ENERGY AUDIT – FINAL REPORT

MILLVILLE BOARD OF EDUCATION
HOLLY HEIGHTS SCHOOL

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CEG PROJECT NO. 9C09072

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I. EXECUTIVE SUMMARY

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

Millville Board of Education
Holly Heights School
2509 East Main Street
Millville, NJ 08332

Municipal Contact Person: Toni Basich
Facility Contact Person: Esteban Garcia

This audit is performed in connection with the New Jersey Clean Energy - Local Government Energy Audit Program. The energy audit is conducted to promote the mission of the office of Clean Energy, 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	$195,739
Natural Gas	$91,123
Total	$286,862

The potential annual energy cost savings for each energy conservation measure (ECM) and renewable energy measure (REM) are shown below in Table 1. Be aware that the ECM's and REM' are not additive because of the interrelation of some of the measures. This audit is consistent with an ASHRAE level 2 audit. The cost and savings for each measure is ± 20%. The evaluations are based on engineering estimations and industry standard calculation methods. More detailed analyses would require engineering simulation models, hard equipment specifications, and contractor bid pricing.

Table 1
Financial Summary Table

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Gymnasium Lighting Replacement	$11,500	$2,905	4.0	278.9%
ECM #2	Variable Speed Chilled Water Pump Control	$8,800	$2,100	4.2	258.0%
ECM #3	DDC Control System Upgrade	$204,000	$11,632	17.5	-14.5%
ECM #4	Demand Control Ventilation	$83,250	$10,109	8.2	82.1%
ECM #5	Roof Top Unit Replacement	$261,670	$46,735	5.6	257.2%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	Photovoltaic Panel Installation	$1,268,910	$92,690	13.7	9.6%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

The estimated demand and energy savings for each ECM and REM is shown below in Table 2. The descriptions in this table correspond to the ECM's and REM's listed in Table 1.

Table 2
Estimated Energy Savings Summary Table

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
ECM #1	Gymnasium Lighting Replacement	5.2	19,492.0	0.0
ECM #2	Variable Speed Chilled Water Pump Control	7.8	14,095.0	0.0
ECM #3	DDC Control System Upgrade	22.0	40,235.0	3,758.0
ECM #4	Demand Control Ventilation	21.0	38,120.0	2,894.0
ECM #5	Roof Top Unit Replacement	97.0	280,168.0	3,329.0
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
REM #1	Photovoltaic Panel Installation	0.0	185,751.0	0.0

Concord Engineering Group (CEG) recommends proceeding with the implementation of all ECM's that provide a calculated simple payback at or under ten (10) years. The following Energy Conservation Measures are recommended for the facility:

- **ECM #1:** Gymnasium Lighting Replacement
- **ECM #2:** Variable Speed Chilled Water Pump Control
- **ECM #4:** Demand Control Ventilation
- **ECM #5:** Roof Top Unit Replacement

In addition to the ECMs, there are maintenance and operational measures that can provide significant energy savings and provide immediate benefit. The ECMs listed above represent investments that can be made to the facility which are justified by the savings seen overtime. However, the maintenance items and small operational improvements below are typically achievable with on site staff or maintenance contractors and in turn have the potential to provide substantial operational savings compared to the costs associated. The following are recommendations which should be considered a priority in achieving an energy efficient building:

1. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.
2. Maintain all weather stripping on entrance doors.
3. Clean all light fixtures to maximize light output.
4. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

In addition to the above recommendations, based on the review of the facility's energy bills and discussions with the School District, the energy audit team recommends Retro-Commissioning of this facility to meet the following objectives:

- Bring existing HVAC equipment to its proper operational state including air and water distribution systems
- Reduce energy use and energy costs
- Improve indoor air quality
- Verify the installation and performance of identified system upgrades
- Address overall building energy use and demand and identify areas of highest energy use and demand
- Identify the location of the most comfort problems or trouble spots in the building
- Review current O&M practices

Through the implementation of a Retro-Commissioning Plan, the School District will be able to continue with their vision of reducing energy usage and operating efficient facilities.

All in all, incentives provide financial motivation and much needed support for the implementation of energy conservation measures. Along with the NJ Smart Start program, the Pay for Performance Program incentives, sponsored by NJ Clean Energy Program, are applicable for this facility. The existing average operating demand above 200 KW and high energy consumption qualifies for the Pay for Performance Program. The incentive based on a 15% electrical energy reduction for this facility would qualify for an additional $13,756 in the Pay for Performance Program. If natural gas consumption could be reduced by 15% the resultant incentive would be approximately $6,395. This would equate to a total incentive equal to approximately $20,151. This option is one to consider for a whole-building approach to energy reduction. The Pay for Performance Program represents a significant commitment to energy reduction of a facility. This option should be reviewed in more detail with a Pay for Performance Program partner.

II. INTRODUCTION

The comprehensive energy audit covers the 102,000 square foot Holly Heights School, which includes the following spaces: classrooms, a library, multipurpose room, cooking facility and gymnasium.

Electrical and natural gas utility information is collected and analyzed for one full year's energy use of the building. The utility information allows for analysis of the building's operational characteristics; calculate energy benchmarks for comparison to industry averages, estimated savings potential, and baseline usage/cost to monitor the effectiveness of implemented measures. A computer spreadsheet is used to calculate benchmarks and to graph utility information (see the utility profiles below).

The Energy Use Index (EUI) is established for the building. Energy Use Index (EUI) is expressed in British Thermal Units/square foot/year (BTU/ft^2/yr), which is 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 the annual consumption of all energy sources to BTU's and dividing by the area (gross square footage) of the building. Blueprints (where available) are utilized to verify the gross area of the facility. The EUI is a good indicator of the relative potential for energy savings. A low EUI indicates less potential for energy savings, while a high EUI indicates poor building performance therefore a high potential for energy savings.

Existing building architectural and engineering drawings (where available) are utilized for additional background information. The building envelope, lighting systems, HVAC equipment, and controls information gathered from building drawings allow for a more accurate and detailed review of the building. The information is compared to the energy usage profiles developed from utility data. Through the review of the architectural and engineering drawings a building profile can be defined that documents building age, type, usage, major energy consuming equipment or systems, etc.

The preliminary audit information is gathered in preparation for the site survey. The site survey provides critical information in deciphering where energy is spent and opportunities exist within a facility. The entire site is surveyed to inventory the following to gain an understanding of how each facility operates:

- Building envelope (roof, windows, etc.)
- Heating, ventilation, and air conditioning equipment (HVAC)
- Lighting systems and controls
- Facility-specific equipment

The building site visit is performed to survey all major building components and systems. The site visit includes detailed inspection of energy consuming components. Summary of building occupancy schedules, operating and maintenance practices, and energy management programs provided by the building manager are collected along with the system and components to determine a more accurate impact on energy consumption.

III. METHOD OF ANALYSIS

Post site visit work includes evaluation of the information gathered, researching possible conservation opportunities, organizing the audit into a comprehensive report, and making recommendations on HVAC, lighting and building envelope improvements. Data collected is processed using energy engineering calculations to anticipate energy usage for each of the proposed energy conservation measures (ECMs). The actual building's energy usage is entered directly from the utility bills provided by the owner. The anticipated energy usage is compared to the historical data to determine energy savings for the proposed ECMs.

It is pertinent to note, that the savings noted in this report are not additive. The savings for each recommendation is calculated as standalone energy conservation measures. Implementation of more than one ECM may in some cases affect the savings of each ECM. The savings may in some cases be relatively higher if an individual ECM is implemented in lieu of multiple recommended ECMs. For example implementing reduced operating schedules for inefficient lighting will result in a greater relative savings. Implementing reduced operating schedules for newly installed efficient lighting will result in a lower relative savings, because there is less energy to be saved. If multiple ECM's are recommended to be implemented, the combined savings is calculated and identified appropriately.

ECMs are determined by identifying the building's unique properties and deciphering the most beneficial energy saving measures available that meet the specific needs of the facility. The building construction type, function, operational schedule, existing conditions, and foreseen future plans are critical in the evaluation and final recommendations. Energy savings are calculated base on industry standard methods and engineering estimations. Energy consumption is calculated based on manufacturer's cataloged information when new equipment is proposed.

Cost savings are calculated based on the actual historical energy costs for the facility. Installation costs include labor and equipment costs to estimate the full up-front investment required to implement a change. Costs are derived from Means Cost Data, industry publications, and local contractors and equipment suppliers. The NJ Smart Start Building® program incentives savings (where applicable) are included for the appropriate ECM's and subtracted from the installed cost. Maintenance savings are calculated where applicable and added to the energy savings for each ECM. The life-time for each ECM is estimated based on the typical life of the equipment being replaced or altered. The costs and savings are applied and a simple payback, simple lifetime savings, and simple return on investment are calculated. See below for calculation methods:

ECM Calculation Equations:

$$Simple\ Payback = \left(\frac{Net\ Cost}{Yearly\ Savings} \right)$$

$$Simple\ Lifetime\ Savings = \left(Yearly\ Savings \times ECM\ Lifetime \right)$$

$$Simple\ Lifetime\ ROI = \frac{(Simple\ Lifetime\ Savings - Net\ Cost)}{Net\ Cost}$$

$$Lifetime\ Ma\,\mathrm{int}\,enance\ Savings = \left(Yearly\ Ma\,\mathrm{int}\,enance\ Savings \times ECM\ Lifetime \right)$$

$$Internal\ Rate\ of\ \mathrm{Re}\,turn = \sum_{n=0}^{N} \left(\frac{Cash\ Flow\ of\ Period}{(1 + IRR)^n} \right)$$

$$Net\ \mathrm{Pr}\,esent\ Value = \sum_{n=0}^{N} \left(\frac{Cash\ Flow\ of\ Period}{(1 + DR)^n} \right)$$

Net Present Value calculations based on Interest Rate of 3%.

IV. HISTORIC ENERGY CONSUMPTION/COST

A. Energy Usage / Tariffs

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

The electric usage profile represents the actual electrical usage for the facility. Atlantic City Electric provides electricity to the facility under their Basic General Service (BGS) rate structure. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. 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 historical data received for the facility.

The gas usage profile shows the actual natural gas energy usage for the facility. South Jersey Natural Gas provides the natural gas to the facility under the Basic General Supply Service (BGSS) rate structures. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

The third party commodity provider PEPCO Energy Service, Co is responsible for providing the commodities of Natural Gas to the Board of Education. Commodity and delivery is billed separately for each respective utility service.

The overall cost for utilities is calculated by dividing the total cost by the total usage. Based on the utility history provided, the average cost for utilities at this facility is as follows:

Description	Average
Electricity	14.9¢ / kWh
Natural Gas	$1.50 / Therm

Table 3
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: Atlantic City Electric
Rate: Annual General Service (AGS)
Meter No: 80566597
Customer ID No: -
Third Party Utility -
TPS Meter / Acct No: -

MONTH OF USE	CONSUMPTION KWH	DEMAND	TOTAL BILL
Jan-09	99,600	184.0	$14,299
Feb-09	100,800	176.0	$14,486
Mar-09	94,800	168.0	$13,680
Apr-09	132,600	173.0	$14,298
May-09	119,400	176.0	$12,875
Jun-08	119,700	480.0	$22,029
Jul-08	121,200	390.0	$22,432
Aug-08	100,500	420.0	$18,496
Sep-08	115,800	176.0	$19,350
Oct-08	109,500	168.0	$15,444
Nov-08	94,500	176.0	$13,657
Dec-08	101,700	176.0	$14,692
Totals	**1,310,100**	**480.0 Max**	**$195,739**

AVERAGE DEMAND 238.6 KW average
AVERAGE RATE $0.149 $/kWh

Figure 1
Electricity Usage Profile

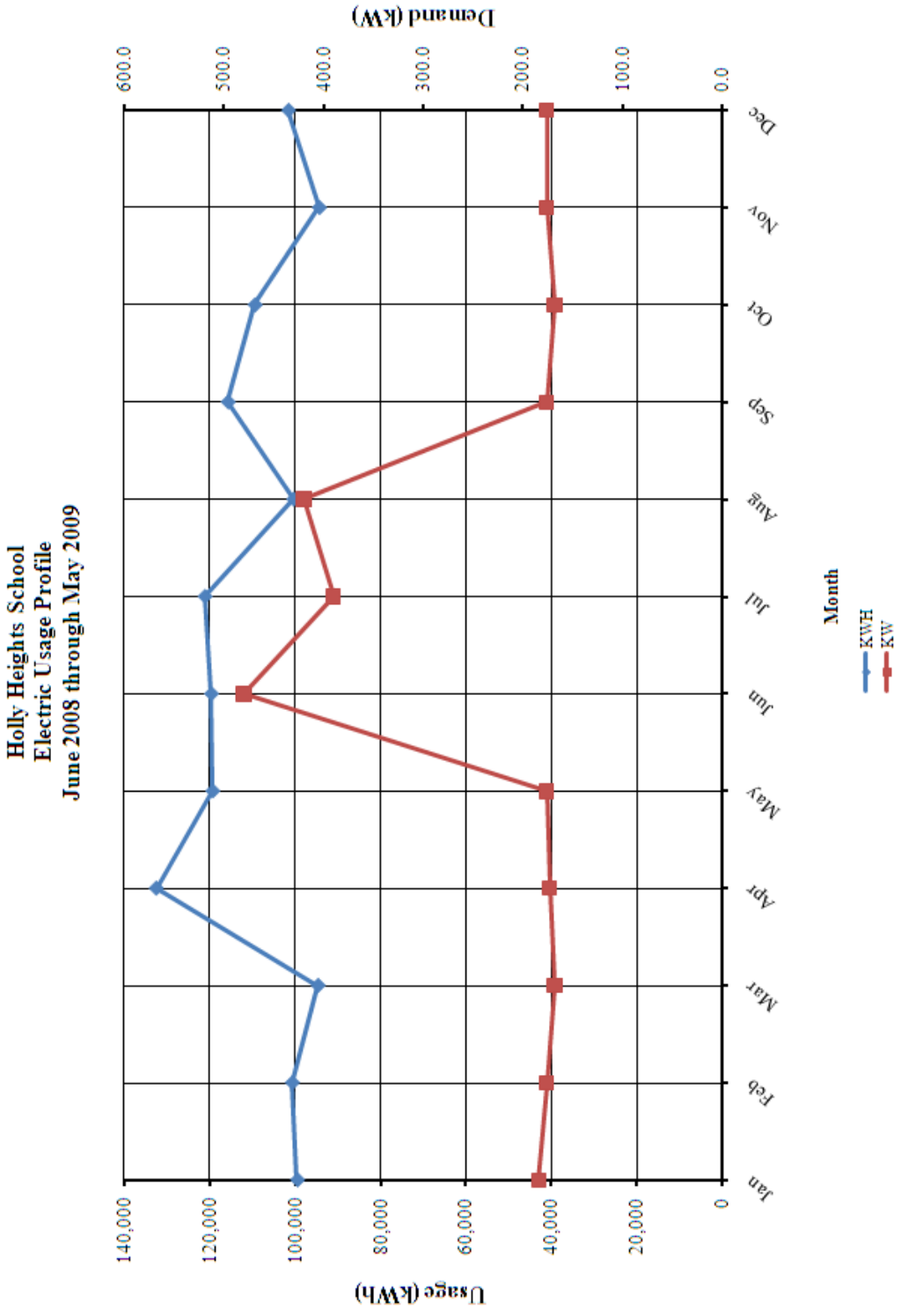
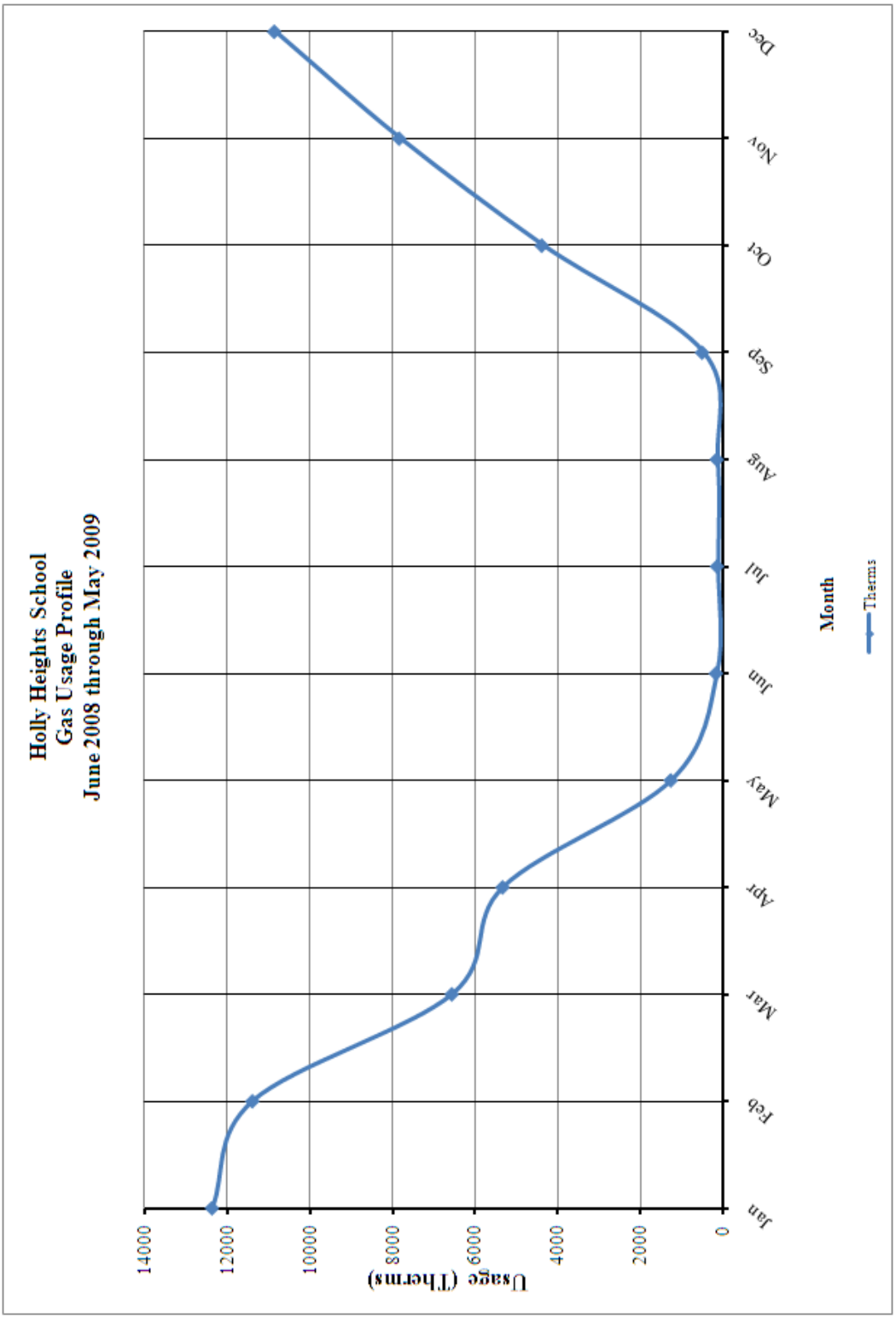


Table 4
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider:	South Jersey Gas	
Rate:	BGSS	
Meter No:	486587	
Point of Delivery ID:	-	
Third Party Utility Provider:	PEPCO Energy Services, Inc.	
TPS Meter No:	-	
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Jan-09	12,372.00	$18,419
Feb-09	11,392.00	$17,347
Mar-09	6,560.00	$9,997
Apr-09	5,330.00	$8,152
May-09	1,254.00	$1,937
Jun-08	158.00	$318
Jul-08	131.00	$286
Aug-08	139.00	$243
Sep-08	493.00	$773
Oct-08	4,380.00	$6,112
Nov-08	7,836.00	$11,507
Dec-08	10,863.00	$16,033
TOTALS	**60,908.00**	**$91,122.98**
AVERAGE RATE:	**$1.50**	**$/THERM**

Estimate Value, Utility Information Not Provided

Figure 2
Natural Gas Usage Profile



B. Energy Use Index (EUI)

Energy Use Index (EUI) is a measure of a building's annual energy utilization per square foot of building. This calculation is completed by converting all utility usage consumed by a building for one year, to British Thermal Units (BTU) and dividing this number by the building square footage. EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types. 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. The ORNL website determines how a building's energy use compares with similar facilities throughout the U.S. and in a specific region or state.

Source use differs from site usage when comparing a building's energy consumption with the national average. Site energy use is the energy consumed by the building at the building site only. Source energy use includes the site energy use as well as all of the losses to create and distribute the energy to the building. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses, which allows for a complete assessment of energy efficiency in a building. The type of utility purchased has a substantial impact on the source energy use of a building. The EPA has determined that source energy is the most comparable unit for evaluation purposes and overall global impact. Both the site and source EUI ratings for the building are provided to understand and compare the differences in energy use.

The site and source EUI for this facility is calculated as follows:

$$Building\ Site\ EUI = \frac{(Electric\ Usage\ in\ kBtu + Gas\ Usage\ in\ kBtu)}{Building\ Square\ Footage}$$

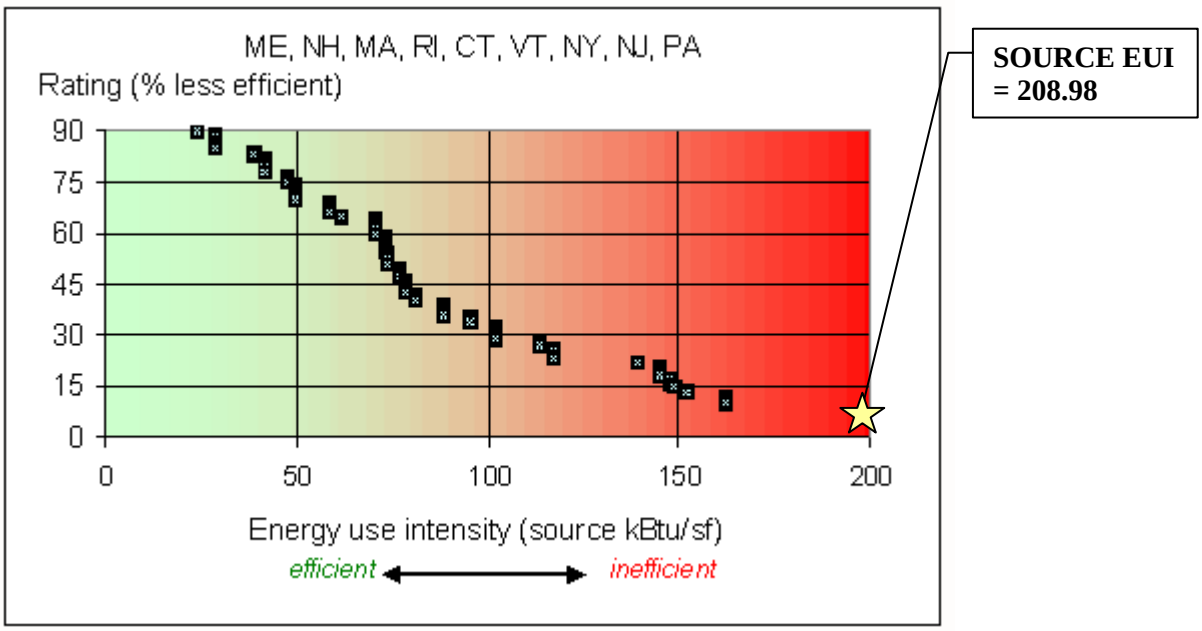
$$Building\ Source\ EUI = \frac{(Electric\ Usage\ in\ kBtu\ X\ SS\ Ratio + Gas\ Usage\ in\ kBtu\ X\ SS\ Ratio)}{Building\ Square\ Footage}$$

Table 5
Facility Energy Use Index (EUI) Calculation

ENERGY USE INTENSITY CALCULATION						
ENERGY TYPE	BUILDING USE			SITE ENERGY	SITE-SOURCE RATIO	SOURCE ENERGY
	kWh	Therms	Gallons	kBtu		kBtu
ELECTRIC	1310100.0			4,472,681	3.340	14,938,756
NATURAL GAS		60908.0		6,090,800	1.047	6,377,068
FUEL OIL			0.0	0	1.010	0
PROPANE			0.0	0	1.010	0
TOTAL				10,563,481		21,315,823
*Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.						
BUILDING AREA		102,000	SQUARE FEET			
BUILDING SITE EUI		*103.56*	kBtu/SF/YR			
BUILDING SOURCE EUI		*208.98*	kBtu/SF/YR			

Figure 3 below depicts a national EUI grading for the source use of Elementary Schools.

Figure 3
Source Energy Use Intensity Distributions: Elementary School



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 tracking and assessment of 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 emphasis is being placed 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. It is vital that local government municipalities assess facility energy usage, benchmark energy usage utilizing Portfolio Manager, set priorities and goals to lessen energy usage and move forward with priorities and goals.

In accordance with the Local Government Energy Audit Program, CEG has created an ENERGY STAR account for the municipality to access and monitoring the facility's yearly energy usage as it compares to facilities of similar type. The login page for the account can be accessed at the following web address; the username and password are also listed below:

https://www.energystar.gov/istar/pmpam/index.cfm?fuseaction=login.login

User Name: millvilleboe
Password: lgeaceg2009

Security Question: What city were you born in?
Security Answer: "millville"

The utility bills and other information gathered during the energy audit process are entered into the Portfolio Manager. The following is a summary of the results for the facility:

Table 6
ENERGY STAR Performance Rating

ENERGY STAR PERFORMANCE RATING		
FACILITY DESCRIPTION	**ENERGY PERFORMANCE RATING**	**NATIONAL AVERAGE**
Holly Heights School	16	50

Refer to **Statement of Energy Performance Appendix** for the detailed energy summary.

V. FACILITY DESCRIPTION

The 102,000 SF Holly Heights School is a one story facility comprised of a classrooms, gymnasium, kitchen, multi-purpose room, administration/faculty offices, library and computer labs. The typical hours of operation for this facility are between 9:00 am and 4:00 pm. Exterior walls are brick and block construction with minimum insulation typical of the time period. The total amount of insulation within the wall is unknown. The windows throughout the facility are in good condition and appear to be maintained. Typical windows throughout the facility are double pane, ¼" clear glass with aluminum frames. Blinds are utilized throughout the facility per occupant comfort. The blinds are valuable because they help to reduce heat loss in the winter and reduce solar heat gain in the summer. The roof is of typical built up rubber construction with dark gray stone covering. The amount of insulation below the roofing is unknown. The building was built in 1975 with the addition of the gymnasium in 1991.

HVAC Systems

The building is conditioned by a traditional 4-pipe system. Hot water and chilled water are piped independently around the facility to provide heating and cooling as needed. A boiler plant containing two (2) identical Smith Series 28A-8 boilers rated at 1,526 MBH output each, these boilers provide heating hot water for the facility. Two (2) 15 HP Bell and Gossett end-suction pumps circulate the hot water throughout the facility.

Chilled water is provided by a 265-Ton McQuay air-cooled chiller located on a pad outside the boiler room. Two (2) 40 HP Bell and Gossett end-suction pumps circulate the chilled water throughout the facility.

AAF unit ventilators equipped with hot and chilled water coils provide conditioned air to the classroom spaces. The classrooms are broken up into four (4) control zones north, east, south and west. A temperature reading is taken in each room an average is then calculated for each wing before the heating and cooling equipment is activated.

The administration office suite, library, auditorium and multipurpose room are conditioned by an over head air distribution system. Five (5) roof-top units (RTU's) provide conditioned air to their assigned space. Two (2) units serve the multipurpose room. Each unit is equipped with a gas fired heat-exchanger and a chilled water coil. The area serviced by each RTU and all pertinent equipment information can be found in the **Major Equipment List Appendix**.

The gymnasium is conditioned by two (2) indoor modular Trane Climate Changer air handling units (AHU's). These air handling units are cooling only and are equipped with chilled water coils that feed off the house chilled water system. Each of the AHU's has a Reznor duct furnace mounted in-line with the unit. The duct furnace provides heat to the air stream via a gas fired heat exchanger. An interlock exists between the Reznor duct furnace and the AHU. The AHU's fans are used to move air across the duct furnace and into the space. Unit capacities can be found in the **Major Equipment List Appendix**.

Entrance doorways are heated via hot water cabinet heaters.

HVAC System Controls

The HVAC systems within the facility are controlled via a Honeywell control system. The Honeywell Company monitors and controls the system from a central plant offsite. The unit ventilators throughout the facility are controlled off a pneumatic control system. All air handling equipment serving the facility utilizes electronic controls.

Domestic Hot Water

Domestic hot water for the facility is provided by four (4) domestic hot water heaters (DHWH) located throughout the facility. Two (2) 80 gallon Bradford White natural gas fired DHWH's, each with a capacity of 505 MBH are located in the boiler room. There are also two (2) 80 gallon Bradford White electric DHWH's, each with a capacity of 6kW located in janitors closets on the north and south side of the facility. The domestic hot water is circulated throughout the building by a hot water re-circ pumps. The circulation pumps are controlled by an aqua stat. The domestic hot water piping insulation appeared to be in good condition.

Lighting

Typical lighting throughout the building is fluorescent tube lay-in fixtures with T-8 lamps and electronic ballasts. Storage rooms and closets lit with a mixture of incandescent lamps and compact fluorescent lamps, all incandescent lamps should be replaced with their compact fluorescent equivalent. A detailed list containing all building light fixtures can be found in the **Investment Grade Lighting Audit Appendix** of this report.

VI. MAJOR EQUIPMENT LIST

The equipment list is considered major energy consuming equipment and through energy conservation measures could yield substantial energy savings. 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 in some cases if a manufactures 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.

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

VII. ENERGY CONSERVATION MEASURES

ECM #1: Gymnasium Lighting Replacement

Description:

The existing Gymnasium lighting systems comprise of a total of twenty-three (23) 400-Watt Metal-Halide (MH) fixtures which have poor lumen maintenance (approximately 30% reduction in lighting output at 40% of rated lamp life). Also, the fixture ballast can be very noisy, require up to 10 minutes to re-strike after shutdown, and there is a noticeable color shift as the lamp approaches the end of its life. The current lighting system is inefficient compared to today's standard, the facility would benefit by replacing these lighting with a more efficient alternative

This ECM would replace each of the existing Gymnasium light fixtures with new T-5 high-bay fixtures with, 4-foot T5 High Output (HO) lamps. The T-5 HO lighting system will utilize 50% of the energy used by the metal halide fixtures. The T-5 HO lamps are rated for 20,000 hours versus the 10,000 hours for the 400-Watt MH lamps so there would be a savings in replacement cost/labor. In addition, the T-5 HO lamps have better lighting quality and lumen maintenance.

Energy Savings Calculations:

The SmartStart Building® incentive is $100 per fixture which equates to: $100 x 23 fixtures = $2,300

Refer to the **Investment Grade Lighting Audit Appendix** for a detailed energy savings calculation for the replacement of the gymnasium fixtures.

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$13,800
NJ Smart Start Equipment Incentive ($):	$2,300
Net Installation Cost ($):	$11,500
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,905
Total Yearly Savings ($/Yr):	$2,905
Estimated ECM Lifetime (Yr):	15
Simple Payback	4.0
Simple Lifetime ROI	278.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$43,575
Internal Rate of Return (IRR)	24%
Net Present Value (NPV)	$23,179.70

ECM #2: Variable Speed Chilled Water Pump Control

Description:

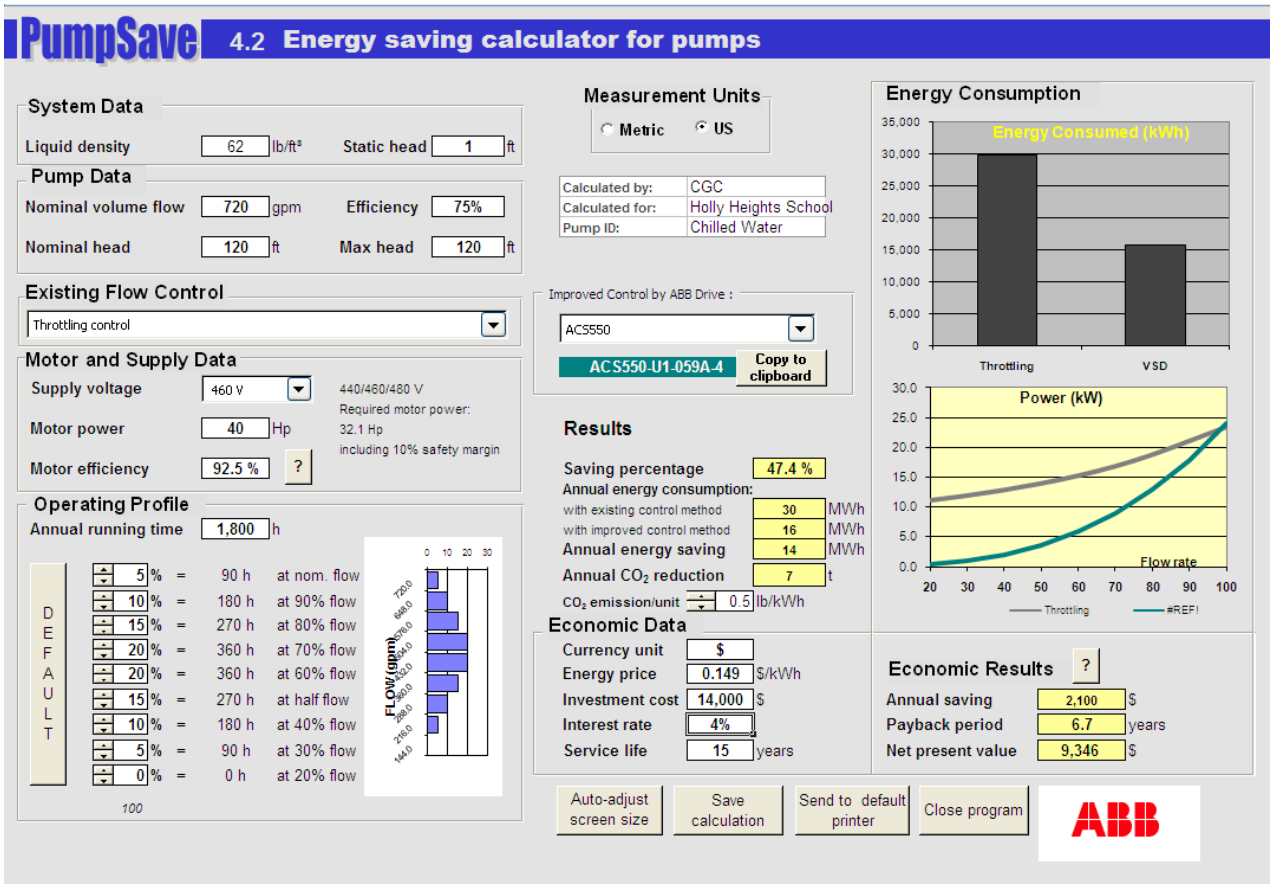
The school is cooled by a 255 ton water cooled chiller. The chiller is pad mounted on the exterior of the boiler room. The chilled water is distributed throughout the facility by two (2) 40 HP Bell and Gossett end-suction pumps (only one pump operates at a time). The chilled water feeds all building unit ventilators, roof top units and indoor air handling units. Each piece of equipment is capable of modulating the chilled water flow, reducing or increasing the total flow as required to satisfy the space. The equipment does not require full flow for the majority of the hours of operation; however the existing pumping system does not have variable speed control, the pumps operate at 100% capacity all the time. The pumping energy of the existing system stays relatively constant, on/off operation, throughout the cooling season.

This ECM includes the installation of two new variable frequency drives (VFDs) for each chilled water pump, although the savings will be for a singular pump (only one pump is needed for system distribution). The reduction in chilled water flow reduces the pumping energy by a significant quantity. As equipment control valves modulate, the VFDs respond by varying the pump motor to match the building's load. This ECM is based on two ABB VFDs model number ACS550, as well as a differential pressure sensor installed in the chilled water piping. This ECM also includes converting the existing 3-way controls valve to 2-way operation by installing an isolation valve in the bypass pipe to the each of the AHU's. 3-way valves would have to be installed before the chilled water enters the chillers to prevent a possibly damaging low flow condition through the chillers.

Energy and cost savings calculations are based on calculation software "PumpSave v4.2," provided by ABB.

Cooling Season Run Hrs.	= 1,800 hrs/yr.
Average Cost of Electricity	= $0.149/kWh
Motor HP (EA.)	= 40 HP
Total GPM	= 720 GPM
Nominal Piping System Head	= 120 Ft Head
Motor Efficiency	= 92.4%
Pump Efficiency	= 75%

Energy Savings Calculations:



Installation cost for the two VFDs and bypass valve installation is estimated to be $10,000 ($6,000 Materials).

From the NJ Smart Start® Program appendix, the unit falls under the category "Variable Frequency Drive" and warrants an incentive based on horsepower. The program incentives are calculated as follows:

$$\text{Smart Start®}\ Incentive = \left(HoresePower \times \ \$/HP\right)$$
$$= \left(2\ Pumps \times 40\ HP \times \$65/HP\right) = \$5{,}200$$

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$14,000
NJ Smart Start Equipment Incentive ($):	$5,200
Net Installation Cost ($):	$8,800
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,100
Total Yearly Savings ($/Yr):	$2,100
Estimated ECM Lifetime (Yr):	15
Simple Payback	4.2
Simple Lifetime ROI	258.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$31,500
Internal Rate of Return (IRR)	23%
Net Present Value (NPV)	$16,269.66

ECM #3: DDC Control System Upgrade

Description:

Classroom unit ventilators are still being controlled with outdated pneumatic controllers throughout this facility. Standard non-programmable pneumatic thermostats that do not utilize night set back, or morning warm-up features are responsible for controlling the classroom conditioning. Modern thermostats and control systems have the capability of saving significant energy as well as improved occupant comfort.

This ECM recommends converting all pneumatic controls to Direct Digital Controls (DDC) in all classrooms. A front end device will provide communication between building equipment the chilled water and hot water plant. The system will respond to the overall classroom's needs and operating schedules as defined by the building operator. The DDC system will provide features such as space averaging, temperature override control, night set-back, morning warm-up mode, etc.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings are based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Energy Management and Control System Savings - 5%-15%.

Energy savings achieved through "Energy Management and Control Systems," average 5%-15%. Savings resulting from the implementation of this ECM for energy management controls are estimated to be 10% of the total HVAC energy cost for the facility.

The cost of a full DDC system with new field devices, controllers, computer, software, programming, etc. is approximately $4.00 per SF (per recent contractor pricing.) Savings from the implementation of this ECM will be achieved through reduced natural gas consumption from reduced heating energy as well as reduced electric consumption from reduced air conditioning energy. Classrooms total approximately 51,000 SF.

Cost of complete DDC System = ($4.00/SF x 51,000 SF) = $204,000.

Heating Assumptions:

Total Classroom Heating Capacity ($H_{L)}$ (Total from equipment list, boiler capacity)	= 5,000 MBH
Average Unit Efficiency	= 70%
Average Cost of Electricity	= $0.149/kWh
Average Cost of Gas	= $1.56/Therm

Cooling Assumptions:

Total Cooling Capacity = 190 tons
(Total from equipment list)
Cooling Season Full Load Cooling Hrs. = 1,800 hrs/yr.

Average Cooling Equipment EER = 10.2 EER for CW
(Est. based on all equipment)

Energy Savings Calculations:

Heating Savings Calculations

$$Heating\ Energy\ Used = \frac{H_L \times HDD \times Hrs}{\Delta t \times Eff \times V}$$

Where:

HDD = number of Heating Degree Days as Specified Base Temperature
(Warm Air $HDD_{65^\circ F}$ = 5,007, Newark International Airport, NJ)

Hrs = Hours per Day

Δt = Design temperature difference, º F (Warm Air = 70 º F)

Eff = Efficiency of Energy Utilization (Existing NG Boiler = 0.85)

V = Heating value of fuel, BTU/Therm (Natural Gas = 100,000 Btu = 1 Therm)

Estimated Energy Consumption of Blower Coils:

$$Electric\ Heating\ Energy\ Used = \frac{(5{,}000{,}000\,Btu/h) \times (4{,}604^\circ F) \times 8h}{70^\circ F \times 70\%} = 3{,}758{,}367{,}346\ Btu/Year$$

Electric Energy Used = 3,758,367,346 Btu/Year x 1Therm/100,000 Btuh = 37,585 Therm/Year

$$Savings. = Heating\ Input(Therms) \times 10\%\ Savings \times Ave\ Cost(\$/Therm)$$

$$Savings. = 37{,}585\ (Therm) \times 10\% \times 1.50\ (\$/Therm) = \$5{,}637$$

Cooling Savings Calculations

$$Est\ Cool\ Cons. = \frac{Cool\ Load\ (Tons) \times 12{,}000\left(\frac{Btu}{Ton\ Hr}\right) \times Full\ Load\ Cooling\ Hrs.}{Ave\ Energy\ Efficiency\ Ratio\left(\frac{Btu}{Wh}\right) \times 1000\left(\frac{Wh}{kWh}\right)}$$

$$Est\ Cool\ Cons. = \frac{190\ (Tons) \times 12{,}000\left(\frac{Btu}{Ton\ Hr}\right) \times 1{,}800\ Hrs.}{10.2\left(\frac{Btu}{Wh}\right) \times 1000\left(\frac{Wh}{kWh}\right)} = 402{,}355\ (kWh)$$

$$Savings. = Cool\ Cons.(kWh) \times 10\%\ Savings \times Ave\ Elec\ Cost\left(\frac{\$}{kWh}\right)$$

$$Savings. = 402{,}355\ (kWh) \times 10\% \times 0.149\left(\frac{\$}{kWh}\right) = \$5{,}995$$

$$Total\ ECM\ Savings = \$5{,}637 + \$5{,}995 = \$11{,}632$$

There are currently no Smart Start® *Incentives* available for a DDC Control System installation.

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$204,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$204,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$11,632
Total Yearly Savings ($/Yr):	$11,632
Estimated ECM Lifetime (Yr):	15
Simple Payback	17.5
Simple Lifetime ROI	-14.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$174,480
Internal Rate of Return (IRR)	-2%
Net Present Value (NPV)	($65,137.94)

ECM #4: Demand Control Ventilation

Description:

The existing air handling units condition their individual spaces with chilled water and are equipped with gas fired heat exchangers. The outside air is set to a minimum damper position to provide outside air to the space whenever the supply fan is set to run (in occupied mode). Unoccupied mode the outside air dampers shut. This operation is typical for the majority of the systems throughout the building. The outside air volume is typically based on the maximum occupancy of the space conditioned. When a given space is not fully occupied the outside air quantity delivered to the space is greater than the amount needed for adequate ventilation.

This ECM includes the installation of CO_2 sensors integrated into a demand control ventilation system, for all air handling units serving the facility. This system allows the air handling unit to respond to changes in occupancy and therefore reduce the amount of outside air that has to be conditioned. Outside air accounts for a large portion of the energy consumption in the HVAC system, especially in high occupancy spaces. The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Demand Control Ventilation - 10%-15%.

Energy savings achieved through "Demand Control Ventilation" average 10%-15%. Savings resulting from the implementation of this ECM for energy management controls are estimated to be 10% of the total HVAC energy cost for the facility.

The components included to install a demand control ventilation system include controllers, software programming, and CO_2 sensors. Each occupied zone would require a CO_2 sensor installed to monitor occupancy levels. This ECM is based on wireless sensors to minimize on installation cost. Savings from the implementation of this ECM will be achieved through reduced gas consumption from reduced heating energy as well as reduced electric consumption from reduced air conditioning energy.

Cost of Demand Control Ventilation System Controls = ($1.50/SF x 51,000 SF) = $76,500.
Cost of CO2 Sensors for all spaces = ($450/Sensor x 15 Sensors) = $6,750
Total = $83,250

Total Gas Usage	= 4,400 MBH
Average Cost of Gas	= $1.50/Therm
Average Unit Efficiency	= 80%

Total Cooling Capacity (Total from equipment list)	= 180 tons
Cooling Season Full Load Cooling Hrs.	= 1,800 hrs/yr.
Average Cooling Equipment EER (Est. based on all equipment)	= 10.2 EER
Average Cost of Electricity	= \$0.149/kWh

Energy Savings Calculations:

Heating Savings Calculations

$$Heating\ Energy\ Used = \frac{H_L \times HDD \times Hrs}{\Delta t \times Eff \times V}$$

Where:

HDD = number of Heating Degree Days as Specified Base Temperature
(Warm Air $HDD_{65^\circ F}$ = 5,007, Newark International Airport, NJ)

Hrs = Hours per Day

Δt = Design temperature difference, º F (Warm Air = 70 º F)

Eff = Efficiency of Energy Utilization (Existing NG Boiler = 0.85)

V = Heating value of fuel, BTU/Therm (Natural Gas = 100,000 Btu = 1 Therm)

Estimated Energy Consumption of Blower Coils:

$$Electric\ Heating\ Energy\ Used = \frac{(4{,}400{,}000\,Btu/h) \times (4{,}604^\circ F) \times 8h}{70^\circ F \times 80\%} = 2{,}893{,}942{,}857\ Btu/Year$$

Electric Energy Used = 2,893,942,857 Btu/Year x 1Therm/100,000 Btuh = 28,939 Therm/Year

$$Savings. = Heating\ Input(Therms) \times 10\%\ Savings \times Ave\ Cost(\$/Therm)$$

$$Savings. = 28{,}939\,(Therm) \times 10\% \times 1.50\,(\$/Therm) = \$4{,}340$$

Cooling Savings Calculations

$$Est\ Cool\ Cons. = \frac{Cool\ Load\ (Tons) \times 12{,}000\left(\frac{Btu}{Ton\ Hr}\right) \times Full\ Load\ Cooling\ Hrs.}{Ave\ Energy\ Efficiency\ Ratio\left(\frac{Btu}{Wh}\right) \times 1000\left(\frac{Wh}{kWh}\right)}$$

$$Est\ Cool\ Cons. = \frac{180\ (Tons) \times 12{,}000\left(\frac{Btu}{Ton\ Hr}\right) \times 1{,}800\ Hrs.}{10.2\left(\frac{Btu}{Wh}\right) \times 1000\left(\frac{Wh}{kWh}\right)} = 381{,}175\ (kWh)$$

$$Savings. = Cool\ Cons.(kWh) \times 10\%\ Savings \times Ave\ Elec\ Cost\left(\frac{\$}{kWh}\right)$$

$$Savings. = 381{,}175\ (kWh) \times 10\% \times 0.149\left(\frac{\$}{kWh}\right) = \$5{,}679$$

$$Total\ ECM\ Savings = \$4{,}430 + \$5{,}679 = \$10{,}109$$

There are currently no Smart Start® *Incentives* available for a Demand Control Ventilation System.

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$83,250
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$83,250
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$10,109
Total Yearly Savings ($/Yr):	$10,109
Estimated ECM Lifetime (Yr):	15
Simple Payback	8.2
Simple Lifetime ROI	82.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$151,635
Internal Rate of Return (IRR)	9%
Net Present Value (NPV)	$37,430.59

ECM #5: Roof Top Unit Replacement

Description:

The library, administration offices, cafeteria and small auditorium are conditioned by roof top air handling equipment containing chilled water coils and gas fired heat exchangers. The roof top equipment is approximately 13 year years of age and approaching its useful service life of 15 years.

This measure would replace the roof top units serving the library, administration offices, cafeteria and small auditorium, five (5) units in total new energy-efficient heating and cooling roof top units, manufactured by AAON RN/RM Series or equivalent. The rooftop unit would be outfitted with economizer section, heat recovery, DDC controls, variable frequency drives and CO2 ventilation control sequence. With the utilization of heat recovery the required mechanical heating and cooling can be greatly reduced.

Note: Equipment sizing is based on a one-for-one replacement. CEG recommends the Owner investigate further the heating and cooling requirements of the building with a HVAC Engineering Professional.

Energy Savings Calculations:

Energy savings calculations for the rooftop replacement have been completed utilizing Trane System Analyzer™ energy savings calculation program. A comparative analysis between the existing HVAC equipment and new HVAC equipment is utilized to calculate the estimated savings.

The estimated construction cost for the replacement of the rooftop units with the recommended equipment is approximately $264,150 including demolition of the existing unit, adapter curb and start-up, testing and balancing of new unit.

NJ Smart Start® Program Incentives are calculated as follows:

From Appendix C, the rooftop unit replacement falls under the category “Unitary HVAC” and warrants an incentive based on efficiency (EER) at a certain cooling tonnage. Total tonnage of equipment to be installed shown below. New units will be smaller in size compared to the existing because of the gain of free heating and cooling from the energy recovery system.

$$\text{Smart Start® } Incentive\ (RTU \geq 30\ to < 63) = \left(Cooling\ Tons \times\ RTU\ \ Incentive\right)$$
$$= \left(137\ Tons \times \$40 / Ton\right) = \underline{\$5{,}480}$$

Maintenance Savings have not been calculated at this time because information was not available to baseline the savings.

Based on the energy model results, the resultant Energy and Cost Savings are as follows:

ENERGY MODEL RESULTS						
UNIT	**ELECTRICAL**			**NATURAL GAS**		**TOTAL COST SAVINGS**
Area Served	**Usage Reduction (kWh)**	**Demand Reduction (kW)**	**COST SAVINGS**	**Usage Reduction (THERMS)**	**COST SAVINGS**	
Library	55,481	19	$8,265	1,227	$1,840	$10,105
Main Office	54,336	20	$8,095	771	$1,155	$9,250
Small Auditorium	28,445	13	$4,240	793	$1,190	$5,430
Multipurpose Room	70,953	22.5	$10,570	269	$405	$10,975
Multipurpose Room	70,953	22.5	$10,570	269	$405	$10,975
Totals	**280,168**	**97**	**$41,740**	**3,329**	**$4,995**	**$46,735**

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$267,150
NJ Smart Start Equipment Incentive ($):	$5,480
Net Installation Cost ($):	$261,670
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$46,735
Total Yearly Savings ($/Yr):	$46,735
Estimated ECM Lifetime (Yr):	20
Simple Payback	5.6
Simple Lifetime ROI	257.2%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$934,700
Internal Rate of Return (IRR)	17%
Net Present Value (NPV)	$433,628.79

VIII. RENEWABLE/DISTRIBUTED ENERGY MEASURES

Globally, renewable energy has become a priority affecting international 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 under the direction of the Board of Public Utilities and instituted a Renewable Energy Incentive Program to provide additional funding to private and public entities for installing qualified renewable 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 Millville Board of Education, to evaluate if there is any potential for solar or wind energy generation.

Solar energy produces clean energy and reduces a building's carbon footprint. This is accomplished via photovoltaic panels which can be mounted on all south and southwestern facades of the building. Flat roof, as well as sloped 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). Parking lots can also be utilized for the installation of a solar array. A truss system can be installed that is high enough to park a vehicle under the array, this way no parking lot area is lost. 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 facility and believes a roof mounted system is best suited. A depiction of the proposed area layouts is shown in **Renewable / Distributed Energy Measures Calculation, Appendix**. Based on measurements of the roof it was determined that a system size of 140.1 kilowatts could be installed. The total system has an estimated kilowatt hour production of 185,751 KWh annually, reducing the overall electric consumption by approximately 14%. A detailed financial analysis can be found in **Renewable / Distributed Energy Measures Calculation, Appendix**. 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.

The proposed photovoltaic array layout is designed based on the specifications for the Sun Power SPR-230 panel. This panel has a "DC" rated full load output of 230 watts, and has a total panel conversion efficiency of 18%. Although panels rated at higher wattages are available through Sun Power and other various manufacturers, in general most manufacturers who produce commercially available solar panels produce a similar panel in the 200 to 250 watt range. This provides more manufacturer options to the public entity if they wish to pursue the proposed solar recommendation without losing significant system capacity.

Estimated solar array generation was then calculated based on the National Renewable Energy Laboratory PVWatts Version 1.0 Calculator. In order to calculate the array generation an

appropriate location with solar data on file must be selected. In addition the system DC rated kilowatt (kW) capacity must be inputted, a DC to AC de-rate factor, panel tilt angle, and array azimuth angle. The DC to AC de-rate factor is based on the panel nameplate DC rating, inverter and transformer efficiencies (95%), mismatch factor (98%), diodes and connections (100%), dc and ac wiring(98%, 99%), soiling, (95%), system availability (95%), shading (if applicable), and age(new/100%). The overall DC to AC de-rate factor has been calculated at an overall rating of 81%. The PVWatts Calculator program then calculates estimated system generation based on average monthly solar irradiance and user provided inputs. The monthly energy generation and offset electric costs from the PVWatts calculator is shown in the Renewable/Distributed Energy Measures Calculation appendix.

The proposed solar array is qualified by the New Jersey Board of Public Utilities Net Metering Guidelines as a Class I Renewable Energy Source. These guidelines allow onsite customer generation using renewable energy sources such as solar and wind with a capacity of 2 megawatts (MW) or less. This limits a customer system design capacity to being a net user and not a net generator of electricity on an annual basis. Although these guidelines state that if a customer does net generate (produce more electricity than they use), the customer will be credited those kilowatt-hours generated to be carried over for future usage on a month to month basis. Then, on an annual basis if the customer is a net generator the customer will then be compensated by the utility the average annual PJM Grid LMP price per kilowatt-hour for the over generation. Due to the aforementioned legislation, the customer is at limited risk if they generate more than they use at times throughout the year. With the inefficiency of today's energy storage systems, such as batteries, the added cost of storage systems is not warranted and was not considered in the proposed design.

Direct purchase involves the BOE paying for 100% of the total project cost upfront via one of the methods noted in the Installation Funding Options section below. Calculations include a utility inflation rate as well as the degradation of the solar panels over time. Based on our calculations the following is the payback period:

FINANCIAL SUMMARY - PHOTOVOLTAIC SYSTEM				
PAYMENT TYPE	**SIMPLE PAYBACK**	**SIMPLE ROI**	**NET PRESENT VALUE**	**INTERNAL RATE OF RETURN**
Direct Purchase	13.69 Years	7.3%	$1,234,162	5.9 %

*The solar energy measure is shown for reference in the executive summary REM table as REM#1.

Given the large amount of capital required by the BOE to invest in a solar system through a Direct Purchase CEG does not recommend the BOE pursue this route. It would be more advantageous for the BOE to solicit Power Purchase Agreement (PPA) Providers who will own, operate, and maintain the system for a period of 15 years. During this time the PPA Provider would sell all of the electric generated by Solar Arrays to the BOE at a reduced rate compared to their existing electric rate.

In addition to the Solar Analysis, CEG also conducted a review of the applicability of wind energy for the facility. Wind energy production is another option available through the Renewable Energy Incentive Program. Wind turbines of various types can be utilized to produce clean energy on a per building basis. Cash incentives are available per kWh of electric usage. CEG's review of the applicability of wind energy for the facility found; the low average wind speed and proximity to residential neighborhoods make facility a poor candidate for wind energy production.

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 the Electric and Natural Gas Usage Profiles included within this report to reference the respective electricity and natural gas usage load profiles.

Electricity:

This facility is comprised of classrooms, gymnasium, kitchen, multi-purpose room, administration/faculty offices, library and computer labs. The typical hours of operation for this facility are 9:00 a.m. to 4:00 p.m. This building was constructed in 1975 with an addition to the gym in 1991.

The Electric Usage Profile demonstrates a fairly flat or consistent load consumption profile throughout the year. For a school this is not as typical especially for the summer months (May-September). There is a slight peak in the month of April that may be consistent with cooling. Cooling in this facility is provided by a (4) pipe system. Chilled water is piped separately. Chilled water is provided by a 265 ton air cooled chiller. AAF unit ventilators with chilled water coils provide conditioned air to the classrooms. The administration office suite, library, auditorium and multipurpose room are conditioned by an over head air distribution system. Five (5) roof-top units (RTU's) provide conditioned air to their assigned space, two (2) of these RTU's serve the multipurpose room. Each unit is equipped with a chilled water coil. The areas are serviced by each RTU. The gymnasium is conditioned by two (2) indoor modular Trane Climate Changer air handling units (AHU's). These air handling units are cooling only and are equipped with chilled water coils that are fed from the house chilled water system. This facility receives its electric delivery service via Atlantic City Electric (ACE) on an MGS rate schedule. This facility receives its electric Commodity service from South Jersey Energy Company through the ACES agreement. A flat (base-load) shaping is important because it will yield more competitive pricing when shopping for alternative energy supply.

Natural Gas:

The Natural Gas Usage Profile demonstrates a very typical heating load profile, with increasing consumption in the winter months (October – March) and a dramatic drop in consumption in the summer months (May – September). Heating is the obvious reason for the winter consumption and in this facility heating is supplied via a traditional 4-pipe system. Hot water is piped independently around the facility to provide heating as needed. A boiler plant containing two (2) identical Smith Series 28A-8 boilers rated at 1,526 MBH output each provide heating hot water for the facility. AAF unit ventilators equipped with hot water coils provide conditioned air to the classroom spaces. The administration office suite, library, auditorium and multipurpose room are

conditioned by an over head air distribution system. The five (5) RTU's mentioned above are also equipped with a gas fired heat-exchangers. The gymnasium is conditioned by two (2) indoor modular Trane Climate Changer air handling units (AHU's). Each of the AHU's has a Reznor duct furnace mounted in-line with the unit. The duct furnace provides heat to the air stream via a gas fired heat exchanger. Domestic hot water for the facility is provided by four (4) domestic hot water heaters (DHWH) located throughout the facility. Two (2) 80 gallon Bradford White natural gas fired DHWH's, each with a capacity of 505 MBH are located in the boiler room. Natural gas Delivery service in this facility is provided by South Jersey Gas Company on a GSG rate schedule. The natural gas commodity service is provided by PEPCO Energy Services through the ACES agreement. A flat load profile will always allow for the most competitive price available when shopping for alternative energy supplies.

Tariff Analysis:

Electricity:

This facility receives electrical delivery Service from Atlantic City Electric on an This facility receives electrical Delivery Service from Atlantic City Electric on a MGS Secondary (Monthly General Service) utility rate. This rate is available at any point in the utility's system where facilities of adequate character and capacity exist for the entire electric service requirements of any customer delivered at one point and metered at or compensated to the voltage of delivery. This schedule is not available to residential customers. This service includes the following charges: Delivery Service Charges, Distribution Demand Charges, Reactive Demand Charges, Non-Utility Generation Charges, Societal Benefits Charges, Regulatory Assets Recovery Charges, Transition Bond Charges, Market Transition Charge Tax, Transmission Demand Charge, Regional Greenhouse Gas Initiative Recovery Charge, and Infrastructure Investment Surcharge.

This facility receives electrical supply service through a Third Party Supplier (South Jersey Energy Company). However, since the passing and implementation of the Electricity Discount and Energy Competition Act (EDECA) in 1999, there have been many changes brought about by the deregulation of the electric industry in New Jersey. Since that time, customers in New Jersey have been able to choose their electrical supplier. Customers who do not choose to switch to a Third Party Supplier (TPS), or who leave a TPS to return to their Electric Delivery Company are supplied with Basic Generation Service. Beside the commodity itself, BGS also has the following charges: System Control Charge, CIEP Standby Fee, Transmission Enhancement Charge and Basic Generation Service Charge.

This facility receives electrical supply service through the ACES agreement (Alliance for Competitive Energy Services). ACES, is an alliance composed of the NJSBA and the NJASBO and is administered by Gable Associate. CEG believes that if the BOE wants to procure alternative energy, they must through the ACES agreement. CEG will make a recommendation that is counter to this agreement. The term of the ACES agreement is the first meter read date on or after April 30, 2009 until the last meter read date, May, 2011. The ACES agreement provides for NJSBA to adopt a resolution for renewal for no more than a (5) consecutive year term. CEG will recommend against such a renewal. CEG believes that if the BOE wants to procure

alternative energy, they must through the ACES agreement. CEG will make a recommendation that is counter to this agreement.

The ACES agreement provides for NJSBA to adopt a resolution for renewal for no more than a (5) consecutive year term. CEG will recommend against such a renewal and believes that a 5 – year term may not be allowed under local government law.

Natural Gas:

This facility is serviced by South Jersey Gas Company (SJG) on its firm delivery rate, General Service Gas (GSG) from the utility and BGSS (Basic Generation Supply Service) when not being served by a Third Party Supplier (TPS). Currently The BOE is procuring natural gas from a Third Party Supplier (TPS), PEPCO Energy Services. This Delivery Rate has the following charges: Customer Charge, Delivery Charge, BSC Volume Charge and Commodity Charge under this rate structure. The BGSS Supply rates are designed to recover SJG's cost of gas applicable to customers who purchase gas from SJG. The company earns no profit from BGSS. BGSS consists of two (2) pricing mechanisms: Residential and Commercial customers that use less than 5,000 therms annually and Commercial and Industrial customers that consume at least 5,000 therms annually.

Imbalances occur when Third Party Suppliers (TPS) are used to supply natural gas and full-delivery is not made, and when a new supplier is contracted or the customer returns to the utility. Note: It is important when utilizing a Third Party Supplier, that an experienced regional supplier is used, otherwise, imbalances can occur, jeopardizing economics and scheduling. If the supplier does not deliver they can be placed on a very costly rate. A customer can automatically be put on an alternative supply rate by the utility.

A "firm account" refers to the type of interstate pipeline service that the utility has subscribed for and delivered on behalf of the customer. Much like the telecom industry, the pipeline space (capacity) has been deregulated. The pipeline capacity is broken down into reliability of service. "Firm service" is the highest level of reliability and is the last, in pecking order, for interruption.

Recommendations:

CEG recommends a global approach that will be consistent with all facilities within the scope of this project. Therefore, CEG recommends aggregating all energy loads. CEG's observations are seen in both the electric and natural gas costs. The average "price to compare" per kWh (kilowatt hour) for all buildings is $.1058/ kWh (kWh is the common unit of electric measure). The average "price to compare" per decatherm for natural gas is $10.90 /dth (dth is the common unit of measure). These Weighted Average Prices are as supplied via Third Party Suppliers (TPS) for electricity (South Jersey Energy Company) and for natural gas (PEPCO Energy services), as administered through the ACES (Alliance for Competitive Energy Services) and the lead agency, The New Jersey School Boards Association, with administration from Gable Associates.

Energy commodities are among the most volatile of all commodities, however at this point and time, energy is extremely competitive. The BOE 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 (January – December 2009) and current electric rates, the BOE could see an improvement of up to 15 % or up to $150,000 in its electric costs annually. (Note: Savings were calculated using an Average Annual Consumption of 9,776,921 kWh and an Average fixed one-year commodity contract). CEG recommends aggregating the entire electric load to gain the most optimal energy costs. CEG recommends that the BOE seek an energy advisor to maximize energy savings and to apply a "managed approach" to procuring energy.

CEG's secondary recommendation coincides with the BOE's natural gas costs. Based on the current market, (which is very competitive), the BOE could see a savings of over 20% or up to $90,000 annually in its natural gas expenditures. Again, CEG recommends the use of any energy advisor to review alternative energy sourcing strategies and to install a "managed approach" to energy procurement.

CEG also recommends that The BOE not renew its energy supply contract with the ACES aggregation and PEPCO Energy Services, and the ACES agreement with South Jersey Energy and its fixed price contract. The fixed priced contract does not accomplish the needs of the BOE. The BOE needs budget protection and CEG has shown that these energy prices are not competitive to the market. The ACES agreement has demonstrated that the price is much above market and the BOE has no way of adjusting the price should prices fall.

CEG further recommends that the BOE create an energy program through a "managed approach." The "managed approach" will take into account creating an "energy budget" that is in line with the BOE's budget year and risk tolerance. Risk tolerance is the appetite that a customer has for risk. Based on the reduced state and local government budgets and the general aversion for risk, the local government is required to manage this risk.

CEG recommends the BOE 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 are currently available. Through its meeting with the Local Distribution Company (LDC), they will learn more about the competitive supply process. They can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at www.nj.gov/bpu, and 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 special attention given to credit mechanisms, imbalances, balancing charges and commodity charges when meeting with their utility representative. In addition, the BOE 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 the BOE frequently changes its supplier for energy, CEG recommends it closely monitor balancing, particularly when the contract is close to termination.

X. INSTALLATION FUNDING OPTIONS

CEG has reviewed various funding options for the facility 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.

iv. *Pay For Performance – The New Jersey Smart Start Pay for Performance program includes incentives based on savings resulted from implemented ECMs. The program is available for all buildings with average demand loads above 200 KW. The facility's participation in the program is assisted by an approved program partner. An "Energy Reduction Plan" is created with the facility and approved partner to shown at least 15% reduction in the building's current energy use. Multiple energy conservation measures implemented together are applicable toward the total savings of at least 15%. No more than 50% of the total energy savings can result from lighting upgrades / changes.*

Total incentive is capped at 50% of the project cost. The program savings is broken down into three benchmarks; Energy Reduction Plan, Project

Implementation, and Measurement and Verification. Each step provides additional incentives as the energy reduction project continues. The benchmark incentives are as follows:

1. *Energy Reduction Plan – Upon completion of an energy reduction plan by an approved program partner, the incentive will grant $0.10 per square foot between $5,000 and $50,000, and not to exceed 50% of the facility's annual energy expense. (Benchmark #1 is not provided in addition to the local government energy audit program incentive.)*

2. *Project Implementation – Upon installation of the recommended measures along with the "Substantial Completion Construction Report," the incentive will grant savings per KWH or Therm based on the program's rates. Minimum saving must be 15%. (Example $0.11 / kWh for 15% savings, $0.12/ kWh for 17% savings, … and $1.10 / Therm for 15% savings, $1.20 / Therm for 17% saving, …) Increased incentives result from projected savings above 15%.*

3. *Measurement and Verification – Upon verification 12 months after implementation of all recommended measures, that actual savings have been achieved, based on a completed verification report, the incentive will grant additional savings per kWh or Therm based on the program's rates. Minimum savings must be 15%. (Example $0.07 / kWh for 15% savings, $0.08/ kWh for 17% savings, … and $0.70 / Therm for 15% savings, $0.80 / Therm for 17% saving, …) Increased incentives result from verified savings above 15%.*

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 no cost/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. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

E. Confirm that outside air economizers on the rooftop units are functioning properly to take advantage of free cooling and avoid excess outside air during occupied periods.

In addition to the recommendations above, implementing Retro-Commissioning would be beneficial for this facility. Retro-Commissioning is a means to verify your current equipment is operating at its designed efficiency, capacity, airflow, and overall performance. Retro-Commissioning provides valuable insight into systems or components not performing correctly or efficiently. The commissioning process defines the original system design parameters and recommends revisions to the current system operating characteristics.

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Millville Board of Education - Holly Heights School

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Savings * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Gymnasium Lighting Replacement	$6,900	$6,900	$2,300	$11,500	$2,905	$0	$2,905	15	$43,575	$0	278.9%	4.0	24.29%	$23,179.70
ECM #2	Variable Speed Chilled Water Pump Control	$8,000	$6,000	$5,200	$8,800	$2,100	$0	$2,100	15	$31,500	$0	258.0%	4.2	22.76%	$16,269.66
ECM #3	DDC Control System Upgrade	$102,000	$102,000	$0	$204,000	$11,632	$0	$11,632	15	$174,480	$0	-14.5%	17.5	-1.89%	($65,137.94)
ECM #4	Demand Control Ventilation	$55,500	$27,750	$0	$83,250	$10,109	$0	$10,109	15	$151,635	$0	82.1%	8.2	8.64%	$37,430.59
ECM #5	Roof Top Unit Replacement	$178,100	$89,050	$5,480	$261,670	$46,735	$0	$46,735	20	$934,700	$0	257.2%	5.6	17.10%	$433,628.79
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	Photovoltaic Panel Installation	$634,455	$634,455	$0	$1,268,910	$27,677	$65,013	$92,690	15	$1,390,350	$975,195	9.6%	13.7	1.16%	($162,382.80)

Notes: 1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

Concord Engineering Group, Inc.

520 BURNT MILL ROAD
VOORHEES, NEW JERSEY 08043
PHONE: (856) 427-0200
FAX: (856) 427-6508

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

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Holly Heights School

Building ID: 1872538
For 12-month Period Ending: May 31, 2009[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: October 07, 2009

Facility
Holly Heights School
2509 E. Main Street
Millville, NJ 08332

Facility Owner
Millville Board of Education
110 N. Third Street
Millville, NJ 08332

Primary Contact for this Facility
Toni Basich
110 N. Third Street
Millville, NJ 08332

Year Built: 1975
Gross Floor Area (ft²): 102,000

Energy Performance Rating[2] (1-100) 16

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	4,470,061
Natural Gas (kBtu)[4]	6,090,800
Total Energy (kBtu)	10,560,861

Energy Intensity[5]

Site (kBtu/ft²/yr)	104
Source (kBtu/ft²/yr)	209

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	1,005

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison

National Average Site EUI	75
National Average Source EUI	151
% Difference from National Average Source EUI	39%
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.

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**

Certifying Professional
Raymond Johnson
520 South Burnt Mill Rd.
Voorhees, NJ 08332

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	Holly Heights School	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	2509 E. Main Street, Millville, NJ 08332	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		☐
Holly Heights School (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	102,000 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?	No	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	236	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	1	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	N/A(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: Atlantic City Electric Co

Fuel Type: Electricity

Meter: Electric Meter (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
05/01/2009	05/31/2009	119,400.00
04/01/2009	04/30/2009	132,600.00
03/01/2009	03/31/2009	94,800.00
02/01/2009	02/28/2009	100,800.00
01/01/2009	01/31/2009	99,600.00
12/01/2008	12/31/2008	101,700.00
11/01/2008	11/30/2008	94,500.00
10/01/2008	10/31/2008	109,500.00
09/01/2008	09/30/2008	115,800.00
08/01/2008	08/31/2008	100,500.00
07/01/2008	07/31/2008	121,200.00
06/01/2008	06/30/2008	119,700.00
Electric Meter Consumption (kWh (thousand Watt-hours))		**1,310,100.00**
Electric Meter Consumption (kBtu (thousand Btu))		**4,470,061.20**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**4,470,061.20**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: Natural Gas Meter (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
05/01/2009	05/31/2009	1,254.00
04/01/2009	04/30/2009	5,330.00
03/01/2009	03/31/2009	6,560.00
02/01/2009	02/28/2009	11,392.00
01/01/2009	01/31/2009	12,372.00
12/01/2008	12/31/2008	10,863.00
11/01/2008	11/30/2008	7,836.00
10/01/2008	10/31/2008	4,380.00
09/01/2008	09/30/2008	493.00
08/01/2008	08/31/2008	139.00

07/01/2008	07/31/2008	131.00
06/01/2008	06/30/2008	158.00
Natural Gas Meter Consumption (therms)		**60,908.00**
Natural Gas Meter Consumption (kBtu (thousand Btu))		**6,090,800.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**6,090,800.00**
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.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

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

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
Holly Heights School
2509 E. Main Street
Millville, NJ 08332

Facility Owner
Millville Board of Education
110 N. Third Street
Millville, NJ 08332

Primary Contact for this Facility
Toni Basich
110 N. Third Street
Millville, NJ 08332

General Information

Holly Heights School	
Gross Floor Area Excluding Parking: (ft^2)	102,000
Year Built	1975
For 12-month Evaluation Period Ending Date:	May 31, 2009

Facility Space Use Summary

Holly Heights School	
Space Type	K-12 School
Gross Floor Area(ft^2)	102,000
Open Weekends?	No
Number of PCs	236
Number of walk-in refrigeration/freezer units	1
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months[o]	N/A
High School?	No
School District[o]	N/A

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 05/31/2009)	**Baseline** (Ending Date 05/31/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	16	16	75	N/A	50
Energy Intensity					
Site (kBtu/ft^2)	104	104	58	N/A	75
Source (kBtu/ft^2)	209	209	118	N/A	151
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	1,005	1,005	567	N/A	726
$kgCO_2e/ft^2$/year	10	10	6	N/A	7

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.

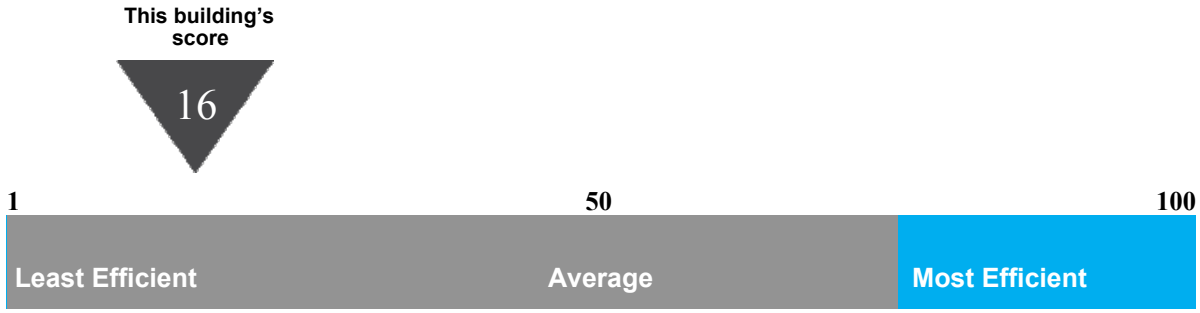
Statement of Energy Performance

2009

Holly Heights School
2509 E. Main Street
Millville, NJ 08332

Portfolio Manager Building ID: 1872538

The energy use of this building has been measured and compared to other similar buildings using the Environmental Protection Agency's (EPA's) Energy Performance Scale of 1–100, with 1 being the least energy efficient and 100 the most energy efficient. For more information, visit energystar.gov/benchmark.



This building uses 209 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending May 2009

Buildings with a score of 75 or higher may qualify for EPA's ENERGY STAR.

I certify that the information contained within this statement is accurate and in accordance with U.S. Environmental Protection Agency's measurement standards, found at energystar.gov

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 10/07/2009

MAJOR EQUIPMENT LIST

Concord Engineering Group

"Millville B.O.E. - Holy Heights School"

Boiler

Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Input (MBh)	Output (MBh)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life
Boiler Room	Entire Facility	HB Smith	2	Series 28A-8	N96-355 & N96-493	2499	1709	70%	Natural Gas	13	35	22

Boiler - Burner

Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Input (MBh)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life
Boiler Room	HB Smith Boilers	Power Flame	2	CR2-G-20A	-	2499	Nat. Gas	13	21	8

HVAC - Pumps

Location	Area Served	Manufacturer	Qty.	Model #	Serial #	HP	RPM	GPM	Ft. Hd	Frame Size	Volts	Phase	Hz	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Boiler Room	Hot Water System	Bell and Gosset	2	Series 1050	-	15	1800	340	105	254T	200	3	60	13	20	7	Hot Water Pumps
Boiler Room	Chilled Water System	Bell and Gosset	2	Series 1050	-	40	1765	720	120	324T	230/460	3	60	13	20	7	Chilled Water Pumps
Boiler Room	Boilers	Bell and Gosset	2	-	-	2	1730	-	-	145Tz	230/460	3	60	13	10	-3	Boiler Circ. Pumps

Domestic Hot Water Heater

Location	Area Served	Manufacturer	Qty	Model #	Serial #	Input	Recovery (gal/h)	Capacity (gal)	Efficiency (%)	Fuel	Volts	Phase	Hz	Approx. Age	ASHRAE Service Life	Remaining Life
Custodial Closet	-	Bradford White	1	M-II-80-6-3SF-05	KJ 906 317	6 kW	35	80	-	Electric	277	1	60	16	12	-4
Custodial Closet	-	Bradford White	1	M-II-80-6-3SF-05	CH-01-2411	6 kW	35	80	-	Electric	277	1	60	3	12	9
Boiler Room	-	Bradford White	2	D80L5053NA	-	505 MBh	459.1	80	80%	Nat. Gas	115	1	60	9	12	3
Gym Mezzanine	Locker Rooms	AO Smith	2	BTC200030	-	199	180.9	100	80%	Nat. Gas	115	1	60	15	12	-3

Roof Top Units

Location	Area Served	Manufacturer	Qty	Model #	Serial #	Equipment Tag	Cooling Coil	Cooling Eff. (EER)	Cooling Capacity (MBh)	Heating Type	Input (MBh)	Output (MBh)	Heating Eff. (%)	Fuel	Volts	Phase	Hz	Approx. Age	ASHRAE Service Life	Remaining Life
Roof	Library	OCTAGON	1	OAS-AH-CW-G6-9-MZ	10820696060	RTU - L01	Chilled Water	-	430.5	Gas HX	600	480	80%	Nat. Gas	460	3	60	13	15	2
Roof	Main Office	OCTAGON	1	OAS-AH-CW-G6-10-MZ	10820696059	RTU - M02	Chilled Water	-	426.5	Gas HX	600	480	80%	Nat. Gas	460	3	60	13	15	2
Roof	Small Auditorium	OCTAGON	1	OAS-AH-CW-G4-9-SZ	10820696061	RTU - AV3	Chilled Water	-	420	Gas HX	400	320	80%	Nat. Gas	460	3	60	13	15	2
Roof	Multi-Purpose	McQuay	1	RDS800CLA	36F0031900	RTU - C04	Chilled Water	-	330	Gas HX	1000	820	82%	Nat. Gas	460	3	60	13	15	2
Roof	Multi-Purpose	McQuay	1	RDS800CLA	36F0031800	RTU - C05	Chilled Water	-	330	Gas HX	1000	820	82%	Nat. Gas	460	3	60	13	15	2

AC Condensers

Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Equipment Tag	Cooling Capacity	Eff.	Refrigerant	Volts	Phase	Hz	Approx. Age	ASHRAE Service Life	Remaining Life
Roof	Gymnasium Office	Sanyo	1	CH1271	87471	K01	1 Ton	10.9 EER	R-410A	115	1	60	2	20	18
Roof		Intercity Products	1	AD030GD	L920674939	S06	2.5 Tons	-	R-22	208/230	1	60	17	20	3
Roof		Mitsubishi	1	PUX-A36NHA	51U00194B	AC - F07	3 Tons	13 SEER	R-410A	208/230	1	60	9	20	11
IDF 2	Server Room	APC Portable	1	AP7003	2A0719G00069		7,200 Btu/h	-	R-22	115	1	60	2	20	18

Duct Furnace

Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Heating Type	Input (MBh)	Output (MBh)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life
Gym Mezzanine	Gymnasium	Reznor	2	HEEDU400-3	-	Gas HX	400	312	78%	Natural Gas	15	13	-2

Indoor Air Handling Units

Location	Area Served	Manufacturer	Qty	Model #	Serial #	Equipment Tag	Cooling Coil	Cooling Eff. (EER)	Cooling Capacity (MBh)	Volts	Phase	Hz	Approx. Age	ASHRAE Service Life	Remaining Life
Gym Mezzanine	Gymnasium	Trane	1	Modular Climate Changer	-	AHU-1	Chilled Water	-	108.5	480	3	60	15	20	5
Gym Mezzanine	Gymnasium	Trane	1	Modular Climate Changer	-	AHU-2	Chilled Water	-	108.5	480	3	60	15	20	5

Kitchen Hood

Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Equipment Tag	Fan HP	CFM	Volts	Phase	Hz	Approx. Age	ASHRAE Service Life	Remaining Life
Roof	Kitchen	-	1	-	-	EF-K22A	1/2	4000	-	-	60	34	25	-9
Roof	Kitchen	-	1	-	-	EF-K22B	1/2	4000	-	-	60	34	25	-9
Roof	Kitchen	-	1	-	-	EF-K22C	1/2	4000	-	-	60	34	25	-9

Air Cooled Chiller

Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Cooling Capacity	Eff.	Refrigerant	Volts	Phase	Hz	Approx. Age	ASHRAE Service Life	Remaining Life
Building Exterior	Chilled Water System	McQuay	1	AL5265A	56F8131901	255	10.2 EER	R-22	460	3	60	13	20	7

INVESTMENT GRADE LIGHTING AUDIT

1	Girls Bathroom	3750	3	2	1' x 4' (1), 1' x 4' Wall Mount (2), 2-Lamp, T8 32W, 2 Surface Mount, 1 Recessed Mount, 2 Direct/Indirect Lens	58	0.17	652.5	$97.22	0	0	No Change Required (NCR)	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
2	Bathroom	3750	1	1	1-Lamp, Incandescent 60W, Recessed Mount, Prismatic Lens	60	0.06	225.0	$33.53	1	1	18 W CFL Lamp	18	0.02	67.5	$10.06	$10.00	$10.00	0.04	157.5	$23.47	0.43
3	Boys Bathroom	3750	3	2	1' x 4' (1) 2 Wall Mount 1' x 4', 2-Lamp, T8 32W, 2 Surface Mounts, 1 Recessed Mount, 1 Prismatic Lens, 2 Direct/Indirect	58	0.17	652.5	$97.22	0	0	NCR	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
4	Boys Bathroom	3750	1	1	1-Lamp, Incandescent 60W, Recessed Mount, Prismatic Lens	60	0.06	225.0	$33.53	1	1	18 W CFL Lamp	18	0.02	67.5	$10.06	$10.00	$10.00	0.04	157.5	$23.47	0.43
5	10 Classroom	3750	12	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.98	3,690.0	$549.81	0	0	NCR	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
6	10 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
7	Area to Courtyard	3750	2	3	2' x 2', 1 Exit sign, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.16	615.0	$91.64	0	0	NCR	1	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
8	12 Classroom	3750	10	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.82	3,075.0	$458.18	0	0	NCR	2	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
9	12 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	3	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
10	11 Classroom	3750	11	3	2' x 4' occupancy sensors, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	4	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
11	11 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	5	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
12	13/15 Classroom	3750	19	3	2' x 4' occupancy sensors, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	1.56	5,842.5	$870.53	0	0	NCR	6	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
13	13 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	7	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
14	15 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	8	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
15	14 Classroom	3750	10	3	2' x 4' occupancy sensors, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.82	3,075.0	$458.18	0	0	NCR	9	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
16	14 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	10	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
17	16 Classroom	3750	11	3	2" x 4', 3-Lamp, T8 32W, Surface Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	11	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
18	16 Bathroom	3750	1	3	2' x 2' bulb, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	12	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

INVESTMENT GRADE LIGHTING AUDIT

19	Utility Room	3750	2	2	2" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.12	435.0	$64.82	0	0	NCR	13	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
20	Utility Room	3750	2	2	2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.12	435.0	$64.82	0	0	NCR	14	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
21	Corridor A/B	3750	23	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	1.89	7,072.5	$1,053.80	0	0	NCR	15	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
22	Men Teacher Bathroom	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	16	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
23	Boys Bathroom	3750	2	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.22	817.5	$121.81	0	0	NCR	17	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
24	21 Classroom	3750	6	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.49	1,845.0	$274.91	0	0	NCR	18	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
25	Custodian Closet	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	19	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
26	Women Teacher Bathroom	3750	1	2	2" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	20	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
27	Girls Bathroom	3750	2	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.22	817.5	$121.81	0	0	NCR	21	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
28	18 Classroom	3750	15	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	1.23	4,612.5	$687.26	0	0	NCR	22	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
29	18 Bathroom	3750	1	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	23	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
30	Open Space Classroom A Corridor	3750	2	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.16	615.0	$91.64	0	0	NCR	24	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
31	Open Space Classroom A Corridor	3750	6	2	2' x 4',2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	25	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
32	A-1 Classroom	3750	12	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	1.31	4,905.0	$730.85	0	0	NCR	26	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
33	A-1 Bathroom	3750	1	3	2' x 4' 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	41	0.04	153.8	$22.91	0	0	NCR	27	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
34	A-2 Classroom	3750	12	4	2' x 4' 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	1.31	4,905.0	$730.85	0	0	NCR	28	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
35	A-2 Closet	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	29	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
36	A-3 Classroom	3750	12	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	1.31	4,905.0	$730.85	0	0	NCR	30	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
37	A-3 Closet	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens		0.00	0.0	$0.00	0	0	NCR	31	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
38	A-4 Classroom	3750	12	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	1.31	4,905.0	$730.85	0	0	NCR	32	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

39	A-4 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens		0.00	0.0	$0.00	0	0	NCR	33	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
40	Open space Classroom B Corridor	3750	6	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	34	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
41	B-1 Classroom	3750	12	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	1.31	4,905.0	$730.85	0	0	NCR	35	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
42	B-1 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	36	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
43	B-2 Classroom	3750	12	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	1.31	4,905.0	$730.85	0	0	NCR	37	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
44	B-2 Closet	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	38	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
45	B-3 Classroom	3750	12	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	1.31	4,905.0	$730.85	0	0	NCR	39	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
46	B-3 Closet	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	40	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
47	B-4 Classroom	3750	12	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	1.31	4,905.0	$730.85	0	0	NCR	41	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
48	B-4 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	42	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
49	20 Classroom	3750	6	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.49	1,845.0	$274.91	0	0	NCR	43	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
50	17 Classroom/Office	3750	8	3	2' x 4', 1 Refrigerator, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.66	2,460.0	$366.54	0	0	NCR	44	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
51	Area to Courtyard	3750	2	3	2' x 2', 1 Exit sign, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.16	615.0	$91.64	0	0	NCR	45	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
52	22 Classroom	3750	11	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	46	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
53	24 Classroom	3750	11	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	47	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
54	Library	3750	32	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	3.49	13,080.0	$1,948.92	0	0	NCR	48	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
55	Library Office	3750	4	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.33	1,230.0	$183.27	0	0	NCR	49	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
56	26 Classroom	3750	11	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	50	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
57	28 Classroom	3750	11	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	51	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

58	23 New Office	3750	6	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.49	1,845.0	$274.91	0	0	NCR	52	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
59	25 Classroom	3750	6	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.49	1,845.0	$274.91	0	0	NCR	53	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
60	Corridor/Library Area	3750	13	3	2' x 2', 4 Exit sings, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	1.07	3,997.5	$595.63	0	0	NCR	54	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
61	D Corridor	3750	5	2	2' x 4', 2 Exit sings, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.29	1,087.5	$162.04	0	0	NCR	55	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
62	D Corridor	3750	2	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.16	615.0	$91.64	0	0	NCR	56	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
63	D-1 Classroom	3750	8	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.46	1,740.0	$259.26	0	0	NCR	57	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
64	D-1 Classroom	3750	5	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.55	2,043.8	$304.52	0	0	NCR	58	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
65	D-1 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	59	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
66	D-2 Classroom	3750	9	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.52	1,957.5	$291.67	0	0	NCR	60	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
67	D-2 Classroom	3750	6	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	61	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
68	D-3 Classroom	3750	6	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	62	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
69	D-3 Classroom	3750	6	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	63	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
70	D-4 Classroom	3750	6	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	64	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
71	D-4 Classroom	3750	6	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	65	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
72	D-4 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	66	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
73	C-5 Office	3750	3	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.17	652.5	$97.22	0	0	NCR	67	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
74	29 Classroom	3750	6	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	68	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
75	29 Classroom	3750	4	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.44	1,635.0	$243.62	0	0	NCR	69	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
76	IDF Room/Teachers Planning Center D	3750	6	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	70	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
77	Corridor/Classroom C1, 2, 3, 4	3750	5	2	2' x 4' 1 Exit sign, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.29	1,087.5	$162.04	0	0	NCR	71	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

78	C-1 Classroom	3750	6	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	72	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
79	C-1 Classroom	3750	6	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	73	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
80	C-1 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	74	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
81	C-2 Classroom	3750	6	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	75	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
82	C-2 Classroom	3750	6	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	76	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
83	C-3 Classroom	3750	6	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	77	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
84	C-3 Classroom	3750	6	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	78	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
85	C-4 Classroom	3750	6	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	79	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
86	C-4 Classroom	3750	6	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	80	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
87	C-4 Bathroom	3750	1	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.11	408.8	$60.90	0	0	NCR	81	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
88	Women Teacher Bathroom	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	82	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
89	Girls Bathroom	3750	2	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.22	817.5	$121.81	0	0	NCR	83	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
90	Custodian Closet	3750	2	2	2" x 4' 2-Lamp, T8 32W, Surface Mount, 1 Prismatic Lens, 1 Direct/Indirect Lens	58	0.12	435.0	$64.82	0	0	NCR	84	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
91	Men's Teacher Bathroom	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	85	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
92	Boys Bathroom	3750	2	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.22	817.5	$121.81	0	0	NCR	86	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
93	Utility Room	3750	2	2	2" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.12	435.0	$64.82	0	0	NCR	87	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
94	31 Science Lab.	3750	14	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	1.15	4,305.0	$641.45	0	0	NCR	88	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
95	31 Prep. Room	3750	2	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.16	615.0	$91.64	0	0	NCR	89	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
96	30 Classroom	3750	19	2	1' x 4', 2-Lamp, T8 32W, Pendant Mount, Direct/Indirect Lens	58	1.10	4,132.5	$615.74	0	0	NCR	90	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
97	32 Classroom	3750	11	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	91	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
98	33 Classroom	3750	11	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	92	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

99	34 Classroom	3750	11	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	93	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
100	35 Classroom	3750	11	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.90	3,382.5	$503.99	0	0	NCR	94	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
101	IDF 2	3750	2	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.16	615.0	$91.64	0	0	NCR	95	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
102	36 Home Arts Room	3750	15	3	2' x 4' Washer/Dryer/2 Ovens with Ranges/1 Microwave, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	1.23	4,612.5	$687.26	0	0	NCR	96	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
103	Women Teacher Bathroom	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	97	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
104	Girls Bathroom	3750	2	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.22	817.5	$121.81	0	0	NCR	98	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
105	Custodian	3750	1	2	2" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	99	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
106	Men's Teacher Bathroom	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	100	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
107	Boys Bathroom	3750	2	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.22	817.5	$121.81	0	0	NCR	101	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
108	38 Radio Station	3750	20	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	1.16	4,350.0	$648.15	0	0	NCR	102	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
109	Custodian to Boiler Room	3750	7	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.41	1,522.5	$226.85	0	0	NCR	103	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
110	Bathroom in Custodian Room	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	104	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
111	Boiler Room	3750	7	4	1' x 4' 1 Exit sign, 4-Lamp, T8 32W, Pendant Mount, Prismatic Lens	109	0.76	2,861.3	$426.33	0	0	NCR	105	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
112	Electrical Room	3750	14	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.81	3,045.0	$453.71	0	0	NCR	106	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
113	Kitchen	3750	34	2	4' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	1.97	7,395.0	$1,101.86	0	0	NCR	107	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
114	Kitchen Office	3750	1	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.11	408.8	$60.90	0	0	NCR	108	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
115	Kitchen Locker Room	3750	2	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.12	435.0	$64.82	0	0	NCR	109	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
116	Kitchen Bathroom	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	110	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
117	Kitchen Trash Can Wash	3750	2	2	4" x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.12	435.0	$64.82	0	0	NCR	111	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
118	Kitchen Storage	3750	5	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.29	1,087.5	$162.04	0	0	NCR	112	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

119	Student Serving Area	3750	16	2	1' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.93	3,480.0	$518.52	0	0	NCR	113	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
120	Dishwashing Area	3750	6	2	4" x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	114	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
121	Teachers Serving Area	3750	5	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.29	1,087.5	$162.04	0	0	NCR	115	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
122	Cafeteria	3750	40	4	2' x 4', 3 Exit signs, 4-Lamp, T12 34W, Recessed Mount, Prismatic Lens	109	4.36	16,350.0	$2,436.15	0	0	NCR	116	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
123	Girls Shower	3750	7	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.41	1,522.5	$226.85	0	0	NCR	117	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
124	Girls Shower	3750	1	4	2' x 4', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.11	408.8	$60.90	0	0	NCR	118	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
125	Boys Shower	3750	9	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.52	1,957.5	$291.67	0	0	NCR	119	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
126	Teachers Dining	3750	6	2	2' x 4' 2 Vending Machines -1 Soda, 1 Candy, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	120	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
127	37 Classroom	3750	3	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.17	652.5	$97.22	0	0	NCR	121	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
128	39 Classroom	3750	3	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.17	652.5	$97.22	0	0	NCR	122	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
129	Custodian	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	123	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
130	C/D Corridor	3750	13	2	2' x 2', 5 Exit signs, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.75	2,827.5	$421.30	0	0	NCR	124	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
131	C/D Corridor	3750	16	3	2' x 2', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	1.31	4,920.0	$733.08	0	0	NCR	125	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
132	Corridor along Kindergarten Classrooms	3750	6	3	2' x 4' 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.49	1,845.0	$274.91	0	0	NCR	126	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
133	44 Classroom	3750	16	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.93	3,480.0	$518.52	0	0	NCR	127	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
134	44 Bathroom	3750	1	2	2' x 2', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	128	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
135	42 Classroom	3750	16	2	2' x 4' 1 Exit sign, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.93	3,480.0	$518.52	0	0	NCR	129	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
136	42 Bathroom	3750	1	2	2' x 2', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	130	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
137	40 Classroom	3750	20	2	2' x 4', 1 Exit sign, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	1.16	4,350.0	$648.15	0	0	NCR	131	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

138	40 Bathroom	3750	1	2	2' x 2', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	132	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
139	Corridor between Office & Cafeteria	3750	11	2	2' x 2', 4 Exit signs, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.64	2,392.5	$356.48	0	0	NCR	133	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
140	Corridor between Office & Cafeteria	3750	5	4	2' x 2', 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.55	2,043.8	$304.52	0	0	NCR	134	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
141	Corridor off Main Office	3750	7	3	2' x 2', 2 Exit signs, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.57	2,152.5	$320.72	0	0	NCR	135	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
142	Corridor off Main Office	3750	3	2	2' x 2', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.17	652.5	$97.22	0	0	NCR	136	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
143	67 Classroom	3750	8	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	82	0.66	2,460.0	$366.54	0	0	NCR	137	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
144	Storage	3750	8	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.46	1,740.0	$259.26	0	0	NCR	138	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
145	Book Storage	3750	6	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	139	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
146	Music Room	3750	12	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.98	3,690.0	$549.81	0	0	NCR	140	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
147	Music Back Room	3750	1	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	141	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
148	Music Room Closet	3750	1	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	142	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
149	Music Room Closet	3750	1	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	143	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
150	Stage Door Area	3750	8	2	6" x 4', 2 Exit signs, 2-Lamp, T8 32W, Pendant Mount, Direct/Indirect Lens	58	0.46	1,740.0	$259.26	0	0	NCR	144	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
151	Stage Area	3750	14	1	Can Light, 1-Lamp, Comp. Flour., Recessed Mount, Direct/Indirect Lens	18	0.25	945.0	$140.81	0	0	NCR	145	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
152	Audio Visual	3750	46	1	Can Light, 2 Exit signs, 1-Lamp, Comp. Flour., Recessed Mount, Direct/Indirect Lens	18	0.83	3,105.0	$462.65	0	0	NCR	146	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
153	Audio Visual	3750	5	1	1-Lamp, Flood lights, Surface Mount, Direct/Indirect Lens	18	0.09	337.5	$50.29	0	0	NCR	147	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
154	Audio Visual	3750	20	1	Recessed into each step throughout seating area, 1-Lamp, Comp. Flour. 13W, Recessed Mount, Direct/Indirect Lens	13	0.26	975.0	$145.28	0	0	NCR	148	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
155	Audio Visual Corridor	3750	4	4	2' x 4' occupancy sensors, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.44	1,635.0	$243.62	0	0	NCR	149	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

156	Gym Entrance	3750	6	4	2' x 2' 1 Exit sign, 4-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	150	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
157	IDF Office Gym Entrance	3750	1	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	151	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
158	Gym	3750	23	1	6 Exit signs, 1-Lamp, Metal Halides 400W, Pendant Mount, Prismatic Lens	455	10.47	39,243.8	$5,847.32	23	4	4-Lamp T-5 HO Cooper F-Bay	229	5.27	19751.25	$2,942.94	$600.00	$13,800.00	5.20	19492.5	$2,904.38	4.75
159	Gym Janitor Room	3750	1	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	151	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
160	Area between Café & Gym	3750	1	2	2' x 2', 2-Lamp, T8 U Lamp, Surface Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	152	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
161	Gym Handicap Bathroom	3750	1	1	3" x 4', 1-Lamp, T8 32W, Surface Mount, Prismatic Lens	28	0.03	105.0	$15.65	0	0	NCR	153	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
162	Gym Office	3750	6	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.49	1,845.0	$274.91	0	0	NCR	154	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
163	Bathroom	3750	1	1	3" x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	155	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
164	Gym Bathroom	3750	1	2	4" x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	156	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
165	Electrical Panel	3750	6	2	1' x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	157	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
166	Electrical Panel	3750	7	2	1' x 4', 2-Lamp, T8 32W, Pendant Mount, Prismatic Lens	58	0.41	1,522.5	$226.85	0	0	NCR	158	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
167	Boys Locker Room	3750	6	2	6" x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.35	1,305.0	$194.45	0	0	NCR	159	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
168	Girls Locker Room	3750	14	2	4" x 4', 2-Lamp, T8 32W, Surface Mount, Prismatic Lens	58	0.81	3,045.0	$453.71	0	0	NCR	160	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
169	Sprinkler/Storage Room	3750	4	2	1' x 4', 2-Lamp, T8 32W, Pendant Mount, Prismatic Lens	58	0.23	870.0	$129.63	0	0	NCR	161	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
170	Main Lobby	3750	6	8	4' x 4', 8-Lamp, T8 32W, Recessed Mount, Prismatic Lens	218	1.31	4,905.0	$730.85	0	0	NCR	162	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
171	Main Lobby Entry	3750	2	2	1' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.12	435.0	$64.82	0	0	NCR	163	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
172	Administration Office	3750	9	2	2' x 4' 2 Exit signs, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.52	1,957.5	$291.67	0	0	NCR	164	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
173	155 Room	3750	4	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.33	1,230.0	$183.27	0	0	NCR	165	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
174	Vice Principal	3750	3	2	2' x 4' occupancy sensors, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.17	652.5	$97.22	0	0	NCR	166	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
175	Vice Principal's Bathroom	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	167	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

176	Copier Room	3750	1	3	2' x 4', 1 Copier, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	82	0.08	307.5	$45.82	0	0	NCR	168	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
177	Principal	3750	3	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.17	652.5	$97.22	0	0	NCR	169	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
178	Bathroom	3750	1	2	3" x 4', 2-Lamp, T8 32W, Surface Mount, Direct/Indirect Lens	58	0.06	217.5	$32.41	0	0	NCR	170	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
179	Health Suite	3750	5	3	2' x 4', 1 Refrigerator, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.55	2,043.8	$304.52	0	0	NCR	171	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
180	Nurse	3750	1	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.11	408.8	$60.90	0	0	NCR	172	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
181	Nurse Storage	3750	1	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.11	408.8	$60.90	0	0	NCR	173	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
182	Exam Room	3750	1	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	174	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
183	Exam Room/Bathroom	3750	1	2	2' x 2', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	175	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
184	Exam Room	3750	1	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	176	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
185	Exam Room Bathroom	3750	1	2	2' x 2', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.06	217.5	$32.41	0	0	NCR	177	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
186	Guidance	3750	3	2	2' x 4', 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.17	652.5	$97.22	0	0	NCR	178	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
187	Teachers Work Room	3750	4	3	2' x 4', 2 Copiers, 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.44	1,635.0	$243.62	0	0	NCR	179	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
188	Conference Room	3750	4	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.44	1,635.0	$243.62	0	0	NCR	180	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
189	Faculty Lounge	3750	6	3	2' x 4', 3-Lamp, T8 32W, Recessed Mount, Prismatic Lens	109	0.65	2,452.5	$365.42	0	0	NCR	181	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
190	Faculty Women's	3750	3	2	1' x 4' (1), 3" x 4' Wall Mount (2), 2-Lamp, T8 32W, 2 Surface Mount, 1 Recessed Mount, 2 Direct/Indirect Lens	58	0.17	652.5	$97.22	0	0	NCR	182	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
191	Faculty Women's	3750	1	1	1-Lamp, Incandescent 60W, Recessed Mount, Prismatic Lens	60	0.06	225.0	$33.53	1	1	18 W CFL Lamp	18	0.02	67.5	$10.06	$10.00	$10.00	0.04	157.5	$23.47	0.43
192	Faculty Men's	3750	3	2	1' x 4' (1), 3" x 4' Wall Mount (2), 2-Lamp, T8 32W, 2 Surface Mount, 1 Recessed Mount, 2 Direct/Indirect Lens	58	0.17	652.5	$97.22	0	0	NCR	182	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
193	Faculty Men's	3750	1	1	1-Lamp, Incandescent 60W, Recessed Mount, Prismatic Lens	60	0.06	225.0	$33.53	1	1	18 W CFL Lamp	18	0.02	67.5	$10.06	$10.00	$10.00	0.04	157.5	$23.47	0.43

194	Hallway in Main Office	3750	5	3	2' x 2', 1 Exit sign, 2-Lamp, T8 32W, Recessed Mount, Prismatic Lens	58	0.29	1,087.5	$162.04	0	0	NCR	182	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
	Totals		1223				100.89	378,348.8	$56,373.96	27				5.339	20021.25	$2,983.17		$13,840.00	5.37	20122.5	$2,998.25	4.62

Project Name: **Millville BOE - Holly Heights School**
Location: **Millville, NJ 08332**
Description: **Photovoltaic System - Direct Purchase**

Simple Payback Analysis

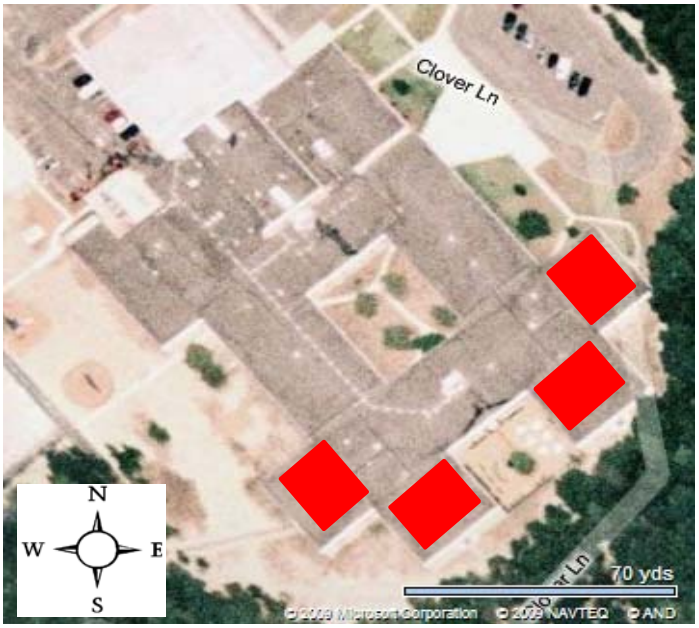
	Photovoltaic System - Direct Purchase
Total Construction Cost	$1,268,910
Annual kWh Production	185,751
Annual Energy Cost Reduction	$27,677
Annual SREC Revenue	$65,013
First Cost Premium	**$1,268,910**
Simple Payback:	**13.69** **Years**

Life Cycle Cost Analysis

Analysis Period (years):	25	Financing %:	0%
Financing Term (mths):	0	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.149**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	0.00%	SREC Value ($/kWh)	$0.350

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Net Cash Flow	Cumulative Cash Flow
0	$1,268,910	0	0	0	$0	(1,268,910)	0
1	$0	185,751	$27,677	$0	$65,013	$92,690	($1,176,220)
2	$0	184,822	$28,507	$0	$64,688	$93,195	($1,083,025)
3	$0	183,898	$29,362	$0	$64,364	$93,727	($989,298)
4	$0	182,979	$30,243	$0	$64,043	$94,286	($895,013)
5	$0	182,064	$31,151	$1,875	$63,722	$92,998	($802,015)
6	$0	181,153	$32,085	$1,866	$63,404	$93,623	($708,392)
7	$0	180,248	$33,048	$1,857	$63,087	$94,278	($614,114)
8	$0	179,346	$34,039	$1,847	$62,771	$94,963	($519,151)
9	$0	178,450	$35,060	$1,838	$62,457	$95,680	($423,472)
10	$0	177,557	$36,112	$1,829	$62,145	$96,428	($327,043)
11	$0	176,670	$37,195	$1,820	$61,834	$97,210	($229,833)
12	$0	175,786	$38,311	$1,811	$61,525	$98,026	($131,807)
13	$0	174,907	$39,461	$1,802	$61,218	$98,877	($32,931)
14	$0	174,033	$40,644	$1,793	$60,911	$99,763	$66,833
15	$0	173,163	$41,864	$1,784	$60,607	$100,687	$167,520
16	$0	172,297	$43,120	$1,775	$60,304	$101,649	$269,169
17	$0	171,435	$44,413	$1,766	$60,002	$102,650	$371,819
18	$0	170,578	$45,746	$1,757	$59,702	$103,691	$475,510
19	$0	169,725	$47,118	$1,748	$59,404	$104,774	$580,284
20	$0	168,877	$48,532	$1,739	$59,107	$105,899	$686,183
21	$1	168,032	$49,988	$1,731	$58,811	$107,068	$793,251
22	$2	167,192	$51,487	$1,722	$58,517	$108,282	$901,533
23	$3	166,356	$53,032	$1,713	$58,225	$109,543	$1,011,076
24	$4	165,524	$54,623	$1,705	$57,934	$110,851	$1,121,928
25	$5	164,697	$56,261	$1,696	$57,644	$112,209	$1,234,137
	Totals:	3,543,740	$743,689	$28,905	$1,240,309	$2,503,047	$1,955,093
				Net Present Value (NPV)			**$1,234,162**
				Internal Rate of Return (IRR)			**5.9%**

Building	Roof Area (sq ft)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Panel Weight (33 lbs)	W/SQFT
Holly Heights School	10000	Sunpower SPR230	613	14.7	9,014	140.99	185,751	20,229	15.64



Station Identification	
City:	Atlantic_City
State:	New_Jersey
Latitude:	39.45° N
Longitude:	74.57° W
Elevation:	20 m
PV System Specifications	
DC Rating:	141.0 kW
DC to AC Derate Factor:	0.810
AC Rating:	114.2 kW
Array Type:	Fixed Tilt
Array Tilt:	39.5°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	14.9 ¢/kWh

Results			
Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	3.61	13289	1980.06
2	4.20	13835	2061.41
3	4.78	16693	2487.26
4	5.23	17144	2554.46
5	5.44	17996	2681.40
6	5.48	16845	2509.91
7	5.55	17416	2594.98
8	5.41	17160	2556.84
9	5.23	16423	2447.03
10	4.60	15358	2288.34
11	3.59	12201	1817.95
12	3.17	11391	1697.26
Year	4.69	185751	27676.90

.= Proposed PV Layout

Notes:

1. Estimated kWH based on the National Renewable Energy Laboratory PVWatts Version 1 Calculator Program.