

HISTORIC AND DESIGN REVIEW COMMISSION

August 17, 2016

Agenda Item No: 16

HDRC CASE NO: 2016-323
ADDRESS: 637 V.F.W. BLVD
LEGAL DESCRIPTION: NCB 8618 BLK LOT 6
ZONING: C2 H
CITY COUNCIL DIST.: 3
DISTRICT: Mission Historic District
APPLICANT: Charles Kirk
OWNER: Vincente Vasquez
TYPE OF WORK: Installation of Solar Panels
REQUEST:

The applicant is requesting a Certificate of Appropriateness for approval to install 20 solar panels on the side pitch of the home located at 637 VFW Blvd.

APPLICABLE CITATIONS:

Historic Design Guidelines, Chapter 3, Guidelines for Additions

6. Designing for Energy Efficiency

C. SOLAR COLLECTORS

i. Location—Locate solar collectors on side or rear roof pitch of the primary historic structure to the maximum extent feasible to minimize visibility from the public right-of-way while maximizing solar access. Alternatively, locate solar collectors on a garage or outbuilding or consider a ground-mount system where solar access to the primary structure is limited.

ii. Mounting (sloped roof surfaces)—Mount solar collectors flush with the surface of a sloped roof. Select collectors that are similar in color to the roof surface to reduce visibility.

FINDINGS:

- a. The Mission Historic District was designated February 17, 1977.
- b. The structure at 637 VFW has a side-gable on hip roof with two front dormers. The applicant is proposing to install 20 total solar panels on the dark brown composition shingles roof of the primary structure. All 20 panels will be on the left slope behind the ridge of the side gable roof. The panels to be installed are black in color. According to the Guidelines for Additions 6.C., installations should be in locations that minimize visibility from the public right-of-way. Staff visited the site on August 10, 2016, and found that the home as a low-pitched roof and that the slope is behind the ridge of the side gable with two dormers. Staff finds the pitch of the roof, the front roof form, and the color of the composition shingles and solar panels minimize the visibility from the public right-of-way. This is consistent with the Guidelines.
- c. The applicant is proposing to mount the panels flush with the pitched roof. This is consistent with Guidelines for Additions 6.C.ii, which states solar collectors should be flush with the roof surface.

RECOMMENDATION:

Staff recommends approval as submitted based on findings a through d.

CASE MANAGER:

Lauren Sage



Flex Viewer

Powered by ArcGIS Server

Printed: Aug 10, 2016

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NO PARKING
NO STOPPING

SALE & RENT
FORD FORD
EX-2015





NO
PARKING
ANYTIME





NO
PARKING
ANYTIME

NOTE
 UTILITY HAS 24-HOUR UNRESTRICTED ACCESS TO PV/AC DISCONNECT AND DEDICATED PV METER. SHALL COMPLY WITH IBC 2015, IRC 2015, NEC 2014, IFC 2015 AND ALL OTHER APPLICABLE CODES PER A.H.J.

ALL CONDUIT TO BE RAN ON EXTERIOR OF HOUSE

VERIFY ELECTRIC METER SEPARATION BETWEEN WATER AND GAS AS REFERENCED IN SECTION 301.15 OF THE CPS ESRM

WORKSPACE IN FRONT OF AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH CPS AND NEC REQUIREMENTS.

A MINIMUM 36" WORKING SPACE CLEARANCE WITH DOORS OPEN IN 90 DEGREE POSITION TO AN OBSTRUCTION NEEDS TO BE MAINTAINED IN FRONT OF THE ELECTRICAL CABINETS.

UPLIFT CALCULATION
 20 PANELS AT 37.5 LBS/PANEL
 372 SQ.FT. UNDER PANELS X
 WIND LOAD OF 30PSF = 11160 LBS
 CONNECTOR: 5/16" X 3.5" LAG SCREW (2.5" MIN.)
 # OF STANDOFFS = 27
 LAG SCREWS
 27 X 2.5" X 210" = 14175 LBS
POINT LOAD CALCULATION
 ARRAY WEIGHT: 20 PANELS = 750 LBS
 LF RAIL: 139 LF X 0.75LBS/LF = 104 LBS
 27 STANDOFFS X .66 = 18 LBS
 20 PANEL ARRAY 872 / 27 =
 32.3 LBS/ATTACHMENT

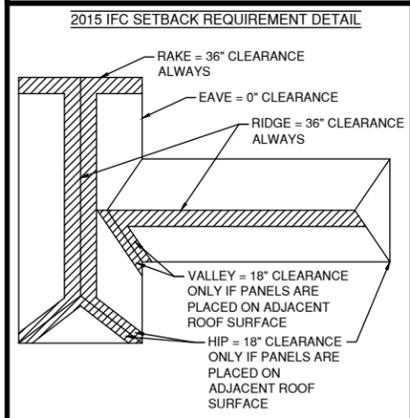
WORST CASE DISTRIBUTION CALCULATION
 872 / 372 SQ.FT. = 2.34 PSF

ADDITIONAL NOTES

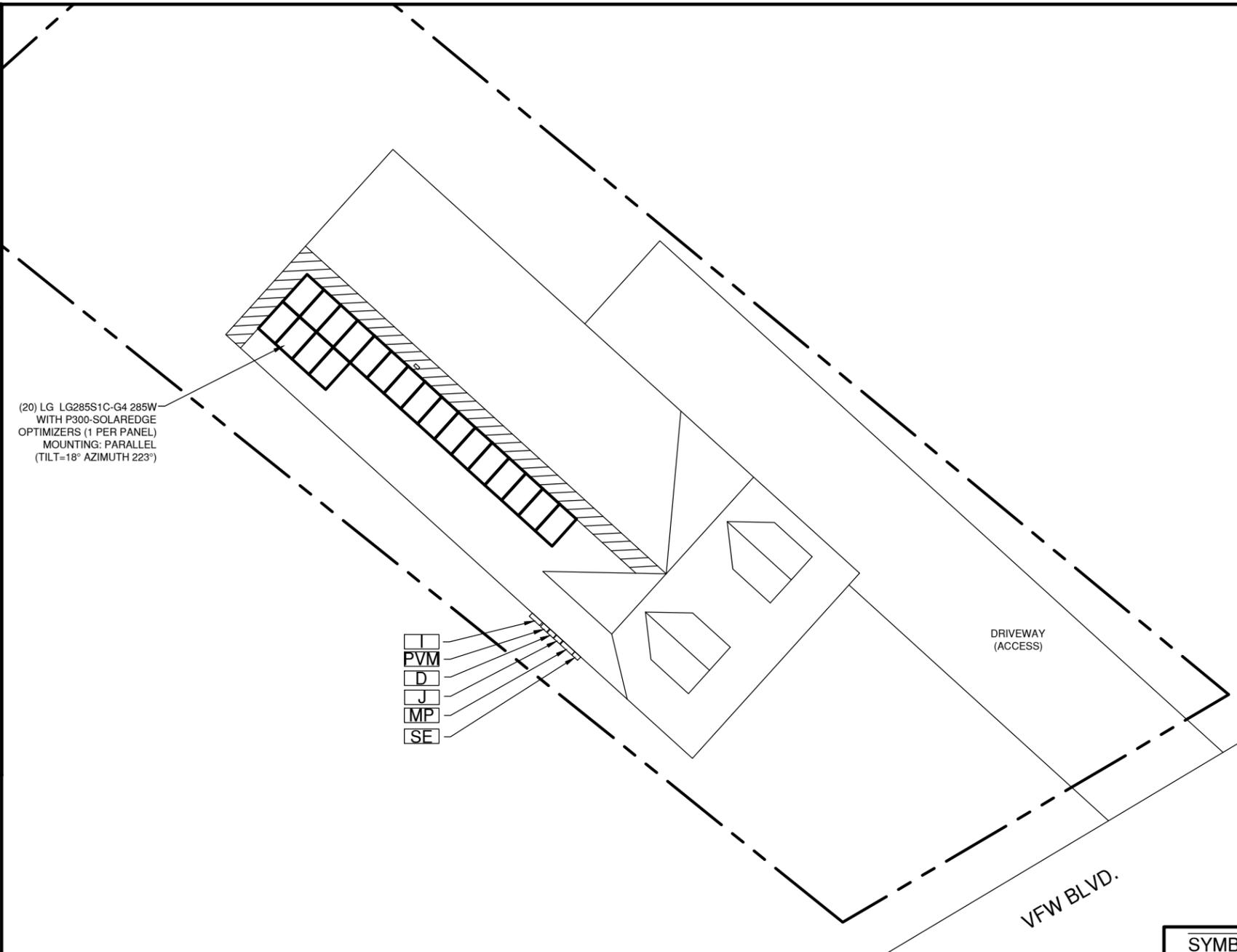
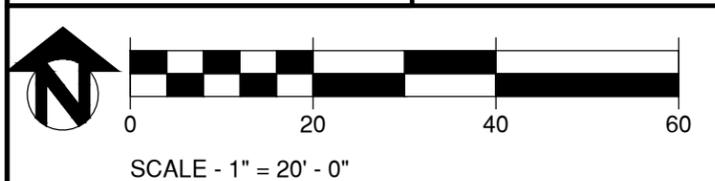
RAPID SHUTDOWN ENABLED SYSTEM INSTALLER SHALL ENSURE ALL SOFTWARE CONFIGURATION AND SPECIAL WIRING REQUIREMENTS ARE MET TO COMPLY WITH MANUFACTURER LISTING AND ALL APPLICABLE CODES.

PULL LB USE RESTRICTIONS
 -1 PULL LB MAX ON D/C SIDE
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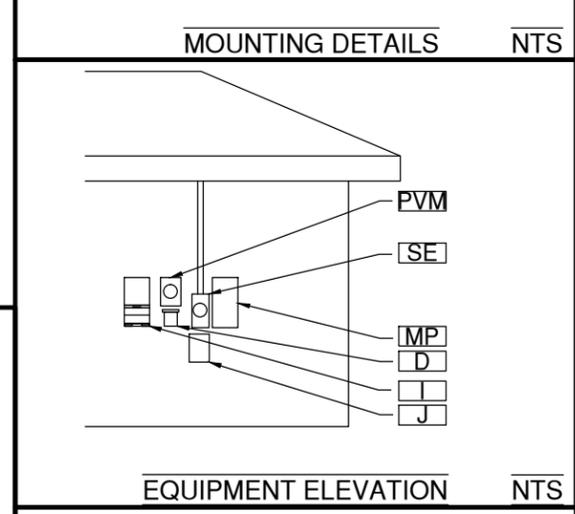
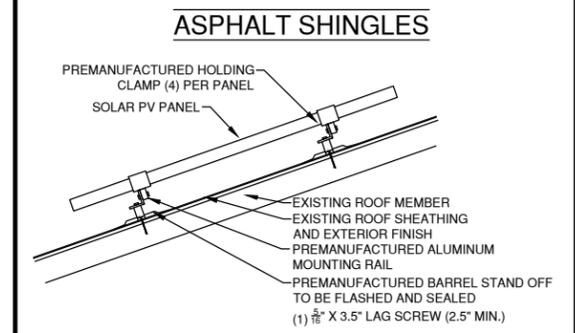
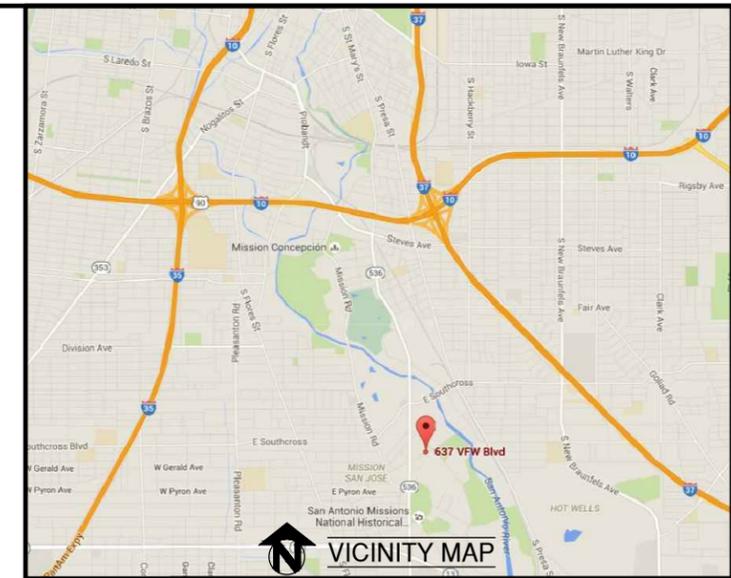
MARKER PLAQUES
 ALL PLAQUES TO REFLECTIVE RED BACKGROUND WITH 3/8" WHITE LETTERING



ALL ROOFS WITH SOLAR TRUSSES 24" O.C.
 ASPHALT SHINGLE
 PITCHED ROOF (4:12)
 SINGLE STORY



(20) LG LG285S1C-G4 285W WITH P300-SOLAREEDGE OPTIMIZERS (1 PER PANEL) MOUNTING: PARALLEL (TILT=18° AZIMUTH 223°)

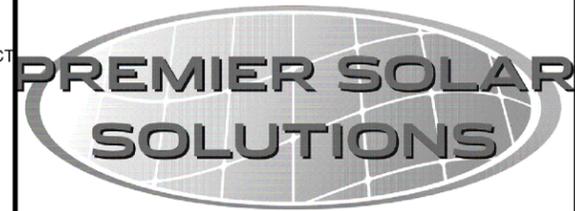


SYMBOL LEGEND

D	DISCONNECT
I	INVERTER
C	COMBINER BOX
J	J-BOX
SE	SERVICE ENTRANCE
LM	LEASE METER
DF	FUSED DISCONNECT
MP	MAIN PANEL
PVM	PV METER
DCD	DC DISCONNECT
DCC	DC COMBINER

LEGEND

SYM.	DISCRIPTION	QTY.
●	ROOF STAND OFF	27
—	EXISTING ROOF MEMBER	N/A
□	SOLAR PANELS	20
▨	2015 IFC SETBACK	N/A



SITE PLAN
 5.0kWAC 5.7kWDC PV PLANT
 VASQUEZ RESIDENCE
 637 VFW BLVD
 SAN ANTONIO, TX 78214
 JOB#11085

NOTE
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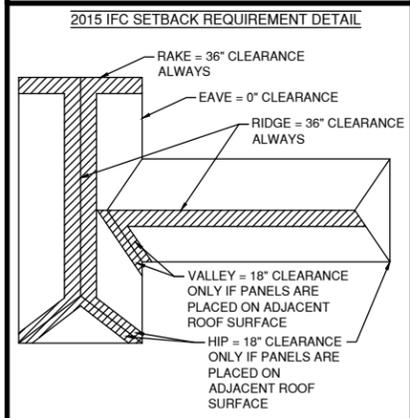
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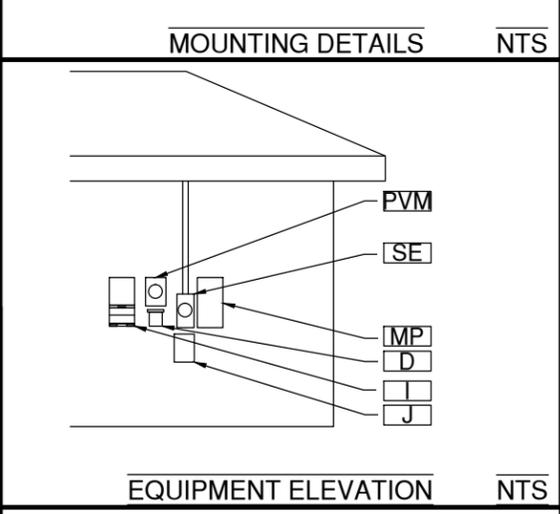
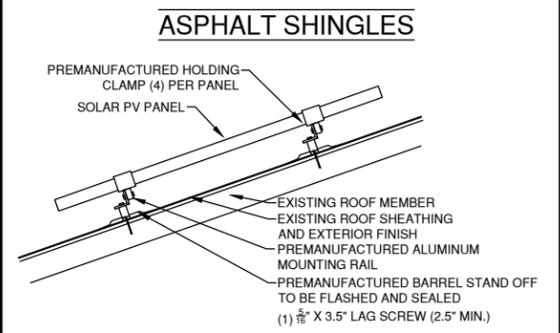
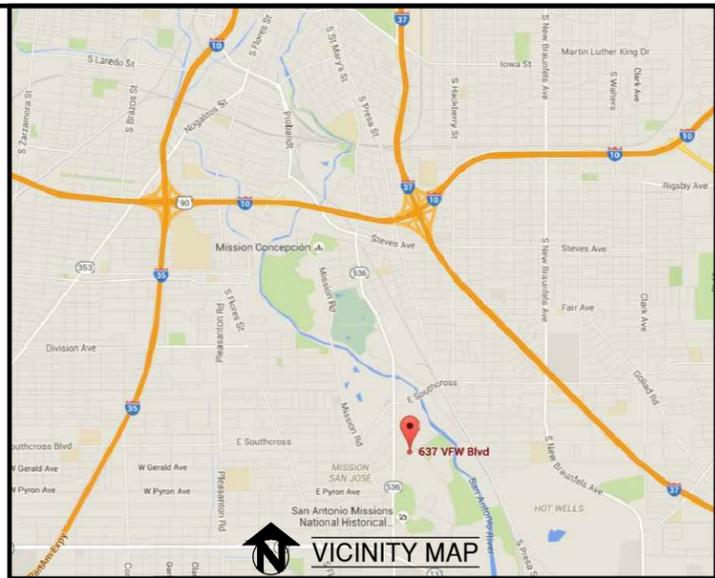
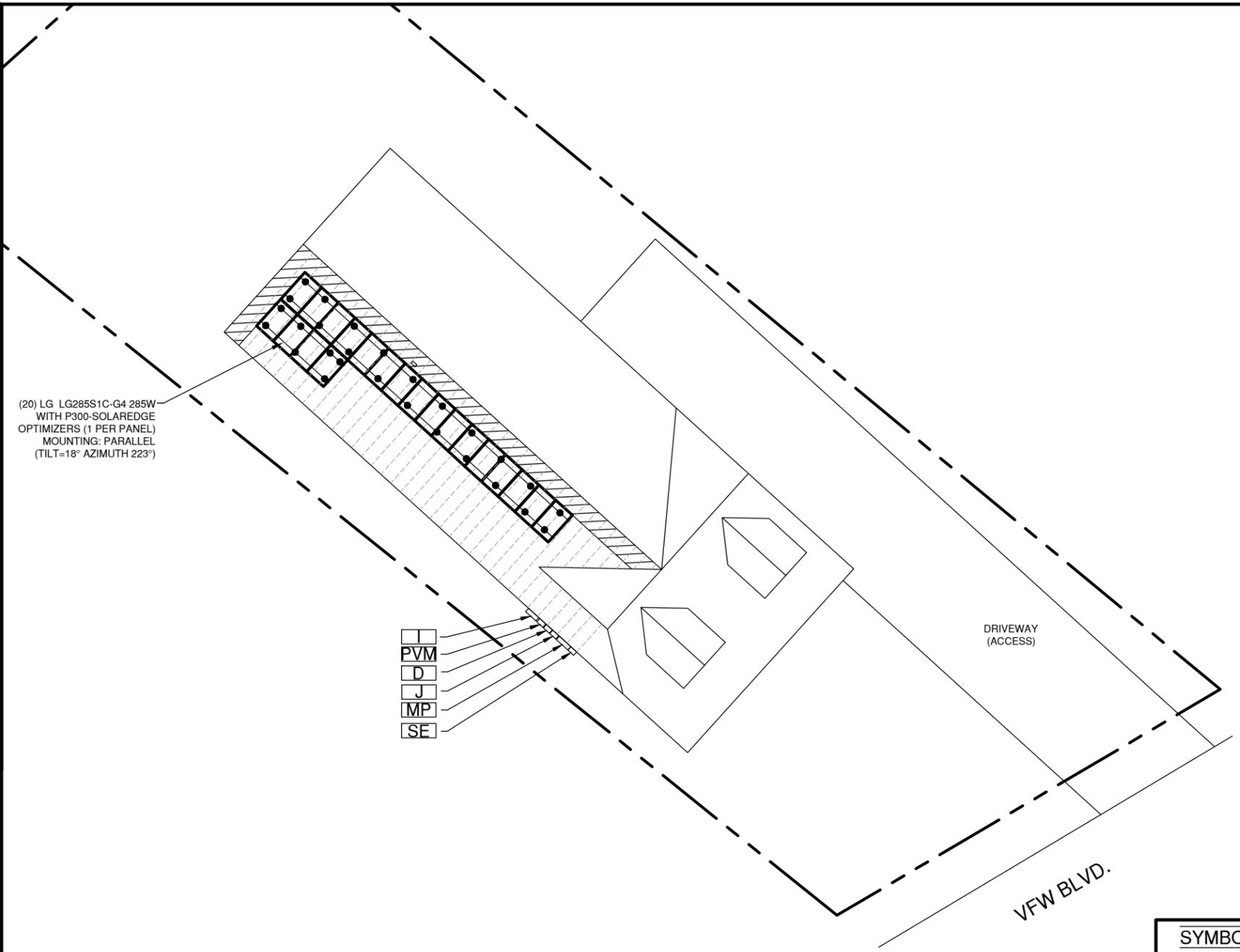
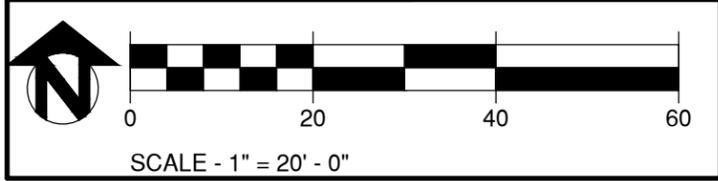
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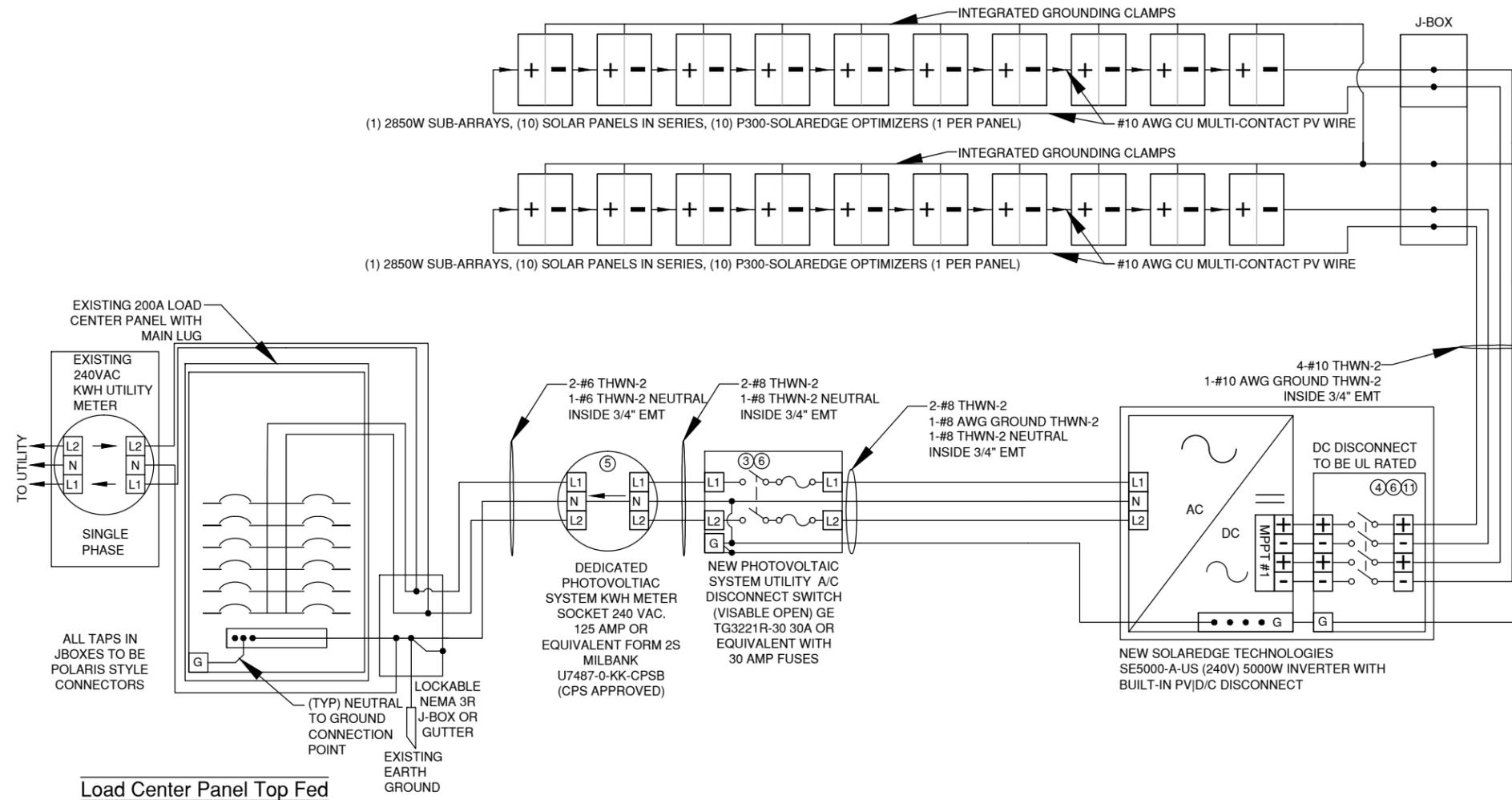
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STRUCTURAL SITE PLAN
 5.0kWAC 5.7kWDC PV PLANT
 VASQUEZ RESIDENCE
 637 VFW BLVD
 SAN ANTONIO, TX 78214
 JOB#11085



5.0kWAC 5.7kWDC PV PLANT

NOTES

1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH NEC AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
2. LABEL BREAKER "PHOTOVOLTAIC ELECTRIC POWER SOURCE" PER NEC 705.10 AND "BREAKERS ARE BACKFED" PER 690-64(B)(5). LABEL MAXIMUM A/C OUTPUT OPERATING CURRENT AND OPERATING VOLTAGE PER NEC 690.54
3. LABEL "PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH", SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE ACCESSIBLE PER UTILITY REQUIREMENTS AND CONFORM TO NEC 705.22
4. LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT SWITCH" PER NEC 690.14(C)(2). SWITCH TO BE LOCKED PER NEC 690.7(D)
5. LABEL "PHOTOVOLTAIC POWER SYSTEM DEDICATED KWH METER"
6. PROVIDE WARNING SIGN PER NEC 690.17 READING "WARNING- ELECTRIC SHOCK HAZARD- DO NOT TOUCH TERMINALS- TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OFF POSITION"
7. LISTING AGENCY NAMES AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B)
8. METALLIC CONDUIT SHALL BE USED WITHIN BUILDING PER NEC 690.31(E)
9. DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL, DO NOT ADD LOADS TO THIS PANEL
10. LABELS TO BE PERMANENTLY ETCHED
11. UN-GROUNDED SYSTEM-STRING IDENTIFICATION, DO NOT USE WHITE, GRAY, OR GREEN MARKING

SOLAR PANEL INFORMATION

LG ELECTRONICS-LG285S1C-G4 285W
UNDER STC CONDITIONS
 Voc= 39.0 VOLTS
 Isc= 9.43 AMPS
 Vmp= 32.3 VOLTS
 Imp= 8.88 AMPS



3-LINE
 5.0kWAC 5.7kWDC PV PLANT
 VASQUEZ RESIDENCE
 637 VFW BLVD
 SAN ANTONIO, TX 78214
 JOB#11085

(RED WITH 3/8" WHITE LETTERS)

PV METER

(RED WITH 3/8" WHITE LETTERS)

WARNING: ELECTRICAL SHOCK HAZARD TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

(RED WITH 3/8" WHITE LETTERS)

WARNING: INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

(RED WITH 3/8" WHITE LETTERS)

WARNING: THIS PREMISE IS SUPPLIED BY MORE THAN ONE SOURCE OF ELECTRICAL POWER (UTILITY,PV)

SE5000-A-US

(RED WITH 3/8" WHITE LETTERS)

<u>PV SYSTEM DC DISCONNECT</u>		
RATED MAX. POWER-POINT CURRENT (IMP)	<u>17.76</u>	ADC
RATED MAX. POWER-POINT VOLTAGE (VMP)	<u>350.0</u>	VDC
MAXIMUM SYSTEM VOLTAGE (VOC)	<u>10.0</u>	VDC
SHORT-CIRCUIT CURRENT (ISC)	<u>2.0</u>	ADC

(RED WITH 3/8" WHITE LETTERS)

REVENUE METER

(RED WITH 3/8" WHITE LETTERS)

<u>PV SYSTEM AC DISCONNECT</u>		
RATED AC OUTPUT CURRENT	<u>21.0</u>	AMPS
NOMINAL OPERATING AC VOLTAGE	<u>240</u>	VOLTS

(RED WITH WHITE LETTERS)

**WARNING:
PHOTOVOLTAIC SYSTEM
EQUIPPED WITH
RAPID SHUTDOWN**

DC CONDUIT STICKER TO BE REFLECTIVE AND COMPLY WITH 605.11.1.2-605.11.1.4

ALL TAGS TO BE REFLECTIVE WITH RED BACKGROUND AND 3/8" WHITE LETTERING



PLAQUES / NAMEPLATES
5.0kWAC 5.7kWDC PV PLANT
VASQUEZ RESIDENCE
637 VFW BLVD
SAN ANTONIO, TX 78214
JOB#11085



LG Mono X[®] Plus **LG285S1C-G4**

60 cell

LG Mono X[®] Plus is LG Electronics' high-quality monocrystalline module. The quality is the result of our strong commitment to developing a module to improve benefits for customers. Features of LG Mono X[®] Plus include durability, convenient installation, and aesthetic exterior.



Enhanced Performance Warranty

LG Mono X[®] Plus provides the enhanced performance warranty. The initial degradation has been improved from -3% to -2%, and the annual degradation has also changed from -0.7%/yr to -0.6%/yr.



Reduced LID (LiLY Technology)

LG Mono X[®] Plus has improved the initial degradation by applying LG's new LiLY (LID-improvement for Lifetime Yield) Technology, which controls formation of Boron-Oxygen pair, the key factor of LID.



Improved Product Warranty

In addition to the enhanced performance warranty, LG has extended the product warranty of LG Mono X[®] Plus for additional 2 years with its newly reinforced frame design.



Aesthetic Roof

LG Mono X[®] Plus may increase the house value with its shiny black frames. Also, it looks similar to all-black module from a long distance.



Outstanding Durability

With newly reinforced frame design, LG Mono X[®] Plus can endure the static snow load up to 6000 Pa, and the static wind load up to 5400 Pa.



Light and Convenient

LG Mono X[®] Plus is carefully designed to benefit installers by allowing quick installation with a weight of just 17kg and better grips.

About LG Electronics

LG Electronics is a global player who has been committed to expanding its capacity, based on solar energy business as its future growth engine. We embarked on a solar energy source research program in 1985, supported by LG Group's rich experience in semi-conductor, LCD, chemistry, and materials industry. We successfully released the first Mono X[®] series to the market in 2010, which were exported to 32 countries in the following 2 years, thereafter. In 2013, LG NeON™ (previously known as Mono X[®] NeON) won "Intersolar Award," which proved LG is the leader of innovation in the industry.



SolarEdge Power Optimizer

Module Add-On For North America

P300 / P400 / P405



POWER OPTIMIZER

PV power optimization at the module-level

- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety



SolarEdge Power Optimizer

Module Add-On for North America

P300 / P400 / P405

	P300 (for 60-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	
INPUT				
Rated Input DC Power ⁽¹⁾	300	400	405	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48	80	125	Vdc
MPPT Operating Range	8 - 48	8 - 80	12.5 - 105	Vdc
Maximum Short Circuit Current (Isc)		10		Adc
Maximum DC Input Current		12.5		Adc
Maximum Efficiency		99.5		%
Weighted Efficiency		98.8		%
Overvoltage Category		II		
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)				
Maximum Output Current		15		Adc
Maximum Output Voltage		60	85	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)				
Safety Output Voltage per Power Optimizer		1		Vdc
STANDARD COMPLIANCE				
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3			
Safety	IEC62109-1 (class II safety), UL1741			
RoHS	Yes			
INSTALLATION SPECIFICATIONS				
Maximum Allowed System Voltage	1000			Vdc
Dimensions (W x L x H)	Pxxx-2 series	141 x 212 x 40.5 / 5.55 x 8.34 x 1.59		mm / in
	Pxxx-5 series	128 x 152 x 27.5 / 5 x 5.97 x 1.08	128 x 152 x 35 / 5 x 5.97 x 1.37	128 x 152 x 48 / 5 x 5.97 x 1.89
Weight (including cables)	Pxxx-2 series	950 / 2.1		gr / lb
	Pxxx-5 series	770 / 1.7	930 / 2.05	930 / 2.05
Input Connector	MC4 Compatible			
Output Wire Type / Connector	Double Insulated; MC4 Compatible			
Output Wire Length	0.95 / 3.0	1.2 / 3.9		m / ft
Operating Temperature Range	-40 - +85 / -40 - +185			°C / °F
Protection Rating	Pxxx-2 series	IP65 / NEMA4		
	Pxxx-5 series	IP68 / NEMA6P		
Relative Humidity	0 - 100			%

⁽¹⁾ Rated STC power of the module. Module of up to +5% power tolerance allowed.

PV SYSTEM DESIGN USING A SOLAREEDGE INVERTER ⁽²⁾	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	8	10	18	
Maximum String Length (Power Optimizers)	25	25	50	
Maximum Power per String	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations		Yes		

⁽²⁾ It is not allowed to mix P405 with P300/P400/P600/P700 in one string.





SolarEdge Single Phase Inverters

For North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /
SE7600A-US / SE10000A-US / SE11400A-US



INVERTERS

The best choice for SolarEdge enabled systems

- Integrated arc fault protection for NEC 2011 690.11 compliance
- Rapid shutdown for NEC 2014 690.12
- Superior efficiency (98%)
- Small, lightweight and easy to install on provided bracket
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- Outdoor and indoor installation
- Fixed voltage inverter, DC/AC conversion only
- Pre-assembled Safety Switch for faster installation
- Optional – revenue grade data, ANSI C12.1



Single Phase Inverters for North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /
SE7600A-US / SE10000A-US / SE11400A-US

	SE3000A-US	SE3800A-US	SE5000A-US	SE6000A-US	SE7600A-US	SE10000A-US	SE11400A-US	
OUTPUT								
Nominal AC Power Output	3000	3800	5000	6000	7600	9980 @ 208V 10000 @ 240V	11400	VA
Max. AC Power Output	3300	4150	5400 @ 208V 5450 @ 240V	6000	8350	10800 @ 208V 10950 @ 240V	12000	VA
AC Output Voltage Min.-Nom.-Max. ⁽¹⁾ 183 - 208 - 229 Vac	-	-	✓	-	-	✓	-	
AC Output Voltage Min.-Nom.-Max. ⁽¹⁾ 211 - 240 - 264 Vac	✓	✓	✓	✓	✓	✓	✓	
AC Frequency Min.-Nom.-Max. ⁽¹⁾	59.3 - 60 - 60.5							Hz
Max. Continuous Output Current	12.5	16	24 @ 208V 21 @ 240V	25	32	48 @ 208V 42 @ 240V	47.5	A
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							Yes
INPUT								
Maximum DC Power (STC)	4050	5100	6750	8100	10250	13500	15350	W
Transformer-less, Ungrounded	Yes							
Max. Input Voltage	500							Vdc
Nom. DC Input Voltage	325 @ 208V / 350 @ 240V							Vdc
Max. Input Current ⁽²⁾	9.5	13	16.5 @ 208V 15.5 @ 240V	18	23	33 @ 208V 30.5 @ 240V	34.5	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600k Ω Sensitivity							
Maximum Inverter Efficiency	97.7	98.2	98.3	98.3	98	98	98	%
CEC Weighted Efficiency	97.5	98	97 @ 208V 98 @ 240V	97.5	97.5	97 @ 208V 97.5 @ 240V	97.5	%
Nighttime Power Consumption	< 2.5						< 4	W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, RS232, Ethernet, ZigBee (optional)							
Revenue Grade Data, ANSI C12.1	Optional ⁽³⁾							
Rapid Shutdown – NEC 2014 690.12	Yes							
STANDARD COMPLIANCE								
Safety	UL1741, UL1699B, UL1998, CSA 22.2							
Grid Connection Standards	IEEE1547							
Emissions	FCC part15 class B							
INSTALLATION SPECIFICATIONS								
AC output conduit size / AWG range	3/4" minimum / 16-6 AWG						3/4" minimum / 8-3 AWG	
DC input conduit size / # of strings / AWG range	3/4" minimum / 1-2 strings / 16-6 AWG						3/4" minimum / 1-3 strings / 14-6 AWG	
Dimensions with Safety Switch (HxWxD)	30.5 x 12.5 x 7.2 / 775 x 315 x 184						30.5 x 12.5 x 10.5 / 775 x 315 x 260	in / mm
Weight with Safety Switch	51.2 / 23.2		54.7 / 24.7				88.4 / 40.1	lb / kg
Cooling	Natural Convection				Natural convection and internal fan (user replaceable)	Fans (user replaceable)		
Noise	< 25						< 50	dBA
Min.-Max. Operating Temperature Range	-13 to +140 / -25 to +60 (-40 to +60 version available ⁽⁴⁾)							°F / °C
Protection Rating	NEMA 3R							

⁽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⁾ Revenue grade inverter P/N: SExxxxA-US000NNR2 (for 7600W inverter:SE7600A-US002NNR2).

⁽⁴⁾ -40 version P/N: SExxxxA-US000NNU4 (for 7600W inverter:SE7600A-US002NNU4).



RoHS

SERIES 100 UL FLASHED L FOOT KIT

SnapNrack Solar Mounting Solutions

The SnapNrack line of solar mounting solutions is designed to reduce total installation costs. The system's technical innovations have been proven to drive down costs and improve installation quality on more than 350 MW of solar installations.

Flashed L Foot Simplified

SnapNrack Series 100 Flashed L Foot Kit is an innovative solution to provide a long lasting watertight seal over the life of the system. The Flashed L Foot provides a fully flashed roof fastener for attachment to composition roof with no required cutting of shingles. The L Foot is engineered for maximum adjustability for a clean level installation.

- 1" slotted bolt connection
- 1" spacers available for increased adjustability
- Clear or Black anodized aluminum components (both available with black flashing)
- No Cutting of shingles



Flashed L Foot in 4 Simple Steps:

- 1) Locate a rafter in the roof using a pilot drill
- 2) Install base to the roof on top of the composition shingle
- 3) Use a breaker bar to separate the composition shingles above the base, and install the flashing
- 4) Attach the L foot on top and proceed with rail installation and leveling

Place order with your distributor. Purchase material for a single project or order in bulk for additional savings

Patent Pending



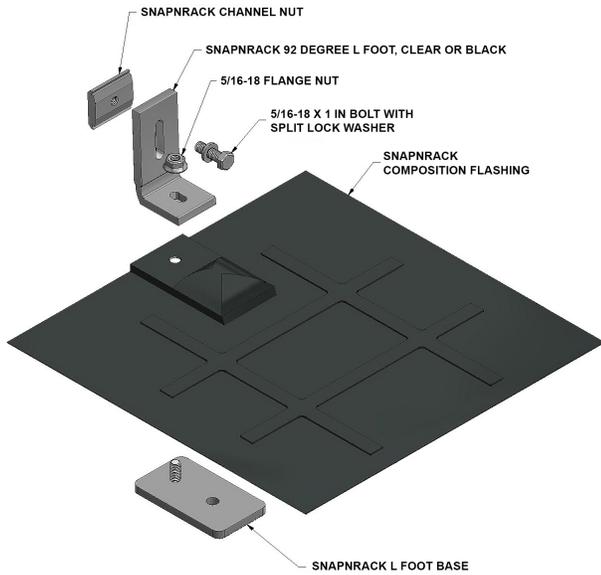


Flashed L Foot Kit Parts

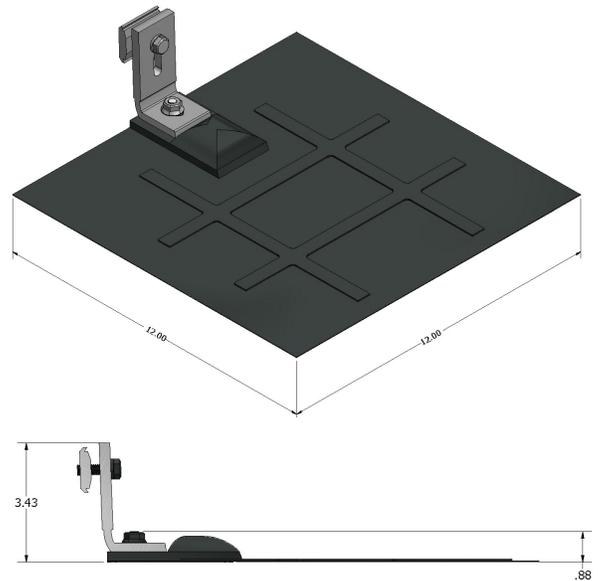


Flashed L Foot Kit Assembled

Flashed L Foot Kit Assembly



Flashed L Foot Kit Dimensions



SnapNrack Flashed L Foot Technical Data <small>Patent Pending</small>	
Materials	<ul style="list-style-type: none"> 6000 Series Aluminum L Foot & Base Stainless Steel Hardware Galvanized Steel Flashing w/ black all weather coating
Material Finish	<ul style="list-style-type: none"> Clear and black anodized aluminum
Weight	<ul style="list-style-type: none"> 1.3 lbs
Design Uplift Load	<ul style="list-style-type: none"> 350 lbs Uplift
Design Ultimate Load	<ul style="list-style-type: none"> 1,000 lbs Uplift
Warranty	<ul style="list-style-type: none"> 10 Year material and workmanship

SnapNrack™
Solar Mounting Solutions

(877) 732-2860 www.SnapNrack.com

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