CITY of ALBUQUERQUE
TWENTY SIXTH COUNCIL

COUNCIL BILL NO. O-24-33 ENACTMENT NO. _____

SPONSORED BY: Klarissa J. Peña, by request

ORDINANCE

ACCEPTING THE INVESTMENT-GRADE AUDIT REPORT AND APPROVING THE ENERGY SAVINGS PERFORMANCE CONTRACT BY AND BETWEEN THE CITY OF ALBUQUERQUE AND YEAROUT ENERGY SERVICES COMPANY, LLC, SUBJECT TO CITY COUNCIL APPROVAL OF A SEPARATE FINANCING TRANSACTION TO FINANCE THE COSTS OF THE ENERGY PERFORMANCE CONTRACT ("EPC"); AUTHORIZING THE EXECUTION AND DELIVERY OF THE EPC AND OTHER AGREEMENTS AND DOCUMENTS IN CONNECTION WITH THE EPC; RATIFYING ACTION PREVIOUSLY TAKEN IN CONNECTION WITH THE EPC; REPEALING ALL ORDINANCES AND PRIOR ACTION IN CONFLICT HEREWITH; AND RELATED MATTERS.

Capitalized terms used in the following preambles have the same meaning as set forth in Section 1 of this Ordinance unless the context requires otherwise.

WHEREAS, the City of Albuquerque, New Mexico (the "City") is a legally and regularly created, established, organized and existing municipal corporation under the general laws of the State and its home rule charter; and

WHEREAS, the City has Home Rule Powers; and

WHEREAS, pursuant to the Statewide Price Agreement No. 90-000-18-00017, the City entered into Professional Services Agreement No. ("PSA 202100819") with Yearout Energy Services Company, LLC, a New Mexico limited liability Company (the "Contractor"), effective as of March 5, 2021 for the purpose of obtaining an investment grade audit of energy usage for various buildings and facilities owned and operated by the City, and to determine the feasibility of entering into a guaranteed utility savings contract for the purpose of installing and implementing energy efficiency measures at the City's facilities; and

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WHEREAS, pursuant to PSA 202100819, if energy conserving measures are determined to be feasible, and if the amount of savings to be realized through the implementation of such measures is determined to be sufficient to cover all such costs, as determined by the City, associated with an Energy Savings Performance Contracting project, the City and the Contractor intend to negotiate a Guaranteed Utility Savings Contract under which the Contractor will design, procure, install, implement, maintain and monitor such energy conserving measures; provided, that the City, by entering into PSA 202100819, was not committed to entering into a Guaranteed Utility Savings Contract; and

WHEREAS, the Contractor has provided the Investment Grade Audit Report dated April 2, 2024 (the "IGA"), a copy of which has been presented to the City Council in connection with its consideration of this Ordinance, and pursuant to which the Contractor recommended the implementation of energy savings measures (including both electricity and natural gas) and throughout City-owned facilities to achieve a total of $15,702,878 reduction in the City's electrical utility and natural gas energy costs resulting in 11% percent reduction in utility costs over the useful life of the energy conserving measures, at a total contract price of $11,442,980 less a $3,000,000 capital contribution from the 3% capital outlay fund (the "Energy Conservation Project" or "Project"); and

WHEREAS, the Contractor has proposed that the City and the Contractor enter into a Professional Services Agreement for Energy Performance Contracting (the "EPC"), a copy of which has been presented to the City Council in connection with its consideration of this Ordinance, and pursuant to which the Contractor will complete the Energy Conservation Project at a total cost not to exceed $11,442,980, and will guarantee utility cost savings at a level equal to the total cost of the Energy Conservation Project; and

WHEREAS, the Energy Conservation Project consists of the following energy savings conservation measures:

Lowering the City of Albuquerque electrical energy consumption in public facilities by way of energy efficient equipment and devices. Removal of old equipment, devices and fixtures and replace with new energy efficient control

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devices, lighting controls, heat and cooling enhancements to minimize both natural gas and electrical consumption.

WHEREAS, pursuant to the Public Facility Energy Efficiency and Water Conservation Act, Sections 6-23-1 through -10 NMSA 1978 (the "Act"), and specifically Section 6-23-5(B)(1) NMSA 1978, the City Council has been advised that the EPC satisfies the requirements of the Act; and

WHEREAS, pursuant to Section 6-23-5(B)(2) NMSA 1978, the Energy, Minerals and Natural Resources Department of the State ("EMNRD") certified to the City by letter dated April 8, 2024 that the Contractor meets the experience requirements established by EMNRD and is a qualified provider of energy efficiency measures, and that the energy savings measures proposed in the IGA appear to have been accurately estimated and are reasonable; and

WHEREAS, the City intends to finance the costs of the Energy Conservation Project through a separate financing arrangement with a third-party financial institution (the "Financing Transaction"); and

WHEREAS, the City Council intends to approve the EPC and authorize its execution and delivery subject to the terms and provisions of this Ordinance.

BE IT ORDAINED BY THE COUNCIL, THE GOVERNING BODY OF THE CITY OF ALBUQUERQUE:

Section 1. Definitions. The terms in this section are defined for all purposes of this Ordinance and of any ordinance amendatory hereof or supplemental hereto, or relating hereto, and of any instrument or document appertaining hereto, except where the context by clear implication herein otherwise requires, shall have the following meanings:

"Act" means the general laws of the State, including Sections 6-23-1 through 6-23-10 NMSA 1978, as amended, and enactments of the Council relating to the EPC and the Financing Transaction, including this Ordinance.

"Authorized Officer" means the following officers of the City: Mayor, Chief Administrative Officer, Chief Financial Officer, or other officer of the City when designated by a certificate signed by the Mayor of the City from time to time.

"Bond Counsel" means an attorney or firm of attorneys nationally recognized for expertise in the area of municipal bonds and the exemption of interest on municipal bonds from federal income taxation.

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"City," "Municipal," or "Municipality" means the Municipal Corporation and body corporate and politic known as the City of Albuquerque, Bernalillo County, New Mexico.

"Conservation Measures" mean, collectively or individually, as the context may require, the energy savings and conservation equipment and improvements of which the Energy Conservation Project is comprised.

"Conservation-Related Cost Savings" means cost savings, other than Utility Cost Savings, in the operating budget of the City that are the direct result of the Conservation Measures.

"Contract Price" means $8,442,980, the maximum amount payable pursuant to the EPC.

"Contractor" means Yearout Energy Services Company, LLC, a New Mexico limited liability company.

"Costs of Issuance" means all costs relating to the execution and delivery of the EPC and the Financing Transaction, including, without limitation, costs of advertising and publication, costs of fees and expenses of the financial advisor, Bond Counsel, and other reasonable and necessary fees and costs, including applicable gross receipts taxes, related to the execution and delivery of the EPC and the Financing Transaction.

"Council" means the Council in which is vested the legislative power of the City.

"Energy Conservation Project" or "Project" means the implementation of energy savings (including both electricity and natural gas) and conservation measures throughout City-owned facilities, including the following energy savings and conservation measures:

[The project's objective is to lower operational costs by reducing the consumption of electrical energy and natural gas. By employing Energy Savings Performance Contracting (ESPC), the project will facilitate the replacement of obsolete equipment, tackle maintenance backlogs, and boost the reliability and resilience of a designated range of city facilities. Furthermore, this initiative will help diminish the carbon footprint of CABQ, bolster the local economy, foster job creation, and support the objectives of the CABQ Climate Action Plan.]

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"EMNRD" means the Energy, Minerals and Natural Resources Department of the State.

"Energy Performance Contract" or "EPC" means the guaranteed utility savings contract by and between the City and the Contractor, the form of which has been presented to the Council in connection with its consideration of this Ordinance.

"Financing Transaction" means the transaction to be entered into by and between the City and the Lender, proceeds of which shall be applied to pay the Contract Price; the principal of, interest on and other payments due in connection with the Financing Transaction shall be payable as provided in a separate ordinance authorizing the Financing Transaction.

"IGA" means the Investment Grade Audit Report provided by the Contractor to the City dated April 2, 2024 proposing the energy efficiency and conservation measures which comprise the Energy Conservation Project.

"Lender" means the bank or other financial institution serving as the lender in connection with the Financing Transaction, which Lender may serve as the lessor if the Financing Transaction is a lease-purchase transaction.

"Ordinance" means this City Ordinance as amended or supplemented from time to time.

"Utility Cost Savings" means the amounts saved by the City in the purchase of electricity that are a direct result of the Conservation Measures.

Section 2. Acceptance of IGA; Ratification of Prior Action.

1. The IGA is hereby accepted and approved.

2. All action heretofore taken (not inconsistent with the express provisions of this Ordinance) by the Council and officers of the City directed toward the Energy Conservation Project, the IGA, the EPC and the Financing Transaction, including, without limitation, the publication of a notice of public meeting and intent to adopt this Ordinance authorizing the execution and delivery of the EPC, is hereby ratified, approved and confirmed, notwithstanding any inconsistent prior action.

Section 3. Findings. The Council makes the following findings and determinations:

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1. Pursuant to Section 6-23-3 of the Act, the amount that the City would spend on the energy conservation measures proposed in the IGA is not likely to exceed the cumulative amount of Utility Cost Savings and Conservation-Related Cost Savings of all energy conservation measures proposed in the IGA over the 15-year term of the EPC from the date of installation of the measures recommended in the IGA if those recommendations are followed, including the financing of those costs pursuant to the Financing Transaction, and excluding the cost of normal repair and replacement of components of the energy conservation measures after the Conservation Measures are installed.

2. The Contractor is a qualified provider who can provide a written guarantee that the Utility Cost Savings and Conservation-Related Cost Savings will meet or exceed the costs of the Conservation Measures.

3. Pursuant to Section 6-23-3(B) of the Act, the EPC includes a written guaranty by the Contractor that the annual Utility Cost Savings and Conservation-Related Cost Savings will meet or exceed the cost of the Conservation Measures.

4. The Contractor will maintain a direct financial relationship with the City, irrespective of the source of financing for the Conservation Measures.

5. Pursuant to Section 6-23-5(B) of the Act, The EPC complies with requirements of the Act.

6. EMNRD has certified that the Contractor is a qualified provider which meets the experience requirements established by EMNRD, and that the guaranteed energy saving from the Conservation Measures appear to be accurately estimated and are reasonable.

Section 4. Authorization of the Energy Conservation Project; Financing Transaction Condition. The Energy Conservation Project is hereby authorized at a total cost not to exceed the Contract Price, excluding any such cost defrayed or to be defrayed by any source other than proceeds of the Financing Transaction allocable to the Contract Price; provided, that the Energy Conservation Project and execution and delivery of the EPC shall be subject to the authorization and closing of the Financing Transaction.

Section 5. Execution and Delivery of EPC. The Mayor or, in the absence of the Mayor, the Chief Administrative Officer, is authorized to execute and

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delivery the EPC, which shall be attested by the City Clerk or a deputy City Clerk, in substantially the form presented to the Council in its consideration of this Ordinance, with such modifications or revisions as the Mayor, in consultation with the City's municipal advisor and Bond Counsel, determines are necessary or convenient to implement the Energy Conservation Project, and the execution and delivery of the EPC by the Mayor, or in the absence of the Mayor, the Chief Administrative Officer, shall be conclusive evidence of the City's approval thereof, as may be modified or revised.

Section 6. Period of Energy Conservation Project's Usefulness. It is hereby determined and recited that the average useful life of the Energy Conservation Project is 15 years, as indicated in the IGA.

Section 7. Authorization to Execute EPC and Delegated Authority.

1. Approval of Documents; Ratification. The form, terms and provisions of the EPC are in all respects approved, authorized and confirmed, with such changes therein not inconsistent with this Ordinance as the Authorized Officers of the City deem necessary or desirable.

2. Delegated Authority and Execution of EPC and Additional Documents. The officers, agents and employees of the City are authorized, empowered and directed to take all action required by this Ordinance, and all such other action as may be necessary or appropriate to effectuate the provisions of this Ordinance, the EPC and any other documents as may be necessary or appropriate to carry out and comply with the provisions of this Ordinance.

Section 8. Severability. If any Section, paragraph, clause or provision of this Ordinance shall be held to be invalid or unenforceable, the invalidity or unenforceability of such Section, paragraph, clause or provision shall not affect any of the remaining provisions of this Ordinance.

Section 9. Repealer Clause. All ordinances or parts of ordinances inconsistent herewith are hereby repealed to the extent only of such inconsistency. This repealer shall not be construed to revive any ordinance or part of any ordinance heretofore repealed.

Section 10. Effective Date, General Summary for Publication. Upon due adoption of this Ordinance, it shall be recorded and preserved by the City Clerk, authenticated by the signature of the President of the Council and City

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Clerk, and approved by the Mayor and the seal of the City impressed hereon, and the title and general summary of the subject matter contained in the Ordinance shall be published in a newspaper which maintains an office and is of general circulation in the City, in accordance with law. This Ordinance shall be in full force and effect after its publication in accordance with law.

Pursuant to Section 3-17-5 NMSA 1978, as amended, the title and a general summary of the subject matter contained in this Ordinance shall be published in substantially the following form:

(Form of Summary of Ordinance for Publication)

CITY OF ALBUQUERQUE, NEW MEXICO

The City Council of the City of Albuquerque, New Mexico, hereby gives notice of the adoption of its Ordinance Bill No. _____ on August __, 2024. Complete copies of the Ordinance are available for public inspection during the normal and regular business hours of the City Clerk, at Plaza del Sol, 600 2nd NW, 7th floor, Albuquerque, New Mexico 87102.

The title of the ordinance is:

ACCEPTING THE INVESTMENT-GRADE AUDIT REPORT AND APPROVING THE ENERGY SAVINGS PERFORMANCE CONTRACT BY AND BETWEEN THE CITY OF ALBUQUERQUE AND YEAROUT ENERGY SERVICES COMPANY, LLC, SUBJECT TO CITY COUNCIL APPROVAL OF A SEPARATE FINANCING TRANSACTION TO FINANCE THE COSTS OF THE ENERGY PERFORMANCE CONTRACT ("EPC"); AUTHORIZING THE EXECUTION AND DELIVERY OF THE EPC AND OTHER AGREEMENTS AND DOCUMENTS IN CONNECTION WITH THE EPC; RATIFYING ACTION PREVIOUSLY TAKEN IN CONNECTION WITH THE EPC; REPEALING ALL ORDINANCES AND PRIOR ACTION IN CONFLICT HEREWITH; AND RELATED MATTERS.

A general summary of the subject matter contained in such ordinance is set forth in the title. This notice also constitutes compliance with Section 3-17-5 and Sections 6-14-4 through 6-14-7, NMSA 1978.

(End of Form of Ordinance for Publication)

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CITY OF ALBUQUERQUE

Albuquerque, New Mexico
Office of the Mayor

Mayor Timothy M. Keller

INTER-OFFICE MEMORANDUM July 26, 2024

TO: Dan Lewis, President, City Council

FROM: Timothy M. Keller, Mayor

SUBJECT: Energy Service Performance Contract

The Department of General Services, Energy and Sustainability Management Division in conjunction with the Department of Finance and Administrative Services, Purchasing Division utilized the Statewide Price Agreement No. 90-000-18-00017 (SPA) to award the ESPC contractor for energy performance contracting (EPC) services.

EPC services aim to help the City of Albuquerque achieve energy efficiency, renewable energy, and emissions reduction goals by combining facility improvements with a financing mechanism tied to calculated cost savings. These services and related financing offer multiple benefits including:

1. Increased quality and value through access to private-sector expertise.
2. Built-in incentives for ESPS to provide high-quality equipment, timely services, and thorough project commissioning.
3. Infrastructure improvements to enhance mission support.
4. Healthier, safer working environments.
5. Smart project management ensures building efficiency improvements and new equipment.
6. Energy efficiency improvements without relying on special appropriations.
7. Guaranteed energy and related operational and maintenance cost savings.
8. Minimized vulnerability to budget impacts due to volatile energy prices, weather, and equipment failure.

Total of 37 facilities will benefit from this Project.

- Alvarado Transportation Center
- North City Hall
- South City Hall
- APD Training Academy
- Palo Duro Senior Center
- Animal Welfare Eastside Shelter
- Barelas Senior Center
- BioPark (Zoo)
- BioPark (Aquarium)
- Daytona Transit Center
- East Central Health and Social Service Center
- Erna Fergusson Library
- Fire Academy
- Fire Station 05
- Fire Station 13 and Fire Arson
- Fire Station 17
- Fire Station 20
- Fire Station 21
- Highland Senior Center
- Holiday Park Community Center
- Law Enforcement Center
- Los Altos Golf Course/Well
- Los Griegos Health and Social Service Center
- Main Library
- North Valley Senior Center
- Northeast Area Command (John Carrillo Substation)
- Open Space Visitors Center
- Palo Duro Fitness Center
- Pino Yards
- Sierra Vista Pool and Tennis Complex
- South Broadway Cultural Center/Library
- Southwest Area Command (Shawn McWethy Substation)
- Special Collections Library
- Taylor Ranch Community Center
- Taylor Ranch Library
- Tony Hillerman Library
- Valley Area Command (Gerald Cline Substation)

Total Reduction in Emissions Over Project Service Life: 47.9M lb CO2e
Job-Years Created: 124
Recommended Project – Impact by the Numbers Energy Cost Reduction Across Impacted Sites: 14%
Total Utility and Operational Cost Savings Over Project Service Life: $15.7 Million
Total Energy Savings Over Project Service Life: 166,000 MMBTU

TITLE/SUBJECT OF LITIGATION: Energy Service Performance Contract

Approved:

Samantha Sengel 7/30/24

Samantha Sengel, EdD Date
Chief Administrative Officer

Approved as to Legal Form:

DocuSigned by:
Lauren Keefe 7/27/2024 | 1:06 PM MDT
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Lauren Keefe Date
City Attorney

Recommended:

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BR

DocuSigned by:
Nathan Martinez 7/26/2024 | 12:52 PM MDT
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Nathan Martinez, Director Date
General Services Department

Cover Analysis

1. What is it?

This project aims to reduce electrical energy, and natural gas consumption. Subsequently reducing operational costs through Energy Savings Performance Contracting (ESPC). Energy and sustainability will replace failing equipment at the end of its useful life, address deferred maintenance issues, and enhance reliability and resilience in the selected portfolio of city facilities. Additionally, it will contribute to reducing CABQ's carbon footprint, stimulate the local economy, support job creation, and align with CABQ Climate Action Plan initiatives.

2. What will this piece of legislation do?

This legislation will empower the Energy & Sustainability Division to execute, for the first time in the City of Albuquerque's history, to participate in an energy service performance contract that will benefit sustainability efforts and reduce the city's carbon footprint in our region.

3. Why is this project needed?

ESPC (Energy Saving Performance Contract) services will help the City of Albuquerque meet energy efficiency, and emissions reduction goals by combining facility improvements with a financing mechanism that is tied to the calculated cost savings.

4. How much will it cost and what is the funding source?

The project's total cost is $11,442,980 aimed at implementing energy-saving upgrades across various City facilities. A capital contribution of $3,000,000 will be provided by the City through Project 305/7322200 3% Energy, with the remaining amount to be financed with $9.25 Million Energy Revenue Savings Bond Proceeds, resulting in an $807,020 overage. The overage is a result of the unknown interest rate the City will receive at bond issuance, and the corresponding

capital contribution amount needed for the project. Repayment of the bonds will be supported by savings and incentives generated from guaranteed utility and conservation-related cost reductions, amounting to a total of $15,702,878 in guaranteed savings. The Energy and Sustainability Management Division has implemented smart metering to accurately measure savings generated by the energy-efficient equipment over its lifespan. In the event that energy savings fall short of covering the debt, the Energy Savings Performance Contract (ESPC) mandates that the contractor compensate for any shortfall. The Municipal Gross Receipts Tax serves as collateral for the bond, and a detailed debt service schedule is attached for reference.

5. Is there a revenue source associated with this contract? If so, what level of income is projected?

A capital contribution of $3,000,000 will be provided by the City through Project 305/7322200 3% Energy, with the remaining amount to be financed with $9.25 Million Energy Revenue Savings Bond Proceeds.

6. What will happen if the project is not approved?

This will affect the city's goal to achieve the 100% renewable goal and impact energy.

7. Is this service already provided by another entity?

No.

FISCAL IMPACT ANALYSIS

TITLE: ACCEPTING THE INVESTMENT-GRADE AUDIT REPORT AND APPROVING THE ENERGY SAVINGS PERFORMANCE CONTRACT

R: O:

FUND: 305

DEPT: Various

[ ] No measurable fiscal impact is anticipated, i.e., no impact on fund balance over and above existing appropriations.

[X] (If Applicable) The estimated fiscal impact (defined as impact over and above existing appropriations) of this legislation is as follows:

	Fiscal Years 2025	2026	2027	Total
Base Salary/Wages				-
Fringe Benefits at				-
Subtotal Personnel	-	-	-	-
Contract	9,996,493	1,446,487		11,442,980
Property		-	-	-
Indirect Costs	-	-	-	-
Total Expenses	$ 9,996,493	$ 1,446,487	$ -	$ 11,442,980
[ ] Estimated revenues not affected				
[x] Estimated revenue impact				
Capital Contribution 3% Energy	3,000,000			3,000,000
Bond Proceeds	9,250,000			9,250,000
City Inkind Match				
City IDOH	-	-	-	-
Total Revenue	$ 12,250,000	$ -	$ -	$ 12,250,000

These estimates do not include any adjustment for inflation.

* Range if not easily quantifiable.

Number of Positions created

COMMENTS: The project's total cost is $11,442,980 aimed at implementing energy-saving upgrades across various City facilities. A capital contribution of $3,000,000 will be provided by the City through Project 305/7322200 3% Energy, with the remaining amount to be financed with $9.25 Million Energy Revenue Savings Bond Proceeds, resulting in an $807,020 overage. The overage is a result of the unknown interest rate the City will receive at bond issuance, and the corresponding capital contribution amount needed for the project. Repayment of the bonds will be supported by savings and incentives generated from guaranteed utility and conservation-related cost reductions, amounting to a total of $15,702,878 in guaranteed savings. The Energy and Sustainability Management Division has implemented smart metering to accurately measure savings generated by the energy-efficient equipment over its lifespan. In the event that energy savings fall short of covering the debt, the Energy Savings Performance Contract (ESPC) mandates that the contractor compensate for any shortfall. The Municipal Gross Receipts Tax serves as collateral for the bond, and a detailed debt service schedule is attached for reference.

COMMENTS ON NON-MONETARY IMPACTS TO COMMUNITY/CITY GOVERNMENT:
The Energy Saving Performance contract services will help the City of Albuquerque meet energy efficiency and emissions reduction goals by combining facility improvements with a financing mechanism that is tied to the calculated cost savings.

PREPARED BY:

DocuSigned by: Elizabeth Jones 7/26/2024 | 12:24 PM MDT
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FISCAL ANALYST

APPROVED:

DocuSigned by: Nathan Martinez 7/26/2024 | 12:52 PM MDT
DIRECTOR (date)

REVIEWED BY:

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EXECUTIVE BUDGET ANALYST

DocuSigned by: Lawrence Davis 7/26/2024 | 4:17 PM
BUDGET OFFICER (date)

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CITY ECONOMIST

YEAROUT ENERGY

City of Albuquerque

Investment Grade Audit (IGA) Report

4/2/2024

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GLOSSARY OF ACRONYMS

AcronymDefinition

BTU: British Thermal Unit(s)
BTUH: British Thermal Unit(s) per Hour
CABQ: City of Albuquerque
CBECS: Commercial Buildings Energy Consumption Survey
CFL: Compact Florescent Lamps
CFM: Cubic Feet per Minute
CLG: Cooling
CMU: Concrete Masonry Unit
COP: Coefficient of Performance
DDC: Direct Digital Control
DHW: Domestic Hot Water
DX: Direct Expansion
ECI: Energy Cost Index ($/ft²-y)
EER: Energy Escalation Rate
EERC: Energy Escalation Rate Calculator
EFF: Efficiency
EIFS: Exterior Insulated Finish System
ERV: Energy Recovery Ventilator
ECI: Energy Cost Index ($/ft²-y)
EUI: Energy Utilization Index (kbtu/ft²-y)
EV: Electric Vehicle
FCU: Fan Coil Unit
FIM: Facility Improvement Measures
ESPC: Energy Savings Performance Contract
EPC: Guaranteed Energy Savings Performance Contract
GUSC: Guaranteed Utility Savings Contract
HE: High Efficiency
HPS: High Pressure Sodium
HTG: Heating
HVAC: Heating, Ventilation and Air Conditioning
IGA: Investment Grade Audit
kbtu: 1,000 British Thermal Units
KVU: Kitchen Ventilation Units
kW: Kilowatt
kWh: Kilowatt Hour
LED: Light Emitting Diode
MH: Metal Halide
MUA: Make-up Air Unit
MV: Mercury Vapor
NG: Natural Gas
NIST: National Institute for Standards and Technology

NM-EMNRD: New Mexico Energy, Minerals, and Natural Resources Department
NM-GSD: New Mexico General Services Department
NM-OSE: New Mexico Office of the State Engineer
PV: Photovoltaic
PVC: Polyvinyl Chloride
RTU: Rooftop Units
SQF: Square Feet
thm: Therm
TPO: Thermoplastic Polyolefin
UH: Unit Heater
VRF: Variable Refrigerant Flow
W: Watt
yr: Year

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1.0 EXECUTIVE SUMMARY

The City of Albuquerque (CABQ) engaged Yearout Energy (YE) in March 2021, following a competitive selection process, to perform an Investment Grade Audit (IGA) of fifty sites. Throughout the IGA process, Yearout Energy collaborated closely with CABQ to identify and co-develop Facility Improvement Measures (FIMs) that would allow the City to leverage future utility and operational cost savings to fund high priority capital improvements through an Energy Performance Contracting (EPC) project. A fundamental benefit of EPC projects is that they allow for the savings from measures with quicker returns to supplement the funding of critical infrastructure improvements and other high priority initiatives.

At the onset of the IGA, CABQ established target reductions for this initial project phase of $282,000 in annual cost savings. Yearout Energy and CABQ have effectively co-developed a recommended project scope that significantly outperforms these initial targets with a first-year cost savings of **$610,566**.

A few additional highlights of the many benefits and impacts of the project include:

- $15,681,041 Utility and Operational Cost Savings Over Project Service Life
- 166,308 MMBTU Total Energy Savings Over Project Service Life
- 47,880,000 lb CO_2e Reduction in Emissions Over Project Service Life
- 124 Local Job-Years Created

PROJECT OBJECTIVES

The primary objectives established for this project include:

- Reduce energy and water consumption.
- Reduce utility and operational costs.
- Align the project scope with the CABQ's adopted Climate Action Plan (CAP).
- Replace existing equipment that has surpassed its useful life.
- Address deferred maintenance and failing infrastructure issues.
- Standardize equipment throughout facilities.
- Improve equipment and system reliability.
- Leverage available incentives and operational cost savings.
- Stimulate the local economy by engaging qualified local contractors to execute the project scope.

- Foster public awareness and education on the project's positive impacts to the community.
- Integrate new equipment and systems with CABQ's Balanced Resource Acquisition and Information Network (BRAIN) initiative for improved City operations.
- Reduce CABQ's carbon footprint.

ALIGNMENT WITH CABQ'S CLIMATE ACTION PLAN (CAP)

As noted above, a primary objective for this project was to ensure that the proposed scope aligned with the CABQ's Climate Action Plan (CAP). Yearout Energy and CABQ worked carefully to develop measures that would fulfill this objective which directly contribute to the following CAP themes:

- Sustainable Buildings – Green Buildings and Developing
- Economic Development – Economic Investment and Job Creation
- Education and Awareness – Public Sustainability Education

EPC PROJECT SUMMARY

As a result of the comprehensive IGA process, Yearout Energy and CABQ have co-developed the following recommended Energy Performance Contracting (EPC) project:

Table 1: EPC Project Summary

Turn-Key EPC Project Amount	$11,442,980
First-Year Annual Utility Cost Savings	$490,578
First-Year Annual Operations and Maintenance Cost Savings	$119,988
Up-Front Capital Contribution by CABQ	$3,000,000
Estimated Incentives from Utility Providers	$200,680
Project Financing Term	15 years
Weighted Average Service Life of Proposed Measures	16.7 years

Environmental Impact (Reduction in Annual Emissions)	2,816,566 lb. CO_2e

The total first year savings, accounting for fees and incentives, is $753,954 as depicted in Preliminary Financial Analysis in Section 7.7 herein.

The co-developed scope of work recommended for implementation as part of this initial project phase includes:

Table 2: EPC Project Facility Improvement Measures (FIMs)

FIM No.	FIM Name	Description
01	Submetering	Install 36 new electric submeters that integrate with the BRAIN for enhanced monitoring.
02	HVAC Equipment & Controls	Replace failing equipment with 80 tons of new high efficiency dual-fuel HVAC equipment.
03	Building Automation System	Install new building automation systems to properly control and monitor equipment at 11 sites.
04	LED Lighting	Upgrade existing lighting to LED technology with lighting controls at 34 sites
05	Building Envelope	Remediate existing air leakage in building envelope to reduce energy losses at 32 sites
06	HE Transformers	Replace 3,966 kVA of aged low voltage transformers with new high efficiency units to reduce energy losses at 6 sites.

The following tables summarize the guaranteed annual utility savings from the proposed FIMs.

Table 3: Facility Improvement Measures (FIMs) Annual Utility Savings Summary

FIM No.	FIM Name	Electricity (kW)	Electricity (kWh)	Natural Gas (therm)
01	Submetering	0	0	0
02	HVAC Equipment	(495)	(40,003)	10,500
03	Building Automation System (BAS)	0	136,799	0
04	LED Lighting	11,463	2,800,968	(50,813)
05	Building Envelope	0	7,065	47,808
06	HE Transformers	418	304,797	0
Total		11,385	3,209,626	7,495

NEXT STEPS

The IGA was developed following the program guidelines outlined by the New Mexico Energy, Minerals, and Natural Resources Department (NM-EMNRD) and New Mexico General Services Department (NM-GSD).

Following acceptance of this report by CABQ and certification of the report by NM-EMNRD, Yearout Energy will develop a Guaranteed Utility Savings Contract (GUSC) to implement the agreed-upon project scope. Yearout Energy estimates implementation of this project to commence in Q2 2024 with a 14-Month overall construction period.

2.0 IGA SITES

The City of Albuquerque (CABQ), located at the base of the Sandia Mountains in the Rio Grande Valley, is the largest city in the state of New Mexico with a population of 564,559 within city limits according to the 2020 census, and nearly 1 million people in the larger metropolitan area. CABQ enjoys a high desert climate (elevation ~5,300'), with cold winters and hot summers, and little precipitation (~8.3" annually). Albuquerque experiences over 300 sunny days per year, large temperature differences between day and night, and four distinct seasons.

Albuquerque is home to Sandia National Labs, the University of New Mexico, four minor league sports teams; the Albuquerque Isotopes, the New Mexico United, the Duke City Gladiators, and the New Mexico Ice Wolves. CABQ hosts the annual Albuquerque International Balloon Fiesta which brings hundreds of thousands of visitors from all over the world. Albuquerque covers 189 mi^2 and CABQ IGA sites are located across the entire geography of the city.

CABQ identified 50 sites for this initial project phase prior to selecting Yearout Energy to perform an Investment Grade Audit (IGA).

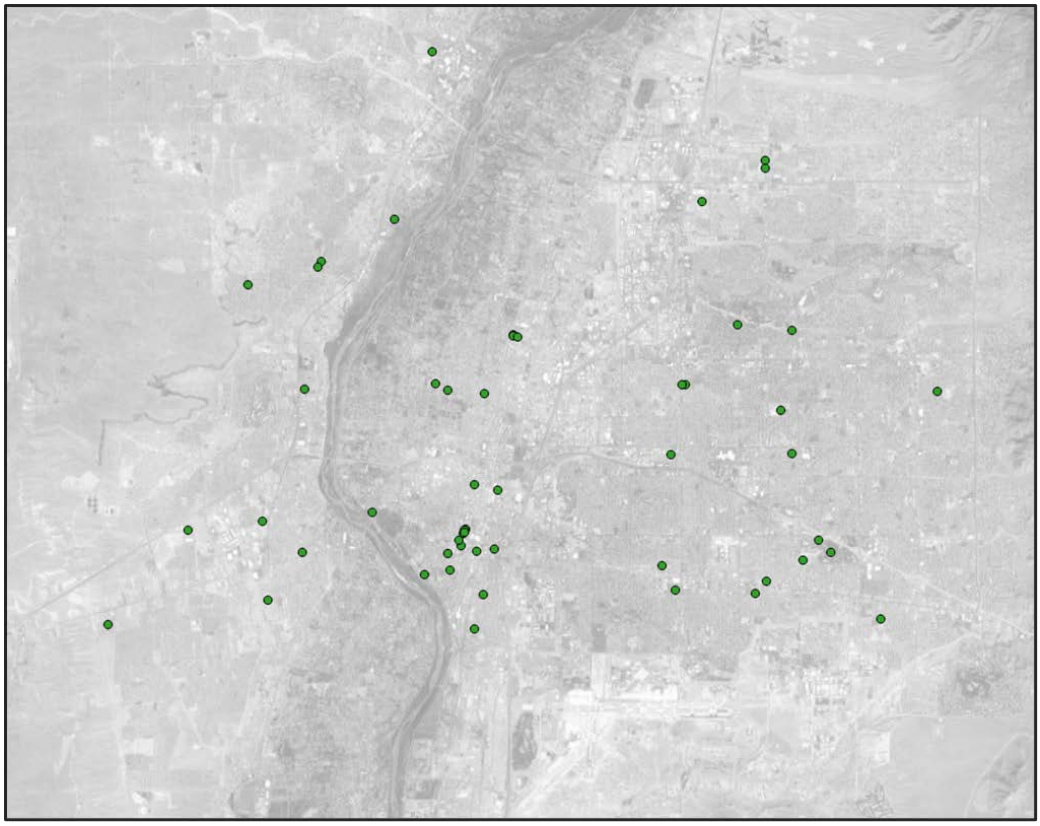


Figure 1: IGA Sites – City of Albuquerque Map

The IGA sites selected are comprised of the following types of building spaces:

- Public Safety
- Public Service
- Public Assembly
- Mechanical Service
- Professional Services
- Office buildings
- Warehouse and Storages
- Recreational Facilities

The buildings are occupied by the following CABQ departments:

- Transit Department
- Police Department
- Fire Department
- Family and Community
- Senior Affairs Department
- Department of Cultural Services / BioPark
- Parks & Recreation Department
- Department of Municipal Development
- Animal Welfare Department
- Environmental Health Department

The sites outlined in the table below were selected by CABQ for inclusion in the IGA and have a collective gross building area of 2,070,000 ft². Several of these sites were surveyed as part of the IGA process but excluded from the phase 1 project scope of work. These sites include:

- Alamosa Community Center
- Arroyo Del Oso Golf Course
- Betsy Patterson Pool at Sandia High School
- Broadway Vehicle Emissions
- Esperanza Bicycle Safety Education Center

- Fire Station 01
- Fire Station 05
- Fire Station 21
- Highland Pool
- Kimo Theater
- Manzano Mesa Multigenerational Center
- Metro Forensics Science Center
- Reality Based Training Center
- Valley Pool

It is also important to note that several sites were intentionally excluded from measures that would reduce energy consumption due to overproduction of existing solar PV systems installed at these sites. This overproduction limits the potential for additional electrical utility cost savings as the result of further conservation efforts.

Refer to APPENDIX B for detailed descriptions of each site.

Table 4: IGA Sites Summary

Site No.	Site Name	Site Code	Gross Area (ft^2)
01	Alamosa Community Center	ALCC	62,760
02	Albuquerque Government Center	ABGC	312,435
03	Alvarado Transportation Center	ALSQ	87,886
04	Animal Welfare Eastside Shelter	AWES	32,421
05	Arroyo Del Oso Golf	ADOG	26,180
06	Barelas Senior Center	BASC	21,165

Site No.	Site Name	Site Code	Gross Area (ft^2)
07	Betsy Patterson Pool at Sandia High School	BPPL	18,457
08	BioPark (Zoo)	BIOP	247,509
09	BioPark (Aquarium)	BPAQ	39,805
10	Broadway Vehicle Emissions	BWVE	8,480
11	City Hall (Old)	CTHL	92,160
12	Daytona Transit Center	DTTC	108,172
13	East Central Health and Social Service Center	ECHC	13,407
14	Erna Fergusson Library	EFLB	15,227
15	Esperanza Bicycle Safety Education Center	EBSC	6,172
16	Fire Academy	FACD	48,500
17	Fire Station 01	FS01	22,946
18	Fire Station 05	FS05	10,205
19	Fire Station 13 and Fire Arson	FS13	10,502
20	Fire Station 17	FS17	8,082
21	Fire Station 20	FS20	13,848

Site No.	Site Name	Site Code	Gross Area (ft^2)
22	Fire Station 21	FS21	10,205
23	Herman Sanchez Community Center	HSCC	23,933
24	Highland Pool	HLPL	21,834
25	Highland Senior Center	HISC	11,600
26	Holiday Park Community Center	HPCC	18,529
27	Kimo Theatre	KIMO	43,168
28	Law Enforcement Center	LAEC	50,888
29	Los Altos Golf Course/Well	LAGC	19,457
30	Los Griegos Health and Social Service Center	LGHS	13,560
31	Main Library	MNLB	119,050
32	Manzano Mesa Multigenerational Center	MMMC	24,986
33	Metro Forensics Science Center	MFSC	50,013
34	North Valley Senior Center	NVSC	17,111
35	Northeast Area Command	NEAC	8,997
36	Open Space Visitors Center	OSVC	8,728

Site No.	Site Name	Site Code	Gross Area (ft^2)
37	Palo Duro Fitness Center	PDFC	4,480
38	Palo Duro Senior Center	PDSC	16,919
39	Pino Yards	PINO	156,000
40	Reality Based Training Center	RBTC	51,420
41	Sierra Vista Pool and Tennis Complex	SVPT	4,042
42	South Broadway Cultural Center/Library	SBCC	32,962
43	Southwest Area Command	SWAC	9,554
44	Special Collections Library	SCLB	14,872
45	Taylor Ranch Community Center	TRCC	39,000
46	Taylor Ranch Library	TRLB	13,352
47	Tony Hillerman Library	THLB	16,214
48	Training Academy	TRAC	24,623
49	Valley Area Command	VAAC	13,208
50	Valley Pool	VLPL	24,634
Total			2,069,658

It should be noted that while each facility experiences its own unique operational schedule, all facilities fall into a few general categories:

- Open to Occupancy 24/7 – Facilities that are available year-round and are open or occupied at all hours of the day. Examples of these building types are fire stations and police stations.
- Theater/Performing Arts – These facilities are closed, except when they are booked for scheduled events.
- Infrequent and Irregular – These facilities are open at irregular intervals, for an average of 8 hours per week, year-round.
- Regular – These facilities are open during regular business hours, for an average of approximately 40-50 hours per week. Examples of these buildings are office buildings, libraries, and senior centers.

The hours of operation noted in the respective facility sections below reflect the hours corresponding to the categories described above. Where possible, actual hours obtained via data logging, staff interviews, etc., have been used to further refine the precision of savings calculations. This data is embedded within individual calculations, when available.

3.0 BASELINE UTILITY ANALYSIS

The baseline utility analysis was performed by evaluating utility records for 2018 through 2020. Where possible, 36 months' worth of utility data was used, but in several cases, this was not possible due to account age or data availability. The utility records consisted of electricity data from the Public Service Company of New Mexico (PNM), natural gas data from Symmetry, and water and sewer data from the Albuquerque Bernalillo County Water Utility Authority (ABCWUA). All data came from utility bills provided by CABQ.

Table 5: Baseline Utility Analysis – Meter Summary

Utility Type	Utility Provider	Meters Baselined
Electricity	PNM	72
Natural Gas	NMGC | Symmetry	96
Water / Sewer	ABCWUA	84
Total	----------	252

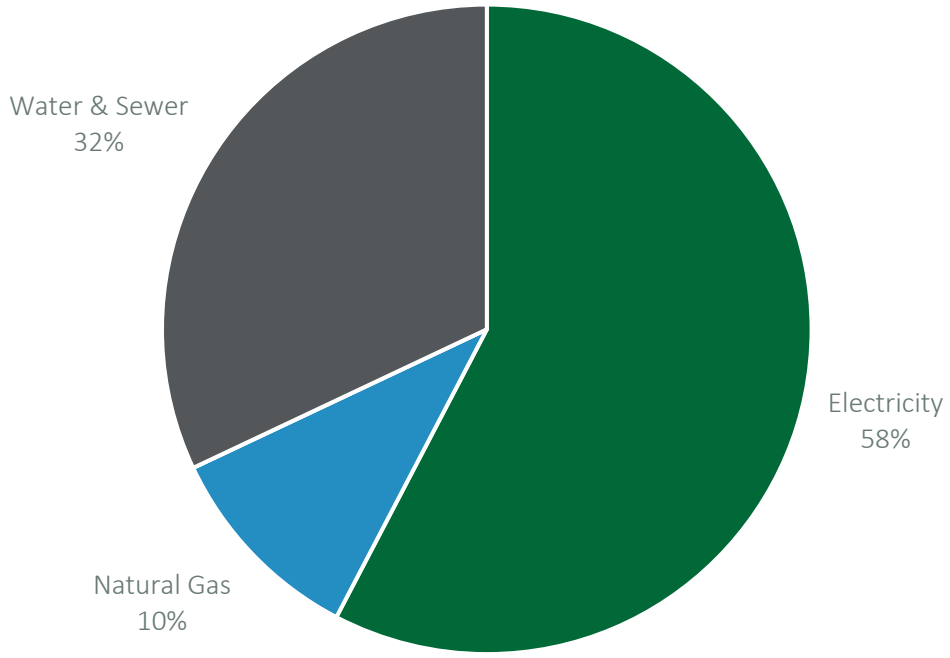
Baselines depicted below use raw, non-weather-normalized data. Refer to APPENDIX A for the complete baseline utility analysis.

The following table and pie chart depict the baseline annual cost by utility type for all CABQ facilities included in the IGA.

Table 6: Baseline Annual Utility Cost Breakdown by Utility Type

Utility Type	$/yr
Electricity	$3,213,812
Natural Gas	$575,020
Water & Sewer	$1,784,210
Total	$5,573,042

Figure 2: Baseline Utility Cost Breakdown by Utility Type

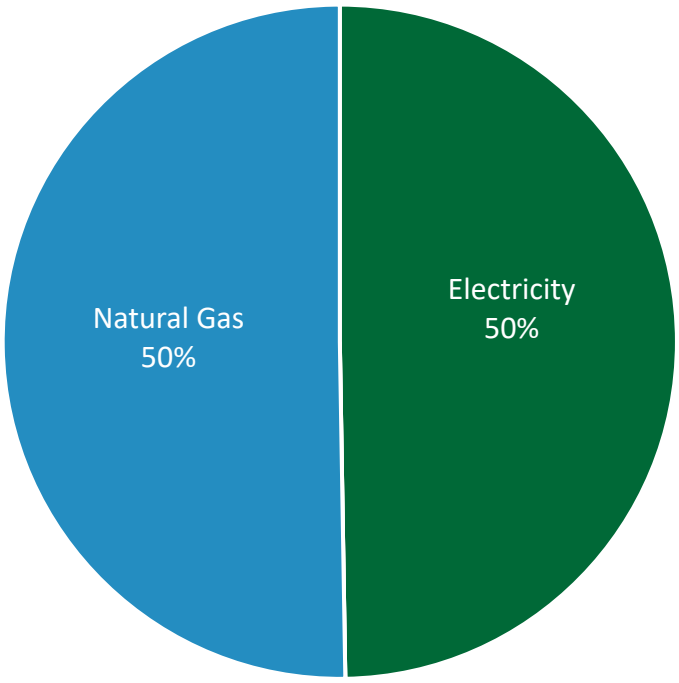


The following table and pie chart depict the baseline annual energy consumption by utility type for all CABQ facilities included in the IGA.

Table 7: Baseline Annual Energy Consumption by Utility Type

Utility Type	kbtu/yr
Electricity	125,671,513
Natural Gas	127,267,204
Total	252,938,717

Figure 3: Baseline Annual Energy Consumption Breakdown by Utility Type



The following table and outlines the baseline annual utility costs per IGA Site (sorted alphabetically):

Table 8: Baseline Annual Utility Cost Per IGA Site

Site	Electricity	Natural Gas	Water & Sewer	Total
Alamosa Community Center	$80,969	$18,206	$31,593	$130,767
Albuquerque Government Center	$520,014	$31,861	$65,765	$617,640
Alvarado Transportation Center	$61,381	$8,373	$17,027	$86,781
Animal Welfare Eastside Shelter	$45,561	$15,126	$12,212	$72,898
Arroyo Del Oso Golf	$4,362	$1,581	$613,113	$619,056
Barelas Senior Center	$25,923	$3,607	$13,454	$42,983
Betsy Patterson Pool at Sandia High School	$28,728	$15,066	$0	$43,794
BioPark (Zoo)	$385,342	$162,169	$14,657	$562,168
BioPark (Aquarium)	$380,888	$1,049	$262,511	$644,449
Broadway Vehicle Emissions (VPMD)	$9,333	$2,571	$6,090	$17,994
City Hall (Old)	$79,637	$15,741	$36,674	$132,051
Daytona Transit Center	$177,788	$54,078	$63,022	$294,889
East Central Health and Social Service Center	$12,178	$1,103	$4,168	$17,448
Erna Fergusson Library	$28,803	$1,930	$7,252	$37,985
Esperanza Bicycle Safety Education Center	$4,778	$1,822	$989	$7,589
Fire Academy	$172,879	$7,400	$72,260	$252,539
Fire Station 01	$23,779	$4,262	$14,244	$42,285

Site	Electricity	Natural Gas	Water & Sewer	Total
Fire Station 05	$2,086	$2,961	$7,191	$12,237
Fire Station 13 and Fire Arson	$13,075	$2,235	$5,552	$20,863
Fire Station 17	$13,040	$2,608	$7,128	$22,777
Fire Station 20	$31,417	$6,570	$6,209	$44,195
Fire Station 21	$1,492	$2,681	$5,633	$9,806
Herman Sanchez Community Center	$35,745	$5,231	$4,489	$45,465
Highland Pool	$42,924	$29,414	$24,151	$96,489
Highland Senior Center	$23,842	$2,934	$8,133	$34,909
Holiday Park Community Center	$26,138	$3,013	$29,914	$59,066
Kimo Theater	$31,165	$3,769	$7,450	$42,384
Law Enforcement Center	$83,135	$7,450	$0	$90,585
Los Altos Golf Course/Well	$29,754	$1,156	$72,639	$103,550
Los Griegos Health and Social Service Center	$30,766	$5,076	$14,489	$50,332
Main Library	$133,809	$1,453	$22,655	$157,917
Manzano Mesa Multigenerational Center	$58,845	$8,858	$48,302	$116,004
Metro Forensics Science Center (MFSC)	$144,883	$27,449	$12,708	$185,040
North Valley Senior Center	$26,270	$2,367	$8,848	$37,484
Northeast Area Command	$20,691	$1,223	$10,430	$32,344
Open Space Visitors Center	$8,937	$2,751	$0	$11,688

Site	Electricity	Natural Gas	Water & Sewer	Total
Palo Duro Fitness Center	$24,142	$1,299	$0	$25,440
Palo Duro Senior Center	$22,490	$3,683	$9,898	$36,070
Pino Yards	$117,453	$33,900	$90,720	$242,073
Reality Based Training Center (RBTC)	$0	$2,210	$0	$2,210
Sierra Vista Pool and Tennis Complex	$11,410	$5,797	$24,283	$41,491
South Broadway Cultural Center/Library	$36,597	$6,100	$7,018	$49,714
Southwest Area Command	$17,666	$1,442	$4,923	$24,030
Special Collections Library	$17,846	$2,857	$2,915	$23,617
Taylor Ranch Community Center	$52,214	$8,706	$19,667	$80,588
Taylor Ranch Library	$20,595	$4,105	$50,485	$75,185
Tony Hillerman Library	$19,723	$1,541	$8,007	$29,271
Training Academy	$17,936	$4,438	$24,025	$46,399
Valley Area Command	$25,832	$535	$0	$26,367
Valley Pool	$29,552	$33,263	$11,320	$74,135
Total	$3,213,812	$575,020	$1,784,210	$5,573,042

3.1. BENCHMARKING

3.1.1. BASELINE ENERGY UTILIZATION INDEX (EUI)

A common approach to benchmarking a facility is through the comparison of the facility's Energy Utilization Index (EUI) against that of similar facilities in similar climates. The EUI is determined by dividing the total annual energy consumption in common units (kbtu) by the area of the facility (ft^2), giving an index in units of kbtu/ft^2-yr. The lower the EUI, the better the energy performance of the facility.

The Commercial Buildings Energy Consumption Survey (CBECS) is a national sample survey that collects information on the stock of U.S. commercial buildings, including their energy-related building characteristics and energy usage data (consumption and expenditures). Commercial buildings include all buildings in which at least half of the floorspace is used for a purpose that is not residential, industrial, or agricultural. By this definition, CBECS includes building types that might not traditionally be considered commercial, such as schools, hospitals, correctional institutions, and buildings used for religious worship, in addition to traditional commercial buildings such as stores, restaurants, warehouses, and office buildings.

The table below outlines the baseline EUI for each IGA site along with the CBECS reference EUI for the most similar building type category available in the cold/very cold climate region (See CBECS 2012 Table C10 for additional details).

Table 9: Baseline EUI Summary (kbtu/ft^2-yr) – Sorted Alphabetically

IGA Site	Baseline EUI	CBECS Bldg. Type	CBECS Median EUI
Alamosa Community Center	116.39	Public Assembly	82.40
Albuquerque Government Center	85.78	Office	85.30
Alvarado Transportation Center	45.01	Service	59.70
Animal Welfare Eastside Shelter	191.57	Lodging	115.00
Arroyo Del Oso Golf	15.39	Public Assembly	82.40
Barelas Senior Center	78.82	Public Assembly	82.40

IGA Site	Baseline EUI	CBECS Bldg. Type	CBECS Median EUI
Betsy Patterson Pool at Sandia High School	233.80	Other	136.90
BioPark (Zoo)	212.21	Other	136.90
BioPark (Aquarium)	412.65	Other	136.90
Broadway Vehicle Emissions (VPMD)	90.37	Service	59.70
City Hall (Old)	67.41	Office	85.30
Daytona Transit Center	200.57	Service	59.70
East Central Health and Social Service Center	37.00	Public Assembly	82.40
Erna Fergusson Library	70.46	Public Assembly	82.40
Esperanza Bicycle Safety Education Center	65.34	Public Assembly	82.40
Fire Academy	213.29	Public Order and Safety	82.80
Fire Station 01	70.31	Public Order and Safety	82.80
Fire Station 05	118.41	Public Order and Safety	82.80
Fire Station 13 and Fire Arson	72.98	Public Order and Safety	82.80
Fire Station 17	108.14	Public Order and Safety	82.80
Fire Station 20	171.02	Public Order and Safety	82.80
Fire Station 21	98.33	Public Order and Safety	82.80

IGA Site	Baseline EUI	CBECS Bldg. Type	CBECS Median EUI
Herman Sanchez Community Center	87.33	Public Assembly	82.40
Highland Pool	381.50	Other	136.90
Highland Senior Center	102.75	Public Assembly	82.40
Holiday Park Community Center	73.65	Public Assembly	82.40
Kimo Theatre	35.64	Public Assembly	82.40
Law Enforcement Center	81.68	Public Order and Safety	82.80
Los Altos Golf Course/Well	47.17	Public Assembly	82.40
Los Griegos Health and Social Service Center	165.95	Public Assembly	82.40
Main Library	41.73	Public Assembly	82.40
Manzano Mesa Multigenerational Center	141.36	Public Assembly	82.40
Metro Forensics Science Center (MFSC)	259.42	Public Order and Safety	82.80
North Valley Senior Center	65.03	Public Assembly	82.40
Northeast Area Command (John Carrillo Substation)	69.68	Public Order and Safety	82.80
Open Space Visitors Center	90.72	Public Assembly	82.40
Palo Duro Fitness Center	180.49	Public Assembly	82.40
Palo Duro Senior Center	78.64	Public Assembly	82.40

IGA Site	Baseline EUI	CBECS Bldg. Type	CBECS Median EUI
Pino Yards	83.13	Service	59.70
Reality Based Training Center	8.69	Public Order and Safety	82.80
Sierra Vista Pool and Tennis Complex	394.91	Other	136.90
South Broadway Cultural Center/Library	66.39	Public Assembly	82.40
Southwest Area Command (Shawn McWethy Substation)	75.27	Public Order and Safety	82.80
Special Collections Library	65.67	Public Assembly	82.40
Taylor Ranch Community Center	106.36	Public Assembly	82.40
Taylor Ranch Library	99.88	Public Assembly	82.40
Tony Hillerman Library	44.88	Public Assembly	82.40
Training Academy	81.60	Public Order and Safety	82.80
Valley Area Command (Gerald Cline Substation)	60.16	Public Order and Safety	82.80
Valley Pool	349.61	Other	136.90

3.1.2. BASELINE ENERGY COST INDEX (ECI)

Another common method for benchmarking a facility is through the comparison of the facility's Energy Cost Index (ECI) against that of similar facilities in similar climates. The ECI is determined by dividing the total annual energy utility cost by the square footage of the facility ($/ft²-yr). The lower the ECI, the better the energy cost performance of the facility. The following table and chart depict the baseline ECI for all sites included in the IGA.

Table 10: Baseline ECI Summary ($/ft²-yr) – Sorted Alphabetically

IGA Site	ECI ($/ft^2-yr)
Alamosa Community Center	$1.58
Albuquerque Government Center (City County)	$1.77
Alvarado Transportation Center	$0.79
Animal Welfare Eastside Shelter	$1.87
Arroyo Del Oso Golf	$0.23
Barelas Senior Center	$1.40
Betsy Patterson Pool at Sandia High School	$2.37
BioPark (Zoo)	$2.21
BioPark (Aquarium)	$9.60
Broadway Vehicle Emissions (VPMD)	$1.40
City Hall (Old)	$1.03
Daytona Transit Center	$2.14
East Central Health and Social Service Center	$0.99
Erna Fergusson Library	$2.02
Esperanza Bicycle Safety Education Center	$1.07

IGA Site	ECI ($/ft^2-yr)
Fire Academy	$3.72
Fire Station 01	$1.22
Fire Station 05	$0.49
Fire Station 13 and Fire Arson	$1.46
Fire Station 17	$1.94
Fire Station 20	$2.74
Fire Station 21	$0.41
Herman Sanchez Community Center	$1.71
Highland Pool	$3.31
Highland Senior Center	$2.31
Holiday Park Community Center	$1.57
Kimo Theatre	$0.81
Law Enforcement Center	$1.78
Los Altos Golf Course/Well	$1.59
Los Griegos Health and Social Service Center	$2.64
Main Library	$1.14
Manzano Mesa Multigenerational Center	$2.71
Metro Forensics Science Center (MFSC)	$3.45
North Valley Senior Center	$1.67

IGA Site	ECI ($/ft^2-yr)
Northeast Area Command (John Carrillo Substation)	$2.44
Open Space Visitors Center	$1.34
Palo Duro Fitness Center	$5.68
Palo Duro Senior Center	$1.55
Pino Yards	$0.97
Reality Based Training Center	$0.04
Sierra Vista Pool and Tennis Complex	$4.26
South Broadway Cultural Center/Library	$1.30
Southwest Area Command (Shawn McWethy Substation)	$2.00
Special Collections Library	$1.39
Taylor Ranch Community Center	$1.56
Taylor Ranch Library	$1.85
Tony Hillerman Library	$1.31
Training Academy	$0.91
Valley Area Command (Gerald Cline Substation)	$2.00
Valley Pool	$2.55

3.2. BASELINE UTILITY RATES

This section outlines the utility rates pertinent to this project. The monthly rates depicted are inclusive of all riders, fuel adjustment factors, and other applicable fees. It was determined during the IGA that the currently applied utility rates where appropriate for all meters. A detailed analysis of each rate along with published tariffs are provided in APPENDIX A.

3.2.1. ELECTRICITY RATES

3.2.1.1. PNM 2A Small Power Service

Provider	PNM
Rate No.	2A
Rate Name	Small Power Service
Effective Date	Jan 1, 2019

Month	Customer Charge	Consumption
	$/month	$/kWh
Jan	$16.80	$0.134492
Feb	$16.80	$0.134492
Mar	$16.80	$0.134492
Apr	$16.80	$0.136161
May	$16.80	$0.136161
Jun	$16.80	$0.160888
Jul	$16.80	$0.159565
Aug	$16.80	$0.159565
Sep	$16.80	$0.134838
Oct	$16.80	$0.144716
Nov	$16.80	$0.144716
Dec	$16.80	$0.144716

3.2.1.2. PNM Rate 3B – General Power Service – Time of Use – PNM XFMR

Provider	PNM
Rate No.	3B
Rate Name	General Power Service – Time of Use – PNM XFMR
Effective Date	Jan 1, 2019

Month	Customer Charge	Demand	On-Peak Consumption	Off-Peak Consumption
	$/month	$/kW	$/kWh	$/kWh
Jan	$86.94515	$20.25844	$0.06672	$0.05402
Feb	$86.94515	$20.25844	$0.06672	$0.05402
Mar	$86.94515	$20.25844	$0.06672	$0.05402
Apr	$86.94515	$20.25844	$0.06839	$0.05569
May	$86.94515	$20.25844	$0.06839	$0.05569
Jun	$86.94515	$27.12842	$0.07440	$0.05569
Jul	$86.94515	$27.12842	$0.07308	$0.05437
Aug	$86.94515	$27.12842	$0.07308	$0.05437
Sep	$86.94515	$20.25844	$0.06707	$0.05437
Oct	$86.94515	$20.25844	$0.07695	$0.06425
Nov	$86.94515	$20.25844	$0.07695	$0.06425
Dec	$86.94515	$20.25844	$0.07695	$0.06425

3.2.1.3.PNM Rate 3C – General Power Service (Low Load Factor) – Time of Use – PNM XFMR

Provider	PNM
Rate No.	3C
Rate Name	General Power Service (Low Load Factor) – Time of Use – PNM XFMR
Effective Date	Jan 1, 2019

Month	Customer Charge	Demand	On-Peak Consumption	Off-Peak Consumption
	$/month	$/kW	$/kWh	$/kWh
Jan	$87.24338	$6.44393	$0.13035	$0.09314
Feb	$87.24338	$6.44393	$0.13035	$0.09314
Mar	$87.24338	$6.44393	$0.13035	$0.09314
Apr	$87.24338	$6.44393	$0.13202	$0.09481
May	$87.24338	$6.44393	$0.13202	$0.09481
Jun	$87.24338	$8.62741	$0.16235	$0.09481
Jul	$87.24338	$8.62741	$0.16102	$0.09348
Aug	$87.24338	$8.62741	$0.16102	$0.09348
Sep	$87.24338	$6.44393	$0.13069	$0.09348
Oct	$87.24338	$6.44393	$0.14057	$0.10336
Nov	$87.24338	$6.44393	$0.14057	$0.10336
Dec	$87.24338	$6.44393	$0.14057	$0.10336

3.2.1.4. PNM Rate 3D – Pilot Muni and Counties General Power Service – Time of Use – PNM XFMR

Provider	PNM
Rate No.	3D
Rate Name	Pilot Muni and Counties General Power Service – TOU – PNM XFMR
Effective Date	Jan 1, 2019

Month	Customer Charge	Demand	On-Peak Consumption	Off-Peak Consumption
	$/month	$/kW	$/kWh	$/kWh
Jan	$86.94515	$20.25844	$0.06672	$0.05402
Feb	$86.94515	$20.25844	$0.06672	$0.05402
Mar	$86.94515	$20.25844	$0.06672	$0.05402
Apr	$86.94515	$20.25844	$0.06839	$0.05569
May	$86.94515	$20.25844	$0.06839	$0.05569
Jun	$86.94515	$27.12842	$0.07440	$0.05569
Jul	$86.94515	$27.12842	$0.07308	$0.05437
Aug	$86.94515	$27.12842	$0.07308	$0.05437
Sep	$86.94515	$20.25844	$0.06707	$0.05437
Oct	$86.94515	$20.25844	$0.07695	$0.06425
Nov	$86.94515	$20.25844	$0.07695	$0.06425
Dec	$86.94515	$20.25844	$0.07695	$0.06425

3.2.1.5. PNM Rate 3D – Pilot Muni and Counties General Power Service (Low Load Factor) – Time of Use – PNM XFMR

Provider	PNM
Rate No.	3E
Rate Name	Pilot Muni and Counties General Power Service (Low Load Factor) – TOU – PNM XFMR
Effective Date	Jan 1, 2019

Month	Customer Charge	Demand	On-Peak Consumption	Off-Peak Consumption
	$/month	$/kW	$/kWh	$/kWh
Jan	$87.24338	$6.44393	$0.13035	$0.09314
Feb	$87.24338	$6.44393	$0.13035	$0.09314
Mar	$87.24338	$6.44393	$0.13035	$0.09314
Apr	$87.24338	$6.44393	$0.13202	$0.09481
May	$87.24338	$6.44393	$0.13202	$0.09481
Jun	$87.24338	$8.62741	$0.16235	$0.09481
Jul	$87.24338	$8.62741	$0.16102	$0.09348
Aug	$87.24338	$8.62741	$0.16102	$0.09348
Sep	$87.24338	$6.44393	$0.13069	$0.09348
Oct	$87.24338	$6.44393	$0.14057	$0.10336
Nov	$87.24338	$6.44393	$0.14057	$0.10336
Dec	$87.24338	$6.44393	$0.14057	$0.10336

3.2.1.6. PNM Rate 4B – Large Power Service – Time of Use – PNM XFMR

Provider	PNM
Rate No.	4B
Rate Name	Large Power Service – Time of Use – PNM XFMR
Effective Date	Jan 1, 2019

Month	Customer Charge	Demand	On-Peak Consumption	Off-Peak Consumption
	$/month	$/kW	$/kWh	$/kWh
Jan	$623.39981	$19.59807	$0.06300	$0.05444
Feb	$623.39981	$19.59807	$0.06300	$0.05444
Mar	$623.39981	$19.59807	$0.06300	$0.05444
Apr	$623.39981	$19.59807	$0.06467	$0.05611
May	$623.39981	$19.59807	$0.06467	$0.05611
Jun	$623.39981	$27.27754	$0.07158	$0.05611
Jul	$623.39981	$27.27754	$0.07026	$0.05479
Aug	$623.39981	$27.27754	$0.07026	$0.05479
Sep	$623.39981	$19.59807	$0.06335	$0.05479
Oct	$623.39981	$19.59807	$0.07322	$0.06467
Nov	$623.39981	$19.59807	$0.07322	$0.06467
Dec	$623.39981	$19.59807	$0.07322	$0.06467

3.2.2. NATURAL GAS RATES

Deregulation, or "open access", for natural gas has been available in the New Mexico Gas Company's (NMGC) service territory since 1987. Under this option, business customers can choose to buy natural gas from the open market seeking lower costs. Natural gas sold by other companies is transported using NMGC infrastructure under guidelines issued by the New Mexico Public Regulation Commission (NM-PRC) Rule 660. CABQ participates in this program and currently purchases natural gas from Symmetry Energy.

The monthly rates depicted are inclusive of all riders, fuel adjustment factors, and other applicable fees. A detailed analysis of each rate along with published tariffs are provided in APPENDIX A.

3.2.2.1. NMGC Rate 54 – Transmission and Delivery General Service Small Volume / Symmetry

Provider	NMGC / Symmetry
Rate No.	54
Rate Name	Transmission and Delivery General Service Small Volume
Effective Date	Jan 1, 2023

Month	Customer Charge	Consumption
	$/month	$/therm
Jan	$29.32	$0.68650
Feb	$29.32	$0.68650
Mar	$29.32	$0.68650
Apr	$29.32	$0.68650
May	$29.32	$0.68650
Jun	$29.32	$0.68650
Jul	$29.32	$0.68650
Aug	$29.32	$0.68650

Month	Customer Charge	Consumption
	$/month	$/therm
Sep	$29.32	$0.68650
Oct	$29.32	$0.68650
Nov	$29.32	$0.68650
Dec	$29.32	$0.68650

3.2.3. WATER AND SEWER RATES

3.2.3.1. ABCWUA – Institutional Rate Class

Provider	ABCWUA
Rate No.	Inst
Rate Name	Institutional Rate Class
Effective Date	Jan 1, 2019
Customer Charge	Varies by Installed Meter Size
Water Consumption	$2.45554 / kgal
Sewer Consumption	$5.29468 / kgal

3.3. BASELINE UTILITY METERS

The following utility meters were used to establish the baselines for each IGA site.

3.3.1. ALAMOSA COMMUNITY CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	115270709 - 1159663 - 6	777783
ELEC	PNM	PV 92-32	115270709 - 1159663 - 6	586614
NG	Symmetry	54	016370510-1192909	1454502
NG	Symmetry	54	016370511-1190945	1735532
NG	Symmetry	54	016370512-1160688	2866295
WATER	ABCWUA	Irrigation	5268179560	13597253
WATER	ABCWUA	Irrigation	3368179560	10243669
WATER	ABCWUA	Irrigation	1268179560	13538276
WATER	ABCWUA	Institutional	3268179560	13597287

3.3.2. ALBUQUERQUE GOVERNMENT CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	4B	032044100-038621-4	473454
NG	Symmetry	54	016370558-0624331	5331487
WATER	ABCWUA	Institutional	7836579560	78224850

3.3.3. ALVARADO TRANSPORTATION CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	115466055-1171702-6	785054
NG	Symmetry	54	016370720-1203595	1433906
WATER	ABCWUA	Institutional	6363929560	68243570

3.3.4. ANIMAL WELFARE EASTSIDE SHELTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	032049100-03800656-7	924177
NG	Symmetry	54	016370612-1219903	245506
NG	Symmetry	54	016370664-0577425	1232378
WATER	ABCWUA	Institutional	4522349560	12514592

3.3.5. ARROYO DEL OSO GOLF COURSE

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	032126900 - 0381081 - 9	619791
NG	Symmetry	54	016370520-0607017	1795425
WATER	ABCWUA	Institutional	2839059560	13105681
WATER	ABCWUA	Institutional	1845579560	85821958

3.3.6. BARELAS SENIOR CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	031925502 - 0379916 - 3	924138
ELEC	PNM	PV 2M-32	031925502 - 0379916 - 3	946991
NG	Symmetry	54	016370710-0664509	1146169
WATER	ABCWUA	Institutional	3336929560	13597221
WATER	ABCWUA	Institutional	1436929560	12514835

3.3.7. BETSY PATTERSON POOL AT SANDA HIGH SCHOOL

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3D	031926901-0379925-5	947342
NG	Symmetry	54	016370700-0608115	1687308
WATER	ABCWUA	Institutional	---	---

3.3.8. BIOPARK (ZOO)

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	4B	031954801-0380105-2	743957
ELEC	PNM	2A	115422598-1197959-6	1003937
ELEC	PNM	PV 92-32	031954801 - 0380105 - 2	924308
NG	Symmetry	54	016370545-1339737	1730624

Type	Provider	Rate	Account No.	Meter No.
NG	Symmetry	54	016370544-0688194	9636529
NG	Symmetry	54	016370547-1205473	0032937
NG	Symmetry	54	016370749-1373367	---
NG	Symmetry	54	016370753-1347231	---
NG	Symmetry	54	016370752-0678631	---
NG	Symmetry	54	016370755-0669499	---
NG	Symmetry	54	016370768-0668125	---
NG	Symmetry	54	016370737-0675189	1690301
NG	Symmetry	54	016370738-1260420	1512950
NG	Symmetry	54	016370739-1260422	1826109
NG	Symmetry	54	016370740-1378976	1704176
NG	Symmetry	54	016370742-0694194	1794266
NG	Symmetry	54	016370743-1225004	1513206
NG	Symmetry	54	016370744-1225383	1513215
NG	Symmetry	54	016370745-0664038	2878085
NG	Symmetry	54	016370746-0668272	1826121
NG	Symmetry	54	016370747-0693379	---
NG	Symmetry	54	016370748-0675418	---
NG	Symmetry	54	016370750-1225606	---

Type	Provider	Rate	Account No.	Meter No.
NG	Symmetry	54	016370751-0664035	---
NG	Symmetry	54	016370777-1382933	---
NG	Symmetry	54	016370756-1225006	---
NG	Symmetry	54	016370757-0663085	---
NG	Symmetry	54	016370758-0668431	---
NG	Symmetry	54	016370759-1248396	---
NG	Symmetry	54	016370760-0683647	---
NG	Symmetry	54	016370761-0664041	---
NG	Symmetry	54	016370762-1225008	---
NG	Symmetry	54	016370763-0674763	---
NG	Symmetry	54	016370764-0668980	---
NG	Symmetry	54	016370766-0684247	---
NG	Symmetry	54	016370767-0668237	---
NG	Symmetry	54	016370769-0664039	---
NG	Symmetry	54	016370770-1225387	---
NG	Symmetry	54	016370771-0691612	---
NG	Symmetry	54	016370772-0683927	---
NG	Symmetry	54	016370773-0672230	---
NG	Symmetry	54	016370774-1225005	---

Type	Provider	Rate	Account No.	Meter No.
NG	Symmetry	54	016370775-1267777	---
NG	Symmetry	54	016370776-1225384	---
WATER	ABCWUA	Institutional	643555835	15096850

3.3.9. BIOPARK (AQUARIUM)

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3D	115658571-1218692-1	947330
ELEC	PNM	4B	032269601-0381869-8	924339
ELEC	PNM	PV 2M-32	032269601 - 0381869 - 8	993663
NG	Symmetry	54	016370654-1218811	9995778
WATER	ABCWUA	Institutional	3350039560	12537999
WATER	ABCWUA	Institutional	6732540659	14444569
WATER	ABCWUA	Institutional	1584579560	73207602
WATER	ABCWUA	Institutional	5684579560	68230377
WATER	ABCWUA	Institutional	3684579560	70001705
WATER	ABCWUA	Institutional	1640039560	13272839
WATER	ABCWUA	Institutional	2707845684	12538158

3.3.10. BROADWAY VEHICLE EMISSIONS

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	031975603 - 0380234 - 1	685254
NG	Symmetry	54	016370725-0623908	1726180
WATER	ABCWUA	Institutional	676282956	13445654

3.3.11. CITY HALL (OLD)

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3D	031943001-0380032-1	415417
NG	Symmetry	54	016370557-0624329	8380342
WATER	ABCWUA	Institutional	3836579560	79955055
WATER	ABCWUA	Institutional	5836579560	67136105

3.3.12. DAYTONA TRANSIT CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	115588735-1242554-4	924220
ELEC	PNM	PV 92-32	115588735-1242554-4	924319
NG	Symmetry	54	016370717-1243618	433059
WATER	ABCWUA	Institutional	9015579560	9055752

3.3.13.EAST CENTRAL HEALTH AND SOCIAL SERVICE CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	031995702 - 0380354 - 1	645277
NG	Symmetry	54	016370569-0571510	3249417
WATER	ABCWUA	Institutional	1082049560	13549402
WATER	ABCWUA	Institutional	1972049560	14295057

3.3.14. ERNA FERGUSSON LIBRARY

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	115507733 - 1222055 - 3	947313
NG	Symmetry	54	016370577-1232601	9994487
WATER	ABCWUA	Institutional	4334059560	13597205
WATER	ABCWUA	Irrigation	4094059560	16056284

3.3.15. ESPERANZA BICYCLE SAFETY EDUCATION CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	115630572 - 0380014 - 2	581326
NG	Symmetry	54	016370579-0653436	17776677
WATER	ABCWUA	Institutional	8962869560	13590129

3.3.16. FIRE ACADEMY

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	115268648 - 1159041 - 3	924235
ELEC	PNM	PV 36-32	115268648 - 1159041 - 3	681127
NG	Symmetry	54	016370583-0672823	1784664
WATER	ABCWUA	Institutional	5304279560	14444597
WATER	ABCWUA	Institutional	3304279560	13597290
WATER	ABCWUA	Institutional	1304279560	14444598

3.3.17. FIRE STATION 01

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	032029400 - 0380546 - 9	947328
NG	Symmetry	54	016370587-0664716	1146165
WATER	ABCWUA	Institutional	3125579560	9149917

3.3.18. FIRE STATION 05

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	115634707 - 1255999 - 2	924149
ELEC	PNM	PV 2M-32	115634707 - 1255999 - 2	993841
NG	Symmetry	54	016370586-1333616	1687311
WATER	ABCWUA	Institutional	1705349560	9149917

Type	Provider	Rate	Account No.	Meter No.
WATER	ABCWUA	Institutional	8605349560	2580

3.3.19. FIRE STATION 13 AND FIRE ARSON

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	032053602 - 0380682 - 3	446856
NG	Symmetry	54	016370599-0617516	1433934
WATER	ABCWUA	Institutional	3818749560	10252510

3.3.20. FIRE STATION 17

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	031937300 - 0379995 - 2	685255
NG	Symmetry	54	016370604-0643193	1414718
WATER	ABCWUA	Institutional	4198869560	67847342

3.3.21. FIRE STATION 20

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	115478138 - 1193167 - 8	947281
NG	Symmetry	54	016370607-1204719	1780138
WATER	ABCWUA	Institutional	4178949560	13597270

3.3.22. FIRE STATION 21

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	115633707 - 1255741 - 4	924175
ELEC	PNM	PV 2M-32	115633707 - 1255741 - 4	947884
NG	Symmetry	54	016370589-1354955	1857932
WATER	ABCWUA	Institutional	2271909294	29229205
WATER	ABCWUA	Irrigation	2850245445	29569008

3.3.23. HERMAN SANCHEZ COMMUNITY CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3D	115658551 - 1247506 - 8	947291
NG	Symmetry	54	016370618-0666466	1735925
WATER	ABCWUA	Institutional	1682929560	12538014

3.3.24. HIGHLAND POOL

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3D	115662635 - 1253191 - 1	947334
NG	Symmetry	54	016370619-0566918	5581538
WATER	ABCWUA	Institutional	7606579560	71758

3.3.25. HIGHLAND SENIOR CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3C	031933601 - 0379972 - 4	947332
NG	Symmetry	54	016370620-0619334	1840202
WATER	ABCWUA	Institutional	6583549560	13597228

3.3.26. HOLIDAY PARK COMMUNITY CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	031935100 - 0379981 - 4	947259
NG	Symmetry	54	016370621-0594781	1721727
WATER	ABCWUA	Institutional	7597125291	12687090
WATER	ABCWUA	Institutional	8050671007	12538094

3.3.27. KIMO THEATRE

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	031970402 - 0380201 - 2	947205
NG	Symmetry	54	016370635-0624366	1785455
WATER	ABCWUA	Institutional	170539560	13445678

3.3.28. LAW ENFORCEMENT CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3D	32079200-0380821	421716
NG	Symmetry	54	016370636-0624653	1836257
WATER	ABCWUA	Institutional	Served From APD Main	---

3.3.29. LOS ALTOS GOLF COURSE

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3C	032007200 - 0380427 - 3	947341
ELEC	PNM	2A	032097700 - 0380920 - 5	277011
ELEC	PNM	2A	031994400 - 0380346 - 4	655952
NG	Symmetry	54	016370639-0577426	600351
WATER	ABCWUA	Institutional	3471349560	9650853
WATER	ABCWUA	Institutional	5270349560	87776
WATER	ABCWUA	Institutional	1630349560	9264863
WATER	ABCWUA	Irrigation	7616579560	13682436

3.3.30. LOS GRIEGOS HEALTH AND SOCIAL SERVICE CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	032222603 - 0381624 - 6	924196
ELEC	PNM	PV 2P-32	032222603-0381624-6	5508643

Type	Provider	Rate	Account No.	Meter No.
NG	Symmetry	54	016370642-0679989	1415126
WATER	ABCWUA	Institutional	4425739560	13597226

3.3.31. MAIN LIBRARY

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3D	031944201 - 0380041 - 5	777768
NG	Symmetry	54	016370644-0624333	492905
WATER	ABCWUA	Institutional	7325579560	82115083

3.3.32. MANZANO MESA MULTIGENERATIONAL CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	116721369 - 1550352 - 8	936219
ELEC	PNM	3D	115497340 - 1206639 - 7	924140
NG	Symmetry	54	016370645-1196030	215031
WATER	ABCWUA	Institutional	4313249560	13597236
WATER	ABCWUA	Institutional	906709881	65227518
WATER	ABCWUA	Institutional	6313249560	12500393
WATER	ABCWUA	Institutional	3084579560	16725632

3.3.33. METRO FORENSICS SCIENCE CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	115472230 - 1199860 - 6	455769
ELEC	PNM	PV 2M-32	115472230 - 1199860 - 6	993645
NG	Symmetry	54	016370610-1204249	127972
WATER	ABCWUA	Institutional	5240639560	13445671

3.3.34. NORTH VALLEY SENIOR CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3C	031928201 - 0379933 - 8	947305
NG	Symmetry	54	016370670-0631623	1434148
WATER	ABCWUA	Irrigation	7631739560	9117470
WATER	ABCWUA	Institutional	7911739560	12500399

3.3.35. NORTHEAST AREA COMMAND

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	031998301 - 0380373 - 6	426888
NG	Symmetry	54	016370630-0607013	9994409/1849097
WATER	ABCWUA	Institutional	6754159560	13597293

3.3.36. OPEN SPACE VISITORS CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	115661612-1263095	581250
NG	Symmetry	54	016370678-1208740	1855663

3.3.37. PALO DURO FITNESS CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3C	32332500-0382201	947279
NG	Symmetry	54	016370681-1335618	2870313

3.3.38. PALO DURO SENIOR CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3C	031942101 - 0380026 - 8	947256
NG	Symmetry	54	016370680-0607431	1687425
WATER	ABCWUA	Institutional	9434059560	10247667

3.3.39. PINO YARDS

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	032133800 - 0381125 - 0	303692
ELEC	PNM	2A	115278244 - 1161761 - 3	498536
ELEC	PNM	2A	032004901 - 0380412 - 6	5505626

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3D	031943901 - 0380038 - 6	924398
ELEC	PNM	2A	032133800 - 1679082 - 7	940872
ELEC	PNM	PV 92-32	031943901 - 0380038 - 6	947312
NG	Symmetry	54	016370686-0603129	5412367
NG	Symmetry	54	016370687-0603128	492823
NG	Symmetry	54	016370679-1163850	1822338
WATER	ABCWUA	Institutional	9062559560	14295546
WATER	ABCWUA	Institutional	7062559560	14968006
WATER	ABCWUA	Institutional	9936579560	14162457
WATER	ABCWUA	Institutional	1159459560	13590896
WATER	ABCWUA	Institutional	5936579560	14162456
WATER	ABCWUA	Institutional	5762559560	15611048

3.3.40. REALITY BASED TRAINING CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	---	924139
NG	Symmetry	54	016370735-0220328	492795

3.3.41. SIERRA VISTA POOL AND TENNIS COMPLEX

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	031950102 - 0380078 - 2	688763
NG	Symmetry	54	016370702-0646852	1433497
WATER	ABCWUA	Institutional	1498869560	88762

3.3.42. SOUTH BROADWAY CULTURAL CENTER / LIBRARY

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	032208002 - 0381540 - 0	947337
NG	Symmetry	54	016370707-0666300	9336220
WATER	ABCWUA	Institutional	6250929560	13597271

3.3.43. SOUTHWEST AREA COMMAND

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	2A	115658566 - 0380647 - 6	419371

Type	Provider	Rate	Account No.	Meter No.
NG	Symmetry	54	016370701-0650105	1822613
WATER	ABCWUA	Institutional	4823179560	15096794

3.3.44. SPECIAL COLLECTIONS LIBRARY

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3C	031944402 - 0380042 - 8	473395
NG	Symmetry	54	016370709-0624659	1720456
WATER	ABCWUA	Institutional	7240829560	14443123
WATER	ABCWUA	Irrigation	9240829560	14968104

3.3.45. TAYLOR RANCH COMMUNITY CENTER

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	115624676 - 1225678 - 2	924167
ELEC	PNM	PV 24-32	115624676 - 1225678 - 2	946971
NG	Symmetry	54	016370559-1246715	1726091
WATER	ABCWUA	Institutional	1604379560	88761
WATER	ABCWUA	Institutional	7404379560	88767

3.3.46. TAYLOR RANCH LIBRARY

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3E	115604526 - 0381132 - 5	947380
NG	Symmetry	54	016370713-0668598	1738265
WATER	ABCWUA	Institutional	7468969560	9058928
WATER	ABCWUA	Institutional	9174579560	82337690

3.3.47. TONY HILLERMAN LIBRARY

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	031935904 - 0379987 - 3	947310
NG	Symmetry	54	016370734-0611259	1779766
WATER	ABCWUA	Institutional	727725956	12047123
WATER	ABCWUA	Institutional	2817259560	14295550

3.3.48. TRAINING ACADEMY

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	032207701 - 0381537 - 3	924324
ELEC	PNM	PV 92-32	032207701 - 0381537 - 3	1003677
NG	Symmetry	54	016370614-0672946	2876678
NG	Symmetry	54	016370691-0676958	1836807

Type	Provider	Rate	Account No.	Meter No.
WATER	ABCWUA	Institutional	4530639560	12198093

3.3.49. VALLEY AREA COMMAND

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	32175102-0381358	947322
NG	Symmetry	54	016370690-1327517	1013125
WATER	ABCWUA	Institutional	9730639560	13445666

3.3.50. VALLEY POOL

Type	Provider	Rate	Account No.	Meter No.
ELEC	PNM	3B	031943301 - 0380034 - 3	947320
NG	Symmetry	54	016370724-0630297	88584
WATER	ABCWUA	Institutional	1625739560	10249183

4.0 FACILITY IMPROVEMENT MEASURES

The two fundamental factors contributing to energy savings are performance and duration. Performance describes the rate of energy use to accomplish a task, while duration describes how long the task operates.

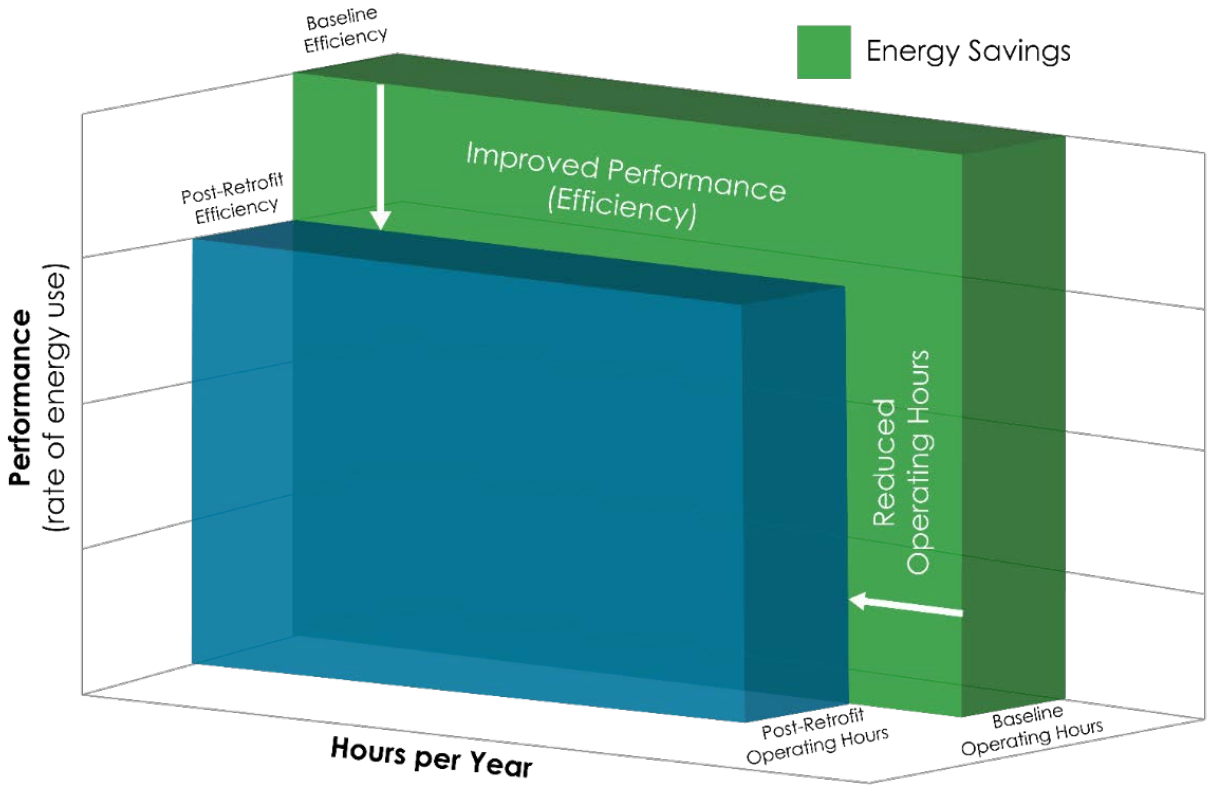


Figure 4: Facility Improvement Measure (FIM) Diagram

(M&V Guidelines: Measurement and Verification for Federal Energy Projects Version 3.0)

A key benefit of EPC projects is that they allow for measures of varying financial returns to be bundled together to form a combined project that meets the desired financial and operational objectives. An Investment Grade Audit (IGA) was performed to establish the baseline condition and performance of each facility, and to identify and co-develop the following recommended Facility Improvement Measures (FIM). Not every FIM will be implemented at each site as outlined section.

Table 11: FIM Matrix

Site	Site No.	01 Submetering	02 HVAC Equipment	03 Building Automation System	04 LED Lighting	05 Building Envelope	06 HE Transformers
Alamosa Community Center	01	–––	–––	–––	–––	–––	–––
Albuquerque Government Center	02	•			•	•	•
Alvarado Transportation Center	03	•			•	•	
Animal Welfare Eastside Shelter	04	•			•	•	
Arroyo Del Oso Golf	05	–––	–––	–––	–––	–––	–––
Barelas Senior Center	06	•			•	•	
Betsy Patterson Pool at Sandia High School	07	–––	–––	–––	–––	–––	–––
BioPark (Zoo)	08	•			•	•	
BioPark (Aquarium)	09	•			•	•	
Broadway Vehicle Emissions	10	–––	–––	–––	–––	–––	–––
City Hall (Old)	11	•			•	•	•
Daytona Transit Center	12	•			•	•	
East Central Health and Social Service Center	13	•			•	•	
Erna Fergusson Library	14	•		•	•	•	
Esperanza Bicycle Safety Education Center	15	–––	–––	–––	–––	–––	–––

Site	Site No.	01 Submetering	02 HVAC Equipment	03 Building Automation System	04 LED Lighting	05 Building Envelope	06 HE Transformers
Fire Academy	16	•			•	•	
Fire Station 01	17	—	—	—	—	—	—
Fire Station 05	18	—	—	—	—	—	—
Fire Station 13 and Fire Arson	19	•		•			
Fire Station 17	20	•		•	•	•	
Fire Station 20	21	•			•	•	
Fire Station 21	22	—	—	—	—	—	—
Herman Sanchez Community Center	23	•			•		
Highland Pool	24	—	—	—	—	—	—
Highland Senior Center	25	•			•	•	
Holiday Park Community Center	26	•			•	•	
Kimo Theater	27	—	—	—	—	—	—
Law Enforcement Center	28	•			•		
Los Altos Golf Course/Well	29	•			•	•	
Los Griegos Health and Social Service Center	30	•			•	•	
Main Library	31	•		•	•	•	•

Site	Site No.	01 Submetering	02 HVAC Equipment	03 Building Automation System	04 LED Lighting	05 Building Envelope	06 HE Transformers
Manzano Mesa Multigenerational Center	32	—	—	—	—	—	—
Metro Forensics Science Center	33	—	—	—	—	—	—
North Valley Senior Center	34	•			•	•	
Northeast Area Command (John Carrillo Substation)	35	•		•	•	•	
Open Space Visitors Center	36	•		•	•	•	
Palo Duro Fitness Center	37	•		•	•		
Palo Duro Senior Center	38	•			•	•	
Pino Yards	39	•			•	•	
Reality Based Training Center (RBTC)	40	—	—	—	—	—	—
Sierra Vista Pool and Tennis Complex	41	•			•	•	
South Broadway Cultural Center/Library	42	•		•		•	•
Southwest Area Command (Shawn McWethy Substation)	43	•		•	•	•	
Special Collections Library	44	•	•	•	•	•	•
Taylor Ranch Community Center	45	•			•	•	•
Taylor Ranch Library	46	•	•	•	•	•	

Site	Site No.	01 Submetering	02 HVAC Equipment	03 Building Automation System	04 LED Lighting	05 Building Envelope	06 HE Transformers
Tony Hillerman Library	47	•			•	•	
Training Academy	48	•			•	•	
Valley Area Command (Gerald Cline Substation)	49	•			•	•	
Valley Pool	50	–––	–––	–––	–––	–––	–––
Total		36	2	11	34	32	6

4.1. 01 SUBMETERING

4.1.1. EXISTING CONDITIONS

No existing electrical submetering equipment is currently installed at the sites impacted by this measure.

4.1.2. PROPOSED MODIFICATIONS

This measure will install new electrical submetering equipment at select sites to enhance overall energy management operations. These devices will provide real-time utility information to the City's Balanced Resource Acquisition and Information Network (BRAIN) platform, allowing City staff to better understand how facilities operate, assist in validating the impact of implemented conservation strategies, and make informed decisions on further optimization efforts.

This is a cost only measure with no associated guaranteed savings. Therefore, the scope of this measure has been limited to one electrical submeter per site so as not to overburden the project. At sites with more than one existing electrical utility meter, the meter with the highest current annual utility cost will receive the submeter.

4.1.3. SAVINGS METHODOLOGY

There are no savings proposed for this measure.

4.1.4. GUARANTEED YEAR 1 UTILITY SAVINGS

There are no savings proposed for this measure.

4.1.5. FINANCIAL SUMMARY

Table 12: 01 Submetering – Financial Summary

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
1.02	Albuquerque Government Center	$0	$0	$4,080	$0
1.03	Alvarado Transportation Center	$0	$0	$4,080	$0
1.04	Animal Welfare Eastside Shelter	$0	$0	$4,080	$0

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
1.06	Barelas Senior Center	$0	$0	$4,080	$0
1.08	BioPark (Zoo)	$0	$0	$4,080	$0
1.09	BioPark (Aquarium)	$0	$0	$4,080	$0
1.11	City Hall (Old)	$0	$0	$4,080	$0
1.12	Daytona Transit Center	$0	$0	$4,080	$0
1.13	East Central Health and Social Service Center	$0	$0	$4,080	$0
1.14	Erna Fergusson Library	$0	$0	$4,080	$0
1.16	Fire Academy	$0	$0	$4,080	$0
1.19	Fire Station 13 and Fire Arson	$0	$0	$4,080	$0
1.20	Fire Station 17	$0	$0	$4,080	$0
1.21	Fire Station 20	$0	$0	$4,080	$0
1.23	Herman Sanchez Community Center	$0	$0	$4,080	$0
1.25	Highland Senior Center	$0	$0	$4,080	$0
1.26	Holiday Park Community Center	$0	$0	$4,080	$0
1.28	Law Enforcement Center	$0	$0	$4,080	$0
1.29	Los Altos Golf Course/Well	$0	$0	$4,080	$0
1.30	Los Griegos Health and Social Service Center	$0	$0	$4,080	$0
1.31	Main Library	$0	$0	$4,080	$0

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
1.34	North Valley Senior Center	$0	$0	$4,080	$0
1.35	Northeast Area Command (John Carrillo Substation)	$0	$0	$4,080	$0
1.36	Open Space Visitors Center	$0	$0	$4,080	$0
1.37	Palo Duro Fitness Center	$0	$0	$4,080	$0
1.38	Palo Duro Senior Center	$0	$0	$4,080	$0
1.39	Pino Yards	$0	$0	$4,080	$0
1.41	Sierra Vista Pool and Tennis Complex	$0	$0	$4,080	$0
1.42	South Broadway Cultural Center/Library	$0	$0	$4,080	$0
1.43	Southwest Area Command (Shawn McWethy Substation)	$0	$0	$4,080	$0
1.44	Special Collections Library	$0	$0	$4,080	$0
1.45	Taylor Ranch Community Center	$0	$0	$4,080	$0
1.46	Taylor Ranch Library	$0	$0	$4,080	$0
1.47	Tony Hillerman Library	$0	$0	$4,080	$0
1.48	Training Academy	$0	$0	$4,080	$0
1.49	Valley Area Command (Gerald Cline Substation)	$0	$0	$4,080	$0
Total		$0	$0	$148,320	$0

4.1.6.SCOPE OF WORK

1. Furnish and install new eGuage (or equivalent) electrical submetering device. Sites and quantities outlined below.
2. Submeter locations to be identified during pre-construction. Indoor installations are planned for all sites.
3. Connection of new metering equipment with the City's BRAIN platform.

Table 13: 01 Submetering – Scope of Work

Site	Meter Qty
Albuquerque Government Center	1
Alvarado Transportation Center	1
Animal Welfare Eastside Shelter	1
Barelas Senior Center	1
BioPark (Zoo)	1
BioPark (Aquarium)	1
City Hall (Old)	1
Daytona Transit Center	1
East Central Health and Social Service Center	1
Erna Fergusson Library	1
Fire Academy	1
Fire Station 13 and Fire Arson	1
Fire Station 17	1
Fire Station 20	1
Herman Sanchez Community Center	1
Highland Senior Center	1

Site	Meter Qty
Holiday Park Community Center	1
Law Enforcement Center	1
Los Altos Golf Course/Well	1
Los Griegos Health and Social Service Center	1
Main Library	1
North Valley Senior Center	1
Northeast Area Command (John Carrillo Substation)	1
Open Space Visitors Center	1
Palo Duro Fitness Center	1
Palo Duro Senior Center	1
Pino Yards	1
Sierra Vista Pool and Tennis Complex	1
South Broadway Cultural Center/Library	1
Southwest Area Command (Shawn McWethy Substation)	1
Special Collections Library	1
Taylor Ranch Community Center	1
Taylor Ranch Library	1
Tony Hillerman Library	1
Training Academy	1

Site	Meter Qty
Valley Area Command	1
Total	36

4.1.7. CLARIFICATIONS

1. Owner to provide network connectivity to submetering equipment through ethernet. WiFi connectivity is acceptable where ethernet is not available.
2. Owner should anticipate potential temporary outages required to complete the scope of work. Yearout Energy will work diligently with the Owner to determine the best plan and schedule for these impacts.
3. Pricing is based on installing submetering equipment indoors within 5-feet of measuring point. Additional costs may be incurred for installation of equipment outside of this range.
4. Assumes a 120V power source is available within 25 feet for energizing equipment.
5. Installation of all materials will be executed per manufacturer's recommendations.
6. Any conditions not meeting current codes, and any system deficiencies will be brought to the attention of the Owner. Any work required to remedy these situations is excluded.

4.1.8. EXCLUSIONS

1. All programming/graphics associated with CABQ's BRAIN platform. This scope will be handled by CABQ with their BRAIN service provider.
2. Cellular monitoring equipment or communication fees.
3. Removal of asbestos containing materials, lead containing materials or any other hazardous / suspect materials.
4. Saw cutting, removal, patching, and replacement of landscaping, gravel ground cover, concrete, and asphalt beyond what is required for proper installation of the system.
5. Cutting, patching, and painting and all other miscellaneous coatings beyond what is required for proper installation of the system.
6. Fire sealing, fireproof patching, damp proofing, and water stops at conduit entrances/penetrations into buildings, beyond what is required for proper installation of the system.

4.1.9. EQUIPMENT SERVICE LIFE

The estimated service life for this FIM is as follows:

Table 14: 01 Submetering – Service Life

FIM Component	% of FIM Total Cost	Median Service Life
Electric Submeter	100%	15 years
FIM Weighted Average Service Life	100%	15 years

4.1.10. PRELIMINARY MEASUREMENT & VERIFICATION PLAN

No M&V proposed for this measure.

4.1.11. WARRANTY

An industry-standard 1-year materials and workmanship warranty is included and commences at substantial completion (beneficial use of equipment/materials). Any material warranties that extend beyond this period will be transferred to the Owner upon project closeout.

The warranty period information is depicted in the following table for the major equipment related to this FIM.

Table 15: 01 Submetering – Warranty Information

Equipment Description	Warranty Period
Electric Submeter	1 year

4.1.12. TRAINING

Yearout Energy will co-develop a training plan with the Owner that is tailored to the needs and skill level of the building operators. Training sessions will be conducted during the project implementation phase. These sessions will be recorded and provided in electronic format to the Owner for future reference. Topics commonly covered during these training sessions include:

1. Equipment start-up, proper operation, shutdown, power failure, etc.
2. Operations and maintenance (O&M) manuals
3. Diagnosing and troubleshooting common equipment issues
4. Preventative maintenance and required documentation
5. Health & safety considerations
6. Warranty information
7. Identified system deficiencies

4.2. 02 HVAC EQUIPMENT

4.2.1. EXISTING CONDITIONS

During the IGA, Yearout Energy surveyed and inventoried existing HVAC equipment at the IGA sites. A considerable amount of this equipment was observed to be in poor operating condition and nearing or surpassed its useful life.

Refer to APPENDIX B for existing facility descriptions and HVAC equipment inventory.

Taylor Ranch Library
Example of aged HVAC equipment that has surpassed its useful life as needs replacement.

Special Collection Library
Example of aged HVAC equipment that has surpassed its useful life as needs replacement.

The following tables outline the existing aged HVAC equipment at each site that is recommended for replacement as part of this initial project phase. There is additional equipment beyond this list in need of replacement but those were excluded due to financial constraints.

This additional equipment can be replaced as part of a future project phase or as funding becomes available.

Table 16: 02 HVAC Equipment – Special Collections Library Existing Equipment

Unit	Clg Tons	Clg Type	Htg Type	Age (Years)	Mfr	Model	Serial
RTU-01	10	DX	NG	20	Lennox	GCS16-120-270-2G	5603C00708
RTU-02	10	DX	NG	35	Lennox	GCS16-1353-270-5G	5688D00236
RTU-03	10	DX	NG	34	Lennox	GCS16-1353-270-5G	5689A00088
RTU-04	10	DX	NG	18	Lennox	TGA120H2BM1G	5605D04062

Table 17: 02 HVAC Equipment – Taylor Ranch Library Existing Equipment

Unit	Clg Tons	Clg Type	Htg Type	Age (Years)	Mfr	Model	Serial
RTU-01	10	DX	NG	20	Lennox	GCS16-120-270-2G	5603J 02535
RTU-02	10	DX	NG	20	Lennox	GCS16-120-270-2G	5603L 09105
RTU-03	10	DX	NG	20	Lennox	GCS16-120-270-2G	5603L 09107
RTU-04	10	DX	NG	20	Lennox	GCS16-120-270-2G	---

4.2.2. PROPOSED MODIFICATIONS

This measure will replace aged HVAC Equipment (older than 15 years) at the select sites outlined below. For alignment with CABQ's Climate Action Plan, the new HVAC packaged units will be converted from natural gas heating to dual-fuel electric heat pumps with auxiliary natural gas furnaces for use during extreme cold temperatures only. This conversion to heat

pump technology with improve the energy performance of the impacted sites while also significantly reducing the amount of fossil fuels consumed on site to heat the facilities.

The following tables outline the proposed new HVAC equipment for each site. As previously noted, there is other existing equipment throughout the IGA sites needing replacement but were excluded from this initial project phase due to financial constraints. This additional equipment can be replaced as part of a future project phase or as funding becomes available.

Table 18: 02 HVAC Equipment – Special Collections Library Proposed Equipment

Unit	Clg Tons	Clg Type	Clg Eff (SEER/IEER)	Htg Type	Htg COP (High/Low)
RTU-01	10	DX	15.50	Heat Pump (Aux NG)	3.50/2.25
RTU-02	10	DX	15.50	Heat Pump (Aux NG)	3.50/2.25
RTU-03	10	DX	15.50	Heat Pump (Aux NG)	3.50/2.25
RTU-04	10	DX	15.50	Heat Pump (Aux NG)	3.50/2.25

Table 19: FIM 2.00 HVAC Equip & Controls – Taylor Ranch Library Proposed Equipment

Unit	Clg Tons	Clg Type	Clg Eff (SEER/IEER)	Htg Type	Htg COP (High/Low)
RTU-01	10	DX	15.50	Heat Pump (Aux NG)	3.50/2.25
RTU-02	10	DX	15.50	Heat Pump (Aux NG)	3.50/2.25
RTU-03	10	DX	15.50	Heat Pump (Aux NG)	3.50/2.25
RTU-04	10	DX	15.50	Heat Pump (Aux NG)	3.50/2.25

4.2.3. SAVINGS METHODOLOGY

Savings for this measure were calculated using a TMY3 Weather BIN Excel-based tool. Savings are primarily the result of replacing aged equipment with new more efficient equipment (increase in cooling IEER and heating COP).

The transition from natural gas furnaces to air-source heat pumps as the primary source of heating resulted in a significant increase in electrical demand and energy to operate this equipment. Making this transition to electrify the new equipment will improve the overall energy performance of the impacted facilities along with supporting CABQ's Climate Action Plan initiative.

Baseline cooling and heating efficiencies have been derated based on unit age using the following NREL formula for properly maintained equipment:

[Derated Cooling Efficiency = Base Efficiency * 0.99^{Age}]

[Derated Heating Efficiency = Base Efficiency * 0.995^{Age}]

Proposed cooling and heating efficiencies were derived from information provided by the manufacturer.

Please refer to APPENDIX F for detailed calculations.

4.2.4. GUARANTEED YEAR 1 UTILITY SAVINGS

Table 20: 02 HVAC Equipment – Guaranteed Year 1 Utility Savings

FIM No.	Site	kW	On-Peak kWh	Off-Peak kWh	therm
2.44	Special Collections Library	(247)	(827)	(12,972)	3,953
2.46	Taylor Ranch Library	(248)	(4,084)	(22,119)	6,547
Total		(495)	(4,911)	(35,091)	10,500

4.2.5. FINANCIAL SUMMARY

Table 21: 02 HVAC Equipment – Financial Summary

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
2.44	Special Collections Library	($103)	$1,279	$253,610	$1,280
2.46	Taylor Ranch Library	$337	$1,148	$253,610	$1,280
Total		$234	$2,427	$507,016	$2,560

4.2.6. SCOPE OF WORK

Table 22: 02 HVAC Equipment – Special Collections Library Scope of Work

Scope Item	Qty
Demo and remove existing packaged units	4
Furnish and install new 10-Ton packaged units (heat pump / aux NG furnace)	4

Table 23: 02 HVAC Equipment – Taylor Ranch Library Scope of Work

Scope Item	Qty
Demo and remove existing packaged units	4
Furnish and install new 10-Ton packaged units (heat pump / aux NG furnace)	4

4.2.7. CLARIFICATIONS

1. The factory provided MERV 8 air filters will be field replaced with aftermarket MERV 13 air filters for improved filtration.
2. Owner should anticipate planned outages required to complete the scope of work. Yearout Energy will work diligently with the Owner to determine the best plan and schedule for these impacts.

3. Pricing includes LOTO procedures, de-energization and re-energization of electrical panels, and installation of new branch panels and circuit breakers required to establish power to equipment.
4. Where necessary to complete work, 4'x4' sections of existing ceiling grid will be removed and reinstalled to facilitate removal of old systems and installation of new equipment.
5. Owner shall provide network connections and IT Support as required for a complete and working system. This includes access to a suitable wireless network with internet access for all controls devices.
6. Pricing is based on existing HVAC equipment and existing controls being functional at time of work and does not include service, repair or warranty of existing equipment or controls.
7. Above quantities and sizing are preliminary and will be finalized once final equipment selections are made.
8. Pricing based on work being performed during normal business hours.
9. New communication wiring will be plenum rated cable not run through raceway in concealed but accessible areas. EMT conduit will be used in exposed areas such as mechanical rooms per code requirements.
10. Manual override and positioning of digital and analog outputs are accomplished through the user interface, assuming a user interface is required.

4.2.8. EXCLUSIONS

1. Removal of all equipment noted "decommission" above, including but not limited to, boilers, pumps, hydronic piping, and controls.
2. Removal and abatement of asbestos-containing materials.
3. Structural and seismic upgrades associated with replacement of HVAC equipment.
4. Condensate pump controls and wiring.
5. Access panels, doors, painting, patching, and the like.
6. Accelerated shipping costs.
7. Hand/Off/Auto operator override switches for digital outputs and positioning switches for analog outputs.
8. Infection control aspects including but not limited to tenting, partitioning, temporary walls, HEPA filters, and ventilation systems.
9. New workstation.
10. Temporary heating, cooling, water, or sewer.
11. Duct cleaning.
12. Firestopping.
13. Heat trace of mechanical systems.
14. Coring of penetrations.
15. Unforeseen underground obstacles or hazardous conditions, including rock excavation.
16. Dewatering, irrigation, or landscaping.
17. Cutting, removal or replacement of concrete or asphalt.

18. Core drilling formed concrete or rebate.
19. Carpentry or painting.
20. Wall or roof openings or associated frames.
21. Architectural sheet metal.
22. Cutting or patching of structural or architectural surfaces, including pipe or duct penetration.
23. Fire related enclosures at diffusers or grease exhaust ducts.
24. Fire stopping of penetrations through fire rate construction.
25. Fire protection and utilities associated with fire protection.

4.2.9. EQUIPMENT SERVICE LIFE

The estimated service life for this FIM is as follows:

Table 24: 02 HVAC Equipment – Service Life

FIM Component	% of FIM Total Cost	Median Service Life
HVAC Equipment	100%	18 years
FIM Weighted Average Service Life		18 years

4.2.10. PRELIMINARY MEASUREMENT & VERIFICATION PLAN

M&V Option A – Retrofit Isolation
Guarantee Factor: 90%

Refer to SECTION 6 for a detailed preliminary M&V Plan.

4.2.11. WARRANTY

An industry-standard 1-year materials and workmanship warranty is included and commences at substantial completion (beneficial use of equipment/materials). Any material warranties that extend beyond this period will be transferred to the Owner upon project closeout.

The warranty period information is depicted in the following table for the major equipment related to this FIM.

Table 25: 02 HVAC Equipment – Warranty Information

Equipment Description	Warranty Period
HVAC Equipment (Parts / Compressor)	1 year / 5 years

4.2.12. TRAINING

Yearout Energy will co-develop a training plan with the Owner that is tailored to the needs and skill level of the building operators. Training sessions will be conducted during the project implementation phase. These sessions will be recorded and provided in electronic format to the Owner for future reference. Topics commonly covered during these training sessions include:

1. Equipment start-up, proper operation, shutdown, power failure, etc.
2. Sequences of operation
3. Operations and maintenance (O&M) manuals
4. Diagnosing and troubleshooting common equipment issues
5. Preventative maintenance and required documentation
6. Health & safety considerations
7. Warranty information
8. Identified system deficiencies
9. Measurement and Verification (M&V) plan and KPIs which drive savings

4.3. 03 BUILDING AUTOMATION SYSTEM (BAS)

4.3.1. EXISTING CONDITIONS

CABQ has made a significant effort to integrate its inventory of sites across the City onto common Building Automation System (BAS) platforms. Currently, the two most deployed platforms are Trane and Automated Logic. A considerable portion of the larger facilities across the city currently have one of these two BAS platforms in operation. However, several of these systems, such as those at the ABQ Government Center, Old City Hall, and the Main Library, as failing pneumatic type systems. The remaining facilities across the city are primarily equipped with convention type thermostats that do not communicate to any shared platform.

Main Library
Example of aged pneumatic thermostat that should be upgraded to a new DDC BAS.

Taylor Ranch Library
Example of a conventional programmable thermostat placed in "Hold" that can be replaced with a new BACnet thermostat for integration with a BAS platform.

4.3.2. PROPOSED MODIFICATIONS

One of the primary objectives at the onset of the project was to integrate equipment not currently tied to one of CABQ's Building Automation System (BAS) platforms and the BRAIN. Implementing new equipment to allow for integration would result in improved visibility, operational efficiency, and remote troubleshooting of the associated HVAC equipment.

This measure will install new BACnet thermostats at several sites to allow for integration of the associated unitary HVAC equipment, while a more extensive replacement of the existing pneumatic controls system with new DDC controls will be implemented at the Main Library. DDC systems provide considerable energy efficiency advantages over pneumatic systems while also improving accuracy and reliability.

The following I/O points will be provided at each site:

Sites Receiving BACnet Thermostats

1. Unitary Equip (RTU, Split System)
    a. Heating
    b. Cooling
    c. Supply Fan Start/Stop
    d. Supply Fan Status
    e. Discharge Air Temperature
    f. Zone Temperature Sensor
    g. Zone Temperature Setpoint

Main Library

1. Dual-Duct Air-Handling Unit (DDAHU)
    a. CHW Valve Position
    b. HW Valve Position
    c. Damper Actuator Position
    d. Filter DP Status
    e. Supply Fan Start/Stop
    f. Supply Fan Status
    g. Supply Fan Speed
    h. Temperature Sensors

2. Dual-Duct Variable-Air-Volume Box (DDVAV Box)
    a. Temperature Sensors
    b. Zone Temperature Sensor

3. Hot Water Plant
    a. Boiler Start/Stop
    b. Temperature Sensors

c. HW Pump Start/Stop
d. HW Pump Status

4. Chilled Water Plant
   a. Chiller Start/Stop
   b. Temperature Sensors
   c. CHW Pump Start/Stop
   d. CHW Pump Status
   e. CW Pump Start/Stop
   f. CW Pump Status

4.3.3. SAVINGS METHODOLOGY

To estimate energy savings for the measure, an end-use analysis approach was taken to isolate the baseline energy consumption associated with the existing HVAC system at the sites where existing pneumatic controls systems are to be replaced with new DDC systems. A savings factor of 20% was then applied to the baseline electricity and natural gas consumption associated with the HVAC systems. Energy savings were calculated as follows:

[Electric Energy Savings (kWh) = (Baseline Electric Usage (kWh) – Lighting System Energy Usage (kWh) – Plug Load Energy Usage (kWh) – Miscellaneous Loads Energy Usage (kWh)) * 20%]

[Natural Gas Energy Savings (therm) = (Baseline Natural Gas Usage (therm) – Domestic How Water Energy Usage (therm) – Miscellaneous Loads Energy Usage (therm)) * 20%]

During the pre-construction phase of the project, Yearout Energy's engineering and commissioning teams will carefully evaluate, identify, and document existing deficiencies associated with the Main Library. Based on these findings, Yearout Energy will develop detailed savings calculations for rectifying these deficiencies as the result of replacing the failing pneumatic control system with new fully functioning DDC system. These calculations will be summarized in the post-installation Measurement and Verification (M&V) report to validate that the guaranteed savings will be achieved.

Although anticipated to realize a modest level of utility savings as the result of establishing proper schedules and set points, no savings are proposed for the sites receiving new BACnet thermostats.

See APPENDIX G for the savings calculations.

4.3.4. GUARANTEED YEAR 1 UTILITY SAVINGS

Table 26: 03 Building Automation System – Guaranteed Year 1 Utility Savings

FIM No.	Site	kW	On-Peak kWh	Off-Peak kWh	therm
3.14	Erna Fergusson Library	0	0	0	0
3.19	Fire Station 13 and Fire Arson	0	0	0	0
3.20	Fire Station 17	0	0	0	0
3.31	Main Library	0	31,053	105,746	0
3.35	Northeast Area Command (John Carrillo Substation)	0	0	0	0
3.36	Open Space Visitors Center	0	0	0	0
3.37	Palo Duro Fitness Center	0	0	0	0
3.42	South Broadway Cultural Center/Library	0	0	0	0
3.43	Southwest Area Command (Shawn McWethy Substation)	0	0	0	0
3.44	Special Collections Library	0	0	0	0
3.46	Taylor Ranch Library	0	0	0	0
Total		0	31,053	105,746	0

4.3.5. FINANCIAL SUMMARY

Table 27: 03 Building Automation System – Financial Summary

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
3.14	Erna Fergusson Library	$0	$1,310	$23,568	$0

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
3.19	Fire Station 13 and Fire Arson	$0	$903	$10,923	$0
3.20	Fire Station 17	$0	$695	$4,681	$0
3.31	Main Library	$8,234	$10,238	$705,085	$0
3.35	Northeast Area Command (John Carrillo Substation)	$0	$774	$10,923	$0
3.36	Open Space Visitors Center	$0	$751	$15,605	$0
3.37	Palo Duro Fitness Center	$0	$385	$4,681	$0
3.42	South Broadway Cultural Center/Library	$0	$2,835	$17,165	$0
3.43	Southwest Area Command (Shawn McWethy Substation)	$0	$822	$10,923	$0
3.44	Special Collections Library	$0	$1,279	$25,751	$0
3.46	Taylor Ranch Library	$0	$1,148	$21,857	$0
Total		$8,234	$21,139	$851,162	$0

4.3.6.SCOPE OF WORK

BACnet Thermostats

The following table outlines the quantity of unitary HVAC equipment that will be integrated via BACnet with the existing Trane Ensemble System at each site.

Table 28: 03 Building Automation System – BACnet Thermostat Scope of Work

Site	Qty
Erna Fergusson Library	6
Fire Station 13 and Fire Arson	7

Site	Qty
Fire Station 17	3
Northeast Area Command	7
Open Space Visitors Center	7
Palo Duro Fitness Center	3
South Broadway Cultural Center	11
Southwest Area Command	7
Special Collections Library	6
Taylor Ranch Library	5
Total	62

DDC System

The following table outlinee the proposed scope of work at the site where existing pneumatic controls will be upgraded with new DDC controls and integrated with the existing Trane Ensemble System.

Table 29: 03 Building Automation System – Main Library DDC Scope of Work

Scope Item	Qty
Decommission existing pneumatic controls system	1
Furnish and install new DDC controls on existing Air-Handling Unit	2
Furnish and install new DDC controls on existing DD VAV Box	87
Furnish and install new DDC controls on HW Boiler	3
Furnish and install new DDC controls on HW Pump	2

Scope Item	Qty
Furnish and install new DDC controls on Chiller	2
Furnish and install new DDC controls on CHW Pump	2
Furnish and install new DDC controls on CW Pump	2
Startup and Programming of new DDC controls	1
Furnish and install new Trane Tracer Ensemble server with software & graphics	1

4.3.7. CLARIFICATIONS

1. Owner should anticipate planned outages required to complete the scope of work. Yearout Energy will work diligently with the Owner to determine the best plan and schedule for these impacts.
2. Pricing includes LOTO procedures, de-energization and re-energization of electrical panels, and installation of new branch panels and circuit breakers required to establish power to equipment.
3. Where necessary to complete work, 4'x4' sections of existing ceiling grid will be removed and reinstalled to facilitate removal of old systems and installation of new equipment.
4. Owner shall provide network connections and IT Support as required for a complete and working system. This includes access to a suitable wireless network with internet access for all controls devices.
5. Pricing is based on existing HVAC equipment and existing controls being functional at time of work and does not include service, repair or warranty of existing equipment or controls.
6. Above quantities and sizing are preliminary and will be finalized once final equipment selections are made.
7. Pricing based on work being performed during normal business hours.
8. New communication wiring will be plenum rated cable not run through raceway in concealed but accessible areas. EMT conduit will be used in exposed areas such as mechanical rooms per code requirements.
9. Manual override and positioning of digital and analog outputs are accomplished through the user interface, assuming a user interface is required.

4.3.8. EXCLUSIONS

1. All programming/graphics associated with CABQ's BRAIN platform. CABQ will work directly with their BRAIN service provided for this work as required.

2. Removal of all equipment noted “decommission” above, including but not limited to, boilers, pumps, hydronic piping, and controls.
3. Removal and abatement of asbestos-containing materials.
4. Modifications to VAV/terminal boxes or conversion kits that may be required for the installation of DDC controls at associated sites.
5. Structural and seismic upgrades associated with replacement of HVAC equipment.
6. Condensate pump controls and wiring.
7. Access panels, doors, painting, patching, and the like.
8. Accelerated shipping costs.
9. Hand/Off/Auto operator override switches for digital outputs and positioning switches for analog outputs.
10. Infection control aspects including but not limited to tenting, partitioning, temporary walls, HEPA filters, and ventilation systems.
11. New workstation.
12. Temporary heating, cooling, water, or sewer.
13. Duct cleaning.
14. Firestopping.
15. Heat trace of mechanical systems.
16. Coring of penetrations.
17. Unforeseen underground obstacles or hazardous conditions, including rock excavation.
18. Dewatering, irrigation, or landscaping.
19. Cutting, removal or replacement of concrete or asphalt.
20. Core drilling formed concrete or rebate.
21. Carpentry or painting.
22. Wall or roof openings or associated frames.
23. Architectural sheet metal.
24. Cutting or patching of structural or architectural surfaces, including pipe or duct penetration.
25. Fire related enclosures at diffusers or grease exhaust ducts.
26. Fire stopping of penetrations through fire rate construction.
27. Fire protection and utilities associated with fire protection.

4.3.9. EQUIPMENT SERVICE LIFE

The estimated service life for this FIM is as follows:

Table 30: 03 Building Automation System – Service Life

FIM Component	% of FIM Total Cost	Median Service Life
Controls Equipment	100%	18 years

FIM Component	% of FIM Total Cost	Median Service Life
FIM Weighted Average Service Life		18 years

4.3.10. PRELIMINARY MEASUREMENT & VERIFICATION PLAN

M&V Option A – Retrofit Isolation
Guarantee Factor: 90%

Refer to SECTION 6 for a detailed preliminary M&V Plan.

4.3.11. WARRANTY

An industry-standard 1-year materials and workmanship warranty is included and commences at substantial completion (beneficial use of equipment/materials). Any material warranties that extend beyond this period will be transferred to the Owner upon project closeout.

The warranty period information is depicted in the following table for the major equipment related to this FIM.

Table 31: 03 Building Automation System – Warranty Information

Equipment Description	Warranty Period
Controls Equipment	1 year

4.3.12. TRAINING

Yearout Energy will co-develop a training plan with the Owner that is tailored to the needs and skill level of the building operators. Training sessions will be conducted during the project implementation phase. These sessions will be recorded and provided in electronic format to the Owner for future reference. Topics commonly covered during these training sessions include:

1. Equipment start-up, proper operation, shutdown, power failure, etc.
2. Sequences of operation
3. Operations and maintenance (O&M) manuals
4. Diagnosing and troubleshooting common equipment issues
5. Preventative maintenance and required documentation
6. Health & safety considerations
7. Warranty information
8. Identified system deficiencies
9. Measurement and Verification (M&V) plan and KPIs which drive savings

4.4. 04 LED LIGHTING

4.4.1. EXISTING CONDITIONS

Approximately a quarter of the existing lighting throughout the IGA sites have already been converted to LED technology. Existing lighting controls are limited throughout. The following table depicts a breakdown of existing lighting fixtures by technology type at the IGA sites.

Table 32: 04 LED Lighting – Existing Lighting Fixtures Inventory

Type	Qty	% of Total
Fluorescent	19,652	67.7%
Light Emitting Diode (LED)	7,775	26.8%
Metal Halide (MH)	861	3.0%
High Pressure Sodium (HPS)	204	0.7%
Incandescent	195	0.7%
Halogen	188	0.6%
Mercury Vapor (MV)	136	0.5%
Quartz	23	0.1%
Total	29,034	100%

Refer to APPENDIX H for a detailed room-by-room lighting inventory.

4.4.2. PROPOSED MODIFICATIONS

This measure will retrofit and/or replace the existing interior and exterior non-LED fixtures. This will significantly reduce the energy consumption of the lighting system while also improving site security and light quality. In addition, the proposed solution would standardize the lighting system throughout the City, resulting in simplified inventory requirements and reduced maintenance costs.

Refer to APPENDIX H for a detailed room-by-room proposed scope.

The following table outlines the IES recommended lighting levels by space type:

Table 33: 04 LED Lighting – IES Illuminance Recommendations

Space Type	IES Illuminance Recommendation (foot-candle)
Auditorium (Assembly)	10 - 20
Exterior (Safety)	0.5 - 2
Gym Exercise & Recreation	30
Locker Room	10 - 30
Library	20 - 50
Office	30 - 50
Conference Room	20 – 70
Corridor	20
Reception / Lobby	5 - 20
Restroom	7.5 - 30
Warehouse (Open)	10 - 30
Dining	5 - 20
Kitchen / Food Prep	50 - 100
Operating Room	100 - 200
Break Room	5 - 20
Parking (Uncovered)	0.75 - 3

4.4.3.SAVINGS METHODOLOGY

Utility Savings for this FIM were calculated using the following formula.

Demand

The existing and proposed fixture demand are calculated as follows:

[Existing Demand (kW) = Fixture Quantity x Fixture Wattage (W) * (1 – BF) / 1,000]

[Proposed Demand (kW) = Fixture Quantity x Fixture Wattage (W) * TET% / 1,000]

[Annual Demand Savings (kW) = (Existing Demand – Proposed Demand) * CF * Months]

Where:

- Burnout Factor (BF) – To account for existing fixtures that have failed and are not currently drawing power, a burnout factor of 5% - 20% has been applied to the existing demand at each site based on observations during the detailed lighting audit.
- Top End Tuning Percent (TET%) – Also referred to as High-End Trim. Where enhanced controls are being proposed that allow for this controls strategy, a TET factor of 85% has been applied. This strategy will limit the maximum power input to the associated fixtures while still maintaining the desired light levels in the spaces served.
- Coincidence Factor (CF) – Also referred to as Diversity Factor. Adjustment to account for the actual number of fixtures operating during the peak demand period. A Coincidence Factor of 0.90 was used for interior fixtures and 0.00 was used for exterior fixtures.
- Months – Number of months where demand savings are expected to occur. Set to 12 months.

Energy Savings

Energy savings are calculated as follows:

[Existing Energy (kWh) = Existing Demand (kW) x Burn Hours (hr/y)]

[Proposed Energy (kWh) = Proposed Demand (kW) x Burn Hours (hr/y) x OccRed%]

Where:

- Burn Hours – Annual lighting operating hours (See table below)
- Occupancy Reduction Percentage (OccRed%) – Where new occupancy/vacancy are proposed, a 15% reduction in Burn Hours has been applied.

Table 34: 04 LED Lighting – Burn Hours by Space Type

Space Type	Annual Burn Hours
Common Area	2,640
Conference Room	2,640
Copy Room	2,640
Corridor	2,640
Emergency	8,760
Exterior	4,192
IT / Data Room	1,920
Kennel	4,380
Kitchen / Food Prep	2,080
Mechanical / Electrical Room	480
Office	2,640
Restroom	2,640
Stairway	8,760
Storage (Open)	2,080
Storage / Closet	480
Warehouse / Shop	2,640

4.4.4. GUARANTEED YEAR 1 UTILITY SAVINGS

Table 35: 04 LED Lighting – Guaranteed Year 1 Utility Savings

FIM No.	Site	kW	On-Peak kWh	Off-Peak kWh	therm
4.02	Albuquerque Government Center	1,865	384,973	31,372	(7,553)
4.03	Alvarado Transportation Center	317	71,388	20,012	(1,658)
4.04	Animal Welfare Eastside Shelter	209	45,645	11,416	(1,035)
4.06	Barelas Senior Center	163	35,012	1,690	(666)
4.08	BioPark (Zoo)	692	142,970	48,591	(3,475)
4.09	BioPark (Aquarium)	333	70,825	15,994	(1,575)
4.11	City Hall (Old)	353	79,719	8,740	(1,605)
4.12	Daytona Transit Center	1,623	310,629	38,178	(6,328)
4.13	East Central Health and Social Service Center	0	11,362	0	(206)
4.14	Erna Fergusson Library	181	37,798	4,272	(763)
4.16	Fire Academy	455	80,724	22,503	(1,873)
4.20	Fire Station 17	0	2,509	0	(46)
4.21	Fire Station 20	138	28,519	4,115	(592)
4.23	Herman Sanchez Community Center	290	73,591	3,866	(1,405)
4.25	Highland Senior Center	173	35,093	871	(652)
4.26	Holiday Park Community Center	0	26,650	0	(483)
4.28	Law Enforcement Center	718	154,309	8,977	(2,962)
4.29	Los Altos Golf Course/Well	59	11,429	326	(213)
4.30	Los Griegos Health and Social Service Center	302	61,589	2,616	(1,165)

FIM No.	Site	kW	On-Peak kWh	Off-Peak kWh	therm
4.31	Main Library	1,059	219,441	29,744	(4,521)
4.34	North Valley Senior Center	214	46,454	16,908	(1,150)
4.35	Northeast Area Command (John Carrillo Substation)	0	26,801	0	(486)
4.36	Open Space Visitors Center	0	5,948	0	(108)
4.37	Palo Duro Fitness Center	73	15,550	743	(296)
4.38	Palo Duro Senior Center	174	35,904	1,407	(677)
4.39	Pino Yards	1,084	258,250	9,985	(4,866)
4.41	Sierra Vista Pool and Tennis Complex	0	8,584	0	(156)
4.43	Southwest Area Command (Shawn McWethy Substation)	0	34,003	0	(617)
4.44	Special Collections Library	153	30,867	112	(562)
4.45	Taylor Ranch Community Center	161	28,407	4,947	(605)
4.46	Taylor Ranch Library	116	24,173	1,537	(466)
4.47	Tony Hillerman Library	149	31,330	981	(586)
4.48	Training Academy	231	44,073	2,859	(851)
4.49	Valley Area Command (Gerald Cline Substation)	179	31,227	2,460	(611)
Total		11,463	2,505,746	295,222	(50,813)

4.4.5. FINANCIAL SUMMARY

Table 36: 04 LED Lighting – Financial Summary

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
4.02	Albuquerque Government Center	$63,248	$12,650	$354,566	$24,981
4.03	Alvarado Transportation Center	$12,128	$2,426	$112,264	$5,484
4.04	Animal Welfare Eastside Shelter	$7,833	$1,567	$111,744	$3,424
4.06	Barelas Senior Center	$5,755	$1,151	$75,698	$2,202
4.08	BioPark (Zoo)	$25,145	$5,029	$246,119	$11,494
4.09	BioPark (Aquarium)	$12,253	$2,451	$160,911	$5,209
4.11	City Hall (Old)	$12,896	$2,579	$929,568	$5,308
4.12	Daytona Transit Center	$55,949	$11,190	$406,063	$20,928
4.13	East Central Health and Social Service Center	$1,497	$299	$36,544	$682
4.14	Erna Fergusson Library	$6,424	$1,285	$78,073	$2,524
4.16	Fire Academy	$15,833	$3,167	$228,653	$6,194
4.20	Fire Station 17	$330	$66	$5,061	$151
4.21	Fire Station 20	$4,910	$982	$46,813	$1,958
4.23	Herman Sanchez Community Center	$10,937	$2,187	$78,886	$4,647
4.25	Highland Senior Center	$5,821	$1,164	$47,172	$2,158
4.26	Holiday Park Community Center	$3,511	$702	$47,597	$1,599
4.28	Law Enforcement Center	$25,393	$5,079	$258,273	$9,797

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
4.29	Los Altos Golf Course/Well	$1,917	$383	$24,104	$705
4.30	Los Griegos Health and Social Service Center	$10,433	$2,087	$130,528	$3,852
4.31	Main Library	$37,707	$7,541	$307,299	$14,951
4.34	North Valley Senior Center	$8,930	$1,786	$75,616	$3,802
4.35	Northeast Area Command (John Carrillo Substation)	$3,531	$706	$41,227	$1,608
4.36	Open Space Visitors Center	$783	$157	$9,838	$357
4.37	Palo Duro Fitness Center	$2,584	$517	$18,564	$978
4.38	Palo Duro Senior Center	$5,980	$1,196	$66,354	$2,239
4.39	Pino Yards	$39,681	$7,936	$384,441	$16,094
4.41	Sierra Vista Pool and Tennis Complex	$1,131	$226	$12,828	$515
4.43	Southwest Area Command (Shawn McWethy Substation)	$4,479	$896	$47,392	$2,040
4.44	Special Collections Library	$5,072	$1,014	$54,790	$1,859
4.45	Taylor Ranch Community Center	$5,460	$1,092	$68,425	$2,001
4.46	Taylor Ranch Library	$4,071	$814	$52,104	$1,543
4.47	Tony Hillerman Library	$5,196	$1,039	$75,525	$1,939
4.48	Training Academy	$7,851	$1,570	$131,992	$2,816
4.49	Valley Area Command (Gerald Cline Substation)	$5,921	$1,184	$80,275	$2,021
Total		$420,590	$84,118	$4,805,307	$168,058

4.4.6. SCOPE OF WORK

Please refer APPENDIX H for a detailed baseline and proposed room-by-room lighting inventory.

4.4.7. CLARIFICATIONS

1. Recycling of lamps will be executed in compliance with appropriate governmental regulations.
2. Disposal of PCB-laden ballasts will be executed in compliance with appropriate governmental regulations.
3. Installation will be executed in accordance with industry-standard safety practices and with the care, skill, and diligence provided by a contractor skilled in the performance of lighting retrofit services.
4. Installation of all equipment will be executed per manufacturer's recommendations.
5. Any conditions not meeting current codes, and any system deficiencies will be brought to the attention of the Owner. Any work required to remedy these situations is excluded.
6. Rebate estimates are subject to utility availability and award and are not guaranteed by Yearout Energy.

4.4.8. EXCLUSIONS

7. Removal of asbestos containing materials, lead containing materials or any other hazardous / suspect materials.
8. All fixtures not outlined for replacement or retrofit in APPENDIX H.
9. Grounding of new and existing luminaires that are not currently grounded in which the luminaire will be retrofitted (not replaced).
10. Seismic bracing of new and existing luminaries that are not currently braced.
11. Replacement of existing LED fixtures unless explicitly called out in scope.
12. Lighting controls unless noted otherwise in APPENDIX H.
13. Yearout Energy has accounted for battery backups where existing. In the event additional battery backups are required, Yearout Energy will charge $400 per unit installed.
14. In-board, out-board double switching of existing fixtures (unless noted otherwise).

4.4.9. EQUIPMENT SERVICE LIFE

The average lifetime of LED lamps that will be installed is 50,000+ hours. With an average of 2,800 effective annual burn hours per fixture, the mean lifetime of replacement lamps is over 17 years. However, Yearout Energy is applying a more conservative estimated service life for this FIM, as follows:

Table 37: 04 LED Lighting – Service Life

FIM Component	% of FIM Total Cost	Median Service Life

LED Lighting	100%	15 years
FIM Weighted Average Service Life		15 years

4.4.10. PRELIMINARY MEASUREMENT & VERIFICATION PLAN

M&V Option A – Retrofit Isolation
Guarantee Factor: 100.0%

Refer to SECTION 6 for a detailed preliminary M&V Plan.

4.4.11. WARRANTY

An industry-standard 1-year materials and workmanship warranty is included and commences at substantial completion (beneficial use of equipment/materials). Any material warranties that extend beyond this period will be transferred to the Owner upon project closeout.

The warranty period information is depicted in the following table for the major equipment related to this FIM.

Table 38: 04 LED Lighting – Warranty Information

Equipment Description	Warranty Period
LED Luminaires	10 years
LED Tubes and Lamps	5 years
Wall JOT Switch	5 years

4.4.12. TRAINING

Yearout Energy will co-develop a training plan with the Owner that is tailored to the needs and skill level of the building operators. Training sessions will be conducted during the project implementation phase. These sessions will be recorded and provided in electronic format to the Owner for future reference. Topics commonly covered during these training sessions include:

1. Equipment start-up, proper operation, shutdown, power failure, etc.
2. Sequences of operation
3. Operations and maintenance (O&M) manuals
4. Diagnosing and troubleshooting common equipment issues

5. Preventative maintenance and required documentation
6. Health & safety considerations
7. Warranty information
8. Identified system deficiencies
9. Measurement and Verification (M&V) plan and KPIs which drive savings

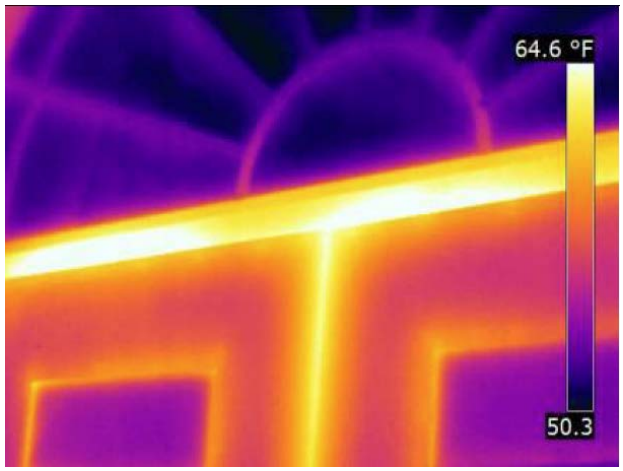
4.5. 05 BUILDING ENVELOPE

4.5.1. EXISTING CONDITIONS

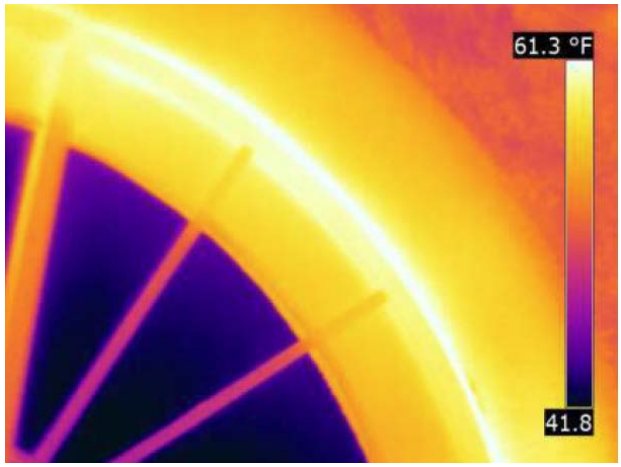
A survey of the building envelope systems at each site was performed to identify existing energy losses. Significant quantities of air infiltration into the buildings were discovered during the envelope survey. The facilities were found to be in a mixed set of conditions regarding infiltration losses, mostly due to age and general maintenance issues.

Door systems were found to be the largest areas of air infiltration/exfiltration, with most needing new weather stripping and sweeps. Often, the replacement seals are of poor quality and are degraded by ultraviolet solar rays. Over time, they lose their flexibility and ability to function reliably.

Alvarado Transportation Center
The thermal image at right from the Alvarado Transportation Center is an example of existing energy losses around exterior doors.



Alvarado Transportation Center
The thermal image at right from the Alvarado Transportation Center is an example of existing energy losses around windows.



4.5.2. PROPOSED MODIFICATIONS

This measure addresses unwanted air infiltration/exfiltration by locating and sealing the cracks, gaps, and openings where unintended air flow occurs. The greatest breaches occur through gaps where walls meet the floors and ceilings, plumbing and electrical penetrations and through gaps or openings around windows and doors. Sealing and weather-stripping are the tools through which these breaches can be repaired.

Proposed modifications include:

- Doors will be fitted with new weather-stripping, sealant, and door sweeps.
- Exterior and interior penetrations will be sealed.
- Piping and electrical penetrations will be sealed.
- Roof/wall seams will be sealed as needed.

The proposed weather-stripping consists of an extruded aluminum carrier with a frame form insert. It will be installed using a compression fit that allows flexibility. The weather-stripping will be applied at the sides and across the top of the doorframe. A sweep will be installed on the bottom of the door. Astragals are the weather-stripping material used to cover the gap between two doors. All door weather-stripping will be sealed after installation using a paintable, silicon acrylic sealant. Latches will be checked to ensure they close and lock properly. Doors will also be checked for damage, such as old screw holes and penetrations. When found, penetrations will be sealed to minimize air infiltration/ex-filtration.

Implementing the proposed modifications will reduce energy losses while also improving occupant comfort.

4.5.3. SAVINGS METHODOLOGY

Energy savings are based on the ASHRAE crack method calculations. Determination of air current air leakage rates is based on many factors, including:

- Linear feet of cracks
- Square feet of openings
- Stack coefficient
- Shield class
- Average wind speed
- Heating or cooling set point
- Average seasonal ambient temperatures

The following equations are based on the ASHRAE crack method:

Heat loss, q, in BTU/h, is determined by the following equation:

[$q = H_l \times Q \times \Delta T$]

Where:
H_l = Heat Loss Coefficient ($\frac{BTU*Min}{ft^3*°F*Hr}$) is calculated as follows:

H_l = Cp x ρ x 60 ($\frac{Min}{Hr}$)

Where:
Cp = Specific Heat ($\frac{BTU}{Lb*°F}$)
P = Air density at site elevation ($\frac{lb}{ft^3}$)
Conversion factor = 60 ($\frac{Min}{Hr}$)

Q = airflow in cubic feet per minute (CFM) and is calculated in the following manner:

[$Q = A_{crack} \times \sqrt{C_s \Delta T + C_w V^2}$]

where:
A_{crack} = crack area reduction (in²)
C_s = stack coefficient = 0.0299 CFM²/in⁴-°F
C_w = wind coefficient = 0.0104 CFM²/in⁴-mph²
V = wind speed = 8.8 mph
[ΔT = temperature difference = $T_{out} - T_{in}$ (deg F)]

ΔT is calculated by subtracting the average outdoor air temperature per hour from the indoor temperature, using 24 data points per month to accurately account for weather variances, and subsequently calculating airflow and heat loss for each set of data. In total, 288 data points are used, and Δt is the number of hours each data point represents. The total heat loss is calculated as follows:

[$q = \sum_{x=1}^{288} H_l \times A_{crack} \times \sqrt{C_s(T_{out} - T_{in}) + C_w V^2} \times (T_{out} - T_{in}) \times \Delta t$]

Table 39: 05 Building Envelope – Air Leakage Area Remediated (ft^2)

Site	Total Remediated Air Leakage (ft^2)
Albuquerque Government Center	7.05
Alvarado Transportation Center	15.39
Animal Welfare Eastside Shelter	12.9
Barelas Senior Center	2.15
BioPark Aquarium	16.54
BioPark Zoo	28.27
City Hall (Old)	68.76
Daytona Transit Center	43.03
East Central Health and Social Services Center	2.25
Erna Fergusson Library	2.01
Fire Academy	8.12
Fire Station 17	4.14
Fire Station 20	8.05
Highland Senior Center	3.91
Holiday Park Community Center	2.4
Los Griegos Health and Social Service Center	3.02
Lost Altos Golf Course/Well	4.54
Main Library	12.06
North Valley Senior Center	4.07

Site	Total Remediated Air Leakage (ft^2)
Northeast Area Command	2.53
Open Space Visitors Center	4.12
Palo Duro Senior Center	4.53
Pino Yards	35.51
Sierra Vista Pool and Tennis Complex	2.47
South Broadway Cultural Center/Library	4.33
Southwest Area Command	3.23
Special Collections Library	2.58
Taylor Ranch Community Center	9.23
Taylor Ranch Library	3.88
Tony Hillerman Library	2.69
Training Academy	9.92
Valley Area Command	4.41
Total	338

4.5.4. GUARANTEED YEAR 1 UTILITY SAVINGS

Table 40: 05 Building Envelope – Guaranteed Year 1 Utility Savings

FIM No.	Site	kW	On-Peak kWh	Off-Peak kWh	therm
5.02	Albuquerque Government Center	0	176	0	1,602

FIM No.	Site	kW	On-Peak kWh	Off-Peak kWh	therm
5.03	Alvarado Transportation Center	0	398	0	2,727
5.04	Animal Welfare Eastside Shelter	0	275	0	1,494
5.06	Barelas Senior Center	0	34	0	252
5.08	BioPark (Zoo)	0	465	0	2,988
5.09	BioPark (Aquarium)	0	356	0	1,764
5.11	City Hall (Old)	0	1,558	0	13,887
5.12	Daytona Transit Center	0	927	0	7,065
5.13	East Central Health and Social Service Center	0	35	0	261
5.14	Erna Fergusson Library	0	44	0	207
5.16	Fire Academy	0	278	0	1,683
5.20	Fire Station 17	0	103	0	612
5.21	Fire Station 20	0	201	0	1,206
5.25	Highland Senior Center	0	62	0	432
5.26	Holiday Park Community Center	0	39	0	270
5.29	Los Altos Golf Course/Well	0	124	0	585
5.30	Los Griegos Health and Social Service Center	0	54	0	360
5.31	Main Library	0	212	0	0
5.34	North Valley Senior Center	0	65	0	459

FIM No.	Site	kW	On-Peak kWh	Off-Peak kWh	therm
5.35	Northeast Area Command (John Carrillo Substation)	0	72	0	396
5.36	Open Space Visitors Center	0	90	0	477
5.38	Palo Duro Senior Center	0	73	0	486
5.39	Pino Yards	0	575	0	3,987
5.41	Sierra Vista Pool and Tennis Complex	0	41	0	252
5.42	South Broadway Cultural Center/Library	0	62	0	432
5.43	Southwest Area Command (Shawn McWethy Substation)	0	81	0	477
5.44	Special Collections Library	0	41	0	270
5.45	Taylor Ranch Community Center	0	145	0	1,017
5.46	Taylor Ranch Library	0	84	0	405
5.47	Tony Hillerman Library	0	38	0	270
5.48	Training Academy	0	248	0	1,485
5.49	Valley Area Command (Gerald Cline Substation)	0	110	0	0
Total		0	7,065	0	47,808

4.5.5. FINANCIAL SUMMARY

Table 41: 05 Building Envelope – Financial Summary

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
5.02	Albuquerque Government Center	$1,112	$222	$7,031	$0
5.03	Alvarado Transportation Center	$1,901	$380	$14,840	$0
5.04	Animal Welfare Eastside Shelter	$1,046	$209	$12,075	$0
5.06	Barelas Senior Center	$175	$35	$2,026	$0
5.08	BioPark (Zoo)	$2,084	$417	$27,629	$0
5.09	BioPark (Aquarium)	$1,236	$247	$14,734	$0
5.11	City Hall (Old)	$9,647	$1,929	$95,534	$0
5.12	Daytona Transit Center	$4,918	$984	$32,188	$0
5.13	East Central Health and Social Service Center	$185	$37	$2,292	$0
5.14	Erna Fergusson Library	$145	$29	$2,063	$0
5.16	Fire Academy	$1,176	$235	$7,630	$0
5.20	Fire Station 17	$436	$87	$5,309	$0
5.21	Fire Station 20	$843	$169	$9,700	$0
5.25	Highland Senior Center	$307	$61	$3,211	$0
5.26	Holiday Park Community Center	$191	$38	$2,402	$0
5.29	Los Altos Golf Course/Well	$422	$84	$3,770	$0
5.30	Los Griegos Health and Social Service Center	$251	$50	$2,781	$0

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
5.31	Main Library	$15	$3	$9,885	$0
5.34	North Valley Senior Center	$325	$65	$3,898	$0
5.35	Northeast Area Command (John Carrillo Substation)	$283	$57	$2,544	$0
5.36	Open Space Visitors Center	$342	$68	$3,578	$0
5.38	Palo Duro Senior Center	$345	$69	$4,040	$0
5.39	Pino Yards	$2,779	$556	$35,135	$0
5.41	Sierra Vista Pool and Tennis Complex	$179	$36	$1,818	$0
5.42	South Broadway Cultural Center/Library	$301	$60	$4,391	$0
5.43	Southwest Area Command (Shawn McWethy Substation)	$340	$68	$3,327	$0
5.44	Special Collections Library	$192	$38	$2,335	$0
5.45	Taylor Ranch Community Center	$709	$142	$8,298	$0
5.46	Taylor Ranch Library	$291	$58	$3,817	$0
5.47	Tony Hillerman Library	$188	$38	$2,368	$0
5.48	Training Academy	$1,019	$204	$7,983	$0
5.49	Valley Area Command (Gerald Cline Substation)	$8	$2	$4,184	$0
Total		$33,393	$6,679	$342,812	$0

4.5.6. SCOPE OF WORK

Table 42: 05 Building Envelope – Scope of Work

Site	*Penetrations (ft^2)	*Wall cracks, window/door frames and vents (ft)	Sets of Weather-strip DF	Door Sweeps	Astragals	Sets of weather-strip DF (OH Door)	Door sweeps (OH Door)
Albuquerque Government Center	0.54	81	24	24	1	0	0
Alvarado Transportation Center	0.65	447	45	45	3	3	2
Animal Welfare Eastside Shelter	0.35	304	36	39	6	3	3
Barelas Senior Center	0.00	16	9	7	2	0	0
BioPark Aquarium	0.22	471	53	53	5	1	1
BioPark Zoo	0.60	570	94	93	23	1	1
City Hall (Old)	0.14	25,373	9	9	0	0	0
Daytona Transit Center	0.83	277	52	51	8	33	0
East Central Health and Social Services Center	0.08	142	6	6	2	0	0
Erna Fergusson Library	0.28	0	7	7	0	0	0
Fire Academy	0.22	403	15	15	7	3	1
Fire Station 17	0.45	0	6	6	0	6	0
Fire Station 20	0.23	235	11	11	3	7	7
Highland Senior Center	0.22	343	6	6	2	0	0

Site	*Penetrations (ft^2)	*Wall cracks, window/door frames and vents (ft)	Sets of Weather-strip DF	Door Sweeps	Astragals	Sets of weather-strip DF (OH Door)	Door sweeps (OH Door)
Holiday Park Community Center	0.09	3	10	10	1	0	0
Los Griegos Health and Social Service Center	0.13	0	12	12	1	0	0
Lost Altos Golf Course/Well	0.08	34	17	17	0	0	0
Main Library	0.24	537	17	17	4	4	4
North Valley Senior Center	0.03	20	16	16	1	0	0
Northeast Area Command	0.05	43	9	9	3	0	0
Open Space Visitors Center	0.04	46	16	16	1	0	0
Palo Duro Senior Center	0.07	258	13	13	3	0	0
Pino Yards	1.27	2,123	73	73	2	14	14
Sierra Vista Pool and Tennis Complex	0.72	17	7	7	0	0	0
South Broadway Cultural Center/Library	0.16	109	12	12	3	1	1
Southwest Area Command	0.17	219	8	8	1	0	0
Special Collections Library	0.00	24	10	10	1	0	0
Taylor Ranch Community Center	0.08	20	34	34	11	0	0
Taylor Ranch Library	0.11	309	9	9	2	0	0

Site	*Penetrations (ft^2)	*Wall cracks, window/door frames and vents (ft)	Sets of Weather-strip DF	Door Sweeps	Astragals	Sets of weather-strip DF (OH Door)	Door sweeps (OH Door)
Tony Hillerman Library	0.00	14	10	10	2	0	0
Training Academy	0.58	586	23	23	0	0	0
Valley Area Command	0.24	409	5	5	0	1	1

**sealed w/ polyurethane sealant*

4.5.7. CLARIFICATIONS

1. Installation will be executed in accordance with industry-standard safety practices and with the care, skill, and diligence provided by a contractor skilled in building envelope services.
2. Installation of all materials will be executed per manufacturer's recommendations.
3. Any conditions not meeting current codes, and any system deficiencies will be brought to the attention of the Owner. Any work required to remedy these situations is excluded.
4. This work has been priced to be done during regular business hours and with 1 trip to each site. YE will coordinate with Owner to ensure full access to all locations at the scheduled time to avoid additional site visit costs.

4.5.8. EXCLUSIONS

1. Removal of asbestos containing materials, lead containing materials or any other hazardous / suspect materials.
2. Removal of caulking, coatings, mastics, flashings, insulation, or any other materials unless clearly specified.
3. Repair or installation of brick or other masonry materials or systems.
4. Repair or installation of window or door systems unless clearly identified.
5. Repair or installation of any structural systems.

4.5.9. EQUIPMENT SERVICE LIFE

The estimated service life for this FIM is as follows:

Table 43: 05 Building Envelope – Service Life

FIM Component	% of FIM Total Cost	Median Service Life
Building Envelope Materials	100%	15 Years
FIM Weighted Average Service Life		15 Years

4.5.10. PRELIMINARY MEASUREMENT & VERIFICATION PLAN

M&V Option A – Retrofit Isolation
Guarantee Factor: 90%

Refer to SECTION 6 for a detailed preliminary M&V Plan.

4.5.11. WARRANTY

An industry-standard 1-year materials and workmanship warranty is included and commences at substantial completion (beneficial use of equipment/materials). Any material warranties that extend beyond this period will be transferred to the Owner upon project closeout.

The warranty period information is depicted in the following table for the major equipment related to this FIM.

Table 44: 05 Building Envelope – Warranty Information

Equipment Description	Warranty Period
Building Envelope Materials	1 year

4.5.12. TRAINING

Yearout Energy will co-develop a training plan with the Owner that is tailored to the needs and skill level of the building operators. Training sessions will be conducted during the project implementation phase. These sessions will be recorded and provided in electronic format to the Owner for future reference. Topics commonly covered during these training sessions include:

1. Sequences of operation
2. Operations and maintenance (O&M) manuals
3. Diagnosing and troubleshooting common equipment issues
4. Preventative maintenance and required documentation
5. Health & safety considerations

6. Warranty information
7. Identified system deficiencies
8. Measurement and Verification (M&V) plan and KPIs which drive savings

4.6. 06 HIGH-EFFICIENCY TRANSFORMERS

4.6.1. EXISTING CONDITIONS

Transformers step down higher voltages delivered via utility distribution to lower voltages required for most building applications, including HVAC, lighting, and plug loads. Regardless of the connected load, transformers operate 24 hours per day and experience constant losses. These losses originate from two major transformer components: the core (typically made of steel), and coil windings (typically made of aluminum or copper). Standards for minimum transformer energy efficiencies were adopted at the discretion of manufacturers until 2007, when minimum efficiency legislation was enacted.

Table 45: 06 HE Transformers – Existing Quantity and Capacity by Site

Site	Transformer Qty	Total Transformer Capacity (kVA)
ABQ Government Center	19	2,128
City Hall (Old)	10	345
Main Library	12	390
South Broadway Center	5	690
Special Collections Library	1	113
Taylor Ranch Community Center	2	300
Total	53	3,966

4.6.2. PROPOSED MODIFICATIONS

This measure will replace aged inefficient low voltage transformers with new more efficient equipment. This will reduce energy losses while also improving the resiliency of the facilities.

The new transformers are ultra-efficient dry-type isolation transformers optimized to maximize energy savings and provide the fastest payback in retrofit applications. The manufacturer has actively measured load profiles and losses for thousands of low-voltage transformers it has retrofitted for applications from K-12 schools to college and hospital campuses, from courthouses to military bases, from general commercial and office buildings to mission critical

data centers and has found that the most common profile is a lightly loaded transformer that feeds predominately electronic equipment. The proposed equipment has been optimized specifically for this profile delivering a per project average of an 80% reduction in losses when replacing existing older transformers. The following table outlines the transformers recommended for replacement.

4.6.3. SAVINGS METHODOLOGY

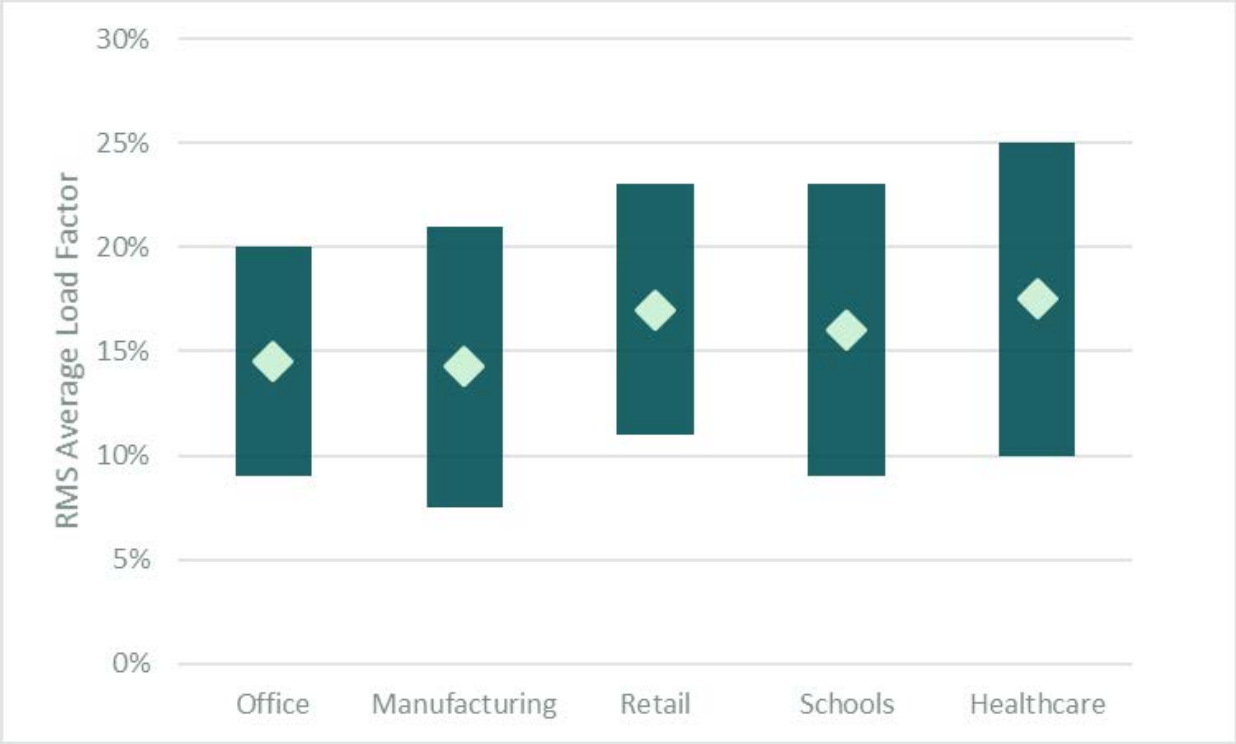
Transformer losses are comprised of two major energy losses: Energy savings are driven by modern, precision-crafted cores and coil windings. Refer to APPENDIX J for specifications.

1. Core loses, also known as no-load losses or energizing losses, are present continuously, regardless of load.
2. Coil losses, also known as load losses, vary with the square of the load placed upon them.

Total Transformer Losses are calculated as follows:

[Total Transformer Losses = No-load Losses (Core) + Load Losses (Coils)]

The below graph is the summary of a survey by the Northeast Energy Efficiency Partnership that indicates that typical transformer loading typically falls within the range of 7 – 24%.



(SOURCE DATA: INDUSTRIAL AND PUBLIC BUILDINGS, THE CADMUS GROUP INC. 12/7/99, PREPARED FOR NEFP)

Figure 5: Root Mean Square (RMS) Transformer Average Load Factor by Facility Type

The following graph shows the two loss components for a representative 75-kVA transformer. No-load losses represent 80-95% of the total losses, with only a small percentage (depicted in the blue-shaded triangular area between the red and orange lines) associated with load-dependent losses.

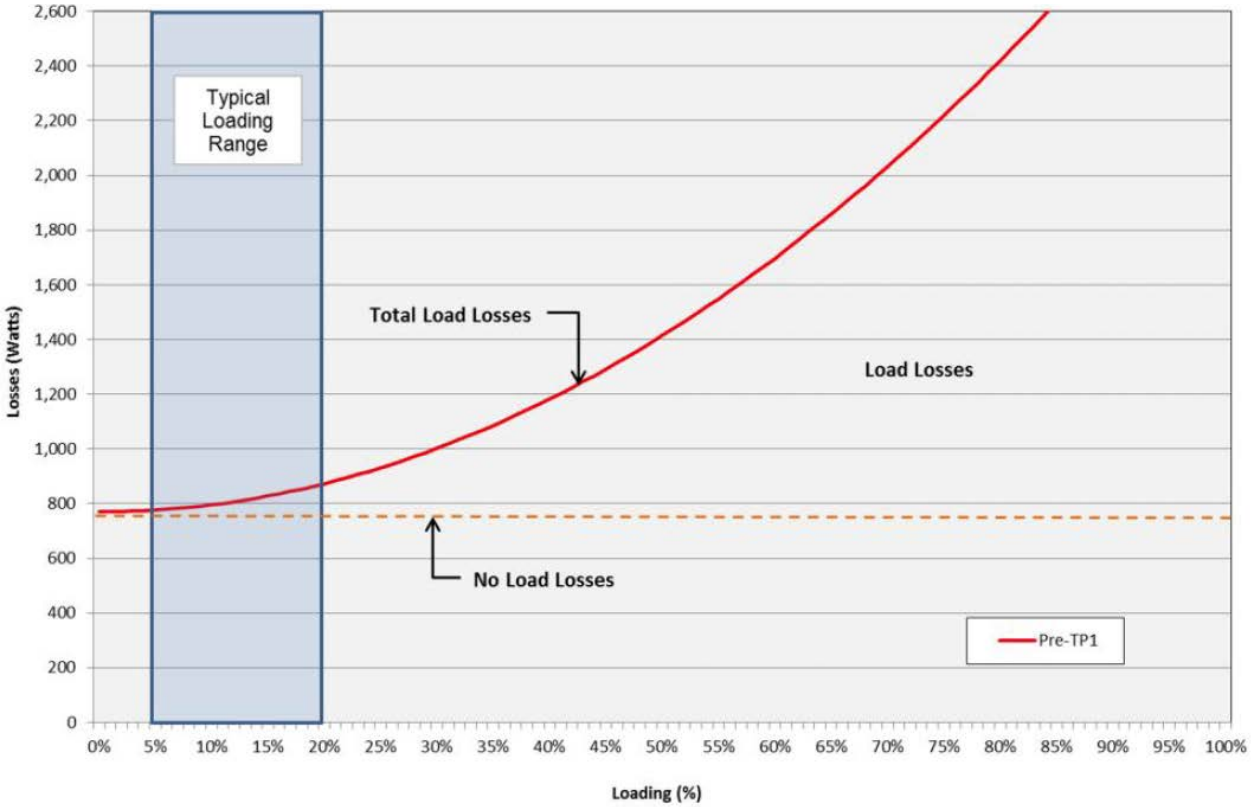


Figure 6: Typical 75 kVA NEMA TP-1 Low-Voltage Dry-Type Transformer Energy Loss Profile

Savings calculations are based on extensive field data collected by the manufacturer over a decade across the country. Most transformers exhibit a very predictable duty-cycle, which allows for the following calculation methodology to be applied with a high level of confidence.

The following equation was used to calculate the On- and Off-Peak power savings:

$[Lp = Ln + l^2 \times (Lf - Ln)]$

where:

- Lp - Total transformer power losses (kW)

- Ln - No-load losses (kW)
- Lf - Full-load losses (kW)
- l - Loading during operating hours (%)

Energy losses were calculated as follows:

[Le = Lp x H]

Where:

- Lp - Total transformer power losses (kW)
- Le - Total transformer energy losses (kWh)
- H - Hours of operation (hr/yr)

Savings for power (kW) and energy (kWh) were calculated as follows:

[Savings = Baseline Transformer Losses – Proposed Transformer Losses]

4.6.4. GUARANTEED YEAR 1 UTILITY SAVINGS

Table 46: 06 HE Transformers – Guaranteed Year 1 Utility Savings

FIM No.	Site	kW	On-Peak kWh	Off-Peak kWh	therm
6.02	Albuquerque Government Center	206	53,520	96,708	0
6.11	City Hall (Old)	50	12,953	23,446	0
6.31	Main Library	53	13,883	25,166	0
6.42	South Broadway Cultural Center/Library	66	17,156	30,964	0
6.44	Special Collections Library	12	3,049	5,510	0
6.45	Taylor Ranch Community Center	31	7,998	14,444	0
Total		418	108,560	196,237	0

4.6.5. FINANCIAL SUMMARY

Table 47: 06 HE Transformers – Financial Summary

FIM No.	Site	Year 1 Utility Savings	Year 1 O&M Savings	Labor, Equip & Material Cost	Estimated Utility Rebate
6.02	Albuquerque Government Center	$13,618	$2,724	$227,570	$14,816
6.11	City Hall (Old)	$3,356	$671	$68,317	$3,591
6.31	Main Library	$3,599	$720	$81,903	$3,853
6.42	South Broadway Cultural Center/Library	$4,441	$888	$69,710	$4,745
6.44	Special Collections Library	$1,042	$208	$12,693	$844
6.45	Taylor Ranch Community Center	$2,071	$414	$29,807	$2,213
Total		$28,127	$5,625	$490,000	$30,062

4.6.6. SCOPE OF WORK

The scope of work for this measure is as follows for all units outlined in the table below:

1. Verify all dimensions in the field.
2. Check for damage and loose connections.
3. Furnish and install new HE Transformer of equal size to existing.
4. Set the transformer plumb and level.
5. Mount transformer on vibration isolation pads suitable for isolating the transformer.

Table 48: 06 HE Transformers – Scope of Work

No.	Site	Tag No.	Location	Size (kVA)
1	ABQ Government Center	79279	Basement Elect Vault B2063	500

No.	Site	Tag No.	Location	Size (kVA)
2	ABQ Government Center	79280	Penthouse	37.5
3	ABQ Government Center	79281	Penthouse	75
4	ABQ Government Center	79282	11th Flr Elect Rm	112.5
5	ABQ Government Center	79283	10th Flr Elect Rm	112.5
6	ABQ Government Center	79284	9th Flr Elect Rm	112.5
7	ABQ Government Center	79285	8th Flr Elect Rm	112.5
8	ABQ Government Center	79286	7th Flr Elect Rm 7008	112.5
9	ABQ Government Center	79287	6th Flr Elect Rm 6006	112.5
10	ABQ Government Center	79288	5th Flr Elect Rm 5007	112.5
11	ABQ Government Center	79289	4th Flr Elect Rm 4009	112.5
12	ABQ Government Center	79290	3rd Flr Elect Rm 3006	112.5
13	ABQ Government Center	79292	1st Flr Elect Rm	112.5
14	ABQ Government Center	79293	2nd Flr Elect Rm	112.5
15	ABQ Government Center	79294	2nd Flr Elect Rm	15
16	ABQ Government Center	79295	2nd Flr Elect Rm	45
17	ABQ Government Center	79296	Basement Elect Rm B2018	112.5
18	ABQ Government Center	79306	Basement Telephone Equip. Rm	75
19	ABQ Government Center	56076	Hallway B-2129 by Phone Rm	30
20	City Hall	79297	Penthouse	15
21	City Hall	79298	Basement Elect Rm	45
22	City Hall	79299	Basement Elect Rm	15
23	City Hall	79300	7th Flr Elect Rm	30

No.	Site	Tag No.	Location	Size (kVA)
24	City Hall	79301	6th Flr Elect Rm	30
25	City Hall	79302	5th Flr Elect Rm	30
26	City Hall	79303	4th Flr Elect Rm	30
27	City Hall	79304	3rd Flr Elect Rm	30
28	City Hall	79305	1st Flr Elect Rm	75
29	City Hall	79307	2nd Flr Elect Rm	45
30	Main Library	79232	3rd Flr Elect Rm	45
31	Main Library	79233	3rd Flr Elect Rm	30
32	Main Library	79234	3rd Flr Elect Rm	30
33	Main Library	79235	3rd Flr East Elect Rm	30
34	Main Library	79236	Childrens Story Room (Lower Level)	30
35	Main Library	79237	Childrens Story Room (Lower Level)	30
36	Main Library	79238	Community Rm Elect Rm	30
37	Main Library	79239	Community Rm Elect Rm	45
38	Main Library	79240	LL Boiler Rm	30
39	Main Library	79241	LL Dock Area	30
40	Main Library	79242	LL Bat Cave Elect Rm	30
41	Main Library	79243	LL Bat Cave Elect Rm	30
42	South Broadway Center	56056	Stage rear loading dock	225
43	South Broadway Center	56057	Stage area lighting room	225
44	South Broadway Center	56058	Mirror wall across from theater entrance	45
45	South Broadway Center	56059	Telephone electrica - Library	150

No.	Site	Tag No.	Location	Size (kVA)
46	South Broadway Center	56060	Telephone electrical room - Library	45
47	Special Collections Library	79244	LL Maint. Office Elect Rm	112.5
48	Taylor Ranch Community Center	79229	Elect Rm Across Classroom 2	150
49	Taylor Ranch Community Center	79230	Main Elect Rm	150

4.6.7. CLARIFICATIONS

1. Work will require system shutdowns. All work shall be coordinated with the Owner to minimize the impact to daily operations. Work shall be conducted during normal work hours when utility interruptions are approved; otherwise, work will be conducted outside of normal work hours when utility interruptions are not approved. All preparation work shall be done prior to shut down to minimize the time the system is down.
2. Installation will be executed in accordance with industry-standard safety practices and with the care, skill, and diligence provided by a contractor skilled in building envelope services.
3. Installation of all materials will be executed per manufacturer's recommendations.
4. Any conditions not meeting current codes, and any system deficiencies will be brought to the attention of the Owner. Any work required to remedy these situations is excluded.

4.6.8. EXCLUSIONS

1. Removal of asbestos containing materials, lead containing materials or any other hazardous / suspect materials.
2. Repair or installation of any structural systems and/or installation of seismic restraints where required.
3. Repair or installation of brick or other masonry materials or systems.
4. Repair of any existing code violations.

4.6.9. EQUIPMENT SERVICE LIFE

The estimated service life for this FIM is as follows:

Table 49: 06 HE Transformers – Service Life

FIM Component	% of FIM Total Cost	Median Service Life
Transformer	100%	32 years

FIM Weighted Average Service Life	32 years

4.6.10. PRELIMINARY MEASUREMENT & VERIFICATION PLAN

M&V Option A – Retrofit Isolation
Guarantee Factor: 90%

Refer to SECTION 6 for a detailed preliminary M&V Plan.

4.6.11. WARRANTY

An industry-standard 1-year materials and workmanship warranty is included and commences at substantial completion (beneficial use of equipment/materials). Any material warranties that extend beyond this period will be transferred to the Owner upon project closeout.

The warranty period information is depicted in the following table for the major equipment related to this FIM.

Table 50: 06 HE Transformers – Warranty Information

Equipment	Warranty Period
Transformer	32 years

4.6.12. TRAINING

Yearout Energy will co-develop a training plan with the Owner that is tailored to the needs and skill level of the building operators. Training sessions will be conducted during the project implementation phase. These sessions will be recorded and provided in electronic format to the Owner for future reference. Topics commonly covered during these training sessions include:

1. Equipment start-up, proper operation, shutdown, power failure, etc.
2. Sequences of operation
3. Operations and maintenance (O&M) manuals
4. Diagnosing and troubleshooting common equipment issues
5. Preventative maintenance and required documentation
6. Health & safety considerations
7. Warranty information
8. Identified system deficiencies
9. Measurement and Verification (M&V) plan and KPIs which drive savings

4.7. GENERAL CLARIFICATIONS AND EXCLUSIONS

4.7.1. GENERAL CLARIFICATIONS

1. Yearout Energy shall provide the necessary scheduling and coordination of its own forces and of subcontractors sufficient to operate the orderly and efficient completion of Yearout Energy's work without delay, interference, or interruption. Yearout Energy will make all efforts to meet schedules agreed to in advance. Yearout Energy's work shall be performed during typical five-day, forty-hour work weeks. If extended hours are required due to extreme circumstances beyond the control of Yearout Energy, Yearout Energy shall be compensated for additional overhead, premium time costs, and lost productivity. Yearout Energy will substantiate circumstances beyond control in writing to the Owner prior to incurring any additional costs for overhead, premium time, and lost productivity.
2. The project will be invoiced monthly, projecting work through the end of the month. Invoices will include pay requests and schedule of values. Our proposal may involve a significant amount of off-site prefabrication. Yearout Energy anticipates invoicing for materials stored and work performed off-site at our fabrication facility. YE anticipates invoices being paid within 30 days of submission. Any delays in payment will result in delays in the project.
3. Payment and performance bond are included.
4. Assumes reasonable access to the work areas.
5. Upgrades and modifications are to match existing material types in like-kind unless specifically noted otherwise in scope of work.
6. Owner should anticipate limited planned outages and service interruptions as necessary to complete scope of work. Yearout Energy will work diligently with the Owner to determine the best plan for work.
7. Assumes that existing building electrical service and infrastructure is adequate to power new equipment.
8. We anticipate temporary power for tools and welding equipment will be available within 75' of work areas.
9. Our proposal anticipates operating under the guidelines of Yearout Energy's Safety Program. We reserve the right to review requirements of any other safety program that will be in force on the project to determine if additional costs will apply.
10. We anticipate parking for craft and supervisory personnel will be on the job site. Any necessary permits will be issued by the Owner for craft personnel.
11. Assumes adequate lay-down areas and storage facilities will be available in order to facilitate the execution of our work.
12. Yearout Energy has included separate trash dumpster for disposal of construction waste.
13. Permits and inspections by the AHJ are included.

4.7.2. GENERAL EXCLUSIONS

1. Removal of any hazardous materials. Should any hazardous materials be encountered, we will immediately notify the Owner to determine a mutually agreeable course of action. YE reserves the right to be compensated for cost related to the discovery, removal, and time delays from hazardous materials. No work will be performed in areas containing hazardous materials.
2. Provisions for seismic calculations.
3. The requirement to provide additional insured status on the employer's worker's compensation insurance.
4. Repair or correction of pre-existing code violations.
5. Existing ductwork cleaning or sealing.
6. Unless specifically noted, roofing work does not include the removal of decking. If decking is required to be replaced after further investigation YE Reserves the right to be compensated for the cost.
7. YE anticipates this project being awarded with 1 PO no later than 60 days after the contract is signed. It is anticipated that the contract will be approved and signed no later than 60 days after it is submitted. If timelines extend beyond this the point the project risks material increases and time delay costs out of our controls and YE anticipates being compensated for these increases.

4.8. OTHER MEASURES CONSIDERED

4.8.1. KENNEL AREA HVAC AT ANIMAL WELFARE EASTSIDE SHELTER

In 2006, the City of Albuquerque passed a comprehensive ordinance dubbed the Albuquerque Humane and Ethical Animal Rules and Treatment (HEART) Ordinance. To meet with the requirements of the HEART Ordinance, significant improvements to the HVAC system are recommended for this site. During the late stages of the IGA, CABQ instructed YE to remove this measure from the EPC project scope with the intent that the City would self-perform this work.

The HEART Ordinance outlines the following requirements regarding the HVAC Systems:

Heating and cooling systems are required if needed to keep the temperature between 60 and 80 degrees Fahrenheit. All kennel buildings constructed after the effective date of this article that are not fully and constantly enclosed shall be required to contain radiant floor heat. Existing kennel buildings not fully and constantly enclosed must install radiant floor heat within five years of the effective date of this article. Ventilation must be such that there are no drafts in the winter, odors, or moisture condensation. The general ventilation guideline for the areas in which the Animals are confined is ten to 15 fresh air changes per hour. All kennel buildings constructed after the effective date of this article shall install ventilation systems that adhere to this guideline. Existing kennel buildings that do not meet this guideline must do so within five years of the effective date of this article.

The evaluated modifications for this site to meet the HEART Ordinance were as follows:

- Remove existing HVAC equipment and install new rooftop Dedicated Outside Air System (DOAS) units with remote DX condensers and natural gas heating. Remote condensers were selected for this application to distribute weight across the roof due to structural concerns in select kennel areas. The remote condensers would have been installed on the roof adjacent to the corresponding DOAS units.
- Integrate new DOAS units with existing Trane BAS.
- Maintain the existing hot water radiant system. Include new controls to integrate HW radiant system onto BAS.

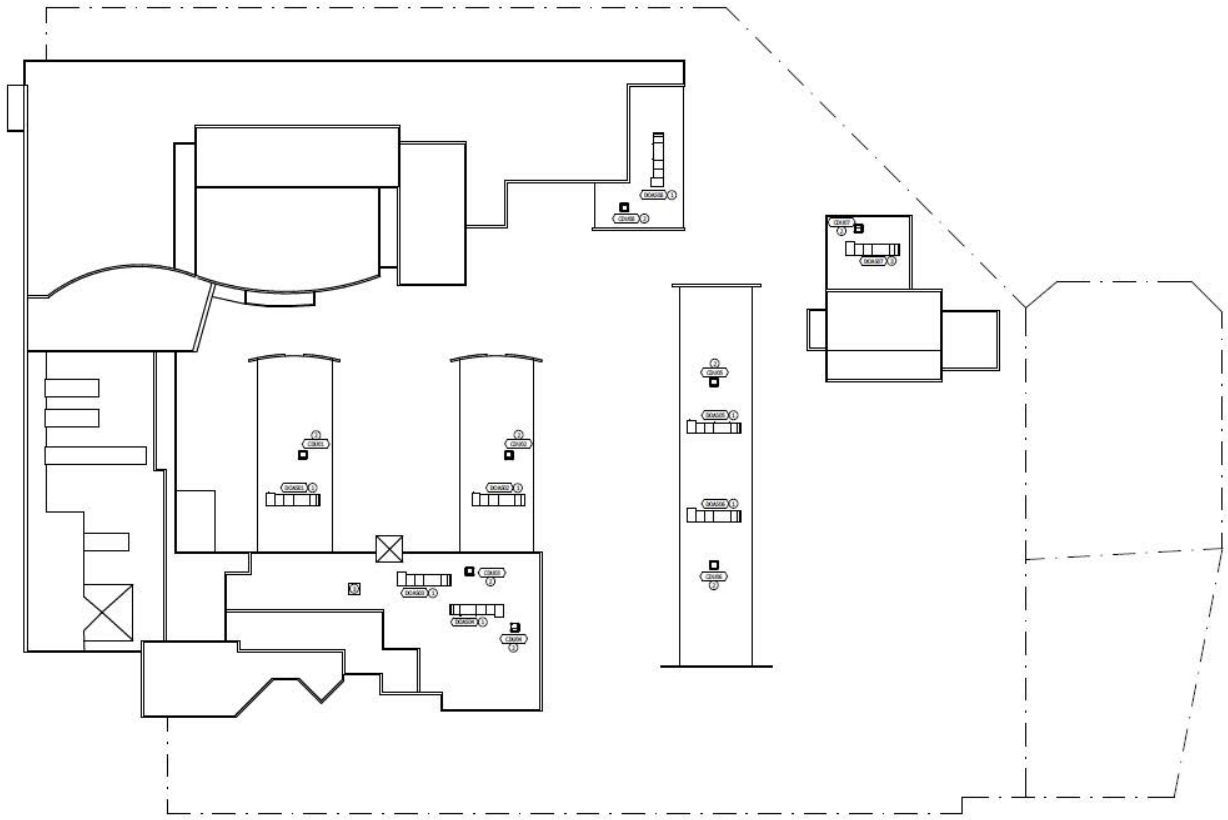


Figure 7: Animal Welfare Eastside Shelter HVAC Improvements

Table 51: Animal Welfare Eastside Shelter HVAC Equipment

Unit	Clg Tons	Clg Type	Clg Eff	Htg MBH	Htg Type	Htg Eff	CFM
DOAS-01 (Kennel 1)	10	DX	11.4 EER	225	Natural Gas	80%	5,000
DOAS-02 (Kennel 2)	10	DX	11.4 EER	225	Natural Gas	80%	5,000
DOAS-03 (Corridor)	10	DX	11.4 EER	225	Natural Gas	80%	5,000
DOAS-04 (Cat Kennel)	10	DX	11.4 EER	225	Natural Gas	80%	5,000
DOAS-05 (Kennel Q)	10	DX	11.4 EER	225	Natural Gas	80%	5,000

Unit	Clg Tons	Clg Type	Clg Eff	Htg MBH	Htg Type	Htg Eff	CFM
DOAS-06 (Kennel Q)	10	DX	11.4 EER	225	Natural Gas	80%	5,000
DOAS-07 (Quarantine)	10	DX	11.4 EER	225	Natural Gas	80%	5,000
DOAS-08 (Clinic Kennel)	7.5	DX	11.4 EER	219	Natural Gas	80%	3,500

4.8.2. HE TRANSFORMERS

The table below outlines additional existing aged low voltage transformers that are not included in the scope of the initial phase project due to financial constraints. These existing transformers would benefit from replacement with new high efficiency equipment and are estimated to have a simple payback of 12 – 25 years.

Table 52: Additional Existing Low Voltage Transformers for Replacement

No.	Site	Tag No.	Location	Desig.	Size (kVA)
1	Alamosa Community Center	79226	Main Elect Rm	M1	225
2	Alamosa Community Center	79227	Main Elect Rm	BB	15
3	Alamosa Community Center	79228	Elect Rm by Gym	LC	75
4	Alvarado Transit Center	79209	Lobby Main Elect Rm	1P	75
5	Kimo Theater	79254	Basement Elect Rm	A	225
6	Kimo Theater	79255	Basement Elect Rm	T1	150
7	Manzano Mesa	79231	Main Elect Rm	P	225
8	BioPark (Aquarium)	79256	Central Plant	EC2N	75
9	BioPark (Aquarium)	79257	Central Plant	T-1	75
10	BioPark (Aquarium)	79258	Behind Admin	Admin	75

No.	Site	Tag No.	Location	Desig.	Size (kVA)
11	BioPark (Aquarium)	79259	Elect Rm Behind Admin	VC2N	112.5
12	BioPark (Aquarium)	79260	Elect Rm Behind Admin	VC2E	75
13	BioPark (Aquarium)	79261	Back Service Road	T-2	75
14	BioPark (Aquarium)	79262	Conservatory Elect Rm	C-2	75
15	BioPark (Aquarium)	79263	Seals ACF	T-3	45
16	BioPark (Aquarium)	79264	ACF Elect Rm	A	75
17	BioPark (Aquarium)	79265	Outside Bug Area	LP2	45
18	BioPark (Aquarium)	79266	Rear Bugarium	Bug	75
19	BioPark (Aquarium)	79267	Fantasy Garden Bunker	FG	75
20	BioPark (Aquarium)	79268	Portables	CYB-2	75
21	BioPark (Aquarium)	79271	Otters Dock	CY-A	45
22	BioPark (Aquarium)	79272	Aquarium Elect Rm	AQ2E	75
23	BioPark (Aquarium)	79273	Back Dock	BD	30
24	BioPark (Aquarium)	79274	Upstairs Mech Rm	MCCN-A	75
25	BioPark (Aquarium)	79275	Upstairs Mech Rm	P1LS	75
26	BioPark (Aquarium)	79276	Upstairs Mech Rm	AQM2	75
27	BioPark (Aquarium)	79277	Restaurant Elect Rm	R2E	75
28	BioPark (Aquarium)	79278	Restaurant Elect Rm	R2N	75
29	BioPark (Zoo)	79249	Behind Amphibian	T-1	25
30	BioPark (Zoo)	79250	Polar Bear Water Quality	WQ	75
31	BioPark (Zoo)	79251	Sea Lion Pump House	3N	45
32	BioPark (Zoo)	79252	Main Pond Pump Rm	MP	15

No.	Site	Tag No.	Location	Desig.	Size (kVA)
33	BioPark (Zoo)	79253	Rhinos	R	45
34	Daytona Transit Center	79210	Gas Station Elect Rm 103	2FE-FUEL1	75
35	Daytona Transit Center	79211	Washing Station	2W	75
36	Daytona Transit Center	79212	Maintenance Logistics	2B	75
37	Daytona Transit Center	79213	Maintenance Logistics	2BE	45
38	Daytona Transit Center	79214	Elect Rm 189 by Roller Dr W10	2D	150
39	Daytona Transit Center	79215	Elect Rm 189 by Roller Dr W10	2DE	75
40	Daytona Transit Center	79216	Maintenance Garage	2A	75
41	Daytona Transit Center	79217	Maintenance Garage	2AE	75
42	Daytona Transit Center	79218	Admin Elect Rm 126	2O	75
43	Daytona Transit Center	79219	Admin Elect Rm 126	2OE	30
44	Daytona Transit Center	79220	Admin Elect Rm 126	2OC	75
45	Daytona Transit Center	79221	Gate Guard Shack	2CE	30
46	Animal Welfare Eastside Shelter	79247	Main Elect Rm 56	DP2	300
47	Erna Fergusson Library	79245	Main Elect Rm	T1	45
48	Erna Fergusson Library	79246	Main Elect Rm	T2	30
49	Fire Station 1	79225	Elect Rm by Alley	L1	50
50	Fire Academy	56062	ER-108	Panel PC	45
51	Fire Academy	56063	ER-126	Panel PB	45
52	Fire Academy	56064	ER-124	Panel PA	75
53	Law Enforcement Center	56047	First floor fire control room	185703	45
54	Law Enforcement Center	56048	2nd floor	185697	30

No.	Site	Tag No.	Location	Desig.	Size (kVA)
55	Law Enforcement Center	56049	3rd floor	185695	45
56	Law Enforcement Center	56050	3rd floor	185696	30
57	Law Enforcement Center	56051	Fourth floor electrical room	185690	30
58	Law Enforcement Center	56052	Fourth floor electrical room	185691	30
59	Law Enforcement Center	56053	Fifth floor electric room	185685	45
60	Law Enforcement Center	56054	Penthouse	185652	15
61	Law Enforcement Center	56055	Basement high voltage room	77240	45
62	Pino Yards	79308	Bldg C Elect Rm	PPM	30
63	Pino Yards	79309	Bldg G Warehouse North Wall	WP1	45
64	Valley Pool	79248	Outside Pump Rm	T1	45

4.8.3. WATER CONSERVATION

During the IGA, Yearout Energy conducted a thorough on-site survey of the existing domestic water fixtures at each site. These evaluations included an examination of a sample of water-use equipment, measurements of existing water consumption, understanding of facility demographics, and analysis of historical water use data. As a result of this survey, it was determined that CABQ would benefit significantly from upgrading existing domestic water fixtures to more water efficient fixtures.

At CABQ's request, water conservation was not explored at all Library, Recreational, and Fire Department sites.

Kimo Theatre
Flushometers like those shown at right at the Kimo Theatre are prone to leakage and in many cases have fallen into disrepair, resulting in a release of much more water than is necessary.

City Hall
This lavatory at City Hall is an example of a fixture whose aerator has either been removed or was never present. Installation of flow control devices will reduce water consumption at these fixtures.

Alamosa Community Center
Broken irrigation line at the Alamosa Community Center

Yearout Energy would recommend that CABQ explore implementing the following modifications as part of a future project phase to reduce water consumption and associated utility costs:

- Remove and dispose of existing flushometer type toilets and replace with new 1.28 GPF toilet china and manual diaphragm flush valves.
- Remove and dispose of existing tank type toilets and replace with new 0.8 GPF tank toilets.
- Remove and dispose of existing urinal flush valve diaphragm kits and replace with new 0.5 GPF flush valve diaphragm kits.
- Remove and dispose of existing urinal flush valve diaphragm kits and replace with new 0.125 GPF flush valve diaphragm kits.
- Retrofit existing sink faucet with new 0.5 GPM aerators (remove and dispose of existing aerator, if applicable).
- Retrofit existing sink faucets with new 1.5 GPM aerators (remove and dispose of existing aerator, if applicable).
- Remove and dispose of existing shower heads and replace with new 1.5 GPM shower heads.
- Remove and dispose of existing water-cooled ice machine heads and replace with new, air-cooled heads. Existing ice machine bin remains in place. The installation includes all electrical, piping, and ancillary equipment to provide a complete system.

The following table outlines the potential domestic water fixture retrofit scope CABQ could explore as part of a future phase of work:

Retrofit Code Key
FAER – Install / Replace Faucet Aerator
RPSH – Replace Showerhead
UDIK – Install Urinal Drop-in Kit
RPTT – Replace Tank Toilet
RPTL – Replace Toilet China and Valve

Table 53: Water Conservation – Domestic Fixture Scope

Site	FAER	RPSH	UDIK	RPTT	RPTL
Alamosa Community Center	13	9	0	10	0
Albuquerque Government Center	119	0	0	0	0
Animal Welfare Eastside Shelter	14	4	0	0	0

Site	FAER	RPSH	UDIK	RPTT	RPTL
Arroyo Del Oso Golf	10	0	6	0	0
Barelas Senior Center	6	0	0	2	0
BioPark Zoo	17	0	8	0	0
BioPark Aquarium	18	2	6	5	20
Broadway Vehicle Emissions	1	0	2	0	0
City Hall	30	0	0	0	0
Daytona Transit Center	18	7	0	1	0
East Central Health and Social Service Ctr	5	0	0	0	0
Esperanza Bicycle Safety Education Center	3	0	1	4	0
Herman Sanchez Community Center	8	4	2	0	8
Highland Senior Center	2	0	0	7	0
Holiday Park Community Center	9	2	0	0	0
Kimo Theatre	15	3	12	5	3
Law Enforcement Center	52	0	0	1	0
Los Altos Golf Course/Well	5	0	0	0	0
Los Griegos Health and Social Service Ctr	11	0	3	6	0
Manzano Mesa Multigenerational Center	15	0	0	0	0
Metro Forensics Science Center (MFSC)	14	6	0	0	0
North Valley Senior Center	1	4	2	0	0

Site	FAER	RPSH	UDIK	RPTT	RPTL
Northeast Area Command	6	2	0	2	0
Open Space Visitors Center	3	1	2	6	0
Palo Duro Senior Center	5	0	2	1	0
Pino Yards	26	3	12	1	0
Southwest Area Command	4	0	0	4	0
Taylor Ranch Community Center	10	12	0	0	0
Training Academy	11	26	0	5	0
Valley Area Command	3	4	0	0	0
Total	454	89	58	60	31

The water utility provider, ABCWUA, offers a Customized Performance Rebate program for projects that improve water use efficiency for commercial, industrial, and institutional customers. The program specifics are as follows:

- Project must result in minimum annual savings of 100,000 gallons.
- Rebate is $10 per unit of water (748 gallons) saved in 12 months.
- Rebate covers 50% of the project cost or up to $50,000, whichever is lower.
- The conservation measures at all project sites can be treated as a single application.
- Following implementation of water conservation strategies, ABCWUA would measure the performance of the project over a 12-month period and issue a rebate to the City as a credit adjustment to the impacted accounts based on the verified savings.

4.8.4. IRRIGATION SYSTEM LEAKS

Yearout Energy recommends that the City of Albuquerque request a complimentary survey from the ABCWUA to identify potential existing irrigation system leaks at the following sites:

- Alamosa Community Center

- Holiday Park Community Center
- Taylor Ranch Community Center

4.8.5. WATER METER DOWNSIZING AT OTHER SITES

The water and wastewater utility provider at all IGA sites is the Albuquerque Bernalillo County Water Utility Authority (ABCWUA). Monthly utility costs from ABCWUA are comprised of the following charges:

- Water Fixed Monthly Charge – This fee recovers costs associated with providing "fixed costs" of service associated with providing capital facilities (pump stations, reservoirs, transmission lines, wells, etc.). Fixed costs occur whether or not any water is used.
- Water Commodity Charge – This charge represents the "unit costs" of pumping, treating, and delivering the commodity (water) itself.
- Water State Surcharge – This tax is a pass-through cost from the State, through the Water Authority, and to the customer for funding the State's water quality testing.
- Sewer Fixed Monthly Charge – This fee recovers costs associated with providing "fixed costs" of service such as sewage lift stations, odor control stations, large diameter interceptor lines, etc. Fixed costs occur whether or not any wastewater flows into the sewer system.
- Sewer Commodity Charge – This charge represents the "unit costs" of collecting, treating, and disposing of wastewater.
- Facility Rehabilitation Charge – This fee funds the repair or replacement of aging water and sewer lines.

The **Water Fixed Monthly Charge** and **Sewer Fixed Monthly Charge** are static values based on the installed water meter size. The City of Albuquerque is categorized as an institutional customer when referencing ABCWUA's rate ordinance.

This measure would downsize existing water meters to the next smallest meter size. This modification will reduce the **Water Fixed Monthly Charge** and **Sewer Fixed Monthly Charge** each month. During the IGA, Yearout Energy worked with ABCWUA to confirm the potential for downsizing the meters. ABCWUA would furnish the new meter and perform all work involved with installation of the new meter, making this a fairly streamline measure for CABQ to implement.

This measure was removed from the final recommended project scope due to the removal of the water conservation measure in this project phase. Yearout Energy highly recommends that CABQ continue to explore this measure, specifically at sites which undergo water conservation

upgrades as part of a future phase of work given the considerable amount of cost savings and attractive return on investment.

4.8.6. TOUCHLESS SENSORS ON DOMESTIC WATER FIXTURES

Yearout Energy evaluated the potential for installing touchless sensors on domestic water fixtures at all IGA sites for hygienic purposes. The cost to include this functionality was significant (~$500,000) and no additional utility savings would be achieved. Therefore, this feature was removed from the final recommended project scope. The table below outlines the sensor quantities per site below that CABQ can explore implementing at some point when funds are available.

Table 54: Potential Touchless Sensor Faucet and Flush Valves Scope

Site	Replace Manual Faucet with Sensor Faucet	Install Flush Valve Side Mount Sensor
Alamosa Community Center	22	28
Albuquerque Government Center	1	1
Animal Welfare Eastside Shelter	10	17
Arroyo Del Oso Golf	10	14
Barelas Senior Center	10	12
BioPark Zoo	32	59
BioPark Aquarium	36	47
Broadway Vehicle Emissions	4	2
City Hall	30	35
Daytona Transit Center	19	32
East Central Health and Social Service Center	7	7
Esperanza Bicycle Safety Education Center	3	0

Site	Replace Manual Faucet with Sensor Faucet	Install Flush Valve Side Mount Sensor
Fire Academy	20	24
Fire Station 01	10	11
Fire Station 05	7	9
Fire Station 13 and Fire Arson	10	8
Fire Station 17	6	2
Fire Station 21	7	9
Herman Sanchez Community Center	0	0
Highland Senior Center	5	2
Holiday Park Community Center	0	11
Kimo Theatre	12	18
Law Enforcement Center	62	70
Los Altos Golf Course/Well	11	13
Los Griegos Health and Social Service Center	12	13
Manzano Mesa Multigenerational Center	0	3
Metro Forensics Science Center (MFSC)	15	21
North Valley Senior Center	8	13
Northeast Area Command	6	4
Open Space Visitors Center	1	0
Palo Duro Senior Center	9	16

Site	Replace Manual Faucet with Sensor Faucet	Install Flush Valve Side Mount Sensor
Pino Yards	31	80
Southwest Area Command	4	0
Taylor Ranch Community Center	2	6
Training Academy	11	11
Valley Area Command	6	11
Total	439	609

4.8.7. EV CHARGING STATIONS

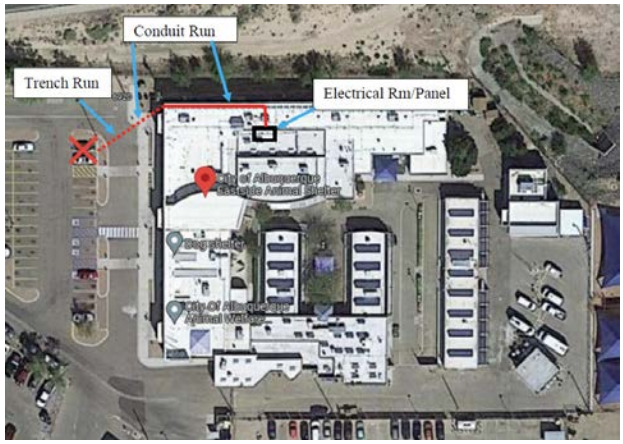
Based on guidance from CABQ during the IGA, Yearout Energy evaluated the potential for installing Level 2 EV charging stations at several sites throughout the city, but this scope was excluded from the final recommended scope based on guidance from CABQ. The following sites were evaluated and CABQ can explore implementing EV chargers at these sites as funding becomes available.

Alamosa Community Center

EV charging stations can be installed at this site as depicted in the image below based on facility staff input. Concrete cutting of sidewalk and trenching will be required through open dirt space to the building where the panel is located. Conduit will be run from panel to charging station location. There is room in the existing panel to accommodate new circuits and requirements for EV charging station.

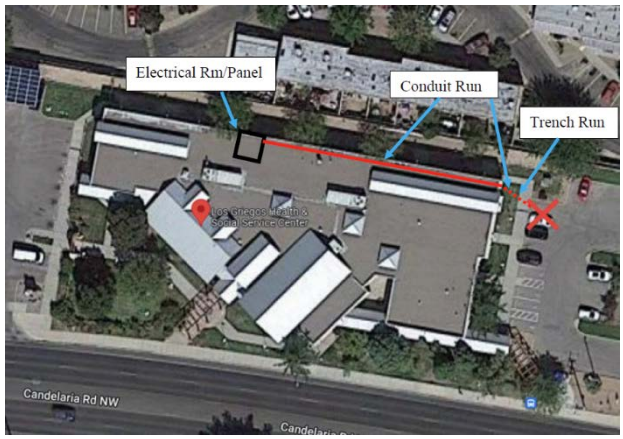
Animal Welfare Eastside Shelter

EV charging stations can be installed at this site as depicted in the image below based on facility staff input. Concrete cutting of sidewalk, landscape and asphalt will be required to run conduit to the building. Underground utilities are around the conduit run and line spotting will be required. Conduit will be run along the north exterior wall to inside the building and in the ceiling to the electrical room. There is room in the existing panel to accommodate circuits for charging station.



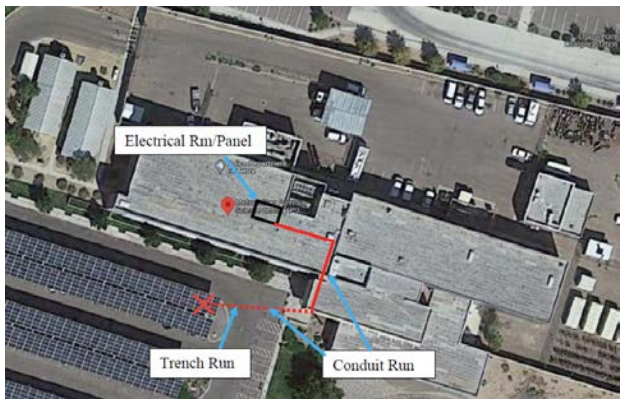
Los Griegos Health and Services Center

EV charging stations can be installed at this site as depicted in the image below based on facility staff input. Concrete cutting of sidewalk and landscape required to run conduit from station to building. Conduit will be run from the building either on the roof or along the wall to the electrical room. Per site visit it was determined that a sub-panel will need to be installed to accommodate the additional circuits for the charging station.



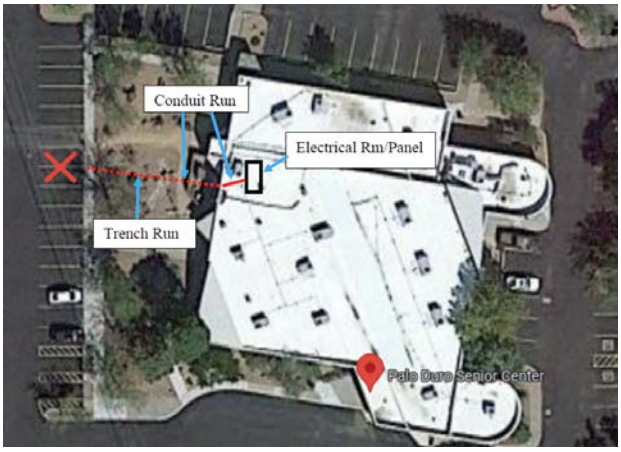
Metro Forensic Science Center

EV charging stations can be installed at this site as depicted in the image below based on facility staff input. Concrete cutting of sidewalk, landscape and asphalt required to run to the building. From the building to the electrical room, conduit will be run in the ceiling, possibly on the roof. There is room in the existing panel to accommodate new circuits.



Palo Duro Senior Center

EV charging stations can be installed at this site as depicted in the image below based on facility staff input. Concrete cutting of sidewalk and landscape will be required. This location has multiple underground utilities in the area. Line spotting required. There is room in the existing panel to accommodate the circuits for the charging station.

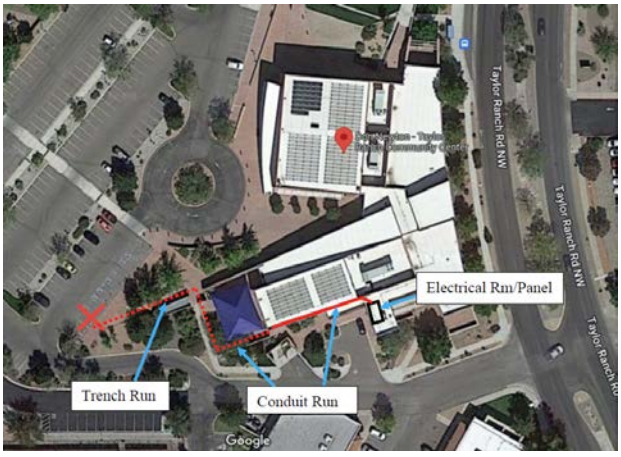


Tony Hillerman Library

EV charging stations can be installed at this site as depicted in the image below based on facility staff input. Concrete cutting of sidewalk, landscape and asphalt will be required for conduit run to the building. From the building, conduit will be run to the northeast side of the building to the electrical room. The existing panel has room to accommodate the new circuits for the charging station.

Taylor Ranch Community Center

EV charging stations can be installed at this site as depicted in the image below based on facility staff input. Concrete cutting of sidewalk, landscape and possible asphalt will be required to run conduit to electrical room panel. There is room in the existing panel to accommodate new circuits for EV charging station.



4.8.8. HVAC EQUIPMENT AT OTHER SITES

Yearout Energy has identified several other IGA sites with existing HVAC equipment that is nearing or surpassed their useful life. These sites were excluded from the recommended project

scope of work due to financial and budgetary constraints. Yearout Energy recommends that the City consider replacing this aged equipment as funding becomes available.

Table 55: Additional HVAC Equipment in Need of Replacement

Site	Description	Qty
Betsy Patterson Pool	Replacement of Packaged RTUs	3
Fire Station 01	Replacement of Packaged RTUs	1
Herman Sanchez Community Center	Replacement of Packaged RTUs	9
Holiday Park Community Center	Replacement of Packaged RTUs	1
Kimo Theater	Replacement of Packaged RTUs	6
Los Griegos Health and Social Services	Replacement of Packaged RTUs	4
Pino Yards	Replacement of Packaged RTUs	14
Taylor Ranch Community Center	Replacement of Packaged RTUs	3

4.8.9. DDC BUILDING AUTOMATION SYSTEM

The aged pneumatic system at the ABQ Government Center and Old City Hall is in need of immediate replacement. The item was removed from the project scope due to financial constraints, but YE recommends CABQ address this deficient system as soon as possible.

Table 56: 03 DDC BAS at ABQ Gov Center and City Hall

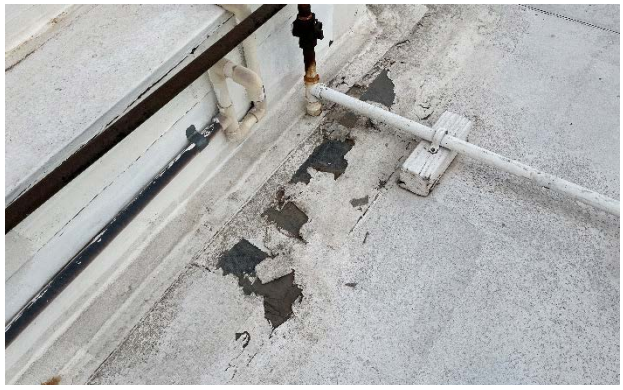
Scope Item	Qty
Decommission existing pneumatic controls system	1
Furnish and install new DDC controls on existing Air-Handling Unit	23
Furnish and install new DDC controls on existing VAV Box	354
Furnish and install new DDC controls on existing DDVAV Box	80

Scope Item	Qty
Furnish and install new DDC controls on HW Boiler	2
Furnish and install new DDC controls on HW Pump	2
Startup and Programming of new DDC controls	1
Furnish and install new Trane Tracer Ensemble server with software & graphics	1
No scope proposed for CHW Plant which is already on Trane BAS	---

4.8.10. ROOFING AT OTHER SITES

Yearout Energy evaluated existing roof conditions at several sites where new rooftop solar PV or rooftop HVAC equipment was considered. These included the Animal Welfare Eastside Shelter, Special Collections Library, and Taylor Ranch Library. The existing roofs at all three sites were found to be in poor condition and in need of replacement. At CABQ's request, roof replacements have been excluded from the project scope. Therefore, rooftop solar at these sites were also not considered for inclusion in the project scope.

Animal Welfare Eastside Shelter
Select areas of the existing roof at this site are in poor condition and should be replaced alongside the installation of new rooftop HVAC equipment on the Kennel Spaces. CABQ intends to perform this work outside of the EPC project scope.



Taylor Ranch Library
The existing roof at this site is in poor condition and in need of replacement prior to installation of new rooftop HVAC equipment and solar PV.

Animal Welfare Eastside Shelter
Select areas of the existing roof at this site are in poor condition and should be replaced alongside the installation of new rooftop HVAC equipment on the Kennel Spaces. CABQ intends to perform this work outside of the EPC project scope.

4.8.11. SOLAR PV

Yearout Energy evaluated the potential for solar PV systems at most sites during the IGA. Most of the sites evaluated were found not to be financially viable for a variety of reasons including poor site conditions, existing solar PV systems, and unattractive utility rates. Many of the sites that were identified as good candidates for solar PV were removed from the recommended project scope due to the failing existing roofs or financial constraints. Adding rooftop solar to sites with failing roof systems is not recommended until the existing roofs can be significantly repaired or replaced. Here is a summary of the sites evaluated for solar PV that were excluded from the recommended project scope.

East Central Health & Social Service Center

5.9 kW dc solar pv rooftop system sized for post-retrofit building performance. Removed from recommended project scope due to failing portions of the roof. Yearout Energy recommends CABQ explore installing solar at this site as funding becomes available for roof repairs/replacement.

Esperanza Bicycle Safety Education Center

19.6 kW dc solar pv rooftop system sized for post-retrofit building performance. Removed from recommended project scope due to failing portions of the roof. Yearout Energy recommends CABQ explore installing solar at this site as funding becomes available for roof repairs/replacement.

Fire Station 13 and Fire Arson

39.2 kW dc solar pv rooftop system sized for post-retrofit building performance. Removed from recommended project scope due to failing portions of the roof. Yearout Energy recommends CABQ explore installing solar at this site as funding becomes available for roof repairs/replacement.

Fire Station 17

39.7 kW dc solar pv rooftop system sized for post-retrofit building performance. Removed from recommended project scope due to failing portions of the roof. Yearout Energy recommends CABQ explore installing solar at this site as funding becomes available for roof repairs/replacement.

Highland Senior Center

39.2 kW dc solar pv rooftop system sized for post-retrofit building performance. Removed from recommended project scope due to failing portions of the roof. Yearout Energy recommends CABQ explore installing solar at this site as funding becomes available for roof repairs/replacement.

NE Area Command

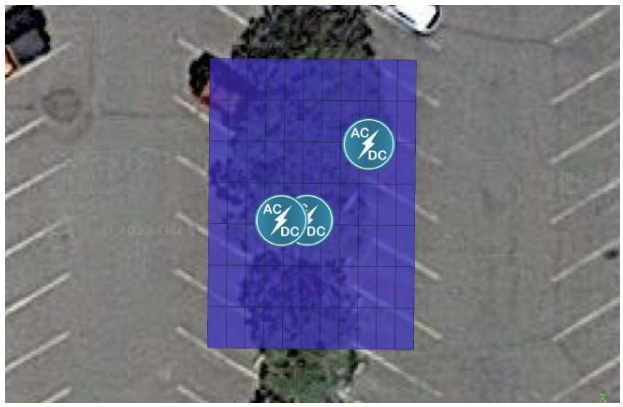
57.0 kW dc solar pv carport sized for post-retrofit building performance. This system has an attractive return on investment compared to the service life of the equipment but was removed due to overall financial constraints.

North Valley Senior Center

47.7 kW dc solar pv rooftop system sized for post-retrofit building performance. Removed from recommended project scope due to failing portions of the roof. Yearout Energy recommends CABQ explore installing solar at this site as funding becomes available for roof repairs/replacement.

Sierra Vista Pool and Tennis Complex

37.7 kW dc solar pv carport sized for post-retrofit building performance. Removed from recommended project scope due to poor financial return.



SW Area Command

55.0 kW dc solar pv carport sized for post-retrofit building performance. This system has an attractive return on investment compared to the service life of the equipment but was removed due to overall financial constraints.

Special Collections Library
32.4 kW dc solar pv rooftop system sized for post-retrofit building performance. Removed from recommended project scope due to the poor condition of the existing roof that needs to be replaced prior to installation.

Taylor Ranch Library
29.3 kW dc solar pv rooftop system sized for post-retrofit building performance. Removed from recommended project scope due to the poor condition of the existing roof that needs to be replaced prior to installation.

4.8.12.SOLAR THERMAL POOL HEATING

Yearout Energy evaluated the potential for solar thermal heating of pool water at several sites during the IGA. The types of systems are notorious for quickly falling into disrepair and malfunctioning when not maintained properly. Preliminary calculations determined this measure to not be financially viable for recommendation.

4.8.13. TREE CANOPY

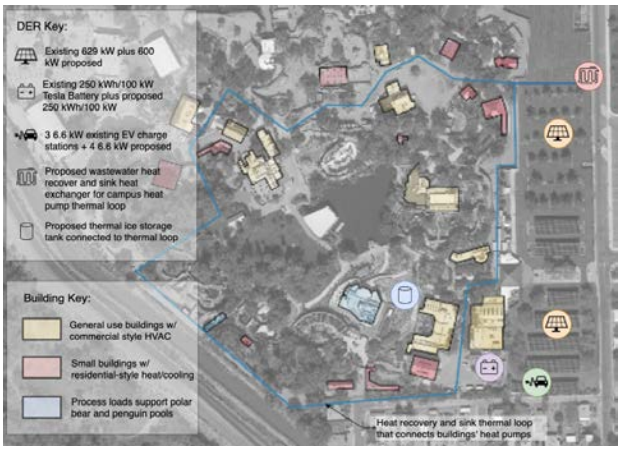
Yearout Energy evaluated the potential for improving the tree canopy at several sites across the City for further alignment with the City's Climate Action Plan. This would have been a cost only measure with no proposed utility or operational savings. A portion of the cost for implementing this measure would have been covered through a grant provided by the Dakota Tree Project, a local non-profit organization. Yearout Energy recommends that the City explore the potential for executing this measure during the project implementation phase utilizing any contingency funds that may be available as the project nears substantial completion.

4.8.14. MICROGRID AT BIOPARK

During the very early stages of the IGA, Yearout Energy worked closely with a team comprised of CABQ, Camus Energy, Sandia National Labs, UNM, PNM, and EPRI to evaluate the potential for implementing a microgrid at the BioPark. The objective was to develop a project and seek outside funding through the Solar-Led Building Retrofits to Increase Grid Harmony and Toughness (SoLBRIGHT) grant. The team developed the scope and submitted the grant application, but no funding was awarded to implement the project.

CABQ BioPark Connected Community

Image of the general technical plan for the BioPark that was proposed in the grant application.



5.0 COMMISSIONING

Commissioning is a systematic process of ensuring, through documented verification, that the building systems and components perform according to the design intent and owner's project requirements. All equipment and systems should be installed according to the manufacturer's recommendations, specifications, and the best practices and standards of the industry. A complete commissioning process begins at the design phase and continues through implementation and acceptance phases with actual verification of performance.

Throughout the commissioning process, the commissioning agent develops specific commissioning procedures and forms as necessary to suit the project requirements while also reviewing equipment submittals, manufacturer's startup documentation, operations, and maintenance documentation, as well as training plan(s) for completeness.

A final commissioning report shall be developed upon completion of the project that includes the pre-functional and functional test forms as well as the master deficiencies list that will be maintained throughout the testing process until all items are closed out.

The completed commissioning report becomes the owner's commissioning record and provides a reference to system setup, test results, and operational data for the commissioned systems.

Yearout Energy will commission all equipment installed as part of the project scope to ensure proper and efficient operation.

5.1. PRELIMINARY COMMISSIONING PLAN BY FIM

The following preliminary commissioning plan is intended to serve as the outline from which the final commissioning plan will be developed during the pre-construction / design phase. The final commissioning plan will be primarily focused on validating the proposed equipment and strategies are implemented in accordance with the savings methodology associated with each measure.

5.1.1. 01 SUBMETERING

- Submittal review
- Installation checkout

5.1.2. 02 HVAC EQUIPMENT

- Submittal review
- Installation checkout
- Verify pre-functional testing of equipment operations (point-to-point checks)
- Functional testing
- Occupied & unoccupied heating operation
- Occupied & unoccupied cooling operation
- Fan operation
- Damper operation
- Internal safety device testing

5.1.3. 03 BUILDING AUTOMATION SYSTEM

- Submittal review
- Installation checkout
- Graphics, scheduling, trending, and alarming checkout
- Functional testing
- Operation & observation of equipment from local and/or remote workstation
- Confirm set points, schedules, and graphics

5.1.4. 04 LED LIGHTING

- Submittal review
- Installation checkout

5.1.5. 05 BUILDING ENVELOPE

- Submittal review
- Installation checkout

5.1.6. 06 HE TRANSFORMERS

- Submittal review
- Installation checkout

6.0 MEASUREMENT AND VERIFICATION

During the Investment Grade Audit (IGA), Yearout Energy follows industry best practices and State requirements to identify and develop the most appropriate Measurement and Verification (M&V) plan per project and individual measure. Procedures for M&V vary based on complexity, risk, cost, magnitude of savings and level of assurance required by project stakeholders. Our approach aligns with guidelines established by the International Performance Measurement and Verification Protocol (IPMVP). Yearout Energy co-develops M&V plans with project stakeholders to ensure methodologies are clearly understood and project risks and responsibilities are properly allocated between Yearout Energy and the Owner.

Following the installation and commissioning of the project scope, Yearout Energy shall execute the post-installation M&V plan to confirm the expected guaranteed savings are achievable based on as-built conditions. Yearout Energy shall author and distribute the findings of the post-installation M&V report with the Owner for complete transparency.

The project is then transitioned into the performance assurance phase, where Yearout Energy shall perform the co-developed annual M&V plan outlined herein for ongoing validation of guaranteed savings. The duration of the performance assurance phase will be the term of the financing unless terminated by the Owner.

The proposed preliminary Measurement and Verification plan has been developed to comply with the State of New Mexico “Public Facility Energy Efficiency and Water Conservation Act” [Chapter 6, Article 23, Section 8 NMSA 1978]. The determination of verified savings will follow current best practices as defined in the 2014 IPMVP Core Concepts June 2014, EVO 10000-1:2014.

6.1. M&V REPORTING

Yearout Energy will prepare an annual M&V Report which will detail the following items for the reporting period:

1. Date and time of site visits
2. Areas assessed with summary of findings
3. Evaluation of system and overall performance
4. Changes to facility operation along with identified impacts to the guarantee
5. Verified utility consumption and cost savings
6. Comparison of verified versus guaranteed savings
7. Description of any required adjustments to the baseline or guaranteed savings
8. Description of any shortfalls in guaranteed savings and plan for reimbursement

Yearout Energy will require ongoing access to all utility information throughout the duration of the performance period.

6.2. ADJUSTMENTS TO THE BASELINE

For the full duration of the performance period, the Owner will be responsible for reporting the following items to Yearout Energy:

1. Changes in facility area
2. Changes in space type or use
3. Changes in operating hours
4. Changes in occupancy
5. Changes in set points, schedules, and sequences of operation
6. Changes in equipment
7. Changes to maintenance procedures
8. Issues with installed equipment

Adjustments to the baseline or guarantee may be necessary when significant changes to any of the above noted items occur. Additional adjustments for changes in weather will be accounted for on applicable measures. According to the IPMVP, baseline adjustments come in two forms:

1. Routine Adjustments: Factors that expected to change routinely during the reporting period. An example is weather.
2. Non-Routine Adjustments: Factors not usually expected to change. Examples include adjustments to facility size, space types, occupancy, and internal loads.

6.3. M&V OPTIONS PER FIM

The proposed M&V option per FIM is depicted in the following table. Please refer to the complete preliminary M&V plan provided herein.

Table 57: M&V Option per FIM

FIM No.	FIM Name	M&V Option
01	Submetering	Non-Measured (No Savings)
02	HVAC Equipment	Option A – Retrofit Isolation
03	Building Automation System	Option A – Retrofit Isolation
04	LED Lighting	Option A – Retrofit Isolation
05	Building Envelope	Option A – Retrofit Isolation
06	HE Transformers	Option A – Retrofit Isolation

6.4. ANNUAL M&V FEE

The Year-1 M&V Fee is $57,292, which will escalate at a rate of 4.00% annually for the duration of the performance period as depicted in the table below. Construction period M&V is included in the turn-key project cost, but annual M&V services, beginning in Year 1, will be renewed and billed for separately at the beginning of each year during the performance period. The Owner is responsible for payment of the annual M&V Fee which is billed quarterly as services are rendered. Maintaining M&V services is required to preserve the guarantee provided by Yearout Energy.

Table 58: Annual M&V Fee

Year	M&V Fee	Year	M&V Fee
1	$57,292	9	$78,408
2	$59,584	10	$81,545
3	$61,967	11	$84,806
4	$64,446	12	$88,199
5	$67,024	13	$91,727
6	$69,705	14	$95,396
7	$72,493	15	$99,211
8	$75,393		

6.5. PRELIMINARY M&V PLAN

6.5.1. 01 SUBMETERING

IPMVP Option	Non-Measured (No Savings)
Guarantee Factor	N/A
IGA Sites Affected	N/A
Key Performance Indicators (KPIs)	N/A
Baseline Value	N/A
Proposed Value	N/A
Baseline Audit Tasks	N/A
Post-Installation M&V Tasks	N/A
Annual M&V Tasks	N/A
Ongoing Owner Responsibilities	N/A
Stipulated Factors	N/A

6.5.2. 02 HVAC EQUIPMENT

IPMVP Option	Option A – Retrofit Isolation
Guarantee Factor	90%
IGA Sites Affected	Refer to FIM Matrix in Section 4.0
Key Performance Indicators (KPIs)	1. Heating and Cooling Capacity 2. Heating and Cooling Efficiency 3. Primary Heating Fuel Source
Baseline Value	Refer to FIM Savings Methodology
Proposed Value	Refer to FIM Savings Methodology
Baseline Audit Tasks	1. Detailed Site Survey / Equipment Inventory 2. Owner Interviews 3. Review Equipment Nameplate / Mfr Information
Post-Installation M&V Tasks	1. Review as-built documentation to validate installed equipment meets minimum performance criteria. 2. Review controls programming to validate schedules and set points are properly established 3. If necessary, revise savings calculations based on as-built conditions.
Annual M&V Tasks	1. Establish and review trends to validate proper operation of equipment over a 2-week period 2. Visually inspect a sample of equipment to validate proper maintenance and operation
Ongoing Owner Responsibilities	1. Immediately notify Yearout Energy of any changes to established schedules and set points

	2. Maintain equipment per manufacturer's and Yearout Energy's recommendations 4. Immediately notify Yearout Energy of any changes made to equipment operation 5. Any replacement equipment shall meet or exceed the proposed performance criteria. 6. Provide Yearout Energy remote access for monitoring HVAC system
Stipulated Factors	1. Weather 2. Internal and External Loads 3. Sequences of Operation 4. Set Points and Schedules 5. Baseline HVAC System Efficiencies

6.5.3. 03 BUILDING AUTOMATION SYSTEM

IPMVP Option	Option A – Retrofit Isolation
Guarantee Factor	90%
IGA Sites Affected	Refer to FIM Matrix in Section 4.0
Key Performance Indicators (KPIs)	1. To Be Determined During Implementation (See FIM Savings Methodology)
Baseline Value	To be Determined During Implementation Phase
Proposed Value	To be Determined During Implementation Phase
Baseline Audit Tasks	1. Detailed Site Survey / Equipment Inventory 2. Owner Interviews 3. Review Equipment Nameplate / Mfr Information
Post-Installation M&V Tasks	To be Determined During Implementation Phase
Annual M&V Tasks	To be Determined During Implementation Phase
Ongoing Owner Responsibilities	To be Determined During Implementation Phase
Stipulated Factors	To be Determined During Implementation Phase

6.5.4. 04 LED LIGHTING

IPMVP Option	Option A – Retrofit Isolation
Guarantee Factor	100%
IGA Sites Affected	Refer to FIM Matrix in Section 4.0
Key Performance Indicators (KPIs)	1. Fixture Input Power 2. Fixture Quantities 3. Burn Hours
Baseline Value	Refer to APPENDIX H (Room-by-Room)
Proposed Value	Refer to APPENDIX H (Room-by-Room)
Baseline Audit Tasks	1. Detailed Lighting Survey 2. Review As-Built and Manufacturer Information 3. Owner Interviews 4. Applied Industry Standards / Best Practices
Post-Installation M&V Tasks	1. Review as-built documentation to validate installed equipment meets minimum performance criteria. 2. Post-installation testing on a sample of fixtures 3. If necessary, revise savings calculations based on as-built conditions.
Annual M&V Tasks	1. Perform visual inspection of a sample of fixtures to validate proper operation
Ongoing Owner Responsibilities	1. Maintain equipment per manufacturer's and Yearout Energy's recommendations 2. Immediately notify Yearout Energy of any changes made to equipment operation

	3. Any replacement equipment shall meet or exceed the proposed performance criteria.
Stipulated Factors	1. Input power per Manufacturer Data 2. Burn Hours

6.5.5. 05 BUILDING ENVELOPE

IPMVP Option	Option A – Retrofit Isolation
Guarantee Factor	90%
IGA Sites Affected	Refer to FIM Matrix in Section 4.0
Key Performance Indicators (KPIs)	1. Leakage Area
Baseline Value	Refer to FIM Savings Methodology
Proposed Value	Refer to FIM Savings Methodology
Baseline Audit Tasks	1. Detailed Building Envelope Survey
Post-Installation M&V Tasks	1. Review as-built documentation to validate materials installed meet minimum performance requirements. 2. Visually inspect a sample of areas to validate materials installed are performing as intended. 3. If necessary, revise savings calculations based on as-built conditions.
Annual M&V Tasks	1. Perform visual inspection of a sample of areas in Year 1 only to validate materials installed are performing as intended.
Ongoing Owner Responsibilities	1. Maintain materials per manufacturer's and Yearout Energy's recommendations 2. Immediately notify Yearout Energy of any changes made to materials installed 3. Any replacement materials shall meet or exceed the proposed performance criteria.

Stipulated Factors	1. Weather 2. HVAC System Efficiencies 3. Operating Schedules

6.5.6. 06 HE TRANSFORMERS

IPMVP Option	Option A – Retrofit Isolation
Guarantee Factor	90%
IGA Sites Affected	Refer to FIM Matrix in Section 4.0
Key Performance Indicators (KPIs)	1. Transformer Losses
Baseline Value	Refer to FIM Savings Methodology
Proposed Value	Refer to FIM Savings Methodology
Baseline Audit Tasks	1. Site survey of existing transformers 2. Applied Industry Standards / Best Practices
Post-Installation M&V Tasks	1. ISO 17025 Certified Test Lab measurements of replacement transformers to validate performance 2. If necessary, revise savings calculations based on as-built conditions.
Annual M&V Tasks	1. None
Ongoing Owner Responsibilities	1. Maintain equipment per manufacturer's and Yearout Energy's recommendations 2. Immediately notify Yearout Energy of any changes made to equipment operation 3. Any replacement equipment shall meet or exceed the proposed performance criteria.
Stipulated Factors	1. Equipment operating hours 2. Equipment percent loading

7.0 ECONOMIC ANALYSIS

7.1. GUARANTEED ANNUAL UTILITY SAVINGS

The following table depicts the Year 1 Guaranteed Utility Consumption Savings per FIM. It is customary and implied on EPC projects that the proposed Year 1 guaranteed savings depicted apply to all years of the performance period unless explicitly noted otherwise.

Table 59: Year 1 Guaranteed Utility Consumption Savings per FIM

FIM No.	FIM Name	GF	Electric (kW)	Electric (kWh)	Natural Gas (therm)
01	Submetering	N/A	0	0	0
02	HVAC Equipment	90%	(495)	(40,003)	10,500
03	Building Automation System	90%	0	136,799	0
04	LED Lighting	100%	11,463	2,800,968	(50,813)
05	Building Envelope	90%	0	7,065	47,808
06	HE Transformers	90%	478	304,797	0
Total			11,385	3,209,626	7,495

An FIM specific guarantee factor is applied to the estimated savings to determine the guaranteed savings for each FIM. The applied guarantee factor is dependent on the FIM type, methodology for calculating savings, understanding of the facility, experience implementing similar measures, and the level of risk acceptable to meet the Owners financial objectives for the project.

Where the estimated savings are positive, the guarantee factor is applied as follows:

[Guaranteed Savings = Estimated Savings * Guarantee Factor]

Where the Estimated Savings are a negative value, the Guarantee Factor is applied as follows:

[Guaranteed Savings = Estimated Savings * (1 + (1 – Guarantee Factor))]

The following table depicts the Year 1 utility cost savings per FIM.

Table 60: Year 1 Utility Cost Savings per FIM

FIM No.	FIM Name	Electricity	Natural Gas	All Utilities
01	Submetering	$0	$0	$0
02	HVAC Equipment	($6,974)	$7,208	$234
03	Building Automation System	$8,234	$0	$8,234
04	LED Lighting	$455,472	($34,883)	$420,590
05	Building Envelope	$573	$32,820	$33,393
06	HE Transformers	$28,127	$0	$28,127
Total		$485,432	$5,145	$490,578

7.2. OPERATIONS AND MAINTENANCE (O&M) SAVINGS

To determine the average annual O&M savings, the identified reduction to baseline O&M expenditures was multiplied by the ratio of the service life of each specific FIM over the proposed finance term. In instances where the FIM Service Life is longer than the analysis period, a ratio of 1 is applied in the equation below as not to inflate the average annual O&M savings for that specific measure.

[Average Annual O&M Savings = Est. Year 1 O&M Savings * (FIM Service Life / Finance Term)]

7.2.1. 01 SUBMETERING

No O&M savings proposed for this measure.

7.2.2. 02 HVAC EQUIPMENT

The average annual cost for maintaining commercial facilities in the US is $\$2.15/ft^2$ per an industry survey performed by Constellation[1]. Estimating that the HVAC system accounts for approximately 40% of these annual costs, the average annual cost to maintain the HVAC system is $\$0.86/ft^2$.

Historic O&M cost records were not available for this measure. The estimated annual O&M savings was calculated using the following conservative equation:

[Estimated Annual O&M Savings = Gross Area (ft^2) * $\$0.86/ft^2$ * 10%]

7.2.3. 03 BUILDING AUTOMATION SYSTEM

As described in the previous measure, the HVAC system is estimated to have an annual maintenance cost of $\$0.86/ft^2$ based on industry surveys. Other studies have found that conversions from pneumatic controls to DDC controls can save up to 40% of annual maintenance costs associated with those systems.

Historic O&M cost records were not available for this measure. The estimated annual O&M savings was calculated using the following conservative equation:

[Estimated Annual O&M Savings = Gross Area (ft^2) * $\$0.86/ft^2$ * 10%]

7.2.4. 04 LED LIGHTING

Historic O&M cost records were not available for this measure. The estimated annual O&M savings was calculated using the following equation:

1 "Reducing Your Commercial Real Estate Operating Costs," Constellation Energy Resources, accessed July 27, 2022, https://www.constellation.com/solutions/for-your-small-business/small-business-resources/commercial-real-estate.html.

[Annual O&M Savings = Year 1 Annual Utility Savings × 20%]

7.2.5. 05 BUILDING ENVELOPE

Historic O&M cost records were not available for this measure. The estimated annual O&M savings was calculated using the following equation:

[Annual O&M Savings = Year 1 Annual Utility Savings × 20%]

7.2.6. 06 HE TRANSFORMERS

Historic O&M cost records were not available for this measure. The estimated annual O&M savings was calculated using the following equation:

[Annual O&M Savings = Year 1 Annual Utility Savings × 20%]

7.2.7. O&M SAVINGS SUMMARY

The Year 1 O&M savings established for this project are depicted in the table below.

Table 61: Year 1 Operations & Maintenance Savings

FIM No.	FIM Name	Average Service Life	Year 1 O&M Savings ($)
01	Submetering	15 years	$0
02	HVAC Equipment	18 years	$2,427
03	Building Automation System	18 years	$21,139
04	LED Lighting	15 years	$84,118
05	Building Envelope	15 years	$6,679
06	HE Transformers	32 years	$5,625
Total			$119,988

7.3. ESTIMATED UTILITY REBATES

Utility providers often provide incentives to customers who implement select efficiency improvements to their facilities. The proposed scope of work for this project will provide the following estimated rebates per FIM.

Table 62: Estimated Utility Rebates

FIM No.	FIM Name	Estimated Rebate ($)
01	Submetering	$0
02	HVAC Equipment	$2,560
03	Building Automation System	$0
04	LED Lighting	$168,058
05	Building Envelope	$0
06	HE Transformers	$30,062
Total		$200,680

Yearout Energy will coordinate with utility providers and submit required documentation during the implementation period. Utility rebates are estimated and subject to availability and final award by the utility provider. Rebates are not guaranteed by Yearout Energy, as these programs are at the discretion of the utility company. All awarded rebates will be paid directly to the Owner by the utility provider.

7.4. ESCALATION RATES

The proposed utility escalation rates were determined using the Energy Escalation Rate Calculator (EERC), a tool developed by the National Institute for Standards and Technology (NIST), which computes an average rate of escalation for a specified time period, which can be used as an escalation rate for contract payments in Energy Performance Contracting (EPC). The calculator prompts the user for information on project location, fuel usage, industry sector, and the beginning and end dates of the performance period. A description of these inputs is provided below.

Input Parameters:

Percent from Electricity:	100%
Location:	NM (West)
Sector:	Commercial
Contract Start:	2024
Contract Duration:	18 years
Social Cost of GHG Assumptions:	Medium - $51 in 2022
Annual Inflation Rate:	4.73%

Results:

Real Rate:	**0.36%**
Nominal Rate:	**5.10%**
Calculated on:	9/6/2022, 2:19:21 PM
Datafile version:	2022

Input Parameters:

Percent from Natural Gas:	100%
Location:	NM (West)
Sector:	Commercial
Contract Start:	2024
Contract Duration:	18 years
Social Cost of GHG Assumptions:	Medium - $51 in 2022
Annual Inflation Rate:	4.73%

Results:

Real Rate:	**3.72%**
Nominal Rate:	**8.63%**
Calculated on:	9/6/2022, 2:20:36 PM
Datafile version:	2022

Percent of Energy Cost Savings: Percentage of energy cost savings in dollars that is attributable to one or more of the fuel types used in the project. This input is used to weight the escalation rate. Independent analysis was run for electricity and natural gas as depicted above.

Location: Selection of the state in which the project is located allows the program to select the energy price escalation rates for the corresponding Census Region.

Sector: Selection of commercial or industrial sector determines the type of utility rate schedule applied to the energy cost calculation.

Performance Period Start Date: Date when energy savings start to accrue, which is usually after project acceptance at the beginning of performance period.

Performance Period Duration: Number of years of the performance period for which the average escalation rate will be calculated.

Carbon Pricing Policy: Medium Carbon Price

Inflation Rate: The sustained increase in the general price level of goods and services in an economy over a period. The average inflation rate over the past 24 months has been 4.73%.

Real and Nominal Escalation Rates: The output of the program is the calculated average escalation rate, stated both in real terms (excluding the rate of inflation) and in nominal terms (including the rate of inflation).

The following annual escalation rates have been factored into the project's economic analysis.

Table 63: Annual Escalation Rates

Category	Escalation Rate
Electricity	5.10% / Year
Natural Gas	8.63% / Year
Operations & Maintenance	4.00% / Year

7.5. EPC PROJECT BUDGET SUMMARY

The table below depicts the proposed EPC Project open-book budget summary.

Table 64: EPC Project Budget Summary

Item	$
Preconstruction	
Design and Other Engineering	$159,880
Pre-Construction Services	$217,537
Other Pre-Construction Costs	$139,224
Construction	
Trade Subcontracts	$393,147
Design/Build Subcontracts	$6,407,791
Direct Purchase Equipment	$343,678
Construction Management	$534,686
Project Engineering	$72,020
General Conditions	$190,774
Construction Completion	$284,590
Other Construction Costs	$531,562
Profit	$927,489
Contingency	$324,621
State Review Fees	$105,270
Gross Receipts Tax	$810,711
Total Amount	$11,442,980

The following table provides a description of the project fees shown in the previous chart.

Pre-Construction Costs	Description
Design and Other Engineering	All professional architectural and engineering costs required to design and specify the project scope of work, including engineering design, architectural design, additional energy engineering not included in IGA, engineering oversight and direction, code review.
Pre-Construction Services	Activities required prior to commencing construction, including safety planning, additional bid solicitation, design review, submittal review, construction management planning, constructability reviews, coordination of utility incentives, scheduling, procurement planning, and other direct costs associated with presenting the best information to the Owner.
Other Pre-Construction Costs	Site visits and Owner meetings are necessary before construction to ensure designs and equipment meet customer needs and align with project objectives. Other Pre-construction Costs may include but are not limited to administrative support, legal review, accounting services, printing, copying, binding, office supplies, business travel, business meals and supervision of project development staff.
Construction Fees	**Description**
Trade Subcontractors	Subcontractors mutually selected by Yearout Energy and the Owner as the result of a competitive RFP process. Such subcontractors may include lighting contractors, sheet metal contractors, piping contractors, electricians, plumbers, carpenters, controls contractors, and other trade contractors as necessary to complete the project scope of work.
Design-Build Subcontractors	Design-Build subcontractors are design and construction contractors that are engaged during the Investment Grade Audit to assist in the development and design of the project scope of work. Design-Build subcontractors act as their own design agent and finalize the design of the work product to be installed with oversight and direction provided by Yearout Energy. Such subcontractors include lighting contractors that perform the audit and design; mechanical contractors that coordinate all of their own electrical, sheet metal work, piping and other support work; specialty contractors like pool cover vendors, and other specialty contractors necessary to complete the Work, are included in this category.

Direct Purchase Equipment	Direct purchases for equipment, materials and supplies made by Yearout Energy.
Construction Management	Oversight and coordination of all work (direct and subcontractors) including construction management, site supervision, safety, quality control, scheduling, budget management, contract administration, submittals, and other construction related items).
Project Engineering	Engineering & design support during the project implementation phase. Periodic inspections of work and supporting the construction manager with engineering analysis of required field modifications.
General Conditions	Miscellaneous project implementation costs, including job trailer, trailer office equipment, temporary utilities, permanent utility connection fees, barriers/security fencing, scaffolding, equipment rental, site guards, cleaning and trash and recycling dumpsters, lifts, and other direct project costs.
Construction Completion	Description
Commissioning	At the completion of the construction, Yearout Energy shall perform pre-functional and post-functional tests of all installed measures to ensure proper operation. This intensive quality assurance process ensures all systems and components installed as part of the EPC project are operating as intended to achieve the desired performance and guaranteed savings.
Construction Measurement & Verification (M&V)	At the completion of construction, Yearout Energy shall perform the measurement and verification (M&V) of installed equipment to verify post-retrofit energy efficiency and operation. These activities include establishing trends and deploying long-term data loggers, reviewing as-built documentation, and updating savings calculations, accordingly, performing post-installation M&V activities defined in performance assurance plan, generating and delivering the post-installation M&V report, and other M&V activities. This effort is necessary to ensure systems will meet the guaranteed energy savings and commence the performance assurance phase.
O&M Manuals	At the completion of construction, Yearout Energy shall provide complete Operation and Maintenance (O&M) Manuals to the Owner for reference.

Training	The process of ensuring that facility staff have been properly trained to operate and maintain the new systems and components installed as part of the EPC project.
Other Construction Costs	Description
Permits	Construction is performed in various jurisdictions requiring compliance with jurisdictional codes. Yearout Energy must pay each jurisdiction to review design drawings; and render decisions on designs meeting code. In addition, Yearout Energy must apply for and receive any necessary construction permits based on designs and/or code review. This line item includes all costs associated with paying code reviewers, application fees and inspections fees for such permits.
Insurance	Yearout Energy is required to possess various levels of Builder's Risk Insurance, Automobile Liability Insurance, Professional Liability Insurance, and other General Liability Umbrella policies. This line item shall include an average amount of insurance that would be attributed to the project scope of work.
Performance & Payment Bonds	A surety bond issued to guarantee satisfactory completion of the project delivered by Yearout Energy to the Owner.
Warranty Labor	The costs associated with supporting and coordinating equipment warranties during the first year following substantial completion.
Profit | Contingency	Description
Profit	The compensation to Yearout Energy for the assumption of the risk and delivery of the EPC Project.
Contingency	A special monetary provision used to cover uncertainties or unforeseeable elements of cost during project implementation. Any unused contingency will be applied towards additional scope as approved by the customer.
Annual Costs	Description
Measurement & Verification (M&V)	The process for quantifying the savings delivered by the various measures included in the EPC project following IPMVP guidelines. Actual costs for this item are highly dependent upon the final measures installed and M&V options selected.

Maintenance	This is an optional item that is at the Owner's discretion to include. The inclusion of this item is typically encouraged for Owners that do not have the in-house capabilities to maintain the equipment after installation.

7.6. FIM SUMMARY

The determination of appropriate FIM's for implementation is the result of an iterative process with input from Owner, engineering best practices, and an economic analysis. Infrastructure capital improvement measures are not driven simply by utility savings or return on investment, but rather by the necessity to keep the facility operational. This project includes both capital improvement and conservation type measures which are blended into a bundled solution that achieves the Owner's operational and financial objectives.

Table 65: FIM Summary

FIM No.	FIM Name	Year 1 Utility Savings	Year 1 O&M Savings	Estimated Rebate ($)	Labor, Equip, Material Cost
01	Submetering	$0	$0	$0	$148,320
02	HVAC Equipment	$234	$2,427	$2,560	$504,456
03	Building Automation System	$8,234	$21,139	$0	$851,162
04	LED Lighting	$420,590	$84,118	$168,058	$4,637,249
05	Building Envelope	$33,393	$6,679	$0	$342,812
06	HE Transformers	$28,127	$5,625	$30,062	$459,938

Pre-Construction	$516,641
Construction	$1,613,632
Profit	$927,489
Contingency	$324,621
State Review Fee	$105,270
Taxes	$810,711
Total Amount	$11,442,980

7.7. PRELIMINARY PROJECT FINANCIAL ANALYSIS

General Inputs

Length of Analysis	17 Years
Turn-Key Project Cost	$11,442,980
Capital Contribution	$3,000,000
Other Funding Sources (Grants, Capital, etc.)	$0
Capitalized Interest (13 Month Construction Period)	$354,605
Loan Origination | Lender Fees (2% of Loan Amount)	$175,952
Net Financed Amount	$8,973,537
Type of Amortization	Savings
Finance Term	15 Years
Annual Interest Rate	4.200%

Rebates and Incentives

Estimated Utility Rebate	$200,680
Estimated IRA Direct Pay	$0

Measurement & Verification

Year 1 M&V Fee	$57,292
M&V Duration	3 Years

	Annual Savings			Annual Costs			Amortization Schedule				
Annual Escalation -->	Electricity	Natural Gas	O&M	M&V	Rebates and Incentives	Total Annual Savings Less Costs	Interest	Principal	Total Payment	Ending Balance	Annual Cash Flow
	5.100%	8.630%	4.000%	4.000%							
Year 1	$485,432	$5,145	$119,988	($57,292)	$200,680	$753,954	($376,889)	($377,065)	($753,953)	$8,596,471	$1
Year 2	$510,189	$5,589	$124,788	($59,584)	$0	$580,983	($361,052)	($219,931)	($580,982)	$8,376,540	$1
Year 3	$536,209	$6,072	$129,780	($61,967)	$0	$610,093	($351,815)	($258,278)	($610,092)	$8,118,262	$1
Year 4	$563,556	$6,596	$134,971	$0	$0	$705,122	($340,967)	($364,155)	($705,121)	$7,754,107	$1
Year 5	$592,297	$7,165	$140,370	$0	$0	$739,831	($325,672)	($414,159)	($739,830)	$7,339,948	$1
Year 6	$622,504	$7,783	$145,984	$0	$0	$776,272	($308,278)	($467,994)	($776,271)	$6,871,954	$1
Year 7	$654,252	$8,455	$151,824	$0	$0	$814,530	($288,622)	($525,908)	($814,529)	$6,346,046	$1
Year 8	$687,619	$9,184	$157,897	$0	$0	$854,700	($266,534)	($588,166)	($854,699)	$5,757,880	$1
Year 9	$722,687	$9,977	$164,213	$0	$0	$896,877	($241,831)	($655,046)	($896,876)	$5,102,834	$1
Year 10	$759,544	$10,838	$170,781	$0	$0	$941,163	($214,319)	($726,844)	($941,162)	$4,375,990	$1
Year 11	$798,281	$11,773	$177,612	$0	$0	$987,667	($183,792)	($803,875)	($987,666)	$3,572,115	$1
Year 12	$838,994	$12,789	$184,717	$0	$0	$1,036,500	($150,029)	($886,471)	($1,036,499)	$2,685,644	$1
Year 13	$881,782	$13,893	$192,105	$0	$0	$1,087,781	($112,797)	($974,984)	($1,087,780)	$1,710,660	$1
Year 14	$926,753	$15,092	$199,790	$0	$0	$1,141,635	($71,848)	($1,069,787)	($1,141,634)	$640,873	$1
Year 15	$974,017	$16,395	$207,781	$0	$0	$1,198,193	($26,917)	($640,873)	($667,789)	$0	$530,405
Year 16	$1,023,692	$17,809	$216,092	$0	$0	$1,257,594	$0	$0	$0	$0	$1,257,594
Year 17	$1,075,901	$19,346	$224,736	$0	$0	$1,319,983	$0	$0	$0	$0	$1,319,983
Total	$12,653,711	$183,901	$2,843,428	($178,843)	$200,680	$15,702,878	($3,621,360)	($8,973,537)	($12,594,882)	----------	$3,107,996

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8.0 ENVIRONMENTAL IMPACT

Through the implementation of the proposed project scope of work the resultant energy savings would deliver the following environmental impact:

Table 66: GHG emissions reduction and equivalents

Fuel Type	Annual Savings	lbs. CO2	Metric Tonnes CO2
Electricity	3,209,626 kWh	2,728,824	1,238
Natural Gas	7,495 therm	87,742	40
Total	----------	2,816,566	1,278

To better understand the reduction in annual emissions, the following table provides equivalencies.

Table 67: Emissions Reduction and Equivalencies, Annual

35,207	Number of 75-Watt Light Bulbs Not Energized; or
349	Acres of Trees Planted; or
1,316,152	Pounds of Coal Not Burned

Other Emissions Factors
Electric: 0.879872 lbs CO_2e / kWh (eGRID 2014v2 Subregion AZNM)
Natural Gas: 11.707 lbs CO_2 / Therm
Steam: 195.3636 lbs CO_2 / Mlbs (Seattle Steam)
Fuel Oil: 22.384 lbs CO_2 / gal
Propane: 12.5 lbs CO_2 / gal
Conversion: 2,204.623 lbs CO_2 / Metric Tonnes CO_2

Equivalents Conversions
Car Emissions: 11,470 lbs CO_2 / car / y
Tree Carbon Sequestration: 8,066 lbs CO_2 / acre / y
Vehicle Mileage Emissions: 0.59 lbs CO_2 / mile
75 W Light Bulb Emissions: 80 lbs CO_2 / Light Bulb / y
Coal Emissions: 2.14 lbs CO_2 / pound Coal
Houses Removed: 22,880 lbs CO_2 / house

9.0 OWNER AWARENESS AND ACKNOWLEDGEMENTS

It is essential that the Owner is fully informed and engaged in the EPC process to ensure a successful project outcome. The following table details the key elements from the proposed project scope for which the Owner's understanding and support are imperative to the success of the project.

Table 68: Owner Awareness and Acknowledgements

Owner shall distribute the IGA Report to all staff and other stakeholders that may be responsible for implementing and/or maintaining the key elements of the project scope of work and associated utility and operational savings.
Owner understands that the pricing reflected herein is valid for only 30 days from the date as depicted on the cover of the IGA Report. Labor, equipment, and materials pricing continues to be volatile, and Yearout Energy reserves the right to adjust pricing if approval of the project extends beyond this window.
Owner agrees with the proposed utility baselines for each site outlined herein.
Owner accepts the proposed escalation rates outlined herein.
Owner confirms, to the best of their knowledge, with the described existing operating hours, set points, sequences of operation, and other inputs outlined herein, which have been used to establish the baseline operating conditions for each site.
Owner understands the proposed scope of work and how these changes may impact building occupants.
Owner shall properly maintain the equipment installed as part of this project per the manufacturer's and Yearout Energy's recommendations.

Owner understands that conservation measures were intentionally excluded at several sites due to the overproduction of the currently installed solar PV systems. Additional conservation efforts at these sites would render minimal financial benefit, therefore, conservation measures at other sites were prioritized to protect the fiscal integrity of the project.

Owner shall engage in the ongoing maintenance and commissioning of systems to ensure savings are sustained throughout the performance period.

If applicable, where denoted “Decommission” in the scope of work, equipment will be abandoned in place following disconnection with not abatement. It is the Owner’s responsibility to secure all abandoned in place equipment and materials.

It was observed during the IGA that the existing boiler at the Main Library failed several years ago, and supplemental heat was being provided by industrial style electric fans blowing directly into the air-handling units. This can also be observed in the baseline natural gas consumption for the site which is extremely low. CABQ is currently replacing the failed equipment outside of this project and should anticipate a steep increase in natural gas consumption at this site once the new boilers are operational. It is important to note that the previous steam boiler is being replaced with a hydronic hot water boiler, but no additional modifications appear to be included for the distribution system, which may result in operational issues.

Owner understands that a full or partial temporary building interruption to the electrical or HVAC systems may be required where undergoing electrical or HVAC upgrades.

Owner understands that an internet-accessible network connection is required for proposed HVAC controls and shall provide Yearout Energy with wired and wireless network connections where required to implement the proposed scope of work.

Owner agrees to provide Yearout Energy with remote access to all building automation systems for performance assurance activities.

Owner understands that an internet-accessible network connection is required for proposed electrical submetering equipment and shall provide Yearout Energy with wired ethernet connections at install locations. Reliable WiFi connectivity is acceptable where wired ethernet connections are not available and shall be provided by the Owner. Cellular connectivity has been excluded from the project scope of work.

Owner has reviewed the proposed M&V Plan in this report and accepts the approach for how guaranteed savings will be evaluated.

Owner realizes that utility rebates are estimated, and the final awarded incentive amount is not guaranteed by Yearout Energy, as these programs are at the discretion of the utility company. All incentives will be paid directly to the Owner from the utility provider.

Owner understands that pricing provided is based on conditions at time of document release and does not account for any additional tariffs or increases in material costs which may occur later.

Owner shall provide Yearout Energy with the following information for the duration of the performance period:

- Grant access to utility information directly from providers (preferred)
- Grant access to utility provider web portals where available (preferred)
- Copies of monthly utility bills (Provided to Yearout Energy electronically)
- Completed Maintenance Checklists (Provided to Yearout Energy electronically)

Owner agrees to immediately notify Yearout Energy of any of the following:

- Changes to facility or individual space operating hours,
- Additions / Remodels to the facility,
- Changes to how individual spaces are utilized,
- Changes to facility equipment,
- Changes to set points, schedules, and sequence of operation,
- Issues with facility equipment; and

- All other items that may affect the energy performance of the facility.

Owner shall remedy any existing code violations that are outside the project scope discovered during the project implementation.

Owner understands that throughout the IGA process, Yearout Energy has been unable to verify if hazardous materials are present in the areas affected by the proposed scope of work. Owner accepts responsibility for identifying and abating any hazardous material within the affected areas prior to the installation of the project scope.

Owner accepts that substantial completion represents the "*installation of equipment is sufficiently completed to the point where the Owner has beneficial use"*. Substantial completions forms will be issued as portions of the project scope are completed, commencing the warranty period for the associated equipment installed. Final Acceptance shall be issued at the conclusion of all project activities, including commissioning and closeout, signifying the commencement of the Performance Period.

FIM Matrix

City of Albuquerque, NM

March 29, 2024

Site	Submetering	HVAC Equipment	Building Automation System	LED Lighting	Building Envelope	HE Transformers
Alamosa Community Center	---	---	---	---	---	---
Albuquerque Government Center (City County)	1 Electric Submeter / BRAIN Integration	---	---	3,143 LED Fixtures	7.05 SF of Remediated Air Leakage	2,128 kVA HE Low Voltage Transformers
Alvarado Transportation Center	1 Electric Submeter / BRAIN Integration	---	---	455 LED Fixtures	15.39 SF of Remediated Air Leakage	---
Animal Welfare Eastside Shelter	1 Electric Submeter / BRAIN Integration	---	---	461 LED Fixtures	12.9 SF of Remediated Air Leakage	---
Arroyo Del Oso Golf	---	---	---	---	---	---
Barelas Senior Center	1 Electric Submeter / BRAIN Integration	---	---	273 LED Fixtures	2.15 SF of Remediated Air Leakage	---
Betsy Patterson Pool at Sandia High School	---	---	---	---	---	---
BioPark (Zoo)	1 Electric Submeter / BRAIN Integration	---	---	1,105 LED Fixtures	28.27 SF of Remediated Air Leakage	---
BioPark (Aquarium)	1 Electric Submeter / BRAIN Integration	---	---	686 LED Fixtures	16.54 SF of Remediated Air Leakage	---
Broadway Vehicle Emissions (VPMD)	---	---	---	---	---	---
City Hall	1 Electric Submeter / BRAIN Integration	---	---	1,010 LED Fixtures	68.76 SF of Remediated Air Leakage	345 kVA HE Low Voltage Transformers
Daytona Transit Center	1 Electric Submeter / BRAIN Integration	---	---	1,388 LED Fixtures	43.03 SF of Remediated Air Leakage	---
East Central Health and Social Service Center	1 Electric Submeter / BRAIN Integration	---	---	96 LED Fixtures	2.25 SF of Remediated Air Leakage	---
Erna Fergusson Library	1 Electric Submeter / BRAIN Integration	---	BACnet WiFi Thermostats / BRAIN Integration	325 LED Fixtures	2.01 SF of Remediated Air Leakage	---
Esperanza Bicycle Safety Education Center	---	---	---	---	---	---
Fire Academy	1 Electric Submeter / BRAIN Integration	---	---	897 LED Fixtures	8.12 SF of Remediated Air Leakage	---
Fire Station 01	---	---	---	---	---	---
Fire Station 05	1 Electric Submeter / BRAIN Integration	---	---	---	---	---
Fire Station 13 and Fire Arson	1 Electric Submeter / BRAIN Integration	---	BACnet WiFi Thermostats / BRAIN Integration	---	---	---
Fire Station 17	1 Electric Submeter / BRAIN Integration	---	BACnet WiFi Thermostats / BRAIN Integration	21 LED Fixtures	4.14 SF of Remediated Air Leakage	---
Fire Station 20	1 Electric Submeter / BRAIN Integration	---	---	239 LED Fixtures	8.05 SF of Remediated Air Leakage	---
Fire Station 21	1 Electric Submeter / BRAIN Integration	---	---	---	---	---
Herman Sanchez Community Center	1 Electric Submeter / BRAIN Integration	---	---	296 LED Fixtures	---	---
Highland Pool	---	---	---	---	---	---
Highland Senior Center	1 Electric Submeter / BRAIN Integration	---	---	203 LED Fixtures	3.91 SF of Remediated Air Leakage	---
Holiday Park Community Center	1 Electric Submeter / BRAIN Integration	---	---	234 LED Fixtures	2.4 SF of Remediated Air Leakage	---
Kimo Theater	---	---	---	---	---	---
Law Enforcement Center	1 Electric Submeter / BRAIN Integration	---	---	856 LED Fixtures	---	---
Los Altos Golf Course/Well	1 Electric Submeter / BRAIN Integration	---	---	118 LED Fixtures	4.54 SF of Remediated Air Leakage	---
Los Griegos Health and Social Service Center	1 Electric Submeter / BRAIN Integration	---	---	553 LED Fixtures	3.02 SF of Remediated Air Leakage	---

FIM Matrix

City of Albuquerque, NM

March 29, 2024

Site	Submetering	HVAC Equipment	Building Automation System	LED Lighting	Building Envelope	HE Transformers
Main Library	1 Electric Submeter / BRAIN Integration	---	Full DDC Upgrade / Energy Valves / BRAIN Integration	1,696 LED Fixtures	12.06 SF of Remediated Air Leakage	390 kVA HE Low Voltage Transformers
Manzano Mesa Multigenerational Center	---	---	---	---	---	---
Metro Forensics Science Center (MFSC)	---	---	---	---	---	---
North Valley Senior Center	1 Electric Submeter / BRAIN Integration	---	---	293 LED Fixtures	4.07 SF of Remediated Air Leakage	---
Northeast Area Command (John Carrillo Substation)	1 Electric Submeter / BRAIN Integration	---	BACnet WiFi Thermostats / BRAIN Integration	135 LED Fixtures	2.53 SF of Remediated Air Leakage	---
Open Space Visitors Center	1 Electric Submeter / BRAIN Integration	---	BACnet WiFi Thermostats / BRAIN Integration	70 LED Fixtures	4.12 SF of Remediated Air Leakage	---
Palo Duro Fitness Center	1 Electric Submeter / BRAIN Integration	---	BACnet WiFi Thermostats / BRAIN Integration	62 LED Fixtures	---	---
Palo Duro Senior Center	1 Electric Submeter / BRAIN Integration	---	---	306 LED Fixtures	4.53 SF of Remediated Air Leakage	---
Pino Yards	1 Electric Submeter / BRAIN Integration	---	---	1,577 LED Fixtures	35.51 SF of Remediated Air Leakage	---
Reality Based Training Center (RBTC)	---	---	---	---	---	---
Sierra Vista Pool and Tennis Complex	1 Electric Submeter / BRAIN Integration	---	---	65 LED Fixtures	2.47 SF of Remediated Air Leakage	---
South Broadway Cultural Center/Library	1 Electric Submeter / BRAIN Integration	---	BACnet WiFi Thermostats / BRAIN Integration	---	4.33 SF of Remediated Air Leakage	690 kVA HE Low Voltage Transformers
Southwest Area Command (Shawn McWethy Substation)	1 Electric Submeter / BRAIN Integration	---	BACnet WiFi Thermostats / BRAIN Integration	163 LED Fixtures	3.23 SF of Remediated Air Leakage	---
Special Collections Library	1 Electric Submeter / BRAIN Integration	40-Tons HE Dual-Fuel Heat Pump Rooftop Packaged Units	BACnet WiFi Thermostats / BRAIN Integration	257 LED Fixtures	2.58 SF of Remediated Air Leakage	113 kVA HE Low Voltage Transformers
Taylor Ranch Community Center	1 Electric Submeter / BRAIN Integration	---	---	320 LED Fixtures	9.23 SF of Remediated Air Leakage	300 kVA HE Low Voltage Transformers
Taylor Ranch Library	1 Electric Submeter / BRAIN Integration	40-Tons HE Dual-Fuel Heat Pump Rooftop Packaged Units	BACnet WiFi Thermostats / BRAIN Integration	202 LED Fixtures	3.88 SF of Remediated Air Leakage	---
Tony Hillerman Library	1 Electric Submeter / BRAIN Integration	---	---	337 LED Fixtures	2.69 SF of Remediated Air Leakage	---
Training Academy	1 Electric Submeter / BRAIN Integration	---	---	487 LED Fixtures	9.92 SF of Remediated Air Leakage	---
Valley Area Command (Gerald Cline Substation)	1 Electric Submeter / BRAIN Integration	---	---	248 LED Fixtures	4.41 SF of Remediated Air Leakage	---
Valley Pool	---	---	---	---	---	---

FIM Cost Matrix

City of Albuquerque, NM

April 5, 2024

YEAROUT ENERGY

Site	Site No.	1 Submetering	2 HVAC Equipment	3 Building Automation System	4 LED Lighting	5 Building Envelope	6 HE Transformers	Total
Alamosa Community Center	01	---	---	---	---	---	---	$0
Albuquerque Government Center	02	$6,599	---	---	$567,881	$11,261	$364,482	$950,222
Alvarado Transportation Center	03	$6,599	---	---	$179,805	$23,768	---	$210,172
Animal Welfare Eastside Shelter	04	$6,599	---	---	$178,973	$19,339	---	$204,910
Arroyo Del Oso Golf	05	---	---	---	---	---	---	$0
Barelas Senior Center	06	$6,599	---	---	$121,240	$3,245	---	$131,083
Betsy Patterson Pool at Sandia High Sch	07	---	---	---	---	---	---	$0
BioPark (Zoo)	08	$6,599	---	---	$394,189	$44,251	---	$445,039
BioPark (Aquarium)	09	$6,599	---	---	$257,718	$23,599	---	$287,915
Broadway Vehicle Emissions (VPMD)	10	---	---	---	---	---	---	$0
City Hall (Old)	11	$6,599	---	---	$1,488,817	$153,009	$109,418	$1,757,842
Daytona Transit Center	12	$6,599	---	---	$650,360	$51,552	---	$708,511
East Central Health and Social Service C	13	$6,599	---	---	$58,530	$3,671	---	$68,799
Erna Fergusson Library	14	$6,599	---	$37,747	$125,044	$3,304	---	$172,694
Esperanza Bicycle Safety Education Cen	15	---	---	---	---	---	---	$0
Fire Academy	16	$6,599	---	---	$366,217	$12,221	---	$385,036
Fire Station 01	17	---	---	---	---	---	---	$0
Fire Station 05	18	---	---	---	---	---	---	$0
Fire Station 13 and Fire Arson	19	$6,599	---	$17,495	---	---	---	$24,093
Fire Station 17	20	$6,599	---	$7,498	$8,105	$8,502	---	$30,704
Fire Station 20	21	$6,599	---	---	$74,977	$15,535	---	$97,110
Fire Station 21	22	---	---	---	---	---	---	$0
Herman Sanchez Community Center	23	$6,599	---	---	$126,346	---	---	$132,945
Highland Pool	24	---	---	---	---	---	---	$0
Highland Senior Center	25	$6,599	---	---	$75,552	$5,142	---	$87,293
Holiday Park Community Center	26	$6,599	---	---	$76,232	$3,847	---	$86,678
Kimo Theater	27	---	---	---	---	---	---	$0
Law Enforcement Center	28	$6,599	---	---	$413,655	---	---	$420,254
Los Altos Golf Course/Well	29	$6,599	---	---	$38,606	$6,038	---	$51,242
Los Griegos Health and Social Service Ce	30	$6,599	---	---	$209,056	$4,454	---	$220,109
Main Library	31	$6,599	---	$1,129,280	$492,177	$15,832	$131,177	$1,775,064
Manzano Mesa Multigenerational Cent	32	---	---	---	---	---	---	$0
Metro Forensics Science Center (MFSC)	33	---	---	---	---	---	---	$0
North Valley Senior Center	34	$6,599	---	---	$121,109	$6,242	---	$133,950
Northeast Area Command (John Carrillo	35	$6,599	---	$17,495	$66,031	$4,075	---	$94,199
Open Space Visitors Center	36	$6,599	---	$24,993	$15,756	$5,731	---	$53,079
Palo Duro Fitness Center	37	$6,599	---	$7,498	$29,733	---	---	$43,830
Palo Duro Senior Center	38	$6,599	---	---	$106,275	$6,470	---	$119,344
Pino Yards	39	$6,599	---	---	$615,729	$56,274	---	$678,602
Reality Based Training Center (RBTC)	40	---	---	---	---	---	---	$0
Sierra Vista Pool and Tennis Complex	41	$6,599	---	---	$20,545	$2,912	---	$30,055
South Broadway Cultural Center/Library	42	$6,599	---	$27,492	---	$7,033	$111,650	$152,773
Southwest Area Command (Shawn McV	43	$6,599	---	$17,495	$75,905	$5,328	---	$105,326
Special Collections Library	44	$6,599	$406,188	$41,243	$87,753	$3,740	$20,329	$565,851
Taylor Ranch Community Center	45	$6,599	---	---	$109,590	$13,290	$47,740	$177,219
Taylor Ranch Library	46	$6,599	$405,860	$35,006	$83,451	$6,114	---	$537,030
Tony Hillerman Library	47	$6,599	---	---	$120,963	$3,793	---	$131,354
Training Academy	48	$6,599	---	---	$211,401	$12,785	---	$230,785
Valley Area Command (Gerald Cline Sut	49	$6,599	---	---	$128,570	$6,701	---	$141,870
Valley Pool	50	---	---	---	---	---	---	$0
Total		$237,553	$812,048	$1,363,240	$7,696,289	$549,055	$784,795	$11,442,980

Schedule of Values

City of Albuquerque, NM

7/25/24

FIM No.	FIM Name	Contract Amount	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Total
1	Submetering	$148,320	$14,832	$0	$0	$66,744	$66,744	$0	$0	$0	$0	$0	$0	$0	$0	$148,320
2	HVAC Equipment	$507,016	$50,702	$0	$0	$202,806	$76,052	$76,052	$50,702	$50,702	$0	$0	$0	$0	$0	$507,016
3	Building Automation System	$851,162	$85,116	$0	$0	$255,349	$85,116	$85,116	$85,116	$85,116	$42,558	$42,558	$42,558	$42,558	$0	$851,162
4	LED Lighting	$4,805,307	$480,531	$0	$1,441,592	$480,531	$480,531	$480,531	$480,531	$480,531	$240,265	$240,265	$0	$0	$0	$4,805,307
5	Building Envelope	$342,812	$34,281	$0	$102,844	$34,281	$85,703	$85,703	$0	$0	$0	$0	$0	$0	$0	$342,812
6	HE Transformers	$490,000	$49,000	$0	$147,000	$49,000	$98,000	$98,000	$49,000	$0	$0	$0	$0	$0	$0	$490,000
Investment Grade Audit (IGA)																
Investment Grade Audit (IGA)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Pre-Construction																
Design and Other Engineering		$159,880	$53,293	$53,293	$53,293	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$159,880
Pre-Construction Services		$217,537	$72,512	$72,512	$72,512	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$217,537
Other Pre-Construction Costs		$139,224	$46,408	$46,408	$46,408	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$139,224
Construction																
Construction Management		$534,686	$0	$0	$0	$53,469	$53,469	$53,469	$53,469	$53,469	$53,469	$53,469	$53,469	$53,469	$53,469	$534,686
Project Engineering		$72,020	$0	$0	$0	$7,202	$7,202	$7,202	$7,202	$7,202	$7,202	$7,202	$7,202	$7,202	$7,202	$72,020
General Conditions		$190,774	$0	$0	$0	$19,077	$19,077	$19,077	$19,077	$19,077	$19,077	$19,077	$19,077	$19,077	$19,077	$190,774
Construction Completion		$284,590	$0	$0	$0	$0	$0	$0	$0	$0	$0	$71,148	$71,148	$71,148	$71,148	$284,590
Other Construction Costs		$531,562	$0	$0	$0	$53,156	$53,156	$53,156	$53,156	$53,156	$53,156	$53,156	$53,156	$53,156	$53,156	$531,562
Profit | Contingency																
Profit		$927,489	$88,668	$17,221	$186,365	$122,161	$102,505	$95,831	$79,825	$74,925	$41,573	$48,688	$24,661	$24,661	$20,405	$927,489
Contingency		$324,621	$31,034	$6,027	$65,228	$42,757	$35,877	$33,541	$27,939	$26,224	$14,550	$17,041	$8,631	$8,631	$7,142	$324,621
Other Project Cost																
Program Administrator Fees		$105,270	$105,270	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$105,270
Taxes		$810,711	$84,763	$14,904	$161,287	$105,723	$88,712	$82,935	$69,084	$64,843	$35,979	$42,136	$21,343	$21,343	$17,659	$810,711
Total Billing		$11,442,980	$1,196,410	$210,367	$2,276,529	$1,492,256	$1,252,144	$1,170,613	$975,100	$915,245	$507,829	$594,739	$301,245	$301,245	$249,258	$11,442,980

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City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

SOURCES AND USES OF FUNDS

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Dated Date	09/13/2024
Delivery Date	09/13/2024

Sources:

Bond Proceeds:	
Par Amount	9,250,000.00
Other Sources of Funds:	
Cash Contribution	3,000,000.00
	12,250,000.00

Uses:

Project Fund Deposits:	
Project Fund	11,758,283.50
Other Fund Deposits:	
Capitalized Interest Fund	411,716.50
Delivery Date Expenses:	
Cost of Issuance	80,000.00
	12,250,000.00

BOND SUMMARY STATISTICS

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Dated Date	09/13/2024
Delivery Date	09/13/2024
Last Maturity	07/01/2042
Arbitrage Yield	3.548836%
True Interest Cost (TIC)	3.548836%
Net Interest Cost (NIC)	3.571050%
All-In TIC	0.857644%
Average Coupon	3.571050%
Average Life (years)	12.394
Duration of Issue (years)	9.959
Par Amount	9,250,000.00
Bond Proceeds	9,250,000.00
Total Interest	4,093,852.00
Net Interest	4,093,852.00
Total Debt Service	13,343,852.00
Maximum Annual Debt Service	1,164,912.00
Average Annual Debt Service	749,654.61
Underwriter's Fees (per $1000)	
Average Takedown	
Other Fee	
Total Underwriter's Discount	
Bid Price	100.000000

Bond Component	Par Value	Price	Average Coupon	Average Life	PV of 1 bp change
Bond Component	9,250,000.00	100.000	3.57105024%	12.394	8,953.45
	9,250,000.00			12.394	8,953.45

	TIC	All-In TIC	Arbitrage Yield
Par Value	9,250,000.00	9,250,000.00	9,250,000.00
+ Accrued Interest			
+ Premium (Discount)			
- Underwriter's Discount			
- Cost of Issuance Expense		-80,000.00	
- Other Amounts		3,000,000.00	
Target Value	9,250,000.00	12,170,000.00	9,250,000.00
Target Date	09/13/2024	09/13/2024	09/13/2024
Yield	3.548836%	0.857644%	3.548836%

BOND PRICING

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Bond Component	Maturity Date	Amount	Rate	Yield	Price
Bond Component:					
	07/01/2025		2.900%	2.900%	100.000
	07/01/2026	285,000	2.890%	2.890%	100.000
	07/01/2027	120,000	2.840%	2.840%	100.000
	07/01/2028	150,000	2.850%	2.850%	100.000
	07/01/2029	250,000	2.830%	2.830%	100.000
	07/01/2030	295,000	2.840%	2.840%	100.000
	07/01/2031	340,000	2.850%	2.850%	100.000
	07/01/2032	385,000	2.860%	2.860%	100.000
	07/01/2033	435,000	2.880%	2.880%	100.000
	07/01/2034	490,000	2.900%	2.900%	100.000
	07/01/2035	550,000	3.090%	3.090%	100.000
	07/01/2036	615,000	3.260%	3.260%	100.000
	07/01/2037	680,000	3.420%	3.420%	100.000
	07/01/2038	755,000	3.540%	3.540%	100.000
	07/01/2039	835,000	3.680%	3.680%	100.000
	07/01/2040	925,000	3.810%	3.810%	100.000
	07/01/2041	1,020,000	3.920%	3.920%	100.000
	07/01/2042	1,120,000	4.010%	4.010%	100.000
		9,250,000			

Dated Date	09/13/2024	
Delivery Date	09/13/2024	
First Coupon	01/01/2025	
Par Amount	9,250,000.00	
Original Issue Discount		
Production	9,250,000.00	100.000000%
Underwriter's Discount		
Purchase Price	9,250,000.00	100.000000%
Accrued Interest		
Net Proceeds	9,250,000.00	

BOND SOLUTION

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Period Ending	Proposed Principal	Proposed Debt Service	Total Adj Debt Service	Revenue Constraints	Unused Revenues	Debt Service Coverage
07/01/2025		253,364	253,364		-253,364	
07/01/2026	285,000	601,705	601,705	753,954	152,249	125.30%
07/01/2027	120,000	428,469	428,469	580,983	152,515	135.60%
07/01/2028	150,000	455,061	455,061	610,093	155,033	134.07%
07/01/2029	250,000	550,786	550,786	705,122	154,337	128.02%
07/01/2030	295,000	588,711	588,711	739,831	151,121	125.67%
07/01/2031	340,000	625,333	625,333	776,272	150,940	124.14%
07/01/2032	385,000	660,643	660,643	814,530	153,888	123.29%
07/01/2033	435,000	699,632	699,632	854,700	155,069	122.16%
07/01/2034	490,000	742,104	742,104	896,877	154,774	120.86%
07/01/2035	550,000	787,894	787,894	941,163	153,270	119.45%
07/01/2036	615,000	835,899	835,899	987,667	151,769	118.16%
07/01/2037	680,000	880,850	880,850	1,036,500	155,651	117.67%
07/01/2038	755,000	932,594	932,594	1,087,781	155,188	116.64%
07/01/2039	835,000	985,867	985,867	1,141,635	155,769	115.80%
07/01/2040	925,000	1,045,139	1,045,139	1,198,193	153,055	114.64%
07/01/2041	1,020,000	1,104,896	1,104,896	1,257,594	152,698	113.82%
07/01/2042	1,120,000	1,164,912	1,164,912	1,319,983	155,071	113.31%
	9,250,000	13,343,852	13,343,852	15,702,878	2,359,026	

BOND DEBT SERVICE

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Period Ending	Principal	Coupon	Interest	Debt Service	Annual Debt Service
01/01/2025			95,011.50	95,011.50	
07/01/2025			158,352.50	158,352.50	253,364.00
01/01/2026			158,352.50	158,352.50	
07/01/2026	285,000	2.890%	158,352.50	443,352.50	601,705.00
01/01/2027			154,234.25	154,234.25	
07/01/2027	120,000	2.840%	154,234.25	274,234.25	428,468.50
01/01/2028			152,530.25	152,530.25	
07/01/2028	150,000	2.850%	152,530.25	302,530.25	455,060.50
01/01/2029			150,392.75	150,392.75	
07/01/2029	250,000	2.830%	150,392.75	400,392.75	550,785.50
01/01/2030			146,855.25	146,855.25	
07/01/2030	295,000	2.840%	146,855.25	441,855.25	588,710.50
01/01/2031			142,666.25	142,666.25	
07/01/2031	340,000	2.850%	142,666.25	482,666.25	625,332.50
01/01/2032			137,821.25	137,821.25	
07/01/2032	385,000	2.860%	137,821.25	522,821.25	660,642.50
01/01/2033			132,315.75	132,315.75	
07/01/2033	435,000	2.880%	132,315.75	567,315.75	699,631.50
01/01/2034			126,051.75	126,051.75	
07/01/2034	490,000	2.900%	126,051.75	616,051.75	742,103.50
01/01/2035			118,946.75	118,946.75	
07/01/2035	550,000	3.090%	118,946.75	668,946.75	787,893.50
01/01/2036			110,449.25	110,449.25	
07/01/2036	615,000	3.260%	110,449.25	725,449.25	835,898.50
01/01/2037			100,424.75	100,424.75	
07/01/2037	680,000	3.420%	100,424.75	780,424.75	880,849.50
01/01/2038			88,796.75	88,796.75	
07/01/2038	755,000	3.540%	88,796.75	843,796.75	932,593.50
01/01/2039			75,433.25	75,433.25	
07/01/2039	835,000	3.680%	75,433.25	910,433.25	985,866.50
01/01/2040			60,069.25	60,069.25	
07/01/2040	925,000	3.810%	60,069.25	985,069.25	1,045,138.50
01/01/2041			42,448.00	42,448.00	
07/01/2041	1,020,000	3.920%	42,448.00	1,062,448.00	1,104,896.00
01/01/2042			22,456.00	22,456.00	
07/01/2042	1,120,000	4.010%	22,456.00	1,142,456.00	1,164,912.00
	9,250,000		4,093,852.00	13,343,852.00	13,343,852.00

BOND DEBT SERVICE

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Period Ending	Principal	Coupon	Interest	Debt Service
07/01/2025			253,364.00	253,364.00
07/01/2026	285,000	2.890%	316,705.00	601,705.00
07/01/2027	120,000	2.840%	308,468.50	428,468.50
07/01/2028	150,000	2.850%	305,060.50	455,060.50
07/01/2029	250,000	2.830%	300,785.50	550,785.50
07/01/2030	295,000	2.840%	293,710.50	588,710.50
07/01/2031	340,000	2.850%	285,332.50	625,332.50
07/01/2032	385,000	2.860%	275,642.50	660,642.50
07/01/2033	435,000	2.880%	264,631.50	699,631.50
07/01/2034	490,000	2.900%	252,103.50	742,103.50
07/01/2035	550,000	3.090%	237,893.50	787,893.50
07/01/2036	615,000	3.260%	220,898.50	835,898.50
07/01/2037	680,000	3.420%	200,849.50	880,849.50
07/01/2038	755,000	3.540%	177,593.50	932,593.50
07/01/2039	835,000	3.680%	150,866.50	985,866.50
07/01/2040	925,000	3.810%	120,138.50	1,045,138.50
07/01/2041	1,020,000	3.920%	84,896.00	1,104,896.00
07/01/2042	1,120,000	4.010%	44,912.00	1,164,912.00
	9,250,000		4,093,852.00	13,343,852.00

COST OF ISSUANCE

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Cost of Issuance	$/1000	Amount
Municipal Advisor - RBC	4.32432	40,000.00
Bond Counsel - Modrall Sperling	4.32432	40,000.00
	8.64865	80,000.00

PROOF OF ARBITRAGE YIELD

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Date	Debt Service	Present Value to 09/13/2024 @ 3.5488357457%
01/01/2025	95,011.50	94,014.10
07/01/2025	158,352.50	153,958.30
01/01/2026	158,352.50	151,274.07
07/01/2026	443,352.50	416,150.20
01/01/2027	154,234.25	142,247.01
07/01/2027	274,234.25	248,510.87
01/01/2028	152,530.25	135,812.91
07/01/2028	302,530.25	264,676.41
01/01/2029	150,392.75	129,281.00
07/01/2029	400,392.75	338,185.81
01/01/2030	146,855.25	121,876.52
07/01/2030	441,855.25	360,306.38
01/01/2031	142,666.25	114,307.45
07/01/2031	482,666.25	379,980.76
01/01/2032	137,821.25	106,608.60
07/01/2032	522,821.25	397,365.95
01/01/2033	132,315.75	98,812.15
07/01/2033	567,315.75	416,279.48
01/01/2034	126,051.75	90,880.44
07/01/2034	616,051.75	436,415.44
01/01/2035	118,946.75	82,793.62
07/01/2035	668,946.75	457,506.43
01/01/2036	110,449.25	74,221.51
07/01/2036	725,449.25	478,999.92
01/01/2037	100,424.75	65,152.42
07/01/2037	780,424.75	497,487.51
01/01/2038	88,796.75	55,617.26
07/01/2038	843,796.75	519,292.13
01/01/2039	75,433.25	45,613.99
07/01/2039	910,433.25	540,934.59
01/01/2040	60,069.25	35,067.94
07/01/2040	985,069.25	565,049.05
01/01/2041	42,448.00	23,924.23
07/01/2041	1,062,448.00	588,369.05
01/01/2042	22,456.00	12,219.01
07/01/2042	1,142,456.00	610,807.50
	13,343,852.00	9,250,000.00

Proceeds Summary

Delivery date	09/13/2024
Par Value	9,250,000.00
Target for yield calculation	9,250,000.00

FORM 8038 STATISTICS

City of Albuquerque, New Mexico
Energy Savings Revenue Bonds
07/22/2024 Preliminary Numbers

Dated Date	09/13/2024
Delivery Date	09/13/2024

Bond Component	Date	Principal	Coupon	Price	Issue Price	Redemption at Maturity
Bond Component:						
	07/01/2025		2.900%	100.000		
	07/01/2026	285,000.00	2.890%	100.000	285,000.00	285,000.00
	07/01/2027	120,000.00	2.840%	100.000	120,000.00	120,000.00
	07/01/2028	150,000.00	2.850%	100.000	150,000.00	150,000.00
	07/01/2029	250,000.00	2.830%	100.000	250,000.00	250,000.00
	07/01/2030	295,000.00	2.840%	100.000	295,000.00	295,000.00
	07/01/2031	340,000.00	2.850%	100.000	340,000.00	340,000.00
	07/01/2032	385,000.00	2.860%	100.000	385,000.00	385,000.00
	07/01/2033	435,000.00	2.880%	100.000	435,000.00	435,000.00
	07/01/2034	490,000.00	2.900%	100.000	490,000.00	490,000.00
	07/01/2035	550,000.00	3.090%	100.000	550,000.00	550,000.00
	07/01/2036	615,000.00	3.260%	100.000	615,000.00	615,000.00
	07/01/2037	680,000.00	3.420%	100.000	680,000.00	680,000.00
	07/01/2038	755,000.00	3.540%	100.000	755,000.00	755,000.00
	07/01/2039	835,000.00	3.680%	100.000	835,000.00	835,000.00
	07/01/2040	925,000.00	3.810%	100.000	925,000.00	925,000.00
	07/01/2041	1,020,000.00	3.920%	100.000	1,020,000.00	1,020,000.00
	07/01/2042	1,120,000.00	4.010%	100.000	1,120,000.00	1,120,000.00
		9,250,000.00			9,250,000.00	9,250,000.00

	Maturity Date	Interest Rate	Issue Price	Stated Redemption at Maturity	Weighted Average Maturity	Yield
Final Maturity	07/01/2042	4.010%	1,120,000.00	1,120,000.00		
Entire Issue			9,250,000.00	9,250,000.00	12.3935	3.5488%

Proceeds used for accrued interest	0.00
Proceeds used for bond issuance costs (including underwriters' discount)	80,000.00
Proceeds used for credit enhancement	0.00
Proceeds allocated to reasonably required reserve or replacement fund	0.00