



# Local Government Energy Audit Report

Watchung Hills Regional High School

September 9, 2019

*Prepared for:*

Watchung Hills Regional High School BOE  
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Warren, New Jersey 07059

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## Disclaimer

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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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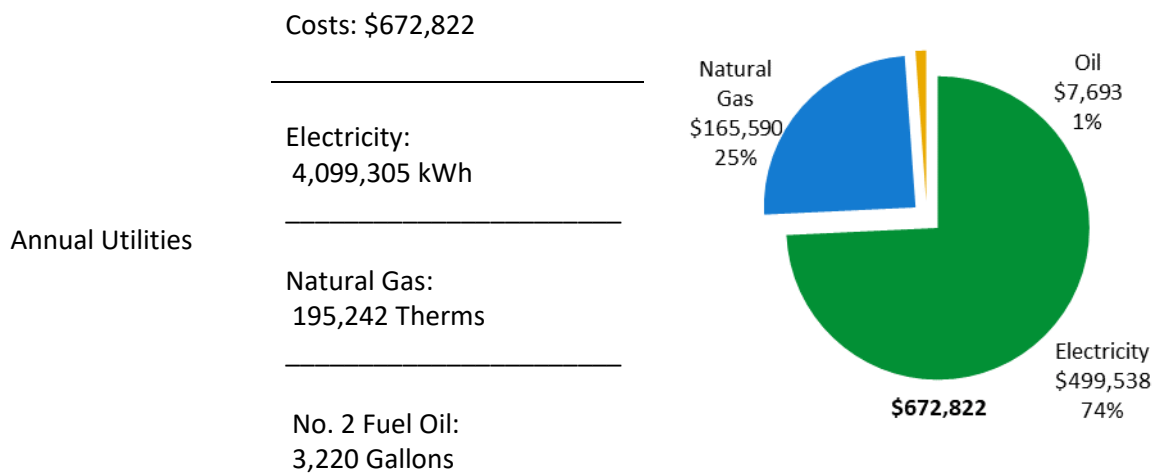
**Appendix B: ENERGY STAR® Statement of Energy Performance..... B-1**

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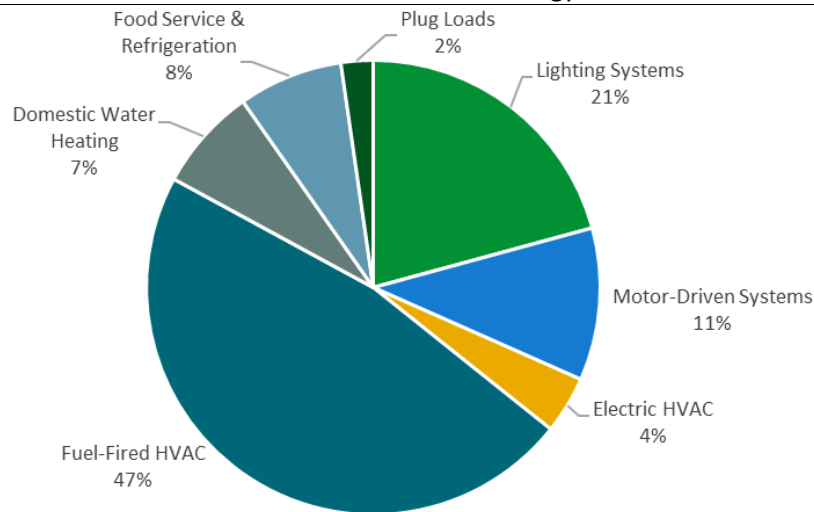
# 1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBP) has sponsored this Local Government Energy Audit (LGEA) report for Watchung Hills Regional High School. This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in your facility. 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



ENERGY STAR® Benchmarking Score	31 <i>(1-100 scale)</i>	This building performs below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.
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*Figure 1 - Energy Use by System*

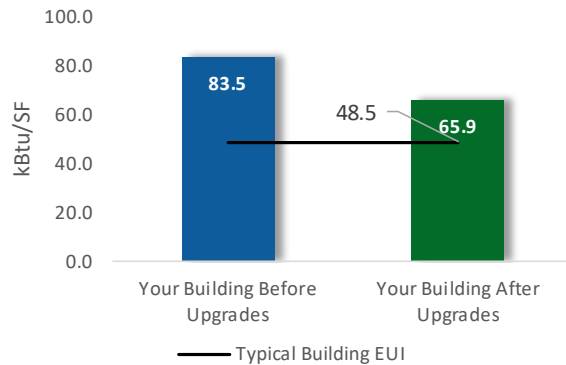
## POTENTIAL IMPROVEMENTS



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.

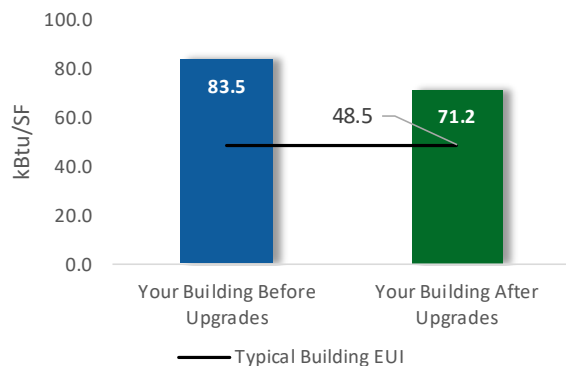
### Scenario 1: Full Package (all evaluated measures)

Installation Cost	\$2,395,476
Potential Rebates & Incentives <sup>1</sup>	\$163,428
Annual Cost Savings	\$208,796
Annual Energy Savings	Electricity: 1,594,959 kWh Natural Gas: 16,619 Therms No. 2 Fuel Oil: 289 Gallons
Greenhouse Gas Emission Savings	904 Tons
Simple Payback	10.7 Years
Site Energy Savings (all utilities)	21%



### Scenario 2: Cost Effective Package<sup>2</sup>

Installation Cost	\$756,920
Potential Rebates & Incentives	\$93,406
Annual Cost Savings	\$177,185
Annual Energy Savings	Electricity: 1,451,546 kWh Natural Gas: 354 Therms
Greenhouse Gas Emission Savings	733 Tons
Simple Payback	3.7 Years
Site Energy Savings (all utilities)	15%



### On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	High

<sup>1</sup> Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

<sup>2</sup> 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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>1,083,103</b>	<b>202.1</b>	<b>-131</b>	<b>\$130,877</b>	<b>\$1,963,153</b>	<b>\$388,455</b>	<b>\$60,451</b>	<b>\$328,004</b>	<b>2.5</b>	<b>1,075,362</b>
ECM 1	Install LED Fixtures	446,927	63.4	0	\$54,462	\$816,934	\$168,636	\$5,785	\$162,851	3.0	450,052
ECM 2	Retrofit Fixtures with LED Lamps	636,175	138.7	-131	\$76,415	\$1,146,219	\$219,819	\$54,666	\$165,153	2.2	625,310
<b>Lighting Control Measures</b>		<b>87,451</b>	<b>17.4</b>	<b>-18</b>	<b>\$10,502</b>	<b>\$84,013</b>	<b>\$77,722</b>	<b>\$7,735</b>	<b>\$69,987</b>	<b>6.7</b>	<b>85,922</b>
ECM 3	Install Occupancy Sensor Lighting Controls	63,575	12.6	-13	\$7,634	\$61,075	\$60,442	\$7,735	\$52,707	6.9	62,463
ECM 4	Install High/Low Lighting Controls	23,877	4.7	-5	\$2,867	\$22,938	\$17,280	\$0	\$17,280	6.0	23,459
<b>Motor Upgrades</b>		<b>12,863</b>	<b>3.9</b>	<b>0</b>	<b>\$1,567</b>	<b>\$23,512</b>	<b>\$23,054</b>	<b>\$0</b>	<b>\$23,054</b>	<b>14.7</b>	<b>12,953</b>
ECM 5	Premium Efficiency Motors	12,863	3.9	0	\$1,567	\$23,512	\$23,054	\$0	\$23,054	14.7	12,953
<b>Variable Frequency Drive (VFD) Measures</b>		<b>280,567</b>	<b>93.3</b>	<b>78</b>	<b>\$34,853</b>	<b>\$522,794</b>	<b>\$296,578</b>	<b>\$25,120</b>	<b>\$271,458</b>	<b>7.8</b>	<b>291,685</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	237,441	83.6	0	\$28,934	\$434,016	\$262,409	\$21,820	\$240,589	8.3	239,101
ECM 7	Install VFDs on Chilled Water Pumps	37,161	9.3	0	\$4,528	\$67,927	\$21,690	\$3,000	\$18,690	4.1	37,421
ECM 8	Install VFDs on Heating Water Pumps	2,798	0.4	0	\$341	\$5,115	\$6,781	\$0	\$6,781	19.9	2,818
ECM 9	Install VFDs on Kitchen Hood Fan Motors	3,166	0.1	78	\$1,049	\$15,736	\$5,697	\$300	\$5,397	5.1	12,345
<b>Electric Unitary HVAC Measures</b>		<b>58,915</b>	<b>63.0</b>	<b>0</b>	<b>\$7,179</b>	<b>\$107,690</b>	<b>\$730,264</b>	<b>\$22,068</b>	<b>\$708,196</b>	<b>98.6</b>	<b>59,327</b>
ECM 10	Install High Efficiency Air Conditioning Units	58,508	62.8	0	\$7,130	\$106,947	\$725,191	\$21,792	\$703,399	98.7	58,917
ECM 11	Install High Efficiency Heat Pumps	407	0.2	0	\$50	\$743	\$5,073	\$276	\$4,797	96.8	409
<b>Electric Chiller Replacement</b>		<b>62,968</b>	<b>90.5</b>	<b>0</b>	<b>\$7,673</b>	<b>\$153,465</b>	<b>\$279,032</b>	<b>\$26,496</b>	<b>\$252,536</b>	<b>32.9</b>	<b>63,409</b>
ECM 12	Install High Efficiency Chillers	62,968	90.5	0	\$7,673	\$153,465	\$279,032	\$26,496	\$252,536	32.9	63,409
<b>Gas Heating (HVAC/Process) Replacement</b>		<b>0</b>	<b>0.0</b>	<b>1,458</b>	<b>\$12,361</b>	<b>\$247,230</b>	<b>\$558,641</b>	<b>\$21,458</b>	<b>\$537,183</b>	<b>43.5</b>	<b>172,521</b>
ECM 13	Install High Efficiency Hot Water Boilers	0	0.0	491	\$4,165	\$83,304	\$174,707	\$13,058	\$161,649	38.8	57,502
ECM 14	Install High Efficiency Steam Boilers	0	0.0	322	\$2,731	\$54,620	\$215,083	\$0	\$215,083	78.8	37,702
ECM 15	Install High Efficiency Furnaces	0	0.0	644	\$5,465	\$109,306	\$168,852	\$8,400	\$160,452	29.4	77,316
<b>HVAC System Improvements</b>		<b>5,869</b>	<b>0.0</b>	<b>227</b>	<b>\$2,641</b>	<b>\$39,006</b>	<b>\$41,046</b>	<b>\$0</b>	<b>\$41,046</b>	<b>15.5</b>	<b>32,499</b>
ECM 16	Implement Demand Control Ventilation (DCV)	5,869	0.0	209	\$2,488	\$37,323	\$40,783	\$0	\$40,783	16.4	30,387
ECM 17	Install Pipe Insulation	0	0.0	18	\$153	\$1,683	\$264	\$0	\$264	1.7	2,112
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>88</b>	<b>\$748</b>	<b>\$7,485</b>	<b>\$222</b>	<b>\$0</b>	<b>\$222</b>	<b>0.3</b>	<b>10,333</b>
ECM 18	Install Low-Flow DHW Devices	0	0.0	88	\$748	\$7,485	\$222	\$0	\$222	0.3	10,333
<b>Food Service &amp; Refrigeration Measures</b>		<b>3,224</b>	<b>0.4</b>	<b>0</b>	<b>\$393</b>	<b>\$1,964</b>	<b>\$460</b>	<b>\$100</b>	<b>\$360</b>	<b>0.9</b>	<b>3,246</b>
ECM 19	Vending Machine Control	3,224	0.4	0	\$393	\$1,964	\$460	\$100	\$360	0.9	3,246
<b>TOTALS (COST EFFECTIVE MEASURES)</b>		<b>1,451,546</b>	<b>312.8</b>	<b>35</b>	<b>\$177,185</b>	<b>\$2,575,977</b>	<b>\$756,920</b>	<b>\$93,406</b>	<b>\$663,514</b>	<b>3.7</b>	<b>1,465,842</b>
<b>TOTALS (ALL MEASURES)</b>		<b>1,594,959</b>	<b>470.6</b>	<b>1,702</b>	<b>\$208,796</b>	<b>\$3,150,312</b>	<b>\$2,395,476</b>	<b>\$163,428</b>	<b>\$2,232,047</b>	<b>10.7</b>	<b>1,807,256</b>

\* - 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 Fixtures with LED Lamps	X		X
ECM 3	Install Occupancy Sensor Lighting Controls	X		X
ECM 4	Install High/Low Lighting Controls			X
ECM 5	Premium Efficiency Motors			X
ECM 6	Install VFDs on Constant Volume (CV) HVAC	X		X
ECM 7	Install VFDs on Chilled Water Pumps	X		X
ECM 8	Install VFDs on Hot Water Pumps			X
ECM 9	Install VFDs on Single-Speed Kitchen Hoods	X		X
ECM 10	Install High Efficiency Electric AC	X		X
ECM 11	Install High Efficiency Heat Pumps	X		X
ECM 12	Install High Efficiency Chillers	X		X
ECM 13	Install High Efficiency Hot Water Boilers	X		X
ECM 14	Install High Efficiency Steam Boilers			X
ECM 15	Install High Efficiency Furnaces	X		X
ECM 16	Implement Demand Control Ventilation			X
ECM 17	Install Pipe Insulation			X
ECM 18	Install Low-Flow Domestic Hot Water Devices			X
ECM 19	Vending Machine Control	X		X

Figure 3 – Funding Options



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

	<b>SmartStart</b> Flexibility to install at your own pace	<b>Direct Install</b> Turnkey installation	<b>Pay for Performance</b> Whole building upgrades
<b>Who should use it?</b>	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together.  Average peak demand should be below 200 kW.  Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time.  Peak demand should be over 200 kW.
<b>How does it work?</b>	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.
<b>What are the Incentives?</b>	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to \$125,000 per project.  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.
<b>How do I participate?</b>	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](http://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 (NJBP) has sponsored this Local Government Energy Audit (LGEA) Report for Watchung Hills Regional High School. This report provides information on how your facility 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.

### 2.1 Site Overview

On April 29, 2019, TRC performed an energy audit at Watchung Hills Regional High School located in Warren, New Jersey. TRC met with Ryan PIESCO to review the facility operations and help focus our investigation on specific energy-using systems.

Watchung Hills Regional High School is a regional comprehensive public high school serving students in portions of Somerset and Morris Counties in New Jersey. The facility is comprised of a school building that includes typical educational, administrative, assembly, and recreation spaces as well as a bus garage, a field house, and a snack stand totaling 406,648 square feet. The original school building was built in 1956 and expanded to accommodate additional spaces in 1960, 1964, 1971 and 2007. Spaces include: classrooms, administrative offices, gymnasiums, locker rooms, auditoriums, kitchens, cafeterias, conference rooms, storage, and mechanical spaces.

Facility lighting consists primarily of 32-Watt T8 fluorescent fixtures. Cooling is provided by an air cooled chiller and roof top units (RTUs), many of which have passed their useful life and are due for an upgrade. Heating is provided by six steam and hot water boilers. Air is exhausted from spaces by roof mounted exhausters. The HVAC system is controlled with a Honeywell building automation system (BAS).

Gymnasium and its locker rooms were under renovation during the assessment. Also, the south building roof sections were under repair.

### 2.2 Building Occupancy

The school operates on a 12-month schedule. The facility is open Monday through Saturday. The gymnasiums are used after classes and on weekends for sports and other events. The entire facility is shut down around 11:00 PM after the cleaning process. During a typical day, the facility is occupied by approximately 2,000 and students and 265 staff.

Building Name	Weekday/Weekend	Operating Schedule
Watchung Hill Regional High School - General Operating Hours	Weekday	5:30 AM - 11:00 PM
	Weekend	6:00 AM - 6:00 PM
Watchung Hill Regional High School - Classes Hours	Weekday	7:30 AM - 2:15 PM
	Weekend	6:00 AM - 4:30 PM

Figure 4 - Building Occupancy Schedule

## 2.3 Building Envelope

The original 1956 building is one-story brick and block building with double-paned aluminum windows. It contains a gymnasium, an auditorium, a cafeteria, a library, and two wings of classrooms.

The 1960 and 1964 additions are both two-story buildings comprised mostly of brick and block construction with full height curtain walls. They expanded the existing library, music room, and classrooms.

The 1971 addition is a two-story building that added another gymnasium, cafeteria, and a wing of classrooms. It is mostly brick and block construction.

The 2007 addition added a performing art center, music and classrooms, and an additional gymnasium and wrestling room. The building is constructed of brick and aluminum composite panel.

The south building consists of sixteen roof sections that appear to be modified bitumen roofing assemblies with an aluminum coating. Many areas of the roof are experiencing blistering. The south roof sections are currently under an existing Tremco warranty. A crew of two people were repairing the roof during the assessment.

Most of the windows of the south building are in fair to poor condition and appear to be single-pane glazing. The joint sealant between the cast stone sills has eroded in many locations. The exterior doors are aluminum with fiberglass reinforced plastic skins and appear to have recently been installed. The doors appear to have been installed in existing hollow metal frames in all locations. Many of these frames and lintels are rusted and in poor condition.

The north building consists of seven roof sections that are Tremco styrene-butadiene-styrene (SBS) modified bitumen roofing assemblies. These roofs were installed recently and are in good condition.

The 2007 addition has eight roof sections made of Ethylene Propylene Diene Monomer, single-ply roofing assemblies, which appear in good condition.

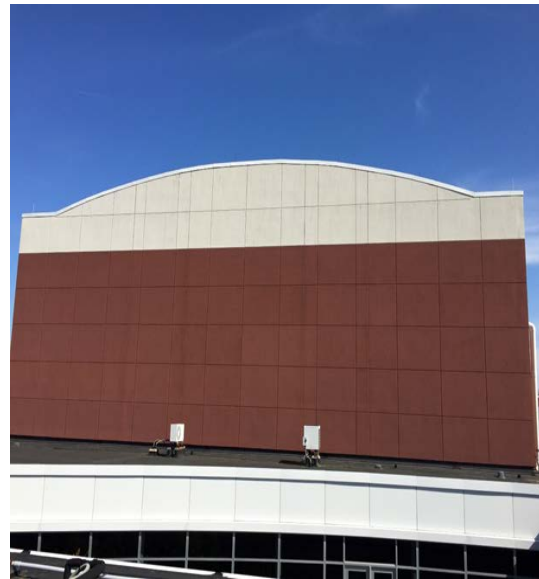
The north building windows single-pane glazing aluminum windows with cementitious panel bridging the windows front the first to second floor. They are in good condition. The building has some storefront entry doors made of aluminum frames with fiberglass reinforced plastic. They are in acceptable condition.

The field house is constructed of concrete masonry units. Steel trusses support pitched roof sections with a wood deck covered with asphalt shingles. Exterior doors are metal and appear in good condition.

The bus garage walls are made of CMUs with a brick veneer façade. Steel trusses support the flat roof with metal deck covered with a standing seam metal roofing system.



*South Building*



*North Building*



*South Building Roofs*



*North Building Roofs*

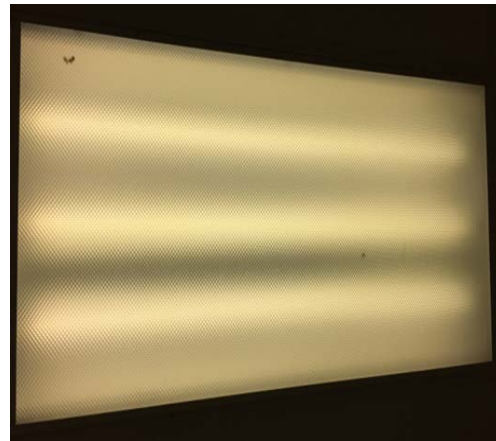


*Field House and Bus Garage*

## 2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps with electronic ballasts, as well as fluorescent T5 and compact fluorescent lamps (CFL). Additionally, there several fixtures with LED tubes, LED panels, LED high bay and incandescent lamps. The T8 fluorescent fixture types include 2- and 3-lamps, 4-foot long surface mounted, recessed troffer fixtures and 2-foot fixtures with U-bend linear tube lamps. The 4-lamp, 4-foot long T5 fixtures are found in the weight room, gym 7-8, and gym 5-6. The 2-lamp (26-Watt each) 4 PIN compact fluorescent fixtures are found in spaces such as the atrium, wrestling room, south cafeteria, main entrance, and some hallways. Areas such as the south kitchen, north cafeteria, and room 108 are primarily lit with LED tubes. The 40-Watt ambient LED panel are found in room 111 and south auditorium. Gym 1-2 and south auditorium are primarily lit with LED high bay fixtures. Most of the interior lighting fixtures are in good condition and lighting levels were generally sufficient. Exit signs throughout the facility are LED fixtures. Lighting fixtures in spaces are controlled with both occupancy sensors and manual wall switches.

Exterior illumination is provided with a combination of LED, high intensity discharge (HID) and CFL fixtures. The front and back parking lots have LED fixtures that are controlled with timers, while the tennis court and the football field are respectively lit with 1000- Watt and 1500-Watt metal halide fixtures controlled with a circuit breaker. The wall pack fixtures consist of metal halide (100-Watt, 250-Watt, and 400-Watt), high pressure sodium (70-Watt and 100-Watt), and CFLs (13-Watt, 26-Watt, 42-Watt). They are controlled with photocells.



*Linear Fluorescent T8 Fixtures*



*T5, Recessed CFLs and LED High Bay Fixtures*





*LED Tube, Atrium Recessed CFLs and Ceiling Mounted Occupancy Sensor*



*Wall Mounted CFL, Metal Halide Fixtures & a Timer*



*Parking Lot LED and Football Metal Halide Lamps*

## 2.5 Air Handling Systems

### Unit Ventilators

The south building classrooms have York unit ventilators, which have steam coils fed by the south plant boilers and chilled water coils fed from the chiller plant. These unit ventilators are very old and past their useful lives. They provide heating and cooling and are controlled with the building energy management system (EMS). The steam and chilled water piping within the unit ventilators is in very poor condition—it leaks frequently and needs replacement. There is a total of 110 unit ventilators in the south building classrooms.

### Air Handling Units

Several big areas of the facility are served with air handling units (AHUs) with either steam or hot water coils and heating and ventilation (H&V) units. Gym 7-8 has two Daikin AHUs with variable frequency drives (VFDs) on the supply fans. They were originally installed with cooling coils but never hooked up to the chilled water plant. A contractor crew was working to hook up the cooling coils to the chilled water plant during the site visits.

The south kitchen has an AHU with steam and chilled water coils. Spaces such as the receiving room, gym 5-6, gym 3-4 and locker rooms, varsity football locker room, junior varsity locker room, room 104 (wood shop), room 3, room 5 have H&V units with steam coils. Many of the AHUs were installed with hot water coils, required steam coils, and are not equipped with VFDs on the supply fans.



*South Kitchen and Gym H&V Unit*

Two Trane AHUs located in the attic floor, which are equipped with steam and chilled water coils, provide tempered air to the south auditorium. The units are variable air volume and appear in good condition.



*South Auditorium AHUs & VFDs*

**Packaged Units**

The north building is served with RTUs. There are nine McQuay RTUs that provide gas fired heating and direct expansion (DX) cooling to spaces such as The Performance Arts Center, Stage, Gym 1-2, Auxiliary Gym, Room 13, and offices. These units are all constant volume air units and do not use a heat recovery system. They have reached their useful lives and appear in poor condition. Additionally, eight Nesbitt multizone gas fired RTUs with DX cooling serve spaces such as the media center, cafeteria, kitchen, and classrooms. These are RTUs without heat recovery or VFD drives. They have passed their useful lives and require frequent maintenance.

The BOE and the business administration offices are served respectively with a five ton and a 7.5 RTU that are within their useful live and appear in good condition.

There are three energy recovery units (ERUs) serving various spaces in the south building.



*McQuay & Nesbitt RTUs*



*Trane RTU (BOE Offices) & ERU*

### **Air Conditioners**

Cooling systems for small spaces such as server closets and private offices consist of 23 split system air conditioners. They vary in capacity between 1.25 ton to 6 ton. Seventeen of the 23 units have passed their useful lives and appear in poor condition. The units serving the security office and room 108 have a respective electric heating capacity of 25 MBH and 37 MBh. Most of the split system units are controlled with programmable thermostats.



*Split System ACs*

### General Building Exhaust Systems

There are numerous fractional horsepower exhaust fans located throughout the building, which serve the restrooms and other areas. There are some specialty exhaust blowers for science rooms with fume hoods. There are two kitchen hood exhaust fans for the north kitchen. Many of the exhaust fans, particularly on the south building, are no longer functioning and need replacement. These fans are critical to providing the correct balance of fresh to exhaust air. The north building classroom ventilation fans have energy recovery wheels. The exhaust fans are controlled by the BMS.



*North & South Building Exhaust Fans*

## 2.6 Heating Systems

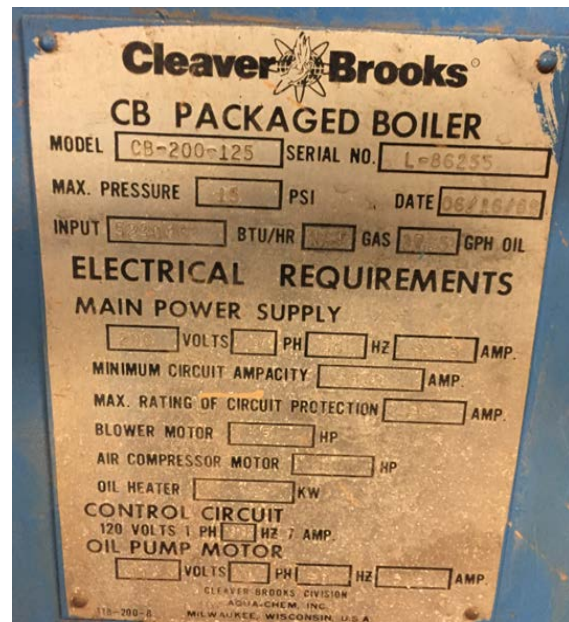
Heating is provided by two boiler plants and RTUs. The south boiler plant is part of the original school and is comprised of three Cleaver Brooks 4,184 MBH output steam boilers. They serve only the south building and provide steam for classroom unit ventilators (UVs), cabinet unit heaters, fin tube radiators, and H&V units. The boilers are 30 years old and beyond their useful lives. Their current operation requires frequent maintenance. The boilers are configured in an automated lead-lag control scheme. Two boilers are required under high load condition.

The north boiler plant consists of three Cleaver Brooks 3,348 MBH output hot water boilers, which serve only portions of the north building. The boilers were installed in 1972, with one being replaced in 2004. The two original boilers have passed their useful lives and require frequent maintenance. Sections of the north building such as the kitchen, north cafeteria, media center, performing arts center, 100s wing, west half of the 300s wing, gym 1-2, and auxiliary gym are served by RTUs, which provide gas-fired heating. The boilers are configured in an automated lead-lag control scheme. Two boilers are required under high-load conditions. The hydronic distribution system is a two-pipe heating only system. Two 10 hp and one 15 hp variable speed pumps, as well as two 20 hp constant speed pumps, distribute heating hot water to hydronic baseboard, unit heaters, AHUs, and H&V units.

Hot water is supplied at 130°F when the outside air temperature is 60°F, and the setpoint is adjusted linearly to 180°F when the outside air is 30°F. The hot water return temperature is typically 155°F.

The two boiler plants are controlled by an EMS.

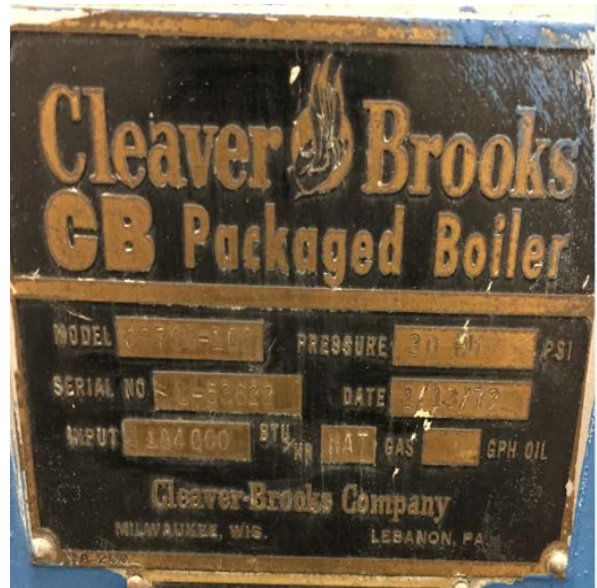
Heating is provided in the field house by an oil fired Weil McLain hot water boiler with 152 MBh output capacity and 85 percent combustion efficiency, while two 115 MBh output capacity oil fired furnaces provide heating in the bus garage. Heating temperature is controlled in the areas with local thermostats. The boiler is in good condition and the furnaces appear in poor condition.



*Cleaver Brooks Steam Boilers*



Steam Boilers EMS Control System



Cleaver Brooks Hot Water Boilers



Oil Fired Boiler



10 HP Hot Water Pumps and VFDs



Steam Boilers EMS Control System

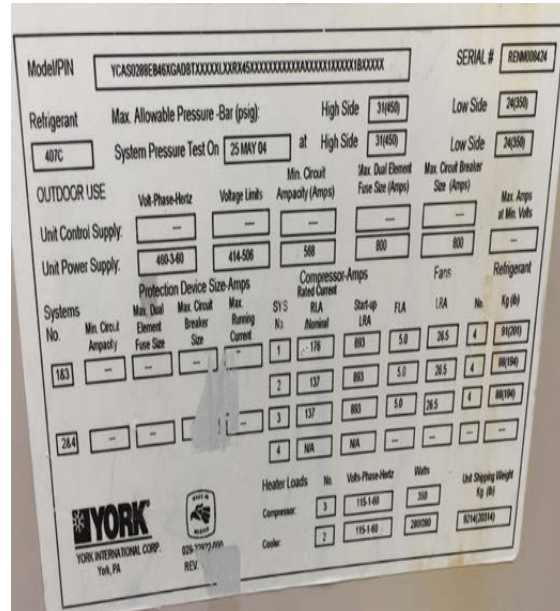


## 2.7 Chilled Water Systems

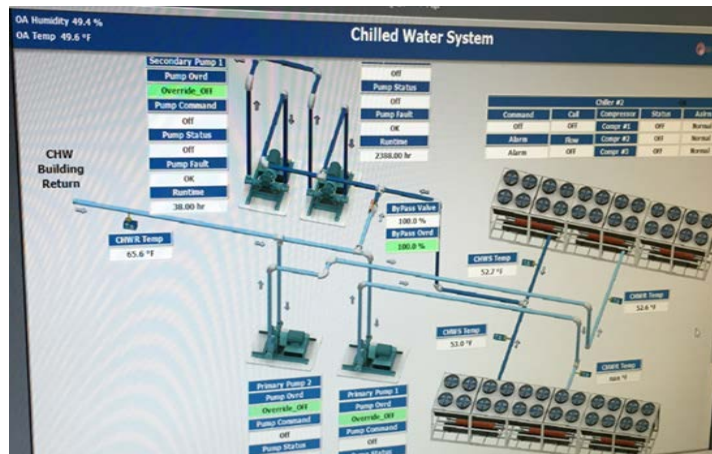
The chiller plant consists of two 288 ton York International air cooled, screw type chillers using ethylene glycol for freeze protection. The chillers are configured in a primary- secondary distribution loop with two 25 hp constant flow primary pumps (P3 & 4) and two 75 hp variable flow secondary pumps (P1 and 2). The chilled water distribution system is two-pipe cooling only.

The chilled water supply temperature is reset based on outside air temperature. 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 plant is locked out when the outside air temperature is below 45°F, and it is turned off from mid-December through February.

The chilled water plant feeds the unit ventilators in the south building, the west wing (excluding the performance arts center, stage, and media center) and west wing's 400s section on the second floor. The chillers may have reached the end of their useful lives. They are controlled with the EMS system.



Chilled Water Plant



Chilled Water Plant EMS Diagram

## 2.8 Building Energy Management Systems

A Honeywell Tridium EMS, which utilizes Niagara Spyder control cards, controls the HVAC equipment, the boiler plants, the chiller plant, the rooftop packaged units, the unit ventilators, and the exhaust fans. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, humidity, heating water loop temperatures, and chilled water loop temperatures. The system is maintained by an outside contractor, AME, under a maintenance contract. There is a head end user interface, allowing the staff to set and modify set points, setbacks, and equipment operation. This system is in good working order.



EMS Main Page

## 2.9 Domestic Hot Water

The south building domestic hot water system consists of two A.O. Smith 199.99 MBh gas fired condensing water heaters with a 95 percent combustion efficiency. Each water heater has a 100 gallon storage tank. The water heaters are in good condition. Three 0.2 hp circulation pumps distribute water to end uses. Domestic hot water pipes are partially insulated.

Domestic hot water in the north building is provided by three A.O. Smith 199.99 MBh gas fired condensing water heaters with a 95 percent combustion efficiency. Each water heater has a 100 gallon storage tank. The water heaters are in good condition. One 0.2 hp circulation pump distribute water to end uses. Domestic hot water pipes are insulated, and insulations are in good condition.

A LAARS 500 MBh gas fired water heater with an 81 percent combustion efficiency supplied 140°F to the kitchen and other areas. It has two 119-gallon free standing storage tanks. Three 0.3 hp circulation pumps distribute water to end uses. Domestic hot water pipes are partially insulated.

The varsity football locker room a 120 gallon 18 kW storage water heater that appears to be in poor condition. The field house and the bus garage are respectively served with an oil fired and electric water heaters and all appear to be in good condition.



*South Building Domestic Water Heater*



*North Building and Kitchen Domestic Water Heater*

## 2.10 Food Service Equipment

The facility houses two commercial kitchens and two cafeterias. The cooking system consists of all-electric convection oven/range tops, griddles, and steamers. The south kitchen has a door type low temperature electric dishwasher. Bulk prepared foods are held in several electric holding cabinets.

Natural gas is much cheaper than electricity. Gas appliances cost more upfront, but over time, gas will save money on the utility bill.



*Kitchen Equipment*

Visit [https://www.energystar.gov/products/commercial\\_food\\_service\\_equipment](https://www.energystar.gov/products/commercial_food_service_equipment) for the latest information on high efficiency food service equipment.

## 2.11 Refrigeration

The facility has commercial refrigeration systems that consist of standup refrigerators and freezers, three walk-in units, and two commercial ice makers located either in the kitchen, cafeteria, or room 108. The refrigeration systems are in good condition.



*Standup & Walk in Refrigeration Systems*

## 2.12 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 2 percent of total building energy use. This is lower than a typical building.

The location is doing a great job managing their electrical plug loads. This report makes additional suggestions for ECMs in this area as well as energy efficient best practices.

There are approximately 330 computer work stations throughout the facility and 700 Chromebooks. Plug loads throughout the building include general office equipment such copiers, printers, televisions, small refrigerators, water coolers, coffee machines, and microwaves. There are classroom typical loads such as smart boards and projectors. There are several residential style refrigerators throughout the building. The main data center is comprised of many types of servers with different wattage.

There are two refrigerated beverage vending machines are located in room 107 and the north cafeteria.



*Copier & Vending Machine*

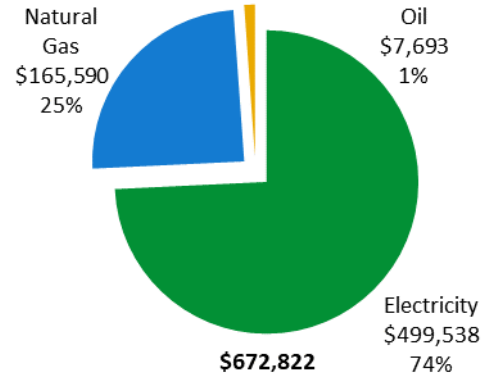
## 2.13 Water-Using Systems

There are several restrooms with toilets, urinals, and sinks. Faucet flow rates in some areas are at 2.2 gallons per minute (gpm) or higher. Toilets are rated at 2.5 gallons per flush (gpf) and urinals are rated at 2.5 gpf. There are restrooms with showers and showerheads are rated as low flow.

### 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	4,099,305 kWh	\$499,538
Natural Gas	195,242 Therms	\$165,590
No. 2 Fuel Oil	3,220 Gallons	\$7,693
<b>Total</b>		<b>\$672,822</b>



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.

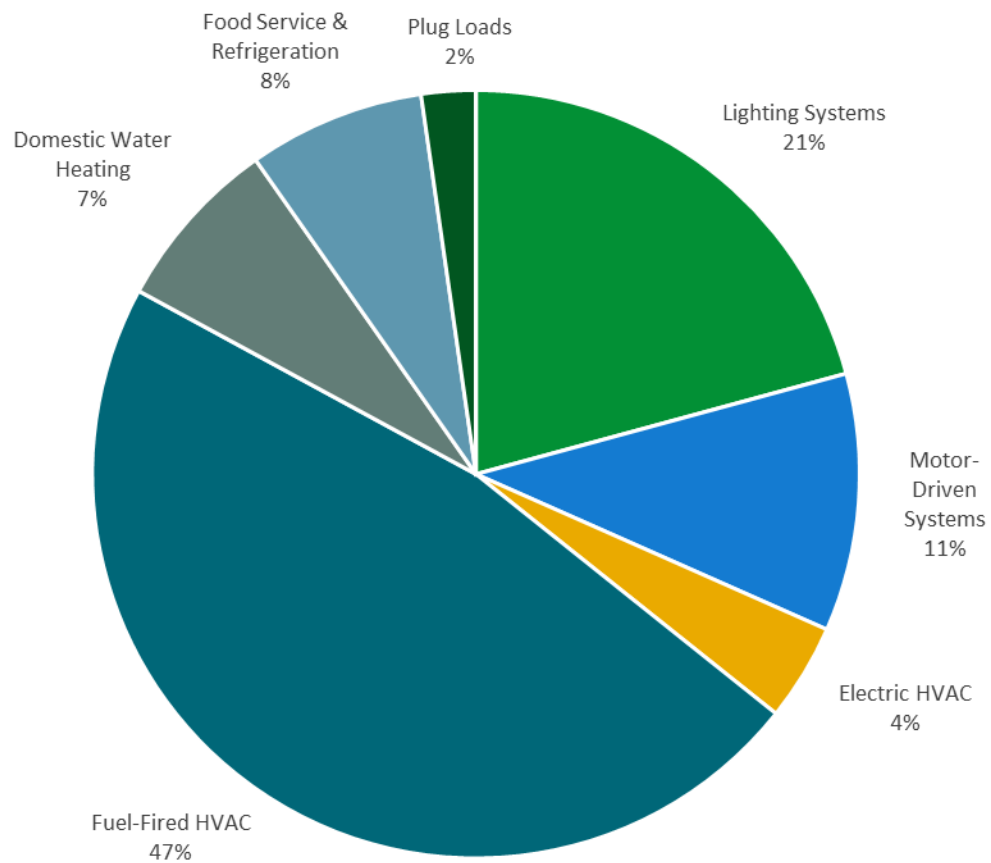
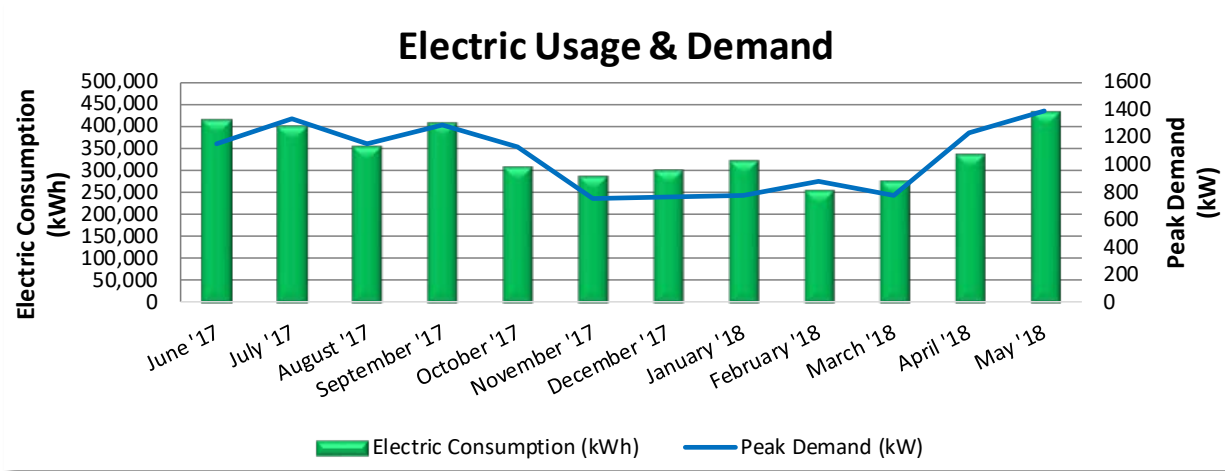


Figure 5 - Energy Balance

### 3.1 Electricity

JCP&L delivers electricity under rate class General Service Secondary, with electric production provided by Great Eastern Energy, a third-party supplier.



Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
7/13/17	31	415,631	1,152	\$8,571	\$48,697
8/14/17	31	402,413	1,335	\$9,949	\$51,334
9/13/17	30	354,713	1,151	\$8,565	\$43,856
10/13/17	31	407,368	1,286	\$8,959	\$49,444
11/13/17	30	309,909	1,135	\$7,892	\$38,669
12/13/17	31	285,663	751	\$5,200	\$33,603
1/12/18	31	299,729	767	\$5,310	\$35,049
2/12/18	28	324,506	778	\$5,382	\$38,264
3/13/18	31	254,570	882	\$6,110	\$31,927
4/11/18	30	275,062	777	\$5,267	\$33,153
5/10/18	31	335,342	1,234	\$8,139	\$41,983
6/12/18	30	434,399	1,388	\$9,809	\$53,559
<b>Totals</b>	<b>365</b>	<b>4,099,305</b>	<b>1,388</b>	<b>\$89,154</b>	<b>\$499,538</b>
<b>Annual</b>	<b>365</b>	<b>4,099,305</b>	<b>1,388</b>	<b>\$89,154</b>	<b>\$499,538</b>

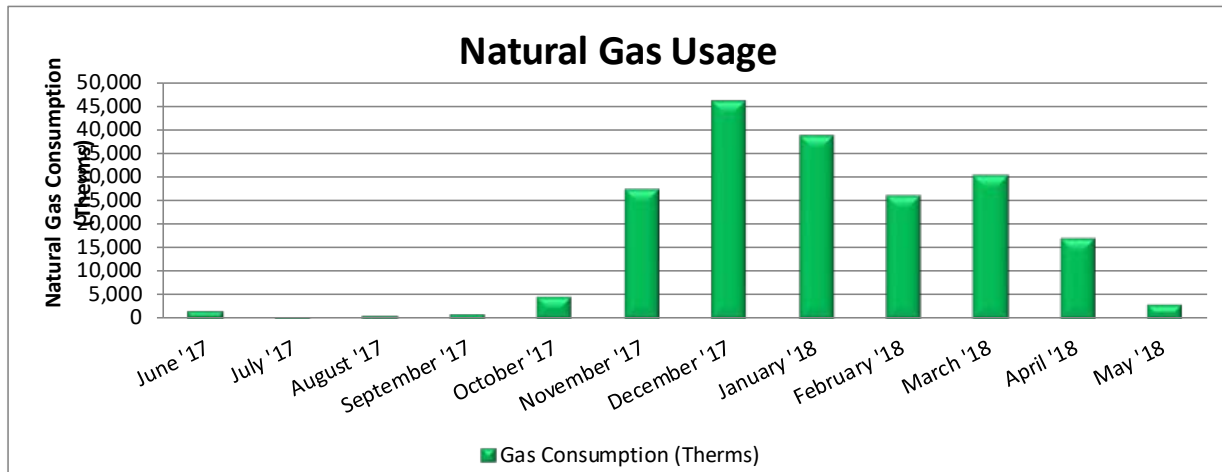
Notes:

- Peak demand of 1,388 kW occurred in June '18.
- The average electric cost over the past 12 months was \$0.122/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 electricity use profile reflects high occupancy from May to September.



### 3.2 Natural Gas

PSE&G delivers natural gas under rate class BGSS, with natural gas supply provided by SFE Energy, a third-party supplier.



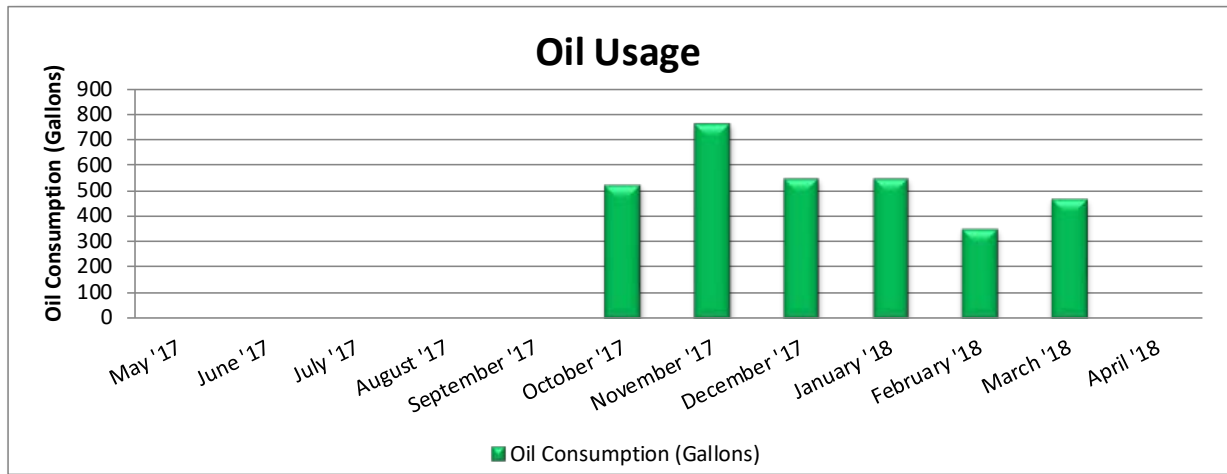
Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
6/30/17	30	1,550	\$1,147
7/31/17	31	318	\$410
8/31/17	31	506	\$519
9/30/17	30	835	\$718
10/31/17	31	4,528	\$5,103
11/30/17	30	27,281	\$24,835
12/31/17	31	45,953	\$38,889
1/31/18	31	38,570	\$33,690
2/28/18	28	25,992	\$24,822
3/31/18	31	30,103	\$23,380
4/30/18	30	16,822	\$10,207
5/31/18	31	2,783	\$1,870
<b>Totals</b>	<b>365</b>	<b>195,242</b>	<b>\$165,590</b>
<b>Annual</b>	<b>365</b>	<b>195,242</b>	<b>\$165,590</b>

Notes:

- The average gas cost for the past 12 months is \$0.848/therm, which is the blended rate used throughout the analysis.
- The gas use profile is typical for a facility with a significant heating load relative to domestic hot water heating system.

### 3.3 No. 2 Fuel Oil

Allied Oil delivers No. 2 Fuel Oil to the project site.



No. 2 Fuel Oil Billing Data			
Period Ending	Days in Period	Oil Usage (Gallons)	Fuel Cost
6/14/17	30	0	\$0
7/14/17	31	0	\$0
8/11/17	31	0	\$0
9/14/17	30	0	\$0
10/13/17	31	0	\$0
11/14/17	30	527	\$1,216
12/13/17	31	766	\$1,837
1/15/18	31	553	\$1,413
2/13/18	28	551	\$1,249
3/14/18	31	356	\$831
4/1/18	30	468	\$1,148
5/10/18	31	0	\$0
<b>Totals</b>	<b>365</b>	<b>3,220</b>	<b>\$7,693</b>
<b>Annual</b>	<b>365</b>	<b>3,220</b>	<b>\$7,693</b>

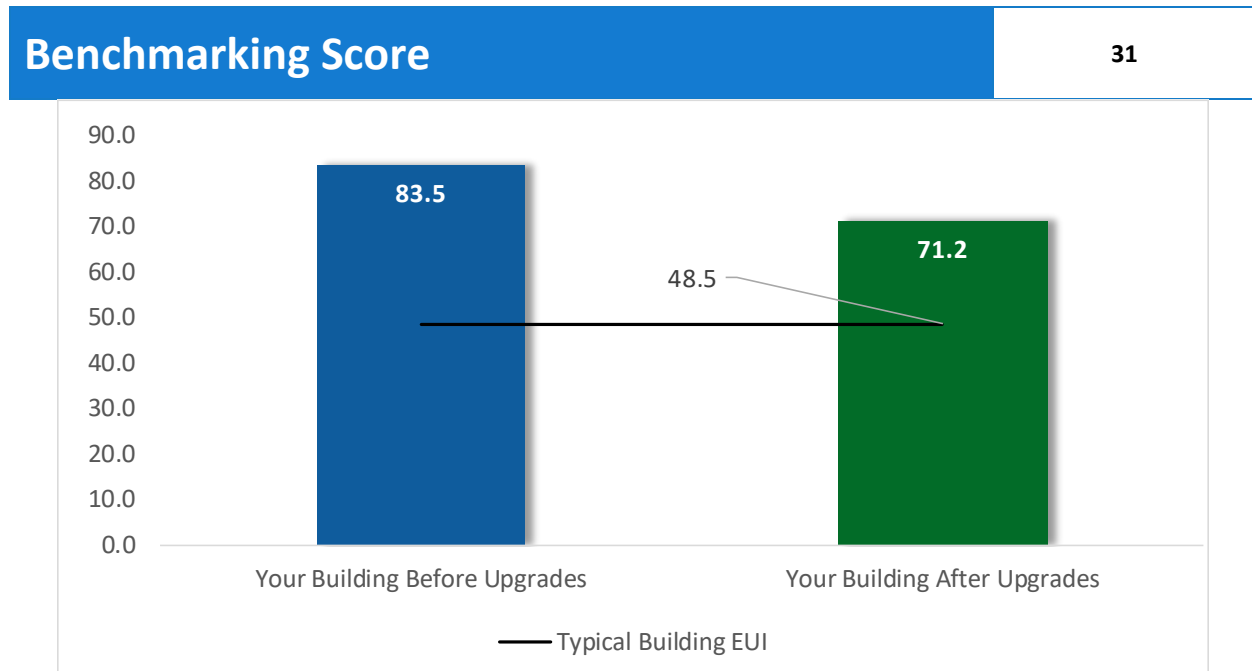
Notes:

- The average No. 2 Fuel Oil cost for the past 12 months is \$2.390/Gallon, which is the blended rate used throughout the analysis.

### 3.4 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 country, 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 below 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**

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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<sup>3</sup>.

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

## 4 ENERGY CONSERVATION MEASURES

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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 the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. 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.

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

#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>1,083,103</b>	<b>202.1</b>	<b>-131</b>	<b>\$130,877</b>	<b>\$388,455</b>	<b>\$60,451</b>	<b>\$328,004</b>	<b>2.5</b>	<b>1,075,362</b>
ECM 1	Install LED Fixtures	446,927	63.4	0	\$54,462	\$168,636	\$5,785	\$162,851	3.0	450,052
ECM 2	Retrofit Fixtures with LED Lamps	636,175	138.7	-131	\$76,415	\$219,819	\$54,666	\$165,153	2.2	625,310
<b>Lighting Control Measures</b>		<b>87,451</b>	<b>17.4</b>	<b>-18</b>	<b>\$10,502</b>	<b>\$77,722</b>	<b>\$7,735</b>	<b>\$69,987</b>	<b>6.7</b>	<b>85,922</b>
ECM 3	Install Occupancy Sensor Lighting Controls	63,575	12.6	-13	\$7,634	\$60,442	\$7,735	\$52,707	6.9	62,463
ECM 4	Install High/Low Lighting Controls	23,877	4.7	-5	\$2,867	\$17,280	\$0	\$17,280	6.0	23,459
<b>Motor Upgrades</b>		<b>12,863</b>	<b>3.9</b>	<b>0</b>	<b>\$1,567</b>	<b>\$23,054</b>	<b>\$0</b>	<b>\$23,054</b>	<b>14.7</b>	<b>12,953</b>
ECM 5	Premium Efficiency Motors	12,863	3.9	0	\$1,567	\$23,054	\$0	\$23,054	14.7	12,953
<b>Variable Frequency Drive (VFD) Measures</b>		<b>280,567</b>	<b>93.3</b>	<b>78</b>	<b>\$34,853</b>	<b>\$296,578</b>	<b>\$25,120</b>	<b>\$271,458</b>	<b>7.8</b>	<b>291,685</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	237,441	83.6	0	\$28,934	\$262,409	\$21,820	\$240,589	8.3	239,101
ECM 7	Install VFDs on Chilled Water Pumps	37,161	9.3	0	\$4,528	\$21,690	\$3,000	\$18,690	4.1	37,421
ECM 8	Install VFDs on Heating Water Pumps	2,798	0.4	0	\$341	\$6,781	\$0	\$6,781	19.9	2,818
ECM 9	Install VFDs on Kitchen Hood Fan Motors	3,166	0.1	78	\$1,049	\$5,697	\$300	\$5,397	5.1	12,345
<b>Electric Unitary HVAC Measures</b>		<b>58,915</b>	<b>63.0</b>	<b>0</b>	<b>\$7,179</b>	<b>\$730,264</b>	<b>\$22,068</b>	<b>\$708,196</b>	<b>98.6</b>	<b>59,327</b>
ECM 10	Install High Efficiency Air Conditioning Units	58,508	62.8	0	\$7,130	\$725,191	\$21,792	\$703,399	98.7	58,917
ECM 11	Install High Efficiency Heat Pumps	407	0.2	0	\$50	\$5,073	\$276	\$4,797	96.8	409
<b>Electric Chiller Replacement</b>		<b>62,968</b>	<b>90.5</b>	<b>0</b>	<b>\$7,673</b>	<b>\$279,032</b>	<b>\$26,496</b>	<b>\$252,536</b>	<b>32.9</b>	<b>63,409</b>
ECM 12	Install High Efficiency Chillers	62,968	90.5	0	\$7,673	\$279,032	\$26,496	\$252,536	32.9	63,409
<b>Gas Heating (HVAC/Process) Replacement</b>		<b>0</b>	<b>0.0</b>	<b>1,458</b>	<b>\$12,361</b>	<b>\$558,641</b>	<b>\$21,458</b>	<b>\$537,183</b>	<b>43.5</b>	<b>172,521</b>
ECM 13	Install High Efficiency Hot Water Boilers	0	0.0	491	\$4,165	\$174,707	\$13,058	\$161,649	38.8	57,502
ECM 14	Install High Efficiency Steam Boilers	0	0.0	322	\$2,731	\$215,083	\$0	\$215,083	78.8	37,702
ECM 15	Install High Efficiency Furnaces	0	0.0	644	\$5,465	\$168,852	\$8,400	\$160,452	29.4	77,316
<b>HVAC System Improvements</b>		<b>5,869</b>	<b>0.0</b>	<b>227</b>	<b>\$2,641</b>	<b>\$41,046</b>	<b>\$0</b>	<b>\$41,046</b>	<b>15.5</b>	<b>32,499</b>
ECM 16	Implement Demand Control Ventilation (DCV)	5,869	0.0	209	\$2,488	\$40,783	\$0	\$40,783	16.4	30,387
ECM 17	Install Pipe Insulation	0	0.0	18	\$153	\$264	\$0	\$264	1.7	2,112
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>88</b>	<b>\$748</b>	<b>\$222</b>	<b>\$0</b>	<b>\$222</b>	<b>0.3</b>	<b>10,333</b>
ECM 18	Install Low-Flow DHW Devices	0	0.0	88	\$748	\$222	\$0	\$222	0.3	10,333
<b>Food Service &amp; Refrigeration Measures</b>		<b>3,224</b>	<b>0.4</b>	<b>0</b>	<b>\$393</b>	<b>\$460</b>	<b>\$100</b>	<b>\$360</b>	<b>0.9</b>	<b>3,246</b>
ECM 19	Vending Machine Control	3,224	0.4	0	\$393	\$460	\$100	\$360	0.9	3,246
<b>TOTALS</b>		<b>1,594,959</b>	<b>470.6</b>	<b>1,702</b>	<b>\$208,796</b>	<b>\$2,395,476</b>	<b>\$163,428</b>	<b>\$2,232,047</b>	<b>10.7</b>	<b>1,807,256</b>

\* - 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	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>1,083,103</b>	<b>202.1</b>	<b>-131</b>	<b>\$130,877</b>	<b>\$388,455</b>	<b>\$60,451</b>	<b>\$328,004</b>	<b>2.5</b>	<b>1,075,362</b>
ECM 1	Install LED Fixtures	446,927	63.4	0	\$54,462	\$168,636	\$5,785	\$162,851	3.0	450,052
ECM 2	Retrofit Fixtures with LED Lamps	636,175	138.7	-131	\$76,415	\$219,819	\$54,666	\$165,153	2.2	625,310
<b>Lighting Control Measures</b>		<b>87,451</b>	<b>17.4</b>	<b>-18</b>	<b>\$10,502</b>	<b>\$77,722</b>	<b>\$7,735</b>	<b>\$69,987</b>	<b>6.7</b>	<b>85,922</b>
ECM 3	Install Occupancy Sensor Lighting Controls	63,575	12.6	-13	\$7,634	\$60,442	\$7,735	\$52,707	6.9	62,463
ECM 4	Install High/Low Lighting Controls	23,877	4.7	-5	\$2,867	\$17,280	\$0	\$17,280	6.0	23,459
<b>Variable Frequency Drive (VFD) Measures</b>		<b>277,768</b>	<b>92.9</b>	<b>78</b>	<b>\$34,512</b>	<b>\$289,797</b>	<b>\$25,120</b>	<b>\$264,677</b>	<b>7.7</b>	<b>288,867</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	237,441	83.6	0	\$28,934	\$262,409	\$21,820	\$240,589	8.3	239,101
ECM 7	Install VFDs on Chilled Water Pumps	37,161	9.3	0	\$4,528	\$21,690	\$3,000	\$18,690	4.1	37,421
ECM 9	Install VFDs on Kitchen Hood Fan Motors	3,166	0.1	78	\$1,049	\$5,697	\$300	\$5,397	5.1	12,345
<b>HVAC System Improvements</b>		<b>0</b>	<b>0.0</b>	<b>18</b>	<b>\$153</b>	<b>\$264</b>	<b>\$0</b>	<b>\$264</b>	<b>1.7</b>	<b>2,112</b>
ECM 17	Install Pipe Insulation	0	0.0	18	\$153	\$264	\$0	\$264	1.7	2,112
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>88</b>	<b>\$748</b>	<b>\$222</b>	<b>\$0</b>	<b>\$222</b>	<b>0.3</b>	<b>10,333</b>
ECM 18	Install Low-Flow DHW Devices	0	0.0	88	\$748	\$222	\$0	\$222	0.3	10,333
<b>Food Service &amp; Refrigeration Measures</b>		<b>3,224</b>	<b>0.4</b>	<b>0</b>	<b>\$393</b>	<b>\$460</b>	<b>\$100</b>	<b>\$360</b>	<b>0.9</b>	<b>3,246</b>
ECM 19	Vending Machine Control	3,224	0.4	0	\$393	\$460	\$100	\$360	0.9	3,246
<b>TOTALS</b>		<b>1,451,546</b>	<b>312.8</b>	<b>35</b>	<b>\$177,185</b>	<b>\$756,920</b>	<b>\$93,406</b>	<b>\$663,514</b>	<b>3.7</b>	<b>1,465,842</b>

\* - 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*

Some ECMs in figure 7 have a long payback period. The analysis does not include the actual annual maintenance costs for equipment that have been evaluated in this report. Adding the maintenance costs to this evaluation will significantly reduce the simple payback period of each ECM, which will allow the school to implement all measures in a more cost effective package.

## 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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>1,083,103</b>	<b>202.1</b>	<b>-131</b>	<b>\$130,877</b>	<b>\$388,455</b>	<b>\$60,451</b>	<b>\$328,004</b>	<b>2.5</b>	<b>1,075,362</b>
ECM 1	Install LED Fixtures	446,927	63.4	0	\$54,462	\$168,636	\$5,785	\$162,851	3.0	450,052
ECM 2	Retrofit Fixtures with LED Lamps	636,175	138.7	-131	\$76,415	\$219,819	\$54,666	\$165,153	2.2	625,310

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 are proposed, we suggest converting all of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the facility, which should help reduce future maintenance costs.

### **ECM 1: Install LED Fixtures**

Replace existing fixtures containing HID 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 since LED lamps last longer than other light sources and therefore do not need to be replaced as often.

**Affected building areas:** exterior fixtures.

### **ECM 2: Retrofit Fixtures with LED Lamps**

Replace fluorescent T5, T8, CFLs and incandescent 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 a direct replacement for most other lighting technologies.

This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide 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:** all areas with fluorescent fixtures with T5 and T8 tubes, CFLs, and incandescent lamps.



## 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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Control Measures</b>		<b>87,451</b>	<b>17.4</b>	<b>-18</b>	<b>\$10,502</b>	<b>\$77,722</b>	<b>\$7,735</b>	<b>\$69,987</b>	<b>6.7</b>	<b>85,922</b>
ECM 3	Install Occupancy Sensor Lighting Controls	63,575	12.6	-13	\$7,634	\$60,442	\$7,735	\$52,707	6.9	62,463
ECM 4	Install High/Low Lighting Controls	23,877	4.7	-5	\$2,867	\$17,280	\$0	\$17,280	6.0	23,459

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 3: 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 that 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, mounted 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, library, restrooms, and storage rooms.

### **ECM 4: 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 considered 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.

#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Motor Upgrades</b>		<b>12,863</b>	<b>3.9</b>	<b>0</b>	<b>\$1,567</b>	<b>\$23,054</b>	<b>\$0</b>	<b>\$23,054</b>	<b>14.7</b>	<b>12,953</b>
ECM 5	Premium Efficiency Motors	12,863	3.9	0	\$1,567	\$23,054	\$0	\$23,054	14.7	12,953

### **ECM 5: 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 are summarized on the next page:**

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
North Boiler Room	North Wing Heating System	1	Heating Hot Water Pump	20.0	Heating Hot Water Pump
North Boiler Room	North Wing Heating System	1	Heating Hot Water Pump	20.0	Heating Hot Water Pump

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Roof	M6A - Half Auditorium	1	Supply Fan	7.5	Supply Fan
Roof	M6B - Half Auditorium	1	Supply Fan	7.5	Supply Fan
Roof	M4A - Performance Art Center (PAC)	1	Supply Fan	15.0	Supply Fan
Roof	M4A - Performance Art Center (PAC)	1	Exhaust Fan	10.0	Exhaust Fan
Roof	M4B - Performance Art Center (PAC)	1	Supply Fan	15.0	Supply Fan
Roof	M4B - Performance Art Center (PAC)	1	Exhaust Fan	10.0	Exhaust Fan
Roof	M5 - Stage @ PAC	1	Supply Fan	15.0	Supply Fan
Roof	M5 - Stage @ PAC	1	Exhaust Fan	10.0	Exhaust Fan

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Roof	M3 - Aux Gym/Boys/Girls Locker Rooms	1	Supply Fan	3.0	Supply Fan
Roof	M2A - Gym 1-2	1	Supply Fan	7.5	Supply Fan
Roof	M2A - Gym 1-2	1	Exhaust Fan	3.0	Exhaust Fan
Roof	M2B - Gym 1-2	1	Supply Fan	7.5	Supply Fan
Roof	M2B - Gym 1-2	1	Exhaust Fan	3.0	Exhaust Fan
Roof	M8 - Room 13 & Offices	1	Supply Fan	7.5	Supply Fan

Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours. The base case motor energy consumption is estimated using the efficiencies found on nameplates or estimated 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

#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Variable Frequency Drive (VFD) Measures</b>		<b>280,567</b>	<b>93.3</b>	<b>78</b>	<b>\$34,853</b>	<b>\$296,578</b>	<b>\$25,120</b>	<b>\$271,458</b>	<b>7.8</b>	<b>291,685</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	237,441	83.6	0	\$28,934	\$262,409	\$21,820	\$240,589	8.3	239,101
ECM 7	Install VFDs on Chilled Water Pumps	37,161	9.3	0	\$4,528	\$21,690	\$3,000	\$18,690	4.1	37,421
ECM 8	Install VFDs on Heating Water Pumps	2,798	0.4	0	\$341	\$6,781	\$0	\$6,781	19.9	2,818
ECM 9	Install VFDs on Kitchen Hood Fan Motors	3,166	0.1	78	\$1,049	\$5,697	\$300	\$5,397	5.1	12,345

Variable frequency drives 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.

Premium efficiency motors have been proposed to be installed only in conjunction with proposed VFD motor measures. Non inverter duty rated motors will need to be replaced when the VFD measure is implemented.

Replacing the motors has a long payback period and may not be justifiable based simply on energy considerations. However, most of the motors are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high efficiency motor can be justified by the marginal savings from the improved efficiency. When the motors are eventually replaced, consider purchasing premium efficiency motors.

### **ECM 6: 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 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. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

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

**Affected:** rooftop packaged units, AHUs, and H&V units.

### **ECM 7: Install VFDs on Chilled Water Pumps**

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

For systems with variable chilled water flow through the chiller, the minimum flow to prevent the chiller from tripping off will need to be determined during the final project design. The control system should be programmed to maintain the minimum flow through the chiller and to prevent pump cavitation.

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

**Affected pumps:** the two 25 hp chilled water pumps (P3 and 4).

### **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 three-way valves or a bypass leg 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:** the two 20 hp hot water pumps.

This measure has a long payback, therefore is not recommended for implemented base on energy savings alone.

### **ECM 9: Install VFDs on Kitchen Hood Fan Motors**

Install VFDs and sensors to control the kitchen hood fan motors. The air flow of the hood is varied based on two key inputs: temperature and smoke/cooking fumes. The VFD controls the amount of exhaust (and kitchen make-up air) based on temperature—the lower the temperature the lower the flow. If the optic sensor is triggered by smoke or cooking fumes, the speed of the fan ramps up to 100%.

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

## 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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Electric Unitary HVAC Measures</b>		<b>58,915</b>	<b>63.0</b>	<b>0</b>	<b>\$7,179</b>	<b>\$730,264</b>	<b>\$22,068</b>	<b>\$708,196</b>	<b>98.6</b>	<b>59,327</b>
ECM 10	Install High Efficiency Air Conditioning Units	58,508	62.8	0	\$7,130	\$725,191	\$21,792	\$703,399	98.7	58,917
ECM 11	Install High Efficiency Heat Pumps	407	0.2	0	\$50	\$5,073	\$276	\$4,797	96.8	409

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units 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 HVAC units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

### **ECM 10: 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, the average cooling load, and the estimated annual operating hours.

This measure is part of a measure to replace package units at this site and as such must be considered in combination with ECM 15.

### **ECM 11: Install High Efficiency Heat Pumps**

Replace standard efficiency heat pumps with high efficiency heat pumps. A higher EER or SEER rating indicates a more efficient cooling system and a higher HSPF rating indicates more efficient heating mode. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average heating and cooling loads, and the estimated annual operating hours.

## 4.6 Electric Chillers

#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Electric Chiller Replacement</b>		<b>62,968</b>	<b>90.5</b>	<b>0</b>	<b>\$7,673</b>	<b>\$279,032</b>	<b>\$26,496</b>	<b>\$252,536</b>	<b>32.9</b>	<b>63,409</b>
ECM 12	Install High Efficiency Chillers	62,968	90.5	0	\$7,673	\$279,032	\$26,496	\$252,536	32.9	63,409

### **ECM 12: Install High Efficiency Chillers**

Replace older inefficient electric chillers with new high efficiency chillers. The type of chiller to be installed depends on the magnitude of the cooling load and variability of the cooling load profile, for example:

- Positive displacement chillers are usually under 600 tons of cooling capacity and centrifugal chillers generally start at 150 tons of cooling capacity.
- Constant speed chillers should be used to meet cooling loads with little or no variation while variable speed chillers are more efficient for variable cooling load profiles.
- Water cooled chillers are more efficient than air cooled chillers but require cooling towers and additional pumps to circulate the cooling water.
- In any given size range, variable speed chillers tend to have better partial load efficiency, but worse full load efficiency, than constant speed chillers.

Energy savings result from the improvement in chiller efficiency and matching the right type of chiller to the cooling load. The energy savings are calculated based on the cooling capacity of the new chiller, the improvement in efficiency compared with the base case equipment, the cooling load profile, and the estimated annual operating hours of the chiller before and after the upgrade.

For the purposes of this analysis, we evaluated the replacement of chillers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your design team to select chillers that are sized appropriately for the cooling load. In some cases, the plant energy use can be reduced by selecting multiple chillers that match the facility load profile rather than one or two large chillers. This can also improve the chiller plant reliability through increased redundancy. Energy savings are maximized by proper selection of new equipment based on the cooling load profile.

Replacing the chillers has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the chillers have reached the end of their normal useful life. Typically, the marginal cost of purchasing high efficiency chillers can be justified by the marginal savings from the improved efficiency. When the chillers are eventually replaced, consider purchasing equipment that exceed the minimum efficiency required by building codes.

## 4.7 Gas-Fired 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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Gas Heating (HVAC/Process) Replacement</b>		<b>0</b>	<b>0.0</b>	<b>1,458</b>	<b>\$12,361</b>	<b>\$558,641</b>	<b>\$21,458</b>	<b>\$537,183</b>	<b>43.5</b>	<b>172,521</b>
ECM 13	Install High Efficiency Hot Water Boilers	0	0.0	491	\$4,165	\$174,707	\$13,058	\$161,649	38.8	57,502
ECM 14	Install High Efficiency Steam Boilers	0	0.0	322	\$2,731	\$215,083	\$0	\$215,083	78.8	37,702
ECM 15	Install High Efficiency Furnaces	0	0.0	644	\$5,465	\$168,852	\$8,400	\$160,452	29.4	77,316

### **ECM 13: Install High Efficiency Hot Water Boilers**

Replace older inefficient hot water boilers with high efficiency hot water boilers. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

The most notable efficiency improvement is condensing hydronic boilers which can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers are evaluated when the return water temperature is less than 130°F during most of the operating hours.

For the purposes of this analysis, we evaluated the replacement of boilers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your mechanical design team to select boilers that are sized appropriately for the heating load. In many cases installing multiple modular boilers rather than one or two large boilers will result in higher overall plant efficiency while providing additional system redundancy.

Replacing the boilers has a long payback and may not be justifiable based simply on energy considerations. However, the boilers have passed the end of their normal useful life. Typically, the marginal cost of purchasing high efficiency boilers can be justified by the marginal savings from the improved efficiency. When the boilers are eventually replaced, consider purchasing boilers that exceed the minimum efficiency required by building codes. We also recommend working with your mechanical design team to determine whether the heating system can operate with return water temperatures below 130°F, which would allow the use of condensing boilers.

### **ECM 14: Install High Efficiency Steam Boilers**

Replace older inefficient steam boilers with high efficiency steam boilers. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

For the purposes of this analysis, we evaluated the replacement of boilers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your mechanical design team to select boilers that are sized appropriately for the heating load. In many cases installing multiple modular boilers rather than one or two large boilers will result in higher overall plant efficiency while providing additional system redundancy.

Replacing the boilers has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the boilers have passed the end of their normal useful life. Typically, the marginal cost of purchasing high efficiency boilers can be justified by the marginal savings from the improved efficiency. When the boiler is eventually replaced, consider purchasing boilers that exceed the minimum efficiency required by building codes.



### **ECM 15: Install High Efficiency Furnaces**

Replace standard efficiency furnaces with condensing furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases which can significantly improve furnace efficiency. Savings result from improved system efficiency.

Note: these units produce acidic condensate that requires proper drainage.

This measure is part of a measure to replace package units at this site and as such must be considered in combination with ECM 10.

## 4.8 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 <sub>2</sub> e Emissions Reduction (lbs)
<b>HVAC System Improvements</b>		<b>5,869</b>	<b>0.0</b>	<b>227</b>	<b>\$2,641</b>	<b>\$41,046</b>	<b>\$0</b>	<b>\$41,046</b>	<b>15.5</b>	<b>32,499</b>
ECM 16	Implement Demand Control Ventilation (DCV)	5,869	0.0	209	\$2,488	\$40,783	\$0	\$40,783	16.4	30,387
ECM 17	Install Pipe Insulation	0	0.0	18	\$153	\$264	\$0	\$264	1.7	2,112

### **ECM 16: Implement Demand Control Ventilation (DCV)**

Demand control ventilation (DCV) monitors the indoor air's carbon dioxide (CO<sub>2</sub>) 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 over ventilated. 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.

This measure has a long simple payback period, therefore, is not recommended for implementation based on energy savings only.

**Affected building areas:** gymnasiums, cafeteria, performing arts center, and auditorium.

### **ECM 17: Install Pipe Insulation**

Install insulation on heating water system piping. Distribution system losses are dependent on water system temperature, the size of the distribution system, and the level of insulation of the piping. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is exposed to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

## 4.9 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 <sub>2</sub> e Emissions Reduction (lbs)
	<b>Domestic Water Heating Upgrade</b>	<b>0</b>	<b>0.0</b>	<b>88</b>	<b>\$748</b>	<b>\$222</b>	<b>\$0</b>	<b>\$222</b>	<b>0.3</b>	<b>10,333</b>
ECM 18	Install Low-Flow DHW Devices	0	0.0	88	\$748	\$222	\$0	\$222	0.3	10,333

### **ECM 18: 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.

## 4.10 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 <sub>2</sub> e Emissions Reduction (lbs)
	<b>Food Service &amp; Refrigeration Measures</b>	<b>3,224</b>	<b>0.4</b>	<b>0</b>	<b>\$393</b>	<b>\$460</b>	<b>\$100</b>	<b>\$360</b>	<b>0.9</b>	<b>3,246</b>
ECM 19	Vending Machine Control	3,224	0.4	0	\$393	\$460	\$100	\$360	0.9	3,246

### **ECM 19: 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 they 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

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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<sup>4</sup>. 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.

### **Window Treatments/Coverings**

Use high-reflectivity films or cover windows with shades or shutters to reduce solar heat gain and reduce the load on cooling and heating systems. Older, single pane windows and east or west-facing windows are especially prone to solar heat gain. In addition, use shades or shutters at night during cold weather to reduce heat loss.

### **Lighting Maintenance**



- Clean lamps, reflectors and lenses of dirt, dust, oil, and smoke buildup every six to twelve months. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust. Together, this can reduce total light output by up to 60% while still drawing full power.
- In addition to routine cleaning, developing a maintenance schedule can ensure that maintenance is performed regularly, and it can reduce the overall cost of fixture re-lamping and re-ballasting. Group re-lamping and re-ballasting maintains lighting levels and minimizes the number of site visits by a lighting technician or contractor, decreasing the overall cost of maintenance.

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<sup>4</sup> <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>.

## **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 Controls**

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Whenever possible, use automatic devices such as twist timers or occupancy sensors to turn off motors when they are not needed.

## **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.

## **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 facility'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.

## **Chiller Maintenance**

Service chillers regularly to keep them operating properly. Chillers are responsible for a substantial portion of a commercial building's overall energy usage and when they do not work well, there is usually a noticeable increase in energy bills and increased occupant complaints. Regular diagnostics and service can save five to ten percent of the cost of operating your chiller. If you already have a maintenance contract in place, your existing service company should be able to provide these services.

## **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.

## **Steam Trap Repair and Replacement**

Steam traps are a crucial part of delivering heat from the boiler to the space heating units. Repair or replace traps that are blocked or allowing steam to pass. Inspect steam traps as part of a regular steam system maintenance plan.

## **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.

## **Furnace Maintenance**

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should: check for gas / carbon monoxide leaks; change the air and fuel filters; check components for cracks, corrosion, dirt, or debris build-up; ensure the ignition system is working properly; test and adjust operation and safety controls; inspect electrical connections; and lubricate motors and bearings.

### **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.

### **Medical 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.

## **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<sup>5</sup> or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"<sup>6</sup> 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 facility 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.

## **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.

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<sup>5</sup> <https://www.epa.gov/watersense>.

<sup>6</sup> <https://www.epa.gov/watersense/watersense-work-0>.

## 6 ON-SITE GENERATION

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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 facility'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.

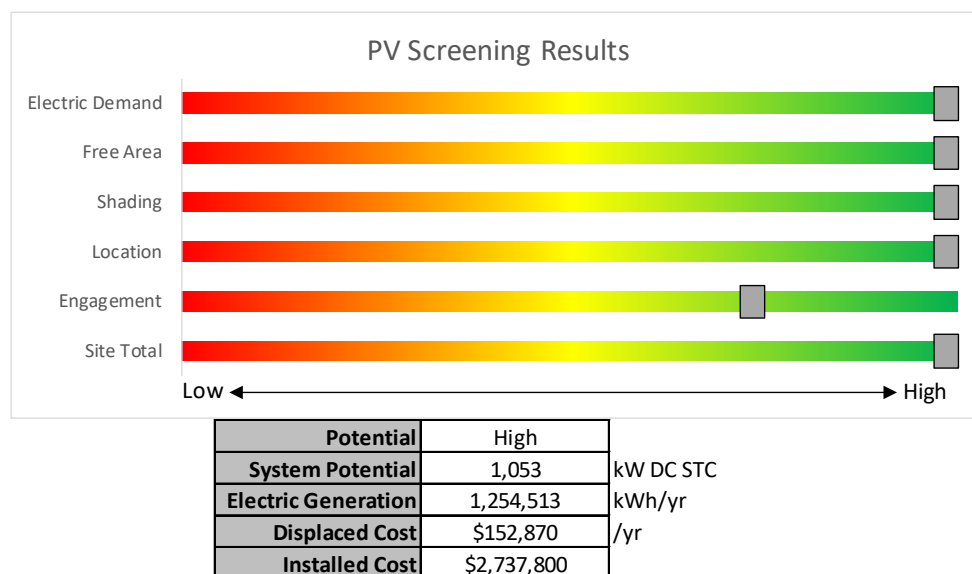


Figure 9 - Photovoltaic Screening

### Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

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](http://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](http://www.njcleanenergy.com/whysolar).
- **New Jersey Solar Market FAQs:** [www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-fags](http://www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-fags).
- **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](http://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 facility 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 **high** potential for installing a cost-effective CHP system.

The magnitude, type, and duration of the thermal demand, the coincident electric load, and the ease of interconnection contribute to the potential for CHP at the site. Based on the amount of hot water used throughout the year and the concurrent electric demand a Microturbine may be feasible. If you are interested in pursuing combined heat and power, we recommend performing a detailed feasibility study, which will provide a thorough understanding of the costs and savings associated with this technology.

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.

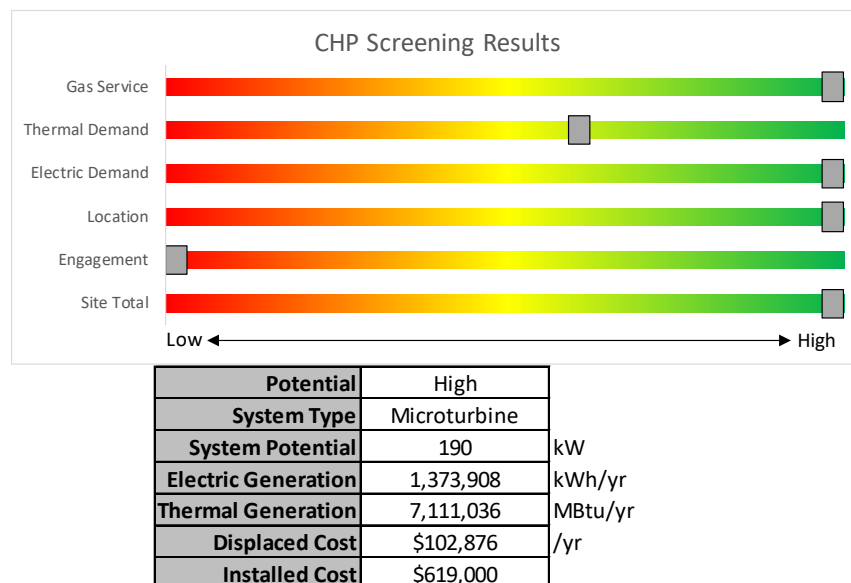


Figure 10 - Combined Heat and Power Screening

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/](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 this facility are identified in the Executive Summary. This section provides an overview of currently available in New Jersey’s Clean Energy Programs.

	<b>SmartStart</b> <i>Flexibility to install at your own pace</i>	<b>Direct Install</b> <i>Turnkey installation</i>	<b>Pay for Performance</b> <i>Whole building upgrades</i>
<b>Who should use it?</b>	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together.  Average peak demand should be below 200 kW.  Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time.  Peak demand should be over 200 kW.
<b>How does it work?</b>	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.
<b>What are the Incentives?</b>	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to \$125,000 per project.  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.
<b>How do I participate?</b>	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 <a href="http://www.njcleanenergy.com">www.njcleanenergy.com</a> 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 your facility. 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 efficient 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](http://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 your facility, 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](http://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](http://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) <sup>1</sup>	Incentive (\$/kW)	% of Total Cost Cap per Project <sup>3</sup>	\$ Cap per Project <sup>3</sup>
Powered by non-renewable or renewable fuel source <sup>4</sup>	≤500 kW	\$2,000	30-40% <sup>2</sup>	\$2 million
	Gas Internal Combustion Engine	>500 kW - 1 MW		
Gas Combustion Turbine	> 1 MW - 3 MW	\$550	30%	\$3 million
Microturbine	>3 MW	\$350		
Fuel Cells with Heat Recovery				
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](http://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](http://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 (Solar Renewable Energy Certificate) 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](http://www.njcleanenergy.com/srec).

## 8 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

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### 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 your facility'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<sup>7</sup>.

### 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<sup>8</sup>.

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<sup>7</sup> [www.state.nj.us/bpu/commercial/shopping.html](http://www.state.nj.us/bpu/commercial/shopping.html).

<sup>8</sup> [www.state.nj.us/bpu/commercial/shopping.html](http://www.state.nj.us/bpu/commercial/shopping.html).

# APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

## Lighting Inventory & Recommendations

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECIM #	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
Gym 3, 4	18	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,300	2, 4	Relamp	Yes	18	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,277	1.0	4,834	-1	\$580	\$2,125	\$360	3.0
Gym 3, 4	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
Weight Room	18	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	s	120	3,300	2, 4	Relamp	Yes	18	LED - Linear Tubes: (4) 4' TSHO (25W) Lamps	High/Low Control	102	2,277	0.6	3,242	-1	\$389	\$2,711	\$0	7.0
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
Gym 7, 8	34	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	s	120	3,300	2, 4	Relamp	Yes	34	LED - Linear Tubes: (4) 4' TSHO (25W) Lamps	High/Low Control	102	2,277	1.2	6,124	-1	\$735	\$5,210	\$0	7.1
Gym 7, 8	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
Room 127	6	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	s	176	3,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	2,277	0.5	2,526	-1	\$303	\$927	\$215	2.3
Room 127	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
Gym 5, 6	24	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	s	120	3,300	2, 4	Relamp	Yes	24	LED - Linear Tubes: (4) 4' TSHO (25W) Lamps	High/Low Control	102	2,277	0.9	4,323	-1	\$519	\$3,614	\$0	7.0
Gym 5, 6	1	Metal Halide: (1) 400W Lamp	Wall Switch	s	458	3,300	2	Relamp	No	1	LED Lamps: 120 Watt - 1L	Wall Switch	137	3,300	0.2	1,164	0	\$140	\$17	\$0	0.1
Gym 5, 6	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
Gym 1, 2	28	LED - Fixtures: High-Bay	Occupancy Sensor	s	141	2,700		None	No	28	LED - Fixtures: High-Bay	Occupancy Sensor	141	2,700	0.0	0	0	\$0	\$0	\$0	0.0
Gym 1, 2	2	Compact Fluorescent: 13 Watt - 2L - 4pin	Occupancy Sensor	s	26	2,700	2	Relamp	No	2	LED Lamps: 9 Watt - 1L	Occupancy Sensor	18	2,700	0.0	46	0	\$6	\$69	\$4	11.7
North Boiler Room	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.3	1,677	0	\$201	\$511	\$140	1.8
Belt Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.3	1,372	0	\$165	\$599	\$125	2.9
Control Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
South Wing Boiler Room	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.4	1,797	0	\$216	\$548	\$150	1.8
Room	3	Incandescent: 60 Watt - 1L	Wall Switch	s	60	3,300	2, 3	Relamp	Yes	3	LED Lamps: 9 Watt - 1L	Occupancy Sensor	9	2,277	0.1	586	0	\$70	\$322	\$38	4.0
Elec Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,300	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.1	719	0	\$86	\$219	\$60	1.8
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Main Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.3	1,372	0	\$165	\$599	\$125	2.9
Main Room	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
Performing	150	Halogen Incandescent: 750 Watt - 1L	Wall Switch	s	750	2,080		None	No	150	Halogen Incandescent: 750 Watt - 1L	Wall Switch	750	2,080	0.0	0	0	\$0	\$0	\$0	0.0
Art Center	48	Halogen Incandescent: 575 Watt - 1L	Wall Switch	s	575	2,080		None	No	48	Halogen Incandescent: 575 Watt - 1L	Wall Switch	575	2,080	0.0	0	0	\$0	\$0	\$0	0.0
Art Center	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	2,080	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.4	1,133	0	\$136	\$548	\$150	2.9

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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
Art Center	21	Incandescent: 65 Watt - 3L	Wall Switch	s	195	2,080		None	No	21	Incandescent: 65 Watt - 3L	Wall Switch	195	2,080	0.0	0	0	\$0	\$0	\$0	0.0
Art Center	15	Halogen Incandescent: 500 Watt - 1L	Wall Switch	s	500	2,080		None	No	15	Halogen Incandescent: 500 Watt - 1L	Wall Switch	500	2,080	0.0	0	0	\$0	\$0	\$0	0.0
Art Center	10	Halogen Incandescent: 250 Watt - 1L	Wall Switch	s	250	2,080		None	No	10	Halogen Incandescent: 250 Watt - 1L	Wall Switch	250	2,080	0.0	0	0	\$0	\$0	\$0	0.0
Art Center	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
Art Center	35	Halogen Incandescent: 75 Watt - 1L	Wall Switch	s	75	2,080		None	No	35	Halogen Incandescent: 75 Watt - 1L	Wall Switch	75	2,080	0.0	0	0	\$0	\$0	\$0	0.0
Art Center	30	LED Lamps: 19 Watt - 1L	Wall Switch	s	19	2,080		None	No	30	LED Lamps: 19 Watt - 1L	Wall Switch	19	2,080	0.0	0	0	\$0	\$0	\$0	0.0
Control Room	3	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	s	44	2,080		None	No	3	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,080	0.0	0	0	\$0	\$0	\$0	0.0
Shop	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	2,080	2, 3	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.5	1,441	0	\$173	\$818	\$185	3.7
Shop	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
South Auditorium	57	LED - Fixtures: High-Bay	Wall Switch	s	35	2,080		None	No	57	LED - Fixtures: High-Bay	Wall Switch	35	2,080	0.0	0	0	\$0	\$0	\$0	0.0
South Auditorium	16	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	s	35	3,300	4	None	Yes	16	LED - Fixtures: Ambient 2x2 Fixture	High/Low Control	35	2,277	0.1	630	0	\$76	\$810	\$0	10.7
South Auditorium	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
Stage	2	Metal Halide: (1) 400W Lamp	Wall Switch	s	400	3,300	2	Relamp	No	2	LED Lamps: 120 Watt - 1L	Wall Switch	120	3,300	0.4	2,033	0	\$244	\$34	\$0	0.1
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
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Gym 3, 4	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 4	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,277	0.3	1,677	0	\$201	\$942	\$110	4.1
Gym 3, 4	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	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Gym 3, 4 Girls RR	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,277	0.2	1,067	0	\$128	\$526	\$70	3.6
Gym 3, 4 Girls RR	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
Gym Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,277	0.1	610	0	\$73	\$416	\$40	5.1
Gym Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Gym Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Football Locker	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,277	0.3	1,372	0	\$165	\$869	\$90	4.7



Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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
Football Locker	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
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Junior LR	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	1,219	0	\$146	\$562	\$115	3.1
Junior LR	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
Shower Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	762	0	\$92	\$453	\$85	4.0
RSH	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Gym 7, 8 Girl LR	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,277	0.2	798	0	\$96	\$453	\$85	3.8
Gym 7, 8 Girl LR	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.3	1,677	0	\$201	\$672	\$145	2.6
Gym 7, 8 Boys LR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,829	0	\$220	\$708	\$155	2.5
Gym 7, 8 Boys LR	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,277	0.1	639	0	\$77	\$416	\$75	4.4
Gym 5, 6 Girls LR	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	1,219	0	\$146	\$562	\$115	3.1
Gym 5, 6 Girls LR	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2, 3	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,277	0.3	1,437	0	\$173	\$869	\$160	4.1
Baseball Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	191	0	\$23	\$55	\$15	1.7
Baseball LR	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2, 3	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,277	0.2	1,118	0	\$134	\$526	\$105	3.1
Baseball LR	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
Closet	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.1	254	0	\$31	\$73	\$20	1.7
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	s	22	3,300	2	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	3,300	0.0	49	0	\$6	\$16	\$3	2.3
Gym 5, 6 Girls RR	23	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2, 3	Relamp	Yes	23	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,277	0.4	1,836	0	\$221	\$960	\$185	3.5
Gym 5, 6 Girls RR	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
RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	127	0	\$15	\$37	\$10	1.7

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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
Basketball LR	24	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2, 3	Relamp	Yes	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,277	0.4	1,916	0	\$230	\$978	\$190	3.4
Basketball LR	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	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	191	0	\$23	\$55	\$15	1.7
Office 2	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	762	0	\$92	\$453	\$85	4.0
RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	s	22	3,300	2	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	3,300	0.0	49	0	\$6	\$16	\$3	2.3
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,300	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.1	359	0	\$43	\$110	\$30	1.8
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
Closet	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
Boys LR	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	s	33	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	116	0	\$14	\$65	\$12	3.8
Boys LR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,744	-1	\$329	\$927	\$215	2.2
Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7
Shower Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	915	0	\$110	\$489	\$95	3.6
Shower Room	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
Girls LR	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	s	33	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	116	0	\$14	\$65	\$12	3.8
Girls LR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,744	-1	\$329	\$927	\$215	2.2
Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7
Shower Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	915	0	\$110	\$489	\$95	3.6
Shower Room	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	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6
Snack Building	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7
Snack Building	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	s	88	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	214	0	\$26	\$37	\$10	1.0
Snack Building	3	Incandescent: 60 Watt - 1L	Wall Switch	s	60	3,300	2, 3	Relamp	Yes	3	LED Lamps: 9 Watt - 1L	Occupancy Sensor	9	2,277	0.1	586	0	\$70	\$322	\$38	4.0
Snack Building	2	Incandescent: 70 Watt - 1L	Wall Switch	s	70	3,300	2	Relamp	No	2	LED Lamps: 10 Watt - 1L	Wall Switch	11	3,300	0.1	432	0	\$52	\$34	\$2	0.6
Snack Building	2	Metal Halide: (1) 70W Lamp	Wall Switch	s	95	3,300	2	Relamp	No	2	LED Lamps: 21 Watt - 1L	Wall Switch	21	3,300	0.1	537	0	\$65	\$34	\$0	0.5

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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
Boys Middle Roof	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Boys Middle Roof	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	191	0	\$23	\$55	\$15	1.7
Girls Middle Roof	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,300	2	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	191	0	\$23	\$55	\$15	1.7
Front Parking Lot	20	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	s	179	4,380		None	No	20	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	179	4,380	0.0	0	0	\$0	\$0	\$0	0.0
Back Parking Lot	12	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	s	179	4,380		None	No	12	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	179	4,380	0.0	0	0	\$0	\$0	\$0	0.0
Wall Pack	15	Compact Fluorescent: 13 Watt - 2L - pin base	Photocell	s	26	4,380	2	Relamp	No	15	LED Lamps: LED Lamps	Photocell	9	4,380	0.1	1,110	0	\$135	\$757	\$0	5.6
Roof Wall Pack	10	Metal Halide: (1) 250W Lamp	Photocell	s	295	4,380	1	Fixture Replacement	No	10	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	75	4,380	1.1	9,636	0	\$1,174	\$6,500	\$1,000	4.7
Street pole light	25	Metal Halide: (1) 250W Lamp	Photocell	s	295	4,380	1	Fixture Replacement	No	25	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell	75	4,380	2.8	24,090	0	\$2,936	\$16,250	\$2,500	4.7
Wall Pack	12	Compact Fluorescent: 42 Watt - 2L - pin base	Photocell	s	84	4,380	2	Relamp	No	12	LED Lamps: LED Lamps	Photocell	29	4,380	0.3	2,870	0	\$350	\$605	\$0	1.7
Wall Pack	16	Compact Fluorescent: 26 Watt - 2L - pin base	Photocell	s	52	4,380	2	Relamp	No	16	LED Lamps: LED Lamps	Photocell	18	4,380	0.3	2,369	0	\$289	\$807	\$0	2.8
Wall Pack	12	Compact Fluorescent: 42 Watt - 1L - pin base	Photocell	s	42	4,380	2	Relamp	No	12	LED Lamps: LED Lamps	Photocell	29	4,380	0.1	662	0	\$81	\$303	\$0	3.8
Wall Pack	10	Compact Fluorescent: 32 Watt - 1L - pin base	Photocell	s	32	4,380	2	Relamp	No	10	LED Lamps: LED Lamps	Photocell	22	4,380	0.0	420	0	\$51	\$252	\$0	4.9
Ext Recessed	13	Metal Halide: (1) 100W Lamp	Photocell	s	128	4,380	1	Fixture Replacement	No	13	LED - Fixtures: Downlight Recessed	Photocell	30	4,380	0.6	5,580	0	\$680	\$1,973	\$65	2.8
Wall Pack	10	Metal Halide: (1) 100W Lamp	Photocell	s	128	4,380	1	Fixture Replacement	No	10	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	30	4,380	0.5	4,292	0	\$523	\$6,500	\$1,000	10.5
Wall Pack	5	High-Pressure Sodium: (1) 100W Lamp	Photocell	s	138	4,380	1	Fixture Replacement	No	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	30	4,380	0.3	2,365	0	\$288	\$3,250	\$500	9.5
Wall Pack	3	Metal Halide: (1) 250W Lamp	Photocell	s	295	4,380	1	Fixture Replacement	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	75	4,380	0.3	2,891	0	\$352	\$1,950	\$300	4.7
Tennis Court	12	Metal Halide: (1) 1000W Lamp	Breaker Panel	s	1,080	3,432	1	Fixture Replacement	No	12	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Breaker Panel	400	3,432	4.1	28,005	0	\$3,413	\$14,334	\$0	4.2
Wrestling Gym	12	Compact Fluorescent: 26 Watt - 6L - pin base	Wall Switch	s	156	3,300	2, 4	Relamp	Yes	12	LED Lamps: 18 Watt - 6L	High/Low Control	109	2,277	0.7	3,513	-1	\$422	\$1,780	\$72	4.0
Wrestling Gym	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
100 Wing Hall	77	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	s	62	2,700	2	Relamp	No	77	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	1.8	7,547	-2	\$906	\$2,812	\$770	2.3
100 Wing Hall	3	Linear Fluorescent - T12: 2' T12 (20W) - 3L	Occupancy Sensor	s	75	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	2,700	0.1	441	0	\$53	\$146	\$27	2.3
100 Wing Hall	9	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	9	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0
Gym 1, 2 Hall	23	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	s	93	2,700	2	Relamp	No	23	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.8	3,381	-1	\$406	\$1,260	\$345	2.3
Gym 1, 2 Hall	10	Compact Fluorescent: 26 Watt - 2L - pin base	Occupancy Sensor	s	52	2,700	2	Relamp	No	10	LED Lamps: 18 Watt - 2L	Occupancy Sensor	36	2,700	0.1	463	0	\$56	\$345	\$20	5.8
Gym 1, 2 Hall	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		
Room 129	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,439	-1	\$293	\$854	\$195	2.3		
Room 130	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4		
Room 128	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	2,134	0	\$256	\$781	\$175	2.4		
Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.1	537	0	\$64	\$416	\$75	5.3		
Boys RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch		33	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	58	0	\$7	\$33	\$6	3.8		
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8		
Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.1	537	0	\$64	\$416	\$75	5.3		
Girls RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch		33	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	58	0	\$7	\$33	\$6	3.8		
Room 126	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	915	0	\$110	\$489	\$95	3.6		
Room 126	1	Linear Fluorescent - T12: 2' T12 (20W) - 4L	Wall Switch		100	3,300	2	Relamp	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	3,300	0.0	240	0	\$29	\$65	\$12	1.8		
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8		
RR	1	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch		50	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	120	0	\$14	\$33	\$6	1.8		
Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8		
Office 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7		
Office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8		
Conf Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7		
Room 125	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4		
Room 123	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4		
Room 124	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	1.1	5,487	-1	\$659	\$2,125	\$465	2.5		
Teacher Lounge	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7		
Room 122	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.9	4,573	-1	\$549	\$1,905	\$405	2.7		
Room 212	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4		
Room 119	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4		
Room 120	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,744	-1	\$329	\$1,197	\$250	2.9		
Room 118	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.2	784	0	\$94	\$292	\$80	2.3		





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 117	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4			
Room 116B	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 116A	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 114A	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.2	784	0	\$94	\$292	\$80	2.3			
Room 114A	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor		32	2,700	2	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,700	0.1	260	0	\$31	\$91	\$25	2.1			
Room 115	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4			
Room 114	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.3	1,372	0	\$165	\$599	\$125	2.9			
Men RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	196	0	\$24	\$73	\$20	2.3			
Women RR	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	735	0	\$88	\$274	\$75	2.3			
Bldg Office	5	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch		40	3,300	3	None	Yes	5	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,277	0.0	225	0	\$27	\$270	\$35	8.7			
Reviewing Hall	34	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	34	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	1.0	5,182	-1	\$622	\$2,052	\$445	2.6			
Maintenance Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	1,219	0	\$146	\$562	\$115	3.1			
Maintenance Office	1	Linear Fluorescent - T12: 2' T12 (20W) - 4L	Wall Switch		100	3,300	2	Relamp	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	3,300	0.0	240	0	\$29	\$65	\$12	1.8			
Cleaner Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			
Men RR	3	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch		50	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,277	0.1	417	0	\$50	\$214	\$18	3.9			
Men RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8			
Girls RR	2	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch		50	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,277	0.1	278	0	\$33	\$335	\$12	9.7			
Girls RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8			
Room 111	23	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch		40	3,300	3	None	Yes	23	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,277	0.2	1,035	0	\$124	\$270	\$35	1.9			
Room 112	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.2	958	0	\$115	\$292	\$80	1.8			
Room 112	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,277	0.1	399	0	\$48	\$207	\$25	3.8			
Room 108A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Hallway	77	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 4	Relamp	Yes	77	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,277	2.3	11,737	-2	\$1,409	\$4,432	\$770	2.6			
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			
Room 109	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.3	1,372	0	\$165	\$599	\$125	2.9			

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 107	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,744	-1	\$329	\$1,197	\$250	2.9			
Room 107	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			
Copy Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			
Room 104	21	Compact Fluorescent: 26 Watt - 2L - pin base	Wall Switch		52	3,300	2, 3	Relamp	Yes	21	LED Lamps: 18 Watt - 2L	Occupancy Sensor	36	2,277	0.4	2,049	0	\$246	\$1,263	\$112	4.7			
Room 104	126	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	126	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	5.7	28,808	-6	\$3,459	\$9,871	\$2,275	2.2			
Room 104	12	Compact Fluorescent: 26 Watt - 2L - pin base	Occupancy Sensor		52	2,700	2	Relamp	No	12	LED Lamps: 18 Watt - 2L	Occupancy Sensor	36	2,700	0.1	556	0	\$67	\$413	\$24	5.8			
Room 104	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 104 Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Break Room 104C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room 104 B	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch		33	3,300	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	232	0	\$28	\$130	\$24	3.8			
Room 104 F	6	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch		33	3,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,277	0.1	463	0	\$56	\$465	\$71	7.1			
Room 104 G	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	190	0	\$23	\$130	\$24	4.6			
Room 104 H	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room 104 I	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room 104 J	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
IT Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	1,067	0	\$128	\$526	\$105	3.3			
Room 104 k	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room 104 m	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	915	0	\$110	\$489	\$95	3.6			
Women RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Men RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Room 104	62	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	62	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	1.9	9,450	-2	\$1,135	\$3,614	\$795	2.5			
Room 104	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	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			
Storage Room	2	Metal Halide: (1) 100W Lamp	Wall Switch		128	3,300	2	Relamp	No	2	LED Lamps: 30 Watt - 1L	Wall Switch	30	3,300	0.1	711	0	\$85	\$34	\$0	0.4			
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.1	479	0	\$58	\$146	\$40	1.8			

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			
Maintenance Shop	23	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	23	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.5	2,755	-1	\$331	\$840	\$230	1.8			
Maintenance Shop	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			
Boys RR	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.3	1,600	0	\$192	\$653	\$140	2.7			
Custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8			
Girls RR	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	1,029	0	\$124	\$383	\$105	2.3			
Room 102	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.3	1,372	0	\$165	\$599	\$125	2.9			
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8			
Atrium	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6			
Atrium	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			
Atrium	78	Compact Fluorescent: 26 Watt - 2L - pin base	Occupancy Sensor		52	2,700	2	Relamp	No	78	LED Lamps: 18 Watt - 2L	Occupancy Sensor	36	2,700	0.9	3,614	-1	\$434	\$2,687	\$156	5.8			
Atrium	5	Incandescent: 70 Watt - 1L	Wall Switch		70	3,300	2, 3	Relamp	Yes	5	LED Lamps: 10 Watt - 1L	Occupancy Sensor	11	2,277	0.2	1,139	0	\$137	\$356	\$40	2.3			
Security Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Main Office	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,323	0	\$159	\$493	\$135	2.3			
Main Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3			
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.1	359	0	\$43	\$110	\$30	1.8			
Main Office	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,744	-1	\$329	\$927	\$215	2.2			
Conf Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.3	1,372	0	\$165	\$599	\$125	2.9			
Principal Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6			
Room G12	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8			
Room G12	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room G2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room G8	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room G10	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room G9	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			



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 G11	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.1	359	0	\$43	\$110	\$30	1.8			
Room G3	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room G4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room G5	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room G6	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room G7	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Guidance Consular Room	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,744	-1	\$329	\$927	\$215	2.2			
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	98	0	\$12	\$37	\$10	2.3			
Boys RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	12	0	\$1	\$37	\$10	18.6			
Boys RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3			
Girls RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	12	0	\$1	\$37	\$10	18.6			
Girls RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3			
90 Wing Hall	32	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	32	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	1.1	4,704	-1	\$565	\$1,753	\$480	2.3			
90 Wing Hall	14	Compact Fluorescent: 26 Watt - 2L - pin base	Occupancy Sensor		52	2,700	2	Relamp	No	14	LED Lamps: 18 Watt - 2L	Occupancy Sensor	36	2,700	0.2	649	0	\$78	\$482	\$28	5.8			
90 Wing Hall	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			
Room 92	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	36	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	1.6	8,231	-2	\$988	\$2,782	\$645	2.2			
Room 92A	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	1,143	0	\$137	\$544	\$110	3.2			
Practice Room 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room 94	38	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	38	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	1.4	5,587	-1	\$671	\$2,081	\$570	2.3			
Room 94	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			
Room 92A	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			
Ensemble Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3			
Storage Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	735	0	\$88	\$274	\$75	2.3			
Room 94A	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			



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			
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Practice Room 3	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			
Practice Room 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			
Practice Room 1	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			
Room 97	23	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	23	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	1.0	5,259	-1	\$631	\$1,800	\$415	2.2			
Room 97	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 97A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8			
Room 96	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3			
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3			
Room 98	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3			
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3			
Theater Hallway	19	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	19	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.7	2,793	-1	\$335	\$1,041	\$285	2.3			
Theater 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	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			
Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Girls Drawing Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			
Girls Drawing Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	48	0	\$6	\$33	\$6	4.6			
Boys Drawing Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	48	0	\$6	\$33	\$6	4.6			
Boys Drawing Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			
Theater Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6			
Boys RR	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	735	0	\$88	\$274	\$75	2.3			
Boys RR	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	95	0	\$11	\$65	\$12	4.6			
Girls RR	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	735	0	\$88	\$274	\$75	2.3			



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 RR	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	95	0	\$11	\$65	\$12	4.6			
Room 108 - Storage	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor		15	2,700		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,700	0.0	0	0	\$0	\$0	\$0	0.0			
Room 108 Closet	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor		15	2,700		None	No	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,700	0.0	0	0	\$0	\$0	\$0	0.0			
Room 108 Closet	4	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor		9	2,700		None	No	4	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,700	0.0	0	0	\$0	\$0	\$0	0.0			
Room 108 Closet	8	LED Lamps: 21 Watt - 1L	Occupancy Sensor		21	2,700		None	No	8	LED Lamps: 21 Watt - 1L	Occupancy Sensor	21	2,700	0.0	0	0	\$0	\$0	\$0	0.0			
Room 110	35	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	35	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	1.1	5,335	-1	\$641	\$2,088	\$455	2.5			
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8			
Room 43 Stairwell	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	3,300	2	Relamp	No	5	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,300	0.2	1,016	0	\$122	\$365	\$100	2.2			
Room 43 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			
300 Wing Hallway	30	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor		114	2,700	2	Relamp	No	30	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,700	1.2	4,990	-1	\$599	\$2,191	\$600	2.7			
300 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 302	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3			
Prep Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Room 304	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,439	-1	\$293	\$1,124	\$230	3.1			
Prep Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			
Room 301	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4			
Room 303	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4			
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.1	479	0	\$58	\$146	\$40	1.8			
Room 305	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4			
Room 307	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4			
Room 306	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,439	-1	\$293	\$1,124	\$230	3.1			
Prep Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			
Room 108	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,439	-1	\$293	\$1,124	\$230	3.1			
Prep Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			
Room 309	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,982	0	\$238	\$745	\$165	2.4			

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 310	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,744	-1	\$329	\$1,197	\$250	2.9			
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.1	479	0	\$58	\$146	\$40	1.8			
Room 311	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,829	0	\$220	\$708	\$155	2.5			
Room 313	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	1,829	0	\$220	\$708	\$155	2.5			
Room 312	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,439	-1	\$293	\$1,124	\$230	3.1			
Prep Room	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.4	2,134	0	\$256	\$1,051	\$210	3.3			
Room 314	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,439	-1	\$293	\$1,124	\$230	3.1			
Prep Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.1	479	0	\$58	\$146	\$40	1.8			
Boys RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3			
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8			
Girls RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3			
Room 316	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,439	-1	\$293	\$1,124	\$230	3.1			
Prep Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			
Room 316	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch		88	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	214	0	\$26	\$37	\$10	1.0			
Room 315	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.5	2,286	0	\$275	\$1,088	\$220	3.2			
Room 315A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			
Storage Room 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8			
Storage Room 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8			
47 Stairwell	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	3,300	2	Relamp	No	5	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,300	0.2	1,016	0	\$122	\$365	\$100	2.2			
47 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			
400 Wing Hall	14	Compact Fluorescent: 26 Watt - 2L - pin base	Occupancy Sensor		52	2,700	2	Relamp	No	14	LED Lamps: 18 Watt - 2L	Occupancy Sensor	36	2,700	0.2	649	0	\$78	\$482	\$28	5.8			
400 Wing Hall	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.8	3,234	-1	\$388	\$1,205	\$330	2.3			
400 Wing Hall	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			
Room 406	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,058	0	\$247	\$767	\$210	2.3			
Stairwell	18	Compact Fluorescent: 26 Watt - 2L - pin base	Wall Switch		52	3,300	2	Relamp	No	18	LED Lamps: 18 Watt - 2L	Wall Switch	36	3,300	0.2	1,019	0	\$122	\$620	\$36	4.8			

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 407	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3			
Prep Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6			
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8			
Room 405	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3			
Room 405	6	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Occupancy Sensor		88	2,700	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.3	1,051	0	\$126	\$219	\$60	1.3			
Room 405	1	Linear Fluorescent - T12: 2' T12 (20W) - 3L	Occupancy Sensor		75	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	2,700	0.0	147	0	\$18	\$49	\$9	2.3			
Room 404	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,058	0	\$247	\$767	\$210	2.3			
Room 402	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,058	0	\$247	\$767	\$210	2.3			
Room 403	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3			
Room 403	1	Compact Fluorescent: 26 Watt - 2L - pin base	Occupancy Sensor		52	2,700	2	Relamp	No	1	LED Lamps: 18 Watt - 2L	Occupancy Sensor	36	2,700	0.0	46	0	\$6	\$34	\$2	5.8			
Prep Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6			
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8			
Room 401	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3			
Room 401	1	Linear Fluorescent - T12: 2' T12 (20W) - 3L	Occupancy Sensor		75	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	2,700	0.0	147	0	\$18	\$49	\$9	2.3			
Room 400	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,058	0	\$247	\$767	\$210	2.3			
Room 400	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Occupancy Sensor		88	2,700	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.2	876	0	\$105	\$183	\$50	1.3			
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8			
Boys RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	48	0	\$6	\$33	\$6	4.6			
Boys RR	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3			
Girls RR	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3			
Girls RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	48	0	\$6	\$33	\$6	4.6			
Storage Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,470	0	\$177	\$548	\$150	2.3			
RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8			
Loading Dock	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Loading Dock	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			



Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$65	5.7
Kitchen Hall	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$30	6.4
Kitchen Hall	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
North Kitchen	50	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	50	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	1.5	7,621	-2	\$915	\$2,906	\$640	2.5
North Kitchen	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
Kitchen Hood	6	Incandescent: 60 Watt - 1L	Wall Switch		60	3,300	2	Relamp	No	6	LED Lamps: 9 Watt - 1L	Wall Switch	9	3,300	0.2	1,111	0	\$133	\$103	\$6	0.7
Storage Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.3	1,372	0	\$165	\$599	\$125	2.9
Walk-in Unit	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch		29	3,300		None	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	0	0	\$0	\$0	\$0	0.0
North Cafeteria	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor		15	2,700		None	No	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,700	0.0	0	0	\$0	\$0	\$0	0.0
North Cafeteria	8	LED Lamps: 21 Watt - 1L	Occupancy Sensor		21	2,700		None	No	8	LED Lamps: 21 Watt - 1L	Occupancy Sensor	21	2,700	0.0	0	0	\$0	\$0	\$0	0.0
North Cafeteria	13	LED Lamps: 15 Watt - 1L	Wall Switch		15	3,300	3	None	Yes	13	LED Lamps: 15 Watt - 1L	Occupancy Sensor	15	2,277	0.0	219	0	\$26	\$270	\$35	8.9
North Cafeteria	4	LED Lamps: 19 Watt - 1L	Wall Switch		19	3,300		None	No	4	LED Lamps: 19 Watt - 1L	Wall Switch	19	3,300	0.0	0	0	\$0	\$0	\$0	0.0
North Cafeteria	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0
North Cafeteria	42	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	42	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	1.3	6,402	-1	\$769	\$2,614	\$560	2.7
Room 105	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.8	3,234	-1	\$388	\$1,205	\$330	2.3
Room 105	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	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	1,219	0	\$146	\$562	\$115	3.1
Room 106	42	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	42	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	1.3	6,402	-1	\$769	\$2,614	\$560	2.7
Main Dean Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	1,074	0	\$129	\$562	\$115	3.5
Room 106	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
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
Football Field	96	Metal Halide: (1) 1500W Lamp	Breaker Panel		1,610	3,432	1	Fixture Replacement	No	96	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Breaker Panel	500	3,432	53.3	365,714	0	\$44,566	\$114,672	\$0	2.6
Announcement Box	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7
Main Entrance	13	Compact Fluorescent: 26 Watt - 2L - pin base	Wall Switch		52	3,300	2, 4	Relamp	Yes	13	LED Lamps: 18 Watt - 2L	High/Low Control	36	2,277	0.3	1,269	0	\$152	\$718	\$26	4.5
South Audi Hall	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3

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			
Hall	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch		15	3,300		None	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	0	0	\$0	\$0	\$0	0.0			
Server Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	64	0	\$8	\$18	\$5	1.7			
Smith Café Hall	52	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	52	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	1.9	7,645	-2	\$918	\$2,848	\$780	2.3			
Smith Café Hall	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0			
BOE Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	1,143	0	\$137	\$544	\$110	3.2			
Room 19B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
BOE Office	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 19C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Room 19D	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Room 19E	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.0	147	0	\$18	\$55	\$15	2.3			
Room 19G	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			
Superintendent	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3			
BOE office entrance	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8			
Hall Main	3	LED Lamps: 13 Watt - 1L	Wall Switch		13	3,300		None	No	3	LED Lamps: 13 Watt - 1L	Wall Switch	13	3,300	0.0	0	0	\$0	\$0	\$0	0.0			
Business Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,286	0	\$275	\$818	\$185	2.3			
Business Office	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			
Room 14B	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3			
Room 14C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Room 14D	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Room 14E	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Room 14F	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8			
Room 14G	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Room 14I	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Room 14K	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.0	147	0	\$18	\$55	\$15	2.3			
Room 14L	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8			



		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
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	64	0	\$8	\$18	\$5	1.7
Room 15	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Room 15	26	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	26	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	1.2	5,945	-1	\$714	\$1,964	\$460	2.1
Room 15	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
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	686	0	\$82	\$434	\$80	4.3
RR1	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8
RR2	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.0	147	0	\$18	\$55	\$15	2.3
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,744	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,744	0.0	136	0	\$16	\$37	\$10	1.6
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,744	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,744	0.0	136	0	\$16	\$37	\$10	1.6
Room 13	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	98	0	\$12	\$37	\$10	2.3
Room 13	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.7	2,940	-1	\$353	\$1,095	\$300	2.3
Room 13	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
Studio	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.2	784	0	\$94	\$292	\$80	2.3
Studio	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
Studio	13	Halogen Incandescent: 70 Watt - 1L	Wall Switch		70	3,744	2, 3	Relamp	Yes	13	LED Lamps: 10 Watt - 1L	Occupancy Sensor	11	2,583	0.6	3,360	-1	\$403	\$494	\$35	1.1
Room 13 Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3
Room 3 Hallway	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3
Room 3 Hallway	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	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3
Room 12	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Closet	1	Linear Fluorescent - T12: 2' T12 (20W) - 1L	Wall Switch		25	3,744	2	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	3,744	0.0	68	0	\$8	\$16	\$3	1.6
Room 10B	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 10A	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3



Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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
Women RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3
Nurse Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	1,029	0	\$124	\$383	\$105	2.3
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.0	147	0	\$18	\$55	\$15	2.3
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3
Storage ROOM	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.0	147	0	\$18	\$55	\$15	2.3
Men RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.0	147	0	\$18	\$55	\$15	2.3
Men RR	1	Compact Fluorescent: 26 Watt - 2L - pin base	Occupancy Sensor		52	2,700	2	Relamp	No	1	LED Lamps: 18 Watt - 2L	Occupancy Sensor	36	2,700	0.0	46	0	\$6	\$34	\$2	5.8
Senior Lounge	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	3,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.5	2,685	-1	\$322	\$1,000	\$235	2.4
Annex Nurse	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
South Cafeteria	72	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 4	Relamp	Yes	72	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,277	3.3	16,462	-3	\$1,977	\$7,184	\$1,080	3.1
South Cafeteria	45	Compact Fluorescent: 26 Watt - 2L - pin base	Wall Switch		52	3,300	2, 4	Relamp	Yes	45	LED Lamps: 18 Watt - 2L	High/Low Control	36	2,277	0.9	4,392	-1	\$527	\$3,710	\$90	6.9
South Cafeteria	4	Compact Fluorescent: 26 Watt - 6L - pin base	Wall Switch		156	3,300	2, 4	Relamp	Yes	4	LED Lamps: 18 Watt - 6L	High/Low Control	109	2,277	0.2	1,171	0	\$141	\$683	\$24	4.7
South Cafeteria	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
South Kitchen	22	LED - Linear Tubes: (2) 4' Lamps	Wall Switch		29	3,300	3	None	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	718	0	\$86	\$540	\$70	5.5
South Kitchen	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
South Kitchen	17	Halogen Incandescent: 250 Watt - 1L	Wall Switch		250	3,300	2, 4	Relamp	Yes	17	LED Lamps: 37 Watt - 1L	High/Low Control	38	2,277	2.7	13,831	-3	\$1,661	\$1,103	\$0	0.7
Kitchen Hood	6	Incandescent: 60 Watt - 1L	Wall Switch		60	3,300	2	Relamp	No	6	LED Lamps: 9 Watt - 1L	Wall Switch	9	3,300	0.2	1,111	0	\$133	\$103	\$6	0.7
RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
Kitchen Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	\$55	\$380	\$65	5.7
Room	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch		29	3,300		None	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	0	0	\$0	\$0	\$0	0.0
Storage Room	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor		29	2,700		None	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	0	0	\$0	\$0	\$0	0.0
Storage Room	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
South Kitchen	5	LED Lamps: 21 Watt - 1L	Wall Switch		21	3,300		None	No	5	LED Lamps: 21 Watt - 1L	Wall Switch	21	3,300	0.0	0	0	\$0	\$0	\$0	0.0
Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.1	537	0	\$64	\$416	\$75	5.3

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
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Girls RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	48	0	\$6	\$33	\$6	4.6
custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor		32	2,700	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,700	0.0	52	0	\$6	\$18	\$5	2.1
Storage RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Boys RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	48	0	\$6	\$33	\$6	4.6
Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor		114	2,700	2	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,700	0.1	333	0	\$40	\$146	\$40	2.7
Room 1	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3
Room 2	27	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	27	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	1.0	3,969	-1	\$477	\$1,479	\$405	2.3
Room 2	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
Room 3	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.9	4,573	-1	\$549	\$1,905	\$405	2.7
Room 3	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
Room 4	44	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	44	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	1.3	6,707	-1	\$805	\$2,687	\$580	2.6
Room 4	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 5	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	127	0	\$15	\$37	\$10	1.7
Room 5	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.7	3,658	-1	\$439	\$1,416	\$310	2.5
Room 5	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
Closet	3	Incandescent: 60 Watt - 1L	Wall Switch		60	3,300	2	Relamp	No	3	LED Lamps: 9 Watt - 1L	Wall Switch	9	3,300	0.1	555	0	\$67	\$52	\$3	0.7
70 Wing Hallway	26	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	26	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.9	3,822	-1	\$459	\$1,424	\$390	2.3
70 Wing Hallway	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
Boys RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	64	0	\$8	\$18	\$5	1.7
Women RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3
Room 71	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 74	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 73	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3
Room 76	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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 75	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 78A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7
Room 78A	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Room 77	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 80	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.7	2,940	-1	\$353	\$1,095	\$300	2.3
Room 79	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 82	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.7	2,940	-1	\$353	\$1,095	\$300	2.3
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
Room 81	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor		114	2,700	2	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,700	0.1	499	0	\$60	\$219	\$60	2.7
20 Wing Hall	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.8	3,234	-1	\$388	\$1,205	\$330	2.3
20 Wing Hall	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 27	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3
Custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor		32	2,700	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,700	0.0	52	0	\$6	\$18	\$5	2.1
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3
Room 28	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.7	3,430	-1	\$412	\$1,092	\$260	2.0
Room 25	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.4	2,058	0	\$247	\$763	\$170	2.4
Room 26	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 24	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Room 23	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,323	0	\$159	\$493	\$135	2.3
Room 22	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Room 23A	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,323	0	\$159	\$493	\$135	2.3
Room 20	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Room 21	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3



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			
Men RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.0	147	0	\$18	\$55	\$15	2.3			
Suit 33 Hall	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,499	-1	\$300	\$931	\$255	2.3			
CMF Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	1,029	0	\$124	\$383	\$105	2.3			
CST Secretary	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3			
Senior P	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Senior H	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,744	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,583	0.1	519	0	\$62	\$380	\$65	5.0			
office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
CST - C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Main	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Marianne	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6			
Room 23 D	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,617	0	\$194	\$602	\$165	2.3			
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8			
Room 23 C	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,617	0	\$194	\$602	\$165	2.3			
Jon Bechi	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Longue Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,617	0	\$194	\$602	\$165	2.3			
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7			
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8			
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3			
Sprinkler Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6			
50 Wing Hall	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	1,911	0	\$230	\$712	\$195	2.3			
50 Wing Hall	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			
Room 56	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 59	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 57A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6			



Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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 57B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7
Room 54	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 57	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 52	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 55	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 53	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Server Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	127	0	\$15	\$37	\$10	1.7
Gym 3, 4 Hall	71	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	71	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	2.5	10,438	-2	\$1,253	\$3,889	\$1,065	2.3
Gym 3, 4 Hall	14	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	14	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0
Room 72 B	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3
Server Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	127	0	\$15	\$37	\$10	1.7
Room 70	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,176	0	\$141	\$438	\$120	2.3
Room 72 B	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Prep Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	735	0	\$88	\$274	\$75	2.3
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	127	0	\$15	\$37	\$10	1.7
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	64	0	\$8	\$18	\$5	1.7
Room 38	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 37	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 36	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 35	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 34	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 32	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 33	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 30	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3



Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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 30	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	686	0	\$82	\$434	\$80	4.3
Server Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	\$55	\$380	\$65	5.7
Room 31	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 29	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.0	180	0	\$22	\$55	\$15	1.8
Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor		114	2,700	2	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,700	0.1	333	0	\$40	\$146	\$40	2.7
Elec Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	127	0	\$15	\$37	\$10	1.7
Room 41	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Room 43 Stairwell	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Room 40	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,499	-1	\$300	\$931	\$255	2.3
Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3
Room 45	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Room 42	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Prep Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
Room 44	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 45A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	294	0	\$35	\$110	\$30	2.3
Room 47	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.5	2,205	0	\$265	\$822	\$225	2.3
Prep Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	588	0	\$71	\$219	\$60	2.3
Room 44A	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	686	0	\$82	\$434	\$80	4.3
Room 46	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 49	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 48	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 51	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Elec Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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 RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3
Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3
stairwell	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	240	0	\$29	\$73	\$20	1.8
stairwell	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.1	359	0	\$43	\$110	\$30	1.8
250 Wing Hall	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
250 Wing Hall	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 251 A	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.3	1,372	0	\$165	\$599	\$125	2.9
Room 251 A	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 252	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,323	0	\$159	\$493	\$135	2.3
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.2	915	0	\$110	\$489	\$95	3.6
Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3
Room 253	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 254	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,323	0	\$159	\$493	\$135	2.3
Room 255	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 256	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,323	0	\$159	\$493	\$135	2.3
Room 257	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3
Room 258	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,323	0	\$159	\$493	\$135	2.3
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	127	0	\$15	\$37	\$10	1.7
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,744	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,744	0.0	72	0	\$9	\$18	\$5	1.5
Stairwell 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.1	359	0	\$43	\$110	\$30	1.8
Stairwell 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Stairwell 3	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.1	318	0	\$38	\$91	\$25	1.7
280 Wing Hall	24	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor		32	2,700	2	Relamp	No	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,700	0.3	1,247	0	\$150	\$438	\$120	2.1
280 Wing Hall	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



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 271	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,744	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,583	0.1	778	0	\$93	\$434	\$80	3.8			
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	64	0	\$8	\$18	\$5	1.7			
Room 270	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 271A	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3			
Room 273	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 272	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 274	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 275	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 276	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.3	1,176	0	\$141	\$438	\$120	2.3			
Room 280	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 271	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 279	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 282	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.6	2,352	0	\$282	\$876	\$240	2.3			
Room 281	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.4	1,764	0	\$212	\$657	\$180	2.3			
Room 283	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	735	0	\$88	\$274	\$75	2.3			
Room 284	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.7	2,940	-1	\$353	\$1,095	\$300	2.3			
Room 285	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3			
Custodial 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	3,300	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	64	0	\$8	\$18	\$5	1.7			
Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	686	0	\$82	\$434	\$80	4.3			
Storage Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3			
Stairwell 4	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	3,300	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,300	0.3	1,617	0	\$194	\$493	\$135	1.8			
Stairwell 4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8			
Stairwell 4	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			
Field House	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	\$73	\$416	\$75	4.7			

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	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
Well Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	98	0	\$12	\$37	\$10	2.3
Fire Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.0	147	0	\$18	\$55	\$15	2.3
RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	48	0	\$6	\$33	\$6	4.6
Trophy Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor		114	2,700	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,700	0.0	166	0	\$20	\$73	\$20	2.7
Trophy Room	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
Boiler Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Boiler Room	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
Hallway	5	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.1	238	0	\$29	\$163	\$30	4.6
Hallway	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
RR 1	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3
Locker Room 1	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	95	0	\$11	\$65	\$12	4.6
Locker Room 1	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3
Locker Room 1	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
RR 2	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	95	0	\$11	\$65	\$12	4.6
Locker Room 2	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor		33	2,700	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,700	0.0	95	0	\$11	\$65	\$12	4.6
Locker Room 2	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.2	882	0	\$106	\$329	\$90	2.3
Locker Room 2	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
RR 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	2,700	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,700	0.1	441	0	\$53	\$164	\$45	2.3
Exterior	13	Halogen Incandescent: 65 Watt - 1L	Timeclock		65	4,380	2	Relamp	No	13	LED Lamps: LED Lamps	Timeclock	10	4,380	0.4	3,146	0	\$383	\$224	\$13	0.6
Men RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	196	0	\$24	\$73	\$20	2.3
Women RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	2,700	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,700	0.0	196	0	\$24	\$73	\$20	2.3
Ext Garage-Flood Light	4	Halogen Incandescent: 50 Watt - 1L	Photocell		50	4,380	1	Fixture Replacement	No	4	LED - Fixtures: Downlight Recessed	Photocell	8	4,380	0.1	745	0	\$91	\$607	\$20	6.5
Ext Garage	2	High-Pressure Sodium: (1) 70W Lamp	Photocell		95	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	21	4,380	0.1	648	0	\$79	\$1,300	\$200	13.9
Ext Garage	2	Compact Fluorescent: 32 Watt - 1L - pin base	Photocell		32	4,380	2	Relamp	No	2	LED Lamps: LED Lamps	Photocell	22	4,380	0.0	84	0	\$10	\$50	\$0	4.9
Ext Garage	2	Metal Halide: (1) 400W Lamp	Photocell		458	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	120	4,380	0.3	2,961	0	\$361	\$1,300	\$200	3.0

		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
Bus Garage	38	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 4	Relamp	Yes	38	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,277	1.1	5,792	-1	\$696	\$3,008	\$380	3.8
Bus Garage	3	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch		158	3,300	2	Relamp	No	3	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	3,300	0.2	937	0	\$112	\$266	\$60	1.8
Bus Garage	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
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	\$14	\$37	\$10	1.8
Storage Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,300	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	1,067	0	\$128	\$526	\$105	3.3

### Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
		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	Various Spaces	28	Exhaust Fan	0.2	60.0%	No	B	2,500		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	Various Spaces	21	Exhaust Fan	0.3	65.0%	No	B	2,500		No	65.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	Various Spaces	9	Exhaust Fan	0.8	70.0%	No	B	2,500		No	70.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	Various Spaces	20	Exhaust Fan	0.3	65.0%	No	B	2,500		No	65.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	Kitchen	2	Kitchen Hood Exhaust Fan	0.5	70.0%	No	N	2,500	9	No	78.2%	Yes	2	0.1	3,166	78	\$1,049	\$5,697	\$300	5.1
Roof	Classrooms 108	4	Exhaust Fan	0.5	70.0%	No	N	2,500		No	70.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	Classrooms 108	1	Exhaust Fan	0.5	70.0%	No	N	2,500		No	70.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	South Wing Kitchen/Classroom 108	3	Supply Fan	3.0	82.0%	No	N	2,500	6	No	89.5%	Yes	3	2.9	8,834	0	\$1,076	\$11,437	\$720	10.0
Roof	Gymnasiums	4	Exhaust Fan	2.0	80.5%	No	B	2,500	6	No	86.5%	Yes	4	2.6	7,818	0	\$953	\$14,492	\$640	14.5
Roof	Science Classrooms	6	Exhaust Fan	1.5	80.5%	No	N	2,500	6	No	86.5%	Yes	6	3.0	8,795	0	\$1,072	\$20,281	\$720	18.3
Roof	Various Spaces	14	Exhaust Fan	0.5	70.0%	No	B	2,500		No	70.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	Gym 7-8	4	Exhaust Fan	0.5	70.0%	No	B	2,500		No	70.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	ERU2	1	Supply Fan	5.0	89.5%	No	W	2,500	6	No	89.5%	Yes	1	1.4	3,907	0	\$476	\$4,197	\$400	8.0
Roof	ERU2	1	Exhaust Fan	5.0	87.5%	No	W	2,500	6	No	89.5%	Yes	1	1.5	4,157	0	\$507	\$4,197	\$400	7.5
Roof	ERU1B	1	Supply Fan	5.0	89.5%	No	W	2,500	6	No	89.5%	Yes	1	1.4	3,907	0	\$476	\$4,197	\$400	8.0
Roof	ERU1B	1	Exhaust Fan	5.0	85.5%	No	W	2,500	6	No	89.5%	Yes	1	1.6	4,419	0	\$538	\$4,197	\$400	7.1
Roof	ERU1A	1	Supply Fan	5.0	89.5%	No	W	2,500	6	No	89.5%	Yes	1	1.4	3,907	0	\$476	\$4,197	\$400	8.0
Roof	ERU1A	1	Exhaust Fan	5.0	85.5%	No	W	2,500	6	No	89.5%	Yes	1	1.6	4,419	0	\$538	\$4,197	\$400	7.1
Attic Floor	South Auditorium - AHU1	1	Supply Fan	5.0	89.5%	Yes	N	2,500		No	89.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Attic Floor	South Auditorium - AHU2	1	Supply Fan	5.0	89.5%	Yes	N	2,500		No	89.5%	No		0.0	0	0	\$0	\$0	\$0	0.0

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
		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	Gym 3-4	8	Exhaust Fan	0.8	70.0%	No	B	2,500		No	70.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	Various Spaces	3	Exhaust Fan	1.0	81.0%	No	B	2,500	6	No	85.5%	Yes	3	1.0	2,836	0	\$346	\$9,848	\$240	27.8
Gym 3-4	Gym 3-4 - AHUs	4	Supply Fan	3.0	82.0%	No	B	2,500	6	No	89.5%	Yes	4	3.9	11,779	0	\$1,435	\$15,250	\$960	10.0
Weigh Room	Weigh Room - AHUs	4	Supply Fan	2.0	81.0%	No	B	2,500	6	No	85.5%	Yes	4	2.5	7,562	0	\$921	\$13,384	\$640	13.8
North Boiler Room	Air Combustion	3	Combustion Air Fan	3.0	85.5%	No	W	2,000		No	85.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
North Boiler Room	North Wing Heating System	2	Heating Hot Water Pump	10.0	91.7%	Yes	W	2,000		No	91.7%	No		0.0	0	0	\$0	\$0	\$0	0.0
North Boiler Room	North Wing Heating System	1	Heating Hot Water Pump	15.0	93.0%	Yes	W	2,000		No	93.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
North Boiler Room	North Wing Heating System	1	Heating Hot Water Pump	20.0	89.0%	No	B	2,000	5	Yes	93.0%	No		0.4	1,082	0	\$132	\$2,248	\$0	17.1
North Boiler Room	North Wing Heating System	1	Heating Hot Water Pump	20.0	91.0%	No	B	2,000	5	Yes	93.0%	No		0.2	529	0	\$64	\$2,248	\$0	34.9
North Boiler Room	Domestic Hot Water Recirculation	2	Heating Hot Water Pump	0.3	65.0%	No	W	2,500		No	65.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
North Boiler Room	Air Combustion	1	Combustion Air Fan	0.3	65.0%	No	W	2,000		No	65.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Receiving Room	Receiving Room - AHU	1	Supply Fan	1.5	78.5%	No	B	2,500	6	No	86.5%	Yes	1	0.5	1,559	0	\$190	\$3,380	\$120	17.2
Belt Room	Domestic Hot Water Recirculation	1	Heating Hot Water Pump	0.2	65.0%	No	W	2,500		No	65.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Belt Room	Gym 5-6 - AHUs	2	Supply Fan	7.5	89.5%	No	W	2,500	6	No	91.0%	Yes	2	4.4	12,069	0	\$1,471	\$9,476	\$1,200	5.6
Belt Room	Hot Water Pump	2	Heating Hot Water Pump	1.5	82.0%	No	B	2,500	8	No	86.5%	Yes	2	0.4	2,798	0	\$341	\$6,781	\$0	19.9
Chiller Control Room	Chilled Water System	2	Chilled Water Pump	25.0	94.1%	No	W	2,500	7	No	94.1%	Yes	2	9.3	37,161	0	\$4,528	\$21,690	\$3,000	4.1
Chiller Control Room	Chilled Water System	2	Chilled Water Pump	75.0	95.0%	Yes	W	2,000		No	95.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
South Wing Boiler	Air Combustion	3	Combustion Air Fan	5.0	84.0%	No	W	2,000		No	84.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
South Wing Boiler	Domestic Hot Water Recirculation	3	Heating Hot Water Pump	0.2	60.0%	No	W	2,500		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
South Wing Boiler	Boiler Feed Water Pump	2	Boiler Feed Water Pump	0.5	70.0%	No	W	2,000		No	70.0%	No		0.0	0	0	\$0	\$0	\$0	0.0

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
		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
Condensate Pump Room	Condensate System	2	Condensate Pump	0.8	70.0%	No	W	2,500		No	70.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Elevator Room	Hydraulic Elevator	1	Process Pump	25.0	80.0%	No	W	1,000		No	80.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Field House	Door Lift	1	Process Pump	0.2	65.0%	No	W	2,500		No	65.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Bus Garage	Door Lift	4	Exhaust Fan	0.2	65.0%	No	W	2,500		No	65.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Bus Garage	Air Compressor	1	Air Compressor	7.5	91.0%	No	W	2,500		No	91.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
South Wing Classrooms	South Wing Classrooms - Unit Ventilators	110	Supply Fan	0.2	60.0%	No	B	2,500		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
School	School - Fan Coils	82	Supply Fan	0.2	60.0%	No	B	2,500		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Gym 3-4	Boys & Girls Locker Rooms - AHUs	2	Supply Fan	1.5	81.0%	No	B	2,500	6	No	86.5%	Yes	2	0.9	2,887	0	\$352	\$6,760	\$240	18.5
Varsity Locker Room	Varsity Locker Room	1	Supply Fan	1.5	81.0%	No	B	2,500	6	No	86.5%	Yes	1	0.5	1,443	0	\$176	\$3,380	\$120	18.5
Junior Varsity Locker Room	Junior Varsity Locker Room	1	Supply Fan	1.5	81.0%	No	B	2,500	6	No	86.5%	Yes	1	0.5	1,443	0	\$176	\$3,380	\$120	18.5
Gym 7-8	AHUs - Gym 7-8	2	Supply Fan	7.5	93.0%	No	W	2,500	6	No	93.0%	Yes	2	4.3	11,280	0	\$1,375	\$9,521	\$1,200	6.1
Room 104	Wood Shop - AHU	1	Supply Fan	1.5	81.0%	No	B	2,500	6	No	86.5%	Yes	1	0.5	1,443	0	\$176	\$3,380	\$120	18.5
North Kitchen	North Kitchen - AHU	1	Supply Fan	1.5	81.0%	No	B	2,500	6	No	86.5%	Yes	1	0.5	1,443	0	\$176	\$3,380	\$120	18.5
South Kitchen	South Kitchen - AHU	1	Supply Fan	2.0	86.5%	No	W	2,500	6	No	86.5%	Yes	1	0.6	1,617	0	\$197	\$3,623	\$160	17.6
Room 3	Room 3 - AHU	1	Supply Fan	1.0	80.0%	No	B	2,500	6	No	85.5%	Yes	1	0.3	975	0	\$119	\$3,283	\$80	26.9
Room 5	Room 5 - AHU	1	Supply Fan	1.0	80.0%	No	B	2,500	6	No	85.5%	Yes	1	0.3	975	0	\$119	\$3,283	\$80	26.9
Roof	N9 - Media Center	1	Supply Fan	15.0	89.5%	No	B	2,500	6	No	92.4%	Yes	1	4.5	12,384	0	\$1,509	\$7,086	\$1,200	3.9
Roof	N9 - Media Center	1	Exhaust Fan	3.0	82.5%	No	B	2,500	6	No	89.5%	Yes	1	1.0	2,901	0	\$354	\$3,812	\$240	10.1
Roof	N8 - Cafeteria/Room 106	1	Supply Fan	10.0	87.5%	No	B	2,500	6	No	91.7%	Yes	1	3.1	8,652	0	\$1,054	\$5,375	\$800	4.3
Roof	N8 - Cafeteria/Room 107	1	Exhaust Fan	1.0	80.5%	No	B	2,500	6	No	85.5%	Yes	1	0.3	960	0	\$117	\$3,283	\$80	27.4



Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
		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	N7 - Kitchen/Rooms 107-109 - 111	1	Supply Fan	7.5	84.5%	No	B	2,500	6	No	91.7%	Yes	1	2.4	7,085	0	\$863	\$4,761	\$600	4.8
Roof	N7 - Kitchen/Rooms 107-109 - 112	1	Exhaust Fan	0.8	70.0%	No	B	2,500	6	No	81.1%	Yes	1	0.3	934	0	\$114	\$2,880	\$60	24.8
Roof	N6 - Media Center	1	Supply Fan	15.0	89.5%	No	B	2,500	6	No	92.4%	Yes	1	4.5	12,384	0	\$1,509	\$7,086	\$1,200	3.9
Roof	N6 - Media Center	1	Exhaust Fan	3.0	82.5%	No	B	2,500	6	No	89.5%	Yes	1	1.0	2,901	0	\$354	\$3,812	\$240	10.1
Roof	M6A - Half Auditorium	1	Supply Fan	7.5	84.5%	Yes	B	2,500	5	Yes	91.7%	No		0.3	910	0	\$111	\$1,154	\$0	10.4
Roof	M6B - Half Auditorium	1	Supply Fan	7.5	84.5%	Yes	B	2,500	5	Yes	91.7%	No		0.3	910	0	\$111	\$1,154	\$0	10.4
Roof	M4A - Performance Art Center (PAC)	1	Supply Fan	15.0	89.5%	Yes	B	2,500	5	Yes	92.4%	No		0.2	687	0	\$84	\$1,891	\$0	22.6
Roof	M4A - Performance Art Center (PAC)	1	Exhaust Fan	10.0	84.7%	Yes	B	2,500	5	Yes	91.7%	No		0.3	1,177	0	\$143	\$1,567	\$0	10.9
Roof	M4B - Performance Art Center (PAC)	1	Supply Fan	15.0	89.5%	Yes	B	2,500	5	Yes	92.4%	No		0.2	687	0	\$84	\$1,891	\$0	22.6
Roof	M4B - Performance Art Center (PAC)	1	Exhaust Fan	10.0	84.7%	Yes	B	2,500	5	Yes	91.7%	No		0.3	1,177	0	\$143	\$1,567	\$0	10.9
Roof	M5 - Stage @ PAC	1	Supply Fan	15.0	89.5%	Yes	B	2,500	5	Yes	92.4%	No		0.2	687	0	\$84	\$1,891	\$0	22.6
Roof	M5 - Stage @ PAC	1	Exhaust Fan	10.0	84.7%	Yes	B	2,500	5	Yes	91.7%	No		0.3	1,177	0	\$143	\$1,567	\$0	10.9
Roof	N5 - Classrooms	1	Supply Fan	15.0	89.5%	No	B	2,500	6	No	92.4%	Yes	1	4.5	12,384	0	\$1,509	\$7,086	\$1,200	3.9
Roof	N5 - Classrooms	1	Exhaust Fan	3.0	82.5%	No	B	2,500	6	No	89.5%	Yes	1	1.0	2,901	0	\$354	\$3,812	\$240	10.1
Roof	N4 - Classrooms	1	Supply Fan	15.0	89.5%	No	B	2,500	6	No	92.4%	Yes	1	4.5	12,384	0	\$1,509	\$7,086	\$1,200	3.9
Roof	N4 - Classrooms	1	Exhaust Fan	3.0	82.5%	No	B	2,500	6	No	89.5%	Yes	1	1.0	2,901	0	\$354	\$3,812	\$240	10.1
Roof	N3 - Classrooms	1	Supply Fan	15.0	89.5%	No	B	2,500	6	No	92.4%	Yes	1	4.5	12,384	0	\$1,509	\$7,086	\$1,200	3.9
Roof	N3 - Classrooms	1	Exhaust Fan	3.0	82.5%	No	B	2,500	6	No	89.5%	Yes	1	1.0	2,901	0	\$354	\$3,812	\$240	10.1
Roof	N2 - Classrooms	1	Supply Fan	15.0	89.5%	No	B	2,500	6	No	92.4%	Yes	1	4.5	12,384	0	\$1,509	\$7,086	\$1,200	3.9
Roof	N2 - Classrooms	1	Exhaust Fan	2.0	82.5%	No	B	2,500	6	No	86.5%	Yes	1	0.6	1,837	0	\$224	\$3,623	\$160	15.5

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
		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	N1 - Classrooms	1	Supply Fan	15.0	89.5%	No	B	2,500	6	No	92.4%	Yes	1	4.5	12,384	0	\$1,509	\$7,086	\$1,200	3.9
Roof	N1 - Classrooms	1	Exhaust Fan	2.0	82.5%	No	B	2,500	6	No	86.5%	Yes	1	0.6	1,837	0	\$224	\$3,623	\$160	15.5
Roof	M3 - Aux Gym/Boys/Girls Locker Rooms	1	Supply Fan	3.0	82.5%	Yes	B	2,500	5	Yes	89.5%	No		0.1	371	0	\$45	\$805	\$0	17.8
Roof	M2A - Gym 1-2	1	Supply Fan	7.5	84.5%	Yes	B	2,500	5	Yes	91.7%	No		0.3	910	0	\$111	\$1,154	\$0	10.4
Roof	M2A - Gym 1-2	1	Exhaust Fan	3.0	82.5%	Yes	B	2,500	5	Yes	89.5%	No		0.1	371	0	\$45	\$805	\$0	17.8
Roof	M2B - Gym 1-2	1	Supply Fan	7.5	84.5%	Yes	B	2,500	5	Yes	91.7%	No		0.3	910	0	\$111	\$1,154	\$0	10.4
Roof	M2B - Gym 1-2	1	Exhaust Fan	3.0	82.5%	Yes	B	2,500	5	Yes	89.5%	No		0.1	371	0	\$45	\$805	\$0	17.8
Roof	M8 - Room 13 & Offices	1	Supply Fan	7.5	84.5%	Yes	B	2,500	5	Yes	91.7%	No		0.3	910	0	\$111	\$1,154	\$0	10.4
Roof	HVAC1	1	Supply Fan	5.0	84.5%	No	B	2,500	6	No	89.5%	Yes	1	1.6	4,554	0	\$555	\$4,197	\$400	6.8
Roof	HVAC3 - Business Office	1	Supply Fan	1.0	82.0%	No	W	2,500	6	No	85.5%	Yes	1	0.3	916	0	\$112	\$3,283	\$80	28.7



### Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
		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 MIMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Security Office	1	Split-System Air-Source HP	2.50	25.00	W		No						0.0	0	0	\$0	\$0	\$0	0.0	
Roof	Room 105	1	Split-System AC	1.25		W		No						0.0	0	0	\$0	\$0	\$0	0.0	
Roof	N9 - Media Center	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00	1.3	1,226	0	\$149	\$17,821	\$730	114.4	
Roof	N8 - Cafeteria/Room 106	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00	1.3	1,226	0	\$149	\$17,821	\$730	114.4	
Roof	N7 - Kitchen/Rooms 107-109 - 111	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00	1.3	1,226	0	\$149	\$17,821	\$730	114.4	
Roof	N6 - Media Center	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00	1.3	1,226	0	\$149	\$17,821	\$730	114.4	
Roof	Room 108	1	Split-System Air-Source HP	3.00	37.00	N	11	Yes	1	Split-System Air-Source HP	3.00	37.00	14.00	3.80	0.2	407	0	\$50	\$5,073	\$276	96.8
Roof	Server closet	1	Split-System AC	1.83		B	10	Yes	1	Split-System AC	1.83		14.00	0.3	324	0	\$39	\$2,738	\$168	65.1	
Roof	Office	1	Split-System AC	3.50		B	10	Yes	1	Split-System AC	3.50		14.00	0.7	620	0	\$76	\$5,237	\$322	65.1	
Roof	M4A - Performance Art Center (PAC)	1	Packaged AC	40.00		B	10	Yes	1	Packaged AC	40.00		12.00	8.2	7,675	0	\$935	\$88,639	\$0	94.8	
Roof	Room 101	1	Split-System AC	1.83		B	10	Yes	1	Split-System AC	1.83		14.00	0.3	324	0	\$39	\$2,738	\$168	65.1	
Roof	West Wing	1	Split-System AC	3.50		B	10	Yes	1	Split-System AC	3.50		14.00	0.7	620	0	\$76	\$5,237	\$322	65.1	
Roof	West Wing	1	Split-System AC	1.00		B	10	Yes	1	Split-System AC	1.00		14.00	0.2	177	0	\$22	\$1,496	\$92	65.1	
Roof	#7 - West Wing	1	Split-System AC	6.00		B	10	Yes	1	Split-System AC	6.00		12.00	0.7	663	0	\$81	\$6,983	\$438	81.0	
Roof	West Wing	1	Split-System AC	1.83		B	10	Yes	1	Split-System AC	1.83		14.00	0.3	324	0	\$39	\$2,738	\$168	65.1	
Roof	M6B - Half Auditorium	1	Packaged AC	20.00		B	10	Yes	1	Packaged AC	20.00		12.00	2.6	2,453	0	\$299	\$33,748	\$1,580	107.6	
Roof	West Wing	1	Split-System AC	1.00		B	10	Yes	1	Split-System AC	1.00		14.00	0.2	177	0	\$22	\$1,496	\$92	65.1	
Roof	M6A - Half Auditorium	1	Packaged AC	20.00		B	10	Yes	1	Packaged AC	20.00		12.00	2.6	2,453	0	\$299	\$33,748	\$1,580	107.6	
Roof	#2 - West Wing	1	Split-System AC	6.00		B	10	Yes	1	Split-System AC	6.00		12.00	0.7	663	0	\$81	\$6,983	\$438	81.0	
Roof	#3 - West Wing	1	Split-System AC	1.00		B	10	Yes	1	Split-System AC	1.00		14.00	0.2	177	0	\$22	\$1,496	\$92	65.1	

		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	#1 - West Wing	1	Split-System AC	6.00		B	10	Yes	1	Split-System AC	6.00		12.00		0.7	663	0	\$81	\$6,983	\$438	81.0
Roof	West Wing	1	Split-System AC	1.83		B	10	Yes	1	Split-System AC	1.83		14.00		0.3	324	0	\$39	\$2,738	\$168	65.1
Roof	M4B - Performance Art Center (PAC)	1	Packaged AC	40.00		B	10	Yes	1	Packaged AC	40.00		12.00		8.2	7,675	0	\$935	\$88,639	\$0	94.8
Roof	M5 - Stage @ PAC	1	Packaged AC	40.00		B	10	Yes	1	Packaged AC	40.00		12.00		8.2	7,675	0	\$935	\$88,639	\$0	94.8
Roof	West Wing	1	Split-System AC	3.50		B	10	Yes	1	Split-System AC	3.50		14.00		0.7	620	0	\$76	\$5,237	\$322	65.1
Roof	West Wing	4	Split-System AC	1.67		B	10	Yes	4	Split-System AC	1.67		14.00		1.3	1,180	0	\$144	\$9,975	\$613	65.1
Roof	N5 - Classrooms	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		11.50		1.1	1,024	0	\$125	\$17,821	\$730	137.0
Roof	N4 - Classrooms	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00		1.3	1,226	0	\$149	\$17,821	\$730	114.4
Roof	N3 - Classrooms	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00		1.3	1,226	0	\$149	\$17,821	\$730	114.4
Roof	N2 - Classrooms	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00		1.3	1,226	0	\$149	\$17,821	\$730	114.4
Roof	N1 - Classrooms	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00		1.3	1,226	0	\$149	\$17,821	\$730	114.4
Roof	M3 - Aux Gym/Boys/Girls Locker Rooms	1	Packaged AC	20.00		B	10	Yes	1	Packaged AC	20.00		12.00		2.6	2,453	0	\$299	\$33,748	\$1,580	107.6
Roof	HVAC1	1	Packaged AC	10.00		B	10	Yes	1	Packaged AC	10.00		12.00		1.3	1,226	0	\$149	\$17,821	\$730	114.4
Roof	M2A - Gym 1-2	1	Packaged AC	20.00		B	10	Yes	1	Packaged AC	20.00		12.00		2.6	2,453	0	\$299	\$33,748	\$1,580	107.6
Roof	M2B - Gym 1-2	1	Packaged AC	20.00		B	10	Yes	1	Packaged AC	20.00		12.00		2.6	2,453	0	\$299	\$33,748	\$1,580	107.6
Roof	Server Closets	2	Split-System AC	1.83		B	10	Yes	2	Split-System AC	1.83		14.00		0.7	648	0	\$79	\$5,476	\$337	65.1
Roof	AC1	1	Packaged AC	6.00		B	10	Yes	1	Packaged AC	6.00		12.00		0.8	736	0	\$90	\$10,693	\$438	114.4
Roof	HVAC3 - Business Office	1	Packaged AC	7.50		W		No							0.0	0	0	\$0	\$0	\$0	0.0
Roof	Business Office	1	Split-System AC	1.00		B	10	Yes	1	Split-System AC	1.00		14.00		0.2	189	0	\$23	\$1,496	\$92	60.9
Roof	M8 - Room 13 & Offices	1	Packaged AC	18.00		B	10	Yes	1	Packaged AC	18.00		11.50		2.0	1,843	0	\$225	\$25,089	\$1,422	105.4

		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	Offices & Server Closets	3	Split-System AC	1.67		B	10	Yes	3	Split-System AC	1.67		14.00		1.0	887	0	\$108	\$7,496	\$461	65.1
Roof	Server Closet	1	Split-System AC	1.00		W		No							0.0	0	0	\$0	\$0	\$0	0.0
Roof	HVAC2 - BOE Offices	1	Packaged AC	5.00		W		No							0.0	0	0	\$0	\$0	\$0	0.0
Roof	AC2 - BOE Offices	1	Split-System AC	5.00		W		No							0.0	0	0	\$0	\$0	\$0	0.0
Ground Floor	Data Center	1	Split-System AC	5.00		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
Ground Floor	School Cooling System	1	Air-Cooled Screw Chiller	288.00	B	12	Yes	1	Air-Cooled Screw Chiller	Variable	288.00	1.24	0.73	90.5	62,968	0	\$7,673	\$279,032	\$26,496	32.9

### Fuel Heating Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
		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
South Wing Boiler Room	South Wing Heating System	3	Natural Draft Steam Boiler	4,184.00	B	14	Yes	3	Natural Draft Steam Boiler	4,184.00	81.00%	Et	0.0	0	322	\$2,731	\$215,083	\$0	78.8
North Wing Boiler Room	North Wing Heating System	3	Non-Condensing Hot Water Boiler	3,348.20	B	13	Yes	3	Non-Condensing Hot Water Boiler	3,348.20	85.00%	Ec	0.0	0	491	\$4,165	\$174,707	\$13,058	38.8
Boiler Room	Field House Heating System	1	Non-Condensing Hot Water Boiler	152.00	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Bus Garage	Bus Garage Heating System	2	Furnace	115.00	B	15	Yes	2	Furnace	115.00	95.00%	AFUE	0.0	0	40	\$340	\$5,211	\$800	13.0
Roof	N9 - Media Center	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	72	\$611	\$10,876	\$400	17.2
Roof	N8 - Cafeteria/Room 106	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	38	\$321	\$10,876	\$400	32.6
Roof	N7 - Kitchen/Rooms 107-109 - 111	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	38	\$321	\$10,876	\$400	32.6
Roof	N6 - Media Center	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	38	\$321	\$10,876	\$400	32.6
Roof	South Wing Kitchen	1	Furnace	376.00	N		No						0.0	0	0	\$0	\$0	\$0	0.0
Roof	Classrooms 108/Cooking Classroom	2	Furnace	376.00	N		No						0.0	0	0	\$0	\$0	\$0	0.0
Roof	M4A - Performance Art Center (PAC)	1	Furnace	400.00	B	15	Yes	1	Furnace	400.00	95.00%	AFUE	0.0	0	32	\$268	\$9,063	\$400	32.3
Roof	M6B - Half Auditorium	1	Furnace	320.00	B	15	Yes	1	Furnace	320.00	95.00%	AFUE	0.0	0	25	\$214	\$7,250	\$400	32.0
Roof	M6A - Half Auditorium	1	Furnace	320.00	B	15	Yes	1	Furnace	320.00	95.00%	AFUE	0.0	0	25	\$214	\$7,250	\$400	32.0
Roof	M4B - Performance Art Center (PAC)	1	Furnace	400.00	B	15	Yes	1	Furnace	400.00	95.00%	AFUE	0.0	0	32	\$268	\$9,063	\$400	32.3
Roof	M5 - Stage @ PAC	1	Furnace	320.00	B	15	Yes	1	Furnace	320.00	95.00%	AFUE	0.0	0	25	\$214	\$7,250	\$400	32.0
Roof	N5 - Classrooms	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	38	\$321	\$10,876	\$400	32.6
Roof	N4 - Classrooms	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	38	\$321	\$10,876	\$400	32.6
Roof	N3 - Classrooms	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	38	\$321	\$10,876	\$400	32.6
Roof	N2 - Classrooms	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	38	\$321	\$10,876	\$400	32.6
Roof	N1 - Classrooms	1	Furnace	480.00	B	15	Yes	1	Furnace	480.00	95.00%	AFUE	0.0	0	38	\$321	\$10,876	\$400	32.6

Location	Area(s)/System(s) Served	Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
		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
Roof	M3 - Aux Gym/Boys/Girls Locker Rooms	1	Furnace	249.60	B	15	Yes	1	Furnace	249.60	95.00%	AFUE	0.0	0	20	\$167	\$5,655	\$400	31.4
Roof	HVAC1	1	Furnace	144.00	B	15	Yes	1	Furnace	144.00	95.00%	AFUE	0.0	0	11	\$96	\$3,263	\$400	29.7
Roof	M2A - Gym 1-2	1	Furnace	249.60	B	15	Yes	1	Furnace	249.60	95.00%	AFUE	0.0	0	20	\$167	\$5,655	\$400	31.4
Roof	M2B - Gym 1-2	1	Furnace	249.60	B	15	Yes	1	Furnace	249.60	95.00%	AFUE	0.0	0	20	\$167	\$5,655	\$400	31.4
Roof	Kitchen	1	Furnace	219.20	N		No						0.0	0	0	\$0	\$0	\$0	0.0
Roof	Room 13 & Offices	1	Furnace	249.60	B	15	Yes	1	Furnace	249.60	95.00%	AFUE	0.0	0	20	\$167	\$5,655	\$400	31.4
Roof	HVAC2 - BOE Offices	1	Furnace	64.00	W		No						0.0	0	0	\$0	\$0	\$0	0.0

### Demand Control Ventilation Recommendations

Location	Area(s)/System(s) Affected	Recommendation Inputs					Energy Impact & Financial Analysis						
		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
Roof	Performance Art Center - M4A/M4B	16	6.00	80.00	0.00	800.00	0.0	2,632	45	\$703	\$8,157	\$0	11.6
Roof	Auditorium - M6A/M6B	16	6.00	40.00	0.00	640.00	0.0	1,177	36	\$449	\$8,157	\$0	18.2
Roof	Cafeteria - N8	16	4.00	10.00	0.00	480.00	0.0	294	27	\$265	\$5,438	\$0	20.5
Gym 3-4 - AHUs	Gym 3-4 - AHUs	16	4.00	0.00	0.00	334.82	0.0	0	20	\$166	\$5,438	\$0	32.7
Gym 5-6 - AHUs	Gym 5-6 - AHUs	16	2.00	0.00	0.00	334.82	0.0	0	20	\$166	\$2,719	\$0	16.4
Gym 7-8 - AHUs	Gym 7-8 - AHUs	16	2.00	0.00	0.00	334.72	0.0	0	20	\$166	\$2,719	\$0	16.4
Aux Gym	Aux Gym	16	2.00	20.00	0.00	249.60	0.0	589	14	\$191	\$2,719	\$0	14.2
Roof	Gym 1-2 - M2A/M2B	16	4.00	40.00	0.00	499.20	0.0	1,177	28	\$382	\$5,438	\$0	14.2

### Pipe Insulation Recommendations

Location	Area(s)/System(s) Affected	Recommendation Inputs			Energy Impact & Financial Analysis						
		ECM #	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	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	17	20	1.50	0.0	0	13	\$113	\$176	\$0	1.5
Boiler Room	Domestic Hot Water System	17	10	1.00	0.0	0	5	\$39	\$88	\$0	2.2

### DHW Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
		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
North Wing Boiler Room	North Wing	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Belt Room	North Wing	3	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	\$0	\$0	\$0	0.0
South Wing Boiler Room	South Wing	2	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Closet	Varsity Locker Room	1	Storage Tank Water Heater (> 50 Gal)	B		No						0.0	0	0	\$0	\$0	\$0	0.0
Electrical Room	North Wing (400 Wing)	2	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Field House	Field House	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Bus Garage	Bus Garage	1	Storage Tank Water Heater (≤ 50 Gal)	W		No						0.0	0	0	\$0	\$0	\$0	0.0

### Low-Flow Device Recommendations

Location	Recommendation Inputs					Energy Impact & Financial Analysis						
	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	18	31	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	88	\$748	\$222	\$0	0.3



### Walk-In Cooler/Freezer Inventory & Recommendations

Location	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
	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
North Kitchen	1	Cooler (35F to 55F)		No	No	No	0.0	0	0	\$0	\$0	\$0	0.0
North Kitchen	1	Cooler (35F to 55F)		No	No	No	0.0	0	0	\$0	\$0	\$0	0.0
South Kitchen	1	Cooler (35F to 55F)		No	No	No	0.0	0	0	\$0	\$0	\$0	0.0

### Commercial Refrigerator/Freezer Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	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
Snack Bar	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
Room 108	6	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
Room 108/South Kitchen	2	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
Room 108	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
Room 108	1	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
North Cafeteria	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
North Cafeteria	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
South Kitchen	3	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0

### Commercial Ice Maker Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	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
South/Nrth Kitchens	2	Ice Making Head (≥450 lbs/day), Batch	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0

### Cooking Equipment Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Equipment Type	High Efficiency Equipment?	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
Room 108	6	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
Room 108	2	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	3	Insulated Food Holding Cabinet (Full Size)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	2	Electric Fryer	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	1	Electric Steamer	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	1	Electric Griddle (≤2 Feet Width)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	1	Electric Steamer	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	1	Electric Steamer	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	1	Electric Convection Oven (Full Size)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	2	Electric Convection Oven (Full Size)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
North Kitchen	2	Insulated Food Holding Cabinet (3/4 Size)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
Soth Kitchen	2	Insulated Food Holding Cabinet (3/4 Size)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
Soth Kitchen	1	Electric Convection Oven (Full Size)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
Soth Kitchen	2	Electric Fryer	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
Soth Kitchen	2	Insulated Food Holding Cabinet (3/4 Size)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!

**Plug Load Inventory**

Existing Conditions				
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
School	14	Refrigerator	155.0	Yes
School	4	Water Cooler	72.0	Yes
School	40	Microwave	800.0	No
School	20	Coffee Machine	450.0	No
School	17	Small Office Fridge	56.0	Yes
School	9	Toaster	500.0	No
School	3	Hot Dog Cooker	5,200.0	No
School	3	Commercial Coffe Machine	1,200.0	No
School	3	Kiln	11,000.0	No
School	1	Combo Washing/Dryer Machine	1,400.0	No
School	1	Small Ice Machine	112.0	Yes
School	330	Desktop Computers	120.0	Yes
School	16	Copy Machine	500.0	Yes
School	700	Chromebooks	45.0	Yes
School	40	Laptop with Monitors	95.0	Yes
School	1	Servers	16,250.0	

**Vending Machine Inventory & Recommendations**

Location	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
	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
Room 107	1	Refrigerated	19	Yes	0.2	1,612	0	\$196	\$230	\$50	0.9
North Wing Cafeteria	1	Refrigerated	19	Yes	0.2	1,612	0	\$196	\$230	\$50	0.9

# 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.

## ENERGY STAR® Statement of Energy Performance

**ENERGY STAR®**  
Score <sup>1</sup>

### Watchung Hills Regional High School

**Primary Property Type:** K-12 School  
**Gross Floor Area (ft²):** 406,648  
**Built:** 1956

**For Year Ending:** May 31, 2018  
**Date Generated:** July 02, 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		
<b>Property Address</b> Watchung Hills Regional High School 108 Stirling Road Warren, New Jersey 07059	<b>Property Owner</b> Watchung Hills Regional High School BOE 108 Stirling Road Warren, NJ 07059 ( ) -	<b>Primary Contact</b> Timothy Stys 108 Stirling Road Warren, NJ 07059 908-647-4800 Extn:4850 tstys@whrhs.org
<b>Property ID:</b> 7164717		

Energy Consumption and Energy Use Intensity (EUI)			
<b>Site EUI</b> 82.4 kBtu/ft²	<b>Annual Energy by Fuel</b>		<b>National Median Comparison</b>
	Natural Gas (kBtu)	19,523,108 (58%)	National Median Site EUI (kBtu/ft²) 68.8
	Electric - Grid (kBtu)	13,989,892 (42%)	National Median Source EUI (kBtu/ft²) 122.6
			% Diff from National Median Source EUI 20%
<b>Source EUI</b> 146.7 kBtu/ft²			<b>Annual Emissions</b>
			Greenhouse Gas Emissions (Metric Tons CO2e/year) 2,454

### 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

Timothy Stys  
 108 Stirling Road  
 Warren, NJ 07059  
 908-647-4800 Extn:4850  
 tstys@whrhs.org



Professional Engineer Stamp  
(if applicable)

## APPENDIX C: GLOSSARY

TERM	DEFINITION
<b>Blended Rate</b>	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.
<b>Btu</b>	<i>British thermal unit</i> : a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
<b>CHP</b>	<i>Combined heat and power</i> . Also referred to as cogeneration.
<b>COP</b>	<i>Coefficient of performance</i> : a measure of efficiency in terms of useful energy delivered divided by total energy input.
<b>Demand Response</b>	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.
<b>DCV</b>	<i>Demand control ventilation</i> : a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
<b>US DOE</b>	<i>United States Department of Energy</i>
<b>EC Motor</b>	<i>Electronically commutated motor</i>
<b>ECM</b>	<i>Energy conservation measure</i>
<b>EER</b>	<i>Energy efficiency ratio</i> : a measure of efficiency in terms of cooling energy provided divided by electric input.
<b>EUI</b>	<i>Energy Use Intensity</i> : measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
<b>Energy Efficiency</b>	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.
<b>ENERGY STAR®</b>	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
<b>EPA</b>	<i>United States Environmental Protection Agency</i>
<b>Generation</b>	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
<b>GHG</b>	<i>Greenhouse gas</i> 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.
<b>gpf</b>	<i>Gallons per flush</i>

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

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

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