11X17 (ANSI B)	DATE:	8/12/2025
SHEET NAME: <b>LABELS</b>			SHEET NO.: <b>PV.06</b>

DISCONNECT DIRECTORY PLAQUE  
INSTALL AT MAIN SERVICE PANEL



**FORMAT**

1. WHITE LETTERING ON A RED BACKGROUND
2. MINIMUM 3/8 INCHES LETTER HEIGHT
3. ALL LETTERS SHALL BE CAPITALIZED
4. ARIAL OR SIMILAR FONT (NON-BOLD)

**MATERIAL**

REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT  
(USE UL-969 AS STANDARD FOR WEATHER RATING).  
DURABLE ADHESIVE MATERIALS

**ADDITIONAL NOTES**

**ENGINEER OF RECORD**



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PAPER:	11X17 (ANSI B)	DATE:	8/12/2025
SHEET NAME:	PLACARD MAP		SHEET NO.: PV.07





# REC ALPHA<sup>®</sup> PURE-RX SERIES

## PRODUCT SPECIFICATIONS

470<sub>WP</sub>  
226<sub>W/m²</sub>

SOLAR'S MOST TRUSTED



COMPACT PANEL SIZE

9 A MODULE CURRENT  
COMPATIBLE WITH MLPE



ELIGIBLE



LEAD-FREE  
ROHS COMPLIANT

EXPERIENCE



PERFORMANCE

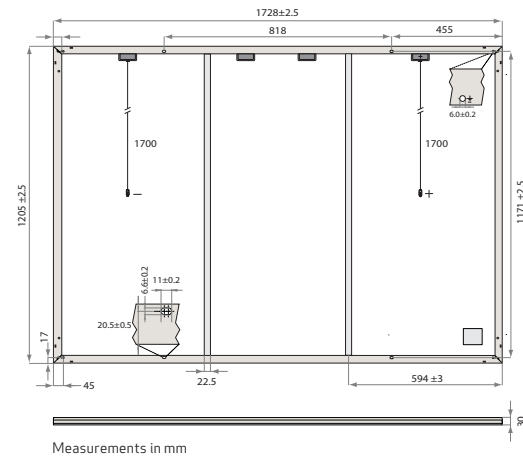
## REC ALPHA PURE-RX SERIES

### PRODUCT SPECIFICATIONS



#### GENERAL DATA

Cell type:	88 half-cut REC bifacial, heterojunction cells with lead-free, gapless technology
Glass:	3.2 mm solar glass with anti-reflective surface treatment in accordance with EN 12150
Backsheet:	Highly resistant polymer
Frame:	Anodized aluminum (black)
Junction box:	4-part, 4 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790
Connectors:	Stäubli MC4 PV-KBT4/KST4 (4 mm <sup>2</sup> ) in accordance with IEC 62852, IP68 only when connected
Cable:	4 mm <sup>2</sup> solar cable, 1.7 + 1.7 m in accordance with EN 50618
Dimensions:	1728 x 1205 x 30 mm (2.08 m <sup>2</sup> )
Weight:	23.4 kg
Origin:	Made in Singapore



Measurements in mm

#### ELECTRICAL DATA

Product Code\*: RECxxxAA Pure-RX

	450	460	470
Power Output - P <sub>MAX</sub> (Wp)	450	460	470
Watt Class Sorting - (W)	0/+10	0/+10	0/+10
Nominal Power Voltage - V <sub>MPP</sub> (V)	54.3	54.9	55.4
Nominal Power Current - I <sub>MPP</sub> (A)	8.29	8.38	8.49
Open Circuit Voltage - V <sub>OC</sub> (V)	65.1	65.3	65.6
Short Circuit Current - I <sub>SC</sub> (A)	8.81	8.88	8.95
Power Density (W/m <sup>2</sup> )	216	221	226
Panel Efficiency (%)	21.6	22.1	22.6
Power Output - P <sub>MAX</sub> (Wp)	343	350	358
Nominal Power Voltage - V <sub>MPP</sub> (V)	51.2	51.7	52.2
Nominal Power Current - I <sub>MPP</sub> (A)	6.70	6.77	6.86
Open Circuit Voltage - V <sub>OC</sub> (V)	61.3	61.6	61.8
Short Circuit Current - I <sub>SC</sub> (A)	7.11	7.17	7.23

Values at standard test conditions (STC: air mass AM1.5, irradiance 1000 W/m<sup>2</sup>, temperature 25°C), based on a production spread with a tolerance of P<sub>MAX</sub>, V<sub>OC</sub> & I<sub>SC</sub> ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m<sup>2</sup>, temperature 20°C, windspeed 1 m/s). \* Where xxx indicates the nominal power class (P<sub>MAX</sub>) at STC above.

#### MAXIMUM RATINGS

Operational temperature:	-40 ... +85°C
Maximum system voltage:	1000 V
Maximum test load (front):	+7000 Pa (713 kg/m <sup>2</sup> )*
Maximum test load (rear):	-4000 Pa (407 kg/m <sup>2</sup> )*
Max series fuse rating:	25 A
Max reverse current:	25 A

\*See installation manual for mounting instructions.  
Design load = Test load / 1.5 (safety factor)

#### WARRANTY

	Standard	REC ProTrust
Installed by an REC Certified Solar Professional	No	Yes
System Size	All	≤25 kW 25-500 kW
Product Warranty (yrs)	20	25
Power Warranty (yrs)	25	25
Labor Warranty (yrs)	0	25
Power in Year 1	98%	98%
Annual Degradation	0.25%	0.25%
Power in Year 25	92%	92%

The REC ProTrust Warranty is only available on panels purchased through an REC Certified Solar Professional installer. Warranty conditions apply. See [www.recgroup.com](http://www.recgroup.com) for more details.

Available from:

#### CERTIFICATIONS

IEC 61215:2021, IEC 61730:2016, UL 61730
IEC 62804 PID
IEC 61701 Salt Mist
IEC 62716 Ammonia Resistance
ISO 11925-2 Ignitability (EN 13501-1 Class E)
IEC 62782 Dynamic Mechanical Load
IEC 61215-2:2016 Hailstone (35mm)
IEC 62321 Lead-free acc. to RoHS EU 863/2015
IEC 61730-2:2016 Fire Class C (as per UL 790)
ISO 14001, ISO 9001, IEC 45001, IEC 62941



Declare.

Living Building  
Challenge Compliant

#### TEMPERATURE RATINGS\*

Nominal Module Operating Temperature:	44°C (±2°C)
Temperature coefficient of P <sub>MAX</sub> :	-0.24 %/°C
Temperature coefficient of V <sub>OC</sub> :	-0.24 %/°C
Temperature coefficient of I <sub>SC</sub> :	0.04 %/°C

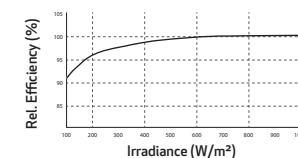
\*The temperature coefficients stated are linear values

#### DELIVERY INFORMATION

Panels per pallet:	33
Panels per 40 ft GP/high cube container:	594 (18 pallets)
Panels per 13.6 m truck:	660 (20 pallets)

#### LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.

REC Solar PTE. LTD.  
20 Tuas South Ave. 14  
Singapore 637312  
[post@recgroup.com](mailto:post@recgroup.com)



[www.recgroup.com](http://www.recgroup.com)



# SolarEdge Home Wave Inverter

## For North America

SE3000H-US / SE3800H-US / SE5000H-US / SE5700H-US /  
SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

12-25  
YEAR  
WARRANTY

INVERTERS



### Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014-2023 per articles 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

## SolarEdge Home Wave Inverter

### For North America

SE3000H-US / SE3800H-US / SE5000H-US / SE5700H-US / SE6000H-US/ SE7600H-US

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4						Units
	SE3000H-US	SE3800H-US	SE5000H-US	SE5700H-US	SE6000H-US	SE7600H-US	
OUTPUT							
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	VA
AC Output Voltage Min. – Nom. – Max. (211 – 240 – 264)	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min. – Nom. – Max. (183 – 208 – 229)	-	✓	-	✓	✓	-	Vac
AC Frequency (Nominal)	59.3 – 60 – 60.5 <sup>(1)</sup>						Hz
Maximum Continuous Output Current @240V	12.5	16	21	24	25	32	A
Maximum Continuous Output Current @208V	-	16	-	24	24	-	A
Power Factor	1, Adjustable – 0.85 to 0.85						
GFDI Threshold	1						A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes						
INPUT							
Maximum DC Power @240V	4650	5900	7750	8900	9300	11800	W
Maximum DC Power @208V	-	5100	-	7750	7750	-	W
Transformer-less, Ungrounded	Yes						
Maximum Input Voltage	480						Vdc
Nominal DC Input Voltage	380						Vdc
Maximum Input Current @240V <sup>(2)</sup>	8.5	10.5	13.5	16	16.5	20	Adc
Maximum Input Current @208V <sup>(2)</sup>	-	9	-	13.5	13.5	-	Adc
Max. Input Short Circuit Current	45						Adc
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600k Sensitivity						
Maximum Inverter Efficiency	99	99.2					%
CEC Weighted Efficiency	99						%
Nighttime Power Consumption	< 2.5						W
ADDITIONAL FEATURES							
Supported Communication Interfaces	RS485, Ethernet, wireless SolarEdge Home Network (optional) <sup>(3)</sup> , Wi-Fi (optional), Cellular (optional)						
Revenue Grade Metering, ANSI C12.20	Optional <sup>(4)</sup>						
Consumption Metering	Optional <sup>(4)</sup>						
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection						
Rapid Shutdown - NEC 2014-2023 per articles 690.11 and 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect						
STANDARD COMPLIANCE							
Safety	Conforms to UL 1741, UL 1741SA, UL 1741SB, UL 1699B Certified by CSA 22.2#107.1, C22.2#330, C22.3#9, ANSI/CAN/UL 9540						
Grid Connection Standards	IEEE1547 and IEEE-1547.1, Rule 21, Rule 14H						
Emissions	FCC Part 15 Class B						
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range	1" Maximum / 14 – 6 AWG						
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1 – 2 strings / 14 – 6 AWG						
Dimensions with Safety Switch (H x W x D)	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	27.5 / 12.5	26.2 / 11.9			lb / kg
Noise	< 25					< 50	dBA
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>(5)</sup>						°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)						

(1) For other regional settings please contact SolarEdge support.  
(2) A higher current source may be used; the inverter will limit its input current to the values stated.  
(3) For more information, refer to the [SolarEdge Home Network](#) datasheet  
(4) Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BEI4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box.  
(5) Full power up to at least 50°C / 122°F; for power de-rating information refer to the [Temperature Derating](#) technical note for North America.

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SolarEdge Home Wave Inverter

For North America

SE10000H-US / SE11400H-US

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4	SE11400H-XXXXXBXX5	Units
	SE10000H-US	SE11400H-US	
OUTPUT			
Rated AC Power Output	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min. – Nom. – Max. (211 – 240 – 264)	✓	✓	Vac
AC Output Voltage Min. – Nom. – Max. (183 – 208 – 229)	-	✓	Vac
AC Frequency (Nominal)	59.3 – 60 – 60.5 <sup>(6)</sup>		Hz
Maximum Continuous Output Current @240V	42	47.5	A
Maximum Continuous Output Current @208V	-	48.5	A
Power Factor	1, Adjustable – 0.85 to 0.85		
GFDI Threshold	1		A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes		
INPUT			
Maximum DC Power @240V	15500	17650	W
Maximum DC Power @208V	-	15500	W
Transformer-less, Ungrounded	Yes		
Maximum Input Voltage	480		Vdc
Nominal DC Input Voltage	380		Vdc
Maximum Input Current @240V <sup>(7)</sup>	27	30.5	Adc
Maximum Input Current @208V <sup>(7)</sup>	-	27	Adc
Max. Input Short Circuit Current	45		Adc
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	600k Sensitivity		
Maximum Inverter Efficiency	99.2		%
CEC Weighted Efficiency	99	99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5		W
ADDITIONAL FEATURES			
Supported Communication Interfaces	RS485, Ethernet, wireless SolarEdge Home Network (optional) <sup>(8)</sup> , Wi-Fi (optional), Cellular (optional)		
Revenue Grade Metering, ANSI C12.20	Optional <sup>(9)</sup>		
Consumption Metering	Optional <sup>(9)</sup>		
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection		
Rapid Shutdown - NEC 2014-2023 per articles 690.11 and 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect		
STANDARD COMPLIANCE			
Safety	Conforms to UL 1741, UL 1741SA, UL 1741SB, UL 1699B Certified by CSA 22.2#107.1, C22.2#330, C22.3#9, ANSI/CAN/UL 9540		
Grid Connection Standards	IEEE1547 and IEEE-1547.1, Rule 21, Rule 14H		
Emissions	FCC Part 15 Class B		
INSTALLATION SPECIFICATIONS			
AC Output Conduit Size / AWG Range	1" Maximum / 14 – 4 AWG		
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1 – 3 strings / 14 – 6 AWG		
Dimensions with Safety Switch (H x W x D)	21.06 x 14.6 x 7.3 / 535 x 370 x 185	21.06 x 14.6 x 8.2 / 535 x 370 x 208 <sup>(10)</sup>	in / mm
Weight with Safety Switch	38.8 / 17.6	44.9 / 20.4 <sup>(10)</sup>	lb / kg
Noise	<50		dBA
Cooling	Natural Convection		
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>(11)</sup>		°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)		

(6) For other regional settings please contact SolarEdge support.

(7) A higher current source may be used; the inverter will limit its input current to the values stated.

(8) For more information, refer to the [SolarEdge Home Network](#) datasheet

(9) Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BEI4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box.

(10) SE11400H-USxxxBox5 is the updated PN, though SE11400H-USxxxBox4 will still be available. All specifications are similar for both models. **EXCLUDING** the weight and dimensions [HxWxD]; The weight and dimensions of SE11400H-USxxxBox4 are 38.8 / 17.6 [lb / kg] and 21.06 x 14.6 x 7.3 / 535 x 370 x 185 [in/mm], accordingly.

(11) Full power up to at least 50°C / 122°F; for power de-rating information refer to the [Temperature Derating](#) technical note for North America.



SolarEdge is a global leader in smart energy technology. By leveraging world-class engineering capabilities and with a relentless focus on innovation, SolarEdge creates smart energy solutions that power our lives and drive future progress.

SolarEdge developed an intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. The SolarEdge DC optimized inverter maximizes power generation while lowering the cost of energy produced by the PV system.

Continuing to advance smart energy, SolarEdge addresses a broad range of energy market segments through its PV, storage, EV charging, UPS, and grid services solutions.

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Cautionary Note Regarding Market Data and Industry Forecasts: This brochure may contain market data and industry forecasts from certain third-party sources. This information is based on industry surveys and the preparer's expertise in the industry and there can be no assurance that any such market data is accurate or that any such industry forecasts will be achieved. Although we have not independently verified the accuracy of such market data and industry forecasts, we believe that the market data is reliable and that the industry forecasts are reasonable.





# Power Optimizer

## For North America

S440, S500



POWER OPTIMIZER

### PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues\*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

\* Expected availability in 2022

[solaredge.com](https://solaredge.com)



## Power Optimizer

### For North America

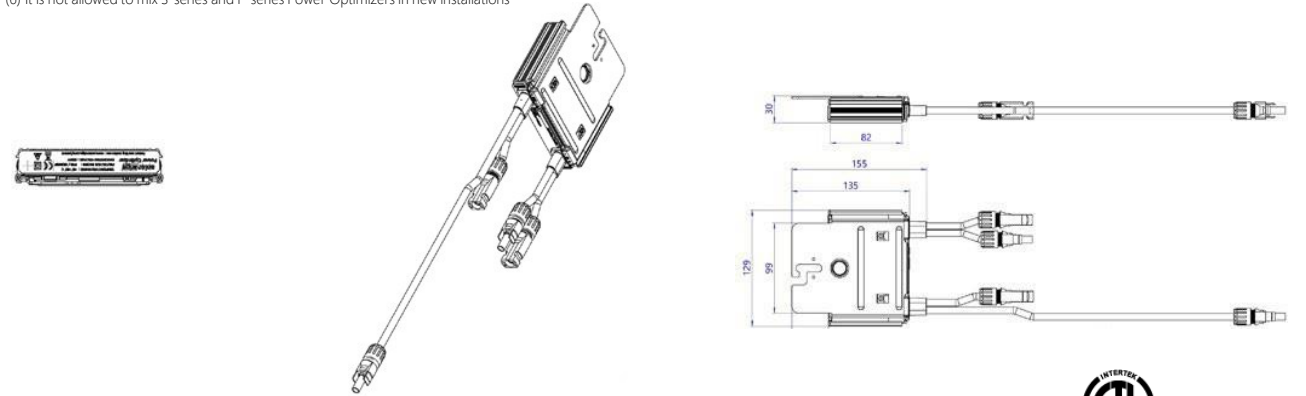
#### S440, S500

	S440	S500	Unit
INPUT			
Rated Input DC Power <sup>(1)</sup>	440	500	W
Absolute Maximum Input Voltage (Voc)	60		Vdc
MPPT Operating Range	8 - 60		Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15	Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.6		%
Overvoltage Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	15		Adc
Maximum Output Voltage	60		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1+/-0.1		Vdc
STANDARD COMPLIANCE			
Photovoltaic Rapid Shutdown System	NEC 2014, 2017 & 2020		
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3		
Safety	IEC62109-1 (class II safety), UL1741		
Material	UL94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 153 x 30 / 5.07 x 6.02 x 1.18		mm / in
Weight (including cables)	655 / 1.5		gr / lb
Input Connector	MC4 <sup>(2)</sup>		
Input Wire Length	0.1 / 0.32		m / ft
Output Connector	MC4		
Output Wire Length	(+) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32		m / ft
Operating Temperature Range <sup>(3)</sup>	-40 to +85		°C
Protection Rating	IP68 / Type6B		
Relative Humidity	0 - 100		%

(1) Rated power of the module at STC will not exceed the power optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed  
(2) For other connector types please contact SolarEdge  
(3) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

PV System Design Using a SolarEdge Inverter		Single Phase HD-Wave	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	S440, S500	8	14	18	
Maximum String Length (Power Optimizers)		25		50 <sup>(4)</sup>	
Maximum Nominal Power per String		5700 (6000 with SE7600-US-SE11400-U)	6000	12750	W
Maximum Allowed Connected Power per String <sup>(5)</sup> (Permitted only when the difference in connected power between strings is 1,000W or less)		Refer to Footnote 5	One String 7200W	15,000W	
Parallel Strings of Different Lengths or Orientations			Two strings or more 7800W		
			Y		

(4) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement  
(5) If the inverters rated AC power ≤ maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power. Refer to: <https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf>  
(6) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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# 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 <sup>1</sup>			
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 <sup>2</sup>	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 <sup>3</sup>			
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% <sup>14</sup>			
Solar to Home/Grid Efficiency	97.5% <sup>5</sup>			
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 <sup>6</sup> )			
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			

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

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

<sup>3</sup>15.4kW off-grid maximum continuous discharge power is only available if on-grid rating is 11.5 kW. If enabled, Powerwall 3 must be installed with an 80 A breaker and appropriately sized conductors.

<sup>4</sup>Typical solar shifting use case.

<sup>5</sup>Tested using CEC weighted efficiency methodology.

<sup>6</sup>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 ( $I_{MP}$ )	15 A <sup>7, 8</sup>
Maximum Short Circuit Current per MPPT ( $I_{SC}$ )	19 A <sup>8</sup>

<sup>7</sup> Only applicable to Powerwall 3 units with 15 A  $I_{MP}$  on the product label. Otherwise, Powerwall 3 has an  $I_{MP}$  of 13 A.

<sup>8</sup> When PV strings are combined on the roof and 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 30 A  $I_{MP}$  / 38 A  $I_{SC}$  (or 26 A  $I_{MP}$  / 30 A  $I_{SC}$  if Powerwall 3 is labeled with 13 A  $I_{MP}$  / 15 A  $I_{SC}$ ).

## Environmental Specifications

Operating Temperature	−20°C to 50°C (−4°F to 122°F) <sup>9</sup>
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

<sup>9</sup> Performance may be de-rated at operating temperatures above 40°C (104°F).

## Compliance Information

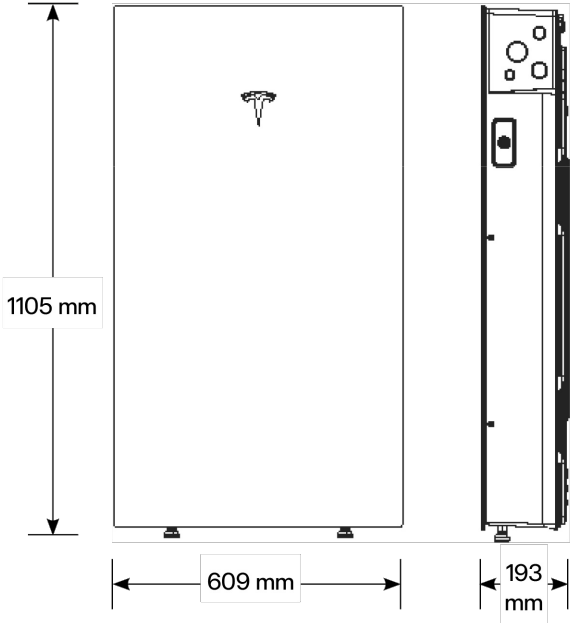
Certifications	UL 1741, UL 9540, UL 9540A, UL 3741, UL 1741 PCS, UL 1741 SA, UL 1741 SB, UL 1973, UL 1699B, UL 1998, CSA C22.2 No. 0.8, CSA C22.2 No. 107.1, CSA C22.2 No. 330, CSA 22.3 No. 9, IEEE 1547, IEEE 1547A, IEEE 1547.1, CA Rule No.21
Grid Connection	United States and Canada
Emissions	FCC Part 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) <sup>10</sup>
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

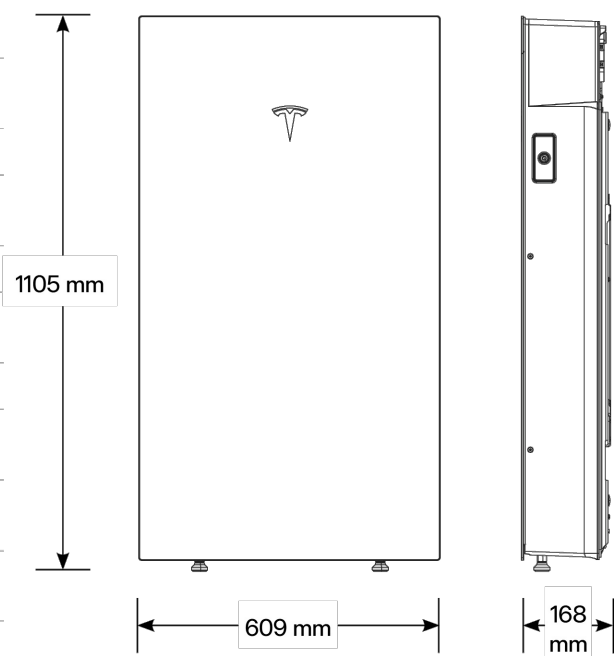
<sup>10</sup> These dimensions include the glass front cover being installed on Powerwall 3.





# 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 <sup>11</sup>
<sup>11</sup> Powerwall 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) <sup>12</sup>
	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
<sup>12</sup> Performance may be de-rated at operating temperatures above 40°C (104°F).		
Compliance Information	Certifications	UL 1973, UL 9540

Mechanical Specifications	Dimensions	1105 x 609 x 168 mm (43.5 x 24 x 6.6 in) <sup>13</sup>	
	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 <sup>14</sup>	
<sup>13</sup> These dimensions include the glass front cover being installed on Powerwall 3 Expansion.			
<sup>14</sup> The Powerwall 3 Expansion harness is a listed component of the UL 9540 certification.			

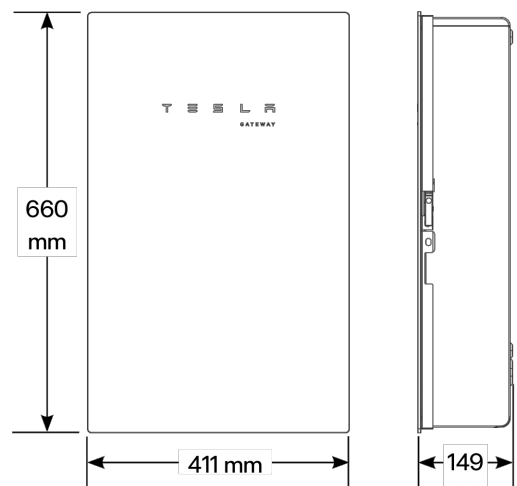
# Gateway 3

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-x1-y	AC Meter	+/- 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 <sup>17</sup>	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		
<sup>17</sup> Only 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
	Emissions	FCC Part 15, Class B, ICES 003

Mechanical Specifications	Dimensions	660 x 411 x 149 mm (26 x 16 x 6 in)	
	Weight	16.3 kg (36 lb)	
	Mounting options	Wall mount	



# Ground Mount System



## Mount on all terrains, in no time.

The IronRidge Ground Mount System combines our XR1000 rails with locally-sourced steel pipes, or mechanical tubing, to create a cost-effective structure capable of handling any site or terrain challenge. Installation is simple with only a few structural components and no drilling, welding, or heavy machinery required. In addition, the system works with a variety of foundation options, including concrete piers and driven piles.

**Rugged Construction**  
Engineered steel and aluminum components ensure durability.

**PE Certified**  
Pre-stamped engineering letters available in most states.

**Simple Assembly**  
Just a few simple components and no heavy equipment.

**Design Software**  
Online tool generates engineering values and bill of materials.

**Flexible Architecture**  
Multiple foundation and array configuration options.

**20 Year Warranty**  
Twice the protection offered by competitors.



**360° Product Tour**  
Visit [ironridge.com](http://ironridge.com)

## Substructure

### Top Caps



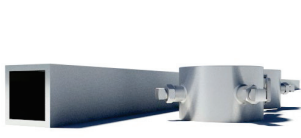
Connect vertical and cross pipes.

### Rail Connectors



Attach Rail Assembly to horizontal pipes.

### Diagonal Braces



Optional Brace provides additional support.

### Cross Pipe & Piers



Steel pipes or mechanical tubing for substructure.

## Rail Assembly

### XR1000 Rails



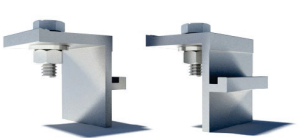
Curved rails increase spanning capabilities.

### Top-Down Clamps



Secure modules to rails and substructure.

### Under Clamps



Alternative clamps for pre-attaching modules to rails.

### Accessories



Wire Clips and End Caps provide a finished look.

## Resources



**Design Assistant**  
Go from rough layout to fully engineered system. For free.  
[Go to ironridge.com/gm](http://ironridge.com/gm)



**NABCEP Certified Training**  
Earn free continuing education credits, while learning more about our systems.  
[Go to ironridge.com/training](http://ironridge.com/training)



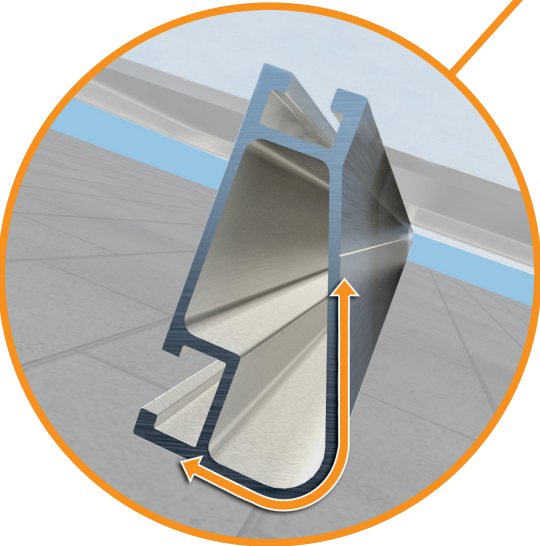
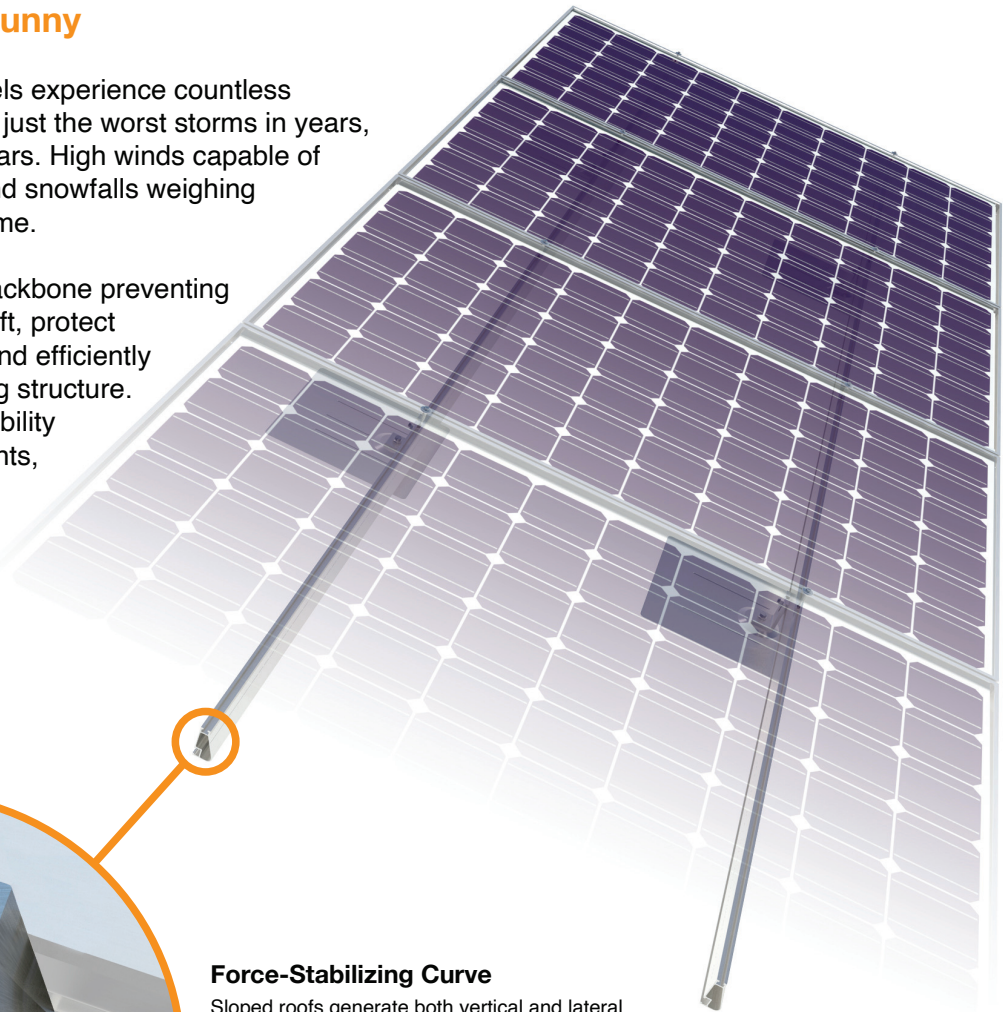


# XR Rail Family

## Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



**Force-Stabilizing Curve**  
Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

### Compatible with Flat & Pitched Roofs

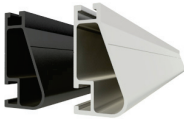
- 

XR Rails are compatible with FlashFoot and other pitched roof attachments.
- 

IronRidge offers a range of tilt leg options for flat roof mounting applications.

### Corrosion-Resistant Materials

All XR Rails are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



## XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



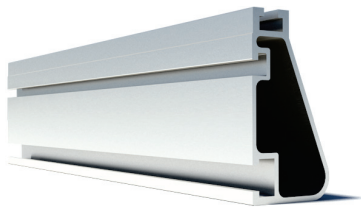
**XR10**  
XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available



**XR100**  
XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



**XR1000**  
XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

## Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.\* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit [IronRidge.com](http://IronRidge.com) for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

\*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.



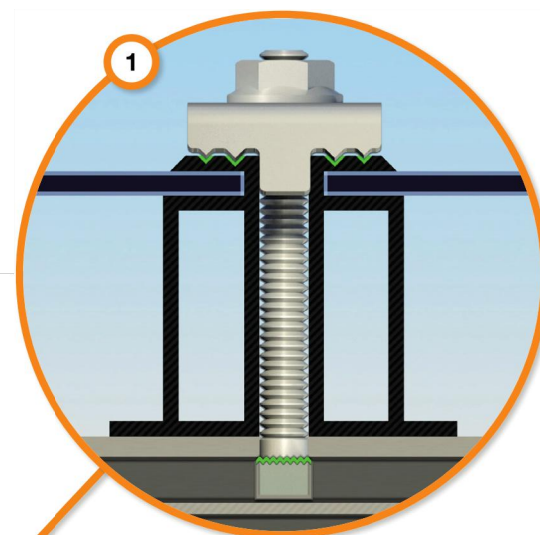


# Integrated Grounding System

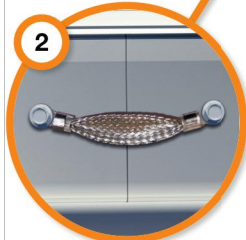
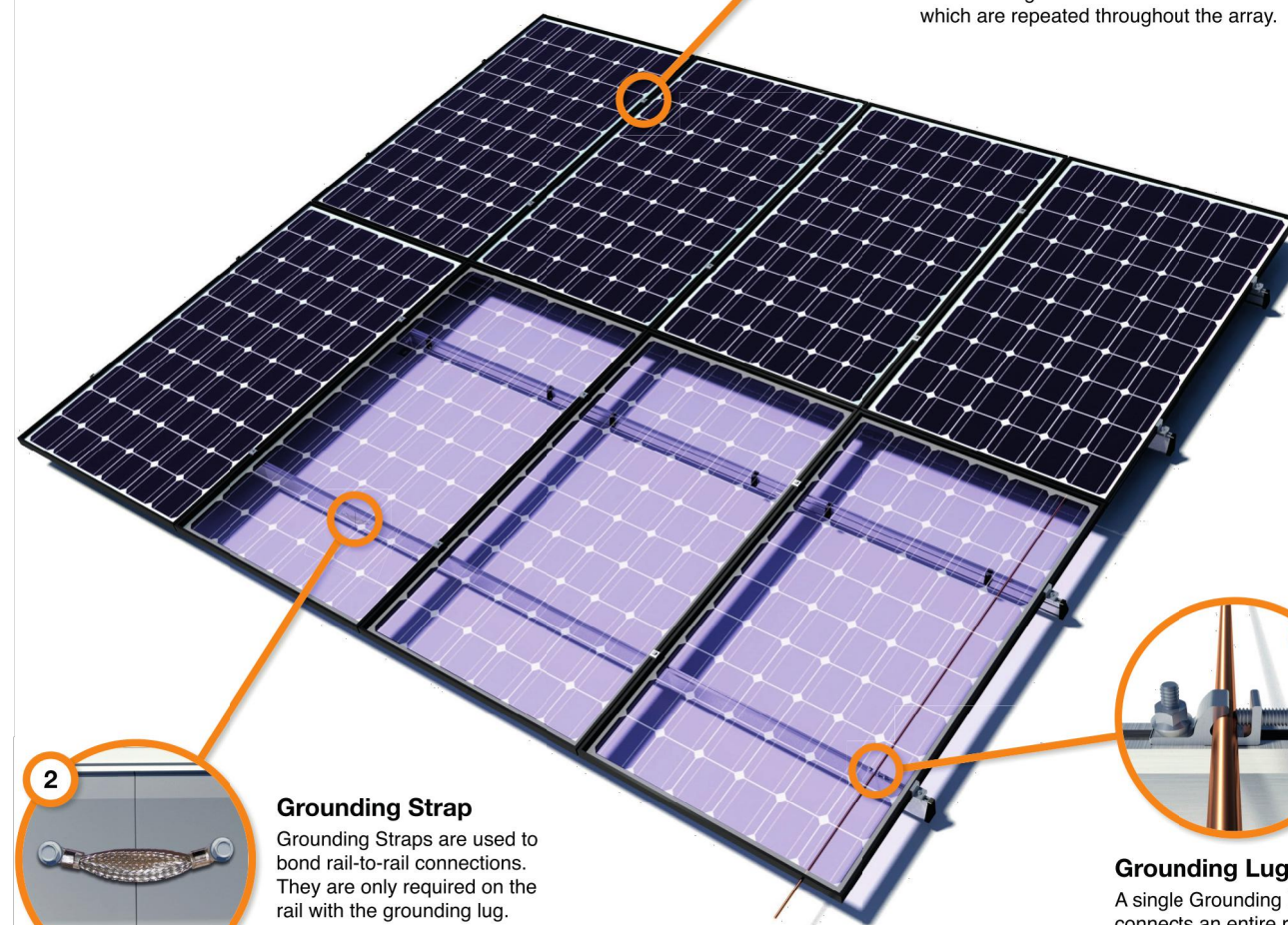
## Simplified Grounding For Greater Safety & Lower Cost

Traditionally, solar modules are grounded by attaching lugs, bolts or clips to the module frame, then connecting these to a copper conductor that runs throughout the array. This process adds time and cost to the installation, and often results in improper grounding, creating significant long-term safety risks.

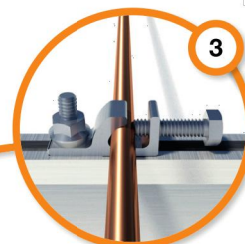
The IronRidge Integrated Grounding System solves these challenges by bonding modules directly to the mounting rails. This approach eliminates separate module grounding hardware, and it creates many parallel grounding paths throughout the array, providing greater safety for system owners.



**Grounding Mid Clamp**  
Each Grounding Mid Clamp pierces through the anodized coatings of both the module frame and the mounting rail to form secure electrical bonds, which are repeated throughout the array.



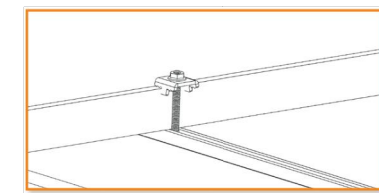
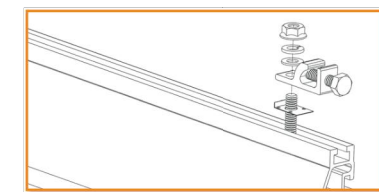
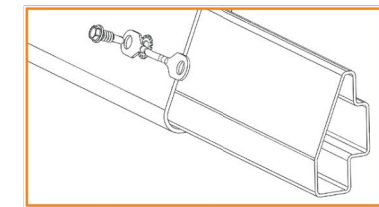
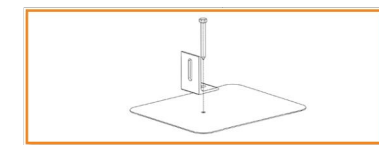
**Grounding Strap**  
Grounding Straps are used to bond rail-to-rail connections. They are only required on the rail with the grounding lug.



**Grounding Lug**  
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.

## Installation Overview

- 1 Install Roof Attachments**
  - Install appropriate roof flashing and/or standoff for roof type.
  - Attach L-Feet to flashing or standoff.
- 2 Prepare Rail Connections**
  - Insert splice into first rail, then secure with Grounding Strap and self-drilling screw.
  - Slide second rail over splice, then secure with opposite end of Grounding Strap and self-drilling screw.
- 3 Mount & Ground Rails**
  - Attach rails to L-Feet and level rails.
  - Install one Grounding Lug per row of modules.
  - Connect Grounding Lug to grounding conductor.
- 4 Install Modules & Clamps**
  - Install first module using End Clamps and Grounding Mid Clamps.
  - Install additional modules using Grounding Mid Clamps.
  - Finish row with a second pair of End Clamps.

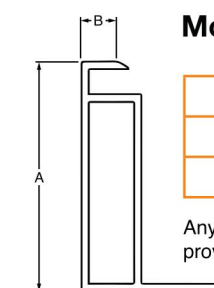


## Testing & Certification

The IronRidge Integrated Grounding System has been tested and certified to UL 2703 by Intertek Group plc.

UL 2703 is a proposed UL standard for evaluating solar module mounting and clamping devices. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

The testing process closely mirrors that of UL 1703, the solar module testing standard, including temperature and humidity cycling, electrical and mechanical load testing, and manufacturing quality reviews.



### Module Frame Compatibility

Dimension	Range
A	31.0mm - 51.0mm
B	5.08mm (minimum)

Any module frames whose parameters are not listed in the provided table have not been tested for compatibility.

The Grounding Clamp has proven robust in grounding 60-cell and 72-cell solar module frames with box construction and a range of anodization thicknesses.

All solar modules listed to UL 1703 and with frame construction within the parameters stated above are compatible with the IronRidge Integrated Grounding System.

 [Go to ironridge.com/ig](https://www.ironridge.com/ig)



25800 Commercentre Drive  
Lake Forest, CA 92630 USA

Telephone: 949.448.4100  
Facsimile: 949.448.4111  
www.intertek.com

# Test Verification of Conformity

In the basis of the tests undertaken, the sample(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

Applicant Name & Address:	IronRidge, Inc. 1495 Zephyr Ave. Hayward, CA 94544
Product Description:	XR Rails with Integrated Grounding.
Ratings & Principle Characteristics:	<u>Fire Class Resistance Rating:</u> <ul style="list-style-type: none"><li>- Class A for Steep Slope Flush-Mount (symmetrical) Applications when using Type 1 and Type 2, Listed Photovoltaic Module.</li><li>- Class A for Low Slope Flush-Mount and Tilt-Mount (symmetrical and asymmetrical) Applications when using Type 1, Listed Photovoltaic Module.</li></ul>
Models:	51-61GD-005, 51-61GD-005B, 51-5000-001, and 51-65-001
Brand Name:	N/A
Relevant Standards:	UL Subject 2703 (Section 15.2 and 15.3) Outline of Investigation for Rack Mounting Systems and Clamping Devices for Flat-Plate Photovoltaic Modules and Panels, Issue Number: 2, Nov 13, 2012 <b>Referencing</b> UL1703 (Section 31.2) Standard for Safety for Flat-Plate Photovoltaic Modules and Panels, May 20, 2014
Verification Issuing Office:	Intertek Testing Services NA, Inc. 25800 Commercentre Dr. Lake Forest, CA 92630
Date of Tests:	08/27/2014 to 01/07/2015
Test Report Number(s):	101541132LAX-002

This verification is part of the full test report(s) and should be read in conjunction with them. This report does not automatically imply product certification.

Completed by: Amar Kacel  
Title: PV Engineer

Reviewed by: Andrew Koretoff  
Title: Reviewer

Signature: 

Signature: 

Date: 01/26/2015

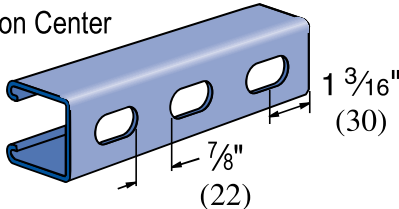
Date: 01/26/2015

*This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.*

P1000 T

Wt/100 Ft: 185 Lbs (275 kg/100 m)

Slots are  
1 1/8" (29) x 9/16" (14)  
2" (51) on Center



Notes:  
\* Load limited by spot weld shear.  
\*\* KL/r > 200  
NR = Not Recommended.  
1. Above loads include the weight of the member. This weight must be deducted to arrive at the net allowable load the beam will support.  
2. Long span beams should be supported in such a manner as to prevent rotation and twist.  
3. Allowable uniformly distributed loads are listed for various simple spans, that is, a beam on two supports. If load is concentrated at the center of the span, multiply load from the table by 0.5 and corresponding deflection by 0.8.  
4. For Pierced Channel, Beam Load Values in the tables are multiplied by the following factor:  
"T" Series      85%

MATERIAL

Unistrut channels are accurately and carefully cold formed to size from low-carbon strip steel. All spot-welded combination members, except P1001T, are welded 3" (76 mm) maximum on center.

**STEEL: PLAIN**  
12 Ga. (2.7 mm), 14 Ga.(1.9 mm) and  
16 Ga. (1.5 mm) ASTM A1011 SS GR 33.

**STEEL: PRE-GALVANIZED**  
12 Ga. (2.7 mm), 14 Ga. (1.9 mm) and  
16 Ga. (1.5mm) ASTM A653 GR 33.

For other materials, see Special Metals or Fiberglass sections.

FINISHES

- All channels are available in:
- Perma Green III (GR).
  - Pre-galvanized (PG), conforming to ASTM A653 G90.
  - Hot-dipped galvanized (HG), conforming to ASTM A123.
  - Plain (PL).

Project: _____		Approval Stamp:
Architect / Engineer: _____		
Date: _____	Phone: _____	
Contractor: _____		
Address: _____ _____		
Notes 1: _____ _____		
Notes 2: _____ _____		



Technical Data Sheet G Series

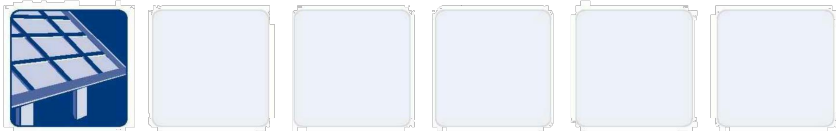
Basic Info

KSF G 76x2100-3xM16	KSF G 76x1600-3xM16	KSF G 76x1300-3xM16
Nominal length (mm)		
2100	1600	1300
Tube diameter (mm)		
76.10	76.10	76.10
Weight (kg)		
14.00	10.50	8.50
Item number		
25456	25455	25454

Construction

- Nut: DIN EN ISO 4032 - 8
- Continuous welded helix
- Coating: Hot-dip galvanized according to DIN EN ISO 1461

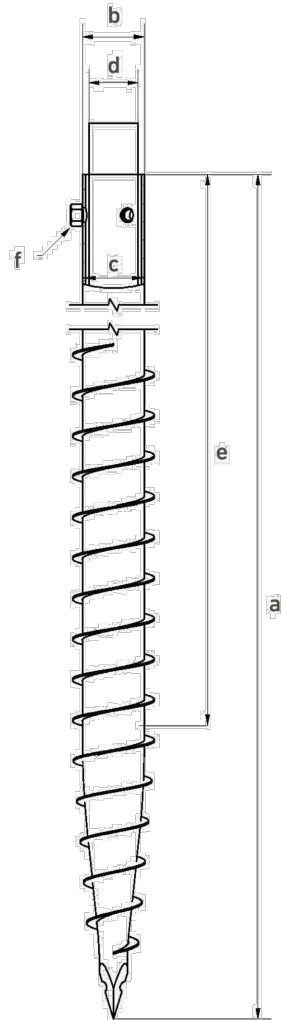
Applications



KSF G 76x  
1300-3xM16

Technical Data

	KSF G 76x2100-3xM16	KSF G 76x1600-3xM16	KSF G 76x1300-3xM16
a	Length (mm) (±25 mm)		
	2080	1580	1280
b	Shaft outer diameter (mm)		
	76.10	76.10	76.10
c	Inner diameter (mm)		
	68.90	68.90	68.90
d	Diameter setting (mm)		
	60	60	60
e	Depth setting (mm) (±25 mm)		
	1815	1315	1020
f	Thread		
	3 x M16	3 x M16	3 x M16



Online Service

KSF G 76x2100-3xM16	KSF G 76x1600-3xM16	KSF G 76x1300-3xM16
Webkey		
G2545611D	G2545511D	G2545411D

