

HISTORIC AND DESIGN REVIEW COMMISSION

December 05, 2018

HDRC CASE NO: 2018-599
ADDRESS: 140 CALLAGHAN AVE
LEGAL DESCRIPTION: NCB 719 BLK 1 LOT NE 107.6 FT OF 10 OR RED 8
ZONING: RM-4 H
CITY COUNCIL DIST.: 1
DISTRICT: Lavaca Historic District
APPLICANT: South Texas Solar Systems
OWNER: Jill and Brian Murphy
TYPE OF WORK: Installation of solar panels on rear accessory structure
APPLICATION RECEIVED: November 16, 2018
60-DAY REVIEW: January 15, 2018
REQUEST:

The applicant is requesting a Certificate of Appropriateness to install a 25-panel solar array on the roof of the non-contributing rear accessory structure located at 140 Callaghan.

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.
- 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 140 Callaghan is a 2-story single family structure constructed in 2007. The property also contains a 1-story rear accessory structure, also constructed in 2007. The two structures are non-contributing to the Lavaca Historic District.
- b. **LOCATION** – The applicant is requesting approval to install 25 solar panels on the southwest and northeast facing sides of the rear accessory structure. Approximately 15 panels will be installed on the southwest-facing pitch of the gable and approximately 10 panels will be installed on the northeast-facing pitch of the gable. The primary and accessory structures are located on a corner lot, so the panels will be visible from the Canal St public right-of-way. 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 to minimize visibility from the street. While the panels will be visible from Canal St, staff finds the location appropriate due to the secondary nature of the rear accessory structure.
- c. **PITCH** – The panels facing southwest will be installed flush with the gable pitch. The panels facing northeast will be installed with a pitch to collect sun from the south. While the applicant has not indicated the exact degree of the pitch, the submitted renderings appear to indicate a pitch of approximately 60 degrees. According to the Historic Design Guidelines, solar collectors should be mounted flush with the surface of a sloped roof. Staff does not find the proposed pitch consistent with the Guidelines.

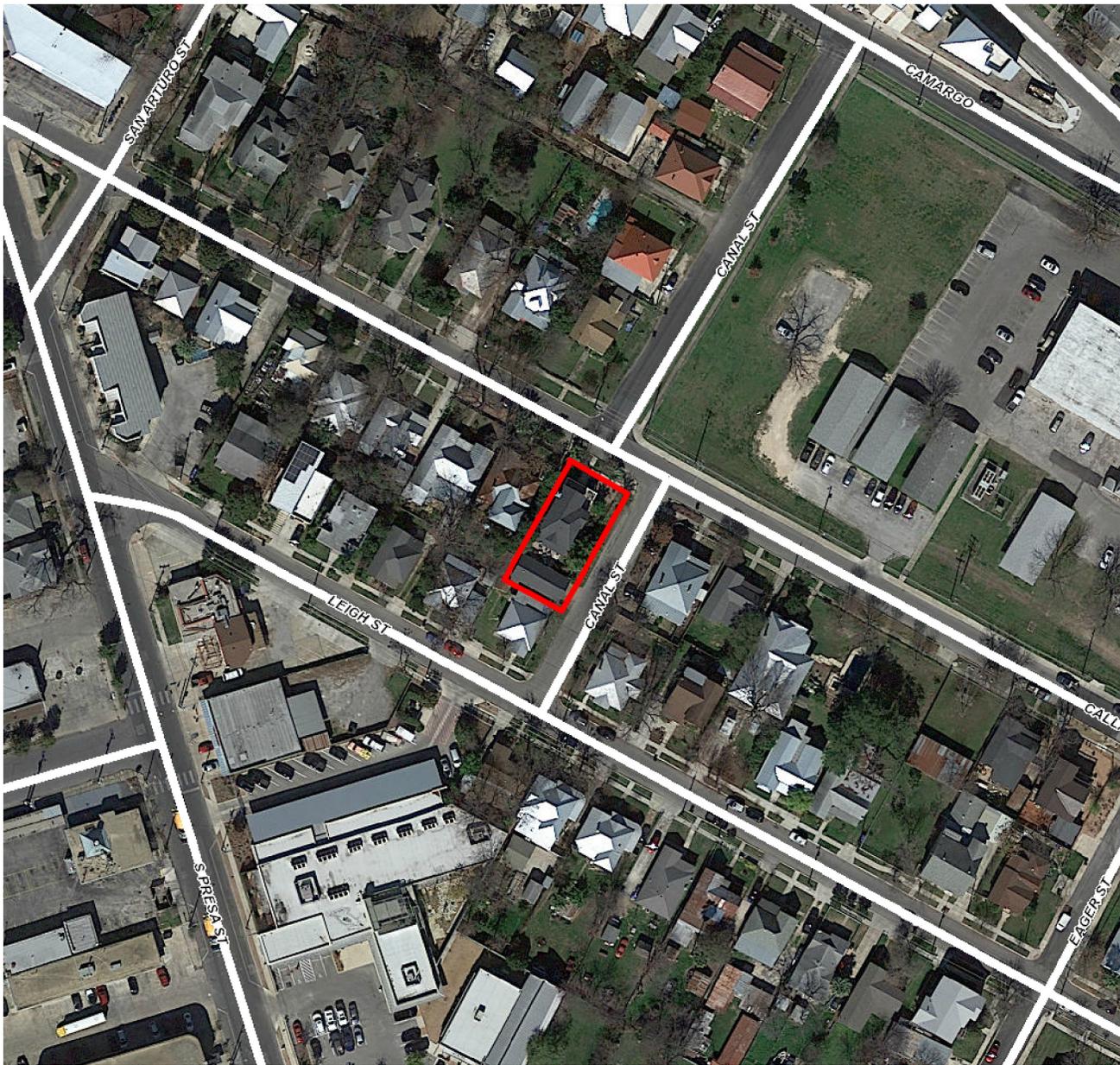
RECOMMENDATION:

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

- i. That the applicant modifies the pitch of the northeast-facing panels to be flush with the roof pitch or, alternatively, relocates these panels to the rear of the primary structure as noted in finding b. If panels are relocated to the primary structure, they are required to be installed flush with roof pitch. The applicant is required to submit updated documents to staff that reflect this change prior to receiving a Certificate of Appropriateness.
- ii. That the solar panels maintain at least 18” of separation from the roof eaves.

CASE MANAGER:

Stephanie Phillips



Flex Viewer

Powered by ArcGIS Server

Printed: Nov 20, 2018

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Written Narrative
Solar Panel Installation
Brian Murphy - Historical District

South Texas Solar Systems is asking to install solar panels on the residence of Brian Murphy- 140 Callaghan Ave San Antonio, TX 78210. South Texas Solar Systems will install 25 Mission Solar 340s to the roof of the home.



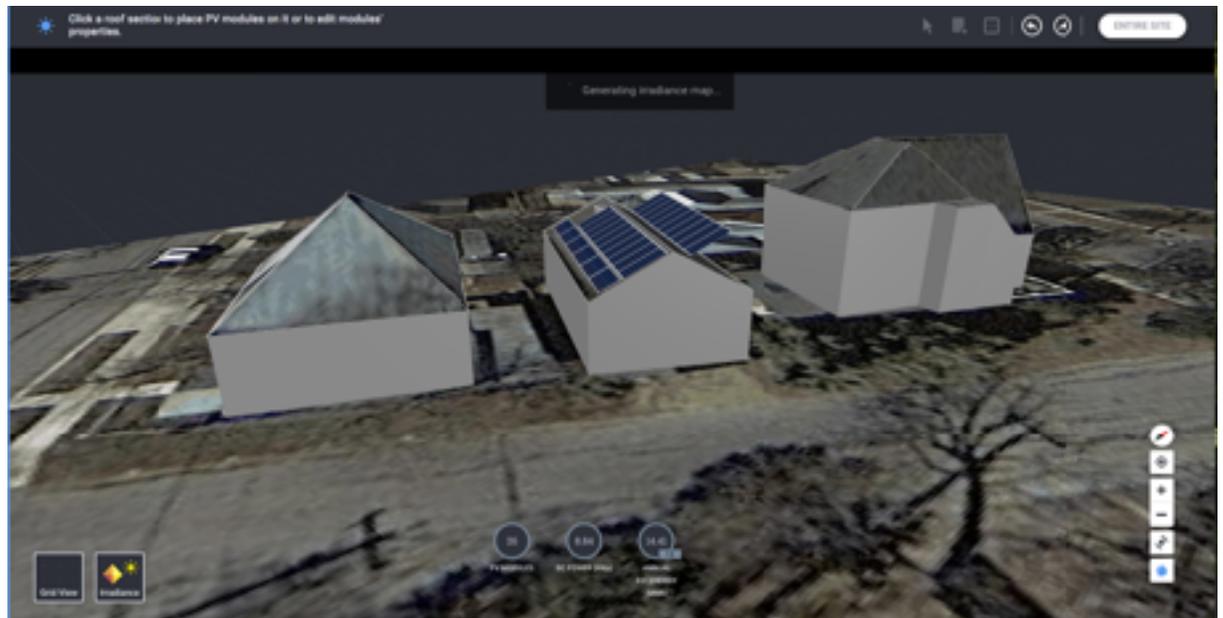
10203 Kotzebue (Suite 109)
San Antonio, Tx, 78217



Brian Murphy Solar Project

140 Callaghan Ave, SA, Tx,
78210

Arial view
Canal St.



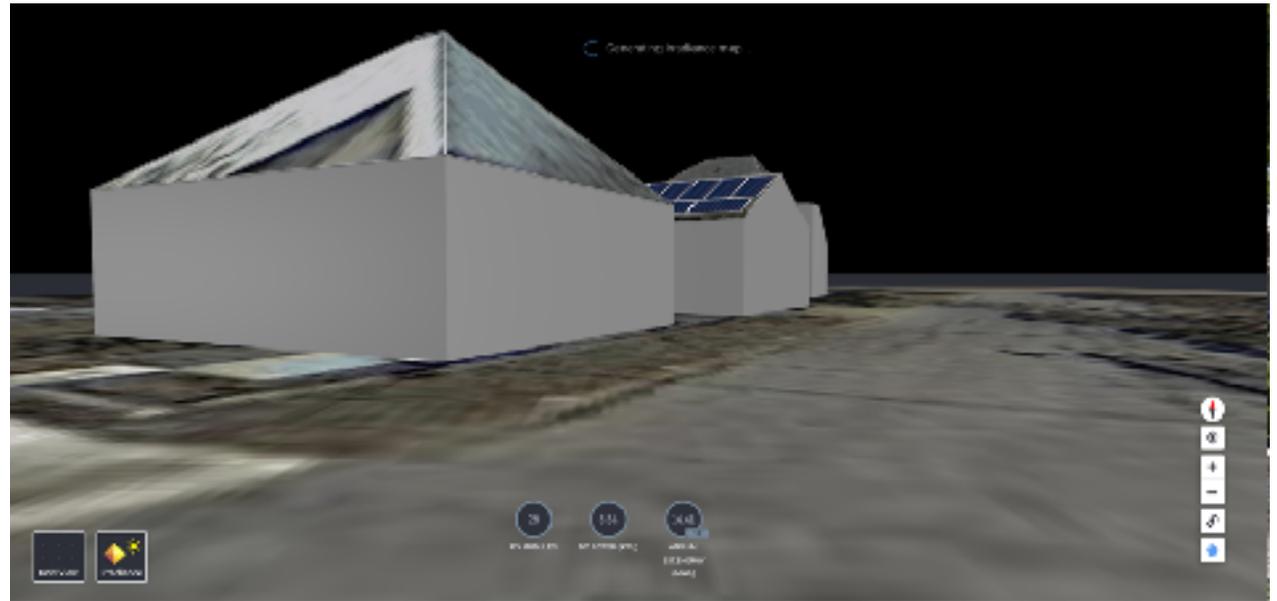
Corner View
Callaghan & Canal St.
(Program Does Not Show Trees)



Corner View
Callaghan & Canal St.
(Street View)



Corner View
Callaghan & Canal St.
(Program Does Not Show Trees)



Corner View
Callaghan & Canal St.
(Street View)



MSE Mono 72

High Power Mono Module



Class Leading Output:
Up to 340W power



Advanced P-Type
monocrystalline cell
technology



Certified Reliability:
3X IEC, salt mist, ammonia



5600 Pa snow load
175 mph wind rating **New!**



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

CERTIFICATIONS

IEC 61215/ IEC 61730/ IEC 61701 UL 1703



*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.

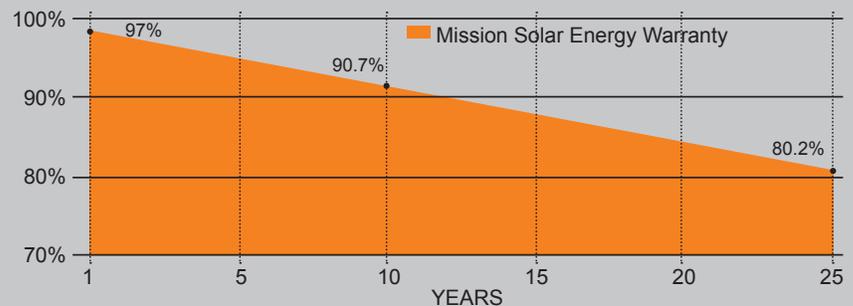
Best in class quality

Mission Solar Energy production lines are fully automated and include multiple quality checks throughout the production process including 2X EL Testing, 100% Visual inspection, and positive binning.

Proven reliability and bankability

Mission Solar Energy panels have been tested by independent testing centers to meet and exceed IEC standards. Our panels are deployed in projects across North America.

25-YEAR LINEAR WARRANTY



ELECTRICAL SPECIFICATIONS

Electrical parameters at Standard Test Condition (STC)

Module Type			MSE330SO6J	MSE335SO6J	MSE340SO6J
Power Output	Pmax	Wp	330	335	340
Module Efficiency		%	16.63	16.93	17.14
Tolerance			-0/+3%		
Short-Circuit Current	Isc	A	9.23	9.38	9.49
Open Circuit Voltage	Voc	V	46.12	46.14	46.35
Rated Current	Imp	A	8.72	8.87	8.95
Rated Voltage	Vmp	V	37.85	37.89	38.02

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	-0.419%/°C
Temperature Coefficient of Voc	-0.315%/°C
Temperature Coefficient of Isc	0.049%/°C

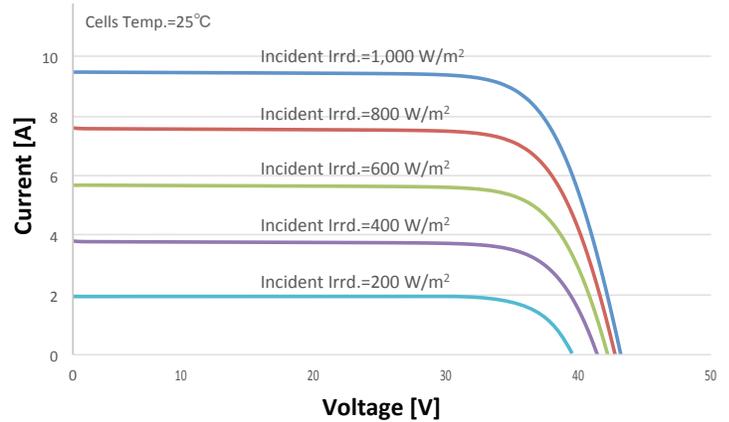
OPERATING CONDITIONS

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
Front & Back Load (UL standard)	5600 Pa (117 psf) New!
Hail Safety Impact Velocity	25mm at 23 m/s

MECHANICAL DATA

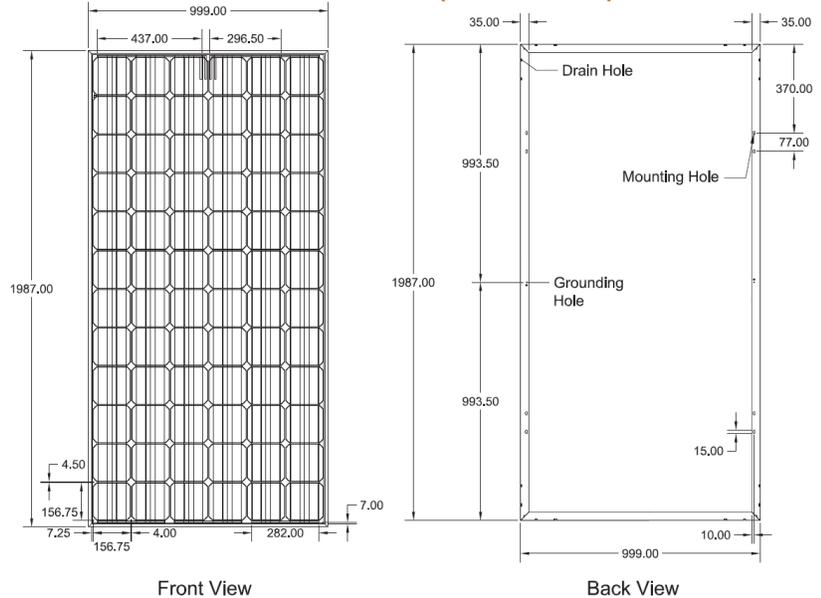
Solar Cells	P-type Mono-crystalline Silicon (156.75mm)
Cell orientation	72 cells (6x12), 4 busbar
Module dimension	1987mm x 999mm x 40mm (78.23 in. x 39.33 in. x 1.57 in.)
Weight	21.6 kg (47.6 lb)
Front Glass	3.2mm (0.126 in.) tempered, Low-iron, Anti-reflective coating
Frame	Anodized aluminum alloy
Encapsulant	Ethylene vinyl acetate (EVA)
J-Box	Protection class IP67 with 3 bypass-diodes
Cables	PV wire, 1.2m (47.24 in.), 4mm ² /12 AWG
Connector	MC4 or compatible

MSE335SO6J: 335WP, 72CELL SOLAR MODULE CURRENT-VOLTAGE CURVE



Current-voltage characteristics with dependence on irradiance and module temperature

BASIC DESIGN (UNITS: mm)





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)





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	600k Ω 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 AFCL 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: SExxxH-US000NNC2

⁽⁴⁾ Power de-rating from 50°C

⁽⁵⁾ -40 version P/N: SExxxH-US000NNU4





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.

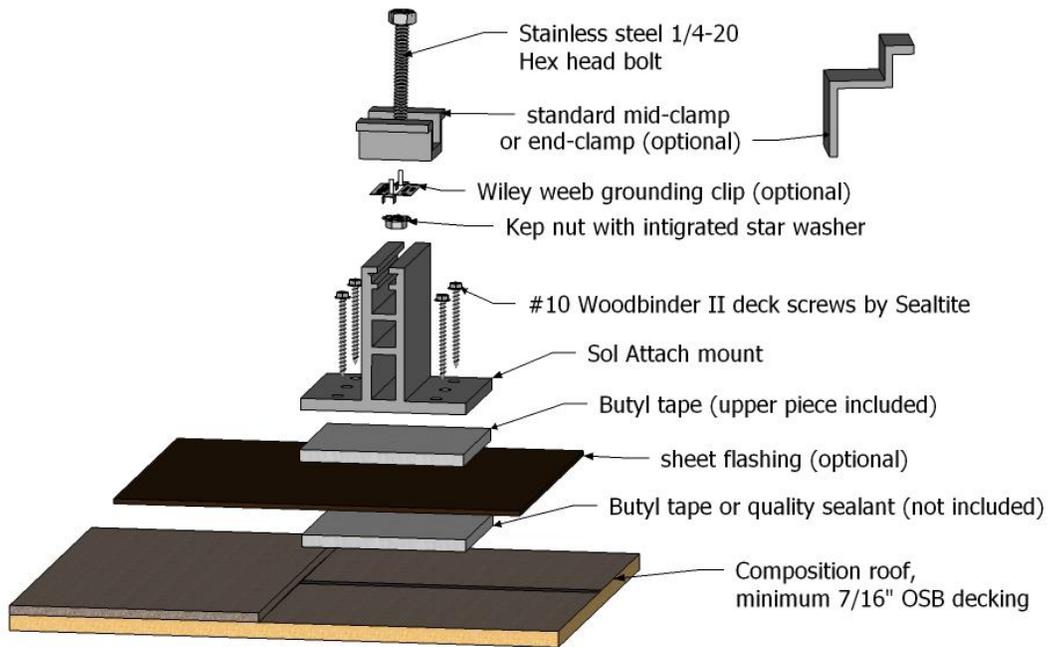
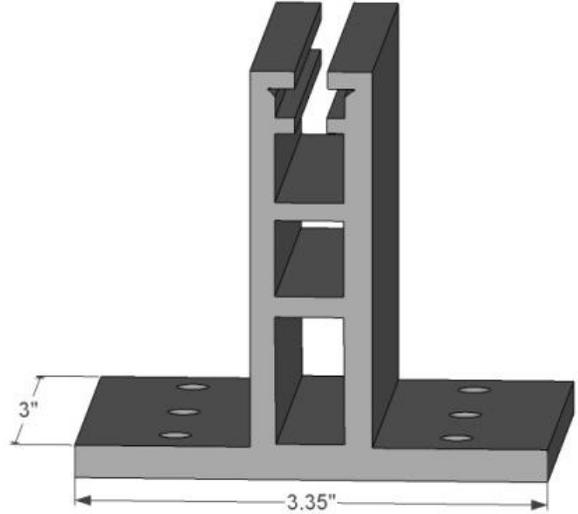
PV SYSTEM DESIGN USING A SOLAREEDGE INVERTER ⁽²⁾	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	8	10	18	
Maximum String Length (Power Optimizers)	25	25	50	
Maximum Power per String	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations		Yes		

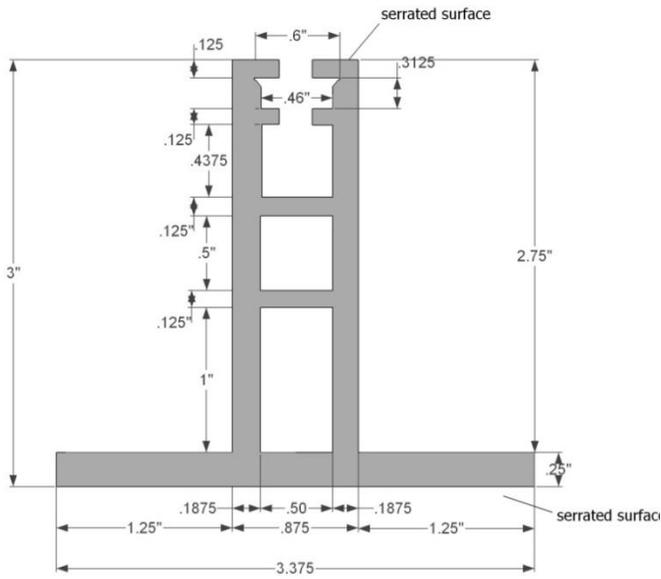
⁽²⁾ It is not allowed to mix P405 with P300/P400/P600/P700 in one string.



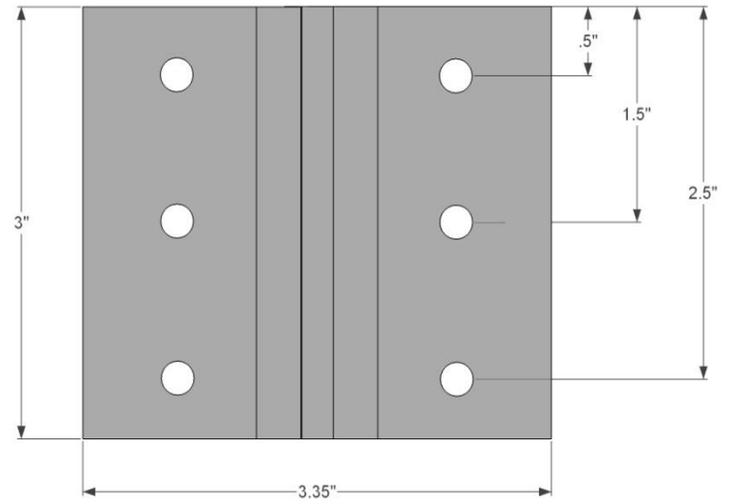
SOL ATTACH

Sol Attach, LLC
Composition roof mounting foot
Extrusions made of 6061-T6 alloy
Patent Pending



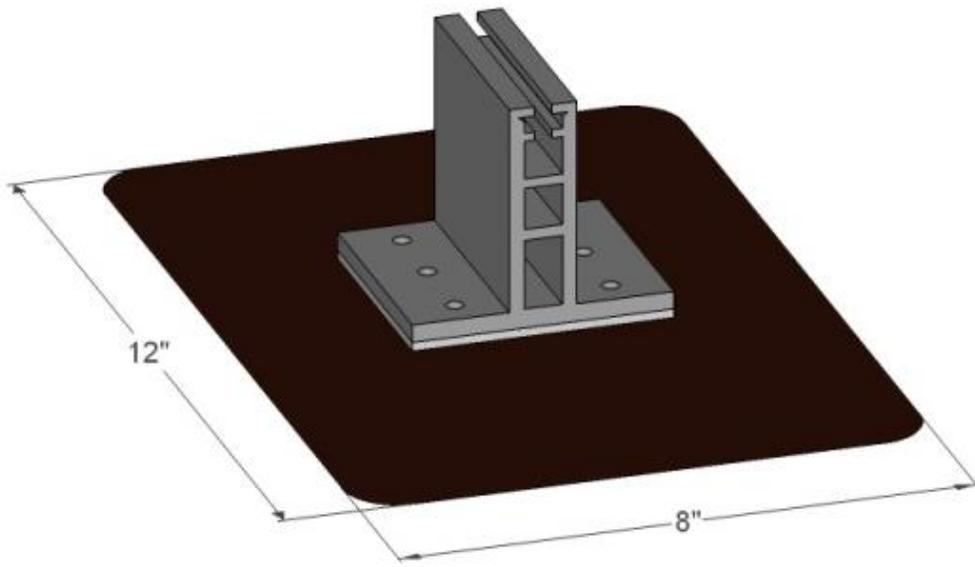


Front View



Top View

Flat flashing



August 25, 2016

Sol Attach
c/o Kevin Stapleton
535 Shady Hollow
New Braunfels, TX 78132



Re: Solar Mounting System for Pitched Rooftops with Sol Attach Roof Mounting System in **Texas**

To Whom It May Concern:

Anchor Engineering, Inc. has reviewed the Sol Attach Roof Mounting System for the design assumptions outlined below and we have concluded that the Sol Attach Roof Mounting System is in compliance with the following codes/standards.

1. ASCE 7-05 – Minimum Design Loads for Buildings and Other Structures, by ASCE/SEI, 2005.
2. ASCE 7-10 – Minimum Design Loads for Buildings and Other Structures, by ASCE/SEI, 2010.
3. 2006 IBC/ 2009 IBC/ 2012 IBC/ 2015 IBC, by International Code Council, 2006/2009/2012/2015.
4. 2006 IRC/ 2009 IRC/ 2012 IRC/ 2015 IRC, by International Code Council, 2006/2009/2012/2015.

Design Assumptions:

- Maximum mean roof height of no more than 30'-0" as defined by ASCE 7-05/ASCE 7-10.
- Importance Factor of no more than 1.0 as defined by ASCE 7-05/ASCE 7-10.
- Dry service conditions.
- Array may be located within roof zones 1, 2, or 3.
- Analysis of the mount is based upon the maximum effects of either the largest gravity loads or wind uplift loads. The point loads (either positive or negative) can act in either direction depending upon the type of loading (i.e. wind, snow...etc.).
- Fasteners installed per manufacturer specifications.
- When using the Sol Attach, four PV mounts per PV module such that adjacent modules share two PV mounts.
- Use two Sol Attach per side unless noted otherwise (See charts below).
- At end clamp locations the Sol Attach Mount is only activated by one half of the panel.
- Snow load = 5 psf.

Product Specifications:

- Aluminum alloy is 6061-T6.
- Kwikseal II Woodbinder Screws. The screws must penetrate the sheathing fully and have a minimum of three threads exposed.
- (3) screws per Sol Attach Mount at end clamp locations.

Module Specifications:

- Modules may be installed in landscape or portrait orientation.
- Modules may have a maximum short side dimension of 39.1".
- Modules may have a maximum long side dimension of 77.1".
- Modules may be a maximum of 59.5lb.

Roof Pitch: 7-27°			
Wind Speed, (V_{ult})	Wind Speed, (V_{asd})	Exposure	Fastener Req'd per Sol Attach w/ 7/16" OSB
155 mph \geq x	120 mph \geq x	C	(6) Screws
155 mph \geq x > 148 mph	120 mph \geq x > 115 mph	B	(6) Screws
148 mph \geq x	115 mph \geq x	B	(4) Screws

Roof Pitch: 27-45°			
Wind Speed, (V_{ult})	Wind Speed, (V_{asd})	Exposure	Fastener Req'd per Sol Attach w/ 7/16" OSB
155 mph \geq x >	120 mph \geq x	B, C	(4) Screws

Module Specifications:

- Modules may be installed in landscape or portrait orientation.
- Modules may have a maximum short side dimension of 39.1".
- Modules may have a maximum long side dimension of 77.1".
- Modules may be a maximum of 59.5lb.

Please see attached data sheets for the Sol Attach Roof Mounting System specification sheet.

The Sol Attach Roof Mounting System was evaluated for pull-out resistance of the fasteners and punching shear in the OSB. Review of any building structural element is outside the scope of this letter.

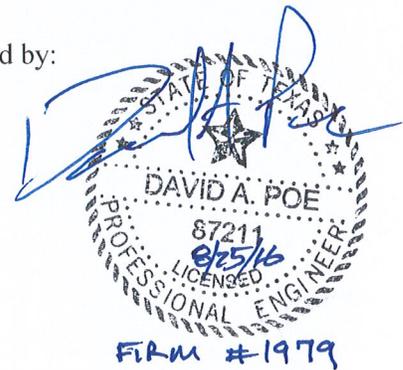
Should questions arise, or if further information is required, please contact our office.

Sincerely,
 Anchor Engineering, Inc.



John J. Laur, E.I.
 Project Manager

Reviewed by:



David A. Poe, P.E., S.E.
 Principal Engineer