

**SERVICE AGREEMENT
BETWEEN SANTA FE COUNTY AND
SOL LUNA SOLAR**

THIS AGREEMENT is made and entered into this 19 day of November 2018, between **SANTA FE COUNTY**, hereinafter the "County" and **LOS EBANISTAS, INC., dba SOL LUNA SOLAR**, P.O. Box 10, Dixon, New Mexico 87527, hereinafter the "Contractor".

WHEREAS, these services were procured pursuant to NMSA 1978, Section 13-1-129 (Procurement under existing contracts), and the Contractor's prices are those stated in State of New Mexico Statewide Price Agreement #80-000-17-00017 (the SPA); and

WHEREAS, the County desires to have constructed and installed a grid-tied, ground-mounted, solar photovoltaic (PV) electric system at the Ken and Patty Senior Center / Max Coll Community Center, 16 Avenida Torreon, Santa Fe, NM 87508 (the facility); and

WHEREAS, the Contractor will provide the County with a PV system per the scope of work in Section 1 below and the Contractor's specifications described in the attached Exhibit A, and shall meet all requirements and specifications as stated in the SPA; and

WHEREAS, the County requires the services of the Contractor and the Contractor is willing to provide the services and both parties wish to enter into this Agreement.

NOW, THEREFORE, it is agreed between the parties:

1. SCOPE OF WORK AND SPECIFICATIONS

Contractor shall provide the following in addition to requirements and specifications in the SPA.

- A. Construct and install a 71,040 watt, ground-mounted, PV system within the area identified in the aerial image depicted in the attached Exhibit B. Placement will not infringe on fire hydrant access as determined by the County Fire Marshal and must leave clear access from the hydrant to street and the driveway on the north and east sides, including at least 10 feet clear space from the valves, and 3 feet of clear space from the back side of the hydrant where there is not a valve. The solar array may extend a minimum height of 1.5 feet to a maximum height of 8 feet above ground level. The County will install a fence as a separate project and the array shall allow adequate room for fencing within the buildable area. Solar scrim or other code-compliant devices are acceptable to meet necessary PV system code requirements. Additional PV system specifications, like solar modules, inverter, mounting system are provided for in Exhibit A.
- B. Complete conduit and electrical line installation via directional drilling below the facility's parking lot between the PV system array and the electrical box.

- C. Any concrete work shall comply with concrete mix design in accordance with New Mexico Department of Transportation Standard Specifications Highway and Bridge Construction (2014 Edition) Sections *509 Portland Cement Concrete Mix Designs* and *510 Portland Cement Concrete*.
- D. Install a system monitoring system that allows for remote monitoring of system performance through secured website access (See SPA Additive Alternate No. 1, #041 and Additive Alternate No. 2, #043).
- E. Consistent with any requirements of the County-approved traffic plan, provide traffic control to minimize project impact on the facility's daily use for the duration of the construction project.
- F. Provide to the County Project Manager a project schedule within 14 days from the date of the Notice to Proceed.
- G. Collaborate with the County Project Manager to obtain and execute a waiver of the County's development review permit fee.
- H. Identify and avoid of all buried infrastructure, luding irrigation system water line, potable water line, and buried irrigation cistern on or near the facility. Any and all locate services are the responsibility of the Contractor.
- I. Maintain a clean and orderly job site during construction with complete job-site cleanup upon completion of the project
- J. Weekly email progress updates to the Project Manager during the course of the project, including copies of all correspondence with, submittals to, and approval of permits and agreements with the electric utility and other regulatory authorities.
- K. Completion of onsite project work within 60 days of commencement of site work.
- L. Upon project completion, provide to the Project Manager one digital copy and one hardcopy of the system owner's manual.
- M. Submit proof and registration of Extended Five-Year Warranty per the SPA Additive Alternate No. 3, #056, to the Project Manager.

2. ADDITIONAL SERVICES

- A. The parties agree that all tasks set forth in Section 1 (Scope of Work), of this Agreement shall be completed in full, to the satisfaction of the County, in accordance with professional standards in accordance with the SPA and for the amount set forth in Section 3 (Compensation, Invoicing and Set-off), of this Agreement, and for no other cost, amount, fee or expense.

- B. The County may from time to time request changes in the Scope of Work to be performed hereunder. Such changes, including any increase or decrease in the amount of the Contractor's compensation, which are mutually agreed upon by and between the County and the Contractor, shall be incorporated in a written amendment to this Agreement.

3. COMPENSATION, INVOICING AND SET-OFF

- A. In consideration of its obligations under this Agreement the Contractor shall be compensated as follows:

- 1) County shall pay to the Contractor in full payment for services satisfactorily performed by invoicing the County in 1/3 intervals as follows: 1/3 upon proof of purchase and delivery of modules and ground mount system; 1/3 upon approved completion of PV installation; and the final 1/3 upon successful interconnection and project acceptance by the County.
- 2) The total amount payable to the Contractor under this Agreement shall not exceed **\$162,359.13**, exclusive of New Mexico gross receipts tax.. Any gross receipts tax levied on the amounts payable under this Agreement shall be paid by the County to the Contractor.
- 3) This amount is a maximum and not a guarantee that the work assigned to be performed by Contractor under this Agreement shall equal the amount stated herein. The parties do not intend for the Contractor to continue to provide services without compensation when the total compensation amount is reached. The County will notify the Contractor when the services provided under this Agreement reach the total compensation amount. In no event will the Contractor be paid for services provided in excess of the total compensation amount without this Agreement being amended in writing.

- B. The Contractor shall submit a written request for interval payments to the County when payment is due under this Agreement. Upon the County's receipt of the written request, the County shall issue a written certification of complete or partial acceptance or rejection of the services for which payment is sought.

- 1) The County's representative for certification of acceptance or rejection of contractual items and services shall be Ashley Zappe, Sustainability Specialist, 505-992-9862, azappe@santafecountynm.gov (Project Manager), or such other individual as may be designated in the absence of the County representative.
- 2) The Contractor acknowledges and agrees that the County may not make any payment hereunder unless and until it has issued a written certification accepting the contractual services or deliverables.

- 3) Within 30 days of the issuance of a written certification accepting the services or deliverables, the County shall tender payment for the accepted items or services. In the event the County fails to tender payment within 30 days of the written certification accepting the items or services, the County shall pay late payment charges of 1.5% per month, until the amount due is paid in full.
- C. In the event the Contractor breaches this Agreement, the County may, without penalty, withhold any payments due the Contractor for the purpose of set-off until such time as the County determines the exact amount of damages it suffered as a result of the breach.
- D. Payment under this Agreement shall not foreclose the right of the County to recover excessive or illegal payment.

4. EFFECTIVE DATE AND TERM

This Agreement shall, upon due execution by all parties, become effective as of the last date of signature by the parties hereto (the Effective Date). The term of this Agreement is one year from the Effective Date, unless earlier terminated pursuant to Section 5 (Termination) or Section 6 (Appropriations and Authorizations). The County has the option to extend the term in one-year increments not to exceed a total of four years

5. TERMINATION

- A. Termination of Agreement for Cause. Either party may terminate the Agreement based upon any material breach of this Agreement by the other party. The non-breaching party shall give the breaching party written notice of termination specifying the grounds for the termination. The termination shall be effective 30 days from the breaching party's receipt of the notice of termination, during which time the breaching party shall have the right to cure the breach. If, however, the breach cannot with due diligence be cured within 30 days, the breaching party shall have a reasonable time to cure the breach, provided that, within 30 days of its receipt of the written notice of termination, the breaching party began to cure the breach and advised the non-breaching party in writing that it intended to cure.
- B. Termination for Convenience of the County. The County may, in its discretion, terminate this Agreement at any time for any reason by giving the Contractor written notice of termination. The notice shall specify the effective date of termination, which shall not be less than 15 days from the Contractor's receipt of the notice. The County shall pay the Contractor for acceptable work, determined in accordance with the specifications and standards set forth in this Agreement, performed before the effective date of termination but shall not be liable for any work performed after the effective date of termination.

6. APPROPRIATIONS AND AUTHORIZATIONS

This Agreement is contingent upon sufficient appropriations and authorizations being made for performance of this Agreement by the Board of County Commissioners of the County and/or, if state funds are involved, the Legislature of the State of New Mexico. If sufficient appropriations and authorizations are not made in this or future fiscal years, this Agreement shall terminate upon written notice by the County to the Contractor. Such termination shall be without penalty to the County, and the County shall have no duty to reimburse the Contractor for expenditures made in the performance of this Agreement. The County is expressly not committed to expenditure of any funds until such time as they are programmed, budgeted, encumbered and approved for expenditure by the County. The County's decision as to whether sufficient appropriations and authorizations have been made for the fulfillment of this Agreement shall be final and not subject to challenge by the Contractor in any way or forum, including a lawsuit.

7. INDEPENDENT CONTRACTOR

The Contractor and its agents and employees are independent contractors and are not employees or agents of the County. Accordingly, the Contractor and its agents and employees shall not accrue leave, participate in retirement plans, insurance plans, or liability bonding, use County vehicles, or participate in any other benefits afforded to employees of the County. Except as may be expressly authorized elsewhere in this Agreement, the Contractor has no authority to bind, represent, or otherwise act on behalf of the County and agrees not to purport to do so.

8. ASSIGNMENT

The Contractor shall not assign or transfer any interest in this Agreement or assign any claims for money due or to become due under this Agreement without the advance written approval of the County. Any attempted assignment or transfer without the County's advance written approval shall be null and void and without any legal effect.

9. SUBCONTRACTING

The Contractor shall not subcontract or delegate any portion of the services to be performed under this Agreement without the advance written approval of the County. Any attempted subcontracting or delegating without the County's advance written approval shall be null and void and without any legal effect.

10. PERSONNEL

A. All work performed under this Agreement shall be performed by the Contractor or under its supervision.

B. The Contractor represents that it has, or will secure at its own expense, all personnel required to discharge its obligations under this Agreement. Such personnel (i) shall not be employees of or have any contractual relationships with the County and (ii) shall be fully

qualified and licensed or otherwise authorized or permitted under federal, state, and local law to perform such work.

11. RELEASE

Upon its receipt of all payments due under this Agreement, the Contractor releases the County, its elected officials, officers, agents and employees from all liabilities, claims, and obligations whatsoever arising from or under or relating to this Agreement.

12. CONFIDENTIALITY

Any confidential information provided to or developed by the Contractor in the performance of this Agreement shall be kept confidential and shall not be made available to any individual or organization by the Contractor without the prior written approval of the County.

13. PUBLICATION, REPRODUCTION, AND USE OF MATERIAL; COPYRIGHT

- A. The County has the unrestricted right to publish, disclose, distribute and otherwise use, in whole or in part, any reports, data, or other material prepared under or pursuant to this Agreement.
- B. The Contractor acknowledges and agrees that any material produced in whole or in part under or pursuant to this Agreement is a work made for hire. Accordingly, to the extent that any such material is copyrightable in the United States or in any other country, the County shall own any such copyright.

14. CONFLICT OF INTEREST

The Contractor represents that it has no and shall not acquire any interest, direct or indirect, that would conflict in any manner or degree with the performance of its obligations under this Agreement.

15. NO ORAL MODIFICATIONS; WRITTEN AMENDMENTS REQUIRED

This Agreement may not be modified, altered, changed, or amended orally but, rather, only by an instrument in writing executed by the parties hereto. The Contractor specifically acknowledges and agrees that the County shall not be responsible for any changes to Section 1 (Scope of Work), of this Agreement unless such changes are set forth in a duly executed written amendment to this Agreement.

16. ENTIRE AGREEMENT; INTEGRATION

This Agreement incorporates all the agreements, covenants, and understandings between the parties hereto concerning the subject matter hereof, and all such agreements, covenants and understandings have been merged into this written Agreement. No prior or contemporaneous

agreement, covenant or understandings, verbal or otherwise, of the parties or their agents shall be valid or enforceable unless embodied in this Agreement.

17. NOTICE OF PENALTIES

The Procurement Code, NMSA 1978, Sections 13-1-28 through 13-1-199, imposes civil and criminal penalties for its violation. In addition, New Mexico criminal statutes impose felony penalties for bribes, gratuities, and kickbacks.

18. EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE

- A. The Contractor agrees to abide by all federal, state, and local laws, ordinances, and rules and regulations pertaining to equal employment opportunity and unlawful discrimination. Without in any way limiting the foregoing general obligation, the Contractor specifically agrees not to discriminate against any person with regard to employment with the Contractor or participation in any program or activity offered pursuant to this Agreement on the grounds of race, age, religion, color, national origin, ancestry, sex, physical or mental handicap, serious medical condition, spousal affiliation, sexual orientation, or gender identity.
- B. The Contractor acknowledges and agrees that failure to comply with this Section shall constitute a material breach of this Agreement.

19. COMPLIANCE WITH APPLICABLE LAW; CHOICE OF LAW

- A. In performing its obligations hereunder, the Contractor shall comply with all applicable laws, ordinances, and regulations.
- B. Contractor shall comply with the requirements of Santa Fe County Ordinance 2014-1 (Establishing a Living Wage).
- C. This Agreement shall be construed in accordance with the substantive laws of the State of New Mexico, without regard to its choice of law rules. Contractor and the County agree that the exclusive forum for any litigation between them arising out of or related to this Agreement shall be state district courts of New Mexico, located in Santa Fe County.

20. RECORDS AND INSPECTIONS

- A. To the extent its books and records relate to (i) its performance of this Agreement or any subcontract entered into pursuant to it or (ii) cost or pricing data (if any) set forth in this Agreement or that was required to be submitted to the County as part of the procurement process, the Contractor agrees to (i) maintain such books and records during the term of this Agreement and for a period of six years from the date of final payment under this Agreement; (ii) allow the County or its designee to audit such

books and records at reasonable times and upon reasonable notice; and (iii) to keep such books and records in accordance with generally accepted accounting principles (GAAP).

- B. To the extent its books and records relate to (i) its performance of this Agreement or any subcontract entered into pursuant to it or (ii) cost or pricing data (if any) set forth in this Agreement or that was required to be submitted to County as part of the procurement process, the Contractor also agrees to require any subcontractor it may hire to perform its obligations under this Agreement to (i) maintain such books and records during the term of this Agreement and for a period of six years from the date of final payment under the subcontract; (ii) to allow the County or its designee to audit such books and records at reasonable times and upon reasonable notice; and (iii) to keep such books and records in accordance with GAAP.

21. INDEMNIFICATION

- A. The Contractor shall defend, indemnify, and hold harmless the County and its elected officials, agents, and employees from any losses, liabilities, damages, demands, suits, causes of action, judgments, costs or expenses (including but not limited to court costs and attorneys' fees) resulting from or directly or indirectly arising out of the Contractor's performance or non-performance of its obligations under this Agreement, including but not limited to the Contractor's breach of any representation or warranty made herein.
- B. The Contractor agrees that the County shall have the right to control and participate in the defense of any such demand, suit, or cause of action concerning matters that relate to the County and that such suit will not be settled without the County's consent, such consent not to be unreasonably withheld. If a conflict exists between the interests of the County and the Contractor in such demand, suit, or cause of action, the County may retain its own counsel to represent the County's interest.
- C. The Contractor's obligations under this section shall not be limited by the provisions of any insurance policy the Contractor is required to maintain under this Agreement.

22. SEVERABILITY

If any term or condition of this Agreement shall be held invalid or non-enforceable by any court of competent jurisdiction, the remainder of this Agreement shall not be affected and shall be valid and enforceable to the fullest extent of the law.

23. NOTICES

Any notice required to be given to either party by this Agreement shall be in writing and shall be delivered in person, by courier service or by U.S. mail, either first class or certified, return receipt requested, postage prepaid, as follows:

To the County: Santa Fe County
Attn: Ashley Zappe, Sustainability Specialist
and Project Manager
102 Grant Avenue
P.O. Box 276
Santa Fe, New Mexico 87504-0276

To the Contractor: Los Ebanistas Inc. dba Sol Luna Solar
Attention: Mark Johnson, Owner
P.O. Box 10
Dixon, NM 87527
mark@sollunasolar.com
505-455-8875

24. CONTRACTOR'S REPRESENTATIONS AND WARRANTIES

The Contractor hereby represents and warrants that:

- A. This Agreement has been duly authorized by the Contractor, the person executing this Agreement has authority to do so, and, once executed by the Contractor, this Agreement shall constitute a binding obligation of the Contractor.
- B. This Agreement and Contractor's obligations hereunder do not conflict with Contractor's corporate agreement or any statement filed with the New Mexico Secretary of State on Contractor's behalf.
- C. Contractor is legally registered and is properly licensed by the State of New Mexico to provide the services anticipated by this Agreement and shall maintain such registration and licensure in good standing throughout the duration of the Agreement.

25. FACSIMILE SIGNATURES

The parties hereto agree that a facsimile signature has the same force and effect as an original for all purposes.

26. NO THIRD-PARTY BENEFICIARIES

This Agreement was not intended to and does not create any rights in any persons not a party hereto.

27. INSURANCE

- A. General Conditions. The Contractor shall submit evidence of insurance as is required herein. Policies of insurance shall be written by companies authorized to write such insurance in New Mexico.

- B. General Liability Insurance, Including Automobile. The Contractor shall procure and maintain during the life of this Agreement a comprehensive general liability and automobile insurance policy with liability limits in amounts not less than \$1,000,000.00 combined single limits of liability for bodily injury, including death, and property damage for any one occurrence. Said policies of insurance shall include coverage for all operations performed for the County by the Contractor; coverage for the use of all owned, non-owned, hired automobiles, vehicles and other equipment, both on and off work; and contractual liability coverage under which this Agreement is an insured contract. Santa Fe County shall be a named additional insured on the policy.
- C. Increased Limits. If, during the life of this Agreement, the Legislature of the State of New Mexico increases the maximum limits of liability under the Tort Claims Act (NMSA 1978, Sections 41-4-1 through 41-4-29), the Contractor shall increase the maximum limits of any insurance required herein.

28. PERMITS, FEES, AND LICENSES

Contractor shall procure all permits and licenses, pay all charges, fees, and royalties, and give all notices necessary and incidental to the due and lawful performance of its obligations hereunder.

29. NEW MEXICO TORT CLAIMS ACT

No provision of this Agreement modifies or waives any sovereign immunity or limitation of liability enjoyed by County or its "public employees" at common law or under the New Mexico Tort Claims Act, NMSA 1978, Section 41-4-1, et seq.

30. CAMPAIGN CONTRIBUTION DISCLOSURE FORM

The Contractor agrees to compute and submit simultaneous with execution of this Agreement a Campaign Contribution Disclosure form approved by the County.

31. SURVIVAL

The provisions of following paragraphs shall survive termination of this Contract; INDEMNIFICATION; RECORDS AND INSPECTION; RELEASE, CONFIDENTIALITY, PUBLICATION, REPRODUCTION, AND USE OF MATERIAL; COPYRIGHT; COMPLIANCE WITH APPLICABLE LAW; CHOICE OF LAW; NO THIRD-PARTY BENEFICIARIES; SURVIVAL.

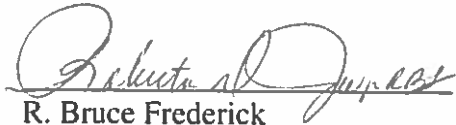
IN WITNESS WHEREOF, the parties have duly executed this Agreement as of the date of last signature below:

SANTA FE COUNTY


Katherine Miller
Santa Fe County Manager


11.19.18
Date

Approved as to form:


R. Bruce Frederick
County Attorney

11-5-18
Date

Finance Department


Stephanie S. Clarke
Finance Director

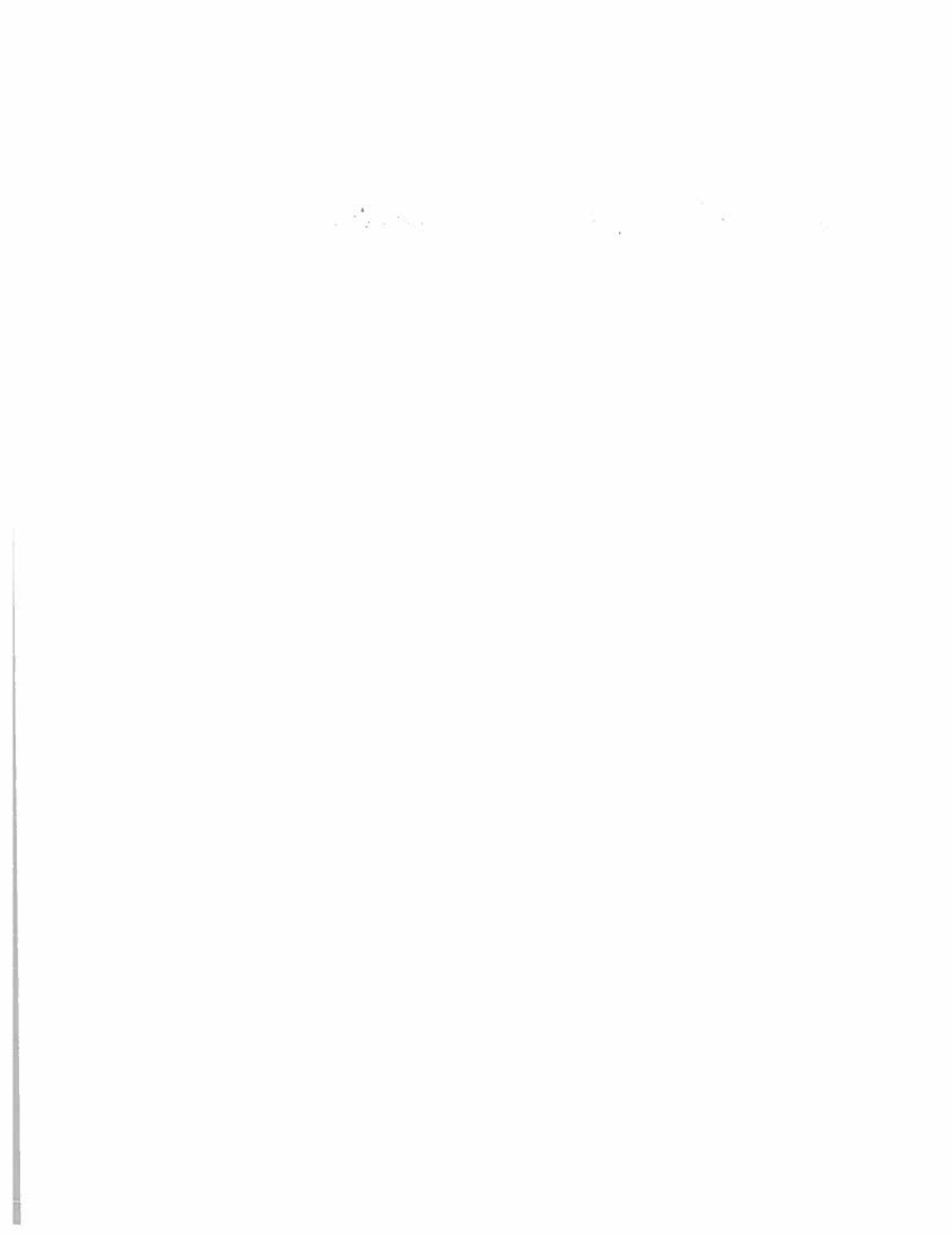
11/13/18
Date

CONTRACTOR:

(Signature)

Date

(Print name and title)




SANTA FE COUNTY

Katherine Miller
Santa Fe County Manager


Date

Approved as to form:



R. Bruce Frederick
County Attorney

11-5-18
Date

Finance Department


Stephanie S. Clarke
Finance Director

11/13/18
Date

CONTRACTOR:

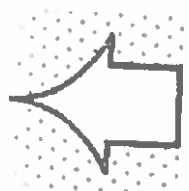


(Signature)

11/14/2018
Date

Mark Johnson VP

(Print name and title)



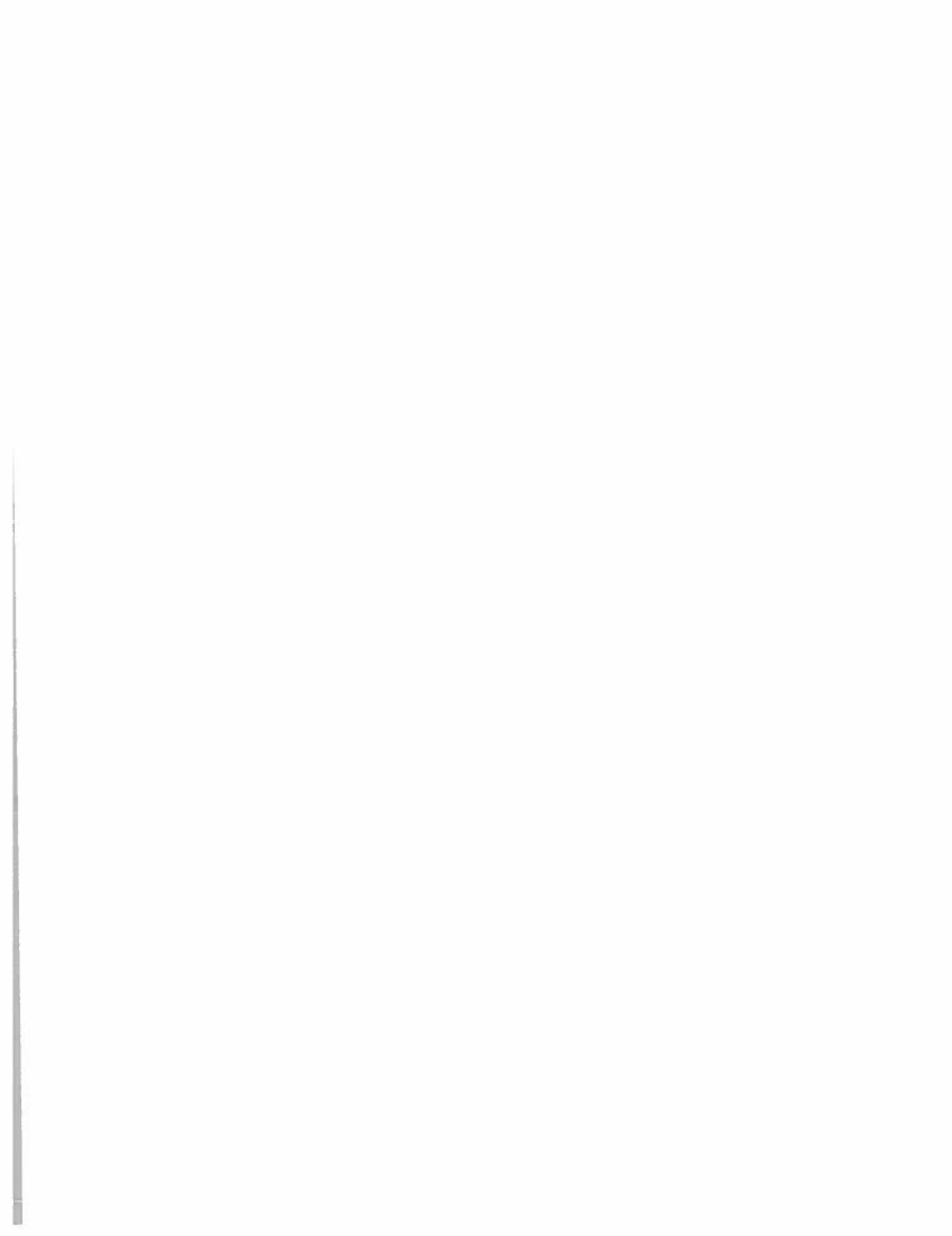


EXHIBIT A

RFQ NO. 2019-0050-PW/KE

OPTION A

REVISED QUOTE SHEETS

(October 5, 2018)

Firm's Name: Sol Luna Solar

Quoted Items from NM Statewide Price Agreement #80-000-17-00017

Note: The price for each Item shall not exceed the price indicated on the Statewide Price Agreement for Zone 4. Quotes are only being accepted from vendors that have agreed to not charge for the preparation of a site-specific proposal.

Solar Photovoltaic Project

Item No. 1: Item # 006 or #013 – with Power System Size up to 50kW or 50.1-100kW

Item #006 or #013- Ground Mount

Price per watt for fixed Ground Mount (include all significant digits):

\$ 2.01 x # of watts DC: 71040 = \$142,790.40

Item No. 2: Wiring and Conduit, with Power System Size up to 50kW or 50.1-100kW

#029 or #032 PV Array Junction to Inverter-Above or below grade – per linear foot:

Price per lineal foot: \$ 10.68 x # of feet: 100 = \$1068.00

#030 or #033 Inverter to Electrical Panel

Price per lineal foot: \$ 10.04 x # of feet: 160 = \$1606.40

#031 or #034 Utility Grid Interconnection

Price per lineal foot: \$ 10.13 x # of feet: 95 = \$962.35

Item No. 2 Total Price:

\$3636.75

Item No. 2A: Directional Drill: Additional cost, if any, to bore under paved and concrete surfaces with directional drill

\$8500.00

Additive Alternate No. 1 – Monitoring System

Item #041, per unit:

\$950.00

Additive Alternate No. 2- Data Communication Wiring for Monitoring

Item # 042 or #043 Price per lineal foot 219 x .042

\$ 91.98

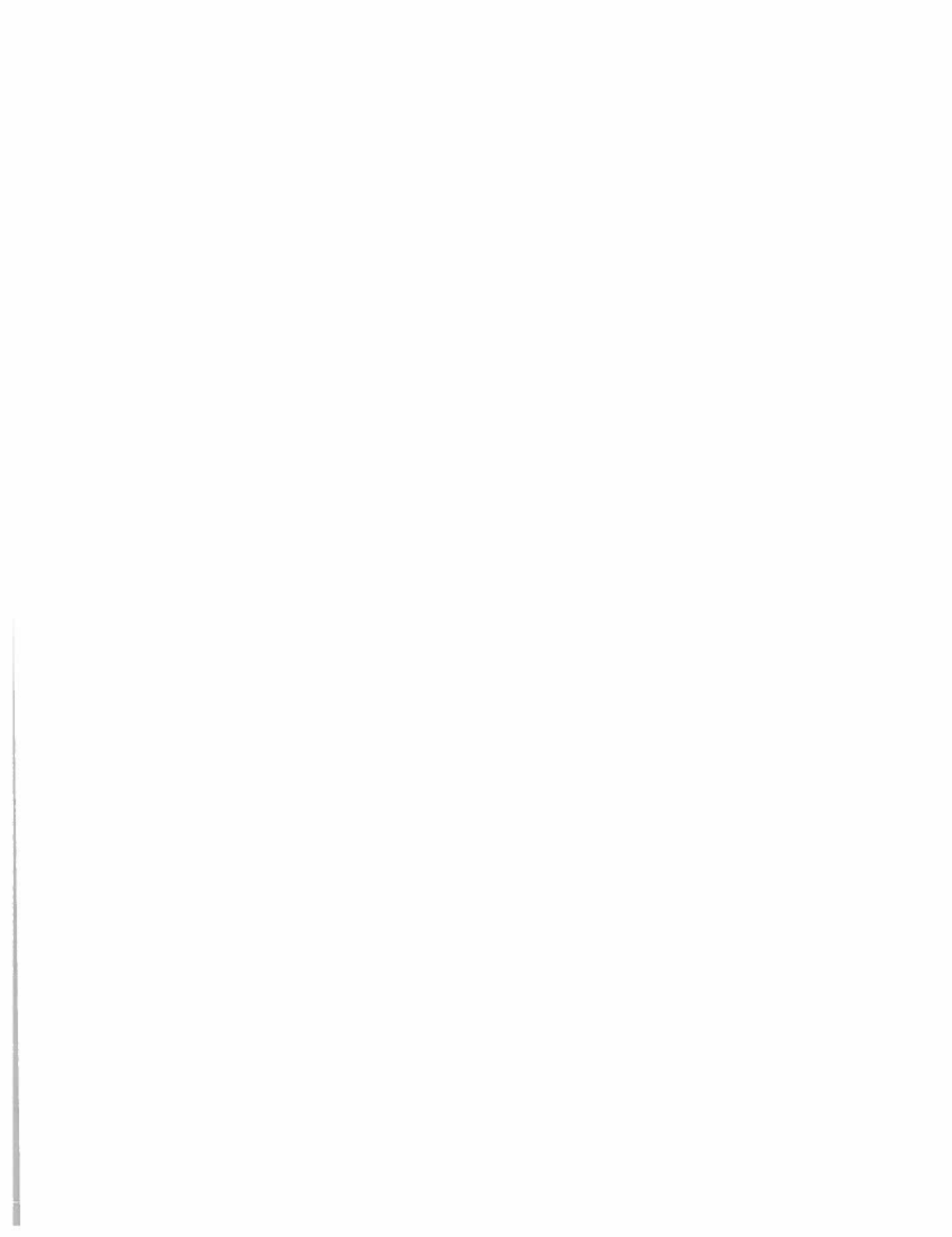
Additive Alternate No. 3 - Extend Warranty an Additional Five Years

#049 or #056 Price per kW per year: \$ 1278 x # of years: 5 =

\$6390.00

Total Quote for Project Solar PV System:

\$162,359.13





71 kW Ground Mount (72 cell)

Prepared For

Santa Fe County
505-992-6759

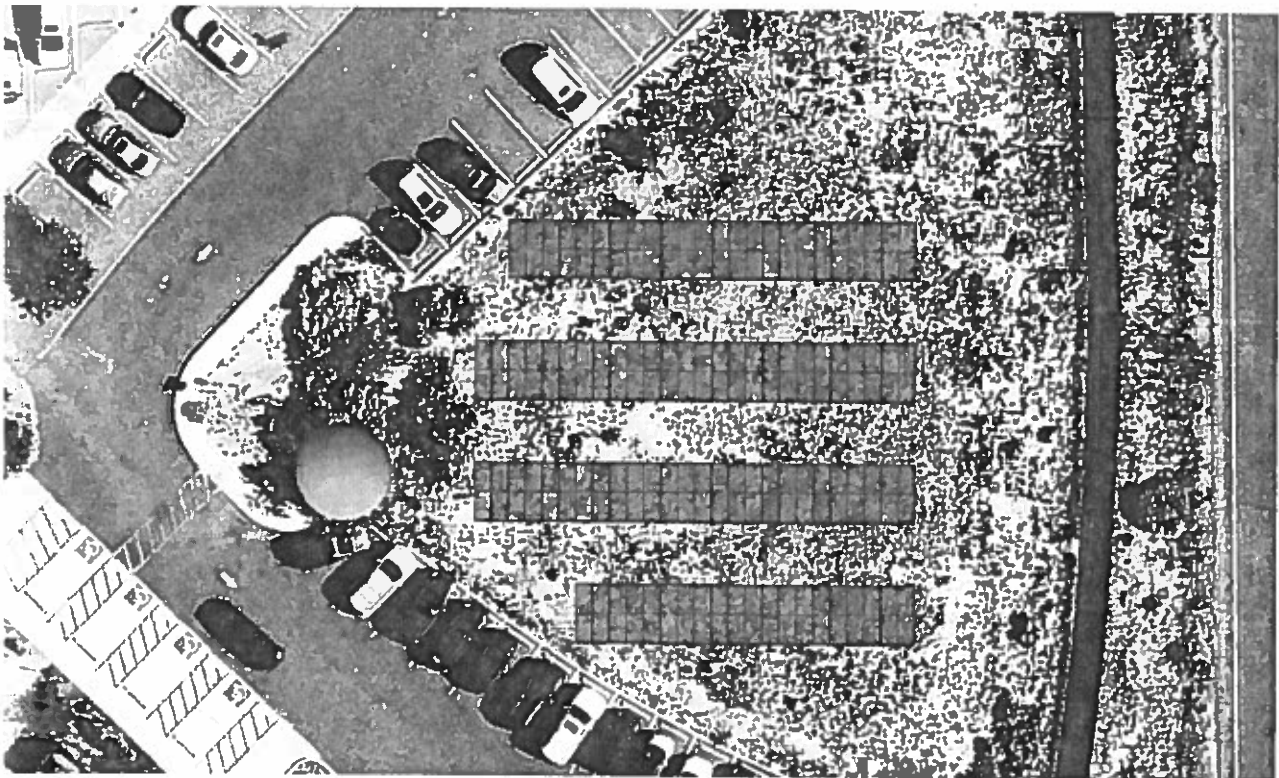
kkemery@santafecountynm.org

Prepared By

Zach Johnson
(575) 779-4860

zach@sollunasolar.com

10/10/2018



Location and Station Identification

Requested Location	87505, USA
Weather Data Source	Lat, Lon: 35.65, -105.94 1.2 mi
Latitude	35.65° N
Longitude	105.94° W

PV System Specifications *(Residential)*

DC System Size	59.2 kW
Module Type	Standard
Array Type	Fixed (open rack)
Array Tilt	30°
Array Azimuth	180°
System Losses	14.08%
Inverter Efficiency	96%
DC to AC Size Ratio	1.2

Economics

Average Retail Electricity Rate	0.123 \$/kWh
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Performance Metrics

Capacity Factor	20.4%
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Additional Required Information: (beyond that required under the SPA)

1	Brand and Model of Solar Panels	Canadian Solar-CS3U-370 MS
2	Type and DC Wattage of Each Module	Monocrystalline-370 Watts
3	Number of Modules	192
4	Brand and Model of Ground-Mount System	Unirac-GFT
5	Brand and Model of Inverter	SolarEdge-43.2 KUS
6	Height of array above ground surface and total height of array	2' above ground surface/8'-total height
7	Total System DC Wattage	71,780
8	First year system AC power production estimate in kWh (using PV Watts)	126,695 kWh

Evaluation Calculation:

A	Total Quote for Project Solar PV system (from Page 8)	\$ 162,558
B	First year system AC power production estimate in kWh (using PV Watts)	126,695
C	Total Quote / first year kWh production per PVWatts	1.29

Is printout of PV Watts analysis included? Yes No

Is PV module specification included? Yes No

Is inverter specification included? Yes No

Is mounting system specification sheet included? Yes No

Is the manufacturer's module warranty information included? Yes No

Is site schematic of solar system included? Yes No

Firm name: Los Ebanistas Inc Dba Sol Luna Solar

Address / City / State / Zip: PO BOX 10 Dixon NM 87527

Phone Number / Email: 505-455-8875 mark@sollunasolar.com

Qualifying Party Name / License: Mark Johnson/ 33662

Contractor License: LosEbanistas

Contractor License Number: 33662

Printed Name of Authorized Official: Mark Johnson

Signature of Authorized Official:  Date: 10/11/2018 4:39:48 PM PDT

RESULTS



Print Results

126,695 kWh/Year*

System output may range from 119,308 to 130,711 kWh per year near this location.

Click [HERE](#) for more information.

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)	Value (\$)
January	5.32	9,682	1,192
February	5.76	9,359	1,152
March	6.54	11,362	1,399
April	6.99	11,566	1,424
May	7.33	12,225	1,505
June	7.34	11,491	1,415
July	6.47	10,358	1,275
August	6.81	10,765	1,325
September	6.67	10,432	1,284
October	6.31	10,877	1,339
November	5.68	9,621	1,184
December	4.94	8,957	1,103
Annual	6.35	126,695	\$ 15,597

User Comments

Download Results: [Monthly](#) | [Hourly](#)

[Find A Local Installer](#)

* Caution: The PVWatts[®] energy estimate is based on an hourly performance simulation using a typical-year weather file that represents a multi-year historical period for Albuquerque, NM for a Fixed (open rack) photovoltaic system. The kWh range is based on analysis of a nearby data site described [here](#).

The estimate for the value of this energy is the product of the AC energy and the average retail electricity rate. This value is useful for basic comparisons but does not account for financial considerations in a cash flow-based analysis. All of these results are based on assumptions described in [Help](#) that may not accurately represent technical or economic characteristics of the project you are modeling.

Location and Station Identification

Requested Location	87505, USA
Weather Data Source	Lat, Lon: 35.65, -105.94 1.2 mi
Latitude	35.65° N
Longitude	105.94° W

PV System Specifications (*Residential*)

DC System Size	71.04 kW
Module Type	Standard
Array Type	Fixed (open rack)
Array Tilt	30°
Array Azimuth	180°
System Losses	14.08%
Inverter Efficiency	96%
DC to AC Size Ratio	1.2

Economics

Average Retail Electricity Rate	0.123 \$/kWh
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Performance Metrics

Capacity Factor	20.4%
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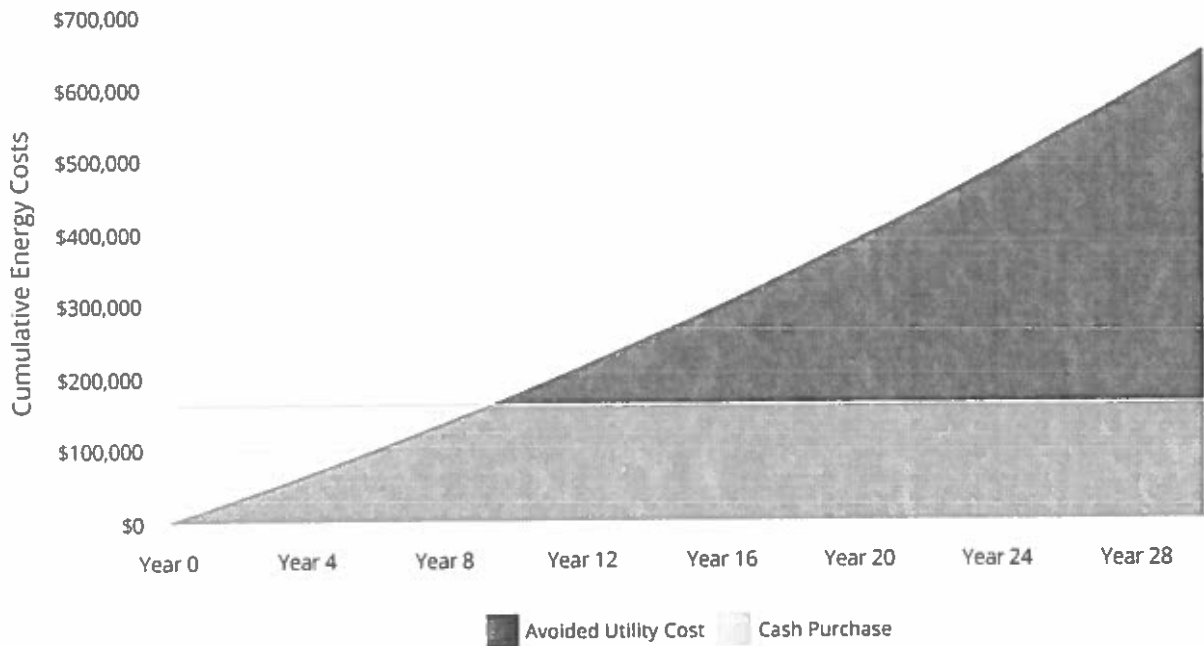
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1 Project Summary

Payment Options	Cash Purchase
Upfront Payment	\$162,588
Total Payments	\$162,588
Rebates and Incentives	-
Net Payments	\$162,588
30-Year Electric Bill Savings	\$649,060
30-Year IRR	11.02%
30-Year LCOE Utility & PV	\$0.064
30-Year LCOE PV	\$0.045
30-Year NPV	\$146,443
Payback Period	9.4 Years
30-Year ROI	299.2%

Combined Solar PV Rating
 Power Rating: 71,040 W-DC
 Power Rating: 61,880 W-AC-CEC

Cumulative Energy Costs By Payment Option



2.1.1 PV System Details

General Information

Facility: Ken and Patty Adam Senior Center
 Address: 16 Avenida Torreon Santa Fe NM 87508

Solar PV System Rating

Power Rating: 71,040 W-DC
 Power Rating: 61,880 W-AC-CEC

Solar PV Equipment Description

Solar Panels: (192) Canadian Solar Inc. CS3U 370MS 1500V
 Inverters: (2) SolarEdge SE43.2K

Energy Consumption Mix

Annual Energy Use: 142,560 kWh

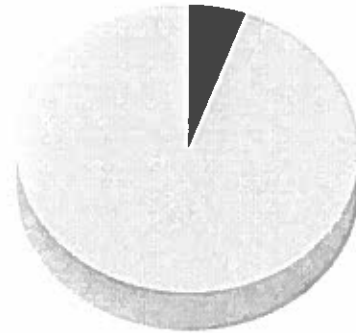
Solar PV Equipment Typical Lifespan

Solar Panels: Greater than 30 Years
 Inverters: 15 Years

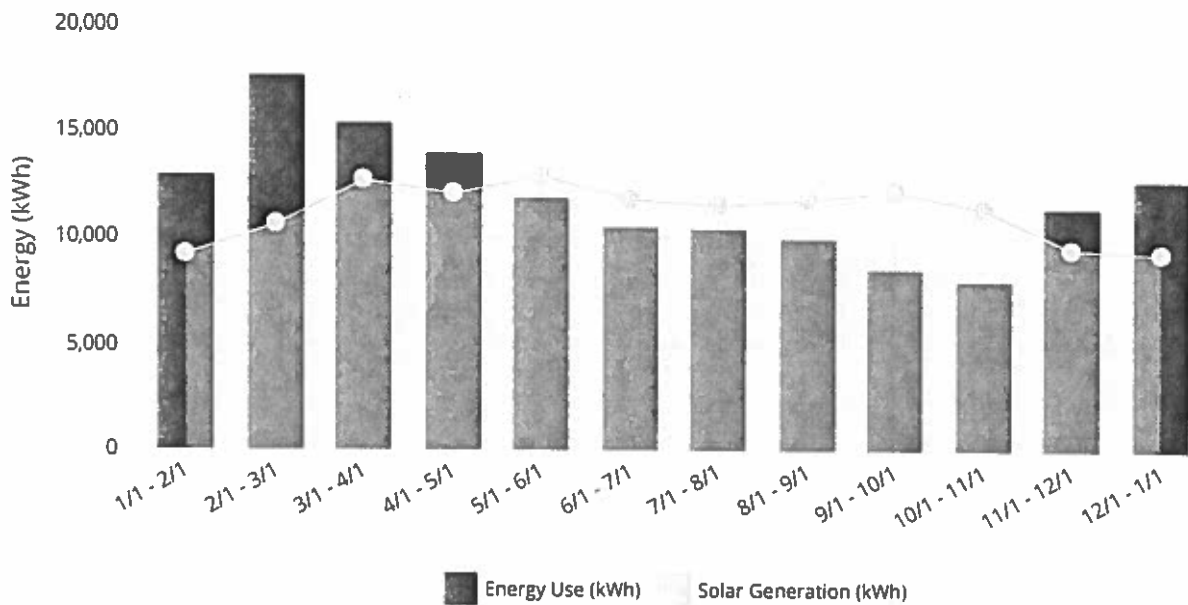
Solar PV System Cost And Incentives

Solar PV System Cost \$162,588

Net Solar PV System Cost: \$162,588



Monthly Energy Use vs Solar Generation



2.1.2 Rebates and Incentives

This section summarizes all incentives available for this project. The actual rebate and incentive amounts for this project are shown in each example.

2.1.3 Utility Rates

The table below shows the rates associate with your current utility rate schedule (2A). Your estimated electric bills after solar are shown on the following page.

Fixed Charges		Energy Charges	
Type	2A	Type	2A
W Monthly	\$16.17	W Flat Rate	\$0.12024
S Monthly	\$16.17	S Flat Rate	\$0.14405

2.1.4 Current Electric Bill

The table below shows your annual electricity costs based on the most current utility rates and your previous 12 months of electrical usage.

Rate Schedule: PNM - 2A

Time Periods	Energy Use (kWh)	Charges		
		Other	Energy	Total
Bill Ranges & Seasons	Total			
1/1/2017 - 2/1/2017 W	12,880	\$16	\$1,549	\$1,565
2/1/2017 - 3/1/2017 W	17,600	\$16	\$2,116	\$2,132
3/1/2017 - 4/1/2017 W	15,360	\$16	\$1,847	\$1,863
4/1/2017 - 5/1/2017 W	13,840	\$16	\$1,664	\$1,680
5/1/2017 - 6/1/2017 W	11,760	\$16	\$1,414	\$1,430
6/1/2017 - 7/1/2017 S	10,480	\$16	\$1,510	\$1,526
7/1/2017 - 8/1/2017 S	10,320	\$16	\$1,487	\$1,503
8/1/2017 - 9/1/2017 S	9,920	\$16	\$1,429	\$1,445
9/1/2017 - 10/1/2017 W	8,480	\$16	\$1,020	\$1,036
10/1/2017 - 11/1/2017 W	7,920	\$16	\$952	\$968
11/1/2017 - 12/1/2017 W	11,360	\$16	\$1,366	\$1,382
12/1/2017 - 1/1/2018 W	12,640	\$16	\$1,520	\$1,536
Totals:	142,560	\$194	\$17,873	\$18,067

2.1.5 New Electric Bill

Rate Schedule: PNM - 2A

Time Periods	Energy Use (kWh)	Charges		
		Other	Energy	Total
Bill Ranges & Seasons	Total			
1/1/2017 - 2/1/2017 W	3,680	\$16	\$442	\$459
2/1/2017 - 3/1/2017 W	6,975	\$16	\$839	\$855
3/1/2017 - 4/1/2017 W	2,669	\$16	\$321	\$337
4/1/2017 - 5/1/2017 W	1,769	\$16	\$213	\$229
5/1/2017 - 6/1/2017 W	-1,144	\$16	-\$29	-\$12
6/1/2017 - 7/1/2017 S	-1,338	\$16	-\$33	-\$17
7/1/2017 - 8/1/2017 S	-1,196	\$16	-\$30	-\$14
8/1/2017 - 9/1/2017 S	-1,869	\$16	-\$47	-\$31
9/1/2017 - 10/1/2017 W	-3,707	\$16	-\$93	-\$77
10/1/2017 - 11/1/2017 W	-3,434	\$16	-\$86	-\$70
11/1/2017 - 12/1/2017 W	1,873	\$16	\$225	\$241
12/1/2017 - 1/1/2018 W	3,374	\$16	\$406	\$422
Totals:	7,652	\$194	\$2,129	\$2,323

Annual Electricity Savings: \$15,744

3.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$162,588	30-Year ROI	299.2%	Electricity Escalation Rate	3%
30-Year IRR	11.02%	PV Degradation Rate	0.8%	Federal Income Tax Rate	30%
30-Year NPV	\$146,443	Discount Rate	5%	State Income Tax Rate	8%
Payback Period	9.4 Years				

Years	Project Costs	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-\$162,588	-	-\$162,588	-\$162,588
1	-	\$15,744	\$15,744	-\$146,844
2	-	\$16,087	\$16,087	-\$130,757
3	-	\$16,436	\$16,436	-\$114,321
4	-	\$16,791	\$16,791	-\$97,529
5	-	\$17,153	\$17,153	-\$80,376
6	-	\$17,522	\$17,522	-\$62,854
7	-	\$17,897	\$17,897	-\$44,956
8	-	\$18,279	\$18,279	-\$26,677
9	-	\$18,668	\$18,668	-\$8,009
10	-	\$19,064	\$19,064	\$11,055
11	-	\$19,466	\$19,466	\$30,521
12	-	\$19,876	\$19,876	\$50,398
13	-	\$20,293	\$20,293	\$70,690
14	-	\$20,717	\$20,717	\$91,407
15	-	\$21,148	\$21,148	\$112,555
16	-	\$21,586	\$21,586	\$134,140
17	-	\$22,031	\$22,031	\$156,172
18	-	\$22,484	\$22,484	\$178,656
19	-	\$22,944	\$22,944	\$201,600
20	-	\$23,412	\$23,412	\$225,011
21	-	\$23,886	\$23,886	\$248,898
22	-	\$24,369	\$24,369	\$273,266
23	-	\$24,858	\$24,858	\$298,125
24	-	\$25,356	\$25,356	\$323,480
25	-	\$25,860	\$25,860	\$349,341
26	-	\$26,372	\$26,372	\$375,713
27	-	\$26,892	\$26,892	\$402,605
28	-	\$27,419	\$27,419	\$430,023
29	-	\$27,953	\$27,953	\$457,977
30	-	\$28,495	\$28,495	\$486,472
Totals:	-\$162,588	\$649,060	\$486,472	-

4.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$162,588	Payback Period	9.4 Years	Discount Rate	5%	State Income Tax Rate	8%
30-Year IRR	11.02%	30-Year ROI	29.2%	Electricity Escalation Rate	3%		
30-Year NPV	\$146,443	PV Degradation Rate	0.8%	Federal Income Tax Rate	30%		

Years	Upfront	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash											
Project Costs	\$162,588	-	-	-	-	-	-	-	-	-	-
Electric Bill Savings	-	\$15,744	\$16,087	\$16,436	\$16,791	\$17,153	\$17,522	\$17,897	\$18,279	\$18,668	\$19,064
Cash	-\$162,588	\$15,744	\$16,087	\$16,436	\$16,791	\$17,153	\$17,522	\$17,897	\$18,279	\$18,668	\$19,064
Total Cash Flow	-\$162,588	\$15,744	\$16,087	\$16,436	\$16,791	\$17,153	\$17,522	\$17,897	\$18,279	\$18,668	\$19,064
Cumulative Cash Flow	\$162,588	-\$146,844	-\$130,757	-\$114,321	-\$97,529	-\$80,376	-\$62,854	-\$44,956	-\$26,677	-\$8,009	\$11,055

4.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$162,588	Payback Period	9.4 Years	Discount Rate	5%	State Income Tax Rate	8%
30-Year IRR	11.02%	30-Year ROI	299.2%	Electricity Escalation Rate	3%		
30-Year NPV	\$146,443	PV Degradation Rate	0.8%	Federal Income Tax Rate	30%		

Years	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21
Cash											
Project Costs	-	-	-	-	-	-	-	-	-	-	-
Electric Bill Savings	\$19,466	\$19,876	\$20,293	\$20,717	\$21,148	\$21,586	\$22,031	\$22,484	\$22,944	\$23,412	\$23,886
Cash	\$19,466	\$19,876	\$20,293	\$20,717	\$21,148	\$21,586	\$22,031	\$22,484	\$22,944	\$23,412	\$23,886
Total Cash Flow	\$19,466	\$19,876	\$20,293	\$20,717	\$21,148	\$21,586	\$22,031	\$22,484	\$22,944	\$23,412	\$23,886
Cumulative Cash Flow	\$30,521	\$50,398	\$70,690	\$91,407	\$112,555	\$134,140	\$156,172	\$178,656	\$201,600	\$225,011	\$248,898

4.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$162,588	Payback Period	9.4 Years	Discount Rate	5%	State Income Tax Rate	8%
30-Year IRR	11.02%	30-Year ROI	299.2%	Electricity Escalation Rate	3%		
30-Year NPV	\$146,443	PV Degradation Rate	0.8%	Federal Income Tax Rate	30%		

Years	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Totals
Cash										
Project Costs	-	-	-	-	-	-	-	-	-	-\$162,588
Electric Bill Savings	\$24,369	\$24,858	\$25,356	\$25,860	\$26,372	\$26,892	\$27,419	\$27,953	\$28,495	\$649,060
Cash	\$24,369	\$24,858	\$25,356	\$25,860	\$26,372	\$26,892	\$27,419	\$27,953	\$28,495	\$486,472
Total Cash Flow	\$24,369	\$24,858	\$25,356	\$25,860	\$26,372	\$26,892	\$27,419	\$27,953	\$28,495	\$486,472
Cumulative Cash Flow	\$273,266	\$298,125	\$323,480	\$349,341	\$375,713	\$402,605	\$430,023	\$457,977	\$486,472	-



59.2 kW Ground Mount (72 Cell)

Prepared For

Santa Fe County

505-992-6759

kkemery@santafecountynm.org

Prepared By

Zach Johnson

(575) 779-4860

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10/10/2018

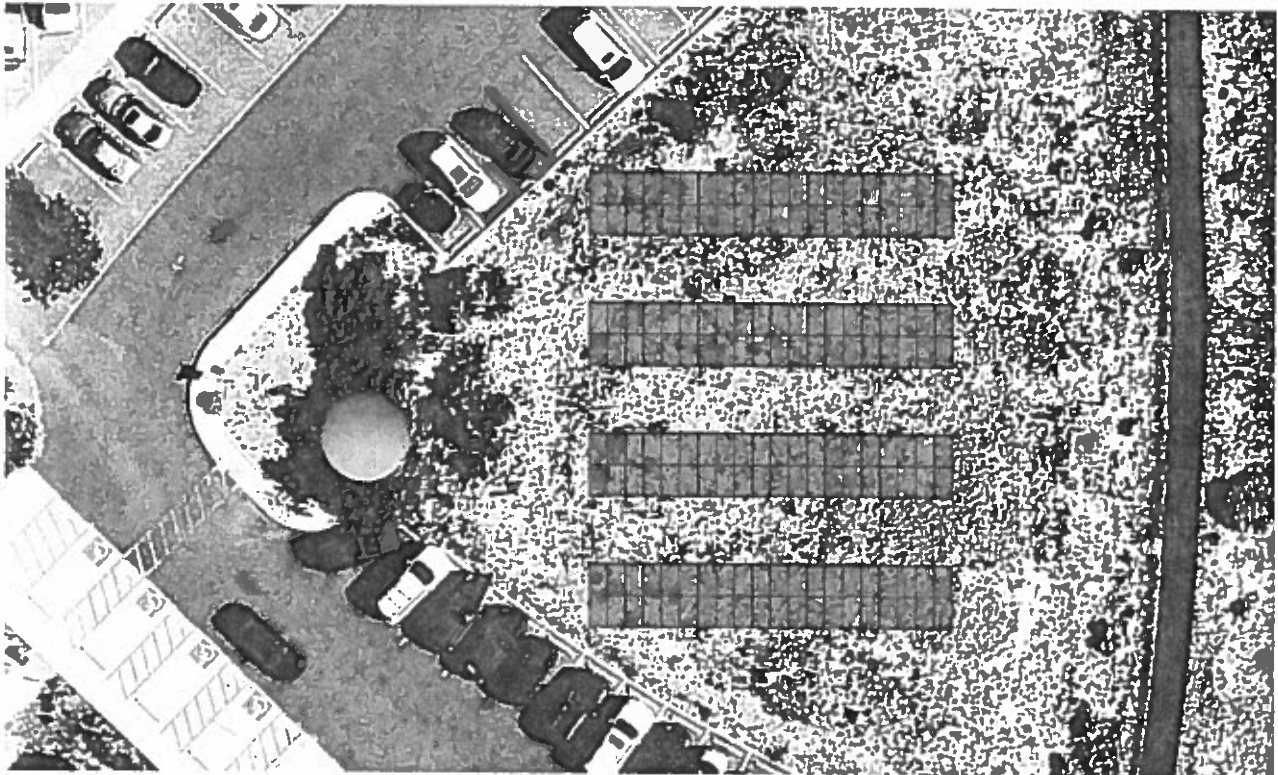


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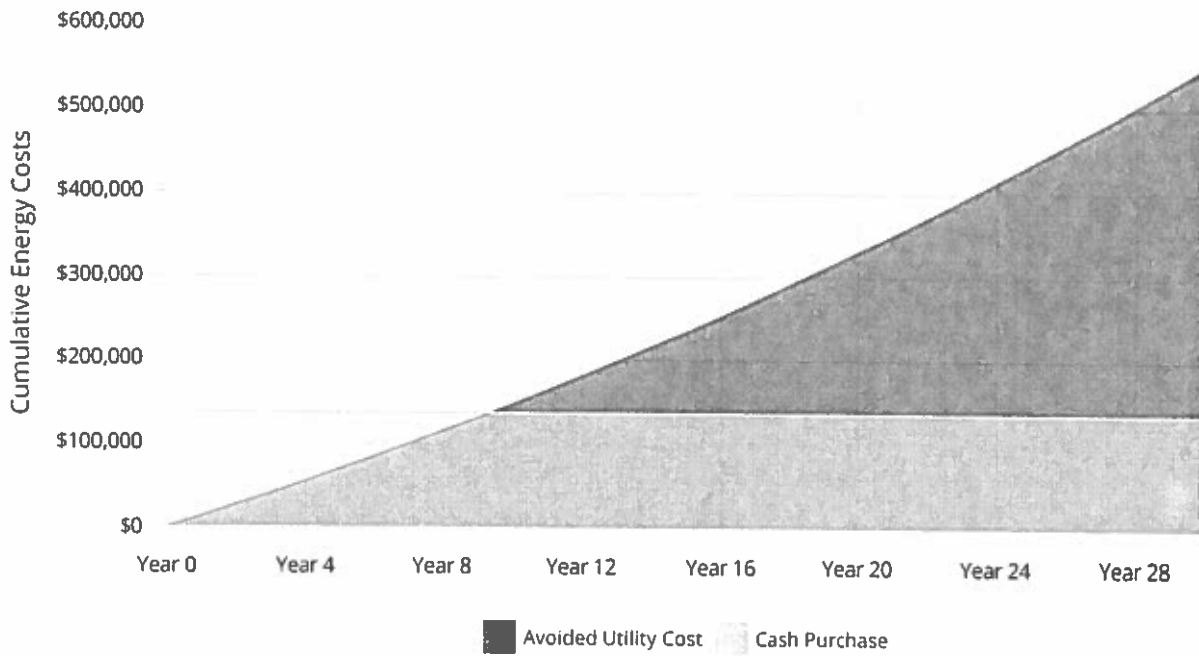
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4.1 Cash Purchase	11

1 Project Summary

Payment Options	Cash Purchase
Upfront Payment	\$137,198
Total Payments	\$137,198
Rebates and Incentives	-
Net Payments	\$137,198
30-Year Electric Bill Savings	\$552,117
30-Year IRR	11.11%
30-Year LCOE Utility & PV	\$0.084
30-Year LCOE PV	\$0.048
30-Year NPV	\$125,676
Payback Period	9.4 Years
30-Year ROI	302.4%

Combined Solar PV Rating
 Power Rating: 59,200 W-DC
 Power Rating: 51,567 W-AC-CEC

Cumulative Energy Costs By Payment Option



2.1.1 PV System Details

General Information

Facility: Ken and Patty Adam Senior Center
 Address: 16 Avenida Torreon Santa Fe NM 87508

Solar PV System Rating

Power Rating: 59,200 W-DC
 Power Rating: 51,567 W-AC-CEC

Solar PV Equipment Description

Solar Panels: (160) Canadian Solar Inc. CS3U 370MS 1000V
 Inverters: (1) SolarEdge SE43.2K

Energy Consumption Mix

Annual Energy Use: 142,560 kWh

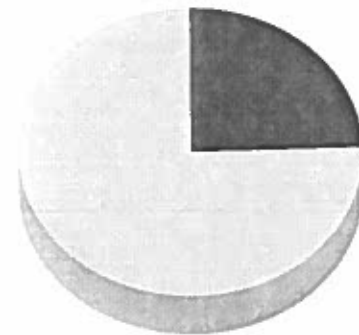
Solar PV Equipment Typical Lifespan

Solar Panels: Greater than 30 Years
 Inverters: 15 Years

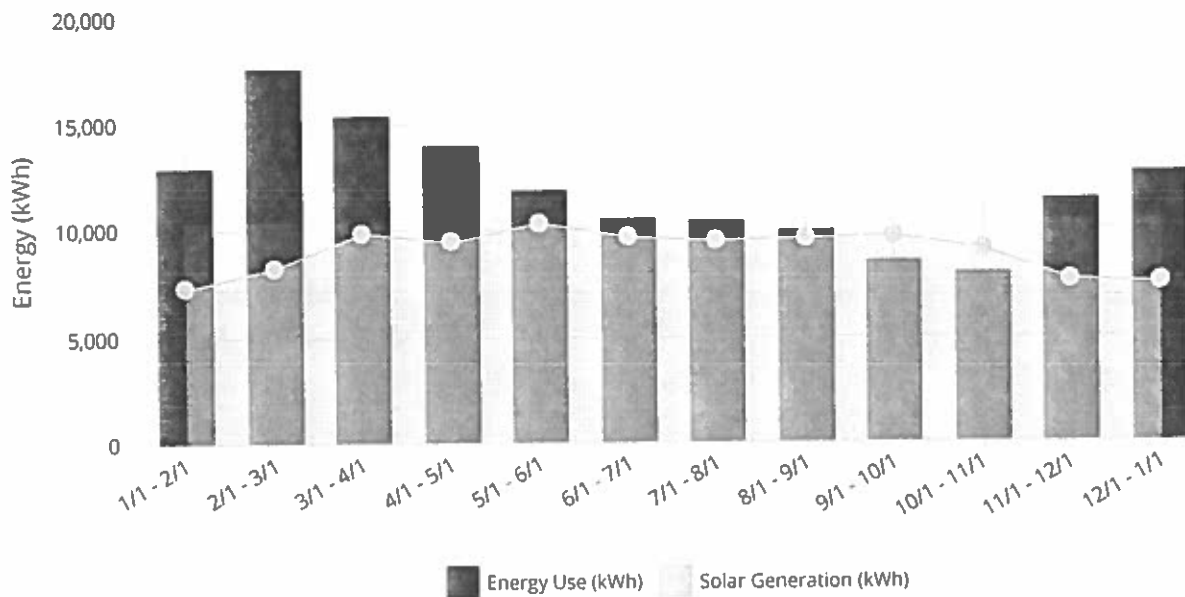
Solar PV System Cost And Incentives

Solar PV System Cost \$137,198

Net Solar PV System Cost: \$137,198



Monthly Energy Use vs Solar Generation



2.1.2 Rebates and Incentives

This section summarizes all incentives available for this project. The actual rebate and incentive amounts for this project are shown in each example.

2.1.3 Utility Rates

The table below shows the rates associate with your current utility rate schedule (2A). Your estimated electric bills after solar are shown on the following page.

Fixed Charges		Energy Charges	
Type	2A	Type	2A
W Monthly	\$16.17	W Flat Rate	\$0.12024
S Monthly	\$16.17	S Flat Rate	\$0.14405

2.1.4 Current Electric Bill

The table below shows your annual electricity costs based on the most current utility rates and your previous 12 months of electrical usage.

Rate Schedule: PNM - 2A

Time Periods	Energy Use (kWh)	Charges		
		Other	Energy	Total
Bill Ranges & Seasons	Total			
1/1/2017 - 2/1/2017 W	12,880	\$16	\$1,549	\$1,565
2/1/2017 - 3/1/2017 W	17,600	\$16	\$2,116	\$2,132
3/1/2017 - 4/1/2017 W	15,360	\$16	\$1,847	\$1,863
4/1/2017 - 5/1/2017 W	13,840	\$16	\$1,664	\$1,680
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6/1/2017 - 7/1/2017 S	10,480	\$16	\$1,510	\$1,526
7/1/2017 - 8/1/2017 S	10,320	\$16	\$1,487	\$1,503
8/1/2017 - 9/1/2017 S	9,920	\$16	\$1,429	\$1,445
9/1/2017 - 10/1/2017 W	8,480	\$16	\$1,020	\$1,036
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11/1/2017 - 12/1/2017 W	11,360	\$16	\$1,366	\$1,382
12/1/2017 - 1/1/2018 W	12,640	\$16	\$1,520	\$1,536
Totals:	142,560	\$194	\$17,873	\$18,067

2.1.5 New Electric Bill

Rate Schedule: PNM - 2A

Time Periods	Energy Use (kWh)	Charges		
		Other	Energy	Total
Bill Ranges & Seasons	Total			
1/1/2017 - 2/1/2017 W	5,619	\$16	\$676	\$692
2/1/2017 - 3/1/2017 W	9,373	\$16	\$1,127	\$1,143
3/1/2017 - 4/1/2017 W	5,518	\$16	\$663	\$680
4/1/2017 - 5/1/2017 W	4,412	\$16	\$531	\$547
5/1/2017 - 6/1/2017 W	1,465	\$16	\$176	\$192
6/1/2017 - 7/1/2017 S	836	\$16	\$120	\$137
7/1/2017 - 8/1/2017 S	836	\$16	\$120	\$137
8/1/2017 - 9/1/2017 S	335	\$16	\$48	\$64
9/1/2017 - 10/1/2017 W	-1,184	\$16	-\$30	-\$13
10/1/2017 - 11/1/2017 W	-1,127	\$16	-\$28	-\$12
11/1/2017 - 12/1/2017 W	3,758	\$16	\$452	\$468
12/1/2017 - 1/1/2018 W	5,190	\$16	\$624	\$640
Totals:	35,031	\$194	\$4,480	\$4,674

Annual Electricity Savings: \$13,393

3.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$137,198	30-Year ROI	302.4%	Electricity Escalation Rate	3%
30-Year IRR	11.11%	PV Degradation Rate	0.8%	Federal Income Tax Rate	30%
30-Year NPV	\$125,676	Discount Rate	5%	State Income Tax Rate	8%
Payback Period	9.4 Years				

Years	Project Costs	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-\$137,198	-	-\$137,198	-\$137,198
1	-	\$13,393	\$13,393	-\$123,805
2	-	\$13,684	\$13,684	-\$110,121
3	-	\$13,981	\$13,981	-\$96,140
4	-	\$14,284	\$14,284	-\$81,856
5	-	\$14,591	\$14,591	-\$67,265
6	-	\$14,905	\$14,905	-\$52,360
7	-	\$15,224	\$15,224	-\$37,135
8	-	\$15,549	\$15,549	-\$21,586
9	-	\$15,880	\$15,880	-\$5,706
10	-	\$16,216	\$16,216	\$10,510
11	-	\$16,559	\$16,559	\$27,069
12	-	\$16,907	\$16,907	\$43,977
13	-	\$17,262	\$17,262	\$61,238
14	-	\$17,622	\$17,622	\$78,861
15	-	\$17,989	\$17,989	\$96,850
16	-	\$18,362	\$18,362	\$115,212
17	-	\$18,741	\$18,741	\$133,952
18	-	\$19,126	\$19,126	\$153,078
19	-	\$19,517	\$19,517	\$172,595
20	-	\$19,915	\$19,915	\$192,510
21	-	\$20,319	\$20,319	\$212,829
22	-	\$20,729	\$20,729	\$233,558
23	-	\$21,146	\$21,146	\$254,704
24	-	\$21,569	\$21,569	\$276,272
25	-	\$21,998	\$21,998	\$298,270
26	-	\$22,433	\$22,433	\$320,703
27	-	\$22,875	\$22,875	\$343,579
28	-	\$23,324	\$23,324	\$366,902
29	-	\$23,778	\$23,778	\$390,680
30	-	\$24,239	\$24,239	\$414,919
Totals:	-\$137,198	\$552,117	\$414,919	-

4.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$137,198	Payback Period	9.4 Years	Discount Rate	5%	State Income Tax Rate	8%
30-Year IRR	11.11%	30-Year ROI	302.4%	Electricity Escalation Rate	3%		
30-Year NPV	\$125,676	PV Degradation Rate	0.8%	Federal Income Tax Rate	30%		

Years	Upfront	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash											
Project Costs	-\$137,198	-	-	-	-	-	-	-	-	-	-
Electric Bill Savings	-	\$13,393	\$13,684	\$13,981	\$14,284	\$14,591	\$14,905	\$15,224	\$15,549	\$15,880	\$16,216
Cash	-\$137,198	\$13,393	\$13,684	\$13,981	\$14,284	\$14,591	\$14,905	\$15,224	\$15,549	\$15,880	\$16,216
Total Cash Flow	-\$137,198	\$13,393	\$13,684	\$13,981	\$14,284	\$14,591	\$14,905	\$15,224	\$15,549	\$15,880	\$16,216
Cumulative Cash Flow	-\$137,198	-\$123,805	-\$110,121	-\$96,140	-\$81,856	-\$67,265	-\$52,360	-\$37,135	-\$21,586	-\$5,706	\$10,510

4.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$137,198	Payback Period	9.4 Years	Discount Rate	5%	State Income Tax Rate	8%
30-Year IRR	11.11%	30-Year ROI	302.4%	Electricity Escalation Rate	3%		
30-Year NPV	\$125,676	PV Degradation Rate	0.8%	Federal Income Tax Rate	30%		




Years	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21
Cash											
Project Costs	-	-	-	-	-	-	-	-	-	-	-
Electric Bill Savings	\$16,559	\$16,907	\$17,262	\$17,622	\$17,989	\$18,362	\$18,741	\$19,126	\$19,517	\$19,915	\$20,319
Cash	\$16,559	\$16,907	\$17,262	\$17,622	\$17,989	\$18,362	\$18,741	\$19,126	\$19,517	\$19,915	\$20,319
Total Cash Flow	\$16,559	\$16,907	\$17,262	\$17,622	\$17,989	\$18,362	\$18,741	\$19,126	\$19,517	\$19,915	\$20,319
Cumulative Cash Flow	\$27,069	\$43,977	\$61,238	\$78,861	\$96,850	\$115,212	\$133,952	\$153,078	\$172,595	\$192,510	\$212,829

4.1 Cash Purchase

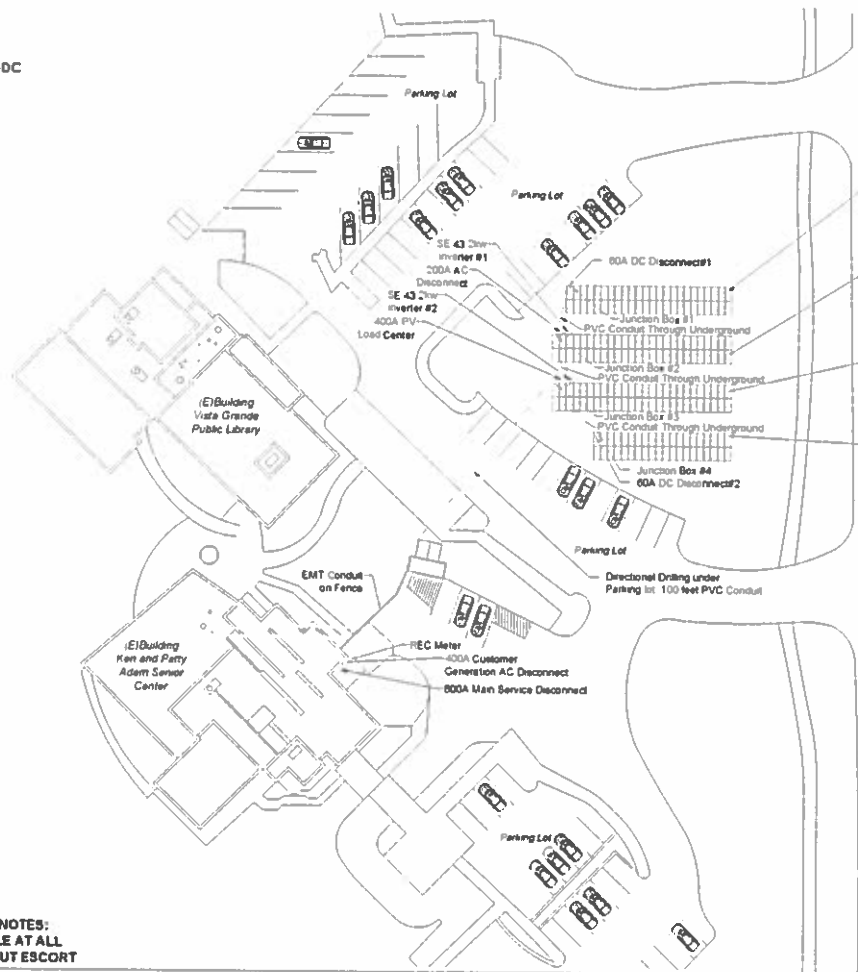
Inputs and Key Financial Metrics

Total Project Costs	\$137,198	Payback Period	9.4 Years	Discount Rate	5%	State Income Tax Rate	8%
30-Year IRR	11.11%	30-Year ROI	302.4%	Electricity Escalation Rate	3%		
30-Year NPV	\$125,676	PV Degradation Rate	0.8%	Federal Income Tax Rate	30%		

Years	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Totals
Cash										
Project Costs	-	-	-	-	-	-	-	-	-	\$137,198
Electric Bill Savings	\$20,729	\$21,146	\$21,569	\$21,998	\$22,433	\$22,875	\$23,324	\$23,778	\$24,239	\$552,117
Cash	\$20,729	\$21,146	\$21,569	\$21,998	\$22,433	\$22,875	\$23,324	\$23,778	\$24,239	\$414,919
Total Cash Flow	\$20,729	\$21,146	\$21,569	\$21,998	\$22,433	\$22,875	\$23,324	\$23,778	\$24,239	\$414,919
Cumulative Cash Flow	\$233,558	\$254,704	\$276,272	\$298,270	\$320,703	\$343,579	\$366,902	\$390,680	\$414,919	-

<p>INSTALLER Los Ebanistas, Inc./Sol Luna Solar</p> <p>Address: 50C County Road 65 Dixon, NM 87527 Phone Number: Tel (505) 455-8875 Lic # 33862</p>		<p>ELECTRICAL ENGINEER</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV #</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV #	DESCRIPTION	DATE																<p>SITE NOTES: A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES. THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION NEC 110.26. ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.</p> <p>EQUIPMENT LOCATIONS: ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26. WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.52 (A), (C) AND NE TABLES 310.15 (B)(1)(A) AND 310.15 (B)(1)(C). JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.54. ADDITIONAL AC DISCONNECTS SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVING DISCONNECT. ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES. ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.</p> <p>STRUCTURAL NOTES: RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY SUBARRAY, ACCORDING TO RAIL MANUFACTURER'S INSTRUCTIONS. JUNCTION BOX WILL BE INSTALLED PER LOCAL REQUIREMENTS. ROOF TOP PENETRATIONS FOR PV RAILWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR. ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER. WHEN POSSIBLE, ALL PV RELATED FACING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.</p> <p>WIRING & CONDUIT NOTES: ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE, CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT INTEND TO LIMIT UP-SIZING. CONDUCTORS SIZED ACCORDING TO NEC 690.4, NEC 690.7 EXPOSED ROOF PV DC CONDUCTORS SHALL BE USE 2 OR PV WIRE, RATED, WET AND UV RESISTANT, AND LISTED FOR 600V. BONDING WIRING SHALL BE LOCATED AND SECURED UNDER THE ARRAY. NEGATIVE GROUNDING SYSTEMS DC CONDUCTORS COLORED OR MARKED AS FOLLOWS: DC POSITIVE BLACK, RED, OR ANY COLOR EXCLUDING WHITE, GRAY AND GREEN DC NEGATIVE WHITE OR GREY. POSITIVE GROUNDING SYSTEMS DC CONDUCTORS COLORED OR MARKED AS FOLLOWS: DC POSITIVE WHITE OR GREY DC NEGATIVE BLACK, RED, OR ANY COLOR EXCLUDING WHITE, GRAY AND GREEN DC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1 BLACK PHASE B OR L2 RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3 BLUE, YELLOW, ORANGE OR OTHER CONVENTION IF NEUTRAL WHITE OR GREY. USE 2 IS NOT INDOOR RATED BUT PV CABLE IS RATED 600V/THWN 2 AND MAY BE USED INSIDE. BOTH USE 2 AND PV WIRE BLACK WIRE MAY BE FIELD MARKED WHITE (NEC 200.6 (A) (8)) THOUGH BOTH ARE AVAILABLE AS UV WHITE. IN 4 WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE</p> <p>DISCONNECT AND OVER-CURRENT PROTECTION NOTES: DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS). DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL BE LOCKABLE, AND BE A VISIBLE BREAK SWITCH. DC DISCONNECTS (INSTALLED) INTO RUDOTOP DC COMBINER OR INSTALLED WITHIN 6 FT, ACCORDING TO NEC 690.55 (E) RAPID SHUTDOWN OF ENERGIZED CONDUCTORS BEYOND 10 FT OF PV ARRAY OR 5 FT INSIDE A BUILDING WITHIN 10 SECONDS. CONTROLLED CONDUCTORS 110, 320 AND 600V (NEC 490.12). LOCATION OF LABEL ACCORDING TO ALL APPLICABLE RATED AND TYPES SPECIFIED ACCORDING TO NEC 690.9, 690.9, AND 240 PV SOURCE AND OUTPUT CIRCUITS SHALL BE PROTECTED BY LISTED OVERCURRENT DEVICES (NEC 690.9 (D)(1) SEE EXCEPTION IN NEC 690.9) IF REQUIRED BY AHJ. SYSTEM WILL INCLUDE ARC FLASH CIRCUIT PROTECTION ACCORDING TO NEC 690.13 AND UL 1699B.</p>
REV #	DESCRIPTION	DATE																				
<p>Designer: Narek Y Date: 11 October, 2018</p>		<p>PHOTOVOLTAIC SYSTEM SUMMARY</p>																				
<p>SCOPE OF WORK 71.04 DC STC PV SYSTEM INSTALLATION ON THE GROUND</p> <p>SHEET INDEX</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>TITLE</th> </tr> </thead> <tbody> <tr><td>PV-1</td><td>SITE PLAN</td></tr> <tr><td>PV-2</td><td>SINGLE LINE DIAGRAM</td></tr> </tbody> </table>		NO.	TITLE	PV-1	SITE PLAN	PV-2	SINGLE LINE DIAGRAM	<p>SYSTEM SIZE DC STC 71.04 KW SYSTEM SIZE AC CEC 84.14 KW SOLAR MODULES (182) CANADIAN SOLAR 370W (CS3U-370MS) 1500V INVERTERS (2) SOLAR EDGE 43.2KW (SE 43.2K) OPTIMIZERS (98) SOLAR EDGE P800R RACKING</p> <p>ELECTRICAL INFORMATION: EXISTING MAIN SERVICE PANEL BUS SIZE: 800A MAIN SERVICE DISCONNECT SIZE: 800A MAX AC VOLTAGE: 120/208V, 3P, 4WRE</p> <p>BUILDING INFORMATION: CONSTRUCTION TYPE: IN-A OCCUPANCY: B # OF STORES: 1 ROOF TYPE MEMBRANE</p> <p>OUTPUT CALCULATIONS: PV SYSTEM MAX DC OUTPUT: 182 * 370W = 71.04 KW PV SYSTEM MAX AC OUTPUT: (182) CS3U-370MS (2) SOLAR EDGE SE 43.2K Primes (PTC Rating) PER MODULE 344 W 344 W * 142 = 65.12 KW 65.12 KW * 87.0% CEC INVERTER = 64.14 KW</p>														
NO.	TITLE																					
PV-1	SITE PLAN																					
PV-2	SINGLE LINE DIAGRAM																					
<p>PROJECT NAME: Ken and Patty Adam Senior Center ADDRESS: 16 Avenida Torreon, Santa Fe, NM 87508</p>		<p>CODE COMPLIANCE THE INSTALLATION OF SOLAR ARRAYS AND PHOTOVOLTAIC POWER SYSTEMS SHALL COMPLY WITH THE FOLLOWING CODES: 2015 (IBC) INTERNATIONAL BUILDING CODE 2015 (IMC) INTERNATIONAL MECHANICAL CODE 2015 (IPC) INTERNATIONAL PLUMBING CODE 2015 (IFC) INTERNATIONAL FIRE CODE 2015 (IRC) INTERNATIONAL RESIDENTIAL CODE 2017 (NEC) NATIONAL ELECTRIC CODE ALL OTHER ORDINANCE ADOPTED BY THE LOCAL GOVERNING AGENCIES</p> <p>PROJECT NOTES THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690. ALL MANUFACTURER'S LISTING AND INSTALLATION INSTRUCTIONS AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION (AHJ) APPLICABLE CODES. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND AND INTERRUPTION (GFI) DEVICE IS INTEGRATED WITH THE INVERTER IN ACCORDANCE WITH NEC 690.54(A) ALL PV SYSTEM COMPONENTS, MODULES, UTILITY INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEM AS REQUIRED BY NEC 690.4 & NEC 690.6D.</p> <p>PV MODULES UL 1705+ IEC61730+ AND IEC61215+ AND NFPA 70 CLASS C FIRE INVERTERS UL 1741 CERTIFIED KEE 1547- 929- 519 COMBINER BOXES UL 1703 OR UL 1741 ACCESSORY MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT OR VOC, IF AVAILABLE. MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7. ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4 (D). SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING (NEC 130.3) ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE IF EXPOSED TO SUNLIGHT. IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY NEC AND AHJ.</p> <p>SCOPE OF WORK PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING OHSTE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ROOF-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEM DETAILED IN THIS DOCUMENT.</p> <p>WORK INCLUDES PV ROOF ATTACHMENTS, PV RACKING SYSTEM INSTALLATION, PV MODULE AND INVERTER INSTALLATION, PV EQUIPMENT GROUNDING, PV SYSTEM WIRING TO A ROOF MOUNTED JUNCTION BOX, PV LOAD CENTERS (IF INCLUDED), PV DISCONNECTS, PV GROUNDING, ELECTRODE & BONDING TO GFC, PV FINAL COMMISSIONING, ELECTRICAL EQUIPMENT RETROFIT FOR PV SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE</p>																				
<p>VICINITY MAP</p> 		<p>SATELLITE VIEW</p> 																				

PHOTOVOLTAIC ARRAY
 (192) Canadian Solar 370W Modules
 (CS6U-370MS 1500V)
 (2) Solar Edge P800s Power Optimizers
 (99) Solar Edge 43.2KW (SE43.2K)
 For 2 x High Power of Bi-Facial PV Modules
PV MODULES: 192 x 370 = 71040W STC-DC
INVERTERS: 2 x 43.2KW = 86.4KW (AC)



- (N) Solar PV Array #1
 48 Canadian Solar 370W
 24 P800s Optimizers
 4 Ground Slope
 30 Deg Array Tilt
 180 Deg Array Azimuth
- (N) Solar PV Array #2
 32 Canadian Solar 370W
 27 P800s Optimizers
 4 Ground Slope
 30 Deg Array Tilt
 180 Deg Array Azimuth
- (N) Solar PV Array #3
 52 Canadian Solar 370W
 27 P800s Optimizers
 4 Ground Slope
 30 Deg Array Tilt
 180 Deg Array Azimuth
- (N) Solar PV Array #4
 40 Canadian Solar 370W
 20 P800s Optimizers
 4 Ground Slope
 30 Deg Array Tilt
 180 Deg Array Azimuth



SCALE: 1" = 1 1/21"
 0 5 20 40 R
 1 10 30

ACCESS NOTES:
 ACCESSIBLE AT ALL
 TIMES WITHOUT ESCORT

Note: In Case of odd number of PV modules in String it is allowed to install one P800s optimizer connected to one PV Module

INSTALLER
Los Ebanistas, Inc./Sol Luna Solar
 Address: 196 County Road 85
 Doon, NM 87527
 Phone Number: Tel: (505) 453-8873
 Lic # 33062



Contractor: Main Johnson

Designer: Ivanak Y

DATE	REVISION	BY

SITE PLAN

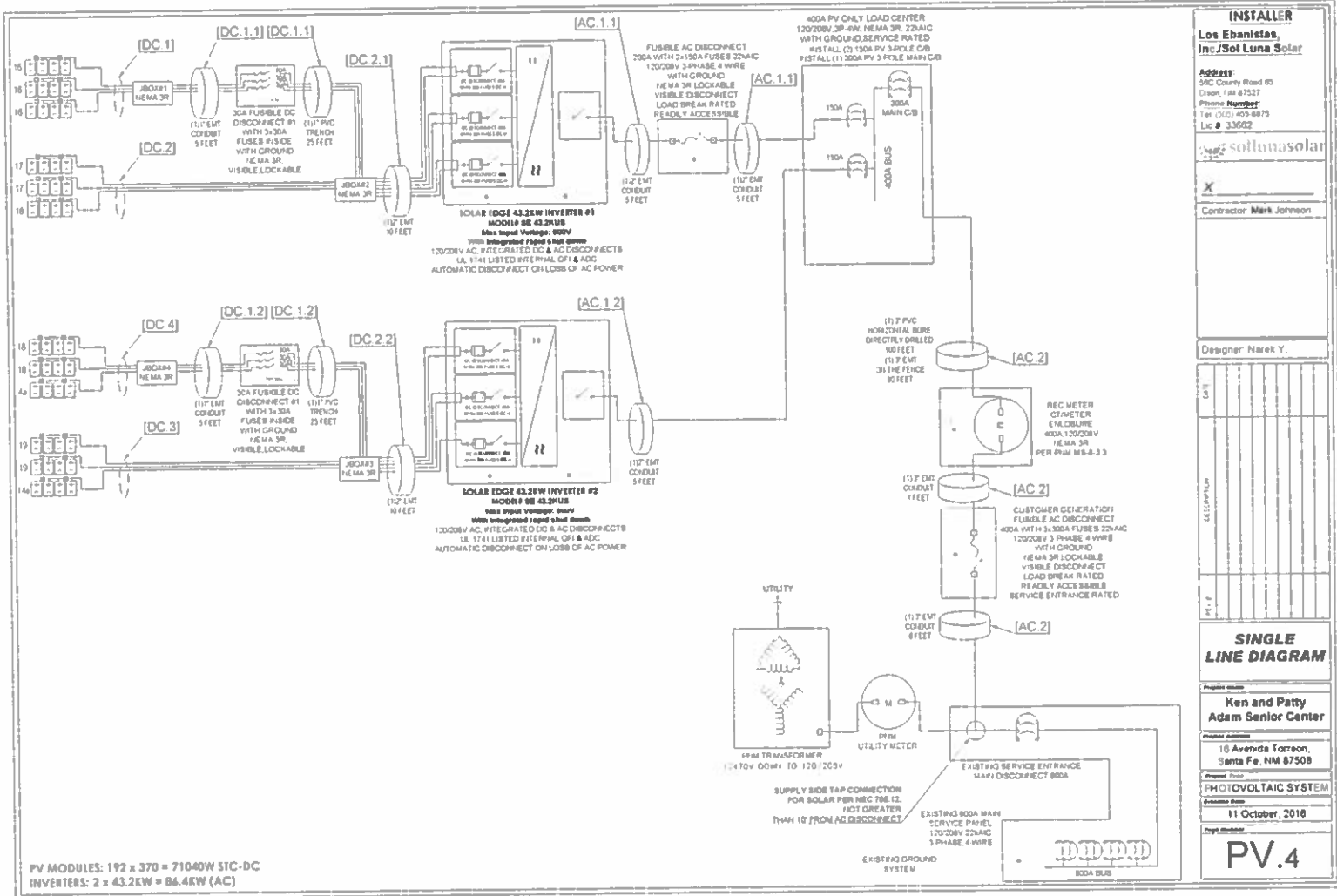
Project Name:
Ken and Patty Adam Senior Center

Project Address:
 16 Avenida Torreon
 Santa Fe, NM 87508

Project Type:
 PHOTOVOLTAIC SYSTEM

Contract Date:
 11 October, 2018

Page Number:
PV.1



--OR--

NO CONTRIBUTIONS IN THE AGGREGATE TOTAL OVER TWO HUNDRED FIFTY DOLLARS (\$250) WERE MADE to an applicable public official by me, a family member or representative.

Mark Johnson

10/11/18

Signature

Date

Owner/Vice President

Title (Position)

