



**Steven Winter Associates, Inc.**  
Architects and Engineers  
[www.swinter.com](http://www.swinter.com)

293 Route 18 South, Suite 330  
East Brunswick, NJ 08816

Telephone: (866) 676-1972  
E-mail: [swinter@swinter.com](mailto:swinter@swinter.com)

*June 17, 2010*

**Local Government Energy Program  
Energy Audit Report**

*For*

***Middletown Township  
Public Library-Main Branch  
55 New Monmouth Road  
Middletown, NJ 07748***

***Project Number: LGEA41***



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## **INTRODUCTION**

On November 23, 2009 and January 8, 2010, Steven Winter Associates, Inc. (SWA) and PMK Group, Inc., a business unit of Birdsall Services Group (BSG-PMK), performed an energy audit and assessment for the Public Library-Main Branch Building. The building is located at 55 New Monmouth Road, Middletown, New Jersey 07748, in Monmouth County. The current conditions and energy-related information were collected in order to analyze and facilitate the implementation of energy conservation measures for the building.

The Public Library – Main Branch was built in 1971 and underwent a complete renovation in 2004. The building has a total area of 39,000 square feet. The Public Library – Main Branch houses meeting rooms, a circulation area, a popular materials area, a toddler area, a children’s room, various reading areas, group study area, quiet study areas and various administrative offices. The building is open from 9:00 AM to 9:00 PM Monday through Thursday, 9:00 AM to 5:00 PM Friday and Saturday, and 1:00 PM to 5:00 PM on Sunday. The building is occupied by approximately 59 employees.

Energy data and building information collected in the field were analyzed to determine the baseline energy performance of each building. Using spreadsheet-based calculation methods, SWA/ BSG-PMK estimated the energy and cost savings associated with the installation of each of the recommended energy conservation measures. The findings for the building are summarized in this report.

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 buildings.

Launched in 2008, the Local Government Energy Audit (LGEA) Program provides subsidized energy audits for municipal and local government-owned facilities, including offices, courtrooms, town halls, police and fire stations, sanitation buildings, transportation structures, schools and community centers. The Program will subsidize 75% of the cost of the audit. If the net cost of the installed measures recommended by the audit, after applying eligible NJ SmartStart Buildings incentives, exceeds the remaining cost of the audit, then the additional 25% will also be paid by the program. The Board of Public Utilities (BPU) Office of Clean Energy has assigned TRC Energy Services to administer the Program.

## EXECUTIVE SUMMARY

This document contains the energy audit report for the Public Library-Main Branch Building, located at 55 New Monmouth Road, Middletown, New Jersey 07748.

Based on the field visits performed by SWA/ BSG-PMK staff on November 23, 2009 and January 8, 2010, 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.

### Current conditions

In the most recent full year of data collected, October, 2008 through September, 2009, the facility consumed a total of 832,560 kWh of electricity for a total cost of \$137,974 and 18,846 therms of natural gas, for a total cost of \$22,598.

With electricity and fossil fuel combined, the building consumed 4,621 MMBtus of energy at a total cost of \$160,572.

SWA/ BSG-PMK has entered energy information about the Facility in the US Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* energy benchmarking system. 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 the complex is 118.0 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 2009 baseline to track the changes in energy consumption associated with the energy improvements.

Buildings achieving an Energy Star rating of 75.0 are eligible to apply for the Energy Star award and receive the Energy Star plaque to convey superior performance. These ratings also greatly help when applying for Leadership in Energy and Environmental Design (LEED) building certification through the United States Green Building Council (USGBC). SWA/ BSG-PMK encourages the Township of Middletown to continue entering utility data in *Energy Star Portfolio Manager* in order to track whether normalized source energy use over time. The building performance rating could not be determined because this is a mixed-use facility, comprised by non-eligible space types categorized as "Other," so kbtu/sqft was used to compare this buildings with others of a similar use. .

(Refer to Section 1.3 for Energy Star Rating)

### Category I Recommendations: Capital Improvement Measures

- Based on the results of SWA/BSG-PMK's survey, no capital improvement measures are recommended.

### Category II Recommendations: Operations and Maintenance

The gutter on the circular roof is not sufficiently supported and should be reinforced to ensure good drainage. The overall roof surface was maintained and clean with the exception of one drain cover that is clogged causing ponding adjacent to the raised roof area.

- Fix weather stripping on break room door.

### **Category III Recommendations: Energy Conservation Measures - Upgrades with associated energy savings**

At this time, BSG-PMK and SWA highly recommend a total of **1** Energy Conservation Measure (ECM) for the Main Library that is summarized in the following table. The total investment cost for this ECM is **\$889,200**. SWA and BSG-PMK estimate a first year savings of **\$105,087** with a simple payback of **8.5 years**. SWA and BSG-PMK estimate that implementing the highly recommended ECMs will reduce the carbon footprint of the Main Library building by **215,902 lbs of CO<sub>2</sub>**.

SWA/BSG-PMK also recommends that the Township of Middletown contact third party energy suppliers in order to negotiate a lower electricity rate. Comparing the current electric rate to average utility rates of similar type buildings in New Jersey, it may be possible to save up to \$ 0.02/kWh, which would have equated to \$13,090 for the past 12 months.

There are various incentives that the Township of Middletown could apply for that could also help lower the cost of installing the ECMs. BSG-PMK and SWA recommend that the Township apply 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.

The following table summarizes the proposed Energy Conservation Measure (ECM) and its economic relevance:

ROI: Return on Investment (%)

**Assumptions:**

Discount rate: 3.2% per DOE FEMP guidelines

Electricity rate: \$0.17 \$/kWh

Energy price escalation rate: 0% per DOE FEMP guidelines

Gas rate: \$1.20 \$/therm

Avg. Annual Demand: 0.00266

Area of Building (SF)

39,000

**Table 1 - Recommended 5-10 Year Payback ECMs**

ECM #	ECM description	Source	Est. Installed Cost, \$	Est. Incentives, \$	Net Est. ECM Cost with Incentives, \$	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, \$	Total 1st Yr Savings, \$	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, \$	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, \$	CO <sub>2</sub> Reduced, lbs/yr
1	148.2-kW Roof-Mounted PV System	Similar Projects	\$889,200	\$0	\$889,200	157,593	34.93	0	13.79	\$0	\$105,087	30	\$2,007,506	8.46	419.22%	14%	11%	\$1,170,552	215,902
TOTAL			\$889,200	\$0	\$889,200	157,593	34.93	0	13.79	\$0.00	\$105,087	-	\$2,007,506	8.46	-	-	-	\$1,170,552	215,902

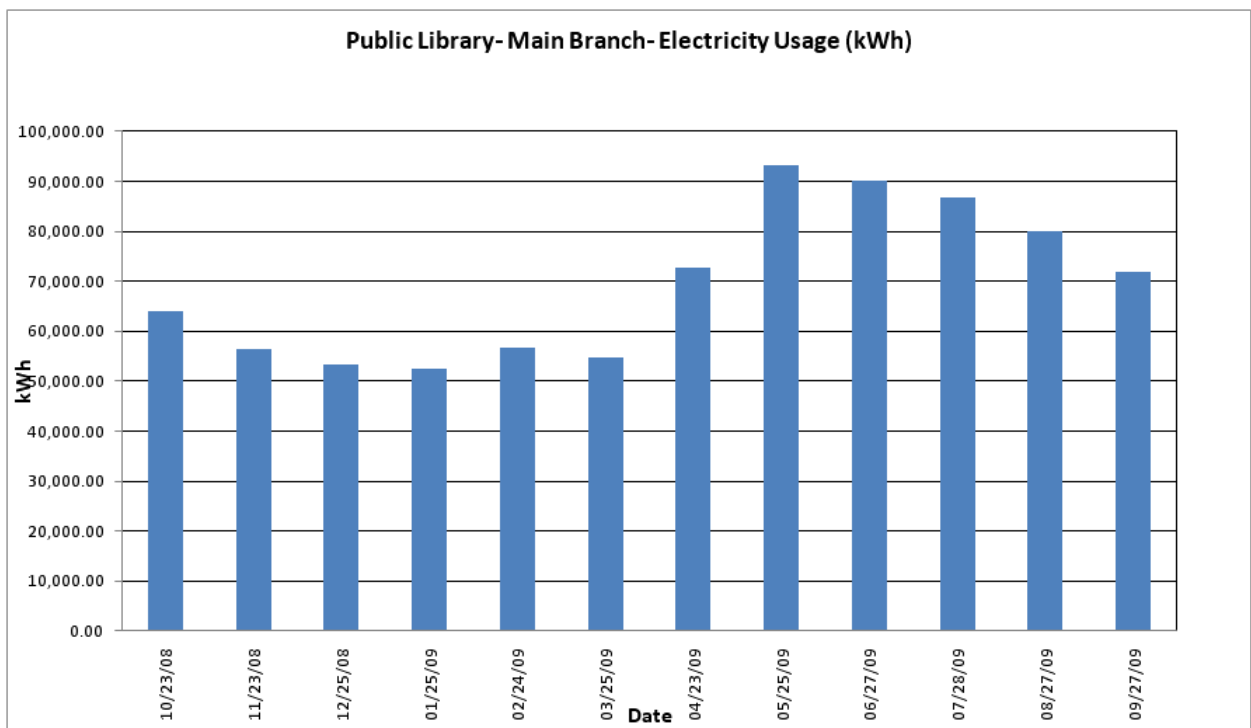
# 1. HISTORIC ENERGY CONSUMPTION

## 1.1 Energy Usage and Cost Analysis

SWA/BSG-PMK analyzed utility bills from November, 2007 through December, 2009 that were received from the utility companies supplying the Public Library- Main Branch with electric and natural gas.

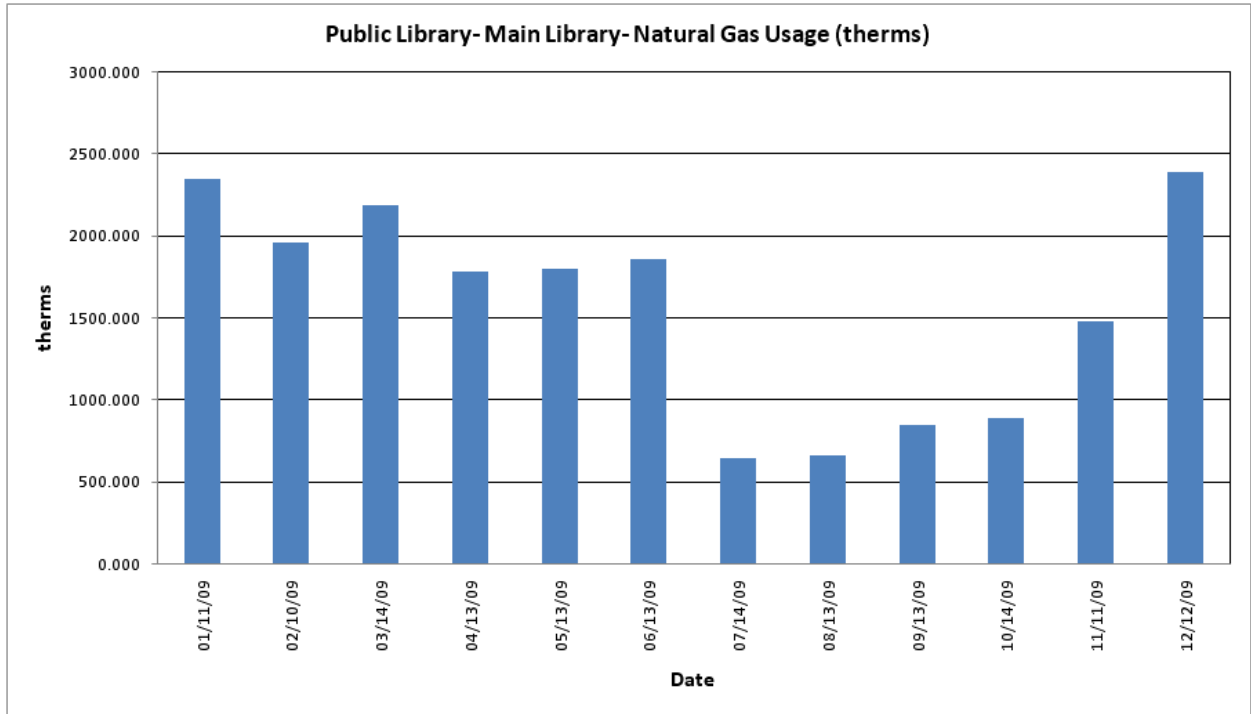
Electricity - The Public Library- Main Branch is currently served by one electric meter and receives electricity from Jersey Central Power & Light at **an average rate of \$0.17/kWh** based on 12 months of utility bills from October, 2008 through September, 2009. The building consumed **832,560 kWh or \$137,974 worth of electricity** during that time span.

The following chart shows electricity usage for the building based on utility bills from October, 2008 through September, 2009:



Natural Gas - The Public Library- Main Branch receives gas from New Jersey Natural Gas at **an average rate of \$1.20/therm** based on 12 months of utility bills from January, 2009 through December, 2009. The building consumed **18,846 therms or \$22,598 worth of natural gas** during that time span.

The following chart shows the natural gas consumption for the complex based on natural gas bills for the 12 month period of January, 2009 through December, 2009:



## 1.2 Utility Rate

The Public Library- Main Branch currently receives electricity from Jersey Central Power & Light for electricity use (kWh) with a separate (kW) demand charge. The complex currently pays an average rate of approximately \$0.17/kWh based on the 12 months of utility bills of October, 2008 through September, 2009.

The Public Library- Main Branch currently receives natural gas supply and transmission from New Jersey Natural Gas at an average aggregated rate of \$1.20/therm based on 12 months of utility bills from January, 2009 through December, 2009.

## 1.3 Energy Benchmarking

The building information and utility data were entered into the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. SWA/ BSG-PMK recommend that the Borough maintain the Portfolio Manager account at the link below. As the account is maintained, SWA/ BSG-PMK can share with the Township and allow future data to be added and tracked using the benchmarking tool.

[http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager)

**Username:** middletowntownship  
**Password:** middletown

Buildings achieving an Energy Star rating of 75.0 are eligible to apply for the Energy Star award and receive the Energy Star plaque to convey superior performance. These ratings also greatly help when applying for Leadership in Energy and Environmental Design (LEED) building certification through the United States Green Building Council (USGBC). SWA/BSG-PMK encourages the Borough to continue entering utility data in Energy Star Portfolio Manager in order to track whether normalized source energy use over time. The Site Energy Use Intensity is 118.0 kBtu/ft<sup>2</sup>yr compared to the national average of 104.0 kBtu/ft<sup>2</sup>yr for commercial buildings classified similarly by the Energy Star Portfolio Manager.



## STATEMENT OF ENERGY PERFORMANCE

### Public Library- Main Branch

Building ID: 2061674  
 For 12-month Period Ending: September 30, 2009<sup>1</sup>  
 Date SEP becomes ineligible: N/A

Date SEP Generated: February 16, 2010

**Facility**  
 Public Library- Main Branch  
 55 New Monmouth Road  
 Middletown, NJ 07748

**Facility Owner**  
 Middletown Township  
 1 Kings Highway  
 Middletown, NJ 07749

**Primary Contact for this Facility**  
 Jason Greenspan  
 1 King's Highway  
 Middletown, NJ 07737

Year Built: 2004  
 Gross Floor Area (ft<sup>2</sup>): 39,000

Energy Performance Rating<sup>2</sup> (1-100) N/A

#### Site Energy Use Summary<sup>3</sup>

Electricity - Grid Purchase(kBtu)	2,835,672
Natural Gas (kBtu) <sup>4</sup>	1,785,480
Total Energy (kBtu)	4,621,152

#### Energy Intensity<sup>5</sup>

Site (kBtu/ft <sup>2</sup> /yr)	118
Source (kBtu/ft <sup>2</sup> /yr)	291

#### Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO <sub>2</sub> e/year)	527
-----------------------------------------------------	-----

#### Electric Distribution Utility

FirstEnergy - Jersey Central Power & Lt Co

#### National Average Comparison

National Average Site EUI	104
National Average Source EUI	246
% Difference from National Average Source EUI	18%
Building Type	Library

Stamp of Certifying Professional
Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

#### Meets Industry Standards<sup>6</sup> 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:

- 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.
- 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.
- Values represent energy consumption, annualized to a 12-month period.
- 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.
- Values represent energy intensity, annualized to a 12-month period.
- 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 (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460.

EPA Form 5900-16

## 2. FACILITY AND SYSTEMS DESCRIPTION

### 2.1 Building Characteristics

The Public Library – Main Branch was built in 1971 and underwent a complete renovation in 2004. The building has a total area of 39,000 square feet. The Public Library – Main Branch houses meeting rooms, a circulation area, a popular materials area, a toddler area, a children’s room, various reading areas, group study area, quiet study areas and various administrative offices.

### 2.2 Building Occupancy Profiles

The building is open from 9:00 AM to 9:00 PM Monday through Thursday, 9:00 AM to 5:00 PM Friday and Saturday, and 1:00 PM to 5:00 PM on Sunday. The building is occupied by approximately 59 employees.

### 2.3 Building Envelope

#### 2.3.1 Exterior Walls

The exterior walls are constructed of 6” steel studs with exterior grade gypsum wallboard and a 3 5/8” Veneer brick veneer. The interior is gypsum wallboard with a paint finish. The walls are in good condition.



#### 2.3.2 Roof

The majority of the roof is constructed from a single-ply EPDM roofing membrane with tapered rigid insulation (R-10). The entry canopy, circular section, and lower front roof are standing seam metal. The roof was found to be in fair condition with a few problem areas identified below.



Category II Repair and Maintenance: The gutter on the circular roof is not sufficiently supported and should be reinforced to ensure good drainage. The overall roof surface was maintained and clean with the exception of one drain cover that is clogged causing ponding adjacent to the raised roof area.



#### 2.3.3 Base

The base of the building is poured concrete on grade. The base is in fair condition



#### 2.3.4 Windows

The building is equipped with thermal double pane store front windows throughout. All are new and in good condition.



### 2.3.5 Exterior doors

The exterior doors are in good condition. The front entry sliders are medium style aluminum store front type doors. The remaining emergency exits are insulated hollow metal doors with steel frames. The weather-stripping was intact and in fair condition with the exception of break room door.



### 2.3.6 Building air tightness

With exception of complaints about drafts at the break room door, the building appeared to be air tight at the time of the audit.

Category II: Repair and Maintenance- Fix weather-stripping on break room door.

## 2.4 HVAC Systems

### 2.4.1 Heating

Heating is provided by a combination of gas-fired roof top Carrier equipment and (1) Aerco 1000 MBH hot water boiler, that feeds 25 VAV box reheat coils throughout. Preheat and morning warm up is provided by the rooftop air conditioning units. Air Handlers 1, 2 and 3 service the Main Library area, Circulation & Popular Materials, and the Children's Room respectively. AC-1 and AC-2 handle the Computer & Meeting Rooms, and Administrative offices respectively as well. One Daiken heat pump split system provides cooling for the Server room.

The boiler is serviced by two Taco pumps, with 1.5 HP Baldor motors.



*Aerco boiler*

### 2.4.2 Cooling

The Carrier roof top units listed above provide cooling and minimum outside area.

### 2.4.3 Ventilation

In addition to the doors and windows, ventilation is provided by the rooftop units and three Loren Cook exhaust fans.

### 2.4.4 Domestic Hot Water

In addition to the doors and windows, ventilation is provided by the Carrier rooftop units and two Loren Cook exhaust fans. One additional Loren Cook fan (GX-1) provides Radon ventilation for an under slab trough.

## 2.5 Electrical systems

### **2.5.1 Lighting**

A complete inventory of all interior, exterior, and exit sign light fixtures were examined and documented in Appendix A of this report including an estimated total lighting power consumption. Our initial findings indicate that performing a lighting upgrade is not required since the building has the most energy efficient T-8 fixtures with electronic ballasts and exit signs lit with light emitting diodes (LEDs). The building also has lighting sensors installed in rooms that are used infrequently such as bathrooms, conference rooms and some offices.

**Refer to Appendix A for further details.**

### **2.5.2 Appliances and process**

At this facility, there are approximately; 40 PC's, three refrigerators (a Whirlpool, a GE, and a Magic Chef unit) and a GE microwave.

### **2.5.3 Elevators**

There are no elevators in the facility.

### **2.5.4 Other electrical systems**

There are currently no other significant energy impacting electrical systems installed at the Main Library.

### 3. EQUIPMENT LIST

Building System	Description	Location	Model #	Fuel	Space Served	Estimated Remaining Useful Life %
Heating	Gas Fired Boiler, 1,000/930 MBH input/output	Mechanical Room	Aerco M# KC-1000	Natural Gas	Entire building	80%
Heating	Circulation Pump	Mechanical Room	Pump - TACO M# FI1207E2CAH1LOA; Motor - Baldor M#M3154T, 1.5HP, EFF. 84%	Electric	Boiler	70%
Heating	Circulation Pump	Mechanical Room	Pump - TACO M# FI1207E2CAH1LOA; Motor - Baldor#M3154T, 1.5HP, EFF. 84%	Electric	Boiler	70%
Ventilation	TX-1: Exhaust Fan	Roof	Loren Cook #100C3B	Electric	Toilet Exhaust	80%
Ventilation	GX-1: Exhaust Fan	Roof	Loren Cook #135ACRU	Electric	Radon Trench Below Slab	80%
Ventilation	TX-2: Exhaust Fan	Roof	Loren Cook #120C3B	Electric	Toilet Exhaust	80%
Heating/ Cooling	AC-2: Roof Top Unit, 7 1/2 Tons; 125/102.5 MBH heating input/output	Roof	Carrier M# 48HJD0008GM-641HY	Electric/ Natural Gas	Admin Offices	70%
Heating/ Cooling	AHU-1: Roof Top Unit, 40 tons; 400 MBH heating, 81% efficient	Roof	Carrier M# 48AKD040GDQ-72619	Electric/ Natural Gas	Main Area	70%
Heating/ Cooling	AHU-2: Roof Top Unit, 50 tons; 400 MBH heating input, 81% efficient	Roof	Carrier M# 48AKD050GEQ-72619	Electric/ Natural Gas	Circulation and Popular Materials	70%
Heating/ Cooling	AC-1: Roof Top Unit, 10 tons; 180/147.6 MBH heating input/output	Roof	Carrier M# 48HJD012G--671HY	Electric/ Natural Gas	Computer Lab/ Meeting Rooms	70%
Heating/ Cooling	AHU-3: Roof Top Unit, 5 tons; 1,164 MBH heat, 81% efficient	Roof	Carrier M# 48AKE060GFQ-72619	Electric/ Natural Gas	Children's Room	70%
Heating/ Cooling	A/C Heat Pump, Cooling - 18,000 BTU/Hr, Heating - 21,600 BTU/Hr	Roof	Daiken M# RX18FVJU	Electric/ Natural Gas	Network Room	70%

Appliance	Refrigerator	Kitchen	Whirlpool #ET8RHMXXKQ04	Electric	Kitchen	68%
Appliance	Refrigerator	Kitchen	GE #JV347H1WW	Electric	Kitchen	68%
Appliance	Refrigerator	Kitchen	Magic Chef #CTB1922GRQ	Electric	Kitchen	68%
Appliance	Microwave	Kitchen	GE #JBP82W0H2WW	Electric	Kitchen	68%
Domestic Hot Water	50 gallon water heater	Mechanical Room	AO Smith	Gas	Mechanical Room	62%

**Note:** The remaining useful life of a system (in %) is the relationship between the system manufactured and/or installed date and the standard life expectancy of similar equipment based on ASHRAE (2003), ASHRAE Handbook: HVAC Applications, Chapter 36.

#### 4. ENERGY CONSERVATION MEASURES

Based on the assessment of the Beachwood Community Center, SWA/ BSG-PMK has separated the investment opportunities into three recommended categories:

1. Capital Improvements - Upgrades not directly associated with energy savings
2. Operations and Maintenance - Low Cost / No Cost Measures
3. Energy Conservation Measures - Higher cost upgrades with associated energy savings

##### **Category I Recommendations: Capital Improvement Measures**

- Based on the results of SWA/BSG-PMK's survey, no capital improvement measures are recommended.

##### **Category II Recommendations: Operations and Maintenance**

The gutter on the circular roof is not sufficiently supported and should be reinforced to ensure good drainage. The overall roof surface was maintained and clean with the exception of one drain cover that is clogged causing ponding adjacent to the raised roof area.

- Fix weather stripping on break room door.

##### **Category III Recommendations: Energy Conservation Measures**

**Summary table**

<b>ECM #</b>	<b>Description</b>
1	148.5-kW Roof-Mounted PV System

## ECM #1: 148.2-kW Roof-Mounted PV System

### Description:

Currently, the Main Library building does not use any renewable energy systems. Renewable energy systems, such as photovoltaic panels, can be mounted on the roof of the facility and can offset a significant portion of the purchased electricity for the building. Power stations generally have two separate electrical charges: usage and demand. Usage is the amount of electricity in kilowatt-hours that a building uses from month to month. Demand is the amount of electrical power that a building uses at any given instance in a month period. During the summer periods, when electric demand at a power station is high due to the amount of air conditioners, lights, equipment, etc. being used within the region, demand charges go up to offset the utility’s cost to provide enough electricity at that given time. Photovoltaic systems not only offset the amount of electricity use by a building, but also reduce the building’s electrical demand, resulting in a higher cost savings as well. BSG-PMK and SWA present below the economics of installing a 148.2-kW PV system to offset electrical demand for the building and reduce the annual net electric consumption for the building. A system of 741 commercial multi-crystalline 200 watt panels would generate 157,593 kWh of electricity per year, or 18.9% of the Main Library’s annual electric consumption.

### Installation cost:

Estimated installed cost: \$889,200; SREC revenue included in “Total 1<sup>st</sup> Year Savings”  
 Source of cost estimate: Similar projects

### Economics:

ECM #	ECM description	Source	Est. Installed Cost, \$	Est. Incentives, \$	Net Est. ECM Cost with Incentives, \$	kWh, 1st Yr Savings	kW Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, \$	Total 1st Yr Savings, \$	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, \$	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, \$	CO <sub>2</sub> Reduced, lb/yr
1	148.2-kW Roof-Mounted PV System	Similar Projects	\$889,200	\$0	\$889,200	157,593	34.93	0	13.79	\$0	\$105,087	30	\$2,007,506	8.46	419.22%	14%	11%	\$1,170,552	215,902
TOTAL			\$889,200	\$0	\$889,200	157,593	34.93	0	13.79	\$0.00	\$105,087	-	\$2,007,506	8.46	-	-	-	\$1,170,552	215,902

### Assumptions:

Cost of installation was estimated, using data from similar projects, at \$7,000 per kW. Annual energy savings were calculated via “PV Watts”, an online tool on the website of the National Renewable Energy Laboratory.

### Rebates/financial incentives:

This ECM is eligible for New Jersey’s Solar Renewable Energy Certificates (SREC). SRECs are marketable certificates issued to the owner of a PV system for each 1,000 kWh (1MWh) of electricity generated. SRECs are sold or traded separately from the power generated; the income from the sale of the SREC can be used to offset the cost of the system by applying the revenue to a loan payment or debt service. The value of the SREC is market driven, and is controlled by the amount of the Solar Alternative Compliance Payment (SACP) which is set by the NJBPU. The SREC market is derived from New Jersey’s

Renewable Portfolio Standard (RPS), which requires that all licensed energy suppliers in the state invest in energy generated from renewable sources, with specific requirements for solar power. If a supplier does not invest by purchasing SRECs, the supplier must pay the SACP for a percentage of the total annual power produced. Since SRECs typically trade just below the SACP, there is an incentive for the supplier to buy SRECs. The SREC Program provides a market for SRECs to be created and verified on the owner's behalf. The New Jersey Clean Energy program facilitates the sale of SRECs to New Jersey electric suppliers. PV system owners in New Jersey with a grid-connected PV system are eligible to participate in New Jersey's SREC Program.

The NJBPU has stated its intention to continue to operate a program of rebates and SRECs, On September 12, 2007, the NJBPU approved an SREC only pilot incentive program. The program set the SACP at an initial value of \$711, decreasing annually for an eight (8) year period. SRECs would be generated for fifteen (15) years (referred to as the Qualification Life), and have a two (2) year trading life. The NJBPU believes that to achieve an internal rate of return of twelve (12) percent, the target SREC price would be \$611, reducing by three (3) percent per year for the same eight (8) year period that the SACP is set.

## **5. RENEWABLE AND DISTRIBUTED ENERGY MEASURES**

### **5.1 Existing Systems**

There are currently no existing renewable energy systems.

### **5.2 Solar Photovoltaic**

As a result of our study, the roof of the Public Library- Main Library building has been identified as conducive for the application of a Photovoltaic (PV) system.

Based on the goal of generating as much of the building's electric load as possible utilizing renewable energy while meeting the limitations of usable space available, a PV system with a design capacity of 148.2 kW was selected. The total annual generating capacity of the system is 157,593 kWh as estimated using PV WATTS calculator provided by the Department of Energy (DOE), National Renewable Energy Laboratory (NREL).

This proposed PV system would include 741 flat, crystalline PV modules installed on the roof. The system is based on commonly used 200 Watt PV modules, and one (1) inverter for conversion to AC power.

The proposed system would generate approximately 18.9 percent of the electric power consumed annually by the Public Library- Main Library building. It is noted this system would supplement the utility power supply since PV electricity production is based on weather and the system size is limited to 18.9 percent. The estimated cost of construction would be approximately \$889,200 for this system. The approximate annual savings would be \$105,087, which would make the approximate payback 8.5 years

If the Client is interested in moving forward, a structural analysis of the roofs must be performed to confirm they will support the addition of PV modules.

### **5.3 Solar Thermal Collectors**

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

### **5.4 Combined Heat and Power**

CHP is not applicable to this project because of the HVAC system type and limited domestic hot water usage.

### **5.5 Geothermal**

Geothermal is not applicable to this project because it would require modifications to the existing heat distribution system, which would not be cost effective.

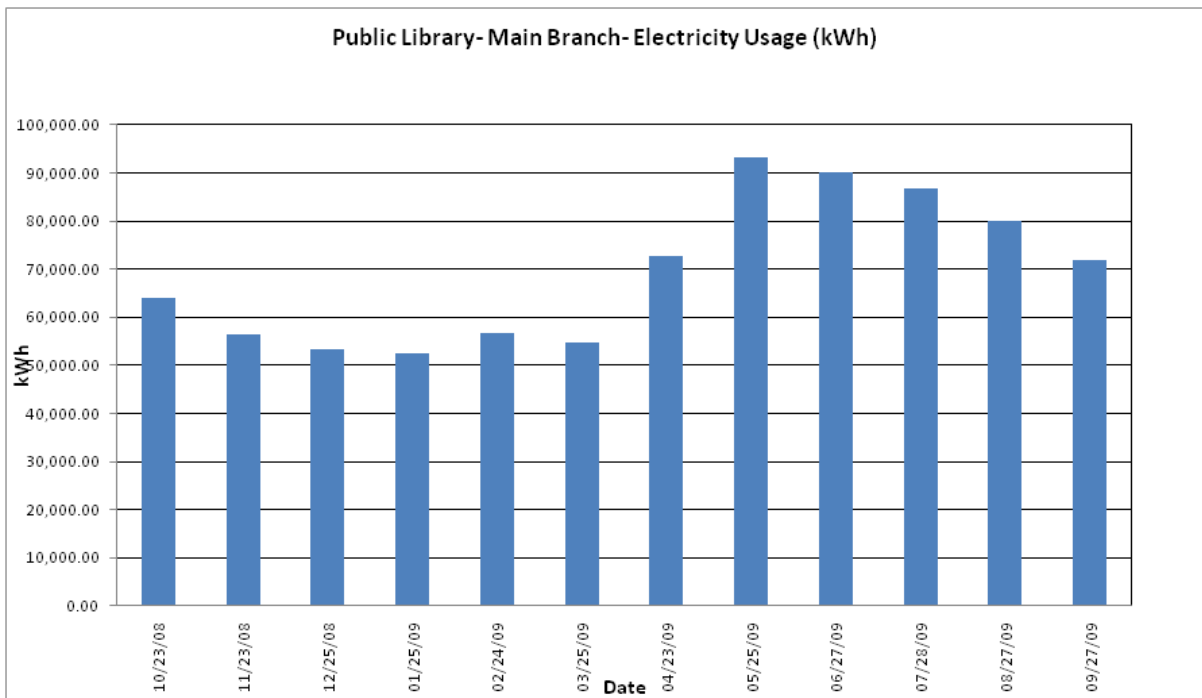
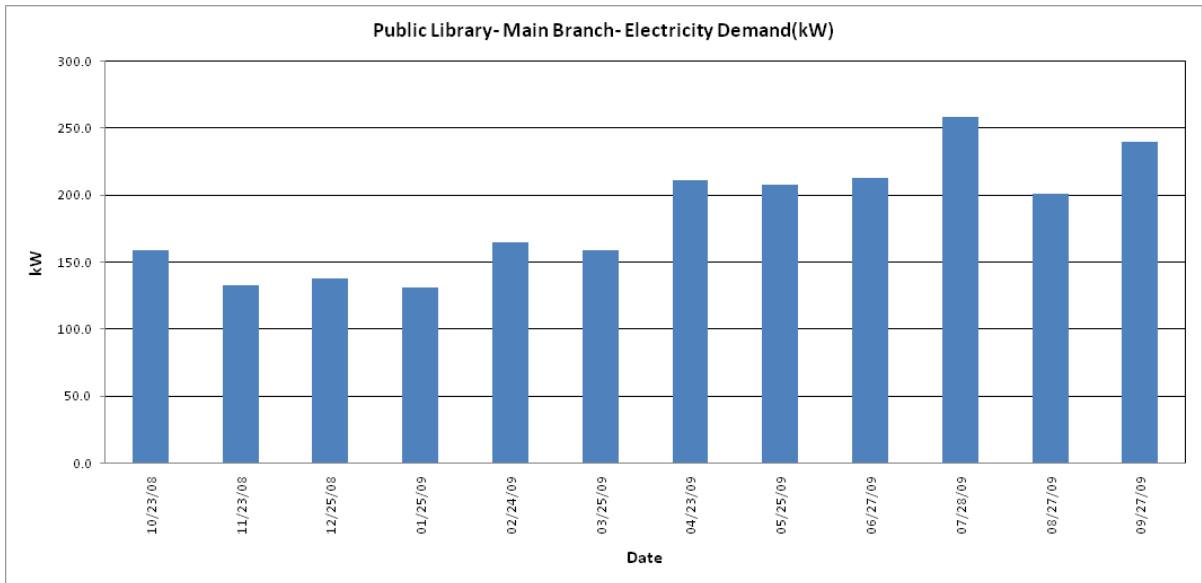
### **5.6 Wind**

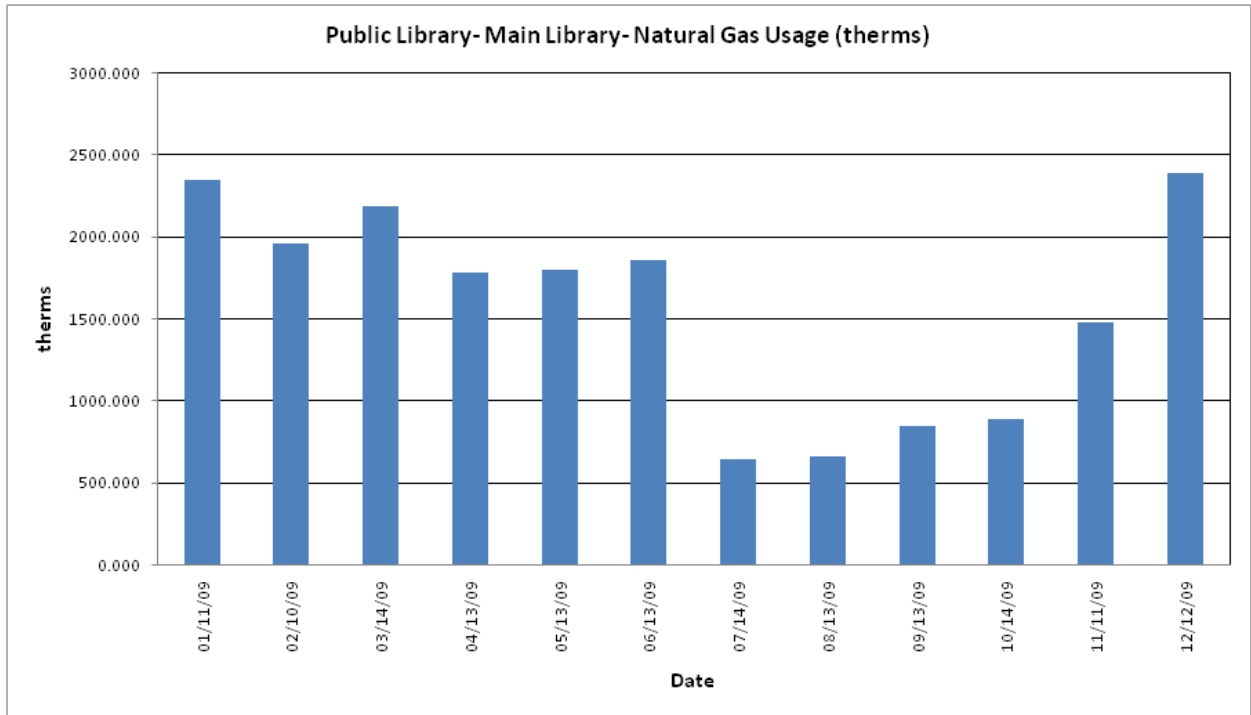
Wind power production is not appropriate for this location because required land is not available for the wind turbine. Also, the available wind energy resource is very low.

## 6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

### 6.1 Load profiles

The average electrical peak demand for the facility during previous year was 184.6 kW and the maximum peak demand was 258.3 kW. The electric and gas load profiles for this project are presented in the following charts. The first chart shows the electric demand (in kW) for the previous 12 months and the other two charts show electric (in kWh) and gas usage (in therms), respectively.



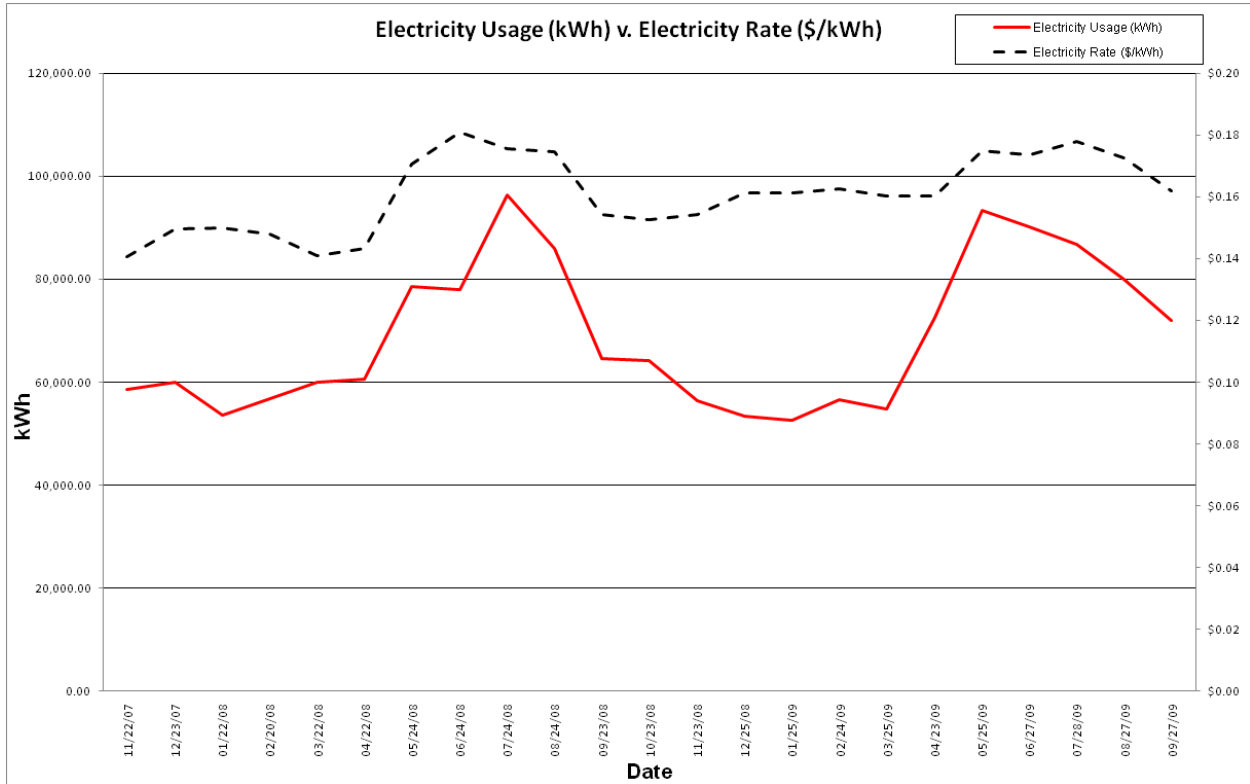


## 6.2 Energy Procurement strategies

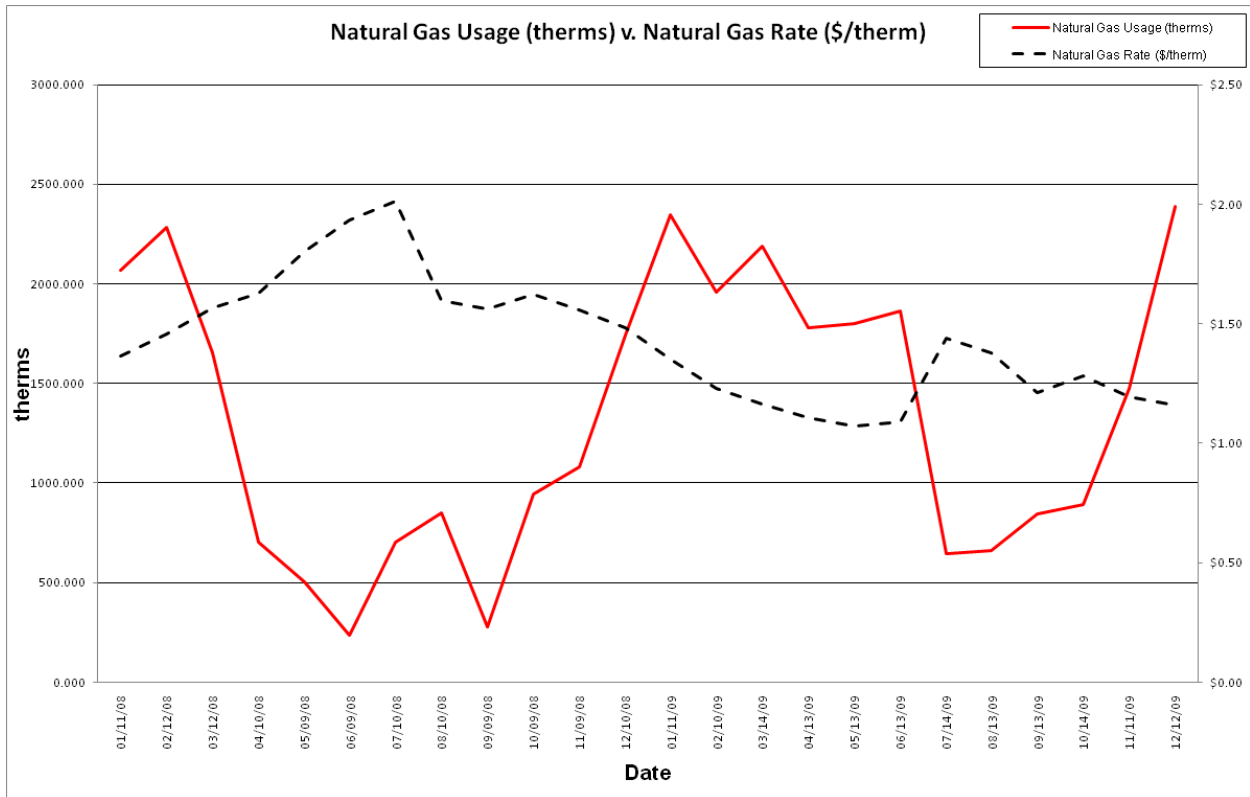
Billing analysis shows price fluctuations of over 20% over the course of the year for the building’s electrical and natural gas accounts. This may be reflective of the utility tariffs under which the building owner secures its’ energy supply. These tariffs often include seasonally adjusted demand charges, or seasonally adjusted usage charges which reflect the markets for the underlying energy commodity. For example, a utility often has tariffs which charge more for electricity in the summer when demand for capacity is high and, the marginal producer of electricity is a higher cost generator who otherwise would not be running in the winter, or shoulder seasons.

Buildings which have a large variation in monthly billing rates can often reduce the costs associated with energy procurement by selecting a third party energy supplier who can provide them with fixed pricing over the course of a contract term as well as attain purchasing economies which may not be available on a utilities default tariff (basic generation service in the case of electric and basic gas service in the case of natural gas).

SWA/BSG-PMK also recommends that the Township of Middletown contact third party energy suppliers in order to negotiate a lower electricity rate. Comparing the current electric rate to average utility rates of similar type buildings in New Jersey, it may be possible to save up to \$ 0.02/kWh, which would have equated to \$13,090 for the past 12 months. Comparing the current natural gas rate to average utility rates of similar type buildings in New Jersey, the Main Library receives natural gas at a rate below the state average. Contact the NJ Energy Choice Program for further information on companies that can act as third party (non-utility) energy suppliers. Purchasing energy from a third party supplier can reduce price fluctuations and can ultimately reduce the annual cost of energy for the facility. Appendix B contains a complete list of third party energy suppliers.



*Electricity prices generally reflect electricity usage*



*Natural gas prices and usage levels fluctuate over the course of the year*

## 7. METHOD OF ANALYSIS

### 7.1 Assumptions and tools

Energy modeling tool: established / standard industry assumptions, E-Quest  
Cost estimates: RS Means 2009 (Facilities Maintenance & Repair Cost Data)  
RS Means 2009 (Building Construction Cost Data)  
RS Means 2009 (Mechanical Cost Data)  
Published and established specialized equipment material and labor costs.  
Cost estimates also based on utility bill analysis and prior experience with similar projects

### 7.2 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, BSG-PMK AND 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.***

# LIGHTING ANALYSIS

Middletown Township  
Main Library  
55 New Monmouth Road



Upgrade Code	Upgrade Description	Existing		Proposed		Lighting		
		Fixture	Watts	Fixture	Watts	Total # of Upgrades	Cost per Upgrade (\$)	SmartStart Rebate per Upgrade
1	(2) Lamp 40W T5 4 Pin Compact Fluorescent / No Upgrade	2L40BIAx	40	No Upgrade	40	260	\$0.00	\$0.00
2	(2) 13W Compact Fluorescent Lamps / No Upgrade	2L13W CF/SI	30	No Upgrade	30	164	\$0.00	\$0.00
3	75W Halogen Downlight / No Upgrade	75W Halogen	75	No Upgrade	75	54	\$0.00	\$0.00
4	(2) 28W T5 Lamps, Electronic Ballast / No Upgrade	2L FP28T5/800	62	No Upgrade	62	20	\$0.00	\$0.00
5	(3) 4' 32W T8 Lamps, Electronic Ballasts / No Upgrade	3L4' T8/ELEC	89	No Upgrade	89	311	\$0.00	\$0.00
6	(3) 31W Compact Fluorescent Lamps, 2x2 Recessed Fixture / No Upgrade	3L31W CF	93	No Upgrade	93	64	\$0.00	\$0.00
7	(2) 55W Compact Fluorescent Wall Wash Flood / No Upgrade	2L55W CF	110	No Upgrade	110	62	\$0.00	\$0.00
8	(2) 4' 32W T8 Lamps, Electronic Ballasts / No Upgrade	2L4' T8/ELEC	61	No Upgrade	61	40	\$0.00	\$0.00
9	(10) 50W Compact Fluorescent Lamps in Decorative Pendant Mounted Fixture / No Upgrade	10L50W CF	500	No Upgrade	500	4	\$0.00	\$0.00
10	(6) 26W Compact Fluorescent Lamps in Decorative Pendant Mounted Fixture / No Upgrade	6L26W CF	156	No Upgrade	156	2	\$0.00	\$0.00
11	70W Metal Halide / No Upgrade	70W MH/BALLAST	95	No Upgrade	95	11	\$0.00	\$0.00
12	150W Metal Halide / No Upgrade	150W MH/BALLAST	195	No Upgrade	195	4	\$0.00	\$0.00
13	LED Exit Sign	LED	2	LED	2	18	\$0.00	\$0.00

## Summary

	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	\$0.00	\$0.00	\$0.00
Rebate	\$0.00	\$0.00	\$0.00
Net Cost	\$0.00	\$0.00	\$0.00
Savings (kWh)	0	0	0
Savings (\$)	\$0.00	\$0.00	\$0.00
Payback			

### Variables:

\$0.17	Avg. Electric Rate (\$/kWh)
	Avg. Demand Rate (\$/kW)
3536	Operating Hours/Year
10	Operating Hours/Work Day

### Assumptions:

25%	Occupancy Sensor Savings (Avg)
40%	Occupancy Sensor Savings(>Avg)

### Notes:

Seq. #	Upgrade Code	Room/Area	Hrs/ Work Day	Hrs/ Year	Existing				Proposed			kW Reduction	Lighting				Occupancy Sensors (ONLY)				SmartStart Rebate		Lighting & Occupancy Sensors					
					Fixture	Qty.	Watts	Foot Candles	Fixture	Qty.	Watts		Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Controls		Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Lighting	Sensors	Energy Savings, kWh	Post-Rebate Cost (\$)	Savings (\$)	Payback (yrs)
																	Type	Qty.										
<b>Totals:</b>					67674				67674	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00			\$0.00	\$0.00	0	\$0.00	\$0.00			
1	1	Toddler Area		0	2L40BIAX	4	160		No Upgrade	4	160	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
2	2	Toddler Area		0	2L13W CF/SI	15	450		No Upgrade	15	450	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
3	1	Children's Room		0	2L40BIAX	12	480		No Upgrade	12	480	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
4	3	Children's Room		0	75W Halogen	5	375		No Upgrade	5	375	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
5	1	Children's Room		0	2L40BIAX	36	1440		No Upgrade	36	1440	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
6	3	Children's Room		0	75W Halogen	17	1275		No Upgrade	17	1275	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
7	1	Reading Area/Parenting Corner		0	2L40BIAX	14	560		No Upgrade	14	560	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
8	2	Reading Area/Parenting Corner		0	2L13W CF/SI	19	570		No Upgrade	19	570	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
9	3	Reading Area/Parenting Corner		0	75W Halogen	15	1125		No Upgrade	15	1125	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
10	1	Program Room		0	2L40BIAX	9	360		No Upgrade	9	360	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
11	4	Storage		0	2L FP28T5/800	2	124		No Upgrade	2	124	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
12	5	Office		0	3L4' T8/ELEC	4	356		No Upgrade	4	356	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
13	5	Manager		0	3L4' T8/ELEC	2	178		No Upgrade	2	178	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
14	1	Room 144		0	2L40BIAX	1	40		No Upgrade	1	40	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
15	2	Vestibule		0	2L13W CF/SI	7	210		No Upgrade	7	210	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
16	2	Lobby 101		0	2L13W CF/SI	18	540		No Upgrade	18	540	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
17	6	Lobby 107		0	3L31W CF	4	372		No Upgrade	4	372	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
18	7	Lobby 107		0	2L55W CF	5	550		No Upgrade	5	550	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
19	4	Janitors Closet		0	2L FP28T5/800	1	62		No Upgrade	1	62	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
20	5	Men's Room		0	3L4' T8/ELEC	3	267		No Upgrade	3	267	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
21	6	Men's Room		0	3L31W CF	1	93		No Upgrade	1	93	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
22	5	Women's Room		0	3L4' T8/ELEC	3	267		No Upgrade	3	267	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
23	6	Women's Room		0	3L31W CF	1	93		No Upgrade	1	93	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
24	1	Landmarks		0	2L40BIAX	4	160		No Upgrade	4	160	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
25	6	Meeting Room		0	3L31W CF	28	2604		No Upgrade	28	2604	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
26	2	Meeting Room		0	2L13W CF/SI	20	600		No Upgrade	20	600	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
27	2	Meeting Room		0	2L13W CF/SI	18	540		No Upgrade	18	540	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
28	6	Pantry		0	3L31W CF	2	186		No Upgrade	2	186	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
29	6	Storage		0	3L31W CF	2	186		No Upgrade	2	186	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
30	1	Circulation Desk		0	2L40BIAX	5	200		No Upgrade	5	200	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
31	2	Circulation Desk		0	2L13W CF/SI	6	180		No Upgrade	6	180	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
32	1	Work Area		0	2L40BIAX	3	120		No Upgrade	3	120	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
33	1	Dept. Manager		0	2L40BIAX	4	160		No Upgrade	4	160	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
34	5	Circ Work Area		0	3L4' T8/ELEC	8	712		No Upgrade	8	712	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
35	1	Popular Materials		0	2L40BIAX	57	2280		No Upgrade	57	2280	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
36	2	Popular Materials		0	2L13W CF/SI	10	300		No Upgrade	10	300	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
37	13	Exits		0	LED	10	20		LED	10	20	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
38	1	Café		0	2L40BIAX	17	680		No Upgrade	17	680	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
39	2	Café		0	2L13W CF/SI	15	450		No Upgrade	15	450	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
40	5	Corridor		0	3L4' T8/ELEC	8	712		No Upgrade	8	712	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
41	5	Office		0	3L4' T8/ELEC	6	534		No Upgrade	6	534	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
42	1	Asst. Directors Office		0	2L40BIAX	4	160		No Upgrade	4	160	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
43	1	Directors Office		0	2L40BIAX	6	240		No Upgrade	6	240	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
44	1	Conf. Room		0	2L40BIAX	5	200		No Upgrade	5	200	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
45	5	Network Room		0	3L4' T8/ELEC	4	356		No Upgrade	4	356	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
46	5	Custodial Room		0	3L4' T8/ELEC	2	178		No Upgrade	2	178	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
47	1	Janitors Closet		0	2L40BIAX	1	40		No Upgrade	1	40	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
48	4	Mechanical Room		0	2L FP28T5/800	8	496		No Upgrade	8	496	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
49	4	Electrical Room		0	2L FP28T5/800	2	124		No Upgrade	2	124	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
50	4	Storage Room		0	2L FP28T5/800	3	186		No Upgrade	3	186	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
51	4	Receiving		0	2L FP28T5/800	4	248		No Upgrade	4	248	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
52	5	Men's Room		0	3L4' T8/ELEC	2	178		No Upgrade	2	178	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
53	5	Women's Room		0	3L4' T8/ELEC	2	178		No Upgrade	2	178	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
54	5	Technical Services		0	3L4' T8/ELEC	2	178		No Upgrade	2	178	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
55	5	Dept. Manager		0	3L4' T8/ELEC	15	1335		No Upgrade	15	1335	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
56	5	Staff Lounge		0	3L4' T8/ELEC	6	534		No Upgrade	6	534	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		
57	13	Exit		0	LED	8	16		LED	8	16	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00		

**Appendix B: Third Party Energy Suppliers (ESCOs)**

Supplier	Telephone & Web Site
<b>American Powernet Management, LP</b> 437 North Grove St. Berlin, NJ 08009 Attn: Brian Vayda	877-977-2636  <a href="mailto:bvayda@americanpowernet.com">bvayda@americanpowernet.com</a> <a href="http://www.americanpowernet.com">www.americanpowernet.com</a>
<b>Commerce Energy, Inc.</b> 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457  <a href="http://www.commerceenergy.com">www.commerceenergy.com</a>
<b>ConEdison Solutions</b> Cherry Tree Corporate Center 535 State Highway 38 Cherry Hill, NJ 08002	(888) 665-0955  <a href="http://www.conedsolutions.com">www.conedsolutions.com</a>
<b>Constellation NewEnergy, Inc.</b> 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827  <a href="http://www.newenergy.com">www.newenergy.com</a>
<b>Credit Suisse, (USA) Inc.</b> 700 College Road East Princeton, NJ 08450	212-538-3124  <a href="http://www.creditsuisse.com">www.creditsuisse.com</a>
<b>Direct Energy Services, LLC</b> 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722  <a href="http://www.directenergy.com">www.directenergy.com</a>
<b>FirstEnergy Solutions</b> 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 Supply chain website <a href="http://www.firstenergycorp.com/supplierregistration">www.firstenergycorp.com/supplierregistration</a> <a href="http://www.fes.com">www.fes.com</a>
<b>Glacial Energy of New Jersey, Inc.</b> 207 LaRoche Avenue Harrington Park, NJ 07640	1-877-569-2841  <a href="http://www.glacialenergy.com">www.glacialenergy.com</a>
<b>Hess Corporation</b> 1 Hess Plaza Woodbridge, NJ 070956	(800) 437-7872 Tom Miller <a href="http://www.hess.com">www.hess.com</a>
<b>IntegrYS Energy Services, Inc.</b> 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	1-877-763-9977 Dole Janssen: 920-617-6029 Charles Kuntz: 614-844-4324 <a href="http://www.integrYSenergy.com">www.integrYSenergy.com</a>