



# Local Government Energy Audit Report

Frist Campus Center

July 3, 2019

*Prepared for:*

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# Disclaimer

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

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

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

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

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

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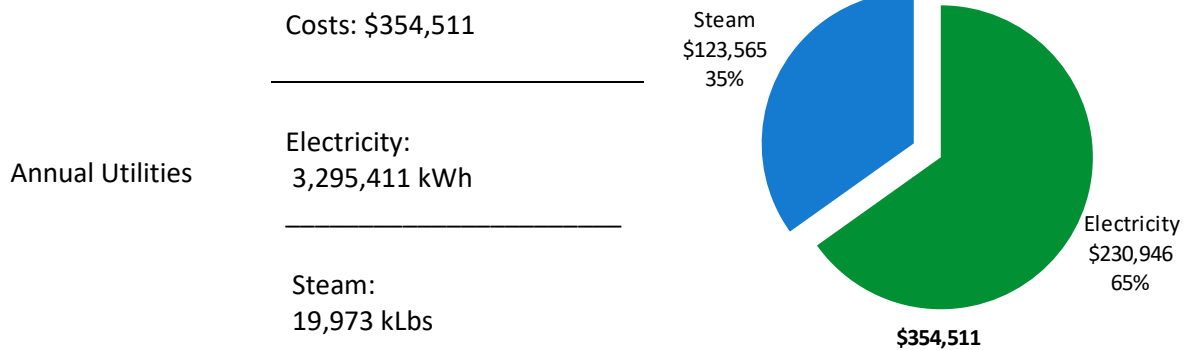
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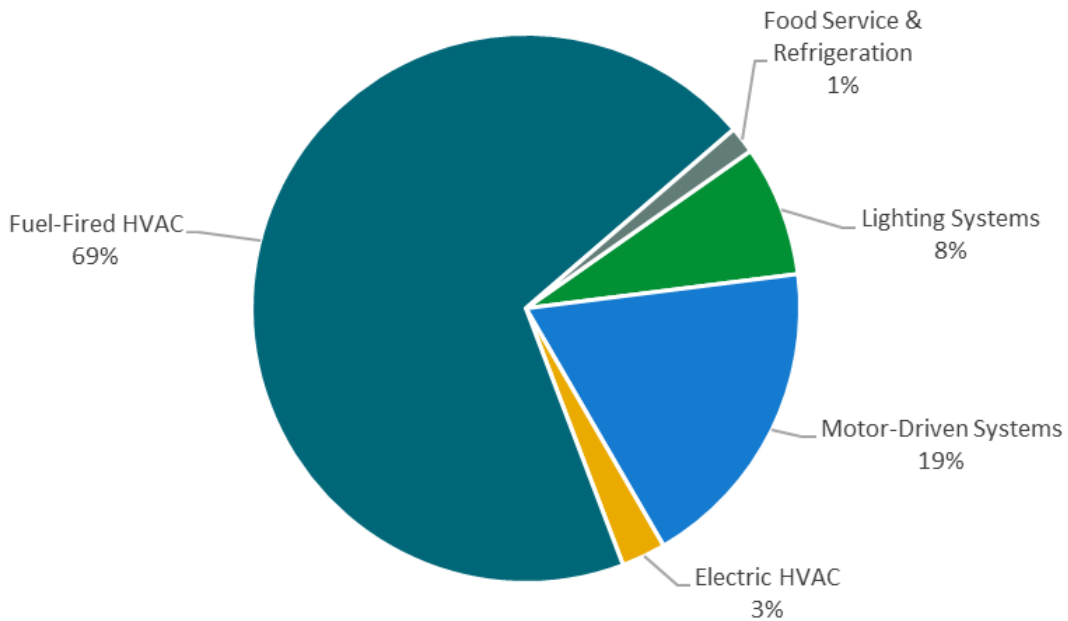
# 1 EXECUTIVE SUMMARY

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

## BUILDING PERFORMANCE REPORT



ENERGY STAR® Benchmarking Score	N/A <i>(1-100 scale)</i>	A standard energy use benchmark is not available for this facility. This report contains suggestions about how to improve building performance and reduce energy costs.
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**Figure 1 - Energy Use by System**

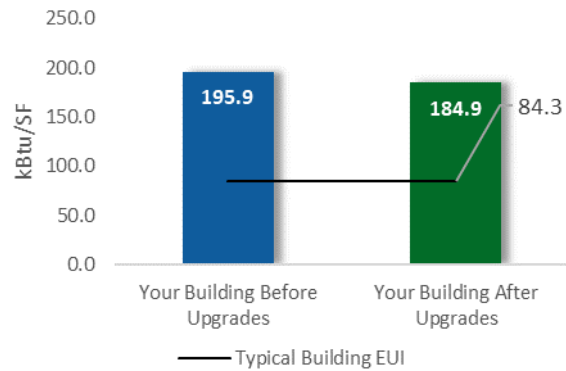
## POTENTIAL IMPROVEMENTS



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

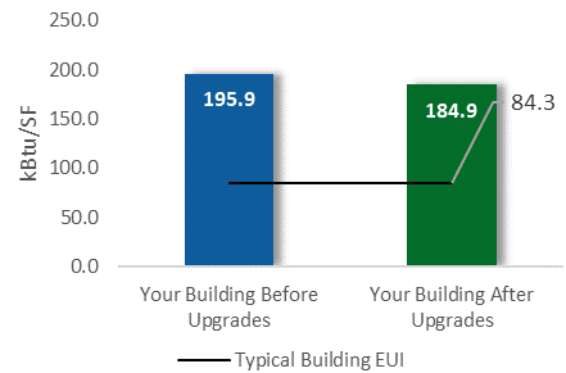
### Scenario 1: Full Package (all evaluated measures)

Installation Cost	\$170,615
Potential Rebates & Incentives <sup>1</sup>	\$23,635
Annual Cost Savings	\$36,979
Annual Energy Savings	Electricity: 549,674 kWh Steam: 74 kLbs
Greenhouse Gas Emission Savings	283 Tons
Simple Payback	4.0 Years
Site Energy Savings (all utilities)	6%



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

Installation Cost	\$167,503
Potential Rebates & Incentives	\$23,335
Annual Cost Savings	\$36,880
Annual Energy Savings	Electricity: 548,193 kWh Steam: 74 kLbs
Greenhouse Gas Emission Savings	282 Tons
Simple Payback	3.9 Years
Site Energy Savings (all utilities)	6%



### On-site Generation Potential

Photovoltaic	Medium
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>126,685</b>	<b>36.3</b>	<b>-53</b>	<b>\$8,142</b>	<b>\$122,131</b>	<b>\$5,212</b>	<b>\$310</b>	<b>\$4,902</b>	<b>0.6</b>	<b>119,831</b>
ECM 1	Retrofit Fixtures with LED Lamps	126,685	36.3	-53	\$8,142	\$122,131	\$5,212	\$310	\$4,902	0.6	119,831
<b>Lighting Control Measures</b>		<b>141,450</b>	<b>12.8</b>	<b>-59</b>	<b>\$9,090</b>	<b>\$72,723</b>	<b>\$63,676</b>	<b>\$11,935</b>	<b>\$51,741</b>	<b>5.7</b>	<b>133,780</b>
ECM 2	Install Occupancy Sensor Lighting Controls	99,785	9.1	-42	\$6,413	\$51,302	\$34,676	\$4,185	\$30,491	4.8	94,374
ECM 3	Install Daylight Dimming Controls	21,520	1.9	-9	\$1,383	\$11,064	\$11,000	\$7,750	\$3,250	2.3	20,353
ECM 4	Install High/Low Lighting Controls	20,145	1.8	-8	\$1,295	\$10,357	\$18,000	\$0	\$18,000	13.9	19,052
<b>Motor Upgrades</b>		<b>8,312</b>	<b>0.9</b>	<b>0</b>	<b>\$552</b>	<b>\$8,284</b>	<b>\$23,241</b>	<b>\$0</b>	<b>\$23,241</b>	<b>42.1</b>	<b>8,370</b>
ECM 5	Premium Efficiency Motors	8,312	0.9	0	\$552	\$8,284	\$23,241	\$0	\$23,241	42.1	8,370
<b>Variable Frequency Drive (VFD) Measures</b>		<b>251,547</b>	<b>22.4</b>	<b>54</b>	<b>\$16,993</b>	<b>\$254,902</b>	<b>\$60,535</b>	<b>\$11,010</b>	<b>\$49,525</b>	<b>2.9</b>	<b>261,239</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	128,371	19.5	0	\$8,529	\$127,929	\$33,347	\$5,360	\$27,987	3.3	129,269
ECM 7	Install VFDs on Heating Water Pumps	35,906	2.9	0	\$2,386	\$35,783	\$10,389	\$0	\$10,389	4.4	36,157
ECM 8	Install VFDs on Kitchen Hood Fan Motors	87,270	0.0	54	\$6,079	\$91,190	\$16,800	\$5,650	\$11,150	1.8	95,813
<b>HVAC System Improvements</b>		<b>3,178</b>	<b>0.0</b>	<b>124</b>	<b>\$853</b>	<b>\$12,797</b>	<b>\$10,875</b>	<b>\$0</b>	<b>\$10,875</b>	<b>12.7</b>	<b>21,299</b>
ECM 9	Implement Demand Control Ventilation (DCV)	3,178	0.0	124	\$853	\$12,797	\$10,875	\$0	\$10,875	12.7	21,299
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>23</b>	<b>\$118</b>	<b>\$1,183</b>	<b>\$57</b>	<b>\$0</b>	<b>\$57</b>	<b>0.5</b>	<b>3,334</b>
ECM 10	Install Low-Flow DHW Devices	0	0.0	23	\$118	\$1,183	\$57	\$0	\$57	0.5	3,334
<b>Food Service &amp; Refrigeration Measures</b>		<b>7,252</b>	<b>0.5</b>	<b>0</b>	<b>\$482</b>	<b>\$7,325</b>	<b>\$3,718</b>	<b>\$380</b>	<b>\$3,338</b>	<b>6.9</b>	<b>7,303</b>
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	5,771	0.5	0	\$383	\$5,752	\$607	\$80	\$527	1.4	5,812
	Refrigeration Controls	1,481	0.0	0	\$98	\$1,574	\$3,112	\$300	\$2,812	28.6	1,491
<b>Custom Measures</b>		<b>11,249</b>	<b>0.3</b>	<b>0</b>	<b>\$747</b>	<b>\$3,737</b>	<b>\$3,300</b>	<b>\$0</b>	<b>\$3,300</b>	<b>4.4</b>	<b>11,328</b>
ECM 12	Reach-In Glass Door Refrigerator - Anti Sweat Heating Controls	11,249	0.3	0	\$747	\$3,736.72	\$3,300	\$0	\$3,300	4.4	11,328
<b>TOTALS</b>		<b>549,674</b>	<b>73.2</b>	<b>89</b>	<b>\$36,979</b>	<b>\$483,081</b>	<b>\$170,615</b>	<b>\$23,635</b>	<b>\$146,980</b>	<b>4.0</b>	<b>566,483</b>

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

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

Figure 2 – Evaluated Energy Improvements

## 1.1 Planning Your Project

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

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

### Pick Your Installation Approach

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

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

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Retrofit Fixtures with LED Lamps	x		
ECM 2	Install Occupancy Sensor Lighting Controls	x		
ECM 3	Install Daylight Dimming Controls	x		
ECM 4	Install High/Low Lighting Controls			
ECM 5	Premium Efficiency Motors			
ECM 6	Install VFDs on Constant Volume (CV) HVAC	x		
ECM 7	Install VFDs on Hot Water Pumps			
ECM 8	Install VFDs on Single-Speed Kitchen Hoods	x		
ECM 9	Implement Demand Control Ventilation			
ECM 10	Install Low-Flow Domestic Hot Water Devices			
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	x		
ECM 12	Reach-In Glass Door Refrigerator - Anti Sweat Heating Controls			

Figure 3 – Funding Options





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

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

Take the next step by visiting [www.njcleanenergy.com](http://www.njcleanenergy.com) for program details, applications, and to contact a qualified contractor.

### *Individual Measures with SmartStart*

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

### *Turnkey Installation with Direct Install*

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

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

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

## **More Options from Around the State**

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

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

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

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

### *Ongoing Electric Savings with Demand Response*

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

## 2 EXISTING CONDITIONS

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

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

### 2.1 Site Overview

On October 10, 2018, TRC performed an energy audit at Frist Campus Center located on the Princeton University campus in Princeton, New Jersey. TRC met with Arthur Murphy to review the facility operations and help focus our investigation on specific energy-using systems.

Frist Campus Center is a 7-story (4-story above grade), 179,174 square foot building built in 2000. Spaces include: classrooms, lecture halls, auditorium, offices, conference rooms, library, kitchens, cafeteria, dining areas, corridors, mechanical spaces, mail rooms, and stairwells.

The site has recently replaced all lighting to LED lighting throughout the building.



*Aerial Screenshot of the Building*

## 2.2 Building Occupancy

The facility is occupied year-round. Based on observation at the time of the audit the typical operating hours of this building are estimated to be from 20 to 21 hours a day.

Building Name	Weekday/Weekend	Operating Schedule
Frist Campus Center	Weekday	7:00 AM - 3:00 AM
	Weekend	8:00 AM - 3:00 AM

*Figure 4 - Building Occupancy Schedule*

## 2.3 Building Envelope

Building walls are concrete block over structural steel with a brick facade. The roof is pitched and is covered with roofing shingles.

Most of the windows are double paned and have aluminum frames. Exterior doors have aluminum frames and are in fair condition with slightly worn door seals. Degraded window and door seals increase drafts and outside air infiltration.



*Exterior Walls & Windows*

## 2.4 Lighting Systems

The primary interior lighting system uses linear LED lamps (2', 3' and 4') throughout the building. Additionally, there are recessed cans, downlights, wall scones that have screw-in and pin-based LED lamps, as well as a few fixtures that have compact fluorescent lamps CFL). The auditorium has several incandescent and halogen incandescent lamp fixtures. Most fixtures are in fair condition.

Interior lighting levels were generally sufficient.



*Auditorium Lighting*



*Linear Lighting Fixtures in Library*



*Interior Lighting Fixtures*

Most lighting fixtures are controlled by wall switches and the remainder by occupancy sensors.

Exterior fixtures include wall packs and recessed cans with CFL and LED lamps. These fixtures are manually controlled.

## 2.5 Air Handling Systems

### Air Handling Units

The building is primarily served by nine air handling units (AHU-1 through 9). All AHU's except AHU-3 & 4 are multi zone units served by supply and return fans that are controlled by VFDs. AC-3 & 4 are both 100% outside air units that are served by 2-speed supply fans. All air handling units have steam heating coils and chilled water cooling coils to address the heating and cooling loads of the zones they serve.

There are several fan coil units in the building serving some of the small single zones. These fan coil units have hot water heating coils.

### Air Conditioners

The phone equipment room and voicemail room in the building are served by terminal computer room air conditioning (CRAC) units. These vary in capacity between 1.31 and 6.61 tons. The units are in fair condition.

All cooling units are controlled using the Siemens building management system.



*Picture of AHU-1*



*Picture of the CRAC Unit*



## 2.6 Heating [Hot Water/Steam] Systems

The central plant for Princeton University campus supplies low pressure steam to the building to serve its heating load. Steam is supplied directly to the air handling units.

Steam is also supplied to a heat exchanger that transfer heat to the heating hot water loop. Heating hot water is supplied to fan coil units throughout the building to serve the heating loads of their respective zones.

The hot water loop has two VFD controlled 10 hp pumps and two constant speed 15 hp pumps.



*Hot Water Pumps*

## 2.7 Chilled Water Systems

The central plant supplies chilled water to the building to serve its cooling load. The chilled water loop is cooled by the chilled water from the central plant with the help of heat exchanger.

There are two 30 hp VFD controlled chilled water pumps that circulates chilled water in the building.



*Chilled Water Pumps*

## 2.8 Building Energy Management Systems (EMS)

A Siemens EMS is used to control the HVAC equipment, air handlers, and the CRAC units. The EMS provides equipment scheduling control, monitors and controls space temperatures, supply air temperatures, humidity, heating water loop temperatures, and chilled water loop temperatures.

## 2.9 Domestic Hot Water

The building's domestic hot water is produced by a heat exchanger using steam from the central plant.



*DHW Heat Exchanger*



## 2.10 Refrigeration

The building has several stand-up refrigerators (reach-in and roll-in) with either solid or glass doors located in multiple locations, such as the convenience store and multiple kitchens and café located in the building. All equipment is standard efficiency and in fair condition.

The kitchens in the building have six walk-in refrigerators that are almost the same capacity. The capacity of these units is estimated to be 1.17 tons and each unit has a two-fan evaporator.

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

## 2.11 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 0.25% percent of total building energy use. This is lower than a typical building.

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

There are approximately 50 computer work stations throughout the facility. Plug loads throughout the building include general café equipment like refrigerators, toasters and microwave, and office equipment including printers, copiers, and overhead projectors (in classrooms).

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



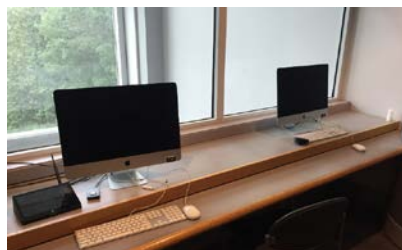
*Large Printer/Copier*



*Microwave & Mini-Fridge*



*Medium Printer*



*Desktop Computers*

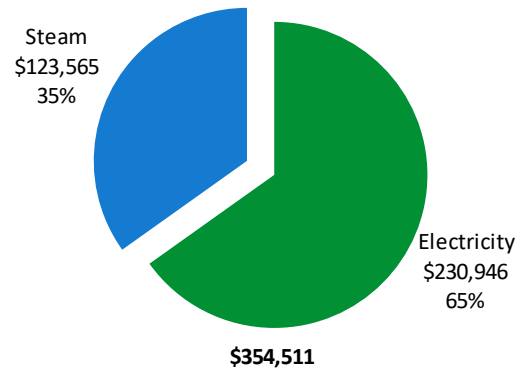
## 2.12 Water-Using Systems

There are multiple restrooms with toilets, urinals, and sinks. Faucet flow rates in some of the restrooms are at 2.2 gallons per minute (gpm).

### 3 ENERGY USE AND COSTS

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

Utility Summary		
Fuel	Usage	Cost
Electricity	3,295,411 kWh	\$230,946
Steam	19,973 kLbs	\$123,565
<b>Total</b>		<b>\$354,511</b>



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

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

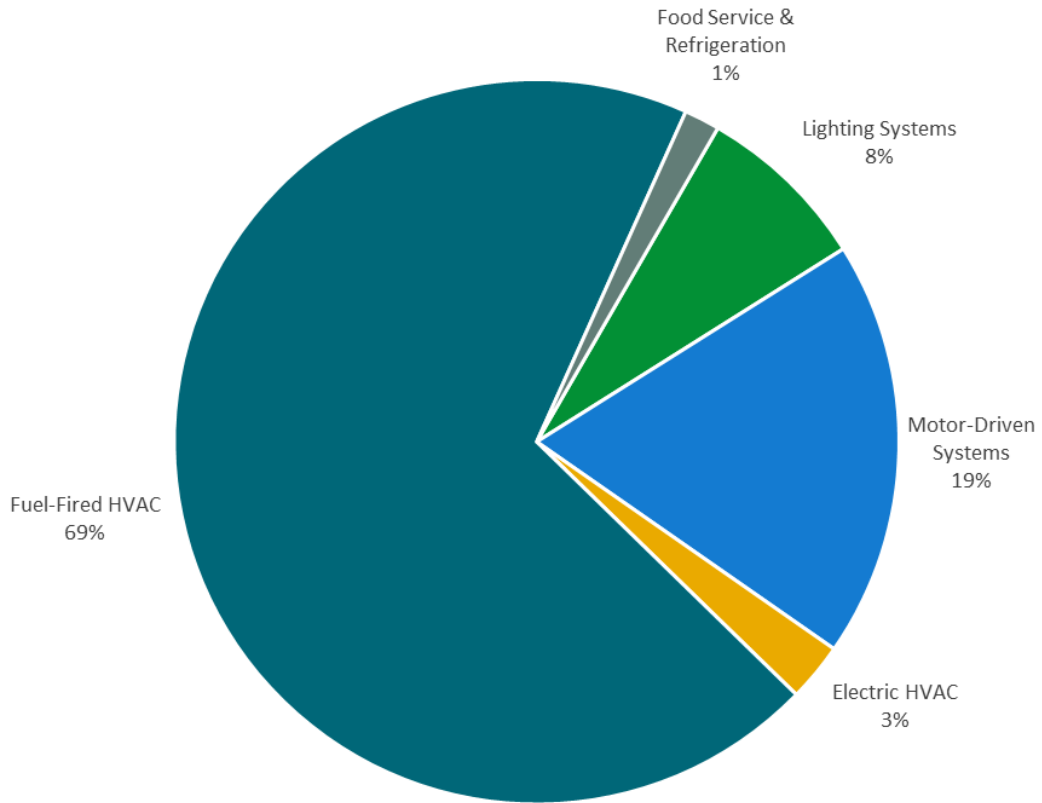
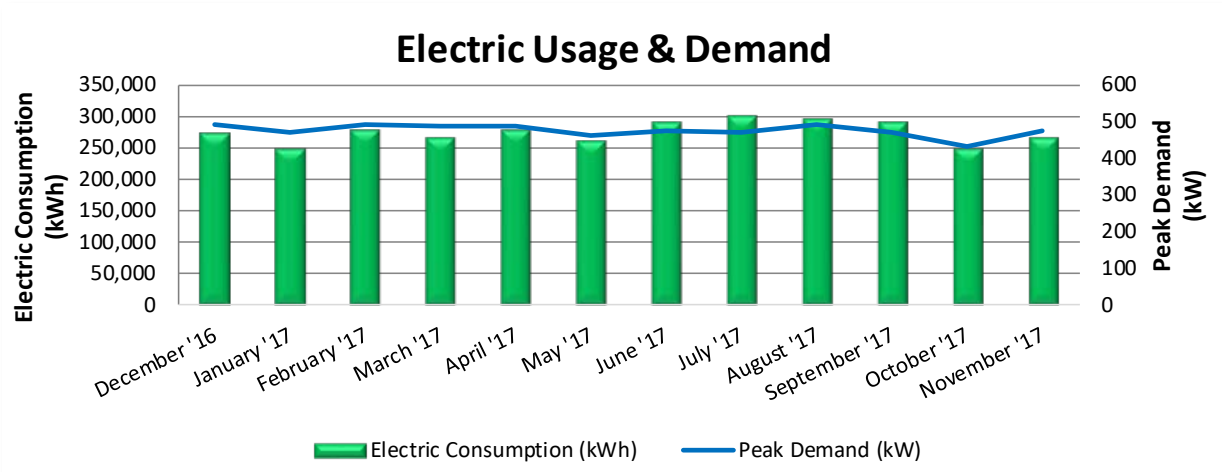


Figure 5 - Energy Balance

### 3.1 Electricity

PSE&G delivers electricity under rate class HTS, with electric production provided by Calpine Energy, a third-party supplier. Electricity is delivered to the campus's two substations from where it is distributed to all buildings in the campus and is monitored by the campus's EMS system.



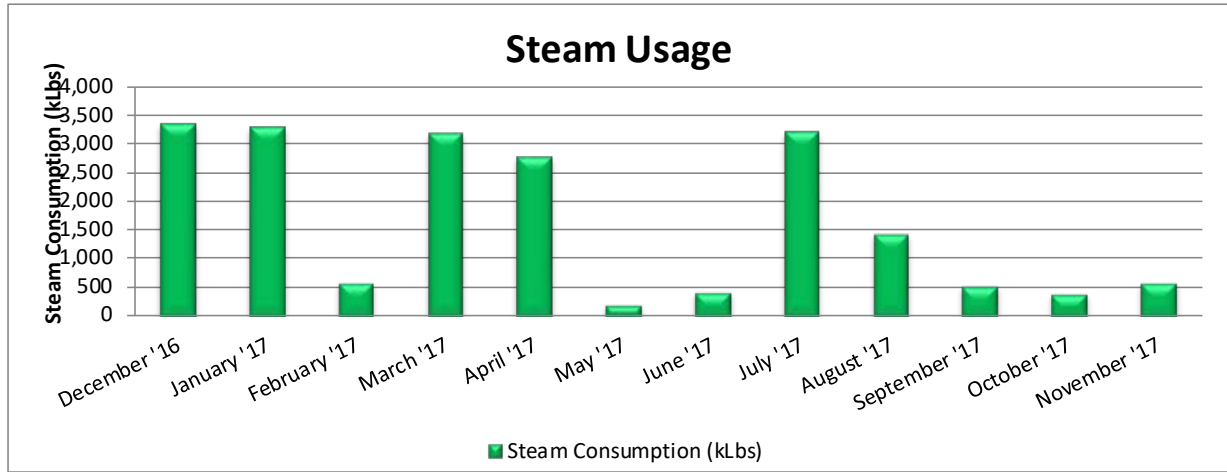
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
12/31/16	31	272,288	493	0	19,526
1/31/17	31	249,257	468	0	21,283
2/28/17	28	277,125	492	0	19,143
3/31/17	31	264,804	487	0	18,902
4/30/17	30	277,302	487	0	18,850
5/31/17	31	261,748	463	0	17,631
6/30/17	30	290,767	476	0	19,695
7/31/17	31	300,003	470	0	23,376
8/31/17	31	296,268	494	0	21,086
9/30/17	30	290,639	469	0	19,292
10/31/17	31	249,256	434	0	14,226
11/30/17	30	265,954	475	0	17,936
<b>Totals</b>	<b>365</b>	<b>3,295,411</b>	<b>494</b>	<b>\$0</b>	<b>\$230,946</b>
<b>Annual</b>	<b>365</b>	<b>3,295,411</b>	<b>494</b>	<b>\$0</b>	<b>\$230,946</b>

Notes:

- Peak demand of 494 kW occurred in August '17.
- The average electric cost over the past 12 months was \$0.066/kWh, which is the blended rate for the building. This rate is derived as an average from the monthly blended rate of the two substations that supply electricity to the building. This report uses this blended rate to estimate energy cost savings. The blended rate for this university is lower than what is typically seen in commercial buildings in New Jersey.
- The monthly electricity usage also includes the electric usage of the chillers in the central plant that supply chilled water to satisfy the building's cooling load. Based on historical data, 62% of the total chilled water produced by the central plant comes from electric chillers.

### 3.2 Steam

Central cogeneration plant delivers steam to the building. The central plant uses natural gas to produce steam. PSE&G supplies natural gas to the central plant under the rate class CIG.



Steam Billing Data			
Period Ending	Days in Period	Steam Usage (kLbs)	Fuel Cost
12/31/16	31	3,340	20,704
1/31/17	31	3,309	20,509
2/28/17	28	577	3,570
3/31/17	31	3,189	19,767
4/30/17	30	2,788	17,269
5/31/17	31	201	1,225
6/30/17	30	421	2,571
7/31/17	31	3,215	19,879
8/31/17	31	1,444	8,909
9/30/17	30	522	3,199
10/31/17	31	382	2,342
11/30/17	30	585	3,621
<b>Totals</b>	<b>365</b>	<b>19,973</b>	<b>\$123,565</b>
<b>Annual</b>	<b>365</b>	<b>19,973</b>	<b>\$123,565</b>

Notes:

- The average Steam cost for the past 12 months is \$6.200/kLb, which is the blended rate used throughout the analysis.
- The total monthly steam usage also includes the gas (steam) energy used to produce chilled water by the absorption chillers to produce chilled water to the building. Based on historical data, 38% of the total chilled water produced by the central plant comes from the absorption chillers.

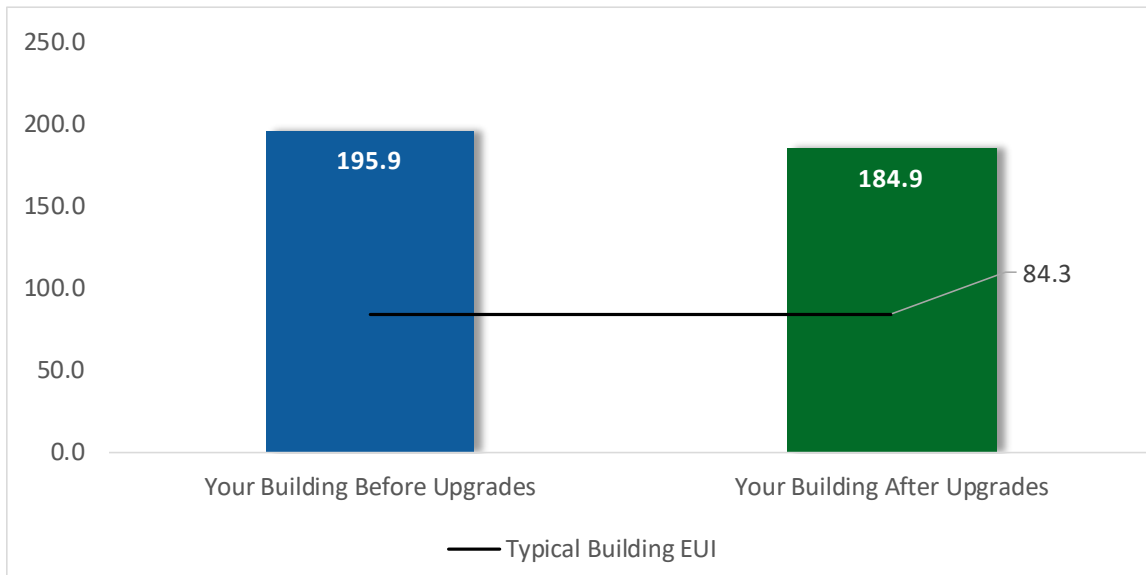
### 3.3 Benchmarking

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

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

<b>Benchmarking Score</b>	<b>N/A</b>
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Due to its unique characteristics, this building type is not able to receive a benchmarking score. This report contains suggestions about how to improve building performance and reduce energy costs.



**Figure 6 - Energy Use Intensity Comparison**

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

## **Tracking Your Energy Performance**

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

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

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

For more information on ENERGY STAR® and Portfolio Manager®, visit their website<sup>3</sup>.

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



## 4 ENERGY CONSERVATION MEASURES

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

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

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

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

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

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>126,685</b>	<b>36.3</b>	<b>-53</b>	<b>\$8,142</b>	<b>\$5,212</b>	<b>\$310</b>	<b>\$4,902</b>	<b>0.6</b>	<b>119,831</b>
ECM 1	Retrofit Fixtures with LED Lamps	126,685	36.3	-53	\$8,142	\$5,212	\$310	\$4,902	0.6	119,831
<b>Lighting Control Measures</b>		<b>141,450</b>	<b>12.8</b>	<b>-59</b>	<b>\$9,090</b>	<b>\$63,676</b>	<b>\$11,935</b>	<b>\$51,741</b>	<b>5.7</b>	<b>133,780</b>
ECM 2	Install Occupancy Sensor Lighting Controls	99,785	9.1	-42	\$6,413	\$34,676	\$4,185	\$30,491	4.8	94,374
ECM 3	Install Daylight Dimming Controls	21,520	1.9	-9	\$1,383	\$11,000	\$7,750	\$3,250	2.3	20,353
ECM 4	Install High/Low Lighting Controls	20,145	1.8	-8	\$1,295	\$18,000	\$0	\$18,000	13.9	19,052
<b>Motor Upgrades</b>		<b>8,312</b>	<b>0.9</b>	<b>0</b>	<b>\$552</b>	<b>\$23,241</b>	<b>\$0</b>	<b>\$23,241</b>	<b>42.1</b>	<b>8,370</b>
ECM 5	Premium Efficiency Motors	8,312	0.9	0	\$552	\$23,241	\$0	\$23,241	42.1	8,370
<b>Variable Frequency Drive (VFD) Measures</b>		<b>251,547</b>	<b>22.4</b>	<b>54</b>	<b>\$16,993</b>	<b>\$60,535</b>	<b>\$11,010</b>	<b>\$49,525</b>	<b>2.9</b>	<b>261,239</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	128,371	19.5	0	\$8,529	\$33,347	\$5,360	\$27,987	3.3	129,269
ECM 7	Install VFDs on Heating Water Pumps	35,906	2.9	0	\$2,386	\$10,389	\$0	\$10,389	4.4	36,157
ECM 8	Install VFDs on Kitchen Hood Fan Motors	87,270	0.0	54	\$6,079	\$16,800	\$5,650	\$11,150	1.8	95,813
<b>HVAC System Improvements</b>		<b>3,178</b>	<b>0.0</b>	<b>124</b>	<b>\$853</b>	<b>\$10,875</b>	<b>\$0</b>	<b>\$10,875</b>	<b>12.7</b>	<b>21,299</b>
ECM 9	Implement Demand Control Ventilation (DCV)	3,178	0.0	124	\$853	\$10,875	\$0	\$10,875	12.7	21,299
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>23</b>	<b>\$118</b>	<b>\$57</b>	<b>\$0</b>	<b>\$57</b>	<b>0.5</b>	<b>3,334</b>
ECM 10	Install Low-Flow DHW Devices	0	0.0	23	\$118	\$57	\$0	\$57	0.5	3,334
<b>Food Service &amp; Refrigeration Measures</b>		<b>7,252</b>	<b>0.5</b>	<b>0</b>	<b>\$482</b>	<b>\$3,718</b>	<b>\$380</b>	<b>\$3,338</b>	<b>6.9</b>	<b>7,303</b>
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	5,771	0.5	0	\$383	\$607	\$80	\$527	1.4	5,812
	Refrigeration Controls	1,481	0.0	0	\$98	\$3,112	\$300	\$2,812	28.6	1,491
<b>Custom Measures</b>		<b>11,249</b>	<b>0.3</b>	<b>0</b>	<b>\$747</b>	<b>\$3,300</b>	<b>\$0</b>	<b>\$3,300</b>	<b>4.4</b>	<b>11,328</b>
ECM 12	Reach-In Glass Door Refrigerator - Anti Sweat Heating Controls	11,249	0.3	0	\$747	\$3,300	\$0	\$3,300	4.4	11,328
<b>TOTALS</b>		<b>549,674</b>	<b>73.2</b>	<b>89</b>	<b>\$36,979</b>	<b>\$170,615</b>	<b>\$23,635</b>	<b>\$146,980</b>	<b>4.0</b>	<b>566,483</b>

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

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

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>126,685</b>	<b>36.3</b>	<b>-53</b>	<b>\$8,142</b>	<b>\$5,212</b>	<b>\$310</b>	<b>\$4,902</b>	<b>0.6</b>	<b>119,831</b>
ECM 1	Retrofit Fixtures with LED Lamps	126,685	36.3	-53	\$8,142	\$5,212	\$310	\$4,902	0.6	119,831
<b>Lighting Control Measures</b>		<b>141,450</b>	<b>12.8</b>	<b>-59</b>	<b>\$9,090</b>	<b>\$63,676</b>	<b>\$11,935</b>	<b>\$51,741</b>	<b>5.7</b>	<b>133,780</b>
ECM 2	Install Occupancy Sensor Lighting Controls	99,785	9.1	-42	\$6,413	\$34,676	\$4,185	\$30,491	4.8	94,374
ECM 3	Install Daylight Dimming Controls	21,520	1.9	-9	\$1,383	\$11,000	\$7,750	\$3,250	2.3	20,353
ECM 4	Install High/Low Lighting Controls	20,145	1.8	-8	\$1,295	\$18,000	\$0	\$18,000	13.9	19,052
<b>Motor Upgrades</b>		<b>8,312</b>	<b>0.9</b>	<b>0</b>	<b>\$552</b>	<b>\$23,241</b>	<b>\$0</b>	<b>\$23,241</b>	<b>42.1</b>	<b>8,370</b>
ECM 5	Premium Efficiency Motors	8,312	0.9	0	\$552	\$23,241	\$0	\$23,241	42.1	8,370
<b>Variable Frequency Drive (VFD) Measures</b>		<b>251,547</b>	<b>22.4</b>	<b>54</b>	<b>\$16,993</b>	<b>\$60,535</b>	<b>\$11,010</b>	<b>\$49,525</b>	<b>2.9</b>	<b>261,239</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	128,371	19.5	0	\$8,529	\$33,347	\$5,360	\$27,987	3.3	129,269
ECM 7	Install VFDs on Heating Water Pumps	35,906	2.9	0	\$2,386	\$10,389	\$0	\$10,389	4.4	36,157
ECM 8	Install VFDs on Kitchen Hood Fan Motors	87,270	0.0	54	\$6,079	\$16,800	\$5,650	\$11,150	1.8	95,813
<b>HVAC System Improvements</b>		<b>3,178</b>	<b>0.0</b>	<b>124</b>	<b>\$853</b>	<b>\$10,875</b>	<b>\$0</b>	<b>\$10,875</b>	<b>12.7</b>	<b>21,299</b>
ECM 9	Implement Demand Control Ventilation (DCV)	3,178	0.0	124	\$853	\$10,875	\$0	\$10,875	12.7	21,299
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>23</b>	<b>\$118</b>	<b>\$57</b>	<b>\$0</b>	<b>\$57</b>	<b>0.5</b>	<b>3,334</b>
ECM 10	Install Low-Flow DHW Devices	0	0.0	23	\$118	\$57	\$0	\$57	0.5	3,334
<b>Food Service &amp; Refrigeration Measures</b>		<b>5,771</b>	<b>0.5</b>	<b>0</b>	<b>\$383</b>	<b>\$607</b>	<b>\$80</b>	<b>\$527</b>	<b>1.4</b>	<b>5,812</b>
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	5,771	0.5	0	\$383	\$607	\$80	\$527	1.4	5,812
<b>Custom Measures</b>		<b>11,249</b>	<b>0.3</b>	<b>0</b>	<b>\$747</b>	<b>\$3,300</b>	<b>\$0</b>	<b>\$3,300</b>	<b>4.4</b>	<b>11,328</b>
ECM 12	Reach-In Glass Door Refrigerator - Anti Sweat Heating Controls	11,249	0.3	0	\$747	\$3,300	\$0	\$3,300	4.4	11,328
<b>TOTALS</b>		<b>548,193</b>	<b>73.2</b>	<b>89</b>	<b>\$36,880</b>	<b>\$167,503</b>	<b>\$23,335</b>	<b>\$144,168</b>	<b>3.9</b>	<b>564,992</b>

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

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

Figure 8 – Cost Effective ECMs

## 4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>126,685</b>	<b>36.3</b>	<b>-53</b>	<b>\$8,142</b>	<b>\$5,212</b>	<b>\$310</b>	<b>\$4,902</b>	<b>0.6</b>	<b>119,831</b>
ECM 1	Retrofit Fixtures with LED Lamps	126,685	36.3	-53	\$8,142	\$5,212	\$310	\$4,902	0.6	119,831

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

### **ECM 1: Retrofit Fixtures with LED Lamps**

Replace compact fluorescent, 4' fluorescent T8 and 2' fluorescent T5 lamps, halogen incandescent and incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as a direct replacement for most other lighting technologies.

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

**Affected building areas:** all areas with fluorescent fixtures with T8 and T5 tubes, CFL lamps, halogen, and incandescent lamps.

## 4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Control Measures</b>		<b>141,450</b>	<b>12.8</b>	<b>-59</b>	<b>\$9,090</b>	<b>\$63,676</b>	<b>\$11,935</b>	<b>\$51,741</b>	<b>5.7</b>	<b>133,780</b>
ECM 2	Install Occupancy Sensor Lighting Controls	99,785	9.1	-42	\$6,413	\$34,676	\$4,185	\$30,491	4.8	94,374
ECM 3	Install Daylight Dimming Controls	21,520	1.9	-9	\$1,383	\$11,000	\$7,750	\$3,250	2.3	20,353
ECM 4	Install High/Low Lighting Controls	20,145	1.8	-8	\$1,295	\$18,000	\$0	\$18,000	13.9	19,052

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 2: Install Occupancy Sensor Lighting Controls**

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

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

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

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

**Affected building areas:** offices, conference rooms, classrooms, breakrooms, multi-purpose rooms, library, kitchens, café, and storage rooms.

### **ECM 3: Install Daylight Dimming Controls**

Install daylight dimming controls that use photosensors to reduce electric lighting in areas when ample daylight lighting is present. Use photosensor controls for fixtures serving areas that are lit by sunlight. As sunlight levels increase in the room, artificial lighting decreases or turns off.

This measure reduces energy use in spaces where ambient daylight provides sufficient lighting levels. Optimum light levels and the method of dimming should be determined during lighting design.

**Affected building areas:** open corridors and hallways throughout the building

#### **ECM 4: Install High/Low Lighting Controls**

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

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

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

**Affected building areas:** hallways and lobbies.

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

### 4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Motor Upgrades</b>		<b>8,312</b>	<b>0.9</b>	<b>0</b>	<b>\$552</b>	<b>\$23,241</b>	<b>\$0</b>	<b>\$23,241</b>	<b>42.1</b>	<b>8,370</b>
ECM 5	Premium Efficiency Motors	8,312	0.9	0	\$552	\$23,241	\$0	\$23,241	42.1	8,370

#### **ECM 5: Premium Efficiency Motors**

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

It is recommended to implement this measure in conjunction with the implementation of the VFD’s measure.

#### **Affected motors:**

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
A Level Mechanical Room,	AHU-3 (Palmer East)	1	Supply Fan	20.0	
A Level Mechanical Room, M23	AHU-4 (Palmer West)	1	Supply Fan	15.0	
A Level Mechanical Room, MA2	Hot Water Loop (P3 & 4)	2	Heating Hot Water Pump	15.0	

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
B36	EF-3 (Ventilation)	1	Exhaust Fan	2.0	
Roof	EF-8 (East Gen/Toilet)	1	Exhaust Fan	3.0	
Roof	EF-9 (West Gen/Toilet)	1	Exhaust Fan	3.0	
Roof	EF-12 (Addn Gen/Toilet)	1	Exhaust Fan	2.0	
470	EF-13 (Kitchen)	1	Kitchen Hood Exhaust Fan	5.0	
470	EF-14 (Kitchen)	1	Kitchen Hood Exhaust Fan	5.0	
470	EF-15 (Kitchen)	1	Kitchen Hood Exhaust Fan	1.5	
470	EF-16 (Kitchen)	1	Kitchen Hood Exhaust Fan	10.0	
470	EF-17 (Kitchen)	1	Kitchen Hood Exhaust Fan	10.0	
470	EF-18 (B34)	1	Exhaust Fan	2.0	

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
470/Roof	EF-25 (Atrium Smoke)	2	Exhaust Fan	10.0	

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

#### 4.4 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Variable Frequency Drive (VFD) Measures</b>		<b>251,547</b>	<b>22.4</b>	<b>54</b>	<b>\$16,993</b>	<b>\$60,535</b>	<b>\$11,010</b>	<b>\$49,525</b>	<b>2.9</b>	<b>261,239</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	128,371	19.5	0	\$8,529	\$33,347	\$5,360	\$27,987	3.3	129,269
ECM 7	Install VFDs on Heating Water Pumps	35,906	2.9	0	\$2,386	\$10,389	\$0	\$10,389	4.4	36,157
ECM 8	Install VFDs on Kitchen Hood Fan Motors	87,270	0.0	54	\$6,079	\$16,800	\$5,650	\$11,150	1.8	95,813

Variable frequency drives control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor —unless the existing motor meets or exceeds IHP 2014 standards—to conservatively account for the cost of an inverter duty rated motor. The savings and cost associated with the new motor are presented with the Premium Efficiency Motor measures. If the proposed VFD measure is not selected for implementation the motor replacement should be reevaluated.

##### **ECM 6: Install VFDs on Constant Volume (CV) Fans**

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

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

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

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



**Affected air handlers:** supply fans in AHUs- 3 & 4; exhaust fans – EF-3 (Ventillation), EF-8 & 9 (East & West General Toilets), EF-25 (Atrium Smoke).

**ECM 7: Install VFDs on Heating Water Pumps**

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

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

**Affected pumps:** 15 hp HHW pumps P 3 & 4.

**ECM 8: Install VFDs on Kitchen Hood Fan Motors**

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

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

4.5 HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>HVAC System Improvements</b>		<b>3,178</b>	<b>0.0</b>	<b>124</b>	<b>\$853</b>	<b>\$10,875</b>	<b>\$0</b>	<b>\$10,875</b>	<b>12.7</b>	<b>21,299</b>
ECM 9	Implement Demand Control Ventilation (DCV)	3,178	0.0	124	\$853	\$10,875	\$0	\$10,875	12.7	21,299

**ECM 9: Implement Demand Control Ventilation (DCV)**

Demand control ventilation (DCV) monitors the indoor air’s carbon dioxide (CO<sub>2</sub>) content to measure room occupancy. This data is used to regulate the amount of outdoor air provided to the space for ventilation.

Standard ventilation systems often provide outside air based on a space’s estimated maximum occupancy but not actual occupancy. During low occupancy periods, the space may then be over ventilated. This wastes energy through excessive fan motor usage as well as 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, system air flow, outside air reduction, and other factors. Energy savings results from eliminating unnecessary ventilation and space conditioning.

**Affected building areas:** AHU-2 (100-L Café), AHU-5 (400 L Gest), AHU-6 (Lecture Hall) & AHU-7 (Perf Hall).

## 4.6 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>23</b>	<b>\$118</b>	<b>\$57</b>	<b>\$0</b>	<b>\$57</b>	<b>0.5</b>	<b>3,334</b>
ECM 10	Install Low-Flow DHW Devices	0	0.0	23	\$118	\$57	\$0	\$57	0.5	3,334

### **ECM 10: 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. [Pre-rinse spray valves (PRSVs) — often used in commercial and institutional kitchens — remove food waste from dishes prior to dishwashing.]

Additional cost savings may result from reduced water usage.

## 4.7 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Food Service &amp; Refrigeration Measures</b>		<b>7,252</b>	<b>0.5</b>	<b>0</b>	<b>\$482</b>	<b>\$3,718</b>	<b>\$380</b>	<b>\$3,338</b>	<b>6.9</b>	<b>7,303</b>
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	5,771	0.5	0	\$383	\$607	\$80	\$527	1.4	5,812
	Refrigeration Controls	1,481	0.0	0	\$98	\$3,112	\$300	\$2,812	28.6	1,491

### **ECM 11: Refrigerator/Freezer Case Electrically Commutated Motors**

Replace shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in walk-in freezers. 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.

## Refrigeration Controls

Install 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 defrost mechanism.

Due to the long payback period, it is not recommended to implement this measure.

## 4.8 Custom Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Custom Measures</b>		<b>11,249</b>	<b>0.3</b>	<b>0</b>	<b>\$747</b>	<b>\$3,300</b>	<b>\$0</b>	<b>\$3,300</b>	<b>4.4</b>	<b>11,328</b>
ECM 12	Reach-In Glass Door Refrigerator - Anti Sweat Heating Controls	11,249	0.3	0	\$747	\$3,300	\$0	\$3,300	4.4	11,328

### ECM 12: Reach-In Glass Door Refrigerator - Anti Sweat Heating Controls

At the time of the site audit, it was observed that condensation was forming on the glass doors of eleven stand up refrigerator units in the concession area. This shows that the anti-sweat heaters (ASH) on the door gaskets are always left on.

It is recommended to install anti-sweat heating (ASH) controls in the eleven stand-up glass door refrigerators. ASH controllers help turn on the heaters only when necessary. Energy savings are realized by turning the heaters off when not necessary.

## 5 ENERGY EFFICIENT BEST PRACTICES

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

### **Energy Tracking with ENERGY STAR® Portfolio Manager®**



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

### **Doors and Windows**

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

### **Lighting 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.

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

## **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.

## **HVAC Filter Cleaning and Replacement**

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

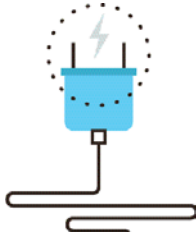
## **Duct Sealing**

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

## **Steam Trap Repair and Replacement**

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

## **Plug Load Controls**



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

## **Water Conservation**



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

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

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

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

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

## **Procurement Strategies**

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

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

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

<sup>7</sup> <https://www.epa.gov/watersense/watersense-work-0>

## 6 ON-SITE GENERATION

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

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

### 6.1 Solar Photovoltaic

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

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

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

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

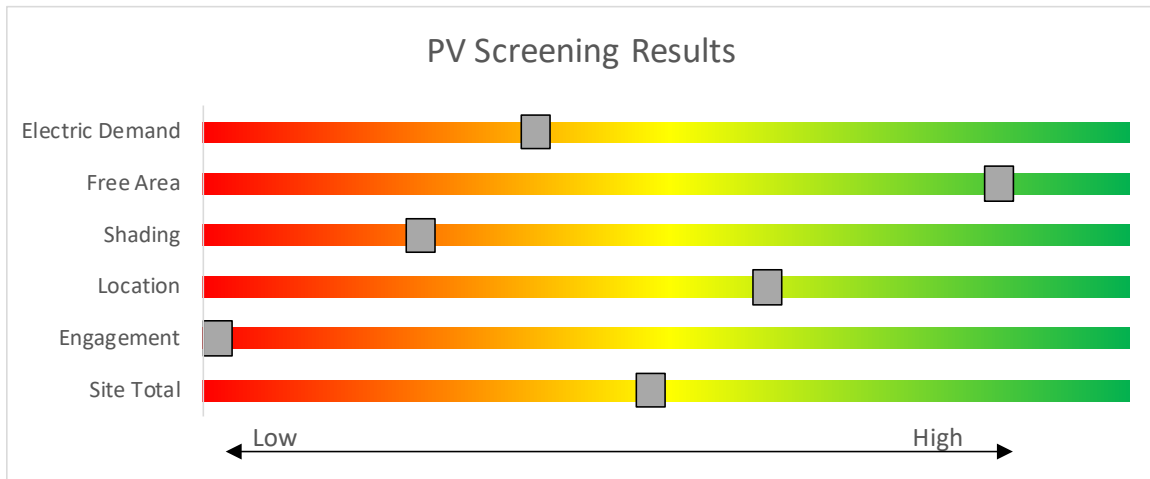


Figure 9 - Photovoltaic Screening

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

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

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

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

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



## 6.2 Combined Heat and Power

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

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

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

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

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

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

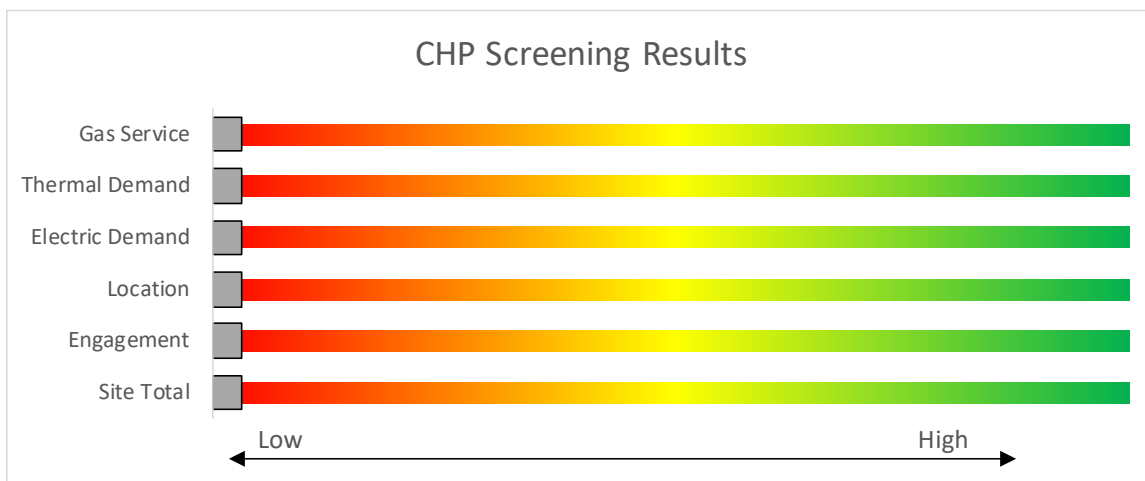


Figure 10 - Combined Heat and Power Screening

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

## 7 PROJECT FUNDING AND INCENTIVES

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

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

## 7.1 SmartStart



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

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

### **Equipment with Prescriptive Incentives Currently Available:**

*Electric Chillers*  
*Electric Unitary HVAC*  
*Gas Cooling*  
*Gas Heating*  
*Gas Water Heating*  
*Ground Source Heat Pumps*  
*Lighting*

*Lighting Controls*  
*Refrigeration Doors*  
*Refrigeration Controls*  
*Refrigerator/Freezer Motors*  
*Food Service Equipment*  
*Variable Frequency Drives*

### **Incentives**

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

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

### **How to Participate**

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

Visit [www.njcleanenergy.com/SSB](http://www.njcleanenergy.com/SSB) for a detailed program description, instructions for applying, and applications.

## 7.2 Energy Savings Improvement Program

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

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

### How to Participate

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

- (1) Use an energy services company or "ESCO."
- (2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.
- (3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

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

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

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

### 7.3 SREC Registration Program

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

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

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

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

Information about the SRP can be found at: [www.njcleanenergy.com/srec](http://www.njcleanenergy.com/srec).

## 8 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

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### 8.1 Retail Electric Supply Options

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

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

A list of licensed third-party electric suppliers is available at the NJBPU website<sup>8</sup>.

### 8.2 Retail Natural Gas Supply Options

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

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

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

A list of licensed third-party natural gas suppliers is available at the NJBPU website<sup>9</sup>.

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

<sup>9</sup> [www.state.nj.us/bpu/commercial/shopping.html](http://www.state.nj.us/bpu/commercial/shopping.html)

# APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

## Lighting Inventory & Recommendations

Location	Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
MAIN DINING & OPEN AREA	25	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Time Switch	S	36	7,300		None	No	25	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Time Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MAIN DINING & OPEN AREA	49	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Time Switch	S	12	7,300		None	No	49	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Time Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MAIN DINING & OPEN AREA	12	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	3	None	Yes	12	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Daylight Dimming	26	4,380	0.1	1,002	0	\$64	\$250	\$250	0.0
KITCHEN - SERVING STATIONS	20	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	20	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.1	597	0	\$38	\$270	\$35	6.1
KITCHEN - SERVING STATIONS	24	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	24	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.2	2,151	-1	\$138	\$540	\$70	3.4
KITCHEN - SERVING STATIONS	10	LED - Fixtures: (2) Philips 10.5T8/36-3000 IF 10/1	Wall Switch	S	26	7,300	2	None	Yes	10	LED - Fixtures: (2) Philips 10.5T8/36-3000 IF 10/1	Occupancy Sensor	26	5,037	0.1	647	0	\$42	\$270	\$35	5.6
KITCHEN - SERVING STATIONS	7	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	7	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	209	0	\$13	\$0	\$0	0.0
KITCHEN - SERVING STATIONS	5	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	5	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	149	0	\$10	\$0	\$0	0.0
KITCHEN - SERVING STATIONS	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	2	None	Yes	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Occupancy Sensor	26	5,037	0.0	194	0	\$12	\$0	\$0	0.0
KITCHEN - DEEP FRYER	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
KITCHEN - DEEP FRYER	2	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	2	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
KITCHEN - DEEP FRYER	3	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	7,300		None	No	3	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	10	7,300	0.0	0	0	\$0	\$0	\$0	0.0
KITCHEN - OPEN AREAS	8	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	32	7,300	2	None	Yes	8	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	32	5,037	0.1	627	0	\$40	\$270	\$35	5.8
KITCHEN - OPEN AREAS	19	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	2	None	Yes	19	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	5,037	0.2	2,554	-1	\$164	\$270	\$35	1.4
KITCHEN - OVENS	3	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	7,300		None	No	3	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	10	7,300	0.0	0	0	\$0	\$0	\$0	0.0
DRINK STORAGE ROOM	4	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	4	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
KITCHEN - PREP STATION 1	5	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	5	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	448	0	\$29	\$270	\$35	8.2
KITCHEN - PREP STATION 1	3	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	3	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
KITCHEN - OPEN AREAS	5	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	5	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	448	0	\$29	\$270	\$35	8.2
KITCHEN - PREP STATION 2	4	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	7,300		None	No	4	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	10	7,300	0.0	0	0	\$0	\$0	\$0	0.0
KITCHEN - OPEN AREAS	4	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	2	None	Yes	4	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	5,037	0.0	538	0	\$35	\$270	\$35	6.8
KITCHEN - DISHWASHING RM	8	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	8	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
KITCHEN COLD BOX 1	2	LED - Fixtures: Philips 9A19/LED/830/DIM	Occupancy Sensor	S	10	7,300		None	No	2	LED - Fixtures: Philips 9A19/LED/830/DIM	Occupancy Sensor	10	7,300	0.0	0	0	\$0	\$0	\$0	0.0
KITCHEN COLD BOX 2	2	LED - Fixtures: Philips 9A19/LED/830/DIM	Occupancy Sensor	S	10	7,300		None	No	2	LED - Fixtures: Philips 9A19/LED/830/DIM	Occupancy Sensor	10	7,300	0.0	0	0	\$0	\$0	\$0	0.0
A10 KITCHEN OFFICE	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
A10 KITCHEN OFFICE	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
REAR KITCHEN CORRIDOR	5	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	32	7,300	4	None	Yes	5	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	High/Low Control	32	5,037	0.0	392	0	\$25	\$200	\$0	7.9
REAR KITCHEN CORRIDOR	3	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	4	None	Yes	3	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	54	5,037	0.0	403	0	\$26	\$0	\$0	0.0
JA1 JANITORS CLOSET	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MA3 MECHANICAL ROOM	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MA4 MECHANICAL ROOM	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MA5 MECHANICAL ROOM	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
A03 CONFERENCE ROOM	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
A03 CONFERENCE ROOM	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
A03 CONFERENCE ROOM	2	LED - Fixtures: (1) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	19	7,300		None	No	2	LED - Fixtures: (1) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	19	7,300	0.0	0	0	\$0	\$0	\$0	0.0
A WEST ENTRANCE VESTIBULE	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
A - WEST ENTRANCE LOBBY	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
A - WEST CORRIDOR & OPEN STAIRWELL	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	3	None	Yes	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Daylight Dimming	36	4,380	0.0	231	0	\$15	\$250	\$0	16.8
A - WEST CORRIDOR & OPEN STAIRWELL	9	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	3	None	Yes	9	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Daylight Dimming	12	4,380	0.0	347	0	\$22	\$500	\$0	22.4
MA2A MECHANICAL ROOMS CORRIDOR	24	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	24	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M112 MECHANICAL ROOM	9	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	9	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M112 MECHANICAL ROOM	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M112 VAULT	10	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	2	None	Yes	10	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	5,037	0.1	1,344	-1	\$86	\$270	\$35	2.7
MA1 CONTROL ROOM	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MB1 CONTROL ROOM	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MJ1 JANITOR CLOSET	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B01 STORAGE	5	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	32	7,300		None	No	5	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	32	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WOMEN'S ROOM	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WOMEN'S ROOM	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WOMEN'S ROOM VESTIBULE	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Occupancy Sensor	S	26	7,300		None	No	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Occupancy Sensor	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0



Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
MEN'S ROOM	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MEN'S ROOM	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MEN'S ROOM VESTIBULE	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
HALL 1 BEHIND B04	5	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	5	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
HALL 2 BEHIND B04	5	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	5	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
STORAGE AREA HALL	8	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	8	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
S81 OPEN STORAGE ROOM	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B04 MULTIPURPOSE ROOM	84	Compact Fluorescent: 32W CFL	High/Low Control	S	32	7,300	1	Relamp	No	84	LED Screw-In Lamps: Pin Based LED Lamp	High/Low Control	22	7,300	0.6	6,475	-3	\$416	\$2,283	\$0	5.5
B04 MULTIPURPOSE ROOM	100	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	100	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.4	4,481	-2	\$288	\$1,350	\$175	4.1
B04 MULTIPURPOSE ROOM	20	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	11	7,300	2	None	Yes	20	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	11	5,037	0.0	523	0	\$34	\$270	\$35	7.0
B04 MULTIPURPOSE ROOM	100	LED - Fixtures: (1) Philips 10.5T8/36-3000 IF 10/1	Wall Switch	S	13	7,300	2	None	Yes	100	LED - Fixtures: (1) Philips 10.5T8/36-3000 IF 10/1	Occupancy Sensor	13	5,037	0.3	3,236	-1	\$208	\$1,350	\$175	5.6
B04 MULTIPURPOSE ROOM	46	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	46	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.1	1,374	-1	\$88	\$810	\$105	8.0
B03 PROJECTOR ROOM	2	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	32	7,300		None	No	2	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	32	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B03 PROJECTOR ROOM	4	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	4	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B03 PROJECTOR ROOM	6	LED - Fixtures: Philips 7MR16/F35 3000 DIM AF2 10/1	Wall Switch	S	7	7,300		None	No	6	LED - Fixtures: Philips 7MR16/F35 3000 DIM AF2 10/1	Wall Switch	7	7,300	0.0	0	0	\$0	\$0	\$0	0.0
BASEMENT CORRIDOR & MAIN LOBBY	41	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	4	None	Yes	41	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	High/Low Control	12	5,037	0.1	1,225	-1	\$79	\$1,400	\$0	17.8
BASEMENT CORRIDOR & MAIN LOBBY	2	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	4	None	Yes	2	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	High/Low Control	26	5,037	0.0	129	0	\$8	\$0	\$0	0.0
BASEMENT CORRIDOR & MAIN LOBBY	12	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	4	None	Yes	12	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	18	5,037	0.0	538	0	\$35	\$400	\$0	11.6
MB8 GENERATOR RM	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MB5	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MB4	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	717	0	\$46	\$270	\$35	5.1
RECEIVING DOCK	22	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	22	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.2	1,972	-1	\$127	\$540	\$70	3.7
RECEIVING OFFICE	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
RECEIVING CORRIDOR	13	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	13	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B06 A COLD BOX	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
B06 B	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B06 CATERING KITCHEN	3	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	3	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B06 CATERING KITCHEN	6	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	2	None	Yes	6	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	5,037	0.1	807	0	\$52	\$270	\$35	4.5
B05 RESTROOM CORRIDOR	3	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	S	21	7,300		None	No	3	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	21	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B05 A MENS RESTROOM	1	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	S	21	7,300		None	No	1	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	21	7,300	0.0	0	0	\$0	\$0	\$0	0.0
B05 B WOMENS RESTROOM	1	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	S	21	7,300		None	No	1	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	21	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR C LOBBY	5	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	5	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
OUTDOOR CANOPY 1	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
VESTIBULE 1	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
OUTDOOR CANOPY 2	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
VESTIBULE 2	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
1ST FL OPEN CORRIDORS	12	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Wall Switch	S	17	7,300	3	None	Yes	12	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Daylight Dimming	17	4,380	0.1	655	0	\$42	\$500	\$0	11.9
1ST FL OPEN CORRIDORS	75	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	3	None	Yes	75	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Daylight Dimming	26	4,380	0.6	6,263	-3	\$403	\$3,250	\$3,250	0.0
1ST FL OPEN CORRIDORS	30	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	3	None	Yes	30	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Daylight Dimming	26	4,380	0.2	2,505	-1	\$161	\$1,250	\$1,250	0.0
OPEN CORRIDORS	8	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	3	None	Yes	8	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Daylight Dimming	26	4,380	0.1	668	0	\$43	\$500	\$0	11.6
OPEN CORRIDORS	12	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	7,300	3	None	Yes	12	LED - Fixtures: Philips 9A19/LED/830/DIM	Daylight Dimming	10	4,380	0.0	366	0	\$24	\$500	\$0	21.2
125 CORRIDOR	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	4	None	Yes	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	High/Low Control	26	5,037	0.0	259	0	\$17	\$200	\$0	12.0
125 CORRIDOR	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	4	None	Yes	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	High/Low Control	12	5,037	0.0	179	0	\$12	\$200	\$0	17.4
OPEN CORRIDORS	72	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	3	None	Yes	72	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Daylight Dimming	36	4,380	0.7	8,326	-3	\$535	\$3,000	\$3,000	0.0
STAIRS 1	10	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	10	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
LOUNGE ADJACENT TO BILLIARDS	10	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	2	None	Yes	10	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Occupancy Sensor	26	5,037	0.1	647	0	\$42	\$270	\$35	5.6
BILLARDS ROOM	11	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	S	12	7,300		None	No	11	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
121 WELCOME DESK	10	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	10	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
121 WELCOME DESK	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
TRACK LIGHTS NEAR MAIL SERVICES	23	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Wall Switch	S	17	7,300	2	None	Yes	23	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Occupancy Sensor	17	5,037	0.1	973	0	\$63	\$540	\$70	7.5
103 MAIL SERVICE SIDE 1	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
LOUNGE NEAR COFFEE SHOP	6	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	6	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
103 MAIL SERVICE SIDE 2	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
107 MAIL SERVICE SIDE 1	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
107 MAIL SERVICE SIDE 2	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
101 VESTIBULE & HALL	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	4	None	Yes	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	High/Low Control	26	5,037	0.0	259	0	\$17	\$200	\$0	12.0
STAIRS #5	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
STAIRS #3	5	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	5	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
STAIRS #3	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
STAIRS #3	12	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	12	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
STAIRS #3	8	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Wall Switch	S	17	7,300		None	Philips	8	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Wall Switch	17	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MENS RESTROOM	5	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	5	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MENS RESTROOM	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WOMENS RESTROOM	6	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	6	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WOMENS RESTROOM	5	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	5	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M20 CLOSET	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M21 CLOSET	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
CAFÉ VIVIAN	40	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	40	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.1	1,195	0	\$77	\$540	\$70	6.1
CAFÉ VIVIAN KITCHEN	11	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	11	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
SHIPPING & PACKING OFFICE	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
102 OFFICE	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
102A OFFICE	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
102B OFFICE	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
JANITOR CLOSET AT ELEVATOR A	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
M111 A	10	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	10	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	896	0	\$58	\$270	\$35	4.1
M12	10	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	10	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	896	0	\$58	\$270	\$35	4.1
104 MAIL ROOM	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
106 MAIL ROOM	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MAIL ROOM 3	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MAIL ROOM 4	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MAIL ROOM 5	3	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	3	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
105 TICKET CENTER	4	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	2	None	Yes	4	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	5,037	0.0	538	0	\$35	\$270	\$35	6.8
M14 BATTERY ROOM	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M13 CONTROL ROOM	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M15 IT OFFICE	54	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	54	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.4	4,839	-2	\$311	\$810	\$105	2.3
113 CORRIDOR	9	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	4	None	Yes	9	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	36	5,037	0.1	807	0	\$52	\$200	\$0	3.9
109 HALL	1	LED - Fixtures: (2) Philips 16.5T8/24-3000 IF-6U 10/1	Wall Switch	S	38	7,300	4	None	Yes	1	LED - Fixtures: (2) Philips 16.5T8/24-3000 IF-6U 10/1	High/Low Control	38	5,037	0.0	95	0	\$6	\$0	\$0	0.0
110 OFFICE/WORKSHOP	4	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	32	7,300		None	No	4	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	32	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M19	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
111 TELECOM SERVICES	6	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	5,037	0.1	568	0	\$36	\$270	\$35	6.4
113 OIT SOLUTIONS	6	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	5,037	0.1	568	0	\$36	\$270	\$35	6.4
113 OIT SOLUTIONS	2	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	2	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
112 TECH CLINIC	5	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	2	None	Yes	5	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	5,037	0.1	672	0	\$43	\$270	\$35	5.4
112 TECH CLINIC	7	LED - Fixtures: (2) Philips 16.5T8/24-3000 IF-6U 10/1	Wall Switch	S	38	7,300	2	None	Yes	7	LED - Fixtures: (2) Philips 16.5T8/24-3000 IF-6U 10/1	Occupancy Sensor	38	5,037	0.1	662	0	\$43	\$270	\$35	5.5
112 TECH CLINIC	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	1	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
112 TECH CLINIC	2	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	7,300		None	No	2	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	10	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WEST STAIRS ENTRANCE	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
CORRIDOR NEAR WEST STAIRS	9	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	9	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	807	0	\$52	\$540	\$0	10.4
114 CONFERENCE ROOM	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8

Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
115 STOCK ROOM	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	54	7,300		None	No	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
115 STOCK ROOM	2	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	S	21	7,300		None	No	2	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	21	7,300	0.0	0	0	\$0	\$0	\$0	0.0
116-118 MAIL SERVICES	21	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	21	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
CONVENIENCE STORE	27	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	7,300	1, 2	Relamp	Yes	27	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	5,037	0.4	4,769	-2	\$306	\$763	\$170	1.9
CONVENIENCE STORE	12	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	21	7,300		None	No	12	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	21	7,300	0.0	0	0	\$0	\$0	\$0	0.0
CONVENIENCE STORE	9	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	21	7,300		None	No	9	LED - Fixtures: (2) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	21	7,300	0.0	0	0	\$0	\$0	\$0	0.0
209 CLASSROOM	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
210 CLASSROOM	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	72	7,300	2	None	Yes	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	5,037	0.1	717	0	\$46	\$270	\$35	5.1
208 CLASSROOM	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	72	7,300	2	None	Yes	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	5,037	0.1	717	0	\$46	\$270	\$35	5.1
207 CLASSROOM	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	72	7,300	2	None	Yes	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	5,037	0.1	717	0	\$46	\$270	\$35	5.1
206 CLASSROOM	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	72	7,300	2	None	Yes	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	5,037	0.1	717	0	\$46	\$270	\$35	5.1
205 CLASSROOM	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	72	7,300	2	None	Yes	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	5,037	0.1	717	0	\$46	\$270	\$35	5.1
2ND FL CORRIDOR	30	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	4	None	Yes	30	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	18	5,037	0.1	1,344	-1	\$86	\$1,000	\$0	11.6
2ND FL CORRIDOR	20	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	11	7,300	4	None	Yes	20	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	High/Low Control	11	5,037	0.0	523	0	\$34	\$800	\$0	23.8
2ND FL CORRIDOR	26	LED - Fixtures: (1) Philips 10.5T8/36-3000 IF 10/1	Wall Switch	S	13	7,300	4	None	Yes	26	LED - Fixtures: (1) Philips 10.5T8/36-3000 IF 10/1	High/Low Control	13	5,037	0.1	841	0	\$54	\$1,000	\$0	18.5
2ND FL CORRIDOR	22	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	4	None	Yes	22	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	High/Low Control	12	5,037	0.1	657	0	\$42	\$800	\$0	18.9
2ND FL CORRIDOR	20	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	4	None	Yes	20	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	High/Low Control	12	5,037	0.1	597	0	\$38	\$800	\$0	20.8
2ND FL CORRIDOR	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300	4	None	Yes	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	High/Low Control	26	5,037	0.0	194	0	\$12	\$200	\$0	16.0
204 OPEN OFFICE	11	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300	2	None	Yes	11	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	5,037	0.1	1,041	0	\$67	\$270	\$35	3.5
204A OFFICE	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
204B OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
204C OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
204C OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
204D OFFICE	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
204E OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
204E OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
203 OFFICE	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M21 MECHANICAL ROOM	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
202 OFFICE	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201 SUITE	16	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	16	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	478	0	\$31	\$270	\$35	7.7
201 SUITE	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201A OFFICE	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201A OFFICE	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	179	0	\$12	\$0	\$0	0.0
201A OFFICE	10	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	10	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.0	448	0	\$29	\$270	\$35	8.2
201B OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201C OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201D OFFICE	3	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	3	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201E OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201F OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201G OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201H OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201I OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201J OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201K OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201L OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
201M OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M26 DATA CLOSET	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M25 DATA CLOSET	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR D LOBBY	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
247 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0



Location	Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis							
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
247 OFFICE	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Occupancy Sensor	S	26	7,300		None	No	3	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Occupancy Sensor	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
246 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
246A OFFICE	3	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	3	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
245 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
245 OFFICE	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
244 CONFERENCE ROOM	2	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	2	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
244 CONFERENCE ROOM	6	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	6	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
244 CONFERENCE ROOM	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	S	12	7,300		None	No	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
243 WOMENS CENTER	12	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	S	12	7,300		None	No	12	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
243 WOMENS CENTER	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Occupancy Sensor	S	26	7,300		None	No	4	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Occupancy Sensor	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0
243 WOMENS CENTER	4	LED - Fixtures: (1) G.C. 5.5PLS/830/HYB/GX23	Occupancy Sensor	S	7	7,300		None	No	4	LED - Fixtures: (1) G.C. 5.5PLS/830/HYB/GX23	Occupancy Sensor	7	7,300	0.0	0	0	\$0	\$0	\$0	0.0
243 WOMENS CENTER	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
243 C OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
243 C OFFICE	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
243 D OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
242 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
242 A OFFICE	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
242 A OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
242 B OFFICE	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
242 B OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
241 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
241 A OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
241 B OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
240 CLASSROOM	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
241 CLASSROOM	5	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	S	26	7,300		None	No	5	LED - Fixtures: (2) HN-H-G24Q-26W-3000-G3	Wall Switch	26	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
S24 STORAGE	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
236/237 HALL	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
237 OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
237 OFFICE	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
236 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
234 CLASSROOM	8	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	8	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
235 OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
235 OFFICE	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
233 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
233 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
232 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
232 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
231/229 HALL	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
231 OFFICE	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
229 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
230 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
230 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
228 CLASSROOM	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
S23 STORAGE	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M23 MECHANICAL ROOM	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M24 MECHANICAL ROOM	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
227 CLASSROOM	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
226 CLASSROOM	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
226 CLASSROOM	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
S22 STORAGE	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0



Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
S21 STORAGE	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
OPEN OFFICE NEAR 221	7	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	7	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
221 CLASSROOM	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
221 CLASSROOM	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
222 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
223 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
225 OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
225 OFFICE	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
224 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
220 CONFERENCE ROOM	6	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	6	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
J21 JANITORS CLOSET	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
219 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
219 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
218 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
218 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
215/217 HALL	4	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	S	12	7,300		None	No	4	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
217 OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
215 OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
213 OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
211 OFFICE	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	S	72	7,300		None	No	1	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
212 OFFICE	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	4	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
214/216 HALL	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300	4	None	Yes	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	High/Low Control	38	5,037	0.0	189	0	\$12	\$200	\$0	16.4
216 OFFICE	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	S	72	7,300		None	No	2	LED - Fixtures: (4) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	72	7,300	0.0	0	0	\$0	\$0	\$0	0.0
214 OFFICE	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	S	38	7,300		None	No	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
3RD FL CORRIDOR	30	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	4	None	Yes	30	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	18	5,037	0.1	1,344	-1	\$86	\$1,000	\$0	11.6

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
3RD FL CORRIDOR	20	LED - Fixtures: (1) Philips 10.5T8/36-3000 IF 10/1	Wall Switch	S	13	7,300	4	None	Yes	20	LED - Fixtures: (1) Philips 10.5T8/36-3000 IF 10/1	High/Low Control	13	5,037	0.1	647	0	\$42	\$800	\$0	19.2
3RD FL CORRIDOR	20	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	11	7,300	4	None	Yes	20	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	High/Low Control	11	5,037	0.0	523	0	\$34	\$800	\$0	23.8
3RD FL CORRIDOR	26	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	4	None	Yes	26	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	18	5,037	0.1	1,165	0	\$75	\$1,000	\$0	13.4
302 LECTURE HALL	48	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300		None	No	48	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	18	7,300	0.0	0	0	\$0	\$0	\$0	0.0
4TH FLOOR LOBBY	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR D VESTIBULE	4	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	4	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR C VESTIBULE	5	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	5	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
332 CORRIDOR/STUDY	5	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	4	None	Yes	5	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	High/Low Control	12	5,037	0.0	149	0	\$10	\$200	\$0	20.8
326 OPEN STUDY AREA & HALLWAY	50	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	4	None	Yes	50	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	High/Low Control	12	5,037	0.1	1,494	-1	\$96	\$1,800	\$0	18.8
325 CORRIDOR/STUDY	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	4	None	Yes	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	High/Low Control	12	5,037	0.0	179	0	\$12	\$200	\$0	17.4
326 OPEN STUDY AREA	16	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	16	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	478	0	\$31	\$270	\$35	7.7
326 OPEN STUDY AREA	8	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	8	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	239	0	\$15	\$0	\$0	0.0
326 OPEN STUDY AREA	4	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	4	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	119	0	\$8	\$0	\$0	0.0
301 CORRIDOR	7	LED - Fixtures: BR30!	Wall Switch	S	32	7,300	4	None	Yes	7	LED - Fixtures: BR30!	High/Low Control	32	5,037	0.0	558	0	\$36	\$200	\$0	5.6
EAST STAIR VEST	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MAIN STAIR CORRIDOR	20	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	3	None	Yes	20	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Daylight Dimming	18	4,380	0.1	1,156	0	\$74	\$1,000	\$0	13.5
ASIAN LIBRARY CORRIDOR	60	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	4	None	Yes	60	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	18	5,037	0.2	2,688	-1	\$173	\$2,000	\$0	11.6
ASIAN LIBRARY CORRIDOR	20	LED - Fixtures: (1) Philips 10.5T8/36-3000 IF 10/1	Wall Switch	S	13	7,300	4	None	Yes	20	LED - Fixtures: (1) Philips 10.5T8/36-3000 IF 10/1	High/Low Control	13	5,037	0.1	647	0	\$42	\$800	\$0	19.2
ASIAN LIBRARY CORRIDOR	20	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	11	7,300	4	None	Yes	20	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	High/Low Control	11	5,037	0.0	523	0	\$34	\$800	\$0	23.8
324 PERIODICALS WORKRM	60	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	60	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.5	5,377	-2	\$346	\$810	\$105	2.0
323 BREAKROOM TABLE RM	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
321 BREAKROOM	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300	2	None	Yes	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	5,037	0.0	378	0	\$24	\$116	\$20	3.9
322 OFFICE	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8
320 OFFICE	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8
319 OFFICE	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
318 OFFICE	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8
316 REF LIBRARY	42	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	42	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.3	3,764	-2	\$242	\$810	\$105	2.9
316 STUDY RM	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
315 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
314 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
314/315 VEST	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
313 STUDY RM	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	717	0	\$46	\$270	\$35	5.1
313 STUDY RM	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	7,300	1, 2	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	5,037	0.0	353	0	\$23	\$37	\$10	1.2
312 CATALOG RM	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8
311 READING RM	16	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	16	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	1,434	-1	\$92	\$270	\$35	2.6
311 READING RM - DESK	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	7,300	1, 2	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	5,037	0.1	1,060	0	\$68	\$380	\$65	4.6
310 CIRCULATION OFFICE	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8
ASIAN LIBRARY DISPLAY CASES	10	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	10	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	896	0	\$58	\$270	\$35	4.1
UNISEX TOILET	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
317 DIRECTOR	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300	2	None	Yes	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	5,037	0.0	378	0	\$24	\$270	\$0	11.1
317A DIRECTOR	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	179	0	\$12	\$0	\$0	0.0
S35 STORAGE	7	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	7	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	627	0	\$40	\$270	\$0	6.7
WEST STAIR CORR/VEST	3	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	3	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	90	0	\$6	\$270	\$0	46.9
309 CLASSROOM	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8
307 CLASSROOM	16	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	16	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	1,434	-1	\$92	\$270	\$35	2.6
306 SUITE (ADMIN)	7	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	7	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	627	0	\$40	\$270	\$35	5.8
UNISEX TOILET	1	Linear Fluorescent - T5: 2' T5 (14W) - 1L	Wall Switch	S	18	7,300	1	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	7,300	0.0	76	0	\$5	\$16	\$3	2.7
304 OFFICE	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
304A OFFICE	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
306A OFFICE	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
308 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
308A OFFICE	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	4	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MENS RM	3	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	3	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MENS RM	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
MENS RM	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR A	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR A	1	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300		None	No	1	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	18	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR B	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR C	1	LED - Fixtures: (3) Philips 10.5T8/36-3000 IF 10/1	Wall Switch	S	39	7,300		None	No	1	LED - Fixtures: (3) Philips 10.5T8/36-3000 IF 10/1	Wall Switch	39	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR D	2	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300		None	No	2	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	18	7,300	0.0	0	0	\$0	\$0	\$0	0.0
ELEVATOR D	2	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	11	7,300		None	No	2	LED - Fixtures: (1) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	11	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WOMENS RM VEST	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WOMENS RM	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	2	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
WOMENS RM	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
328 TEACHING/LEARNING CETNER	16	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	16	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	478	0	\$31	\$270	\$35	7.7
328 TEACHING/LEARNING CETNER	3	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	3	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
330 CLASSROOM	12	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	12	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	1,075	0	\$69	\$0	\$0	0.0
330 CLASSROOM	21	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Wall Switch	S	17	7,300	2	None	Yes	21	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Occupancy Sensor	17	5,037	0.1	889	0	\$57	\$540	\$70	8.2
330A	4	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Wall Switch	S	32	7,300	2	None	Yes	4	LED - Fixtures: (3) Philips 8.5T8/24-3000 IF 10/1	Occupancy Sensor	32	5,037	0.0	314	0	\$20	\$0	\$0	0.0
330 CLOSET	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
329 OFFICE/CUBICALS	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
329 OFFICE/CUBICALS	2	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	2	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
329 OFFICE/CUBICALS	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
328 CLOSET #1	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0
329 CLOSET #1	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300		None	No	1	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	12	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Location	Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis							
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
328A OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
328B OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
328C OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
328D OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
331 OFFICE	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	2	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
302 BLACKBOARD LIGHTS	4	Halogen Incandescent: HALOGEN	Wall Switch	S	575	7,300	1	Relamp	No	4	LED Screw-In Lamps: LED Screw-In Lamp	Wall Switch	86	7,300	1.4	15,699	-7	\$1,009	\$69	\$4	0.1
301 AUDITORIUM - BACK STAIRS	10	Halogen Incandescent: HALOGEN	Wall Switch	S	10	1,920	1	Relamp	No	10	LED Screw-In Lamps: LED Screw-In Lamp	Wall Switch	2	1,920	0.1	180	0	\$12	\$172	\$10	14.1
301 AUDITORIUM - FRONT STAIRS	3	Halogen Incandescent: HALOGEN	Wall Switch	S	10	1,920	1	Relamp	No	3	LED Screw-In Lamps: LED Screw-In Lamp	Wall Switch	2	1,920	0.0	54	0	\$3	\$52	\$3	14.1
301 AUDITORIUM - BACK OF STAGE	1	Halogen Incandescent: HALOGEN	Wall Switch	S	10	1,920	1	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamp	Wall Switch	2	1,920	0.0	18	0	\$1	\$17	\$1	14.1
301 AUDITORIUM	16	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Wall Switch	S	17	1,920	2	None	Yes	16	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Occupancy Sensor	17	1,325	0.1	178	0	\$11	\$270	\$35	20.5
301 AUDITORIUM	20	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Wall Switch	S	17	1,920	2	None	Yes	20	LED - Fixtures: Philips 17PAR38/F25/830 DIM AF SO	Occupancy Sensor	17	1,325	0.1	223	0	\$14	\$270	\$35	16.4
301 AUDITORIUM	16	Halogen Incandescent: HALOGEN	Wall Switch	S	750	1,920	1	Relamp	No	16	LED Screw-In Lamps: LED Screw-In Lamp	Wall Switch	113	1,920	7.3	21,542	-9	\$1,384	\$276	\$16	0.2
301 AUDITORIUM	74	Halogen Incandescent: HALOGEN	Wall Switch	S	575	1,920	1	Relamp	No	74	LED Screw-In Lamps: LED Screw-In Lamp	Wall Switch	86	1,920	26.0	76,386	-32	\$4,909	\$1,275	\$74	0.2
301 AUDITORIUM - CHAIR STAIR LIGHT	18	Incandescent: INC	Wall Switch	S	32	1,920	1	Relamp	No	18	LED Screw-In Lamps: LED Screw-In Lamp	Wall Switch	5	1,920	0.4	1,034	0	\$66	\$310	\$18	4.4
301 AUDITORIUM - BALCONY CHAIR STAIR LIGHT	1	Incandescent: INC	Wall Switch	S	32	1,920	1	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamp	Wall Switch	5	1,920	0.0	57	0	\$4	\$17	\$1	4.4
S31 IN 301 AUD	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
301 AUDITORIUM BACK HALL/STAIR	6	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	1,920	2	None	Yes	6	LED - Fixtures: Philips 9A19/LED/830/DIM	Occupancy Sensor	10	1,325	0.0	37	0	\$2	\$270	\$0	112.6
301 OUTSIDE CORRIDOR	2	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	7,300	4	None	Yes	2	LED - Fixtures: Philips 9A19/LED/830/DIM	High/Low Control	10	5,037	0.0	47	0	\$3	\$200	\$0	65.8
301 CONTROL BOOTH	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
402A	3	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	3	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
402A BATH	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
402A VANITY LIGHTS	15	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	7,300		None	No	15	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	10	7,300	0.0	0	0	\$0	\$0	\$0	0.0
402B	3	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	3	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
402B BATH	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300		None	No	1	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	54	7,300	0.0	0	0	\$0	\$0	\$0	0.0
402B VANITY LIGHTS	15	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	S	10	7,300		None	No	15	LED - Fixtures: Philips 9A19/LED/830/DIM	Wall Switch	10	7,300	0.0	0	0	\$0	\$0	\$0	0.0

Existing Conditions							Proposed Conditions							Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
M41 MAIN OFFICE	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	3	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
402 DRESS ROOM HALL	6	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	4	None	Yes	6	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	54	5,037	0.1	807	0	\$52	\$200	\$0	3.9
400 LEVEL EAST STAIR HALL	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Wall Switch	S	12	7,300	2	None	Yes	6	LED - Fixtures: (1) HN-V-G24Q-26W-3000-G3	Occupancy Sensor	12	5,037	0.0	179	0	\$12	\$270	\$0	23.4
M42	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8
M42	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
M31	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300		None	No	1	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	36	7,300	0.0	0	0	\$0	\$0	\$0	0.0
STORAGE CLOSET BEHIND EAST STAIRS	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300		None	No	1	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	38	7,300	0.0	0	0	\$0	\$0	\$0	0.0
HALL BEHIND EAST STAIRS	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300	2	None	Yes	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Occupancy Sensor	38	5,037	0.0	378	0	\$24	\$270	\$0	11.1
HALL BEHIND EAST STAIRS	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	2	None	Yes	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	54	5,037	0.0	269	0	\$17	\$270	\$0	15.6
M32 STORAGE	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	6	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.0	538	0	\$35	\$270	\$35	6.8
303 CLASSROOM	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	36	7,300	2	None	Yes	8	LED - Fixtures: (2) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	36	5,037	0.1	717	0	\$46	\$270	\$35	5.1
S32 Corridor	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	Wall Switch	S	38	7,300	4	None	Yes	4	LED - Fixtures: (2) Philips 16.5T8/22.5-3000 IF-BX 10/1	High/Low Control	38	5,037	0.0	378	0	\$24	\$200	\$0	8.2
S32 Corridor	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	54	7,300	4	None	Yes	2	LED - Fixtures: (3) Philips 15T8/48-3000 IF DIM 10/1	High/Low Control	54	5,037	0.0	269	0	\$17	\$200	\$0	11.6
STAIRS #4	11	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300		None	No	11	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	18	7,300	0.0	0	0	\$0	\$0	\$0	0.0
409 ASIAN LIBRARY	64	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	64	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.3	2,868	-1	\$184	\$1,080	\$140	5.1
409 ASIAN LIBRARY	6	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300		None	No	6	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	18	7,300	0.0	0	0	\$0	\$0	\$0	0.0
409 ASIAN LIBRARY	6	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300		None	No	6	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	18	7,300	0.0	0	0	\$0	\$0	\$0	0.0
410 ASIAN LIBRARY	160	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	160	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.6	7,169	-3	\$461	\$2,160	\$280	4.1
410 ASIAN LIBRARY	34	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	34	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.1	1,523	-1	\$98	\$540	\$70	4.8
410 ASIAN LIBRARY	16	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	16	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.1	717	0	\$46	\$270	\$35	5.1
407 ASIAN LIBRARY	106	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	106	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.4	4,750	-2	\$305	\$1,350	\$175	3.8
407 ASIAN LIBRARY	12	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	12	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.0	538	0	\$35	\$270	\$35	6.8
407 ASIAN LIBRARY	12	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	12	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.0	538	0	\$35	\$270	\$35	6.8
404 ASIAN LIBRARY	26	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Wall Switch	S	18	7,300	2	None	Yes	26	LED - Fixtures: (1) Philips 15T8/48-3000 IF DIM 10/1	Occupancy Sensor	18	5,037	0.1	1,165	0	\$75	\$540	\$70	6.3



## Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
B Level Mechanical Room	AHU-1 (B Level MP RM)	1	Supply Fan	25.0	92.4%	Yes	W	7,300		No	92.4%	No		0.0	0	0	\$0	\$0	\$0	0.0
B Level Mechanical Room	AHU-1 (B Level MP RM)	1	Return Fan	7.5	89.5%	Yes	W	7,300		No	89.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
A Level Mechanical Room, M21	AHU-2 (100-L Café)	1	Supply Fan	15.0	91.0%	Yes	W	7,300		No	91.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
A Level Mechanical Room, M21	AHU-2 (100-L Café)	1	Return Fan	5.0	87.5%	Yes	W	7,300		No	87.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
A Level Mechanical Room,	AHU-3 (Palmer East)	1	Supply Fan	20.0	89.5%	No	W	7,300	5, 6	Yes	93.0%	Yes	1	6.0	43,751	0	\$2,907	\$8,582	\$1,600	2.4
A Level Mechanical Room, M23	AHU-4 (Palmer West)	1	Supply Fan	15.0	91.0%	No	W	7,300	5, 6	Yes	93.0%	Yes	1	4.4	31,798	0	\$2,113	\$7,041	\$1,200	2.8
3rd Floor Mechanical Room, M35	AHU-5 (400 L Gest)	1	Supply Fan	40.0	93.0%	Yes	W	7,300		No	93.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
3rd Floor Mechanical Room, M35	AHU-5 (400 L Gest)	1	Return Fan	10.0	89.5%	Yes	W	7,300		No	89.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
4th Floor Mechanical Room, M43	AHU-6 (Lecture Hall)	1	Supply Fan	10.0	89.5%	Yes	W	7,300		No	89.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
4th Floor Mechanical Room, M43	AHU-6 (Lecture Hall)	1	Return Fan	2.0	84.0%	Yes	W	7,300		No	84.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
4th Floor Mechanical Room, M43	AHU-7 (Perf Hall)	1	Supply Fan	15.0	91.0%	Yes	W	7,300		No	91.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
4th Floor Mechanical Room, M43	AHU-7 (Perf Hall)	1	Return Fan	5.0	87.5%	Yes	W	7,300		No	87.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
470	AHU-8 (200-300 Addn)	1	Supply Fan	30.0	92.4%	Yes	W	7,300		No	92.4%	No		0.0	0	0	\$0	\$0	\$0	0.0
470	AHU-8 (200-300 Addn)	1	Return Fan	15.0	91.0%	Yes	W	7,300		No	91.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
470	AHU-9 (Dining & Commons)	1	Supply Fan	100.0	94.1%	Yes	W	7,300		No	94.1%	No		0.0	0	0	\$0	\$0	\$0	0.0
470	AHU-9 (Dining & Commons)	2	Return Fan	15.0	91.0%	Yes	W	7,300		No	91.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
A Level Mechanical Room, MA2	Condensate	2	Condensate Pump	2.0	84.0%	Yes	W	3,650		No	84.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
A Level Mechanical Room, MA2	Hot Water Loop (P1 & 2)	2	Heating Hot Water Pump	10.0	91.7%	Yes	W	3,650		No	91.7%	No		0.0	0	0	\$0	\$0	\$0	0.0
A Level Mechanical Room, MA2	Hot Water Loop (P3 & 4)	2	Heating Hot Water Pump	15.0	91.0%	No	W	3,650	5, 7	Yes	92.4%	Yes	2	3.1	36,886	0	\$2,451	\$14,172	\$0	5.8
A Level Mechanical Room, MA2	Secondary Chilled Water Loop (CHWP 1 & 2)	2	Chilled Water Pump	30.0	92.4%	Yes	W	3,650		No	92.4%	No		0.0	0	0	\$0	\$0	\$0	0.0

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
A Level Mechanical Room	Compressed Air	2	Air Compressor	5.0	87.5%	No	W	2,190		No	87.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
B07	EF-1 (Ventilation)	1	Exhaust Fan	0.3	67.5%	No	W	7,300		No	67.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
B33	EF-2(Ventilation)	1	Exhaust Fan	0.3	71.4%	No	W	7,300		No	71.4%	No		0.0	0	0	\$0	\$0	\$0	0.0
B36	EF-3 (Ventilation)	1	Exhaust Fan	2.0	84.0%	No	W	7,300	5, 6	Yes	87.5%	Yes	1	0.6	3,949	0	\$262	\$3,565	\$160	13.0
120	EF-4 (Ventilation)	1	Exhaust Fan	0.3	71.4%	No	W	7,300		No	71.4%	No		0.0	0	0	\$0	\$0	\$0	0.0
105	EF-5 (Ventilation)	1	Exhaust Fan	0.3	67.5%	No	W	7,300		No	67.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
470	EF-6 (Ventilation)	2	Exhaust Fan	0.5	75.3%	No	W	7,300		No	75.3%	No		0.0	0	0	\$0	\$0	\$0	0.0
Attic	EF-7 (Ventilation)	1	Exhaust Fan	0.3	71.4%	No	W	7,300		No	71.4%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	EF-8 (East Gen/Toilet)	1	Exhaust Fan	3.0	86.5%	No	W	7,300	5, 6	Yes	88.5%	Yes	1	0.9	5,671	0	\$377	\$4,081	\$240	10.2
Roof	EF-9 (West Gen/Toilet)	1	Exhaust Fan	3.0	86.5%	No	W	7,300	5, 6	Yes	88.5%	Yes	1	0.9	5,671	0	\$377	\$4,081	\$240	10.2
Attic	EF-10 (301 Projector)	1	Exhaust Fan	0.3	67.5%	No	W	7,300		No	67.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Roof	EF-12 (Addn Gen/Toilet)	1	Exhaust Fan	2.0	84.0%	No	W	7,300	5, 6	Yes	87.5%	Yes	1	0.6	3,949	0	\$262	\$3,565	\$160	13.0
470	EF-13 (Kitchen)	1	Kitchen Hood Exhaust Fan	5.0	87.5%	No	W	7,300	5, 8	Yes	89.5%	Yes	1	0.1	14,541	9	\$1,011	\$4,076	\$1,000	3.0
470	EF-14 (Kitchen)	1	Kitchen Hood Exhaust Fan	5.0	87.5%	No	W	7,300	5, 8	Yes	89.5%	Yes	1	0.1	14,541	9	\$1,011	\$4,076	\$1,000	3.0
470	EF-15 (Kitchen)	1	Kitchen Hood Exhaust Fan	1.5	84.0%	No	W	7,300	5, 8	Yes	86.5%	Yes	1	0.0	4,558	3	\$316	\$3,391	\$450	9.3
470	EF-16 (Kitchen)	1	Kitchen Hood Exhaust Fan	10.0	91.7%	No	W	7,300	5, 8	Yes	91.7%	Yes	1	0.0	27,417	17	\$1,911	\$5,895	\$1,600	2.2
470	EF-17 (Kitchen)	1	Kitchen Hood Exhaust Fan	10.0	91.7%	No	W	7,300	5, 8	Yes	91.7%	Yes	1	0.0	27,417	17	\$1,911	\$5,895	\$1,600	2.2
470	EF-18 (B34)	1	Exhaust Fan	2.0	84.0%	No	W	7,300	5, 6	Yes	87.5%	Yes	1	0.6	3,949	0	\$262	\$3,565	\$160	13.0
450 Attic	EF-19 (Genral/Toilet)	1	Exhaust Fan	1.5	84.0%	No	W	7,300		No	84.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
301 Attic	EF-20 (Attic/Vent)	1	Exhaust Fan	0.3	67.5%	No	W	7,300		No	67.5%	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?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
303 Attic	EF-21 (Attic/Vent)	1	Exhaust Fan	0.2	67.5%	No	W	7,300		No	67.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
470/Roof	EF-25 (Atrium Smoke)	2	Exhaust Fan	10.0	91.7%	No	W	7,300	5, 6	Yes	91.7%	Yes	2	5.9	35,760	0	\$2,376	\$11,791	\$1,600	4.3
Various	FCU-1 to 7	7	Fan Coil Unit	0.1	67.5%	No	W	7,300		No	67.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Various	FCU-11 to 17	7	Fan Coil Unit	0.1	67.5%	No	W	7,300		No	67.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Various	FCU-21 to 26	6	Fan Coil Unit	0.1	67.5%	No	W	7,300		No	67.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Various	FCU-31 to 36	6	Fan Coil Unit	0.1	67.5%	No	W	7,300		No	67.5%	No		0.0	0	0	\$0	\$0	\$0	0.0

### Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis					
		System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives
122	CCAU-1 (Phone Equipment)	1	Packaged Terminal AC	5.78		W		No						0.0	0	0	\$0	\$0	\$0	0.0
122	CCAU-2 (Phone Equipment)	1	Packaged Terminal AC	5.78		W		No						0.0	0	0	\$0	\$0	\$0	0.0
122	CCAU-3 (Phone Equipment)	1	Packaged Terminal AC	9.61		W		No						0.0	0	0	\$0	\$0	\$0	0.0
122	CCAU-4 (Phone Equipment)	1	Packaged Terminal AC	9.61		W		No						0.0	0	0	\$0	\$0	\$0	0.0
122	CCAU-5 (Voice Mail)	1	Packaged Terminal AC	1.65		W		No						0.0	0	0	\$0	\$0	\$0	0.0
122	CCAU-6 (Voice Mail)	1	Packaged Terminal AC	1.31		W		No						0.0	0	0	\$0	\$0	\$0	0.0

### Electric Chiller Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis					
		Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Remaining Useful Life	ECM #	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives
Central Plant	Chilled water Loop	1	Water-Cooled Centrifugal Chiller	600.00			No						0.0	0	0	\$0	\$0	\$0	0.0

### Fuel Heating Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions					Proposed Conditions						Energy Impact & Financial Analysis					
		System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives
Throughout Building	Chilled Water Loop (Absorption Chiller)	1	Furnace	7,166.96			No					0.0	0	0	\$0	\$0	\$0	0.0
Throughout Building	Heating Hot Water Loop	1	Furnace	8,958.70			No					0.0	0	0	\$0	\$0	\$0	0.0

### Demand Control Ventilation Recommendations

Location	Area(s)/System(s) Affected	Recommendation Inputs					Energy Impact & Financial Analysis						
		ECM #	Number of Zones	Cooling Capacity of Controlled System (Tons)	Electric Heating Capacity of Controlled System (kBtu/hr)	Output Heating Capacity of Controlled System (MBh)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
A Level Mechanical Room, M21	AHU-2 (100-L Café)	9	2.00	43.58	0.00	247.00	0.0	804	32	\$222	\$2,719	\$0	12.3
3rd Floor Mechanical Room, M35	AHU-5 (400 L Gest)	9	2.00	50.00	0.00	197.00	0.0	923	26	\$196	\$2,719	\$0	13.9
4th Floor Mechanical Room, M43	AHU-6 (Lecture Hall)	9	2.00	31.08	0.00	201.00	0.0	573	26	\$175	\$2,719	\$0	15.5
4th Floor Mechanical Room, M43	AHU-7 (Perf Hall)	9	2.00	47.58	0.00	297.00	0.0	878	39	\$261	\$2,719	\$0	10.4

### Low-Flow Device Recommendations

Location	Recommendation Inputs					Energy Impact & Financial Analysis						
	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	10	8	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	23	\$118	\$57	\$0	0.5

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

Location	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
	Cooler/Freezer Quantity	Case Type/Temperature	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	6	Medium Temp Freezer (0F to 30F)	11, NR	Yes	Yes	No	0.5	7,252	0	\$482	\$3,718	\$380	6.9

### Commercial Refrigerator/Freezer Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Convenience Store	7	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
Convenience Store	4	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
Multiple locations	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
Multiple locations	20	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0
Multiple locations	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0

### Commercial Ice Maker Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Ice Maker Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Multiple Locations	10	Self-Contained Unit (≥175 lbs/day), Batch	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0

### Plug Load Inventory

Existing Conditions				
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Throughout Building	10	Overhead Projector	200.0	No
Throughout Building	50	Desktop PC	150.0	No
Throughout Building	10	Printer (Small)	60.0	No
Throughout Building	2	Printer (Medium)	200.0	No
Throughout Building	10	Printer (Large)	600.0	No
Throughout Building	3	Microwave	1,000.0	No
Throughout Building	1	Refrigerator	170.0	No
Throughout Building	1	Mini-Fridge	153.0	No
Throughout Building	1	Scanner	200.0	No
Throughout Building	3	LED TV (60')	71.0	No
Throughout Building	2	Toaster	850.0	No

# APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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

## ENERGY STAR® Statement of Energy Performance

LEARN MORE AT [energystar.gov](http://energystar.gov)

N/A

### Frist Campus Center

Primary Property Type: College/University  
Gross Floor Area (ft<sup>2</sup>): 179,174  
Built: 2000

For Year Ending: November 30, 2017  
Date Generated: December 17, 2018

ENERGY STAR®  
Score<sup>1</sup>

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

Property & Contact Information			
<b>Property Address</b> Frist Campus Center Princeton University Campus Princeton, New Jersey 08544	<b>Property Owner</b> The Trustees at Princeton University Princeton University Princeton, NJ 08544 ( ) -	<b>Primary Contact</b> Arthur Murphy Princeton University Princeton, NJ 08544 609-258-9298 amurphy@princeton.edu	
<b>Property ID:</b> 6665241			

Energy Consumption and Energy Use Intensity (EUI)			
<b>Site EUI</b> 235 kBtu/ft <sup>2</sup>	<b>Annual Energy by Fuel</b> District Chilled Water - 4,233,760 (10%) Absorption (kBtu) Electric - Grid (kBtu) 10,438,663 (25%) District Chilled Water - 6,907,714 (16%) Electric (kBtu) District Steam (kBtu) 20,528,036 (49%)	<b>National Median Comparison</b> National Median Site EUI (kBtu/ft <sup>2</sup> ) 118.7 National Median Source EUI (kBtu/ft <sup>2</sup> ) 180.6 % Diff from National Median Source EUI 98%	
<b>Source EUI</b> 357.5 kBtu/ft <sup>2</sup>	<b>Annual Emissions</b> Greenhouse Gas Emissions (Metric Tons CO <sub>2</sub> e/year) 3,098		

### Signature & Stamp of Verifying Professional

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

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

Licensed Professional

\_\_\_\_\_  
( ) -  
\_\_\_\_\_



Professional Engineer Stamp  
(if applicable)

## APPENDIX C: GLOSSARY

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

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



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