



# County of Lackawanna

Lackawanna County  
Administration Building  
200 Adams Avenue  
Scranton, Pennsylvania  
18503

## Certified Copy

Ordinance: 14-0145

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File Number: 14-0145

**Ordinance #233**

**Second Reading**

Authorizing the Incurrence of Two Lease Obligations for an Energy Performance Contract Municipal Lease/Purchase Agreement

**First Reading: July 16, 2014**

**Second Reading: August 20, 2014**

BOARD OF COMMISSIONERS  
OF THE  
COUNTY OF LACKAWANNA, PENNSYLVANIA

ORDINANCE #233

AN ORDINANCE OF LACKAWANNA COUNTY, PENNSYLVANIA (THE "LACKAWANNA COUNTY BOARD OF COMMISSIONERS"), AUTHORIZING THE INCURRENCE OF TWO LEASE OBLIGATIONS IN AN AGGREGATE AMOUNT NOT TO EXCEED EIGHT MILLION DOLLARS (\$8,000,000) TO BE EVIDENCED BY AN ENERGY PERFORMANCE CONTRACT MUNICIPAL (QECB) LEASE/PURCHASE AGREEMENT IN AN AMOUNT NOT TO EXCEED TWO MILLION TWO HUNDRED THOUSAND DOLLARS (\$2,200,000) AND A TAX-EXEMPT EQUIPMENT LEASE/PURCHASE AGREEMENT IN AN AMOUNT NOT TO EXCEED FIVE MILLION EIGHT HUNDRED THOUSAND DOLLARS (\$5,800,000), BOTH WITH MCCLURE COMPANY, AS LESSOR ("LESSOR"), PURSUANT TO WHICH THE LACKAWANNA COUNTY BOARD OF COMMISSIONERS WILL PAY TO LESSOR THE RENTAL PAYMENTS FOR THE PURPOSES OF PROVIDING CERTAIN EQUIPMENT FOR THE LACKAWANNA COUNTY BOARD OF COMMISSIONERS; AUTHORIZING THE EXECUTION AND DELIVERY OF SUCH LEASE PURCHASE AGREEMENTS; SETTING FORTH THE AMOUNTS OF THE RENTAL PAYMENTS TO BE MADE THEREUNDER AND COVENANTING TO PAY SUCH AMOUNTS FROM CURRENT REVENUES, SUBJECT TO ANNUAL APPROPRIATION; AUTHORIZING AND DIRECTING THE TAKING OF NECESSARY OR APPROPRIATE ACTIONS, INCLUDING EXECUTION AND DELIVERY OF REQUISITE DOCUMENTS IN CONNECTION WITH THE LEASE PURCHASE AGREEMENTS; AND TAKING RELATED ACTIONS.

**WHEREAS,** the Lackawanna County Board of Commissioners has determined that it is in the best interests of the Lackawanna County Board of Commissioners to finance certain equipment

("Equipment") as more particularly described in Exhibit "A" annexed hereto and made a part hereof.

WHEREAS, the Lackawanna County Board of Commissioners desires by this Ordinance to authorize the execution and delivery on behalf of the Lackawanna County Board of Commissioners of (i) an Energy Performance Contract Municipal (QECB) Lease/Purchase Agreement (the "QECB Lease Purchase Agreement") and a Municipal Tax-Exempt Lease/Purchase Agreement (the "Tax-Exempt Lease Purchase Agreement," and, together with the QECB Lease Purchase Agreement, the "Lease Purchase Agreements"), and to authorize the taking of necessary or appropriate actions by the County required to performed by it under the Lease Purchase Agreements.

NOW, THEREFORE, BE IT ENACTED AND ORDAINED by the Lackawanna County Board of Commissioners, as follows:

Section 1. Approval of the Lackawanna County Board of Commissioners. The Lackawanna County Board of Commissioners hereby authorizes and approves the financing of the Equipment pursuant to the Lease Purchase Agreements with Lessor. The Lackawanna County Board of Commissioners determines to incur lease obligations debt in an aggregate principal amount not to exceed Eight Million Dollars (\$8,000,000) by the execution and delivery of two Lease Purchase Agreements. The Lackawanna County Board of Commissioners hereby finds and determines that the realistic estimated useful life of the Equipment is at least twenty (20) years.

Section 2. Form of Lease Purchase Agreements. The Lease Purchase Agreements will be in form and substance satisfactory to the Lackawanna County Board of Commissioners, with the advice of counsel, and will provide that the Lackawanna County Board of Commissioners' repayment obligations to the Lessor thereunder. A form of the proposed Lease Purchase Agreements are attached as an exhibit hereto.

Section 3. Execution and Delivery of Lease Purchase Agreement. The proper officers of the Lackawanna County Board of Commissioners are hereby authorized and directed to execute, attest, seal and deliver the Lease Purchase Agreements in the form provided in Section 2 hereof. Such execution, attestation and delivery of the Lease Purchase Agreements will constitute conclusive evidence of such approval.

Section 4. Amounts Payable Under Lease Rental Debt Documents. The amounts required to be paid under the Lease Purchase Agreements, from the current revenues of the Lackawanna County Board of Commissioners, are as set forth in Exhibit "B" annexed hereto and made a part hereof.

Section 5. Rental Payments from Current Revenues of Lackawanna County Board of

Commissioners. The Lackawanna County Board of Commissioners covenants to pay Lessor the rental payments as set forth in Exhibit "B" hereto from current revenues subject to annual appropriation.

Section 6. Qualified Energy Conservation Bond Representations. The Lackawanna County Board of Commissioners understands and intends that the QECB Lease Purchase Agreement, and the transactions thereunder with respect to the Equipment, will, to the extent that the Government Unit receives an allocation of volume cap, be treated as a Qualified Energy Conservation Bond under Sections 54A and 54D of the, Internal Revenue Code of 1986, as amended (the "Code"). In furtherance thereof, the Government Unit is hereby designating the Qualified Energy Conservation Obligation (as defined in the "QECB Lease Purchase Agreement" as a "qualified energy conservation bond" pursuant to Section 54D(a) of the Code, hereby agrees that it will take every other action required to qualify the Qualified Energy Conservation Obligation as a "qualified energy conservation bond" pursuant to Section 54D(a) of the Code and will not take or omit any action that would or might jeopardize such tax status.

Section 7. Qualified Tax Exempt Obligation Designation. The Lackawanna County Board of Commissioners hereby designates the obligation incurred under the QECB Lease Purchase Agreement, to the extent that such obligation is not a Qualified Energy Conservation Bond, and designates the obligation incurred under the Tax-Exempt Lease Purchase Agreement as "qualified tax exempt obligations" within the meaning of Section 265(b)(3) of the Internal Revenue Code. The Lackawanna County Board of Commissioners has not issued and does not reasonably expect to issue more than \$10,000,000 of tax exempt obligations during calendar year 2014. The Lackawanna County Board of Commissioners hereby covenants, with respect to the QECB Lease Purchase Agreement, to the extent that such obligation is not a Qualified Energy Conservation Bond, and to the Tax-Exempt Lease Purchase Agreement (such agreements being referred to herein as the "Tax-Exempt Obligations"), that it will take every other action required to qualify the Tax-Exempt Obligations as a "qualified tax-exempt obligations" and will not take or omit any action that would or might jeopardize such tax exempt status.

Section 8. Further Action. The officers of the Lackawanna County Board of Commissioners are hereby severally authorized and empowered on behalf of the Lackawanna County Board of Commissioners to execute any and all papers and documents and to do or cause to be done any and all acts and things necessary or appropriate for the implementation of this Ordinance and to effectuate

the authorization, execution, delivery and performance of the Lease Purchase Agreements.

Section 9. Appointment of Professionals. The Lackawanna County Board of Commissioners hereby appoints Buchanan Ingersoll & Rooney PC, as Bond Counsel, for the purpose of rendering any and all necessary opinions with respect to the Lease Purchase Agreements. The Lackawanna County Board of Commissioners hereby appoints Hutchinson Schokey & Erley & Co. as placement agent for the Lackawanna County Board of Commissioners in connection with the placement of the Lease Purchase Agreements with investors.

Section 10. Inconsistent Ordinances are Repealed. All ordinances and resolutions to the extent inconsistent herewith shall be and the same hereby are rescinded, canceled and annulled.

**ADOPTED** at a regular meeting of the Board of Commissioners of Lackawanna

County held on August 20, 2014.

COUNTY OF LACKAWANNA

  
JIM WANSACZ

  
COREY D. O'BRIEN

  
PATRICK M. O'MALLEY

ATTEST:

  
STEVEN M. BARCOSKI  
INTERIM CHIEF OF STAFF

Approved as to form and legality:

  
DONALD J. FREDERICKSON, ESQUIRE  
COUNTY SOLICITOR

EXHIBIT "A"



# County of Lackawanna

Lackawanna County  
Administration Building  
200 Adams Avenue  
Scranton, Pennsylvania  
18503

**Certified Copy**

**Resolution: 14-0141**

**File Number: 14-0141**

Awarding the Guaranteed Energy Savings Contract

**BE IT RESOLVED**, that the Board of Commissioners of Lackawanna County does hereby award the Guaranteed Energy Savings Contract, after receiving the recommendation of the County Prison Board, to develop and implement comprehensive facilities upgrade programs for Lackawanna County, to The McClure Company, Energy Services Specialist, 4101 North Sixth Street, Harrisburg, PA 17110, and to enter into a Performance Based Energy Savings Agreement and authorize the Notice to Proceed, as attached hereto.


**ADOPTED** at a regular meeting of the Board of Commissioners of Lackawanna

County held on July 16, 2014.


**COUNTY OF LACKAWANNA**

  
JIM WANSACZ

  
COREY D. O'BRIEN

  
PATRICK M. O'MALLEY

**ATTEST:**

  
STEVEN M. BARCOSKI  
INTERIM CHIEF OF STAFF

Approved as to form and legality:

  
DONALD J. FREDERICKSON, ESQUIRE  
COUNTY SOLICITOR

**PERFORMANCE BASED ENERGY SAVINGS AGREEMENT**

**BETWEEN**

**MCCLURE COMPANY**

**AND**

**COUNTY OF LACKAWANNA**

**DATED: JULY 16, 2014**

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## **PERFORMANCE BASED ENERGY SAVINGS AGREEMENT**

THIS PERFORMANCE BASED ENERGY SAVINGS AGREEMENT (the "Agreement") dated this 16th day of July 2014, by and between MCCLURE COMPANY ("McClure"), a Pennsylvania corporation having an address of 4101 North Sixth Street, Harrisburg, Pennsylvania 17110; and the COUNTY OF LACKAWANNA ("Client"), having an address of 200 Adams Avenue, Sixth Floor, Scranton, PA 18503

### **BACKGROUND**

A. The Client desires to install various energy conservation measures for the purpose of achieving reductions in energy consumption or demand.

B. McClure, among other things, is in the business of providing energy conservation services to third parties, including without limitation, providing the design, implementation, and monitoring of energy conservation projects.

C. McClure has analyzed energy use at the Client's Facilities (described in Schedule A) and made recommendations as set forth herein concerning energy conservation measures which, if installed and implemented, will yield Guaranteed Energy Savings (detailed in Schedule D) to the Client.

D. The Client's Board of Commissioners selected McClure Company as the final Energy Services Company to negotiate a Guaranteed Energy Savings Agreement. The official selection was made on April 17<sup>th</sup>, 2014.

NOW THEREFORE, in consideration of the promises contained herein, and intending to be legally bound hereby, the parties hereto agree as follows:

### **AGREEMENT**

#### **I. BACKGROUND:**

The Background paragraphs are incorporated in this Agreement as if fully set forth in this Agreement.

#### **II. DEFINITIONS:**

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

A. "**Agreement**" means this Agreement, and all Schedules and Addendum attached hereto and made a part hereof, including without limitation:

Schedule "A" – Client Facilities  
Schedule "B" – Energy Use Base

Schedule "C" – Base Energy Rates  
Schedule "D" – Guaranteed Energy Savings  
Schedule "E" – Energy Conservation Measures  
Schedule "F" – Total Project Fees  
Schedule "G" – Insurance  
Schedule "H" – Additional Terms and Conditions  
Schedule "I" – Standards of Occupancy and Comfort  
Schedule "J" – Materials and Maintenance Savings  
Schedule "K" – Stipulated Lighting Hours of Operation  
Schedule "L" – Measurement and Verification Plan  
Schedule "M(a)" – Certificate of Substantial Completion  
Schedule "M(b)" – Certificate of Final Completion  
Attachment "A" – Scope of Work for Energy Conservation Measures  
Attachment "B" – Lighting Audit  
Attachment "C" – Commissioning Plan  
Attachment "D" – Mechanical Service Agreement

and all amendments, change orders, modifications and supplements thereof or thereto.

B. **“Base Energy Rates”** means those energy rates described on Schedule C and increased each year on a cumulative basis as shown in the table below. This is used by McClure, as set forth in Section V, to calculate the EC Savings for the various EC Measures.

**Percent Increase Table**

Year	Electric	Gas	Oil	Propane	Water
1	2.5%	2.5%	N/A	N/A	3%
2	2.5%	2.5%	N/A	N/A	3%
3	2.5%	2.5%	N/A	N/A	3%
4	2.5%	2.5%	N/A	N/A	3%
5	2.5%	2.5%	N/A	N/A	3%
6	2.5%	2.5%	N/A	N/A	3%
7	2.5%	2.5%	N/A	N/A	3%
8	2.5%	2.5%	N/A	N/A	3%
9	2.5%	2.5%	N/A	N/A	3%
10	2.5%	2.5%	N/A	N/A	3%
11	2.5%	2.5%	N/A	N/A	3%
12	2.5%	2.5%	N/A	N/A	3%
13	2.5%	2.5%	N/A	N/A	3%
14	2.5%	2.5%	N/A	N/A	3%
15	2.5%	2.5%	N/A	N/A	3%
16	2.5%	2.5%	N/A	N/A	3%
17	2.5%	2.5%	N/A	N/A	3%
18	2.5%	2.5%	N/A	N/A	3%
19	2.5%	2.5%	N/A	N/A	3%
20	2.5%	2.5%	N/A	N/A	3%

C. **“Commencement Date”** means the first day of the month following Substantial Completion of all EC Measures.

D. **“Contract Year”** means each one-year period following the Commencement Date.

E. **“EC Measures”** means the energy conservation measures described in the attached Schedule E.

F. **“EC Savings”** means the energy conservation savings achieved through reduction in energy consumption, demand, energy rates, maintenance or materials by implementation of the EC Measures identified by McClure, which will be calculated as set forth in Section V of this Agreement.

G. **“Energy Savings Period”** means the period commencing on the Commencement Date and terminating on the fifteenth year anniversary of the Commencement Date.

H. **“Energy Use Base”** means the energy usage and demand, if applicable, of the Client’s Facilities, as described on Schedule B of this Agreement, which may be adjusted from time to time due to changes in any of the factors that may affect energy use of any of the Facilities, in accordance with the provisions of Section VII of this Agreement.

I. **“Equipment”** means all items of equipment provided to Client by McClure pursuant to this Agreement.

J. **“Facilities”** means the Client’s facilities as detailed in Schedule “A”.

K. **“Guaranteed Energy Savings,”** means the amount of dollar savings, as shown on Schedule D, that McClure guarantees that the Client will realize in EC Savings from the EC Measures during the Energy Savings Period.

L. **“Program”** means the performance based guaranteed energy savings program, which covers the full complement of EC Measures to be designed, implemented and monitored by McClure pursuant to this Agreement, including the McClure Guaranteed Energy Savings.

M. **“Substantial Completion”** means when all the items of new Equipment included in the EC Measures for the Program are operational and McClure notifies the Client thereof in writing and the Client confirms the same in writing to McClure, which confirmation shall not be unreasonably withheld. The Substantial Completion date shall be the earlier of:

(a) The date of which Client executes a Certificate of Substantial Completion attached hereto as Schedule “M(a)”

Or

(b) Twelve (12) months after McClure’s receipt of Customer’s Notice to Proceed subject to adjustments set forth in Section XXIX of this Agreement.

N. **“Investment Grade Audit (IGA)”** means the detailed comprehensive analysis of the Clients facilities, equipment and operating procedures for the purposes of evaluating various EC Measures for their energy savings potential, maintenance savings potential, appropriateness for the facility, and installation costs.

### III. EC MEASURES:

A. The Client authorizes McClure to design, implement and monitor the Program, and McClure agrees to design, implement and monitor the Program, under and subject to the terms and conditions provided in this Agreement. McClure, itself or through its subcontractors, shall supply all labor, materials, equipment, management, and supervision necessary to design, install and commission all EC Measures. McClure’s responsibilities to perform the EC Measures described on Schedule E for each of Client’s Facilities (on a Facility-by-Facility basis and not necessarily on a simultaneous basis) shall include:

1. providing all necessary designs, plans and specifications;
2. selecting subcontractors; provided however, Client shall have the right to reject any subcontractor in Client’s sole discretion that has not been previously approved in relation to the Notice to Proceed.

3. awarding subcontracts;
4. obtaining and evaluating submitted drawings on all equipment to be provided;
5. progress inspections during installation;
6. training the Client's personnel on proper operation of the newly installed equipment;
7. final inspection; and
8. commissioning or start-up of each item of Equipment.

B. The Client shall provide McClure and its subcontractors with access to all of the Facilities, as well as to available information requested by McClure about the Facilities and shall cooperate fully with McClure at all stages of the implementation of the EC Measures provided the implementation activities do not interfere with normal or critical government operations. Any required facility disruptions shall be fully coordinated by McClure Company and shall receive Client approval prior to implementation.

C. The Client represents that it is the owner or lessee of the Facilities, that it will be the owner or lessee at all times during which any work under this Agreement is performed and during the Energy Savings Period, and that it will obtain and provide evidence of the consent of any mortgagee, owner, or other party who may have the right to disapprove any work to be done on the Facilities.

D. McClure will be required to work with current building management and maintenance personnel, to coordinate construction and provide appropriate training in the operation of all retrofits. No equipment shall be installed that will require the hiring of additional personnel by the Client unless contract negotiations produce an explicit exemption from this rule for a specific issue.

E. Client shall retain the option to; approve proposed equipment, materials, products and installation plans that may be proposed in the project that has otherwise not been previously pre-approved in relation to the Notice to Proceed as described in Section I, Background, of this Agreement or as described in Attachment A, "Scope of Work" and Attachment C, "Major Equipment Data" of this Agreement.

F. . Client shall retain the right to: (i) approve equipment specifications and installation plans for any proposed changes prior to the implementation of any modifications; and (ii) make routine inspections and be present during any equipment and systems commissioning procedures conducted; If Client approval is requested, Client shall grant or deny the request within three (3) weeks of receipt of proposed requested change.

G. Client reserves the right of final approval over the scope of work and all end use conditions not previously approved and agreed upon in relation to the Notice to Proceed as described in Section I, Background, of this Agreement or as described in Attachment A, "Scope of Work" and Attachment C, "Major Equipment Data" of this Agreement.

H. All drawings, reports and materials prepared by McClure in performance of the contract shall become the property of Client and shall be delivered to them as needed or within thirty (30) days after construction is completed and accepted by the Client that the project is fully installed and operating.

#### **IV. MAINTENANCE:**

A. The Client shall maintain all Equipment installed under this Agreement in a manner consistent with the manufacturer's recommended maintenance schedules and procedures.

B. The Client acknowledges and consents to McClure's right to monitor EC Savings and energy management performance by conducting onsite measurements, including but not limited to, reading meters and installing and observing onsite monitoring equipment ("Monitoring Services"). The Client agrees to cooperate fully with any such measures instituted by McClure pursuant to this Subsection. McClure shall not institute any measures which reasonably interfere with the business of the Client conducted at the Facilities.

C. McClure shall provide Preventative Maintenance Services for Equipment as identified and set forth in Attachment D in a manner consistent with the manufacturer's recommended maintenance schedules and procedures. The Client understands and agrees the Preventive Maintenance Services defined in Attachment D are not "Full Coverage", therefore the Client is responsible for all maintenance activities and Equipment not covered in the scope of services defined in Attachment D.

D. The Preventative Maintenance Services shall automatically terminate at the end of the period as set forth in Schedule D.

#### **V. EC SAVINGS:**

A. EC Measures that are designated for the **Option A** method of Measurement and Verification (as set forth in Schedule L) will be measured with spot or short- term metering. Key performance factors such as lighting hours will be stipulated as part of the contract. McClure will submit a report of the results to the client upon completion of the monitoring period. If the EC Measures fail to meet the projected EC Savings, McClure will repair or modify the EC Measures until the required operation is achieved. If the EC Savings cannot be met after modification, McClure will calculate the annual energy use of the EC Measures at the installed efficiency and pay the client the difference between the base year and cost and the calculated cost.

B. EC Measures categorized as **Option B** for Measurement and Verification (as set forth in Schedule L) will be tested for energy efficient operation at the time of system start up. If the EC Measures do not operate in accordance with parameters defined in the design documents and the energy calculations, McClure will modify or repair the EC Measures until specified conditions are met. If the EC Measures cannot meet the specified operation criteria, McClure will calculate the annual energy use of the EC Measures at the installed efficiency and pay the client the difference between the base year cost and the calculated cost.

C. EC Measures categorized as **Option C** for Measurement and Verification (as set forth in Schedule L) will be measured with the “whole house” method. The current energy bills are compared to historical energy bills. The historical energy bills are referred to as the baseline.

D. EC Measures categorized as **Option D** for Measurement and Verification (as set forth in Schedule L) will be measured with computer simulation of building energy use.

If the projected energy savings are verified through either Options A, B, or D the client will (i) accept the EC Measures as complete, (ii) agree that long term and ongoing savings as defined in the contract schedules will be realized and (iii) waive any further measurement and verification of the EC Measures to include metering, site inspections and reporting.

E. Calculation of EC Savings shall be derived from the cumulative monthly savings achieved from the sum of the Energy Use Savings, Fuel Switch Savings, Energy Rate Reduction Savings, Maintenance and Materials Savings, and Other Identified Savings, all as defined below, as adjusted pursuant to changes in the factors affecting energy use, as provided in Section VII of this Agreement.

(i) **“Energy Use Savings”** are those savings achieved through reduction in energy and demand use. McClure will calculate Energy Use Savings achieved at each of the Facilities by subtracting the energy consumption for the then current monthly period from the Energy Use Base for the corresponding month as set forth in Schedule B hereof, and multiplying the number of units saved (i.e., therms of natural gas, kilowatts, kilowatt hours, pounds of steam, and gallons of oil) by the Base Energy Rates applicable to such monthly period. The dollar amount arrived at by such calculation shall be the Energy Use Savings for such monthly period.

(ii) **“Fuel Switch Savings”** are those savings achieved by switching to a more economical source of energy. McClure will calculate Fuel Switch Savings by subtracting the cost of the alternate energy utilized during each monthly period from the Energy Use Savings for such corresponding period. The cost of the alternate energy utilized is determined by multiplying the number of units of alternate energy utilized by the average unit cost applicable to such monthly period. In no case, however, shall the unit costs used in this calculation be greater than the Base Energy Rate for such alternate energy used.

(iii) **“Energy Rate Reduction Savings”** are those savings achieved through a reduction in fuel and/or electricity rates by one of the following means:

(a) Improve rate from local electric utility company, natural gas company, or fuel company,

(b) Direct purchase of natural gas or electricity, or

(c) Bulk purchase of fuel.

(d) Installation of equipment to provide a secondary fuel source so that the primary fuel can be supplied on an interruptible basis



(iv) **“Materials and Maintenance Savings”** are those savings achieved through reduction in regularly needed materials and maintenance due to the implementation of the EC Measures identified by McClure, which are stipulated as set forth in Schedule J.

(v) **“Other Identified Savings”** are those savings identified by McClure that may result from performance under this Agreement, and which do not meet the definition of the other types of savings referenced in this Section V. If such savings are agreed to by the Client, for the purposes of meeting the Guaranteed Energy Savings, these savings will be detailed in a schedule appended to this Agreement. Such savings will then be considered as a component of the EC Savings for the purposes of this Agreement.

If the Client fails to notify McClure of changes in factors affecting energy use, as required under Section VII hereof, EC Savings shall be calculated using good faith estimates.

## **VI. ENERGY SAVINGS GUARANTY:**

A. Subject to changes in factors affecting energy use, as discussed in Section VII of this Agreement, McClure guarantees that the Client will realize total EC Savings from the EC Measures during each Contract Year of not less than the Guaranteed Energy Savings set forth on Schedule D of this Agreement. Savings in any year are guaranteed to the extent necessary to make payment under the contract year. Savings will meet or exceed the cost of the energy conservation measures to be evaluated, recommended, designed, implemented or installed under this Agreement.

B. If the projected energy savings are verified through either Options A, B, or D the client may (i) accept the EC Measures as complete, (ii) agree that long term and ongoing savings as defined in the contract schedules will be realized and (iii) waive any further measurement and verification of the EC Measures to include metering, site inspections and reporting.

C. If at the end of the first year, McClure has failed to achieve the annual Energy Savings Guarantee, McClure will repair or modify the EC Measures until the required savings are achieved. If the EC Savings cannot be met after modification, McClure will calculate the Guaranteed Energy Savings shortfall and will pay the Client the shortfall for year one. When the total energy savings in any one year during the guarantee period exceed the Energy Savings Guarantee as set forth in Schedule D and are in addition to those monies due the ESCO for compensation for services as set forth in Schedule F, such excess savings shall first be applied to reimburse McClure for any payment McClure made to the Client to meet the guarantee for previous years in which the energy savings fell short of McClure’s Energy Savings Guarantee.

D. Should a disagreement arise as to the calculation of annual total EC Savings, an independent public accounting firm may be engaged by either party to conduct a review and give an opinion on whether the calculation of annual dollar savings or deficiencies as prepared by McClure is fairly stated in accordance with this Agreement. The independent public accounting firm shall be mutually agreed upon by the parties (if the parties cannot agree upon an accounting firm, then each shall designate a firm, and the two designated firms shall identify a mutually agreeable third firm). The independent public accounting firm shall include in its report any exceptions determined by its review. Exercise of the right to request a review shall in no way effect the Client’s obligation to make current payments pursuant to this Agreement unless otherwise described herein. Any payments

between the parties necessary to resolve any irregularities identified in the review will be made within 60 days after submission of the review to the parties. If the review is called by McClure, McClure shall pay the cost of the review. If the review is called for by the Client, the following structure will be applied to paying for the review:

If the review determines that McClure's preparation of the annual total EC Savings was more than 10% in error, McClure shall pay the entire cost of the review; however, if McClure's determination of the annual total EC Savings are in error of 10% or less than the amounts as determined by the independent public accounting firm, the Client shall pay for the entire cost of the review. In any case, the annual Energy Savings Report shall be amended to reflect the findings of the review and the calculations of savings relating to the guarantee will be modified if necessary.

## **VII. CHANGES IN FACTORS AFFECTING ENERGY USE:**

A. Certain factors that may affect energy use of the Facilities are taken into account when establishing the Energy Use Base. These factors include, without limitation, hours and levels of occupancy; adjustments in labor force; building use and operational procedures; temperature, humidification and ventilation levels; installed lighting and scheduled use; building construction and size; general level of repair and efficiency of heating and air conditioning equipment and other energy-using equipment; the amount of heating and air conditioning and other energy-using equipment. McClure has established the initial Energy Use Base after consideration of these factors and certain other anomalous use of the Facilities. The standards of occupancy and comfort set forth in Schedule J to this Agreement, includes the assumptions that McClure has utilized in consideration of these factors in establishing the Energy Use Base. Client acknowledges and understands that due to changes in the factors affecting energy use, the Energy Use Base may be adjusted by McClure from time to time to more accurately reflect the affect that a change in any of the factors has to the energy use of a Facility. In addition, utility data collected during the period before construction of any EC Measures may indicate a change of the energy use pattern at a Facility and require an adjustment to the Energy Use Base. McClure shall notify the Client, in writing, of all such adjustments.

B. The Client shall notify McClure within thirty (30) business days of any change in any factor that affects energy use at any of the Facilities. McClure will determine the effect that any such change will have on EC Savings and present to the Client a written analysis of the effects of the changes. Changes that are long term or permanent will be reflected in an adjustment to the Energy Use Base. Temporary changes that affect energy use will be calculated and used as an adjustment to the corresponding month's EC Savings.

C. If a change in any of the factors used in establishing the Energy Use Base occurs and results in a reduced Energy Use Base, then the Guaranteed Energy Savings will be decreased as necessary to reflect such adjustment. If, however, the change results in an increase to the Energy Use Base, then there will be no corresponding adjustment to the Guaranteed Energy Savings.

D. Client and McClure may from time to time desire to make a major construction or other change to the Facilities (outside of the EC Measures set forth in this Agreement) to one or more of the Facilities for the express purpose of increasing EC Savings. Any such change will be made only with the prior consent of both parties, which will not be unreasonably withheld. The Energy Use Base will not be adjusted to reflect any changes agreed to under this subparagraph. If McClure elects to

pay for the cost of any such changes, then the same may be implemented by McClure without the Client's consent so long as such changes do not unreasonably interfere with the conduct of Client's business.

E. If Client performs any large-scale changes to any of its Facilities, including but not limited to building additions, new buildings, and new or changed HVAC equipment, which is outside of the EC Measures contemplated in this Agreement, McClure has the right to charge the Client for a new engineering study or such other work reasonably required by McClure to assess the effect of such changes on savings. Such hours will be billed at current McClure engineering rates. Before initiating such work, McClure will notify the client in writing of the intent and cost associated with the work. The Client will, within 30 days in writing, notify McClure with permission to proceed, or alternatively at no charge, will stipulate that the projected EC Savings for the affected Facility have been achieved.

## **VIII. WARRANTIES; REMEDIES; LIMITATIONS OF LIABILITY:**

A. McClure will perform the Work in a professional and workmanlike manner. McClure will promptly re-perform any non-conforming Work for no charge as long as Client provides written notice to McClure within one (1) year following Substantial Completion or such other period identified in Attachment A. If McClure installs or furnishes goods or equipment under this Agreement, and such goods or equipment is covered by an end-user warranty from their manufacturer, McClure will transfer the benefits of such warranty to Client. The foregoing remedy with respect to the Work, together with any remedy provided by goods or equipment manufacturers, shall be Client's sole and exclusive remedies for warranty claims. Client agrees that the one (1) year period following Substantial Completion, or such other period identified in Attachment A, shall be a reasonable time for purposes of submitting valid warranty claims with respect to the Work. These exclusive remedies shall not have failed of their essential purpose so long as McClure transfers the benefits of any goods or equipment end-user warranty to Client and remains willing to re-perform any non-conforming Work for no charge within the one (1) year period described above or such other period identified in Attachment A. **NO OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY ARE PROVIDED BY MCCLURE.** This warranty does not extend to any Work that has been abused, altered, misused, repaired by Client or third parties without the supervision or prior written approval of McClure, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage.

The one (1) year period set forth herein shall not be extended by corrective work performed by McClure pursuant to this section. Notwithstanding any language herein to the contrary, if any defect in the Equipment is due to: (i) an error, omission, negligence or willful misconduct of the Client, Client employee or other agent or invitee of the Client, or (ii) any act which would customarily be covered by standard forms of property or casualty insurance then, in each case, the Client shall pay McClure for the reasonable and customary time and materials cost of the repair, and such charges shall be in addition to all other payments due McClure under this Agreement.

B. In no event, whether under theory of contract, warranty, tort (including negligence), strict liability, or otherwise will McClure or any subcontractor be liable for any indirect, special, incidental or consequential damages, including without limitation, loss of use of any equipment or property, cost of substitute equipment or service, lost profits or down-time costs, even if Client has been advised as to

the possibility of such damages. With respect to Guaranteed Energy Savings, the total liability of McClure for each Contract Year shall not exceed the Guaranteed Energy Savings for such Contract Year, as set forth on Schedule D of this Agreement. With respect to all other claims in any manner relating to, or in connection with, this Agreement or the work being performed hereunder, the total liability of McClure shall not exceed the Total Project Fee set forth in Schedule F.

C. McClure Company is not providing advice with respect to municipal financial products or the issuance of municipal securities, including advice with respect to their structure, timing, terms and other similar matters. The Energy Savings Guarantee set forth in section VI of this Agreement, the Investment Grade Audit and the calculations on which the Guarantee and the Investment Grade Audit are based are the result of advice provided by engineers working for McClure Company.

## **IX. REPRESENTATIONS AND WARRANTIES OF CLIENT:**

A. The Client hereby warrants and represents to McClure that: (i) the Client has provided McClure with all records heretofore requested by McClure and the information set forth therein is, and all information in other records to be subsequently provided by the Client pursuant to this Agreement will be, true and accurate in all material respects; and (ii) the Client has not entered into any contracts or agreements with other persons or entities regarding the provision of energy management services or with regard to servicing any of the Equipment located on the Facilities.

B. The Client represents and warrants that it has the legal power and authority to enter into this Agreement and to consummate the transactions contemplated hereby, in accordance with the terms and conditions of this Agreement. The Client has received all necessary authorizations, approvals or other action by all governmental authorities or regulatory bodies required for the due execution, delivery and performance by the Client under this Agreement. This Agreement is contingent upon the Client receiving and executing a final financing terms and conditions to fund construction of the EC Measures described within this Agreement and supporting Schedules and Appendices.

## **X. AFFIRMATIVE COVENANTS OF CLIENT:**

A. The parties hereto acknowledge and agree that McClure has entered into this Agreement in material reliance upon the prospect of earning compensation based on projected EC Savings exceeding Guaranteed Energy Savings from the Facilities, as set forth herein. The parties further acknowledge and agree that said EC Savings will not likely be obtained unless certain procedures and methods of operation designed for energy conservation shall be implemented and followed by the Client on a regular basis. The Client agrees that it shall adhere to, follow and implement the procedures and methods of operation and maintenance set forth in this Agreement and the Schedules hereto.

B. The Client agrees that McClure shall have the right, with or without prior notice, to inspect the Facilities to determine if the Client is in compliance with its obligations as set forth above. In the event that any inspection discloses that the Client has failed on the date of the inspection to be in compliance with any items set forth above, then the Guaranteed Energy Savings shall be assumed to

have been achieved for and with respect to the portion of the Contract Year during which such failure shall have existed.

C. The Client will provide McClure with copies of any successor or additional contracts for the management or servicing of pre-existing equipment or the Equipment, which may be executed from time to time hereinafter within ten (10) days after execution thereof.

## **XI. AFFIRMATIVE COVENANTS OF MCCLURE**

McClure must secure all licenses and permits and comply with all federal and state laws with respect to this project. All work completed under this contract must be in compliance with all building and codes appropriate accreditation, certification and licensing standards.

This Agreement is a Prevailing Wage Rate Agreement and subject to the provisions, duties, obligations, remedies and penalties of the Pennsylvania Prevailing Wage Act, Act 15, 1961, P.L. 981, as amended, 43 P.S. Section 165-1 et seq.

## **XII. TERMINATION OF MONITORING:**

The monitoring services set forth in Section IV of this Agreement shall begin on the Commencement Date and shall continue in effect for the period as set forth in Schedule D. Such services shall be automatically renewed thereafter at the end of the subsequent Contract Year, unless this Agreement is terminated pursuant to this Section. The Client may cancel the Monitoring Services; effective at the end of any Contract Year, by providing sixty (60) days advance written notice to McClure.

The Client acknowledges and agrees that if, for any reason, it (i) cancels or terminates receipt of monitoring services, (ii) fails to pay for monitoring services, (iii) fails to fulfill any of its responsibilities necessary to enable McClure to complete the work and provide monitoring services, or (iv) otherwise cancels, terminates or materially breaches this Agreement, the Energy Savings Guarantee as set forth in Schedule D shall automatically terminate and McClure shall have no liability hereunder.

## **XIII. [Intentionally Omitted]**

## **XIV. WORKING HOURS AND SCHEDULE:**

It is agreed that all installation work shall be conducted with minimal disruption to the Client's daily activities. Major disruptions shall be fully coordinated and agreed upon with the Client prior to commencement of disruptive activities. Work performed during occupied periods must be returned to a condition for full use by the Client. Normal working hours shall be generally defined as 6AM to 5PM, Monday through Friday and / or in compliance with local ordinances.

## **XV. CHANGE ORDERS**

The Total Project Fee as set forth in Schedule F is understood to be a fixed lump sum fee for the scope of work set forth in this Agreement and supporting attachments. Additional work outside of the agreed upon scope of work, if requested by the Client will be subjected change order and subsequent contract amendment. Additionally, work corresponding to Section XXIX will be subjected to a Change Order and subsequent contract amendment as required.

## **XVI. TERMINATION OF AGREEMENT:**

A. McClure may terminate this Agreement without further responsibility or liability upon the occurrence of any of the following events:

1. All or any part of Client's ownership or lessee's interest in the Facilities is transferred voluntarily or involuntarily by any means including but not limited to the transfer of any ownership interest in the Client;

2. If Client defaults in any payment or any other obligation to McClure under this Agreement.

B. Client may terminate this Agreement at any time after the Client has signed off on the Measurement and Verification results and the Client has met all financial obligations as detailed in Section XVII below.

C. Either party may terminate this Agreement pursuant to Section XIX below.

D. In the event of termination, McClure and Client shall continue to be responsible for their respective payment obligations accrued under this Agreement prior to the effective date of termination.

## **XVII. FEES AND TERMS OF PAYMENT:**

A. McClure will, on or about the first day of each month during the construction period, calculate the value of the work performed on account of the Total Project Fee, calculated by reference to the values set forth on Schedule F, during the preceding month and submit same to the Client for payment. A fee of twenty percent (20%) of the Total Project Fee will be invoiced to the Client upon both parties' acceptance of the Agreement. All invoices of McClure shall be due and payable by Client within (30) days of the invoice date. The Client shall have (20) days from the date of receipt of said invoice to notify McClure of any irregularity in the billing. Interest at a rate of 0.5% per month will accrue on all unpaid balances not in dispute more than (30) calendar days after the invoice date. Title to the EC Measures shall not pass until full payment by Client of the Total Project Fee. Without limitation to the obligation of Client to pay to McClure the Total Project Fee, when due as provided herein, if Client receives any third party financing, Client shall make payment to McClure directly or authorize such third party to make payment to McClure directly.

## **XVIII. INDEPENDENT CONTRACTOR:**

McClure is an independent contractor and is not an employee, partner, legal representative, joint venture or agent of Client. McClure does not in any way assume any of the contractual or other obligations of Client to other parties under any agreements referred to herein or otherwise. The Client is not an employee, partner, legal representative, joint venture or agent of McClure. The Client does not in any way assume any of the contractual or other obligations of McClure to other parties under any agreements referred to herein or otherwise.

## **XIX. CASUALTY OR CONDEMNATION OF FACILITIES:**

Any fire, flood or other casualty or condemnation affecting any portion of the Facilities may be a material change. If so, the notice thereof shall be given to McClure by Client and the required Energy Use Base modifications will be made. If any fire, flood or other casualty or condemnation renders a majority of the Facilities incapable of being occupied and the affected portion is not reconstructed or restored within 120 days from the date of such casualty or condemnation, either party may terminate this Agreement by delivery of written notice to the other, in which case McClure shall receive the payments described in Section XVII. If any fire, flood or other casualty or condemnation renders any particular Facility incapable of being occupied and such Facility is not reconstructed or restored within 120 days from the date of such casualty or condemnation, McClure may remove such Facility for the purpose of calculating the Energy Savings Guaranty, in which case McClure shall receive the payments described in Section XVII with respect to such Facility, and this Agreement shall continue in full force and effect. Notwithstanding anything to the contrary in this Agreement, in no event shall McClure be obligated to make any payment to Client under the Guaranteed Energy Savings with respect to any Facility for any period of time in which such Facility incurs any casualty, including without limitation, from fire, flood, collapse or otherwise.

## **XX. NOTICES:**

Any notice required or permitted to be given under this Agreement shall be sufficient if in writing, and if sent by registered or certified mail, postage prepaid, return receipt requested, or by facsimile, to either party at the following addresses:

If to Client: COUNTY OF LACKAWANNA  
200 Adams Avenue, Sixth Floor  
Scranton, PA 18503  
Attention: Board of Commissioners

If to McClure: MCCLURE COMPANY  
4101 North Sixth Street  
Harrisburg, Pennsylvania 17110  
Fax No.: (717) 236-5239  
Attention: President

Notice shall be deemed given two days after sent by mail, or on the date of receipt of confirmation of fax, and such receipt is confirmed orally by the recipient.

## **XXI. GOVERNING LAW:**

This Agreement shall be governed and construed under the laws of the Commonwealth of Pennsylvania, notwithstanding its law of conflicts of law. This agreement is for a public work project and the McClure Company is subject to, and must comply with the requirements of the Pennsylvania Public Works Employment Verification Act, Act 127-1012 (the "Act").

## **XXII. INDEMNIFICATION:**

A. To the extent of McClure's negligence or intentional misconduct, McClure shall indemnify, defend, and hold harmless the Client and Client's representatives and employees from and against all claims, damages, losses, and expenses arising out of the performance of the work, provided any such claim, damage, loss or expense is caused by any negligent or intentional misconduct of McClure, McClure's representative or employees. McClure shall require all contractors and subcontractors to deliver to McClure and Client a certificate of insurance coverage with types and amounts of insurance as set forth in Schedule G. All such insurance coverage for contractors and subcontractors shall list McClure and Client as additional insureds.

B. To the extent of Client's negligence or intentional misconduct, Client shall indemnify, defend and hold harmless McClure and McClure's representatives and employees from and against all claims, damages, losses and expenses arising out of the performance of the work, provided any such claim, damage, loss or expense is caused by any negligent or intentional misconduct of Client, Client's representative or employees.

## **XXIII. DOCUMENTS:**

All drawings and specifications prepared by McClure shall remain the property of McClure until such time as the Total Project Fee has been paid in full, at which time, said documents shall become the property of Client. Client shall not make any changes to said documents without the prior written consent of McClure. Client grants McClure a perpetual, non-exclusive and royalty-free license to use all such drawings, designs and specifications.

## **XXIV. SEVERABILITY:**

This Agreement shall be severable and to the extent that any part of the Agreement is unenforceable for any reason whatsoever, the remaining parts of this Agreement shall remain in full force and effect.



**XXV. ASSIGNMENT; SUCCESSORS AND ASSIGNS:**

This Agreement is not assignable by either McClure or Client without the prior written consent of the other party.

**XXVI. INSURANCE; RISK OF LOSS:**

In the performance of the services under this Agreement, McClure shall use reasonable care to prevent the loss or damage of any of Client’s equipment or property. However, notwithstanding that Client’s equipment may be in the care, custody or control of McClure in connection with the performance of services under this Agreement, risk of loss or damage to the equipment and property shall remain with the Client at all times. Nothing in this Agreement places any responsibility or liability on McClure or its subcontractors for conditions pre-existing at Client’s Facilities or on the equipment being worked upon. Client shall defend, indemnify and hold harmless MCCLURE and its subcontractors against any claims or liabilities based on such pre-existing conditions. McClure and Client at all times during the term of this Agreement shall carry the types of insurance coverage as set forth in the attached Schedule G.

**XXVII. MEDIATION OR ARBITRATION:**

Any dispute, controversy or claim arising out of or relating to this Agreement or any breach or alleged breach hereof, shall, upon the request of any party involved (and without regard to whether or not any provision of this Agreement expressly provides for arbitration), be submitted to mediation or litigation in the Court of Common Pleas of Lackawanna County. The expenses of the mediation or litigation shall be borne equally by the parties to the mediation or litigation, provided that each party shall pay for and bear the cost of its own experts, evidence and counsel.

**XXVIII. PRIOR AGREEMENTS:**

This Agreement supersedes the terms and conditions of any prior agreements, understandings or representations, oral or written, between the parties, and contains the entire agreement of the parties with respect to the subject matter herein.

**XXIX. EXCLUDED MATERIAL AND ACTIVITIES:**

A. The Client recognizes that in connection with the installation and/or service or maintenance of Equipment at the Client’s Facilities, McClure may encounter, but is not responsible for, any work relating to (i) asbestos, materials containing asbestos, or the existence, use, detection, removal, containment or treatment thereof, or (ii) pollutants, hazardous wastes, hazardous materials, contaminants, or the storage, handling, use, transportation, treatment or the disposal, discharge, leakage, detection, removal, or containment thereof. The materials and activities listed in the foregoing sentence are hereinafter referred to as “Excluded Materials and Activities”. The Client agrees that if McClure’s performance of any work under this Agreement involves Excluded Materials

and Activities, Client shall bear the sole risk and responsibility therefore. In the event McClure discovers Excluded Materials, McClure shall immediately cease work, remove all McClure personnel or subcontractors from the site, and notify the Client. The Client shall be responsible to handle such Excluded Materials at the Client's expense. McClure does not take title to any Excluded Materials, and does not assume any responsibility for the transportation, handling or disposal of Excluded Materials. If Excluded Materials are discovered at a Facility, McClure shall undertake no further work at such Facility except as authorized by the Client in writing.

B. Notwithstanding anything to the contrary in this Agreement, the Client hereby releases and agrees to indemnify, defend, and hold harmless McClure, its assigns, consultants, contractors, subcontractors, and their respective shareholders, officers, directors, agents and employees (and each of them) from and against all costs, claims, fines, fees, damages or liability (including without limitation, all attorneys' fees and costs, costs of settlement or suit) arising out of, or in any manner connected with any work related to Excluded Materials and Activities performed by or for the Client, or with respect to the ownership, handling or transportation of Excluded Materials, whether such claim or action arises in contract, warranty, tort (including negligence), strict liability, environmental liability, or otherwise, and from any cause whatsoever. Any such proceeding or suit shall not be settled without the prior written consent of McClure, which consent shall not be unreasonably withheld.

C. McClure Company shall be responsible for proper installation, handling and disposal of hazardous waste materials associated with any new work as described in this Agreement and supporting Schedules and Appendices.

**XXX. BONDING**

A performance and payment bond will be provided which will guarantee the installation and/or improvements only. McClure Company will be responsible for the energy savings and the guaranteed energy savings, which are not covered by the bond. NOW THEREFORE, the parties hereto, have caused their duly authorized representatives to execute and deliver this Agreement as of the date first above written.

**McClure Company**

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

**County of Lackawanna Commissioners**

**Jim Wansacz**

Signature: Jim Wansacz  
Title: Chairman

**Corey D. O'Brien**

Signature: Corey D. O'Brien  
Title: Vice-Chairman

**Patrick M. O'Malley**

Signature: Patrick M. O'Malley  
Title: Commissioner

**SCHEDULE A – CLIENT FACILITIES**

<b>Building Name</b>	<b>Area (Sq Ft)</b>	<b>Building Type</b>
<b>Courthouse</b>	68,614	Office
<b>Visitors Center</b>	14,000	Public Assembly
<b>McDade Park</b>	4,283	Public Assembly
<b>Prison</b>	205,902	Penitentiary
<b>911 Building</b>	35,350	Office
<b>Aylesworth Park</b>	1,000	Public Assembly
<b>Covington Park</b>	1,000	Public Assembly

## **SCHEDULE B – ENERGY USE BASE**

Utility data was provided to McClure Company by Lackawanna County for review and analysis under this contract. The utility data provided ranges from 1/2011 to 12/2012, covering two years of utility use and costs for most facilities.

The baseline will be adjusted accordingly to account for differences in weather patterns. See measurement and verification in Schedule L.

The Energy Use Base may be revised, from time to time, due to any changes in factors that affect energy use at any of the Facilities, as provided in Section VII in the Agreement.

### ***Courthouse***

The baseline energy to determine electric and natural gas savings was selected as the period of 1/2011 to 4/2014.

### ***Visitors Center***

The baseline energy to determine electric and natural gas savings was selected as the period of 1/2012 to 4/2014.

### ***McDade Park***

The baseline energy to determine electric savings was selected as the period of 1/2012 to 12/2014.

### ***Prison***

The baseline energy to determine electric, natural gas and water savings was selected as the period of 1/2011 to 4/2014.

### ***911 Building***

The baseline energy to determine electric and natural gas savings was selected as the period of 1/2012 to 4/2014.

### ***Aylesworth Park***

The baseline energy to determine electric savings was selected as the period of 1/2012 to 12/2014.

### ***Covington Park***

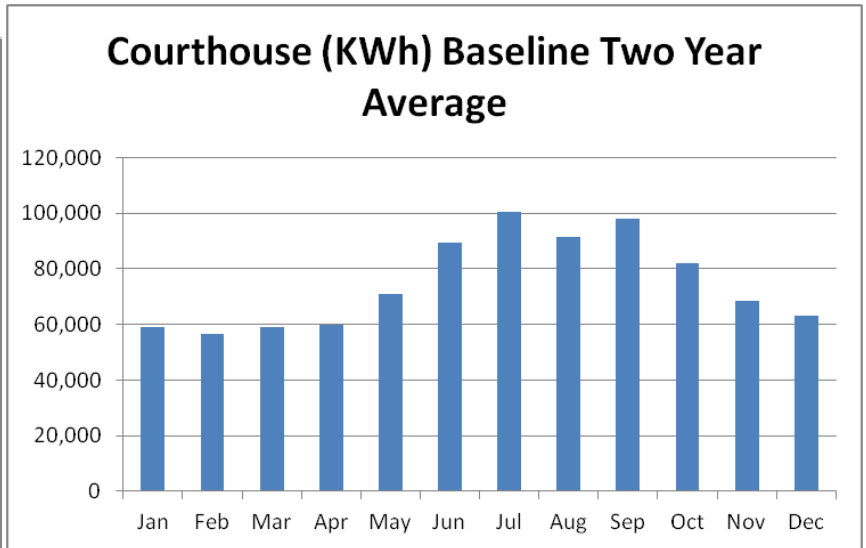
The baseline energy to determine electric savings was selected as the period of 1/2012 to 12/2014.

Utility providers and rate structures or pricings are included in the table below

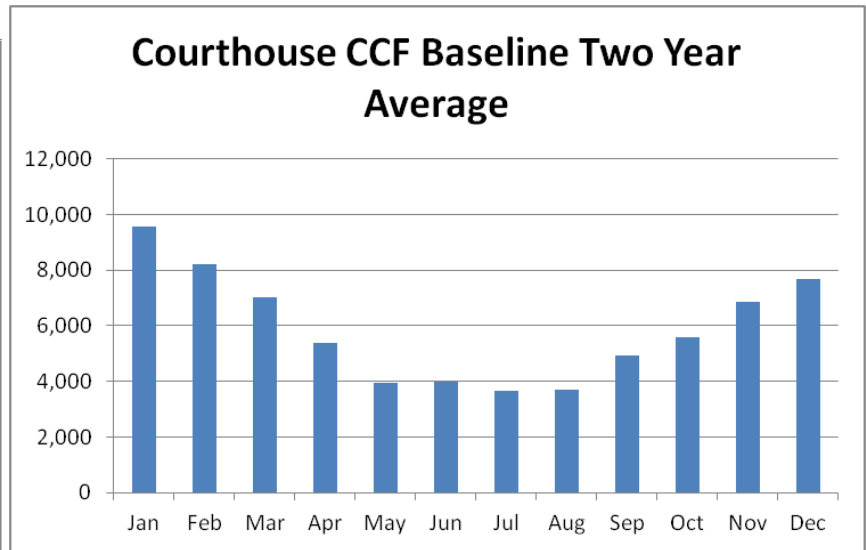
<b>Rate Structure</b>	<b>Site</b>	<b>Vender Name</b>	<b>Account Number</b>	<b>Service</b>
<b>GS3</b>	Courthouse	PPL	76759-69004	Electric Distribution
	Courthouse	UGI Energy Services	COLA105	Electric Generation
	Courthouse	UGI	922500835381	Gas Distribution
	Courthouse	UGI Energy Services	LACC620	Gas Commodity
<b>GS3</b>	Visitors Center	PPL	38700-43005	Electric Distribution
	Visitors Center	Direct Energy	1187950	Electric Generation
	Visitors Center	UGI	920402200974	Gas
<b>GS1</b>	McDade Park	PPL	42201-59002	Electric Distribution
	McDade Park	Direct Energy	1187950	Electric Generation
<b>GS1</b>	McDade Park	PPL	40001-59002	Electric Distribution
	McDade Park	Direct Energy	1187950	Electric Generation
<b>LP4</b>	McDade Park	PPL	42401-59008	Electric Distribution
	McDade Park	Direct Energy	1187950	Electric Generation
<b>GS3</b>	McDade Park	PPL	41601-59002	Electric Distribution
	McDade Park	Direct Energy	1187950	Electric Generation
<b>GS3</b>	McDade Park	PPL	79772-01001	Electric Distribution
	McDade Park	Direct Energy	1187950	Electric Generation
<b>SA</b>	McDade Park	PPL	42001-59006	Electric
<b>GS3</b>	Prison	PPL	57650-48007	Electric Distribution
	Prison	UGI Energy Services	COL152	Electric Generation
	Prison	UGI	922501017547	Gas Distribution
	Prison	UGI Energy Services	LACC610	Gas Commodity
	Prison	PAWC	24-0619368-6	Water
<b>GS1</b>	Aylesworth Park	PPL	17211-28017	Electric Distribution
	Aylesworth Park	Direct Energy	1187950	Electric Generation
<b>GS1</b>	Aylesworth Park	PPL	95835-24000	Electric Distribution
	Aylesworth Park	Direct Energy	1187950	Electric Generation
<b>GS1</b>	Aylesworth Park	PPL	86801-85002	Electric Distribution
	Aylesworth Park	Direct Energy	1187950	Electric Generation
<b>GS1</b>	Covington Park	PPL	90404-23004	Electric
<b>GS1</b>	Covington Park	PPL	86928-48005	Electric

## Energy Baseline by Building

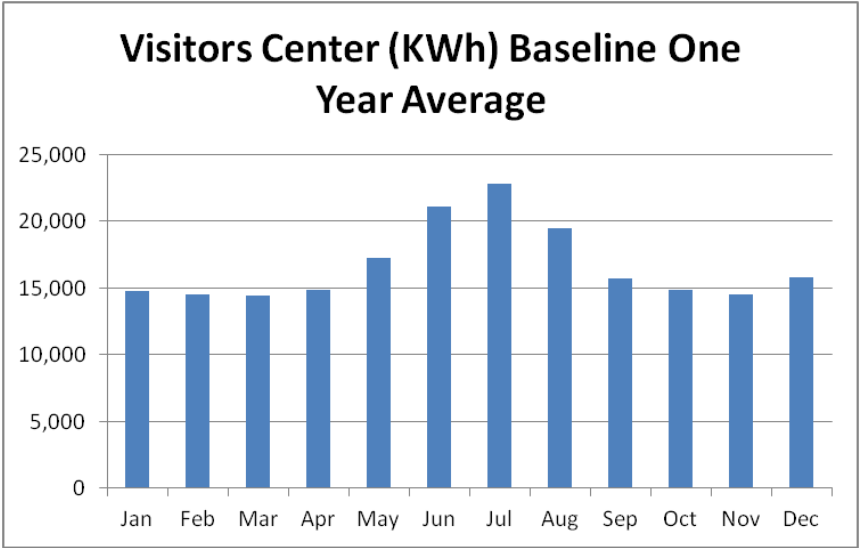
Courthouse (KWh) Baseline Two Year Average	
Month	(KWh)
Jan	59,100
Feb	56,550
Mar	59,100
Apr	60,000
May	70,800
Jun	89,550
Jul	100,650
Aug	91,350
Sep	98,100
Oct	82,200
Nov	68,400
Dec	63,150



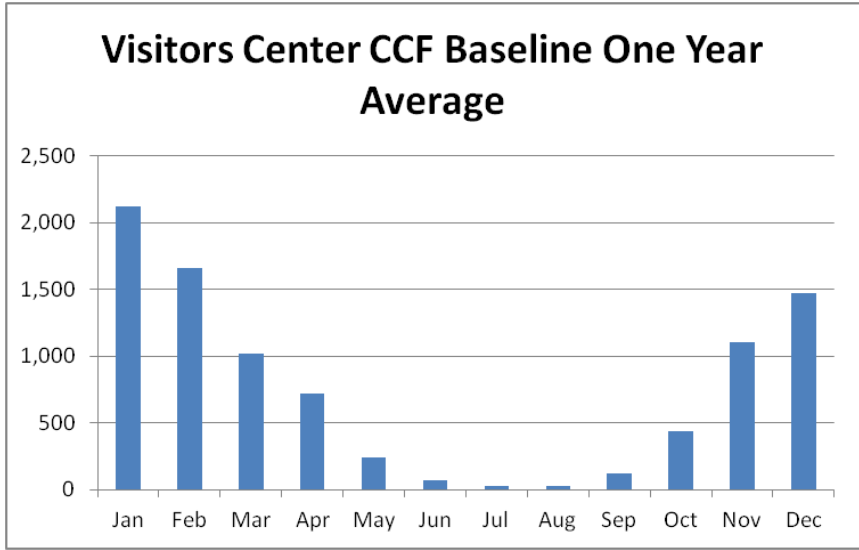
Courthouse CCF Baseline Two Year Average	
Month	CCF
Jan	9,570
Feb	8,205
Mar	7,020
Apr	5,400
May	3,942
Jun	3,998
Jul	3,647
Aug	3,695
Sep	4,934
Oct	5,595
Nov	6,850
Dec	7,680



Visitors Center (KWh) Baseline One Year Average	
Month	(KWh)
Jan	14,800
Feb	14,560
Mar	14,400
Apr	14,880
May	17,280
Jun	21,120
Jul	22,800
Aug	19,440
Sep	15,760
Oct	14,880
Nov	14,560
Dec	15,840

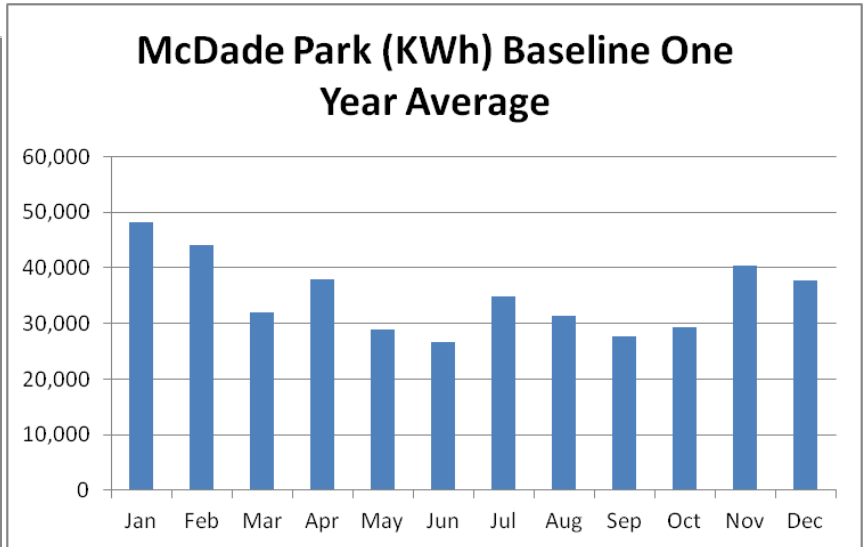


Visitors Center CCF Baseline One Year Average	
Month	CCF
Jan	2,118
Feb	1,660
Mar	1,019
Apr	716
May	245
Jun	71
Jul	25
Aug	24
Sep	125
Oct	434
Nov	1,101
Dec	1,471

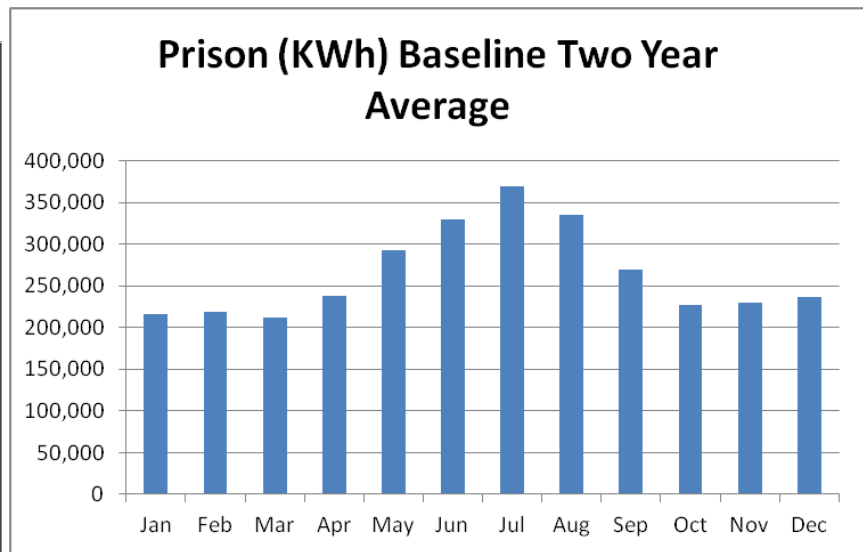




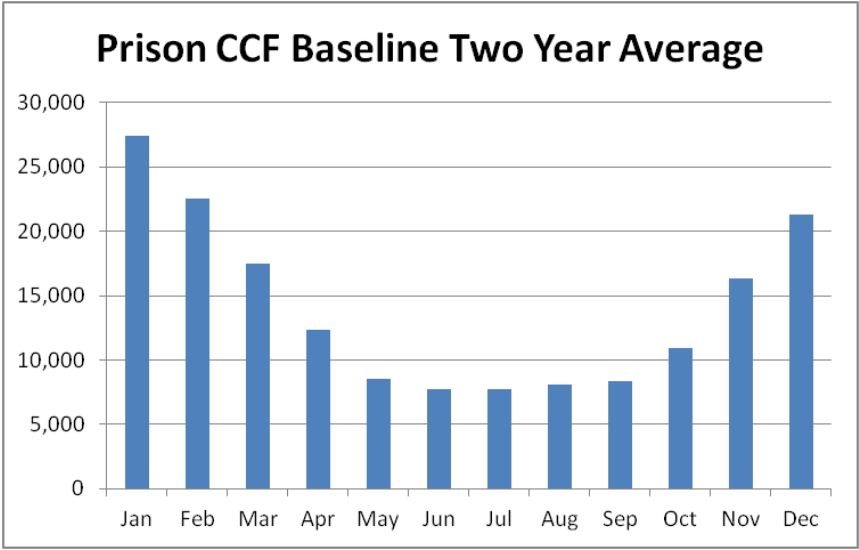
McDade Park (KWh) Baseline One Year Average	
Month	(KWh)
Jan	48,158
Feb	44,049
Mar	32,066
Apr	37,950
May	28,867
Jun	26,569
Jul	34,820
Aug	31,277
Sep	27,623
Oct	29,306
Nov	40,447
Dec	37,706



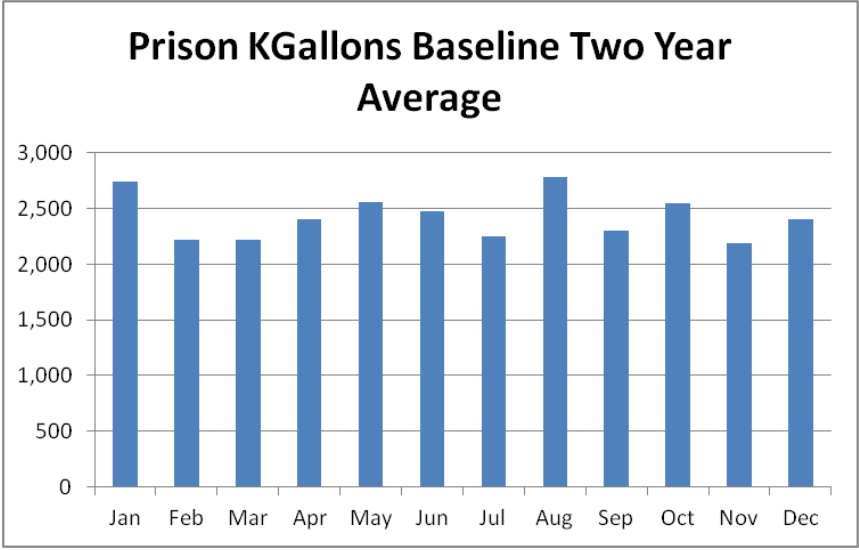
Prison (KWh) Baseline Two Year Average	
Month	(KWh)
Jan	216,000
Feb	219,000
Mar	212,250
Apr	237,375
May	292,875
Jun	329,250
Jul	369,000
Aug	334,500
Sep	269,625
Oct	227,250
Nov	229,125
Dec	237,000



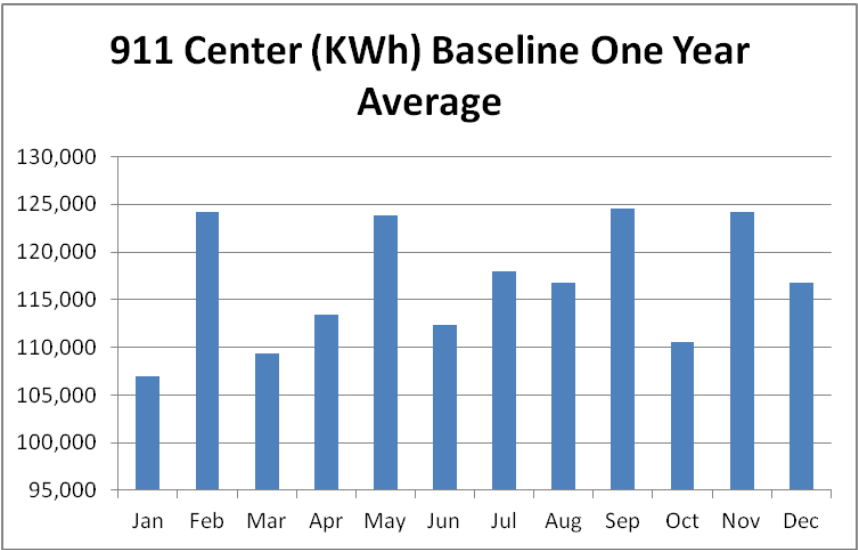
Prison CCF Baseline Two Year Average	
Month	CCF
Jan	27,424
Feb	22,525
Mar	17,486
Apr	12,352
May	8,511
Jun	7,736
Jul	7,710
Aug	8,116
Sep	8,355
Oct	10,962
Nov	16,291
Dec	21,312



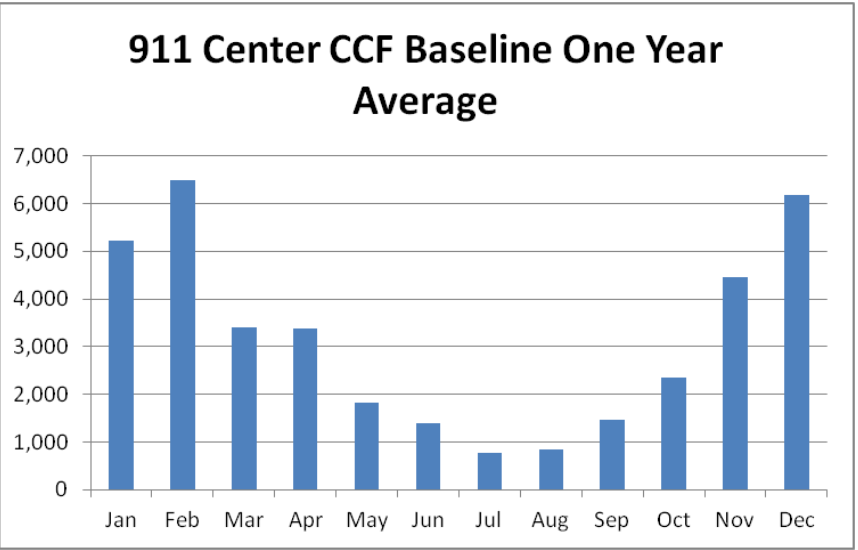
Prison KGallons Baseline Two Year Average	
Month	KGallons
Jan	2,747
Feb	2,219
Mar	2,219
Apr	2,408
May	2,562
Jun	2,473
Jul	2,250
Aug	2,789
Sep	2,301
Oct	2,551
Nov	2,191
Dec	2,401



911 Center (KWh) Baseline One Year Average	
Month	(KWh)
Jan	107,000
Feb	124,200
Mar	109,400
Apr	113,400
May	123,800
Jun	112,400
Jul	118,000
Aug	116,800
Sep	124,600
Oct	110,600
Nov	124,200
Dec	116,800



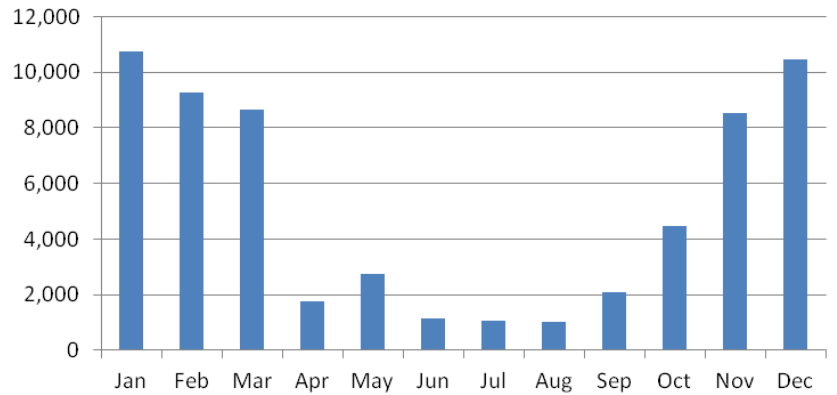
911 Center CCF Baseline One Year Average	
Month	CCF
Jan	5,210
Feb	6,497
Mar	3,401
Apr	3,385
May	1,829
Jun	1,382
Jul	768
Aug	841
Sep	1,476
Oct	2,348
Nov	4,454
Dec	6,187



**Aylesworth Park (KWh) Baseline One Year Average**

Month	(KWh)
Jan	10,749
Feb	9,263
Mar	8,657
Apr	1,749
May	2,763
Jun	1,158
Jul	1,083
Aug	1,020
Sep	2,109
Oct	4,475
Nov	8,542
Dec	10,446

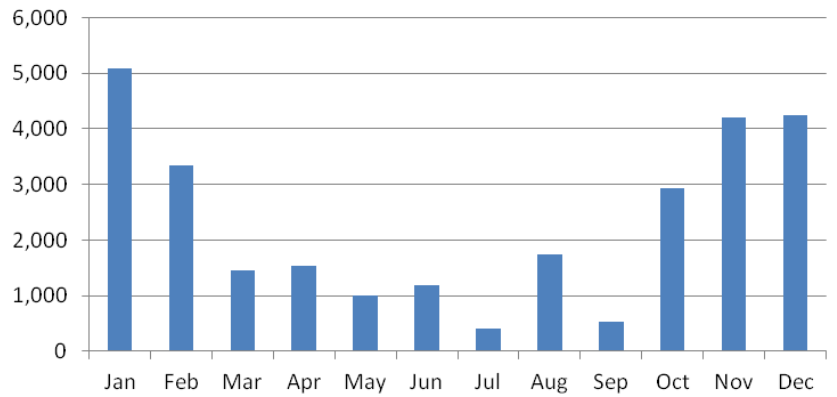
**Aylesworth Park (KWh) Baseline One Year Average**



**Covington Park (KWh) Baseline One Year Average**

Month	(KWh)
Jan	5,089
Feb	3,350
Mar	1,446
Apr	1,542
May	1,012
Jun	1,182
Jul	407
Aug	1,739
Sep	535
Oct	2,937
Nov	4,199
Dec	4,238

**Covington Park (KWh) Baseline One Year Average**

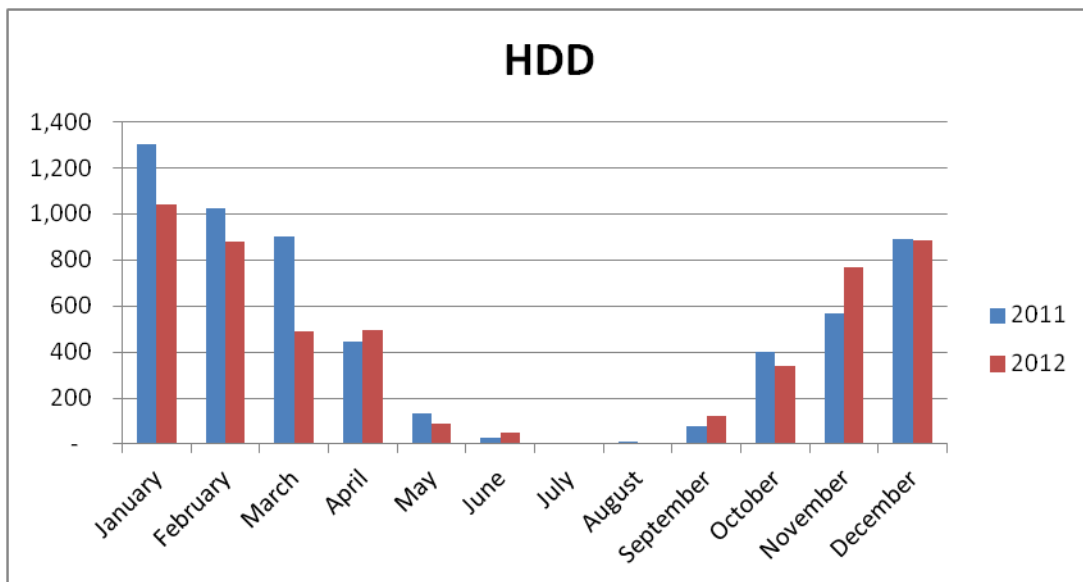


Year 1			Year 2		
Month	Heating Degree Days	Cooling Degree Days	Month	Heating Degree Days	Cooling Degree Days
Jan-11	1,304	-	Jan-12	1,041	-
Feb-11	1,022	-	Feb-12	880	-
Mar-11	904	-	Mar-12	490	-
Apr-11	444	12	Apr-12	497	5
May-11	132	70	May-12	89	87
Jun-11	28	126	Jun-12	50	122
Jul-11	-	312	Jul-12	-	338
Aug-11	9	155	Aug-12	2	220
Sep-11	78	87	Sep-12	120	57
Oct-11	400	-	Oct-12	338	5
Nov-11	565	-	Nov-12	770	-
Dec-11	890	-	Dec-12	885	-
<b>Totals:</b>	<b>5,776</b>	<b>762</b>	<b>Totals:</b>	<b>5,162</b>	<b>834</b>

Data is from [www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/cdus/degree\\_days/](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/degree_days/) for the station: Scranton

Degree Day Explanation:

A degree day is a quantitative index demonstrated to reflect demand for energy to heat or cool houses and businesses. This index is derived from daily temperature observations at nearly 200 major weather stations in the contiguous United States. The "heating year" during which heating degree days are accumulated extends from July 1st to June 30th and the "cooling year" during which cooling degree data are accumulated extends from January 1st to December 31st. A mean daily temperature (average of the daily maximum and minimum temperatures) of 65°F is the base for both heating and cooling degree day computations. Heating degree days are summations of negative differences between the mean daily temperature and the 65°F base; cooling degree days are summations of positive differences from the same base. For example, cooling degree days for a station with daily mean temperatures during a seven-day period of 67,65,70,74,78,65 and 68, are 2,0,5,9,13,0,and 3, for a total for the week of 32 cooling degree days.



## **SCHEDULE C – BASE ENERGY RATES**

EC Savings from all meters at the Facilities will be calculated by using the Base Energy Rates listed below.

The Base Energy Rates listed below will be increased each year on a cumulative basis as shown in the table in Article II.B of the Agreement.

Electric rates are determined by the incremental cost of a unit of energy, in this case \$/kWh.

Natural gas rates are determined by the incremental cost of a unit of energy, in this case \$/CCF.

Water and sewer are determined by the incremental cost of the utility, in this case \$/kGal.

### Electric Rates

1. Courthouse:	\$0.08743 / kWh
2. Visitors Center:	\$0.08666 / kWh
3. McDade Park:	\$0.09193 / kWh
4. Prison:	\$0.09300 / kWh
5. 911 Building:	\$0.07990 / kWh
6. Aylesworth Park:	\$0.10320 / kWh
7. Covington Park:	\$0.13790 / kWh

### Natural Gas Rates

1. Courthouse:	\$0.78464 / CCF
2. Visitors Center:	\$0.79332 / CCF
3. Prison:	\$0.62100 / CCF
4. 911 Building:	\$0.75382 / CCF

### Combined Water / Sewer Rates

1. Prison:	\$15.33500 / kGal
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## **SCHEDULE D – GUARANTEED ENERGY SAVINGS PER CONTRACT YEAR**

The Guaranteed Energy Savings per Contract Year is shown in column (2) in the table below. Year One (1) savings are measured and verified. Years Two through Twenty (2 – 20) are projected based on the Year One (1) measurement. Operational Savings in Column 3 include both Operational Savings and Warranty Savings in Years One (1) through Five (5). See Detailed Operational and Maintenance Worksheet on the next page.

Lease Payments below are good faith estimates based on preliminary information and current market conditions and inserted here for illustrative purposes.

Approval of this GESA is contingent upon final financing arrangements, therefore a revised cash flow, Figure D.1, will be amended upon successful closing of the financial agreement between the County and Lender.

Figure D.1 – Project Cash Flow

**Lackawanna County  
Scranton, PA  
Retrofit  
Project Proforma Cash Flows  
18.5 Year Lease Term**

Total Project Cost	7,476,933	<b>One Time Escalation</b>	Electric	0.0%
Less: Customer Equity	-	<b>Annual Escalation Rates</b>	Electric	2.50%
Total Amount Financed	7,476,933		Oil	2.50%
			Propane	2.50%
First Year Energy Savings	292,856		Gas	2.50%
First year Operational Savings	430,415		Coal	2.50%
Total First Year Savings	723,271		Water	3.00%
			Maintenance	3.00%

1	2	3	4	5	6	7	8	9	10
Year	Energy Savings	Operational Savings	Total Savings	Avoided Capital Outlays	Lease Payments	Performance Assurance Fee	Annual Service Agreement Fee	Net Savings	Accumulated Savings
const.	144,148		144,148		134,790			9,358	9,358
1	292,856	430,415	723,271	0	513,920	20,000	(188,500)	851	10,210
2	300,838	446,393	747,231	0	500,920	20,600	(192,270)	33,441	43,651
3	309,039	397,978	707,017	0	477,276	21,218	(196,115)	12,408	56,059
4	317,466	370,597	688,063	0	483,839	0	(200,038)	4,186	60,246
5	326,124	381,715	707,839	0	494,940	0	(204,038)	8,861	69,107
6	335,021	384,362	719,383	0	506,386	0	(208,119)	4,877	73,984
7	344,162	395,893	740,055	0	522,590	0	(212,282)	5,183	79,167
8	353,555	407,770	761,324	0	539,291	0	(216,527)	5,506	84,673
9	363,206	420,003	783,208	0	556,506	0	(220,858)	5,845	90,518
10	373,122	432,603	805,725	0	574,250	0	(225,275)	6,200	96,718
11	383,312	445,581	828,893	0	592,539	0	(229,780)	6,574	103,292
12	393,783	458,948	852,731	0	611,389	0	(234,376)	6,966	110,257
13	404,542	472,717	877,258	0	630,816	0	(239,064)	7,379	117,636
14	415,597	486,898	902,495	0	650,889	0	(243,845)	7,761	125,397
15	426,957	501,505	928,462	0	671,476	0	(248,722)	8,264	133,661
16	438,629	516,550	955,180	0	692,745	0	(253,696)	8,739	142,400
17	450,624	532,047	982,671	0	714,666	0	(258,770)	9,235	151,635
18	462,950	548,008	1,010,958	0	737,258	0	(263,946)	9,754	161,389
19	475,615	564,448	1,040,063	0	781,673	0	(269,224)	(10,834)	150,555
20	488,630	581,382	1,070,012	0	0	0	(232,343)	837,669	988,224
	7,800,175	9,175,814	16,975,989	0	11,388,159	61,818	(4,537,788)	988,224	



**Table D.1 – Operational Savings**

Contract Year	ANNUAL OPERATIONAL SAVINGS											
	Prison HVAC Emergency Repairs	Prison Refrigeration Emergency Repairs	Prison Cable TV Revenue	Prison Plumbing Controls	Prison Paper Towels	County Wide Service Agreement Eliminations	Lighting Warranty - Lamps	Lighting Warranty - Ballasts	Project Act 129 Rebates	CHP Act 129 Rebate Savings	CHP Demand Response Revenue	Total Operational Savings
1	\$76,443	\$11,080	\$54,720	\$12,240	\$15,000	\$162,071	\$11,392	\$7,595	\$27,966	\$24,430	\$27,478	\$430,415
2	\$78,736	\$11,412	\$56,362	\$12,607	\$15,450	\$166,933	\$11,734	\$7,823	\$27,966	\$24,430	\$32,940	\$446,393
3	\$81,098	\$11,755	\$58,052	\$12,985	\$15,914	\$171,941	\$12,086	\$8,058			\$26,089	\$397,978
4	\$83,531	\$12,107	\$59,794	\$13,375	\$16,391	\$177,099		\$8,299				\$370,597
5	\$86,037	\$12,471	\$61,588	\$13,776	\$16,883	\$182,412		\$8,548				\$381,715
6	\$88,618	\$12,845	\$63,435	\$14,190	\$17,389	\$187,885						\$384,362
7	\$91,277	\$13,230	\$65,339	\$14,615	\$17,911	\$193,521						\$395,893
8	\$94,015	\$13,627	\$67,299	\$15,054	\$18,448	\$199,327						\$407,770
9	\$96,836	\$14,036	\$69,318	\$15,505	\$19,002	\$205,307						\$420,003
10	\$99,741	\$14,457	\$71,397	\$15,970	\$19,572	\$211,466						\$432,603
11	\$102,733	\$14,891	\$73,539	\$16,450	\$20,159	\$217,810						\$445,581
12	\$105,815	\$15,337	\$75,745	\$16,943	\$20,764	\$224,344						\$458,948
13	\$108,989	\$15,797	\$78,018	\$17,451	\$21,386	\$231,074						\$472,717
14	\$112,259	\$16,271	\$80,358	\$17,975	\$22,028	\$238,007						\$486,898
15	\$115,627	\$16,759	\$82,769	\$18,514	\$22,689	\$245,147						\$501,505
16	\$119,096	\$17,262	\$85,252	\$19,070	\$23,370	\$252,501						\$516,550
17	\$122,669	\$17,780	\$87,810	\$19,642	\$24,071	\$260,076						\$532,047
18	\$126,349	\$18,314	\$90,444	\$20,231	\$24,793	\$267,879						\$548,008
19	\$130,139	\$18,863	\$93,157	\$20,838	\$25,536	\$275,915						\$564,448
20	\$134,043	\$19,429	\$95,952	\$21,463	\$26,303	\$284,192						\$581,382
	<b>\$2,054,052</b>	<b>\$297,724</b>	<b>\$1,470,347</b>	<b>\$328,893</b>		<b>\$4,354,908</b>	<b>\$35,212</b>	<b>\$40,323</b>	<b>\$55,932</b>	<b>\$48,860</b>	<b>\$86,507</b>	<b>\$9,175,814</b>

## SCHEDULE E – ENERGY CONSERVATION MEASURES

ECM Number	ECM Title
1	Prison Roof Top Unit Replacement
2	Prison Kitchen Hood Controls
3	Prison Refrigeration System Replacement
4	Prison Plumbing Upgrades
5	Prison Laundry Ozone System Upgrade
6	Prison Emergency Generator with CHP System
7	Prison Steam to Hot Water Conversion
8	Prison Cell Cable/Power
9	Courthouse Recommissioning
10	Prison Paper Towel Replacement
11	County Wide Lighting Upgrades
12	County Wide Building Envelope Upgrades

## **SCHEDULE F – TOTAL PROJECT FEES**

### **Work:**

The Total Project Fee for the Energy Conservation Measures listed in Schedule E is Seven Million Four Hundred Seventy Six Thousand Nine Hundred Thirty Three Dollars (\$7,476,933).

### **Measurement and Verification Services:**

Measurement and Verification Services will be billed as a standalone invoice on an annual basis for the 3 year term. The total fee per year is as follows:

Year 1:	\$20,000
Year 2:	\$20,600
Year 3:	\$21,218

### **Preventative Maintenance Services:**

Included within this Agreement is a 3 Year Mechanical Service Agreement as described in Attachment D. The Mechanical Service Agreement fee will be billed as a standalone invoice on a quarterly basis for the 3 year term. The total fee per year is as follows:

Year 1:	\$188,500
Year 2:	\$192,270
Year 3:	\$196,115

## SCHEDULE G – INSURANCE

McClure, at all times during this Agreement, shall carry as a minimum the following amounts of insurance. Greater amounts will be carried where required by law:

(1) Workers' Compensation, etc.:	
(a) State	Statutory
(b) Applicable Federal (e.g. Longshoreman's)	Statutory
(c) Employer Liability	\$100,000 each incident \$500,000 disease-policy limit \$1,000 disease-each employee
(2) Comprehensive General Liability:	
(a) Bodily Injury: \$1,000,000 \$1,000,000	Each Occurrence Annual Aggregate, Products, and Completed Operations
(b) Property Damage \$1,000,000 \$1,000,000	Each Occurrence Annual Aggregate
(c) Property Damage Liability Insurance will provide Explosion, Collapse, and Underwater coverage where applicable	
(d) Personal injury, with employment exclusion deleted \$1,000,000	Annual Aggregate
(3) Comprehensive Automobile Liability:	
(a) Bodily Injury: \$1,000,000 \$1,000,000	Each Person Each Accident
(b) Property Damage: \$1,000,000	Each Occurrence
(4) Umbrella Liability:	
(a) \$25,000,000	

## SCHEDULE H – ADDITIONAL TERMS AND CONDITIONS

McClure shall comply with all governmental requirements applicable to the work, under this Agreement, including without limitation to the following:

- (a) Human Relations Act - The provisions of the Pennsylvania Human Relations Act, Act 222 of October 27, 1955 (P.L. 744) (43 P.S. Section 951, Et. Seq.) of the Commonwealth of Pennsylvania prohibit discrimination because of race, color, religious, creed, ancestry, age, sex, national origin, handicap or disability, by employers, employment agencies, labor organizations, contractors and others. The contractor shall agree to comply with the provisions of this Act as amended that is made part of this specification. Your attention is directed to the language of the Commonwealth's non-discrimination clause in 16 PA. Code 349.101.
- (b) Provision for the Use of Steel and Steel Products made in the U.S.A. - In accordance with Act 3 of the 1978 General Assembly of the Commonwealth of Pennsylvania, if any steel or steel products are to be used or supplied in the performance of the contract, only those produced in the United States as defined therein shall be used or supplied in the performance of the contract or any subcontracts there under. In accordance with Act 161 of 1982, cast iron products; shall also be included and produced in the United States. Act 141 of 1984 further defines "steel products" to include machinery and equipment. The act also provides clarifications and penalties.
- (c) Environmental Statutes and Regulations - Contractor shall comply with all applicable provisions of federal and state laws dealing with the prevention of environmental pollution and the preservation of natural resources, including but not limited to Act 247 of October 25, 1972; the Federal Air Quality Act of 1967; the Clean Air Act; the Clean Water Restoration Act; the Water Pollution Control Act Amendments of 1956; the Water Quality Act of 1965; the Water Quality Improvement Act of 1970; the Water Pollution Control Act Amendments of 1972; the Water Facilities Act (see Consolidated Farmer's Home administration Act of 1961); the Watershed Protection and Flood Prevention Act; the Pennsylvania Air Pollution Control Act; the Clean Streams Law; the Solid Waste Management Act; the Municipal Waste Planning, Recycling and Waste Reduction Act; the Pennsylvania Sewage Facilities Act; AHERA; and all rules and regulations there under, including but not limited to those formulated by the United States Environmental Protection Agency and the Pennsylvania Department of Environmental Resources. Nothing contained in the Contract shall be construed as relieving Contractor in any way of Contractor's responsibility for strict compliance with all government requirements pertaining to environmental protection.
- (d) Safety and Health Regulations - The Contract is to be governed at all times by applicable provisions of federal law, including but not limited to the following: William-Steiger Occupational Safety and Health Act of 1970, Public Law 91-596. Part 1910 - Occupational Safety and Health Standards, Chapter XIII of title 29, code of federal Regulations. Nothing contained in the Contract shall be construed as relieving Contractor in any way of Contractor's responsibility for strict compliance with all governmental requirements pertaining to health and safety.

- (e) Bonds Required – McClure shall furnish and deliver to the Client at or before the execution of this Agreement by McClure:
- i. Performance Bond – A performance bond for the installation portion of the Agreement at one hundred percent (100%) of the contract amount, conditioned upon the faithful performance of the contract in accordance with the plans, specifications and conditions of the contract, within the time specified therein. Such bond shall be solely for the protection of the Client. The surety company which issues said bond must be legally authorized to do business in the Commonwealth of Pennsylvania and must have a rating of B+, A or A+ as determined by the A.M. Best company or an equivalent rating agency deemed satisfactory to Client.
  - ii. Labor and Material Payment Bond – A labor and material payment bond at one hundred percent (100%) of the contract amount, solely for the protection of claimants supplying labor and/or materials to McClure to whom the contract was awarded, or to any of his subcontractors in the prosecution of the work provided for in such contract, and shall be conditioned for the prompt payment of all such material furnished or labor supplied or performed in the prosecution of the work. “Labor and/or materials” shall include public utility services and reasonable rentals of equipment, but only for periods when the equipment rented is actually used at the site. The surety company which issues said bond must be legally authorized to do business in the Commonwealth of Pennsylvania and must have a rating of B+, A or A+ as determined by the A.M. Best Company or an equivalent rating agency deemed satisfactory to Client.
  - iii. Additional Security – Should any surety company providing any bond required in this Contract be deemed unsatisfactory to the Client, notice will be given to McClure to that effect, and McClure shall immediately substitute a new surety company or companies satisfactory to Client, without any additional cost or expense to Client.
  - iv. Failure to Furnish Bonds – Failure to furnish and deliver any bond as required by this Contract, shall entitle the Client to declare McClure’s Bid or Proposal to be non-responsive, and not the lowest responsible bid or proposal, and shall constitute a basis to award the contract to another bidder or proposer.

## **SCHEDULE I – STANDARDS OF OCCUPANCY AND COMFORT**

Listed below are the post project targeted baseline thermal comfort conditions and minimum lighting levels. See Table I.1 below for each building’s baseline temperature set points and current operating status.

It is understood that existing and installed equipment may not allow for exact times and temperatures to be met, but every effort will be made to meet the below standards as closely as the equipment allows.

Buildings listed with “as is” are to remain as currently operating at the established set points, ventilation rates, and schedule set forth by the County. The baseline for those not listed “as is” will be as described, and while there are space outliers, such as gyms and public meeting spaces, the schedule will be set up as listed with the prescribed set points. Modifications can be made, but could impact the level of savings and may require an adjustment in the M&V methodology. These schedules and set points have been developed with the staff at Lackawanna County and through historical project data for similar facilities.

Post project lighting levels will meet or exceed the required levels as set forth by the Illuminating Engineering Society of North America (IESNA). IESNA is the recognized standard for determining minimum lighting levels. The energy index and installation practices of the installed lighting will be in full compliance with the PA statewide 2009 Uniform Construction Code (UCC). The UCC recognizes NFPA 70: National Electrical Code as the standard for electrical related work. As for the installed lighting the UCC references the International Energy Conservation Code 2009 (IECC 2009) for lighting power requirements. While lighting power has little effect on the standards of comfort provided by adequate light levels, referenced from IESNA, the new lighting fixtures and lamps will be below the maximum power allowance found in IECC 2009 Section 505.5.2 Table 505.5.2 for each building and its function, as expected when using lower wattage lamps and fixtures to provide similar lighting levels as their existing counterparts.

### **IESNA RECOMMENDED LIGHTING LEVELS:**

Average Reading and Writing:	50 FC
Office:	25 FC
Corridors:	10 FC
Storage:	30 FC
Entrances:	5 FC
Parking Lots:	0.8 – 3.6 FC

**TABLE I.1 – Baseline Thermal Comfort Conditions**

<b>Building Name</b>	<b>Typical Occupied Schedule</b>	<b>HVAC Occupied Heating/Cooling Temperature</b>	<b>Ventilation Rate</b>	<b>HVAC Unoccupied Heating/Cooling Temperature</b>
<b>Courthouse</b>	7:00 AM – 6:00 PM	70/72	In accordance With IMC 2009	60/85
<b>Prison</b>	24/7	70/75	In accordance With IMC 2009	60/85



## SCHEDULE J – OPERATIONS AND MAINTENANCE SAVINGS

### General

The operations and maintenance savings have been calculated from data provided by Lackawanna County Administrators, Business Office, Buildings and Grounds, industry standards and averages, actual material costs, actual repair costs, and outside purchased repairs and service costs. The County agrees the recurring or non-recurring savings listed below are non-energy measured stipulated savings achieved as a result of the scope of work described within this contract.

#### 1. Lighting Retrofit; Cumulative 5 Year Savings = \$60,344

This savings represents the lamps and ballasts that the County will not have to replace as a result of the retrofit. O&M savings are calculated using the manufacturer's expected rated product life and hours of operation. The Operation and Maintenance Savings reflects the estimated material savings that will be realized by implementing this project. Failure rates and time estimates were based on average hours of operation and industry standards. The manufacturer of the lamps and ballasts will provide a three (3) year warranty on the lamps and a five (5) year warranty on the ballasts. The 5 years savings is as follows:

Year 1 = \$18,987  
Year 2 = \$19,557  
Year 3 = \$20,144  
Year 4 = \$8,299  
Year 5 = \$8,548

#### 2. Act 129 Utility Rebates; Year 1 Savings = \$52,396

The District's Electrical Distribution Company is PPL. In 2009, the Public Utility Commission mandated each of the Commonwealth's (7) EDC's implement a rebate program that incentivizes customers to proactively install energy efficient equipment. Based on PPL's published prescriptive rebates, we have estimated the total rebate amount to be \$52,396. McClure Company will apply for the rebates on behalf of the District. All rebate monies go directly to the District. We do not have direct control of when the rebate monies are disbursed, therefore, to remain conservative; we have shown them being received over a 2 year period as follows:

Year 1:

- HVAC and Lighting = \$27,966
- Prison Combined Heat and Power = \$24,430

Year 2:

- HVAC and Lighting = \$27,966
- Prison Combined Heat and Power = \$24,430

**3. Prison HVAC and Refrigeration Emergency Repairs; Year 1 Savings = \$87,523**

The County provided 2 years (2011 - 2014) of invoices from PLD Associates, the 3<sup>rd</sup> party entity that provided emergency repairs, as needed, to the Prison's HVAC system and Dietary refrigeration system. It's important to note, these costs are for emergency repairs only and not routine preventative maintenance. The County is incurring this average cost on an annual basis due to the poor condition of the existing equipment. These units will be replaced as a result of this project's scope of work.

**4. Prison "Acorn" Plumbing Controls; Year 1 Savings = \$12,240**

The County provided 2 years (5/2012 – 5/2014) of material invoices related to the Prison's plumbing system associated with the penal sinks and showers. These units will be replaced as a result of this project's scope of work.

**5. Prison Paper Towel Reduction; Year 1 Savings = \$15,000**

Through the RFP process, the County estimated and stipulated the annual amount spent on hand paper towels within the Prison staff and Visitor's areas. This amount will be reduced by installing electric hand dryers in these areas.

**6. Service Agreement Elimination; Year 1 Savings = \$162,701**

The County retains service from several 3<sup>rd</sup> party entities as required to maintain their facilities systems such as HVAC, Building Automation, etc. The County has requested McClure Company to include these services as a single agreement as part of the overall Guaranteed Energy Savings Agreement. As such, the County decided not to renew agreements or shift to a "month to month" basis until the GESA is finalized and approved by the County's Board of Commissioners.

The savings amount above is the current or estimated value of existing, previous and / or expired service agreements that are being displaced as set forth in Attachment D. A breakdown by facility and service discipline is shown on Table J.1.

As shown in Schedule D, the County will re-direct these savings to partially defray the cost of the new single service agreement. For example:

Year 1 Service Agreement Elimination = \$162,701

Year 1 New Single Service Agreement = \$188,500\*

***\*The new single service agreement includes a broader scope of work resulting in a higher annual cost. Major services not previously encumbered by the County include; Prison Building Automation System and Prison Combined Heat and Power.***

**Table J.1 –Service Agreement History Cost Breakdown**

Facility	Service	Cost		Current / Previous
		Amount	Source	Vendor
Prison	Emergency Generator	\$2,615	County	Penn Power
Prison	HVAC Water Treatment	\$3,200	Estimate	
Courthouse	Building Automation	\$16,960	County	Siemens
Courthouse	HVAC	\$5,932	County	Tri State
Courthouse	HVAC Water Treatment	\$3,050	County	IntegriTec, Inc
911 Center	HVAC	\$23,500	County	Tri State
911 Center	Building Automation	\$28,406	County	Honeywell
911 Center	Emergency Generator	\$8,700	County	Modern
911 Center	HVAC Water Treatment	\$3,500	Estimate	
Gateway Building	HVAC	\$6,569	Estimate	
Gateway Building	HVAC Water Treatment	\$0		
Administration Building	HVAC - Central Equipment Only	\$55,654	County	Honeywell
Administration Building	HVAC Water Treatment	\$0		
Trolley Museum	ATC	\$0	County	Siemens
Visitor's Center	ATC	\$3,985	County	Siemens
<b>TOTAL</b>		<b>\$162,071</b>		

**7. Prison Demand Response; 3 Year Revenue = \$86,507**

The Prison has the ability to engage in an electrical Demand Side Response (DSR) program with the electrical grid operator, PJM Interconnection and a curtailment service provider (CSP). PJM operates the world’s largest wholesale electric market and serves approximately 51 million people across 15 states. They govern over 56,000 miles of transmission lines, which are served by over 1082 generating sources.

We recommend Lackawanna County engage in the PJM Capacity Market Program. This program provides revenue to end users based on their commitment to curtail a stipulated amount of electrical capacity from the power grid. The end user is required to curtail this load within 2 hours from the time the emergency (event) is called. An event can only be called from June through September, non-holiday weekdays, during the hours from 12 PM to 8 PM. There are 10 maximum annual outages with each outage lasting no more than 6 hours. If no events are called, the County will still be paid the full revenue for their readiness to respond.

Each year a “test” event is called to make sure the end user is indeed capable of responding. If for some reason, the County is not able to comply, they will be charged 120% of the shortfall. However, if in that same year, the County successfully responds to an actual event, the failed test event is mitigated from the program and the County is back on track for the total revenue stream.

The revenue values have been calculated based on the most recent PJM allocations as of the date of this GESA.

	\$ / MW	Curtailed Load (KW)	CSP Fees and Fuel Costs	NET Revenue
Year 1	\$45,797	800	25%	\$27,478
Year 2	\$54,900	800	25%	\$32,940
Year 3	\$43,482	800	25%	\$26,089
			<b>TOTALS</b>	<b>\$86,507</b>

As part of this GESA, McClure Company will coordinate the selection of a Curtailment Service Provider and eventual enrollment into the program. The Demand Response Agreement will ultimately be between the CSP and County. All revenues will go directly to the County.

**8. Prison Cable Television; Year 1 Revenue = \$54,720**

Revenue associated with a future inmate cable television system was calculated based on estimated and agreed upon variables provided by the County and the future services provider; Correctional Cable TV. The following simple and conservative methodology was utilized to calculate the annual revenue:

Total Number of Inmates=	950
Historical Avg. % of Inmates to purchase a monthly subscription =	40% (380)
Conservative Monthly Subscription Fee per Inmate =	\$12
 Conservative Revenue = 380 Inmates x \$12 per month x 12 months =	 <b>\$54,720</b>

Additional revenue sources such as the selling television sets and other ancillary devices have not been included in the above calculations.

The County agrees and understands McClure Company, as a part of this GESA, is responsible for providing the power and cable infrastructure to support a cable television system. Facilitating the actual cable service, front end digital equipment (typically furnished or “leased” cable provider) annual services, cable packages, etc will need to be a separate agreement between the County and the County’s preferred service provider.

## SCHEDULE K – STIPULATED LIGHTING HOURS OF OPERATION

The following table summarizes the hours of operation that are stipulated under this project. For more detailed information, see the lighting “Line by Line” in Attachment B.

		PRISON (MAIN JAIL)	PRISON (TOWER)	PRISON (COMM CORR)	VISITORS CENTER	PARKS	911 CENTER
CAF	CAF	4,380	4,380	4,380	2,600	3,000	N/A
COR	CORRIDOR	8,760	8,760	8,760	2,600	3,000	N/A
CR	CLASSROOM	4,380	4,380	4,380	N/A	N/A	N/A
CS	COMMON SPACE	8,760	8,760	8,760	2,600	3,000	N/A
E	EXIT SIGN	8,760	8,760	8,760	8,760	8,760	N/A
EXT	EXTERIOR LIGHTING	4,000	4,000	4,000	4,000	3,000	4,380
GYM	GYM	4,380	4,380	4,380	N/A	N/A	N/A
JC	JANITOR CLOSET	4,380	4,380	4,380	2,600	3,000	N/A
KIT	KITCHEN	4,380	4,380	4,380	2,600	3,000	N/A
LIB	LIBRARY	4,380	4,380	4,380	N/A	N/A	N/A
LR	LOCKER ROOM	4,380	4,380	4,380	2,600	3,000	N/A
LU	LOW USAGE / MISC	500	500	500	500	500	N/A
MRH	MECH ROOM HIGH	4,380	4,380	4,380	2,600	3,000	N/A
MRL	MECH ROOM LOW	2,000	2,000	2,000	1,000	1,000	N/A
OH	OFFICE HIGH	4,380	4,380	4,380	2,600	3,000	N/A
OL	OFFICE LOW	4,380	4,380	4,380	1,560	1,560	N/A
PTR	PRIVATE TOILET ROOM	500	500	500	500	500	N/A
SH	STORAGE HIGH	4,380	4,380	4,380	2,600	3,000	N/A
SL	STORAGE LOW	500	500	500	500	500	N/A
ST	STAIRS	4,380	4,380	4,380	2,600	3,000	N/A
TR	TOILET ROOMS	4,380	4,380	4,380	2,600	3,000	N/A
24/7	24 HOURS 7 DAYS A WEEK	8,760	8,760	8,760	8,760	8,760	N/A
CEL	CELL	4,380	4,380	4,380	N/A	N/A	N/A
CT	COURT HOUSE	N/A	N/A	N/A	N/A	N/A	N/A
DYR	DAYROOM	4,380	4,380	4,380	2,600	N/A	N/A
NITE	CELL NITE LIGHTS	4,380	N/A	N/A	N/A	N/A	N/A

## SCHEDULE L – MEASUREMENT AND VERIFICATION PLAN

### M&V Plan: M&V General Overview

This section provides procedures and guidelines for quantifying savings resulting from the installation of ECMs under energy performance contracts and is intended to comply with the International Performance Measurement & Verification Protocol (IPMVP). The IPMVP was developed to provide a commonly accepted methodology for measuring energy savings associated with performance contracts. There are two components of M&V for Energy Saving Performance Contracting (ESPC) projects:

- **Verifying ECM potential to perform and generate savings** - by confirming that: i) baseline conditions are accurately defined, and ii) the appropriate equipment components or systems are properly installed, performing per specification and have the potential to generate predicted savings.
- **Verifying ECM performance (savings)** - by determining the actual energy savings achieved by the installed ECM.

The general approach to determining energy savings involves comparing the energy use associated with a facility, or certain systems within a facility, before installation of the ECM (baseline) and after installation of the ECM (post-installation). Therefore, in general:

$$\text{Energy savings} = (\text{baseline energy use}) - (\text{post-installation energy use})$$

As ESPC projects are based on pay for performance, each ECM or site will have a site-specific verification process to determine its savings. For each site or project, the baseline and post-installation energy use will be defined using metering, billing analysis and/or engineering calculations (possibly including computer simulation). In addition, values for certain factors that affect energy use and savings, and that are beyond the control of McClure Company (i.e., building occupancy), may be stipulated by the client sponsoring the project.

With the completion of the project, McClure Company will submit a report that defines projected energy savings based on the before and after measurements. This report must be accepted and approved by the client.

### Verifying ECM Potential to Perform

#### Maintaining Service Quality

The Demand Side Management (DSM) measures installed under ESPC programs should maintain or improve the quality of service provided to the client by the affected equipment or systems. For example, lighting projects that reduce lighting levels must maintain some minimum standards, i.e., the minimum standard for the facility's primary use.

#### Baseline Verification

Baseline conditions may be defined by either the client or McClure Company. If the baseline is client-defined, then McClure Company will have the opportunity to verify it. If the baseline is defined by McClure Company, the client will verify it. Baseline physical conditions such as equipment counts,

nameplate data, and energy consumption rate and control strategies will typically be determined through surveys, inspections and/or spot or short-term metering activities. Variables which affect baseline energy calculations such as weather, outdoor air code compliance, and building occupancy are identified.

### Post-Installation Verification

In a post-installation M&V verification, McClure Company and client agree that the proper equipment components or systems were installed, are operating correctly and have the potential to generate the predicted savings. Verification methods may include surveys, inspections and/or continuous metering. MCCLURE COMPANY is expected to complete the system/equipment commissioning.

### **Verifying ECM Performance**

Either after the ECM is installed, McClure Company and client will determine energy savings in accordance with an agreed-upon M&V method using verification techniques defined in this M&V plan.

### Verification Techniques

Baseline energy use, post-installation energy use and energy (and cost) savings will be determined using the following M&V techniques:

- Engineering Calculations
- Metering And Monitoring
- Utility Meter Billing Analysis
- Computer Simulations, e.g. Trane Trace Building Simulation
- Agreed-Upon Stipulations By The Client and McClure Company

### Estimating Energy Savings

There are numerous factors that can affect energy savings during the term of a contract such as weather, operating hours, process loads and heat exchanger fouling. In general, one ESPC contract objective may be to adjust baseline energy use up or down for factors beyond the control of McClure Company (e.g., changes in building occupancy or weather), and adjust post-installation energy use for controllable factors (e.g., maintenance of equipment efficiency).

In order to calculate energy savings, the client may in some cases stipulate the value of factors that are difficult to determine or that may vary during the contract term. In other situations, continuous or regular interval measurements throughout the term of the contract may be compared to baseline energy measurements to determine savings.

There are four industry-accepted options to verifying energy savings. **Option A** emphasizes verification of performance factors and involves determining long-term savings through use of stipulations for operational factors. **Option B and C** involves use of long term metering data; **Option B** involves end use data analysis and **Option C** involves whole building data analysis. **Option D** involves calibrated building simulation.

**Option A** focuses on physical assessment of equipment changes to insure the installation is to specification. Key performance factors (lighting wattage or chiller efficiency) are determined with spot

or short-term measurements and operational factors (lighting hours of operation or cooling ton-hours) are stipulated based on analysis of historical data or spot/short term measurements. The savings are determined using spot or short-term measurements. An example of the measurements will be measuring the wattage use of fixed number of samples of lighting fixtures both before and after the lighting retro-fit.

**Option B** savings are determined after the project completion by short term or continuous measurements taken up to one year following the completion of the installation. The baseline for option B is determined through energy measurements during the IGA phase. The actual baseline is projected to an annual cost through use of standard engineering calculations. The savings are determined by comparison of the baseline to the measured results.

**Option C** is also referred to as the “whole house” method to determine savings. The current year utility bills are compared to historical bills. The historical bills are adjusted to account for factors such as weather. The savings are determined by analysis of utility meter (or sub-meter) data using techniques from simple comparison to regression analysis.

**Option D** savings are determined through simulation of facility components and/or the whole facility. The savings are determined by energy simulation/modeling calibrated with monthly utility billing data and or end-use metering



## M&V Methodology

The following table outlines the methodology proposed for each ECM:

<b>ECM Number</b>	<b>ECM Title</b>	<b>M&amp;V Methodology</b>
1	Prison Roof Top Unit Replacement	IPMVP Option C
2	Prison Kitchen Hood Controls	IPMVP Option B
3	Prison Refrigeration System Replacement	IPMVP Option B
4	Prison ICON System/Plumbing Upgrades	IPMVP Option C
5	Prison Laundry Ozone System Upgrade	IPMVP Option B
6	Prison Emergency Generator with CHP System	IPMVP Option C
7	Prison Boiler Room Conversion from Steam	IPMVP Option C
8	Prison Cell Cable/Power	No Associated Savings
9	Courthouse Re-commissioning	IPMVP Option C
10	County Wide Paper Towel Replacement	IPMVP Option A
11	County Wide Lighting Upgrades	IPMVP Option A
12	County Wide Building Envelope Upgrades	IPMVP Option A

The remainder of this section will describe the measurement and verification methods that will be used for the various ECM's on this project.

## ***M&V Plan***

### **Utility Bill Comparison**

**Based on IPMVP Option: C**

**Applies to ECM: 1, 4, 5, 6, 7, & 9**

### **ECM Definition**

The measures covered by this verification plan are the electric, natural gas, and water/sewer savings associated with all the mechanical energy conservation measures (ECMs) that directly impact the select facilities within the County. Various ECMs are included in the utility bill comparison and are considered “whole house” impacts to the overall energy consumption of the facility. This includes, but is not limited to, control upgrades, plumbing fixture replacement, mechanical equipment replacement, and controls recommissioning.

### **Verification Method**

Option C involves the comparison of historical energy use to post installation energy use. The actual utility bills will provide the basis of comparison.

### **Baseline Demand**

The baseline energy use for these ECMs will be the electric, natural gas, and water/sewer use as a two year average (2011 & 2012) where sufficient utility data is available. Otherwise the base line will be a one year (2012) baseline.

### **Adjustments to Baseline Demand**

The baseline demand will be adjusted to account for changes in the weather. The baseline energy use will be adjusted to account for changes in the weather between the baseline year and current year of measurement and verification.

As part of the overall energy savings, McClure is proposing reducing operating hours of certain pieces of mechanical equipment. Part of the energy savings associated with the new controls automation will be to reduce the hours of operation of the mechanical equipment. Once McClure proves the reduced operating hours can be achieved without effecting comfort any increase in operating hours could result in an adjustment, to the current month’s energy bill. McClure will prove the hours of operation can be reduced during the commissioning phase.

The amount of outside ventilation air entering the mechanical equipment for ventilation may be less than that required by code. Since outside air can have a significant impact on energy use, especially if current operation of the mechanical equipment does not meet outside air code requirements, an adjustment to the energy baseline will be made to account for the additional outside air required to meet code requirements. The outside air adjustment uses industry standard bin analysis and the code compliant design outdoor air to calculated the anticipated heating/cooling demand to condition the outdoor air.

### **Determining Energy Savings**

The savings are determined by comparing the post installation utility usage to the baseline energy use on a monthly basis. Along with a comparison of baseline energy use to post installation energy

use, the post installation energy use will be compared to the expected savings on a monthly basis. The table below represents the format that will be used to determine energy savings.

Projected savings are not used in the guarantee determination but do provide a reference to utility performance compared to expected reduction.

*Savings Calculation: (KWH and CCF)*

**HDD Impact** = *Percentage Adjusted Baseline Impacted by Heating Degree Days (HDD)*

**Weather ADJ** = *Current Month HDD/ Current Month Baseline HDD*

**ADJ Baseline** = *((Contract Baseline + Outside Air Adjustment) \* Weather Adj \* HDD impact) + (1 – HDD Impact)\*(Contract Baseline+ Outside Air Adjustment)*

**Projected Use** = *Adj Baseline – (Projected savings + Lighting Savings)*

**HDD Impact** = 0

**Weather ADJ** = 1

**ADJ Baseline** = *Contract baseline*

**Projected Use** = *Adj Baseline – Projected savings*

*Electric Savings Determination*

**Measured Savings** = *(Adj. Baseline – Lighting Savings) – Year One*

*Gas and Water Savings Determination*

**Measured Savings** = *Adj. Baseline – Year One*

## **M&V**

### **Calculated Savings from Short Term Metering**

**Based on IPMVP Option: B**

**Applies to ECM: 2 & 3**

#### **ECM Definition**

The measures covered by this verification plan are energy saving associated with adding a variable speed drive and control system to the motor, as well as replacing the existing refrigeration systems. The pre-installation energy usage will be measured by programmable meters. The post installation energy use will be measured and recorded by the hood control system programmable logic controller.

#### **Verification Method Overview**

Surveys will be made of all baseline (existing) equipment. Corrections may be required for non-operating equipment. Equipment energy use will be determined from short-term measurements of representative sample of equipment. The equipment to be replaced will also be metered after installation to determine the reduction in electrical use.

#### **Baseline Demand**

The baseline conditions identified are from pre-installation surveys on 7/20/2013 and 6/17/2014. In the pre-installation survey, the equipment to be changed is inventoried and a representative sample is metered on a short-term basis. On 7/20/2103 the refrigeration motors and relating equipment was metered to determine a baseline electric use. On 6/17/2014 the Hood supply and exhaust makeup air units were metered to determine their baseline electric use. These values will be used in the M&V calculations to determine energy savings.

#### **Determining Energy Savings**

The annual baseline energy is measured and calculated following installation. The energy use is again metered and the reduction in electrical use is documented.

#### **Equations for Calculation of Energy and Demand Savings**

$$KWH_{baseline} = (Volts * Amps * 1.732) / 1,000 * sample\ period\ Interval\ (hr)$$

$$KWH_{post} = (Volts * Amps * 1.732) / 1,000 * sample\ period\ Interval\ (hr)$$

$$KWH_{savings} = KWH_{baseline} - KWH_{post}$$

##### **Baseline**

Volts = Measured by Fluke voltmeter

Amps = Measured by a programmable data logger.

##### **Post**

Electrical use of variable speed drive will be integrated into the exhaust fan controller. The electrical information will be trended and stored. This will result in a permanent record of VFD electrical use.

## **M&V**

### **Calculated Savings from Short Term Metering**

**Based on IPMVP Option: B**

**Applies to ECM: 10**

#### **ECM Definition**

This M&V method covers the proposed energy usage increase through implementation of electric hand dryers replacing paper towel dispensers. For this M&V method, the savings associated with the ECMs must be verified with end-use metering.

#### **Verification Method**

McClure Company will audit a sampling of the new electric hand dryers through use of data logging devices to determine typical use and energy use. Any additional variables related to the proposed system will be metered by McClure Company to establish calculated baseline system energy use as a function of appropriate variables. McClure Company will apply the results of the post-installation metering to determine the difference between pre-installation and post-installation input energy use (and demand). This difference represents the system savings.

#### **Baseline Demand**

McClure Company will establish energy rates that apply to the targeted system. This data will be obtained from nameplates and spot metering where required for systems and devices that will be directly affected by the ECM in the IGA.

If the project is subject to any energy standards, codes or minimum performance standards, these standards will be accounted for in the baseline model. McClure Company will combine the results of energy input data and variable(s) monitoring to establish the pre-installation relationship between the quantities. This relationship will establish a baseline model.

#### **Determining Energy Savings**

After installing the ECM, McClure Company will meter appropriate variables. The post-installation metered data will then be used directly in the savings calculation to verify the IGA savings calculations. These independent variables will be monitored for a particular observation interval that corresponds to the baseline data.

Electrical savings

$$KWH_{baseline} = (Volts * Amps * 1.732) / 1,000 * Hours\ of\ operation(hr)$$

$$KWH_{post} = (Volts * Amps * 1.732) / 1,000 * Hours\ of\ operation(hr)$$

$$KWH_{savings} = KWH_{baseline} - KWH_{post}$$

***M&V Plan Lighting***  
***Lighting Spot Metering with Stipulated Operating Hours***  
**Based on IPMVP Option: A**  
**Applies to ECM: 11**

### **ECM Definition**

The measures covered by this verification plan are lighting retrofits of existing fixtures, lamps, and/or ballasts with an identical number of more energy efficient fixtures, lamps, and/or ballasts. These lighting efficiency projects cause a reduction in demand.

### **Verification Method**

Surveys will be made of all baseline (existing) and post-installation (new) lighting fixtures. Corrections may be required for non-operating fixtures. The operating hours are stipulated in the contract and were determined by pre-installation metering. The metering results along with the associated measured operating hours will be reviewed with the school district prior to contract signing. Fixture wattage will be determined from a combination of documentation on each fixture/ballast/lamp and spot measurements of representative fixtures or lighting circuits. The results of the verification will be presented with the M&V report.

### **Baseline Demand**

The baseline conditions identified in the pre-installation survey will be defined by McClure Company and verified by the Client. In the pre-installation survey, the equipment to be changed and the replacement equipment to be installed will be inventoried. The surveys include, in a set format, fixture, lamp, and ballast types; usage area designations, counts of fixtures; and location of occupancy sensors.

### **Fixture Wattage Metering**

McClure Company will take true RMS wattage measurements from a representative sample of the baseline and post-installation fixtures agreed upon by McClure Company and the Client. Readings will be averaged to determine per fixture wattage values. For post-installation fixtures, readings will be taken after the new fixtures have been operating for at least 100 hours. Meters used for this task will be calibrated and have an accuracy of +/- 2% of reading or better.

### **Adjustments to Baseline Demand**

Prior to installation of new lighting fixtures, adjustments to the baseline demand may be required for non-operating fixtures. In addition, after ECM installation, adjustments to baseline demand may be required because of remodeling or changes in occupancy.

With respect to non-operating fixtures, McClure Company will also identify any non-operating fixtures only as part of the pre and post installation electrical measurements. The report documenting the pre and post electrical readings will also document rooms that were included in the electrical measurements that had lamp or fixture failures. The number of lamps failed for each electrical reading will be documented. Non-operating fixtures are those that are typically operating but that have broken lamps, ballasts, and/or switches that are intended for repair.

For non-operating fixtures, the baseline electrical use is adjusted to account for failed lamps or fixtures for the pre-installation electrical readings. The adjustment is repeated for each failed lamp or fixture. A separate spreadsheet is included with the lighting measurement and verification report to document each instance of adjustment and the amount of the adjustment.

### Determining Energy Savings

The annual baseline energy usage is the sum of the baseline kWh for all of the usage areas. The post-retrofit energy usage is calculated similarly. The pre and post electrical readings will sample a total of at least 10 % of the total fixtures to be replaced or have an existing fixture get new lamps and ballasts. The electrical savings are measured as described below, the percentage savings achieved compared to the expected savings is the percentage of the total lighting savings McClure will report as saved. The energy savings are calculated as the difference between baseline and post-installation energy usage. The stipulated operating hours will be used for both the baseline and post-installation energy calculations.

$$kWh Savings_t = \sum_u [ (kW/fixture_{baseline} \times Quantity_{baseline} ) - ( kW/Fixture_{post} \times Quantity_{post} ) \times Hours of Operation]_{t,u}$$

Where:

*kWh Savings<sub>t</sub>* = kilowatt-hour savings realized during the post-installation time period *t*

*kW/fixture<sub>baseline</sub>* = lighting baseline demand per fixture for usage group *u*

*kW/fixture<sub>post</sub>* = lighting demand per fixture during post-installation period for usage group *u*

*Quantity<sub>baseline</sub>* = quantity of affected fixtures before the lighting retrofit adjusted for inoperative lighting fixtures for usage group *u*

*Quantity<sub>post</sub>* = quantity of affected fixtures after the lighting retrofit for usage group *u* and time period *t*

*Hours of Operation* = total number of post-installation operating hours (assumes number is the same before and after the lighting retrofit) for usage

## Sample Equipment Survey Data Sheet

Project: Lackawanna County

Dates: Pre-retrofit: Sept 13

Post-retrofit: Jan 14

Random Sample #	Bldg	IGA Line-by-Line # Bldg Location		Light Levels (fc's)	Measured Volts(RMS) (V)	Current Draw (amps)	Calculated Watts (W)
1	Visitors Center	4	Pre-retrofit	70	278.9	0.589	164.27
		Room A7	Post-retrofit	80	280.3	0.350	98.11
2	Visitors Center	6	Pre-retrofit	8 (avg)	281.1	0.295	82.92
		1 <sup>st</sup> Fl Halls	Post-retrofit	15 (avg)	280.9	0.184	51.69
3	Jefferson	7	Pre-retrofit	87	279.9	0.482	134.91
		Room A5	Post-retrofit	110	281.2	0.269	75.64
4	Jefferson	33	Pre-retrofit	26	281.1	0.379	106.54
		Lobby Entr.	Post-retrofit	23	279.8	0.121	33.86
74	Prison	750	Pre-retrofit	21	121.1	0.359	43.47
		Alpha Day Room	Post-retrofit	25	121.2	0.185	22.42
75	Prison	762	Pre-retrofit	24	119.9	0.609	73.02
		Hallway	Post-retrofit	29	119.9	0.435	52.16
Totals			Pre-retrofit				23,338.80
			Post-retrofit				11,560.99



### Sample Equipment Survey Data Sheet (cont.)

IGA Watts (W)	Stipulated Hours	Calculated Energy (KWh)	IGA Energy (KWh)	AS BUILT Fixture Types	NOTES
164	6,216	1,021	1,019	(1) 44SE	ONLY (1) FIXTURE SAMPLED
98	6,216	610	609	(1) LB44LP	
82	6,216	515	510	(1) 24SE	ONLY (1) FIXTURE SAMPLED
51	6,216	321	317	(1) LB24LP	
164	6,216	839	1,019	(1) 44SE	ONLY (1) FIXTURE SAMPLED
98	6,216	470	609	(1) LB44LP	
106	6,216	662	659	(1) 42SS	ONLY (1) FIXTURE SAMPLED
33	6,216	210	205	(1) LB22REF	
50	6,216	270	311	(1) 14EE	ONLY (1) FIXTURE SAMPLED
25	6,216	139	155	(1) LB14	
86	8,760	640	753	(1) 24EE	ONLY (1) FIXTURE SAMPLED
51	8,760	457	447	(1) LB24LP	
86	8,760	758	753	(2) 14EE	
51	8,760	455	447	(1) LB24LPTW	
86	6,216	449	535	(1) 24UEE	
51	6,216	211	317	(1) LB22REF	
576	6,216	3,578	3,580	(5) 34EE	ONLY (5) FIXTURES SAMPLED
380	6,216	2,358	2,362	(5) LB34LP	
22,711		136,558	133,109		
11,335		70,605	69,119		

Actual Power Savings for Sampled Group:	11.78KW
IGA Power Savings Projections for Sampled Group:	11.38KW
Actual Energy Savings for Sampled Group:	65,953KWh
IGA Energy Savings Projections for Sampled Group:	63,990KWh
Actual KWh Sampled/IGA KWh Sampled:	103.1%
IGA Savings Projections for Total Program:	282.10KW
Percentage of Total Retrofits Sampled:	4.0%
IGA Total Energy Savings Guaranteed:	1,779,537
Actual Total Energy Savings Based on Results of Sampled Group:	1,834,127
Contract Rate: \$	0.05527per KWh
Energy Cost Savings Guaranteed Based on IGA: \$	98,355
Actual Energy Cost Saved: \$	<b>101,372</b>

## **M&V**

### **Calculated Savings with Stipulated Variables- Building Envelope**

**Based on IPMVP Option: A**

**Applies to ECM: 12**

#### **ECM Definition**

The measures covered by this verification plan are the energy savings related to the reduced electrical and gas use associated with sealing and insulating the building envelope. The savings are determined by measuring the area of leaks that are sealed.

#### **Verification Method Overview**

Option A involves the use calculations based in how much insulation is added or cracks to the outside that are sealed. As part of the verification process and the measurement and verification report pictures of conditions prior to the building envelope improvements (baseline) and pictures of the same location after the building envelope improvements have been completed will be included. The stipulated variables are marked in italics below. The following variables are measured:

- Area where leaks repaired
- Building thermal conductance ( $U = 1/R$ ) based on building construction
- Heating Degree Days
- Cooling Degree days

Government web site to determine HDD and CDD

[www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/cdus/degree\\_days/](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/degree_days/)

#### **Baseline Demand**

The baseline is existing conditions and is not measured or calculated. The savings are calculated based on improvements to the building envelope.

#### **Determining Energy Savings**

##### **Infiltration Rate**

$$Q = k * dp^n * A$$

Q = average air flow infiltration in cubic feet per minute

A = Total infiltration crack area in square feet

*k = flow coefficient = 80 cfm/pascalf<sup>2</sup>*

*dp<sup>n</sup> = differential pressure across the crack opening due to wind*

*n = 0.65 from ASHRAE fundamentals*

*dp<sup>n</sup> = depend on average regional wind conditions*

##### **Air Leakage Cooling Loss Calculation**

Cooling loss per year (BTU/year) =  $60 * Q * \rho * c_p * CDD * 24$

*Rho = density = 0.075*

*Cp = specific heat = 0.24*

CDD = Cooling degree days (determined locally from weather conditions)

### **Conductive Cooling Loss**

Cooling Energy Lost per year (BTU/year) =  $U * A * CDD * 24$

$U = 1/R = \text{BTU/hr F ft}^2$

$A = \text{Area ft}^2$

CDD = Cooling degree days (determined locally from weather conditions)

### **Air Leakage Heat Loss**

Heat Lost per year (BTU/year) =  $60 * Q * \rho * C_p * HDD * 24$

Where:

60 min/hr

$Q = \text{Infiltration rate}$

$\rho = \text{density } 0.075 \text{ lb/ft}^3$

$C_p = 0.24 \text{ BTU/lb F}$

HDD = Heating Degree Days

Resulting Equation:

Heat Lost per year (BTU/year) =  $25.92 * Q * HDD$

**SCHEDULE M(a) - CERTIFICATE OF SUBSTANTIAL COMPLETION**

**PARTIES:** MCCLURE COMPANY (“McClure”)  
4101 North Sixth Street  
Harrisburg, PA 17110

And

COUNTY OF LACKAWANNA (Client” or “County”)  
200 Adams Avenue  
6th Floor  
Scranton, PA 18503

**DATE:** \_\_\_\_\_, 20\_\_\_\_\_

**PROJECT:** Performance Based Energy Savings Agreement between McClure Company and the County of Lackawanna dated July 16, 2014.

By executing this Certificate of Substantial Completion, Client acknowledges the following:

1. The work set forth in the Performance Based Energy Savings Agreement is substantially complete.
2. Client has “Beneficial Use” of the facilities and systems are operational such that Client could occupy and utilize the facility for its intended use in accordance with the defined construction schedule in prescribed within this Agreement.
3. Client has received pertinent system and equipment operations and maintenance manuals, manufacturer’s warranty information and initial training required under the Performance Based Energy Savings Agreement. Client acknowledges supplemental maintenance manuals, warranty information and training may need to be provided after the Substantial Completion date.
4. The warranty as defined in the Performance Based Energy Savings Agreement is in full effect as of the date of this Certificate of Substantial Completion.
5. The following punch list items must be completed by McClure Company (check as applicable):

- Punch list attached
- Punch list complete

6. Upon completion of the punch list items, or if such punch list items are complete, McClure and Client shall sign the Certificate of Final Completion attached hereto.

**CLIENT:**  
Signature: \_\_\_\_\_  
Printed Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**MCCLURE COMPANY:**  
Signature: \_\_\_\_\_  
Printed Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**SCHEDULE M(b) - CERTIFICATE OF FINAL COMPLETION**

**PARTIES:** MCCLURE COMPANY (“McClure”)  
4101 North Sixth Street  
Harrisburg, PA 17110

And

COUNTY OF LACKAWANNA (Client” or “County”)  
200 Adams Avenue  
6th Floor  
Scranton, PA 18503

**DATED:** \_\_\_\_\_, 20\_\_\_\_\_

**PROJECT:** Performance Based Energy Savings Agreement between McClure Company and the County of Lackawanna dated July 16, 2014.

By executing this Certificate of Final Completion, Client acknowledges the following:

1. The work set forth in the Performance Based Energy Savings Agreement has been reviewed and determined by Client to be fully complete.
2. Client accepts the work as complete and hereby releases McClure’s obligations under and performance and payment bonds posted for the project as of the date set forth above.
3. Client agrees to release to release final payment within thirty (30) calendar days as of the execution date set forth above. Interest at a rate of 0.5% per month will accrue on all unpaid balances more than (30) calendar days after the date set forth above.

**CLIENT:**  
Signature: \_\_\_\_\_  
Printed Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**MCCLURE COMPANY:**  
Signature: \_\_\_\_\_  
Printed Name: \_\_\_\_\_  
Title: \_\_\_\_\_

## Attachment A – Scope of Work

### ECM 1 – PRISON HVAC UPGRADES

#### Areas Implemented

✓ Prison

#### Proposed Solution

McClure Company is proposing to replace the existing roof top units (RTUs) that provided heating and cooling to a majority of the Prison. The units were installed during the last renovation in the late 1990's and are in poor condition, operating beyond their useful life.

The majority of the Prison is conditioned by (39) Carrier packaged rooftop units (RTUs). The existing units are equipped with direct expansion (DX) cooling and natural gas heating ranging in size from 5 to 30 tons. The units are approximately 16 years old and, while operational, are at the end of their anticipated useful life. The units have been a maintenance concern for some time and require frequent service and repairs.

In addition to the RTUs there are (15) Venmar rooftop energy recovery units (ERVs) which pre-treat the outside air to (15) packaged rooftop units. The energy recovery units are equipped with a flat plate heat exchanger capable of transferring sensible heat only between the exhaust and outdoor intake air paths. The units are also approximately 16 years old and are operational. While the units are operational, advances in energy recovery technology provide an opportunity for replacement with units capable of recovering both sensible and latent heat, thus increasing the overall effectiveness of the ERV.



Typical Packaged Rooftop Unit



Typical Energy Recovery Unit

McClure Company is proposing to remove the (39) packaged RTUs and the (15) ERVs. The RTUs will be replaced in kind with DX/gas units. The new RTUs will include lead stage variable speed scroll compressors to limit compressor cycling and more closely match building load during part load operation. Where RTUs serve areas with varying occupant densities, such as gymnasiums, exercise rooms, etc., demand control ventilation (DCV) will be incorporated. DCV reduces outside air to a space when the space is unoccupied or operating at reduced occupancy, thus reducing energy usage when outside air is not required.

Demand controlled ventilation using carbon dioxide sensors combines two technologies: advanced gas sensing and an air handling system that uses data from the carbon dioxide sensor to regulate ventilation. Carbon dioxide sensors continually monitor the air in a conditioned space. Since people exhale carbon dioxide the difference between the indoor CO<sub>2</sub> and the level outside the building indicates occupancy and/or activity level and thus ventilation requirements. The sensors send CO<sub>2</sub> readings to the ventilation controls, which automatically increase ventilation when CO<sub>2</sub> concentrations in a zone rise above a specified level.

Either too little or too much fresh air in a building can be a problem. Over-ventilation results in higher energy usage and costs than are unnecessary with appropriate ventilation, while potentially increasing IAQ problems in warm humid weather. Inadequate ventilation leads to poor air quality that can cause occupant discomfort and health problems. To ensure adequate air quality in buildings, the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) recommends ventilation rates in ASHRAE 62. To meet the standard, many ventilation systems are designed to supply air at the maximum level whenever a building is occupied as if every area were always at full occupancy. The result in many cases has been buildings that are highly over-ventilated. The development of CO<sub>2</sub> based demand control was driven in part to satisfy ASHRAE 62 without over-ventilating. A CO<sub>2</sub> level around 1,100 ppm (a differential of 700 ppm, assuming outdoor air level is around 400 ppm) indicates the ventilation rate has dropped below acceptable levels.

To avoid the problems of too much or too little fresh air, the terminal equipment can employ demand control ventilation to adjust the ventilation air supplied to an indoor space according to the occupancy level. CO<sub>2</sub> sensors have emerged as the primary technology for monitoring occupancy and implementing demand control ventilation.

The ERVs will be replaced with new units equipped with total energy recovery wheels. The total energy recovery wheel allows for the transfer of both sensible and latent energy; and therefore; reduces the amount of energy required to temper outside air when compared to the sensible only flat plate heat exchangers that are existing.

As part of ECM 6, all new units will be integrated into the new web based direct digital control system. With the new DDC system in place, specific RTUs will be able to leverage scheduling and DCV strategies to minimize energy use during non/low occupied times. Typical spaces that will be scheduled include gymnasiums, laundry, offices, kitchen, and medical offices. Currently there is minimal control of the schedule that controls the operation of these units resulting in a simple occupied/unoccupied operation at best. By fully engaging the new DDC system with the modern RTUs featuring modulating compressors and heating capabilities, McClure Company will be better able to meet the specific loads of the facility during all times, including during unoccupied times.

### **Scope of Work**

- ✓ Remove (39) Carrier packaged rooftop units.
- ✓ Remove (15) rooftop, sensible only, flat plate style energy recovery units.
- ✓ Installation of (39) new packaged rooftop units as manufactured by Aeon.
- ✓ Installation of (15) rooftop, total energy recovery, wheel style, energy recovery units. Basis of design manufacturer – Greenheck.
- ✓ New DDC controls for RTUs and ERVs as part of ECM 6.
- ✓ Full system startup and commissioning.

## ECM 2 – PRISON KITCHEN HOOD CONTROLS

### Areas Implemented

✓ Prison

### Proposed Solution

The two (2) existing kitchen makeup air units serving the Ventmaster kitchen hoods are to be retrofitted with an Energy Management System. The Energy Management System is designed to automatically reduce exhaust and supply airflow quantities while still completely capturing & containing heat and smoke generated by the cooking appliances.

Using the Energy Management System, the existing exhaust fans and the supply fans will modulate between factory set low speed and high speed. The low speed will be an idle speed that will be engaged when no cooking is detected. This modulation from low to high speed is dependent on the duct temperature sensed. A 100% airflow override button is also supplied with an adjustable timer.

The modulation of the fans between low and high speed is enabled by new variable frequency drives contained within the Energy Management System. The variable frequency drives reduce the airflow by approximately 20% when the cooking appliances are at idle temperature. The modulation of the fans during cooking operation allows for maximized energy savings versus a fan running on high speed during the same cooking period.

An adjustable, fully modulating temperature sensor is mounted in the exhaust duct and monitors the exhaust air temperature. The sensor then works in conjunction with a panel mounted temperature controller.



Existing hood make up air units



## ECM 3 – PRISON REFRIGERATION UPGRADES

### Areas Implemented

- ✓ Prison

### Proposed Solution

McClure Company is proposing to remove and replace the refrigeration equipment associated with the (2) walk in coolers and (1) walk in freezer at the Prison. The new equipment will feature higher efficiency condensing and evaporating units, as well as new insulated copper refrigerant lines.

The prison currently utilizes (2) walk in coolers and (1) walk in freezer. The existing refrigeration equipment is manufactured by Witt and is original to the last renovation, making it approximately 15 years old. The equipment is in poor condition and is not operating as intended or with good levels of efficiency.

McClure Company is proposing to replace the existing equipment and connecting refrigerant lines with new equipment as manufactured by Russell Heat Transfer Products, or approved equal. All motors for the evaporators will be electronically commutated (EC), or brushless DC motors. The EC motors provide a substantial increase in efficiency over the standard motors typically used in these systems.



Existing condensing unit



Existing evaporator with frozen coil in freezer. The ice prevented the fan from operating properly

## ECM 4 –PRISON PLUMBING UPGRADES

### Areas Implemented

✓ Prison

### Proposed Solution

McClure Company is proposing to install a new plumbing control system that will provide abuse control and incorporate lower flow flushometers located in inmate housing areas. The new system will include upgrades to showers and combination toilet/sink fixtures located within cells.

There are approximately (469) combination fixtures located throughout the facility, with each housing unit containing (32) to (60) fixtures. The fixtures utilize pneumatic control for operation of the water valve that allows the fixture to operation for a predetermined amount of time, but as many times as the button is pressed. The existing fixtures are stainless steel sink/toilet combination units with the original high flow flushometer. The existing system allows for continual flushing and repeated sink use (in preset increments) without lockout timers or the ability for the facility to provide controlled lock out. This abuse along with the proper use of the fixtures has contributed to a higher than expected water usage of approximately 29 million gallons per year. For similar facilities 60-75% of the total water usage can be attributed to fixtures serving inmates. The continual “abuse”, along with the flow rates of the existing equipment provides a great opportunity to install a plumbing control system cable of providing abuse lock out and minimizing flow.

In addition to the combination fixtures, approximately (10) standard sinks are also located in inmate use areas and are subject to abusive usage.

There are approximately (56) ADA showers with both standard shower heads and associated hand wands, along with (7) standard showers. Again, these fixtures are subject to continual abuse from inmates and utilize a pneumatic control to limit operation time, but not operation cycles. Prison personnel provided details as to showers operating for hours or days without timing out. There is no lockout feature on the existing fixtures to prevent continual operation by repeatedly pressing the control button. Given the prolong abuse, some of the existing control functionality has failed, allowing showers to run constantly until manually shut off and controls repaired by maintenance staff.

McClure Company is proposing to install a plumbing control system as manufactured by I-CON or equal. The system uses low voltage and battery operated solenoid valves to provide water when engaged. The system has a customizable setting for preset run time (how long water flows), lock out (number of operation cycles till disabled), and lock out time (how long system is locked out till reset). This system will be implemented across all fixtures utilized by inmates.

The controller is an electronic device that manages the operation of plumbing valves. When an input signal is received from a sensor, the controller sends an output signal to the solenoid directing it to open the valve and close the valve after a pre-programmed time, depending on the application. Controllers are sized to handle from one to multiple applications and are available in battery and 24 VAC versions. Controllers can also be networked together and then can be linked to a central control computer system that allows for lockdowns, searches, data collection, and other enhanced features.

The controller used for control of the combination units will feature a new 1.6 gallon per flush (GPF) flushometer to replace the existing, high flow, 3.5 GPF unit. The combination of lower flow by the new flushometer when combined with the lock out feature of the controller can drastically impact the water usage. The controller will also command the usage of the faucet contained within the combination unit. Outside of the combination units, new controllers will be installed on standard porcelain lavatories and toilets. While not reducing flow, these units will offer protection from abuse through the lock out feature. Expected settings found in similar facilities allow for 2-3 flushes per hour with a lock out of 30-60 minutes when the number of flushes is exceeded. Typical sink operation allows for 15-30 seconds of washing, repeatable for 3-4 cycles per 30 minutes before lockout.

Additionally, McClure Company will install controllers for all inmate showers. Operating in much the same manner, the controller is intended to limit abuse of the fixtures. Typical operation allows for 3-5 minutes of operation, repeatable for 2-3 cycles before a 60 minute lock out period.

All timing and lock out settings are fully customizable to match existing operation or allow for standardization of operation throughout the facility. Each fixture will receive a new control sensor button.

## ECM 5 – PRISON LAUNDRY SYSTEM UPGRADES

### Areas Implemented

✓ Prison

### Proposed Solution

McClure Company is proposing to install a new ozone-based laundry system designed to reduce both cold and hot water cycles for the (2) 150 lbs Milnor washers. The system will not be installed on the 35 lbs Milnor or 150 lbs Unimax washers.

With the application of ozone, the system will also be incorporating additional disinfection protection of linen during the wash operations. The ozone system destroys microorganisms such as Aspergillus Niger and other fungi; staphylococcus; Bacillus megaterium; and E. coli, among many others. In addition to water, energy, and chemical savings, the use of ozone in laundries also reduces linen replacement costs by reducing chlorine in the washing cycles. (Chlorine is a key contributor to linen degradation).

#### Lackawanna County – Prison Laundry Ozone

Equipment Mfr.	Size	Install Ozone System (Y/N)
Milnor	35 lbs	No
Milnor	150 lbs	Yes
Milnor	150 lbs	Yes
Unimax	150 lbs	No

The Lackawanna County Prison has 4 washing machines, 2 of which are good candidate for retrofit with an ozone system. The washing machines use several different programs for the different wash materials they process. Each program has a series of fills and drains, using either hot or cold water plus chemicals appropriate for the type of program and washer being used.

An ozone system will be installed for the washing machines listed above. Current methods of chemical soil removal require temperatures ranging from 140 to 170°F. Depending on the type of material being washed, ozone, a powerful oxidizing agent, will reduce the required temperature to between 100 and 130°F and completely eliminate the need for heat in some cycles. Because the addition of ozone will make the washing process more efficient, a reduced run time and corresponding reduction in electricity consumption will occur. In addition, the oxidizing effect reduces soil levels allowing for reduced chemicals and lower fill levels or elimination of whole cycles from a program.

## ECM 6 – PRISON EMERGENCY GENERATOR UPGRADES WITH CHP

### Areas Implemented

- ✓ Prison

### Proposed Solution

McClure Company is proposing to install a new 600 kW Diesel generator to provide emergency backup power to the building life safety systems. In addition, the installation of (3) 75 kW combined heat and power (CHP) generators is proposed. The CHP units are capable of providing supplemental energy to the proposed 600 kW generator during emergency situations. As a result of other energy conservation measures (ECMs) and advance control strategies limiting peak demand and usage, the combined capacity of the units will be sufficient enough to carry the facility during power outages. The new CHP units will be installed in the boiler room.

The Prison is currently served by (1) 400 kW Detroit Diesel generator that provides emergency backup power to life safety systems only. The existing generator is not large enough or properly connected to the facility to provide full back up power.

In order to provide full back up power, McClure Company is proposing to install a new 600 kW diesel generator as well as (3) supplemental 75 kW gas fired combined heat and power generators. CHP basis of design is Aegis TP-75LES. While primarily installed to provide supplemental emergency power, the CHP unit offers other benefits that make it more advantageous when compared to a standard generator. Rather than only operating during test events and emergency situations, CHP units are best utilized when they can run constantly, providing electrical energy and reclaiming the heat from the process to provide ancillary heating to a system.

At the Prison there is currently a year round heating load requirement for domestic hot water. Using the CHP units, “waste” heat from the generation of electricity will be reclaimed, via a heat exchanger, and used to provide the heating energy for the domestic and building heating hot water systems. The CHP system will be interfaced with the proposed boiler upgrades in ECM 8. During low heating load periods, the heat exchangers will be bypassed or the units cycled off, based on the economics of operation. The potential heat reclaimed from the CHP unit should offset the need to operate the heating hot water boilers for domestic hot water generation purposes during much of the shoulder and summer months.

The CHP unit will use natural gas and operate, similar to an emergency generator in creating the electrical energy, which will be fed into the buildings circuits by new paralleling switchgear and a 2000/3P, 480V electrically operated breaker with distribution switchboard. This will allow the electricity to be used by the facility anytime the unit is operating, effectively lowering the demand and usage of the facility by the power provided by the CHP. The system output voltage will be 480 VAC, 3 phase at 60 Hz with a power factor of 1.0. A glycol/water mix will be circulated through the CHP unit jacket. The mix will then be pumped to a plate and frame heat exchanger which will transfer heat from the glycol/water mix to the boiler water system. When the building domestic hot water and heating hot water demand is not sufficient enough to remove the necessary heat from the CHP glycol water mix, the mix will be diverted to be dissipated by a



Existing 400 kW emergency generator



remote cooling radiator. The exhaust pipes from the CHP units will be extended out through the exterior wall and terminated. New louvers will be installed in the exterior wall of the mechanical room to provide combustion air, ventilation air and relief air to the new CHP unit.

While not an instantaneous emergency generation system, such as the new 600 kW Diesel generator which can synchronize to the building systems in less than a few moments, the CHP unit will have to undergo a restart in which it will synchronize with the frequency of the new 600 kW generator. This process may take 5-10 minutes, but once operating, the unit can provide full power as a supplementary emergency generator. The sequence of operation would be to use the existing generator as the primary emergency backup, allowing the CHP unit to restart and synchronize with the system before providing power to all systems. Once utility power is restored to the facility, the unit will cycle off and resynchronize to the utility power grid frequency.

As a result of other ECM's at the Prison the effective peak load should be reduced sufficiently to allow the two units to fully remove the facility from the grid. This may require implementation of some advanced control strategies that are now feasible with the new RTU's and control system (ECMs 5 & 6) such as temporary temperature setback, staggered starting of equipment, and equipment cycling based on demand.

### **Scope of Work**

- ✓ Installation of (1) new 600 kW diesel emergency generator (or approved equal).
- ✓ Installation on (3) new Aegis TP-75LES CG132-08 CHP units (or approved equal).
- ✓ Installation of CHP exhaust pipes.
- ✓ Installation of (1) plate and frame heat exchanger.
- ✓ Installation of piping and pumps required to interface CHP glycol/water mix with building domestic hot water and heating hot water systems.
- ✓ Installation of (2) louvers in mechanical room exterior wall to provide combustion air, ventilation air and relief air to the CHP unit.
- ✓ Installation of (1) remote radiator, on grade, and interconnecting piping to connect to the CHP unit.
- ✓ New DDC controls for CHP system.
- ✓ Full system startup, combustion testing and commissioning.

## ECM 7 – PRISON STEAM TO HOT WATER CONVERSION

### Areas Implemented

- ✓ Prison

### Proposed Solution

McClure Company is proposing to retrofit the existing gas fired steam central plant to a hot water central plant through boiler conversions and installation of hot water central plant equipment, such as pumps and domestic hot water (DHW) units.

The existing steam central plant for the Prison consists of (3) 4000 MBH gas fired Bryan Water Tube steam boilers. The boilers are natural gas fired and are approximately 16 years old. The boilers are in good condition and operable.

The low pressure steam plant serves (4) steam to hot water, shell and tube heat exchangers. Heat exchanger (C-2) makes 180°F heating hot water serving miscellaneous hydronic heating equipment throughout the Prison. Heating hot water is circulated through the Prison by (2) 7.5 HP heating hot water pumps. The remaining heat exchangers make domestic hot water for a portion of the Prison. Heat exchanger, C-1 makes 140°F domestic water to serve the Kitchen. Heat exchanger, C-3 makes 160°F domestic hot water to serve the Laundry. Heat exchanger C-4 makes 120°F domestic hot water to serve the Minimum Security area of the Prison.



Existing Bryan Boiler

McClure Company is proposing to convert (3) existing steam boilers to heating hot water boilers. Given the boilers are in good condition and have useful life remaining the opportunity to convert them to hot water boilers is advantageous. The conversion will allow for the boilers to continue operating, but at a higher overall system efficiency since there is no conversion to hot water through a heat exchanger or large stand by losses that are associated with steam systems.

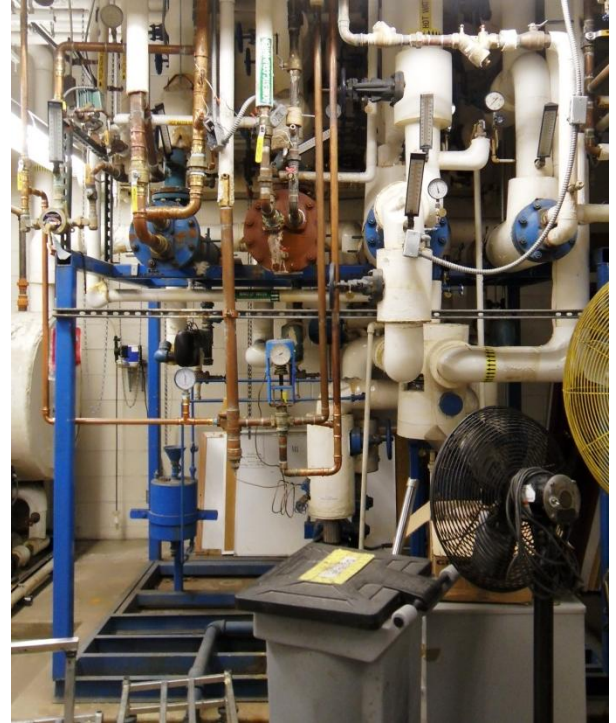
The associated condensate receiver, condensate return system and all steam piping in the mechanical room will be removed. Domestic service heat exchangers C-1, C-3 and C-4 will be removed. The separate domestic hot water services, serving the Kitchen, Laundry and Minimum Security will be combined and served by (1) 1250 gallon storage water heater. Storage water heater, basis of design is Hubbell BHW. The storage water heater shall generate domestic hot water using the building heating hot water provided by existing Bryan boilers. Master mixing valves will be installed to mix 160°F water down to serve the 140°F and 120°F domestic hot water loops.



Typical Bryan Water Tube Steam Boiler

## Scope of Work

- ✓ Convert (3) steam producing Bryan water tube boilers to produce heating hot water.
- ✓ Removal of (2) 7.5 HP heating hot water pumps.
- ✓ Installation of (2) new 15 HP heating hot water pumps with premium efficiency motors and associated VFDs.
- ✓ Installation of new piping to connect existing heating hot water system to existing boilers.
- ✓ Installation of (1) new Hubbell storage domestic water heater (or approved equal).
- ✓ Installation of (2) master mixing valves to provide hot water to 140°F Kitchen and 120°F Minimum security domestic hot water loops.
- ✓ New DDC controls for central plant heating equipment.
- ✓ Full system startup, combustion testing and commissioning.



Existing Heat Exchangers



## **ECM 8 – PRISON INMATE CELL CABLE AND POWER**

### **Areas Implemented**

✓ **Prison**

### **Proposed Solution**

McClure Company is proposing to install power wiring and cable to each cell excluding Disciplinary Confinement and Special Handling. Each cell will have the appropriate number of hookups to accommodate the number of inmates assigned to the cell.

Currently the facility has no individual power or cable system available to the inmates. Group areas may have access to selective cable and power providing a single source for each cell wing to view. As part of this proposal, McClure Company will provide RG6 cable from a centralized electrical closet to each cells with 1 or 2 hookups per cell dependent upon cell occupancy. The cable will terminate on a combination outlet with 120V electrical service. There will be 7-8 cells on each 20A circuit. A lock out or de-energizing feature will be incorporated into the electrical service for each cell to prevent unauthorized usage of the electrical power.

Cable service can be provided by Correctional Cable TV (CCTV) or approved equal. CCTV will provide the necessary communication devices to receive the selected programming package and connect to the installed infrastructure described above.

Through implementation of this upgrade, McClure Company will be providing the necessary power and cable infrastructure to support the CCTV system. All other components for this to be a fully functioning system will be coordinated between the selected provider and the County, which shall include but not limited to; front end equipment, cable boxes, program selection, annual service agreement, individual televisions, etc.

## ECM 9 – COURTHOUSE RECOMMISSIONING

### Areas Implemented

- ✓ Courthouse

### Proposed Solution

McClure Company is proposing to re-commission (retro-commission, RCx) the mechanical systems at the Courthouse. The Courthouse has been identified as a good candidate for an RCx effort based on the overall condition of the major equipment, existing level of automation controls, and current building performance.

Given the dynamics of each system within the facility, a specific plan will be developed and tailored for each system to properly test the equipment and rate each based on desired performance. Through slight modifications to the existing control schedules, set points and optimizing the algorithms, the County will be able to operate the facility at peak efficiency *without* compromising occupant comfort or equipment operations. Though recently renovated and just out of a commissioning process, there is still ample opportunity. The new equipment and controls makes this particular re-commissioning effort a low cost /no cost solution.

Typically the building and system commissioning following a standard construction project is only concerned with providing equipment operation to meet design data, such as airflows or set points, minimizing occupant discomfort, and ensuring equipment has necessary inputs, such as flow or power. This commissioning combats two of the three important aspects of a proper functioning system, occupant comfort and equipment operation. However, by leveraging the advanced control system and spending time to investigate the actual use of the facility, it is fairly easy to incorporate the third aspect, energy. While still conscientious of the first two aspects, McClure Company is proposing to investigate and complete the third aspect through modifications to the existing control logic.

A typical re-commissioning effort will include (but not limited to):

- Calibrating indoor and outdoor air sensors. In addition to tuning to calibrating sensors,
- Calibrating and inspecting damper and valve controls. Outside air dampers will also be inspected to ensure it is closed when the air handling equipment is indexed to the unoccupied mode of operation.
- Detailed review of all operating schedules. Often control schedule remain unchanged while building occupancy will change. Another area of concern is over time for many reasons the mechanical equipment does not follow the schedule resulting in more hours of operation than required by actual occupancy.
- Detailed review of current sequence of operations for major and terminal equipment.

The RCx has already started with a detailed audit of the entire building including individual short term metering of major equipment operation and temperatures. Operating schedules, temperature set points, discharge temperatures, outdoor air damper control, fan start / stop, pump operation, boiler burner operation, and many other parameters have already been reviewed and metered as part of this proposal. Enhancing all operating parameters results in substantial savings and provides a great return on investment.

Although a specific plan is developed for each building, McClure Company utilizes the industry standard retro-commissioning protocol developed by the National Environmental Balancing Bureau (NEBB), as the base procedure for all re-commissioning plans. The systematic approach our Project Development Team and 3<sup>rd</sup> Party Commissioning Agents (if utilized) outlined in the manual serves as the fundamental guidelines for designing each re-commissioning effort.

McClure Company has the in house expertise to implement the re-commissioning effort, however, in some instances; we may call upon 3<sup>rd</sup> parties to assist us in the effort. These 3<sup>rd</sup> parties range from NEBB certified commissioning agents and balancers to consultants well versed in retro-commissioning.

## Scope of Work

- ✓ Coordinate with selected control vendor to provide review of existing control logic and control parameters
- ✓ Review typical operating procedures of the facility with the County to develop improved scheduling on a system by system basis
- ✓ Develop and integrate new control parameters and logic to meet the expected operation of the equipment while still conscious of the energy impact
- ✓ Investigation into any improperly operating equipment, including, but not limited to, control actuation, OA dampers, motor operation, air flow balancing, water flow balancing, and sensor calibration as may be required to properly implement the new control logic
- ✓ Full testing and commissioning of new control logic to ensure proper operation.

## **ECM 10 – PRISON PAPER TOWEL DISPENSER REPLACEMENT**

### **Areas Implemented**

- ✓ **Prison**

### **Proposed Solution**

McClure Company is proposing to replace approximately (15) paper towel dispensers with new high speed hand dryers.

The large use of paper towels translates to a considerable amount of O&M savings as a result of eliminating the need to purchase paper products and eliminates large amounts of paper waste from the County. The new high speed dryers utilize series commutated motors to minimize the energy use of the equipment while still providing up to 16,000 linear feet per minute of air. These features lead to shorter drying times with minimal energy use.

New hand dryers will be installed as close to locations of the removed paper towel dispensers as possible, while still allowing for electrical connections for the equipment. Certain installations may require surface mounted wire mold to conceal the electrical wiring. Wiring will be to the nearest circuit and hardwired where possible.

## ECM 11 – COUNTY WIDE LIGHTING UPGRADES

### Areas Implemented

- ✓ McDade Park
- ✓ Aylesworth Park
- ✓ County Prison
- ✓ 911 Center
- ✓ Covington Park

### Proposed Solution

McClure Company is proposing to replace or retrofit the existing inefficient lighting systems throughout Lackawanna County at the above listed facilities.

The lighting audit conducted on May 13<sup>th</sup> through 15<sup>th</sup> revealed a total of 4,274 interior and exterior fixtures that contained a combination of T-12 / T-8 fluorescent lighting, incandescent lighting and high intensity discharge mercury vapor and metal halide fixtures. Fixtures overall are in good condition and operational. Due to the overall condition of the existing fixtures, the process of retrofitting to new fixtures has been very selective. Therefore, a majority of this project will be a re-lamp/re-ballast of existing fixtures to more efficient lamps/ballasts. In addition to the retrofit of the current design, occupancy sensors will be installed in various areas to help decrease the amount of energy used by the limiting the new lights run time while the area is unoccupied.

By using a holistic approach in relamping/reballasting, the County will have a common stock of lamps/ballasts to pull from for future maintenance.

### Design

Aside from energy savings, as mentioned above, implementing this ECM allows the County to standardize on lamp stock. A non-proprietary, proven lamp and ballast combination has been selected that will provide the greatest performance and energy savings of the lighting systems considered. The ballasts provide a greater level of energy savings over the standard T-8 ballast and incorporate an intelligent voltage capability allowing the ballast to be used on both 120v and 277v applications.

The proposed T-8 lamps are a premium, high lumen, extended life type that again yields better results versus standard grade T-8 Lamps. For this project a 25-watt energy saving lamp has been selected. This lamp and ballast system will provide the greatest energy savings of the various lamp/ballast options explored, and will greatly improve the efficiency of the existing T-12/T-8 linear fluorescent lighting system by utilizing the latest in T-8 fluorescent technology. This retrofit strategy will maintain light levels while still providing a reduction in energy usage. In addition to retrofitting the existing linear lamp fixtures we also work to standardize lamp stock inventories by eliminating expensive U-tube lamps and eight-foot lamps. These fixtures would be modified to accommodate the appropriate number of linear lamps to provide comparable light levels and reduced energy consumption.

The design strategy for the use of incandescent lamps is to eliminate where possible. In applications where it is used as a primary source of illumination and sufficient operating hours are present, we will replace the existing incandescent fixtures with new fixtures utilizing LED lamps for greater energy savings. In areas where incandescent fixtures are the primary light source but have limited operating hours we will replace the incandescent lamps with a self-ballasted



screw-in LED Light. Compact fluorescent lamps and LED bulbs offer a tremendous energy savings potential and a significantly longer operating life when compared to incandescent.

In general, this ECM will include:

- Existing T8 32W fixtures will be replaced with T8 25W fixtures and ballasts.
- Existing T12 40 W fixtures will be replaced with T8 25W fixtures and ballasts.
- Existing incandescent bulbs will be replaced with equivalent LED bulbs.
- Existing incandescent / fluorescent exit signs will be replaced with LED units.
- The general lay-in 4L & 3L T8 fixtures will match the T12s and receive a reflector - delamp retrofit with 25 watt T8 lamps and normal power ballast.
- The general lay-in or surface mounted 2L and 1L T12 & T8 fixtures called for lamp for lamp retrofit with 25 watt T8 lamps and low power ballast, no delamping or reflector.
- Where U-bend T12 or T8 bulbs were found, a reflector will be used to convert the fixture to accommodate linear 2' T8 lamps and normal power ballast.

#### **Prison:**

- Fixtures with two 4-foot F40 T12 lamps and standard ballast will be retrofit with two 4-foot F25 T8 lamps and low-power electronic ballast.
- Fixtures with two, three or four 2-foot F17 T8 lamps and normal-power ballast will be retrofit with low-power ballast.
- Fixtures with two or three 4-foot F32 T8 lamps and high-power ballast will be retrofit with two or three 4-foot F25 T8 lamps and low-power ballast.
- Fixtures with 150-watt incandescent lamps will be relamped with 20-watt PAR 38 LED bulbs
- 150- and 200-watt metal halide high bays will be retrofit with 36-watt LED screw-ins
- 175-watt high pressure sodium wallpacks will be replaced by new 40-watt LED wallpacks
- 250-watt metal halide floods will be replaced by new 50-watt LED floods.
- 400-watt high pressure sodium floods will be replaced by new 140-watt LED shoeboxes with adjustable arms.
- 400-watt metal halide shoeboxes will be replaced by new 140-watt LED shoeboxes with fixed arms
- 400-watt metal halide wallpacks will be replaced by new 60-watt LED wallpacks.
- Fixtures with 60-watt incandescent lamps will be relamped with 12-watt LED A-lamps.
- Fixtures with 50-watt halogen lamps will be relamped with 4-watt LED lamps.
- 250-watt metal halide high bays will be replaced by surface mounted box fixtures with three T5 fluorescent lamps (There is no cost-effective LED option for this application.)
- Fixtures with two 13-watt compact fluorescents will remain unchanged because they are already energy efficient.

#### **McDade Park:**

- Fixtures with one 3- or 4-foot T12 lamp and standard ballast will be retrofit with one 3- or 4-foot F25 T8 lamp and low-power electronic ballast
- Fixtures with two 3- or 4-foot T12 lamps and standard ballast will be retrofit with 3- or 4-foot F25 T8 lamps and electronic ballast.

- Fixtures with two 8-foot F96 T12 lamps and standard ballast will be retrofit with two 8-foot F96 T8 lamps and electronic ballast.
- Fixtures with four 4-foot F40 T12 lamps and standard ballast will be retrofit with four 4-foot F25 T8 lamps and low-power electronic ballast.
- Fixtures with one 4-foot F32 T8 lamps and normal-power ballast will be retrofit with one 4-foot F25 T8 lamp and low-power ballast
- Fixtures with two, three or four 4-foot F32 T8 lamps and high-power ballast will be retrofit with two, three or four 4-foot F25 T8 lamps and low-power ballast.
- Fixtures with 100-watt incandescent lamps or 13-watt compact fluorescent lamps will be relamped with 12-watt LED A lamps.
- 150-watt metal halide cobraheads will be replaced by new 30-watt LED area lights.
- 150-watt metal halide high bays will be replaced by new 36-watt LED screw-ins
- 175- and 250-watt metal halide floods will be replaced by new 50-watt LED floods
- Fixtures with 60- or 75-watt incandescent lamps will be relamped with 12-watt LED A lamps.
- 70-watt high pressure sodium and metal halide wallpacks will be replaced by new wall-mounted security lights with 14-watt LED lamps and sensors
- 70-watt metal halide high bays will be replaced by new 38-watt LED canopy lights
- 75-watt incandescent floods will be relamped with 20-watt LED PAR 38 lamps.
- Fixtures with two 26-watt compact fluorescent lamps will be replaced by new canopy lights with one 38-watt LED lamp.
- 45-watt compact fluorescent screw-ins will be replaced by new wall-mounted security lights with 14-watt LED lamps and sensors
- Exit signs with four 7.5-watt incandescent lamps will be replaced by new exit signs with 2-watt LED lamps.
- 250-watt metal halide cobrahead at the pool will be left unchanged, per customer's request.

#### **Aylesworth Park:**

- Fixtures with two 4-foot F32 T8 lamps and high-power ballast will be retrofit with two 4-foot F25 T8 lamps and low-power ballast
- Fixtures with four 4-foot F32 T8 lamps and normal power ballast will be retrofit with two 4-foot F25 T8 lamps with reflectors, or with four 4-foot F25 T8 lamps, and low-power ballast.
- 70-watt metal halide floods will be replaced by new 30-watt LED floods
- 70-watt metal halide wallpacks will be replaced by new wall-mounted security lights with 14-watt LED lamps and sensors
- Fixtures with two 26-watt compact fluorescent lamps will be replaced by new canopy fixtures with one 38-watt LED lamp.
- Fixtures with 15-watt compact fluorescent screw-ins will be relamped with 12-watt LED A lamps.
- 2x4 fixtures with four T5 lamps and reflectors will be left unchanged because they were recently installed and already energy efficient.

#### **Covington Park:**

- Fixtures with three 4-foot F32 T8 lamps and normal-power ballast will be retrofit with three 4-foot F25 T8



lamps and low-power ballast.

- 100- and 250-watt metal halide wallpacks will be replaced by new 40-watt LED wallpacks
- Fixtures with two 26-watt compact fluorescent lamps will be replaced by new wallpacks with one 40-watt LED lamp.

At the end of this ECM section is the detailed lighting fixture line by line listing data for each existing and proposed fixture.

### **Grants, Rebates and Tax Incentives**

Certain lighting retrofit projects may qualify for grants rebates and/or tax Incentives. These incentives, which are provided by Federal and State Governments, and by local utility companies, can vary greatly from one region of the country to another. Since the program timeline incentives may change from time to time, and since they may be limited to specific types of technology or products, we track and monitor these variables and work to design our projects to take full advantage of the offerings.

The following are the Grants, Rebates, and Tax Incentives that may be applicable to this project:

Utility Rebate with PPL \$ 55,931\*

\*The rebate amount is valid for the duration of the Utility's incentive program and may change as the Utility's program changes.

### **Material Disposal**

#### ***Recycling / Hazardous Waste Disposal***

Disposal will be provided through a certified and approved hazardous waste recycler for all lamp and ballast waste both hazardous and non-hazardous that is associated with the energy efficient lighting upgrade in the facility. This will eliminate any need for the county to seek outside lamp/ballast disposal methods for this material. This service is comprehensive and includes the containment drums, lamp shipping packing cartons, waste receptacles, transportation, labor and all on and off site handling to complete the process. A completed document/certificate showing proof of total destruction of all lamp and hazardous ballast waste can be provided back to the county for their records.

#### ***Spare Lamp, Ballast and Sensors Materials***

As part of the lighting scope proposal, there will be furnished, at no additional cost to the county 3% of the total number of installed lamps for shelf stock. Ballast shelf stock will also be furnished for a total of 3% of the total installed number of ballasts on the project. There will be no shelf stock of LED fixtures. Future replacement lamps and ballasts can be purchased at most electrical distributors.



## Operating Hours

The operating hours are as follows:

		PRISON (MAIN JAIL)	PRISON (TOWER)	PRISON (COMM CORR)	VISITORS CENTER	PARKS	911 CENTER
CAF	CAF	4,380	4,380	4,380	2,600	3,000	N/A
COR	CORRIDOR	8,760	8,760	8,760	2,600	3,000	N/A
CR	CLASSROOM	4,380	4,380	4,380	N/A	N/A	N/A
CS	COMMON SPACE	8,760	8,760	8,760	2,600	3,000	N/A
E	EXIT SIGN	8,760	8,760	8,760	8,760	8,760	N/A
EXT	EXTERIOR LIGHTING	4,000	4,000	4,000	4,000	3,000	4,380
GYM	GYM	4,380	4,380	4,380	N/A	N/A	N/A
JC	JANITOR CLOSET	4,380	4,380	4,380	2,600	3,000	N/A
KIT	KITCHEN	4,380	4,380	4,380	2,600	3,000	N/A
LIB	LIBRARY	4,380	4,380	4,380	N/A	N/A	N/A
LR	LOCKER ROOM	4,380	4,380	4,380	2,600	3,000	N/A
LU	LOW USAGE / MISC	500	500	500	500	500	N/A
MRH	MECH ROOM HIGH	4,380	4,380	4,380	2,600	3,000	N/A
MRL	MECH ROOM LOW	2,000	2,000	2,000	1,000	1,000	N/A
OH	OFFICE HIGH	4,380	4,380	4,380	2,600	3,000	N/A
OL	OFFICE LOW	4,380	4,380	4,380	1,560	1,560	N/A
PTR	PRIVATE TOILET ROOM	500	500	500	500	500	N/A
SH	STORAGE HIGH	4,380	4,380	4,380	2,600	3,000	N/A
SL	STORAGE LOW	500	500	500	500	500	N/A
ST	STAIRS	4,380	4,380	4,380	2,600	3,000	N/A
TR	TOILET ROOMS	4,380	4,380	4,380	2,600	3,000	N/A
24/7	24 HOURS 7 DAYS A WEEK	8,760	8,760	8,760	8,760	8,760	N/A
CEL	CELL	4,380	4,380	4,380	N/A	N/A	N/A
CT	COURT HOUSE	N/A	N/A	N/A	N/A	N/A	N/A
DYR	DAYROOM	4,380	4,380	4,380	2,600	N/A	N/A
NITE	CELL NITE LIGHTS	4,380	N/A	N/A	N/A	N/A	N/A

## ECM 12 – COUNTY WIDE BUILDING ENVELOPE ENHANCEMENTS

### Areas Implemented

- ✓ Courthouse
- ✓ Visitor Center
- ✓ County 911 Building
- ✓ Prison

### Proposed Solution

McClure Company is proposing to reduce the amount of infiltration air and increase critical insulation areas for each of the buildings listed above. Infiltration can be defined as unregulated outside air entering a building unintentionally. This air must be treated (heated or cooled) by the building’s heating or cooling system to maintain acceptable indoor temperatures. Even the smallest cracks / penetrations can have a significant impact on the annual heating and cooling energy consumption.

Each building listed above was fully surveyed to leverage the savings opportunities available in limiting infiltration. Common savings areas include door weather stripping, air sealing roof wall interfaces, insulation of attic spaces, and air sealing interior to exterior penetrations. The table below breaks out the opportunities available at each facility with specific descriptions in subsequent paragraphs about each facility.

Building	Door Weather Stripping	Roof/Wall Interface	Attic/Wall Air Sealing	Soffits
Courthouse	X	X	X	
Visitors Center	X	X		
County 911		X		
Prison	X	X		X

### Courthouse

- New weather-stripping and door sweeps will be installed on all doors where necessary. All man doors will use Q-Ion weather-stripping
- Gaps in the attic will be sealed with 1/2lb open cell spray foam. Depending on the identified roof wall gap, the seal can be from the top and the bottom of the support joist. Larger gaps will be sealed in a similar fashion using 1/2lb foam and 1” foam board. This will not only seal the gaps but also add an R-7 thermal boundary to the steel beams.
- A 4’ x 10’ area in the attic, where the previous spray foam was removed, will be re-sprayed with the same thickness (approx. 3”) of 2lb. foam. The foam will then have flash inhibitor applied to it.

### Visitors Center

- The majority of the doors will receive new weather-stripping and door sweeps. Q-Ion weather-stripping will be installed on all man doors. Overhead doors will be fitted with aluminum carriers and 3” industrial seals, bottom seals will be fitted with U-receivers and slide track seals.
- The roof/wall interfaces will be sealed with 1/2lb open cell spray foam. This will create an air boundary from the inside of the building and allow the curtain wall gap to breath and relieve



Gap from deteriorated door seal at Visitors Center

moisture that may develop. Larger gaps will be sealed in a similar fashion using 1/2lb foam and 1" foam board. This will not only seal the gaps, but also add an R-7 thermal boundary to the steel beams.

### County 911 Building

- The roof top exhaust fan hoods will be removed and the gap between the duct and the curb will be air sealed. The hood will be reinstalled with tarred screws to prevent infiltration at the mounting holes. The roof top fans will also be inspected and lubricated. A master list of equipment and conditions will be given to the maintenance department with the closeout package.
- The majority of the gaps in the roof/wall interface will be sealed with 1/2lb open cell spray foam. Depending on the location, a seal from both the top and the bottom of the support joist will occur. Larger gaps will be sealed using 1/2lb of foam and 1" foam board. This will add an R-7 thermal boundary to the steel beams.

### Prison

- Most of the doors will receive weather-stripping with the man doors receiving Q-lon weather stripping and the Overhead doors receiving aluminum carriers and 3" industrial seals. The bottom seals will be fitted with U-receivers and slide track seals.
- The roof top exhaust fan hoods will be removed and the gap between the duct and the curb will be air sealed. The hood will be reinstalled with tarred screws to prevent infiltration at the mounting holes. The roof top fans will also be inspected and lubricated. A master list of equipment and conditions will be given to the maintenance department with the closeout package.
- The soffits around the entry ways have openings of 1"-3" in width from the interior wall plane. To prevent outside air from infiltrating, the soffits will be treated with a combination of foil face foam board and 1 part open cell spray foam. Essentially an insulated wall will be constructed where the openings in the soffit have been left wide open. This creates a thermal barrier between the outside air and the conditioned interior space.



Soffit at Prison with no air barrier



		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
<b>Lackawana County Center For Public Safety</b>										
	Main Entrance	2,000	7	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	7	NO CHANGE			
	Main Entrance	2,000	3	COMPACT FLUORESCENT 45W S/I	45	3	RELAMP LED A LAMP 12 WATT	12	198	0.099
	Main Lobby (N/A Deco Fixture	2,000								
	Main Lobby	2,000	5	MR20	50	5	RELAMP LED MR16 4 WATT	4	460	0.23
	Main Hallway	2,000	7	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	7	NO CHANGE			
	Mens Room	2,000	3	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	3	NO CHANGE			
	Ladies Room	2,000	5	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	5	NO CHANGE			
	Janitor Closet	1,000	1	3L 4' F32 T8 ELE N BALLAST	105	1	RELAMP T8 4' 3L 25W	66	39	0.039
	Classroom 103	2,000	9	3L 4' 54W T5 N LUTRON BALLAST	175	9	RELAMP 4' T5 3L HO 47	167	144	0.072
	Classroom 103	2,000	2	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	2	NO CHANGE			
	Classroom 103 (2 Storage Ro	1,000	4	2L 4' F32 T8 ELE HP BALLAST	70	4	RELAMP T8 4' 2L 25W	44	104	0.104
	Classroom 156	2,000	45	3L 4' 54W T5 N LUTRON BALLAST	175	45	RELAMP 4' T5 3L HO 47	167	720	0.36
	Room 154	2,000	6	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	6	NO CHANGE			
	Room 154	2,000	1	4L 4' 54W T5 N LUTRON BALLAST	234	1	RELAMP 4' T5 4L HO 47	204	60	0.03
	Room 154	2,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
	Room 155	2,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RELAMP T8 4' 2L 25W	44	104	0.052
	Room 153	2,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RELAMP T8 4' 2L 25W	44	104	0.052
	Room 151	2,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RELAMP T8 4' 2L 25W	44	104	0.052
	Hallway	2,000	9	3L 4' F32 T8 ELE N BALLAST	105	9	RELAMP T8 4' 3L 25W	66	702	0.351
	Bathroom	2,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RELAMP T8 4' 2L 25W	44	52	0.026
	Bathroom	2,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
	Storage Closet	2,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
	Room 160	2,000	2	3L 4' F32 T8 ELE N BALLAST	105	2	RELAMP T8 4' 3L 25W	66	156	0.078
	Server Room 162 (Clean Ro	2,000	30	2L 4' 54W T5 N LUTRON BALLAST	117	30	RELAMP 4' T5 2L HO 47	102	900	0.45
	Room 157	2,000	16	3L 4' F32 T8 ELE N BALLAST	105	16	RELAMP T8 4' 3L 25W	66	1248	0.624
	Room 157	2,000	12	3L 4' F32 T8 ELE N BALLAST	105	12	RELAMP T8 4' 3L 25W	66	936	0.468
	Room 159	2,000	4	3L 4' F32 T8 ELE N BALLAST	105	4	RELAMP T8 4' 3L 25W	66	312	0.156
	Room 168 (911 Call Center	2,000	33	3L 4' 54W T5 N LUTRON BALLAST	175	33	RELAMP 4' T5 3L HO 47	167	528	0.264
	Room 165	2,000	3	3L 4' F32 T8 ELE N BALLAST	105	3	RELAMP T8 4' 3L 25W	66	234	0.117
	Room 166	2,000	3	3L 4' F32 T8 ELE N BALLAST	105	3	RELAMP T8 4' 3L 25W	66	234	0.117
	Room 167	2,000	3	3L 4' F32 T8 ELE N BALLAST	105	3	RELAMP T8 4' 3L 25W	66	234	0.117
	Room 169	2,000	10	3L 4' 54W T5 N LUTRON BALLAST	175	10	RELAMP 4' T5 3L HO 47	167	160	0.08
	Long Hallway	2,000	15	COMPACT FLUORESCENT 45W S/I	45	16	RELAMP LED A LAMP 12 WATT	12	966	0.483
	Long Hallway	2,000	17	MR20	50	17	RELAMP LED MR16 4 WATT	4	1564	0.782

		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
	Long Hallway (Wattage Estimate)	2,000	6	70 WATT MH WALLPACK	92	6	NO CHANGE			
	Long Hallway	2,000	8	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	8	NO CHANGE			
	Room 148	2,000	6	2L 4' F32 T8 ELE HP BALLAST	70	6	RELAMP T8 4' 2L 25W	44	312	0.156
	Ladies Room	2,000	5	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	5	NO CHANGE			
	Ladies Room	2,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RELAMP T8 4' 2L 25W	44	52	0.026
	Ladies Loicker Room	2,000	4	2L 4' F32 T8 ELE HP BALLAST	70		RELAMP T8 4' 2L 25W	44	560	0.28
	Ladies Loicker Room	2,000	5	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	5	NO CHANGE			
	Room 140 Sleep Room	1,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
	Room 140 Sleep Room	1,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	1	NO CHANGE			
	Main Hallway	2,000	10	3L 2' 24W T5 2X2 RECESSED CTR DESIGN	75	10	NO CHANGE			
	Main Hallway	2,000	12	MR20	50	12	RELAMP LED MR16 4 WATT	4	1104	0.552
	Kitchen / Break Room	2,000	3	2L 4' 54W T5 N LUTRON BALLAST	117	3	RELAMP 4' T5 2L HO 47	102	90	0.045
	Kitchen / Break Room	2,000	3	COMPACT FLUORESCENT 45W S/I	45	3	RELAMP LED A LAMP 12 WATT	12	198	0.099
	Room 135	2,000	1	4L 4' 54W T5 N LUTRON BALLAST	234	1	RELAMP 4' T5 4L HO 47	204	60	0.03
	Room 143	2,000	3	2L 4' F32 T8 ELE HP BALLAST	70	3	RELAMP T8 4' 2L 25W	44	156	0.078
	Room 146	2,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
	Mens Room	2,000	6	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	6	NO CHANGE			
	Mens Room	2,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RELAMP T8 4' 2L 25W	44	52	0.026
	Mens Loicker Room	2,000	3	3L 4' F32 T8 ELE N BALLAST	105	3	RELAMP T8 4' 3L 25W	66	234	0.117
	Mens Loicker Room	2,000	4	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	4	NO CHANGE			
	Mens Sleep Room	1,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
	Mens Sleep Room	1,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	1	NO CHANGE			
	Room 137	2,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RELAMP T8 4' 2L 25W	44	104	0.052
	Main Hallway	2,000	10	COMPACT FLUORESCENT 45W S/I	45	10	RELAMP LED A LAMP 12 WATT	12	660	0.33
	Main Hallway	2,000	4	MR20	50	4	RELAMP LED MR16 4 WATT	4	368	0.184
	Conference Room	2,000	2	2L 4' 54W T5 N LUTRON BALLAST	117	2	RELAMP 4' T5 2L HO 47	102	60	0.03
	Conference Room	2,000	4	1L 2' BIA X LAMP	43	4	NO CHANGE			
	Conference Room	2,000	3	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	3	NO CHANGE			
	Conference Room	2,000	4	MR20	50	4	RELAMP LED MR16 4 WATT	4	368	0.184
	Room 128	2,000	8	2L 4' 54W T5 N LUTRON BALLAST	117	8	RELAMP 4' T5 2L HO 47	102	240	0.12
	Room 128	2,000	4	1L 4' 54W T5 N LUTRON BALLAST	58	4	RELAMP 4' T5 1L HO 47	51	56	0.028
	Main Hallway	2,000	4	3L 2' 24W T5 2X2 RECESSED CTR DESIGN	75	4	NO CHANGE			
	Main Hallway	2,000	7	MR20	50	7	RELAMP LED MR16 4 WATT	4	644	0.322
	Side Office	2,000	8	2L 4' 54W T5 N LUTRON BALLAST	117	8	RELAMP 4' T5 2L HO 47	102	240	0.12
	Room 123	2,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RELAMP T8 4' 2L 25W	44	104	0.052
	Copiers	2,000	10	3L 2' 24W T5 2X2 RECESSED CTR DESIGN	75	10	NO CHANGE			
	Room 112	2,000	1	4L 4' 54W T5 N LUTRON BALLAST	234	1	RELAMP 4' T5 4L HO 47	204	60	0.03
	Room 112	2,000	2	1L 4' 54W T5 N LUTRON BALLAST	58	2	RELAMP 4' T5 1L HO 47	51	28	0.014
	Room 144	2,000	2	4L 4' 54W T5 N LUTRON BALLAST	234	2	RELAMP 4' T5 4L HO 47	204	120	0.06
	Main Reception Area	2,000	3	2L 4' 54W T5 N LUTRON BALLAST	117	3	RELAMP 4' T5 2L HO 47	102	90	0.045
	Room 111	2,000	1	4L 4' 54W T5 N LUTRON BALLAST	234	1	RELAMP 4' T5 4L HO 47	204	60	0.03
	Side Entrance To Building	2,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			

		EXISTING				PROPOSED				SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved	
	Garage	2,000	46	2L 4' F32 T8 ELE HP BALLAST	70	46	RELAMP T8 4' 2L 25W	44	2392	1.196	
	Garage Loft	2,000	3	3L 4' F32 T8 ELE N BALLAST	105	3	RELAMP T8 4' 3L 25W	66	234	0.117	
	Garage Message Board	2,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RELAMP T8 4' 2L 25W	44	52	0.026	
	Garage Bathroom	2,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RELAMP T8 4' 2L 25W	44	52	0.026	
	SWAT Storage Room	2,000	4	3L 4' F32 T8 ELE N BALLAST	105	4	RELAMP T8 4' 3L 25W	66	312	0.156	
	Room 103	2,000	1	3L 4' F32 T8 ELE N BALLAST	105	1	RELAMP T8 4' 3L 25W	66	78	0.039	
	Room 104	2,000	4	3L 4' F32 T8 ELE N BALLAST	105	4	RELAMP T8 4' 3L 25W	66	312	0.156	
	Outside Lighting										
	Side Picnic Canopy	4,368	4	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	4	NEW LED CANOPY 38 WATT	38	244.608	0.056	
	Cut Off Wall Packs	4,368	22	175 WATT MH WALLPACK	205	22	NEW LED WALL PACK 40 W CUTOFF	40	15855.84	3.63	
	Upper And Lower Parking Lots	4,368	19	400 WATT MH SHOEBOX	465	19	NEW LED SHOEBOX LOT 140 W ARM	140	26972.4	6.175	
	Upper Sidewalk	4,368	3	100 WATT MH SHOEBOX	130	3	NEW LED SHOEBOX LOT 70 W ARM	61	904.176	0.207	
	Flag Pole (Recessed In Groun	4,368	3	175 WATT MH HIGH HAT	205	3	NO CHANGE				
	Lawn Fixtures	4,368	2	175 WATT MH FLOOD	205	2	NEW LED FLOOD 50 WATT	44	1406.496	0.322	
	<b>Option 1 Totals</b>		<b>546</b>			<b>543</b>			<b>65,099</b>	<b>20.319</b>	
	<b>Lackawana Visitors Center</b>										
	(2) Stairwells	8,760	12	2L 4' F32 T8 ELE HP BALLAST	70	12	RETRO 2L 4 FT F25 T8 ELE L	41	3048.48	0.348	
	Gift Shop	2,000	28	COMPACT FLUORESCENT 23W HW	23	28	NO CHANGE				
	Gift Shop	2,000	8	50 WATT INCAN FLOOD	50	8	RELAMP PAR 30 LED BULB 13 WATT	13	592	0.296	
	Gift Shop	2,000	2	MR20	50	2	RELAMP LED MR16 4 WATT	4	184	0.092	
	Exits	8,760	2	EXIT SGN (2) 20 WATT INCANDESCENT	40	2	NEW EXIT SIGN 2 WATT BAT BACK FLOOD	2	665.76	0.076	
	Gift Shop	2,000	2	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	2	NO CHANGE				
	Gift Shop Office	2,000	7	COMPACT FLUORESCENT 23W HW	23	7	NO CHANGE				
	Gift Shop Office	2,000	2	MR20	50	2	RELAMP LED MR16 4 WATT	4	184	0.092	
	Elevator	8,760	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	508.08	0.058	
	Basement	2,000	11	4L 4' F32 T8 ELE N BALLAST	112	11	RETRO 4L 4 FT F25 T8 ELE L	80	704	0.352	
	Exits	8,760	3	EXIT SGN (2) 20 WATT INCANDESCENT	40	3	NEW EXIT SIGN 2 WATT BAT BACK FLOOD	2	998.64	0.114	
	Kitchen	2,000	7	4L 4' F32 T8 ELE N BALLAST	112	7	RETRO 4L 4 FT F25 T8 ELE L	80	448	0.224	
	Boiler Room	2,000	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	128	0.064	
	Elevator Room	2,000	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	64	0.032	
	First Floor Halls	2,000	6	COMPACT FLUORESCENT 23W HW	23	6	NO CHANGE				
	First Floor Halls	2,000	14	COMPACT FLUORESCENT 23W HW	23	14	NO CHANGE				
	Mens Room	2,000	3	3L 2' BIAX LAMP	105	3	NEW FIX 2X2 2L F017 L REC PRISM	27	468	0.234	
	Mens Room	2,000	8	COMPACT FLUORESCENT 23W HW	23	8	NO CHANGE				
	Ladies Room	2,000	3	3L 2' BIAX LAMP	105	3	NEW FIX 2X2 2L F017 L REC PRISM	27	468	0.234	
	Ladies Room	2,000	8	COMPACT FLUORESCENT 23W HW	23	8	NO CHANGE				
	Daycare Room	2,000	24	3L 2' BIAX LAMP	105	24	NEW FIX 2X2 2L F017 L REC PRISM	27	3744	1.872	
	Daycare Room	2,000	28	75 WATT INCAN FLOOD	75	28	RELAMP PAR 38 LED BULB 20 WATT	20	3080	1.54	
	Exits	8,760	1	EXIT SGN (2) 20 WATT INCANDESCENT	40	1	NEW EXIT SIGN 2 WATT BAT BACK FLOOD	2	332.88	0.038	
	Second Floor										
	Second Floor Halls	2,000	5	COMPACT FLUORESCENT 23W HW	23	5	NO CHANGE				

		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
	Exits	8,760	1	EXIT SGN (2) 20 WATT INCANDESCENT	40	1	NEW EXIT SIGN 2 WATT BAT BACK FLOOD	2	332.88	0.038
	Second Floor Halls	2,000	6	COMPACT FLUORESCENT 23W HW	23	6	NO CHANGE			
	Second Floor Halls	2,000	3	COMPACT FLUORESCENT 23W HW	23	3	NO CHANGE			
	Exits	8,760	1	EXIT SGN (2) 20 WATT INCANDESCENT	40	1	NEW EXIT SIGN 2 WATT BAT BACK FLOOD	2	332.88	0.038
	Daycare Room	2,000	18	3L 2' BIAX LAMP	105	18	NEW FIX 2X2 2L F017 L REC PRISM	27	2808	1.404
	Daycare Room	2,000	3	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	3	NO CHANGE			
	(2) Bathrooms	2,000	6	3L 2' BIAX LAMP	105	6	NEW FIX 2X2 2L F017 L REC PRISM	27	936	0.468
	End Daycare Room	2,000	40	75 WATT INCAN FLOOD	75	40	RELAMP PAR 38 LED BULB 20 WATT	20	4400	2.2
	Exits	8,760	2	EXIT SGN (2) 20 WATT INCANDESCENT	40	2	NEW EXIT SIGN 2 WATT BAT BACK FLOOD	2	665.76	0.076
	End Daycare Room	2,000	14	COMPACT FLUORESCENT 23W HW	23	14	NO CHANGE			
	End Daycare Room	2,000	6	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	6	NO CHANGE			
	Bathroom	2,000	5	3L 2' BIAX LAMP	105	5	NEW FIX 2X2 2L F017 L REC PRISM	27	780	0.39
	Outdoor Poles - N /A 6 LED S									
	<b>Option 2 Totals</b>								<b>25,873</b>	<b>10.28</b>
	<b>Total: Lackawanna Admin Building</b>		<b>2,010</b>			<b>2,007</b>			<b>142,590</b>	<b>49.8238</b>



		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
1	Waiting Area	8,760	14	4L 2' F17 ELE N BALLAST	60	14	RETRO 4L 2 FT F17 T8 ELE L	53	854	0.09744
2	Waiting Area	8,760	18	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	18	NO CHANGE			
3	Locker Cove	8,760	2	4L 2' F17 ELE N BALLAST	60	2	RETRO 4L 2 FT F17 T8 ELE L	53	122	0.01392
4	Bathroom Entry	8,760	1	3L 4' F32 T8 ELE N BALLAST	105	1	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.045
5	Mens Rm	8,760	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.029
6	Mens Rm	8,760	2	4L 2' F17 ELE N BALLAST	60	2	RETRO 4L 2 FT F17 T8 ELE L	53	122	0.01392
7	Womens Rm	8,760	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.029
8	Womens Rm	8,760	2	4L 2' F17 ELE N BALLAST	60	2	RETRO 4L 2 FT F17 T8 ELE L	53	122	0.01392
9	Reception Desk	4,380	4	4L 2' F17 ELE N BALLAST	60	4	RETRO 4L 2 FT F17 T8 ELE L	53	122	0.02784
10	Entrance Way	4,380	8	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	8	NO CHANGE			
11	Gate Foyer	8,760	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.09
12	B Block	4,380	9	2L 4' F32 T8 ELE HP BALLAST	70	9	RETRO 2L 4 FT F25 T8 ELE L	41	1,143	0.261
13	B Block	4,380	8	250 WATT MH HIGH BAY	295	8	KB 3 LAMP T5 SURFACE MOUNT BOX	178	4,100	0.936
14	Loft	4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135
15	Electrical Rm	2,000	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	180	0.09
16	6 Cells B Block	4,380	24	3L 4' F32 T8 ELE N BALLAST	105	24	RETRO 3L 4 FT F25 T8 ELE L	60	4,730	1.08
17	Bathroom 1	4,380	4	2L 4' F32 T8 ELE HP BALLAST	70	4	RETRO 2L 4 FT F25 T8 ELE L	41	508	0.116
18	Bathroom 2	4,380	4	2L 4' F32 T8 ELE HP BALLAST	70	4	RETRO 2L 4 FT F25 T8 ELE L	41	508	0.116
19	Counselor Office	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
20	Utility Closet	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
21	DA Block									
22		4,380	9	2L 4' F32 T8 ELE HP BALLAST	70	9	RETRO 2L 4 FT F25 T8 ELE L	41	1,143	0.261
23		4,380	8	250 WATT MH HIGH BAY	295	8	KB 3 LAMP T5 SURFACE MOUNT BOX	178	4,100	0.936
24		4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135
25		4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
26		4,380	24	3L 4' F32 T8 ELE N BALLAST	105	24	RETRO 3L 4 FT F25 T8 ELE L	60	4,730	1.08
27		4,380	4	2L 4' F32 T8 ELE HP BALLAST	70	4	RETRO 2L 4 FT F25 T8 ELE L	41	508	0.116
28		4,380	4	2L 4' F32 T8 ELE HP BALLAST	70	4	RETRO 2L 4 FT F25 T8 ELE L	41	508	0.116
29		4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
30		2,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	58	0.029
31	DC Block									
32		4,380	9	2L 4' F32 T8 ELE HP BALLAST	70	9	RETRO 2L 4 FT F25 T8 ELE L	41	1,143	0.261
33		4,380	8	250 WATT MH HIGH BAY	295	8	KB 3 LAMP T5 SURFACE MOUNT BOX	178	4,100	0.936
34		4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135
35		4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
36		4,380	24	3L 4' F32 T8 ELE N BALLAST	105	24	RETRO 3L 4 FT F25 T8 ELE L	60	4,730	1.08
37		4,380	4	2L 4' F32 T8 ELE HP BALLAST	70	4	RETRO 2L 4 FT F25 T8 ELE L	41	508	0.116
38		4,380	4	2L 4' F32 T8 ELE HP BALLAST	70	4	RETRO 2L 4 FT F25 T8 ELE L	41	508	0.116
39		4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
40		2,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	58	0.029
41	Hallway	8,760	12	4L 4' F32 T8 ELE N BALLAST	112	12	RETRO 4L 4 FT F25 T8 ELE L	80	3,364	0.384
42	Office by Laundry	4,380	3	2L 4' F32 T8 ELE HP BALLAST	70	3	RETRO 2L 4 FT F25 T8 ELE L	41	381	0.087
43	Change Out	4,380	7	2L 4' F32 T8 ELE HP BALLAST	70	7	RETRO 2L 4 FT F25 T8 ELE L	41	889	0.203



		EXISTING				PROPOSED				SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved	
44	Laundry Hall	8,760	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	561	0.064	
45	Bathroom	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029	
46	Laundry	4,380	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	140	0.032	
47	Room 1	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
48	Room 2	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
49	Bathroom	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029	
50	Janitor Closet	4,380	1	2L 2' F17 ELE N BALLAST	34	1	RETRO 2L 2 FT F17 T8 ELE L	27	33	0.00748	
51	Laundry Room	4,380	18	2L 4' F32 T8 ELE HP BALLAST	70	18	RETRO 2L 4 FT F25 T8 ELE L	41	2,286	0.522	
52	Behind Laundry Machines	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
53	Boiler Room	4,380	3	2L 4' F32 T8 ELE HP BALLAST	70	3	RETRO 2L 4 FT F25 T8 ELE L	41	381	0.087	
54	Water service	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
55	Inmate Bathroom	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029	
56	Mutli Purpose Room	4,380	6	2L 4' F32 T8 ELE HP BALLAST	70	6	RETRO 2L 4 FT F25 T8 ELE L	41	762	0.174	
57	Bathroom	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029	
58	Room 1	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029	
59	Interview Room	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
60	4 Interview Rooms	4,380	8	2L 4' F32 T8 ELE HP BALLAST	70	8	RETRO 2L 4 FT F25 T8 ELE L	41	1,016	0.232	
61	Inmate visitation	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
62	Prisoner Side	4,380	8	3L 4' F32 T8 ELE N BALLAST	105	8	RETRO 3L 4 FT F25 T8 ELE L	60	1,577	0.36	
63	Visitor Side	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18	
64	Echo Block J-K	4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288	
65	2 Parts 60 cells total	4,380	60	2L 4' F32 T8 ELE HP BALLAST	70	60	RETRO 2L 4 FT F25 T8 ELE L	41	7,621	1.74	
66	Bathroom	4,380	8	3L 2' F17 ELE N BALLAST	44	8	RETRO 3L 2 FT F17 T8 ELE L	40	148	0.03376	
67	Block	4,380	21	250 WATT MH HIGH BAY	295	21	KB 3 LAMP T5 SURFACE MOUNT BOX	178	10,762	2.457	
68	Block	4,380	8	4L 2' F17 ELE N BALLAST	60	8	RETRO 4L 2 FT F17 T8 ELE L	53	244	0.05568	
69	Utility Closet	2,000	2	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	2	NO CHANGE				
70	Gulf Block Same As Above										
71		4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288	
72		4,380	60	2L 4' F32 T8 ELE HP BALLAST	70	60	RETRO 2L 4 FT F25 T8 ELE L	41	7,621	1.74	
73		4,380	8	3L 2' F17 ELE N BALLAST	44	8	RETRO 3L 2 FT F17 T8 ELE L	40	148	0.03376	
74		4,380	21	250 WATT MH HIGH BAY	295	21	KB 3 LAMP T5 SURFACE MOUNT BOX	178	10,762	2.457	
75		4,380	8	4L 2' F17 ELE N BALLAST	60	8	RETRO 4L 2 FT F17 T8 ELE L	53	244	0.05568	
76		4,380	2	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	2	NO CHANGE				
77	Crossover	8,760	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	1,183	0.135	
78	Crossover 2	8,760	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.029	
79	Electrical Rm	2,000	3	4L 4' F32 T8 ELE N BALLAST	112	3	RETRO 4L 4 FT F25 T8 ELE L	80	192	0.096	
80	Hot Water Room	2,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	116	0.058	
81	3 additional Crossovers	8,760	3	2L 4' F32 T8 ELE HP BALLAST	70	3	RETRO 2L 4 FT F25 T8 ELE L	41	762	0.087	
82	Electrical Rm	2,000	6	4L 4' F32 T8 ELE N BALLAST	112	6	RETRO 4L 4 FT F25 T8 ELE L	80	384	0.192	
83	Hot Water Room	2,000	6	2L 4' F32 T8 ELE HP BALLAST	70	6	RETRO 2L 4 FT F25 T8 ELE L	41	348	0.174	
84	Stairway 10	8,760	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	561	0.064	
85		8,760	3	2L 4' F32 T8 ELE HP BALLAST	70	3	RETRO 2L 4 FT F25 T8 ELE L	41	762	0.087	
86	Lobby Stairs	8,760	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	280	0.032	

		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
87	Hallway 2	8,760	19	4L 4' F32 T8 ELE N BALLAST	112	19	RETRO 4L 4 FT F25 T8 ELE L	80	5,326	0.608
88	Alpha Block (wings A-B-C)	4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
89	60 Cells	4,380	20	4L 4' F32 T8 ELE N BALLAST	112	20	RETRO 4L 4 FT F25 T8 ELE L	80	2,803	0.64
90	Block	4,380	3	4L 2' F17 ELE N BALLAST	60	3	RETRO 4L 2 FT F17 T8 ELE L	53	91	0.02088
91	Shower	4,380	2	3L 2' F17 ELE N BALLAST	44	2	RETRO 3L 2 FT F17 T8 ELE L	40	37	0.00844
92	Block	4,380	5	250 WATT MH HIGH BAY	295	5	KB 3 LAMP T5 SURFACE MOUNT BOX	178	2,562	0.585
93	Utility Closet	4,380	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
94	Officer	4,380	1	2L 2' F17 ELE N BALLAST	34	1	RETRO 2L 2 FT F17 T8 ELE L	27	33	0.00748
95	Cossover	4,380	6	3L 4' F32 T8 ELE N BALLAST	105	6	RETRO 3L 4 FT F25 T8 ELE L	60	1,183	0.27
96	B bloc	4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
97		4,380	20	4L 4' F32 T8 ELE N BALLAST	112	20	RETRO 4L 4 FT F25 T8 ELE L	80	2,803	0.64
98		4,380	3	4L 2' F17 ELE N BALLAST	60	3	RETRO 4L 2 FT F17 T8 ELE L	53	91	0.02088
99		4,380	2	3L 2' F17 ELE N BALLAST	44	2	RETRO 3L 2 FT F17 T8 ELE L	40	37	0.00844
100		4,380	5	250 WATT MH HIGH BAY	295	5	KB 3 LAMP T5 SURFACE MOUNT BOX	178	2,562	0.585
101		4,380	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
102		4,380	1	2L 2' F17 ELE N BALLAST	34	1	RETRO 2L 2 FT F17 T8 ELE L	27	33	0.00748
103	C Block									
104		4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
105		4,380	10	4L 4' F32 T8 ELE N BALLAST	112	10	RETRO 4L 4 FT F25 T8 ELE L	80	1,402	0.32
106		4,380	6	4L 2' F17 ELE N BALLAST	60	6	RETRO 4L 2 FT F17 T8 ELE L	53	183	0.04176
107		4,380	4	3L 2' F17 ELE N BALLAST	44	4	RETRO 3L 2 FT F17 T8 ELE L	40	74	0.01688
108		4,380	11	250 WATT MH HIGH BAY	295	11	KB 3 LAMP T5 SURFACE MOUNT BOX	178	5,637	1.287
109		4,380	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
110	Charlie Block	4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
111		4,380	20	4L 4' F32 T8 ELE N BALLAST	112	20	RETRO 4L 4 FT F25 T8 ELE L	80	2,803	0.64
112		4,380	3	4L 2' F17 ELE N BALLAST	60	3	RETRO 4L 2 FT F17 T8 ELE L	53	91	0.02088
113		4,380	2	3L 2' F17 ELE N BALLAST	44	2	RETRO 3L 2 FT F17 T8 ELE L	40	37	0.00844
114		4,380	5	250 WATT MH HIGH BAY	295	5	KB 3 LAMP T5 SURFACE MOUNT BOX	178	2,562	0.585
115		4,380	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
116		4,380	1	2L 2' F17 ELE N BALLAST	34	1	RETRO 2L 2 FT F17 T8 ELE L	27	33	0.00748
117		4,380	6	3L 4' F32 T8 ELE N BALLAST	105	6	RETRO 3L 4 FT F25 T8 ELE L	60	1,183	0.27
118		4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
119		4,380	20	4L 4' F32 T8 ELE N BALLAST	112	20	RETRO 4L 4 FT F25 T8 ELE L	80	2,803	0.64
120		4,380	3	4L 2' F17 ELE N BALLAST	60	3	RETRO 4L 2 FT F17 T8 ELE L	53	91	0.02088
121		4,380	2	3L 2' F17 ELE N BALLAST	44	2	RETRO 3L 2 FT F17 T8 ELE L	40	37	0.00844
122		4,380	5	250 WATT MH HIGH BAY	295	5	KB 3 LAMP T5 SURFACE MOUNT BOX	178	2,562	0.585
123		4,380	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE			
124		4,380	1	2L 2' F17 ELE N BALLAST	34	1	RETRO 2L 2 FT F17 T8 ELE L	27	33	0.00748
125										
126		4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
127		4,380	10	4L 4' F32 T8 ELE N BALLAST	112	10	RETRO 4L 4 FT F25 T8 ELE L	80	1,402	0.32
128		4,380	6	4L 2' F17 ELE N BALLAST	60	6	RETRO 4L 2 FT F17 T8 ELE L	53	183	0.04176
129		4,380	4	3L 2' F17 ELE N BALLAST	44	4	RETRO 3L 2 FT F17 T8 ELE L	40	74	0.01688

		EXISTING				PROPOSED				SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved	
130		4,380	11	250 WATT MH HIGH BAY	295	11	KB 3 LAMP T5 SURFACE MOUNT BOX	178	5,637	1.287	
131		4,380	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NO CHANGE				
132	Library B	4,380	7	4L 4' F32 T8 ELE N BALLAST	112	7	RETRO 4L 4 FT F25 T8 ELE L	80	981	0.224	
133	Barber Shop	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
134	Barber Shop Storage	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029	
135	Camera Montering	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09	
136	Class Room A	4,380	6	4L 4' F32 T8 ELE N BALLAST	112	6	RETRO 4L 4 FT F25 T8 ELE L	80	841	0.192	
137	Storage	4,380	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	140	0.032	
138	Class Room B	4,380	12	4L 4' F32 T8 ELE N BALLAST	112	12	RETRO 4L 4 FT F25 T8 ELE L	80	1,682	0.384	
139	Storage	4,380	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	140	0.032	
140	Shift Commander	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18	
141	Bathroom	4,380	1	4L 2' F17 ELE N BALLAST	60	1	RETRO 4L 2 FT F17 T8 ELE L	53	30	0.00696	
142	Closet	4,380	1	2L 2' F17 ELE N BALLAST	34	1	RETRO 2L 2 FT F17 T8 ELE L	27	33	0.00748	
143	Class D	4,380	7	4L 4' F32 T8 ELE N BALLAST	112	7	RETRO 4L 4 FT F25 T8 ELE L	80	981	0.224	
144	Staff Break Room	4,380	3	2L 4' F32 T8 ELE HP BALLAST	70	3	RETRO 2L 4 FT F25 T8 ELE L	41	381	0.087	
145		4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135	
146	Offie Captain	4,380	4	4L 4' F32 T8 ELE N BALLAST	112	4	RETRO 4L 4 FT F25 T8 ELE L	80	561	0.128	
147	Closet	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029	
148	Hallway	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18	
149	Storage	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
150	Hall to Admn	4,380	6	4L 4' F32 T8 ELE N BALLAST	112	6	RETRO 4L 4 FT F25 T8 ELE L	80	841	0.192	
151	Central Control Entry	4,380	9	4L 2' F17 ELE N BALLAST	60	9	RETRO 4L 2 FT F17 T8 ELE L	53	274	0.06264	
152	Bathroom	4,380	1	4L 2' F17 ELE N BALLAST	60	1	RETRO 4L 2 FT F17 T8 ELE L	53	30	0.00696	
153	Hall at Admin Entry	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
154	Kitchen Chapel Hall	4,380	4	4L 4' F32 T8 ELE N BALLAST	112	4	RETRO 4L 4 FT F25 T8 ELE L	80	561	0.128	
155	Library A	4,380	4	4L 4' F32 T8 ELE N BALLAST	112	4	RETRO 4L 4 FT F25 T8 ELE L	80	561	0.128	
156		4,380	1	4L 2' F17 ELE N BALLAST	60	1	RETRO 4L 2 FT F17 T8 ELE L	53	30	0.00696	
157	Library C	4,380	3	4L 4' F32 T8 ELE N BALLAST	112	3	RETRO 4L 4 FT F25 T8 ELE L	80	420	0.096	
158	Counsler Office B	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09	
159	Counsler Office A	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09	
160	Staff Dinning	4,380	6	4L 4' F32 T8 ELE N BALLAST	112	6	RETRO 4L 4 FT F25 T8 ELE L	80	841	0.192	
161	Kitchen	4,380	36	4L 4' F32 T8 ELE N BALLAST	112	36	RETRO 4L 4 FT F25 T8 ELE L	80	5,046	1.152	
162	Kitchen	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09	
163	Coolers	4,380	6	60 WATT INCANDESCENT	60	6	RELAMP LED A LAMP 12 WATT	12	1,261	0.288	
164	Freight Elevator	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058	
165	Emergency Stairs	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18	
166	Bathrooms	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09	
167	Office	4,380	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	280	0.064	
168	Utility	4,380	1	3L 4' F32 T8 ELE N BALLAST	105	1	RETRO 3L 4 FT F25 T8 ELE L	60	197	0.045	
169	Storage	4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135	
170	Hood Lights	4,380	8	2 LAMP 4 FT F40 T12 EE / STD	86	8	RETRO 2L 4 FT F25 T8 ELE L	41	1,577	0.36	
171	Storage 2	4,380	8	3L 4' F32 T8 ELE N BALLAST	105	8	RETRO 3L 4 FT F25 T8 ELE L	60	1,577	0.36	
172	Library B Office	4,380	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	280	0.064	

		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
173	Chapel	4,380	14	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	14	NO CHANGE			
174	Chapel	4,380	5	MR20	50	5	RELAMP LED MR16 4 WATT	4	1,007	0.23
175	Upstairs Cooridor 2	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
176	Inmate Toilet	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
177	Class Room C	4,380	4	4L 4' F32 T8 ELE N BALLAST	112	4	RETRO 4L 4 FT F25 T8 ELE L	80	561	0.128
178	Maintenace Storage	4,380	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	140	0.032
179	Maintenace	4,380	7	4L 4' F32 T8 ELE N BALLAST	112	7	RETRO 4L 4 FT F25 T8 ELE L	80	981	0.224
180	Shop	4,380	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	280	0.064
181	Toilet/Shower	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
182	Office	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
183	Mechanical Room	4,380	19	4L 4' F32 T8 ELE N BALLAST	112	19	RETRO 4L 4 FT F25 T8 ELE L	80	2,663	0.608
184	Phone Room	4,380	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	140	0.032
185	Electrical Rm	4,380	4	4L 4' F32 T8 ELE N BALLAST	112	4	RETRO 4L 4 FT F25 T8 ELE L	80	561	0.128
186	Outside Bay Door	4,380	6	400 WATT MH WALLPACK	465	6	NEW LED WALL PACK 60 WATT	64	10,538	2.406
187	Above Bay Door	4,380	2	175 WATT MH WALLPACK	205	2	NEW LED WALL PACK 40 WATT	40	1,445	0.33
188	Rear Parking Walls	4,380	22	400 WATT MH WALLPACK	465	22	NEW LED WALL PACK 60 WATT	64	38,640	8.822
189		4,380	7	175 WATT MH WALLPACK	205	7	NEW LED WALL PACK 40 WATT	40	5,059	1.155
190	Kitchen Basement	4,380	5	2L 4' F32 T8 ELE HP BALLAST	70	5	RETRO 2L 4 FT F25 T8 ELE L	41	635	0.145
191	Booking Entry	4,380	4	4L 4' F32 T8 ELE N BALLAST	112	4	RETRO 4L 4 FT F25 T8 ELE L	80	561	0.128
192	Search Room	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058
193		4,380	1	3L 2' F17 ELE N BALLAST	44	1	RETRO 3L 2 FT F17 T8 ELE L	40	18	0.00422
194	Booking Office	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
195	Booking Office 2	4,380	1	3L 4' F32 T8 ELE N BALLAST	105	1	RETRO 3L 4 FT F25 T8 ELE L	60	197	0.045
196	Booking	4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
197		4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
198	Holding	4,380	4	4L 2' F17 ELE N BALLAST	60	4	RETRO 4L 2 FT F17 T8 ELE L	53	122	0.02784
199	Office	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
200	Cell I1-i8	4,380	8	2L 4' F32 T8 ELE HP BALLAST	70	8	RETRO 2L 4 FT F25 T8 ELE L	41	1,016	0.232
201	Roof lights	4,380	8	400 WATT HPS FLOOD	465	8	NEW LED SHOEBOX LOT 140 W ADJ	140	11,388	2.6
202	Yard lights7	4,380	7	400 WATT HPS FLOOD	465	7	NEW LED SHOEBOX LOT 140 W ADJ	140	9,965	2.275
203	Linen Issue	4,380	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	280	0.064
204	Staff Bathroom	4,380	1	4L 2' F17 ELE N BALLAST	60	1	RETRO 4L 2 FT F17 T8 ELE L	53	30	0.00696
205	Property Room	4,380	15	2L 4' F32 T8 ELE HP BALLAST	70	15	RETRO 2L 4 FT F25 T8 ELE L	41	1,905	0.435
206	Utility Room	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
207	Female Hall L-M-N-P	4,380	4	2L 4' F32 T8 ELE HP BALLAST	70	4	RETRO 2L 4 FT F25 T8 ELE L	41	508	0.116
208	Medical Dept	4,380	5	3L 4' F32 T8 ELE N BALLAST	105	5	RETRO 3L 4 FT F25 T8 ELE L	60	986	0.225
209	Storage	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
210	Utility	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
211	Staff Bathroom	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
212	Medical Exam Rm 3	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
213	Medical Exam Rm 2	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
214	Medical Exam Rm 1	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
215	Medical Supervisor	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09

		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
216	Dentist	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
217	Nurse Lab	4,380	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	280	0.064
218	Classification	4,380	4	250 WATT MH HIGH BAY	295	4	KB 3 LAMP T5 SURFACE MOUNT BOX	178	2,050	0.468
219	16 Cells	4,380	16	2L 4' F32 T8 ELE HP BALLAST	70	16	RETRO 2L 4 FT F25 T8 ELE L	41	2,032	0.464
220		4,380	2	4L 2' F17 ELE N BALLAST	60	2	RETRO 4L 2 FT F17 T8 ELE L	53	61	0.01392
221		4,380	2	3L 2' F17 ELE N BALLAST	44	2	RETRO 3L 2 FT F17 T8 ELE L	40	37	0.00844
222		4,380	1	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	1	NO CHANGE			
223	Medical Unit	4,380								
224	14 Cells	4,380	14	2L 4' F32 T8 ELE HP BALLAST	70	14	RETRO 2L 4 FT F25 T8 ELE L	41	1,778	0.406
225		4,380	4	250 WATT MH HIGH BAY	295	4	KB 3 LAMP T5 SURFACE MOUNT BOX	178	2,050	0.468
226		4,380	2	4L 2' F17 ELE N BALLAST	60	2	RETRO 4L 2 FT F17 T8 ELE L	53	61	0.01392
227		4,380	2	3L 2' F17 ELE N BALLAST	44	2	RETRO 3L 2 FT F17 T8 ELE L	40	37	0.00844
228	Medical Control Room	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
229	Isolation	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058
230	2 Utility Closets	4,380	2	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	2	NO CHANGE			
231	Crossover	4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135
232	Hallway 4	4,380	22	4L 4' F32 T8 ELE N BALLAST	112	22	RETRO 4L 4 FT F25 T8 ELE L	80	3,084	0.704
233	Bravo Block L M N P	4,380	6	4L 4' F32 T8 ELE N BALLAST	112	6	RETRO 4L 4 FT F25 T8 ELE L	80	841	0.192
234	Hall to intake	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058
235		4,380	23	250 WATT MH HIGH BAY	295	23	KB 3 LAMP T5 SURFACE MOUNT BOX	178	11,787	2.691
236	Bathroom	4,380	16	3L 2' F17 ELE N BALLAST	44	16	RETRO 3L 2 FT F17 T8 ELE L	40	296	0.06752
237		4,380	12	4L 2' F17 ELE N BALLAST	60	12	RETRO 4L 2 FT F17 T8 ELE L	53	366	0.08352
238	Cells	4,380	14	2L 4' F32 T8 ELE HP BALLAST	70	14	RETRO 2L 4 FT F25 T8 ELE L	41	1,778	0.406
239	Cells	4,380	8	2L 4' F32 T8 ELE HP BALLAST	70	8	RETRO 2L 4 FT F25 T8 ELE L	41	1,016	0.232
240	Cells	4,380	8	2L 4' F32 T8 ELE HP BALLAST	70	8	RETRO 2L 4 FT F25 T8 ELE L	41	1,016	0.232
241	Cells	4,380	30	2L 4' F32 T8 ELE HP BALLAST	70	30	RETRO 2L 4 FT F25 T8 ELE L	41	3,811	0.87
242	Utility	4,380	8	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	8	NO CHANGE			
243	Crossover	4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135
244	Crossover	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058
245	Control	4,380	3	4L 4' F32 T8 ELE N BALLAST	112	3	RETRO 4L 4 FT F25 T8 ELE L	80	420	0.096
246	Control Bathroom	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
247	Fox Block	4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
248	Cells	4,380	32	2L 4' F32 T8 ELE HP BALLAST	70	32	RETRO 2L 4 FT F25 T8 ELE L	41	4,065	0.928
249	Crossover	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
250	Utility	4,380	2	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	2	NO CHANGE			
251	Block	4,380	21	250 WATT MH HIGH BAY	295	21	KB 3 LAMP T5 SURFACE MOUNT BOX	178	10,762	2.457
252	Bathroom	4,380	4	4L 2' F17 ELE N BALLAST	60	4	RETRO 4L 2 FT F17 T8 ELE L	53	122	0.02784
253		4,380	4	3L 2' F17 ELE N BALLAST	44	4	RETRO 3L 2 FT F17 T8 ELE L	40	74	0.01688
254	Control Bathroom	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
255	Hotel Block	4,380	9	4L 4' F32 T8 ELE N BALLAST	112	9	RETRO 4L 4 FT F25 T8 ELE L	80	1,261	0.288
256		4,380	32	2L 4' F32 T8 ELE HP BALLAST	70	32	RETRO 2L 4 FT F25 T8 ELE L	41	4,065	0.928
257		4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
258		4,380	2	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	2	NO CHANGE			

Line Ref	Location:	EXISTING			PROPOSED			SAVINGS		
		Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
259		4,380	21	250 WATT MH HIGH BAY	295	21	KB 3 LAMP T5 SURFACE MOUNT BOX	178	10,762	2.457
260		4,380	4	4L 2' F17 ELE N BALLAST	60	4	RETRO 4L 2 FT F17 T8 ELE L	53	122	0.02784
261		4,380	4	3L 2' F17 ELE N BALLAST	44	4	RETRO 3L 2 FT F17 T8 ELE L	40	74	0.01688
262		4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
263	Indoor Gym 1	4,380	19	250 WATT MH HIGH BAY	295	19	KB 3 LAMP T5 SURFACE MOUNT BOX	178	9,737	2.223
264	Bathroom	4,380	1	4L 2' F17 ELE N BALLAST	60	1	RETRO 4L 2 FT F17 T8 ELE L	53	30	0.00696
265	Office	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
266	Gym 2	4,380	19	250 WATT MH HIGH BAY	295	19	KB 3 LAMP T5 SURFACE MOUNT BOX	178	9,737	2.223
267		4,380	1	4L 2' F17 ELE N BALLAST	60	1	RETRO 4L 2 FT F17 T8 ELE L	53	30	0.00696
268		4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
269	2 inmate Bath	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058
270	Delta	4,380	6	4L 4' F32 T8 ELE N BALLAST	112	6	RETRO 4L 4 FT F25 T8 ELE L	80	841	0.192
271	Bubble	4,380	3	4L 4' F32 T8 ELE N BALLAST	112	3	RETRO 4L 4 FT F25 T8 ELE L	80	420	0.096
272	Bubble Bath	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
273	Bathrooms	4,380	12	4L 2' F17 ELE N BALLAST	60	12	RETRO 4L 2 FT F17 T8 ELE L	53	366	0.08352
274		4,380	12	3L 2' F17 ELE N BALLAST	44	12	RETRO 3L 2 FT F17 T8 ELE L	40	222	0.05064
275	Block	4,380	21	250 WATT MH HIGH BAY	295	21	KB 3 LAMP T5 SURFACE MOUNT BOX	178	10,762	2.457
276	Crossover	4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135
277		4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
278	2 Utility Closets	4,380	2	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	2	NO CHANGE			
279	Stair 7	4,380	6	3L 4' F32 T8 ELE N BALLAST	105	6	RETRO 3L 4 FT F25 T8 ELE L	60	1,183	0.27
280	Heater Rom	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058
281	Gate 4C	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
282	Office	4,380	3	3L 4' F32 T8 ELE N BALLAST	105	3	RETRO 3L 4 FT F25 T8 ELE L	60	591	0.135
283	Check in	4,380	3	4L 2' F17 ELE N BALLAST	60	3	RETRO 4L 2 FT F17 T8 ELE L	53	91	0.02088
284	Records Hall	4,380	9	4L 2' F17 ELE N BALLAST	60	9	RETRO 4L 2 FT F17 T8 ELE L	53	274	0.06264
285	Muster Rm	4,380	8	4L 4' F32 T8 ELE N BALLAST	112	8	RETRO 4L 4 FT F25 T8 ELE L	80	1,121	0.256
286	Closet	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
287	Utility	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
288	Female Locker Room	4,380	7	2L 4' F32 T8 ELE HP BALLAST	70	7	RETRO 2L 4 FT F25 T8 ELE L	41	889	0.203
289	Mens Locker Room	4,380	9	2L 4' F32 T8 ELE HP BALLAST	70	9	RETRO 2L 4 FT F25 T8 ELE L	41	1,143	0.261
290	Records Office	4,380	10	3L 4' F32 T8 ELE N BALLAST	105	10	RETRO 3L 4 FT F25 T8 ELE L	60	1,971	0.45
291	Office	4,380	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	394	0.09
292	Behind Reception	4,380	2	4L 2' F17 ELE N BALLAST	60	2	RETRO 4L 2 FT F17 T8 ELE L	53	61	0.01392
293	Front Face	4,380	5	175 WATT MH WALLPACK	205	5	NEW LED WALL PACK 40 WATT	40	3,614	0.825
294		4,380	10	175 WATT HPS WALLPACK	205	10	NEW LED WALL PACK 40 WATT	40	7,227	1.65
295	Parking lot	4,380	4	400 WATT MH SHOEBOX	465	4	NEW LED SHOEBOX LOT 140 W ARM	140	5,694	1.3
296	Parking lot	4,380	6	150 WATT MH HIGH BAY	190	6	LED SCREW IN RETRO FIT36 WATT	36	4,047	0.924
297	Flag	4,380	8	150 WATT INCANDESCENT	150	8	RELAMP PAR 38 LED BULB 20 WATT	20	4,555	1.04
298	Ground Mount Floods	4,380	15	250 WATT MH FLOOD	295	15	NEW LED FLOOD 50 WATT	44	16,491	3.765
299	Admin Building	4,380	7	4L 2' F17 ELE N BALLAST	60	7	RETRO 4L 2 FT F17 T8 ELE L	53	213	0.04872
300	Office Right Side	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
301	Closet	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029

		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
302	Closet	4,380	1	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	1	NO CHANGE			
303	Office 2	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
304	Hall	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
305	Captain Office	4,380	3	2L 4' F32 T8 ELE HP BALLAST	70	3	RETRO 2L 4 FT F25 T8 ELE L	41	381	0.087
306	Stair Hall	4,380	4	4L 2' F17 ELE N BALLAST	60	4	RETRO 4L 2 FT F17 T8 ELE L	53	122	0.02784
307	Stair Hall	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058
308	Basement	4,380	8	2L 4' F32 T8 ELE HP BALLAST	70	8	RETRO 2L 4 FT F25 T8 ELE L	41	1,016	0.232
309	Cell/Closet	4,380	8	3L 4' F32 T8 ELE N BALLAST	105	8	RETRO 3L 4 FT F25 T8 ELE L	60	1,577	0.36
310	Stairs Up	4,380	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	254	0.058
311		4,380	3	4L 2' F17 ELE N BALLAST	60	3	RETRO 4L 2 FT F17 T8 ELE L	53	91	0.02088
312	Upstairs Office	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
313		4,380	3	4L 2' F17 ELE N BALLAST	60	3	RETRO 4L 2 FT F17 T8 ELE L	53	91	0.02088
314	Office 1	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
315	Office 2	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
316	Office 3	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
317	Office 4	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
318	Office 5	4,380	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	788	0.18
319	Old Stairwell	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
320	Old Stairwell	4,380	3	COMPACT FLOURESENT PLUG IN 2 LAMP 13 W	26	3	NO CHANGE			
321	1st Floor Restroom	4,380	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	127	0.029
322	Admin Lanterns	4,380	4	200 WATT MH HIGH BAY	240	4	LED SCREW IN RETRO FIT36 WATT	36	3,574	0.816
<b>Original Estimate Totals: Prison</b>			<b>1,881</b>			<b>1,881</b>			<b>440,436</b>	<b>99</b>
<b>Total: Prison</b>			<b>1,881</b>			<b>1,881</b>			<b>440,436</b>	<b>99.0969</b>



		EXISTING				PROPOSED				SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved	
1	Park office	3,000	14	65 WATT INCAN FLOOD	65	14	RELAMP PAR 30 LED BULB 13 WATT	13	2,184	0.728	
2	Bills office	3,000	2	4 LAMP 4 FT F40 T12 EE / STD	172	2	RETRO 4L 4 FT F25 T8 ELE L	80	552	0.184	
3	Office 2	3,000	2	4 LAMP 4 FT F40 T12 EE / STD	172	2	RETRO 4L 4 FT F25 T8 ELE L	80	552	0.184	
4	Restroom 1	3,000	2	60 WATT INCANDESCENT	60	2	RELAMP LED A LAMP 12 WATT	12	288	0.096	
5	Closet	3,000	1	60 WATT INCANDESCENT	60	1	RELAMP LED A LAMP 12 WATT	12	144	0.048	
6	Restroom, 2	3,000	2	60 WATT INCANDESCENT	60	2	RELAMP LED A LAMP 12 WATT	12	288	0.096	
7	Pavilion 1	3,000	10	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	10	NEW LED CANOPY 38 WATT	38	420	0.14	
8	Men's rm	3,000	2	4 LAMP 4 FT F40 T12 EE / STD	172	2	RETRO 4L 4 FT F25 T8 ELE L	80	552	0.184	
9	Women's rm	3,000	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	192	0.064	
10	Pavilion 2	3,000	10	70 WATT MH HIGH BAY	92	10	NEW LED CANOPY 38 WATT	38	1,620	0.54	
11	Men's rm	3,000	5	13W CFL	13	5	RELAMP LED A LAMP 12 WATT	12	15	0.005	
12	Pavilion 2	3,000	2	COMPACT FLUORESCENT 45W S/I	45	2	NEW LED WALL MOUNT SECURITY W SENS	14	186	0.062	
13	Women's rm	3,000	5	13W CFL	13	5	RELAMP LED A LAMP 12 WATT	12	15	0.005	
14	All roadway fixture being chan										
15	Tour building entry	3,000	6	60 WATT INCANDESCENT	60	6	RELAMP LED A LAMP 12 WATT	12	864	0.288	
16	Track lights	3,000	51	65 WATT INCAN FLOOD	65	51	RELAMP PAR 30 LED BULB 13 WATT	13	7,956	2.652	
17	Closet	3,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	87	0.029	
18	Men's rm	3,000	6	2L 4' F32 T8 ELE HP BALLAST	70	6	RETRO 2L 4 FT F25 T8 ELE L	41	522	0.174	
19	Women's rm	3,000	7	2L 4' F32 T8 ELE HP BALLAST	70	7	RETRO 2L 4 FT F25 T8 ELE L	41	609	0.203	
20	Mop closet	3,000	1	2 LAMP 3 FT F30 T12 STD / STD	80	1	RETRO 2L 3 FT F25 T8 ELE L	39	123	0.041	
21	Display case	3,000	1	1 LAMP 3 FT F30 T12 STD / STD	46	1	RETRO 1L 3 FT F25 T8 ELE L	20	80	0.0265	
22	Office	3,000	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	270	0.09	
23	Snack bar	3,000	4	3L 4' F32 T8 ELE N BALLAST	105	4	RETRO 3L 4 FT F25 T8 ELE L	60	540	0.18	
24	Storage	3,000	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	270	0.09	
25	Break rm	3,000	1	3L 4' F32 T8 ELE N BALLAST	105	1	RETRO 3L 4 FT F25 T8 ELE L	60	135	0.045	
26	Suoiviner closet	3,000	2	3L 4' F32 T8 ELE N BALLAST	105	2	RETRO 3L 4 FT F25 T8 ELE L	60	270	0.09	
27	Theater	3,000	8	65 WATT INCAN FLOOD	65	8	RELAMP PAR 30 LED BULB 13 WATT	13	1,248	0.416	
28	Pendant fixture	3,000	4	150 WATT MH HIGH BAY	190	4	LED SCREW IN RETRO FIT36 WATT	36	1,848	0.616	
29	Poles outside	3,000	2	150 WATT MH COBRAHEAD	195	2	NEW LED AREA LIGHT 30 WATT	30	990	0.33	
30	Coal mine hoast house track p	3,000	31	65 WATT INCAN FLOOD	65	31	RELAMP PAR 30 LED BULB 13 WATT	13	4,836	1.612	
31	Can lights par 38	3,000	13	75 WATT INCAN FLOOD	75	13	RELAMP PAR 38 LED BULB 20 WATT	20	2,145	0.715	
32	Ceiling fans	3,000	4	60 WATT INCANDESCENT	60	4	RELAMP LED A LAMP 12 WATT	12	576	0.192	
33	Kitchen	3,000	4	1 LAMP 4 FT F40 T12 EE / STD	51	4	RETRO 1L 4 FT F25 T8 ELE L	20	372	0.124	
34	Tracks par 30	3,000	5	65 WATT INCAN FLOOD	65	5	RELAMP PAR 30 LED BULB 13 WATT	13	780	0.26	
35	Hallway	3,000	2	1 LAMP 4 FT F40 T12 EE / STD	51	2	RETRO 1L 4 FT F25 T8 ELE L	20	186	0.062	
36	Office	3,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	174	0.058	
37	Office entry	3,000	1	2 LAMP 4 FT F40 T12 EE / STD	86	1	RETRO 2L 4 FT F25 T8 ELE L	41	135	0.045	
38	Control rm	3,000	4	1L 4' F32 T8 ELE N BALLAST	28	4	RETRO 1L 4 FT F25 T8 ELE L	20	96	0.032	
39	Exits	3,000	4	EXIT SIGN (4) 7.5 W INCANDESCENT	30	4	NEW EXIT SIGN 2 WATT BAT BACK	2	336	0.112	
40	Control rm	3,000	1	2 LAMP 4 FT F40 T12 EE / STD	86	1	RETRO 2L 4 FT F25 T8 ELE L	41	135	0.045	
41	Private office	3,000	2	2 LAMP 4 FT F40 T12 EE / STD	86	2	RETRO 2L 4 FT F25 T8 ELE L	41	270	0.09	
42	Men's rm	3,000	2	2 LAMP 4 FT F40 T12 EE / STD	86	2	RETRO 2L 4 FT F25 T8 ELE L	41	270	0.09	



		EXISTING				PROPOSED				SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved	
43	Women's rm	3,000	4	1 LAMP 4 FT F40 T12 EE / STD	51	4	RETRO 1L 4 FT F25 T8 ELE L	20	372	0.124	
44	Outside deco A lamps	3,000	5	75 WATT INCANDESCENT	75	5	RELAMP LED A LAMP 12 WATT	12	945	0.315	
45	Floods 2 headed	3,000	2	75 WATT INCAN FLOOD	75	2	RELAMP PAR 38 LED BULB 20 WATT	20	330	0.11	
46	Through way jelly jar A lamps	3,000	3	60 WATT INCANDESCENT	60	3	RELAMP LED A LAMP 12 WATT	12	432	0.144	
47	Barn storage	3,000	1	2 LAMP 8FT F96 T12 EE / STD	138	1	RETRO 2L 8FT F96 T8 N	110	84	0.028	
48		3,000	2	2 LAMP 4 FT F40 T12 EE / STD	86	2	RETRO 2L 4 FT F25 T8 ELE L	41	270	0.09	
49		3,000	2	60 WATT INCANDESCENT	60	2	RELAMP LED A LAMP 12 WATT	12	288	0.096	
50											
51	Front building loading platform	3,000	13	75 WATT INCAN FLOOD	75	13	RELAMP PAR 38 LED BULB 20 WATT	20	2,145	0.715	
52	Jelly jar	3,000	9	60 WATT INCANDESCENT	60	9	RELAMP LED A LAMP 12 WATT	12	1,296	0.432	
53	Mine	3,000	1	2 LAMP 4 FT F40 T12 EE / STD	86	1	RETRO 2L 4 FT F25 T8 ELE L	41	135	0.045	
54	Mine jelly jar	3,000	75	100 WATT INCANDESCENT	100	75	RELAMP LED A LAMP 12 WATT	12	19,800	6.6	
55	Pool	3,000									
56	Parking lot yoke mount photo	3,000	2	175 WATT MH FLOOD	205	2	NEW LED FLOOD 50 WATT	44	966	0.322	
57	Pool garage	3,000	3	2 LAMP 8FT F96 T12 EE / STD	138	3	RETRO 2L 8FT F96 T8 N	110	252	0.084	
58	Pool	3,000	1	250 WATT MH COBRAHEAD	295	1	NO CHANGE				
59	Women's rm	3,000	1	2 LAMP 4 FT F40 T12 EE / STD	86	1	RETRO 2L 4 FT F25 T8 ELE L	41	135	0.045	
60	Men's rm	3,000	1	2 LAMP 4 FT F40 T12 EE / STD	86	1	RETRO 2L 4 FT F25 T8 ELE L	41	135	0.045	
61	Canopys	3,000	8	70 WATT MH HIGH BAY	92	8	NEW LED CANOPY 38 WATT	38	1,296	0.432	
62	Wall packs	3,000	2	70 WATT MH WALLPACK	92	2	NEW LED WALL MOUNT SECURITY W SENS	14	468	0.156	
63	Bathroom top of hill	3,000	4	70 WATT HPS WALLPACK	95	4	NEW LED WALL MOUNT SECURITY W SENS	14	972	0.324	
64	Men's rm	3,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	174	0.058	
65	Closet	3,000	1	2L 4' F32 T8 ELE HP BALLAST	70	1	RETRO 2L 4 FT F25 T8 ELE L	41	87	0.029	
66	Women's rm	3,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	174	0.058	
67	Garage	3,000									
68	Pole lights barn yard	3,000	2	150 WATT MH COBRAHEAD	195	2	NEW LED AREA LIGHT 30 WATT	30	990	0.33	
69	Outside building par38	3,000	5	75 WATT INCAN FLOOD	75	5	RELAMP PAR 38 LED BULB 20 WATT	20	825	0.275	
70	Maxlite security	3,000	1	70 WATT MH WALLPACK	92	1	NEW LED WALL MOUNT SECURITY W SENS	14	234	0.078	
71	Garage 1	3,000	2	4L 4' F32 T8 ELE N BALLAST	112	2	RETRO 4L 4 FT F25 T8 ELE L	80	192	0.064	
72	Break rm	3,000	3	4L 4' F32 T8 ELE N BALLAST	112	3	RETRO 4L 4 FT F25 T8 ELE L	80	288	0.096	
73	Sink rm	3,000	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	96	0.032	
74	Bathroom	3,000	2	60 WATT INCANDESCENT	60	2	RELAMP LED A LAMP 12 WATT	12	288	0.096	
75	Office	3,000	2	4 LAMP 4 FT F40 T12 EE / STD	172	2	RETRO 4L 4 FT F25 T8 ELE L	80	552	0.184	
76	Garage 2	3,000	12	2 LAMP 8FT F96HO T12 EE / STD	227	12	RETRO 2L 8FT F96HO T8	158	2,484	0.828	
77	Storage	3,000	1	2 LAMP 4 FT F40 T12 EE / STD	86	1	RETRO 2L 4 FT F25 T8 ELE L	41	135	0.045	
78	Wood shop	3,000	5	2 LAMP 8FT F96HO T12 EE / STD	227	5	RETRO 2L 8FT F96HO T8	158	1,035	0.345	
79	Wood shop	3,000	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	96	0.032	
80	Garage 3	3,000	2	2 LAMP 8FT F96HO T12 EE / STD	227	2	RETRO 2L 8FT F96HO T8	158	414	0.138	
81	Outside park office par 38 floo	3,000	11	75 WATT INCAN FLOOD	75	11	RELAMP PAR 38 LED BULB 20 WATT	20	1,815	0.605	
82	Sign	3,000	5	250 WATT MH FLOOD	295	5	NEW LED FLOOD 50 WATT	44	3,765	1.255	
<b>Original Estimate Totals: Parks</b>			<b>431</b>			<b>431</b>			<b>77,096</b>	<b>26</b>	

		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
	<b>Aylesworth Park</b>									
1	Office	3,000	3	2L 4' F32 T8 ELE HP BALLAST	70	3	RETRO 2L 4 FT F25 T8 ELE L	41	261	0.087
2	Personal office	3,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	174	0.058
3	Storage closet	3,000	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 2X4 4L TO 2L 4FT F25 T8 L REFL	39	219	0.073
4	Bathroom	3,000	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 2X4 4L TO 2L 4FT F25 T8 L REFL	39	219	0.073
5	Garage	3,000	6	NEW FIX T5 HO 4L 2X4 REF OPEN	234	6	NO CHANGE			
6	Storage	3,000	1	4L 4' F32 T8 ELE N BALLAST	112	1	RETRO 4L 4 FT F25 T8 ELE L	80	96	0.032
7	Water pump room	3,000	1	COMPACT FLUORESCENT 15W S/I	15	1	RELAMP LED A LAMP 12 WATT	12	9	0.003
8	Men's rm	3,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	174	0.058
9	Women's rm	3,000	2	2L 4' F32 T8 ELE HP BALLAST	70	2	RETRO 2L 4 FT F25 T8 ELE L	41	174	0.058
10	On building above garage doc	3,000	4	70 WATT MH FLOOD	92	4	NEW LED FLOOD 30 WATT	27	780	0.26
11	Building walls maxlite security	3,000	4	70 WATT MH WALLPACK	92	4	NEW LED WALL MOUNT SECURITY W SENS	14	936	0.312
12	Canopy	3,000	8	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	8	NEW LED CANOPY 38 WATT	38	336	0.112
	<b>Option 1 Totals</b>		<b>35</b>			<b>35</b>			<b>3,378</b>	<b>1.126</b>

		EXISTING				PROPOSED			SAVINGS	
Line Ref	Location:	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	KW Saved
	<b>Covington park</b>									
1	Baseball park building	3,000	6	3L 4' F32 T8 ELE N BALLAST	105	6	RETRO 3L 4 FT F25 T8 ELE L	60	810	0.27
2	Baseball park building	3,000	3	250 WATT MH WALLPACK	295	3	NEW LED WALL PACK 40 WATT	40	2295	0.765
3	Covington park	3,000	1	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	1	NEW LED WALL PACK 40 WATT	40	36	0.012
4	Covington park	3,000	1	100 WATT MH WALLPACK	130	1	NEW LED WALL PACK 40 WATT	40	270	0.09
5	Canopy	3,000	6	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	6	NEW LED CANOPY 38 WATT	38	252	0.084
6	Canopy	3,000	3	COMPACT FLOURESENT PLUG IN 2 LAMP 26 W	52	3	NEW LED CANOPY 38 WATT	38	126	0.042
7	Wall wash	3,000	3	50 WATT INCANDESCENT	50	3	NEW LED FLOOD 14 WATT	15	315	0.105
	<b>Option 2 Totals</b>								<b>4,104</b>	<b>1.368</b>
	<b>Total: Parks</b>		<b>478</b>			<b>478</b>			<b>84,578</b>	<b>28.1925</b>

## Attachment C – Project Commissioning

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This document describes McClure Company's standard building commissioning plan. The purpose of the commissioning plan is to guide the installation contractor and commissioning team through an effective process. It describes the reasoning behind the commissioning plan, and how it should be implemented.

### Benefits of Commissioning

Because all building systems are integrated, a deficiency in one or more components can result in suboptimal operation and performance among other components. Remedying these deficiencies can result in a variety of benefits including:

- Improved building occupant productivity
- Lower utility bills through energy savings
- Increased occupant and owner satisfaction
- Enhanced environmental/health conditions and occupant comfort
- Improved system and equipment function
- Improved building operation and maintenance
- Increased occupant safety
- Better building documentation
- Shortened occupancy transition period
- Significant extension of equipment/systems life cycle

Industry sources indicate that on average the operating costs of a commissioned building range from 8% to 20% below that of a non-commissioned building.

The following sections describe what is to be expected from the McClure commissioning team. The McClure team will develop commissioning specifications and complete a commissioning report at the end of the project. The level of commissioning for each ECM will be included as part of this submittal.

### Develop Commissioning Specifications

The commissioning tasks for the contractors will be identified in the commissioning specification and will include:

- Detailed description of the responsibilities of all parties
- Details of the commissioning process (i.e. schedule and sequence of activities)
- Deficiency resolution
- Submittals
- O& M Manuals
- Functional testing process and specific functional test requirements including acceptance criteria
- As-built drawings

### Complete Final Commissioning Report

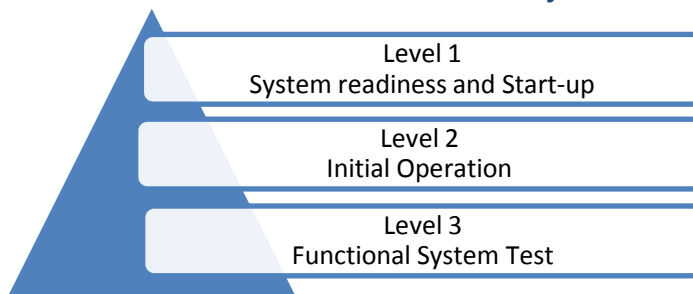
During post-construction, the commissioning supervisor is responsible for delivering a final commissioning report. The final commissioning report shall include at a minimum:

- A statement that systems have been completed in accordance with the contract documents and that the systems are performing in accordance with the final Owner's Project Requirements document

- Identification and discussion of any substitutions, compromises or variances between the final design intent, contract documents and as-built conditions
- Post-Construction activities and results including deferred & seasonal testing results, test data reports and additional training documentation

The final commissioning report will serve as a critical reference and benchmark document for future re commissioning of the facility. In addition, the commissioning supervisor is responsible at this stage to assure the design professional updates to the CAD As-Built drawings have been completed.

### Levels of Intensity



Proposed Energy Conservation Measures (ECMs) can vary greatly in size, scope and complexity. Systems can be of a critical or highly specialized nature or can be as simple as plugging in a new specialized control. Because of this potential for variance, McClure Company will employ three different levels of commissioning intensity.

#### ***Level 1 - System Readiness and Startup***

The McClure Company project manager, commissioning supervisor, and appropriate subcontractor should perform Level 1 Commissioning during the construction and acceptance phases of the project. This level basically involves a visual inspection of the installation.

The contractor performs all required tasks. The Commissioning supervisor documents the installation. An example of an ECM specific to this project that level 1 commissioning is appropriate is the vending misers.

Level 1 commissioning is intended to:

- Ensure that the contractor meets basic contractual requirements to produce a complete installation, in accordance with the contract documents.
- Help the contractor plan, organize, and coordinate that part of his/her work related to completing the installation and getting equipment and systems ready to start properly, safely, and on schedule.
- Identify problems that may arise and provide a mechanism for problem resolution by the responsible parties, with necessary follow-up.
- Provide documentation showing that system installation is in accordance with requirements.

#### ***Level 2 - Initial Operation***

Level 2 commissioning requires the pre-start up testing of the various systems. The commissioning supervisor along with the appropriate subcontractor conducts systems tests to ensure system condition and capacities.

Level 2 commissioning is proper level of commissioning for an ECM that acts as an independent system and is not a component of a larger integrated system. An example of an independent system that is proposed for this project is the steam and condensate replacement. While the replacement of the steam and condensate system will have an impact on energy savings, the replacement of the steam and condensate system once it has been pressure tested and no longer leaks, will not have an impact on heating systems.

Level 2 commissioning is intended to include comprehensive pre-start up checks and tests, and to:

- Ensure that the contractor meets basic contractual requirements to produce a fully functioning installation in accordance with the contract documents.
- Ensure that system operations are checked and that specified performance is achieved in all respects. This is where McClure Company's approach of using the service of an independent commissioning supervisor really adds value.
- Provide documentation showing that system operation is in accordance with requirements.
- Ensure that the contractor is able to operate the equipment and systems, and can demonstrate system performance according to contract requirements.
- Provide a framework for giving training demonstrations in proper systems operation to the Client(s), and for providing maintenance instructions and recommendations for the completed system.

### ***Level 3 - Functional System Test***

Level 3 commissioning is the most detailed and exhaustive application of the commissioning process.

Level 3 is the required level of commissioning when the individual components of the system are integrated into a control system. An example of a system specific to this project that will require level 3 commissioning is the dual fuel summer boiler.

Level 3 commissioning is intended to:

- Ensure that systems operation, including all control sequences, is adequately checked and that functional performance, as specified by the requirements, is achieved in all respects.
- Provide documentation that reflects system operation in accordance with requirements.
- Ensure that the contractor is able to operate the equipment and systems, and demonstrate system performance and functionality (according to contract requirements), to the client(s).
- Provide a framework for giving training in proper systems operation to the clients(s), and for providing maintenance instructions and recommendations for the completed system.

### Sample Commissioning Reports

McClure Company  
 4101 North Sixth Street  
 P. O. Box 1579  
 Harrisburg, PA 17105-1579  
 Tel. 717.232.9743  
 Fax 717.236.5239  
 24-hr. Svc. 717.233.6431  
 www.mcclureco.com



CONTRACTORS AND ENGINEERS

#### HVAC Start-Up Sheet

Job Name	<input type="text"/>	Unit No.	<input type="text"/>
Job No.	<input type="text"/>	Mfr.	<input type="text"/>
Date	<input type="text"/>	Model No.	<input type="text"/>
		Serial No.	<input type="text"/>

Evaporator / Fan Section	Cooling						Heating						
Entering Air/Water Temp.	Cool						Heat						
Leaving Air/Water Temp.	Cool						Heat						
Supply Fan Amps	Nameplate		Actual				L1	L2	L3				
Return Fan Amps	Nameplate		Actual				L1	L2	L3				
Lube Motor/Drive													
Belt Adjust													
Belt Replace													
Filter Inspect													
Filter Replace/Clean													
Check Electrical Connections													
Economizer Operation													
Set Points													
Filter Sizes													
Belt Sizes													
<b>Compressor Section</b>													
Discharge Pressure Per Circuit	Cool	1	2	3	3	1	2	3					
Suction Pressure Per Circuit	Cool	1	2	3	3	1	2	3					
Check Crankcase Heater													
Oil Level/Pressure													
Amps/1.	L1	L2	L3	2	L1	L2	L3	3	L1	L2	L3		
Volts/ 1.	L1	L2	L3	2	L1	L2	L3	3	L1	L2	L3		
Sight Glass Clear ?													
HI Press Cycle CI/CO													
LO Press Cycle CI/CO													
Superheat/Circuit				1	2	3							
Sub Cooling/Circuit				1	2	3							
Liquid Line Temp/Circuit				1	2	3							
Suction Line Temp/Circuit				1	2	3							
<b>Condenser</b>													
Volts	Nameplate		Actual				L1	L2	L3				
Fan/Amps	Nameplate		Actual				L1	L2	L3				
Belt Adjust													
Belt Replace													
Belt Sizes													
Lube Motor/Drive													
Entering Air/Water Temp.													
Leaving Air/Water Temp.													



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### HVAC Start-Up Sheet

Job Name	0	Unit No.	0
Job No.	0	Mfr.	0
Date	0	Model No.	0
		Serial No.	0

Heating Section / Electric Heat	Cooling			Heating		
Volts	Nameplate		Actual	L1	L2	L3
Amps/Stage	Nameplate		Actual	L1	L2	L3
Stage 1			Actual	L1	L2	L3
Stage 2			Actual	L1	L2	L3
Stage 3			Actual	L1	L2	L3
Check Electrical Connections						
<b>Gas Heat</b>						
Line Pressure Inches WC	Nameplate		Actual			
Manifold Pressure Inches WC	Nameplate		Actual			
<b>Cooling Tower</b>						
Fan Amps	Nameplate		Actual			
Pump Amps	Nameplate		Actual			
Sump Heater Amps	Nameplate		Actual			
Check Water Level						
Check Damper Operation						
Check Bleed Off						
Belt Sizes						

#### Field Notes / Additional Information

CRANK CASE HEATER 138A00  
 TWO COMPRESSOR  
 THREE CONDENSER FANS



# McClure Company

## System Ready to Start-up Check List

Date \_\_\_\_\_ Date Req'd \_\_\_\_\_ Construction Job # \_\_\_\_\_  
 Project Manager \_\_\_\_\_ Service Job # \_\_\_\_\_  
 Foreman to Contact \_\_\_\_\_ Job Phone # \_\_\_\_\_  
 Owner to Contact \_\_\_\_\_ Special Instructions \_\_\_\_\_  
 Address \_\_\_\_\_

CHILLERS	Ready			Air Handlers / Rooftop Units / ERU	Ready		
	Yes	No	N/A		Yes	No	N/A
Equip Tag:				Equip Tag:			
Unit set and secured in correct location				Shipping blocks & Hardware Removed			
Unit set level				Unit set and secured in correct location			
Air clearances adequate				Unit set level			
Service clearances around unit sufficient				Service clearances around unit sufficient			
Any visible damage				Any visible damage			
Any apparent Oil or Refrigerant leaks				Any apparent Oil or Refrigerant leaks			
Flow Switch installed				Sealed between unit & roof curb			
Temp or DP switch installed				Duct work completed			
System filled and air purged (glycol)				Filter installed correctly			
Pumps started (CHW or Condenser)				Condensate Piping complete			
Electrical Complete				Gas Piping complete			
Control wiring Completed				Gas Regulator & Valves installed			
Control Valves operable				Vibration Isolators (in free state)			
Will we have a building load				Electrical Complete			
Disconnect switch installed				Control wiring Completed			
Correct fuse installed				Disconnect switch installed			
Vibration Isolators (in free state)				Correct fuse installed			
Suction Pipe Insulated				Belts on site			
All components installed (hot gas bypass, expansion valves, solenoid valves, sight glass, driers, etc.				Economizers installed and wired			
Piping leak checked				O & M Manual on site			
Chilled Water piping insulated				Submittals on site			
O & M Manual on site				Accessories on site (in dry area)			
Submittals on site				Is there factory start-up included			
Is Relief Valves & PRV Piped to Exterior							
Flush Piping only, not chiller							
Strainer installed at chiller							
Refrigerant Monitor installed complete							
Heat Trace required							
Is there factory start-up included							

Project Name  
Project# 21460

COMMISSIONING PLAN  
Date: 5-13-10

**COMMISSIONING PLAN**  
**FUNCTIONAL PERFORMANCE TESTS**

**Project Name**  
Town, PA

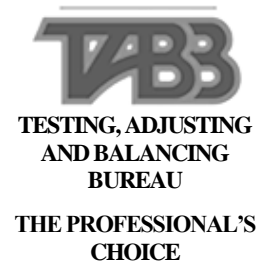
**Sample**

4101 North Sixth Street  
Harrisburg, PA 17110  
717-232-9743  
717-236-5239 fax



Certification No. 2708

**McClure Company is recognized for quality work in many technical construction market segments. Our approach is designed to deliver unexpected service at every level of the organization as it relates to specific projects, to not only meet installation standards, but also to maximize completion, budget, and quality that exceeds your expectations. Our participation in the following organizations helps to advance our standards.**



## FUNCTIONAL PERFORMANCE TESTS

**Two Pipe Unit Ventilators**

**UV-2 Room No. 012 CAFETERIA**

Tests:	Yes	No
The UV is indexed to occupied/un-occupied by the time of day schedule 6:00AM to 6:00PM Monday through Friday:	X	
The discharge air temperature is limited to 120°F:	X	
In the heating warm-up mode the fan is energized and the coil valve is 100% open:	X	
When the occupied space temperature is achieved the hot water coil valve modulates closed:	X	
The warm-up sequence includes an optimal start time:	X	
Whenever the UV is in the occupied mode the fan runs continuously:	X	
When the mechanical plant is in the heating mode and upon a fall in space temperature 1°F below set point the dual temperature coil valve modulates open:	X	
When the mechanical plant is in the heating mode and upon a rise in space temperature 1°F above set point the dual temperature coil valve modulates closed :	X	
When the mechanical plant is in the cooling mode and upon a fall in space temperature 1°F below set point the dual temperature coil valve modulates closed: :	X	
When the mechanical plant is in the cooling mode and upon a rise in space temperature 1°F above set point the dual temperature coil valve modulates open :	X	
The wall mounted thermostat is calibrated, actual 68°F@ thermostat, BAS reading 68.5°F:	X	
When indexed to the dual temperature coil valve is 100% open:	X	
In the heating unoccupied mode the UV fan is cycled to maintain space temperature set point 55°	X	
In the cooling unoccupied mode the valve is closed an the fan is off:	X	
A global signal is sent to the UV when the central system is in the heating or cooling mode	X	

**Two Pipe Unit Ventilators w/ DX Cooling**

**UV-30 Room No.**

Tests:	Yes	No
The UV-30 is indexed to occupied/un-occupied by the time of day schedule 6:00AM to 6:00PM Monday through Friday:	X	
The discharge air temperature is limited to 120°F:	X	
In the heating warm-up mode the fan is energized and the coil valve is 100% open:	X	
The outdoor air damper is 100% closed:	X	
When the occupied space temperature is achieved the hot water coil valve modulates closed:	X	
The warm-up sequence includes an optimal start time:	X	

Whenever the UV is in the occupied mode the fan runs continuously:	<b>X</b>	
The outdoor air damper opens to the minimum position of 20%:	<b>X</b>	
When the mechanical plant is in the heating mode and upon a fall in space temperature 1°F below set point the dual temperature coil valves modulates open:	<b>X</b>	
When the mechanical plant is in the heating mode and upon a rise in space temperature 1°F above set point the dual temperature coil valves modulates closed and the mechanical cooling is enabled:	<b>X</b>	
When the mechanical plant is in the cooling mode and upon a rise in space temperature 1°F above set point the dual temperature coil valves modulates open:	<b>X</b>	
Tests:	<b>Yes</b>	<b>No</b>
The wall mounted thermostat is calibrated; actual 68°F@ thermostat, BAS reading 68°F:	<b>X</b>	
When indexed to the unoccupied mode and the mechanical plant is the heating mode, the dual temperature coil valve is 100% open:	<b>X</b>	
In the heating unoccupied mode the UV fan is cycled to maintain space temperature set point 55°	<b>X</b>	
In the cooling unoccupied mode the UV valve is closed and the fan is off:	<b>X</b>	
A global signal is sent to the UV when the mechanical plant system is in the heating or cooling mode	<b>X</b>	

### Existing Air Handling Units

#### AH-2 Gymnasium

Tests:	<b>Yes</b>	<b>No</b>
The unit is indexed to occupied/un-occupied by the time of day schedule 6:00AM to 6:00PM Monday through Friday:	<b>X</b>	

### Warm-up Mode

Tests:	<b>Yes</b>	<b>No</b>
The supply fan is energized and the outside air damper is closed:	<b>X</b>	
The hot water coil valve is open:	<b>X</b>	
When the warm-up temperature is achieved the outdoor air damper remains closed but the hot water valve modulates to maintain temperature set point:	<b>X</b>	
The warm-up sequence includes an optimal start time:	<b>X</b>	

### Occupied Mode

Tests:	<b>Yes</b>	<b>No</b>
The supply fan is energized and runs continuously:	<b>X</b>	
The outdoor air damper opens to the reduced minimum position:	<b>X</b>	
When the mechanical plant is in the heating mode and upon a fall in space temperature 1°F below set point the coil valves modulates open:	<b>X</b>	

When the mechanical plant is in the heating mode and upon a rise in space temperature 1°F above set point the coil valve modulates closed:	X	
Upon a continued rise in space temperature the unit is indexed to the economizer mode of operation:	X	
The mixed air controller overrides the outdoor damper to the mixed air temperature from falling below the 50°F set point:	X	
If economizer is not available and the space temperature rises above set point the mechanical cooling is enabled:	X	
When the CO2 level in the space is above 1,200 ppm the outdoor air damper modulates open to the design minimum position:	X	
The CO2 sequence operates only in the occupied mode and when the supply fan is energized:	X	
The mixed air temperature act as a low limit:	X	

**Safeties and alarms**

Tests:	Yes	No
When the supply fan fails an alarm is generated @ the operator work station:	X	
When the discharge air temperature is below 40°F an alarm is generated @ the operator work station:	X	
Upon smoke detection the supply and exhaust fans shut down and an alarm is generated @ the operator work station	X	
When the low limit safety switch mounted on the leaving side of the hot water reheat coil trips @ 38°F, the supply fan shuts down and the outdoor air damper closes:	X	

**New Air Handling Unit**

**AH-1 Library**

Tests:	Yes	No
The unit is indexed to occupied/un-occupied by the time of day schedule 6:00AM to 6:00PM Monday through Friday:	X	

**Warm-up Mode**

Tests:	Yes	No
The supply fan is energized and the outside air damper is closed:	X	
The dual temperature coil valve is open:	X	
When the warm-up temperature set point 70°F is achieved the outdoor air damper remains closed but the dual temperature valve modulates to maintain temperature set point:	X	
The warm-up sequence includes an optimal start time:	X	
When the mechanical plant is in cooling mode the duct mounted electric reheat coil replaces the AHU coil:	X	
When the mechanical plant is in cooling mode the dual temperature coil is in by-pass:	X	
The warm-up sequence includes an optimal start time:	X	



### Occupied Mode

Tests:	Yes	No
The supply fan is energized and runs continuously:	X	
The outdoor air damper opens to the minimum position:	X	
<b>Following test with the Mechanical Plant in Cooling Mode</b>		
When the mechanical plant is in the cooling mode and upon a fall in space temperature 1°F below set point the coil valves modulates closed:	X	
When the mechanical plant is in the cooling mode and upon a continued fall in space temperature 1°F below set point the 1 <sup>st</sup> stage of electric heat is energized:	X	
When the space temperature stays below the set point the 2 <sup>nd</sup> stage of electric heat is energized:	X	
Upon a rise in space humidity above 58% RH the chilled water valve opens:	X	
If the discharge air temperature or space temperature fall below set point the 1 <sup>st</sup> stage of electric heat is energized:	X	
When the discharge air temperature or space temperature stay below the set point the 2 <sup>nd</sup> stage of electric heat is energized:	X	
When the space humidity falls below set point the unit returns to normal operation:	X	
The mixed air controller overrides the outdoor damper to the mixed air temperature from falling below the 50°F set point:	X	

### Unoccupied Mode

Tests:	Yes	No
The supply fan is off:	X	
The outside air damper is closed:	X	
The dual temperature coil valve is closed:	X	
When the space temperature fall below 55°F set point the fan is on and the dual temperature coil valve modulates to maintain space temperature set point:	X	
When the Mechanical Plant is in cooling mode the electric coil is enabled upon a fall in space temperature:	X	
When the space humidity is above set point 58% RH and chilled water is available the coil valve opens:	X	
If the space temperature or discharge air temperature falls below set point and the Mechanical Plant is in cooling mode the 1 <sup>st</sup> stage of electric heat is energized:	X	

### Occupied Mode with the Mechanical Plant in Heating Mode

Tests:	Yes	No
The supply fan is energized and runs continuously:	X	

Upon a rise in space temperature 1°F above set point the mechanical cooling is enabled: <sup>1</sup>	X	
Upon a continued rise in space temperature and a 50% call for cooling the 2 <sup>nd</sup> stage of mechanical cooling is enabled:	X	
Upon a fall in space temperature 1°F below set point the dual temperature coil valve modulates open:	X	
If supply air temperature cannot be maintained with the valve 100% open the 1 <sup>st</sup> stage of electric heat is enabled:	X	
Upon a rise in space humidity above 60% RH the 1 <sup>st</sup> stage of mechanical cooling is enabled:	X	
If the discharge air temperature or space temperature fall below set point the dual temperature coil valve modulates open:	X	
If the discharge air temperature or space temperature continue to fall below set point the 1 <sup>st</sup> stage of electric heat is energized:	X	
When the discharge air temperature or space temperature stay below the set point the 2 <sup>nd</sup> stage of electric heat is energized:	X	
When the space humidity falls below set point the unit returns to normal operation:	X	
When the discharge air temperature or space temperature stay below the set point the 2 <sup>nd</sup> stage of electric heat is energized:	X	
With the mechanical plant in heating mode and AH-1 in the unoccupied mode and a call for humidity control. The heating the hot water coil valve modulates open to maintain space or discharge air temperature:	X	

### **Safeties and alarms**

Tests:	Yes	No
When the supply fan fails an alarm is generated @ the operator work station:	X	
When the discharge air temperature is below 40°F an alarm is generated @ the operator work station:	X	
Upon smoke detection the supply and exhaust fans shut down and an alarm is generated @ the operator work station	X	
When the low limit safety switch mounted on the leaving side of the hot water reheat coil trips @ 38°F, the supply fan shuts down and the outdoor air damper closes:	X	
When compressor #1 fails an alarm is generated @ the operator work station:	X	
When compressor #2 fails an alarm is generated @ the operator work station:	X	
A high condensate alarm is generated @ the operator work station:	X	

## **OPERATOR'S WORKSTATION GRAPHICS**

### **ENERGY RECOVERY UNITS**

#### **Operator Adjustable - Commandable**

Tests:	Yes	No
Unit START/STOP	X	
Space humidity set point	X	

<sup>1</sup> There is not an economizer mode for AH-1



Heat Wheel On/Off	X	
O. A. heating set point	X	
R. A. cooling set point stage 1	X	
R. A. cooling set point stage 2	X	
Occupied/Unoccupied	X	
Humidity control On/Off	X	
Reheat control On/Off	X	

**Alarms at the Workstation**

Tests:	Yes	No
Supply fan failed	X	
Exhaust fan failed	X	
Heat wheel failed	X	
Low discharge air temperature	X	
Freeze stat	X	

**Graphics only**

Tests:	Yes	No
Heating enable	X	
Heating on/off	X	
Dehumidification on/off	X	
Cooling stages on/off	X	

**MECHANICAL PLANT**

**Operator Adjustable - Commandable**

Tests:	Yes	No
Pump P-1 Stop/Start	X	
Pump P-2 Stop/Start	X	
Boiler 1 Stop/Start	X	
Boiler 2 Stop/Start	X	
Dual temperature hot water supply temperature	X	

**Alarms at the Workstation**

Tests:	Yes	No
P-1 failure	X	
P-2 failure	X	
Boiler #1 failure	X	
Boiler #2 failure	X	

**Graphics only**

Tests:	Yes	No
System return water temperature	X	
Outside air temperature	X	
Outside humidity	X	
Pump P-1 status	X	

Pump P-2 status	X	
Pump P-1 speed	X	
Pump P-2 speed	X	
Boiler 1 status	X	
Boiler 2 status	X	
Diverting valve V-1 status	X	
Isolation valve V-2 status	X	
Isolation valve V-3 status	X	
Switchover valve V-4 status	X	
Bypass valve V-5 status	X	
Hot water differential pressure	X	
Combustion damper status		

**AIR HANDLING UNIT AC-1**

**Operator Adjustable - Commandable**

Tests:	Yes	No
Space Humidity	X	
Space Temperature	X	
AC-1 stop/start	X	

**Alarms at the Workstation**

Tests:	Yes	No
Supply fan failure	X	
Freeze stat	X	
Smoke detector	X	
Low discharge air temperature	X	
Compressor #1 failed	X	
Compressor #2 failed	X	
High condensate	X	
Dirty filter	X	

**Graphics only**

Tests:	Yes	No
Electric Heat status	X	
DX cooling stage #1 status	X	
DX cooling stage #2 status	X	
Supply fan status	X	
Discharge air temperature	X	
Mixed air temperature	X	
Space relative humidity	X	
Space temperature	X	

**Classroom Unit Ventilators**

### Operator Adjustable - Commandable

Tests:	Yes	No
Supply fan on/off	X	
Dual temperature water valve open/closed	X	
Space temperature set point	X	

### Alarms at the Workstation

Tests:	Yes	No
Supply fan failed	X	
Freeze stat ( UV-30 & 31) only	X	

### Graphics only

Tests:	Yes	No
Supply fan status	X	
Space temperature	X	
Dual temperature valve position	X	
Outdoor air damper position (UV 30 & 31 only)	X	
DX enabled/disabled (UV-30 & 31 only)	X	

## Attachment D – 3 Year Mechanical Service Agreement

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### **General**

A 3 year mechanical service agreement is included as part of this Guaranteed Energy Services Agreement (GESA). The mechanical service agreement will provide the County of Lackawanna with ongoing, comprehensive scheduled maintenance. This agreement will be implemented, scheduled, administered, monitored and kept current by McClure Company, including Automatic Temperature Control systems. The service activities will be planned and scheduled on a regular basis by our comprehensive maintenance scheduling and system based on manufacturers' recommendations, equipment location, application, type, run time and McClure Company's expertise. The County will be kept informed of the agreement's status on a continuing basis utilizing detailed Service Reports, presented after each service visit for the County's review, approval signature and record.

### **Cancellation of Existing Service Agreements**

The County shall be responsible for providing formal cancellation notices to all entities currently providing active service to equipment and / or systems defined within this Mechanical Service Agreement. The County shall notify McClure Company of any irregularities or disputes with cancellation notices so the planned tasking, scope of work and / or effective date set forth within this Agreement can be modified as necessary. Otherwise, the scope of work, in its entirety, will commence on the Effective Date as set forth in this Agreement.

The County anticipates the possible sale of the Administration Building and Gateway Building within the term of this mechanical service agreement, therefore both parties agree the fee associated with these buildings can be eliminated from the overall service agreement fee as follows:

- Administration Building = \$34,784 at 2% annual escalation from the Effective Date
- Gateway Building = \$11,969 at 2% annual escalation from the Effective Date

### **Annual Fee**

The Year 1 fee for the 3 year mechanical service agreement is \$188,500. Subsequent annual fees are escalated at 2% per year as listed in Schedule D of the GESA. The County understands and agrees payment of this fee is separate of the Total Project Fee (one time construction cost) listed in Schedule F and will be billed on a quarterly basis for the term of the 3 year service agreement.

### **Effective Date**

The Effective Date of this 3 year mechanical service agreement is October 1<sup>st</sup>, 2014.

### **Service Agreement Modification**

The new service agreement, with 30 days written notice to McClure Company, may be modified, at the County's discretion, to reflect a change in scope of work, type of coverage or future sale of County owned facilities.

### **Termination and Renewal Option**

This Agreement will not automatically renew at the end of the 3 year term. The County and McClure Company retain the option to mutually agree to renew the service agreement in its entirety as set forth herein or in a modified form for any number of additional years up to and including the 20<sup>th</sup> year of the GESA. The County may also opt to modify or terminate the Service Agreement at anytime during the term of the GESA with 30 days written notice. In the event of a renewed service agreement, the GESA will be revised to reflect the changes.

Fees shown beyond the 3 year term in Schedule D are not guaranteed and will be reassessed should the County decide to opt for a renewal beyond the initial 3 year term.

## **Planned Maintenance Agreement – Mechanical Equipment**

### **Inspection and Testing Services**

Includes labor, supervision, testing devices, travel expenses required to visually inspect and test the equipment or systems designated herein to determine operating condition and efficiency.

### **Operation and Efficiency Program**

Includes labor, supervision, equipment, tools, travel and expenses required to regularly and systematically examine, clean, align, adjust, test, tighten, lubricate the equipment or systems designated herein to extend equipment life and maximize safe and efficient operation and energy savings. A general overview of the major mechanical equipment included per facility is listed below. Detailed tasking schedules are shown on the proceeding pages.

### **Prison – Mechanical Equipment**

- ✓ (39) new packaged rooftop units;
  - (4) inspections per year
  - (1) belt change per year
  - Miscellaneous materials as required to perform tasking
  - Filters and filter change labor provided by County personnel
- ✓ (15) new energy recovery ventilators
  - (4) inspections per year
  - (1) belt change per year
  - Miscellaneous materials as required to perform tasking
  - Filters and filter change labor provided by County personnel
- ✓ (3) existing gas fired hot water boilers (converted from steam)
- ✓ (6) hot water pumps
- ✓ (3) walk in freezers / coolers
- ✓ Heating hot water chemical treatment

### **Prison – Automatic Temperature Controls**

- ✓ (1) new direct digital control system
  - (1) inspection per month

### **Prison – Other**

- ✓ (3) Aegis packaged gas fired combined heat and power units.
  - (1) inspection between 750 hours and 1000 hours of recorded run time.
- ✓ (1) 600 KW emergency generator
  - (1) inspection and (1) preventative maintenance per year

### **Courthouse – Mechanical Equipment**

- ✓ (2) existing water cooled chillers
  - (4) inspections per year

- Miscellaneous materials as required to perform tasking
- ✓ (2) existing cooling towers
  - (4) inspections per year
  - Miscellaneous materials as required to perform tasking
- ✓ (3) existing gas fired condensing
  - (4) inspections per year
  - Miscellaneous materials as required to perform tasking
- ✓ (8) chilled and hot water pumps
- ✓ Chilled and heating hot water chemical treatment

#### **Courthouse – Automatic Temperature Controls**

- ✓ (1) existing Siemens direct digital control system
  - (6) inspections per year

#### **Administration Building – Mechanical Equipment**

- ✓ (1) existing cooling tower
  - (4) inspections per year
  - Miscellaneous materials as required to perform tasking
- ✓ (2) existing gas fired boilers
  - (4) inspections per year
  - Miscellaneous materials as required to perform tasking
- ✓ (4) base mounted pumps
- ✓ (4) filter changes per year – water source heat pumps
- ✓ Heat pump loop chemical treatment EXCLUDED

#### **Administration Building – Automatic Temperature Controls**

- ✓ (1) existing Honeywell control system
  - (2) inspections per year

#### **Gateway Center – Mechanical Equipment**

- ✓ (4) existing packaged rooftop units;
  - (4) inspections per year
  - (1) belt change per year
  - Miscellaneous materials as required to perform tasking
  - (4) Filter changes per year
- ✓ (1) existing gas fired boiler
  - (4) inspections per year
  - Miscellaneous materials as required to perform tasking
- ✓ (2) base mounted pumps Heat pump loop chemical treatment
- ✓ Heating hot water chemical treatment EXCLUDED

**Gateway Center – Automatic Temperature Controls**

- ✓ (1) existing Honeywell control system
  - (2) inspections per year

**911 Center – Mechanical Equipment**

- ✓ (2) air cooled chillers
  - (4) inspections per year
  - Miscellaneous materials as required to perform tasking
- ✓ (2) existing gas fired boilers
  - (4) inspections per year
  - Miscellaneous materials as required to perform tasking
- ✓ (8) chilled and heating hot water pumps
- ✓ Chilled and hot heating hot water chemical treatment

**911 Center – Automatic Temperature Controls**

- ✓ (1) existing Honeywell direct digital control system
  - (6) inspections per year

**911 Center – Other**

- ✓ (2) 600 KW emergency generator
  - (1) inspection and (1) preventative maintenance per year, each
  - (1) load bank test, each

**Visitor's Center – Automatic Temperature Controls**

- ✓ (1) existing Siemens direct digital control system
  - (2) inspections per year



**TASKING SCHEDULES**

**FACILITY – PRISON**

**Energy Recovery Ventilators**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>15</b>	<b>ENERGY RECOVER UNITS</b>													
	GAIN ACCESS TO UNIT	X			X			X			X			
	CHECK HEAT WHEELS CONDITION	X			X			X			X			
	CHECK CONTROL SET POINTS				X						X			
	CHECK AIR FILTERS	X			X			X			X			
	CHECK OPERATION OF DAMPERS				X						X			
	CHECK SUPPLY AND RETURN FAN S	X			X			X			X			
	CHECK FOR VISUAL VIBRATIONS & ALIGNMENT	X			X			X			X			
	CHECK SUPPLY AND RETURN FAN MOTORS	X			X			X			X			
	LUBRICATE AS REQUIRED				X						X			
	CHECK MOTOR OPER. & VOLTAGE, AMPER				X						X			
	CHECK BELT(S)				X						X			
	CHECK OPERATION OF HEAT WHEELS	X			X			X			X			
	CHECK CONTACT. & PTS, ELEC. CONNECT				X						X			
	CUSTOMER WILL CHANGE AIR FILTERS	X			X			X			X			
	CHANGE BELTS AS REQUIRED				X									
	CHECK SET POINTS AND OPERATION	X			X			X			X			

**Packaged Rooftop Units**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>39</b>	<b>PACKAGED UNIT</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK COIL CONDITION (1)	X			X			X			X			
	CHECK CONTROL SET POINTS (2)	X			X			X			X			
	CHECK SAFETIES (3)				X						X			
	CHECK EXPANSION VALVES (4)							X						
	CHECK UNIT CHARGE (5)				X			X						
	CHECK EVAPORATOR TD (6)				X			X						
	CHECK CRANKCASE HEATER (7)	X			X									
	CHECK CONDENSATE PAN AND DRAIN (8)				X			X						
	CLEAN CONDENSATE PAN AND DRAIN (9)				X									
	CHECK ECONOMIZER OPERATION (10)	X			X			X			X			
	ADJUST DAMPER LINKAGE IF REQUIRED (11)				X						X			
	CHECK MOTOR OPER. , VOLT & AMPER. (12)				X						X			
	CHECK DRIVE, FAN CONDITIONS (13)	X			X			X			X			
	CHECK GAS HEAT EXCHANGER (14)										X			
	CHECK GAS HEAT OPERATION (15)	X									X			
	CHECK GAS HEAT PRESSURES, TEMPS AND SAFETIES	X									X			
	CHECK CONTACTOR AND POINTS (17)				X						X			
	CHECK ELECTRICAL CONNECTIONS (18)				X						X			
	LUBRICATE AS REQUIRED (19)				X						X			
	CLEAN CONDENSER COILS (20)				X									
	CHECK EVAPORATOR COIL (22)	X			X			X			X			
	CHECK BELT(S)(23)	X			X			X			X			
	CHANGE BELT(S)(24)				X									
	(CUSTOMER INSTALLS) CHECK AIR FILTERS (25)	X			X			X			X			

**Gas Fired Hot Water Boilers**

Qty	Description	Maintenance Schedule												Diag.
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>3</b>	<b>BOILERS</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK RELIEF VALVE (1)										X			
	CHECK FOR VISIBLE WATER LEAKS(2)	X			X			X			X			
	CHECK ALL SAFETIES (3)	X									X			
	SEQUENCE CONTROLS (4)	X									X			
	CHECK HEAT EXCHANGER SURFACES (5)										X			
	CLEAN BURNER ASSEMBLY (6)										X			
	CLEAN HEAT EXCHANGER SURFACES (7)										X			
	CHECK FOR COMBUSTION LEAKAGE (8)	X									X			
	CHECK FLAME QUALITY (9)	X									X			
	CHECK ORIFICE AND NOZZLE (10)										X			
	CHECK IGNITION OPERATION (11)										X			
	ASSURE FUEL SUTOFF (12)	X									X			
	CHECK GAS PRESSURE REGULATOR (13)	X									X			
	CHECK EXPANSION TANK SIGHTGLASS (14)	X			X			X			X			
	CHECK BOILER TEMP/PRES (15)	X			X			X			X			
	CHECK CONTACTOR AND POINTS (16)	X									X			
	CHECK ELECTRICAL CONNECTIONS (17)	X									X			
	DIGITAL COMBUSTION ANALYSIS (18)	X									X			

**Walk in Cooler / Freezer**

Qty	Description	Maintenance Schedule												Diag.
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>3</b>	<b>WALK IN COOLER / FREEZERS</b>													
	GAIN ACCESS TO UNIT	X			X			X			X			
	CHECK COIL CONDITION				X			X			X			
	CHECK CONTROL SET POINTS				X						X			
	CHECK TEMPS	X			X			X			X			
	CHECK & CALIBRATE SAFETIES	X			X			X			X			
	CHECK DRIVE CONDITION	X			X			X			X			
	CHECK FOR BEARING PLAY	X			X			X			X			
	CHECK EVAPORATOR COILS				X			X						
	CHECK CRANKCASE HEATER	X									X			
	CHECK MOTOR OPERATION	X			X			X			X			
	CHECK CONDENSATE PAN AND DRAIN				X			X						
	CLEAN CONDENSATE PAN AND DRAIN				X			X						
	CHECK CONTACTOR AND POINTS	X			X			X			X			
	CHECK ELECTRICAL CONNECTIONS	X			X			X			X			
	PRESSURE WASH CONDENSER COILS										X			
	CHECK UNIT CHARGE				X			X						
	CHECK SYSTEM PRESSURES	X			X			X			X			
	CHECK SYSTEM TEMPS.				X			X						
	CHECK DOOR GASKETS AND SEALS	X			X			X			X			
	CHECK WALK IN LIGHTS	X			X			X			X			
	CHECK DOOR HANDLE ASSEMBLY	X			X			X			X			

**Hot Water Pumps**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
4	<b>HOT WATER PUMPS</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK COUPLING (1)	X								X				
	CHECK SEALS AND GASKETS (2)	X								X				
	CHECK STARTER/CONTACTOR (3)	X								X				
	CHECK ELECTRICAL CONNECTIONS (4)	X								X				
	CHECK INLET PRESSURE (5)	X								X				
	CHECK OUTLET PRESSURE (6)	X								X				
	CHECK MOTOR OPERATING AMPS (7)	X								X				
	LUBRICATE AS REQUIRED (8)	X								X				
	CHECK COUPLERS (9)	X								X				
	CHECK OPERATION OF VFD's (10)	X								X				
	CHECK FOR VISUAL VIBRATIONS & LEAKS (11)	X			X			X		X				

**FACILITY – COURTHOUSE**

**Cooling Tower**

Qty	Description	Maintenance Schedule												Diag.
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
2	<b>COOLING TOWER</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	INSPECT GENERAL CONDITION OF UNIT (1)	X			X			X			X			
	CLEAN DEBRIS FROM UNIT (2)	X			X			X			X			
	CLEAN AND FLUSH SUMP, CLEAN SUMP STRAINER (3)				X									
	CHECK SUMP WATER LEVEL AND ADJUST AS NEEDED (4)	X			X			X			X			
	INSPECT SPRAY NOZZLES (5)				X									
	CHECK ALL DRIVE BELTS, CHANGE OR ADJUST AS NEEDED (6)	X			X			X			X			
	CHECK MAKE-UP VALVE, BLEED RATE (7)	X			X			X			X			
	CHANGE FAN BELTS (8)				X									
	CHECK FAN BEARING, CHECK LOCKING COLLARS & LUBRICATE AS NEEDED (9)				X						X			
	CHECK FAN & PUMP MOTOR VOLTAGE & CURRENT, LUBRICATE MOTOR BEARINGS AS NEEDED (10)				X						X			
	INSPECT PROTECTIVE FINISH (11)				X						X			
	FILL SUMP (12)				X									
	DRAIN SUMP (IF NEEDED) (13)										X			
	CHECK SUMP HEATERS (14)	X			X						X			

**Gas Fired Boiler**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>3</b>	<b>BOILERS</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK RELIEF VALVE (1)									X				
	CHECK FOR VISIBLE WATER LEAKS(2)	X			X			X		X				
	CHECK ALL SAFETIES (3)	X								X				
	SEQUENCE CONTROLS (4)	X								X				
	CHECK HEAT EXCHANGER SURFACES (5)									X				
	CLEAN BURNER ASSEMBLY (6)									X				
	CLEAN HEAT EXCHANGER SURFACES (7)									X				
	CHECK FOR COMBUSTION LEAKAGE (8)	X								X				
	CHECK FLAME QUALITY (9)	X								X				
	CHECK ORIFICE AND NOZZLE (10)									X				
	CHECK IGNITION OPERATION (11)									X				
	ASSURE FUEL SUTOFF (12)	X								X				
	CHECK GAS PRESSURE REGULATOR (13)	X								X				
	CHECK EXPANSION TANK SIGHTGLASS (14)	X			X			X		X				
	CHECK BOILER TEMP/PRES (15)	X			X			X		X				
	CHECK CONTACTOR AND POINTS (16)	X								X				
	CHECK ELECTRICAL CONNECTIONS (17)	X								X				
	DIGITAL COMBUSTION ANALYSIS (18)	X								X				

**Water Cooled Chiller**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
2	CHILLER													
	GAIN ACCESS TO UNIT	X			X			X			X			
	CHECK CHILLER LOG	X			X			X			X			
	CHECK CHILLED WATER TEMPS	X			X			X			X			
	CHECK TOWER WATER TEMPS	X			X			X			X			
	CHECK CHILLED WATER PRESSURES	X			X			X			X			
	CHECK CONDENSER WATER PRESSURES	X			X			X			X			
	CHECK APPROACH TEMPS EVAP & COND.	X			X			X			X			
	CHECK LIQUID LINE SIGHT GLASSES	X			X			X			X			
	CHECK VFD OPERATION	X			X			X			X			
	CHECK REFRIGERANT PRESSURES	X			X			X			X			
	VISUALLY CHECK PIPING LEAKS/DAMAGE	X			X			X			X			
	VISUAL CHECK SYSTEM FOR VIBRATIONS	X			X			X			X			
	CHECK OPERATING/SAFETY CONTROLS	X			X			X			X			
	ANNUAL SHUT DOWN WORK				X									
	CHECK FLOW SWITCHES				X						X			
	CLEAN CONDENSER TUBES				X									
	CHECK OPERATION OF GUIDE VANE ACTUATOR				X						X			
	CHECK ALL SENSORS AND SAFETY CONTROLS				X									
	MEG OHM MOTORS				X									
	PRESSURIZE AND LEAK CHECK CHILLER				X									
	CHECK, CLEAN & TIGHTEN ALL ELECTRICAL CONTACTS & CONNECTIONS IN PANELS	X			X			X			X			
	CHECK STARTER PANEL AND COMPONENTS				X									
	CLEAN UP JOB SITE				X			X			X			



**FACILITY – 911 CENTER**

**Air Cooled Chiller**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
2	<b>CHILLERS</b>													
	CHECK AUXILIARY EQUIPMENT OPERATION				X									
	CHECK REFRIGERANT AND OIL LEVELS				X									
	CHECK OIL SUMP HEATERS				X									
	CHECK AND TEST ALL OPERATING AND SAFETY CONTROLS				X									
	CHECK CHILLED WATER PRESSURE DROP ACROSS EVAPORATOR BUNDLE				X									
	VERIFY WATER CHILLER START SEQUENCE				X									
	LOG ALL OPERATING CONDITIONS AFTER UNIT STABILIZES				X									
	REVIEW OPERATING PROCEDURES AND OWNERS LOG WITH CHILLER OPERATOR				X									
	DOWNLOAD ALL NEW REVISIONS TO MCQUAY SOFTWARE RELATED TO UNIT OPERATIONS				X									
	CLEAN AIR COLLED CONDENSER COILS				X									
	INSPECT FOR REFRIGERANT AND OIL LEAKS	X			X			X			X			
	INSPECT VIBRATION ELIMINATORS AND INSPECT WATER PIPING FOR LEAKS	X			X			X			X			
	CHECK REFRIGERANT IN SIGHT GLASS				X			X						
	CHECK COMPRESSOR OIL PRESENCE IN SIGHT GLASS	X			X			X			X			
	INSPECT ELECTRICAL CONNECTIONS									X				
	CHECK RELAYS AND OPERATING/SAFETY CONTROLS	X			X			X			X			
	CHECK CRANKCASE HEATER OPERATION	X									X			
	PERFORM MICRO TECH CHECK, LOG AND CHECK FAULT ANALYSIS, ANALYZE PERFORMANCE	X									X			
	TAKE AND RECORD WATERSIDE PRESSURE DROPS ACROSS VESSELS	X									X			
	CHECK OPERATION OF ELECTRONIC EXPANSION VALVE	X									X			
	CHECK OPERATION OF CONDENSER FANS	X									X			
	CHECK OPERATING PRESSURES AND TEMPERATURES	X									X			
	CHECK CHILLED WATER PUMPS										X			
	VERIFY PROPER OPERATION OF CHILLER BARREL AND PIPING FREEZE PROTECTION HEATERS	X									X			
	CONFIRM OPERATION OF COMPRESSOR CRANKCASE HEATERS	X									X			
	VERIFY PROPER OPERATION OF LOW AMBIENT CONTROLS										X			

**Gas Fired Boilers**

Qty	Description	Maintenance Schedule											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2	BOILERS												
	GAIN ACCESS TO UNIT (0)	X			X			X			X		
	INSPECT FIRESIDE OF BOILER AND RECORD CONDITION										X		
	BRUSH AND VACUUM SOOT AND DIRT FROM FLUES AND COMBUSTION CHAMBER										X		
	INSPECT FIREBRICK AND REFRACTORY FOR DEFECTS										X		
	VISUALLY INSPECT BOILER PRESSURE VESSEL FOR POSSIBLE LEAKS AND RECORD CONDITION										X		
	DISASSEMBLE, INSPECT AND CLEAN LOW-WATER CUTOFF										X		
	CHECK HAND VALVES AND AUTOMATIC FEED EQUIPMENT ADJUST AS REQUIRED										X		
	INSPECT, CLEAN AND LUBRICATE THE BURNER AND COMBUSTION CONTROL EQUIPMENT										X		
	REASSEMBLE BOILER										X		
	CHECK BURNER SEQUENCE OF OPERATION AND COMBUSTION AIR EQUIPMENT										X		
	CHECK FUEL PIPING FOR LEAKS AND PROPER SUPPORT										X		
	REVIEW OWNER'S LOG, LOG ALL OPERATING CONDITIONS	X									X		
	SHUT OFF BURNER AND OPEN ELECTRICAL DISCONNECT										X		
	CLOSE FUEL SUPPLY VALVES										X		
	REVIEW BOILER OPERATION WITH BOILER OPERATOR	X									X		
	REVIEW MANUFACTURE'S RECOMMENDATIONS FOR BOILER AND BURNER STARTUP										X		
	CHECK FUEL SUPPLY										X		
	CHECK AUXILLARY EQUIPMENT OPERATION										X		
	INSPECT BURNER, BOILER AND CONTROLS PRIOR TO STARTUP										X		
	START BURNER, CHECK OPERATING CONTROLS, TEST SAFETY CONTROLS & PRESSURE RELIEF VALVE										X		
	PERFORM COMBUSTION TESTS AND ADJUST BURNER FOR MAXIUM EFFICIENCY										X		
	LOG ALL OPERATING CONDITIONS										X		
	INSPECT BOILER AND BURNER AND MAKE ADJUSTMENTS AS REQUIRED	X									X		
	TEST LOW WATER CUT-OFF AND PRESSURE RELIEF VALVE	X									X		
	CHECK OPERATING AND SAFETY CONTROLS	X									X		

**Circulating Pump**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
4	<b>PUMPS</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK MOUNTING BASE (1)	X			X			X			X			
	CHECK SEALS AND GASKETS (2)	X			X			X			X			
	CHECK STARTER/CONTACTOR (3)				X						X			
	CHECK ELECTRICAL CONNECTIONS (4)				X						X			
	CHECK INLET PRESSURE (5)	X			X			X			X			
	CHECK OUTLET PRESSURE (6)	X			X			X			X			
	CHECK MOTOR OPERATING AMPS (7)				X						X			
	LUBRICATE AS REQUIRED (8)				X						X			
	CHECK COUPLERS (9)	X			X			X			X			
	CHECK OPERATION OF VFD's (10)	X			X			X			X			
	CHECK FOR VISUAL VIBRATIONS & LEAKS (11)	X			X			X			X			

**Variable Frequency Drives**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
24	<b>VFD'S</b>													
	VACUUM DUST FROM P.C. BOARDS AND INTERANL CABINET PARTS	X									X			
	VISUALLY INSPECT ALL POWER CONNECTIONS FOR DISCOLORATION	X									X			
	TIGHTEN ELECTRICAL CONNECTIONS ON LINE/LOAD SIDE OF CIRCUIT BREAKER, OUTPUT CONNECTORS, AND BYPASS SWITCH SCR'S AND POWER MODULES													
	VERIFY CABINET FAN OPERATION, CLEAN AND LUBRICATE	X									X			
	VERIFY ALL INTERLOCKS ARE CONNECTD CORRECTLY IE BYPASS SWITCHCHS, MOTOR AND TEMPERATURE SWITCHES OVERLOADS, AND SUPPLY RETURN FANS	X									X			
	VERIFY ALL REMOTE STOP/START CONTACTS AND RUN, ENABLE CONTACTS	X									X			
	MEGGER OUTPUT LEADS, RECORD READING	X									X			
	VERIFY SUPPLY VOLTAGE AND PHASE SEQUENCE ARE CORRECT	X									X			
	VERIFY SPEED COMMAND FOR AUTO OPERATION IS CORRECT ADJUST AS NEEDED	X									X			
	VERIFY SPEED SHAPING IS CORRECT FOR APPLICATION, ADJUST AS NEEDED	X									X			
	START AND RUN VFD IN MANUAL AT FULL SPEED, VERIFY OUTPUT VOLTAGES AND CLAMP VOLTAGES ADJUST IF NECESSARY	X									X			
	IF APPLICABLE, RUN OUT SET POINT AND FAULTS, ETC ON THERMAL TAPE													
	PRINTER FOR CUSTOMER FILE	X									X			
	VERIFY WITH CUSTOMER WHETHER AUTO RESTART AND OTHER SPECIAL OPTIONS ARE ENABLED PER THEIR REQUEST	X									X			

**FACILITY – ADMINISTRATION BUILDING**

**Cooling Tower**

Qty	Description	Maintenance Schedule												Diag.
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1	<b>COOLING TOWER</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	INSPECT GENERAL CONDITION OF UNIT (1)	X			X			X			X			
	CLEAN DEBRIS FROM UNIT (2)	X			X			X			X			
	CLEAN AND FLUSH SUMP, CLEAN SUMP STRAINER (3)				X									
	CHECK SUMP WATER LEVEL AND ADJUST AS NEEDED (4)	X			X			X			X			
	INSPECT SPRAY NOZZLES (5)				X									
	CHECK ALL DRIVE BELTS, CHANGE OR ADJUST AS NEEDED (6)	X			X			X			X			
	CHECK MAKE-UP VALVE, BLEED RATE (7)	X			X			X			X			
	CHANGE FAN BELTS (8)				X									
	CHECK FAN BEARING, CHECK LOCKING COLLARS & LUBRICATE AS NEEDED (9)				X						X			
	CHECK FAN & PUMP MOTOR VOLTAGE & CURRENT, LUBRICATE MOTOR BEARINGS AS NEEDED (10)				X						X			
	INSPECT PROTECTIVE FINISH (11)				X						X			
	FILL SUMP (12)				X									
	DRAIN SUMP (IF NEEDED) (13)										X			
	CHECK SUMP HEATERS (14)	X			X						X			

**Gas Fired Boiler**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
2	<b>BOILERS</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK RELIEF VALVE (1)									X				
	CHECK FOR VISIBLE WATER LEAKS(2)	X			X			X		X				
	CHECK ALL SAFETIES (3)	X								X				
	SEQUENCE CONTROLS (4)	X								X				
	CHECK HEAT EXCHANGER SURFACES (5)									X				
	CLEAN BURNER ASSEMBLY (6)									X				
	CLEAN HEAT EXCHANGER SURFACES (7)									X				
	CHECK FOR COMBUSTION LEAKAGE (8)	X								X				
	CHECK FLAME QUALITY (9)	X								X				
	CHECK ORIFICE AND NOZZLE (10)									X				
	CHECK IGNITION OPERATION (11)									X				
	ASSURE FUEL SUTOFF (12)	X								X				
	CHECK GAS PRESSURE REGULATOR (13)	X								X				
	CHECK EXPANSION TANK SIGHTGLASS (14)	X			X			X		X				
	CHECK BOILER TEMP/PRES (15)	X			X			X		X				
	CHECK CONTACTOR AND POINTS (16)	X								X				
	CHECK ELECTRICAL CONNECTIONS (17)	X								X				
	DIGITAL COMBUSTION ANALYSIS (18)	X								X				

**Circulating Pumps**

Qty	Description	Maintenance Schedule												Diag. Notes
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>4</b>	<b>PUMPS</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK MOUNTING BASE (1)	X			X			X			X			
	CHECK SEALS AND GASKETS (2)	X			X			X			X			
	CHECK STARTER/CONTACTOR (3)				X						X			
	CHECK ELECTRICAL CONNECTIONS (4)				X						X			
	CHECK INLET PRESSURE (5)	X			X			X			X			
	CHECK OUTLET PRESSURE (6)	X			X			X			X			
	CHECK MOTOR OPERATING AMPS (7)				X						X			
	LUBRICATE AS REQUIRED (8)				X						X			
	CHECK COUPLERS (9)	X			X			X			X			
	CHECK OPERATION OF VFD's (10)	X			X			X			X			
	CHECK FOR VISUAL VIBRATIONS & LEAKS (11)	X			X			X			X			

### Water Source Heat Pumps

Qty	Description	Maintenance Schedule											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
97	<b>WATER SOURCE HEAT PUMPS</b>												
	GAIN ACCESS TO UNIT (0)	x			x			x			x		
	CHANGE ALL DISPOSABLE AIR FILTERS AND CELAN ALL WASHABLE FILTERS	x			x			x			x		
	CHECK EVAPORATIVE COIL SECTIONS FOR DIRT & DEBRIS CLEAN AS REQUIRED				x								
	CHECK CONDITION OF EVAPORATIVE FAN MOTORS & BEARINGS AND LUBRICATE AS NEEDED				x						x		
	CHECK CONDITION OF FAN MOTOR HOUSING AND MOUNTS AND TIGHTEN AS NEEDED				x						x		
	CHECK AND FLUSH CONDENSATE TRAPS AND CLEAN CONDENSATE PANS				x								
	CHECK TEMPERATURE DIFFERENTIAL ACROSS EVAPORATIVE COILS				x						x		
	CHECK FOR OIL AND REFRIGERANT LEAKS BY VISUAL INSPECTION	x			x			x			x		
	CHECK THERMOSTATS AND OPERATING CONTROLS CHECK ALL LOW VOLTAGE CONTROL WIRING				x						x		
	CHECK AMP DRAW ON EVAPORATIVE FAN MOTORS AND COMPRESSORS				x						x		
	CHECK ELECTRICAL CONNECTIONS AND TIGHTEN AS NEEDED CHECK DISCONNECTS	x			x			x			x		
	CHECK SYSTEM OPERATION IN COOLING MODE IN SPRING, HEATING IN FALL				x						x		
	CHECK CONDITION OF EVAPORATOR COIL	x			x			x			x		
	CHECK CONDENSATE DRAINS FOR BLOCKAGE FLUSH AND DRAIN LINE IF NEEDED							x					
	PERFORM A VISUAL SYSTEM CONDITION/OPERATIONS OVERVIEW	x			x			x			x		

**FACILITY – GATEWAY CENTER**

**Packaged Rooftop Unit**

Qty	Description	Maintenance Schedule												Diag.
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
4	<b>PACKAGED UNIT</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK COIL CONDITION (1)	X			X			X			X			
	CHECK CONTROL SET POINTS (2)	X			X			X			X			
	CHECK SAFETIES (3)				X						X			
	CHECK EXPANSION VALVES (4)							X						
	CHECK UNIT CHARGE (5)				X			X						
	CHECK EVAPORATOR TD (6)				X			X						
	CHECK CRANKCASE HEATER (7)	X			X									
	CHECK CONDENSATE PAN AND DRAIN (8)				X			X						
	CLEAN CONDENSATE PAN AND DRAIN (9)				X									
	CHECK ECONOMIZER OPERATION (10)	X			X			X			X			
	ADJUST DAMPER LINKAGE IF REQUIRED (11)				X						X			
	CHECK MOTOR OPER. , VOLT & AMPER. (12)				X						X			
	CHECK DRIVE, FAN CONDITIONS (13)	X			X			X			X			
	CHECK GAS HEAT EXCHANGER (14)										X			
	CHECK GAS HEAT OPERATION (15)	X									X			
	CHECK GAS HEAT PRESSURES, TEMPS AND SAFETIES	X									X			
	CHECK CONTACTOR AND POINTS (17)				X						X			
	CHECK ELECTRICAL CONNECTIONS (18)				X						X			
	LUBRICATE AS REQUIRED (19)				X						X			
	CLEAN CONDENSER COILS (20)				X									
	CHECK EVAPORATOR COIL (22)	X			X			X			X			
	CHECK BELT(S)(23)	X			X			X			X			
	CHANGE BELT(S)(24)				X									
	(CUSTOMER INSTALLS) CHECK AIR FILTERS (25)	X			X			X			X			



**Gas Fired Boiler**

Qty	Description	Maintenance Schedule												Diag.
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1	BOILER													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK RELIEF VALVE (1)										X			
	CHECK FOR VISIBLE WATER LEAKS(2)	X			X			X			X			
	CHECK ALL SAFETIES (3)	X									X			
	SEQUENCE CONTROLS (4)	X									X			
	CHECK HEAT EXCHANGER SURFACES (5)										X			
	CLEAN BURNER ASSEMBLY (6)										X			
	CLEAN HEAT EXCHANGER SURFACES (7)										X			
	CHECK FOR COMBUSTION LEAKAGE (8)	X									X			
	CHECK FLAME QUALITY (9)	X									X			
	CHECK ORIFICE AND NOZZLE (10)										X			
	CHECK IGNITION OPERATION (11)										X			
	ASSURE FUEL SUTOFF (12)	X									X			
	CHECK GAS PRESSURE REGULATOR (13)	X									X			
	CHECK EXPANSION TANK SIGHTGLASS (14)	X			X			X			X			
	CHECK BOILER TEMP/PRES (15)	X			X			X			X			
	CHECK CONTACTOR AND POINTS (16)	X									X			
	CHECK ELECTRICAL CONNECTIONS (17)	X									X			
	DIGITAL COMBUSTION ANALYSIS (18)	X									X			

**Circulating Pump**

Qty	Description	Maintenance Schedule												Diag.
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>2</b>	<b>HOT WATER PUMPS</b>													
	GAIN ACCESS TO UNIT (0)	X			X			X			X			
	CHECK MOUNTING BASE (1)	X			X			X			X			
	CHECK SEALS AND GASKETS (2)	X			X			X			X			
	CHECK STARTER/CONTACTOR (3)				X						X			
	CHECK ELECTRICAL CONNECTIONS (4)				X						X			
	CHECK INLET PRESSURE (5)	X			X			X			X			
	CHECK OUTLET PRESSURE (6)	X			X			X			X			
	CHECK MOTOR OPERATING AMPS (7)				X						X			
	LUBRICATE AS REQUIRED (8)				X						X			
	CHECK COUPLERS (9)	X			X			X			X			
	CHECK OPERATION OF VFD's (10)	X			X			X			X			
	CHECK FOR VISUAL VIBRATIONS & LEAKS (11)	X			X			X			X			

## Planned Maintenance Agreement – Water Treatment Services

Water Treatment Services are included as part of this mechanical service agreement and, in general, will include the following:

- ✓ Equipment Inspections
- ✓ Onsite water analysis with written report
- ✓ Cleaning of electrodes and recalibration of water and chemical control equipment
- ✓ Adjust chemical proportioning and bleed rates
- ✓ Review onsite operator control logs
- ✓ Onsite operator training to include instruction and procedures for chemical testing and system monitoring. Operator awareness of alarm conditions and system operation will be highly stressed.
- ✓ Provide a written report at the completion of each service visit.
- ✓ Discuss finding and recommendations with operators or designated individuals.
- ✓ Deliver and setup of chemicals.
- ✓ Startup and shutdown instructions and services, equipment inspections and reports.
- ✓ Chemical additions to closed loop systems when necessary (closed loop chemistry included and stored offsite)

### Applicable Facilities:

- ✓ Prison (Heating Hot Water)
- ✓ Courthouse (Heating Hot Water and Chilled Water)
- ✓ 911 Center (Heating Hot Water and Chilled Water)

Frequency of visits: Monthly

## Planned Maintenance Agreement – Automatic Temperature Controls (ATC)

The facilities included within the Automatic Temperature Controls Agreement include:

- ✓ Prison
- ✓ Courthouse
- ✓ Gateway
- ✓ Admin
- ✓ 911 Center
- ✓ Visitor's Center

Site visits pertaining to Automatic Temperature Controls for the above referenced facilities are included as part of this mechanical service agreement. The frequency of visits per facility is as follows:

- ✓ Prison: 12 visits per year
- ✓ Courthouse: 6 visits per year
- ✓ Gateway: 2 visits per year
- ✓ Admin: 2 visits per year
- ✓ 911 Center: 6 visits per year
- ✓ Visitor's Center: 2 visits per year

ATC services will be fully administered by McClure Company and coordinated with the appropriate ATC provider per facility. A professional technician will perform all scheduled preventive maintenance inspections in accordance with the Services outlined in this attachment.

The County agrees to assist McClure Company, if needed, to grant permission to act on the County's behalf to gain access to informational and passwords directly with the ATC provider.

Service activities will be conducted during normal working hours at intervals determined by the manufacturers' recommendations, usage, location, run-time intervals and/or our experience. Scheduled preventive maintenance inspections for the covered equipment will provide those services required to maintain the system at maximum performance and reliability levels and may include the following:

- ✓ Analyze, adjust and calibrate the following (as applicable):
  - Temperature sensors
  - Humidity sensors
  - Diagnostic LEDs
  - Printers
  - Power supplies
  - Work stations
  - Controllers
  - Modems
  - Input/output points
  - Communication cabling
  - Transmitters
- ✓ Conduct an annual inspection and thorough preventive maintenance routine on each piece of covered equipment. In addition, make periodic tests and adjustments to ensure efficient and reliable operation of other major components.