

August 8, 2011

Oregon Public Utilities Commission
550 Capitol Street NE #215
PO Box 2148
Salem, OR 97308-2148

Re: ***Request for Waiver of the 12-Month Installation Requirement Pursuant to OAR 860-084-0210(1)***

Dear Commission:

This is a request for waiver of the 12-month installation requirement pursuant to OAR 860-084-0210(1) for reasons relating to building construction roof defects at the place of the intended installation. For the reasons stated below, the City believes that a 3-month extension will allow the City to follow public contracting laws and to install the photovoltaic solar system; and that the waiver is in conformance with OAR 860-084-000(3), which allows waiver of any of the rules relating to Solar Photovoltaic Pilot Programs, for good cause.

In June 2009, the City commenced an extensive remodel of the Police Station located at 2501 Shasta Way, Klamath Falls, Oregon 97601. As part of this remodel, the City replaced the roof at the Police Station. Pursuant to state law, the City must spend about \$80,000 on photovoltaic solar system, which represents 1.5% of the original construction contract for remodeling the Police Department building.

Anticipating that the City would install a PC solar system on the building, the City worked with a third-party financing company and Oregon solar installer AES, to finance three different City locations. The third-party financing company sought to work with other public entities in Oregon, and to present the package of multiple solar facilities for investors to finance. Without the City's knowledge, AES submitted a Feed-In Tariff application for the City and the City was awarded an allocation of 72-kilowatts (see attached application). The City was thrilled to be awarded the allocation; however, after working with the third-party financier for over two years, the financing company was unable to secure financing in a timely and satisfactory manner for the City. Rather than financing three locations, the City decided to move forward only with the Police Station project because of the Feed-In Tariff allocation and reduce the project to the amount required by state law. The City recognizes that by reducing the project, it will utilize less than the 72 kilowatts awarded and the City willingly releases 57 kilowatts, which is the amount above the estimated system of 15 kilowatts.

During this past winter, the City discovered that there was moisture trapped in the remodeled roof membrane. In order to ensure that the photovoltaic solar system would not interfere with the

investigation and remedy of the roof and that the City would not have to reinstall any solar facility, the City chose to assess the roof before moving forward with the solar facility. After lengthy negotiations with the construction contractor, the City hired a consultant to determine the source, cause and remedy for the moisture in the roof. A copy of the consultant's memo is attached. As a result, the parties agreed to install temporary vents in the roof to dry out the trapped moisture during the summer. These vents conflict with the installation of solar panels because of the proposed solar panel design (see attached design). It is anticipated that the temporary vents will be removed and the roof will be patched in mid-August 2011. Final completion of the remodel is pending the results of the vents, which are expected to be successful.

As you are aware as a public entity, the City is required to follow Oregon public contracting law and needs significantly more lead time than a private industry to solicit and award contracts. For example, rather than an authorized manager awarding the contract, the City's Council, at a public meeting held only twice a month, must award contracts that exceed \$20,000. The City anticipates that it will be able to solicit and install the solar facility on the intended building of the Police Building by January 5, 2012.

On Monday August 8, 2011, the City will release a solicitation for construction of the PV Solar Facility and will be seeking quotes for the Police Station building. A copy of the solicitation is attached. We understand that since the roof will not be patched by the date of release of this solicitation, that the adjacent garage facility may not be acceptable as an alternative site for a solar facility, and that some of the equipment needed for the solar facility may need two months of lead time to order, it may not be possible to construct the solar facility before October 5, 2011.

From the inception of the remodel, the City has planned to install a solar facility and has made considerable progress in the design and engineering of the solar facility. This 3-month extension is requested only because of a factor outside the City's control, which required multiple agencies (architects, engineers, contractor, roofing subcontractor, roofing manufacturer, City project manager, and roofing consultant) to work together to diagnose and agree on a remedy, so that we may conclude our construction of the building before installing the solar facility.

Based on the reasons stated above, the City requests the waiver in conformance with OAR 860-084-000(3), that allows the Commission to grant a waiver of the 12-month installation requirement for good cause.

Thank you for your consideration and should you have any questions, please do not hesitate to contact us at 541-883-5323.

Sincerely,

/s/ Rick Whitlock
City Manager

/s/ Joanna Lyons-Antley
City Attorney

Oregon Solar Incentive Program
Interconnection Application
4 Pages

EXHIBIT A
APPLICATION FOR SOLAR INCENTIVE PROGRAM INTERCONNECTION
LEVEL 1, 2 OR 3 INTERCONNECTION APPLICATION
CAPACITY OF 100 KW OR LESS

Section 1: To Be Completed By Pacific Power

Customer-Generator Name: Klamath Falls City
 Level: 2 Pacific Power Request No: 5480718
 Application Received Date: _____
 Application fee: \$122.00 Date Paid _____

Section 2: To Be Completed By Applicant

A. Applicant Information
 Name: Rick Whitlock
 Pacific Power Customer Account No: 39623431-006
 Service Address: 2501 Shasta Way
 City: Klamath Falls State: OR Zip Code: 97601
 Mailing Address (if different from above): P.O. Box 237
 City: Klamath Falls State: OR Zip Code: 97601
 Daytime Phone: (541) 883-5323 Cell Phone: () _____
 Email: rwhitlock@ci.klamath-falls.or.us

B. System Information
 Generation Nameplate Capacity of Panels: 63 kW (Combine DC total)
 Inverter Manufacture: Enphase Model: M190-72 Number of Inverters: 252 Rating: .19 kW
 Manufacturer Nameplate Inverter Total Capacity Rating: 47.88 kW
 Inverter(s): Single Phase Three Phase Multiple Single Phase Connected on Poly-phase (three phase) system – (Attach Inverter and Panel Technical Specifications Sheets)
 Type of Service: Single Phase Three Phase
 If Three Phase Transformer, Indicate Type: Wye Delta
 Please note: A disconnect switch is not required for an inverter-based facility for services of 600 volts or less with a maximum rating as follows:
 Service Type—Maximum Facility Size (kW)
 240 Volts, Single-Phase, 3 Wire—7.2 kW
 120/208 Volts, 3-Phase, 4 Wire—10.5 kW
 120/240 Volts, 3-Phase 4 Wire—12.5 kW
 277/480, 3-Phase 4 Wire—25.0 kW
 Manual disconnect required: Yes No
 System location (show meter, production meter socket and disconnect switch in diagrams)
 One-Line Diagram Attached: Yes No Site Plan Attached: Yes No
 Installation Test Plan attached: Yes No
 Other Information: _____
 Anticipated Operational Date of Generation Facilities: 7/1/2011
 (Pacific Power must be notified at least five (5) business days prior to starting operation.)
 (A Pacific Power Engineer may contact you for additional information)

C. Application Fees

Application Fees must be paid with Application for Interconnection.

Interconnection Level Requested (select one only):

- Level 1 (25 kW or less in most cases – submitting Level 1 may be moved to Level 2)
- Level 2 (Not more than 100 kW – submitting Level 2 may be moved to Level 3)
- Level 3 (Not more than 100 kW)

Level 1: No Fee

Level 2:

\$	50.00	Base
+ \$	72.00	\$1.00 x 72 kW of DC generation capacity
\$	122.00	TOTAL APPLICATION FEE

Level 3:

\$	100.00	Base
+ \$	_____	\$2.00 x _____ kW of DC generation capacity
\$	_____	TOTAL APPLICATION FEE

Pursuant to the Rules, Applicant is responsible for costs of any studies or required system upgrades.

D. Production and Site Control

1. Annual System Production Estimate: 85,631 kWh

System applying for participation in the Oregon Solar Incentive Program must be sized to generate 90 percent or less than existing service's annual usage. If annual usage is unavailable, it will be estimated by Pacific Power based upon the rolling average of three years' usage by a similarly situated site. Annual kilowatt-hours (kWh) production estimate must use a forecasting methodology consistent with the methodologies used by the Energy Trust of Oregon. Information can be found at: <http://energytrust.org/shared-resources/solar-calculator/>.

2. Applicant has legal right (e.g. through ownership, lease, or irrevocable license) to maintain the Eligible System. Yes No

E. Additional Information

1. Systems must be installed by a qualified Energy Trust Trade Allies in good standing. A list of qualified Allies can be found at <http://energytrust.org/trade-ally/>.
2. An equipment package will be considered certified for interconnected operation if it has been submitted by a manufacturer to a nationally recognized testing and certification laboratory, and has been tested and listed by the laboratory for continuous interactive operation with an electric distribution system in compliance with the applicable IEEE and UL 1741 standards in the Rule.
3. If the equipment package has been tested and listed as an integrated package, which includes a generator or other electric source, the equipment package will be deemed certified, and Pacific Power will not require any further design review, testing or additional information.
4. If the equipment package includes only the interface components (switchgears, inverters, or other interface devices), an interconnection applicant must show that the generator or other electric source being utilized with the equipment package is compatible with the equipment package and consistent with the testing and listing specified for the package. If the generator or electric source being utilized with the equipment package is consistent with the testing and listing performed by the nationally recognized testing and certification laboratory, the equipment package will be deemed certified and Pacific Power will not require further design review, testing or additional equipment.
5. Customer-Generator must post signage indicating on-site generation in accordance with NEC 110.22 and 430.102. The signage must be permanent and located adjacent to the meter base, generation meters and disconnect switch noting "Parallel Generation on Site" and identifying the manual disconnect switch with the words "Manual Disconnect for Parallel Generation" and generation meters with "Generation Meter."


- The sign shall be metal or plastic engraved of sufficient durability to withstand the environment involved.
6. Pacific Power will not be responsible for the cost of determining the rating of equipment owned by the customer-generator or of equipment owned by other local customers.
 7. Customer-Generator may operate the eligible Facility temporarily for testing and obtaining inspection approval. Customer-Generator shall not operate the eligible Facility in continuous parallel without an executed Interconnection and Standard Contract, and approval from Pacific Power.
 8. Customer-generator will pay to Pacific Power at the time of application the applicable Application fee as set forth in 860-084-0280.
 9. An eligible facility must be equipped with metering equipment that can measure the flow of electricity in both directions, comply with ANSI C12.1 standards and OAR 860-023-0015. Pacific Power will install the required metering equipment at Pacific Power's expense.
 10. Production Meter Socket:
 - a. PacifiCorp requires the output of the solar panel inverter to be connected to the line side of the production meter socket. The load side of the meter base shall be connected to the panel.
 - b. Customer must provide and install a meter socket that is manufactured in accordance with ANSI-C12.7 and UL/ANSI-414 and appropriately rated for the output of the inverter. Refer to the company's WEB site at <http://www.pacificpower.net/con/esr/mse.html> for a list of approved meter bases.
 - c. Stainless steel meter enclosures are recommended for coastal areas and corrosive atmospheres. This will prevent early failure due to corrosion.

F. Customer-generator Acknowledgment

I certify that the information provided in this Application is true. I will provide Pacific Power a copy of the signed government electrical inspection approval document when obtained, if not already provided with this Application.

I agree to abide by the terms of this Application and I agree to notify Pacific Power thirty (30) days prior to modification or replacement of the System's components or design. Any such modification or replacement may require submission of a new Application to Pacific Power.

I agree not to operate the eligible Facility in parallel with Pacific Power, except temporarily for testing and obtaining inspection approval, until this Application is approved by Pacific Power, until this agreement is signed by both parties, and until I have provided Pacific Power with at least ten (10) days notice of anticipated start date.

Customer-Generator or Applicant:  Date: 12/3/10

Rick Whitlock, City Manager

Please send completed application to:

Pacific Power – Oregon Solar Incentive Program
 Attention: Travis Tanner
 825 NE Multnomah, Suite 800
 Portland, OR 97232

Section 3. To be completed by Installation Contractor

A. Installation Contractor Information/Hardware and Installation Compliance

Installation Contractor (Company Name): Advanced Energy Systems

Contractor's License No.: CCB# 160523 Proposed Installation Date: 6/1/2011

Mailing Address: 65 Centennial Loop

City: Eugene State: OR Zip Code: 97401

Daytime Phone: (541) 683-2345 Fax: (541) 683-2040 Email: jonathan@aesrenew.com

System, the proposed System hardware is in compliance with *Underwriters Laboratories (UL) 1741, Standard for Static Inverters and Charge Controllers for Use in Photovoltaic Systems; UL 1703, Standard for Safety: Flat-Plate Photovoltaic Modules and Panels; and IEEE 1262-1995, IEEE Recommended Practice for Qualification of Photovoltaic (PV) Modules.*

System must be installed in compliance with IEEE Standards, Recommended Practice for Utility Interface of Photovoltaic Systems. All System types must be installed in compliance with applicable requirements of

local electrical codes, Pacific Power and the National Electrical Code® (NEC) and must use a non-islanding inverter.

The System must include a manual, lockable, load-break (disconnect) switch, unless exempt under OAR 860-084-0340, accessible at all times to Pacific Power personnel and located within 10 feet of Pacific Power's meter. The disconnect switch may be located more than 10 feet from Pacific Power's meter if permanent instructions are posted at the meter indicating the precise location of the disconnect switch. Pacific Power must approve the location of the disconnect switch prior to the installation of the eligible facility.

The System must be measured by a meter that is capable of measuring the capacity of the eligible system only. The meter will be accessible to Pacific Power at all times. The meter that measures the production will be limited to only the production of the System installed under the requirements of 860-084-0100.

If the eligible Facility is designed to provide uninterruptible power to critical loads, either through energy storage, back-up generator, or the generation source, the eligible Facility will include a parallel blocking scheme for this backup source. This function may be integral to the inverter manufacturer's packaged system.

Does the eligible Facility include a parallel blocking scheme: Yes No

Signed (Contractor): _____ Date: _____

Name (Print): Eric Nill

Section 4. To be completed by Pacific Power:

A. If approving the application:

Pacific Power does not, by approval of this Application, assume any responsibility or liability for damage to property or physical injury to persons. Further, this Application does not constitute a dedication of the owner's System to Pacific Power electrical system equipment or facilities.

Customer-Generator entered into an Interconnection and eligible Service Agreement with Pacific Power on the ____ day of _____, 20__.

Customer-Generator satisfactorily passed Commissioning Tests on the ____ day of _____, 20__.

(Pacific Power may waive Commissioning Tests at its option; if tests are waived initial here ____)

This Application is approved by Pacific Power on this ____ day of _____, 20__

Signed (Pacific Power Representative): _____ Date: _____

B. If denying the application:

This application is denied by Pacific Power on this ____ day of _____, 20__ for the following reason(s): _____

Signed (Pacific Power Representative): _____ Date: _____

Section 5. To be completed by Pacific Power Meterman

Served from Facility Point No.: _____

New Net Meter No.: _____ Date net meter installed: _____

Production Meter No.: _____ Date Production meter installed: _____

Manual disconnect device in proper location (if required) and permanent signage in place: Yes No

Signature/Title: _____ Date: _____

Oregon Solar Incentive Program
Standard Contract
21 Pages

**VOLUMETRIC INCENTIVE PAYMENT AND INTERCONNECTION AGREEMENT
(Net Metering Option)**

BETWEEN

Klamath Falls City
[a new solar photovoltaic system with 100 kW Nameplate Capacity, or Less]

AND

PACIFIC POWER

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Exhibit A Application for Solar Incentive Program Interconnection

Exhibit B Participant’s Volumetric Incentive Rate

Interconnection Appendix

This Agreement shall be used for all approved Net Metering Applications for Interconnection according to the procedures and requirements set forth in Commission Rules, Oregon Administrative Rules (“OAR”) Chapter 860, Division 84 (Solar Photovoltaic Pilot Program Rules).

VOLUMETRIC INCENTIVE PAYMENT AND INTERCONNECTION AGREEMENT

THIS VOLUMETRIC INCENTIVE PAYMENT AND INTERCONNECTION AGREEMENT (“**Agreement**”) is between Klamath Falls City, "**Participant**" and **PacifiCorp** (d/b/a Pacific Power), an Oregon corporation acting in its regulated utility capacity, "**Pacific Power**." (Participant and Pacific Power are referred to individually as a "**Party**" or collectively as the "**Parties**").

RECITALS

A. Participant intends to construct, own, operate and maintain a solar photovoltaic energy system that is an eligible system under Oregon Administrative Rule (“**OAR**”) 860-084-120. Participant is a retail electric customer of Pacific Power and participant’s system will be permanently installed at 425 Walnut Ave Klamath Falls, Or [Street address, City, County, State] with a Nameplate Capacity of 72 -kilowatts (kW) as further described in Participant’s Application for Solar Incentive Program Interconnection, attached hereto as **Exhibit A** (“**Eligible System**”).

B. Participant intends to net meter the energy generated by its Eligible System under the Commission’s Solar Photovoltaic Pilot Program.

C. Participant’s Eligible System requires a Level 2 Interconnection Review, as that term is used in OAR 860, Division 84.

D. This Agreement provides the terms and conditions whereby Pacific Power interconnects Participant’s Eligible System to Pacific Power’s system and compensates Participant for Payable Generation generated by its Eligible System.

E. Participant’s reservation start date is October 6, 2010 (“**Reservation Start Date**”).

F. Participant estimates that the average annual energy to be delivered by the Eligible System to Pacific Power is 85,631 kilowatt-hours (kWh), which amount of energy Pacific Power will include in its resource planning.

AGREEMENT

NOW, THEREFORE, the Parties mutually agree as follows:

SECTION 1: DEFINITIONS

When used in this Agreement, the following terms shall have the following meanings:

1.1 “**Accumulated Excess Generation**” means sum of uncompensated Excess Generation for each month of a Generation Year-to-date.

1.2 “**Application for Solar Incentive Program Interconnection**” means the application form filled out by Participant (Attached hereto as **Exhibit A**) and used by Pacific Power to determine Participant’s requirements for interconnection.

1.3 “**Billing Period**” means the time period between Pacific Power’s consecutive readings of Participant’s meter(s) in the normal course of Pacific Power’s business. Such periods typically range between twenty-seven (27) and thirty-four (34) days and coincide approximately, but not exactly, with calendar months. Participant’s generation and consumption shall be accounted for in identical Billing Periods. Any reference herein to a “monthly charge” or “monthly period” shall be interpreted to mean a charge or rate applicable during the Billing Period most closely approximating that calendar month.

1.4 “**Commission**” means the Public Utility Commission of Oregon.

1.5 “**Effective Date**” shall have the meaning set forth in Section 2.1.

1.6 “**Eligible Generation**” means the actual Eligible System generation, net of System Requirements and losses, if any, to Pacific Power’s generation meter(s).

1.7 “**Eligible System**” shall have the meaning set forth in Recital A.

1.8 “**Excess Generation**” (kWh) means that increment of Eligible Generation generated in excess of Participant’s retail electricity consumption on a monthly (Billing Period) basis.

1.9 “**Expiration Date**” shall have the meaning set forth in Section 2.3.

1.10 “**Generation Year**” unless otherwise specified, means a twelve-month period beginning at 12:00:01 a.m. prevailing Pacific Time on April 1 and terminating at midnight on March 31 of the following calendar year, except that the first Generation Year shall commence at 12:00:01 a.m. on the Effective Date and the last Generation Year shall end at midnight on the Expiration Date.

1.11 “**Interconnection Appendix**” means the attached appendix to this Agreement, providing for the construction, modification, testing, operation, and maintenance of

Interconnection Facilities required to accommodate generation from Participant's Eligible System.

1.12 "**Interconnection Facilities**" means facilities and equipment installed or modified in order to accommodate the interconnection of the Eligible System.

1.13 "**Nameplate Capacity**" means the maximum rated direct current output of a solar photovoltaic system, measured at an irradiance level of 1000W/m², with reference air mass 1.5 solar spectral irradiance distribution and cell or module junction temperature of 25°C.

1.14 "**Operation Date**" means the date that the Eligible System is deemed by Pacific Power to be fully operational and reliable, and authorized for operation in parallel with Pacific Power's distribution system in accordance with Article 3 of the Interconnection Appendix.

1.15 "**Participant's Retail Rate**" (\$/kWh) means the sum of the Distribution Energy Charge and the Transmission & Ancillary Services Charge in the Pacific Power service schedule under which Participant takes retail electric service.

1.16 "**Payable Generation**" means Eligible Generation (kWh) during a Billing Period plus Accumulated Excess Generation (if any), up to Participant's actual Billing Period usage.

1.17 "**Point of Interconnection**" means the point of common coupling between Participant's Eligible System and Pacific Power's distribution system.

1.18 "**Qualifying Assignee**" means a person to whom Participant may assign Volumetric Incentive Rate payments. Pacific Power or its affiliate or any other regulated utility is not a Qualifying Assignee. Qualifying Assignees include, but are not limited to:

- (a) A lender providing up front financing to Participant;
- (b) A company or individual who enters into a financial agreement with Participant to own and operate the Eligible System on behalf of Participant in return for compensation;
- (c) A company or individual who contracts with Participant to locate the Eligible System on property owned by Participant; or
- (d) Any entity identified by Participant to receive payments that Pacific Power is obligated to pay to Participant.

1.19 "**Renewable Energy Certificates**" is defined in Section 6.

1.20 "**Reservation Start Date**" means the date consumer secured an entitlement to capacity under Pacific Power's Solar Photovoltaic Pilot Program as set forth in Recital E.

1.21 "**Solar Photovoltaic Pilot Program**" or "**Pilot Program**" means the Commission's implementation of ORS 757.365 (2009)(as amended by House Bill 3690(2010)) via the Solar Photovoltaic Pilot Program Rules, including any subsequent revisions thereto.

1.22 “Solar Photovoltaic Pilot Program Rules”, or “Rules”, means Oregon Administrative Rules (“OAR”) Chapter 860, Division 84 and related Commission orders interpreting or augmenting those Rules.

1.23 “Volumetric Incentive Rate” means the incentive price paid by Pacific Power for Eligible Generation set forth in Exhibit B.

Capitalized terms not defined herein shall have the meaning set forth in the Solar Photovoltaic Pilot Program Rules.

SECTION 2: TERM; EFFECTIVE DATE

2.1 This Agreement shall become effective on the latest date of execution by either Party, below (“Effective Date”).

2.2 This Agreement shall terminate automatically if the Eligible System has not been installed within twelve months of the Reservation Start Date, unless the Commission waives termination for good cause shown.

2.3 Except as otherwise provided herein, this Agreement shall expire at midnight exactly fifteen (15) years after the Operation Date (“Expiration Date”).

SECTION 3: CERTIFICATIONS AND WARRANTIES

Participant certifies and warrants to Pacific Power that:

3.1 The information set forth in Exhibit A (Participant’s Application for Solar Incentive Program Interconnection) is accurate, to the best of Participant’s knowledge.

3.2 Participant’s Eligible System is and shall for the term of this Agreement continue to be an Eligible System under OAR 860-084-120.

3.3 The Eligible System will not benefit from expenditures under ORS 757.612 (3)(b)(B) or tax credits under ORS 469.160 or ORS 469.185 to 469.225.

3.4 The Eligible System is a new system, made with all new components, installed after the Reservation Start Date.

3.5 The Eligible System complies with siting, design, interconnection, installation, and electric output standards and codes required by the laws of Oregon.

3.6 Participant has not and will not compete for a power purchase agreement for its Eligible System under the Commission’s Solar Capacity Standard, as described in OAR 860-084-0020 through OAR 860-084-0080.

3.7 The Eligible System meets quality, reliability, and system installation requirements established by the Commission. (See OAR 860-084-0240(2)(e)(B); OAR 860-084-0120).

3.8 Participant (or any subsequent owner of the Eligible System) will remain a retail electricity customer of Pacific Power during this Agreement.

3.9 The Eligible System complies with the size requirements of OAR 860-084-0100(2)(e).

3.10 The Eligible System will be installed on the same property where Participant buys electricity from Pacific Power.

3.11 Participant possesses the legal right (e.g. through ownership, lease, or irrevocable license) to maintain its Eligible Facility at the site described in Exhibit A for the term of this Agreement and, if requested by Pacific Power, will provide documentation of such right at any time.

3.12 Participant will notify Pacific Power within 30 days of any changes to the Eligible System.

SECTION 4: OBLIGATIONS OF THE PARTIES

4.1 Participant is participating in the Net Metering Option as provided for under the Commission's Solar Photovoltaic Pilot Program Rules, as may be amended from time to time. The Parties' performance of this Agreement is subject to the requirements set forth therein. Performance of this Agreement shall also be subject to the requirements of Pacific Power's Schedule 136 Tariff and other applicable Pacific Power tariffs, as may be amended from time to time. In the event that the provisions of this Agreement conflict with the Solar Photovoltaic Pilot Program Rules or any Pacific Power tariff, the Commission's rules and Pacific Power's tariffs shall take precedence in that order.

4.2 Payable Generation. Commencing on the Operation Date, unless otherwise provided herein, Participant will sell and Pacific Power will purchase all Payable Generation from the Eligible System. Participant shall not sell any generation from the Eligible System to any party except Pacific Power during this Agreement.

4.3 Accumulated Excess Generation. At the end of each Generation Year, Participant shall forfeit Accumulated Excess Generation, if any, and Pacific Power shall make a corresponding donation to Pacific Power's low-income assistance program at the applicable average annual avoided cost tariff rate in Pacific Power's Schedule 37 Tariff. Pacific Power may retain for its benefit any Renewable Energy Certificates associated with Accumulated Excess Generation.

4.4 Participant remains responsible for Commission-authorized minimum monthly charges and all other non-volumetric tariff charges (including the meter fee in Section 10), which Pacific Power will assess in Participant's retail monthly bill.

SECTION 5: VOLUMETRIC INCENTIVE RATES

Pacific Power shall pay Participant the difference between Participant's Volumetric Incentive Rate (as set forth in Pacific Power's Schedule 136 Tariff) and Participant's Retail Rate (\$/kWh) for all Payable Generation. The resulting rate is provided in Exhibit B.

SECTION 6: RENEWABLE ENERGY CERTIFICATES

Pacific Power shall own all the Renewable Energy Certificates ("RECs") associated with the Eligible System; Participant shall reasonably cooperate as needed to help Pacific Power perfect its ownership thereof. RECs means all right, title and interest in and to Environmental Attributes, plus the REC Reporting Rights. "Environmental Attributes" means any and all credits, benefits, claims, emissions reductions, environmental air quality credits, and emissions reduction credits, offsets, and allowances, howsoever entitled, resulting from the avoidance of the emission of any gas, chemical, or other substance attributable to the generation of the Payable Generation by the Eligible System and the delivery of the Payable Generation to Pacific Power's meter, and include without limitation any of the same arising out of legislation or regulation concerned with oxides of nitrogen, sulfur, or carbon, with particulate matter, soot, or mercury, or implementing the United Nations Framework Convention on Climate Change (the "UNFCCC") or the Kyoto Protocol to the UNFCCC or crediting "early action" with a view thereto, or laws or regulations involving or administered by the Clean Air Markets Division of the Environmental Protection Agency or successor administrator (collectively with any state or federal entity given jurisdiction over a program involving transferability of Environmental Attributes, the "CAMD"), but specifically excluding only (i) the wind production tax credits, if any, and (ii) matters designated by Pacific Power as sources of liability or adverse wildlife or environmental impacts. "REC Reporting Rights" means the right to report to any agency, authority or other party, including without limitation under Section 1605(b) of the Energy Policy Act of 1992, or under any present or future domestic, international or foreign emissions trading program, exclusive ownership of the Environmental Attributes. One REC represents the Environmental Attributes attributable to the generation of 1 MWh of Payable Generation by the Eligible System and the delivery thereof to the electricity grid.

SECTION 7: INTERCONNECTION

7.1 Prior to interconnecting its Eligible System, Participant shall obtain Pacific Power's approval in accordance with the requirements of Article 3 of the Interconnection Appendix. Participant will abide by all requirements for construction, testing, operation and maintenance set forth in the Solar Photovoltaic Pilot Program Rules and all applicable Pacific Power tariffs.

7.2 Interconnection Appendix. The Parties shall perform all obligations set forth in the Interconnection Appendix.

7.3 Allocation of costs. Participant shall be responsible for all costs, including overheads, associated with procuring, installing, owning, operating, maintaining, repairing, and replacing its Eligible System (including any disconnect switch required by OAR 860-084-

340(3)), any associated equipment package, and any associated Interconnection Facilities or modifications described in the Interconnection Appendix.

7.4 Access. As provided in the Solar Photovoltaic Pilot Program Rules, Participant shall provide Pacific Power access to any required disconnect switch at the Eligible System at all times and for inspection when otherwise permitted. Pacific Power will provide reasonable notice to Participant when possible prior to using its right of access. Additionally, as provided in Pacific Power & Light Company Oregon Rule 6, or its successor tariff, Participant shall permit Pacific Power access to the metering equipment.

SECTION 8: TEMPORARY DISCONNECTION

8.1 Pacific Power or Participant may temporarily disconnect the Eligible System from Pacific Power's system for so long as reasonably necessary in the event one or more of the following conditions or events occurs:

- 8.1.1 Emergency conditions. Pacific Power or Participant may immediately and temporarily disconnect the Eligible System in an emergency. Pacific Power shall notify Participant promptly when Pacific Power becomes aware of an emergency condition that may reasonably be expected to affect operation of the Eligible System. Participant shall notify Pacific Power promptly when it becomes aware of an emergency condition that may reasonably be expected to affect Pacific Power's system. To the extent the information is known, the notification shall describe the emergency condition, the extent of any damage or deficiency, the expected effect on the operation of each Party's facilities and operations, the anticipated duration, and the necessary corrective action.
- 8.1.2 Scheduled maintenance, repair or construction. Pacific Power or the Participant may disconnect the Eligible System during maintenance of the Eligible System or Pacific Power's distribution system. Parties will make reasonable efforts to provide two (2) business days notice to the other Party prior to such interruption and shall use reasonable efforts to coordinate such interruption.
- 8.1.3 Likelihood of harm to other customers. Pacific Power may disconnect the Eligible Facility if it will likely cause disruption or deterioration of service to other customers, or if operating the Eligible System could cause damage to Pacific Power's electric distribution system. In such event, Pacific Power shall provide the Participant supporting documentation used to reach the decision to disconnect the Eligible Facility upon the Participant's request.
- 8.1.4 Unauthorized modifications. Pacific Power may disconnect the Eligible Facility if the Participant makes any change to the Eligible System, other

than minor equipment modifications, without prior written authorization of Pacific Power.

8.1.5 Nonconformance with this Agreement. Pacific Power may disconnect the Eligible System if it determines that the Eligible System is noncompliant with this Agreement, the Rules or its tariffs.

8.2 If the Eligible System must be physically disconnected for any reason, Pacific Power may do so by disconnecting all service to the Participant or all service to the premises where the Eligible System is located, or both.

8.3 The Parties shall cooperate with each other to restore the Eligible System, Interconnection Facilities, and Pacific Power's system to their normal operating state as soon as reasonably practicable following any disconnection pursuant to this Section 8.

SECTION 9: PARTICIPANT'S ADDITIONAL COOPERATION

9.1 Agreement to Release Information. Participant hereby agrees to allow Pacific Power to release information concerning its participation in the Solar Photovoltaic Pilot Program, including the names of all participants in the Pilot Program, to the Oregon Department of Revenue, the Oregon Department of Energy, the Commission and the Energy Trust of Oregon ("ETO"). Pacific Power shall use reasonable efforts to pursue appropriate confidentiality terms with the above agencies and organizations. As required by OAR 860-084-0240 (2)(f), Pacific Power shall provide Participant with documentation of the confidentiality requirements that those receiving the information must follow.

9.2 Agreement to Participate in Surveys. Participant hereby agrees to complete up to three surveys on the effectiveness of the Pilot Program in order to remain eligible for participation in the Pilot Program. Information to be provided may include, but is not limited to: understanding the various factors contributing to participation in the Pilot Program; understanding decision processes used to choose between the volumetric incentive rate solar program and the existing net-metering solar program; and satisfaction with and recommendations for improving the Pilot Program processes. Participant agrees that Pacific Power may release information concerning Participant obtained from the surveys to the Commission, Oregon Department of Revenue, Oregon Department of Energy, and the ETO.

SECTION 10: METERING

10.1 Subject to Section 10.4, Pacific Power shall install, own and maintain, at its sole expense, a kilowatt-hour meter(s) and associated equipment to measure the flow of energy in each direction, in accordance with OAR 860-084-0280. Participant shall provide, at its sole expense, adequate facilities, including, but not limited to, a current transformer enclosure (if required), meter socket(s) and junction box, for the installation of the meter and associated equipment. Participant hereby consents to the installation and operation by Pacific Power, of one or more additional meters to monitor the flow of electricity in each direction. Such meters shall be located on the premises of Participant.

10.2 Metering shall be performed at the location and in a manner consistent with this Agreement.

10.3 Pacific Power may periodically inspect, test, repair and replace its metering equipment. If any of the inspections or tests discloses an error exceeding two percent (2%), either fast or slow, proper correction, based upon the inaccuracy found, shall be made of previous readings for the actual period during which the metering equipment rendered inaccurate measurements if that period can be ascertained. If the actual period cannot be ascertained, the proper correction shall be made to the measurements taken during the time the metering equipment was in service since last tested, but not exceeding three (3) billing periods, in the amount the metering equipment shall have been shown to be in error by such test. Any correction in billings or payments resulting from a correction in the meter records shall be made in the next monthly billing or payment rendered following the repair of the meter.

10.4 Monthly Meter Fee. In accordance with Commission Order No. 10-198, Participant shall pay a \$10 monthly meter fee, for each additional meter required, for the term of this Agreement. The monthly meter fee shall be included in Participant's monthly retail service bill.

SECTION 11: BILLINGS, COMPUTATIONS, AND PAYMENTS

11.1 On or before the forty-fifth (45th) day following the end of each month, Pacific Power shall send to Participant payment for Participant's deliveries of Payable Generation to Pacific Power, together with computations supporting such payment. Participant elects the following method of payment:

- Payments will be paid directly to the Participant; the Participant will continue to receive a standard monthly utility bill for electricity purchased under the applicable rate schedule [default option if none selected]; or
- Payments will be netted with the Participant's monthly utility bill for electricity purchased under the Participant's applicable schedule.

Pacific Power may deduct from any such payment, above, amounts owing and delinquent more than 45 days on Participant's monthly utility bill or owing under this Agreement.

11.2 Corrections. Pacific Power shall have up to eighteen months to adjust any payment made pursuant to Section 11.1. In the event Pacific Power determines it has overpaid Participant (for Excess Output or otherwise), Pacific Power may adjust Participant's future payment accordingly in order to recapture any overpayment in a reasonable time.

SECTION 12: PARTICIPANT'S DEPOSIT

Participant paid Pacific Power \$1440.00 at the time it submitted its Solar Photovoltaic Pilot Program Capacity Reservation Application ("Reservation Fee"). Pacific Power shall refund the Reservation Fee by mailing Participant a check with Participant's first incentive

payment or incentive payment statement. In the event Participant does not achieve operation in substantial compliance with this Agreement, Participant shall be deemed to have forfeited its Reservation Fee. Pacific Power will notify Participant in writing when it has deemed the Reservation Fee forfeited.

SECTION 13: DEFAULTS AND REMEDIES

13.1 Events of Default. The following events shall constitute defaults under this Agreement:

13.1.1 Breach of Material Term. Failure of a Party to perform any material obligation imposed upon that Party by this Agreement or breach by a Party of a representation or warranty set forth in this Agreement.

13.1.2 Non-delivery. Participant's failure to deliver Payable Generation for any 12-month period.

13.1.3 Insolvency. A Party files a petition or otherwise commences, authorizes or acquiesces in the commencement of a proceeding or cause of action under any bankruptcy or similar law for the protection of creditors, or has such a petition filed against it and such petition is not withdrawn or dismissed within sixty (60) days after such filing.

13.1.4 Participant is found by the Commission to have made a false certification hereunder.

13.2 Notice; Opportunity to Cure. For a default under Section 13.1.1, a defaulting Party shall have sixty (60) days to cure after receipt of written notice from the non-defaulting Party. If the default is not capable of cure within the 60-day period, the defaulting Party must begin to cure the default within twenty (20) calendar days after receipt of the written default notice, and must continuously and diligently complete the cure within six (6) months of the receipt of the notice.

13.3 Termination. If a default described herein has not been cured within the prescribed time to cure (if any) above, the non-defaulting Party may terminate this Agreement at its sole discretion by delivering written notice to the other Party. Upon termination, the Eligible System will be disconnected from Pacific Power's system at Participant's expense. The termination of this Agreement will not relieve either Party of its liabilities and obligations, owed or continuing at the time of termination. In the event this Agreement is terminated because of Participant's default, neither Participant nor the Eligible System shall be eligible, at any location in Oregon, for subsequent volumetric incentive rates, other feed-in tariffs, or pilot programs prior to the Expiration Date. The non-defaulting Party may contest a termination by seeking dispute resolution with the Commission within 30 days of termination, else termination shall be final.

SECTION 14: INDEMNIFICATION AND LIABILITY

14.1 Indemnities.

14.1.1 Indemnity by Participant. Participant shall release, defend, indemnify and hold harmless Pacific Power, its directors, officers, agents, and representatives against and from any and all loss, fines, penalties, claims, actions or suits, including costs and attorney's fees, both at trial and on appeal, resulting from, or arising out of or in any way connected with (a) the energy delivered by Participant under this Agreement to and at the Point of Interconnection, (b) any facilities on Participant's side of the Point of Interconnection, (c) Participant's operation and/or maintenance of the Eligible System, or (d) arising from this Agreement, including without limitation any loss, claim, action or suit, for or on account of injury, bodily or otherwise, to, or death of, persons, or for damage to, or destruction or economic loss of property belonging to Pacific Power, Participant or others, excepting only such loss, claim, action or suit as may be caused solely by the fault or gross negligence of Pacific Power, its directors, officers, employees, agents or representatives.

14.1.2 Indemnity by Pacific Power. Pacific Power shall release, defend, indemnify and hold harmless Participant, its directors, officers, agents, Lenders and representatives against and from any and all loss, fines, penalties, claims, actions or suits, including costs and attorney's fees, both at trial and on appeal, resulting from, or arising out of or in any way connected with the energy delivered by Participant under this Agreement after the Point of Interconnection, including without limitation any loss, claim, action or suit, for or on account of injury, bodily or otherwise, to, or death of, persons, or for damage to, or destruction or economic loss of property, excepting only such loss, claim, action or suit as may be caused solely by the fault or gross negligence of Participant, its directors, officers, employees, agents, Lenders or representatives.

14.2 No Dedication. Nothing in this Agreement shall be construed to create any duty to, any standard of care with reference to, or any liability to any person not a Party to this Agreement. No undertaking by one Party to the other under any provision of this Agreement shall constitute the dedication of that Party's system or any portion thereof to the other Party or to the public, nor affect the status of Pacific Power as an independent public utility corporation or Participant as an independent individual or entity.

14.3 No Consequential Damages. NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR SPECIAL, PUNITIVE, INDIRECT, EXEMPLARY OR CONSEQUENTIAL DAMAGES, WHETHER SUCH DAMAGES ARE ALLOWED OR PROVIDED BY CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, STATUTE OR OTHERWISE.

SECTION 15: INSURANCE

15.1 Certificates. Prior to connection of the Eligible System to Pacific Power's electric system, Participant shall secure and continuously carry insurance in compliance with the requirements of this Section 15. Upon request, participant shall provide Pacific Power insurance certificate(s) (of "ACORD Form" or the equivalent) evidencing Participant's compliance with the insurance requirements hereunder. Liability coverage written on a "claims-made" basis, if any, shall be specifically identified on the certificate. If requested by Pacific Power, a copy of each insurance policy, certified as a true copy by an authorized representative of the issuing insurance company, shall be furnished to Pacific Power.

15.2 Required Policies and Coverages. Without limiting any liabilities or any other obligations of Participant under this Agreement, Participant shall secure and continuously carry with an insurance company or companies rated not lower than "B+" by the A.M. Best Company the insurance coverage specified below:

Liability insurance shall be provided with a minimum single limit of \$1,000,000 to protect against and from all loss by reason of injury to persons or damage to property based upon and arising out of the activity under this Agreement.

15.3 The liability policy required herein shall include provisions or endorsements i) naming Pacific Power, its Board of Directors, Officers and employees as additional insureds, ii) cross liability coverage so that the insurance applies separately to each insured against whom claim is made or suit is brought, even in instances where one insured claims against or sues another insured, iii) such insurance is primary insurance with respect to the interests of Pacific Power and that any other insurance maintained by Pacific Power is excess and not contributory insurance with the insurance required hereunder, and iv) such policies shall not be canceled or their limits of liability reduced without 1) ten (10) days prior written notice to Pacific Power if canceled for nonpayment of premium, or 2) thirty (30) days prior written notice to Pacific Power if canceled for any other reason; *provided however*, that the requirements of this Section 15.3 shall not apply to liability insurance carried by residential or noncommercial farming customers.

SECTION 16: DISCLOSURE REQUIRED BY OAR 860-084-0240(2)(K)

In conformance with OAR 860-084-0240(2)(K) Pacific Power hereby notifies Participant that payments under the net metering option may be taxable as income under Oregon and Federal Tax law and Participant's Eligible System may be subject to property tax in the State of Oregon.

SECTION 17: FORCE MAJEURE

17.1 As used in this Agreement, a Force Majeure Event shall mean any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation, or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause which is in each case (i) beyond the reasonable control of such affected Party, (ii) by the exercise of reasonable foresight

such Party could not reasonably have been expected to avoid and (iii) by the exercise of due diligence, such Party shall be unable to prevent or overcome.

17.2 If a Force Majeure Event prevents a Party from fulfilling any obligations under this Agreement, the Party affected by the Force Majeure Event (“Affected Party”) shall promptly notify the other Party of the existence of the Force Majeure Event. The notification must specify in reasonable detail the circumstances of the Force Majeure Event, the expected duration, and the steps that the Affected Party is taking to mitigate the effects of the event on its performance, and if the initial notification was verbal, it should be promptly followed up with a written notification. The Affected Party shall keep the other Party informed on a continuing basis of developments relating to the Force Majeure Event until the event ends. The Affected Party will be entitled to suspend or modify its performance of obligations under this Agreement (other than the obligation to make payments) only to the extent that the effect of the Force Majeure Event cannot be reasonably mitigated. The Affected Party will use reasonable efforts to resume its performance as soon as possible. The Parties shall immediately report to the Commission should a Force Majeure Event prevent performance of any non-waivable obligations required by Commission Rules.

SECTION 18: SUCCESSORS AND ASSIGNS

18.1 This Agreement may be assigned by either Party with the consent of the other Party. A Party’s consent to an assignment may not be unreasonably withheld. The assigning Party must give the non-assigning Party written notice of the assignment at least fifteen days (15) before the effective date of the assignment. The non-assigning Party must submit its objection to the assignment, if any, to the assigning Party in writing at least five (5) business days before the effective date of the assignment. If a written objection is not received within that time period, the non-assigning party is deemed to consent to the assignment.

18.2 Exceptions to the Consent Requirement

18.2.1 Either Party may assign its rights and obligations under this Agreement without the consent of the other Party to any affiliate (including a merger or acquisition of the Party with another entity) of the assigning Party with an equal or greater creditworthiness and with the legal authority and operational ability to satisfy the obligations of the assigning Party under this Agreement.

18.2.2 Participant may assign its rights and obligations under this Agreement, without the consent of Pacific Power, for collateral security purposes to aid in obtaining financing for the Eligible System.

18.2.3 Participant may assign Section 11.1 payments to a single Qualifying Assignee at any time by providing Pacific Power written notice and a \$25 setup fee; *provided*, that such notice and payment must be given at least 15 business days before becoming effective to allow Pacific Power time to determine that the assignee is a Qualifying Assignee and process the

change. Such notice shall specify the term of assignment and whether the assignment is revocable. Such an assignment will not operate to delegate any responsibilities or duties of Participant under this Agreement to Qualifying Assignee.

18.3 Any attempted assignment that violates this Article is void. An assignee is responsible for meeting the same obligations as the assigning Party.

SECTION 19: DISPUTES

Nothing in this Agreement shall restrict or enlarge the rights of any Party to file a complaint with the Commission under relevant provisions of the Commission's rules.

SECTION 20: MISCELLANEOUS

20.1 Survival. The rights and obligations set forth in Sections 9, 11, 13.3, and 15.5 shall survive Termination or Expiration of this Agreement.

20.2 Amendment. The Parties may only amend this Agreement by a written instrument duly executed by both Parties in accordance with the provisions of the applicable Commission rules and Orders, or by the Commission for good cause shown.

20.3 No Third-Party Beneficiaries. This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, or where permitted, their successors in interest or their assigns.

20.4 Counterparts. This Agreement may be executed in one or more counterparts, whether electronically or otherwise, and each counterpart shall have the same force and effect as an original Agreement and as if all the Parties had signed the same document.

20.5 No Partnership/Joint and Several Liability. This Agreement will not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party. If Participant includes two or more parties, each such party shall be jointly and severally liable for Participant's obligations under this Agreement.

20.6 Severability. If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other governmental authority, (1) such portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as

practicable the benefits to each Party that were affected by such ruling, and (3) the remainder of the Agreement shall remain in full force and effect.

20.7 Waiver. Any waiver at any time by either Party of its rights with respect to a default under this Agreement or with respect to any other matters arising in connection with this Agreement must be in writing, and such waiver shall not be deemed a waiver with respect to any subsequent default or other matter.

20.8 Subcontractors. Nothing in this Agreement shall prevent a Party from using the services of any subcontractor, or designating a third-party agent as one responsible for a specific obligation or act required in the Agreement (collectively subcontractors), as it deems appropriate to perform its obligations under the Agreement; provided, however, that each Party will require its subcontractors to comply with all applicable terms and conditions of the Agreement in providing such services and each Party will remain primarily liable to the other Party for the performance of the subcontractor.

20.8.1 The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made. Any applicable obligation imposed by the Agreement upon the hiring Party shall be equally binding upon, and will be construed as having application to, any subcontractor of such Party.

20.8.2 The obligations under this Section will not be limited in any way by any limitation of a subcontractor's insurance.

SECTION 21: ENTIRE AGREEMENT

This Agreement together with all exhibits, appendices or other attachments, which are incorporated herein by reference, supersedes all prior agreements, proposals, representations, negotiations, discussions or letters, whether oral or in writing, regarding Pacific Power's purchase of Payable Generation from the Eligible System.

SECTION 22: NOTICES

22.1 All notices except as otherwise provided in this Agreement shall be in writing, shall be directed as follows and shall be considered delivered if delivered in person or when deposited in the U.S. Mail, postage prepaid by certified or registered mail and return receipt requested.

Notices	Pacific Power	Participant
All Notices	Pacific Power Volumetric Net Metering 825 NE Multnomah Street	City of Klamath Falls Attn: City Manager PO Box 237, Klamath Falls Oregon, 97601

Notices	Pacific Power	Participant
	Portland, OR 97232 Attn: Travis Tanner, Suite 800 Email: oregonsolar@pacificcorp.com Phone: (503) 813 - 5952 Facsimile: (503) 331 - 4442 Duns: 00-790-9013 Federal Tax ID Number: 93-0246090	City of Klamath Falls Attn: City Manager Email: rwhitlock@ci.klamath-falls.or.us Phone: 541-883-5316 Facsimile: 541-883-5399 Federal Tax ID Number: (93-6002195)
Outage notification:	(same as street address above) Attn: Resource Planning, Suite 600 Phone: (503) 813 - 6090 Facsimile: (503) 813 - 6265	Maintenance Department 1199 S. Spring Street Klamath Falls, OR 97601 Attn: Rick Slover Phone: 541-883-5257 Cell: 541-892-4541
Payments:		City of Klamath Falls Finance Department PO Box 237, KFO 97601
With Additional Notices of an Event of Default or Potential Event of Default to:	(same as street address above) Attn: Pacific Power General Counsel Phone: (503) 813-7502 Facsimile: (503) 813-7252	City of Klamath Falls Attn: City Attorney PO Box 237 Klamath Falls, OR 97601 Phone: 541-883-5323 Facsimile: 541-883-5399

22.2 The Parties may change the person to whom such notices are addressed, or their addresses, by providing written notices thereof in accordance with this Section 22, provided that any requested change to the payee and the address where payments are made shall be submitted in writing at least 15 days before becoming effective and shall provide sufficient information for Pacific Power to determine that the substitute payee is a Qualifying Assignee.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed in their respective names as of the date first above written.

Participant

By: 

Name: Rick Whitlock

Title: City Manager

Date: 12/3/10

Pacific Power

By: _____

Name: _____

Title: _____

Date: _____

EXHIBIT B—Participant’s Volumetric Incentive Rate

Volumetric Incentive Rate: The effective rate Pacific Power shall pay Participant equals the difference between Participant’s Volumetric Incentive Rate (as set forth in Pacific Power’s Schedule 136 Tariff) and Participant’s Retail Rate (\$/kWh):

Volumetric Incentive Rate (VIR): \$0.495/kWh
Participant’s Retail Rate (RR): \$0. ___/kWh*
Net Volumetric Incentive Rate (VIR_{net}): \$0. ___/kWh

*The Participant’s Retail Rate is the retail rate in effect at the time of the Billing Period.

**INTERCONNECTION APPENDIX
FOR
LEVEL 2 INTERCONNECTION**

This Level 2 Interconnection Appendix (“**Interconnection Appendix**”) is part of the Volumetric Incentive Payment and Interconnection Agreement (“**Agreement**”) between Participant (Klamath Falls City) and PacifiCorp d/b/a Pacific Power (“**Pacific Power**”). Terms not defined in this Interconnection Appendix shall have the meaning set forth in the Agreement.

Article 1. Scope and Limitations of Interconnection Appendix

This Interconnection Appendix shall be used for all Applications to interconnect under the Level 2 System Interconnection Review procedures set forth in the Rules. This Interconnection Appendix contains standard terms and conditions approved by the Commission under which Participant’s Eligible System, which is described in Exhibit A to the Agreement (Application for Solar Incentive Program Interconnection) and which has a Nameplate Capacity of 500 kW or less, will interconnect to, and operate in parallel with, Pacific Power’s system.

Article 2. Review

2.1 Initial Review and Additional Review

In accordance with the Rules, Pacific Power conducted an initial review of the proposed interconnection. The initial review determined that the Eligible System (Pacific Power to select appropriate option):

Meets all applicable requirements; or

Failed to meet one or more applicable requirements, but additional review enabled Pacific Power to determine that the Eligible System could be interconnected consistent with safety, reliability and power quality standards. Participant authorized additional review and Pacific Power conducted such additional review and provided Participant with a good faith, non-binding estimate of the costs of required minor modifications. The required minor modifications are described in the attached **Attachment A**. A non-binding, good faith estimate of the cost and schedule for the required minor modifications is included in **Attachment B**.

Article 3. Inspection and Start-up

3.1 Upon completion of initial (and any subsequent) construction of the Eligible System, Participant shall provide Pacific Power the data listed in OAR 860-048-0400 and an As-built Supplement, which shall update information in Exhibit A to the Agreement

(Application for Solar Incentive Program Interconnection) to conform with the installed Eligible Facility.

- 3.2 Participant shall provide Pacific Power with written notice of the anticipated start date for operation of the Eligible System. The anticipated start date shall not be less than ten (10) business days after the date the Participant executes and returns the Agreement to Pacific Power.
- 3.3 An inspection of the Eligible System is required / is not required (Pacific Power to select option).
- 3.4 Witnessing of the Eligible System commissioning tests by Pacific Power is required / is not required (Pacific Power to select option).
- 3.5 **Participant shall not interconnect or operate the Eligible System in parallel with Pacific Power's distribution system unless all of the following have occurred:**
- 3.5.1 Approval of the interconnection by the electrical code official with jurisdiction over the interconnection;
- 3.5.2 Successful completion of any inspection or witnessing of commissioning tests, or both, required by Pacific Power under this Article (successful completion must be documented by written notice from Pacific Power to Participant stating that the inspection and/or commissioning test were completed to Pacific Power's satisfaction, such notice shall not be unreasonably withheld or delayed); and
- 3.5.3 Passing of the planned start date provided by Participant.

If the inspection and/or commissioning tests are not satisfactory, Participant will repair or replace the unsatisfactory equipment or otherwise address any problems and reschedule an inspection and/or commissioning test as appropriate.

PARTICIPANT SHALL NOT INTERCONNECT OR OPERATE THE ELIGIBLE SYSTEM IN PARALLEL WITH PACIFIC POWER'S ELECTRIC DISTRIBUTION SYSTEM UNTIL PARTICIPANT RECEIVES WRITTEN AUTHORIZATION FROM PACIFIC POWER INDICATING THAT THE INTERCONNECTION IS APPROVED, PARTICIPANT HAS PAID ANY AMOUNT DUE UNDER ARTICLE 6.2 OF THIS INTERCONNECTION APPENDIX, AND THE ELIGIBLE SYSTEM MAY BEGIN OPERATION.

Article 4. Standards

Participant will design its Eligible System to comply with the IEEE standards as that term is defined in OAR 860-084-0010. The Eligible System and all modifications and other Interconnection Facilities required to interconnect the Eligible System to Pacific Power's

distribution system shall be designed, maintained and operated in compliance with IEEE standards and in compliance with the National Electric Safety Code and the National Electric Code as adopted by Oregon statute or regulation.

Article 5. Eligible System Testing and Maintenance

Each Party shall be responsible for the safe installation, maintenance, repair and condition of their respective lines and equipment. Each Party shall provide Interconnection Facilities that adequately protect the other Party's facilities, personnel and other persons from damage and injury.

Participant shall conduct maintenance and testing as set forth in the Rules, including without limitation:

- 5.1 Annual Test. Participant shall conduct an annual test, at its expense, in which the Eligible System is disconnected from Pacific Power's system to ensure that the inverter stops delivering power to the grid.
- 5.2 Manufacturer-recommended Testing and Maintenance. Participant shall conduct any manufacturer-recommended testing or maintenance at its expense.
- 5.3 Testing for IEEE Compliance. Participant shall conduct any post-installation testing, at its expense, necessary to ensure compliance with IEEE standards as set forth in the Rules or to ensure safety. This includes replacing a major equipment component that is different from the originally installed model.
- 5.4 Records of Testing and Maintenance. When Participant performs maintenance or testing in accordance with the Rules, it must retain written records documenting the maintenance and results of the testing for seven (7) years.
- 5.5 Pacific Power Testing. After interconnection approval is granted, Pacific Power shall have the right to inspect Participant's facility at reasonable hours and with reasonable prior notice to Participant. If Pacific Power discovers that the Eligible Facility is not in compliance with the requirements of the Agreement, this Interconnection Appendix, the Rules, or Commission order, Pacific Power may require Participant to disconnect the Eligible System until compliance is achieved. Participant's electric service may be disconnected by Pacific Power if the Eligible System must be physically disconnected for any reason.

Article 6. Modifications

6.1 Minor Modifications (Pacific Power to select applicable option)

No minor modifications are required.

Pursuant to the additional review conducted by Pacific Power, minor modifications are required to enable the interconnection to be made consistent with safety, reliability and power quality standards applicable to Level 2 interconnection reviews. The Participant shall pay for the cost to procure, install, and construct, operate, maintain, repair and replace any such minor modifications. A description of the minor modifications may be found in Attachment A. A non-binding, good faith estimate of the cost of the minor modifications is provided in Attachment B and totals \$_____. Participant shall remit a payment deposit in the amount of the estimated cost of the minor modifications prior to Pacific Power commencing the work required for the minor modifications.

6.2 Payment

Participant shall submit a deposit of \$_____ [Pacific Power to insert total deposit amounts for all modifications] at the time it executes and submits the Agreement to Pacific Power. Pacific Power may require progress payments from Participant or Pacific Power may wait until construction and installation of all equipment and facilities are complete and the total actual cost of such equipment and facilities has been established and then provide Participant with a statement indicating whether actual cost was more or less than the deposit paid by Participant. If actual costs exceed the deposit, Pacific Power will invoice Participant for the balance and Participant shall pay any such invoice within 30 days of receipt. If actual costs are less than the deposit, Pacific Power will refund the difference to Participant. Participant shall pay any balance owing prior to initial operation of the Eligible System.

Attachment A
Required Modifications

[Pacific Power to insert required modifications]

Disconnect Switch. The following disconnect switch requirements shall apply (Pacific Power to select case that applies):

The Eligible System must include and maintain a manual disconnect switch that will disconnect the Eligible System from Pacific Power's distribution system. The disconnect switch must be a lockable, load-break switch that plainly indicates whether it is in the open or closed position. The disconnect switch must be readily accessible to the Pacific Power at all times and be located within 10 feet of the Pacific Power meter. The disconnect switch may be located more than 10 feet from the Pacific Power meter if permanent instructions are posted at the meter indicating the precise location of the disconnect switch. Participant shall obtain Pacific Power's written approval of the location of the disconnect switch prior to the installation of the facility. Participant shall install and maintain the required disconnect switch at Participant's expense.

No disconnect switch is required because customer service is 600 volts or less and the Eligible System is inverter based with a maximum rating as shown below:

- (a) Service type: 240 Volts, Single-phase, 3 Wire—Maximum size 7.2 kilowatts
- (b) Service type: 120/208 Volts, 3-Phase, 4 Wire—Maximum size 10.5 kilowatts
- (c) Service type: 120/240 Volts, 3-Phase 4 Wire—Maximum size 12.5 kilowatts
- (d) Service type: 277/480, 3-Phase, 4 Wire—Maximum size 25.0 kilowatts
- (e) For other service types, the Eligible System must not impact the Participant's service conductors by more than 30 amperes.

Attachment B
Non-Binding, Good Faith Estimate of Modifications Cost and Schedule



Professional Roof Consultants, Inc.
1108 NE Grand Avenue, Suite 300
Portland, OR 97214

Voice: 503 280-8759
Fax: 503 280-8866

ProfessionalRoofConsultants.com

CITY OF KLAMATH FALLS POLICE STATION ROOF SYSTEM EVALUATION

**A SURVEY AND INVESTIGATION OF EXISTING ROOF
SYSTEMS TO DETERMINE ROOF SYSTEM MOISTURE
CONTENT AND CORRECTIVE ACTION.**



PRESENTED TO:

CITY OF KLAMATH FALLS
226 SOUTH 5TH STREET
KLAMATH FALLS, OREGON 97601

MAY 20, 2011

PROJECT # R2888.01

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- **3. CONCLUSIONS**

1. INTRODUCTION



The City of Klamath Falls has recently completed a project which upgraded an existing facility and transformed it into a new Police Station. The project, which was designed and led by the architectural collaboration of HSR Architecture, and constructed by Howard S. Wright Construction, is currently in the process of closing out; however, a roofing issue has arisen that must be resolved prior to accepting and warranting the project. The suspected existence of moisture within the roof system is considered to be the issue that must be corrected.

In May of 2011, the City of Klamath Falls retained Professional Roof Consultants, Inc. for the purpose of performing a survey and investigation of the roofing systems that cover the new Klamath Falls Police Station, located in Klamath Falls, Oregon. The roof areas that cover the facility are being inspected due to reports of the existence of moisture within the roof systems.

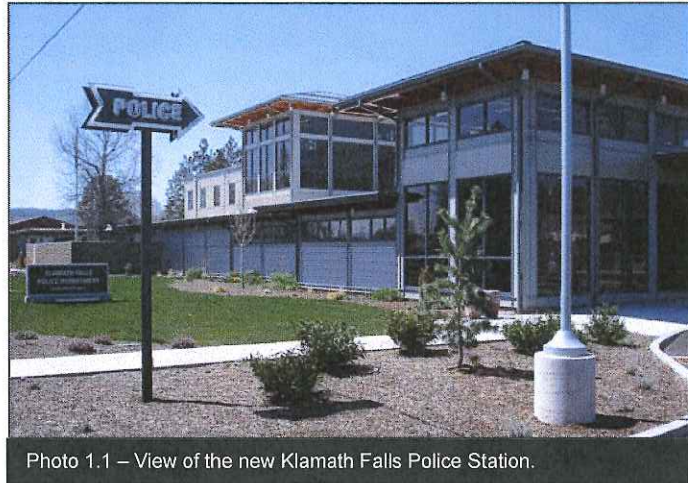


Photo 1.1 – View of the new Klamath Falls Police Station.

PURPOSE OF THE SURVEY

The survey was conducted on May 4th, 2011, with research and report preparation occurring prior to, and shortly after survey tasks were completed. While the initial purpose of retaining PRC was to perform a moisture survey and provide input, it was made apparent that additional information would be required to properly close out the project, and to satisfy project requirements. The goals of this survey and evaluation include the following:

1. *Identify if moisture exists within the roof systems, and identify quantities and locations.*
2. *Determine the source of moisture and determine assignment of responsibility (design or construction issue).*
3. *Provide a recommendation with regard to resolution of moisture issue, including an outline of a repair scope to return the roof system to an acceptable condition.*
4. *Provide documentation of incomplete or unsatisfactory conditions with regard to roofing and flashing.*
5. *Communicate with the roofing materials manufacturer with regard to recommended repairs / replacement of systems as required to maintain specified warranties.*

THE PLAYERS

A number of organizations and individuals have been involved with the construction of the new Police Station project since its inception. Since the identification of initial moisture within the roof system shortly after construction of the building, various inspections, recommendations, and correspondence have occurred, with the following individuals directly involved with the resolution of the roofing issue:

Owner's Representative:	Samanthea Totten-Perry (City of Klamath Falls)
Klamath Falls Police Dept.:	Police Chief James L. Hunter
Architect:	John Ralston (HSR Architecture)
Engineer:	D. Scott Souders, PE (ZCS Engineering, Inc.)
General Contractor:	Rob Kelleher and Gordon Crews (HSW Builders)
Roofing Contractor:	Thomas Hunziker (AM-1 Roofing)
Roofing Manufacturer:	John Pohorsky, Terry Becerra, and Kelly Hammons (GAF)

TASKS AND PROCEDURES

This report serves several purposes and a number of tasks were performed in order to accomplish our objectives, including the following:

1. Review of various plan, elevation, and detail drawings prepared by HSR Architecture, dated September 02, 2008 (Permit Set); provided by HSR Architecture.
2. Review of roof system submittals; provided by HSW Builders.
3. Review of Daily Reports during installation of roof system; provided by HSW Builders.
4. Review of various reports and correspondence from GAF, the roofing material manufacturer; provided by HSR Architecture and HSW Builders.
5. Review of various e-mail correspondence between AM-1 Roofing (roofing contractor), Klamath Falls, HSR Architecture, and HSW Builders (post roof installation); provided by HSR Architecture and HSW Builders.
6. Meet design and construction team on sight and participate in pre- and post-evaluation discussions, interviews, and meetings.
7. Conduct a moisture survey of the roof areas covering the Klamath Falls Police Station via roof cores located by PRC, and cut by AM-1 Roofing. The survey was performed on May 4, 2011, with participants that included the Owner, the Architect, General Contractor, roofing contractor, and the roofing materials manufacturer.
8. The survey was considered to be an electronic capacitance moisture survey, and was performed utilizing a Delmhorst Instrument Company TotalCheck handheld combination moisture meter / thermo-hygrometer. Moisture readings were taken only at core locations.
9. Investigation of reported leaks at the building interior while on site.
10. A tour of the roof area to document roof system components and related flashings, and completion of the systems in accordance with the drawings and specifications.
11. Review of available construction photos, provided by ZCS Engineering, Inc.
12. Review of weather data for period of time when roof system installation occurred (01/2010 – 03/2010, via Weather Underground historical data; wunderground.com).
13. Communicate with roofing materials manufacturer (GAF) and determine various test results and warranty requirements for the specified system.
14. Analyze all data and information retrieved from field investigations and determine conclusions and recommendations.
15. Writing and assembly of this report.

DATA CATALOGING AND READINGS

Moisture testing of the roof systems covering the Klamath Falls Police Station included random coring of the roof system and spot-checking of materials using electronic capacitance moisture detection equipment. A Delmhorst TotalCheck handheld moisture meter was utilized with detachable insulated 6-inch pins (probes).

Existing conditions were documented on Moisture Test forms, including current weather, type and thickness of the roof system components, and the amount of moisture observed and detected as the components were removed from each core location.

This particular moisture meter has a range of settings which can detect moisture in a variety of materials including concrete, wood, insulation and drywall (gypsum) materials. The first core location utilized predetermined material selections (drywall and wood) to determine moisture levels. For the remainder of core locations, the moisture meter was fixed at Relative setting with a 0-100 reference scale, offering a qualitative indication of moisture.

Example:

- *Data readings of the DensDeck cover board (which is a gypsum-based product) at the first core location were taken using a Drywall setting, and yielded readings of 0.1% - which is considered sufficiently dry.*

- *Data readings of the DensDeck cover board at the second core location when taken at a Drywall setting yielded results of 29% - 42% (wet). When switched to a Relative setting at this location, the revised setting yielded results of 64% - 79% moisture content (wet).*
- *Relative settings were used for the remainder of the testing process to determine moisture readings relative to adjacent materials, as some materials were obviously wet, and other materials were obviously dry. For the most part, when fixed on the Relative setting, results of 10% or under were considered to be dry, while anything over 10% was considered to be wet (the higher the percentage, the more moisture within the material).*
- *Moisture readings on wood materials (plywood sheathing at roof deck) utilized the Wood setting, and yielded readings of between 6.8% and 7.2%; considered to be dry for wood materials.*

Locations that were selected for coring included areas where previous signs of moisture had existed – as observed through the winter months of 2010 / 2011 – and at as many locations that a 1-day survey would allow. Six locations were selected in total, with each location designated as #1, #2, #3, #4, #5, and #6.

REFERENCES

Reference material used for research and ascertaining design criteria for this investigation includes the following:

- National Roofing Contractors Association (NRCA); The NRCA Roofing Manual – Membrane Roof Systems; 2007 Edition.
- 2007 Oregon Structural Specialty Code.
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA); Architectural Sheet Metal Manual - Fifth Edition.
- GAF Architectural Binder – Division 7 (Low Slope Roofing Solutions); TPO Mechanically Attached Roofing Specifications and Details.
- Roof Consultants Institute (RCI – re-formed as the Institute of Roofing, Waterproofing, and Building Envelope Professionals); Manual of Practice.

REPORT FORMAT

The information contained in this report is divided into three sections:

1. Introduction

This section, which describes the project, the report outline, tasks and procedures associated with accumulation of pertinent information, identification of reference standards, and outlines the goals and objectives of the investigation.

2. Existing Conditions & Findings

This section identifies all pertinent construction data obtained from the field investigations and forms a record of all observations recorded in the field. Photographic documentation is included in this section, along with various graphic representations of the systems that cover the roof, and information recorded on forms utilized in the field investigation.

3. Conclusions

This section is a summary of the conditions found and drawn from each part of this evaluation, along with recommendations made and graphic representations.

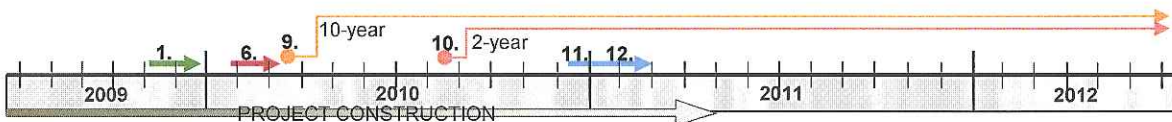
2. EXISTING CONDITIONS & FINDINGS



The Klamath Falls Police Station is a new 30,000 square foot building designed by HSR Architecture, and constructed by HSW Builders. The new facility is a combination of wood and steel-framed construction, which also utilized an existing cast in place concrete structure (an armory) in part of its construction, resulting in a mixed 1- and 2-story facility. The project was started in late 2009, and is currently considered to be substantially complete and in use by the City of Klamath Falls as a fully-functioning police station.

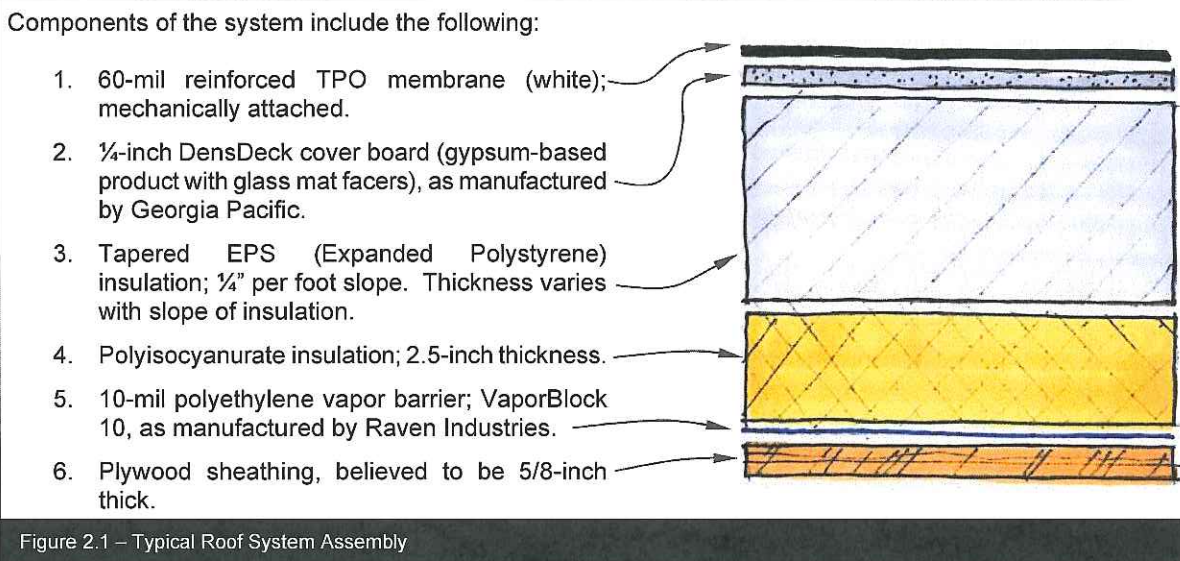
A chronological order of events, as they relate to the roofing scope and resulting roof-related issues on this project, includes the following:

- 1. Roof Demolition:** Removal of existing roof systems from existing structures took place on, or around, November 1, 2009. Removal of the existing roofing exposed approximately 15,000 square feet of existing plywood sheathing.
- 2. Plywood Sheathing Replacement:** Existing plywood sheathing was inspected, and approximately 15 sheets of plywood sheathing were removed and replaced with new materials due to deterioration and / or damage.
- 3. Roofing Materials:** Roofing materials that were ordered for the project arrived on site approximately 7 – 10 days before roofing operations took place; indicating materials were on site on, or around, January 17 – 20, 2010.
- 4. Material Storage and Protection:** General Contractor has stated that materials that were stored on site were covered with plastic sheeting and tarps to protect from moisture damage during the winter months; however, there has been no photographic documentation of this effort available to review.
- 5. Moisture Content of Substrate:** General contractor states that moisture readings were taken at the plywood sheathing substrate to determine if the sheathing was within the specified target range for maximum moisture content for construction; targets were set at 19% MC for Douglas Fir, and 14% MC for Hemlock. HSW states that all readings taken during construction were 15% and below.
- 6. Roof Installation:** AM-1 Roofing started installation of the new roof systems on January 27, 2010, and concluded with roof installation in early March, 2010. It is unknown as to what type of temporary seals and tie-offs were installed between phases of roof installation.
- 7. Weather Conditions:** Winter weather conditions were prevalent during installation of the roofing systems on this building, with several instances of "weather events" occurring during installation. Average humidity levels were around 85% during installation. HSW has stated that the project was secured and tarped during inclement weather events.
- 8. Manufacturer Inspection:** GAF technical representative visited the site and toured the roofs to perform a punch list inspection on April 20, 2010. A Roof Inspection Report was issued on April 22, 2010.
- 9. Manufacturer Warranty:** GAF issued a 10-year "EverGuard Diamond Pledge NDL Roof Guarantee", with the date of completion being March 15, 2010, and date of expiration being March 15, 2020.
- 10. Contractor Warranty:** AM-1 Roofing issued a 2-year materials and workmanship warranty on roofing substantial completion date of August 23, 2010.
- 11. Observations of Moisture within Roof:** Inspections of the roof were conducted between December of 2010, and February of 2011 – by the design / build team and roofing contractor / manufacturer. Initial tours of the roof revealed a "cracking" sound when the roof was stepped on, with indications that ice exists at the underside of the membrane.
- 12. Manufacturer Inspection:** GAF performed an inspection of the roof system on February 9, 2011, to assist in determining why ice (moisture) exists within the roof system, and to offer a solution. A Roof Investigation Report was issued by GAF on February 12, 2011. Lack of venting appears to be the consensus of the manufacturer's inspector and the roofing contractor. Moisture is suspected to have been introduced during construction.



ROOF SYSTEM ASSEMBLY

The roof system that was specified and submitted for this project is a mechanically fastened TPO (Thermoplastic Polyolefin) roof membrane installed over a tapered insulation assembly, installed over a vapor barrier. GAF is the manufacturer of the roof system assemblies, and has provided a 10-year NDL (no dollar limit) warranty on the roof system, as specified. AM-1 Roofing, Inc. is the contractor that installed the roof system, and has provided a 2-year workmanship and material warranty, as specified.



This particular roof assembly is relatively fast to install and relies on minimal adhesives to seal the membrane together, or to hold it in place. The seams and penetration flashings of this membrane are heat-welded together to form a watertight seal. Edge flashings (at gutter edges) utilize pre-coated galvanized steel flashings that are "stripped in" to the field membrane utilizing a self-adhering TPO flashing tape.

Pre-coated galvanized steel counter flashings and other assorted flashings (including skylights, siding systems, mechanical units, etc.) were installed by contractors other than the roofing contractor. These flashings are installed in a manner that should weather-lap the roof membrane in order to keep moisture out of the roof system, and out of the building.

ROOF SYSTEM MOISTURE EVALUATION

As a result of moisture being observed within the roof system during the winter months of 2010 / 11, the City of Klamath Falls was prompted to retain an independent consulting firm to initiate a detailed assessment and evaluation of the roof system and the moisture issue. After reviewing roof system specifications, drawings, submittals, and installation documentation, a site visit was scheduled for the purpose of conducting a moisture survey of the new roof system.

This particular moisture survey was limited to taking moisture readings at locations on the roof that were cut open (cores). This type of testing was selected in an effort to retain actual moisture data from within the system – including all layers of insulation, and down to the roof deck – and to also examine each layer of material to determine the actual condition of the materials. Six locations were selected in total, with each location designated as #1, #2, #3, #4, #5, and #6. Four of the core / test locations were situated at the main upper (2nd story) roof area; one at the west end of the first floor level; and one at the first floor level, between the entrance and the stair tower.

The process of coring and testing each location included the following:

1. Locations for cores - approximately 6"x6" square - were marked on the surface of the roof (by PRC) using a yellow marking crayon.
2. The roof membrane was cut out and observations of the conditions were made, and moisture readings were taken at the underside of the membrane using a Delmhorst TotalCheck handheld moisture meter. Readings and observations were documented on Moisture Test forms.
3. Moisture readings were taken at the top side of the cover board and documented.
4. The cover board was cut out to expose the underlying EPS insulation. Moisture readings were taken at the edges and underside of the cover board, with readings and observations documented.
5. Moisture readings were taken at the top side of the EPS insulation. Probes were inserted into the insulation to identify if moisture exists within the EPS insulation. Readings and observations were documented.
6. EPS insulation was cut out and removed to expose the underlying polyisocyanurate insulation. Moisture readings were taken at the top surface of the insulation and documented.
7. The polyisocyanurate insulation was cut and removed to expose the vapor barrier membrane. Moisture readings were taken at the underside of the insulation and the top of the vapor barrier.
8. At the first two test locations (#1 and #4), the vapor barrier membrane was cut to expose the underlying plywood sheathing roof deck. Moisture readings were taken and documented.
9. Each location was documented using digital photography, and the components of the assembly were re-assembled. A new 60-mil reinforced TPO patch was installed over each core location.

The figure below illustrates the location of each core / test area on the roof areas that cover the Klamath Falls Police Station. In addition, two known leak locations are also identified; a) the leak in the hallway of the second floor – entering the building at a new / existing construction joint, and b) the leak at south hallway of the second floor, adjacent to offices.

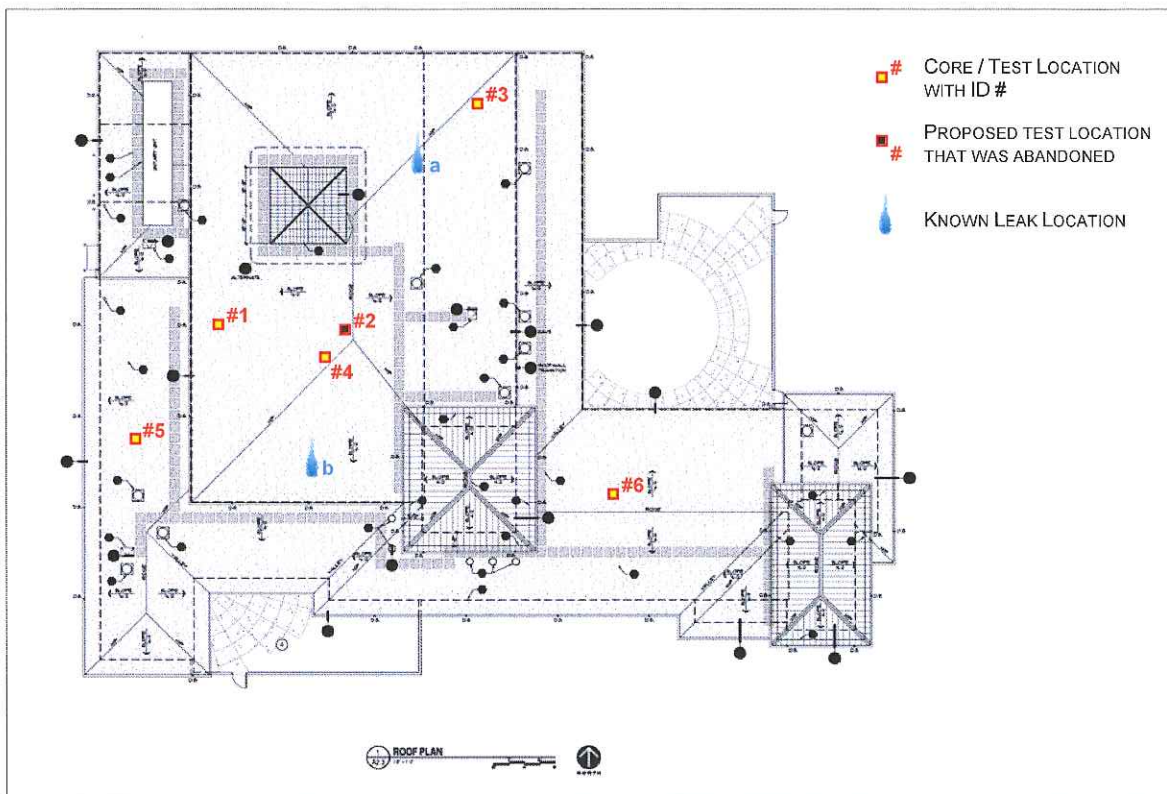


Figure 2.2 – Roof plan with core / test locations and known leak locations.

The order of testing was altered shortly after initial marking of core locations on the roof surface. Initially, three (3) areas were marked on the 2nd floor roof; however, a revised location was added and indicated as Core #4, and #2 was abandoned due to its close proximity to #4. Core #4 was added since this particular location is where a previous core had been taken, and where significant moisture had been observed; the team was eager to observe this same location to detect if any change had taken place.

Results of the tests are documented on Moisture Test forms which are included following this section of the report. The forms also include photo documentation of each test / core location.

The following is a summary of conditions observed at each test location:

TABLE 2.1 – TEST / CORE SUMMARY	
Core #	Summary Observations
1	Considered to be dry between and within all layers, with no component deterioration observed.
2	Location not cored due to addition of Core #4 - a location that was added and is located where previous tests had taken place.
3	Considerably wet within the top layers of the system (underside of membrane, and within cover board [65% - 95%]), and at the top and bottom facer of the polyiso insulation (bottom layer of insulation [26% - 28%]). Cover board illustrated slight deformation with thumb pressure; other materials appeared to be stable. Most moisture that does exist is present at the upper level of the assembly.
4	Considerably wet within the top layers of the system (underside of membrane, and within cover board [29% - 79%]), and at the top and bottom facer of the polyiso insulation (bottom layer of insulation [26%]). Cover board illustrated slight deformation with thumb pressure; other materials appeared to be stable. Dry under the vapor barrier, and plywood is considered to be dry. Most moisture that does exist is present at the upper level of the assembly.
5	Materials near the surface revealed some moisture; not as wet as the two locations at the upper roof area. Facer of polyiso insulation contained moisture (bottom layer of insulation [14.3% - 34%]). Most moisture that does exist is present at the lower level of the assembly.
6	Materials near the surface revealed some moisture – particularly near the joint of the underlying EPS insulation (which had a gap of approx. 1/2"); not as wet as the two locations at the upper roof area [13.5% - 26%]. Facer of polyiso insulation contained slight levels of moisture (bottom layer of insulation [6% - 21%]), but considerably less than Core #5. Most moisture that does exist is present at the upper level of the assembly. This location had an air leak from the building interior; a steady stream of air was felt passing through the insulation joints – which equates to a breach in the vapor barrier.

Of the five (5) locations tested, 4 of the locations were found to have moisture within the roof system, and two of the 4 locations had a significant amount of moisture within the system (located at the 2nd floor roof area). Moisture levels at the upper roof area existed primarily in the upper layers of insulation, however, the lowest level of the assembly was found to contain moisture on the facer of the insulation board.

It should be noted that there was no significant damage to the materials within the system as a result of the moisture, and no mold growth was observed on any of the materials.

Moisture Test forms should be referenced for more detailed information regarding individual test locations.



Photo 2.1 – Typical core extraction and test location.

LEAK EVALUATION

A tour of the building interior, along with interviews with building personnel, revealed that there are two (2) active leaks that could be roof-related. Representatives from PRC and HSR (as well as HSW and AM-1 – later in the day) made observations from within and also studied the areas of the roof directly over and adjacent to the leaks. With the exception of one location of the membrane where impact damage was observed, no obvious signs of roof membrane defects could be found over or near each of the two leak locations.

Further examination of the roof system and rooftop components adjacent to the leak locations were conducted, including observations of the skylight and related flashings at the base of the skylight. These are problem areas that could very well be taking in moisture to the roof deck level where the vapor barrier exists. At Leak Location (a), water is entering the building through a construction joint; where the existing building was added onto. It was noted (during construction) by HSW Builders and AM-1 Roofing that the roof structure on the existing building was somewhat level, or deflected. Water that enters the system can pool on the vapor barrier (below the insulation) until it reaches a height, or depth, where it reaches the building joint; an area where it is possible to have a breach in the vapor barrier.

The source of water for this newest leak is believed to be originating from failing flashing seams at the base of the skylight. Evidence of standing water exists on the first horizontal

Leak Location (b) exists in the field of the roof where no penetrations exist, and no deficiencies were observed. However, this is an area where moisture is known to exist within the roof system from other sources, and, under the right climatic conditions, can become active due to accumulation of condensing water vapor within the roof system. In addition, the roof edge flashings were observed to have some deficiencies that could be allowing moisture to enter the roof assembly, and possibly migrate back to a point of entry below the roof membrane.

As with leak Leak Location (a), the latest source of moisture within the roof system at Leak Location (b) could be originating from the skylight flashings or the edge flashings (at the gutter edge). Moisture that enters the roof system at these locations could migrate on top of the vapor barrier until a breach is found (un-sealed seam or a hole in the membrane), thus allowing water to enter into the building structure.

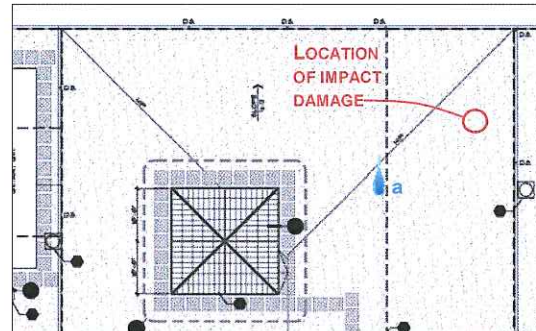


Figure 2.3 – Partial Roof Plan at Leak Location (a).

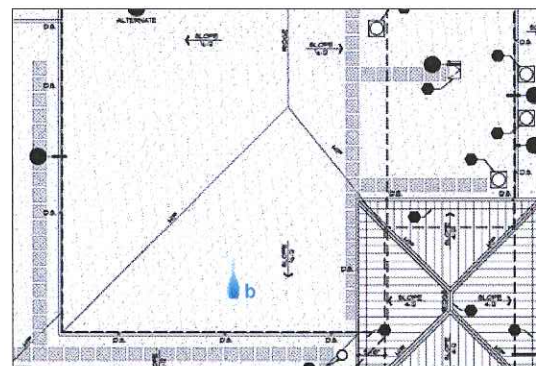


Figure 2.4 – Partial Roof Plan at Leak Location (b).

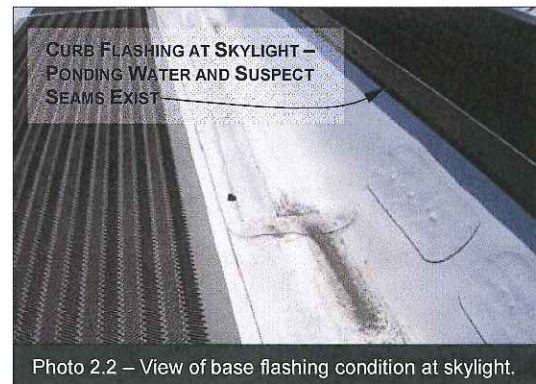


Photo 2.2 – View of base flashing condition at skylight.



Photo 2.3 – Impact damage near Leak Location (a).

DISCUSSION – MOISTURE ORIGINATION

Weather and Installation: A part of the process of this evaluation included review of available documentation that was prepared during the process of construction. Documentation that was provided by HSW included “Superintendent Daily Report” forms that were generated on a daily basis by the site superintendent; a total of 27 reports were provided for review, and included data from 1/27/2010 through 3/3/2010. These forms included work progress notes, weather conditions, accomplishments, and other useful information.

In addition to reviewing Daily Reports, weather history was reviewed for dates included on Daily Report forms. The following is a summary of information reviewed with regard to work progress and weather conditions:

- Daily Reports that were provided revealed 24 days of roofing operations – from January through March of 2010.
 - 10 of the 24 days of roofing progress were performed during weather conditions that would be considered acceptable with little-to-no risk of moisture residing within roof system as a result of cold, moist atmospheric conditions or precipitation.
 - 11 of the 24 days of roofing progress were performed during weather conditions that would be considered high-risk for moisture to be allowed within the roof system, with weather history and daily reports indicating a trace or more of rain or snow during the time of roof installation.
 - Sheet metal flashing work followed roofing installation with a significant delay in sequence, allowing several days / weeks before leading edges of the roof system were protected. Unless temporary seals were installed over leading edges of base flashings and penetrations, this is a likely (and common) scenario that would allow moisture into the roof assembly.
- The probability of moisture entering the roof assembly during installation of the roof, at each roof area of the building, is considered to be high. Moisture that is trapped within the system will remain and follow a cycle of internal condensation as weather conditions change.
 - Phasing of roof system components and related sheet metal flashings (delays between roofing and installation of flashings) can allow water to enter the system at the leading edges of base flashing and penetrations.

Moisture Content in Roof Deck: Winter construction can pose a number of challenges with regard to moisture control within roof systems. One of the biggest challenges is keeping the roof substrate (in this case – plywood) of the building dry so that roofing materials do not absorb any residual moisture. HSW has stated and documented that moisture readings at plywood substrates were taken prior to installation of roofing products, with readings documented at 15% or below.

- While attempts were made to only allow roofing operations to take place when plywood sheathing was significantly “dry”, the reality of keeping a schedule and proceeding with roofing in a timely manner ultimately allowed materials to be installed when not all areas of the plywood sheathing were dry. There were several documented instances when roof installation proceeded immediately (or shortly) after a weather event would allow the roof deck to become wet.
- A vapor barrier was installed over the roof deck prior to installation of the roofing materials; however, vapor barrier terminations, seams, and holes (created by accidental punctures, or penetrated due to fasteners for the roof system) can allow moisture vapor to migrate upward into the roof assembly. However, the very existence of a vapor barrier should have prevented the majority of any underlying moisture to migrate up into the roof system.

Moisture Content in Roofing Materials: Aside from maintaining an ideal atmosphere during installation of construction materials, keeping supplies dry between significant weather events poses a challenge, especially when interior storage options are not available. HSW has stated that roofing materials were covered with plastic sheeting when initially delivered and stored on site (on the roof). AM-1 has stated that insulation packaging was utilized to protect materials from precipitation; however, the packaging is not intended to provide weather protection, and will allow moisture to come into contact with the underlying insulation materials.

- The probability of moisture existing within the roof system due to wet roofing materials is high due to the

fact that some materials were stored without proper weather protection (uncovered insulation, cover board, and membrane rolls) during storage, or just before / after actual use, and coming into contact with a wet surface (such as the plywood sheathing or the surface of the finished membrane).

Roof Leaks: It was documented that at least one roof leak was observed during construction near the east edge of the upper roof area shortly after initial installation of the roof system. AM-1 stated that the leak was caused from either damage to the roof membrane from other trades, or an incomplete penetration flashing. It is unclear as to the actual source; however, the leak was corrected by AM-1 during construction, with no recurring moisture infiltration evident after the repair.

Moisture has entered the roof system, and within the building, due to two current leak locations (reference Figure 2.2 for approximate locations).

- Water that has entered the roof system due to damage or from faulty flashings will allow a significant amount of moisture to exist within this type of system; trapped between the vapor barrier and the roof membrane, within the insulation assembly. Only a hole or void in the vapor barrier will allow the moisture to escape, and, if the breach is located higher than the plane of the roof deck, moisture will continue to exist and migrate through the system.

DISCUSSION – ROOF DESIGN

This roof was designed as a mechanically-fastened TPO roofing system over a rigid insulation assembly. The construction team has expressed interest in resolving the excessive moisture issue by installing vents through the roof to allow the system to “dry out” over time. Vents were not designed into the roof system, and a properly designed and installed roof system should not require vents within the system.

Code requires vapor barriers in certain types of construction, and it is recommended practice to install vapor barriers in certain types of climatic conditions and buildings with special use / function. In this case, the building official required the installation of a vapor barrier as originally specified. This assembly has been referred to as a “closed” system; since a roof membrane exists above the insulation, and a vapor barrier exists below the insulation (above the roof deck). A “closed” system of this type does not require venting if moisture does not exist within the materials.

- The roof system was designed in accordance with industry standards, and, as supplemented by manufacturer submittals, addressed code requirements and building use and function. The fact that a vapor barrier exists does not allow moisture to exit from within the system; however, it is not the intent of the design to install a roof system with the amount of moisture that presently exists.

The roof areas that cover the police station are intended to be somewhat “clean” in appearance, with only the required number of penetrations (plumbing vents, HVAC units, skylights, mechanical equipment, etc.). The roof areas are bordered by gutters, not parapet walls; therefore rooftop equipment that may be located close to roof edges is clearly visible from ground level – especially at the lower roof levels.

- The Owner and design team have expressed interest in maintaining the design intent of having a relatively “clean” roof area, free of excessive roof penetrations that may affect the aesthetics of the building, as well as hinder access when traversing the roof during routine maintenance (HVAC units, cleaning gutters, inspections, etc.). In addition, increased penetrations (if vents are to be added) can be a tripping hazard, may be at risk of allowing moisture to enter the roof system during adverse weather conditions, and are an inherent weak spot in the roof assembly.

ROOF SYSTEM INSPECTION AND APPROVAL

During the process of inspecting the roof areas over the Klamath Falls Police Station, observations were made of general installation practices and detailing. PRC is aware that the roofing materials manufacturer (GAF) has performed an inspection of the roof assembly and has also generated a punch list of items to correct (which were discussed with AM-1 and soon after corrected – shortly after the April 20, 2010 inspection performed by GAF. During our tour of the roof areas, several items were observed that should be addressed in order to conform to GAF standards and warranty requirements, including the following:

1. Base flashing terminations at the perimeter of the skylight on the upper roof area are severely bridged in some locations (not in contact with the substrate), and do not have proper perimeter securement around the curbed penetration. These items must be addressed in order to control damage as a result of possible membrane shrinkage, and to avoid potential wind damage from improper securement.
2. The skylight curb flashings are fabricated using precoated galvanized steel flashings which were installed with no slope to drain, and lapped seams. There is evidence at several seams that water intrusion may be occurring due to improper sealing of the seams, and the fact that the flashings do not properly drain. Corner flashings have not been properly fabricated and seamed.
3. The edge flashing detail at the perimeter of all roof areas utilizes a precoated galvanized steel edge flashing with pressure-sensitive (self-adhering) flashing tape adhered to the metal and to the membrane. At numerous locations, the metal edge flashing has been installed with a slope directed back to the roof surface, and not into the gutter. This has resulted in significant ponding water along the gutter edge.
4. The lapped joints of the metal edge flashing at all gutter edges moves excessively, and is allowing the pressure-sensitive flashing tape to disbond, bridge, and separate from the metal at each edge flashing joint. Moisture can (and in some cases, does) enter the roof system at these locations. The detail is considered high-maintenance.
5. Excessive wrinkles were observed in the membrane, especially at corner locations. While this is inherent with mechanically-fastened roof systems – especially when constructed during the winter months (the membrane “shrinks” during cold weather, and expands during warm weather) – the size of some of the wrinkles may allow increased movement of the membrane during high wind events.
6. A breach in the vapor barrier was observed within the roof assembly at the lower roof area, close in proximity to Core location #6. Air was observed to be escaping from the system at this core location, which indicates a hole in the vapor barrier. This should be investigated further, and a repair method developed in order to prevent interior air from entering into the roof assembly.





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 ProfessionalRoofConsultants.com

MOISTURE TEST # 1

PROJECT:	KLAMATH FALLS POLICE STATION	PROJECT #:	R2888.01
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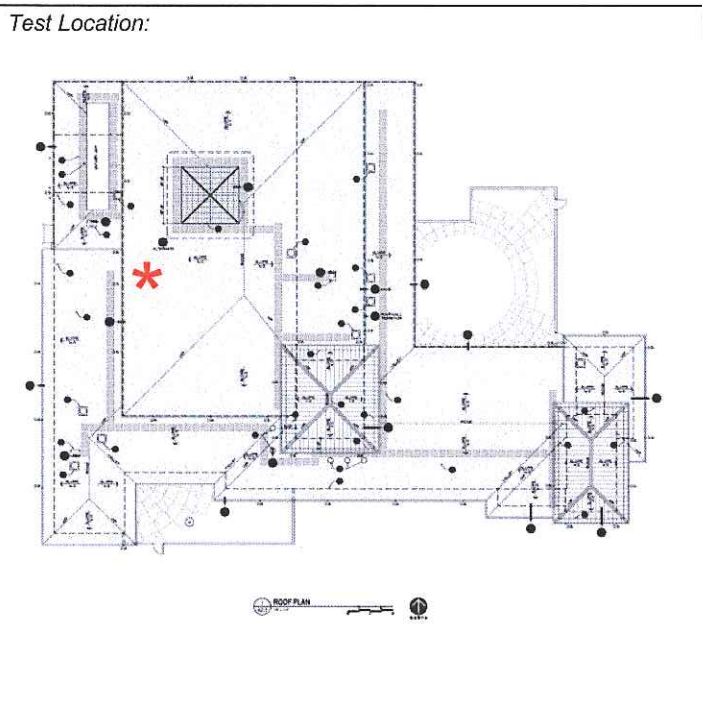
Inspection Date:	05/04/11	Start Time:	10:35 am	Weather @ Start:	Clear, Sunny, 52°F
		Finish Time:	11:00 am	Weather @ Finish:	Clear, Sunny, Light Wind, 54°F

Technicians:
 Thomas Hunziker – AM-1 Roofing
 John Pohorsky - GAF
 Steven L. McBride - Professional Roof Consultants, Inc.

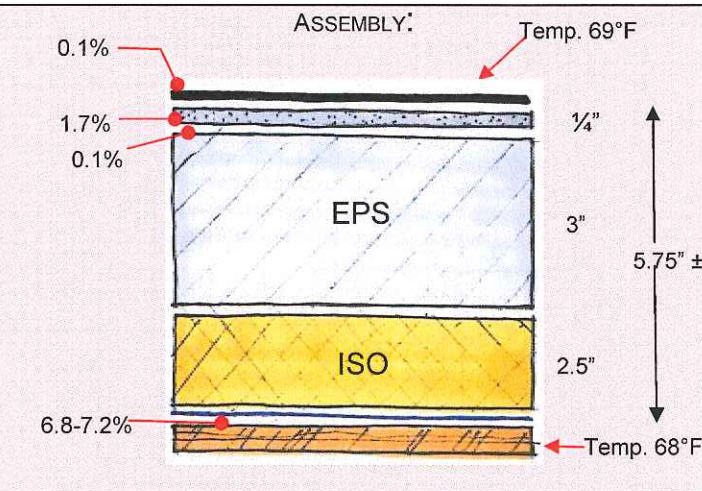
Attendees:
 John Ralston – Phoenix Architecture
 Gordon Crews – HSW
 Rob Kelleher – HSW
 Terry Becerra - GAF

Purpose:
 To determine quantities of moisture that may or may not exist within roof assembly; between vapor barrier at roof deck, within rigid insulation layers, and under roof membrane.

- Setup:
- Approx. 6"x6" area marked on surface of roof membrane as test sample.
 - Each material within system is cut out, evaluated, and tested for moisture.
 - Moisture reading taken with Delmhorst Total Check Electronic Capacitance Meter with attached probes.

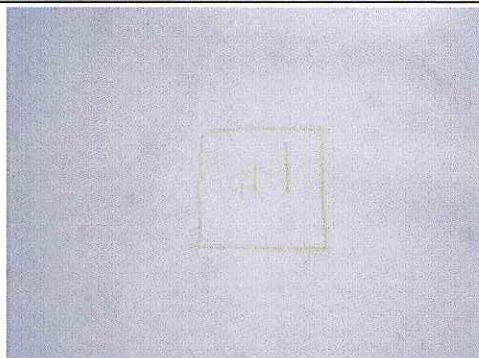


- Observations:
- Meter set to "Drywall" to evaluate content of Densdeck material
 - No signs of moisture on surface of materials
 - Reading = Relatively to Completely Dry as components are dismantled
 - Cover board, insulation, vapor barrier are all dry and in good condition with no moisture present.
 - Plywood substrate is considered to be dry.



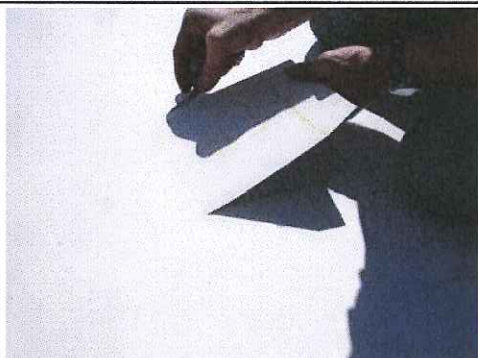
A. PHOTO DOCUMENTATION

1.01



View of marked Core location #1.

1.02



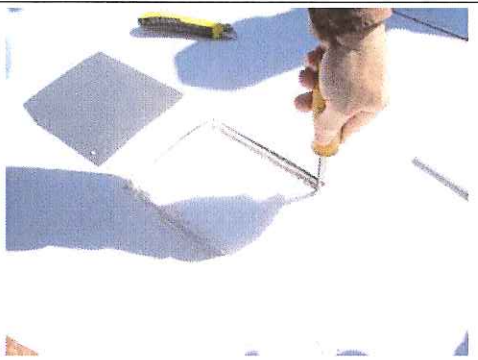
Membrane is cut at marked location.

1.03



Cover board is cut and removed.

1.04



Tapered EPS insulation is cut and removed.

1.05



Polyisocyanurate insulation is cut and removed.

1.06



Probes inserted into plywood through cut in vapor barrier.

END OF MOISTURE TEST #1

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MOISTURE TEST # 2

PROJECT:	KLAMATH FALLS POLICE STATION	PROJECT #:	R2888.01
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<i>Inspection Date:</i>	05/04/11	<i>Start Time:</i>	N/A	<i>Weather @ Start:</i>	N/A
		<i>Finish Time:</i>	N/A	<i>Weather @ Finish:</i>	N/A

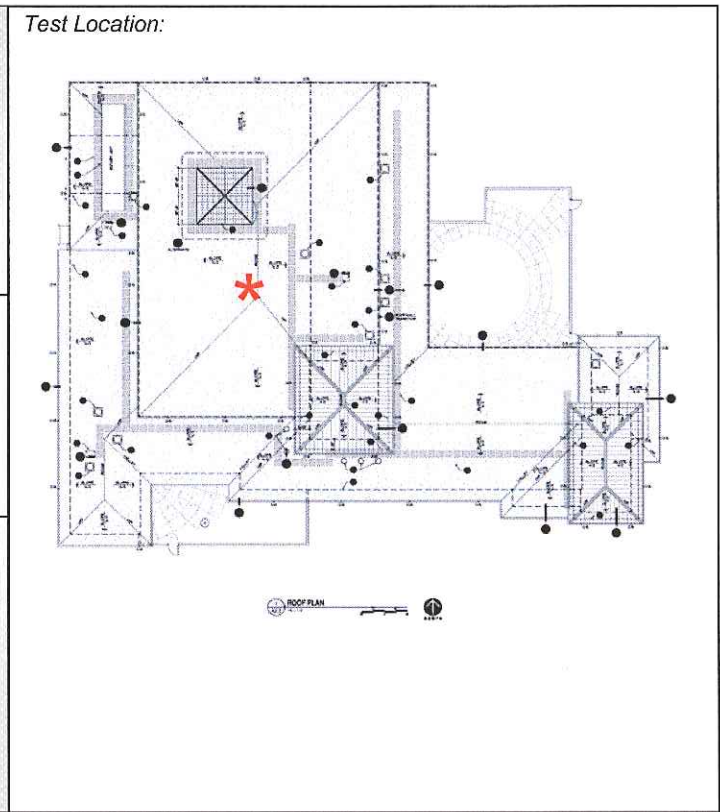
Technicians:
 Thomas Hunziker - AM-1 Roofing
 John Pohorsky - GAF
 Steven L. McBride - Professional Roof Consultants, Inc.

Attendees:
 John Ralston - Phoenix Architecture
 Gordon Crews - HSW
 Rob Kelleher - HSW
 Terry Becerra - GAF

Purpose:
 To determine quantities of moisture that may or may not exist within roof assembly; between vapor barrier at roof deck, within rigid insulation layers, and under roof membrane.

Setup:

- Approx. 6"x6" area marked on surface of roof membrane as test sample.



Observations:

NO TEST PERFORMED AT THIS TEST LOCATION.

END OF MOISTURE TEST #2

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MOISTURE TEST # 3

PROJECT:	KLAMATH FALLS POLICE STATION	PROJECT #:	R2888.01
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<i>Inspection Date:</i>	05/04/11	<i>Start Time:</i>	11:40 am	<i>Weather @ Start:</i>	Clear, Sunny, 59°F
		<i>Finish Time:</i>	12:10 pm	<i>Weather @ Finish:</i>	Clear, Sunny, Light Wind, 60°F

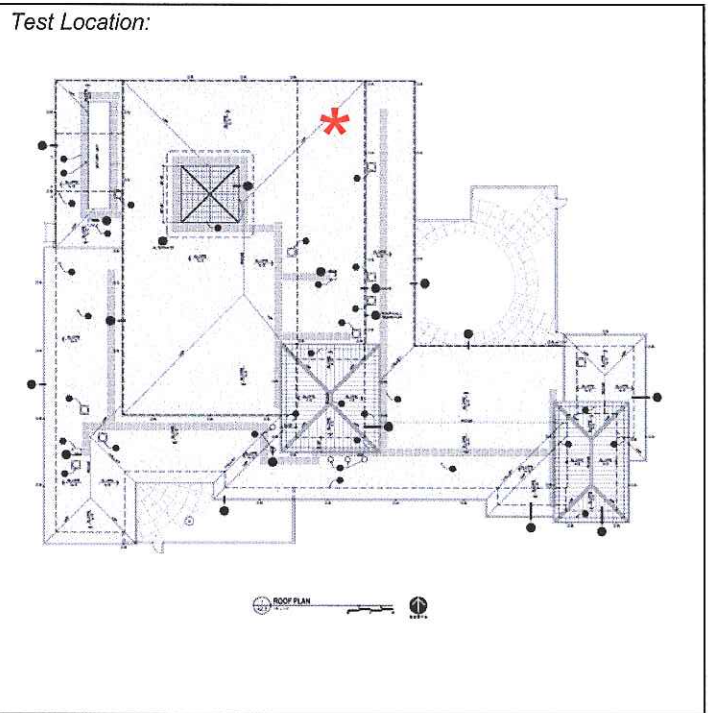
Technicians:
 Thomas Hunziker - AM-1 Roofing
 John Pohorsky - GAF
 Steven L. McBride - Professional Roof Consultants, Inc.

Attendees:
 John Ralston - Phoenix Architecture
 Gordon Crews - HSW
 Rob Kelleher - HSW
 Terry Becerra - GAF

Purpose:
 To determine quantities of moisture that may or may not exist within roof assembly; between vapor barrier at roof deck, within rigid insulation layers, and under roof membrane.

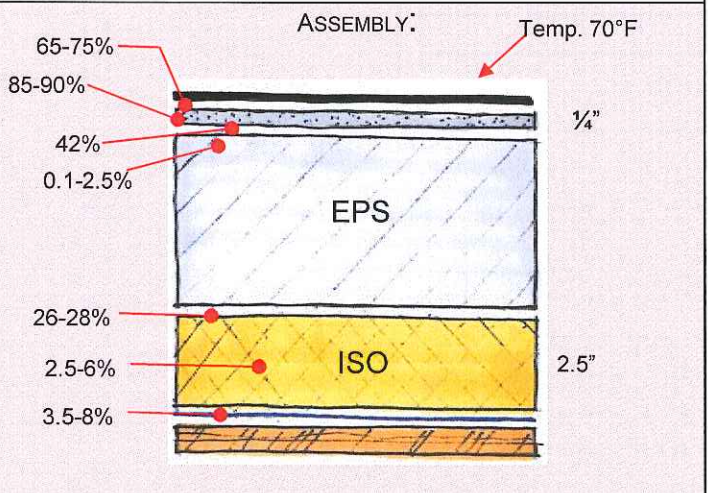
Setup:

- Approx. 6"x6" area marked on surface of roof membrane as test sample.
- Each material within system is cut out, evaluated, and tested for moisture.
- Moisture reading taken with Delmhorst Total Check Electronic Capacitance Meter with attached probes.



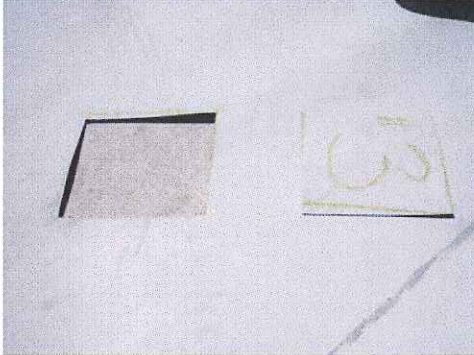
Observations:

- Meter set to numerical reference scale (Relative 0-100) for testing of variety of materials.
- Visibly wet on surface of Densdeck and underside of membrane.
- "Thumb Pressure" on Densdeck: Slight. Compression of Densdeck: Feels "wet" to touch (damp) has lost compression resistance.
- Moist materials toward top.
- Damp facer on ISO.
- This area seems to be the "wettest" of all areas tested.



A. PHOTO DOCUMENTATION & OBSERVATIONS

3.01



Membrane cut and removed to reveal underlying DensDeck cover board.

3.02



Moisture probes inserted through face of cover board.

3.03



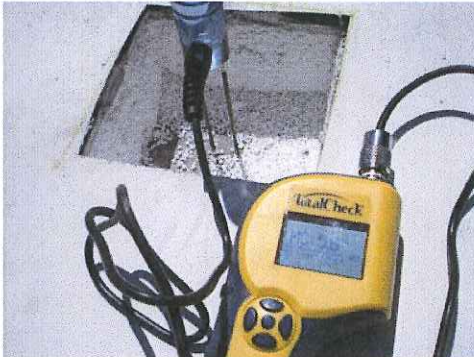
View of underside of membrane where moisture was observed.

3.04



Moisture readings taken at face of lower polyiso layer of insulation.

3.05



Probes inserted into core of polyiso insulation.

3.06



Measurement taken at core location.

END OF MOISTURE TEST #3

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MOISTURE TEST # 4

PROJECT:	KLAMATH FALLS POLICE STATION	PROJECT #:	R2888.01
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<i>Inspection Date:</i>	05/04/11	<i>Start Time:</i>	11:00 am	<i>Weather @ Start:</i>	Clear, Sunny, 54°F
		<i>Finish Time:</i>	11:35 am	<i>Weather @ Finish:</i>	Clear, Sunny, Light Wind, 58°F

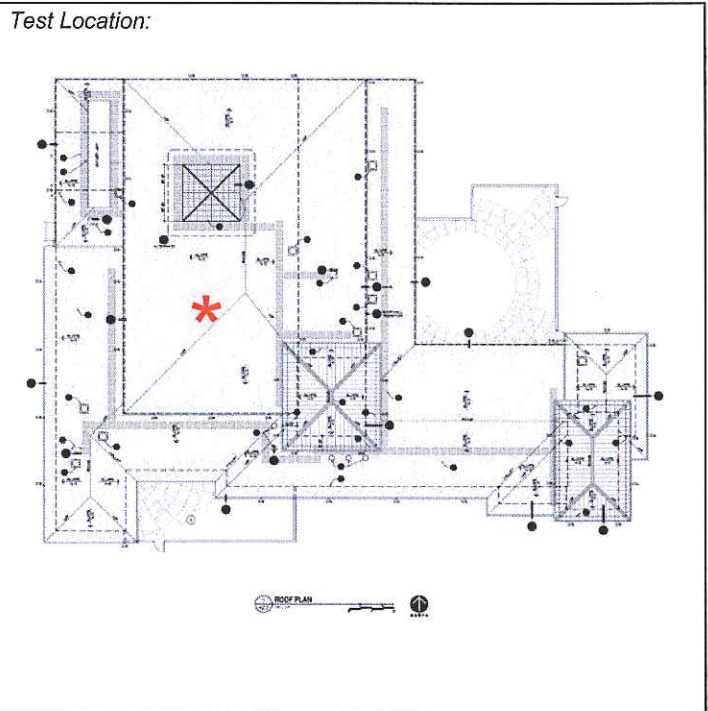
Technicians:
 Thomas Hunziker - AM-1 Roofing
 John Pohorsky - GAF
 Steven L. McBride - Professional Roof Consultants, Inc.

Attendees:
 John Ralston - Phoenix Architecture
 Gordon Crews - HSW
 Rob Kelleher - HSW
 Terry Becerra - GAF

Purpose:
 To determine quantities of moisture that may or may not exist within roof assembly; between vapor barrier at roof deck, within rigid insulation layers, and under roof membrane.

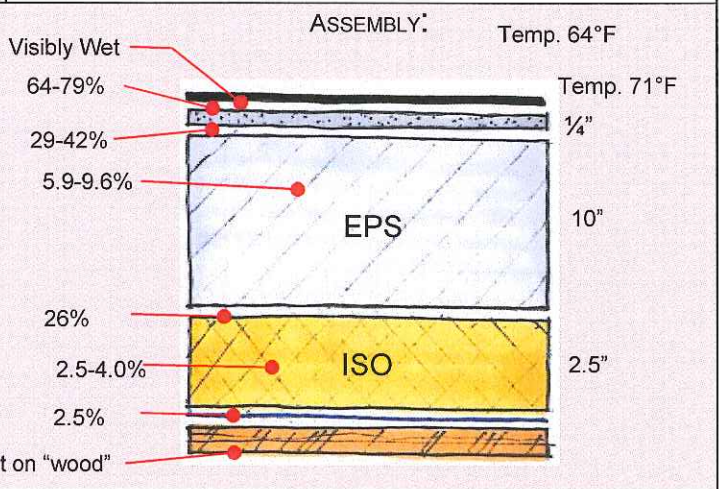
Setup:

- Approx. 6"x6" area marked on surface of roof membrane as test sample.
- Each material within system is cut out, evaluated, and tested for moisture.
- Moisture reading taken with Delmhorst Total Check Electronic Capacitance Meter with attached probes.



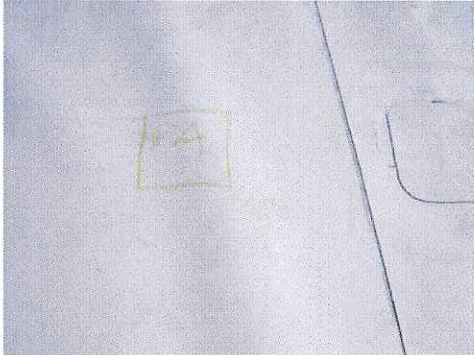
Observations:

- Meter set to numerical reference scale (Relative 0-100).
- Moisture found near surface, minor moisture at lower levels of assembly.
- Moisture at surface.
- Physically and visibly wet at underside of roof membrane and top of Densdeck.
- Switched testing to relative to associate levels of different materials.



A. PHOTO DOCUMENTATION & OBSERVATIONS

4.01



View of marked Core location on membrane.

4.02



Moisture readings taken at facer of cover board.

4.03



Moisture readings taken within core of cover board.

4.04



Probes inserted at facer of polyiso insulation layer.

4.05



Readings taken through vapor barrier and into plywood sheathing.

4.06



Measurement taken at core location.

END OF MOISTURE TEST #4

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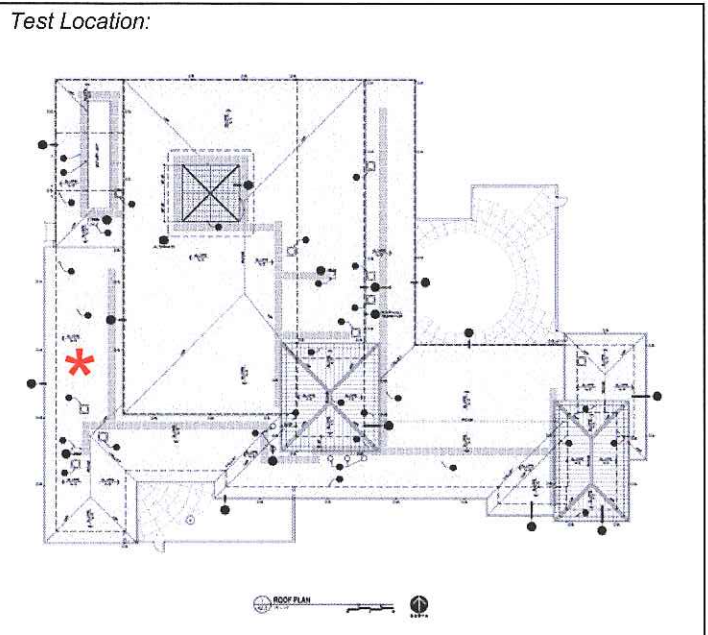
MOISTURE TEST # 5

PROJECT:	KLAMATH FALLS POLICE STATION	PROJECT #:	R2888.01
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<i>Inspection Date:</i>	05/04/11	<i>Start Time:</i>	12:30 pm	<i>Weather @ Start:</i>	Clear, Sunny, Breezy, 61°F
		<i>Finish Time:</i>	12:42 pm	<i>Weather @ Finish:</i>	Clear, Sunny, Light Wind, 62°F

Technicians:
 Thomas Hunziker – AM-1 Roofing
 John Pohorsky - GAF
 Steven L. McBride - Professional Roof Consultants, Inc.

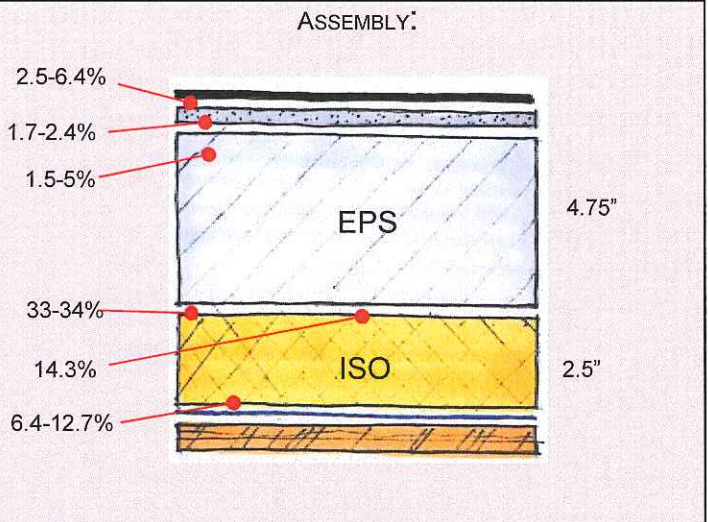
Attendees:
 None



Purpose:
 To determine quantities of moisture that may or may not exist within roof assembly; between vapor barrier at roof deck, within rigid insulation layers, and under roof membrane.

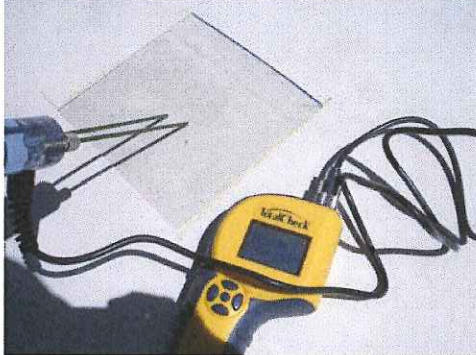
- Setup:
- Approx. 6"x6" area marked on surface of roof membrane as test sample.
 - Each material within system is cut out, evaluated, and tested for moisture.
 - Moisture reading taken with Delmhorst Total Check Electronic Capacitance Meter with attached probes.

- Observations:
- Meter set to numerical reference scale (Relative 0-100).
 - Visibly and physically dry at top.
 - Lower zone (face of ISO) is damp on facer more damp.
 - Joint area (joint/gap in insulation) contains more moisture than adjacent surfaces.
 - Evidence of minor-moderate amounts of Moisture at this location.
 - Most moisture exists at facer of ISO layer of insulation.



A. PHOTO DOCUMENTATION & OBSERVATIONS

5.01



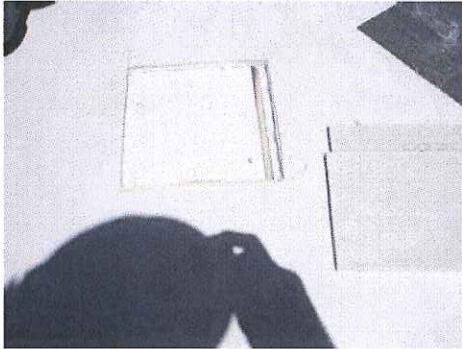
Membrane cut and removed to expose surface of cover board.

5.02



Probes inserted into core of cover board.

5.03



Cover board removed to expose tapered EPS insulation.

5.04



Probes inserted into facer of underlying polyiso insulation.

5.05



Moisture reading taken at upper portion of polyiso insulation layer.

5.06



Measurement taken of assembly at core.

END OF MOISTURE TEST #5

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MOISTURE TEST # 6

PROJECT:	KLAMATH FALLS POLICE STATION	PROJECT #:	R2888.01
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<i>Inspection Date:</i>	05/04/11	<i>Start Time:</i>	12:50 pm	<i>Weather @ Start:</i>	Sunny, Warm, 62°F
		<i>Finish Time:</i>	1:10 pm	<i>Weather @ Finish:</i>	Sunny, Warm, 62°F

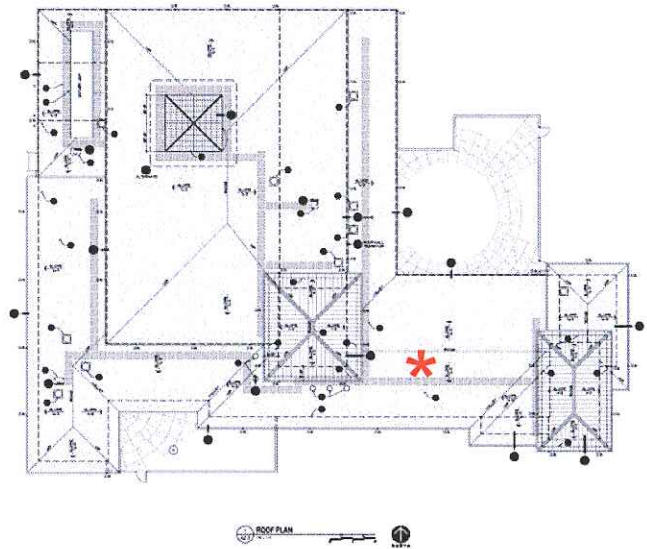
Technicians:
 Thomas Hunziker - AM-1 Roofing
 John Pohorsky - GAF
 Steven L. McBride - Professional Roof Consultants, Inc.

Attendees:
 None

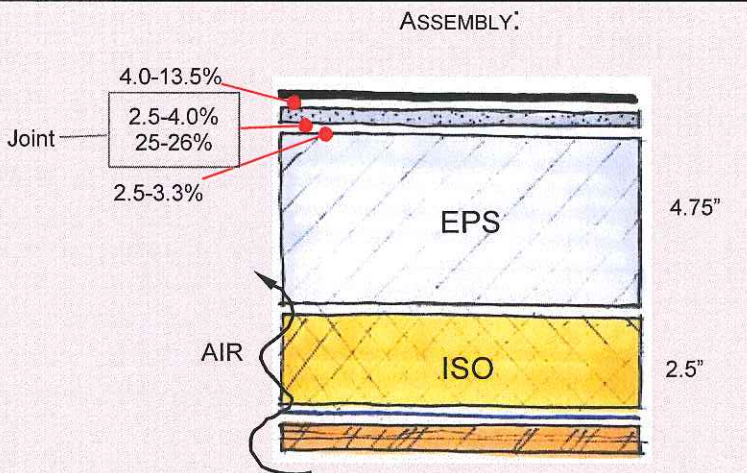
Purpose:
 To determine quantities of moisture that may or may not exist within roof assembly; between vapor barrier at roof deck, within rigid insulation layers, and under roof membrane.

- Setup:
- Approx. 6"x6" area marked on surface of roof membrane as test sample.
 - Each material within system is cut out, evaluated, and tested for moisture.
 - Moisture reading taken with Delmhorst Total Check Electronic Capacitance Meter with attached probes.

Test Location:



- Observations:
- Meter set to numerical reference scale (Relative 0-100).
 - Visibly dry, but Densdeck is moist.
 - Physically moist, but structurally sound. Test taken at Joint: Difference in moisture content on either side of joint.
 - Air leak is observed: Air pressure from interior source is blowing air into/through insulation joints.



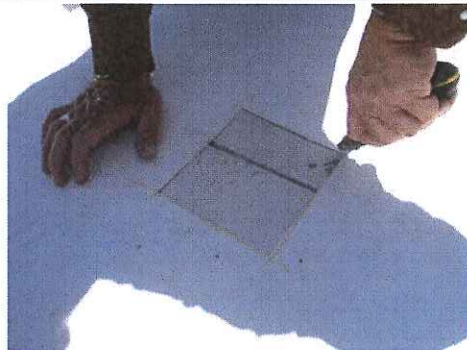
A. PHOTO DOCUMENTATION & OBSERVATIONS

6.01



Test location marked on surface of membrane.

6.02



Cover board cut in preparation of being removed to expose EPS insulation.

6.03



Testing of facer where moisture was observed on polyiso insulation.

6.04



Moisture readings taken at facer of polyiso insulation.

6.05



Moisture reading taken at surface of vapor barrier at joint of insulation.

6.06



Measurement taken from deck (within insulation joint) to top of assembly.

END OF MOISTURE TEST #6

PROFESSIONAL ROOF CONSULTANTS, INC.

3. CONCLUSIONS



MOISTURE WITHIN ROOF SYSTEM

The roof systems that cover the new Klamath Falls Police Station contain varying levels of moisture. Moisture primarily exists within the facer material of lower level rigid polyisocyanurate insulation, and within the gypsum-based DensDeck cover board in which the roof membrane is placed over. The parties that are involved in this issue can all agree that moisture does exist, and that corrective action is required in order to remove the moisture. Replacement of the roof systems may not be necessary, as the amount of moisture that currently resides in the system has not damaged the components or the system as a whole.

Venting of the roof system has been proposed, and can quite possibly prove to be an effective method of removing moisture; however, vents should only be considered temporary (not a permanent part of the system).

In addition, the venting option can only be considered if the membrane manufacturer (GAF) will honor the specified and issued warranty once the existing insulation components are considered to be dry, and the vents are then removed from the system – in order to return the roof system to the assembly that was specified.

As part of this evaluation, PRC worked with GAF after the site survey to determine if the wet cover board – which exhibits lower compressive / impact strength than a normal dry sample – could be effectively dried. A sample of the wet cover board was retained by GAF for testing. Testing included drying the sample (at room temperature for one week) and analyzing the material to determine the compressive / impact strength after drying vs. a control (new) sample. Results of testing revealed an impact resistance equal to the control sample. GAF concluded that the manufacturer would honor the issued warranty as long as the wet materials could be dried.

CORRECTIVE ACTION

The following corrective action is being proposed in an effort to dry the roof and return the materials to an acceptable condition, and to provide a warranted roof system with a longevity that will match the design life of the system:

1. Receive letter of agreement from the roofing material manufacturer and affected contractors stating the intent of this process, and their agreement to supply specified warranties upon successful completion of the repair process.
2. Provide manufacturer-approved, one-way roofing vents (approximately 34 units); consider GAF 1-way TPO low-profile roofing vents. (Reference Figure 3.1 for proposed vent layout.)
3. Install vents through membrane, and where required, cut and remove cover board to allow for free venting of underlying insulation units.
4. Vents shall be flashed to roof membrane by heat-welding technique, per manufacturer's published installation instructions.
5. Vents shall be installed in spring of 2011, with manufacturer providing inspections of completed vent installation to determine proper installation.
6. In September of 2011, roof assemblies shall be inspected to determine moisture content of insulation. If testing reveals dry materials (to a point as determined satisfactory by all parties), vents shall be removed, and new roof membrane and cover board installed over openings in roof.
7. Manufacturer to provide written 10-year NDL warranty starting from date of completed repair process (or extend previously issued warranties).

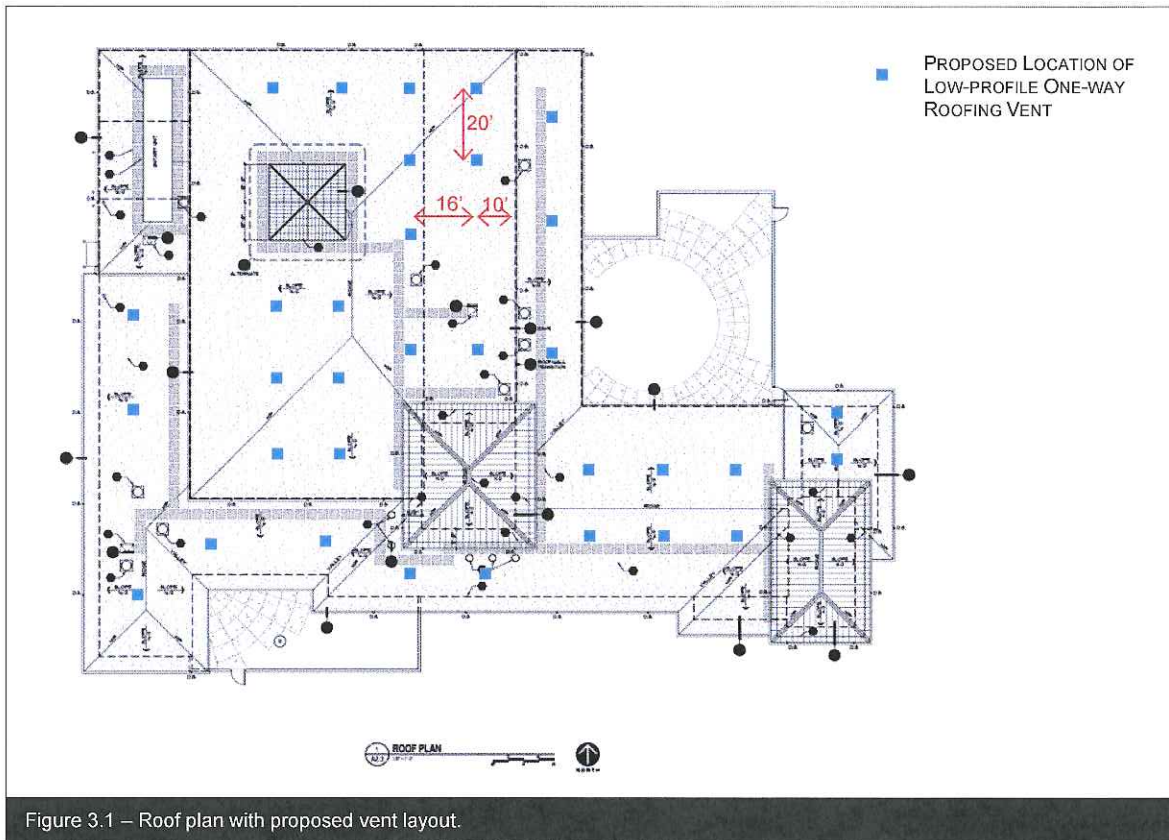


Figure 3.1 – Roof plan with proposed vent layout.

ASSIGNMENT OF RESPONSIBILITY

Weather and Installation: Historical weather data and daily reports reveal that there is a high probability of moisture entering the roof assembly during installation of the roof, at each roof area of the building. In addition, phasing of roof system components and related sheet metal flashings may also have allowed moisture to enter the roof system at locations that were incomplete over extended periods of time (gutter edges and penetrations, un-clad walls, etc.).

Moisture Content in Roof Deck: Moisture within the plywood sheathing is considered to be a small contributor to moisture that now exists within the roof assemblies.

Moisture Content in Roofing Materials: There is a high probability that some moisture that currently exists within the roof system originated from the use of wet materials within the roof system; most being wet insulation that may not have been adequately protected from the elements.

Roof Leaks: Water has entered the roof system due to past and current roof leaks, and is considered to be a significant contributor to the current roof moisture issue. Leaks must be resolved before the system can be dried.

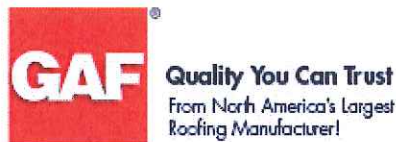
Roof Design: The existence of moisture within the system is not a direct result of the design of the roof, or the existence of the vapor barrier within the roof assembly.

ROOF SYSTEM INSPECTION AND APPROVAL

As part of the repair process for this roof assembly, the contractors are expected to comply with manufacturer's published installation instructions and recommendations for roof system securement and flashing of penetrations and terminations. This shall include roof penetrations (skylights) which are not warranted by the manufacturer, but are flashed into the roof system. The roofing materials manufacturer shall provide recommendations and approvals to correct the following deficiencies:

1. Base flashing terminations at the perimeter of the skylight on the upper roof area must be corrected to remove bridged membrane and to provide proper securement of the membrane at the perimeter of the large skylight curb.
2. The pre-coated galvanized steel flashings which terminate the roofing system at the skylight curb, and extend up under the curbed skylight unit, must be removed and replaced with flashings that are properly seamed, that have appropriate sealant applied between flashing seams, and that slope to drain.
3. The edge flashing detail at the perimeter of all roof areas should be corrected to provide proper slope to drain into gutters. Ponding water along the flashing termination should not be considered acceptable.
4. The lapped joints of the edge flashings are not adequately covered with flashing materials, and are not properly anchored / sealed to resist water penetration as a result of movement. Repairs must be installed at all edge flashing joints in a manner that will not result in annual failure as a result of flashing movement.
5. Manufacturer to address possible repairs to membrane locations where excessive wrinkling has occurred, and where there is a risk of wind damage perimeter and in-seam securement issue).
6. At the lower roof level, near Core / Test location #6, a breach in the vapor barrier was observed by witnessing air being forced through the insulation units from within the building (which exited the core location). The vapor barrier breach must be identified and repaired in order to prevent interior air from entering into the roof assembly.

Repairs must be performed in an effort to provide a roof system with a minimum 20-year service life, and to minimize maintenance and repair requirements over the life of the roof system. All repairs shall be in accordance with the project contract documents, and manufacturer's published installation requirements as required to receive specified warranties.



John Pohorsky RRC
Field Services
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Fontana CA 92337

15 June 2011

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Samanthea Totten-Perry
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Klamath Falls OR 97601

samtp@ci.klamath-falls.or.us

**REFERENCE: KLAMATH FALLS POLICE STATION
2501 SHASTA WAY
KLAMATH FALLS OREGON 97601**

SUBJECT: GAF FILE # 2010-00000150 LEAK INSPECTION REPORT

Dear Rob and Samantha:

GAF has been requested by HSW Builders to review the report, project # R2888.01 prepared by Steven McBride; PRC, Inc dated May 20, 2011. GAF attended the 4 May 2011 site inspection and assisted with the coring and documenting of the roof samples. The PRC, Inc. report, appears to be accurate based on the results of the 4 May 2011 findings. However, the report goes beyond the 4 May inspection and although probably factual, GAF will not comment on items in which we have no firsthand knowledge.

Typically, moisture enters into a roof assembly through three modes; roof leaks through the completed assembly, wet materials that comprise the roof system, or moisture / water vapor from the interior collecting within the assembly and condensing. Keeping this in mind, I have included what I believe to be the primary facts collected and documented in the PRC, Inc. report.

The report states, in part, the following:

- "There were two known leak locations both on the upper roof area. This could account for some or all of the moisture found when this roof was cored on 4 May".
- "11 out of 24 days were considered high risk and the probability of moisture entering in the system is considered high."
- "The probability of moisture existing within the roof system due to wet roofing materials is high because some materials were stored without proper weather protection."
- "The GAF inspection dated February 11, 2011 concluded lack of venting appears to be the consensus of the manufacturer's inspector and the roofing contractor." The lack of venting could cause moisture build up within the assembly if the system were design to exhaust trapped moisture. Based on the roofing contractor's; Thomas Hunziker; AM-1 Roofing, suggestion to install vents during the 4 May 2011 inspection Thomas was more persuasive that vents are the answer. GAF does recommend vents when overlaying an existing roof as it is difficult to verify if there is trapped moisture within an existing assembly and vents roof systems where the roof deck is known to contain moisture such as concrete, gypsum, insulating lightweight concrete. However, GAF does not default to the installation of roof vents on all roof installations as some roofing manufacturer's do.
- "A vapor barrier was designed and incorporated into the roof assembly and at core location #6, an air leak was observed: Air pressure from interior source is blowing air into/through insulation joints." This is in an indication that the vapor barrier may have been compromised during installation or the lack proper determination may also allow the vapor pressure into the roof assembly.

The report provides probable causes of the moisture within the system and substantial evidence to the same; however, GAF believes it is inconclusive as to the root cause(s) or source(s) of the moisture. It may never be possible to be 100% conclusive and that being said it appears the conclusions based on the information gathered could be a viable solution. GAF agrees that any leak sources discovered in the roof membrane need to be properly addressed as well as compromises in the vapor barrier. The goal is to prevent additional moisture from entering into the assembly, either from the top down through the membrane or the bottom up through the vapor barrier. Then properly address the trapped moisture.

The next issue is dealing with the moisture, which is currently trapped within the system. It has been suggested that 32 one-way roof top vents be installed to "dry out the moisture" and this could be possible however many articles have been written and investigations conducted and the effectiveness of vents are inconclusive. In some cases they appear to dry out the roof assembly and others they appear to add moisture into the assembly. Without additional information GAF is not certain nor could we guarantee that one way vents will properly address the existing moisture. The goal is to move the moist air trapped within to remove or exhaust. These vents could be temporary as we are removing the existing trapped moisture and no additional moisture should be entering into the system if the sources are properly addressed as described above.

Steep slope roof installations incorporate mechanical venting to exhaust the air in the attic areas, which has been proven effective. Would it be prudent to discuss incorporating a mechanical vent(s) on the roof to move the air within the mechanically fastened system thus exhausting the current air out to dry the system? This could eliminate the need for as many static vents as proposed.

GAF appreciates the professional involvement of all parties involved to reach a common goal of determining the sources of the moisture, eliminating these sources, dealing with the trapped moisture and then ultimately providing the building owner with a roof assembly compliant with the requirements of the specification. We look forward to additional discussions to move this process along.

Respectfully,

GAF



John Pohorsky, RRC
Field Services

Cc: Project file, AM 1 Roofing; Thomas@am1roofing.com, PRC, Inc.; Steven McBride

KlamathFallsPoliceStationLeakInspection.Doc

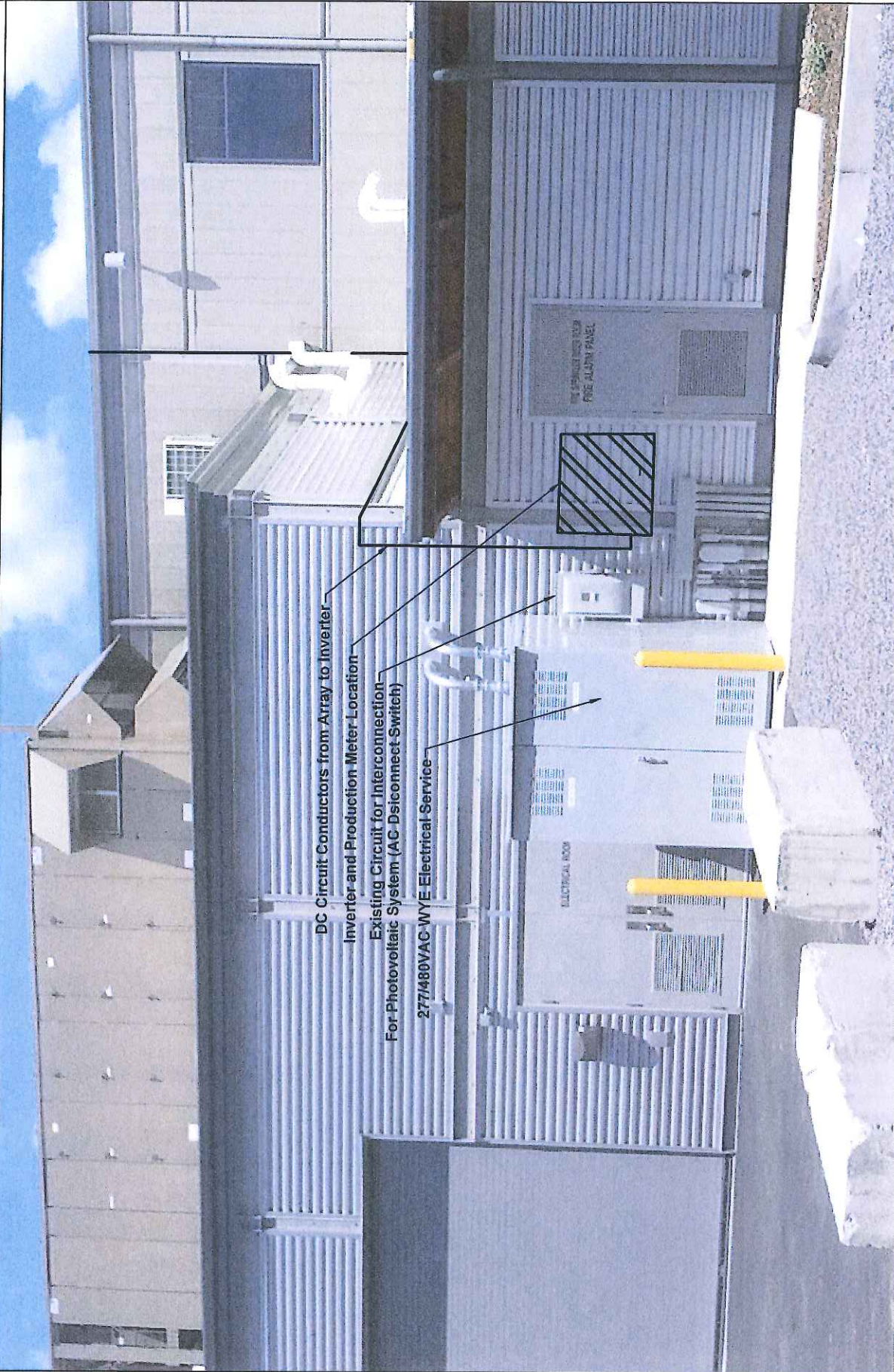
Site Plan



Proposed Array Location
(South-West Corner of Upper Roof)

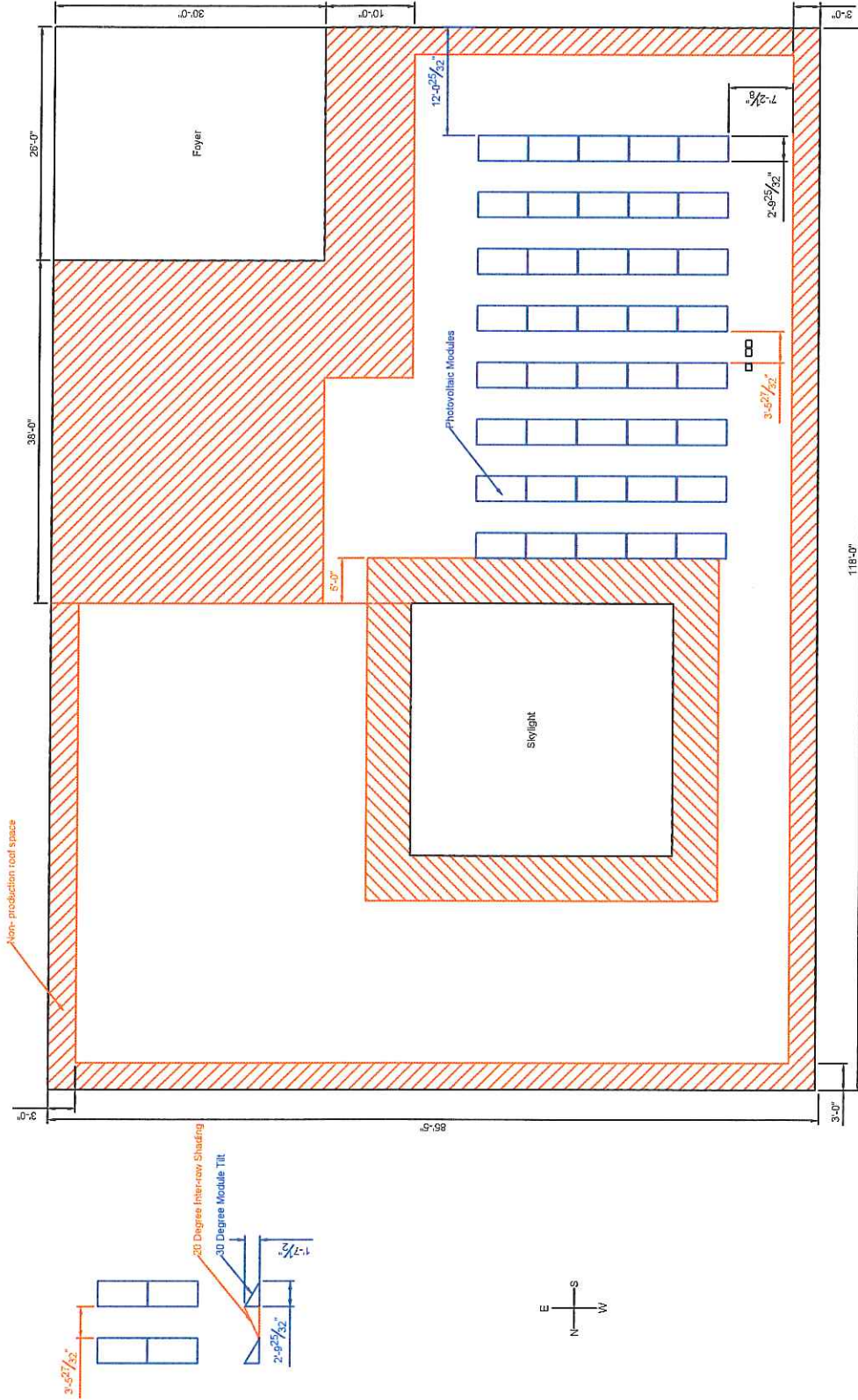
Project Name:	Klamath Falls Police Station	Rev: 1
Sheet Title:	9.4kw Grid Tied Photovoltaic System	
Location:	2501 Shasta Way, Klamath Falls, OR, 97601	
Date:	6/6/2011	Scale: N/A
		Sheet: 1a/5

Site Plan



Project Name: Klamath Falls Police Station		Rev: 1
Sheet Title: 9.4kw Grid Tied Photovoltaic System		
Location: 2501 Shasta Way, Klamath Falls, OR, 97601		
Date: 6/6/2011	Scale: N/A	Sheet 1b/5

Racking Layout



Project Name: Klamath Falls Police Station

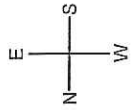
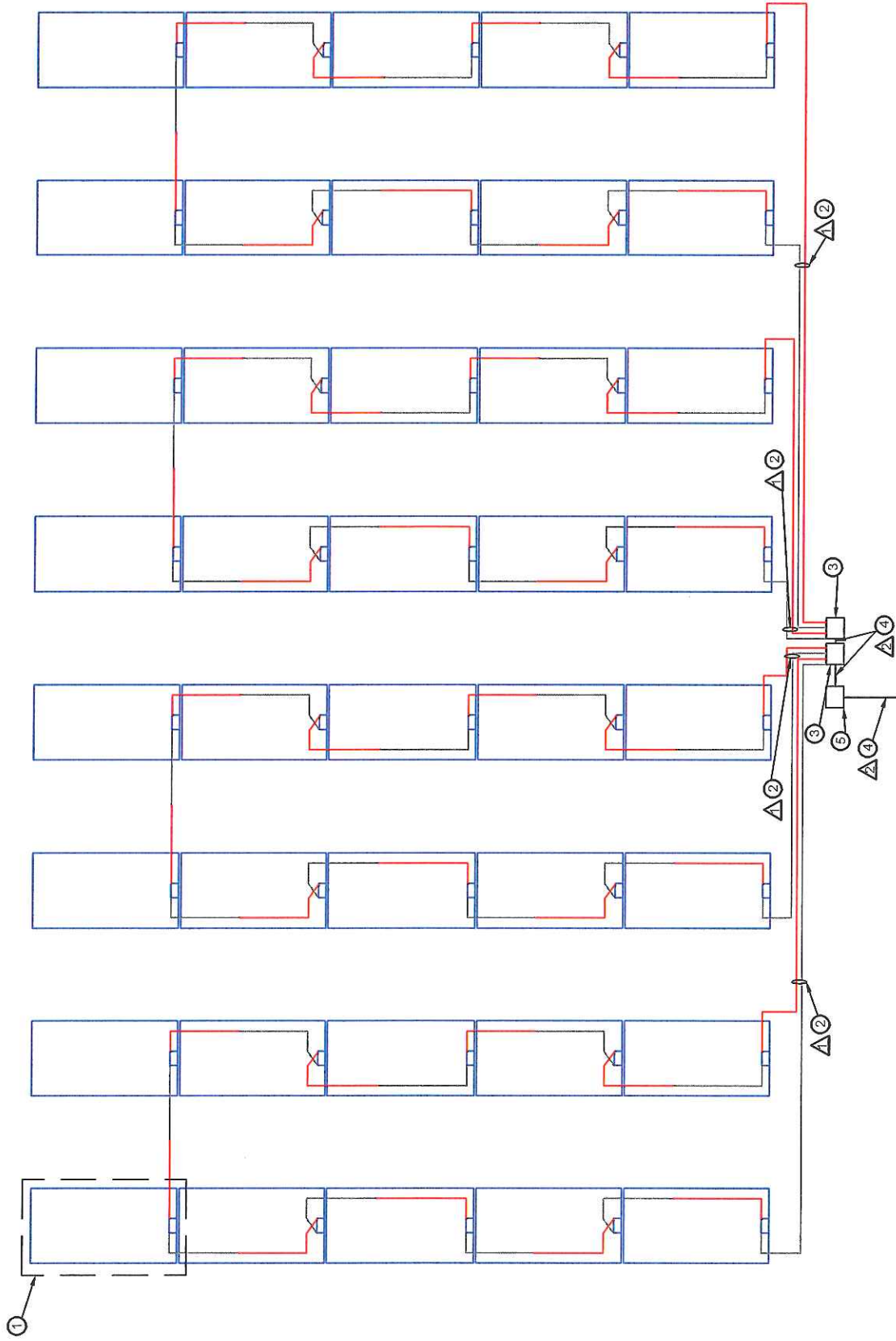
Sheet Title: 9.4kw Grid Tied Photovoltaic System

Location: 2501 Shasta Way, Klamath Falls, OR, 97601

Date: 6/6/2011 Scale: N/A Sheet: 2/5

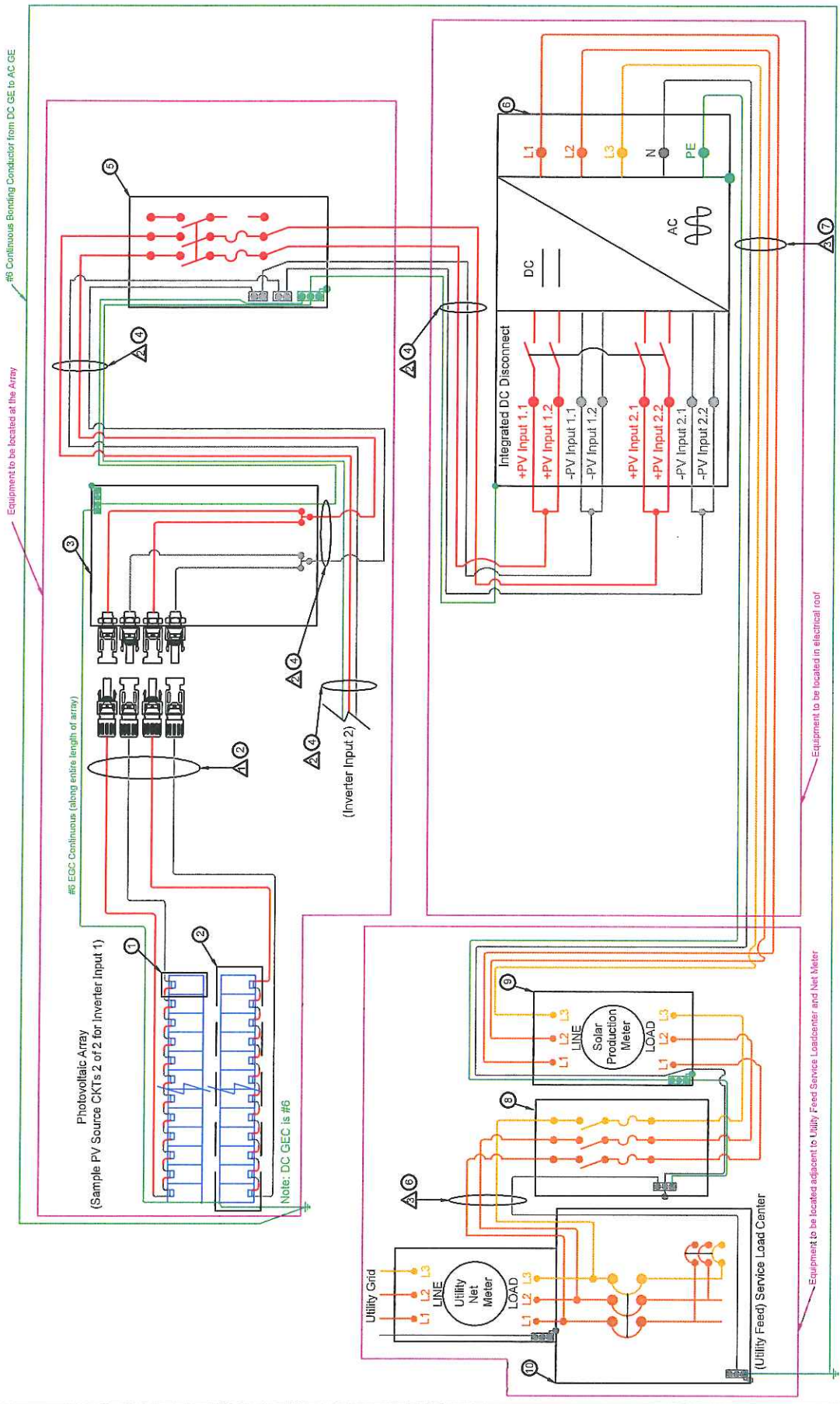
Rev: 1

Source Circuit Details



Project Name:	Klamath Falls Police Station	Rev: 1
Sheet Title:	9.4kw Grid Tied Photovoltaic System	
Location:	2501 Shasta Way, Klamath Falls, OR, 97601	
Date:	6/6/2011	Sheet: 3/5
	Scale: N/A	

Electrical Schematic



Project Name:	Klamath Falls Police Station
Sheet Title:	9.4kw Grid Tied Photovoltaic System
Location:	2501 Shasta Way, Klamath Falls, OR, 97601
Date:	6/6/2011
Scale:	N/A
Sheet:	4/5
Rev:	1

Equipment and Wire Schedule

Tag	PV Module Ratings @ STC (Same for Inverter Input 1 and 2)	Tag	DC Disconnect Ratings (Same for Inverter Input 1 and 2)
①	Module Make	SolarWorld or Equal	Make
	Module Number	Sunmodule SW235	Model
	Max Power-Point Current (Imp)	7.77A	Current Rating / Voltage Rating
	Max Power-Point Voltage (Vmp)	30.3V	Overcurrent Protection Fuse Size
	Open-Circuit Voltage (Voc)	37.5V	NEMA Enclosure Rating/ UL Listing
	Short-Circuit Current (Isc)	8.19	
	Max-Series Fuse (OCPPD)	15A	
	Max Power (Pmp)	235W	
	Type of Connectors/ UL Listing	MC4/ UL1703	
	Dimensions	65.55" x 39.02"	
Total Modules in Array	40		
②	PV Source Circuit Ratings (Same for Inverter Input 1 and 2)		
	Number of Modules in Series	10	Number of Inverters
	Imp @ STC	7.77	Inverter Make/ Inverter Model
	Vmp @STC	303.0V	MPPT-Voltage Range
	Voc @ STC	375.0V	Max DC Input Voltage
	Isc @STC	8.19A	Max Array Isc
	Min Circuit Voltage (Average Low Temp)	272.7V	
	Max Circuit Voltage (Record High Temp)	443.1V	
	Circuit Distance	65'	
	Circuit Conductor Type and Size	Pos.: USE-2 10AWG, Neg.: USE-2 10AWG Grid.: Bare #6 if in free air (THWN-2 if in conduit)	
③	Percentage of Voltage Drop in Circuit	0.60%	Percentage of Voltage Drop in Circuit
	Conduit Type and Size	FREE AIR	Conduit Type and Size
④	Combiner Box Ratings (Same for Inverter Input 1 and 2)		
	Make	MidNite Solar or Equal	Current Rating/ Voltage Rating
	Model	MNPV3	Number of Poles
	Max Circuit Amps/ Voltage	20A/ 600VDC	NEMA Enclosure Rating
	Max Rated Current (Continuous)	60A	
	NEMA Enclosure Rating/ UL Listing	Type 3R/ UL 1741	
	PV Output Circuit Ratings (Same for Inverter Input 1 and 2)		
	Total Number of Strings	2	
	Rated Max Imp	7.77A	
	Max Circuit Current	8.19A	
Max Circuit OCPD (156% applied to Isc)	12.76A		
⑤	Inverter Ratings		
	Circuit Distance	60'	
	Circuit Conductor Type and Size	Pos.: THWN-2 4AWG, Neg.: THWN-2 4AWG, Grid.: Bare #6 if in free air (THWN-2 if in conduit)	
	Percentage of Voltage Drop in Circuit	0.25%	
	Conduit Type and Size	(1)-3/4" EMT	
	Solar Production Meter Ratings		
	Max. Current Rating	100A	
	NEMA Enclosure Rating	3R	
	Number of Jaws	7	
	(Utility Feed) Existing Service		
Main Breaker Size/ Busbar rating	1000A/ 1000A		
Service Conductors Size	(3)500MCM		
System Voltage (3 phase)	480V WYE		
Overall Voltage Drop			
VDC_Drop Total For		0.88%	
VAC_Drop Total		0.11%	
⑥	Inverter Output Circuit Ratings		
	Circuit Distance	20'	
	Circuit Conductor Type and Size	L1.: THWN-2 10AWG L2.: THWN-2 10AWG, L3.: THWN-2 10AWG NUC.: THWN-2 10AWG, Grid.: THWN-2 6AWG	
	Percentage of Voltage Drop in Circuit	0.11%	
	Conduit Type and Size	3/4" EMT	
	(Photovoltaic Output) Fused Service Disconnect Ratings		
	Current Rating/ Voltage Rating	800V/ 30A	
	Number of Poles	3	
	NEMA Enclosure Rating	3R	
	Solar Production Meter Ratings		
Max. Current Rating	100A		
NEMA Enclosure Rating	3R		
Number of Jaws	7		
(Utility Feed) Existing Service			
Main Breaker Size/ Busbar rating	1000A/ 1000A		
Service Conductors Size	(3)500MCM		
System Voltage (3 phase)	480V WYE		
Overall Voltage Drop			
VDC_Drop Total For		0.88%	
VAC_Drop Total		0.11%	

Project Name: Klamath Falls Police Station	
Sheet Title: 9.4kw Grid Tied Photovoltaic System	Rev: 1
Location: 2501 Shasta Way, Klamath Falls, OR, 97601	
Date: 6/6/2011	Scale: N/A
	Sheet: 5/5



POWER-FAB® CRS
Non-penetrating Flat Roof
Mounting System



- COMMUNICATIONS
- ENERGY
- SPECIAL INDUSTRIES
- SOLAR

POWER-FAB®
Quality Hardware for the PV Industry



The POWER-FAB® CRS PV Solar Mounting System



The POWER-FAB CRS is a fully ballasted, high strength mounting system that evenly distributes loading over the roof surface.

The top down module clamping system is designed to install fast, and provide a secure mounting structure for most framed modules. Multiple rows of modules tested in a full scale wind tunnel facility qualify designs that require no roof penetrations and minimize the dead load on the roof. To maximize energy production, the POWER-FAB CRS offers an open air design and a variety of tilt angles, from 5 to 25 degrees. The system features the flexibility to configure the racking around roof obstructions and avoid shaded areas while maximizing the number of modules.

Key Benefits

- Fast installation
- High strength, reliability
- Roof layout flexibility
- Lower overall installed costs
- Increased module density
- Higher energy production
- Lower distributed roof loading

Installers

Installers demand a racking solution that installs quickly, and hassle-free. The POWER-FAB CRS System features fewer components and an intuitive design for faster installations.

- Top access clamps with captive nuts in brackets
- Single tool assembly
- Precision length components eliminate measuring and cutting on site
- Longer rails require less splices
- Spacer jigs assure proper module placement – no measuring
- Track bolt system eliminates drilling
- Integrated module grounding system option – Wiley Electronic's WEEBS
- EPDM Rubber included – no additional roof mats required



EPDM rubber protection slides easily into rail channel.



Assembly is fast, simple, and precise.

System Owners

System owners expect a mounting system that is reliable, and will withstand the environment for the life of the PV module. The POWER-FAB® CRS System also maximizes energy production for a faster return on investment.

- Corrosion resistant aluminum components
- EPDM rubber protects roof surfaces
- No roof penetrations
- Full scale wind tunnel qualified
- Open air design increases energy production
- High strength module clamps



Open air design for increased energy production.

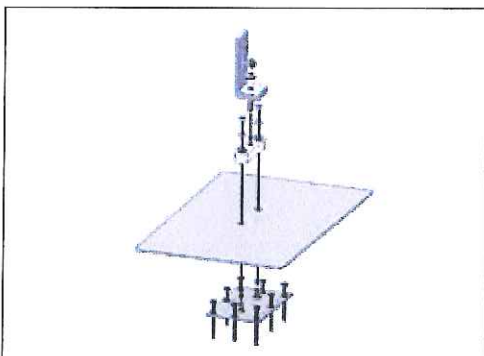
Engineers & Architects

Engineers & Architects prefer mounting systems that offer flexibility in design. The POWER-FAB CRS System also offers a higher strength design that exceeds building code requirements.

- Full Scale Wind Tunnel qualified
- Grid-work of interconnected high strength rails
- Reduced roof loading
- Penetration options to offset ballasting and/or meet seismic requirements
- Compatible with most framed PV modules
- Configurable around roof obstructions
- EPDM base increases friction and protects roof surface

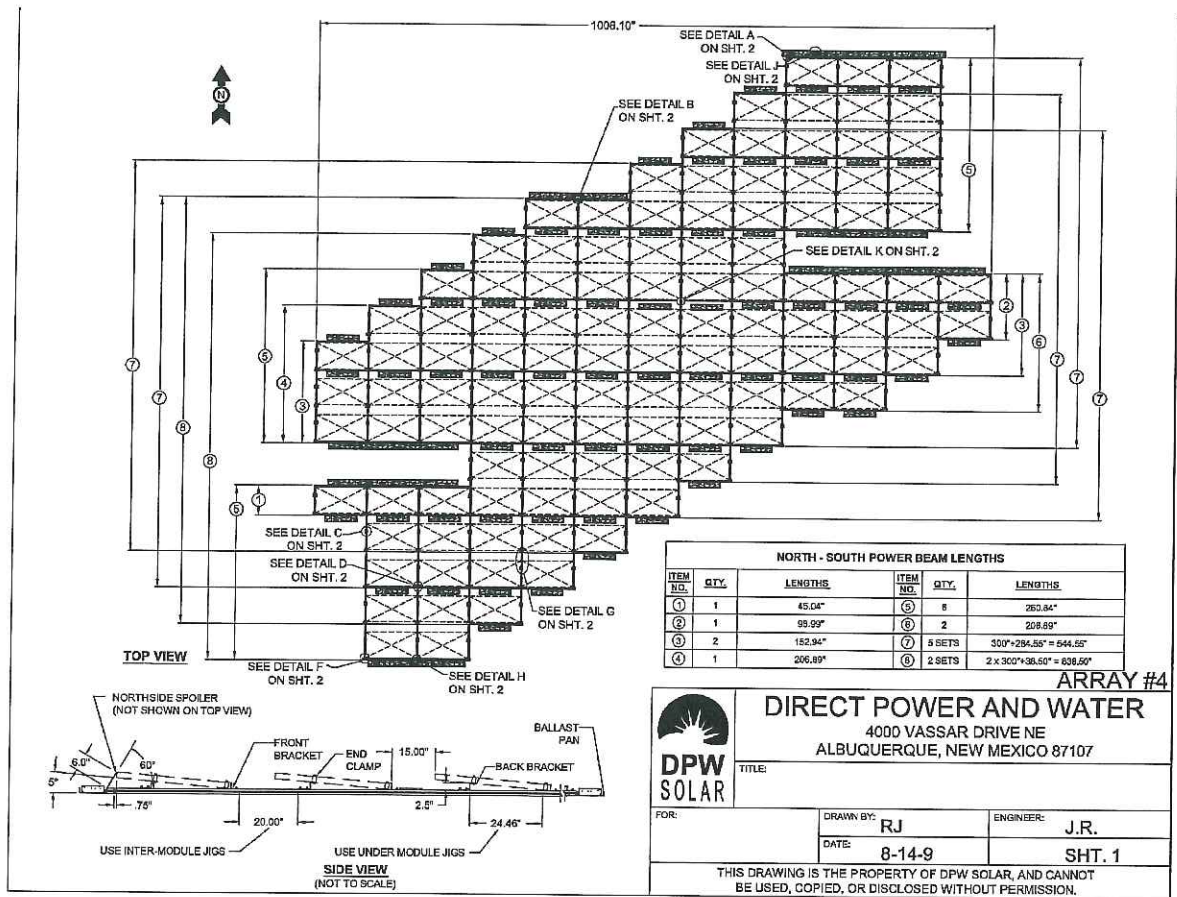


The POWER-FAB CRS has been full scale wind tunnel tested and qualified.



Optional penetration hardware to reduce roof loads.

Example of a Complex Roof Layout



The POWER-FAB® CRS system is adaptable to any roof layout.

Standard Product Wind Loading Specifications			
Wind Load	Standard Tilt Angle**	Roof Loading	Category
90 mph	10 degree	< 6 lbs./ft ²	Exposure C
130 mph	5 degree	< 6 lbs./ft ²	Exposure C

Contact factory representative for other tilt angle and wind load options. Full scale wind tunnel data used to calculate ballast weights along with ASCE 07-05 and building code requirements.

**Tilt angles from 5 - 25 degrees available



PREFORMED
LINE PRODUCTS

4000-B Vassar Drive NE
Albuquerque, New Mexico 87107
USA

Telephone: 800.260.3792
Fax: 505.889.3548
Web Site: www.DPWSolar.com
E-mail: info@power-fab.com

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3.11.1M

Our engineering staff is available to assist with your next project. Please contact our technical support group and provide module type, tilt angle, design wind speed, exposure category and building height information.

CITY OF KLAMATH FALLS REQUEST FOR QUOTES FOR PV SOLAR FACILITY

SOLICITATION DOCUMENTS INCLUDE:

- 1. INSTRUCTIONS (14 pages)**
- 2. SAMPLE CONTRACT (7 pages)**
- 3. QUOTE FORM (3 pages)**
- 4. PAYMENT BOND (2 pages)**
- 5. PERFORMANCE BOND (2 pages)**
- 6. CITY'S FEED IN TARIFF
APPLICATION & CONTRACT
(30 pages)**
- 7. SAMPLE DRAWINGS (10 pages)**

QUOTES DUE BY AUGUST 18, 2011 AT 2:00 PM

INSTRUCTIONS FOR PV SOLAR FACILITY AT CITY POLICE STATION

1.0 General Information

The City of Klamath Falls has a vision of sustainable government in the area of energy efficiency and renewable power in City buildings. The City is requesting Quotes to install a photovoltaic solar system (PV Solar Facility) on its recently remodeled Police Station to both meet the City's vision and recent laws requiring the installation of solar panels on remodeled public buildings. Pursuant to state law, the City must spend about \$80,000 on the PV Solar Facility, which represents 1.5% of the original construction contract for remodeling the Police Station. The Police Station is located at 2501 Shasta Way, Klamath Falls, Oregon 97601.

In October 2010, the City received a Feed-In Tariff (FIT) allocation. A FIT is a financing mechanism designed to accelerate investment in renewable energy technologies, by offering long-term contracts to renewable energy producers, typically based on the cost of generation of each different technology. The City was awarded a 72 kW allocation and will receive a payment of \$.0495 per kWh produced. According to the terms of the FIT, the City must install a fully operational system no later than October 5, 2011. As a result of the deadline, the City will impose liquidated damages, as discussed below, for the amount of payment lost if the contractor does not meet the deadline. **A copy of the application and agreement with Pacific Power is attached to this Request for Quotes.**

The City acknowledges that it is unlikely \$80,000 will be sufficient to purchase the labor and materials to install the 72 kW FIT allocation for the PV Solar Facility. Recognizing that the City does not have sufficient funds to spend more than \$80,000 for the PV Solar Facility, the City will select the Quote that meets its needs and produces the highest amount of kW hours and is at least a 10 kW facility, for the amount closest to and not exceeding \$80,000.

The City is requesting a quote, including the costs of all necessary equipment and labor for the PV Solar Facility for \$80,000 and at least 10kW facility to be placed on the Police Station, as described below.

The City obtained a scope of work for the PV Solar Facility on the Police Station. Firms submitting quotes may use the attached drawings and scope of work for their quote. Contractors submitting quotes are instructed to do their own inspection of the roof, as part of the mandatory meeting. For firms submitting their own scope of work, please follow the written scope of work when preparing quotes and provide sufficient information, including drawings, to allow the City to evaluate the Quotes submitted.

Detailed drawings of the Police Station, including the parking lot access, electrical access, and the other information needed, will be available for inspection at the Public Works' Conference Room, located at 226 S. 5th Klamath Falls, OR 97601. For more details contact Public Works Executive Analyst Gina Johnson at 541-883-5363. Copies may be made upon request, at the cost of the contractor.

The Police Station is a restricted facility with restricted access and limited hours of work. The selected contractor will comply with a security plan that will be negotiated with the selected contractor.

After review of the documents, the City will select the contractor and location of the PV Solar Facility which will best fit the City's needs. The selected contractor will install manufactured equipment, as specified in the scope of work or negotiated, on the roof of the City Police Station. The selected contractor will be required to work around temporary vents, currently installed on the roof and to work with the roofing manufacturer to ensure that the installed PV Solar Facility does not affect the roof warranty. Once designed, the City will coordinate the structural engineering review with the Police Station project engineer to meet the engineering requirements for a building permit, but the selected contractor will be responsible to obtain the permits, and if necessary, make changes to obtain the permit.

The selected contractor will be required to execute the proposed attached Contract after award by City Council. Firms submitting Quotes are encouraged to carefully and completely review solicitation documents, including the Sample Contract, before submitting a Quote. All firms submitting Quotes are referred to as "Quoters" in the Quote Documents. The awarded Quoter will be designated as the Contractor.

Attached to these Instructions are the following documents:

1. Sample Contract (7 pages)
2. Quote Form (3 pages)
3. Payment Bond (2 pages)
4. Performance Bond (2 pages)
5. Feed-In Tariff Application and Contract (30 pages)
6. Sample Drawings (10 pages)

1.1 Anticipated Solicitation Schedule

8/8/11	Issuance of Request for Quotes Solicitation
8/12/11	Mandatory Meeting at 11:00 am at Police Station, 2501 Shasta Way, Klamath Falls, Oregon 97601
8/18/11	Quotes due by 2:00 pm
8/22/11	Recommendation for Award of Contract to City Council and Poll of Council
8/24/11	Notice to Proceed Issued
9/6/11	City Council Ratification of Poll

1.2 Questions

All inquiries, whether relating to the Request for Quotes process, administration, deadline, award, the intent, or technical aspects of the services must be in writing to: City Attorney Joanna Lyons-Antley, 500 Klamath, Klamath Falls, OR 97601, Fax: 541-883-5399, jlyons@ci.klamath-falls.or.us.

All questions must be received no later than **August 15, 2011 at noon**. Substantive questions and answers will be issued as official addenda to this Request for Quotes. When appropriate, revisions, substitutions or clarifications of the Request for Quotes or attached terms and conditions will be issued as official addenda to this Request for Quotes. Changes or modifications to this Request for Quotes shall be binding on the City only if in the form of a written addenda issued by the City.

1.3 Addenda

City reserves the right to make changes in the Request for Quotes document and the sample Contract, by written addenda prior to the closing time and date. Addenda will be e-mailed, mailed or faxed to all parties on the Request for Quotes list.

2.0 Quote and Submission Requirements

2.1 Terms and Conditions

By submitting its Quote, the selected firm agrees to be bound by the attached sample Contract. The scope of work will be negotiated by the City. Any Quote that is received conditioned on the City's acceptance of any other terms and conditions or rights to negotiate may, in the sole discretion of City, be rejected as non-responsive. Any subsequent negotiated changes may be subject to prior approval by the City.

2.2 Due Date

Quotes for the service described in these documents will be received by the City, until August 18, 2011, at 2:00 p.m., as determined by the clock in the City Administration Office. Quotes shall be in sealed, opaque envelopes and may be delivered to Lisa Olson, City Recorder, or her designee at City of Klamath Falls, 500 Klamath, Klamath Falls, Oregon 97601. Quote Form Attached.

It is the firms' responsibility to deliver the quote in time to reach the designated person by the time specified. All quotes shall bear the words "CITY OF KLAMATH FALL PV SOLAR FACILITY QUOTE" on the face of the envelope.

Any quote received later than August 18, 2011, at 2:00 pm, shall be rejected and returned to the Quoter unopened. Facsimile transmitted quotes shall not be accepted.

2.3 No Electronic, Faxed or Late Quote Submissions

Mis-deliveries, late, faxed or electronic submittals will be considered non-responsive, with no exceptions. Please do not wait until the last minute for delivery. Contractors mailing a quote should allow normal mail delivery time to ensure timely receipt of their quotes. Any quote received after the scheduled closing time for receipt of the quotes will be returned to the Quoter unopened and will not be considered.

2.4 Public Records

This request for quotes and one copy of every quote submitted in response shall be kept by the City and made part of a file. Our practice is to schedule requests for inspection of any solicitation, and all requests to inspect records must be accompanied by a written request on forms provided by the City Recorder's office. If a Quote contains any information that is considered exempt through disclosure under the Oregon Public Records law, Quoters must clearly designate any portion of the Quote as exempt, along with a justification and a citation to the authority relied upon. Application of the Oregon Public Records Law shall determine whether any information is exempt from disclosure.

2.5 Prevailing Wage and CCB Public Works Bond

This project is a public improvement and is a public work subject to ORS 279C.800 to 279C.870. No bid shall be considered unless it contains a statement that they will comply with ORS 279C.800 to 279C.870. Prior to the contractor starting work, the contractor shall file with the Construction Contractors Board a public works bond with a corporate surety authorized to do business in this state in the amount of \$30,000.

Workers shall be paid not less than the minimum hourly rate of wage as specified in July 1, 2011 Prevailing Wage Rates for Public Works Contracts in Oregon located online at: http://egov.oregon.gov/BOLI/WHD/PWR/pwr_Oregon_2011.shtml, which is hereby incorporated by this reference.

2.6 Performance and Payment Bonds

The selected contractor will provide a performance bond and payment bond, on the form specified by the City as attached to this document and subject to the approval of the City, in the sum equal to 100% of the contract to insure the faithful performance of the contract. City will accept a surety bond written by a surety company with an AM Best rating of A- or better and authorized to do business in the state of Oregon. In lieu of a surety bond, the City, in its sole discretion, may permit bidder to submit cash, a cashier's check or certified check in an amount equal to the estimated total contract price for each of the performance and payment bonds. If the successful bidder complies with the terms, conditions and provisions of the Solicitation Documents in all respects, and performs all matters and things required to be undertaken and done under the Solicitation Documents, and the requirements of all laws of the State of Oregon, then the obligation of contractors and the surety of contractors shall be void, otherwise such obligations shall remain in full force and effect.

2.7 Resident Firm

Each quote must identify whether the contractor is a "resident bidder" pursuant to ORS 279A.120 and ORS 279C.365(1)(h). The City shall prefer goods and services that have been manufactured or produced in the State of Oregon if price, fitness, availability and quality are otherwise equal. Contractors will be subject to an out-of-state preference penalty equal to the percentage preference given in its state.

2.8 Bid Security

Bid security in an amount no less than ten percent (10%) of the amount bid in the form of a cashier's check or certified check made payable to City of Klamath Falls, a surety bond effective for at least (30) thirty days from a company licensed to do business in the State of Oregon, or an irrevocable letter of credit issued by an insured institution as defined in ORS 706.008 shall accompany this bid. If this bid is accepted and the undersigned fails or neglects to execute and return the contract and provide a payment and performance bond, if one is required, within ten (10) days from the date of receiving from the City contract prepared and ready for execution, the City may, at its option, determine that the contractor has abandoned the contract and declare a forfeiture of the bid security as liquidated damages and not as a penalty.

2.9 Subcontractors

First tier subcontractors disclosure is not required because the estimated value of the contract does not exceed \$100,000.

2.10 Construction Contractors Board

No quote shall be received or considered by the City unless the contractor is registered with the Construction Contractors Board as required by ORS 671.530. Firms submitting quotes shall submit proof of current registration with their quotes.

2.11 Public Works Bond

The contractor and every subcontractor must have a public works bond filed with the Construction Contractors Board before starting work on the project, unless exempt. ORS 279C.830(3). Firms submitting quotes shall submit proof of current public works bonding with their quotes.

2.12 Mandatory Meeting

All Quoters must meet and tour the Police Station on Friday, August 12, 2011, at 11:00 am. Quoters shall meet in the lobby of the Police Station at 2501 Shasta Way, Klamath Falls, Oregon 97601.

Attendance by an authorized representative of the firm is required in order to be deemed responsive to this Request for Quotes, and Quotes from those not attending will not be considered for evaluation.

2.13 Terms and Conditions/Insurance

By submitting its Quote, the selected firm agrees to be bound by the attached sample contract and insurance provisions and as it is negotiated by the City and the selected firm.

2.14 Liquidated Damages

Failure of the Contractor to complete the Work within the specified time limit will result in actual damage to the City. By submitting its Quote, the selected contractor agrees to complete the PV Solar Facility by October 5, 2011, and if the contractor does not complete the work by that date, the Contractor shall pay the City in the amount of the lost amount of the Feed-In Tariff that would have been given to the City if the project was completed on time, based on the Name Plate Capacity of the selected contract, over the lifetime of the Feed-In Tariff. The Contractor hereby agrees that said sum may be deducted from monies due the Contractor under the Contract, or if no money is due the Contractor, the Contractor hereby agrees to pay the City such total sum as computed aforesaid.

3.0 Evaluation of Quotes

3.1 Quotes

Firms submitting Quotes must satisfy themselves, by such means as they prefer, as to the actual conditions and requirements of the service to be provided, and shall not at any time after submission of the Quote assert that there was any misunderstanding in regard to the nature, quality or description of the services to be provided.

3.2 Cost of Quote

City is not liable for any cost incurred by the firm submitting the quote in responding to this Request for Quotes.

3.3 Format for Quote and Page Length Limitation

All quotes must include one original and three copies of the Quote. The Quote must not exceed 50 pages. Quotes that are hard to read because of font size, legibility, graphics, paper size etc. may be considered non-responsive.

3.4 Content of Quotes

The designated, qualified individual must sign any quote associated with this solicitation. Quotes may be rejected by the City as non-responsive, if any of the documents are not provided or the documents are substantially incomplete.

All Quotes shall provide the following information:

1. Documentation of qualifications of the installer as:
 - a. State of Oregon Tax Credit Certified Technician: Solar Electric
 - b. Energy Trust of Oregon Trade Ally: Solar Electric
 - c. North American Board of Energy Practitioner (NABEP) full certification
 - d. Licensed contractor with Oregon CCB
 - e. Oregon Electrical Contractor
 - f. Oregon CCB public works bond on file with CCB

- g. Willingness to obtain a City Business License
- 2. Provide at least 3 references (contact name, address, and phone number) from other cities, counties, or commercial/industrial users for which you installed similar PV Solar Facilities. If possible, provide references from other Feed-In Tariff customers.
- 3. Proposal and scope of work for at least a 10 kw facility for \$80,000 (the amount required by Oregon law to be spent at the site) for the Police Station Roof. If the proposal does not adopt the sample drawings, the proposal must give sufficient details to allow the City to evaluate the feasibility of the proposal as to both buildings and the ability to meet the Feed-In Tariff requirements. Must include the layout and erections drawings, including relevant conduit sizing and voltage drop calculations per NEC 2011. Must state what the "Name Plate Capacity" for the proposed PV Solar Facility. Must state any engineering reviews needed to coordinate with the City's project engineer. Provide detail on costs for products used, labor, and overhead. Describe proposed solar performance monitoring system.
- 4. Product Data/Warranties:
 - a. Manufacturer's data sheets on each product to be used, including: preparation instructions and recommendations; Storage and handling requirements and recommendations; and installation methods.
 - b. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
 - c. Manufacturer's Warranties.
 - d. Installers Warranties.
 - e. Statement from the roof manufacturer that the roof manufacturer's warranty will not be affected by the installed product. No penetration of the roof membranes or roof surfaces will be permitted.
- 5. Timeline with installation benchmarks with respect to critical construction junctures for rough in, roofing, electrical general contractor, structural, final installation, and owner training. Detailed installation must be completed, fully operational and approved by Pacific Power for FIT prior to October 6, 2011, that is, not later than October 5, 2011. Any quote that cannot meet the October 5, 2011 deadline will be considered nonresponsive and for those contractors not meeting the deadline, liquidated damages will be assessed as described above.

3.5 Evaluation Process

The selection process shall be administered in accordance with the authority and procedures described in Oregon Revised Statutes Chapter 279A and 279C. The contract, if awarded, shall be within sixty (60) days from the due date of the quote submission. Contract award resulting from this solicitation shall be based upon a finding in the public interest by the City of Klamath Falls City Council. A Review Committee, comprised of selected staff, shall be established to review, score and rank the Quotes. If considered necessary or desirable, the Review Committee may conduct negotiations or elect to interview selected firms/individuals. The Committee shall

recommend the highest ranking quote to the City Council. References may be contacted at any time during the selection scoring process.

City reserves the right to cancel the solicitation or reject any or all Quotes for good cause and is not liable for any costs a contractor incurs while preparing or presenting the Quote.

3.6 Evaluation Criteria

The Quote will be scored according the criteria below:

- Contract price & composition (25%)
- Qualifications and references (25%)
- Feasibility and performance characteristics of proposal, including but not limited to, the name plate capacity, warranties on PV Solar Facility, ability to retain roof warranty, and Contractor's ability to meet requirements for FIT (50%)

3.7 Negotiations

If negotiations are conducted, the Committee will begin contract negotiations with the highest-ranked contractor, as follows, and be directed toward obtaining written agreement on: (a) Contractor's tasks, staffing, and a performance schedule; and (b) a contract price which is consistent with the Quote, taking into account the estimated value, scope, complexity and nature of the services.

If negotiations are conducted, and the highest-ranked firm and the City cannot agree on fair costs within a reasonable period of time, the City will begin negotiations with the next highest-ranked firm that has submitted an acceptable quote.

3.9 City's Right to Reject or Withdraw Quotes

The City reserves the right to waive minor informalities in the Quotes. The City may also reject any Quote not in compliance with all prescribed procedures contained in ORS chapters 279A, B, and C, the procedures contained in the City's Public Contracting Rules or for good cause, and may reject all Quotes upon a finding that is in the public interest to do so.

No firm submitting a Quote may modify or withdraw a Quote after the hour set for receipt of Quotes unless sixty (60) days have elapsed and the City has not let a contract. Quote modification may be made at any time prior to the stated date and time for Quote receipt. The request shall be prepared on company letterhead and signed by an authorized officer.

3.10 Substitution Requests

As part of the Quote and before the contract is awarded, the Contractor may offer material or equipment of equal or better quality and performance in substitution for those specified. The City will consider offers of substitution only from the Contractor and not from suppliers, distributors, manufacturers or subcontractors. If the offered substitution necessitates changes to or coordination with other portions of the Work, the Contractor, as a condition of the City's

acceptance of the substitution, shall perform such changes or coordination at no additional cost to the City.

The Contractor's offers of substitution shall be made in writing as part of the Quote and shall include sufficient data to enable the Engineer to assess the acceptability of the material or equipment for the particular application and requirements. The written offer of substitution shall include all pertinent data describing the proposed product including, but not limited to, a statement on how the proposed product differs (if at all) from the specified product, a statement regarding the efficiency and appearance of the proposed product, a list of installations where the proposed product has been in successful operation and service, and such other information as may be required by the City.

The cost of review of an initial proposed substitution will be borne by the City; the cost of review, including design and engineering review, of an additional or separate proposed substitution for the same material or equipment covered by an initial proposed substitution shall be charged to the Contractor. In addition, the cost of engineering or re-design efforts incurred by the City as necessary to acceptance of a proposed substitution shall be charged to the Contractor.

A substitution shall not relieve the Contractor from responsibility for the efficiency, quality and performance of the substituted material or equipment. All substituted materials must have manufacturers with domestic manufacturing with a minimum of ten years documented experience in producing components for stated duty.

4.0 Scope of Work

4.1 General

4.1.1 Summary. The intent of the Scope of Work is for the selected Contractor to provide a complete and workable solar energy facility with complete systems as required by applicable codes as indicated, and as specified. The Scope of Work provides a sample complete Grid Interactive Photovoltaic (PV) Facility as described below and indicated in the drawings. Contractor shall be responsible for all costs associated, including insurance coverage with the construction of PV Solar Facility and Solar Monitoring System at the City Police Station. The selected firm shall furnish all labor, materials, permits, design (but not including all architectural and structural engineering drawings and specifications, if the sample design is selected by the contractor), transportation, storage and equipment rental costs to construct the entirety of each solar electric system in accordance with the final approved plans and specifications for each location. Construction shall include the required cost of power system components, and installation of the solar power system (including tie-ins to the existing utility electric service in accordance with the net metering and interconnection agreements with the electric utility. If requested and approved by the City, any and all roof penetrations must be done by a licensed contractor and work shall be in compliance with existing roofing manufacturer warranty guidelines.

4.1.2 Permits. Contractor is responsible for all applicable Building Permits, which will include the Building and Electrical, as well as full plan review as required by the jurisdiction. City will assist with structural engineering review of the proposed plans by Contractor, if the

Contractor selects the sample design provided by the City. If the Contractor selects a design other than the sample design, the Contractor is responsible for the architectural and structural review.

4.2 Design/Performance Requirements

4.2.1 Structural Performance. Designed to resist ASCE 7-05 Minimum Design Loads for Buildings and Other Structures. Design all materials, assembly and attachments to resist snow, wind, suction and uplift loading at any point without damage or permanent set. No penetration of the roof membranes or roof surfaces will be permitted, unless approved by the City.

4.2.2 Electrical Design. Photovoltaic Array: 9.4 kw SC DC Watts, 25 year module power warranty, 10 year inverter warranty. CPUC approved Electric Rule 21 – Generating Facility Interconnections IEEE 929 (2000) – Recommended Practice for Utility Interface of Photovoltaic Systems. Business Energy Tax Credit Technical requirements, Oregon Department of Energy. NEC 2011 Section 690 Solar Photovoltaic Systems. PP&L Electric Net Metering Requirements. Energy Trust of Oregon.

4.2.3. Material. The PV Facility shall consist of PV modules, mounting system, AC and DC disconnects. Power invert(s), conductors, conduit, wire management, monitoring devices, over current protection, and all other accessories needed for proper operation. The PV Facility may also consist of disconnecting combiner boxes and wiring gutters. The complete system is to be integrated into the facility electrical system, without impact to the utility service or power quality.

4.2.4. Guarantee. The electrical work shall be guaranteed for a period of two (2) years following date of substantial completion. The contractor shall provide troubleshooting service for at least two (2) years. Solar Module output 25 year guarantee. No more than 3% deviation from specified rate power for the first year and no more than a 0.7% decrease, per year thereafter.

4.2.5. Materials/Manufacturers. The PV shall use the following materials and manufacturers (or the equivalent, if approved through substitution in Section 3.10):

1. Photovoltaic modules –SolarWorld 235 or equivalent. Acceptable Photovoltaic module Manufacturer: SolarWorld 25300 NW Evergreen Rd., Hillsboro, Oregon 97124. According to the sample drawings attached, would require 40.
2. Inverter –Aurora Power One PVI 10.0 or equivalent. Acceptable Inverter Manufacturer: Power-One 740 Calle Plano, Camarillo, California 93012. According to the sample drawings attached, would require one.
3. Photovoltaic Racking – DPW Solar, Power-Fab CRS Non-penetrating flat roof mounting system (or equivalent) installed per recommendations of membrane roof manufacturer. Concrete ballast blocks per manufacturer. Hardware: Bolts, nuts, washers, and screws 18-8A2 stainless steel. Acceptable Racking Manufacturer: DPW Solar, 4000-B Vassar Drive NE, Albuquerque, New Mexico 87107.
4. DC Combiner Boxes – Provide DC Combiner boxes, as necessary, with finger-safe string disconnecting fuse holders and 600VDC rated fusing. Boxes shall be weatherproof construction with fuses for individual module protection and DC load break rated disconnect. Provide terminals for the connection of input and

- output conductors to connect the arrays indicated on plans. Fusing shall be rated for photovoltaic applications, Ferraz Shawmut ATM or approved equal.
5. Remote Monitoring – Aurora Easy Control Pro Data Monitoring System (or equivalent).
 6. Meters, as required, by the Feed-In Tariff and Pacific Power.

4.3 Installation

The contractor shall install the PV Facility as follows:

4.3.1. Delivery, Storage, and Handling. Receive, handle and store materials in conformance with the manufacturer's printed instructions. Store products undercover, in manufacturer's unopened packaging until ready for installation. Store materials in a dry, warm, ventilated location. Protect materials from exposure to moisture and physical damage. Roof placement: Spread bundles and crates to avoid overloading the roof structure. Place the material directly over major supports such as beams and trusses. Installation and startup shall be supervised, checked, and tested by a qualified representative of the PV Facility installing contractor. Caution needs to be exercised in the installation of the PV modules, in that they can generate lethal voltages when exposed to sunlight. The PV modules will go live with open circuit voltage when they are removed from their enclosed shipping containers. Contractor is responsible for instructing that "energized equipment" protocol be established for those working with and around the installation of the PV modules.

4.3.2. Coordination. Coordinate work with roofing installer and manufacturer to verify collector mounting and framework with specified components. Coordinate work with other operations and installation of roofing materials to avoid damage to installed insulation and membrane materials. Coordinate with, notify, and protect all others on site when testing and commissioning solar circuits. In the event of solar electric system capacity prior to permanent utility supply to the AC system, the solar electric system shall be disconnected at the DC disconnect and locked out until such time as the permanent utility supply has been commissioned. Readily accessible DC and AC disconnects must be installed within reach of the solar inverter. AC load panels receiving photovoltaic energy must be marked in accord with NEC 08 690.54 and 690.56(B). AC wiring configuration of the inverter must be coordinated and compatible with the balance of the AC utility supply. Coordinate installation with local electrical utility in accordance with utility net metering guidelines, and if required, provide placard at point of utility service in accordance with utility's published guidelines. Coordinate installation of the remote monitoring with City's IS staff.

4.3.3. Examination. Examine installation area to verify the work can be performed in accordance with the drawings and structural calculations, without interference from other equipment or trades. Do not begin installation until substrates have been properly prepared. If preparation is the responsibility of another installer, notify City of unsatisfactory preparation before proceeding.

Photovoltaic module electrical pre-installation inspection: check voltage of each module prior to installation.

4.3.4. Installation. Install in accordance with manufacturer's instructions. Install components plumb and level. Make provisions for erection loads, and for sufficient temporary bracing to maintain indicated alignment until completion of erection and installation of permanent attachments. Provide enough room to safely move around the array area during

installation as required per local building code. Where appropriate, apply anti-galling and/or corrosive treatments to each mechanical and electrical. Anchor racking standoffs to structure as indicated per manufacturing and design requirements.

Separate dissimilar metals using manufacturing recommended antisieze to eliminate the possibility of corrosive electrolytic action between metals and to provide uniformity in clamp loads. Anchor rails to standoffs as per manufacturing instructions, using manufacturing recommended antisieze shading hardware and rails prior to installation and avoiding spinning on nuts at high speed to prevent galling. Fasten all conductors to eliminate slack and exposure to elements. All power wiring shall be installed in conduit unless noted otherwise. USE-2 insulated wire with wire management may be used beneath PV panels. Conductors installed shall consider route, length and shall be sized to keep voltage drop below 2% from panel to Inverter and 2% from inverter to building service. Routing of raceways between PV arrays shall be kept concealed and hid behind panel assemblies, where possible. All electrical connections required between the various items of the Facility shall be provided rung out and tested for continuity prior to energizing. If necessary, run communication wire from inverter to portal or communication room. Install placards: provide all signage as per NEC 690.12, 690.53, 690.54, and 690.64; and Main PV system disconnect to be clearly labeled "Solar PV Disconnect Switch." Provide utility required identification on utility disconnect and signage on utility meter labeled "PP&L Net-Metered Solar PV Generation On Site." No penetration of the roof membranes or roof surfaces will be permitted, unless authorized by the City.

4.3.5. Intermediate and Final Inspection.

The selected contractor shall arrange for all intermediate and final permit-required inspections and all requisite documentation and inspections from the electric utility to permit connection of the PV Facility to the City building to obtain Feed-In Tariff benefits for the City. Final inspection will be performed by City personnel and the contractor shall provide training on the PV Solar Facility, including but not limited to, monitoring system, maintenance and cleaning. During the start-up, City shall observe and verify each system performance requirement. Required commissioning and acceptance test services shall include: starting each Solar Electric System until it achieves the performance requirements and conducting the successful delivery of power within thirty (30) days following the completion of the system, meeting each system requirement as designed. Roof inspection may also be required by the roofing manufacturer and the City will pay for the first roofing inspection and all other roofing inspections shall be borne by the Contractor.

4.3.6. Applicable Publications. Publications listed below form a part of this specification, to the extent referenced. The publications are referred to in the text by basic designation only.

- Underwriters Laboratories (UL): 1703 Flat Plate PV Modules and Panels' Standard for Safety of Static Inverters and Charge controllers for use in PV Power systems; 1741 Inverters Converters Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
- ASTM Standards: E927 Solar Simulation for Terrestrial PV Testing; E1038 Test Method for Determining resistance of PV Modules to Hail by Impact with Propelled Ice Balls; E1171 Test Method for PV Modules in Cyclic temperature and Humidity Environments; E1328 Terminology Relating to PV Solar Energy Conversion; E1462 Test Methods for Solar Insulation Integrity and Ground Path Continuity of PV Modules;

- E1596 Test Methods for Solar Insulation Integrity and Ground Path Continuity of PV Modules; E1596 Test Methods for Solar Radiation Weathering of PV Modules
- National Electrical Code (NEC): 690 Solar PV Systems