

Solar Photovoltaic Project

Mark & Erin Asahara
7787 Britt Place
Santee, CA 92071

Drawing Sheets Included

- C-1 - Cover Sheet
- E-1 - Electrical Single Line
- R-1 - Roof Layout
- P-1 - Plot Plan
- S-1 - Signage Page

Spec Sheets Included

- SP-1 - LG Solar Panel Spec.
- SP-2 - Enphase Spec.
- SP-3 - Everest Racking Spec.
- SP-4 - Everest Racking Spec Cont.
- SP-4A - Everest Fire UL
- SP-5 - Flashed L Foot Kit.
- SP-6 - Amphenol Lug Spec.
- SP-7 - Additional Notes

System Voltages

Maximum Amperage per 11 Panel String (TYP of 1) = 11.45A + 25% = 14.32A
Maximum Amperage per 10 Pnale String (TYP of 1) = 10.41A + 25% = 13.02A
Total for Both = (10.41 + 11.45) +25% = 27.32A
See E-1 For Breaker Details

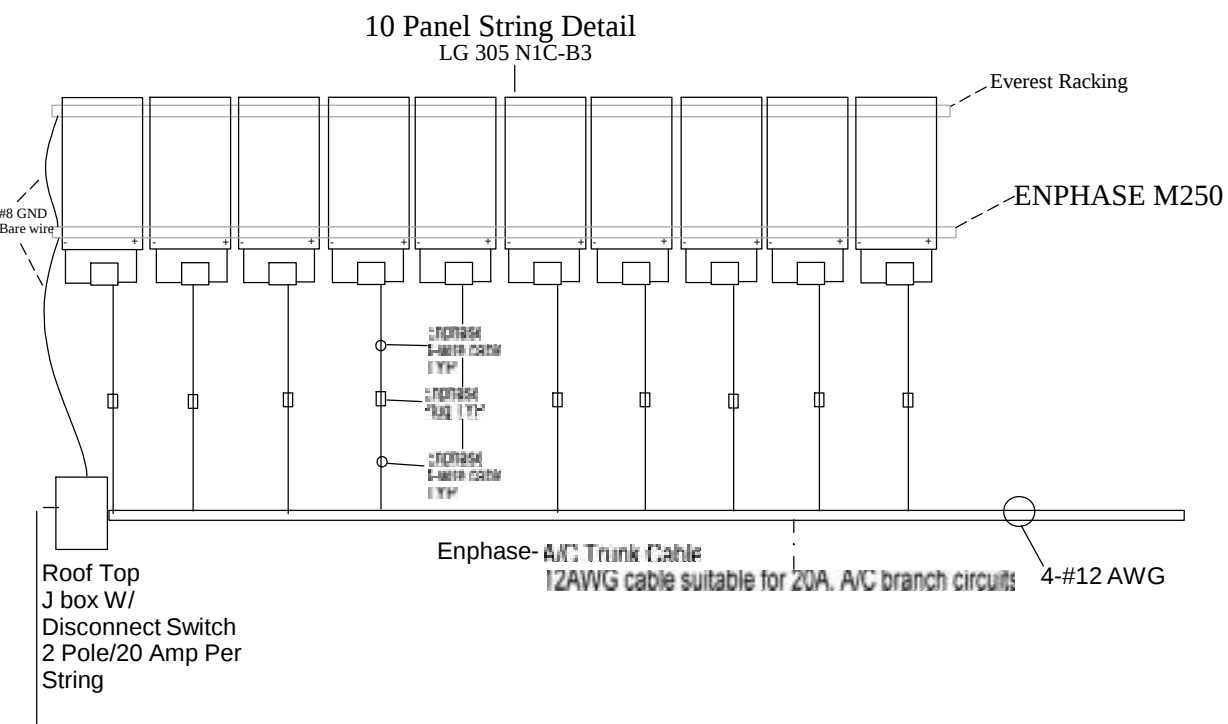
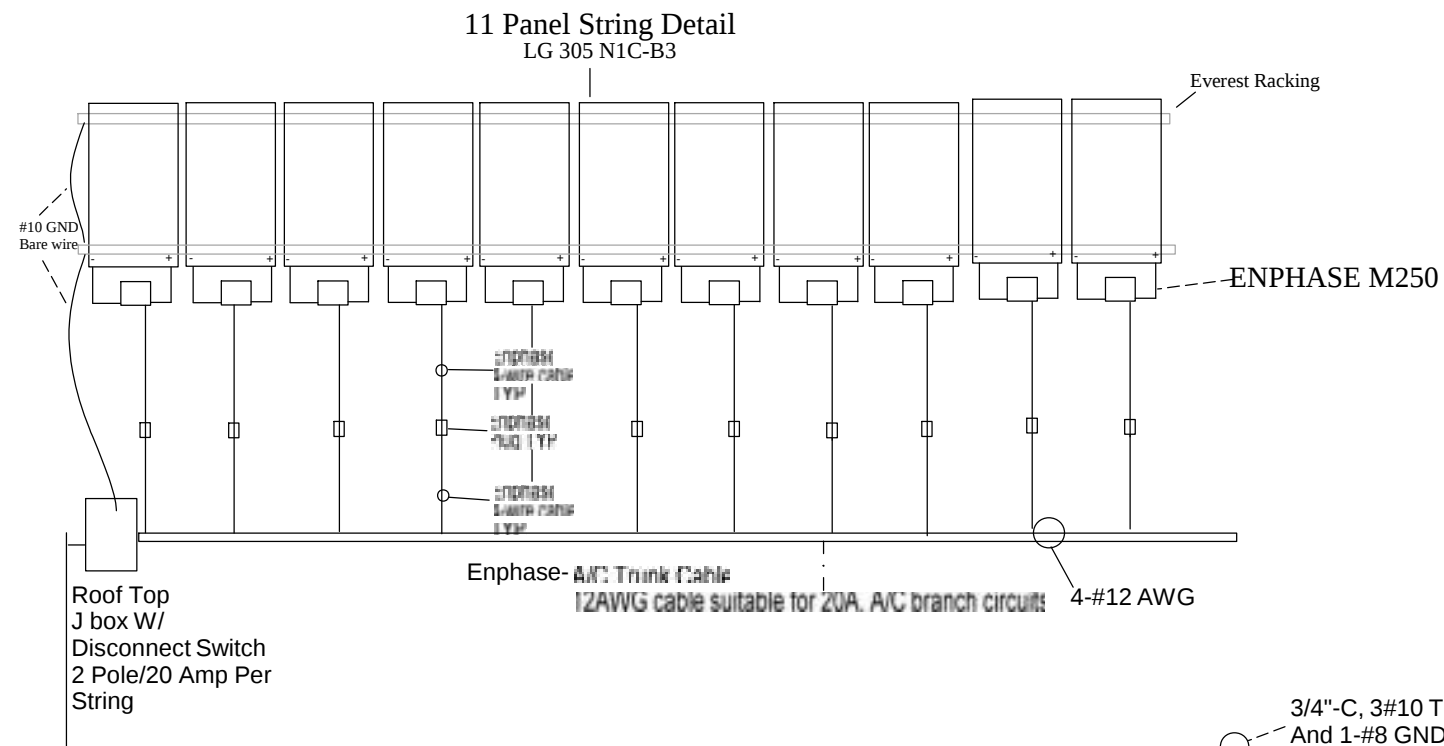
System Notes

System size in STC-DC watts = 6.4kW
System Componets
21 - LG 305 N1C-B3
1 - String of 11
1 - String of 10
21 - Enphase M250 Micro Inverters
Racking by "Everest Racking Systems"
Estimated Annual Output= 9.45 kWh

General Notes

- #1 All plaques will will meet 2013 CEC and SanteeArea and SDGE requirements for alternate self generation power source equipment, specifications.Will be plastic engraved with contrasting letters, mounted with pop rivets in such a way as to not endanger the integrity of the enclosure.
- #2 Alternative Power Placard shall meet Santee Area specifications.
- #3 Any Photovoltaic conduit entering the building shall be in metal conduit and labeled every 5ft "CAUTION DC CIRCUIT".
- #4 Any liquid-tight flexible conduit shall be sun light resistant.
- #5 All Solar modules,equipment and metallic components will be bonded.
- #6 Solar modules will be grounded using the supplied connection point,identified on the module and manufacturer's instructions.
- #7 All plumbing and mechanical roof vents to be clear from photovoltaic array,or extended above solar panels.
- #8 System will not be energized untill approved by SDGE
- #9 Lags shall be a minmum 2-1/2' enbedment into wood. Lag screws shall be at least 6" from any truss joints.
- #10 Lags used are 5/16' and 3-1/2' long, Maximum Spacing 6' on Center.
- #11 This system is designed to meet the requirements of the 2013 CBC and CFC, and Article 690 of the National Electric Code (NEC NFPA 70).
- #12 This system shall comply with:
 - 2013 Edition of the California Residential Code as amended and adopted by the City of Santee.
 - 2013 Edition of the California Electrical Code as amended and adopted by the City of Santee.
 - 2013 Edition of the California Fire Code as amended and adopted by the City of Santee.
- #13 Photovoltaic source circuits and PV output circuits shall not be contained in the same raceway, cable tray, outlet box, junction box, or similar fitting as conductors, feeders, or branch circuits of other non-PV systems, unless the conductors of the different systems are separated by a partition. Photovoltaic system conductors shall be identified and grouped as required by 690.4(B)(1) through (4). The means of identification shall be permitted by separate color coding, marking tape, tagging, or other approved means. (CEC Article 690.4 B)
- #14 The connection to a module or panel shall be arranged so that removal of a module or panel from a photovoltaic source circuit does not interrupt a grounded conductor to other PV source circuits. (CEC Article 690.4 C)
- #15 Photovoltaic source and PV output conductors, in and out of conduit, and inside of a building or structure, shall be routed along building structural members such as beams, rafters, trusses, and columns where the location of those structural menbers can be determined by observation. Where circuits are imbedded in built-up laminate, or membrane roofing materials in roof areas not covered by PV modules and associated equipment, the location of circuits shall be clearly marked. (CEC Article 690.4 F)

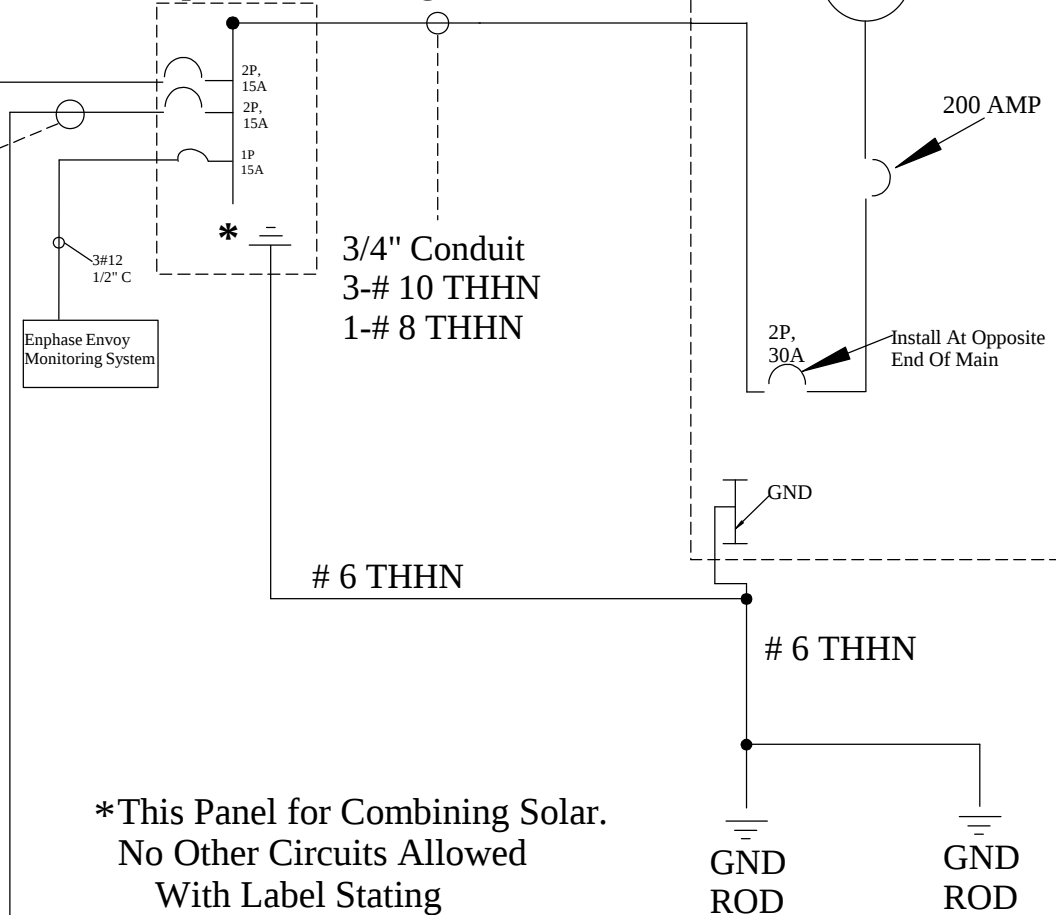
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Notes:
Solar Breaker Opposite side of Bus from Main Breaker
* All Circuits other than the solar, are relocated from the old panel, into new panel, with new breakers.
-Ground Wire on roof is #10 Bare.
Panels are Grounded with "Amphenol" Grounding Lug UL2703 IDS-52-1
* 30 Amp breaker will be installed on the opposite side of the buss from the main.
* 1 Existing Main Electrical Panel, is not a center fed breaker.
Solar breaker shall not exceed 20% of Panel buss rating.
Inverter shall be listed to U.L. standard 1741+ identified as an interactive photovoltaic power system.

X _____

New Sub Panel*
125 Amp Rated Bussing



*This Panel for Combining Solar.
No Other Circuits Allowed
With Label Stating
"Sub Panel For Solar Only".

Single Line



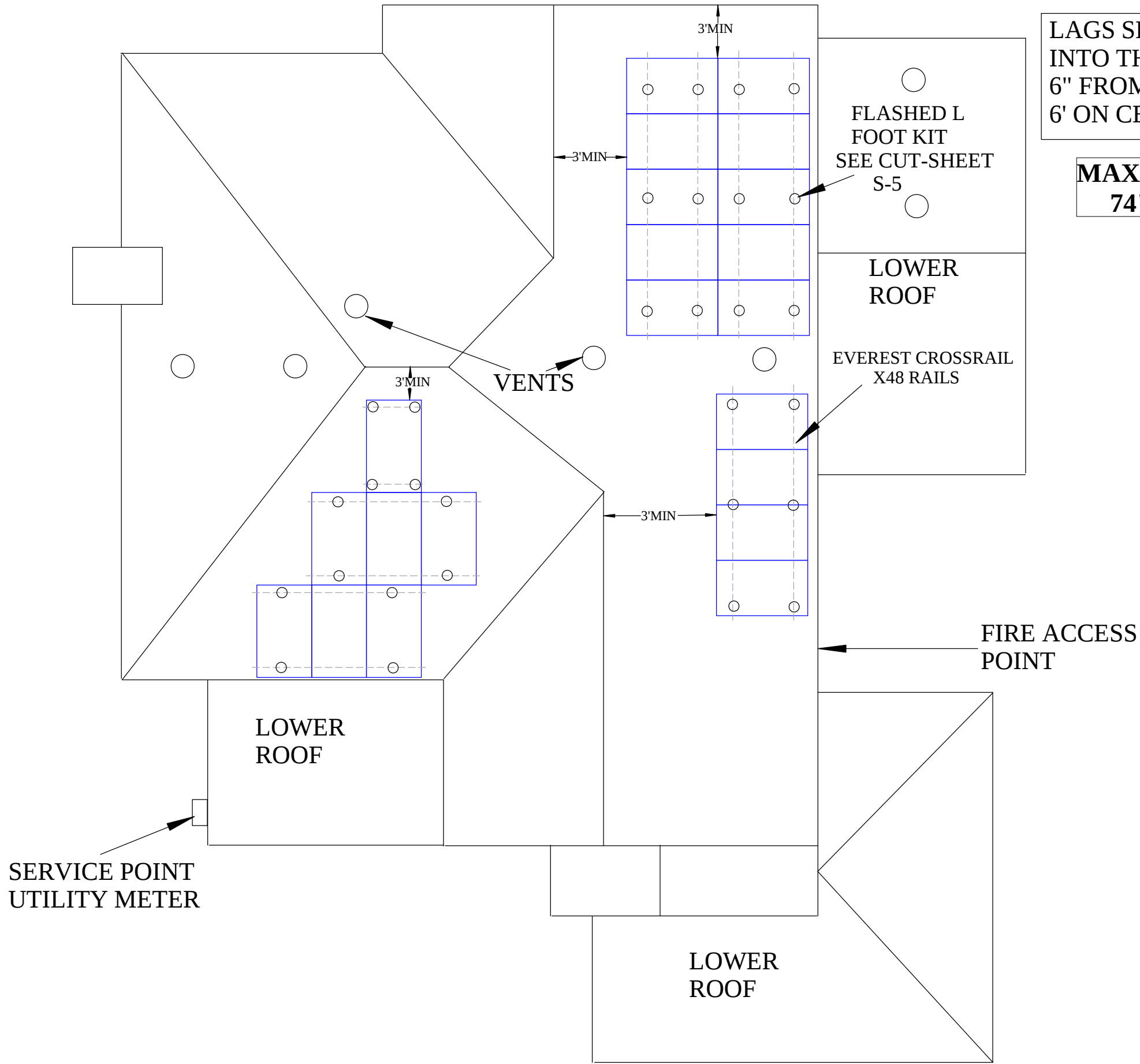
Asahara Solar Project
7787 Britt Place
Santee, CA 92071

Secure Roofing & Solar
999 Rancheros Dr Suite B San Marcos, CA 92069
760 546 0254 CSLB #990002 (C-39 C-46)

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6/5/2015
Single line
No Scale
Sheet

E-1

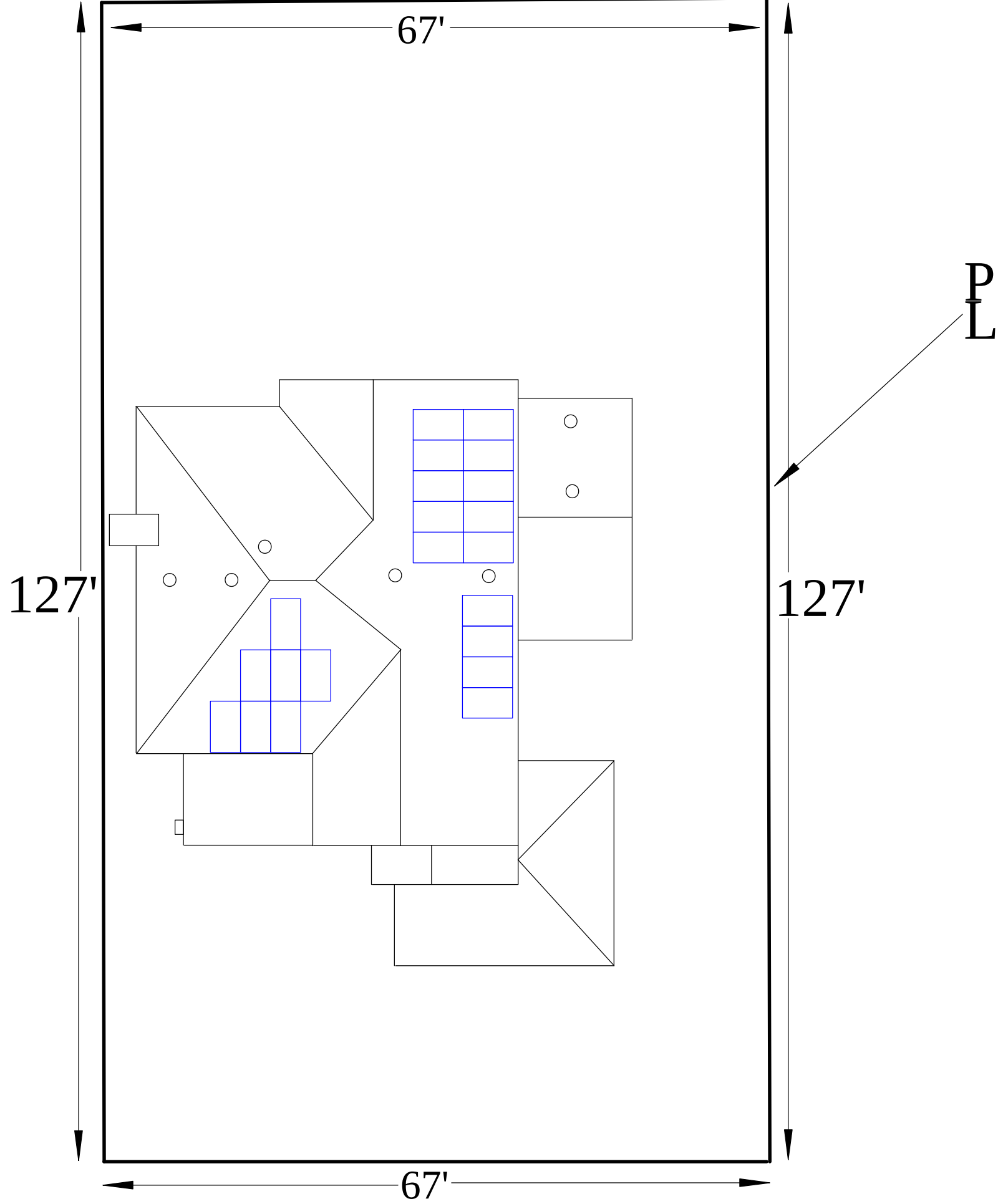
All Exposed Conduit will be Painted to Match Surrounding Roof or Walls
ROOF TYPE = ASPHALT SHINGLE



LAGS SHALL BE A MINIMUM OF 2.5" ENBEDMENT INTO THE WOOD. STAND OFFS SHALL BE AT LEAST 6" FROM TRUSS JOINT. MAX STAND OFF SPACING 6' ON CENTER

MAXIMUM SPACING BETWEEN STANDOFFS
74" - SEE EVEREST CUTSHEET ON SP-4

EXISTING ROOF
JOISTS 2"x6"
2' ON CENTER

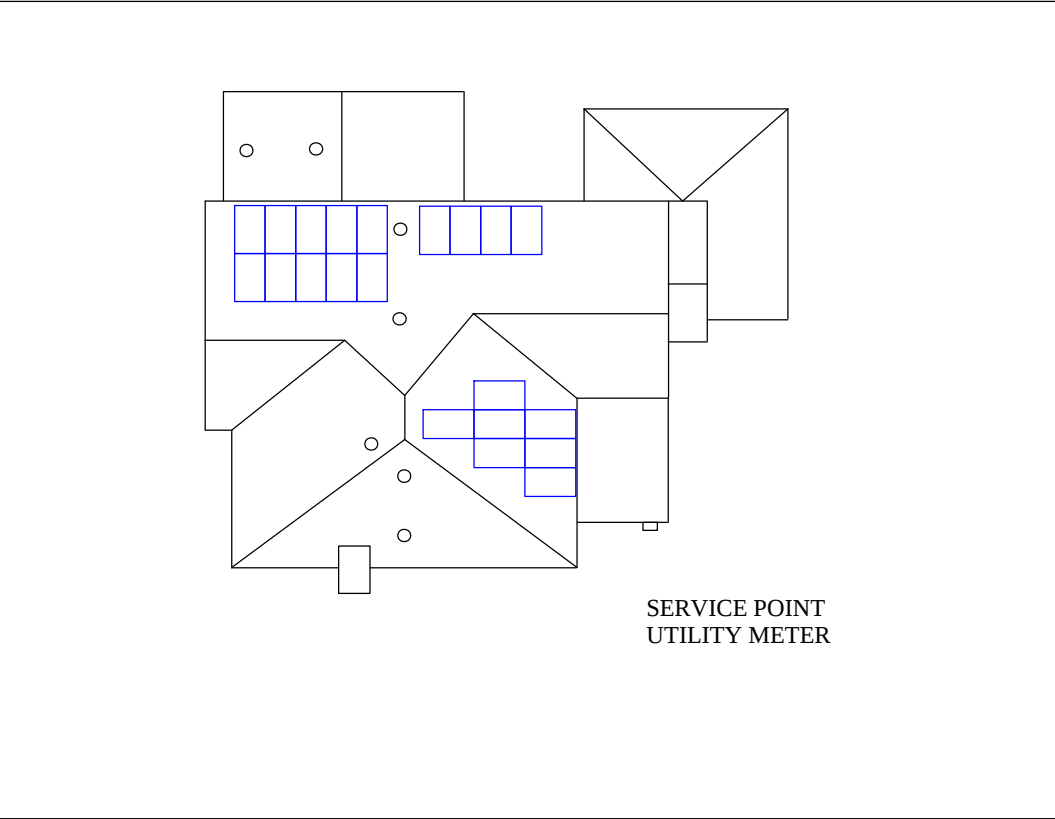


WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH THE LINE AND LOAD SIDE MAY
BE ENERGIZED IN THE OPEN POSITION

Install on pull boxes with interal terminals

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE
THIS OVERCURRENT DEVICE

Install on AC Disconnect



Install on Main Electric Service

DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE
DISCONNECT
DC Operating Parameters:

Max. System Voltage:
Maximum Current:
Rated Vmp:
Rated Imp:

Install on DC Disconnect

WARNING
ELECTRIC SHOCK HAZARD.
IF GROUND FAULT IS INDICATED, NORMALLY
GROUNDED CONDUCTORS MAY BE
UNGROUNDDED AND ENERGIZED.

At each junction box,combiner box,disconnect,and device where energized,
underground circuits may be exposed during service:(NEC 690.5(C))

CAUTION: SOLAR CIRCUIT

Place every 10 feet on all interior and exterior DC conduits,
raceways,enclosures,and cable assemblies,at turns,
above and /or below penerations,all DC combiners,
and junction boxes.

SIGNAGE

Signage material shall be reflective,
weather - resistant material suitable for the
enviroment.

ALL SIGNAGE SHALL FALL WITHIN THE FORMAT:

White lettering on a Red Background
Minimum 3/8" Letter Height
All letters shall be Capitaized
Arial or Similar Font, Non-Bold

ON MAIN SERVICE DISCONNECT:

Sign may be placed within the main service
disconnect.The sign shal be placed on
the outside cover if the main service disconnect
is operable with the service panel closed.

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Signage Sample

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6/7/2015
Signage Sample
No Scale
Sheet



Innovation for
a Better Life



LG NeON[™] 2 LG320N1C-G4 LG315N1C-G4 LG310N1C-G4 LG305N1C-G4

60 cell

LG's new module, NeON[™] 2, adopts Cello technology. Cello technology replaces 3 busbars with 12 thin wires to enhance power output and reliability. NeON[™] 2 demonstrates LG's efforts to increase customer's values beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.



Enhanced Performance Warranty

LG NeON[™] 2 has an enhanced performance warranty. The annual degradation has fallen from -0.7%/yr to -0.6%/yr. Even after 25 years, the cell guarantees 2.4% more output than the previous NeON[™] modules.



Aesthetic Roof

LG NeON[™] 2 has been designed with aesthetics in mind; thinner wires that appear all black at a distance. The product may increase the value of a property with its modern design.



Better Performance on a Sunny Day

LG NeON[™] 2 now performs better on sunny days thanks to its improved temperature coefficient.



High Power Output

Compared with previous models, the LG NeON[™] 2 has been designed to significantly enhance its output efficiency, thereby making it efficient even in limited space.



Outstanding Durability

With its newly reinforced frame design, LG has extended the warranty of the NeON[™] 2 for an additional 2 years. Additionally, LG NeON[™] 2 can endure a front load up to 6000 Pa, and a rear load up to 5400 Pa.



Double-Sided Cell Structure

The rear of the cell used in LG NeON[™] 2 will contribute to generation, just like the front; the light beam reflected from the rear of the module is reabsorbed to generate a great amount of additional power.

About LG Electronics

LG Electronics is a global player who has been committed to expanding its capacity, based on solar energy business as its future growth engine. We embarked on a solar energy source research program in 1995, supported by LG Group's rich experience in semi-conductor, LCD, chemistry, and materials industry. We successfully released the first Mono X[®] series to the market in 2010, which were exported to 32 countries in the following 2 years, thereafter in 2013, NeON[™] (previously known as Mono X[®] NeON) won "Innovator Award", which proved LG is the leader of innovation in the industry.

LG NeON[™] 2

LG320N1C-G4

LG315N1C-G4

LG310N1C-G4

LG305N1C-G4

Mechanical Properties

Cells	6 x 10
Cell Vendor	LG
Cell Type	Monocrystalline / N-type
Cell Dimensions	156.75 x 156.75 mm / 6 x 6 inch
# of Busbar	12 (Multi Wire Busbar)
Dimensions (L x W x H)	1640 x 1000 x 40 mm 64.57 x 39.37 x 1.57 inch
Front Load	6000 Pa / 125 psf
Rear Load	5400 Pa / 113 psf
Weight	17.0 ± 0.5 kg / 37.48 ± 1.1 lbs
Connector Type	MC4, MC4 Compatible, IP67
Junction Box	IP67 with 3 Bypass Diodes
Length of Cables	2 x 1000 mm / 2 x 39.37 inch
Glass	High Transmission Tempered Glass
Frame	Anodized Aluminum

Certifications and Warranty

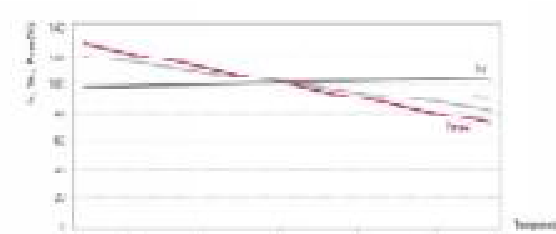
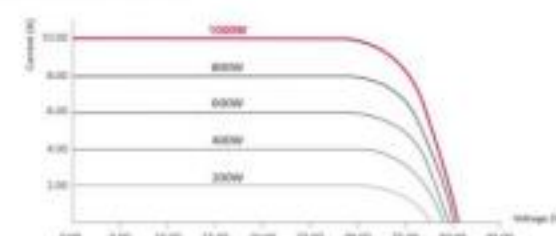
Certifications (In Progress)	IEC 61215, IEC 61730-1/-2, UL 1703, ISO 9001, IEC 62716 (Ammonia Test), IEC 61701 (Salt Mist Corrosion Test)
Module Fire Performance	Type 2 (UL 1703)
Product Warranty	12 years
Output warranty of Pmax (Measurement Tolerance ± 3%)	Linear warranty*

* 1) 1st year: 38%, 2) After 2nd year: 0.8% annual degradation, 3) 8.34% for 25 years

Temperature Coefficients

NOCT	46 ± 3 °C
Pmpp	-0.38 %/°C
Voc	-0.28 %/°C
Isc	0.03 %/°C

Characteristic Curves



Electrical Properties (STC *)

	320 W	315 W	310 W	305 W
MPP Voltage (Vmpp)	33.6	33.2	32.8	32.5
MPP Current (Impp)	9.53	9.50	9.45	9.39
Open Circuit Voltage (Voc)	40.9	40.6	40.4	40.1
Short Circuit Current (Isc)	10.05	10.02	9.96	9.93
Module Efficiency (%)	19.5	19.2	18.9	18.6
Operating Temperature (°C)	-40 ~ +90			
Maximum System Voltage (V)	1000			
Maximum Series Fuse Rating (A)	20			
Power Tolerance (%)	0 ~ +3			

* STC (Standard Test Condition) Irradiance 1000 W/m², Module Temperature 25 °C, AM 1.5

* The nameplate power output is measured and determined by LG Electronics at its sole and absolute discretion.

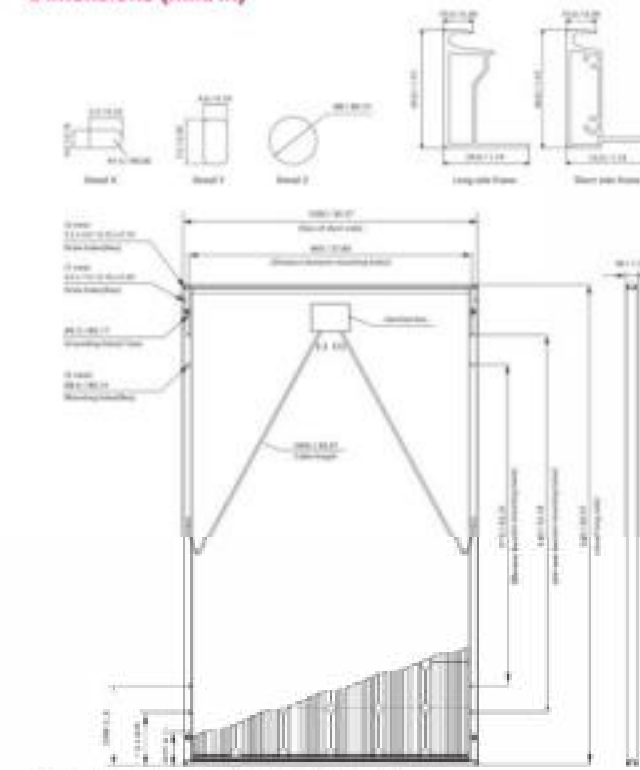
* The typical change in module efficiency at 250 W/m² in relation to 1000 W/m² is -2.0%.

Electrical Properties (NOCT*)

	320 W	315 W	310 W	305 W
Maximum Power (Pmpp)	234	230	226	223
MPP Voltage (Vmpp)	30.7	30.4	30.0	29.7
MPP Current (Impp)	7.60	7.58	7.54	7.49
Open Circuit Voltage (Voc)	37.9	37.6	37.4	37.1
Short Circuit Current (Isc)	8.10	8.08	8.03	8.01

* NOCT (Nominal Operating Cell Temperature) Irradiance 800 W/m², ambient temperature 20 °C, wind speed 1 m/s

Dimensions (mm/in)



* The dimensions between the center of the mounting spreading holes



North America Solar Business Team
LG Electronics USA, Inc.
1000 Sylvan Ave, Englewood Cliffs, NJ 07632

Contact: ls.solar@lge.com
www.lgusa.com

Product specifications are subject to change without notice.
DS-62-60 E-16-4-EN-56427

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01/04/2015

Innovation for a Better Life



LG Spec.



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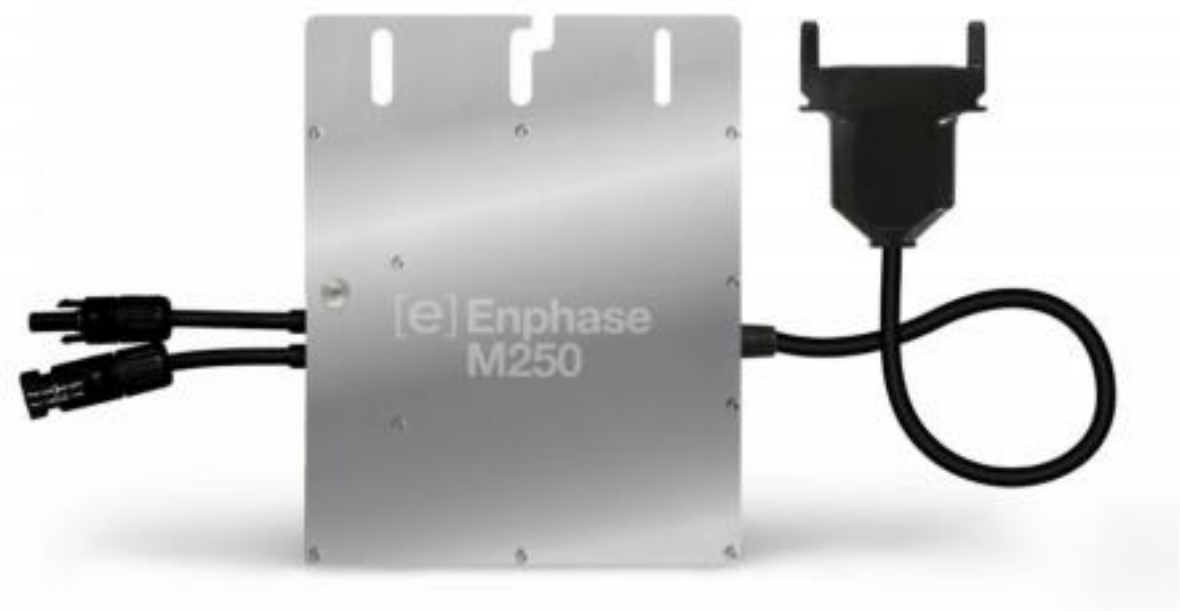
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SP-1

Enphase® M250



The **Enphase Energy Microinverter System** improves energy harvest, increases reliability, and dramatically simplifies design, installation, and management of solar power systems.

The Enphase System includes the microinverter, the Envoy Communications Gateway,™ and Enlighten,® Enphase's monitoring and analysis software.

PRODUCTIVE

- Optimised for higher-power modules
- Maximises energy production
- Minimises impact of shading, dust, and debris

RELIABLE

- 4th-generation product
- More than one million hours of testing
- System availability greater than 99.8%

SMART

- Quick and simple design, installation, and management
- 24/7 monitoring and analysis

SAFE

- Extra low-voltage DC reduces fire risk
- No single point of system failure
- Easy installation with Engage Cable



Enphase® M250 Microinverter // DATA

INPUT DATA (DC)	M250-60-230-S22
Recommended input power (STC)	210 - 310 W
Maximum input DC voltage	48 V
Peak power tracking voltage	27 V - 39 V
Operating range	16 V - 48 V
Min/Max start voltage	22 V / 48 V
Max DC short circuit current	15 A
Max input current	10 A
OUTPUT DATA (AC)	
Peak output power	258 W
Rated output power	250 W
Rated output current	1.09 A
Nominal voltage	230 V
Nominal frequency	50.0 Hz
Power factor	>0.95
Maximum units per 20 A branch circuit	14 (Ph + N), 42 (3Ph + N)
Maximum units per cable section	14 (Ph + N), 24 (3Ph + N)
EFFICIENCY	
EN 50530 (EU) efficiency	95.7%
Static MPPT efficiency (weighted, reference EN50530)	99.6%
Dynamic MPPT efficiency (fast irradiation changes, reference EN50530)	99.3%
Night time power consumption	0.055 W
MECHANICAL DATA	
External operating temperature range (ambient)	-40°C to +65°C
Internal operating temperature range	-40°C to +85°C
Enclosure environmental rating	Outdoor - IP67
Connector type	MC4
Dimensions (WxHxD)	179 mm x 217 mm x 28 mm (with bracket)
Weight	1.66 kg
Cooling	Natural convection - No fans
FEATURES	
Compatibility	Compatible with 60-cell PV modules.
Communication	Power line
Monitoring	Enlighten Manager and MyEnlighten monitoring options
Transformer design	High frequency transformers, galvanically isolated
Compliance	AS4777, G10/11, CEI 0-21, EN50438, EN62109-1, EN62109-2, ERDF-NOI-RES_13E_V5, G59/2, G83/2, VDE 0126-1-1 / A1, VDE AR N 4105

To learn more about Enphase microinverter technology, visit enphase.com/au.



Jan 30, 2014

Everest Solar Systems, LLC
3809 Ocean Ranch Blvd, Suite 111
Oceanside, CA 92056
Attn: Andy Neshat



RE: *CrossRail PV Panel Mounting System Evaluation*

To whom it may concern:

Per your request, Moment Structural Engineering Group has performed a comprehensive structural analysis of the Everest Solar CrossRail Solar PV Mounting System for typical installations in the State of California. When installed per the conditions and design criteria described herein, the CrossRail Solar PV Mounting System is compliant with the sections of the design reference documents noted below.

Design Reference Documents

- o 2013 Triennial Edition of Title 24, California Code of Regulations
Based on 2012 International Building Code & 2012 International Residential Code
- o ASCE/SEI 7-10 – Minimum Design Loads for Buildings and Other Structures
- o 2010 Aluminum Design Manual, by the Aluminum Association
- o Section and materials data provided by Everest Solar Systems
 - Rail section properties appear in Table 25 of this report

Overview

The CrossRail PV-panel roof mounting system consists of extruded aluminum support rails, module clamps, attachments, and fasteners spanning between points of attachment on an existing roof structure. Attachment of the CrossRail Mounting System to the existing roof structure shall be the responsibility of the installer, and should be analyzed by a registered design professional where required by the local authority having jurisdiction.

Methods & Design Parameters

Applicable combinations of dead, wind, and snow loads were evaluated in accordance with current code requirements to determine allowable rail span lengths, based on assumptions of single-span conditions and allowable deflection of L/120.

Design wind pressures were determined using Components and Cladding calculations in Chapter 26-30 of ASCE 7-10, using the loading parameters listed below. Configurations not conforming to these parameters will require additional analysis. Calculation of applicable roof snow load should be based upon ground snow load maps and equations and factors of ASCE 7-10, Chapter 7 and

moment STRUCTURAL ENGINEERING GROUP, LLC.
10530 Warwick Ave, Suite C5 • Fairfax, VA 22030 • Phone: 703-998-2350 • Web: www.msegllc.com

CROSSRAIL MOUNTING SYSTEM EVALUATION

Jan 30, 2013 • PAGE 3 OF 3

Summary

This assessment has provided design validation for code-compliant installations of the CrossRail PV Mounting system in the State of California. For the configurations and design loadings noted previously, the attached span tables represent maximum span lengths based on allowable stresses and deflection criteria. For all other configurations, refer to Everest Solar Systems for engineering support.

This report does not provide analysis of any existing structures, as may be required by the local authority having jurisdiction.

We appreciate the opportunity to have assisted you with this project. Should you have any further questions regarding this analysis, please feel free to contact us by phone or email.

Best Regards,



Shawn P. Kelley, P.E.
Principal
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spkelley@msegllc.com

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6/5/2015
Cover Sheet
No Scale
Sheet

SP-3



Everest Racking Spec

Table 5: Maximum Span Length (in.) - Wind Exposure C Condition									
Exposure C	Ultimate Wind Speed, V (mph)	Rail Type	Roof Snow Load (psf)						
			0	10	20	30	40	50	
Roof Wind Pressure Zone 1	110	X80	113	108	93	80	71	64	
		X48	77	74	66	61	56	52	
	115	X80	109	107	93	80	71	64	
		X48	74	73	65	60	56	52	
	120	X80	106	105	92	79	71	64	
		X48	72	72	65	60	56	52	
	130	X80	100	100	90	78	70	64	
		X48	68	68	63	59	55	52	
	140	X80	95	95	89	77	69	63	
		X48	64	64	62	58	54	51	
	150	X80	91	91	87	76	68	63	
		X48	61	61	61	57	54	51	
	160	X80	87	87	84	75	68	62	
		X48	59	59	59	56	53	50	
	170	X80	87	87	84	75	68	62	
		X48	59	59	59	56	53	50	
Roof Wind Pressure Zone 2	110	X80	93	93	90	80	71	64	
		X48	63	63	63	61	56	52	
	115	X80	90	90	87	80	71	64	
		X48	61	61	61	60	56	52	
	120	X80	87	87	85	79	71	64	
		X48	59	59	59	59	56	52	
	130	X80	82	82	81	75	70	64	
		X48	56	56	56	56	55	52	
	140	X80	78	78	76	72	68	63	
		X48	53	53	53	53	53	51	
	150	X80	75	75	73	69	65	62	
		X48	51	51	51	51	51	50	
	160	X80	71	71	69	66	63	60	
		X48	48	48	48	48	48	48	
	170	X80	71	71	69	66	63	60	
		X48	48	48	48	48	48	48	
Roof Wind Pressure Zone 3	110	X80	81	81	79	74	70	64	
		X48	55	55	55	55	55	52	
	115	X80	78	78	77	72	68	64	
		X48	53	53	53	53	53	52	
	120	X80	76	76	74	70	66	63	
		X48	52	52	52	52	52	51	
	130	X80	72	72	70	66	63	60	
		X48	49	49	49	49	49	48	
	140	X80	68	68	66	63	60	58	
		X48	46	46	46	46	46	45	
	150	X80	65	65	62	60	57	55	
		X48	44	44	44	44	44	43	
	160	X80	62	62	59	57	55	53	
		X48	42	42	42	42	41	40	
	170	X80	62	62	59	57	55	53	
		X48	42	42	42	42	41	40	

Table 6: Maximum Uplift (lb.) - Wind Exposure C Condition									
Exposure C	Ultimate Wind Speed, V (mph)	Rail Type	Roof Snow Load (psf)						
			0	10	20	30	40	50	
Roof Wind Pressure Zone 1	110	X80	-394	-377	-324	-279	-248	-223	
		X48	-269	-258	-230	-213	-195	-181	
	115	X80	-420	-412	-358	-308	-274	-247	
		X48	-285	-281	-250	-231	-216	-200	
	120	X80	-447	-443	-388	-333	-300	-270	
		X48	-304	-304	-274	-253	-236	-219	
	130	X80	-501	-501	-451	-391	-351	-321	
		X48	-341	-341	-316	-296	-276	-261	
	140	X80	-559	-559	-523	-453	-406	-370	
		X48	-376	-376	-365	-341	-317	-300	
	150	X80	-618	-618	-590	-516	-461	-428	
		X48	-414	-414	-414	-387	-366	-346	
	160	X80	-676	-676	-653	-583	-528	-482	
		X48	-458	-458	-458	-435	-412	-388	
	170	X80	-676	-676	-653	-583	-528	-482	
		X48	-458	-458	-458	-435	-412	-388	
Roof Wind Pressure Zone 2	110	X80	-590	-590	-571	-507	-450	-406	
		X48	-400	-400	-400	-387	-355	-330	
	115	X80	-626	-626	-605	-557	-494	-445	
		X48	-425	-425	-425	-418	-390	-362	
	120	X80	-663	-663	-647	-602	-541	-487	
		X48	-449	-449	-449	-449	-426	-396	
	130	X80	-737	-737	-728	-674	-629	-575	
		X48	-503	-503	-503	-503	-494	-467	
	140	X80	-818	-818	-797	-755	-713	-661	
		X48	-556	-556	-556	-556	-556	-535	
	150	X80	-907	-907	-883	-834	-786	-750	
		X48	-617	-617	-617	-617	-617	-605	
	160	X80	-980	-980	-953	-911	-870	-828	
		X48	-663	-663	-663	-663	-663	-663	
	170	X80	-980	-980	-953	-911	-870	-828	
		X48	-663	-663	-663	-663	-663	-663	
Roof Wind Pressure Zone 3	110	X80	-773	-773	-754	-706	-668	-611	
		X48	-525	-525	-525	-525	-525	-496	
	115	X80	-815	-815	-805	-752	-711	-669	
		X48	-554	-554	-554	-554	-554	-543	
	120	X80	-868	-868	-845	-799	-753	-719	
		X48	-594	-594	-594	-594	-594	-584	
	130	X80	-969	-969	-943	-899	-848	-808	
		X48	-660	-660	-660	-660	-660	-646	
	140	X80	-1066	-1066	-1035	-980	-941	-909	
		X48	-721	-721	-721	-721	-721	-706	
	150	X80	-1173	-1173	-1119	-1063	-1029	-993	
		X48	-764	-764	-764	-764	-764	-776	
	160	X80	-1276	-1276	-1214	-1173	-1142	-1091	
		X48	-864	-864	-864	-864	-844	-823	
	170	X80	-1276	-1276	-1214	-1173	-1132	-1091	
		X48	-864	-864	-864	-864	-844	-823	

NOTICE OF COMPLETION
AND
AUTHORIZATION TO APPLY THE UL MARK



01/07/2015

Everest Solar Systems
Dan Glaser
Ste 111
3809 Ocean Ranch Blvd
Oceanside Ca 92056, Us

Our Reference: File E467724, Vol. 1 Project Number 4786601840
Your Reference: D.Glaser 10/07-3
Project Scope: Fire System Testing - Everest CrossRail System utilizing CrossRail 48 rails. Class A System fire rating with Listed Type 1 and 2 modules.

Dear Dan Glaser:

Congratulations! UL's investigation of your product(s) has been completed under the above Reference Number and the product was determined to comply with the applicable requirements. This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Mark at authorized factories under UL's Follow-Up Service Program. To provide your manufacturer(s) with the intended authorization to use the UL Mark, you must send a copy of this notice to each manufacturing location currently authorized under File E467724, Vol. 1.

Records in the Follow-Up Services Procedure covering the product are now being prepared and will be sent in the near future. Until then, this letter authorizes application of the UL Mark for 90 days from the date indicated above.

Additional requirements related to your responsibilities as the Applicant can be found in the document "Applicant responsibilities related to Early Authorizations" that can be found at the following web-site:
<http://www.ul.com/EAResponsibilities>

Any information and documentation provided to you involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

We are excited you are now able to apply the UL Mark to your products and appreciate your business. Feel free to contact me or any of our Customer Service representatives if you have any questions.

Very truly yours,

Nathan Wang
847-664-3951
Senior Project Engineer
Nathan.Wang@ul.com

Reviewed by:

Bruce A. Mahrenholz
847-664-3009
CPO Director
Bruce.A.Mahrenholz@ul.com

NBKE968-0F1168



Asahara Solar Project
7787 Britt Place
Santee, CA 92071

Secure Roofing & Solar
999 Rancheros Dr Suite B San Marcos, CA 92069
760 546 0254 CSLB #990002 (C-39 C-46)

Drawn By M Gipe
6/5/2015
Cover Sheet
No Scale
Sheet

SP-4A

SERIES 100 UL FLASHED L FOOT KIT

SnapNrack Solar Mounting Solutions

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

Flashed L Foot Simplified

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

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



Flashed L Foot in 4 Simple Steps:

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

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

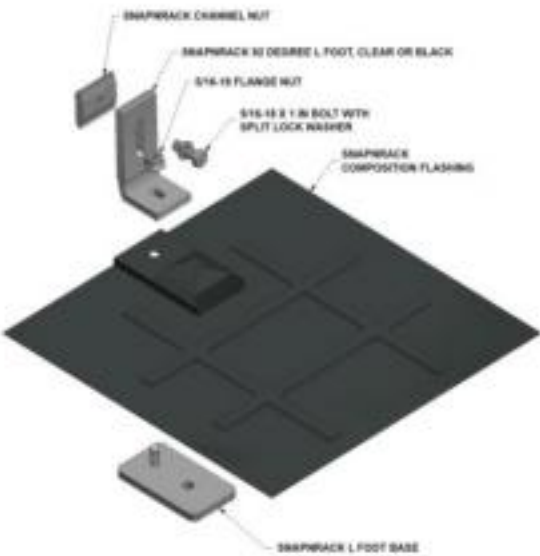


Flashed L Foot Kit Parts

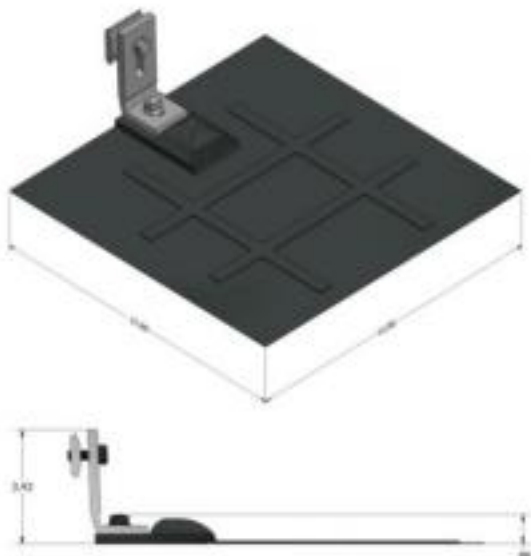


Flashed L Foot Kit Assembled

Flashed L Foot Kit Assembly



Flashed L Foot Kit Dimensions



SnapNrack Flashed L Foot Technical Data Patent Pending	
Materials	• 6000 Series Aluminum L Foot & Base • Stainless Steel Hardware • Galvanized Steel Flashing w/ black all weather coating
Material Finish	• Clear and black anodized aluminum
Weight	• 1.3 lbs
Design Uplift Load	• 3300 lbs uplift
Design Ultimate Load	• 10000 lbs uplift
Warranty	• 10 Year material and workmanship

SnapNrack™
Solar Mounting Solutions

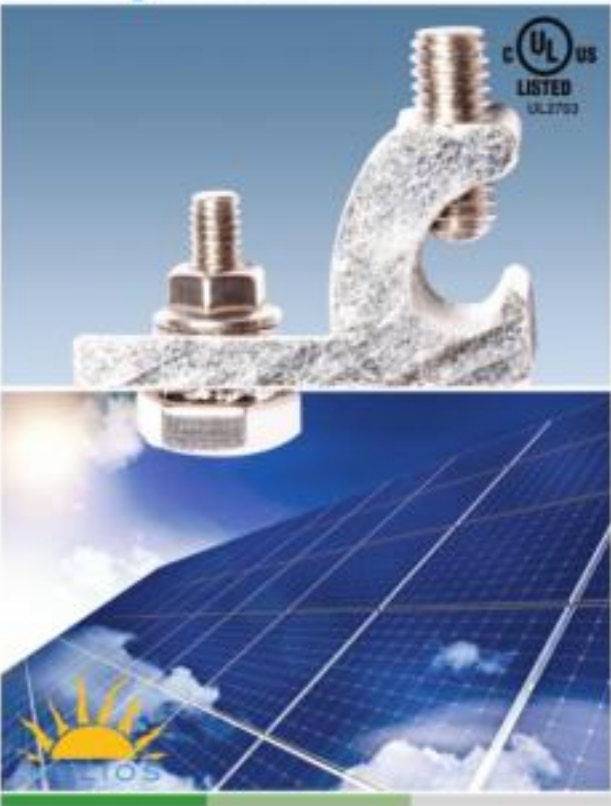
(877) 732-2860 www.SnapNrack.com

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Amphenol®

IDS-52-3



HelioLug

Amphenol Industrial Solar Technologies (AIST) offers products and solutions for all segments of the solar electric system. AIST understands the need for efficient (low loss) power transfer, highly reliable, and cost effective solutions that are required to be competitive in this industry. We can provide panel manufacturers, installers, and OEM's with connectivity products for both thin film and crystalline silicon technologies. Amphenol® has a broad range of technologies to help minimize the cost of inverters and power conditioners. Amphenol® Industrial Solar Technologies can help you power the planet with the sun.

The HelioLug is a grounding component for solar modules and solar racking systems allowing easy termination to the ground wire.

The HelioLug has a versatile enough design it can be used for commercial or utility scale installations as well as residential installations. It is UL 2703 certified for use with a ground wire, eliminating potential code compliance surprises. The HelioLug comes with all the certified custom hardware needed for making rapid, secure connections to PV modules and racks.

The HelioLug is just one of the solar solutions Amphenol® Industrial Solar Technologies has to offer.

Features:

- UL 2703 certified grounding lug
- Meets all NEC 2008/2011 requirements
- Quick and easy installation
- For use with virtually all module frames and racks, (0.09 inches (2 mm) to 0.25" (6.35 mm) thick)
- Capable of accepting 4-12 AWG solid copper conductors
- Code compliant "first make - last break" grounding system
- Compatible with all module grounding holes, (0.16" (4mm) to 0.295" (7.5mm))
- Certified reusable hardware for servicing without replacement

www.amphenol-industrial.com



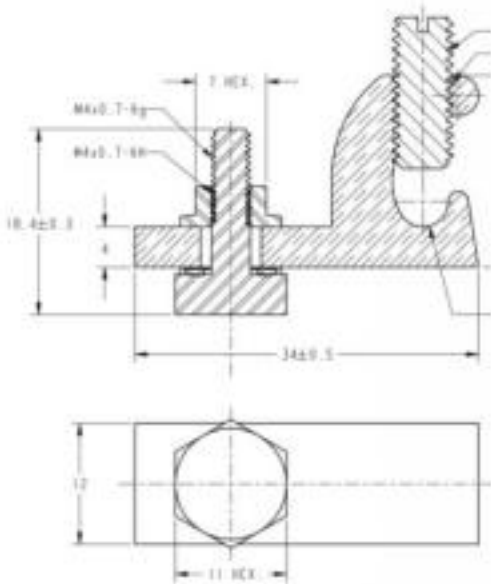
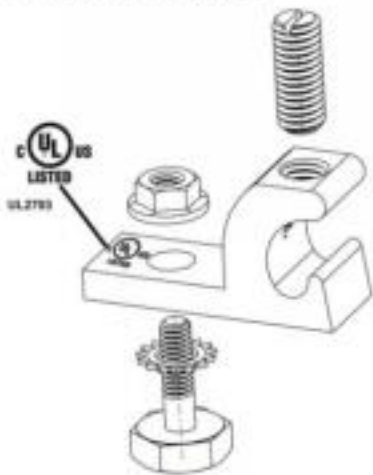
HelioLug

UL 2703 E338690

QIMS7 (Canada) E338690

Included Components:

- 1) Lay in lug (tin-plated, solid copper lay-in lug with a stainless-steel set screw)
- 2) Stainless star washer
- 3) Stainless steel bolt
- 4) Stainless serrated lock nut



How to order

1		2		3		4	
HG		L		U		I	
Product Line		Product Type		Approvals		Packaging	
HG	Helios Grounding Products	L	HelioLug (Wire Range 4-12 AWG)	U	UL	I	Individual
						M	1000 pcs

INSTALLATION INSTRUCTIONS:

- Place the lug to the designated module grounding hole with the star washer between the grounding lug and the module frame in order to break through the anodizing and establish electrical contact with the aluminum. Torque the bolt and nut to 30 in-lbs. NOTE: These instructions provide guidelines for general use. If available, the specific module manufacturer's instructions for the location of the star washer are to be followed.
- For the attachment to the racking, slide the bolt into the mounting channel of the extrusion or into a 1/4" hole drilled through the extrusion. Place the star washer between the racking and lug and secure the nut and bolt to 30 in-lbs. NOTE:
- Insert a 4 to 12 AWG copper wire into the lug and tighten the lug set screw to the copper wire to the torque based on the wire size. (4-6 AWG at 35 in-lbs and 8-12 AWG at 30 in-lbs). Do not exceed the maximum rated overcurrent protection, 20 A (12 AWG), 40 A (10 AWG), 60 A (8 AWG), 150 A (6 AWG), and 200 A (4 AWG).

Notes: Specifications are subject to change without notice. Contact your nearest Amphenol Corporation Sales Office for the latest specifications. All statements, information and data given herein are believed to be accurate and reliable but are presented without guarantee, warranty, or responsibility of any kind, expressed or implied. Discrepancies or suggestions concerning possible use of our products are made without representation or warranty that any such use is free of patent infringement and the user assumes all liability for such use. The user should assume that all safety measures are indicated or that other measures may not be required. Specifications are listed and may not apply to all connections.

For further information on your individual application requirements, contact: Amphenol Corporation

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Amphenol Spec



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Secure Roofing & Solar
999 Rancheros Dr Suite B San Marcos, CA 92069
760 546 0254 CSLB #990002 (C-39 C-46)

Drawn By M Gipe

6/5/2015

Cover Sheet

No Scale

Sheet

SP-6

A. GENERAL

1. **Applicable codes.** All projects shall comply with the following referenced codes:
- a. 2013 California Electric Code (CEC)
 - b. 2013 California Building Code (CBC) and/or 2013 California Residential Code (CRC)
 - c. 2013 California Plumbing Code (CBC)
 - d. 2013 California Mechanical Code (CMC)
 - e. County of San Diego Consolidated Fire Code

B. ROOF

1. **Roofing and weatherproofing.** All roofing and weatherproofing installation shall comply with the following methods and requirements:
- a. Any arrays integrated with the roofing material shall be Class "A" rated in accordance with ASTM E 108 or UL 790. (County of San Diego Building Code 92.1.1505.1, CBC 1505.8, CRC 902.3)
 - b. All roof penetrations shall be secure and weather-tight. (CRC 903..2)
 - c. Module installations shall not cover or block any roof plumbing or mechanical vent locations. (CPC 904, CPC 906, CMC 802.6, CMC 510.8)
2. **Firefighter access requirements.** All roof-mounted solar photovoltaic systems shall comply with the following:
- a. Roof access points shall be provided per the following and in conformance with CRC R331.4.1 or CBC 3111.4.1 as applicable:
 - 1. Located in areas not requiring placement of ground ladders over openings such as doors or windows.
 - 2. Located at strong points of building construction in locations where access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.

C. ELECTRICAL

1. **Wiring methods.** All wiring installation shall comply with the following wiring methods and requirements:
- a. Corrosion resistant conduit shall be used for all underground runs and installations. (CEC 690)
 - b. All exposed wiring shall be listed as sunlight resistant and all outdoor equipment shall be NEMA 3R rated. (CEC 690.31, CEC 310.8)
 - c. Photovoltaic DC conductors entering the building shall be installed in a metallic raceway. (CEC 690.31)
 - d. Markings shall be placed on interior and exterior DC conduit, raceway, enclosures, and cable assemblies every 10 feet -- and within 1 foot of turns or bends and within 1 foot above and below penetrations of roof/ceiling assemblies, walls, or barriers -- with minimum 3/8-inch-high white lettering on red background reading: "WARNING: PHOTOVOLTAIC POWER SOURCE." (CEC 690.31)
 - e. DC breakers shall be listed and rated for PV use. (CEC 705.12)
 - f. All equipment shall be identified on a warning placard clearly showing the location of all pertinent equipment and disconnects. Alternate power source placard shall meet the specifications of the San Diego Area Newsletter. The placard shall be metal or plastic, with engraved letters in a contrasting color to the placard, include the location of meter, disconnects, inverter, the array, and a footprint of the entire building and site. The placard will be attached by pop-rivets, screws, or other approved fasteners. Refer to the sample placard for alternative power source (diagram on the right) for further requirements. (CEC 110)

- g. PV connection in panel board shall be positioned at the opposite (load) end from the input feeder location or main circuit location. (CEC 705.12)
- h. If approved plans show de-rating of the main breaker, a placard label is required at the panel stating: "THIS PANEL HAS BEEN DE-RATED TO (insert amperage size). DO NOT INSTALL LARGER BREAKERS." Refer to the sample placard for alternative power source (diagram on the right) for further requirements. (CEC 690.53, CEC 690.17, CEC 705.10)
- i. Wire sizing and terminations shall be in conformance with the sixty degree (60") column of CEC Table 310.15(B)(16).
- j. All exterior conduit placement and sizing shall have ambient temperature adjustments in conformance with the ASHRAE designated design temperate and comply with CEC 310.15(b)(3)(c).

2. **Grounding methods.** All grounding installation shall comply with the following grounding methods and requirements:

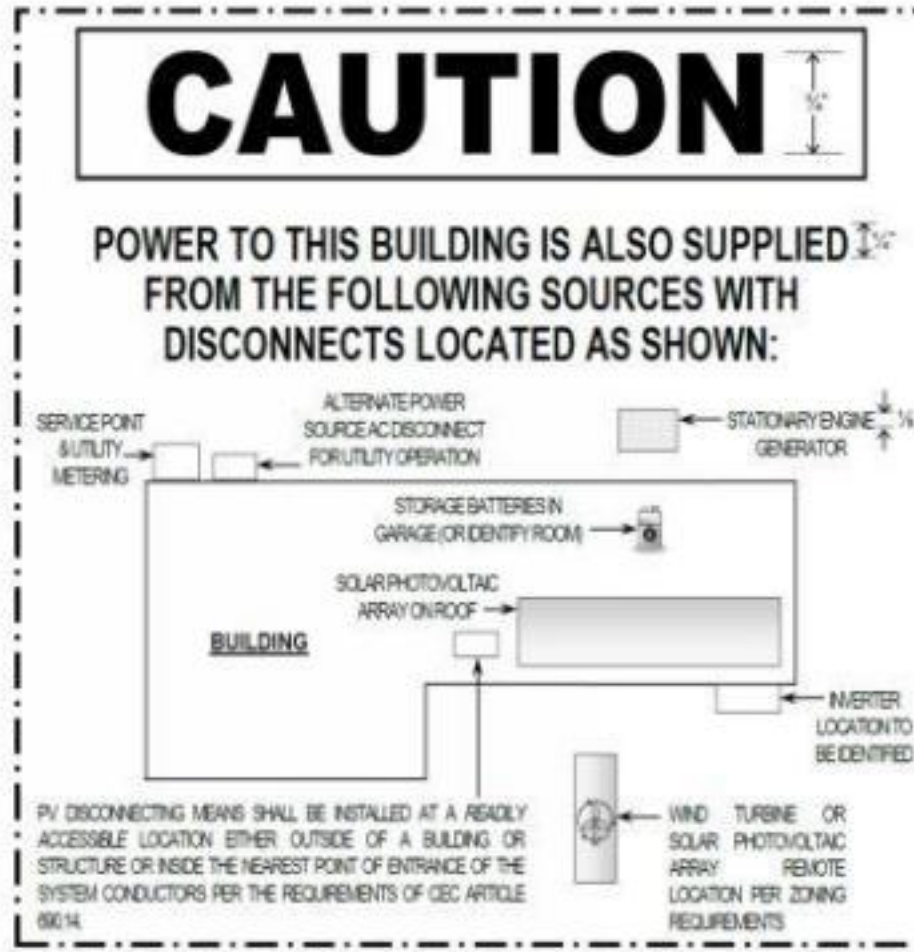
- a. All modules shall be grounded in accordance with the CEC and the manufacturer's installation instructions. (CEC 250)
- b. Third-party grounding devices must be specifically mentioned in the module manufacturer's installation instructions by device make and model. These installation instructions must be reviewed by the module listing agency as part of the listing of the module to UL 1703. Grounding devices listed to UL 2703 also may be acceptable if the device installation instructions mention the specific module make and model.
- c. Unless specified by the manufacturer, all inverters (including micro-inverters) shall have a grounding electrode conductor with a minimum size of #8 copper wires. (CEC 690.47)
- d. Electric service panels shall be grounded with a grounding electrode(s) that complies with CEC Article 250. Ground-rods shall be supplemented by a second ground-rod installed at least 6 feet apart. (CEC 690.47)
- e. If the existing main service panel does not have verifiable grounding electrode, it shall be the contractor's responsibility to install a supplemental grounding electrode. Service grounding electrode must be verified at the time of inspection for all buildings. Buildings with a metallic water pipe system as the sole grounding electrode shall have a supplemental electrode installed. (CEC 690.47)
- f. All combiner boxes shall be listed for DC current and listed by a nationally recognized testing agency. (CEC 690.47)
- g. Manufacturer's technical cut sheets and installation manuals for all equipment and components shall be provided on site.
- h. All terminals of the disconnecting means may be energized in the open position in conformance with CEC 690.17.

D. MISCELLANEOUS

1. **Zoning requirements.** All roof-mounted solar photovoltaic systems shall comply with:
- a. County of San Diego zoning requirements per setbacks for Solar Photovoltaic Panels. Reference handout PDS#276 for further details.
2. **Manufactured or mobile home requirements.** All roof-mounted solar photovoltaic installations on manufactured or mobile homes require a permit from the State of California Department of Housing and Community Development (HCD). Contact HCD at (951) 782-4420 for further information.

SAMPLE PLACARD FOR ALTERNATE POWER SOURCE

This is a sample placard required when there is an alternate source of power connected to the premises wiring system. Specify the type of generation, such as stationary engine generator, solar photovoltaic (PV) array, wind turbine, batteries, fuel cell, etc. The placard must be metal or plastic, with engraved letters in a contrasting color, and must include the location of the service point, utility meter, AC and DC disconnects, inverter, and PV array, generator, or other type of generation source, and a footprint of the entire building and site. The placard shall be attached to the service disconnect with pop-rivets, machine screws, or other fasteners as approved by the County of San Diego, Building Division. *Epoxy is not an acceptable method of securing the placard.*



THESE ARE MINIMUM REQUIREMENTS AND SHALL NOT SUPERSEDE MORE RESTRICTIVE SPECIFICATIONS ON THE PLANS OR AS REQUIRED BY APPLICABLE CODE.