CITY OF EAST ORANGE

CITY HALL

44 City Hall Plaza, East Orange NJ 07017

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

May 2016

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CHA PROJECT NO. 30993

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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 ±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 City of East Orange 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 energy conservation measures (ECMs) have also been identified in this study. This report details the results of the energy audit conducted for the building listed below:

Building Name	Address	Square Feet	Construction Date
City Hall	44 City Plaza, East Orange, NJ 07017	56,024	1928

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

City Hall	Electric Savings (kWh)	NG Savings (therms)	Total Savings (\$)	Payback (years)
City Hall	157,344	4,411	30,402	11.3

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. The 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 further 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 choses 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. This decision is generally based on the need to replace the piece(s) of equipment due to its age, such as a boiler.

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

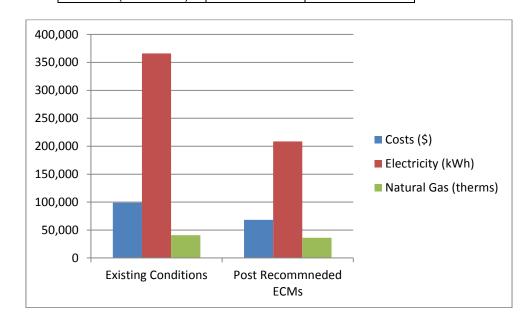
ECM#	Energy Conservation Measure	Est. Costs (\$)	Est. Savings (\$/year)	Payback w/o Incentive	Potential Incentive (\$)*	Payback w/ Incentive	Recommended
ECM- 1	Install thermostat control valves on steam radiators	41,869	2,996	14.0	0	14.0	Y
ECM-	Install Window AC Controller	54,000	4,184	12.9	0	12.9	Υ
ECM-	Replace the DHW Heaters with Condensing Heaters	15,510	546	28.4	800	26.9	Y
ECM-	Replace old plumbing fixtures with low flow plumbing fixtures	270,848	1,983	136.6	0	136.6	N
ECM- L1	Lighting Replacements with Controls (Occupancy Sensors)	233,441	22,676	10.3	14,502	9.7	Y
	Total**	615,668	32,385	19.0	15,302	18.5	
	Total(Recommended)	344,820	30,402	11.3	15,302	10.8	

^{*} Incentive shown is per the New Jersey SmartStart Program.

By implementing the recommended ECMs, the building could result in a total of 90 metric tons of LIFETIME greenhouse gas (GHG) reduction.

If the City of East Orange implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs (\$)	98,790	68,388	31%
Electricity (kWh)	365,959	208,615	43%
Natural Gas (therms)	40,670	36,259	11%
Site FUI (kbtu/SF/Yr)	94 9	77 4	



2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

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

Building Name: City Hall

Address: 44 City Hall Plaza, East Orange NJ 07017

Gross Floor Area: 56,024

Number of Floors: Three floors and one basement

Year Built: 1928



General

Description of Spaces: This is a historic building. The building houses the civic administration and finance offices, treasurer offices, public works office, city council offices, tax assessor's offices, council chambers, restrooms and mechanical room.

Description of Occupancy: The facility has approximately 134 permanent employees working during the office hours.

Number of Computers: The building has approximately 100 computers.

Building Usage: The regular hours are typically 7:00AM to 5:00PM Monday through Friday during the year. The lights are typically on from 6:00AM to 11:00PM, Monday through Friday.

Construction Materials: Stone, concrete block, and structure steel with stone facade.

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Roof: The building has a flat roof which is covered a with white rubber membranes. The roof had been recently replaced and is believed to be well insulated. The roof is in good condition and therefore no ECMs associated with roof improvements are evaluated.

Windows: The windows in City Hall were upgraded to double pane glass with aluminum frames and appear to be in good condition. Therefore, no ECMs associated with window replacement are evaluated.

Exterior Doors: Exterior doors are bronze doors and in good condition except that the door seals have worn out. Door seals are recommended to be replaced as part of the operations and maintenance (O&M) work.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: The building is heated by two Johnston steam boilers located in an underground boiler plant. These two boilers were about 40 years old and the burners were replaced in 2010. This boiler plant serves City Hall, Health Service Department and the old Police Department which is abandoned now. Each of these boilers has an output of 6,500MBH and 80% efficiency based on the discussions with facility staff. The burners are controlled by MPC Platinum boiler controller which turns on the boiler when the steam pressure is less than 5 psig and turns off the boiler when the steam pressure reaching 10 psig. These two boilers are running at alternative mode to provide steam through steam tunnels to the steam coils in the AHUs and steam radiators throughout the City Hall and Health Service Center. Condensate is returned to the stem boilers by a condensate tank driven by two condensate pumps located in the boiler room. A steam trap survey was completed when the burners were upgraded. However, steam trap surveys were not completed since then. Therefore, survey and repair steam traps regularly were included in the O&M.

Cooling: The building does not have a central cooling system. The council chambers are served by two Carrier air handling units (AHU) located in the basement mechanical room. Each of the AHUs has a steam coil and a DX cooling coil. The condensers of the DX cooling coil are located on the roof of the council chambers. Each of the AHUs has a cooling capacity of 12.5 ton and EER of 10.8. The 2nd floor City Clerk office closet has a Trane vertical packaged air conditioner which serves the City Clerk office, City Council office and Council Chair office. This AC unit has a rated cooling capacity of 5 ton. The tax collector office is cooled by two Mitsubishi split AC units. Each of the split AC units has a rated cooling capacity of 2 ton. Besides these three AHUs and the split AC units, there are about 176 window AC units in City Hall to cool the building. Each of the window AC unit has a typical cooling capacity of 1 ton.

ECMs related to installing window AC control was evaluated.

Ventilation: Each of the AHUs has an air intake to provide fresh air for the areas it serves. The amount of the outdoor air provided from each ventilation unit is unknown due to missing drawings/documents; however, it is believed that each unit provides fixed minimum ventilation quantities and only operates during the office hours based on the discussions with facility staff. The rest of the building is ventilated by opening windows by the staff. Therefore, there is no ECMs are associated with ventilation system.

Exhaust: This building has multiple fractional HP exhaust fans serving restrooms and general building exhaust, all located on the roof. The exhaust fans appear to be in good condition and therefore no ECMs associated with exhaust system were evaluated.

Controls Systems

Each of the AHUs has a programmable thermostat to control the room temperature. The cooling season occupied temperature is typically set at 68°F and the unoccupied temperature is set at 80°F. The heating season occupied temperature is typically set between 73°F and the unoccupied temperature is set at 65°F. According to the facility staff, the rest of the building is manually controlled. The staff turn on or off the steam radiator, window AC units and open windows to maintain room comfort level. Therefore an ECM related to installing thermostats on the steam radiators is included.

Domestic Hot Water Systems

Two gas fired DHW heater located in the central boiler plant are used to provide DHW for both City Hall and Health Service Center. Each of the heater has a rated 199.9 MBH heating input and an efficiency of 80%. The DHW is circulated by a circulation pump driven by a ³/₄ HP motor. We have included an ECM that evaluates the potential savings associated with replacing the heaters with high efficiency condensing heaters.

Kitchen Equipment

The building does not have a commercial kitchen. There are a few pantry with household microwaves and refrigerator for staff to store and heat their lunches.

Plug Load

This building has computers, residential appliances (microwaves, refrigerators, etc.), and printers which contribute to the plug load. The computer monitors go into sleep mode when they are not used as do the copiers As the plug load is a relatively small portion of the total electrical load, no ECMs are recommend however we have included and O & M measure to replace the small appliances with Energy Star rated appliances when the old ones reach the end of their useful life span

Plumbing Systems

The plumbing fixtures are old and appear to be in poor condition. Therefore an ECM associated with upgrading the plumbing fixtures with low flow plumbing fixtures is recommended.

Lighting Systems

This building has 32W T-8 fluorescent lighting, metal halide fixtures, CFLs lamps and incandescent lights. The majority of lighting fixtures are 32 watt T-8 fluorescent linear fixtures. There are eight exterior metal halides on the roof. Each of them is believed to be about 400W. The roof tower has five 100W incandescent lights. The rest of the exterior lights are wall mounted 175W metal halides. All of the interior lights are controlled by manual switches. An ECM is included for replacing all for the lighting with LED equivalent and controlled by occupancy sensors was evaluated.

3.0 UTILITIES

Natural gas, electricity and water are separately metered into this building. Utilities used by the building are delivered and supplied by the following utility companies:

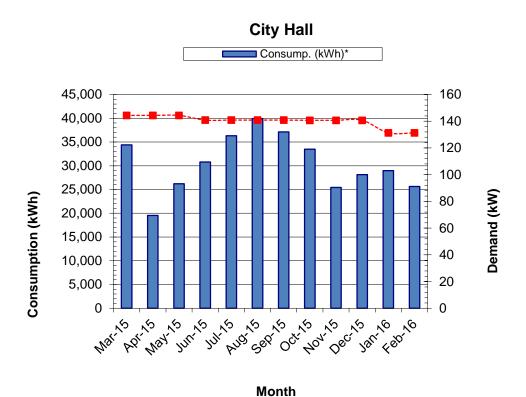
	Electric	Natural Gas
Deliverer	PSE&G	PSE&G
Supplier	PSE&G	PSE&G

For the 12-month period ending in February 2016, the utilities usages and costs for the building were as follows:

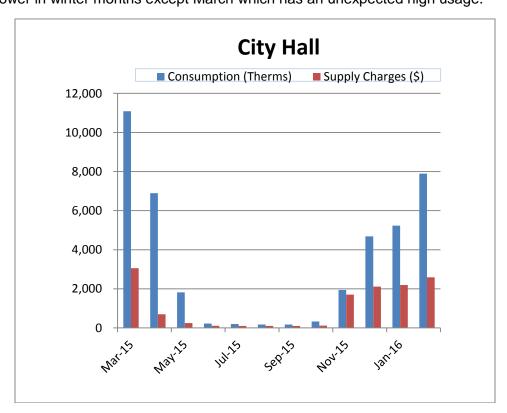
Electric						
Annual Usage	365,959	kWh/yr				
Annual Cost	66,123	\$				
Blended Rate	0.181	\$/kWh				
Peak Demand	144.3	kW				
Min. Demand	131.3	kW				
Avg. Demand	140.1	kW				
Natural Gas						
Annual Usage	40,670	Therms/yr				
Annual Cost	32,667	\$				
Rate	0.803	\$/therm				
Energy Summary						
Building Area	56,024	SF				
Energy Usage Intensity (EUI)	95	KBtu/SF/yr				
Energy Cost Index (ECI)	1.76	\$/SF/yr				
Total Annual Utility Costs	98,790	\$				

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)

^{*}Some months that do not have utility data and the missing demand usage are estimated and highlighted in the utility spreadsheet



The electric usage is higher in summer months due to the air conditioning energy usage and lower in winter months except March which has an unexpected high usage.



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

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.

Compar	Recommended to			
Utility	Units	Average Rate	NJ Average	Shop for Third
			Rate	Party Supplier?
Electricity	\$/kWh	\$0.181	\$0.13	Y
Natural Gas	\$/Therm	\$0.803	\$0.96	N

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

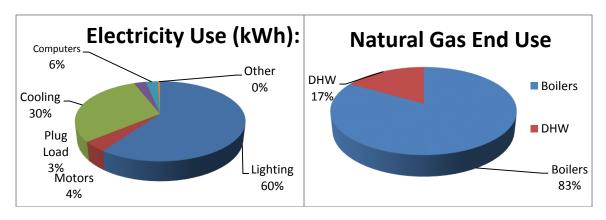
Additional information on selecting a third party energy supplier is available here:

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 scores for all buildings types. The buildings that do not have energy ratings now are compared with national median EUI.

The sites EUI is the amount of heat and electricity consumed by a building as reflected in its 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 provides an equivalent measure for various types of buildings with differing energy sources. The results of the benchmarking is contained in the table below. Copies of the benchmarking report are available in Appendix F.

Site EUI kBtu/ft²/yr	Source EUI (kBtu/ft²/yr)	Energy Star Rating (1-100)
94.9	146.2	N/A

The national median site EUI is 79.9 kBtu/ft2/yr and source EUI is 123.1 kBtu/ft2/yr. The building has 19% higher source EUI than the national median source EUI. It is believed that the old steam system and the lack of control on the window AC units contribute to the high EUI. It is expected that the EUI will be reduced by implementing the measures discussed in this report and the building be qualified for energy star certification.

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-cost 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 (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 Thermostat Control Valves on Steam Radiators

The existing steam radiators in the building are controlled by manual thermostats which are broken and/or not functioning properly or running all the time without control. It is suggested that digital programmable thermostats be installed to control the unit heaters and implement a night set-back temperature during unoccupied hours. Savings result from the reduced steam boiler operation.

The cost of implementing this measure includes installing the control valves on the steam radiators and thermostats, wiring and disconnecting the old thermostats, and the labor cost on doing temperature settings on these new thermostats.

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

ECM-1 Install Thermostat Control Valves on Steam Radiators

Budgetary Cost		Annua	l Utility Savings		ROI	Potential Incentive*	Payback (without	Payback (with
Cost	EI	ectricity	Natural Gas	Total		incentive	incentive)	incentive)
\$	kW	kWh	Therms	\$		\$	Years	Years
41,869	0	0	3,731	2,996	0.1	0	14.0	14.0

^{*} 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 Install Window A/C Units Controller

There are about 176 window A/C units in the building which typically, are left on by the occupants when they leave the room.

This ECM evaluates the installation of programmable "smart" timers that interrupt the electrical supply to the window air conditioners when the room is unoccupied. The timers are configurable to operate as a standalone timer or they can be wirelessly interconnected to provide remote temperature control using software.

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

ECM-2 Install Window A/C Units Controller

Budgetary Cost		Annua	l Utility Savings ROI		ROI	Potential Incentive*	Payback (without	Payback (with
Cost	EI	ectricity	Natural Gas	Total		incentive	incentive)	incentive)
\$	kW	kWh	Therms	\$		\$	Years	Years
54,000	0	23,115	0	4,184	0.2	0	12.9	12.9

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

This measure is recommended.

5.3 ECM-3 Replace the DHW Heaters with Condensing Heaters

Two gas fired DHW heater located in the central boiler plant are used to provide DHW for both City Hall and Health Service Center. Each of the heater has a rated 199.9 MBH heating input and an efficiency of 80%. This ECM evaluates the energy savings associated with replacing the existing DHW heater with a condensing boiler/heat exchanger which has an efficiency of around 96%.

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

ECM-3 Replace the	DHW Heaters with	Condensing Heaters
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Budgetary Cost		Annua	l Utility Savings		ROI	Potential Incentive*	Payback (without	Payback (with
Cost	Electricity Natural G	Natural Gas	Total		incentive	incentive)	incentive)	
\$	kW	kWh	Therms	\$		\$	Years	Years
15,510	0	0	680	546	(0.3)	800	28.4	26.9

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

This measure is recommended.

5.4 ECM-4 Upgrade the Plumbing Fixtures with Low Flow Fixtures

This building contains older style high flow water toilets (3.5 GPF), urinals (1.5 GPF), and high flow faucets (2.0 GPM). Waterless urinals and low-flow toilets/faucets are recommended to replace the existing plumbing fixtures.

The water savings associated from replacing existing high flow fixtures with low-flow/no-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, waterless urinals, 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-4 Upgrade the Plumbing Fixtures with Low Flow Fixtures

Budgetary Cost	Annua	l Utility Savings		ROI	Potential Incentive*	Payback (without	Payback (with
	Water	Natural Gas	Total		IIICelliive	incentive)	incentive)
\$	kGal	Therms	\$		\$	Years	Years
270,848	154	154 1,509 1,9		(0.9)	0	136.6	136.6

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

This measure is not recommended due to long payback period.

5.5 ECM-L1 Lighting Replacements with Controls (Occupancy Sensors)

This building has 32W T-8 fluorescent lighting, metal halide fixtures, CFLs lamps and incandescent lights. The majority of lighting fixtures are 32 watt T-8 fluorescent linear fixtures. There are eight exterior metal halides on the roof. Each of them is believed to be about 400W. The roof tower has five 100W incandescent lights. The rest of the exterior lights are wall mounted 175W metal halides. All of the interior lights are controlled by manual switches. The 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 looks at replacing the lights with LED and installing occupancy sensors.

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 Replacements with Controls (Occupancy Sensors)

Budgetary Cost		Annual	Utility Savings		ROI	Potential Incentive*	Payback (without	Payback (with
Cost	Ele	ctricity		incentive	incentive)	incentive)		
\$	kW kWh		Therms	\$		\$	Years	Years
233,441	24 134,229		0	22,676	0.1	14,502	10.3	9.7

^{*}LED new fixtures are still qualified for prescribed incentives, however, LED retrofits must go through the custom incentive which is not calculated in LGEA study therefore, the potential incentive shown in the table is the possible prescribed incentive.

This measure is recommended.

5.6 Additional O&M Opportunities

This list of operations and maintenance (O&M) type measures represent low-cost or nocost 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:

- Purchase ENERGY STAR® appliances when needed
- Survey and repair steam traps
- Cover window AC in winter season
- Repair Door seals

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 facility 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.

Web URL: http://www.njcleanenergy.com/commercial-industrial/home/home/

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. It is then installed, paid for and then the incentives are reimbursed to the owner.

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 was 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 does qualify for 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 200 kW. 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/SFMinimum 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.

<u>Electric</u>

- 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.

The electric demand of this building does not meet the 200kW requirement for P4P program.

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.

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	Potential PV
Area	Array Size
(Ft ²)	(kW)
24,230	59

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

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 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 \$204/SREC for January 2016 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 D and summarized as follows:

Photovoltaic (PV) Rooftop Solar Power Generation -59 kW System

Budgetary Cost	Annual Utility Savings Electricity Natural Gas		Total Savings	New Jersey Renewable SREC	Payback (without SREC)	Payback (with SREC)	Recommended	
			Natural Gas					Ŗ
\$	kW	kWh	Therms	\$	\$	Years	Years	Y/N
\$235,600	59	71,358	0	\$9,348	\$17,840	25.2	8.7	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 township 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.

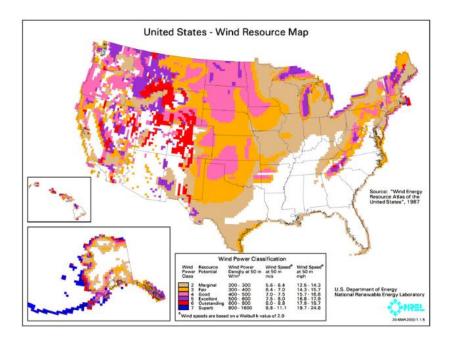
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping). 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 building 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 building.

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 building.

7.3 Combined Heat and Power Plant

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. This 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 facility to consider. The sizing and energy savings of the mini-size CHP require further study.

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 the 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 March 2015 through February 2016 the following table summarizes the electricity load profile for the building.

Building Electric Load Profile

			Onsite	
Peak Demand	Min Demand	Avg Demand	Generation	Eligible?
kW	kW	kW	Y/N	Y/N
144.3	131.3	140.1	N	N

^{*}the demand is estimated from one month bill

This measure is not recommended due to the lack of enough onsite generation.

8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for City of East Orange.

The following projects should be considered for implementation:

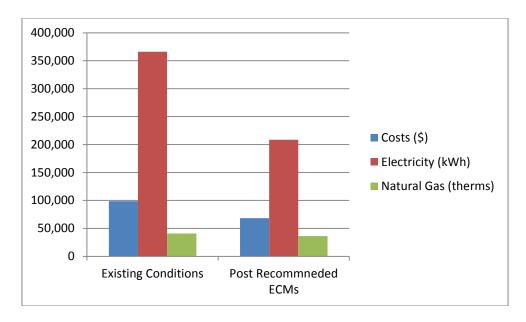
- Install thermostat control valves on steam radiators
- Install Window AC Controller
- Replace the DHW Heaters with Condensing Heaters
- Lighting Replacements with LED and add Controls (Occupancy Sensors)

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)
157,344	4,411	30,402	11.3

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs (\$)	98,790	68,388	31%
Electricity (kWh)	365,959	208,615	43%
Natural Gas (therms)	40,670	36,259	11%
Site EUI (kbtu/SF/Yr)	94.9	77.4	



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



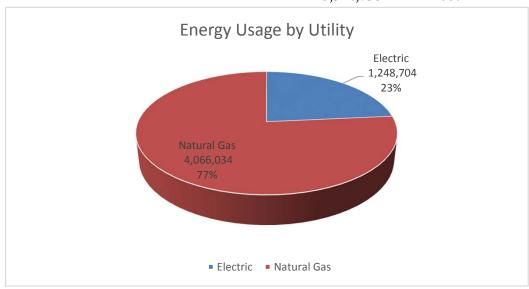
East Orange NJBPU LGEA City Hall

Annual Utilities

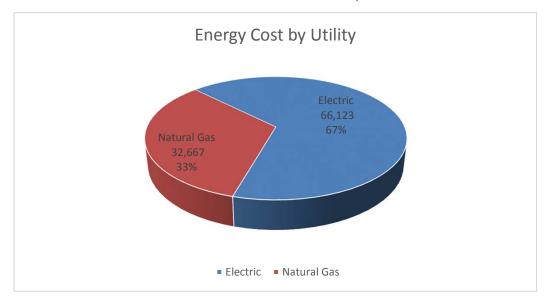
12-month Summary

Electric							
Annual Usage	365,959	kWh/yr					
Annual Cost	66,123	\$					
Blended Rate	0.181	\$/kWh					
Peak Demand	144.3	kW					
Min. Demand	131.3	kW					
Avg. Demand	140.1	kW					
Natu	ıral Gas						
Annual Usage	40,670	Therms/yr					
Annual Cost	32,667	\$					
Rate	0.803	\$/therm					
Energy	Summary						
Building Area	56,024	SF					
Energy Usage Intensity (EUI)	95	KBtu/SF/yr					
Energy Cost Index (ECI)	1.76	\$/SF/yr					
Total Annual Utility Costs	98,790	\$					

Utility	KBtu	0/0
Electric	1,248,704	23%
Natural Gas	4,066,034	77%
	5,314,738	100%



Utility	\$	0/0
Electric	66,123	67%
Natural Gas	32,667	33%
	98,790	100%



East Orange NJBPU LGEA City Hall

Electric Service

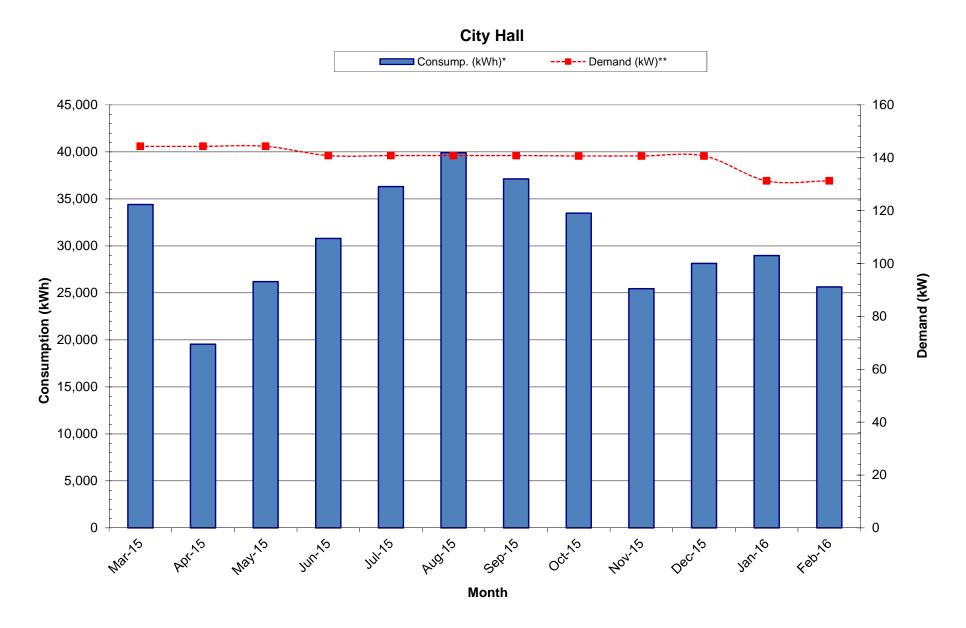
Account No.: 4215550203 Delivery: PSE&G Meter No.: 778016174, 9209943 Supply:

			P	rovider Charge	s	Usage (kWh) vs. Dem	and (kW) Charges			Unit Costs		
	Consump.	Demand	Delivery	Supplier	Total	Consumption	Demand	Delivery	Supplier	Consumption Rate	Demand	Blended Rate
Month	(kWh)*	(kW)**	(\$)*	(\$)	(\$)	(\$)	(\$)	(\$/kWh)	(\$/kWh)	(\$/kWh)	(\$/kW)	(\$/kWh)
March-15	34,400	144	1,731	4,176.26	5,907.14	5574.16	332.98	0.050	0.121	0.162	2.307	0.172
April-15	19,537	144	1,004	2,594.37	3,598.63	3286.46	312.17	0.051	0.133	0.168	2.163	0.184
May-15	26,197	144	1,373	3,518.13	4,891.14	4573.77	317.37	0.052	0.134	0.175	2.199	0.187
June-15	30,790	141	2,431	3,744.62	6,175.81	5866.11	309.70	0.079	0.122	0.191	2.199	0.201
July-15	36,308	141	2,754	4,400.38	7,154.16	6844.46	309.70	0.076	0.121	0.189	2.199	0.197
August-15	39,918	141	3,046	4,637.45	7,683.79	7303.54	380	0.076	0.116	0.183	2.700	0.192
September-15	37,122	141	2,796	4,472.36	7,268.48	6197.42	1071.06	0.075	0.120	0.167	7.605	0.196
October-15	33,483	141	1,526	3,797.10	5,323.33	4252.27	1071.06	0.046	0.113	0.127	7.614	0.159
November-15	25,446	141	1,190	3,306.06	4,496.15	3529.23	966.92	0.047	0.130	0.139	6.874	0.177
December-15	28,144	141	1,177	3,496.43	4,673.08	3523.83	1149.25	0.042	0.124	0.125	8.170	0.166
January-16	28,972	131	1,028	3,666.61	4,694.58	4328.11	366.47	0.035	0.127	0.149	2.792	0.162
February-16	25,642	131	929	3,328.13	4,257.14	3922.08	335.06	0.036	0.130	0.153	2.553	0.166
Total (All)	365,959	144.32	\$20,985.53	\$45,137.90	\$66,123.43	\$59,201.45	\$6,921.98	\$0.06	\$0.12	\$0.16	\$4.12	\$0.18
Notes	1	2	3	4	5			6	7			8

Number of kWh of electric energy used per month
 Number of kW of power measured

- Number of kW of power measured
 Electric charges from Delivery provider
 Electric charges from Supply provider note, includes 8.875% tax
 Total charges (Delivery + Supplier)
 Delivery Charges (\$) / Consumption (kWh)
 Supplier Charges (\$) / Consumption (kWh)
 Total Charges (\$) / Consumption (kWh)

- * Based on combined numbers provided by client
 ** Addition of two accounts provided by client



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Natural Gas Service

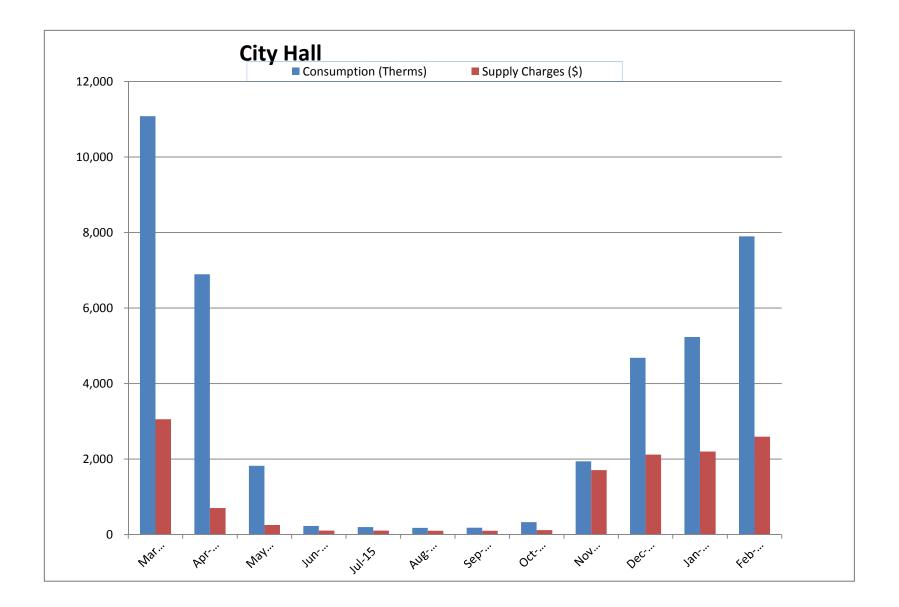
Account No.: 4215550203

Meter No:

Delivery: PSE&G

Supply: Direct Energy/South Jersey Energy/PSE&G

Month	Consumption (Therms)	Delivery Charges (\$)	Supply Charges (\$)	Total Charges (\$)	Rate (\$/Therm)
March-15	11,083.15	3,056.04	5,814.38	8,870.43	0.80
April-15	6,894.63	701.14	3,419.60	4,120.74	0.60
May-15	1,821.47	253.38	842.00	1,095.38	0.60
June-15	228.65	106.84	105.57	212.41	0.93
July-15	200.08	104.00	95.32	199.32	1.00
August-15	175.87	101.62	83.65	185.27	1.05
September-15	179.64	102.30	86.52	188.82	1.05
October-15	328.97	117.85	149.46	267.31	0.81
November-15	1,941.83	1,708.14	844.36	2,552.50	1.31
December-15	4,683.40	2,116.64	2,035.19	4,151.83	0.89
January-16	5,233.95	2,199.84	2,416.25	4,616.09	0.88
February-16	7,898.41	2,593.09	3,613.82	6,206.91	0.79
Total (12 Months)	40,670	\$ 13,160.89	\$ 19,506.13	\$ 32,667.02	\$ 0.80



PSE&G ELECTRIC SERVICE TERRITORY Last Updated: 7/21/15

$*\underline{CUSTOMER\ CLASS} - R - RESIDENTIAL\ C - COMMERCIAL\ I - INDUSTRIAL$

Supplier	Telephone	*Customer
	& Web Site	Class
Abest Power & Gas of NJ,	(888)987-6937	R/C/I
LLC		
202 Smith Street	www. AbostPower com	ACTIVE
Perth Amboy, NJ 08861	www.AbestPower.com	
AEP Energy, Inc. f/k/a	(866) 258-3782	R/C/I
BlueStar Energy Services 309 Fellowship Road, Fl. 2	WWW aapanaray aam	ACTIVE
Mount Laurel, NJ 08054	www.aepenergy.com	ACTIVE
Agera Energy, LLC	(844) 692-4372	R/C/I
115 route 46, Building F	` '	K/C/I
Parsippany, NJ 07054	www.ageraenergy.com	
Alpha Gas and Electric, LLC	(855) 553-6374	R/C
641 5 th Street	(833) 333-0374	N/C
Lakewood, NJ 08701	www.alphagasandelectric.com	ACTIVE
Ambit Northeast, LLC d/b/a	877-282-6284	R/C
Ambit Northeast, ELC u/b/a Ambit Energy	077-202-0204	NC
103 Carnegie Center		
Suite 300		ACTIVE
Princeton, NJ 08540	www.ambitenergy.com	
American Power & Gas of	(800) 205-7491	R/C/I
NJ, LLC - 10000 Lincoln		
Drive East – Suite 201 Marlton,		
NJ 08053	www.GoAPG.com	
American Powernet	(877) 977-2636	C/I
Management, LP		
437 North Grove St.	www.americanpowernet.com	
Berlin, NJ 08009		ACTIVE
Amerigreen Energy, Inc.	888-559-4567	C/I
333 Sylvan Avenue, Suite 305		
Englewood Cliffs, NJ 07632	www.amerigreen.com	ACTIVE
AP Gas & Electric, (NJ) LLC	(855) 544-4895	R/C/I
10 North Park Place, Suite 420		
Morristown, NJ 07960	www.apgellc.com	ACTIVE
Astral Energy LLC	(888)850-1872	R/C/I
16 Tyson Place		
Bergenfield, NJ 07621	www.AstralEnergyLLC.com	ACTIVE

Barclays Capital Services,	(800) 526-7000	C
Inc.		
70 Hudson Street		ACTIV
Jersey City, NJ 07302-4585	www.barclays.com	
BBPC, LLC d/b/a Great	(888) 651-4121	C
Eastern Energy		
116 Village Blvd. Suite 200		
Princeton, NJ 08540	www.greateasternenergy.com	ACTIV
Berkshire Energy Partners,	(610) 255-5070	C/I
LLC		
9 Berkshire Road		ACTIV
Landenberg, PA 19350		
Attn: Dana A. LeSage, P.E.	<u>www.berkshireenergypartners.com</u>	
Blue Pilot Energy, LLC	(800) 451-6356	R/C
197 State Rte. 18 South		
Ste. 3000		
East Brunswick, NJ 08816	www.bluepilotenergy.com	ACTIV
Brick Standard, LLC	(201)706-8101	C/I
235 Hudson Street Suite 1		
Hoboken, NJ 07030	<u>www.standardalternative.com</u>	ACTI
CCES LLC dba Clean	(877) 933-2453	R/C
Currents Energy Services		
566 Terhune Street		
Teaneck, NJ 07666	www.cleancurrents.com	ACTIV
Champion Energy Services,	(888) 653-0093	R/C/
LLC		
1200 Route 22		ACTI
Bridgewater, NJ 08807	www.championenergyservices.com	
Choice Energy, LLC	(888) 565-4490	R/C
4257 US Highway 9, Suite 6C		
Freehold, NJ 07728	www.4choiceenergy.com	ACTIV
Charles Tilled 1. Tax	(000) CLD VIEW	D/C/
Clearview Electric, Inc.	(888) CLR-VIEW	R/C/
1744 Lexington Avenue Pennsauken, NJ 08110	(800) 746- 4702 <u>www.clearviewenergy.com</u>	ACTI
Pennsauken, NJ 08110		ACTIV
Commerce Energy, Inc.	1-866-587-8674	R/C
7 Cedar Terrace		
Ramsey, NJ 07446	www.commerceenergy.com	ACTIV
Community Energy Inc.	(866)946-3123	R/C/
51 Sandbrook Headquarters	(000)7 +0 3123	10,07
Road		
Stockton, NJ 08559	www.communityenergyinc.com	ACTIV

ConEdison Solutions Cherry Tree Corporate Center	(888) 665-0955	C/I
535 State Highway		
Suite 180		ACTIVE
Cherry Hill, NJ 08002	www.conedsolutions.com	
ConocoPhillips Company 224 Strawbridge Drive	(800) 646-4427	C/I
Suite 107		ACTIVE
Moorestown, NJ 08057	www.conocophillips.com	1101112
Constellation New Energy,	(888) 635-0827	R/C/I
Inc.		
900A Lake Street, Suite 2	www.constellation.com	ACTIVE
Ramsey, NJ 07446	(977) 007 0005	R
Constellation Energy 900A Lake Street, Suite 2	(877) 997-9995	K
Ramsey, NJ 07446	www.constellation.com	ACTIVE
Constellation Energy	1 (800) 536-0151	R/C/I
Services, Inc.		
116 Village Boulevard		
Suite 200 Princeton, NJ 08540	www.intagryconorgy.com	
Corporate Services Support	<u>www.integrysenergy.com</u> 1(800) 761-4000	C
Corp.	1(800) 701-4000	C
665 Howard Avenue		
Somerset, NJ 08873	www.morganstanley.com	
Credit Suisse, (USA) Inc.	(800) 325-2000	C
700 College Road East Princeton, NJ 08450	www.creditsuisse.com	ACTIVE
Direct Energy Business, LLC	(888) 925-9115	C/I
1 Hess Plaza Woodbridge	http://www.business.directenergy.com/	ACTIVE
		C/I
Direct Energy Business Marketing, LLC (fka Hess	(800) 437-7872	C/1
Energy Marketing)		
1 Hess Plaza		
Woodbridge, NJ 07095	http://www.business.directenergy.com/	ACTIVE
Direct Energy Small	(888) 925-9115	C/I
Business, LLC (fka Hess Small Business Services,		
LLC)		
One Hess Plaza		
Woodbridge, NJ 07095	http://www.business.directenergy.com/small-	ACTIVE
	<u>business</u>	

Direct Energy Services, LLC	1 (866) 348-4193	C/I
1 Hess Plaza Woodbridge, NJ 07095	www.directenergy.com	
,		INACTIVE
Discount Energy Group, LLC 811 Church Road, Suite 149	(800) 282-3331	R/C
Cherry Hill, New Jersey 08002		A CONTACT
	www.discountenergygroup.com	ACTIVE
DTE Energy Supply, Inc.	(877) 332-2450	C/I
One Gateway Center,		
Suite 2600		ACTIVE
Newark, NJ 07102	www.dtesupply.com	СЛ
EDF Energy Services, LLC 1 Meadowlands Plaza Suite 200, Office No. 246	1 (877) 432-4530	C/I
East Rutherford, NJ 07073	www.edfenergyservices.com	
Energy.me Midwest LLC 90 Washington Blvd	(855) 243-7270	R/C/I
Bedminster, NJ 07921	www.energy.me	ACTIVE
Energy Plus Holdings LLC	(877) 866-9193	R/C
309 Fellowship Road		
East Gate Center, Suite 200 Mt. Laurel, NJ 08054	www.energypluscompany.com	ACTIVE
EnerPenn d/b/a	(855) 363-7736	R/C/I
YEP Energy		
89 Headquarters Plaza North #1463	www.yepenergyNJ.com	ACTIVE
Morristown, NJ 07960	www.yepenergytvs.com	ACTIVE
Ethical Electric Benefit Co.	(888) 444-9452	R/C
d/b/a Ethical Electric/d/b/a		
Clean Energy Option 100 Overlook Center, 2 nd Fl.	www.ethicalelectric.com	ACTIVE
Princeton, NJ 08540	www.cuncurerecture.com	ACTIVE
Energy Service Providers,	(866) 568-0290	R/C
Inc., d/b/a New Jersey Gas &		
Electric 1 Bridge Plaza fl. 2		
Fort Lee, NJ 07024	www.njgande.com	ACTIVE
Everyday Energy, LLC	844-684-5506	R/I
One International Blvd.,		
Suite 400 Mahwah NJ 07405 0400	www.anarayrawarda.comaast.com	
Mahwah, NJ 07495-0400	www.energyrewards.comcast.com	

FirstEnergy Solutions	(888) 254-63590-	C/I
150 West State Street Trenton, NJ 08608	www.fes.com	ACTIVE
First Point Power, LLC	(888) 875-1711	R/C/I
90 Washington Valley Road Bedminister, NJ 07921	www.firstpointpower.com	
<u>, </u>		D/C/T
Frontier Utilities Northeast, LLC	(877) 437-6930	R/C/I
199 New Road, Suite		
61-187		
Linwood, NJ 08221	www.frontierutilities.com	
Gateway Energy Services	(800) 805-8586	R/C
Corporation		
1 Hess Plaza		
Woodbridge, NJ 07095	www.gesc.com	ACTIVE
GDF SUEZ Energy	(866) 999-8374	C/I
Resources NA, Inc.		
333 Thornall Street		
Sixth Floor		A COMPANY
Edison, NJ 08837	www.gdfsuezenergyresources.com	ACTIVE
GDF Suez Retail Energy	1-866-252-0078	R/C/I
Solutions LLC d/b/a THINK ENERGY		
333 Thornall St. Sixth Floor	www.mythinkenergy.com	ACTIVE
Edison, NJ 08819	www.mytmmkenergy.com	MOTIVE
Glacial Energy of New	(888) 452-2425	C/I
Jersey, Inc.		0.2
21 Pine Street, Suite 237		
Rockaway, NJ 07866	www.glacialenergy.com	ACTIVE
Global Energy Marketing	(800) 542-0778	R/C/I
LLC		
129 Wentz Avenue		ACTIVE
Springfield, NJ 07081	www.globalp.com	
Greenlight Energy, Inc.	(888) 453-4427	R
2608 25 th Road		
Astoria, NY 11102		
	www.greenlightenergy.us	
Green Mountain Energy	(866) 767-5818	C/I
Company		
211 Carnegie Center Drive	www.greenmountain.com/commercial-home	
Princeton, NJ 08540		ACTIVE

(877) 940-3835	R/C
,	
www.harborsideenergynj.com	ACTIVE
(800) 437-7872	C/I
www.hess.com	ACTIVE
(888) 264-4908	R/C/I
www.hikoenergy.com	ACTIVE
(800) 831-9507 ext. 4354	I
www.holcim.us	
(877) Hudson 9	С
www.hudsonenergyservices.com	ACTIVE
(877) 887-6866	R/C
www.idtenergy.com	ACTIVE
(877) 235-6708	R/C
	ACTIVE
(866) 403-2620	R/C/I
www.mspireenergy.com	
(800) 536 0151	C/I
(600) 330-0131	U/I
	ACTIVE
www.integrysenergy.com	
	R/C/I
(,	
Jsynergyllc.com	ACTIVE
(973) 589-0700	I
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	(800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (800) 831-9507 ext. 4354 www.holcim.us (877) Hudson 9 www.hudsonenergyservices.com (877) 887-6866 www.idtenergy.com (877) 235-6708 www.chooseindependence.com (866) 403-2620 www.inspireenergy.com (800) 536-0151 www.integrysenergy.com (516) 331-2020 Jsynergyllc.com

Liberty Power Delaware,	(866) 769-3799	C/I
LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	www.libertypowercorp.com	ACTIVE
Liberty Power Holdings,	(866) 769-3799	R/C/I
LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	www.libertypowercorp.com	ACTIVE
Linde Energy Services	(800) 247-2644	C/I
575 Mountain Avenue Murray Hill, NJ 07974	www.linde.com	ACTIVE
Marathon Power LLC	(888) 779-7255	R/C/I
302 Main Street Paterson, NJ 07505	www.mecny.com	ACTIVE
MP2 Energy NJ, LLC	(877) 238-5343	R/C/I
111 River Street, Suite 1204 Hoboken, NJ 07030	www.mp2energy.com	ACTIVE
Natures Current, LLC	(215) 464-6000	R/C/I
95 Fairmount Avenue Philadelphia, Pennsylvania 19123	www.naturescurrent.com	ACTIVE
MPower Energy NJ LLC	(877) 286-7693	R/C/I
One University Plaza, Suite 507	www.mpowerenergy.com	ACTIVE
Hackensack, NJ 07601 NATGASCO, Inc. (Supreme	(800) 840-4427	R/C/I
Energy, Inc.) 532 Freeman St. Orange, NJ 07050	www.supremeenergyinc.com	ACTIVE
New Jersey Gas & Electric	(866) 568-0290	R/C/
10 North Park Place Suite 420		
Morristown, NJ 07960	www.njgande.com	ACTIVE
New Jersey, LLC 651 Jernee Mill Road	(877) 528-2890 Commercial (800) 882-1276 Residential	R/C/I
Sayreville, NJ 08872	www.nexteraenergyservices.com	ACTIVE
Noble Americas Energy Solutions	(877) 273-6772	C/I
The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	www.noblesolutions.com	ACTIVE

Nordic Energy Services, LLC	(877) 808-1027	R/C/I
50 Tice Boulevard, Suite 340		A COUNT
Woodcliff Lake, NJ 07677	www.nordiceenergy.us.com	ACTIV
North American Power and	(888) 313-9086	R/C/I
Gas, LLC 222 Ridgedale Avenue		
Cedar Knolls, NJ 07927	www.napower.com	ACTIV
North Eastern States, Inc.	(888) 521-5861	R/C/I
d/b/a Entrust Energy 90 Washington Valley Road		
Bedminster, NJ 07921	www.entrustenergy.com	ACTIV
Oasis Power, LLC d/b/a	(800)324-3046	R/C
Oasis Energy 11152 Westheimer, Suite 901		ACTIVE
Houston, TX 77042	www.oasisenergy.com	ACTIVE
,		
Palmco Power NJ, LLC One Greentree Centre	(877) 726-5862	R/C/I
10,000 Lincoln Drive East,		
Suite 201		
Marlton, NJ 08053	www.PalmcoEnergy.com	ACTIV
Park Power, LLC	(856) 778-0079	R/C/I
1200 South Church St.		
Suite 23		
Mount Laurel, NJ 08054	www.parkpower.com	ACTIV
Plymouth Rock Energy, LLC	(855) 32-POWER (76937)	R/C/I
338 Maitland Avenue Teaneck, NJ 07666	www.plymouthonorgy.com	ACTIV
,	www.plymouthenergy.com	
Power Management Co., LLC b/b/a PMC Lightsavers	(585) 249-1360	C/I
Limited Liability Company		
1600 Moseley Road		
Victor, NY 14564	www.powermanagementco.com	ACTIV
PPL Energy Plus, LLC	(800) 281-2000	C
Shrewsbury Executive Offices		
788 Shrewsbury Ave., Suite		/I
2178 Tinton Follo, NI, 07724	www.polonororplus.com	A CURTATI
Tinton Falls, NJ 07724	www.pplenergyplus.com	ACTIV
Progressive Energy Consulting, LLC	(917) 837-7400	R/C/I
PO Box 4582	Progressivenrg@optionline.net	ACTIVE
Wayne, New Jersey 07474	110gressiveing & optionime.net	

Prospect Resources, Inc.	(847) 673-1959	С
208 W. State Street Trenton, NJ 08608-1002	www.prospectresources.com	ACTIVE
Public Power & Utility of New Jersey, LLC	(888) 354-4415	R/C/I
One International Blvd, Suite 400 Mahwah, NJ 07495	www.ppandu.com	ACTIVE
Reliant Energy 211 Carnegie Center	(877) 297-3795 (877) 297-3780	R/C/I
Princeton, NJ 08540	www.reliant.com	ACTIVE
ResCom Energy LLC 18C Wave Crest Ave.	(888) 238-4041	R/C/I
Winfield Park, NJ 07036	http://rescom-energy.com	ACTIVE
Residents Energy, LLC 550 Broad Street	(888) 828-7374	R/C
Newark, NJ 07102	www.residentsenergy.com	
Respond Power LLC 1001 East Lawn Drive	(888) 625-6760	R/C/I
Teaneck, NJ 07666	www.majorenergy.com	ACTIVE
Save on Energy, LLC 1101 Red Ventures Drive	1 (877)-658-3183	R/C
Fort Mill, SC 29707	www.saveonenergy.com	
SFE Energy One Gateway Center	1 (877) 316-6344	R/C/I
Suite 2600 Newark, NJ 07012	www.sfeenergy.com	ACTIVE
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4	(800) 695-0666	С
Barrington, NJ 08007	www.sjnaturalgas.com	ACTIVE
SmartEnergy Holdings, LLC 100 Overlook Center 2nd Floor	(800) 443-4440	R/C/I
Princeton, NJ NJ 08540		A COPYLER
United States of America	www.smartenergy.com	ACTIVE P/C/I
South Jersey Energy Company	(800) 266-6020	R/C/I
1 South Jersey Plaza, Route 54 Folsom, NJ 08037	www.southjerseyenergy.com	ACTIVE
Spark Energy Gas, LP/ Spark Energy	(713)600-2600	R/C/I

2105 City West Blvd. Suite 100		
Houston, TX 77042	www.sparkenergy.com	ACTIV
Sperian Energy Corp.	(888) 682-8082	R/C/I
1200 Route 22 East, Suite 2000		
Bridgewater, NJ 08807		ACTIV
G F G	www.sperianenergy.com	C/T
Sprague Energy Corp. 12 Ridge Road	855-466-2842	C/I
Chatham Township, NJ 07928	www.spragueenergy.com	ACTIV
		_
Starion Energy PA Inc. 101 Warburton Avenue	(800) 600-3040	R/C/I
Hawthorne, NJ 07506	www.starionenergy.com	ACTIV
		_
Stream Energy New Jersey, LLC	(877) 369-8150	R/C
309 Fellowship Rd., Suite 200	www.streamenergy.net	ACTIV
Mt. Laurel, NJ 08054	<u></u>	
Summit Energy Services, Inc.	1 (800) 90-SUMMIT	C/I
10350 Ormsby Park Place		
Suite 400		
Louisville, KY 40223		
TO 1 TO 1 A	www.summitenergy.com	ACTIVE
Talen Energy Marketing, LLC	(888) 289-7693	R/C
788 Shrewsbury Avenue,		
Suite 2178 Tinton Falls, NJ		
07724		
	www.pplenergyplus.com/*	
Texas Retail Energy LLC	(866) 532-0761	C/I
Park 80 West Plaza II, Suite 200		
Saddle Brook, NJ 07663		ACTIV
Attn: Chris Hendrix	Texasretailenergy.com	71011
TransCanada Power	(877) MEGAWAT	C/I
Marketing Ltd.	, ,	
190 Middlesex Essex Turnpike,		
		ACTIV
Suite 200		
Iselin, NJ 08830	www.transcanada.com/powermarketing	
	www.transcanada.com/powermarketing (877) 933-2453	R/C/I

UGI Energy Services, Inc. dba UGI Energy Link	(800) 427-8545	C/I
224 Strawbridge Drive		
Suite 107		
Moorestown, NJ 08057	www.ugienergylink.com	ACTIVE
Verde Energy USA, Inc.	(800) 388-3862	R/C
2001 Route 46		
Waterview Plaza Suite 301		
Parsippany, NJ 07054	www.lowcostpower.com	ACTIVE
Viridian Energy	(866) 663-2508	R/C/I
2001 Route 46, Waterview		
Plaza		
Suite 310		
Parsippany, NJ 07054	www.viridian.com	ACTIVE
XOOM Energy New Jersey,	(888) 997-8979	R/C/I
LLC		
744 Broad Street. 16 th Floor		
Newark, NJ 07102	www.xoomenergy.com	ACTIVE
Your Energy Holdings, LLC	(855) 732-2493	R/C/I
One International Boulevard		
Suite 400		
Mahwah, NJ 07495-0400	www.thisisyourenergy.com	ACTIVE

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PSE&G GAS SERVICE TERRITORY Last Updated 7/21/15

$*\underline{CUSTOMER\ CLASS} - R - RESIDENTIAL\ C - COMMERCIAL\ I - INDUSTRIAL$

Supplier	Telephone & Web Site	*Customer Class
Agera Energy, LLC 115 route 46, Building F Parsippany, NJ 07054	(844) 692-4372 www.ageraenergy.com	R/C/I
Ambit Northeast, LLC d/b/a Ambit Energy 103 Carnegie Center	877-282-6284	R/C
Suite 300 Princeton, NJ 08540	www.ambitenergy.com	ACTIVE
American Power & Gas of NJ, LLC 10000 Lincoln Drive East – Suite 201	(800) 2057491	R/C/I
Marlton, NJ 08053 Amerigreen Energy, Inc.	<u>www.GoAPG.com</u> (888)559-4567	C/I
333 Sylvan Avenue Suite 305 Englewood Cliffs, NJ 07632	www.amerigreen.com	ACTIVE
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	888-850-1872 www.AstralEnergyLLC.com	R/C/I ACTIVE
BBPC, LLC Great Eastern	888-651-4121	C
Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	www.greateasternenergy.com	ACTIVE
Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	(888) 565-4490	R/C/I
	www.4choiceenergy.com	
Clearview Electric Inc. d/b/a Clearview Gas 1744 Lexington Ave.	800-746-4720	R/C
Pennsauken, NJ 08110	www.clearviewenergy.com	ACTIVE

Colonial Energy, Inc.	845-429-3229	C/I
83 Harding Road		
Wyckoff, NJ 07481	www.colonialgroupinc.com	ACTIVE
Commerce Energy, Inc.	888 817-8572	R
7 Cedar Terrace Ramsey, NJ 07746	www.commorcoonercy.com	ACTIVE
•	www.commerceenergy.com	
Compass Energy Services,	866-867-8328	C/I
Inc.		ACTIVE
33 Wood Avenue South, 610 Iselin, NJ 08830	www.compassenergy.net	ACTIVE
Compass Energy Gas	866-867-8328	C/I
Services, LLC	800-807-8328	
33 Wood Avenue South		
Suite 610	www.compassenergy.net	ACTIVE
Iselin, NJ 08830		
ConocoPhillips Company	800-646-4427	C/I
224 Strawbridge Drive, Suite		
107	www.conocophillips.com	ACTIVE
Moorestown, NJ 08057		
Consolidated Edison Energy,	888-686-1383 x2130	
Inc.		
d/b/a Con Edison Solutions		
535 State Highway 38, Suite 140	www.conedenergy.com	
Cherry Hill, NJ 08002		
Consolidated Edison	888-665-0955	C/I
Solutions, Inc.	888-003-0733	C/1
Cherry Tree Corporate Center		ACTIVE
535 State Highway 38, Suite	www.conedsolutions.com	
140		
Cherry Hill, NJ 08002		
Constellation NewEnergy-	800-785-4373	C/I
Gas Division, LLC		
116 Village Boulevard, Suite		
200 Primarkan NJ 08540	www.constellation.com	ACTIVE
Princeton, NJ 08540	200 505 1252	TO CO
Chaica Inc	800-785-4373	R/C/I
Choice, Inc. 116 Village Blvd., Suite 200	www.constallation.com	ACTIVE
Princeton, NJ 08540	www.constellation.com	ACTIVE
·		
Constellation Energy	1 (800) 536-0151	C/I
Services Natural Gas, LLC		
116 Village Boulevard		

Suite 200		
Princeton, NJ 08540		
	www.integrysenergy.com	
Direct Energy Business, LLC	888-925-9115	C/I
1 Hess Plaza	1	A CONTENT
Woodbridge, NJ 07095	http://www.business.directenergy.com/	ACTIVE
Direct Energy Business	(800) 437-7872	C/I
Marketing, LLC (fka Hess Energy Marketing)		
One Hess Plaza		
Woodbridge, NJ 07095	http://www.business.directenergy.com/	ACTIVE
Direct Energy Small	(888) 925-9115	C/I
Business, LLC (fka Hess		
Small Business Services,		
LLC) One Hess Plaza	http://www.business.directenergy.com/small-	ACTIVE
Woodbridge, NJ 07095	business	I MOTIVE
Direct Energy Services,	1 (866) 348-4193	C/I
LLC		
1 Hess Plaza		
Woodbridge, NJ 07095	www.directenergy.com	INACTIVE
Dominion Retail, Inc. d/b/a	(866)237-4765	R/C
Dominion Energy Solutions	(000)237 1703	
395 Route #70 West, Suite	www.dominionenergy.com	
125 Lakewood, NJ 08701		
Everyday Energy, LLC	844-684-5506	R/I
One International Blvd., Suite 400		
Mahwah, NJ 07495-0400	www.energyrewards.comcast.com	
Frontier Utilities Northeast,	(877) 437-6930	R/C/I
LLC	(0.17) 101 0300	
199 New Road, Suite		
61-187	vyvyvy frontiomytilities com	
Linwood, NJ 08221 Glacial Energy of New	<u>www.frontierutilities.com</u> 888-452-2425	C/I
Jersey, Inc.	000-432-2423	C/1
21 Pine Street, Suite 237	www.glacialenergy.com	ACTIVE
Rockaway, NJ 07866		
Gateway Energy Services	(800) 805-8586	R/C
Corporation		
1 Hess Plaza Woodbridge, NJ 07095		
Woodonage, NJ 07073	www.gesc.com	ACTIVE
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Global Energy Marketing,	800-542-0778	C/I
LLC 129 Wentz Avenue Springfield, NJ 07081	www.globalp.com	ACTIVE
Great Eastern Energy 116 Village Blvd., Suite 200	888-651-4121	C/I
Princeton, NJ 08540	www.greateastern.com	ACTIVE
Greenlight Energy 2608 25 th Road	(888) 453-4427	R
Astoria, NY 11102	www.greenlightenergy.us	ACTIVE
Harborside Energy LLC 101 Hudson Street, Suite 2100	877-940-3835	R/C
Jersey City, NJ 07302	www.harborsideenergynj.com	ACTIVE
Hess Energy, Inc. One Hess Plaza	800-437-7872	C/I
Woodbridge, NJ 07095	www.hess.com	ACTIVE
HIKO Energy, LLC 655 Suffern Road	888 264-4908	R/C/I
Teaneck, NJ 07666	www.hikoenergy.com	ACTIVE
Hudson Energy Services, LLC	877- Hudson 9	С
7 Cedar Street Ramsey, NJ 07466	www.hudsonenergyservices.com	ACTIVE
IDT Energy, Inc. 550 Broad Street	877-887-6866	R/C
Newark, NJ 07102	www.idtenergy.com	ACTIVE
Infinite Energy dba Intelligent Energy 1200 Route 22 East Suite 2000	(800) 927-9794	R/C/I
Bridgewater, NJ 08807-2943	www.InfiniteEnergy.com	ACTIVE
Integrys Energy Services- Natural Gas, LLC 101 Eisenhower Parkway	(800) 536-0151	C/I
Suite 300 Roseland, NJ 07068	www.integrysenergy.com	ACTIVE
Jsynergy LLC 445 Cental Ave. Suite 204	(516) 331-2020	R/C/I
Cedarhurst, NY 11516	www.Jsnergyllc.com	ACTIVE
Major Energy Services, LLC 1001 East Lawn Drive Teaneck NJ 07666	888-625-6760 www.majorenergy.com	R/C/I ACTIVE

Marathon Power LLC	888-779-7255	R/C/I
302 Main Street Paterson, NJ 07505	www.mecny.com	ACTIVE
Metromedia Energy, Inc.	1-877-750-7046	C/I
6 Industrial Way Eatontown, NJ 07724	www.metromediaenergy.com	ACTIVE
Metro Energy Group, LLC 14 Washington Place	888-53-Metro	R/C
Hackensack, NJ 07601	www.metroenergy.com	ACTIVE
MPower Energy NJ LLC One University Plaza, Suite	877-286-7693	R/C/I
507 Hackensack, NJ 07601	www.mpowerenergy.com	ACTIVE
NATGASCO (Supreme Energy, Inc.)	800-840-4427	R/C/I
532 Freeman Street Orange, NJ 07050	www.supremeenergyinc.com	ACTIVE
New Energy Services LLC	800-660-3643	R/C/I
101 Neptune Avenue Deal, New Jersey 07723	www.newenergyservicesllc.com	ACTIVE
New Jersey Gas & Electric 10 North Park Place Suite 420	866-568-0290	R/C
Morristown, NJ 07960	www.njgande.com	ACTIVE
Noble Americas Energy Solutions	877-273-6772	C/I
The Mac-Cali Building 581 Main Street, 8th fl. Woodbridge, NJ 07095	www.noblesolutions.com	ACTIVE
North American Power & Gas, LLC d/b/a North American Power	888- 313-8086	R/C/I
197 Route 18 South Ste. 300 New Brunswick, NJ 08816	www.napower.com	ACTIVE
North Eastern States, Inc. d/b/a Entrust Energy	(888) 521-5861	R/C/I
90 Washington Valley Road Bedminster, NJ 07921	www.entrustenergy.com	ACTIVE
Oasis Power, LLC d/b/a	(800)324-3046	R/C
Oasis Energy 11152 Westheimer, Suite 901 Houston, TX 77042	www.oasisenergy.com	ACTIVE

Palmco Energy NJ, LLC	877-726-5862	R/C/I
One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	www.PalmcoEnergy.com	ACTIVE
Plymouth Rock Energy, LLC 338 Maitland Avenue	855-32-POWER (76937)	R/C/I
Teaneck, NJ 07666	www.plymouthenergy.com	ACTIVE
PPL EnergyPlus, LLC Shrewsbury Executive Offices	(732) 741-0505	C/I
788 Shrewsbury Avenue Suite 2200 Tinton Falls, NJ 07724	www.pplenergyplus.com	ACTIVE
Public Power & Utility of New Jersey, LLC	(888) 354-4415	R/C/I
One International Blvd, Suite 400 Mahwah, NJ 07495	www.ppandu.com	ACTIVE
Residents Energy, LLC 550 Broad Street	(888) 828-7374	R/C
Newark, NJ 07102	www.residentsenergy.com	
Respond Power LLC 1001 East Lawn Drive	(877) 973-7763	R/C/I
Teaneck, NJ 07666	www.respondpower.com	ACTIVE
Save on Energy, LLC 1101 Red Ventures Drive	1 (877) 658-3183	R/C
Fort Mill, SC 29707	www.saveonenergy.com	ACTIVE
SFE Energy	1 (877) 316-6344	R/C/I
One Gateway Center Suite 2600 Newark, NJ 07012	www.sfeenergy.com	ACTIVE
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4	(800) 695-0666	C
Barrington, NJ 08007	www.sjnaturalgas.com	ACTIVE
Star Energy Partners, LLC CEO Corporate Center	(855427-7827	R/C/I
1812 Front Street Scotch Plains, NJ 07076	www.starenergypartners.com	
South Jersey Energy Company	800-266-6020	R/C/I
1 South Jersey Plaza, Route 54	www.southjerseyenergy.com	ACTIVE

Folsom, NJ 08037		
SouthStar Energy d/b/a New Jersey Energy	(866) 477-8823	R/C
1085 Morris Avenue, Suite 155		
Union, NJ 07083	www.newjerseyenergy.com	ACTIVE
Spark Energy Gas, LP/ Spark Energy 2105 City West Blvd. Suite 100	(713)600-2600	R/C/I
Houston, TX 77042	www.sparkenergy.com	ACTIVE
Sperian Energy Corp.	888-682-8082	R/C/I
Bridgewater Center		A CONTACTO
1200 Route 22 East Bridgewater, NJ 08807	www.cpariananaray.com	ACTIVE
Sprague Energy Corp.	www.sperianenergy.com 855-466-2842	C/I
12 Ridge Road	833-400-2842	C/I
Chatham Township, NJ 07928	www.spragueenergy.com	ACTIVE
Stuyvesant Energy LLC	800-640-6457	С
10 West Ivy Lane, Suite 4		A CONTACT
Englewood, NJ 07631	www.stuyfuel.com	ACTIVE
Stream Energy New Jersey,	(877) 369-8150	R/C
LLC		
309 Fellowship Road Suite 200		
Mt. Laurel, NJ 08054	www.streamenergy.net	ACTIVE
Summit Energy Services, Inc.	1 (800) 90-SUMMIT	C/I
10350 Ormsby Park Place		
Suite 400 Louisville, KY 40223	www.summitenergy.com	ACTIVE
Systrum Energy	877-797-8786	R/C/I
1 Bergen Blvd.	011-171-0100	IV C/I
Fairview, NJ 07022	www.systrumenergy.com	ACTIVE
Talen Energy Marketing,	(888) 289-7693	R/C
LLC		
788 Shrewsbury Avenue, Suite 2178	www.pplenergyplus.com/*	
Tinton Falls, NJ 07724		
Tiger Natural Gas, Inc. dba	888-875-6122	R/C/I
Tiger, Inc.		
234 20th Avenue		
Brick, NJ 008724	www.tigernaturalgas.com	ACTIVE

UGI Energy Services, Inc.	800-427-8545	C/I
dba UGI Energy Link		
224 Strawbridge Drive, Suite	www.ugienergylink.com	ACTIVE
107		
Moorestown, NJ 08057		
UGI Energy Services, Inc.	856-273-9995	C/I
d/b/a GASMARK		
224 Strawbridge Drive, Suite	2. 12.1	A CONTRACT
107	www.ugienergylink.com	ACTIVE
Moorestown, NJ 08057		
Verde Energy USA, Inc.	800-388-3862	R/C
2001 Route 46		
Waterview Plaza, Suite 301	www.low.oostmow.on	ACTIVE
Parsippany, NJ 07054	www.lowcostpower.com	
Viridian Energy PA LLC	866-663-2508	R/C
2001 Route 46, Waterview Plaza Suite 230		
Parsippany, NJ 07054	www.viridian.com	ACTIVE
11 1		
Vista Energy Marketing, L.P. 197 State Route 18 South,	888-508-4782	R/C/I
Suite 3000		
South Wing		
East Brunswick, NJ 08816	www.vistaenergymarketing.com	ACTIVE
Woodruff Energy	800-557-1121	R/C/I
73 Water Street	000-337-1121	K/C/I
PO Box 777		
Bridgeton, NJ 08302	www.woodruffenergy.com	ACTIVE
Woodruff Energy US LLC	800-457-1121	C/I
73 Water Street	000 437 1121	
P.O. Box 777		
Bridgeton, NJ 08302	www.woodruffenergy.com	ACTIVE
XOOM Energy New Jersey,	888-997-8979	R/C/I
LLC		
744 Broad Street. 16th Floor	www.xoomenergy.com	ACTIVE
Newark, NJ 07102		
Your Energy Holdings, LLC	855-732-2493	R/C/I
One International Boulevard		
Suite 400		
Mahwah, NJ 07495-0400	www.thisisyourenergy.com	ACTIVE

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CHA Project # 30993 City of East Orange City Hall

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.	Current year	Years Old	ASHRAE life expectancy
Boiler	2	Johnston	N/A	N/A	Steam Boiler	6,500MBH Energy Output	~80% Efficiency	Underground Boiler Plant	City Hall Court Chamber and Health Services	1980	-11	Burner replaced in 2010	2016	36	25
DHW Heater	2	Rheem	G100-200	URNG0109G00539	DHW Heater	199.9MBH heating input,	~80% Efficiency	Underground Boiler Plant	City Hall Court Chamber and Health Services	2007	11		2016	9	20
AHU-1	1	Carrier	40RM-014-B611YC	4403F61807	AHU with steam coil and DX cooling coil	12.5 ton cooling capacity	EER of 10.8	The AHU is located in the basement and the condenser is located on the roof the council chamber	council chamber	2003	7		2016	18	20
AHU-2	1	Carrier	40RM-014-B611YC	4403F61808	AHU with steam coil and DX cooling coil		EER of 10.9	The AHU is located in the basement and the condenser is located on the roof the council chamber	council chamber	2004	8		2016	12	20
AHU-Office	1	Trane	2TTA3060A3	62820U14F	AHU with DX cooling	5 ton cooling capacity	N/A	AHU is in the city clerk office closet and the condenser on the roof	City Clerk, city council and council chair offices	2003	7		2016	13	20
Split Heat Pump Unit	2	Misubishi	MS-A12WA	3000263	Split AC for Tax Collector office	2 ton cooling capacity	N/A	Split AC unit	Tax collector office	2006	10		2016	10	20
Window AC Units	176	Sunbeam	SBRAC12KEWG	N/A	Window AC units	1 ton cooling capacity	N/A	offices	offices	2005	9		2016	11	20

Cost of Electricity:

\$0.160 \$/kWh \$4.12 \$/kW

				EXISTING CONDITIONS								
			No. of			Watts per					Retrofit Control	
Field	Area Description Unique description of the location - Room number/Room	Usage Describe Usage Type	Fixtures No. of	Standard Fixture Code Lighting Fixture Code	Fixture Code Code from Table of Standard Fixture	Fixture Value from	kW/Space (Watts/Fixt) * (Fixt	Exist Control Pre-inst. control	Annual Hours Estimated	Annual kWh (kW/space) *	Retrofit control device	Notes
Code	name: Floor number (if applicable)	using Operating Hours	fixtures	Lighting Fixture Code	Wattages	Table of	No.)	device		(Annual Hours)	Retroit Control device	Notes
	` '''		before the			Standard			the usage group	` ´		
			retrofit			Fixture						
32LED	Basement Planning Area	Offices	1	1T 32 R F 2 (ELE)	F42LL	Wattages 60	0.06	SW	3640	218	C-OCC	
32LED	Basement Planning Area	Offices	2	1T 32 R F 2 (ELE)	F42LL F42LL	60	0.12	SW	3640	437	C-OCC	
32LED	Basement Planning Area	Offices	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3640	874	C-OCC	
32LED	Basement Planning Area	Offices	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	3640	655	C-OCC	
32LED	Basement Planning Area	Offices	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	3640	655	C-OCC	
32LED 34LED	Basement Planning Area Basement Planning Area	Offices Offices	3	1T 32 C F 2 (ELE)	F42LL F42ILL	60 59	0.24 0.18	SW SW	3640 3640	874 644	C-OCC C-OCC	
32LED	Building Maintenance	Offices	5	1T 32 R F 2 (ELE)	F42LL	60	0.30	SW	3640	1.092	C-OCC	
34LED	Building Maintenance	Offices	2	1T 32 C F 2 (ELE)	F42ILL	59	0.12	SW	3640	430	C-OCC	
34LED	Building Maintenance	Offices	1	1T 32 C F 2 (ELE)	F42ILL	59	0.06	SW	3640	215	C-OCC	
34LED 34LED	Building Maintenance Building Maintenance	Offices Offices	1	1T 32 C F 2 (ELE) 1T 32 C F 2 (ELE)	F42ILL F42ILL	59 59	0.24 0.06	SW SW	3640 3640	859 215	C-OCC C-OCC	
34LED	Mail Room	Offices	1	1T 32 C F 2 (ELE)	F42ILL F42ILL	59	0.06	SW	3640	215	C-OCC	
34LED	Mail Room	Offices	1	1T 32 C F 2 (ELE)	F42ILL	59	0.06	SW	3640	215	C-OCC	
34LED	Mail Room	Offices	2	1T 32 C F 2 (ELE)	F42ILL	59	0.12	SW	3640	430	C-OCC	
34LED	Mail Room	Offices	1	1T 32 C F 2 (ELE)	F42ILL	59	0.06	SW	3640	215	C-0CC	
15LED 15LED	Mail Room Mail Room	Offices Offices	1 4	S 32 C F 2 (ELE) S 32 C F 2 (ELE)	F42LL F42LL	60 60	0.06 0.24	SW SW	3640 3640	218 874	C-OCC C-OCC	
25	Storage	Storage Areas	5	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.24	SW	3640	510	C-OCC	
14	Womens	Restroom	3	CIRC 32/40 C F 2 (MAG)	FC32/40/1	80	0.24	SW	3640	874	C-OCC	
34LED	Storage	Storage Areas	1	1T 32 C F 2 (ELE)	F42ILL	59	0.06	SW	3640	215	C-OCC	
15LED	Storage	Storage Areas	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	3640	437	0.000	
32LED 32LED	Procorment Procorment	Offices Offices	2	1T 32 R F 2 (ELE) 1T 32 R F 2 (ELE)	F42LL F42LL	60 60	0.06 0.12	SW SW	3640 3640	218 437	C-OCC	
32LED	Procorment	Offices	12	1T 32 R F 2 (ELE)	F42LL F42LL	60	0.72	SW	3640	2,621	C-OCC	
34LED	Storage	Storage Areas	3	1T 32 C F 2 (ELE)	F42ILL	59	0.18	SW	3640	644	C-OCC	
32LED	Neighbood Housing	Offices	9	1T 32 R F 2 (ELE)	F42LL	60	0.54	SW	3640	1,966	C-OCC	
32LED	Neighbood Housing	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC	
15LED 71LED	Storage Storage	Storage Areas Storage Areas	1 1	S 32 C F 2 (ELE)	F42LL I60/1	60 60	0.06	SW SW	3640 3640	218 218	C-OCC	
32LED	Neighbood Housing	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC	
32LED	Neighbood Housing	Offices	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	3640	2,184	C-OCC	R22 is inaccessible
32LED	HR Office	Offices	8	1T 32 R F 2 (ELE)	F42LL	60	0.48	SW	3640	1,747	C-OCC	
34LED 35LED	Hallway Hallway	Hallways Hallways	2	1T 32 C F 2 (ELE) T 32 R F 3 (ELE)	F42ILL F43ILL/2	59 90	0.12 0.63	SW SW	8736 8736	1,031 5,504	NONE NONE	Light facing up and invisible
274LED	Boiler Room	Mechanical Room	6	100W In	I100/1	100	0.60	SW	8736	5,242	NONE	Light facing up and invisible
32LED	Mens	Restroom	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218	C-OCC	
34LED	Storage	Storage Areas	2	1T 32 C F 2 (ELE)	F42ILL	59	0.12	SW	3640	430	C-OCC	
34LED	Hallway	Hallways	5	1T 32 C F 2 (ELE)	F42ILL	59	0.30	SW	8736	2,577	NONE	
15LED 34LED	Boiler Room Boiler Room	Mechanical Room Mechanical Room	2	S 32 C F 2 (ELE)	F42LL F42ILL	60 59	0.06 0.12	SW SW	8736 8736	524 1,031	NONE NONE	
32LED	1st Floor Admin Office	Offices	47	1T 32 R F 2 (ELE)	F42LL	60	2.82	SW	3640	10,265	C-OCC	
228	1st Floor Admin Office	Offices	1	W60CF1	F81EL	60	0.06	SW	3640	218	C-OCC	
32LED	1st Floor Admin Office	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC	
25 32LED	1st Floor Admin Office 1st Floor Admin Office	Offices Offices	6	R 13 C CF 2 (ELE) 1T 32 R F 2 (ELE)	CFQ13/2-L F42LL	28 60	0.17 0.18	SW SW	3640 3640	612 655	C-OCC C-OCC	
32LED	conference	Conference	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	2912	1.747	C-OCC	
20LED	Storage	Storage Areas	4	S 28 P F 1 (ELE)	F41ILL	31	0.12	SW	3640	451	C-OCC	
32LED	Womens	Restroom	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218	C-OCC	facing up
5LED	Womens Tresure	Restroom	1 12	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.06	SW	3640	218	C-0CC	
32LED 32LED	Tresure Tresure	Offices Offices	12	1T 32 R F 2 (ELE)	F42LL F42LL	60	0.72	SW SW	3640 3640	2,621 655	C-OCC	
32LED	Tresure	Offices	6	1T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3640	1,310	C-OCC	
32LED	Storage	Storage Areas	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	3640	655	C-OCC	
32LED	Public Info	Offices	6	1T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3640	1,310	C-OCC	
32LED 32LED	Storage Director	Storage Areas Offices	6 4	1T 32 R F 2 (ELE)	F42LL F42LL	60 60	0.36 0.24	SW SW	3640 3640	1,310 874	C-OCC C-OCC	
32LED	Tax Accessor	Offices	17	1T 32 R F 2 (ELE)	F42LL F42LL	60	1.02	SW	3640	3,713	C-OCC	
274LED	Tax Accessor	Offices	1	100W In	I100/1	100	0.10	SW	3640	364	C-OCC	
32LED	Tax Accessor	Offices	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3640	874	C-OCC	
25 32LED	Restroom Tax Collector	Restroom Offices	2	R 13 C CF 2 (ELE) 1T 32 R F 2 (ELE)	CFQ13/2-L F42LL	28 60	0.06 0.18	SW SW	3640 3640	204 655	C-OCC C-OCC	
5LED	Tax Collector	Offices	3 4	2T 32 R F 2 (ELE)	F42LL FU2LL	60	0.18	SW	3640	874	C-0CC	
32LED	Tax Collector	Offices	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3640	874	C-OCC	
71LED	Tax Collector	Offices	4	1 60	I60/1	60	0.24	SW	3640	874	C-OCC	
274LED	Vault	Storage Areas	4	100W In	1100/1	100	0.40	SW	3640	1,456	C-OCC	
32LED 32LED	Vault Copy	Storage Areas Offices	15 2	1T 32 R F 2 (ELE) 1T 32 R F 2 (ELE)	F42LL F42LL	60 60	0.90 0.12	SW SW	3640 3640	3,276 437	C-OCC C-OCC	
32LED	Сору	Offices	3	1T 32 R F 2 (ELE)	F42LL F42LL	60	0.12	SW	3640	655	C-OCC	
32LED	Office	Offices	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3640	874	C-OCC	
32LED	Office	Offices	6	1T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3640	1,310	C-OCC	
71LED	Main Lobby Main Lobby	Hallways	24	160	160/1	60	1.44	SW	8736	12,580	NONE	
741 55	Main I Oppy	Hallways	6	1 60	160/1	60	0.36	SW	8736	3,145	C-OCC	
71LED 71LED	Main Lobby	Hallways	5	160	160/1	60	0.30	SW	8736	2,621	C-OCC	

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Cost of Electricity:

\$0.160 \$/kWh \$4.12 \$/kW

	nung & Addit input			SVETIME CONDITIONS											
_				EXISTING CONDITIONS No. of Watte per							Detrofft 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	Unique description of the location - Room number/Room	Describe Usage Type	No. of	Lighting Fixture Code	Code from Table of Standard Fixtur		(Watts/Fixt) * (Fixt	Pre-inst. control	Estimated	(kW/space) *	Retrofit control device	Notes			
Code	name: Floor number (if applicable)	using Operating Hours	fixtures	Lighting Fixture Code	Wattages	Table of	No.)	device	annual hours for		Trouble Control				
			before the			Standard			the usage group						
			retrofit			Fixture									
15LED	Mens	Restroom	1	S 32 C F 2 (ELE)	F42LL	Wattages 60	0.06	SW	3640	218	C-OCC				
15LED	Hallway	Hallways	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	8736	1,048	NONE	 			
15LED	Hallway	Hallways	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	8736	1,572	NONE				
274LED	Concil Chamber	Offices	18	100W In	I100/1	100	1.80	SW	3640	6,552	C-OCC				
32LED	conference	Conference	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	2912	699	C-OCC				
15LED	Restroom	Restroom	1 2	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	3640	218	C-OCC				
25 35LED	Stair conference	Hallways Conference	6	R 13 C CF 2 (ELE) T 32 R F 3 (ELE)	CFQ13/2-L F43ILL/2	28 90	0.06 0.54	SW SW	8736 2912	489 1,572	NONE C-OCC	 			
25	conference	Conference	5	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.14	SW	2912	408	C-OCC				
71LED	Main Lobby	Hallways	2	I 60	160/1	60	0.12	SW	8736	1,048	NONE				
5LED	2nd Floor Law Dept	Offices	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.36	SW	3640	1,310	C-OCC				
32LED	Copy	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC				
32LED 34LED	Office Office	Offices Offices	2	1T 32 R F 2 (ELE) 1T 32 C F 2 (ELE)	F42LL F42ILL	60 59	0.24 0.12	SW SW	3640 3640	874 430	C-OCC C-OCC				
32LED	Storage	Storage Areas	2	1T 32 G F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC				
32LED	Office	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC				
32LED	Office	Offices	6	1T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3640	1,310	C-OCC				
32LED	Magistrates Office	Offices	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3640	874	C-OCC				
32LED	Magistrates Office	Offices	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3640	874	C-OCC				
32LED 35LED	Magistrates Office Magistrates Office	Offices Offices	6	1T 32 R F 2 (ELE) T 32 R F 3 (ELE)	F42LL F43ILL/2	60 90	0.36 0.09	SW SW	3640 3640	1,310 328	C-OCC C-OCC	+			
32LED	Magistrates Office	Offices	4	17 32 R F 3 (ELE)	F43ILL/2	60	0.09	SW	3640	328 874	C-OCC	+			
32LED	Magistrates Office	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC	1			
32LED	Magistrates Office	Offices	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218	C-OCC				
35LED	Magistrates Office	Offices	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	3640	328	C-OCC				
25	Magistrates Office	Offices	16	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.45	SW	3640	1,631	C-OCC				
71LED 32LED	mens Womens	Restroom Restroom	2 2	I 60 1T 32 R F 2 (ELE)	I60/1 F42LL	60	0.12 0.12	SW SW	3640 3640	437 437	C-OCC C-OCC				
71LED	Storage	Storage Areas	1	160	I60/1	60	0.06	SW	3640	218	C-OCC	+			
32LED	Storage	Storage Areas	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218	C-OCC				
71LED	Mayor Office	Offices	16	I 60	160/1	60	0.96	SW	3640	3,494	C-OCC				
32LED	Mayor Office	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC				
71LED 5LED	Restroom	Restroom Offices	6	1 60	I60/1	60	0.06	SW	3640	218	C-OCC				
5LED	Council Office Council Office	Offices	6	2T 32 R F 2 (u) (ELE) 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL	60	0.36 0.36	SW SW	3640 3640	1,310 1,310	C-OCC C-OCC	+			
5LED	Council Office	Offices	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	3640	437	C-OCC				
5LED	Council Office	Offices	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	3640	437	C-OCC				
5LED	Council Office	Offices	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	3640	437	C-OCC				
5LED	Council Office	Offices	1	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.06	SW	3640	218	C-OCC				
5LED 5LED	Council Office Council Office	Offices Offices	2	2T 32 R F 2 (u) (ELE) 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL	60	0.12 0.12	SW SW	3640 3640	437 437	C-OCC C-OCC				
5LED	Council Office	Offices	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	3640	437	C-OCC	-			
5LED	Pub Info Office	Offices	3	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.18	SW	3640	655	C-OCC				
5LED	Pub Info Office	Offices	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	3640	437	C-OCC				
5LED	Pub Info Office	Offices	7	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.42	SW	3640	1,529	C-OCC				
5LED	Pub Info Office	Offices	7	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.42	SW	3640	1,529	C-OCC				
5LED 5LED	Pub Info Office Pub Info Office	Offices Offices	2	2T 32 R F 2 (u) (ELE) 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL	60	0.24 0.12	SW SW	3640 3640	874 437	C-OCC C-OCC	 			
5LED	Pub Info Office	Offices	2	2T 32 R F 2 (u) (ELE)	FUZLL	60	0.12	SW	3640	437	C-OCC	 			
5LED	Pub Info Office	Offices	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	3640	437	C-OCC				
32LED	City Clerk	Offices	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	SW	3640	3,931	C-OCC				
32LED	City Clerk	Offices	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3640	874	C-OCC	203B Not Accessible			
15LED	Vault Restroom	Storage Areas	1 1	S 32 C F 2 (ELE)	F42LL I60/1	60	0.06	SW	3640 3640	218	C-0CC				
71LED 15LED	Restroom City Clerk	Restroom Offices	3	I 60 S 32 C F 2 (ELE)	160/1 F42LL	60	0.06 0.18	SW SW	3640 3640	218 655	C-OCC C-OCC	+			
15LED	City Clerk	Offices	1	S 32 C F 2 (ELE)	F42LL F42LL	60	0.06	SW	3640	218	C-OCC	 			
71LED	Hallway	Hallways	1	160	I60/1	60	0.06	SW	8736	524	NONE	1			
71LED	Hallway	Hallways	2	I 60	I60/1	60	0.12	SW	8736	1,048	NONE	213 not accessible			
71LED	Hallway	Hallways	2	160	I60/1	60	0.12	SW	8736	1,048	NONE				
15LED	3rd Floor Stair	Hallways	2	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	8736	524	NONE	 			
15LED 15LED	Stair Womens	Hallways Restroom	1	S 32 C F 2 (ELE) S 32 C F 2 (ELE)	F42LL F42LL	60	0.12 0.06	SW SW	8736 3640	1,048 218	NONE C-OCC	 			
32LED	Office	Offices	2	1T 32 R F 2 (ELE)	F42LL F42LL	60	0.06	SW	3640	437	C-OCC	 			
32LED	Property Mainttenance	Offices	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3640	874	C-OCC	<u> </u>			
71LED	Restroom	Restroom	1	I 60	160/1	60	0.06	SW	3640	218	C-OCC				
32LED	Property Mainttenance	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC				
32LED	Property Mainttenance	Offices	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	3640	2,184	C-OCC				
32LED 32LED	Property Mainttenance Property Mainttenance	Offices Offices	4	1T 32 R F 2 (ELE) 1T 32 R F 2 (ELE)	F42LL F42LL	60 60	0.12 0.24	SW SW	3640 3640	437 874	C-OCC C-OCC	 			
32LED	Property Mainttenance Property Mainttenance	Offices	3	1T 32 R F 2 (ELE)	F42LL F42LL	60	0.24	SW	3640	655	C-OCC	 			
32LED	Property Mainttenance	Offices	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	3640	655	C-OCC				
35LED	Property Mainttenance	Offices	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	3640	655	C-OCC				
32LED	Property Mainttenance	Offices	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	3640	655	C-OCC				
32LED	Property Mainttenance	Offices	9	1T 32 R F 2 (ELE)	F42LL	60	0.54	SW	3640	1,966	C-OCC				
32LED	Storage	Storage Areas	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218	C-OCC				

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Cost of Electricity:

\$0.160 \$/kWh \$4.12 \$/kW

	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 Fix 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	mens	Restroom	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC	
25	mens	Restroom	1	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.03	SW	3640	102		
32LED	mens	Restroom	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218		
32LED	Storage	Storage Areas	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437	C-OCC	
32LED	Engineer	Offices	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218	C-OCC	
32LED	Engineer	Offices	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	3640	655	C-OCC	
32LED	Engineer	Offices	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218	C-OCC	
32LED	Engineer	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3640	437		
32LED	Engineer	Offices	6	1T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3640	1,310	C-OCC	
71LED	Restroom	Restroom	2	I 60	I60/1	60	0.12	SW	3640	437	C-OCC	
32LED	Engineer	Offices	34	1T 32 R F 2 (ELE)	F42LL	60	2.04	SW	3640	7,426	C-OCC	
32LED	Engineer	Offices	51	1T 32 R F 2 (ELE)	F42LL	60	3.06	SW	3640	11,138	C-OCC	
32LED	Storage	Storage Areas	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3640	218		_
25	Stair	Hallways	1	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.03	SW	8736	245		_
71LED	Stair	Hallways	5	I 60	I60/1	60	0.30	SW	8736	2,621		_
146LED		Outdoor Lighting	8	High Bay MH 400	MH400/1	458	3.66	SW	4368	16,004		
274LED	Exterior Light	Outdoor Lighting	5	100W In	I100/1	100	0.50	SW	4368	2,184	NONE	
64LED	Exterior Light	Outdoor Lighting	14	175 MH	MH175/1	215	3.01	SW	4368	13,148	NONE	
	Total		765				51.82			219,262		

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22.ED 23.ED 24.ED 24.ED 24.ED 24.ED 24.ED 24.ED 24.ED 25.ED 25.ED 26.ED 27.ED 28.ED	Area Description scription of the location - Room number/Room name: Floor number (if applicable) Basement Planning Area Basement Basem	No. of Fixtures Standard Fixture Code	F42LL	Watts per Fixture WW/SF WW/SF Www. Watts/Fix Watts/F	1	Estimated daily hours for the usage group (Annual Hours) (Annual H	No. of fixtures after the retrofit 118	I "Lighting Fixture Code" Example 27 40 R F(U) = 232 Troff 4 W Recess. Floor 2 lamps U shape STLED4 STLED5 STLED4 A R LED Tube 4 R LED Tube 5 R LED Tube 7 R LED Tube 8 R LED Tube 1 R LED	200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 5TLED4 STLED4 CFQ13/2-L FCS2/40/1	Watts per Fixture Value from Table of Standard Fixture Wattages 40 40 440 450 550 550 550 550 550 550 5	kW/Space (Watts/Fixt)* (Number of Fixtures) 0.0 0.1 0.2 0.1 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Retrofit Control Annual F	148 148	Original Annual White Original Origina	ual (kWh Saved) * Cost for renovations to	Measures cost to b recovere \$15 28 \$15 28 \$30 28 \$30 28 \$30 28 \$40 28 \$45 28 \$45 28 \$60 28 \$105 12 \$75 28 \$70 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 12 \$35 10 \$36 12 \$37 10 \$38 12 \$39 12 \$30	Simple Paybac Simple Payba
22.ED 23.ED 24.ED 24.ED 24.ED 24.ED 24.ED 24.ED 24.ED 25.ED 25.ED 26.ED 27.ED 28.ED	Basement Planning Ares Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Mail Roorn Mail Roo	No. of fixtures before the retrofit of Review Code* Example before the retrofit of ADR (FU) = 212 Troff 40 w Recess. Fl amps U shape 1 1 17 32 R F 2 (ELE) 2 17 32 R F 2 (ELE) 3 17 32 R F 2 (ELE) 3 17 32 R F 2 (ELE) 4 17 32 R F 2 (ELE) 3 17 32 R F 2 (ELE) 4 17 32 R F 2 (ELE) 5 17 32 R F 2 (ELE) 5 17 32 R F 2 (ELE) 1 1 18 18 R F 2 (ELE) 1 1 18 R F 2 (ELE)	FA2LL	Value from Table of Standard Pitchtre Wattages (Watts/Fix Table of Standard Pitchtre Wattages 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 59 0.0 59 0.0 59 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60	1	Estimated daily hours for the usage group (Annual Hours) (Annual H	No. of fixtures after the retrofit 118	I "Lighting Fixture Code" Example 27 40 R F(U) = 232 Troff 4 W Recess. Floor 2 lamps U shape STLED4 STLED5 STLED4 A R LED Tube 4 R LED Tube 5 R LED Tube 7 R LED Tube 8 R LED Tube 1 R LED	Code from Table of Standard Fixture Wattages STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 TED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 CF013/2-L FC32/40/1	Value from Table of Standard Flatture Wattages 40 40 40 40 40 40 30 30 30 30 30 30 30 40 40 40 40 40 40 40 40 40 40 40 40 40	(Watts/Fixt) * (Number of Fixtures) 0.0 0.1 0.1 0.2 0.1 0.1 0.2 0.1 0.1 0.2 0.1 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.0 0.0	Retrofit control Estimated device	Annual Hours 1.446	Original Annual Why Original Annual Why Gentrofit Annual Why Gentrofit Original Annual Why Original Ori	Cost for	Lighting cost to b recovers 515 282 585 1235 1255 12570 1215 1355 122 122 122 122 122 122 122 122 122 1	of time tendency available tende
24.ED	Basement Planning Ares Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Mail Roort Storage Womens Storage Storage Storage Storage Storage Procorment Procorment Procorment Procorment Procorment Storage Neiphbood Housing Neiphbood Housing Storage Storage Storage Storage Storage Hallway Boiler Roort Mens Storage Neiphbood Housing Neiphbood Housing Neiphbood Housing Neiphbood Housing Neiphbood Housing Neiphbood Housing Hallway Boiler Roort Mens Storage Hallway Hallway Hallway Hallway	1 1732 R F 2 (ELE) 2 1732 R F 2 (ELE) 4 1732 R F 2 (ELE) 3 1732 R F 2 (ELE) 4 1732 R F 2 (ELE) 5 1732 R F 2 (ELE) 5 1732 R F 2 (ELE) 1 1732 G F 2 (ELE) 1 1732 G F 2 (ELE) 1 1 1732 G F 2 (ELE) 2 1 1732 G F 2 (ELE) 1 1 1732 G F 2 (ELE) 1 1 1732 G F 2 (ELE) 2 1 1732 G F 2 (ELE) 1 1 1732 G F 2 (ELE) 1 1 1732 G F 2 (ELE) 2 1 1732 G F 2 (ELE) 3 3 G G S 2 (ELE) 4 S 32 G F 2 (ELE) 5 R 13 G G F 2 (ELE) 1 1 1732 G F 2 (ELE) 2 1 1732 R F 2 (ELE) 1 1 1 3 3 R F 2 (ELE) 1 1 1 3 3 R F 2 (ELE) 1 1 1 10 1732 R F 2 (ELE) 1 1 1 10 1732 R F 2 (ELE) 1 1 1 10 1732 R F 2 (ELE) 1 1 1 10 1732 R F 2 (ELE) 1 1 1 10 1732 R F 2 (ELE) 1 1 1 10 1732 R F 2 (ELE) 1 1 1 10 1732 R F 2 (ELE) 1 1 1 10 1732 R F 2 (ELE) 1 1 1 1732 R F 2 (ELE)	F42LL	Fixture Wattages 0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 59 0.0 59 0.0 59 0.0 59 0.0 59 0.0 59 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0	1	3640 2 2 3640 4 3640 5 3640 2 2 3640 8 3640 2 2 3640 8 3640 2 3 3640 4 3 3640 4 3 3640 4 3 3640 4 3 3640 5 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	337 2 774 4 4555 3 555 3 774 4 4 4444 3 774 4 4 4444 3 775 1 775 1 776 1 777 1	STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 4 fl.ED Tube 6 fl.ED Tube 7 fl.ED Tube 1 fl.ED Tube 1 fl.ED Tube 1 fl.ED Tube STLED4 STLED5	STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 200732x2 CONTRACT STLED4 STLED4 STLED4 STLED4 STLED4 STLED4	Fixture Wattages 40 40 40 40 40 40 30 30 30 30 30 30 30 30 30 30 30 30 30	0.0 0.1 0.2 0.1 0.1 0.2 0.1 0.2 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0	SW 3,640 SW 3,640	146 291 582 437 437 582 328 218 100 105 105 106 106 106	3	\$ 12.64 \$ 356.70 \$ 25.27 \$ 713.40 \$ 50.55 \$ 1.426.80 \$ 37.91 \$ 1.070.10 \$ 37.91 \$ 1.070.10 \$ 50.55 \$ 1.426.80 \$ 37.91 \$ 701.10 \$ 50.55 \$ 1.426.80 \$ 54.97 \$ 701.10 \$ 63.18 \$ 1.783.50 \$ 36.65 \$ 467.40 \$ 18.32 \$ 233.70 \$ 18.32 \$ 323.70 \$ 36.65 \$ 467.40 \$ 14.64 \$ 356.70 \$ 12.64 \$ 356.70	recovers	8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 10.8 8.2 10.8
24.ED	Basement Planning Ares Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Bulding Maintenanoc Mail Roort Storage Womens Storage Storage Storage Storage Storage Procorment Procorment Procorment Procorment Procorment Storage Neiphbood Housing Neiphbood Housing Storage Storage Storage Storage Storage Hallway Boiler Roort Mens Storage Neiphbood Housing Neiphbood Housing Neiphbood Housing Neiphbood Housing Neiphbood Housing Neiphbood Housing Hallway Boiler Roort Mens Storage Hallway Hallway Hallway Hallway	2 1T 32 R F 2 (ELE) 4 1T 32 R F 2 (ELE) 3 1T 32 R F 2 (ELE) 3 1T 32 R F 2 (ELE) 4 1T 32 R F 2 (ELE) 4 1T 32 R F 2 (ELE) 5 1T 32 R F 2 (ELE) 5 1T 32 R F 2 (ELE) 6 1T 32 R F 2 (ELE) 7 1T 32 R F 2 (ELE) 1 1T 32 C F 2 (ELE) 2 1T 32 C F 2 (ELE) 3 C F 2 (ELE) 4 S 32 C F 2 (ELE) 5 R T 3 C C F 2 (ELE) 2 T 32 C F 2 (ELE) 3 C F 2 (ELE) 3 C F 2 (ELE) 1 T 32 R F 2 (ELE)	F42LL	60	1	3640 44 3640 68 3640 66 3640 66 3640 66 3640 66 3640 7	337 2 774 4 4555 3 555 3 774 4 4 4444 3 774 4 4 4444 3 775 1 775 1 776 1 777 1	STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 STLED5 STLED5 STLED6 STLED6 4 N.ED Tube 5 N.ED Tube 7 N.ED Tube 8 N.ED Tube 1 N.ED T	STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 200732-2 200732-2 200732-2 200732-2 200732-2 200732-2 200732-2 200732-2 200732-2 200732-2 200732-2 5TLED4 STLED4 GF013/2-L FC03/240/1	40 40 40 40 40 40 40 40 33 30 30 30 30 30 30 30 30 3	0.1 0.2 0.1 0.1 0.2 0.1 0.2 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.0	SW 3,640	291 5828 437 437 5828 728 218 109 109 109 1199 1441 146	1 146 0.0 2 291 0.1 7 218 0.1 7 218 0.1 7 218 0.1 9 291 0.1 3 317 0.1 3 347 0.1 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0	\$ 25.27 \$ 713.40 \$ 50.55 \$ 1.426.80 \$ 37.91 \$ 1.070.10 \$ 37.91 \$ 1.070.10 \$ 50.55 \$ 1.426.80 \$ 50.55 \$ 1.426.80 \$ 50.55 \$ 1.426.80 \$ 50.55 \$ 1.426.80 \$ 1.426.80 \$ 1.478.350 \$ 1.426.80 \$ 1.478.350 \$ 1.426.80 \$ 1.478.350 \$ 1.426.80 \$ 1.478.350 \$ 1.478.350 \$ 1.478.350 \$ 1.478.350 \$ 1.478.350 \$ 1.478.35 \$ 1.478.350 \$ 1.478.350	\$30 88 860 288 \$45 288	8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.2 27.0 8.8 10.8 8.8 10.8 8.9 10
23.LED 23.LED 23.LED 23.LED 24.LED 24.LED 24.LED 24.LED 24.LED 24.LED 25.LED 25.LED 26.LED 26.LED 27.LED 28.LED 28	Basement Planning Area Bulding Maintenanox Bulding Maintenanox Bulding Maintenanox Bulding Maintenanox Bulding Maintenanox Bulding Maintenanox Mail Roorn Normal Mail Roorn Normal Mail Roorn Neiphood Housing Storage Neiphood Housing Neiphood Ho	3 1T 32 R F 2 (ELE) 3 1T 32 R F 2 (ELE) 4 1T 32 R F 2 (ELE) 5 1T 32 R F 2 (ELE) 5 1T 32 R F 2 (ELE) 6 1T 32 R F 2 (ELE) 7 1T 32 R F 2 (ELE) 1 1T 32 C F 2 (ELE) 2 1T 32 C F 2 (ELE) 3 CIRC 32440 C F 2 (MAG) 1 1T 32 C F 2 (ELE) 3 CIRC 32440 C F 2 (MAG) 1 1T 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 3 1T 32 C F 2 (ELE) 1 1T 32 R F 2 (ELE) 1 1 1T 32 R F 2 (ELE) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	F42LL	59 0.0. 60 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0.	2 SWW 2 SWW 3 SWW 5 SWW 5 SWW 5 SWW 7 SWW	3640 8 3640 6 36	774 4 45555 3 555 3 774 4 4444 3 992 5 5 30 2 2115 1 155 1 155 1 155 1 155 1 174 1 155 1 175 1 155 1 174 3 174 4 174 4 174 4 377 4 377 2 377 2 115 1 1377 2	STLED4 STLED4 STLED4 STLED4 4 fllED Tube 5 fllED Tube 6 fllED Tube 7 fllED Tube 7 fllED Tube 8 fllED Tube 8 fllED Tube 1 fllED Tube 1 fllED Tube 1 fllED Tube STLED4 STLED5 STLED4 STLED5 STLED5 STLED6 STLED6 STLED7 STLED7 STLED7 STLED8 STLED8 STLED8 STLED8 STLED8	STLED4 STLED4 STLED4 STLED4 STLED4 STLED4 200732x2 STLED4 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 5TLED4 STLED4 STLED4 STLED4 GF013/2-L FG23/40/1	30 40 30 30 30 30 30 30 30 30 30 30 40 40	0.1 0.2 0.1 0.0 0.1 0.0 0.0 0.0 0.0 0.1 0.0	SW 3,640	582 437 437 582 328 728 108 109 109 119 119 119 119 119	7	\$ 50.55 \$ 1.426.80 \$ 37.91 \$ 1.070.10 \$ 37.91 \$ 1.070.10 \$ 50.55 \$ 1.426.80 \$ 54.97 \$ 701.10 \$ 63.18 \$ 1.783.50 \$ 36.65 \$ 467.40 \$ 18.32 \$ 233.70 \$ 73.29 \$ 934.80 \$ 18.32 \$ 233.70 \$ 18.32 \$ 335.70 \$ 36.65 \$ 467.40 \$ 18.32 \$ 335.70 \$ 18.32 \$ 335.70 \$ 18.32 \$ 335.70 \$ 18.32 \$ 335.70 \$ 36.65 \$ 36.70 \$ 12.64 \$ 356.70	\$60	8.2 27.0 8.2 27.0 8.2 27.0 8.8 10.8 8.2 27.0 10.8 10.8 8.2 27.0 10.8 10.8 8.2 10.8 10.8 10
21.ED 41.ED	Basement Planning Area Basement Planning Area Basement Planning Area Bulding Maintenanoc Mail Roorn Mens Storage Hallway Hallway Hallway Hallway Hallway Hallway	3 1132 R F 2 (ELE) 4 1132 R F 2 (ELE) 5 1132 R F 2 (ELE) 5 1132 R F 2 (ELE) 2 1132 C F 2 (ELE) 1 1 132 C F 2 (ELE) 2 1 1132 C F 2 (ELE) 1 1 132 C F 2 (ELE) 1 1 132 C F 2 (ELE) 2 1 132 C F 2 (ELE) 1 1 132 C F 2 (ELE) 2 1 132 C F 2 (ELE) 3 3 C F 2 (ELE) 5 R 13 C G F 2 (ELE) 5 R 13 C G F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 3 C F 2 (ELE) 1 1 1 1 3 C F 2 (ELE) 1 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE) 1 1 1 1 2 C F 2 (ELE)	F42LL	59 0.0. 60 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 59 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0. 60 0.0.	2 SWW 3 SWW	3840 6 6 8 3640 8 8 3640 6 9 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	1444 3 3 992 5 5 330 2 2 115 1 1 155 1 1 155 1 1 155 1 1 155 1 1 155 1 1 156 1 1 157 1 15 1 1 15 1 1 1 15 1 1 1 15 1 1 1 1	STLED4 STLED4 4 RLED TUBE STLED4 4 RLED TUBE 5 RLED TUBE 5 RLED TUBE 5 RLED TUBE 6 RLED TUBE 7 RLED TUBE 7 RLED TUBE 8 RLED TUBE 9 RLED TU	STLED4 STLED4 STLED4 200732x2 STLED4 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 200732x2 5TLED4 STLED4 STLED4 GF013/2-L FG23/40/1	30 40 30 30 30 30 30 30 30 30 30 30 40 40	0.1 0.2 0.1 0.0 0.1 0.0 0.0 0.0 0.0 0.1 0.0	SW 3,6404	437 582 328 728 218 109 437 109 109 218 109	7 218 0.1 2 291 0.1 3 317 0.1 3 394 0.1 5 394 0.1 5 100 0.0 7 422 0.1 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 101 101 101	\$ 37.91 \$ 1.070.01 \$ 50.55 \$ 1.426.80 \$ 54.97 \$ 701.10 \$ 63.18 \$ 1.783.50 \$ 36.65 \$ 467.40 \$ 18.32 \$ 233.70 \$ 73.29 \$ 934.80 \$ 18.32 \$ 233.70 \$ 18.32 \$ 233.70 \$ 18.32 \$ 233.70 \$ 18.32 \$ 233.70 \$ 18.32 \$ 433.70 \$ 18.32 \$ 433.70 \$ 18.32 \$ 33.70 \$ 18.32 \$ 33.70	\$45	8.2 27.0 10.8 8.2 27.0 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 2 28.2 3.8 10.8 3.8 10.8
21.ED 41.ED 41.ED 41.ED 41.ED 41.ED 41.ED 41.ED 41.ED 41.ED 51.ED	Bulding Maintenanoc Mail Roor Storage Womens Storage Focorment Frocorment Procorment Horiphood Housing Neiphood Housing Hallway Hallway Hallway Boiler Roor Mens Storage Hallway Hallway Hallway	5 1T 32 R F 2 (ELE) 2 1T 32 G F 2 (ELE) 1 1T 32 G F 2 (ELE) 4 1T 32 G F 2 (ELE) 1 1T 32 G F 2 (ELE) 2 1T 32 G F 2 (ELE) 1 1T 32 G F 2 (ELE) 1 1S 32 G F 2 (ELE) 1 1S 32 G F 2 (ELE) 3 CIRC 32440 G F 2 (MAG) 1 1T 32 G F 2 (ELE) 3 CIRC 32440 G F 2 (MAG) 1 1T 32 G F 2 (ELE) 2 S 32 G F 2 (ELE) 2 S 32 G F 2 (ELE) 3 T 32 G F 2 (ELE) 1 1T 32 G F 2 (ELE) 2 S 32 G F 2 (ELE) 2 S 32 G F 2 (ELE) 1 1T 32 G F 2 (ELE) 2 S 32 G F 2 (ELE) 1 1T 32 G F 2 (ELE) 2 S 32 G F 2 (ELE) 1 1T 32 G F 2 (ELE) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	F42LL	60 0.0. 59 0.0 59 0.0 59 0.0 59 0.0 59 0.0 59 0.0 59 0.0 59 0.0 59 0.0 60 0.0	3 SW	3640 1.0. 3640 4. 3640 4. 3640 2. 3640 8. 3640 9. 3640 9. 3640 9. 3640 2. 3640 2. 3640 2. 3640 9.	992 5 103 2 115 1 1569 4 115 1 157 1 158 1 158 1 158 1 159 4 159 1	STLED4 4 fl LED Tube 5 fl LED Tube 4 fl LED Tube 4 fl LED Tube 7 fl LED Tube 8 fl LED Tube	STLED4 200732x2 STLED4 STLED4 GF013/2-L FC623/40/1	30 30 30 30 30 30 30 30 30 40	0.2 0.1 0.0 0.1 0.0 0.0 0.0 0.0 0.0	SW 3,640	728 218 109 437 109 109 109 109 109 119 119 119	B 211 0.1 9 106 0.0 7 422 0.1 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 106 0.0 107 0.0 108 0.0	\$ 63.18 \$ 1,783.50 \$ 36.65 \$ 467.40 \$ 18.32 \$ 233.70 \$ 73.29 \$ 233.70 \$ 18.32 \$ 233.70 \$ 18.32 \$ 233.70 \$ 18.32 \$ 233.70 \$ 36.65 \$ 467.40 \$ 18.32 \$ 233.70 \$ 18.32 \$ 335.70 \$ 18.32 \$ 335.70 \$ 18.32 \$ 36.50 \$ 12.64 \$ 356.70	\$75\$ 28 \$70\$ 12 \$35\$ 12 \$140 12 \$35\$ 12 \$35\$ 12 \$35\$ 12 \$35\$ 12 \$35\$ 12 \$35\$ 12 \$35\$ 12 \$00\$ 28	8.2 27.0 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.6 10.8 2.6 10.8 2.6 10.8 2.6 10.8 2.6 10.8 2.8 2.8 2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.
44.ED 44.ED 44.ED 44.ED 44.ED 44.ED 44.ED 54.ED	Building Maintenanox Building Maintenanox Building Maintenanox Mail Roorn Storage Womens Storage Focorment Procorment Procorment Procorment Procorment Storage Neiphbood Housing Neiphbood Housing Storage Storage Hallway Hallway Boiler Roorn Mens Storage Hallway Hens Storage Hallway Hallway Hens Storage Mens Storage Hallway Hens Storage Mens Storage Hallway Hallway Hens Storage	4 1T32 GF 2 (ELE) 1 1T32 GF 2 (ELE) 1 1T32 GF 2 (ELE) 1 1T32 GF 2 (ELE) 2 1T32 GF 2 (ELE) 1 1T32 GF 2 (ELE) 2 1T32 GF 2 (ELE) 3 1GF 2 (ELE) 4 S32 GF 2 (ELE) 5 R 13 G GF 2 (ELE) 5 R 13 G GF 2 (ELE) 2 S32 GF 2 (ELE) 2 S32 GF 2 (ELE) 3 GRG 3240 GF 2 (MAG) 1 1T32 GF 2 (ELE) 1 1T32 GF 2 (ELE) 2 1T32 RF 2 (ELE) 1 1 3T32 RF 2 (ELE) 1 1 3T32 RF 2 (ELE) 1 1 1 3T32 GF 2 (ELE) 1 1 1 3T32 RF 2 (ELE) 1 1 1 3T32 RF 2 (ELE) 1 1 1 3T32 RF 2 (ELE) 1 1 1 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	F42ILL	59 0.0.5 59 0.0.5 59 0.0.5 59 0.0.5 59 0.0.6 59 0.0.6 59 0.0.6 60 0.0.6	1 SW	3840 2 3 4 4 4 4 3840 4 4 3840 4 4 3840 4 4 3840 4 2 3840 4 3840 5 3840 6 3 3840 6 3 3840 7 5 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	115 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4 RLED Tube 5 RLED Tube 1 RLED Tube 1 RLED Tube 1 RLED Tube 1 RLED Tube 2 RLED Tube 3 RLED Tube 3 RLED Tube 4 RLED Tube 5 RLED 6 RLED Tube 8 R 13 C G F 2 (ELE) 6 RC 32/40 C F 2 (MAG) 4 RLED Tube 8 RLED Tube	200732x2 200732x2 200733x2 200733x2 200732x2 200732x2 200732x2 5TLED4 STLED4 CFG13/2-L FG32/40/1	30 30 30 30 30 30 30 30 30 40 40	0.1 0.0 0.0 0.0 0.0 0.1 0.0 0.0	SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640	109 437 109 109 109 218 109 218 109	7 422 0.1 9 106 0.0 9 106 0.0 9 106 0.0 9 106 0.0 3 211 0.1 9 106 0.0 5 73 0.0	\$ 18.32 \$ 233.70 \$ 73.29 \$ 934.80 \$ 18.32 \$ 233.70 \$ 18.32 \$ 233.70 \$ 36.65 \$ 467.40 \$ 12.44 \$ 356.70 \$ 12.64 \$ 356.70 \$ 50.55 \$ 142.64	\$35 12 \$140 12 \$35 12 \$35 12 \$35 12 \$35 12 \$70 12 \$35 12 \$50 28	2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 2 28.2 4.01/01/01 4.01/01/01
44.ED 44.ED 44.ED 44.ED 44.ED 54.ED	Building Maintenance Mail Room Storage Womens Storage Storage Procorment Procorment Procorment Procorment Storage Storage Storage Hailway Hailway Hailway Boiler Room Mens Storage Storage Storage Storage Storage Maiphood Housing Storage Maiphood Housing Neiphood Housing Neiphood Housing Neiphood Housing Neiphood Housing Hailway Hailway Hailway Boiler Room Mens Storage Hanny Mens Storage Hailway	1 1T 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 2 1T 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 1 1S 32 C F 2 (ELE) 1 S 32 C F 2 (ELE) 3 CIRC 32440 C F 2 (RAG) 1 1T 32 C F 2 (ELE) 3 CIRC 32440 C F 2 (RAG) 1 1T 32 C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 1 1T 32 C F 2 (ELE) 1 1 1T 32 C F 2 (ELE) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	F42 L	59 0.0 59 0.0 59 0.0 59 0.0 59 0.0 60 0.0	SW SW SW SW SW SW SW SW	3840 2 2 3840 2 3 3840 2 3 3840 3 3840 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1:15 1 1 1 1	4 fleD Tube 5 fleD Tube 5 fleD Tube 5 fleD Tube 5 fleD Tube 6 fleD Tube 6 fleD Tube 7 fleD Tube	200732x2 200732x2 200732x2 200732x2 200732x2 STLED4 STLED4 CFQ13/2-L FC32/40/1	30 30 30 30 30 30 40 40 40	0.0 0.0 0.0 0.1 0.0 0.0	SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640	109 109 109 218 109 146	9 106 0.0 9 106 0.0 9 106 0.0 3 211 0.1 9 106 0.0 6 73 0.0	\$ 18.32 \$ 233.70 \$ 18.32 \$ 233.70 \$ 18.32 \$ 233.70 \$ 36.65 \$ 467.40 \$ 18.32 \$ 233.70 \$ 12.64 \$ 356.70 \$ 50.55 \$ 1,426.80	\$35 12 \$35 12 \$35 12 \$35 12 \$70 12 \$35 12 \$30 28	2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 2.8 10.8 8.2 28.2 8.2 28.2 #DIV/0! #DIV/0!
MLED MLED SLED SLED SLED SLED SLED SLED SLED S	Mail Room Storage Womens Storage Storage Storage Procorment Procorment Procorment Storage Neiphbood Housing Storage Storage Storage Hailway Hailway Hailway Boiler Room Mens Storage Hailway Hens Storage Hailway	1 1132 C F 2 (ELE) 2 1132 C F 2 (ELE) 1 132 C F 2 (ELE) 1 1 132 C F 2 (ELE) 1 1 5 32 C F 2 (ELE) 4 5 32 C F 2 (ELE) 5 R 13 C C F 2 (ELE) 5 R 13 C C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1 13 C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1 13 C F 2 (ELE) 1 2 113 C F 2 (ELE) 1 2 113 C F 2 (ELE) 1 1 13 C F 2 (ELE) 1 1 1 3 C F 2 (ELE) 1 1 1 60 2 1 1 3 C F 2 (ELE) 1 1 1 1 3 C F 2 (ELE) 1 1 1 1 3 C F 2 (ELE) 1 1 1 1 3 C F 2 (ELE) 1 1 1 1 3 C F 2 (ELE) 1 1 1 1 3 C F 2 (ELE)	F42 LL F42 LL F42 L F52 40/1 F42 L	59 0.0 59 0.0 59 0.0 60 0.0 60 0.2 28 0.0 59 0.0 60 0.0	SW SW SW SW SW SW SW SW	3640 2 2 3640 4 3640 2 3 3640 2 3 3640 3 3640 3 3640 8 3 3640 5 3 3640 8 3 3640 4 2 3 3640 4 2 3 3640 4 2 3 3640 4 2 3 3640 4 3 3640 4 2 3 3640 4 2 3 3640 4 2 3 3640 4 2 3 3640 4 2 3 3640 4 3 3640 4 4 3 3 3640 4 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	115 1 1 330 2 115 1 1 115 1 1 1174 4 4 110 5 174 3 115 1 1 118 1 1 1 118 1 1 1 1 1 1 1 1 1	4 n LED Tube 4 n LED Tube 4 n LED Tube 5 n LED Tube 5 n LED Tube 5 n LED Tube 6 n LED Tube 7 n LED Tube 6 n LED Tube 7 n LED Tube	200732x2 200732x2 STLED4 STLED4 CFQ13/2-L FC32/40/1	30 30 30 40 40 28	0.1 0.0 0.0	SW 3,640 SW 3,640 SW 3,640 SW 3,640 SW 3,640	109 218 109 146	9 106 0.0 8 211 0.1 9 106 0.0 6 73 0.0	\$ 18.32 \$ 233.70 \$ 36.65 \$ 467.40 \$ 18.32 \$ 233.70 \$ 12.64 \$ 366.70 \$ 50.55 \$ 1,426.80	\$35 12 \$70 12 \$35 12 \$0 28	2.8 10.8 2.8 10.8 2.8 10.8 8.2 28.2 8.2 28.2 #DIV/0! #DIV/0!
SLED SLED 25 14 44ED SLED 21ED 21ED 21ED 21ED 21ED 21ED 21ED 21	Mail Room Mail Room Mail Room Storage Womens Storage Storage Storage Storage Procorment Procorment Procorment Procorment Storage Naghbood Housing Naghbood Housing Storage Storage Hallway Hallway Hallway Boiler Room Mens Storage Hallway	4 S 32 C F 2 (ELE) 5 R 13 C G F 2 (ELE) 3 CIRC 32/40 C F 2 (MAG) 1 1 17 32 C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1 17 32 R F 2 (ELE) 1 2 17 32 R F 2 (ELE) 1 2 17 32 R F 2 (ELE) 1 3 17 32 C F 2 (ELE) 1 3 17 32 C F 2 (ELE) 1 1 32 R F 2 (ELE) 1 1 2 17 32 R F 2 (ELE) 1 1 160 2 1 17 32 R F 2 (ELE) 1 1 17 32 R F 2 (ELE) 1 1 1 32 R F 2 (ELE)	F42LL F42LL CF0132-L FC32/40/1 F42LL	60 0 0. 28 0. 30 0. 59 0. 60 0. 60 0. 59 0. 60 0. 60 0. 59 0. 60 0. 60 0. 59 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0. 60 0.	1 SW 2 SW 1 SW 2 SW 1 SW 1 SW 1 SW 1 SW	3640 2 2 3640 8 3640 5 5 3640 5 5 3640 5 5 3640 5 5 3640 2 3 3640 2 3 3640 4 4 3 3640 4 2 3 3640 2 2 3 3640 2 2 5 3640 5 3 3640 2 5 5 3640 5 3 3640 5 5 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	118 1 1 174 4 4 110 5 1 174 3 3 115 1 1 137 2 1 18 1	STLED4 R 13 C CF 2 (ELE) CIRC 32/40 C F 2 (MAG) 4 ft LED Tube STLED4	STLED4 STLED4 CFQ13/2-L FC32/40/1	30 40 40 28	0.0	SW 3,640 SW 3,640	146		\$ 12.64 \$ 356.70 \$ 50.55 \$ 1,426.80	\$0 28	8.2 28.2 8.2 28.2 #DIV/0! #DIV/0!
25 14 44.ED 55.ED 22.ED 24.ED	Storage Womens Storage Storage Storage Procorment Procorment Procorment Procorment Procorment Storage Neighbood Housing Neighbood Housing Storage Storage Storage Holfice Hallway Hallway Boiler Room Mens Storage Hallway Boiler Room Mens Storage Hallway	3 CIRC 32/40 C F 2 (MAG) 1 1 17 32 C F 2 (ELE) 2 S 32 C F 2 (ELE) 1 1 17 32 R F 2 (ELE) 2 117 32 R F 2 (ELE) 12 117 32 R F 2 (ELE) 3 117 32 C F 2 (ELE) 3 117 32 R F 2 (ELE) 1 1 160 2 117 32 R F 2 (ELE) 1 1 1 32 R F 2 (ELE) 2 1 1 32 R F 2 (ELE) 3 1 1 32 R F 2 (ELE) 4 1 1 32 R F 2 (ELE) 5 1 1 32 R F 2 (ELE)	CFC1392L FC3240/1 F42LL	28 0.0 80 0.2 59 0.1 60 0.0 60 0.0 59 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0 60 0.0	SW SW SW SW SW SW SW SW	3640 8 3640 2 3640 4 3640 4 3640 2 3640 4 3640 2,6	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	R 13 C CF 2 (ELE) CIRC 32/40 C F 2 (MAG) 4 ft LED Tube STLED4	CFQ13/2-L FC32/40/1	28	0.2		582	2 291 0.1		\$0 28 \$0	#DIV/0! #DIV/0!
44.ED 53.ED 22.ED 22.ED 22.ED 23.ED 24.ED	Storage Storage Procorment Procorment Procorment Storage Neighbood Housing Neighbood Housing Storage Storage Storage Storage Housing Storage Housing Storage Housing Housing Housing Hallway Hallway Boiler Room Mens Storage Hallway	2 S32 C F 2 (ELE) 1 1 13 2 R F 2 (ELE) 2 113 2 R F 2 (ELE) 12 113 2 R F 2 (ELE) 3 113 2 G F 2 (ELE) 9 113 2 R F 2 (ELE) 1 S32 C F 2 (ELE) 1 S32 C F 2 (ELE) 1 1 160 2 113 2 R F 2 (ELE) 10 113 2 R F 2 (ELE) 10 113 2 R F 2 (ELE) 11 2 R F 2 (ELE) 12 113 2 R F 2 (ELE) 13 113 2 R F 2 (ELE) 14 113 2 R F 2 (ELE) 15 113 2 R F 2 (ELE) 16 113 2 R F 2 (ELE) 2 113 2 C F 2 (ELE)	F42LL	59 0. 60 0. 60 0. 60 0. 60 0. 59 0. 60 0. 60 0. 60 0. 60 0. 60 0.	SW SW SW SW SW SW SW SW	3640 2 3640 4 3640 2 3640 4 3640 2,6	15 1 137 2 118 1	4 ft LED Tube STLED4		80	0.1 0.2	SW 3,640 SW 3,640	874	1 0.0	e e		10.8
21.ED 41.ED 21.ED 41.ED	Procorment Procorment Procorment Storage Neighbood Housing Neighbood Housing Storage Storage Storage Neighbood Housing Hallway Hallway Hallway Boiler Room Mens Storage Hallway	2 1T 32 R F 2 (ELE) 12 1T 32 R F 2 (ELE) 3 1T 32 C F 2 (ELE) 9 1T 32 R F 2 (ELE) 1 S 32 C F 2 (ELE) 1 1 60 2 1T 32 R F 2 (ELE) 10 1T 32 R F 2 (ELE) 10 1T 32 R F 2 (ELE) 8 1T 32 R F 2 (ELE) 2 1T 32 C F 2 (ELE) 2 1T 32 C F 2 (ELE)	F42LL	60 0. 60 0.3 59 0.3 60 0.3 60 0.6 60 0.0 60 0.0	1 SW 7 SW 2 SW 5 SW	3640 4 3640 2,6	218 1		200732x2 STLED4	30	0.0 0.1	SW 3,640 SW 3,640	109	9 106 0.0	\$ 18.32 \$ 233.70 \$ 25.27 \$ 713.40		8.2 28.2
44.ED 22.ED 22.ED 24.ED 11.ED 24.ED 24.ED 24.ED 24.ED 24.ED 24.ED 24.ED 24.ED 44.ED 44.ED 44.ED 44.ED 44.ED 44.ED 44.ED	Storage Neighbood Housing Neighbood Housing Neighbood Housing Storage Storage Storage Storage Neighbood Housing Neighbood Housing Hel Office Hallway Hallway Boiler Room Mens Storage Hallway Hallway Hallway Hallway	3 1T 32 C F 2 (ELE) 9 1T 32 R F 2 (ELE) 2 1T 32 R F 2 (ELE) 1 S 32 C F 2 (ELE) 1 160 2 1T 32 R F 2 (ELE) 10 1T 32 R F 2 (ELE) 8 1T 32 R F 2 (ELE) 2 1T 32 C F 2 (ELE)	F42ILL F42LL F42LL F42LL I60/1 F42LL IF42LL IF42LL IF42LL IF42LL IF42LL	60 0.5 60 0.7 60 0.7 60 0.7	5 SW	3640 2,6	13/	STLED4 STLED4	STLED4 STLED4	40 40	0.0 0.1	SW 3,640 SW 3,640	146 291	1 146 0.0	\$ 12.64 \$ 356.70 \$ 25.27 \$ 713.40	\$15 28 \$30 28	8.2 27.0 8.2 27.0
21.ED 55.ED 11.ED 21.ED 21.ED 21.ED 21.ED 21.ED 41.ED 41.ED 55.ED 44.ED 55.ED 44.ED 55.ED 44.ED 44.ED 44.ED 44.ED 44.ED 44.ED	Neighbood Housing Storage Storage Storage Neighbood Housing Neighbood Housing HROffice Hallway Hallway Hallway Boiler Room Mens Storage Hallway	1 S 32 C F 2 (ĒLE) 1 1 160 2 117 32 R F 2 (ĒLE) 10 117 32 R F 2 (ĒLE) 8 117 32 R F 2 (ĒLE) 2 117 32 C F 2 (ĒLE)	F42LL F42LL I60/1 F42LL F42LL	60 0.1	SW SW		121 12 144 3	STLED4 4 ft LED Tube	STLED4 200732x2	40 30	0.5 0.1	SW 3,640 SW 3,640	328		\$ 151.64 \$ 4,280.40 \$ 54.97 \$ 701.10	\$105 12	8.2 27.0 2.8 10.8
11.ED 22.ED 22.ED 22.ED 23.ED 44.ED 54.ED 44.ED 44.ED 55.ED 44.ED 44.ED 44.ED 44.ED 44.ED 44.ED 44.ED 44.ED	Storage Neighbood Housing Neighbood Housing Hel Office Hallway Hallway Hallway Boiler Room Mens Storage Hallway	1 160 2 1T 32 R F 2 (ELE) 10 1T 32 R F 2 (ELE) 8 1T 32 R F 2 (ELE) 2 1T 32 C F 2 (ELE)	I60/1 F42LL F42LL	60 0.1		3640 4	9 137 2 118 1	STLED4 STLED4 STLED4	STLED4 STLED4 STLED4	40	0.4 0.1 0.0	SW 3,640 SW 3,640 SW 3,640	291	0 655 0.2 1 146 0.0 6 73 0.0	\$ 113.73 \$ 3,210.30 \$ 25.27 \$ 713.40 \$ 12.64 \$ 356.70	\$30 28	8.2 27.0 8.2 27.0 8.2 28.2
2LED 2LED 4LED 5LED 74LED 2LED 4LED 4LED 4LED 5LED 4LED 4LED 4LED 4LED 5LED	Neighbood Housing HR Office Hailway Hailway Boiler Room Mens Storage Hailway	10 1T 32 R F 2 (ELE) 8 1T 32 R F 2 (ELE) 2 1T 32 C F 2 (ELE)	F42LL	60 0.1	1 SW	3640 2	18 1	LED15W STLED4	LED15W STLED4	15	0.0 0.1	SW 3,640 SW 3,640	55	5 164 0.0	\$ 28.43 \$ 6.75 \$ 25.27 \$ 713.40	\$0 0.	
5LED '4LED 2LED 4LED 4LED 5LED 4LED 2LED	Hallway Boiler Room Mens Storage Hallway	2 1T 32 C F 2 (ELE)	F42LL	60 0.6 60 0.5	S SW S SW	3640 2,1 3640 1,7	84 10 47 8	STLED4 STLED4	STLED4 STLED4	40	0.4 0.3	SW 3,640 SW 3,640	1,456 1,165	6 728 0.2 5 582 0.2	\$ 126.37 \$ 3,567.00 \$ 101.09 \$ 2,853.60	\$150 28 \$120 28	8.2 27.0 8.2 27.0
2LED 4LED 4LED 5LED 4LED 2LED	Mens Storage Hallway		F42ILL F43ILL/2	59 0.6 90 0.6	SW SW	8736 1,0 8736 5,5	131 2 104 7	4 ft LED Tube T 59 R LED	200732x2 RTLED38	30 38	0.1 0.3	SW 8,736 SW 8,736	2,324	4 507 0.1 4 3,180 0.4	\$ 83.94 \$ 467.40 \$ 526.78 \$ 1,653.75	\$175 3.	i.6 4.7 i.1 2.8
4LED 5LED 4LED 2LED	Hallway	6 100W In 1 1T 32 R F 2 (ELE) 2 1T 32 C F 2 (ELE)	1100/1 F42LL F42ILL	100 0.6 60 0.1 59 0.1	1 SW	3640 2	242 6 218 1 30 2	STLED4 4 ft LED Tube	STLED4 200732x2	25 40 30	0.2 0.0 0.1	SW 8,736 SW 3,640 SW 3,640	146	6 73 0.0	\$ 651.24 \$ 243.00 \$ 12.64 \$ 356.70 \$ 36.65 \$ 467.40	\$15 28	0.4 0.3 8.2 27.0 2.8 10.8
4LED 2LED	Boiler Room	5 1T 32 C F 2 (ELE) 1 S 32 C F 2 (ELE)	F42ILL F42ILL F42LL	59 0.3 59 0.3 60 0.3	3 SW		i77 5 i24 1	4 ft LED Tube 4 ft LED Tube STLED4	200732X2 200732X2 STLED4	30 40	0.1 0.2 0.0	SW 8,736 SW 8,736	1,310		\$ 209.84 \$ 1,168.50 \$ 28.94 \$ 356.70		i.6 4.7 2.3 12.3
128	Boiler Room 1st Floor Admin Office	2 1T 32 C F 2 (ELE) 47 1T 32 R F 2 (ELE)	F42ILL F42LL	59 0.1 60 2.8	1 SW	8736 1,0		4 ft LED Tube STLED4	200732x2 STLED4	30 40	0.1 1.9	SW 8,736 SW 3,640	524 6,843	4 507 0.1	\$ 83.94 \$ 467.40 \$ 593.93 \$ 16,764.90		i.6 4.7 8.2 27.0
228 2LED	1st Floor Admin Office 1st Floor Admin Office	1 W60CF1 2 1T 32 R F 2 (ELE)	F81EL F42LL	60 0.°			1 137 2	W60CF1 STLED4	STLED4	60 40	0.1 0.1	SW 3,640 SW 3,640	291	3 - 0.0 1 146 0.0	\$ - \$ - \$ 25.27 \$ 713.40	\$0 \$30 28	#DIV/0! 8.2 27.0
25 2LED 2LED	1st Floor Admin Office 1st Floor Admin Office	6 R 13 C CF 2 (ELE) 3 1T 32 R F 2 (ELE) 10 1T 32 R F 2 (ELE)	CFQ13/2-L F42LL F42LL	28 0.2 60 0.2 60 0.6	2 SW 2 SW 6 SW	3640 6	112 6 155 3	R 13 C CF 2 (ELE) STLED4 STI FD4	CFQ13/2-L STLED4 STLED4	28 40 40	0.2 0.1 0.4	SW 3,640 SW 3,640 SW 2,912	437	7 218 0.1	\$ - \$ - \$ 37.91 \$ 1,070.10 \$ 103.07 \$ 3,567.00		#DIV/0! 8.2 27.0 4.6 33.2
OLED 2LED	conference Storage Womens	4 S 28 P F 1 (ELE) 1 1T 32 R F 2 (ELE)	F41ILL F42LL	31 0.°	1 SW	3640 4	151 4 118 1	4 ft LED Tube STLED4	200732x1 STLED4	15	0.4 0.1 0.0	SW 2,912 SW 3,640 SW 3.640	218	3 233 0.1	\$ 40.44 \$ 580.80 \$ 12.64 \$ 356.70	\$60 14	4.4 12.9 8.2 27.0
ELED 2LED	Womens Tresure	1 2T 32 R F 2 (u) (ELE) 12 1T 32 R F 2 (ELE)	FU2LL F42LL	60 0.1 60 0.1	1 SW	3640 2	218 1 321 12	2T 25 R LED STLED4	2RTLED STLED4	25 40	0.0	SW 3,640 SW 3,640	91	1 127 0.0	\$ 22.11 \$ 202.50 \$ 151.64 \$ 4,280.40	\$15 9.	
2LED 2LED	Tresure Tresure	3 1T 32 R F 2 (ELE) 6 1T 32 R F 2 (ELE)	F42LL F42LL	60 0.3 60 0.4	\$ SW	3640 1,3	3 10 6	STLED4 STLED4	STLED4 STLED4	40 40	0.1 0.2	SW 3,640 SW 3,640	874	4 437 0.1	\$ 37.91 \$ 1,070.10 \$ 75.82 \$ 2,140.20	\$90 28	8.2 27.0 8.2 27.0
2LED 2LED 2LED	Storage Public Info	3 1T 32 R F 2 (ELE) 6 1T 32 R F 2 (ELE) 6 1T 32 R F 2 (ELE)	F42LL F42LL F42LL	60 0.2 60 0.4 60 0.4	\$ SW		155 3 110 6	STLED4 STLED4 STLED4	STLED4 STLED4 STLED4	40	0.1 0.2 0.2	SW 3,640 SW 3,640 SW 3,640	874	4 437 0.1	\$ 37.91 \$ 1,070.10 \$ 75.82 \$ 2,140.20 \$ 75.82 \$ 2,140.20	\$90 28	8.2 27.0 8.2 27.0 8.2 27.0
2LED 2LED 2LED	Storage Director Tax Accessor	4 1T 32 R F 2 (ELE) 17 1T 32 R F 2 (ELE)	F42LL F42LL	60 0.3 60 1.0	2 SW	3640 8	74 4 13 17	STLED4 STLED4		40	0.2 0.2 0.7	SW 3,640 SW 3,640	582	2 291 0.1	\$ 50.55 \$ 1,426.80 \$ 214.83 \$ 6,063.90	\$60 28	8.2 27.0
4LED 2LED	Tax Accessor Tax Accessor	1 100W In 4 1T 32 R F 2 (ELE)	I100/1 F42LL	100 0.1 60 0.2			164 1 174 4	LED25W STLED4	LED25W STLED4	25 40	0.0 0.2	SW 3,640 SW 3,640	582	1 273 0.1	\$ 47.39 \$ 40.50 \$ 50.55 \$ 1,426.80	\$3 0. \$60 28	1.9 0.8 8.2 27.0
25 2LED	Restroom Tax Collector	2 R 13 C CF 2 (ELE) 3 1T 32 R F 2 (ELE)	CFQ13/2-L F42LL	28 0.: 60 0.2	2 SW	3640 6	04 2 55 3	R 13 C CF 2 (ELE) STLED4 2T 25 R LED	CFQ13/2-L STLED4 2RTLED	28 40	0.1 0.1 0.1	SW 3,640 SW 3,640	437	7 218 0.1	\$ - \$ - \$ 37.91 \$ 1,070.10	\$0 \$45 28	#DIV/0! 8.2 27.0
SLED 2LED 1LED	Tax Collector Tax Collector Tax Collector	4 2T 32 R F 2 (u) (ELE) 4 1T 32 R F 2 (ELE)	FU2LL F42LL I60/1	60 0.3	2 SW 2 SW 9 SW	3640 8	74 4 74 4 74 4	STLED4 LED15W	STLED4 LED15W	40	0.1	SW 3,640 SW 3,640 SW 3,640	582	4 510 0.1 2 291 0.1 8 655 0.2	\$ 88.46 \$ 810.00 \$ 50.55 \$ 1,426.80 \$ 113.73 \$ 27.00	\$60 28	
4LED 2LED	Vault Vault	4 100W In 15 1T 32 R F 2 (ELE)	1100/1 F42LL	100 0.4		3640 1,4	156 4 176 15	LED25W STLED4	LED25W STLED4	25 40	0.1 0.6	SW 3,640 SW 3,640	364	4 1,092 0.3	\$ 189.55 \$ 162.00 \$ 189.55 \$ 5,350.50	\$12 0.	0.9 0.8 8.2 27.0
2LED 2LED	Copy Copy Office	2 1T 32 R F 2 (ELE) 3 1T 32 R F 2 (ELE)	F42LL F42LL	60 0.3 60 0.3	1 SW	3640 4 3640 6	37 2 55 3	STLED4 STLED4	STLED4 STLED4	40 40	0.1 0.1	SW 3,640 SW 3,640	291 437	1 146 0.0	\$ 25.27 \$ 713.40 \$ 37.91 \$ 1,070.10	\$30 28 \$45 28	8.2 27.0 8.2 27.0
2LED 2LED 1LED	Office	4 1T 32 R F 2 (ELE) 6 1T 32 R F 2 (ELE) 24 160	F42LL F42LL I60/1	60 0.2 60 0.4 60 1.4	4 SW	3640 1,3	174 4 110 6	STLED4 STLED4 LED15W		40 40 15	0.2	SW 3,640 SW 3,640 SW 8,736	874		\$ 50.55 \$ 1,426.80 \$ 75.82 \$ 2,140.20 \$ 1,562.98 \$ 162.00	\$90 28	8.2 27.0 8.2 27.0
1LED 1LED	Main Lobby Main Lobby Main Lobby	6 160 5 160	160/1 160/1 160/1	60 0.4 60 0.5	4 SW		45 6	LED15W LED15W LED15W	LED15W LED15W LED15W	15	0.4 0.1 0.1	SW 8,736 SW 8,736 SW 8,736	786	3 2,359 0.3	\$ 1,562.98 \$ 162.00 \$ 390.74 \$ 40.50 \$ 325.62 \$ 33.75	\$0 0.	0.1
1LED 5LED	Mens Mens	2 I 60 1 S 32 C F 2 (ELE)	160/1 F42LL	60 0.1	1 SW	3640 4	137 2 118 1	LED15W STLED4	LED15W STLED4	15 40	0.0	SW 3,640 SW 3,640	109	9 328 0.1	\$ 56.87 \$ 13.50 \$ 12.64 \$ 356.70	\$0 0.	
5LED 5LED	Hallway Hallway	2 S 32 C F 2 (ELE) 3 S 32 C F 2 (ELE)	F42LL F42LL	60 0.3 60 0.3	2 SW	8736 1,5	148 2 172 3	STLED4 STLED4	STLED4 STLED4	40 40	0.1 0.1	SW 8,736 SW 8,736	1,048	9 349 0.0 8 524 0.1	\$ 57.89 \$ 713.40 \$ 86.83 \$ 1,070.10	\$0 12	2.3 12.3 2.3 12.3
ZLED SLED	Concil Chamber conference Restroom	18 100W In 4 1T 32 R F 2 (ELE) 1 S 32 C F 2 (ELE)	1100/1 F42LL F42LL	100 1.8 60 0.3 60 0.3		2912 6	552 18 599 4 218 1	STLED4 STLED4	STLED4	25 40	0.5 0.2 0.0	SW 3,640 SW 2,912 SW 3,640	1,638 466		\$ 852.98 \$ 729.00 \$ 41.23 \$ 1,426.80 \$ 12.64 \$ 356.70	\$60 34	1.9 0.8 4.6 33.2 8.2 28.2
25 5LED	Stair conference	1 S 32 C F 2 (ELE) 2 R 13 C GF 2 (ELE) 6 T 32 R F 3 (ELE)	CFQ13/2-L F43ILL/2	28 0.1 90 0.5	I SW		189 2 172 6	R 13 C CF 2 (ELE) T 59 R LED	CFQ13/2-L RTI FD38	28	0.0 0.1	SW 8,736 SW 2,912	489		\$ 12.64 \$ 356.70 \$ - \$ - \$ 160.79 \$ 1.417.50	\$0	#DIV/0! 1.8 7.9
25 1LED	conference Main Lobby	5 R 13 C CF 2 (ELE) 2 I 60	CFQ13/2-L I60/1	28 0.1 60 0.1		2912 4 8736 1,0	108 5 148 2	R 13 C CF 2 (ELE) LED15W	CFQ13/2-L LED15W	28 15	0.1	SW 2,912 SW 8,736			\$ - \$ - \$ 130.25 \$ 13.50	\$0	#DIV/0!
LED 2LED	2nd Floor Law Dep Copy Office	6 2T 32 R F 2 (u) (ELE) 2 1T 32 R F 2 (ELE)	FU2LL F42LL	60 0.4 60 0.7	1 SW	3640 4	110 6 137 2	2T 25 R LED STLED4	2RTLED STLED4	25 40	0.2 0.1	SW 3,640 SW 3,640	291	1 146 0.0	\$ 132.69 \$ 1,215.00 \$ 25.27 \$ 713.40	\$30 28	0.2 8.5 8.2 27.0
2LED 4LED 2LED	Office	4 1T 32 R F 2 (ELE) 2 1T 32 C F 2 (ELE) 2 1T 32 R F 2 (ELE)	F42LL F42ILL F42LL	60 0.2 59 0.1 60 0.1	1 SW	3640 4	174 4 130 2 137 2	STLED4 4 ft LED Tube STLED4	STLED4 200732x2 STLED4	30 40	0.2 0.1	SW 3,640 SW 3,640 SW 3,640	218		\$ 50.55 \$ 1,426.80 \$ 36.65 \$ 467.40 \$ 25.27 \$ 713.40	\$70 12	8.2 27.0 2.8 10.8 8.2 27.0
2LED 2LED 2LED	Storage Office Office	2 11 32 R F 2 (ELE) 2 1T 32 R F 2 (ELE) 6 1T 32 R F 2 (ELE)	F42LL F42LL F42LL	60 0.4	1 SW	3640 4	37 2 37 2 110 6	STLED4 STLED4 STLED4	STLED4	40 40 40	0.1 0.1 0.2	SW 3,640 SW 3,640 SW 3,640	291	1 146 0.0	\$ 25.27 \$ 713.40 \$ 25.27 \$ 713.40 \$ 75.82 \$ 2,140.20	\$30 28	
2LED 2LED	Magistrates Office	4 1T 32 R F 2 (ELE) 4 1T 32 R F 2 (ELE)	F42LL F42LL	60 0.2 60 0.2	2 SW 2 SW	3640 8 3640 8	374 4 374 4	STLED4 STLED4	STLED4 STLED4	40 40	0.2 0.2	SW 3,640 SW 3,640	582 582	2 291 0.1 2 291 0.1	\$ 50.55 \$ 1,426.80 \$ 50.55 \$ 1,426.80	\$60 28 \$60 28	8.2 27.0 8.2 27.0
2LED 5LED	Magistrates Office Magistrates Office Magistrates Office	6 1T 32 R F 2 (ELE) 1 T 32 R F 3 (ELE)	F42LL F43ILL/2	60 0.4 90 0.1	\$ SW 1 SW	3640 1,3	110 6 128 1 174 4	STLED4 T 59 R LED	STLED4 RTLED38	40 38	0.2	SW 3,640 SW 3,640	874 138	4 437 0.1	\$ 75.82 \$ 2,140.20 \$ 32.86 \$ 236.25	\$90 28 \$25 7.	8.2 27.0 '.2 6.4
2LED 2LED 2LED	Magistrates Office Magistrates Office	4 1T 32 R F 2 (ELÉ) 2 1T 32 R F 2 (ELE) 1 1T 32 R F 2 (ELE)	F42LL F42LL F42LL	60 0.2 60 0.1 60 0.1	1 SW	3640 4	174 4 137 2 118 1	STLED4 STLED4 STLED4	STLED4	40	0.2 0.1 0.0	SW 3,640 SW 3,640 SW 3,640	291	1 146 0.0	\$ 50.55 \$ 1,426.80 \$ 25.27 \$ 713.40 \$ 12.64 \$ 356.70	\$30 28	8.2 27.0 8.2 27.0 8.2 27.0
SLED 25	Magistrates Office Magistrates Office Magistrates Office	1 11 32 R F 2 (ELE) 1 T 32 R F 3 (ELE) 16 R 13 C C F 2 (ELE)	F42LL F43ILL/2 CFQ13/2-L	60 0.° 90 0.° 28 0.4	1 SW	3640 3	128 1	T 59 R LED R 13 C CF 2 (ELE)	RTLED38	38 28	0.0 0.0 0.4	SW 3,640 SW 3,640 SW 3,640	138	189 0.1	\$ 12.64 \$ 356.70 \$ 32.86 \$ 236.25 \$ - \$ -		
1LED 2LED	mens Womens	2 160 2 (ELE) 2 1T 32 R F 2 (ELE)	I60/1 F42LL	60 0.3	SW SW	3640 4 3640 4	37 2 37 2	LED15W STLED4	LED15W STLED4	15 40	0.0 0.1	SW 3,640 SW 3,640	109	9 328 0.1 1 146 0.0	\$ 56.87 \$ 13.50 \$ 25.27 \$ 713.40	\$0 0. \$30 28	0.2 8.2 27.0
1LED 2LED	Storage Storage	1 160 1 1732 R F 2 (ELE)	I60/1 F42LL	60 0.1 60 0.1	1 SW	3640 2	18 1 18 1	STLED4	LED15W STLED4	15 40	0.0	SW 3,640 SW 3,640	146	5 164 0.0 6 73 0.0 4 2,621 0.7	\$ 28.43 \$ 6.75 \$ 12.64 \$ 356.70	\$0 0. \$15 28	0.2 0.2 0.2 0.2
1LED 2LED 1LED	Mayor Office Mayor Office Restroom	16 160 2 1T 32 R F 2 (ELE) 1 160	I60/1 F42LL I60/1	60 1.0 60 0.1 60 0.1	1 SW	3640 4	194 16 137 2	STLED4	STLED4	15 40	0.2 0.1 0.0	SW 3,640 SW 3,640 SW 3,640	291	1 146 0.0	\$ 454.92 \$ 108.00 \$ 25.27 \$ 713.40 \$ 28.43 \$ 6.75	\$30 28	8.2 27.0
ILED ILED	Council Office Council Office	6 2T 32 R F 2 (u) (ELE) 6 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL	60 0.4 60 0.4	4 SW	3640 1,3	18 1 10 6 10 6	2T 25 R LED 2T 25 R LED	LED15W 2RTLED 2RTLED	25 25	0.0 0.2 0.2	SW 3,640 SW 3,640	546		\$ 132.69 \$ 1,215.00 \$ 132.69 \$ 1,215.00	\$90 9.	0.2 0.2 0.2 8.5 0.2 8.5
SLED SLED	Council Office Council Office	2 2T 32 R F 2 (u) (ELE) 2 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL	60 0.° 60 0.°	1 SW 1 SW	3640 4 3640 4	37 2 37 2	2T 25 R LED 2T 25 R LED	2RTLED 2RTLED 2RTLED 2RTLED	25 25	0.1 0.1	SW 3,640 SW 3,640	182	2 255 0.1	\$ 44.23 \$ 405.00 \$ 44.23 \$ 405.00	\$30 9. \$30 9.	1.2 8.5 1.2 8.5
LED SLED	Council Office Council Office	2 2T 32 R F 2 (u) (ELE) 1 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL	60 0.3	SW SW	3640 4 3640 2	137 2 118 1	2T 25 R LED 2T 25 R LED	2RTLED	25 25	0.1 0.0	SW 3,640 SW 3,640	182		\$ 44.23 \$ 405.00 \$ 22.11 \$ 202.50	\$30 9. \$15 9.	0.2 8.5 0.2 8.5
LED LED	Council Office Council Office	2 2T 32 R F 2 (u) (ELE) 2 2T 32 R F 2 (u) (ELE) 2 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL FU2LL	60 0.° 60 0.°	1 SW	3640 4	37 2 37 2	2T 25 R LED 2T 25 R LED 2T 25 R LED	2RTLED 2RTLED 2RTLED	25 25	0.1 0.1 0.1	SW 3,640 SW 3,640	182	2 255 0.1	\$ 44.23 \$ 405.00 \$ 44.23 \$ 405.00	\$30 9.	0.2 8.5 0.2 8.5
ILED ILED	Council Office Pub Info Office Pub Info Office	2 21 32 R F 2 (u) (ELE) 3 2T 32 R F 2 (u) (ELE) 2 2T 32 R F 2 (u) (ELE)	FUZLL FUZLL FUZLL	60 0.: 60 0.: 60 0.:	2 SW	3640 6	37 2 355 3 37 2	2T 25 R LED 2T 25 R LED 2T 25 R LED	2RTLED 2RTLED 2RTLED	25 25 25	0.1 0.1 0.1	SW 3,640 SW 3,640 SW 3,640	273	3 382 0.1	\$ 44.23 \$ 405.00 \$ 66.34 \$ 607.50 \$ 44.23 \$ 405.00	\$45 9.	1.2 8.5 1.2 8.5 1.2 8.5
SLED SLED	Pub Info Office Pub Info Office Pub Info Office	7 2T 32 R F 2 (u) (ELE) 7 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL FU2LL	60 0.4 60 0.4	4 SW	3640 1.5	29 7 29 7	2T 25 R LED 2T 25 R LED 2T 25 R LED 2T 25 R LED	2RTLED 2RTLED 2RTLED 2RTLED	25 25	0.1 0.2 0.2	SW 3,640 SW 3,640	637	7 892 0.2 7 892 0.2	\$ 44.23 \$ 405.00 \$ 154.80 \$ 1,417.50 \$ 154.80 \$ 1,417.50	\$105 9.	1.2 8.5 1.2 8.5 1.2 8.5 1.2 8.5

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ECM-L1 Ligi	iting Replacements																				
			EXISTING CON	DITIONS							RETROFIT	CONDITIONS						COST & SAVI	NGS ANALYSIS		
ı			Exionite doi:	DI III OI II							NE INOI II	CONDITIONS				1		0001 4 0741	NOO AMAETOIO	Simple Payback	
				Watts per								Watts per		Retrofit			Annual kWh		NJ Smart Star		
	Area Description	No. of Fixtures Standard Fixture Code	Fixture Code	Fixture	kW/Space	Exist Control			Number of Fixt		Fixture Code	Fixture	kW/Space	Control		Annual kWh		W Saved Annual \$ Saved			Simple Payback
Field Code	Unique description of the location - Room number/Roon name: Floor number (if applicable)	om No. of fixtures "Lighting Fixture Code" Example 2T before the retrofit 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2	Code from Table of Standard	Value from Table of	(Watts/Fixt) * (Fixt			(W/space) * Annual Hours)	No. of fixtures the retrofit	after "Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w	Code from Table of Standard Fixture	Value from Table of	(Watts/Fixt) * (Number of	Retrofit contri device	ol Estimated annual hours	(kW/space) * (Annual	(Original Annual kWh) - (Retrofit kW) - (Re	Annual (kWh Saved) * trofit (\$/kWh)	Cost for Prescriptive renovations to Lighting	Length of time	Length of time for renovations cost to
	name. Floor number (ii applicable)	lamps U shape	Fixture Wattages	Standard	NO.)	control device	usage group	Allitual Hours)	the retront	Recess. Floor 2 lamps U shape	Wattages	Standard	Fixtures)	device	for the usage	Hours)	Annual kWh) Annual k		lighting system Measures	for renovations cost to be	be recovered
		isinpo o snapo		Fixture			usuge group			recoods rico. 2 lamps o shape	Mattages	Fixture	i ixtaroo,		group	,	Alliada Kirily	,	ingriting by otom	recovered	Borosovered
				Wattages								Wattages			,						
5LED	Pub Info Office	2 2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	3640	437		2T 25 R LED	2RTLED	25	0.1	SW	3,640	182			3 \$ 405.00 \$30	9.2	8.5
5LED 5LED	Pub Info Office Pub Info Office	2 2T 32 R F 2 (u) (ELE) 2 2T 32 R F 2 (u) (ELE)	FU2LL FU2LL	60	0.1	SW	3640 3640	437		2T 25 R LED 2T 25 R LED	2RTLED 2RTLED	25	0.1	SW	3,640 3,640	182	255 0.1 255 0.1	\$ 44.2 \$ 44.2		9.2 9.2	8.5 8.5
32LED	City Clerk	18 1T 32 R F 2 (U) (ELE)	FUZEE F42LL	60	0.1	SW	3640	3.93		STLED4	STLED4	40	0.1	SW	3,640	2,621	1.310 0.4	\$ 44.2		28.2	27.0
32LED	City Clerk	4 1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3640	874		STLED4	STLED4	40	0.2	SW	3,640	582	291 0.1	\$ 50.5		28.2	27.0
15LED	Vault	1 S 32 C F 2 (ELE)	F42LL	60	0.1	SW	3640	218		STLED4	STLED4	40	0.0	SW	3,640	146	73 0.0	\$ 12.6	4 \$ 356.70 \$0	28.2	28.2
71LED	Restroom	1 160	160/1	60	0.1	SW	3640	218		LED15W	LED15W	15	0.0	SW	3,640	55	164 0.0	\$ 28.4		0.2	0.2
15LED	City Clerk	3 S 32 C F 2 (ELE)	F42LL	60	0.2	SW	3640	658		STLED4	STLED4	40	0.1	SW	3,640	437	218 0.1	\$ 37.9		28.2	28.2
15LED 71LED	City Clerk Hallway	1 S 32 C F 2 (ELE)	F42LL I60/1	60 60	0.1	SW	3640 8736	218 524	1 1	STLED4 LED15W	STLED4 LED15W	40	0.0	SW	3,640 8,736	146	73 0.0 393 0.0	\$ 12.6 \$ 65.1		28.2	28.2
71LED	Hallway	1 160	160/1	60	0.1	SW	8736	1,04		LED15W	LED15W		0.0	SW	8,736	262	786 0.1	\$ 130.2		0.1	0.1
71LED	Hallway	2 160	160/1	60	0.1	SW	8736	1,04	2	LED15W	LED15W	15	0.0	SW	8,736	262	786 0.1	\$ 130.2		0.1	0.1
15LED	3rd Floor Stair	1 S 32 C F 2 (ELE)	F42LL	60	0.1	SW	8736	524		STLED4	STLED4	40	0.0	SW	8,736	349	175 0.0	\$ 28.9		12.3	12.3
15LED	Stair	2 S 32 C F 2 (ELE)	F42LL	60	0.1	SW	8736	1,04		STLED4	STLED4	40	0.1	SW	8,736	699	349 0.0	\$ 57.8		12.3	12.3
15LED 32LED	Womens Office	1 S 32 C F 2 (ELE) 2 1T 32 R F 2 (ELE)	F42LL F42LL	60	0.1	SW	3640 3640	218		STLED4 STLED4	STLED4 STLED4	40	0.0	SW	3,640 3,640	146	73 0.0	\$ 12.6	4 \$ 356.70 \$0 7 \$ 713.40 \$30	28.2 28.2	28.2
32LED	Property Mainttenance	4 1T 32 R F 2 (ELE)	F42LL F42LL	60	0.1	SW	3640	874		STLED4	STLED4	40	0.1	SW	3,640	582	146 0.0 291 0.1	\$ 25.2		28.2	27.0
71LED	Restroom	1 160	160/1	60	0.1	SW	3640	218		LED15W	LED15W	15	0.0	SW	3,640	55	164 0.0	\$ 28.4		0.2	0.2
32LED	Property Mainttenance	2 1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3640	437	2	STLED4	STLED4	40	0.1	SW	3,640	291	146 0.0	\$ 25.2		28.2	27.0
32LED	Property Mainttenance	10 1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	3640	2,184		STLED4	STLED4	40	0.4	SW	3,640	1,456		\$ 126.3		28.2	27.0
32LED 32LED	Property Mainttenance	2 1T 32 R F 2 (ELE) 4 1T 32 R F 2 (ELE)	F42LL F42LL	60	0.1	SW	3640 3640	437 874		STLED4 STLED4	STLED4 STLED4	40	0.1	SW	3,640 3,640	291 582	146 0.0 291 0.1	\$ 25.2		28.2	27.0
32LED	Property Mainttenance Property Mainttenance	4 1T 32 R F 2 (ELE) 3 1T 32 R F 2 (ELE)	F42LL F42LL	60	0.2	SW	3640	655		STLED4 STLED4	STLED4		0.2	SW	3,640	38Z 437			5 \$ 1,426.80 \$60 1 \$ 1.070.10 \$45	28.2 28.2	27.0 27.0
32LED	Property Mainttenance	3 1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3640	658		STLED4	STLED4	40	0.1	SW	3,640	437			1 \$ 1,070.10 \$45	28.2	27.0
35LED	Property Mainttenance	2 T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3640	655		T 59 R LED	RTLED38	38	0.1	SW	3,640	277	379 0.1	\$ 65.7	1 \$ 472.50 \$50	7.2	6.4
32LED	Property Mainttenance	3 1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3640	658		STLED4	STLED4	40	0.1	SW	3,640	437	218 0.1		1 \$ 1,070.10 \$45	28.2	27.0
32LED 32LED	Property Mainttenance	9 1T 32 R F 2 (ELE)	F42LL F42LL	60	0.5	SW	3640	1,966 218	9	STLED4 STLED4	STLED4	40	0.4	SW	3,640	1,310	655 0.2	\$ 113.7		28.2	27.0 27.0
15LED	Storage mens	1 1T 32 R F 2 (ELE) 2 S 32 C F 2 (ELE)	F42LL F42LL	60	0.1	SW	3640 3640	218		STIED4	STLED4 STLED4	40	0.0	SW	3,640 3,640	146	73 0.0 146 0.0	\$ 12.6 \$ 25.2		28.2 28.2	27.0
25	mens	1 R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.0	SW	3640	103	1	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3,640	102	- 0.0	\$ 25.2	\$ - \$0	20.2	#DIV/0!
32LED	mens	1 1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3640	218	1	STLED4	STLED4	40	0.0	SW	3,640	146	73 0.0	\$ 12.6	4 \$ 356.70 \$15	28.2	27.0
32LED	Storage	2 1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3640	437		STLED4	STLED4	40	0.1	SW	3,640	291	146 0.0	\$ 25.2		28.2	27.0
32LED	Engineer	1 1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3640	218		STLED4	STLED4		0.0	SW	3,640	146			4 \$ 356.70 \$15	28.2	27.0
32LED 32LED	Engineer	3 1T 32 R F 2 (ELE) 1 1T 32 R F 2 (ELE)	F42LL F42LL	60 60	0.2	SW	3640 3640	655 218		STLED4 STLED4	STLED4 STLED4	40	0.1	SW	3,640 3,640	437	218 0.1 73 0.0	\$ 37.9 \$ 12.6	1 \$ 1,070.10 \$45 4 \$ 356.70 \$15	28.2 28.2	27.0 27.0
32LED	Engineer Engineer	1 11 32 R F 2 (ELE) 2 1T 32 R F 2 (ELE)	F42LL F42LL	60	0.1	SW	3640	437		STLED4 STLED4	STLED4	40	0.0	SW	3,640	291	146 0.0	\$ 12.6		28.2	27.0
32LED	Engineer	6 1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3640	1,310	6	STLED4	STLED4		0.2	SW	3,640	874			2 \$ 2,140.20 \$90	28.2	27.0
71LED	Restroom	2 160	160/1	60	0.1	SW	3640	437	2	LED15W	LED15W	15	0.0	SW	3,640	109	328 0.1	\$ 56.8	7 \$ 13.50 \$0	0.2	0.2
32LED	Engineer	34 1T 32 R F 2 (ELE)	F42LL	60	2.0	SW	3640	7,426	34	STLED4	STLED4	40	1.4	SW	3,640	4,950	2,475 0.7 3,713 1.0	\$ 429.6		28.2	27.0
32LED 32LED	Engineer Storage	51 1T 32 R F 2 (ELE) 1 1T 32 R F 2 (ELE)	F42LL F42LL	60	3.1	SW	3640 3640			STLED4 STLED4	STLED4 STLED4	40	2.0	SW	3,640 3,640	7,426		\$ 644.4 \$ 12.6		28.2	27.0
32LED 25	Storage Stair	1 R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.0	SW	8736	218	1	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.0	SW	8,736	245	73 0.0	\$ 12.0	\$ - \$0	28.2	27.0 #DIV/0!
71LED	Stair	5 160	160/1	60	0.3	SW	8736	2,62		LED15W	LED15W	15	0.1	SW	8,736	655	1,966 0.2	\$ 325.6	2 \$ 33.75 \$0	0.1	0.1
146LED	Exterior Light	8 High Bay MH 400	MH400/1	458	3.7	SW	4368	16,004	8	BAYLED78W	BAYLED78W	93	0.7	SW	4,368	3,250	12,755 2.9	\$ 2,185.0		3.1	2.7
274LED	Exterior Light	5 100W In	I100/1	100	0.5	SW	4368	2,184		LED25W	LED25W	25	0.1	SW	4,368	546	1,638 0.4	\$ 280.6		0.7	0.7
64LED	Exterior Light	14 175 MH	MH175/1	215	3.0	SW	4368	13,14	14	BAYLED78W	BAYLED78W	93	1.3	SW	4,368	5,687	7,461 1.7	\$ 1,278.1	3 \$ 11,818.74 \$1,400	9.2	8.2
	Total	765			51.8			219,262	765			5,770	27.6			110,542	108,720 2	1.3 \$18,595	\$213,596 \$11,562		
•								•	•								nd Savings	24.3	\$1,200		
																	h Savings	108,720	\$17,395		<u> </u>
																Tota	al savings		\$18,595	11.5	10.9

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Utility Costs			Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	А	st	
\$	0.181	\$/kWh blended		0.000420205	56,024	Electric	Natural Gas	Fuel Oil
\$	0.160	\$/kWh supply	365,959	0.000420205		\$ 66,123	\$ 32,667	
\$	4.12	\$/kW	144.3	0				
\$	0.80	\$/Therm	40,670	0.00533471				
\$	5.00	\$/kgals		0				
		\$/Gal						

			City F	lall																			
Recommend?		Item			Sa	vings			Cost	Simple	Life	GHG Reduction	NJ Smart Start	Direct Install	Payback w/		Simple	Projected Lifetin	ne Savings		RO	NPV	IRR
Y or N			kW	kWh	therms	No. 2 Oil gal	Water kgal	\$		Payback	Expectancy	(Metric tons)	Incentives	Eligible (Y/N)	Incentives	kW	kWh	therms	kgal/yr	\$			
Υ	ECM-1	Install thermostat control valves on steam radiators	0.0	0	3,731	0	0	2,996	41,869	14.0	15	19.9	\$ -	N	14.0	0.0	0	55,971	0	\$ 44,9	44 0.	(\$6,099)	0.9%
Υ	ECM-2	Install Window AC Controller	0.0	23,115	0	0	0	4,184	54,000	12.9	15	9.7	\$ -	N	12.9	0.0	346,719	0	0	\$ 62,7	56 0.2	(\$4,055)	1.9%
Υ	ECM-3	Replace the DHW Heaters with Condensing Heaters	0.0	0	680	0	0	546	15,510	28.4	20	3.6	\$ 800	N	26.9	0.0	0	13,600	0	\$ 10,9	21 (0.	3) (\$6,586)	-2.7%
N	ECM-4	Replace old plumbing fixtures with low flow plumbing fixtures	0.0	0	1,509	0	154	1,983	270,848	136.6	10	8.0	\$ -	N	136.6	0.0	0	15,088	1,543	\$ 19,8	32 (0.	9) (\$253,931)	-31.5%
Υ	ECM-L1	Lighting Replacements with Controls (Occupancy Sensors)	24.3	134,229	0	0	0	22,676	233,441	10.3	10	56.4	\$ 14,502	N	9.7	242.6	1,342,290	0	0	\$ 254,9	49 0.1	(\$25,508)	0.6%
Total			24.3	157,344	5,920	0	154	\$ 32,385 \$	615,668	19.0	14.0	98	\$ 15,302		18.5	243	1,689,009	84,658	1,543	\$ 393,4	02 (0.	4) (296,179	9) -3.5%
Recommended Measures (highlighted green above)			24.3	157,344	4,411	0	0	\$ 30,402 \$	344,820	11.3	15.0	90	\$ 15,302	0	10.8	243	1,689,009	69,571	-	\$ 373,5	70 0.1	(42,248	3) 4.4%
		% of Existing	17%	43%	11%	0	0																

water

		City:	Newarl	k, NJ	1		
	Occupied F	lours/Week	60				
			Building	Auditorium	Gymnasium	Library	Classrooms
	Enthalpy		Operating	Occupied	Occupied	Occupied	Occupied
Temp	h (Btu/lb) Bin Hours		Hours	Hours	Hours	Hours	Hours
102.5							
97.5	35.4	6	2	0	0	0	0
92.5	37.4	31	11	0	0	0	0
87.5	35.0	131	47	0	0	0	0
82.5	33.0	500	179	0	0	0	0
77.5	31.5	620	221	0	0	0	0
72.5	29.9	664	237	0	0	0	0
67.5	27.2	854	305	0	0	0	0
62.5			331	0	0	0	0
57.5			214	0	0	0	0
52.5	18.2	730	261	0	0	0	0
47.5	16.0	491	175	0	0	0	0
42.5	14.5	656	234	0	0	0	0
37.5	12.5	1,023	365	0	0	0	0
32.5	10.5	734	262	0	0	0	0
27.5	8.7	334	119	0	0	0	0
22.5	7.0	252	90	0	0	0	0
17.5	5.4	125	45	0	0	0	0
12.5	3.7	47	17	0	0	0	0
7.5	2.1	34	12	0	0	0	0
2.5	1.3	1	0	0	0	0	0
-2.5							
-7.5							

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

leating System Efficiency	78%
Cooling Eff (kW/ton)	1.2

Hea	ating	
Hours	9,454	Hrs
Weighted Avg	2	F
Avg	25	F

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

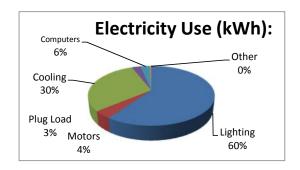
City of East Orange – City Hall CHA Project Number: 30993

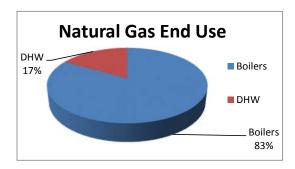
City Hall

Utility End Use Analysis								
Electric	ity Use (kWh):	Notes/Comments:						
365,959	Total	Based on utility analysis						
219,000	Lighting	From Lighting Calculations						
15,000	Motors	Estimated						
110,000	Cooling	Calculated from Cooling Capacity						
10,000	Plug Load	Estimated						
10,000	Computers	Estimated						
1,959	Other	Remaining						
Natural Ga	s Use (Therms):	Notes/Comments:						
40,670	Total	Based on utility analysis						
33,870	Boilers							
6,800	DHW	Based on utility analysis						

60% 4% 30% 3% 3% 1%

83% 17%





City of East Orange – City Hall CHA Project Number: 30993

City Hall

ECM-1 Install thermostat control valves on steam radiators

Description: This ECM evaluates installing thermostat control valves on the steam radiators throughout the building to have more accurate control on the room temperature (temperature setback at night) and reduce energy usage

Day Setback

==") =:			
KISTING CONDITIC	NS		
Heating			
ating Season Facility Temp	80	F	Th
eekly Occupied Hours	60	hrs	H
ating Season Setback Temp	72	F	Sh
ating Season % Savings per	1%		Ph
nual Boiler Capacity	3,387,000	Mbtu/yr	
nnected Heating Load	1,598,376	Btu/hr	Caph
uivalent Full Load Heating	900	hrs	EFLHh
ating Equipment Efficiency	78%		AFUEh
AVINGS			
tural Gas Savings	905	Therms ³	
oling Electricity Savings	0	kWh	

Nighttime Setback

EXISTING CONDITION:	EXISTING CONDITIONS							
Heating								
Heating Season Facility Temp	80	F						
Weekly Occupied Hours	60	hrs						
Heating Season Setback Temp	65	F						
Heating Season % Savings per	3%							
Annual Boiler Capacity	3,387,000	Mbtu/yr						
Connected Heating Load Capacity	1,598,376	Btu/hr						
Equivalent Full Load Heating Hours	500	hrs						
Heating Equipment Efficiency	78%							
SAVINGS								
Natural Gas Savings	2,827	Therms ³						
Cooling Electricity Savings	0	kWh						

\$0.18 \$/kWh Blended \$0.80 \$/Therm

COMBINED SAVINGS							
Natural Gas Savings	3,731	Therms					
Cooling Electricity Savings	0	kWh					
Total Cost Savings	\$ 2,996						
Estimated Total Project Cost	\$ 41,869						
Simple Payback	14.0	Yrs					
along forms NII Donton along the control of the Control		Hard Theorem					

Savings calculation formulas are taken from NJ Protocols document for Occupancy Controlled Thermostats

Algorithms

Cooling Energy Savings (kWh) = ((($T_c*(H+5)+S_c*(168-(H+5)))/168$) $T_c)*(P_c*Cap_{hp}*12*EFLH_c/EER_{hp})$

 $\begin{aligned} & \text{Heating Energy Savings (kWh)} = (((T_h*(H+5)+S_h*(168-(H+5)))/168) - T_h)*(P_h*Cap_{np}*12*EFLH_f/EER_{hp}) \end{aligned}$

 $\label{eq:heating-energy-savings} \begin{array}{l} \mbox{Heating Energy Savings (Therms)} = (T_h \mbox{-} (T_h \mbox{*} (H + 5)) \mbox{+} S_h \mbox{*} (168 \mbox{-} (H + 5))) \mbox{/} (168 \mbox{*} (H + 5))) \mbox{/} (168 \mbox{*} (H + 5))) \mbox{/} (168 \mbox{-} (H + 5)))$

Definition of Variables

T_h = Heating Season Facility Temp. (°F)

T_b = neating Season Facility Temp. (°F)
T_c = Cooling Season Facility Temp. (°F)
S_b = Heating Season Setback Temp. (°F)
S_c = Cooling Season Setup Temp. (°F)
H = Weekly Occupied Hours

Caphp = Connected load capacity of heat pump/AC (Tons) - Provided on Application. $Cap_h = Connected heating load capacity (Btu/hr) – Provided on Application. EFLH_c = Equivalent full load cooling hours EFLH_h = Equivalent full load heating hours$

EPLH_b = Equivalent turn load nearing mous P_b = Heating season percent savings per degree setback P_c = Cooling season percent savings per degree setup $AFUE_b$ = Heating equipment efficiency – Provided on Application. EER_{bp} = Heat pump/AC equipment efficiency – Provided on Application

Occupancy Controlled Thermostats

Component	Type	Value	Source
Th	Variable		Application
T _c	Variable		Application
Sh	Fixed	T _h -5°	
Sc	Fixed	T _c +5°	
H	Variable		Application; Default
			of 56 hrs/week
Caphp	Variable		Application
Caph	Variable		Application
EFLH _c	Fixed	381	1
EFLH _h	Fixed	900	PSE&G
Ph	Fixed	3%	2
Pc	Fixed	6%	2
AFUE _h	Variable		Application
EERhp	Variable		Application

Sources:

- JCP&L metered data from 1995-1999
 ENERGY STAR Products website

City of East Orange – City Hall CHA Project Number: 30993

City Hall

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-1 Install thermostat control valves on steam radiators - Cost

Description	QTY UI	UNIT	UNIT COSTS			SUB	TOTAL CO	STS	TOTAL	REMARKS	
Description	QII	QTY UNIT		LABOR	EQUIP.	MAT.	LABOR	EQUIP.	COST	REWARKS	
						\$ -	\$ -	\$ -	\$ -		
Boiler Controller	1	ea	\$ 12,000	\$ 15,000		\$ 12,324	\$ 18,690	\$ -	\$ 31,014	Estimated	
						\$ -	\$ -	\$ -	\$ -		

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

\$ 31,014	Subtotal					
\$ 10,855	35% Contingency					
\$ 41,869	Total					

EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (btu/h)	_	
Window AC	Office	2,112,000	12,000	176 units
	Total btu/h of all window A/C Units:	2 112 000	htu/h	176 unitss

ECM-2 Install Window AC Controller

ECM Description: Window A/C units are currently controlled manually by the occupants and are not turned off when the room is unoccupied. This ECM evaluates implementation of a digital timer device that will automatically turn the window A/C unit off at a preset time.

ASSUMPTIO	NS	Comments	
Electric Cost	\$0.181	/ kWh	
Average run hours per Week	60	Hours	
Space Balance Point	55	F	
Space Temperature Setpoint	72	deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	2,112,000	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	11.0		
Existing Annual Electric Usage	64,955	kWh	
<u>Item</u>	<u>Value</u>	<u>Units</u>	<u>Comments</u>

ANNUAL SAVINGS					
Annual Electrical Usage Savings	23,115	kWh			
Annual Cost Savings	\$4,184				
Total Project Cost	\$54,000				
Simple Payback	13	years			

OAT - DB Bin Temp F	Annual Hours	Existing Hours of Operation	Proposed % of time of operation	Proposed hrs of Operation
102.5	0	0	100%	0
97.5	6	5	100%	5
92.5	31	24	100%	24
87.5	131	90	87%	78
82.5	500	289	73%	212
77.5	620	294	60%	176
72.5	664	245	47%	114
67.5	854	0	0%	0
62.5	927	0	0%	0
57.5	600	0	0%	0
52.5	730	0	0%	0
47.5	491	0	0%	0
42.5	656	0	0%	0
37.5	1,023	0	0%	0
32.5	734	0	0%	0
27.5	334	0	0%	0
22.5	252	0	0%	0
17.5	125	0	0%	0
12.5	47	0	0%	0
7.5	34	0	0%	0
2.5	1	0	0%	0
-2.5	5,027	0	0%	0
-7.5	0	0	0%	0
Total	13,787	947	64%	610

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ECM-2 Install Window AC Controller - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS		SUBTOTAL COSTS			TOTAL	REMARKS	
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	COST	REWARKS
						0	\$ -	\$ -	\$ -	
Window AC Controller	176	EA	\$ 100	\$ 100	\$ -	18075.2	\$ 21,930	\$ -	\$ 40,005	Estimated
						\$ -	\$	\$ -	\$	

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

\$,	Total
\$ 14.002	35% Contingency
\$ 40,005	Subtotal

City of East Orange – City Hall CHA Project Number: 30993

City Hall

ECM-3 Replace the DHW Heaters with Condensing Heaters

Description: This ECM evaluates the energy savings associated with installing a water-water heat exchanger and utilizing the proposed condensing boiler (See ECM-3) to produce hot water

<u>Item</u>	<u>Value</u>	<u>Units</u>	Formula/Comments
Avg. Monthly Utility Demand by Water Heater	567	Therms/month	Calculated from utility bill
Total Annual Utility Demand by Water Heater	680,000	MBTU/yr	1therm = 100 MBTU
Existing DHW Heater Efficiency	81%	•	Per manufacturer nameplate
Total Annual Hot Water Demand (w/ standby losses)	550,800	MBTU/yr	·
Existing Tank Size	200	Gallons	Per manufacturer nameplate
Hot Water Piping System Capacity	5	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	140	°F	Per building personnel
Room Temperature	72	°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	25,441	MBTU/yr	
New Tank Size	200	Gallons	Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Hot Water Piping System Capacity	5	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	140	°F	
Room Temperature	72	°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	25,441	MBTU/yr	
Total Annual Hot Water Demand	550,800	MBTU/yr	
Proposed Avg. Hot water heater efficiency	90%		Estimated
Proposed Fuel Use	6,120	Therns	Standby Losses and inefficient DHW heater eliminated
·			
Utility Cost	\$0.80	\$/Therm	
Existing Operating Cost of DHW	\$5,460	\$/yr	
Proposed Operating Cost of DHW	\$4,914	\$/yr	

Savings Summary:

Utility	Energy Savings	Cost Savings
Therms/yr	680	\$546

City of East Orange – City Hall CHA Project Number: 30993 City Hall

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-3 Replace the DHW Heaters with Condensing Heaters - Cost

Description	QTY UNIT		UNIT COSTS		SUBTOTAL COSTS		TOTAL	REMARKS		
Description			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	COST	REWARKS
Condensing Heater	2	EA	\$ 4,500	\$ 500		\$ 9,243	\$ 1,246	\$ -	\$ 10,489	From Internet Price/ Estimated Cost*
Miscellaneous Electrical/Controls	1	LS				\$ -	\$ -	\$ -	\$ 1,000	Estimated

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

\$ 11,489	Subtotal
\$ 4,021	35% Contingency
\$ 15,510	Total

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City 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 CO	NDITIONS	
Cost of Water / 1000 Gallons	\$5.00 \$ / kGal	
Urinals in Building to be replaced	20	
Average Flushes / Urinal (per Day)	5	
Average Gallons / Flush	1.5 Gal	

PROPOSED CONDITIONS							
Proposed Urinals to be Replaced	20						
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	54.75	kGal / year					
Proposed Urinal Water Use	4.56	kGal / year					
Water Savings	50.19	kGal / year					
Cost Savings	\$251	/ year					

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

City of East Orange – City Hall CHA Project Number: 30993

City 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 CONDI	TIONS	
Cost of Water / 1000 Gallons	\$5.00	\$ / kGal
Toilets in Building	40	
Average Flushes / Toilet (per Day)	3	
Average Gallons / Flush	3.5	Gal

PROPOSED	CONDIT	ΓΙΟΝS	
Proposed Toilets to be Replaced		40	
Proposed Gallons / Flush		1.28	Gal

SAVINGS		
Current Toilet Water Use	153.30	kGal / year
Proposed Toilet Water Use	56.06	kGal / year
Water Savings	97.24	kGal / year
Cost Savings	\$486	/ year

City of East Orange – City Hall CHA Project Number: 30993

City Hall

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 CON	DITIONS	
Cost of Water / 1000 Gallons	\$5.00	\$ / kGal
Faucets in Building	40	
Average Uses / Faucet (per day)	3	# Uses
Average Time of Use	10.0	seconds
Average Flowrate	2.0	gpm

PROPOSED	CONDITIONS
Proposed Faucets to be Replaced	40
Proposed Flowrate	0.5 gpm

HEATING SAVINGS								
Fuel Cost	\$ 0.80	/kWh						
Number of Faucets	40							
Hours per Day of Usage	0.5	hrs						
Days per Year of Facility Usage	230	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	80%							
Conversion Factor	100,000 Btu/Therm							
SAVINGS	3							
Current Faucet Water Use	9.20	kGal / year						
Proposed Faucet Water Use	2.30	kGal / year						
Water Savings	6.90 kGal / year							
Heating Savings	,	Therms						
Cost Savings	\$1,246	/ 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

City of East Orange – City Hall CHA Project Number: 30993 City Hall

#RE	F!		

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description QTY		UNIT	Ĺ	JNIT COST	S	SUE	STOTAL CO	STS	TOTAL COST	DEMVDKS
Description	QII	OINIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	TOTAL COST	KEWAKKS
									\$ -	
Low-Flow Urinal	20	EA	\$ 1,200	\$ 1,000	\$ -	\$ 24,648	\$ 24,920	\$ -	\$ 49,568	Vendor Estimate
Low-Flow Toilet	40	EA	\$ 1,400	\$ 1,000	\$ -	\$ 57,512	\$ 49,840	\$ -	\$ 107,352	Vendor Estimate
Low-Flow Faucet	40	EA	\$ 700	\$ 300	\$ -	\$ 28,756	\$ 14,952	\$ -	\$ 43,708	Vendor Estimate
						\$ -	\$ -	\$ -	\$ -	

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

\$ 200,628	Subtotal
\$ 70,220	35% Contingency
\$ 270,848	Total

City of East Orange - City Hall CHA Project Number: 30993 City Hall

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 200 kW and minimum area of building is 50,000 ft to be most cost-effective for commercial and industrial buildings. However, multifamily buildings with peak demand over 100kW are still eligible. Market manager has the discretion to approve applications that fall below 200kW minimum.

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
- up to 70% of lighting savings may be considered but performance target will increase by 1% for each percent over 50%
- Scope should includes two or more unique measures
- 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)	56,024	
Is this audit funded by NJ BPU (Y/N)	Yes	
Board of Public Utilites (BPU)		_
	Annual	Utilities

#1	
\$0.05	\$/sqft
	#1 \$0.05

	kWh	Therms
Existing Cost (from utility)	\$66,123	\$32,667
Existing Usage (from utility)	365,959	40,670
Proposed Savings	157,344	4,411
Existing Total MMBtus	5,5	18
Proposed Savings MMBtus	1,0	000
% Energy Reduction	18.	1%
Proposed Annual Savings	\$30	,402

	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	\$1.06
Incentive #3	\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.11	\$1.06

	Incentives \$		
	Elec	Gas	Total
Incentive #1	\$0	\$0	\$5,000
Incentive #2	\$16,613	\$4,658	\$21,271
Incentive #3	\$16,613	\$4,658	\$21,271
Total All Incentives	\$33,226	\$9,315	\$47,541

Total Troject cost	\$344,020	
		Allowable
% Incentives #1 of Utility Cost*	5.1%	\$5,000
% Incentives #2 of Project Cost**	6.2%	\$21,271
% Incentives #3 of Project Cost**	6.2%	\$21,271
Total Eligible Incentives***	\$47	,541
Project Cost w/ Incentives	\$297	7,279

Project Payb	ack (years)
w/o Incentives	w/ Incentives
11.3	9.8

^{*} Maximum allowable incentive is 50% of annual utility cost if not funded by NJ BPU, and %25 if LGEA is funded by NJBPU.

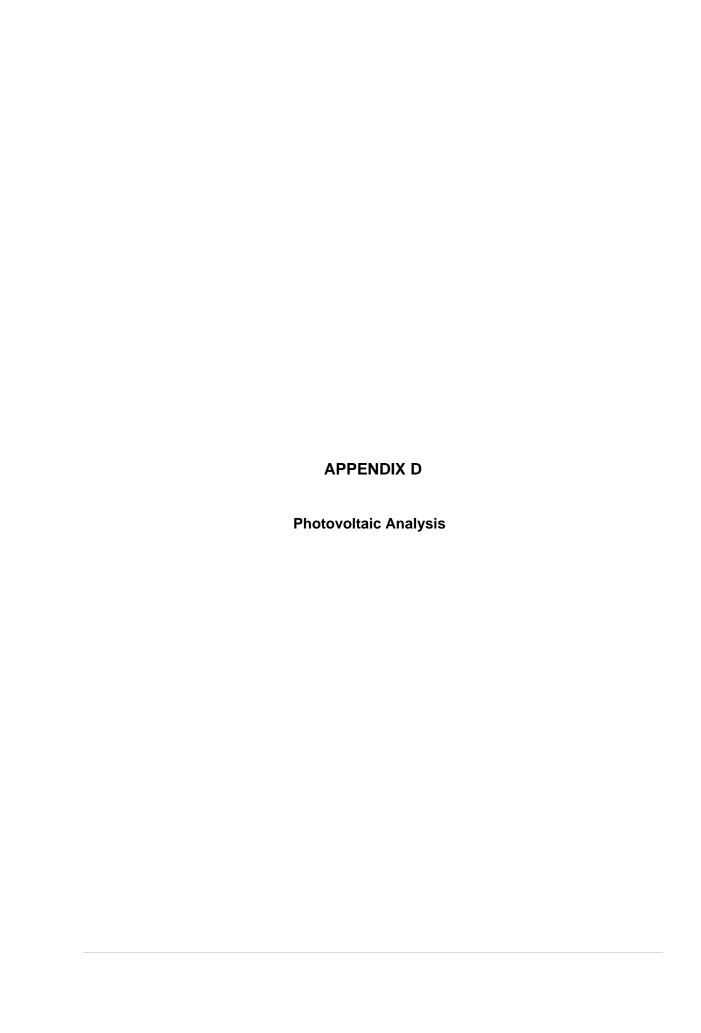
Maximum allowable amount of Incentive #2 & #3 is \$1 million per gas account and \$1 million per electric account; maximum 2 million per project

^{**} Maximum allowable amount of Incentive #2 is 50% of total project cost.

^{**}Maximum allowable amount of Incentive #3 is 50% of total project cost.

***Maximum allowable amount of Incentive #3 is 50% 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.





Caution: 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.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

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The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

71,358 kWh per Year *

System output may range from 68,639 to 74,747kWh per year near this location.

Month	Solar Radiation (kWh / m² / day)	AC Energy (kWh)	Energy Value (\$)
January	2.39	3,776	491
February	3.16	4,479	582
March	4.07	6,247	812
April	4.83	6,948	903
May	5.70	8,215	1,068
June	5.94	8,070	1,049
July	5.77	8,013	1,042
August	5.38	7,420	965
September	4.65	6,377	829
October	3.61	5,266	685
November	2.35	3,438	447
December	2.01	3,109	404
Annual	4.16	71,358	\$ 9,277

Location and Station Identification

Requested Location	44 City Hall Plaza East Orange, NJ 07019
Weather Data Source	(TMY2) NEWARK, NJ 3.4 mi
Latitude	40.7° N
Longitude	74.17° W

PV System Specifications (Commercial)

DC System Size	58.9 kW
Module Type	Standard
Array Type	Fixed (open rack)
Array Tilt	10°
Array Azimuth	185°
System Losses	14%
Inverter Efficiency	96%
DC to AC Size Ratio	1.1

Initial Economic Comparison

Average Cost of Electricity Purchased from Utility	0.13 \$/kWh
Initial Cost	2.60 \$/Wdc
Cost of Electricity Generated by System	0.14 \$/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.

City of East Orange City Hall

Cost of Electricity \$0.131 /kWh
Electricity Usage 339,360 kWh/yr
System Unit Cost \$4,000 /kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

	Budgetary	Annual Utility Savings				Estimated	Total	Federal Tax	New Jersey Renewable	Payback (without	Payback (with
	Cost				Maintenance	Savings	Credit	** SREC	incentive)	incentive)	
						Savings					
	\$	kW	kWh	therms	\$	\$	\$	\$	\$	Years	Years
	\$235,600	59	71,358	0	\$9,348	0	\$9,348	\$0	\$17,840	25.2	8.7
_	** E-151-1-0-1- December 5								/4.000lI-		-

^{**} Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= \$250 /1000kwh

Area Output*

393 m2
4.230 ft2

Perimeter Output*

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

3,596 ft2

Approximate System Size: Is the roof flat? (Yes/No) Yes

8 watt/ft2 33,842 DC watts

59 kW From PV Watts

PV Watts Inputs***

Array Tilt Angle
Array Azimuth
Zip Code
DC/AC Derate Factor

Array PW Watts (always 20 if flat, if pitched - enter estimated roof angle)
Enter into PV Watts (default)
Enter into PV Watts
Enter into PV Watts
Enter into PV Watts
Enter into PV Watts

PV Watts Output

71,358 annual kWh calculated in PV Watts program

% Offset Calc

Usage 339,360 (from utilities)

PV Generation 71,358 (generated using PV Watts)

% offset 21%

* http://www.freemaptools.com/area-calculator.htm

** http://www.flettexchange.com

*** http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html

System Capacity: 58.9 kWdc (393 m^2)



4/22/2016 Page 1, BUILDING NAME





Existing thermostat



Existing lighting on the roof



Existing Window ACs



Existing DHW Heater





ENERGY STAR[®] Statement of Energy Performance



City Hall

Primary Property Type: Other - Public Services Gross Floor Area (ft²): 56,024

Built: 1928

ENERGY STAR® Score¹

For Year Ending: February 29, 2016 Date Generated: April 18, 2016

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1. The ENERGY STAR climate and business		ent of a building's energy	y efficiency as compared with similar buildings natio	nwide, adjusting fo		
Property & Con	tact Information					
Property Address City Hall 44 City Hall Plaza East Orange, New		Property Owner	Primary Contact	Primary Contact		
Property ID: 4936	6598					
Energy Consun	nption and Energy U	se Intensity (EUI)				
Site EUI 94.9 kBtu/ft² Source EUI 146.2 kBtu/ft²	Annual Energy by Fu Electric - Grid (kBtu) Natural Gas (kBtu)	1,248,652 (24%)	National Median Comparison National Median Site EUI (kBtu/ft²) National Median Source EUI (kBtu/ft²) % Diff from National Median Source EUI Annual Emissions Greenhouse Gas Emissions (Metric Tons CO2e/year)	79.9 123.1 19% 383		
Signature & S	Stamp of Verifyin	g Professional				
I	(Name) verify that	at the above informatio	n is true and correct to the best of my knowled	ge.		
Signature:	sional	_Date:				
, ()						
			Professional Engineer Stamp			

(if applicable)