



Steven Winter Associates, Inc.
Architects and Engineers

50 Washington Street
Norwalk, CT 06854
www.swinter.com

Telephone
Facsimile
E-mail:

(203) 857-0200
(203) 852-0741
swinter@swinter.com

July 15, 2009

**Local Government Energy Program
Energy audit report**

For

***Town Hall
Holmdel
Holmdel, NJ 07733***

Project Number: LGEA03



TABLE OF CONTENTS

INTRODUCTION 3
EXECUTIVE SUMMARY 4
1. HISTORIC ENERGY CONSUMPTION 7
1.1. ENERGY USAGE AND COST ANALYSIS..... 7
1.2. UTILITY RATE 8
1.3. ENERGY BENCHMARKING..... 8
2. FACILITY AND SYSTEMS DESCRIPTION 10
2.1. BUILDING CHARACTERISTICS 10
2.2. BUILDING OCCUPANCY PROFILES 10
2.3. BUILDING ENVELOPE 10
2.3.1. EXTERIOR WALLS 10
2.3.2. ROOF 10
2.3.3. BASE 11
2.3.4. WINDOWS 11
2.3.5. EXTERIOR DOORS..... 11
2.3.6. BUILDING AIR TIGHTNESS..... 12
2.4. HVAC SYSTEMS 12
2.4.1. HEATING 12
2.4.2. COOLING..... 13
2.4.3. VENTILATION 13
2.4.4. DOMESTIC HOT WATER 13
2.5. ELECTRICAL SYSTEMS 14
2.5.1. LIGHTING..... 14
2.5.2. APPLIANCES AND PROCESS..... 15
2.5.3. ELEVATORS 16
2.5.4. OTHER ELECTRICAL SYSTEMS 16
3. EQUIPMENT LIST 17
4. ENERGY CONSERVATION MEASURES..... 18
4.1. EXISTING SYSTEMS 24
4.2. SOLAR PHOTOVOLTAIC 24
4.3. SOLAR THERMAL COLLECTORS 24
4.4. COMBINED HEAT AND POWER 24
4.5. GEOTHERMAL 24
4.6. WIND 24
5. ENERGY PURCHASING AND PROCUREMENT STRATEGIES 24
5.1. LOAD PROFILES 24
5.2. TARIFF ANALYSIS 26
5.3. ENERGY PROCUREMENT STRATEGIES..... 26
6. METHOD OF ANALYSIS 28
6.1. ASSUMPTIONS AND TOOLS 28
6.2. DISCLAIMER 28
APPENDIX A: LIGHTING STUDY 29
APPENDIX B: THIRD PARTY ENERGY SUPPLIERS (ESCOS)..... 35

INTRODUCTION

On May 13th Steven Winter Associates, Inc. (SWA) performed an energy audit and assessment of the Holmdel Township buildings located in Holmdel, NJ. Current conditions and energy-related information was collected in order to analyze and facilitate the implementation of energy conservation measures for the building.

Energy data collected in the field was imported into the eQUEST energy conservation software to generate a baseline model of the building. SWA simulated the installation of energy improvement measures on the baseline model of the building. Energy saving calculations and projected economics are automated and served as the basis for our conclusions.

There are five separate buildings that were evaluated for this energy audit; Town Hall, Department of Public Works, the Senior Community Center, Swim Club, and Middle Road Pump Station. The buildings were built at different times with several additions or expansions. Each building is unique in area and also building construction.

The present report is for the Town Hall only.

The Town Hall is over 30 years old and houses the courthouse, administrative offices, financial offices, the police station, the Board of Education, a library, and many other offices. The building is two stories with a total area of 37,898 square feet (including the basement). The building is operated and occupied at different times of the day. The Board of Education, administrative offices and financial offices are operated from 8am to 5:30pm on weekdays. The police station is operated 24 hours per day and encompasses approximately 25% of the building area.

The goal of this energy audit is to provide sufficient information to make decisions regarding the implementation of the most appropriate and most cost effective energy conservation measures for the building.

EXECUTIVE SUMMARY

This document contains the energy audit report for the Holmdel Town Hall located at 4 Crawfords Corner Road, Holmdel, NJ 07733. The Town Hall is a two story building that includes a finished attic space with roof dormers. Based on the field visit performed by Steven Winter Associates (SWA) staff on May 13th, 2009 and the results of a comprehensive energy analysis, this report describes the site's current conditions and recommendations for improvements. Suggestions for measures related to energy conservation and improved comfort are provided in the scope of work. Energy and resource savings are estimated for each measure that results in a reduction of heating, cooling, and electric usage.

The energy audit performed by SWA encompasses five buildings of various ages and constructions. A report has been generated for each building in order to fully document the existing conditions and recommended Energy Conservation Measures (ECMs). Based on the field visits performed by Steven Winter Associates (SWA) staff on May 13th, 2009 and the results of a comprehensive energy analysis, this report describes the site's current conditions and recommendations for improvements. Suggestions for measures related to energy and conservation and improved comfort are provided in the scope of work. Energy and resource savings are estimated for each measure that results in a reduction of heating, cooling and electric usage.

In the most recent year (May 2008-May 2009), the Town Hall electric meter recorded approximately 853,760 kWh or \$140,236 worth of electricity. The total amount of gas recorded by the Town Hall gas meter was 2,279 therms or \$3,499 worth of natural gas. The average aggregated cost of electricity was calculated to be \$0.16/kWh and the average aggregated cost of natural gas was calculated to be \$1.68/therm. With electricity and gas combined, the building consumed 3141 MMBtus of energy at a total cost of \$143,735 in the most recent year.

SWA benchmarked Holmdel Town Hall using the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The Portfolio Manager was not capable of generating a benchmark score for the building since the building is a mixed use building. The benchmark rating is based on the facility's source energy use, level of business activity, and geographical location. The Portfolio Manager is also capable of generating a site energy use intensity number using 2008 as a baseline year.

In order to compare commercial buildings equitably, the *Portfolio Manager* ratings convey the consumption of each type of energy in a single common unit. The EPA uses source energy to represent the total amount of raw fuel required to operate the building. The site energy use intensity for Town Hall building is 81.6 kBtu/sq.ft/year. After energy efficiency improvements are made, future utility bills can be added to the Portfolio Manager and the site energy use intensity for a different time period can be compared to the year 2008 baseline to track the changes in energy consumption associated with the energy improvements.

SWA recommends a total of 5 Energy Conservation Measures (ECMs) for Holmdel Town Hall. The total investment cost for these ECMs is **\$214,600**. SWA estimates a first year savings of **\$20,407** with a simple payback of **10.5 years**. SWA also estimates that Holmdel Town Hall will be able to reduce their carbon footprint by **226,757 lbs of CO2 annually**.

There are various incentives that the Town Hall could apply for that could also help lower the cost of installing the ECMs. SWA recommends that the Town Hall applies for the NJ SmartStart program through the New Jersey Office of Clean Energy. This incentive can help provide technical assistance for the building in the implementation phase of any energy conservation project. There are also prescriptive measure incentives that would pay Town Hall up to \$19,090 for lighting upgrades and up

to \$12,300 for upgrading the recommended motors. The total amount of incentives available at this point in time for the Town Hall is **\$31,390**.

When pursuing incentives through the SmartStart program, SWA encourages building managers to contact the program provider to obtain more detailed information on the program guidelines and request pre-approval for all planned upgrades. At the time of this report, there are prescriptive measure incentives that would pay the Town Hall up to \$19,090 for lighting upgrades and up to \$12,300 for upgrading the recommended motors. Incentives are also available for the installation of occupancy sensors and dimming controls. Incentives for lighting controls vary and are based on the quantity and type of controls installed.

For further information on both custom and prescriptive incentives, please visit:

<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/equipment-incentives/equi>

The New Jersey Clean Energy website also provides information on incentives for renewable energy. Visit the website to download a copy of the Renewable Energy Incentive Program (REIP) Guidebook. Incentives include up to \$1.00 per watt for eligible photovoltaic projects.

Holmdel Township personnel should become familiar with New Jersey Clean Energy programs aimed specifically at schools if they are considering building new facilities or doing major renovations. For further information about specific program information, please visit:

<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/school-construction/about>

The following table summarizes the proposed Energy Conservation Measures (ECM) are their economical relevance.

ECM Table without Incentives															
ECM #	ECM description	Installed Cost		1st year energy and cost savings						Simple Payback (SPP)	Life of Measure (LoM)	Lifetime Cost Savings (\$)	Return on Invest (ROI)	Annual Carbon Reduction (lbs of CO2)	
		Estimated Cost (\$)	Source	Electric Savings		Fuel Savings		Cost Savings (\$)							
				Consumption	Demand	Natural Gas									
1	Upgrade two existing chilled water pump motors	\$ 8,880	RS Means	3,120 kWh	0 kW	0 kW	0 Therms	\$ 499	17.8	10	\$ 4,215	-5.3%	5,586		
2	Upgrade AHU#1 with premium motors and VFD controls	\$ 27,850	RS Means	53,100 kWh	5 kW	0 kW	0 Therms	\$ 8,496	3.3	10	\$ 71,738	15.8%	95,076		
3	Upgrade existing lighting	\$ 120,765	RS Means	56,408 kWh	5 kW	0 kW	0 Therms	\$ 9,025	13.4	20	\$ 131,824	0.5%	100,999		
4	Retro commissioning of existing building systems	\$ 56,847	Similar Project	10,743 kWh	1 kW	207 kW	0 Therms	\$ 2,067	27.5	20	\$ 30,185	-2.3%	21,517		
5	Install Vending/Miser technology	\$ 258	RS Means	1,999 kWh	0 kW	0 kW	0 Therms	\$ 320	0.8	10	\$ 2,701	94.7%	3,579		
Total Scope of Work		\$ 214,600	-	-	11.0	-		\$ 20,407	10.5		\$ 240,664		226,757		
Definitions:			Assumptions:												
SPP: Simple Payback (years)			Discount rate = 3.2%			per DOE FEMP guidelines			Average Electric Rate = 0.16			\$/kWh			
LoM: Life of Measure (years)			Energy price escalation rate = 0%			per DOE FEMP guidelines			Average Fuel Rate = 1.68			\$/Therm			
ROI: Return on Investment (%)			Carbon Dioxide per unit Electricity = 1.7905			lbs of CO2/kWh									
			Carbon Dioxide per unit of Fuel = 11.023			lbs of CO2/unit fuel									

1. HISTORIC ENERGY CONSUMPTION

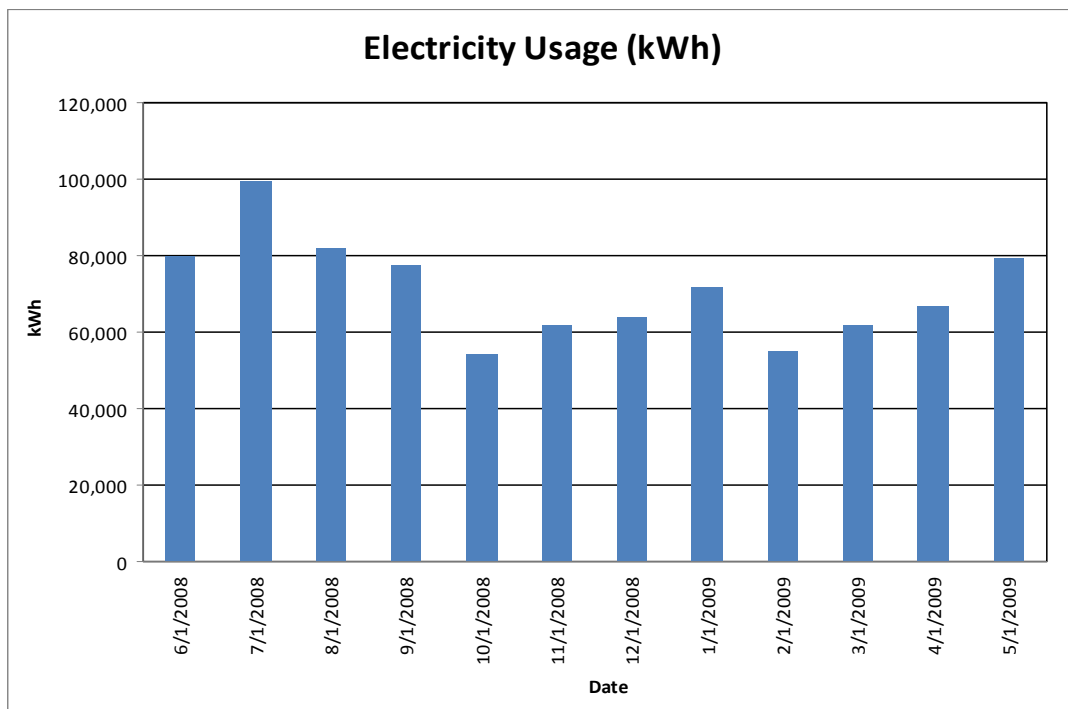
1.1. Energy usage and cost analysis

SWA analyzed utility bills from May 2008 through May 2009 that were received from Holmdel Township.

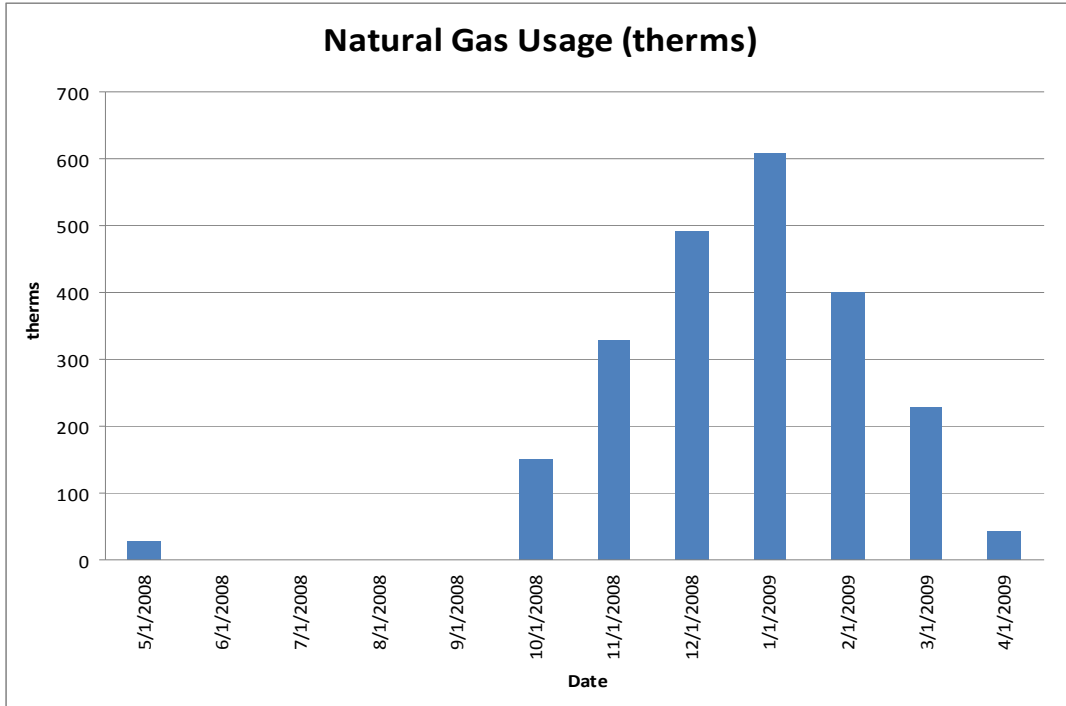
Electricity –The Town Hall electric meter currently buys electricity from JCP&L at **an average rate of \$.16/kWh** based on the previous 12 months worth of utility bills. The Town Hall electric meter purchased **approximately 853,760 kWh or \$140,236 worth of electricity** in the previous year.

Natural Gas –The Town Hall gas meter currently buys natural gas from NJNG at **an average aggregated rate of \$1.68/therm** based on the previous 12 months worth of utility bills. The Town Hall gas meter purchased **approximately 2,279 therms or \$3,499 worth of natural gas** in the previous year. Natural gas is primarily used for heating and domestic hot water production within the building.

The following chart shows electricity usage for the Town Hall electric meter based on utility bills for the 12 month period of May 2008 – May 2009.



The following chart shows natural gas usage for the Town Hall meter based on utility bills for the 12 month period of May 2008 – May 2009.



1.2. Utility rate

Electricity is received from the Town Hall electric meter which is purchased from JCP&L at a general service market rate for electricity usage (kWh) with a separate (kW) demand charge. The electric meter charges are currently an average rate of approximately \$0.16/kWh based on the previous 12 months of utility bills.

Natural gas is received from the Town Hall gas meter which is purchased at a general service market rate for natural gas (therms). The Town Hall currently pays an average aggregated rate of approximately of \$1.68/therm based on the previous 12 months of utility bills.

1.3. Energy benchmarking

The Town Hall information and utility data were entered into the U.S. Environmental Protection Agency’s (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The building data could be documented; however, a performance score could not be generated since the building is mixed-use and cannot be easily categorized. The Energy Star Portfolio Manager currently is not capable of generating a benchmark score for certain building types such as mixed use buildings. SWA recommends that Holmdel Township create a Portfolio Manager account at the link below. When an account is created, SWA can share the Holmdel Township facilities and allow future data to be added and tracked using the benchmarking tool.

http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

STATEMENT OF ENERGY PERFORMANCE

Holmdel Township - Municipal Building/Town Hall

Building ID: 1798685
For 12-month Period Ending: April 30, 2009¹
Date SEP becomes ineligible: N/A

Date SEP Generated: August 10, 2009

Facility Holmdel Township - Municipal Building/Town Hall 4 Crawford's Corner road Holmdel, NJ 07733	Facility Owner N/A	Primary Contact for this Facility N/A
---	------------------------------	---

Year Built: 1980
Gross Floor Area (ft²): 37,899

Energy Performance Rating² (1-100) 47

Site Energy Use Summary³

Natural Gas (kBtu) ⁴	226,935
Electricity (kBtu)	2,845,695
Total Energy (kBtu)	3,072,630

Energy Intensity⁵

Site (kBtu/ft ² /yr)	81
Source (kBtu/ft ² /yr)	257

Emissions (based on site energy use)

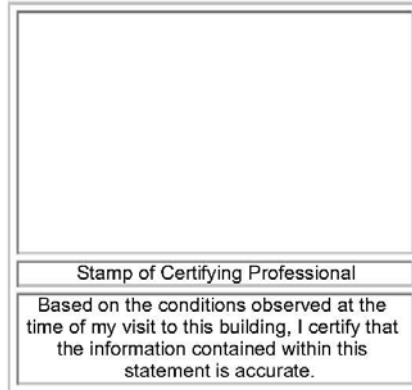
Greenhouse Gas Emissions (MtCO ₂ e/year)	447
---	-----

Electric Distribution Utility

Jersey Central Power & Lt Co

National Average Comparison

National Average Site EUI	79
National Average Source EUI	250
% Difference from National Average Source EUI	3%
Building Type	Office



Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional
N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

The government estimates the average time needed to fill out this form is 6 hours (includes the time for entering energy data, PE facility inspection, and notarizing the SEP) and welcomes suggestions for reducing this level of effort. Send comments (referencing OMB control number) to the Director, Collection Strategies Division, U.S., EPA (2022T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460.

EPA Form 5900-16

2. FACILITY AND SYSTEMS DESCRIPTION

2.1. Building Characteristics

The 35,180 SF Town Hall was built in 1980 and serves as library, staff rooms, meeting rooms, the police station headquarters, administrative offices, unfinished attic space, and court room with associated offices. The building has two stories including a finished attic space with roof dormers. The administrative office section includes approximately 16,000 SF of space and is typically used 50 hours per week. The court room covers about 1000 SF and is used two days per week, 18 hours. The court room roof will soon be replaced with added insulation and new lighting. The Board of Education, located on the second floor includes approximately 9,000 SF and is in use 8-9 hours per day except for summer months. The Police department covers approximately 9,000 SF and is in use about 24 hours per day.

2.2. Building occupancy profiles

The peak occupancy for the Holmdel Town Hall is approximately 110 persons during weekdays from 9 am to 5:30 pm. On occasion there are library activities held on some evenings but only that part of the building is occupied and accessible during those events. The police station operates on a 24 hour schedule.

2.3. Building envelope

2.3.1. Exterior walls

The exterior walls consist of a 4” brick façade. There are 2”x6” wood studs spaced 16” on center with 5-1/2” of R-19 fiberglass batt insulation in each stud bay.

2.3.2. Roof

The roof has an 8/12 pitch gable roof with brown colored asphalt shingles. The roof is constructed with 6” foil-faced fiberglass batt insulation (R-19) between the wooden rafters. On the day of the site visit, SWA inspected the roof and observed no major deficiencies. The roof surface appeared to be in good condition and it would not be cost effective to upgrade at this point in time. If any portion of the building is renovated or improved as part of a capital improvement plan, SWA recommends increased insulation is added to the roof during construction.



6” Foil-faced fiberglass found in rafters in 2nd Floor Mechanical Room



Fiberglass above ceiling tiles on 2nd floor

2.3.3. Base

The building's base is a 6" concrete slab with poured perimeter foundation. No insulation was detected. There were no reported problems with water penetration or moisture. The main floor above is constructed of a concrete slab over metal decking with no insulation.

2.3.4. Windows

The 1" tinted, double pane windows are fixed aluminum-framed units with argon gas filling.



Windows in Detectives office on 1st floor

2.3.5. Exterior doors

The doors are aluminum-framed units with insulating gas properties and a tinted film. The exterior doors of the building were observed to have the original weather-stripping, which is no longer performing as intended. SWA recommends that the exterior doors of the building be weather-stripped in order to decrease the amount of conditioned air that is lost around each door. SWA also recommends checking the weather-stripping of each door on a regular basis and replacing any broken seals immediately. Tight seals around the door will help ensure that the building is kept tight and insulated over time.

2.3.6. Building air tightness

The Town Hall building has a leaky shell with poor air sealing to separate conditioned air from outside air. The ceiling provides a poor air and thermal seal from the vented attic space above and therefore, the volume of the building that requires heat is expanded. SWA recommends installing sheetrock as an air barrier in the mechanical room to prevent unconditioned air leaking into the building and to prevent the loss of conditioned air from the surrounding office spaces. Additionally, any holes or penetrations in the building should be sealed to prevent the loss of conditioned air. All plumbing, wiring, HVAC or ductwork penetrations should be sealed with foam or caulk. The attic plane should be a completely sealed and air tight barrier in order to prevent the loss of conditioned air. All other building penetrations, including fans, air conditioners, pipe, wire, or HVAC penetrations throughout the building should be sealed.

2.4. HVAC systems

2.4.1. Heating

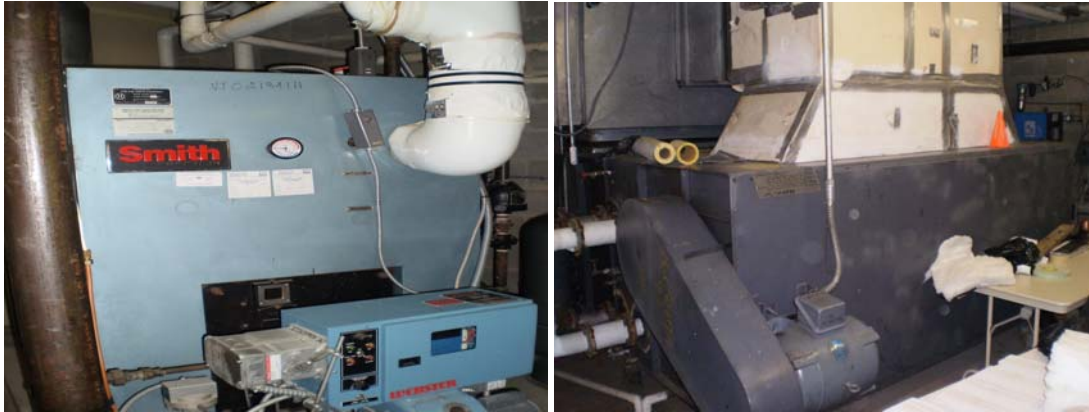
The building contains one 2.49 MMBTU/hr A O Smith hot water boiler that provides heat throughout the entire building. The building also contains a 100 ton chiller. The boiler and chiller are always on because they also serve the police department that stays open 168 hours per week, 52 weeks a year. This results in a high energy consumption and cost. The boiler and chiller operate quite inefficiently when they operate at part load during most of the hours when the municipal offices are off, thereby further increasing the consumption and cost of energy. Both the boiler and chiller are operated by a central control system located in the mechanical room.

A large central air handling unit (AHU) along with the central hot water boiler, hot water pumps in basement and 100 ton central chiller and chilled water pumps on second floor mechanical room and the connecting air distribution ducts provide space cooling and heating to municipal offices and police department spaces.

There is the AHU #2 that provides space comfort to the second floor areas of the Board of Education (BOE). The BOE has a similar operation schedule to the municipal offices. Aforementioned hot water boiler and chiller along with the pumps supply the AHU #2.

Court room has linear diffuser and in-floor linear hot water heater radiator to cool and heat the area. Same air-cooled chiller and hot water boiler serves this room.

The Police Department has independent split heat pump units. Also the 5 ton, AHU #3 provides space comfort to the Police Department training space. These units provide only partial heating and cooling support. The central heating and cooling system stays on 168 hours per week, 52 weeks per year at a low, inefficient part load factor.



2.4.2. Cooling

The building is cooled primarily from a 100 ton chiller and large central AHU units. The cool, conditioned air is delivered via ductwork to each individual space. There have been complaints from office works that air is not distributed evenly and some rooms reach excessive temperatures during the summer. The cooling system equipment and distribution are also explained in section 2.4.1 above with the heating system.

All of the AHUs appear to be quite old and the operations staff indicated that all of the components of the chiller system are at least 20 years old and are in need of constant repair, replacement and maintenance. Connecting ducts are heavily duct taped, which are dry and fraying and leak an excessive amount of conditioned air and energy.



Mini heat split in Interrogation room

2.4.3. Ventilation

The building uses air-handling units to mix fresh outside air with return air and provide conditioned ventilation throughout the building.

There are also exhaust fans for the bathrooms that help induce fresh air throughout the building.

2.4.4. Domestic Hot Water

Domestic Hot Water for the building is provided by an A.O. Smith natural gas-fired, atmospheric hot water storage tank with a capacity of 200 MBTU/hr. The storage tank has a capacity of 100 gallons of storage.

It is not cost-effective to replace the existing water heating equipment with higher efficiency equipment. However, higher efficiency water heating equipment will save energy and should be strongly considered upon replacement of the equipment. Energy saving appliances bearing the ENERGY STAR label should be selected to ensure efficiency performance. Incentives may be available to offset any added costs for the installed equipment.

More efficient water-consuming fixtures and appliances save both energy and money through reduced energy consumption for water heating, as well decreased water and sewer bills. SWA recommends adding controlled on/off timers on all lavatory faucets to reduce domestic hot water demand and save water. Building staff can also easily install faucet aerators and/or low-flow fixtures to reduce hot water consumption. In addition, routine maintenance practices that identify and quickly address water leaks are a low-cost way to save water and energy.



Hot Water Heater in Basement Mechanical Room

2.5. Electrical systems

2.5.1. Lighting

The Town Hall showed a great need for updated lighting throughout the building. Many fixtures appeared to be original to the building and contained inefficient ballasts, as well as inefficient incandescent bulbs. SWA recommends replacing all magnetic ballasts with electronic ballasts and all T12 fluorescent bulbs with T8 fluorescent bulbs. Replacing the magnetic ballasts alone will result in a 15-20% savings per light fixture and replacing T12 bulbs with T8 bulbs will result in an additional 10-15% savings per light fixture. Incandescent bulbs were found in restrooms and should be upgraded to compact fluorescent bulbs. The building has approximately 13 exit signs installed, 10 of which are older fluorescent type fixtures. Fluorescent exit signs waste an unnecessary amount of energy since they run 24 hours per day and should be upgraded to newer LED exit signs. SWA recommends replacing all fluorescent exit signs with newer 5W LED models. See the lighting schedule attached in the Appendix A for complete lighting retrofit details.

Although natural day lighting has been shown to improve occupant health, solar heat gain and glare from older glazing often negatively impact activities and comfort within the space. During the time of our visit some shades were half drawn throughout the building. To understand the comfort concerns and identify those rooms and offices with the most significant problems, building staff can conduct an occupant survey. For problem areas, it may be beneficial to install tinted glazing or a window film to reduce the glare and solar heat gains. This recommendation will not provide energy savings but may improve occupant comfort.

Exit Lights – The building contains all a mix of inefficient 20W fluorescent exist signs as well as newer 5W LED models.

Exterior Lighting – The exterior lighting was surveyed during the building audit. SWA has deemed it not cost effective to replace exterior lighting at this time. All exterior lighting is controlled by a timer located in the boiler room. There is no need for any immediate upgrade of lighting or timer; however, SWA recommends that the building maintenance adjust the timer at least twice per year in order to make sure that the timer stays current with Daylight Savings Time.



Exterior light left on during daytime hours

2.5.2. Appliances and process

Appliances, such as refrigerators, that are over 10 years of age should be replaced with newer efficient models with the Energy Star label. For example, Energy Star refrigerators use as little as 315kwh/hr. When compared to the average electrical consumption of older equipment, Energy Star equipment results in a large savings. Look for the Energy Star label when replacing appliances and equipment, including: window air conditioners, refrigerators, printers, computers, copy machines, etc. More information can be found in the “Products” section of the Energy Star website at: <http://www.energystar.gov>

Computers left on consume a lot of energy. A typical desk top computer uses 65 to 250 watts and uses the same amount of energy when the screen saver is left on. Televisions in classrooms use approximately 3-5 watts of electricity when turned off. SWA recommends all computers and appliances (i.e. fridges, coffee makers, televisions, etc.) be plugged in to power strips and turned off each evening just as the lights are turned off.



Vending Machine in Town Hall, near break room



Kitchen in Communications office

2.5.3. Elevators

The Town Hall contains a hydraulic elevator. There are currently no energy efficient options that are cost-effective for this type of elevator.

2.5.4. Other electrical systems

There are currently no other electrical systems in the building.

3. EQUIPMENT LIST

INVENTORY

Building System	Description	Model#	Fuel	Space served	Estimated Remaining useful life %
Heating	One 2.49 MMbtu/hr hot water boiler	A O Smith	Gas	All areas	10
Heating	2 HW pumps	B & G	Electric	All areas	10
Cooling	Roof top 100 ton air cooled chiller. 98.6 kW EER of 9.7	Trane CGAA 1001RC5100 4B5C361EFR	Electric	All areas except BOE & police	10
Cooling	2 chw pumps @ 7.5 hp	B & G	electric	AHU 1 & 2	10
Cooling	Air Handling Unit #1 in building basement. Trane "Climate Changer" w/60 hp fan	Trane	electric	All areas except BOE & police	Past usual life of 15 yrs
Cooling	Air Handling Unit #2 on 2 nd Fl, BOE	Trane	electric	BOE, 2 nd floor	20
Cooling	Air Handling Unit #3	Trane	electric	Police training room	20
Cooling	R/T condenser DX 5 tons, 60 MBTU for AHU#3	Trane	electric	Serves AHU#3	20
Cool/heat	1 ph small heat pump 28 Mbtuh cooling & 28 Mbtuh heating	Mitsubishi MR SLIM # MXZ3A30NA	electric	Police areas	20
Cool/heat	1 ph small heat pump, 30 mbtu	Sanyo CL3030NA	electric	Police areas	20
Cool/heat	1 ph small heat pump, 30 mbtu	Payne 3008E12234	electric	Police areas	30
DWH	A O Smith, gas 200 MMbtu/hr with 100 gallon tank	A O Smith	gas	All areas	30

Note:

The remaining useful life of a system (in %) is an estimate based on the system date of built and existing conditions derived from visual inspection.

4. ENERGY CONSERVATION MEASURES

Summary table

ECM#	Description
1	Upgrade two existing chilled water pump motors
2	Upgrade AHU #2 with premium motors and VFD controls
3	Upgrade existing lighting
4	Retro commissioning of existing building systems
5	Install VendingMiser technology on vending machines

ECM#1: Upgrade two existing chilled water pump motors

Description:

The mechanical room contains two existing 7.5 HP chilled water pumps to help circulate chilled water throughout the building. Only one of these pumps operates at any given time and the other one is pressed into service according to facility’s pre-determined time and maintenance schedule. The motors are currently being worn unevenly and need to be replaced because of their alternating operation. If the building is to go retro commissioning as recommended for ECM #4, then a proper maintenance schedule will be advised to prevent uneven wear of the two chilled water pumps. Although this measure does not have a positive return on investment, it will decrease maintenance costs as well as wear on the pumps.

Installation cost:

Estimated installed cost: \$8,880
 Source of cost estimate: *RS Means*

Economics:

1st year energy and cost savings						Simple Payback (SPP)	Life of Meas. (LoM)	Lifetime Cost Savings	Return on Invest (ROI)	
Electricity Savings			Fuel Savings		Cost Savings					
Consumption	Demand		Natural Gas							
3,120	kWh	0	kW	0	Therms	\$499	17.79	10	\$4,215	-5.25%

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit and using the billing analysis. SWA assumed that the CHW pumps operate 24 hours a weekday for 85 weekdays of summer.

Rebates/financial incentives:

*NJ Clean Energy – SmartStart Building Program – Incentive for three-phase motors (\$45-\$700 per motor)
 Maximum incentive amount is \$1,400*

*NJ Clean Energy – SmartStart Building Program – Incentive for VFDs on Chilled-water pumps (\$60 per HP).
 Maximum incentive amount is \$900.*

Options for funding ECM:

This project may benefit from enrolling in NJ SmartStart program with Technical Assistance to offset a portion of the cost of implementation.

<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings>

ECM#2: Upgrade AHU#1 with premium motors and VFD controls

Description:

Currently, the Town Hall building has a conventional magnetic starter controlled 60 HP fan in AHU #1. Demand for heating and cooling varies throughout the day and the conventional controls run the fan at 100% the entire day. Efficiency can be improved by upgrading to NEMA premium efficiency motor. SWA recommends upgrading the motor as well as installing a Variable Frequency Drive (VFD) control. Installing a VFD will allow the motor to respond to the variation in demand and reduce excessive use of power.

Installation cost:

Estimated installed cost: \$27,850
 Source of cost estimate: *RS Means*

Economics:

1st year energy and cost savings					Simple Payback (SPP)	Life of Meas. (LoM)	Lifetime Cost Savings	Return on Invest (ROI)		
Electricity Savings		Fuel Savings		Cost Savings						
Consumption	Demand	Natural Gas								
53,100	kWh	5	kW	0	Therms	\$8,496	3.28	10	\$71,738	15.76%

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit and using the billing analysis. SWA assumes that the AHU fan operates only 24 hours a day for 85 summer weekdays and 129 winter weekdays for a total of 214 weekdays. SWA assumes that existing motor efficiency is 94.5% and can be upgraded to 98.1% NEMA premium efficiency.

Rebates/financial incentives:

*NJ Clean Energy – SmartStart Building Program – Incentive for three-phase motors (\$45-\$700 per motor)
 Maximum incentive amount is \$700*

*NJ Clean Energy – SmartStart Building Program – Incentive for VFDs on VAV systems (\$65-\$155 per HP)
 Maximum incentive amount is \$9,300.*

Options for funding ECM:

This project may benefit from enrolling in NJ SmartStart program with Technical Assistance to offset a portion of the cost of implementation.

<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings>

ECM#3: Upgrade existing lighting

Description:

Currently, the Town Hall has mostly inefficient lighting. The building uses mostly inefficiency T12 fluorescent lighting with magnetic ballasts as the general lighting. SWA recommends that all 625 fixtures that contained T12 fixtures and/or magnetic ballasts should be upgraded to T8 fixtures with electronic ballasts. SWA observed that there were approximately 21 fixtures that used incandescent bulbs that can be upgraded to CFL screw-type bulbs. SWA also observed 17 fluorescent exit signs that should be upgraded to newer LED exit signs. Exit signs are left on 24 hours per day, 365 days per year and therefore show a good opportunity for savings.

Installation cost:

Estimated installed cost: \$120,765
 Source of cost estimate: RSMMeans

Economics:

1st year energy and cost savings						Simple Payback (SPP)	Life of Meas. (LoM)	Lifetime Cost Savings	Return on Invest (ROI)	
Electricity Savings			Fuel Savings		Cost Savings					
Consumption	Demand		Natural Gas							
56,408	kWh	5	kW	0	Therms	\$9,025	13.38	20	\$131,824	0.46%

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit and using the billing analysis. Savings were estimated using a standard price for replacing fixtures but this installed cost can be reduced greatly if all of the lighting is undertaken at the same time, especially if the work is done in-house.

Rebates/financial incentives:

*NJ Clean Energy – Prescriptive Lighting, T-5 and T-8 lamps with electronic ballast in existing facilities (\$10-\$30 per fixture, depending on quantity of lamps)
 Maximum incentive amount is \$18,750.*

*NJ Clean Energy – Prescriptive Lighting, LED Exit Signs (\$10/\$20 per fixture)
 Maximum incentive amount is \$340.*

Options for funding ECM:

*This project may benefit from enrolling in NJ SmartStart program with Technical Assistance to offset a portion of the cost of implementation.
<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings>*

ECM#4: Retro commissioning of existing building systems

Description:

The Holmdel Town Hall building is old and has had many mechanical changes and additions since it was first built. The building has had mechanical equipment moved around, changed and added as the use of different spaces changed. SWA recommends that the building undergo retro commissioning in order to review all of the systems within the building as a whole. Much of the equipment can be operated more efficiently and provide more comfort to the building tenants if it is adjusted for the use of the building. Retro commissioning can also take inventory of how each piece of equipment is used and if it can be controlled more efficiently or operated in such a way to reduce maintenance costs.

Installation cost:

Estimated installed cost: \$56,847
 Source of cost estimate: Vendor

Economics:

1st year energy and cost savings						Simple Payback (SPP)	Life of Meas. (LoM)	Lifetime Cost Savings	Return on Invest (ROI)	
Electricity Savings		Fuel Savings		Cost Savings						
Consumption	Demand	Natural Gas								
10,743	kWh	1	kW	207	Therms	\$2,067	27.51	20	\$30,185	-2.35%

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit and using the billing analysis. SWA assumes retro commissioning will achieve a savings of 10% for heating and cooling usage only in the building.

Rebates/financial incentives:

There are no incentives available for this measure at this time.

Options for funding ECM:

This project may benefit from enrolling in NJ SmartStart program with Technical Assistance to offset a portion of the cost of implementation.
<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings>

ECM#5: *Install VendingMiser technology*

Description:

The Holmdel Town Hall building currently contains two vending machines; a cold beverage type vending machine and a snack type vending machine. These vending machines contain display lights that are left on 24 hours per day. SWA recommends installing a VendingMiser device on each snack machine that adds an occupancy sensor to the display lighting. This device allows the display lighting to shut off when no occupancy has been detected in the hallway for a preset amount of time.

Installation cost:

Estimated installed cost: \$56,847

Source of cost estimate: Vendor

Economics:

1st year energy and cost savings						Simple Payback (SPP)	Life of Meas. (LoM)	Lifetime Cost Savings	Return on Invest (ROI)	
Electricity Savings			Fuel Savings		Cost Savings					
Consumption	Demand		Natural Gas							
1,999	kWh	0	kW	0	Therms	\$320	0.81	10	\$2,701	94.68%

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit and using the billing analysis. SWA calculated savings using the VendingMiser calculator provided at http://www.usatech.com/energy_management/energy_calculator.php

Rebates/financial incentives:

There are no incentives available for this measure at this time.

Options for funding ECM:

This project may benefit from enrolling in NJ SmartStart program with Technical Assistance to offset a portion of the cost of implementation.

<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings>

RENEWABLE AND DISTRIBUTED ENERGY MEASURES

4.1. Existing systems

There are currently no existing renewable energy systems.

4.2. Solar Photovoltaic

Solar Photovoltaic (PV) technology is not cost effective for this project since much of the roof area is broken up with angular jogs in the roof and dormers.

4.3. Solar Thermal Collectors

Solar thermal collectors are not cost effective for this project and would not be recommended due to the low amount of domestic hot water use throughout the building.

4.4. Combined Heat and Power

CHP is not applicable for this building because of the current HVAC configuration.

4.5. Geothermal

Geothermal is not applicable for this building because it would not be cost effective to change to a geothermal system.

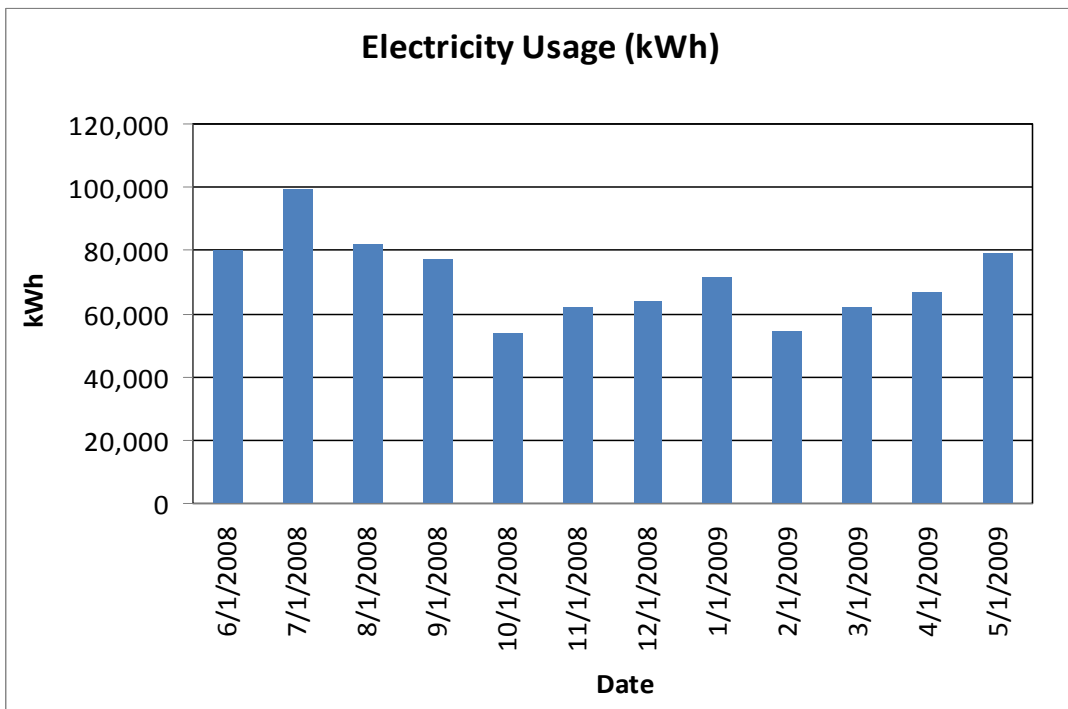
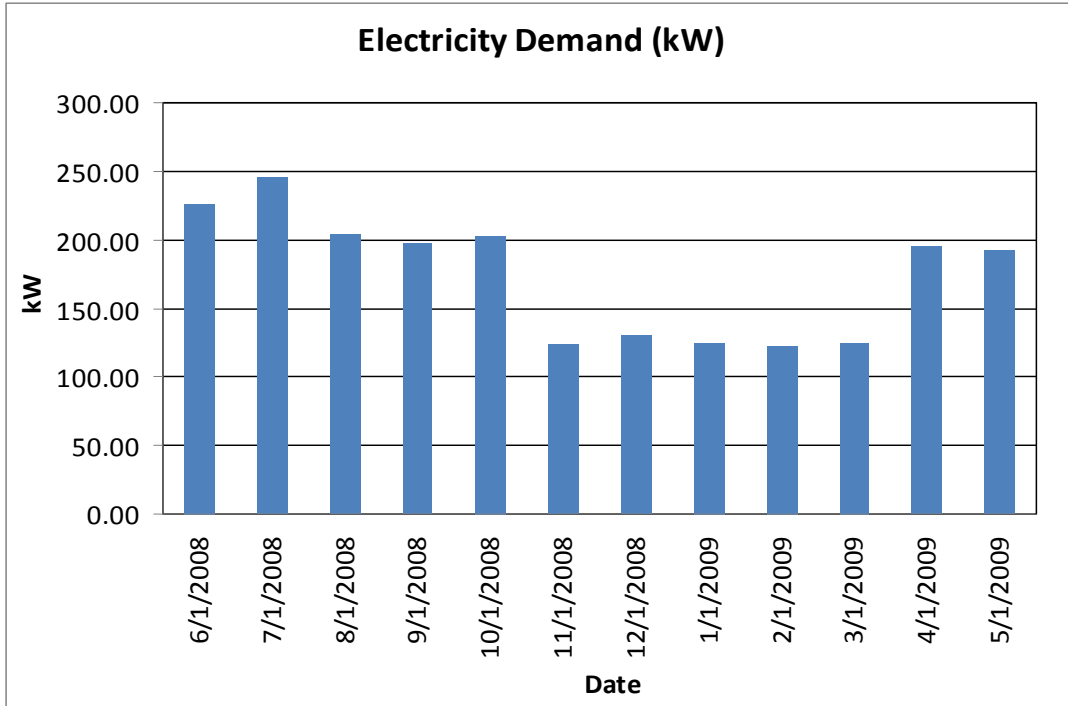
4.6. Wind

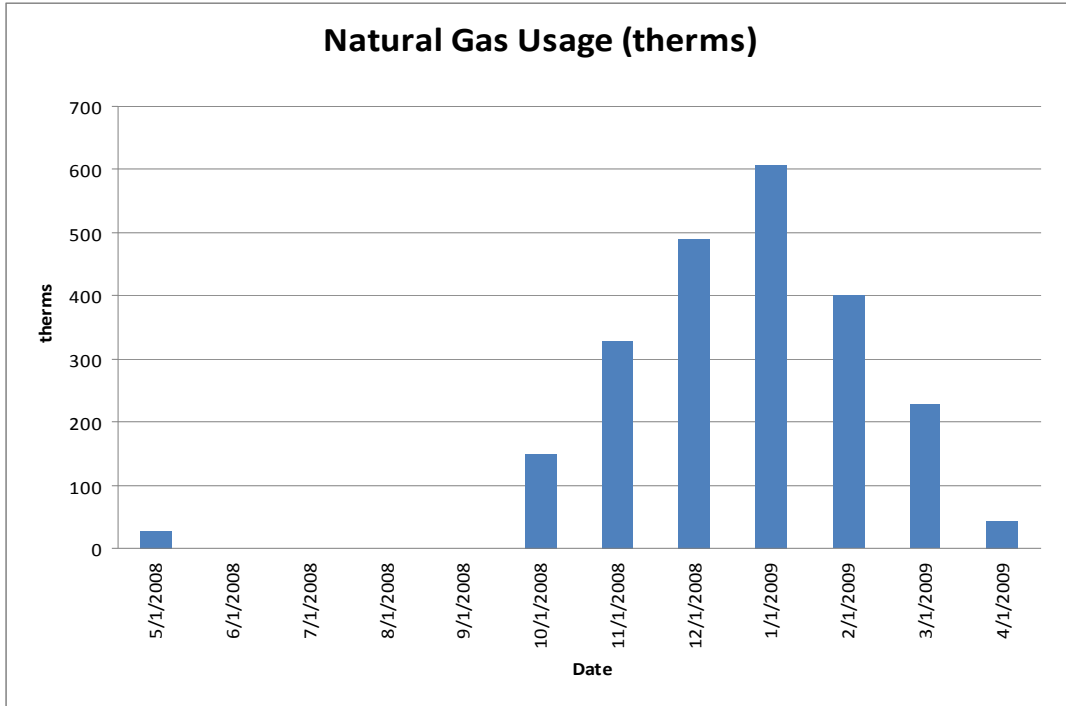
Wind power production is not appropriate for this location, because required land is not available for the wind turbine. Also available wind energy resource is very low.

5. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

5.1. Load profiles

The average electrical peak demand for the previous year was 175.9 kW and the maximum peak demand was 245.5 kW. The electric and gas load profiles for this project are presented in the following charts. The first chart shows electric demand (in kW) for the previous 12 months and the other two charts show electric and gas usage (in kWh), respectively.





5.2. Tariff analysis

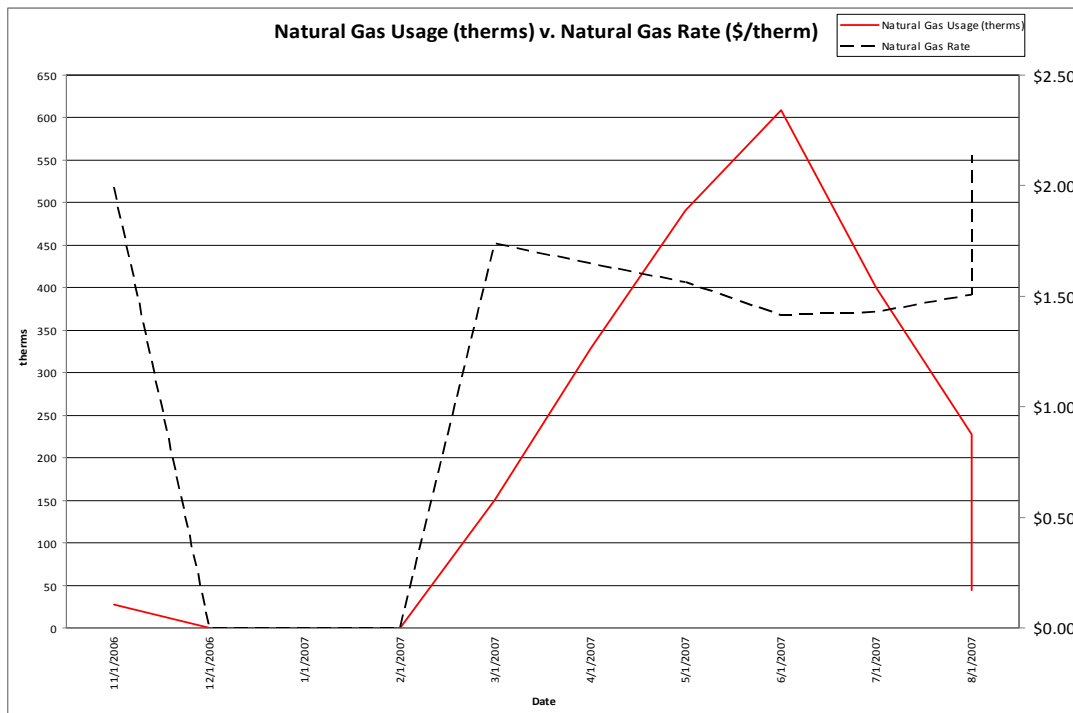
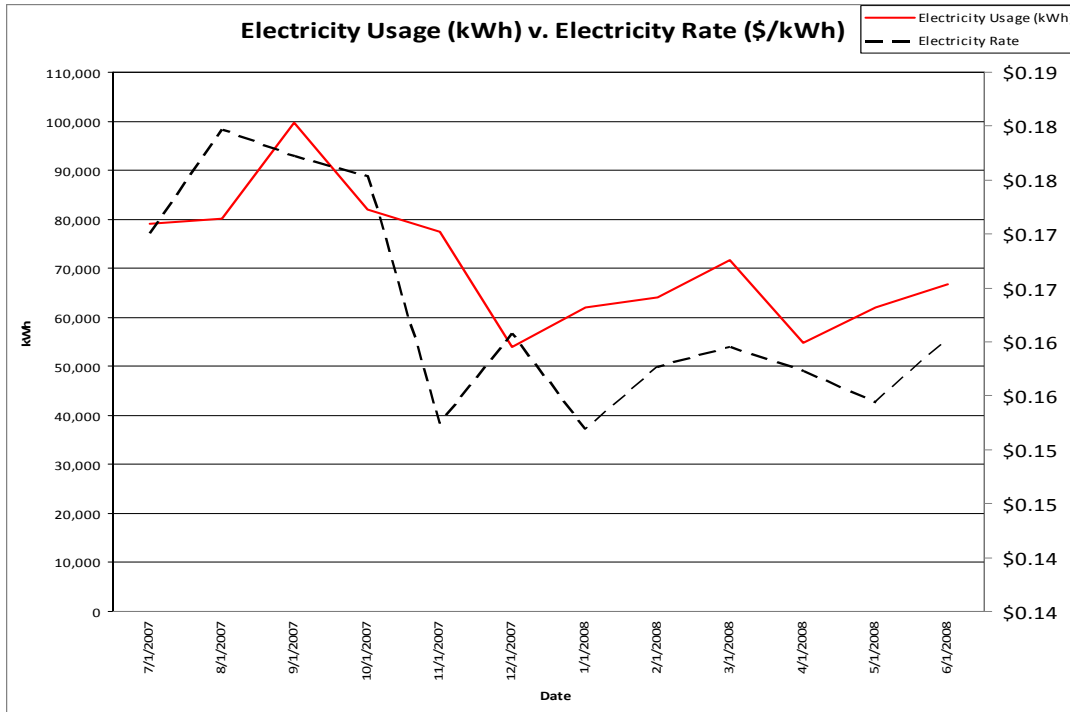
Currently, natural gas and electricity is provided to the Town Hall through the Town Hall gas and electric meters. Natural gas is purchased for the Town Hall meter from NJNG at a general service rate. The general service rate for natural gas charges a market-rate price based on usage and the Town Hall billing does not breakdown demand costs. Demand prices are reflected in the utility bills and can be verified by observing the price fluctuations throughout the year. Typically, the natural gas prices increase during the heating months when natural gas is used by the rooftop air-handling units.

Electricity is purchased for the Town Hall meter from JCP&L at a general service rate. The general service rate for electricity charges a market-rate price based on usage and the Town Hall billing does not breakdown demand costs. Demand prices are reflected in the utility bills and can be verified by observing the price fluctuations throughout the year.

5.3. Energy Procurement strategies

The Town Hall purchases natural gas via the Town Hall gas meter from NJNG. Electricity is received from the Town Hall electric meter directly from JCP&L and no ESCO is used. SWA analyzed the utility rate for electricity over the previous 12 months. Electric bill analysis shows fluctuations of 22% over the most recent 12 month period. SWA recommends that Town Hall explore the opportunity of purchasing electricity from an ESCO in order to reduce electric rate fluctuation and ultimately reduce the annual cost of energy for the Town Hall. Natural Gas Bill analysis shows fluctuations of over 34% over the most recent 12 month period. SWA recommends that Town Hall explore the opportunity of purchasing natural gas from an ESCO in order to reduce natural gas fluctuation and ultimately reduce the annual cost of energy for the Town Hall. Appendix B contains a complete list of third party energy suppliers for JCP&L and NJNG service.

Town Hall is already enrolled in a Demand Response Program and Emergency Programs through a contract agreement with Enernoc. Prior to any curtailment or emergency events, temperature set points are decreased by a couple of degrees to “boost” the building thermal loads. This system allows Town Hall to receive additional revenues from these energy programs without any disruption in occupants comfort.



6. METHOD OF ANALYSIS

6.1. Assumptions and tools

Energy modeling tool: eQUEST V3.6
Cost estimates: RS Means 2009 (Facilities Maintenance & Repair Cost Data)
RS Means 2009 (Building Construction Cost Data)
RS Means 2009 (Mechanical Cost Data)
Cost estimates also based on utility bill analysis and prior experience with similar projects

6.2. Disclaimer

This engineering audit was prepared using the most current and accurate fuel consumption data available for the site. The estimates that it projects are intended to help guide the owner toward best energy choices. The costs and savings are subject to fluctuations in weather, variations in quality of maintenance, changes in prices of fuel, materials, and labor, and other factors. Although we cannot guarantee savings or costs, we suggest that you use this report for economic analysis of the building and as a means to estimate future cash flow.

THE RECOMMENDATIONS PRESENTED IN THIS REPORT ARE BASED ON THE RESULTS OF ANALYSIS, INSPECTION, AND PERFORMANCE TESTING OF A SAMPLE OF COMPONENTS OF THE BUILDING SITE. ALTHOUGH CODE-RELATED ISSUES MAY BE NOTED, SWA STAFF HAVE NOT COMPLETED A COMPREHENSIVE EVALUATION FOR CODE-COMPLIANCE OR HEALTH AND SAFETY ISSUES. THE OWNER(S) AND MANAGER(S) OF THE BUILDING(S) CONTAINED IN THIS REPORT ARE REMINDED THAT ANY IMPROVEMENTS SUGGESTED IN THIS SCOPE OF WORK MUST BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS THAT APPLY TO SAID WORK. PARTICULAR ATTENTION MUST BE PAID TO ANY WORK WHICH INVOLVES HEATING AND AIR MOVEMENT SYSTEMS, AND ANY WORK WHICH WILL INVOLVE THE DISTURBANCE OF PRODUCTS CONTAINING MOLD, ASBESTOS, OR LEAD.

Appendix A: Lighting study

Existing Lighting Conditions																
#	Building	Level/Floor	Location in Building	Fixture Type	Ballast Type	No. of Fixtures	No. of Lamps	Type of Lamp	Watts/Lamp	Hrs/Day	Energy Use (Watt hours/day)	Annual Energy Use (kWh/year)	Controls	Daylighting possible?	Total Power (Watts)	
1	Town Hall	Basement	Mechanical Room	4' linear T12	magnetic	7	1	Fluorescent	40	12	3360	877	Switch	No	280	
2	Town Hall	Basement	Mechanical Room - Desk	4' linear T12	magnetic	1	1	Fluorescent	40	12	480	125	Switch	No	40	
3	Town Hall	Basement	Smaller Boiler Room	4' linear T12	magnetic	2	1	Fluorescent	40	12	960	251	Switch	No	80	
4	Town Hall	Basement	Larger Boiler Room	4' linear T12	magnetic	6	1	Fluorescent	40	12	2880	752	Switch	No	240	
5	Town Hall	Basement	Electrical Room	4' linear T12	magnetic	2	1	Fluorescent	40	12	960	251	Switch	No	80	
6	Town Hall	Basement	Alarm Room	4' linear T12	magnetic	1	1	Fluorescent	40	24	960	251	Switch	No	40	
7	Town Hall	Basement	Server Room	4' linear T12	magnetic	4	4	Fluorescent	40	24	15360	4009	Switch	No	640	
8	Town Hall	Basement	Entrance to Mechanical Room	2' U-shaped T12	magnetic	1	2	Fluorescent	34	12	816	213	Switch	No	68	
9	Town Hall	Basement	Hallway	4' linear T12	magnetic	4	2	Fluorescent	40	12	3840	1002	Switch	No	320	
10	Town Hall	Basement	Women's Room	135W inc.	-	1	1	Incandescent	135	12	1620	423	Switch	No	135	
11	Town Hall	Basement	Women's Room	2' linear T12	magnetic	1	2	Fluorescent	20	12	480	125	Switch	No	40	
12	Town Hall	Basement	Men's Room	135W inc.	-	1	1	Incandescent	135	12	1620	423	Switch	No	135	
13	Town Hall	Basement	Men's Room	2' linear T12	magnetic	1	2	Fluorescent	20	12	480	125	Switch	No	40	
14	Town Hall	Basement	Break Room	4' linear T12	magnetic	3	4	Fluorescent	40	12	5760	1503	Switch	No	480	
15	Town Hall	Basement	Break Room - Kitchen	4' linear T12	magnetic	1	4	Fluorescent	40	12	1920	501	Switch	No	160	
16	Town Hall	Basement	Hallway	Fl. Exit Sign	-	3	1	Fluorescent	20	24	1440	376	None	No	60	
17	Town Hall	Basement	Library Hallway	4' linear T12	magnetic	1	4	Fluorescent	40	12	1920	501	Switch	No	160	
18	Town Hall	Basement	Rec. Room	4' linear T12	magnetic	8	1	Fluorescent	40	12	3840	1002	Switch	No	320	
19	Town Hall	Basement	Rec. Room - Office (Left hand side)	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640	
20	Town Hall	Basement	Rec. Room - Office (Right hand side)	4' linear T12	magnetic	2	4	Fluorescent	40	10	3200	835	Switch	No	320	
21	Town Hall	Basement	Rec. Room - Closet	4' linear T12	magnetic	1	2	Fluorescent	40	4	320	84	Switch	No	80	
22	Town Hall	Basement	Storage through Rec. Room	4' linear T12	magnetic	4	1	Fluorescent	40	4	640	167	Switch	No	160	
23	Town Hall	Basement	Storage through Rec. Room	4' linear T12	magnetic	2	2	Fluorescent	40	4	640	167	Switch	No	160	
24	Town Hall	Basement	Fire Panel/Electrical Room	4' linear T12	magnetic	4	1	Fluorescent	40	4	640	167	Switch	No	160	
25	Town Hall	Basement	Library	4' linear T12	magnetic	12	2	Fluorescent	40	10	9600	2506	Switch	No	960	
26	Town Hall	Basement	Library - Conference Room	4' linear T12	magnetic	24	2	Fluorescent	40	10	19200	5011	Switch	No	1920	
27	Town Hall	Basement	Library	Fl. Exit Sign	-	2	1	Fluorescent	20	24	960	251	None	No	40	
28	Town Hall	Basement	Library - Stock Room	4' linear T12	magnetic	1	4	Fluorescent	40	10	1600	418	Switch	No	160	
29	Town Hall	Basement	Library - Stock Room	4' linear T12	magnetic	4	2	Fluorescent	40	10	3200	835	Switch	No	320	
30	Town Hall	Basement	Library - Desk Area	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640	
31	Town Hall	Basement	Library - Desk Area	75W Halogen	-	6	1	Halogen	75	10	4500	1175	Switch	No	450	
32	Town Hall	Basement	Library - Book Shelf Area	4' linear T12	magnetic	88	2	Fluorescent	40	10	70400	18374	Switch	No	7040	
33	Town Hall	Basement	Library - Book Shelf Area	4' linear T12	magnetic	10	6	Fluorescent	40	10	24000	6264	Switch	No	2400	
34	Town Hall	Basement	Elevator Machine Room	4' linear T12	magnetic	1	1	Fluorescent	40	4	160	42	Switch	No	40	
35	Town Hall	Basement	Elevator Cab	3' linear T12	magnetic	1	4	Fluorescent	30	24	2880	752	Switch	No	120	
36	Town Hall	Basement	Stairwell	4' linear T12	magnetic	1	2	Fluorescent	40	24	1920	501	Switch	No	80	
37	Town Hall	First Floor	Front Lobby	400W Multi-Vapor	-	2	1	Multi-Vapor	400	24	19200	5011	None	No	800	
38	Town Hall	First Floor	Front Lobby	400W Multi-Vapor	-	7	1	Multi-Vapor	400	24	67200	17539	Switch	No	2800	
39	Town Hall	First Floor	Front Vestibule	Mercury spot lights	-	4	1	Mercury	20	24	0	0	Switch	No	0	
40	Town Hall	First Floor	Front Vestibule	Fl. Exit Sign	-	1	1	Fluorescent	20	24	480	125	None	No	20	
41	Town Hall	First Floor	Front Lobby	2' U-shaped T12	magnetic	10	2	Fluorescent	34	24	16320	4260	Switch	No	680	
42	Town Hall	First Floor	Lobby - Men's Room	2' U-shaped T12	magnetic	3	2	Fluorescent	34	24	4896	1278	Switch	No	204	
43	Town Hall	First Floor	Lobby - Men's Room	4' linear T12	magnetic	1	2	Fluorescent	40	24	1920	501	Switch	No	80	
44	Town Hall	First Floor	Lobby - Women's room	2' U-shaped T12	magnetic	3	2	Fluorescent	34	24	4896	1278	Switch	No	204	
45	Town Hall	First Floor	Lobby - Women's room	4' linear T12	magnetic	1	2	Fluorescent	40	24	1920	501	Switch	No	80	
46	Town Hall	Police	Entrance	2' U-shaped T12	magnetic	4	2	Fluorescent	34	24	6528	2383	Switch	No	272	
47	Town Hall	Police	Hallway	4' linear T12	magnetic	3	2	Fluorescent	40	24	5760	2102	Switch	No	240	
48	Town Hall	Police	Chief's Secretary	4' linear T12	magnetic	4	4	Fluorescent	40	12	7680	2803	Switch	No	640	
49	Town Hall	Police	Chief's Office	4' linear T12	magnetic	4	4	Fluorescent	40	12	7680	2803	Switch	No	640	
50	Town Hall	Police	Captain's Office	4' linear T12	magnetic	2	4	Fluorescent	40	12	3840	1402	Switch	No	320	

51	Town Hall	Police	Traffic Office	4' linear T12	magnetic	3	4	Fluorescent	40	12	5760	2102	Switch	No	480
52	Town Hall	Police	Training Room	4' linear T12	magnetic	12	2	Fluorescent	40	12	11520	4205	Switch	No	960
53	Town Hall	Police	Training Room	Fl. Exit Sign	-	1	1	Fluorescent	20	24	480	175	None	No	20
54	Town Hall	Police	Training - Storage	4' linear T12	magnetic	1	1	Fluorescent	40	4	160	58	Switch	No	40
55	Town Hall	Police	Back Stairwell	Fl. Exit Sign	-	1	1	Fluorescent	20	24	480	175	Switch	No	20
56	Town Hall	Police	Back Stairwell	4' linear T12	magnetic	3	2	Fluorescent	40	24	5760	2102	Switch	No	240
57	Town Hall	Police	Liutenant's Office	4' linear T12	magnetic	3	4	Fluorescent	40	12	5760	2102	Switch	No	480
58	Town Hall	Police	Main Police Hallway	4' linear T12	magnetic	15	2	Fluorescent	40	24	28800	10512	Switch	No	1200
59	Town Hall	Police	Main Police Hallway	Fl. Exit Sign	-	1	1	Fluorescent	20	24	480	175	None	No	20
60	Town Hall	Police	Stairwell	4' linear T12	magnetic	4	2	Fluorescent	40	40	12800	4672	Switch	No	320
61	Town Hall	Police	Stairwell	Fl. Exit Sign	-	1	1	Fluorescent	20	24	480	175	None	No	20
62	Town Hall	Police	Office 1	4' linear T12	magnetic	2	4	Fluorescent	40	12	3840	1402	Switch	No	320
63	Town Hall	Police	Office 2	4' linear T12	magnetic	2	4	Fluorescent	40	12	3840	1402	Switch	No	320
64	Town Hall	Police	Detective's Bureau	4' linear T12	magnetic	10	4	Fluorescent	40	12	19200	7008	Switch	No	1600
65	Town Hall	Police	Dispatch	2' U-shaped T12	magnetic	6	2	Fluorescent	34	24	9792	3574	Switch	No	408
66	Town Hall	Police	Dispatch	4' linear T12	magnetic	4	2	Fluorescent	40	24	7680	2803	Switch	No	320
67	Town Hall	Police	Dispatch - Office	4' linear T12	magnetic	2	4	Fluorescent	40	24	7680	2803	Switch	No	320
68	Town Hall	Police	Dispatch - 3 cells	135W inc.	-	6	2	Incandescent	135	24	38880	14191	Switch	No	1620
69	Town Hall	Police	Dispatch - Restroom	135W inc.	-	1	1	Incandescent	135	24	3240	1183	Switch	No	135
70	Town Hall	Police	Dispatch - Restroom	2' linear T12	magnetic	1	2	Fluorescent	20	24	960	350	Switch	No	40
71	Town Hall	Police	Photo ID Room	4' linear T8	electronic	1	4	Fluorescent	32	12	1536	561	Switch	No	128
72	Town Hall	Police	Photo ID Room	4' linear T8	magnetic	1	4	Fluorescent	34	12	1632	596	Switch	No	136
73	Town Hall	Police	Hallway	4' linear T12	magnetic	7	2	Fluorescent	40	24	13440	4906	Switch	No	560
74	Town Hall	Police	Hallway	Fl. Exit Sign	-	3	1	Fluorescent	20	24	1440	526	None	No	60
75	Town Hall	Police	Newer Hallway	4' linear T12	magnetic	2	4	Fluorescent	40	24	7680	2803	Switch	No	320
76	Town Hall	Police	Newer Hallway	LED Exit Sign	-	1	1	LED	5	24	120	44	None	No	5
77	Town Hall	Police	Office 1	4' linear T12	magnetic	1	4	Fluorescent	40	12	1920	701	Switch	No	160
78	Town Hall	Police	Office 2	4' linear T12	magnetic	2	4	Fluorescent	40	12	3840	1402	Switch	No	320
79	Town Hall	Police	Closet 1	4' linear T12	magnetic	1	1	Fluorescent	40	4	160	58	Switch	No	40
80	Town Hall	Police	Closet 2	4' linear T12	magnetic	1	1	Fluorescent	40	4	160	58	Switch	No	40
81	Town Hall	Police	Closet 3	4' linear T12	magnetic	1	1	Fluorescent	40	4	160	58	Switch	No	40
82	Town Hall	Police	DWI	4' linear T12	magnetic	2	4	Fluorescent	40	12	3840	1402	Switch	No	320
83	Town Hall	Police	Cell Hallway	60W inc. bulb	-	3	1	Incandescent	60	24	4320	1577	Switch	No	180
84	Town Hall	Police	Cell Hallway	17W CFL bulb	-	1	1	CFL	17	24	408	149	Switch	No	17
85	Town Hall	Police	Processing	4' linear T12	magnetic	2	4	Fluorescent	40	24	7680	2803	Switch	No	320
86	Town Hall	Police	Room at bottom of Stairs	4' linear T12	magnetic	1	1	Fluorescent	40	12	480	175	Switch	No	40
87	Town Hall	Police	Basement - Archives/Storage	4' linear T12	magnetic	4	4	Fluorescent	40	12	7680	2803	Switch	No	640
88	Town Hall	Police	Basement - Hallway	4' linear T12	magnetic	4	4	Fluorescent	40	12	7680	2803	Switch	No	640
89	Town Hall	Police	Basement - Hallway	Fl. Exit Sign	-	2	1	Fluorescent	20	24	960	350	None	No	40
90	Town Hall	Police	Basement	4' linear T12	magnetic	4	4	Fluorescent	40	24	15360	5606	Switch	No	640
91	Town Hall	Police	Evidence 1	4' linear T12	magnetic	4	4	Fluorescent	40	12	7680	2803	Switch	No	640
92	Town Hall	Police	Evidence 2	4' linear T12	magnetic	4	4	Fluorescent	40	12	7680	2803	Switch	No	640
93	Town Hall	Police	Physical Fitness Area	4' linear T12	magnetic	6	1	Fluorescent	40	12	2880	1051	Switch	No	240
94	Town Hall	Police	Locker Rooms	4' linear T12	magnetic	8	4	Fluorescent	40	12	15360	5606	Switch	No	1280
95	Town Hall	Police	Men's Room	2' U-shaped T12	magnetic	2	2	Fluorescent	34	12	1632	596	Switch	No	136
96	Town Hall	Police	Women's Room	2' U-shaped T12	magnetic	2	2	Fluorescent	34	12	1632	596	Switch	No	136
97	Town Hall	Police	Locker Room - Bath	2' U-shaped T12	magnetic	1	1	Fluorescent	34	12	408	149	Switch	No	34
98	Town Hall	First Floor	Lobby Closet	4' linear T12	magnetic	1	2	Fluorescent	40	4	320	84	Switch	No	80
99	Town Hall	First Floor	Town Clerk	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640
100	Town Hall	First Floor	Town Clerk Hallway	4' linear T12	magnetic	8	1	Fluorescent	40	10	3200	835	Switch	No	320
101	Town Hall	First Floor	Board of Health	4' linear T12	magnetic	8	1	Fluorescent	40	10	3200	835	Switch	No	320
102	Town Hall	First Floor	Board of Health	4' linear T12	magnetic	6	4	Fluorescent	40	10	9600	2506	Switch	No	960
103	Town Hall	First Floor	Finance	4' linear T12	magnetic	8	4	Fluorescent	40	10	12800	3341	Switch	No	1280
104	Town Hall	First Floor	Finance - Back Office	4' linear T12	magnetic	2	4	Fluorescent	40	10	3200	835	Switch	No	320
105	Town Hall	First Floor	Administrative	4' linear T12	magnetic	5	4	Fluorescent	40	10	8000	2088	Switch	No	800
106	Town Hall	First Floor	Administrative - Conference Room	4' linear T12	magnetic	3	4	Fluorescent	40	10	4800	1253	Switch	No	480
107	Town Hall	First Floor	Hallway	4' linear T12	magnetic	30	1	Fluorescent	40	12	14400	3758	Switch	No	1200
108	Town Hall	First Floor	Hallway	LED Exit Sign	-	1	1	LED	5	24	120	31	None	No	5
109	Town Hall	First Floor	Township Clerk	4' linear T12	magnetic	10	4	Fluorescent	40	10	16000	4176	Switch	No	1600
110	Town Hall	First Floor	Data Processing	4' linear T12	magnetic	2	4	Fluorescent	40	10	3200	835	Switch	No	320
111	Town Hall	First Floor	Township Clerk - Back Office	4' linear T12	magnetic	2	4	Fluorescent	40	10	3200	835	Switch	No	320
112	Town Hall	First Floor	Break Room	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640
113	Town Hall	First Floor	Tax Collector	4' linear T12	magnetic	6	4	Fluorescent	40	10	9600	2506	Switch	No	960
114	Town Hall	First Floor	Closet	4' linear T12	magnetic	2	4	Fluorescent	40	4	1280	334	Switch	No	320
115	Town Hall	First Floor	Stairwell	LED Exit Sign	-	1	1	LED	5	24	120	31	None	No	5
116	Town Hall	First Floor	Stairwell	4' linear T12	magnetic	5	4	Fluorescent	40	12	9600	2506	Switch	No	800
117	Town Hall	Second Floor	Construction Official's Office	4' linear T12	magnetic	6	4	Fluorescent	40	10	9600	2506	Switch	No	960
118	Town Hall	Second Floor	Construction Official's Office	4' linear T12	magnetic	2	2	Fluorescent	40	10	1600	418	Switch	No	160
119	Town Hall	Second Floor	Construction Official's Office	75W Flood Light	-	1	1	Flood	75	10	750	196	Switch	No	75
120	Town Hall	Second Floor	Construction Office	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640

121	Town Hall	Second Floor	Construction Office	4' linear T12	magnetic	2	2	Fluorescent	40	10	1600	418	Switch	No	160
122	Town Hall	Second Floor	Planning Board	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640
123	Town Hall	Second Floor	Planning Board	4' linear T12	magnetic	3	2	Fluorescent	40	10	2400	626	Switch	No	240
124	Town Hall	Second Floor	Planning Board - Closet	4' linear T12	magnetic	2	4	Fluorescent	40	4	1280	334	Switch	No	320
125	Town Hall	Second Floor	Tax Assessor	4' linear T12	magnetic	2	4	Fluorescent	40	10	3200	835	Switch	No	320
126	Town Hall	Second Floor	Tax Assessor	4' linear T12	magnetic	2	2	Fluorescent	40	10	1600	418	Switch	No	160
127	Town Hall	Second Floor	Break Room	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640
128	Town Hall	Second Floor	Break Room	4' linear T12	magnetic	2	2	Fluorescent	40	10	1600	418	Switch	No	160
129	Town Hall	Second Floor	Mechanical Room #4	4' linear T12	magnetic	4	1	Fluorescent	40	10	1600	418	Switch	No	160
130	Town Hall	Second Floor	Hallway	2' U-shaped T12	magnetic	9	2	Fluorescent	34	12	7344	1917	Switch	No	612
131	Town Hall	Second Floor	Hallway	LED Exit Sign	-	1	1	LED	5	24	120	31	None	No	5
132	Town Hall	Second Floor	Newer Hallway	4' linear T12	magnetic	7	2	Fluorescent	40	12	6720	1754	Switch	No	560
133	Town Hall	Second Floor	Newer Hallway	4' linear T12	magnetic	2	4	Fluorescent	40	12	3840	1002	Switch	No	320
134	Town Hall	Second Floor	Closet	4' linear T12	magnetic	1	1	Fluorescent	40	4	160	42	Switch	No	40
135	Town Hall	Second Floor	Board of Education	4' linear T12	magnetic	15	4	Fluorescent	40	10	24000	6264	Switch	No	2400
136	Town Hall	Second Floor	Board of Education - Break Room	4' linear T12	magnetic	2	1	Fluorescent	40	10	800	209	Switch	No	80
137	Town Hall	Second Floor	Board of Education - Conference Room	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640
138	Town Hall	Second Floor	Board of Education - Office 1	4' linear T12	magnetic	3	4	Fluorescent	40	10	4800	1253	Switch	No	480
139	Town Hall	Second Floor	Board of Education - Office 1	4' linear T12	magnetic	2	2	Fluorescent	40	10	1600	418	Switch	No	160
140	Town Hall	Second Floor	Board of Education - Office 2	4' linear T12	magnetic	2	4	Fluorescent	40	10	3200	835	Switch	No	320
141	Town Hall	Second Floor	Board of Education - Office 2	4' linear T12	magnetic	2	2	Fluorescent	40	10	1600	418	Switch	No	160
142	Town Hall	Second Floor	Board of Education - Office 3	4' linear T12	magnetic	2	4	Fluorescent	40	10	3200	835	Switch	No	320
143	Town Hall	Second Floor	Board of Education - Office 3	4' linear T12	magnetic	2	2	Fluorescent	40	10	1600	418	Switch	No	160
144	Town Hall	Second Floor	Board of Education - Office 4	4' linear T12	magnetic	2	4	Fluorescent	40	10	3200	835	Switch	No	320
145	Town Hall	Second Floor	Board of Education - Office 4	4' linear T12	magnetic	2	2	Fluorescent	40	10	1600	418	Switch	No	160
146	Town Hall	Second Floor	Board of Education	Fl. Exit Sign	-	1	1	Fluorescent	20	24	480	125	None	No	20
147	Town Hall	Second Floor	Board of Education - Office with lower ceiling	2' U-shaped T12	magnetic	16	2	Fluorescent	34	10	10880	2840	Switch	No	1088
148	Town Hall	Second Floor	Superintendent's Office	2' U-shaped T12	magnetic	12	2	Fluorescent	34	10	8160	2130	Switch	No	816
149	Town Hall	Second Floor	Loft above Superintendent's Office	4' linear T12	magnetic	4	1	Fluorescent	40	10	1600	418	Switch	No	160
150	Town Hall	Second Floor	Mechanical Room	4' linear T12	magnetic	4	1	Fluorescent	40	10	1600	418	Switch	No	160
151	Town Hall	Second Floor	Hall outside Mechanical Room	2' U-shaped T12	magnetic	2	2	Fluorescent	40	12	1920	501	Switch	No	160
152	Town Hall	Second Floor	Closet	4' linear T12	magnetic	1	1	Fluorescent	40	4	160	42	Switch	No	40
153	Town Hall	Second Floor	Hall outside Mechanical Room	Fl. Exit Sign	-	1	1	Fl	20	24	480	125	Switch	No	20
154	Town Hall	Second Floor	Server Room	4' linear T12	magnetic	1	4	Fluorescent	40	12	1920	501	Switch	No	160
155	Town Hall	Second Floor	Stairwell to Lobby	75W Flood Light	-	2	1	Flood	75	12	1800	470	Switch	No	150
156	Town Hall	Second Floor	Court Offices	4' linear T12	magnetic	4	4	Fluorescent	40	12	7680	2004	Switch	No	640
157	Town Hall	Second Floor	Court Offices	4' linear T12	magnetic	8	4	Fluorescent	40	12	15360	4009	Switch	No	1280
158	Town Hall	Second Floor	Office	4' linear T12	magnetic	4	4	Fluorescent	40	10	6400	1670	Switch	No	640

Proposed Lighting Conditions															
#	Building	Level/Floor	Location in Building	Fixture Type	Ballast Type	No. of Fixtures	No. of Lamps	Type of Lamp	Watts/Lamp	Hrs/Day	Energy Use (Watt hours/day)	Annual Energy Use (kWh/year)	Controls	Daylighting possible?	Total Power (Watts)
1	Town Hall	Basement	Mechanical Room	4' linear T8	electronic	7	1	Fluorescent	32	12	2688	702	Switch	No	224
2	Town Hall	Basement	Mechanical Room - Desk	4' linear T8	electronic	1	1	Fluorescent	32	12	384	100	Switch	No	32
3	Town Hall	Basement	Smaller Boiler Room	4' linear T8	electronic	2	1	Fluorescent	32	12	768	200	Switch	No	64
4	Town Hall	Basement	Larger Boiler Room	4' linear T8	electronic	6	1	Fluorescent	32	12	2304	601	Switch	No	192
5	Town Hall	Basement	Electrical Room	4' linear T8	electronic	2	1	Fluorescent	32	12	768	200	Switch	No	64
6	Town Hall	Basement	Alarm Room	4' linear T8	electronic	1	1	Fluorescent	32	24	768	200	Switch	No	32
7	Town Hall	Basement	Server Room	4' linear T8	electronic	4	4	Fluorescent	32	24	12288	3207	Switch	No	512
8	Town Hall	Basement	Entrance to Mechanical Room	2' U-shaped T8	electronic	1	2	Fluorescent	32	12	768	200	Switch	No	64
9	Town Hall	Basement	Hallway	4' linear T8	electronic	4	2	Fluorescent	32	12	3072	802	Switch	No	256
10	Town Hall	Basement	Women's Room	32W CFL	-	1	1	CFL	32	12	384	100	Switch	No	32
11	Town Hall	Basement	Women's Room	2' linear T8	electronic	1	2	Fluorescent	17	12	408	106	Switch	No	34
12	Town Hall	Basement	Men's Room	32W CFL	-	1	1	CFL	32	12	384	100	Switch	No	32
13	Town Hall	Basement	Men's Room	2' linear T8	electronic	1	2	Fluorescent	17	12	408	106	Switch	No	34
14	Town Hall	Basement	Break Room	4' linear T8	electronic	3	4	Fluorescent	32	12	4608	1203	Switch	No	384
15	Town Hall	Basement	Break Room - Kitchen	4' linear T8	electronic	1	4	Fluorescent	32	12	1536	401	Switch	No	128
16	Town Hall	Basement	Hallway	LED Exit Sign	-	3	1	LED Exit	5	24	360	94	None	No	15
17	Town Hall	Basement	Library Hallway	4' linear T8	electronic	1	4	Fluorescent	32	12	1536	401	Switch	No	128
18	Town Hall	Basement	Rec. Room	4' linear T8	electronic	8	1	Fluorescent	32	12	3072	802	Switch	No	256
19	Town Hall	Basement	Rec. Room - Office (Left hand side)	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512
20	Town Hall	Basement	Rec. Room - Office (Right hand side)	4' linear T8	electronic	2	4	Fluorescent	32	10	2560	668	Switch	No	256
21	Town Hall	Basement	Rec. Room - Closet	4' linear T8	electronic	1	2	Fluorescent	32	4	256	67	Switch	No	64
22	Town Hall	Basement	Storage through Rec. Room	4' linear T8	electronic	4	1	Fluorescent	32	4	512	134	Switch	No	128
23	Town Hall	Basement	Storage through Rec. Room	4' linear T8	electronic	2	2	Fluorescent	32	4	512	134	Switch	No	128
24	Town Hall	Basement	Fire Panel/Electrical Room	4' linear T8	electronic	4	1	Fluorescent	32	4	512	134	Switch	No	128
25	Town Hall	Basement	Library	4' linear T8	electronic	12	2	Fluorescent	32	10	7680	2004	Switch	No	768
26	Town Hall	Basement	Library - Conference Room	4' linear T8	electronic	24	2	Fluorescent	32	10	15360	4009	Switch	No	1536
27	Town Hall	Basement	Library	LED Exit Sign	-	2	1	LED Exit	5	24	240	63	None	No	10
28	Town Hall	Basement	Library - Stock Room	4' linear T8	electronic	1	4	Fluorescent	32	10	1280	334	Switch	No	128
29	Town Hall	Basement	Library - Stock Room	4' linear T8	electronic	4	2	Fluorescent	32	10	2560	668	Switch	No	256
30	Town Hall	Basement	Library - Desk Area	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512
31	Town Hall	Basement	Library - Desk Area	28W CFL	-	6	1	CFL	28	10	1680	438	Switch	No	168
32	Town Hall	Basement	Library - Book Shelf Area	4' linear T8	electronic	88	2	Fluorescent	32	10	56320	14700	Switch	No	5632
33	Town Hall	Basement	Library - Book Shelf Area	4' linear T8	electronic	10	6	Fluorescent	32	10	19200	5011	Switch	No	1920
34	Town Hall	Basement	Elevator Machine Room	4' linear T8	electronic	1	1	Fluorescent	32	4	128	33	Switch	No	32
35	Town Hall	Basement	Elevator Cab	3' linear T8	electronic	1	4	Fluorescent	25	24	2400	626	Switch	No	100
36	Town Hall	Basement	Stairwell	4' linear T8	electronic	1	2	Fluorescent	32	24	1536	401	Switch	No	64
37	Town Hall	First Floor	Front Lobby	400W Multi-Vapor	-	2	1	Multi-Vapor	400	24	19200	5011	None	No	800
38	Town Hall	First Floor	Front Lobby	400W Multi-Vapor	-	7	1	Multi-Vapor	400	24	67200	17539	Switch	No	2800
39	Town Hall	First Floor	Front Vestibule	Mercury spot lights	-	4	1	Mercury		24	0	0	Switch	No	0
40	Town Hall	First Floor	Front Vestibule	LED Exit Sign	-	1	1	Fluorescent	5	24	120	31	None	No	5
41	Town Hall	First Floor	Front Lobby	2' U-shaped T8	electronic	10	2	Fluorescent	32	24	15360	4009	Switch	No	640
42	Town Hall	First Floor	Lobby - Men's Room	2' U-shaped T8	electronic	3	2	Fluorescent	32	24	4608	1203	Switch	No	192
43	Town Hall	First Floor	Lobby - Men's Room	4' linear T8	electronic	1	2	Fluorescent	32	24	1536	401	Switch	No	64
44	Town Hall	First Floor	Lobby - Women's room	2' U-shaped T8	electronic	3	2	Fluorescent	32	24	4608	1203	Switch	No	192
45	Town Hall	First Floor	Lobby - Women's room	4' linear T8	electronic	1	2	Fluorescent	32	24	1536	401	Switch	No	64
46	Town Hall	Police	Entrance	2' U-shaped T8	electronic	4	2	Fluorescent	34	24	6528	2383	Switch	No	272
47	Town Hall	Police	Hallway	4' linear T8	electronic	3	2	Fluorescent	32	24	4608	1682	Switch	No	192
48	Town Hall	Police	Chief's Secretary	4' linear T8	electronic	4	4	Fluorescent	32	12	6144	2243	Switch	No	512
49	Town Hall	Police	Chief's Office	4' linear T8	electronic	4	4	Fluorescent	32	12	6144	2243	Switch	No	512
50	Town Hall	Police	Captain's Office	4' linear T8	electronic	2	4	Fluorescent	32	12	3072	1121	Switch	No	256

51	Town Hall	Police	Traffic Office	4' linear T8	electronic	3	4	Fluorescent	32	12	4608	1682	Switch	No	384
52	Town Hall	Police	Training Room	4' linear T8	electronic	12	2	Fluorescent	32	12	9216	3364	Switch	No	768
53	Town Hall	Police	Training Room	LED Exit Sign	-	1	1	Fluorescent	5	24	120	44	None	No	5
54	Town Hall	Police	Training - Storage	4' linear T8	electronic	1	1	Fluorescent	32	4	128	47	Switch	No	32
55	Town Hall	Police	Back Stairwell	LED Exit Sign	-	1	1	Fluorescent	17	24	408	149	Switch	No	17
56	Town Hall	Police	Back Stairwell	4' linear T8	electronic	3	2	Fluorescent	32	24	4608	1682	Switch	No	192
57	Town Hall	Police	Lieutenant's Office	4' linear T8	electronic	3	4	Fluorescent	32	12	4608	1682	Switch	No	384
58	Town Hall	Police	Main Police Hallway	4' linear T8	electronic	15	2	Fluorescent	32	24	23040	8410	Switch	No	960
59	Town Hall	Police	Main Police Hallway	LED Exit Sign	-	1	1	Fluorescent	5	24	120	44	None	No	5
60	Town Hall	Police	Stairwell	4' linear T8	electronic	4	2	Fluorescent	32	40	10240	3738	Switch	No	256
61	Town Hall	Police	Stairwell	LED Exit Sign	-	1	1	Fluorescent	5	24	120	44	None	No	5
62	Town Hall	Police	Office 1	4' linear T8	electronic	2	4	Fluorescent	32	12	3072	1121	Switch	No	256
63	Town Hall	Police	Office 2	4' linear T8	electronic	2	4	Fluorescent	32	12	3072	1121	Switch	No	256
64	Town Hall	Police	Detective's Bureau	4' linear T8	electronic	10	4	Fluorescent	32	12	15360	5606	Switch	No	1280
65	Town Hall	Police	Dispatch	2' U-shaped T8	electronic	6	2	Fluorescent	32	24	9216	3364	Switch	No	384
66	Town Hall	Police	Dispatch	4' linear T8	electronic	4	2	Fluorescent	32	24	6144	2243	Switch	No	256
67	Town Hall	Police	Dispatch - Office	4' linear T8	electronic	2	4	Fluorescent	32	24	6144	2243	Switch	No	256
68	Town Hall	Police	Dispatch - 3 cells	50W CFL	-	6	2	CFL	50	24	14400	5256	Switch	No	600
69	Town Hall	Police	Dispatch - Restroom	50W CFL	-	1	1	CFL	50	24	1200	438	Switch	No	50
70	Town Hall	Police	Dispatch - Restroom	2' linear T8	electronic	1	2	Fluorescent	17	24	816	298	Switch	No	34
71	Town Hall	Police	Photo ID Room	4' linear T8	electronic	1	4	Fluorescent	32	12	1536	561	Switch	No	128
72	Town Hall	Police	Photo ID Room	4' linear T8	electronic	1	4	Fluorescent	32	12	1536	561	Switch	No	128
73	Town Hall	Police	Hallway	4' linear T8	electronic	7	2	Fluorescent	32	24	10752	3924	Switch	No	448
74	Town Hall	Police	Hallway	LED Exit Sign	-	3	1	Fluorescent	5	24	360	131	None	No	15
75	Town Hall	Police	Newer Hallway	4' linear T8	electronic	2	4	Fluorescent	32	24	6144	2243	Switch	No	256
76	Town Hall	Police	Newer Hallway	LED Exit Sign	-	1	1	LED	5	24	120	44	None	No	5
77	Town Hall	Police	Office 1	4' linear T8	electronic	1	4	Fluorescent	32	12	1536	561	Switch	No	128
78	Town Hall	Police	Office 2	4' linear T8	electronic	2	4	Fluorescent	32	12	3072	1121	Switch	No	256
79	Town Hall	Police	Closet 1	4' linear T8	electronic	1	1	Fluorescent	32	4	128	47	Switch	No	32
80	Town Hall	Police	Closet 2	4' linear T8	electronic	1	1	Fluorescent	32	4	128	47	Switch	No	32
81	Town Hall	Police	Closet 3	4' linear T8	electronic	1	1	Fluorescent	32	4	128	47	Switch	No	32
82	Town Hall	Police	DWI	4' linear T8	electronic	2	4	Fluorescent	32	12	3072	1121	Switch	No	256
83	Town Hall	Police	Cell Hallway	32W CFL	-	3	1	Incandescent	32	24	2304	841	Switch	No	96
84	Town Hall	Police	Cell Hallway	17W CFL bulb	-	1	1	CFL	17	24	408	149	Switch	No	17
85	Town Hall	Police	Processing	4' linear T8	electronic	2	4	Fluorescent	32	24	6144	2243	Switch	No	256
86	Town Hall	Police	Room at bottom of Stairs	4' linear T8	electronic	1	1	Fluorescent	32	12	384	140	Switch	No	32
87	Town Hall	Police	Basement - Archives/Storage	4' linear T8	electronic	4	4	Fluorescent	32	12	6144	2243	Switch	No	512
88	Town Hall	Police	Basement - Hallway	4' linear T8	electronic	4	4	Fluorescent	32	12	6144	2243	Switch	No	512
89	Town Hall	Police	Basement - Hallway	LED Exit Sign	-	2	1	Fluorescent	17	24	816	298	None	No	34
90	Town Hall	Police	Basement	4' linear T8	electronic	4	4	Fluorescent	32	24	12288	4485	Switch	No	512
91	Town Hall	Police	Evidence 1	4' linear T8	electronic	4	4	Fluorescent	32	12	6144	2243	Switch	No	512
92	Town Hall	Police	Evidence 2	4' linear T8	electronic	4	4	Fluorescent	32	12	6144	2243	Switch	No	512
93	Town Hall	Police	Physical Fitness Area	4' linear T8	electronic	6	1	Fluorescent	32	12	2304	841	Switch	No	192
94	Town Hall	Police	Locker Rooms	4' linear T8	electronic	8	4	Fluorescent	32	12	12288	4485	Switch	No	1024
95	Town Hall	Police	Men's Room	2' U-shaped T8	electronic	2	2	Fluorescent	32	12	1536	561	Switch	No	128
96	Town Hall	Police	Women's Room	2' U-shaped T8	electronic	2	2	Fluorescent	32	12	1536	561	Switch	No	128
97	Town Hall	Police	Locker Room - Bath	2' U-shaped T8	electronic	1	1	Fluorescent	32	12	384	140	Switch	No	32
98	Town Hall	First Floor	Lobby Closet	4' linear T8	electronic	1	2	Fluorescent	32	4	256	67	Switch	No	64
99	Town Hall	First Floor	Town Clerk	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512
100	Town Hall	First Floor	Town Clerk Hallway	4' linear T8	electronic	8	1	Fluorescent	32	10	2560	668	Switch	No	256
101	Town Hall	First Floor	Board of Health	4' linear T8	electronic	8	1	Fluorescent	32	10	2560	668	Switch	No	256
102	Town Hall	First Floor	Board of Health	4' linear T8	electronic	6	4	Fluorescent	32	10	7680	2004	Switch	No	768
103	Town Hall	First Floor	Finance	4' linear T8	electronic	8	4	Fluorescent	32	10	10240	2673	Switch	No	1024
104	Town Hall	First Floor	Finance - Back Office	4' linear T8	electronic	2	4	Fluorescent	32	10	2560	668	Switch	No	256
105	Town Hall	First Floor	Administrative	4' linear T8	electronic	5	4	Fluorescent	32	10	6400	1670	Switch	No	640
106	Town Hall	First Floor	Administrative - Conference Room	4' linear T8	electronic	3	4	Fluorescent	32	10	3840	1002	Switch	No	384
107	Town Hall	First Floor	Hallway	4' linear T8	electronic	30	1	Fluorescent	32	12	11520	3007	Switch	No	960
108	Town Hall	First Floor	Hallway	LED Exit Sign	-	1	1	LED	5	24	120	31	None	No	5
109	Town Hall	First Floor	Township Clerk	4' linear T8	electronic	10	4	Fluorescent	32	10	12800	3341	Switch	No	1280
110	Town Hall	First Floor	Data Processing	4' linear T8	electronic	2	4	Fluorescent	32	10	2560	668	Switch	No	256
111	Town Hall	First Floor	Township Clerk - Back Office	4' linear T8	electronic	2	4	Fluorescent	32	10	2560	668	Switch	No	256
112	Town Hall	First Floor	Break Room	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512
113	Town Hall	First Floor	Tax Collector	4' linear T8	electronic	6	4	Fluorescent	32	10	7680	2004	Switch	No	768
114	Town Hall	First Floor	Closet	4' linear T8	electronic	2	4	Fluorescent	32	4	1024	267	Switch	No	256
115	Town Hall	First Floor	Stairwell	LED Exit Sign	-	1	1	LED	5	24	120	31	None	No	5
116	Town Hall	First Floor	Stairwell	4' linear T8	electronic	5	4	Fluorescent	32	12	7680	2004	Switch	No	640
117	Town Hall	Second Floor	Construction Official's Office	4' linear T8	electronic	6	4	Fluorescent	32	10	7680	2004	Switch	No	768
118	Town Hall	Second Floor	Construction Official's Office	4' linear T8	electronic	2	2	Fluorescent	32	10	1280	334	Switch	No	128
119	Town Hall	Second Floor	Construction Official's Office	32W CFL	-	1	1	CFL	32	10	320	84	Switch	No	32
120	Town Hall	Second Floor	Construction Office	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512

121	Town Hall	Second Floor	Construction Office	4' linear T8	electronic	2	2	Fluorescent	32	10	1280	334	Switch	No	128
122	Town Hall	Second Floor	Planning Board	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512
123	Town Hall	Second Floor	Planning Board	4' linear T8	electronic	3	2	Fluorescent	32	10	1920	501	Switch	No	192
124	Town Hall	Second Floor	Planning Board - Closet	4' linear T8	electronic	2	4	Fluorescent	32	4	1024	267	Switch	No	256
125	Town Hall	Second Floor	Tax Assessor	4' linear T8	electronic	2	4	Fluorescent	32	10	2560	668	Switch	No	256
126	Town Hall	Second Floor	Tax Assessor	4' linear T8	electronic	2	2	Fluorescent	32	10	1280	334	Switch	No	128
127	Town Hall	Second Floor	Break Room	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512
128	Town Hall	Second Floor	Break Room	4' linear T8	electronic	2	2	Fluorescent	32	10	1280	334	Switch	No	128
129	Town Hall	Second Floor	Mechanical Room #4	4' linear T8	electronic	4	1	Fluorescent	32	10	1280	334	Switch	No	128
130	Town Hall	Second Floor	Hallway	2' U-shaped T8	electronic	9	2	Fluorescent	32	12	6912	1804	Switch	No	576
131	Town Hall	Second Floor	Hallway	LED Exit Sign	-	1	1	LED	5	24	120	31	None	No	5
132	Town Hall	Second Floor	Newer Hallway	4' linear T8	electronic	7	2	Fluorescent	32	12	5376	1403	Switch	No	448
133	Town Hall	Second Floor	Newer Hallway	4' linear T8	electronic	2	4	Fluorescent	32	12	3072	802	Switch	No	256
134	Town Hall	Second Floor	Closet	4' linear T8	electronic	1	1	Fluorescent	32	4	128	33	Switch	No	32
135	Town Hall	Second Floor	Board of Education	4' linear T8	electronic	15	4	Fluorescent	32	10	19200	5011	Switch	No	1920
136	Town Hall	Second Floor	Board of Education - Break Room	4' linear T8	electronic	2	1	Fluorescent	32	10	640	167	Switch	No	64
137	Town Hall	Second Floor	Board of Education - Conference Room	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512
138	Town Hall	Second Floor	Board of Education - Office 1	4' linear T8	electronic	3	4	Fluorescent	32	10	3840	1002	Switch	No	384
139	Town Hall	Second Floor	Board of Education - Office 1	4' linear T8	electronic	2	2	Fluorescent	32	10	1280	334	Switch	No	128
140	Town Hall	Second Floor	Board of Education - Office 2	4' linear T8	electronic	2	4	Fluorescent	32	10	2560	668	Switch	No	256
141	Town Hall	Second Floor	Board of Education - Office 2	4' linear T8	electronic	2	2	Fluorescent	32	10	1280	334	Switch	No	128
142	Town Hall	Second Floor	Board of Education - Office 3	4' linear T8	electronic	2	4	Fluorescent	32	10	2560	668	Switch	No	256
143	Town Hall	Second Floor	Board of Education - Office 3	4' linear T8	electronic	2	2	Fluorescent	32	10	1280	334	Switch	No	128
144	Town Hall	Second Floor	Board of Education - Office 4	4' linear T8	electronic	2	4	Fluorescent	32	10	2560	668	Switch	No	256
145	Town Hall	Second Floor	Board of Education - Office 4	4' linear T8	electronic	2	2	Fluorescent	32	10	1280	334	Switch	No	128
146	Town Hall	Second Floor	Board of Education	LED Exit Sign	-	1	1	Fluorescent	5	24	120	31	None	No	5
147	Town Hall	Second Floor	Board of Education - Office with lower ceiling	2' U-shaped T8	electronic	16	2	Fluorescent	32	10	10240	2673	Switch	No	1024
148	Town Hall	Second Floor	Superintendent's Office	2' U-shaped T8	electronic	12	2	Fluorescent	32	10	7680	2004	Switch	No	768
149	Town Hall	Second Floor	Loft above Superintendent's Office	4' linear T8	electronic	4	1	Fluorescent	32	10	1280	334	Switch	No	128
150	Town Hall	Second Floor	Mechanical Room	4' linear T8	electronic	4	1	Fluorescent	32	10	1280	334	Switch	No	128
151	Town Hall	Second Floor	Hall outside Mechanical Room	2' U-shaped T8	electronic	2	2	Fluorescent	32	12	1536	401	Switch	No	128
152	Town Hall	Second Floor	Closet	4' linear T8	electronic	1	1	Fluorescent	32	4	128	33	Switch	No	32
153	Town Hall	Second Floor	Hall outside Mechanical Room	LED Exit Sign	-	1	1	LED Exit	5	24	120	31	Switch	No	5
154	Town Hall	Second Floor	Server Room	4' linear T8	electronic	1	4	Fluorescent	32	12	1536	401	Switch	No	128
155	Town Hall	Second Floor	Stairwell to Lobby	32W CFL	-	2	1	CFL	32	12	768	200	Switch	No	64
156	Town Hall	Second Floor	Court Offices	4' linear T8	electronic	4	4	Fluorescent	32	12	6144	1604	Switch	No	512
157	Town Hall	Second Floor	Court Offices	4' linear T8	electronic	8	4	Fluorescent	32	12	12288	3207	Switch	No	1024
158	Town Hall	Second Floor	Office	4' linear T8	electronic	4	4	Fluorescent	32	10	5120	1336	Switch	No	512

Existing Usage (kWh/year)	275,038
Proposed Usage (kWh/year)	218,629
Existing Cost (\$)	\$44,006
Proposed Cost (\$)	\$34,981
Total Savings (kWh)	56,408
Total Savings (\$)	\$9,025
Existing Lighting Power Density (W/sq.ft)	1.86
Proposed Lighting Power Density (W/sq.ft)	1.49

Appendix B: Third Party Energy Suppliers (ESCOs)

Third Party Electric Suppliers for JCPL Service Territory	Telephone & Web Site
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com
BOC Energy Services, Inc. 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.boc.com
Commerce Energy, Inc. 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457 www.commerceenergy.com
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 www.newenergy.com
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07926	(800) 977-0500 www.fes.com
Glacial Energy of New Jersey, Inc. 207 LaRoche Avenue Harrington Park, NJ 07640	(877) 569-2841 www.glacialenergy.com
Integrus Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrusenergy.com
Liberty Power Holdings, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(800) 363-7499 www.libertypowercorp.com
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) 363-7499 www.pepco-services.com
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com
Sempra Energy Solutions 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.semprasolutions.com
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com
Suez Energy Resources NA, Inc. 333 Thornall Street, 6th Floor Edison, NJ 08837	(888) 644-1014 www.suezenergyresources.com

Third Party Gas Suppliers for NJNG Service Territory	Telephone & Web Site
Cooperative Industries 412-420 Washington Avenue Belleville, NJ 07109	(800) 628-9427 www.cooperativenet.com
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com
UGI Energy Services, Inc. d/b/a/ GASMARK 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	(800) 724-1880 www.intelligentenergy.org
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	(877) 750-7046 www.metromediaenergy.com
MxEnergy, Inc. 510 Thornall Street, Suite 270 Edison, NJ 08837	(800) 375-1277 www.mxenergy.com
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	(800) 840-4427 www.natgasco.com
NJ Gas & Electric 1 Bridge Plaza, Fl. 2 Fort Lee, NJ 07024	(866) 568-0290 www.NewJerseyGasElectric.com
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	(800) 363-7499 www.pepco-services.com
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	(800) 557-1121 www.woodruffenergy.com