

CERTIFICATE OF APPROPRIATENESS

Application Date: August 5, 2015

Applicant: Janeice Weinand & Kevin Cullen, owners

Property: 1125 Tulane St, Lot 7, Houston Heights 36th Amend Subdivision. The property includes a 2,436 square foot, two-story wood frame single-family residence and a detached garage situated on a 4,620 square foot interior lot.

Significance: Noncontributing residence, constructed circa 2005, located in the Houston Heights Historic District West.

Proposal: Alteration – Install 28, 65"x40"x2" solar panels to the south side roof of a noncontributing structure, attached by 3.5" lag screws every 48".

See enclosed application materials and detailed project description on p. 4-11 for further details.

Public Comment: No public comment received.

Civic Association: No comment received.

Recommendation: Approval

HAHC Action: Approved

CERTIFICATE OF APPROPRIATENESS

Basis for Issuance: HAHC Approval
Effective: August 27, 2015



**PLANNING &
DEVELOPMENT
DEPARTMENT**

COA valid for one year from effective date. COA is in addition to any other permits or approvals required by municipal, state and federal law. Permit plans must be stamped by Planning & Development Department for COA compliance prior to submitting for building or sign permits. Any revisions to the approved project scope may require a new COA.



PROPERTY LOCATION

HOUSTON HEIGHTS HISTORIC DISTRICT WEST

Building Classification

- Contributing
- Non-Contributing
- Park



INVENTORY PHOTO





ROOF PLAN
PROPOSED



PANEL DETAILS

SUNNY BOY 3000TL-US / 3800TL-US / 4000TL-US / 5000TL-US / 6000TL-US / 7000TL-US / 7700TL-US




**THE WORLD'S ONLY
SECURE POWER SUPPLY**



<p>Certified</p> <ul style="list-style-type: none"> • UL 1741 and 1699B compliant • Highest AFCI meets the requirements of NEC 2011 (990.1) 	<p>Innovative</p> <ul style="list-style-type: none"> • Secure Power Supply provides daytime power during grid outage 	<p>Powerful</p> <ul style="list-style-type: none"> • 97.6% maximum efficiency • Wide input voltage range • Module management with OptiFlow Global Peak MPPT tracking 	<p>Flexible</p> <ul style="list-style-type: none"> • Two MPPT trackers provide numerous design options • Extended operating temperature range
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SUNNY BOY 3000TL-US / 3800TL-US / 4000TL-US / 5000TL-US / 6000TL-US / 7000TL-US / 7700TL-US

Setting new heights in residential inverter performance

The Sunny Boy 3000TL-US/3800TL-US/4000TL-US/5000TL-US/6000TL-US/7000TL-US/7700TL-US represents the next step in performance for UL certified inverters. Its transformerless design means high efficiency and reduced weight. Maximum power production is derived from wide input voltage and operating temperature ranges. Multiple MPPT trackers and OptiFlow™ Global Peak mitigate the effect of shade and allow for installation at challenging sites. The unique Secure Power Supply feature provides daytime power in the event of a grid outage. High performance, flexible design and innovative features make the Sunny Boy TL-US series the first choice among solar professionals.



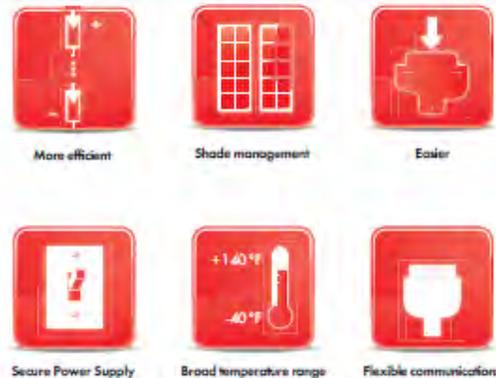
Technical data	Sunny Boy 3000TL-US		Sunny Boy 3800TL-US		Sunny Boy 4000TL-US	
	208 V AC	240 V AC	208 V AC	240 V AC	208 V AC	240 V AC
Input (DC)						
Max. usable DC power (@ cos φ = 1)	3200 W		4200 W		4200 W	
Max. DC voltage	600 V		600 V		600 V	
Rated MPPT voltage range	175 - 480 V		175 - 480 V		175 - 480 V	
MPPT operating voltage range	125 - 500 V		125 - 500 V		125 - 500 V	
Min. DC voltage / start voltage	125 V / 150 V		125 V / 150 V		125 V / 150 V	
Max. operating input current / per MPP tracker	18 A / 15 A		24 A / 15 A		24 A / 15 A	
Number of MPP trackers / strings per MPP tracker			2 / 2			
Output (AC)						
AC nominal power	3000 W		3330 W 3840 W		4000 W	
Max. AC apparent power	3000 VA		3330 VA 3840 VA		4000 VA	
Nominal AC voltage / adjustable	208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●
AC voltage range	183 - 229 V	211 - 264 V	183 - 229 V	211 - 264 V	183 - 229 V	211 - 264 V
AC grid frequency; range	60 Hz / 59.3 - 60.5 Hz		60 Hz / 59.3 - 60.5 Hz		60 Hz / 59.3 - 60.5 Hz	
Max. output current	15 A		16 A		20 A	
Power factor (cos φ)	1		1		1	
Output phases / line connections	1 / 2		1 / 2		1 / 2	
Harmonics	< 4%		< 4%		< 4%	
Efficiency						
Max. efficiency	97.2%	97.6%	97.2%	97.5%	97.2%	97.5%
CEC efficiency	96.5%	96.5%	96.5%	97.0%	96.5%	97.0%
Protection devices						
DC disconnection device			●			
DC reverse-polarity protection			●			
Ground fault monitoring / Grid monitoring			● / ●			
AC short circuit protection			●			
All-pole sensitive residual current monitoring unit			●			
Arc fault circuit interrupter (AFCI) compliant to UL 1699B			●			
Protection class / overvoltage category			I / IV			
General data						
Dimensions (W / H / D) in mm (in)			490 / 519 / 185 (19.3 / 20.5 / 7.3)			
DC Disconnect dimensions (W / H / D) in mm (in)			187 / 297 / 190 (7.4 / 11.7 / 7.5)			
Packing dimensions (W / H / D) in mm (in)			617 / 597 / 266 (24.3 / 23.5 / 10.5)			
DC Disconnect packing dimensions (W / H / D) in mm (in)			370 / 240 / 280 (14.6 / 9.4 / 11.0)			
Weight / DC Disconnect weight			24 kg (53 lb) / 3.5 kg (8 lb)			
Packing weight / DC Disconnect packing weight			27 kg (60 lb) / 3.5 kg (8 lb)			
Operating temperature range			-40 °C ... +60 °C (-40 °F ... +140 °F)			
Noise emission (typical)	≤ 25 dB(A)		< 25 dB(A)		< 25 dB(A)	
Internal consumption at night	< 1 W		< 1 W		< 1 W	
Topology	Transformerless		Transformerless		Transformerless	
Cooling	Convection		Convection		Convection	
Electronics protection rating	NEMA 3R		NEMA 3R		NEMA 3R	
Features						
Secure Power Supply	●		●		●	
Display: graphic	●		●		●	
Interfaces: RS485 / Speedwire/Webconnect	○/○		○/○		○/○	
Warranty: 10 / 15 / 20 years	●/○/○		●/○/○		●/○/○	
Certificates and permits (more available on request)	UL 1741, UL 1998, UL 1699B, IEEE1547, FCC Part 15 (Class A & B), CAN/CSA C22.2 107.1-1					
NOTE: US inverters ship with gray lids						
Type designation	SB 3000TL-US-22		SB 3800TL-US-22		SB 4000TL-US-22	

Accessories

- Speedwire/Webconnect interface SWDMALUS-10
- ES485 interface DN-485CBLUS-10
- Fan kit for SB 3000/3800/4000/5000TLUS-22 FANKIT02-10

● Standard feature ○ Optional feature – Not available
Data of nominal conditions

Sunny Boy 5000TLUS		Sunny Boy 6000TLUS		Sunny Boy 7000TLUS		Sunny Boy 7700TLUS	
208 V AC	240 V AC	208 V AC	240 V AC	208 V AC	240 V AC	208 V AC	240 V AC
5300 W		6300 W		7300 W		8000 W	
600 V		600 V		600 V		600 V	
175 - 480 V		210 - 480 V		245 - 480 V		270 - 480 V	
125 - 500 V		125 - 500 V		125 - 500 V		125 - 500 V	
125 V / 150 V		125 V / 150 V		125 V / 150 V		125 V / 150 V	
30 A / 15 A		30 A / 15 A		30 A / 18 A		30 A / 18 A	
2 / 2							
4550 W	5000 W	5200 W	6000 W	6000 W	7000 W	6650 W	7680 W
4550 VA	5000 VA	5200 VA	6000 VA	6000 VA	7000 VA	6650 VA	7680 VA
208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●
183 - 229 V	211 - 264 V	183 - 229 V	211 - 264 V	183 - 229 V	211 - 264 V	183 - 229 V	211 - 264 V
60 Hz / 59.3 - 60.5 Hz		60 Hz / 59.3 - 60.5 Hz		60 Hz / 59.3 - 60.5 Hz		60 Hz / 59.3 - 60.5 Hz	
	22 A		25 A		29.2 A		32 A
	1		1		1		1
	1 / 2		1 / 2		1 / 2		1 / 2
	< 4%		< 4%		< 4%		< 4%
97.2%	97.6%	97.0%	97.4%	96.8%	96.8%	96.8%	97.3%
96.5%	97.0%	96.5%	97.0%	96.5%	96.5%	96.5%	96.5%
●							
● / ●							
●							
●							
1 / IV							
490 / 519 / 185 (19.3 / 20.5 / 7.3)							
187 / 297 / 190 (7.4 / 11.7 / 7.5)							
617 / 597 / 266 (24.3 / 23.5 / 10.5)							
370 / 240 / 280 (14.6 / 9.4 / 11.0)							
24 kg (53 lb) / 3.5 kg (8 lb)							
27 kg (60 lb) / 3.5 kg (8 lb)							
-40 °C ... +60 °C (-40 °F ... +140 °F)							
< 29 dB(A)		< 29 dB(A)		< 29 dB(A)		< 29 dB(A)	
< 1 W		< 1 W		< 1 W		< 1 W	
Transformerless		Transformerless		Transformerless		Transformerless	
Convection		Fan		Fan		Fan	
NEMA 3R		NEMA 3R		NEMA 3R		NEMA 3R	
●		●		●		●	
○/○		○/○		○/○		○/○	
●/○/○		●/○/○		●/○/○		●/○/○	
UL 1741, UL 1998, UL 16998, IEEE1547, FCC Part 15 (Class A & B), CAN/CSA C22.2 107.1-1							
SB 5000TLUS-22		SB 6000TLUS-22		SB 7000TLUS-22		SB 7700TLUS-22	



A NEW GENERATION OF INNOVATION

THE SUNNY BOY TL-US RESIDENTIAL SERIES HAS YET AGAIN REDEFINED THE CATEGORY.

Transformerless design

The Sunny Boy 3000TL-US / 3800TL-US / 4000TL-US / 5000TL-US / 6000TL-US / 7000TL-US / 7700TL-US are transformerless inverters, which means owners and installers benefit from high efficiency and lower weight. A wide input voltage range also means the inverters will produce high amounts of power under a number of conditions.

Additionally, transformerless inverters have been shown to be among the safest string inverters on the market. An industry first, the TL-US series has been tested to UL 1741 and UL 1699B and is in compliance with the arc fault requirements of NEC 2011.

Increased energy production

OptiTrac™ Global Peak, SMA's shade-tolerant MPP tracking algorithm, quickly adjusts to changes in solar irradiation, which mitigates the effects of shade and results in higher total power output. And, with two MPP trackers, the TL-US series can ably handle complex roofs with multiple orientations or string lengths.

An extended operating temperature range of -40 °F to +140 °F ensures power is produced

in all types of climates and for longer periods of time than with most traditional string inverters.

Secure Power Supply

One of many unique features of the TL-US residential series is its innovative Secure Power Supply. With most grid-tied inverters, when the grid goes down, so does the solar-powered home. SMA's solution provides daytime energy to a dedicated power outlet during prolonged grid outages, providing homeowners with access to power as long as the sun shines.

Simple installation

As a transformerless inverter, the TL-US residential series is lighter in weight than its transformer-based counterparts, making it easier to lift and transport. A new wall mounting plate features anti-theft security and makes hanging the inverter quick and easy. A simplified DC wiring concept allows the DC disconnect to be used as a wire raceway, saving labor and materials.

The 3800TL-US and 7700TL-US models allow installers to maximize system size and energy production for customers with 100 A and 200 A service panels.

Leading monitoring and control solutions

The new TL-US residential line features more than high performance and a large graphic display. The monitoring and control options provide users with an outstanding degree of flexibility. Multiple communication options allow for a highly controllable inverter and one that can be monitored on Sunny Portal from anywhere on the planet via an Internet connection. Whether communicating through RS485, or SMA's new plug-and-play WebConnect, installers can find an optimal solution to their monitoring needs.

Wide Power Class Range

Whether you're looking for a model to maximize a 100 A service panel or trying to meet the needs of a larger residential PV system, the Sunny Boy TL-US with Secure Power Supply has you covered. Its wide range of power classes—from 3 to 7.7 kW—offers customers the right size for virtually any residential application. The TL-US series is not only the smartest inverter on the planet, it's also the most flexible.

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www.SMA-America.com

SMA America, LLC

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Sunmodule⁺ Plus

SW 280 MONO BLACK



SOLARWORLD
REAL VALUE



TUV Power controlled:
Lowest measuring tolerance in industry



Every component is tested to meet 3 times IEC requirements.



Designed to withstand heavy accumulations of snow and ice



Sunmodule Plus:
Positive performance tolerance



25-year linear performance warranty and 10-year product warranty



Glass with anti-reflective coating



World-class quality
Fully-automated production lines and seamless monitoring of the process and material ensure the quality that the company sets as its benchmark for its sites worldwide.

SolarWorld Plus-Sorting
Plus-Sorting guarantees highest system efficiency. SolarWorld only delivers modules that have greater than or equal to the nameplate rated power.

25-year linear performance guarantee and extension of product warranty to 10 years
SolarWorld guarantees a maximum performance digression of 0.7% p.a. in the course of 25 years, a significant added value compared to the two-phase warranties common in the industry. In addition, SolarWorld is offering a product warranty, which has been extended to 10 years.*

*In accordance with the applicable SolarWorld Limited Warranty at purchase. www.solarworld.com/warranty



- Dielectric strength 5000V
- Safety tested IEC 61731
- Automatic Disconnection
- Heavy sand resistant



Accumulation resistance tested
Positive Temperature Power Coefficient



PERFORMANCE INDEX
SULPHUR TESTS
HYDROLYSE-RESISTANT



UL 1703









Home Innovation
WE'RE HERE TO HELP.



MADE IN USA OF US
AND IMPORTED PARTS

solarworld.com

Sunmodule Plus SW 280 MONO BLACK



PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)*

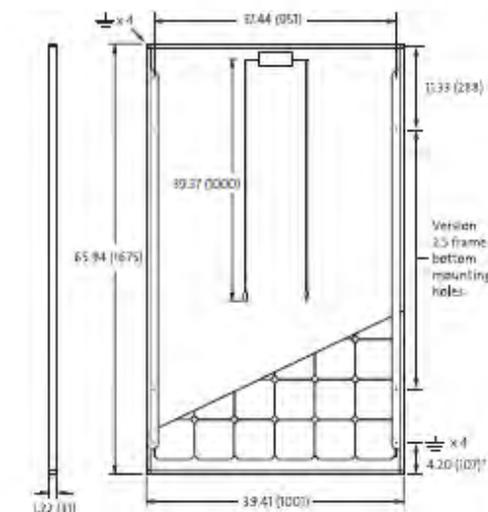
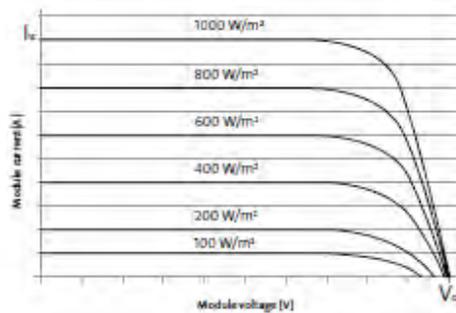
Maximum power	P_{max}	280 Wp
Open circuit voltage	V_{oc}	39.5 V
Maximum power point voltage	V_{mp}	31.2 V
Short circuit current	I_{sc}	9.71 A
Maximum power point current	I_{mp}	9.07 A
Module efficiency	η_{mod}	16.7 %

*STC: 1000 W/m², 25°C, AM 1.5

) Measuring tolerance (I_{sc}) that is due to TUV Rheinland: +/- 2% (TUV Power Control Ltd).

THERMAL CHARACTERISTICS

NOCT	48 °C
TC I _{sc}	0.044 %/°C
TC V _{oc}	-0.31 %/°C
TC P _{mp}	-0.43 %/°C
Operating temperature	-40°C to 85°C



All units provided are Imperial. SI units provided in parentheses.
SolarWorld AG reserves the right to make specification changes without notice.

PERFORMANCE AT 800 W/m², NOCT, AM 1.5

Maximum power	P_{max}	207.2 Wp
Open circuit voltage	V_{oc}	35.8 V
Maximum power point voltage	V_{mp}	28.3 V
Short circuit current	I_{sc}	7.85 A
Maximum power point current	I_{mp}	7.33 A

Minor reduction in efficiency under partial load conditions at 25°C: at 200 W/m², 100% (+/- 2%) of the STC efficiency (1000 W/m²) is achieved.

COMPONENT MATERIALS

Cells per module	60
Cell type	Mono crystalline
Cell dimensions	6.17 in x 6.17 in (156.75 x 156.75 mm)
Front	Tempered glass (EN 12150)
Frame	Black anodized aluminum
Weight	39.5 lbs (17.9 kg)

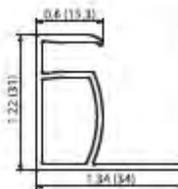
SYSTEM INTEGRATION PARAMETERS

Maximum system voltage SC II / NEC	1000 V	
Maximum reverse current	25 A	
Number of bypass diodes	1	
Design Loads*	Two rail system	113 psf downward 64 psf upward
Design Loads*	Three rail system	170 psf downward 71 psf upward
Design Loads*	Edge mounting	30 psf downward 30 psf upward

* Please refer to the Sunmodule installation instructions for the details associated with these load cases.

ADDITIONAL DATA

Power sorting*	-0 Wp / +5 Wp
J-Box	IP65
Module leads	PV wire per UL4703 with H4 connectors
Module type (UL 1703)	T
Glass	Low iron tempered with ARC



VERSION 2.5 FRAME

- Compatible with both "Top-Down" and "Bottom" mounting methods
- Grounding locations:
 - 4 corners of the frame
 - 4 locations along the length of the module in the extended flange!

SW-D1-6026/US 12/2014