OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

LAND USE APPLICATION FORM

Type I (OCMC 17.50.030.A)	Type II (OCMC 17.50.030.B)	Type III / IV (OCMC 17.50.030.C)
❑ Compatibility Review	❑ Detailed Development Review	❑ Annexation
❑ Lot Line Adjustment	❑ Geotechnical Hazards	❑ Code Interpretation / Similar Use
❑ Non-Conforming Use Review	❑ Minor Partition (<4 lots)	❑ Concept Development Plan
❑ Natural Resource (NROD) Verification	❑ Minor Site Plan & Design Review	❑ Conditional Use
❑ Site Plan and Design Review	❑ Non-Conforming Use Review	❑ Comprehensive Plan Amendment (Text/Map)
❑ Extension of Approval	❑ Site Plan and Design Review	❑ Detailed Development Plan
	❑ Subdivision (4+ lots)	☒ Historic Review
	❑ Minor Variance	❑ Municipal Code Amendment
	❑ Natural Resource (NROD) Review	❑ Variance
		❑ Zone Change

File Number(s): HR 18-14

Proposed Land Use or Activity: Adding Rooftop Solar Panels

Project Name: 176564 Denise Beasley Number of Lots Proposed (If Applicable): _____

Physical Address of Site: 301 Madison St, Oregon City, OR 97045

Clackamas County Map and Tax Lot Number(s): _____

Applicant(s):

Applicant(s) Signature: _____

Applicant(s) Name Printed: Denise Beasley Date: 9/25/2018

Mailing Address: 301 Madison St, Oregon City, OR 97045

Phone: 503-329-6173 Fax: _____ Email: dbeasley@gmail.com

Property Owner(s):

Property Owner(s) Signature: _____

Property Owner(s) Name Printed: Denise Beasley Date: 9/25/2018

Mailing Address: 301 Madison St, Oregon City, OR 97045

Phone: 503-329-6173 Fax: _____ Email: dbeasley@gmail.com

Representative(s):

Representative(s) Signature: _____

Representative (s) Name Printed: Auric Solar LLC Date: 9/25/2018

Mailing Address: 9530 SW Tualatin-Sherwood Rd, Tualatin, OR 97062

Phone: 503-793-4391 Fax: _____ Email: matt.ellis@auricsolar.com

All signatures represented must have the full legal capacity and hereby authorize the filing of this application and certify that the information and exhibits herewith are correct and indicate the parties willingness to comply with all code requirements.

Submitted by:

Auric Solar LLC, 9530 SW Tualatin-Sherwood Rd, Tualatin, OR 97062

Property:

Denise Beasley, 301 Madison St, Oregon City, OR 97045

List of Permit Approvals Sought:

Building and electrical permit for adding solar photovoltaic system.

Description of Work:

The proposed project is for adding a solar photovoltaic system to the residence. We have two locations in mind and are seeking approval on one of them. The first location is roof mounted on the house where we would like to add 11 *Silfab Solar SLA – 310M* modules. The second location is a ground mount structure in the backyard of the property, where we would like to add 12 *Silfab Solar SLA – 310M* modules. Depending on which project we get approval on will determine the project timeline, however, I would anticipate about 1-3 days' worth of work.

Either project will comply with all applicable codes (i.e. NEC, OSSC, etc.). Proper setbacks will also be used where required. Guidelines set forth by the Historic Review Committee and any other affiliated group will be followed.

The solar project will serve two main purposes:

1. Reducing the Beasley's power bill.
2. Reducing the Beasley's carbon footprint.

If roof mounted: The *Silfab Solar SLA – 310M* solar modules will be used with the *Snap N Rack* roof racking system. Both are all black and will be aesthetically appealing on the black asphalt shingle roof. There will be modules facing Madison St and 3rd St, as depicted in our site plan. The modules will sit 4" off the roof.

If ground mounted: The same *Silfab Solar SLA – 310M* will be used with the *Snap N Rack* ground racking system. This racking system is silver but will be covered by the modules, except at the feet. This structure would be in the backyard facing 3rd St. The ground mount will start at 2 ft and go up to 11 ft high in the back. The front to back post distance will be approximately 7 ft. The width of the array will be 17 ft.

Our solar systems use micro-inverters which are placed behind each individual panel. These are used for multiple reasons, the main reason being the efficiency compared to a single inverter system. For aesthetics purposes, there will not be a large single inverter on the side of them home as is the case with those types of systems. The only material that will be seen on the home are the panels and our AC combiner box, which will be placed on the wall next to the meter. A piece of conduit will parallel the existing meter conduit coming down the wall and into the combiner box. From the AC combiner box there will be a small piece of conduit to the meter, where we will land the circuit breaker for the system. This will be the system shutoff location of the solar system. We will attempt to match the color of the existing conduit and home, with variation due to the fading.

1. The purpose of the historic overlay district as set forth in Section 17.40.010; *It is declared as a matter of public policy that the protection, enhancement, perpetuation and use of improvements of special character or special historical or aesthetic interest or value is a public necessity and is required in the interest of the health, prosperity, safety and welfare of the people. The purpose of this chapter is to:*

For exterior alterations of historic sites in an historic district or conservation district or individual landmark, the criteria to be used by the board in reaching its decision on the certificate of appropriateness shall be:

A. *Effect and accomplish the protection, enhancement and perpetuation of such improvements and of districts which represent or reflect elements of the city's cultural, social, economic, political and architectural history; The purpose of the historic overlay district as set forth in Section 17.40.010;*

B. *Safeguard the city's historic, aesthetic and cultural heritage as embodied and reflected in such improvements and districts;*

C. Complement any National Register Historic districts designated in the city;

D. Stabilize and improve property values in such districts;

E. Foster civic pride in the beauty and noble accomplishments of the past;

F. Protect and enhance the city's attractions to tourists and visitors and the support and stimulus to business and industry thereby provided;

G. Strengthen the economy of the city;

H. Promote the use of historic districts and landmarks for the education, pleasure, energy conservation, housing and public welfare of the city; and

I. Carry out the provisions of LCDC Goal 5.

RESPONSE:

A. The addition of solar modules to the historic home will not alter the historic feature of the home. They will continue to enhance the home.

B. The plan supports the preservation of the historic site. Circa 1900, most homes west of the Mississippi had independent renewable energy sources, primarily wind turbines and water wheels, which were mainly used to pump water. Electricity from the grid was very rare at that point. Thus, renewable energy sources and independently producing your own power are very period values and ideas.

C. We plan to follow all rules, regulations and guidelines provided by the city

D. Solar panels have been proven to improve property values. We can provide links to articles, as desired. We have also met with metro area real estate appraisers that have indicated to us that they add the invoice value of the system in the first 5 years and $4/watt after that, which should always result in strong gains for the homeowner.

E. Home owners with solar are usually very proud of their installation. Additionally, more and more neighborhoods, landlords and homeowners are telling us they want renewable energy coming straight in to their home.

F. Our installations look very nice, as we have a strong focus on aesthetics, and will do a great job enhancing the neighborhood for residents and tourists alike.

G. The local economy will be strengthened by continuing to increase the value of the home.

H. Solar will help accomplish all of these, especially energy conservation

I. Solar will comply with all the provisions of the LCDC's Goal 5. It will not alter, nor remove, the historic nature of the home in any way.

2. The provisions of the city comprehensive plan;

   Section 5: Open Spaces, Scenic and Historic Areas, and Natural Resources
   Policy 5.3.8: Preserve and accentuate historic resources as part of an urban environment that is being reshaped by new development projects.

RESPONSE: Ground mounted solar will look similar to a tinted greenhouse. Roof mounted solar, will look like part of the roof, but will not shape the overall aesthetic of the roof or home.

3. The economic use of the historic site and the reasonableness of the proposed alteration and their relationship to the public interest in the structure's or landmark's preservation or renovation;

RESPONSE: The overall structure will not lose its shape or general aesthetic. The solar panels will accentuate the roof/ground.

4. The value and significance of the historic site;

RESPONSE: Total value of the site, according to

5. The physical condition of the historic site;

RESPONSE: The condition of the property is very good. The addition of solar will add value to the home.

6. The general compatibility of exterior design, arrangement, proportion, detail, scale, color, texture and materials proposed to be used with the historic site;

RESPONSE: Triple black panels, even layout/arrangement. See photos and spec/cut sheets.

7. Pertinent aesthetic factors as designated by the board;

RESPONSE: TBD

8. Economic, social, environmental and energy consequences; and

RESPONSE: The home value will be increased; the CO2 emissions will be decreased by approximately 7000 lbs per year and it will be the equivalent of planting 81 trees per year.

9. Design guidelines adopted by the historic review board.

   - *The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.*

   RESPONSE: No distinctive materials will be removed. A portion of the roof, which is brand new, will be covered, but not altered. The ground mount structure will look as nice or nicer than any greenhouse on any surrounding property.

   - *New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.*

RESPONSE: No historic materials will be destroyed in any way. The integrity of the property will not be compromised in any way.

- *New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

RESPONSE: If the solar panels were to be removed later, no aspects of the property would be affected in any way.

- *Traditional landscape elements evident in the District (grass, trees, shrubs, picket fences, etc.) should be preserved, and are encouraged in site redevelopment. Inappropriate landscape treatments such as berms and extensive non- vegetative ground cover (e.g. mulch and bark dust) are discouraged.*

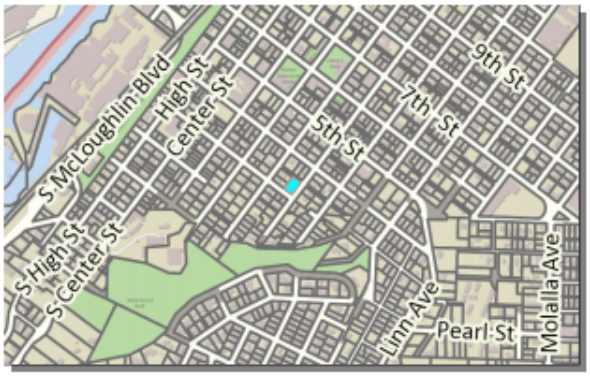
RESPONSE: No traditional landscape elements will be touched or affected with either installation.

"We are like tenant farmers chopping down the fence around our house for fuel when we should be using Nature's inexhaustible sources of energy--sun, wind and tide. I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that."

— Thomas Alva Edison, 1931

Taxlot Detail Report

Taxlot: 2-2E-31DB-02800



Overview Map

Taxlot highlighted in blue

Taxlot Information

APN: 2-2E-31DB-02800 *In City?* Y

Alt ID: 00580222 *In UGB?* Y

Site Address: 301 MADISON ST
OREGON CITY, OR 97045

Year Built: 1900

Taxpayer Information

Taxpayer: *Suppressed*

Address: *Suppressed*

Reference Information

Parcel Area (GIS - acres): 0.23

Parcel Area (GIS - sq. ft): 10,044

Twn/Rng/Sec: 2S 2E 31

Tax Map Reference: 22E31DB (03_2s2e31db)

Values

Import Date: 08/30/2018

Land Value (Mkt): $131,337

Building Value (Mkt): $240,300

Total Value (Mkt): $371,637

Note: The values above are Market, NOT Assessed values.

Assessed Value: $183,822

Exempt Amount: $0

Planning Designations

Zoning: R-6

Comprehensive Plan: LR

Subdivision: (1) CLACKAMAS COUNTY ADDITION

PUD (if known):

Partition Plat: N/A

Neighborhood Assn: MCLOUGHLIN

Urban Renewal District: N/A

Concept Plan: N/A

Historic District: MCD

Historic Designated Structure: MCD

In Willamette Greenway? N

In Geologic Hazard? N

In High Water Table Area? N

In Nat. Res. Ovl. Dist. (NROD)? N

In 1996/FEMA 100 Yr Floodplain? N

In FEMA Floodway? N

In Sewer Moratorium Area? N

In Thayer Pond Fee Area? N

In Bvrcrk. Rd Access Plan Area? N

In Barlow Trail Corridor? N

In Enterprise Zone? N

In SDC Discount Area? N

In Vert. House Dev. Zone? N

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City of Oregon City
PO Box 3040
625 Center St
Oregon City, OR 97045
(503) 657-0891
www.orcity.org

Site Photos

Southeast (with Panel for visual)

Southeast View (Front)

Southeast View (Corner)

Southwest View (Corner)

Meter Conduit (for visual of where our conduit will run)

Site Photos (continued)

216 Madison St

302 Madison St

312 Madison St

820 3rd St

816 3rd St

Satellite Image of Neighboring Homes

OREGON CITY HISTORIC RESOURCE SURVEY FORM

Street Address: **301 MADISON ST**					City: **OREGON CITY**		
USGS Quad Name: **Oregon City**			GPS Latitude: **45 21 09 N**			Longitude: **122 36 20 W**	
Township: **02S**	Range: **02E**	Section: **31**	Block: **108**	Lot: **3x, 4x**		Map #: **22E31DB**	Tax Lot #: **2800**

Date of Construction: **c. 1895**	Historic Name: **Seiler, Rudolph and Augusta, House**	Historic Use or Function: **Domestic - single dwelling**
Grouping or Cluster Name: **NA**	*Current Name or Use: **Domestic - single dwelling**	Associated Archaeological Site: **Unknown**

Architectural Classification(s): **Queen Anne / Vernacular**	Plan Type/Shape: **L-shaped**	Number of Stories: **2.0**
Foundation Material: **Post and beam**	Structural Framing: **Unknown**	Moved? **No**
Roof Type/Material: **Cross gable / Composition shingle**	Window Type/Material: **1/1 wood double-hung**	

Exterior Surface Materials Primary: **Channel drop** Secondary: Decorative:

Exterior Alterations or Additions/Approximate Date: **Pendants removed**

Number and Type of Associated Resources: **Metal outbuilding (1)**

Integrity: **Good** Condition: **Good**	Local Ranking: **Designated Historic Site**	National Register Listed? **No**

Potentially Eligible: ☐ Individually or ☑ As a contributing resource in a district

Not Eligible: ☐ Intact but lacks distinction

☐ Altered (choose one): ☐ Reversible/Potentially eligible individually or in district

☐ Reversible/Ineligible as it lacks distinction

☐ Irretrievable loss of integrity

☐ Not 50 years old

Description of Physical and Landscape Features:

This Queen Anne style house occupies a large double lot at the corner of Madison and 3rd Street. It has a steep gable roof with rakeboards and a molding trim. The exterior surface material is a channel siding with cornerboards. Vertical siding is used for the skirting around the house. The watertable and cap still exist, but have begun to deteriorate. Most of the windows are 1/1 double-hung surrounded by a simple board trim and many have fixed metal storm windows. Decorative features on this house include chamferred corners with pendants (not originals), fancy porch brackets, and a spindle rail in the gable. The house has an L-shaped plan and sits on a post and beam foundation. The property is surrounded by a picket fence. In the northwest corner of the backyard is a small outbuilding that has wood drop siding, cornerboards, and an old metal roof ridge. There is also a large apple tree in the yard. The 1982 survey notes that the single story porches and single story gabled wing are additions. If this is true, they appear to be very early additions.

Statement of Significance:

Rudolph and August Seiler purchased two lots in 1895 and built their house shortly thereafter. Mr. Seiler was a German emigrant who worked in the Oregon City mills. A relative, Florence Seiler, also lived with the couple and was added to the house title some years later. In 1944, the property was sold to Edward and Erma Bouls, who resold it four years later. The new owners were Albert and Helen Blaske, who continued to occupy the house until its sale to Eric Blaske in 1968.


DIRECTV

Aurora Shade Report

Customer
Denise Beasley

Designer
Mechelle Saunders

Organization
Auric Solar

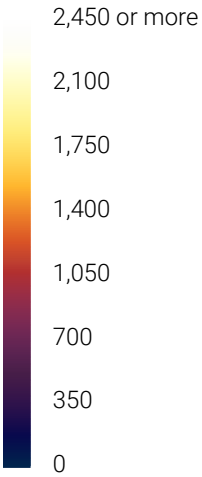
Address
301 Madison Street
Oregon City
OR egon City

Coordinates
(45.352328, -122.605515)

Date
27 September 2018

Annual irradiance

kWh/m^2/year



Summary

Array	Panel Count	Azimuth (deg.)	Pitch (deg.)	Annual TOF (%)	Annual Solar Access (%)	Annual TSRF (%)
1	12	216	30	97	87	84
Weighted average by panel count	-	-	-	-	87	84

Monthly solar access (%) across arrays

Array	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	89	84	82	84	88	91	92	84	82	85	88	90

Customer
Denise Beasley

Address
301 Madison Street
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(45.352328, -122.605515)

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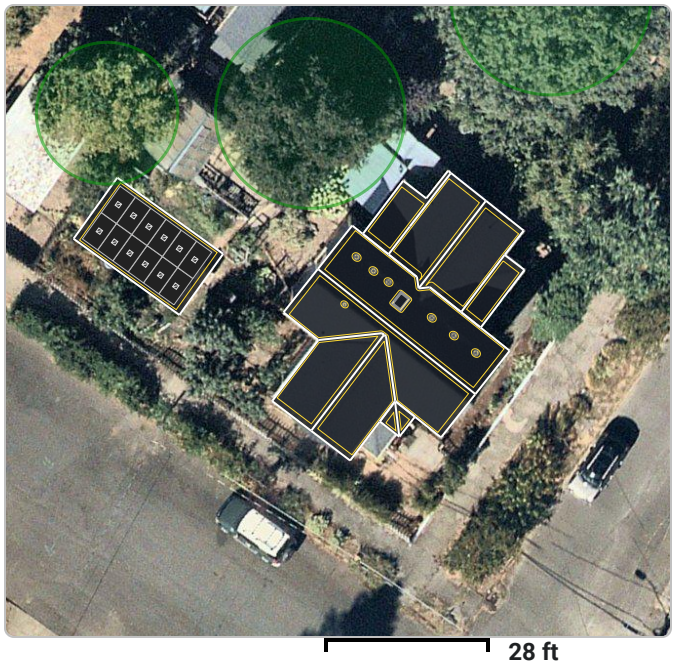
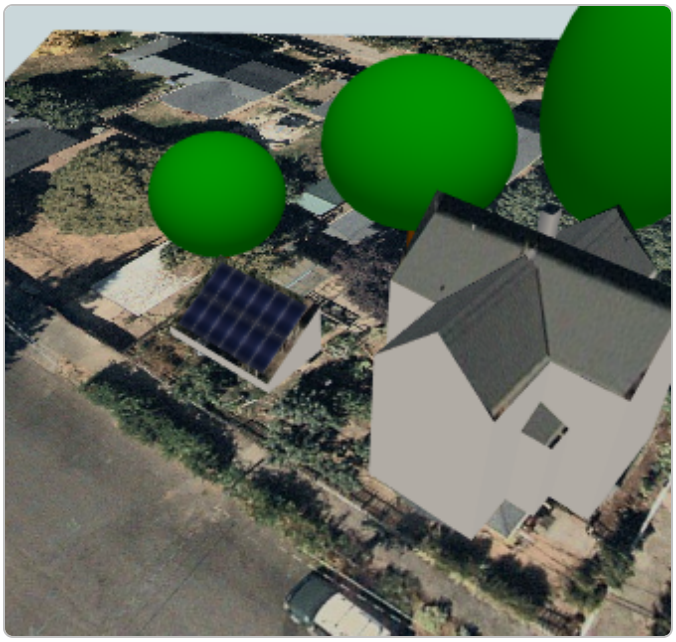
Auric Solar

Date
27 September 2018

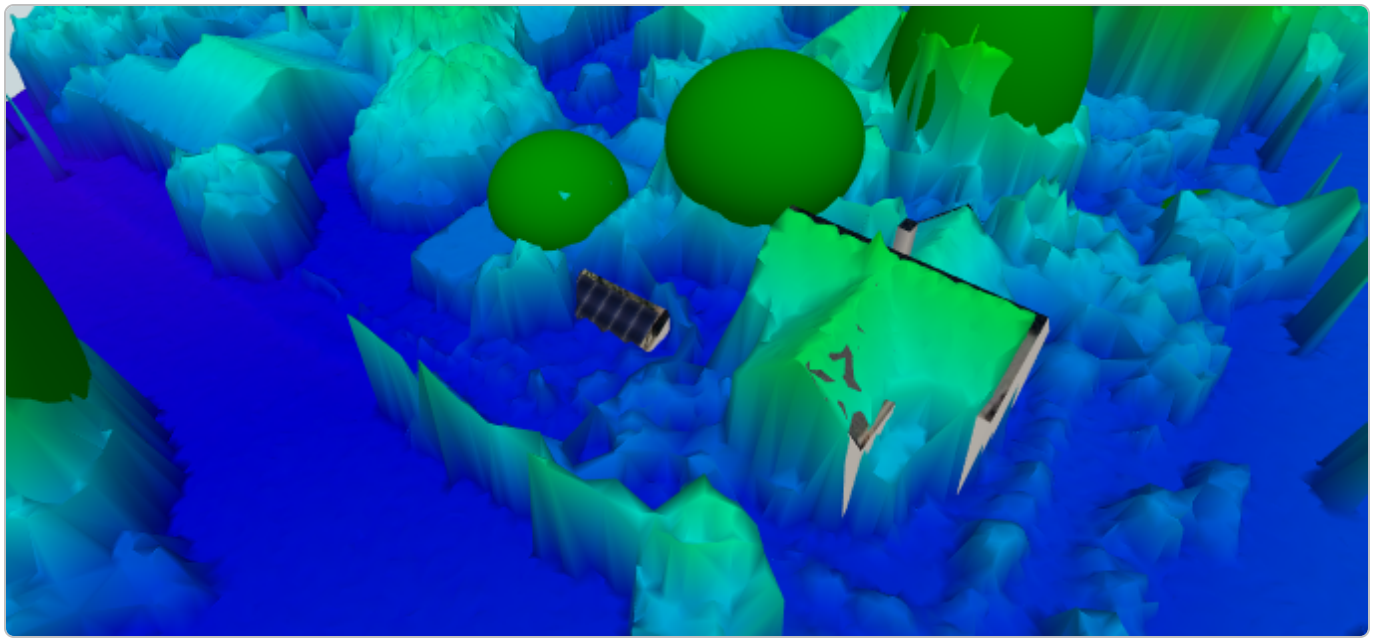
Zoomed out satellite view



3D model



3D model with LIDAR overlay



Customer
Denise Beasley

Address
301 Madison Street
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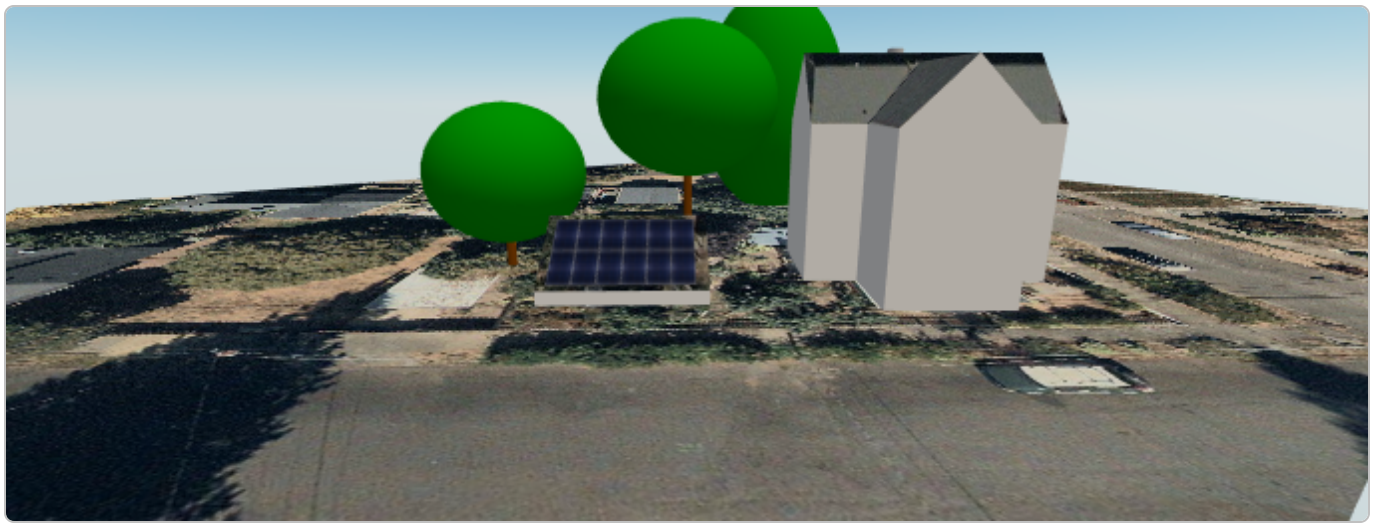
Mechelle Saunders

Coordinates
(45.352328, -122.605515)

Organization
Auric Solar

Date
27 September 2018

Street view and corresponding 3D model



I, **Mechelle Saunders**, certify that I have generated this shading report to the best of my abilities, and I believe its contents to be accurate.

Silfab SOLAR

Los Angeles • Toronto • Minneapolis

SLA-M
Monocrystalline

BAA ARRA TARIFF FREE | 25 25-YEAR GUARANTEE | AUTOMATED MANUFACTURING | JUST-IN-TIME | DNV TESTED | TIER 1 BANKABLE $$$ | 1000 VOLTS | HIGH EFFICIENCY

310 Wp 60 Cell

Monocrystalline PV Module

CE IEC TÜV Intertek Fraunhofer ISE

100% MAXIMUM POWER DENSITY
Silfab's SLA-M 310 ultra-high-efficiency modules are optimized for both Residential and Commercial projects where maximum power density is preferred.

100% NORTH AMERICAN QUALITY MATTERS
Silfab's fully-automated manufacturing facility ensures precision engineering is applied at every stage. Superior reliability and performance combine to produce one of the highest quality modules with the lowest defect rate in the industry.

NORTH AMERICAN CUSTOMIZED SERVICE
Silfab's 100% North American based team leverages just-in-time manufacturing to deliver unparalleled service, on-time delivery and flexible project solutions.

ENSURES MAXIMUM EFFICIENCY
60 of the highest efficiency, premium quality monocrystalline cells result in a maximum power rating of 310Wp.

ADVANCED PERFORMANCE WARRANTY
25-year linear power performance guarantee to 82%

ENHANCED PRODUCT WARRANTY
12-year product/workmanship warranty

BUILT BY INDUSTRY EXPERTS
With over 35 years of industry experience, Silfab's technical team are pioneers in PV technology and are dedicated to an innovative approach that provides superior manufacturing processes including: infra-red cell sorting, glass washing, automated soldering and meticulous cell alignment.

44 PPM DEFECT RATE*
Total automation ensures strict quality control during each step of the process at our certified ISO manufacturing facility.
*As of December 31, 2016

LIGHT AND DURABLE
Over-engineered to weather low load bearing structures up to 5400 Pa. Light-weight frame exclusively designed with wide-ranging racking compatibility and durability.

PID RESISTANT
Proven in accordance to IEC 62804-1

AVAILABLE IN
All Black

Auric SOLAR
Proud Partner

MADE IN NORTH AMERICA

Electrical Specifications		SILFAB SLA Monocrystalline	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	310	234
Maximum power voltage (Vpmax)	V	33.05	29.7
Maximum power current (Ipmax)	A	9.38	7.88
Open circuit voltage (Voc)	V	40.25	37.2
Short circuit current (Isc)	A	9.93	8.14
Module efficiency	%	19.0	17.9
Maximum system voltage (VDC)	V	1000	
Series fuse rating	A	15	
Power Tolerance	Wp	+/-5	

Measurement conditions: STC 1000 W/m2 • AM 1.5 • Temperature 25 °C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ≤ 3%
• Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by +/-5.

Temperature Ratings		SILFAB SLA Monocrystalline
Temperature Coefficient Isc	%/K	0.03
Temperature Coefficient Voc	%/K	-0.30
Temperature Coefficient Pmax	%/K	-0.38
NOCT (± 2°C)	°C	45
Operating temperature	°C	-40/+85

Mechanical Properties and Components		SILFAB SLA Monocrystalline
Module weight (± 1 kg)	kg	19
Dimensions (H x L x D; ± 1mm)	mm	1650 x 990 x 38
Maximum surface load (wind/snow)*	N/m²	5400
Hail impact resistance		ø 25 mm at 83 km/h
Cells		60 - Si monocrystalline - 3 or 4 busbar - 156.75 x 156.75 mm
Glass		3.2 mm high transmittance, tempered, antireflective coating
Backsheet		Multilayer polyester-based
Frame		Anodized Al
Bypass diodes		3 diodes-45V/12A, IP67/IP68
Cables and connectors (See installation manual)		1200 mm ø 5.7 mm (4 mm2), MC4 compatible

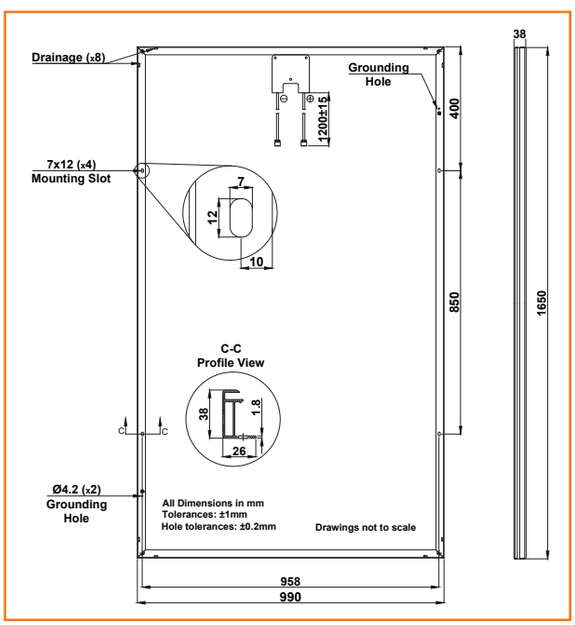
Warranties	SILFAB SLA Monocrystalline
Module product warranty	12 years
Linear power performance guarantee	25 years ≥ 97% end of 1st year ≥ 90% end of 12th year ≥ 82% end of 25th year

Certifications	SILFAB SLA Monocrystalline
Product	ULC ORD C1703, UL 1703, IEC 61215, IEC 61730, IEC 61701, CEC listed
	UL Fire Rating: Type 2 (Type 1 on request)
Factory	ISO 9001:2008

Warning: Read the installation and User Manual before handling, installing and operating modules.

Third-party generated pan files from PV Evolution Labs available for download at: www.silfab.ca/downloads

- Pallet Count: up to 25 per pallet
- Container Count: 900



Silfab Solar Inc.
240 Courtneypark Drive East • Mississauga, Ontario Canada L5T 2S5
Tel +1 905-255-2501 • Fax +1 905-696-0267
info@silfab.ca • www.silfab.ca

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate seamlessly with the Enphase IQ Envoy™, Enphase Q Aggregator™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.

Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell modules.

UL CERTIFIED
SAFETY US-CA
E341165

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US	IQ7PLUS-72-2-US
Commonly used module pairings[1]	235 W - 350 W +	235 W - 440 W +
Module compatibility	60-cell PV modules only	60-cell and 72-cell PV modules
Maximum input DC voltage	48 V	60 V
Peak power tracking voltage	27 V - 37 V	27 V - 45 V
Operating range	16 V - 48 V	16 V - 60 V
Min/Max start voltage	22 V / 48 V	22 V / 60 V
Max DC short circuit current (module Isc)	15 A	15 A
Overvoltage class DC port	II	II
DC port backfeed current	0 A	0 A
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		295 VA	
Maximum continuous output power	240 VA		290 VA	
Nominal (L-L) voltage/range[2]	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A	1.15 A	1.21 A	1.39 A
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit[3]	16 (240 VAC) 13 (208 VAC)		13 (240 VAC) 11 (208 VAC)	
Overvoltage class AC port	III		III	
AC port backfeed current	0 A		0 A	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.7 leading ... 0.7 lagging		0.7 leading ... 0.7 lagging	

EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak CEC efficiency	97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %

MECHANICAL DATA	IQ 7 Microinverter
Ambient temperature range	-40°C to +65°C
Relative humidity range	4% to 100% (condensing)
Connector type	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - No fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environmental category / UV exposure rating	NEMA Type 6 / outdoor

FEATURES	
Communication	Power Line Communication (PLC)
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.
Compliance	CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.

1. No enforced DC/AC ratio. See the compatibility calculator at https://enphase.com/en-us/support/module-compatibility.
2. Nominal voltage range can be extended beyond nominal if required by the utility.
3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

2018-02-08

CERTIFICATE OF COMPLIANCE

Certificate Number	20180521-E341165
Report Reference	E341165-20171030
Issue Date	2018-May-21

Issued to: Enphase Energy Inc.

1420 N. McDowell Blvd. Petaluma, CA 94954-6515

This is to certify that representative samples of Photovolic Grid Support Utility Interactive Inverter with Rapid Shutdown Functionality

Models IQ7PD-72-2-US and IQ7PD-84-2-US

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

Standard(s) for Safety:

UL 1741, Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741, Second Edition, dated January 28, 2010. Including the requirements in UL 1741 Supplement SA, sections as noted in the Technical considerations.

IEEE 1547, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.

IEEE 1547.1, IEEE Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.

UL 62109-1, Safety of Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements; IEC 62109-2, Safety of Power Converters for use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters.

CSA C22.2 No. 107.1-01, General Use Power Supplies.

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

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

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	20170112-E486080
Report Reference	E486080-20160830
Issue Date	2017-JANUARY-12
Issued to:	ENPHASE ENERGY INC 1420 N McDowell Blvd Petaluma CA 94954-6515
This is to certify that representative samples of	DISTRIBUTED GENERATION WIRING SYSTEMS AND HARNESSES Photovoltaic Wiring Harness. Models 840-00387 or Q-12-10-240, 840-00388 or Q-12-17-240, 840-00389 or Q-12-20-200, 840-00800 or Q-DCC-7, 840-00386 or Q-DCC-5, 840-00385 or Q-DCC-2. Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL Subject 9703 - Outline of Investigation for Distributed Generation Wiring Harnesses
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

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

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	20180521-E341165
Report Reference	E341165-20171030
Issue Date	2018-May-21

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Standards for Safety:

UL 1741, Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741, Second Edition, dated January 28, 2010. Including the requirements in UL 1741 Supplement SA, sections as noted in the Technical considerations.

IEEE 1547, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.
IEEE 1547.1, IEEE Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.

UL 62109-1, Safety of Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements; IEC 62109-2, Safety of Power Converters for use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters.

CSA C22.2 No. 107.1-01, General Use Power Supplies.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

Appendix: VRise and Conductor Length Tables

Internal VRise of Q Cables with IQ Series Microinverters

Use the following tables to determine the voltage rise attributed to the Q Cable that connects the IQ Micros. Reference the IQ Micro and Q Cable type (model numbers provided) to find the appropriate table. For end fed circuits reference the number of microinverters in the circuit to find the voltage rise attributed to the Q Cable. For center-fed circuits, reference the number of microinverters in the longer of the two sub-branches.

IQ 6:

Table 1.1: Internal Q Cable VRise (IQ 6 – 240V / Portrait Cable, Q-12-10-240)

IQ 6 Microinverters per branch																
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
VRise (V)	0.02	0.05	0.10	0.16	0.24	0.34	0.45	0.58	0.79	0.89	1.07	1.26	1.47	1.70	1.94	2.20
VRise (%)	0.01	0.02	0.04	0.07	0.10	0.14	0.19	0.24	0.30	0.37	0.45	0.53	0.61	0.71	0.81	0.92
Current (A)	0.96	1.92	2.88	3.83	4.79	5.75	6.71	7.67	8.63	9.58	10.54	11.50	12.46	13.42	14.38	15.33

Table 1.2: Internal Q Cable VRise (IQ 6 – 240V / Landscape 60-Cell Cable, Q-12-17-240)

IQ 6 Microinverters per branch																
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
VRise (V)	0.02	0.07	0.15	0.25	0.37	0.52	0.70	0.90	1.12	1.37	1.64	1.94	2.27	2.61	2.99	3.37
VRise (%)	0.01	0.03	0.06	0.10	0.16	0.22	0.29	0.37	0.47	0.57	0.68	0.81	0.94	1.09	1.25	1.41
Current (A)	0.96	1.92	2.88	3.83	4.79	5.75	6.71	7.67	8.63	9.58	10.54	11.50	12.46	13.42	14.38	15.33

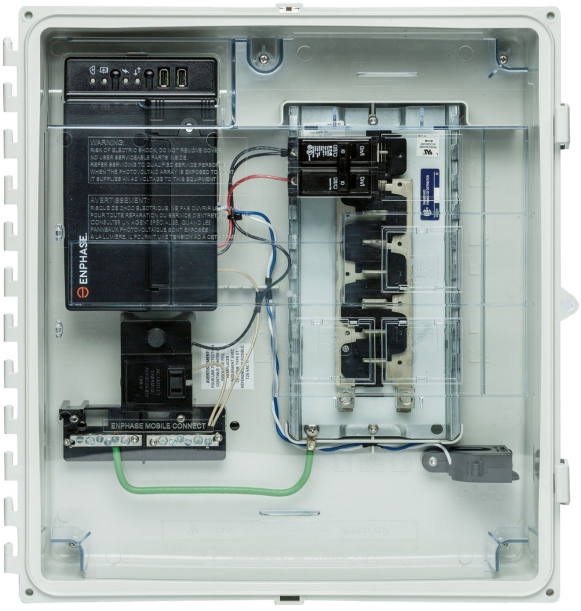
Table 1.3: Internal Q Cable VRise (IQ 6 – 240V / Landscape 72-Cell Cable*, Q-12-20-200)

IQ 6 Microinverters per branch																
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
VRise (V)	0.03	0.09	0.17	0.29	0.43	0.60	0.80	1.03	1.29	1.58	1.89	2.23	2.61	3.10	3.44	3.89
VRise (%)	0.01	0.04	0.07	0.12	0.18	0.25	0.33	0.43	0.54	0.66	0.79	0.93	1.09	1.25	1.43	1.62
Current (A)	0.96	1.92	2.88	3.83	4.79	5.75	6.71	7.67	8.63	9.58	10.54	11.50	12.46	13.42	14.38	15.33
***Note that IQ 6 Micros are compatible with 60-cell PV modules only, but can be used with Q-12-20-200 cable.**																

Enphase IQ Combiner+

(X-IQ-AM1-240-2)

The **Enphase IQ Combiner+**™ with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.



Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Provides production metering and optional consumption monitoring
- Supports installation of the Enphase Q Aggregator™

Simple

- Eaton BR series panelboard interior
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year warranty
- UL listed

UL LISTED

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

Enphase IQ Combiner+

MODEL NUMBER	
IQ Combiner+ X-IQ-AM1-240-2	IQ Combiner+ with Enphase IQ Envoy™ for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES (order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G / 12-year data plan) CELLMODEM-01 (3G / 5-year data plan) CELLMODEM-M1 (4G LTE CAT-M1 / 5-year data plan)	Plug and play industrial grade cellular modem with data plan for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.)
Consumption Monitoring CT CT-200-SPLIT	Split core current transformers enable whole home consumption metering* (+/- 2.5%).
Circuit Breakers BRK-15A-2-240 BRK-20A-2-240	 Breaker, 2 pole, 15A, Eaton BR215 Breaker, 2 pole, 20A, Eaton BR220
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	240 VAC, 60 HZ
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80 A (any combination)
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy
MECHANICAL DATA	
Dimensions (WxHxD)	49.3 x 46.5 x 16.0 cm (19.4” x 18.3” x 6.3”)
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 3 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	802.3, Cat5E (or Cat 6) UTP Ethernet cable - not included
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) (not included)
COMPLIANCE	
Compliance, Combiner	UL 1741 CAN/CSA C22.2 No. 107.1 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Compliance, IQ Envoy	UL 916 CAN/CSA C22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

To learn more about Enphase offerings, visit **enphase.com**

2018-05-02

ENPHASE.

SolaDeck

FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURE

SolaDeck Model SD 0783

Basic Features

- Stamped Seamless Construction
- 18 Gauge Galvanized Steel
- Powder Coated Surfaces
- Flashes into the roof deck
- 3 Roof deck knockouts .5", .75", 1"
- 5 Centering dimples for entry/exit fittings or conduit
- 2 Position Ground lug installed
- Mounting Hardware Included

SolaDeck UL50 Type 3R Enclosures

Available Models:
Model SD 0783 - (3" fixed Din Rail)
Model SD 0786 - (6" slotted Din Rail)

SolaDeck UL 1741 Combiner/Enclosures

Models SD 0783-41 and SD 0786-41 are labeled and ETL listed UL STD 1741 according to the UL STD 1741 for photovoltaic combiner enclosures.

Max Rated - 600VDC, 120AMPS

Model SD 0783-41 3" Fixed Din Rail fastened using Norlock System

****Typical System Configuration**

4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
1- Power Distribution Block 600VDC 175AMP
1- Bus Bar with UL lug

Model SD 0786-41 6" Slotted Din Rail fastened using steel studs

****Typical System Configuration**

4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
4- Din Rail Mounted Terminal Blocks
Bus Bars with UL lug

**Fuse holders and terminal blocks added in the field must be UL listed or recognized and meet 600 VDC 30 AMP 110C for fuse holders, 600V 50 AMP 90C for rail mounted terminal blocks and 600 V 175 AMP 90C for Power Distribution Blocks. Use Copper Wire Conductors.

Cover is trimmed to allow conduit or fittings, base is center dimpled for fitting locations.

Model SD 0783-41, wired with Din Rail mounted fuse holders, bus bar and power distribution block.

Model SD 0786-41, wired with Din Rail mounted fuse holders, terminal blocks and bus bars.

RSTC Enterprises, Inc • 2219 Heimstead Road • Eau Cliare, WI 54703
For product information call 1(866) 367-7782

SnapNrack™
Solar Mounting Solutions

snapnrack.com

Series 100 Residential Roof Mount System

The SnapNrack Series 100 Roof Mount System is engineered to optimize material use, labor resources and aesthetic appeal. This innovative system simplifies the process of installing solar modules, shortens installation times, and lowers installation costs; maximizing productivity and profits.

The Series 100 Roof Mount System boasts unique, pre-assembled, stainless steel "Snap-In" hardware and watertight flash attachments. This system is installed with a single tool. No cutting or drilling means less rail waste. It is fully integrated with built-in wire management, solutions for all roof types, one-size-fits-all features, and can withstand extreme environmental conditions. Series 100 is listed to UL Standard 2703 for Grounding/Bonding, Fire Classification and Mechanical Loading. UL 2703 Certification and Compliance ensures that SnapNrack installers can continue to provide the best in class installations in quality, safety and efficiency.

- Appealing design with built-in aesthetics
- No grounding lugs required for modules
- All bonding hardware is fully integrated
- Rail splices bond rails together, no rail jumpers required
- No drilling of rail or reaching for other tools required
- Class A Fire Rating for Type 1 and 2 modules

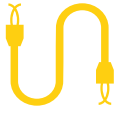
System Features Include


Snap in Hardware


Single Tool Installation


Easy Leveling


No Cutting or Drilling


Integrated Wire Management


Preassembled hardware


Integrated bonding

UL 2703 Certified

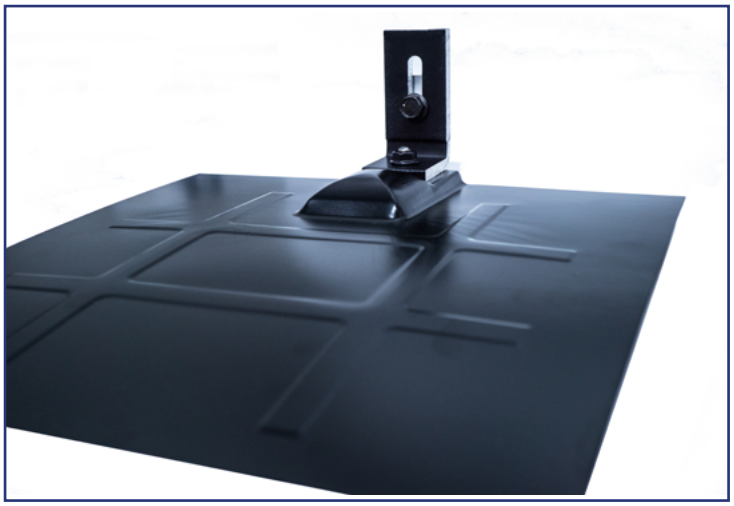
SnapNrack™
Solar Mounting Solutions

snapnrack.com

Series 100 Flashed L Foot Kit

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.

- Slotted attachment provides 1” vertical adjustability for array leveling
- 1” spacers available for increased elevation adjustability
- Offered in silver or black anodized aluminum. Both are available with black galvanized steel or aluminum flashing.
- No cutting of shingles



242-92051

Features Include

Snap in Hardware

Single Tool Installation

Easy Leveling

No Cutting or Drilling

Preassembled hardware

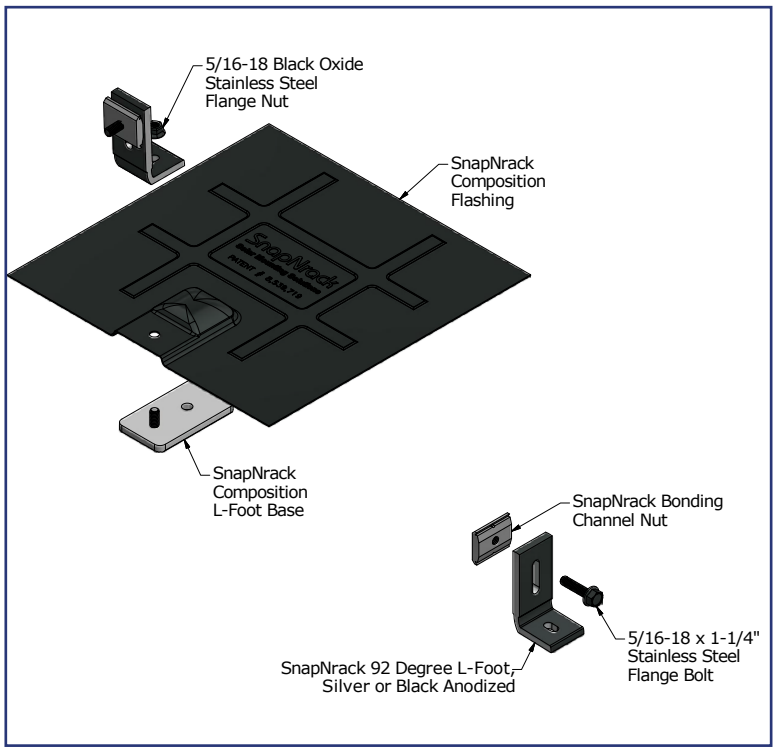
Integrated bonding

UL 2703 Certified

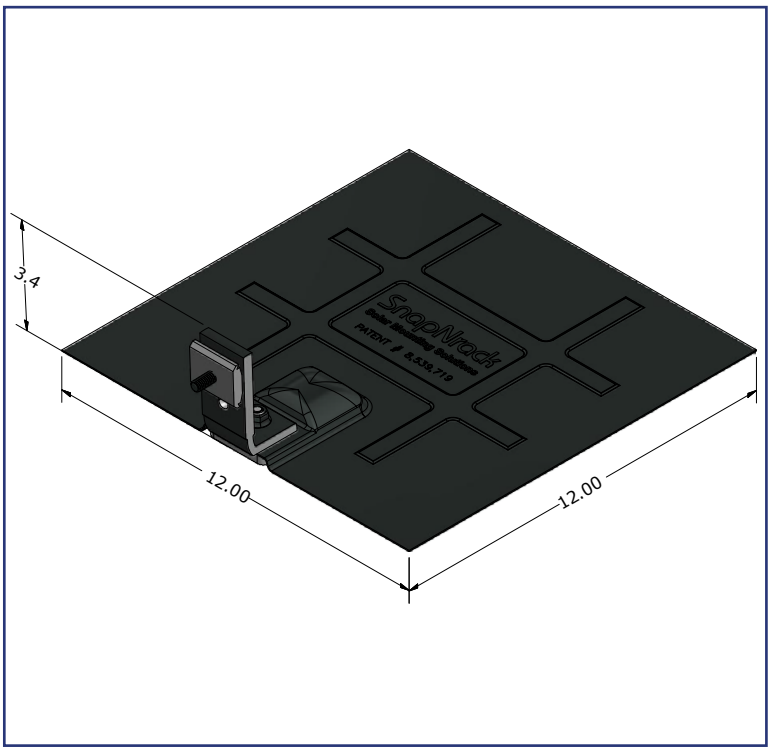
SnapNrack™
Solar Mounting Solutions

snapnrack.com

Flashed L Foot Kit Assembly



Flashed L Foot Kit Dimensions



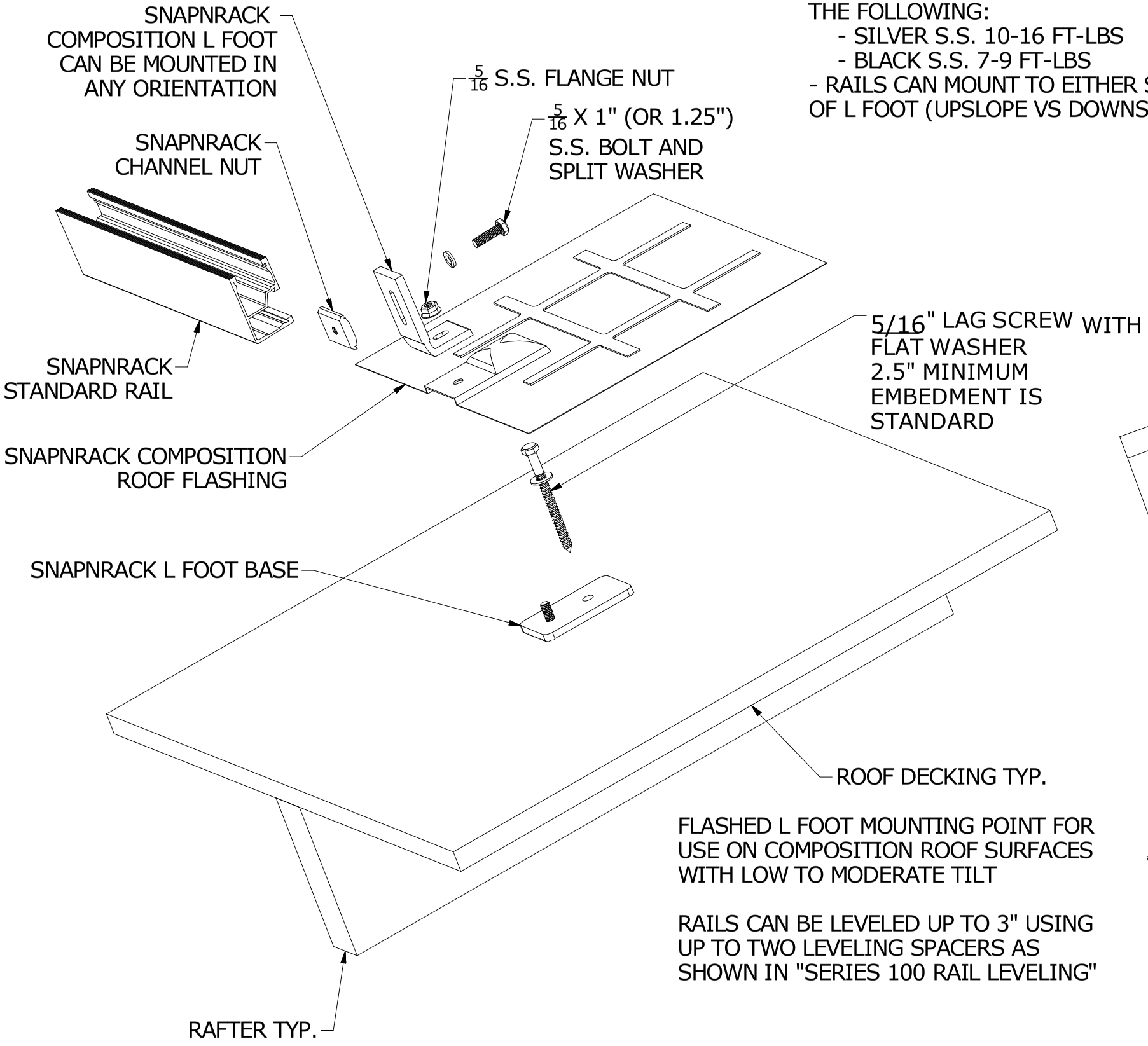
FLASHED L FOOT KIT TECHNICAL DATA	
Materials	• 6000 Series aluminum L foot & base • Stainless steel hardware • Galvanized steel or aluminum flashing w/ black all weather coating
Material Finish	Silver or black anodization
Design Uplift Load	340 lb
Torque Specification	• Flange nut: 10-16 ft-lbs • Rail attachment: silver hardware 10-16 ft-lbs, black hardware 8-10 ft-lbs

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

NOTES:

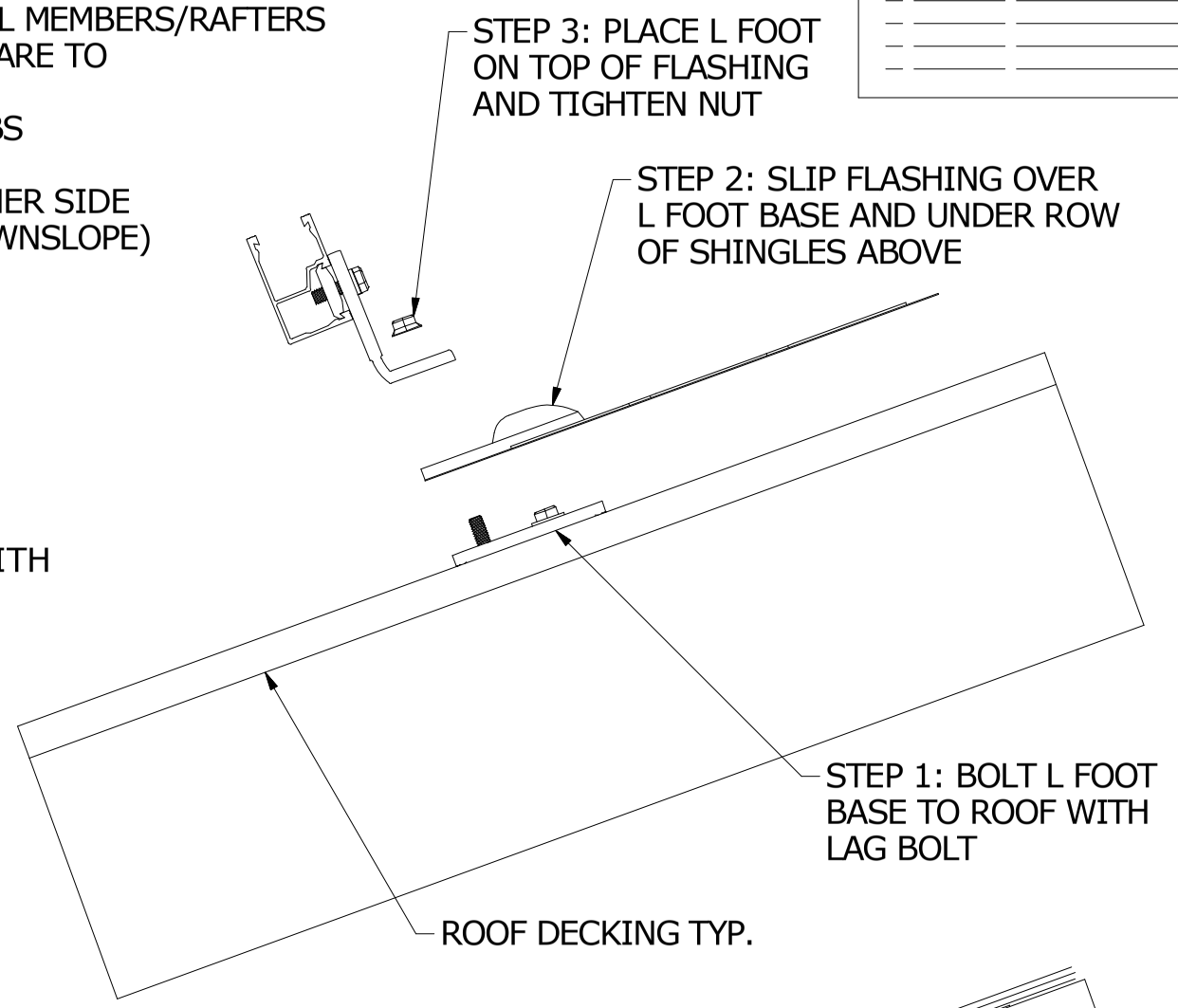
- 5/16" LAG BOLTS MUST EMBED 2.5" INTO ROOF STRUCTURAL MEMBERS/RAFTERS
- TORQUE ALL 5/16" HARDWARE TO THE FOLLOWING:
  - SILVER S.S. 10-16 FT-LBS
  - BLACK S.S. 7-9 FT-LBS
- RAILS CAN MOUNT TO EITHER SIDE OF L FOOT (UPSLOPE VS DOWNSLOPE)

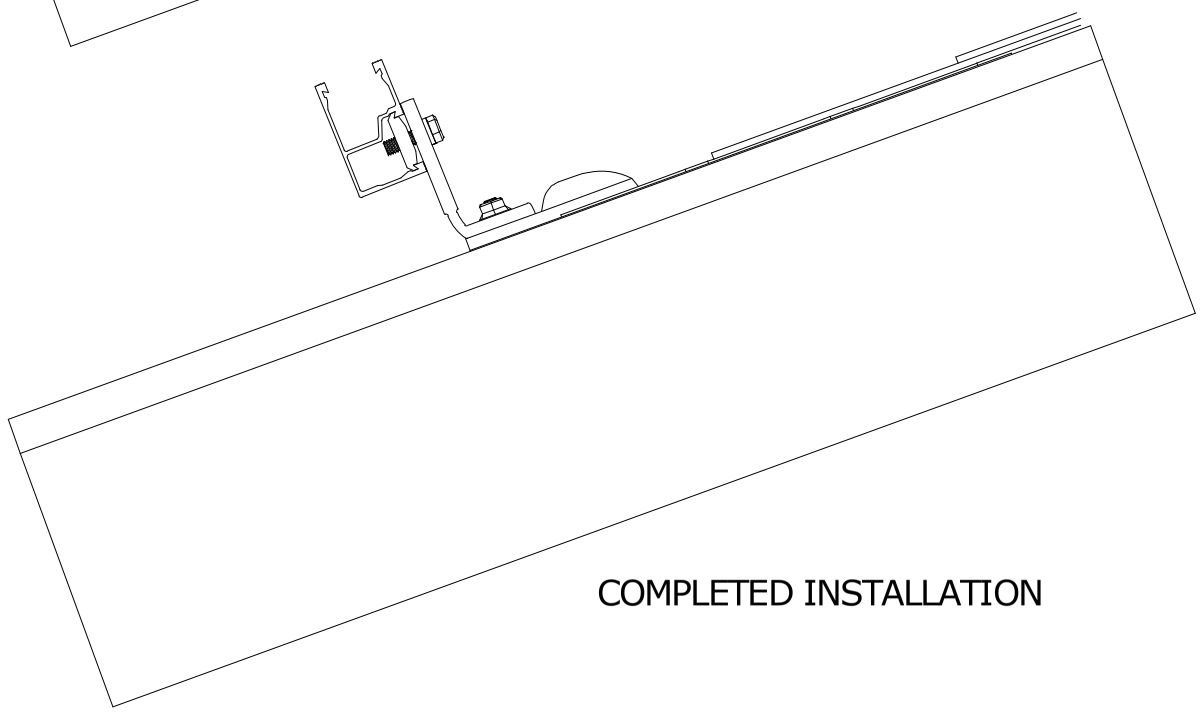
REVISION:



FLASHED L FOOT MOUNTING POINT FOR USE ON COMPOSITION ROOF SURFACES WITH LOW TO MODERATE TILT

RAILS CAN BE LEVELED UP TO 3" USING UP TO TWO LEVELING SPACERS AS SHOWN IN "SERIES 100 RAIL LEVELING"





COMPLETED INSTALLATION

SnapNrack™ PV Mounting Systems

MAINSTREAM ENERGY CORP.
775 FIERO LANE, SUITE 200 • SAN LUIS OBISPO, CA 93401 USA
PHONE (805) 528-9705 • FAX (805) 528-9701

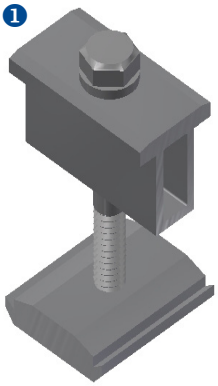
DESIGNER: G McPheeters DRAFTER: D Ryan APPROVED BY:	SCALE: DNS DATE: 120113	PART NUMBER: S100 PEN D01	DESCRIPTION: PEN DETAIL 01, FLASHED L FOOT TO RAFTER	REV F

System Ground Methods Include:

1. SnapNrack Mid Clamp
2. SnapNrack Universal End Clamp
3. SnapNrack X Clamp
4. SnapNrack Bonding Lug
5. Ilsco Bonding Lug

All SnapNrack Module Clamps contain a SnapNrack Bonding Channel Nut in assembly to properly ground the system (except Universal End Clamps) .

1



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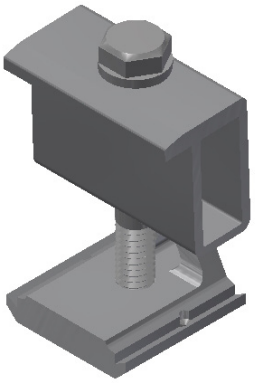
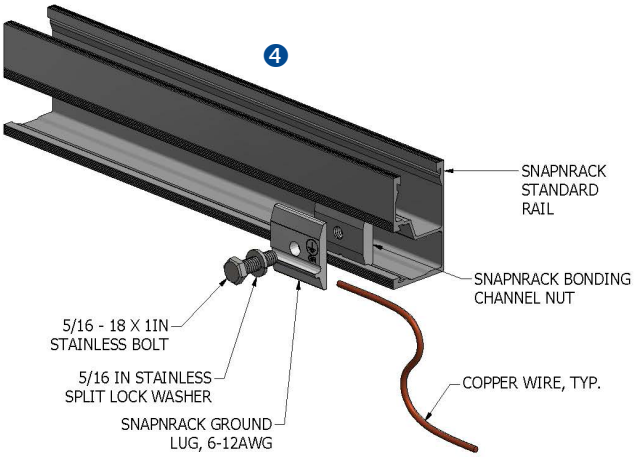


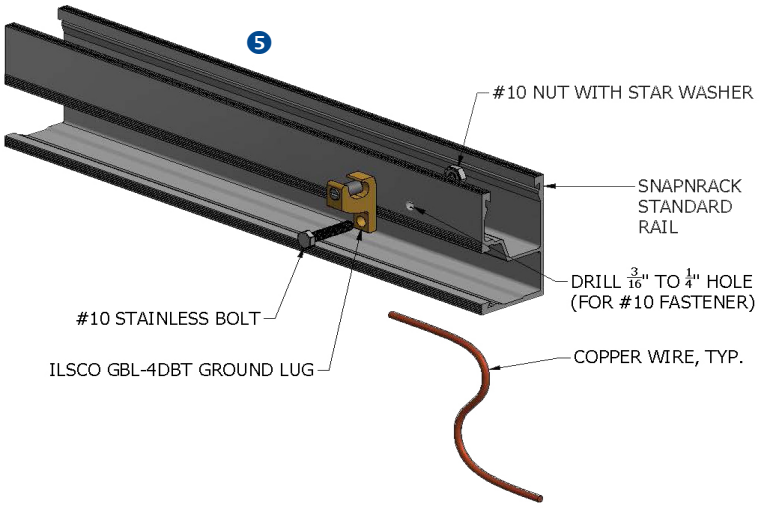
SnapNrack Bonding Lug Assembly

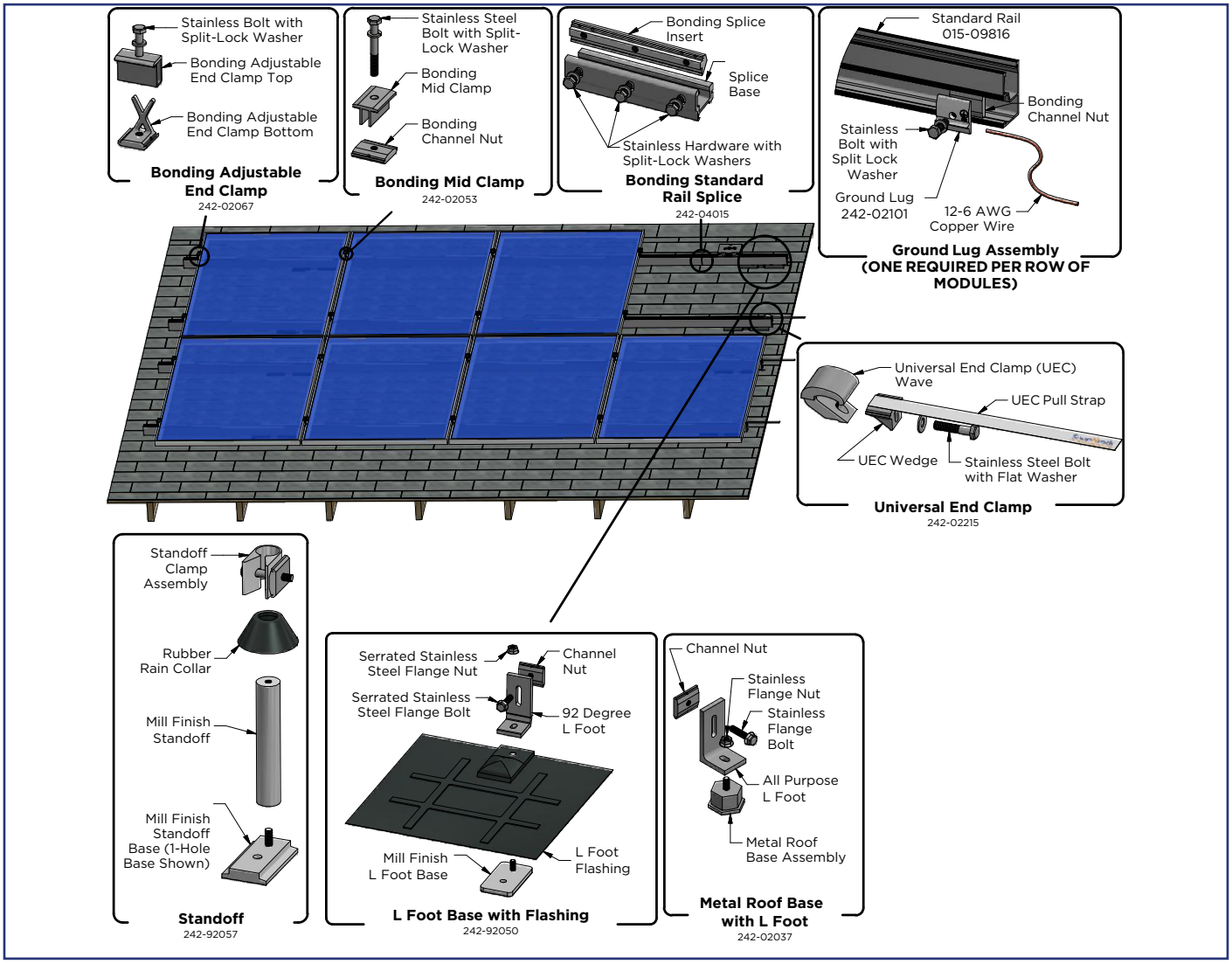
4



Ilsco Bonding Lug Assembly

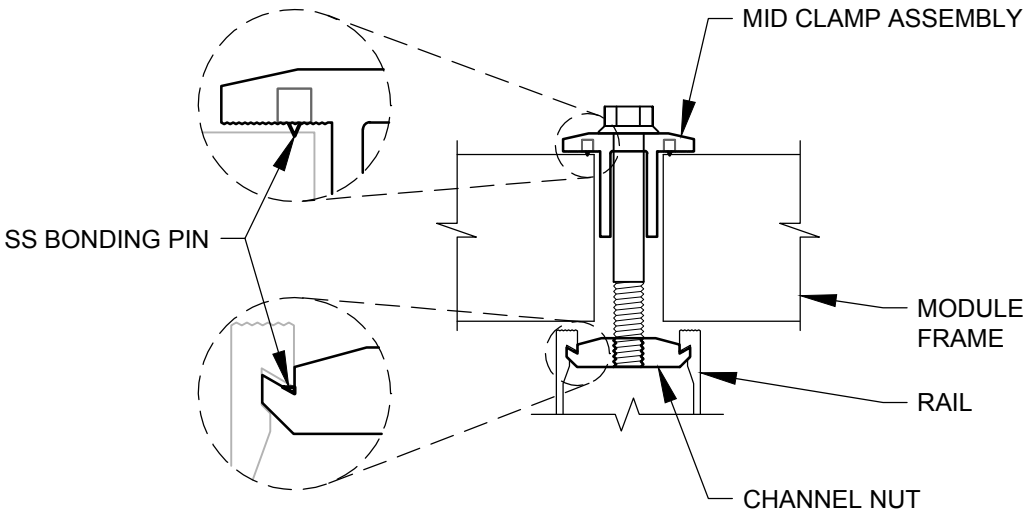
5



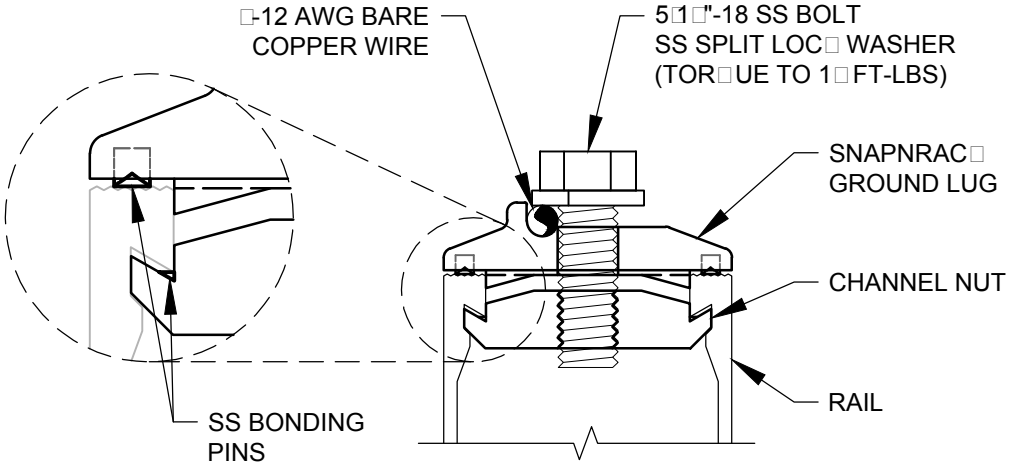


SERIES 100 TECHNICAL DATA

Materials	• 6000 Series aluminum • Stainless steel • Galvanized steel and aluminum flashing
Material Finish	• Silver and black anodized aluminum • Mill finish on select products • Silver or black coated hardware Note: Appearance of mill finish products may vary and change over time.
Wind Loads	110 – 190 mph (ASCE 7-10)
Snow Loads	0 – 120 psf
Array Pitch	0 – 60 degrees



NOTE:
1. AD□USTABLE END CLAMPS USE SAME BONDING PIN DESIGN TO BOND MODULES TO RAIL



NOTE:
1. ALL HARDWARE IS INCLUDED FROM MANUFACTURER
2. A MINIMUM OF ONE GROUND LUG IS TO BE INSTALLED ON EVERY CONTINUOUS ROW OF MODULES
3. GROUND LUG MAY BE INSTALLED IN EITHER RAIL CHANNEL
4. GROUND LUG MAY BE INSTALLED SO GROUND WIRE IS PARALLEL OR PERPENDICULAR TO RAIL
5. ENSURE SPLIT LOC□ WASHER IS INSTALLED ON TOP OF COPPER WIRE

ASSEMBLER:	
INSPECTOR:	

DESCRIPTION:

SNAPNRAC□ MOUNTING SYSTEM
GROUNDING DETAILS

PART NUMBER:	SCALE:
	□□□

DRAWN BY: M□□□□□□□□□□□□

APPROVED BY: □□□□□□□□□M□□

REVISION:

G	1□11□201□	NEW ITEM

SnapNrack™
Solar Mounting Solutions

S□nr□n S□□□□LLC
595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902

Oregon
Kate Brown, Governor

Construction Contractors Board
www.oregon.gov/ccb
Mailing Address:
PO Box 14140
Salem, OR 97309-5052
Phone # 503-378-4621

CCB LICENSE DETAIL REPORT

LICENSE: 212831

GENERAL INFORMATION

AURIC SOLAR LLC
2310 SOUTH 1300 WEST
SALT LAKE CITY UT 84119
801-878-3363

LICENSE STATUS: Active
FIRST LICENSED: 11/16/2016
LICENSE EXPIRES: 11/16/2018
ENTITY: Limited Liability Company
IND. CONT. STATUS: Nonexempt

ENDORSEMENTS

COMMERCIAL: CSC1 - Specialty Contractor 1
RESIDENTIAL: RSC - Specialty Contractor

ADDITIONAL CERTIFICATES / LICENSES

CERTIFIED HOME INSPECTOR: NO
LICENSED LEAD BASED PAINT: NO

ASSOCIATED NAMES

THANIEL SHAFFER BISHOP, RMI Owner
JESS SCOTT PHILLIPS, Member (Limited Liability Company)
ROBERT TYLER GORDON, Member (Limited Liability Company)
THANIEL SHAFFER BISHOP, Member (Limited Liability Company)
TRENTON JAY VANSICE, Member (Limited Liability Company)

RESIDENTIAL BOND INFORMATION

COMPANY: CINCINNATI INSURANCE COMPANY (THE)
AMOUNT $ 15,000
EFFECTIVE TO: 11/16/2018

COMMERCIAL BOND INFORMATION

COMPANY: CINCINNATI INSURANCE COMPANY (THE)
AMOUNT: $ 50,000
EFFECTIVE TO: 11/16/2018

INSURANCE INFORMATION

COMPANY: AUTO OWNERS INS CO
OCCURANCE / AGGREGATE AMOUNT: $1,000,000 / $2,000,000
CANCELLATION DATE: 09/10/2017

OTHER LICENSE NUMBERS

This report was generated by the CCB on: November 16, 2016, 1:40 pm