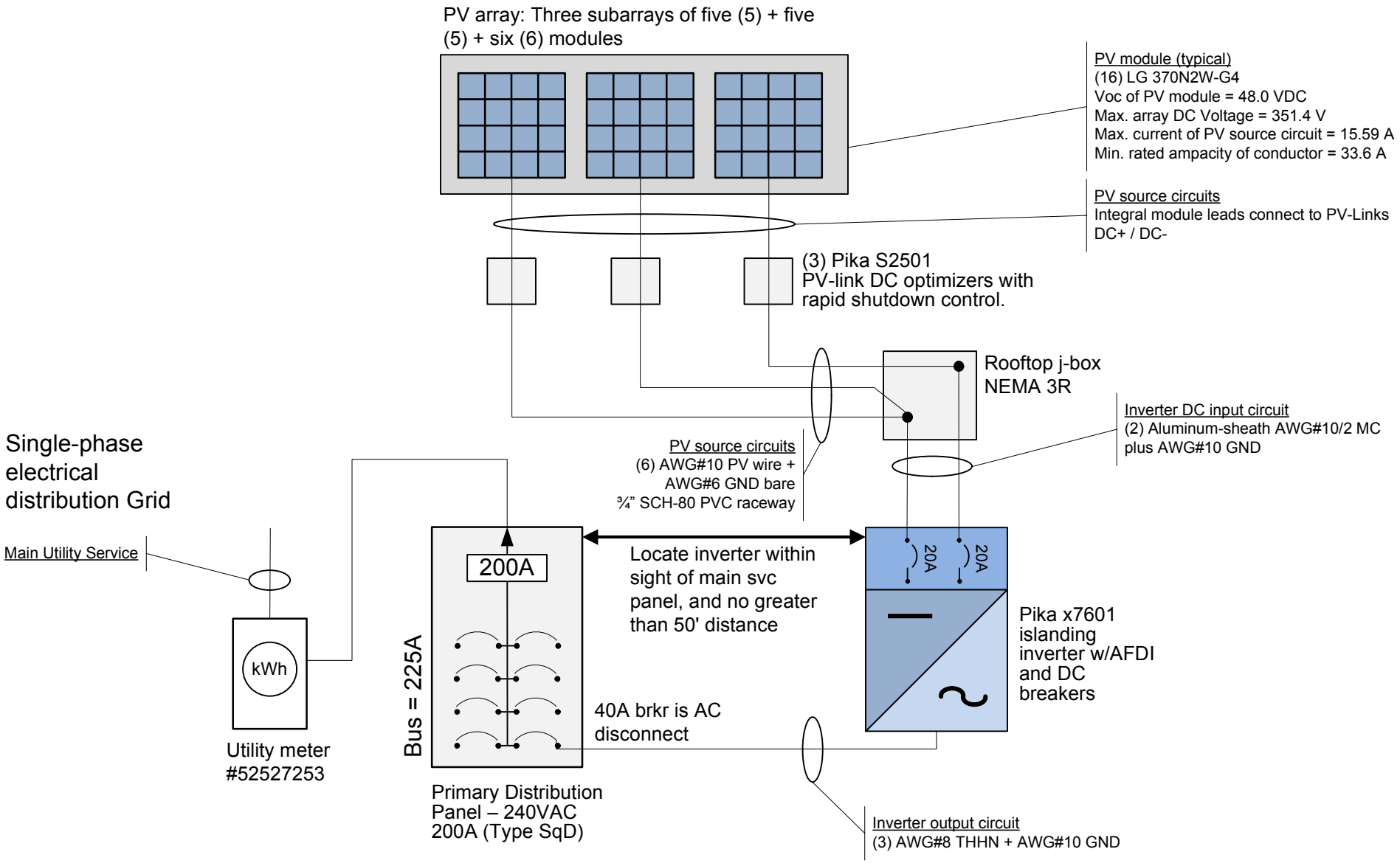


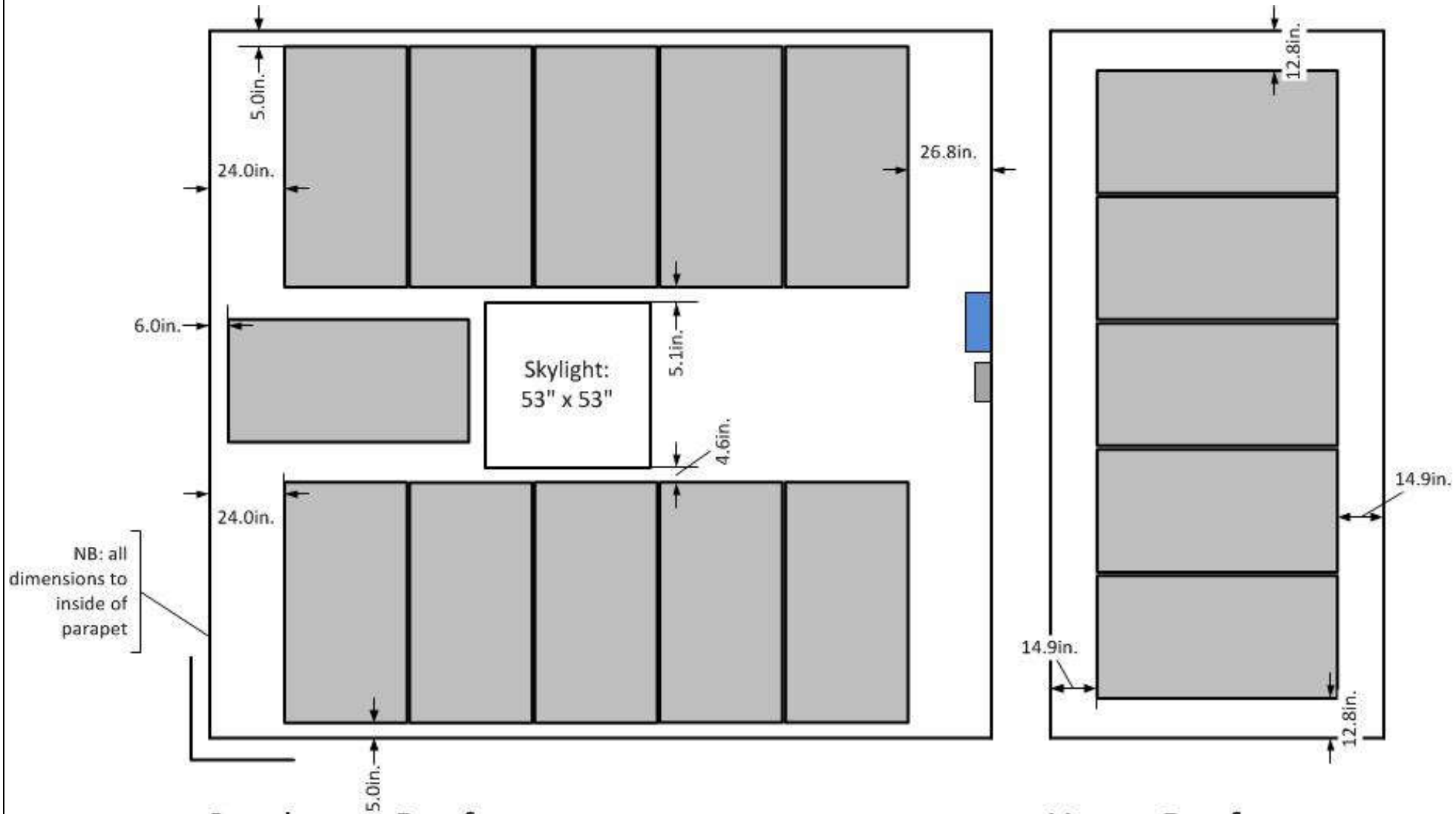
CERTIFIED Solar PV Installer

Solar GTPV System – One line digram

48 Hancock Street, Portland, Maine 04101

DRAWN BY:	DATE:	PAGE:	rev.
WR Kessler; certification No. PV 032611-169	8 March 2017	1 of 1	1

SOLAR ROOF: module layout



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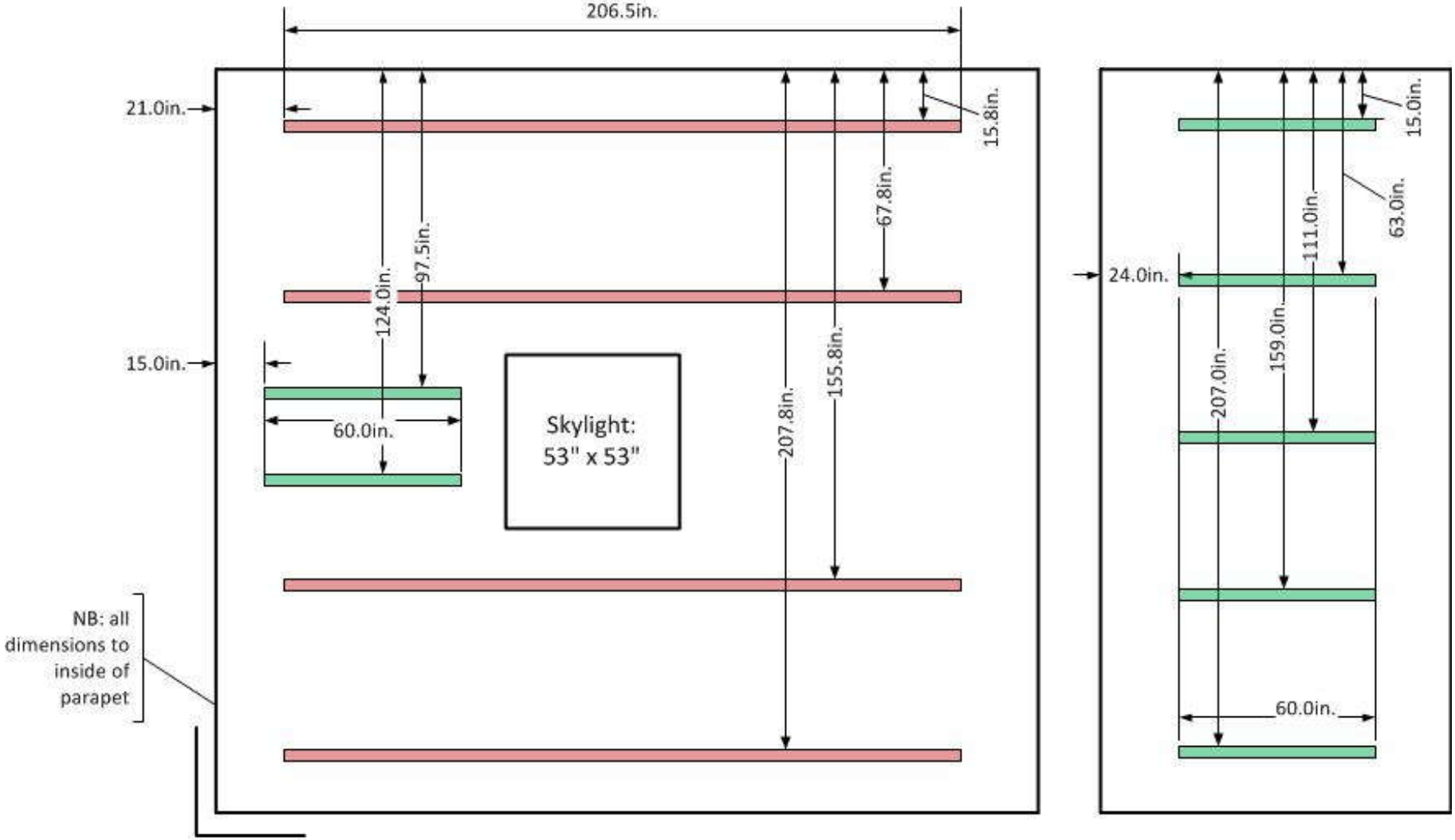
ROOF LAYOUT: solar support curbing



Southwest Roof

Upper Roof

2x4 curb with railing running parallel to curb

2x4 curb with railing running perpendicular to curb

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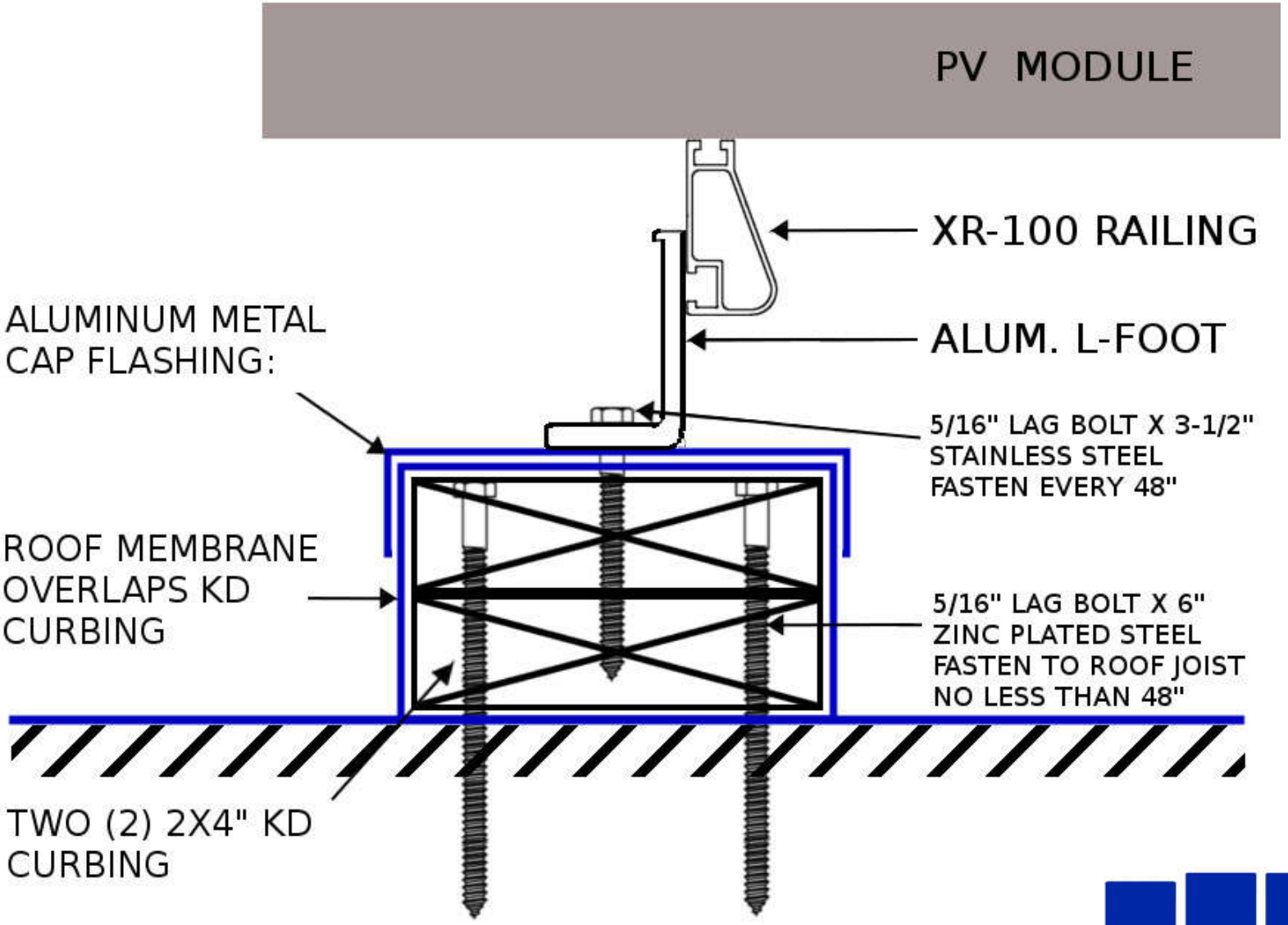
SOLAR ROOF CURBING: FASTENING DETAIL



RENEWABLE ENERGY
DEVELOPMENT ASSOCIATES

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at http://sam.nrel.gov) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

1,023 kWh per Year *

System output may range from 980 to 1,052kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Energy Value ($)
January	1.89	45	3
February	2.87	62	4
March	3.99	95	7
April	4.67	104	7
May	5.53	123	9
June	5.55	117	8
July	6.13	131	9
August	5.31	115	8
September	4.32	92	6
October	2.87	65	4
November	1.77	39	3
December	1.55	36	2
Annual	3.87	1,024	$ 70

User Comments

48 Hancock St production model. Flat mounted array. kWAC per kWDC yield assuming two full months of snowcover.

Location and Station Identification

Requested Location	04101	
Weather Data Source	(TMY3) PORTLAND INTL JETPORT, ME	2.3 mi
Latitude	43.65° N	
Longitude	70.3° W	

PV System Specifications *(Residential)*

DC System Size	1 kW
Module Type	Standard
Array Type	Fixed (roof mount)
Array Tilt	0°
Array Azimuth	144°
System Losses	22.67%
Inverter Efficiency	97%
DC to AC Size Ratio	1.1

Economics

Average Cost of Electricity Purchased from Utility	0.07 $/kWh

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Solar photovoltaic system summary

Technical Summary			
System Capacity:	5,920 watts DC	**No. of panels:**	16
Est. Solar Production:	6,062 kWh / year	**Orientation**	< 2°
CO2 offset:	4,540 lbs / year	**Roof pitch:**	1 - 2°
Array Area:	333 ft2	**Roof material:**	EPDM memb.
Inverter location:	Garage	**25-year est. production:**	150,000 kWh

Scope of Materials *Denotes REDA can provide stock item at wholesale rate, quoted at right.

	Part	QTY	Notes/Vendor
	LG Solar 370-watt module (370N2W-GW)	16	Civic Solar
*	Pika x7601 Islanding inverter	1	2595 /ea
*	Pika PV Link	3	395 /ea
*	MC-4 15' AWG-10 lead pair (male + female end)	3	17.5 /pair
	WEEB for ironridge (compression grounding clip)	6	AltE Store
	PV link fastens to Railing with 1/4" SS hardware	xx	Sundry supplier
*	MC wire clips, DCS-1307	30	0.4 /ea
*	Polaris 2-hole connector for AWG 10-12	2	8.32 /ea
	Polaris 3-hole connector AWG 10-12	2	Sundry supplier
	Carlon 8" x 8" j-boxbox	1	Sundry supplier
*	3/4" Hub 2-HOLE Strain Relief for #10 USE-2	3	2.24 /ea
*	1/2" Hub 1-HOLE Strain Relief for #6 bare Cu	1	1.67 /ea
	ALUMINUM JACKET AWG10/2 + ground MC cable	250'	Sundry supplier
	SqD 40A 2-pole breaker	1	Sundry supplier
	THHN-2 AWG-8 BLK wire for inverter AC output circuit	30'	Sundry supplier
	THHN-2 AWG-8 BLK wire for inverter AC output circuit	15'	Sundry supplier
	Iron ridge XR-100 railing, 17-foot SILVER	6	AltE Store
	Iron ridge XR-100 railing, 11-foot SILVER	1	AltE Store
*	Serrated L-foot, each	36	2 /ea
	Kit, 4pcs, Square-Bolt FM-SQ-BHW	9	AltE Store
	Kit, 4pcs, Universal Module Clamp, UFO-CL-001	10	AltE Store

	Kit, 2pcs, Grounding Lug, GD-LUG-003	2	AltE Store
	Kit, 4pcs, Stopper Sleeve UFO-STP-46MM	4	AltE Store
*	SS Lag bolt 5/16" x 4"	40	1 /ea
	SS washer HW for 5/16" lags	40	Sundry supplier
	Steel/Zn Lag bolt 5/16" x 6"	44	Sundry supplier
	Zn washer HW for 5/16" x6" lags	44	Sundry supplier
*	Ecobond sealant for L-foot penetrations	3	7.5 /ea