

WILLIAM PATTERSON UNIVERSITY

PIONEER HALL

300 Pompton Road, Wayne NJ 07470

**LOCAL GOVERNMENT ENERGY AUDIT PROGRAM
FOR
NEW JERSEY
BOARD OF PUBLIC UTILITIES**

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Prepared by:



6 Campus Drive
Parsippany, NJ 07054
(973) 538-2120

CHA PROJECT NO. 28661

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REPORT DISCLAIMER

This audit was conducted in accordance with the standards developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) for a Level II audit. Cost and savings calculations for a given measure were estimated to within $\pm 20\%$, and are based on data obtained from the owner, data obtained during site observations, professional experience, historical data, and standard engineering practice. Cost data does not include soft costs such as engineering fees, legal fees, project management fees, financing, etc.

A thorough walkthrough of the building was performed, which included gathering nameplate information and operating parameters for all accessible equipment and lighting systems. Unless otherwise stated, model, efficiency, and capacity information included in this report were collected directly from equipment nameplates and /or from documentation provided by the owner during the site visit. Typical operation and scheduling information was obtained from interviewing staff and spot measurements taken in the field.

List of Common Energy Audit Abbreviations

- A/C – Air Conditioning
- AHS – Air Handling Unit
- BMS – Building Management System
- Btu – British thermal unit
- CDW – Condenser Water
- CFM – Cubic feet per minute
- CHW – Chilled Water
- DCV – Demand Control Ventilation
- DDC – Direct Digital Control
- DHW – Domestic Hot Water
- DX – Direct Expansion
- EER – Energy Efficiency Ratio
- EF – Exhaust Fan
- EUI – Energy Use Intensity
- Gal – Gallon
- GPD – Gallons per day
- GPF – Gallons Per Flush
- GPH – Gallons per hour
- GPM – Gallons per minute
- GPS – Gallons per second
- HHW – Heating Hot Water
- HID – High Intensity Discharge
- HP – Horsepower
- HRU – Heat Recovery Unit
- HVAC – Heating, Ventilation, Air Conditioning
- HX – Heat Exchanger
- kbtu/mbtu – One thousand (1,000) Btu
- kW – Kilowatt (1,000 watts)
- kWh – Kilowatt-hours
- LED – Light Emitting Diode
- mbh – Thousand Btu per hour
- mmbtu – One million (1,000,000) Btu
- OCC – Occupancy Sensor
- PSI – Pounds per square inch
- RTU – Rooftop Unit
- SBC – System Benefits Charge
- SF – Square foot
- UH – Unit Heater
- V – Volts
- VAV – Variable Air Volume
- VSD – Variable Speed Drive
- W – Watt

1.0 EXECUTIVE SUMMARY

This report summarizes the energy audit performed by CHA for William Patterson University (WPU) in connection with the New Jersey Board of Public Utilities (NJBPU) Local Government Energy Audit (LGEA) Program. The purpose of this report is to identify energy savings opportunities associated with major energy consumers and inefficient practices. Low-cost and no-cost are also identified during the study. This report details the results of the energy audit conducted for the building listed below:

Building Name	Address	Square Feet	Construction Date
Pioneer Hall	300 Pompton Road, Wayne NJ 07470	65,886	1972

The potential total annual energy and cost savings for the recommended energy conservation measures (ECM) identified in the survey are shown below:

Building Name	Electric Savings (kWh)	NG Savings (therms)	Total Savings (\$)	Payback (years)
Pioneer Hall	220,422	7,879	37,472	13.5

Each individual measure's annual savings are dependent on that measure alone, there are no interactive effects calculated. There are three options shown for Lighting ECM savings; only one option can be chosen. Incentives shown (if any) are based only on the SmartStart Incentive Program. Other NJBPU or local utility incentives may also be available/ applicable and are discussed in Section 6.0.

Each measure recommended by CHA typically has a stand-alone simple payback period of 15 years or less. However, if the owner chooses to pursue an Energy Savings Improvement Plan (ESIP), high payback measures could be bundled with lower payback measures which ultimately can result in a payback which is favorable for an ESIP project to proceed. Occasionally, we will recommend an ECM that has a longer payback period, based on the need to replace that piece(s) of equipment due to its age, such as a boiler for example.

The following table provides a detailed summary of each ECM for the building surveyed, including costs, savings, SmartStart incentives and payback.

Summary of Energy Conservation Measures

ECM #	Energy Conservation Measure	Est. Costs (\$)	Est. Savings (\$/year)	Payback w/o Incentive	Potential Incentive (\$)*	Payback w/ Incentive	Recommended
ECM-1	Install Occupancy Sensors/Thermostats for Fan Coil Units	232,223	12,014	19.3	0	19.3	Y
ECM-2	Replace 3-Way Valves with 2-Way Valves and Install VFDs on the Pump Motors	95,019	5,726	16.6	4,000	15.9	Y
ECM-3	Add Outdoor Air Damper Actuator and DDC to Optimize Ventilation Rate	20,394	706	28.9	0	28.9	Y
ECM-4	Replace the DHW Heat Exchangers with a Designated Gas Fired Condensing DHW Heater	29,061	7,333	4.0	300	3.9	Y
ECM-5	Install Vending Miser	1,120	940	1.2	0	1.2	Y
ECM-6	Replace High Flow Plumbing Fixtures with Low Flow Plumbing Fixtures	339,885	2,061	164.9	0	164.9	N
ECM-L1**	Lighting Replacements / Upgrades	127,774	10,723	11.9	19,465	10.1	N
ECM-L2**	Install Lighting Controls (Add Occupancy Sensors)	540	56	9.6	70	8.3	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	128,314	10,752	11.9	19,535	10.1	Y
Total**		846,016	39,532	21.4	23,835	20.8	
Total (Recommended)		506,131	37,472	13.5	23,835	12.9	

* Incentive shown is per the New Jersey SmartStart Program.

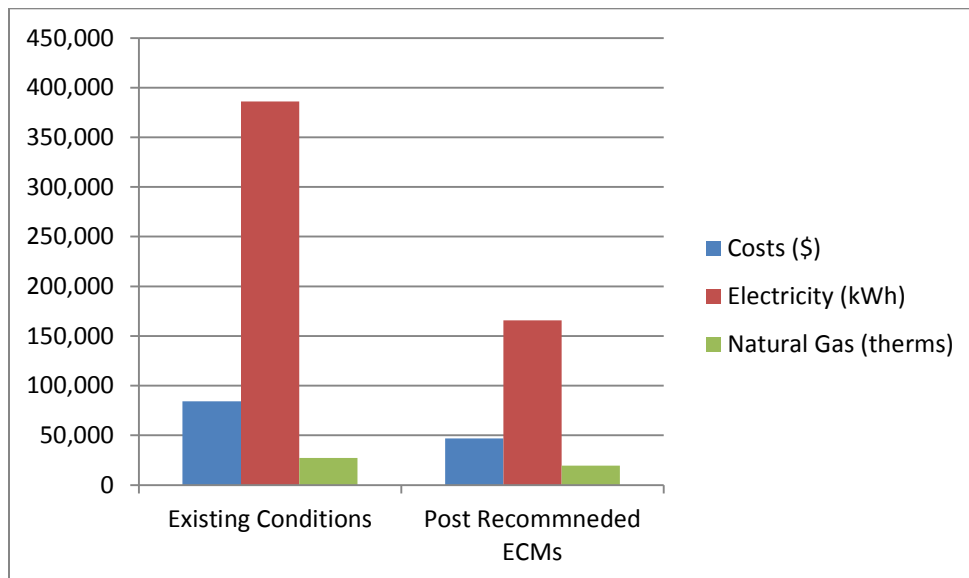
** These ECMs are not included in the Total, as they are alternate measures not recommended.

The following alternative energy measures are also recommended for further study:

- Photovoltaic (PV) Rooftop Solar Power Generation – 30 kW System

If WPU implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs (\$)	84,231	46,759	44%
Electricity (kWh)	386,000	165,578	57%
Natural Gas (therms)	27,283	19,404	29%
Site EUI (kbtu/SF/Yr)	61.4	38.0	



Pioneer Hall and Heritage Hall share the same boilers and chiller in one mechanical room. The electric usage is provided by WPU and the gas usages of these two buildings are estimated to be identical.

2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

The following is a summary of building information related to HVAC, plumbing, building envelope, lighting, kitchen equipment and domestic hot water systems as observed during CHAs site visit. See appendix B for detailed information on mechanical equipment, including capacities, model numbers and age. See appendix F for some representative photos of some of the existing conditions observed while onsite.

Building Name: Pioneer Hall

Address: 300 Pompton Road, Wayne NJ 07470

Gross Floor Area: 65,886

Number of Floors: 6 floors

Year Built: 1972



Building Envelope

Description of Spaces: The building serves as a residence hall. It includes offices, lounges, meeting rooms, laundry rooms, dormitory rooms, rest rooms and mechanical rooms.

Description of Occupancy: The building serves as a residence hall for about 130 students. There are about 6 office staff and housekeeping office.

Number of Computers: The building has approximately 140 desktop and laptop computers.

Building Usage: The building operates 24/7 during the school year which is approximately 34 weeks per year. Occasionally, it is also used for temporary student residency during summer and winter semester sections.

Construction Materials: The building is constructed of structural steel framing, concrete masonry units (CMU) with brick façade.

Roof: The building has a flat roof which is covered with grey rubber membrane. It is believed that the roof is well insulated. The roof is in good condition and no ECMs associated with roof replacement.

Windows: The windows in this building are double pane windows with window mesh screens. The windows are in good condition.

Exterior Doors: Exterior doors throughout the school are aluminum frame with double pane safety glass. Sweeps on exterior doors are still in good condition.

No ECMs are evaluated related to the building envelop.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: Pioneer Hall shares the same boilers and chiller with Heritage Hall. These two buildings have almost identical HVAC system layout. Each has a two pipe system which circulates HHW during the heating season and converts to CHW during the cooling system. Control valves are located in the main mechanical room and manually switched over from HHW to CHW or vice versa. The majority of the HVAC equipment is located in a detached mechanical room on the south side of Pioneer Hall. Five (5) Aerco Benchmark 2.0 boilers are used to provide the heating hot water (HHW) for the heating loop for both Pioneer Hall and Heritage Hall. Each of the boilers has a rated energy input of 2,000 MBH and efficiency ranging from 87% to 98% depending on the return water temperature. The HHW for Pioneer Hall is circulated by two lead/lag 10 HP pumps and two lead/lag 15HP pumps. Each room in the building has a fan coil (FC) unit equipped with a two-pipe coil and three-way valve. Each FC unit has a 1/25 HP fan and outdoor air intake grill to provide ventilation in the room. Apart from the fan coil system, there is Trane AHU located in the penthouse mechanical rooms to serve the common areas.

Cooling: The cooling system shares the same piping and pumps as the heating system. A pad mounted 300 ton Trane air cooled chiller located outside the main mechanical room provides chilled water for both Pioneer Hall and Heritage Hall. The fan coil units and the AHU mentioned in heating section are switched over the cooling mode when the piping system is changed to the chilled water loop. In addition to the central cooling system, Pioneer Hall has an Airedale packaged AC unit designated to cool the student lounge room 102 and a small window unit for the elevator motor mechanical room.

An ECM related to install VFDs on the dual temp pumps and two-way valves to the piping system is evaluated.

Ventilation: The ventilation of this building is provided by the fan coil units and the AHU. Each fan coil unit has a small air intake on the wall to provide fresh air for the student rooms. The AHU in the penthouse mechanical room provides fresh air for the common areas. An ECM related to utilize economizer mode is evaluated.

Exhaust: This building has multiple fractional HP exhaust fans for restrooms and general exhaust. The exhaust fans are located on the roof and appear to be in good condition. Therefore, there are no ECMs associated with exhaust fans.

Controls Systems

During the site visit, it was observed that Andover control panels were installed in the detached main mechanical room. However, it was found that this building is not in the central system after reviewing the control screens with the facility technician. It is believed that the central DDC computers do not have access to control the HVAC equipment in this building. This issue is

possibly caused by misconfiguring Andover CPU into the system or other technical issues. An ECM related to connect the fan coil units in this building to the DDC system is evaluated.

Domestic Hot Water Systems

Currently, the domestic hot water is provided by the plate frame heat exchangers which use heating hot water from the Aerco Benchmark 2.0 boilers to heat the city water up to 140 °F the heat exchangers are located in the detached main mechanical room. Pioneer Hall shares the same DHW system with Heritage Hall. The HHW is circulated by two 3HP lead/lag pumps. The heating hot water boilers and two HHW pumps designated to overcome the pressure loss of the heat exchangers have to run in the summer season in order to provide sufficient DHW. In addition to the extra energy usage from the HHW pumps, the heating efficiency is reduced due to the effectiveness of the heat exchangers. Therefore, an ECM evaluating replacing the heat exchangers with a designated DHW high efficiency condensing heater is included in this study.

Kitchen Equipment

There is no kitchen in this building.

Plug Load

This building has computers, monitors, TVs, residential appliances (microwave, refrigerator), portable electric heaters (personal) and vending machines which contribute to the plug load in the building. The installation of vending machine occupancy sensors has been evaluated in an effort to reduce the plug load in the building.

Plumbing Systems

The restrooms contain older style toilets that utilize a higher volume of water per flush (3.5 GPF) than currently available new units. The sink faucets are double handle type and do not appear to have low-flow type aerators, dispensing at 2.5 GPM. An ECM is included to evaluate the water savings potential of installing low- flow plumbing fixtures.

Lighting Systems

The building has a mixture of 32W T-8 fluorescent lighting and a few CFLs. The majority of lighting fixtures in the common areas are 32W T-8 fluorescent fixtures. The dormitory rooms are identical after discussion with the school staff and therefore 10% of the rooms were surveyed. The bedroom has a T8 fixture and the students may have desk lights or floor lights which are not included in this study. The lights in the inaccessible rooms are estimated based on discussions with the school staff. There are about (12) 400W metal halides used as exterior lights. All of the lights in this building are controlled by manual switches. We have provided three alternatives for lighting that include adding occupancy sensors to the existing lights, replacing the lights with LED lights and a third ECM that evaluates adding occupancy sensors to the proposed LED lights.

3.0 UTILITIES

Natural gas and electricity are metered into this building under Account # 65-059-537-01. Utilities used by the building are delivered and supplied by the following utility companies:

	Electric	Natural Gas
Deliverer	PSE&G	PSE&G
Supplier	Direct Energy	HESS

For the 12-month period ending in January 2014, the utilities usages and costs for the building were as follows:

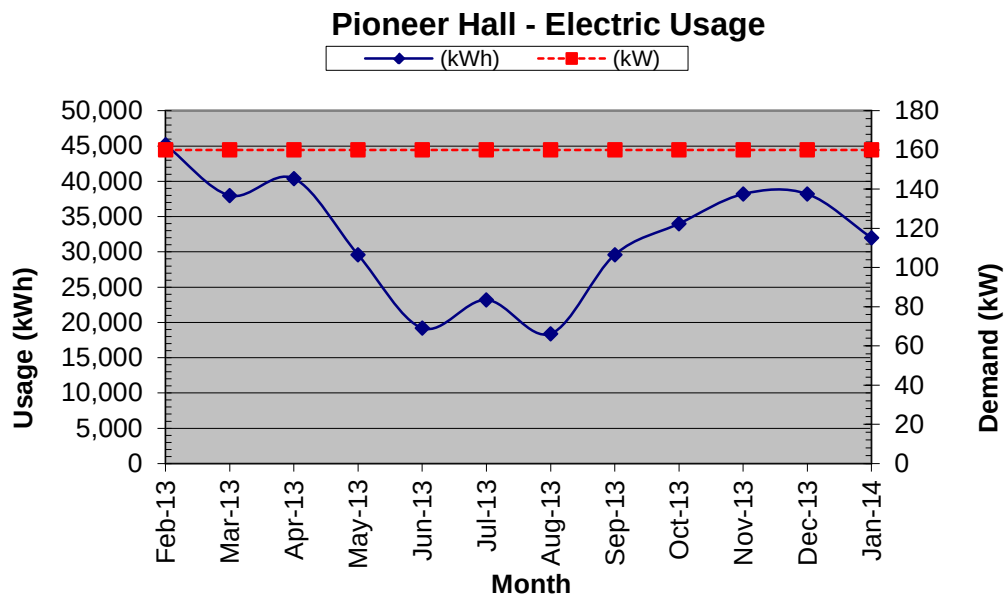
Electric		
Annual Consumption	386,000	kWh
Annual Cost	57,106	\$
Blended Unit Rate	0.148	\$/kWh
Supply Rate	0.107	\$/kWh
Demand Rate	11.93	\$/kW
Peak Demand	160.0	kW
Natural Gas		
Annual Consumption	27,283	Therms
Annual Cost	27,125	\$
Unit Rate	0.994	\$/therm

Blended Rate: Average rate charged determined by the annual cost / annual usage

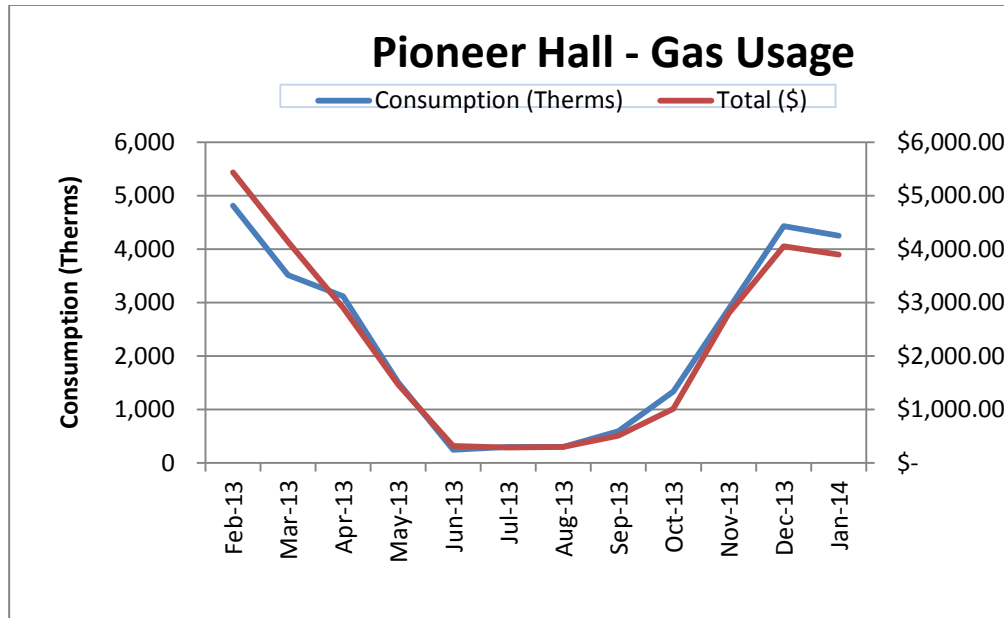
Supply Rate: Actual rate charged for electricity usage in kWh (based on most recent electric bill)

Demand Rate: Rate charged for actual electrical demand in kW (based on most recent electric bill)

*The missing demand usage and kWh usage in some months are estimated and highlighted in the utility spreadsheet



The building has higher electric consumption in the winter season and less in the summer months. It is noted that the building was not occupied most of the time during the summer months due to the school summer vacation. Therefore, the summer electric usage is less than other months.



The natural gas usage in this building is for heating and domestic hot water heating. The gas usage in the non-heating season is for domestic hot water only and relatively small. The gas usage during the heating season is correlated to winter weather conditions.

Pioneer Hall and Heritage Hall share the same boilers and chiller in one mechanical room. The electric usage is provided by WPU and the gas usages of these two buildings are estimated to be identical.

See Appendix A for utility analysis.

Under New Jersey's energy deregulation law, the supply portion of the electric (or natural gas) bill is separated from the delivery portion. The supply portion is open to competition, and customers can shop around for the best price for their energy suppliers. The electric and natural gas distribution utilities will still deliver the gas/ electric supplies through their wires and pipes – and respond to emergencies, should they arise – regardless of where those supplies are purchased. Purchasing the energy supplies from a company other than your electric or gas utility is purely an economic decision; it has no impact on the reliability or safety of the service.

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	School Average Rate	NJ Average Rate	
Electricity	\$/kWh	\$0.15	\$0.13	Y
Natural Gas	\$/Therm	\$0.99	\$0.96	Y

* Per U.S. Energy Information Administration (2013 data – Electricity and Natural Gas, 2012 data – Fuel Oil)

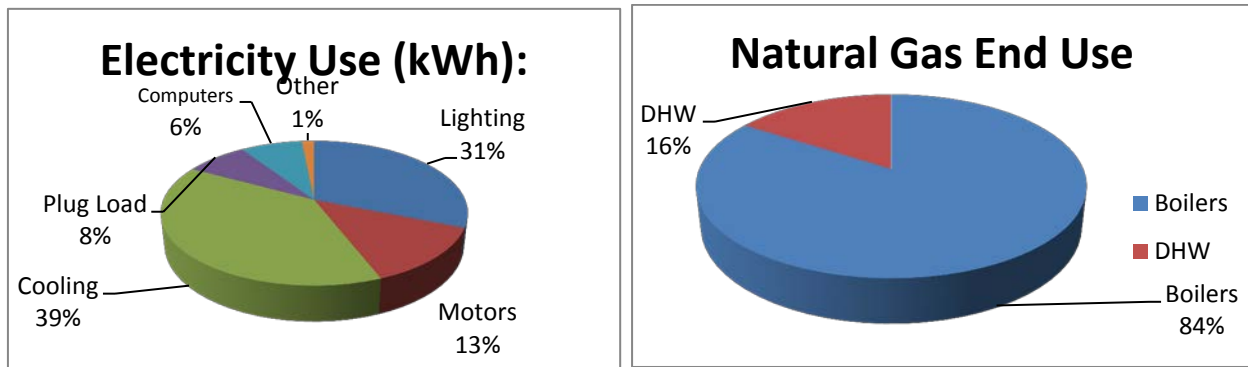
Additional information on selecting a third party energy supplier is available here:

<http://www.state.nj.us/bpu/commercial/shopping.html>.

See Appendix A for a list of third-party energy suppliers licensed by the Board of Public Utilities to sell within the building's service area.

The charts below represent estimated utility end-use utility profiles for the building. The values used within the charts were estimated from a review of the utility analysis and the energy savings calculations.

Site End-Use Utility Profile



4.0 BENCHMARKING

The EPA Portfolio Manager benchmarking tool provides a site and source Energy Use Intensity (EUI), as well as an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft²/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100, with 100 being the most efficient. In order for a building to receive an Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed measures, the Energy Star rating will increase. However, the EPA does not have a score for all types of buildings. The buildings that do not have an energy rating now are compared with the national median EUI.

The site EUI is the amount of heat and electricity consumed by a building as reflected in utility bills. Site energy may be delivered to a facility in the form of primary energy, which is raw fuel burned to create heat or electricity, such as natural gas or oil; or as secondary energy, which is the product created from a raw fuel such as electricity or district steam. To provide an equitable comparison for different buildings with varying proportions of primary and secondary energy consumption, Portfolio Manager uses the convention of source EUIs. The source energy also accounts for losses incurred in production, storage, transmission, and delivery of energy to the site, which provide an equivalent measure for various types of buildings with differing energy sources. The results of the benchmarking are contained in the table below.

Site EUI kBtu/ft ² /yr*	Source EUI (kBtu/ft ² /yr)*	Energy Star Rating (1-100)
61.4	106.2	N/A

*Pioneer Hall and Heritage Hall share the same boilers and chiller in one mechanical room. The electric usage is provided by WPU and the gas usages of these two buildings are estimated to be identical.

The building has lower EUIs than the national median EUIs (national median site EUI is 151.7 kBtu/ft² and national median source EUI is 262.6 kBtu/ft²), and is considered an energy efficient building.

5.0 ENERGY CONSERVATION MEASURES

The following types of energy savings opportunities are identified in this section of the report:

- Energy conservation measures (ECMs) are energy savings recommendations that typically require a financial investment. For these areas of opportunity, CHA prepared detailed calculations, as summarized in this section and in Appendix C. In general, additional savings may exist from reductions in maintenance activities associated with new equipment or better controls; however for conservatism, maintenance savings are not accounted for in this report; instead the only savings which are reported are those derived directly from reductions in energy which can be tracked by the utility bills.
- Operational and Maintenance measures (O&M) consist of low- or no-cost operational opportunities, which if implemented would have positive impacts on overall building operation, comfort levels, and/or energy usage. There are no estimated savings, costs or paybacks associated with the O&M measures included as part of this study.

Energy savings were quantified in the form of:

- electrical usage (kWh=Kilowatt-hour),
- electrical demand (kW=kilowatts),
- natural gas (therms=100,000 Btu),
- propane gas (gallons=91,650 Btu),
- fuel oil (gallons =138,700 Btu), and
- water (kgal=1,000 gallons).

These recommendations are influenced by the time period that it takes for a proposed project to “break even” referred to as “Simple Payback”. Simple payback is calculated by dividing the estimated cost of implementing the ECM by the energy cost savings (in dollars) of that ECM.

Another financial indicator of the performance of a particular ECM is the Return on Investment or ROI, which represents the benefit (annual savings over the life of a project) of an investment divided by the cost of the investment. The result is expressed as a percentage or ratio.

Two other financial analyses included in this report are Internal Rate of Return (IRR) and Net Present Value (NPV). Internal Rate of Return is the discount rate at which the present value of a project costs equals the present value of the project savings. Net Present Value is the difference between present value of an investment's future net cash flows and the initial investment. If the NPV equals “0”, the project would equate to investing the same amount of dollars at the desired rate. NPV is sometimes referred to as Net Present Worth. These values are provided in the Summary Tab in Appendix C.

5.1 ECM-1 Install Occupancy Sensors/DDC to Control Individual Fan Coil Units

Each living room and bedroom in this building has a fan coil (FC) unit which is currently controlled by a manually adjusted controller. The temperature in each room is not accurately controlled and the fan coil units are running all the time regardless of the rooms are occupied or not. During the site visit, it was found that the dorms are not occupied, however, some of the fan coil units were left on. The fan coil unit occupancy sensors could be shared with the lighting circuits. Therefore, occupancy sensors that control both the lights and FC units would help reduce the energy usage in the building. The occupancy sensors would be connected to the DDC system and set the rooms to unoccupied mode when the room is not occupied for 15 minutes and return to the occupied mode once they sense occupancy.

To implement this ECM, occupancy sensors, thermostats and a DDC system would be installed and connected to operate the fan coil units and reset the room temperature during unoccupied hours.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-1 Install Occupancy Sensors/DDC to Control Individual Fan Coil Units

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
232,223	0	35,136	6,855	12,014	0.3	0	19.3	19.3

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities

This measure is recommended.

5.2 ECM-2 Replace 3-Way Valves with 2-Way Valves and Install VFDs on the Pump Motors

The building has a two-pipe system, therefore the boilers provide the hot water for the two-pipe system during the heating season and the chillers provide the chilled water for the system. The control valve switches between heating and cooling. The dual temperature water is circulated by two 15HP pumps running in lead and lag mode. It was observed that the fan coil units have three way valves. This measure looks at installing the VFDs on the dual temp water pumps and two-way valves/pressure transducers in the water loop to utilize the energy savings from the VFD pumps.

The savings of this measure are calculated from the motor speed reduction when the HHW/CHW system is only partially loaded. The load percentage of the pumps is calculated by estimating the percentage of two-way valves open in each temperature bin. Therefore, partial energy savings in each bin can be calculated as the difference between the energy drawn by the full-load old motors and the energy drawn by the VFD driven motors.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-2 Replace 3-Way Valves with 2-Way Valves and Install VFDs on the Pump Motors

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
95,019	0	53,207	0	5,726	1.1	4,000	16.6	15.9

* Incentive shown is per the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is recommended since the total payback including this measure is less than 15 years.

5.3 ECM-3 Add Outdoor Air Damper Actuator and DDC to Optimize Ventilation Rate

The building has an AHU in the roof mechanical room to provide heating, cooling and ventilating for the commons areas. This unit is assumed to be designed to provide ventilation based on maximum occupancy. Maximum occupancy occurs only 34 weeks per year and by reducing the amount of ventilation energy savings will result. Connect this AHU to the central DDC system will allow for a reduction of outside air during periods of low occupancy. The quantity of ventilation air will be based on school schedule. During unoccupied periods, the outside air dampers should be closed.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-3 Add Outdoor Air Damper Actuator and DDC to Optimize Ventilation Rate

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
20,394	0	2,495	339	706	(0.3)	0	28.9	28.9

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities

This measure is recommended since the total payback including this measure is less than 15 years.

5.4 ECM-4 Replace DHW Heat Exchangers with a Designated Condensing Gas Fired Heaters

The domestic hot water is provided by five plate frame heat exchangers which use heating hot water from the Aerco Benchmark 2.0 boilers to heat the city water up to 140°F. The heat exchangers reduce the heating efficiency by adding the heat exchanger effectiveness and increase the pump power by adding extra head loss. Replacing the heat exchangers with new condensing gas heaters would reduce energy usage. New modulating condensing gas heaters are available that can operate as high as 96%. The water pumps circulating the HHW from the Aerco boilers to the heat exchangers could

be eliminated. The retrofit considered in this measure involves installing a single condensing hot water heater and adding the flue gas vent for the heater in the mechanical room.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-4 Replace DHW Heat Exchangers with a Designated Condensing Gas Fired Heaters

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$	%	\$	Years	Years
29,061	0	44,945	685	7,333	4.0	300	4.0	3.9

* Incentive shown is per the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is recommended.

5.5 ECM-5 Install Vending Misers

Cold drink and snack vending machines are typically operating 24/7 regardless of occupancy. A Vending miser uses a passive infrared occupancy sensor technology to detect potential customers and cycles the compressors during unoccupied times to maintain desired product temperatures. This measure considered installing vending misers to save energy on (2) refrigerated machines and (2) dry product machines in the cafeteria.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-5 Install Vending Misers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
1,120	0	6,354	0	940	15.8	0	1.2	1.2

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities

This measure is recommended.

5.6 ECM-6 Install Low Flow Plumbing Fixtures

The plumbing fixtures in this building are older high flow fixtures. The water savings associated from replacing existing high flow fixtures with low-flow fixtures was calculated by taking the difference of the annual water usage for the proposed and base case. The basis of this calculation is the estimate usage of each fixture, gallons per use, and number of fixtures. Replacing the existing fixtures in the restrooms with 1.28 Gals/flush toilets and 0.5 gpm faucets will conserve water which will result in lower annual water and sewer charges. Faucets with low-flow push valves were not considered for replacement.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-6 Install Low Flow Plumbing Fixtures

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Water	Total				
\$	kW	kWh	Therms	kGal	\$		\$	Years	Years
339,885	0	0	268	239	2,061	(0.9)	0	164.9	164.9

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities

These measures are not recommended due to the long paybacks.

5.7.1 ECM-L1 Lighting Replacement / Upgrades

The existing lighting system consists of mostly 32 watt T8 linear fluorescent fixtures which until recently represented the most efficient lighting technology available. Exterior lighting includes 400W wall mounted area light fixtures. Recent technological improvements in light emitting diode (LED) technologies have driven down the initial costs making it a viable option for installation.

Overall energy consumption can be reduced by replacing inefficient bulbs and linear fluorescent bulbs with more efficient LED technology. To compute the annual savings for this ECM, the energy consumption of the current lighting fixtures was established and compared to the proposed fixture power requirement with the same annual hours of operation. The difference between the existing and proposed annual energy consumption was the energy savings. These calculations are based on 1 to 1 replacements of the fixtures, and do not take into account lumen output requirements for a given space. A more comprehensive engineering study should be performed to determine correct lighting levels.

Supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture, are provided in Appendix C and summarized below:

ECM-L1 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
127,774	17	78,010	0	10,723	0.1	19,465	11.9	10.1

* LED retrofits must go through the "custom" measures incentive option under New Jersey SmartStart Program. There are no "prescriptive" incentives for LED retrofits. Projects must achieve a minimum of 75,000 kWh annual savings to qualify for "custom" incentives. See section 6.0 for other incentive opportunities

This measure is not recommended in lieu of ECM L3.

5.7.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

Presently, all interior lighting fixtures are controlled by wall mounted switches. Review of the comprehensive lighting survey determined that lighting in some areas could benefit from installation of occupancy sensors to turn off lights when they are unoccupied.

This measure recommends installing occupancy sensors for the current lighting system. Using a process similar to that utilized in Section L1, the energy savings for this measure was calculated by applying the known fixture wattages in the space to the estimated existing and proposed times of operation for each fixture.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
540	0	527	0	56	0.4	70	9.6	8.3

* Incentive shown is per the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is not recommended in lieu of ECM L3.

5.7.3 ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

This measure is a combination of ECM-L1 and ECM-L2; recommending replace/upgrade the current lighting fixtures to more efficient ones and installing occupancy sensors on the new lights. Interactive effects of the higher efficiency lights and occupancy sensors lead the energy and cost savings for this measure to not be cumulative or equivalent to the sum of replacing the lighting fixtures alone and installing occupancy sensors without the lighting upgrade. The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
128,314	17	78,285	0	10,752	0.1	19,535	11.9	10.1

* LED retrofits must go through the "custom" measures incentive option under New Jersey SmartStart Program. There are no "prescriptive" incentives for LED retrofits. Projects must achieve a minimum of 75,000 kWh annual savings to qualify for "custom" incentives. See section 6.0 for other incentive opportunities

This measure is recommended.

5.8 Additional O&M Opportunities

This list of operations and maintenance (O&M) - type measures represent low-cost or no-cost opportunities, which if implemented will have a positive impact on the overall

building operations, comfort and/or energy consumption. The recommended O&M measures for this building are as follows:

- O&M-1 Replace air filters in all Fan Coil Units

6.0 PROJECT INCENTIVES

6.1 Incentives Overview

The following sections give detailed information on available incentive programs including New Jersey Smart Start, Direct Install, New Jersey Pay for Performance (P4P) and Energy Savings Improvement Plan (ESIP). If the School District wishes to and is eligible to participate in the Energy Savings Improvement Plan (ESIP) program and/or the Pay for Performance Incentive Program (P4P), it cannot participate in either the Smart Start or Direct Install Programs. Refer to Appendix D for more information on the Smart Start program.

6.1.1 New Jersey Smart Start Program

For this energy audit, The New Jersey Smart Start Incentives are used in the energy savings calculations, where applicable. This program is intended for medium and large energy users and provides incentives for:

- Electric Chillers
- Gas Chillers
- Gas Heating
- Unitary HVAC
- Ground Source Heat Pumps
- Variable frequency Drives/ motors
- Refrigeration
- Prescriptive and performance lighting and lighting controls

The equipment is procured using a typical bid- build method, installed and paid for and then the incentives are reimbursed to the owner.

Refer to Appendix D for more information on the Smart Start program.

6.1.2 Direct Install Program

The Direct Install Program applies to smaller facilities that have a peak electrical demand of 200 kW or less in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric utility companies.

Direct Install is funded through New Jersey's Clean Energy Program and is designed to provide capital for building energy upgrade projects to fast track implementation. The program will pay up to 70% of the costs for lighting, HVAC, motors, refrigeration, and

other equipment upgrades with higher efficiency alternatives. If a building is eligible for this funding, the Direct Install Program can reduce the implementation cost of energy conservation projects.

The Direct Install program has specific HVAC equipment and lighting requirements and is generally applicable only to smaller package HVAC units, small boilers and lighting retrofits.

The program pays a maximum amount of \$75,000 per building, and up to \$250,000 per customer per year. Installations must be completed by an approved Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this energy audit. The incentive is reimbursed to the Owner upon successful replacement and payment of the equipment.

The building qualifies for this program because its electrical demand is less than the maximum peak electrical demand of 200 kW for the last 12 month period.

Refer to Appendix D for more information on this program.

6.1.3 New Jersey Pay For Performance Program (P4P)

This building may be eligible for incentives from the New Jersey Office of Clean Energy. The most significant incentives are available from the New Jersey Pay for Performance (P4P) Program. The P4P program is designed to offset the cost of energy conservation projects for facilities that pay the Societal Benefits Charge (SBC) and whose demand (kW) in any of the preceding 12 months exceeds 100 kW. This demand minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations and *is not applicable to public schools*. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). Additionally, the overall return on investment (ROI) must exceed 10%. If the participant is a municipal electric company customer, and a customer of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. Available incentives are as follows:

Incentive #1: Energy Reduction Plan – This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP). The ERP must include a detailed energy audit of the desired ECMs, energy savings calculations (using building modeling software) and inputting of all utility bills into the EPA Portfolio Manager website.

- Incentive Amount: \$0.10/SF
- Minimum incentive: \$5,000
- Maximum Incentive: \$50,000 or 50% of Facility annual energy cost

The standard incentive pays \$0.10 per square foot, up to a maximum of \$50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an initial 75% incentive toward performance of the energy audit, facilities are only eligible for an

additional \$0.05 per square foot, up to a maximum of \$25,000, rather than the standard incentive noted above. The ERP must be completed by a Certified Energy Manager (CEM) and submitted along with the project application.

Incentive #2: Installation of Recommended Measures – This incentive is based on projected energy savings as determined in Incentive #1 (Minimum 15% savings must be achieved), and is paid upon successful installation of recommended measures.

Electric

- Base incentive based on 15% savings: \$0.09/ per projected kWh saved.
- For each % over 15% add: \$0.005 per projected kWh saved.
- Maximum incentive: \$0.11/ kWh per projected kWh saved.

Gas

- Base incentive based on 15% savings: \$0.90/ per projected Therm saved.
- For each % over 15% add: \$0.05 per projected Therm saved.
- Maximum incentive: \$1.25 per projected Therm saved.

Incentive cap: 25% of total project cost

Incentive #3: Post-Construction Benchmarking Report – This incentive is paid after acceptance of a report proving energy savings over one year utilizing the Environmental Protection Agency (EPA) Portfolio Manager benchmarking tool.

Electric

- Base incentive based on 15% savings: \$0.09/ per projected kWh saved.
- For each % over 15% add: \$0.005 per projected kWh saved.
- Maximum incentive: \$0.11/ kWh per projected kWh saved.

Gas

- Base incentive based on 15% savings: \$0.90/ per projected Therm saved.
- For each % over 15% add: \$0.05 per projected Therm saved.
- Maximum incentive: \$1.25 per projected Therm saved.

Combining Incentives #2 and #3 will provide a total of \$0.18/ kWh and \$1.8/therm not to exceed 50% of total project cost. Additional Incentives for #2 and #3 are increased by \$0.005/kWh and \$0.05/therm for each percentage increase above the 15% minimum target to 20%, calculated with the EPA Portfolio Manager benchmarking tool, not to exceed 50% of total project cost.

For the purpose of demonstrating the eligibility of the ECM's to meet the minimum savings requirement of 15% annual savings and 10% ROI for the Pay for Performance Program, all ECM's identified in this report have been included in the incentive calculations. The results for the building are shown in Appendix C, with more detailed program information in Appendix D.

6.1.4 Energy Savings Improvement Plan

The Energy Savings Improvement Program (ESIP) allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. Under the recently enacted Chapter 4

of the Laws of 2009 (the law), the ESIP provides all government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.

ESIP allows local units to use “energy savings obligations” (ESO) to pay for the capital costs of energy improvements to their facilities. ESIP loans have a maximum loan term of 15 year. ESOs are not considered “new general obligation debt” of a local unit and do not count against debt limits or require voter approval. They may be issued as refunding bonds or leases. Savings generated from the installation of energy conservation measures pay the principal of and interest on the bonds; for that reason, the debt service created by the ESOs is not paid from the debt service fund, but is paid from the general fund.

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. Pursuing a Local Government Energy Audit through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach. The “Local Finance Notice” outlines how local governments can develop and implement an ESIP for their facilities. The ESIP can be prepared internally if the entity has qualified staff. If not, the ESIP must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs. Refer to Appendix D for more information on this program.

6.1.5 Renewable Energy Incentive Program

The Renewable Energy Incentive Program (REIP) is part of New Jersey's efforts to reach its Energy Master Plan goals of striving to use 30 percent of electricity from renewable sources by 2020.

Incentives for sustainable bio-power projects and for energy storage projects are currently under development, with competitive solicitations for each of those technologies expected to begin in the first quarter of 2014. The wind program is currently on hold.

New solar projects are no longer eligible for REIP incentives, but can register for Solar Renewable Energy Certificates (SRECs) through the SREC Registration Program (SRP).

7.0 | ALTERNATIVE ENERGY SCREENING EVALUATION

7.1 Solar

7.1.1 Photovoltaic Rooftop Solar Power Generation

The building was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The amount of available roof area determines how large of a solar array can be installed on any given roof. The table below summarizes the approximate roof area available on the building and the associated solar array size that can be installed.

Available Roof Area (Ft ²)	Potential PV Array Size (kW)
4,624	30

The PVWATTS solar power generation model was utilized to calculate PV power generation; this model is provided in Appendix E.

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey Solar Renewable Energy Certificates Program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. Payments that will be received by the PV producer (school) will change from year to year dependent upon supply and demand. There is no definitive way to calculate an exact price that will be received by the PV producer for SREC credits over the next 15 years. Renewable Energy Consultants estimates an average of \$175/SREC for 2014 and this number was utilized in the cash flow for this report.

The system costs for PV installations were derived from recent solar contractor budgetary pricing in the state of New Jersey and include the total cost of the system installation (PV panels, inverters, wiring, ballast, controls). The cost of installation is currently about \$4.00 per watt or \$4,000 per kW of installed system, for a typical system. There are other considerations that have not been included in this pricing, such as the condition of the roof and need for structural reinforcement. Photovoltaic systems can be ground mounted if the roof is not suitable, however, this installation requires a substantial amount of open property (not wooded) and underground wiring, which adds more cost. PV panels have an approximate 20 year life span; however, the inverter device that converts DC electricity to AC has a life span of 10 to 12 years and will most likely need to be replaced during the useful life of the PV system.

The implementation cost and savings related to this ECM are presented in Appendix E and summarized as follows:

Photovoltaic (PV) Rooftop Solar Power Generation – 30 kW System

Budgetary Cost	Annual Utility Savings			Total Savings	New Jersey Renewable SREC	Payback (without SREC)	Payback (with SREC)	Recommended
	Electricity		Natural Gas					
\$	kW	kWh	Therms	\$	\$	Years	Years	Y/N
120,000	30	35,848	0	5,413	6,273	22.2	10.3	FS

Note: CHA typically recommends a more detailed evaluation be conducted for the installation of PV Solar arrays when the screening evaluation shows a payback of less than 20 years. Therefore, this ECM is recommended for further study. Before implementation is pursued, the school district should consult with a certified solar PV contractor.

7.1.2 Solar Thermal Hot Water Generation

Active solar thermal systems use solar collectors to gather the sun's energy to heat a fluid. An absorber in the collector (usually black colored piping) converts the sun's energy into heat. The heat is transferred to circulating water, antifreeze, or air for immediate use or is storage for later utilization. Applications for active solar thermal energy include supplementing domestic hot water, heating swimming pools, space heating or preheating air in residential and commercial buildings.

A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. Systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually placed on the roof of the building, oriented south, and tilted at the same angle as the site's latitude, to maximize the amount of solar radiation collected on a yearly basis.

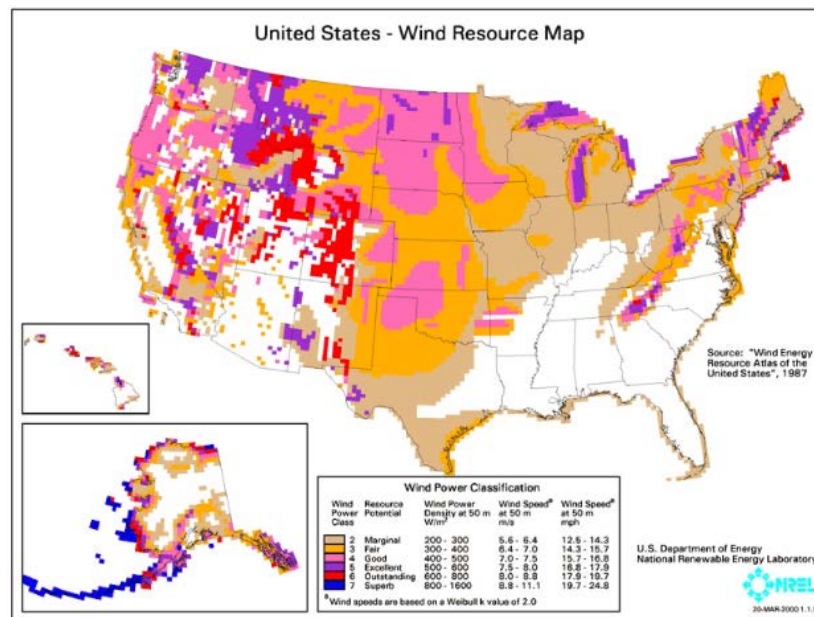
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping). The most practical system would transfer the heat from the panels to thermal storage tanks and then use the pre-heated water for domestic hot water production. DHW is presently produced by natural gas fired water heaters and, therefore, this measure would offer natural gas utility savings. Unfortunately, the amount of domestic hot water that is currently used by this school is very small. Installing a solar domestic hot water system is not recommended due to the limited amount of domestic hot water presently consumed by the school.

This measure is not recommended due to the relatively low domestic hot water usage.

7.2 Wind Powered Turbines

Wind power is the conversion of kinetic energy from wind into mechanical power that is used to drive a generator which creates electricity by means of a wind turbine. A wind

turbine consists of rotor and blades connected to a gearbox and generator that are mounted onto a tower. Newer wind turbines also use advanced technology to generate electricity at a variety of frequencies depending on the wind speed, convert it to DC and then back to AC before sending it to the grid. Wind turbines range from 50 – 750 kW for utility scale turbines down to below 50 kW for residential use. On a scale of 1 (the lowest) to 7 (the highest), Class 3 and above (wind speeds of 13 mph or greater) are generally considered “good wind resource” according to the Wind Energy Development Programmatic EIS Information Center hosted by the Bureau of Land Management. According to the map below, published by NREL, Newark, NJ is classified as Class 1 at 50m, meaning the city would not be a good candidate for wind power.



This measure is not recommended due to the location of the school.

7.3 Combined Heat and Power Plant and Fuel Cell

Combined heat and power (CHP), cogeneration, is self-production of electricity on-site with beneficial recovery of the heat byproduct from the electrical generator. Common CHP equipment includes reciprocating engine-driven, micro turbines, steam turbines, and fuel cells. Typical CHP customers include industrial, commercial, institutional, educational institutions, and multifamily residential facilities. CHP systems that are commercially viable at the present time are sized approximately 50 kW and above, with numerous options in blocks grouped around 300 kW, 800 kW, 1,200 kW and larger. Typically, CHP systems are used to produce a portion of the electricity needed by a facility some or all of the time, with the balance of electric needs satisfied by purchase from the grid.

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. The building has sufficient need for electrical generation and the ability to use most of the thermal byproduct during the winter; however thermal

usage during the summer months does not exist. Thermal energy produced by the CHP plant in the warmer months will be wasted. An absorption chiller could be installed to utilize the heat to produce chilled water; however, there is no chilled water distribution system in the building. CHP is not recommended due to the building's limited summer thermal demand.

This measure is not recommended due to the absence of year-round thermal loads which are needed for efficiency CHP operation. However, a mini-size CHP could be an option for the school to consider. The sizing and energy savings of the mini-size CHP require further study.

A fuel cell system with recovery and productive use of waste heat is another alternative energy option viable in the market. A full analysis of all campus buildings would need to be completed to determine the economic viability. The several buildings included in the scope of work are not good candidates for CHP or Fuel cell technology based on their utility usage and geographic locations on their own relative to the main campus.

7.4 Demand Response Curtailment

Presently, electricity is delivered by PSE&G, which receives the electricity from regional power grid RFC. PSE&G is the regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia including the State of New Jersey.

Utility Curtailment is an agreement with the utility provider's regional transmission organization and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and utility provider offers incentives to the CSP to participate in this program. Enrolling in the program will require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. Part of the program also will require that program participants reduce their required load or run emergency generators with notice to test the system.

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From February 2013 through January 2014 the following table summarizes the electricity load profile for the building.

Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
160	160	160	N	Y

This measure is not recommended due to the function of this building.

8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for the Pioneer Hall at William Patterson University.

The following projects should be considered for implementation:

- Install Occupancy Sensors/Thermostats for Fan Coil Units
- Replace 3-Way Valves with 2-Way Valves and Install VFDs on the Pump Motors
- Add Outdoor Air Damper Actuator and DDC to Optimize Ventilation Rate
- Replace the DHW Heat Exchangers with a Designated Gas Fired Condensing DHW Heater
- Install Vending Miser
- Lighting Replacements with Controls (Occupancy Sensors)

The potential annual energy and cost savings for the recommended ECMs are shown in the following table.

Electric Savings (kWh)	Natural Gas Savings (therms)	Total Savings (\$)	Payback (years)
220,422	7,879	37,472	13.5

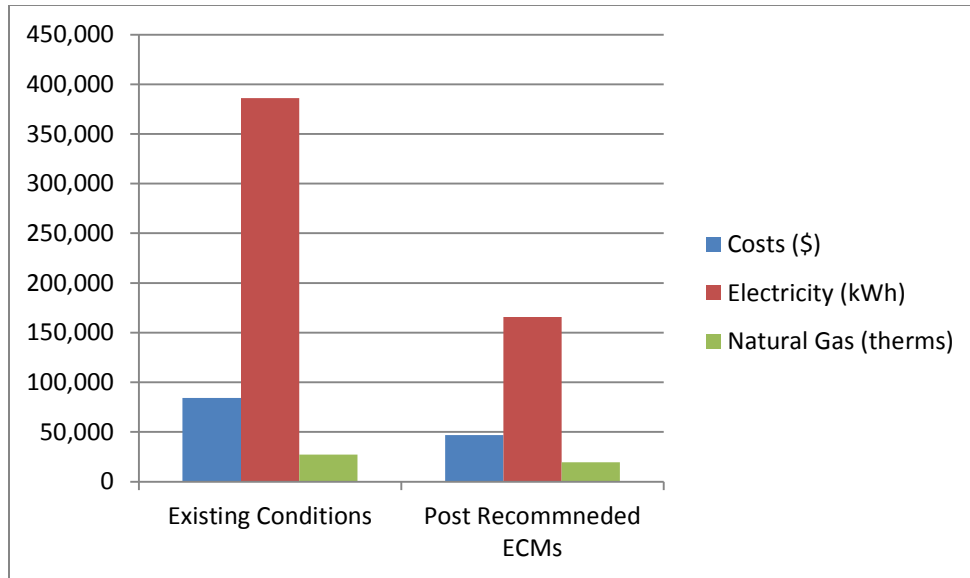
The following alternative energy measures are recommended for further study:

- Photovoltaic (PV) Rooftop Solar Power Generation – 30 kW System

If WPU implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs (\$)	84,231	46,759	44%
Electricity (kWh)	386,000	165,578	57%
Natural Gas (therms)	27,283	19,404	29%
Site EUI (kbtu/SF/Yr)	61.4	38.0	

Pioneer Hall and Heritage Hall share the same boilers and chiller in one mechanical room. The electric usage is provided by WPU and the gas usages of these two buildings are estimated to be identical.



Next Steps: This energy audit has identified several areas of potential energy savings. William Paterson University can use this information to pursue incentives offered by the NJBPU's NJ Clean Energy Program. Additional meetings will be scheduled with WPU staff members to review possible options.

APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

William Patterson University LGEA
Pioneer Hall - Electric Usage

Annual Utilities
12-month Summary

Electric		
Annual Usage	386,000	kWh/yr
Annual Cost	57,106	\$
Blended Rate	0.148	\$/kWh
Consumption Rate	0.089	\$/kWh
Demand Rate	11.93	\$/kW
Peak Demand	160.0	kW
Min. Demand	160.0	kW
Avg. Demand	160.0	kW
Natural Gas		
Annual Usage	27,283	therms/yr
Annual Cost	27,125	\$
Rate	0.994	\$/therm

**William Patterson University LGEA
Pioneer Hall**

Utility Bills: Account Numbers

<u>Account Number</u>	<u>Building Name</u>	<u>Location</u>	<u>Type</u>	<u>Notes</u>
66-459-555-02	Pioneer Hall	300 Pompton Road, Wayne NJ 07470	Electricity	
66-459-555-02	Pioneer Hall	301 Pompton Road, Wayne NJ 07470	Natural Gas	

William Patterson University LGEA
Pioneer Hall - Electric Usage

For Service at:

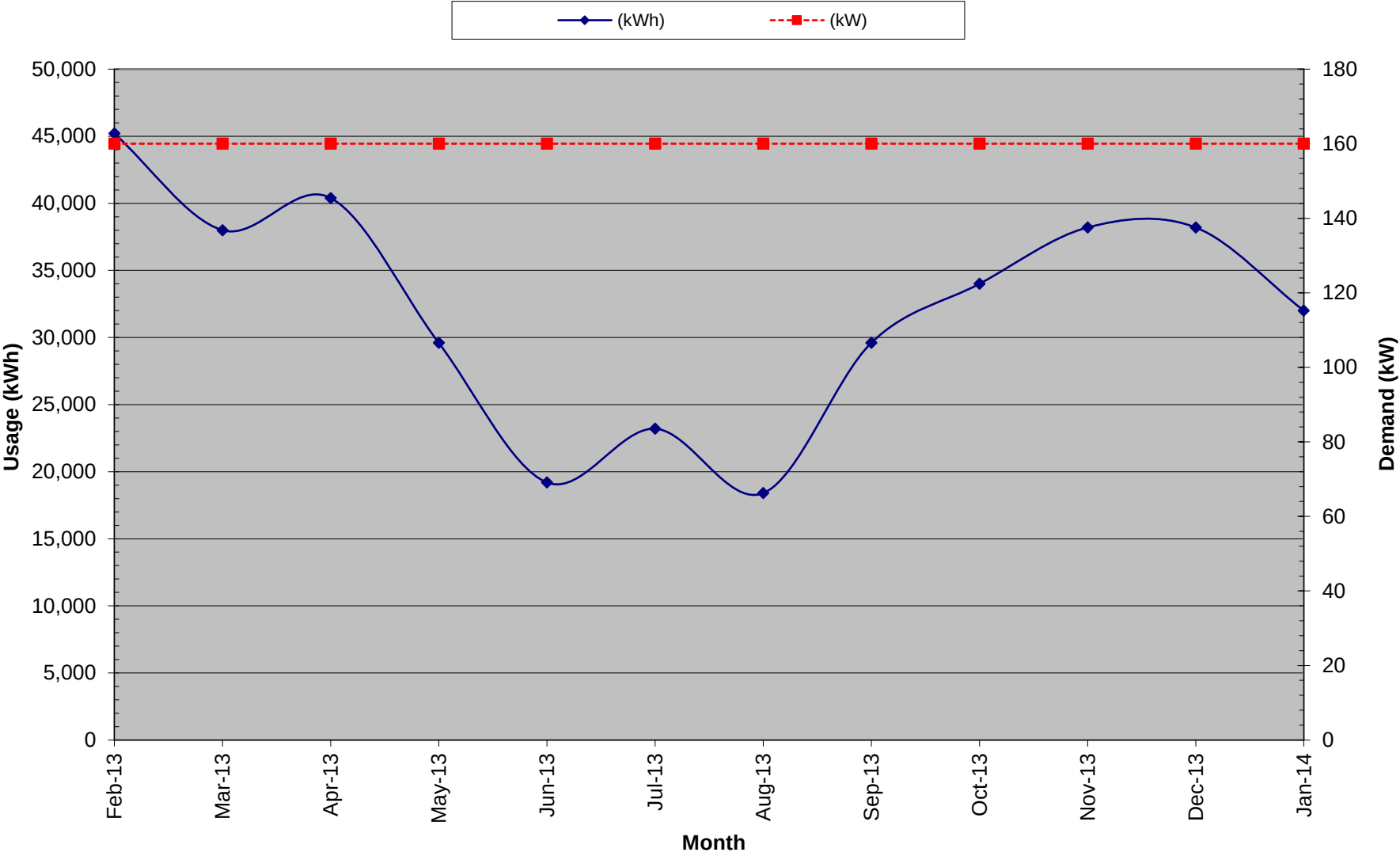
Account No.: 66-459-555-02
Meter No.: 778020819
Electric Service

Delivery - PSE&G
Supplier - Direct Energy

Month	Consumption (kWh)	Demand (kW)	Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
			Delivery (\$)	Supplier (\$)	Total (\$)	Consumption (\$)	Demand (\$)	Blended Rate (\$/kWh)	Consumption (\$/kWh)	Demand (\$/kW)
February-13	45,200	160.00	4,459.16	1,967.32	6,426.48	4,517.68	1,908.80	0.14	0.10	11.93
March-13	38,000	160.00	3,748.85	1,685.79	5,434.64	3,525.84	1,908.80	0.14	0.09	11.93
April-13	40,400	160.00	3,985.62	1,885.89	5,871.51	3,962.71	1,908.80	0.15	0.10	11.93
May-13	29,600	160.00	2,920.16	1,603.39	4,523.55	2,614.75	1,908.80	0.15	0.09	11.93
June-13	19,200	160.00	1,894.16	1,351.22	3,245.38	1,336.58	1,908.80	0.17	0.07	11.93
July-13	23,200	160.00	2,288.77	1,606.32	3,895.09	1,986.29	1,908.80	0.17	0.09	11.93
August-13	18,400	160.00	1,815.23	1,087.87	2,903.10	994.30	1,908.80	0.16	0.05	11.93
September-13	29,600	160.00	2,920.16	2,085.70	5,005.86	3,097.06	1,908.80	0.17	0.10	11.93
October-13	34,000	160.00	3,354.24	1,427.74	4,781.98	2,873.18	1,908.80	0.14	0.08	11.93
November-13	38,200	160.00	3,768.58	-3,768.58	0.00	-1,908.80	1,908.80	0.00	0.00	0.00
December-13	38,200	160.00	3,768.58	6,812.85	10,581.43	8,672.63	1,908.80	0.28	0.23	11.93
January-14	32,000	160.00	3,156.93	1,279.70	4,436.63	2,527.83	1,908.80	0.14	0.08	11.93
Total (All)	386,000	160.00	\$38,080.44	\$19,025.21	\$57,105.65	\$34,200.05	\$22,905.60	\$0.15	\$0.09	\$11.93
Total (last 12-months)	232,800	160.00	\$22,966.65	\$11,882.82	\$34,849.47	\$19,579.07	\$15,270.40	\$0.15	\$0.08	\$11.93
Notes	1	2	3	4	5	6	7	8	9	10

- 1.) Number of kWh of electric energy used per month
- 2.) Number of kW of power measured
- 3.) Electric charges from Delivery provider
- 4.) Electric charges from Supply provider
- 5.) Total charges (Delivery + Supplier)
- 6.) Charges based on the number of kWh of electric energy used
- 7.) Charges based on the number of kW of power measured
- 8.) Total Charges (\$) / Consumption (kWh)
- 9.) Consumption Charges (\$) / Consumption (kWh)
- 10.) Demand Charges (\$) / Demand (kW)
- Estimated

Pioneer Hall - Electric Usage



William Patterson University LGEA
Pioneer Hall - Gas Usage

For Service at:

Account No.: 66-459-555-02

Meter No: Heritage Hall and Pioneer Hall share the same mechanical room which is detached from the buildings and the NG data was not available

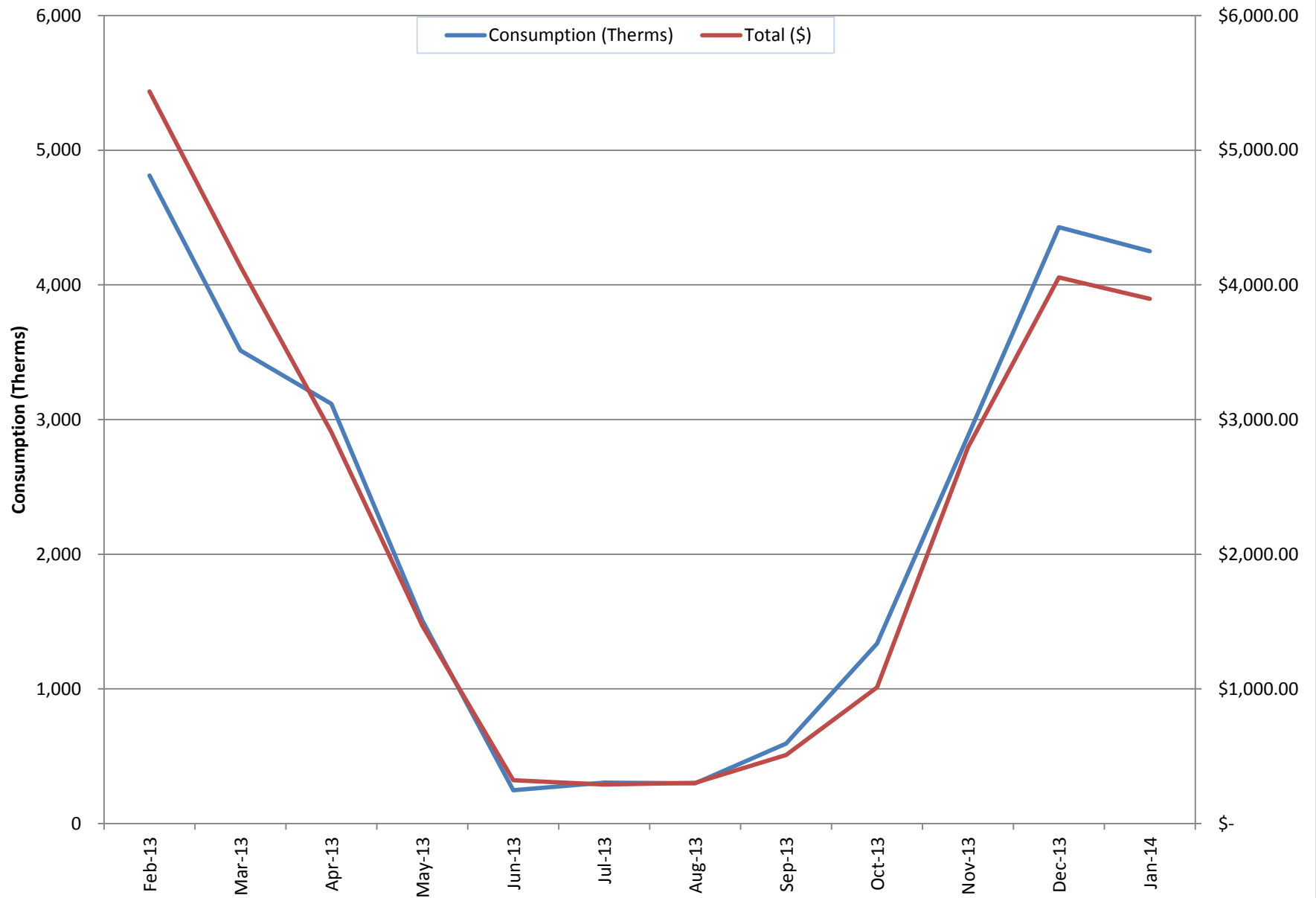
Natural Gas Service

Delivery - PSE&G

Supplier - Direct Energy

Month	Consumption (Therms)	Charges			Unit Costs		
		Delivery (\$)	Supply (\$)	Total (\$)	Delivery (\$/Therm)	Supply (\$/Therm)	Total (\$/Therm)
February-13	4,811	\$ 2,749.77	\$ 2,685.99	\$ 5,435.76	\$ 0.572	\$ 0.558	\$ 1.130
March-13	3,513	\$ 2,174.81	\$ 1,961.45	\$ 4,136.26	\$ 0.619	\$ 0.558	\$ 1.177
April-13	3,117	\$ 1,166.43	\$ 1,740.10	\$ 2,906.53	\$ 0.374	\$ 0.558	\$ 0.933
May-13	1,507	\$ 627.11	\$ 841.41	\$ 1,468.52	\$ 0.416	\$ 0.558	\$ 0.974
June-13	247	\$ 182.84	\$ 137.84	\$ 320.68	\$ 0.741	\$ 0.558	\$ 1.299
July-13	303	\$ 120.97	\$ 169.15	\$ 290.12	\$ 0.399	\$ 0.558	\$ 0.958
August-13	299	\$ 135.17	\$ 166.95	\$ 302.12	\$ 0.452	\$ 0.558	\$ 1.010
September-13	593	\$ 177.45	\$ 331.31	\$ 508.75	\$ 0.299	\$ 0.558	\$ 0.857
October-13	1,337	\$ 264.10	\$ 746.36	\$ 1,010.46	\$ 0.198	\$ 0.558	\$ 0.756
November-13	2,878	\$ 1,187.12	\$ 1,606.63	\$ 2,793.75	\$ 0.413	\$ 0.558	\$ 0.971
December-13	4,429	\$ 1,582.48	\$ 2,472.53	\$ 4,055.02	\$ 0.357	\$ 0.558	\$ 0.916
January-14	4,249	\$ 1,524.76	\$ 2,372.22	\$ 3,896.98	\$ 0.359	\$ 0.558	\$ 0.917
Total	27,283.00			\$ 27,124.94			\$ 0.994

Pioneer Hall - Gas Usage



PSE&G ELECTRIC SERVICE TERRITORY
Last Updated: 10/24/12

***CUSTOMER CLASS - R – RESIDENTIAL C – COMMERCIAL I –INDUSTRIAL**

Supplier	Telephone & Web Site	*Customer Class
AEP Energy, Inc. 309 Fellowship Road, Fl. 2 Mount Laurel, NJ 08054	(866) 258-3782 www.aepenergy.com	C/I ACTIVE
Alpha Gas and Electric, LLC 641 5 th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	R/C ACTIVE
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877)-30-AMBIT (877) 302-6248 www.ambitenergy.com	R/C ACTIVE
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com	C ACTIVE
Amerigreen Energy, Inc. 1463 Lamberton Road Trenton, NJ 08611	888-423-8357 www.amerigreen.com	R/C ACTIVE
AP Gas & Electric, LLC 10 North Park Place, Suite 420 Morristown, NJ 07960	(855) 544-4895 www.apge.com	R/C/I ACTIVE
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(201) 384-5552 www.astralenergylc.com	R/C/I ACTIVE
Barclays Capital Services, Inc. 70 Hudson Street Jersey City, NJ 07302-4585	(888) 978-9974 www.group.barclays.com	C ACTIVE
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	(888) 651-4121 www.greateasternenergy.com	C/I ACTIVE
Champion Energy Services, LLC 72 Avenue L Newark, NJ 07105	(877) 653-5090 www.championenergyservices.com	R/C/I ACTIVE

Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	888-565-4490 www.4choiceenergy.com	R/C ACTIVE
Clearview Electric, Inc. 505 Park Drive Woodbury, NJ 08096	(888) CLR-VIEW (800) 746-4702 www.clearviewenergy.com	R/C/I ACTIVE
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07446	1-866-587-8674 www.commerceenergy.com	R ACTIVE
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	C/I ACTIVE
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(866) 237-7693 www.constellation.com	R/C/I ACTIVE
Constellation Energy 900A Lake Street, Suite 2 Ramsey, NJ 07446	(877) 997-9995 www.constellation.com	R ACTIVE
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	(212) 538-3124 www.creditsuisse.com	C ACTIVE
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergybusiness.com	C/I ACTIVE
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 348-4193 www.directenergy.com	R ACTIVE
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, New Jersey 08002	(800) 282-3331 www.discountenergygroup.com	R/C ACTIVE
Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route #70 West Suite 125 Lakewood, NJ 08701	(866) 275-4240 www.dom.com/products	R/C ACTIVE

DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102	(877) 332-2450 www.dtesupply.com	C/I ACTIVE
Energy.me Midwest LLC 90 Washington Blvd Bedminster, NJ 07921	(855) 243-7270 www.energy.me	R/C/I ACTIVE
Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054	(877) 866-9193 www.energypluscompany.com	R/C ACTIVE
Ethical Electric Benefit Co. d/b/a Ethical Electric 100 Overlook Center, 2 nd Fl. Princeton, NJ 08540	(888) 444-9452 www.ethicalelectric.com	R/C ACTIVE
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 www.fes.com	C/I ACTIVE
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com	R/C/I ACTIVE
GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, NJ 08837	(866) 999-8374 www.gdfsuezenergyresources.com	C/I ACTIVE
Glacial Energy of New Jersey, Inc. 75 Route 15 Building E Lafayette, NJ 07848	(888) 452-2425 www.glacialenergy.com	C/I ACTIVE
Global Energy Marketing LLC 129 Wentz Avenue Springfield, NJ 07081	(800) 542-0778 www.globalp.com	C/I ACTIVE
Green Mountain Energy Company 211 Carnegie Center Drive Princeton, NJ 08540	(866) 767-5818 www.greenmountain.com/commercial-home	C/I ACTIVE

Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	C/I ACTIVE
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	R/C ACTIVE
HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Ridgefield, NJ 07657	(877) 390-7155 www.hopenergy.com	R/C/I ACTIVE
Hudson Energy Services, LLC 7 Cedar Street Ramsey, New Jersey 07446	(877) Hudson 9 www.hudsonenergyservices.com	C ACTIVE
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	(877) 887-6866 www.idtenergy.com	R/C ACTIVE
Independence Energy Group, LLC 3711 Market Street, 10 th Fl. Philadelphia, PA 19104	(877) 235-6708 www.chooseindependence.com	R/C ACTIVE
Integrays Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integraysenergy.com	C/I ACTIVE
Keil & Sons, Inc. d/b/a Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	(877) 797-8786 www.systrumenergy.com	R/C/I ACTIVE
Liberty Power Delaware, LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	(866) 769-3799 www.libertypowercorp.com	C/I ACTIVE
Liberty Power Holdings, LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	(866) 769-3799 www.libertypowercorp.com	C/I ACTIVE

Linde Energy Services 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.linde.com	C/I ACTIVE
Marathon Power LLC 302 Main Street Paterson, NJ 07505	(888) 779-7255 www.mecny.com	R/C/I ACTIVE
MXenergy Electric Inc. 900 Lake Street Ramsey, NJ 07446	(800) 785-4374 www.mxenergy.com	R/C/I ACTIVE
NATGASCO, Inc. 532 Freeman St. Orange, NJ 07050	(973) 678-1800 x. 251 www.supremeenergyinc.com	R/C ACTIVE
NextEra Energy Services New Jersey, LLC 651 Jernee Mill Road Sayreville, NJ 08872	(877) 528-2890 Commercial (800) 882-1276 Residential www.nexteraenergyservices.com	R/C/I ACTIVE
New Jersey Gas & Electric 1 Bridge Plaza fl. 2 Fort Lee, NJ 07024	(866) 568-0290 www.NJGandE.com	R/C ACTIVE
Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.noblesolutions.com	C/I ACTIVE
North American Power and Gas, LLC 222 Ridgedale Avenue Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	R/C/I ACTIVE
Palmco Power NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	R/C/I ACTIVE
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) ENERGY-9 (363-7499) www.pepco-services.com	C/I ACTIVE
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	R/C/I ACTIVE

PPL Energy Plus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com	C/I ACTIVE
Public Power & Utility of New Jersey, LLC 39 Old Ridgebury Rd. Suite 14 Danbury, CT 06810	(888) 354-4415 www.ppandu.com	R/C/I ACTIVE
Reliant Energy 211 Carnegie Center Princeton, NJ 08540	(877) 297-3795 (877) 297-3780 www.reliant.com/pjm	R/C/I ACTIVE
ResCom Energy LLC 18C Wave Crest Ave. Winfield Park, NJ 07036	(888) 238-4041 http://rescomenergy.com	R/C/I ACTIVE
Respond Power LLC 10 Regency CT Lakewood, NJ 08701	(877) 973-7763 www.respondpower.com	R/C/I ACTIVE
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 266-6020 www.southjerseyenergy.com	C/I ACTIVE
Sperian Energy Corp. 1200 Route 22 East, Suite 2000 Bridgewater, NJ 08807	(888) 682-8082	R/C/I ACTIVE
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, N.J. 08007	(800) 695-0666 www.sjnaturalgas.com	R/C ACTIVE
Spark Energy, L.P. 2105 CityWest Blvd., Ste 100 Houston, Texas 77042	(800) 441-7514 www.sparkenergy.com	R/C/I ACTIVE
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com	C/I ACTIVE
Starion Energy PA Inc. 101 Warburton Avenue Hawthorne, NJ 07506	(800) 600-3040 www.starionenergy.com	R/C/I ACTIVE
Stream Energy 309 Fellowship Rd., Suite 200 Mt. Laurel, NJ 08054	(877) 39-8150 www.streamenergy.net	R ACTIVE

UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com	C/I ACTIVE
Verde Energy USA, Inc. 50 East Palisades Avenue Englewood, NJ 07631	(800) 388-3862 www.lowcostpower.com	R/C/I ACTIVE
Viridian Energy 2001 Route 46, Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	R/C/I ACTIVE
Xoom Energy New Jersey, LLC 744 Broad Street Newark, NJ 07102	(888) 997-8979 www.xoomenergy.com	R/C/I ACTIVE
YEP Energy 89 Headquarters Plaza North #1463 Morristown, NJ 07960	(855) 363-7736 www.yepenergyNJ.com	R/C/I ACTIVE
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	(855) 732-2493 www.thisisyourenergy.com	R/C/I ACTIVE

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PSE&G GAS SERVICE TERRITORY
Last Updated: 10/24/12

***CUSTOMER CLASS - R – RESIDENTIAL C – COMMERCIAL I - INDUSTRIAL**

Supplier	Telephone & Web Site	*Customer Class
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877)-30-AMBIT (877) 302-6248 www.ambitenergy.com	R/C ACTIVE
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	888-850-1872 www.astralenergyllc.com	R/C/I ACTIVE
BBPC, LLC Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	C/I ACTIVE
Clearview Electric Inc. d/b/a Clearview Gas 1744 Lexington Ave. Pennsauken, NJ 08110	800-746-4720 www.clearviewenergy.com	R/C ACTIVE
Colonial Energy, Inc. 83 Harding Road Wyckoff, NJ 07481	845-429-3229 www.colonialgroupinc.com	C/I ACTIVE
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07746	(888) 817-8572 www.commerceenergy.com	R ACTIVE
Compass Energy Services, Inc. 1085 Morris Avenue, Suite 150 Union, NJ 07083	866-867-8328 908-638-6605 www.compassenergy.net	C/I ACTIVE
ConocoPhillips Company 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-646-4427 www.conocophillips.com	C/I ACTIVE
Consolidated Edison Energy, Inc. d/b/a Con Edison Solutions 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-686-1383 x2130 www.conedenergy.com	

Consolidated Edison Solutions, Inc. Cherry Tree Corporate Center 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-665-0955 www.conedsolutions.com	C/I ACTIVE
Constellation NewEnergy-Gas Division, LLC 900A Lake Street, Suite 2 Ramsey, NJ 07466	(800) 900-1982 www.constellation.com	C/I ACTIVE
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 www.directenergy.com	C/I ACTIVE
Direct Energy Services, LLP 120 Wood Avenue, Suite 611 Iselin, NJ 08830	866-348-4193 www.directenergy.com	R ACTIVE
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	800-805-8586 www.gesc.com	R/C/I ACTIVE
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergyservices.com	C/I ACTIVE
Global Energy Marketing, LLC 129 Wentz Avenue Springfield, NJ 07081	800-542-0778 www.globalp.com	C/I ACTIVE
Great Eastern Energy 116 Village Blvd., Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	C/I ACTIVE
Greenlight Energy 330 Hudson Street, Suite 4 Hoboken, NJ 07030	718-204-7467 www.greenlightenergy.us	C ACTIVE
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	C/I ACTIVE
Hess Small Business Services, LLC One Hess Plaza Woodbridge, NJ 07095	888-494-4377 www.hessenergy.com	C/I ACTIVE
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	R/C ACTIVE

Hudson Energy Services, LLC 7 Cedar Street Ramsey, NJ 07446	877- Hudson 9 www.hudsonenergyservices.com	C ACTIVE
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	877-887-6866 www.idtenergy.com	R/C ACTIVE
Integrus Energy Services – Natural Gas, LLC 99 Wood Avenue South Suite #802 Iselin, NJ 08830	800-536-0151 www.integrusenergy.com	C/I ACTIVE
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	800-927-9794 www.intelligentenergy.org	R/C/I ACTIVE
Keil & Sons, Inc. d/b/a Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	1-877-797-8786 www.systrumenergy.com	R/C/I ACTIVE
Major Energy Services, LLC 10 Regency CT Lakewood, NJ 08701	888-625-6760 www.majorenergy.com	R/C/I ACTIVE
Marathon Power LLC 302 Main Street Paterson, NJ 07505	888-779-7255 www.mecny.com	R/C/I ACTIVE
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	800-828-9427 www.metromediaenergy.com	C ACTIVE
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	888-53-Metro www.metroenergy.com	R/C ACTIVE
MxEnergy, Inc. 900 Lake Street Ramsey, NJ 07446	800-758-4374 www.mxenergy.com	R/C/I ACTIVE
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	800-840-4GAS www.natgasco.com	C ACTIVE
New Energy Services LLC 101 Neptune Avenue Deal, New Jersey 07723	800-660-3643 www.newenergyservicesllc.com	R/C/I ACTIVE

New Jersey Gas & Electric 1 Bridge Plaza, Fl. 2 Fort Lee, NJ 07024	866-568-0290 www.NJGandE.com	R/C ACTIVE
Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th fl. Woodbridge, NJ 07095	877-273-6772 www.noblesolutions.com	C/I ACTIVE
North American Power & Gas, LLC d/b/a North American Power 197 Route 18 South Ste. 3000 East Brunswick, NJ 08816	(888) 313-9086 www.napower.com	R/C/I ACTIVE
Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	R/C/I ACTIVE
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	800-363-7499 www.pepco-services.com	C/I ACTIVE
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	855-32-POWER (76937) www.plymouthenergy.com	R/C/I ACTIVE
PPL EnergyPlus, LLC 811 Church Road - Office 105 Cherry Hill, NJ 08002	800-281-2000 www.pplenergyplus.com	C/I ACTIVE
Respond Power LLC 10 Regency CT Lakewood, NJ 08701	(877) 973-7763 www.respondpower.com	R/C/I ACTIVE
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	800-266-6020 www.southjerseyenergy.com	C/I ACTIVE
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	800-695-0666 www.sjnaturalgas.com	R/C ACTIVE
Spark Energy Gas, L.P. 2105 CityWest Blvd, Ste 100 Houston, Texas 77042	800-411-7514 www.sparkenergy.com	R/C/I ACTIVE
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	855-466-2842 www.spragueenergy.com	C/I ACTIVE

Stuyvesant Energy LLC 10 West Ivy Lane, Suite 4 Englewood, NJ 07631	800-640-6457 www.stuyfuel.com	C ACTIVE
Stream Energy New Jersey, LLC 309 Fellowship Road Suite 200 Mt. Laurel, NJ 08054	(973) 494-8097 www.streamenergy.net	R/C ACTIVE
Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	877-797-8786 www.systrumenergy.com	R/C/I ACTIVE
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	800-557-1121 www.woodruffenergy.com	R/C/I ACTIVE
Woodruff Energy US LLC 73 Water Street, P.O. Box 777 Bridgeton, NJ 08302	856-455-1111 800-557-1121 www.woodruffenergy.com	C/I ACTIVE
Xoom Energy New Jersey, LLC 744 Broad Street Newark, NJ 07102	888-997-8979 www.xoomenergy.com	R/C/I ACTIVE
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	(855) 732-2493 www.thisisyourenergy.com	R/C/I ACTIVE

[Back to main supplier information page](#)

APPENDIX B

Equipment Inventory

CHA Project # 28661
Pioneer Hall
William Paterson University

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
Boiler	5	AERCO	Benchmark 2000	N/A	HHW Boiler	2000 MBH input, 1740-1900 MBH output	87%-98% Eff.	Common Mechanical RM for Pioneer Hall and Heritage Hall	HHW Loop for HHW Coils, Serve both Pioneer Hall and Heritage Hall	2000	11	
CHW/HHW Pump Motor	2	US Electrical Motors	T577A	N/A	HHW Pump/Motor	10HP	86.5%	Common Mechanical RM for Pioneer Hall and Heritage Hall	Poineer HHW/CHW Coils in FCUs	1999	5	
CHW/HHW Pump Motor	2	Marathon Electric	T56DA	N/A	HHW Pump/Motor	15HP	91.0%	Common Mechanical RM for Pioneer Hall and Heritage Hall	HHW/CHW Coils in AHUs	1999	5	
HHW Pump Motor for DHW HXs	2	US Electrical Motors	T58DA	N/A	CHW Pump/Motor	3HP	84%	Common Mechanical RM for Pioneer Hall and Heritage Hall	HHW/CHW Coils	1999	5	
Chiller	1	Trane	RTAA3004XR01AOD1ABDF GSN	U99006646	Electric Air Cooled Chiller	~300 tons	N/A	Outside Ground	Provide CHW for Both Pioneer Hall and Heritage Hall	1999	5	
AHU	1	Centralaire	1016F2-HHCI	90907DD01	AHU	N/A	N/A	Roof Penthouse Mechanical RM	Hallways/Common Areas	1999	5	
Fan Coil Units	many	Airtherm	031-1R-SF	9090608	FCU	0.04HP Fan Comtor and HHW/CHW Coil	N/A	Student Rooms, Offices, Lounges	Classrooms, Offices, Computer Labs and some Hallways	1999	5	
Packaged AC Unit	1	Airedale	VUCH-5	PA1814-U8788	PTAC	~1.5 ton	N/A	Student Lounge 102	Student Lounge 102	2000	6	
Split AC Unit	1	EMI	MH4D9922AAAAA0F	1-00-E-5234-20	Split AC Unit	~1 ton	N/A	RD Office	RD Office	2000	6	
Split AC Unit	1	EMI	MH4D9922AAAAA0F	1-00-E-5174-20	Split AC Unit	~1 ton	N/A	Office	Office	2000	6	

Cost of Electricity:

\$0.107	\$/kWh
\$11.93	\$/kW

			EXISTING CONDITIONS								Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
25	Entrance Lobby	Hallways	8	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.22	SW	8736	1,957	NONE	
25	Elevator Lobby	Hallways	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.31	SW	8736	2,691	NONE	
32LED	Corridor	Hallways	7	1T 32 R F 2 (ELE)	F42LL	60	0.42	SW	8736	3,669	NONE	
32LED	Corridor	Hallways	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	8736	5,242	NONE	
32LED	Security Office	Offices	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	Wall Mounted
15LED	Electric Service Room	Mechanical Room	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	8736	1,572	NONE	
15LED	Janitor Room	Storage Areas	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
15LED	Data Room	Mechanical Room	6	S 32 C F 2 (ELE)	F42LL	60	0.36	SW	8736	3,145	NONE	
55LED	Student Lounge	Staff Lounge	9	2T 17 R F 3 (ELE)	F23ILL	47	0.42	SW	4368	1,848	C-OCC	
15LED	Bedroom 101	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	Wall Mounted
15LED	Bedroom 101	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 101	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Computer Room	Staff Lounge	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	4368	786	C-OCC	
15LED	Bedroom 103	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 103	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 103	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 104	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 104	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 104	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 105	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 105	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 105	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 109	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 109	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 109	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 110	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 110	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 110	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 111	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 111	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 111	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 112	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 112	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 112	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
32LED	2nd Floor Corridor	Hallways	7	1T 32 R F 2 (ELE)	F42LL	60	0.42	SW	8736	3,669	NONE	
32LED	2nd Floor Corridor	Hallways	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	8736	5,242	NONE	
25	2nd Floor Elevator Lobby	Hallways	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.31	SW	8736	2,691	NONE	
15LED	Bedroom 201	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	Locked
15LED	Bedroom 201	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 201	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 202	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 202	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 202	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	

Cost of Electricity:

\$0.107	\$/kWh
\$11.93	\$/kW

			EXISTING CONDITIONS								Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Retrofit Control	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 203	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 203	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 203	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 204	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 204	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 204	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 205	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 205	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 205	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 206	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 206	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
15LED	Bedroom 207	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 207	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 207	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 208	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 208	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 208	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 209	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 209	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 209	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 210	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 210	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 210	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 211	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 211	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 211	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 212	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 212	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 212	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
32LED	3rd Floor Corridor	Hallways	7	1T 32 R F 2 (ELE)	F42LL	60	0.42	SW	8736	3,669	NONE	
32LED	3rd Floor Corridor	Hallways	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	8736	5,242	NONE	
25	3rd Floor Elevator Lobby	Hallways	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.31	SW	8736	2,691	NONE	
15LED	Bedroom 301	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	Locked
15LED	Bedroom 301	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 301	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom302	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom302	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 302	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	

Cost of Electricity:

\$0.107	\$/kWh
\$11.93	\$/kW

			EXISTING CONDITIONS								Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 303	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 303	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 303	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 304	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 304	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 304	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 305	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 305	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 305	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 306	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 306	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
15LED	Bedroom 307	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 307	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 307	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 308	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 308	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 308	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 309	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 309	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 309	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 310	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 310	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 311	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 311	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 311	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 312	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 312	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 312	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
32LED	4th Floor Corridor	Hallways	7	1T 32 R F 2 (ELE)	F42LL	60	0.42	SW	8736	3,669	NONE	
32LED	4thFloor Corridor	Hallways	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	8736	5,242	NONE	
25	4th Floor Elevator Lobby	Hallways	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.31	SW	8736	2,691	NONE	
15LED	Bedroom 401	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	Locked
15LED	Bedroom 401	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 401	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 402	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 402	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	

Cost of Electricity:

\$0.107	\$/kWh
\$11.93	\$/kW

			EXISTING CONDITIONS								Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Retrofit Control	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
15LED	Living Room 402	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 403	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 403	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 403	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 404	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 404	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 404	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 405	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 405	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 405	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 406	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 406	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
15LED	Bedroom 407	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 407	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 407	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 408	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 408	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 408	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 409	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 409	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 409	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 410	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 410	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 410	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 411	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 411	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 411	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 412	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 412	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 412	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
32LED	5th Floor Corridor	Hallways	7	1T 32 R F 2 (ELE)	F42LL	60	0.42	SW	8736	3,669	NONE	
32LED	5th Floor Corridor	Hallways	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	8736	5,242	NONE	
25	5thFloor Elevator Lobby	Hallways	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.31	SW	8736	2,691	NONE	
15LED	Bedroom 501	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	Locked
15LED	Bedroom 501	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 501	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 502	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	

Cost of Electricity:

\$0.107	\$/kWh
\$11.93	\$/kW

			EXISTING CONDITIONS								Retrofit	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Retrofit Control	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
15LED	Bedroom 502	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 502	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 503	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 503	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 503	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 504	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 504	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 504	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 505	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 505	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 505	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 506	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 506	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
15LED	Bedroom 507	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 507	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 507	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 508	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 508	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 508	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 509	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 509	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 509	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 510	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 510	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 510	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 511	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 511	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 511	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 512	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 512	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 212	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
32LED	6th Floor Corridor	Hallways	7	1T 32 R F 2 (ELE)	F42LL	60	0.42	SW	8736	3,669	NONE	
32LED	6th Floor Corridor	Hallways	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	8736	5,242	NONE	
25	6th Floor Elevator Lobby	Hallways	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.31	SW	8736	2,691	NONE	
15LED	Bedroom 601	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	Locked
15LED	Bedroom 601	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 601	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	

Cost of Electricity:

\$0.107	\$/kWh
\$11.93	\$/kW

			EXISTING CONDITIONS								Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
15LED	Bedroom 602	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 602	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 602	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 603	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 603	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 603	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 604	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 604	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 604	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 605	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 605	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 605	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 606	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 606	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
15LED	Bedroom 607	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 607	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 607	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 608	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 608	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 608	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 609	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 609	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 609	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 610	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 610	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 610	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 611	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 611	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 611	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
15LED	Bedroom 612	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Bedroom 612	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Living Room 612	Dorm	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2856	171	NONE	
15LED	Restroom	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	4368	262	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
220LED	Restroom	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	4368	87	NONE	
231LED	Outdoor	Outdoor Lighting	12	WP400MH1	MH400/1	458	5.50	SW	4368	24,007	NONE	
	Total		604				33.49			166,377		

APPENDIX C

ECM Calculations

William Paterson University - Pioneer Hall
CHA Project Numer: 28661

Rate of Discount (used for NPV) 3.0%

Estimated	Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
	\$ 0.148	\$/kWh blended		0.000420205	65,886	Electric	Natural Gas	Fuel Oil
	\$ 0.107	\$/kWh supply	386,000	0.000420205		\$ 57,106	\$ 27,125	
	\$ 11.93	\$/kW	160.0	0				
	\$ 0.99	\$/Therm	27,283	0.00533471				
	\$ 7.50	\$/kgals		0				
		\$/Gal						

Recommend? Y or N	Pioneer Hall																						
		Item	Savings					Cost	Simple Payback	Life Expectancy	Equivalent CO ₂ (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings					ROI	NPV	IRR	
			kW	kWh	therms	No. 2 Oil gal	Water kgal								\$	kW	kWh	therms	kgal/yr				\$
Y	ECM-1	Install Occupancy Sensors/Thermostats for Fan Coil Units	0.0	35,136	6,855	0	0	12,014	\$ 232,223	19.3	15	51.3	\$ -	N	19.3	0.0	527,040	102,825	0	\$ 180,210	(0.2)	(\$88,800)	-3.0%
Y	ECM-2	Replace 3-Way Valves with 2-Way Valves and Install VFDs on the Pump Motors	0.2	53,207	0	0	0	5,726	\$ 95,019	16.6	15	22.4	\$ 4,000	N	15.9	3.5	798,105	0	0	\$ 118,616	0.2	(\$22,659)	-0.7%
Y	ECM-3	Add Outdoor Air Damper Actuator and DDC to Optimize Ventilation Rate	0.0	2,495	339	0	0	706	\$ 20,394	28.9	15	2.9	\$ -	N	28.9	0.0	37,422	5,080	0	\$ 10,588	(0.5)	(\$11,967)	-7.3%
Y	ECM-4	Replace the DHW Heat Exchangers with a Designated Gas Fired Condensing DHW	0.0	44,945	685	0	0	7,333	\$ 29,061	4.0	20	22.5	\$ 300	N	3.9	0.0	898,904	13,699	0	\$ 146,654	4.0	\$80,331	25.2%
Y	ECM-5	Install Vending Miser	0.0	6,354	0	0	0	940	\$ 1,120	1.2	18	2.7	\$ -	N	1.2	0.0	114,372	0	0	\$ 16,927	14.1	\$11,813	83.9%
N	ECM-6	Replace High Flow Plumbing Fixtures with Low Flow Plumbing Fixtures	0.0	0	268	0	239	2,061	\$ 339,885	164.9	20	1.4	\$ -	N	164.9	0.0	0	5,353	4,786	\$ 41,213	(0.9)	(\$309,227)	-15.0%
N	ECM-L1	Lighting Replacements / Upgrades	16.6	78,010	0	0	0	10,723	\$ 127,774	11.9	15	32.8	\$ 19,465	N	10.1	248.9	1,170,150	0	0	\$ 208,820	0.6	\$19,701	5.4%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	527	0	0	0	56	\$ 540	9.6	15	0.2	\$ 70	N	8.3	0.0	7,905	0	0	\$ 1,170	1.2	\$203	8.4%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	16.6	78,285	0	0	0	10,752	\$ 128,314	11.9	15	32.9	\$ 19,535	N	10.1	248.9	1,174,275	0	0	\$ 209,431	0.6	\$19,582	5.4%
Total (Does Not Include ECM-L1 & ECM-L2)			16.8	220,422	8,146	0	239	\$ 39,532	\$ 846,016	21.4	16.9	136	\$ 23,835		20.8	252	3,550,118	126,956	4,786	\$ 723,640	(0.1)	-325612.27	-2.9%
Recommended Measures (highlighted green above)			16.8	220,422	7,879	0	0	\$ 37,472	\$ 506,131	13.5	16.3	135	\$ 23,835	0	12.9	252	3,550,118	121,603	-	\$ 682,426	0.3	-11611.595	2.7%
% of Existing			11%	57%	29%	0	0																

City:			Newark, NJ				
Occupied Hours/Week			168				
Temp	Enthalpy	Bin Hours	Building	Auditorium	Gymnasium	Library	Classrooms
	h (Btu/lb)		Operating Hours	Occupied Hours	Occupied Hours	Occupied Hours	Occupied Hours
102.5							
97.5	35.4	6	6	0	0	0	0
92.5	37.4	31	31	0	0	0	0
87.5	35.0	131	131	0	0	0	0
82.5	33.0	500	500	0	0	0	0
77.5	31.5	620	620	0	0	0	0
72.5	29.9	664	664	0	0	0	0
67.5	27.2	854	854	0	0	0	0
62.5	24.0	927	927	0	0	0	0
57.5	20.3	600	600	0	0	0	0
52.5	18.2	730	730	0	0	0	0
47.5	16.0	491	491	0	0	0	0
42.5	14.5	656	656	0	0	0	0
37.5	12.5	1,023	1,023	0	0	0	0
32.5	10.5	734	734	0	0	0	0
27.5	8.7	334	334	0	0	0	0
22.5	7.0	252	252	0	0	0	0
17.5	5.4	125	125	0	0	0	0
12.5	3.7	47	47	0	0	0	0
7.5	2.1	34	34	0	0	0	0
2.5	1.3	1	1	0	0	0	0
-2.5							
-7.5							

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

Heating System Efficiency	88%
Cooling Eff (kW/ton)	1.2

Heating	
Hours	4,427 Hrs
Weighted Avg	40 F
Avg	28 F

Cooling	
Hours	4,333 Hrs
Weighted Avg	68 F
Avg	78 F

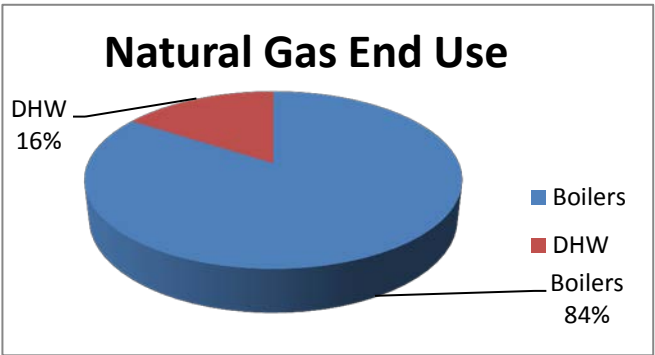
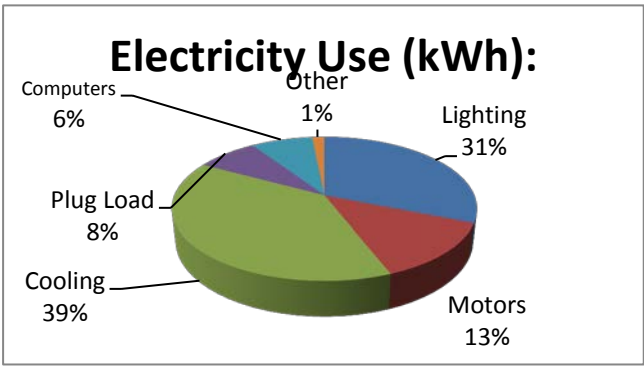
William Paterson University - Pioneer Hall
CHA Project Numer: 28661
Pioneer Hall

Hillside Share the Chiller with Century Hall

Utility End Use Analysis		
Electricity Use (kWh):		Notes/Comments:
386,000	Total	Based on utility analysis
120,000	Lighting	From Lighting Calculations
50,000	Motors	Estimated
150,000	Cooling	Estimated
30,000	Plug Load	Estimated
30,000	Computers	Estimated
6,000	Other	Remaining
Natural Gas Use (Therms):		Notes/Comments:
27,283	Total	Based on utility analysis
22,956	Boilers	Therms/SF x Square Feet Served
4,327	DHW	Based on utility analysis

31%
13%
39%
8%
8%
2%

84%
16%



William Paterson University - Pioneer Hall
CHA Project Numer: 28661
Pioneer Hall

ECM-1 Install Occupancy Sensors/Thermostats for Fan Coil Units

Description: This ECM evaluates the energy savings associated with installing an occupancy sensor to control the space temperature 2 F higher (cooling)or 2 F lower(heating) during regularly occupied times when there are no occupants in the room.

Equipment Tag	Equipment Description	General Type	Total Cooling Capacity (ton)	Total Heating Capacity (MBH)	
	Fan Coil Units	HVAC	150	2,000	<Estimated

Item	Value	Units	Formula/Comments
Gas Rate	\$ 0.99	/threm	
Electricity Rate	\$ 0.15	/kWh	
FORMULA CONSTANTS			
Load "on" Factor	60%		NJ Protocols
Cooling Occupied %	80%		Estimated
Heating Occupied %	90%		Estimated
HEATING - FCUs			
Heating Capacity	2,000	MBH	Estimated
Baseline Heating Efficiency	88%		
Existing Run Hours	3,016	hrs	Estimated
Proposed Run Hours	2,715	hrs	Estimated Based on School Hours
Heating Savings	6,855	therm	
COOLING - FCUs			
Cooling Capacity	150	ton	Estimated
Existing Run Hours	1,171	hrs	Estimated
Proposed Run Hours	937	hrs	Estimated Based on School Hours
Chiller Efficiency	1.0	kW/ton	Estimated
Cooling Savings	35,136	kWh	
SAVINGS			
Gas Savings	6,855	therm	
Electric Savings	35,136	kWh	
Cost Savings	\$ 12,014		

Savings calculation formulas are taken from NJ Protocols document for Electric HVAC Equipment

William Paterson University - Pioneer Hall
CHA Project Numer: 28661
Pioneer Hall

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-1 Install Occupancy Sensors/Thermostats for Fan Coil Units - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Thermostat with Occupancy Sensors	150	EA	\$ 460	\$ 200	\$ -	\$ 70,863	\$ 37,380	\$ -	\$ 108,243	Internet Price
Connect to DDC system	150	EA	\$ 200	\$ 250		\$ 30,810	\$ 46,725	\$ -	\$ 77,535	Estimated
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

\$ 185,778	Subtotal
\$ 46,445	25% Contingency
\$ 232,223	Total

William Paterson University - Pioneer Hall
CHA Project Numer: 28661
Pioneer Hall

ECM-2 Replace 3-Way Valves with 2-Way Valves and Install VFDs on the Pump Motors

Variable Inputs

Supply Electric Rate	\$0.107
Demand Rate	\$11.930
Heating System "On" Point	55
VFD Efficiency	98.5%

Electric Savings	53,207
Demand Savings	0.2
Cost Savings	\$ 5,726

This measure looks at reactivating the VFDs for the Pump Motors and replace 3-way valves with 2-way valves.

PUMP SCHEDULE							
Pump ID	Qty	HP	Total HP	Existing Motor Motor Eff.	Motor Motor Eff.	Exist. Motor kW Note 1	New Motor kW Note 2
P-1	1	10.0	10.0	86.5%	89.5%	6.90	6.67
P-2	1	10.0	10.0	86.5%	89.5%		
P-3	1	15.0	15.0	91.0%	91.0%	9.84	9.84
P-4	1	15.0	15.0	91.0%	91.0%		
					Total:	16.74	16.51

<Lead/Lag

<Lead/Lag

SAVINGS ANALYSIS								
OAT - DB Avg Temp F	Annual Hours in Bin	Running Hours Bin	Pump Load %	Existing Pump kWh	Proposed Pump kW	Speed efficiency %	Proposed Pump kWh	Proposed Savings kWh
(A)	(B)	(C) =IF(A>TP,0,C)	(D) =0.5+0.5* (55-A)/(55-12)) See Note 4	(E) =D*AA	(F) =BB*E^3.0/CC See Note 5	(G)	(H) =C*F/G	(I) =E-H
See Note 3	See Note 3							
102.5	0	0	0%	0	0.0	0.0%	0	0
97.5	0	0	0%	0	0.0	0.0%	0	0
92.5	3	3	100%	21	16.8	99.0%	51	-30
87.5	34	34	82%	235	9.2	100.0%	312	-77
82.5	131	131	65%	904	4.6	93.4%	645	259
77.5	500	500	65%	3,450	4.6	93.4%	2,463	987
72.5	620	620	65%	4,278	4.6	93.4%	3,054	1,224
67.5	664	664	65%	4,581	4.6	93.4%	3,271	1,310
62.5	854	854	65%	5,892	4.6	93.4%	4,207	1,685
57.5	927	927	65%	6,396	4.6	93.4%	4,566	1,829
52.5	600	600	65%	10,042	4.6	93.4%	2,956	7,087
47.5	610	610	65%	10,209	4.6	93.4%	3,005	7,205
42.5	611	611	65%	10,226	4.6	93.4%	3,010	7,216
37.5	656	656	70%	10,979	5.8	96.3%	3,974	7,005
32.5	1,023	1,023	76%	17,122	7.4	98.6%	7,682	9,440
27.5	734	734	82%	12,285	9.2	100.0%	6,776	5,509
22.5	334	334	88%	5,590	11.3	100.0%	3,787	1,803
17.5	252	252	94%	4,218	13.7	100.0%	3,463	754
12.5	125	125	99%	2,092	16.5	99.2%	2,075	17
7.5	47	47	100%	787	16.8	99.0%	795	-9
2.5	22	22	100%	368	16.8	99.0%	372	-4
-2.5	13	13	100%	218	16.8	99.0%	220	-2
-7.5	0	0	0%	0	0.0	0.0%	0	0
	8,760	8,760		109,891			56,684	53,207

Notes:

- 1) Existing motor power was determined using motor nameplate data. Formula: Motor HP x 0.746 x 0.8 / Exist. Motor Eff.
- 2) New motor power is the same as existing motor power adjusted for the new efficiency, if a new motor is proposed.
- 3) Weather data from NOAA for Newark, NJ
- 4) The pump load is estimated at 100% at 12 deg. OAT and 50% at 55 deg. OAT and varies linearly in between.
- 5) The required VFD motor draw is based on a 3 power relationship to load.

William Paterson University - Pioneer Hall
CHA Project Numer: 28661
Pioneer Hall

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-2 Replace 3-Way Valves with 2-Way Valves and Install VFDs on the Pump Motors - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
VFDs	2		\$ 2,336	\$ 772		\$ 4,798	\$ 1,924	\$ -	\$ 6,722	Estimated
Motors	2		\$ 861	\$ 110		\$ 1,768	\$ 274	\$ -	\$ 2,043	Estimated
2-Way Valves	72		\$ 300	\$ 200		\$ 22,183	\$ 17,942	\$ -	\$ 40,126	Estimated
Electrical - misc.	1		\$ 3,000	\$ 5,000		\$ 3,081	\$ 6,230	\$ -	\$ 9,311	Estimated
Programming	1		\$ 3,000	\$ 5,000		\$ 3,081	\$ 6,230	\$ -	\$ 9,311	Estimated
Pressure Transducer	2		\$ 500	\$ 3,000		\$ 1,027	\$ 7,476	\$ -	\$ 8,503	Estimated

\$ 76,015	Subtotal
\$ 19,004	25% Contingency
\$ 95,019	Total

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

ECM-3 Add Outdoor Air Damper Actuator and DDC to Optimize Ventilation Rate

AIR HANDLER	AREA SERVED	CFM	OA CFM	% OA
Trane AHU	Commen Area	3,000	900	30% <<Estimated
				30% <<Estimated
				30% <<Estimated

900 CFM

ECM 6: Demand Controlled Ventilation

ECM Description: This ECM evaluates the energy savings associated with reducing the quantity of outdoor air being introduced to the building during unoccupied hours. The reduction in outdoor air ventilation is achieved using DDC system to track the building schedule since the buildig is only occupied for about 34 weeks/yr.

Electric Cost	\$	0.15	/kWh
Natural Gas Cost	\$	0.99	/therm
Facility Ventilation Heating Load		34,020	BTU/Hour ^{1,2,3}
Facility Ventilation Cooling Load		9,720	BTU/Hour ^{1,2,3}
Existing Ventilation Heating Usage		3,387	Therms ²
Existing Ventilation Cooling Usage		24,948	kWh ³
Proposed Ventilation Heating Usage		3,048	Therms ⁷
Proposed Ventilation Cooling Usage		22,453	kWh ⁷
Total heating savings		339	Therms
Total cooling savings		2,495	kWh
Total cost savings	\$	706	
Estimated Total Project Cost		\$20,394	⁸
Simple Payback		28.9	years

Note: costs are used for enrgy savings calculations only. Do not use for procurment

Assumptions

- 900 OA AHU airflow based exsiting equipment model numbers
- 35 °F, Assumed average heating Δt (mixed air and supply)
- 10 °F, Assumed average cooling Δt (mixed air and supply)
- 88% Heating Efficiency - %
- 1.0 Cooling Efficiency - kW/Ton
- 8,760 AHU run time per heating/cooling season bin data
- 10% Estimated savings for Ventilation Reduction
- \$ 20,394 estimated measure cost for installation of sensors and associated controls

William Paterson University - Pioneer Hall

CHA Project Numer: 28661

Pioneer Hall

ECM-3 Add Outdoor Air Damper Actuator and DDC to Optimize Ventilation Rate - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Damper Actuator	3	EA	\$ 2,000	\$ 500		\$ 6,162	\$ 1,869	\$ -	\$ 8,031	Estimated
Connect to DDC	1	EA	\$ 2,000	\$ 2,500		\$ 2,054	\$ 3,115	\$ -	\$ 5,169	Estimated
Wiring and Misc	1	EA	\$ -	\$ 2,500		\$ -	\$ 3,115	\$ -	\$ 3,115	Estimated
						\$ -	\$ -	\$ -	\$ -	

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

\$ 16,315	Subtotal
\$ 4,079	25% Contingency
\$ 20,394	Total

William Paterson University - Pioneer Hall						
CHA Project Numer: 28661						
ECM-4 Replace the DHW Heat Exchangers with a Designated Gas Fired Condensing DHW Heater						
<u>Summary</u>						
* Replace Existing Heat Exchangers w/ NG Condensing Boiler and remove (2) Pumps						
Pump Motor	10.0	HP				
Motor Efficiency	87%					
Run Hours	5,242	hr/yr				
Pump Motor Annuual Energy Usage	44,945	kWh				
<u>Item</u>	<u>Value</u>	<u>Units</u>	<u>Formula/Comments</u>			
Occupied days per week	7	days/wk				
Water supply Temperature	60	°F	Temperature of water coming into building			
Hot Water Temperature	140	°F				
Hot Water Usage per day	1,427	gal/day	Calculated from usage below			
Annual Hot Water Energy Demand	279,629	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint			
Existing Tank Size	200	Gallons				
Hot Water Temperature	140	°F	Per building personnel			
Average Room Temperature	70	°F				
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)			
Standby Losses (Heat Loss)	2.9	MBH				
Annual Standby Hot Water Load	25,550	MBTU/yr				
Total Annual Hot Water Demand (w/ standby losses)	305,179	Mbtu/yr	Building demand plus standby losses			
Existing Water Heater Efficiency	70%		Boiler and Heat Loss due the HXs			
Total Annual Energy Required	435,970	Mbtu/yr				
Total Annual Natural Gas Required	4,359.7	Therms /yr	Per Utility Bills			
New Tank Size	400	Gallons	One Storage Tank			
Hot Water Temperature	140	°F				
Average Room Temperature	70	°F				
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)			
Standby Losses (Heat Loss)	5.8	MBH				
Annual Standby Hot Water Load	51,100	MBTU/yr				
Prop Annual Hot Water Demand (w/ standby losses)	330,729	MBTU/yr				
Proposed Avg. Hot water heater efficiency	90%		Based on condensing DHW Heater			
Proposed Total Annual Energy Required	367,477	MBTU/yr				
Proposed Fuel Use	3,675	Therms /yr	Standby Losses and inefficient DHW heater eliminated			
Proposed Fuel Savings	685	Therms /yr				
Natural Gas Utility Unit Cost	\$0.99	\$/Therm				
Existing Operating Cost of DHW	\$4,334	\$/yr				
Proposed Operating Cost of DHW	\$3,653	\$/yr				
proposed Electric Savings	44,945	kWh				
Annual Utility Cost Savings	\$7,333	\$/yr				

William Paterson University - Pioneer Hall
CHA Project Numer: 28661
Pioneer Hall

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-4 Replace the DHW Heat Exchangers with a Designated Gas Fired Condensing DHW Heater - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Heat Exchangers Removal	1	LS		\$ 500		\$ -	\$ 623	\$ -	\$ 623	Estimated
High Efficiency Gas-Fired DHW Heater	1	EA	\$ 10,000	\$ 5,000		\$ 10,270	\$ 6,230	\$ -	\$ 16,500	From Internet Price/ Estimated Labor Cost*
Miscellaneous Electrical	1	LS	\$ 300			\$ 308	\$ -	\$ -	\$ 308	RS Means 2012
Venting Kit	1	EA	\$ 450	\$ 650		\$ 462	\$ 810	\$ -	\$ 1,272	RS Means 2012
Miscellaneous Piping and Valves	1	LS	\$ 2,000	\$ 2,000		\$ 2,054	\$ 2,492	\$ -	\$ 4,546	Estimated

* Rheem SPIDEfire
**Cost Estimates are for Energy Savings calculations only, do not use for procurement

\$ 23,249	Subtotal
\$ 5,812	25% Contingency
\$ 29,061	Total

William Paterson University - Pioneer Hall
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Pioneer Hall

ECM-5 Install Vending Miser

Description : Vending machines generally operate 24/7 regardless of the actual usage. This measure proposes installing vending machine controls to reduce the total run time of these units. Cold beverage machines will cycle on for 15 minutes every two hours in order to keep beverages at a desired temperature. The result is a reduction in total electrical energy usage.

Unit Cost: \$0.148 \$/kWh blended

Energy Savings Calculations:

Existing	
Cold Beverage Vending Machine Electric usage	7,008 kWh ^{1,4,7}
Snack Vending Machine Electric usage	3,504 kWh ^{2,5,7}
Dual Vending Machine Electric Usage	- kWh ^{3,6,7}
Total Vending Machine Electric Usage	10,512 kWh

Proposed	
Cold Beverage Vending Machine Electric usage	2,646 kWh ⁸
Snack Vending Machine Electric usage	1,512 kWh
Dual Vending Machine Electric Usage	0 kWh
Total Vending Machine Electric Usage	4,158 kWh

Vending Machine Controls Usage Savings	6,354 kWh
Total cost savings	\$ 940
Estimated Total Project Cost	\$ 1,120 ⁹
Simple Payback	1 years

Assumptions

1	2	Number of cold beverage vending machines
2	2	Number of snack vending machines
3	0	Number of dual snack/beverage vending machines
4	400	Average wattage, typical of cold beverage machines based on prior project experience
5	200	Average wattage, typical of snack machines based on prior project experience
6	300	Average wattage, typical of dual snack/beverage machines based on prior project experience
7	8760	Hours per year vending machine plugged in
8	7560	Building Occupied Hours
9	0.50	Vending Machine Traffic Factor (0.75 for High Traffic, 0.5 for Medium, 0.25 for low)

William Paterson University - Pioneer Hall
CHA Project Numer: 28661
Pioneer Hall

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-5 Install Vending Miser - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									\$ -	
Vending Miser	4	EA	\$ 200	\$ 15	\$ -	\$ 822	\$ 75	\$ -	\$ 896	Vendor Estimation
						\$ -	\$ -	\$ -	\$ -	

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

\$ 896	Subtotal
\$ 224	25% Contingency
\$ 1,120	Total

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Pioneer Hall

ECM: Replace urinals and flush valves with low flow

Description: This ECM evaluates the water savings associated with replacing/ upgrading urinals with 0.125 GPF urinals and or flush valves.

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$7.50	\$ / kGal
Urinals in Building to be replaced	0	
Average Flushes / Urinal (per Day)	20	
Average Gallons / Flush	1.5	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	0	
Proposed Gallons / Flush	0.125	Gal
Proposed Material Cost of new urinal & valve	\$1,200	RS Means 2012
Proposed Installation Cost of new urinal & valve	\$1,000	RS Means 2012
Total cost of new urinals & valves		

SAVINGS		
Current Urinal Water Use	0.00	kGal / year
Proposed Urinal Water Use	0.00	kGal / year
Water Savings	0.00	kGal / year
Cost Savings	\$0	/ year

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

William Paterson University - Pioneer Hall
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Pioneer Hall

ECM: Replace toilets and flush valves with low flow

Description: This ECM evaluates the water savings associated with repalcing/
upgrading toilets to 1.28 GPF fixtures and/or flush valves.

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$7.50	\$ / kGal
Toilets in Building	72	
Average Flushes / Toilet (per Day)	3	
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	72	
Proposed Gallons / Flush	1.28	Gal

SAVINGS		
Current Toilet Water Use	275.94	kGal / year
Proposed Toilet Water Use	100.92	kGal / year
Water Savings	175.02	kGal / year
Cost Savings	\$1,313	/ year

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ECM: Replace faucets with low flow

Description; This ECM evaluates the water savings resulting from replacing/ upgrading faucets to 0.5 gallon per minute flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$7.50	\$ / kGal
Faucets in Building	72	
Average Uses / Faucet (per day)	5	# Uses
Average Time of Use	30	seconds
Average Flowrate	2.0	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	72	
Proposed Flowrate	0.5	gpm

HEATING SAVINGS		
Fuel Cost	\$ 0.99	/therm
Number of Faucets	72	
Hours per Day of Usage	0.042	hrs
Days per Year of Facility Usage	238	days
Average Flowrate	2.0	gpm
Proposed Flowrate	0.5	gpm
Heat Content of Water	8.33	Btu/gal/F
Temperature Difference (Intake and Output)	35	F
Water Heating Equipment Efficiency	70%	
SAVINGS		
Current Faucet Water Use	85.68	kGal / year
Proposed Faucet Water Use	21.42	kGal / year
Water Savings	64.26	kGal / year
Heating Savings	268	therms
Cost Savings	\$748	/ year

Savings calculation formulas are taken from NJ Protocols document for Faucet

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

William Paterson University - Pioneer Hall
CHA Project Numer: 28661
Pioneer Hall

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-6 Replace High Flow Plumbing Fixtures with Low Flow Plumbing Fixtures - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									\$ -	
Low-Flow Urinal	0	EA	\$ 1,200	\$ 1,000	\$ -	\$ -	\$ -	\$ -	\$ -	Vendor Estimate
Low-Flow Toilet	72	EA	\$ 1,400	\$ 1,000	\$ -	\$ 103,522	\$ 89,712	\$ -	\$ 193,234	Vendor Estimate
Low-Flow Faucet	72	EA	\$ 700	\$ 300	\$ -	\$ 51,761	\$ 26,914	\$ -	\$ 78,674	Vendor Estimate
						\$ -	\$ -	\$ -	\$ -	

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

\$ 271,908	Subtotal
\$ 67,977	25% Contingency
\$ 339,885	Total

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New Jersey Pay For Performance Incentive Program

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per April, 2012. Building must have a minimum average electric demand of 100 kW. This minimum is waived for buildings owned by local governments or non-profit organizations. At a minimum, all recommended measures were used for this calculation. To qualify for P4P incentives, the following P4P requirements must be met:

- At least 15% source energy savings
- No more than 50% savings from lighting measures
- Scope includes more than one measure
- Project has at least a 10% internal rate of return
- At least 50% of the source energy savings must come from investor-owned electricity and/or natural gas (note: exemption for fuel conversions)

Total Building Area (Square Feet)		65,886	
Is this audit funded by NJ BPU (Y/N)		Yes	
Board of Public Utilites (BPU)			
	Annual Utilities		
	kWh	Therms	
Existing Cost (from utility)	\$57,106	\$27,125	
Existing Usage (from utility)	386,000	27,283	
Proposed Savings	220,422	7,879	
Existing Total MMBtus	4,046		
Proposed Savings MMBtus	1,540		
% Energy Reduction	38.1%		
Proposed Annual Savings	\$37,472		

		Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
		\$/kWh	\$/therm	\$/kWh	\$/therm	\$/kWh	\$/therm	\$/kWh	\$/therm
Incentive #2		\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.11	\$1.25
Incentive #3		\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.11	\$1.25

	Incentives \$		
	Elec	Gas	Total
Incentive #1	\$0	\$0	\$5,000
Incentive #2	\$24,246	\$9,848	\$34,095
Incentive #3	\$24,246	\$9,848	\$34,095
Total All Incentives	\$48,493	\$19,696	\$73,189

Total Project Cost		\$506,131	
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	Allowable Incentive	
% Incentives #1 of Utility Cost*	5.9%	\$5,000
% Incentives #2 of Project Cost**	6.7%	\$34,095
% Incentives #3 of Project Cost**	6.7%	\$34,095
Total Eligible Incentives***	\$73,189	
Project Cost w/ Incentives	\$432,942	

Project Payback (years)	
w/o Incentives	w/ Incentives
13.5	11.6

* Maximum allowable incentive is 50% of annual utility cost if not funded by NJ BPU, and %25 if it is.

** Maximum allowable amount of Incentive #2 is 25% of total project cost.

Maximum allowable amount of Incentive #3 is 25% of total project cost.

*** Maximum allowable amount of Incentive #1 is \$50,000 if not funded by NJ BPU, and \$25,000 if it is.

Maximum allowable amount of Incentive #2 & #3 is \$1 million per gas account and \$1 million per electric account; maximum 2 million per project

EXISTING CONDITIONS												RETROFIT CONDITIONS												COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures before the retrofit	Standard Fixture Code "Lighting Fixture Code" Example = 2x2' Troff 40 w Recess. Floor 2 40 R F(U)	Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exst Control [Pre-inst. control device	Annual Hours Estimated daily hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Number of Fixtures after the retrofit	Standard Fixture Code "Lighting Fixture Code" Example = 2x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Annual kWh Saved	Annual kWh Saved	Annual \$ Saved	Retrofit Cost Cost for renovations to lighting system	NJ Smart Start Lighting Incentive Prescriptive Lighting Measures	Simple Payback With Out Incentive Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered						
																		(Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual \$ Saved (KWh Saved) * (\$/KWh)										
25	Entrance Lobby	8	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.2	SW	8736	1,957	8	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.2	SW	8,736	1,957	- 0.0	\$ -	\$ -	\$0			#DIV/0!						
25	Elevator Lobby	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	SW	8736	2,691	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	SW	8,736	2,691	- 0.0	\$ -	\$ -	\$0			#DIV/0!						
32LED	Corridor	7	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	8736	3,669	7	4t LED Tube	200732x2	30	0.2	SW	8,736	1,835	1,835 0.2	\$ 226.36	\$ 1,635.90	\$245	7.2	6.1							
32LED	Corridor	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	8736	5,242	10	4t LED Tube	200732x2	30	0.3	SW	8,736	2,621	2,621 0.3	\$ 323.37	\$ 2,337.00	\$350	7.2	6.1							
32LED	Security Office	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4t LED Tube	200732x2	30	0.0	SW	4,368	131	131 0.0	\$ 18.32	\$ 233.70	\$35	12.8	10.8							
15LED	Electric Service Room	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	8736	1,572	3	4t LED Tube	200732x2	30	0.1	SW	8,736	786	786 0.1	\$ 97.01	\$ 701.10	\$105	7.2	6.1							
15LED	Janitor Room	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4t LED Tube	200732x2	30	0.0	SW	4,368	131	131 0.0	\$ 18.32	\$ 233.70	\$35	12.8	10.8							
15LED	Data Room	6	S 32 C F 2 (ELE)	F42LL	60	0.4	SW	8736	3,145	6	4t LED Tube	200732x2	30	0.2	SW	8,736	1,572	1,572 0.2	\$ 194.02	\$ 1,402.20	\$210	7.2	6.1							
58LED	Student Lounge	9	2T 17 R F 3 (ELE)	F231LL	47	0.4	SW	4368	1,848	9	2T 25 R LED	2011LED	25	0.2	SW	4,368	983	855 0.2	\$ 120.89	\$ 1,822.50	\$450	15.1	11.4							
15LED	Bedroom 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Bedroom 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Living Room 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4t LED Tube	200732x2	30	0.0	SW	4,368	131	131 0.0	\$ 18.32	\$ 233.70	\$35	12.8	10.8							
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87	1	2t LED Tube	200714x2	16	0.0	SW	4,368	70	17 0.0	\$ 2.44	\$ 191.70	\$35	78.5	64.2							
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87	1	2t LED Tube	200714x2	16	0.0	SW	4,368	70	17 0.0	\$ 2.44	\$ 191.70	\$35	78.5	64.2							
15LED	Computer Room	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	4368	786	3	4t LED Tube	200732x2	30	0.1	SW	4,368	393	393 0.1	\$ 54.95	\$ 701.10	\$105	12.8	10.8							
15LED	Bedroom 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Bedroom 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Living Room 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4t LED Tube	200732x2	30	0.0	SW	4,368	131	131 0.0	\$ 18.32	\$ 233.70	\$35	12.8	10.8							
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87	1	2t LED Tube	200714x2	16	0.0	SW	4,368	70	17 0.0	\$ 2.44	\$ 191.70	\$35	78.5	64.2							
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87	1	2t LED Tube	200714x2	16	0.0	SW	4,368	70	17 0.0	\$ 2.44	\$ 191.70	\$35	78.5	64.2							
15LED	Bedroom 104	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Bedroom 104	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Living Room 104	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4t LED Tube	200732x2	30	0.0	SW	4,368	131	131 0.0	\$ 18.32	\$ 233.70	\$35	12.8	10.8							
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87	1	2t LED Tube	200714x2	16	0.0	SW	4,368	70	17 0.0	\$ 2.44	\$ 191.70	\$35	78.5	64.2							
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87	1	2t LED Tube	200714x2	16	0.0	SW	4,368	70	17 0.0	\$ 2.44	\$ 191.70	\$35	78.5	64.2							
15LED	Bedroom 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Bedroom 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Living Room 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4t LED Tube	200732x2	30	0.0	SW	4,368	131	131 0.0	\$ 18.32	\$ 233.70	\$35	12.8	10.8							
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87	1	2t LED Tube	200714x2	16	0.0	SW	4,368	70	17 0.0	\$ 2.44	\$ 191.70	\$35	78.5	64.2							
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87	1	2t LED Tube	200714x2	16	0.0	SW	4,368	70	17 0.0	\$ 2.44	\$ 191.70	\$35	78.5	64.2							
15LED	Bedroom 109	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0	SW	2,856	86	86 0.0	\$ 13.46	\$ 233.70	\$35	17.4	14.8							
15LED	Bedroom 109	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4t LED Tube	200732x2	30	0.0																

EXISTING CONDITIONS											RETROFIT CONDITIONS											COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures before the retrofit	Standard Fixture Code "Lighting Fixture Code" Example 40 R F(U) = 2'x2' Troff 40 w Recess, Floor 2 lamps U shape	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control [Pre-inst. control device	Annual Hours Estimated daily hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Number of Fixtures after the retrofit	Standard Fixture Code "Lighting Fixture Code" Example 2'x2' R F(U) = 2'x2' Troff 40 w Recess, Floor 2 lamps U shape	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Annual kWh Saved	Annual kWh Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive Prescriptive Lighting Measures	Simple Payback With Out Incentive Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered				
																		(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kWh) - (Retrofit Annual kWh)	(KWh Saved) * (\$/KWh)	Cost for renovations to lighting system							
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
15LED	Bedroom 212	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Bedroom 212	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Living Room 212	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Restroom	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
32LED	3rd Floor Corridor	7	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	8736	3,669	7	4 f LED Tube	200732x2	30	0.2	SW	8,736	1,835	1,835	0.2	\$	226.36	\$	1,635.90	\$245	7.2	6.1		
32LED	3rd Floor Corridor	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	8736	5,242	10	4 f LED Tube	200732x2	30	0.3	SW	8,736	2,621	2,621	0.3	\$	323.37	\$	2,337.00	\$350	7.2	6.1		
25	3rd Floor Elevator Lobby	11	R13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	SW	8736	2,691	11	R13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	SW	8,736	2,691	-	0.0	\$	-	\$	-	\$0	#DIV/0!			
15LED	Bedroom 301	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Bedroom 301	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Living Room 301	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Restroom	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
15LED	Bedroom 302	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Bedroom 302	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Living Room 302	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Restroom	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
15LED	Bedroom 303	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Bedroom 303	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Living Room 303	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Restroom	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2		
15LED	Bedroom 304	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Bedroom 304	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Living Room 304	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8		
15LED	Restroom	1	S32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8		
220LED	Restroom	1	S17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70</					

EXISTING CONDITIONS												RETROFIT CONDITIONS												COST & SAVINGS ANALYSIS									
Area Description		No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kWh Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback	Simple Payback									
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/Space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 21 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * (\$/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered									
15LED	Bedroom 408	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Bedroom 408	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Living Room 408	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
15LED	Bedroom 409	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Bedroom 409	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Living Room 409	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
15LED	Bedroom 410	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Bedroom 410	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Living Room 410	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
15LED	Bedroom 411	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Bedroom 411	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Living Room 411	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
15LED	Bedroom 412	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Bedroom 412	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Living Room 412	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
15LED	Bedroom 501	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Bedroom 501	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Living Room 501	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4								
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5								
220LED	Restroom	1	S 17 C F 1 (ELE)	F21LL	20	0.0	SW	4368																									

				EXISTING CONDITIONS							RETROFIT CONDITIONS							COST & SAVINGS ANALYSIS								
Area Description		No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-Inst. control device	Estimated daily hours for the usage group	(kW/Space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * (\$/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
15LED	Bedroom 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Bedroom 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Living Room 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
15LED	Bedroom 605	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Living Room 605	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
15LED	Bedroom 606	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Living Room 606	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8
15LED	Bedroom 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Bedroom 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Living Room 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
15LED	Bedroom 608	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Living Room 608	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
15LED	Bedroom 609	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Bedroom 609	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Living Room 609	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
15LED	Bedroom 610	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Bedroom 610	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Living Room 610	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
15LED	Bedroom 611	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Bedroom 611	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Living Room 611	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	SW	2,856	86	86	0.0	\$	13.46	\$	233.70	\$35	17.4	14.8
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	SW	4,368	131	131	0.0	\$	18.32	\$	233.70	\$35	12.8	10.8
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	SW	4,368	70	17	0.0	\$	2.44	\$	191.70	\$35	78.5	64.2
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1																

EXISTING CONDITIONS										RETROFIT CONDITIONS										COST & SAVINGS ANALYSIS						
Field Code	Area Description	No. of Fixtures before the retrofit	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control	Annual Hours	Annual kWh	No. of Fixtures after the retrofit	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours	Annual kWh	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual \$ Saved (kW Saved) * (\$/kWh)	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Incentive	Simple Payback		
Unique description of the location - Room number/Room name: Floor number (if applicable)			Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages						"Lighting Fixture Code" Example 2T 40 R F(U) = 2x2' Troff 40 w Recess. Floor 2 lamps U shape					Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kW Saved) * (\$/kWh)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered		
25	Entrance Lobby	8	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.2	SW	8736	1,956.9	8	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.2	NONE	8736	1,956.9	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
25	Elevator Lobby	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	SW	8736	2,690.7	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	NONE	8736	2,690.7	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
32LED	Corridor	7	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	8736	3,669.1	7	1T 32 R F 2 (ELE)	F42LL	60	0.4	NONE	8736	3,669.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
32LED	Corridor	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	8736	5,241.6	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	NONE	8736	5,241.6	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
321LED	Security Office	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Electric Service Room	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	8736	1,572.5	3	S 32 C F 2 (ELE)	F42LL	60	0.2	NONE	8736	1,572.5	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Janitor Room	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Data Room	6	S 32 C F 2 (ELE)	F42LL	60	0.4	SW	8736	3,145.0	6	S 32 C F 2 (ELE)	F42LL	60	0.4	NONE	8736	3,145.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
58LED	Student Lounge	9	2T 17 R F 3 (ELE)	F231LL	47	0.4	SW	4368	1,847.7	9	2T 17 R F 3 (ELE)	F231LL	47	0.4	C-OC	3494.4	1,478.1	369.5	0.0	\$39.54	\$270.00	\$35.00	6.8	5.3		
151LED	Bedroom 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F211LL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Computer Room	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	4368	786.2	3	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OC	3494.4	629.0	157.2	0.0	\$16.83	\$270.00	\$35.00	16.0	14.0		
15LED	Bedroom 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
151LED	Living Room 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F211LL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F211LL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 104	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 104	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 104	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F211LL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F211LL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F211LL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F211LL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F211LL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 109	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 109	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 109	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60																					

EXISTING CONDITIONS										RETROFIT CONDITIONS										COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures before the retrofit	Standard Fixture Code Lighting Fixture Code	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control [Pre-inst. control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Number of Fixtures after the retrofit	Standard Fixture Code "Lighting Fixture Code" Example 2T 40 R F(U) = 2x2' Troff 40 w Recess. Floor 2 lamps U shape	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual \$ Saved (kW Saved) * (\$/kWh)	Retrofit Cost Cost for renovations to lighting system	NJ Smart Start Lighting Incentive	Simple Payback With Incentive Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 212	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 212	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 212	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
32LED	3rd Floor Corridor	7	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	8736	3,669.1	7	1T 32 R F 2 (ELE)	F42LL	60	0.4	NONE	8736	3,669.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
32LED	3rd Floor Corridor	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	8736	5,241.6	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	NONE	8736	5,241.6	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
25	3rd Floor Elevator Lobby	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	SW	8736	2,690.7	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	NONE	8736	2,690.7	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 301	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 301	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 301	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 302	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 302	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 302	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 303	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 303	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 303	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 304	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 304	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 304	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 305	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 305	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED																										

EXISTING CONDITIONS											RETROFIT CONDITIONS											COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures before the retrofit	Standard Fixture Code		Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control Pre-Inst. control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Number of Fixtures after the retrofit	Standard Fixture Code		Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual \$ Saved (kW Saved) * (\$/kWh)	Retrofit Cost Cost for renovations to lighting system	NJ Smart Start Lighting Incentive	Simple Payback With Incentive Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered		
			Lighting Fixture Code	Lighting Fixture Code								Lighting Fixture Code	Lighting Fixture Code														Example 21 40 R F(U) = 2x2' Troff 40 w Recess. Floor 2 lamps U shape	
15LED	Bedroom 408	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 408	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 408	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 409	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 409	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 409	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 410	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 410	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 410	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 411	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 411	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 411	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
32LED	5th Floor Corridor	7	1T 32 R F 2 (ELE)	F42LL	F42LL	60	0.4	SW	8736	3,669.1	7	1T 32 R F 2 (ELE)	F42LL	F42LL	60	0.4	NONE	8736	3,669.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
32LED	5th Floor Corridor	10	1T 32 R F 2 (ELE)	F42LL	F42LL	60	0.6	SW	8736	5,241.6	10	1T 32 R F 2 (ELE)	F42LL	F42LL	60	0.6	NONE	8736	5,241.6	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
25	5th Floor Elevator Lobby	11	R 13 C CF 2 (ELE)	CFQ132-L	CFQ132-L	28	0.3	SW	8736	2,690.7	11	R 13 C CF 2 (ELE)	CFQ132-L	CFQ132-L	28	0.3	NONE	8736	2,690.7	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 501	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 501	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Living Room 501	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1 (ELE)	F21ILL	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 502	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!		
15LED	Bedroom 502	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	F42LL	60													

Lighting Out		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures before the retrofit	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control	Annual Hours	Annual kWh (kW/Space) * (Annual Hours)	No. of fixtures after the retrofit	Standard Fixture Code Example 2'x 4' R F(U) Recess. Floor 2 lamps U shape	Fixture Code	Watts per Fixture	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours	Annual kWh (kW/Space) * (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual \$ Saved (kW Saved) * (\$/kWh)	Retrofit Cost Cost for renovations to lighting system	NJ Smart Start Lighting Incentive	Simple Payback Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 605	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 605	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 606	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 606	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 608	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 608	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 608	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 609	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 609	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 609	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 610	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 610	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 611	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 611	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 611	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87.4	1	S 17 C F 1(ELE)	F21ILL	20	0.0	NONE	4368	87.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 612	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Bedroom 612	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Living Room 612	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171.4	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	2856	171.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262.1	1	S 32 C F 2 (ELE)	F42LL	60	0.1	NONE	4368	262.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!

		EXISTING CONDITIONS										RETROFIT CONDITIONS										COST & SAVINGS ANALYSIS									
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exisit Control	Annual Hours	Annual kWh	No. of fixtures after the retrofit	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	Lighting Incentive	Simple Payback								
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-Inst. control device	Estimated daily hours for the usage group	(kW/Space) * (Annual Hours)	No. of fixtures after the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * (\$/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Simple Payback							
25	Entrance Lobby	8	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.2	SW	8736	1,957	8	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.2	NONE	8,736	1,957	- 0.0	\$ -	\$ -	\$ -										
25	Elevator Lobby	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	SW	8736	2,691	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	NONE	8,736	2,691	- 0.0	\$ -	\$ -	\$ -										
32LED	Corridor	7	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	8736	3,669	7	4 f LED Tube	200732x2	30	0.2	NONE	8,736	1,835	1,835	0.2	\$ 226.36	\$ 1,635.90	\$ 245	7.2	6.1							
32LED	Corridor	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	8736	5,242	10	4 f LED Tube	200732x2	30	0.3	NONE	8,736	2,621	2,621	0.3	\$ 323.37	\$ 2,337.00	\$ 350	7.2	6.1							
32LED	Security Office	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8							
15LED	Electric Service Room	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	8736	1,572	3	4 f LED Tube	200732x2	30	0.1	NONE	8,736	786	786	0.1	\$ 97.01	\$ 701.10	\$ 105	7.2	6.1							
15LED	Janitor Room	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8							
15LED	Data Room	6	S 32 C F 2 (ELE)	F42LL	60	0.4	SW	8736	3,145	6	4 f LED Tube	200732x2	30	0.2	NONE	8,736	1,572	1,572	0.2	\$ 194.02	\$ 1,402.20	\$ 210	7.2	6.1							
58LED	Student Lounge	9	2T 17 R F 3 (ELE)	F23ILL	47	0.4	SW	4368	1,848	9	2T 25 R LED	2011LED	25	0.2	C-OC	3,494	786	1,061	0.2	\$ 141.92	\$ 2,092.50	\$ 485	14.7	11.3							
15LED	Bedroom 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Bedroom 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Living Room 101	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8							
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2							
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2							
15LED	Computer Room	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	4368	786	3	4 f LED Tube	200732x2	30	0.1	C-OC	3,494	314	472	0.1	\$ 63.36	\$ 971.10	\$ 140	15.3	13.1							
15LED	Bedroom 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Bedroom 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Living Room 103	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8							
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2							
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2							
15LED	Bedroom 104	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Living Room 104	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8							
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2							
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2							
15LED	Bedroom 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Bedroom 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Living Room 105	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 f LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8							
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2							
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL	20	0.0	SW	4368	87	1	2 f LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2							
15LED	Bedroom 109	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Bedroom 109	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Living Room 109	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 f LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8							
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368																							

		EXISTING CONDITIONS										RETROFIT CONDITIONS										COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures before the retrofit	Standard Fixture Code		Fixture Code Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control (Pre-inst. control device)	Annual Hours Estimated daily hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Number of Fixtures after the retrofit	Standard Fixture Code Lighting Fixture Code	Fixture Code Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual \$ Saved (kWh Saved) * (\$/kWh)	Retrofit Cost Cost for renovations to lighting system	N3 Smart Start Lighting Incentive Prescriptive Lighting Measures	Simple Payback With Out Incentive Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered			
			Lighting Fixture Code	Standard Fixture Code																								
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
15LED	Bedroom 212	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Bedroom 212	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Living Room 212	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
32LED	3rd Floor Corridor	7	IT 32 R F 2 (ELE)	F42LL	F42LL	60	0.4	SW	8736	3,669	7	4 ft LED Tube	200732x2	30	0.2	NONE	8,736	1,835	1,835	0.2	\$ 226.36	\$ 1,635.90	\$ 245	7.2	6.1			
32LED	3rd Floor Corridor	10	IT 32 R F 2 (ELE)	F42LL	F42LL	60	0.6	SW	8736	5,242	10	4 ft LED Tube	200732x2	30	0.3	NONE	8,736	2,621	2,621	0.3	\$ 323.37	\$ 2,337.00	\$ 350	7.2	6.1			
25	3rd Floor Elevator Lobby	11	R 13 C CF 2 (ELE)	CFQ13/2-L	CFQ13/2-L	28	0.3	SW	8736	2,691	11	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.3	NONE	8,736	2,691	-	0.0	\$ -	\$ -	\$ -	-	-			
15LED	Bedroom 301	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Bedroom 301	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Living Room 301	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
15LED	Bedroom 302	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Bedroom 302	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Living Room 302	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
15LED	Bedroom 303	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Bedroom 303	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Living Room 303	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2			
15LED	Bedroom 304	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Bedroom 304	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Living Room 304	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8			
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8			
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.4							

EXISTING CONDITIONS										RETROFIT CONDITIONS										COST & SAVINGS ANALYSIS									
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures before the retrofit	Standard Fixture Code	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Pre-Inst. control device	Annual Hours Estimated daily hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Number of Fixtures after the retrofit	Standard Fixture Code	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/Space) * (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual \$ Saved (kWh Saved) * (\$/kWh)	Retrofit Cost Cost for renovations to lighting system	Prescriptive Lighting Measures	Simple Payback Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered			
15LED	Bedroom 408	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Bedroom 408	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Living Room 408	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	4368	262	1	4 fL LED Tube		200732x2	30	0.0	NONE	4,368	131	131.00	\$	18.32	\$	233.70	\$	35	12.8	10.8	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
15LED	Bedroom 409	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Bedroom 409	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Living Room 409	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	4368	262	1	4 fL LED Tube		200732x2	30	0.0	NONE	4,368	131	131.00	\$	18.32	\$	233.70	\$	35	12.8	10.8	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
15LED	Bedroom 410	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Bedroom 410	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Living Room 410	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	4368	262	1	4 fL LED Tube		200732x2	30	0.0	NONE	4,368	131	131.00	\$	18.32	\$	233.70	\$	35	12.8	10.8	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
15LED	Bedroom 411	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Bedroom 411	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Living Room 411	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	4368	262	1	4 fL LED Tube		200732x2	30	0.0	NONE	4,368	131	131.00	\$	18.32	\$	233.70	\$	35	12.8	10.8	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
15LED	Bedroom 412	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Bedroom 412	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Living Room 412	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	4368	262	1	4 fL LED Tube		200732x2	30	0.0	NONE	4,368	131	131.00	\$	18.32	\$	233.70	\$	35	12.8	10.8	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
15LED	Bedroom 501	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Bedroom 501	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Living Room 501	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	2856	171	1	4 fL LED Tube		200732x2	30	0.0	NONE	2,856	86	86.00	\$	13.46	\$	233.70	\$	35	17.4	14.8	
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL		60	0.1	SW	4368	262	1	4 fL LED Tube		200732x2	30	0.0	NONE	4,368	131	131.00	\$	18.32	\$	233.70	\$	35	12.8	10.8	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	191.70	\$	35	78.5	64.2	
220LED	Restroom	1	S 17 C F 1 (ELE)	F21ILL		20	0.0	SW	4368	87	1	2 fL LED Tube		200714x2	16	0.0	NONE	4,368	70	17.00	\$	2.44	\$	1					

		EXISTING CONDITIONS										RETROFIT CONDITIONS										COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Incentive	Simple Payback					
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/Space) * (Annual Hours)	No. of fixtures after the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * (\$/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Simple Payback				
	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2				
15LED	Bedroom 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Bedroom 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Living Room 604	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8				
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2				
220LED	Restroom	1	S 17 C F 1(ELE)	F21ILL	20	0.0	SW	4368	87	1	2 ft LED Tube	200714x2	16	0.0	NONE	4,368	70	17	0.0	\$ 2.44	\$ 191.70	\$ 35	78.5	64.2				
15LED	Bedroom 605	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Bedroom 605	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Living Room 605	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
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15LED	Bedroom 606	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Living Room 606	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Restroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	4368	262	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,368	131	131	0.0	\$ 18.32	\$ 233.70	\$ 35	12.8	10.8				
15LED	Bedroom 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Bedroom 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
15LED	Living Room 607	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
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15LED	Bedroom 608	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
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15LED	Bedroom 609	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2856	171	1	4 ft LED Tube	200732x2	30	0.0	NONE	2,856	86	86	0.0	\$ 13.46	\$ 233.70	\$ 35	17.4	14.8				
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220LED																												

APPENDIX D

New Jersey Board of Public Utilities Incentives

- i. Smart Start**
 - ii. Direct Install**
 - iii. Pay for Performance (P4P)**
 - iv. Energy Savings Improvement Plan (ESIP)**
-

I. SMART START



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SBC CREDIT PROGRAM



With New Jersey SmartStart Buildings ...

... A smart start now means better performance later! Whether you're starting a commercial or industrial project from the ground up, renovating existing space, or upgrading equipment, there are unique opportunities to upgrade the energy efficiency of the project.

Special Notice

Enhanced incentives are available for NJ SmartStart Building upgrades in buildings impacted by Hurricane Sandy. Eligible projects receive an additional 50% and new incentives have been added for high efficiency food service equipment.

Visit the Sandy web page for details and important links.

New Jersey SmartStart Buildings can provide a range of support — at no cost to you — for substantial energy savings, both now and for the future. Learn more about:

[Project Categories](#)

[Custom Measures](#)

[Incentives for Qualifying Equipment and Projects](#)

[Program Terms and Conditions](#)

[Find a Trade Ally](#)

Please note: pre-approval is required for almost all energy efficiency incentives. To receive an incentive, you must submit an application form (and applicable worksheets) and receive an approval letter from the program before any equipment is installed (click here for complete Terms and Conditions). Upon receipt of an approval letter, you may proceed to install the equipment listed on your approved application. Equipment installed prior to the date of the approval letter is not eligible for an incentive. **Any customer and/or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Getting Started

Submit your project application form as soon as you know you will be doing a construction project or replacing/adding equipment.

PAST PROGRAMS**TOOLS AND RESOURCES****PROGRAM UPDATES****CONTACT US**

Apply for pre-approval by submitting an application for the type of equipment you have or plan to install. The application should be accompanied by a related worksheet, where applicable, manufacturer's specification sheet (refer to the specific program requirements on the background application for specs needed for your project) for the equipment you are planning to install. (Program representatives will review your application package and approve it, reject it, or advise you of upgrades in equipment that will save energy costs and/or increase your incentive.)

Support for Custom Energy-Efficiency Measures

Custom measures allows program participants the opportunity to receive an incentive for energy-efficiency measures that are not on the prescriptive equipment Incentive list, but are project/facility specific.

Incentives for Qualifying Equipment and Projects

Financial incentives are available for large and small projects. These incentives offset some or maybe even all! — of the added cost to purchase qualifying energy-efficient equipment, and provides significant long-term energy savings. Ranges of incentives are available for qualifying equipment (depending on type, size, and efficiency) in several categories.

Find out more about equipment incentives

For specific details on equipment requirements and financial incentives, including incentives for equipment not listed here, contact a program representative. Fiscal year financial incentives will be limited to a maximum of \$500,000 per customer utility account and are available as long as permits are obtained.

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Equipment Incentives

Special Notice

Enhanced incentives are available for NJ SmartStart Building upgrades in buildings impacted by Hurricane Sandy. Eligible projects receive an additional 50% and new incentives have been added for high efficiency food service equipment.

Visit the Sandy web page for details and important links.

More reasons for a smart start on your next project!

New Jersey SmartStart Buildings provides **financial incentives for qualifying equipment**. These incentives were developed to help our customers offset some of the added cost to purchase qualifying energy-efficient equipment, which provides significant long-term energy savings. A wide range of incentives are available for qualifying equipment (depending on type, size and efficiency).

Listed below are the types of qualifying equipment and ranges of incentives. For details on equipment requirements and full listings of incentives, refer to the **online application forms**.

Please note that almost all equipment incentives require pre-approval before equipment is installed. (click for exceptions) To start the pre-approval process, submit an Equipment Application, and appropriate Equipment Worksheets, for the type of equipment you are planning to install along with equipment specification sheets (refer to the specific program requirements on the back of the application for specific details needed for your project) and a current utility bill(s).

In order to be eligible to receive financial incentives under this Program, Applicants must receive electric and/or gas service from one of the regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.



Electric Chillers

Water-cooled chillers (\$12 - \$170 per ton)
Air-cooled chillers (\$8 - \$52 per ton)

Gas Cooling

Gas absorption chillers (\$185-\$450 per ton)
Gas Engine-Driven Chillers (Calculated through Custom Measure F)

PAST PROGRAMS**TOOLS AND RESOURCES****PROGRAM UPDATES****CONTACT US****Desiccant Systems** (\$1.00 per cfm - gas or electric)**Electric Unitary HVAC**

Unitary AC and split systems (\$73 - \$92 per ton)
 Air-to-air heat pumps (\$73 - \$92 per ton)
 Water-source heat pumps (\$81 per ton)
 Packaged terminal AC & HP (\$65 per ton)
 Central DX AC Systems (\$40 - \$72 per ton)
 Dual Enthalpy Economizer Controls (\$250)
 Occupancy Controlled Thermostats (\$75 each)
 A/C Economizing Controls (\$85 - \$170 each)

Ground Source Heat Pumps

Closed Loop (\$450-750 per ton)

Gas Heating

Gas-fired boilers < 300 MBH (\$300 per unit)
 Gas-fired boilers ≥ 300 MBH - 1500 MBH (\$1.75 per MBH)
 Gas-fired boilers ≥ 1500 MBH - ≤ 4000 MBH (\$1.00 per MBH)
 Gas-fired boilers > 4000 MBH (Calculated through Custom Measure)
 Gas furnaces (\$300-\$400 per unit)
 Gas infrared heaters - indoor only (\$300 - \$500 per unit)
 Boiler economizing controls (\$1,200 - \$2,700 per unit)

Variable Frequency Drives

Variable air volume (\$65 - \$155 per hp)
 Chilled-water pumps (\$60 per hp)
 Compressors (\$5,250 to \$12,500 per drive)

Natural Gas Water Heating

Gas water heaters ≤ 50 gallons (\$50 per unit)
 Gas-fired water heaters > 50 gallons (\$1.00 - \$2.00 per MBH)
 Tankless water heaters replacing a free standing water heater > 82 energy factor (\$300 per heater)
 Gas-fired booster water heaters (\$17 - \$35 per MBH)

Premium Motors

Three-phase motors (\$45 - \$700 per motor) (**Incentive was discontinued effective March 1, 2013 except for buildings impacted by Hurricane Sandy. Approved applications will have the standard timeframe from the program commitment date to complete the installation.**)

Refrigerator/Freezer Case Premium Efficiency Motors (ECM)

Fractional (< 1 HP) Electronic Commutated Motors (ECM) (\$40 per for replacement of existing shaded-pole motor in refrigerated/freezer case)

Prescriptive Lighting

New Linear Fluorescent

T-12, HID and Incandescent to T-5 and T-8 (\$25 - \$200 per fixture) (**Note: T12 replacements are only available for buildings impacted by Hurricane Sandy**)

New Induction (\$70 per replaced HID fixture)

New LED

Screw-in/Plug-in (\$10 - \$20 per lamp)

Refrigerator/Freezer Case (\$30 - \$65 per fixture)

Outdoor pole/arm/wall-mounted luminaires (\$100 - \$175 per fixture)

Display case (\$30 per case)

Shelf-mounted display and task (\$15 per linear foot)

Wall-wash, desk, recessed (\$20 - \$35 per fixture)

Parking garage luminaires (\$100 per fixture)

Track or Mono-Point directional (\$50 per fixture)

Stairwell and Passageway luminaires (\$40 per fixture)

High-Bay, Low-Bay (\$150 per fixture)

Bollard (\$50 per fixture)

Luminaires for Ambient Lighting of Interior Commercial Space
Linear panels (\$50 per fixture)

Fuel pump canopy (\$100 per fixture)

LED retrofit kits (custom measures)

New Pulse-Start Metal Halide (\$25 per fixture)

Linear Fluorescent Retrofit (\$10 - \$20 per fixture)

Induction Retrofit (\$50 per retrofitted HID fixture)

New Construction/Complete Renovation (performance-based)

Note: Incentives for T-12 to T-5 and T-8 lamps with electronic ballast in facilities (\$10 per fixture, 1-4 lamps) and T-5/T-8 high bay fixtures (\$16 - per fixture) were discontinued effective March 1, 2013 for T-12 retrofits replacements except for buildings impacted by Hurricane Sandy. Approved applications will have the standard timeframe of one year from the project commitment date to complete the installation

Lighting Controls

Occupancy Sensors

Wall mounted (\$20 per control)

Remote mounted (\$35 per control)

Daylight dimmers (\$25 per fixture controlled, \$50 per fixture for office applications only)

Occupancy controlled hi-low fluorescent controls (\$25 per fixture controlled)

HID or Fluorescent Hi-Bay Controls

Occupancy hi-low (\$35 per fixture controlled)

Daylight dimming (\$45 per fixture controlled)

Refrigeration

Covers and Doors

Energy-Efficient doors for open refrigerated doors/covers (\$100 per door)

Aluminum Night Curtains for open refrigerated cases (\$3.50 per linear foot)

Controls

Door Heater Control (\$50 per control)

Electric Defrost Control (\$50 per control)

Evaporator Fan Control (\$75 per control)

Novelty Cooler Shutoff (\$50 per control)

Food Service Equipment

Cooking

Combination Electric Oven/Steamer (\$1,000 per oven)
 Combination Gas Oven/Steamer (\$750 per oven)
 Electric Convection Oven (\$350 per oven)
 Gas Convection Oven (\$500 per oven)
 Gas Rack Oven (\$1,000 single, \$2,000 double)
 Gas Conveyor Oven (\$500 small deck, \$750 large deck)
 Electric Fryer (\$200 per vat)
 Gas Fryer (\$749 per vat)
 Electric Large Vat Fryer (\$200 per vat)
 Gas Large Vat Fryer (\$500 per vat)
 Electric Griddle (\$300 per griddle)
 Gas Griddle (\$125 per griddle)
 Electric Steam Cooker (\$1,250 per steamer)
 Gas Steam Cooker (\$2,000 per steamer)

Holding

Full Size Insulated Cabinets (\$300 per cabinet)
 Three Quarter Size Insulated Cabinets (\$250 per cabinet)
 Half Size Insulated Cabinets (\$200 per cabinet)

Cooling

Glass Door Refrigerators (\$75 - \$150 per unit)
 Solid Door Refrigerators (\$50 - \$200 per unit)
 Glass Door Freezers (\$200 - \$1,000 per unit)
 Solid Door Freezers (\$100 - \$600 per unit)
 Ice Machines (\$50 - \$500 per unit)

Cleaning

Dishwashers (\$400 - \$1,500 per unit)

Other Equipment Incentives*

Performance Lighting (\$1.00 per watt per square foot below program incentive threshold, currently 5% more energy efficient than ASHRAE 2007 for New Construction only.)

Custom electric and gas equipment incentives (not prescriptive)

*Equipment incentives are calculated based on type, efficiency, size, and application and are evaluated on a case-by-case basis. Contact us for details.

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II. DIRECT INSTALL



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NEW JERSEY'S CLEAN ENERGY PROGRAM

DIRECT Install

Let us pay up to 70% of your energy efficiency upgrade.

Sometimes, the biggest challenge to improving energy efficiency is knowing where to and how to get through the process. Created specifically for existing small to medium facilities, Direct Install is a turnkey solution that makes it easy and affordable to upgrade high efficiency equipment. Direct Install is designed to cut your facility's energy costs replacing lighting, HVAC and other outdated operational equipment with energy efficient alternatives. The program pays up to 70% of retrofit costs, dramatically improving your payback on the project. There is a \$125,000 incentive cap on each project.

ELIGIBILITY



Existing small to mid-sized commercial and industrial facilities with a peak electric demand that did not exceed 200 kW in any of the preceding 12 months are eligible to participate in Direct Install. Applicants will submit the last 12 months of electric utility bills indicating that they are below the demand threshold and have occupied the building during that time. Buildings must be located in New Jersey and served by the state's public, regulated electric or natural gas utility companies.

SYSTEMS & EQUIPMENT ADDRESSED BY THE PROGRAM

Lighting
Heating, Cooling & Ventilation (HVAC)
Refrigeration
Motors
Natural Gas
Variable Frequency Drives



Measures eligible for Direct Install are limited to specific equipment categories, types and capacities. Boilers may not exceed 500,000 Btuh and furnaces may not exceed 140,000 Btuh.

III. PAY FOR PERFORMANCE (P4P)



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APPLICATIONS AND
FORMS

APPROVED PARTNERS

NEW CONSTRUCTION

FAQS

BECOME A PARTNER

COMBINED HEAT & POWER AND
FUEL CELLSLOCAL GOVERNMENT ENERGY
AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT
PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

[Home](#) » [Commercial & Industrial](#) » [Programs](#) » [Pay for Performance](#)

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

Take a comprehensive, whole-building approach to saving energy in your existing facility. Earn incentives that are directly linked to your savings. Pay for Performance relies on a



program partners who provide technical services under direct contract to you. Acting as your energy expert, your partner will develop a whole-building energy reduction plan for each project with a whole-building technical component of a traditional energy audit, a financial plan for full implementation of energy efficient measures and a construction schedule for installation.

Eligibility

Existing commercial, industrial and institutional buildings with a peak demand over 100 kW for any of the preceding twelve months are eligible to participate including hotels and casinos, large office buildings, family buildings, supermarkets, manufacturing facilities, schools, shopping malls and restaurants. Buildings that fall into the following customer classes are not required to meet the 100 kW demand threshold to participate in the program: hospitals, public colleges and universities, 501(c)(3) non-profit organizations, affordable multifamily housing, and local governmental entities. Your energy reduction plan will define a comprehensive package of measures capable of reducing the existing energy consumption of your building by 15% or more.

Exceptions to the 15% threshold requirement may be made for certain industrial, manufacturing, water treatment and datacenter building types whose annual energy consumption is heavily weighted on process loads. Details are available in the high energy intensity section of this page.

ENERGY STAR Portfolio Manager

Pay for Performance takes advantage of the ENERGY STAR Program with Portfolio Manager, EPA's interactive tool that allows facility managers to track and evaluate energy and water consumption across all of their buildings. The tool provides the opportunity to load in the characteristics and energy usage of your buildings and determine an energy performance benchmark score. You can then assess energy management goals over time, identify strategic opportunities for savings, and receive EPA recognition for superior energy performance.



This rating system assesses building performance by tracking and scoring energy use in your facilities and comparing it to similar buildings. That can be a big help in locating opportunities for cost-justified energy efficiency upgrades. And, based on our findings, you may be invited to participate in the Building Performance with ENERGY STAR initiative and receive special recognition as an industry leader in energy efficiency.

Incentives

**OIL, PROPANE & MUNICIPAL
ELECTRIC CUSTOMERS**

Pay for Performance incentives are awarded upon the satisfactory completion of three p milestones:

EDA PROGRAMS

Incentive #1 - Submittal of complete energy reduction plan prepared by an app program partner - Contingent on moving forward, incentives will be between \$5 \$50,000 based on approximately \$.10 per square foot, not to exceed 50% of th annual energy expense.

SBC CREDIT PROGRAM

Incentive #2 - Installation of recommended measures - Incentives are based on the projected level of electricity and natural gas savings resulting from the installation of comprehensive energy-efficiency measures.

PAST PROGRAMS

TOOLS AND RESOURCES

Incentive #3 - Completion of Post-Construction Benchmarking Report - A completed report verifying energy reductions based on one year of post-

PROGRAM UPDATES

implementation results. Incentives for electricity and natural gas savings will be based on actual savings, provided that the minimum performance threshold of savings has been achieved.

CONTACT US



A detailed Incentive Structure document is available on the applications and form

Steps to Participation

[Click here](#) for a step-by-step description of the program.

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PAY FOR PERFORMANCE APPLICATION FORM

July 1, 2013 - June 30, 2014

Utility Serving Applicant: ☐ Atlantic City Electric ☐ Jersey Central Power & Light ☐ PSE&G
☐ New Jersey Natural Gas ☐ Elizabethtown Gas ☐ Rockland Electric Co. ☐ South Jersey Gas
☐ Other Electric Service Provider (please specify): _____
☐ Other Fuel Provider: _____ ☐ Oil: _____ ☐ Other (Please specify): _____

Instructions

1. Read the program material to determine project qualification.
2. Read the Participation Agreement and sign where indicated.
3. Fill out all applicable spaces on this form.
4. Provide a copy of the customer's company W-9 form.
5. Provide the most recent consecutive 12 month period of utility bills for the project.

6. Provide brief description of facility.
7. Partner must submit the application package via e-mail, mail or fax DIRECTLY to the Market Manager – see back of this form.

Approval of this Application is not an approval of the project's scope of work. Scope of work is only approved upon approval of the Energy Reduction Plan. See application and program guidelines for more information.

Customer/Owner Information (payment will be made to entity entered here)

Company Name		Project Contact/Title	
Company Address		City	State Zip
Phone/Fax	E-mail	Federal ID/SSN	

Partner Information

Company Name		Project Contact/Title	
Company Address		City	State Zip
Phone	Fax	E-mail	

Project Information

Project Name			
Building Address		City	State Zip
Utility Account Number(s): Electric		Gas	
* Note: Please use the back of this page for additional utility accounts if quantity exceeds space allotment.			
Annual Peak kW Demand	Building Type		Number of Buildings
Size of Building(s) (gross sq/ft)		Direct, Master or Sub Metered	

Funding

☐ Check the box if an Energy Savings Improvement Program (ESIP) will be a source of funding. ESIP allows government agencies to pay for energy related improvements using the value of the resulting energy savings.

Do you expect to receive funding under any other efficiency programs? ☐ No ☐ Yes If Yes, please specify below:

Utility Program #1 – Utility: _____	Program Name: _____
Utility Program #2 – Utility: _____	Program Name: _____
Federal Program #1 – Organization: _____	Program Name: _____
Federal Program #2 – Organization: _____	Program Name: _____
Other Program – Organization: _____	Program Name: _____

Additional Project information

Additional Utility Account(s)

Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number

Additional Comments:

Complete this application form and send it directly to the Commercial/Industrial Market Manager by e-mail, mail or fax.

New Jersey's Clean Energy Program
c/o TRC Energy Services-P4P
900 Route 9 North, Suite 404 • Woodbridge, NJ 07095

Phone: 866-657-6278 • Fax: 732-855-0422
E-mail: P4P@NJCleanEnergy.com

Visit our website: NJCleanEnergy.com/P4P

New Jersey SmartStart Buildings[®] is a registered trademark. Use of the mark without the permission of the New Jersey Board of Public Utilities, Office of Clean Energy is prohibited.

*Incentives/Requirements subject to change.



002-FY14-04/14

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

Design Incentives – Incentives that may be offered to design professionals by the Program.

Design Services – Services that may be offered to design professionals under the Program.

Energy-Efficient Measures – Any device eligible to receive a Program Incentive payment through the NJ Clean Energy Commercial and Industrial Program (New Jersey SmartStart Buildings).

New Jersey Utilities – The regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

Administrator – New Jersey Board of Public Utilities, Office of Clean Energy

Participating Customers – Those non-residential electric and/or gas service customers of the New Jersey Utilities who participate in this Program.

Product Installation or Equipment Installation – Installation of the Energy-Efficient Measures.

Projects with a contract threshold of \$14,187 (increasing to \$15,444 effective July 1, 2014) are required to pay no less than prevailing wage rate to workers employed in the performance of any construction undertaken in connection with Board of Public Utilities financial assistance, or undertaken to fulfill any condition of receiving Board of Public Utilities financial assistance, including the performance of any contract to construct, renovate or otherwise prepare a facility, the operations of which are necessary for the receipt of Board of Public Utilities financial assistance. By submitting an application, or accepting program incentives, applicant agrees to adhere to New Jersey Prevailing Wage requirements, as applicable.

Program – The Commercial and Industrial Energy-Efficient Construction Program (New Jersey SmartStart Buildings) offered herein by the New Jersey Board of Public Utilities, Office of Clean Energy pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq.

Program Incentives – Refers to the amount or level of incentive that the Program provides to Participating Customers pursuant to the Program offered herein (see description under "Incentive Amount" heading).

Program Offer – Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities identified above.

Program Manager – TRC Energy Services.

Application and Eligibility Process – The Program pays incentives after the installation of qualified energy-efficient

measures that were pre-approved (for exceptions to this condition, please refer to "Exceptions for Approval".) In order to be eligible for Program Incentives, a Customer, or an agent (contractor/vendor) authorized by a Customer, must submit a properly completed application package. The package must include an application signed by the customer; a complete (current) utility bill; and technology worksheet and manufacturer's cut sheets (where appropriate). This information must be submitted to the Program Manager before equipment is installed. Applications for measures that are self installed by customers must be submitted by the customer and not the sales vendor of the measure, however, the customer may elect to assign payment of the incentive to the sales vendor. This application package must be received by the Program Manager on or before June 30, 2014 in order to be eligible for the fiscal year July 1, 2013-June 30, 2014 incentives. The Program Manager will review the application package to determine if the project is eligible for a Program Incentive. If eligible, the Customer will receive an approval letter with the estimated authorized incentive amount and the date by which the equipment must be installed in order for the approval to remain in effect. Upon receipt of an approval letter, the Customer may then proceed to install the equipment listed on the approved application. Equipment installed prior to the date of the Program Manager's approval letter is not eligible for an incentive. The Program Manager reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the approval letter. All equipment must be purchased within 12 months of date of application. **Any Customer and/or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Exceptions for Approval – The Application and Eligibility Process pertains to all projects except for those involving either Gas Heating, Unitary HVAC or Motors having an incentive amount less than \$5,000 that were installed within 12 months of receipt of the application. These measures, at this incentive level, may be installed without prior approval. In addition, but at the sole discretion of the Program Manager, emergency replacement of equipment may not require a prior approval determination and letter. **In such cases, please notify the Program Manager of such emergencies as early as possible, that an application will soon be sent in that was not pre-approved.**

Post-Installation Approval – After installation is completed, the Customer, or an agent authorized by the Customer, must finalize and submit an invoice for the purchase of the equipment (material cost must be broken out from labor costs), and any other required documentation as specified on the equipment application or in the Program Manager's initial approval letter.

Please refer to the program guide on the NJCleanEnergy.com/ssb website for the complete Application and Eligibility Process.

The Program Manager reserves the right to verify sales transactions and to have reasonable access to Participating Customer's facility to inspect both pre-existing product or equipment (if applicable) and the Energy-Efficient Measures

installed under this Program, either prior to issuing incentives or at a later time.

Energy-Efficient Measures must be installed in buildings located within a New Jersey Utilities' service territory and designated on the Participating Customer's incentive application. Program Incentives are available for qualified Energy-Efficient Measures as listed and described in the Program materials and incentive applications. The Participating Customer must ultimately own the equipment, either through an up-front purchase or at the end of a short-term lease. Design Incentives are available to design professionals as described in the Program materials and applications. A different and separate agreement must be executed by participating design professionals to be eligible for this type of incentive. The design professional does not need to be based in New Jersey.

Equipment procured by Participating Customers through another program offered by New Jersey's Clean Energy Program or the New Jersey Utilities, as applicable, is not eligible for incentives through this program. Customers who have not contributed to the Societal Benefits Charge of the applicable New Jersey Utility are not be eligible for incentives offered through this program.

Incentive Amount – Program Incentives will equal either: a) the approved Program Incentive amount, or b) the actual equipment cost of the Energy-Efficient Measure, whichever is less, as determined by the Program Manager. Products offered at no direct cost to the customer are ineligible. Incomplete application submissions, applications requiring inspections and unanticipated high volume of activities may cause processing delays. Program Incentives are limited to \$500,000 per utility account in a calendar year. Contact the Program Manager regarding any questions.

Tax Liability – The Program Manager will not be responsible for any tax liability that may be imposed on any Participating Customer as a result of the payment of Program Incentives. All Participating Customers must supply their federal tax identification number or social security number to the Program Manager on the application form in order to receive a Program Incentive. In addition, Participating Customers must also provide a Tax Clearance Form (entitled "Business Assistance or Incentive Clearance Certificate") that is dated within 90 days of equipment installation.

Endorsement – The Program Manager and Administrator do not endorse, support or recommend any particular manufacturer, product or system design in promoting this Program.

Warranties – THE PROGRAM MANAGER AND ADMINISTRATOR DO NOT WARRANT THE PERFORMANCE OF INSTALLED EQUIPMENT, AND/OR SERVICES RENDERED AS PART OF THIS PROGRAM, EITHER EXPRESSLY OR IMPLICITLY. NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING EQUIPMENT OR SERVICES PROVIDED BY A MANUFACTURER OR VENDOR. CONTACT YOUR VENDOR/SERVICES PROVIDER FOR DETAILS REGARDING PERFORMANCE AND WARRANTIES.

Limitation of Liability – By virtue of participating in this Program, Participating Customers agree to waive any and all claims or damages against the Program Manager or the Administrator, except the receipt of the Program Incentive. Participating Customers agree that the Program Manager's and Administrator's liability, in connection with this Program, is limited to paying the Program Incentive specified. Under no circumstances shall the Program Manager, its representatives, or subcontractors, or the Administrator, be liable for any lost profits, special, punitive, consequential or incidental damages or for any other damages or claims connected with or resulting from participation in this Program. Further, any liability attributed to the Program Manager under this Program shall be individual, and not joint and/or several.

Assignment – The Participating Customer may assign Program Incentive payments to a specified vendor.

Participating Customer's Certification – Participating Customer certifies that he/she purchased and installed the equipment listed in their application at their defined New Jersey location. Participating Customer agrees that all information is true and that he/she has conformed to all of the Program and equipment requirements listed in the application.

Termination – The New Jersey Board of Public Utilities reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this Program without prior or further notice.

Acknowledgement – I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Program Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the NJ SmartStart Buildings Program. Additionally, I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of New Jersey's Clean Energy Program.

CUSTOMER'S SIGNATURE
PARTNER SIGNATURE
By signing, I certify that I have read, understand and agree to the Participation Agreement listed above.

IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)



Your Power to Save

At Home, for Business, and for the Future

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HOME

RESIDENTIAL

COMMERCIAL, INDUSTRIAL
AND LOCAL GOVERNMENT

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND
FUEL CELLSLOCAL GOVERNMENT ENERGY
AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT
PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL
ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

PAST PROGRAMS

TOOLS AND RESOURCES

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Energy Savings Improvement Program

A new State law allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. Under Chapter 4 of the Laws of 2009 (the law), the "Energy Savings Improvement Program" (ESIP), provides all government agencies in New Jersey with a flexible tool to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. The program also allows agencies to reduce energy usage with minimal expenditure of new financial resources.

This Local Finance Notice outlines how local governments can develop and implement an ESIP at their facilities. Below are two sample RFPs:

Local Government
School Districts (K-12)

All RFPs must be submitted to the Board for approval at ESIP@bpu.state.nj.us.

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings
Procedures for Implementation

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs. Local units considering an ESIP should carefully review the Local Finance Notice, the law, and consult with qualified professionals to determine how they should approach the task.

The NJ Board of Public Utilities sponsored Sustainable Jersey in the creation of an ESIP Guidebook that explains how to implement the program. The guidebook also includes a list of successful projects and a list of helpful resources.

FIRST STEP – ENERGY AUDIT

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit as prescribed in P.L.2012 c.55.

ENERGY REDUCTION PLANS

If you have an ESIP plan that needs to be submitted to the Board of Public Utilities, please email it to ESIP@bpu.state.nj.us. Please limit the file size to 3MB (or break it into smaller files).

Frankford Township School District
Northern Hunterdon-Voorhees Regional High School
Manalapan Township (**180 MB** - Right Click, Save As)

ESIP PROGRAM

Final version 42413

BPU RULES

1. Public Entity must decide if they will use an ESCO or DIY method or Hybrid thereof prior to issuing the RFP and the RFP must state the intended method. A change in the project procurement model after the RFP closing date will be cause for immediate rejection and disqualification of potential Clean Energy program incentives.
2. RFP procedures shall be adhered to as per the legislation, including the use of BPU approved forms. Any alteration of the forms, without prior approval from the BPU shall be grounds for rejection.
3. RFP must include copy of an audit (ASHRAE Level II w/Level III for lighting) and audit must be prepared by a firm classified by DPMC in the 036 discipline.
4. All firms, including professional services, whether using ESCO or DIY model, must be DPMC classified.
5. If an Architect is engaged by the public entity, the architectural fees are the responsibility of the public entity and must be paid directly to the firm. These fees may be included in the energy cost savings analysis and payback.

ESCO's may contract directly with an architectural firm, in which case the architectural firm serves as a subcontractor to the ESCO and the project related service costs may be included within the project's economic model.

6. Public entity shall conduct pre-bid meetings and site visits per existing statutes.

In the interest of open public bidding transparency, it is a requirement of the BPU that all proposers must attend the pre-proposal bid meeting.

7. There shall be no negative cash flow in any year of the program.
section 7 (1)(a)
"the energy savings resulting from the program will be sufficient to cover the cost of the program's energy conservation measures."
8. SREC values are not permitted to be used in the energy cost savings calculations.
9. Capital cost avoidance values are not to be used in the energy savings calculations.
10. Operational and Maintenance (O&M) cost savings may be permitted in the cost savings calculations, but only with supporting documentation.
11. Blended utility rates shall not be permitted. Use the actual utility tariff or local contracted rates if there is a third party supplier.

For the RFP proposals, the public entity shall define the utility rates in the RFP

12. Contracted third party utility rates may only be used for the term of the contract (5 yr. maximum)
Subsequent years are to be projected at the utility tariff rates plus the annual BPU escalation rates.
13. Public entity shall conduct M&V (measurement and verification) at the one (1) year operational date and shall provide a copy of the M&V report to the Board of Public Utilities.

For the RFP proposals, the ESCO shall provide the cost for the one (1) year M&V only. For comparative purposes, the one year M&V pricing shall be indicated on the proposal Form VI, under the “Annual Service Costs” column. Additional M&V costs are at the discretion of the local unit and are not to be included in the proposal.

14. The decisions made by BPU staff regarding compliance or other issues that arise in connection with the RFP procurement process shall be considered a final decision of the BPU. Any appeal will need to be through the New Jersey Superior Court, Appellate Division.
15. For the RFP proposals only, Demand Response (DR) revenues claimed by ESCO’s can only be projected for a maximum period of three (3) years. DR revenue projections beyond three years will not be permitted. DR revenues must be included and presented under the “Energy Rebates/Incentives” column of FORM VI.
16. ESCO “fees” proposed during the RFP phase of the project cannot increase post-award. ESCO’s are required to maintain the fee percentages through final contract negotiations and construction of the Board approved Energy Savings Plan
17. Public Bid openings shall be held on the due date of the proposal submissions. The public entity shall announce the name of the bidder and the total dollar amount. After award of a contract, all proposals received will be made available by the owner for public inspection
18. Rejection of bids by the public entity shall be conducted in accordance with the appropriate sections of the applicable legislation, as stated in Title 40A:11-13.2. Additionally all proposals must be returned to the respective ESCO’s upon rejection.
19. Field changes that exceed 5% of the project cost require BPU approval.
20. Energy Savings Plans (ESP) that is dependent upon incentives from the Clean Energy Program must review the current program requirements, at the time of application, for each incentive to insure eligibility. If any program incentive is denied, resubmission of all ESIP related forms will be necessary to remain ESIP qualified.

APPENDIX E

Photovoltaic Analysis

Photovoltaic (PV) Solar Power Generation - Screening Assessment

William Patterson University
Heritage Hall

Cost of Electricity	\$0.151	/kWh
Electricity Usage	401,000	kWh/yr
System Unit Cost	\$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary	Annual Utility Savings				Estimated	Total		New Jersey	Payback	Payback
Cost					Maintenance	Savings	Federal Tax	Renewable	(without	(with
					Savings		Credit	** SREC	incentive)	incentive)
\$	kW	kWh	therms	\$	\$	\$	\$	\$	Years	Years
\$120,000	30.0	35,848	0	\$5,413	0	\$5,413	\$0	\$6,273	22.2	10.3

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= \$175 /1000kwh

Area Output*
957 m2
10,298 ft2

Perimeter Output*
148 m
486 ft

Available Roof Space for PV:
(Area Output - 10 ft x Perimeter) x 85%
4,624 ft2

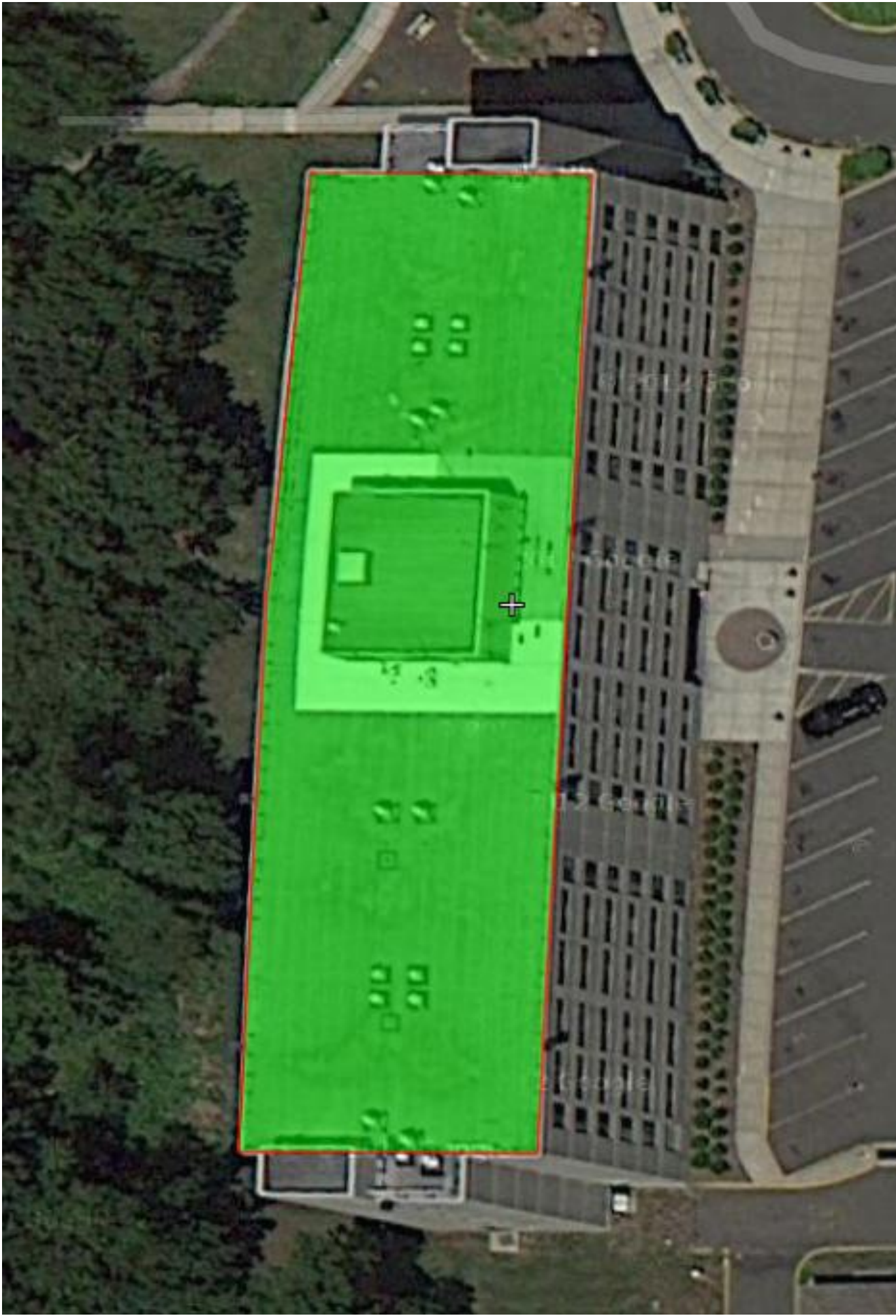
Approximate System Size: Is the roof flat? (Yes/No) Yes
8 watt/ft2
36,994 DC watts
30 kW Enter into PV Watts

PV Watts Inputs***
Array Tilt Angle 20 Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)
Array Azimuth 180 Enter into PV Watts (default)
Zip Code 07470 Enter into PV Watts
DC/AC Derate Factor 0.83 Enter into PV Watts

PV Watts Output
35,848 annual kWh calculated in PV Watts program

% Offset Calc
Usage 401,000 (from utilities)
PV Generation 35,848 (generated using PV Watts)
% offset 9%

* <http://www.freemaptools.com/area-calculator.htm>
** <http://www.flettexchange.com>
*** http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html





Cautions: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at <http://sam.nrel.gov>) that allow for more precise and complex modeling of PV systems.

Disclaimer: The PVWatts® Model ("Model") is provided by the National Renewable Energy Laboratory ("NREL"), which is operated by the Alliance for Sustainable Energy, LLC ("Alliance") for the U.S. Department Of Energy ("DOE") and may be used for any purpose whatsoever.

The names DOE/NREL/ALLIANCE shall not be used in any representation, advertising, publicity or other manner whatsoever to endorse or promote any entity that adopts or uses the Model. DOE/NREL/ALLIANCE shall not provide

any support, consulting, training or assistance of any kind with regard to the use of the Model or any updates, revisions or new versions of the Model.

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RESULTS

35,848 kWh per Year

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)	Energy Value (\$)
January	2.91	2,269	343
February	3.51	2,423	366
March	4.21	3,158	477
April	4.19	2,951	446
May	5.95	4,245	641
June	6.27	4,182	631
July	5.24	3,582	541
August	4.75	3,259	492
September	5.09	3,398	513
October	3.55	2,565	387
November	2.73	1,937	293
December	2.49	1,879	284
Annual	4.24	35,848	\$ 5,413

Location and Station Identification

Requested Location	300 Pompton Rd, Wayne, NJ
Weather Data Source	CALDWELL/ESSEX CO., NJ (TMY3)
Latitude	40.88° N
Longitude	74.28° W

PV System Specifications (Commercial)

DC Rating	30 kW
DC to AC Derate Factor	0.83
Array Type	Fixed (open rack)
Array Tilt	20°
Array Azimuth	180°

Initial Economic Comparison

Average Cost of Electricity Purchased from Utility	0.15 \$/kWh
Cost of Electricity Generated by System	0.21 \$/kWh

These values can be compared to get an idea of the cost-effectiveness of this system. However, system costs, system financing options (including 3rd party ownership) and complex utility rates can significantly change the relative value of the PV system.

APPENDIX F

Photos

**ECM-1 Replace 3-Way
Valves/Actuators with 2-Way
Valves/Actuators and Install
VFDs on the Pump Motors**



Existing Pumps

**ECM-2 Add the AHU to the DDC
System and Reduce Ventilation
During Unoccupied Hours**



Existing AHU

**ECM-3 Add the Boiler and HVAC
Equipment to the DDC controls**



Existing Boilers

**ECM-4 Replace the DHW Heat
Exchangers with a Designated
Condensing DHW Heater**



Existing Heat Exchangers

ECM-5 Install Vending Misers



Existing Control Screen

ECM-5 Replace High Flow Plumbing Fixtures with Low Flow Plumbing Fixtures



Existing Plumbing Fixtures

ECM-L1 Lighting Replacement / Upgrades



Existing CFLs

ECM-L2 Install Lighting Controls (Occupancy Sensors)

No Pictures Available

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

See ECM L-1 and L-2

APPENDIX G

EPA Benchmarking Report



ENERGY STAR[®] Statement of Energy Performance

N/A

Pioneer Hall

Primary Property Function: College/University
Gross Floor Area (ft²): 65,886
Built: 1972

ENERGY STAR[®]
Score¹

For Year Ending: January 31, 2014
Date Generated: July 20, 2014

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

Property & Contact Information

Property Address

Pioneer Hall
300 Pompton Road
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4113368

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

61.4 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,728,300 (67%)
Electric - Grid (kBtu)	1,317,032 (33%)

National Median Comparison

National Median Site EUI (kBtu/ft ²)	151.7
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	-60%

Source EUI

106.2 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO ₂ e/year)	312
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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

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Professional Engineer Stamp
(if applicable)