Local Government Energy Audit Report

Mainland Regional High School

April 7, 2025

Prepared for:
Mainland Regional HS District
1301 Oak Ave
Linwood, New Jersey 08221

Prepared by:
TRC
317 George Street
New Brunswick, New Jersey 08901

Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities and help prioritize specific measures for implementation. 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 reviewed the energy conservation measures and estimates of energy savings 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 material and labor costs primarily on RS Means cost manuals as well as on our experience at similar facilities. This approach is based on standard cost estimating manuals and is vendor neutral. Cost estimates include material and labor pricing associated with one for one equipment replacements. Cost estimates do not include demolition or removal of hazardous waste. The actual implementation costs for energy savings projects are anticipated to be significantly higher based on the specific conditions at your site(s). We strongly recommend that you work with your design engineer or contractor to develop actual project costs for your specific scope of work for the installation of high efficiency equipment. We encourage you to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on selected products and installers. TRC and NJBPU do not guarantee cost estimates and shall in no event be held liable should actual installed costs vary from these material and labor estimates.

Incentive values provided in this report are estimated based on previously run state efficiency programs. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available utility 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.

Table of Contents

1 **Executive Summary** **1**

1.1 Planning Your Project 4

Pick Your Installation Approach 4

Options from Your Utility Company 4

Options from New Jersey's Clean Energy Program 5

2 **Existing Conditions** **6**

2.1 Site Overview 6

2.2 Building Occupancy 7

2.3 Building Envelope 7

2.4 Lighting Systems 10

2.5 Air Handling Systems 14

Unit Ventilators 14

Unitary Electric HVAC Equipment 16

Unitary Heating Equipment 19

Packaged Units 20

Air Handling Units (AHUs) 25

2.6 Heating Hot Water Systems 26

2.7 Chilled Water Systems 29

2.8 Building Automation System (BAS) 30

2.9 Domestic Hot Water 31

2.10 Food Service Equipment 33

2.11 Refrigeration 34

2.12 Plug Load and Vending Machines 35

2.13 Water-Using Systems 36

2.14 On-Site Generation 37

3 **Energy and Water Use and Costs** **38**

3.1 Electricity 40

3.2 Natural Gas 42

3.3 Water 43

3.4 Benchmarking 45

Tracking your Energy Performance 46

3.5 Understanding Your Utility Bills 47

4 Energy Conservation Measures 48

4.1 Lighting 51

ECM 1: Install LED Fixtures 51

ECM 2: Retrofit Fixtures with LED Lamps 51

4.2 Lighting Controls 52

ECM 3: Install Occupancy Sensor Lighting Controls 52

ECM 4: Install High/Low Lighting Controls 52

4.3 Variable Frequency Drives (VFD) 53

ECM 5: Install VFDs on Constant Volume (CV) Fans 53

ECM 6: Install VFDs on Kitchen Hood Fan Motors 53

4.4 Unitary HVAC 54

ECM 7: Install High Efficiency Air Conditioning Units 54

ECM 8: Install High Efficiency Heat Pumps 54

4.5 Electric Chillers 54

ECM 9: Install High Efficiency Chillers 54

4.6 Gas-Fired Heating 55

ECM 10: Install High Efficiency Furnaces 55

4.7 HVAC Improvements 56

ECM 11: Implement Demand Control Ventilation (DCV) 56

4.8 Domestic Water Heating 56

ECM 12: Install Low-Flow DHW Devices 56

4.9 Food Service and Refrigeration Measures 57

ECM 13: Refrigerator/Freezer Case Electrically Commutated Motors 57

ECM 14: Refrigeration Controls 57

ECM 15: Replace Refrigeration Equipment 58

ECM 16: Vending Machine Control 58

4.10 Custom Measures 58

ECM 17: Install Semi-Automatic Cover for Swimming Pool 58

4.11 Measures for Future Consideration 58

Retro-Commissioning Study 59

Upgrade to a Heat Pump System 59

VRF Systems 60

5 Energy Efficient Best Practices 61

Energy Tracking with ENERGY STAR Portfolio Manager 61

Weatherization 61
Doors and Windows 61
Window Treatments/Coverings 61
Lighting Maintenance 62
Lighting Controls 62
Motor Controls 62
Motor Maintenance 62
Fans to Reduce Cooling Load 62
Thermostat Schedules and Temperature Resets 62
Economizer Maintenance 63
Chiller Maintenance 63
AC System Evaporator/Condenser Coil Cleaning 63
HVAC Filter Cleaning and Replacement 63
Ductwork Maintenance 63
Boiler Maintenance 64
Furnace Maintenance 64
Label HVAC Equipment 64
Optimize HVAC Equipment Schedules 64
Water Heater Maintenance 65
Refrigeration Equipment Maintenance 65
Procurement Strategies 65
6 Water Best Practices 66
Getting Started 66
Leak Detection and Repair 66
Toilets and Urinals 66
Faucets and Showerheads 67
Commercial Kitchen Equipment 68
Ice Machines 68
Pools and Spas 69
7 On-Site Generation 71
7.1 Solar Photovoltaic 72
7.2 Combined Heat and Power 74
8 Electric Vehicles 75
8.1 EV Charging 75

9 Project Funding and Incentives 77

9.1 New Jersey's Clean Energy Program 78

9.2 Utility Energy Efficiency Programs 85

10 Project Development 87

11 Energy Purchasing and Procurement Strategies 88

11.1 Retail Electric Supply Options 88

11.2 Retail Natural Gas Supply Options 88

Appendix A: Equipment Inventory & Recommendations A-1

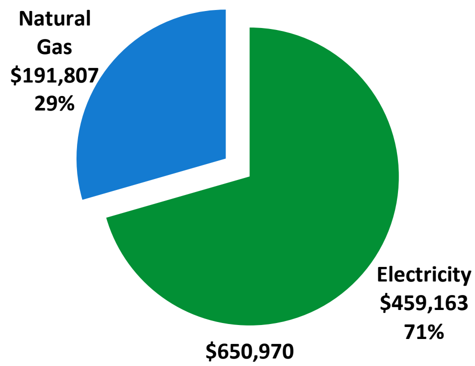
Appendix B: ENERGY STAR Statement of Energy Performance B-1

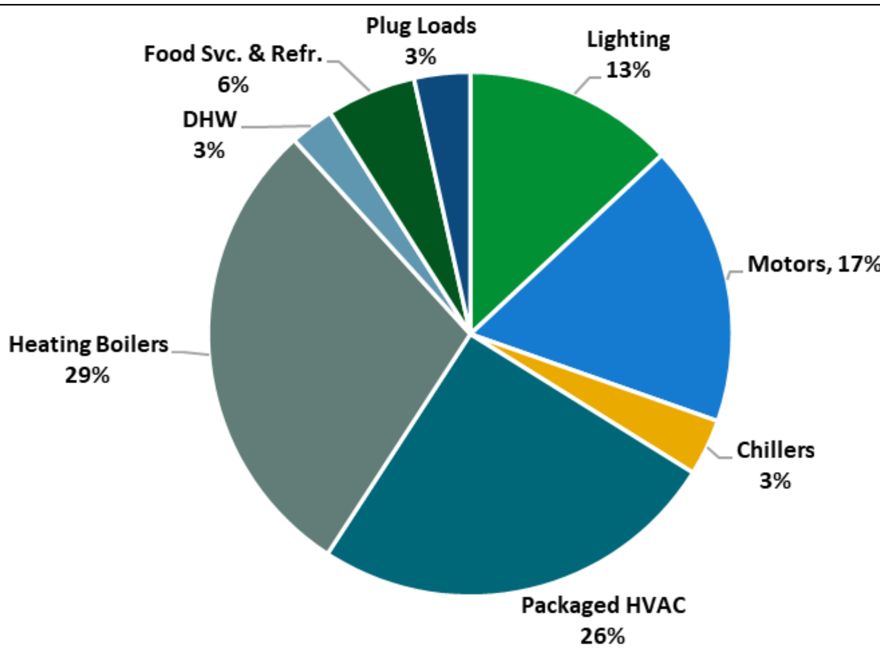
Appendix C: Glossary C-1

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Mainland 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 conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Energy Utilities	Costs: $650,970 Electricity: 3,891,389 kWh Natural Gas: 125,728 Therms Water: 2,115,813 Gallons	
ENERGY STAR® Benchmarking Score	17 *(1-100 scale)*	This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.



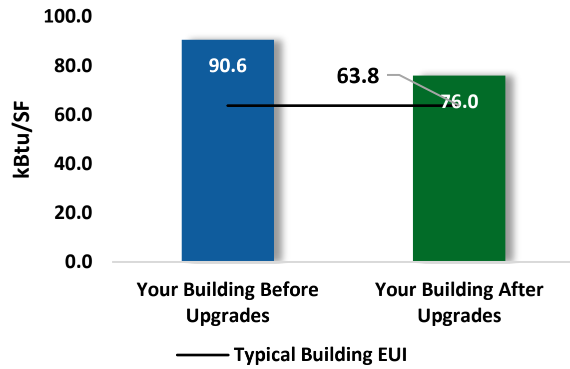
Energy Use by System

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.

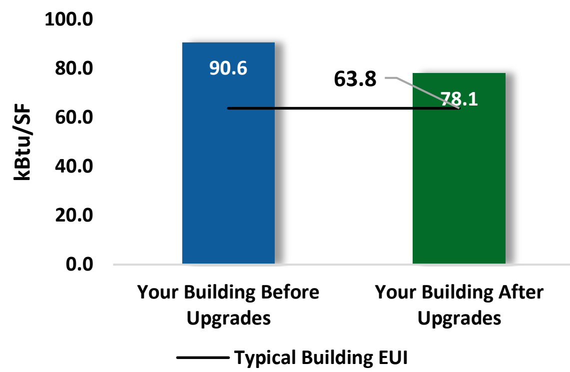
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$1,514,530
Potential Rebates & Incentives[1]	$109,750
Annual Cost Savings	$135,227
Annual Energy Savings	Electricity: 1,089,396 kWh Natural Gas: 4,381 Therms
Greenhouse Gas Emission Savings	574 Tons
Simple Payback	10.4 Years
Site Energy Savings (All Utilities)	16%



Scenario 2: Cost Effective Package[2]

Installation Cost	$560,270
Potential Rebates & Incentives	$59,620
Annual Cost Savings	$115,968
Annual Energy Savings	Electricity: 933,522 kWh Natural Gas: 3,813 Therms
Greenhouse Gas Emission Savings	492 Tons
Simple Payback	4.3 Years
Site Energy Savings (all utilities)	14%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on previously run state rebate programs. Contact your utility provider for current program incentives that may apply.

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**558,413**	**82.4**	**-115**	**$64,135**	**$170,030**	**$33,870**	**$136,160**	**2.1**	**548,848**
ECM 1	Install LED Fixtures	Yes	5,081	0.0	0	$600	$5,570	$400	$5,170	8.6	5,116
ECM 2	Retrofit Fixtures with LED Lamps	Yes	553,332	82.4	-115	$63,535	$164,460	$33,470	$130,990	2.1	543,732
Lighting Control Measures			**110,965**	**15.4**	**-23**	**$12,739**	**$67,960**	**$7,980**	**$59,980**	**4.7**	**109,024**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	110,500	15.4	-23	$12,686	$67,680	$7,800	$59,880	4.7	108,567
ECM 4	Install High/Low Lighting Controls	Yes	465	0.1	0	$53	$280	$180	$100	1.9	457
Variable Frequency Drive (VFD) Measures			**221,881**	**44.4**	**78**	**$27,378**	**$226,100**	**$15,700**	**$210,400**	**7.7**	**232,618**
ECM 5	Install VFDs on Constant Volume (CV) Fans	Yes	211,435	44.3	0	$24,948	$213,800	$15,400	$198,400	8.0	212,914
ECM 6	Install VFDs on Kitchen Hood Fan Motors	Yes	10,445	0.1	78	$2,429	$12,300	$300	$12,000	4.9	19,705
Unitary HVAC Measures			**117,044**	**54.8**	**48**	**$14,549**	**$723,300**	**$34,200**	**$689,100**	**47.4**	**123,529**
ECM 7	Install High Efficiency Air Conditioning Units	No	114,350	52.0	48	$14,231	$708,800	$33,700	$675,100	47.4	120,817
ECM 8	Install High Efficiency Heat Pumps	No	2,694	2.9	0	$318	$14,500	$500	$14,000	44.0	2,713
Electric Chiller Replacement			**12,770**	**6.2**	**0**	**$1,507**	**$201,500**	**$3,100**	**$198,400**	**131.7**	**12,859**
ECM 9	Install High Efficiency Chillers	No	12,770	6.2	0	$1,507	$201,500	$3,100	$198,400	131.7	12,859
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**8**	**$128**	**$3,600**	**$500**	**$3,100**	**24.2**	**985**
ECM 10	Install High Efficiency Furnaces	No	0	0.0	8	$128	$3,600	$500	$3,100	24.2	985
HVAC System Improvements			**13,601**	**0.0**	**82**	**$2,852**	**$39,600**	**$0**	**$39,600**	**13.9**	**23,264**
ECM 11	Implement Demand Control Ventilation (DCV)	Yes	13,601	0.0	82	$2,852	$39,600	$0	$39,600	13.9	23,264
Domestic Water Heating Upgrade			**0**	**0.0**	**72**	**$1,104**	**$9,150**	**$1,610**	**$7,540**	**6.8**	**8,471**
ECM 12	Install Low-Flow DHW Devices	Yes	0	0.0	72	$1,104	$9,150	$1,610	$7,540	6.8	8,471
Food Service & Refrigeration Measures			**19,347**	**2.0**	**0**	**$2,283**	**$29,790**	**$1,590**	**$28,200**	**12.4**	**19,482**
ECM 13	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,049	0.1	0	$124	$1,500	$160	$1,340	10.8	1,056
ECM 14	Refrigeration Controls	No	2,387	0.0	0	$282	$7,460	$330	$7,130	25.3	2,404
ECM 15	Replace Refrigeration Equipment	No	5,213	0.6	0	$615	$18,400	$800	$17,600	28.6	5,249
ECM 16	Vending Machine Control	Yes	10,699	1.2	0	$1,262	$2,430	$300	$2,130	1.7	10,773
Custom Measures			**0**	**0.0**	**287**	**$4,379**	**$43,500**	**$0**	**$43,500**	**9.9**	**33,604**
ECM 17	Install Semi-Automatic Cover for Swimming Pool	Yes	0	0.0	287	$4,379	$43,500	$0	$43,500	9.9	33,604
TOTALS (COST EFFECTIVE MEASURES)			**916,607**	**143.5**	**381**	**$113,972**	**$560,270**	**$59,620**	**$500,650**	**4.4**	**967,659**
TOTALS (ALL MEASURES)			**1,054,020**	**205.2**	**438**	**$131,053**	**$1,514,530**	**$98,550**	**$1,415,980**	**10.8**	**1,112,685**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

All Evaluated Energy Improvements[3]

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

[3] TRC bases estimated material and labor costs primarily on RS Means cost manuals as well as on our experience at similar facilities. This approach is based on standard cost estimating manuals and is vendor neutral. Cost estimates include material and labor pricing associated with one for one equipment replacements. Cost estimates do not include demolition or removal of hazardous waste. The actual implementation costs for energy savings projects are anticipated to be significantly higher based on the specific conditions at your site(s). We strongly recommend that you work with your design engineer or contractor to develop actual project costs for your specific scope of work for the installation of high efficiency equipment. We encourage you to obtain multiple estimates when considering measure installations.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decision 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

Utility-run energy efficiency programs and 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.

Options from Your Utility Company

Prescriptive and Custom Rebates

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 Prescriptive and Custom Rebates 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 may be required for some incentives. Contact your utility company for more details prior to project installation.

Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized contractor. This program can provide incentives up to 70% or 80% of the cost of selected measures. A Direct Install contractor will assess and verify individual measure eligibility and perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Engineered Solutions

The Engineered Solutions program provides tailored energy-efficiency assistance and turnkey engineering services to municipalities, universities, schools, hospitals, and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. The program provides all professional services from audit, design, construction administration, to commissioning and measurement and verification for custom whole-building energy-efficiency projects. Engineered Solutions 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.

For more details on these programs please contact your utility provider.

Options from New Jersey's Clean Energy Program

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 and Power (CHP)

The CHP program provides incentives for combined heat and power (i.e., 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.

Successor Solar Incentive Program (SuSI)

New Jersey is committed to supporting solar energy. Solar projects help the state reach the renewable goals outlined in the state's Energy Master Plan. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available, but certified solar projects are able to earn one SREC II (Solar Renewable Energy Certificates II) for each megawatt-hour of solar electricity produced from a qualifying solar facility.

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.

Large Energy User Program (LEUP)

LEUP is designed to promote self-investment in energy efficiency for the largest energy consumers in the state. Customers in this category spend about $5 million a year on energy bills. This program incentivizes owners/users of buildings to upgrade or install energy conserving measures in existing buildings to help offset the capital costs associated with the project. The efficiency upgrades are customized to meet the requirements of the customers' existing facilities, while advancing the State's energy efficiency, conservation, and greenhouse gas reduction goals.

For more details on these programs please visit New Jersey's Clean Energy Program website.

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Mainland 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.

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 September 28, 2024, TRC performed an energy audit at Mainland Regional High School located in Linwood, New Jersey. TRC met with facility representative to review the facility operations and help focus our investigation on specific energy-using systems.

Mainland Regional High School is a single-story, 278,650 square foot school building built in 1960. Spaces include classrooms, gymnasiums, a theater, offices, a cafeteria, corridors, a pool, storage/electrical spaces, computer labs, shop classrooms, conference rooms, a library, a commercial kitchen, restrooms, locker rooms, and mechanical spaces.

The campus grounds also include a 1,500 square foot maintenance garage and a 5,300 square foot storage garage.

Recent Improvements and Facility Concerns

The facility has not received any major improvements within recent years.

During the facility interview process, maintenance staff noted that there was particular interest in replacing HVAC equipment that were installed during renovations of the main school building in 2000. Concerns were also raised over the lack of controls for corridor lighting.

2.2 Building Occupancy

The school is fully occupied from September through June. Typical weekday occupancy is approximately 250 staff and 1,200 students. Facility maintenance staff operate the building between 5:00 AM to 11:00 PM. Students occupy the building during normal school hours between 8:00 AM to 2:30 PM, with additional occupation until 9:00 PM for most of the school year depending on after-school activities. There is no Sunday occupancy.

Summer occupancy includes summer schooling and pool access in certain portions of the building, as well as continuing maintenance activities.

Building Name	Weekday/Weekend	Operating Schedule
Mainland Regional High School	Weekday	5:00 AM - 11:00 PM
	Weekend	7:30 AM - 3:30 PM
Maintenance Garage	Weekday	5:00 AM - 11:00 PM
	Weekend	N/A
Storage Garage	Weekday	5:00 AM - 11:00 PM
	Weekend	N/A

Building Occupancy Schedule

2.3 Building Envelope

The high school's walls are made of concrete masonry units (CMUs) with a brick façade and painted CMU interior finish. Facility staff noted that the sections of the building renovated in 2000 have experienced issues with delamination in its brick façade.

The flat roof is supported with steel trusses and a metal deck and finished with an insulated layer of an unknown thickness. The roof has a covering of black EDPM in areas renovated in 2000 and gray EDPM in areas refinished in the early 2010's. The roof areas from 2000 are noted to have issues in terms of leaks and general wear and tear.

Most of the facility windows are double glazed and have aluminum frames with a thermal break in all areas of the building. The glass-to-frame seals are in good condition in areas renovated in the early 2010's, and their operable window weather seals are in good condition. A portion of the windows installed in the areas of the building constructed in the 1990's are noted to be in worse condition than other areas of the facility. Exterior doors have aluminum frames and are in good condition with undamaged door seals throughout the facility. Degraded window and door seals increase drafts and outside air infiltration.



Typical Facility Exterior Walls

Flat Roof with Gray & Black Membrane

Typical Facility Double-Pane Windows

***Left**: Typical Facility Glass Doors & **Right**: Typical Facility FRP Exterior Door*

The maintenance garage is constructed of CMUs with no exterior wall insulation. Facility staff have not reported any issues with the exterior walls. The uninsulated flat garage roof is covered with a black EDPM covering. Facility staff have noted that the roof is old and in poor condition. Single pane windows are installed within metal frames. These windows being noted to be in very poor condition. The maintenance garage has new steel exterior doors and an insulated roll-up garage door.

Maintenance Garage Exterior Walls, Windows, & Doors

The storage garage is a wood pole barn structure with metal siding and a metal roof. The exterior walls and roof are not insulated and there are few single pane, metal framed exterior windows installed. The steel exterior doors are new, but the roll-up garage door is older and uninsulated.

Storage Garage Exterior Walls

Left: *Storage Garage Windows &* ***Right:*** *Storage Garage Exterior Doors*

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. Fixture types include 2- 3- or 4-lamp, 2- or 4-foot long recessed and surface mounted fixtures. There are also 2-foot fixtures with U-Bend tube lamps. Typically, T8 fluorescent lamps use electronic ballasts. Additionally, there are some LED general purpose lamps.

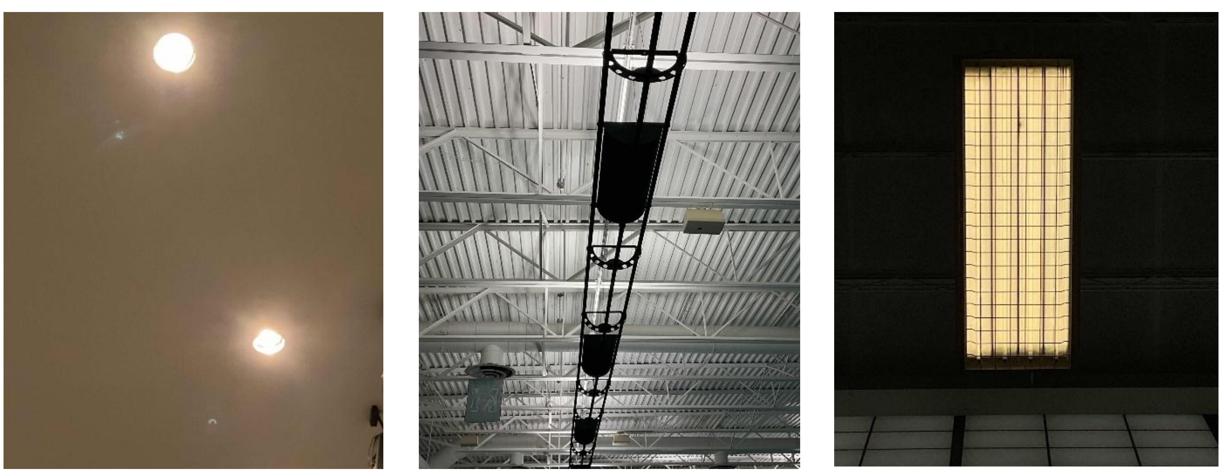
The auxiliary gymnasium's and pool's lighting fixtures have been replaced with manually controlled high bay LED lamps. The library also has several ceiling mounted LED light fixtures that are manually controlled.

Auditorium fixtures consist mainly of 300-Watt incandescent general-purpose lamps and are manually controlled.

All exit signs are LED. Most fixtures are in good condition. Interior lighting levels were generally sufficient. Most lighting fixtures are controlled by occupancy sensors in offices, restrooms/locker rooms, storage areas, offices, classrooms, computer labs, and conference rooms. The remainder of spaces are controlled by wall switches.

Typical Linear T8 & T8 U-Bend Linear Fluorescent Fixtures

Typical LED General Purpose Bulbs



***Left:** Incandescent Lights Installed in Auditorium/Theater & **Middle:** LED High Bay Fixtures in Pool Room & **Right:** Linear Fluorescent T8 Fixtures Installed in Gymnasium*


Typical Facility Lighting Controls

Exterior fixtures include wall packs with LED and metal halide lamps. Exterior light fixtures are controlled by a time clock, switch, or photocell, depending on the fixture.

The athletic fields are illuminated with flood lights with 1500-Watt metal halide lamps and are manually controlled by a breaker switch in the athletic field's press box.


Left: *Typical Metal Hallide Wall Pack &* ***Right:*** *Typical LED Wall Pack*

Typical Sport's Field Lighting

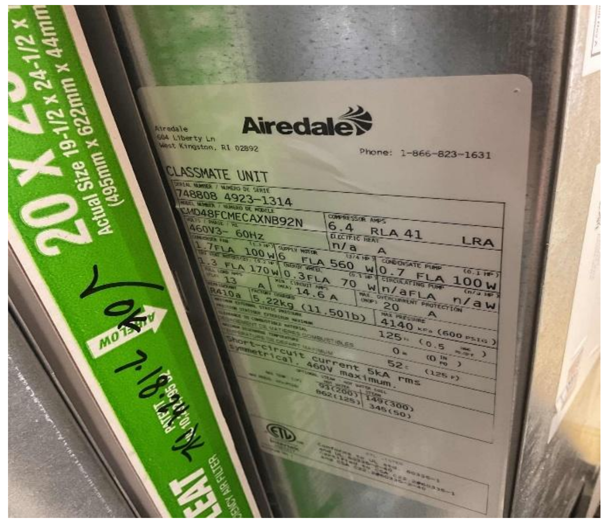
The primary lighting equipment present within the maintenance and storage garages are 2- and 4-lamp, 4-foot T8 linear fluorescent fixtures. These fixtures are controlled by wall switches. Both buildings' exterior lighting is handled by LED wall packs that are equipped with photocells.

Left: *Typical T8 Fixture Installed in Garages &* ***Right:*** *Typical Exterior LED Wall Pack Installed on Garages*

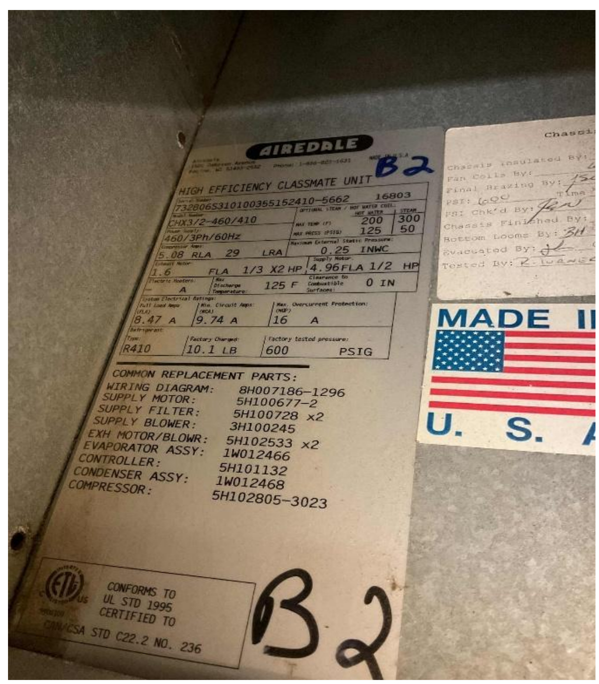
2.5 Air Handling Systems

Unit Ventilators

Unit ventilators are equipped with supply fan motors and pneumatically controlled outside air dampers and fan coil valves connected to the heating hot water distribution system. The majority of the units are connected to split system condensing units to provide direct expansion (DX) cooling. They provide heating, cooling, and ventilation to classrooms and office spaces. These systems were installed in phases between the early 2000's to 2024 and appear to be in good operating condition.



Typical AIREDALE Unit Ventilator



Typical AIREDALE Unit Ventilator (cont.)

Typical Unit Ventilators in Offices & Band Room

Typical Programmable Thermostat for Local HAVC Control

Unitary Electric HVAC Equipment

Various office spaces, classrooms, and corridors throughout the main building are conditioned by unitary electric HVAC equipment. These include split air conditioning (AC) systems attached to unit ventilators and fan coil units. The locations served, quantity of units, cooling capacities, efficiencies, and conditions are summarized in the table below. Additional information can be found in Appendix A.

Location	Quantity	Cooling Capacity (Tons)	Efficiency (SEER)	Condition
A Hallway & Offices	12 Units	1.5 Tons	10.5 SEER	Beyond Useful Life Span
B Hall Offices	1 Unit	2 Tons	12 SEER	Within Useful Life Span
B Hall Offices	6 Units	1.5 Tons	10.5 SEER	Beyond Useful Life Span
C Hall Classrooms	2 Units	2 Tons	10.5 SEER	Beyond Useful Life Span
C Hall Classrooms	2 Units	4 Tons	10.5 SEER	Beyond Useful Life Span
C Hall Classrooms	2 Units	2.5 Tons	10.5 SEER	Beyond Useful Life Span
ERG Room	1 Unit	5 Tons	10.5 SEER	Beyond Useful Life Span
Gymnasium Corridor	4 Units	1.5 Tons	10.5 SEER	Beyond Useful Life Span
W Hall Offices & Corridor	6 Units	1.5 Tons	10.5 SEER	Beyond Useful Life Span
W Hall Corridor & A Hall Corridor	3 Units	1.5 Tons	10.5 SEER	Beyond Useful Life Span
IT Room	1 Unit	1.5 Tons	11 SEER	Beyond Useful Life Span
Maintenance Manager Office	1 Unit	1.5 Tons	12 SEER	Within Useful Life Span

Typical Condensing Unit Utilized by Unit Ventilators

Typical Condensing Unti Utilized by Unit Ventilators

In addition to the split system AC units, there are several split system heat pumps installed throughout the building. The table on the next page summarizes the locations served, quantity, cooling capacity, heating capacity, respective efficiencies, and condition. More detailed information can be found in Appendix A.

Location Served	Quantity of Units	Cool Capacity (Tons)	Cooling Efficiency (SEER)	Heating Capacity (MBh)	Heating Efficiency (HSPF)	Condition
C Hall Office	1 Unit	1 Ton	10.5 SEER	14 MBh	6.5 HSPF	Beyond Useful Life Span
IT Room	1 Unit	3 Tons	12 SEER	34 MBh	6.5 HSPF	Beyond Useful Life Span
Lobby Security Office	1 Unit	0.75 Tons	11 SEER	12 MBh	6 HSPF	Beyond Useful Life Span
N Hall Electrical Room	1 Unit	2.5 Tons	12 SEER	30 MBh	8 HSPF	Within Useful Life Span
W Hall Electrical Room	1 Unit	2 Tons	13 SEER	30 MBh	8 HSPF	Within Useful Life Span

Typical Condensing Unit for Split System Air Sourced Units

The building's boiler room and press-box also receive supplemental cooling from window mounted AC units, with rated cooling capacities of 0.5-tons and seasonal energy efficiency ratings (SEER) between 10.0 and 10.9.

Typical Window Mounted AC Units

Unitary Heating Equipment

Several areas of the building receive supplemental heating from electric resistance heaters. These vary in capacity between 1 kW and 7.5 kW. The units are in fair condition. The equipment is controlled by manual dial thermostats.

Typical Manually Controlled Electric Unit Heaters

The maintenance garage has two ceiling mounted electric resistance unit heaters with manual dial controls. These units have a heating capacity of 3 kW and are in fair condition.

Typical Electric Unit Heater Installed in Garages

Packaged Units

The building is serviced by a series of 41 packaged roof top units (RTUs). These RTUs have a wide range of cooling/heating capacities, efficiencies, fuel types, operational conditions, and locations served. The table below provides a summary of this data. Greater detail is provided for each unit in Appendix A.

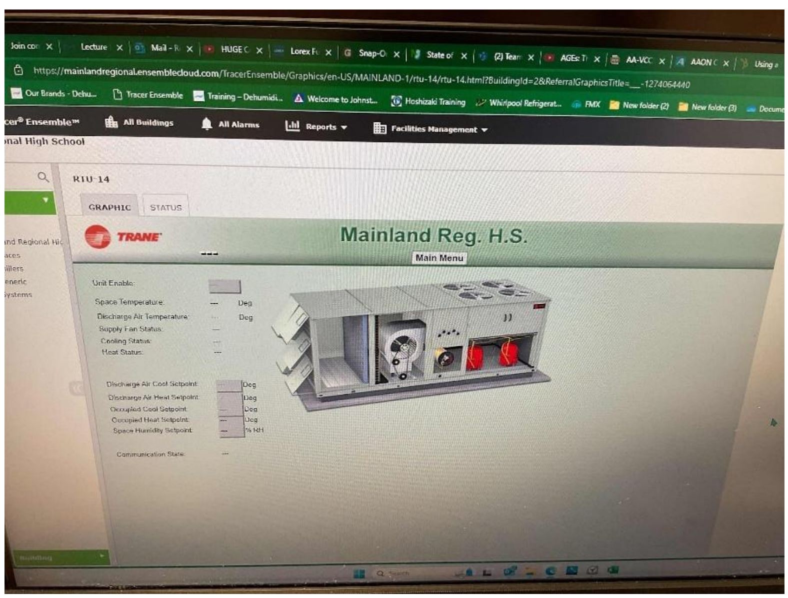
Location Served	Quantity of Units	Cooling Capacity (Tons)	Efficiency (SEER)	Heating Capacity (MBh)	Efficiency (AFUE/COP)	Heating Type	Condition
A Hall Classrooms	1 Unit	5 Tons	10.5 SEER	104 MBh	80% AFUE	Natural Gas	Beyond Useful Life Span
Band Room & Guidance Offices	2 Units	9 Tons	11 SEER	68.24 MBh	1 COP	Electric Resistance	Beyond Useful Life Span
Cafeteria	2 Units	13 Tons	11 SEER	234 MBh	80% AFUE	Natural Gas	Beyond Useful Life Span
Child Study Team Office	1 Unit	8 Tons	11 SEER	68.24 MBh	1 COP	Electric Resistance	Beyond Useful Life Span
District Admin Offices	1 Unit	3 Tons	11 SEER	51.18 MBh	1 COP	Electric Resistance	Beyond Useful Life Span
East & West Girls Locker Rooms	2 Units	9 Ton	11 SEER	156 MBh	80% AFUE	Natural Gas	Beyond Useful Life Span
East Gym	2 Units	25 Tons	11 SEER	325 MBh	80% AFUE	Natural Gas	Beyond Useful Life Span
Main Office	1 Unit	7 Tons	11 SEER	51.18 MBh	1 COP	Electric Resistance	Beyond Useful Life Span
Room N2	1 Unit	10 Tons	11 SEER	68.24 MBh	1 COP	Electric Resistance	Within Useful Life Span
Rooms N4 & N6	2 Units	4 Tons	12 SEER	104 MBh	80% AFUE	Natural Gas	Within Useful Life Span
Room N8	1 Unit	5 Tons	12 SEER	104 MBh	1 COP	Electric Resistance	Within Useful Life Span

Location Served	Quantity of Units	Cooling Capacity (Tons)	Efficiency (SEER)	Heating Capacity (MBh)	Efficiency (AFUE/COP)	Heating Type	Condition
East & West Boys Locker Rooms	2 Units	13 Tons	11 SEER	234 MBh	80% AFUE	Natural Gas	Beyond Useful Life Span
Nurses Office	1 Unit	3 Tons	14 SEER	25.59 MBh	1 COP	Electric Resistance	Within Useful Life Span
Pool Office	1 Unit	1.5 Tons	11 SEER	-	-	Hot Water Coils	Beyond Useful Life Span
Rooms S1, S3, & S5	2 Units	4 Tons	12 SEER	104 MBh	80% AFUE	Natural Gas	Within Useful Life Span
Room S2	1 Unit	5 Tons	12 SEER	104 MBh	80% AFUE	Natural Gas	Within Useful Life Span
West Gym	2 Units	25 Tons	11 SEER	325 MBh	80% AFUE	Natural Gas	Beyond Useful Life Span
Media Center	2 Units	2 Tons	14 SEER	48 MBh	80% AFUE	Natural Gas	Within Useful Life Span
Room W1 & Classrooms	1 Unit	5 Tons	13 SEER	121.5 MBh	81% AFUE	Natural Gas	Within Useful Life Span
Room W3 & W5	2 Units	4 Tons	11 SEER	96 MBh	80% AFUE	Natural Gas	Beyond Useful Life Span
Trainer Room	1 Unit	6.25 Tons	11 SEER	166 MBh	81% AFUE	Natural Gas	Beyond Useful Life Span
W Hall Classrooms	1 Unit	5 Tons	13 SEER	104 MBh	80% AFUE	Natural Gas	Within Useful Life Span
Room W23 & W25	1 Unit	4 Tons	14 SEER	104 MBh	80% AFUE	Natural Gas	Within Useful Life Span
Room W23 & W26	1Unit	6 Tons	13 SEER	25.59 MBh	1 COP	Electric Resistance	Within Useful Life Span
West Gym	1 Unit	16 Tons	11 SEER	219 MBh	81% AFUE	Natural Gas	Beyond Useful Life Span
C Hallway (AHU-11)	1 Unit	10 Tons	9.5 SEER	203 MBh	81% AFUE	Natural Gas	Beyond Useful Life Span
Pool Lobby (AHU-5)	1 Unit	10 Tons	9.5 SEER	203 MBh	81% AFUE	Natural Gas	Beyond Useful Life Span
Pool Locker Room (AHU-15)	1 Unit	25 Tons	9.5 SEER	520 MBh	80% AFUE	Natural Gas	Beyond Useful Life Span
Theater/Auditorium (AHU-13)	1 Unit	50 Tons	9.3 SEER	-	-	Hot Water Coil	Within Useful Life Span
Auxiliary Gym (AHU-14A)	1 Unit	12.5 Tons	9.5 SEER	203 MBh	81% AFUE	Natural Gas	Beyond Useful Life Span
Weight Room (AHU-12)	1 Unit	12.5 Tons	11 SEER0	284 MBh	81% AFUE	Natural Gas	Beyond Useful Life Span

Typical TRANE RTU

Typical AAON RTU

Typical TRANE RTU Mislabeled as AHU

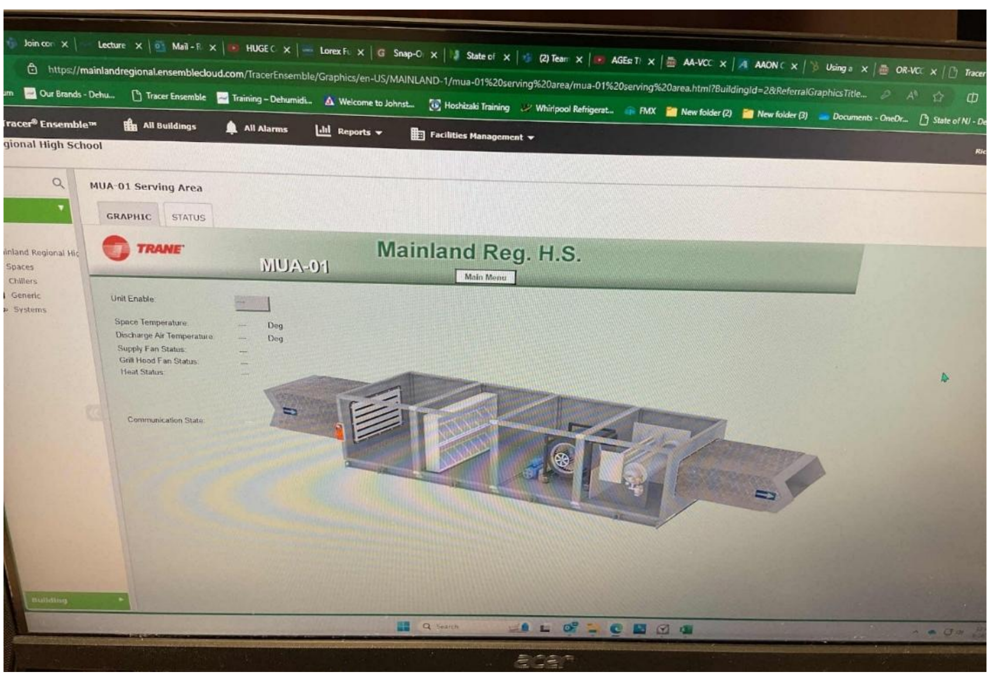


BAS Screenshot - Typical RTU Configuration

In addition to the RTU's, three makeup air units (MUAs) with natural gas-fired burners are installed to serve various areas throughout the building. The table on the next page summarizes the heating/cooling capacities of these units, locations they primarily serve, efficiencies, and condition. This information is covered in greater detail in Appendix A.

Location Served	Cooling Capacity (Tons)	Efficiency (SEER)	Heating Capacity (MBh)	Efficiency (AFUE)	Condition
C Hall	10 Tons	10.9 SEER	96 MBh	80%	Beyond Useful Life Span
Serving Room	-	-	80 MBh	80%	Within Useful Life Span
Kitchen	-	-	840 MBh	80%	Within Useful Life Span

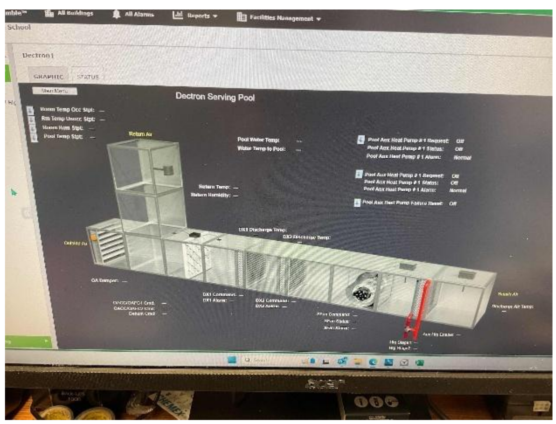
Typical MUA Units



BAS Screenshot - Typical MUA Configuration

The building's pool room has its heating/cooling and dehumidification needs are met by a Dectron dehumidification unit. This unit has a rated cooling capacity of 12.5 tons with an efficiency of 9.5 SEER. The unit has a natural gas burner with a capacity of 480 MBh and a thermal efficiency of 80 percent. Installed in 2007, the unit is approaching the end of its useful life span but is still in fair operational condition.

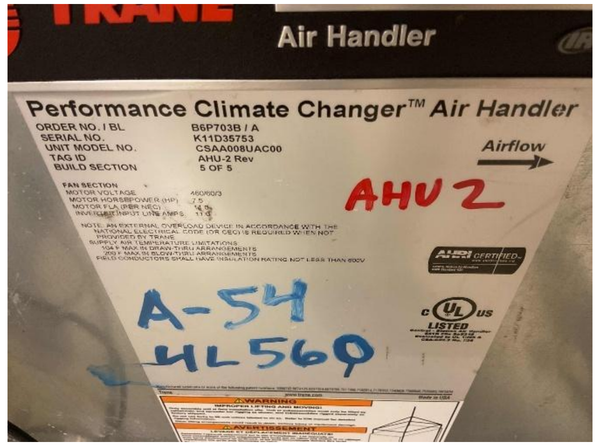
Dectron RTU Utilized for Dehumidification in Pool Room



BAS Screenshot - Dectron Unit Configuration

Air Handling Units (AHUs)

The building's library and library office are conditioned by two Trane Climate Changer air handling units. These units are equipped with supply and return fan motors, energy recovery wheels, hot water heating coils, and chilled water coils. The units are located in an annex above the library on the building's roof. The supply fan motor is rated for 10 hp for the library AHU and 7.5 hp for the library offices AHU. Both supply and return motors are equipped with variable frequency drives (VFDs). The AHUs are still in good condition and are controlled by the facility's building automation system (BAS).



Typical AHU

2.6 Heating Hot Water Systems

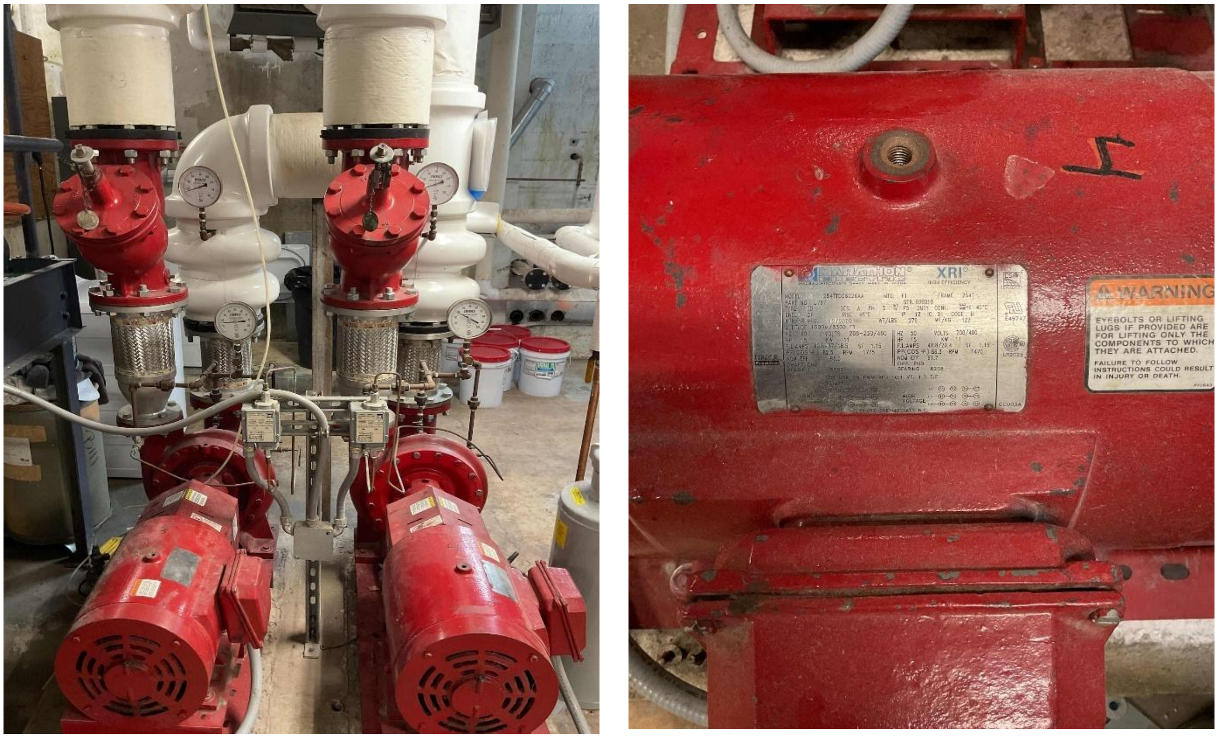
Six condensing AERCO Benchmark 3000 2,838 MBh hot water boilers serve the building's heating load. The burners are modulating with a nominal efficiency of 94.6 percent. The boilers are configured in a lead-lag control scheme. Multiple boilers required under high load conditions. Installed in 2012, they are in good condition.

The hydronic distribution system is a 2-pipe heating and cooling system.

The boilers are configured in a variable flow primary distribution with two 15 hp and four 7.5 hp VFD controlled hot water pumps operating with a lead-lag control scheme. The boilers provide hot water to unit ventilators, fan coil units, and heating hot water coils in AHUs/RTUs throughout the building.

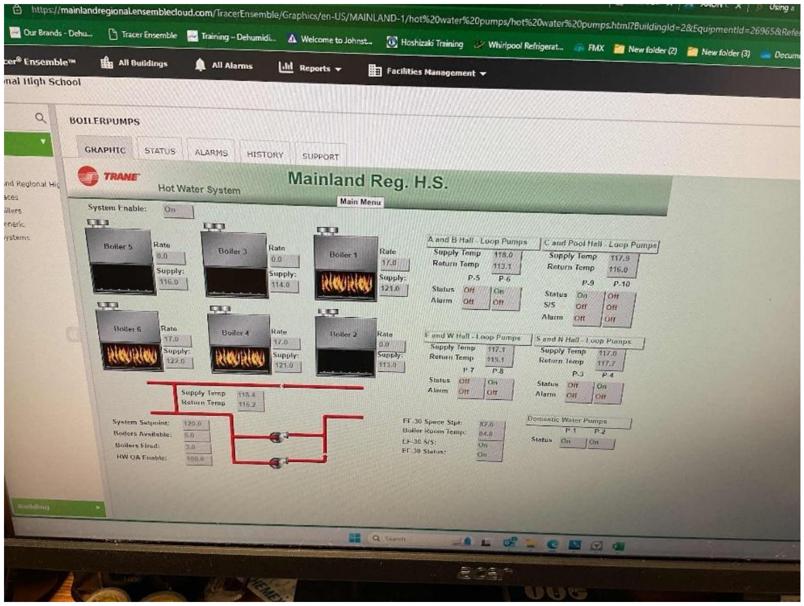
Hot water is supplied at 120°F when the outside air temperature is low. The hot water return temperature is typically 115°F. The system is locked out at an outside temperature of 65°F.

AERCO Benchmark Hot Water Boilers with Certification Information



Heating Hot Water Pumps

Heating Hot Water Pump VFDs



BAS Screenshot - Heating Hot Water Boiler Configuration

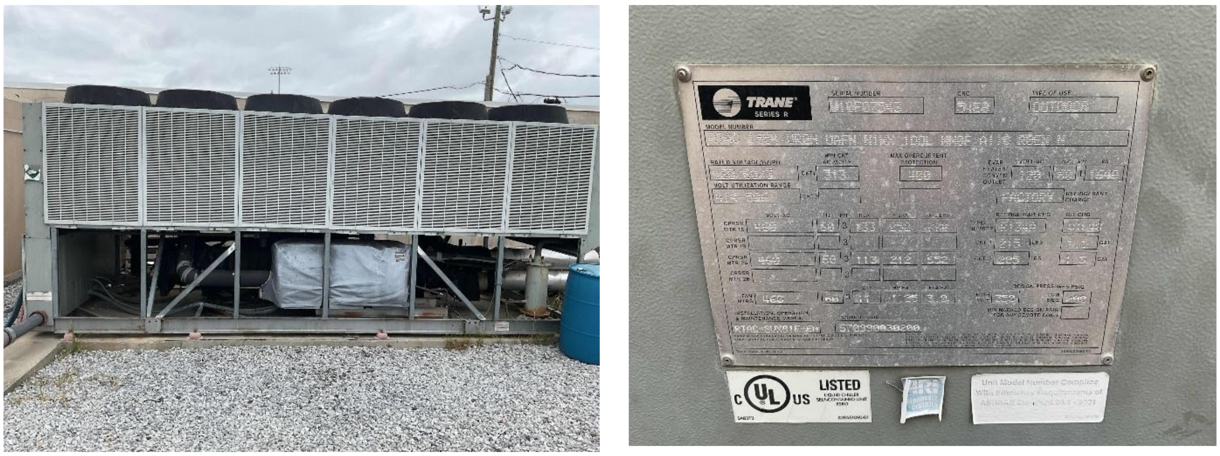
In addition to the boilers utilized for building conditioning, a Pennant PNCH natural gas fired heater is installed near the pool room to provided water heating for the pool. This boiler/heater is non-condensing, with an output capacity of 638 MBh and efficiency of 85 percent. The units are in good condition and operating within its useful life span.

PENNANT Natural Gas Pool Heater

2.7 Chilled Water Systems

The chiller plant consists of a 155-ton, Carrier, R-22, air-cooled reciprocating chiller that utilizes glycol. The chiller is configured to operate with two 20 hp chilled water circulator motors that are VFD controlled. The chilled water supply temperature is reset based on outside air temperature. However, during the time of the audit, the chiller was undergoing emergency maintenance and was not operational. As a result, the set points for the chiller and the outside air temperature reset are not known.

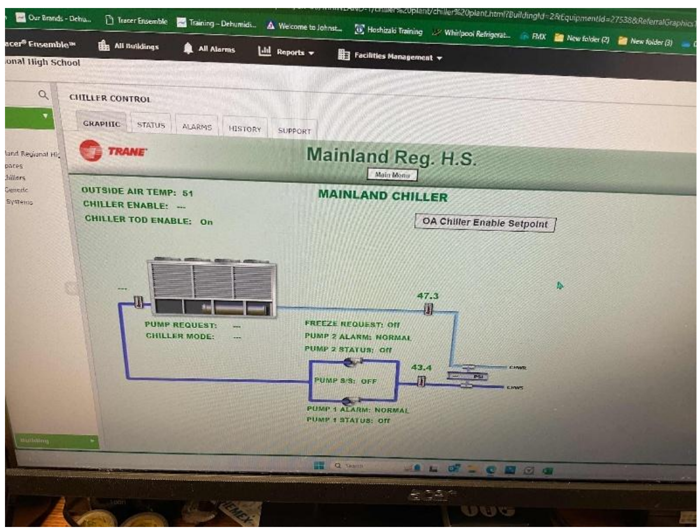
The chiller plant supplies chilled water to various air handlers, RTUs, unit ventilators, and fan coil units throughout the facility.



TRANE Air-Cooled Chiller

Chilled Water Pumps

Chilled Water Pump VFDs

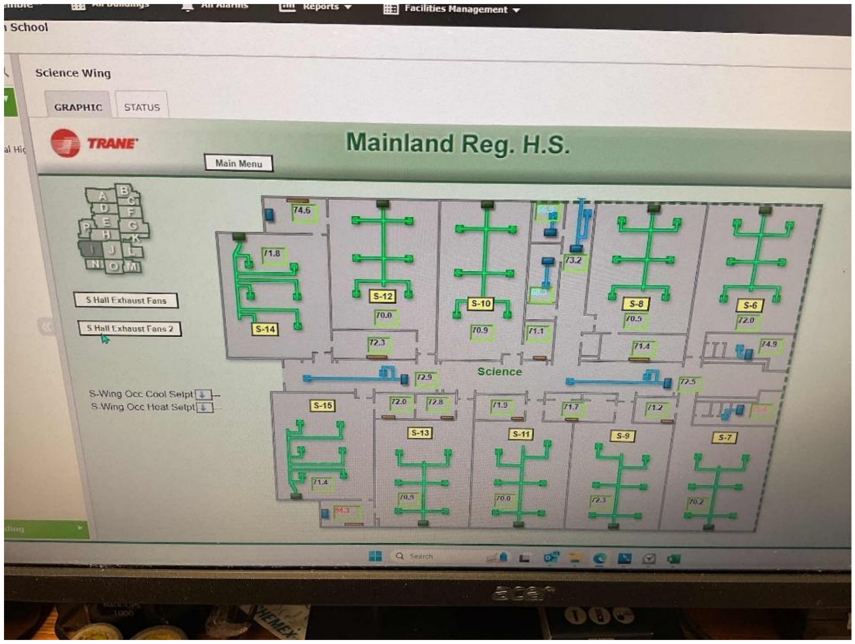


BAS Screenshot - Chiller Configuration

2.8 Building Automation System (BAS)

A Trane BAS controls the majority of the HVAC equipment including, the boilers, the chiller, the air handlers, and the package units. The BAS provides equipment scheduling controls, in addition to monitoring and controlling space temperatures, supply air temperatures, humidity, heating water loop temperatures, and chilled water loop temperatures. Facility staff noted that the AAON RTUs are not managed by the Trane BAS. The maintenance and storage garage facilities are not managed by the BAS.

The site staff expressed an interest in expanding the level of control provided by the BAS, as the corridor lighting is not currently managed by the system.



BAS Screenshot - Science Wing Layout

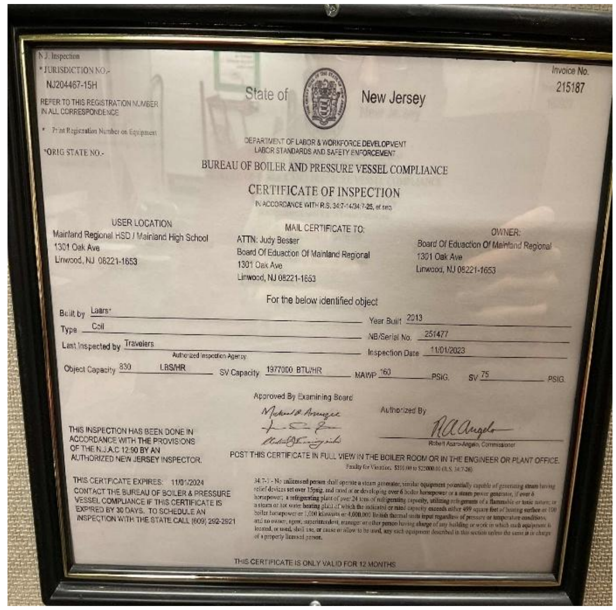
2.9 Domestic Hot Water

The majority of the facility's hot water is produced by a LAARS RHEOS+ 1,779.1 MBh natural-gas domestic hot water boiler with an efficiency of 80 percent. The boiler is connected to an insulated storage tank with an estimated capacity of 850 gallons.

An additional 28-gallon A.O. Smith 4.5 kW electric storage tank water heater is installed in a janitorial closet in the southwestern wing of the facility.

Two 5 hp circulation pumps distribute water from the main domestic hot water boiler system to end uses. The circulation pumps operate continuously.

The domestic hot water pipes are insulated, and the insulation is in good condition.



LAARS RHEOS+ Domestic Hot Water Boiler with Certification Information

Domestic Hot Water Boiler Configuration & Storage Tank

Electric Storage Water Heater Installed in Janitorial Closet

2.10 Food Service Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare meals for students. Most cooking is done using electric and gas-fired ovens. Bulk prepared foods are held in several electric holding cabinets. Equipment is mostly high efficiency and is in good condition.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high efficiency food service equipment.

Typical Food Service Equipment

2.11 Refrigeration

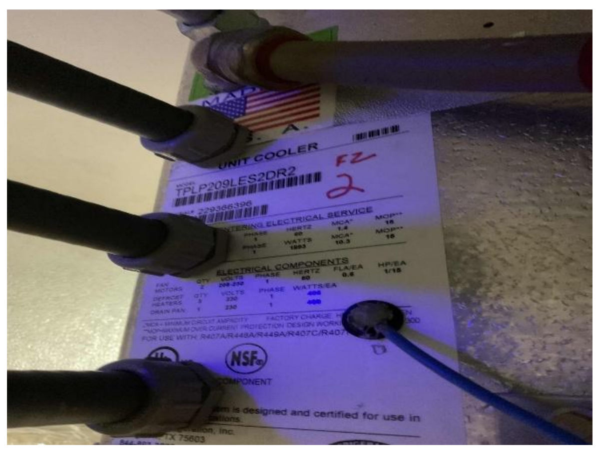
The kitchen has several stand-up refrigerators with either solid or glass doors. There is also a refrigerator chest. All equipment is standard efficiency and in good condition.

The walk-in refrigerator has an estimated 0.75-ton compressor and a two-fan evaporator. The walk-in medium temperature freezer has a 0.75-ton compressor two-fan evaporator. Both walk-in units are located on the exterior of the building and do not have any advanced energy-saving controls installed.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high efficiency food service equipment.



Typical Refrigeration & Freezer Equipment



Walk-In Freezer Evaporator Unit

Walk-In Cooler Evaporator Unit

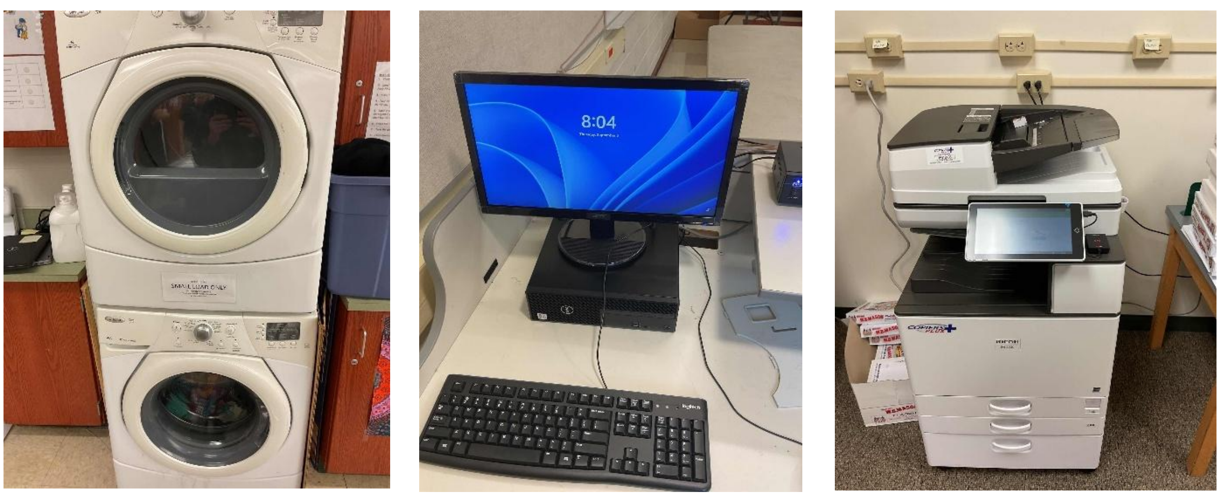
2.12 Plug Load and Vending Machines

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

There are approximately 281 computer workstations throughout the facility. Plug loads include general cafe and office equipment. There are classroom typical loads such as smart boards, projectors, and fans.

There are several residential style refrigerators throughout the building that are used to store staff meals and classroom supplies. These vary in condition and efficiency.

There are six refrigerated beverage vending machines and three non-refrigerated vending machines. The vending machines are not equipped with occupancy-based controls.



Typical Plug Load Fixtures

2.13 Water-Using Systems

Water is provided by a municipal water supply company. An on-site well is present but is utilized solely for sports field irrigation.

Potable water is used for drinking, cleaning, cooking, sanitary fixtures, building conditioning, irrigation, and the facility's pool. Water leaks were not observed/reported.

EPA WaterSense® has set maximum flow rates for sanitary fixtures. They are: 1.28 gallons per flush (gpf) for toilets, 0.5 gpf for urinals, 1.5 gallons per minute (gpm) for lavatory faucets, and 2.0 gpm for showerheads. There are 24 restrooms with toilets, urinals, and sinks. Faucet flow rates are at 0.5 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

There are several restrooms with showers and showerheads are rated at 2.5 gpm.

Landscaping systems are controlled by timers, with the facility's sports fields drawing water from an on-site well.

The pool is not covered when not in use, and it is not drained during the off-season.

Typical Water Using Fixtures

Pool Room

2.14 On-Site Generation

Mainland Regional High School has a 764 kW photovoltaic (PV) array with approximately 1,500 to 2,000 panels.

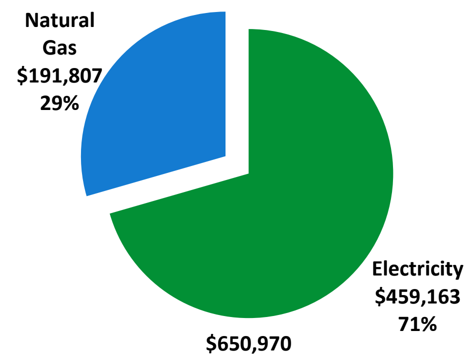
Mainland Regional High School has a natural-gas emergency generator that, in the event of a power outage, serves critical services (lighting, IT infrastructure, and fire access controls) and is only used for emergency needs.

Typical Solar Array Installed on Facility Roof

3 Energy and Water Use and Costs

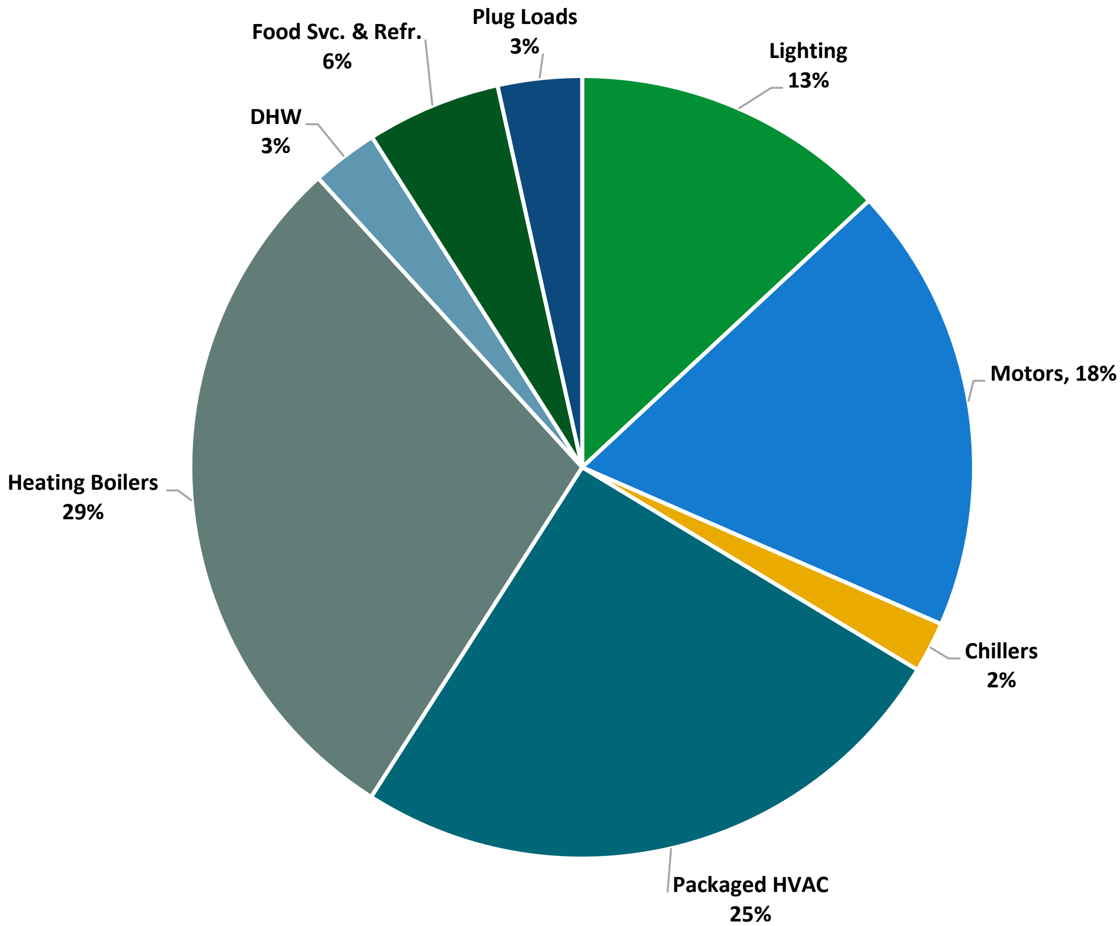
Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	3,891,389 kWh	$459,163
Natural Gas	125,728 Therms	$191,807
Total		**$650,970**



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.

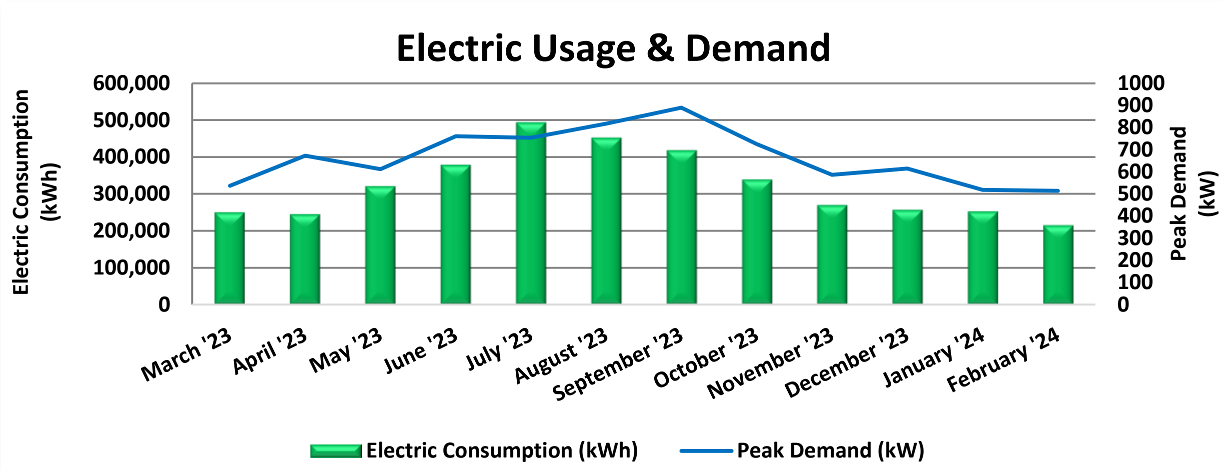
The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated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



Energy Balance by System

3.1 Electricity

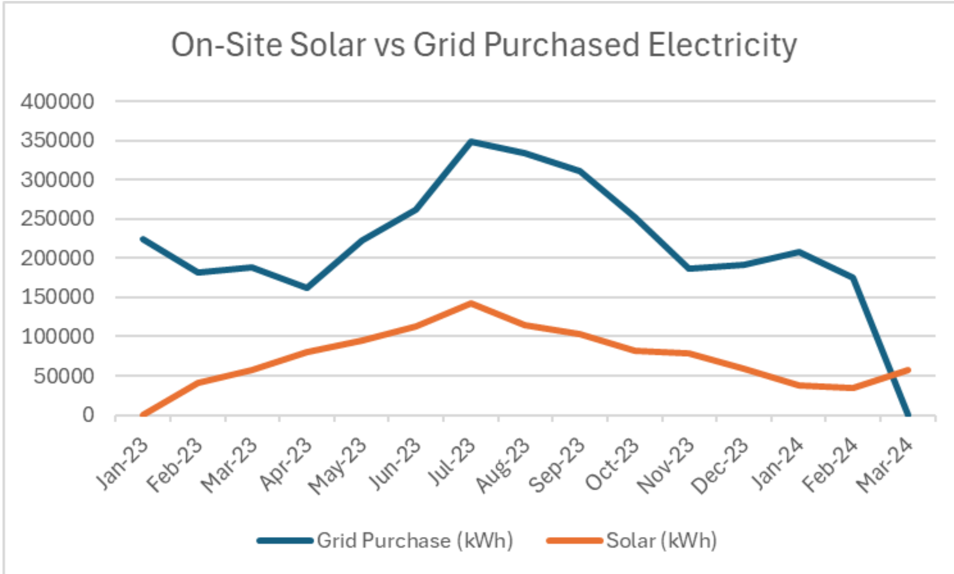
Atlantic City Electric delivers electricity under rate class General service secondary, with electric production provided by Approved Energy II LLC, a third-party supplier.



Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
4/4/23	29	250,087	537	$8,974	$35,096
5/1/23	27	245,010	672	$8,056	$30,441
6/2/23	32	321,217	611	$9,493	$37,446
7/6/23	34	378,278	760	$9,562	$39,687
8/4/23	29	493,462	753	$9,822	$49,716
9/4/23	31	451,760	817	$10,595	$49,614
10/4/23	30	418,073	890	$10,767	$47,324
11/5/23	32	338,685	725	$9,628	$39,213
12/5/23	30	270,084	587	$8,995	$31,098
1/4/24	30	256,954	615	$9,196	$32,450
2/5/24	32	252,658	518	$10,487	$36,292
3/5/24	29	215,121	514	$9,345	$30,786
Totals	**365**	**3,891,389**	**890**	**$114,920**	**$459,163**
Annual	**365**	**3,891,389**	**890**	**$114,920**	**$459,163**

Notes:

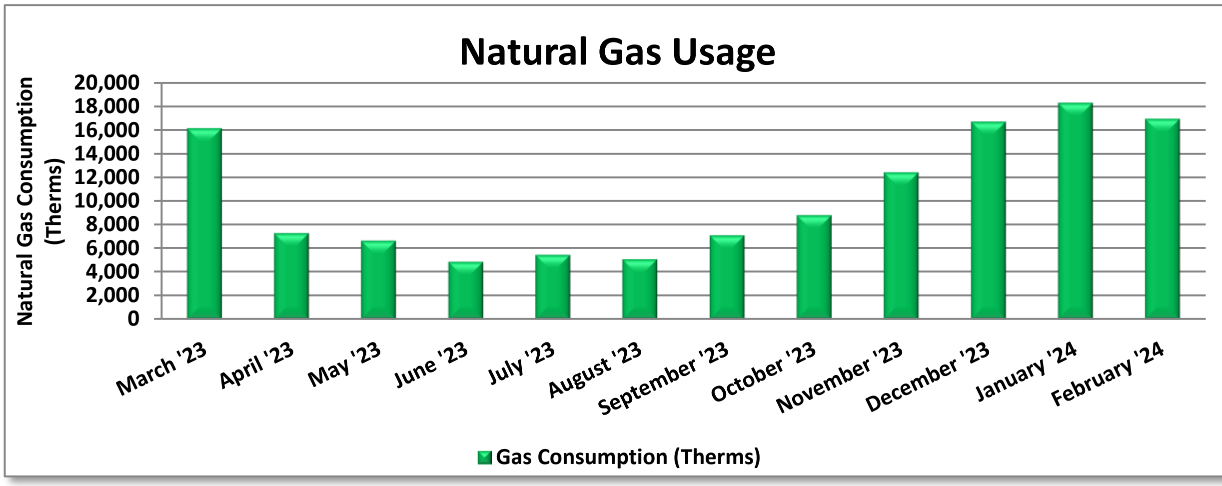
- Peak demand of 890 kW occurred in September '23.
- Average demand over the past 12 months was 667 kW.
- The average electric cost over the past 12 months was $0.118/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.
- Some of the electricity generated on-site is used on-site and the remainder is exported to the grid.



On-Site Solar vs Grid Purchased Electricity
400000
350000
300000
250000
200000
150000
100000
50000
0
Jan-23
Feb-23
Mar-23
Apr-23
May-23
Jun-23
Jul-23
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Grid Purchase (kWh)
Solar (kWh)

3.2 Natural Gas

South Jersey Gas delivers natural gas under rate class General service FT (SJ-GSG) , with natural gas supply provided by UGI, a third-party supplier.



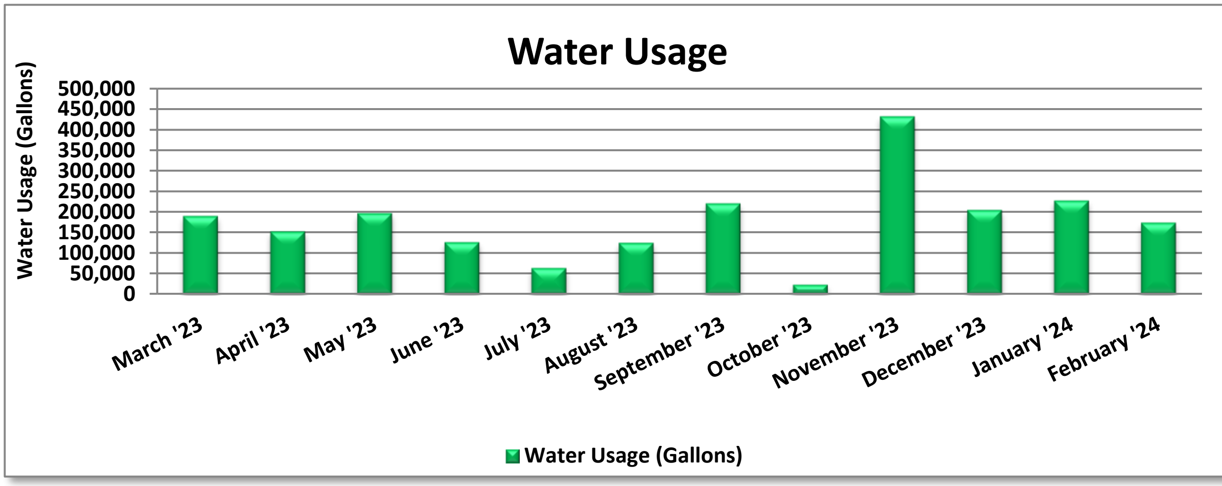
Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
4/4/23	29	16,146	$25,320
5/1/23	27	7,282	$10,037
6/2/23	32	6,638	$9,889
7/6/23	34	4,870	$7,314
8/4/23	29	5,448	$8,025
9/4/23	31	5,084	$7,528
10/4/23	30	7,085	$10,607
11/5/23	32	8,812	$14,169
12/5/23	30	12,419	$19,783
1/4/24	30	16,704	$25,558
2/5/24	32	18,308	$27,784
3/5/24	29	16,933	$25,795
Totals	**365**	**125,728**	**$191,807**
Annual	**365**	**125,728**	**$191,807**

Notes:

- The average gas cost for the past 12 months is $1.526/therm, which is the blended rate used throughout the analysis.

3.3 Water

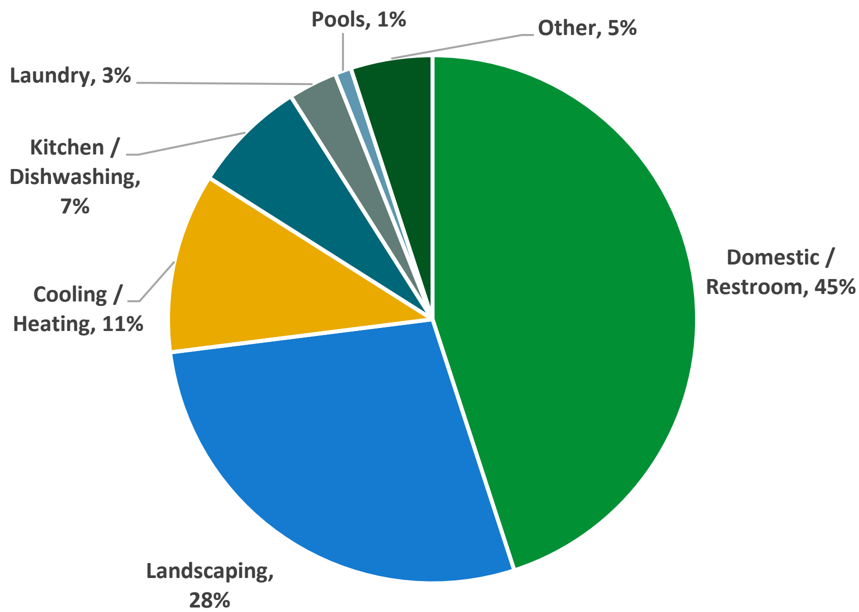
New Jersey American Water delivers water to the project site.



Water Billing Data			
Period Ending	**Days in Period**	**Water Usage (gallons)**	**Water Cost**
4/12/23	34	190,000	$2,123
5/10/23	28	153,000	$1,497,942
6/11/23	32	197,000	$2,236
7/13/23	32	127,000	$1,656
8/9/23	27	64,000	$749,168
9/13/23	35	125,000	$1,659
10/10/23	27	221,000	$2,500
11/13/23	34	23,000	$803
12/12/23	29	432,000	$4,385
1/11/24	30	205,000	$2,414
2/12/24	32	228,000	$2,650
3/12/24	29	174,000	$2,165
Totals	**369**	**2,139,000**	**$2,269,700**
Annual	**365**	**2,115,813**	**$2,245,097**

Notes:

- The average cost of water for the past 12 months is $1.0611/gal.



Typical Education Water End Use[4]

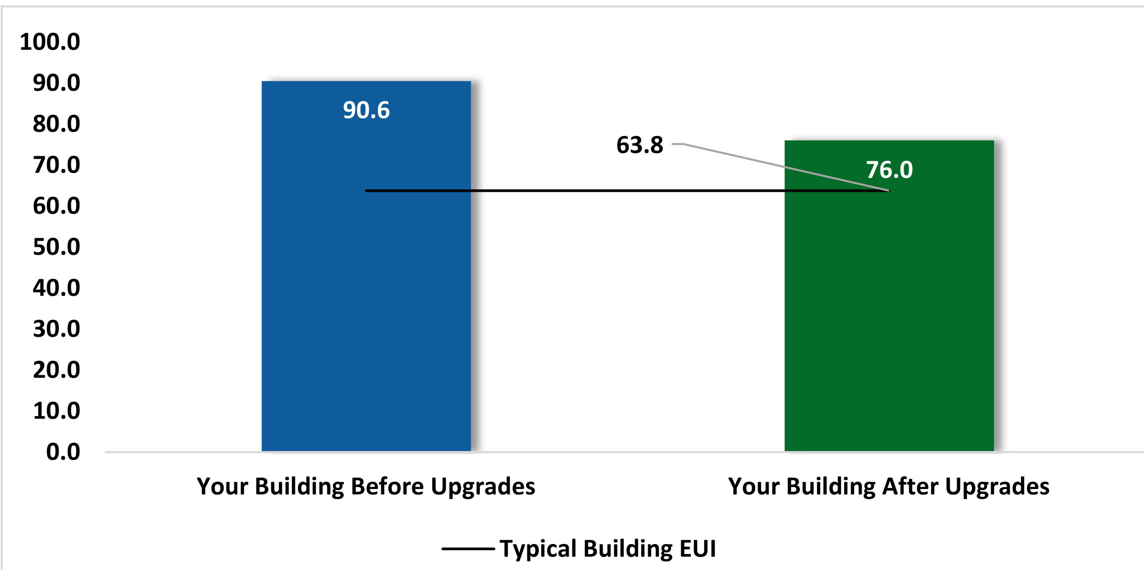
[4] Chart is of typical water end use and not specific to the facility

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.

Benchmarking Score	17



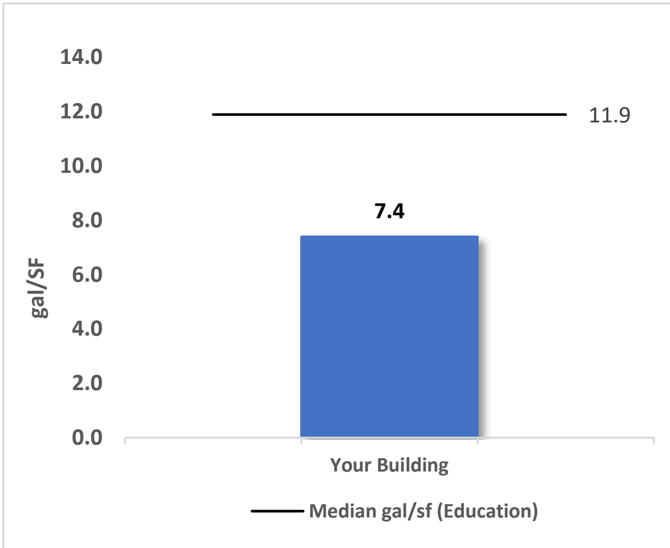
Energy Use Intensity Comparison[5]

This building performs at, or 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. Several factors can cause a building to vary from 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.

[5] Based on all evaluated ECMs

Water Benchmarking



A benchmark is provided for your building's water use based on the annual water use in gallons per square foot of building area (gal/sf-yr). Your building is compared to other similar buildings based on average water usage as available from the 2012 Commercial Buildings Energy Consumption Survey (CBECS) and from the EPA ENERGY STAR DataTrends Water Use Tracking database.

Water use varies considerably depending mainly on the extent of outdoor water use and whether process water is used, such as for vehicle washing and for laboratory sterilizers. Cooling towers and steam boilers are also significant water users. Kitchens and sanitary fixtures may use varying amounts of water.

Tracking your Energy Performance

Keeping track of your energy and water use on a monthly basis is one of the best ways to keep utility costs in check and keep your facility operating efficiently. 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 have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

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

For more information on ENERGY STAR and Portfolio Manager, visit their website.

3.5 Understanding Your Utility Bills

The State of New Jersey Department of the Public Advocate provides detailed information on how to read natural gas and electric bills. Your bills contain important information including account numbers, meter numbers, rate schedules, meter readings, and the supply and delivery charges. Gas and electric bills both provide comparisons of current energy consumption with prior usage.

Sample bills, with annotation, may be viewed at:
https://www.nj.gov/rpa/docs/Understanding_Electric_Bill.pdf
https://www.nj.gov/rpa/docs/Understanding_Gas_Bill.pdf

Why Utility Bills Vary

Utility bills vary from one month to another for many reasons. For this reason, assessing the effects of your energy savings efforts can be difficult.

Billing periods vary, typically ranging between 28 and 33 days. Electric bills provide the kilowatt-hours (kWh) used per month while gas bills provide therms (or hundreds of cubic feet - CCF) per month consumption information. Monthly consumption information can be helpful as a tool to assess your efforts to reduce energy, particularly when compared to monthly usage from a similar calendar period in a prior year.

Bills typically vary seasonally, often with more gas consumed in the winter for heating, and more electricity used in the summer when air conditioning is used. Facilities with electric heating may experience higher electricity use in the winter. Seasonal variance will be impacted by the type of heating and cooling systems used. Normal seasonal fluctuations are further impacted by the weather. Extremely cold or hot weathers causes HVAC equipment to run longer, increasing usage. Other monthly fluctuations in usage can be caused by changes in building occupancy. Utility bills provide a comparison of usage between the current period and comparable billing month period of the prior year. Year-to-year monthly use comparisons can point to trends with energy savings for measures/projects that were implemented within the timeframe, but these comparisons do not account for changing weather of occupancy patterns.

The price of fuel and purchased power used to produce and delivery electricity and gas fluctuates. Any increase or decrease in these costs will be reflected in your monthly bill. Additionally, billing rates occasionally change after justification and approval of the NJBPU. For this reason, it is more useful to review energy use rather than cost when assessing energy use trends or the impact of energy conservation measures implemented.

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements and provide information about the cost effectiveness of those improvements. Most energy conservation measures have received preliminary analysis of feasibility, which identifies expected ranges of savings. 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 in this report are based on the previously run state rebate program SmartStart, which has been retired. Now, all investor-owned gas and electric utility companies are offering complementary energy efficiency programs directly to their customers. Some measures and proposed upgrades may be eligible for higher incentives than those shown below. The incentives in the summary tables should be used for high-level planning purposes. To verify incentives, reach out to your utility provider or visit the NJCEP website for more information.

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	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**558,413**	**82.4**	**-115**	**$64,135**	**$170,030**	**$33,870**	**$136,160**	**2.1**	**548,848**
ECM 1	Install LED Fixtures	Yes	5,081	0.0	0	$600	$5,570	$400	$5,170	8.6	5,116
ECM 2	Retrofit Fixtures with LED Lamps	Yes	553,332	82.4	-115	$63,535	$164,460	$33,470	$130,990	2.1	543,732
Lighting Control Measures			**110,965**	**15.4**	**-23**	**$12,739**	**$67,960**	**$7,980**	**$59,980**	**4.7**	**109,024**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	110,500	15.4	-23	$12,686	$67,680	$7,800	$59,880	4.7	108,567
ECM 4	Install High/Low Lighting Controls	Yes	465	0.1	0	$53	$280	$180	$100	1.9	457
Variable Frequency Drive (VFD) Measures			**238,796**	**44.4**	**78**	**$29,374**	**$226,100**	**$15,700**	**$210,400**	**7.2**	**249,652**
ECM 5	Install VFDs on Constant Volume (CV) Fans	Yes	228,350	44.3	0	$26,944	$213,800	$15,400	$198,400	7.4	229,947
ECM 6	Install VFDs on Kitchen Hood Fan Motors	Yes	10,445	0.1	78	$2,429	$12,300	$300	$12,000	4.9	19,705
Unitary HVAC Measures			**117,044**	**54.8**	**48**	**$14,549**	**$723,300**	**$34,200**	**$689,100**	**47.4**	**123,529**
ECM 7	Install High Efficiency Air Conditioning Units	No	114,350	52.0	48	$14,231	$708,800	$33,700	$675,100	47.4	120,817
ECM 8	Install High Efficiency Heat Pumps	No	2,694	2.9	0	$318	$14,500	$500	$14,000	44.0	2,713
Electric Chiller Replacement			**31,230**	**-22.5**	**0**	**$3,685**	**$201,500**	**$14,300**	**$187,200**	**50.8**	**31,449**
ECM 9	Install High Efficiency Chillers	No	31,230	-22.5	0	$3,685	$201,500	$14,300	$187,200	50.8	31,449
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**8**	**$128**	**$3,600**	**$500**	**$3,100**	**24.2**	**985**
ECM 10	Install High Efficiency Furnaces	No	0	0.0	8	$128	$3,600	$500	$3,100	24.2	985
HVAC System Improvements			**13,601**	**0.0**	**82**	**$2,852**	**$39,600**	**$0**	**$39,600**	**13.9**	**23,264**
ECM 11	Implement Demand Control Ventilation (DCV)	Yes	13,601	0.0	82	$2,852	$39,600	$0	$39,600	13.9	23,264
Domestic Water Heating Upgrade			**0**	**0.0**	**72**	**$1,104**	**$9,150**	**$1,610**	**$7,540**	**6.8**	**8,471**
ECM 12	Install Low-Flow DHW Devices	Yes	0	0.0	72	$1,104	$9,150	$1,610	$7,540	6.8	8,471
Food Service & Refrigeration Measures			**19,347**	**2.0**	**0**	**$2,283**	**$29,790**	**$1,590**	**$28,200**	**12.4**	**19,482**
ECM 13	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,049	0.1	0	$124	$1,500	$160	$1,340	10.8	1,056
ECM 14	Refrigeration Controls	No	2,387	0.0	0	$282	$7,460	$330	$7,130	25.3	2,404
ECM 15	Replace Refrigeration Equipment	No	5,213	0.6	0	$615	$18,400	$800	$17,600	28.6	5,249
ECM 16	Vending Machine Control	Yes	10,699	1.2	0	$1,262	$2,430	$300	$2,130	1.7	10,773
Custom Measures			**0**	**0.0**	**287**	**$4,379**	**$43,500**	**$0**	**$43,500**	**9.9**	**33,604**
ECM 17	Install Semi-Automatic Cover for Swimming Pool	Yes	0	0.0	287	$4,379	$43,500	$0	$43,500	9.9	33,604
TOTALS			**1,089,396**	**176.5**	**438**	**$135,227**	**$1,514,530**	**$109,750**	**$1,404,780**	**10.4**	**1,148,308**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**558,413**	**82.4**	**-115**	**$64,135**	**$170,030**	**$33,870**	**$136,160**	**2.1**	**548,848**
ECM 1	Install LED Fixtures	5,081	0.0	0	$600	$5,570	$400	$5,170	8.6	5,116
ECM 2	Retrofit Fixtures with LED Lamps	553,332	82.4	-115	$63,535	$164,460	$33,470	$130,990	2.1	543,732
Lighting Control Measures		**110,965**	**15.4**	**-23**	**$12,739**	**$67,960**	**$7,980**	**$59,980**	**4.7**	**109,024**
ECM 3	Install Occupancy Sensor Lighting Controls	110,500	15.4	-23	$12,686	$67,680	$7,800	$59,880	4.7	108,567
ECM 4	Install High/Low Lighting Controls	465	0.1	0	$53	$280	$180	$100	1.9	457
Variable Frequency Drive (VFD) Measures		**238,796**	**44.4**	**78**	**$29,374**	**$226,100**	**$15,700**	**$210,400**	**7.2**	**249,652**
ECM 5	Install VFDs on Constant Volume (CV) Fans	228,350	44.3	0	$26,944	$213,800	$15,400	$198,400	7.4	229,947
ECM 6	Install VFDs on Kitchen Hood Fan Motors	10,445	0.1	78	$2,429	$12,300	$300	$12,000	4.9	19,705
HVAC System Improvements		**13,601**	**0.0**	**82**	**$2,852**	**$39,600**	**$0**	**$39,600**	**13.9**	**23,264**
ECM 11	Implement Demand Control Ventilation (DCV)	13,601	0.0	82	$2,852	$39,600	$0	$39,600	13.9	23,264
Domestic Water Heating Upgrade		**0**	**0.0**	**72**	**$1,104**	**$9,150**	**$1,610**	**$7,540**	**6.8**	**8,471**
ECM 12	Install Low-Flow DHW Devices	0	0.0	72	$1,104	$9,150	$1,610	$7,540	6.8	8,471
Food Service & Refrigeration Measures		**11,747**	**1.4**	**0**	**$1,386**	**$3,930**	**$460**	**$3,470**	**2.5**	**11,829**
ECM 13	Refrigerator/Freezer Case Electrically Commutated Motors	1,049	0.1	0	$124	$1,500	$160	$1,340	10.8	1,056
ECM 16	Vending Machine Control	10,699	1.2	0	$1,262	$2,430	$300	$2,130	1.7	10,773
Custom Measures		**0**	**0.0**	**287**	**$4,379**	**$43,500**	**$0**	**$43,500**	**9.9**	**33,604**
ECM 17	Install Semi-Automatic Cover for Swimming Pool	0	0.0	287	$4,379	$43,500	$0	$43,500	9.9	33,604
TOTALS		**933,522**	**143.5**	**381**	**$115,968**	**$560,270**	**$59,620**	**$500,650**	**4.3**	**984,692**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**552,276**	**81.5**	**-114**	**$63,430**	**$168,160**	**$33,450**	**$134,710**	**2.1**	**542,818**
ECM 1	Install LED Fixtures	5,081	0.0	0	$600	$5,570	$400	$5,170	8.6	5,116
ECM 2	Retrofit Fixtures with LED Lamps	547,195	81.5	-114	$62,831	$162,590	$33,050	$129,540	2.1	537,702

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources is proposed, we suggest converting all 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 and incandescent 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 fixture(s).

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: classrooms, theater, and exterior areas

ECM 2: Retrofit Fixtures with LED Lamps

Replace fluorescent, HID, or 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. Be sure to specify replacement lamps that are compatible with existing dimming controls, where applicable. In some circumstances, you may need to upgrade your dimming system for optimum performance.

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 T8 tubes

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**109,011**	**15.2**	**-23**	**$12,515**	**$67,150**	**$7,880**	**$59,270**	**4.7**	**107,105**
ECM 3	Install Occupancy Sensor Lighting Controls	108,546	15.1	-23	$12,462	$66,870	$7,700	$59,170	4.7	106,648
ECM 4	Install High/Low Lighting Controls	465	0.1	0	$53	$280	$180	$100	1.9	457

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: classrooms, computer labs, conference rooms, dining areas, electrical rooms, gymnasiums, janitorial areas, library, locker rooms, mechanical areas, offices, pool area, shops, storage areas, theater, and garages

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 code requirements for egress. 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. 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 occupants approach the area. This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

Affected Building Areas: corridors

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**238,796**	**44.4**	**78**	**$29,374**	**$226,100**	**$15,700**	**$210,400**	**7.2**	**249,652**
ECM 5	Install VFDs on Constant Volume (CV) Fans	228,350	44.3	0	$26,944	$213,800	$15,400	$198,400	7.4	229,947
ECM 6	Install VFDs on Kitchen Hood Fan Motors	10,445	0.1	78	$2,429	$12,300	$300	$12,000	4.9	19,705

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 inverter duty rated motor to conservatively account for the cost of an inverter duty rated motor.

ECM 5: Install VFDs on Constant Volume (CV) Fans

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

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

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

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. 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 Air Handlers: Trane RTUs and AHUs, AAON RTUs, Dectron RTU, MUA-1 & -3, and building exhaust fans motors rated for 1 hp or greater

ECM 6: Install VFDs on Kitchen Hood Fan Motors

Install VFDs and sensors to control the kitchen hood fan motor(s). 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.

4.4 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**117,044**	**54.8**	**48**	**$14,549**	**$723,300**	**$34,200**	**$689,100**	**47.4**	**123,529**
ECM 7	Install High Efficiency Air Conditioning Units	114,350	52.0	48	$14,231	$708,800	$33,700	$675,100	47.4	120,817
ECM 8	Install High Efficiency Heat Pumps	2,694	2.9	0	$318	$14,500	$500	$14,000	44.0	2,713

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 equipment is eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 7: Install High Efficiency Air Conditioning Units

We evaluated replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. Some of the replacement units will incorporate efficient gas furnaces. 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 and heating load, and the estimated annual operating hours.

Affected Units: TRANE RTUs/Condensing Units/AHUs, AAON RTUs, Dectron RTU, and EMI split-system air conditioner

ECM 8: Install High Efficiency Heat Pumps

We evaluated replacing the 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.

Affected Units: three Fujitsu air-sourced heat pumps serving C-Hall offices, IT Room, and lobby security office

4.5 Electric Chillers

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Chiller Replacement		**31,230**	**-22.5**	**0**	**$3,685**	**$201,500**	**$14,300**	**$187,200**	**50.8**	**31,449**
ECM 9	Install High Efficiency Chillers	31,230	-22.5	0	$3,685	$201,500	$14,300	$187,200	50.8	31,449

ECM 9: Install High Efficiency Chillers

We evaluated replacing the older inefficient electric chiller with a new high efficiency chiller. 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 chiller has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the chiller [is nearing, has reached] the end of its normal useful life. Typically, the marginal cost of purchasing a high-efficiency chiller can be justified by the marginal savings from the improved efficiency. When the chiller is eventually replaced, consider purchasing equipment that exceed the minimum efficiency required by building codes.

4.6 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**8**	**$128**	**$3,600**	**$500**	**$3,100**	**24.2**	**985**
ECM 10	Install High Efficiency Furnaces	0	0.0	8	$128	$3,600	$500	$3,100	24.2	985

ECM 10: Install High Efficiency Furnaces

We evaluated replacing the standard efficiency furnace attached to the make-up air unit with a condensing furnace. 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 require proper drainage.

Affected Units: MUA-1

4.7 HVAC Improvements

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**13,601**	**0.0**	**82**	**$2,852**	**$39,600**	**$0**	**$39,600**	**13.9**	**23,264**
ECM 11	Implement Demand Control Ventilation (DCV)	13,601	0.0	82	$2,852	$39,600	$0	$39,600	13.9	23,264

ECM 11: Implement Demand Control Ventilation (DCV)

Demand control ventilation (DCV) is a control strategy that monitors the indoor air's carbon dioxide (CO2) 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. Implementation of this measure is dependent upon having a building automation system (BAS) or other smart building control system connected to the space conditioning equipment serving the noted areas.

Affected Building Areas: theater, pool room, gymnasiums, locker rooms, and weight room

4.8 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**10**	**$159**	**$180**	**$90**	**$90**	**0.6**	**1,222**
ECM 12	Install Low-Flow DHW Devices	0	0.0	10	$159	$180	$90	$90	0.6	1,222

ECM 12: Install Low-Flow DHW Devices

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

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

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

4.9 Food Service and Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**19,347**	**2.0**	**0**	**$2,283**	**$29,790**	**$1,590**	**$28,200**	**12.4**	**19,482**
ECM 13	Refrigerator/Freezer Case Electrically Commutated Motors	1,049	0.1	0	$124	$1,500	$160	$1,340	10.8	1,056
ECM 14	Refrigeration Controls	2,387	0.0	0	$282	$7,460	$330	$7,130	25.3	2,404
ECM 15	Replace Refrigeration Equipment	5,213	0.6	0	$615	$18,400	$800	$17,600	28.6	5,249
ECM 16	Vending Machine Control	10,699	1.2	0	$1,262	$2,430	$300	$2,130	1.7	10,773

ECM 13: Refrigerator/Freezer Case Electrically Commutated Motors

Replace permanent split capacitor (PSC) motors with electronically commutated (EC) motors in walk-in freezer and cooler. Fractional horsepower EC motors are significantly more efficient than mechanically commutated, brushed motors, particularly at low speeds or partial load. By using variable-speed technology, EC motors can optimize fan usage. Because these motors are brushless and use DC power, losses due to friction and phase shifting are eliminated.

Savings for this measure consider both the increased efficiency of the motor as well as the reduction in refrigeration load due to motor heat loss.

Affected Units: Trenton Refrigeration Evaporators for walk-in cooler and freezer

ECM 14: Refrigeration Controls

We evaluated installing additional controls to optimize the operation of walk-in coolers and freezers.

Many walk-in coolers and freezers have continuously operating electric heaters on the doors to prevent condensation formation. This measure adds a control system feature to shut off the door heaters when the humidity level is low enough that condensation will not occur if the heaters are off. This is done by measuring the ambient humidity and temperature of the store, comparing that to the dewpoint, and using pulse width modulation to control the anti-sweat door heaters.

Defrost controllers can be used to override defrost of evaporator fans when the defrost operation is not necessary, which reduces annual energy consumption. This measure is applicable to existing evaporator fans with a traditional electric de-frost mechanism.

Many walk-in coolers and freezers have evaporator fans that run continuously. The measure adds a control system feature to automatically shut off evaporator fans when not needed.

Novelty coolers often run continuously. This measure adds a control system feature to automatically shut off novelty coolers based on pre-set store operating hours. Based on programmed hours, the control mechanism shuts off the cooler at the end of business and then begins operation on reduced cycles. Regular compressor operation begins the following day an hour before the start of business.

Energy savings for each of the control measures account for reduction in compressor and fan operating hours as well as reduction in the refrigeration heat load as appropriate.

ECM 15: Replace Refrigeration Equipment

We evaluated replacing existing stand-up glass and solid door refrigerators with new ENERGY STAR rated equipment. The energy savings associated with this measure come from reduced energy usage, due to more efficient technology, and reduced run times.

ECM 16: Vending Machine Control

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

4.10 Custom Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Custom Measures		**0**	**0.0**	**287**	**$4,379**	**$43,500**	**$0**	**$43,500**	**9.9**	**33,604**
ECM 17	Install Semi-Automatic Cover for Swimming Pool	0	0.0	287	$4,379	$43,500	$0	$43,500	9.9	33,604

ECM 17: Install Semi-Automatic Cover for Swimming Pool

Installing a pool cover will reduce the energy use associated with conditioning the space as well as heating the pool water. Consider installing a retractable pool cover, which will reduce pool water evaporation during unoccupied periods of time. Evaporation occurs when the pool water is heated to a temperature above the temperature of the air. Pools have high ventilation loads to control humidity. Reducing evaporation from the pool surface will result in water savings, reduced chemical treatment, pool water heating energy and ventilation savings due to lower humidity levels when the cover is in place. Implementation of this measure would require installation of pool cover, reel system, and control system.

4.11 Measures for Future Consideration

There are additional opportunities for improvement that Mainland Regional HS District may wish to consider. These potential upgrades typically require further analysis, involve substantial capital investment, and/or include significant system reconfiguration. These measure(s) are therefore beyond the scope of this energy audit. These measure(s) are described here to support a whole building approach to energy efficiency and sustainability.

Mainland Regional HS District may wish to consider the Energy Savings Improvement Program (ESIP) or other whole building approach. With interest in implementing comprehensive, largescale and/or complex system wide projects, these measures may be pursued during development of a future energy savings plan. We recommend that you work with your energy service company (ESCO) and/or design team to:

- Evaluate these measures further.
- Develop firm costs.
- Determine measure savings.
- Prepare detailed implementation plans.

Other modernization or capital improvement funds may be leveraged for these types of refurbishments. As you plan for capital upgrades, be sure to consider the energy impact of the building systems and controls being specified.

Retro-Commissioning Study

Due to the complexity of today's HVAC systems and controls, a thorough analysis and rebalance of heating, ventilation, and cooling systems should periodically be conducted. There are indications at this site that systems may not be operating correctly or as efficiently as they could be. One important tool available to building operators to ensure proper system operation is retro-commissioning.

Retro-commissioning is a common practice recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to be implemented every few years. We recommend that you contact a reputable engineering firm that specializes in energy control systems and retro-commissioning. Ask them to propose a scope of work and an outline of the procedures and processes to be implemented, including a schedule and the roles of all responsible parties.

Once goals and responsibilities are established, the objective of the investigation process is to understand how the building is currently operating, identify the issues, and determine the most cost-effective way to improve performance. The retro-commissioning agent will review building documentation, interview building occupants, and inspect and test the equipment. Information is then compiled into a report and shared with facility staff, who will select which recommendations to implement after reviewing the findings.

The implementation phase puts the selected processes into place. Typical measures may include sensor calibration, equipment schedule changes, damper linkage repair and similar relatively low-cost adjustments—although more expensive sophisticated programming and building control system upgrades may be warranted. Approved measures may be implemented by the agent, the building staff, or by subcontractors. Typically, a combination of these individuals makes up the retro-commissioning team.

After the approved measures are implemented, the team will verify that the changes are working as expected. Baseline and post-case measurements will allow building staff to monitor equipment and ensure that the benefits are maintained.

Upgrade to a Heat Pump System

Electric resistance heating units work by passing an electric current through wires to heat them. The system is 100% efficient since for every unit of electricity consumed, one unit of heat is produced.

But there is a way to convert electricity to create heat at better than a 1:1 ratio. Heat pumps operate on a more efficient principle, the refrigeration cycle. Instead of directly converting electricity to heat, electricity does the work, via a compressor, of moving refrigerant through a system that transfers heat from a cooler place to a warmer place. That system can move three to five as much energy as is available using electric resistance heating methods. Heat pumps work in a similar manner to an air conditioner, except they reverse the cooling process to circulate warm air instead of cold air. Also, heat pumps are generally capable of dispensing refrigerated air as they can typically be operated in air conditioning mode.

An electric furnace or boiler has no flue loss through a chimney. The AFUE rating for an all-electric furnace or boiler is between 95% and 100%. The lower values are for units installed outdoors because they have greater jacket heat loss. However, despite their high efficiency, the higher cost of electricity in most parts of the country makes all-electric furnaces or boilers an uneconomic choice. If you are interested in electric heating, consider installing a heat pump system.

Electric resistance heat, including electric furnaces and baseboard heaters, can be inexpensive to install but often expensive to run. Facilities with these systems can save substantial energy at a moderate cost by installing a heat pump when they replace a central air conditioner.

Even in buildings without central air-conditioning, there are opportunities to save energy when an existing electric furnace needs to be replaced, as well as opportunities to install ductless electric heat pumps in buildings with baseboard electric heaters and electric fan coils. Unit ventilators with built-in electric resistance heaters can be replaced with unit ventilators with integrated heat pumps.

Electric heat pumps have high coefficient of performance (COP) ratings and are substantially more efficient than traditional electric heating systems. Further investigation is required to determine whether installing a heat pump system is a cost-effective solution when replacing existing electrical heating systems.

VRF Systems

Consider variable refrigerant flow (VRF) systems as part of a comprehensive package unit upgrade project. (VRF systems use direct expansion (DX) heat pumps to transport heat between an outdoor condensing unit and a network of indoor evaporators, located near or within the conditioned space, through refrigerant piping installed in the building. Attributes that distinguish VRF from other DX system types are:

- Multiple indoor units connected to a common outdoor unit.
- Scalability
- Variable capacity
- Distributed control
- Simultaneous heating and cooling capability

VRF provides flexibility by allowing for many different indoor units (with different capacities and configurations), individual zone control, the unique ability to offer simultaneous heating and cooling in separate zones on a common refrigerant circuit, and heat recovery from one zone to another. VRF systems are equipped with at least one variable-speed and/or variable-capacity compressor.

To match the building's load profiles, energy is transferred from one indoor space to another through the refrigerant line, and only one energy source is necessary to provide both heating and cooling. VRF systems also operate efficiently at part load because of the compressor's variable capacity control. VRF systems are ideal for applications with varying loads or where zoning is required. Some other advantages of VRF systems include consistent comfort, quiet operation, energy efficiency, installation flexibility, zoned heating and cooling, state-of-the-art controls, and reliability.

VRF systems are more expensive than conventional heat pump systems; however, the higher initial cost can be offset by improved cooling efficiency during part load operation—a SEER (cooling) rating of 18.0 is not uncommon for small packaged VRF-equipped heat pumps.

When you are replacing packaged HVAC equipment, we recommend a comprehensive approach. Work with your contractor or design engineer to make sure your systems are sized and zoned according to current space configurations and occupancy. Select high efficiency equipment and controls that match your heating and cooling needs. Commission the system and controls to ensure proper operation, comfort, ventilation, and energy use.

5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs.

Operation and maintenance (O&M) plans enhance the operational efficiency of HVAC and other energy intensive systems and could save 5% –20% of the energy usage in your building without substantial capital investment. A successful plan includes your records of energy usage trends and costs, building equipment lists, current maintenance practices, and planned capital upgrades, and it incorporates your ideas for improved building operation. Your plan will address goals for energy-efficient operation, provide detail on how to reach the goals, and outline procedures for measuring and reporting whether goals have been achieved.

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 cannot manage what you do not 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[6] . 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. Materials used may include caulk, polyurethane foam, and other weather-stripping materials. There is an energy savings opportunity by reducing the uncontrolled air exchange between the outside and inside of the building. Blower door assisted comprehensive building air sealing will reduce the amount of air exchange, which will in turn reduce the load on the buildings heating and cooling equipment, providing energy savings and increased occupant comfort.

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 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.

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

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.

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. Adjust exterior lighting time clock controls seasonally as needed to match your lighting requirements.

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.

Ductwork Maintenance

Duct maintenance has two primary goals: keep the ducts clean to avoid air quality problems and seal leaks to save energy. Check for cleanliness, obstructions that block airflow, water damage, and leaks. Ducts should be inspected at least every two years.

The biggest symptoms of clogged air ducts are differing temperatures throughout the building and areas with limited airflow from supply registers. If a particular air duct is clogged, then air flow will only be cut off to some rooms in the building—not all of them. The reduced airflow will make it more difficult for those areas to reach the temperature setpoint, which will cause the HVAC system to run longer to cool or heat that area properly. If you suspect clogged air ducts, ensure that all areas in front of supply registers are clear of items that may block or restrict air flow, and you should check for fire dampers or balancing dampers that have failed closed.

Duct leakage in commercial buildings can account for 5%–25% of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building wasting conditioned air. Check ductwork for leakage. Eliminating duct leaks can improve ventilation system performance and reduce heating and cooling system operation.

Distribution system losses are dependent on air system temperature, the size of the distribution system, and the level of insulation of the ductwork. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is missing or worn, the system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

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 and efficiently. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the boiler heat exchanger to improve heat transfer.

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.

Label HVAC Equipment

For improved coordination in maintenance practices, we recommend labeling or re-labeling the site HVAC equipment. Maintain continuity in labeling by following labeling conventions as indicated in the facility drawings or BAS building equipment list. Use weatherproof or heatproof labeling or stickers for permanence, but do not cover over original equipment nameplates, which should be kept clean and readable whenever possible. Besides equipment, label piping for service and direction of flow when possible. Ideally, maintain a log of HVAC equipment, including nameplate information, asset tag designation, areas served, installation year, service dates, and other pertinent information.

This investment in your equipment will enhance collaboration and communication between your staff and your contracted service providers and may help you with regulatory compliance.

Optimize HVAC Equipment Schedules

Energy management systems (BAS) typically provide advanced controls for building HVAC systems, including chillers, boilers, air handling units, rooftop units and exhaust fans. The BAS monitors and reports operational status, schedules equipment start and stop times, locks out equipment operation based on outside air or space temperature, and often optimizes damper and valve operation based on complex algorithms. These BAS features, when in proper adjustment, can improve comfort for building occupants and save substantial energy.

Know your BAS scheduling capabilities. Regularly monitor HVAC equipment operating schedules and match them to building operating hours to eliminate unnecessary equipment operation and save energy. Monitoring should be performed often at sites with frequently changing usage patterns – daily in some cases. We recommend using the optimal start feature of the BAS (if available) to optimize the building warmup sequence. Most BAS scheduling programs provide for holiday schedules, which can be used during reduced use or shutdown periods. Finally, many systems are equipped with a one-time override function, which can be used to provide additional space conditioning due to a one-time, special event. When available this override feature should be used rather than changing the base operating schedule.

Water Heater Maintenance

The lower the supply water temperature that is used for hand washing sinks, the less energy is needed to heat the water. Reducing the temperature results in energy savings and the change is often unnoticeable to users. Be sure to review the domestic water temperature requirements for sterilizers and dishwashers as you investigate reducing the supply water temperature.

Also, 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.

Refrigeration Equipment Maintenance

Preventative maintenance keeps commercial refrigeration equipment running reliably and efficiently. Commercial refrigerators and freezers are mission-critical equipment that can cost a fortune when they go down. Even when they appear to be working properly, refrigeration units can be consuming too much energy. Have walk-in refrigeration and freezer and other commercial systems serviced at least annually. This practice will allow systems to perform to their highest capabilities and will help identify system issues if they exist.

Maintaining your commercial refrigeration equipment can save between five and ten percent on energy costs. When condenser coils are dirty, your commercial refrigerators and freezers work harder to maintain the temperature inside. Worn gaskets, hinges, door handles or faulty seals cause cold air to leak from the unit, forcing the unit to run longer and use more electricity.

Regular cleaning and maintenance also help your commercial refrigeration equipment to last longer.

Procurement Strategies

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

6 Water Best Practices

Getting Started

The commercial and institutional sector is the second largest consumer of publicly supplied water in the United States, accounting for 17% of the withdrawals from public water supplies[7]. In New Jersey, excluding water used for power generation, approximately 80% of total water use was attributed to potable supply during the period of 2009 to 2018. Water withdrawals for potable supply have not changed noticeably during the period from 1990 to 2018[8].

Water management planning serves as the foundation for any successful water reduction effort. It is the first step a commercial or institutional facility owner or manager should take to achieve and sustain long-term water savings. Understanding how water is used within a facility is critical for the water management planning process. A water assessment provides a comprehensive account of all known water uses at the facility. It allows the water management team to establish a baseline from which progress and program success can be measured. It also enables the water management team to set achievable goals and identify and prioritize specific projects based on the relative savings opportunities and project cost-effectiveness.

Water conservation devices may significantly reduce your water and sewer usage costs. Any reduction in water use reduces grid-level electricity use since a significant amount of electricity is used to treat and deliver water from reservoirs to end users.

For more information regarding water conservation or additional details regarding the practices shown below go to the EPA's WaterSense website[9] or download a copy of EPA's "WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities"[10] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Leak Detection and Repair

Identifying and repairing leaks and other water use anomalies within a facility's water distribution system or from processes or equipment can keep a facility from wasting significant quantities of water. Examples of common leaks include leaking toilets and faucets, drip irrigation malfunctions, stuck float valves, and broken distribution lines. Reading meters, installing failure abatement technologies, and conducting visual and auditory inspections are important best practices to detect leaks. Train building occupants, employees, and visitors to report any leaks that they detect. To reduce unnecessary water loss, detected leaks should be repaired quickly. Repairing leaks in water distribution that is pressurized by on-site pumps or in heated or chilled water piping will also reduce energy use.

Toilets and Urinals

Toilets and urinals are considered sanitary fixtures and are found in most facilities. High efficiency fixtures are at least 20% more efficient than available standard products. Leaking or damaged equipment is a substantial source of water waste. Train users to report continuously flushing, leaking, or otherwise improperly operating equipment to the appropriate personnel. Depending on the age of the equipment

---

[7] Estimated from analyzing data in: Solley, Wayne B,. et al, "Estimated Use of Water in the United States in 1995", U.S Geological Survey Circular 1200, (1998)

[8] https://dep.nj.gov/wp-content/uploads/dsr/trends-water-supply.pdf

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

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

and the frequency of use, it may be cost effective to replace older inefficient fixtures with current generation WaterSense labeled equipment.

Commercial facilities typically use tank toilets or wall-mount flushometers. Educate and inform users with restroom signage and other means to avoid flushing inappropriate objects. For tank toilets, periodically check to ensure fill valves are working properly and that water level is set correctly. Annually test toilets to ensure the flappers are not worn or allowing water to seep from the tank into the bowl and down the sewer. Control stops and piston valves on flushometer toilets should be checked at least annually.

Most urinals use water to flush liquid. These standard single-user fixtures are present in most facilities. Non-water urinals use a specially designed trap that allows liquid waste to drain out of the fixture through a trap seal, and into the drainage system. Flushing urinals should be inspected at least annually for proper valve and sensor operation. For non-water urinals, follow maintenance practices as directed by the manufacturer to ensure products perform as expected. Non-water urinals can be considered during urinal replacement, however, review the condition and design of the existing plumbing system and the expected usage patterns to ensure that these products will provide the anticipated performance.

Faucets and Showerheads

Faucets and showerheads are sanitary fixtures that generally dispense heated water. Reducing water use by these fixtures translates into a reduction of site fuel or electric use depending on how water is heated. High efficiency fixtures are at least 20% more efficient than available standard products. Leaking or damaged equipment is a substantial source of water waste. Train users to report continuously dripping, leaking, or otherwise improperly operating equipment to the appropriate personnel. Depending on the age of the equipment and the frequency of use, it may be cost effective to replace older fixtures with current generation WaterSense labeled equipment.

Faucets are used for a variety of purposes, and standard flow rates are dictated by the intended use. Public use lavatory faucets and kitchen faucets are subject to maximum flow rates while service sinks are not. Periodically inspect faucet aerators for scale buildup to ensure flow is not being restricted. Clean or replace the aerator or other spout end device as needed. Check and adjust automatic sensors (where installed) to ensure they are operating properly to avoid faucets running longer than necessary. Post materials in restrooms and kitchens to ensure user awareness of the facility's water-efficiency goals. Remind users to turn off the tap when they are done and to consider turning the tap off during sanitation activities when it is not being used. Consider installing lavatory and kitchen faucet fixtures with reduced flow. Federal standards limit kitchen and restroom faucet flows to 2.2 gpm. To qualify for a WaterSense label a faucet cannot exceed 1.5 gpm.

Effective in 1992, the maximum allowable flow rate for all showerheads sold in the United States is 2.5 gpm. Since this standard was enacted, many showerheads have been designed to use even less water. WaterSense labeled equipment is designed to use 2.0 gpm, or less. For optimum showerhead efficiency, the system pressure should be tested to make sure that it is between 20 and 80 pounds per square inch (psi). Verify that plumbing lines are routed through a shower valve to prevent water pressure fluctuations. Periodically inspect showerheads for scale buildup to ensure flow is not being restricted. In general, replace showerheads with 2.5 gpm flow rates or higher with WaterSense labeled models. Note: Use of poor performing replacement reduced flow showerheads may result in increased use if the duration of use is increased to compensate for reduced performance. WaterSense labeled showerheads are independently certified to meet or exceed minimum performance requirements for spray coverage and force.

Commercial Kitchen Equipment

Commercial and institutional sectors, including hospitals, offices, and schools, have substantial kitchen water use. Water in food service is used for steam cooking, spray/flow cleaning, dish washing, and ice making. In most commercial kitchens, the commercial dishwasher and pre-rinse spray valve account for over two-thirds of the water use. Newer technologies and better practices are available that can significantly reduce commercial kitchen equipment water and energy use. For example, ENERGY STAR qualified dishwashers and steam cookers are at least 10% more water-efficient and 15% more energy-efficient than standard models. With some models saving significantly more.

Cooking equipment includes combination ovens, steam cookers, and steam kettles. For efficient steam cooking operation, fill vessels to capacity, when possible, set temperatures optimally for the process, and keep doors and lids closed while cooking. Replace gaskets to ensure proper sealing and repair leaks. When replacing combination ovens, select connectionless equipment; replace steam cookers with ENERGY STAR rated steam cookers.

Spray/flow cleaning equipment includes dipper wells, pre-rinse spray valves, food disposals, and wash down sprayers. Turn off water when service periods are slow and keep flow rates to minimum level. Train users to scrape food rather than rely on water pressure. Inspect for leaks and scaling. Test system pressure to ensure it is between 20 and 80 pounds per square inch (psi) for optimum flow and performance of spray equipment. For dipper wells, consider installing in-line flow restrictors to reduce flow. Pre-rinse spray valves can be replaced with new assemblies which use 1.3 gpm or less. Washdown sprayers can be equipped with self-closing nozzles or consider mopping/sweeping as an alternative.

Dishwashers range in type and include undercounter, stationary/hood, conveyor, and flight-type models. Only run dishwashers when they are full, and fill racks to maximum capacity. Be sure to replace damaged dishwasher racks. Educate staff to scrape dishes prior to loading. Ensure that final rinse pressure and water temperature are within the manufacturer's recommendations. Operate the dishwasher close to or at the minimum flow rate and set rinse cycle time to the manufacturer's minimum recommended settings. Make sure that manual fill valves close completely after the wash tank is filled. Find and repair any leaks. Inspect valves and rinse nozzles for proper operation and repair worn nozzles. Look for ENERGY STAR qualified models when purchasing or leasing a new commercial dishwasher or replacing an existing unit. Consider your kitchen throughput to select an appropriately sized commercial dishwasher since an oversized dishwasher will waste water if the machine is not loaded to capacity.

Ice Machines

Commercial ice machines use refrigeration units to freeze water into ice. Ice machines typically use water for two purposes: cooling the refrigeration unit and making ice. Because the ice-making process generates a significant amount of heat, either water or air is used to remove this waste heat from the ice machine's refrigeration unit.

Water-cooled ice machines generally pass water through the machine once to cool it and then dispose of the single-pass water down the drain. Water-cooled systems can use less water by recirculating the cooling water through a chiller or a cooling tower to lower the temperature, returning the water to the machine for reuse. To eliminate using water to cool the refrigeration unit altogether, air can be used to cool the unit. Air-cooled ice machines use motor-driven fans or centrifugal blowers to move air through the refrigeration unit to remove heat. In general, water-cooled units are more energy efficient than air-cooled units but use more water. Commercial ice machines that are ENERGY STAR qualified are, on average, 15% more energy-efficient and 10% more water-efficient than standard air-cooled models.

For optimal ice machine efficiency, consider the following:

- Clean the ice machine to remove lime and scale buildup; sanitize it to kill bacteria and fungi. Run the self-cleaning sequence if available. For machines without a self-cleaning mode, shut down the machine, empty the bin of ice, add cleaning or sanitizing solution to the machine, switch it to cleaning mode, and then switch it to ice production mode. For health and safety purposes, create and discard several batches of ice to remove residual cleaning solution.
- Keep the ice machine's coils clean to ensure the heat exchange process is running efficiently.
- Keep the lid closed to preserve cool air and maintain the appropriate temperature.
- Install a timer to shift ice production to off-peak hours to decrease peak energy demand.
- Work with the manufacturer to ensure that the ice machine's rinse cycle is set to the lowest possible frequency that still provides sufficient ice quality and meets local water quality and site requirements.
- Follow the manufacturer's use and care instructions for the specific ice machine model.
- Train users to report leaking or otherwise improperly operating ice machines to the appropriate personnel.

If the machine is cooled using single-pass water, modify the machine to operate on a closed loop that recirculates the cooling water through a cooling tower or heat exchanger, if possible.

When replacing an ice machine or installing a new one, ensure that the new model is sized appropriately to fit the facility's need. Choose an ice machine that is appropriate for the quality of ice needed. Producing ice of higher quality than required will use water unnecessarily. Look for ENERGY STAR qualified models, all of which are air-cooled. Also consider air- or water-cooled ice machines that meet the efficiency specifications outlined by the Consortium for Energy Efficiency. If feasible, consider selecting air-cooled flake or nugget ice machines, which use less water and energy than cubed ice machines.

Pools and Spas

A large volume of water is used to fill commercial pools or spas. Much of this water is often lost in day-to-day operation due to evaporation, leaking, and splashing. Ongoing pool or spa maintenance also creates significant losses in filter cleaning and mineral buildup control.

Because evaporation, filter cleaning, and mineral buildup control represent the greatest uses of water for commercial pools and spas, they also provide the most significant opportunities to achieve water savings. The California Urban Water Conservation Council (CUWCC) estimates that water evaporation, filter backwashing, and mineral buildup control account for 56%, 23%, and 21% of pool water use, respectively. Water losses from leaks and splashing are not included in this estimate because they are difficult to quantify.

Water continually escapes pools and spas due to evaporation from the pool/spa surface. The rate of evaporation will depend upon several factors, including water temperature, the pool's ambient conditions (e.g., indoor or outdoor), the extent of convection over the pool's open surface, and the surface area of water that comes in contact with air. The table below provides an overview of evaporation losses for various pool sizes, as estimated by CUWCC. As noted below the annual loss from evaporation can be greater than the spa or pool volume.

Pool Type	Pool Volume (gal)	Water Loss (gal/yr)
Spa	1,100	6,300
Hotel (in ground)	34,000	40,000
Public (in ground)	150,000	160,000
Olympic (in ground)	860,000	570,000

Evaporation Water Losses by Pool Type

To control evaporation, consider the following:

- Do not heat pools above 79°F to reduce water evaporation rates.
- Limit the use of sprays, waterfalls, and other features.
- Use pool covers to reduce evaporation rates during periods in which the pool is not in use.

All swimming pools require pool filtration systems to keep the water free of particulate matter. As debris builds up on the filter, water flow becomes restricted and reduces filter efficiency, performance, and sanitation. For this reason, filters must be cleaned regularly. The rule of thumb is that filter cleaning is necessary after the filter pressure has increased by 5 to 10 pounds per square inch (psi). Most pool filters are cleaned by backwashing the filter. Consider the following regarding filter cleaning:

- Clean filter media only as necessary and not on a set schedule (i.e., clean only when the filter is no longer operating effectively).
- Utilize the sight glass if one is installed to monitor the visual quality of the backwash water running through the filter to determine when backwashing is complete.
- Install a pool filter pressure gauge. This will provide a means for determining when filter cleaning is necessary.

Pools and spas must be drained of some water on a regular basis to control mineral salt concentrations that gradually build up. The frequency of these events can be reduced by prolonging the useful life of the water by considering the following:

- Maintain proper pH, alkalinity, and hardness levels to avoid the need to drain the pool or to avoid using excess make-up water to correct water quality issues.
- When draining the pool, perform a partial drain rather than a full drain.

To check your pool for leaks and prevent them from occurring, actively monitor the pool's water levels. If the pool is losing more than two inches of water per week, it could be leaking. In addition, actively monitor for leaks around the pump seals, pipe joints, piping in filtration system suction or return lines, pool liners, and along the pool edges. Repair leaks as soon as they are identified.

7 On-Site Generation

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the 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.

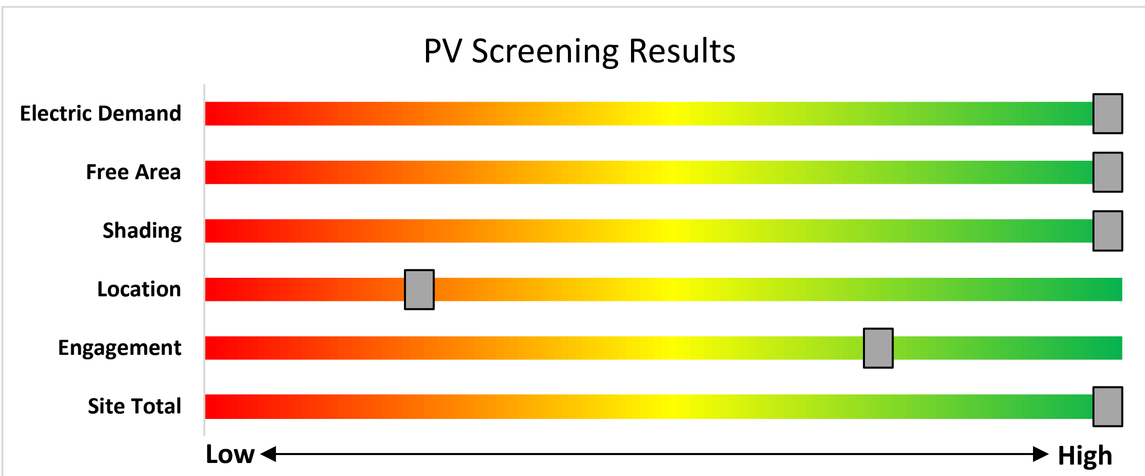
7.1 Solar Photovoltaic

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 in the parking lot be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

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



Potential	High	
System Potential	322	kW DC STC
Electric Generation	383,621	kWh/yr
Displaced Cost	$45,270	/yr
Installed Cost	$1,088,400	

Photovoltaic Screening

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available for solar projects. Solar projects may qualify to earn SREC- IIs (Solar Renewable Energy Certificates-II), however, the project owners must register their solar projects prior to the start of construction to establish the project's eligibility.

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:

- **Successor Solar Incentive Program (SuSI):** https://www.njcleanenergy.com/renewable-energy/programs/susi-program
- **Basic Info on Solar PV in NJ**: http://www.njcleanenergy.com/whysolar
- **NJ Solar Market FAQs**: ww.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the NJ Market**: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

7.2 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.

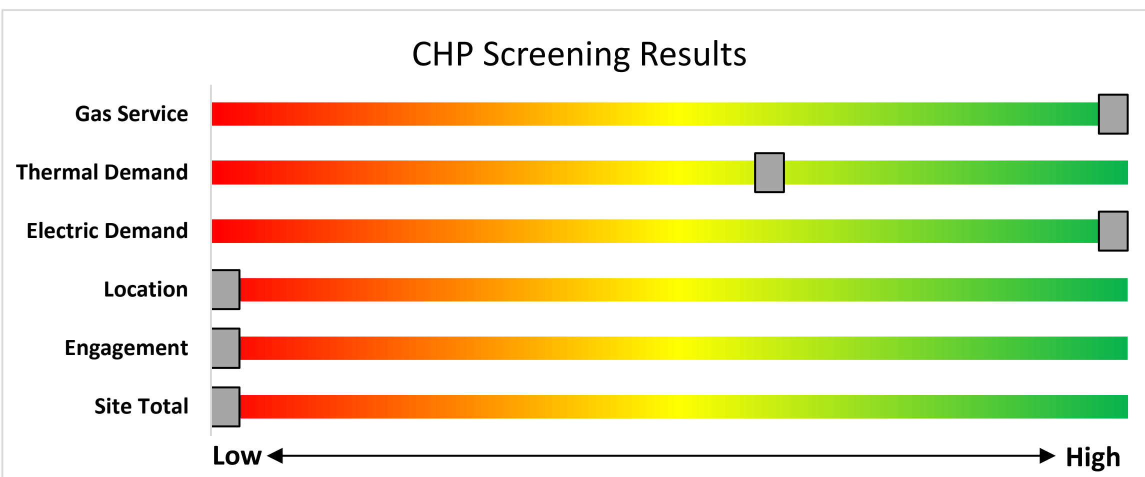
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be 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 no potential for installing a cost-effective CHP system.

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

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



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/

8 ELECTRIC VEHICLES

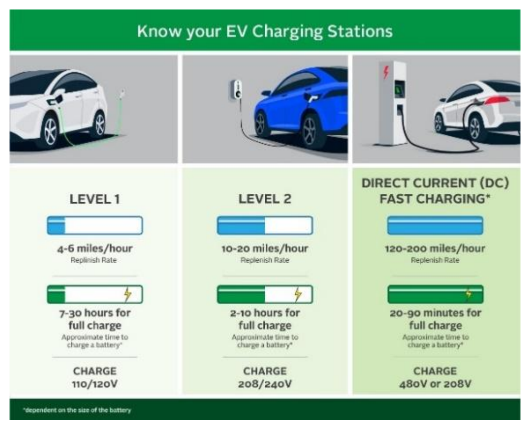
All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes all-electric vehicles as zero-emission vehicles because they produce no direct exhaust or tailpipe emissions.

EVs are typically more expensive than similar conventional and hybrid vehicles, although some cost can be recovered through fuel savings, federal tax credit, or state incentives.

8.1 EV Charging

EV charging stations provide a means for electric vehicle operators to recharge their batteries at a facility. While many EV drivers charge at home, others do not have access to regular home charging, and the ability to charge at work or in public locations is critical to making EVs practical for more drivers. Charging can also be used for electric fleet vehicles, which can reduce fuel and maintenance costs for fleets that replace gas or diesel vehicles with EVs.

EV charging comes in three main types. For this assessment, the screening considers addition of Level 2 charging, which is most common at workplaces and other public locations. Depending on the site type and usage, other levels of charging power may be more appropriate.



The preliminary assessment of EV charging at the facility shows that there is high potential for adding EV chargers to the facility's parking, based on potential costs of installation and other site factors.

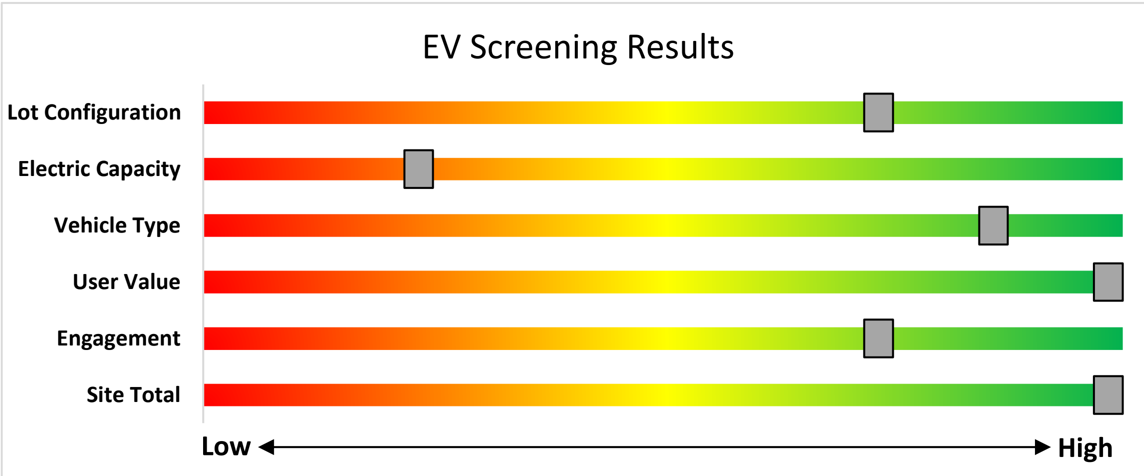
The primary costs associated with installing EV charging are the charger hardware and the cost to extend power from the facility to parking spaces. This may include upgrades to electric panels to serve increased loads.

The type and size of the parking area impact the costs and feasibility of adding EV charging. Parking structure installations can be less costly than surface lot installations as power may be readily available, and equipment and wiring can be surface mounted. Parking lot installations often require trenching through concrete or asphalt surface. Large parking areas provide greater flexibility in charger siting than smaller lots.

The location and capacity of facility electric panels also impact charger installation costs. A Level 2 charger generally requires a dedicated 208-240V, 40 Amp circuit. The electric panel nearest the planned installation may not have available capacity and may need to be upgraded to serve new EV charging loads. Alternatively, chargers could be powered from a more distant panel. The distance from the panel to the location of charging stations ties directly to costs, as conduits, cables, and potential trenching costs all increase on a per-foot basis. The more charging stations planned, the more likely it is that additional electrical capacity will be needed.

Other factors to consider when planning for EV charging at a facility include who the intended users are, how long they park vehicles at the site, and whether they will need to pay for the electricity they use.

The graphic below displays the results of the EV charging assessment conducted as part of this audit. The position of each slider indicates the impact each factor has on the feasibility of installing EV charging at the site.



EV Charger Screening

Electric Vehicle Programs Available

New Jersey is leading the way on electric vehicle (EV) adoption on the East Coast. There are several programs designed to encourage EV adoption in New Jersey, which is crucial to reaching a 100% clean energy future.

NJCEP offers a variety of EV programs for vehicles, charging stations, and fleets. Certain EV charging stations that receive electric utility service from Atlantic City Electric Company (ACE), Public Service Electric and Gas Company (PSE&G) or Jersey Central Power and Light (JCP&L), may be eligible for additional electric vehicle charging incentives directly from the utility. Projects may be eligible for both the incentives offered by this BPU program and incentives offered by ACE, PSE&G or JCP&L, up to 90% of the combined charger purchase and installation costs. Please check ACE, PSE&G or JCP&L program eligibility requirements before purchasing EV charging equipment, as additional conditions on types of eligible chargers may apply for utility incentives.

EV Charging incentive information is available from Atlantic City Electric, PSE&G and JCP&L. For more information and to keep up to date on all EV programs please visit https://www.njcleanenergy.com/commercial-industrial/programs/electric-vehicle-programs

9 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? New Jersey's Clean Energy Programs and Utility Energy Efficiency Programs can help. Pick the program that works best for you. This section provides an overview of currently available incentive programs in New Jersey.

NJBPU and NJCEP Administered Programs

- New Construction (residential, commercial, industrial, government)
- Large Energy Users
- Energy Savings Improvement Program (financing)
- State Facilities Initiative*
- Local Government Energy Audits
- Combined Heat & Power & Fuel Cells

*State facilities are also eligible for utility programs

Utility Administered Programs

- Existing buildings (residential, commercial, industrial, government)
- Efficient Products
  - Lighting & Marketplace
  - HVAC
  - Appliance Rebates
  - Appliance Recycling

9.1 New Jersey's Clean Energy Program

Save money while saving the planet! New Jersey's Clean Energy Program is a statewide program that offers incentives, programs, and services that benefit New Jersey residents, businesses, educational, non-profit, and government entities to help them save energy, money, and the environment.

Large Energy Users

The Large Energy Users Program (LEUP) is designed to foster self-directed investment in energy projects. This program is offered to New Jersey's largest energy customers. To qualify entities must have incurred at least $5 million in total energy costs in the prior fiscal year.

Incentives

Incentives are based on the specifications below. The maximum incentive per entity is the lesser of:

- $4 million
- 75% of the total project(s) cost
- 90% of total NJCEP fund contribution in previous year
- $0.33 per projected kWh saved; $3.75 per projected Therm saved annually.

How to Participate

To participate in LEUP, you will first need submit an enrollment application. This program requires all qualified and approved applicants to submit an energy plan that outlines the proposed energy efficiency work for review and approval. Applicants may submit a Draft Energy Efficiency Plan (DEEP), or a Final Energy Efficiency Plan (FEEP). Once the FEEP is approved, the proposed work can begin.

Detailed program descriptions, instructions for applying, and applications can be found at http://www.njcleanenergy.com/LEUP.

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[11]

Eligible Technology	Size (Installed Rated Capacity)	Incentive ($/Watt)[5]	% of Total Cost Cap per Project	$ Cap per Project
CHPs powered by non-renewable or renewable fuel source, or a combination:[4] - Gas Internal Combustion Engine - Gas Combustion Turbine - Microturbine	≤500 kW[1]	$2.00	30-40%[2]	$2 million
	>500 kW - 1 MW[1]	$1.00		
	> 1 MW - 3 MW[1]	$0.55	30%	$3 million
Fuel Cells ≥60%	>3 MW[1]	$0.35		
Fuel Cells ≥40%	Same as above[1]	Applicable amount above	30%	$1 million
Waste Heat to Power (WHP)[3] Powered by non-renewable fuel source. Heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine)	≤1MW[1]	$1.00	30%	$2 million
	> 1MW[1]	$.50	30%	$3 million

11

[1] Incentives are tiered, which means the incentive levels vary based upon the installed rated capacity, as listed in the chart above. For example, a 4 MW CHP system would receive $2.00/watt for the first 500 kW, $1.00/watt for the second 500 kW, $0.55/watt for the next 2 MW and $0.35/watt for the last 1 MW (up to the caps listed).

[2] The maximum incentive will be limited to 30% of total project. For CHP projects up to 1 MW, this cap will be increased to 40% where a cooling application is used or included with the CHP system (e.g. absorption chiller).

[3] Projects will be eligible for incentives shown above, not to exceed the lesser of % of total project cost per project cap or maximum $ per project cap. Projects installing CHP or FC with WHP will be eligible for incentive shown above, not to exceed the lesser caps of the CHP or FC incentive. Minimum efficiency will be calculated based on annual total electricity generated, utilized waste heat at the host site (i.e. not lost/rejected), and energy input.

[4] Systems fueled by a Class 1 Renewable Fuel Source, as defined by N.J.A.C. 14:8-2.5, are eligible for a 30% incentive bonus. If the fuel is mixed, the bonus will be prorated accordingly. For example, if the mix is 60/40 (60% being a Class 1 renewable), the bonus will be 18%. This bonus will be included in the final performance incentive payment, based on system performance and fuel mix consumption data. Total incentive, inclusive of bonus, shall not exceed above stipulated caps.

[5] CHP-FC systems located at Critical Facility and incorporating blackstart and islanding technology are eligible for a 25% incentive bonus. This bonus incentive will be paid with the second/Installation incentive payment. Total incentive, inclusive of bonus, shall not exceed above stipulated caps.

How to Participate

You will 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 http://www.njcleanenergy.com/CHP.

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The program is used to register and certify 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 SREC-IIs (Solar Renewable Energy Certificates-II). SuSI consists of two sub-programs. The Administratively Determined Incentive (ADI) Program and the Competitive Solar Incentive (CSI) Program.

Administratively Determined Incentive (ADI) Program

The ADI Program provides administratively set incentives for net metered residential projects, net metered non-residential projects 5 MW or less, and all community solar projects.

After the registration is accepted, construction is complete, and a complete final as-built packet has been submitted, the project is issued a New Jersey certification number, which enables it to generate New Jersey SREC- IIs.

Market Segments	Size MW dc	Incentive Value ($/SREC II)	Public Entities Incentive Value - $20 Adder ($/SRECII)
Net Metered Residential	All types and sizes	$90	N/A
Small Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects smaller than 1 MW	$100	$120
Large Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects 1 MW to 5 MW	$90	$110
Small Net Metered Non-Residential Ground Mount	Projects smaller than 1 MW	$85	$105
Large Net Metered Non-Residential Ground Mount	Projects 1 MW to 5 MW	$80	$100
LMI Community Solar	Up to 5 MW	$90	N/A
Non-LMI Community Solar	Up to 5 MW	$70	N/A
Interim Subsection (t)	All types and sizes	$100	N/A

Eligible projects may generate SREC-IIs for 15 years following the commencement of commercial operations which is defined as permission to operate (PTO) from the Electric Distribution Company. After 15 years, projects may be eligible for a NJ Class I REC.

SREC-IIs will be purchased monthly by the SREC-II Program Administrator who will allocate the SREC-IIs to the Load Serving Entities (BGS Providers and Third-Party Suppliers) annually based on their market share of retail electricity sold during the relevant Energy Year.

The ADI Program online portal is now open to new registrations.

Competitive Solar Incentive (CSI) Program

The CSI Program opened on April 15, 2023, and will serve as the permanent program within the SuSI Program providing incentives to larger solar facilities. The CSI Program is open to qualifying grid supply solar facilities, non-residential net metered solar installations with a capacity greater than five (5) megawatts ("MW"), and to eligible grid supply solar facilities installed in combination with energy storage.

CSI eligible facilities will only be allowed to register in the CSI program upon award of a bid pursuant to N.J.A.C. 14:8-11.10.

The CSI program structure has separate categories, or tranches, to ensure that a range of solar project types, including those on preferred sites, are able to participate despite potentially different project cost profiles. The Board has approved four tranches for grid supply and large net metered solar and an additional fifth tranche for storage in combination with grid supply solar. The following table lists procurement targets for the first solicitation:

Tranche	Project Type	MW (dc) Targets
Tranche 1.	Basic Grid Supply	140
Tranche 2.	Grid Supply on the Built Environment	80
Tranche 3.	Grid Supply on Contaminated Sites and Landfills	40
Tranche 4.	Net Metered Non- Residential	40
Tranche 5.	*Storage Paired with Grid	160 MWh

*The storage tranche of 160 MWh corresponds to a 4-hour storage pairing of 40 MW of solar

Solar projects help the State of New Jersey reach renewable energy goals outlined in the state's Energy Master Plan.

If you are considering installing solar on your building, visit the following link for more information: https://njcleanenergy.com/renewable-energy/programs/susi-program

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 contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the energy conservation measures (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 can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

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

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

Demand Response (DR) Energy Aggregator

Demand Response Energy Aggregator is a program designed to reduce the electric load when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Grid operators call upon curtailment service providers and commercial facilities to reduce electric usage during times of peak demand, making the grid more reliable and reducing transmission costs for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and participants receive payments whether or not their facility is called upon to curtail its electric usage.

Typically, an electric customer must be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with greater capability to quickly curtail their demand during peak hours receive higher payments. Customers with back-up generators on site may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in DR programs often find it to be a valuable source of revenue for their facility, because the payments can significantly offset annual electric costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature setpoints on thermostats (so that air conditioning units run less frequently) or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR curtailment event. DR program participants may need to install smart meters or may need to also sub-meter larger energy-using equipment, such as chillers, to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a DR activity in most situations.

The first step toward participation in a DR program is to contact a curtailment service provider. A list of these providers is available on the website of the independent system operator, PJM, and it includes contact information for each company, as well as the states where they have active business[12]. PJM also posts training materials for program members interested in specific rules and requirements regarding DR activity along with a variety of other DR program information[13].

Curtailment service providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding program rules and requirements for metering and controls, assess a facility's ability to temporarily reduce electric load, and provide details on payments to be expected for participation in the program. Providers usually offer multiple options for DR to larger facilities, and they may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

[12] http://www.pjm.com/markets-and-operations/demand-response.aspx.

[13] http://www.pjm.com/training/training-events.aspx.

9.2 Utility Energy Efficiency Programs

The Clean Energy Act, signed into law by Governor Murphy in 2018, requires New Jersey's investor-owned gas and electric utilities to reduce their customers' use by set percentages over time. To help reach these targets the New Jersey Board of Public Utilities approved a comprehensive suite of energy efficiency programs to be run by the utility companies.

Prescriptive and Custom

The Prescriptive and Custom rebate program through your utility provider 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.

Equipment Examples

Lighting
Lighting Controls
HVAC Equipment
Refrigeration
Gas Heating
Gas Cooling
Commercial Kitchen Equipment
Food Service Equipment
Variable Frequency Drives
Electronically Commutate Motors
Variable Frequency Drives
Plug Loads Controls
Washers and Dryers
Agricultural
Water Heating

The Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type. The Custom program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives.

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 or less 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.

How to Participate

To participate in Direct Install, you will work with a participating contractor. 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 Direct Install program, subject to program rules and eligibility, while the remaining percent of the cost is paid to the contractor by the customer.

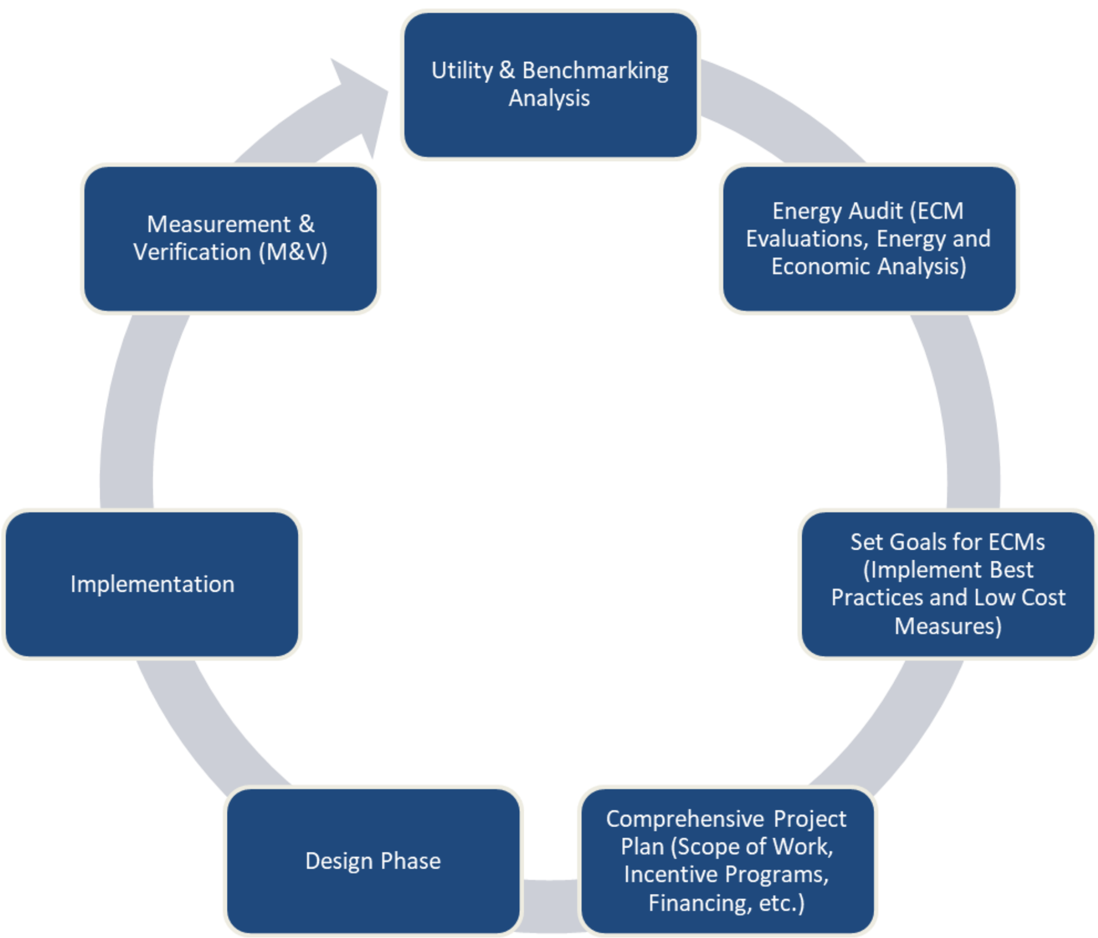
Engineered Solutions

The Engineered Solutions Program provides tailored energy-efficiency assistance and services to municipalities, universities, schools, hospitals, and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. Customers receive expert guided services, including investment-grade energy auditing, engineering design, installation assistance, construction administration, commissioning, and measurement and verification (M&V) services to support the implementation of cost-effective and comprehensive efficiency projects. Engineered Solutions is generally a good option for medium to large sized facilities with a peak demand over 200 kW looking to implement as many measures as possible under a single project to achieve deep energy savings. Engineered Solutions 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 for this program are based on project scope and energy savings achieved.

For more information on any of these programs, contact your local utility provider or visit https://www.njcleanenergy.com/transition.

10 Project Development

Energy conservation measures (ECMs) have been identified for your site, and their energy and economic analyses are provided within this LGEA report. Note that some of the identified projects may be mutually exclusive, such as replacing equipment versus upgrading motors or controls. The next steps with project development are to set goals and create a comprehensive project plan. The graphic below provides an overview of the process flow for a typical energy efficiency or renewable energy project. We recommend implementing as many ECMs as possible prior to undertaking a feasibility study for a renewable project. The cyclical nature of this process flow demonstrates the ongoing work required to continually improve building energy efficiency over time. If your building(s) scope of work is relatively simple to implement or small in scope, the measurement and verification (M&V) step may not be required. It should be noted through a typical project cycle, there will be changes in costs based on specific scopes of work, contractor selections, design considerations, construction, etc. The estimated costs provided throughout this LGEA report demonstrate the unburdened turn-key material and labor cost only. There will be contingencies and additional costs at the time of implementation. We recommend comprehensive project planning that includes the review of multiple bids for project work, incorporates potential operations and maintenance (O&M) cost savings, and maximizes your incentive potential.



Project Development Cycle

11 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

11.1 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. 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[14].

11.2 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 fluctuate monthly. The utility provides basic gas supply service 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[15].

---

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Classroom - A1	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704	3	None	Yes	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	96	0	$11	$0	$0	0.0
HS-Classroom - A1	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Classroom - A10	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704	3	None	Yes	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	77	0	$9	$0	$0	0.0
HS-Classroom - A10	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - A2	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - A2	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - A3	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.6	4,563	-1	$524	$1,720	$280	2.7
HS-Classroom - A4	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - A4	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - A5	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - A5	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - A6	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - A6	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - A7	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - A7	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Classroom - A8	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - A8	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - Art Room C13	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - Art Room C13	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.3	1,955	0	$224	$710	$130	2.6
HS-Classroom - Art Room C14	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - B1	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B1	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,955	0	$224	$790	$130	2.9
HS-Classroom - B10	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B10	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - B11	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Classroom - B11	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - B12	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B12	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Classroom - B14	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B14	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - B2	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B2	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,955	0	$224	$790	$130	2.9
HS-Classroom - B3	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B3	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Classroom - B4	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	2,607	-1	$299	$940	$160	2.6
HS-Classroom - B5	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B5	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,955	0	$224	$790	$130	2.9
HS-Classroom - B6	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B6	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	2,607	-1	$299	$940	$160	2.6
HS-Classroom - B7	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B7	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,955	0	$224	$790	$130	2.9
HS-Classroom - B8	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	3	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B8	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,955	0	$224	$790	$130	2.9
HS-Classroom - B9	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - B9	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - Band E1	37	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	37	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	1.7	12,059	-3	$1,384	$3,330	$670	1.9
HS-Classroom - Band E1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	652	0	$75	$280	$50	3.1
HS-Classroom - Band E1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	652	0	$75	$280	$50	3.1
HS-Classroom - Band E1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.2	1,304	0	$150	$580	$100	3.2
HS-Classroom - Band E1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	652	0	$75	$280	$50	3.1

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Classroom - Band E1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	652	0	$75	$280	$50	3.1
HS-Classroom - C1	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C10	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C11	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C12	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C2	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.7	5,215	-1	$599	$1,870	$310	2.6
HS-Classroom - C3	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C4	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C5	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C6	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C7	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C8	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - C9	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - Choir	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
HS-Classroom - Choir	27	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	27	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	1.4	10,336	-2	$1,187	$3,050	$610	2.1
HS-Classroom - Dance Studio L1	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
HS-Classroom - Dance Studio L1	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.6	4,237	-1	$486	$1,150	$240	1.9
HS-Classroom - N2	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	3,246	2	Relamp	No	7	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,246	0.1	437	0	$50	$180	$40	2.8
HS-Classroom - N2	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Classroom - N4	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	3,246	2	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,246	0.1	312	0	$36	$130	$30	2.8
HS-Classroom - N4	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,178	0	$135	$510	$100	3.0
HS-Classroom - N6	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - N8	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - S1	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	3,246	2	Relamp	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,246	0.1	375	0	$43	$150	$30	2.8
HS-Classroom - S1	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,414	0	$162	$610	$120	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Classroom - S10	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Classroom - S10	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Classroom - S10	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.1	311	0	$36	$270	$30	6.7
HS-Classroom - S11	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Classroom - S11	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Classroom - S12	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Classroom - S12	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Classroom - S13	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Classroom - S13	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Classroom - S14	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,356	0	$271	$1,010	$200	3.0
HS-Classroom - S14	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	652	0	$75	$480	$70	5.5
HS-Classroom - S6	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Classroom - S6	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Classroom - S7	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Classroom - S7	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Classroom - S8	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,356	0	$271	$1,010	$200	3.0
HS-Classroom - S8	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Classroom - S9	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Classroom - S9	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Classroom - Strings E2	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.7	5,215	-1	$599	$1,670	$310	2.3
HS-Classroom - W1	6	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,704	2, 3	Relamp	Yes	6	LED Lamps: A19 Lamps	Occupancy Sensor	9	3,246	0.2	1,670	0	$192	$480	$50	2.2
HS-Classroom - W1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Classroom - W1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.2	1,304	0	$150	$580	$100	3.2
HS-Classroom - W1	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.3	1,955	0	$224	$710	$130	2.6
HS-Classroom - W10	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Classroom - W10	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - W12	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - W12	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - W13	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - W13	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - W14	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - W14	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - W15	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - W15	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - W16	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - W16	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Classroom - W17	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Classroom - W18	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Classroom - W19	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	2,607	-1	$299	$940	$160	2.6
HS-Classroom - W20	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Classroom - W21	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Classroom - W23	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.8	5,866	-1	$673	$2,030	$340	2.5
HS-Classroom - W25	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	589	0	$68	$250	$50	3.0
HS-Classroom - W25	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.8	5,866	-1	$673	$2,030	$340	2.5
HS-Classroom - W3	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	2,607	-1	$299	$940	$160	2.6
HS-Classroom - W3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Classroom - W4	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	S	12	3,246		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - W4	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	2,121	0	$243	$910	$180	3.0
HS-Classroom - W5	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
HS-Classroom - W5	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	2,825	-1	$324	$990	$170	2.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Classroom - W6	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	S	12	3,246		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - W6	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	2,121	0	$243	$910	$180	3.0
HS-Classroom - W9	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	S	12	3,246		None	No	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Classroom - W9	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	1,767	0	$203	$760	$150	3.0
HS-Computer Lab - Library L102	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.4	2,607	-1	$299	$840	$160	2.3
HS-Computer Lab - S3	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	3,246	2	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,246	0.1	312	0	$36	$130	$30	2.8
HS-Computer Lab - S3	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	1,767	0	$203	$760	$150	3.0
HS-Computer Lab - S5	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	3,246	2	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,246	0.1	312	0	$36	$130	$30	2.8
HS-Computer Lab - S5	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	1,767	0	$203	$760	$150	3.0
HS-Computer Lab - W11	7	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	S	12	3,246		None	No	7	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Computer Lab - W11	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,592	-1	$298	$1,110	$220	3.0
HS-Computer Lab - W8	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	4	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Computer Lab - W8	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,259	-1	$374	$1,090	$190	2.4
HS-Conference - CST	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Conference - CST 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Conference - District Admin Office	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.1	621	0	$71	$530	$60	6.6
HS-Conference - E4	8	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.2	828	0	$95	$710	$80	6.6
HS-Conference - Guidance	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Conference - Main Office	5	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.1	1,015	0	$117	$770	$90	5.8
HS-Corridor - A Hall	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
HS-Corridor - A Hall	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	36	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	0.9	5,724	-1	$657	$1,820	$360	2.2
HS-Corridor - A Hall	8	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	8	LED - Linear Tubes: (2) U-Lamp	Timeclock	33	4,380	0.2	1,118	0	$128	$710	$80	4.9
HS-Corridor - B & C Halls	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
HS-Corridor - B & C Halls	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	28	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	0.7	4,452	-1	$511	$1,420	$280	2.2
HS-Corridor - Backstage	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Corridor - Backstage	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 4	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,246	0.3	1,914	0	$220	$720	$280	2.0
HS-Corridor - E 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
HS-Corridor - E Hall	17	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Timeclock	S	33	4,380	2	Relamp	No	17	LED - Linear Tubes: (2) 2' Lamps	Timeclock	17	4,380	0.2	1,310	0	$150	$640	$100	3.6
HS-Corridor - E Hall	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	27	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	0.6	4,293	-1	$493	$1,370	$270	2.2
HS-Corridor - L 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
HS-Corridor - L Hall	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	0.3	1,749	0	$201	$560	$110	2.2
HS-Corridor - Main Lobby	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
HS-Corridor - Main Lobby	8	LED Lamps: (1) 12W A19 Screw-In Lamp	Timeclock	S	12	4,380		None	No	8	LED Lamps: (1) 12W A19 Screw-In Lamp	Timeclock	12	4,380	0.0	0	0	$0	$0	$0	0.0
HS-Corridor - Main Lobby	8	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Timeclock	S	33	4,380	2	Relamp	No	8	LED - Linear Tubes: (2) 2' Lamps	Timeclock	17	4,380	0.1	617	0	$71	$300	$50	3.5
HS-Corridor - Main Lobby	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Timeclock	S	32	4,380	2	Relamp	No	18	LED - Linear Tubes: (1) 4' Lamp	Timeclock	15	4,380	0.2	1,518	0	$174	$460	$90	2.1
HS-Corridor - N Hall	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
HS-Corridor - N Hall	52	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	52	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	1.2	8,268	-2	$949	$2,630	$520	2.2
HS-Corridor - Pool 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
HS-Corridor - Pool Hall	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	13	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	0.3	2,067	0	$237	$660	$130	2.2
HS-Corridor - Pool Lobby	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,246	2	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.5	2,474	-1	$284	$880	$210	2.4
HS-Corridor - S 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
HS-Corridor - S Hall	50	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	50	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	1.2	7,950	-2	$913	$2,530	$500	2.2
HS-Corridor - S Wing	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
HS-Corridor - S Wing	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	0.3	2,226	0	$256	$710	$140	2.2
HS-Corridor - SW Connector	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
HS-Corridor - SW Connector	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	0.3	1,749	0	$201	$560	$110	2.2
HS-Corridor - W 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
HS-Corridor - W Hall	45	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	45	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	1.1	7,155	-1	$821	$2,280	$450	2.2
HS-Corridor - W Wing	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
HS-Corridor - W Wing	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	4,380	2	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	4,380	0.2	1,431	0	$164	$460	$90	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Dining Area - East West Cafeteria N200-201	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
HS-Dining Area - East West Cafeteria N200-201	12	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704		None	No	12	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Dining Area - East West Cafeteria N200-201	56	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	56	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	3.0	21,437	-4	$2,461	$6,270	$1,260	2.0
HS-Dining Area - Faculty Dining N202	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
HS-Dining Area - Faculty Dining N202	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	3,911	-1	$449	$1,570	$250	2.9
HS-Dining Area - Teachers Room S909	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	471	0	$54	$200	$40	3.0
HS-Electrical Room - B Hall	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Electrical Room - C12	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Electrical Room - Main Office E309	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	236	0	$27	$100	$20	3.0
HS-Electrical Room - N Hall by Gyms	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	171	0	$20	$50	$10	2.0
HS-Electrical Room - Server Room L107	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,246	0.0	228	0	$26	$200	$30	6.5
HS-Electrical Room - SW Connector	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	171	0	$20	$50	$10	2.0
HS-Exterior - Courtyards	10	LED - Fixtures: Wall Pack	Photocell		50	4,380		None	No	10	LED - Fixtures: Wall Pack	Photocell	50	4,380	0.0	0	0	$0	$0	$0	0.0
HS-Exterior - Ground	15	LED Lamps: (1) 12W A19 Screw-In Lamp	Timeclock		12	4,380		None	No	15	LED Lamps: (1) 12W A19 Screw-In Lamp	Timeclock	12	4,380	0.0	0	0	$0	$0	$0	0.0
HS-Exterior - Ground	14	LED - Fixtures: Outdoor Porch Wall Mount	Timeclock		25	4,380		None	No	14	LED - Fixtures: Outdoor Porch Wall Mount	Timeclock	25	4,380	0.0	0	0	$0	$0	$0	0.0
HS-Exterior - Ground	11	LED - Fixtures: Wall Pack	Photocell		20	4,380		None	No	11	LED - Fixtures: Wall Pack	Photocell	20	4,380	0.0	0	0	$0	$0	$0	0.0
HS-Exterior - Ground	5	LED - Fixtures: Wall Pack	Photocell		50	4,380		None	No	5	LED - Fixtures: Wall Pack	Photocell	50	4,380	0.0	0	0	$0	$0	$0	0.0
HS-Exterior - Ground	43	LED - Fixtures: Wall Pack	Photocell		50	4,380		None	No	43	LED - Fixtures: Wall Pack	Photocell	50	4,380	0.0	0	0	$0	$0	$0	0.0
HS-Exterior - Ground	3	Metal Halide: (1) 150W Lamp	Photocell		190	4,380	1	Fixture Replacement	No	3	LED - Fixtures: High-Bay	Photocell	45	4,380	0.0	1,905	0	$225	$2,090	$150	8.6
HS-Exterior - Ground 2	5	Metal Halide: (1) 150W Lamp	Timeclock		190	4,380	1	Fixture Replacement	No	5	LED - Fixtures: High-Bay	Timeclock	45	4,380	0.0	3,176	0	$375	$3,480	$250	8.6
HS-Exterior - Press Box	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	4,704	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	776	0	$92	$250	$50	2.2
HS-Exterior - Roof	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,704	2	Relamp	No	9	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,704	0.0	2,371	0	$280	$800	$180	2.2
HS-Food Preparation - Concession EG11	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	171	0	$20	$50	$10	2.0
HS-Food Preparation - Concession Stand P906	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.2	1,304	0	$150	$580	$100	3.2
HS-Food Preparation - Kitchen N209	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	171	0	$20	$50	$10	2.0

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Food Preparation - Kitchen N209	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Food Preparation - Kitchen N209	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.4	2,825	-1	$324	$990	$170	2.5
HS-Food Preparation - Kitchen N209	63	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	63	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	1.9	13,688	-3	$1,571	$4,840	$810	2.6
HS-Food Preparation - Kitchen N209	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,304	0	$150	$630	$100	3.5
HS-Food Preparation - Serving Rooms N209	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,738	0	$200	$730	$120	3.1
HS-Food Preparation - Serving Rooms N209	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,738	0	$200	$730	$120	3.1
HS-Food Preparation - Serving Rooms N209	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	2,173	0	$249	$840	$140	2.8
HS-Food Preparation - Serving Rooms N209	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,304	0	$150	$630	$100	3.5
HS-Gymnasium - Auxiliary Gym	9	LED - Fixtures: Ceiling Mount	Wall Switch	S	60	4,704	3	None	Yes	9	LED - Fixtures: Ceiling Mount	Occupancy Sensor	60	3,246	0.1	866	0	$99	$330	$40	2.9
HS-Gymnasium - Crew ERG Room EG2	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,955	0	$224	$790	$130	2.9
HS-Gymnasium - East EG1	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
HS-Gymnasium - East EG1	36	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	36	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	1.9	13,781	-3	$1,582	$4,180	$830	2.1
HS-Gymnasium - Weight 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
HS-Gymnasium - Weight Room	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.6	4,594	-1	$527	$1,390	$280	2.1
HS-Gymnasium - West Gym WG1	36	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	36	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	1.9	13,781	-3	$1,582	$4,180	$830	2.1
HS-Janitorial - A Hall	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Janitorial - Kitchen N209	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	171	0	$20	$50	$10	2.0
HS-Janitorial - N Hall	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Janitorial - SW Connector	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	30	4,704		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	30	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Janitorial - W Hall	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	171	0	$20	$50	$10	2.0
HS-Library L100	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
HS-Library L100	24	LED - Fixtures: Ceiling Mount	Wall Switch	S	12	4,704	3	None	Yes	24	LED - Fixtures: Ceiling Mount	Occupancy Sensor	12	3,246	0.1	462	0	$53	$660	$70	11.1
HS-Library L100	64	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	64	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	1.9	13,905	-3	$1,596	$4,890	$820	2.5
HS-Library L100	45	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	45	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	2.0	14,666	-3	$1,684	$3,830	$790	1.8
HS-Library L100	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	978	0	$112	$520	$90	3.8

Location	Existing Conditions: Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	Proposed Conditions: ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Energy Impact & Financial Analysis: Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Library L100	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.3	1,955	0	$224	$710	$130	2.6
HS-Library L100	23	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	23	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.6	4,669	-1	$536	$2,690	$300	4.5
HS-Locker Room - East Gym Boys	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
HS-Locker Room - East Gym Boys	6	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	S	12	3,246		None	No	6	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Locker Room - East Gym Boys	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	825	0	$95	$350	$70	3.0
HS-Locker Room - East Gym Boys	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,178	0	$135	$510	$100	3.0
HS-Locker Room - East Gym Boys	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,521	0	$175	$680	$110	3.3
HS-Locker Room - East Gym Boys	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	707	0	$81	$300	$60	3.0
HS-Locker Room - East Gym Girls	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
HS-Locker Room - East Gym Girls	7	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	S	12	3,246		None	No	7	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Locker Room - East Gym Girls	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,521	0	$175	$680	$110	3.3
HS-Locker Room - East Gym Girls	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Locker Room - East Gym Girls	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	236	0	$27	$100	$20	3.0
HS-Locker Room - East Gym Girls	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	943	0	$108	$400	$80	3.0
HS-Locker Room - East Gym Girls	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.1	812	0	$93	$680	$80	6.4
HS-Locker Room - Kitchen N209	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Locker Room - Men's Pool Showers	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
HS-Locker Room - Men's Pool Showers	6	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704	3	None	Yes	6	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	115	0	$13	$0	$0	0.0
HS-Locker Room - Men's Pool Showers	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.5	3,259	-1	$374	$960	$190	2.1
HS-Locker Room - West Gym Boys	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
HS-Locker Room - West Gym Boys	6	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	S	12	3,246		None	No	6	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Locker Room - West Gym Boys	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,178	0	$135	$510	$100	3.0
HS-Locker Room - West Gym Boys	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	825	0	$95	$350	$70	3.0
HS-Locker Room - West Gym Boys	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,521	0	$175	$680	$110	3.3
HS-Locker Room - West Gym Boys	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	707	0	$81	$300	$60	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Locker Room - West Gym Girls	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
HS-Locker Room - West Gym Girls	7	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	S	12	3,246		None	No	7	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Locker Room - West Gym Girls	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	236	0	$27	$100	$20	3.0
HS-Locker Room - West Gym Girls	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,521	0	$175	$680	$110	3.3
HS-Locker Room - West Gym Girls	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Locker Room - West Gym Girls	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	943	0	$108	$400	$80	3.0
HS-Locker Room - West Gym Girls	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.1	812	0	$93	$680	$80	6.4
HS-Locker Room - Women's Pool Showers	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
HS-Locker Room - Women's Pool Showers	6	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704	3	None	Yes	6	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	115	0	$13	$0	$0	0.0
HS-Locker Room - Women's Pool Showers	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.5	3,259	-1	$374	$960	$190	2.1
HS-Mechanical - Boiler Room W905	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	2,390	0	$274	$890	$150	2.7
HS-Mechanical - Pool Filter Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	652	0	$75	$480	$70	5.5
HS-Office - Nurse	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
HS-Office - Nurse	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	236	0	$27	$100	$20	3.0
HS-Office - Nurse	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	236	0	$27	$100	$20	3.0
HS-Office - Nurse	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	3.0
HS-Office - Nurse	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	943	0	$108	$400	$80	3.0
HS-Office - Nurse	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	471	0	$54	$200	$40	3.0
HS-Office - Backstage	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.2	1,304	0	$150	$580	$100	3.2
HS-Office - Boiler Room Maintenance W905	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
HS-Office - Boiler Room Maintenance W905	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,304	0	$150	$630	$100	3.5
HS-Office - Child Study Team	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
HS-Office - Child Study Team	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,414	0	$162	$610	$120	3.0
HS-Office - Child Study Team	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	26	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.6	3,063	-1	$352	$1,310	$260	3.0
HS-Office - District Admin	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

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Office - District Admin	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,414	0	$162	$610	$120	3.0
HS-Office - District Admin	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	1,649	0	$189	$710	$140	3.0
HS-Office - District Admin	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.1	621	0	$71	$530	$60	6.6
HS-Office - E3a	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.2	1,531	0	$176	$680	$120	3.2
HS-Office - E5	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,086	0	$125	$580	$90	3.9
HS-Office - E7	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,521	0	$175	$680	$110	3.3
HS-Office - English Office S915	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,304	0	$150	$630	$100	3.5
HS-Office - Facility Manager W901	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.3	2,173	0	$249	$840	$140	2.8
HS-Office - Guidance	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
HS-Office - Guidance	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,592	-1	$298	$1,110	$220	3.0
HS-Office - Guidance	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.5	2,474	-1	$284	$1,060	$210	3.0
HS-Office - Guidance	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Office - IT L107	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.3	2,297	0	$264	$860	$160	2.7
HS-Office - Kitchen N209	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.2	1,531	0	$176	$680	$120	3.2
HS-Office - Library L100	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.3	1,955	0	$224	$710	$130	2.6
HS-Office - Lobby Security	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	30	4,704		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	30	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Office - Main	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	4,704	3	None	Yes	5	LED Lamps: (1) 12W A19 Screw-In Lamp	Occupancy Sensor	12	3,246	0.0	96	0	$11	$0	$0	0.0
HS-Office - Main	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	943	0	$108	$400	$80	3.0
HS-Office - Main	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	943	0	$108	$400	$80	3.0
HS-Office - Main	20	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	20	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.6	4,060	-1	$466	$2,430	$270	4.6
HS-Office - N904	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Office - Pool	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.2	1,630	0	$187	$650	$120	2.8
HS-Office - S907	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Office - S912	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.2	1,304	0	$150	$580	$100	3.2
HS-Office - S914	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.2	1,304	0	$150	$580	$100	3.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Office - Security	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	236	0	$27	$100	$20	3.0
HS-Office - Social Studies Office S917	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,304	0	$150	$630	$100	3.5
HS-Office - Special Education	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,738	0	$200	$730	$120	3.1
HS-Office - Trainer	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.5	3,911	-1	$449	$1,090	$220	1.9
HS-Office - Vice Principals	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	171	0	$20	$50	$10	2.0
HS-Office - Vice Principals	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Office - Vice Principals	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.2	1,218	0	$140	$860	$100	5.4
HS-Office - Vice Principals	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.2	1,218	0	$140	$860	$100	5.4
HS-Pool	7	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	4,704	3	None	Yes	7	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	3,246	0.0	101	0	$12	$0	$0	0.0
HS-Pool	18	LED - Fixtures: Close to Ceiling Mount	Wall Switch	S	50	4,704	3	None	Yes	18	LED - Fixtures: Close to Ceiling Mount	Occupancy Sensor	50	3,246	0.2	1,444	0	$166	$660	$70	3.6
HS-Restroom - A Hall Boys	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	589	0	$68	$250	$50	3.0
HS-Restroom - A Hall Girls	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	589	0	$68	$250	$50	3.0
HS-Restroom - Child Study Team	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	3.0
HS-Restroom - District Office Men's	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	3.0
HS-Restroom - District Office Women's	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	3.0
HS-Restroom - E Wing Female	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Restroom - E Wing Female	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.0	104	0	$12	$90	$10	6.7
HS-Restroom - E Wing Male	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Restroom - E Wing Male	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.0	104	0	$12	$90	$10	6.7
HS-Restroom - Female W Hall Students	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	471	0	$54	$200	$40	3.0
HS-Restroom - Main Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	3.0
HS-Restroom - Maintenance Office W905	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch		30	4,704		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	30	4,704	0.0	0	0	$0	$0	$0	0.0
HS-Restroom - Male W Hall Students	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	471	0	$54	$200	$40	3.0
HS-Restroom - N Hall All Gender Staff	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	3.0
HS-Restroom - N Hall All Gender Students	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Restroom - N Hall Boys	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	3,246	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	530	0	$61	$190	$50	2.3
HS-Restroom - N Hall Girls	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	3,246	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	530	0	$61	$190	$50	2.3
HS-Restroom - N8	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	3.0
HS-Restroom - Nurse	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	118	0	$14	$50	$10	3.0
HS-Restroom - Pool Lobby Boys	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
HS-Restroom - Pool Lobby Boys	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	3,246	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	707	0	$81	$250	$60	2.3
HS-Restroom - Pool Lobby Girls	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
HS-Restroom - Pool Lobby Girls	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	3,246	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	707	0	$81	$250	$60	2.3
HS-Restroom - Pool Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	4,704	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,704	0.0	256	0	$29	$60	$20	1.4
HS-Restroom - S Hall Female Faculty	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	236	0	$27	$100	$20	3.0
HS-Restroom - S Hall Male Faculty	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.0	236	0	$27	$100	$20	3.0
HS-Restroom - W Wing Female Faculty	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Restroom - W Wing Female Faculty	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.0	104	0	$12	$90	$10	6.7
HS-Restroom - W Wing Male Faculty	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Restroom - W Wing Male Faculty	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor		62	3,246	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,246	0.0	104	0	$12	$90	$10	6.7
HS-Server Room - IT L107	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.5	3,445	-1	$396	$1,130	$220	2.3
HS-Shop - Theater/Stage	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.6	4,345	-1	$499	$1,670	$270	2.8
HS-Shop - Wood Shop	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,086	0	$125	$580	$90	3.9
HS-Shop - Wood Shop	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.5	3,911	-1	$449	$1,090	$220	1.9
HS-Shop - Wood Shop	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.5	3,445	-1	$396	$1,130	$220	2.3
HS-Storage - Book Storage S919	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,304	0	$150	$630	$100	3.5
HS-Storage - Dressing Room E504	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	3,246	2	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.1	400	0	$46	$180	$40	3.0
HS-Storage - Dressing Room E506	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	3,246	2	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.1	400	0	$46	$180	$40	3.0
HS-Storage - E505	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	869	0	$100	$530	$80	4.5
HS-Storage - East Gym 2 EG1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,704	0.0	171	0	$20	$50	$10	2.0

	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**	**Estimated M&L Cost ($)**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
HS-Storage - East Gym EG1	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	707	0	$81	$300	$60	3.0
HS-Storage - Kitchen 2 N209	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Storage - Kitchen N209	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	652	0	$75	$480	$70	5.5
HS-Storage - Next to P906	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.2	1,086	0	$125	$580	$90	3.9
HS-Storage - Pool	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	652	0	$75	$480	$70	5.5
HS-Storage - Projections and Costumes E508	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	4,704	3	None	Yes	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	3,246	0.0	29	0	$3	$0	$0	0.0
HS-Storage - Projections and Costumes E508	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
HS-Storage - Projections and Costumes E508	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.1	652	0	$75	$280	$50	3.1
HS-Storage - S Hall by W12	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	652	0	$75	$480	$70	5.5
HS-Storage - School Store N1	8	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	S	9	3,246		None	No	8	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	3,246	0.0	0	0	$0	$0	$0	0.0
HS-Storage - School Store N1	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,246	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,246	0.3	1,414	0	$162	$510	$120	2.4
HS-Storage - Stage	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	3,246	2	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.1	400	0	$46	$180	$40	3.0
HS-Storage - W Hall by W12	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	652	0	$75	$480	$70	5.5
HS-Storage - West Gym PE	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,246	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	353	0	$41	$150	$30	3.0
HS-Theater	30	Incandescent: (1) 300W A19 Screw-In Lamp	Wall Switch	S	300	4,704	2, 3	Relamp	Yes	30	LED Lamps: A19 Lamps	Occupancy Sensor	45	3,246	5.8	41,750	-9	$4,793	$1,420	$100	0.3
HS-Theater	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.8	5,742	-1	$659	$1,660	$340	2.0
HS-Football Field	40	Metal Halide: (1) 1500W Lamp	Breaker Panel		1,610	50		None	No	40	Metal Halide: (1) 1500W Lamp	Breaker Panel	1,610	50	0.0	0	0	$0	$0	$0	0.0
MG-Exterior	1	LED - Fixtures: Wall Pack	Photocell		50	4,380		None	No	1	LED - Fixtures: Wall Pack	Photocell	50	4,380	0.0	0	0	$0	$0	$0	0.0
MG-Garage	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.4	2,680	-1	$308	$950	$180	2.5
SG-Exterior	3	LED - Fixtures: Wall Pack	Photocell		50	4,380		None	No	3	LED - Fixtures: Wall Pack	Photocell	50	4,380	0.0	0	0	$0	$0	$0	0.0
SG-Garage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,704	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,246	0.1	435	0	$50	$250	$40	4.2
SG-Garage	13	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,704	2, 3	Relamp	Yes	13	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,246	0.7	4,976	-1	$571	$1,480	$300	2.1

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	**Motor Quantity**	**Motor Application**	**HP Per Motor**	**Full Load Efficiency**	**VFD Control?**	**Manufacturer**	**Model**	**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**	**Estimated M&L Cost ($)**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
HS-Shop - Wood Shop	Air Compressor - Wood Shop	1	Air Compressor	5.00	89.5%	No			W	1,250		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior - Pump Room	Chilled Water	2	Chilled Water Pump	20.00	93.0%	Yes			W	2,800		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Classrooms	Various Spaces	1	Exhaust Fan	0.25	65.0%	No			W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	1	Exhaust Fan	0.13	65.0%	No	Cook	90 ACEH 90C15DH	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	1	Exhaust Fan	0.50	75.0%	No	Cook	135 ACE	W	4,536		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	3	Exhaust Fan	0.75	75.0%	No			W	4,536		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	3	Exhaust Fan	1.00	82.5%	No	Greenheck	CUBE-220-15	W	4,536	5	No	82.5%	Yes	3	0.9	4,614	0	$544	$12,900	$200	23.3
HS-Exterior roof	Various Spaces	10	Exhaust Fan	0.17	65.0%	No	Greenheck	GB-071	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	1	Exhaust Fan	0.17	65.0%	No		GB-081	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	4	Exhaust Fan	0.17	65.0%	No		GB-090	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	2	Exhaust Fan	0.25	65.0%	No		GB-100	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	3	Exhaust Fan	0.25	65.0%	No		GB-130	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	2	Exhaust Fan	0.75	75.0%	No		GB-160	W	4,536		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	1	Exhaust Fan	0.75	75.0%	No		GB-180	W	4,536		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	3	Exhaust Fan	0.75	75.0%	No		SWB-207	W	4,536		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	2	Exhaust Fan	0.75	75.0%	No		SWB-212	W	4,536		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior roof	Various Spaces	1	Exhaust Fan	0.75	75.0%	No			W	4,536		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Mechanical - Boiler Room W905	Heating Water	4	Heating Hot Water Pump	7.50	91.0%	Yes			W	2,500		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Mechanical - Boiler Room W905	Heating Water	2	Heating Hot Water Pump	15.00	93.0%	Yes			W	2,500		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Exterior - Roof	Kitchen Exhaust	1	Kitchen Hood Exhaust Fan	1.50	84.0%	No			W	5,250	6	No	86.5%	Yes	1	0.0	4,540	39	$1,134	$4,400	$100	3.8

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Exterior - Roof	Kitchen Exhaust	2	Kitchen Hood Exhaust Fan	1.00	82.0%	No			W	5,250	6	No	85.5%	Yes	2	0.0	5,905	39	$1,295	$7,900	$200	5.9
HS-Mechanical - Boiler Room W905	DHW Circulation	2	DHW Circulation Pump	5.00	87.5%	No			W	8,760		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
HS-Mechanical - Pool Filter Room	Pool Process Pump	1	Process Pump	1.25	82.5%	No			W	3,391		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
HS-Mechanical - Pool Filter Room	Pool Filtration Pump	2	Pool Filtration Pump	15.00	90.2%	No			W	3,391		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	AHU-11 - C-Hallway	1	Supply Fan	3.00	84.0%	No	Trane	YCD120B4	W	4,536	5	No	89.5%	Yes	1	0.9	5,033	0	$594	$5,100	$200	8.3
HS-Penthouse	AHU-1 - Library	1	Supply Fan	10.00	91.2%	Yes	Trane	Climate Changer AHU	W	4,536		No	91.2%	No		0.0	0	0	$0	$0	$0	0.0
HS-Penthouse	AHU-1 - Library	1	Return Fan	5.00	89.5%	Yes	Trane	Climate Changer AHU	W	4,536		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
HS-Penthouse	AHU-1 - Library	1	Other	0.17	60.0%	No	Trane	Climate Changer AHU	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Penthouse	AHU-2 - Library Offices	1	Supply Fan	7.50	89.5%	Yes	Trane	Climate Changer AHU	W	4,536		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
HS-Penthouse	AHU-2 - Library Offices	1	Return Fan	5.00	89.5%	Yes	Trane	Climate Changer AHU	W	4,536		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
HS-Penthouse	AHU-2 - Library Offices	1	Other	0.03	60.0%	No	Trane	Climate Changer AHU	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Pool Dehumidification	1	Supply Fan	20.00	91.0%	No	Dectron	LD-152-PR-X	W	4,536	5	No	93.0%	Yes	1	5.9	28,968	0	$3,418	$12,200	$1,300	3.2
HS-Roof	Pool Dehumidification	1	Exhaust Fan	2.40	82.0%	No	Dectron	LD-152-PR-X	W	4,536		No	82.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Pool Dehumidification	1	Process Blower	5.30	84.0%	No	Dectron	LD-152-PR-X	W	4,536		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Pool Dehumidification	1	Process Pump	0.75	70.0%	No	Dectron	LD-152-PR-X	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	AHU-5 - Lobby Pool	1	Supply Fan	3.00	84.0%	No	Trane	YCD120B4	W	4,536	5	No	89.5%	Yes	1	0.9	5,033	0	$594	$5,100	$200	8.3
HS-Roof	AHU-15 - Pool Locker Room	1	Supply Fan	5.00	86.0%	No	Trane	SFHFC254P	W	4,536	5	No	89.5%	Yes	1	1.5	7,897	0	$932	$5,600	$900	5.0
HS-Roof	AHU-15 - Pool Locker Room	1	Combustion Air Fan	0.25	60.0%	No	Trane	SFHFC254P	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Theater - Auditorium	2	Supply Fan	10.00	91.7%	Yes	Trane	OANGO50D3	W	4,536		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Theater - Auditorium	1	Exhaust Fan	7.50	89.5%	Yes	Trane	OANGO50D4	W	4,536		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Roof	Theater - Auditorium	1	Other	0.17	60.0%	No	Trane	OANGO50D5	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Gymnasium	Crew ERG Room Ege	1	Supply Fan	0.33	60.0%	No	Trane	BCHC036	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Units - A Hallway & Offices	12	Supply Fan	0.13	60.0%	No	Trane	4TTB3018E	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	B Hall Offices	5	Supply Fan	0.13	60.0%	No	Trane	4TTR4024L	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - C Hall Classrooms	2	Supply Fan	0.08	60.0%	No	Trane	TTP024C	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - C Hall Classrooms	2	Supply Fan	0.33	60.0%	No	Trane	TTP048D	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - C Hall Classrooms	2	Supply Fan	0.33	60.0%	No	Trane	TTP030D	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - ERG Room	1	Supply Fan	0.20	60.0%	No	Trane	4TTB3060D	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - Corridor Gym & Hllways	4	Supply Fan	0.20	60.0%	No	Trane	4TTB3018E	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - W Hall Offices & Hallways	6	Supply Fan	0.13	60.0%	No	Trane	4TTB3018E	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - W HallWay & A Hallways	3	Supply Fan	0.13	60.0%	No	Trane	4TTB3018E	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - MUA - C Hall	1	Supply Fan	1.00	80.0%	No	Trane	TTA120B	W	4,536		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Corridors	Fan Coil Units	30	Supply Fan	0.13	60.0%	No			W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	MUA-1 - C Hall	1	Supply Fan	1.50	80.0%	No	Trane		B	4,536	5	No	86.5%	Yes	1	0.5	2,701	0	$319	$4,400	$100	13.5
HS-Roof	MUA-3 - Kitchen	1	Supply Fan	15.00	92.4%	No	Greenheck	IGX-120-32	W	4,536	5	No	93.0%	Yes	1	4.3	20,839	0	$2,459	$10,300	$1,200	3.7
HS-Roof	MUA-2 - Serving Room	1	Supply Fan	0.75	70.0%	No	Greenheck	IG-109-I-10	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Electrical Room	ERV- B Hall	1	Supply Fan	0.25	60.0%	No	Greenheck	ERV-MINIV-450-QD	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Electrical Room	ERV- B Hall	1	Exhaust Fan	0.25	60.0%	No	Greenheck	ERV-MINIV-450-QD	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	ERV-10 - A Hall	1	Exhaust Fan	0.75	70.0%	No	Greenheck	ERCH-20M-15-4	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	ERV-6 & 9 - W Hall Restrooms	2	Exhaust Fan	0.75	70.0%	No	Greenheck	ERCH-20M-15-5	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	**Motor Quantity**	**Motor Application**	**HP Per Motor**	**Full Load Efficiency**	**VFD Control?**	**Manufacturer**	**Model**	**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**	**Estimated M&L Cost ($)**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
HS-Pool Storage	Combustion Air Fan	1	Combustion Air Fan	0.33	65.0%	No	US Motors	S55JXP	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RAC-12 - A Hall Classrooms	1	Supply Fan	1.00	80.0%	No	Trane	YHC060E4	W	4,536		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	Auxiliary Gym	1	Supply Fan	5.00	90.2%	No	Trane	YCD150C4	W	4,536	5	No	90.2%	Yes	1	1.4	7,034	0	$830	$5,600	$900	5.7
HS-Roof	RTU-3 & 4 - Band Room & Guidance Offices	2	Supply Fan	2.00	82.0%	No	AAON	RN-009-3-A	W	4,536	5	No	86.5%	Yes	2	1.2	6,770	0	$799	$9,400	$200	11.5
HS-Roof	RTU-3 & 4 - Band Room & Guidance Offices	2	Exhaust Fan	2.00	82.0%	No	AAON	RN-009-3-A	W	4,536	5	No	86.5%	Yes	2	1.3	6,770	0	$799	$9,400	$200	11.5
HS-Roof	RTU-5 & 6 - Cafeteria	2	Supply Fan	5.00	86.5%	No	AAON	RN-013-3-A	W	4,536	5	No	89.5%	Yes	2	3.0	15,555	0	$1,835	$11,300	$1,800	5.2
HS-Roof	RTU-5 & 6 - Cafeteria	2	Exhaust Fan	3.00	84.0%	No	AAON	RN-013-3-A	W	4,536	5	No	89.5%	Yes	2	1.9	10,066	0	$1,188	$10,200	$400	8.3
HS-Roof	RTU-5 & 6 - Cafeteria	2	Combustion Air Fan	0.25	60.0%	No	AAON	RN-013-3-A	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-1 - CST Offices	1	Supply Fan	2.00	82.0%	No	AAON	RN-008-3-A	W	4,536	5	No	86.5%	Yes	1	0.6	3,385	0	$399	$4,700	$100	11.5
HS-Roof	RTU-1 - CST Offices	1	Exhaust Fan	2.00	82.0%	No	AAON	RN-008-3-A	W	4,536	5	No	86.5%	Yes	1	0.6	3,385	0	$399	$4,700	$100	11.5
HS-Roof	RTU-1- District Aministration Offices	1	Supply Fan	1.00	80.0%	Yes	AAON	RN-003-8-W	W	4,536		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-1- District Aministration Offices	1	Exhaust Fan	1.00	80.0%	Yes	AAON	RN-003-8-W	W	4,536		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-10 & 11 - East & West Girls Locker Rooms	2	Supply Fan	3.00	84.0%	Yes	AAON	RN-009-3-A	W	4,536		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-10 & 11 - East & West Girls Locker Rooms	2	Exhaust Fan	2.00	82.0%	Yes	AAON	RN-009-3-A	W	4,536		No	82.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-12 & 13- East Gym	2	Supply Fan	15.00	92.0%	Yes	AAON	RN-025-3-A	W	4,536		No	92.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-12 & 13- East Gym	2	Exhaust Fan	10.00	91.0%	Yes	AAON	RN-025-3-A	W	4,536		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-12 & 13- East Gym	4	Combustion Air Fan	0.25	60.0%	No	AAON	RN-025-3-A	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-2 - Main Office	1	Supply Fan	2.00	82.0%	No	AAON	RNA-007-3-2	W	4,536	5	No	86.5%	Yes	1	0.6	3,385	0	$399	$4,700	$100	11.5
HS-Roof	RTU - Room N2	1	Supply Fan	3.00	84.0%	No	Trane	YCD120B4	W	4,536	5	No	89.5%	Yes	1	0.9	5,033	0	$594	$5,100	$200	8.3
HS-Roof	RTU - Room N2	1	Exhaust Fan	1.00	80.0%	No	Trane	YCD120B5	W	4,536	5	No	85.5%	Yes	1	0.3	1,770	0	$209	$3,900	$100	18.2

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Roof	RTUs - Rooms N4 & N6	2	Supply Fan	0.75	70.0%	No	Trane	YHC048E4R	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room N8	1	Supply Fan	0.75	70.0%	No	Trane	YHC060E4R	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-7 & 14 - West & East Boys Locker Rooms	4	Supply Fan	5.00	86.5%	No	AAON	RN-013-3-A	W	4,536	5	No	89.5%	Yes	4	6.0	31,110	0	$3,671	$22,600	$3,600	5.2
HS-Roof	RTU-7 & 14 - West & East Boys Locker Rooms	4	Exhaust Fan	3.00	84.0%	No	AAON	RN-013-3-A	W	4,536	5	No	89.5%	Yes	4	3.9	20,133	0	$2,376	$20,500	$800	8.3
HS-Roof	RTU - Nurse Office	1	Supply Fan	0.33	65.0%	No	Trane	THC036E4	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTUs - Rooms S1- S3 & S5	2	Supply Fan	0.33	65.0%	No	Trane	YHC048E4R	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room S2	1	Supply Fan	0.75	65.0%	No	Trane	YHC060E4R	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-9 - West Gym	1	Supply Fan	15.00	92.0%	Yes	AAON	RN-025-3-A	W	4,536		No	92.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-9 - West Gym	1	Exhaust Fan	10.00	91.0%	Yes	AAON	RN-025-3-A	W	4,536		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-9 - West Gym	2	Combustion Air Fan	0.25	60.0%	No	AAON	RN-025-3-A	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - W1 Media	2	Supply Fan	0.33	65.0%	No	Trane	4YCC4024A	W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room W1 & Classroms	1	Supply Fan	1.50	82.0%	No	Trane	YSC060G4	W	4,536	5	No	86.5%	Yes	1	0.5	2,539	0	$300	$4,400	$100	14.4
HS-Roof	RTU - Room W5 & W3	2	Supply Fan	1.00	80.0%	No	Trane	YSC048A3	W	4,536	5	No	85.5%	Yes	2	0.6	3,540	0	$418	$7,900	$200	18.4
HS-Roof	RTU - Trainer Room	1	Supply Fan	2.00	80.0%	No	Trane	YCD075C4	W	4,536	5	No	86.5%	Yes	1	0.6	3,601	0	$425	$4,700	$100	10.8
HS-Roof	RTU - W Hall Classrooms	1	Supply Fan	1.00	80.0%	No	Trane	YHC060E4R	W	4,536	5	No	85.5%	Yes	1	0.3	1,770	0	$209	$3,900	$100	18.2
HS-Roof	RTU - Room W23 & W25	1	Supply Fan	1.00	80.0%	No	Trane	THC048E4R	W	4,536	5	No	85.5%	Yes	1	0.3	1,770	0	$209	$3,900	$100	18.2
HS-Roof	RTU - Room W23 & W26	1	Supply Fan	1.00	80.0%	No	Trane	THC060E4R	W	4,536	5	No	85.5%	Yes	1	0.3	1,770	0	$209	$3,900	$100	18.2
HS-Roof	RTU - Weight Room	1	Supply Fan	5.00	86.0%	No	Trane	YCD150B4	W	4,536	5	No	89.5%	Yes	1	1.5	7,897	0	$932	$5,600	$900	5.0
HS-Roof	RTU-8 - West Gym	1	Supply Fan	7.50	89.5%	No	AAON	RN-016-3-A	W	4,536	5	No	91.0%	Yes	1	2.2	10,949	0	$1,292	$6,700	$1,000	4.4
HS-Roof	RTU-8 - West Gym	1	Exhaust Fan	3.00	84.0%	No	AAON	RN-016-3-A	W	4,536	5	No	89.5%	Yes	1	1.0	5,033	0	$594	$5,100	$200	8.3

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Roof	RTU-8 - West Gym	1	Combustion Air Fan	0.25	65.0%	No	AAON	RN-016-3-A	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-8 - West Gym	2	Other	0.16	60.0%	No	AAON	RN-016-3-A	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Various Spaces	Hydronic Unit Heaters	22	Supply Fan	0.13	60.0%	No			W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Social Studies & English Office	Social Studies & English Office	4	Supply Fan	0.33	65.0%	No	Trane		W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-C & S Wing Classrooms & Office E7	C & S Wing Classrooms & Office E7	22	Supply Fan	1.00	70.0%	No	AIREDALE	UVEW6CHW4-115	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-A, B & W Wing Classrooms & Computer Lab	A, B & W Wing Classrooms & Computer Lab	34	Supply Fan	0.50	70.0%	No	AIREDALE	CHX3/2	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-A5 Classroom	A5 Classroom	1	Supply Fan	0.75	70.0%	No	AIREDALE	CMD48FCMECAX	W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Classroom Choir	Classroom Choir	4	Supply Fan	0.50	70.0%	No	Trane		W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-Classroom Band, SS Office 917	Classroom Band, SS Office 917	6	Supply Fan	0.50	70.0%	No	Trane		W	4,536		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-School Store & English Office S915	School Store & English Office S915	4	Supply Fan	0.33	65.0%	No	Trane		W	4,536		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-C & S Wing Classrooms & Office E7	C & S Wing Classrooms & Office E7	22	Exhaust Fan	0.33	60.0%	No	AIREDALE	UVEW6CHW4	W	4,536		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-A5 Classroom	A5 Classroom	1	Other	0.10	60.0%	No	AIREDALE	CMD48FCME	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
HS-A5 Classroom	A5 Classroom	1	Other	0.20	60.0%	No	AIREDALE	CMD48FCME	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
MG-Garage	Garage Roll Up Door Motor	1	Other	0.50	70.0%	No			W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0

Packaged HVAC Inventory & Recommendations

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Manufacturer	Model	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/IEER/ EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Roof	AHU-11 - C-Hallway	1	Package Unit	10.00	203.00	9.50	0.812 AFUE	Trane	YCD120B4	B	7	Yes	1	Package Unit	10.00	203.00	14.00	0.82 Et	2.0	4,466	1	$542	$19,000	$800	33.6
HS-Roof	Pool Dehumidification	1	Package Unit	12.50	480.00	9.50	0.8 AFUE	Dectron	LD-152-PR-X	B	7	Yes	1	Package Unit	12.50	480.00	14.00	0.82 Et	2.5	5,583	6	$748	$21,000	$1,100	26.6
HS-Roof	AHU-5 - Lobby Pool	1	Package Unit	10.00	203.00	9.50	0.812 AFUE	Trane	YCD120B4	B	7	Yes	1	Package Unit	10.00	203.00	14.00	0.82 Et	2.0	4,466	1	$542	$19,000	$800	33.6
HS-Roof	AHU-15 - Pool Locker Room	1	Package Unit	25.00	520.00	9.50	0.8 AFUE	Trane	SFHFC254P	B	7	Yes	1	Package Unit	25.00	520.00	12.50	0.82 Et	3.8	8,337	6	$1,080	$39,300	$2,100	34.4
HS-Roof	AHU-13 - Theater - Auditorium	1	Package Unit	50.00		9.30		Trane	OANGO50D3	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Gymnasium	Crew ERG Room Ege	1	Package Unit	3.00		12.00		Trane	BCHC036	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Units - A Hallway & Offices	12	Split-System	1.50		10.50		Trane	4TTB3018E	B	7	Yes	12	Split-System	1.50		16.00		3.5	7,779	0	$918	$48,900	$1,900	51.2
HS-Roof	Condensing Unit - B Hall Office	1	Split-System	2.00		12.00		Trane	4TTR4024L	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	Condensing Unit - B Hall Office	6	Split-System	1.50		10.50		Trane	4TTB3018E	B	7	Yes	6	Split-System	1.50		16.00		1.8	3,889	0	$459	$24,400	$900	51.2
HS-Roof	Condensing Unit - C Hall Classrooms	2	Split-System	2.00		10.50		Trane	TTP024C	B	7	Yes	2	Split-System	2.00		16.00		0.8	1,729	0	$204	$8,800	$400	41.2
HS-Roof	Condensing Unit - C Hall Classrooms	2	Split-System	4.00		10.50		Trane	TTP048D	B	7	Yes	2	Split-System	4.00		16.00		1.6	3,457	0	$408	$16,200	$800	37.8
HS-Roof	Condensing Unit - C Hall Classrooms	2	Split-System	2.50		10.50		Trane	TTP030D	B	7	Yes	2	Split-System	2.50		16.00		1.0	2,161	0	$255	$10,100	$500	37.7
HS-Roof	Condensing Unit - ERG Room	1	Split-System	5.00		10.50		Trane	4TTB3060D	B	7	Yes	1	Split-System	5.00		16.00		1.0	2,161	0	$255	$10,800	$500	40.4
HS-Roof	Condensing Unit - Corridor Gym & Hallways	4	Split-System	1.50		10.50		Trane	4TTB3018E	B	7	Yes	4	Split-System	1.50		16.00		1.2	2,593	0	$306	$16,300	$600	51.3
HS-Roof	Condensing Unit - W Hall Offices & Hallways	6	Split-System	1.50		10.50		Trane	4TTB3018E	B	7	Yes	6	Split-System	1.50		16.00		1.8	3,889	0	$459	$24,400	$900	51.2
HS-Roof	Condensing Unit - W HallWay & A Hallways	3	Split-System	1.50		10.50		Trane	4TTB3018E	B	7	Yes	3	Split-System	1.50		16.00		0.9	1,945	0	$229	$12,200	$500	51.0
HS-Roof	Condensing Unit - MUA - C Hall	1	Split-System	10.00		10.90		Trane	TTA120B	B	7	Yes	1	Split-System	10.00		14.00		1.2	2,682	0	$316	$17,300	$800	52.1
HS-Restroom	Restroom	1	Electric Resistance Heat		13.65		1 COP		WH4404	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Restroom	Restroom	1	Electric Resistance Heat		3.41		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	MUA-1 - C Hall	1	Forced Air Furnace		96.00		0.8 AFUE	Trane		B	10	Yes	1	Forced Air Furnace		96.00		0.97 AFUE	0.0	0	8	$128	$3,600	$500	24.2

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Manufacturer	Model	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	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Roof	MUA-3 - Kitchen	1	Forced Air Furnace		840.00		0.8 AFUE	Greenheck	IGX-120-32	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	MUA-2 - Serving Room	1	Forced Air Furnace		80.00		0.8 AFUE	Greenheck	IG-109-I-10	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RAC-12 - A Hall Classrooms	1	Package Unit	5.00	104.00	10.50	0.8 AFUE	Trane	YHC060E4	B	7	Yes	1	Package Unit	5.00	104.00	16.00	0.82 AFUE	1.0	2,161	1	$274	$13,000	$500	45.6
HS-Roof	AHU-14A - Auxiliary Gym	1	Package Unit	12.50	203.00	9.50	0.812 AFUE	Trane	YCD150C4	B	7	Yes	1	Package Unit	12.50	203.00	14.00	0.82 Et	2.5	5,583	1	$674	$21,000	$1,100	29.5
HS-Roof	RTU-3 & 4 - Band Room & Guidance Offices	2	Package Unit	9.00		11.00		AAON	RN-009-3-A	B	7	Yes	2	Package Unit	9.00		14.00		2.1	4,629	0	$546	$26,300	$1,400	45.6
HS-Roof	RTU-3 & 4 - Band Room & Guidance Offices	2	Package Unit		68.24		1 COP	AAON	RN-009-3-A	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-5 & 6 - Cafeteria	2	Package Unit	13.00	234.00	11.00	0.8 AFUE	AAON	RN-013-3-A	B	7	Yes	2	Package Unit	13.00	234.00	14.00	0.82 Et	3.0	6,686	6	$876	$42,800	$2,300	46.2
HS-Roof	RTU-1 - CST Offices	1	Package Unit	8.00		11.00		AAON	RN-008-3-A	B	7	Yes	1	Package Unit	8.00		14.00		0.9	2,057	0	$243	$11,500	$600	44.9
HS-Roof	RTU-1 - CST Offices	1	Package Unit		68.24		1 COP	AAON	RN-008-3-A	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-1- District Aministration Offices	1	Package Unit	3.00		11.00		AAON	RN-003-8-W	B	7	Yes	1	Package Unit	3.00		16.00		0.5	1,125	0	$133	$7,100	$300	51.2
HS-Roof	RTU-1- District Aministration Offices	1	Package Unit		51.18		1 COP	AAON	RN-003-8-W	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-10 & 11 - East & West Girls Locker Rooms	2	Package Unit	9.00	156.00	11.00	0.8 AFUE	AAON	RN-009-3-A	B	7	Yes	2	Package Unit	9.00	156.00	14.00	0.82 Et	2.1	4,629	4	$604	$36,500	$1,400	58.1
HS-Roof	RTU-12 & 13- East Gym	2	Package Unit	25.00	325.00	11.00	0.802469135802469 AFUE	AAON	RN-025-3-A	B	7	Yes	2	Package Unit	25.00	325.00	12.50	0.82 Et	3.3	7,200	7	$955	$78,700	$4,300	77.9
HS-Roof	RTU-2 - Main Office	1	Package Unit	7.00		11.00		AAON	RNA-007-3-1	B	7	Yes	1	Package Unit	7.00		14.00		0.8	1,800	0	$212	$10,300	$600	45.7
HS-Roof	RTU-2 - Main Office	1	Package Unit		51.18		1 COP	AAON	RNA-007-3-2	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room N2	1	Package Unit	10.00	68.24	11.00	1 COP	Trane	YHC120E4R	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTUs - Rooms N4 & N6	2	Package Unit	4.00	104.00	12.00	0.8 AFUE	Trane	YHC048E4R	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room N8	1	Package Unit	5.00	104.00	12.00	0.8 AFUE	Trane	YHC060E4R	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-7 & 14 - West & East Boys Locker Rooms	2	Package Unit	13.00	234.00	11.00	0.798634812286689 AFUE	AAON	RN-013-3-A	B	7	Yes	2	Package Unit	13.00	234.00	14.00	0.82 Et	3.0	6,686	6	$882	$42,800	$2,300	45.9
HS-Roof	RTU - Nurse Office	1	Package Unit	3.00	25.59	14.00	1 COP	Trane	THC036E4	W		No							0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Manufacturer	Model	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	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Roof	RTU - Pool Office	1	Package Unit	1.50		11.00		Trane	YCC018F1	B	7	Yes	1	Package Unit	1.50		16.00		0.3	563	0	$66	$5,000	$200	72.3
HS-Roof	RTUs - Rooms S1- S3 & S5	2	Package Unit	4.00	104.00	12.00	0.8 AFUE	Trane	YHC048E4R	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room S2	1	Package Unit	5.00	104.00	12.00	0.8 AFUE	Trane	YHC060E4R	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU-9 - West Gym	1	Package Unit	25.00	325.00	11.00	0.802469135802469 AFUE	AAON	RN-025-3-A	B	7	Yes	1	Package Unit	25.00	325.00	12.50	0.82 Et	1.6	3,600	3	$478	$39,300	$2,100	77.9
HS-Roof	RTU - Media Center	2	Package Unit	2.00	48.00	14.00	0.8 AFUE	Trane	4YCC4024A	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room W1 & Classroms	1	Package Unit	5.00	121.50	13.00	0.81 AFUE	Trane	YSC060G4	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room W5 & W3	2	Package Unit	4.00	96.00	11.00	0.8 AFUE	Trane	YSC048A3	B	7	Yes	2	Package Unit	4.00	96.00	16.00	0.82 AFUE	1.4	3,000	2	$390	$22,600	$800	55.9
HS-Roof	RTU - Trainer Room	1	Package Unit	6.25	166.00	11.00	0.809756097560976 AFUE	Trane	YCD075C4	B	7	Yes	1	Package Unit	6.25	166.00	14.00	0.82 Et	0.7	1,607	1	$205	$15,000	$500	70.6
HS-Roof	RTU - W Hall Classrooms	1	Package Unit	5.00	104.00	13.00	0.8 AFUE	Trane	YHC060E4R	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room W23 & W25	1	Package Unit	4.00	104.00	14.00	0.8 AFUE	Trane	THC048E4R	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	RTU - Room W23 & W26	1	Package Unit	6.00	25.59	13.00	1 COP	Trane	THC060E4R	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	AHU-12 - Weight Room	1	Package Unit	12.50	284.00	11.00	0.811428571428571 AFUE	Trane	YCD150B4	B	7	Yes	1	Package Unit	12.50	284.00	14.00	0.82 Et	1.5	3,214	1	$402	$21,000	$1,100	49.6
HS-Roof	RTU-8 - West Gym	1	Package Unit	16.00	219.00	11.00	0.811111111111111 AFUE	AAON	RN-016-3-A	B	7	Yes	1	Package Unit	16.00	219.00	14.00	0.82 Et	1.9	4,114	1	$503	$24,100	$1,400	45.1
HS-Roof	C Hall Office	1	Split-System Air-Source HP	1.00	14.00	10.50	6.5 HSPF	Fujitsu	AOU12RL2	B	8	Yes	1	Split-System Air-Source HP	1.00	14.00	15.50	8.5 HSPF	0.7	628	0	$74	$3,900	$100	51.2
HS-Roof	IT Room	1	Split-System Air-Source HP	3.00	34.00	12.00	6.5 HSPF	Fujitsu	AOU36RLXB	B	8	Yes	1	Split-System Air-Source HP	3.00	34.00	15.50	8.5 HSPF	1.5	1,425	0	$168	$7,000	$300	39.9
HS-Roof	It Room	1	Split-System	1.50		11.00		EMI		B	7	Yes	1	Split-System	1.50		16.00		0.3	563	0	$66	$4,100	$200	58.8
HS-Roof	Lobby - Security	1	Split-System Air-Source HP	0.75	12.00	11.00	6 HSPF	Fujitsu	AOU9RLXB	B	8	Yes	1	Split-System Air-Source HP	0.75	12.00	15.50	8.5 HSPF	0.7	641	0	$76	$3,600	$100	46.3
HS-Roof	Maintenance Manager Office	1	Split-System	1.50		12.00		LG	LSU186CE	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	N Hall Electrical Room	1	Split-System Air-Source HP	2.50	30.00	12.00	8 HSPF	Fujitsu	AOU30RLXB	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Roof	W Hall Electrical Room	1	Split-System Air-Source HP	2.00	30.00	13.00	8 HSPF			W		No							0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/EER)	Heating Mode Efficiency	Manufacturer	Model	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	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Classroom W1 & Weight Room	Classroom W1 & Weight Room	3	Electric Resistance Heat		17.06		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
HS-Pump Room	Pump Room	1	Electric Resistance Heat		25.59		1 COP	Trane	UHEC-072AACA	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	Kitchen N209	1	Electric Resistance Heat		25.59		1 COP	Dayton	2Y60	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Office Trainer	Office Trainer	1	Electric Resistance Heat		5.12		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
HS-A, B & W Wing Classrooms & Computer Lab	A, B & W Wing Classrooms & Computer Lab Airedale Package Unit	34	Package Unit	3.00		13.50		Airedale/Modine	CHX3/2	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Press Box	Press Box	2	Window AC	0.50		10.90		GE	AHTE06AAQ3	W		No							0.0	0	0	$0	$0	$0	0.0
HS-Boiler Room W905	Boiler Room W905	1	Window AC	0.50		10.00		GE		W		No							0.0	0	0	$0	$0	$0	0.0
MG-Garage	Garage	2	Unit Heater		10.24		1 COP	Dayton		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)	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Exterior	Chilled Water Production System	1	Air-Cooled Reciprocating Chiller	155.00	Trane	RTAC 1554 UR0H UAFN N1WX 1DDL NN0F A11C R0EX N	W	9	Yes	1	Air-Cooled Screw Chiller	Variable	155.00	1.24	0.73	-22.5	31,230	0	$3,685	$201,500	$14,300	50.8

Space Heating Boiler Inventory & Recommendations

		Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Mechanical - Boiler Room W905	HW Heating System	6	Condensing Hot Water Boiler	2,838	Aerco	Benchmark 3000	W		No						0.0	0	0	$0	$0	$0	0.0
HS-Pool Storage	Pool Heater	1	Non-Condensing Hot Water Boiler	638	Pennant	PNCH	W		No						0.0	0	0	$0	$0	$0	0.0

Demand Control Ventilation Recommendations

		Recommendation Inputs					Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Affected**	**ECM #**	**Number of Zones**	**Cooling Capacity of Controlled System (Tons)**	**Electric Heating Capacity of Controlled System (kBtu/hr)**	**Output Heating Capacity of Controlled System (MBh)**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Estimated M&L Cost ($)**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
HS-Roof	AHU-13 - Theater - Auditorium	11	4.00	50.00	0.00	567.60	0.0	3,548	12	$602	$5,900	$0	9.8
HS-Roof	AHU-15 - Pool Locker Room	11	3.00	25.00	0.00	520.00	0.0	1,774	13	$408	$4,400	$0	10.8
HS-Roof	AHU-14A - Auxiliary Gym	11	2.00	12.50	0.00	203.00	0.0	868	5	$179	$2,900	$0	16.2
HS-Roof	RTU-5 & 6 - Cafeteria	11	4.00	26.00	0.00	468.00	0.0	1,560	12	$363	$5,900	$0	16.3
HS-Roof	RTU-10 & 11 - East & West Girls Locker Rooms	11	3.00	18.00	0.00	312.00	0.0	1,080	8	$246	$4,400	$0	17.9
HS-Roof	RTU-7 & 14 - West & East Boys Locker Rooms	11	4.00	26.00	0.00	468.00	0.0	1,560	12	$363	$5,900	$0	16.3
HS-Roof	RTU-9 - West Gym	11	3.00	25.00	0.00	325.00	0.0	1,500	8	$301	$4,400	$0	14.6
HS-Roof	AHU-12 - Weight Room	11	2.00	12.50	0.00	284.00	0.0	750	7	$195	$2,900	$0	14.9
HS-Roof	RTU-8 - West Gym	11	2.00	16.00	0.00	219.00	0.0	960	5	$196	$2,900	$0	14.8

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	**System Quantity**	**System Type**	**Manufacturer**	**Model**	**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**	**Estimated M&L Cost ($)**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
HS-Mechanical - Boiler Room W905	DHW System	1	Boiler	Laars	RHEOS+	W		No						0.0	0	0	$0	$0	$0	0.0
HS-Janitorial - SW Connector	DWH System	1	Storage Tank Water Heater (≤ 50 Gal)	A.O Smith	ENL-30 100	W		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	**ECM #**	**Device Quantity**	**Device Type**	**Existing Flow Rate (gpm)**	**Proposed Flow Rate (gpm)**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Estimated M&L Cost ($)**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
HS-Restrooms	12	22	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	10	$159	$180	$90	0.6
HS-Restrooms	12	83	Faucet Aerator (Lavatory)	0.50	0.50	0.0	0	0	$0	$700	$330	0.0
HS-Locker Rooms	12	79	Showerhead	2.50	1.50	0.0	0	62	$944	$8,270	$1,190	7.5

Walk-In Cooler/Freezer Inventory & Recommendations

Location	Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis						
	Cooler/ Freezer Quantity	Case Type/Temperature	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Kitchen N209	1	Cooler (35F to 55F)	Trenton	TPLP209MAS1DR 2	13, 14	Yes	No	Yes	0.1	1,251	0	$148	$2,810	$160	18.0
HS-Kitchen N209	2	Medium Temp Freezer (0F to 30F)	Trenton	TPLP209LES2DR2	13, 14	Yes	Yes	Yes	0.1	2,185	0	$258	$6,150	$330	22.6

Commercial Refrigerator/Freezer Inventory & Recommendations

Location	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Refrigerator/ Freezer Type	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-East/West Cafeteria	1	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)	TRUE	CD26HD	Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	1	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)			No		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)		TOM-48DXB-N	No	15	Yes	0.1	822	0	$97	$4,900	$100	49.5
HS-Kitchen N209	6	Refrigerator Chest		780	No		No	0.0	0	0	$0	$0	$0	0.0
HS-Concession EG11	1	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	QBD	DC12	No		No	0.0	0	0	$0	$0	$0	0.0
HS-Concession Stand P906	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)		243006	No		No	0.0	0	0	$0	$0	$0	0.0
HS-Classroom N2	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Arctic Air		No		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	TRUE	T-49	No	15	Yes	0.1	935	0	$110	$2,700	$100	23.6
HS-Kitchen N209	2	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	Traulsen	AHT-2-32WUT	No	15	Yes	0.2	1,962	0	$232	$5,600	$400	22.5
HS-Kitchen N209	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Traulsen	AHT-1-32WUT	No	15	Yes	0.2	1,494	0	$176	$5,200	$200	28.4

Commercial Ice Maker Inventory & Recommendations

Location	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Ice Maker Type	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Food Preparation - Serving Rooms N209	1	Ice Making Head (<450 lbs/day), Batch	Hoshizaki	B-500SF	No		No	0.0	0	0	$0	$0	$0	0.0
HS-Office - Trainer	1	Ice Making Head (≥450 lbs/day), Batch	Hoshizaki	KM-901MAJ	No		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	Manufacturer	Model	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Kitchen N209	1	Gas Convection Oven (Full Size)	Southbend	GCX-10X	Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	2	Gas Fryer			Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	2	Gas Fryer	Pitco		Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	1	Electric Griddle (3 Feet Width)			Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	1	Insulated Food Holding Cabinet (1/2 Size)			Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Faculty Dining Room	1	Insulated Food Holding Cabinet (Full Size)	Traulsen		Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	1	Insulated Food Holding Cabinet (Full Size)	Continental		Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	2	Insulated Food Holding Cabinet (Full Size)	Metro	3 SERIES	Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	2	Insulated Food Holding Cabinet (Full Size)	Victory		Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	1	Insulated Food Holding Cabinet (Full Size)	Metro	C539-HLDS-U-GY	Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	1	Gas Rack Oven (Double)	Garlett		No		No	0.0	0	0	$0	$0	$0	0.0
HS-Classroom N2	3	Electric Combination Oven/Steam Cooker (<15 Pans)			Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Concession Stand	1	Electric Combination Oven/Steam Cooker (<15 Pans)			Yes		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	4	Gas Convection Oven (Full Size)	SouthBend	SLGS/22SC	No		No	0.0	0	0	$0	$0	$0	0.0
HS-Kitchen N209	2	Gas Rack Oven (Single)			Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

Location	Existing Conditions					
	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
HS-Computer Lab & Offices	2	Fan (portable)	100	No		
HS-Art Room C13	1	Kiln	300	No		
HS-Mainland Regional HS	32	Laptop	45	No		
HS-Mainland Regional HS	29	Microwave	1,000	No		
HS-Mainland Regional HS	7	Papershredder	200	No		
HS-Mainland Regional HS	11	Printer (Medium/Small)	20	No		
HS-Mainland Regional HS	18	Printer/Copier (Large)	200	No		
HS-Mainland Regional HS	90	Projector	200	No		
HS-Mainland Regional HS	22	Refrigerator (Mini)	40	No		
HS-Mainland Regional HS	9	Refrigerator (Residential)	500	No		
HS-Mainland Regional HS	5	Serving Table (Chilled/Heated)	1,000	No		
HS-Mainland Regional HS	4	Speakers (Large)	200	No		
HS-Mainland Regional HS	9	Speakers (Medium/Small)	100	No		
HS-Mainland Regional HS	19	Television	150	No		
HS-Classroom - N2	1	Toaster	850	No		
HS-Mainland Regional HS	3	Toaster Oven	1,200	No		
HS-Mainland Regional HS	2	Water cooler	192	No		
HS-Mainland Regional HS	16	Water Fountain	192	No		
HS-Classroom - Choir	20	Keyboards	75	No		
HS-Computer Lab - W11	1	3D Printer	300	No		
HS-Dining Area - Faculty Dining N202	1	Sandwich Press	50	No		
HS-Food Preparation - Kitchen N209	1	Deli Slicer	100	No		
HS-Food Preparation - Kitchen N209	1	Hobart Mixer	250	No		
HS-Food Preparation - Kitchen N209	2	Possibly Mixer Kettle	200	No		
HS-Gymnasium - Weight Room	1	Treadmill	700	No		
HS-Office - IT L107	1	Portable Ice Machine	150	No		
HS-Office - Trainer	2	Hydrotherapy Unit	300	No		
HS-Shop rooms	3	Drill press	500	No		
HS-Shop rooms	2	Jigsaw	500	No		
HS-Shop rooms	3	Table Saw	500	No		
HS-Shop - Wood Shop	3	Portable Table Saw	400	No		
HS-Mainland Regional HS	281	Deskop Computers	270	No		
HS-Mainland Regional HS	2	Clothes Dryer	2,000	No		
HS-Mainland Regional HS	2	Clothes Washers	1,500	No		
HS-Mainland Regional HS	21	Coffee Machines	800	No		

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
HS-Mainland Regional HS	2	Dehumidifiers	450	No		
HS-Mainland Regional HS	1	Server	4,000	No		
MG-Maintenance Garage	2	Fan (Ceiling)	100	No		
MG-Maintenance Garage	7	Fan (Large)	150	No		
MG-Maintenance Garage	1	Other (drill press)	500	No		
MG-Maintenance Garage	1	Refrigerator (Residential)	200	No		
MG-Maintenance Garage	1	Refrigerator (Residential)	200	No		
MG-Maintenance Garage	1	Toaster Oven	1,200	No		

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
HS-Corridor - A Hall	1	Non-Refrigerated	16	Yes	0.0	343	0	$40	$270	$0	6.7
HS-Corridor - W Hall	1	Non-Refrigerated	16	Yes	0.0	343	0	$40	$270	$0	6.7
HS-Dining Area - East West Cafeteria N200-201	1	Non-Refrigerated	16	Yes	0.0	343	0	$40	$270	$0	6.7
HS-Corridor - A Hall	2	Refrigerated	16	Yes	0.4	3,224	0	$380	$540	$100	1.2
HS-Corridor - W Hall	1	Refrigerated	16	Yes	0.2	1,612	0	$190	$270	$50	1.2
HS-Dining Area - East West Cafeteria N200-201	2	Refrigerated	16	Yes	0.4	3,224	0	$380	$540	$100	1.2
HS-Exterior - Ground	1	Refrigerated	16	Yes	0.2	1,612	0	$190	$270	$50	1.2

Custom (High Level) Measure Analysis

Swimming Pool Cover

Existing Conditions				Proposed Conditions			Energy Impact & Financial Analysis										
Description	Pool Heating System	Evaporation Heat Loss (MMBtu/yr)	Evaporation Water Loss (gal/yr)	Description	Evaporation Heat Loss (MMBtu)	Evaporation Water Loss (gal/yr)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Simple Payback w/ Incentives in Years
Swimming Pool		492	48,043	Semi-Automatic Cover for Swimming Pool	205	20,018	0	0	287	$4,379	$43,500	$0	$0	$0	$43,500	9.93	9.93

Appendix B: ENERGY STAR Statement of Energy Performance

Energy use intensity (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

LEARN MORE AT energystar.gov

17

ENERGY STAR® Score[1]

Mainland Regional High School (Campus)

Primary Property Type: K-12 School
Gross Floor Area (ft²): 285,450
Built: 1960

For Year Ending: January 31, 2024
Date Generated: February 03, 2025

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Mainland Regional High School (Campus) 1301 Oak Ave Linwood, New Jersey 08221	Mainland Regional HS District 1301 Oak Ave. Linwood, NJ 08221 609-927-4151 x1045	Judi Bessor 1301 Oak Ave. Linwood, NJ 08221 609-927-4151 x1045 jbessor@mainlandregional.net

Property ID: 35864336

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
91 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	9,895,440 (38%)
Natural Gas (kBtu)	12,512,422 (48%)
Electric - Solar (kBtu)	3,560,278 (14%)

Annual Emissions	
Total (Location-Based) GHG Emissions (Metric Tons CO2e/ year)	1,846

Source EUI
155.6 kBtu/ft²

National Median Comparison	
National Median Site EUI (kBtu/ft²)	63.8
National Median Source EUI (kBtu/ft²)	109.2
% Diff from National Median Source EUI	42%

Green Power	
Green Power – Onsite (kWh)	0
Green Power – Offsite (kWh)	0
Percent of RECs Retained	0%

Signature & Stamp of Verifying Professional

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

LP Signature: ______________________Date: ___________

Licensed Professional

____ ________
,
(___)___-______
____

Professional Engineer or Registered Architect Stamp (if applicable)

APPENDIX C: GLOSSARY

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

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

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