



Building Permit Application
City of Portland, Oregon - Bureau of Development Services

1900 SW 4th Avenue, Portland, Oregon 97201 • 503-823-7310 • TTY 503-823-6868 • www.portlandoregon.gov/bds

| Type of work | |
|--|---|
| <input type="checkbox"/> New construction | <input checked="" type="checkbox"/> Addition/alteration/replacement |
| <input type="checkbox"/> Demolition | <input type="checkbox"/> Other: |
| Category of construction | |
| <input checked="" type="checkbox"/> 1 & 2 family dwelling | <input type="checkbox"/> Commercial/industrial |
| <input type="checkbox"/> Multifamily | <input type="checkbox"/> Master builder |
| <input type="checkbox"/> Accessory building | <input type="checkbox"/> Other: |
| Job site information and location | |
| Job no.: | Job address: 7410 SE 113th Ave |
| City/State/ZIP: Portland, OR 97266 | |
| Suite/bldg./apt. no.: | Project name: Meyers |
| Cross street/directions to job site: Flavel to SE 112th Ave, North on 112th Ave to Knapp, Knapp East to SE 113th Ave | |
| Subdivision: | Lot no. |
| Tax map/parcel no. | |
| Description of work | |
| Add 6.16KW roof-mounted Photovoltaic System | |
| Provide RS Permit no. | |
| Property owner | |
| <input checked="" type="checkbox"/> Property owner | <input type="checkbox"/> Tenant |
| Name: Louis Meyers | E-mail: |
| Address: 7410 SE 113th Ave. | |
| City/State/ZIP: Portland, OR 97266 | |
| Phone: 503-760-8075 | FAX: |
| Owner installation: This installation is being made on property that I own, which is not intended for sale, lease, rent, or exchange. | |
| Owner signature: | Date: |
| Contractor | |
| <input checked="" type="checkbox"/> Contractor | |
| Business name: Premier Energy | E-mail: dtracy@solaruniverse.com |
| Address: 556 Somerset Road | |
| City/State/ZIP: Woodland, WA 98674 | |
| Phone: 503-828-9500 | FAX: |
| CCB lic. no. 195595 | |
| Authorized signature: | |
| Print name: Dan Tracy | Date: 7/10/12 |
| Applicant | |
| <input type="checkbox"/> Applicant | <input checked="" type="checkbox"/> Contact Person |
| Business name: Premier Energy Inc. | |
| Contact name: Dan Tracy | |
| Address: 556 Somerset Road | |
| City/State/ZIP: Woodland, WA 98674 | |
| Phone: 503-828-9500 | FAX: |
| E-mail: dtracy@solaruniverse.com | |
| Authorized signature: | |
| Print name: Dan Tracy | Date: 7/10/12 |

This permit application expires if a permit is not obtained within 180 days after it has been accepted as complete.

| Office Use Only | |
|-----------------|--|
| Permit no: | |
| Date received: | |
| By: | |

Required Data: One and Two Family Dwelling

Permit fees* are based on the value of the work performed. Indicate the value (rounded to the nearest dollar) of all equipment, materials, labor, overhead, and the profit for the work indicated on this application.

| | |
|-------------------------|-------------|
| Valuation: | |
| Number of bedrooms: | |
| Number of bathrooms: | |
| Total number of floors: | |
| New dwelling area: | square feet |
| Garage/carport area: | square feet |
| Covered porch area: | square feet |
| Deck area: | square feet |
| Other structure area: | square feet |

Required Data: Commercial Use

Permit fees* are based on the value of the work performed. Indicate the value (rounded to the nearest dollar) of all equipment, materials, labor, overhead, and the profit for the work indicated on this application.

| Valuation: | |
|-------------------------|-------------|
| Existing building area: | square feet |
| New building area: | square feet |
| Number of stories: | |
| Type of construction: | |
| Occupancy groups | |
| Existing: | |
| New: | |

Notice

All contractors and subcontractors are required to be licensed with the Oregon Construction Contractors Board under ORS 701 and may be required to be licensed in the jurisdiction in which work is being performed. If the applicant is exempt from licensing, the following reasons apply.

Statement of Fact: I certify that the facts and information set forth in this application are true and complete to the best of my knowledge. I understand that any falsification, misrepresentation or omission of fact (whether intentional or not) in this application or any other required document, as well as any misleading statement or omission, may be cause for revocation of permit and/or certificate of occupancy, regardless of how or when discovered.

Building Permit Fees*

| Please refer to fee schedule | |
|------------------------------|--|
| Fees due upon application | |
| Amount received | |
| Date received | |

Residential Combo permit subcontractor submittals only can be faxed to 503-823-7693.



Electrical Renewable Energy Permit Application

City of Portland, Oregon - Bureau of Development Services

1900 SW 4th Avenue, Portland, Oregon 97201 • 503-823-7363 • FAX 503-823-4172 • TTY 503-823-6868 • www.portlandoregon.gov/bds

| Type of work | | |
|---|---|---|
| <input type="checkbox"/> New construction | <input checked="" type="checkbox"/> Addition/alteration/replacement | |
| <input type="checkbox"/> Demolition | <input type="checkbox"/> Other: | |
| Category of construction | | |
| <input checked="" type="checkbox"/> 1 & 2 family dwelling | <input type="checkbox"/> Commercial/industrial | <input type="checkbox"/> Accessory building |
| <input type="checkbox"/> Multifamily | <input type="checkbox"/> Master builder | <input type="checkbox"/> Other: |
| Job site information and location | | |
| Job no.: | Job address: 7410 SE 113th Ave | |
| City/State/ZIP: Portland, OR 97266 | | |
| Suite/bldg./apt. no.: | Project name: Meyers | |
| Cross street/directions to job site: SE 113th Ave near Knapp | | |
| Subdivision: | Lot no. | Tax map/parcel no. |
| Description of work | | |
| Add 6.16 kW roof-mounted Photovoltaic System | | |
| Provide RS permit no. | | |
| Property owner <input checked="" type="checkbox"/> Tenant <input type="checkbox"/> | | |
| Name: Louis Meyers | E-mail: | |
| Address: 7410 SE 113th Ave | | |
| City/State/ZIP: Portland, OR 97266 | | |
| Phone: 503-760-8075 | FAX: | |
| Owner installation: This installation is being made on property that I own, which is not intended for sale, lease, rent, or exchange. | | |
| Owner signature: | | Date: |
| Contractor <input type="checkbox"/> Subcontractor <input checked="" type="checkbox"/> | | |
| Business name: MJ Electrical Inc. | E-mail: mike@MJelectricalinc.com | |
| Address: PO Box 1673 | | |
| City/State/ZIP: Brush Prairie, WA 98606 | | |
| Phone: 360-859-3316 | FAX: 360-882-7450 | |
| Elec. lic. no. C423 | CCB lic. no. 182623 | |
| Metro or City lic no. | Date: | |
| Supervising electrician Signature, required: <i>[Signature]</i> | | |
| Print name: Michael Lipe | License no. 53755 | |
| Authorized signature: _____ | | |
| Print name: | Date: | |
| Applicant <input checked="" type="checkbox"/> Contact Person <input checked="" type="checkbox"/> | | |
| Business name: Premier Energy Inc | | |
| Contact name: Dan Tracy | | |
| Address: 556 Somerset Road | | |
| City/State/ZIP: Woodland, WA 98674 | | |
| Phone: 503-828-9500 | FAX: | |
| E-mail: dtracy@solaruniverse.com | | |

This permit application expires if a permit is not obtained within 180 days after it has been accepted as complete.

| Fee Schedule | | | | |
|--|------|-------|-------------------------------------|----|
| Description | Qty. | Fee | Total | ** |
| Renewable energy installation per system total | | | | |
| 5 kva or less | | \$130 | | 2 |
| 5.01 to 15 kva | 1 | \$186 | \$186 | 2 |
| 15.01 to 25 kva | | \$243 | | 2 |
| Miscellaneous | | | | |
| Describe: | | | | |
| Hourly rate: | | \$151 | | |
| Each additional inspection over allowable in any of the above | | | | |
| Per inspection | | \$92 | | |
| Investigation fee | | | | |
| Other | | | | |
| Electrical permit fees* | | | | |
| | | | Subtotal | |
| | | | Plan review (25% of permit fee) | |
| | | | State surcharge (12% of permit fee) | |
| | | | TOTAL PERMIT FEE | |

** Number of inspections allowed per permit.

RS Combo Permit/No Fees Due

Residential Combo permit subcontractor submittals only can be faxed to 503-823-7693.



Checklist and Submittal Requirements for Prescriptive Installations of Solar Photovoltaic and Solar Water Heating Systems in accordance with Oregon Solar Installation Specialty Code (OSISC)

Instructions

Complete the following with all the information requested. This form must be submitted along with the application for installation.

Property Owner Information

Property Owner Name: Louis Meyers Installation Address: 7410 SE 113th Ave.
 Day Phone: 503-760-8075 Evening Phone: SAME Email: _____
 Contractor: Premier Energy Inc. CCB#: 195595
 Day Phone: 503-828-9500 Evening Phone: 503-806-4427 Email: dtracy@solaruniverse.com

PV Modules or Solar Water Heating Collectors

Manufacturer: Grape Solar Model Number: GS-P-220-FS Listing Agency: UL-1703

Site Plan and Structural Plan

- Attach a simple site plan showing the location of the PV or solar water heating system in relation to buildings, structures, property lines, and, as applicable, flood hazard areas.
- Attach a simple structural plan showing the roof framing (rafter size, type and spacing) and PV module system racking attachment. Plans must be shown in sufficient detail to assess whether the requirements of section 304.9 of OSISC or one of the exceptions have been met.
- Attach simple building elevation.
- The plans must be on 8.5 x 11 or larger paper.

Structural Information

Roof Design and Attachment

- Roof rafter size: 2 x 6 inches OR Manufactured Trusses
- Rafter or manufactured roof truss spacing 24 inches o.c.
- For roof rafters, maximum rafter span allowed per table 305.4.1 (Appendix "B") of the Oregon Solar Installation Specialty Code (OSISC) (www.oregonbcd.org/programs/solar/solar_code/100110_OSISC.pdf) for the size and spacing of roof rafters is 8 ft 10 inches.

Checklist to determine if your installation qualifies for prescriptive path

- Yes No Is this conventional light framed wood construction?
 Yes No Does the structure have pre-engineered trusses?

OR

Does structure have roof framing members spaced at 24" o.c. maximum AND comply with the applicable allowable span in table 305.4.1 (Appendix "B") of the Oregon Solar Installation Specialty Code (OSISC)?

- Yes No Is the roofing material metal, single layer wood shingle, or not more than two layers of composition shingle?
- Yes No Is the weight of the modules and racking less than 4.5 pounds per square foot?
- Yes No Is the module height less than 18 inches above the roof in accordance with section 305.4?

For Standing Seam Metal Roofs Only (If not applicable please skip this section)

- Yes No Is the metal gauge 26 or heavier?
- Yes No Clamp design: Are clamps designed to withstand uplift of at least 115 pounds for clamps spaced at 60 inches on center or less or at least 75 pounds for clamps spaced at 48 inches on center or less?
- Yes No Is the spacing of the clamps as measured along the seam greater than or equal to 24" o.c. and less than 60" o.c. AND the spacing perpendicular to the seam not greater than 24" o.c.?
- Yes No Is the roofing panel width 18-inches or greater?
- Yes No Is the roofing panel attached with at least #10 screws at 24" o.c.?
- Yes No Is the roofing panels installed over minimum 1/2-inch nominal wood structural panels attached to framing with 8d nails at 6" o.c. at panel edges and 12" o.c. field nailing?

If you have indicated "No" on any of these requirements above, the project may not be submitted using the prescriptive path.

Fire Fighter Access and Escape

Access and escape pathways are not required when the array is located on a non-occupied accessory structures that is separated from occupied structures by a 6 foot minimum separation distance or by a minimum two-hour fire rated assembly.

General Requirements: For all other roof mounted systems, a minimum 36" wide pathway is required along three sides of the solar roof, located over a structurally supported area. Any roof with a slope greater than 2:12 can not use the bottom roof edge as a pathway. Pathways and solar panels shall be located outside 12" of the low point of a valley.

If the array is greater than 150 feet in length or width, additional 36" wide intermediate pathways and cutouts are required. See code for details.

If the roof has smoke and/or heat vents, a 36" pathway shall be provided to and around each vent.

Exceptions to General Requirements:

- Yes No Is the roof slope greater than 2:12?
- Yes No Is the array area 1,000 sq ft or less?
- Yes No Is the array 150 feet or less in length or width?

If you have indicated "No" to any of the items above, exceptions do not apply, provide a simple plan conforming with the general requirements.

If you have indicated "Yes" to all of the items above, see below for reduced access and escape pathway requirements.

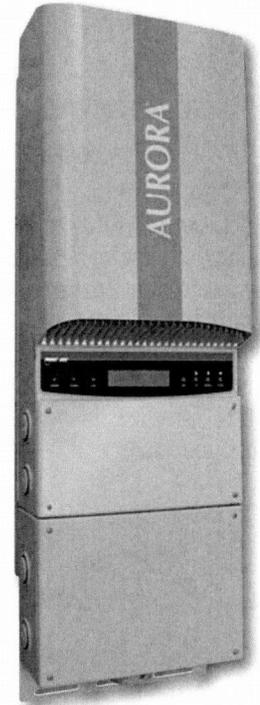
Is the array 25% or less of the roof area? Yes No

- If Yes, a 12" pathway along each side of any horizontal ridge is required.
- If No, a 12" pathway along each side of any horizontal ridge is required and a minimum of one 36" pathway is required from ridge to eave over a structurally supported area.

Provide a simple plan showing conformance to the reduced access pathway requirements.

As the property owner or authorized representative of the above listed property, I certify that I have verified the information provided above and that the roof rafters (if applicable to the project), meet the span requirements of Table 305.4.1 (Appendix B) of the Oregon Solar Installation Specialty Code.

Applicant name (please print) Dan Tracy Signature Dan Tracy Date 7/10/12



General Specifications Outdoor Models

PVI-5000-OUTD-US
PVI-6000-OUTD-US

High-Efficiency, 5kW to 6kW Inverters

Aurora[®] grid-tie transformerless inverters offer a unique combination of ultra-high efficiencies, installer-friendly designs, long service life, and competitive initial acquisition costs; significantly increasing return on investment in solar-power installations.

Industry-Leading Features and Performance

- High efficiencies deliver more energy – up to 97% (96,5 CEC).
- Two inputs with independent MPPTs, optimize power from multiple arrays oriented in different directions.
- Compact size and high power density: 6000W max of output power in a box just 38 5/8" x 12 13/16 x 7 11/16"

Unmatched Applications Flexibility

- Full-rated power available up to 50°C ambient temperature.
- Dual input sections with parallel option, with independent high-speed MPPTs, optimize energy harvesting from multiple arrays oriented in different directions.
- Wide MPPT operating range: 90 to 580VDC

Field-Proven Reliability

- IP65 (NEMA 4) rated enclosure withstands the harshest environmental conditions.
- Front-mounted heat sink resists contamination, enhancing cooling and increasing reliability and long-term efficiency.
- Grid-connected operation according to international standards, UL1741/IEEE1547 & CSA-C22.2 N.107.1-01
- Ten-year warranty, optionally extendable to fifteen and twenty years.

Installer Friendly

- Reverse-polarity protection minimizes potential damage caused by miswiring during installation.
- Front-panel mounted LCD display provides real-time updates for all critical operating parameters.
- RS-485 and USB communications interfaces.
- Integrated DC switch available in compliance with NEC Standard, Article 690 "Solar Photovoltaic System" (USA)
- Anti-islanding protection

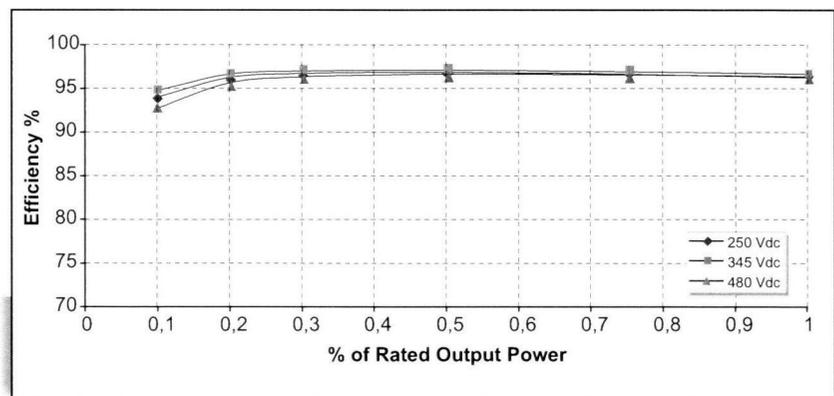
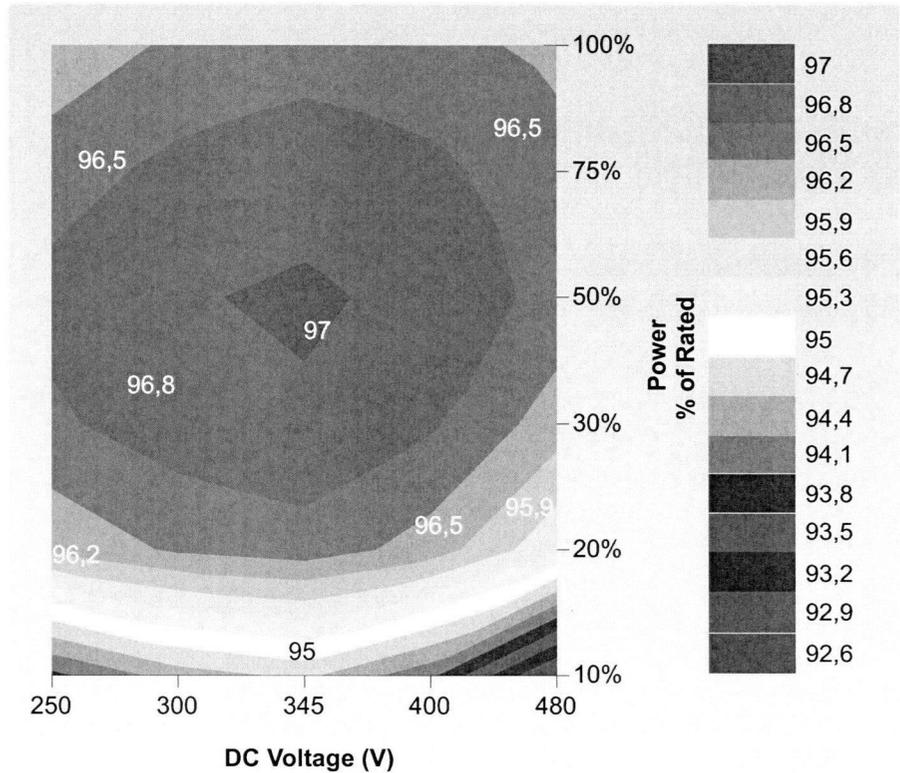
| Models | AC Power |
|--|----------|
| PVI-5000-OUTD | 5kW |
| PVI-6000-OUTD | 6kW |
| Options | |
| Aurora Communicator software simplifies monitoring via PC. Aurora Easy Control datalogger is available for remote control via Internet, modem or GSM | |



High Efficiencies Across a Broad Range of Operating Conditions

PVI-5000 and PVI-6000 inverters provide 208/240/277 Vac selectable outputs, at up to 97% efficiency (CEC 96.5). The graph to the right demonstrates the high efficiencies, across a continuous range of input voltages and load conditions, for the PVI-6000.

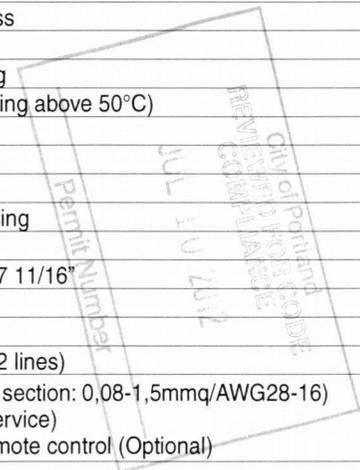
The graphs below depict the industry-leading performance of all models at three discrete MPPT-voltage reference points, and a continuous range of load conditions.



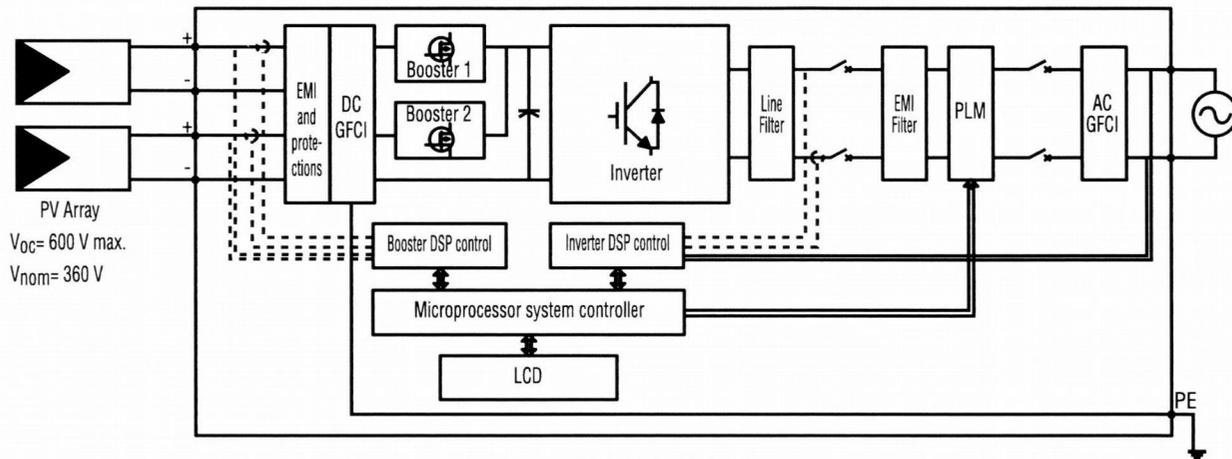
| SPECIFICATIONS | PVI-5000-OUTD | PVI-6000-OUTD |
|--|---|--------------------------------|
| INPUT PARAMETERS (DC Side) | | |
| Nominal DC Power [kW] | 5.15 | 6.18 |
| Total Max. Recommended DC Power [kW] | 5.3 | 6.4 |
| Operating MPPT Input Voltage Range [V] | 90 to 580 (360 nominal) | |
| Full Power MPPT Range [V] | 140-530 | 170-530 |
| Max. Input Voltage [V] | 600 | |
| Activation Voltage [V] | 200 nominal (adjustable within 120-350) | |
| No Of Independent MPPT Trackers | 2 | |
| Max. Input Power, Each MPPT [kW] | 4 | 4 |
| No. Of DC Inputs | 2 (1 each MPPT) | 2 (1 each MPPT) |
| Max. DC Current, Each MPPT [A] | 18 (22 short circuit) | 18 (22 short circuit) |
| Thermally Protected DC Side Varistor | 4 (2 for each MPPT) | |
| DC Switch | Integrated (Rating: 600Vdc/25A) | |
| DC Connections | 4 (2 POSITIVE, 2 NEGATIVE) SCREW TERMINAL BLOCK 3 KNOCK-OUTS: G1&1/2" or G1" (using ring reduction) CONDUCTOR CROSS SECTION : MAX AWG4 | |
| OUTPUT PARAMETERS (AC Side) | | |
| Nominal AC Power [kW] | 5000 | 6000 |
| Max. AC Power [kW] | 5000 | 6000 |
| AC Grid Connection | single phase / split phase | |
| Nominal AC Voltage Range [V] | Default : 240V split phase Optional : 208 or 277 single phase (setting required) | |
| Maximum AC Voltage Range [V] | 187.2-224.6 ; 216-259.2 ; 249.3-299.2 | |
| Nominal AC Frequency [Hz] | 60 | |
| Max. AC Line Current [A] | 24; 20;18 (30 short circuit) | 29; 25;21.6 (30 short circuit) |
| AC Side Varistor | 2 (Live - Neutral / Live - PE) SCREW TERMINAL BLOCK | |
| AC Connection | 3 KNOCK-OUTS: G1&1/2" or G1" (using ring reduction) CONDUCTOR CROSS SECTION : AWG4/8 | |
| Line Power Factor | 1 | |
| AC Current Distortion (THD) | <2% at rated power with sine wave voltage | |
| Max. Efficiency | 97% | |
| CEC Efficiency | 96.5% | |
| Feed In Power Threshold [W] | 20 | |
| Night Time Consumption [W] | < 2 | |
| Isolation | Transformer-less | |
| ENVIRONMENTAL PARAMETERS | | |
| Cooling | Natural cooling | |
| Ambient Temp. Range [°C] | -25 / + 60 (output power derating above 50°C) | |
| Operating Altitude [ft] | 6.000 | |
| Acoustical Noise [dBA] | < 50 @ 1mt | |
| Environmental IP Rating | IP65 | |
| Relative Humidity | 0-100% condensing | |
| MECHANICAL | | |
| Dimensions (HxWxD) [Inches] | 38 5/8" x 12 13/16" x 7 11/16" | |
| Weight [lbs] | 66 | |
| OTHER | | |
| Display | YES (Alphanumeric 2 lines) | |
| Communication | RS485 (Spring terminal block - Conductor cross section: 0,08-1,5mmq/AWG28-16) USB connection (Service) "Aurora Easy-Control" system for remote control (Optional) | |

Standards and Codes

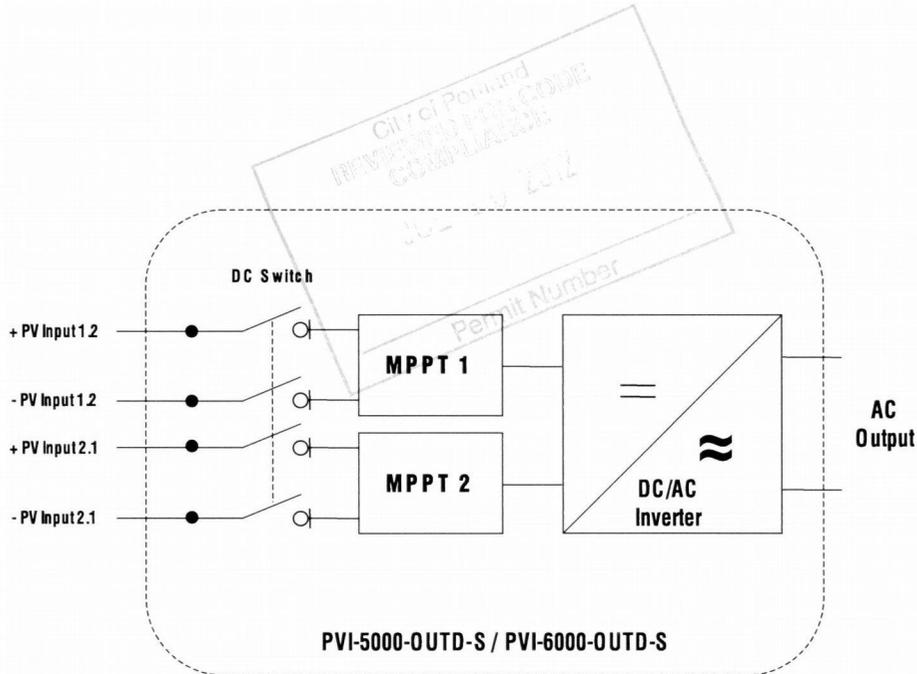
Aurora inverters comply with standards set for grid-tied operation, safety, and electromagnetic compatibility including: UL1741/IEEE1547 & CSA -C22.2 N.107.1-01, VDE0126, CEI 11-20, DK5940, CEI64-8, IEC 61683, IEC 61727, EN50081, EN50082, EN61000, CE certification, El Real Decreto RD1663/2000 de España.



Block Diagram and Operating Configurations



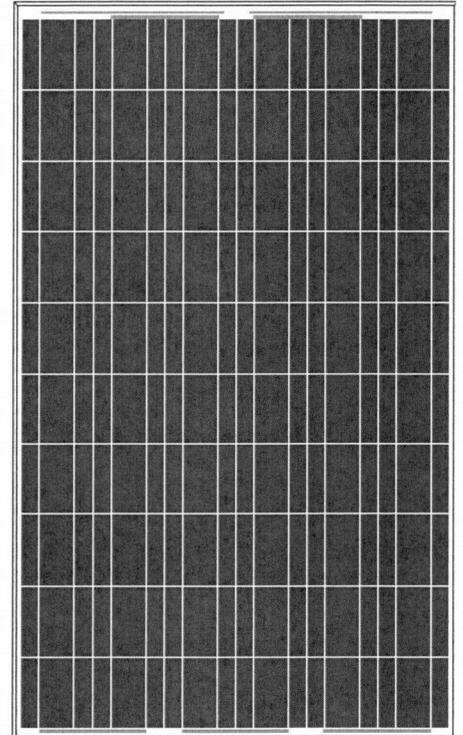
Inverter electrical block diagram



Rev.1.1 June.10, 2009

**Overview**

- High efficiency solar cells (approx. 16%) with quality silicon material for high module conversion efficiency and long term output stability and reliability.
- Positive power output tolerance from 0% to +3%.
- Rigorous quality control to meet the highest international standards.
- High transmittance, low iron tempered glass with enhanced stiffness and impact resistance.
- Unique frame design with strong mechanical strength for greater than 30 lbs/ft² wind load and snow load withstanding and easy installation.
- Advanced encapsulation material with multilayer sheet lamination to provide long-life and enhanced cell performance.
- Outstanding electrical performance under high temperature and weak light environments.

**Applications**

- Any large or small on-grid /off-grid solar power stations.
- Commercial/industrial building roof-top and ground systems.
- Residential roof-top and ground systems.

Warranty

- 10 year limited product warranty on materials and workmanship.
- 25 year warranty on >80% power output and 10 year warranty on >90% power output.
- Refer to warranty document for detailed warranty information.

Certifications

- ETL UL-1703 ISO 9000:2000
- CE TUV IEC61215 IEC61730

**Mechanical Specifications**

| Characteristic | Details |
|------------------------------|--|
| Cell Size | 156mm x 156mm (6.14" x 6.14") |
| Module Dimension (L x W x T) | 1650mm x 990mm x 40mm (64.9" x 38.9" x 1.6") |
| No. of Cells | 6 x 10 = 60 |
| Weight | 19.5 kg (43.3 lbs) |
| Cable Length | ≥ 900mm (35.4") for positive (+) and negative (-) |
| Type of Connector | MC-IV |
| Junction Box | IP65 Rated |
| No. of Holes in Frame | 4 draining holes, 8 installation holes, 2 grounding holes, 16 air outlet holes. |

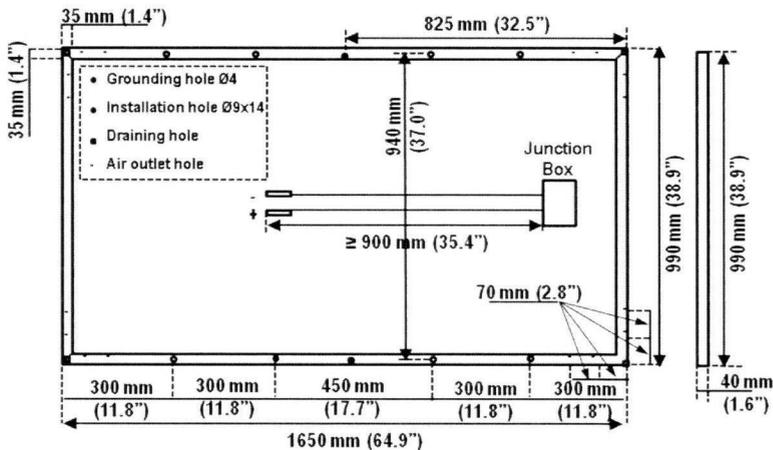
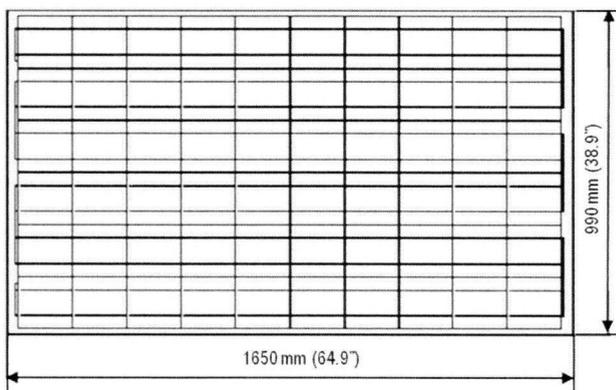
Electrical Specifications

(STC* = 25 °C, 1000W/m² Irradiance, and AM=1.5)

| Model | GS-P-220-Fab5 | |
|---|--|--|
| Max System Voltage (IEC/UL) | 1000V / 600V | |
| Maximum Power P _{max} | 220 W (0%, +3%) | |
| CEC Listed PTC Power | 197.2 W | |
| Voltage at Maximum Power Point V _{mpp} | 30.1 V | |
| Current at Maximum Power Point I _{mpp} | 7.31 A | |
| Open Circuit Voltage V _{oc} | 36.3 V | |
| Short Circuit Current I _{sc} | 7.81 A | |
| Module Efficiency (%) | 13.5% | |
| Temperature Coefficient of V _{oc} | -0.138 V/°C (-0.38% /°C) | |
| Temperature Coefficient of I _{sc} | 3.12x10 ⁻³ A/°C (0.04% /°C) | |
| Temperature Coefficient of P _{max} | -1.03 W/°C (-0.47% /°C) | |

*Standard Test Conditions

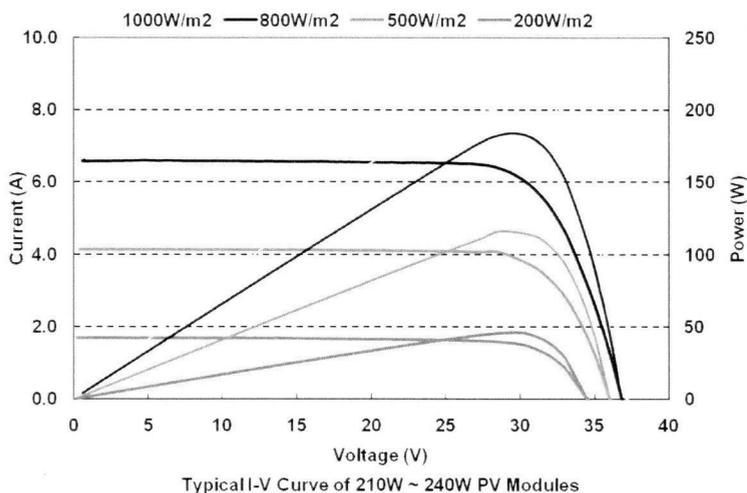
Physical Specifications mm (inch)



Other Performance Data

| Power Tolerance | Operating Temperature | Max Series Fuse Rating | NOCT* |
|-----------------|-----------------------|------------------------|--------------|
| 0%, +3% | -40 °C to +85 °C | 15 A | 47 °C ± 2 °C |

*Normal Operating Cell Temperature



1305 South Bertelsen Road
 Eugene, Oregon 97402, USA
 Tel: 541.349.9000; Fax: 541.343.9000



Division: 06—WOOD AND PLASTICS
Section: 06060—Connections and Fasteners

REPORT HOLDER:

SunModo Corporation
1905 SE 5th St, Suite A
Vancouver, WA 98661

EVALUATION SUBJECT

SunModo EZ Roof Mount L-Foot Kit for Shingle Roofs

1.0 EVALUATION SCOPE:

Compliance with the following codes:

2009 International Building Code®
2009 International Residential Code®
2006 International Building Code®
2006 International Residential Code®

1.2 Evaluated in accordance with:

Evaluation Criteria for Joist Hangers and Miscellaneous Connectors (IAPMO ES EC002-2011)
Acceptance Criteria for Roof Flashing for Pipe Penetrations (ICC-ES AC286)

1.3 Properties Evaluated:

Structural
Weather Protection

2.0 USES

EZ Roof Mount L-Foot Kit for Shingle Roofs is used to mount solar systems and other rooftop devices such as satellite dishes on asphalt shingle roofs with wood rafters underneath.

EZ Roof Mount is specifically designed to be used for installation of solar panels for electric or hot water production on roofs with slopes from 3 to 12 units vertical in 12 units horizontal.

3.0 DESCRIPTION

3.1 General Description

EZ Roof Mount L-Foot Kit consists of 5 basic components: (1) shoe assembly with captive waterproof washer, (2) lag bolt to fasten through the shingles to the roof rafter, (3) flashing that is placed under the row of shingles above the shoe and then over the shoe, (4) L-Foot that is placed over the protruding shoe threads and (5) hex cap that is secured on to the shoe. See Figures 1 to 5 in Table 2.

3.2 Materials

EZ Roof Mount is fabricated from aluminum. Shoe assembly is fabricated using casting aluminum alloy with dimensions of 2.80 inches in diameter and 1.00 inches in height. It is held in place using one 5/16 inch diameter lag bolt that is 4 inch in length and made of stainless steel. Flashing is fabricated from sheet aluminum with dimensions of 10.0 inches in width, 12.5 inches in length and 0.04 inches in thickness.

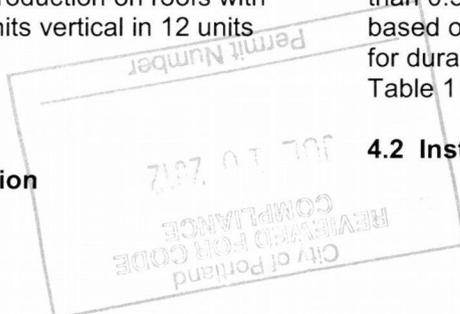
L foot is 6063-T5 aluminum with dimensions of 2.00 inches in width, 3.00 inches in height and 0.24 inches in thickness. It contains a 0.375 inch diameter round hole with a 0.83 inch diameter chamfer (in base) that is located in the center of the base leg. A 1.64 inch long by 0.40 inch wide slot occurs in center and is located 0.30 inches from the top edge of the vertical leg, which has a scallop front and rear face. See Table 2 for component material properties and figures.

4.0 DESIGN AND INSTALLATION

4.1 Design

Tabulated allowable loads shown in Table 1 of this report are based on allowable stress design (ASD). Adjustments to these values are required for wet service conditions, sustained exposure to elevated temperatures, use with fire retardant lumber or with lumber whose specific gravity is less than 0.55 (Southern Pine). Allowable values based on fastener strength may be adjusted for duration of loading. See footnotes of Table 1 for more detailed explanation.

4.2 Installation



EZ Roof Mount must be installed using the 5/16 inch diameter stainless steel lag screw at each bracket location as described in the manufacturer's installation instructions. Lag screw must penetrate into the roof rafter a minimum of 2 ½ inches. Prior to installation, the roof rafter shall be bored with the required lead and clearance hole for the unthreaded and shank portions of the lag screw as required in Section 11.1.3 of the NDS -05. Threaded portion of the lag screw shall be inserted into its lead hole by turning with a wrench and not driving by a hammer. Roof rafter should have a moisture content of 18% or less.

Use of auxiliary holes in the Shoe is not covered in this certification other than the use of an extra fastener to stop the shoe from rotating during installation.

Flashing should be installed full under the shingle up to the raised portion of the flashing to prevent water ingress under the shingle. No portion of the flashing should be bent upward; the flashing must rest fully against the roof shingles, otherwise the water and wind performance may be impaired.

5.0 CONDITIONS OF USE

EZ Roof Mount L-Foot Kit for Shingle Roofs described in this report complies with the codes listed in Section 1.0 of this report subject to the following conditions:

5.1 EZ Roof Mount shall be installed in accordance with this report, manufacturer's installation instructions and the codes listed in Section 1.1.

5.2 Calculations to verify the imposed loads on the EZ Roof Mount assembly do not exceed the allowable loads contained in Table 1 of this report shall be submitted to the code official when requested. Calculations shall be prepared by a registered design professional when required by the statutes of the jurisdiction where the work is constructed.

6.0 EVIDENCE SUBMITTED

Testing and analysis data submitted is in conformance with Evaluation Criteria for

Joist Hangers and Miscellaneous Connectors (IAPMO ES EC 002-2011).

Rain test data and thickness of aluminum flashing submitted is in conformance with Acceptance Criteria for Roof Flashing for Pipe Penetrations (ICC-ES AC 286-2008). Rain test conformed to Underwriters Laboratory Standard for Gas Vents, UL 441-96 Section 25.

Test results are from laboratories in compliance with ISO/IEC 17025.

7.0 IDENTIFICATION

A die-stamp label in the flashing bearing the name and address of the manufacturer, the model number, IAPMO ES Mark of Conformity, and this evaluation report number (Evaluation Report XXXX) identifies the products listed in this report.

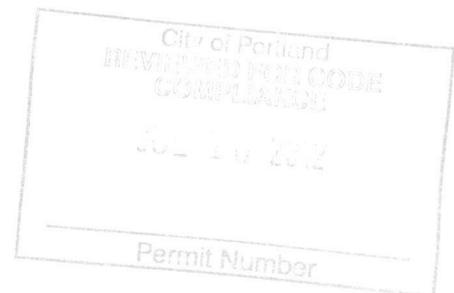


Table 1: ALLOWABLE LOADS FOR EZ ROOF MOUNT L-FOOT KIT (lbs.)^{1,2,3,4,5}

| Load Direction (see figure below) | Ultimate Load Test Value F.S. = 3.0 | Test Load at 0.125 inch deflection | Calculated Fastener Strength | Allowable Design Load |
|--------------------------------------|---|--|------------------------------------|--------------------------|
| Uplift (Withdrawal) | 720 | 230 | TBD | TBD |
| Lateral | 280 | 130 | TBD | TBD |

Notes

1. Allowable load values are based on the least value from the ultimate test load divided by three (strength limit), tested load at 0.125 inch deflection (deflection limit) or calculated fastener capacity (withdrawal, lateral) for wood with a specific gravity of 0.55 (Southern Pine).
2. Allowable load values are based on lumber with all of the following characteristics:
 - a. Located in dry service conditions where the moisture content does not exceed 19% for an extended period of time such as in most covered structures.
 - b. Located where it does not experience sustained exposure to elevated temperatures that exceed 100° F.

For any other conditions, allowable table values shall be multiplied by the related adjustment factor(s) (C_m and/or C_t) in accordance with the National Design Specification for Wood Construction (NDS-05).
3. Allowable load values are based on lumber with a specific gravity of 0.55 (Southern Pine or equal). *For use in wood species with a lower specific gravity, allowable table values shall be adjusted by the ratio of allowable withdrawal and lateral loads for the other wood species to the values for the calculated fastener strength shown in the table (SUGGESTION).*
4. Allowable load values for withdrawal are based on a minimum penetration of 2 ½ inches into the roof rafter by one 5/16 inch x 4 inch long stainless steel lag screw.
5. Allowable values based on calculated fastener strength in wood may be adjusted for load duration in accordance with Section 10.3.2 of the NDS-05.

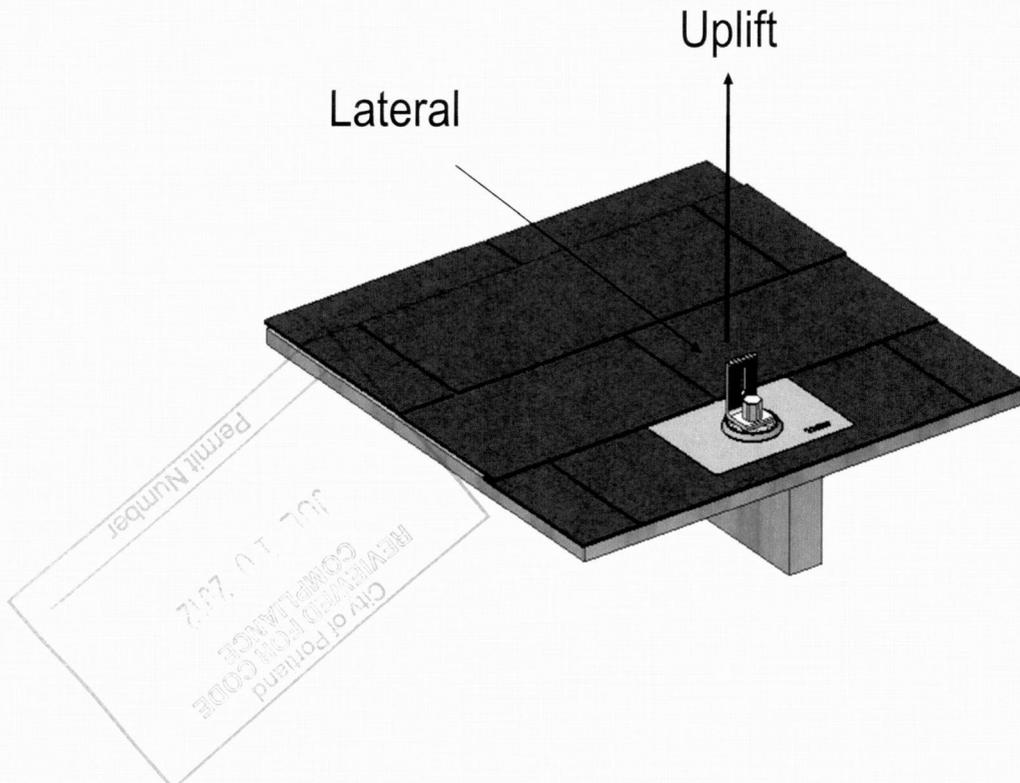


Table 2: MATERIAL PROPERTIES

| Component | Material |
|-------------------|----------------------------------|
| Shoe | Aluminum alloy ANSI/AA A380.0 |
| Waterproof Washer | EPDM with durometer rating of 60 |
| Lag Bolt | 304 stainless steel ASTM A 240 |
| L-foot | Aluminum alloy 6063-T6 ASTM B221 |
| Hex Cap | Aluminum alloy ANSI/AA A380.0 |
| Flashing | Aluminum alloy 1060 ASTM B209 |

EZ ROOF MOUNT COMPONENTS

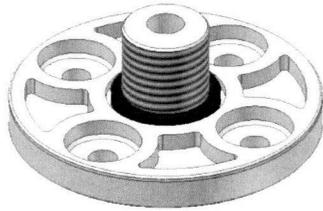


Figure 1: Shoe Assembly



Figure 4: Hex Cap



Figure 2: Lag Bolt

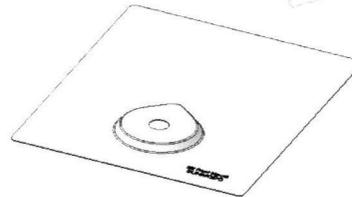


Figure 5: Flashing

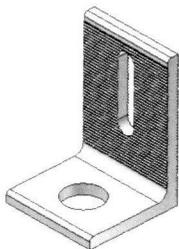
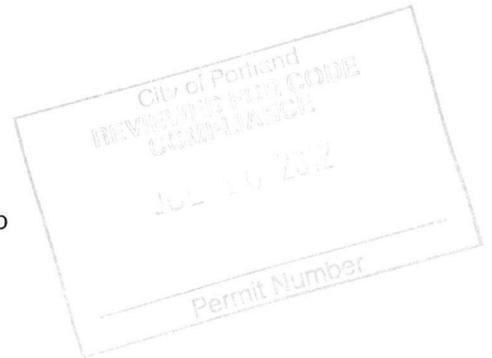


Figure 3: L-foot



Patent Pending

Ez Roof Mount



- * Easy to install
- * All Aluminum
- * All in One Roof Flashing & Mount
- * Mounts with all Standard Racking Systems
- * Stainless Steel Hardware

SUNMODO

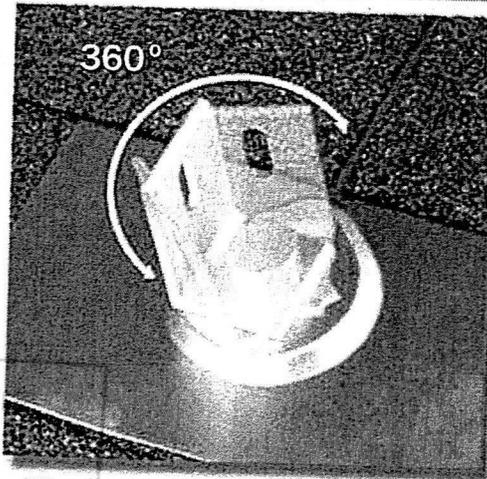
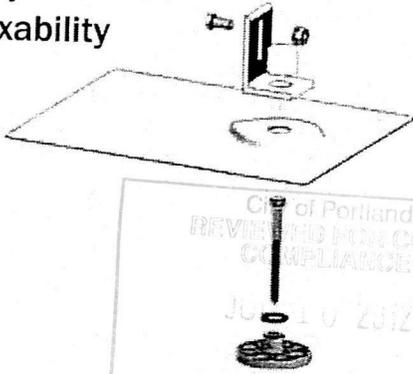
Visit us at: www.sunmodo.com

Ez Roof Mount

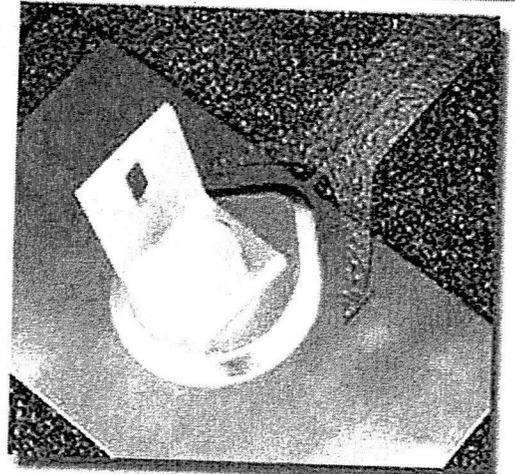
... Engineered and Designed for easy installation.
Our roof mounting system is water tight and durable for any composite/shake roof!

Key Features

- Minimum Parts & Hardware
- Easy to install
- Flexibility



The L Foot can swivel 360° for multiple configurations!



Flashing designed to redirect water flow!

Ez Roof Mount Kit

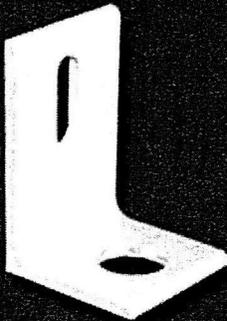
#K10040-001

The Ez Roof Mount Kit comes complete with the following parts:

- 1 - Roof Mount Flashing
- 1 - Roof Mount Shoe
- 1 - Hex Cap
- 1 - Flashing L Foot

- 1 - Water sealing washer
- 1 - Hex lag bolt 5/16 x 4
- 1 - Hex bolt 3/8 - 16 x 3/4
- 1 - Flange nut 3/8 - 16

Flashing L Foot



Hex Cap



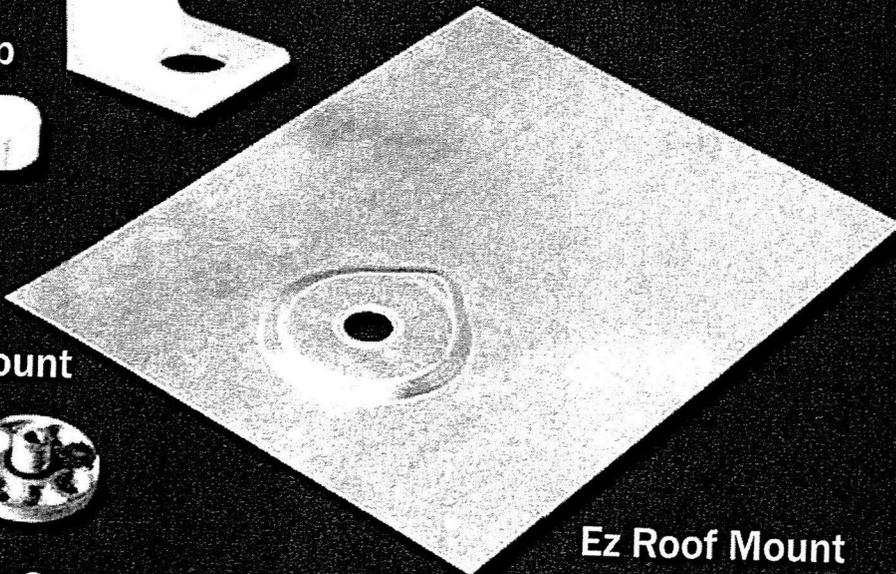
Roof Mount Shoe



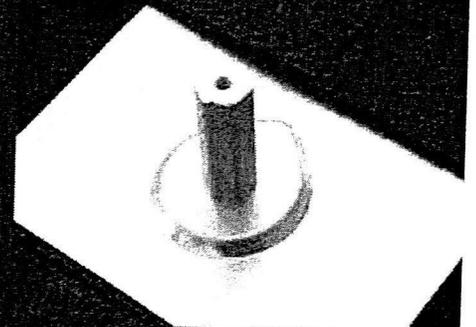
Stainless Steel Hardware



Ez Roof Mount Flashing



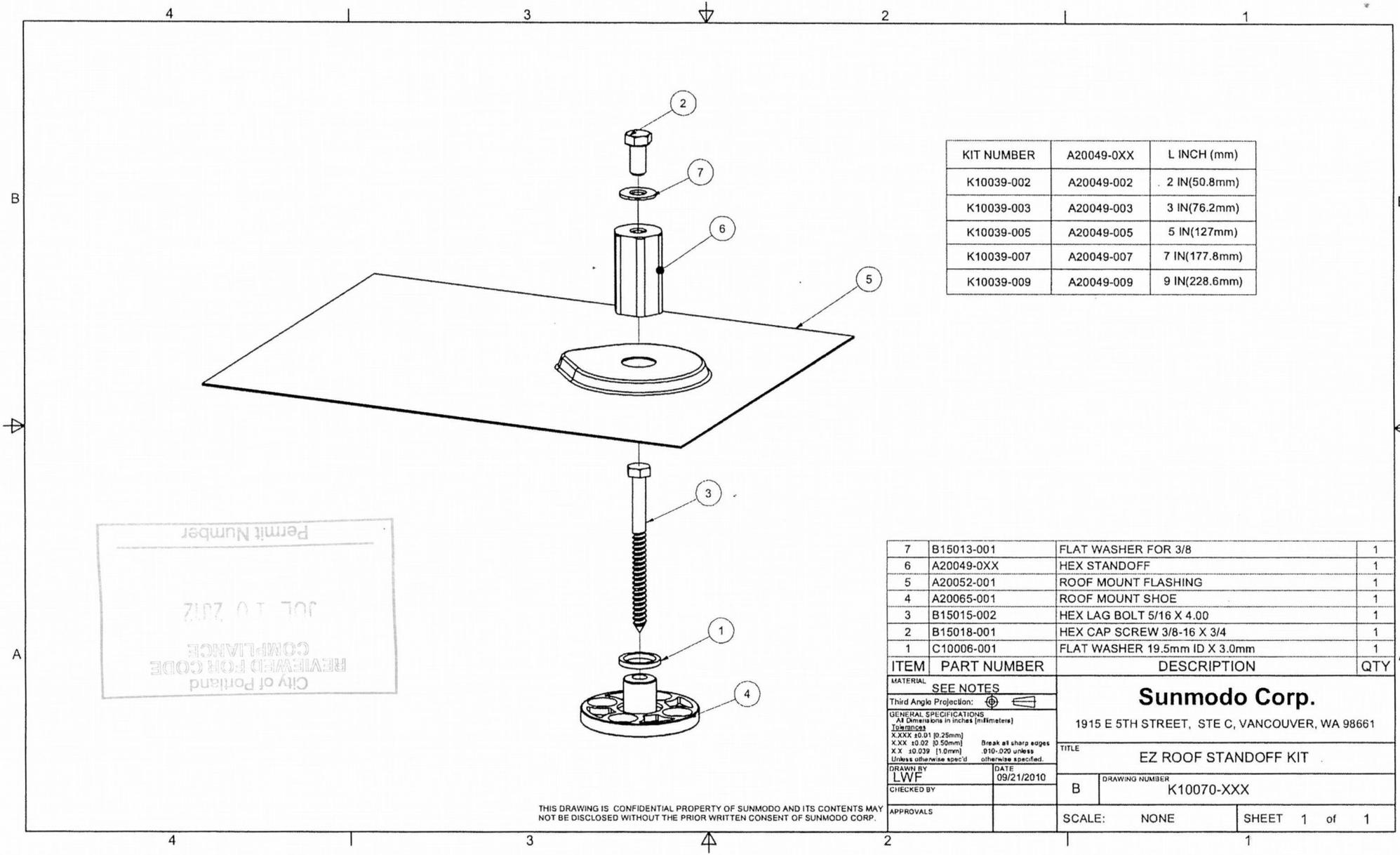
Optional kits available with standoffs!



SUNMOD

Contact: 360-844-0048
503-850-4633

sales@sunmodo.com
www.sunmodo.com



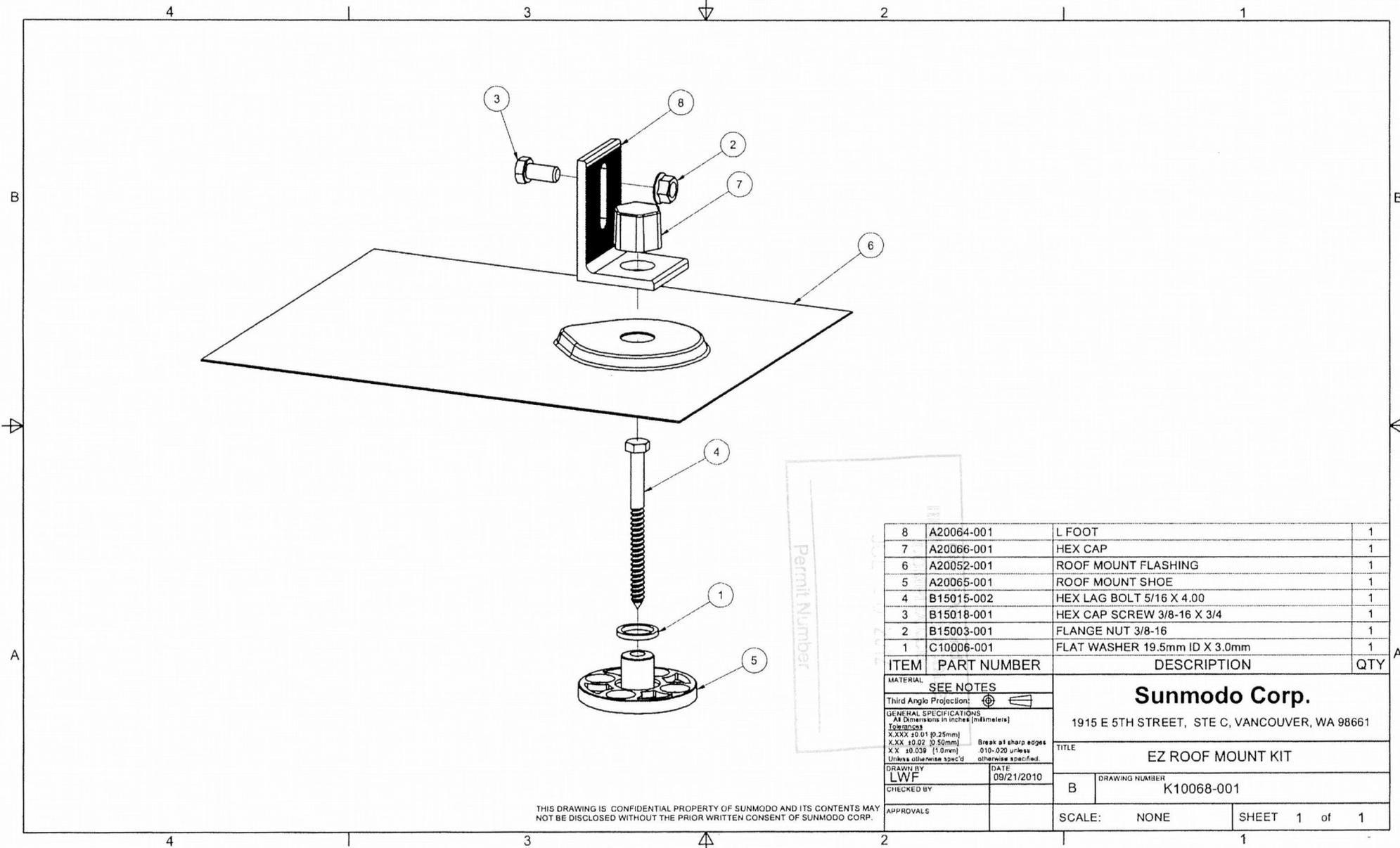
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|------------|------------|---------------|
| K10039-002 | A20049-002 | 2 IN(50.8mm) |
| K10039-003 | A20049-003 | 3 IN(76.2mm) |
| K10039-005 | A20049-005 | 5 IN(127mm) |
| K10039-007 | A20049-007 | 7 IN(177.8mm) |
| K10039-009 | A20049-009 | 9 IN(228.6mm) |

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| ITEM | PART NUMBER | DESCRIPTION | QTY |
|------|-------------|-------------------------------|-----|
| 7 | B15013-001 | FLAT WASHER FOR 3/8 | 1 |
| 6 | A20049-0XX | HEX STANDOFF | 1 |
| 5 | A20052-001 | ROOF MOUNT FLASHING | 1 |
| 4 | A20065-001 | ROOF MOUNT SHOE | 1 |
| 3 | B15015-002 | HEX LAG BOLT 5/16 X 4.00 | 1 |
| 2 | B15018-001 | HEX CAP SCREW 3/8-16 X 3/4 | 1 |
| 1 | C10006-001 | FLAT WASHER 19.5mm ID X 3.0mm | 1 |

| | | | |
|---|--|----------------|--------------|
| MATERIAL | | SEE NOTES | |
| Third Angle Projection: | | | |
| Sunmodo Corp. 1915 E 5TH STREET, STE C, VANCOUVER, WA 98661 | | | |
| GENERAL SPECIFICATIONS All Dimensions in inches (millimeters) Fractions X.XXX ±0.01 (0.25mm) X.XX ±0.02 (0.50mm) X.X ±0.039 (1.0mm) Unless otherwise specified. | | | |
| DRAWN BY | | DATE | |
| LWF | | 09/21/2010 | |
| CHECKED BY | | DRAWING NUMBER | |
| | | B K10070-XXX | |
| APPROVALS | | SCALE: NONE | SHEET 1 of 1 |

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| ITEM | PART NUMBER | DESCRIPTION | QTY |
|------|-------------|-------------------------------|-----|
| 8 | A20064-001 | L FOOT | 1 |
| 7 | A20066-001 | HEX CAP | 1 |
| 6 | A20052-001 | ROOF MOUNT FLASHING | 1 |
| 5 | A20065-001 | ROOF MOUNT SHOE | 1 |
| 4 | B15015-002 | HEX LAG BOLT 5/16 X 4.00 | 1 |
| 3 | B15018-001 | HEX CAP SCREW 3/8-16 X 3/4 | 1 |
| 2 | B15003-001 | FLANGE NUT 3/8-16 | 1 |
| 1 | C10006-001 | FLAT WASHER 19.5mm ID X 3.0mm | 1 |

| | | | |
|--|--|--------------------|--|
| MATERIAL | | SEE NOTES | |
| Third Angle Projection: | | | |
| GENERAL SPECIFICATIONS All Dimensions in inches (millimeters) TOLERANCES X.XXX ±0.01 (0.25mm) X.XX ±0.02 (0.50mm) X.X ±0.03 (1.0mm) Unless otherwise specified | | | |
| DRAWN BY LWF | | DATE 09/21/2010 | |
| CHECKED BY | | DATE | |
| APPROVALS | | SCALE: NONE | |
| | | SHEET 1 of 1 | |

Sunmodo Corp.
1915 E 5TH STREET, STE C, VANCOUVER, WA 98661

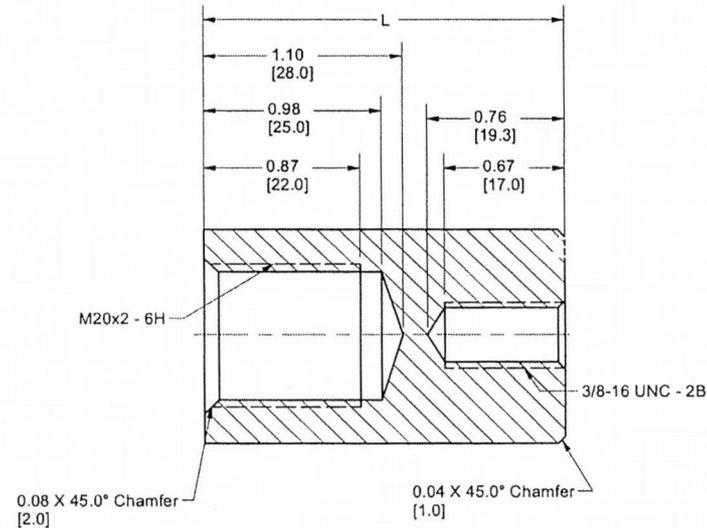
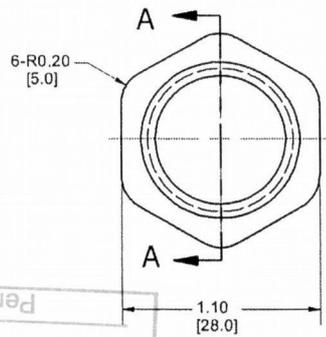
TITLE
EZ ROOF MOUNT KIT
DRAWING NUMBER
B K10068-001

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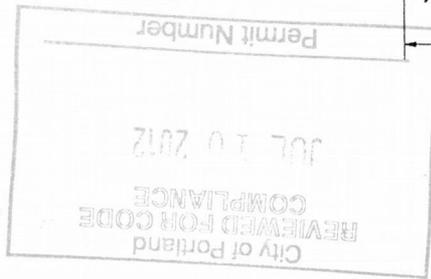
NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
2. MATERIAL: AL 6063-T5.
FINISH: CLEAR ANODIZED 10 μ m THICK.
3. BREAK ALL BURS AND SHARP EDGES.
4. UNSPECIFIED CHAMFER 0.5X45°.

| NO. | L |
|------------|----------------|
| A20049-002 | 2 In (50.8mm) |
| A20049-003 | 3 In (76.2mm) |
| A20049-005 | 5 In (127mm) |
| A20049-007 | 7 In (177.8mm) |
| A20049-009 | 9 In (228.6mm) |



SECTION A-A

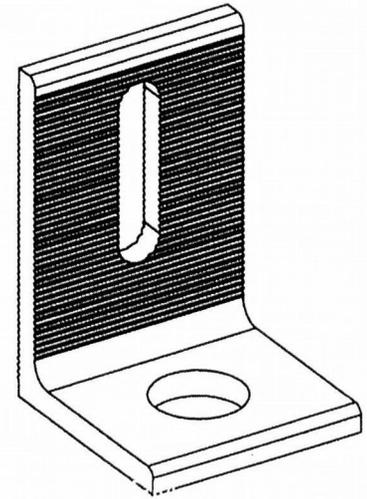
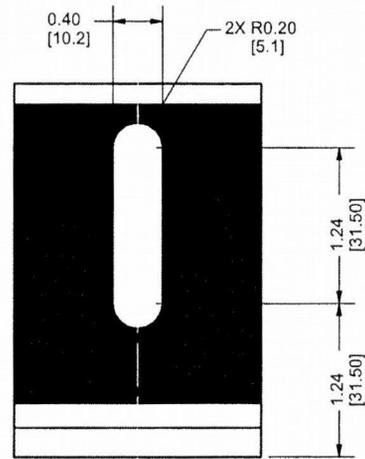
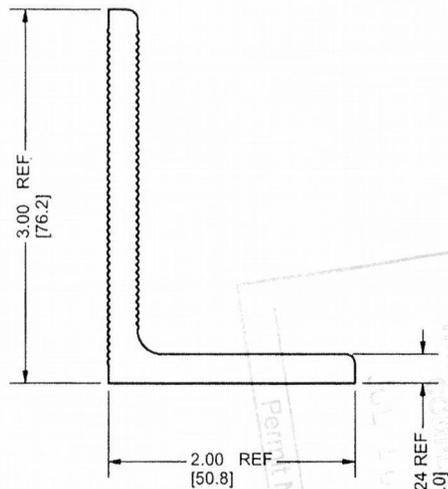
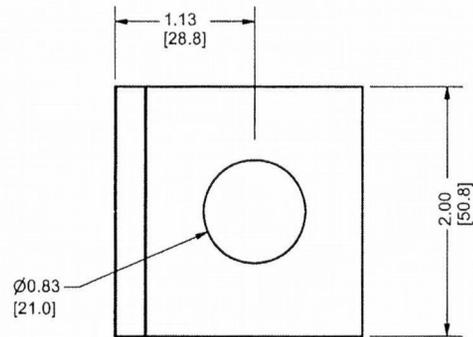


| | | | |
|---|------------------|--|--|
| MATERIAL: SEE NOTES | | Sunmodo Corp. 1118 NW KLIICKITAT LANE, CAMAS, WA 98607 | |
| Third Angle Projection: | | | |
| GENERAL SPECIFICATIONS All Dimensions in inches [millimeters] | | TITLE: HEX STANDOFF | |
| Tolerances XXX ±0.01 (0.25mm) XX ±0.02 (0.50mm) X ±0.039 (1.0mm) Unless otherwise specified | | DRAWING NUMBER: A20049-XXX | |
| DRAWN BY: LWF | DATE: 11/12/2010 | B | |
| CHECKED BY: | | SCALE: NONE | |
| APPROVALS: | | SHEET 1 of 1 | |

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NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILLIMETERS].
2. MATERIAL: SUNMODO EXTRUSION A20012 WITH ANODIZING.

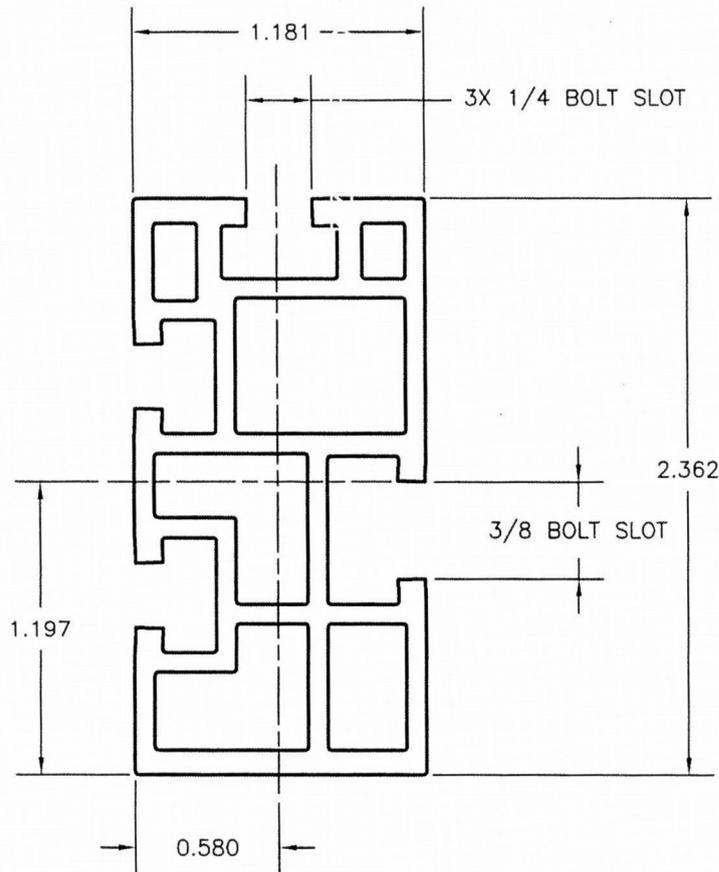


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| | | | |
|---|--------------------|---|------------------------------|
| MATERIAL SEE NOTES | | Sunmodo Corp. 1118 NW KLUCKITAT LANE, CAMAS, WA 98607 | |
| Third Angle Projection: | | | |
| GENERAL SPECIFICATIONS All Dimensions in Inches (Millimeters) Tolerances XXXX ±0.01 (0.25mm) XXX ±0.02 (0.50mm) XX ±0.039 (1.0mm) Unless otherwise spec'd | | TITLE L FOOT | |
| DRAWN BY LWF | DATE 08/04/2010 | B | DRAWING NUMBER A20064-001 |
| APPROVALS | | SCALE: NONE | SHEET 1 of 1 |

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
2. MATERIAL: ALUMINUM 6063-T6.
FINISH: CLEAR ANODIZED.



Weight: 1.20 lbs/ft
 Area = 1.00 in²
 Perimeter = 19.68 in
 Bounding Box: X: -0.580, 0.601
 Y: -1.197, 1.165
 Centroid: (0.000, 0.000)
 Moments of Inertia (in⁴): Ix: .581, Iy: .150
 Inertia Tensor (in⁴): Ixy: .016
 Radii of Gyration: X: 0.761, Y: 0.387

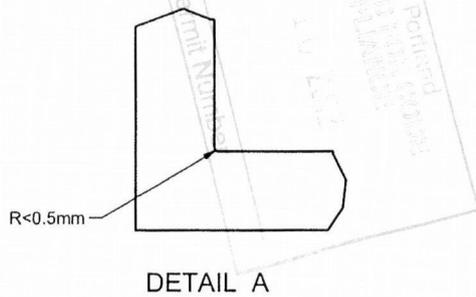
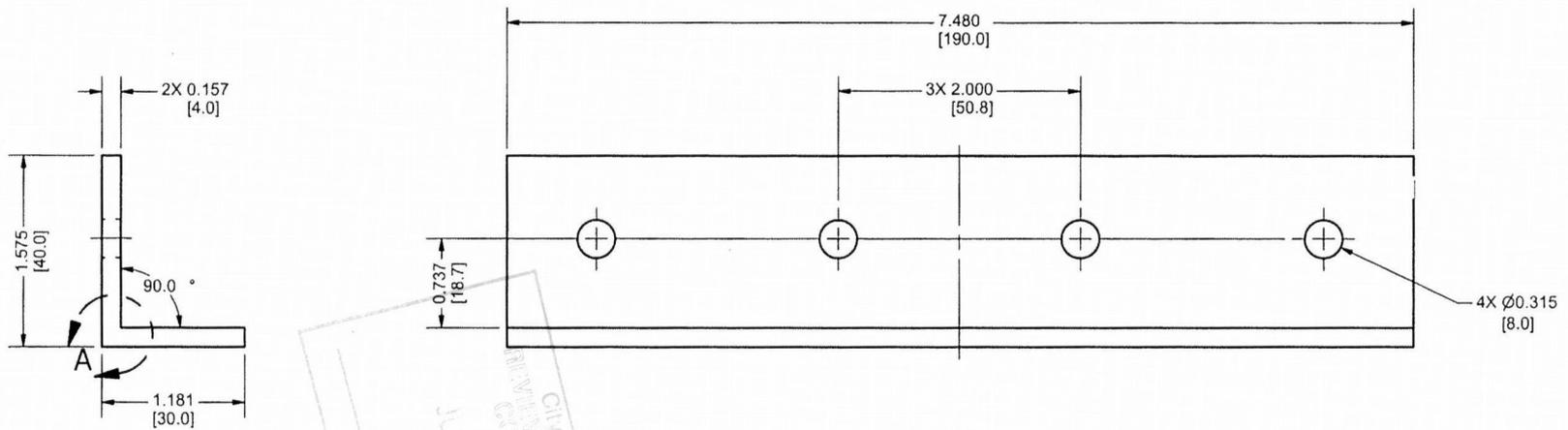
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 JUL 10 2012
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| | | | |
|---|-------------------|---|--|
| MATERIAL SEE NOTES | | Sunmodo Corp. | |
| Third Angle Projection: | | 1118 NW KLICKITAT LANE, CAMAS, WA 98607 | |
| All dimensions are in inches (millimeters) Tolerances unless otherwise noted | | TITLE ALUMINUM RAIL | |
| X .XX ±0.007 (0.14mm) Break all sharp edges X .XX ±0.004 (0.10mm) .010-.020 unless X .XX ±0.001 (2.54mm) otherwise specified | | DRAWING NUMBER A20015 | |
| DRAWN BY JL | DATE 1/12/2009 | SCALE: NONE | |
| CHECKED BY | | SHEET 1 of 1 | |
| APPROVALS | | | |

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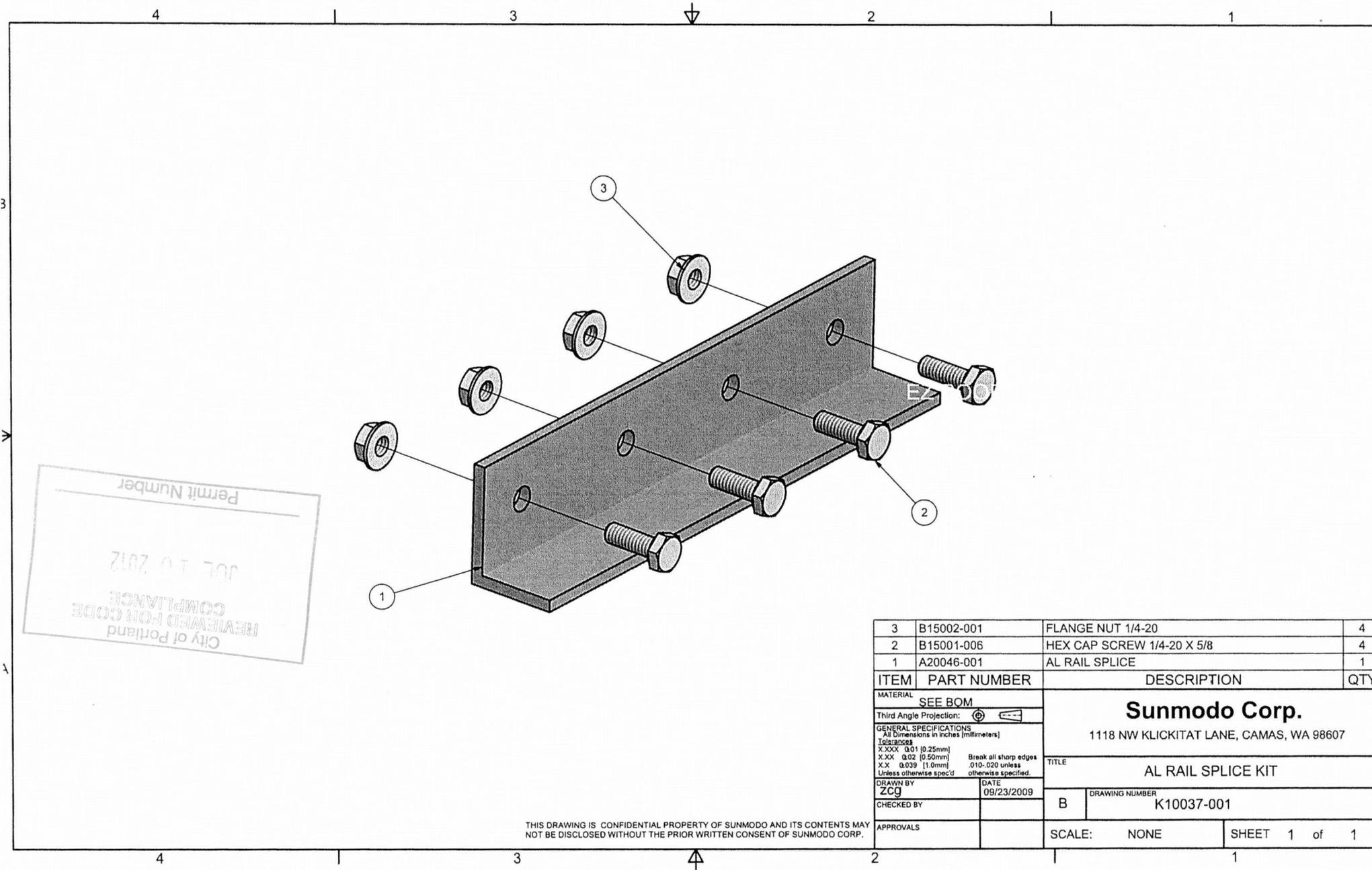
NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
2. MATERIAL: ALUMINUM 6063-T5.
FINISH: CLEAR ANODIZED.
3. BREAK BURRS AND SHARP EDGES.
4. THE PART SHOULD BE FREE OF OIL AND DIRTY MARKS.



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| | | | |
|---|--------------------|---|--|
| MATERIAL SEE NOTES | | Sunmodo Corp. 1118 NW KLICKITAT LANE, CAMAS, WA 98607 | |
| Third Angle Projection: | | | |
| GENERAL SPECIFICATIONS All Dimensions in inches [millimeters] | | TITLE AL RAIL SPLICE | |
| Tolerances XXX ±0.01 [0.25mm] XX ±0.02 [0.50mm] X ±0.039 [1.0mm] Unless otherwise specified | | DRAWING NUMBER A20046-001 | |
| DRAWN BY ZCG | DATE 09/22/2009 | SCALE: NONE | |
| CHECKED BY | APPROVALS | SHEET 1 of 1 | |



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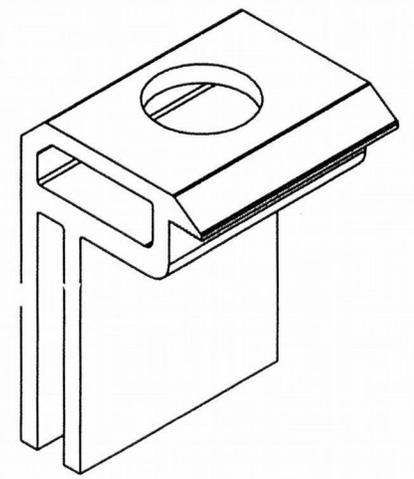
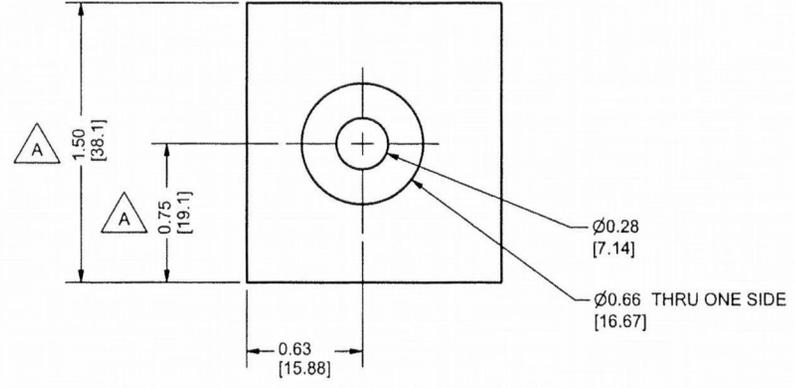
| 3 | B15002-001 | FLANGE NUT 1/4-20 | 4 |
|---|-------------|---|------------------------------|
| 2 | B15001-006 | HEX CAP SCREW 1/4-20 X 5/8 | 4 |
| 1 | A20046-001 | AL RAIL SPLICE | 1 |
| ITEM | PART NUMBER | DESCRIPTION | QTY |
| MATERIAL SEE BOM | | Sunmodo Corp. 1118 NW KLICKITAT LANE, CAMAS, WA 98607 | |
| Third Angle Projection: | | | |
| GENERAL SPECIFICATIONS All Dimensions in inches (millimeters) Tolerances X.XXX ±0.01 (0.25mm) X.XX ±0.02 (0.50mm) X.X ±0.03 (1.0mm) Unless otherwise spec'd | | TITLE AL RAIL SPLICE KIT | |
| DRAWN BY ZCG | | DATE 09/23/2009 | |
| CHECKED BY | | B | DRAWING NUMBER K10037-001 |
| APPROVALS | | SCALE: NONE | SHEET 1 of 1 |

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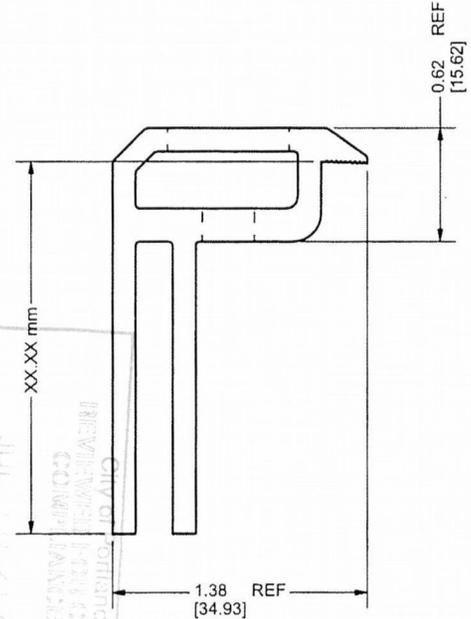
NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
2. MATERIAL: SUNMODO EXTRUSION A20022-001 WITH ANODIZING.

| REVISIONS | | | |
|-----------|------------------------------|----|---------|
| REV | DESCRIPTION | BY | DATE |
| A | 1.50 WAS 2.00 & .75 WAS 1.00 | JL | 6/29/09 |



| PART NO. | XX.XX mm |
|------------|----------|
| A20023-001 | 20 |
| A20023-002 | 24 |
| A20023-003 | 28 |
| A20023-004 | 30 |
| A20023-005 | 32 |
| A20023-006 | 34 |
| A20023-007 | 35 |
| A20023-008 | 36 |
| A20023-009 | 38 |
| A20023-010 | 40 |
| A20023-011 | 42 |
| A20023-012 | 43 |
| A20023-013 | 44 |
| A20023-014 | 45 |
| A20023-015 | 46 |
| A20023-016 | 48 |
| A20023-017 | 50 |
| A20023-018 | 51 |

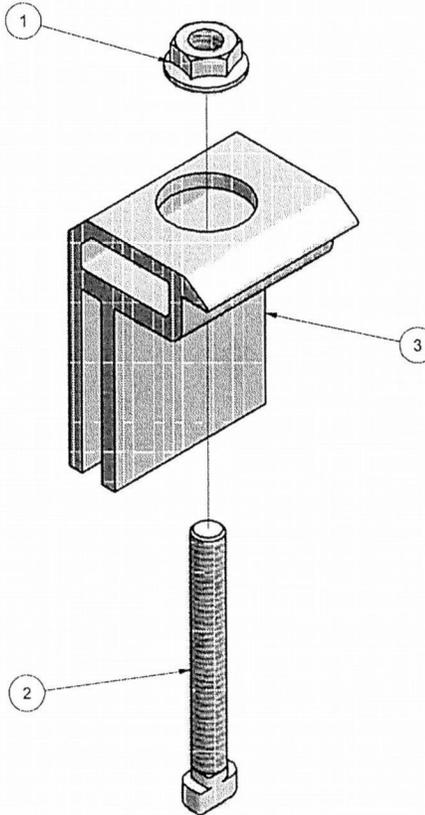


Permit Number
 JUL 10 2012
 SUNMODO CORPORATION
 1118 NW KLICKITAT LANE
 CAMAS, WA 98607
 (509) 865-1111

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| | | | |
|---|-----------------|---|--|
| MATERIAL: SEE NOTES | | Sunmodo Corp. 1118 NW KLICKITAT LANE, CAMAS, WA 98607 | |
| Third Angle Projection: | | | |
| All dimensions are in inches [millimeters] Tolerances unless otherwise noted: XXXX ±0.07 (0.16mm) Break all sharp edges XXX ±0.01 (0.25mm) 0.10-0.20 unless XX ±0.039 (1.0mm) otherwise specified | | TITLE: END CLAMP | |
| DRAWN BY: JL | DATE: 1/28/2009 | DRAWING NUMBER: A20023-XXX | |
| CHECKED BY: | | SCALE: 3:2 SHEET 1 of 1 | |
| APPROVALS: | | | |

| REVISIONS | | | |
|-----------|--------------------------------------|-----|----------|
| REV | DESCRIPTION | BY | DATE |
| A | Match -XXX number to panel thickness | LWF | 03/13/10 |



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 JUL 10 2012
 Permit Number

(A)

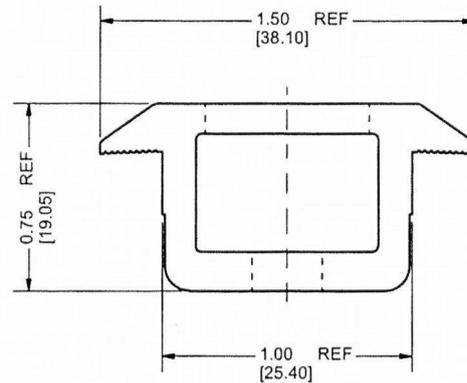
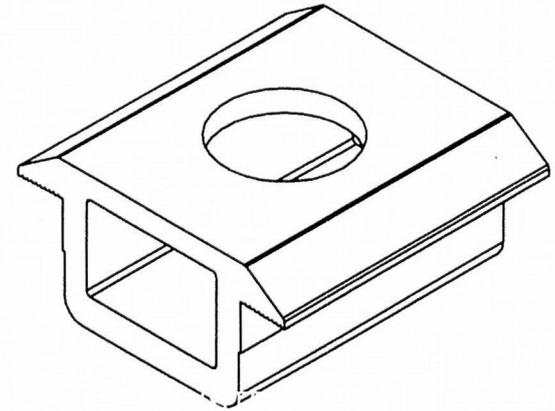
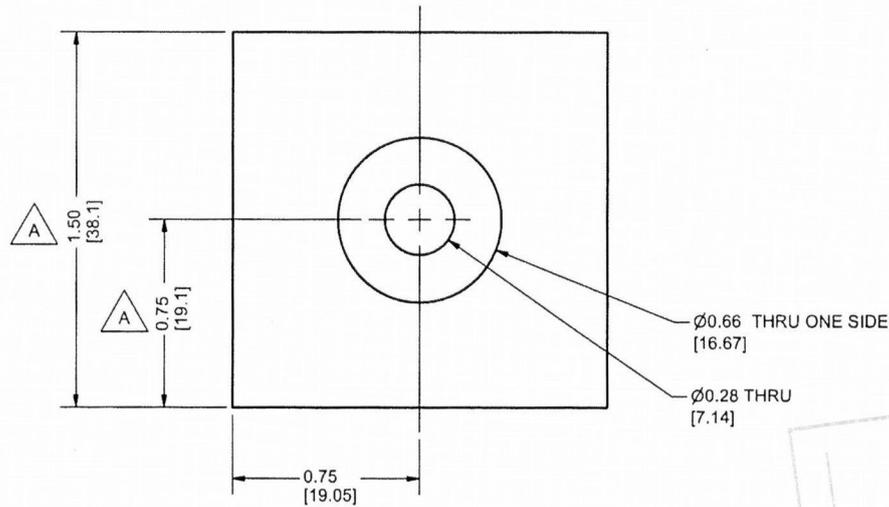
| KIT NUMBER | END MOUNT CLAMP KIT | PANEL THICKNESS mm |
|------------|---------------------|--------------------|
| K10002-020 | A20023-020 | 20 |
| K10002-024 | A20023-024 | 24 |
| K10002-028 | A20023-028 | 28 |
| K10002-030 | A20023-030 | 30 |
| K10002-032 | A20023-032 | 32 |
| K10002-034 | A20023-034 | 34 |
| K10002-035 | A20023-035 | 35 |
| K10002-036 | A20023-036 | 36 |
| K10002-038 | A20023-038 | 38 |
| K10002-040 | A20023-040 | 40 |
| K10002-042 | A20023-042 | 42 |
| K10002-043 | A20023-043 | 43 |
| K10002-044 | A20023-044 | 44 |
| K10002-045 | A20023-045 | 45 |
| K10002-046 | A20023-046 | 46 |
| K10002-048 | A20023-048 | 48 |
| K10002-050 | A20023-050 | 50 |
| K10002-051 | A20023-051 | 51 |

| 3 | A20023-XXX | END MOUNT CLAMP | 1 |
|--|-------------|--------------------------------|--------------|
| 2 | B20006-001 | T-Bolt 1/4 -20 X 2.00 | 1 |
| 1 | B15002-001 | FLANGE NUT 1/4-20 | 1 |
| ITEM | PART NUMBER | DESCRIPTION | QTY |
| MATERIAL: SEE BOM | | | |
| Third Angle Projection: | | | |
| GENERAL SPECIFICATIONS All Dimensions in inches (millimeters) Tolerances XXX ±0.01 (0.25mm) XX ±0.02 (0.50mm) X ±0.03 (0.75mm) Break at sharp edges 0.01-0.20 unless otherwise specified. | | | |
| DRAWN BY LWF | | DATE 03/13/2010 | |
| CHECKED BY | | DRAWING NUMBER B K10002-XXX | |
| APPROVALS | | SCALE: NONE | SHEET 1 of 1 |

THIS DRAWING IS CONFIDENTIAL PROPERTY OF SUNMODO AND ITS CONTENTS MAY NOT BE DISCLOSED WITHOUT THE PRIOR WRITTEN CONSENT OF SUNMODO CORP.

- NOTES: UNLESS OTHERWISE SPECIFIED
1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
 2. MATERIAL: ALUMINUM 6063-T6.
FINISH: CLEAR ANODIZED.

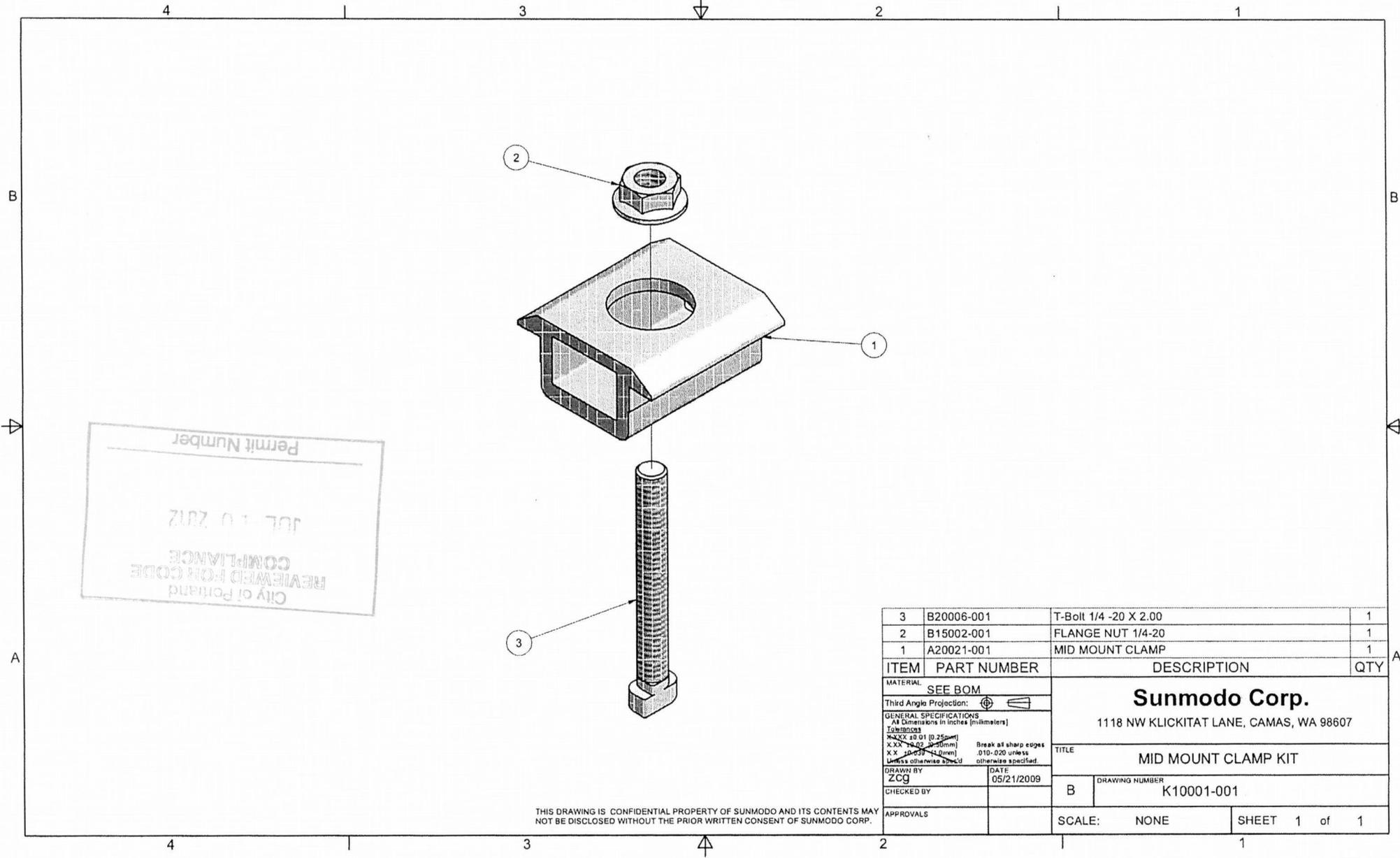
| REVISIONS | | | |
|-----------|-------------------------------|----|---------|
| REV | DESCRIPTION | BY | DATE |
| A | 1.50 WAS 2.00. & .75 WAS 1.00 | JL | 6/29/09 |



| | |
|---|-----------------------|
| MATERIAL SEE NOTES | |
| Third Angle Projection: | |
| All dimensions are in inches [millimeters] Tolerances unless otherwise noted | |
| X.XXX 0.007 [0.18mm] | Break all sharp edges |
| X.XX 0.01 [0.25mm] | .010-.020 unless |
| X.X 0.039 [1.0mm] | otherwise specified |
| DRAWN BY JL | DATE 1/28/2009 |
| CHECKED BY | |
| APPROVALS | |

| | |
|---|------------------------------|
| Sunmodo Corp. | |
| 1118 NW KLICKITAT LANE, CAMAS, WA 98607 | |
| TITLE MID CLAMP | |
| B | DRAWING NUMBER A20021-001 |
| SCALE: 2:1 | SHEET 1 of 1 |

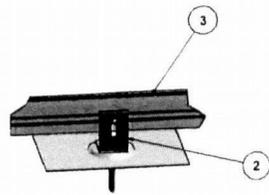
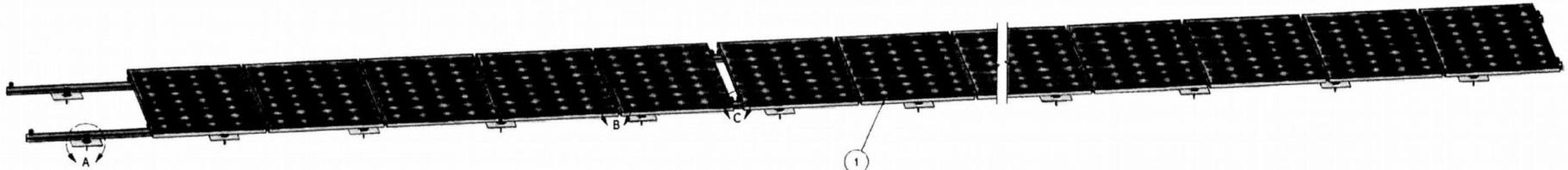
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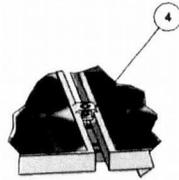
City of Portland
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 COMPLIANCE
 JUL 10 2012
 Permit Number

THIS DRAWING IS CONFIDENTIAL PROPERTY OF SUNMODO AND ITS CONTENTS MAY NOT BE DISCLOSED WITHOUT THE PRIOR WRITTEN CONSENT OF SUNMODO CORP.

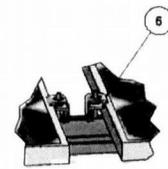
| 3 | B20006-001 | T-Bolt 1/4 -20 X 2.00 | 1 |
|--|--------------------|--|--------------|
| 2 | B15002-001 | FLANGE NUT 1/4-20 | 1 |
| 1 | A20021-001 | MID MOUNT CLAMP | 1 |
| ITEM | PART NUMBER | DESCRIPTION | QTY |
| MATERIAL: SEE BOM | | | |
| Third Angle Projection: | | Sunmodo Corp. 1118 NW KLIKITAT LANE, CAMAS, WA 98607 | |
| GENERAL SPECIFICATIONS All Dimensions in inches (millimeters) Tolerances XXXX ±0.01 (0.25mm) XXX ±0.005 (0.127mm) XX ±0.002 (0.0508mm) Unless otherwise specified, Break at sharp edges .010-.020 unless otherwise specified. | | | |
| DRAWN BY ZCG | DATE 05/21/2009 | DRAWING NUMBER B K10001-001 | |
| CHECKED BY | | SCALE: NONE | SHEET 1 of 1 |
| APPROVALS | | | |



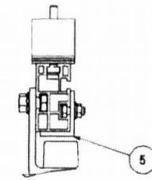
DETAIL A



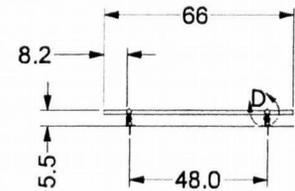
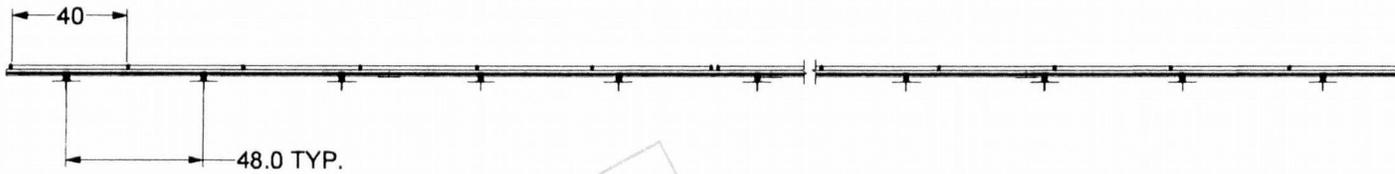
DETAIL B



DETAIL C



DETAIL D

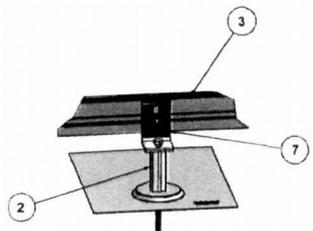
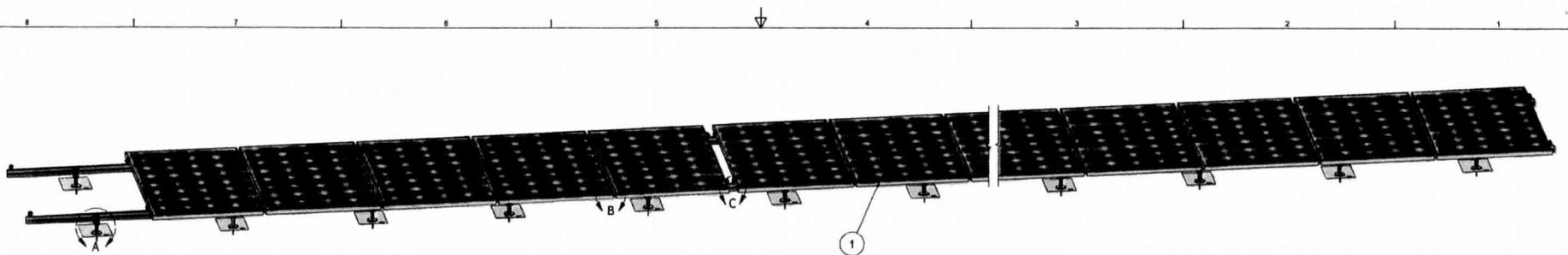


| ITEM | PART NUMBER | DESCRIPTION | QTY | | | | | | | | | | |
|------|-------------|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|--|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| 1 | | SOLAR PANEL | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| 2 | K10068-001 | EZ ROOF MOUNT KIT | 8 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | 22 | |
| 3 | A20015-XXX | TOTAL AL RAILS LENGTH (INCH) | 340 | 424 | 508 | 598 | 682 | 766 | 850 | 934 | 1018 | 1108 | |
| 4 | K10001-001 | MID CLAMP KIT | 8 | 8 | 10 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | |
| 5 | K10037-001 | 1/4 AL RAIL SPLICE KIT | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | |
| 6 | K10002-0XX | END CLAMP KIT | 4 | 4 | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 12 | |

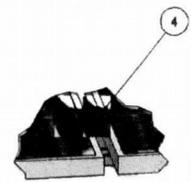
SEE BOM
 11/19/2011
 LWF
 01/04/2011

Sunmodo Corp.
 1915 E 5TH STREET, STE C, VANCOUVER, WA 98061
 TITLE: 1 ROW ROOF CONFIGURATION
 D: 1 ROW ROOF CONFIGURATION
 SCALE: NONE SHEET 1 of 1

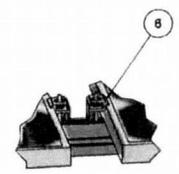
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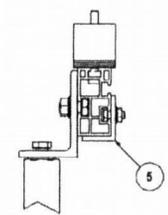
DETAIL A



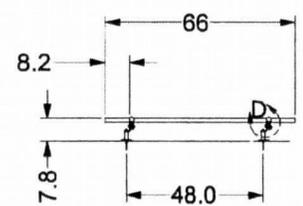
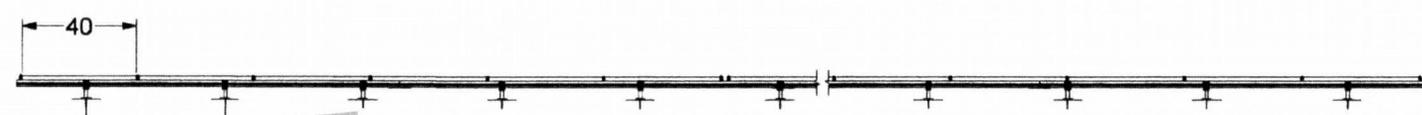
DETAIL B



DETAIL C



DETAIL D

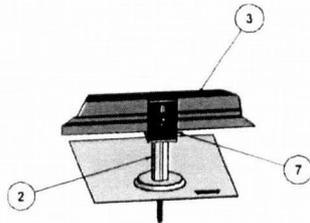
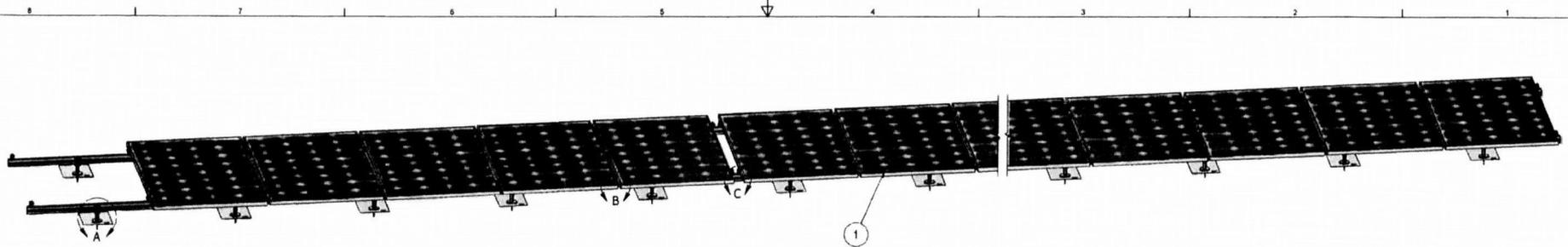


JUL 10 2012
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 City of Portland
 Hermit Number

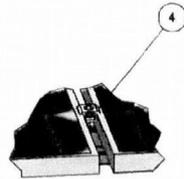
| ITEM | PART NUMBER | DESCRIPTION | QTY | | | | | | | | | | |
|------|-------------|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|--|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| 1 | | SOLAR PANEL | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| 2 | K10070-003 | EZ ROOF STANDOFF KIT | 8 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | 22 | |
| 3 | A20015-XXX | TOTAL AL RAILS LENGTH (INCH) | 340 | 424 | 508 | 598 | 682 | 766 | 850 | 934 | 1018 | 1108 | |
| 4 | K10001-001 | MID CLAMP KIT | 6 | 8 | 10 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | |
| 5 | K10037-001 | 1/4 AL RAIL SPLICE KIT | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | |
| 6 | K10002-0XX | END CLAMP KIT | 4 | 4 | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 12 | |
| 7 | K10066-001 | L FOOT KIT | 8 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | 22 | |

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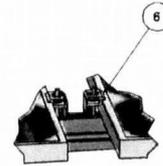
| | |
|--|---|
| SEE BOM 1915 E 5TH STREET, STE C, VANCOUVER, WA 98061 TEL: 206.461.1111 FAX: 206.461.1112 WWW.SUNMOD.COM | Sunmodo Corp. 1915 E 5TH STREET, STE C, VANCOUVER, WA 98061 TEL: 206.461.1111 FAX: 206.461.1112 WWW.SUNMOD.COM |
| PROJECT: 1 ROW ROOF CONFIGURATION SHEET: D SCALE: NONE SHEET 1 of 1 | |



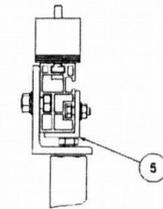
DETAIL A



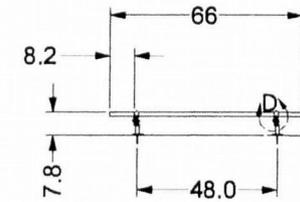
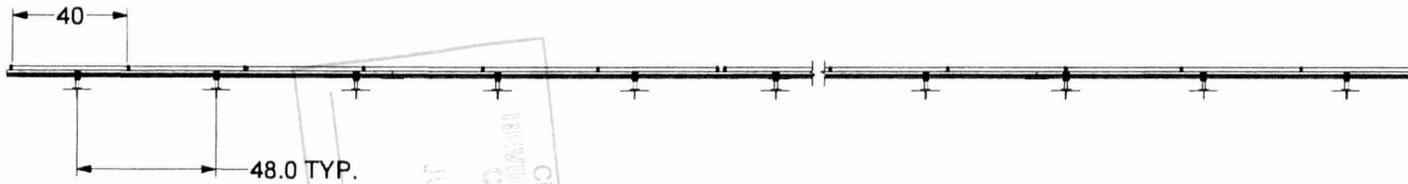
DETAIL B



DETAIL C



DETAIL D

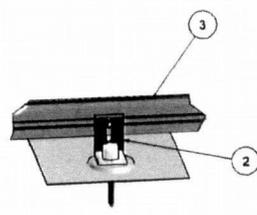
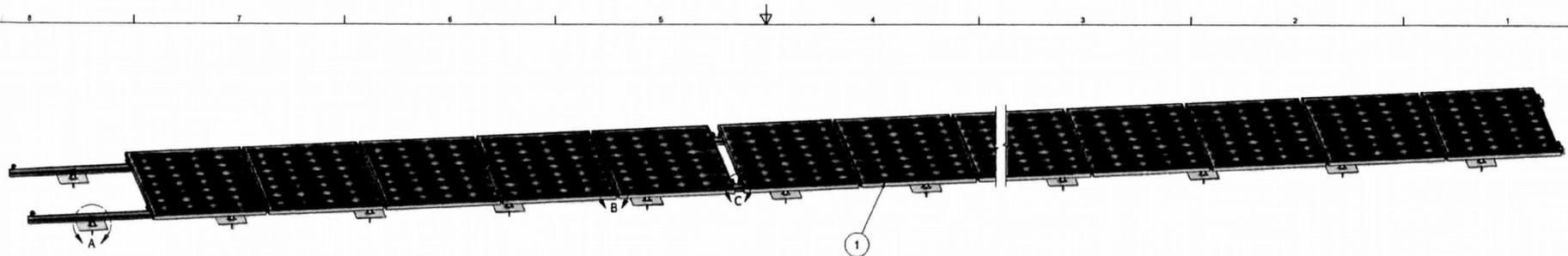


| ITEM | PART NUMBER | DESCRIPTION | QTY | | | | | | | | | | | | |
|------|-------------|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|--|--|--|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | |
| 1 | | SOLAR PANEL | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | |
| 2 | K10070-003 | EZ ROOF STANDOFF KIT | 8 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | 22 | | | |
| 3 | A20015-XXX | TOTAL AL RAILS LENGTH (INCH) | 340 | 424 | 508 | 598 | 682 | 766 | 850 | 934 | 1018 | 1108 | | | |
| 4 | K10001-001 | MID CLAMP KIT | 6 | 8 | 10 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | | | |
| 5 | K10037-001 | 1/4 AL RAIL SPLICE KIT | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | | | |
| 6 | K10002-0XX | END CLAMP KIT | 4 | 4 | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 12 | | | |
| 7 | K10066-001 | L FOOT KIT | 8 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | 22 | | | |

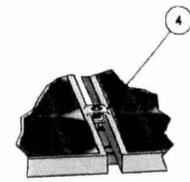
Permit Number
 JUL 11 2011
 CITY OF VANCOUVER
 INVILLIWA
 COMM

| | |
|--|--|
| SEE BCM DATE: 02/21/2011 LWF 02/21/2011 | Sunmodo Corp. 1015 E 5TH STREET, STE C, VANCOUVER, WA 98661 1 ROW ROOF CONFIGURATION D SCALE: NONE SHEET 1 of 1 |
|--|--|

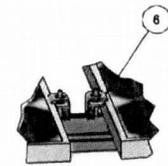
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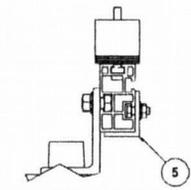
DETAIL A



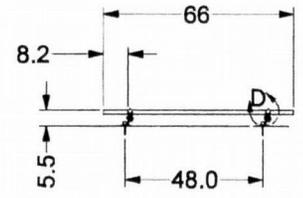
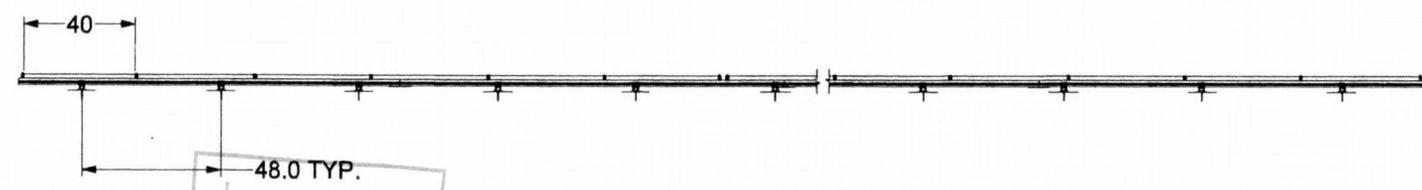
DETAIL B



DETAIL C



DETAIL D



| ITEM | PART NUMBER | DESCRIPTION | QTY | | | | | | | | | | |
|------|-------------|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|--|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| 1 | | SOLAR PANEL | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| 2 | K10068-001 | EZ ROOF MOUNT KIT | 8 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | 22 | |
| 3 | A20015-XXX | TOTAL AL RAILS LENGTH (INCH) | 340 | 424 | 508 | 598 | 682 | 766 | 850 | 934 | 1018 | 1108 | |
| 4 | K10001-001 | MID CLAMP KIT | 6 | 8 | 10 | 10 | 12 | 14 | 16 | 18 | 20 | 20 | |
| 5 | K10037-001 | 1/4 AL RAIL SPLICE KIT | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | |
| B | K10002-0XX | END CLAMP KIT | 4 | 4 | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 12 | |

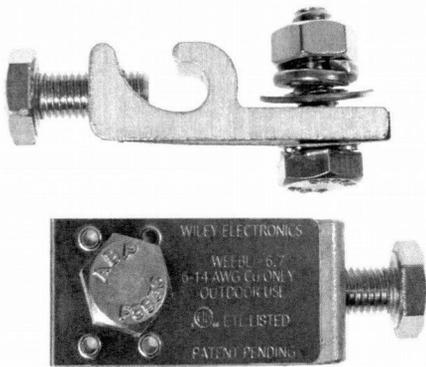
Permit Number
 JUL 10 2012
 REVIEWED FOR CODE COMPLIANCE
 City of Portland

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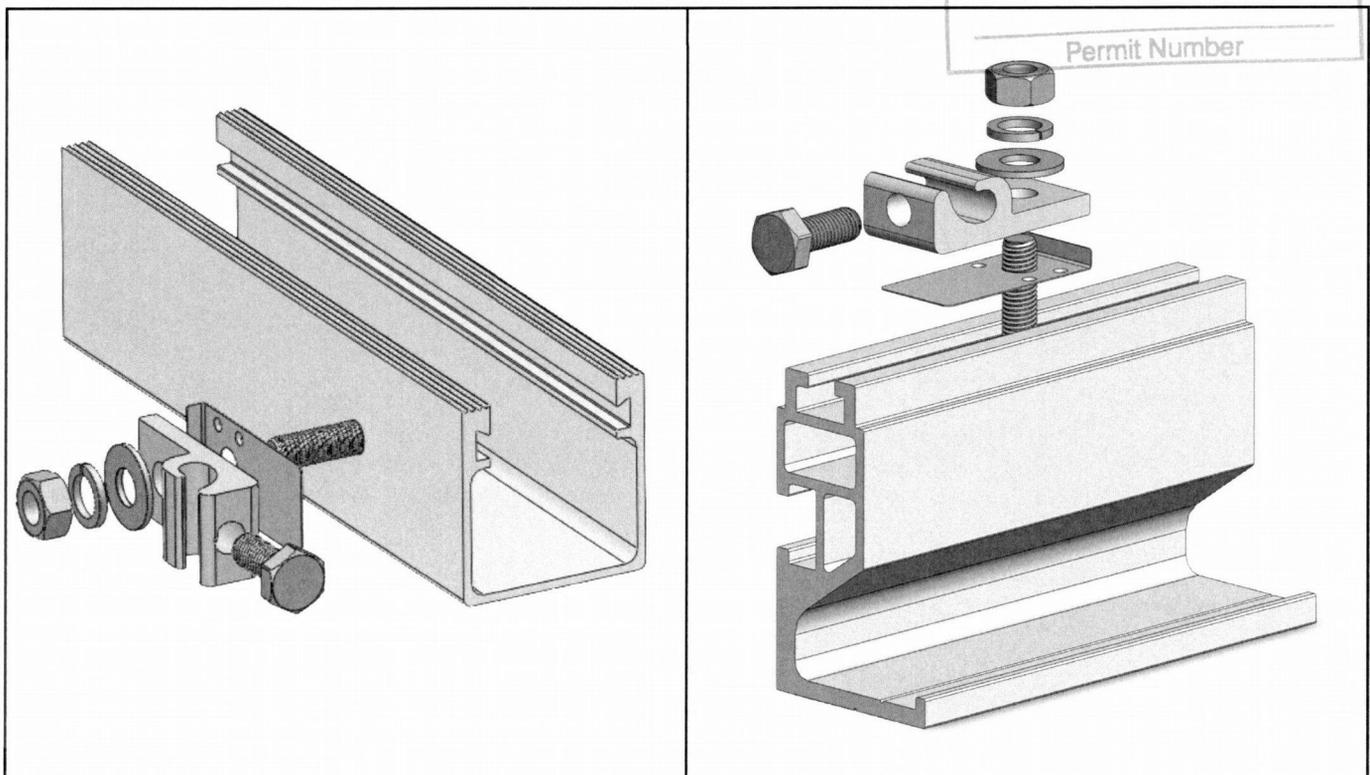
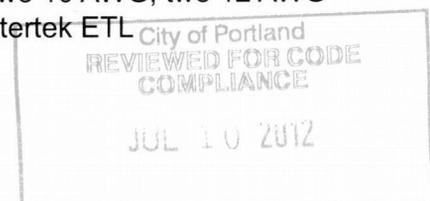
| | |
|---|---|
| SEE ECM PROJECT: 1815 E 5TH STREET, SITE C, VANCOUVER, WA 98061 DATE: 8/16/2011 SCALE: NONE SHEET: 1 of 1 | Sunmodo Corp. 1815 E 5TH STREET, SITE C, VANCOUVER, WA 98061 1 ROW ROOF CONFIGURATION D SCALE: NONE SHEET 1 of 1 |
|---|---|

WEEB Lug

The WEEB Lug consists of a WEEB (Washer, Electrical Equipment Bond), lay-in lug, and hardware. It is used with one solid or stranded copper wire (6AWG to 14AWG), or two copper wires (10AWG to 12AWG) to provide a continuous ground on roof or ground mounted solar systems. Unlike traditional lay-in lugs, the WEEB Lug does not require surface preparation on rail or module to install. The WEEB Lug is installed using a 1/4-20 stainless steel screw which tightens the WEEB, allowing the specialized teeth to embed into anodized aluminum, galvanized steel, or any electrically conductive metal to establish a gas tight electrical connection. The tin-plated Lug assures minimum contact resistance and protection against corrosion. The copper wire is clamped by a 1/4-28 stainless steel screw, which is horizontal to the tang for easy access when mounted under a PV module. The low profile of the WEEB Lug allows it to be installed in a variety of positions and comes with hardware to mount it to a rail or through a 1/4 inch clearance hole.

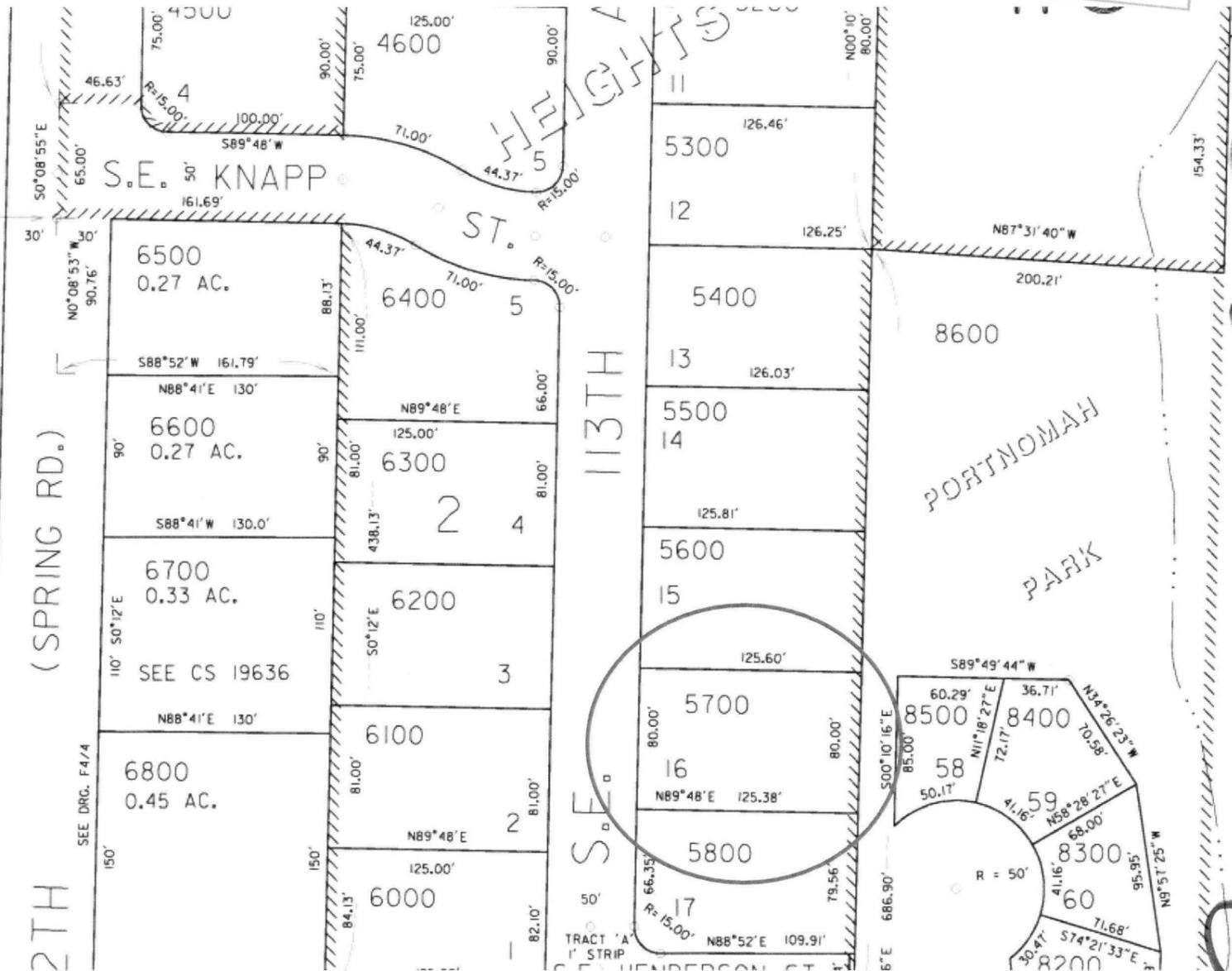
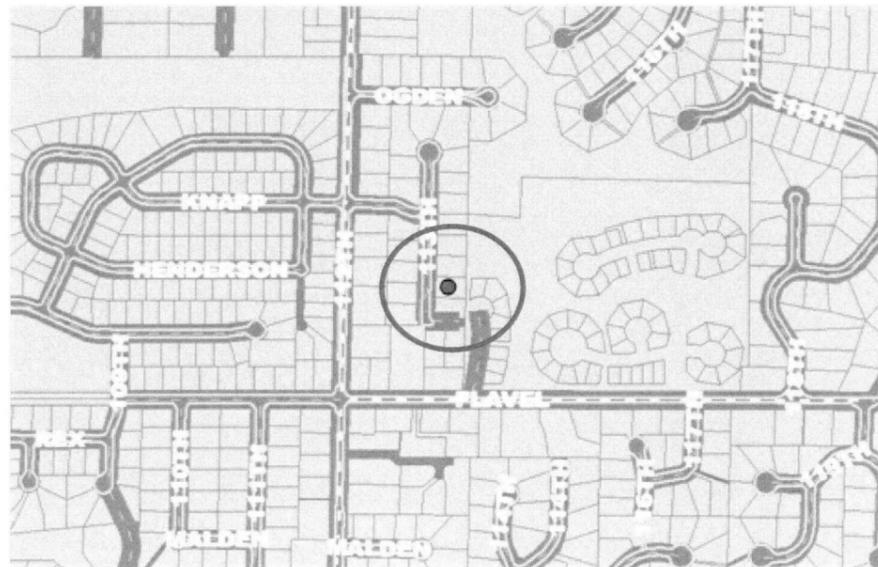
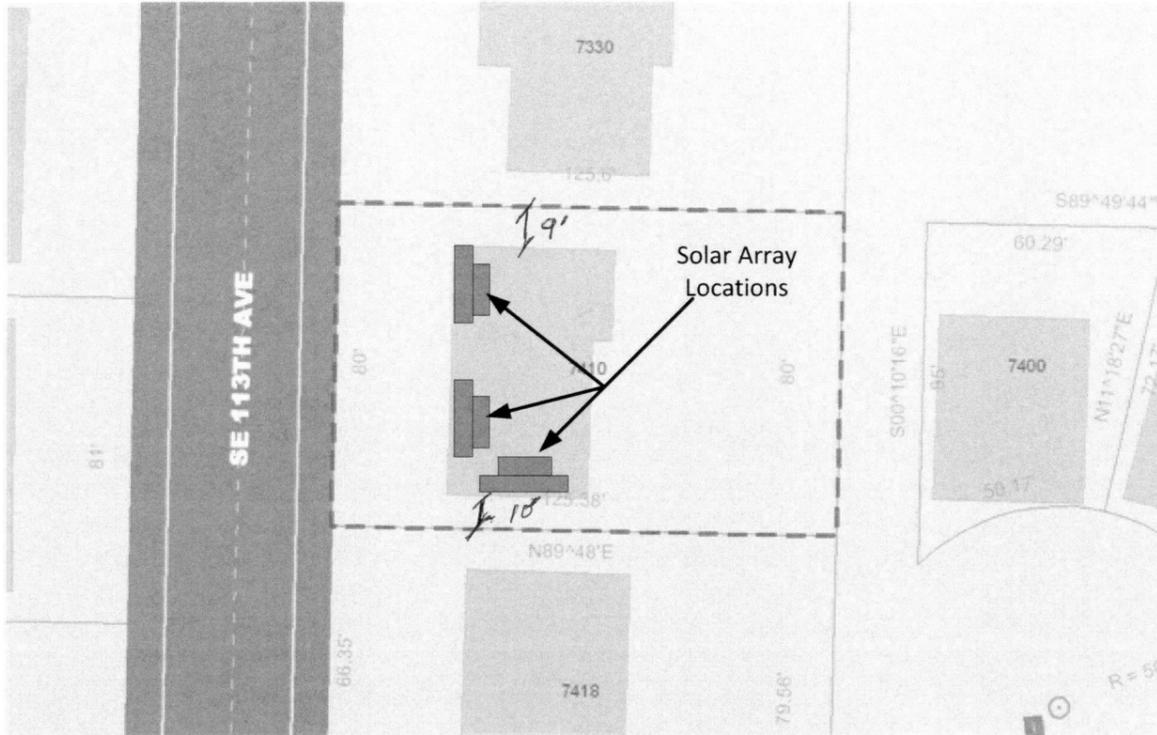


- Material: 304 stainless steel, tin-plated copper, outdoor rated
- Low profile design
- Multiple equipment ground conductor allowance:
One 14 AWG to 6 AWG or two 10 AWG, two 12 AWG
- Listed to ANSI/UL 467 by Intertek ETL



Meyers Residence

Site Map and Residence location



City of Portland
REVIEWED FOR CODE
COMPLIANCE
JUL 10 2012
Permit Number

12-159389-2
SEE (



| | | |
|--------------|---|--|
| Plot Map | Contractor: Premier Energy dba Solar Universe 556 Sommerset Road Woodland, WA 98674 (503) 806-4427 Contact: Steve Dow | Customer: Louis Meyers 7410 SE 113 th Ave. Portland, OR 97266 (503) 760-8075 |
| July 2, 2012 | | |

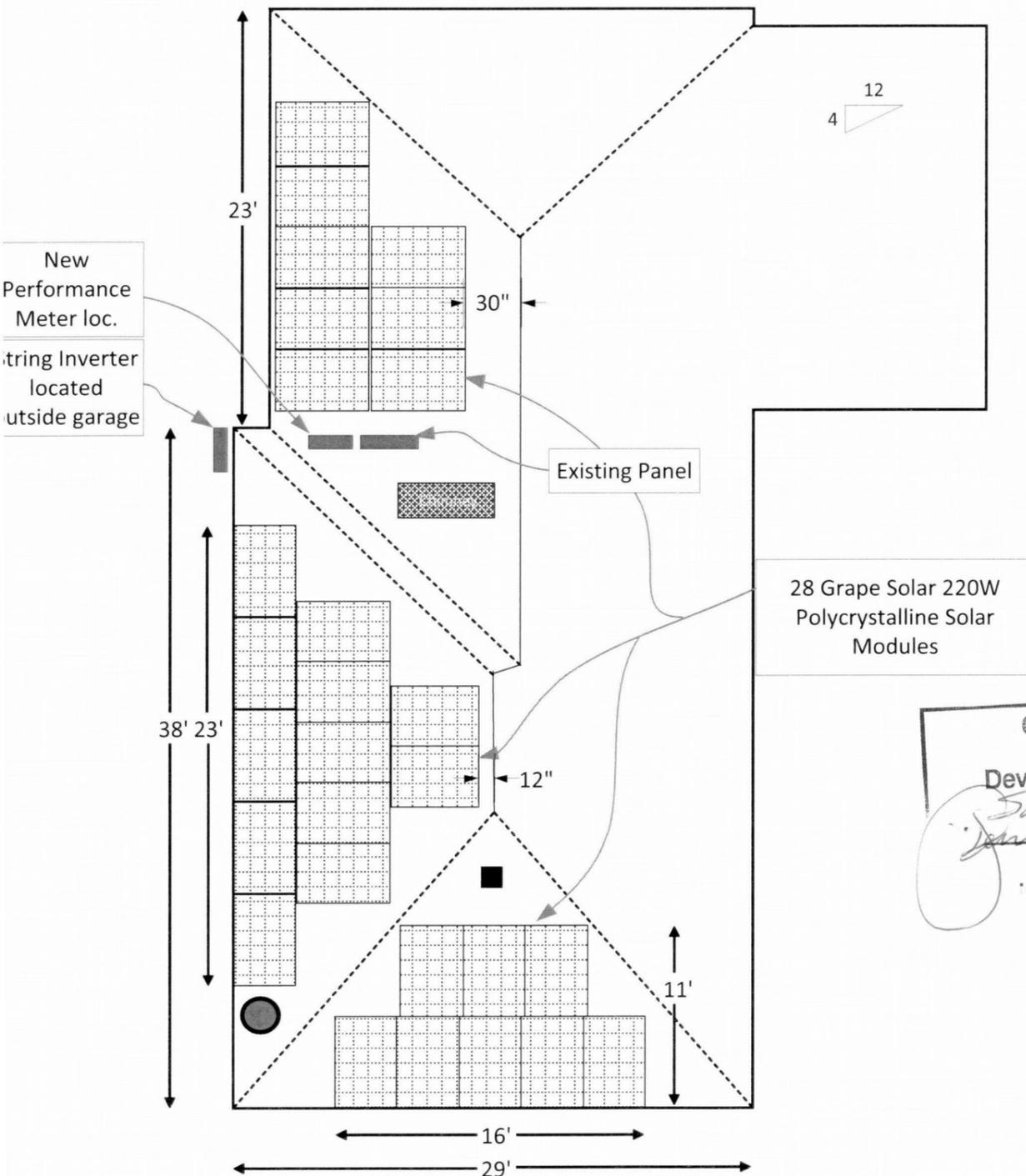


Meyers Residence

Roof Top Photovoltaic System Layout

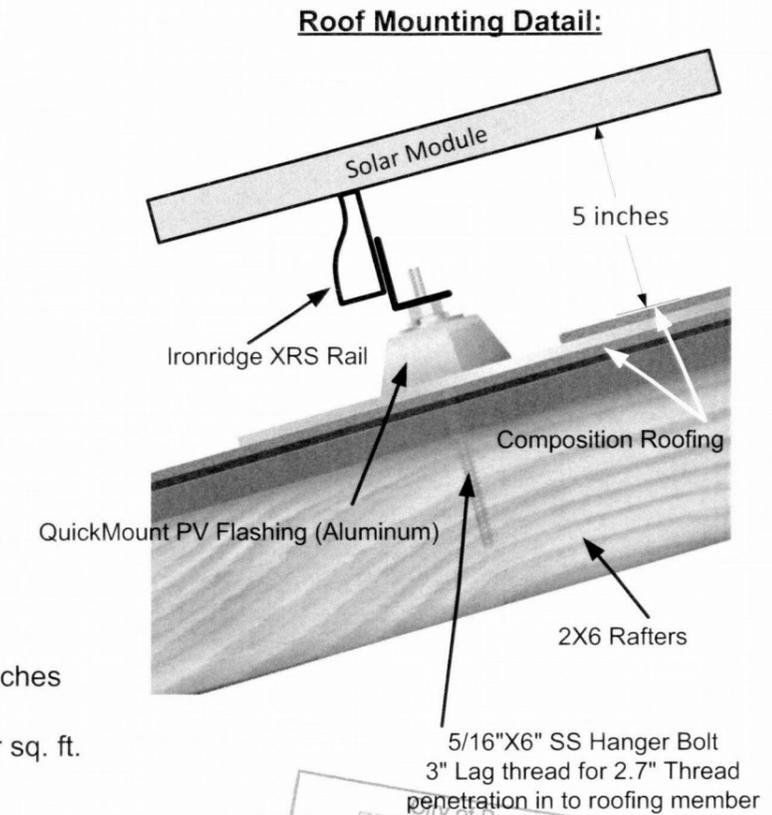
Legend:

- = Sun Eye Reading Location
- = Roof Vent



City of Portland
Bureau of
Development Services
Solar only
Date *7/10/2012*
Approved by
[Signature]
and Zoning Review

1905 sq. ft. = Main Floor Building Area
2019 sq. ft. = Roof Area
478 sq. ft. = Total array area
23.7% = Area of Total Roof that the array covers



Mounting Notes

1. Rafters: 2x6 @ 24" O.C. Max span: 8'10"
2. Roof penetrations: 48" O.C.
3. Composition Roofing
4. Panel height off roof < 18 inches
5. Weight of PV modules and assembly less than 4.5 lbs per sq. ft.
6. Azimuth: 180°, 270°
7. Module Tilt: 18°
8. String Inverter located out doors
9. WEEB Grounding Hardware
10. All installations comply with manufacturer's installation instructions
11. All horizontal ridges kept clear of PV components at least 1 ft. either side
12. PV array to cover less than 25% of total roof area
13. **Solar Code 305.4 #3.2:** Attachments shall be spaced no greater than 24" O.C. in any direction when located within 36" of a roof edge, hip, eave, or ridge.

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JUL 10 2012
Permit Number

| EQUIPMENT |
|--------------------------------------|
| (28) Grape Solar 220W Poly Modules |
| (1) PVI-6000-OUTD-US String Inverter |
| SunModo Racking system |
| SunModo PV Roof Flashings |

June 29, 2012
Louis Meyers
7410 SE 113th Ave.
Portland, OR 97266
(503) 760-8075

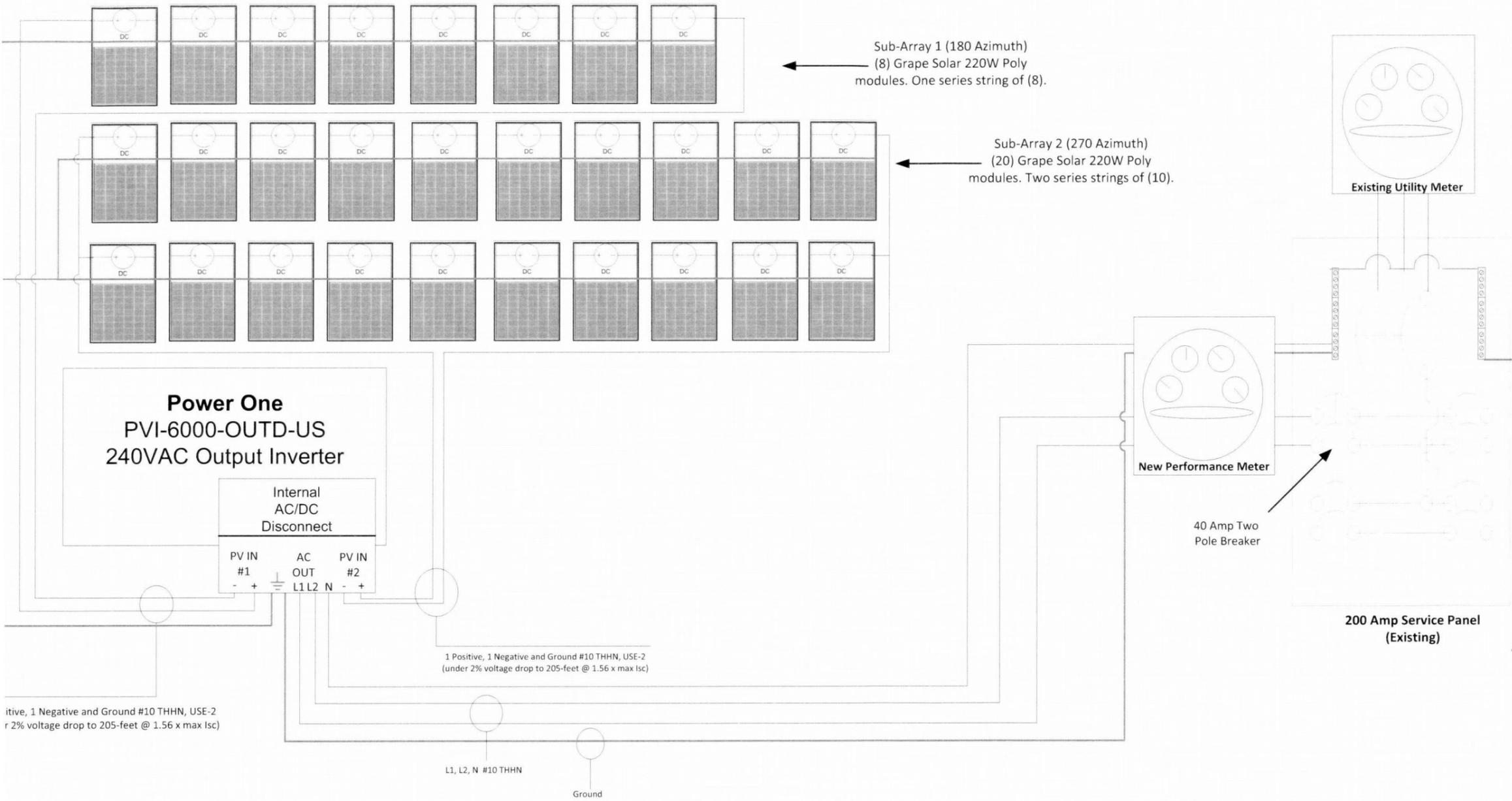


ELECTRICAL CONTRACTOR:
MJ Electrical, INC.
PO BOX 1673
Brush Prairie, WA 98606
OR CCB# 182623
Mike Lipe: (360) 608-5510

GENERAL CONTRACTOR:
Premier Energy dba. Solar Universe
556 Sommerset Road
Woodland, WA 98674
OR CCB# 195595
Dan Tracy: (503) 410-6884

Meyers Residence

Photovoltaic Installation Electrical Diagram
 Rated 6.16 kW under standard test conditions



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 JUL 10 2012
 Permit Number

#6 Bare CU Ground
 Bonding all rails together
 Via WEEB and Gnd Lugs.



Project Name:
 Meyers Residence

System Specifications:
 (28) Grape Solar 220W Poly Modules
 (28) Power One 6kW PVI-6000-OUTD-US String Inverter
 Modules grounded to racking system through WEEBS clips
 SunModo Rail & Mounting Hardware
 Aluminum SunModo Flashing with SS Hardware

Structure Info:
 2 x 6 Rafters on 24" Centers
 Sloped roof with Composition Roofing

Array Info:
 Total Array weight = 1335 lbs.

Module Specifications:
 Grape Solar 220W Polycrystalline
 Pmax: 220 Watts
 Vmp: 30.1 V
 Imp: 7.31 A
 Voc: 36.3 V
 Isc: 7.81 A
 Max Series Fuse: 15A
 Max System Voltage: 600V
 Dimensions: 64.9"x38.9"x1.6"
 Weight: 43.3 lbs.

Inverter Specifications:
 Power One PVI-6000-OUTD-US
 Compliance: UL-1741
 Max DC Input Voltage: 600VDC
 Max DC Input Current: 18 Amps
 Max DC Short Current: 22 Amps
 Max AC Output Power: 6000 Watts
 Nominal Output Current: 29 A
 Nominal Voltage Range: 240 VAC



Three Line Drawing
 June 29, 2012

Contractor:
 Premier Energy dba Solar Universe
 556 Sommerset Road
 Woodland, WA 98674
 (503) 410-6884
 Contact: Dan Tracy

Customer:
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 7410 SE 113th Ave.
 Portland, OR 97266
 (503) 760-8075