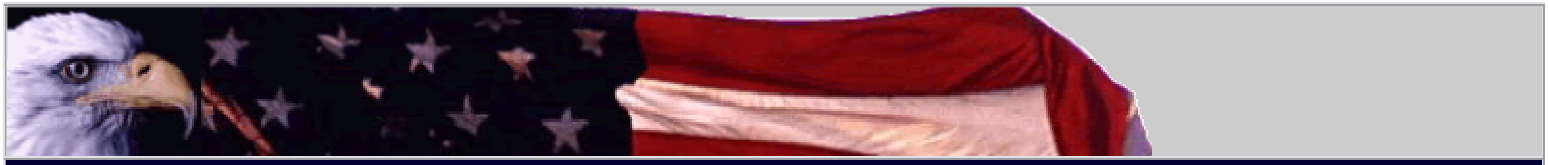

# Brooks Crossing Elementary School, NJ

# ENERGY AUDIT – FINAL REPORT
## CEG PROJECT NO. 9C08134

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# I. EXECUTIVE SUMMARY

This report presents the findings of an energy audit conducted for:

Brooks Crossing Elementary School
50 Deans Rhode Hall Road
Monmouth Junction, NJ 08852

Facility Contact Person: Robert Blum (on-site)
Anthony Tonzini (Board Administrator)

This audit was performed in connection with the New Jersey Clean Energy Local Government Energy Audit Program. These energy audits are conducted to promote the office of Clean Energy's mission, which is to use innovation and technology to solve energy and environmental problems in a way that improves the State's economy. This can be achieved through the wiser and more efficient use of energy.

The annual energy costs at this facility are as follows:

| | |
|---|---|
| Electricity | $ 183,087 |
| Natural Gas | $ 64,368 |
| Total | $ 247,455 |

The potential annual energy cost savings are shown below in Table 1. The costs are inclusive of incentive dollars. The cost of each measure for this level of auditing is ± 20% until detailed engineering, specifications, and hard proposals are obtained. Refer to Section VII for a more detailed evaluation of the ECM's.

**Table 1**
**Energy Conservation Measures (ECM's)**

| ECM # | Description | Total Project Cost, $ | Annual Savings | Simple Payback (Years) |
|---|---|---|---|---|
| ECM #1 | PREMIUM EFFICIENCY MOTORS | $26,258 | $1,379 | 19.0 |
| ECM #2 | VARIABLE SPEED PUMPING | $41,938 | $19,870 | 2.1 |
| ECM #3 | ENERGY RECOVERY WHEEL UNITS | $194,250 | $919 | 211.4 |
| ECM #4 | LIGHTING RETROFIT | $87,378 | $9,615 | 9.1 |
| ECM #5 | 400 KW PV SOLAR | $3,203,720 | $327,149 | 9.8 |

The estimated demand and energy savings are shown below in Table 2. The information in this table corresponds to the ECM's in Table 1.

**Table 2**
**Estimated Energy Savings**

| | | Annual Utility Reduction | | |
|---|---|---|---|---|
| ECM # | Description | Demand Reduction (KW) | Consumption Reduction (KWH) | Consumption Reduction (Therms) |
| ECM #1 | PREMIUM EFFICIENCY MOTORS | 2 | 9,362 | -65 |
| ECM #2 | VARIABLE SPEED PUMPING | 19 | 115,221 | 0 |
| ECM #3 | ENERGY RECOVERY WHEEL UNITS | 1 | -46,037 | 4,502 |
| ECM #4 | LIGHTING RETROFIT | 24 | 59,475 | 0 |
| ECM #5 | 400 KW PV SOLAR | 400 | 626,898 | 0 |

Concord Engineering recommends the implementation of all ECM's that provide a simple payback of seven to ten (7 to 10) years or less.

The following Energy Conservation Measures are recommended for Brooks Crossing Elementary School:

> ECM # 2 Variable Speed Pumping

> ECM # 4 Lighting Retrofit

> ECM # 5 400 KW PV Solar

# II. INTRODUCTION

The Brooks Crossing Elementary School is included in this energy audit. Based on our survey and the documentation available, it was determined that the building area is approximately 82,400 SF.

The first task was to collect and review two years worth of utility energy data for electricity and natural gas. This information was used to analyze operational characteristics, calculate energy benchmarks for comparison to industry averages, estimate savings potential, and establish a baseline to monitor the effectiveness of implemented measures. A computer spreadsheet was used to enter, sum, and calculate benchmarks and to graph utility information.

The Energy Use Index (EUI) is expressed in British Thermal Units/square foot/year (BTU/ft$^2$/yr) and can be used to compare energy consumption to similar building types or to track consumption from year to year in the same building. The EUI is calculated by converting annual consumption of all fuels to BTU's then dividing by the area (gross square footage) of the building. EUI is a good indicator of the relative potential for energy savings. A comparatively low EUI indicates less potential for large energy savings. Blueprints obtained from the District were used to calculate the gross area of the three buildings.

Obtaining Architectural and Mechanical drawings, a building profile was created that included age, occupancy, description, and existing conditions of Architectural and Mechanical Systems. The profile noted the major energy – consuming equipment or systems and components that are inherently inefficient. Also, by reviewing the mechanical drawings and equipment schedules, questions regarding the lighting systems/controls, HVAC zone controls, or setback operations were noted.

The site visit was spent inspecting the actual systems and answering specific questions from the preliminary review. The building manager provided occupancy schedules, O & M practices, the building energy management program, and other information that has an impact on energy consumption.

The post-site work included evaluation of the information gathered during the site visit, researching possible conservation opportunities, organizing the audit into a comprehensive report, and making recommendations on mechanical and building envelope improvements.

# III. METHOD OF ANALYSIS

The first step in the energy analysis is the site survey. The auditor walks the entire site to determine building size and to inventory the building envelope (roof, windows, etc.), the heating, ventilation, and air conditioning equipment (HVAC), the lighting equipment, other facility-specific equipment, and to gain an understanding of how each facility is used.

The collected data is then processed using engineering calculations, Microsoft Excel spread sheets and Trane Trace 700™ building simulation software that calculate the anticipated energy usage. The actual energy usage is entered directly from the utility bills. The anticipated energy usage is compared to the actual usage. If necessary, corrections are made to the site-collected data until the anticipated energy usage matches the actual usage. This process develops an end-use baseline for all of the fuels used at the facility. This baseline is used to calculate the energy savings for the measures that are recommended in this report.

The savings in this report are not duplicative. The savings for each recommendation may actually be higher if the individual recommendations were installed instead of the entire project. For example, the lighting module calculates the change in wattage and multiplies it by the new operating hours instead of the existing operating hours (if there was a change in the hours at all). The lighting controls module calculates the change in hours and multiplies it by the new system wattage instead of the existing wattage. Therefore, if you chose to install the recommended lighting system but not the lighting controls, the savings achieved with the new lighting system would actually be higher because there would have been no reduction in the hours of use.

The same principal follows for heating, cooling, and temperature recommendations – even with fuel switching. If there are recommendations to change the temperature settings to reduce fuel use, then the savings for the heating/cooling equipment recommendations are reduced, as well.

Our thermal module calculates the savings for temperature reductions utilizing Trane Trace 700™ building simulation software. The savings are calculated in "output" values – meaning energy, not fuel savings. To show fuel savings we multiply the energy values times the fuel conversion factor (these factors are different for electricity, natural gas, fuel oil, etc.) and also take into account the heating/cooling equipment efficiency. The temperature recommendation savings are lower when the heating/cooling equipment is more efficient or is using a cheaper fuel.

Thermal recommendations (insulation, windows, etc.) are evaluated by taking the difference in the thermal load due to reduced heat transfer. Again, the "thermal load" is the thermal load after the other recommendations have been accounted for.

Lastly, installation costs are then applied to each recommendation and simple paybacks are calculated. Costs are derived from Means Cost Data, other industry publications, and local contractors and suppliers. The New Jersey SmartStart$_{tm}$ Building program incentives (refer to Appendix C) are calculated for the appropriate ECM's and subtracted from the installed cost prior to calculation of the simple payback. In addition, where applicable, maintenance cost savings are estimated and applied to the net savings.

# IV. HISTORIC ENERGY CONSUMPTION/COST

A. Energy Usage / Tariffs

Table 3 and Figure 1 represent the electrical usage for the surveyed facility from June 2007 to May 2008. The existing Facility is currently served electric under the Public Service Electric and Gas Company (PSEG) Large Power and Lighting (LPL) Tariff. This electric rate has a component for consumption that is measured in kilowatt-hours (kWh). It is calculated by multiplying the wattage of the equipment times the hours that it operates. For example, a 1,000 Watt lamp operating for 5 hours would measure 5,000 Watt-hours. Since one kilowatt is equal to 1,000 Watts, the measured consumption would be 5 kWh. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the most current rate structure available.

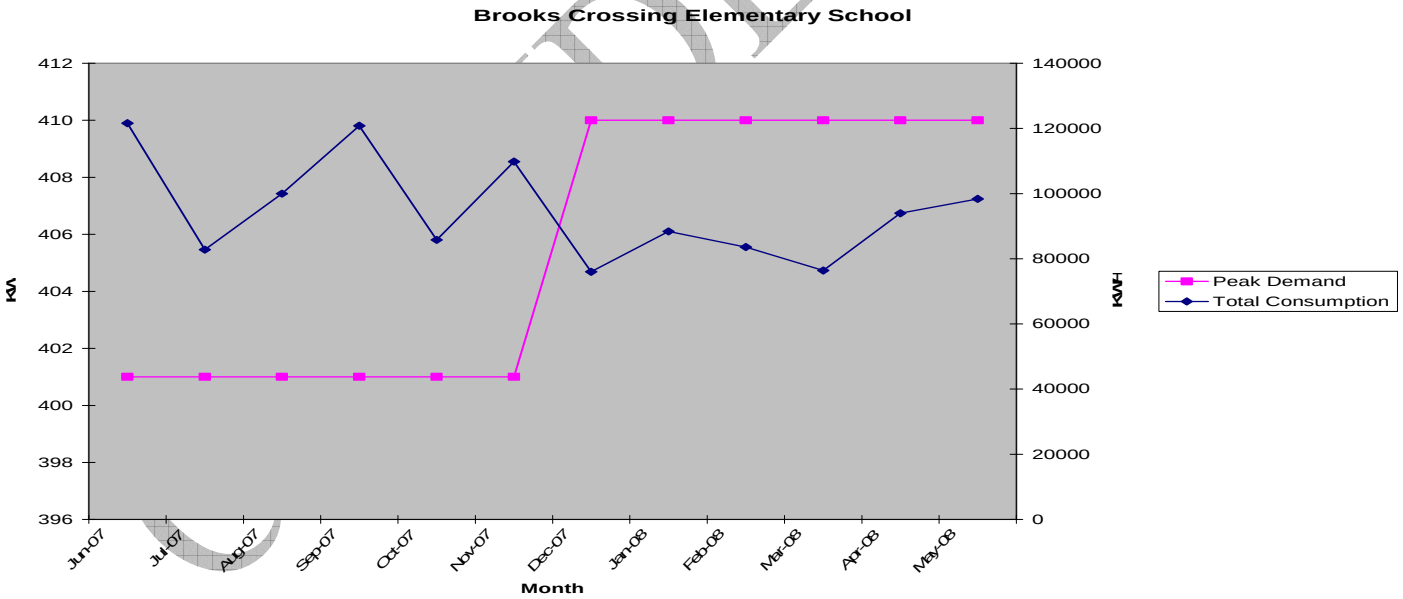
Table 4 and Figure 2 show the natural gas energy usage for the surveyed facility from June 2007 to May 2008. Woodruff Energy supplies the natural gas and PSE&G delivers the fuel to the burner. Below is the average unit cost for the utilities at this facility.

| Description | Average |
|---|---|
| Electricity | 16¢/kWh |
| Natural Gas | $1.74 / Therm |

## Table 3
## Electricity Billing Data

| Provider | Month | Start Date | End Date | Account | Utility Type | Billing Days | Peak Demand | Units | Off Peak Usage | Units | On Peak Usage | Units | Total Consumption | Units | Total $ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSE&G Co (14105) | Jun-07 | 6/1/2007 | 7/3/2007 | 6290200151E | Electric | 32 | 401 | kw | 41800 | kwh | 79800 | kwh | 121600 | kwh | $ 23,033.45 |
| PSE&G Co (14105) | Jul-07 | 7/3/2007 | 8/1/2007 | 6290200151E | Electric | 29 | 401 | kw | 33400 | kwh | 49400 | kwh | 82800 | kwh | $ 17,915.66 |
| PSE&G Co (14105) | Aug-07 | 8/1/2007 | 8/30/2007 | 6290200151E | Electric | 29 | 401 | kw | 35600 | kwh | 64400 | kwh | 100000 | kwh | $ 22,302.45 |
| PSE&G Co (14105) | Sep-07 | 8/30/2007 | 10/1/2007 | 6290200151E | Electric | 32 | 401 | kw | 39600 | kwh | 81200 | kwh | 120800 | kwh | $ 23,035.38 |
| PSE&G Co (14105) | Oct-07 | 10/1/2007 | 10/23/2007 | 6290200151E | Electric | 22 | 401 | kw | 25600 | kwh | 60200 | kwh | 85800 | kwh | $ 11,319.18 |
| PSE&G Co (14105) | Nov-07 | 10/23/2007 | 12/3/2007 | 6290200151E | Electric | 41 | 401 | kw | 37800 | kwh | 72000 | kwh | 109800 | kwh | $ 15,069.64 |
| PSE&G Co (14105) | Dec-07 | 12/3/2007 | 1/2/2008 | 6290200151E | Electric | 30 | 410 | kw | 27600 | kwh | 48400 | kwh | 76000 | kwh | $ 10,309.94 |
| PSE&G Co (14105) | Jan-08 | 1/2/2008 | 2/1/2008 | 6290200151E | Electric | 30 | 410 | kw | 29600 | kwh | 58800 | kwh | 88400 | kwh | $ 11,889.90 |
| PSE&G Co (14105) | Feb-08 | 2/1/2008 | 3/3/2008 | 6290200151E | Electric | 31 | 410 | kw | 31000 | kwh | 52600 | kwh | 83600 | kwh | $ 11,523.43 |
| PSE&G Co (14105) | Mar-08 | 3/3/2008 | 4/2/2008 | 6290200151E | Electric | 30 | 410 | kw | 26800 | kwh | 49600 | kwh | 76400 | kwh | $ 10,572.53 |
| PSE&G Co (14105) | Apr-08 | 4/2/2008 | 5/1/2008 | 6290200151E | Electric | 29 | 410 | kw | 29200 | kwh | 64800 | kwh | 94000 | kwh | $ 12,639.49 |
| PSE&G Co (14105) | May-08 | 5/1/2008 | 6/2/2008 | 6290200151E | Electric | 32 | 410 | kw | 34000 | kwh | 64400 | kwh | 98400 | kwh | $ 13,476.20 |
| | | | | | | Max Peak: | 410 | kw | | | 12 Month Total: | | 1137600 | kwh | $ 183,087.25 |
| | | | | | | | | | | | Avg. Cost per kwh: | | $ 0.16 | | |

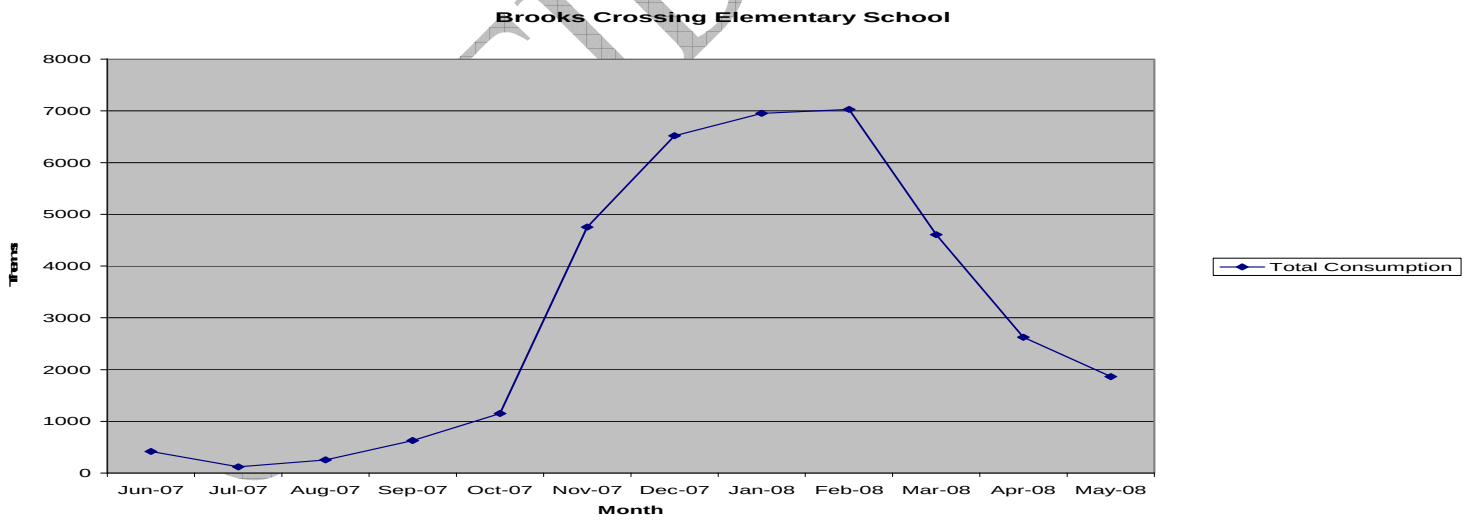
## Figure 1
## Electricity Usage Profile



## Table 4
## Natural Gas Billing Data

| Provider | Month | Start Date | End Date | Account | Utility Type | Billing Days | Consumption | Units | Total $ |
|---|---|---|---|---|---|---|---|---|---|
| PSE&G CO (14105) | Jun-07 | 6/1/2007 | 7/3/2007 | 6290200151G | Gas | 32 | 417 | therms | $ 730.75 |
| PSE&G CO (14105) | Jul-07 | 7/3/2007 | 8/1/2007 | 6290200151G | Gas | 29 | 120 | therms | $ 276.63 |
| PSE&G CO (14105) | Aug-07 | 8/1/2007 | 8/31/2007 | 6290200151G | Gas | 30 | 255 | therms | $ 483.31 |
| PSE&G CO (14105) | Sep-07 | 8/31/2007 | 9/30/2007 | 6290200151G | Gas | 32 | 629 | therms | $ 1,056.30 |
| PSE&G CO (14105) | Oct-07 | 9/30/2007 | 10/31/2007 | 6290200151G | Gas | 31 | 1150 | therms | $ 2,033.36 |
| PSE&G CO (14105) | Nov-07 | 10/31/2007 | 12/3/2007 | 6290200151G | Gas | 33 | 4752 | therms | $ 8,698.08 |
| PSE&G CO (14105) | Dec-07 | 12/3/2007 | 1/2/2008 | 6290200151G | Gas | 30 | 6518 | therms | $ 11,524.71 |
| PSE&G CO (14105) | Jan-08 | 1/2/2008 | 2/1/2008 | 6290200151G | Gas | 30 | 6953 | therms | $ 12,219.74 |
| PSE&G CO (14105) | Feb-08 | 2/1/2008 | 3/3/2008 | 6290200151G | Gas | 30 | 7027 | therms | $ 12,121.60 |
| PSE&G CO (14105) | Mar-08 | 3/3/2008 | 4/2/2008 | 6290200151G | Gas | 30 | 4606 | therms | $ 8,253.84 |
| PSE&G CO (14105) | Apr-08 | 4/2/2008 | 5/1/2008 | 6290200151G | Gas | 29 | 2624 | therms | $ 4,056.09 |
| PSE&G CO (14105) | May-08 | 5/1/2008 | 6/2/2008 | 6290200151G | Gas | 32 | 1864 | therms | $ 2,913.49 |
| | | | | | | 12 Month Total: | 36915 | therms | $ 64,367.90 |
| | | | | | | Average Cost per therm: | $ 1.74 | | |

## Figure 2
## Natural Gas Usage Profile



B. Energy Use Index (EUI)

The Oak Ridge National Laboratory (ORNL) Buildings Technology Center under a contract with the U.S. Department of Energy maintains a Benchmarking Building Energy Performance Program. Their website allows the user to determine how well the client's building energy use intensity (EUI) compares with similar facilities in the U.S. and NJ.

Elementary School EUI = (Electric Usage in kBtu/h + Gas Usage in kBtu/h) / SF

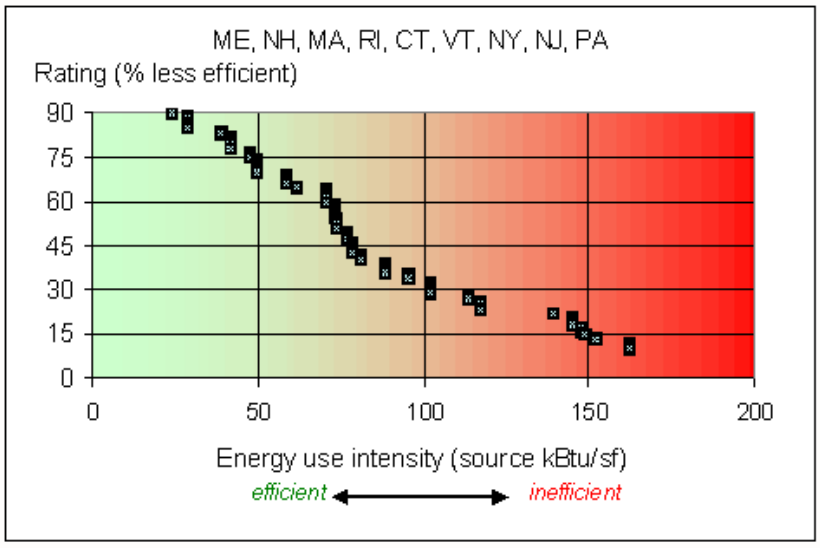
Electric = ((1,137,600 kWh) * (1000 W/kW) * (3.414 Btu/h / 1 W))/ (1000 Btu/h / 1 kBtu/h)
= 3,883,766.40 kBTU

Gas = ((36,915 therms) * (100,000 Btu/h / 1 W)) / (1000 Btu/h / 1 kBtu/h) = 3,691,500 kBtu

EUI = (3,883,766.40 kBTU/h + 3,691,500 kBtu/h) / (82,400 SF) = 91.9 kBtu/SF

School EUI = 85 kBtu/SF

**Figure 3**
**Energy Use Intensity Distributions: Schools**



C. EPA Energy Benchmarking System

The United States Environmental Protection Agency (EPA) in an effort to promote energy management has created a system for benchmarking energy use amongst various end users. The benchmarking tool utilized for this analysis is entitled Portfolio Manager. The Portfolio Manager tool allows you to track and assess energy consumption via the template forms located on the ENERGY STAR website (www.energystar.gov). The importance of benchmarking for local government municipalities is becoming more important as utility costs continue to increase and more emphasis is being placed throughout multiple arenas on carbon reduction, greenhouse gas emissions and other environmental impacts.

Based on information gathered from the ENERGY STAR website, Government agencies spend more than $10 billion a year on energy to provide public services and meet constituent needs. Furthermore, energy use in commercial buildings and industrial facilities is responsible for more than 50 percent of U.S. carbon dioxide emissions. Therefore, it is vital that local government municipalities assess their energy usage, benchmark this usage utilizing Portfolio Manager, set priorities and goals to lessen their energy usage and move forward with these priorites and goals. Saving energy will in-turn save the environement.

In accordance with the Local Government Energy Audit Program, CEG has created an Energy Star account for the school district in order to allow the school district access to monitoring their yearly energy usage as it compares to facilities of similar type. The following is the user name and password for this account:

| | |
|---|---|
| User Name: | Antcaucci |
| Password: | password |

Utilizing the utility bills and other information gathered during the energy audit process, CEG entered the respective data into Portfolio Manager and the following is a summary of the results:

**Table 5**
**ENERGY STAR Performance Rating**

| FACILITY DESCRIPTION | ENERGY PERFORMANCE RATING | NATIONAL AVERAGE |
|---|---|---|
| Brooks Crossing Elementary | 26 | 50 |

Specific building types are detailed on the ENERGY STAR website. Non-typical buildings are covered by an “Other” category.

Refer to Appendix G for detailed energy benchmarking report entitled “STATEMENT OF ENERGY PERFORMANCE.”

# V. FACILITY DESCRIPTION

The existing Facility is approximately 82,400 square feet and was constructed in 2002. It is occupied by approximately 560 students and 45 faculty personnel. The facility is open 6:30am – 8pm Monday through Friday, and 6am – 8pm on the weekends.

The building as designed is separated into four (4) main areas, connected through adjoining corridors which will be referenced in the report. Area "100" is located at the front, North East corner and consists of the Main Entrance and Lobby, Main Office, Principal's Office, General Offices, Gymnasium, Cafetorium (Cafeteria & Stage), Kitchen, Mechanical Room, Storage Rooms, Music and Art Classrooms, and Boy's and Girl's lavatory facilities. Area "200" is located at the front, North West corner and consists of (7) Classrooms, (3) Small Group Rooms, Computer Technology, Media Center, Health Suite, Nurses Office and Storage Rooms. Area "300" is located at the back, South West corner and consists of (13) Classrooms, (2) Small Group Rooms, Boy's and Girl's lavatory facilities, and Storage Room areas. Area "400" is located at the back, South East corner and consists of (8) Classrooms, Faculty Dining Room, Boy's and Girl's Lavatory facilities, and Storage Room area. Area's "200", "300", and "400" enclose a large court-yard area, approximately 15,000 square feet.

The building is a single story structure of steel, brick and block construction with slab on grade. The roof is metal deck with rigid insulation covered by rubber membrane. Some areas of the building also have decorative standing seam metal roofing which is backed by rigid insulation and metal decking. The Media Center has a 400 square foot sky light clerestory well.

Overall the facility's construction is very tight and no major problems with the envelope were reported. The roofing material has been well maintained and has its original integrity with minimal patching. All of the penetrations were properly sealed. The windows and doors also seemed to be well maintained allowing minimal infiltration of outdoor air.



HVAC System

The "air side" of the HVAC system which distributes the conditioned air for heating and cooling, consists of rooftop air handling units, floor mounted classroom unit ventilators, fan coil units, cabinet heaters, and roof mounted exhaust fans. Most of the airside equipment has a hot water heating coil, chilled water coil respectively along with a supply air fan. The heating and cooling coils are fed from the Central Plant and controlled by the Building Management System (BMS), both described later in the report.

The large rooms and corridors such as the Gymnasium, Cafeteria, Art and Music Classrooms, Media Center, and Faculty Dining are conditioned by the large McQuay roof mounted air handling units (RTU). The rooftop units are curb mounted and are ducted through the roof into the plenum ceiling space. The Gym, Cafeteria, and front office/corridor RTU's have external duct work into the building space. The units consist of a cooling coil, pre-heat and re-heat hot water coils, and supply and return fans. They also have enthalpy controlled economizers with

motorized dampers for the availability of free outdoor air cooling. Each RTU has a wall mounted thermostat for zone control.

The general classrooms each have floor mounted vertical unit ventilators located in the corner of the classroom on the exterior wall, and are ducted from the top of the unit into the ceiling and distributed through ceiling diffusers. The units are 4-pipe, with both heating and cooling coils, and have integral supply fan, power exhaust fan, and a combination modulating outside, exhaust, and return air damper. The unit is connected to a wall mounted louver for intake and exhaust air.

Two Small Group Classrooms are heated and cooled by ceiling mounted fan coil units above the ceiling with ductwork distribution into the classroom.

The Gymnasium is served by (2) rooftop air handling units located on adjacent roofs. The units have exterior ductwork which travels horizontally through the wall into the space and distributed by ceiling diffusers. The return air is returned to the unit via one large return air grille for each RTU. Each RTU has its own wall mounted thermostat for individual zone control.

The Cafeteria is served by one large RTU located on the adjacent rooftop and ducted horizontally into the conditioned space similar to the gym units. All supply, outside air, and exhaust air is handled through the rooftop air handling unit.

The Kitchen has a cooking line with a grease/fume exhaust hood rated at 4830 cfm. The hood make-up air is provided by MAU-1, a roof mounted natural gas-fired unit in combination with KEF-1, roof mounted exhaust fan, and transfer air from the cafeteria. The kitchen also has a separate rooftop air handling unit to provide air conditioning and heating if required.

The Main and General offices are served by a rooftop air handling unit. Wall fin radiation is provided for additional heating to off-set perimeter heat loss.

In total, the bathrooms have approximately (11) roof mounted exhaust fans for ventilation. Conditioned air is transferred from the adjacent rooms and corridors and also directly supplied from the rooftop air handling units.

The corridors are conditioned by rooftop air handling units providing both cooling and heating. In addition, (9) cabinet unit heaters are located near the corridor exit doors and in the vestibules for supplemental heating.

The Head End Room is conditioned by a separate small DX split system heat pump unit, and has its own roof mounted exhaust fan and outside air intake.



Central Plant - Heating

The facility is heated by (3) Raypak, Hi-efficiency Delta, H9-1532 natural gas-fired boilers rated at 1530 MBH total input and 1285 MBH output (84% Efficiency). The boilers were installed when the building was constructed. It was noted that the boilers are in excellent working condition.

The boilers operate as required to maintain a hot water supply temperature of 180ºF and is distributed by (2) 390 GPM, Armstrong pumps. Pumps HWP-1 and HWP-2 are used in a lead-lag service, one pump operating and one pump standby, and supply all of the rooftop air handling units, classroom unit ventilators, fan coil units, unit heaters, cabinet heaters, and finned tube radiation.

The Raypak boilers are required by the manufacturer to have constant volume circulating pumps through each boiler while in operation. Each boiler has an in-line 3 HP, 140 GPM circulating pump. The hot water loop operates with a 35% ethylene glycol solution.

The boilers are activated on outside air temperature of 65°F and the water temperature is reset based on the outside air temperature reset schedule, 120ºF minimum and 180ºF maximum. The activation temperature can be reset at the main BMS interface.

The terminal equipment (air handlers, etc.) tied into the heating hot water loop have 2-way control valves which control the flow of hot water through the coils. The valves modulate according to the room's desired temperature set-point. The pumps are constant speed and the system has a bypass valve which allows system flow to remain constant even when control valves open and close throughout the building.

Central Plant - Cooling

The facility is cooled by (2) McQuay reciprocating compressor-chillers with roof mounted air cooled condensers. The chillers operate on R-22 refrigerant and are rated at 170 Tons of cooling each. Each unit has (2) reciprocating compressors. The chillers were installed in 2002 when the building was constructed. It was reported that both chillers run simultaneously on very hot days, otherwise only one chiller is required to satisfy the cooling requirements. We estimate that both chillers total about 150% of the building's cooling load requirements.

The chilled water loop operates with a 35% ethylene glycol solution. The chillers are sequenced through their ATC control system to maintain a chilled water loop temperature of 44 F supply, and 54 F return water temperature. The distribution system is maintained by two chilled water pumps. CHWP-1 and CHWP-2 circulate chilled water to all rooftop air handling units, unit ventilators, and terminal units throughout the facility.

The terminal equipment (air handlers, etc.) tied into the chilled water loop have 2-way control valves which control the flow of chilled water through the coils. The valves modulate according to the room's desired temperature set-point. The pumps are constant speed and the system has a bypass valve which allows system flow to remain constant even when control valves open and close throughout the building.

The chillers operate according to the building's occupied schedule and activate on an outside air temperature between 60ºF and 65ºF. The set-point is adjustable at the main BMS interface.

Controls System

All HVAC equipment is controlled by a Johnson Controls Metasys Building Management System (BMS). The system has a graphics package and no problems were reported with its operation.

The BMS is set to keep all of the building's rooms at a temperature of 68ºF - 72ºF during the winter months and a range of 70ºF - 74ºF in the summertime. The air-side equipment's local thermostats sense temperature and have a 2ºF plus or minus adjustment.

Domestic Hot Water

Domestic hot water for the school and the kitchen is provided by (2) PVI-Turbo-Gas, combination water heater/storage tanks. HWH-1 supplies hot water at 140 F to the kitchen, has a burner rated at 399,000 Btu/hr input, and 175 Gallon storage capacity with a recovery rate of 500 gal/hr. HWH-2 supplies hot water at 120ºF to the facility, has a burner rated at 399,000 Btu/hr input, and 250 Gallon storage capacity with a recovery rate of 500 gal/hr. Both units have an operating efficiency of approximately 83% and have no reported problems.

Lighting

The majority of the lighting is first generation T8 fluorescent technology. The facility also has metal halide in its gymnasiums. In all, CEG personnel counted approximately 1,228 fixtures of varying types. The building lighting power density is rated at 1.31 watts per square foot. A room by room count of lighting fixtures is provided in the Appendix. (Refer to the Appendix E – Lighting Audit).

# VI. MAJOR EQUIPMENT LIST

Following the completion of the field survey a detailed equipment list was created. The equipment within this list is considered major energy consuming equipment whose replacement could yield substantial savings. In addition, the list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment if a manufacturers date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Equipment denoted by an asterisk indicates an estimate of the equipment ratings due to equipment inaccessibility, worn nameplates, lack of nameplates, etc.

**Refer to Appendix D for the Major Equipment List for this facility.**

# VII. ENERGY CONSERVATION MEASURES

Life cycle costing (LCC) is an integral part to energy auditing. The applicable costs reviewed in completing a life cycle costing analysis are as follows: utility costs, installation costs, maintenance costs, and equipment replacement costs. The NIST-BLCC 5.3™ program determines operation costs based on the energy use of the building systems (HVAC, lighting, etc.) in conjunction with the utility, installation and maintenance costs. The NIST-BLCC software is endorsed by the Federal Energy Management Program and is the approved software for all federal life cycle costing analysis. When calculating the LCC of a respective ECM, recurring costs for existing HVAC equipment replacement play a major role. The delineation of the respective costs is as follows:

Utility Rates

The utility rates for electric and natural gas are as noted in Section IV of this report.

Installed Costs – Construction Cost Estimate

The installed costs for the energy conservations measures have been completed utilizing RS Means estimating software, engineering estimates and contractor pricing.

Some initial cost can be avoided by utilizing the New Jersey SmartStart$_{tm}$ Financial Incentive program (www.njsmartbuildings.com). The program offers financial incentives on various types of building equipment. Incentives were utilized in CEG's Life Cycle Costing calculations detailed in the financial analysis.

Maintenance Costs

Maintenance costs are based on a variety of variables and are difficult to calculate, therefore it is an industry practice to develop these costs based on the methods established in ASHRAE Applications Handbook 2007, Chapter 36 or to estimate the numbers based on ASHRAE Research Data issued in peer-reviewed journals.

Recurring Costs – Equipment Replacement Costs

HVAC Equipment Replacement Costs are calculated utilizing the installation costs estimated by the cost consultant with an estimated inflation rate (approx. 2.0%) for the time of the study life that the replacement occurs. The recommended service life per ASHRAE Applications Handbook 2007, Chapter 36 has been used as the basis for the analysis software to determine equipment replacement frequency for the 20 year Life Cycle Cost Analysis. Refer to Appendix B for a listing of the recurring / replacement costs per ECM.

Economic Parameters

The LCC analysis was performed using a 20-year Study Life with a Cost of Capital equal to 5%. The project was not modeled as being financed because the project is privately funded. The utility costs, maintenance and replacement costs incorporate a 2.0% average long-term inflation rate calculated annually for the DOE/FEMP projects according to 10 CFR 436. Depending on any unforeseen changes in rate structure by the utility providers, this inflation rate is likely to increase.

## Base Building Model

*Base Case reflects existing equipment, operating conditions and energy consumption.*



**Base Building**
**Energy Consumption Summary**

**ENERGY CONSUMPTION SUMMARY**
By CAE

| | Elect Cons. (kWh) | Gas Cons. (kBtu) | % of Total Building Energy | Total Building Energy (kBtu/yr) | Total Source Energy* (kBtu/yr) |
|---|---|---|---|---|---|
| **Alternative 1 BASE CASE** | | | | | |
| **Primary heating** | | | | | |
| Primary heating | 38 | 3,388,243 | 46.3 % | 3,388,373 | 3,566,961 |
| Other Htg Accessories | 80,335 | | 3.7 % | 274,184 | 822,633 |
| **Heating Subtotal** | **80,373** | **3,388,243** | **50.0 %** | **3,662,556** | **4,389,594** |
| **Primary cooling** | | | | | |
| Cooling Compressor | 125,469 | | 5.9 % | 428,226 | 1,284,808 |
| Tower/Cond Fans | 15,868 | | 0.7 % | 54,157 | 162,488 |
| Condenser Pump | | | 0.0 % | 0 | 0 |
| Other Clg Accessories | 633 | | 0.0 % | 2,159 | 6,478 |
| **Cooling Subtotal....** | **141,970** | | **6.6 %** | **484,543** | **1,453,773** |
| **Auxiliary** | | | | | |
| Supply Fans | 285,229 | | 13.3 % | 973,485 | 2,920,747 |
| Pumps | 69,396 | | 3.2 % | 236,850 | 710,622 |
| Stand-alone Base Utilities | 16,587 | | 0.8 % | 56,610 | 169,846 |
| Aux Subtotal.... | 371,212 | | 17.3 % | 1,266,945 | 3,801,215 |
| **Lighting** | | | | | |
| Lighting | 463,321 | | 21.6 % | 1,581,316 | 4,744,421 |
| **Receptacle** | | | | | |
| Receptacles | 95,553 | | 4.5 % | 326,121 | 978,460 |
| **Cogeneration** | | | | | |
| Cogeneration | | | 0.0 % | 0 | 0 |
| **Totals** | | | | | |
| **Totals**** | **1,152,428** | **3,388,243** | **100.0 %** | **7,321,480** | **15,367,463** |

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

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# ECM # 1: PREMIUM EFFICIENCY MOTORS

The existing air handling unit and pump motors were evaluated for increased efficiency.

All of the major HVAC equipment was installed in 2002 when the school was initially constructed. Most of the existing rooftop air-handling units have (2) fans and (2) motors per unit. Based on the serial numbers and data collected from the manufacturer's none of the equipment were outfitted with "high", or premium, efficiency motors. In addition, the boiler hot water in-line circulating pump motors are not listed as premium efficiency. However, the chilled water pumps, CHWP-1 & 2, 40 HP motors are rated at 93% and the main hot water pumps, HWP-1 & 2, 20 HP motors are rated at 91% efficiency.

In this alternative, due to the extensive payback we are suggesting replacing all major HVAC related motors (greater than ½ HP) with premium efficiency motors when the motors have expired.

Based on the potential savings and construction costs the simple payback for this alternative is 19 years. The table below shows a summary of the energy consumption for this alternative.



**ECM No. 1**
**Energy Consumption Summary**

**ENERGY CONSUMPTION SUMMARY**
By CAE

| | Elect Cons. (kWh) | Gas Cons. (kBtu) | % of Total Building Energy | Total Building Energy (kBtu/yr) | Total Source Energy* (kBtu/yr) |
|---|---|---|---|---|---|
| **Alternative 2 PREMIUM EFF. MOTORS** | | | | | |
| **Primary heating** | | | | | |
| Primary heating | 38 | 3,394,746 | 46.5 % | 3,394,876 | 3,573,806 |
| Other Htg Accessories | 80,335 | | 3.8 % | 274,184 | 822,633 |
| **Heating Subtotal** | **80,373** | **3,394,746** | **50.3 %** | **3,669,059** | **4,396,440** |
| **Primary cooling** | | | | | |
| Cooling Compressor | 125,120 | | 5.9 % | 427,036 | 1,281,237 |
| Tower/Cond Fans | 15,825 | | 0.7 % | 54,012 | 162,052 |
| Condenser Pump | | | 0.0 % | 0 | 0 |
| Other Clg Accessories | 633 | | 0.0 % | 2,159 | 6,478 |
| **Cooling Subtotal....** | **141,578** | | **6.6 %** | **483,207** | **1,449,766** |
| **Auxiliary** | | | | | |
| Supply Fans | 276,258 | | 12.9 % | 942,869 | 2,828,891 |
| Pumps | 69,396 | | 3.3 % | 236,850 | 710,622 |
| Stand-alone Base Utilities | 16,587 | | 0.8 % | 56,610 | 169,846 |
| Aux Subtotal.... | 362,241 | | 17.0 % | 1,236,329 | 3,709,358 |
| **Lighting** | | | | | |
| Lighting | 463,321 | | 21.7 % | 1,581,316 | 4,744,421 |
| **Receptacle** | | | | | |
| Receptacles | 95,553 | | 4.5 % | 326,121 | 978,460 |
| **Cogeneration** | | | | | |
| Cogeneration | | | 0.0 % | 0 | 0 |
| **Totals** | | | | | |
| **Totals**** | **1,143,067** | **3,394,746** | **100.0 %** | **7,296,032** | **15,278,445** |

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

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## ECM # 2: VARIABLE SPEED PUMPING

The existing chilled water and hot water pumps are constant speed. Both systems have a bypass valve which allows for recirculation when terminal equipments' control valves close down. We suggest installing new pumps with variable frequency drives (VFD). The existing 2-way control valves at all of the terminal equipment can remain. The new pumps would be controlled by remote differential pressure sensors to keep the system charged properly. The VFD's modulate the pump's speed in order to maintain the necessary system pressure as prescribed at the BMS.

This is a very cost effective energy conservation measure and based on the potential energy savings and installation costs the simple payback for this alternative is 2.1 years. The table below shows a summary of the energy consumption for this alternative.

**ECM No. 2**
**Energy Consumption Summary**

**ENERGY CONSUMPTION SUMMARY**
By CAE

| | Elect Cons. (kWh) | Gas Cons. (kBtu) | % of Total Building Energy | Total Building Energy (kBtu/yr) | Total Source Energy* (kBtu/yr) |
|---|---|---|---|---|---|
| **Alternative 3 VARIABLE FREQUENCY PUMPS** | | | | | |
| **Primary heating** | | | | | |
| Primary heating | 38 | 3,388,243 | 48.9 % | 3,388,373 | 3,566,961 |
| Other Htg Accessories | 19,742 | | 1.0 % | 67,381 | 202,162 |
| **Heating Subtotal** | **19,780** | **3,388,243** | **49.9 %** | **3,455,753** | **3,769,123** |
| **Primary cooling** | | | | | |
| Cooling Compressor | 125,469 | | 6.2 % | 428,226 | 1,284,808 |
| Tower/Cond Fans | 15,868 | | 0.8 % | 54,157 | 162,488 |
| Condenser Pump | | | 0.0 % | 0 | 0 |
| Other Clg Accessories | 633 | | 0.0 % | 2,159 | 6,478 |
| **Cooling Subtotal....** | **141,970** | | **7.0 %** | **484,543** | **1,453,773** |
| **Auxiliary** | | | | | |
| Supply Fans | 285,229 | | 14.1 % | 973,485 | 2,920,747 |
| Pumps | 14,768 | | 0.7 % | 50,402 | 151,220 |
| Stand-alone Base Utilities | 16,587 | | 0.8 % | 56,610 | 169,846 |
| Aux Subtotal.... | 316,583 | | 15.6 % | 1,080,496 | 3,241,813 |
| **Lighting** | | | | | |
| Lighting | 463,321 | | 22.8 % | 1,581,316 | 4,744,421 |
| **Receptacle** | | | | | |
| Receptacles | 95,553 | | 4.7 % | 326,121 | 978,460 |
| **Cogeneration** | | | | | |
| Cogeneration | | | 0.0 % | 0 | 0 |
| **Totals** | | | | | |
| **Totals**** | **1,037,207** | **3,388,243** | **100.0 %** | **6,928,229** | **14,187,591** |

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

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## ECM # 3: ENERGY RECOVERY WHEEL UNITS

The existing facility has (12) McQuay rooftop air handling units installed in 2002. Three (3) of these units, RTU-1 the Cafeteria, RTU-3 & 4 the Gymnasium would be candidates for energy recovery enthalpy wheel units due to their high percentage of outside air and ductwork configuration. Using this technology, the exhaust air is ducted through one side of the energy recovery wheel, while the outside air is ducted through the opposite side of the wheel, resulting in a transfer of thermal energy. This provides pre-treated outdoor air prior to reaching the heating and cooling coils, therefore lowering the required chiller and boiler capacity.

Based on the potential savings and construction costs the simple payback for this alternative is 211 years. This alternative does not "pay back" due to the high construction costs. The table below shows a summary of the energy consumption for this alternative.

**ECM No. 3**
**Energy Consumption Summary**

**ENERGY CONSUMPTION SUMMARY**
By CAE

| | Elect Cons. (kWh) | Gas Cons. (kBtu) | % of Total Building Energy | Total Building Energy (kBtu/yr) | Total Source Energy* (kBtu/yr) |
|---|---|---|---|---|---|
| **Alternative 4 ENERGY RECOVERY UNITS** | | | | | |
| **Primary heating** | | | | | |
| Primary heating | 38 | 2,938,000 | 41.8 % | 2,938,130 | 3,093,021 |
| Other Htg Accessories | 80,236 | | 3.9 % | 273,844 | 821,615 |
| **Heating Subtotal** | **80,274** | **2,938,000** | **45.7 %** | **3,211,974** | **3,914,636** |
| **Primary cooling** | | | | | |
| Cooling Compressor | 125,029 | | 6.1 % | 426,723 | 1,280,298 |
| Tower/Cond Fans | 15,857 | | 0.8 % | 54,120 | 162,377 |
| Condenser Pump | | | 0.0 % | 0 | 0 |
| Other Clg Accessories | 632 | | 0.0 % | 2,157 | 6,473 |
| **Cooling Subtotal....** | **141,518** | | **6.9 %** | **483,001** | **1,449,148** |
| **Auxiliary** | | | | | |
| Supply Fans | 322,901 | | 15.7 % | 1,102,060 | 3,306,512 |
| Pumps | 69,263 | | 3.4 % | 236,393 | 709,251 |
| Stand-alone Base Utilities | 16,587 | | 0.8 % | 56,610 | 169,846 |
| Aux Subtotal.... | 408,750 | | 19.9 % | 1,395,064 | 4,185,609 |
| **Lighting** | | | | | |
| Lighting | 463,321 | | 22.5 % | 1,581,316 | 4,744,421 |
| **Receptacle** | | | | | |
| Receptacles | 104,602 | | 5.1 % | 357,006 | 1,071,124 |
| **Cogeneration** | | | | | |
| Cogeneration | | | 0.0 % | 0 | 0 |
| **Totals** | | | | | |
| **Totals**** | **1,198,465** | **2,938,000** | **100.0 %** | **7,028,360** | **15,364,938** |

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

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## ECM # 4: LIGHTING UPGRADE / RETROFIT

*Upgrade the Fluorescent Lighting*

A simple change from the old to the new can provide substantial savings. A typical drop-ceiling lay in fixture with two, 4-foot lamps (32 Watt lamps) has a total wattage of about 64 Watts. By using the new 28 Watt energy saving lamps and ballasts the total wattage would be about 56 Watts. The new 28 Watt T8 energy saver lamps can fit right into the existing fixtures without any fixture modifications. The 28 Watt T8 allows you to save four watts per lamp and up to 15% in energy costs. This comes at the price of decreased lumen output. This means that the room light levels will drop about 15%.

The 28 Watt T8 should operate on the existing T8 ballast. However, if you choose to upgrade to the new high efficiency ballast, you can realize up to 6% in energy savings. They, too, can fit into the existing fixtures without any fixture modifications.

Energy efficient electronic ballasts reduce lighting system costs by using less power and offer the ability to use fewer ballasts to serve the lighting system. The existing ballasts add wattage to the lighting system due to their operating characteristics. High efficiency electronic ballasts subtract wattage from the lighting system due to their operating characteristics. These can be used to substitute older existing electronic or magnetic ballasts. The existing magnetic ballasts can only operate up to two lamps. One electronic ballast can operate up to four lamps, resulting in fewer ballasts required to serve the lighting system. Further ballast reductions may be possible by "tandem wiring" the ballasts. Instead of using one ballast for every fixture, it may be feasible to use one ballast for every two or more fixtures. A single ballast can operate the lamps in adjacent light fixtures.

*Install Compact Fluorescent Lighting*

Compact fluorescent lamps (CFL's) were created to be replacements for the standard incandescent lamps that are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to look like the incandescent lamp. The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light. In some instances, this is still not the desired ambiance, but in most cased the significant energy savings and the "neat incandescent" effect is welcomed.

The CFL buyer should spend some time shopping around, since the CFL is available in a myriad of shapes and sizes depending on the specific application. But for almost any application, there is a lamp that fits the need. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 25-Watt CFL for a 100-Watt incandescent lamp.

The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. Then there is a 3000K, a 3500K, and a 4100K. The 4100K would be the "brightest" or

"coolest" output. It would be wise to see an example of each before making a purchase, and even to see a sample of the lamp you are buying since Kelvin ratings vary between manufacturers.

A CFL can be chosen to screw right into your existing fixtures, or a new pin-based CFL fixture could be purchased. A pin-based CFL fixture makes it impossible for someone to replace the lamp with a screw base incandescent.

*Replace 250 watt metal halide fixtures*

Replacement of the existing 250 watt metal halide fixtures in the gymnasium and cafeteria with T5HO fluorescent fixtures may offer energy savings. The T5HO fixtures use less power than the existing fixtures. The new fixture will need to be equipped with a wire guard for protection of the lamps. Metal Halide fixture requires a warm up time to come to full brightness; because of this, the fixture tends to be tuned on and left on all day. The T5HO fixtures will come to full brightness instantaneously allowing for the gym fixtures to be switched off when it is not in use.

*Install LED Exit Signs*

LED stands for light-emitting-diode. LED's are very small light sources that people most readily associate with electronic equipment. LED exit signs have been made in a variety of shapes and sizes and there are also retrofit kits that allow you to simply modify your existing exit signs to accommodate the LED technology. The benefits of LED are twofold. First, you are installing an exit sign that will last for 20-30 years without maintenance. This results in tremendous maintenance savings because the incandescent or fluorescent lamps that you are currently using need to be replaced at a rate of 1-5 times per year. Lamp costs ($2-$7 each) and labor costs ($8-$20 per lamp) add up rapidly. The second benefit of LED is that it only uses 2 Watts. In comparison, your existing sign uses 10-40 or even 60 Watts. It is highly recommended that you install samples of the products that you are interested in purchasing. This will confirm that they are compatible with you electrical system.

Simple Payback for This Measure = 0.6 Years

A detailed Investment Grade Lighting Audit can be found in Appendix C.

*Install Lighting Controls to Reduce the Lighting Use*

In some areas the lighting is left on unnecessarily. Many times this is due to the idea that it is better to keep the lights on rather than to continuously switch them on and off. The on/off dilemma was studied and it was found that the best option is to turn the lights off whenever possible. Although this does reduce the lamp life, the energy savings far outweigh the lamp replacement costs. The cutoff for when to turn the lights off is around two minutes. If the lights can be off for only a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is all it would take. Another type is the time-clock which allows the user to set an on/off schedule. Time-clocks can

be a dial clock with on/off indicators on it, or a time-clock can be a small box the size of a thermostat where the user programs the on/off schedule in a digital format like setting the alarm on a wristwatch. Occupancy sensors detect motion and will switch the lights on when the room is occupied. They can either be mounted in place of the current wall switch, or they can be mounted on the ceiling to cover large areas. Lastly, photocells are a lighting control that sense light levels and will turn the lights off when there is adequate daylight. These are mostly used outside, but they are becoming much more popular in energy-efficient office designs as well under the "daylight harvesting" name.

Lutron offers a system where the retrofitted ballasts are addressable, like a fire alarm system. Each ballast in this system can be controlled independently. This allows for more switching options and dimming capability. The system would require all of the ballasts and switches to be replaced. The system is expandable, so you could start with a single classroom and slowly add more and more classrooms to the system. Furthermore, this system can be expanded to include utilizes daylight sensors and/or occupancy sensors. All of these measures (dimming, occupancy sensors and daylight harvesting) are energy saving strategies brought together in one efficient system. They even offer a software package that would allow you to track the savings and each classroom could see how much energy they are saving.

To determine an estimated savings for lighting controls, we used ASHAE 90.1-2004 (NJ Energy Code). Appendix G states that occupancy sensors have a 10% power adjustment factor for daytime occupancies for buildings over 5,000ft$^2$. CEG recommends the installation of dual technology occupancy sensors in all classrooms, private offices, conference rooms, restrooms, lunch rooms, storage rooms, lounges, file rooms, etc.

From Appendix C of this report, we calculated the lighting power density (Watts/ft$^2$) of the existing school to be 107,460 Watts / 82,400 SF = 1.31 Watts/ft$^2$. Ten percent of this value is the resultant energy savings due to installation of occupancy sensors:

10% x 107,460 watts x 2470 hrs/yr.

= 26,543 kWh x $0.16/kWh

Savings = $4,247 / yr

Installation cost per dual-technology sensor is $75/unit. Total number of rooms to be retrofitted is 131. Total cost to install sensors is $25,545.

Simple Payback = 6 Years.

# VIII. RENEWABLE/DISTRIBUTED ENERGY MEASURES (ECM # 5)

In recent years renewable energy has leaped into mainstream society affecting global and domestic energy policy. The State of New Jersey has taken a proactive approach, and has recently adopted in its Energy Master Plan a goal of 30% renewable energy by 2020. To help reach this goal New Jersey created the Office of Clean Energy underneath the Board of Public Utilities and instituted a Renewable Energy Incentive Program to provide additional funding to private and public entities for installing qualified technologies. A renewable energy source can greatly reduce a building's operating expenses while producing clean environmentally friendly energy. CEG has assessed the feasibility of installing renewable energy technologies for the facility and concluded that there is a potential for solar energy generation.

Solar energy production is a great way to produce clean energy and reduce a buildings carbon footprint. In order to do this Photovoltaic panels will be mounted on all south and southwestern facets of the building. Flat roof, as well as slopped areas can be utilized; flat areas will have the panels turned to an optimum solar absorbing angle. (A structural survey of the roof would be necessary before the installation of PV panels is considered). The state of NJ has instituted a program in which one Solar Renewable Energy Certificate (SREC) is given to the owner for every 1000 kWh of generation. SREC's can be sold anytime on the market at their current market value. The value of the credit varies upon the current need of the power companies. The average value per credit is around $350, this value was used in our financial calculations. This equates to $0.35 per kWh generated.

CEG has reviewed the existing roof area of the building being audited for the purposes of determining a potential for a roof mounted photovoltaic system. A roof area of 49,000 S.F. can be utilized for a PV system on the Elementary School. A depiction of the area utilized is shown in Appendix F following the financial calculations. Using this square footage it was determined that a system size of 400 kilowatts could be installed. A system of this size has an estimated kilowatt hour production of 626,898 KWh annually, reducing the overall utility bill by almost 42 percent. Combining the overall utility bill savings with the renewable energy credits shows a net profit of about $70,000/year. A detailed financial analysis can be found in Appendix F. This analysis illustrates the payback of the system over a 25 year period. The eventual degradation of the solar panels and the price of accumulated SREC's are factored into the payback.

CEG has reviewed financing options for the owner. Two options were studied and they are as follows: Self-financed and direct purchase without finance. Self-finance was calculated with 90% of the total project cost financed at a 5% interest rate over 20 years. Direct purchase involves the local government paying 100% of the total cost upfront. Both of these calculations include utility inflation rate as well as the degradation of the solar panels over time. Based on our calculations the following are the payback periods for the respective method of payment:

| Payment Type | Life Cycle Payback | IRR |
|---|---|---|
| Self-Finance | 14.3 Years | 30 % |
| Direct Purchase | 9.7 Years | 9.4 % |

Wind energy production is another option available through the Renewable Energy Incentive Program. Small wind turbines can be utilized to produce clean energy on a per building basis. Cash incentives are available per kWh of electric usage. CEG has reviewed the applicability of wind energy for South Brunswick and has determined it is not a viable option. Low average wind speeds for the area are not adequate for wind turbine generation. Typical wind turbines start producing energy at 8 mph wind speeds. South Brunswick averages 4 mph wind speeds making this application impractical.

# IX. ENERGY PURCHASING AND PROCUREMENT STRATEGY

**Load Profile:**

Load Profile analysis was performed to determine the seasonal energy usage of the facility. Irregularities in the load profile will indicate potential problems within the facility. Consequently based on the profile a recommendation will be made to remedy the irregularity in energy usage. For this report, the facility's energy consumption data was gathered in table format and plotted in graph form to create the load profile. Refer to Section IV, Figures 1 and 2 included within this report to reference the respective electricity and natural gas usage load profile for June 2007 through May 2008.

Electricity:

Section IV, Figure 1 demonstrates a typical cooling profile, (April –October), complimenting the heating load. It is evident that there is a significant reduction in the On Peak Load from October 2007 to November 2007 and a substantial increase from March 2007 to April 2007. The Off Peak load is typical, with some expected increased consumption in the June-September period. The base-load shaping is important because a flat consumption profiles will yield more competitive pricing.

Natural Gas:

Section IV, Figure 2 demonstrates a typical heating load (November –March), and complimentary cooling load (April –October). Consequently there is a clear separation between summer and winter loads consistent with Wholesale Energy Pricing. Heating loads carry a much higher average cost because of the higher demand for natural gas during the winter.

**Tariff Analysis:**

Electricity:

South Brunswick – Brooks Crossing Elementary receives electrical service through Public Service Electric and Gas Company (PSE&G) on a LPLS (Large Power and Lighting Service) rate. This utility tariff is for delivery service for general purposes at secondary distribution voltages where the customers measured peak demand exceeds 150 kw in any month and also at primary distribution voltages. Customers may either purchase electric supply from a Third Party Supplier (TPS) of from PSE&G's Basic Generation Service default service as detailed in the rate schedule. The rate schedule has a Delivery Charge; Distribution kW and kWh Charge, Societal Benefits Charge, Non-utility Generation Charge, Securitization Charge, System Control Charge, Customer Account Services Charge, Standby Fee, Base Rate Distribution Adjustment Charge, Solar Pilot Recovery Charge and RGGI Charge. The customer can elect to have the Commodity Charge serviced through the utility or by a Third Party Supplier (TPS).

Natural Gas:

South Brunswick – Brooks Crossing Elementary receives natural gas service through Public Service Electric and Gas Company LVG (Large Volume Gas) rate class, when not receiving commodity by a Third Party Supplier. This utility tariff is for firm delivery service for general purposes. This rate schedule has a Delivery Charge, Balancing Charge, Societal Benefits Charge, Realignment Adjustment Charge, Margin Adjustment Charge, RGGI Charge and Customer Account Service Charge. The customer can elect to have the Commodity Charge serviced through the utility or by a Third Party Supplier (TPS). It is pertinent to note, should the TPS not deliver, the customer may receive service from PSE&G under Emergency Sales Service. Emergency Sales Service carries an extremely high penalty cost of service.

Imbalances occur when Third Party Suppliers are used to supply natural gas, full-delivery is not made, and when a new supplier is contracted or the customer returns to the utility. It is important when utilizing a Third Party Supplier, that an experienced regional supplier is used. Otherwise, imbalances can occur, jeopardizing economics and scheduling.

From review of the information provided by the School District, South Brunswick is utilizing the services of a Third Party Supplier, Woodruff Energy for natural gas service. The contract is administered through the Middlesex Regional Educational Services Commission (MRESC) for the term, August 1, 2008 through July 31, 2010. The agreement is between the MRESC and South Brunswick BOE and it does not define the full and final price. Based on the limited data available, it appears that South Brunswick is paying 25%-50% above market price.

Additionally, the MRESC charges $.0325 per deka-therm for administering this RFP. The South Brunswick BOE could realize additional savings by evaluating a new natural gas contract. It should be noted that there was not a Woodruff Energy Contract available for review, nor a complete delivered natural gas price.

**Recommendations:**

CEG recommends a global approach that will be consistent with all facilities. CEG's primary observation is seen in the electricity costs. South Brunswick's "weighted average price" per kWh (kilowatt hour) for all buildings is $.1614/kWh (kWh is the common unit of electric measure). The average price per deka-therm for natural gas is $12.50/dth (Dth is the common unit of measure). Energy commodities are among the most volatile of all commodities, however at this point and time, energy is extremely competitive. South Brunswick could see significant savings if it were to take advantage of these current market prices quickly, before energy increases. Based on last year's historical consumption (June 2007 through May 2008) and current electric rates, South Brunswick would see savings of over $500,000 per year (Note: Savings were calculated using South Brunswick High School's Average Annual Consumption of 8,520,053 kWh and a variance of $.06/kWh utilizing a fixed one-year commodity contract). South Brunswick should aggregate its entire electric load to gain the most optimal energy costs. CEG recommends advisement for alternative sourcing and supply of energy on a "managed approach".

CEG's secondary recommendation coincides with South Brunswick's natural gas costs and the contract with MRESC and Woodruff Energy. CEG recognized a segment of the natural gas cost is not competitive with current market prices. Based on the current market, South Brunswick is paying approximately $1.717 per unit above market in the PSEG territory and about $.58 per unit above market in the Elizabethtown Gas and New Jersey Natural Gas territories. CEG recommends further advisement on these prices. South Brunswick should also consider procuring energy (natural gas) on its own. By procuring energy through the MRESC it is paying a premium of $.0325 per unit. CEG recommends alternative sourcing strategies.

CEG recommends that South Brunswick schedule a meeting with their current utility providers to review their utility charges and current tariff structures for electricity and natural gas. This meeting would provide insight regarding alternative procurement options that might be available to South Brunswick. Through its meeting with the Local Distribution Company (LDC), South Brunswick will learn more about the competitive supply process. South Brunswick can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at www.nj.gov/bpu. South Brunswick should also consider using a billing-auditing service to further analyze the utility invoices, manage the data and use the data to manage ongoing demand-side management projects. Furthermore, CEG recommends South Brunswick pay attention to credit mechanisms, imbalances, balancing charges and commodity charges when meeting with their utility representative. In addition, South Brunswick should also ask the utility representative about alternative billing options. Some utilities allow for consolidated billing options when utilizing the service of a Third Party Supplier.

Finally, if South Brunswick frequently changes its supplier for energy (natural gas), it needs to closely monitor balancing, particularly when the contract is close to termination.

# X. INSTALLATION FUNDING OPTIONS

CEG has reviewed various funding options for the Owner to utilize in subsidizing the costs for installing the energy conservation measures noted within this report. Below are a few alternative funding methods:

i. *Energy Savings Improvement Program (ESIP)* – Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and par for the costs using the value of energy savings that result from the improvements. The "Energy Savings Improvement Program (ESIP)" law provides a flexible approach that can allow all government agencies in New Jersey to improve and reduce energy usage with minimal expenditure of new financial resources.

ii. *Municipal Bonds* – Municipal bonds are a bond issued by a city or other local government, or their agencies. Potential issuers of municipal bonds include cities, counties, redevelopment agencies, school districts, publicly owned airports and seaports, and any other governmental entity (or group of governments) below the state level. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.

iii. *Power Purchase Agreement* – Public Law 2008, Chapter 3 authorizes contractor of up to fifteen (15) years for contracts commonly known as "power purchase agreements." These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system. These renewable energy systems are typically solar panels, windmills or other systems that create renewable energy. In exchange for the third party's work of installing, maintaining and owning the renewable energy system, the contracting unit (Owner) agrees to purchase the power generated by the renewable energy system from the third party at agreed upon energy rates.

CEG recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

# XI. ADDITIONAL RECOMMENDATIONS

The following recommendations include low cost measures, Operation & Maintenance (O&M) items, and water conservation measures with attractive paybacks. These measures are not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Use cog-belts instead of v-belts on all belt-driven fans, etc. These can reduce electrical consumption of the motor by 2-5%.

D. Repair/replace piping and ductwork insulation in the attic spaces.

E. Reduce lighting in specified areas where the foot-candle levels are above 70 in private offices and above 30 in corridor, lobbies, etc. During the site survey, many areas were measured at over 100 foot-candles.

F. Provide more frequent air filter changes to decrease overall fan horsepower requirements and maintain better IAQ.

G. Install a Vending Miser system to turn off vending machines when not in use.

H. Efficient parking lot lighting fixtures can reduce the energy use on the site without compromising safety or illumination. "Hockey puck" fixtures which use 175-Watt metal halide lamps use 70% less electricity than "cobra head" fixtures using 250-watt high pressure sodium lamps.

I. Clean all fixtures to maximize light output.

J. Feel for air drafts around electrical outlets. Inexpensive pads are available, as are plugs for unused sockets.

K. Confirm that outside air economizers on the air handling units are functioning properly to take advantage of free cooling.

In addition to the recommendations above CEG would also like to suggest Retro-Commissioning. Retro-Commissioning is a means to verify your current equipment is operating at their designed capacity, airflow, etc. Commissioning agents would use an independent balancing company to perform air and water balancing on the existing systems.

# APPENDIX

**Electric Cost Summary**
**Brooks Crossing**
**Elementary**
**PSE & G**
**Acct.No:6290200151E**



| Month | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 | Nov-07 | Dec-07 | Jan-08 | Feb-08 | Mar-08 | Apr-08 | May-08 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Last Meter Read Date | 6/1/2007 | 7/3/2007 | 8/1/2007 | 8/30/2007 | 10/1/2007 | 10/23/2007 | 12/3/2007 | 1/2/2008 | 2/1/2008 | 3/3/2008 | 4/2/2008 | 5/1/2008 | 6/1/2007 |
| Current Meter Read Date | 7/3/2007 | 8/1/2007 | 8/30/2007 | 10/1/2007 | 10/23/2007 | 12/3/2007 | 1/2/2008 | 2/1/2008 | 3/3/2008 | 4/2/2008 | 5/1/2008 | 6/2/2008 | 6/2/2008 |
| Billing Days | 32 | 29 | 29 | 32 | 22 | 41 | 30 | 30 | 31 | 30 | 29 | 32 | 367 |
| KWH | 121,600 | 82,800 | 100,000 | 120,800 | 85,800 | 109,800 | 76,000 | 88,400 | 83,600 | 76,400 | 94,000 | 98,400 | 1,137,600 |
| KW | 401 | 401 | 401 | 401 | 401 | 401 | 410 | 410 | 410 | 410 | 410 | 410 | 410 |
| Monthly Load Factor | 39% | 30% | 36% | 39% | 41% | 28% | 26% | 30% | 27% | 26% | 33% | 31% | 32% |
| Electric Delivery, $ | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Delivery $/kwh | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0 |
| Electric Supply, $ | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Supply $/kwh | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0 |
| Total Cost, $ | $23,033 | $17,916 | $22,302 | $23,035 | $11,319 | $15,070 | $10,310 | $11,890 | $11,523 | $10,573 | $12,639 | $13,476 | $183,087 |
| $/KWH | $0.1894 | $0.2164 | $0.2230 | $0.1907 | $0.1319 | $0.1372 | $0.1357 | $0.1345 | $0.1378 | $0.1384 | $0.1345 | $0.1370 | $0.1609 |

**Natural Gas Cost Summary**
**Brooks Crossing**
**Elementary**
**PSE & G**
**Acct. No.6290200151G**



| Month | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 | Nov-07 | Dec-07 | Jan-08 | Feb-08 | Mar-08 | Apr-08 | May-08 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Billing Days | 32 | 29 | 30 | 30 | 31 | 34 | 30 | 30 | 31 | 30 | 29 | 32 | 368 |
| Last Meter Read Date | 6/1/2007 | 7/3/2007 | 8/1/2007 | 8/31/2007 | 9/30/2007 | 10/30/2007 | 12/3/2007 | 1/2/2008 | 2/1/2008 | 3/3/2008 | 4/2/2008 | 5/1/2008 | 6/1/2007 |
| Current Meter Read Date | 7/3/2007 | 8/1/2007 | 8/31/2007 | 9/30/2007 | 10/31/2007 | 12/3/2007 | 1/2/2008 | 2/1/2008 | 3/3/2008 | 4/2/2008 | 5/1/2008 | 6/2/2008 | 6/2/2008 |
| Gas Used per 100 cu ft | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BTU Factor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Therms (Burner Tip) | 417 | 120 | 255 | 629 | 1,150 | 4,752 | 6,518 | 6,953 | 7,027 | 4,606 | 2,624 | 1,864 | 36,915 |
| Total Distribution Cost | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Cost per Therm | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 | $0.000 |
| Total Commodity Cost | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Cost per Therm | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 |
| Total Cost | $731 | $277 | $483 | $1,056 | $2,033 | $8,698 | $11,525 | $12,220 | $12,122 | $8,254 | $4,056 | $2,913 | $64,368 |
| Cost per Therm | $1.75 | $2.31 | $1.90 | $1.68 | $1.77 | $1.83 | $1.77 | $1.76 | $1.73 | $1.79 | $1.55 | $1.56 | $1.74 |

## CONSTRUCTION COST AND REBATES

| **BASE CASE - EXISTING EQUIPMENT** | Qty | Unit Cost $ | Material $ | Labor $ | Total $ |
|---|---|---|---|---|---|
| **Total Cost** | | | $0 | $0 | **$0** |
| | | | | | |
| **ECM # 1 - PREMIUM EFFICIENCY MOTORS** | Qty | Unit Cost $ | Material $ | Labor $ | Total $ |
| Premium Efficiency Motors | 1 | $14,000 | $14,000 | $14,000 | $28,000 |
| Premium Efficiency Motor Rebate | | | | | $1,742 |
| **Total** | | | | | **$26,258** |
| | | | | | |
| **ECM # 2 - VARIABLE SPEED PUMPING** | Qty | Unit Cost $ | Material $ | Labor $ | Total $ |
| CHW Pump Motors (40 HP) | 2 | $1,700 | $3,400 | $6,800 | $6,800 |
| HW Pump Motors (20 HP) | 2 | $1,000 | $2,000 | $4,000 | $6,000 |
| Variable Frequency Drive > 5HP | 4 | $2,500 | $10,000 | $17,500 | $27,500 |
| Controls | 4 | $250 | $1,000 | $1,750 | $2,750 |
| Piping/Control Valves | 4 | $350 | $1,400 | $2,450 | $3,850 |
| VFD Rebate CHW ($60/HP >20 HP) | | | | | $4,800 |
| Premium Efficiency Motor Rebate | | | | | $162 |
| **Total** | | | | | **$41,938** |
| | | | | | |
| **ECM # 3 - ENERGY RECOVERY UNITS** | Qty | Unit Cost $ | Material $ | Labor $ | Total $ |
| (3) Energy Recovery Wheel Units | 1 | $58,000 | $58,000 | $116,000 | $174,000 |
| Ductwork | 3 | $1,500 | $4,500 | $9,000 | $13,500 |
| Controls | 3 | $750 | $2,250 | $4,500 | $6,750 |
| **Total** | | | | | **$194,250** |
| | | | | | |
| **ECM # 4 - LIGHTING RETROFIT** | Qty | Unit Cost $ | Material $ | Labor $ | Total $ |
| Lighting Retrofit | 1 | $27,978 | $27,978 | $60,480 | $88,458 |
| Lighting Rebate | | | | | $1,080 |
| **Total** | | | | | **$87,378** |
| | | | | | |
| **ECM # 5 - PV SOLAR** | Qty | Unit Cost $ | Material $ | Labor $ | Total $ |
| PV Solar | 1,313 | $1,525 | $2,002,325 | $1,201,395 | $3,203,720 |
| **Total** | | | | | **$3,203,720** |

## EQUIPMENT REPLACEMENT COST FOR EACH ALTERNATE

**BASE CASE - EXISTING EQUIPMENT**

| | $ | Life | Yr Incurred |
|---|---|---|---|
| Existing Fan Motors | $8,300 | 18 | 11 |
| Existing Pump Motors | $6,300 | 18 | 11 |
| New Premium Efficiency Fan Motors | $0 | 18 | 18 |
| New Premium Efficiency Pump Motors | $0 | 18 | 18 |
| New VFD's on CHW & HW Pumps | $0 | 17 | 17 |
| New Energy Recovery Units | $0 | 25 | 25 |

**ECM # 1 - PREMIUM EFFICIENCY MOTORS**

| | $ | Life | Yr Incurred |
|---|---|---|---|
| Existing Fan Motors | $0 | 18 | 11 |
| Existing Pump Motors | $0 | 18 | 11 |
| New Premium Efficiency Fan Motors | $12,600 | 18 | 18 |
| New Premium Efficiency Pump Motors | $1,500 | 18 | 18 |
| New VFD's on CHW & HW Pumps | $0 | 17 | 17 |
| New Energy Recovery Units (3) | $0 | 25 | 25 |

**ECM # 2 - VARIABLE SPEED PUMPING**

| | $ | Life | Yr Incurred |
|---|---|---|---|
| Existing Fan Motors | $8,300 | 18 | 11 |
| Existing Pump Motors | $0 | 18 | 11 |
| New Premium Efficiency Fan Motors | $0 | 18 | 18 |
| New Premium Efficiency Pump Motors | $5,400 | 18 | 18 |
| New VFD's on CHW & HW Pumps | $10,000 | 17 | 17 |
| New Energy Recovery Units (3) | $0 | 25 | 25 |

**ECM # 3 - ENERGY RECOVERY WHEEL UNITS**

| | $ | Life | Yr Incurred |
|---|---|---|---|
| Existing Fan Motors | $8,300 | 25 | 20 |
| Existing Pump Motors | $6,300 | 20 | 10 |
| New Premium Efficiency Fan Motors | $0 | 25 | 25 |
| New Premium Efficiency Pump Motors | $0 | 25 | 25 |
| New VFD's on CHW & HW Pumps | $0 | 17 | 17 |
| New Energy Recovery Units (3) RTU- 1, 3, & 4 | $58,000 | 25 | 25 |

**ECM # 4 - LIGHTING RETROFIT**

| | $ | Life | Yr Incurred |
|---|---|---|---|
| Existing Fan Motors | $15,000 | 25 | 20 |
| Existing Pump Motors | $5,000 | 20 | 10 |
| New Premium Efficiency Fan Motors | $0 | 25 | 25 |
| New Premium Efficiency Pump Motors | $0 | 25 | 25 |
| New VFD's on CHW & HW Pumps | $0 | 17 | 17 |
| New Energy Recovery Units (3) | $0 | 25 | 25 |

**ECM # 5 - PV SOLAR**

| | $ | Life | Yr Incurred |
|---|---|---|---|
| Existing Fan Motors | $15,000 | 25 | 20 |
| Existing Pump Motors | $5,000 | 20 | 10 |
| New Premium Efficiency Fan Motors | $0 | 25 | 25 |
| New Premium Efficiency Pump Motors | $0 | 25 | 25 |
| New VFD's on CHW & HW Pumps | $0 | 17 | 17 |
| New Energy Recovery Units (3) | $0 | 25 | 25 |

| Annual Maintenance Cost | | | | |
|---|---|---|---|---|
| **ECM** | **Base** | **Additional** | **Solar PV** | **Total** |
| **BASE CASE - EXISTING EQUIPMENT** | $28,700 | $0 | $0 | $28,700 |
| **ECM # 1 - PREMIUM EFFICIENCY MOTORS** | $28,700 | $0 | $0 | $28,700 |
| **ECM # 2 - VARIABLE SPEED PUMPING** | $28,700 | -$1,435 | $0 | $27,265 |
| **ECM # 3 - ENERGY RECOVERY WHEEL UNITS** | $28,700 | $0 | $0 | $28,700 |
| **ECM # 4 - LIGHTING RETROFIT** | $28,700 | $0 | $0 | $28,700 |
| **ECM # 5 - SOLAR PV SYSTEM** | $28,700 | $0 | $1,500 | $30,200 |

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## SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives as of January, 2009:

### Electric Chillers

| | |
|---|---|
| Water-Cooled Chillers | $12 - $170 per ton |
| Air-Cooled Chillers | $8 - $52 per ton |

### Gas Cooling

| | |
|---|---|
| Gas Absorption Chillers | $185 - $400 per ton |
| Gas Engine-Driven Chillers | Calculated through custom measure path) |

### Desiccant Systems

| | |
|---|---|
| | $1.00 per cfm – gas or electric |

### Electric Unitary HVAC

| | |
|---|---|
| Unitary AC and Split Systems | $73 - $93 per ton |
| Air-to-Air Heat Pumps | $73 - $92 per ton |
| Water-Source Heat Pumps | $81 per ton |
| Packaged Terminal AC & HP | $65 per ton |
| Central DX AC Systems | $40- $72 per ton |
| Dual Enthalpy Economizer Controls | $250 |

### Ground Source Heat Pumps

| | |
|---|---|
| Closed Loop & Open Loop | $370 per ton |

### Gas Heating

| | |
|---|---|
| Gas Fired Boilers < 300 MBH | $300 per unit |
| Gas Fired Boilers ≥ 300 - 1500 MBH | $1.75 per MBH |
| Gas Fired Boilers ≥1500 - ≤ 4000 MBH | $1.00 per MBH |
| Gas Fired Boilers > 4000 MBH | (Calculated through Custom Measure Path) |
| Gas Furnaces | $300 - $400 per unit |

## Variable Frequency Drives

| | |
|---|---|
| Variable Air Volume | $65 - $155 per hp |
| Chilled-Water Pumps | $60 per hp |
| Compressors | $5,250 to $12,500 per drive |

## Natural Gas Water Heating

| | |
|---|---|
| Gas Water Heaters ≤ 50 gallons | $50 per unit |
| Gas-Fired Water Heaters >50 gallons | $1.00 - $2.00 per MBH |
| Gas-Fired Booster Water Heaters | $17 - $35 per MBH |

## Premium Motors

| | |
|---|---|
| Three-Phase Motors | $45 - $700 per motor |

## Prescriptive Lighting

| | |
|---|---|
| T-5 and T-8 Lamps w/Electronic Ballast in Existing Facilities | $10 - $30 per fixture, (depending on quantity) |
| Hard-Wired Compact Fluorescent | $25 - $30 per fixture |
| Metal Halide w/Pulse Start | $25 per fixture |
| LED Exit Signs | $10 - $20 per fixture |
| T-5 and T-8 High Bay Fixtures | $16 - $284 per fixture |

## Lighting Controls – Occupancy Sensors

| | |
|---|---|
| Wall Mounted | $20 per control |
| Remote Mounted | $35 per control |
| Daylight Dimmers | $25 per fixture |
| Occupancy Controlled hi-low Fluorescent Controls | $25 per fixture controlled |

## Lighting Controls – HID or Fluorescent Hi-Bay Controls

| | |
|---|---|
| Occupancy hi-low | $75 per fixture controlled |
| Daylight Dimming | $75 per fixture controlled |

## Other Equipment Incentives

| | |
|---|---|
| Performance Lighting | $1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2004 for New Construction and Complete Renovation |
| Custom Electric and Gas Equipment Incentives | not prescriptive |

| TAG | MAKE | MODEL | TYPE | CAPACITY | EFFICIENCY | SERVES | LOCATION | REMAINING USEFUL LIFE | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| RTU-1 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 6000 CFM, 33 TONS COOLING, 425 MBH HTG. | N/A | CAFETORIUM | SOUTHEAST LOWER ROOF NEXT TO CAFETERIA | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-2 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 3100 CFM, 11.25 TONS COOLING, 191 MBH HTG. | N/A | GYM OFFICES | LOWER ROOF BETWEEN GYM & CAFETERIA | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-3 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 4150 CFM, 24 TONS COOLING, 361 MBH HTG. | N/A | WEST GYM | LOWER ROOF NORTHWEST SIDE OF GYM | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-4 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 4150 CFM, 24 TONS COOLING, 361 MBH HTG. | N/A | EAST GYM | LOWER ROOF SOUTHWEST SIDE OF GYM | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-5 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 1300 CFM, 5 TONS COOLING, 87 MBH HTG. | N/A | ART CLASS | CENTRAL ROOF EAST | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-6 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 1600 CFM, 6.5 TONS COOLING, 90 MBH HTG. | N/A | MUSIC CLASS | CENTRAL ROOF EAST | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-7 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 6520 CFM, 11 TONS COOLING, 425 MBH HTG. | N/A | OFFICES & CORRIDOR | CENTRAL ROOF EAST | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-8 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 2950 CFM, 4.6 TONS COOLING, 191 MBH HTG. | N/A | FACULTY DINING | SOUTHEAST ROOF ABOVE FACULTY DINING ROOM | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-9 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 5580 CFM, 18.6 TONS COOLING, 345 MBH HTG. | N/A | MEDIA | CENTRAL ROOF EAST | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-10 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 1805 CFM, 5.4 TONS COOLING, 108 MBH HTG. | N/A | WEST CORRIDOR | NORTHWEST ROOF ABOVE WEST CORRIDOR | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-11 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 2140 CFM, 6.7 TONS COOLING, 126 MBH HTG. | N/A | SOUTH CORRIDOR | SOUTHWEST ROOF ABOVE SOUTH CORRIDOR | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, PREHEAT, RA FAN, ECONOMIZER. |
| RTU-12 | MCQUAY | RDS708BY | ROOFTOP AIR HANDLER | 1800 CFM, 7.25 TONS COOLING, 100 MBH HTG. | N/A | KITCHEN | SOUTH SIDE ROOF ABOVE KITCHEN | 13 YEARS | ROOFTOP AIR HANDLER. REHEAT, CHW COOLING, COMBO FILTER/MIX BOX, ECONOMIZER. |
| MAU-1 | GREENHECK | KSI-115-H30-DB | MAKE-UP AIR / EXH | 4830 CFM, 380 MBH INPUT/334 MBH OUTPUT | N/A | KITCHEN | SOUTH SIDE ROOF ABOVE KITCHEN | 17 YEARS | MAKE-UP AIR / EXHAUST, GAS FIRED HEAT, 480/60/3, 5 HP. |

| TAG | MAKE | MODEL | TYPE | CAPACITY | EFFICIENCY | SERVES | LOCATION | REMAINING USEFUL LIFE | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| AC - (#) CLASS ROOMS | AIREDALE | VUCHW | VERTICAL UNIT VENTILATOR, 4-PIPE, CH & HW | 2 Thru 4 TON | N/A | 29 INDIVIDUAL UNITS, CLASSROOMS | CLASSROMS ON OUTSIDE WALL | 13 YEARS | COOLING & HEATING UNIT VENTILATOR, W/ POWER EXHAUST, ECONOMIZER, RA GRILLE, DUCTED SUPPLY, INTAKE & EXHAUST AIR LOUVERS |
| CAC-1 | AIREDALE | CAC-2/14 INDOOR | AHU SPLIT SYSTEM HEAT PUMP | 400 CFM | N/A | HEAD END ROOM-204 | CEILING MOUNTED IN ROOM | 8 YEARS | CEILING RECESSED 4-WAY INTEGRAL DIFFUSER. |
| CACCU-1 | AIREDALE | SHC-12 OUTDOOR | CONDENSING UNIT SPLIT SYSTEM HEAT PUMP | 1 TON COOLING, 10.6 MBH HTG. | N/A | HEAD END ROOM-204 | ROOF ABOVE ROOM | 8 YEARS | DIFFUSER, REMOTE CONDENSING UNIT ON ROOF. |
| FCU-1 | MCQUAY | TSC-508 | CEILING RECESSED | 560 CFM, 16.4 MBH COOLING, 45.4 MBH HTG. | N/A | SMALL GROUP CLASSROOM 317 | CLASSROOM 317 | 13 YEARS | HORIZ. CONCEALED W/DUCT SUPPLY, RETURN GRILLE, DUCTED OA TO ROOF. |
| FCU- 2 | MCQUAY | TSC-508 | CEILING RECESSED | 560 CFM, 16.4 MBH COOLING, 45.4 MBH HTG. | N/A | SMALL GROUP CLASSROOM 333 | CLASSROOM 333 | 13 YEARS | HORIZ. CONCEALED W/DUCT SUPPLY, RETURN GRILLE, DUCTED OA TO ROOF. |
| UH-1 | MCQUAY | UH-33 | PROPELLER UNIT HEATER | 540 CFM, 13.4 MBH, 1/20 HP | N/A | MECHHANICAL ROOM 127 | MECHHANICAL ROOM 127 | 13 YEARS | HORIZONTAL, CEILING HUNG, FREE DISCHARGE LOUVER. |
| UH-2 | MCQUAY | UH-18 | PROPELLER UNIT HEATER | 320 CFM, 7.8 MBH, 1/25 HP | N/A | MECHHANICAL ROOM 122 | MECHHANICAL ROOM 122 | 13 YEARS | HORIZONTAL, CEILING HUNG, FREE DISCHARGE LOUVER. |
| CH-1 | MCQUAY | WHR195E272-ER10 | AIR COOLED SPLIT RECIP. COMPRESSOR-CHILLER | 170 TONS | 8.6 EER | CENTRAL PLANT, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 13 YEARS | DUAL COMPRESSORS, R-22. |
| CH- 2 | MCQUAY | WHR195E272-ER10 | AIR COOLED SPLIT RECIP. COMPRESSOR-CHILLER | 170 TONS | 8.6 EER | CENTRAL PLANT, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 13 YEARS | DUAL COMPRESSORS, R-22. |
| CU-1 | MCQUAY | ACD-16527 | AIR COOLED CONDENSER | 85 TONS | N/A | CENTRAL PLANT, ENTIRE BUILDING | LOWER ROOF BETWEEN GYM & CAFETERIA | 13 YEARS | ROOF MTD, PIPED TO INDOOR COMPRESSOR CHILLER CH-1, (10) 1.5 HP FANS ON EACH. |
| CU-2 | MCQUAY | ACD-16527 | AIR COOLED CONDENSER | 85 TONS | N/A | CENTRAL PLANT, ENTIRE BUILDING | LOWER ROOF BETWEEN GYM & CAFETERIA | 13 YEARS | ROOF MTD, PIPED TO INDOOR COMPRESSOR CHILLER CH-1, (10) 1.5 HP FANS ON EACH. |
| CU-3 | MCQUAY | ACD-16527 | AIR COOLED CONDENSER | 85 TONS | N/A | CENTRAL PLANT, ENTIRE BUILDING | LOWER ROOF BETWEEN GYM & CAFETERIA | 13 YEARS | ROOF MTD, PIPED TO INDOOR COMPRESSOR CHILLER CH-2, (10) 1.5 HP FANS ON EACH. |
| CU-4 | MCQUAY | ACD-16527 | AIR COOLED CONDENSER | 85 TONS | N/A | CENTRAL PLANT, ENTIRE BUILDING | LOWER ROOF BETWEEN GYM & CAFETERIA | 13 YEARS | ROOF MTD, PIPED TO INDOOR COMPRESSOR CHILLER CH-2, (10) 1.5 HP FANS ON EACH. |
| CHWP-1 | ARMSTRONG | 4030 | BASE MOUNTED, END SUCTION PUMP | 459 GPM @ 150' HD, 40 HP | N/A | CHILLED WATER ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 13 YEARS | MAIN CHW PUMP-CONSTANT SPEED |

| TAG | MAKE | MODEL | TYPE | CAPACITY | EFFICIENCY | SERVES | LOCATION | REMAINING USEFUL LIFE | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| CHWP-2 | ARMSTRONG | 4030 | BASE MOUNTED, END SUCTION PUMP | 459 GPM @ 150' HD, 40 HP | N/A | CHILLED WATER ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 13 YEARS | STAND-BY PUMP-CONSTANT SPEED |
| CHWP-1 | BALDOR | M2539T | ODP MOTOR, 324-T FRAME | 40 HP, 1770 RPM, 230/460/60/3 | 93% | CHILLED WATER ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 11 YEARS | MATCHED W/ CHWP-1 PUMP |
| CHWP-2 | BALDOR | M2539T | ODP MOTOR, 324-T FRAME | 40 HP, 1770 RPM, 230/460/60/3 | 93% | CHILLED WATER ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 11 YEARS | MATCHED W/ CHWP-2 PUMP |
| B-1 | RAYPAK | H9-1532 HI-DELTA | HOT WATER BOILER | 1530 MBH input, 1285 MBH output | 84% | CENTRAL PLANT, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 18 YEARS | HI EFFICIENCY, SEALED COMBUSTION PACKAGED BOILER W/ SEQUENCING CONTROL. |
| B-2 | RAYPAK | H9-1532 HI-DELTA | HOT WATER BOILER | 1530 MBH input, 1285 MBH output | 84% | CENTRAL PLANT, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 18 YEARS | HI EFFICIENCY, SEALED COMBUSTION PACKAGED BOILER W/ SEQUENCING CONTROL. |
| B-3 | RAYPAK | H9-1532 HI-DELTA | HOT WATER BOILER | 1530 MBH input, 1285 MBH output | 84% | CENTRAL PLANT, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 18 YEARS | HI EFFICIENCY, SEALED COMBUSTION PACKAGED BOILER W/ SEQUENCING CONTROL. |
| HWP-1 | ARMSTRONG | 4030 | BASE MOUNTED, END SUCTION PUMP | 390 GPM @ 125' HD, 20 HP | N/A | HOT WATER, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 13 YEARS | MAIN HWP PUMP STAND-BY-CONSTANT SPEED |
| HWP-2 | ARMSTRONG | 4030 | BASE MOUNTED, END SUCTION PUMP | 390 GPM @ 125' HD, 20 HP | N/A | HOT WATER, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 13 YEARS | STAND-BY PUMP-CONSTANT SPEED |
| HWP-1 | BALDOR | M2515T | ODP, 256-T FRAME | 20 HP, 1760 RPM, 230/460/60/3 | 91% | HOT WATER, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 11 YEARS | MATCHED W/ HWP-1 PUMP |
| HWP-2 | BALDOR | M2515T | ODP, 256-T FRAME | 20 HP, 1760 RPM, 230/460/60/3 | 91% | HOT WATER, ENTIRE BUILDING | CENTRAL PLANT - SOUTHEAST SIDE | 11 YEARS | MATCHED W/ HWP-2 PUMP |
| P-1 | MARATHON | 8VH182TTDR-5337 | IN-LINE MTD. PUMP-CONSTANT SPEED | 140 GPM @ 36' HD, 3 HP. 1730 RPM | N/A | BOILER B-1 | CENTRAL PLANT - SOUTHEAST SIDE | 3 YEARS | BOILER CIRCULATING PUMP w/ RAYPAK BOILER. |
| P-2 | MARATHON | 8VH182TTDR-5337 | IN-LINE MTD. PUMP-CONSTANT SPEED | 140 GPM @ 36' HD, 3 HP. 1730 RPM | N/A | BOILERS B-2 | CENTRAL PLANT - SOUTHEAST SIDE | 3 YEARS | BOILER CIRCULATING PUMP w/ RAYPAK BOILER. |
| P-3 | MARATHON | 8VH182TTDR 5337 | IN-LINE MTD. PUMP-CONSTANT SPEED | 140 GPM @ 36' HD, 3 HP. 1730 RPM | N/A | BOILERS B-3 | CENTRAL PLANT - SOUTHEAST SIDE | 3 YEARS | BOILER CIRCULATING PUMP w/ RAYPAK BOILER. |
| KITCHEN DHW-#1 | PVI-TURBO GAS | 500P-175A-TP | DOMESTIC WATER HEATER W/ STORAGE TANK | 399 MBH INPUT, 175 GAL, 500 GAL/HR RECOVERY. | 83% | KITCHEN HOT WATER | CENTRAL PLANT - SOUTHEAST SIDE | 13 YEARS | HI-EFFICIENCY, TURBO GAS, PACKAGED HOT WATER HEATER, POLYSHIELD, 140 F SETPOINT |
| BUILDING DHW-#2 | PVI-TURBO GAS | 500P-250A-TP | DOMESTIC WATER HEATER W/ STORAGE TANK | 399 MBH INPUT, 250 GAL, 500 GAL/HR RECOVERY | 83% | BUILDING DOMESTIC HOT WATER | CENTRAL PLANT - SOUTHEAST SIDE | 13 YEARS | HI-EFFICIENCY, TURBO GAS, PACKAGED HOT WATER HEATER, POLYSHIELD, 120 F SETPOINT |

| | Existing Fixtures | | | | | | | | | Proposed Fixtures | | | | | | | | | | Fixtures Retrofitted | | | Unit Installation Cost | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Existing Lighting Fixture Type | Room Number | Room Name | Lighting Fixture Description | Lamps per Fixture | Foot Candles | Voltage | Watts | Qty of Fixtures | Total Watts | New Lighting Fixture Type | Existing/Replace | Description | Lamps per Fixture | Foot Candles | Watts | Qty of Fixtures | Total Watts | Wattage Reduction | Average Burn Hours | Ave $/kwh | Energy Savings, kWh | Energy Savings, $ | Qty | Material Each | Labor Each | Total Each | Total Materials | Total Labor | Total All | Rebate Estimate | Simple Payback |
| **First Floor** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **N** | 100 | VESTIBULE | 6L-T8-25w | 6 | | 277 | 150 | 2 | 300 | Retro N | Existing to Remain | Existing to Remain | 6 | | 150 | 2 | 300 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **C** | 101 | ENTRY | 4L-150W-MH | 4 | | 277 | 720 | 1 | 720 | Retro C | Existing to Remain | Existing to Remain | 4 | | 720 | 1 | 720 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **A** | 102 | MAIN OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 8 | 912 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 8 | 672 | 240 | 2470 | $0.16 | 593 | $94.85 | 8 | 25.44 | 60 | $85.44 | $203.52 | $480.00 | $683.52 | $0.00 | 7.2 |
| **A** | 103 | WORK ROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 3 | 342 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 3 | 252 | 90 | 2470 | $0.16 | 222 | $35.57 | 3 | 25.44 | 60 | $85.44 | $76.32 | $180.00 | $256.32 | $0.00 | 7.2 |
| **A** | 104 | GENERAL OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 3 | 342 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 3 | 252 | 90 | 2470 | $0.16 | 222 | $35.57 | 3 | 25.44 | 60 | $85.44 | $76.32 | $180.00 | $256.32 | $0.00 | 7.2 |
| **A** | 105 | GENERAL OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 3 | 342 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 3 | 252 | 90 | 2470 | $0.16 | 222 | $35.57 | 3 | 25.44 | 60 | $85.44 | $76.32 | $180.00 | $256.32 | $0.00 | 7.2 |
| **A2** | 106 | PASSAGE | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 5 | 295 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 5 | 210 | 85 | 2470 | $0.16 | 210 | $33.59 | 5 | 22.28 | 60 | $82.28 | $111.40 | $300.00 | $411.40 | $0.00 | 12.2 |
| **A** | 107 | PRINCIPAL OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 3 | 342 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 3 | 252 | 90 | 2470 | $0.16 | 222 | $35.57 | 3 | 25.44 | 60 | $85.44 | $76.32 | $180.00 | $256.32 | $0.00 | 7.2 |
| **A1** | 108 | CONFERENCE ROOM | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 6 | 522 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 6 | 378 | 144 | 2470 | $0.16 | 356 | $56.91 | 6 | 23.93 | 60 | $83.93 | $143.58 | $360.00 | $503.58 | $0.00 | 8.8 |
| **A** | 109 | GENERAL OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 3 | 342 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 3 | 252 | 90 | 2470 | $0.16 | 222 | $35.57 | 3 | 25.44 | 60 | $85.44 | $76.32 | $180.00 | $256.32 | $0.00 | 7.2 |
| **A** | 110 | GENERAL OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 3 | 342 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 3 | 252 | 90 | 2470 | $0.16 | 222 | $35.57 | 3 | 25.44 | 60 | $85.44 | $76.32 | $180.00 | $256.32 | $0.00 | 7.2 |
| **A2** | 111 | PASSAGE | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A2** | 112 | TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **B** | 113 | STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A2** | 114 | CORRIDOR | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 11 | 649 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 11 | 462 | 187 | 2470 | $0.16 | 462 | $73.90 | 11 | 22.28 | 60 | $82.28 | $245.08 | $660.00 | $905.08 | $0.00 | 12.2 |
| **D** | 114 | CORRIDOR | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 1 | 52 | Retro D | Existing to Remain | Existing to Remain | 2 | | 52 | 1 | 52 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **F** | 114 | CORRIDOR | 2L-CFL-13w pin-base | 2 | | 120/277 | 26 | 40 | 1040 | Retro F | Existing to Remain | Existing to Remain | 2 | | 26 | 40 | 1040 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **F1** | 114 | CORRIDOR | 2L-CFL-13w pin-base | 2 | | 120/277 | 26 | 19 | 494 | Retro F1 | Existing to Remain | Existing to Remain | 2 | | 26 | 19 | 494 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **H** | 114 | CORRIDOR | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 40 | 2360 | Retro H | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 63 | 40 | 2520 | -160 | 2470 | $0.16 | (395) | -$63.23 | 40 | 23.93 | 60 | $83.93 | $957.20 | $2,400.00 | $3,357.20 | $0.00 | -53.1 |
| **N** | 115 | VESTIBULE | 6L-T8-25w | 6 | | 277 | 150 | 2 | 300 | Retro N | Existing to Remain | Existing to Remain | 6 | | 150 | 2 | 300 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **C1** | 116 | ENTRY | 2L-175W-MH | 2 | | 277 | 420 | 1 | 420 | Retro C1 | Existing to Remain | Existing to Remain | 2 | | 420 | 1 | 420 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **G** | 117 | GYMNASIUM | 1L-250W-MH & 1L-150W-QUARTZ | 2 | | 120/277 | 288 | 12 | 3456 | Retro G | Replace fixture | 4-54w T5HO lamps with acrylic lens and wire guard | 4 | | 216 | 12 | 2592 | 864 | 2470 | $0.16 | 2,134 | $341.45 | 12 | 180 | 75 | $255.00 | $2,160.00 | $900.00 | $3,060.00 | $540.00 | 7.4 |
| **G1** | 117 | GYMNASIUM | 1L-250W-MH | 1 | | 277 | 288 | 12 | 3456 | Retro G1 | Replace fixture | 4-54w T5HO lamps with acrylic lens and wire guard | 4 | | 216 | 12 | 2592 | 864 | 2470 | $0.16 | 2,134 | $341.45 | 12 | 180 | 75 | $255.00 | $2,160.00 | $900.00 | $3,060.00 | $540.00 | 7.4 |
| **B** | 118 | GYMNASIUM STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| **B** | 119 | GYMNASIUM STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| **A1** | 120 | GYMNASIUM OFFICE | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 2 | 174 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 2 | 126 | 48 | 2470 | $0.16 | 119 | $18.97 | 2 | 23.93 | 60 | $83.93 | $47.86 | $120.00 | $167.86 | $0.00 | 8.8 |
| **B** | 121 | GYMNASIUM STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 4 | 236 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 4 | 168 | 68 | 2470 | $0.16 | 168 | $26.87 | 4 | 22.28 | 60 | $82.28 | $89.12 | $240.00 | $329.12 | $0.00 | 12.2 |
| **B** | 122 | MECHANICAL RM | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| **A2** | 123 | CORRIDOR | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 6 | 354 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 6 | 252 | 102 | 2470 | $0.16 | 252 | $40.31 | 6 | 22.28 | 60 | $82.28 | $133.68 | $360.00 | $493.68 | $0.00 | 12.2 |
| **F** | 123 | CORRIDOR | 2L-CFL-13w pin-base | 2 | | 120/277 | 26 | 14 | 364 | Retro F | Existing to Remain | Existing to Remain | 2 | | 26 | 14 | 364 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **F1** | 123 | CORRIDOR | 2L-CFL-13w pin-base | 2 | | 120/277 | 26 | 8 | 208 | Retro F1 | Existing to Remain | Existing to Remain | 2 | | 26 | 8 | 208 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **H** | 123 | CORRIDOR | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 22 | 1298 | Retro H | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 63 | 22 | 1386 | -88 | 2470 | $0.16 | (217) | -$34.78 | 22 | 23.93 | 60 | $83.93 | $526.46 | $1,320.00 | $1,846.46 | $0.00 | -53.1 |
| **B** | 124 | CHAIR STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 6 | 354 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 6 | 252 | 102 | 2470 | $0.16 | 252 | $40.31 | 6 | 22.28 | 60 | $82.28 | $133.68 | $360.00 | $493.68 | $0.00 | 12.2 |
| **A2** | 125 | GIRL'S TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| **A2** | 126 | BOY'S TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| **B** | 127 | JANITOR CL | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |

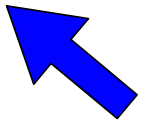
| | Existing Fixtures | | | | | | | | | Proposed Fixtures | | | | | | | | | | Fixtures Retrofitted | | | Unit Installation Cost | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Existing Lighting Fixture Type | Room Number | Room Name | Lighting Fixture Description | Lamps per Fixture | Foot Candles | Voltage | Watts | Qty of Fixtures | Total Watts | New Lighting Fixture Type | Existing/Replace | Description | Lamps per Fixture | Foot Candles | Watts | Qty of Fixtures | Total Watts | Wattage Reduction | Average Burn Hours | Ave $/kwh | Energy Savings, kWh | Energy Savings, $ | Qty | Material Each | Labor Each | Total Each | Total Materials | Total Labor | Total All | Rebate Estimate | Simple Payback |
| B | 128 | MECHANICAL RM | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 12 | 708 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 12 | 504 | 204 | 2470 | $0.16 | 504 | $80.62 | 12 | 22.28 | 60 | $82.28 | $267.36 | $720.00 | $987.36 | $0.00 | 12.2 |
| B | 129 | ELECTRICAL RM | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 4 | 236 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 4 | 168 | 68 | 2470 | $0.16 | 168 | $26.87 | 4 | 22.28 | 60 | $82.28 | $89.12 | $240.00 | $329.12 | $0.00 | 12.2 |
| A | 130 | KITCHEN | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| A2 | 131 | PANTRY | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| A | 134 | OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 1 | 114 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 1 | 84 | 30 | 2470 | $0.16 | 74 | $11.86 | 1 | 25.44 | 60 | $85.44 | $25.44 | $60.00 | $85.44 | $0.00 | 7.2 |
| B | 135 | JANITOR CL | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A2 | 136 | PASSAGE | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 6 | 354 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 6 | 252 | 102 | 2470 | $0.16 | 252 | $40.31 | 6 | 22.28 | 60 | $82.28 | $133.68 | $360.00 | $493.68 | $0.00 | 12.2 |
| A2 | 137 | TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A2 | 138 | LOCKERS | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A2 | 139 | RECEIVING/STORAGE | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 6 | 354 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 6 | 252 | 102 | 2470 | $0.16 | 252 | $40.31 | 6 | 22.28 | 60 | $82.28 | $133.68 | $360.00 | $493.68 | $0.00 | 12.2 |
| A1 | 140 | CAFETORIUM | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 48 | 4176 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 48 | 3024 | 1152 | 2470 | $0.16 | 2,845 | $455.27 | 48 | 23.93 | 60 | $83.93 | $1,148.64 | $2,880.00 | $4,028.64 | $0.00 | 8.8 |
| D | 140 | CAFETORIUM | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 5 | 260 | Retro D | Existing to Remain | Existing to Remain | 2 | | 52 | 5 | 260 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| R | 140 | CAFETORIUM | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 8 | 416 | Retro R | Existing to Remain | Existing to Remain | 2 | | 52 | 8 | 416 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| B | 141 | STAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 28 | 1652 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 28 | 1176 | 476 | 2470 | $0.16 | 1,176 | $188.12 | 28 | 22.28 | 60 | $82.28 | $623.84 | $1,680.00 | $2,303.84 | $0.00 | 12.2 |
| J | 142 | ART CLASSROOM | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 28 | 2436 | Retro J | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 28 | 1764 | 672 | 2470 | $0.16 | 1,660 | $265.57 | 28 | 23.93 | 60 | $83.93 | $670.04 | $1,680.00 | $2,350.04 | $0.00 | 8.8 |
| B | 143 | STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| B | 144 | STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| A | 145 | MUSIC CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 20 | 2280 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 20 | 1680 | 600 | 2470 | $0.16 | 1,482 | $237.12 | 20 | 25.44 | 60 | $85.44 | $508.80 | $1,200.00 | $1,708.80 | $0.00 | 7.2 |
| A2 | 200 | CORRIDOR | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 15 | 885 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 15 | 630 | 255 | 2470 | $0.16 | 630 | $100.78 | 15 | 22.28 | 60 | $82.28 | $334.20 | $900.00 | $1,234.20 | $0.00 | 12.2 |
| D | 200 | CORRIDOR | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 6 | 312 | Retro D | Existing to Remain | Existing to Remain | 2 | | 52 | 6 | 312 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| D | 201 | MEDIA CENTER | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 59 | 3068 | Retro D | Existing to Remain | Existing to Remain | 2 | | 52 | 59 | 3068 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| D1 | 201 | MEDIA CENTER | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 21 | 1092 | Retro D1 | Existing to Remain | Existing to Remain | 2 | | 52 | 21 | 1092 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| H | 201 | MEDIA CENTER | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 20 | 1180 | Retro H | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 63 | 20 | 1260 | -80 | 2470 | $0.16 | (198) | -$31.62 | 20 | 23.93 | 60 | $83.93 | $478.60 | $1,200.00 | $1,678.60 | $0.00 | -53.1 |
| T | 201 | MEDIA CENTER | 3L-T8-32w | 3 | | 120/277 | 87 | 36 | 3132 | Retro T | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 36 | 2268 | 864 | 2470 | $0.16 | 2,134 | $341.45 | 36 | 23.93 | 60 | $83.93 | $861.48 | $2,160.00 | $3,021.48 | $0.00 | 8.8 |
| P | 201 | MEDIA CENTER | 9L-T8-32w | 9 | | 277 | 320 | 4 | 1280 | Retro P | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 9 | | 189 | 4 | 756 | 524 | 2470 | $0.16 | 1,294 | $207.08 | 4 | 32.99 | 60 | $92.99 | $131.96 | $240.00 | $371.96 | $0.00 | 1.8 |
| C2 | 201 | MEDIA CENTER | 4L-175W-MH | 4 | | 277 | 840 | 1 | 840 | Retro C2 | Existing to Remain | Existing to Remain | 4 | | 840 | 1 | 840 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| A1 | 202 | WORK ROOM | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 4 | 348 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 4 | 252 | 96 | 2470 | $0.16 | 237 | $37.94 | 4 | 23.93 | 60 | $83.93 | $95.72 | $240.00 | $335.72 | $0.00 | 8.8 |
| A2 | 203 | MEDIA STORAGE | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| B1 | 204 | HEAD END ROOM | 4L-T8-32w-1'x4' | 4 | | 120/277 | 114 | 4 | 456 | Retro B1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 4 | 336 | 120 | 2470 | $0.16 | 296 | $47.42 | 4 | 25.44 | 60 | $85.44 | $101.76 | $240.00 | $341.76 | $0.00 | 7.2 |
| A | 205 | OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 2 | 228 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 2 | 168 | 60 | 2470 | $0.16 | 148 | $23.71 | 2 | 25.44 | 60 | $85.44 | $50.88 | $120.00 | $170.88 | $0.00 | 7.2 |
| T | 206 | COMPUTER LAB | 3L-T8-32w | 3 | | 120/277 | 87 | 19 | 1653 | Retro T | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 19 | 1197 | 456 | 2470 | $0.16 | 1,126 | $180.21 | 19 | 23.93 | 60 | $83.93 | $454.67 | $1,140.00 | $1,594.67 | $0.00 | 8.8 |
| A | 207 | SMALL GROUP | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 6 | 684 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 6 | 504 | 180 | 2470 | $0.16 | 445 | $71.14 | 6 | 25.44 | 60 | $85.44 | $152.64 | $360.00 | $512.64 | $0.00 | 7.2 |
| A | 208 | KINDERGARTEN CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| A2 | 208 | KINDERGARTEN CLASSROOM | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |

| | Existing Fixtures | | | | | | | | | Proposed Fixtures | | | | | | | | | | | Fixtures Retrofitted | | | Unit Installation Cost | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Existing Lighting Fixture Type | Room Number | Room Name | Lighting Fixture Description | Lamps per Fixture | Foot Candles | Voltage | Watts | Qty of Fixtures | Total Watts | New Lighting Fixture Type | Existing/Replace | Description | Lamps per Fixture | Foot Candles | Watts | Qty of Fixtures | Total Watts | Wattage Reduction | Average Burn Hours | Ave $/kwh | Energy Savings, kWh | Energy Savings, $ | Qty | Material Each | Labor Each | Total Each | Total Materials | Total Labor | Total All | Rebate Estimate | Simple Payback |
| **B1** | 211 | COMM RM | 4L-T8-32w-1'x4' | 4 | | 120/277 | 114 | 3 | 342 | Retro B1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 3 | 252 | 90 | 2470 | $0.16 | 222 | $35.57 | 3 | 25.44 | 60 | $85.44 | $76.32 | $180.00 | $256.32 | $0.00 | 7.2 |
| **A1** | 212 | PRE-SCHOOL CLASSROOM | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 16 | 1392 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 16 | 1008 | 384 | 2470 | $0.16 | 948 | $151.76 | 16 | 23.93 | 60 | $83.93 | $382.88 | $960.00 | $1,342.88 | $0.00 | 8.8 |
| **A2** | 212 | PRE-SCHOOL CLASSROOM | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| **A1** | 217 | PRE-SCHOOL CLASSROOM | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 16 | 1392 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 16 | 1008 | 384 | 2470 | $0.16 | 948 | $151.76 | 16 | 23.93 | 60 | $83.93 | $382.88 | $960.00 | $1,342.88 | $0.00 | 8.8 |
| **A2** | 217 | PRE-SCHOOL CLASSROOM | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| **A** | 218 | SMALL GROUP | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 6 | 684 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 6 | 504 | 180 | 2470 | $0.16 | 445 | $71.14 | 6 | 25.44 | 60 | $85.44 | $152.64 | $360.00 | $512.64 | $0.00 | 7.2 |
| **A** | 219 | SMALL GROUP | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 6 | 684 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 6 | 504 | 180 | 2470 | $0.16 | 445 | $71.14 | 6 | 25.44 | 60 | $85.44 | $152.64 | $360.00 | $512.64 | $0.00 | 7.2 |
| **B** | 220 | STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| **A2** | 221 | CORRIDOR | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 15 | 885 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 15 | 630 | 255 | 2470 | $0.16 | 630 | $100.78 | 15 | 22.28 | 60 | $82.28 | $334.20 | $900.00 | $1,234.20 | $0.00 | 12.2 |
| **D** | 221 | CORRIDOR | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 10 | 520 | Retro D | Existing to Remain | Existing to Remain | 2 | | 52 | 10 | 520 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **A2** | 223 | WOMEN | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A2** | 224 | MEN | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **B** | 225 | JANITOR CL | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A1** | 226 | WAITING RM | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 2 | 174 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 2 | 126 | 48 | 2470 | $0.16 | 119 | $18.97 | 2 | 23.93 | 60 | $83.93 | $47.86 | $120.00 | $167.86 | $0.00 | 8.8 |
| **A** | 227 | HEALTH SUITE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 2 | 228 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 2 | 168 | 60 | 2470 | $0.16 | 148 | $23.71 | 2 | 25.44 | 60 | $85.44 | $50.88 | $120.00 | $170.88 | $0.00 | 7.2 |
| **A2** | 227 | HEALTH SUITE | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| **A1** | 227 | HEALTH SUITE | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 2 | 174 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 2 | 126 | 48 | 2470 | $0.16 | 119 | $18.97 | 2 | 23.93 | 60 | $83.93 | $47.86 | $120.00 | $167.86 | $0.00 | 8.8 |
| **A** | 228 | NURSE'S OFFICE | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 2 | 228 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 2 | 168 | 60 | 2470 | $0.16 | 148 | $23.71 | 2 | 25.44 | 60 | $85.44 | $50.88 | $120.00 | $170.88 | $0.00 | 7.2 |
| **A2** | 229 | TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 231 | KINDERGARTEN CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| **A2** | 231 | KINDERGARTEN CLASSROOM | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| **A** | 236 | KINDERGARTEN CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| **A2** | 236 | KINDERGARTEN CLASSROOM | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| **A** | 237 | KINDERGARTEN CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| **A2** | 237 | KINDERGARTEN CLASSROOM | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| **A** | 242 | KINDERGARTEN CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| **A2** | 242 | KINDERGARTEN CLASSROOM | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| **C** | 242 | ENTRY | 4L-150W-MH | 4 | | 277 | 720 | 1 | 720 | Retro C | Existing to Remain | Existing to Remain | 4 | | 720 | 1 | 720 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **A** | 300 | 1ST GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| **A2** | 301 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A2** | 302 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **B** | 303 | STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |

| | Existing Fixtures | | | | | | | | | Proposed Fixtures | | | | | | | | | | | Fixtures Retrofitted | | | Unit Installation Cost | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Existing Lighting Fixture Type | Room Number | Room Name | Lighting Fixture Description | Lamps per Fixture | Foot Candles | Voltage | Watts | Qty of Fixtures | Total Watts | New Lighting Fixture Type | Existing/Replace | Description | Lamps per Fixture | Foot Candles | Watts | Qty of Fixtures | Total Watts | Wattage Reduction | Average Burn Hours | Ave $/kwh | Energy Savings, kWh | Energy Savings, $ | Qty | Material Each | Labor Each | Total Each | Total Materials | Total Labor | Total All | Rebate Estimate | Simple Payback |
| A | 304 | 1ST GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| A | 305 | 1ST GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| A2 | 306 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| B | 307 | ELECTRICAL RM | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| B | 308 | STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 2 | 118 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 2 | 84 | 34 | 2470 | $0.16 | 84 | $13.44 | 2 | 22.28 | 60 | $82.28 | $44.56 | $120.00 | $164.56 | $0.00 | 12.2 |
| A2 | 309 | CORRIDOR | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 15 | 885 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 15 | 630 | 255 | 2470 | $0.16 | 630 | $100.78 | 15 | 22.28 | 60 | $82.28 | $334.20 | $900.00 | $1,234.20 | $0.00 | 12.2 |
| D | 309 | CORRIDOR | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 8 | 416 | Retro D | Existing to Remain | Existing to Remain | 2 | | 52 | 8 | 416 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| A | 310 | 1ST GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| A2 | 311 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A2 | 312 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| B | 313 | STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| A | 314 | 1ST GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 12 | 1368 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 12 | 1008 | 360 | 2470 | $0.16 | 889 | $142.27 | 12 | 25.44 | 60 | $85.44 | $305.28 | $720.00 | $1,025.28 | $0.00 | 7.2 |
| A | 315 | 2ND GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| A2 | 316 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A | 317 | SMALL GROUP | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 8 | 912 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 8 | 672 | 240 | 2470 | $0.16 | 593 | $94.85 | 8 | 25.44 | 60 | $85.44 | $203.52 | $480.00 | $683.52 | $0.00 | 7.2 |
| A | 318 | 2ND GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| A2 | 319 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A | 320 | 2ND GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| A2 | 321 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A | 322 | 2ND GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| A2 | 323 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A | 324 | 3RD GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| A2 | 325 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A | 326 | 3RD GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| A2 | 327 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A2 | 328 | CORRIDOR | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 28 | 1652 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 28 | 1176 | 476 | 2470 | $0.16 | 1,176 | $188.12 | 28 | 22.28 | 60 | $82.28 | $623.84 | $1,680.00 | $2,303.84 | $0.00 | 12.2 |
| D | 328 | CORRIDOR | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 16 | 832 | Retro D | Existing to Remain | Existing to Remain | 2 | | 52 | 16 | 832 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| A2 | 329 | GIRL'S TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| B | 330 | JANITOR CL | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| A2 | 331 | BOY'S TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| B1 | 332 | COMMUNICATION RM | 4L-T8-32w-1'x4' | 4 | | 120/277 | 114 | 2 | 228 | Retro B1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 2 | 168 | 60 | 2470 | $0.16 | 148 | $23.71 | 2 | 25.44 | 60 | $85.44 | $50.88 | $120.00 | $170.88 | $0.00 | 7.2 |
| A | 333 | SMALL GROUP | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 8 | 912 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 8 | 672 | 240 | 2470 | $0.16 | 593 | $94.85 | 8 | 25.44 | 60 | $85.44 | $203.52 | $480.00 | $683.52 | $0.00 | 7.2 |

| | Existing Fixtures | | | | | | | | | Proposed Fixtures | | | | | | | | | | Fixtures Retrofitted | | | Unit Installation Cost | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Existing Lighting Fixture Type | Room Number | Room Name | Lighting Fixture Description | Lamps per Fixture | Foot Candles | Voltage | Watts | Qty of Fixtures | Total Watts | New Lighting Fixture Type | Existing/Replace | Description | Lamps per Fixture | Foot Candles | Watts | Qty of Fixtures | Total Watts | Wattage Reduction | Average Burn Hours | Ave $/kwh | Energy Savings, kWh | Energy Savings, $ | Qty | Material Each | Labor Each | Total Each | Total Materials | Total Labor | Total All | Rebate Estimate | Simple Payback |
| **A** | 334 | 3RD GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 335 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 336 | 3RD GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 337 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 400 | 4TH GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 401 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 402 | 4TH GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 403 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 404 | 4TH GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 405 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 406 | 4TH GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 407 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 408 | 5TH GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 409 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 410 | 5TH GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 411 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 412 | 5TH GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 413 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A** | 414 | 5TH GRADE CLASSROOM | 4L-T8-32w-2'x4' | 4 | | 120/277 | 114 | 13 | 1482 | Retro A | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 4 | | 84 | 13 | 1092 | 390 | 2470 | $0.16 | 963 | $154.13 | 13 | 25.44 | 60 | $85.44 | $330.72 | $780.00 | $1,110.72 | $0.00 | 7.2 |
| **A2** | 415 | CLOSET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A2** | 416 | GIRL'S TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| **A2** | 417 | BOY'S TOILET | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 3 | 177 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 3 | 126 | 51 | 2470 | $0.16 | 126 | $20.16 | 3 | 22.28 | 60 | $82.28 | $66.84 | $180.00 | $246.84 | $0.00 | 12.2 |
| **B** | 418 | STORAGE | 2L-T8-32w-1'x4' | 2 | | 120/277 | 59 | 6 | 354 | Retro B | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 6 | 252 | 102 | 2470 | $0.16 | 252 | $40.31 | 6 | 22.28 | 60 | $82.28 | $133.68 | $360.00 | $493.68 | $0.00 | 12.2 |
| **A2** | 419 | MEN | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **A2** | 420 | WOMEN | 2L-T8-32w-2'x4' | 2 | | 120/277 | 59 | 1 | 59 | Retro A2 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 2 | | 42 | 1 | 42 | 17 | 2470 | $0.16 | 42 | $6.72 | 1 | 22.28 | 60 | $82.28 | $22.28 | $60.00 | $82.28 | $0.00 | 12.2 |
| **D** | 421 | FACULTY DINING | 2L-CFL-26w pin-base | 2 | | 120/277 | 52 | 3 | 156 | Retro D | Existing to Remain | Existing to Remain | 2 | | 52 | 3 | 156 | 0 | 2470 | $0.16 | 0 | $0.00 | 0 | 0 | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| **A1** | 421 | FACULTY DINING | 3L-T8-32w-2'x4' | 3 | | 120/277 | 87 | 10 | 870 | Retro A1 | Relamp, Reballast | 28w-T8 energy saver w/ electronic T8 High Efficiency ballast | 3 | | 63 | 10 | 630 | 240 | 2470 | $0.16 | 593 | $94.85 | 10 | 23.93 | 60 | $83.93 | $239.30 | $600.00 | $839.30 | $0.00 | 8.8 |
| | | | | | | | | | | | | | | | | | | | 2470 | $0.16 | | | 0 | | | | | | | | |
| **Total First Floor** | | | | | | | | **1228** | **107460** | | | | | | | **1228** | **83381** | **24079** | | | **59,475** | **$9,516.02** | **1002** | | | | **$27,978** | **$60,480** | **$88,458** | **$1,080** | **9.2** |

| Building | Roof Area (sq ft) | Panel | Qty | Panel Sq Ft | Panel Total Sq Ft | Total KW | Total Annual kWh | Panel Weight (33 lbs) | W/SQFT |
|---|---|---|---|---|---|---|---|---|---|
| Brooks Crossing Elementary School | 49,050 | Sunpower SPR305-WHT | 1313 | 19.3 | 25,304 | 400 | 626,898 | 43,329 | 15.83 |



NORTH

Brooks Crossing Elementary –Main Campus

**Brooks Crossing Elementary Main Campus - PV Solar Financials**
**Self Financed 90%-20 Year Term-5.0% Interest Rate**

| | | | | | |
|---|---|---|---|---|---|
| Total Project Cost | $3,203,720 | System Size (kW) | 400 | Tax Rate | 0.0% |
| | | Utility Rate ($/kWh) | $0.1600 | | |
| Net Project Cost | $3,203,720 | Utility Rate Inflation | 3.00% | | |
| Percent Financed | **90%** | REC Value ($/kWh) | $0.350 | | |
| Capital Outlay | $320,372 | Term (years) | **20** | | |
| Financing Principal | $2,883,348 | Rate | **5.0%** | | |

| Year | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solar Generation (kWh) | | 626,898 | 623,764 | 620,645 | 617,541 | 614,454 | 611,381 | 608,325 | 605,283 | 602,257 | 599,245 | 596,249 | 593,268 |
| Utility Rate per kWh | | $0.160 | $0.165 | $0.170 | $0.175 | $0.180 | $0.185 | $0.191 | $0.197 | $0.203 | $0.209 | $0.215 | $0.221 |
| Federal Tax Credit | | $0 | | | | | | | | | | | |
| Cash effect of depreciation | | $0 | $0 | $0 | $0 | $0 | $0 | | | | | | |
| Avoided Utility Pmnt (from Solar Generation) | | $100,304 | $102,796 | $105,351 | $107,969 | $110,652 | $113,401 | $116,219 | $119,107 | $122,067 | $125,101 | $128,209 | $131,395 |
| Revenue from REC Sale | | $219,414 | $218,317 | $217,226 | $216,140 | $215,059 | $213,984 | $212,914 | $211,849 | $210,790 | $209,736 | $208,687 | $207,644 |
| Subtotal | | $319,718 | $321,113 | $322,576 | $324,108 | $325,711 | $327,385 | $329,133 | $330,957 | $332,857 | $334,837 | $336,897 | $339,039 |
| Finance payment | | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) |
| Interest expense | | ($144,167) | ($139,807) | ($135,229) | ($130,423) | ($125,375) | ($120,076) | ($114,511) | ($108,668) | ($102,533) | ($96,092) | ($89,328) | ($82,226) |
| Operations & Maintenance | | $0 | $0 | $0 | $0 | $0 | $3,057 | $3,179 | $3,306 | $3,439 | $3,576 | $3,719 | $3,868 |
| Subtotal | | ($144,167) | ($139,807) | ($135,229) | ($130,423) | ($125,375) | ($117,019) | ($111,332) | ($105,362) | ($99,095) | ($92,515) | ($85,609) | ($78,358) |
| Net Savings | | $175,551 | $181,306 | $187,347 | $193,686 | $200,335 | $210,366 | $217,801 | $225,595 | $233,762 | $242,321 | $251,288 | $260,681 |
| Taxes on net savings (no tax on principle payment) | | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Net savings after taxes | | $175,551 | $181,306 | $187,347 | $193,686 | $200,335 | $210,366 | $217,801 | $225,595 | $233,762 | $242,321 | $251,288 | $260,681 |
| Principal Payment | | ($87,200) | ($91,560) | ($96,138) | ($100,945) | ($105,992) | ($111,292) | ($116,856) | ($122,699) | ($128,834) | ($135,276) | ($142,039) | ($149,141) |
| Net Cash Flow After Taxes | ($320,372) | $88,351 | $89,746 | $91,209 | $92,741 | $94,343 | $99,075 | $100,945 | $102,896 | $104,928 | $107,045 | $109,248 | $111,540 |
| Cumulative savings before taxes | | $175,551 | $356,857 | $544,204 | $737,889 | $938,224 | $1,148,591 | $1,366,392 | $1,591,986 | $1,825,749 | $2,068,070 | $2,319,358 | $2,580,039 |

| Year | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solar Generation (kWh) | 590,301 | 587,350 | 584,413 | 581,491 | 578,584 | 575,691 | 572,812 | 569,948 | 567,099 | 564,263 | 561,442 | 558,634 | 555,841 |
| Utility Rate per kWh | $0.228 | $0.235 | $0.242 | $0.249 | $0.257 | $0.264 | $0.272 | $0.281 | $0.289 | $0.298 | $0.307 | $0.316 | $0.325 |
| Federal Tax Credit | | | | | | | | | | | | | |
| Subtotal | | | | | | | | | | | | | |
| Avoided Utility Pmnt (from Solar Generation) | $134,661 | $138,007 | $141,436 | $144,951 | $148,553 | $152,245 | $156,028 | $159,905 | $163,879 | $167,951 | $172,125 | $176,402 | $180,786 |
| Revenue from REC sale | $206,606 | $205,572 | $204,545 | $203,522 | $202,504 | $201,492 | $200,484 | $199,482 | $198,484 | $197,492 | $196,505 | $195,522 | $194,544 |
| Subtotal | $341,266 | $343,579 | $345,981 | $348,473 | $351,057 | $353,736 | $356,512 | $359,387 | $362,363 | $365,443 | $368,629 | $371,924 | $375,330 |
| Finance payment | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | ($231,367) | $0 | $0 | $0 | $0 | $0 |
| Interest expense | ($74,769) | ($66,939) | ($58,717) | ($50,085) | ($41,021) | ($31,504) | ($21,510) | ($11,017) | $0 | $0 | $0 | $0 | $0 |
| Operations & Maintenance | $4,023 | $4,184 | $4,351 | $4,525 | $4,706 | $4,894 | $5,090 | $5,294 | $5,505 | $5,726 | $5,955 | $6,193 | $6,440 |
| Subtotal | ($70,746) | ($62,755) | ($54,367) | ($45,560) | ($36,315) | ($26,609) | ($16,420) | ($5,724) | $5,505 | $5,726 | $5,955 | $6,193 | $6,440 |
| Net Savings | $270,520 | $280,824 | $291,614 | $302,913 | $314,743 | $327,127 | $340,092 | $353,663 | $367,869 | $371,169 | $374,584 | $378,117 | $381,771 |
| Taxes on net savings (no tax on principle payment) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Net savings after taxes | $270,520 | $280,824 | $291,614 | $302,913 | $314,743 | $327,127 | $340,092 | $353,663 | $367,869 | $371,169 | $374,584 | $378,117 | $381,771 |
| Principal Payment | ($156,598) | ($164,428) | ($172,650) | ($181,282) | ($190,346) | ($199,864) | ($209,857) | ($220,350) | $0 | $0 | $0 | $0 | $0 |
| Net Cash Flow After Taxes | $113,921 | $116,396 | $118,965 | $121,631 | $124,396 | $127,263 | $130,235 | $133,313 | $367,869 | $371,169 | $374,584 | $378,117 | $381,771 |
| Cumulative savings before taxes | $2,850,559 | $3,131,383 | $3,422,997 | $3,725,910 | $4,040,653 | $4,367,780 | $4,707,872 | $5,061,535 | $5,429,404 | $5,800,573 | $6,175,157 | $6,553,274 | $6,935,044 |

| | |
|---|---|
| Internal Rate of Return After Taxes | 30% |
| NPV of After Tax Cash Flows | $937,591 |
| NPV Discount Rate | 8.00% |

These Figures are estimates for discussion only.

**Brooks Crossing Elementary Main Campus - PV Solar Financials**
**Purchase**

| | | | | | |
|---|---|---|---|---|---|
| **Total Project Cost** | **$3,203,720** | **System Size (kW)** | **400** | Tax Rate | 0.0% |
| | | Utility Rate ($/kWh) | $0.1600 | | |
| | | Utility Rate Inflation | 3.00% | | |
| | | REC Value ($/kWh) year 1-25 | $0.350 | | |
| Capital Outlay | $3,203,720 | | | | |

| Year | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solar Generation (kWh) | | 626,898 | 623,764 | 620,645 | 617,541 | 614,454 | 611,381 | 608,325 | 605,283 | 602,257 | 599,245 | 596,249 | 593,268 |
| Utility Rate per kWh | | $0.160 | $0.165 | $0.170 | $0.175 | $0.180 | $0.185 | $0.191 | $0.197 | $0.203 | $0.209 | $0.215 | $0.221 |
| Capital Outlay | ($3,203,720) | | | | | | | | | | | | |
| Tax Credit | | $0 | | | | | | | | | | | |
| Cash effect of depreciation | | $0 | $0 | $0 | $0 | $0 | $0 | | | | | | |
| Avoided Utility Pmnt (from Solar Generation) | | $100,304 | $102,796 | $105,351 | $107,969 | $110,652 | $113,401 | $116,219 | $119,107 | $122,067 | $125,101 | $128,209 | $131,395 |
| Revenue from REC Sale | | $219,414 | $218,317 | $217,226 | $216,140 | $215,059 | $213,984 | $212,914 | $211,849 | $210,790 | $209,736 | $208,687 | $207,644 |
| Subtotal | | $319,718 | $321,113 | $322,576 | $324,108 | $325,711 | $327,385 | $329,133 | $330,957 | $332,857 | $334,837 | $336,897 | $339,039 |
| Operations & Maintenance | | $0 | $0 | $0 | $0 | $0 | $3,057 | $3,179 | $3,306 | $3,439 | $3,576 | $3,719 | $3,868 |
| Subtotal | | $0 | $0 | $0 | $0 | $0 | $3,057 | $3,179 | $3,306 | $3,439 | $3,576 | $3,719 | $3,868 |
| Net Savings | | $319,718 | $321,113 | $322,576 | $324,108 | $325,711 | $330,442 | $332,312 | $334,263 | $336,296 | $338,413 | $340,616 | $342,907 |
| Taxes on net savings | | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Net Savings after taxes | ($3,203,720) | $319,718 | $321,113 | $322,576 | $324,108 | $325,711 | $330,442 | $332,312 | $334,263 | $336,296 | $338,413 | $340,616 | $342,907 |
| Cumulative Savings | $0 | $319,718 | $640,831 | $963,408 | $1,287,516 | $1,613,226 | $1,943,668 | $2,275,981 | $2,610,243 | $2,946,539 | $3,284,952 | $3,625,568 | $3,968,475 |

| Year | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solar Generation (kWh) | 590,301 | 587,350 | 584,413 | 581,491 | 578,584 | 575,691 | 572,812 | 569,948 | 567,099 | 564,263 | 561,442 | 558,634 | 555,841 |
| Utility Rate per kWh | $0.228 | $0.235 | $0.242 | $0.249 | $0.257 | $0.264 | $0.272 | $0.281 | $0.289 | $0.298 | $0.307 | $0.316 | $0.325 |
| Avoided Utility Pmnt (from Solar Generation) | $134,661 | $138,007 | $141,436 | $144,951 | $148,553 | $152,245 | $156,028 | $159,905 | $163,879 | $167,951 | $172,125 | $176,402 | $180,786 |
| Revenue from REC sale | $206,606 | $205,572 | $204,545 | $203,522 | $202,504 | $201,492 | $200,484 | $199,482 | $198,484 | $197,492 | $196,505 | $195,522 | $194,544 |
| Subtotal | $341,266 | $343,579 | $345,981 | $348,473 | $351,057 | $353,736 | $356,512 | $359,387 | $362,363 | $365,443 | $368,629 | $371,924 | $375,330 |
| Operations & Maintenance | $4,023 | $4,184 | $4,351 | $4,525 | $4,706 | $4,894 | $5,090 | $5,294 | $5,505 | $5,726 | $5,955 | $6,193 | $6,440 |
| Subtotal | $4,023 | $4,184 | $4,351 | $4,525 | $4,706 | $4,894 | $5,090 | $5,294 | $5,505 | $5,726 | $5,955 | $6,193 | $6,440 |
| Net Savings | $345,289 | $347,763 | $350,332 | $352,998 | $355,763 | $358,631 | $361,602 | $364,681 | $367,869 | $371,169 | $374,584 | $378,117 | $381,771 |
| Taxes on net savings | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Net savings after taxes | $345,289 | $347,763 | $350,332 | $352,998 | $355,763 | $358,631 | $361,602 | $364,681 | $367,869 | $371,169 | $374,584 | $378,117 | $381,771 |
| Cumulative Savings | $4,313,763 | $4,661,526 | $5,011,858 | $5,364,856 | $5,720,620 | $6,079,250 | $6,440,852 | $6,805,533 | $7,173,402 | $7,544,571 | $7,919,155 | $8,297,272 | $8,679,042 |

| | |
|---|---|
| After Tax IRR | 9.4% |
| NPV of Net Savings After Taxes | $371,156 |
| NPV Discount Rate | 8.00% |

**Brooks Crossing Elementary Main Campus - PV Solar Financials**
**Depreciation Calculations**

| | |
|---|---|
| Project Cost | $3,203,720 |
| NJ BPU Grant | $0 |
| Net Project Cost | $3,203,720 |
| Federal Tax Credit | $0 |
| Federal Depreciation Basis | $0 |
| Federal Tax Rate | 0% |

| Year | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depreciation percentage - Federal | | 20.00% | 32.00% | 19.20% | 11.52% | 11.52% | 5.76% | | | | | | |
| MACRS Depreciation Amount - Federal | | $0 | $0 | $0 | $0 | $0 | $0 | | | | | | |
| Federal Tax Credit | | $0 | | | | | | | | | | | |
| Cash effect of Federal depreciation | | $0 | $0 | $0 | $0 | $0 | $0 | | | | | | |
| Total Annual tax savings on depreciation | | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

These figures are estimates for discussion only. Actual results and depreciation methods may vary.

OMB No. 2060-0347

# STATEMENT OF ENERGY PERFORMANCE
# Brooks Crossing Elementary

**Building ID:** 1749034
**For 12-month Period Ending:** May 31, 2008[1]
**Date SEP becomes ineligible:** N/A
**Date SEP Generated:** May 18, 2009

**Facility**
Brooks Crossing Elementary
50 Deans Rhode Hall Road
Monmouth Junction, NJ 08852

**Facility Owner**
N/A

**Primary Contact for this Facility**
N/A

**Year Built:** 2002
**Gross Floor Area (ft²):** 82,400

**Energy Performance Rating**[2] (1-100) 26

**Site Energy Use Summary**[3]

| | |
|---|---|
| Electricity (kBtu) | 3,881,491 |
| Natural Gas (kBtu)[4] | 3,691,500 |
| Total Energy (kBtu) | 7,572,991 |

**Energy Intensity**[5]

| | |
|---|---|
| Site (kBtu/ft²/yr) | 92 |
| Source (kBtu/ft²/yr) | 204 |

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

| | |
|---|---|
| Greenhouse Gas Emissions ($MtCO_2e$/year) | 787 |

**Electric Distribution Utility**
PSE&G - Public Service Elec & Gas Co

**National Average Comparison**

| | |
|---|---|
| National Average Site EUI | 74 |
| National Average Source EUI | 164 |
| % Difference from National Average Source EUI | 24% |
| Building Type | K-12 School |

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.

**Certifying Professional**
N/A

**Meets Industry Standards**[6] **for Indoor Environmental Conditions:**

| | |
|---|---|
| Ventilation for Acceptable Indoor Air Quality | **N/A** |
| Acceptable Thermal Environmental Conditions | **N/A** |
| Adequate Illumination | **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.

# ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE in double-checking the information that the building owner or operator has entered into Portfolio Manager.

**Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.**
NOTE: You must check each box to indicate that each value is correct, OR include a note.

| CRITERION | VALUE AS ENTERED IN PORTFOLIO MANAGER | VERIFICATION QUESTIONS | NOTES | ☑ |
|---|---|---|---|---|
| **Building Name** | Brooks Crossing Elementary | Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings? | | ☐ |
| **Type** | K-12 School | Is this an accurate description of the space in question? | | ☐ |
| **Location** | 50 Deans Rhode Hall Road, Monmouth Junction, NJ 08852 | Is this address accurate and complete? Correct weather normalization requires an accurate zip code. | | ☐ |
| **Single Structure** | Single Facility | Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building | | ☐ |

Elementary School (K-12 School)

| CRITERION | VALUE AS ENTERED IN PORTFOLIO MANAGER | VERIFICATION QUESTIONS | NOTES | ☑ |
|---|---|---|---|---|
| **Gross Floor Area** | 82,400 Sq. Ft. | Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area. | | ☐ |
| **Open Weekends?** | Yes | Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days. | | ☐ |
| **Number of PCs** | 50 | Is this the number of personal computers in the K12 School? | | ☐ |
| **Number of walk-in refrigeration/freezer units** | 2 | Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas. | | ☐ |
| **Presence of cooking facilities** | Yes | Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no". | | ☐ |
| **Percent Cooled** | 100 % | Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment? | | ☐ |
| **Percent Heated** | 100 % | Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment? | | ☐ |

| | | | | |
|---|---|---|---|---|
| **Months** | 11 (Optional) | Is this school in operation for at least 8 months of the year? | | ☐ |
| **High School?** | No | Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'. | | ☐ |

# ENERGY STAR® Data Checklist for Commercial Buildings

## *Energy Consumption*

***Power Generation Plant or Distribution Utility:*** PSE&G - Public Service Elec & Gas Co

**Fuel Type: Electricity**

**Meter: Electric Meter 1 (kWh)**
**Space(s):** Entire Facility

| Start Date | End Date | Energy Use (kWh) |
|---|---|---|
| 05/01/2008 | 05/31/2008 | 98,400.00 |
| 04/01/2008 | 04/30/2008 | 94,000.00 |
| 03/01/2008 | 03/31/2008 | 76,400.00 |
| 02/01/2008 | 02/29/2008 | 83,600.00 |
| 01/01/2008 | 01/31/2008 | 88,400.00 |
| 12/01/2007 | 12/31/2007 | 76,000.00 |
| 11/01/2007 | 11/30/2007 | 109,800.00 |
| 10/01/2007 | 10/31/2007 | 85,800.00 |
| 09/01/2007 | 09/30/2007 | 120,800.00 |
| 08/01/2007 | 08/31/2007 | 100,000.00 |
| 07/01/2007 | 07/31/2007 | 82,800.00 |
| 06/01/2007 | 06/30/2007 | 121,600.00 |
| **Electric Meter 1 Consumption (kWh)** | | **1,137,600.00** |
| **Electric Meter 1 Consumption (kBtu)** | | **3,881,491.20** |
| **Total Electricity Consumption (kBtu)** | | **3,881,491.20** |
| **Is this the total Electricity consumption at this building including all Electricity meters?** | | ☐ |

**Fuel Type: Natural Gas**

**Meter: Gas Meter 1 (therms)**
**Space(s):** Entire Facility

| Start Date | End Date | Energy Use (therms) |
|---|---|---|
| 05/01/2008 | 05/31/2008 | 1,864.00 |
| 04/01/2008 | 04/30/2008 | 2,624.00 |
| 03/01/2008 | 03/31/2008 | 4,606.00 |
| 02/01/2008 | 02/29/2008 | 7,027.00 |
| 01/01/2008 | 01/31/2008 | 6,953.00 |
| 12/01/2007 | 12/31/2007 | 6,518.00 |
| 11/01/2007 | 11/30/2007 | 4,752.00 |
| 10/01/2007 | 10/31/2007 | 1,150.00 |
| 09/01/2007 | 09/30/2007 | 629.00 |

| | | |
|---|---|---|
| 08/01/2007 | 08/31/2007 | 255.00 |
| 07/01/2007 | 07/31/2007 | 120.00 |
| 06/01/2007 | 06/30/2007 | 417.00 |
| **Gas Meter 1 Consumption (therms)** | | **36,915.00** |
| **Gas Meter 1 Consumption (kBtu)** | | **3,691,500.00** |
| **Total Natural Gas Consumption (kBtu)** | | **3,691,500.00** |
| **Is this the total Natural Gas consumption at this building including all Natural Gas meters?** | | ☐ |

| **Additional Fuels** | |
|---|---|
| Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility. | ☐ |

## Certifying Professional

(When applying for the ENERGY STAR, this must be the same PE that signed and stamped the SEP.)

APPENDIX G
PG. 5 OF 6

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

# FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

**Facility**
Brooks Crossing Elementary
50 Deans Rhode Hall Road
Monmouth Junction, NJ 08852

**Facility Owner**
N/A

**Primary Contact for this Facility**
N/A



## General Information

| Brooks Crossing Elementary | |
|---|---|
| Gross Floor Area Excluding Parking: ($ft^2$) | 82,400 |
| Year Built | 2002 |
| For 12-month Evaluation Period Ending Date: | May 31, 2008 |

## Facility Space Use Summary

| Elementary School | |
|---|---|
| Space Type | K-12 School |
| Gross Floor Area($ft^2$) | 82,400 |
| Open Weekends? | Yes |
| Number of PCs | 50 |
| Number of walk-in refrigeration/freezer units | 2 |
| Presence of cooking facilities | Yes |
| Percent Cooled | 100 |
| Percent Heated | 100 |
| Months[o] | 11 |
| High School? | No |
| School District[o] | South Brunswick |

## Energy Performance Comparison

| | Evaluation Periods | | Comparisons | | |
|---|---|---|---|---|---|
| **Performance Metrics** | **Current** (Ending Date 05/31/2008) | **Baseline** (Ending Date 05/31/2008) | **Rating of 75** | **Target** | **National Average** |
| Energy Performance Rating | 26 | 26 | 75 | N/A | 50 |
| Energy Intensity | | | | | |
| *Site (kBtu/$ft^2$)* | 92 | 92 | 58 | N/A | 74 |
| *Source (kBtu/$ft^2$)* | 204 | 204 | 128 | N/A | 164 |
| Energy Cost | | | | | |
| *$/year* | N/A | N/A | N/A | N/A | N/A |
| *$/$ft^2$/year* | N/A | N/A | N/A | N/A | N/A |
| Greenhouse Gas Emissions | | | | | |
| $MtCO_2e$/year | 787 | 787 | 495 | N/A | 633 |
| $kgCO_2e/ft^2$/year | 10 | 10 | 6 | N/A | 8 |

More than 50% of your building is defined as K-12 School. Please note that your rating accounts for all of the spaces listed. The National Average column presents energy performance data your building would have if your building had an average rating of 50.

Notes:
o - This attribute is optional.
d - A default value has been supplied by Portfolio Manager.