HISTORIC AND DESIGN REVIEW COMMISSION

March 21, 2018

HDRC CASE NO:	**2018-124**
ADDRESS:	355 E KINGS HWY
LEGAL DESCRIPTION:	NCB 6327 BLK 2 LOT W 39.70' OF E 45' OF THE S 100' OF 56 & SW TRI 34.32' OF 57
ZONING:	R-5 H
CITY COUNCIL DIST.:	1
DISTRICT:	Monte Vista Historic District
APPLICANT:	Joel Turney
OWNER:	Samuel Asvestas
TYPE OF WORK:	Installation of solar panels
APPLICATION RECEIVED:	March 02, 2018
60-DAY REVIEW:	May 01, 2018

REQUEST:

The applicant is requesting a Certificate of Appropriateness for approval to install a roof-mounted solar array on the primary structure located at 355 E Kings Hwy.

APPLICABLE CITATIONS:

Historic Design Guidelines, Chapter 3,Guidelines for Additions

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.
iii. *Mounting (flat roof surfaces)*—Mount solar collectors flush with the surface of a flat roof to the maximum extent feasible. Where solar access limitations preclude a flush mount, locate panels towards the rear of the roof where visibility from the public right-of-way will be minimized.

FINDINGS:

a. The primary structure located at 355 E Kings Hwy is a 2-story single family home constructed circa 2017 with Prairie Revival influences. The structure is non-contributing to the Monte Vista Historic District.
b. LOCATION – The applicant is requesting approval to install 36 solar panels on the west elevation of the primary 2-story structure. The roof has a very low slope. According to the Historic Design Guidelines for Additions 6.C.i, solar collectors should be located on a side or rear roof pitch to the maximum extent possible. Staff finds that the location of the panels is appropriate and that the panels are minimally visible from the public right-of-way based on their location and the minimal pitch of the roof.
c. PITCH – The panels will be installed flush with the roof pitch. Staff finds the proposal consistent with the Guidelines.

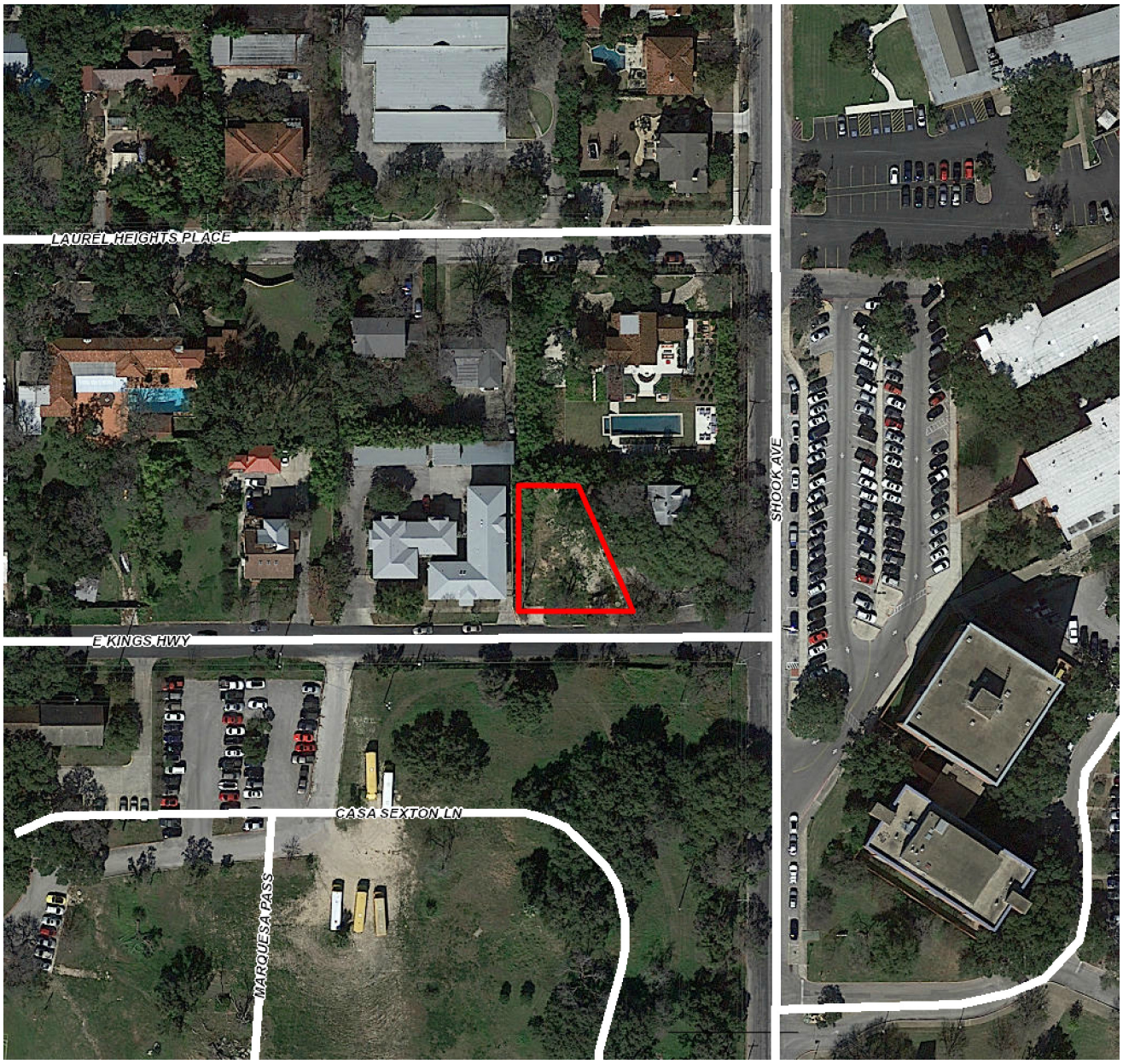
RECOMMENDATION:

Staff recommends approval based on findings a through c with the following stipulations:

i. That the solar panels maintain at least 18” of separation from the roof eaves.

CASE MANAGER:

Stephanie Phillips



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Flex Viewer

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Printed:Mar 10, 2018


NATIONAL


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CONSTRUCTION RENTALS
1-800-352-5675


NATIONAL

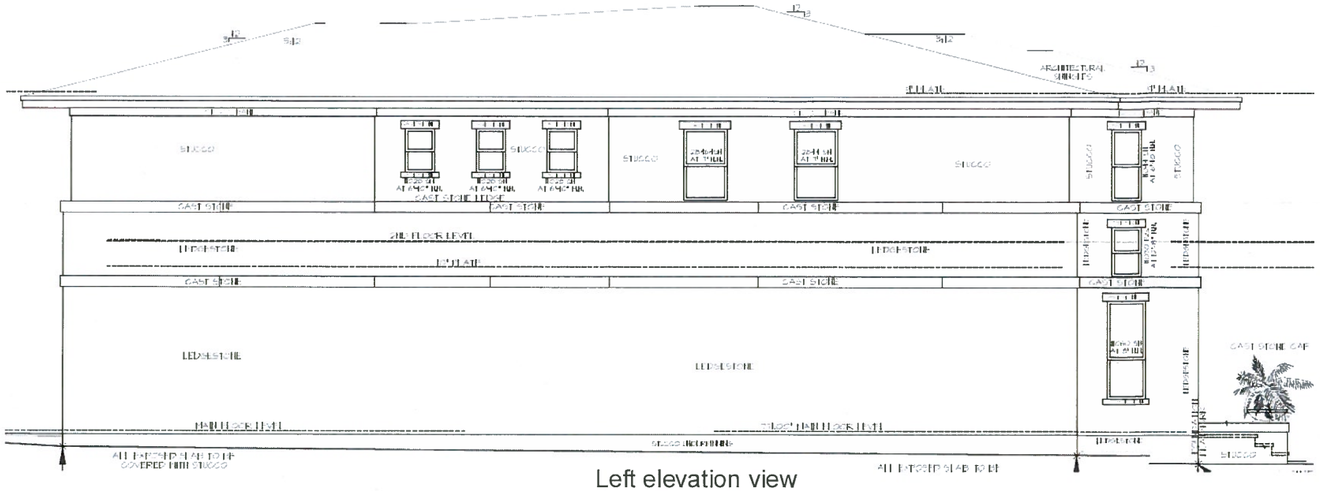
TURNEY LIGHITNG AND ELECTRIC

355 E Kings Highway

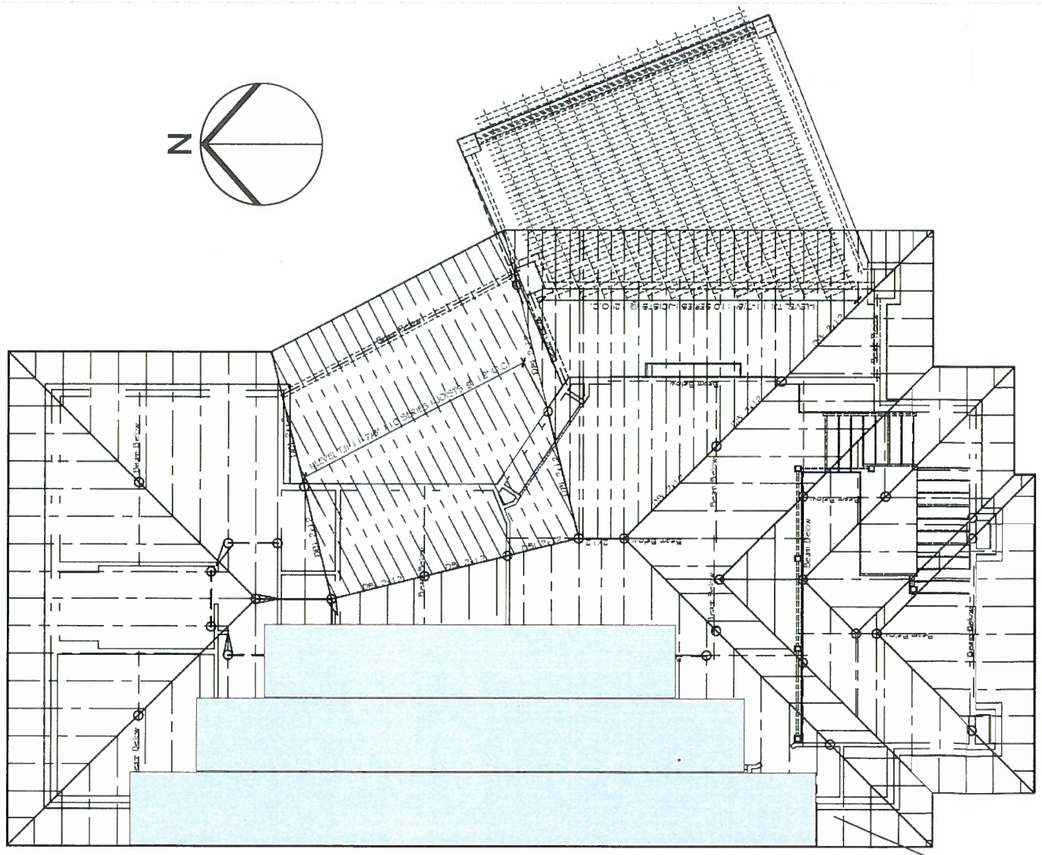
Full roof layout in relation to panels.

NOT TO SCALE.
See the detailed roof plan that holds panels for scale drawing.

Metal Roof. Standing Seam.
36 modules.
14.03 degree pitch.
3:12 pitch.3 vertical, 12-horizontal



Left elevation view

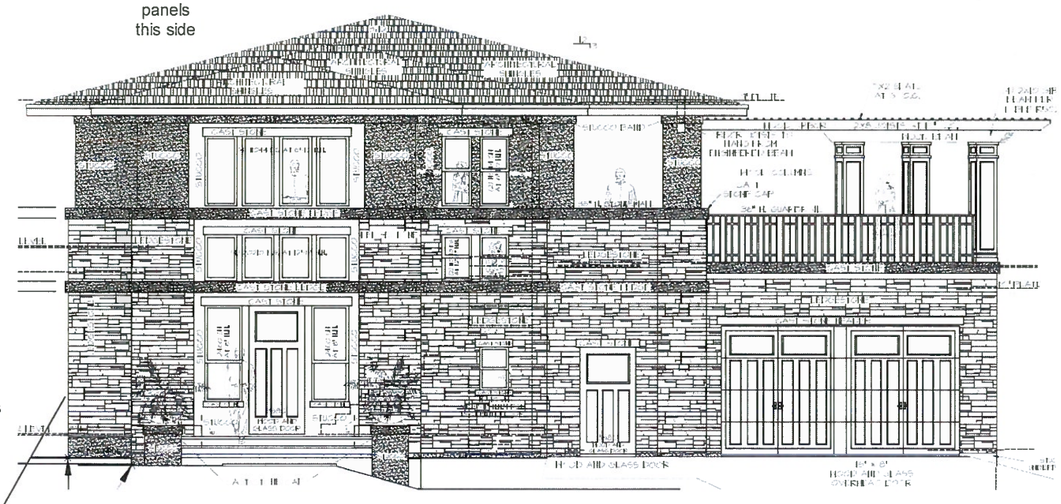


Left side of house
Birds eye view

ROOF PLAN

Front of House. faces Kings Hwy.

Solar panels this side



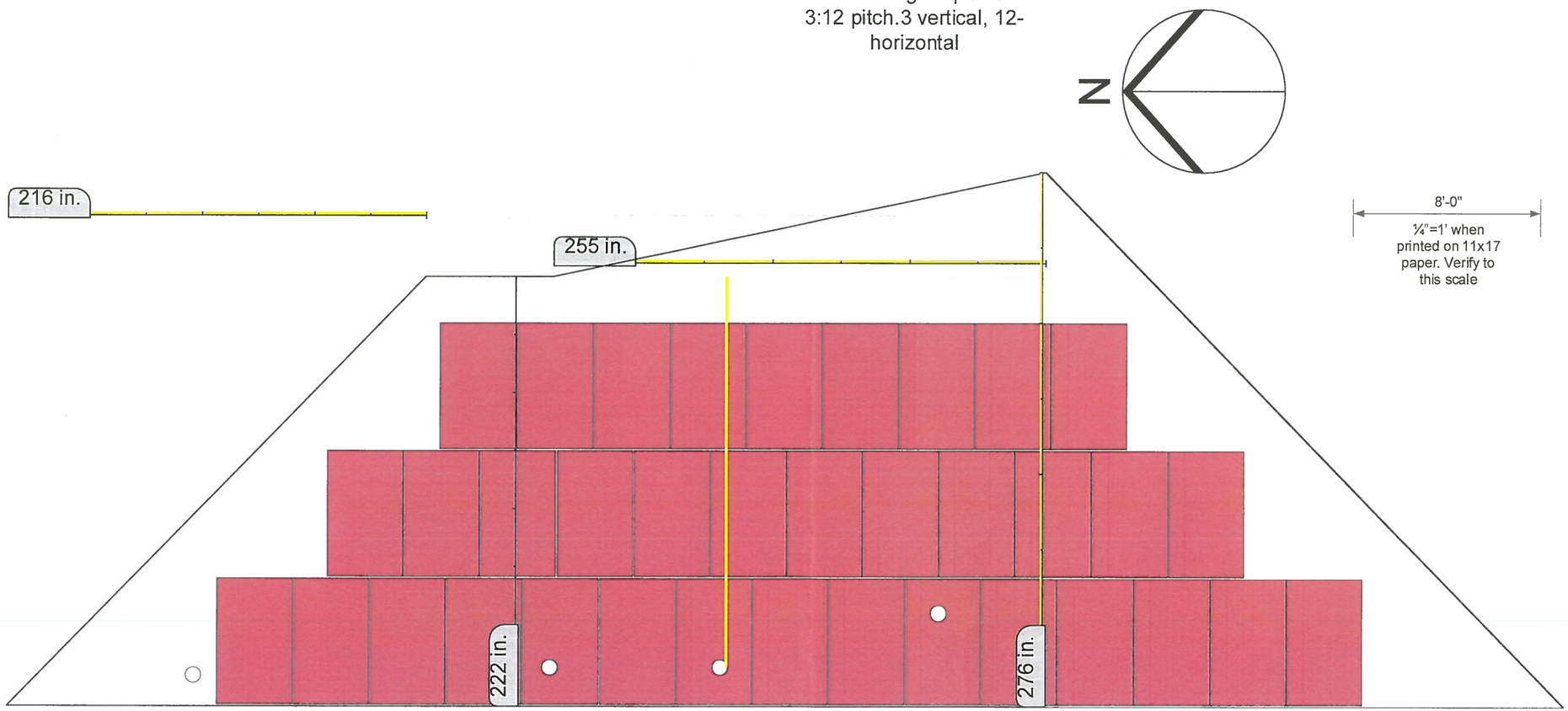
Front elevation view

Electrical service Here.

TURNEY LIGHITNG AND ELECTRIC

355 E Kings Highway
Original 8-10-17
Rev 8-10-17 removed fireplace.
Revised 2-28-18 added measurements and scale verification bar.

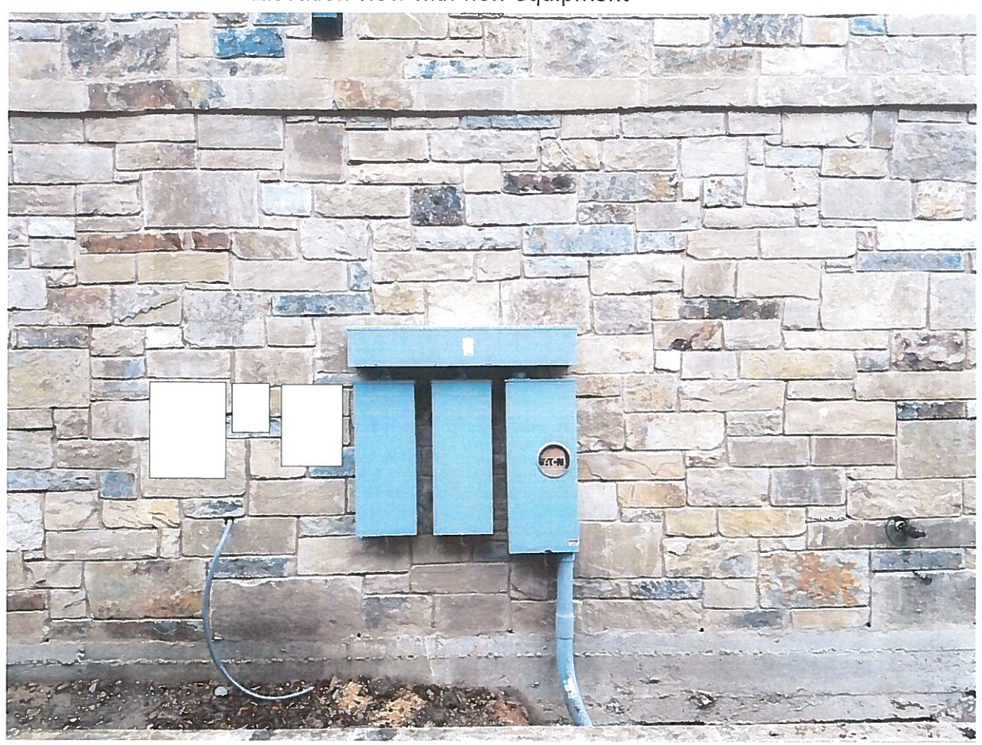
Metal Roof. Standing Seam.
36 modules.
14.03 degree pitch.
3:12 pitch.3 vertical, 12-horizontal



Riser Diagram

Existing Elevation view

Elevation view with new equipment



TURNEY LIGHTING ELECTRIC AND SOLAR

355 Kings Hwy

Original 2-22-18

8X8X48 GUTTER

Solar Edge
HD wave inv
7.6kw 17.7" x 14.6"
7.6KW inv.

60a
Dis.
Stnrd.

PV METER
CODE 27
200AMP
METER
15.5"X13"

200AMP
MAIN BKR
GE
40A Bkr for P.O.I.

200AMP
MAIN BKR
GE

CPS
CODE 03
320AMP
METER
SOCKET
36.62"X15"
600MCM
LUGS

4'-0"

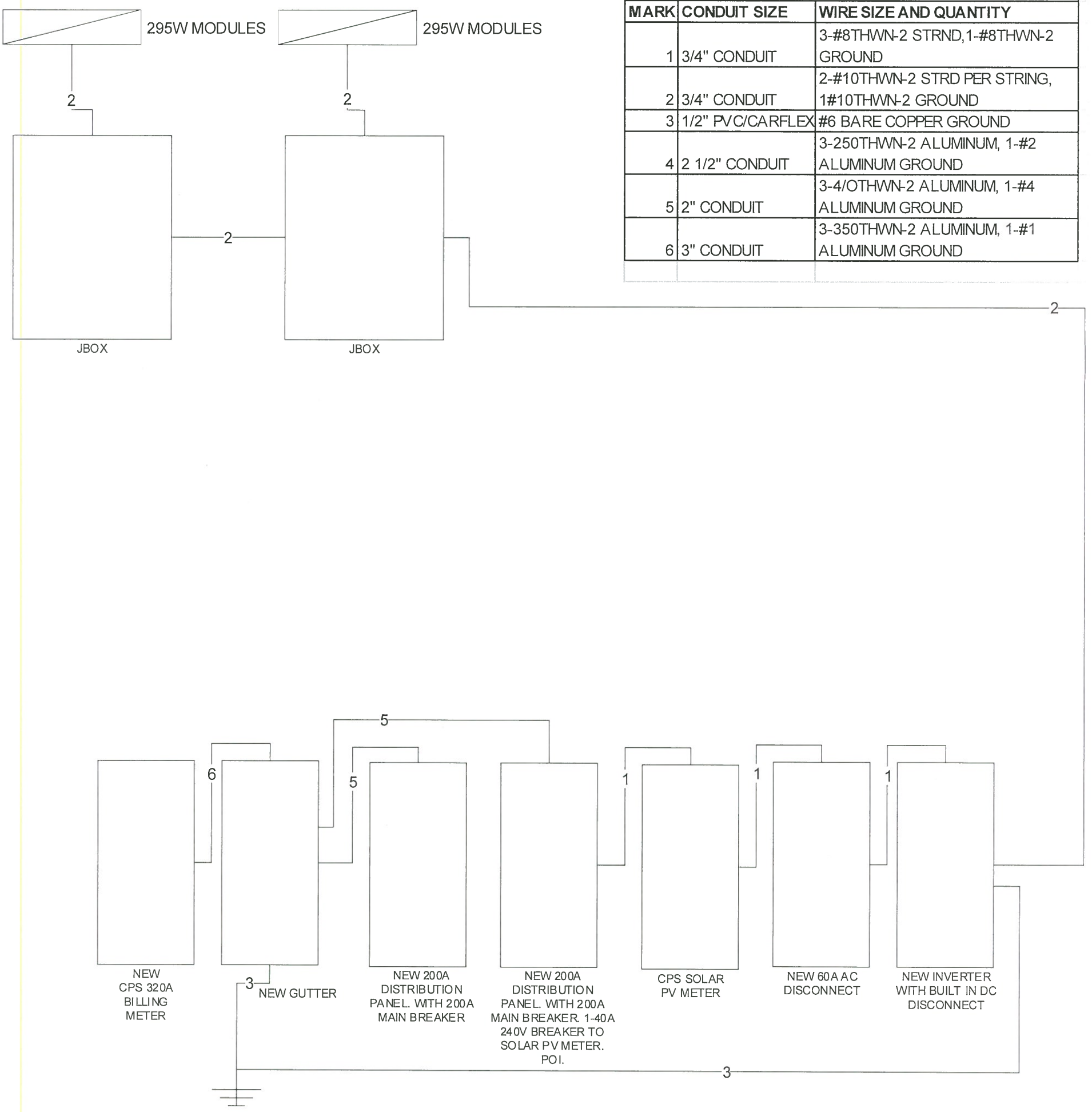
1" = 1' on 11x17
Verify to scale

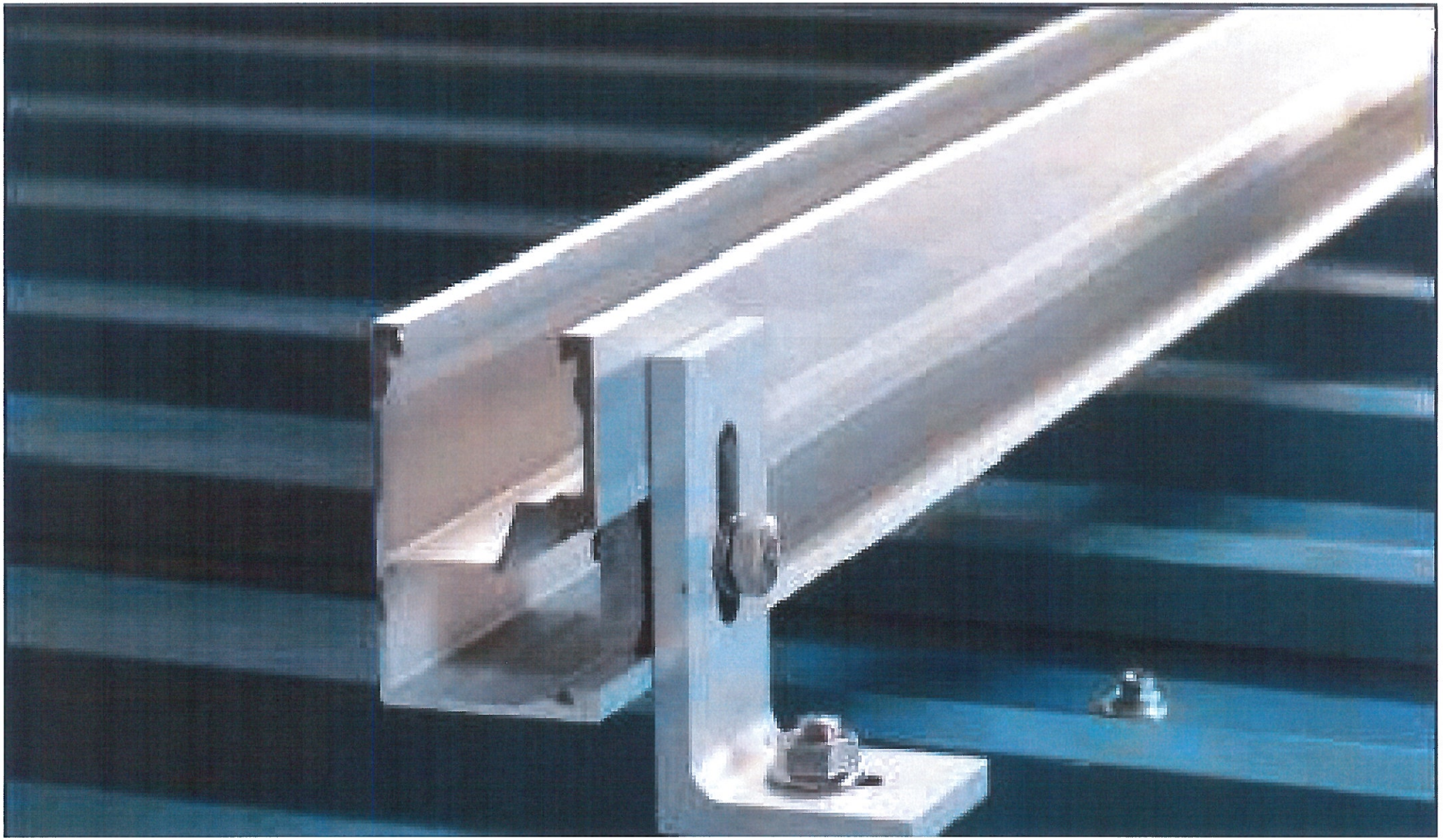
ELECTRICAL ONE LINE DIAGRAM/ SITE MAP

Turney Lighting and Electric

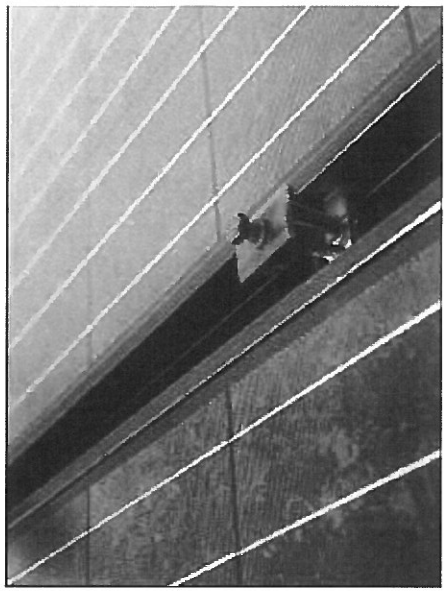
For new sub array. Snap-N-Rack UL series mounting system covers the EGC through the railing and to the modules. See attached certificate of compliance and submittals for UL listing. 1 new EGC ran to each new individual row of modules. Equipment ground for new optimizers provided through the rails. See attached specs.

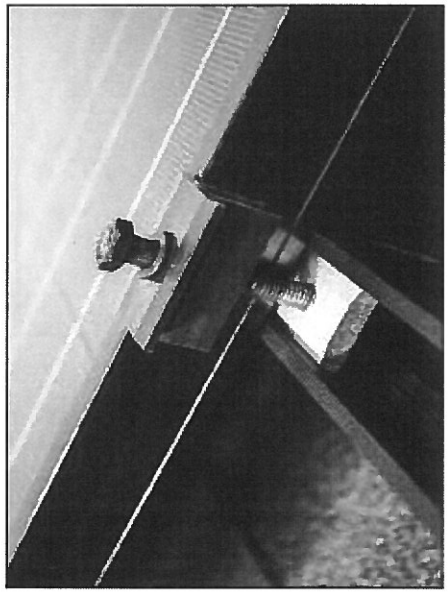
CABLE AND CONDUIT SCHEDULE		
MARK	CONDUIT SIZE	WIRE SIZE AND QUANTITY
1	3/4" CONDUIT	3-#8THWN-2 STRND,1-#8THWN-2 GROUND
2	3/4" CONDUIT	2-#10THWN-2 STRD PER STRING, 1#10THWN-2 GROUND
3	1/2" PVC/CARFLEX	#6 BARE COPPER GROUND
4	2 1/2" CONDUIT	3-250THWN-2 ALUMINUM, 1-#2 ALUMINUM GROUND
5	2" CONDUIT	3-4/OTHWN-2 ALUMINUM, 1-#4 ALUMINUM GROUND
6	3" CONDUIT	3-350THWN-2 ALUMINUM, 1-#1 ALUMINUM GROUND

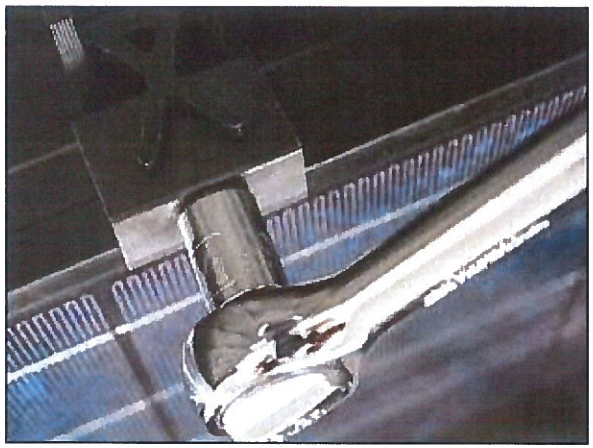


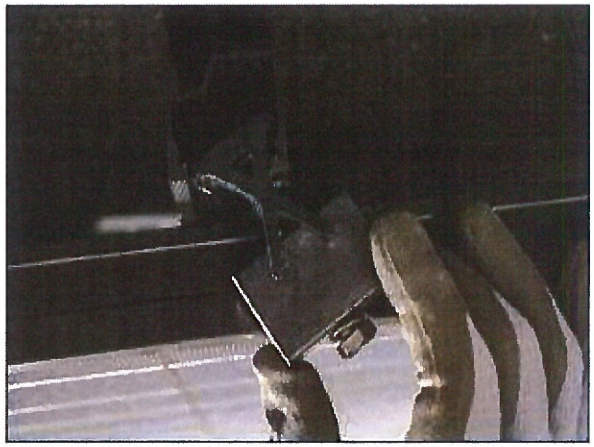



NORTH









MSE PERC 60

High Power PERC Rooftop Module

MISSION SOLAR ENERGY

- Class Leading Output: 300W power
- Advanced Technology: PERC and 4 busbars drive >18% module efficiency
- Superior Aesthetics: All-black design coupled with outstanding power output
- Certified Reliability: 3X IEC, salt mist, ammonia
- Buy American Act

Proudly assembled in the USA
Mission Solar Energy is headquartered in San Antonio, TX with module facilities onsite. Our hardworking team calls Texas home and is devoted to producing high quality solar products and services. Our supply chain includes local and domestic vendors increasing our impact to the U.S. economy.

Assembled in the USA

Superior Aesthetics
MSE PERC 60's slick all-black design coupled with outstanding power output makes it ideal for DG installations including commercial and rooftop systems.

Outstanding performance with PERC
Passivated Emitter Rear Contact (PERC) technology provides excellent power output through advanced cell structure.

Best in class quality
Mission Solar Energy production lines are fully automated and include multiple quality checks throughout the production process.

CERTIFICATIONS

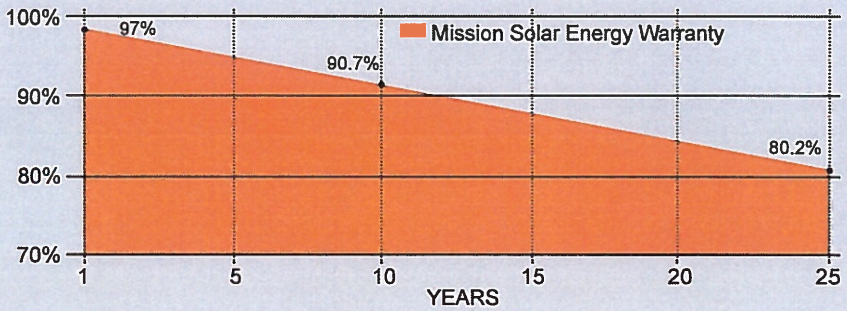
IEC 61215/ IEC 61730/ IEC 61701
UL 1703: CSA

Independently Audited by SOLARBUYER

PowerGuard SPECIALTY INSURANCE SERVICES

*As there are different certification requirements in different markets, please contact your local Mission Solar Energy sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

25-YEAR LINEAR WARRANTY



ELECTRICAL SPECIFICATIONS

Electrical parameters at Standard Test Condition (STC)

Module Type			MSE290SQ5T	MSE295SQ5T	MSE300SQ5T
Power Output	Pmax	Wp	290	295	300
Module Efficiency		%	17.45	17.75	18.05
Tolerance				0~+3%	
Short-Circuit Current	Isc	A	9.44	9.52	9.61
Open Circuit Voltage	Voc	V	39.81	40.11	40.18
Rated Current	Imp	A	8.95	9.03	9.17
Rated Voltage	Vmp	V	32.54	32.72	32.80

STC: Irradiance 1000 W/m2, Cell temperature of 25°C, AM 1.5

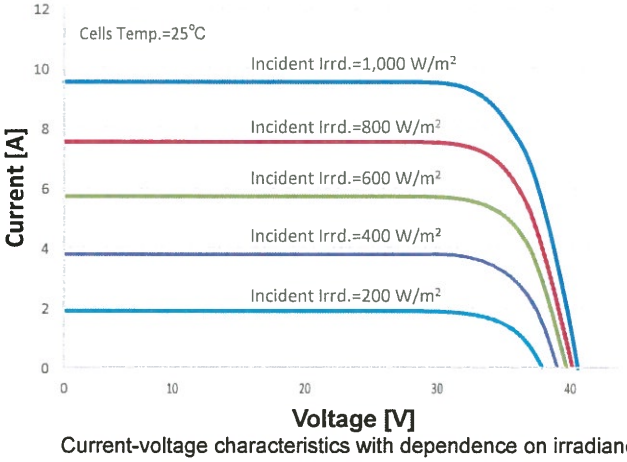
TEMPERATURE COEFFICIENTS

Normal Operating Cell Temperature (NOCT)	44°C (±2°C)
Temperature Coefficient of Pmax	-0.427%/°C
Temperature Coefficient of Voc	-0.318%/°C
Temperature Coefficient of Isc	0.042%/°C

OPERATING CONDITIONS

Maximum System Voltage	1,000VDC
Operating Temperature Range	-40°C (-40°F) to +90°C (194°F)
Maximum Series Fuse Rating	15A
Fire Safety Classification	Type 1, Class C
Static Load Wind/Snow	2400Pa/5400Pa
Hail Safety Impact Velocity	25mm at 23 m/s

MSE295SQ5T: 295WP, 60CELL SOLAR MODULE CURRENT-VOLTAGE CURVE

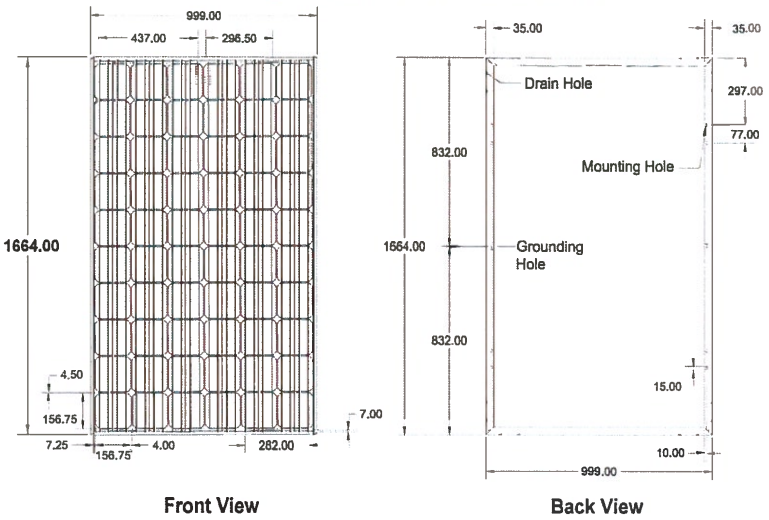


Current-voltage characteristics with dependence on irradiance and module temperature

MECHANICAL DATA

Solar Cells	P-type Mono-crystalline Silicon (156.75mm)
Cell orientation	60 cells (6x10), 4 busbar
Module dimension	1664mm x 999mm x 40mm (65.51 in. x 39.33 in. x 1.57 in.)
Weight	18.2 kg (40.1 lb)
Front Glass	3.2mm (0.126 in.) tempered, Low-iron, Anti-reflective coating
Frame	Anodized aluminum alloy
Encapsulant	Ethylene vinyl acetate (EVA)
J-Box	Protection class IP67 with 3 bypass-diodes
Cables	PV wire, 1m (39.37 in.), 4mm² / 12 AWG
Connector	MC4 or compatible

BASIC DESIGN (UNITS: mm)



MISSION SOLAR ENERGY

Mission Solar Energy reserves the right to make specification changes without notice.

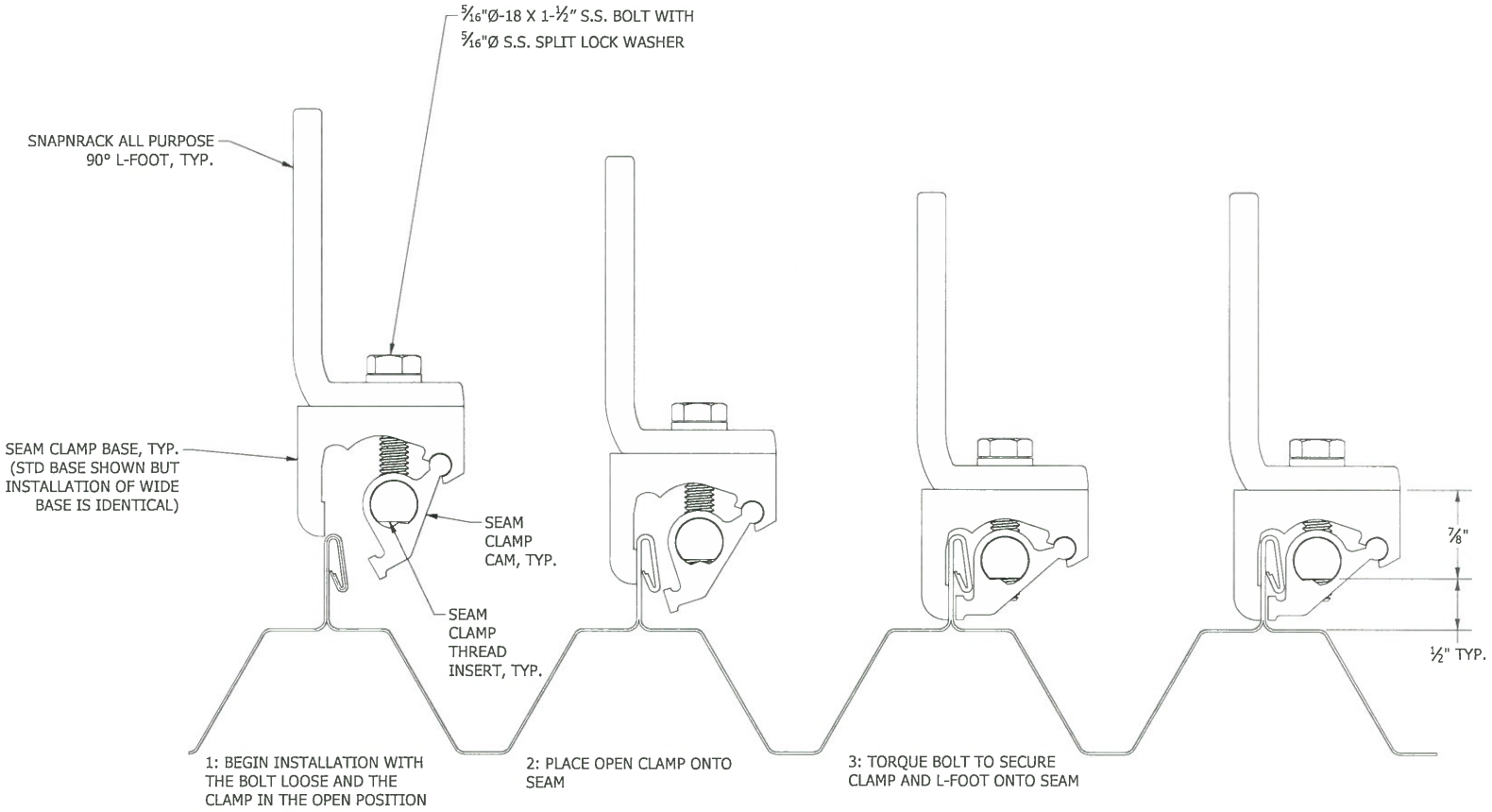
Rev. 7.03

8303 South New Braunfels Ave. | San Antonio | TX | 78235 | missionsolar.com | info@missionsolar.com | (210) 531-8600

CAMMING SEAM CLAMPS ARE SPECIFIED WITH A BLACK OXIDE STAINLESS STEEL BOLT. IT IS IMPORTANT TO USE THE PROVIDED BOLT AND TO TIGHTEN TO 16 FT-LBS FOR FULL LOAD CAPABILITY.

REVISION:

F	11/30/2013		
G	11/28/2017		ECF



SnapNrack™ Solar Mounting Solutions	Sunrun South LLC 595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.	DESIGNER: G.McPheeters DRAFTER: D.Ryan APPROVED BY: G.McPheeters	SCALE: DNS DATE: 11/28/2017	PART NUMBER: S100 PEN-D06	DESCRIPTION: SEAM CLAMP	REV G

CERTIFICATE OF COMPLIANCE

Certificate Number	20140204-E359313
Report Reference	E359313-20140201
Issue Date	2014-FEBRUARY-04

Issued to: SNAPNRACK
STE 200
775 FIERO LANE
SAN LUIS OBISPO CA 93401

This is to certify that representative samples of MOUNTING SYSTEMS, MOUNTING DEVICES, CLAMPING DEVICES AND GROUND LUGS FOR USE WITH PHOTOVOLTAIC MODULES AND PANELS

USL – Series 100 Mounting and Bonding Systems for use with Photovoltaic Modules

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL Subject 2703-the Outline of Investigation for Mounting Systems, Mounting Devices, Clamping/Retention Devices, And Ground Lugs for use with Flat-Plate Photovoltaic Modules and Panels

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Listing Mark should be considered as being covered by UL's Listing and Follow-Up Service.

The UL Listing Mark generally includes the following elements: the symbol UL in a circle: Ⓤ with the word "LISTED"; a control number (may be alphanumeric) assigned by UL; and the product category name (product identifier) as indicated in the appropriate UL Directory.

Look for the UL Listing Mark on the product.

William R. Carney, Director, North American Certification Programs

UL LLC

SnapNrack™
Solar Mounting Solutions

Series 100

Metal Roof Solutions

The Best Attachment Methods for Metal Roofs

- Preassembled hardware to reduce install time
- The fastest & most secure method for mounting on metal roofs
- Fully sealed & weatherproof to maintain the integrity of the roof
- Single tool installation using a standard 1/2" socket

Start Mounting Solar on Your Metal Roof Today

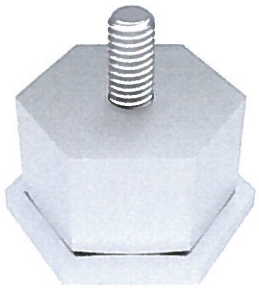
RESOURCES	snapnrack.com/resources
DESIGN	snapnrack.com/configurator
WHERE TO BUY	snapnrack.com/where-to-buy

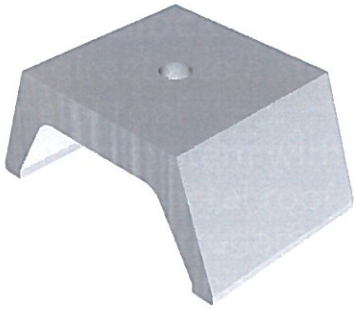
SnapNrack Metal Roof Solutions

provide installers with the most intuitive method for mounting Series 100 racking to metal roofs. SnapNrack's products are the most effective way of attaching to standing seam, corrugated metal and trapezoidal roofs.

Metal Roof Base

- Provides robust, self-sealing mounting base for metal roofs with a flat mounting surface
- Seals to the roof with integral EPDM rubber washer and top sealing cap
- Completed assembly finishes with L Foot attachment point for mounting Series 100 system



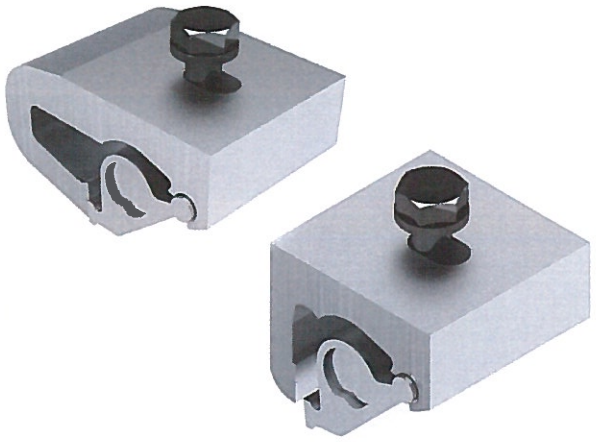


Corrugated Straddle Block

- Allows attachment directly to a structural member covered with corrugated metal roof
- Supports the mounting system without collapsing or crushing the ridge in the metal roof material
- Attaches at the peak of corrugation, out of water channel for improved weatherproofing

Standing Seam Clamps

- Single bolt installation of entire mount and L Foot reduces labor compared to the competition
- Available in two models that work with multiple standing seam metal roof configurations
- Cam-lock attachment provides industry-leading pull out resistance as the clamp tightens more when being pulled



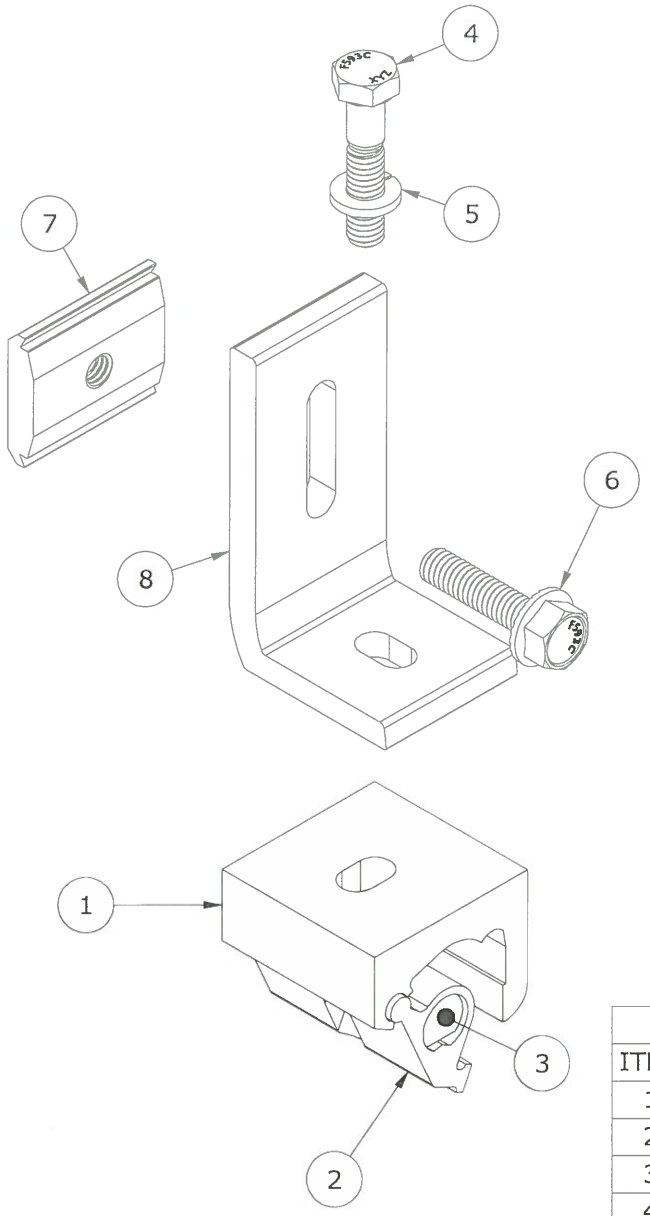
Quality. Performance. Innovation.

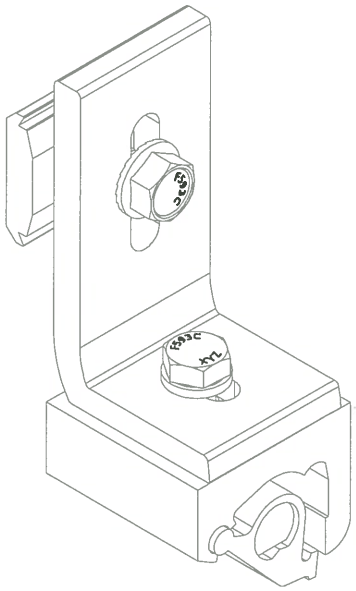
SnapNrack solutions are focused on simplifying the installation experience through intuitive products and the best wire management in the industry.

SnapNrack
Solar Mounting Solutions

877-732-2860 www.snapnrack.com contact@snapnrack.com

DESCRIPTION:	DRAWN BY:	SnapNrack™ Solar Mounting Solutions
SNAPNRACK, STANDARD BASE SEAM CLAMP WITH L FOOT	D.Ryan	
PART NUMBER(S):	REVISION:	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902
242-05150	B	THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.





PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	SNAPNRACK SEAM CLAMP STD BASE
2	1	SNAPNRACK SEAM CLAMP CAM
3	1	SNAPNRACK SEAM CLAMP INSERT
4	1	5/16IN-18 X 1-1/2IN SS HCS BOLT BLACK
5	1	5/16IN SS SPLIT LOCK WASHER BLACK
6	1	BOLT, FLANGED HEX, 5/16IN-18 X 1-1/4IN, SS
7	1	SNAPNRACK CHANNEL NUT 5/16IN-18
8	1	SNAPNRACK, AP90 L FOOT PRC, CLEAR

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL	OPTIONS:
DESIGN LOAD (LBS):	235 UP, 235 DOWN, 212 SIDE	
ULTIMATE LOAD (LBS):	686 UP, 353 DOWN, 637 SIDE	
TORQUE SPECIFICATION:	16.7 LB-FT	
CERTIFICATION:	UL 2703, FILE E359313	
WEIGHT (LBS):	0.56	

DESCRIPTION:

SNAPNRACK, STANDARD BASE SEAM CLAMP WITH L FOOT

PART NUMBER(S):

242-05150

DRAWN BY:

D.Ryan

REVISION:

B

SnapNrack™
Solar Mounting Solutions

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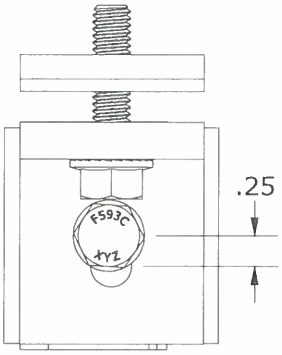
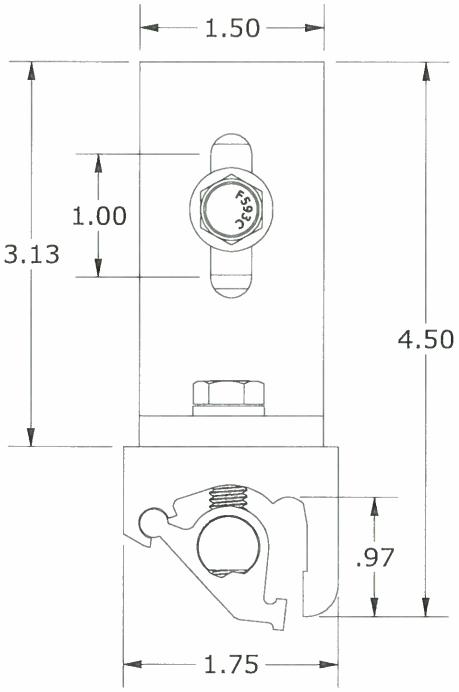
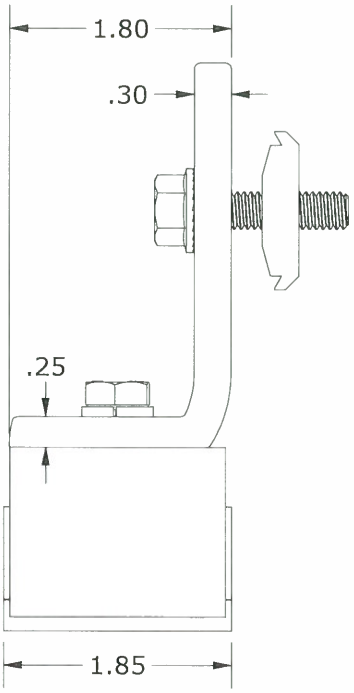






ALL DIMENSIONS IN INCHES

solaredge

SolarEdge Single Phase Inverters

for North America

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

INVERTERS

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Extremely small and easy to install outdoors or indoors
- High reliability without any electrolytic capacitors
- Built-in module-level monitoring
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

HD wave

Single Phase Inverters for North America

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

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	
OUTPUT						
Rated AC Power Output	3000	3800	5000	6000	7600	VA
Max. AC Power Output	3000	3800	5000	6000	7600	VA
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	-	✓	-	-	Vac
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5[1]					Hz
Maximum Continuous Output Current 208V	-	-	24	-	-	A
Maximum Continuous Output Current 240V	12.5	16	21	25	32	A
GFDI Threshold	1					A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes					
INPUT						
Maximum DC Power	4650	5900	7750	9300	11800	W
Transformer-less, Ungrounded	Yes					
Maximum Input Voltage	480					Vdc
Nominal DC Input Voltage	380				400	Vdc
Maximum Input Current 208V [2]	-	-	13.5	-	-	Adc
Maximum Input Current 240V [2]	8.5	10.5	13.5	16.5	20	Adc
Max. Input Short Circuit Current	45					Adc
Reverse-Polarity Protection	Yes					
Ground-Fault Isolation Detection	600kΩ Sensitivity					
Maximum Inverter Efficiency	99	99.2				%
CEC Weighted Efficiency	99					%
Nighttime Power Consumption	< 2.5					W
ADDITIONAL FEATURES						
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)					
Revenue Grade Data, ANSI C12.20	Optional[3]					
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect					
STANDARD COMPLIANCE						
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07					
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)					
Emissions	FCC Part 15 Class B					
INSTALLATION SPECIFICATIONS						
AC Output Conduit Size / AWG Range	0.75-1" Conduit / 14-6 AWG					
DC Input Conduit Size / # of Strings / AWG Range	0.75-1" Conduit /1-2 strings / 14-6 AWG					
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174					in / mm
Weight with Safety Switch	22 / 10		25.1 / 11.4	26.2 / 11.9		lb / kg
Noise	< 25				< 50	dBA
Cooling	Natural Convection				Natural convection and internal fan (user replaceable)	
Operating Temperature Range	-13 to +140 / -25 to +60[4] (-40°F / -40°C option)[5]					°F / °C
Protection Rating	NEMA 3R (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] Revenue grade inverter P/N: SExxxxH-US000NNC2
[4] Power de-rating from 50°C
[5] -40 version P/N: SExxxxH-US000NNU4

RoHS

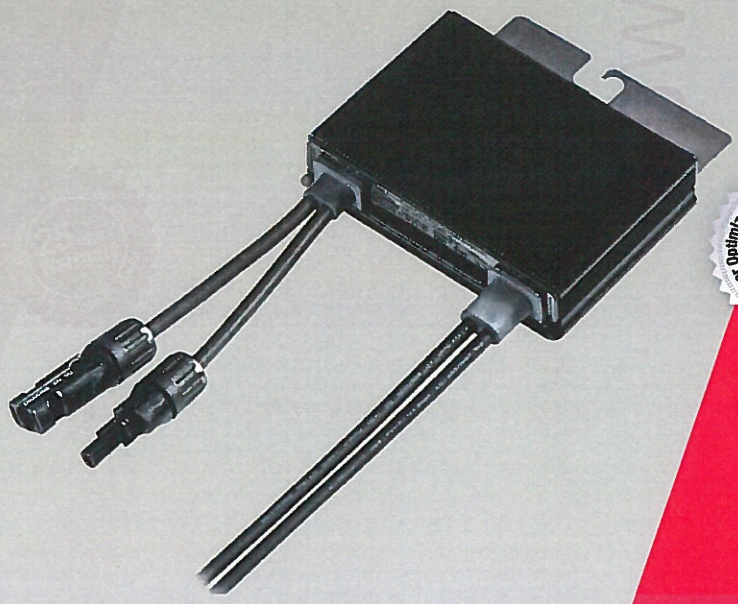
solaredge

SolarEdge Power Optimizer

Module Add-On For North America

P300 / P320 / P370 / 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 / P320 / P370 / P400 / P405

	P300 (for 60-cell modules)	P320 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	
INPUT						
Rated Input DC Power[1]	300	320	370	400	405	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	125	Vdc
MPPT Operating Range	8 - 48		8 - 60	8 - 80	12.5 - 105	Vdc
Maximum Short Circuit Current (Isc)	10	11		10.1		Adc
Maximum DC Input Current	12.5	13.75		12.63		Adc
Maximum Efficiency	99.5					%
Weighted Efficiency	98.8					%
Overvoltage Category	II					
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)						
Maximum Output Current	15					Adc
Maximum Output Voltage	60				85	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE 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
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters					
Dimensions (W x L x H)	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 50 / 5 x 5.97 x 1.96	mm / in
Weight (including cables)	630 / 1.4			750 / 1.7	845 / 1.9	gr / lb
Input Connector	MC4 Compatible		MC4 / Amphenol AH4	MC4 Compatible		
Output Wire Type / Connector	Double Insulated; MC4 Compatible		Double Insulated; MC4 / Amphenol AH4	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	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 SOLAREDGE INVERTER[2][3]	SINGLE PHASE HD-WAVE	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	5700 (6000 with SE7600H-US)	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations	Yes				

[2] For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf.
[3] It is not allowed to mix P405 with P300/P370/P400/P600/P700 in one string.