Perfection Group
Celebrating over 65 years of Perfection!

August 8, 2017

Marshall County Fiscal Court
ATTN: Mr. Kevin Neal, Judge/Executive
1101 North Main Street
Benton, KY 42025

Dear Marshall County Fiscal Court:

The Perfection Group is pleased to submit this Energy Savings Performance Contract proposal to the Marshall County Fiscal Court. Our objective is to provide you with a unique approach to upgrading your facilities and infrastructure. These upgrades will result in energy-efficient and modernized facilities. We have worked diligently to understand each department's needs through this RFP process. As an established company, we take seriously the importance of gaining your business, and making sure this long-term partnership is successful for the Fiscal Court. We want to give a special thanks to Brad Warning, Emily Martin, and Gary Techenbrock for all their help throughout the development of this project. They have been instrumental in providing us with material, data, their time and facility expertise.

This response to your Request for Proposal was developed with implementation in mind. It is structured to give the Marshall County Fiscal Court a clear understanding of opportunities to address your building needs with sound data and supporting information to move forward. Remember this is *YOUR PROGRAM* - you ultimately pick and choose what *YOU* want to do. We are flexible in providing a scope of work and financial model that makes the most sense to you.

As you review the information enclosed in this Request for Proposal, we believe that you will agree that **The Perfection Group** is ideally suited to help you achieve your needs, both now and in the future. During this development process, we have provided our resources and time to produce this *fully detailed and engineered solution* for the Fiscal Court. We look forward to discussing our recommendations with you in further detail and in ultimately delivering excellent results to the county.

Respectfully,

Nick Roberts – Green Account Executive
Matt Callahan – Green Business Development Manager
Tony Apro – President/CRO Green Buildings Director

MARSHALL COUNTY
EST. 1842
COME TO RELAX • STAY TO EXPLORE

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

Perfection Group, Inc., with help from Fiscal Court personnel, has developed a 20 year facilities improvement program that meets many major needs of the County, and pays for itself with a substantial positive cash flow. We have identified a variety of individual projects across 7 county facilities, and have developed a fleet program that will significantly reduce the County's cost of operations.

Benefits of Working with the Perfection Group:
The Perfection Group is an experienced Performance Contracting Partner that provides a single point of contact for the county. Our team of experts has extensive knowledge of the Kentucky performance contracting legislation and the construction marketplace. **The team assigned to your performance contract brings 265 years of project management experience specializing in performance based contracting work.** Perfection Group has a very strong track record in Kentucky energy savings projects. We have worked with numerous Kentucky counties, cities and businesses over the past few years implementing and delivering successful projects. Five of our customers have received Energy Star Recognition after our projects were complete.

Proven Track Record:
Perfection Group has a proven track record with Energy Efficiency projects with County Governments in Kentucky, specifically Energy Savings Performance Contracts. We have served as the preferred vendor for nearly ***70%*** of the ESPC projects that have been completed by county governments in the state. In many of our projects, throughout our company footprint, we have provided multiple phases of Performance Contracts. The fact that our customers want to continue working with us over multiple phases speaks volumes about our level of service and commitment to our customers. We take great pride in our work, and our partnerships and that is the main reason for our success.

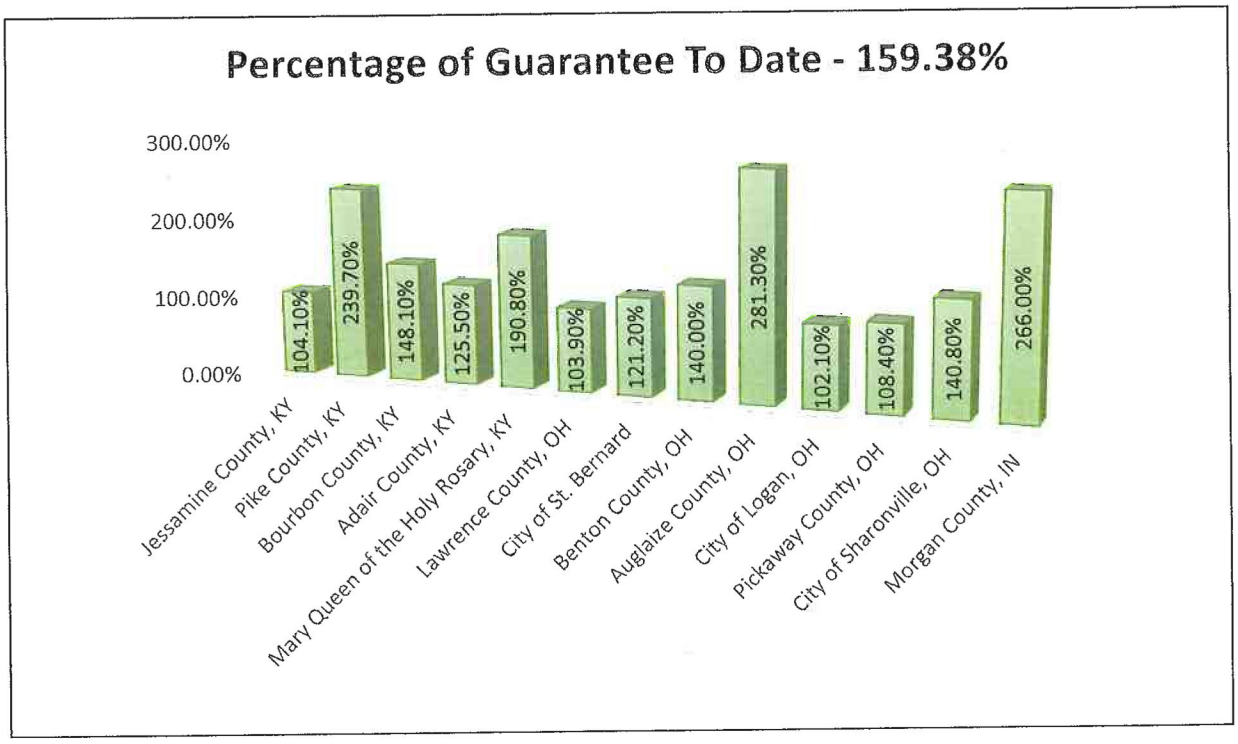
Self-Performance:
The Perfection Group can *self-perform* a majority of all the energy improvements. This allows us to apply a higher level of control during project implementation and deliver the results expected by our clients. We only have to subcontract out very few trades. However, we understand using local resources and vendors is important to the local economy. We work with our customers to identify if they have any preferred vendors before making any subcontractor selections. If they do not have a preferred provider for a specified type of work, we can recommend up to three vendors who we have worked with in the past and feel comfortable working with as part of our team.

1 EXECUTIVE SUMMARY

Self-performance is not only a benefit during the implementation of these ECM's, but post construction for the long-term, as well. Because Perfection Group has a highly-skilled service division, we can maintain and service Marshall County duration the duration of this program. Marshall County has a maintenance staff that takes care of many functions throughout the County's facilities, and we will supplement the maintenance staff to provide training and service to the more sophisticated systems.

Guaranteed Success:

Perfection Group can happily report that we have never missed a project guarantee. As the graph shows below, our realistic approach to providing accurate savings models coupled with advanced project management and delivery is the benchmark for our success. We have a dedicated team of qualified, certified and licensed engineers to provide all necessary reporting required by the state, the customer, our board of advisors, and banking and bonding entities.



Legendary Customer Service:

It is our mission to provide our customers with a level of customer service that is unmatched in the industry. Our customers are our most important stakeholders in our business and the lifeblood of our business. Only by satisfying our customers first do we have the opportunity to satisfy the needs of our other stakeholders. We want to meet or exceed their expectations on every partnership. We know by satisfying and delighting our customers they become advocates for our business. We serve our customers competently, efficiently, knowledgeably and with care.

1 EXECUTIVE SUMMARY

Project Management:

Project management is a vital part of The Perfection Group's ability to provide customer satisfaction to The Marshall County Fiscal Court. We excel in this area, and we are flexible enough to help you gain the full value this project offers. A key to consistent delivery of our projects is our attention to Project Management. At The Perfection Group, a Project Manager is provided as a single focal point with responsibility for the implementation phase of the project. The project manager has the ultimate responsibility to meet the customer's needs and expectations. The Perfection Group directly handles all aspects of the project management. The Project Manager will work closely with Marshall County designated representatives.

Effective Project Management applies people, communication skills, technical expertise, project knowledge, and management talent in a pro-active manner to ensure that the project is met on time, within budget, and at the quality expected by The Marshall County Fiscal Court. Our process is built upon the major functions of planning, designing, installing, commissioning, and successfully completing the project. These functions provide a foundation for a cohesive, effective mechanism to manage the scope of work, and assure completion on time, within budget, and with the quality we all demand. The Perfection Group has devised a very sophisticated project management system to be used on all of our projects.

Added Value:

Perfection Group goes above and beyond what is expected of a traditional ESCO with regards to Energy Savings Performance Contracting. We have included 3 years of Measurement and Verification into this program. We view this relationship as a long-term partnership, and with the investment made by the County, we feel that it is our duty to make sure the program is meeting the standards set forth by ourselves and our clients. In addition, we treat this response to the RFP as an **Investment Grade Audit**. This fully engineered, turn-key solution is buy ready and we do not intend for the Fiscal Court to pay for an investment grade audit after the vendor selection process. With that said, Perfection Group will not impose any penalties, financial or otherwise, on the County if a Contract Agreement cannot be met. As stated earlier, we view this relationship as a long-term partnership. Our company has the capabilities and expertise to be a service provider after construction, not just a liaison for ECM implementation.

Next Steps:

The Perfection Group welcomes the opportunity to discuss the concepts and recommendations described within this response with The Marshall County Fiscal Court in the near future. After selection of **The Perfection Group** as the preferred provider, The Perfection Group and both parties will mutually "Co-author" the final project utilizing energy, operational and capital cost avoidance savings to jointly craft the optimal scope of work for the final project. This is your project, and we are flexible in providing you the best solution.

2 GENERAL INFORMATION

To: Marshall County Fiscal Court

Brad Warning, Deputy County Judge/Executive

1101 Main Street

Benton, KY 42025

Re: Response to the Request for Proposals for Energy Savings Performance Contracting

Date: August 8, 2017

From: Nick Roberts

Firm Name: Perfection Group, Inc.

Address: 2514 Regency Road, Suite 105, Lexington, KY 40503

General Phone Number: (859) 361-3317

Contact Person: Nick Roberts

Title: Green Building Solutions – Account Executive

Phone: (859) 361-3317 **Fax:** (855) 879-8051

E-mail Address: nroberts@perfectiongroup.com

2.2 COMPANY PROFILE

Firm Name: Perfection Group, Inc.

Mailing and Physical Address: Corporate Office
2649 Commerce Boulevard
Cincinnati, Ohio 45241

Perfection Group, Inc. - Ownership Team

Anthony J. Apro	President / C.R.O.	(859) 421-9443
Jack Albrecht	C.E.O. / Chairman of the Board	(513) 354-2818
W. John Albrecht	VP– Mechanical Building Solutions	(513) 354-2885
Todd Albrecht	VP –Service Building Solutions	(513) 354-2811

Corporate Website: www.perfectiongroup.com

Submittal is for: Perfection Group, Inc.
2514 Regency Rd Suite 105
Lexington, KY 40503
(859) 885-1488

Business SIC Codes: 1711 Plumbing, Heating, Air Conditioning
1731 Electrical Work

Former Name(s) of Firm (if applicable)

Name: Perfection Services, Inc.

Address: 2649 Commerce Blvd., Cincinnati, OH 45241

Type of Firm

- ☑ Corporation
- ☐ Partnership
- ☐ Sole Proprietorship
- ☐ Joint Venture

Federal Employer Identification Number

31-1067245

2.2 COMPANY PROFILE

D. Corporate Background

1. **Years Under Present Name:** 12 years
2. **Former Names:** Perfection Services for 56 years.
3. **State Qualification:** Kentucky, Ohio, Indiana, West Virginia, Tennessee, Florida
4. **Lawsuit Involvement:**
   - ☐ Yes
   - ☑ No
5. **Construction Arbitration Involvement**
   - ☐ Yes
   - ☑ No
6. **National Relations Board or Similar Involvement**
   - ☐ Yes
   - ☑ No
7. **OSHA-Type Proceedings**
   - ☐ Yes
   - ☑ No
8. **Bankruptcy Involvement**
   - ☐ Yes
   - ☑ No

E. Attachments

F. Authorization

Dated at _____ this day of _____, 2016.

Name of Organization: _____

By _____ Title _____

2.2 COMPANY PROFILE

G. NOTARY STATEMENT

Mr./Ms. Matt Callahan being duly sworn deposes and says that

he/she is the GBS Manager of Perfection Group, Inc. and that

answers to the foregoing questions and all statements therein contained are true and correct.

Signed M P Callahan

Subscribed and sworn before me this 7th day of August, 2017.

Notary Public Benjamin A. Burch

My Commission Expires October 09, 2017.

NOTARY ID# 498151
BENJAMIN A. BURCH
NOTARY PUBLIC
STATE AT LARGE, KENTUCKY
MY COMMISSION EXPIRES OCT 9, 2017

2.3 A. General Qualifications
2. Personnel Information

Project History

Perfection Group has an extensive, successful track record with Energy Savings Performance Contracting, especially with County Governments in Kentucky. We take great pride in our long-term relationships with our clients, and fully understand that one bad reference can ruin a business. That is why we go above and beyond to provide Legendary Customer Service to make sure our customers are satisfied. Below are highlights of (5) projects done within the past 3 years in Kentucky and Ohio. See attached Case Studies for additional Project References.

Project Reference - Boyle County Fiscal Court

a. KRS 45a.352 – Energy Savings Performance Contract in Danville, Kentucky
b. Project Dates – 4/30/2015 – November 2015
c. Project Size – 3 buildings with total square footage of 77,200.
d. Project Dollar Amount – $2,843,549 total contract price
e. Source of Funds – KaCO Financing
f. Contract Terms – Guaranteed Savings for 15 years
g. Technical Design Personnel – Perfection Group Engineers
h. Project Schedule – Completed on Schedule
i. List of Improvements – Interior and Exterior Lighting, Retro-commissioning, HVAC, Building Automation Controls, Water Conservation
j. Projected Annual Savings – $505,138
k. Guaranteed Savings – $45,805
l. Comments – N/A
m. References –
    a. Harold McKinney – Judge/Executive
    b. hmckinney@boyleky.com
    c. Mary Conley – County Treasurer
    d. 321 West Main Street, Room 111
       Danville, Kentucky 40422
       (859) 238-1100

2.3 A. General Qualifications
2. Personnel Information

Project Reference - Carter County Fiscal Court

a. KRS 45a.352 – Energy Savings Performance Contract in Grayson, Kentucky
b. Project Dates – 1/6/2016 – June 2016
c. Project Size – 3 buildings with a total square footage of 54,716.
d. Project Dollar Amount – $1,755,373 total contract price
e. Source of Funds – Financed by KaCO
f. Contract Terms – Guaranteed Savings for 15 years
g. Technical Design Personnel – Perfection Group Engineers
h. Project Schedule – Completed on Schedule
n. List of Improvements – List of Improvements – Interior and Exterior Lighting, Retro-commissioning, HVAC, Building Automation Controls, Water Conservation, Fleet Program
i. Projected Annual Savings –
j. Guaranteed Savings – $34,105
k. Comments – Fleet program included
l. References –
    a. Mike Malone – Judge/Executive
    b. 300 West Main Street
       Room 227
       Grayson, KY 41143
    c. (606) 474-5366

Project Reference - Pulaski County Fiscal Court

a. KRS 45a.352 – Energy Savings Performance Contract in Somerset, Kentucky
b. Project Dates – 4/13/2016 – March 2017
c. Project Size – 10 buildings with a total square footage of 142,639
d. Project Dollar Amount – $4,560,782 total contract price
e. Source of Funds – Financed with KaCO
f. Contract Terms – 20 year Program with Guaranteed Savings
g. Technical Design Personnel – Perfection Group Engineers
h. Project Schedule – Completed on Schedule
o. List of Improvements – List of Improvements – Interior and Exterior Lighting, Retro-commissioning, HVAC, Building Automation Controls, Water Conservation, Fleet Program, Building Envelope
i. Projected Annual Savings –
j. Guaranteed Savings – $105,389
k. Comments – Fleet Program included
l. References –
    a. Steve Kelley – Judge/Executive skelley@pcgovt.com
    b. Joan Isaacs – Treasurer jiasaacs@pcgovt.com
    c. 100 N. Main Street
       Suite 202
       Somerset, Kentucky 42501
       Phone: 606-678-4853

2.3 A. General Qualifications
2. Personnel Information

Project Reference - City of Monroe

a. HB 420 - Energy Savings Performance Contract in Monroe, Ohio
b. Project Dates – 8/24/2014 – March 2015
c. Project Size – 6 buildings with a total square footage of 71,486.
d. Project Dollar Amount – $928,282 total contract price
e. Source of Funds –
f. Contract Terms – Guaranteed Savings for 15 years
g. Technical Design Personnel – Perfection Group Engineers
h. Project Schedule – Completed on Schedule
p. List of Improvements – List of Improvements – Interior and Exterior Lighting, Retro-commissioning, HVAC, Building Automation Controls, Water Conservation, Fleet Program
i. Projected Annual Savings – $142,330
j. Guaranteed Savings – $25,800 guaranteed savings
k. Comments – Fleet program included
l. References –
    a. William Brock, City Manager
    b. 513-539-7374
    c. brockb@monroeoh.org
    d. 233 South Main Street
    e. Monroe, OH 45050

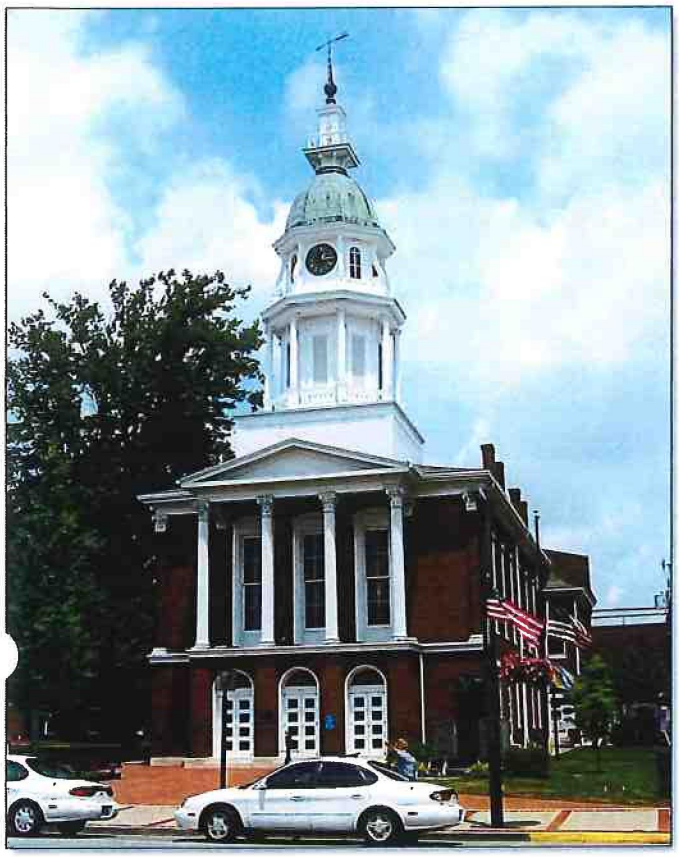
Project Reference - Clinton County

a. HB 420 – Energy Savings Performance Contract in Wilminton, Ohio
b. Contract Start Date – 6/29/2015 – March 2016
c. Project Size – 2 buildings with total square footage of 55,253
d. Project Dollar Amount – $5,229,539 total contract price
e. Source of Funds – Financed from local bank and upfront capital
f. Contract Terms – Guaranteed Savings for 15 years
g. Technical Design Personnel – Perfection Group Engineers
h. Project Schedule – Completed on Schedule
q. List of Improvements – List of Improvements – Interior and Exterior Lighting, Retro-commissioning, HVAC, Building Automation Controls, Building Envelope
i. Projected Annual Savings – 120,351
j. Guaranteed Savings – $69,432
k. Comments – Complete Courthouse restoration project
l. References –
    a. Mary Ann Foland, County Administrator
    b. mafoland@clintoncountyadmin.com
    c. 46 S. South Street
    d. Wilmington, OH 45177
    e. 937-382-2103

2.3 A. General Qualifications
2. Personnel Information

BOYLE COUNTY FISCAL COURT – KY

KRS 45A.352 Energy Savings Performance Contract



CHALLENGES

The county's aging infrastructure had many components that were in need of replacement, and were costly to maintain. This, coupled with rising utility costs, gave the Boyle County the opportunity to pursue Performance Contracting as a means to achieve their goals.

SOLUTIONS

The project covered upgrades to 5 facilities. Energy conservation measures that were incorporated consisted of the following:

- Lighting retrofits and occupancy sensors
- Installation of an energy-efficient multi-zone Variable Refrigerant Flow system at the Courthouse
- Insulated the Courthouse attic with efficient, long lasting blown-in insulation
- Centralized building automation systems
- Installed gas-fired generators at the Courthouse and Jail
- Retro-commissioned the refrigeration equipment at the Jail to increase efficiency and extend the system life-cycle
- Replaced (22) roof mounted package HVAC units at the Jail with high efficiency roof top units with economizers and

"I think this is a solution to a problem that has plagued the Courthouse for a long-time. The Perfection Group has been a great partner in identifying needs, and providing cost effective solutions to meet those needs."

PROJECT SUMMARY

LOCATION: Danville, Kentucky

PROJECT COST: $2,843,549

GUARANTEED SAVINGS: $45,805

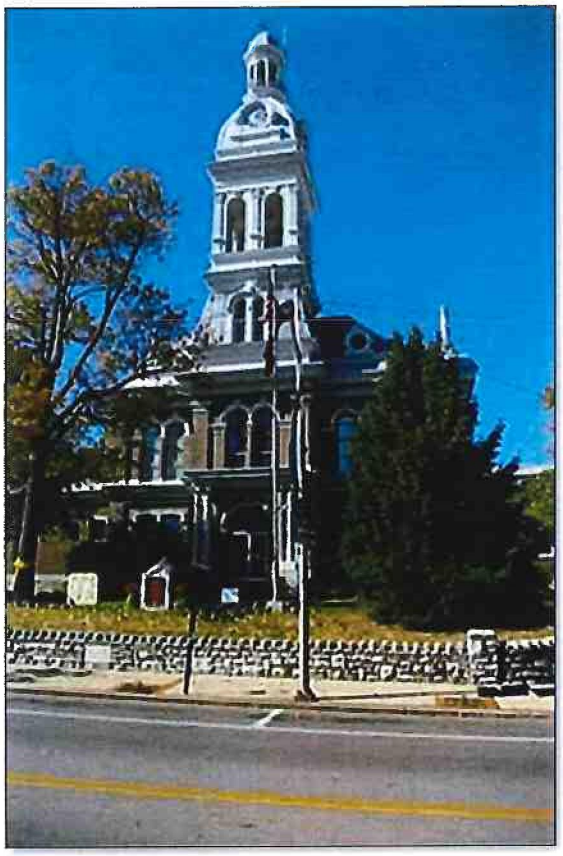
OTHER BENEFITS: Utility Rebates

Department For Local Government funded this ESPC project.

2.3 A. General Qualifications
2. Personnel Information

JESSAMINE COUNTY FISCAL COURT – KY

KRS 45A.352 Energy Savings Performance Contract



CHALLENGES

After being approached by Jessamine County to help them save money, Perfection Group performed an energy analysis and determined that the county had multiple savings opportunities due to the aging infrastructure in many of their facilities. Also, the traffic outside the courtroom made the windows rattle so bad that it was difficult to conduct court meetings.

SOLUTIONS

The project covered upgrades to 6 facilities. Energy conservation measures that were incorporated consisted of the following:

- Lighting retrofits and occupancy sensors
- New windows at the Courthouse
- Retro-commission existing HVAC systems
- Building automation at the Courthouse and Detention Center
- Water conservation at the Detention Center
- Replacement of boiler and chiller at the Courthouse

"Part of the project's positive cash flow savings can be used for additional energy savings improvements or other County projects, allowing us to continue to reap the benefits indefinitely."

- William Neal Cassity, Judge Executive

PROJECT SUMMARY

LOCATION: Nicholasville, Kentucky

PROJECT COST: $799,788.00

GUARANTEED SAVINGS: $53,000

OTHER BENEFITS: The Courthouse received an Energy Star award. Also 104% of guaranteed energy savings were achieved.

2.3 A. General Qualifications
2. Personnel Information

BOURBON COUNTY FISCAL COURT – KY

KRS 45A.352 Energy Savings Performance Contract

CHALLENGES

Bourbon County, located in the heart of Thoroughbred country, was looking for methods to reduce their energy and operational expenses. Although Bourbon County had made improvements to their facilities over the years, there was still potential for increased benefits from an Energy Savings Performance Contract. They also wanted to make these changes to offset the tax revenue loss from potential Industrial/Commercial businesses closing or migrating to other areas.

SOLUTIONS

The project covered upgrades to (7) facilities including: Courthouse, Judicial Center, Regional Jail, Road Department, Fire Department, Legion Park, and the Farmers Market. Energy conservation measures that were incorporated consisted of the following:

- Lighting retrofits and occupancy sensors
- New controls in the facilities
- Retro-commission existing HVAC systems
- Centralized building automation system
- Installed new overhead door at the Road Department
- Installed new windows at the Fire Department

"One of the things I loved about Perfection Group is that they provided the court with a solution for our facilities without any upfront engineering cost to the county."

- Mark Offutt, County Magistrate

PROJECT SUMMARY

LOCATION: Paris, Kentucky

PROJECT COST: $585,000

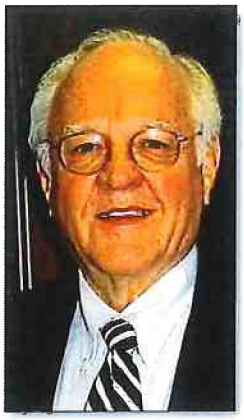
GUARANTEED SAVINGS: $21,000

OTHER BENEFITS: Perfection secured a $100,000 Energy Efficiency Grant from the Department for Local Government. The Courthouse won an Energy Star Award in 2016.

2.3 A. General Qualifications
2. Personnel Information

PIKE COUNTY FISCAL COURT – KY

KRS 45A.352 Energy Savings Performance Contract



"We have been looking for a long time to reduce our long-term energy costs. We dealt with two companies in the past, but neither could supply the fiscal court with the complete verification with savings and shelter for the county that Perfection could if there were to be a shortfall after the first year."

CHALLENGES

The county was paying nearly $600,000 annually in electric and gas, and utility costs were continually rising. Much of the aging infrastructure was costly to maintain.

SOLUTIONS

The project covered upgrades to 8 facilities including: (3) Courthouses, the Hall of Justice, multiple Community Centers, a Fire Department, the Animal Shelter, the Road Garage, and various street lighting. Energy conservation measures that were incorporated consisted of the following:

- Lighting retrofits and occupancy sensors
- Replacement of Cooling Tower, Boiler, Domestic Hot Water Boiler, various Split Systems
- Retro-commission existing HVAC systems
- Centralized building automation system
- Vending-mizer controls

PROJECT SUMMARY

LOCATION: Pikeville, KY

PROJECT COST: $1,300,000

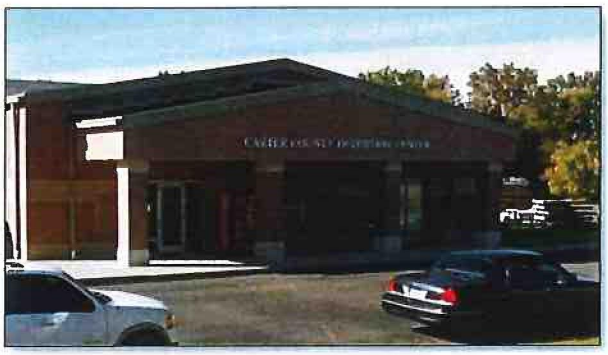
GUARANTEED SAVINGS: $65,000

OTHER BENEFITS: The Main Courthouse was awarded the ENERGY STAR AWARD. Year one savings were more than double after the first Measurement & Verification.

2.3 A. General Qualifications
2. Personnel Information

CARTER COUNTY FISCAL COURT – KY

KRS 45A.352 Energy Savings Performance Contract



"Our Detention Center is a very important source of revenue for Carter County, if we don't fix the HVAC it could jeopardize our state and federal inmate population and in turn lose much needed revenues. This ESPC will address just that and other important capital projects that need done throughout our facilities."

- Mike Malone, Judge Executive

CHALLENGES

The county's aging courthouse HVAC and the Detention Centers continuous HVAC failures led them to working with Perfection Group to help fix this problem. This, coupled with rising utility costs, gave the Carter County the opportunity to pursue Performance Contracting as a means to achieve their goals. The project construction is expected to being on March 1, 2016.

SOLUTIONS

The project is covering 3 facilities. Energy conservation measures that are being implemented are as follows:

- Lighting retrofits and occupancy sensors
- Installation of an energy-efficient multi-zone Variable Refrigerant Flow system at the Courthouse
- Centralized building automation systems
- Retro-commissioned the refrigeration equipment at the Jail to increase efficiency and extend the system life-cycle
- Replaced (30) water source heat pumps at the Detention Center with environmentally friendly R-410A refrigerant
- Implemented water conservation measures at the Jail by installing low flush combination units and showers
- Retro-fitting (9) county vehicles with Liquid Propane to achieve major fuel savings
- Implementing a Fleet Management Program to reduce operating costs on aged vehicles

PROJECT SUMMARY

LOCATION: Grayson, Kentucky

PROJECT COST: $1,755,373

GUARANTEED SAVINGS: $34,105

OTHER BENEFITS: Utility Rebates

Project to be completed: Nov. 2016

2.3 A. General Qualifications
2. Personnel Information

Pulaski County Fiscal Court

KRS 45A.352 Energy Savings Performance Contract

PROJECT SUMMARY

PROJECT COST: $4,560,782

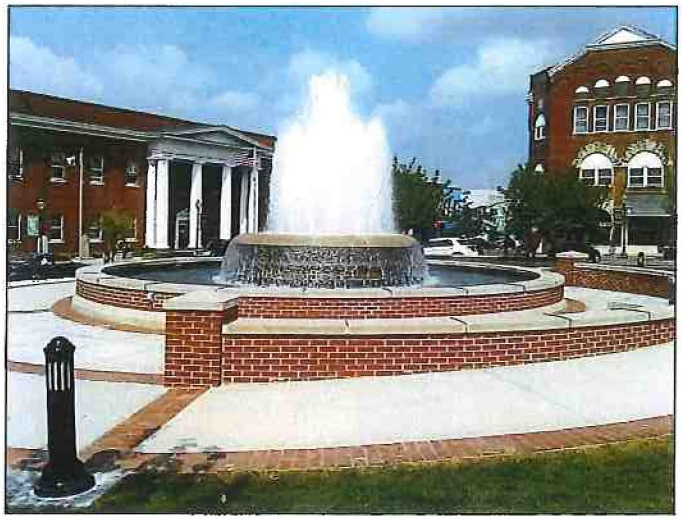
GUARANTEED ENERGY SAVINGS: $105,389

OPERATIONAL SAVINGS: $65,932

ALTERNATIVE FUELS SAVINGS: $50,094

"Perfection Group has gone through all of our facilities and found a way we can make updates including: roofing, lighting, and HVAC controls. It's a win-win for everybody. We desperately need upgrades here at the Courthouse, and there would be no way that we could come up with the monies to make these improvements and repairs that need to be done. We are going to be responsible by going green with better facilities."

-Steve Kelley, Judge Executive



SOLUTION: The project covered upgrades to 9 County Facilities and County Fleet solutions that drastically reduce the owning and operating costs to the county while providing brand new systems. Energy conservation measures that were incorporated consisted of the following:

- Lighting retrofits and occupancy sensors
- Replacement of mechanical systems including: Chiller, boilers, packaged rooftop units, and split systems.
- Centralized building automation system
- New roof at the Courthouse
- Water Conservation including: new combi-units and showers at the Detention Center, and low volume sinks and toilets
- Vending machine controls
- Fleet management, GPS, and Alternative Fuels

2.3 A. General Qualifications
2. Personnel Information

COMPANY HISTORY – THE PERFECTION GROUP

In 1951, Ed Albrecht founded the Perfection Heating Company to fill the growing need for qualified contractors who could convert coal-burning furnaces into gas-fired units in residences. He ran the business from the basement of his home and employed a field installation crew of less than 15 people.

In the 1970's Ed's son, Jack, became active in the business and quickly started influencing Perfection's future. Under Jack's vision Perfection began expanding into commercial mechanical installation projects. One of Perfection's first big commercial projects was the conversion of what was Kenwood Plaza (a retail strip center) into Kenwood Towne Center, one of Cincinnati's largest, and nicest, indoor shopping malls.

By the late 1980's, **The Perfection Group** had become one of the most respected commercial mechanical contractors in the Southern Ohio and Northern Kentucky. This expansion into commercial projects included design-build construction jobs and the installation of building automation systems. **The Perfection Group** focused on helping client's custom design HVAC systems that maximized building comfort and building operating efficiency. The growth of **The Perfection Group** over this time can be evidenced by the move of the business in 1989 to our current 26,450 sq. ft. office/warehouse located in Sharonville, OH.

During that same time frame, Jack also increased the focus on growing **The Perfection Group's** mechanical service business. In that 20 year period, with Jack's leadership, Perfection Service grew from one office in Cincinnati with a handful of service agreements to three offices located in Cincinnati, Lexington, and Louisville. By 1990, these three offices served over 2000 service customers.

In the 1990's **The Perfection Group** saw its mechanical and service businesses continue to grow both in size and geography. New service companies were opened in Knoxville, TN, Charleston, WV, Indianapolis, IN, Dayton, OH and Columbus, OH. This expanded **The Perfection Group's** foot print to include (9) eight major cities covering large portions of (6) different states – Ohio, Kentucky, Indiana, Tennessee, West Virginia, and Florida. During this decade, at the request of many of our customers, **The Perfection Group** also added electrical contracting and performance contracting to our capabilities. These complimentary services allowed **The Perfection Group** to self-perform larger and more complex projects. By the year 2000 **The Perfection Group** grew to be a $32 million company with approximately 200 associates.

Our success during this period was further evidenced by the regional and national awards The Perfection Group received on projects we did. The Perfection Group was awarded the top national award, the Flying Eagle Award of Excellence, by the Associated Builders and Contractors, Inc. (ABC) for projects The Perfection Group did in 1993 and 1997. The Perfection Group also received several regional and local awards from ABC and other organizations during this time, as well. Then, in 1999 The Perfection Group was awarded its first Ohio Governor's Award for Excellence in Energy Efficiency for the HB264 project we did with Princeton City Schools.

2.3 A. General Qualifications
2. Personnel Information

With the turn of the century **The Perfection Group's** focus changed from geographical growth to growing the business units established in the 1990's. **The Perfection Group's** performance Contracting and energy conservation business continued to be strong as indicated by the (3) three additional Ohio Governor's Award for Excellence in Energy Efficiency. The projects receiving the award included Reynolds and Reynolds (Dayton), The Regency Condo (Cincinnati), and the Melink Corporate Headquarters (Milford).

The 2000's have also seen the increasing roles and influence of Jack Albrecht's sons, John and Todd, on the business. **The Perfection Group's** focus on actively serving our local communities, along with being good environmental stewards, has increased with John and Todd's influence. The evidence of this can be seen in **The Perfection Group's** Mission Statement, Vision Statement, and list of Core Values that were developed as a result of a strategic planning process in 2006-2007 (see later in this section – The Perfection Group Corporate Profile). The reference to energy efficiency, "Green Building" and environmental stewardship in these three statements has been an increasing focus for **The Perfection Group** over the past several years. So much so, that **The Perfection Group** created a Green Building Solutions Team in 2008 comprised of some of **The Perfection Group's** most experienced and talented associates.

The Perfection Group's Green Building Solution's Division is solely focused on the design and implementation of energy conservation and sustainability initiatives for commercial facilities in Ohio, Indiana, Kentucky and Tennessee. **The Perfection Group** is currently working with public and private entities throughout this four state region to explore and implement "Green Building" solutions.

2.3 A. General Qualifications
2. Personnel Information

MISSION, VISION, AND VALUES – PERFECTION GROUP

MISSION

Founded in 1951, Perfection Group, Inc. is an industry leader that designs, installs, and services mechanical and environmental systems focusing on energy efficient facility operations for commercial, industrial and institutional customers.

VISION

We will be the best at educating and developing our associates.
We will be the best at providing Legendary Service.
We will be the best at designing and supporting green building solutions.
We will make a difference for our associates, our clients and our world by living up to our name.

CORE VALUES

Integrity
We believe in honesty, decency and fairness.
Mutual trust and respect drives all of our business.

Performance Excellence
There is no substitute for outstanding performance. We recruit and recognize associates who are both passionate and enthusiastic. We maintain a collaborative atmosphere where hard work and loyalty fortify our success. Individually and collectively, we take ownership and assume responsibility for our actions and results. We continually seek ways to recognize and celebrate excellence.

Legendary Customer Service
Our customers are our most important stakeholders in our business and the lifeblood of our business. Only by satisfying our customers first do we have the opportunity to satisfy the needs of our other stakeholders. We want to meet or exceed their expectations on every partnership. We know by satisfying and delighting our customers they become advocates for our business. We serve our customers competently, efficiently, knowledgeably and with care.

Profitable Growth
We are committed to profitable growth through a dedication to clear, aggressive and achievable financial performance goals. We are passionate about building and sustaining long term relationships with our associates and our customers.

2.3 A. General Qualifications
2. Personnel Information

Premier Safety Performance

We are committed to comprehensive safety education and awareness, perpetuating consistently safe behavior and preventing accidents so each employee feels respected and secure in their work and their daily responsibilities.

Personal and Professional Development

We are truly committed to having our associates be *the* experts in our industry.

We expect our associates to both utilize our resources for personal and professional development and seek additional opportunities for continuous learning and improvement.

Environmental Stewardship

We preserve our environment through innovative, sustainable designs which reduce energy consumption and costs enhancing the quality of life for our customers, our employees and our communities. Perfection is dedicated to protecting the environment in which we live and to conserving the natural resources we use. We conduct all business in concert with this commitment. *What's good for our earth is good for our business.*

Work Life Balance

We support our associates having a true balance between their commitment to their work responsibilities and a commitment to their personal lives. Balance supports harmony between our work and our homes.

2.3 A. General Qualifications
2. Personnel Information

PERFECTION GROUP, INC. – COMPANY PROFILE

Mechanical Solutions

- Mechanical Solutions
- Complete Design Build Services
- Engineering Support Services
- CAD/CAM/CAE Services
- Application Engineering
- Advanced Project Management
- Full Service Commissioning
- Professional Engineer Services

Service Solutions

- Energy Retrofits
- Predictive Maintenance
- Preventive Maintenance
- Asset Protection Planning
- 24 Hour Service
- 100% Service Accountability
- Perfect-Ware Tracking
- 160 Service Vehicles

Green Buildings

- Dedicated "Green' Team
- Complete Engineering Team
- Certified Energy Managers
- Self-Performance Solutions
- Proven ECM Services
- Proven Market Focus
- Sustainable Solutions
- Measurement & Verification

2.3 A. General Qualifications
2. Personnel Information

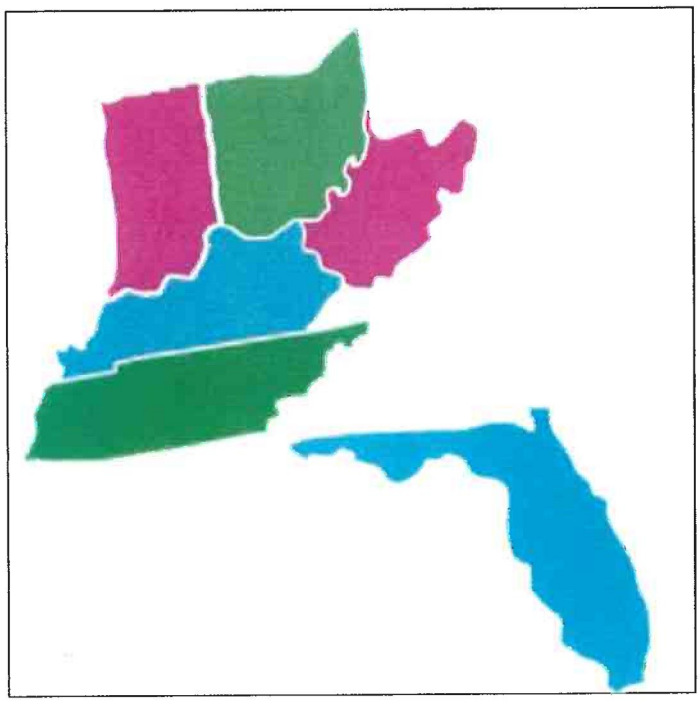
Ability to Self-Perform

As noted in previous sections, if chosen, Perfection will be the prime contractor for this Energy Conservation Project as detailed in this proposal. Perfection's current intent is to self-perform all mechanical and electrical energy conservation measures that are identified for implementation. The work that Perfection self-performs typically represents about 75% of the work performed in an energy conservation project. Perfection is able to self-perform this work because of our work-force. As a design build mechanical and electrical contractor, Perfection employs over 250 highly experienced and trained engineers, system designers, project managers, installers and service technicians. These individuals work for one of Perfection's seven business units listed below. Based on project size, requirements and complexity, Perfection will assign the necessary people and manpower (even shifting people within business units, if needed) to achieve the project requirements and expectations.

The following is a list of Perfection's business units:

Green Solutions Group

- Lexington, KY
- Cincinnati, OH
- Indianapolis, IN
- Knoxville, TN



Perfection Mechanical

- Cincinnati, OH

Northern Service Division

- Cincinnati, OH
- Dayton, OH
- Columbus, OH

Central Service Division

- Lexington, KY
- Louisville, KY
- Charleston, WV

Southern Service Division

- Knoxville, TN
- Nashville, TN
- Gainesville, FL

2.3 A. General Qualifications
2. Personnel Information

ANTHONY J APRO, SR. – PRESIDENT/CRO

A 22 year veteran of Perfection Group, Mr. Apro has spent the last 8 years as President of the company. In that time span the Perfection Group Ownership Group has focused on establishment and refinement of their Strategic Plan. With a defined Mission, Vision, Core Values and Strategic Goals in place Perfection Group is pleased to report attainment of measurable progress in all areas. More specifically Perfection Group has seen growth in their strategic areas of Base Business Growth, Geographic Expansion, Green Building Solutions Services and Leadership Development. Perfection is committed to both customer and associate satisfaction. Achieving success in both customer and employee retention, Perfection Group can boast long term relationships in both key areas.

Mr. Apro began his career in the industry after completion of his post graduate work in 1981. Anthony J. Apro Sr. resides in Nicholasville, Kentucky with his wife Jill Apro. A 34 year veteran of the industry, Mr. Apro is experienced in several areas including:

- Building High Performance Teams
- General Business Management
- Energy Solutions Performance Contracting
- Strategic Planning
- Customer Satisfaction
- Green Building Solution Services
- Building Automation & Controls
- Service & Construction Maintenance
- Leadership Development
- National Historic Preservation Society Member

EDUCATION
Centre College 1979
Danville, KY

Jniversity of Cincinnati 1981
Cincinnati, OH
Master's in Science

USC 1993
Los Angeles, CA
MBA Graduate

MEMBERSHIPS/TRAINING
Leadership KY 2013
Leadership KY Board 2015

PROJECTS CONSULTED

- Pike County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Bourbon County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Jessamine County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Adair County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Carter County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Boyle County Fiscal Court – Guaranteed Energy Savings Performance Contract

2.3 A. General Qualifications
2. Personnel Information

W. JOHN ALBRECHT, JR., P.E., CEM – PROJECT PRINCIPAL

Mr. Albrecht is responsible for design-build solutions including new construction, retrofits for existing buildings, and energy savings solutions for institutional customers. He oversees engineering for Perfection's Design Build and Green Engineering Departments and coordinates project management and operations for the Mechanical team. Mr. Albrecht resides in Cincinnati, Ohio with his wife Carol and two teenage daughters.

EDUCATION
Xavier University
Master's in BA

University of Cincinnati
Cincinnati, OH
Bachelor of Science
Electrical Engineering

MEMBERSHIPS/TRAINING
Professional Engineer (P.E.) registered in KY, OH, IN & TN
Member of ASHRAE
Certified Energy Manager (CEM)
Certified Green Building Engineer (GBE)
Certified Energy Auditor (CEA)
Certified Sustainable Development Professional (CSDP)

RELEVANT PROJECT EXPERIENCE

Boyle County Fiscal Court – Louisa, KY
Cash Flow and energy calculation for a Guaranteed Energy Savings Performance Contract under KRS 45A.352 totaling 2.8 Million Dollars across multiple buildings. Building upgrades at multiple locations including Lighting Retrofits, HVAC upgrades, Building Automation Controls Upgrades, Water Conservation Measures and Generators.

Jessamine County Fiscal Court – Nicholasville, KY
Cash Flow and energy calculations for a $850,000 Guaranteed Energy Savings Performance Contract under KRS 45A.352 across multiple buildings. Building upgrades at multiple locations including Lighting Retrofits, HVAC upgrades, Building Automation Controls Upgrades, and Water Conservation Measures.

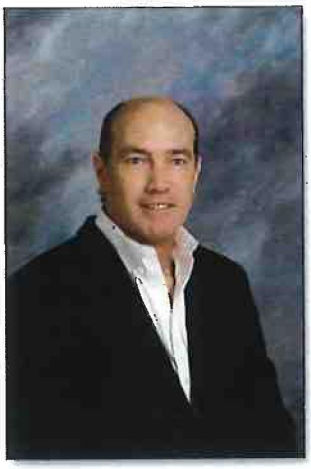
Bourbon County Fiscal Court – Paris, KY
Cash flow and energy calculation for a $435,000 Guaranteed Energy Savings Performance Contract under KRS 45A.352 across multiple buildings. Building upgrades at multiple locations including Lighting Retrofits, HVAC Upgrades, and Building Automation Control systems.

City of Athens – Athens, OH
Guaranteed Energy Savings Project including lighting, new control systems, retro-commissioning, and replacement windows at four facilities under Ohio House Bill 295 Project. Guaranteed savings were $49,431 annual.

City of Monroe – Monroe, OH
Cash flow and energy calculations for $928,000 energy conservation project including lighting, new control systems, retro-commissioning, replacement of HVAC equipment, roof replacements, street lighting, and a fleet management program as part of an Ohio House Bill 295 Project.

City of Saint Bernard – Saint Bernard, Ohio
Cash flow and energy calculations for $600,000 energy conservation project including new control systems, retro-commissioning, and replacement equipment upgrades for the City Building, Fire House, and Police facilities as part of an Ohio House Bill 420 Project. Total energy and operational savings were projected to be $60,000 per year. After the first year, the actual savings were over $72,000, representing over 120% of the annual goal.

2.3 A. General Qualifications
2. Personnel Information



MATTHEW P. CALLAHAN – GREEN BUILDINGS SOUTH MANAGER

Matt Callahan brings a history of management and leadership skills to Perfection Group. A Perfection veteran of over 12 years, Matt brings detailed experience in contract services negotiations, customer satisfaction, and general management of the Perfection Kentucky operation. Since 2012 Matt's efforts have been focused on the development and growth of the Green Buildings Solutions market in Kentucky.

With over 6 successful projects implemented in the municipal market in Kentucky, Matt has become an expert in project development, financing and cost benefit analysis. Matt and his family reside in Lexington, Kentucky with their five children.

EDUCATION
Centre College 1987

MEMBERSHIPS/TRAINING
Energy Services Coalition
Green Buildings KY Council
SP Group Maintenance Training
SP Group Bundled Solutions Training
SP Group Leadership Training
KLC Partner
KACo Cornerstone Partner

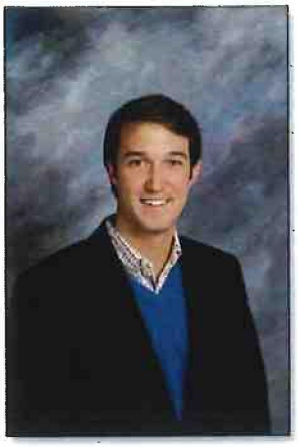
PROJECTS CONSULTED

- Pike County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Bourbon County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Jessamine County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Adair County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Carter County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Boyle County Fiscal Court – Guaranteed Energy Savings Performance Contract

BACKGROUND

- General Manager – Patent Plastics, Inc.
- Regional Manager – ITW Plexus
- Perfection Group – Maintenance Sales
- Perfection Group – Central Area Director
- Perfection Group – Green Buildings Solutions Manager
- Energy Services Coalition Member
- Green Buildings KY Council Member

2.3 A. General Qualifications
2. Personnel Information



ANDREW M. APRO – GREEN BUILDINGS SOLUTIONS ACCOUNT EXECUTIVE

Andrew Apro has been affiliated with the building management industry since an early age, having been brought up in the business. Upon graduation Andrew fulfilled a role as a contract services specialist focusing on reducing customer owning and operating costs. A natural progression to the Green Building Solutions Group occurred in early 2012. As part of the South Business Development Team, the focus on municipal, institutional and private sector projects has been a success for both Perfection Group and its customers.

Andrew and his wife Virginia reside in Lexington, Kentucky and are active in the community.

EDUCATION
Georgetown College 2007
Studied Business Administratior

University of Louisville 2009
BS Business Administration

MEMBERSHIPS/TRAINING
Energy Services Coalition
Green Buildings KY Council
SP Group Maintenance Training
SP Group Bundled Solutions Training
SP Group Leadership Training
KLC Partner

PROJECTS CONSULTED

- Pike County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Bourbon County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Jessamine County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Adair County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Carter County Fiscal Court – Guaranteed Energy Savings Performance Contract
- Boyle County Fiscal Court – Guaranteed Energy Savings Performance Contract

BACKGROUND

- Perfection Group – Technician Assistant
- Lane's End Farm – Barn Foreman
- Perfection Group – Contract Service Rep
- Perfection Group – Green Buildings Solutions Rep
- Perfection Group – Green Buildings Account Executive
- Energy Services Coalition Member
- Green Buildings KY Council Member
- KACo (KY Association of Counties) – Cornerstone Partner

2.3 A. General Qualifications
2. Personnel Information

NICHOLAS ROBERTS – GREEN BUILDINGS SOLUTIONS ACCOUNT EXECUTIVE

Nick Roberts has had a diverse and successful career since joining Perfection Group in 2010. Perfection strategy of maintaining legendary customer satisfaction is imbedded in the Customer Service Center in Louisville, KY. Nick assumed the assignment of moving this division to a high performance team in early 2011 and the measurement of customer retention has improved to legendary standards. Nick brought a distinct leadership skill and team building approach to the operation and instituted high level goals to sustain customer satisfaction. He moved into Green Buildings Business Development in January 2014 and has been involved with signature projects successful to both Perfection and the customer.

Specializing in municipal, institutional and private sector projects, Nick has become a leader in the Energy Services Market. A native of Pikeville, KY, Nick now resides in Lexington, KY with his wife and two sons.

EDUCATION
University of Kentucky - 2010
M.B.A

Georgetown College - 2007
B.A. Economics
B.A. Psychology

MEMBERSHIPS/TRAINING
Lean/Six Sigma Green Belt
Energy Services Coalition
Green Buildings KY Council
SP Group Executive Leadership Forum
SP Group Bundled Solutions Training
SP Group Leadership Training
KLC Partner
Leadership KY - 2016

Background:

- US Bank – Personal Banker
- Perfection Group – Customer Service Manager
- Perfection Group – Green Buildings Account Executive
- Energy Services Coalition Member
- Green Buildings KY Council Member
- KACo (KY Association of Counties) – Cornerstone Partner
- Six Sigma Green Belt Certification

Education:

- Georgetown College Graduate 2007
- University of Kentucky MBA Graduate 2010

2.3 A. General Qualifications
2. Personnel Information

MEMBERSHIPS/TRAINING
Commonwealth of KY
Journeyman HVAC Mechanic
Journeyman HVAC License
OSHA Safety Certification

WILLIAM LIPPERT – SENIOR PROJECT MANAGER

Mr. Lippert is in charge of total turnkey delivery of energy savings projects. He manages the delivery side and helps bring improvements to ensure legendary service to the customer. Mr. Lippert works with Project Managers to help facilitate these duties for the Service and Mechanical Divisions as well.

During his 28 years of service with Perfection, Mr. Lippert has held nine different positions including: Mechanical Installation, Mechanical Superintendent, Service Technician, Service Project Manager, Service Supervisor, Mechanical Project Manager, Service Manager, Area Operations Manager and currently, Operations Manager of Green Building Solutions.

RELEVANT PROJECT EXPERIENCE

Boyle County Fiscal Court – Louisa, KY
Project managed a Guaranteed Energy Savings Performance Contract under KRS 45A.352 totaling 2.8 Million Dollars across multiple buildings. Building upgrades at multiple locations including Lighting Retrofits, HVAC upgrades, Building Automation Controls Upgrades, Water Conservation Measures and Generators.

Jessamine County Fiscal Court – Nicholasville, KY
Project Managed an $850,000mGuaranteed Energy Savings Performance Contract under KRS 45A.352 across multiple buildings. Building upgrades at multiple locations including Lighting Retrofits, HVAC upgrades, Building Automation Controls Upgrades, and Water Conservation Measures.

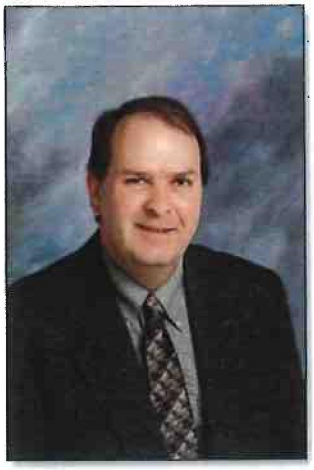
Bourbon County Fiscal Court – Paris, KY
Project managed a $435,000 Guaranteed Energy Savings Performance Contract under KRS 45A.352 across multiple buildings. Building upgrades at multiple locations including Lighting Retrofits, HVAC Upgrades, and Building Automation Control systems.

City of Athens – Athens, OH
Project managed Guaranteed Energy Savings Project including lighting, new control systems, retro-commissioning, and replacement windows at four facilities under Ohio House Bill 295 Project. Guaranteed savings were $49,431 annual.

City of Monroe – Monroe, OH
Project managed a $928,000 energy conservation project including lighting, new control systems, retro-commissioning, replacement of HVAC equipment, roof replacements, street lighting, and a fleet management program as part of an Ohio House Bill 295 Project.

City of Saint Bernard – Saint Bernard, Ohio
Project managed $600,000 energy conservation project including new control systems, retro-commissioning, and replacement equipment upgrades for the City Building, Fire House, and Police facilities as part of an Ohio House Bill 420 Project. Total energy and operational savings were projected to be $60,000 per year. After the first year, the actual savings were over $72,000, representing over 120% of the annual goal.

2.3 A. General Qualifications
2. Personnel Information



DAVID H. BLEVINS – ENGINEERING MANAGER GREEN BUILDING SOLUTIONS

Mr. Blevins is the engineering manager of the Perfection Group performance contracting team. With over 30 years of mechanical contracting, service and retro-commissioning experience, Dave brings a long history of energy retrofits and engineering to Perfection.

He is well known for expertise in the energy and controls areas performing energy audits on all types of facilities including savings calculations and Energy Star Ratings. With an extensive background in service and installation of mechanical and control systems finding energy conservation measures and developing energy projects is a natural fit. As a LEED accredited professional David has been instrumental in many LEED certified projects and is involved in design, specification, development and estimating for performance based energy and control projects.

Dave resides in Cincinnati, Ohio was his wife.

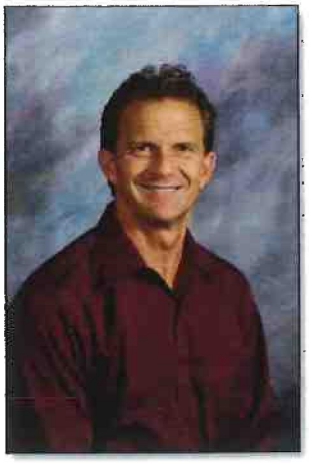
EDUCATION
University of Cincinnati
Cincinnati, OH

MEMBERSHIPS/TRAINING
LEED AP, O+M
Member of ASHRAE
Certified Energy Manager (CEM)
Certified Green Buildings Engineer (GBE)
KY Journeyman's License
Refrigeration Service Engineers Society
Association of Energy Engineers

RELEVANT PROJECT EXPERIENCE

- Pike County Fiscal Court – Kentucky
- Jessamine County Fiscal Court – Kentucky
- Adair County Fiscal Court – Kentucky
- Bourbon County Fiscal Court – Kentucky
- Carter County Fiscal Court – Kentucky
- Boyle County Fiscal Court – Kentucky
- Mary Queen of the Holy Rosary Church & School - Kentucky
- Morgan County – Indiana
- City of Martinsville - Indiana
- Pickaway County – Ohio
- Auglaize County – Ohio
- Lawrence County - Ohio
- City of St. Bernard – Ohio
- City of Athens – Ohio
- City of Monroe – Ohio
- City of Middletown – Ohio
- City of Sharonville – Ohio
- City of North College Hill – Ohio

2.3 A. General Qualifications
2. Personnel Information



GREG HORN – GREEN BUILDINGS ENGINEER

Mr. Horn has twenty-nine years of experience in mechanical contracting, system design, service and retro-commissioning. He utilizes his extensive expertise in mechanical systems and energy saving retrofit design to provide facility solutions throughout the region. With many years of service experience and problem solving,

Mr. Horn as the knowledge and experience to evaluate the operation of existing systems and recommend the best energy conservation measures for that facility. With his comprehensive approach, Mr. Horn has been instrumental in integrating many facility, control and mechanical systems to maximize energy savings.

Greg resides in Louisville, Kentucky with his wife. His two children attend the University of Kentucky.

EDUCATION
Ball State University
Muncie, IN

MEMBERSHIPS/TRAINING
Member of ASHRAE
Certified Energy Manager (CEM)
EPA Universal Refrigerant Certification
KY Journeyman's License
OSHA Safety Certification
Metrics Software Factory Trained

OSHA

metrix

RELEVANT PROJECT EXPERIENCE

- Pike County Fiscal Court – Kentucky
- Jessamine County Fiscal Court – Kentucky
- Adair County Fiscal Court – Kentucky
- Bourbon County Fiscal Court – Kentucky
- Carter County Fiscal Court – Kentucky
- Boyle County Fiscal Court – Kentucky
- Mary Queen of the Holy Rosary Church & School - Kentucky
- Morgan County – Indiana
- City of Martinsville - Indiana
- Pickaway County – Ohio
- Auglaize County – Ohio
- Lawrence County - Ohio
- City of St. Bernard – Ohio
- City of Athens – Ohio
- City of Monroe – Ohio
- City of Middletown – Ohio
- City of Sharonville – Ohio
- City of North College Hill – Ohio

2.3 A. General Qualifications
2. Personnel Information

MICHELLE MARKUS – PERFORMANCE CONTRACT ENGINEER

Michelle has worked extensively in Performance Contracting for over 9 years. She is responsible for performing energy engineering audits, identifying Energy Conservation Measures, developing scopes of work, modeling building energy use, calibrating energy baselines, detailed utility analysis, calculating energy savings, and development of Measurement & Verification protocols.

Michelle's background in Performance Contracting expands many markets, including K-12 School Districts, Higher Education, Laboratories, Municipalities, Government Facilities, and Correctional Facilities.

Michelle resides in Cincinnati, Ohio with her husband, Mike and their three children.

EDUCATION
The Ohio State University
Columbus, OH

MEMBERSHIPS/TRAINING
Engineer in Training (EIT)
Certified Energy Manager (CEM)
Association of Energy Engineers
Member of ASHRAE

RELEVANT PROJECT EXPERIENCE

- United States Coast Guard, Puerto Rico
- City of Holland, MI
- Veteran's Hospital – VISN 1
- Chambers County School District, AL
- Marshfield School District, WI
- Carteret County School District, NC
- University of Illinois
- Town of East Greenwich, RI
- Stevens Point Area School District, WI
- Mifflinburg Area School District, PA
- East Stroudsburg University, PA
- Pratt University, NY
- NC State University
- Jasper County Schools, AL
- Lakeland Union School District, WI
- Traver School District, WI
- Fort Huachuca, AZ

2.3 A. General Qualifications
2. Personnel Information

EDUCATION
Honorably Discharged member of the US Air Force with a course study in Instructional System Design (IST)

ITT Technical Institute – Associate of Arts Degree in Architectural Engineering

MEMBERSHIPS/TRAINING
Member of ASHRAE since 1985

Tim Myers – Sr. Project Manager
Mr. Myers has been involved in the design, installation and maintenance of HVAC, Plumbing, Electrical and Controls systems since 1984, providing to date 32 years of continuous experience to the construction/service industry. He has worked in both design and installation and has provided great insight into all phases of project development and implementation.

Mr. Myers is experienced in the training of Project Managers and providing state licensing training for Journeymen Mechanics. He led numerous Corrective Action Teams to resolve industry challenges and establish design and installation standards to maintain uniformity within the construction company. Mr. Myers has also been the leader on the assembly of estimates for numerous large projects.

RELEVANT PROJECT EXPERIENCE

Pulaski County, KY, Green Project
Provided Project Management of multiple sub-contractors, including General Trades, Roofing, Masonry Restoration, Electrical/Lighting, Plumbing, Audio/Video, Garage Doors, Crane/Rigging, Commercial Dishwasher, and Fire Alarm. Also managed in house Design and Installation teams for HVAC, and Controls. Project entailed installation of energy efficient systems and components for nine separate facilities with in the county.

UGN, Monroe, OH
Provided Design for base building and Design and Project management for multiple secondary projects to connect owner supplied process equipment. Worked closely with Corporate and Facility Management to develop maintenance procedures that would help eliminate plant down time due to equipment outages. Systems included High Pressure Steam, Chilled Water, Domestic Soft water, and Compressed Air.

VA Medical Center, Lexington, Ky.
Partnered with a local Engineer to provide design insight and manage the final controls scope revisions. Assisted the VA personnel with adjusting the scope to more precisely meet their needs and expectations. Assisted field personnel and Project Manager with engineering questions acting as the liaison between the field and Engineer.

Holiday Inn Hotel and Conference Center, Cincinnati, OH
Worked with the owner and Perfection Sales Staff to design a highly efficient Variable Refrigeration Volume System (VRF) for the guest tower. Also provided assistance to our Project Management Team during construction. This building has surpassed all expectations with regard to guest comfort and energy efficiency.

James H. Quillen VA Medical Center, Mountain Home, TN.
Partnered with a local Engineer on Design and Project Management of new Chiller Plant managing the installation and startup of the project utilizing field personnel and numerous subcontractors. The project also included a complete renovation of the HVAC and DDC Controls systems in the Nursing Home Facility.

2.3 A. General Qualifications
2. Personnel Information

Dick Vollrath Performance Contract Engineer

Mr. Vollrath has fifty years of experience in mechanical contracting, control system design, service and retro-commissioning. His experience in control and mechanical system's provides his clients with Facility solutions that reduce owning and operating expenses.

Mr. Vollrath has the experience to review current system equipment and operation to determine the most cost effective conservation measures for a wide variety of facilities. He has a proven track record of successful energy retrofit projects.

Dick Resides in New Carlisle Ohio with his wife Jan and are very active in their local Church.

Education
ITT technical Institute
Indianapolis Indiana

Memberships/Training
Certified energy Manager (CEM)
Business energy Professional (BEP)
Association of Energy Engineers

Relevant Project Experience

- Auglaize County Law enforcement center/Administration Building - Ohio
- Bexley City Schools – Ohio
- Celina Aluminum Precision Technology – Ohio
- Dayton Art Institute - Ohio
- Edison State Community College - Ohio
- Greater Dayton Surgery Center - Ohio
- Greenview Local Schools - Ohio
- HBC-II, LLC - Ohio
- Health Care Property Management of America - Ohio
- Lillibridge Healthcare Services - Ohio
- Mary Rutan Hospital - Ohio
- Oneil & Associates - Ohio
- Pickaway County - Ohio
- Wapakoneta City Schools - Ohio
- Wilmington City Schools – Ohio

2.3 A. General Qualifications
2. Personnel Information

Certifications & Qualifications

Perfection Group, Inc.

Engineering Permit **2282** **Current**

Expires: **12/31/2016**

This is to certify that the firm identified above has met the requirements of the law; is duly permitted and is entitled to practice as indicated in the Commonwealth of Kentucky until this permit expires.

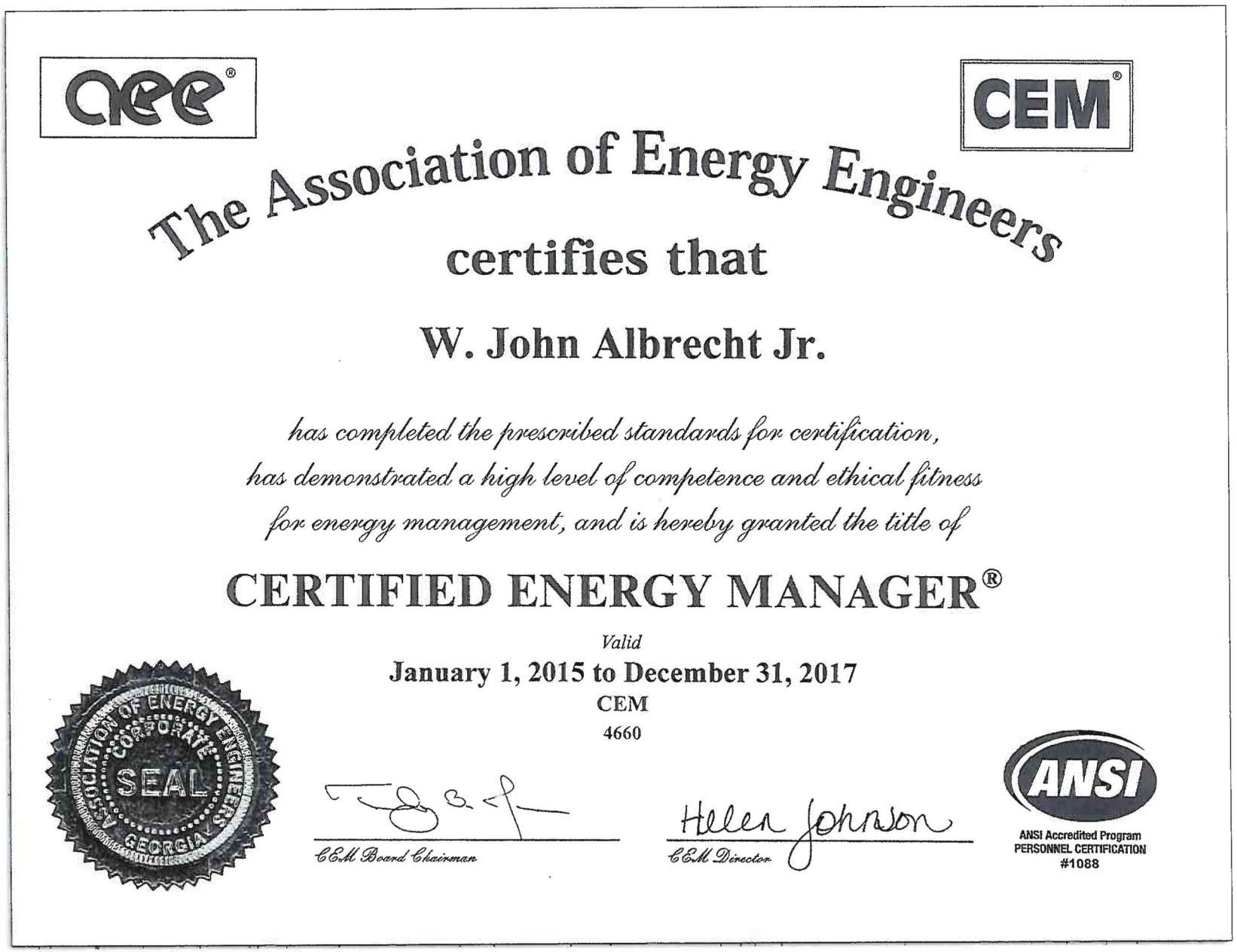
Secretary-Treasurer

William John Albrecht, Jr.

Professional Engineer # 22435 Current
Expires: 06/30/2019

This is to certify that the person identified above has met the requirements of the law' is duly licensed and is entitled to practice as indicated in the Commonwealth of Kentucky until this license expires.

Secretary-Treasurer



aee®

CEM®

The Association of Energy Engineers

certifies that

W. John Albrecht Jr.

has completed the prescribed standards for certification,
has demonstrated a high level of competence and ethical fitness
for energy management, and is hereby granted the title of

CERTIFIED ENERGY MANAGER®

Valid

January 1, 2015 to December 31, 2017

CEM

4660

ASSOCIATION OF ENERGY ENGINEERS CORPORATE SEAL GEORGIA

CEM Board Chairman

Helen Johnson

CEM Director

ANSI

ANSI Accredited Program
PERSONNEL CERTIFICATION
#1088

GBE™

CERTIFIED GREEN BUILDING ENGINEER

The Association of Energy Engineers

CERTIFIES THAT

W. John Albrecht Jr.

has completed the prescribed standards for certification, has demonstrated a high level of competence and ethical fitness for green building engineering, design, and construction and is hereby granted the title of

CERTIFIED GREEN BUILDING ENGINEER

GBE Board Chairman

Francine Dessi
GBE Director

December 31, 2017
Certification Expiration Date

238

ASSOCIATION OF ENERGY ENGINEERS CORPORATE SEAL GEORGIA

AWARDED BY:

aee®
The Association of Energy Engineers

The Association of Energy Engineers

certifies that

W. John Albrecht Jr.

has completed the prescribed standards for certification, has demonstrated a high level of competence and ethical fitness for the practice of sustainable development and is hereby granted the title of

CSDP Certified Sustainable Development Professional

Certification Expiration Date:

December 31, 2017

687

ASSOCIATION OF ENERGY ENGINEERS CORPORATE SEAL GEORGIA

CSDP Board Chairman

Francine Desbin

CSDP Certification Director

AWARDED BY:

aee®

CERTIFIED ENERGY AUDITOR

CERTIFIED ENERGY AUDITOR

The Association of Energy Engineers

CERTIFIES THAT

W. John Albrecht Jr.

has completed the prescribed standards for certification, has demonstrated a high level of competence and ethical fitness for energy auditing, and is hereby granted the title of

CERTIFIED ENERGY AUDITOR

Terry Nichus
CEA Board Chair

Francine Desir
CEA Certification Director

December 31, 2017
Certification Expiration Date

976

AWARDED BY:
The Association of Energy Engineers

ASSOCIATION OF ENERGY ENGINEERS CORPORATE SEAL GEORGIA

2.3 A. General Qualifications
2. Personnel Information

ASHRAE

Advancing HVAC&R to Serve Humanity and Promote a Sustainable World

1791 Tullie Circle, NE • Atlanta, GA 30329-2305 USA • Tel 404-636-8400 • Fax: 404-321-5478 • www.ashrae.org

Jeff H. Littleton
Executive Vice President
jlittleton@ashrae.org

Dear W:

Thank you for your continued commitment to ASHRAE.

We look forward to continuing to provide you with access to the latest technology and to the best and brightest minds in the industry. If there is anything we can do to improve on your benefits or to assist you, please don't hesitate to call. Enclosed are your membership card and a publications catalog. You can always find the most up-to-date ASHRAE information at ASHRAE.org.

Again, thank you. Your commitment helps strengthen our Society, allowing you and your fellow ASHRAE members to continue improving the quality of life around the world.

If you have questions about your membership, please call an ASHRAE customer service representative today at (800) 527-4723 (US/Canada) or (404) 636-8400 (International).

Sincerely,

Jeff H. Littleton

MBR# 8083168

ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

Name Mr W John Albrecht, Jr
Member since 7/1/2006
Membership grade Member
Paid thru 6/30/2010

1791 Tullie Circle, N.E. • Atlanta, Georgia 30329-2305 • 404-636-8400 • www.ashrae.org

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

AN INTERNATIONAL ORGANIZATION

Kentucky
UNBRIDLED SPIRIT

License No: KY1536

COMMONWEALTH OF KENTUCKY

DEPARTMENT OF HOUSING, BUILDINGS AND CONSTRUCTION
DIVISION OF PLUMBING
BOILER INSPECTION SECTION

BOILER CONTRACTORS LICENSE

This is to Certify that W JOHN ALBRECHT JR of PERFECTION GROUP INC has duly qualified for, and is hereby granted, a license to install, erect, and/or repair boilers - pressure vessels - pressure piping - and other related equipment in compliance with KRS 236 and the applicable Rules and Regulations published by THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

Issue Date: ***June 27, 2013***

Expiration Date: ***August 31, 2014***

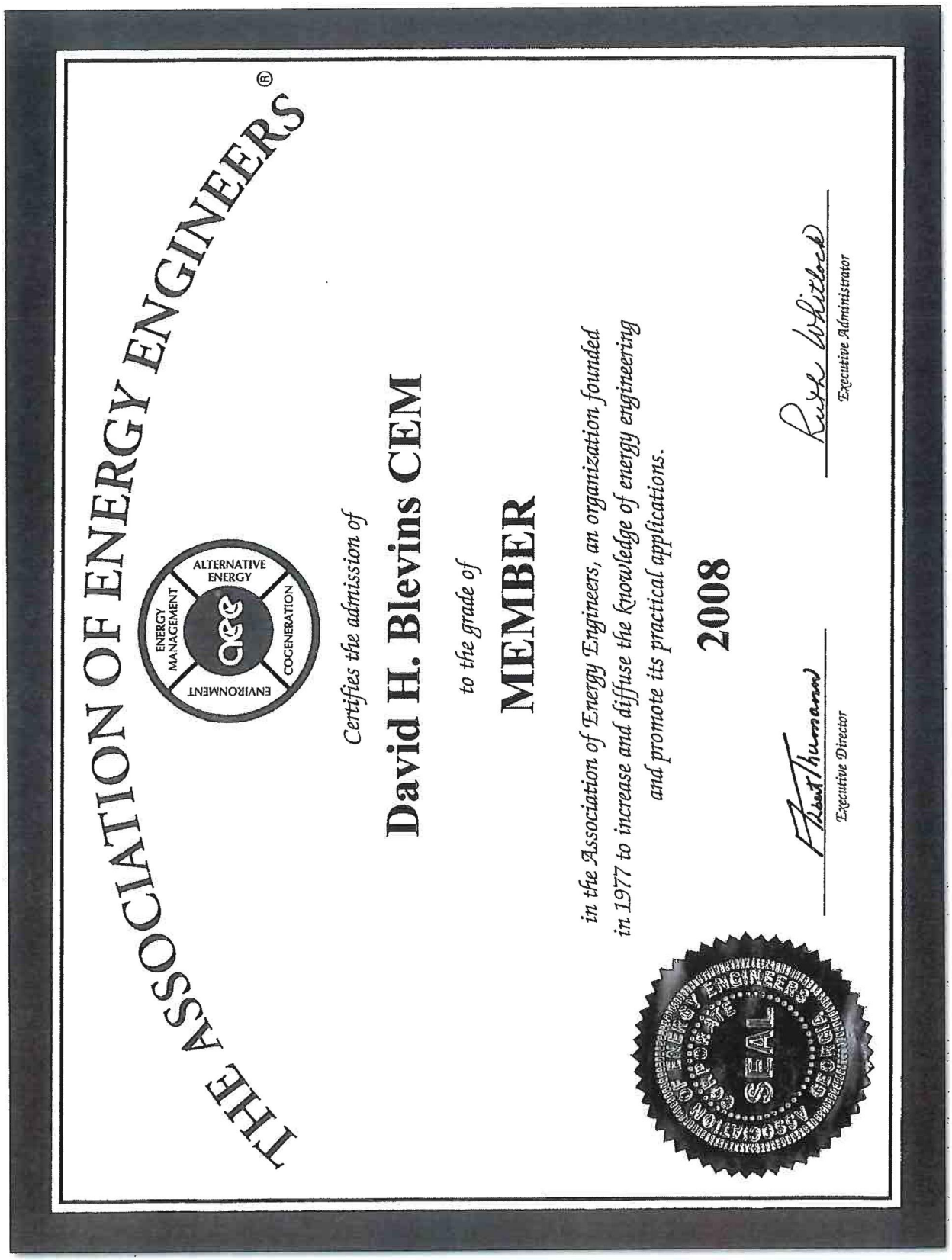
COMMONWEALTH OF KENTUCKY
UNITED WE STAND
DIVIDED WE FALL

Commissioner

Rodney Handy

Chief Boiler Inspector

2.3 A. General Qualifications
2. Personnel Information



THE ASSOCIATION OF ENERGY ENGINEERS®

ALTERNATIVE ENERGY · COGENERATION · ENVIRONMENT · ENERGY MANAGEMENT

Certifies the admission of

David H. Blevins CEM

to the grade of

MEMBER

in the Association of Energy Engineers, an organization founded in 1977 to increase and diffuse the knowledge of energy engineering and promote its practical applications.

2008

Executive Director

Executive Administrator

2.3 A. General Qualifications
2. Personnel Information

GBCI

GREEN BUILDING CERTIFICATION INSTITUTE

HEREBY CERTIFIES THAT

David Blevins

HAS ACHIEVED THE DESIGNATION OF

LEED® ACCREDITED PROFESSIONAL

BY DEMONSTRATING THE KNOWLEDGE OF GREEN BUILDING PRACTICE REQUIRED FOR SUCCESSFUL IMPLEMENTATION OF THE LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED®) GREEN BUILDING RATING SYSTEM™.

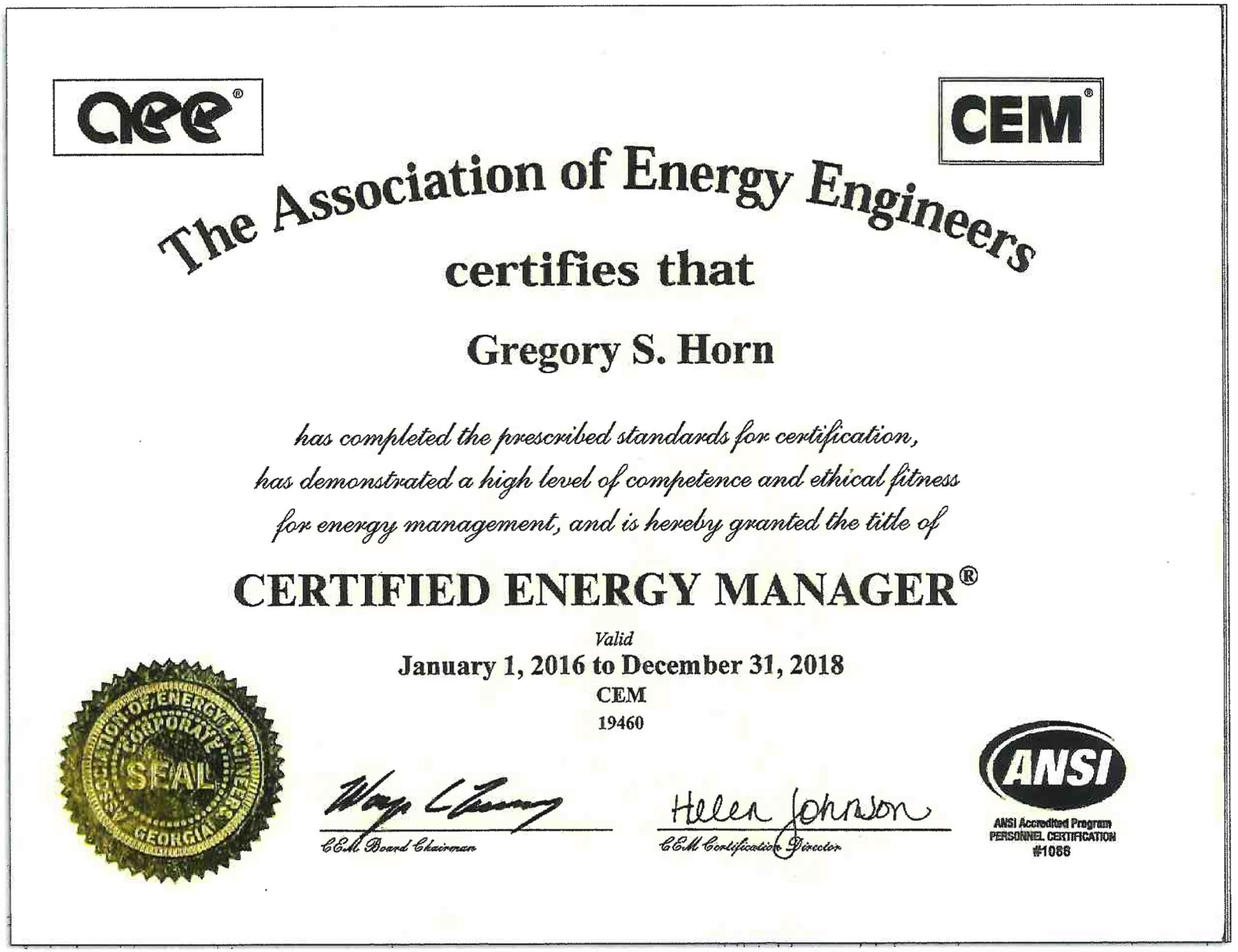
LEED AP

Chairman

April 17, 2009
Date Issued

Peter Templeton, President

Printed on 50% bamboo fibers / 50% post-consumer fibers with vegetable based inks



aee®

CEM®

The Association of Energy Engineers

certifies that

Gregory S. Horn

has completed the prescribed standards for certification,
has demonstrated a high level of competence and ethical fitness
for energy management, and is hereby granted the title of

CERTIFIED ENERGY MANAGER®

Valid
January 1, 2016 to December 31, 2018
CEM
19460

ASSOCIATION OF ENERGY ENGINEERS CORPORATE SEAL GEORGIA

CEM Board Chairman

CEM Certification Director

ANSI
ANSI Accredited Program
PERSONNEL CERTIFICATION
#1068

2.3 A. General Qualifications
2. Personnel Information

Commonwealth of Kentucky
Public Protection Cabinet
Department of Housing, Buildings & Construction
Division of HVAC
Frankfort, KY
WILLIAM J ALBRECHT
Kentucky Master HVAC Contractor
#HM03308
Perfection Group
Kentucky
Expires: 01/31/2017

2.3 A. General Qualifications
2. Personnel Information

E. Subcontractors

Perfection Group is committed to providing the best solutions to Marshall County Fiscal Court. Perfection Group has the ability to self-perform many Energy Conservation Measures in this proposal which provides the added value to the project. We have also developed relationships with strategic partners that are reliable and provide a cost effective solution to the customer. We also understand the importance of using ***local*** resources as much as possible to help drive the economy on a local level. We are open to using other resources and subcontractors provided that they meet our standards for project implementation, and construction requirements. Listed below are strategic partners we are using on this project:

LIGHTING PARTNER - **Lighting Services, Inc.** is a comprehensive lighting solutions company performing work nationally since 1998. Our mission is to reduce our customers operating costs while im[illegible]ing facility environments. For over a decade we've helped our customers by ***Converting Science into Savings.***

ROOFING MANUFACTURER - **The Garland Company, Inc.**, a leading manufacturer of high-performance roofing and building envelope solutions, offers a wide range of modified and built-up roofing (BUR) systems, sustainable solutions, architectural and structural metal options, and maintenance and restoration systems for new construction, retrofit, and renovation.

ROOFING CONTRACTOR – **Minter Roofing** is a local, industry leader in replacement, installation of premium roofing and gutter systems. The Benton company has completed many successful roofing projects in Marshall County, and is very active in the community.

WATER CONSERVATION PARTNER -

Comprehensive Turn-Key Cost and Savings Proposals

We will take our Detailed Facility Audit, facility population data, and historical usage data and develop a comprehensive Turn-Key Cost and Savings Proposal.

Complete Project Implementation

Our trained, certified Installation Technicians will install, commission and quality check the entire project. A complete equipment orientation for your client is included.

Accurate Measurement and Verification

We use a combination of off the shelf tools as well as our own proprietary equipment to record consumption data and produce an accurate M & V report.

2.3 GENERAL APPROACH

Project Services

Approach and Process

The Perfection Group follows a stringent process for identifying energy conservation measures to ensure that savings are "real" and verifiable. During the development of an energy program we divide the process into two distinct phases. The first phase is dedicated to evaluating and determining the historical energy consumption for the buildings as well as operating expenses in order to accurately establish the baseline from which future energy savings are measured and guaranteed. This is a critical component to the success of any energy performance program. The second phase of our assessment utilizes the information from the historical data and tailors an energy program that maximizes the potential savings to the district while making as many infrastructure upgrades that are economically feasible. Outlined below is a summary of the process we followed to evaluate and analyze the facilities.

Pre-Program Evaluation

Meet with client's key members: Discuss needs and direction of the potential project. We want to know what problems you face, what are your major barriers to over-come and what your priorities are. Determine how performance based contracting can fit into your long-term facilities plan.

Walk-through audit: Our audit team (in-house engineers) talk to associates, maintenance personnel, and officials about their building and what they would like to see improved. We examine all aspects of the facilities energy value chain. This includes the cost to "buy" energy, to "convert" it into a form for the facilities and to "dispose" of any waste energy or materials. We walk through your facilities to get a feel for how each building is operating and identify the potential for savings and comfort improvements. **We will take light level readings to make sure some areas are not over-lit while others are under-lit. We will also take carbon dioxide readings to make sure the building is receiving enough fresh air for the amount of people in it (or too much for too few people)**. As stated in your purpose for looking at performance contracting, we should *"provide better working conditions in the identified facilities".*

Audit energy bills: With the necessary energy bills, we analyze the operating characteristics of your facilities as they relate to energy consumption. Our analysis compares your operating costs to known standards and will normalize the data to account for weather effects from year to year. It is very important that we receive at least two years of energy bills to make the most accurate comparisons.

Review building prints: If available, we will have our in-house engineering department review all original building mechanical prints. We feel this is an important part of our investigation because we want to evaluate how the building was originally designed. This is important for two reasons. First, we can see what limitations the original systems have, so we know what changes are best suited for improvement. Second, we can see what changes have taken place over the years and can compare what the prints have to what we actually found on our survey.

2.3 General Approach

Review with engineering department: All of our survey findings are reviewed with the engineering department along with the building prints. This review meeting is very important because the engineering department is the one that must design and layout any new systems that will be recommended. The engineering group offers potential solutions to the various building problems or savings opportunities uncovered during the interviews or walk-through surveys.

Formulate ways to reduce costs: Once the initial building survey and engineering study is finished, we review what we have found and analyze ways to save money in the buildings. This team includes the original survey team, the energy bill audit team, the controls team, and the engineering team. This "team" covers all aspects for each area to ensure a complete and detailed study for each building. The unique ability to have all this talent in-house is invaluable to the performance contracting process. The Perfection Group does not need to out-source any engineering design work, so each building has the right amount of attention without "over-engineering" that adds to the cost of your project.

Estimate installed systems: Once the departments are finished with discussing the best systems to install to give the best building improvements and payback, our estimating team takes the designs and estimates the cost to install them. Being a mechanical contractor, we have devised sophisticated estimating procedures to quickly and accurately determine how much it costs to install almost every type of pipe or ductwork, HVAC system, or control system. The number of years of experience in our estimating department is very impressive. That is how we can provide our clients with multiple options to choose from, because we have simplified the estimating step and do not have to rely on sub-contractors to determine the price of different system designs.

Project energy savings: The Perfection Group has taken the time to simplify the methods we use to estimate energy savings. We have taken the complex formulas for determining energy savings and developed our own easier-to-use spread sheets. Many of these spreadsheets will be provided to you to show the basis of the various energy conservation measures. Our goal is to make it easier for our customers to understand how we intend to save energy, as well as, insures greater accuracy on our part. Also, these same spreadsheets are used in the manuals we put together as part of the savings guarantee, which will also be discussed in more detail in our Measurement and Verification (M&V) plan.

Verification meeting: As part of our process, we have a verification meeting with the appropriate personnel to make sure what we have accurately identified the M&V process required for each potential energy cost measure. We want to make the buildings more comfortable, but we want to do it in such a way that you will be happy with the proposed systems and designs.

Review recommendations with upper management: Many of our senior managers and associates have extensive backgrounds in performance contracting. They have a diverse knowledge of the controls and performance contracting market and are integrally involved with our projects to make sure the customer is receiving the best value for the dollar.

2.3 General Approach

Prepare the proposal and make recommendations: The last step in the process is to prepare a formal proposal and present our recommendations. The proposal is structured to cover all energy cost savings options so that you and The Perfection Group can work together to custom tailor the final program to meet the needs of your facilities.

Commissioning

Commissioning of installed equipment and systems is considered industry best-practice. Commissioning ensures that systems are designed, installed, functionally tested in all modes of operation, and are capable of being operated and maintained in conformity with the design intent (i.e., appropriate lighting levels, cooling capacity, comfortable temperatures, etc.). Benefits of commissioning include increased building comfort, reduced operational problems, lower installation costs, fewer contractor call-backs, and improved energy performance. Commissioning usually requires taking performance measurements to ensure that systems are working properly. Because of the overlap in commissioning and post-installation measurement and verification (M&V) activities, some people may confuse the two. The difference is that commissioning ensures that systems are functioning properly; post-installation M&V quantifies how well the systems are working from an energy standpoint.

The Commissioning Department at The Perfection Group is responsible for the start-up of the HVAC systems that The Perfection Group's mechanical division installs. Being a large commercial and industrial, as well as, design/build contractor, this department must be familiar with all types of equipment and their respective applications. To accomplish this, we employ six technicians with a combined experience of over 90 years, most of whom are long tenured associates of The Perfection Group. The Commissioning Group takes great pride in being responsible for the successful completion and turnover of all projects installed by The Perfection Group.

The commissioning process typically starts in the office. An equipment list accompanied by a sequence of operation is provided by the Engineering Department and turned over to the Project Manager and the Commissioning Supervisor. This is reviewed for accuracy and then all pertinent information is supplied to the technician(s) who will start the equipment. Detailed start-up sheets on all equipment are completed. Water and air balancing are performed and a balancing report is generated. On some projects, an independent testing and balancing company are part of the specifications and if so, would be on site at this time. When the building is ready for occupancy, or the systems are installed and ready for start-up, all equipment and related system components (belts, filters, strainers, etc.) are checked again and the system is put into automatic operation. Special attention is paid to temperature control, noise levels and aesthetics at this time. After the building is occupied, owner training and orientation are provided. A copy of the equipment manuals, start-up sheets and balancing reports will also be available.

Once the project is commissioned, the project moves into the "Monitoring and Verification" phase. As part of any energy program, The Perfection Group customizes a plan that minimizes costs while ensuring that all critical energy conservation measures are covered. The Perfection Group utilizes a monitoring and verification plan that follows the international protocol. Enclosed with this proposal is a sample copy of our Monitoring and Verification Plan.

2.3 General Approach

The Perfection Difference

- **Experience** — Our leadership team has been providing Energy Savings Performance Contracting services since the early-80's with the majority of our team members having over 28 years of experience. We are an industry leader in delivering successful Energy Savings Performance Contracts in the state of Kentucky.

- **Choice** — Because we are not an equipment manufacturer or a utility company, we have no motivation to push one particular design or product. We offer the best design and products to meet the needs of your facilities and can often provide the manufacturer based energy service company products at a lower cost than they are able. The future is fast approaching and we believe that in this time of great technological change no public entity should lock into any technology that prevents its systems from interacting with another. To that point we espouse using open architecture controls which allow a cost effective way to integrate existing and future building automation systems.

- **Service** — By using open equipment systems we avoid the added costs associated with proprietary equipment in your facilities with the expectation of requiring an expensive maintenance contract when complete. We train the in-house maintenance team and back them up with our experts who are available throughout the life of the system in person or via remote connections. Our intent is to help you maintain and support the HVAC & Control Systems to ensure maximum energy savings.

- **Price** — As an experienced Energy Savings Performance Contracting provider, Marshall County Fiscal Court can be assured that the final contract will include all associated costs for the project. **The Perfection Group** is responsible for completing the project on time and on budget. Unlike typical construction projects where change orders are the norm, **The Perfection Group** strives to eliminate change orders unless The County staff would request additional work outside of the agreed upon scope of work.

- **Local Team** – **The Perfection Group** is a Kentucky Incorporated company but we are committed to growing the economy of the counties where we work. Performance Contracting is quickly becoming a big business. Often our competitors are large ESCO's, and their guarantees are held by publicly traded companies, with home offices in distant states or foreign countries. **The Perfection Group** owners are present and available to The County staff and administrators.

- **Open Systems** — We are experts in the design and installation of "open" automated control systems. These systems give you the ability to pick and choose various components to assemble a temperature control system which is low cost and easy to operate and maintain. **The Perfection Group** is skilled in the design, programming, and commissioning of sophisticated building automation systems. Because these systems are the central force behind operating an efficient, comfortable and easy to maintain building, **The Perfection Group** brings valuable experience to Marshall County Fiscal Court. Our staff is experienced in the integration of various manufacturers of building automation systems. **The Perfection Group's** staff consists of building automation system veterans with experience on Honeywell, JCI, Delta, Alerton, Andover, Distech, Trane and others.

2.3 GENERAL APPROACH

- **Responsiveness** — We specialize in doing business with a variety of facilities throughout the state of Kentucky. Our reputation is the most important asset we own. We are committed to meeting whatever response time Marshall County Fiscal Court deems necessary for us to demonstrate our commitment to your facilities and people. We go the extra mile, just ask our customers.

- **On-Site Project Management** – **The Perfection Group's** Team brings time-tested management approaches to every project, which is critical to the stable and successful completion of each project. **The Perfection Group's** Team will develop a detailed Master Project Schedule integrating all components of the project including design, fabrication, delivery, and multiple construction phases of the project into one complete schedule. This integration of all phases of the project allows our management team to understand the relationships of the various phases of the project to each other.

- **Measurement and Verification** – **The Perfection Group** has an innovative measurement and verification technology designed to lower the ongoing cost to gather and measure energy use. This **Perfection Group** tool allows our customers to gather facility equipment profiles via a web-based application. The data is analyzed by software to present reports including average daily profiles, equipment operation runtimes, base line comparisons, point trending, and summary reports. The result is a lower cost method for Marshall County Fiscal Court to track true ongoing results.

Project/Construction Management

Project management is a vital part of The Perfection Group's ability to provide customer satisfaction to The Center. We excel in this area, and we are flexible enough to help The Fiscal Court gain the full value that a Performance Contract offers. As described throughout this response, we will work to establish a plan and then work that plan for exceptional results.

A key to consistent delivery of our systems and services is our attention to Project Management. At The Perfection Group, a Project Manager is provided as a single focal point for all contracts with responsibility for the implementation phase of the project. The Project Manager will work closely with The Center designated representatives. This Project Manager will maintain a presence for the duration of the project. The Perfection Group directly handles all aspects of the project management.

Effective Project Management applies people, communication skills, technical expertise, project knowledge, and management talent in a pro-active manner to ensure that our contract commitments are met on time, within budget, and at the quality expected by The Fiscal Court.

Our process is built upon the major functions of planning, designing, installing, commissioning, and successfully completing the project. These functions provide a foundation for a cohesive, effective mechanism to manage the scope of work, and assure completion on time, within budget, and with the quality we all demand.

Below is an overview of our approach to managing the project. If selected, we will design a preliminary time-line showing the necessary activities and schedule for implementation of the project.

2.3 General Approach

The Perfection Group has devised a very sophisticated project management system to be used on all of our projects. The project manager has the ultimate responsibility to balance the customer's needs and expectations with the need to insure that we meet our cost and delivery projections. Bill Lippert will be the Senior Project Manager dedicated to Energy Savings Project. With an extensive history in Project Management, Bill Lippert brings years of knowledge and experience in implementing Energy Savings Performance Contracts in the State of Kentucky and has already been involved with this project design.

At The Perfection Group, the project management function is a team concept. Many people have input into a project and the various functions that need to be coordinated for a successful project. With all of the reporting and documentation we have, everyone involved with the project - sales, engineering, other project managers, management, etc., are all "up to speed" on every project.

The Perfection Group's Green Solutions Team and Mechanical Group work closely together on all of the activities associated with the initial design and engineering of the project, including all of the CAD drawings, engineering calculations, etc. Once design is complete, the project is run through our computerized estimating system to determine the costs of the project. The Perfection Group's Green Solutions Team is responsible for all of the cost savings projections, assembling the proposal documentation, customer contacts and managing the entire sales process. Once a project is agreed to by the customer, then The Perfection Group team will work with the customer's management team to finalize project scope, draw up final contract documents, and coordinate any final financing issues.

A lot of people provide value to our performance contracting projects. We all work well as a unified team to our customers. Many departments interact to provide a total solution to our customers. The various departments are invisible to our customers - they only know that The Perfection Group is working in their best interest. In the case of Perfection Group, all of these functions are completed with in-house personnel. **Well over 75% of all of our projects are completed with in-house capabilities!**

Monitoring and Verification

The potential to generate savings may be verified through spot/short-term metering and inspections conducted immediately before and immediately after installation. Annual (or some other regular interval) inspections must be conducted to verify that the proper equipment/systems are installed and the equipment/systems are performing to specification. If conditions have changed, additional performance period measurements or non-routine adjustments may be appropriate.

Collecting comprehensive baseline data is critical to the success of the M&V plan. All data collected do not necessarily need to be incorporated into the model, but may be included to meet specific model accuracy requirements. All collected information and inputs need to be documented in a format that allows due-diligence review.

- Utility bill records: Collect a minimum of 12 (and preferably 24, 36, or 48) consecutive months of utility bills for the months immediately before installation of the ECMs. The billing data should include meter read date, kWh consumption, peak electric demand, and heating fuel use (e.g., natural gas). Additional data in hourly and 15-minute formats may be required.

2.3 General Approach

- Architectural, mechanical, and electrical drawings: as-built drawings are preferred.
- Site survey data: Comprehensive equipment and system data, typically collected during an investment grade audit, including:
- HVAC systems: primary equipment (e.g., chillers and boilers): capacities,
    - Number, model and serial numbers, age, condition, operating schedules, etc.
- HVAC systems: secondary equipment (e.g., air-handling units, terminal boxes): characteristics, fan sizes and types, motor sizes and efficiencies, design-flow rates and static pressures, duct-system types, economizer operation, and type of controls.
- HVAC system controls, including location of zones, temperature set-points, control set-points and schedules, and any special control sequences.
- Lighting systems: number and types of lamps, with nameplate data for lamps and ballasts, lighting schedules, etc.
- Building occupants: population counts, occupation schedules in different zones.
- Other major energy-consuming loads: type (industrial process, air compressors, water heaters, elevators), energy consumption, schedules of operation.

In general, the procedure for determining energy savings is as follows:

- Develop and validate an appropriate baseline model relating the baseline energy use during normal operations to key independent variables.
- Install ECMs and continuously measure the independent variables used in the baseline model. Along with any additional variables that may be needed for performance period model development.
- Using the baseline model, estimate what the energy use would have been without the ECMs by driving the baseline model with the performance period weather or other independent variables.
- Calculate savings by comparing the predicted baseline energy use with the actual energy use of the performance period.

2.3 GENERAL APPROACH

Savings Calculations

Total Savings. The "Total Savings" to Marshall County Fiscal Court shall consist of (a) energy cost reductions resulting, among other things, from electric energy use and demand reduction, natural gas use reduction, and other fuel and water savings resulting from the ECMs; (b) operating cost reductions, including labor, materials, and contracted services cost reductions, resulting from the ECMs; and (c) capital avoidance savings; and (d) any other savings mutually agreed upon by the Parties.

Stipulated Values and Rates. For purposes of calculating Total Savings, "Stipulated Values" shall mean the agreed values for variables such as equipment run time, flow rates, labor costs, machine loading, and other values agreed to by Marshall County Fiscal Court that may be uneconomical to monitor precisely and are specifically stipulated by The Center and Perfection in lieu of direct measurement. In addition, Total Savings shall be calculated based upon rates and rate schedules for electricity, natural gas, other fuels, water and production output in effect at the time of the applicable Performance Contract.

Adjusted Savings. Where Perfection Group furnishes or arranges for ongoing maintenance relating to ECMs, Perfection may provide for periodic verification of Total Savings (excluding the portions of Total Savings based on Stipulated Values). Such verification will determine actual Total Savings for the most recent previous 12 months for which data are available ("Adjusted Savings") and Perfection Group will report the Adjusted Savings to Marshall County Fiscal Court. Based on the results of the periodic verification, the Total Savings set forth in the Performance Contract, beginning with the next month, will be adjusted to reflect the most recently verified Adjusted Savings.

Savings Calculation Methodology

The calculation method to determining savings was done with eQuest computer modeling software. eQuest is an hourly, whole-building simulation program provided by the Department of Energy. It receives user-defined inputs such as building characteristics, lighting, equipment, occupancy, heating and cooling systems, and hourly weather data. The simulation output is a monthly summation of energy usage in terms of electricity and fuel/natural gas.

The monthly simulation output is compared to the weather normalized utility baseline. Calibration of the model to the utility baseline is performed through an iterative process by modifying the model inputs and repeating the simulation process. Once the model output data follows closely with the baseline utility data, energy conservation measures can then be simulated.

Energy conservation measures are simulated by targeting and modifying certain parameters, then re-running the simulation. The model results are then compared to the results of the baseline run in order to calculate the difference in energy usage. The figures and tables below illustrate the output from the model, and the calibration to the utility baseline.

O&M and Other Related Savings

Operations & Maintenance and other energy-related cost savings are allowable in Energy Savings Performance Contracts (ESPCs), and are defined as reduction in expenses (other than energy cost savings) related to energy and water consuming equipment. Energy-related cost savings can result from avoided expenditures for operations, maintenance, equipment repair, or equipment replacement due to the ESPC project. This includes capital funds for projects (e.g., equipment replacement) that, because of the ESPC project, will not be necessary. Sources of energy-related savings include:

- Avoided current or planned capital expense.
- Transfer of responsibility for O&M and/or equipment repair and replacement (R&R) to The Perfection Group.
- Avoided renovation, renewal, or repair costs as a result of replacing old and unreliable equipment.

Maintenance Contracts & Other Services

As part of this energy conservation project, The Perfection Group will work with you to develop a maintenance program that is specifically designed for you and your facility. Based on our initial estimates, the maintenance contract required to support/enhance energy savings would be negotiated outside of this energy conservation agreement/package. A maintenance program is attached. Our intent is to design a Preventative Maintenance program, with The Marshall County maintenance staff that allows you to maintain and support the HVAC and control systems. One key to keep in mind when determining the final scope of maintenance is that ***Energy Savings goals are difficult to achieve if the facility improvements are not well maintained.***

Potential Maintenance and Support Overview

One potential maintenance scenario could have The Perfection Group performing maintenance on the mechanical and control systems at The Marshall County facilities.

The scope of work could include:

Control System

- On site staff training will be based upon one hour sessions twice per year
- Includes diagnostic support and system updates
- Graphical updates and enhancements
- Program and operational updates and enhancements to refine facility control
- Review of energy strategies employed with enhancement recommendations
- Database and system backups, Software updates
- Network and communications scans
- Consultation on strategies employed and expansion planning
- Local and remote technical support with available 24/7 service
- (Typical activities include verification, calibrations, sequence adjustment,
- control cycling, panel wiring integrity inspection and functional analysis)

2.3 General Approach

Mechanical Systems

- Air filter service
- Coil cleaning
- Belt replacement and adjustment
- Chemical treatment of chilled, heating and cooling loops
- Lubrication and cleaning
- Verify proper operation
- Inspect for component integrity and worn or doubtful parts
- Reduced labor rates for repair services
- Measure temperatures and pressures, water, oil, refrigerant etc.
- Documentation including Web View of all services performed date and time stamped
- Local and remote technical support with available 24/7 service
- (Typical activities include verification, calibrations, sequence adjustment, system cycling, control cycling, component integrity inspection and functional run test.)

Speed of Response

The Perfection Group guarantees a two-hour response time to all emergency calls to our contract customers.

Frequency of Inspections, Calibration Services, and Maintenance Services

On a regular basis, the service activities will be directed and scheduled, on a regular basis, by our comprehensive equipment maintenance scheduling system based on manufacturers' recommendations, equipment location, application, type, run time, and Perfection Group, Inc.'s own experience. See the section titled "Implementation Plan" for a detailed description of the service provided and the frequency of service. Inspection, calibration, and maintenance services will consist of the following:

Test and Inspect

Job labor, travel labor and travel and living expenses required to visually INSPECT and TEST equipment to determine its operating condition and efficiency. Typical activities include:

- **TESTING** for excessive vibration; motor winding resistance; refrigerant charge; fan RPM; refrigerant oil (acid); water condition; flue gas analysis; safety controls, combustion and draft; crankcase heaters, control system(s), etc.

- **INSPECTING** for worn, failed or doubtful parts; mountings, drive couplings; oil level; rotation; soot; flame composition and shape; pilot and igniter; steam, water, oil and/or refrigerant leaks, etc.

Preventative Maintenance

Job labor, travel labor and travel and living expenses required to clean, align, calibrate, tighten, adjust, lubricate and paint equipment. These activities are intended to extend equipment life and assure proper operating condition and efficiency. Typical activities include:

- CLEANING coil surfaces; fan impellers and blades; electrical contacts; burner orifices; passages and nozzles; pilot and igniter; cooling tower baffles, basin, sump and float; chiller, condenser and boiler tubes.

- ALIGNING belt drives; drive couplings; air fins.
- CALIBRATING safety controls; temperature and pressure controls.
- TIGHTENING electrical connections; mounting bolts; pipe clamps; refrigerant piping fittings; damper sections.
- ADJUSTING belt tension; refrigerant charge; super heat; fan RPM; water chemical feed and feed rate; burner fuel/air ratios; gas pressure; set point of controls and limits; compressor cylinder unloaders; damper close-off; sump floats.
- LUBRICATING motors; fan and damper bearings; valve stems; damper linkages; fan vane linkages.
- PAINTING, for corrosion control, as directed by our scheduling system and on an as-needed basis.

Repair and/or Replacement Services

Repair and/or replacement service will include job labor, travel labor, parts procurement labor (locating, ordering, expediting and transporting) and travel and living expenses required to repair or remove and replace broken, worn and/or doubtful components and/or parts and equipment.

Documentation of Services

On a regular basis, the service activities will be directed and scheduled by our comprehensive equipment maintenance scheduling system (Perfection Performance Plus) based on manufacturers' recommendations, equipment location, application, type, run time, and Perfection Group, Inc.'s own experience. The Customer is informed of the program's progress and results on a continuing basis via a detailed Service Report. This report is presented after each service call for our Customer's review, approval signature and record. This information is also logged into our service management software with 24 hours of the work being completed.

PERFECTION PERFORMANCE PLUS (P3)

The Perfection Group uses a software package called Perfection Performance Plus (P3) to help manage its customers' assets. This software was developed by The Perfection Group to help our companies run a more effective service business. We set out to create software that would help our customers accomplish specific goals they have set for their existing and future facilities; most importantly to allow customers to gain visibility and control over their facility assets.

P3 is an operational management software that provides an integrated, organized and structured environment for servicing facilities. The software can be accessed via the Internet from practically any client device. The software can also be used by a disconnected user, allowing synchronization of data to a central database when a connection is available. Multiple users, including local, remote and mobile, can be simultaneously working with and making changes to the data. P3 allows business owners and facility managers to accurately evaluate equipment performance through immediate recording of activity and real time reporting of trends. P3 provides accountability

through constantly measuring performance standards of equipment, labor and response time. Facility managers can be assured that assets are properly maintained by efficiently managing labor, materials and installation in one comprehensive package.

Our software, P3, provides our customers with 1) Real-Time Asset Management, 2) Asset Condition Reporting, and 3) Annual Energy Star Benchmarking. See below for details on this features. Our system has the capability to track preventative maintenance and repairs back to a single piece of equipment. This feature allows for better asset management and performance accountability.

Real-Time Asset Management

The Perfection Group will provide a customized web site that gives the client the ability to view open and closed service calls, detailed call resolutions, scheduled and completed preventive maintenance, and service call history for each individual piece of equipment listed on the Inventory of Equipment page(s) of this contract. This data is easy to access from any browser and updates the client on the current equipment status. This information is captured in real-time each time a technician performs work on a piece of equipment.

Asset Condition Report

The Perfection Group will provide a web-based Asset Condition Report that will determine the age, useful life, overall condition and value of the equipment listed on the Inventory of Equipment page(s) of this contract. Further, The Perfection Group will capture refrigerant capacities and type, filter and belt information, as well as photographs of the equipment. This report may assist in short and long term capital planning and budgeting.

Annual Energy Star Benchmark

The Perfection Group will provide a web-based annual Energy Star Benchmark that will compare the energy performance of the facility to a database of similar buildings nationwide. This analysis may assist in the identification of energy efficiency improvements for the facility. These improvements may help reduce operating costs and improve the financial performance of the building. Client will need to provide utility bills on an annual basis in order to accurately complete benchmark. Our intent is to design a Preventative Maintenance program, with The Center maintenance staff, that allows you to maintain and support the HVAC and control systems. One key to keep in mind when determining the final scope of maintenance is that Energy Savings goals are difficult to achieve if the improvements are not well maintained.

Billing and Invoices

Marshall County Fiscal Court will pay for the Services on a monthly basis during the Installation Phase (as defined below) in an amount equal to the invoice for work performed and equipment and materials on-site or in storage. Where the Contract requires Perfection Group to provide ongoing maintenance services, Marshall County Fiscal Court shall pay for such maintenance services monthly for the Services Term at the rate specified in the Performance Contract.

2.3 GENERAL APPROACH

Provision of Funding

Perfection Group, Inc. works with our customers under a variety of different compensation arrangements, depending upon the types of services provided and the needs of the customer. Outlined below are typical approaches we have used. Please note that these are not mutually exclusive, and aspects of each may be combined in a unique agreement structure for The Fiscal Court. We welcome the opportunity to discuss with you various incentive-based structures in more detail.

- Third Party Leasing (Typically used with Performance Contracts)
- Performance Based (Paid from Savings)
- Guaranteed Savings with Fixed Fee
- Performance Based Pricing

Third Party Leasing / Financing (Typically used with Performance Contracts)

Due to the longer agreements terms used with Performance Contracts, the cost of the project installation (either the full amount or a portion of the total) is financed through a third party financing company. The basic form of the agreement will vary from project to project, but the typical financial terms are – lease, loan, or bonds. In all of these financial arrangements the customer and the financing organization determine the best suitable financial instrument for the project being financed. The finance agreement will be made between the purchasing customer and the financial organization. Under these financing agreements the installation cost of the project will be paid to the installing contractor on a progress payment basis during the installation phase of the project. The final payment, or retainage, can be paid to the installing contractor at some agreed period after the completion of the project installation (typically no later than 90 days after substantial project completion).

The decision on who to use for the financing is ultimately The Fiscal Court. If you have a Bonding Agent or local bank that you would like to work with, Perfection will coordinate as needed to help facilitate the financing package. If Marshall County Fiscal Court does not have a preferred financial organization to use on a project like this, we would like to recommend the following companies:

Compass Municipal Advisors (KACo)
333 West Vine Street, Suite 1610
Lexington, KY 40507
859.457.0241

Ross, Sinclaire & Associates, LLC
325 West Main Street, Suite 300
Lexington, KY 40507
859.977.6600

Hilliard Lyons
300 West Vine Street
Lexington, KY 40507
800.944.2000

All annual agreements (i.e. M&V expenses, maintenance contracts, etc.) will be arranged directly between The Center and Perfection Group, and are not included in the project third-party financing.

Note: The interest rate used in Perfection's financial model (see enclosed) is based on interest rate information provided to Perfection, by KaCO's partner Compass Finance, for Marshall County Fiscal Court based on common knowledge information available for both parties. Rates may vary some based on actual financial instrument and detailed credit information.

2.3 General Approach

Insurance & Bonding

Perfection will provide a bond for the faithful performance of the project and guaranteed savings, (once selected as the provider of services, as part of the project contract documents). Our current bonding capacity is $12,000,000 per job, without asking for a variance on a specific job.

Performance Bond Rates:

First $ 500,000 @ $18.92 (per $1,000 of project)
Next $2,000,000 @ $11.44 (per $1,000 of project)
Next $2,500,000 @ $ 9.07 (per $1,000 of project)

We have attached a letter stating that we can provide a performance bond for the faithful guarantee of the savings. However, we would like to point out that the customer has an option whether to require such a bond. They are not cheap, and before making that final decision you should ask yourself whether you want to invest in an "insurance policy" or get more work done in the project.

National Association of Energy Services Companies (NAESCO)

Perfection Group is 1 of the 39 members in good standing with the National Association of Energy Services Companies.

NAESCO Mission Statement:

The mission of the National Association of Energy Service Companies (NAESCO) is to promote efficiency as the first priority in a portfolio of economic and environmentally sustainable energy resources and to encourage customers and public officials to think energy efficiency first when they are making energy resource procurement or energy policy choices.

Source: NAESCO Website (www.naesco.org/members)

2.3 C. PRELIMINARY ESPC PROJECT

Recommended Efficiency Measures

In this section, we present the potential opportunities and economics that exist for The Center that will generate savings and provide new systems and infrastructure to the facility. The economics for the energy savings program are based on the following Energy Conservation Measures (ECMs):

ECM #1	Lighting System Upgrades
ECM #2	Retro-Commissioning of Mechanical & Electrical Infrastructure
ECM #3	Building Automation & Control Retrofits
ECM #4	Mechanical & Electrical Retrofits / Upgrades
ECM #5	Water Conservation Measures
ECM #6	Building Envelope Energy Conservation Measures
ECM #7	Renewable Energy Conservation Measures
ECM #8	Fleet Management / Alternative Fuels

General Scope and ECM Notes:

- Prices include non-prevailing wage rates during normal business hours.
- Materials are calculated with sales tax.
- Performance bonds are optional.
- No asbestos or lead paint identification or removal is included.
- No PCB ballast removal is included.
- We are not responsible for existing system problems or deficiencies.
- Existing leaking valves or piping problems such as damaged insulation or mold is excluded.
- Engineering, project management, permits as required, stamped drawings and project submittal data are all included.

Included in Pricing:

- System engineering
- Engineered drawings
- Commissioning of the newly installed and replacement systems
- Standard one year warranty on all furnished components and workmanship
- Extension of manufacturer's component warranties as available
- Job books, system drawings, operating sequences, and on site customer training are included as part of the system installation.

2.3 C. PRELIMINARY ESPC PROJECT

COURTHOUSE

1101 Main Street
Benton, KY 42025

Year Built:	1915	**Square Footage:**	34,640	**Occupancy:**	25-50
Renovations:	1978	**# of Stories:**	3	**Energy Source:**	Natural Gas & Electric
Survey Date:	7/11/2017	**Hours of Operation:**	M-F: 8-5	**Computers:**	30-35

2.3 C. PRELIMINARY ESPC PROJECT

ECM #1 Lighting

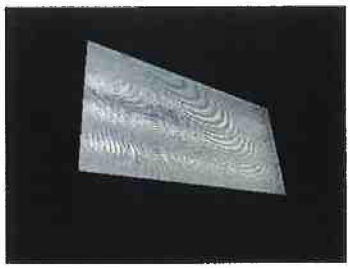
The existing linear fluorescent lighting is comprised of T-8 sized lamps with 32 watts per lamp. Storage rooms and restrooms have high wattage incandescent bulbs. There are a few CFL screw in bulbs in decorative fixtures throughout. We are proposing to retrofit the majority of the fluorescent fixtures with UL Type B tubes, de-lamping where appropriate. This will eliminate the ballast and provide the best return on investment. Occupancy sensors will be installed in restrooms, breakrooms, and conference rooms. See table below for detailed scope of work.

The exterior of the courthouse consisted had a few different fixtures. There were wall sconces with incandescent lamps, bollards with HID lamps and a couple flood lights that were already LED. The wall sconces and the bollards will be retrofit with LED A-line lamps.

Benefits of an LED Conversion include:

1.) Fluorescent bulbs are being phased out of manufacturing
2.) LED bulbs have much longer burn hours than fluorescents
4.) Brighter burning light, and reduction of bulbs and wattage per fixture
5.) Rebates are strong

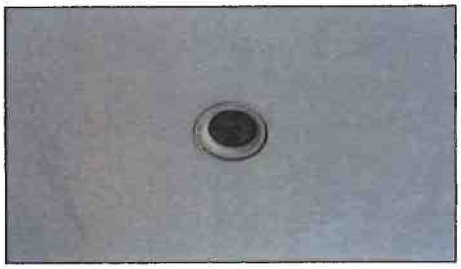
Fixture Quantity	Pre kWh	Post kWh	kWh Savings
445	84,780	27,776	57,004



High wattage T-8 fluorescent lighting

Some exits signs are LED and some are Incandescent

400 watt Metal Halide exterior lighting



200/250 watt outdoor canopy lighting

High wattage 4 foot fluorescent lighting

High wattage metal halides are throughout the large rooms

2.3 C. Preliminary ESPC Project

Location		Existing Fixture			Proposed Fixture		
Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Play Room	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Kitchenette	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Storage	Keyless Inc 60W A	1	60	LED 10W A19 Replacement	1	10
1st Floor	Restroom	Vanity Inc 25W A	4	25	LED 10W A19 Replacement	4	10
1st Floor	Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Activity Room	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Stairwell	2X4 Prism Rec 3L 32W T8	6	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	6	26
1st Floor	Stairwell	Wall Sconce Inc 75W A	2	75	LED 10W A19 Replacement	2	10
1st Floor	Conference Room 207	4' Wrap BP 4L 32W T8	6	112	RT, 4' 13W LED 4L	6	52
1st Floor	Hallway	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
Floor	Break Room 206	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Office 205	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Office 205a	2X4 Prism Rec 3L 32W T8	5	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	5	26
1st Floor	Restroom 205	Fan Inc 60W A 2L	1	120	LED 10W A19 Replacement 2L	1	20
1st Floor	Open Office 204	2X4 Prism Rec 3L 32W T8	23	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	23	26
1st Floor	Computer Room 204a	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Kitchenette	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	File Room	2X4 Prism Rec 3L 32W T8	6	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	6	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	5	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	5	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Open Office	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Hallway	2X4 Prism Rec 3L 32W T8	8	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	8	26
1st Floor	Stairwell	Wall Sconce CFL 13W screw In	1	13	LED 10W A19 Replacement Lens	1	10
1st Floor	Stairwell	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Restroom	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Office 200	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Plotter Room	4' Strip BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Open Office	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Open Office Restroom	Vanity Inc 75W A 3L	1	225	LED 10W A19 Replacement 3L	1	50
1st Floor	Vault Storage	8' Strip SP 2L	1	138	RT, 4' 13W LED 4L, 8' BC Kit	1	52
1st Floor	Vault Storage	4' Strip BP 2L	2	72	RT, 4' 13W LED 2L	2	26
1st Floor	Back Hallway	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Office	2x2 Prism Rec 2L U6	1	72	RT, 2' 9W LED 3L, 2x2 Refl Kit	1	27
1st Floor	Office Restroom	Vanity Inc 40W G25 3L	1	120	LED 5W G25 Replacement 3L	1	15
1st Floor	Office	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
' Floor	Office Storage	4' Vaportight BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Back Hallway	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Stairwell	4' Wrap BP 4L 32W T8	1	112	RT, 4' 13W LED 4L	1	52
1st Floor	Stairwell	12" Rec Sq. CFL 13W Screw In	1	13	LED 10W A19 Replacement	1	10
1st Floor	court Room	2X4 Prism Rec 3L 32W T8	38	89	RT, 4' 13W LED 3L	38	39
1st Floor	court Room	Track Head CFL 18W Screw In	24	18	LED 12W PAR30 Replacement	24	12
1st Floor	court Room back Room 1	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	court Room back Room 2	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Stairwell	2x2 Prism Rec 2L U6	1	72	RT, 2' 9W LED 3L, 2x2 Refl Kit	1	27
2nd Floor	Stairwell	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Hallway	2X4 Prism Rec 3L 32W T8	7	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	7	26
2nd Floor	Office 104	2X4 Prism Rec 3L 32W T8	9	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	9	26
2nd Floor	Office Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Office WorkRoom	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
d Floor	Office 103	2X4 Prism Rec 3L 32W T8	6	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	6	26

2.3 C. Preliminary ESPC Project

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
2nd Floor	Office File Room	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
2nd Floor	Stairwell	12" Rec Sq. CFL 13W Screw In	1	13	LED 10W A19 Replacement	1	10
2nd Floor	Stairwell	4' Wrap BP 4L 32W T8	1	112	RT, 4' 13W LED 4L	1	52
2nd Floor	Hallway Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Hallway Storage	Drum CFL 13W Screw In 2L	1	26	LED 10W A19 Replacement 2L	1	20
2nd Floor	Hallway	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Conference 101	2X4 Prism Rec 3L 32W T8	8	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	8	26
2nd Floor	Server Room	4' Wrap BP 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Office 100	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
2nd Floor	Break Room	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Judge Office	2X4 Prism Rec 3L 32W T8	8	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	8	26
2nd Floor	Judge Restroom	Globe CFL 13W Screw In 2L	1	26	LED 10W A19 Replacement 2L	1	20
2nd Floor	Judge Restroom	Fan CFL 13W Screw In	1	13	LED 10W A19 Replacement	1	10
2nd Floor	Kitchenette	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Office	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Office Copy Room	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
2nd Floor	Em Office	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Kitchenette	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Stairwell	12" Rec Sq. CFL 13W Screw In	1	13	LED 10W A19 Replacement	1	10
2nd Floor	Stairwell	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Men's Restroom	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Office 110	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office 110a	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Evidence Room	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	B03	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	B03	4' Wrap BP 4L 32W T8	26	112	RT, 4' 13W LED 4L	26	52
1st Floor	Maintenance Room	4' Wrap BP 2L	5	72	RT, 4' 13W LED 2L	5	26
1st Floor	Lower Hallway	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Stairwell	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Stairwell	Wall Sconce CFL 13W Screw In	1	13	LED 10W A19 Replacement	1	10
1st Floor	B00	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Closet	Keyless Inc 100W A	1	100	LED 10W A19 Replacement	1	10
1st Floor	Bottom Stairwell	4' Wrap BP 4L 32W T8	1	112	RT, 4' 13W LED 4L	1	52
1st Floor	Closet	Keyless Inc 100W A	1	100	LED 10W A19 Replacement	1	10
1st Floor	Hallway	4' Wrap BP 4L 32W T8	2	112	RT, 4' 13W LED 4L	2	52
1st Floor	records	4' Wrap BP 4L 32W T8	15	112	RT, 4' 13W LED 4L	15	52
' Floor	Restroom	Vanity Inc 60W A 4L	1	240	LED 10W A19 Replacement 4L	1	40
ıst Floor	B02	Keyless Inc 100W A	1	100	LED 10W A19 Replacement	1	10
1st Floor	B02	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Men's and Women's Restroom	4' Wrap BP 4L 32W T8	3	112	RT, 4' 13W LED 2L, 4' Wrap Kit	3	26
1st Floor	Stairwell	Jelly Jar Inc 43W A	1	43	LED 10W A19 Replacement	1	10
1st Floor	Stairwell	CYL Inc 65W R30	2	65	LED 12W BR30 Replacement	2	12
Exterior	Door d	Wall Sconce Inc 100W A	2	100	LED 10W A19 Replacement	2	10
Exterior	Door d	Bollard MH 70W	2	95	LED 17W A21 Retrofit	2	17
Exterior	Flag Pole	Flood LED 37W	1	37	No Action	1	37
Exterior	Door a	Bollard MH 70W	4	95	LED 17W A21 Retrofit	4	17
Exterior	Door a	Wall Sconce Inc 100W A	2	100	LED 10W A19 Replacement	2	10
Exterior	Door b	Bollard MH 70W	2	95	LED 17W A21 Retrofit	2	17
Exterior	Door b	Wall Sconce Inc 100W A	2	100	LED 10W A19 Replacement	2	10
Exterior	Door c	6" Rec Can CFL 18W Screw In	10	18	LED 12W BR30 Replacement	10	12
1st Floor	109 Office	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	109a Office	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	County Clerk 106	2X4 Prism Rec 3L 32W T8	27	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	27	26
ıst Floor	Office	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Break Room	2X4 Prism Rec 3L 32W T8	5	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	5	26
1st Floor	Restroom	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	5	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	5	26
1st Floor	Closet	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Copy Room/Plate Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Storage	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Storage	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Storage	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Women's Restroom	Vanity Inc 40W G25	5	40	LED 5W G25 Replacement	5	5
1st Floor	Women's Restroom	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26

ECM #2 Retro-Commissioning

Retro-commissioning is the process of renewing, rebuilding, cleaning, calibrating and verifying system operations. Including minor repairs and fix up parts as well as labor. The intent of retro-commissioning is to extend the service life of the equipment, improves operations and conserves energy through proper function.

- Perfection Group will retro-commission (2) split systems that have R-410A refrigerant.

ECM #3 Building Automation Controls

Space temperatures are currently controlled by nonprogrammable thermostats for each HVAC system.

- Perfection Group will upgrade each thermostat to Web Enable programmable thermostats. These thermostats allow for scheduling and have setback and alarming capabilities to not only achieve maximum energy savings, but to fix issues early on before they lead to major component failures.

Nonprogrammable Thermostat

2.3 C. PRELIMINARY ESPC PROJECT

ECM #4 Mechanical Upgrades

Conditioning for the Courthouse is provided by (9) rooftop units and (6) split systems that vary in size, age, and manufacturer. All the rooftop units use R-22 refrigerant which is not environmentally friendly and very costly due to the phase out mandated by the EPA. The systems are 10 SEER and 81% heat. Of the (6) split systems, four are older, lower SEER systems. Currently, no bathroom has exhaust fans for ventilation. The Domestic Hot Water heater has a capacity of 40 gallons and was installed in 2015.

HVAC Improvements

- Replace (9) Rooftop units with 15 SEER energy efficient units with economizers to maximize energy savings. The new systems will use environmentally friendly R-410A refrigerant.
- Replace (4) split systems – condensing unit and indoor air handler – with higher 16+SEER systems with environmentally friendly R-410A refrigerant.
- Replace disconnects, and fix electrical issues on the roof.
- Perfection Group will air balance the many spaces to adequately condition each zone to reduce comfort issues.
- Add (3) high efficiency exhaust fans, one for each restroom to improve ventilation.

HVAC condensate drain needs to be extended. It is causing water ponding.

Electrical conduit splitting in multiple areas on the roof

Aged Split System on the roof

10 SEER RTU with R22 refrigerant

Unit with coil damage and poor drain

Panel sitting on ground with loose wires

2.3 C. PRELIMINARY ESPC PROJECT

ECM #5 Water Conservation Upgrades

Currently, the Courthouse toilets flush at a rate of 4 gallons per flush. The sinks are high volume. There are a total of (31) fixtures in the Courthouse, twenty-eight of can improve with water conservation efforts. We recommend upgrading toilets with a 1.28 gallon per flush, and install flow moderators on all sinks that will restrict flows to 0.35 -1.5 gallon per minute. See chart below for details.

Room	Existing Fixture Description	Existing Quantity	Existing Usage	Units	Measure Description	New Quantity	Quantity Upgraded	Gallons Saved per Unit
2ND FL RR	Closet Floor Elongated Tank Left	1	2.5	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	1.2
2ND FL RR	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
ECON DEVELOPMENT OFFICE	Closet Floor Elongated Tank Left	1	3.5	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	2.2
ECON DEVELOPMENT OFFICE	Kitchen Sink 4" Standard	1	2.5	per minute	Retrofit with 1.5 gpm VP laminar flow moderator	1	1	1.0
[illegible]L OUTREACH OFFICE	Closet Floor Elongated Tank Left	2	4.0	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	2	2	2.7
2ND FL OUTREACH OFFICE	Lavatory Sink 8" Standard	1	2.2	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.9
2ND FL OUTREACH OFFICE	Shower 0 Standard	1	2.5	per minute	No Action	1	0	0.0
2ND FL OUTREACH OFFICE	Kitchen Sink 8" Standard	1	2.5	per minute	Retrofit with 1.5 gpm VP laminar flow moderator	1	1	1.0
2ND FL. WEST OFFICE	CLoset Fl MT Wall Out Elongated Diaphragm	1	3.5	per flush	New Floor Mount Wall Outlet Toilets and 1.6 Valve	1	1	1.9
2ND FL. WEST OFFICE	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
GIS OFFICE	CLoset Fl MT Wall Out Elongated Tank Left	1	4.0	per flush	New Floor Mount Wall Outlet Tank Toilets 1.6 GPF	1	1	2.4
GIS OFFICE	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
JUDGE EXEC [illegible]ICE	Closet Floor Elongated Tank Left	1	1.6	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	0.3

2.3 C. PRELIMINARY ESPC PROJECT

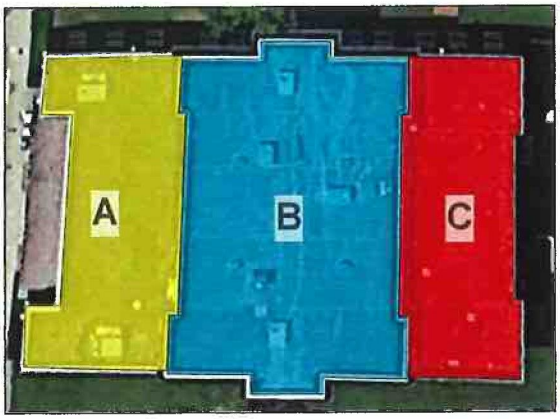
Room	Existing Fixture Description	Existing Quantity	Existing Usage	Units	Measure Description	New Quantity	Quantity Upgraded	Gallons Saved per Unit
JUDGE EXEC OFFICE	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
JUDGE EXEC OFFICE	Kitchen Sink 8" Diaphragm Hard Wired IR	1	2.5	per minute	Retrofit with 1.5 gpm VP laminar flow moderator	1	1	1.0
1ST FL MRR	Closet Floor Elongated Tank Left	1	4.5	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	3.2
1ST FL MRR	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
105 VOTER REGI	Closet Floor Round Tank Left	1	3.5	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	2.2
105 VOTER REGI	Kitchen Sink 4" Standard	1	2.5	per minute	Retrofit with 1.5 gpm VP laminar flow moderator	1	1	1.0
1ST FL WRR	Closet Floor ADA Elongated Tank Left	1	35.0	per flush	New 1.28 gpf tank toilet with elongated bowl - ADA - 12"	1	1	33.7
1ST FL WRR	Closet Floor Elongated Tank Left	2	1.6	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	2	2	0.3
1ST FL WRR	Lavatory Sink 4" Standard	2	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	2	2	1.7
ARCHIVES	Closet Floor Elongated Tank Left	1	1.6	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	0.3
ARCHIVES	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
BASEMENT MRR	Closet Floor ADA Elongated Tank Left	1	3.5	per flush	New 1.28 gpf tank toilet with elongated bowl - ADA - 12"	1	1	2.2
BASEMENT MRR	Urinal Floor Round Twist	2	0.3	per flush	No Action	2	0	0.0
BASEMENT MRR	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7

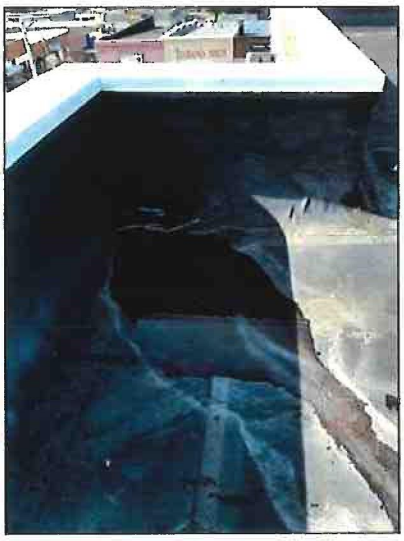
2.3 C. PRELIMINARY ESPC PROJECT

ECM #6 Building Envelope

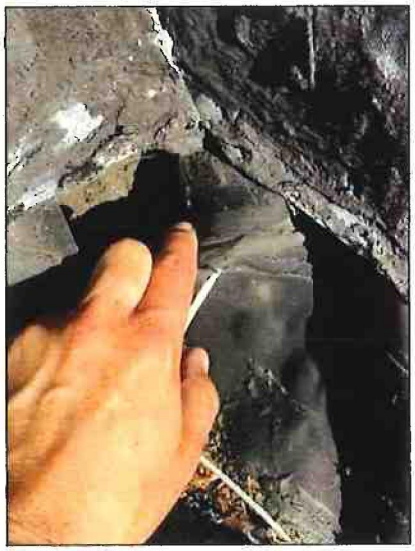
Roof Replacement

The roof is a rubber EPDM roof that is designed to last 15-18 years with proper drainage. This roof age has passed its expected life span. The middle section (Section B in the image to the right) has good slope for drainage in the middle, but poor gutter systems lead to ponding around the perimeter. The side sections (Sections A and C in the image to the right) also have ponding issues. They also have flashing deterioration and shrinking at the perimeter causing the rubber membrane to pull away and rip. Sandbags are in places to try to hold the roof down. The perimeter walls are allowing water into the system and causing damage to the deck below.

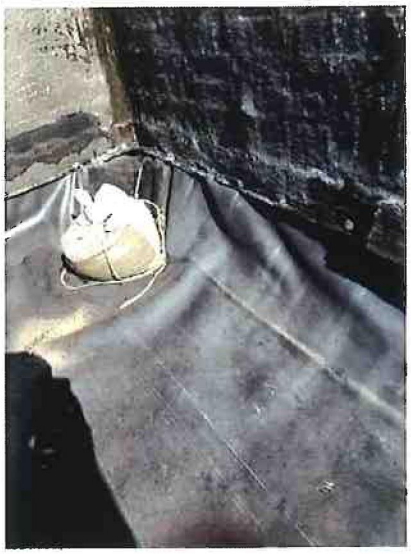




Ponding water around the overflow drain. Due to the lack of tapered insulation, the water does not find its way properly to the drains.

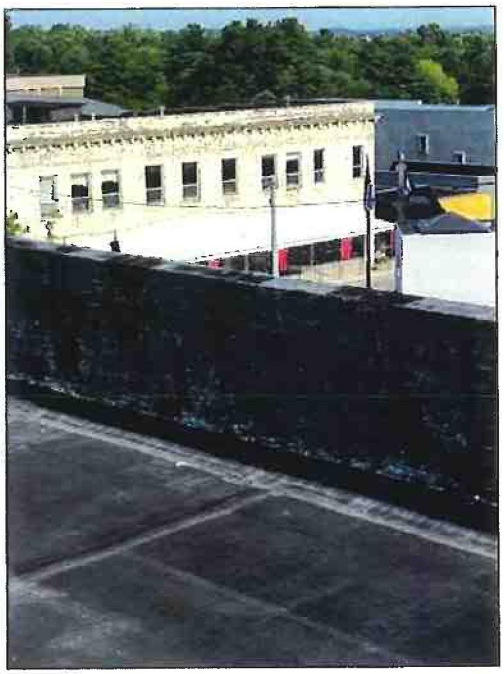


Overtime, as UV Rays have hit the EPDM, the rubber membrane shrinks. This leads to tears which allows water to penetrate the system and leak into the building.

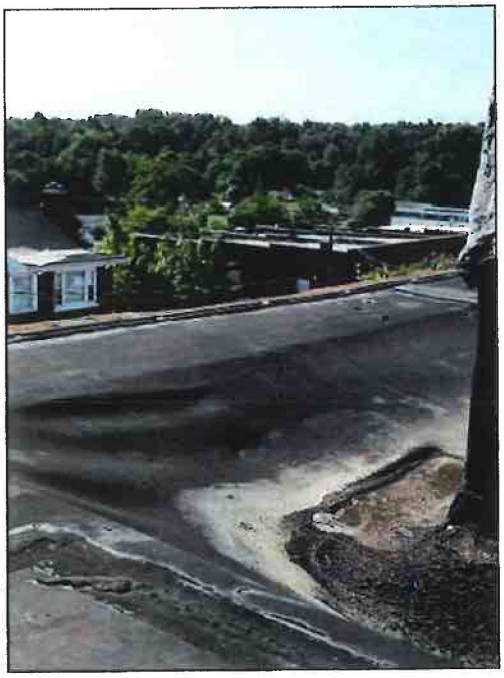


The roof system is tearing away from the flashings. Sandbags are in place to try to keep the rubber membrane down due to the shrinkage.

2.3 C. Preliminary ESPC Project

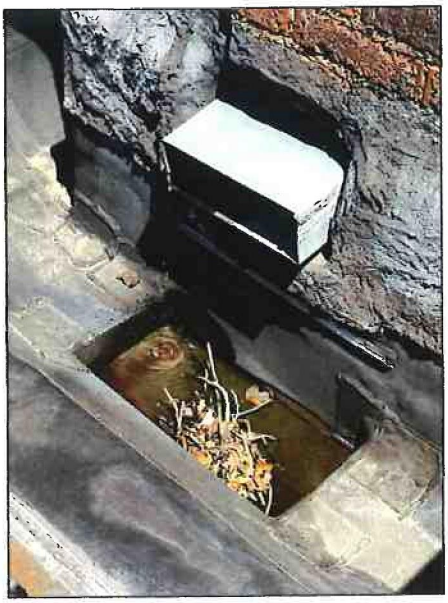


Parapet wall needs to be addressed. It is currently allowing water into the system. The water may not be showing up on the interior, but it is getting down to the wood deck and damaging the structure of the deck.



Single ply tenting occurs around the perimeter of the roof as the EPDM rubber shrinks overtime.

The poor drainage from the gutters have led to masonry issues on the exterior of the building. By upgrading the roof, this will prevent further damage.



2.3 C. Preliminary ESPC Project

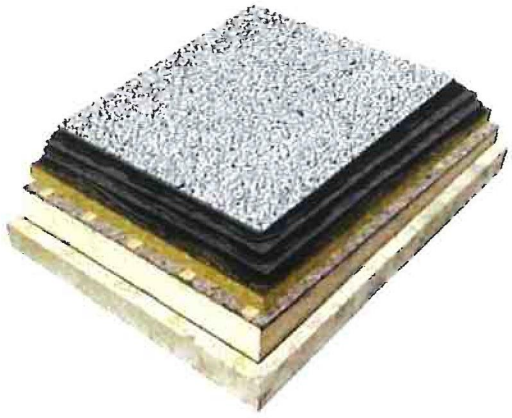
Section A Scope of Work

- Provide all labor, equipment, and materials to install the roof system.
- Contractor will remove and properly dispose of the existing roof down to the deck. Contactor will follow all local, state, and federal guidelines. All asphaltic material shall be treated as if it contains asbestos.
- Install 1/2" Wood Fiberboard Insulation recovery board adhered in insulation adhesive. Stagger joints between layers where needed.
- Install base ply of modified membrane and smooth surface modified in a SEBS/SIS modified cold process adhesive as specified.
- The cap sheet will be mineral surface while heat welding the seams if possible.
- The roof system will comply with all performance characteristics, warranty, and inspection requirements.
- The flashing joints will receive a three course of mastic and mesh. Use reflective mastic on final coat.
- **Warranty: 30 year NDL**

Section B Scope of Work

- Provide all labor, equipment, and materials to install the roof system.
- Contractor will remove and properly dispose of the existing roof down to the deck. Contactor will follow all local, state, and federal guidelines. All asphaltic material shall be treated as if it contains asbestos.
- The roofer will Mechanically fasten 2 inchs of polyiso insulation to the wood deck.
- Install 1/2" Wood Fiberboard Insulation recovery board adhered in insulation adhesive. Stagger joints between layers where needed.
- Install base ply of modified membrane and smooth surface modified in a SEBS/SIS modified cold process adhesive as specified.
- The cap sheet will be mineral surface.
- The roof system will comply with all performance characteristics, warranty, and inspection requirements.
- The flashing joints will receive a three course of mastic and mesh. Use reflective mastic on final coat.

Section C Scope of Work



- Provide all labor, equipment, and materials to install the roof system.
- Contractor will remove and properly dispose of the existing roof down to the deck.
- The contractor will install a 1/8":12" tapered Polyisocyanurate using insulation adhesive during to the gypsum deck. Insulation package starting 1" starting point. Stagger all insulation joints.
- Install 1/2" Wood Fiberboard Insulation recovery board adhered in insulation adhesive. Stagger joints between layers where needed.
- Install base ply of modified membrane and smooth surface modified in a Green Loc adhesive as specified. Install flood coat of cold process adhesive as used in the roof system and aggregate. The roof system will comply with all performance characteristics, warranty, and inspection requirements.
- The flashing joints will receive a three course of Green loc mastic and mesh.

2.3 C. PRELIMINARY ESPC PROJECT

Insulation Installation and Weather Seals

Perfection Group, Inc. proposes to install additional insulation in the attic and replace the door seals on the four (4) entrance doors to the facility.

Benefits of Attic Insulation:

1. The vast majority of facilities will experience a high amount of energy savings as a result of significantly reduced heat loss. Also, insulation can help keep in the cool air in times of hot weather
2. For those who care only about facility expenders, the first benefit is enough. On the other hand, those motivated by helping the environment will be happy, too. Insulating the attic space according to the Department of Energy, is one of the most important energy-savings projects you can complete in the facility. The energy saved with this means less need for energy creation, so power plants won't need to produce as much energy. Reducing the amount of energy, we consume can have a big effect on the local ecosystem.
3. When the attic is not properly insulated, the rising heat might lead to melting snow on the roof, which can than lead to ice dams, Moisture, ice dams, and condensation can slowly.

Benefits of Door Weather Seals:

1. Depending on what keep in your facility, the extreme heat and cold during times of the year can be damaging. Weather strips keep the weather outside and allow you better control the temperature inside.
2. The average door will be opened and closed more than 200 times in the next month alone. Multiply that by the years of use and you'll begin to understand the beating your doors take. A weather strip can also serve as a form of protection for your door, cushioning it from repetitive contact with the door frame.
3. The advantage of using a door seal is that it acts as a barrier between the outdoor elements and the indoors. Without it heavy rains can leak through small cracks, wind blows through gaps, and cold weather easily penetrates the doors. A weather seal can prolong the life of the facility and everything in it by providing additional protection from the outdoors.

ECM #7 Other

There are (2) vending machines in the Courthouse. It currently runs the lighting and compressors 24/7. We will be installing (2) VendingMiser controls on these machines. They use a motion sensor to reduce the runtime saving energy over extended off hours, weekends and holidays while maintaining a cold product. This reduced energy consumption without any perceptible change in the product dispensed.

VendingMISER controls will eliminate compressor run time and save wasted energy dollars

Energy Savings Calculations

ECM Summary

Courthouse	Energy & Water Savings					Cost Savings					Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	Electric kWh	Peak kW	Nat Gas CCF	Water kGal	Sewer kGal	Elec $ Saved	Nat Gas $ Saved	Water $ Saved	Sewer $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Total Lighting	61,306	23	-933	0	0	$7,071	-$752	$0	$0	$6,318	20	4	19	26.7	15.6	42.3	
Total RCx	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	26.7	15.6	42.3	
Total Controls	7,109	0	367	0	0	$820	$296	$0	$0	$1,116	5	1	5	26.0	14.5	40.5	
Total Mechanical	24,281	0	575	0	0	$2,800	$464	$0	$0	$3,264	13	3	12	23.6	12.8	36.4	
Total Water	0	0	64	72	72	$0	$52	$285	$665	$1,002	0	0	0	23.6	12.6	36.3	
Total Envelope	397	0	579	0	0	$46	$467	$0	$0	$513	3	1	3	23.6	10.9	34.5	
Total Renewable Energy	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	23.6	10.9	34.5	
Total Miscellaneous	3,772	0	-84	0	0	$435	-$68	$0	$0	$367	1	0	1	23.2	11.2	34.4	
Total:	96,865	23	568	72	72	$11,172	$458	$285	$665	$12,581	43	9	40	32.7	12.9	45.6	Baseline
% Saved:	29%		13%	30%	30%	29%	13%	30%	30%	28%				23.2	11.2	34.4	Post Project

ECM Summary

Courthouse		Energy & Water Savings					Cost Savings					Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	ECM #	Electric kWh	Peak kW	Nat Gas CCF	Water kGal	Sewer kGal	Elec $ Saved	Nat Gas $ Saved	Water $ Saved	Sewer $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Lighting Upgrades	1-1	61,306	23	-933	0	0	$7,071	-$752	$0	$0	$6,318	20	4	19	26.7	15.6	42.3	
Total Lighting		**61,306**	**23**	**-933**	**0**	**0**	**$7,071**	**-$752**	**$0**	**$0**	**$6,318**	**20**	**4**	**19**	**26.7**	**15.6**	**42.3**	
Total RCx		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**26.7**	**15.6**	**42.3**	
Scheduling	3-1	7,109	0	367	0	0	$820	$296	$0	$0	$1,116	5	1	5	26.0	14.5	40.5	
Total Controls		**7,109**	**0**	**367**	**0**	**0**	**$820**	**$296**	**$0**	**$0**	**$1,116**	**5**	**1**	**5**	**26.0**	**14.5**	**40.5**	
Replace Splits / Package Units	4-1	24,281	0	478	0	0	$2,800	$385	$0	$0	$3,186	12	3	12	23.6	13.1	36.7	
Replace DHW Heater	4-2	0	0	97	0	0	$0	$79	$0	$0	$79	1	0	0	23.6	12.8	36.4	
Total Mechanical		**24,281**	**0**	**575**	**0**	**0**	**$2,800**	**$464**	**$0**	**$0**	**$3,264**	**13**	**3**	**12**	**23.6**	**12.8**	**36.4**	
Water Conservation	5-1	0	0	64	72	72	$0	$52	$285	$665	$1,002	0	0	0	23.6	12.6	36.3	
Total Water		**0**	**0**	**64**	**72**	**72**	**$0**	**$52**	**$285**	**$665**	**$1,002**	**0**	**0**	**0**	**23.6**	**12.6**	**36.3**	
Replace Roofing	6-1	345	0	506	0	0	$40	$408	$0	$0	$448	3	1	3	23.6	11.1	34.7	
Attic Insulation / Weatherstripping	6-2	53	0	73	0	0	$6	$59	$0	$0	$65	0	0	0	23.6	10.9	34.5	
Total Envelope		**397**	**0**	**579**	**0**	**0**	**$46**	**$467**	**$0**	**$0**	**$513**	**3**	**1**	**3**	**23.6**	**10.9**	**34.5**	
Total Renewable Energy		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**23.6**	**10.9**	**34.5**	
Add Exhaust to (3) Restrooms	8-1	-743	0	-84	0	0	-$86	-$68	$0	$0	-$153	-1	0	-1	23.7	11.2	34.8	
Vendmiser (2)	8-2	4,515	0	0	0	0	$521	$0	$0	$0	$521	2	0	2	23.2	11.2	34.4	
Total Miscellaneous		**3,772**	**0**	**-84**	**0**	**0**	**$435**	**-$68**	**$0**	**$0**	**$367**	**1**	**0**	**1**	**23.2**	**11.2**	**34.4**	
Total:		**96,865**	**23**	**568**	**72**	**72**	**$11,172**	**$458**	**$285**	**$665**	**$12,581**	**43**	**9**	**40**	**32.7**	**12.9**	**45.6**	**Baseline**
% Saved:		**29%**		**13%**	**30%**	**30%**	**29%**	**13%**	**30%**	**30%**	**28%**				**23.2**	**11.2**	**34.4**	**Post Project**

Interior Lighting Retrofit

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction, as well as the HVAC interaction.

Building Name: Courthouse

Occupied Hours: 2,349
Unoccupied Hours: 6,411

Lighting:

Existing Interior Lighting kW:	34.1	*Monthly kW*
Existing Interior Lighting kWh:	77,873	*Annual kWh*
Proposed Interior Lighting kW:	11.5	*Monthly kW*
Proposed Interior Lighting kWh:	26,891	*Annual kWh*
Interior Lighting kW **Saved**:	22.6	*Monthly kW*
Interior Lighting kWh **Saved**:	50,982	*Annual kWh*

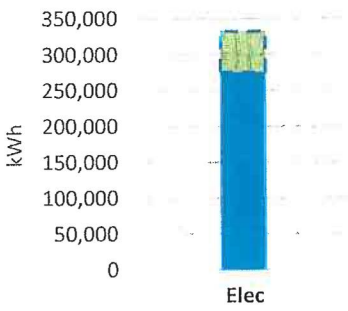
HVAC Interaction:

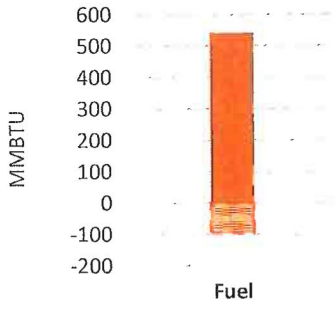
Cooling kWh **Saved**:	4,963	*Annual kWh*
Primary Heating Fuel **Penalty**:	-933	*Annual CCF*

Total Savings

55,945	***Annual kWh***
22.6	***Monthly kW***
-933	***Annual CCF***

$6,452	***Electric $ Saved***
$0	***Elec Demand $ Saved***
-$752	***CCF $ Saved***





16.8% Saved from Electric Baseline
-21.4% Saved from Nat Gas Baseline

Exterior Lighting

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction.

Building Name: Courthouse

Hours of Exterior Lighting Operation - Existing:	4,380
Hours of Exterior Lighting Operation - Proposed:	4,380

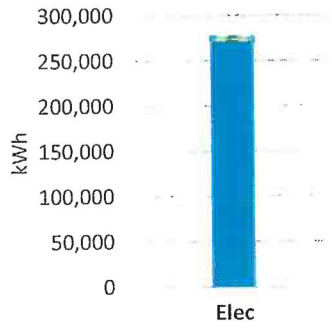
Lighting:

Existing Interior Lighting kW:	1.6	*Monthly kW*
Existing Interior Lighting kWh:	6,907	*Annual kWh*
Proposed Interior Lighting kW:	0.4	*Monthly kW*
Proposed Interior Lighting kWh:	1,546	*Annual kWh*

Total Savings

5,361	***Annual kWh***

$618	***Electric $ Saved***



1.9% % Savings from Electric Baseline

Scheduling & Set-points

ECM Overview:

Energy consumption can be reduced by applying a heating setback and/or cooling setup temperature and turning off the HVAC system during unoccupied times.

Building Name: Courthouse

System ID: All Systems

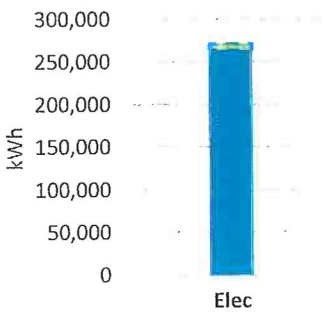
HVAC Conditions:

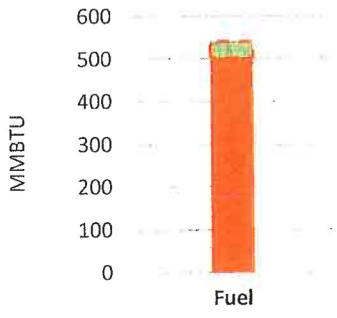
	Existing		Proposed	
HVAC Occupied Hours:	4,176		3,132	
HVAC Unoccupied Hours:	4,584		5,628	
Occupied Heating Set-point:	70	°F	70	°F
Unoccupied Heating Set-point:	65	°F	60	°F
Occupied Cooling Set-point:	72	°F	72	°F
Unoccupied Cooling Set-point:	75	°F	80	°F
All Systems Supply Fan HP:	17	HP		

Total Savings

7,109	***Annual kWh***
367	***Annual CCF***

$820	***Electric $ Saved***
$296	***CCF $ Saved***





2.6% % Savings from Electric Baseline

6.9% % Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Courthouse

System ID: (7) Package Units Totaling 30 Tons

HVAC Conditions:

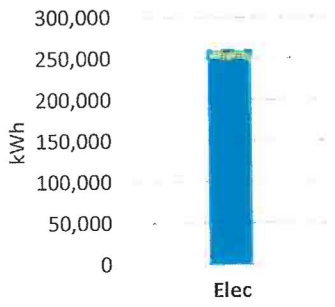
	Existing	Proposed	
Cooling Efficiency	10.0	15.0	SEER
Heating Efficiency	80%	93%	

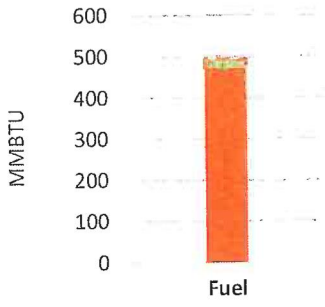
Total Annual Cooling Hours:	4,415
Total Annual Heating Hours:	3,426

Total Savings

11,140	***Annual kWh***
239	***Annual CCF***

$1,285	***Electric $ Saved***
$193	***CCF $ Saved***





4.3%	% Savings from Electric Baseline
4.9%	% Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Courthouse

System ID: (2) Package Units Totaling 17.5 Tons

HVAC Conditions:

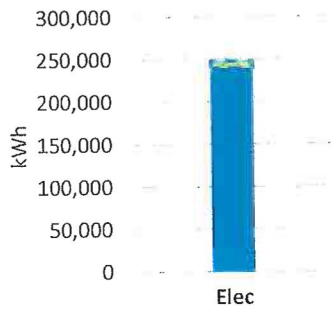
	Existing	Proposed	
Cooling Efficiency	7.8	12.0	SEER
Heating Efficiency	80%	93%	

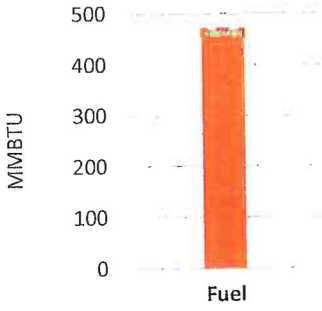
Total Annual Cooling Hours:	4,415
Total Annual Heating Hours:	3,426

Total Savings

8,417	***Annual kWh***
139	***Annual CCF***

$971	***Electric $ Saved***
$112	***CCF $ Saved***





3.4%	% Savings from Electric Baseline
3.0%	% Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Courthouse

System ID: (1) 5 Ton Split

HVAC Conditions:

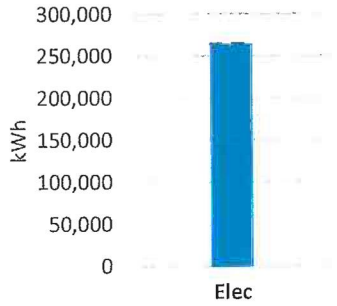
	Existing	Proposed	
Cooling Efficiency	10.0	14.0	SEER
Primary Heating Efficiency	80%	93%	

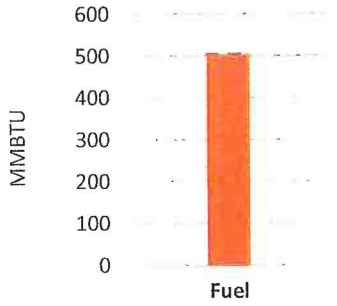
Total Annual Cooling Hours: 4,415
Total Annual Heating Hours: 3,426

Total Savings

1,591	***Annual kWh***
40	***Annual CCF***

$184	***Electric $ Saved***
$32	***CCF $ Saved***





0.6% % Savings from Electric Baseline
0.8% % Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Courthouse

System ID: (3) Splits Totaling 7.5 Tons

HVAC Conditions:

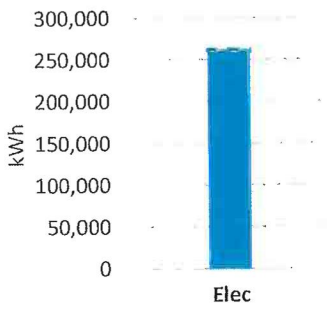
	Existing	Proposed	
Cooling Efficiency	10.0	16.0	SEER
Heating Efficiency	80%	93%	

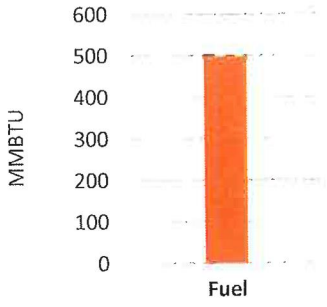
Total Annual Cooling Hours: 4,415
Total Annual Heating Hours: 3,426

Total Savings

3,133	***Annual kWh***
60	***Annual CCF***

$361	***Electric $ Saved***
$48	***CCF $ Saved***





1.2% % Savings from Electric Baseline
1.2% % Saved from Nat Gas Baseline

Replace Water Heater

ECM Overview:

Energy savings can be realized by replacing an outdated domestic hot water heating system with a new, high efficiency system.

Building Name: Courthouse

System ID: DHW Heater

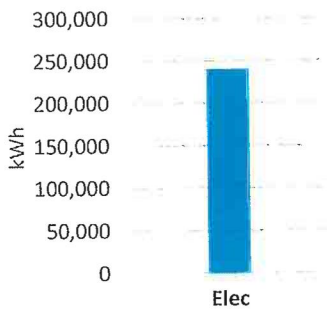
Domestic Hot Water Conditions:

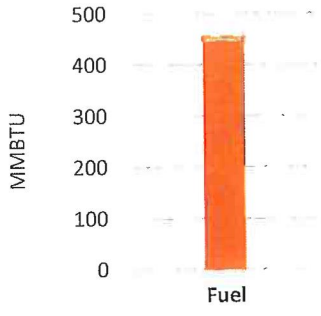
Existing Water Heater Efficiency:	65%	
Proposed Water Heater Efficiency:	92%	
Existing Annual Hot Water Usage:	26,000	Gallons
Proposed Annual Hot Water Usage:	26,000	Gallons
Baseline Annual Utility Consumption:	265	CCF
Proposed Annual Utility Consumption:	188	CCF

Total Savings

97	*Annual CCF*

$79	*CCF $ Saved*





0.0% % Savings from Electric Baseline

2.2% % Saved from Nat Gas Baseline

Add Exhaust Fans

ECM Overview:

Three restrooms in the Courthouse do not have working exhaust fans. Exhaust is required to maintain both health code and occupant comfort.

Building Name: Courthouse

Equipment ID: Exhaust Fans (x3)

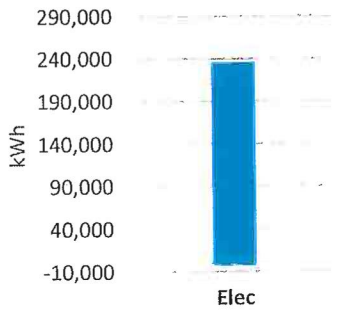
Conditions:

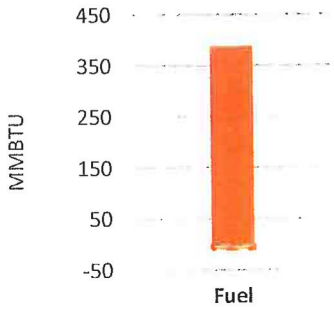
Current Restroom Exhaust:	0	CFM
Added Restroom Exhaust:	450	CFM
Annual kWh Increase:	743	kWh
Annual Fuel Increase:	8,567	kBTU

Total Savings

-743	*Annual kWh*
-84	*Annual CCF*

-$86	*Electric $ Saved*
-$68	*CCF $ Saved*





-0.3% % Savings from Electric Baseline

-2.3% % Saved from Nat Gas Baseline

Water Conservation

ECM Overview:

Water usage savings can be realized by replacing outdated flow and flush fixtures with modern fixtures. This calculation accounts for the reduction is water use when replacing outdated water fixtures with modern fixtures.

Building Name: Courthouse

System ID: All Fixtures

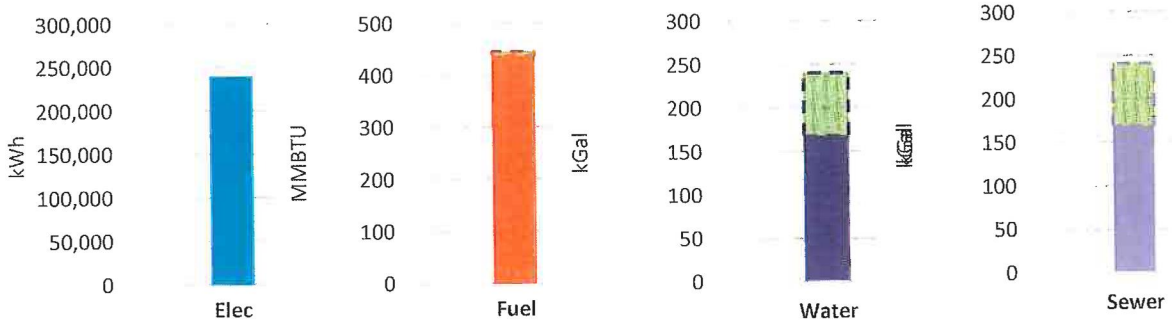
Water Fixture Conditions:

	Total # Fixtures	Existing Flow/Flush Rate		Proposed Flow/Flush Rate	
Kitchen Faucet	4	2.5	GPM	1.5	GPM
Public Lavatory (restroom) Faucet	10	2.0	GPM	0.4	GPM
Toilet (Tank)	13	5.5	GPF	1.3	GPF
Toilet (Flushometer)	1	3.5	GPF	1.6	GPF
Showerhead	-	-	GPM	-	GPM

Total Savings

64	*Annual CCF*
72	*Annual Water kGal*
72	*Annual Sewer kGal*

$52	*CCF $ Saved*
$285	*Water $ Saved*
$665	*Sewer $ Saved*



1.5% % Saved from Nat Gas Baseline

30.1% % Savings from Water Baseline

30.1% % Savings from Sewer Baseline

Add Insulation

ECM Overview:

Energy savings can be realized from adding insulation to sections of the envelope (roof, walls, etc.). The savings come from improved envelope R-values.

Building Name: Courthouse

Insulation Data:

Area of Added Roof Insulation: 11,547 ft^2

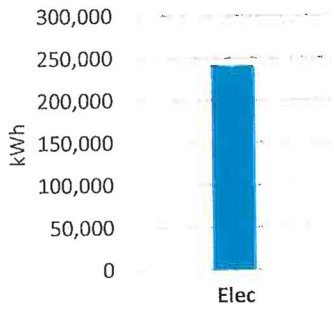
Existing R Value of Insulation, Roof: 10

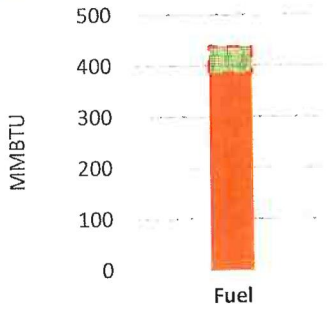
Proposed R Value of Insulation, Roof: 34

Total Savings

345	***Annual kWh***
506	***Annual CCF***

$40	***Electric $ Saved***
$408	***CCF $ Saved***





0.1% % Savings from Electric Baseline

11.8% % Saved from Nat Gas Baseline

Weather-Strip

ECM Overview:

Poor weather-stripping around doors and windows leads to unnecessary infiltration. This infiltration puts an additional load on the HVAC system. Re-sealing the doors and windows will prevent this unnecessary infiltration.

Building Name: Courthouse

Opening Data:

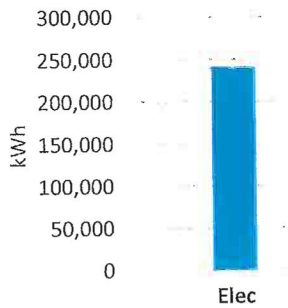
Opening Type	Qty	Length (in)	Width (in)	Air Leakage
Door	4	216	0.1	86

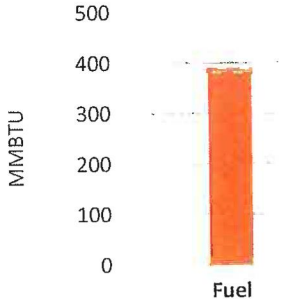
Avg. Indoor Temp - Cooling Mode:	74.1	°F
Avg. Indoor Temp - Heating Mode:	66.1	°F
Avg. Outdoor Daily Summer Temperature:	71.1	°F
Avg. Outdoor Daily Winter Temperature:	43.4	°F

Total Savings

53	***Annual kWh***
73	***Annual CCF***

$6	***Electric $ Saved***
$59	***CCF $ Saved***





0.0%	% Savings from Electric Baseline
1.9%	% Saved from Nat Gas Baseline

Vending Machine Control

ECM Overview:

By implementing motion detection sensors on vending machines, savings can be realized by extending the off cycle times during overnight, weekend, holiday and other less occupied times in the facility.

Building Name: Courthouse

System ID: All machines

Occupied Hours: 2,349
Unoccupied Hours: 6,411

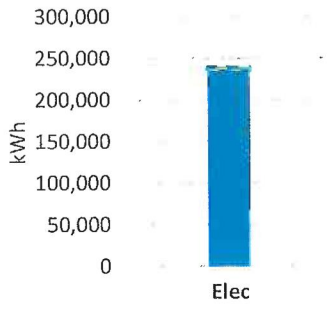
Vending Machine Summary:

Number of Cold Drink Vending Machines:	2	
Power Requirements of Cold Drink Vending Machine:	380	watts
Cold Drink Machine Existing Annual Energy:	6,658	kWh
Cold Drink Machine Estimated Annual Energy:	2,142	kWh

Total Savings

4,515	*Annual kWh*

$521	*Electric $ Saved*



1.9% % Savings from Electric Baseline

2.3 C. Preliminary ESPC Project

Judicial Center

80 Judicial Drive
Benton, KY 42025

Year Built:	2002	**Square Footage:**	58,122	**Occupancy:**	Varies
Renovations:		**# of Stories:**	3	**Energy Source:**	Natural Gas & Electric
Survey Date:	7/11/2017	**Hours of Operation:**	M-F: 8-5	**Computers:**	5

2.3 C. PRELIMINARY ESPC PROJECT

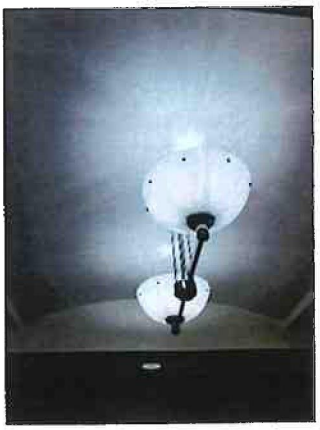
ECM #1 Lighting

The Judicial Center is a newer building that is mostly T8, but has some HID and compact fluorescent technology as well. The fluorescent fixtures will receive 13w UL Type B lamps and be delamped if appropriate. The CFL wall sconces and can lights will get pin based LED replacement lamps. HID fixtures will be upgraded to LED with lamps, or retrofit kits. Sensors will be added to restrooms, conference rooms.

There are a lot of 400w facade floods that will be replaced with LED floods. Area lights will also be replaced with new fixtures. Benefits of the lighting retrofit include:

1.) Fluorescent bulbs are being phased out of manufacturing
2.) LED bulbs have much longer burn hours than fluorescents
3.) Operational savings from installing LED's (Less replacements)
4.) Brighter burning light, and reduction of bulbs and wattage per fixture
5.) Utility Rebates are strong

Fixture Quantity	Pre kWh	Post kWh	kWh Savings
879	237,299	74,569	162,730



2.3 C. PRELIMINARY ESPC PROJECT

Location		Existing Fixture			Proposed Fixture		
Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
Basement	Mechanical Room	4' Wrap BP 2L 32W T8	25	59	RT, 4' 13W LED 2L	25	26
Basement	Areaway	Wall Pack CFL 42W 4P	2	48	Wall Pack LED CO 1900L	2	14
Basement	Corridor	1x4 Prism Rec 2L 32W T8	17	59	RT, 4' 13W LED 2L	17	26
Basement	Corridor	8" Rec Can CFL 42W 4P	16	48	LED 15W 4P G24Q H Replacement	16	15
Basement	Circuit Clerk	2X4 Prism Rec 4L 32W T8	15	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	15	26
Basement	Future Development	2X4 Prism Rec 4L 32W T8	8	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	8	26
Basement	Future Toilets	4' Wrap BP 2L 32W T8	4	59	RT, 4' 13W LED 2L	4	26
Basement	Corridor	Decorative MH 70W	7	95	LED 17W A21 Retrofit	7	17
Basement	Security	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
Basement	Storage	4' Wrap BP 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
1st Floor	Work Room	2X4 Prism Rec 4L 32W T8	3	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Bookkeeper	2X4 Par Rec 4L 32W T8	4	112	RT, 4' 13W LED 4L	4	52
1st Floor	Staff Work Area	2X4 Par Rec 4L 32W T8	12	112	RT, 4' 13W LED 4L	12	52
1st Floor	Staff Work Area	2X4 Par Rec 4L 32W T8	8	112	RT, 4' 13W LED 4L	8	52
1st Floor	Driver's license	2X4 Par Rec 4L 32W T8	9	112	RT, 4' 13W LED 4L	9	52
1st Floor	Clerk's Office	2X2 Par Rec 3L T8	4	47	RT, 2' 9W LED 3L	4	27
1st Floor	Circuit Clerk/Public Area	Decorative MH 70W	2	95	LED 17W A21 Retrofit	2	17
1st Floor	Circuit Clerk/Public Area	10" Rec Can CFL 32W 4P 2L	2	62	LED 15W 4P G24Q H Replacement 2L	2	30
1st Floor	Telecommunications	1x4 Prism Rec 2L 32W T8	4	59	RT, 4' 13W LED 2L	4	26
1st Floor	Circulation	2X2 Prism Rec 4L T8	4	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	4	27
1st Floor	Employee lounge	2X4 Prism Rec 4L 32W T8	4	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Special Files	1x4 Prism Rec 2L 32W T8	6	59	RT, 4' 13W LED 2L	6	26
1st Floor	General Files	1x4 Prism Rec 2L 32W T8	15	59	RT, 4' 13W LED 2L	15	26
1st Floor	District Judge	2X4 Prism Rec 4L 32W T8	4	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Passage	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	1	27
1st Floor	District Judge	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	District Judge	1x4 Prism Rec 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
1st Floor	Conference	2X2 Par Rec 4L T8	6	61	RT, 2' 9W LED 4L	6	36
1st Floor	District Judge	2X2 Par Rec 3L T8	4	47	RT, 2' 9W LED 3L	4	27
1st Floor	District Judge	2X4 Prism Rec 4L 32W T8	4	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Vestibule	Decorative CFL 13W 2P 2L	3	31	LED 5W 2P GX23 H Replacement 2L	3	10

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Vestibule	10" Rec Can CFL 32W 4P 2L	6	62	LED 15W 4P G24Q H Replacement 2L	6	30
1st Floor	Main Corridor	Decorative MH 70W	8	95	LED 17W A21 Retrofit	8	17
1st Floor	Main Corridor	8" Rec Can CFL 42W 4P	34	48	LED 15W 4P G24Q H Replacement	34	15
1st Floor	Main Corridor	Decorative MH 175W 2L	2	430	LED Retrofit 9000L 2L	2	180
1st Floor	Main Corridor	2X2 Prism Rec 4L T8	13	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	13	27
1st Floor	Seating	8" Rec Can CFL 42W 4P	6	48	LED 15W 4P G24Q H Replacement	6	15
1st Floor	Witness Waiting	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Witness Waiting	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Vestibule	Decorative MH 70W	1	95	LED 17W A21 Retrofit	1	17
1st Floor	Public Space	2X2 Par Rec 4L T8	12	61	RT, 2' 9W LED 4L	12	36
1st Floor	Janitor's Closet	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
1st Floor	Conference Room	2X4 Prism Rec 4L 32W T8	3	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Client 1	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Client 2	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Client 3	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Open Office	10" Rec Can CFL 32W 4P 2L	33	62	LED 15W 4P G24Q H Replacement 2L	33	30
1st Floor	Open Office	Decorative MH 175W	4	215	LED Retrofit 9000L	4	90
1st Floor	Holding	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Holding	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Jury Deliberation	2X2 Par Rec 4L T8	6	61	RT, 2' 9W LED 4L	6	36
1st Floor	Jury Deliberation	2X4 Prism Rec 4L 32W T8	8	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	8	26
1st Floor	Vestibule	1x4 Prism Rec 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
1st Floor	Vestibule	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	1	27
1st Floor	Secure Access Corridor	1x4 Prism Sur 2L 32W T8	10	59	RT, 4' 13W LED 2L	10	26
1st Floor	Corridor to Deterntion Center	1x4 Prism Sur 2L 32W T8	8	59	RT, 4' 13W LED 2L	8	26
1st Floor	Exit lobby	1x4 Prism Rec 2L 32W T8	10	59	RT, 4' 13W LED 2L	10	26
1st Floor	Storage	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
1st Floor	Staff Workstations	2X4 Par Rec 4L 32W T8	15	112	RT, 4' 13W LED 4L	15	52
1st Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Secretary	2X4 Prism Rec 4L 32W T8	3	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Secretary	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Secretary	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Corridor	2X2 Prism Rec 4L T8	4	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	4	27
1st Floor	Conference	2X2 Par Rec 4L T8	3	61	RT, 2' 9W LED 4L	3	36
1st Floor	Toilet	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
1st Floor	Kitchen	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
1st Floor	Toilet	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
1st Floor	Clerk's Office	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Reception	10" Rec Can CFL 32W 4P 2L	9	62	LED 15W 4P G24Q H Replacement 2L	9	30
1st Floor	Reception	3' UC 1L 25W T8	2	26	RT, 3' 12W LED 1L	2	12
1st Floor	Reception	10" Rec Can CFL 32W 4P 2L	9	62	LED 15W 4P G24Q H Replacement 2L	9	30
1st Floor	Reception	3' UC 1L 25W T8	2	26	RT, 3' 12W LED 1L	2	12
1st Floor	Clerk's Office	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
1st Floor	Men's Restroom 1	4' Strip BP 2L 32W T8	7	59	RT, 4' 13W LED 2L	7	26
1st Floor	Men's Restroom 1	8" Rec Can CFL 42W 4P	3	48	LED 15W 4P G24Q H Replacement	3	15
[illegible]or	Women's Restroom 1	4' Strip BP 2L 32W T8	7	59	RT, 4' 13W LED 2L	7	26
1st Floor	Women's Restroom 1	8" Rec Can CFL 42W 4P	3	48	LED 15W 4P G24Q H Replacement	3	15
1st Floor	Stairwell 1	4' Wall Bracket BP 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
1st Floor	Stairwell 2	10" Rec Can CFL 32W 4P 2L	4	62	LED 15W 4P G24Q H Replacement 2L	4	30
1st Floor	Stairwell 2	Wall Sconce CFL 13W Screw In	4	13	LED 10W A19 Replacement	4	10
2nd Floor	Circuit Judge	2X2 Par Rec 3L T8	4	47	RT, 2' 9W LED 3L	4	27
2nd Floor	Conference	2X2 Par Rec 4L T8	6	61	RT, 2' 9W LED 4L	6	36
2nd Floor	Reception Waiting	2X4 Prism Rec 4L 32W T8	4	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
2nd Floor	Law Clerk	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Conference	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Cubicle	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Cubicle	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
[illegible]loor	Cubicle	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
2nd Floor	library suite	2X2 Par Rec 3L T8	8	47	RT, 2' 9W LED 3L	8	27
2nd Floor	library suite	8" Rec Can CFL 42W 4P	5	48	LED 15W 4P G24Q H Replacement	5	15
2nd Floor	Toilet	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Toilet	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Clerk's Storage	1x4 Prism Rec 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
2nd Floor	Server	1x4 Prism Rec 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
2nd Floor	Storage	1x4 Prism Rec 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
2nd Floor	Reception Waiting	2X4 Prism Rec 4L 32W T8	4	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
2nd Floor	Reception Waiting	1x4 Prism Rec 2L 32W T8	4	59	RT, 4' 13W LED 2L	4	26
2nd Floor	Reception Waiting	2X4 Prism Rec 4L 32W T8	4	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
2nd Floor	Office	1x4 Prism Rec 2L 32W T8	4	59	RT, 4' 13W LED 2L	4	26
2nd Floor	Main Corridor	8" Rec Can CFL 42W 4P	35	48	LED 15W 4P G24Q H Replacement	35	15
2nd Floor	Main Corridor	Decorative MH 70W	7	95	LED 17W A21 Retrofit	7	17
2nd Floor	Main Corridor	2X2 Prism Rec 4L T8	19	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	19	27
2nd Floor	Attorney	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Waiting	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Attorney	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Waiting	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Main Corridor	Decorative MH 175W 2L	2	430	LED Retrofit 9000L 2L	2	180
2nd Floor	Public Area	2X2 Par Rec 4L T8	8	61	RT, 2' 9W LED 4L	8	36
2nd Floor	Circuit Courtroom	10" Rec Can CFL 32W 4P 2L	33	62	LED 15W 4P G24Q H Replacement 2L	33	30
2nd Floor	Circuit Courtroom	Decorative MH 175W	4	215	LED Retrofit 9000L	4	90
2nd Floor	Back Hallway	1x4 Prism Rec 2L 32W T8	3	59	RT, 4' 13W LED 2L	3	26
2nd Floor	Vestibule	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	1	27
2nd Floor	Vestibule	2X2 Prism Rec 4L T8	2	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	2	27
2nd Floor	Vestibule	1x4 Prism Rec 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
2nd Floor	Jury Deliberation	2X2 Par Rec 4L T8	6	61	RT, 2' 9W LED 4L	6	36
2nd Floor	Jury Deliberation	6" Rec Can Inc 100W A	8	100	LED 12W BR30 Replacement	8	12
2nd Floor	Holding	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Holding	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Interview	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Corridor	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
2nd Floor	Office	1x4 Prism Rec 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
2nd Floor	Office	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Office	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Stairwell	1x4 Prism Sur 2L 32W T8	3	59	RT, 4' 13W LED 2L	3	26
2nd Floor	Storage 1	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Storage 2	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Storage 3	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	children Waiting	1x4 Prism Rec 2L 32W T8	4	59	RT, 4' 13W LED 2L	4	26
2nd Floor	Reception Waiting	2X2 Prism Rec 4L T8	6	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	6	27
2nd Floor	Reception Waiting	8" Rec Can CFL 42W 4P	3	48	LED 15W 4P G24Q H Replacement	3	15
2nd Floor	Domestic Hearing	10" Rec Can CFL 32W 4P 2L	12	62	LED 15W 4P G24Q H Replacement 2L	12	30
2nd Floor	Domestic Hearing	Wall Sconce CFL 13W Screw In	6	13	LED 10W A19 Replacement	6	10
2nd Floor	Domestic Hearing	Decorative MH 100W	1	128	LED 17W A21 Retrofit	1	17
2nd Floor	Toilet	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
[illegible]oor	Toilet	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Family Court	2X2 Par Rec 4L T8	4	61	RT, 2' 9W LED 4L	4	36
2nd Floor	Family Court	6" Rec Can Inc 100W A	4	100	LED 12W BR30 Replacement	4	12
2nd Floor	Storage	4' Strip BP 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Conference	2X2 Par Rec 4L T8	2	61	RT, 2' 9W LED 4L	2	36
2nd Floor	Conference	8" Rec Can CFL 42W 4P	4	48	LED 15W 4P G24Q H Replacement	4	15
2nd Floor	Social Worker	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Clerk	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	court administrator	2X4 Prism Rec 4L 32W T8	4	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
2nd Floor	Corridor	2X2 Prism Rec 4L T8	2	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	2	27
2nd Floor	Vestibule	10" Rec Can CFL 32W 4P 2L	2	62	LED 15W 4P G24Q H Replacement 2L	2	30
2nd Floor	Vestibule	2X2 Par Rec 4L T8	3	61	RT, 2' 9W LED 4L	3	36
2nd Floor	Witness hearing	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	Witness hearing	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
2nd Floor	grand juty	2X2 Par Rec 4L T8	6	61	RT, 2' 9W LED 4L	6	36
2nd Floor	grand juty	8" Rec Can CFL 42W 4P	6	48	LED 15W 4P G24Q H Replacement	6	15
2nd Floor	Vestibule	2X2 Prism Rec 4L T8	3	61	RT, 2' 9W LED 3L, 2x2 Refl Kit	3	27
[illegible] Floor	Office	2X4 Prism Rec 4L 32W T8	1	112	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
[illegible]loor	Passage	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
2nd Floor	Toilet	1x4 Prism Rec 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
2nd Floor	Toilet	1x4 Prism Rec 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
2nd Floor	Men's Restroom 2	4' Strip BP 2L 32W T8	7	59	RT, 4' 13W LED 2L	7	26
2nd Floor	Men's Restroom 2	8" Rec Can CFL 42W 4P	3	48	LED 15W 4P G24Q H Replacement	3	15
2nd Floor	Women's Restroom 2	4' Strip BP 2L 32W T8	7	59	RT, 4' 13W LED 2L	7	26
2nd Floor	Women's Restroom 2	8" Rec Can CFL 42W 4P	3	48	LED 15W 4P G24Q H Replacement	3	15
2nd Floor	Stairwell	10" Rec Can CFL 32W 4P 2L	6	62	LED 15W 4P G24Q H Replacement 2L	6	30
2nd Floor	Stairwell	Wall Sconce CFL 13W Screw In	2	13	LED 10W A19 Replacement	2	10
2nd Floor	Vestibule	9" Rec Can MH 175W	12	215	LED 17W PAR38 Retrofit	12	17
2nd Floor	Vestibule	10" Rec Can CFL 32W 4P 2L	3	62	LED 15W 4P G24Q H Replacement 2L	3	30
Exterior		6" Rec Can MH 50W	3	72	LED 12W BR30 Retrofit	3	12
Exterior		Shoebox MH 400W	6	458	Area LED 15L	6	155
[illegible]or		6" Rec Can MH 50W	2	72	LED 12W BR30 Retrofit	2	12
Exterior	Sally Port	Wall Pack MH 175W	1	215	Wall Pack LED FT 4000L	1	37
Exterior		Decorative MV 400W	7	455	LED Retrofit 9000L	7	90
Exterior	Exit Sally Port	Wall Pack MH 175W	1	215	Wall Pack LED FT 4000L	1	37
Exterior	Rear Exit	Wall Pack MH 175W	1	215	Wall Pack LED FT 4000L	1	37
Exterior		Decorative MH 150W	2	190	LED Retrofit 9000L	2	90
Exterior	side	Wall Pack HPS 50W	4	66	Wall Pack LED CO 1900L	4	14
Exterior		Shoebox MH 400W	8	458	Area LED 15L	8	155
Exterior		Flood MH 150W	2	190	Flood LED 4000L	2	29
Exterior	Flag	Flood MH 175W	2	215	Flood LED 5600L	2	42
Exterior	Building Floods	Flood MH 400W	17	458	Flood LED 10L	17	90
Exterior	Bollards	Bollard MH 70W	2	95	LED 17W A21 Retrofit	2	17

2.3 C. PRELIMINARY ESPC PROJECT

ECM #2 Retro-Commissioning

Retro-commissioning is the process of renewing, rebuilding, cleaning, calibrating and verifying system operations. Including minor repairs and fix up parts as well as labor. The intent of retro-commissioning is to extend the service life of the equipment, improves operations and conserves energy through proper function.

- Perfection Group will retro-commission the cold water and hot water pumps, the ERV system, and heat exchanger.

ECM #3 Building Automation Controls

Currently, the Judicial Center temperatures are controlled by an Alerton Building Automation System. The system is 15 years old, and is old technology. Certain components for the system are obsolete.

Perfection Group proposes to furnish and install a state of the art Direct Digital Control System incorporating the latest in open protocol Web Server technology. The Web accessible front end will include graphic representation of floor plans and individual equipment components allowing user adjustment of operating perimeters, occupancy scheduling, set point adjustment, integration of economizer, demand ventilation and control of the mechanical HVAC systems.

The building operation will be sequence developed to provide maximum energy savings while maintaining space comfort. Optimum start stop and night pre cooling will take advantage of outside conditions to lower the overall building load demands placed on the mechanical systems. System resets will be initiated and based on space conditions, local space set points, outdoor conditions and system capabilities to ensure efficient system operations. Individual set points can be limited by the building operator locally and remotely adjusted.

System components include:

- Web server (hardware, and software license as required)
- BacNet based fully integrated controllers
- Programmable DDC modules to integrate I/O functions
- Electronic actuators
- Space temperature sensors
- Network cabling
- System engineering
- As-Built control drawings
- Back up copies of software and operating programs
- Graphics package including interface to control devices
- Standard one year warranty on all furnished components and workmanship
- Extension of manufactures component warranties as available

2.3 C. Preliminary ESPC Project

ECM #4 Mechanical Upgrades

The Judicial Center is currently conditioned by a heating/cooling water loop that uses a cooling tower and boilers for heat transfer and (48) Water Source Heat Pumps of various sizes. These WSHP's are approximately 15 years old and at the end of their life cycle. The cooling tower and holding tank are dilapidated, but are set to be replaced under a separate project. There are (2) Lochinvar Copper Finn boilers that are original to the building.

- Upgrade the boilers to 98% efficient Lochinvar boilers to achieve maximum energy efficiency.
- Replace (48) Water Source Heat Pumps with increased energy efficiency ratings
- Replace the Domestic Hot Water Heater to a high efficiency system

Aged 15 year old Boilers

Domestic Hot Water Boiler

ECM #5 Water Conservation Upgrades

No recommendations at the time.

ECM #6 Building Envelope

No recommendations at this time.

Energy Savings Calculations

ECM Summary

Judicial Center	Energy & Water Savings			Cost Savings			Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	Electric kWh	Peak kW	Nat Gas CCF	Elec $ Saved	Nat Gas $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Total Lighting	118,487	22	-49	$12,727	-$49	$12,679	48	10	45	36.3	1.0	37.3	
Total RCx	509	0	3	$55	$3	$57	0	0	0	36.3	1.0	37.2	
Total Controls	17,510	0	5	$1,881	$5	$1,885	7	2	7	35.2	0.9	36.2	
Total Mechanical	14,471	0	114	$1,554	$113	$1,667	7	1	6	34.4	0.7	35.1	
Total Water	0	0	0	$0	$0	$0	0	0	0	34.4	0.7	35.1	
Total Envelope	0	0	0	$0	$0	$0	0	0	0	34.4	0.7	35.1	
Total Renewable Energy	0	0	0	$0	$0	$0	0	0	0	34.4	0.7	35.1	
Total Miscellaneous	0	0	0	$0	$0	$0	0	0	0	34.4	0.7	35.1	
Total:	150,977	22	72	$16,217	$71	$16,289	62	13	58	43.3	0.9	44.1	Baseline
% Saved:	20%		14%	20%	14%	19%				34.4	0.7	35.1	Post Project

ECM Summary

Judicial Center		Energy & Water Savings			Cost Savings			Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	ECM #	Electric kWh	Peak kW	Nat Gas CCF	Elec $ Saved	Nat Gas $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Lighting Upgrades	1-1	118,487	22	-49	$12,727	-$49	$12,679	48	10	45	36.3	1.0	37.3	
Total Lighting		**118,487**	**22**	**-49**	**$12,727**	**-$49**	**$12,679**	**48**	**10**	**45**	**36.3**	**1.0**	**37.3**	
RCx ERV, Heat Exchanger, Pumps	2-1	509	0	3	$55	$3	$57	0	0	0	36.3	1.0	37.2	
Total RCx		**509**	**0**	**3**	**$55**	**$3**	**$57**	**0**	**0**	**0**	**36.3**	**1.0**	**37.2**	
BAS Replacement	3-1	17,510	0	5	$1,881	$5	$1,885	7	2	7	35.2	0.9	36.2	
Total Controls		**17,510**	**0**	**5**	**$1,881**	**$5**	**$1,885**	**7**	**2**	**7**	**35.2**	**0.9**	**36.2**	
Replace WSHPs	4-1	14,131	0	23	$1,518	$23	$1,540	6	1	6	34.4	0.9	35.3	
Replace Boiler	4-2	0	0	91	$0	$90	$90	0	0	0	34.4	0.7	35.2	
RCx Pumps (from ECM 2-1)	4-3	340	0	0	$37	$0	$37	0	0	0	34.4	0.7	35.1	
Total Mechanical		**14,471**	**0**	**114**	**$1,554**	**$113**	**$1,667**	**7**	**1**	**6**	**34.4**	**0.7**	**35.1**	
Total Water		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**34.4**	**0.7**	**35.1**	
Total Envelope		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**34.4**	**0.7**	**35.1**	
Total Renewable Energy		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**34.4**	**0.7**	**35.1**	
Total Miscellaneous		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**34.4**	**0.7**	**35.1**	
Total:		**150,977**	**22**	**72**	**$16,217**	**$71**	**$16,289**	**62**	**13**	**58**	**43.3**	**0.9**	**44.1**	**Baseline**
% Saved:		**20%**		**14%**	**20%**	**14%**	**19%**				**34.4**	**0.7**	**35.1**	**Post Project**

Interior Lighting Retrofit

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction, as well as the HVAC interaction.

Building Name: Maintenance Building

Occupied Hours: 2,610
Unoccupied Hours: 6,150

Lighting:

Existing Interior Lighting kW:	13.6	*Monthly kW*
Existing Interior Lighting kWh:	24,514	*Annual kWh*
Proposed Interior Lighting kW:	3.6	*Monthly kW*
Proposed Interior Lighting kWh:	6,437	*Annual kWh*
Interior Lighting kW **Saved**:	8.0	*Monthly kW*
Interior Lighting kWh **Saved**:	18,077	*Annual kWh*

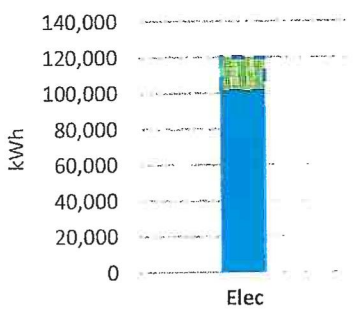
HVAC Interaction:

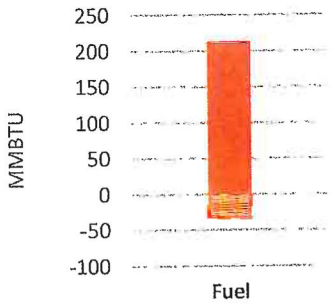
Cooling kWh **Saved**:	450	*Annual kWh*
Primary Heating Fuel **Penalty**:	-331	*Annual CCF*

Total Savings

18,527	***Annual kWh***
8.0	***Monthly kW***
-331	***Annual CCF***

$2,464	***Electric $ Saved***
$0	***Elec Demand $ Saved***
-$271	***CCF $ Saved***





15.4% Saved from Electric Baseline
-18.9% Saved from Nat Gas Baseline

Exterior Lighting

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction.

Building Name: Maintenance Building

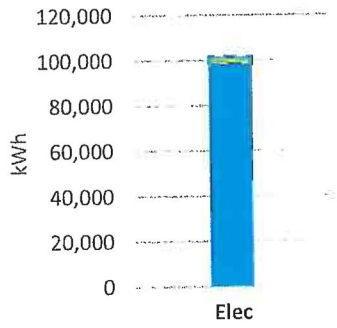
Hours of Exterior Lighting Operation - Existing:	4,380
Hours of Exterior Lighting Operation - Proposed:	4,380

Lighting:

Existing Interior Lighting kW:	1.0	*Monthly kW*
Existing Interior Lighting kWh:	4,393	*Annual kWh*
Proposed Interior Lighting kW:	0.2	*Monthly kW*
Proposed Interior Lighting kWh:	1,056	*Annual kWh*

Total Savings

3,337	***Annual kWh***
$444	***Electric $ Saved***



3.3% % Savings from Electric Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Maintenance Building

System ID: Split System (2.5 Ton)

HVAC Conditions:

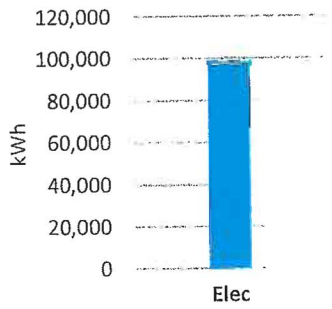
	Existing	Proposed	
Cooling Efficiency	9.7	16.0	SEER
Primary Heating Efficiency	80%	92%	

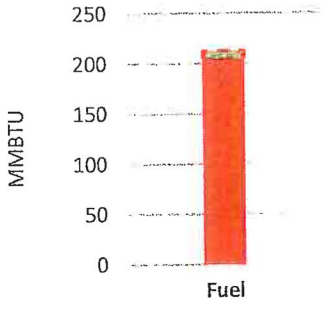
Total Annual Cooling Hours: 4,415
Total Annual Heating Hours: 2,232

Total Savings

1,514	*Annual kWh*
79	*Annual CCF*

$201	*Electric $ Saved*
$65	*CCF $ Saved*





1.5% % Savings from Electric Baseline
3.8% % Saved from Nat Gas Baseline

Convert Unit Heaters to IR

ECM Overview:

Converting unit heaters to infrared heaters, which use both radiant heat and convection heating, can provide savings.

Building Name: Maintenance Building

System ID: Garage Heaters

UH Conditions:

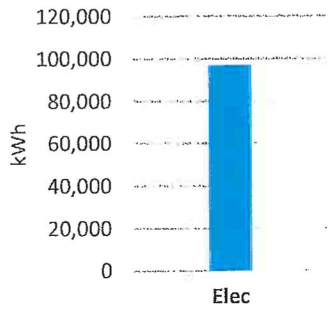
Existing Unit Heater Type: Older Unit Heaters
Existing Unit Heater Efficiency: 76%

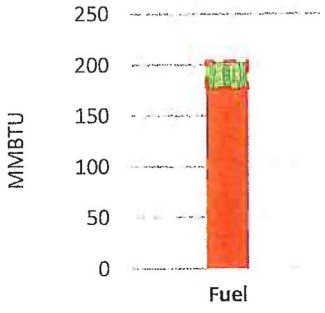
Proposed Unit Heater Type: Infrared Unvented Heaters
Proposed IR Heater Efficiency: 92%

Total Savings

0	*Annual kWh*
259	*Annual CCF*

$0	*Electric $ Saved*
$212	*CCF $ Saved*





0.0% % Savings from Electric Baseline
13.0% % Saved from Nat Gas Baseline

Vending Machine Control

ECM Overview:

By implementing motion detection sensors on vending machines, savings can be realized by extending the off cycle times during overnight, weekend, holiday and other less occupied times in the facility.

Building Name: Maintenance Building

System ID: All machines

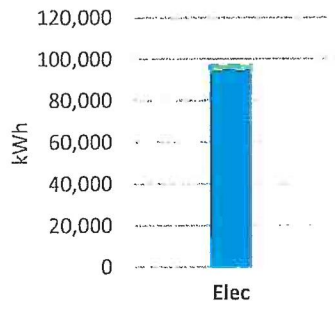
Occupied Hours: 2,610
Unoccupied Hours: 6,150

Vending Machine Summary:

Number of Cold Drink Vending Machines:	1	
Power Requirements of Cold Drink Vending Machine:	380	watts
Cold Drink Machine Existing Annual Energy:	3,329	kWh
Cold Drink Machine Estimated Annual Energy:	1,190	kWh

Total Savings

2,139	***Annual kWh***	**$284**	***Electric $ Saved***



2.2% % Savings from Electric Baseline

2.3 C. Preliminary ESPC Project

Road Department Building

160 Homer Lucas Lane
Benton, KY 42025

Year Built:	1986	**Square Footage:**	19,473	**Occupancy:**	Varies
Renovations:	N/A	**# of Stories:**	1	**Energy Source:**	Natural Gas & Electric
Survey Date:	7/11/2017	**Hours of Operation:**	6:00 – 3:30	**Computers:**	5

2.3 C. PRELIMINARY ESPC PROJECT

ECM #1 Lighting

The building currently has 4' T8 32watt fluorescent fixtures in the office space. The truck bays are lit by 8' 2 lamp fluorescent fixtures. The exterior of the building and throughout the outer structures, there are very high wattage fixtures. Exit signs are not LED. The retrofit recommendation is to upgrade to LED throughout. Some benefits of a lighting retro-fit include:

1.) Fluorescent bulbs are being phased out of manufacturing
2.) LED bulbs have much longer burn hours than fluorescents
3.) Operational savings from installing LED's (Less replacements)
4.) Brighter burning light, and reduction of bulbs and wattage per fixture
5.) Utility Rebates are strong

Fixture Quantity	Pre kWh	Post kWh	kWh Savings
150	57,612	12,976	44,637

4' Fluorescent Fixtures in Office

High Wattage Exterior Flood

T-8 High Wattage Fluorescent Lighting in Truck Bay

Location		Existing Fixture			Proposed Fixture		
Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
Exterior	Building Mounted	Flood MH 400W	2	458	Flood LED 15L	2	133
Exterior	Building Mounted	Flood Hal 75W PAR38 2L	1	150	LED 14W PAR38 Replacement 2L	1	28
Exterior	Building Mounted	Barnlight LED 28W	1	28	No Action	1	28
Exterior	Tank Area	Barnlight LED 28W	2	28	No Action	2	28
	General Lighting	8' Strip HO 2L	46	207	RT, 4' 13W LED 4L, 8' BC Kit	46	52
	Exits	Exit Combo Inc 15W 2L	2	30	Exit Sign LED Combo	2	4
	Pit	8' Strip BP 4L 32W T8	3	112	RT, 4' 13W LED 4L	3	52
	Task	8' Strip HO 2L	2	207	RT, 4' 13W LED 4L, 8' BC Kit	2	52

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
	Restroom	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Office	8' Strip HO 2L	2	207	RT, 4' 13W LED 4L, 8' BC Kit	2	52
Exterior	Salt Building	Flood MH 400W	5	458	Flood LED 15L	5	133
Exterior	Salt Building	Flood Quartz 500W	5	500	Flood LED 4000L	5	29
	Salt Building	Flood Inc 65W R40	1	65	LED 14W PAR38 Replacement	1	14
	Truck Storage Building	High Bay MH 400W	18	458	High Bay LED 18L	18	112
	Truck Storage Building	Barnlight MV 175W	2	205	Barn Light LED 2200L	2	28
Exterior	Fuel Tank	Barnlight LED 28W	1	28	No Action	1	28
	Salt Spreader Storage Building	Keyless Inc 100W A	8	100	LED 10W A19 Replacement	8	10
	Salt Spreader Storage Building	Keyless Inc 75W A	5	75	LED 10W A19 Replacement	5	10
Exterior	Back Hoe Building	Barnlight LED 28W	1	28	No Action	1	28
	Back Hoe Building	Keyless Inc 75W A	6	75	LED 10W A19 Replacement	6	10
	Truck Storage	8' Strip HO 2L	4	207	RT, 4' 13W LED 4L, 8' BC Kit	4	52
	Truck Storage	Keyless Inc 75W A	7	75	LED 10W A19 Replacement	7	10
Exterior	Truck Storage	Barnlight MV 175W	1	205	Barn Light LED 2200L	1	28
	Break Room	2X4 Prism Rec 3L 32W T8	11	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	11	26
	Break Room Restroom	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
	Office Hallway	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
	Office Hallway Restroom	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Office 1	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
	Office 2	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
	Main Hallway	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
	Main Hallway	Exit Sign Inc	1	30	Exit Sign LED BB	1	3

2.3 C. PRELIMINARY ESPC PROJECT

ECM #2 Retro-Commissioning

Retro-commissioning is the process of renewing, rebuilding, cleaning, calibrating and verifying system operations. Including minor repairs and fix up parts as well as labor. The intent of retro-commissioning is to extend the service life of the equipment, improves operations and conserves energy through proper function.

- Perfection Group will retro-commission the (3) infrared tube heaters in the truck bays.

ECM #3 Building Automation Controls

Currently, the building temperatures are controlled by nonprogrammable thermostats.

- Perfection Group recommends upgrading to Web Enabled programmable thermostats with scheduling and setback capabilities. Also, these thermostats allow for alarming and remote access which will prevent major issues, and maximize energy efficiency.

Nonprogrammable Thermostat

ECM #4 Mechanical Upgrades

The building is currently conditioned by (2) package units. The truck bays are heated by energy efficient natural gas infrared tube heaters that are several years old, but have life left. The domestic hot water system is outdated.

- Perfection Group will install (2) new, high efficiency 15 SEER package units with modulating economizer to maximize energy savings.
- Replace the existing Richmond 30 Gallon water heater with a new Rheem 40 Gallon energy efficient water Heater designed for the application and required usage within the facility.

ECM #5 Water Conservation Upgrades

No recommendations at this time.

2.3 C. PRELIMINARY ESPC PROJECT

ECM #6 Building Envelope

Currently, the truck bay doors have worn out seals and have gaps that allow conditioned air to exit the space.

Garage Door Improvements

Perfection Group, Inc. proposes to replace the door seals on five (5) Bay Doors and the four (4) entrance doors to the facility.

Benefits of Door weather seals:

1. Depending on what keep in your facility, the extreme heat and cold during times of the year can be damaging. Weather strips keep the weather outside and allow you better control the temperature inside.
2. The average door will be opened and closed more than 200 times in the next month alone. Multiply that by the years of use and you'll begin to understand the beating your doors take. A weather strip can also serve as a form of protection for your door, cushioning it from repetitive contact with concrete and siding.
3. The advantage of using a door seal is that it acts as a barrier between the outdoor elements and the indoors. Without it heavy rains can leak through small cracks, wind blows through gaps, and cold weather easily penetrates the doors. A weather seal can prolong the life of the facility and everything in it by providing additional protection from the outdoors.

ECM #7 Other

There is (1) vending machine in the Road Department. It currently runs the lighting and compressors 24/7. We will be installing (1) VendingMiser controls on these machines. They use a motion sensor to reduce the runtime saving energy over extended off hours, weekends and holidays while maintaining a cold product. This reduced energy consumption without any perceptible change in the product dispensed.

VendingMISER controls will eliminate compressor run time and save wasted energy dollars

Energy Savings Calculations

ECM Summary

Road Department	Energy & Water Savings			Cost Savings			Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	Electric kWh	Peak kW	Nat Gas CCF	Elec $ Saved	Nat Gas $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Total Lighting	39,236	12	-336	$4,108	-$283	$3,825	14	3	13	21.4	16.5	37.9	
Total RCx	0	0	95	$0	$80	$80	1	0	0	21.4	15.7	37.2	
Total Controls	0	0	0	$0	$0	$0	0	0	0	21.4	15.7	37.2	
Total Mechanical	570	0	19	$60	$16	$75	0	0	0	21.3	15.6	36.9	
Total Water	0	0	0	$0	$0	$0	0	0	0	21.3	15.6	36.9	
Total Envelope	27	0	37	$3	$31	$34	0	0	0	21.3	15.3	36.5	
Total Renewable Energy	0	0	0	$0	$0	$0	0	0	0	21.3	15.3	36.5	
Total Miscellaneous	2,139	0	0	$224	$0	$224	1	0	1	20.7	15.3	36.0	
Total:	41,972	12	-185	$4,394	-$156	$4,239	16	3	15	31.8	13.8	45.6	Baseline
% Saved:	35%		-11%	35%	-11%	30%				20.7	15.3	36.0	Post Project

ECM Summary

Road Department		Energy & Water Savings			Cost Savings			Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	ECM #	Electric kWh	Peak kW	Nat Gas CCF	Elec $ Saved	Nat Gas $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Lighting Upgrades	1-1	39,236	12	-336	$4,108	-$283	$3,825	14	3	13	21.4	16.5	37.9	
Total Lighting		**39,236**	**12**	**-336**	**$4,108**	**-$283**	**$3,825**	**14**	**3**	**13**	**21.4**	**16.5**	**37.9**	
RCx IR Tubes (3)	2-1	0	0	95	$0	$80	$80	1	0	0	21.4	15.7	37.2	
Total RCx		**0**	**0**	**95**	**$0**	**$80**	**$80**	**1**	**0**	**0**	**21.4**	**15.7**	**37.2**	
Total Controls		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**21.4**	**15.7**	**37.2**	
Replace Package Units (2)	4-1	570	0	9	$60	$8	$68	0	0	0	21.3	15.7	36.9	
Replace DHW Heater	4-2	0	0	9	$0	$8	$8	0	0	0	21.3	15.6	36.9	
Total Mechanical		**570**	**0**	**19**	**$60**	**$16**	**$75**	**0**	**0**	**0**	**21.3**	**15.6**	**36.9**	
Total Water		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**21.3**	**15.6**	**36.9**	
Replace Door Seals (5)	6-1	27	0	37	$3	$31	$34	0	0	0	21.3	15.3	36.5	
Total Envelope		**27**	**0**	**37**	**$3**	**$31**	**$34**	**0**	**0**	**0**	**21.3**	**15.3**	**36.5**	
Total Renewable Energy		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**21.3**	**15.3**	**36.5**	
Vendmiser	8-1	2,139	0	0	$224	$0	$224	1	0	1	20.7	15.3	36.0	
Total Miscellaneous		**2,139**	**0**	**0**	**$224**	**$0**	**$224**	**1**	**0**	**1**	**20.7**	**15.3**	**36.0**	
Total:		**41,972**	**12**	**-185**	**$4,394**	**-$156**	**$4,239**	**16**	**3**	**15**	**31.8**	**13.8**	**45.6**	Baseline
% Saved:		**35%**		**-11%**	**35%**	**-11%**	**30%**				**20.7**	**15.3**	**36.0**	Post Project

Interior Lighting Retrofit

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction, as well as the HVAC interaction.

Building Name: Road Department

Occupied Hours: 2,610
Unoccupied Hours: 6,150

Lighting:

Existing Interior Lighting kW:	23.4	*Monthly kW*
Existing Interior Lighting kWh:	30,462	*Annual kWh*
Proposed Interior Lighting kW:	9.0	*Monthly kW*
Proposed Interior Lighting kWh:	12,104	*Annual kWh*
Interior Lighting kW **Saved**:	11.6	*Monthly kW*
Interior Lighting kWh **Saved**:	18,358	*Annual kWh*

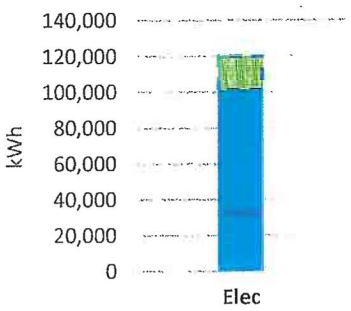
HVAC Interaction:

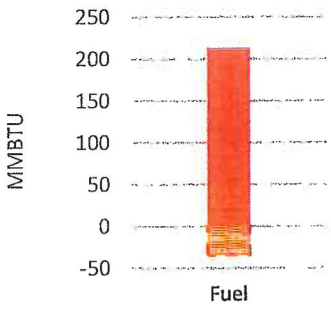
Cooling kWh **Saved**:	403	*Annual kWh*
Primary Heating Fuel **Penalty**:	-336	*Annual CCF*

Total Savings

18,761	***Annual kWh***
11.6	***Monthly kW***
-336	***Annual CCF***

$1,964	***Electric $ Saved***
$0	***Elec Demand $ Saved***
-$283	***CCF $ Saved***





15.6% Saved from Electric Baseline
-19.2% Saved from Nat Gas Baseline

Exterior Lighting

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction.

Building Name: Road Department

Hours of Exterior Lighting Operation - Existing:	4,380
Hours of Exterior Lighting Operation - Proposed:	4,380

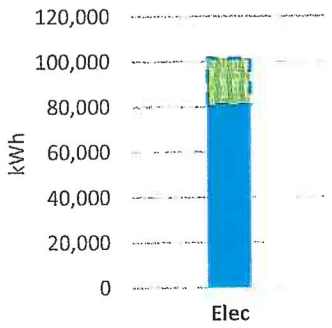
Lighting:

Existing Interior Lighting kW:	6.2	*Monthly kW*
Existing Interior Lighting kWh:	27,160	*Annual kWh*
Proposed Interior Lighting kW:	1.6	*Monthly kW*
Proposed Interior Lighting kWh:	6,685	*Annual kWh*

Total Savings

20,475	***Annual kWh***

$2,144	***Electric $ Saved***



20.2% % Savings from Electric Baseline

Retro-Commissioning

ECM Overview:

Older systems degrade in efficiency as they age. Mechanical retro-commissioning will increase the efficiency of the system up to or near the starting unit efficiency.

Building Name: Road Department

System ID: IR Tube Heaters (3)

HVAC Conditions:

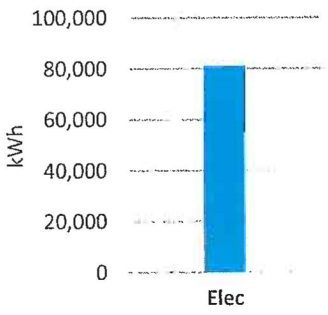
	Nameplate	De-rated	
Heating Efficiency:	80%	74%	%

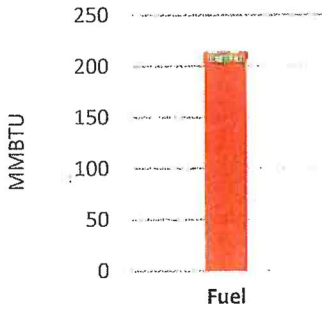
Total Annual Heating Hours: 2,232

Total Savings

0	*Annual kWh*
95	*Annual CCF*

$0	*Electric $ Saved*
$80	*CCF $ Saved*





0.0% % Savings from Electric Baseline

4.5% % Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Road Department

System ID: Package Units (2)

HVAC Conditions:

	Existing	Proposed	
Cooling Efficiency	10.4	15.0	SEER
Primary Heating Efficiency	78%	80%	

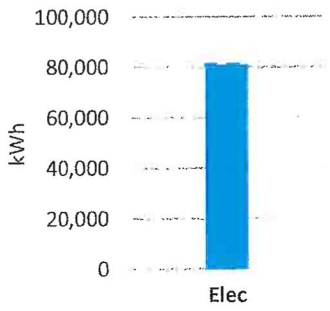
Total Annual Cooling Hours: 4,415

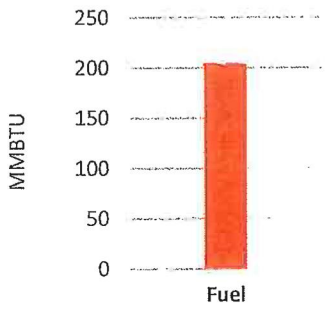
Total Annual Heating Hours: 2,571

Total Savings

570	*Annual kWh*
9	*Annual CCF*

$60	*Electric $ Saved*
$8	*CCF $ Saved*





0.7% % Savings from Electric Baseline

0.5% % Saved from Nat Gas Baseline

Replace Water Heater

ECM Overview:

Energy savings can be realized by replacing an outdated domestic hot water heating system with a new, high efficiency system.

Building Name: Road Department

System ID: DHW Heater

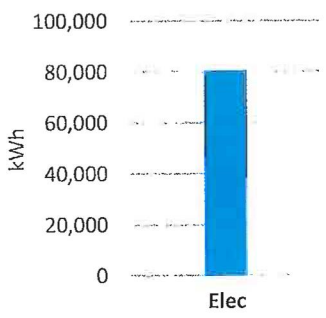
Domestic Hot Water Conditions:

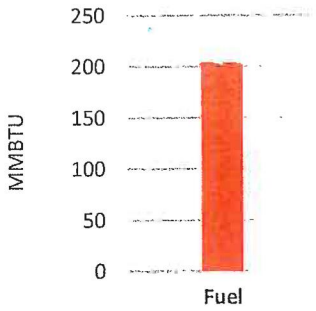
Existing Water Heater Efficiency:	65%	
Proposed Water Heater Efficiency:	92%	
Existing Annual Hot Water Usage:	3,900	Gallons
Proposed Annual Hot Water Usage:	3,900	Gallons
Baseline Annual Utility Consumption:	32	CCF
Proposed Annual Utility Consumption:	23	CCF

Total Savings

9	*Annual CCF*

$8	*CCF $ Saved*





0.0%	% Savings from Electric Baseline
0.5%	% Saved from Nat Gas Baseline

Weather-Strip

ECM Overview:

Poor weather-stripping around doors and windows leads to unnecessary infiltration. This infiltration puts an additional load on the HVAC system. Re-sealing the doors and windows will prevent this unnecessary infiltration.

Building Name: Road Department

Opening Data:

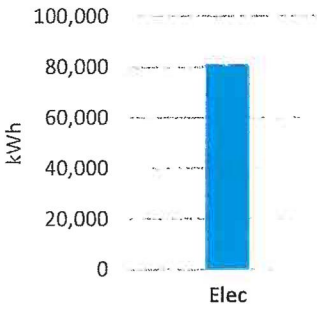
Opening Type	Qty	Length (in)	Width (in)	Air Leakage Area (in2)
Bay Door	5	720	0.1	360

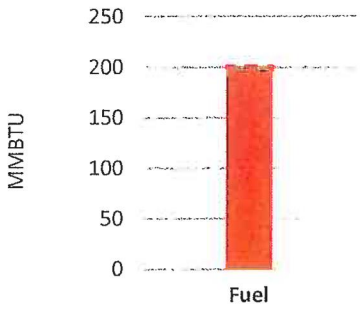
Avg. Indoor Temp - Cooling Mode:	72.0	°F
Avg. Indoor Temp - Heating Mode:	55.0	°F
Avg. Outdoor Daily Summer Temperature:	71.1	°F
Avg. Outdoor Daily Winter Temperature:	43.4	°F

Total Savings

27	*Annual kWh*
37	*Annual Therm*

$3	*Electric $ Saved*
$31	*CCF $ Saved*





0.0%	% Savings from Electric Baseline
1.9%	% Saved from Nat Gas Baseline

Vending Machine Control

ECM Overview:

By implementing motion detection sensors on vending machines, savings can be realized by extending the off cycle times during overnight, weekend, holiday and other less occupied times in the facility.

Building Name: Road Department

System ID: All machines

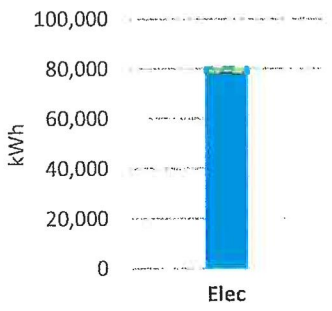
Occupied Hours: 2,610
Unoccupied Hours: 6,150

Vending Machine Summary:

Number of Cold Drink Vending Machines:	1	
Power Requirements of Cold Drink Vending Machine:	380	watts
Cold Drink Machine Existing Annual Energy:	3,329	kWh
Cold Drink Machine Estimated Annual Energy:	1,190	kWh

Total Savings

2,139	***Annual kWh***
$224	***Electric $ Saved***



2.7% % Savings from Electric Baseline

2.3 C. Preliminary ESPC Project

Detention Center/Sheriff's Office/911 Complex

54 Judicial Drive
Benton, KY 42025

Year Built:	1991	**Square Footage:**	23,006	**Occupancy:**	225-250
Renovations:	N/A	**# of Stories:**	1	**Energy Source:**	Natural Gas & Electric
Survey Date:	7/11/2017	**Hours of Operation:**	24/7	**Computers:**	20-25

2.3 C. PRELIMINARY ESPC PROJECT

ECM #1 Lighting

The majority of the Detention Center is standard 4' fluorescent fixtures with 2 or 3 lamp T8 32 watt bulbs. The cell security fixtures are also T8 32 watt, many of which have been delamped to 2 lamps per fixture. We recommend retrofitting the standard fluorescent fixtures to 13 watt UL type B lamps. Exit signs are not LED, and will be retrofit to 3 watt LED. The exterior lighting consists of 175 watt wall packs. The shoebox pole lights are 100 watt metal hallides. These fixtures will be retrofit to LED, and will have significant wattage reduction.

Some benefits of a lighting retro-fit include:

1.) Fluorescent bulbs are being phased out of manufacturing
2.) LED bulbs have much longer burn hours than fluorescents
3.) Operational savings from installing LED's (Less replacements)
4.) Brighter burning light, and reduction of bulbs and wattage per fixture
5.) Utility Rebates are strong

Fixture Quantity	Pre kWh	Post kWh	kWh Savings
469	150,082	56,442	93,640

Cell secured T8 32 watt fixtures

4' fluorescent fixtures

Location		Existing Fixture			Proposed Fixture		
Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
Exterior	Building Mounted	Wall Pack MH 175W	4	215	Wall Pack LED FT 4000L	4	37
Exterior	Poles	Shoebox MH 100W	4	128	Area LED 6000L	4	55
1st Floor	Foyer	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Foyer	Vending Machine Snack	1	485	No Action	1	485
1st Floor	Foyer	Vending Machine Drink	1	485	No Action	1	485

2.3 C. Preliminary ESPC Project

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Hallway	2X4 Prism Rec 3L 32W T8	8	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	8	26
1st Floor	911 Center	2X4 Prism Rec 2L 32W T8	5	59	RT, 4' 13W LED 2L	5	26
1st Floor	Restroom	1x4 Prism Sur 2L 32W T8	1	59	RT, 4' 13W LED 2L	1	26
1st Floor	Break Room	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
1st Floor	Hallway	Exit Sign CFL 7W 2L	1	21	Exit Sign LED BB	1	3
1st Floor	Server	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Kitchen	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Office	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Main Office	2X4 Prism Rec 3L 32W T8	8	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	8	26
1st Floor	Main Office	2X4 Prism Rec 3L 32W T8	6	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	6	26
1st Floor	Sherriff	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Storage	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Evidence	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
1st Floor	Lab	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 3L	2	39
1st Floor	Women's Restroom	1x4 Prism Sur 2L	2	72	RT, 4' 13W LED 2L	2	26
1st Floor	Women's Restroom	3' Wall Bracket 2L	1	66	RT, 3' 12W LED 2L	1	26
1st Floor	Men's Restroom	1x4 Prism Sur 2L	3	72	RT, 4' 13W LED 2L	3	26
1st Floor	Men's Restroom	3' Wall Bracket 2L	1	66	RT, 3' 12W LED 2L	1	26
1st Floor	Mechanical Room	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Conference/Storage	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
1st Floor	Interview 3	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
Lower Level	Corridor	2X4 Prism Rec 3L 32W T8	6	89	RT, 4' 13W LED 3L	6	39
Lower Level	Room 1	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 3L	4	39
Lower Level	Room 2	1x4 Prism Sur 2L	1	72	RT, 4' 13W LED 2L	1	26
Lower Level	Room 3	1x4 Prism Sur 2L	1	72	RT, 4' 13W LED 2L	1	26
Lower Level	Room 4	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 3L	4	39

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
Lower Level	Room 4 Restroom	1x4 Prism Sur 2L	1	72	RT, 4' 13W LED 2L	1	26
Lower Level	Room 5	2X4 Prism Rec 3L 32W T8	8	89	RT, 4' 13W LED 3L	8	39
Lower Level	Room 6	2X4 Prism Rec 3L 32W T8	6	89	RT, 4' 13W LED 3L	6	39
Lower Level	Restroom 1	1x4 Prism Sur 2L TP	4	72	RT, 4' 13W LED 2L TP	4	26
Lower Level	Restroom 2	1x4 Prism Sur 2L TP	3	72	RT, 4' 13W LED 2L TP	3	26
Lower Level	Cell Room 6	1x4 Prism Sur 2L TP	4	72	RT, 4' 13W LED 2L TP	4	26
Lower Level	Cell Room 7	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
Lower Level	Cell Room 8	1x4 Prism Sur 2L TP	2	72	RT, 4' 13W LED 2L TP	2	26
Lower Level	Cell Room 9	1x4 Prism Sur 2L TP	2	72	RT, 4' 13W LED 2L TP	2	26
Lower Level	Cell Room 10	1x4 Prism Sur 2L TP	2	72	RT, 4' 13W LED 2L TP	2	26
Lower Level	Cell Room 11	1x4 Prism Sur 2L TP	2	72	RT, 4' 13W LED 2L TP	2	26
Lower Level	Cell 8	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
Lower Level	Cell 8	Night Light CFL 13W 2P	1	17	LED 5W 2P GX23 H Replacement	1	5
Lower Level	Cell 9	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
Lower Level	Cell 9	Night Light CFL 13W 2P	1	17	LED 5W 2P GX23 H Replacement	1	5
Lower Level	Cell Room 12	1x4 Prism Sur 2L TP	2	72	RT, 4' 13W LED 2L TP	2	26
Lower Level	Cell Room 13	1x4 Prism Sur 2L TP	2	72	RT, 4' 13W LED 2L TP	2	26
Lower Level	Cell Room 14	1x4 Prism Sur 2L TP	4	72	RT, 4' 13W LED 2L TP	4	26
Lower Level	Cell Room 15	1x4 Prism Sur 2L TP	4	72	RT, 4' 13W LED 2L TP	4	26
Lower Level	Cell Room 16	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
Lower Level	Cell 10	1x4 Prism Sur 2L TP	2	72	RT, 4' 13W LED 2L TP	2	26
Lower Level	Cell 10	Night Light CFL 13W 2P	1	17	LED 5W 2P GX23 H Replacement	1	5
Lower Level	Cell 11	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
Lower Level	Cell 11	Night Light CFL 13W 2P	1	17	LED 5W 2P GX23 H Replacement	1	5
Lower Level	Cell 12	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
Lower Level	Cell 12	Night Light CFL 13W 2P	1	17	LED 5W 2P GX23 H Replacement	1	5
Lower Level	Corridor	2X4 Prism Rec 3L 32W T8	5	89	RT, 4' 13W LED 3L	5	39
	Hallway	2X4 Prism Rec 3L 32W T8	6	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	6	26
	Hallway	Exit Sign CFL 13W Screw In 2L	1	26	Exit Sign LED BB	1	3
	Open Office	2X4 Prism Rec 3L 32W T8	5	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	5	26

2.3 C. Preliminary ESPC Project

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
	Office	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
	Office Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Office Restroom	1x4 Prism Sur 2L	1	72	RT, 4' 13W LED 2L	1	26
	Office Restroom	3' Wall Bracket 2L	1	66	RT, 3' 12W LED 2L	1	26
	Men's Restroom	1x4 Prism Sur 2L	1	72	RT, 4' 13W LED 2L	1	26
	Women's Restroom	1x4 Prism Sur 2L	1	72	RT, 4' 13W LED 2L	1	26
	Janitor's Closet/Storage	1x4 Prism Sur 2L	1	72	RT, 4' 13W LED 2L	1	26
	Holding Corridor	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Visitation	1x4 Prism Sur 2L	2	72	RT, 4' 13W LED 2L	2	26
	Visitation	4' Corner Mount BP 2L TP	3	72	RT, 4' 13W LED 2L TP	3	26
	Cell 1-7	1x4 Prism Rec 2L 32W T8 TP	24	59	RT, 4' 13W LED 2L TP	24	26
	Cell 1-7	Night Light CFL 13W 2P	18	17	LED 5W 2P GX23 H Replacement	18	5
	Cell Restroom 1-7	3' Corner Mount 2L TP	7	66	RT, 3' 12W LED 2L TP	7	26
	Cell Restroom 1-7	Night Light CFL 13W 2P	7	17	LED 5W 2P GX23 H Replacement	7	5
	Cell Entry 1-7	4' Corner Mount BP 2L TP	7	72	RT, 4' 13W LED 2L TP	7	26
	Cell	2' Corner Mount 2L TP	6	51	RT, 2' 9W LED 2L TP	6	18
	Cell	4' Corner Mount BP 2L TP	8	72	RT, 4' 13W LED 2L TP	8	26
	Hallway	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
	Isolation Cell	2' Corner Mount 2L TP	2	51	RT, 2' 9W LED 2L TP	2	18
	061+002	4' Corner Mount BP 2L TP	2	72	RT, 4' 13W LED 2L TP	2	26
	061+002	2' Corner Mount 2L TP	2	51	RT, 2' 9W LED 2L TP	2	18
	41 Cell	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
	41 Cell	3' Corner Mount 2L TP	1	66	RT, 3' 12W LED 2L TP	1	26
	49 Cell	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
	49 Cell	3' Corner Mount 2L TP	1	66	RT, 3' 12W LED 2L TP	1	26
	50 Cell	1x4 Prism Sur 2L TP	1	72	RT, 4' 13W LED 2L TP	1	26
	50 Cell	3' Corner Mount 2L TP	1	66	RT, 3' 12W LED 2L TP	1	26
	Kitchenette	2X4 Prism Rec 3L 32W T8	12	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	12	26

2.3 C. Preliminary ESPC Project

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
	Hood	Jelly Jar CFL 13W Screw In	6	13	LED 10W A19 Replacement	6	10
	Restroom	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
	Office	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
	Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Electrical	4' Strip BP 2L	1	72	RT, 4' 13W LED 2L	1	26
	Back Hallway	2X4 Prism Rec 3L 32W T8	15	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	15	26
	Holding Corridor	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Cell	4' Corner Mount BP 2L TP	3	72	RT, 4' 13W LED 2L TP	3	26
	Cell	3' Corner Mount 2L TP	1	66	RT, 3' 12W LED 2L TP	1	26
	Cell Right	4' Corner Mount BP 2L TP	3	72	RT, 4' 13W LED 2L TP	3	26
	Cell Right	3' Corner Mount 2L TP	1	66	RT, 3' 12W LED 2L TP	1	26
	Cell Left	4' Corner Mount BP 2L TP	3	72	RT, 4' 13W LED 2L TP	3	26
	Cell Left	3' Corner Mount 2L TP	1	66	RT, 3' 12W LED 2L TP	1	26
	Storage	1x4 Prism Rec 2L	2	72	RT, 4' 13W LED 2L	2	26
	Storage	1x4 Prism Rec 2L	2	72	RT, 4' 13W LED 2L	2	26
	Restroom	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Office	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
	43	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Hallway to Kitchen	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
	Booking	2X4 Prism Rec 3L 32W T8	5	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	5	26
	Sally Port Mezzanine	1x4 Prism Sur 2L	12	72	RT, 4' 13W LED 2L	12	26
	Sally Port Mezzanine	1x4 Prism Sur 2L	4	72	RT, 4' 13W LED 2L	4	26
	Mezzanine	4' Strip BP 2L	17	72	RT, 4' 13W LED 2L	17	26

2.3 C. Preliminary ESPC Project

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
	Mezzanine	Keyless Inc 100W A	1	100	LED 10W A19 Replacement	1	10
	Mezzanine	4' Strip BP 2L	1	72	RT, 4' 13W LED 2L	1	26
	Booking	2X4 Prism Rec 3L 32W T8	3	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	3	26
	33	1x4 Prism Rec 2L	4	72	RT, 4' 13W LED 2L	4	26
	34	1x4 Prism Rec 2L	4	72	RT, 4' 13W LED 2L	4	26
	39	1x4 Prism Rec 2L	4	72	RT, 4' 13W LED 2L	4	26
	Storage	3' Wall Bracket 2L	1	66	RT, 3' 12W LED 2L	1	26
	Employee Room	2X4 Prism Rec 3L 32W T8	2	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	2	26
	Hallway	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
	Storage	2X4 Prism Rec 3L 32W T8	1	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	1	26
	Juvenile	2X4 Prism Rec 3L 32W T8	4	89	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
	Juvenile	Exit Sign CFL 7W 2L	1	21	Exit Sign LED BB	1	3
	28	1x4 Prism Rec 2L	4	72	RT, 4' 13W LED 2L	4	26
	124	1x4 Prism Rec 2L	4	72	RT, 4' 13W LED 2L	4	26
	32	1x4 Prism Rec 2L	1	72	RT, 4' 13W LED 2L	1	26
	Stairwell	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
	Mezzanine	4' Strip BP 2L	33	72	RT, 4' 13W LED 2L	33	26
	Control Room	6" Rec Can CFL 18W Screw In	12	18	LED 12W BR30 Replacement	12	12
	Control Room	2x2 Prism Rec 2L U6	6	72	RT, 2' 9W LED 2L, 2x2 Refl Kit	6	18

ECM #2 Retro-Commissioning

Retro-commissioning is the process of renewing, rebuilding, cleaning, calibrating and verifying system operations. Including minor repairs and fix up parts as well as labor. The intent of retro-commissioning is to extend the service life of the equipment, improves operations and conserves energy through proper function.

- Perfection Group will retro-commission the (2) newer Carrier split systems located on the Detention Center roof.

2.3 C. PRELIMINARY ESPC PROJECT

ECM #3 Building Automation Controls

Currently, the Detention Center temperatures are controlled by an Alerton Building Automation System. The system is 15 years old, and is old technology. Certain components for the system are obsolete.

Perfection Group proposes to furnish and install a state of the art Direct Digital Control System incorporating the latest in open protocol Web Server technology. The Web accessible front end will include graphic representation of floor plans and individual equipment components allowing user adjustment of operating perimeters, occupancy scheduling, set point adjustment, integration of economizer, demand ventilation and control of the mechanical HVAC systems.

The building operation will be sequence developed to provide maximum energy savings while maintaining space comfort. Optimum start stop and night pre cooling will take advantage of outside conditions to lower the overall building load demands placed on the mechanical systems. System resets will be initiated and based on space conditions, local space set points, outdoor conditions and system capabilities to ensure efficient system operations. Individual set points can be limited by the building operator locally and remotely adjusted.

System components include:

- Web server (hardware, and software license as required)
- BacNet based fully integrated controllers
- Programmable DDC modules to integrate I/O functions
- Electronic actuators
- Space temperature sensors
- Network cabling
- System engineering
- As-Built control drawings
- Back up copies of software and operating programs
- Graphics package including interface to control devices
- Standard one year warranty on all furnished components and workmanship
- Extension of manufactures component warranties as available

2.3 C. PRELIMINARY ESPC PROJECT

ECM #4 Mechanical Upgrades

The Detention Center HVAC consists of (10) split systems – (5) for the Detention Center, (2) for 911 Center, and (3) for Sheriff's Office. Two of the systems for the Detention Center were recently replaced. The systems vary in size and are mostly original to the facility which is past their life expectancy. They have SEER ratings under 10. Operational issues have been a continual issue for these systems according to the maintenance staff. The older units use R22 refrigerant which is very expensive due to the phase out by the EPA.

Perfection Group recommends the following scope of work:

- Replace (8) split systems with 16-18 SEER high efficiency split systems.
- Replace (3) hot water boilers with 98+ efficient units providing domestic and heating water.
- Air balance the system to ensure proper air flow to each zone.
- Replace disconnects
- Correct and cleanup piping and exposed electrical wiring

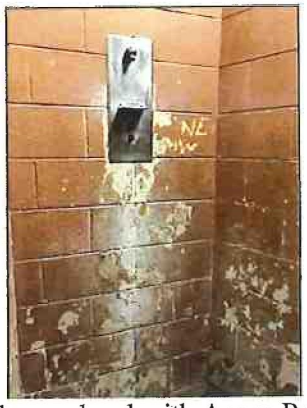
Aged Indoor Air Handler with poor wiring and duct runs

Older split systems with 9 SEER Rating

2.3 C. PRELIMINARY ESPC PROJECT

ECM #5 Water Conservation Upgrades

Water consumption at the Detention Center is one of the biggest opportunities for energy savings within the County. Current comi units in the Jail Cells are 4.5 gallons per flush. We recommend retrofitting to a 3.5 gallon per flush kit. Sinks in the combi units are efficient. See chart below for detailed scope of work.



Shower head with Acorn Push Button timer

4.5 gpf Combi Unit

Room	Existing Fixture Description	Existing Quantity	Existing Usage	Units	Measure Description	New Quantity	Qty Upgraded	Gallons Saved per Unit
LOBBY MRR	Closet Floor ADA Elongated Tank Left	1	3.5	per flush	New 1.28 gpf tank toilet with elongated bowl - ADA - 12"	1	1	2.2
LOBBY MRR	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
LOBBY WRR	Closet Floor ADA Elongated Tank Left	1	3.5	per flush	New 1.28 gpf tank toilet with elongated bowl - ADA - 12"	1	1	2.2
LOBBY WRR	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
CONTROL RM	Closet Floor Elongated Diaphragm	1	3.5	per flush	New floor mounted elongated bowl and new 1.28 gpf valve	1	1	2.2
CONTROL RM	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
DORMS	Closet Floor Combi Diaphragm	18	4.5	per flush	Retrofit existing Diaphragm valve with 3.5 gpf kit	18	18	1.0
DORMS	Lavatory Sink Combi Push Button	18	0.5	per minute	No Action	18	0	0.0

2.3 C. PRELIMINARY ESPC PROJECT

Room	Existing Fixture Description	Existing Quantity	Existing Usage	Units	Measure Description	New Quantity	Qty Upgraded	Gallons Saved per Unit
DORMS	Shower Acorn Push Button	14	2.5	per minute	No Action	14	0	0.0
ISOLATION CELLS	Closet Floor Combi Diaphragm	2	4.5	per flush	Retrofit existing Diaphragm valve with 3.5 gpf kit	2	2	1.0
ISOLATION CELLS	Lavatory Sink Combi Push Button	2	0.5	per minute	No Action	2	0	0.0
DETOX CELLS	Closet Floor Combi Diaphragm	3	4.5	per flush	Retrofit existing Diaphragm valve with 3.5 gpf kit	3	3	1.0
DETOX CELLS	Lavatory Sink Combi Push Button	3	0.5	per minute	No Action	3	0	0.0
DETOX CELLS	Closet Floor Floor Flusher Diaphragm	3	3.5	per flush	No Action	3	0	0.0
MSRR	Closet Floor ADA Elongated Tank Left	1	1.6	per flush	New 1.28 gpf tank toilet with elongated bowl - ADA - 12"	1	1	0.3
MSRR	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
ISRR	Kitchen Sink 8" Standard	1	2.5	per minute	Retrofit with 1.5 gpm VP laminar flow moderator	1	1	1.0
TRUSTEE CELL	Closet Floor Combi Diaphragm	1	4.5	per flush	Retrofit existing Diaphragm valve with 3.5 gpf kit	1	1	1.0
TRUSTEE CELL	Lavatory Sink Combi Push Button	1	0.5	per minute	No Action	1	0	0.0
TRUSTEE CELL	Shower 0 Push Button	1	2.5	per minute	No Action	1	0	0.0
HOLDING CELL	Closet Floor Combi Diaphragm	2	4.5	per flush	Retrofit existing Diaphragm valve with 3.5 gpf kit	2	2	1.0
HOLDING CELL	Lavatory Sink Combi Standard	2	0.5	per minute	No Action	2	0	0.0
HOLDING CELL	Shower Acorn Metered	1	2.5	per minute	No Action	1	0	0.0
LAUNDRY	Washer Unimac	1	0.0	per minute	No Action	1	0	0.0
LAUNDRY	Dryer	1	0.0	per minute	No Action	1	0	0.0
KITCHEN	Lavatory Sink 8" Standard	1	2.5	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	2.2
KITCHEN	Kitchen Sink 8" Standard	2	2.5	per minute	No Action	2	0	0.0
KITCHEN	Closet Floor Elongated Tank Left	1	1.6	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	0.3
KITCHEN	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
CELLS	Closet Wall Combi Diapgragm	5	4.5	per flush	Retrofit existing Diaphragm valve with 3.5 gpf kit	5	5	1.0

2.3 C. PRELIMINARY ESPC PROJECT

Room	Existing Fixture Description	Existing Quantity	Existing Usage	Units	Measure Description	New Quantity	Qty Upgraded	Gallons Saved per Unit
CELLS	Lavatory Sink Combi Metered	5	0.5	per minute	No Action	5	0	0.0
CELLS	Shower Acorn Metered	1	1.0	per minute	No Action	1	0	0.0
SHERIFF	Closet Floor Elongated Tank Left	1	1.6	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	0.3
SHERIFF	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
SHERIFF	Closet Floor Elongated Tank Left	1	3.5	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	2.2
SHERIFF	Urinal Wall Small Ft Print Diaphragm	1	0.5	per flush	New Small Urinal and .125 Valve 3/4" Stop	1	1	0.4
SHERIFF	Lavatory Sink 4" Standard	1	2.0	per minute	Retrofit with 0.35 gpm vandal proof spray moderator	1	1	1.7
SHERIFF	Shower 0 Standard	2	2.5	per minute	No Action	2	0	0.0

ECM #6 Building Envelope

No recommendations at this time.

ECM #7 Other

There is (1) vending machine in the Detention Center. It currently runs the lighting and compressors 24/7. We will be installing (1) VendingMiser controls on these machines. They use a motion sensor to reduce the runtime saving energy over extended off hours, weekends and holidays while maintaining a cold product. This reduced energy consumption without any perceptible change in the product dispensed.

VendingMISER controls will eliminate compressor run time and save wasted energy dollars

2.3 C. PRELIMINARY ESPC PROJECT

ECM #7 Kitchen Equipment Upgrades

Current Situation: Old equipment, low staffed. Each meal is prepared for approximately 250 people.

Solution: Newer, more energy efficient equipment. More opportunity for batch cooking which cooks more in a shorter time frame. The equipment will run less, and allows for less skilled labor to cook. Cooking will now be able to be done ahead of time and stored to be reheated at a later date by inmates. Training on all new equipment is included. Perfection Group will upgrade the following equipment:

Ice Maker

Air-Cooled with production capacity up to 387 lbs per 24 hours
UL Listed, Energy Star Rated
Warranty: 3 year parts and labor on entire machine
5 year parts and labor on evaporator, compressor, and condenser

Reach-in Freezer

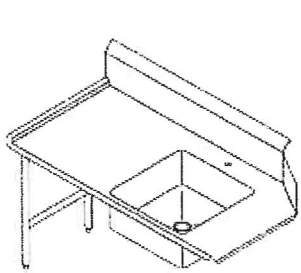
Two-section, 46 cubic feet, self-contained refrigeration with microprocessor control
UL Listed, Energy Star Rated
Warranty: 3 year service/labor & 5 year compressor warranty

2.3 C. Preliminary ESPC Project

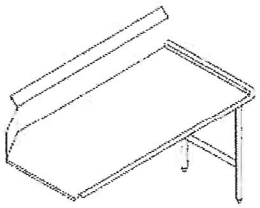
Reach-in Refrigerator

Two-section, 46 cubic feet, self-contained refrigeration with microprocessor control
UL Listed, Energy Star Rated
Warranty: 3 year service/labor & 5 year compressor warranty

Dishwasher







The dishwasher replacement includes larger capacity to better serve the needs of the kitchen. This will allow for shorter run hours on more energy efficient equipment which will reduce the amount of water and reduce the amount of natural gas needed to heat the water. Features include:

- Ventless Door Type Dishwasher with energy recovery
- Hot water sanitize with a capacity of 40 racks/hour
- Larger table top space
- Energy Star Rated
- Larger drying racks
- Disposer with 3 hp motor, stainless steel construction

2.3 C. Preliminary ESPC Project

Combi Oven

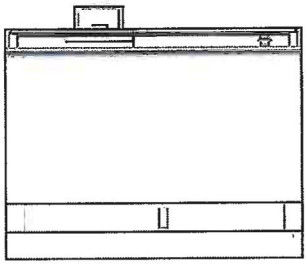
Programmable 1 touch cooking setting for multiple products at one time. The method of batch cooking will allow a less skilled, short-handed staff to prepare meals in a shorter, easier time frame.
Capacity of (11) 18" x 26" full size sheets or (22) 12" x 20" full size hotel pans
(3) power levels, (4) cooking modes
ComiClean Plus with (5) cleaning levels
Energy Star Rated

Blast Chiller Freezer

Quickchiller quick freezers product so it can be prepared ahead of time and reheated at a later date to serve. This is ideal for a low-staffed kitchen where cooks cannot be at every shift. This reduces the need to start up all kitchen equipment for reheat meals.
(20) preset menu options with stainless steel worktop.
Warranty: 5 year limited compressor

2.3 C. Preliminary ESPC Project

HD Range, 48" Thermostatic Griddle and Convection Oven



Perfection Group will replace the (2) 24" stove tops with (1) 48" stove top. A convection oven will be installed underneath the new range. This range is 15-20% more efficient, and preheats much quicker allowing for less run hours. Standard 3 year warranty on this equipment.

Kettle

Stationary kettle will replace the current outdated kettle in the kitchen.
40 gallon capacity
Electronic ignition
100,000 BTU
One year Warranty

Planetary Mixers

The mixers are original to the building.
The new Hobart mixers are equipped with smart timers, 10 accessories
Standard 1 year warranty on parts and labor

Energy Savings Calculations

ECM Summary

Detention Center / SO / 911 Complex	Energy & Water Savings					Cost Savings					Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	Electric kWh	Peak kW	Nat Gas CCF	Water kGal	Sewer kGal	Elec $ Saved	Nat Gas $ Saved	Water $ Saved	Sewer $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Total Lighting	99,559	20	-1,482	0	0	$9,952	-$1,166	$0	$0	$8,786	33	7	31	103.9	126.0	229.9	
Total RCx	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	103.9	126.0	229.9	
Total Controls	6,367	0	393	0	0	$636	$310	$0	$0	$946	5	1	4	102.9	124.2	227.2	
Total Mechanical	30,421	0	2,555	0	0	$3,041	$2,011	$0	$0	$5,051	26	6	25	98.4	112.9	211.3	
Total Water	0	0	217	744	744	$0	$171	$1,867	$4,355	$6,393	1	0	1	98.4	111.9	210.4	
Total Envelope	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	98.4	111.9	210.4	
Total Renewable Energy	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	98.4	111.9	210.4	
Total Miscellaneous	2,496	0	0	0	0	$249	$0	$0	$0	$249	1	0	1	98.1	111.9	210.0	
Total:	138,842	20	1,684	744	744	$13,879	$1,325	$1,867	$4,355	$21,425	66	14	62	118.7	119.4	238.1	Baseline
% Saved:	17%		6%	12%	12%	17%	6%	12%	12%	14%				98.1	111.9	210.0	Post Project

ECM Summary

Detention Center / SO / 911 Complex		Energy & Water Savings					Cost Savings					Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	ECM #	Electric kWh	Peak kW	Nat Gas CCF	Water kGal	Sewer kGal	Elec $ Saved	Nat Gas $ Saved	Water $ Saved	Sewer $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Lighting Upgrades	1-1	99,559	20	-1,482	0	0	$9,952	-$1,166	$0	$0	$8,786	33	7	31	103.9	126.0	229.9	
Total Lighting		**99,559**	**20**	**-1,482**	**0**	**0**	**$9,952**	**-$1,166**	**$0**	**$0**	**$8,786**	**33**	**7**	**31**	**103.9**	**126.0**	**229.9**	
Total RCx		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**103.9**	**126.0**	**229.9**	
BAS Replacement	3-1	6,367	0	393	0	0	$636	$310	$0	$0	$946	5	1	4	102.9	124.2	227.2	
Total Controls		**6,367**	**0**	**393**	**0**	**0**	**$636**	**$310**	**$0**	**$0**	**$946**	**5**	**1**	**4**	**102.9**	**124.2**	**227.2**	
Replace Split Systems (8)	4-1	29,627	0	463	0	0	$2,962	$364	$0	$0	$3,326	15	3	14	98.5	122.2	220.7	
Replace HW Boiler and DHW Boiler Systems	4-2	0	0	2,051	0	0	$0	$1,614	$0	$0	$1,614	11	2	10	98.5	113.1	211.6	
Replace Exhaust Fan with Vari Green style	4-3	793	0	0	0	0	$79	$0	$0	$0	$79	0	0	0	98.4	113.1	211.5	
Replace Kitchen Exhaust and MUA Unit	4-4	0	0	42	0	0	$0	$33	$0	$0	$33	0	0	0	98.4	112.9	211.3	
Total Mechanical		**30,421**	**0**	**2,555**	**0**	**0**	**$3,041**	**$2,011**	**$0**	**$0**	**$5,051**	**26**	**6**	**25**	**98.4**	**112.9**	**211.3**	
Water Conservation	5-1	0	0	217	744	744	$0	$171	$1,867	$4,355	$6,393	1	0	1	98.4	111.9	210.4	
Total Water		**0**	**0**	**217**	**744**	**744**	**$0**	**$171**	**$1,867**	**$4,355**	**$6,393**	**1**	**0**	**1**	**98.4**	**111.9**	**210.4**	
Total Envelope		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**98.4**	**111.9**	**210.4**	
Total Renewable Energy		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**98.4**	**111.9**	**210.4**	
Vendmiser	8-2	1,183	0	0	0	0	$118	$0	$0	$0	$118	0	0	0	98.3	111.9	210.2	
Replace Exhaust Fan with Vari Green style (VF	8-3	1,313	0	0	0	0	$131	$0	$0	$0	$131	1	0	1	98.1	111.9	210.0	
Total Miscellaneous		**2,496**	**0**	**0**	**0**	**0**	**$249**	**$0**	**$0**	**$0**	**$249**	**1**	**0**	**1**	**98.1**	**111.9**	**210.0**	
Total:		**138,842**	**20**	**1,684**	**744**	**744**	**$13,879**	**$1,325**	**$1,867**	**$4,355**	**$21,425**	**66**	**14**	**62**	**118.7**	**119.4**	**238.1**	**Baseline**
% Saved:		**17%**		**6%**	**12%**	**12%**	**17%**	**6%**	**12%**	**12%**	**14%**				**98.1**	**111.9**	**210.0**	**Post Project**

Interior Lighting Retrofit

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction, as well as the HVAC interaction.

Building Name: Detention Center / SO / 911 Complex

Occupied Hours: 8,760
Unoccupied Hours: 0

Lighting:

Existing Interior Lighting kW:	31.7	*Monthly kW*
Existing Interior Lighting kWh:	144,072	*Annual kWh*
Proposed Interior Lighting kW:	11.6	*Monthly kW*
Proposed Interior Lighting kWh:	56,954	*Annual kWh*
Interior Lighting kW **Saved**:	20.1	*Monthly kW*
Interior Lighting kWh **Saved**:	87,118	*Annual kWh*

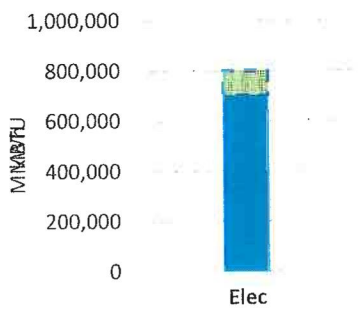
HVAC Interaction:

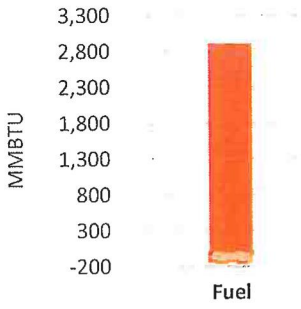
Cooling kWh **Saved**:	8,044	*Annual kWh*
Primary Heating Fuel **Penalty**:	-1,482	*Annual CCF*

Total Savings

95,162	***Annual kWh***
20.1	***Monthly kW***
-1,482	***Annual CCF***

$9,512	***Electric $ Saved***
$0	***Elec Demand $ Saved***
-$1,166	***CCF $ Saved***





11.9% Saved from Electric Baseline
-5.5% Saved from Nat Gas Baseline

Exterior Lighting

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction.

Building Name: Detention Center / SO / 911 Complex

Hours of Exterior Lighting Operation - Existing:	4,380
Hours of Exterior Lighting Operation - Proposed:	4,380

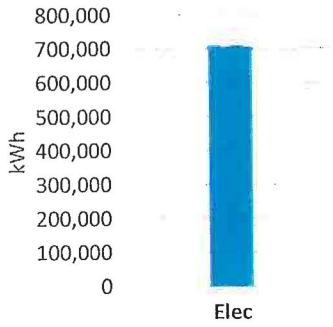
Lighting:

Existing Interior Lighting kW:	1.4	*Monthly kW*
Existing Interior Lighting kWh:	6,009	*Annual kWh*
Proposed Interior Lighting kW:	0.4	*Monthly kW*
Proposed Interior Lighting kWh:	1,612	*Annual kWh*

Total Savings

4,397	***Annual kWh***

$440	***Electric $ Saved***



0.6% % Savings from Electric Baseline

Scheduling & Set-points

ECM Overview:

Energy consumption can be reduced by applying a heating setback and/or cooling setup temperature and turning off the HVAC system during unoccupied times.

Building Name: Detention Center / SO / 911 Complex

System ID: All Systems

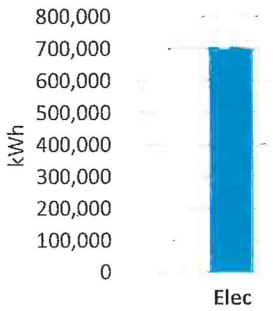
HVAC Conditions:

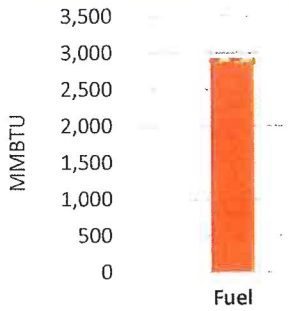
	Existing		Proposed	
HVAC Occupied Hours:	8,760		7,300	
HVAC Unoccupied Hours:	0		1,460	
Occupied Heating Set-point:	70	°F	70	°F
Unoccupied Heating Set-point:	70	°F	65	°F
Occupied Cooling Set-point:	72	°F	72	°F
Unoccupied Cooling Set-point:	72	°F	75	°F
All Systems Supply Fan HP:	11	HP		

Total Savings

6,367	***Annual kWh***
393	***Annual CCF***

$636	***Electric $ Saved***
$310	***CCF $ Saved***





0.9% % Savings from Electric Baseline

1.4% % Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Detention Center / SO / 911 Complex

System ID: (5) Split Systems Totaling 32 Tons

HVAC Conditions:

	Existing	Proposed	
Cooling Efficiency	10.0	13.0	SEER
Primary Heating Efficiency	80%	85%	

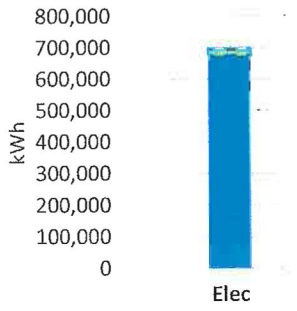
Total Annual Cooling Hours: 4,271

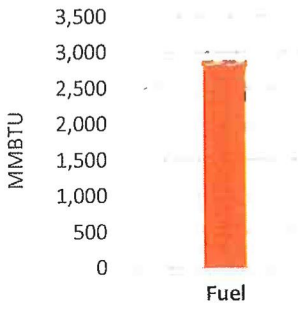
Total Annual Heating Hours: 3,649

Total Savings

19,168	***Annual kWh***
435	***Annual CCF***

$1,916	***Electric $ Saved***
$343	***CCF $ Saved***





2.8% % Savings from Electric Baseline

1.6% % Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Detention Center / SO / 911 Complex

System ID: Split Totaling 5 Tons (Cooling Only)

HVAC Conditions:

	Existing	Proposed	
Cooling Efficiency	8.4	16.0	SEER
Heating Efficiency	80%	85%	

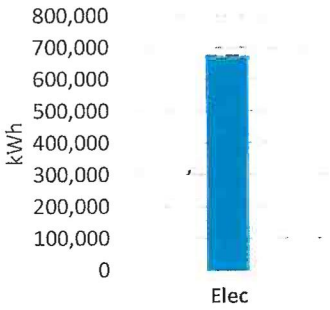
Total Annual Cooling Hours: 4,271

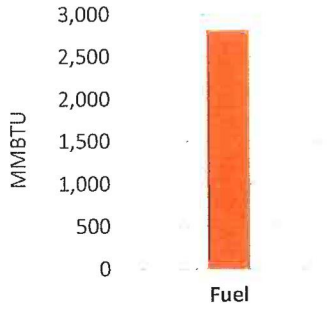
Total Annual Heating Hours: 3,649

Total Savings

7,471	***Annual kWh***
0	***Annual CCF***

$747	***Electric $ Saved***
$0	***CCF $ Saved***





1.1% % Savings from Electric Baseline

0.0% % Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Detention Center / SO / 911 Complex

System ID: Split Systems Totaling 2 Tons

HVAC Conditions:

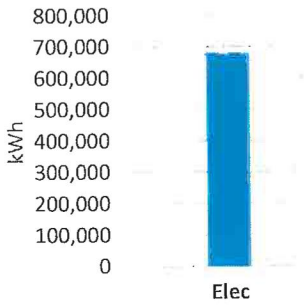
	Existing	Proposed	
Cooling Efficiency	8.4	16.0	SEER
Heating Efficiency	80%	85%	

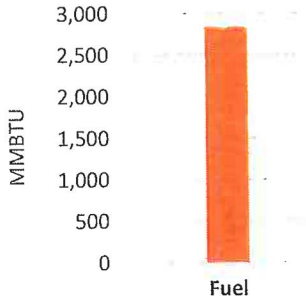
Total Annual Cooling Hours:	4,271
Total Annual Heating Hours:	3,649

Total Savings

2,988	***Annual kWh***
27	***Annual CCF***

$299	***Electric $ Saved***
$21	***CCF $ Saved***





0.4%	% Savings from Electric Baseline
0.1%	% Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Detention Center / SO / 911 Complex

System ID: Kitchen Exhaust & MUA

HVAC Conditions:

	Existing	Proposed
Heating Efficiency	80%	95%

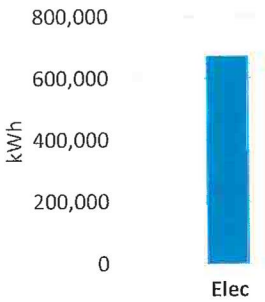
Total Annual Cooling Hours: 4,271

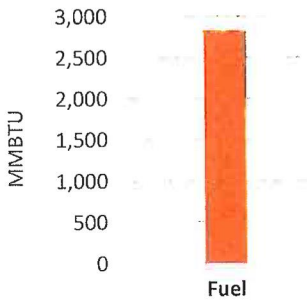
Total Annual Heating Hours: 3,649

Total Savings

0	*Annual kWh*
42	*Annual CCF*

$0	*Electric $ Saved*
$33	*CCF $ Saved*





0.0% % Savings from Electric Baseline

0.2% % Saved from Nat Gas Baseline

Replace Boiler

ECM Overview:

Replacing an old inefficient boiler with a new high efficient boiler will reduce energy consumption. Older boilers are often oversized and no longer operating at the original efficiency. Replacing with a properly sized boiler the is high efficiency will generate savings.

Building Name: Detention Center / SO / 911 Complex

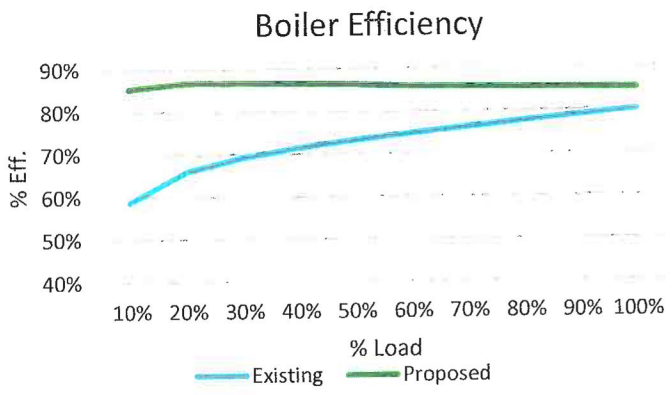
Boiler Conditions:

Existing Boiler Type: Atmospheric Boiler
Nominal Boiler Efficiency: 80%

Proposed Boiler Type: Condensing Boiler_97% Eff
Nominal Boiler Efficiency: 93%

Boiler Efficiency

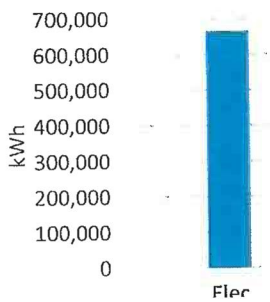
% Load	Existing	Proposed
10%	59%	85%
20%	66%	87%
30%	69%	87%
40%	71%	86%
50%	73%	86%
60%	75%	86%
70%	76%	86%
80%	77%	85%
90%	79%	85%
100%	80%	85%

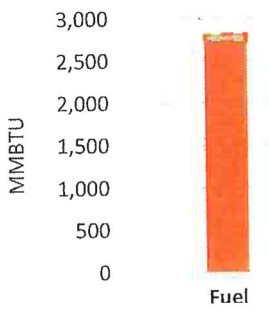


Total Savings

728	*Annual CCF*

$573	*CCF $ Saved*





Replace Water Heater

ECM Overview:

Energy savings can be realized by replacing an outdated domestic hot water heating system with a new, high efficiency system.

Building Name: Detention Center / SO / 911 Complex

System ID: DHW

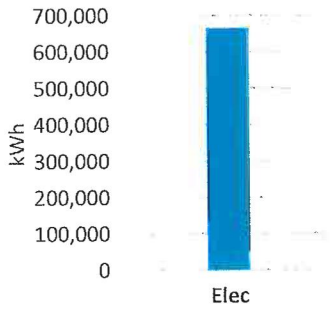
Domestic Hot Water Conditions:

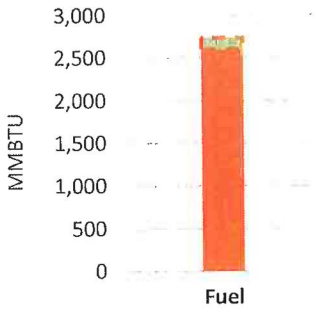
Existing Water Heater Efficiency:	65%	
Proposed Water Heater Efficiency:	89%	
Existing Annual Hot Water Usage:	337,625	Gallons
Proposed Annual Hot Water Usage:	240,500	Gallons
Baseline Annual Utility Consumption:	2,757	CCF
Proposed Annual Utility Consumption:	1,434	CCF

Total Savings

0	*Annual kWh*
1,323	*Annual CCF*

$0	*Electric $ Saved*
$1,041	*CCF $ Saved*





0.0% % Savings from Electric Baseline

4.9% % Saved from Nat Gas Baseline

Vari Green Exhaust Fans - Vary Flow

ECM Overview:

This calculation estimates the savings realized when using a Vari-Green Exhaust Fan. Vari-Green fans utilize a variable speed motor to be able to vary the speed of the exhaust fan.

Building Name: Class D Felony

System ID: Vari Green Exhaust Fans

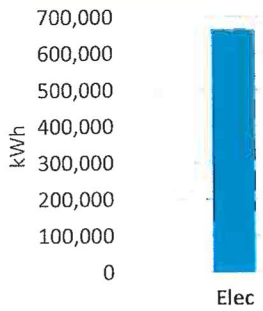
Total Fan Operating Hours_Occupied: 8,760
Total Fan Operating Hours_Unoccupied: 0

Fan Control:

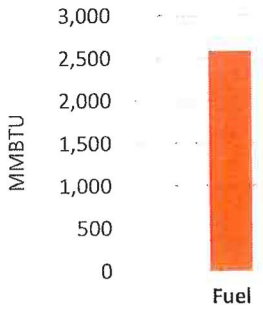
	Motor A	Motor B
Quantity	4	2
HP	1.50	0.25
BHP	1.28	0.21
RPM	1,750	1,750
Watt Draw	1,118	186
Turndown HP	1.09	0.18
Turndown BHP	0.93	0.15
Turndown RPM	1,575	1,575
Turndown Watt Draw	815	136

Total Savings

1,313	*Annual kWh*



$131	*Electric $ Saved*



0.2% % Savings from Electric Baseline
0.0% % Saved from Nat Gas Baseline

Vari Green Exhaust Fans - Motors

ECM Overview:

Replacing older motors with high efficient models will result in electric consumption savings.

Building Name: Detention Center / SO / 911 Complex

System ID: Vari Green Exhaust Fans

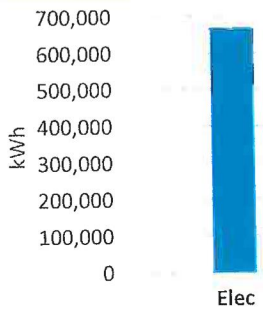
Motor Conditions:

System ID:	Exhaust Fan 1	Exhaust Fan 2	Exhaust Fan 3	Exhaust Fan 4	Exhaust Fan 5	Exhaust Fan 6
Design BHP:	1.1	1.1	1.1	1.1	0.2	0.2
Operating Hours	3,940	3,940	3,940	3,940	3,940	3,940
Existing Motor Efficiency:	0.8	0.8	0.8	0.8	0.8	0.8
Existing Motor kWh:	1,362	1,362	1,362	1,362	227	227
Proposed Motor kWh:	1,172	1,172	1,172	1,172	195	195

Total Savings

793	*Annual kWh*

$79	*Electric $ Saved*



0.1% % Savings from Electric Baseline

Water Conservation

ECM Overview:

Water usage savings can be realized by replacing outdated flow and flush fixtures with modern fixtures. This calculation accounts for the reduction is water use when replacing outdated water fixtures with modern fixtures.

Building Name: Detention Center / SO / 911 Complex

System ID: All Fixtures

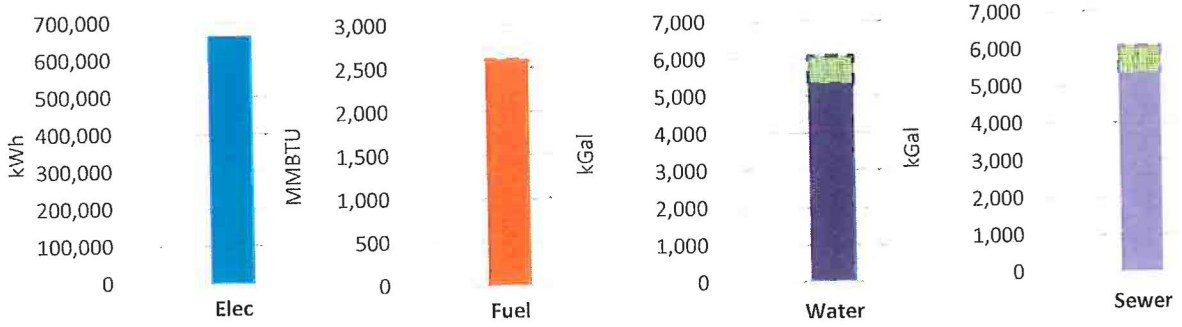
Water Fixture Conditions:

	Total # Fixtures	Existing Flow/Flush Rate		Proposed Flow/Flush Rate	
Kitchen Faucet	1	2.5	GPM	2.2	GPM
Public Lavatory (restroom) Faucet	15	1.1	GPM	0.6	GPM
Toilet (Tank)	14	1.9	GPF	1.3	GPF
Toilet (Flushometer)	23	4.4	GPF	3.4	GPF
Showerhead	-	-	GPM	-	GPM

Total Savings

217	*Annual CCF*
744	*Annual Water kGal*
744	*Annual Sewer kGal*

$171	*CCF $ Saved*
$1,867	*Water $ Saved*
$4,355	*Sewer $ Saved*



0.9% % Saved from Nat Gas Baseline

12.3% % Savings from Water Baseline

12.3% % Savings from Sewer Baseline

Vending Machine Control

ECM Overview:

By implementing motion detection sensors on vending machines, savings can be realized by extending the off cycle times during overnight, weekend, holiday and other less occupied times in the facility.

Building Name: Detention Center / SO / 911 Complex

System ID: Vending Machine

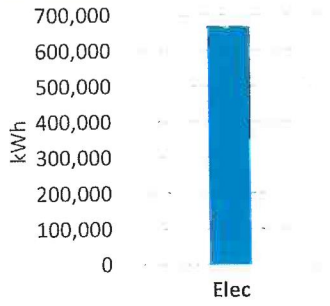
Occupied Hours: 8,760
Unoccupied Hours: 0

Vending Machine Summary:

Number of Cold Drink Vending Machines:	1	
Power Requirements of Cold Drink Vending Machine:	450	watts
Cold Drink Machine Existing Annual Energy:	3,942	kWh
Cold Drink Machine Estimated Annual Energy:	2,759	kWh

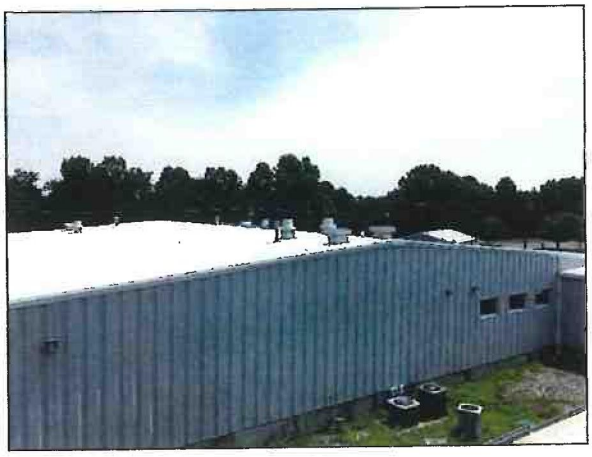
Total Savings

1,183	***Annual kWh***
$118	***Electric $ Saved***



0.2% % Savings from Electric Baseline

CLASS D FELONY CENTER



54 Judicial Drive
Benton, KY 42025

Year Built:	1996	**Square Footage:**	8,627	**Occupancy:**	Varies
Renovations:	N/A	**# of Stories:**	1	**Energy Source:**	Natural Gas & Electric
Survey Date:	7/11/2017	**Hours of Operation:**	24/7	**Computers:**	5

2.3 C. PRELIMINARY ESPC PROJECT

ECM #1 Lighting

We recommend a lighting retrofit for interior and exterior of the Class D facility. Currently the facility uses mostly T-8 32 watt fluorescent lights. We will be installing all new 13 watt LED lighting throughout the facility. There are a few CFL can lights that will be retrofit to a 15 watt lamp. The exterior fixtures is shared with the Detention Center/Sheriff's Office/911 Complex. See building above for details.

Some benefits of a lighting retro-fit include:

1.) Fluorescent bulbs are being phased out of manufacturing
2.) LED bulbs have much longer burn hours than fluorescents
3.) Operational savings from installing LED's (Less replacements)
4.) Brighter burning light, and reduction of bulbs and wattage per fixture
5.) Utility Rebates are strong

Fixture Quantity	Pre kWh	Post kWh	kWh Savings
112	51,246	18,813	32,433

Location		Existing Fixture			Proposed Fixture		
Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Area 1	2X4 Prism Rec 4L 32W T8	10	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	10	39
1st Floor	Area 1	6" Rec Can CFL 32W 4P	3	34	LED 15W 4P G24Q H Replacement	3	15
1st Floor	Area 2	2X4 Prism Rec 4L 32W T8	10	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	10	39
1st Floor	Area 2	6" Rec Can CFL 32W 4P	3	34	LED 15W 4P G24Q H Replacement	3	15
1st Floor	Area 3	2X4 Prism Rec 4L 32W T8	10	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	10	39
1st Floor	Area 3	6" Rec Can CFL 32W 4P	3	34	LED 15W 4P G24Q H Replacement	3	15
1st Floor	Area 4	2X4 Prism Rec 4L 32W T8	10	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	10	39
1st Floor	Area 4	6" Rec Can CFL 32W 4P	3	34	LED 15W 4P G24Q H Replacement	3	15
1st Floor	Corridor	1x4 Prism Sur 2L 32W T8	8	59	RT, 4' 13W LED 2L	8	26
1st Floor	Corridor	6" Rec Can CFL 32W 4P	3	34	LED 15W 4P G24Q H Replacement	3	15

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Main Corridor	2X4 Prism Rec 4L 32W T8	9	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	9	39
1st Floor	Main Corridor	6" Rec Can CFL 32W 4P	4	34	LED 15W 4P G24Q H Replacement	4	15
1st Floor	Area 5	2X4 Prism Rec 4L 32W T8	9	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	9	39
1st Floor	Area 6	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	2	39
1st Floor	Toilet	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 4L	1	36
1st Floor	Toilet	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 4L	1	36
1st Floor	Area 7	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 4L	1	36
1st Floor	Area 7	2X4 Prism Rec 4L 32W T8	5	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	5	39
1st Floor	Main Corridor 1	2X4 Prism Rec 4L 32W T8	11	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	11	39
1st Floor	Cell 1	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 4L	1	36
Floor	Cell 2	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 4L	1	36
1st Floor	Cell 3	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 4L	1	36
1st Floor	Cell 4	2X2 Prism Rec 4L T8	1	61	RT, 2' 9W LED 4L	1	36
1st Floor	Storage	2X4 Prism Rec 4L 32W T8	2	112	RT, 4' 13W LED 3L, 2x4 Refl Kit	2	39

ECM #2 Retro-Commissioning

No recommendations at this time.

ECM #3 Building Automation Controls

Currently, the building temperatures are controlled by nonprogrammable thermostats.

- Perfection Group recommends upgrading to Web Enabled programmable thermostats with scheduling and setback capabilities. Also, these thermostats allow for alarming and remote access which will prevent major issues, and maximize energy efficiency.

2.3 C. PRELIMINARY ESPC PROJECT

ECM #4 Mechanical Upgrades

The Class D Felony Center is conditioned by (4) split systems that have reached the end of their life expectancy. The units are 11.2 SEER with 80% heating and use R22 refrigerant. R22 refrigerant is harmful to the environment and is very costly due to the EPA phase out. There are (6) inefficient exhaust fans on the roof.

- Perfection Group will replace the (4) split systems with 17 SEER units with furnaces that are 95% efficient. The new systems will use environmentally friendly R-410A refrigerant.
- Adjust ductwork and perform air balance to ensure proper air flow to each zone.
- Replace (6) exhaust fans with very efficient Greenheck direct drive Vari Green Exhaust Fans – (4) 200 CFM fans and (2) 50 CFM fans. Curb adapters are included.
- Replace the existing Lochinvar ETN076 75 Gallon water heater with a new Lochinvar LTI540-N 75 Gallon energy efficient water Heater designed for the application and required usage within the facility.

ECM #5 Water Conservation Upgrades

.oom	Existing Fixture Description	Existing Quantity	Existing Usage	Units	Measure Description	New Quantity	Qty Upgraded	Gallons Saved per Unit
CLASS D	Closet Floor Elongated Tank Left	1	3.5	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	1	1	2.2
D SIDE	Lavatory Sink 4" Standard	14	2.0	per minute	Retrofit with 1.0 gpm VP spray moderator	14	14	1.0
D SIDE	Closet Floor Elongated Tank Left	14	1.6	per flush	New 1.28 gpf tank toilet with elongated bowl 12" Set Back	14	14	0.3
D SIDE	Shower Single Standard	12	2.5	per minute	No Action	12	0	0.0

ECM #6 Building Envelope

No recommendations at this time.

ECM #7 Other/Renewable Energy

No recommendations at this time.

Energy Savings Calculations

ECM Summary

Class D Felony	Energy & Water Savings					Cost Savings					Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	Electric kWh	Peak kW	Nat Gas CCF	Water kGal	Sewer kGal	Elec $ Saved	Nat Gas $ Saved	Water $ Saved	Sewer $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Total Lighting	35,661	5	-609	0	0	$3,565	-$479	$0	$0	$3,086	11	2	11	302.3	325.6	627.9	
Total RCx	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	302.3	325.6	627.9	
Total Controls	4,027	0	292	0	0	$403	$230	$0	$0	$632	3	1	3	300.7	322.2	622.9	
Total Mechanical	18,380	0	1,541	0	0	$1,837	$1,212	$0	$0	$3,050	16	3	15	293.5	304.0	597.4	
Total Water	0	0	67	276	276	$0	$53	$693	$1,617	$2,362	0	0	0	293.5	303.2	596.6	
Total Envelope	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	293.5	303.2	596.6	
Total Renewable Energy	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	293.5	303.2	596.6	
Total Miscellaneous	269	0	0	0	0	$27	$0	$0	$0	$27	0	0	0	293.3	303.2	596.5	
Total:	58,337	5	1,291	276	276	$5,831	$1,016	$693	$1,617	$9,157	31	7	29	316.4	318.4	634.8	Baseline
% Saved:	7%		5%	5%	5%	7%	5%	5%	5%	6%				293.3	303.2	596.5	Post Project

ECM Summary

Class D Felony		Energy & Water Savings					Cost Savings					Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	ECM #	Electric kWh	Peak kW	Nat Gas CCF	Water kGal	Sewer kGal	Elec $ Saved	Nat Gas $ Saved	Water $ Saved	Sewer $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Lighting Upgrades	1-1	35,661	5	-609	0	0	$3,565	-$479	$0	$0	$3,086	11	2	11	302.3	325.6	627.9	
Total Lighting		35,661	5	-609	0	0	$3,565	-$479	$0	$0	$3,086	11	2	11	302.3	325.6	627.9	
Total RCx		0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	302.3	325.6	627.9	
Communicating Tstats (for Split Systems)	3-1	4,027	0	292	0	0	$403	$230	$0	$0	$632	3	1	3	300.7	322.2	622.9	
Total Controls		4,027	0	292	0	0	$403	$230	$0	$0	$632	3	1	3	300.7	322.2	622.9	
Replace Split Systems (4) w/ Communicating	4-1	18,126	0	424	0	0	$1,812	$334	$0	$0	$2,146	10	2	9	293.6	317.2	610.7	
Replace DHW System	4-2	0	0	1,117	0	0	$0	$879	$0	$0	$879	6	1	6	293.6	304.0	597.5	
Replace Exhaust Fans with Vari Green	4-3	254	0	0	0	0	$25	$0	$0	$0	$25	0	0	0	293.5	304.0	597.4	
Total Mechanical		18,380	0	1,541	0	0	$1,837	$1,212	$0	$0	$3,050	16	3	15	293.5	304.0	597.4	
Water Conservation	5-1	0	0	67	276	276	$0	$53	$693	$1,617	$2,362	0	0	0	293.5	303.2	596.6	
Total Water		0	0	67	276	276	$0	$53	$693	$1,617	$2,362	0	0	0	293.5	303.2	596.6	
Total Envelope		0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	293.5	303.2	596.6	
Total Renewable Energy		0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	293.5	303.2	596.6	
Replace Exhaust Fans with Vari Green (VFD)	8-1	269	0	0	0	0	$27	$0	$0	$0	$27	0	0	0	293.3	303.2	596.5	
Total Miscellaneous		269	0	0	0	0	$27	$0	$0	$0	$27	0	0	0	293.3	303.2	596.5	
Total:		58,337	5	1,291	276	276	$5,831	$1,016	$693	$1,617	$9,157	31	7	29	316.4	318.4	634.8	Baseline
% Saved:		7%		5%	5%	5%	7%	5%	5%	5%	6%				293.3	303.2	596.5	Post Project

Interior Lighting Retrofit

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction, as well as the HVAC interaction.

Building Name: Class D Felony

Occupied Hours: 8,760
Unoccupied Hours: 0

Lighting:

Existing Interior Lighting kW:	9.8	*Monthly kW*
Existing Interior Lighting kWh:	51,246	*Annual kWh*
Proposed Interior Lighting kW:	3.6	*Monthly kW*
Proposed Interior Lighting kWh:	18,813	*Annual kWh*
Interior Lighting kW **Saved**:	5.0	*Monthly kW*
Interior Lighting kWh **Saved**:	32,433	*Annual kWh*

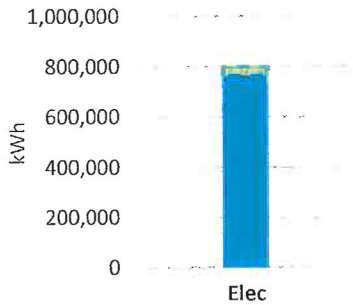
HVAC Interaction:

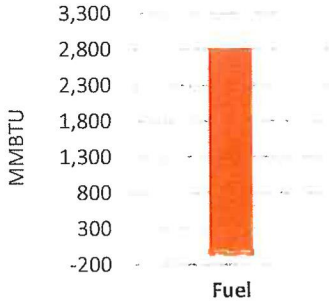
Cooling kWh **Saved**:	3,228	*Annual kWh*
Primary Heating Fuel **Penalty**:	-609	*Annual CCF*

Total Savings

35,661	***Annual kWh***
5.0	***Monthly kW***
-609	***Annual CCF***

$3,565	***Electric $ Saved***
$0	***Elec Demand $ Saved***
-$479	***CCF $ Saved***





4.5% Saved from Electric Baseline
-2.3% Saved from Nat Gas Baseline

Scheduling & Set-points

ECM Overview:

Energy consumption can be reduced by applying a heating setback and/or cooling setup temperature and turning off the HVAC system during unoccupied times.

Building Name: Class D Felony

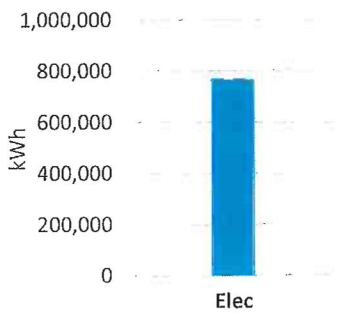
System ID: All Systems

HVAC Conditions:

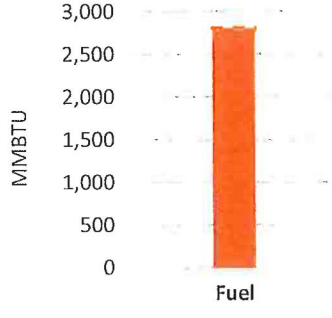
	Existing		Proposed	
HVAC Occupied Hours:	8,760		5,840	
HVAC Unoccupied Hours:	0		2,920	
Occupied Heating Set-point:	70	°F	70	°F
Unoccupied Heating Set-point:	70	°F	65	°F
Occupied Cooling Set-point:	70	°F	70	°F
Unoccupied Cooling Set-point:	70	°F	72	°F
All Systems Supply Fan HP:	4	HP		

Total Savings

4,027	***Annual kWh***
292	***Annual CCF***



$403	***Electric $ Saved***
$230	***CCF $ Saved***



0.5% % Savings from Electric Baseline

1.1% % Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Class D Felony

System ID: Split Systems (4)

HVAC Conditions:

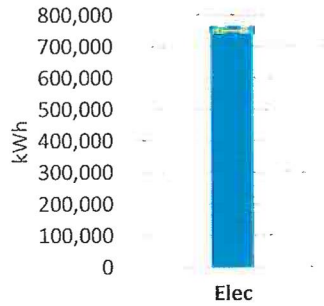
	Existing	Proposed	
Cooling Efficiency	9.7	16.0	SEER
Primary Heating Efficiency	78%	90%	

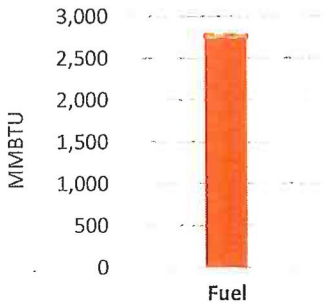
Total Annual Cooling Hours:	4,100
Total Annual Heating Hours:	3,649

Total Savings

18,126	***Annual kWh***
424	***Annual CCF***

$1,812	***Electric $ Saved***
$334	***CCF $ Saved***





2.4%	% Savings from Electric Baseline
1.6%	% Saved from Nat Gas Baseline

Replace Water Heater

ECM Overview:

Energy savings can be realized by replacing an outdated domestic hot water heating system with a new, high efficiency system.

Building Name: Class D Felony

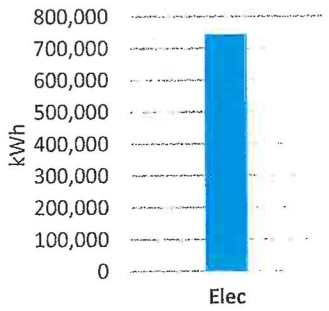
System ID: DHW Heater (3)

Domestic Hot Water Conditions:

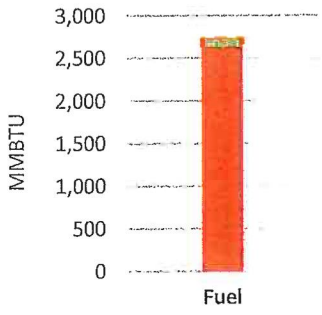
Existing Water Heater Efficiency:	65%	
Proposed Water Heater Efficiency:	96%	
Existing Annual Hot Water Usage:	423,399	Gallons
Proposed Annual Hot Water Usage:	423,399	Gallons
Baseline Annual Utility Consumption:	3,458	CCF
Proposed Annual Utility Consumption:	2,341	CCF

Total Savings

1,117	*Annual CCF*



$879	*CCF $ Saved*



0.0%	% Savings from Electric Baseline
4.2%	% Saved from Nat Gas Baseline

Vari Green Exhaust Fans - Motors

ECM Overview:

Replacing older motors with high efficient models will result in electric consumption savings.

Building Name: Class D Felony

System ID: Vari Green Exhaust Fans

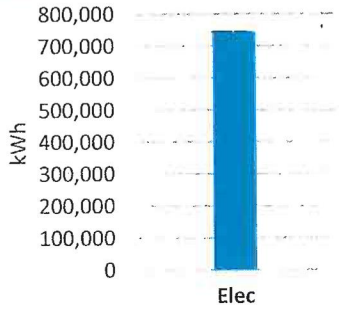
Motor Conditions:

System ID:	Exhaust Fan 1	Exhaust Fan 2	Exhaust Fan 3	Exhaust Fan 4	Exhaust Fan 5	Exhaust Fan 6
Design BHP:	0.2	0.2	0.2	0.2	0.1	0.1
Operating Hours	3,484	3,484	3,484	3,484	3,484	3,484
Existing Motor Efficiency:	0.75	0.75	0.75	0.75	0.75	0.75
Existing Motor kWh:	258	258	258	258	172	209
Proposed Motor kWh:	204	204	204	204	136	136

Total Savings

254	*Annual kWh*

$25	*Electric $ Saved*



0.03% % Savings from Electric Baseline

Vari Green Exhaust Fans - Vary Flow

ECM Overview:

This calculation estimates the savings realized when using a Vari-Green Exhaust Fan. Vari-Green fans utilize a variable speed motor to be able to vary the speed of the exhaust fan.

Building Name: Class D Felony

System ID: Vari Green Exhaust Fans

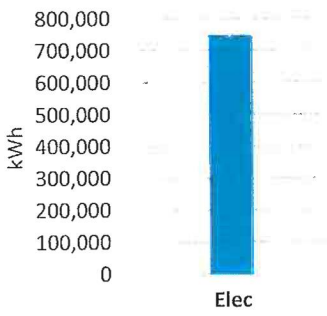
Total Fan Operating Hours_Occupied: 8,760
Total Fan Operating Hours_Unoccupied: 0

Fan Control:

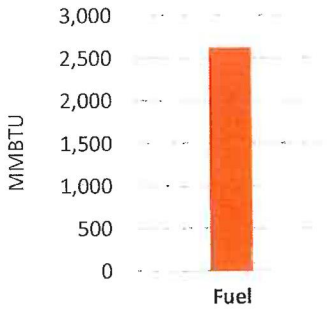
	Motor A	Motor B
Quantity	4	2
HP	0.25	0.17
RPM	1,750	1,750
Watt Draw	186	124
Turndown HP	0.18	0.12
Turndown RPM	1,575	1,575
Turndown Watt Draw	136	91

Total Savings

269	*Annual kWh*



$27	*Electric $ Saved*



0.04% % Savings from Electric Baseline
0.0% % Saved from Nat Gas Baseline

Water Conservation

ECM Overview:

Water usage savings can be realized by replacing outdated flow and flush fixtures with modern fixtures. This calculation accounts for the reduction is water use when replacing outdated water fixtures with modern fixtures.

Building Name: Class D Felony

System ID: All Fixtures

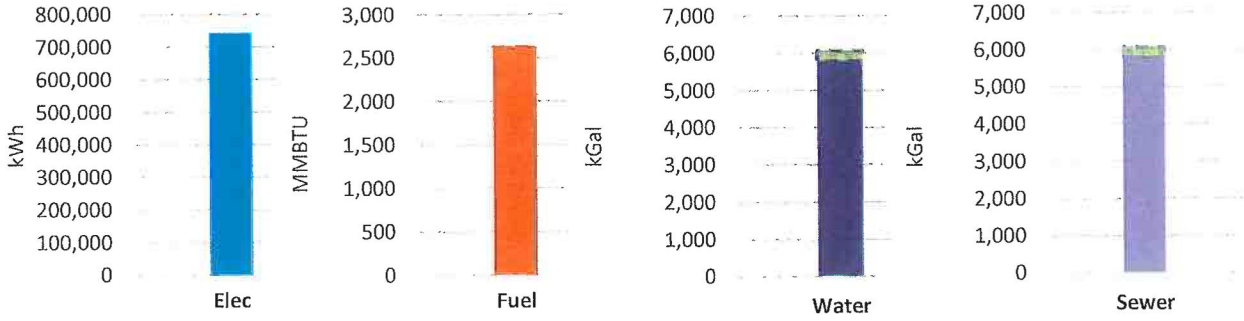
Water Fixture Conditions:

	Total # Fixtures	Existing Flow/Flush Rate		Proposed Flow/Flush Rate	
Kitchen Faucet	-	-	GPM	-	GPM
Public Lavatory (restroom) Faucet	5	1.1	GPM	0.6	GPM
Toilet (Tank)	5	1.9	GPF	1.3	GPF
Toilet (Flushometer)	9	4.4	GPF	3.4	GPF
Showerhead	-	-	GPM	-	GPM

Total Savings

67	*Annual CCF*
276	*Annual Water kGal*
276	*Annual Sewer kGal*

$53	*CCF $ Saved*
$693	*Water $ Saved*
$1,617	*Sewer $ Saved*



0.3%	% Saved from Nat Gas Baseline
4.6%	% Savings from Water Baseline
4.6%	% Savings from Sewer Baseline

2.3 C. Preliminary ESPC Project

Mike Miller Park

596 US Highway 68 West
Benton, KY 42025

Year Built:	2000	**Square Footage:**	Varies	**Occupancy:**	Varies
Renovations:	N/A	**# of Stories:**	1	**Energy Source:**	Propane & Electric
Survey Date:	7/11/2017	**Hours of Operation:**	Varies	**Computers:**	2-5

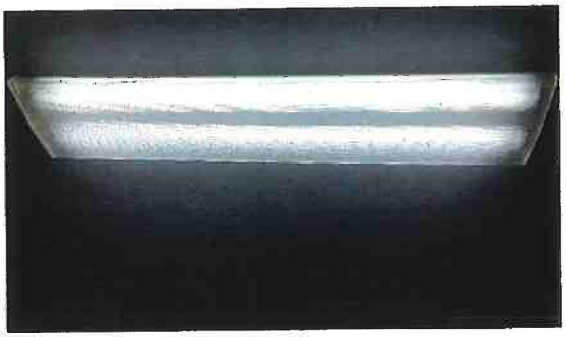
2.3 C. PRELIMINARY ESPC PROJECT

ECM #1 Lighting

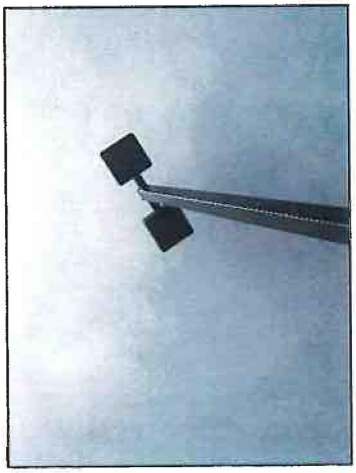
Mike Miller Park has a main office building, concession stands, park shelters, a Splash Pad, sports lighting, and a storage building for Christmas Lights. Interior is mainly T8 32 watt fluorescent fixtures. There are a few can lights on the first floor of the office building that has already been converted to low wattage lamps. The main power consumers are the roadway, parking lot, and sports lighting. The roadway lighting mainly consists of 400w metal hallides. The wattages will be significantly reduced by converting to LED. There are 1,000 watt and 1,500 watt floods for the baseball and soccer fields. These will be replaced with new 38,000 lumen and 62,000 lumen fixtures, respectively. See chart below for details.

Facility	Fixture Quantity	Pre kWh	Post kWh	kWh Savings
County Park	365	101,496	32,514	68,983
County Park - Sports Lighting	242	149,267	60,523	88,744

Can lights in main office



T8 32 Watt fluorescent fixture



400w Shoebox parking lot lighting

1,000 watt Baseball Field Lighting

Entrance roadway lighting

2.3 C. PRELIMINARY ESPC PROJECT

Location		Existing Fixture			Proposed Fixture		
Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Men's Restroom	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Women's Restroom	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Kitchenette	Track Head LED 10W PAR30	4	10	No Action	4	10
1st Floor	Open Room	6" Rec Can LED 10W R30	14	10	No Action	14	10
1st Floor	Office	Track Head Inc 65W BR30	3	65	LED 12W PAR30 Replacement	3	12
1st Floor	Office	Drum CFL 13W Screw In 2L	1	26	LED 10W A19 Replacement 2L	1	20
1st Floor	Office	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Hallway	Ceiling Fan Inc 40W A	1	40	LED 10W A19 Replacement	1	10
1st Floor	Hallway Storage	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Stairwell	4' Wrap BP 4L	2	144	4' Wrap 4' 13W LED 2L	2	26
Basement	Break Room	8' Strip SP 2L	2	138	RT, 4' 13W LED 4L, 8' BC Kit	2	52
Basement	Office	4' Wrap BP 4L	1	144	4' Wrap 4' 13W LED 2L	1	26
Basement	Bay Area	8' Strip SP 2L	6	138	RT, 4' 13W LED 4L, 8' BC Kit	6	52
Basement	Bay Area	4' Wrap BP 4L	3	144	RT, 4' 13W LED 4L	3	52
Basement	Building Mounted	Flood LED 10W PAR38	3	10	No Action	3	10
Exterior	Cart Storage Area	8' Strip HO 2L	2	207	RT, 4' 13W LED 4L, 8' BC Kit	2	52
Exterior	Cart Storage Area	Barnlight CFL 42W Screw In	1	42	Barn Light LED 2200L	1	28
Exterior	Field 1	Sportslighter MH 1000W	20	1080	Sportslighter LED 38L	20	443
Exterior	Field 2	Sportslighter MH 1000W	18	1080	Sportslighter LED 38L	18	443
Exterior	Field 3	Sportslighter MH 1000W	26	1080	Sportslighter LED 38L	26	443
Exterior	Concessions	6" Rec Can Inc 65W R30	9	65	LED 12W BR30 Replacement	9	12
1st Floor	Storage	4' Wrap BP 2L	2	72	RT, 4' 13W LED 2L	2	26
1st Floor	Pumping Chase	Jelly Jar Inc 100W A	2	100	LED 10W A19 Replacement	2	10
1st Floor	Men's Restroom	4' Wrap BP 2L	4	72	RT, 4' 13W LED 2L	4	26
1st Floor	Men's Restroom	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26

2.3 C. Preliminary ESPC Project

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
2nd Floor	Press Box	4' Wrap BP 4L	8	144	RT, 4' 13W LED 4L	8	52
2nd Floor	Press Box Storage	4' Wrap BP 4L	2	144	RT, 4' 13W LED 4L	2	52
1st Floor	Press Box Stair	4' Wrap BP 2L	2	72	RT, 4' 13W LED 2L	2	26
1st Floor	Concessions Stand	4' Wrap BP 4L	6	144	RT, 4' 13W LED 4L	6	52
1st Floor	Women's Restroom	4' Wrap BP 2L	4	72	RT, 4' 13W LED 2L	4	26
1st Floor	Women's Restroom	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Janitor's Closet	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
Exterior	Soffit	6" Rec Can Inc 65W R30	6	65	LED 12W BR30 Replacement	6	12
Exterior	Batting Cage	Flood MH 400W	2	458	Flood LED 15L	2	133
Exterior	Batting Cage	Wall Pack MH 250W	2	295	Wall Pack LED FT 7000L	2	57
Exterior	Parking lot	Shoebox MH 400W	3	458	Area LED 15L	3	155
Exterior	Parking lot	Shoebox MH 400W	4	458	Area LED 15L	4	155
Exterior	Mechanical Room	4' Strip BP 2L 32W T8	2	59	RT, 4' 13W LED 2L	2	26
Exterior	Parking lot	Shoebox MH 400W	8	458	Area LED 15L	8	155
Exterior	Parking lot	Shoebox MH 400W	1	458	Area LED 15L	1	155
	elt EUR	6" Rec Can Inc 65W R30	16	65	LED 12W BR30 Replacement	16	12
	Men's Restroom	4' Wrap BP 2L	3	72	RT, 4' 13W LED 2L	3	26
	Men's Restroom	4' Wrap BP 2L	3	72	RT, 4' 13W LED 2L	3	26
Exterior	Pavilion	6" Rec Can Inc 65W R30	6	65	LED 12W BR30 Replacement	6	12
Exterior	Pavilion	6" Rec Can Inc 65W R30	8	65	LED 12W BR30 Replacement	8	12
Exterior	Field 4	Sportslighter MH 1000W	48	1080	Sportslighter LED 38L	48	443
Exterior	Field 4	Sportslighter MH 1500W	2	1610	Sportslighter LED 62L	2	629
Exterior	Field 5	Sportslighter MH 1500W	36	1610	Sportslighter LED 62L	36	629
	Concessions 4+5	6" Rec Can Inc 65W R30	7	65	LED 12W BR30 Replacement	7	12
	Men's Restroom	4' Wrap BP 2L	2	72	RT, 4' 13W LED 2L	2	26
	Women's Restroom	4' Wrap BP 2L	2	72	RT, 4' 13W LED 2L	2	26

2.3 C. Preliminary ESPC Project

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
	Concessions stand	2X4 Prism Rec 4L	4	144	RT, 4' 13W LED 2L, 2x4 Refl Kit	4	26
	Press Box	4' Wrap BP 4L	4	144	RT, 4' 13W LED 4L	4	52
	Stairwell	Jelly Jar Inc 100W A	1	100	LED 10W A19 Replacement	1	10
1st Floor	Interior	8' Strip HO 2L	3	207	RT, 4' 13W LED 4L, 8' BC Kit	3	52
Exterior		Barnlight CFL 42W Screw In	1	42	Barn Light LED 2200L	1	28
	Storage	8' Strip HO 2L	6	207	RT, 4' 13W LED 4L, 8' BC Kit	6	52
	Storage	Low Bay MH 400W	4	458	High Bay LED 18L	4	112
Exterior	Tennis Courts	Sportslighter MH 1000W	16	1080	Sportslighter LED 38L	16	443
Exterior	Tennis Courts	Sportslighter MH 1000W	8	1080	Sportslighter LED 38L	8	443
	Pavilion	6" Rec Can Inc 65W R30	4	65	LED 12W BR30 Replacement	4	12
1st Floor	Men's Restroom	4' Wrap BP 2L	3	72	RT, 4' 13W LED 2L	3	26
	Women's Restroom	4' Wrap BP 2L	3	72	RT, 4' 13W LED 2L	3	26
Exterior		6" Rec Can Inc 65W R30	3	65	LED 12W BR30 Replacement	3	12
	Main pavillion	8" Rec Can MH 100W	6	128	LED 12W BR30 Retrofit	6	12
Exterior	Soccer Field	6" Rec Can Inc 65W R30	8	65	LED 12W BR30 Replacement	8	12
Exterior	Soccer Field	Sportslighter MH 1000W	24	1080	Sportslighter LED 38L	24	443
Exterior	Soccer Field	Sportslighter MH 1000W	20	1080	Sportslighter LED 38L	20	443
Exterior	Soccer Field	Sportslighter MH 1000W	24	1080	Sportslighter LED 38L	24	443
Exterior	Concessions	6" Rec Can Inc 65W R30	12	65	LED 12W BR30 Replacement	12	12
Exterior	Concessions	6" Rec Can CFL 19W Screw In	3	19	LED 12W BR30 Replacement	3	12
Exterior	Concessions	6" Rec Can LED 10W R30	5	10	No Action	5	10
	Women's Restroom	4' Wrap BP 2L	2	72	RT, 4' 13W LED 2L	2	26
	Men's Restroom	4' Wrap BP 2L	2	72	RT, 4' 13W LED 2L	2	26
	Concessions	4' Wrap BP 2L	6	72	RT, 4' 13W LED 2L	6	26
	Pavilion	6" Rec Can Inc 65W R30	6	65	LED 12W BR30 Replacement	6	12

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
	Pavilion	6" Rec Can Inc 65W R30	6	65	LED 12W BR30 Replacement	6	12
	Pavilion	6" Rec Can Inc 65W R30	4	65	LED 12W BR30 Replacement	4	12
	Pavilion	6" Rec Can Inc 65W R30	4	65	LED 12W BR30 Replacement	4	12
Exterior	Front Drive	Shoebox MH 400W	4	458	Area LED 15L	4	155
Exterior	Front Drive	Shoebox MH 400W	2	458	Area LED 15L	2	155
Exterior	Front Drive	Shoebox MH 400W	11	458	Area LED 15L T5	11	148
Exterior	Ball Field Drive	Shoebox MH 400W	6	458	Area LED 15L	6	155
Exterior	Splash Pad Parking	Shoebox MH 400W	8	458	Area LED 15L	8	155
Exterior	Splash Pad Parking	Shoebox MH 400W	1	458	Area LED 15L	1	155
Exterior	Ball Parking 4/5	Shoebox MH 400W	2	458	Area LED 15L	2	155
Exterior	Ball Parking 4/5	Shoebox MH 400W	2	458	Area LED 15L	2	155
terior	Pond Drive	Shoebox MH 400W	3	458	Area LED 15L	3	155
exterior	Main Drive	Shoebox MH 400W	11	458	Area LED 15L	11	155
Exterior	Ball Parking 1-3	Shoebox MH 400W	4	458	Area LED 15L	4	155
Exterior	Playground Parking - Main Pavilion	Shoebox MH 400W	2	458	Area LED 15L	2	155
Exterior	Playground Parking - Main Pavilion	Shoebox MH 400W	2	458	Area LED 15L	2	155
Exterior	shelter-hill top Pavilion	Shoebox MH 400W	2	458	Area LED 15L	2	155
Exterior	Soccer Parking	Shoebox MH 400W	6	458	Area LED 15L	6	155
Exterior	Soccer Parking	Shoebox MH 400W	3	458	Area LED 15L	3	155
Exterior	Statue	Flood MH 100W	1	128	Flood LED 2000L	1	22
Exterior	Flag Pole	Flood MH 400W	2	458	Flood LED 10L	2	90
Exterior	Memorial	8' Strip HO 2L	2	207	RT, 4' 13W LED 4L, 8' BC Kit	2	52
Exterior	Memorial	Bollard CFL 42W Screw In	20	42	LED 17W A21 Retrofit	20	17
Exterior	Memorial	Flood MH 175W	2	215	Flood LED 4000L	2	29
Exterior	Memorial	Flood MH 175W	2	215	Flood LED 4000L	2	29
Exterior	Sign Flood	Flood MH 175W	2	215	Flood LED 4000L	2	29
terior	Flag Flood	Flood MH 400W	1	458	Flood LED 10L	1	90

2.3 C. Preliminary ESPC Project

ECM #2 Retro-Commissioning

No recommendations at this time.

ECM #3 Building Automation Controls

No recommendations at this time.

ECM #4 Mechanical Upgrades

The County Park has multiple buildings with mechanical systems. The Welcome Center has an outdated 4 ton split system with propane heating. The Welcome Center also has an 80% unit heater. There are 3 ton heat pump systems for both the main concession stand and the concession stand for Fields #4 and #5. Fields #4 and #5 has a defective hot water heater. The Christmas storage building uses a 30kw electric heater.

- Replace the Welcome Center 4 ton split system with an energy efficient system with propane heat and a condensing unit that uses environmentally friendly R-410A refrigerant.
- Replace (2) 3 ton heat pump systems for concession stands with high SEER heat pumps to achieve maximum energy savings.
- Upgrade the 30kw electric heater for the Christmas Storage building with a new electric heater.
- Replace the defective hot water heater with an Energy Star rated hot water heater.

ECM #5 Water Conservation Upgrades

No recommendations at this time.

ECM #6 Building Envelope

No recommendations at this time.

ECM #7 Other

There is (1) vending machine in the Park. It currently runs the lighting and compressors 24/7. We will be installing (1) VendingMiser controls on these machines. They use a motion sensor to reduce the runtime saving energy over extended off hours, weekends and holidays while maintaining a cold product. This reduced energy consumption without any perceptible change in the product dispensed.

VendingMISER controls will eliminate compressor run time and save wasted energy dollars

Energy Savings Calculations

ECM Summary

County Park	Energy & Water Savings					Cost Savings					Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	Electric kWh	Peak kW	Water kGal	Sewer kGal	Propane Gallons	Elec $ Saved	Water $ Saved	Sewer $ Saved	Propane $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Total Lighting	156,361	12	0	0	-52	$4,757	$0	$0	-$66	$4,691	63	13	60	72.8	4.7	77.5	
Total RCx	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	72.8	4.7	77.5	
Total Controls	3,082	0	0	0	58	$94	$0	$0	$74	$168	2	0	1	71.9	4.3	76.2	
Total Mechanical	4,969	0	0	0	13	$151	$0	$0	$16	$168	2	0	2	70.5	4.2	74.7	
Total Water	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	70.5	4.2	74.7	
Total Envelope	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	70.5	4.2	74.7	
Total Renewable Energy	0	0	0	0	0	$0	$0	$0	$0	$0	0	0	0	70.5	4.2	74.7	
Total Miscellaneous	2,645	0	0	0	0	$80	$0	$0	$0	$80	1	0	1	69.8	4.2	73.9	
Total:	167,057	12	0	0	19	$5,083	$0	$0	$24	$5,107	68	14	64	117.1	4.3	121.4	Baseline
% Saved:	40%		0%	0%	3%	40%	0%	0%	3%	16%				69.8	4.2	73.9	Post Project

ECM Summary

County Park		Energy & Water Savings					Cost Savings					Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	ECM #	Electric kWh	Peak kW	Water kGal	Sewer kGal	Propane Gallons	Elec $ Saved	Water $ Saved	Sewer $ Saved	Propane $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Lighting Upgrades	1-1	156,361	12	0	0	-52	$4,757	$0	$0	-$66	$4,691	63	13	60	72.8	4.7	77.5	
Total Lighting		**156,361**	**12**	**0**	**0**	**-52**	**$4,757**	**$0**	**$0**	**-$66**	**$4,691**	**63**	**13**	**60**	**72.8**	**4.7**	**77.5**	
Total RCx		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**72.8**	**4.7**	**77.5**	
Scheduling	3-1	3,082	0	0	0	58	$94	$0	$0	$74	$168	2	0	1	71.9	4.3	76.2	
Total Controls		**3,082**	**0**	**0**	**0**	**58**	**$94**	**$0**	**$0**	**$74**	**$168**	**2**	**0**	**1**	**71.9**	**4.3**	**76.2**	
Replace Split System (Welcome Center)	4-1	729	0	0	0	8	$22	$0	$0	$10	$32	0	0	0	71.7	4.2	75.9	
Replace Split System (Concession x2)	4-2	3,727	0	0	0	0	$113	$0	$0	$0	$113	2	0	1	70.7	4.2	74.9	
Replace Units Heater (Welcome Center)	4-3	0	0	0	0	5	$0	$0	$0	$7	$7	0	0	0	70.7	4.2	74.8	
Replace Units Heater (Christmas Storage)	4-4	170	0	0	0	0	$5	$0	$0	$0	$5	0	0	0	70.6	4.2	74.8	
Replace DHW Heater	4-5	343	0	0	0	0	$10	$0	$0	$0	$10	0	0	0	70.5	4.2	74.7	
Total Mechanical		**4,969**	**0**	**0**	**0**	**13**	**$151**	**$0**	**$0**	**$16**	**$168**	**2**	**0**	**2**	**70.5**	**4.2**	**74.7**	
Total Water		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**70.5**	**4.2**	**74.7**	
Total Envelope		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**70.5**	**4.2**	**74.7**	
Total Renewable Energy		**0**	**0**	**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**70.5**	**4.2**	**74.7**	
Vendmiser (2)	8-1	2,645	0	0	0	0	$80	$0	$0	$0	$80	1	0	1	69.8	4.2	73.9	
Total Miscellaneous		**2,645**	**0**	**0**	**0**	**0**	**$80**	**$0**	**$0**	**$0**	**$80**	**1**	**0**	**1**	**69.8**	**4.2**	**73.9**	
Total:		**167,057**	**12**	**0**	**0**	**19**	**$5,083**	**$0**	**$0**	**$24**	**$5,107**	**68**	**14**	**64**	**117.1**	**4.3**	**121.4**	**Baseline**
% Saved:		**40%**		**0%**	**0%**	**3%**	**40%**	**0%**	**0%**	**3%**	**16%**				**69.8**	**4.2**	**73.9**	**Post Project**

Interior Lighting Retrofit

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction, as well as the HVAC interaction.

Building Name: County Park

Occupied Hours: 2,610
Unoccupied Hours: 6,150

Lighting:

Existing Interior Lighting kW:	16.1	*Monthly kW*
Existing Interior Lighting kWh:	15,159	*Annual kWh*
Proposed Interior Lighting kW:	4.6	*Monthly kW*
Proposed Interior Lighting kWh:	4,698	*Annual kWh*
Interior Lighting kW **Saved**:	11.5	*Monthly kW*
Interior Lighting kWh **Saved**:	10,461	*Annual kWh*

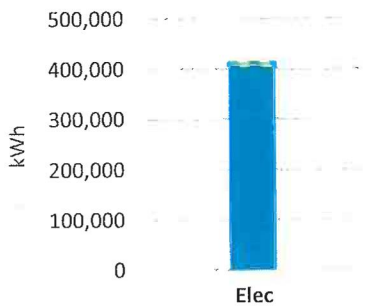
HVAC Interaction:

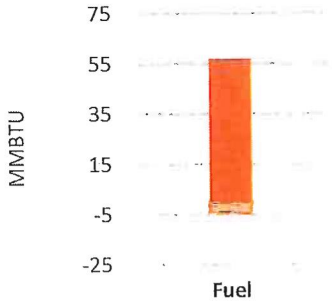
Cooling kWh **Saved**:	437	*Annual kWh*
Primary Heating Fuel **Penalty**:	-52	*Annual Gal (Propane)*
Secondary Heating Fuel **Penalty**:	-1,762	*Annual kWh*

Total Savings

9,136	***Annual kWh***
11.5	***Monthly kW***
-52	***Annual Propane Gal***

$278	***Electric $ Saved***
$0	***Elec Demand $ Saved***
-$66	***Propane $ Saved***





2.2% Saved from Electric Baseline
-9.1% Saved from Misc Fuel Baseline

Exterior Lighting

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction.

Building Name: County Park

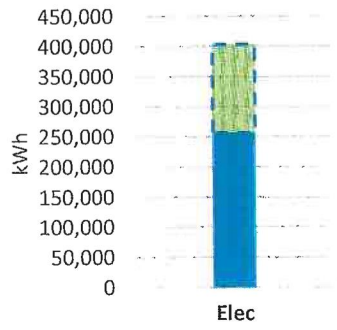
Hours of Exterior Lighting Operation - Existing:	4,380
Hours of Exterior Lighting Operation - Proposed:	4,380

Lighting:

Existing Interior Lighting kW:	330.1	*Monthly kW*
Existing Interior Lighting kWh:	235,605	*Annual kWh*
Proposed Interior Lighting kW:	129.6	*Monthly kW*
Proposed Interior Lighting kWh:	88,380	*Annual kWh*

Total Savings

147,225	***Annual kWh***
$4,480	***Electric $ Saved***



36.4% % Savings from Electric Baseline

Scheduling & Set-points

ECM Overview:

Energy consumption can be reduced by applying a heating setback and/or cooling setup temperature and turning off the HVAC system during unoccupied times.

Building Name: County Park

System ID: All Systems

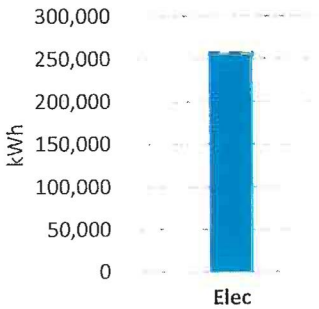
HVAC Conditions:

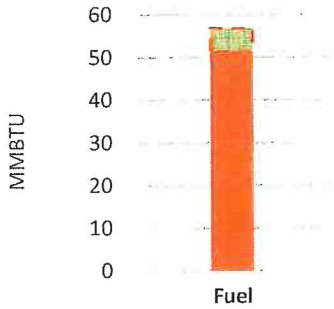
	Existing		Proposed	
HVAC Occupied Hours:	8,760		7,300	
HVAC Unoccupied Hours:	0		1,460	
Occupied Heating Set-point:	70	°F	70	°F
Unoccupied Heating Set-point:	70	°F	60	°F
Occupied Cooling Set-point:	72	°F	72	°F
Unoccupied Cooling Set-point:	72	°F	78	°F
All Systems Supply Fan HP:	3	HP		

Total Savings

3,082	***Annual kWh***
58	***Annual Propane***

$94	***Electric $ Saved***
$74	***Propane $ Saved***





1.2% % Savings from Electric Baseline

9.3% % Saved from Misc Fuel Baseline

HVAC Replacement - Fields 1,2,3 & Fields 4,5

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: County Park - Field 1,2,3 & Field 4,5

System ID: Split Systems (Heat Pump x2)

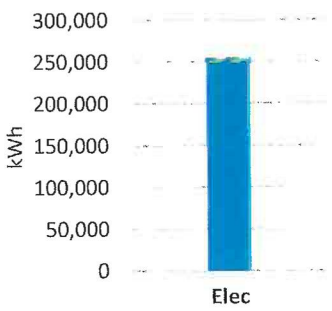
HVAC Conditions:

	Existing	Proposed	
Cooling Efficiency	9.7	16.0	SEER
Heating Efficiency	2.0	3.0	COP

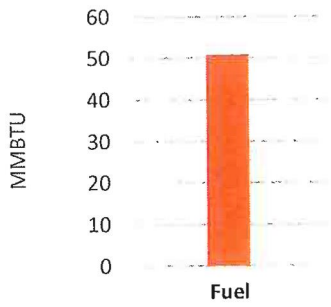
Total Annual Cooling Hours:	4,415
Total Annual Heating Hours:	2,783

Total Savings

3,727	*Annual kWh*



$113	*Electric $ Saved*



1.5%	% Savings from Electric Baseline
0.0%	% Saved from Misc Fuel Baseline

Replace Water Heater

ECM Overview:

Energy savings can be realized by replacing an outdated domestic hot water heating system with a new, high efficiency system.

Building Name: County Park - Field 4 & 5

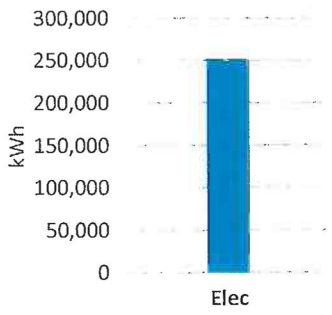
System ID: Electric DHW Heater

Domestic Hot Water Conditions:

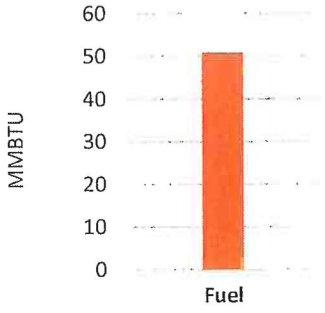
Existing Water Heater Efficiency:	83%	
Proposed Water Heater Efficiency:	95%	
Existing Annual Hot Water Usage:	9,100	Gallons
Proposed Annual Hot Water Usage:	9,100	Gallons
Baseline Annual Utility Consumption:	2,175	kWh
Proposed Annual Utility Consumption:	1,900	kWh

Total Savings

343	*Annual kWh*



$10	*Electric $ Saved*



0.1% % Savings from Electric Baseline

0.0% % Saved from Misc Fuel Baseline

HVAC Replacement - Welcome Center Split System

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: County Park - Welcome Center

System ID: Split Systems (Propane x1)

HVAC Conditions:

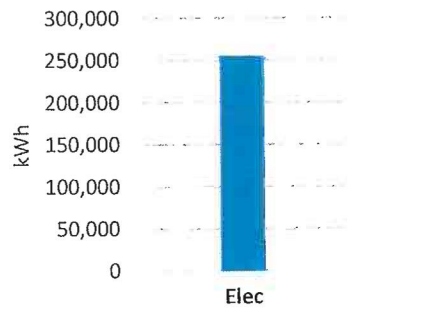
	Existing	Proposed	
Cooling Efficiency	9.7	16.0	SEER
Primary Heating Efficiency	76%	95%	

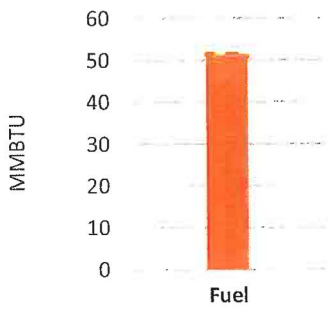
Total Annual Cooling Hours:	4,415
Total Annual Heating Hours:	2,783

Total Savings

729	*Annual kWh*
8	*Annual Propane Gal*

$22	*Electric $ Saved*
$10	*Propane $ Saved*





0.3%	% Savings from Electric Baseline
1.4%	% Saved from Misc Fuel Baseline

Replace Unit Heater - Welcome Center

ECM Overview:

Converting old unit heaters to a high efficiency version can provide savings.

Building Name: County Park - Welcome Center

System ID: Unit Heater (Propane x2)

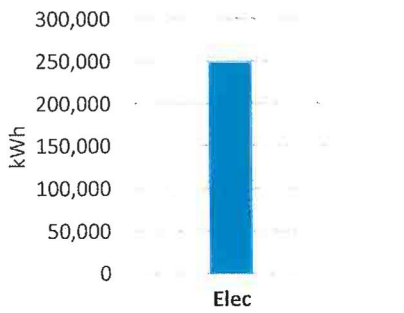
UH Conditions:

Existing Unit Heater Type: Older Unit Heaters
Existing Unit Heater Efficiency: 76%

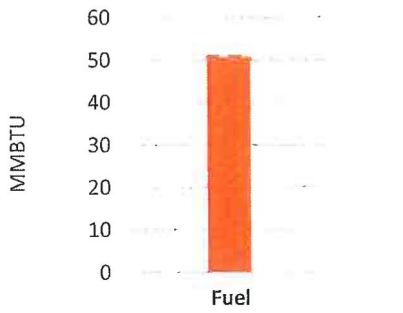
Proposed Unit Heater Type: New Unit Heaters
Proposed IR Heater Efficiency: 92%

Total Savings

5	*Annual Propane Gal*



$7	*Propane $ Saved*



0.0% % Savings from Electric Baseline
0.9% % Saved from Misc Fuel Baseline

Replace Unit Heater - Christmas Storage

ECM Overview:

Converting unit heaters to infrared heaters, which use both radiant heat and convection heating, can provide savings.

Building Name: County Park - Christmas Storage

System ID: Unit Heater (Electric x1)

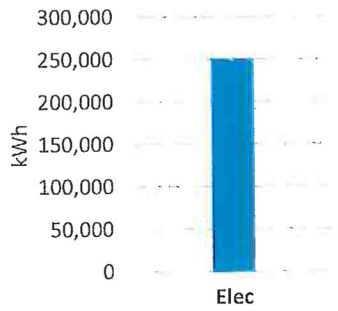
UH Conditions:

Existing Unit Heater Type: Older Unit Heaters
Existing Unit Heater Efficiency: 76%

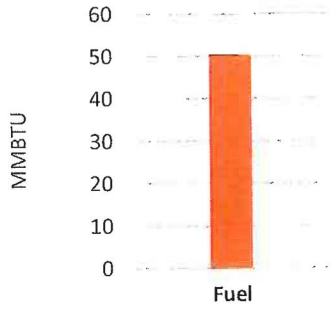
Proposed Unit Heater Type: New Unit Heaters
Proposed IR Heater Efficiency: 80%

Total Savings

170	*Annual kWh*



$5	*Electric $ Saved*



0.1% % Savings from Electric Baseline
0.0% % Saved from Misc Fuel Baseline

Vending Machine Control

ECM Overview:

By implementing motion detection sensors on vending machines, savings can be realized by extending the off cycle times during overnight, weekend, holiday and other less occupied times in the facility.

Building Name: County Park

System ID: (2) Vending Machines

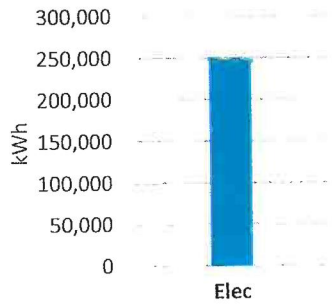
Occupied Hours: 2,610
Unoccupied Hours: 6,150

Vending Machine Summary:

Number of Cold Drink Vending Machines:	1	
Power Requirements of Cold Drink Vending Machine:	380	watts
Power Requirements of Uncooled Snack Machine:	90	watts
Cold Drink Machine Existing Annual Energy:	3,329	kWh
Cold Drink Machine Estimated Annual Energy:	1,190	kWh
Uncooled Snack Machine Existing Annual Energy:	788	kWh
Uncooled Snack Machine Estimated Annual Energy:	282	kWh

Total Savings

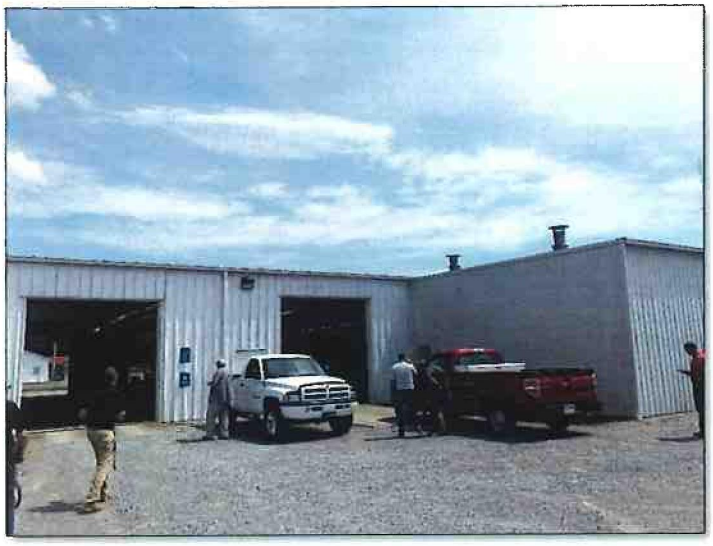
2,645	*Annual kWh*
$80	*Electric $ Saved*



1.1% % Savings from Electric Baseline

2.3 C. Preliminary ESPC Project

Maintenance Garage Building



591 US Hwy 68 West
Benton, KY 42025

Year Built:	2009	**Square Footage:**		**Occupancy:**	Varies
Renovations:	N/A	**# of Stories:**	1	**Energy Source:**	Natural Gas & Electric
Survey Date:	10/11/2016	**Hours of Operation:**	M-F: 8-5	**Computers:**	5

2.3 C. Preliminary ESPC Project

ECM #1 Lighting

The truck bay area is high wattage 8' fluorescent fixtures. The office space has 4' fluorescent fixtures with 4 lamps. The retrofit recommendations is to reduce wattage to 13 watt LED and delamp in the office space. Exterior lighting are high wattage wall packs. Exit signs are not LED. See chart below for details.

Fixture Quantity	Pre kWh	Post kWh	kWh Savings
83	28,907	7,363	21,544

Fluorescent 8' fixture

High wattage Exit Sign

Location		Existing Fixture			Proposed Fixture		
Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
	Storage	8' Strip HO 2L	3	207	RT, 4' 13W LED 4L, 8' BC Kit	3	52
Exterior	Building Mounted	Wall Pack HPS 50W	1	66	Wall Pack LED CO 1900L	1	14
Exterior	Front	Wall Pack MH 250W	1	295	Wall Pack LED FT 7000L	1	57
Exterior	Rear Exit	Wall Pack MH 250W	2	295	Wall Pack LED FT 7000L	2	57
Exterior	Corner	Flood CFL 13W Screw In	4	13	LED 14W PAR38 Replacement	4	14
1st Floor	Open Bays	8' Strip HO 2L	28	207	RT, 4' 13W LED 4L, 8' BC Kit	28	52
1st Floor	Wash Bay	8' Strip HO 2L	8	207	RT, 4' 13W LED 4L, 8' BC Kit	8	52
1st Floor	Storage	8' Strip HO 2L	7	207	RT, 4' 13W LED 4L, 8' BC Kit	7	52
1st Floor	Restroom Area	8' Strip HO 2L	2	207	RT, 4' 13W LED 4L, 8' BC Kit	2	52
1st Floor	Restroom Area	4' Strip BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Restroom	8' Strip BP 4L 32W T8	1	112	RT, 4' 13W LED 4L	1	52
2nd Floor	Storage	4' Wrap BP 4L	1	144	RT, 4' 13W LED 4L	1	52
Mezzanine	Storage	8' Strip HO 2L	2	207	RT, 4' 13W LED 4L, 8' BC Kit	2	52
1st Floor	Tool Storage	8' Strip HO 2L	6	207	RT, 4' 13W LED 4L, 8' BC Kit	6	52
1st Floor	Office	8' Strip HO 2L	4	207	RT, 4' 13W LED 4L, 8' BC Kit	4	52
1st Floor	Office Storage	2' Strip 2L	1	51	RT, 2' 9W LED 2L	1	18
1st Floor	Office Restroom	8' Strip HO 2L	1	207	RT, 4' 13W LED 4L, 8' BC Kit	1	52
1st Floor	Office Restroom	Vanity Inc 60W A 2L	1	120	LED 10W A19 Replacement 2L	1	20

2.3 C. PRELIMINARY ESPC PROJECT

Floor	Room	Fixture	Quantity	Input Wattage	ECM	Quantity	Input Wattage
1st Floor	Office Restroom	4' Wrap BP 2L	1	72	RT, 4' 13W LED 2L	1	26
1st Floor	Office Conference Room	4' Wrap BP 4L	4	144	RT, 4' 13W LED 4L	4	52
1st Floor	Office	4' Wrap BP 4L	4	144	RT, 4' 13W LED 4L	4	52

ECM #2 Retro-Commissioning

No recommendations at this time.

ECM #3 Building Automation Controls

No recommendations at this time.

ECM #4 Mechanical Upgrades

The office space is conditioned by (1) 2.5 ton split system that has reached the end of its life expectancy. The truck bays are heated by (2) forced air gas-fired unit heater, and a radiant heater. The domestic hot water heater has passed its useful life.

- Perfection group will replace the split system with a high SEER 2.5 ton split system to serve the office space. The unit will use less expensive, environmentally friendly R-410A refrigerant.
- Replace the existing Richmond 30 Gallon water heater with a new Rheem 40 Gallon energy efficient water Heater designed for the application and required usage within the facility.
- Replace the existing gas unit Heaters with three (3) new high efficient IR Tube Heater designed to meet the requirements of the area. Infrared heating is considered to be one of the most efficient heating methods a business owner can choose to install. Traditional heaters - those designed to heat the air - are drying, inefficient, and often result in ceiling becoming the warmest part of the room. Infrared heaters have none of these undesirable side effects. These heaters work similarly to the sun; the infrared waves emitted by the heaters are absorbed by the room's contents directly, gradually warming them rather than heating the air. The result is a quiet, comfortable, and draft-free facility, and a heating system that is both more energy efficient and more economical than traditional systems.

ECM #5 Water Conservation Upgrades

No recommendations at this time.

ECM #6 Building Envelope

No recommendations at this time.

2.3 C. PRELIMINARY ESPC PROJECT

ECM #7 Other

There are (1) vending machines in the Maintenance Garage. It currently runs the lighting and compressors 24/7. We will be installing (1) VendingMiser controls on these machines. They use a motion sensor to reduce the runtime saving energy over extended off hours, weekends and holidays while maintaining a cold product. This reduced energy consumption without any perceptible change in the product dispensed.

VendingMISER controls will eliminate compressor run time and save wasted energy dollars

ECM Summary

Maintenance Building	Energy & Water Savings			Cost Savings			Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	Electric kWh	Peak kW	Nat Gas CCF	Elec $ Saved	Nat Gas $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Total Lighting	21,864	8	-331	$2,908	-$271	$2,637	7	2	7	27.8	17.6	45.4	
Total RCx	0	0	0	$0	$0	$0	0	0	0	27.8	17.6	45.4	
Total Controls	0	0	0	$0	$0	$0	0	0	0	27.8	17.6	45.4	
Total Mechanical	1,514	0	347	$201	$284	$486	2	1	2	27.4	14.6	42.0	
Total Water	0	0	0	$0	$0	$0	0	0	0	27.4	14.6	42.0	
Total Envelope	0	0	0	$0	$0	$0	0	0	0	27.4	14.6	42.0	
Total Renewable Energy	0	0	0	$0	$0	$0	0	0	0	27.4	14.6	42.0	
Total Miscellaneous	2,139	0	0	$284	$0	$284	1	0	1	26.8	14.6	41.4	
Total:	25,516	8	16	$3,394	$13	$3,407	10	2	10	34.0	14.8	48.7	Baseline
% Saved:	21%		1%	27%	1%	24%				26.8	14.6	41.4	Post Project

ECM Summary

Maintenance Building		Energy & Water Savings			Cost Savings			Environmental Impact			Rolling Energy Usage Intensity			
ECM Description	ECM #	Electric kWh	Peak kW	Nat Gas CCF	Elec $ Saved	Nat Gas $ Saved	Total $ Saved	Tons CO_2 Reduced	# Cars Removed	Acres of Forest	Elec kBTU/sf	Fuel kBTU/sf	Total kBTU/sf	
Lighting Upgrades	1-1	21,864	8	-331	$2,908	-$271	**$2,637**	7	2	7	27.8	17.6	45.4	
Total Lighting		**21,864**	**8**	**-331**	**$2,908**	**-$271**	**$2,637**	**7**	**2**	**7**	**27.8**	**17.6**	**45.4**	
Total RCx		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**27.8**	**17.6**	**45.4**	
Total Controls		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**27.8**	**17.6**	**45.4**	
Replace Split System (1)	4-1	1,514	0	79	$201	$65	**$266**	1	0	1	27.4	16.9	44.3	
Install IR Tube Heaters	4-2	0	0	259	$0	$212	**$212**	1	0	1	27.4	14.7	42.1	
Replace DHW Heater	4-3	0	0	9	$0	$8	**$8**	0	0	0	27.4	14.6	42.0	
Total Mechanical		**1,514**	**0**	**347**	**$201**	**$284**	**$486**	**2**	**1**	**2**	**27.4**	**14.6**	**42.0**	
Total Water		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**27.4**	**14.6**	**42.0**	
Total Envelope		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**27.4**	**14.6**	**42.0**	
Total Renewable Energy		**0**	**0**	**0**	**$0**	**$0**	**$0**	**0**	**0**	**0**	**27.4**	**14.6**	**42.0**	
Vendmiser	8-1	2,139	0	0	$284	$0	**$284**	1	0	1	26.8	14.6	41.4	
Total Miscellaneous		**2,139**	**0**	**0**	**$284**	**$0**	**$284**	**1**	**0**	**1**	**26.8**	**14.6**	**41.4**	
Total:		**25,516**	**8**	**16**	**$3,394**	**$13**	**$3,407**	**10**	**2**	**10**	**34.0**	**14.8**	**48.7**	Baseline
% Saved:		**21%**		**1%**	**27%**	**1%**	**24%**				**26.8**	**14.6**	**41.4**	Post Project

Interior Lighting Retrofit

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction, as well as the HVAC interaction.

Building Name: Judicial Center

Occupied Hours: 2,610
Unoccupied Hours: 6,150

Lighting:

Existing Interior Lighting kW:	59.0	*Monthly kW*
Existing Interior Lighting kWh:	149,559	*Annual kWh*
Proposed Interior Lighting kW:	36.7	*Monthly kW*
Proposed Interior Lighting kWh:	92,609	*Annual kWh*
Interior Lighting kW **Saved**:	22.3	*Monthly kW*
Interior Lighting kWh **Saved**:	56,950	*Annual kWh*

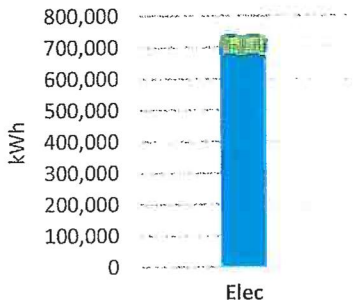
HVAC Interaction:

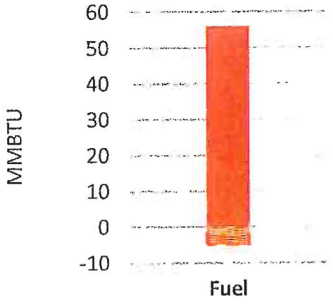
Cooling kWh **Saved**:	3,924	*Annual kWh*
Primary Heating Fuel **Penalty**:	-49	*Annual CCF*

Total Savings

60,873	***Annual kWh***
22.3	***Monthly kW***
-49	***Annual CCF***

$6,539	***Electric $ Saved***
$0	***Elec Demand $ Saved***
-$49	***CCF $ Saved***





8.3% Saved from Electric Baseline
-9.8% Saved from Nat Gas Baseline

Exterior Lighting

ECM Overview:

Reduction in lighting wattage reduces electrical energy consumption for all burn hours. This calculation takes into account the savings realized by the wattage reduction.

Building Name: Judicial Center

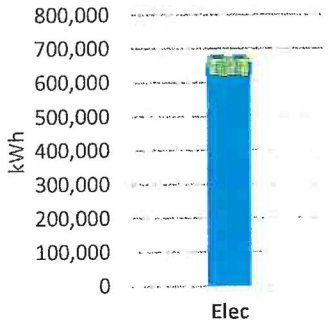
Hours of Exterior Lighting Operation - Existing:	5,110
Hours of Exterior Lighting Operation - Proposed:	5,110

Lighting:

Existing Interior Lighting kW:	20.0	*Monthly kW*
Existing Interior Lighting kWh:	87,740	*Annual kWh*
Proposed Interior Lighting kW:	6.9	*Monthly kW*
Proposed Interior Lighting kWh:	30,127	*Annual kWh*

Total Savings

57,613	***Annual kWh***
$6,189	***Electric $ Saved***



8.5% % Savings from Electric Baseline

Retro-Commissioning

ECM Overview:

Older systems degrade in efficiency as they age. Mechanical retro-commissioning will increase the efficiency of the system up to or near the starting unit efficiency.

Building Name: Judicial Center

System ID: ERV & Heat Exchanger

HVAC Conditions:

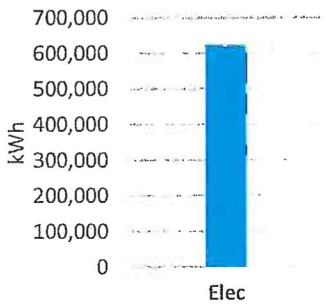
	Nameplate	De-rated	
Cooling Efficiency:	13.0	12.4	EER
Heating Efficiency:	85%	81%	%

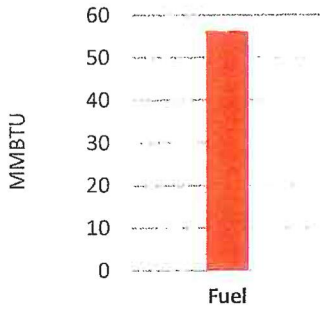
Total Annual Cooling Hours:	4,886
Total Annual Heating Hours:	3,874

Total Savings

509	*Annual kWh*
3	*Annual CCF*

$55	*Electric $ Saved*
$3	*CCF $ Saved*





0.1%	% Savings from Electric Baseline
0.5%	% Saved from Nat Gas Baseline

Retro-Commissioning
Motor Efficiency

ECM Overview:

Retrocommissioning older motors will result in electric consumption savings.

Building Name: Judicial Center

System ID: 7 Pumps

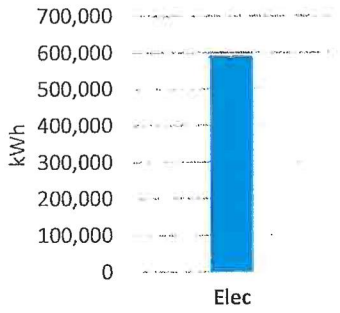
Motor Conditions:

System ID:	P-1, P-2	P-3, P-4	P-5, P-6	P-7
Design BHP:	0.3	11.4	11.4	0.7
Operating Hours	3,081	3,782	3,782	6,863
Existing Motor Efficiency:	0.8	0.8	0.8	0.8
Existing Motor kWh:	327	26,603	26,603	1,180
Proposed Motor kWh:	325	26,438	26,438	1,173

Total Savings

340	*Annual kWh*

$37	*Electric $ Saved*



0.1% % Savings from Electric Baseline

Scheduling & Set-points

ECM Overview:

Energy consumption can be reduced by applying a heating setback and/or cooling setup temperature and turning off the HVAC system during unoccupied times.

Building Name: Judicial Center

System ID: All Systems

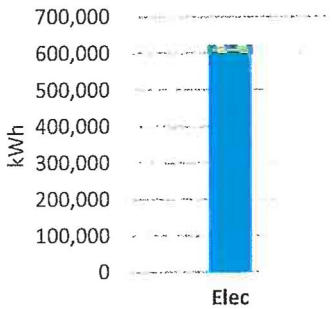
HVAC Conditions:

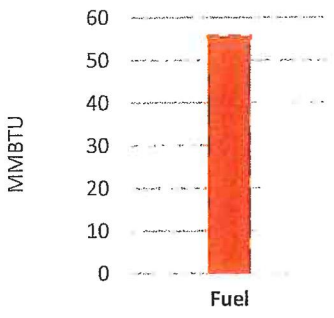
	Existing		Proposed	
HVAC Occupied Hours:	6,205		3,914	
HVAC Unoccupied Hours:	2,555		4,846	
Occupied Heating Set-point:	70	°F	70	°F
Unoccupied Heating Set-point:	70	°F	60	°F
Occupied Cooling Set-point:	72	°F	72	°F
Unoccupied Cooling Set-point:	72	°F	80	°F
All Systems Supply Fan HP:	20	HP		

Total Savings

17,510	*Annual kWh*
5	*Annual CCF*

$1,881	*Electric $ Saved*
$5	*CCF $ Saved*





2.8%	% Savings from Electric Baseline
0.9%	% Saved from Nat Gas Baseline

HVAC Replacement

ECM Overview:

Energy savings can be realized by replacing an outdated mechanical system with a new, high efficiency system.

Building Name: Judicial Center

System ID: WSHPs

HVAC Conditions:

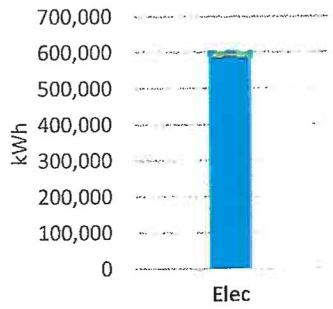
	Existing	Proposed	
Cooling Efficiency	16.4	17.0	SEER
Primary Heating Efficiency	85%	90%	
Secondary Heating Efficiency	2.5	2.7	COP

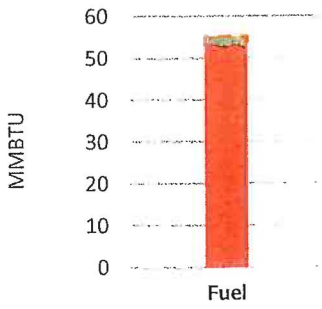
Total Annual Cooling Hours:	3,897
Total Annual Heating Hours:	3,649

Total Savings

14,131	***Annual kWh***
23	***Annual CCF***

$1,518	***Electric $ Saved***
$23	***CCF $ Saved***





2.4%	% Savings from Electric Baseline
4.2%	% Saved from Nat Gas Baseline

Replace Boiler

ECM Overview:

Replacing an old inefficient boiler with a new high efficient boiler will reduce energy consumption. Older boilers are often oversized and no longer operating at the original efficiency. Replacing with a properly sized boiler the is high efficiency will generate savings.

Building Name: Judicial Center

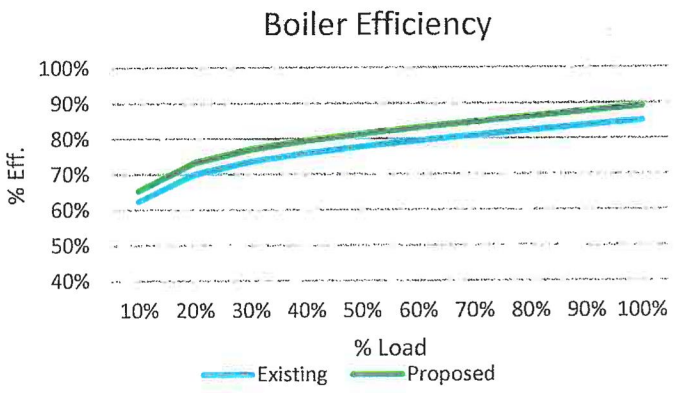
Boiler Conditions:

Existing Boiler Type: Atmospheric Boiler
Nominal Boiler Efficiency: 85%

Proposed Boiler Type: Atmospheric Boiler
Nominal Boiler Efficiency: 89%

Boiler Efficiency

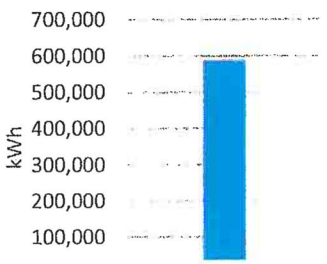
% Load	Existing	Proposed
10%	62%	65%
20%	70%	73%
30%	74%	77%
40%	76%	79%
50%	78%	81%
60%	79%	83%
70%	81%	85%
80%	82%	86%
90%	84%	88%
100%	85%	89%

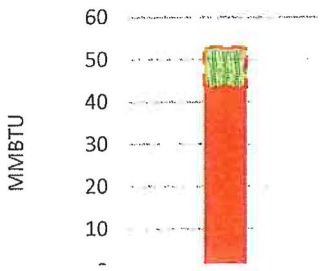


Total Savings

0	*Annual kWh*
91	*Annual CCF*

$0	*Electric $ Saved*
$90	*CCF $ Saved*





Replace Water Heater

ECM Overview:

Energy savings can be realized by replacing an outdated domestic hot water heating system with a new, high efficiency system.

Building Name: Maintenance Building

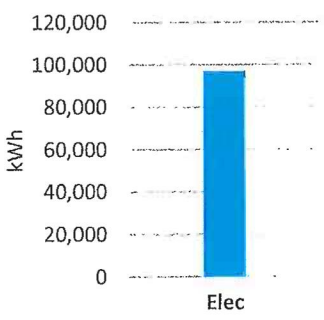
System ID: DHW Heater

Domestic Hot Water Conditions:

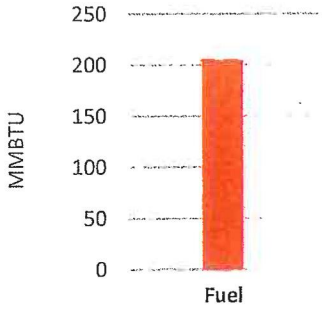
Existing Water Heater Efficiency:	65%	
Proposed Water Heater Efficiency:	92%	
Existing Annual Hot Water Usage:	3,900	Gallons
Proposed Annual Hot Water Usage:	3,900	Gallons
Baseline Annual Utility Consumption:	32	CCF
Proposed Annual Utility Consumption:	23	CCF

Total Savings

9	*Annual CCF*



$8	*CCF $ Saved*



0.0%	% Savings from Electric Baseline
0.5%	% Saved from Nat Gas Baseline

2.3 C. Preliminary ESPC Project

Fleet Management Program

BENEFITS OF A FLEET MANAGEMENT PROGRAM

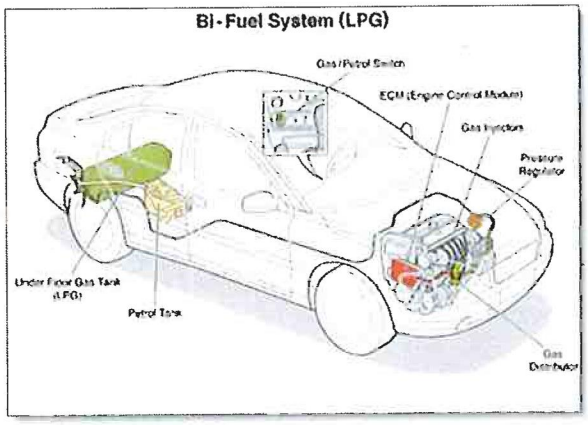
- Optimizes the usage of every vehicle and thereby reduces the size of the county's fleet
- Standardizes job specific vehicles
- Reduces vehicle operational costs due to less maintenance requirements. Detailed costs breakdowns show department managers where their dollars are being spent, and the true cost of owning/operating vehicles and equipment
- Alleviates the budget confusion and uncertainty for user department
- Maximize the benefit of a "reserve" fleet, with minimum resources
- Employees will show a pride of ownership and take better care of their vehicle
- Safer vehicles because they are turned over more often
- Improved fuel savings with newer vehicles
- Maximize cash value of current fleet, and resale value of leased vehicles

2.3 C. PRELIMINARY ESPC PROJECT

ALTERNATIVE FUELS

BENEFITS OF CONVERTING TO LIQUID PROPANE

- Lower engine maintenance costs
- Lower cost of fuel, increased fuel efficiency
- Higher octane
- Dual fuel capabilities
- Extended driving distance
- Environmentally friendly
- Increased engine life
- Transferability to new vehicles
- Training for Maintenance Staff to do installs



Vehicle Fuel Savings

ECM Overview:

Propane can be purchased at a significantly lower cost than gasoline. As a result, Marshall County has a significant cost savings opportunity to upgrade their high usage vehicles to run on propane.

Vehicle Fuel Summary:

Total Number of Vehicles Analyzed:	41
Number of Vehicles to be Upgraded:	20
Percentage of Alternative Fuel Use:	80%

Total Savings

10,879	*Annual Gasoline Gal*

$20,671	*Gasoline $ Saved*

2.3 D. SERVICES

Ongoing Preventative Maintenance Agreements

As part of this energy conservation project, The Perfection Group will work with you to develop a maintenance program that is specifically designed for you and your facility. Based on our initial estimates, the maintenance contract required to support/enhance energy savings would be negotiated outside of this energy conservation agreement/package.

Our intent is to design a Preventative Maintenance program, with the Marshall County maintenance staff, that allows you to maintain and support the HVAC and control systems. One key to keep in mind when determining the final scope of maintenance is that **Energy Savings goals are difficult to achieve if the facility improvements are not well maintained**.

Perfection Group will also provide training to the Marshall County maintenance staff on all ECM's implemented. This will allow the staff to fix minor issues, and maintain systems where needed.

See attached document for Maintenance Contract Agreement.

Measurement & Verification

Perfection Group follows guidelines set forth in the International Performance Measurement and Verification Protocol to ensure savings are met. Perfection Group has included the first 3 years of Measurement & Verification in the proposal. Thereafter, Perfection typically works with our customers to determine the level of analysis and reporting required by the customer to minimize the on-going annual costs so more savings are retained by the customer to be used as needed to reinvest in the buildings, or to utilize elsewhere within the customer's budget. The fee structure can vary substantially depending on the reporting methodology selected under the terms of the guarantee and client's requirements. Perfection Group looks forward to working with your leadership team to determine the level of annual measurement and verification that you feel is appropriate for this project.

Maintenance Contract

Customized Maintenance Proposal

for

Marshall County Fiscal Court

Energy Savings Performance Contract
Maintenance Agreement

Courthouse
Judicial Center
Detention Center
Sheriff's Office
E911
Mike Miller Park
Maintenance Garage
Road Department

Perfection Group, Inc.

Certified

prepared for:

Marshall County ESPC Maintenance Agreement

Proposal Number: MC-621686 **Proposal Date: 08/07/2017**

By:

Perfection Group; Inc.
2649 Commerce Blvd.
Cincinnati, OH 45241
(513) 772-7545

Hereinafter: **Perfection Group, Inc.**

And

For:

Marshall County Fiscal Court
1101 Main Street
Benton, KY 42025
Kevin Neal

Hereinafter: **Customer**

Perfection Group, Inc. will provide the described services attached hereto and made a part of this Agreement in accordance with the Terms and Conditions as set forth on the following pages.

Agreement Provided:	***Certified***
Agreement Location:	**All above mentioned facilities**
Agreement Amount:	**$60,000.00**

Agreement coverage will commence on March 1, 2018. This Agreement is payable in advance in the amount of per quarter , beginning on the effective date of March 1, 2018 through February 28, 2023.

Perfection Group, Inc. guarantees the price stated in this Proposal for thirty (30) days from proposal date above.

This proposal is the property of Perfection Group, Inc. and is provided for our Customer's use only. This proposal will become a binding Agreement only after acceptance by Customer and approved by an authorized agent of Perfection Group, Inc. as evidenced by their signature(s) below. This Agreement sets forth all of the terms and conditions binding upon the parties hereto; and no person has authority to make any claim, representation, promise or condition on behalf of Perfection Group, Inc. which is not expressed herein. This annual Agreement shall continue in effect from year to year unless either party gives written notice to the other intention not to renew thirty (30) days prior to any anniversary date.

PERFECTION GROUP, INC.

Signature: Matt Callahan (Sales Representative) Date

Approval Signature: Niack Apro Date

CUSTOMER

Authorized Representative Signature Date

Kevin Neal
Name & Title (Print/Type)

Proposal Number: MC-621686

Proposal Date: 08/07/2017

Certified Provided by Perfection Group, Inc. for: Marshall County ESPC Maintenance Agreement

Our **Certified Maintenance Agreement (CMA)** is designed to provide the Client with an on-going maintenance program. The CMA program will be initiated, scheduled, administered, monitored and updated by the contractor.

The service activities will be directed and scheduled, on a regular basis, by our comprehensive equipment maintenance scheduling system based on manufacturers' recommendations, equipment location, application, type, run time, and Perfection Group, Inc.'s own experience. The Customer is informed of the program's progress and results on a continuing basis via a detailed Service Report, presented after each service call for Client's review, approval signature and record.

THE CONTRACTOR WILL PROVIDE THE FOLLOWING PROFESSIONAL MAINTENANCE SERVICES FOR THE BUILDING ENVIRONMENTAL MECHANICAL SYSTEM(S) COMPRISED OF THE EQUIPMENT LISTED ON SCHEDULE 1 (INVENTORY OF EQUIPMENT):

TEST AND INSPECT: Job labor, travel labor and travel and living expenses required to visually INSPECT and TEST equipment to determine its operating condition and efficiency. Typical activities include:
-**TESTING** for proper operation; motor winding resistance; refrigerant charge; fan RPM; refrigerant oil (acid); water condition; flue gas analysis; safety controls; combustion and draft; crankcase heaters; control system(s), etc.
-**INSPECTING** for worn, failed or doubtful parts; mountings; drive couplings; oil level; rotation; soot; flame composition and shape; pilot and igniter; steam, water, oil and/or refrigerant leaks, etc.

PREVENTIVE MAINTENANCE: Job labor, travel labor and travel and living expenses required to clean, align, calibrate, tighten, adjust, lubricate and paint equipment. These activities are intended to extend equipment life and assure proper operating condition and efficiency. Typical activities include:

-**CLEANING** coil surfaces; fan impellers and blades; electrical contacts; burner orifices; passages and nozzles; pilot and igniter; cooling tower baffles, basin, sump and float.
-**ALIGNING** belt drives; drive couplings; air fins, etc.
-**CALIBRATING** safety controls; temperature and pressure controls, etc.
-**TIGHTENING** electrical connections; mounting bolts; pipe clamps; refrigerant piping fittings; damper sections, etc.
-**ADJUSTING** belt tension; refrigerant charge; super heat; fan RPM; water chemical feed and feed rate; burner fuel/air ratios; gas pressure; set point of controls and limits; compressor cylinder unloaders; damper close-off; sump floats, etc.
-**LUBRICATING** motors; fan and damper bearings; valve stems; damper linkages; fan vane linkages, etc.

Proposal Number: MC-621686 Proposal Date: 08/07/2017

Perfection Group is pleased to provide a customized ESPC Maintenance Agreement for the facilities with a Scope of Work under the ESPC Project. Buildings top include:

- Courthouse
- Judicial Center
- Detention Center
- Sheriff's Office
- E 911
- Mike Miller Park
- Maintenance Garage
- Road Department

Systems and maintenance programs to be developed once the ESPC Scope of Work has been determined along with a needs analysis for the HVAC/Mechanical & Controls installed or currently on premises.

2.3 FINANCIAL APPROACH

Perfection Group, Inc. works with our customers under a variety of different compensation arrangements, depending upon the types of services provided and the needs of the customer. Outlined below are typical approaches we have used. Please note that these are not mutually exclusive, and aspects of each may be combined in a unique agreement structure for The Fiscal Court. We welcome the opportunity to discuss with you various incentive-based structures in more detail.

- Third Party Leasing (Typically used with Performance Contracts)
- Performance Based (Paid from Savings)
- Guaranteed Savings with Fixed Fee
- Performance Based Pricing

Third Party Leasing / Financing (Typically used with Performance Contracts)

Due to the longer agreements terms used with Performance Contracts, the cost of the project installation (either the full amount or a portion of the total) is financed through a third party financing company. The basic form of the agreement will vary from project to project, but the typical financial terms are – lease, loan, or bonds. In all of these financial arrangements the customer and the financing organization determine the best suitable financial instrument for the project being financed. The finance agreement will be made between the purchasing customer and the financial organization. Under these financing agreements the installation cost of the project will be paid to the installing contractor on a progress payment basis during the installation phase of the project. The final payment, or retainage, can be paid to the installing contractor at some agreed period after the completion of the project installation (typically no later than 90 days after substantial project completion).

The decision on who to use for the financing is ultimately The Fiscal Court. If you have a Bonding Agent or local bank that you would like to work with, Perfection will coordinate as needed to help facilitate the financing package. If The Fiscal Court does not have a preferred financial organization to use on a project like this, we would like to recommend the following companies:

Compass Municipal Advisors (KACo)
333 West Vine Street, Suite 1610
Lexington, KY 40507
859.457.0241

Ross, Sinclaire & Associates, LLC
325 West Main Street, Suite 300
Lexington, KY 40507
859.977.6600

Hilliard Lyons
300 West Vine Street
Lexington, KY 40507
800.944.2000

All annual agreements (i.e. M&V expenses, maintenance contracts, etc.) will be arranged directly between The Center and Perfection Group, and are not included in the project third-party financing.

Note: The interest rate used in Perfection's financial model (see enclosed) is based on interest rate information provided to Perfection, by KaCO's partner Compass Finance, for Marshall County Fiscal Court based on common knowledge information available for both parties. Rates may vary some based on actual financial instrument and detailed credit information.

2.3 FINANCIAL APPROACH

Performance Based (Paid from Savings)

Paid from Savings is one option Perfection uses to fund efficiency/productivity projects. Under this approach, Perfection conducts initial planning and preliminary investigative work at no up-front cost to the customer. Once Perfection identifies and the customer approves viable projects, Perfection executes installation contracts, provides permanent financing, and assumes implementation cost and operating performance risks. Savings measurement can be either stipulated or measured and verified through metering.

To compensate Perfection for its investment, the customer pays Perfection each month an agreed-upon percentage of the projected energy savings. The allocation of savings between Perfection and the customer is determined based upon such factors as project payback, desired term of the agreement and so on.

Guaranteed Savings with Fixed Fee

When we deliver a strategic integrated solution incorporating energy supply, usage and productivity management, we structure an all-in financial arrangement with a guaranteed reduction in total costs against a baseline. The baseline is an average of the current spending for the defined scope. Savings measurement is typically against a standard business metric, such as cost per unit of output or cost per square foot.

One structure the agreement can take is the following: The customer pays Perfection an annual amount that reflects the guaranteed cost savings determined and agreed upon during due diligence. This amount is significantly less than what the customer has been paying. In return, Perfection assumes full responsibility and accountability for managing, operating, maintaining and supporting the customer's internal energy value chain from the point-of-purchase to the point-of-production.

In other words, Perfection manages the procurement of all required energy commodities, installs real-time metering and Internet-based energy information and billing administration, implements engineering projects and other initiatives, maintains the equipment and delivers contractually guaranteed levels of service. The agreement is for a fixed term of years. The longer the agreement terms the greater the annual cost reduction because of the expanded set of potential energy projects and activities that can be implemented.

Performance Based Pricing

We pride ourselves on being able to provide the very best economic value for our clients. In fact, many of our clients have told us that one of the main reasons that they chose to work with Perfection was because we provided the best value to them. We understand the economic pressures that organizations and business face today, and have found some creative and unique ways to provide our clients with full value for their projects.

This project could be complex and will require significant cooperation between Perfection and your maintenance and operations staff. Because of this complexity, we would recommend our Performance Based program (described below).

2.3 FINANCIAL APPROACH

Design/Build

One of the other critical steps to helping you achieve the best economic value is our use of the design build concept. Perfection is uniquely positioned in the market to provide these services because we are a full-service mechanical and electrical contractor, as well as a recognized engineering firm. Our design build approach can save you thousands of dollars over competitors that have to hire multiple sub-contractors.

Because Perfection uses our own in-house personnel to engineer, design and install our work, we save our clients thousands of dollars in additional over-head and mark-up. With Perfection, you are paying only for the work actually performed, and you eliminate the extra over-head costs.

Performance Based Pricing

A Performance Based project is similar to a "not to exceed" project. In this arrangement we both agree on the scope of work, and then we provide you with a detailed estimate to complete the work. **Under our Performance Based Pricing, if we can find ways to save money on the installation of the agreed upon HVAC retrofits (without cutting corners and sacrificing quality), then we will split the savings with you 50%-50%.**

The shared savings methodology gives us both incentives to find the best and most cost effective ways to implement the project. Once the project begins, there is incentive for us to work as a team, trying to improve the scheduling of manpower and building accessibility. We cannot stress enough that this project is a team effort, and working together, we can both save money in the end. You can use the saved money to reduce the cost of the project or include other project items.

At Jessamine County, Adair County, Bourbon County, City of Middletown, City of Monroe, City of Sharonville, City of North College Hill, J.W. Harris, and Reynolds & Reynolds, we found ways to provide more services to the customer than they originally expected. At Pike County Fiscal Court, for example, we saved $100,000 over the guarantee alone.

In our Performance Based Pricing, we can provide our customers with documented proof to justify every dollar spent on their project. There are no hidden costs, no additional mark-ups that have not been agreed upon up-front with the customer. This not only saves money, it is a wonderful justification for The Center should anyone question the value of this project. We will agree on a not to exceed total contract amount (unless the scope of work is adjusted by your staff) and share the savings. We will share our estimates with you once you have chosen us as your contractor of choice.

Value Engineering

Value engineering is just one of the many services we can provide. As stated earlier regarding our Performance Based Pricing, we are willing to "open up our books" if that is what it takes to earn your respect and trust. Our in-house engineering makes this entire process possible. Without a dedicated engineering staff, and without many of the project management features we will discuss later, there would be no "value" in our Performance Based methodology.

Penalties and Other Costs

In the event the Marshall County Fiscal Court terminates the project after it enters the final due diligence phase of the program, Perfection will not impose any penalty, financial or otherwise to the Fiscal Court.

2.3 FINANCIAL APPROACH

Savings

Total Savings. The "Total Savings" to the Marshall County Fiscal Court shall consist of (a) energy cost reductions resulting, among other things, from electric energy use and demand reduction, natural gas use reduction, and other fuel and water savings resulting from the ECMs; (b) operating cost reductions, including labor, materials, and contracted services cost reductions, resulting from the ECMs; and (c) capital avoidance savings; and (d) any other savings mutually agreed upon by the Parties.

Stipulated Values and Rates. For purposes of calculating Total Savings, "Stipulated Values" shall mean the agreed values for variables such as equipment run time, flow rates, labor costs, machine loading,, and other values agreed to by the Marshall County Fiscal Court that may be uneconomical to monitor precisely and are specifically stipulated by the both the Marshall County Fiscal Court and Perfection in lieu of direct measurement. In addition, Total Savings shall be calculated based upon rates and rate schedules for electricity, natural gas, other fuels, water and production output in effect at the time of the applicable Performance Contract.

Adjusted Savings. Where Perfection Group furnishes or arranges for ongoing maintenance relating to ECMs, Perfection may provide for periodic verification of Total Savings (excluding the portions of Total Savings based on Stipulated Values). Such verification will determine actual Total Savings for the most recent previous 12 months for which data are available ("Adjusted Savings") and Perfection Group will report the Adjusted Savings to the Marshall County Fiscal Court. Based on the results of the periodic verification, the Total Savings set forth in the Performance Contract, beginning with the next month, will be adjusted to reflect the most recently verified Adjusted Savings.

Financial Model

See the attached Financial Model that outlines the details of the 20 year program.