
# Local Government Energy Audit Report

## Bridgeton High School

## September 6, 2019

*Prepared for:*

Bridgeton Board of Education
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# Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC Energy Services (TRC) reviewed the energy conservation measures and estimates of energy savings were reviewed for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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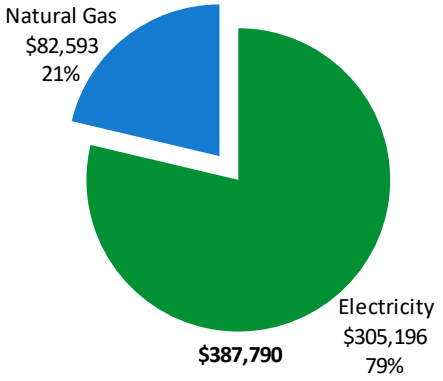
# 1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Bridgeton High School. This report provides you with information about the High School's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in the High School. TRC Energy Services (TRC) conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

## BUILDING PERFORMANCE REPORT

| | | |
|---|---|---|
| Annual Utilities | Costs: $387,790<br><br>Electricity:<br>1,908,954 kWh<br><br>Natural Gas:<br>84,367 Therms |  |
| ENERGY STAR® Benchmarking Score | 54<br>*(1-100 scale)* | This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs. |

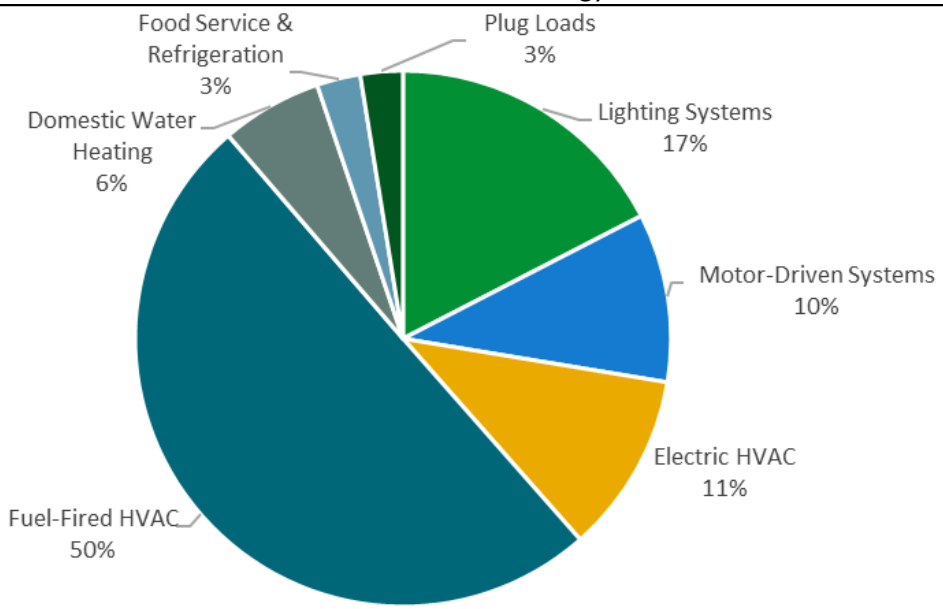


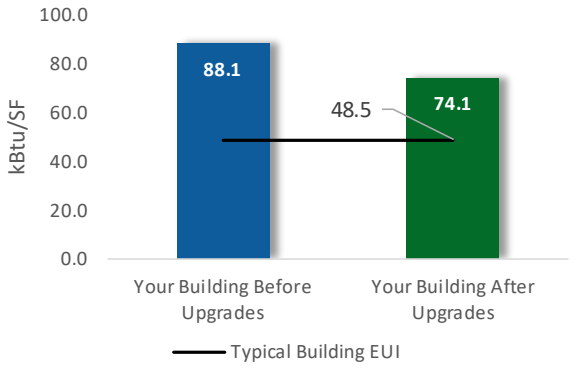

*Figure 1 - Energy Use by System*

## POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

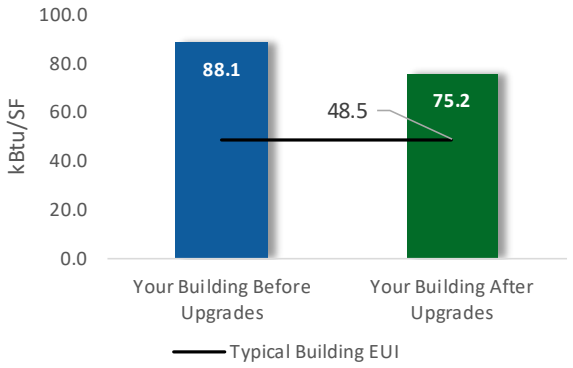
### Scenario 1: Full Package (all evaluated measures)

| | |
|---|---|
| Installation Cost | $527,258 |
| Potential Rebates & Incentives[1] | $52,808 |
| Annual Cost Savings | $102,697 |
| Annual Energy Savings | Electricity: 628,589 kWh<br>Natural Gas: 2,248 Therms |
| Greenhouse Gas Emission Savings | 330 Tons |
| Simple Payback | 4.6 Years |
| Site Energy Savings (all utilities) | 16% |




### Scenario 2: Cost Effective Package[2]

| | |
|---|---|
| Installation Cost | $349,971 |
| Potential Rebates & Incentives | $44,739 |
| Annual Cost Savings | $98,520 |
| Annual Energy Savings | Electricity: 609,975 kWh<br>Natural Gas: 1,021 Therms |
| Greenhouse Gas Emission Savings | 313 Tons |
| Simple Payback | 3.1 Years |
| Site Energy Savings (all utilities) | 15% |




### On-site Generation Potential

| | |
|---|---|
| Photovoltaic | High |
| Combined Heat and Power | None |

[1] Incentives are based on current SmartStart Prescriptive incentives. Other Program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Lifetime Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lighting Upgrades** | | **441,245** | **82.9** | **-74** | **$69,819** | **$1,047,281** | **$179,462** | **$34,919** | **$144,543** | **2.1** | **435,648** |
| ECM 1 | Install LED Fixtures | 106,421 | 13.1 | -4 | $16,974 | $254,605 | $76,000 | $7,525 | $68,475 | 4.0 | 106,680 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 180 | 0.0 | 0 | $28 | $427 | $110 | $12 | $98 | 3.5 | 177 |
| ECM 3 | Retrofit Fixtures with LED Lamps | 334,644 | 69.7 | -70 | $52,817 | $792,249 | $103,352 | $27,382 | $75,970 | 1.4 | 328,791 |
| **Lighting Control Measures** | | **85,891** | **18.1** | **-18** | **$13,556** | **$108,449** | **$78,819** | **$8,540** | **$70,279** | **5.2** | **84,389** |
| ECM 4 | Install Occupancy Sensor Lighting Controls | 75,121 | 16.4 | -16 | $11,856 | $94,851 | $72,294 | $8,540 | $63,754 | 5.4 | 73,807 |
| ECM 5 | Install High/Low Lighting Controls | 10,770 | 1.8 | -2 | $1,700 | $13,599 | $6,525 | $0 | $6,525 | 3.8 | 10,582 |
| **Motor Upgrades** | | **955** | **0.3** | **0** | **$153** | **$2,289** | **$876** | **$0** | **$876** | **5.7** | **961** |
| ECM 6 | Premium Efficiency Motors | 955 | 0.3 | 0 | $153 | $2,289 | $876 | $0 | $876 | 5.7 | 961 |
| **Variable Frequency Drive (VFD) Measures** | | **68,878** | **10.9** | **0** | **$11,012** | **$165,180** | **$67,432** | **$1,080** | **$66,352** | **6.0** | **69,360** |
| ECM 7 | Install VFDs on Constant Volume (CV) Fans | 12,832 | 4.1 | 0 | $2,052 | $30,773 | $18,630 | $1,080 | $17,550 | 8.6 | 12,922 |
| ECM 8 | Install VFDs on Heating Water Pumps | 56,046 | 6.8 | 0 | $8,960 | $134,407 | $48,802 | $0 | $48,802 | 5.4 | 56,438 |
| **Electric Unitary HVAC Measures** | | **18,615** | **12.4** | **0** | **$2,976** | **$44,641** | **$144,716** | **$6,931** | **$137,785** | **46.3** | **18,745** |
| ECM 9 | Install High Efficiency Air Conditioning Units | 18,615 | 12.4 | 0 | $2,976 | $44,641 | $144,716 | $6,931 | $137,785 | 46.3 | 18,745 |
| **HVAC System Improvements** | | **6,215** | **0.0** | **119** | **$2,162** | **$32,436** | **$21,751** | **$0** | **$21,751** | **10.1** | **20,237** |
| ECM 10 | Implement Demand Control Ventilation (DCV) | 6,215 | 0.0 | 119 | $2,162 | $32,436 | $21,751 | $0 | $21,751 | 10.1 | 20,237 |
| **Domestic Water Heating Upgrade** | | **0** | **0.0** | **197** | **$1,933** | **$25,340** | **$33,052** | **$1,138** | **$31,914** | **16.5** | **23,124** |
| ECM 11 | Install High Efficiency Gas-Fired Water Heater | 0 | 0.0 | 123 | $1,201 | $18,018 | $32,572 | $1,138 | $31,434 | 26.2 | 14,366 |
| ECM 12 | Install Low-Flow DHW Devices | 0 | 0.0 | 75 | $732 | $7,323 | $480 | $0 | $480 | 0.7 | 8,758 |
| **Food Service & Refrigeration Measures** | | **6,790** | **0.8** | **0** | **$1,086** | **$5,428** | **$1,150** | **$200** | **$950** | **0.9** | **6,837** |
| ECM 13 | Vending Machine Control | 6,790 | 0.8 | 0 | $1,086 | $5,428 | $1,150 | $200 | $950 | 0.9 | 6,837 |
| **TOTALS (COST EFFECTIVE MEASURES)** | | **609,975** | **112.9** | **102** | **$98,520** | **$1,368,386** | **$349,971** | **$44,739** | **$305,232** | **3.1** | **626,191** |
| **TOTALS (ALL MEASURES)** | | **628,589** | **125.3** | **225** | **$102,697** | **$1,431,044** | **$527,258** | **$52,808** | **$474,451** | **4.6** | **659,302** |

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

*Figure 2 – Evaluated Energy Improvements*

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

## 1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

### Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

| Energy Conservation Measure | | SmartStart | Direct Install | Pay For Performance |
|---|---|---|---|---|
| ECM 1 | Install LED Fixtures | X | | X |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | X | | X |
| ECM 3 | Retrofit Fixtures with LED Lamps | X | | X |
| ECM 4 | Install Occupancy Sensor Lighting Controls | X | | X |
| ECM 5 | Install High/Low Lighting Controls | | | X |
| ECM 6 | Premium Efficiency Motors | | | X |
| ECM 7 | Install VFDs on Constant Volume (CV) HVAC | X | | X |
| ECM 8 | Install VFDs on Hot Water Pumps | | | X |
| ECM 9 | Install High Efficiency Electric AC | X | | X |
| ECM 10 | Implement Demand Control Ventilation | | | X |
| ECM 11 | Install High Efficiency Gas Water Heater | X | | X |
| ECM 12 | Install Low-Flow Domestic Hot Water Devices | | | X |
| ECM 13 | Vending Machine Control | X | | X |

*Figure 3 – Funding Options*

## New Jersey's Clean Energy Programs At-A-Glance

| | **SmartStart**<br>Flexibility to install at your own pace | **Direct Install**<br>Turnkey installation | **Pay for Performance**<br>Whole building upgrades |
|---|---|---|---|
| **Who should use it?** | Buildings installing individual measures or small group of measures. | Small to mid-size facilities that can bundle multiple measures together.<br>Average peak demand should be below 200 kW.<br>Not suitable for significant building shell issues. | Mid to large size facilities looking to implement as many measures as possible at one time.<br>Peak demand should be over 200 kW. |
| **How does it work?** | Use in-house staff or your preferred contractor. | Pre-approved contractors pass savings along to you via reduced material and labor costs. | Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives. |
| **What are the Incentives?** | Fixed incentives for specific energy efficiency measures. | Incentives pay up to 70% of eligible costs, up to $125,000 per project.<br>You pay the remaining 30% directly to the contractor. | Up to 25% of installation cost, calculated based on level of energy savings per square foot. |
| **How do I participate?** | Submit an application for the specific equipment to be installed. | Contact a participating contractor in your region. | Contact a pre-qualified partner to develop your energy reduction plan and set your energy savings targets. |

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

### *Individual Measures with SmartStart*

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

### *Turnkey Installation with Direct Install*

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility, and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

### *Whole Building Approach with Pay for Performance*

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

## More Options from Around the State

### *Financing and Planning Support with the Energy Savings Improvement Program (ESIP)*

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

### *Resiliency with Return on Investment through Combined Heat & Power (CHP)*

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

### *Ongoing Electric Savings with Demand Response*

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

# 2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Bridgeton High School. This report provides information on how the High School uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see **Appendix A: Equipment Inventory & Recommendations.**

## 2.1 Site Overview

On March 21, 2019, TRC performed an energy audit at Bridgeton High School located in Bridgeton, New Jersey. TRC met with Mike Steven to review the High School operations and help focus our investigation on specific energy-using systems.

Bridgeton High School is a two-story, 169,725 square foot building built in 1950. Spaces include: classrooms, a gymnasium, locker rooms, a weight room, an auditorium, administrative offices, conference rooms, a cafeteria, hallways, stairwells, a receiving room, a kitchen, restrooms, storage rooms, and electrical and mechanical spaces. The building is 100% heated and 95% cooled. The space heating system includes new condensing hot water boilers serving fin tube baseboard radiators, unit ventilators, and air handling units, while the cooling is provided by one air cooled chiller and rooftop units.

The site is interested in installing a new roof, retrofitting lights, replacing the remaining old exterior doors, and replacing domestic hot water heater and rooftop units (RTUs), but has been unable to move projects forward.

The site was planning on remodeling the guidance office with new carpet.

## 2.2 Building Occupancy

The High School is occupied from September through June. Typical weekday occupancy is 1,614, including students and staff. There are Saturday activities in the gymnasium. Building occupancy also includes continuing custodial and maintenance activities. It should be noted that the energy and economic analysis for this building is based on the use of the building during the utility billing period, and that results will vary based on changes to building use patterns. The typical schedule is presented in the table below.

| Building Name | Weekday/Weekend | Operating Schedule |
|---|---|---|
| Bridgeton High School - Classes Hours | Weekday | 7:45 AM - 2:25 PM |
| | Weekend | 8:30 AM - 3:00 PM (Saturday) |
| Bridgeton High School - General Operating Hours | Weekday | 6:30 AM - 11:00 PM |
| | Weekend | 8:30 AM - 5:00 PM |

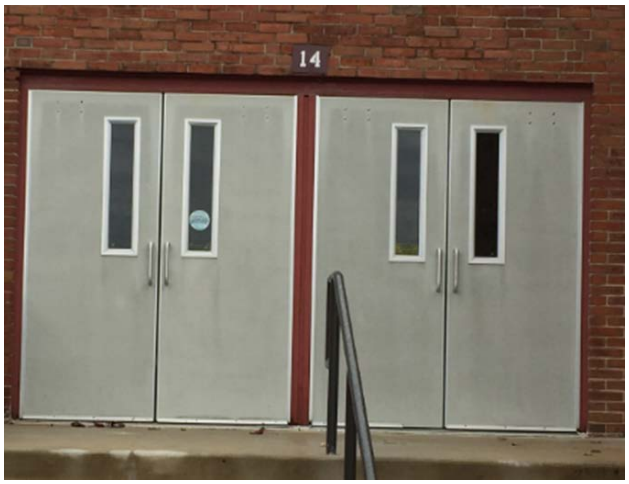
*Figure 4 - Building Occupancy Schedule*

## 2.3 Building Envelope

Building walls are concrete masonry units (CMU) over structural steel with a brick facade. The building has a flat tar and gravel roof. The site contact stated that the roof is in poor condition. Most of the windows are double-paned with aluminum frames. The glass-to-frame seals are in good condition. Window frame seals are in good condition, showing little evidence of excessive wear. Exterior doors are metal or metal with double-pane window glass and metal frames. Portions of the exterior doors have been replaced and the remaining are in fair condition, with weather-stripping missing or in poor condition. Degraded window and door seals increase drafts and outside air infiltration.

*Building Façade*



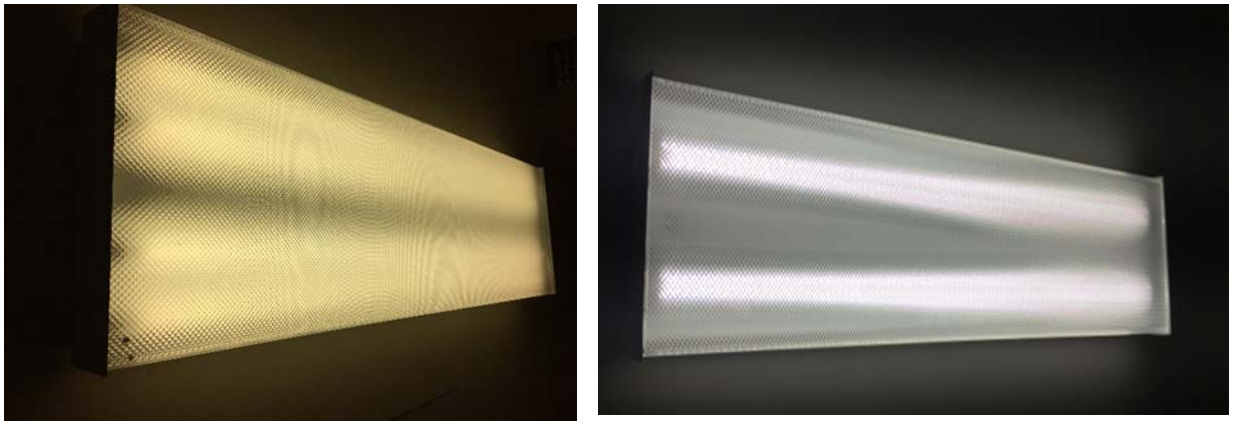



*Roof, Window, and Exterior Doors*

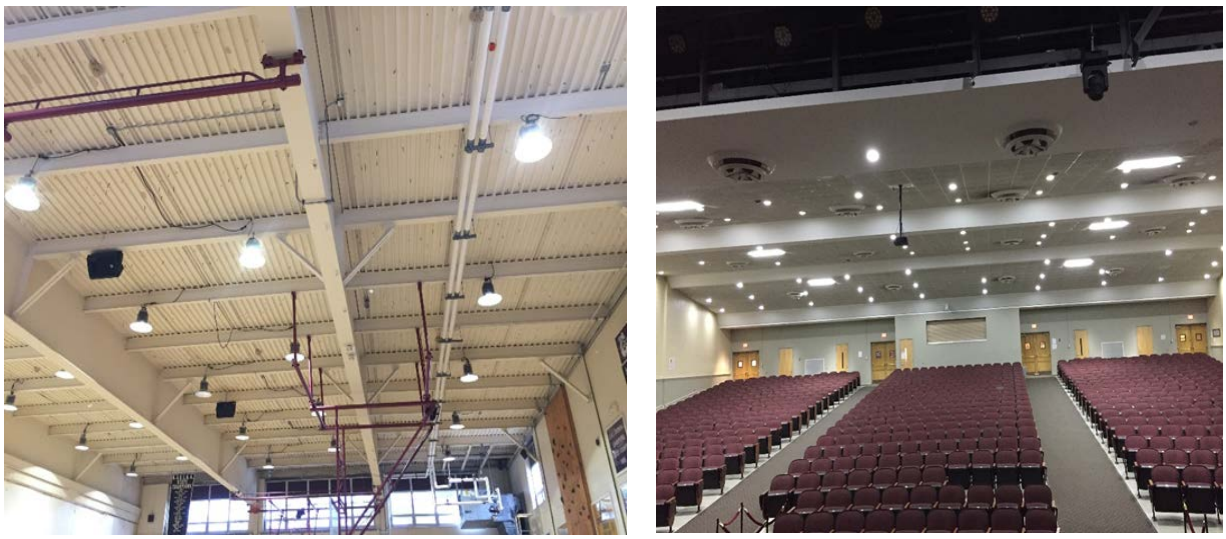
## 2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps with electronic ballasts. Fixtures include 2-, 3-, and 4-lamp, 4-foot long surface-mounted wraparound, recessed troffers, and pendant-mounted units. The hallways and the main lobby are lit with linear fluorescent U-bend lamps. The restrooms and hallways lights have been retrofitted to LED linear tubes. The gymnasium and the auditorium are lit respectively with LED high bay and screw-in lamps. There four 50-Watt LED panels in the principal's office. Additionally, there are several compact fluorescent lamps (CFLs), incandescent, and LED purpose general purpose lamps. CFLs are found in the library, while the small spaces such as closets and storage rooms are primarily lit with incandescent lamps. Interior lights are controlled mostly by wall switches.

Exterior fixtures include 150-Watt high pressure sodium (HPS), 250-Watt metal halide, and three 65-Watt LED fixtures. The parking lot is lit with 38 400-Watt metal halide and two 75-Watt LED fixtures. Exterior light fixtures are controlled with photocells.



*Linear Fluorescent T8 & LED Tubes*



*Gym LED High Bay and Auditorium LED Lamps*



*CFLs and LED Exit Signs*



*Exterior Fixtures*

## 2.5 Air Handling Systems

### Unit Ventilators

The classroom unit ventilators have supply fan motors, pneumatically controlled outside air dampers that operate with a pneumatic control system. This system is original to the building and appears to be in good operating condition. The unit ventilators provide heating and cooling and are controlled with the building energy management system (EMS). There are approximately 96 unit ventilators in the High School.

*Typical Unit Ventilator and Johnson EMS Control*

### Air Handling Units (AHUs)

The gymnasium is served by four overhead mounted AHUs, while the library has one floor-mounted AHU. They are equipped with hot water coils for heating. Additionally, there is one AHU in the mechanical room that serves various spaces in the building.


*Gym and Cafeteria AHUs*

## General Building Exhaust System

There are numerous fractional horsepower exhaust fans located throughout the building that serve the restrooms and other areas. There are some specialty exhaust blowers for science rooms with fume hoods. The exhaust fans are manually controlled by switches and appear in the EMS for monitoring purposes only.

## Packaged Units

The library is served by a 40-ton McQuay packaged unit with a gas-fired furnace section that provides heating. The auditorium is served by two 25-ton units (RTU1-2), while the stage has a 15-ton unit (RTU3). The units (RTU1-2-3) are 14 years old and appear to be in fair condition. Two York units, 15-ton each, provide cooling to the cafeteria's east and west sides. They are newer and in good condition. The science classroom is conditioned by a 7-ton AAON unit and has a gas-fired furnace section. Rooms J10, J12, and J14 are served, respectively, by 4-ton and 6-ton Carrier units that appear to be in poor condition and in need of replacement. The packaged RTUs are controlled by the EMS.

*Library and Auditorium RTUs*


*Old Carrier and Newer York RTUs*

**Air Conditioners**

Many private offices, server closets, and teacher and faculty lunch rooms are cooled by window and split system air conditioners (ACs). There are 15 window ACs that vary in capacity between 0.67-ton to 1.5-ton. There are 10 split system ACs varying in size from 0.75-ton to 5-ton. Additionally, 13 split system heat pumps are used to provide cooling and heating to various spaces throughout the building. Each has 1.5-ton cooling capacity and 20 MBh heating capacity. The window ACs are all in good condition, each with an estimated efficiency of 10.3 EER. Also, the split systems ACs and heat pump units are in good condition except for three units serving the library equipment room and two offices. Many of the split system are located on the roof while others are on the ground floor. Most of the split ACs are controlled via programmable thermostats.

*Split System and Window ACs*

## 2.6 Heating Hot Water Systems

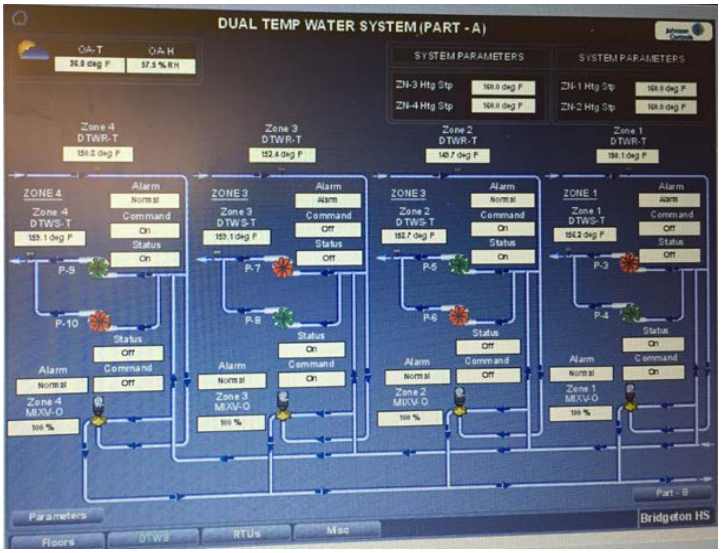
Five LAARS model MGH3000NX 2,814 MBh high-efficiency condensing hot water boilers serve the building heating load. The burners are fully-modulating with a nominal efficiency of 93%. The boilers are sequenced based on the heating load. Multiple boilers are required under high load conditions. The boilers were manufactured in August 2015 and are in good condition and well maintained.

The hydronic distribution system is a 2-pipe, heating only system. The heating water distribution is a primary/secondary system. The primary distribution system has two variable speed 10 hp pumps. The secondary loop has eight constant speed pumps operating in lead/lag fashion. They are three 7.5 hp, four 5 hp, and one 10 hp secondary distribution hot water pumps. Each boiler has a 1.5 hp hot water return pump. All constant speed secondary distribution pumps are in poor condition and in need of replacement.

Hot water is distributed to hydronic baseboards, unit heaters, and AHUs. The boilers are controlled by a Johnson Metasys EMS that has a full modulation sequencing control capability. It changes the heating temperature setpoint based on the outdoor temperature and return water temperature.

*Hot Water Return Pumps and VFDs*

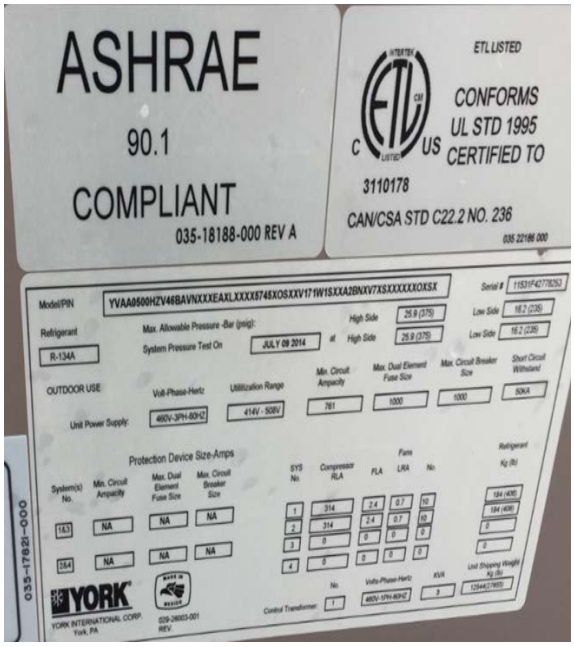

*Condensing LAARS Boilers*




*Hot Water Pumps and Hot Water Control Diagram*

## 2.7 Chilled Water Systems

The chilled water system consists of a 400-ton, variable speed, air-cooled screw York chiller located on the roof. The chilled water distribution loop has two 10 hp variable speed pumps. The chilled water supply temperature is controlled via the Johnson Metasys EMS. Chilled water is distributed at 42°F when the outside air temperature is above 60°F and the setpoint is reset to 50°F when the outside air is below 55°F. The chiller is locked out when the outside air temperature is below 45°F, and it is turned off from mid-December through February. The chiller is in good condition and well maintained.




*York Chiller*

*Chilled Water Pumps*

## 2.8 Building Energy Management Systems (EMS)

A Johnson Metasys EMS controls the RTUs, boilers, chiller, and unit ventilators. The EMS system provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, heating water loop temperatures, and chilled water loop temperatures. The exhaust fans appear on the EMS system for monitoring purposes only. The AHUs and some split system ACs are not controlled by the EMS. The EMS does not control the interior or exterior lights. The site staff expressed interest in expanding the level of control provided by the EMS system. Expanding the current EMS with additional training on operating the EMS system will provide extra energy savings.

The hot water heating system in the hallways is controlled with a pneumatic control system using the 5 hp air compressor located in the boiler room.


*EMS System*

## 2.9 Domestic Hot Water

Hot water is produced by a Lochinvar (Model: CWN0665), 665 MBh gas-fired boiler and held in two separate storage tanks, each with approximately 400-gallon storage capacity. The domestic water heater has an estimated combustion efficiency of 77%. The boiler is 26 years old, has passed its normal useful live, and appears in poor condition. Two 3 hp and one 0.3 hp circulation pumps distribute hot water to end uses. The domestic hot water pipes are insulated and in good condition. The facility staff expressed a great interest in replacing the water heater with a more efficient heater.

*DHW and Storage Tanks*

## 2.10 Food Service Equipment

The kitchen has all-electric equipment that is used to prepare breakfasts and lunches for students. Most cooking is done using conventional electric ovens. Bulk prepared foods are held in several electric holding cabinets. Equipment is high-efficiency and is in good condition.

The dishwasher is an ENERGY STAR® high-temperature, rack type unit with a 36 kW electric booster pump.


*Kitchen Equipment*

## 2.11 Refrigeration

The kitchen has two stand-up refrigerators with solid doors. There is also a refrigerator chest in the cafeteria. All equipment is high-efficiency and in good condition. Additionally, the kitchen has two walk-in units.

The walk-in cooler has an estimated 0.5-ton compressor and a two-fan evaporator, the walk-in low temperature freezer has a 0.75-ton compressor and a two-fan evaporator. The kitchen and the athletic office each have a commercial ice making machine.

*Refrigeration System*

## 2.12 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 3% percent of total building energy use. This is lower than a typical building.

You seem to already be doing a great job managing your electrical plug loads. This report makes additional suggestions for ECMs in this area, as well as Energy Efficient Best Practices.

There are approximately 271 computer work stations throughout the High School. Plug loads throughout the building include general café and office equipment. There are typical classroom loads such as Smart Boards, projectors, and fans.

There are several residential-style refrigerators throughout the building. There a total of three kilns located in the art classrooms.

There are four refrigerated beverage vending machines and one non-refrigerated vending machine located in the faculty rooms, cafeteria, and teacher lunch room. Vending machines are not equipped with occupancy-based controls.


*Vending Machine and Kilns*

## 2.13 Water-Using Systems

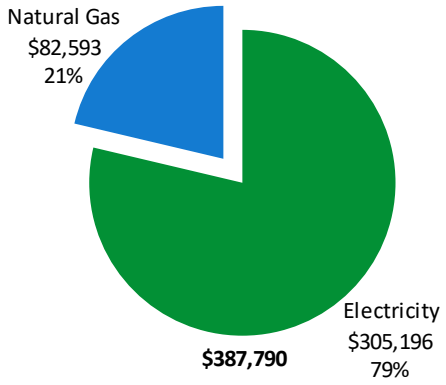
There are several restrooms with toilets, urinals, and sinks. Faucet flow rates are at 2.5 gallons per minute (gpm) or higher. Toilets are rated at 2.5 gallons per flush (gpf) and urinals are rated at 2.5 gpf.

*Typical Sinks*

# 3 ENERGY USE AND COSTS

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

| Utility Summary | | |
|---|---|---|
| **Fuel** | **Usage** | **Cost** |
| Electricity | 1,908,954 kWh | $305,196 |
| Natural Gas | 84,367 Therms | $82,593 |
| **Total** | | **$387,790** |




An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

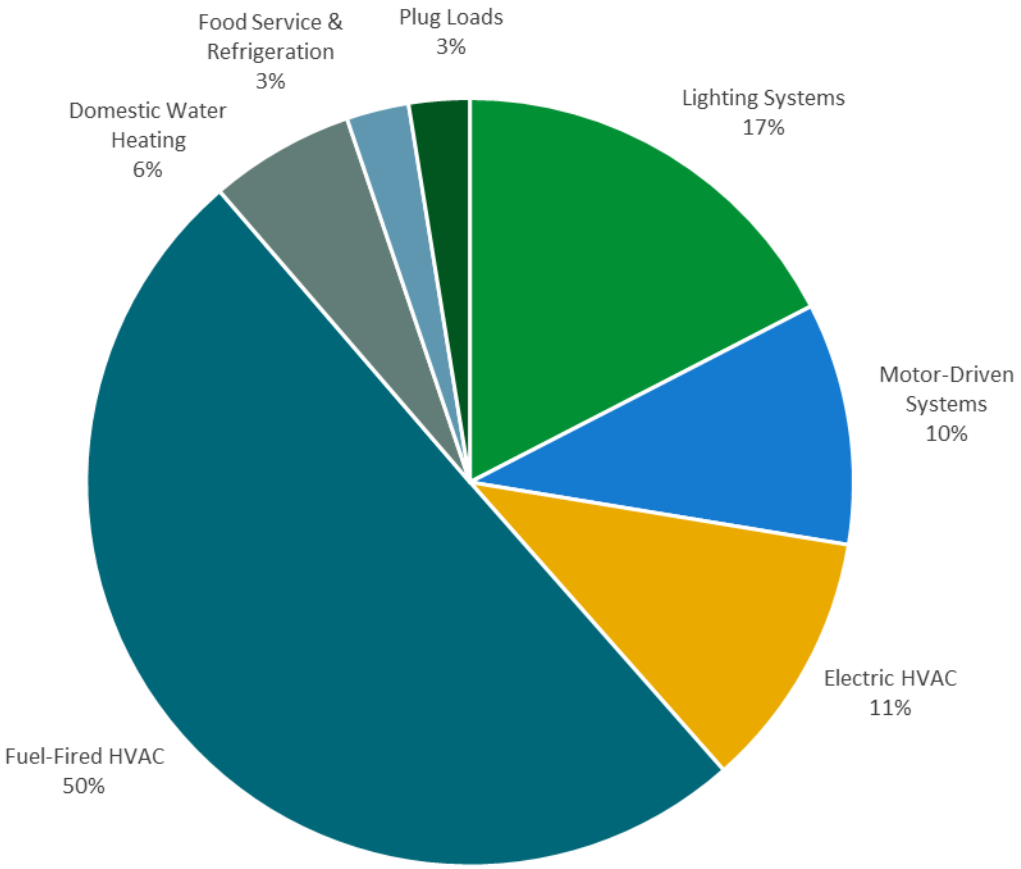
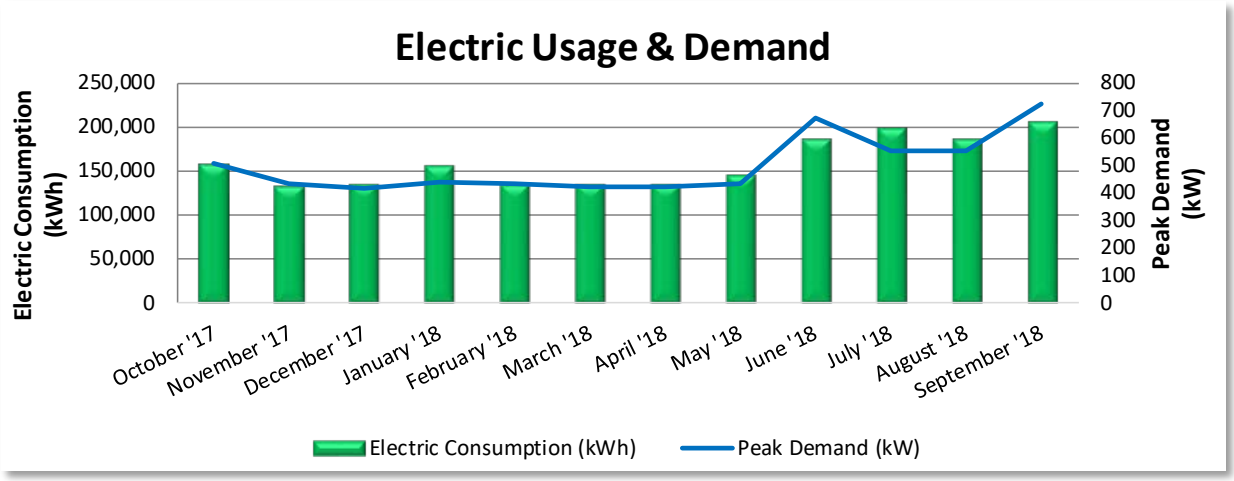



*Figure 5 - Energy Balance*

## 3.1 Electricity

Atlantic City Electric delivers electricity under rate class Annual General Service Primary with electric production provided by South Jersey Energy, a third-party supplier.



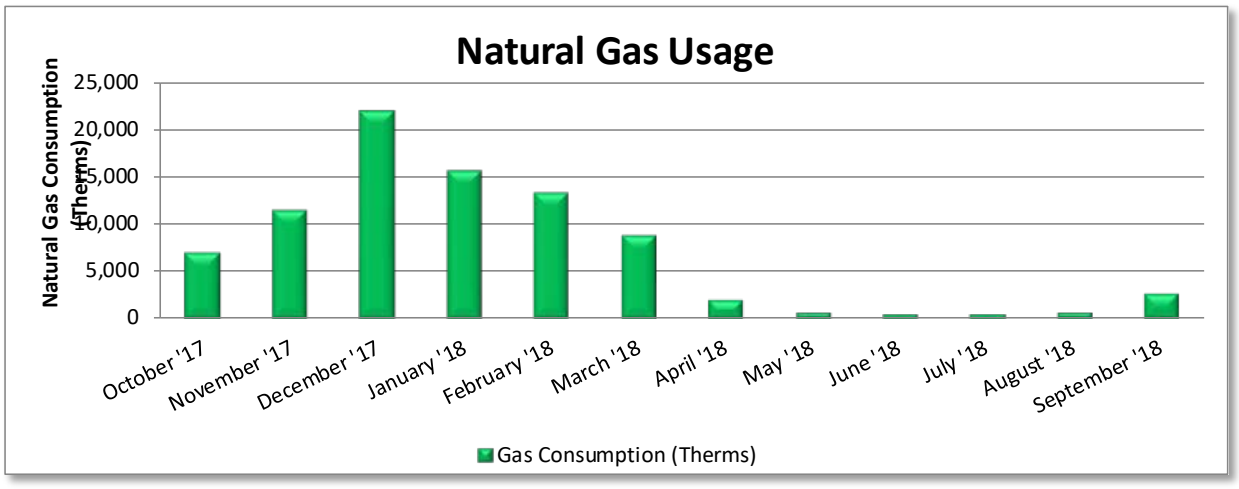

| Electric Billing Data | | | | | |
|---|---|---|---|---|---|
| **Period Ending** | **Days in Period** | **Electric Usage (kWh)** | **Demand (kW)** | **Demand Cost** | **Total Electric Cost** |
| 10/30/17 | 31 | 158,030 | 510 | $4,591 | $25,449 |
| 11/29/17 | 30 | 132,427 | 436 | $4,324 | $21,809 |
| 12/28/17 | 31 | 134,729 | 417 | $4,180 | $21,959 |
| 1/30/18 | 31 | 156,780 | 441 | $4,746 | $25,756 |
| 2/27/18 | 28 | 134,612 | 436 | $4,026 | $22,089 |
| 3/28/18 | 31 | 134,242 | 422 | $4,169 | $22,205 |
| 4/29/18 | 30 | 134,069 | 422 | $4,474 | $22,528 |
| 5/30/18 | 31 | 146,057 | 434 | $4,321 | $23,914 |
| 6/28/18 | 30 | 186,526 | 671 | $4,900 | $29,068 |
| 7/30/18 | 31 | 197,993 | 554 | $4,461 | $30,116 |
| 8/30/18 | 31 | 187,046 | 551 | $4,299 | $28,550 |
| 9/27/18 | 30 | 206,443 | 725 | $5,113 | $31,754 |
| **Totals** | **365** | **1,908,954** | **725** | **$53,604** | **$305,196** |
| **Annual** | **365** | **1,908,954** | **725** | **$53,604** | **$305,196** |

Notes:

- Peak demand of 725 kW occurred in September '18.
- The average electric cost over the past 12 months was $0.160/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.
- The facility electric profile is consistent with a site with electric cooling and shows an increase in use during the summer likely due to increased cooling system operation.

## 3.2 Natural Gas

South Jersey Gas delivers natural gas under rate class General Service LV.




| Gas Billing Data | | | |
|---|---|---|---|
| **Period Ending** | **Days in Period** | **Natural Gas Usage (Therms)** | **Natural Gas Cost** |
| 10/30/17 | 31 | 6,908 | $6,377 |
| 11/29/17 | 30 | 11,501 | $10,289 |
| 12/28/17 | 31 | 21,890 | $19,799 |
| 1/30/18 | 31 | 15,568 | $15,286 |
| 2/27/18 | 28 | 13,219 | $12,141 |
| 3/28/18 | 31 | 8,728 | $7,719 |
| 4/29/18 | 30 | 1,901 | $2,326 |
| 5/30/18 | 31 | 625 | $1,733 |
| 6/28/18 | 30 | 467 | $1,318 |
| 7/30/18 | 31 | 435 | $1,270 |
| 8/30/18 | 31 | 535 | $1,454 |
| 9/27/18 | 30 | 2,590 | $2,882 |
| **Totals** | **365** | **84,367** | **$82,593** |
| **Annual** | **365** | **84,367** | **$82,593** |

Notes:

- The average gas cost for the past 12 months is $0.979/therm, which is the blended rate used throughout the analysis.
- The gas use profile is typical for a facility with space heating as the dominant natural gas use.

## 3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the county, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

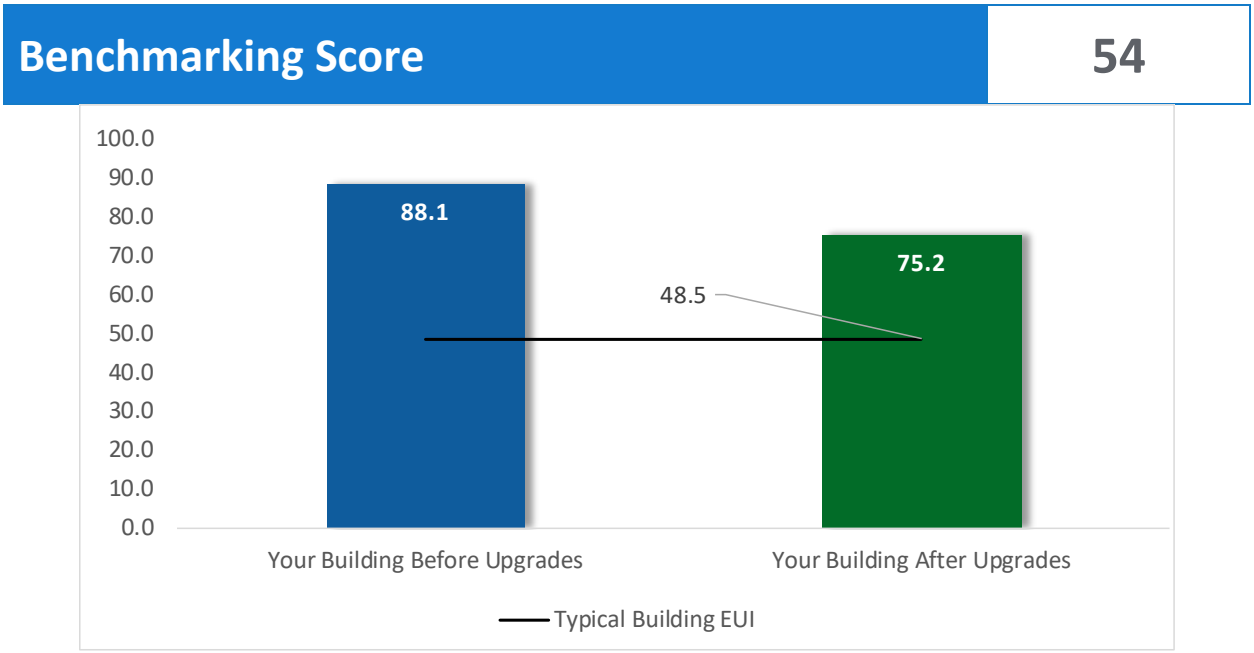



*Figure 6 - Energy Use Intensity Comparison*

This building performs at the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause as building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

## Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

**We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.**

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1

# 4 ENERGY CONSERVATION MEASURES

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Lighting Upgrades** | | **441,245** | **82.9** | **-74** | **$69,819** | **$179,462** | **$34,919** | **$144,543** | **2.1** | **435,648** |
| ECM 1 | Install LED Fixtures | 106,421 | 13.1 | -4 | $16,974 | $76,000 | $7,525 | $68,475 | 4.0 | 106,680 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 180 | 0.0 | 0 | $28 | $110 | $12 | $98 | 3.5 | 177 |
| ECM 3 | Retrofit Fixtures with LED Lamps | 334,644 | 69.7 | -70 | $52,817 | $103,352 | $27,382 | $75,970 | 1.4 | 328,791 |
| **Lighting Control Measures** | | **85,891** | **18.1** | **-18** | **$13,556** | **$78,819** | **$8,540** | **$70,279** | **5.2** | **84,389** |
| ECM 4 | Install Occupancy Sensor Lighting Controls | 75,121 | 16.4 | -16 | $11,856 | $72,294 | $8,540 | $63,754 | 5.4 | 73,807 |
| ECM 5 | Install High/Low Lighting Controls | 10,770 | 1.8 | -2 | $1,700 | $6,525 | $0 | $6,525 | 3.8 | 10,582 |
| **Motor Upgrades** | | **955** | **0.3** | **0** | **$153** | **$876** | **$0** | **$876** | **5.7** | **961** |
| ECM 6 | Premium Efficiency Motors | 955 | 0.3 | 0 | $153 | $876 | $0 | $876 | 5.7 | 961 |
| **Variable Frequency Drive (VFD) Measures** | | **68,878** | **10.9** | **0** | **$11,012** | **$67,432** | **$1,080** | **$66,352** | **6.0** | **69,360** |
| ECM 7 | Install VFDs on Constant Volume (CV) Fans | 12,832 | 4.1 | 0 | $2,052 | $18,630 | $1,080 | $17,550 | 8.6 | 12,922 |
| ECM 8 | Install VFDs on Heating Water Pumps | 56,046 | 6.8 | 0 | $8,960 | $48,802 | $0 | $48,802 | 5.4 | 56,438 |
| **Electric Unitary HVAC Measures** | | **18,615** | **12.4** | **0** | **$2,976** | **$144,716** | **$6,931** | **$137,785** | **46.3** | **18,745** |
| ECM 9 | Install High Efficiency Air Conditioning Units | 18,615 | 12.4 | 0 | $2,976 | $144,716 | $6,931 | $137,785 | 46.3 | 18,745 |
| **HVAC System Improvements** | | **6,215** | **0.0** | **119** | **$2,162** | **$21,751** | **$0** | **$21,751** | **10.1** | **20,237** |
| ECM 10 | Implement Demand Control Ventilation (DCV) | 6,215 | 0.0 | 119 | $2,162 | $21,751 | $0 | $21,751 | 10.1 | 20,237 |
| **Domestic Water Heating Upgrade** | | **0** | **0.0** | **197** | **$1,933** | **$33,052** | **$1,138** | **$31,914** | **16.5** | **23,124** |
| ECM 11 | Install High Efficiency Gas-Fired Water Heater | 0 | 0.0 | 123 | $1,201 | $32,572 | $1,138 | $31,434 | 26.2 | 14,366 |
| ECM 12 | Install Low-Flow DHW Devices | 0 | 0.0 | 75 | $732 | $480 | $0 | $480 | 0.7 | 8,758 |
| **Food Service & Refrigeration Measures** | | **6,790** | **0.8** | **0** | **$1,086** | **$1,150** | **$200** | **$950** | **0.9** | **6,837** |
| ECM 13 | Vending Machine Control | 6,790 | 0.8 | 0 | $1,086 | $1,150 | $200 | $950 | 0.9 | 6,837 |
| **TOTALS** | | **628,589** | **125.3** | **225** | **$102,697** | **$527,258** | **$52,808** | **$474,451** | **4.6** | **659,302** |

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

*Figure 7 – All Evaluated ECMs*

| # | *Energy Conservation Measure Static* | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Lighting Upgrades** | | **441,245** | **82.9** | **-74** | **$69,819** | **$179,462** | **$34,919** | **$144,543** | **2.1** | **435,648** |
| ECM 1 | Install LED Fixtures | 106,421 | 13.1 | -4 | $16,974 | $76,000 | $7,525 | $68,475 | 4.0 | 106,680 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 180 | 0.0 | 0 | $28 | $110 | $12 | $98 | 3.5 | 177 |
| ECM 3 | Retrofit Fixtures with LED Lamps | 334,644 | 69.7 | -70 | $52,817 | $103,352 | $27,382 | $75,970 | 1.4 | 328,791 |
| **Lighting Control Measures** | | **85,891** | **18.1** | **-18** | **$13,556** | **$78,819** | **$8,540** | **$70,279** | **5.2** | **84,389** |
| ECM 4 | Install Occupancy Sensor Lighting Controls | 75,121 | 16.4 | -16 | $11,856 | $72,294 | $8,540 | $63,754 | 5.4 | 73,807 |
| ECM 5 | Install High/Low Lighting Controls | 10,770 | 1.8 | -2 | $1,700 | $6,525 | $0 | $6,525 | 3.8 | 10,582 |
| **Motor Upgrades** | | **955** | **0.3** | **0** | **$153** | **$876** | **$0** | **$876** | **5.7** | **961** |
| ECM 6 | Premium Efficiency Motors | 955 | 0.3 | 0 | $153 | $876 | $0 | $876 | 5.7 | 961 |
| **Variable Frequency Drive (VFD) Measures** | | **68,878** | **10.9** | **0** | **$11,012** | **$67,432** | **$1,080** | **$66,352** | **6.0** | **69,360** |
| ECM 7 | Install VFDs on Constant Volume (CV) HVAC | 12,832 | 4.1 | 0 | $2,052 | $18,630 | $1,080 | $17,550 | 8.6 | 12,922 |
| ECM 8 | Install VFDs on Hot Water Pumps | 56,046 | 6.8 | 0 | $8,960 | $48,802 | $0 | $48,802 | 5.4 | 56,438 |
| **HVAC System Improvements** | | **6,215** | **0.0** | **119** | **$2,162** | **$21,751** | **$0** | **$21,751** | **10.1** | **20,237** |
| ECM 10 | Implement Demand Control Ventilation | 6,215 | 0.0 | 119 | $2,162 | $21,751 | $0 | $21,751 | 10.1 | 20,237 |
| **Domestic Water Heating Upgrade** | | **0** | **0.0** | **75** | **$732** | **$480** | **$0** | **$480** | **0.7** | **8,758** |
| ECM 12 | Install Low-Flow Domestic Hot Water Devices | 0 | 0.0 | 75 | $732 | $480 | $0 | $480 | 0.7 | 8,758 |
| **Food Service & Refrigeration Measures** | | **6,790** | **0.8** | **0** | **$1,086** | **$1,150** | **$200** | **$950** | **0.9** | **6,837** |
| ECM 13 | Vending Machine Control | 6,790 | 0.8 | 0 | $1,086 | $1,150 | $200 | $950 | 0.9 | 6,837 |
| **TOTALS** | | **609,975** | **112.9** | **102** | **$98,520** | **$349,971** | **$44,739** | **$305,232** | **3.1** | **626,191** |

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

*Figure 8 – Cost Effective ECMs*

## 4.1 Lighting

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Lighting Upgrades** | | **441,245** | **82.9** | **-74** | **$69,819** | **$179,462** | **$34,919** | **$144,543** | **2.1** | **435,648** |
| ECM 1 | Install LED Fixtures | 106,421 | 13.1 | -4 | $16,974 | $76,000 | $7,525 | $68,475 | 4.0 | 106,680 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 180 | 0.0 | 0 | $28 | $110 | $12 | $98 | 3.5 | 177 |
| ECM 3 | Retrofit Fixtures with LED Lamps | 334,644 | 69.7 | -70 | $52,817 | $103,352 | $27,382 | $75,970 | 1.4 | 328,791 |

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources is proposed, we suggest converting all fixtures of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the High School, which should help reduce future maintenance costs.

### ECM 1: Install LED Fixtures

Replace existing fixtures containing HID (metal halide and high-pressure sodium) lamps with new LED light fixtures. This measure saves energy by installing LEDs, which use less power than other technologies with a comparable light output.

In some cases, HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixtures.

Maintenance savings may also be achieved as LED lamps last longer than other light sources and therefore do not need to be replaced as often.

**Affected building areas:** weight room, library, and exterior fixtures.

### ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Retrofit fluorescent T12 fixture by removing the fluorescent tubes and ballasts and replacing them with LED tubes and LED drivers (if necessary), which are designed to be used in retrofitted fluorescent fixtures.

The measure uses the existing fixture housing but replaces the electric components with more efficient lighting technology, which uses less power than other lighting technologies while providing equivalent lighting output. Maintenance savings may also be achieved as LED tubes last longer than fluorescent tubes and therefore do not need to be replaced as often.

**Affected building areas**: storage room.

### ECM 3: Retrofit Fixtures with LED Lamps

Replace fluorescent T8, incandescent, and compact fluorescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as direct replacements for most other lighting technologies.

This measure saves energy by installing LEDs, which use less power than other lighting technologies while providing equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

**Affected building areas:** most of the interior fixtures.

## 4.2 Lighting Controls

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Lighting Control Measures** | | **85,891** | **18.1** | **-18** | **$13,556** | **$78,819** | **$8,540** | **$70,279** | **5.2** | **84,389** |
| ECM 4 | Install Occupancy Sensor Lighting Controls | 75,121 | 16.4 | -16 | $11,856 | $72,294 | $8,540 | $63,754 | 5.4 | 73,807 |
| ECM 5 | Install High/Low Lighting Controls | 10,770 | 1.8 | -2 | $1,700 | $6,525 | $0 | $6,525 | 3.8 | 10,582 |

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

### ECM 4: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote-mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

**Affected building areas:** offices, conference rooms, classrooms, locker rooms, library, restrooms, and storage rooms.

### ECM 5: Install High/Low Lighting Controls

Install occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low level after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

The controller lowers the light level by dimming the fixture output. Therefore, the controlled fixtures need to have a dimmable ballast or driver. This will need to be taken into account when selecting retrofit lamps and bulbs for the areas proposed for high/low control.

This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

**Affected building areas**: hallways.

For this type of measure the occupancy sensors will generally be ceiling or fixture mounted. Sufficient sensor coverage must be provided to ensure that lights turn on in each area as an occupant approaches.

## 4.3 Motors

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Motor Upgrades** | | **955** | **0.3** | **0** | **$153** | **$876** | **$0** | **$876** | **5.7** | **961** |
| ECM 6 | Premium Efficiency Motors | 955 | 0.3 | 0 | $153 | $876 | $0 | $876 | 5.7 | 961 |

### ECM 6: Premium Efficiency Motors

Replace standard efficiency motors with IHP 2014 efficiency motors. This evaluation assumes that existing motors will be replaced with motors of equivalent size and type. In some cases, additional savings may be possible by downsizing motors to better meet the motor's current load requirements.

**Affected motors:**

| Location | Area(s)/System(s) Served | Motor Quantity | Motor Application | HP Per Motor | Additional Motor Description |
|---|---|---|---|---|---|
| Boiler Room | Domestic Hot Water Recirculation | 1 | Heating Hot Water Pump | 3.0 | Domestic Hot Water Recirculation |

Savings are based on the difference between baseline, proposed efficiencies, and the assumed annual operating hours. The base case motor energy consumption is estimated using the efficiencies found on nameplates or based on the age of the motor and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the current *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*.

## 4.4 Variable Frequency Drives (VFD)

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Variable Frequency Drive (VFD) Measures** | | **68,878** | **10.9** | **0** | **$11,012** | **$67,432** | **$1,080** | **$66,352** | **6.0** | **69,360** |
| ECM 7 | Install VFDs on Constant Volume (CV) Fans | 12,832 | 4.1 | 0 | $2,052 | $18,630 | $1,080 | $17,550 | 8.6 | 12,922 |
| ECM 8 | Install VFDs on Heating Water Pumps | 56,046 | 6.8 | 0 | $8,960 | $48,802 | $0 | $48,802 | 5.4 | 56,438 |

Variable frequency drives (VFDs) control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor to conservatively account for the cost of an inverter duty rated motor.

### ECM 7: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone while maintaining a constant supply air temperature.

VAV system controls should not raise the supply air temperature at the expense of the fan power. A common mistake is to reset the supply air temperature to achieve chiller energy savings, which can lead to additional air flow requirements. Supply air temperature should be kept low (e.g. 55°F) until the minimum fan speed (typically about 50%) is met. At this point, it is efficient to raise the supply air temperature as the load decreases, but not such that additional air flow and thus fan energy is required.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

### ECM 8: Install VFDs on Heating Water Pumps

Install VFDs to control heating water pumps. Two-way valves must serve the hot water coils and the hot water loop must have a differential pressure sensor installed. If a bypass leg or three-way valves are used in the hot water distribution, they will need to be modified when this measure is implemented. As the hot water valves close, the differential pressure increases, and the VFD modulates the pump speed to maintain a differential pressure setpoint.

Energy savings result from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

**Affected pumps:** four 5 hp, three 7.5 hp hot water pumps in the boiler room, one 10 hp, and four 1 hp hot water pumps serving AHUs in the gymnasium

## 4.5 Electric Unitary HVAC

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Electric Unitary HVAC Measures** | | **18,615** | **12.4** | **0** | **$2,976** | **$144,716** | **$6,931** | **$137,785** | **46.3** | **18,745** |
| ECM 10 | Install High Efficiency Air Conditioning Units | 18,615 | 12.4 | 0 | $2,976 | $144,716 | $6,931 | $137,785 | 46.3 | 18,745 |

Replacing the packaged and split system units has a long payback period and may not be justifiable based simply on energy considerations. However, several of the units at the High School are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high-efficiency unit can be justified by the marginal savings from the improved efficiency. When the packaged and split system units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

### ECM 9: Install High-Efficiency Air Conditioning Units

Replace standard efficiency packaged air conditioning units with high-efficiency packaged air conditioning units. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high-efficiency unit, average cooling load, and estimated annual operating hours.

## 4.6 HVAC

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **HVAC System Improvements** | | **6,215** | **0.0** | **119** | **$2,162** | **$21,751** | **$0** | **$21,751** | **10.1** | **20,237** |
| ECM 11 | Implement Demand Control Ventilation (DCV) | 6,215 | 0.0 | 119 | $2,162 | $21,751 | $0 | $21,751 | 10.1 | 20,237 |

### ECM 10: Implement Demand Control Ventilation (DCV)

Demand control ventilation (DCV) monitors the indoor air's carbon dioxide ($CO_2$) content to measure room occupancy. This data is used to regulate the amount of outdoor air provided to the space for ventilation.

Standard ventilation systems often provide outside air based on a space's estimated maximum occupancy but not actual occupancy. During low occupancy periods, the space may then be overventilated. This wastes energy through heating and cooling the excess outside air flow. DCV reduces unnecessary outdoor air intake by regulating ventilation based on actual occupancy levels. DCV is most suited for facilities where occupancy levels vary significantly from hour to hour and day to day.

Energy savings associated with DCV are based on hours of operation, space occupancy, outside air reduction, and other factors. Energy savings results from eliminating unnecessary ventilation and space conditioning.

**Affected building areas:** gymnasium, cafeterias, auditorium, stage, and library.

## 4.7 Domestic Water Heating

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Domestic Water Heating Upgrade** | | **0** | **0.0** | **197** | **$1,933** | **$33,052** | **$1,138** | **$31,914** | **16.5** | **23,124** |
| ECM 12 | Install High Efficiency Gas-Fired Water Heater | 0 | 0.0 | 123 | $1,201 | $32,572 | $1,138 | $31,434 | 26.2 | 14,366 |
| ECM 13 | Install Low-Flow DHW Devices | 0 | 0.0 | 75 | $732 | $480 | $0 | $480 | 0.7 | 8,758 |

### ECM 11: Install High-Efficiency Gas-Fired Water Heater

Replace the existing tank water heater with a high-efficiency tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water and fewer operating hours to maintain the tank water temperature.

Replacing the water heater has a long payback period and may not be justifiable based simply on energy considerations. However, the heater has passed the end of its normal useful life and appears in poor condition. Typically, the marginal cost of purchasing a high-efficiency unit can be justified by the marginal savings from the improved efficiency. When the packaged and split system units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

### ECM 12: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low-flow devices are recommended to reduce hot water usage:

| Device | Flow Rate |
|---|---|
| Faucet aerators (lavatory) | 0.5 gpm |

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing.

Additional cost savings may result from reduced water usage.

## 4.8 Food Service & Refrigeration Measures

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Food Service & Refrigeration Measures** | | **6,790** | **0.8** | **0** | **$1,086** | **$1,150** | **$200** | **$950** | **0.9** | **6,837** |
| ECM 14 | Vending Machine Control | 6,790 | 0.8 | 0 | $1,086 | $1,150 | $200 | $950 | 0.9 | 6,837 |

### ECM 13: Vending Machine Control

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time and power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

# 5 ENERGY EFFICIENT BEST PRACTICES

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

## Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions.[4] Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

## Weatherization

Caulk or weather strip leaky doors and windows to reduce drafts and loss of heated or cooled air. Sealing cracks and openings can reduce heating and cooling costs, improve building durability, and create a healthier indoor environment.

## Doors and Windows

Close exterior doors and windows in heated and cooled areas. Leaving doors and windows open leads to a loss of heat during the winter and chilled air during the summer. Reducing air changes per hour (ACH) can lead to increased occupant comfort as well as heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

## Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly.

## Motor Maintenance

Motors have many moving parts. As these parts degrade over time, the efficiency of the motor is reduced. Routine maintenance prevents damage to motor components. Routine maintenance should include cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager

## Fans to Reduce Cooling Load

Install ceiling fans to supplement your cooling system. Thermostat settings can typically be increased by 4°F with no change in overall occupant comfort due to the wind chill effect of moving air.

## Thermostat Schedules and Temperature Resets

Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the High School's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

## Economizer Maintenance

Economizers can significantly reduce cooling system load. A malfunctioning economizer can increase the amount of heating and mechanical cooling required by introducing excess amounts of cold or hot outside air. Common economizer malfunctions include broken outdoor thermostat or enthalpy control, or dampers that are stuck or improperly adjusted.

Periodic inspection and maintenance will keep economizers working in sync with the heating and cooling system. This maintenance should be part of annual system maintenance, and it should include proper setting of the outdoor thermostat/enthalpy control, inspection of control and damper operation, lubrication of damper connections, and adjustment of minimum damper position.

## AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

## HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

## Duct Sealing

Duct leakage in commercial buildings can account for five to twenty-five percent of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building wasting conditioned air. Eliminating duct leaks can improve ventilation system performance and reduce heating and cooling system operation.

## Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

## Water Heater Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

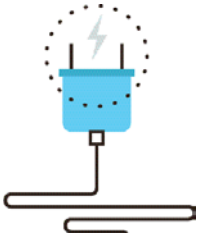
## Compressed Air System Maintenance

Compressed air systems require periodic maintenance to operate at peak efficiency. A maintenance plan for compressed air systems should include:

- Inspection, cleaning, and replacement of inlet filter cartridges
- Cleaning of drain traps
- Daily inspection of lubricant levels to reduce unwanted friction
- Inspection of belt condition and tension
- Check for leaks and adjust loose connections
- Overall system cleaning

Contact a qualified technician for help with setting up periodic maintenance schedule.

## Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

## Computer Power Management Software

Many computers consume power during nights, weekends, and holidays. Screen savers are commonly confused as a power management strategy. This contributes to avoidable, excessive electrical energy consumption. There are innovative power management software packages available that are designed to deliver significant energy saving and provide ongoing tracking measurements. A central power management platform helps enforce energy savings policies as well as identify and eliminate underutilized devices

## Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense™ ratings for urinals is 0.5 gpf and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense™ website[6] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the High School is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

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[5] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices

[6] https://www.epa.gov/watersense

[7] https://www.epa.gov/watersense/watersense-work-0

## Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense™ products where available.

# 6 ON-SITE GENERATION

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the High School's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for your facility. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

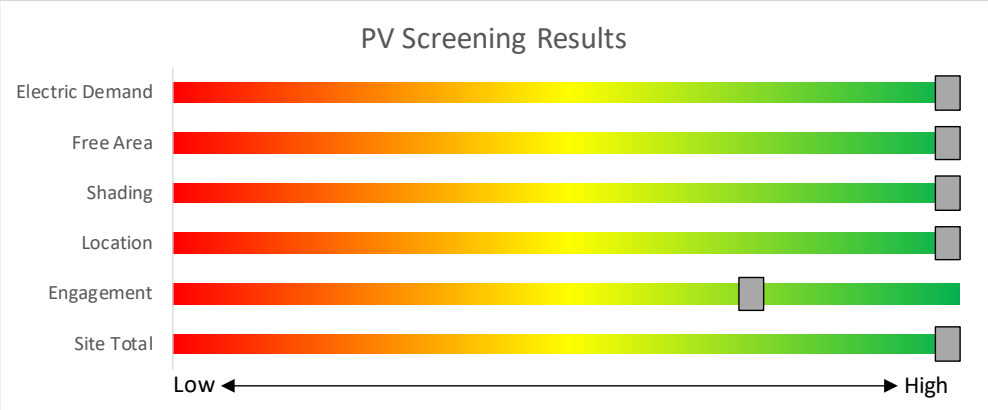
## 6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has high potential for installing a PV array.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high potential. A PV array located on the roof may be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.




| | | |
|---|---|---|
| **Potential** | High | |
| **System Potential** | 502 | kW DC STC |
| **Electric Generation** | 598,068 | kWh/yr |
| **Displaced Cost** | $95,620 | /yr |
| **Installed Cost** | $1,305,200 | |

*Figure 9 - Photovoltaic Screening*

**Solar Renewable Energy Credit (SREC) Registration Program**

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

- **Basic Info on Solar PV in New Jersey**: www.njcleanenergy.com/whysolar
- **New Jersey Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the New Jersey Market**: www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

## 6.2 Combined Heat and Power

Combined heat and power (CHP) generates electricity at the High School and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

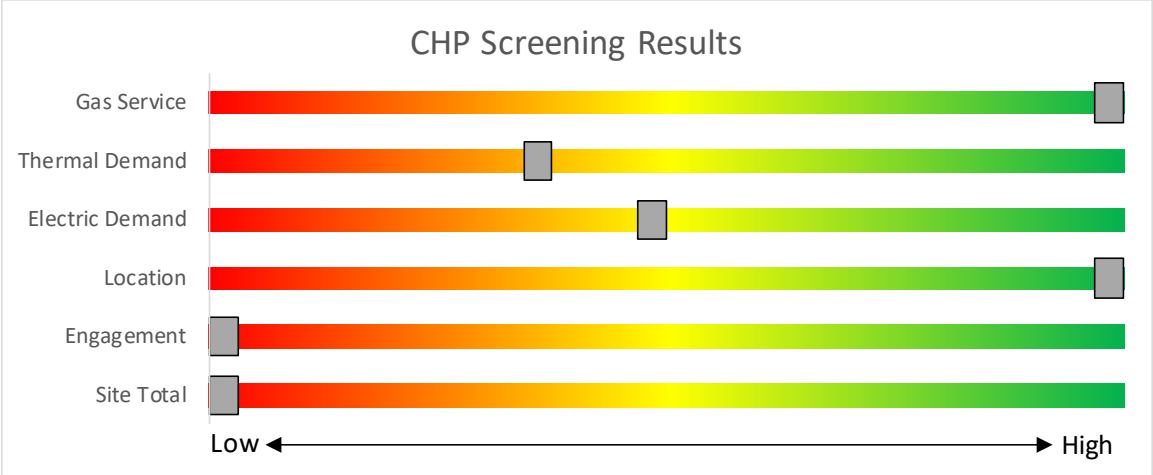
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has no potential for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. The lack of gas service, low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.




| | | |
|---|---|---|
| **Potential** | None | |
| **System Type** | None | |
| **System Potential** | 180 | kW |
| **Electric Generation** | 1,274,760 | kWh/yr |
| **Thermal Generation** | 6,649,998 | MBtu/yr |
| **Displaced Cost** | $134,739 | /yr |
| **Installed Cost** | $583,000 | |

*Figure 10 - Combined Heat and Power Screening*

Find a qualified firm that specializes in commercial CHP cost assessment and installation: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/

# 7 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? New Jersey's Clean Energy Programs can help. Pick the program that works best for you. Incentive programs that may apply to the High School are identified in the Executive Summary. This section provides an overview of currently available New Jersey's Clean Energy Programs.

| | **SmartStart**<br>*Flexibility to install at your own pace* | **Direct Install**<br>*Turnkey installation* | **Pay for Performance**<br>*Whole building upgrades* |
|---|---|---|---|
| **Who should use it?** | Buildings installing individual measures or small group of measures. | Small to mid-size facilities that can bundle multiple measures together.<br>Average peak demand should be below 200 kW.<br>Not suitable for significant building shell issues. | Mid to large size facilities looking to implement as many measures as possible at one time.<br>Peak demand should be over 200 kW. |
| **How does it work?** | Use in-house staff or your preferred contractor. | Pre-approved contractors pass savings along to you via reduced material and labor costs. | Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives. |
| **What are the Incentives?** | Fixed incentives for specific energy efficiency measures. | Incentives pay up to 70% of eligible costs, up to $125,000 per project.<br>You pay the remaining 30% directly to the contractor. | Up to 25% of installation cost, calculated based on level of energy savings per square foot. |
| **How do I participate?** | Submit an application for the specific equipment to be installed. | Contact a participating contractor in your region. | Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets. |
| Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor. | | | |

## 7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at the High School. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficiency equipment based on market trends and new technologies.

**Equipment with Prescriptive Incentives Currently Available:**

*Electric Chillers*
*Electric Unitary HVAC*
*Gas Cooling*
*Gas Heating*
*Gas Water Heating*
*Ground Source Heat Pumps*
*Lighting*
*Lighting Controls*
*Refrigeration Doors*
*Refrigeration Controls*
*Refrigerator/Freezer Motors*
*Food Service Equipment*
*Variable Frequency Drives*

**Incentives**

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

**How to Participate**

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

## 7.2 Direct Install

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at the High School, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

**Incentives**

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

**How to Participate**

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

## 7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

**Incentives**

Incentives are based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

**How to Participate**

Contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan), assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

## 7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

**Incentives**

| Eligible Technologies | Size (Installed Rated Capacity)[1] | Incentive ($/kW) | % of Total Cost Cap per Project[3] | $ Cap per Project[3] |
|---|---|---|---|---|
| Powered by non-renewable or renewable fuel source[4] | ≤500 kW | $2,000 | 30-40%[2] | $2 million |
| Gas Internal Combustion Engine | >500 kW - 1 MW | $1,000 | | |
| Gas Combustion Turbine | > 1 MW - 3 MW | $550 | 30% | $3 million |
| Microturbine<br>Fuel Cells with Heat Recovery | >3 MW | $350 | | |
| Waste Heat to Power* | <1 MW | $1,000 | 30% | $2 million |
| | > 1MW | $500 | | $3 million |

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

**How to Participate**

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at: www.njcleanenergy.com/CHP.

## 7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

**How to Participate**

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the energy savings plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

*ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.*

## 7.6 SREC Registration Program

The SREC Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: www.njcleanenergy.com/srec.

# 8 Energy Purchasing and Procurement Strategies

## 8.1 Retail Electric Supply Options

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for the High School's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[8].

## 8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier typically depends on whether a customer prefers budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

[8] www.state.nj.us/bpu/commercial/shopping.html.

[9] www.state.nj.us/bpu/commercial/shopping.html

# APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

## Lighting Inventory & Recommendations

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Storage Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 229 | 0 | $36 | $189 | $20 | 4.7 |
| Boiler Room | 13 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 3,640 | 3 | Relamp | No | 13 | LED - Linear Tubes: (3) 4' Lamps | Wall Switch | 44 | 3,640 | 0.5 | 2,577 | -1 | $407 | $712 | $195 | 1.3 |
| Boiler Room | 2 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 2 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Restroom | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 3,120 | 3 | Relamp | No | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 3,120 | 0.0 | 192 | 0 | $30 | $73 | $20 | 1.7 |
| H Wing Hallway | 34 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 34 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 1.0 | 6,288 | -1 | $992 | $1,917 | $340 | 1.6 |
| H Wing Hallway | 2 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 2 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Office | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 1 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.1 | 212 | 0 | $33 | $189 | $20 | 5.1 |
| Office | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 94 | 0 | $15 | $37 | $10 | 1.8 |
| Closet | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,714 | 0.1 | 318 | 0 | $50 | $150 | $2 | 3.0 |
| Stairwell - Gymn | 8 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 8 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Staff Shower Room | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 344 | 0 | $54 | $380 | $65 | 5.8 |
| Office | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 2,600 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Office | 1 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 1 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Office | 1 | LED - Fixtures: LED Corn Bulb | Wall Switch | S | 13 | 2,600 | | None | No | 1 | LED - Fixtures: LED Corn Bulb | Wall Switch | 13 | 2,600 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Boys Locker Room | 19 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 4 | Relamp | Yes | 19 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,763 | 0.6 | 3,514 | -1 | $555 | $1,234 | $260 | 1.8 |
| Boys Locker Room | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 4,004 | 3 | Relamp | No | 2 | LED Lamps: LED Screw in | Wall Switch | 10 | 4,004 | 0.1 | 484 | 0 | $76 | $34 | $2 | 0.4 |
| Boys Locker Room | 4 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 4 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Restroom | 1 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 3,120 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 3,120 | 0.0 | 55 | 0 | $9 | $33 | $6 | 3.1 |
| Office | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 2,600 | 0.0 | 160 | 0 | $25 | $73 | $20 | 2.1 |
| Restroom | 2 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 3,120 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 3,120 | 0.0 | 110 | 0 | $17 | $65 | $12 | 3.1 |
| Restroom | 1 | Compact Fluorescent: Screw in | Wall Switch | S | 14 | 3,120 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 3,120 | 0.0 | 14 | 0 | $2 | $17 | $1 | 7.1 |
| Restroom | 2 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 3,120 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 3,120 | 0.0 | 110 | 0 | $17 | $65 | $12 | 3.1 |
| Storage Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Gymnasium | 32 | LED - Fixtures: High-Bay | Wall Switch | S | 120 | 4,004 | | None | No | 32 | LED - Fixtures: High-Bay | Wall Switch | 120 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Gymnasium | 4 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 4 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Girls Locker Room | 19 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 4 | Relamp | Yes | 19 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,763 | 0.6 | 3,514 | -1 | $555 | $1,234 | $260 | 1.8 |
| Girls Locker Room | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 4,004 | 3 | Relamp | No | 2 | LED Lamps: LED Screw in | Wall Switch | 10 | 4,004 | 0.1 | 484 | 0 | $76 | $34 | $2 | 0.4 |
| Girls Locker Room | 4 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 4 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Restroom | 1 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 3,120 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 3,120 | 0.0 | 55 | 0 | $9 | $33 | $6 | 3.1 |
| Office | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 2,600 | 0.0 | 160 | 0 | $25 | $73 | $20 | 2.1 |
| Restroom | 2 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 3,120 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 3,120 | 0.0 | 110 | 0 | $17 | $65 | $12 | 3.1 |
| Restroom | 1 | Compact Fluorescent: Screw in | Wall Switch | S | 14 | 3,120 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 3,120 | 0.0 | 14 | 0 | $2 | $17 | $1 | 7.5 |
| Restroom | 2 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 3,120 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 3,120 | 0.0 | 110 | 0 | $17 | $65 | $12 | 3.1 |
| Storage Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Storage Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Weight Room | 8 | Metal Halide: (1) 250W Lamp | Wall Switch | S | 295 | 4,004 | 1, 4 | Fixture Replacement | Yes | 8 | LED - Fixtures: Downlight Pendant | Occupancy Sensor | 75 | 2,763 | 1.4 | 8,571 | -2 | $1,353 | $1,484 | $75 | 1.0 |
| Weight Room | 2 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 2 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Room | 1 | LED - Fixtures: LED Corn Bulb | Wall Switch | S | 13 | 2,484 | | None | No | 1 | LED - Fixtures: LED Corn Bulb | Wall Switch | 13 | 2,484 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Room | 2 | LED - Linear Tubes: (2) 8' Lamps | Wall Switch | S | 72 | 2,484 | 4 | None | Yes | 2 | LED - Linear Tubes: (2) 8' Lamps | Occupancy Sensor | 72 | 1,714 | 0.0 | 122 | 0 | $19 | $116 | $0 | 6.0 |
| Ticket Boot | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,714 | 0.1 | 318 | 0 | $50 | $266 | $2 | 5.3 |
| Custodial | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 94 | 0 | $15 | $37 | $10 | 1.8 |
| Girls Restroom | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 3,120 | | None | No | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 3,120 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Girls Restroom | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 3,120 | | None | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 3,120 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room H7 | 23 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 23 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.7 | 3,038 | -1 | $480 | $1,380 | $300 | 2.3 |
| Room H7 | 2 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 2,860 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 2,860 | 0.0 | 101 | 0 | $16 | $65 | $12 | 3.3 |
| Storage Room | 1 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 2,484 | 0.0 | 44 | 0 | $7 | $33 | $6 | 3.8 |
| Room H6 | 18 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 18 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 2,378 | 0 | $375 | $1,197 | $250 | 2.5 |
| Room H4 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room H5 | 27 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 27 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.8 | 3,567 | -1 | $563 | $1,526 | $340 | 2.1 |
| Room H4A | 6 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 6 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.2 | 793 | 0 | $125 | $489 | $95 | 3.2 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Room H3 | 27 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 27 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.8 | 3,567 | -1 | $563 | $1,526 | $340 | 2.1 |
| Receiving Room | 6 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 4 | Relamp | Yes | 6 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,763 | 0.2 | 1,110 | 0 | $175 | $489 | $95 | 2.3 |
| Closet | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Room H1 | 27 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 27 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.8 | 3,567 | -1 | $563 | $1,526 | $340 | 2.1 |
| Room H2 | 12 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 12 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.4 | 1,585 | 0 | $250 | $708 | $155 | 2.2 |
| Room H2A | 11 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 11 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.6 | 2,560 | -1 | $404 | $1,073 | $255 | 2.0 |
| Room H1 | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 2,860 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 2,860 | 0.0 | 173 | 0 | $27 | $17 | $1 | 0.6 |
| Closet | 1 | LED - Fixtures: LED Corn Bulb | Wall Switch | S | 13 | 2,484 | | None | No | 1 | LED - Fixtures: LED Corn Bulb | Wall Switch | 13 | 2,484 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room H2A | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 2,860 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,973 | 0.1 | 366 | 0 | $58 | $150 | $2 | 2.6 |
| Bill's Office | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.2 | 846 | 0 | $134 | $832 | $150 | 5.1 |
| Basement Stairwell | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Basement Stairwell | 1 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 1 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Basement | 6 | LED Lamps: LED Screw in | Wall Switch | S | 10 | 4,004 | | None | No | 6 | LED Lamps: LED Screw in | Wall Switch | 10 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| J Wing Hallway | 23 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 23 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.7 | 4,254 | -1 | $671 | $1,290 | $230 | 1.6 |
| J Wing Hallway | 4 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 4 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Hallway Display | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 291 | 0 | $46 | $73 | $20 | 1.2 |
| Copy Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 240 | 0 | $38 | $189 | $20 | 4.5 |
| Restroom | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 3,120 | 0.0 | 189 | 0 | $30 | $17 | $1 | 0.5 |
| Room J1 | 33 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 33 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 1.8 | 7,680 | -2 | $1,212 | $2,950 | $730 | 1.8 |
| Room J2 | 27 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 2,860 | 3, 4 | Relamp | Yes | 27 | LED - Linear Tubes: (3) 4' Lamps | Occupancy Sensor | 44 | 1,973 | 1.2 | 5,350 | -1 | $844 | $2,019 | $475 | 1.8 |
| Room J3 | 27 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 2,860 | 3, 4 | Relamp | Yes | 27 | LED - Linear Tubes: (3) 4' Lamps | Occupancy Sensor | 44 | 1,973 | 1.2 | 5,350 | -1 | $844 | $2,019 | $475 | 1.8 |
| Room J6 | 45 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 2,860 | 3, 4 | Relamp | Yes | 45 | LED - Linear Tubes: (3) 4' Lamps | Occupancy Sensor | 44 | 1,973 | 2.0 | 8,917 | -2 | $1,407 | $3,005 | $745 | 1.6 |
| Room J3 | 1 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 1 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Room | 1 | LED - Fixtures: LED Corn Bulb | Wall Switch | S | 13 | 2,484 | | None | No | 1 | LED - Fixtures: LED Corn Bulb | Wall Switch | 13 | 2,484 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Room | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 2,484 | 0.0 | 150 | 0 | $24 | $17 | $1 | 0.7 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Room J6 | 1 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 1 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Room | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,714 | 0.1 | 318 | 0 | $50 | $150 | $2 | 3.0 |
| Storage Room | 1 | Linear Fluorescent - T12: 2' T12 (20W) - 4L | Wall Switch | S | 100 | 2,484 | 2, 4 | Relamp & Reballast | Yes | 1 | LED - Linear Tubes: (4) 2' Lamps | Occupancy Sensor | 34 | 1,714 | 0.1 | 209 | 0 | $33 | $226 | $12 | 6.5 |
| Office | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 240 | 0 | $38 | $189 | $20 | 4.5 |
| Paint Room | 2 | LED - Fixtures: LED Corn Bulb | Wall Switch | S | 13 | 2,600 | | None | No | 2 | LED - Fixtures: LED Corn Bulb | Wall Switch | 13 | 2,600 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Basement | 5 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 4,004 | 4 | None | Yes | 5 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 2,763 | 0.1 | 396 | 0 | $62 | $270 | $35 | 3.8 |
| Men Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 2,600 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room J8 | 45 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 2,860 | 3, 4 | Relamp | Yes | 45 | LED - Linear Tubes: (3) 4' Lamps | Occupancy Sensor | 44 | 1,973 | 2.0 | 8,917 | -2 | $1,407 | $3,275 | $780 | 1.8 |
| Storage Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Storage Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 229 | 0 | $36 | $189 | $20 | 4.7 |
| Electrical Room | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 360 | 0 | $57 | $380 | $65 | 5.5 |
| Room J5 | 9 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 2,860 | 3, 4 | Relamp | Yes | 9 | LED - Linear Tubes: (3) 4' Lamps | Occupancy Sensor | 44 | 1,973 | 0.4 | 1,783 | 0 | $281 | $763 | $170 | 2.1 |
| Conference Room | 7 | U-Bend Fluorescent - T8: U T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 7 | LED - Linear Tubes: (2) U-Lamp | Occupancy Sensor | 33 | 1,794 | 0.2 | 785 | 0 | $124 | $777 | $105 | 5.4 |
| Room J7 | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.1 | 396 | 0 | $63 | $380 | $65 | 5.0 |
| Room J9 | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.2 | 698 | 0 | $110 | $489 | $95 | 3.6 |
| Office | 8 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 8 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.4 | 1,693 | 0 | $267 | $854 | $195 | 2.5 |
| Office | 1 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 1 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Restroom | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 3,120 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 3,120 | 0.0 | 113 | 0 | $18 | $37 | $10 | 1.5 |
| Room J10 | 10 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 10 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.5 | 2,327 | 0 | $367 | $1,000 | $235 | 2.1 |
| Server Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 2,600 | 0.0 | 160 | 0 | $25 | $73 | $20 | 2.1 |
| Room J11 | 12 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 12 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.6 | 2,793 | -1 | $441 | $1,146 | $275 | 2.0 |
| Guidance Office | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.2 | 846 | 0 | $134 | $562 | $115 | 3.3 |
| Room J12 | 12 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 12 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.6 | 2,793 | -1 | $441 | $1,146 | $275 | 2.0 |
| Room J13 | 12 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 12 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.6 | 2,793 | -1 | $441 | $1,146 | $275 | 2.0 |
| Room J13 | 1 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 1 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Room J14 | 14 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 14 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.7 | 3,258 | -1 | $514 | $1,292 | $315 | 1.9 |
| I Wing Hallway | 2 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 4,004 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 4,004 | 0.0 | 141 | 0 | $22 | $65 | $12 | 2.4 |
| I Wing Hallway | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Hallway Display | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 145 | 0 | $23 | $37 | $10 | 1.2 |
| Restroom | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 3,120 | | None | No | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 3,120 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Custodial | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 94 | 0 | $15 | $37 | $10 | 1.8 |
| C Wing Hallway | 18 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 18 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.5 | 3,329 | -1 | $525 | $1,107 | $180 | 1.8 |
| C Wing Hallway | 4 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 4 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room C1 | 28 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 28 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.8 | 3,699 | -1 | $584 | $1,562 | $350 | 2.1 |
| Closet | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 459 | 0 | $72 | $416 | $75 | 4.7 |
| Room C2 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C3 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C4 | 24 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 24 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.7 | 3,170 | -1 | $500 | $1,686 | $345 | 2.7 |
| Room C5 | 17 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 17 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 2,246 | 0 | $354 | $1,161 | $240 | 2.6 |
| Closet | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 344 | 0 | $54 | $380 | $65 | 5.8 |
| Room C6 | 24 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 24 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.7 | 3,170 | -1 | $500 | $1,686 | $345 | 2.7 |
| Room C7 | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.1 | 264 | 0 | $42 | $189 | $20 | 4.1 |
| Restroom | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 2,153 | 0.1 | 399 | 0 | $63 | $150 | $2 | 2.4 |
| Room C8 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Women Restroom | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,763 | 0.1 | 370 | 0 | $58 | $343 | $20 | 5.5 |
| Boys Restroom | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 3,120 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,153 | 0.1 | 288 | 0 | $45 | $343 | $20 | 7.1 |
| Storage Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 229 | 0 | $36 | $189 | $20 | 4.7 |
| Storage Room | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,714 | 0.1 | 318 | 0 | $50 | $150 | $2 | 3.0 |
| Custodial | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| B Wing Hallway | 30 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 30 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.9 | 5,548 | -1 | $876 | $1,770 | $300 | 1.7 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| B Wing Hallway | 7 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 7 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Office | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.2 | 846 | 0 | $134 | $562 | $115 | 3.3 |
| Restroom | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 3,120 | 0.0 | 189 | 0 | $30 | $17 | $1 | 0.5 |
| Room B1 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room B2 | 25 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 25 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.8 | 3,303 | -1 | $521 | $1,453 | $320 | 2.2 |
| Room B3 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Closet | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 2,484 | 0.0 | 153 | 0 | $24 | $73 | $20 | 2.2 |
| Room B4 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room B5 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room B6 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room B7 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room B8 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room B9 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room B10 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room B12 | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.1 | 528 | 0 | $83 | $416 | $75 | 4.1 |
| A Wing Hallway | 17 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 17 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.5 | 3,144 | -1 | $496 | $1,071 | $170 | 1.8 |
| A Wing Hallway | 4 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 4 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Closet | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,714 | 0.1 | 318 | 0 | $50 | $150 | $2 | 3.0 |
| Room A1 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A2 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A3 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A4 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A5 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A6 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A7 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Room A8 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A9 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A10 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A11 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Office | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 360 | 0 | $57 | $380 | $65 | 5.5 |
| Restroom | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 2,153 | 0.1 | 399 | 0 | $63 | $304 | $2 | 4.8 |
| Women Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Closet | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Room A13 | 5 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 5 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.2 | 661 | 0 | $104 | $453 | $85 | 3.5 |
| Room A13 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 1 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.1 | 233 | 0 | $37 | $189 | $20 | 4.6 |
| Men Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 2,600 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| D Wing Hallway | 32 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 32 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 1.0 | 5,918 | -1 | $934 | $1,843 | $320 | 1.6 |
| D Wing Hallway | 6 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 6 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| E Wing Hallway | 8 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 8 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.2 | 1,480 | 0 | $234 | $517 | $80 | 1.9 |
| E Wing Hallway | 2 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 2 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room E1 | 36 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 36 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 1.1 | 4,756 | -1 | $751 | $2,125 | $465 | 2.2 |
| Office | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 360 | 0 | $57 | $380 | $65 | 5.5 |
| Piano Room | 9 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 9 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.3 | 1,081 | 0 | $171 | $599 | $125 | 2.8 |
| Storage Room1 | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 229 | 0 | $36 | $189 | $20 | 4.7 |
| Storage Room2 | 3 | Compact Fluorescent: Screw in | Wall Switch | S | 14 | 2,484 | 3 | Relamp | No | 3 | LED Lamps: LED Screw in | Wall Switch | 7 | 2,484 | 0.0 | 57 | 0 | $9 | $52 | $3 | 5.4 |
| Storage Room3 | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,484 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,714 | 0.2 | 809 | 0 | $128 | $408 | $80 | 2.6 |
| Room E2 | 36 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 36 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 1.1 | 4,756 | -1 | $751 | $2,125 | $465 | 2.2 |
| Office | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 1 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.1 | 212 | 0 | $33 | $189 | $20 | 5.1 |
| Storage Room1 | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 229 | 0 | $36 | $189 | $20 | 4.7 |
| Storage Room2 | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,714 | 0.1 | 404 | 0 | $64 | $262 | $40 | 3.5 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| West Cafeteria | 28 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 4,004 | 3, 4 | Relamp | Yes | 28 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 2,763 | 1.5 | 9,123 | -2 | $1,440 | $2,315 | $595 | 1.2 |
| West Cafeteria | 5 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 5 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| East Cafeteria | 28 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 4,004 | 3, 4 | Relamp | Yes | 28 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 2,763 | 1.5 | 9,123 | -2 | $1,440 | $2,585 | $630 | 1.4 |
| East Cafeteria | 5 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 5 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Closet | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 459 | 0 | $72 | $416 | $75 | 4.7 |
| Storage Closet | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 459 | 0 | $72 | $416 | $75 | 4.7 |
| Storage Closet | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 2,484 | 0.0 | 150 | 0 | $24 | $17 | $1 | 0.7 |
| Main Entrance | 3 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 3 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Main Entrance | 30 | Linear Fluorescent - T8: 2' T8 (17W) - 4L | Wall Switch | S | 63 | 4,004 | 3, 5 | Relamp | Yes | 30 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.9 | 5,680 | -1 | $897 | $1,770 | $300 | 1.6 |
| Display Light | 21 | Incandescent: Screw in | Wall Switch | S | 65 | 4,004 | 3 | Relamp | No | 21 | LED Lamps: LED Screw in | Wall Switch | 10 | 4,004 | 0.8 | 5,087 | -1 | $803 | $362 | $21 | 0.4 |
| Display Light | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 145 | 0 | $23 | $37 | $10 | 1.2 |
| Conference Room | 12 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 12 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.4 | 1,441 | 0 | $227 | $708 | $155 | 2.4 |
| Main Office Hallway | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 4,004 | 3, 5 | Relamp | Yes | 3 | LED - Linear Tubes: (4) 4' Lamps | High/Low Control | 58 | 2,763 | 0.2 | 978 | 0 | $154 | $444 | $60 | 2.5 |
| Principal Office | 4 | LED - Fixtures: Ambient 2x4 Fixture | Wall Switch | S | 50 | 4,004 | 4 | None | Yes | 4 | LED - Fixtures: Ambient 2x4 Fixture | Occupancy Sensor | 50 | 2,763 | 0.0 | 273 | 0 | $43 | $270 | $35 | 5.5 |
| Secretary Office | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 4,004 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 2,763 | 0.1 | 652 | 0 | $103 | $416 | $75 | 3.3 |
| Restroom | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 3,120 | 0.0 | 189 | 0 | $30 | $17 | $1 | 0.5 |
| Office | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.1 | 423 | 0 | $67 | $416 | $75 | 5.1 |
| Office | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.2 | 635 | 0 | $100 | $489 | $95 | 3.9 |
| Restroom | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 3,120 | 0.0 | 189 | 0 | $30 | $17 | $1 | 0.5 |
| Main Office | 6 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 4 | Relamp | Yes | 6 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,763 | 0.2 | 1,110 | 0 | $175 | $489 | $95 | 2.3 |
| Assistant Principal | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 4,004 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 2,763 | 0.1 | 652 | 0 | $103 | $416 | $75 | 3.3 |
| Copy Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 94 | 0 | $15 | $37 | $10 | 1.8 |
| Copy Room | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.2 | 635 | 0 | $100 | $489 | $95 | 3.9 |
| Library | 80 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 4 | Relamp | Yes | 80 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,763 | 2.4 | 14,795 | -3 | $2,335 | $4,541 | $1,010 | 1.5 |
| Library | 37 | Metal Halide: (1) 70W Lamp | Wall Switch | S | 95 | 4,004 | 1, 4 | Fixture Replacement | Yes | 37 | LED - Fixtures: Downlight Pendant | Occupancy Sensor | 21 | 2,763 | 2.1 | 13,120 | -3 | $2,071 | $6,155 | $255 | 2.8 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Library | 55 | Compact Fluorescent: 4PIN | Wall Switch | S | 26 | 4,004 | 3, 4 | Relamp | Yes | 55 | LED Lamps: LED Screw in | Occupancy Sensor | 18 | 2,763 | 0.5 | 3,256 | -1 | $514 | $1,757 | $160 | 3.1 |
| Library | 9 | Compact Fluorescent: 4PIN | Wall Switch | S | 104 | 4,004 | 3, 4 | Relamp | Yes | 9 | LED Lamps: LED P24 GL Lamp 4PIN | Occupancy Sensor | 73 | 2,763 | 0.3 | 2,131 | 0 | $336 | $1,178 | $71 | 3.3 |
| Library | 5 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 5 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Library - Office | 7 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 2,600 | 3, 4 | Relamp | Yes | 7 | LED - Linear Tubes: (3) 4' Lamps | Occupancy Sensor | 44 | 1,794 | 0.3 | 1,261 | 0 | $199 | $653 | $140 | 2.6 |
| Men Restroom | 1 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 2,600 | 0.0 | 46 | 0 | $7 | $33 | $6 | 3.7 |
| Women Restroom | 1 | Linear Fluorescent - T8: 2' T8 (17W) - 2L | Wall Switch | S | 33 | 4,004 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 2' Lamps | Wall Switch | 17 | 4,004 | 0.0 | 70 | 0 | $11 | $33 | $6 | 2.4 |
| Main Guidance Office | 7 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 4 | Relamp | Yes | 7 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,763 | 0.2 | 1,295 | 0 | $204 | $526 | $105 | 2.1 |
| Office1 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 94 | 0 | $15 | $37 | $10 | 1.8 |
| Office2 | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 240 | 0 | $38 | $189 | $20 | 4.5 |
| Office3 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 94 | 0 | $15 | $37 | $10 | 1.8 |
| Office4 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 94 | 0 | $15 | $37 | $10 | 1.8 |
| Storage Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Conference Room | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 360 | 0 | $57 | $380 | $65 | 5.5 |
| Storage Room | 5 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 2,484 | 3, 4 | Relamp | Yes | 5 | LED - Linear Tubes: (3) 4' Lamps | Occupancy Sensor | 44 | 1,714 | 0.2 | 861 | 0 | $136 | $390 | $75 | 2.3 |
| Roof Access | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Mechanical Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 180 | 0 | $28 | $73 | $20 | 1.9 |
| Nurse Office | 9 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 9 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.5 | 1,904 | 0 | $301 | $927 | $215 | 2.4 |
| Office1 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 1 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.1 | 212 | 0 | $33 | $189 | $20 | 5.1 |
| Office2 | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.1 | 423 | 0 | $67 | $416 | $75 | 5.1 |
| Office3 | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.1 | 423 | 0 | $67 | $416 | $75 | 5.1 |
| Office4 | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.2 | 846 | 0 | $134 | $562 | $115 | 3.3 |
| Office5 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,600 | 3, 4 | Relamp | Yes | 1 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.1 | 212 | 0 | $33 | $189 | $20 | 5.1 |
| Office6 | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 240 | 0 | $38 | $189 | $20 | 4.5 |
| Restroom | 3 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3, 4 | Relamp | Yes | 3 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 2,153 | 0.1 | 598 | 0 | $94 | $322 | $38 | 3.0 |
| School Bank | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 480 | 0 | $76 | $416 | $75 | 4.5 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Faculty Room | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 480 | 0 | $76 | $416 | $75 | 4.5 |
| Restroom | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 3,120 | 0.0 | 189 | 0 | $30 | $17 | $1 | 0.5 |
| Auditorium | 90 | LED Lamps: Screw in | Wall Switch | S | 65 | 4,004 | | None | No | 90 | LED Lamps: Screw in | Wall Switch | 65 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Auditorium | 6 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 4,004 | | None | No | 6 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Auditorium | 6 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 6 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Auditorium Entrance | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 4,004 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 4,004 | 0.0 | 242 | 0 | $38 | $17 | $1 | 0.4 |
| Stage | 9 | LED Lamps: Corn Bulb | Wall Switch | S | 35 | 2,484 | | None | No | 9 | LED Lamps: Corn Bulb | Wall Switch | 35 | 2,484 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Stage | 2 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 2 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Storage Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,714 | 0.1 | 404 | 0 | $64 | $262 | $40 | 3.5 |
| Dressing Room1 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Dressing Room1 | 5 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 2,484 | 4 | None | Yes | 5 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,714 | 0.1 | 246 | 0 | $39 | $270 | $35 | 6.1 |
| Dressing Room2 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Dressing Room2 | 5 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 2,484 | 4 | None | Yes | 5 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,714 | 0.1 | 246 | 0 | $39 | $270 | $35 | 6.1 |
| Teacher Lunch | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 4,004 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 2,763 | 0.1 | 652 | 0 | $103 | $416 | $75 | 3.3 |
| Kitchen | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 4,004 | 3 | Relamp | No | 1 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | 58 | 4,004 | 0.0 | 247 | 0 | $39 | $73 | $20 | 1.4 |
| Kitchen | 20 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3 | Relamp | No | 20 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.5 | 2,907 | -1 | $459 | $730 | $200 | 1.2 |
| Kitchen | 8 | LED Lamps: Corn Bulb | Wall Switch | S | 13 | 4,004 | | None | No | 8 | LED Lamps: Corn Bulb | Wall Switch | 13 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Kitchen | 9 | Compact Fluorescent: Screw in | Wall Switch | S | 23 | 4,004 | 3 | Relamp | No | 9 | LED Lamps: LED Screw in | Wall Switch | 10 | 4,004 | 0.1 | 515 | 0 | $81 | $155 | $9 | 1.8 |
| Diswasher Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3 | Relamp | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 291 | 0 | $46 | $73 | $20 | 1.2 |
| Storage Room | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,714 | 0.1 | 318 | 0 | $50 | $150 | $2 | 3.0 |
| Storage Room | 2 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 2,484 | 4 | None | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,714 | 0.0 | 98 | 0 | $16 | $116 | $0 | 7.5 |
| Custodial | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 2,484 | 0.0 | 150 | 0 | $24 | $17 | $1 | 0.7 |
| Kitchen Locker Room | 2 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 2,600 | 4 | None | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,794 | 0.0 | 103 | 0 | $16 | $116 | $0 | 7.1 |
| Restroom | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 3,120 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 3,120 | 0.0 | 189 | 0 | $30 | $17 | $1 | 0.5 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Kitchen Office | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 480 | 0 | $76 | $416 | $75 | 4.5 |
| Kitchen | 24 | Incandescent: Screw in | Wall Switch | S | 250 | 4,004 | 3 | Relamp | No | 24 | LED Lamps: LED Screw in | Wall Switch | 38 | 4,004 | 3.7 | 22,462 | -5 | $3,545 | $413 | $24 | 0.1 |
| Storage Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 229 | 0 | $36 | $189 | $20 | 4.7 |
| F Wing Hallway | 16 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 16 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.5 | 2,959 | -1 | $467 | $1,034 | $160 | 1.9 |
| F Wing Hallway | 2 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 2 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room F1 | 21 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 21 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.6 | 2,774 | -1 | $438 | $1,307 | $280 | 2.3 |
| Room F3 | 27 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 27 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.8 | 3,567 | -1 | $563 | $1,526 | $340 | 2.1 |
| Room F5 | 33 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 33 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 1.0 | 4,359 | -1 | $688 | $2,015 | $435 | 2.3 |
| Office | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,600 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,794 | 0.1 | 240 | 0 | $38 | $189 | $20 | 4.5 |
| Storage Room | 2 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,714 | 0.1 | 229 | 0 | $36 | $189 | $20 | 4.7 |
| Girls Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 3,120 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 3,120 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Custodial | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Boys Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 3,120 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 3,120 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| A Wing Hallway - 2nd Floor | 17 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 17 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.5 | 3,144 | -1 | $496 | $1,071 | $170 | 1.8 |
| A Wing Hallway - 2nd Floor | 2 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 2 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room A25 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A21 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Storage Room | 4 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3, 4 | Relamp | Yes | 4 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,714 | 0.2 | 635 | 0 | $100 | $185 | $4 | 1.8 |
| Room A22 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A23 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A24 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A26 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A27 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A28 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A29 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Room A30 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A31 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room A32 | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.1 | 396 | 0 | $63 | $650 | $100 | 8.8 |
| Room A33 | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,860 | 0.0 | 104 | 0 | $16 | $37 | $10 | 1.6 |
| Room A33 | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,860 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,973 | 0.2 | 698 | 0 | $110 | $489 | $95 | 3.6 |
| Women Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Men Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 2,600 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Restroom | 2 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 3,120 | 4 | None | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 2,153 | 0.0 | 123 | 0 | $19 | $270 | $0 | 13.9 |
| Hallway Display | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 145 | 0 | $23 | $37 | $10 | 1.2 |
| B Wing Hallway - 2nd Floor | 24 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 24 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.7 | 4,439 | -1 | $701 | $1,551 | $240 | 1.9 |
| B Wing Hallway - 2nd Floor | 3 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 3 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4L | Wall Switch | S | 114 | 2,484 | 3, 4 | Relamp | Yes | 1 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 1,714 | 0.1 | 202 | 0 | $32 | $189 | $20 | 5.3 |
| Storage Room | 1 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3 | Relamp | No | 1 | LED Lamps: LED Screw in | Wall Switch | 10 | 2,484 | 0.0 | 150 | 0 | $24 | $17 | $1 | 0.7 |
| Room B21 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B22 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B23 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B24 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B25 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B26 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B27 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B28 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B29 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B30 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B32 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Teacher Lunch | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 2,763 | 0.1 | 555 | 0 | $88 | $380 | $65 | 3.6 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Teacher Lunch | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 4,004 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 2,763 | 0.1 | 512 | 0 | $81 | $150 | $2 | 1.8 |
| Restroom | 2 | LED - Linear Tubes: (4) 4' Lamps | Wall Switch | S | 58 | 3,120 | 4 | None | Yes | 2 | LED - Linear Tubes: (4) 4' Lamps | Occupancy Sensor | 58 | 2,153 | 0.0 | 123 | 0 | $19 | $270 | $0 | 13.9 |
| Room B33 | 4 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.1 | 528 | 0 | $83 | $416 | $75 | 4.1 |
| Room B34 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room B35 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Elevator Room | 3 | Linear Fluorescent - T8: 4' T8 (32W) - 3L | Wall Switch | S | 93 | 2,484 | 3, 4 | Relamp | Yes | 3 | LED - Linear Tubes: (3) 4' Lamps | Occupancy Sensor | 44 | 1,714 | 0.1 | 516 | 0 | $81 | $434 | $80 | 4.3 |
| Elevator Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Hallway Display | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 145 | 0 | $23 | $37 | $10 | 1.2 |
| C Wing Hallway - 2nd Floor | 17 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3, 5 | Relamp | Yes | 17 | LED - Linear Tubes: (2) 4' Lamps | High/Low Control | 29 | 2,763 | 0.5 | 3,144 | -1 | $496 | $1,071 | $170 | 1.8 |
| C Wing Hallway - 2nd Floor | 2 | Exit Signs: LED - 2 W Lamp | None | | 6 | 8,760 | | None | No | 2 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Storage Room | 2 | Incandescent: Screw in | Wall Switch | S | 65 | 2,484 | 3, 4 | Relamp | Yes | 2 | LED Lamps: LED Screw in | Occupancy Sensor | 10 | 1,714 | 0.1 | 318 | 0 | $50 | $150 | $2 | 3.0 |
| Room C21 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C22 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C23 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C24 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C25 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C26 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C27 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C28 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C29 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C30 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C31 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C32 | 15 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,860 | 3, 4 | Relamp | Yes | 15 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.5 | 1,982 | 0 | $313 | $1,088 | $220 | 2.8 |
| Room C34 | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 2,860 | 4 | None | Yes | 4 | LED - Linear Tubes: (2) 4' Lamps | Occupancy Sensor | 29 | 1,973 | 0.0 | 113 | 0 | $18 | $540 | $0 | 30.2 |
| Hallway Display | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 4,004 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 145 | 0 | $23 | $37 | $10 | 1.2 |

| | Existing Conditions | | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Fixture Quantity | Fixture Description | Control System | Light Level | Watts per Fixture | Annual Operating Hours | ECM # | Fixture Recommendation | Add Controls? | Fixture Quantity | Fixture Description | Control System | Watts per Fixture | Annual Operating Hours | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Storage Room | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | S | 62 | 2,484 | 3 | Relamp | No | 1 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,484 | 0.0 | 90 | 0 | $14 | $37 | $10 | 1.9 |
| Men Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 2,600 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 2,600 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Women Restroom | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 2 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| C Wing Stairwell - South | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| C Wing Stairwell - North | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| A Wing Stairwell - South | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| A Wing Stairwell - North | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| B Wing Stairwell - East | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| A Wing Stairwell - West | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | S | 29 | 4,004 | | None | No | 4 | LED - Linear Tubes: (2) 4' Lamps | Wall Switch | 29 | 4,004 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Exterior Wall Pack | 10 | High-Pressure Sodium: (1) 150W Lamp | Photocell | | 188 | 4,380 | 1 | Fixture Replacement | No | 10 | LED - Fixtures: Outdoor Wall-Mounted Area Fixture | Photocell | 45 | 4,380 | 0.7 | 6,263 | 0 | $1,001 | $9,660 | $1,000 | 8.6 |
| Exterior Wall Pack | 3 | LED - Fixtures: Outdoor Wall-Mounted Area Fixture | Photocell | | 65 | 4,380 | | None | No | 3 | LED - Fixtures: Outdoor Wall-Mounted Area Fixture | Photocell | 65 | 4,380 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Exterior Wall Pack | 25 | Metal Halide: (1) 250W Lamp | Photocell | | 295 | 4,380 | 1 | Fixture Replacement | No | 25 | LED - Fixtures: Outdoor Wall-Mounted Area Fixture | Photocell | 75 | 4,380 | 2.8 | 24,090 | 0 | $3,851 | $24,149 | $2,500 | 5.6 |
| Pole Lighting | 38 | Metal Halide: (1) 400W Lamp | Photocell | | 458 | 4,380 | 1 | Fixture Replacement | No | 38 | LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture | Photocell | 120 | 4,380 | 6.4 | 56,257 | 0 | $8,994 | $35,361 | $3,800 | 3.5 |
| Pole Lighting | 2 | LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture | Photocell | | 75 | 4,380 | | None | No | 2 | LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture | Photocell | 75 | 4,380 | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Motor Inventory & Recommendations

| | | Existing Conditions | | | | | | | Proposed Conditions | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | Motor Quantity | Motor Application | HP Per Motor | Full Load Efficiency | VFD Control? | Remaining Useful Life | Annual Operating Hours | ECM # | Install High Efficiency Motors? | Full Load Efficiency | Install VFDs? | Number of VFDs | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Boiler Room | Hot Water Recirculation Pumps | 5 | Heating Hot Water Pump | 1.5 | 86.5% | Yes | N | 2,745 | | No | 86.5% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Boiler Room | Hot Water Recirculation Pumps | 2 | Heating Hot Water Pump | 10.0 | 91.7% | Yes | N | 2,745 | | No | 91.7% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Boiler Room | Hot Water Recirculation Pumps | 4 | Heating Hot Water Pump | 5.0 | 84.5% | No | B | 2,745 | 9 | No | 89.5% | Yes | 4 | 2.4 | 20,003 | 0 | $3,198 | $16,305 | $0 | 5.1 |
| Boiler Room | Hot Water Recirculation Pumps | 2 | Heating Hot Water Pump | 7.5 | 84.0% | No | B | 2,745 | 9 | No | 91.0% | Yes | 2 | 2.0 | 15,611 | 0 | $2,496 | $9,476 | $0 | 3.8 |
| Boiler Room | Compressed Air System | 1 | Air Compressor | 5.0 | 89.5% | No | W | 2,745 | | No | 89.5% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Boiler Room | Hot Water Recirculation Pumps | 1 | Heating Hot Water Pump | 10.0 | 86.5% | No | B | 2,745 | 9 | No | 91.7% | Yes | 1 | 1.2 | 9,784 | 0 | $1,564 | $5,152 | $0 | 3.3 |
| Boiler Room | Hot Water Recirculation Pumps | 1 | Heating Hot Water Pump | 7.5 | 89.5% | No | B | 2,745 | 8 | No | 91.0% | Yes | 1 | 0.8 | 6,626 | 0 | $1,059 | $4,738 | $0 | 4.5 |
| Boiler Room | Chilled Water Recirculation Pumps | 2 | Chilled Water Pump | 10.0 | 91.7% | Yes | W | 2,745 | | No | 91.7% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Boiler Room | Domestic Hot Water Recirculation | 1 | Heating Hot Water Pump | 3.0 | 89.5% | No | W | 2,745 | | No | 89.5% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Boiler Room | Domestic Hot Water Recirculation | 1 | Heating Hot Water Pump | 3.0 | 75.5% | No | B | 2,745 | 6 | Yes | 89.5% | No | | 0.3 | 955 | 0 | $153 | $876 | $0 | 5.7 |
| Boiler Room | Domestic Hot Water Recirculation | 1 | Heating Hot Water Pump | 0.3 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Boiler Room | Boiler Room | 1 | Exhaust Fan | 0.8 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Gymnsium | Hot Water Recirculation Pumps | 4 | Heating Hot Water Pump | 1.0 | 82.0% | No | W | 2,745 | 9 | No | 85.5% | Yes | 4 | 0.5 | 4,022 | 0 | $643 | $13,131 | $0 | 20.4 |
| Gymnsium | AHUs | 4 | Supply Fan | 3.0 | 86.5% | No | W | 2,745 | 7 | No | 89.5% | Yes | 4 | 3.6 | 11,296 | 0 | $1,806 | $15,250 | $960 | 7.9 |
| Mechanical Room | AHU - Library | 1 | Heating Hot Water Pump | 0.3 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Mechanical Room | AHU | 1 | Supply Fan | 1.5 | 82.0% | No | W | 2,745 | 7 | No | 86.5% | Yes | 1 | 0.5 | 1,536 | 0 | $246 | $3,380 | $120 | 13.3 |
| Elevator Room | Hydraulic Elevator | 1 | Process Pump | 15.0 | 70.0% | No | W | 2,745 | | No | 70.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Cafeterias | 2 | Exhaust Fan | 0.5 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Science Classroom | 2 | Exhaust Fan | 0.5 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Various location | 20 | Exhaust Fan | 0.3 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

| | | Existing Conditions | | | | | | | Proposed Conditions | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | Motor Quantity | Motor Application | HP Per Motor | Full Load Efficiency | VFD Control? | Remaining Useful Life | Annual Operating Hours | ECM # | Install High Efficiency Motors? | Full Load Efficiency | Install VFDs? | Number of VFDs | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Roof | School | 1 | Exhaust Fan | 0.2 | 60.0% | No | W | 2,745 | | No | 60.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | School | 1 | Exhaust Fan | 0.3 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Various location | 7 | Exhaust Fan | 0.3 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | School | 1 | Exhaust Fan | 0.3 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Various location | 3 | Exhaust Fan | 0.5 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Various location | 4 | Exhaust Fan | 0.8 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | School | 1 | Exhaust Fan | 0.3 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | School | 1 | Exhaust Fan | 0.3 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | School | 1 | Exhaust Fan | 0.1 | 60.0% | No | W | 2,745 | | No | 60.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| School | Classrooms | 96 | Supply Fan | 0.2 | 60.0% | No | W | 2,745 | | No | 60.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | RTU1, RTU2 | 2 | Supply Fan | 7.5 | 89.5% | No | W | 3,391 | | No | 89.5% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | RTU1, RTU3 | 2 | Return Fan | 5.0 | 86.5% | No | W | 2,745 | | No | 86.5% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Auditorium Stage RTU3 | 1 | Supply Fan | 5.0 | 86.5% | No | W | 2,745 | | No | 86.5% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Cafeteria East RTU | 1 | Supply Fan | 7.5 | 89.5% | No | W | 3,391 | | No | 89.5% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Cafeteria West RTU | 1 | Supply Fan | 7.5 | 89.5% | No | W | 3,391 | | No | 89.5% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Cafeteria East RTU | 1 | Exhaust Fan | 0.8 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Cafeteria West RTU | 1 | Exhaust Fan | 0.8 | 65.0% | No | W | 2,745 | | No | 65.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Science Classroom RTU | 1 | Supply Fan | 1.0 | 82.0% | No | W | 2,745 | | No | 82.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Ground Floor | Woodshop | 1 | Other | 5.0 | 84.0% | No | W | 2,745 | | No | 84.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Woodshop | Woodshop | 6 | Other | 1.0 | 82.0% | No | W | 2,745 | | No | 82.0% | No | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Electric HVAC Inventory & Recommendations

| | | Existing Conditions | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | System Quantity | System Type | Cooling Capacity per Unit (Tons) | Heating Capacity per Unit (MBh) | Remaining Useful Life | ECM # | Install High Efficiency System? | System Quantity | System Type | Cooling Capacity per Unit (Tons) | Heating Capacity per Unit (MBh) | Cooling Mode Efficiency (SEER/EER) | Heating Mode Efficiency (COP) | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Athletic Office | Athletic Office | 1 | Window AC | 1.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Athletic Office | Athletic Office | 1 | Window AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room H4 | Room H4 | 1 | Window AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room H4A | Room H4A | 1 | Window AC | 1.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room H2 | Room H2 | 2 | Window AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room H2A | Room H2A | 1 | Window AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Principal Ofice | Principal Ofice | 1 | Window AC | 1.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Secretaire Office | Secretaire Office | 1 | Window AC | 0.67 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Main Office | Main Office | 2 | Window AC | 1.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Copy Room | Copy Room | 1 | Window AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Guidance Office | Guidance Office | 2 | Window AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Faculty Lunch | Faculty Lunch | 1 | Window AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Teacher Lunch | Teacher Lunch | 1 | Window AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room A33 | Room A33 | 1 | Window AC | 1.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Room C34 | Room C34 | 1 | Window AC | 1.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Library | 1 | Packaged AC | 40.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Nurse Office | 1 | Split-System AC | 1.50 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Library Equipment Room | 1 | Split-System AC | 4.00 | | B | 10 | Yes | 1 | Split-System AC | 4.00 | | 14.00 | | 1.1 | 1,664 | 0 | $266 | $5,985 | $368 | 21.1 |
| Roof | RTU1 - Auditorium | 1 | Packaged AC | 25.00 | | B | 10 | Yes | 1 | Packaged AC | 25.00 | | 12.00 | | 3.3 | 4,934 | 0 | $789 | $42,185 | $1,975 | 51.0 |
| Roof | RTU2 - Auditorium | 1 | Packaged AC | 25.00 | | B | 10 | Yes | 1 | Packaged AC | 25.00 | | 12.00 | | 3.3 | 4,934 | 0 | $789 | $42,185 | $1,975 | 51.0 |

| | | Existing Conditions | | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | System Quantity | System Type | Cooling Capacity per Unit (Tons) | Heating Capacity per Unit (kBtu/hr) | Remaining Useful Life | ECM # | Install High Efficiency System? | System Quantity | System Type | Cooling Capacity per Unit (Tons) | Heating Capacity per Unit (kBtu/hr) | Cooling Mode Efficiency (SEER/EER) | Heating Mode Efficiency (COP) | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Roof | Auditorium Stage RTU3 | 1 | Packaged AC | 15.00 | | B | 10 | Yes | 1 | Packaged AC | 15.00 | | 12.00 | | 2.0 | 2,961 | 0 | $473 | $20,908 | $1,185 | 41.7 |
| Roof | Cafeteria East | 1 | Packaged AC | 15.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Cafeteria West | 1 | Packaged AC | 15.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Kitchen Office | 1 | Split-System AC | 0.75 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Various Spaces | 13 | Split-System Air-Source HP | 1.50 | 20.00 | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Science Classroom | 1 | Packaged AC | 7.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | School | 1 | Split-System AC | 1.00 | | B | 10 | Yes | 1 | Split-System AC | 1.00 | | 14.00 | | 0.2 | 231 | 0 | $37 | $1,496 | $92 | 38.0 |
| Roof | Room J7 - AC1 | 1 | Split-System AC | 5.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Room J10 | 1 | Packaged AC | 4.00 | | B | 10 | Yes | 1 | Packaged AC | 4.00 | | 14.00 | | 0.8 | 1,218 | 0 | $195 | $9,076 | $368 | 44.7 |
| Roof | Room J12 | 1 | Packaged AC | 6.00 | | B | 10 | Yes | 1 | Packaged AC | 6.00 | | 12.00 | | 0.8 | 1,184 | 0 | $189 | $10,693 | $438 | 54.2 |
| Roof | Room J14 | 1 | Packaged AC | 6.00 | | B | 10 | Yes | 1 | Packaged AC | 6.00 | | 12.00 | | 0.8 | 1,184 | 0 | $189 | $10,693 | $438 | 54.2 |
| Ground Floor | School | 1 | Split-System AC | 1.00 | | B | 10 | Yes | 1 | Split-System AC | 1.00 | | 14.00 | | 0.2 | 305 | 0 | $49 | $1,496 | $92 | 28.8 |
| Ground Floor | School | 2 | Split-System AC | 2.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Ground Floor | School | 1 | Split-System AC | 1.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Ground Floor | School | 2 | Split-System AC | 4.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Ground Floor | School | 2 | Split-System AC | 3.00 | | W | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Electric Chiller Inventory & Recommendations

| | | Existing Conditions | | | | Proposed Conditions | | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | Chiller Quantity | System Type | Cooling Capacity per Unit (Tons) | Remaining Useful Life | ECM # | Install High Efficiency Chillers? | Chiller Quantity | System Type | Constant/ Variable Speed | Cooling Capacity (Tons) | Full Load Efficiency (kW/Ton) | IPLV Efficiency (kW/Ton) | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Roof | School Cooling System | 1 | Air-Cooled Screw Chiller | 400.00 | N | | No | | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Fuel Heating Inventory & Recommendations

| | | Existing Conditions | | | | Proposed Conditions | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | System Quantity | System Type | Output Capacity per Unit (MBh) | Remaining Useful Life | ECM # | Install High Efficiency System? | System Quantity | System Type | Output Capacity per Unit (MBh) | Heating Efficiency | Heating Efficiency Units | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Boiler Room | School Heating System | 5 | Condensing Hot Water Boiler | 2,814.00 | N | | No | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Library | 1 | Furnace | 320.00 | W | | No | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Roof | Science Classroom | 1 | Furnace | 72.90 | W | | No | | | | | | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Demand Control Ventilation Recommendations

| | | Recommendation Inputs | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Affected | ECM # | Number of Zones | Cooling Capacity of Controlled System (Tons) | Electric Heating Capacity of Controlled System (kBtu/hr) | Output Heating Capacity of Controlled System (MBh) | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Gymnasium | Heating/Ventilation Units - Gymnasium | 11 | 4.00 | 0.00 | 0.00 | 2,110.50 | 0.0 | 0 | 101 | $992 | $5,438 | $0 | 5.5 |
| Roof | Library | 11 | 3.00 | 40.00 | 0.00 | 320.00 | 0.0 | 1,554 | 18 | $425 | $4,078 | $0 | 9.6 |
| Roof | RTU1 - Auditorium | 11 | 2.00 | 25.00 | 0.00 | 0.00 | 0.0 | 1,251 | 0 | $200 | $2,719 | $0 | 13.6 |
| Roof | RTU2 - Auditorium | 11 | 2.00 | 25.00 | 0.00 | 0.00 | 0.0 | 1,251 | 0 | $200 | $2,719 | $0 | 13.6 |
| Roof | Cafeteria - East | 11 | 2.00 | 15.00 | 0.00 | 0.00 | 0.0 | 761 | 0 | $122 | $2,719 | $0 | 22.3 |
| Roof | Cafeteria - West | 11 | 2.00 | 15.00 | 0.00 | 0.00 | 0.0 | 761 | 0 | $122 | $2,719 | $0 | 22.3 |
| Roof | RTU3 - Auditorium Stage | 11 | 1.00 | 15.00 | 0.00 | 0.00 | 0.0 | 638 | 0 | $102 | $1,359 | $0 | 13.3 |

## DHW Inventory & Recommendations

| | | Existing Conditions | | | Proposed Conditions | | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | System Quantity | System Type | Remaining Useful Life | ECM # | Replace? | System Quantity | System Type | Fuel Type | System Efficiency | Efficiency Units | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Boiler Room | Domestic Hot Water System | 1 | Storage Tank Water Heater (> 50 Gal) | B | 12 | Yes | 1 | Storage Tank Water Heater (> 50 Gal) | Natural Gas | 89.00% | Et | 0.0 | 0 | 123 | $1,201 | $32,572 | $1,138 | 26.2 |

## Low-Flow Device Recommendations

| | Recommendation Inputs | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | ECM # | Device Quantity | Device Type | Existing Flow Rate (gpm) | Proposed Flow Rate (gpm) | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| School | 13 | 67 | Faucet Aerator (Lavatory) | 2.50 | 0.50 | 0.0 | 0 | 75 | $732 | $480 | $0 | 0.7 |

## Walk-In Cooler/Freezer Inventory & Recommendations

| | Existing Conditions | | Proposed Conditions | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Cooler/ Freezer Quantity | Case Type/Temperature | ECM # | Install EC Evaporator Fan Motors? | Install Electric Defrost Control? | Install Evaporator Fan Control? | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Kitchen | 1 | Low Temp Freezer (-35F to -5F) | | No | No | No | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Kitchen | 1 | Cooler (35F to 55F) | | No | No | No | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Commercial Refrigerator/Freezer Inventory & Recommendations

| | Existing Conditions | | | Proposed Conditions | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Quantity | Refrigerator/ Freezer Type | ENERGY STAR Qualified? | ECM # | Install ENERGY STAR Equipment? | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Kitchen | 1 | Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.) | Yes | | No | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Kitchen | 1 | Stand-Up Refrigerator, Glass Door (>50 cu. ft.) | Yes | | No | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Cafeteria | 1 | Refrigerator Chest | Yes | | No | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Commercial Ice Maker Inventory & Recommendations

| | Existing Conditions | | | Proposed Conditions | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Quantity | Ice Maker Type | ENERGY STAR Qualified? | ECM # | Install ENERGY STAR Equipment? | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Kitchen | 1 | Ice Making Head (<450 lbs/day), Batch | Yes | | No | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |
| Athletic Office | 1 | Ice Making Head (<450 lbs/day), Batch | Yes | | No | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Cooking Equipment Inventory & Recommendations

| | Existing Conditions | | | Proposed Conditions | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Quantity | Equipment Type | High Efficiency Equipement? | ECM # | Install High Efficiency Equipment? | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Kitchen | 3 | Insulated Food Holding Cabinet (Full Size) | Yes | | No | 0.0 | 0 | 0 | FALSE | $0 | $0 | #DIV/0! |
| Kitchen | 1 | Electric Steamer | Yes | | No | 0.0 | 0 | 0 | FALSE | $0 | $0 | #DIV/0! |
| Kitchen | 2 | Electric Steamer | Yes | | No | 0.0 | 0 | 0 | FALSE | $0 | $0 | #DIV/0! |
| Kitchen | 4 | Electric Convection Oven (Half Size) | Yes | | No | 0.0 | 0 | 0 | FALSE | $0 | $0 | #DIV/0! |

## Dishwasher Inventory & Recommendations

| | Existing Conditions | | | | | Proposed Conditions | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Quantity | Dishwasher Type | Water Heater Fuel Type | Booster Heater Fuel Type | ENERGY STAR Qualified? | ECM # | Install ENERGY STAR Equipment? | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Payback w/ Incentives in Years |
| Kitchen | 1 | Single Tank Conveyor (High Temp) | Electric | N/A | Yes | | No | 0.0 | 0 | 0 | $0 | $0 | $0 | 0.0 |

## Plug Load Inventory

| | Existing Conditions | | | |
|---|---|---|---|---|
| Location | Quantity | Equipment Description | Energy Rate (W) | ENERGY STAR Qualified? |
| School | 44 | Printer | 55.0 | Yes |
| School | 14 | Microwave | 1,000.0 | No |
| School | 271 | Computer | 120.0 | Yes |
| School | 14 | Small Refrigerator | 85.0 | Yes |
| School | 2 | Commercial Coffee Machine | 1,200.0 | No |
| School | 3 | Water Cooler | 92.0 | Yes |
| School | 3 | Refrigerator | 224.0 | Yes |
| School | 9 | Copy Machine | 600.0 | Yes |
| School | 9 | Wall TVs | 224.0 | Yes |
| School | 1 | Washer/Dryer | 5,670.0 | No |
| School | 1 | Kiln | 9,984.0 | No |
| School | 2 | kiln | 11,000.0 | No |
| School | 4 | Server | 850.0 | No |
| Kitchen | 1 | Electric Booster Pump | 36,000.0 | No |

## Vending Machine Inventory & Recommendations

| | Existing Conditions | | Proposed Conditions | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Quantity | Vending Machine Type | ECM # | Install Controls? | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Faculty Lunch | 1 | Refrigerated | 14 | Yes | 0.2 | 1,612 | 0 | $258 | $230 | $50 | 0.7 |
| Faculty Lunch | 1 | Non-Refrigerated | 14 | Yes | 0.0 | 343 | 0 | $55 | $230 | $0 | 4.2 |
| Cafeteria | 2 | Refrigerated | 14 | Yes | 0.4 | 3,224 | 0 | $515 | $460 | $100 | 0.7 |
| Teacher Lunch | 1 | Refrigerated | 14 | Yes | 0.2 | 1,612 | 0 | $258 | $230 | $50 | 0.7 |

# APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

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## ENERGY STAR® Statement of Energy Performance

**54**

ENERGY STAR® Score[1]

### Bridgeton High School

**Primary Property Type:** K-12 School
**Gross Floor Area (ft²):** 169,725
**Built:** 1950

**For Year Ending:** August 31, 2018
**Date Generated:** May 10, 2019

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

### Property & Contact Information

| Property Address | Property Owner | Primary Contact |
|---|---|---|
| Bridgeton High School<br>111 N. West Ave<br>Bridgeton, New Jersey 08302 | Bridgeton Board of Education<br>41 Blank Street<br>Bridgeton, NJ 8302<br>(____)____-_____ | Nicole Albanese<br>41 Blank Street<br>Bridgeton, NJ 8302<br>856-455-8030 x2040<br>nalbanese@bridgeton.k12.nj.us |

**Property ID:** 6751386

### Energy Consumption and Energy Use Intensity (EUI)

**Site EUI**
89.2 kBtu/ft²

**Source EUI**
163.9 kBtu/ft²

| Annual Energy by Fuel | |
|---|---|
| Natural Gas (kBtu) | 8,342,180 (55%) |
| Electric - Grid (kBtu) | 6,804,635 (45%) |

| National Median Comparison | |
|---|---|
| National Median Site EUI (kBtu/ft²) | 93.2 |
| National Median Source EUI (kBtu/ft²) | 171.2 |
| % Diff from National Median Source EUI | -4% |
| **Annual Emissions** | |
| Greenhouse Gas Emissions (Metric Tons CO2e/year) | 1,132 |

### Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

**Licensed Professional**

____ _____
,
(____)____-_____
_____

**Professional Engineer Stamp (if applicable)**

# APPENDIX C: GLOSSARY

| TERM | DEFINITION |
|---|---|
| **Blended Rate** | Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour. |
| **Btu** | *British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit. |
| **CHP** | *Combined heat and power*. Also referred to as cogeneration. |
| **COP** | *Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input. |
| **Demand Response** | Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives. |
| **DCV** | *Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need. |
| **US DOE** | *United States Department of Energy* |
| **EC Motor** | *Electronically commutated motor* |
| **ECM** | *Energy conservation measure* |
| **EER** | *Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input. |
| **EUI** | *Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance. |
| **Energy Efficiency** | Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service. |
| **ENERGY STAR®** | ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA. |
| **EPA** | *United States Environmental Protection Agency* |
| **Generation** | The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil). |
| **GHG** | *Greenhouse gas:* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface. |
| **gpf** | *Gallons per flush* |

| | |
|---|---|
| **gpm** | *Gallon per minute* |
| **HID** | *High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor. |
| **hp** | *Horsepower* |
| **HPS** | *High-pressure sodium*: a type of HID lamp. |
| **HSPF** | *Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input. |
| **HVAC** | *Heating, ventilating, and air conditioning* |
| **IHP 2014** | US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency. |
| **IPLV** | *Integrated part load value:* a measure of the part load efficiency usually applied to chillers. |
| **kBtu** | One thousand British thermal units |
| **kW** | *Kilowatt*: equal to 1,000 Watts. |
| **kWh** | *Kilowatt-hour*: 1,000 Watts of power expended over one hour. |
| **LED** | *Light emitting diode*: a high-efficiency source of light with a long lamp life. |
| **LGEA** | *Local Government Energy Audit* |
| **Load** | The total power a building or system is using at any given time. |
| **Measure** | A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption. |
| **MH** | *Metal halide*: a type of HID lamp. |
| **MBh** | *Thousand Btu per hour* |
| **MBtu** | *One thousand British thermal units* |
| **MMBtu** | *One million British thermal units* |
| **MV** | *Mercury Vapor:* a type of HID lamp. |
| **NJBPU** | *New Jersey Board of Public Utilities* |
| **NJCEP** | *New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment. |
| **psig** | Pounds per square inch gauge |
| **Plug Load** | Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug. |
| **PV** | *Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current). |

| | |
|---|---|
| **SEER** | *Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input. |
| **SEP** | *Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®. |
| **Simple Payback** | The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings. |
| **SREC** | *Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array. |
| **T5, T8, T12** | A reference to a linear lamp diameter. The number represents increments of 1/8$^{th}$ of an inch. |
| **Temperature Setpoint** | The temperature at which a temperature regulating device (thermostat, for example) has been set. |
| **therm** | 100,000 Btu. Typically used as a measure of natural gas consumption. |
| **tons** | A unit of cooling capacity equal to 12,000 Btu/hr. |
| **Turnkey** | Provision of a complete product or service that is ready for immediate use |
| **VAV** | *Variable air volume* |
| **VFD** | *Variable frequency drive*: a controller used to vary the speed of an electric motor. |
| **WaterSense™** | The symbol for water efficiency. The WaterSense™ program is managed by the EPA. |
| **Watt (W)** | Unit of power commonly used to measure electricity use. |