LOCAL GOVERNMENT ENERGY AUDIT PROGRAM: REGIONAL HIGH SCHOOL ENERGY AUDIT REPORT

PREPARED FOR:

LOWER CAPE MAY REGIONAL SCHOOL DISTRICT
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TABLE OF CONTENTS

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I. EXECUTIVE SUMMARY

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

Lower Cape May Regional School District
Regional High School
687 Route 9 North
Erma, NJ 08204

District Contact Person: Frank Onorato
Facility Contact Person: Thomas Frisoli Jr.

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	$ 306,498
Natural Gas	$ 130,444
Total	$436,942

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's 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	Lighting Upgrade	$56,495	$13,542	4.2	259.6%
ECM #2	Lighting Controls	$25,125	$10,154	2.5	506.2%
ECM #3	DDC Control System	$464,000	$33,707	13.8	9.0%
ECM #4	High Efficiency Condensing Boilers	$398,000	$18,082	22.0	13.6%
ECM #5	HW Pipe Insulation	$1,800	$356	5.1	197.0%
ECM #6	Rooftop/AC Replacements	$137,510	$5,294	26.0	-42.3%
ECM #7	Walk-In Box Controls	$2,477	$545	4.5	230.0%
ECM #8	Occupancy Controlled Power Strips	$18,000	$1,905	9.4	58.8%
ECM #9	CRT TV Replacement	$33,600	$351	95.7	-84.3%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	727 kW Parking Lot Solar Array	$5,094,040	$381,656	13.3	49.8%
REM #2	(3) 100 kW Wind Turbines	$1,394,153	$75,285	18.5	8.0%
REM #3	(2) 75 kW CHP Plant	$525,000	$26,181	20.1	-0.3%

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	Lighting Upgrade	38.5	106628.0	0.0
ECM #2	Lighting Controls	30.8	79951.0	0.0
ECM #3	DDC Control System	0.0	145280.0	12505.0
ECM #4	High Efficiency Condensing Boilers	0.0	0.0	14821.0
ECM #5	HW Pipe Insulation	0.0	0.0	280.6
ECM #6	Rooftop/AC Replacements	24.9	41686.0	0.0
ECM #7	Walk-In Box Controls	0.0	4290.0	0.0
ECM #8	Occupancy Controlled Power Strips	0.0	15000.0	0.0
ECM #9	CRT TV Replacement	0.0	2762.0	0.0
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
REM #1	727 kW Parking Lot Solar Array	727.0	800118.0	0.0
REM #2	(3) 100 kW Wind Turbines	0.0	495296.0	0.0
REM #3	(2) 75 kW CHP Plant	150.0	228049.0	(2225.0)

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:** Lighting Upgrade
- **ECM #2:** Lighting Controls
- **ECM #5:** HW Pipe Insulation
- **ECM #7:** Walk-In Box Controls
- **ECM #8:** Occupancy Controlled Power Strips

Although ECM #3 does not provide a payback less than 10 years, it is recommended the District further investigate the potential of controls benefits by either expanding the existing Carrier System or contacting another controls vendor to have discussions about the advantages of a controls upgrade and get more refined estimated pricing. The District should also strongly consider ECM #4 that involves install new modular boilers, while the existing sectionals provide turn down capability, the condensing boilers can operate at efficiency levels above 90%, and reduce system losses through radiated heat from the boilers. Lastly ECM #6 Rooftop/AC replacement many of the rooftops are past their useful life expectancy and could potentially cost the District more money over time as the efficiency will likely decline with continued use, and the units will likely require additional maintenance further driving costs up.

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.
5. Educate staff and students on awareness of wasteful energy practices such as leaving lights on unnecessarily, leaving on of non-essential computer and/or equipment at the end of the day, leaving of outside doors/windows open as a means to control room temperature, etc.

Renewable Energy Measures (REMs) were also reviewed for implementation at the High School. CEG utilized a parking canopy mounted solar array to house a substantial PV system. The recommended 727 kW PV system will produce approximately 800,118 kWh of electricity annually and will reduce the schools electrical consumption from the grid by 33%. The system's calculated simple payback of 13.3 years is past the standard 10 year simple payback threshold; however, with alternative funding this payback could be lessened. CEG also reviewed the applicability of Wind Generation and came to the conclusion the site has good potential for the installation of commercial sized wind turbines in the 100 kW range. The proposed system consisted of three (3) 100 kW Northwind 100 turbines that would generate 495,296 kWh annually. While the payback for the system was over 20 years there is a potential that Renewable Energy Certificates (REC) pricing for wind energy will increase in the coming years providing a more lucrative payback, furthermore alternative funding paths could be taken to increase the Districts return on investment. CEG recommends the Owner review all funding options before deciding to not implement this renewable energy measure.

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.

Overall, the Regional High School is moving in the right direction of reducing energy usage and costs by already purchasing energy supply from a third party supplier and utilizing energy efficiency equipment and controls strategies that are available to them. With the implementation of the above recommended measures the District will realize further energy savings at the High School.

II. INTRODUCTION

The comprehensive energy audit covers the 232,000 square foot Lower Cape May Regional High School. The school has seven classroom wings, offices, mechanical rooms, auditorium, two gymnasiums, cafeteria, kitchen, and recently added greenhouse.

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. The facilities receive electric distribution service through Atlantic City Electric Company (ACE) on rate schedule Annual General Service - AGS rate structure. The school has contracted South Jersey Energy, a Third Party Supplier (TPS), to provide electric commodity supply (generation) service. 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 Gas (SJG) provides natural gas to the facility under the Firm Transportation rate structure. A Third Part Supplier (TPS) has been contracted, Pepco Energy Services for the commodity portion of the gas bill. 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 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	12.7¢ / kWh
Natural Gas	$1.22 / Therm

Table 3
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: Atlantic City Electric
Rate: Annual General Service
Meter No: 83996248
Account # 0104 5679 9971
Third Party Utility SJ Energy Co.
TPS Meter / Acct No: 010456799971

MONTH OF USE	CONSUMPTION KWH	DEMAND	TOTAL BILL
Aug-09	222,857	529.9	$27,737
Sep-09	243,944	687.6	$30,968
Oct-09	189,122	589.0	$23,940
Nov-09	170,694	518.4	$21,713
Dec-09	206,656	515.5	$26,215
Jan-10	182,133	456.5	$23,026
Feb-10	153,244	465.8	$19,863
Mar-10	191,158	455.8	$24,230
Apr-10	170,787	466.6	$21,852
May-10	199,011	575.3	$25,003
Jun-10	268,246	704.9	$33,925
Jul-10	223,478	486.0	$28,028
Totals	**2,421,330**	**704.9 Max**	**$306,498**

AVERAGE DEMAND 537.6 KW average

AVERAGE RATE $0.127 $/kWh

Figure 1
Electricity Usage Profile

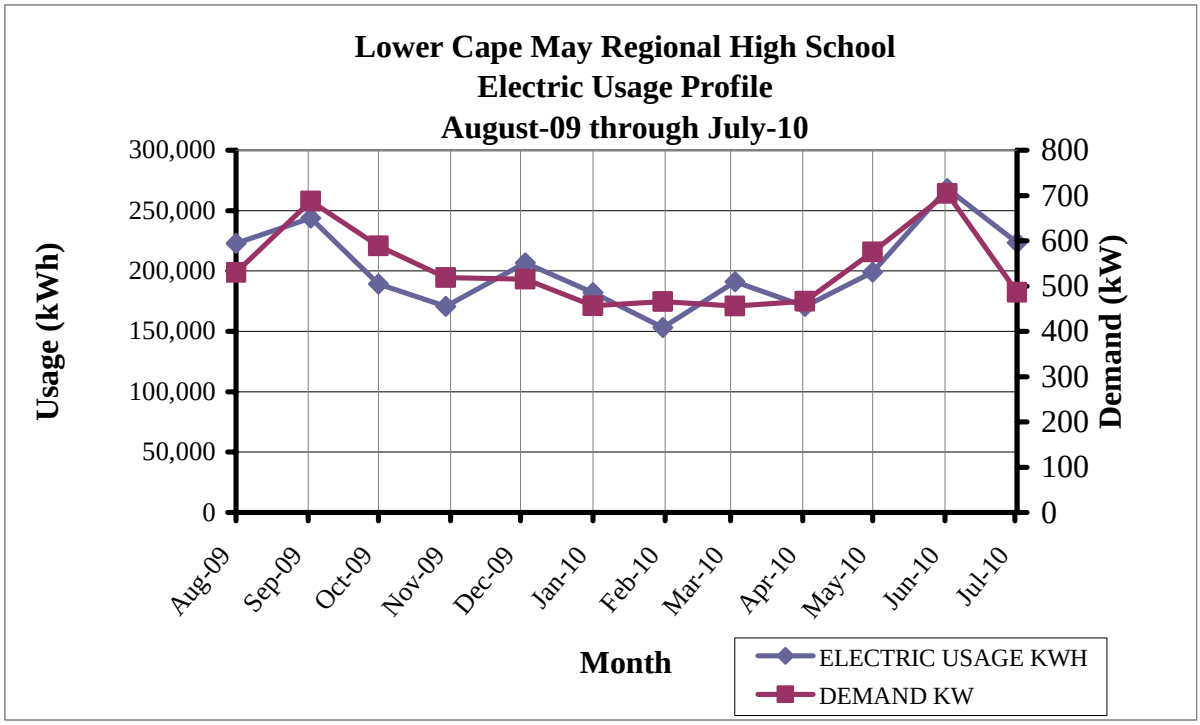
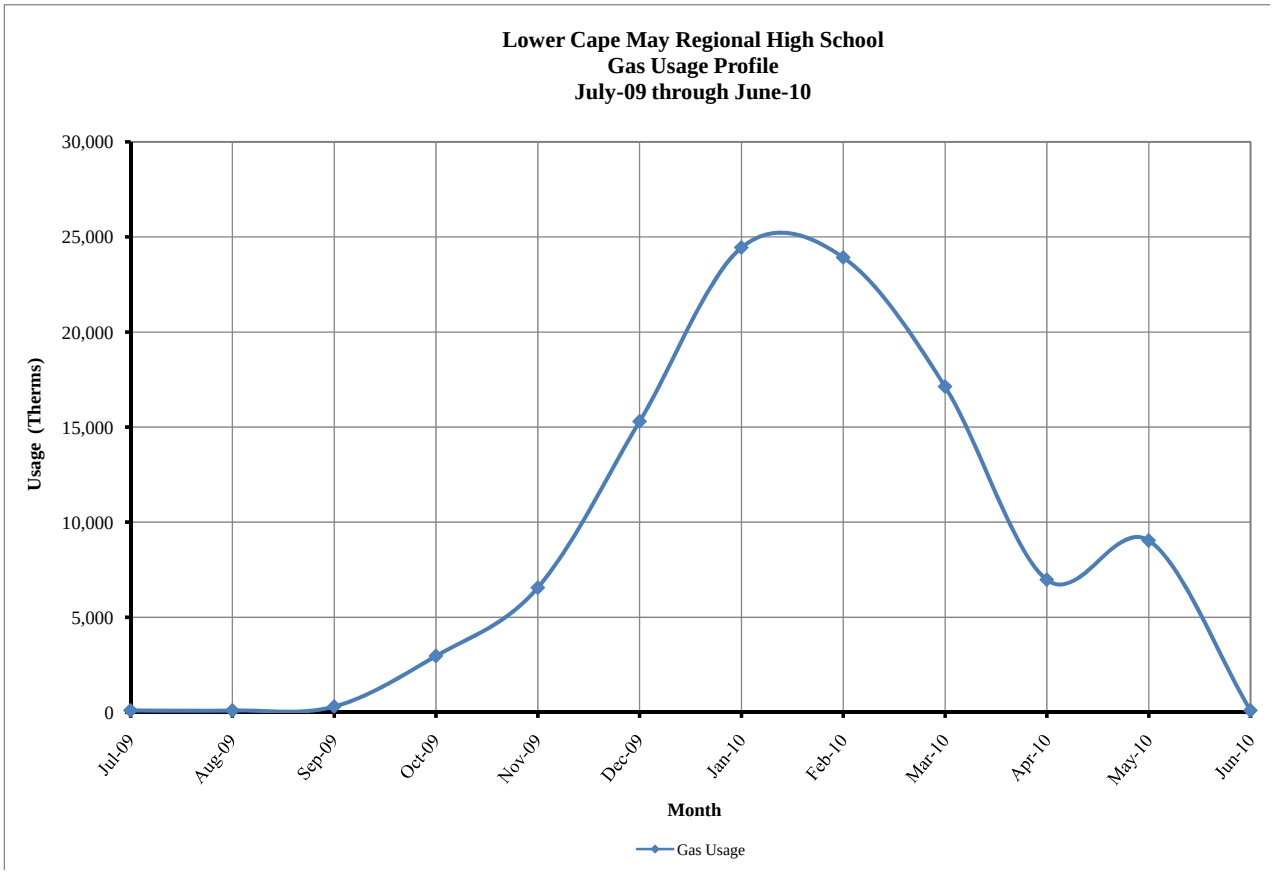


Table 4
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider:	South Jersey Gas	
Rate:	Firm Transportation	
Meter No:	450784	
Point of Delivery ID:	4 15 55 5784 0 4	
Third Party Utility Provider:	Pepco Energy Services	
TPS Meter No:	50542	
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Jul-09	103.50	$249.58
Aug-09	103.20	$348.74
Sep-09	307.50	$694.39
Oct-09	2,969.60	$3,937.17
Nov-09	6,560.00	$8,118.32
Dec-09	15,302.30	$17,913.28
Jan-10	24,442.60	$28,076.96
Feb-10	23,919.20	$29,212.62
Mar-10	17,134.20	$21,181.76
Apr-10	6,976.80	$8,912.40
May-10	9,037.60	$11,606.94
Jun-10	102.80	$191.62
TOTALS	**106,959.30**	**$130,443.78**
AVERAGE RATE:	**$1.22**	**$/THERM**

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:

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

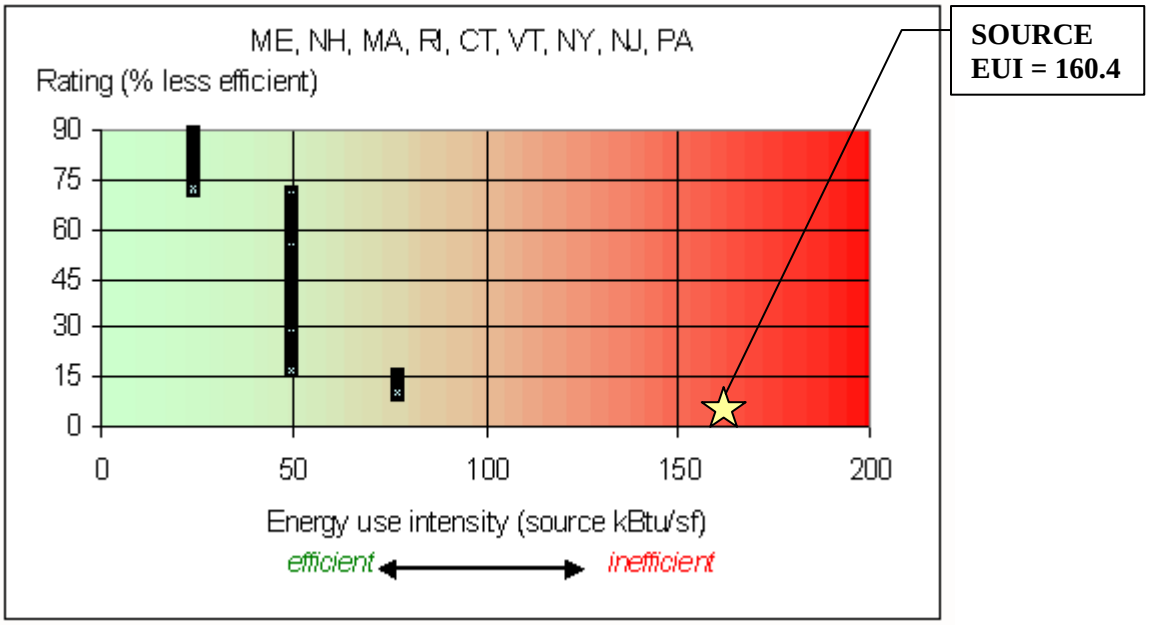
$$Building\ \ Source\ EUI = \frac{(Electric\ Usage\ in\ kBtu\ \ X\ \ SS\ \ Ratio + Gas\ Usage\ in\ kBtu\ \ X\ \ SS\ \ Ratio)}{Building\ \ Square\ \ Footage}$$

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	2,421,330.0			8,266,421	3.340	27,609,845
NATURAL GAS		109,551.7		10,955,171	1.047	11,470,064
TOTAL				19,221,592		39,079,909
*Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.						
BUILDING AREA		243,600	SQUARE FEET			
BUILDING SITE EUI		*78.91*	kBtu/SF/YR			
BUILDING SOURCE EUI		*160.43*	kBtu/SF/YR			

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

Figure 3
Source Energy Use Intensity Distributions: High Schools



In order to calculate the EUI for the High School, building areas and natural gas data was added to reflect the supplied power and heating to the Maintenance, Ground Maintenance, and Vehicle Garage buildings.

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: LCMRSDBOE
Password: lgeaceg2010

Security Question: What city were you born in?
Security Answer: cape may

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**
High School	N/A	50

Refer to **Statement of Energy Performance Appendix** for the detailed energy summary.
Given the High School supplies electric and heating hot water to other buildings is was set up as a campus facility in Energy Star and therefore does not qualify for a specific rating.

V. FACILITY DESCRIPTION

The 232,000 square foot Lower Cape May Regional High School. The school has seven classroom wings, offices, mechanical rooms, auditorium, two gymnasiums, cafeteria, kitchen, and recently added greenhouse. Typical hours of operation for the facility are from 7:30 A.M. to 2:25 P.M. with additional activities in the afternoon for students such as athletics and after school programs. The maintenance staff works with three shifts to ensure someone is on the grounds twenty-four hours per day with the night shift from midnight to 8:00 A.M. having one staff member on. Exterior walls are brick construction, insulation, and concrete block wall. The windows throughout the facility are of varying vintage based on when the addition was placed in service but all appeared to be well maintained and all were double pane glass the newer additions had coated glass. Most of the roof is of built up construction with stone covering, however some of the additions were constructed of standing seam metal roof system. The original building was built in 1964 with additions and renovations occurring in 1988, 1995, 1999, 2002, and 2006.

HVAC Systems

The High School is conditioned and heated through a variety of systems through the various additions and renovations of the building. Most of the classrooms are conditioned by unit ventilator systems. The older Nesbitt units are hot water heating only with a switch operated fan and can be found in A, B, C, and D wings of the building. These units are not fitted with hot water control valves. The S-Wing is fitted with newer Trane self-contained units with direct expansion cooling and hot water heating. The classrooms also have hot water baseboard heat along the perimeter walls; many are not fitted with control valves, but some are controlled through the ventilator thermostat.

The larger classrooms, shops, music room, and labs are conditioned by split system and rooftop air handlers with direct expansion cooling and either hot water heating coils or gas fired heat exchangers.

The two Woodshops are conditioned by ceiling hung 4 ton Carrier split system air handlers with DX cooling and hot water heating coils, in addition to this system a Sterling gas fired heating and ventilating make-up air unit brings in fresh air to replace the exhausted air.

The Cafeteria is conditioned by a 30 ton Trane rooftop unit with DX cooling and 600 MBH gas fired heat exchanger and a 6 ton Carrier rooftop unit with DX cooling only for the recent cafeteria addition. Supplemental heating is provided on the perimeter walls by hot water baseboard.

The Library/Media Center is conditioned by a variable air volume 50 ton Carrier rooftop unit with DX cooling and 400 MBH gas fired heat exchanger. The unit serves approximately fourteen (14) VAV boxes located throughout the space.

The Auditorium is conditioned by two (2) AAON rooftop units rated at 60 tons of cooling fitted with 540 MBH gas fired heat exchanger. Each unit has a 15 horsepower supply fan motor fitted

with a variable speed drive. Additionally there is a 17.5 ton Carrier rooftop unit that feeds the corridor area entering into the auditorium.

The newer gymnasium is conditioned by a 50 ton AAON rooftop unit with a gas fired heat exchanger rated at 780 MBH. The unit has a 15 horsepower supply fan and 5 horsepower exhaust fan.

The school has two kitchens that are conditioned by two (2) Sterling gas fired heating and ventilating make-up air units. The newer kitchen located by the cafeteria operated daily to supply student meals at the high school only. The older kitchen on the back side of the building is no longer utilized for student meal preparation and is currently being renovated for use as a teaching kitchen.

Entrance doorways are heated via hot water cabinet heaters.

Exhaust System

Air is exhausted from the toilet rooms through the roof exhausters. The toilet room exhaust fan is operated based on the facility occupancy schedule. The kitchen and dishwasher hoods have dedicated mushroom type roof exhausters that operate only while the kitchen is in use.

HVAC System Controls

The HVAC systems within the facility are controlled via standalone thermostat control systems as well as a Carrier Comfort View System. The system only operates the HVAC equipment that supplies the new portion of cafeteria, auditorium, gymnasiums, media center, woodshop, carving shop, bagel shop, and E-Wing. Many of these areas are controlled by time schedules that allow for temperature setbacks during scheduled unoccupied times. The remaining portion of the facility is controlled by stand alone thermostats. Most of these thermostats are older dial types that are settable to temperature with no additional control capability. Many of the unit ventilator fans are controlled via switch operation and are turned on and off via occupant comfort.

Domestic Hot Water

Domestic hot water for the facility is provided by a single A.O. Smith Legend 2000 series boiler coupled with an approximately 500 gallons storage tank. The boiler is rated at 750,000 btu/hr input. An additional hot water boiler is located in the kitchen adjacent to the dishwasher that is a Bradford & White rated at 505,000 btu/hr input with an 80 gallon storage tank.

Lighting

Typical lighting throughout building is fluorescent tube lay-in fixtures with 32 watt 700 series T-8 lamps and electronic ballasts. Storage rooms and closets are lit with a mixture of incandescent lamps and fluorescent lamps. The new and auxiliary gyms are both lit via 400 watt metal halide down light fixtures.

Additional Equipment

The kitchen is equipped with an Insinger Dishwasher Model Admiral 66-4 fitted with a natural gas fired booster heater. The machines appeared to be in good condition and relatively new meaning it likely has water and energy savings features already installed.

The kitchen also has two walk-in refrigeration boxes and one walk-in freezer. It was noted walk-in doors were shut during normal kitchen operation and only opened when retrieving items.

The old kitchen has two walk-in refrigeration boxes that are utilized as additional food storage currently for the school.

VI. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation of 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: Lighting Upgrade

Description:

The High School's lighting is comprised of 32 watt T8 fluorescent fixtures with electronic ballasts in a majority of areas, the gymnasium is fitted with 400 watt metal halide lamps, and many of the existing exit signs utilize incandescent bulbs.

This ECM proposes re-lamping of all 32 watt T8 lamps with new 28 watt super saver T8 lamps, replacement of incandescent exit signs with LED exit signs, and finally replacement of metal halide fixtures with high bay T5 high output fluorescent fixtures. Further retrofit details are provided in the Lighting Appendix.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

From the **NJ Smart Start Incentive Appendix**, the replacement of a T-12 fixture to a T-5 or T-8 fixture warrants the following incentive: T-5 or T-8 (1-4 lamps) = $10 per fixture

$$\text{Smart Start®}\ Incentive = (\#\ of\ 1-4\ lamp\ \ fixtures \times\ \$10)$$
$$\text{Smart Start®}\ Incentive = (29\ \ fixtures \times\ \$10) = \$290$$

From the **NJ Smart Start Incentive Appendix**, incentives for the replacement of metal halide to fluorescent T5 or T8 fixtures and wattage reductions $15 per fixture.

$$\text{Smart Start®}\ Incentive = (\#\ \ \ fixtures \times\ \$10)$$
$$\text{Smart Start®}\ Incentive = (176\ \ fixtures \times\ \$15) = \$2640$$

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$59,425
NJ Smart Start Equipment Incentive ($):	$2,930
Net Installation Cost ($):	$56,495
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$13,542
Total Yearly Savings ($/Yr):	$13,542
Estimated ECM Lifetime (Yr):	15
Simple Payback	4.2
Simple Lifetime ROI	259.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$203,130
Internal Rate of Return (IRR)	23%
Net Present Value (NPV)	$105,168.52

ECM #2: Lighting Controls

Description:

In some areas the lighting is left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

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:

- Occupancy Sensors for Lighting Control 10% - 20% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 10% of the total light energy controlled by occupancy sensors and 10% to 20% of the total light energy controlled by daylight or combination of control technologies (savings vary depending on space type and conditions surveyed in the field. The majority of the savings is expected to be after school hours when rooms are left with lights on.

This ECM includes replacement of standard wall switches with sensors wall switches for all individual offices, classrooms, large bathrooms, and libraries. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent.

The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$Energy\ Savings = \left(20\% \times Occuapancy\ Sensored\ Light\ Energy\ \left(kWh/Yr\right)\right)$$

$$Savings. = Energy\ Savings\ (kWh) \times Ave\ Elec\ Cost\left(\frac{\$}{kWh}\right)$$

See the **Investment Grade Lighting Audit Appendix** for details.

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Occupancy Sensor Wall Mounted (existing facility only) = $20 per sensor.
Occupancy Sensor Remote Mounted (existing facility only) = $35 per sensor

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$28,500
NJ Smart Start Equipment Incentive ($):	$3,375
Net Installation Cost ($):	$25,125
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$10,154
Total Yearly Savings ($/Yr):	$10,154
Estimated ECM Lifetime (Yr):	15
Simple Payback	2.5
Simple Lifetime ROI	506.2%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$152,310
Internal Rate of Return (IRR)	40%
Net Present Value (NPV)	$96,092.79

ECM #3: DDC Control System

Description:

The current HVAC systems within the High School are mainly controlled via standalone thermostat controls, however some sections of the building are controlled via a Carrier Comfort System. This ECM assumes that a whole new DDC system will be installed to encompass all HVAC systems. If the existing Comfort System's architecture could be expanded to include the remaining buildings HVAC systems it could potentially reduce implementation cost. It is suggested the district have discussions with their current control systems provider for a better understanding of available options.

This ECM includes installing a Building Automation system with Direct Digital Controls (DDC) wired through an Ethernet backbone and front end controller within the High School only. The system will include new thermostat controllers for all indoor air-handling systems and the rooftop units, in addition to each piece of equipment being wired back to a front end controller and computer interface. With the communication between the devices and the front end computer interface, the Owner will be able to take advantage of equipment scheduling for occupied and unoccupied periods based on the actual occupancy of the facility. Due to the fact that the Middle School has limited hours of occupancy, including evening and weekend hours, having supervisory control over all of the equipment makes sense. The DDC system will also aid in the response time to service / maintenance issues when the facility is not under normal maintenance supervision, i.e. after-hours.

The new DDC system has the potential to provide substantial savings by controlling the HVAC systems as a whole and provide operating schedules and features such as space averaging, night set-back, temperature override control, 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 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 referenced report:

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

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 15% of the total energy cost for the facility.

The cost of a full DDC system with new field devices, controllers, computer, software, programming, etc. is approximately $2.00 per SF considering the school can potentially expand the existing control system architecture for additional equipment and areas. Savings from the implementation of this ECM will be from the reduced energy consumption currently used by the HVAC system by proper control of schedule and temperatures via the DDC system.

Cost of complete DDC System = ($2.00/SF x 232,000 SF) = $464,000

Energy Savings Calculations:

15% Savings on HVAC Energy Calculations

DDC CONTROL SYSTEM SAVINGS CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
		10% Savings	
Building Square-foot	232,000		
Total Electric Usage (kWh)	2,421,330		
Total Natural Gas Usage (therm)	107,503		
Estimated Percentage of Electric Usage for HVAC	40%		
Estimated Percentage of Gas Usage for Heating	78%		
Estimated HVAC Electric Usage (kWh)	968,532	823,252	
Estimated Heating Gas Usage (therm)	83,369	70,864	
Electric Cost ($/kWh)	$ 0.127	$ 0.127	
Nat Gas Cost ($/Therm)	$ 1.220	$ 1.220	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Consumption (kWh)	968,532	823,252	145,280
Nat Gas Consumption (Therms)	83,369	70,864	12,505
Energy Cost ($)	$224,714	$191,007	$33,707
COMMENTS:	Savings based on U.S. Department of Energy "Advanced Sensors & Controls for building Applications: Market Assessment & Potential R&D Pathaways" study posted April 2005		

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$464,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$464,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$33,707
Total Yearly Savings ($/Yr):	$33,707
Estimated ECM Lifetime (Yr):	15
Simple Payback	13.8
Simple Lifetime ROI	9.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$505,605
Internal Rate of Return (IRR)	1%
Net Present Value (NPV)	($61,608.02)

ECM #4: High Efficiency Condensing Boilers

Description:

The High School has two natural gas fired boiler rated at 8,761 MBH. The building requires one boiler to satisfy the load of the building. The boilers are not fitted with outdoor air reset or hot water reset controls.

This ECM recommends removing the two H.B. Smith boilers, and install four (4) AERCO Benchmark 3.0 gas fired condensing boilers rated at 3,000 MBH each. The AERCO boilers will be fitted with factory controls for boiler staging, hot water reset, and outdoor air reset capabilities. The new boilers require modifications to the existing gas line, and hot water supply and return lines, new concrete pad, and new boiler venting out the boiler room roof.

Energy Savings Calculations:

CONDENSING BOILER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Cast Iron Boilers	New Condensing Boilers	
Existing Nat Gas (Therms)	107,503		
Est. Kitchen equipment Usage (therms)	10,730		
Est. Domestic Hot Water Heating Input (therms)	13,404		
Est. Heating Input (therms)	83,369		
Est. Heating Input for Rooftops (therms)	16,674		
Est. Heating Input Boilers (therms)	66,695		
Boiler Efficiency (%)	70%	90%	20%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	4,669	4,669	
Gas Cost ($/Therm)	1.22	1.22	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	66,695	51,874	14,821
Energy Cost ($)	$81,368	$63,286	$18,082
COMMENTS:	Heating Usage based on removal of domestic hot water usage estimate and 10% miscellaneous gas equipment.		

From the **NJ Smart Start Appendix**, the installation of new condensing boilers warrants the following incentive: $1.00 per MBH.

$$\text{Smart Start®}\ Incentive = (Boiler\ MBH \times \$1.00) = (3{,}000 \times \$1.00) \times 4 = \$12{,}000$$

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$410,000
NJ Smart Start Equipment Incentive ($):	$12,000
Net Installation Cost ($):	$398,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$18,082
Total Yearly Savings ($/Yr):	$18,082
Estimated ECM Lifetime (Yr):	25
Simple Payback	22.0
Simple Lifetime ROI	13.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$452,050
Internal Rate of Return (IRR)	1%
Net Present Value (NPV)	($83,135.46)

ECM #5: HW Pipe Insulation

Description:

The A Wing in the High School currently has approximately 200 feet of un-insulated hot water piping located in a crawl space running parallel with the A-Wing main corridor. This is causing the hallway to become overheated and placing unnecessary additional load on the boilers.

This ECM would insulate all bare hot water pipes with ½ inch fiberglass insulation in the crawl space.

Energy Savings Calculations:

Hot Water Pipe Insulation Savings Calculation

Existing: Un-Insulated Copper Pipe Proposed: Addition of 0.5" Fiberglass Insulation

Nominal Pipe Size, In.	Length, Feet	Heat Loss Coefficient	Heat Loss, Btu/Hr	Heat Loss Coefficient	Heat Loss, Btu/Hr		Heat Loss Saved, Btu/Hr
3/4	200	0.43	9,890.0	0.25	5,750.0		4,140.0
		Total Loss Btu/Hr	9,890.0	Total Loss Btu/Hr	5750.0	Total Saved Btu/Hr	4140.0
		Therms per year	670.4	Therms per year	389.8	Therms Saved per year	280.6
						Cost Savings	$356.40

Calculation Constants	
Heating Season Months	6.5
Heating Operating Days	198
Hot Water Boiler Efficiency	70%
Hot Water Supply Temp, F	180
Outdoor Air Base Temp, F	65
Natural Gas Cost ($/therm)	$1.27

*Source: Engineering Methods for Estimated the Impacts of Demand-Side Management Programs, Volu

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$1,800
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$1,800
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$356
Total Yearly Savings ($/Yr):	$356
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.1
Simple Lifetime ROI	197.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$5,346
Internal Rate of Return (IRR)	18%
Net Present Value (NPV)	$2,454.68

ECM #6: Rooftop & AC Replacement

Description:

Many of the High Schools split system condensing units and rooftop units are at or nearing the end of their useful life expectancy. The replacement of these units with new more efficient equipment could provide substantial energy savings. Based on the system requirements replacement options were reviewed and the most energy efficient commercially available equipment was selected. While many of these units could be replaced one for one with new more efficient equipment, it recommended the district further review the potential to combine these replacement options with expanding or replacing the existing control system to ensure the units can communicate with the new control system.

Energy Savings Calculations:

				EXISTING	PROPOSED
Unit No.	Area Served	Existing Manuf./Model	Cooling Tons	Cooling EER	Cooling EER
AC-Café	Cafeteria	Trane/YCO360	30	8.00	10.10
Classrooms	Classrooms (3 Units)	ICP/PAMA048	12	9.00	12.50
AC		ICP/PSN8036	3	8.00	12.00
AC		Trane/TCC030F	3	8.70	13.50
AC-Music	Music Room	Trane/TCD180	15	9.50	11.40
S-Wing-AC-1	S-Wing Classroom (5 Units)	Trane/TTR048	20	10.00	12.50
AC-D-Wind	D-Wing Classroom	Carrier/50LJ006	5	8.60	11.50
AC-HomeEc-1	Home Economics	Carrier/50LJ005	4	8.30	12.50
AC-HomeEc-2	Home Economics	Carrier/50LJ004	3	8.40	13.50
RTU-B-Wing	B-Wing (2 Units)	Rheem/RRGG-05	3	8.00	11.40
RTU-M-Wing	M-Wing	Carrier/50LJ006	5	8.60	11.50
CU	3 Units	AAF/RCU918	4.5	8.00	11.50
RTU		Carrier/50LJ005	4	8.30	12.50

Calculation Constants	
Coincidence Factor	67.00%
Full Load Hours	1,121
Heating Degree Day	5,169
Outdoor Design Temp, F	13.00
Oversize Factor	80.00%
Degree Day Adjustment Factor	0.55
Electric Cost, $/kWh	$0.1270
NG Cost, $/therm	$1.2200

$$Electric\ Demand\ Savings = \frac{Cooling(Tons)\times 12{,}000\left(\frac{Btu}{Ton\ hr}\right)}{1000\left(\frac{W}{kW}\right)}\times\left(\frac{1}{EER_{OLD}}-\frac{1}{EER_{NEW}}\right)\times CF.$$

$$Electric\ \ Usage\ \ Savings\ \ = \frac{Cooling\ \ (Tons\ \ ) \times 12\ ,000\ \left(\frac{Btu}{Ton\ \ hr}\right)}{1000\ \left(\frac{W}{kW}\right)} \times \left(\frac{1}{EER_{\ OLD}} - \frac{1}{EER_{\ NEW}}\right) \times Full\ \ Load\ \ Hrs\ .$$

$$Heating\ \ Savings\ \ = \frac{Capcity\ \ \left(\frac{Btu}{hr}\right) \times Heat\ \ Deg\ \ Days\ \times Adjustment\ \ \ Factor\ \times 24\ \ Hrs\ \times Oversize\ \ \ Factor}{Design\ \ Temp\ \ Difference\ \ (^{\circ}F\ ) \times Fuel\ \ Heat\ \ Value\ \left(\frac{Btu}{Therm}\right)}$$

$$x\left(\frac{1}{Eff_{\ OLD}} - \frac{1}{Eff_{\ NEW}}\right)$$

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$144,813
NJ Smart Start Equipment Incentive ($):	$7,303
Net Installation Cost ($):	$137,510
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$5,294
Total Yearly Savings ($/Yr):	$5,294
Estimated ECM Lifetime (Yr):	15
Simple Payback	26.0
Simple Lifetime ROI	-42.3%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$79,410
Internal Rate of Return (IRR)	-6%
Net Present Value (NPV)	($74,310.57)

ECM #7: Walk-In Box Controls

Description:

The five (5) refrigerated walk-in cooler/freezers have a bank of evaporator fans that circulate the cold air over and under the food. These banks of evaporator fans (typically 1/15 HP motors) run continuously and give off heat that must be removed by the refrigeration.

This measure would install an evaporator fan controller that features two-speed operation of the evaporator fans – high speed during cooling, and low speed when not cooling manufactured by Frigitek or equivalent. The estimated energy savings assumes that the cooler is not opened for 10 hours per day.

Energy Savings Calculations:

Installing controllers on each of the two (2) evaporator fan motors in the five (5) walk-in cooler/freezers would save approximately 357.51 kWh/month x 12 months = 4,290 kWh/Year.

Annual Energy Cost Savings = 4,290 kWh x $0.127/kWh = $544.84/Year

Refer to the **Frigitek Analysis Appendix** for detailed energy savings calculations.

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,477
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$2,477
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$545
Total Yearly Savings ($/Yr):	$545
Estimated ECM Lifetime (Yr):	15
Simple Payback	4.5
Simple Lifetime ROI	230.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$8,173
Internal Rate of Return (IRR)	21%
Net Present Value (NPV)	$4,027.63

ECM #8: Occupancy Controlled Power Strips

Description:

Plug loads in buildings are increasingly becoming a majority share of electrical consumption annually, as HVAC and lighting technologies are becoming more efficient and more energy is being utilized other equipment. The High School has approximately two hundred computers used by staff and students. During the survey it was noted that many of these computers were on and operating while no one was using the work station. To reduce idle power draw load from the computer and peripheral equipment while not in use, CEG recommends the installation of Watt Stopper IDP-3050 occupancy controlled power strip. The power strip has the same features of a typical strip except it is fitted with an infrared occupancy sensor. The sensor reads when an occupant is using their workstation and insures all equipment is fully powered, however when an occupant is not present the strip shuts power off to devices plugged into the control outlets of the strip. Installing these power strips could substantially reduce energy waste due to plugged in equipment. The intent of this ECM is to provide control of ancillary devices such as computer monitors, speakers, printers, phone charges, task lights, and etc. that can be shut off by the control outlets when the user is not present.

Energy Savings Calculations:

The manufacturer has estimated that typical savings for their power strip can save 75 kilowatt-hours per work station or more.

POWER STRIP SAVINGS CALCULATIONS	
ECM INPUTS	
Number of Computers	200
Power Strip Information	
Manufacturer	Watt Stopper
Model	IDP-3050
Savings per Workstation (kWh/yr)	75
Electric Cost ($/kWh)	$0.127
Total Electric Savings, kWh	15,000
Total Cost Savings	$1,905.00

Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$18,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$18,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,905
Total Yearly Savings ($/Yr):	$1,905
Estimated ECM Lifetime (Yr):	15
Simple Payback	9.4
Simple Lifetime ROI	58.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$28,575
Internal Rate of Return (IRR)	6%
Net Present Value (NPV)	$4,741.77

ECM #9: CRT TV Replacement

Description:

The High School currently has older Cathode Ray Tube Televisions in its classrooms. These TV's are older technology and use a substantial amount of electricity when in use and also while powered off in idle power draw mode. The TV's appeared to be 32" screen size units; in general these units draw 125 watts or more of power while in use and 3 watts or more while in idle mode. Newer televisions such as Liquid Crystal Displays (LCD) use power much more efficiently than older CRT models and in many cases draw nearly zero power while in idle mode.

This ECM recommends that the school replace these older televisions with new LCD type units of similar size.

Energy Savings Calculations:

Estimated Cost per LCD Television = $500

$$ElectricUsage = \frac{\#of\ TVs \times Op.Power(W) \times Operation(Hrs) + \#of\ TVs \times Idle\,Power(W) \times IdleOp,(Hrs)}{1000\left(\frac{W}{KW}\right)}$$

$$Energy\ Cost = Electric\ Usage(kWh) \times Ave\ Elec\ Cost\left(\frac{\$}{kWh}\right)$$

CRT TELEVISION REPLACEMENT CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	32" CRT TV	32" LCD TV	
# of Televisions	70	70	
TV Power Cons. (W)	125	70	55
Idle TV Power Cons. (W)	3	0.25	2.75
Run Time %	25%	25%	
Operating Hrs per Week	8	8	
Operating Weeks per Yr	40	40	
Idle Hrs per Week	161	161	
Idle Weeks per Yr	52	52	
Elec Cost ($/kWh)	0.127	0.127	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	4,378	1,616	2,762
Energy Cost ($)	$556	$205	$351
COMMENTS:	Operating Hours per week based on Run Time % times 30 hours per week .		

Energy Savings Summary:

ECM #9 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$33,600
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$33,600
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$351
Total Yearly Savings ($/Yr):	$351
Estimated ECM Lifetime (Yr):	15
Simple Payback	95.7
Simple Lifetime ROI	-84.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$5,265
Internal Rate of Return (IRR)	-17%
Net Present Value (NPV)	($29,409.78)

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 measures (REM) for the Lower Cape May Regional High School utilizing renewable technologies and concluded that there is potential for solar energy generation. The solar photovoltaic system calculation summary will be concluded as **REM#1** within this report.

Solar Generation

Solar energy produces clean energy and reduces a building's carbon footprint. This is accomplished via photovoltaic panels which are mounted in south and southwestern facades of the building. Parking lots can be utilized in lieu of rooftop type installations that could require costly roof and structural work, for the installation of a solar array. A truss system can be installed that is high enough to park vehicles under the array and 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 existing roof area and site of Lower Cape May Regional High School for the purposes of determining a potential for a photovoltaic system. CEG believes a ground mounted parking lot canopy system is best suited for this site. An area of 46,550 S.F. can be utilized for a PV system as depicted in the **Renewable / Distributed Energy Measures Calculation Appendix**. Using this square footage it was determined that a system size of 727.72 kilowatts could be installed. A system of this size has an estimated kilowatt hour production of 800,118 KWh annually, reducing the overall utility bill by approximately 33% percent. A detailed financial analysis can be found in the **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.

The array system capacity was sized on available parking lot space at the existing facility. 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 77%. 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 district 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:

Table 7
Financial Summary – Photovoltaic System

FINANCIAL SUMMARY - PHOTOVOLTAIC SYSTEM		
PAYMENT TYPE	**SIMPLE PAYBACK**	**INTERNAL RATE OF RETURN**
Direct Purchase	13.35 Years	6.0%

*The solar energy measure is shown for reference in the executive summary Renewable Energy Measure (REM) table

Given the large amount of capital required by the school to invest in a solar system through a Direct Purchase CEG does not recommend the school pursue this route. It would be more advantageous for the school 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 school at a reduced rate compared to their existing electric rate. This allows the school to have little to no upfront investment costs in the system and also enables them to indirectly take advantage of Federal tax and grant incentives that they would otherwise not qualify for.

Wind Generation

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. Based on CEG's review of the applicability of wind energy for the facility, it was determined that based on 30 meter wind maps an average wind speed of 6.0 meters per second is available making wind a potential option for the school. Based on the current 705 kW peak load, CEG recommends three 100 kilowatt Northwind 100 Turbine at a hub height of 37 meters (120 feet). Based on our estimates the turbines could potentially produce 495,296 kilowatt-hours of electric annually. In addition electrical savings the district can receive Renewable Energy Certificates (REC) for wind energy production, with a current market price of approximately $25 per megawatt-hour or production. The following table summarized the benefits and costs for the installation of the turbine.

Table 8
Summary – Wind Turbine

REM #2 - WINDTURBINES	
Installation Cost ($):	$1,685,000
NJ Smart Start Equipment Incentive ($):	$290,848
Net Installation Cost ($):	$1,394,152
Maintenance Savings ($):	($12,600)
REC Revenue ($/Yr):	$12,382
Energy Savings ($/Yr):	$62,903
Total Yearly Savings ($/Yr):	$62,685
Estimated ECM Lifetime (Yr):	25
Simple Payback	22.24
Lifetime Energy Savings	$1,572,564

It should be noted the NJ Office of Clean Energy Offers incentives for performing Feasibility Studies for up to 50% of the study costs, with maximums based on expected project size in kilowatts. It is further recommended that if the school is interested in pursing this option they look into an anemometer loan program to study wind speeds at the school. Many Colleges and Universities in the state of New Jersey offer this program.

Combined Heat & Power

Combined heat and power, or cogeneration is the simultaneous production of two useful forms of energy (electricity and thermal) from a single fuel source. The standard CHP system is comprised of a prime mover (reciprocating engine or turbine generator) and a heat recovery unit. The heat recovery unit utilizes the waste and exhaust heat from the prime mover to produce hot water or steam. The hot water or steam can in turn be utilized to produce chilled water. In some cases the prime mover exhaust can be directly vented into an absorption chiller, which will produce chilled water without the need for a heat recovery unit.

Depending on the design and application CHP systems can have total efficiencies of 70% to 90%. This is much higher than the traditional utility grid generation with simple cycle generators (25% to 45%) and combined cycle power plants (50% to 60%) due to the more complete utilization of the exhaust and/or waste heat from the prime mover. The higher efficiency of CHP can result in significant energy cost savings. In addition the higher fuel efficiency results in lower emissions per unit of power produced compared to traditional electrical and steam generating units.

The efficiency and cost savings of CHP systems depend on the complete use of the exhaust thermal energy from the prime mover. The economics of CHP are very sensitive to the thermal energy production and consumption. If the prime mover exhaust thermal energy cannot be completely used, the system efficiency is reduced, which will negatively impact the project lifecycle cost and payback. Therefore when examining a potential CHP system it is important to consider the thermal load profiles first and then review the electrical profiles.

After review of the facility's existing thermal load it was determined that only a small combined heat and power plant could be installed on site that would operate at peak efficiency. The analysis assumes the plant will operate only during the winter months November through April, at the facilities peak thermal load, for approximately 10 hours per day. Based on the load information we recommend the installation of two TeCogen 75 kW engines. The proposed plant will recover the waste engine heat and utilize it for domestic hot water and building space heating.

The savings were calculated based on using natural gas as the primary fuel source. The following table shows the simple payback, and further analysis of each option can be reviewed in **Appendix F – Combined Heat & Power Analysis.**

Table 9
Summary – Combined Heat & Power

Description	Total Cost	Simple Payback, Years	Internal Rate of Return	Net Present Value (NPV)
(2) 75 kW TeCogen	$525,000	20.05	-0.03%	($135,491)

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:

The electricity usage profile demonstrates a steady year long load profile for facilities that have occupancy during the summer months.

The historical usage profile is beneficial and will allow for more competitive energy prices when shopping for alternative suppliers mainly due to the relatively flat load profile. Third Party Supplier (TPS) electric commodity contracts that offer's a firm, fixed price for 100% of the facilities electric requirements and are lower than the Atlantic City Electric's (AECO) BGS-FP default rate are recommended.

Natural Gas:

The Natural Gas Usage Profile demonstrates a very typical natural gas (heat load) profile. The summer months June – August have little consumption.

This load profile will yield less favorable natural gas pricing when shopping for alternative suppliers. This is because the higher winter month consumption will yield higher pricing which will not be offset by the summer month consumption. Nymex commodity pricing is generally higher in the winter months of November – March and lower in the summer months of April – October. Obtaining a flat load profile, (usage is similar each month), will yield optimum natural gas pricing when shopping for alternative suppliers. Third Party Supplier (TPS) natural gas commodity contracts that offer a product structure to include either 1) a fixed basis rate with a market based Nymex/commodity rate or 2) a fixed basis rate with fixed Nymex/commodity winter rate (Nov – March) and market based Nymex/commodity rate for the summer months (April – October) for 100% of the facilities **metered** natural gas requirements are both recommended due to current market pricing.

Tariff Analysis:

Electricity:

The facilities receive electrical service through Atlantic City Electric (AECO) on AGS-Sec (Annual General Service Secondary) rate and MGS (Monthly General Service). The facilities have contracted a Third Party Supplier (TPS) to provide electric commodity service on a fixed price through South Jersey Energy as of May 2009. The current electric supply contract expires May 2012. The current electric commodity rate is below the AECO BGS-FP thus providing a savings. For electric supply (generation) service, the client has a choice to either use AECO's default service rate BGS-FP or contract with a Third Party Supplier (TPS) to supply electric.

Each year since 2002, the four New Jersey Electric Distribution Companies (EDCs) - Public Service Gas & Electric Company (PSE&G), Atlantic City Electric Company (ACE), Jersey Central Power & Light Company (JCP&L), and Rockland Electric Company (RECO) - have procured several billion dollars of electric supply to serve their Basic Generation Service (BGS) customers through a statewide auction process held in February.

BGS refers to the service of customers who are not served by a third party supplier or competitive retailer. This service is sometimes known as Standard Offer Service, Default Service, or Provider of Last Resort Service.

The Auction Process has consisted of two auctions that are held concurrently, one for larger customers on an hourly price plan (BGS-CIEP) and one for smaller commercial and residential customers on a fixed-price plan (BGS-FP). This facility's rate structure is based on the fixed-price plan (BGS-FP).

The utility, Atlantic City Electric will continue to be responsible for maintaining the existing network of wires, pipes and poles that make up the delivery system, which will serve all consumers, regardless of whom they choose to purchase their electricity or natural gas from. AECO's delivery service rate includes the following charges: Customer Service Charge, Distribution Charge, Market Transition, Transition Bond Charge, Non Utility Generation Charge, Societal Benefits Charge (SBC), Infrastructure Investment Charge, System Control Charge, Regulatory Assets Recovery Charge, and Regional Greenhouse Gas Initiative Charge.

Natural Gas:

The facilities currently receive natural gas distribution service through South Jersey Gas on rate schedules General Service Gas - Firm Transportation (GSG-FT) and have a master billing account which eliminates individual customer service charges and provides long term savings. Pepco Energy is the contracted Third Party Supplier (TPS) which provides natural gas commodity supply service. The terms and conditions of the natural gas contract with Pepco Energy is not available, however historical billings suggest the current commodity pricing under contract is much higher (approx $.30/therm or $3.00/decatherm) than current market pricing and South Jersey Gas BGSS' price to compare.

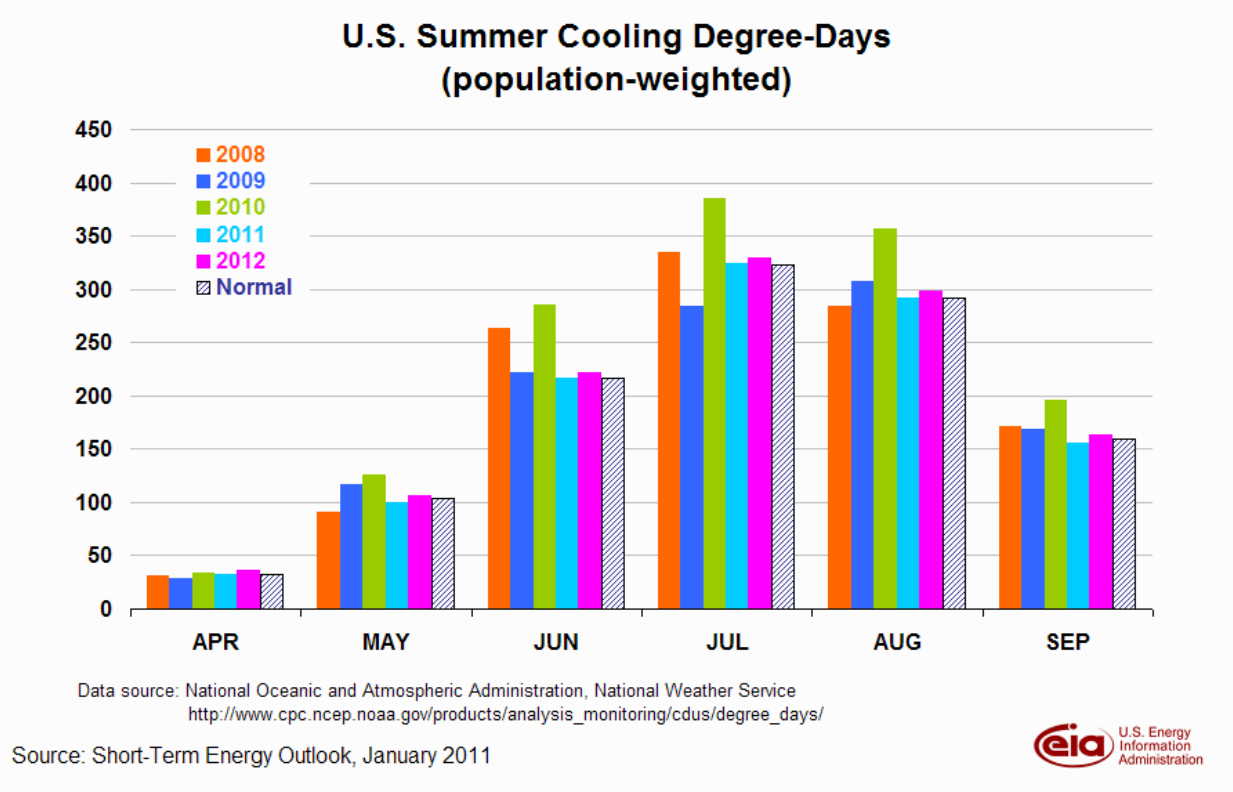
South Jersey Gas provides basic gas supply service (BGSS) to customers who choose not to shop from a Third Party Supplier (TPS) for natural gas commodity. The option is essential to protect the reliability of service to consumers as well as protecting consumers if a third party supplier defaults or fails to provide commodity service. Please refer to the link below for a recap of natural gas BGSS charges from South Jersey Gas for rate schedule GSG.
http://www.southjerseygas.com/108/tariff/bgssrates.pdf

The utility, South Jersey Gas is responsible for maintaining the existing network of wires, pipes and poles that make up the delivery system, which will serve all consumers, regardless of whom they choose to purchase their electricity or natural gas from. South Jersey Gas's delivery service rate includes the following charges: Customer Service Charge, Distribution Charge, & Societal Benefits Charge (SBC).

Electric and Natural Gas Commodities Market Overview:

Current electricity and natural gas market pricing has remained relatively stable over the last year. Commodity pricing in 2008 marked historical highs in both natural gas and electricity commodity. Commodity pricing commencing spring of 2009 continuing through 2010, has decreased dramatically over 2008 historic highs and continues to be favorable for locking in long term (2-5 year) contracts with 3rd Party Supplier's for both natural gas and electricity supply requirements.

It is important to note that both natural gas and electric commodity market prices are moved by supply and demand, political conditions, market technicals and trader sentiment. This market is continuously changing Energy commodity pricing is also correlated to weather forecasts. Because weather forecasts are dependable only in the short-term, prolonged temperature extremes can really cause extreme price swings.



Short Term Energy Outlook - US Energy Information Administration (1/11/2011):

U.S. Natural Gas Prices. The Henry Hub spot price averaged $4.25 per MMBtu during December, an increase of about 54 cents from November's price of $3.71 per MMBtu. EIA expects the higher forecast production during the first half of 2011 compared with the same period last year, combined with a decline in consumption, to moderate natural gas spot prices. The projected spot price falls to a low of $3.73 per MMBtu in June then rises to $4.61 in December, averaging $4.02 per MMBtu for all of 2011, which is $0.37 per MMBtu lower than the 2010 average and $0.31 per MMBtu lower than in last month's *Outlook.* In 2012, the spot price rises to an average of $4.50 per MMBtu.

Uncertainty over future natural gas prices is slightly lower this year compared with last year at this time. Natural gas futures for March 2011 delivery (for the 5-day period ending January 6) averaged $4.39 per MMBtu, and the average implied volatility over the same period was 43 percent. This produced lower and upper bounds for the 95-percent confidence interval for March 2011 contracts of $3.21 per MMBtu and $6.02 per MMBtu, respectively. At this time last year, the natural gas March 2010 futures contract averaged $5.73 per MMBtu and implied volatility averaged 57 percent. The corresponding lower and upper limits of the 95-percent confidence interval were $3.88 per MMBtu and $8.47 per MMBtu.

U.S. Electricity Retail Prices. EIA expects the U.S. retail price for electricity distributed to the residential sector during 2010 to average 11.6 cents per kilowatt-hour, about the same level as in 2009. EIA expects the U.S. residential price to increase only slightly over the forecast period--by 0.6 percent in 2011 and by 1.0 percent in 2012.

Recommendations:

1. CEG recommends a continued aggregated approach for 3rd party commodity supply procurement strategies for electric and natural gas supply service. Aggregating the usage of all facilities for electricity and natural gas supply service, would allow the facilities to achieve a reduction in commodity supply costs. Energy commodities are among the most volatile of all commodities, however at this point and time, energy is extremely competitive. Contracts due to expire in the near term would yield more favorable pricing than previously realized. It is important to aggregate usage where available and take advantage of these current market prices quickly, before energy increases.

   Overall, after review of the utility consumption, billing, and current commodity pricing outlook, CEG recommends that the school facilities continue to participate in the ACES energy supply aggregation groups for both electricity and natural gas. Both aggregation groups utilize the advisement of 3rd party unbiased Energy Consulting Firm experienced in the aggregation of and procurement of retail electricity and natural gas commodity. It is important to note that the Energy Consulting Firm should incorporate a rational, defensible strategy for purchasing commodity in volatile markets based upon the following:

   - Budgets that reflect sound market intelligence
   - An understanding of historical prices and trends
   - Awareness of seasonal opportunities (e.g. shoulder months)
   - Negotiation of fair contractual terms
   - An aggressive, market based price

2. CEG recommends that the school district consider utilizing a third party utility billing-auditing service to further analyze historical utility invoices such as water, sewer, natural gas and electric for incorrect billings and rate tariff optimization services. This service can be based on a shared savings model with no cost to the school district. The service could provide refunds on potential incorrect billings that may have been passed through by the utilities and paid by the school.

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 that were audited as part of the NJ Clean Energy's Local Government Energy Audit Program. 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%.

v. *Direct Install Program* – The New Jersey Clean Energy's Direct Install Program is a state funded program that targets small commercial and industrial facilities with peak demand of less than 100 kW. This turnkey program is aimed at providing owners a seamless, comprehensive process for analysis, equipment replacement and financial incentives to reduce consumption, lower utility costs and improve profitability. The program covers up to 60% of the cost for eligible upgrades including lighting, lighting controls, refrigeration, HVAC, motors, variable speed drives, natural gas and food service. Participating contractors (refer to www.njcleanenergy.com) conduct energy assessments in addition to your standard local government energy audit and install the cost-effective measures.

vi. *Energy Efficiency and Conservation Block Grants* – The EECGB rebate provides supplemental funding up to $50,000 for counties and local government entities to implement energy conservation measures. The EECGB funding is provided through the American Recovery and Reinvestment Act (ARRA). The local

government must be among the eligible local government entities listed on the NJ Clean Energy website as follows - http://njcleanenergy.com/commercial-industrial/programs/eecbg-eligible-entities. This program is limited to municipalities and counties that have not already received grants directly through the US department of Energy.

This incentive is provided in addition to the other NJ Clean Energy program funding. This program's incentive is considered the entity's capital and therefore can be applied to the LGEA program's requirements to implement the recommended energy conservation measures totaling at least 25% of the energy audit cost. Additional requirements of this program are as follows:

1. The entity must utilize additional funding through one or more of the NJ Clean Energy programs such as Smart Start, Direct Install, and Pay for Performance.

2. The EECBG funding in combination with other NJ Clean Energy programs may not exceed the total cost of the energy conservation measures being implemented.

3. Envelope measures are applicable only if recommended by the LGEA energy audit and if the energy audit was completed within the past 12 months.

4. New construction and previously installed measures are not eligible for the EECBG rebate.

5. Energy conservation measures eligible for the EECBG must fall within the list of approved energy conservation measures. The complete list of eligible measures and other program requirements are included in the "EECBG Complete Application Package." The application package is available on the NJ Clean Energy website - http://njcleanenergy.com/commercial-industrial/programs/energy-efficiency-and-conservation-block-grants.

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.

F. Educate staff and students on awareness of wasteful energy practices such as leaving lights on unnecessarily, leaving on of non-essential computer and/or equipment at the end of the day, leaving of outside doors/windows open as a means to control room temperature, etc.

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.

XII. ENERGY AUDIT ASSUMPTIONS

The assumptions utilized in this energy audit include but are not limited to following:

A. Cost Estimates noted within this report are based on industry accepted costing data such as RS Means™ Cost Data, contractor pricing and engineering estimates. All cost estimates for this level of auditing are +/- 20%. Prevailing wage rates for the specified region has been utilized to calculate installation costs. The cost estimates indicated within this audit should be utilized by the owner for prioritizing further project development post the energy audit. Project development would include investment grade auditing and detailed engineering.
B. Energy savings noted within this audit are calculated utilizing industry standard procedures and accepted engineering assumptions. For this level of auditing, energy savings are not guaranteed.
C. Information gathering for each facility is strongly based on interviews with operations personnel. Information dependent on verbal feedback is used for calculation assumptions including but not limited to the following:
    a. operating hours
    b. equipment type
    c. control strategies
    d. scheduling
D. Information contained within the major equipment list is based on the existing owner documentation where available (drawings, O&M manuals, etc.). If existing owner documentation is not available, catalog information is utilized to populate the required information.
E. Equipment incentives and energy credits are based on current pricing and status of rebate programs. Rebate availability is dependent on the individual program funding and applicability.
F. Equipment (HVAC, Plumbing, Electrical, & Lighting) noted within an ECM recommendation is strictly noted as a **basis for calculation** of energy savings. The owner should use this equipment information as a benchmark when pursuing further investment grade project development and detailed engineering for specific energy conservation measures.

Utility bill annual averages are utilized for calculation of all energy costs unless otherwise noted. Accuracy of the utility energy usage and costs are based on the information provided. Utility information including usage and costs is estimated where incomplete data is provided.

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Lower Cape May Regional High 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 Svaing * 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	Lighting Upgrade	$59,425	$0	$2,930	$56,495	$13,542	$0	$13,542	15	$203,130	$0	259.6%	4.2	22.88%	$105,168.52
ECM #2	Lighting Controls	$28,500	$0	$3,375	$25,125	$10,154	$0	$10,154	15	$152,310	$0	506.2%	2.5	40.16%	$96,092.79
ECM #3	DDC Control System	$464,000	$0	$0	$464,000	$33,707	$0	$33,707	15	$505,605	$0	9.0%	13.8	1.09%	($61,608.02)
ECM #4	High Efficiency Condensing Boilers	$210,000	$200,000	$12,000	$398,000	$18,082	$0	$18,082	25	$452,050	$0	13.6%	22.0	1.00%	($83,135.46)
ECM #5	HW Pipe Insulation	$800	$1,000	$0	$1,800	$356	$0	$356	15	$5,346	$0	197.0%	5.1	18.18%	$2,454.68
ECM #6	Rooftop/AC Replacements	$82,750	$62,063	$7,303	$137,510	$5,294	$0	$5,294	15	$79,410	$0	-42.3%	26.0	-6.19%	($74,310.57)
ECM #7	Walk-In Box Controls	$2,477	$0	$0	$2,477	$545	$0	$545	15	$8,173	$0	230.0%	4.5	20.69%	$4,027.63
ECM #8	Occupancy Controlled Power Strips	$18,000	$0	$0	$18,000	$1,905	$0	$1,905	15	$28,575	$0	58.8%	9.4	6.42%	$4,741.77
ECM #9	CRT TV Replacement	$33,600	$0	$0	$33,600	$351	$0	$351	15	$5,265	$0	-84.3%	95.7	-17.43%	($29,409.78)
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	727 kW Parking Lot Solar Array	$5,094,040	$0	$0	$5,094,040	$101,615	$280,041	$381,656	20	$7,633,120	$5,600,820	49.8%	13.3	4.20%	$584,037.55
REM #2	(3) 100 kW Wind Turbines	$1,190,000	$495,000	$290,847	$1,394,153	$62,903	$12,382	$75,285	20	$1,505,700	$247,640	8.0%	18.5	0.74%	($274,102.31)
REM #3	(2) 75 kW CHP Plant	$525,000	$0	$0	$525,000	$26,181	$0	$26,181	20	$523,620	$0	-0.3%	20.1	-0.03%	($135,492.83)

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* .

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SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives as of February, 2010:

Electric Chillers

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

Energy Efficiency must comply with ASHRAE 90.1-2004

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
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat

Energy Efficiency must comply with ASHRAE 90.1-2004

Ground Source Heat Pumps

Closed Loop & Open Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2004

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, AFUE ≥ 92%

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
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

Retro fit of T12 to T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities	$10 per fixture (1-4 lamps)
Replacement of T12 with new T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities	$25 per fixture (1-2 lamps) $30 per fixture (3-4 lamps)
Replacement of incandescent with screw-in PAR 38 or PAR 30 (CFL) bulb	$7 per bulb
T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
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
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture
HID ≥ 100w Replacement with new HID ≥ 100w	$70 per fixture
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$42 per 5 foot $65 per 6 foot

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
Daylight Dimming - office	$50 per fixture controlled

Premium Motors

Three-Phase Motors	$45 - $700 per motor
Fractional HP Motors Electronic Communicated Motors (replacing shaded pole motors in refrigerator/freezer cases)	$40 per electronic communicated motor

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
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and a IRR of at least 10%.
Multi Measures Bonus	15%

MAJOR EQUIPMENT LIST

Concord Engineering Group

Lower Cape May Regional High School

Rooftop / AC Units

Tag	AC-Woodshop 1, 2	AC-8	AC-CAFÉ
Unit Type	Indoor DX/HW	RTU DX Packaged	RTU
Qty	2	1	1
Location	Woodshop Ceiling	Roof	Roof
Area Served	Woodshop	Gym Lobby/Corridor	Cafeteria
Manufacturer	Carrier	Carrier	Trane
Model #	39LA03ACCBT-AMJ-19	50GL-030---311	YCO360AFHA1818O1AEH
Serial #	Z103F33625	2503G41376	JD95D90588
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	4	3	30
Cooling Efficiency (SEER/EER)	9.5 EER	10.7 EER	
Heating Type	Hot Water	None	Heat Exchanger
Heating Input (MBH)	N/A	N/A	600
Efficiency	N/A	N/A	81%
Fuel	N/A	N/A	Gas
Approx Age	8	8	16
ASHRAE Service Life	15	15	15
Remaining Life	7	7	(1)
Comments			7.5 HP Supply Fan

Rooftop / AC Units

Tag	AC-CAFÉ - 2	Classrooms	Main Office Unit
Unit Type	RTU	RTU	RTU
Qty	1	3	1
Location	Roof	Roof	Roof
Area Served	Cafeteria Addition	Classrooms	Main Office
Manufacturer	Carrier	Inner City Products	Rheem
Model #	50HJ-007P-641RQ	PAMA048H1	RRNA-C060JK10E
Serial #	2903G30373	B924312427	2G7227ADAAF090703641
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	6.0	4	5
Cooling Efficiency (SEER/EER)	11.1 EER		
Heating Type	None	None	Heat Exchange
Heating Input (MBH)	N/A	N/A	100
Efficiency	N/A	N/A	80%
Fuel	N/A	N/A	Gas
Approx Age	8	19	4
ASHRAE Service Life	15	15	15
Remaining Life	7	(4)	11
Comments		3/4 HP Fan Motor	1 HP Blower Motor

Rooftop / AC Units

Tag	RTU-Media Ctr	AC	AC
Unit Type	RTU - VAV	RTU	RTU
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	Media Center	N/A	
Manufacturer	Carrier	Inner City Products	Trane
Model #	48AYD050-G-611EE	PSN8036	TCC030F100BA
Serial #	3504F55271	N/A	K154K2Y1H
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	50	3	3
Cooling Efficiency (SEER/EER)	9.5 EER	8 EER	10 SEER
Heating Type	Heat Exchanger	Heat Exchanger	None
Heating Input (MBH)	400	100	N/A
Efficiency	81%	79%	N/A
Fuel	Gas	Gas	N/A
Approx Age		21	16
ASHRAE Service Life	15	15	15
Remaining Life			
Comments			

Rooftop / AC Units

Tag	AC-Music Room	RTU-#2	AC-6
Unit Type	Music Room	RTU	RTU
Qty	1	2	1
Location	Roof	Roof	Roof
Area Served	Music Room	Auditorium	Auditorium Corridor
Manufacturer	Trane	AAON	Carrier
Model #	TCD180B30ADC	RK-60-E0	48HGD020AA-601AE
Serial #	K19100405D	200307 AKGZ49778	3803F55069
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	15	60	17.5
Cooling Efficiency (SEER/EER)		11 EER	11.2 EER
Heating Type		Heat Exchanger	Heat Exchanger
Heating Input (MBH)		540	250
Efficiency		81%	82%
Fuel		Gas	Gas
Approx Age	16		
ASHRAE Service Life	15		
Remaining Life	(1)		
Comments		15 HP SF	5 HP SF fan

Rooftop / AC Units

Tag	Small Carrier	AC-Mini	S-Swing AC-1
Unit Type	Condensing Unit	Mini-Split	Condensing Unit
Qty	1	1	5
Location	Roof	Roof	Roof
Area Served		Auditorium Room	S-Wing Classrooms
Manufacturer	Carrier	Carrier	Trane
Model #	38CKC036630	38AN012110	TTR048C100A2
Serial #	2103E40131	2203V21638	K15278220
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	3	1	4
Cooling Efficiency (SEER/EER)			10 EER
Heating Type	None	None	None
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	8	8	16
ASHRAE Service Life	15	15	15
Remaining Life	7	7	(1)
Comments			

Rooftop / AC Units

Tag	S-Wing AC-2	S-Wing AC-3	S-Wing AC-4
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	S-Wing Classroom	S-Wing Classroom	S-Wing Classroom
Manufacturer	Payne	Trane	ICP
Model #	PA13NR048-H	2TTR3048A1000AA	HAC048AKC3
Serial #	3808X75981	6091UJ61F	E040416627
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	4	4	4
Cooling Efficiency (SEER/EER)	-	-	-
Heating Type	None	None	None
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	3	5	7
ASHRAE Service Life	15	15	15
Remaining Life	12	10	8
Comments	R-22, 1P 208/230	R-22, 1P 208/230	R-22, 1P 208/230

Rooftop / AC Units

Tag	RTU-S-Wing	AC-RTU-S-Wing	AC-1A, B, C, D
Unit Type	Rooftop - Split	Air Cooled Condenser	Rooftop
Qty	1	1	4
Location	Roof	Roof	Roof
Area Served	Fresh Air Unit top Classrooms	RTU-S-Wing	E-Wing, Classrooms
Manufacturer	Trane	Trane	Carrier
Model #	MCC	CGAEC20GABA1FTWDHA	50HJ-005P-641
Serial #	N/A	J95D80997	0404G40122
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	-	20	5
Cooling Efficiency (SEER/EER)	-	-	10 EER
Heating Type	Electric	None	None
Heating Input (MBH)	15 kW	N/A	N/A
Efficiency	100%	N/A	N/A
Fuel	Electric	N/A	N/A
Approx Age	16	16	7
ASHRAE Service Life	15	15	15
Remaining Life	(1)	(1)	8
Comments	Unit was off	R-22	R-22, Has Supply and Return Air

Rooftop / AC Units

Tag	AC-2A, B, C	HV-1	AC-D-Wing
Unit Type	Rooftop	H&V Unit	Rooftop
Qty	3	2	1
Location	Roof	Kitchen Roof	Roof
Area Served	S-Wing Classrooms	Kitchen &Old Kitchen	D-Wing Classroom
Manufacturer	Carrier	Sterling	Carrier
Model #	50HJ-005P-641RQ	N/A	50LJ006
Serial #	0404G40123	N/A	1992G13863
Cooling Type	DX	None	DX
Cooling Capacity (Tons)	4	N/A	5
Cooling Efficiency (SEER/EER)	10 EER	N/A	8.6 EER
Heating Type	None	Heat Exchanger	None
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	Nat. Gas	N/A
Approx Age	7	N/A	19
ASHRAE Service Life	15	15	15
Remaining Life	8	#N/A	(4)
Comments			R-22

Rooftop / AC Units

Tag	AC-4A	AC-Home Ec-1	AC-Home EC-2
Unit Type	Rooftop	Rooftop	Rooftop
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	Facilities Office	Home Economics	Home Economics
Manufacturer	Carrier	Carrier	Carrier
Model #	50HJ-005P-641RQ	50LJ005520	50LJ004
Serial #	4003G30359	2092G16846	2092G16838
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	5	4	3
Cooling Efficiency (SEER/EER)	10 EER	8.3 EER	8.4 EER
Heating Type	None	None	None
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	8	19	19
ASHRAE Service Life	15	15	15
Remaining Life	7	(4)	(4)
Comments	R-22	R-22	R-22

Rooftop / AC Units

Tag	AC--M-Wing	AC-M-Wing	RTU-B-Wing
Unit Type	Rooftop	Condensing Unit	Rooftop
Qty	1	3	2
Location	Roof	Roof	Roof
Area Served	M-Wing	M-Wing	B-Wing
Manufacturer	Carrier	ICP	Rheem
Model #	50LJ006	NAC036GKC3	RRGG-05E18JKR
Serial #	1992G13864	E053546917	ALA4464 A HA A F049
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	5	3	1.5
Cooling Efficiency (SEER/EER)	8.6 EER	-	-
Heating Type	None	None	Heat Exchanger
Heating Input (MBH)	N/A	N/A	50
Efficiency	N/A	N/A	79%
Fuel	N/A	N/A	Nat. Gas
Approx Age	19	6	21
ASHRAE Service Life	15	15	15
Remaining Life	(4)	9	(6)
Comments			

Rooftop / AC Units

Tag	RTU-7	RTU-1	MUA-1
Unit Type	Rooftop	Rooftop	H&V
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	Corridor by Gym	Gym	Woodshop
Manufacturer	Carrier	AAON	Sterling
Model #	48HJF008P-641RQ	RK-50-3-E0-S3N	N/A
Serial #	2903G11521	700367-AJ0U	N/A
Cooling Type	DX	DX	None
Cooling Capacity (Tons)	7.5	50	N/A
Cooling Efficiency (SEER/EER)	11 EER	11 EER	N/A
Heating Type	Heat Exchanger	Heat Exchanger	Heat Exchanger
Heating Input (MBH)	224	780	-
Efficiency	82%	81%	-
Fuel	Nat. Gas	Nat. Gas	Nat. Gas
Approx Age	8		
ASHRAE Service Life	15	15	15
Remaining Life	7	15	15
Comments	R-22	10 HP SF, 5 HP EF	

Rooftop / AC Units

Tag	CU-1A, B	CU-	RTU
Unit Type	Condensing Unit	Condensing Unit	Rooftop
Qty	2	3	1
Location	Roof	Roof	Roof
Area Served	Woodshop		
Manufacturer	Carrier	AAF	Carrier
Model #	38CKC048660	RCU918-1	50LJ005520
Serial #	1503E34960	28910255371	2092G16845
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	4	1.5	4
Cooling Efficiency (SEER/EER)	9.5 EER	~8 EER	8.3 EER
Heating Type	None	None	None
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	8	22	19
ASHRAE Service Life	15	15	15
Remaining Life	7	(7)	(4)
Comments	R-22	R-22. 208/230 1P	R-22, 230V, 1P

MAJOR EQUIPMENT LIST

Concord Engineering Group

Lower Cape May Regional High School

Boilers

Tag	Boiler-1 & 2		
Unit Type	Cast Iron Sectional		
Qty	2		
Location	Boiler Room		
Area Served	Whole Building		
Manufacturer	H.B. Smith		
Model #	4500A-S/W-20		
Serial #	MB2003-39		
Input Capacity (MBH)	8,761		
Rated Output Capacity (MBH)	6,041		
Approx. Efficiency %	69%		
Fuel	Nat. Gas		
Approx Age			
ASHRAE Service Life	30		
Remaining Life	30		
Comments	Blower Motors 5 HP 3450 RPM, 82.5% EFF, Fr. 182TC; Power Exhaust 2 HP		

MAJOR EQUIPMENT LIST

Concord Engineering Group

Lower Cape May Regional High School

Domestic Water Heaters

Tag	HWH-1	HWH-K1	
Unit Type	Boiler	Boiler	
Qty	1	1	
Location	Boiler Room	Kitchen	
Area Served	Whole Building	Kitchen Booster	
Manufacturer	A.O. Smith	Bradford & White	
Model #	LW-750-300	D80L5053NA	
Serial #	L-02 70639	PA0809229	
Size (Gallons)	~500 gal Tank	80	
Input Capacity (MBH/KW)	750 MBH	505 MBH	
Recovery (Gal/Hr)		459.1	
Efficiency %	90%		
Fuel	Nat. Gas	Nat. Gas	
Approx Age	9	15	
ASHRAE Service Life	12	12	
Remaining Life	3	(3)	
Comments	140F Storage Temp		

MAJOR EQUIPMENT LIST

Concord Engineering Group

Lower Cape May Regional High School

Pumps

Tag	HWP-1 & 2	HWP-2A & 2B	HWP-1&2
Unit Type			
Qty	2	2	2
Location	Boiler Room	Boiler Room	Boiler Room
Area Served			
Manufacturer	Taco	Taco	B&G
Model #	FT2057F2GAJL1A	N/A	N/A
Serial #	N/A	N/A	N/A
Horse Power	15	5	3
Flow	350 GPM, 100 FTHD	94 GPM, 110 FTHD	N/A
Motor Info	Baldor, Frame 215T	Baldor, Frame 182JM	U.S. Electric, Frame 182JM
Electrical Power	230/460V 3P	230/460V 3P	230/460V 3P
RPM	3525	3500	1730
Motor Efficiency %	91.7%	90.2%	78.5%
Approx Age			
ASHRAE Service Life	20	20	20
Remaining Life			
Comments	Has ABB VSD @ 49%, 49.5 Hz, Pump#1 was off	Has ABB VSD @16%, 29.5 Hz	Oldest Set of Pumps Rebuilt Recently

Investment Grade Lighting Audit

CEG Job #: 9C10089

Project: Lower Cape Regional High School **Lower Cape Regional High School** **KWH COST: $0.127**

Bldg. Sq. Ft. 232,000

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
232.21	Cafeteria	2600	76	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	6.54	16,993.6	$2,158.19	76	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	5.47	14227.2	$1,806.85	$14.00	$1,064.00	1.06	2766.4	$351.33	3.03
602		8760	1	2	Incandescent Exit Sign	20	0.02	175.2	$22.25	1	1	LED Exit Sign	2	0.00	17.52	$2.23	$65.00	$65.00	0.02	157.68	$20.03	3.25
601		8760	2	2	(2) 7w CFL Exit Sign	16	0.03	280.3	$35.60	2	1	LED Exit Sign	2	0.00	35.04	$4.45	$65.00	$130.00	0.03	245.28	$31.15	4.17
242.21	Kitchen	2600	20	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	2.14	5,564.0	$706.63	20	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.96	5096	$647.19	$28.00	$560.00	0.18	468	$59.44	9.42
617		2600	6	1	Hood Light w/Globe & Cage, 100w A19 Lamp	100	0.60	1,560.0	$198.12	6	1	(1) 26w CFL Lamp	26	0.16	405.6	$51.51	$20.00	$120.00	0.44	1154.4	$146.61	0.82
770	Aux Gym	2600	30	1	400w MH, Down Light	465	13.95	36,270.0	$4,606.29	30	4	2x4 54w T5HO 4 Lamp w/Reflective Lens, Wire Cage	236	7.08	18408	$2,337.82	$240.00	$7,200.00	6.87	17862	$2,268.47	3.17
601		8760	5	2	(2) 7w CFL Exit Sign	16	0.08	700.8	$89.00	5	1	LED Exit Sign	2	0.01	87.6	$11.13	$65.00	$325.00	0.07	613.2	$77.88	4.17
242.21	Boy's Locker Room	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
602		8760	1	2	Incandescent Exit Sign	20	0.02	175.2	$22.25	1	1	LED Exit Sign	2	0.00	17.52	$2.23	$65.00	$65.00	0.02	157.68	$20.03	3.25
242.21	Boy's Restroom	2600	2	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.21	556.4	$70.66	2	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.20	509.6	$64.72	$28.00	$56.00	0.02	46.8	$5.94	9.42
242.11	Girl's Locker Room	2600	5	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.54	1,391.0	$176.66	5	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.49	1274	$161.80	$28.00	$140.00	0.05	117	$14.86	9.42
602		8760	1	2	Incandescent Exit Sign	20	0.02	175.2	$22.25	1	1	LED Exit Sign	2	0.00	17.52	$2.23	$65.00	$65.00	0.02	157.68	$20.03	3.25
221.31	Team Room	2600	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.12	322.4	$40.94	2	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.10	260	$33.02	$14.00	$28.00	0.02	62.4	$7.92	3.53
242.11	Boiler Room Stairs	4400	1	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.11	470.8	$59.79	1	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.10	431.2	$54.76	$28.00	$28.00	0.01	39.6	$5.03	5.57
613.1	Boiler Room	4400	4	1	Industrial Fixture, 300w A19 Lamp	300	1.20	5,280.0	$670.56	4	2	2 Lamp, 32w T8, Pendant Mount, No Lens	62	0.25	1091.2	$138.58	$95.00	$380.00	0.95	4188.8	$531.98	0.71
602		8760	1	2	Incandescent Exit Sign	20	0.02	175.2	$22.25	1	1	LED Exit Sign	2	0.00	17.52	$2.23	$65.00	$65.00	0.02	157.68	$20.03	3.25
242.11	Girl's Restroom	2600	1	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.11	278.2	$35.33	1	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.10	254.8	$32.36	$28.00	$28.00	0.01	23.4	$2.97	9.42
222.21	A16 Classroom	2600	12	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.74	1,934.4	$245.67	12	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.60	1560	$198.12	$14.00	$168.00	0.14	374.4	$47.55	3.53
222.21	A14 Classroom	2600	14	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.87	2,256.8	$286.61	14	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.70	1820	$231.14	$14.00	$196.00	0.17	436.8	$55.47	3.53

Investment Grade Lighting Audit

242.22	A12 Nurse	2600	8	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.83	2,163.2	$274.73	8	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.78	2038.4	$258.88	$28.00	$224.00	0.05	124.8	$15.85	14.13
227.21		2600	4	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.26	676.0	$85.85	4	2	Sylvania Lamp FBO30/841XP/6//SS/ECO	49	0.20	509.6	$64.72	$24.00	$96.00	0.06	166.4	$21.13	4.54
242.21	Main Office	2600	4	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.43	1,112.8	$141.33	4	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.39	1019.2	$129.44	$28.00	$112.00	0.04	93.6	$11.89	9.42
242.21	VP Office	2600	2	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.21	556.4	$70.66	2	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.20	509.6	$64.72	$28.00	$56.00	0.02	46.8	$5.94	9.42
242.21	Main Office - Counter Area	2600	13	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.39	3,616.6	$459.31	13	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.27	3312.4	$420.67	$28.00	$364.00	0.12	304.2	$38.63	9.42
121.14	Vault	2600	1	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., No Lens	78	0.08	202.8	$25.76	1	2	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	50	0.05	130	$16.51	$80.00	$80.00	0.03	72.8	$9.25	8.65
121.34	Copy Room	2600	1	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mnt., No Lens	78	0.08	202.8	$25.76	1	2	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	50	0.05	130	$16.51	$80.00	$80.00	0.03	72.8	$9.25	8.65
121.11	Kitchenette	2600	2	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	78	0.16	405.6	$51.51	2	2	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	50	0.10	260	$33.02	$100.00	$200.00	0.06	145.6	$18.49	10.82
222.21	Office	2600	2	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.12	322.4	$40.94	2	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.10	260	$33.02	$14.00	$28.00	0.02	62.4	$7.92	3.53
242.21	Principal's Office	2600	4	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.43	1,112.8	$141.33	4	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.39	1019.2	$129.44	$28.00	$112.00	0.04	93.6	$11.89	9.42
242.21	Media Center	2600	41	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	4.39	11,406.2	$1,448.59	41	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	4.02	10446.8	$1,326.74	$28.00	$1,148.00	0.37	959.4	$121.84	9.42
211.35		2600	36	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., White Diffuser	30	1.08	2,808.0	$356.62	36	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.90	2340	$297.18	$7.00	$252.00	0.18	468	$59.44	4.24
232.21	Media Center Office	2600	7	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.60	1,565.2	$198.78	7	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.50	1310.4	$166.42	$14.00	$98.00	0.10	254.8	$32.36	3.03
232.21	Media Center Storage	2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	894.4	$113.59	4	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.29	748.8	$95.10	$14.00	$56.00	0.06	145.6	$18.49	3.03
222.22	Media Center Classroom	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.46	1,206.4	$153.21	8	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.40	1040	$132.08	$14.00	$112.00	0.06	166.4	$21.13	5.30
232.21	Study Room	2600	3	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.26	670.8	$85.19	3	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.22	561.6	$71.32	$14.00	$42.00	0.04	109.2	$13.87	3.03
222.22	Tech Room	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$76.61	4	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.20	520	$66.04	$14.00	$56.00	0.03	83.2	$10.57	5.30
221.31	TV Studio	2600	8	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.50	1,289.6	$163.78	8	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.40	1040	$132.08	$14.00	$112.00	0.10	249.6	$31.70	3.53

Investment Grade Lighting Audit

232.21		2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	894.4	$113.59	4	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.29	748.8	$95.10	$14.00	$56.00	0.06	145.6	$18.49	3.03
242.21	A7 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
232.21	Guidance - Reception Area	2600	13	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.12	2,906.8	$369.16	13	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.94	2433.6	$309.07	$14.00	$182.00	0.18	473.2	$60.10	3.03
232.21	Guidance - Side Offices	2600	24	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	2.06	5,366.4	$681.53	24	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.73	4492.8	$570.59	$14.00	$336.00	0.34	873.6	$110.95	3.03
221.11	Guidance - File Storage	2600	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	322.4	$40.94	2	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.10	260	$33.02	$14.00	$28.00	0.02	62.4	$7.92	3.53
242.21	A5 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	A2 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	A3 Classroom	2600	8	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.86	2,225.6	$282.65	8	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.78	2038.4	$258.88	$28.00	$224.00	0.07	187.2	$23.77	9.42
242.21	A1 Classroom	2600	28	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	3.00	7,789.6	$989.28	28	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	2.74	7134.4	$906.07	$28.00	$784.00	0.25	655.2	$83.21	9.42
601		8760	2	2	(2) 7w CFL Exit Sign	16	0.03	280.3	$35.60	2	1	LED Exit Sign	2	0.00	35.04	$4.45	$65.00	$130.00	0.03	245.28	$31.15	4.17
222.21	A1 Office	2600	4	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	644.8	$81.89	4	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.20	520	$66.04	$14.00	$56.00	0.05	124.8	$15.85	3.53
222.21	Practice Rooms (3)	1200	3	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	223.2	$28.35	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	180	$22.86	$14.00	$42.00	0.04	43.2	$5.49	7.66
227.211	A1 Hall	2600	8	2	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	34	0.27	707.2	$89.81	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
602		8760	3	2	Incandescent Exit Sign	20	0.06	525.6	$66.75	3	1	LED Exit Sign	2	0.01	52.56	$6.68	$65.00	$195.00	0.05	473.04	$60.08	3.25
563	Auditorium Lobby	2600	10	2	Recessed Down Light, 26w Quad PL Lamp	52	0.52	1,352.0	$171.70	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
650		2600	6	2	Wall Sconce, (2) 26w PL Quad Lamp	54	0.32	842.4	$106.98	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.21		2600	7	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Acrylic Lens	58	0.41	1,055.6	$134.06	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.44	Stage	1200	7	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic	58	0.41	487.2	$61.87	7	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.35	420	$53.34	$14.00	$98.00	0.06	67.2	$8.53	11.48
611		1200	13	1	Wall Mnt. Globe w/Cage, (1) 60w A19 Lamps	60	0.78	936.0	$118.87	13	1	Energy Star Rated, Dimmable 13w CFL Lamp	13	0.17	202.8	$25.76	$20.00	$260.00	0.61	733.2	$93.12	2.79
232.21	Women's Dressing Room	1200	3	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.26	309.6	$39.32	3	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.22	259.2	$32.92	$14.00	$42.00	0.04	50.4	$6.40	6.56
232.21	Men's Dressing Room	1200	3	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.26	309.6	$39.32	3	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.22	259.2	$32.92	$14.00	$42.00	0.04	50.4	$6.40	6.56

Investment Grade Lighting Audit

562	Auditorium	1200	42	1	Recessed Down Light, (1) 150w PAR Lamp	150	6.30	7,560.0	$960.12	42	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.44	Cat Walk	150	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic	58	0.17	26.1	$3.31	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	22.5	$2.86	$14.00	$42.00	0.02	3.6	$0.46	91.86
242.11	Boy's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
242.11	Girl's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
232.21	B1 Classroom	2600	6	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.52	1,341.6	$170.38	6	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.43	1123.2	$142.65	$14.00	$84.00	0.08	218.4	$27.74	3.03
242.21	S1 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.61	4,173.0	$529.97	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.14	351	$44.58	9.42
242.21	S2 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.61	4,173.0	$529.97	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.14	351	$44.58	9.42
242.11	Boy's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
242.11	Girl's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
242.21	S3 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.61	4,173.0	$529.97	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.14	351	$44.58	9.42
242.21	S4 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.61	4,173.0	$529.97	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.14	351	$44.58	9.42
242.21	S5 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.61	4,173.0	$529.97	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.14	351	$44.58	9.42
242.21	S6 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.61	4,173.0	$529.97	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.14	351	$44.58	9.42
242.21	S7 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.61	4,173.0	$529.97	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.14	351	$44.58	9.42
242.21	S8 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.61	4,173.0	$529.97	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.14	351	$44.58	9.42
242.21	B5 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	B6 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42

Investment Grade Lighting Audit

242.21	B7 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	B8 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	B9 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	B10 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	B11 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	B12 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	B13 Classroom	2600	6	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.64	1,669.2	$211.99	6	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.59	1528.8	$194.16	$28.00	$168.00	0.05	140.4	$17.83	9.42
3520	B13 Restroom	1200	1	2	Ceiling Mount White Globe, (2) 100w A Lamp	200	0.20	240.0	$30.48	1	2	26w CFL Lamp	52	0.05	62.4	$7.92	$30.00	$30.00	0.15	177.6	$22.56	1.33
242.21	B14 School Store	2600	8	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.86	2,225.6	$282.65	8	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.78	2038.4	$258.88	$28.00	$224.00	0.07	187.2	$23.77	9.42
242.21	M4 Classroom	2600	10	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	2,782.0	$353.31	10	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.98	2548	$323.60	$28.00	$280.00	0.09	234	$29.72	9.42
242.21	M5 Classroom	2600	10	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	2,782.0	$353.31	10	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.98	2548	$323.60	$28.00	$280.00	0.09	234	$29.72	9.42
242.21	M6 Classroom	2600	10	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	2,782.0	$353.31	10	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.98	2548	$323.60	$28.00	$280.00	0.09	234	$29.72	9.42
242.21	M7 Classroom	2600	10	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	2,782.0	$353.31	10	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.98	2548	$323.60	$28.00	$280.00	0.09	234	$29.72	9.42
242.21	Teacher's Lounge	2600	2	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.21	556.4	$70.66	2	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.20	509.6	$64.72	$28.00	$56.00	0.02	46.8	$5.94	9.42
242.22	M8 Classroom	2600	12	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.25	3,244.8	$412.09	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.07	187.2	$23.77	14.13
242.22	M9 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$515.11	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.09	234	$29.72	14.13
242.22	M10 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$515.11	15	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.47	3822	$485.39	$28.00	$420.00	0.09	234	$29.72	14.13

Investment Grade Lighting Audit

242.21	M11 Classroom	2600	17	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.82	4,729.4	$600.63	17	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.67	4331.6	$550.11	$28.00	$476.00	0.15	397.8	$50.52	9.42
242.11	Boy's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
242.11	Girl's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
242.21	C1 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C2 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C3 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C4 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C5 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C6 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C7 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C8 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C9 Classroom	2600	16	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.71	4,451.2	$565.30	16	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.57	4076.8	$517.75	$28.00	$448.00	0.14	374.4	$47.55	9.42
242.21	C10 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C11 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	C12 Classroom	2600	16	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.71	4,451.2	$565.30	16	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.57	4076.8	$517.75	$28.00	$448.00	0.14	374.4	$47.55	9.42
221.14	C13 Shop	2600	44	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	2.55	6,635.2	$842.67	44	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	2.20	5720	$726.44	$14.00	$616.00	0.35	915.2	$116.23	5.30

Investment Grade Lighting Audit

121.32	Prep Room	2600	4	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Recessed Mnt., Prismatic Lens	78	0.31	811.2	$103.02	4	2	2 Lamp, 32w T8, Elect. Ballast; retrofit	58	0.23	603.2	$76.61	$80.00	$320.00	0.08	208	$26.42	12.11
221.14	C14 Shop	2600	38	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	2.20	5,730.4	$727.76	38	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	1.90	4940	$627.38	$14.00	$532.00	0.30	790.4	$100.38	5.30
242.21	C15 Classroom	2600	19	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	2.03	5,285.8	$671.30	19	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.86	4841.2	$614.83	$28.00	$532.00	0.17	444.6	$56.46	9.42
121.37	C16 Classroom	2600	18	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mnt., Clear Acrylic Lens	78	1.40	3,650.4	$463.60	18	2	2 Lamp, 32w T8, Elect. Ballast; retrofit	58	1.04	2714.4	$344.73	$80.00	$1,440.00	0.36	936	$118.87	12.11
601		8760	2	2	(2) 7w CFL Exit Sign	16	0.03	280.3	$35.60	2	1	LED Exit Sign	2	0.00	35.04	$4.45	$65.00	$130.00	0.03	245.28	$31.15	4.17
221.31	C16 Storage	2600	3	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.19	483.6	$61.42	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	390	$49.53	$14.00	$42.00	0.04	93.6	$11.89	3.53
221.15	Greenhouse	1200	7	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.41	487.2	$61.87	7	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.35	420	$53.34	$14.00	$98.00	0.06	67.2	$8.53	11.48
242.21	D1 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D2 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D3 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D4 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D5 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D6 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D7 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D8 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D9 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D10 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42

Investment Grade Lighting Audit

242.21	D11 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.11	Boy's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
242.11	Girl's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.32	834.6	$105.99	3	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	0.29	764.4	$97.08	$28.00	$84.00	0.03	70.2	$8.92	9.42
242.21	D12 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D13 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D14 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D15 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
242.21	D16 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	3,338.4	$423.98	12	4	Relamp - Sylvania Lamp FO28/841/SS/ECO	98	1.18	3057.6	$388.32	$28.00	$336.00	0.11	280.8	$35.66	9.42
142.31	Storage	2600	3	4	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mnt., Parabolic Lens	156	0.47	1,216.8	$154.53	3	3	3 Lamp , 32w T8, Elect. Ballast, Specular Reflector; retrofit	86	0.26	670.8	$85.19	$100.00	$300.00	0.21	546	$69.34	4.33
613		2600	2	1	Industrial Fixture, 100w A19 Lamp	100	0.20	520.0	$66.04	2	1	(1) 26w CFL Lamp	26	0.05	135.2	$17.17	$20.00	$40.00	0.15	384.8	$48.87	0.82
770	E1 Weight Room	2600	12	1	400w MH, Down Light	465	5.58	14,508.0	$1,842.52	12	4	2x4 54w T5HO 4 Lamp w/Reflective Lens, Wire Cage	236	2.83	7363.2	$935.13	$240.00	$2,880.00	2.75	7144.8	$907.39	3.17
232.21	E2 Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.03	2,683.2	$340.77	12	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.86	2246.4	$285.29	$14.00	$168.00	0.17	436.8	$55.47	3.03
232.21	Kiln Room	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$56.79	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$47.55	$14.00	$28.00	0.03	72.8	$9.25	3.03
232.21	E3 Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.03	2,683.2	$340.77	12	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.86	2246.4	$285.29	$14.00	$168.00	0.17	436.8	$55.47	3.03
232.21	E5 Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.03	2,683.2	$340.77	12	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.86	2246.4	$285.29	$14.00	$168.00	0.17	436.8	$55.47	3.03
232.21	E4 Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.03	2,683.2	$340.77	12	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.86	2246.4	$285.29	$14.00	$168.00	0.17	436.8	$55.47	3.03
232.11	E7 Office	2600	9	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	86	0.77	2,012.4	$255.57	9	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.65	1684.8	$213.97	$14.00	$126.00	0.13	327.6	$41.61	3.03
232.21	E7 Side Offices (3)	2600	6	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.52	1,341.6	$170.38	6	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.43	1123.2	$142.65	$14.00	$84.00	0.08	218.4	$27.74	3.03
232.11	M14 Teacher's Lounge	2600	10	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	86	0.86	2,236.0	$283.97	10	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.72	1872	$237.74	$14.00	$140.00	0.14	364	$46.23	3.03

Investment Grade Lighting Audit

221.34	Copy Room	2600	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.23	603.2	$76.61	4	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.20	520	$66.04	$14.00	$56.00	0.03	83.2	$10.57	5.30
221.31	Custodial Receiving	2600	9	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.56	1,450.8	$184.25	9	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.45	1170	$148.59	$14.00	$126.00	0.11	280.8	$35.66	3.53
232.21	Custodial Office	2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	894.4	$113.59	4	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.29	748.8	$95.10	$14.00	$56.00	0.06	145.6	$18.49	3.03
770	New Gym	2600	36	1	400w MH, Down Light	465	16.74	43,524.0	$5,527.55	36	4	2x4 54w T5HO 4 Lamp w/Reflective Lens, Wire Cage	236	8.50	22089.6	$2,805.38	$240.00	$8,640.00	8.24	21434.4	$2,722.17	3.17
232.21	Boy's Locker Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.69	1,788.8	$227.18	8	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.58	1497.6	$190.20	$14.00	$112.00	0.11	291.2	$36.98	3.03
232.21	Gym Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$56.79	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$47.55	$14.00	$28.00	0.03	72.8	$9.25	3.03
232.21	Girl's Locker Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.69	1,788.8	$227.18	8	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.58	1497.6	$190.20	$14.00	$112.00	0.11	291.2	$36.98	3.03
232.21	Gym Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$56.79	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$47.55	$14.00	$28.00	0.03	72.8	$9.25	3.03
232.21	Men's Restroom	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$56.79	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$47.55	$14.00	$28.00	0.03	72.8	$9.25	3.03
232.21	Corridors	3400	234	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	20.12	68,421.6	$8,689.54	234	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	16.85	57283.2	$7,274.97	$14.00	$3,276.00	3.28	11138.4	$1,414.58	2.32
227.21		3400	28	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	1.82	6,188.0	$785.88	28	2	Sylvania Lamp FBO30/841XP/6//SS/ECO	49	1.37	4664.8	$592.43	$24.00	$672.00	0.45	1523.2	$193.45	3.47
601		8760	9	2	(2) 7w CFL Exit Sign	16	0.14	1,261.4	$160.20	9	1	LED Exit Sign	2	0.02	157.68	$20.03	$65.00	$585.00	0.13	1103.76	$140.18	4.17
602		8760	2	2	Incandescent Exit Sign	20	0.04	350.4	$44.50	2	1	LED Exit Sign	2	0.00	35.04	$4.45	$65.00	$130.00	0.04	315.36	$40.05	3.25
711	Exterior	4400	26	1	100w HPS Bollards	125	3.25	14,300.0	$1,816.10	26	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
710		4400	49	1	100w HPS Wallpack	125	6.13	26,950.0	$3,422.65	49	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
725		4400	6	1	150w HPS Wallpack	188	1.13	4,963.2	$630.33	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
712		4400	14	1	100w HPS Recessed, 18" Square, Fresnel Lens	125	1.75	7,700.0	$977.90	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
738		4400	3	1	175w Mercury Vapor Area Light	210	0.63	2,772.0	$352.04	3	1	100w HPS Wallpack	125	0.38	1650	$209.55	$130.00	$390.00	0.26	1122	$142.49	2.74
	Totals		1,947	499			213.06	587,382	$74,598	1,947	484			154.4	415,324	$52,746		$59,425	38.5	106,628	$13,542	4.39

CEG Job #: 9C10089
Project: Lower Cape Regional High School
Address: 0
0
Building SF: 232,000

Lower Cape Regional High School

KWH COST: $0.127

ECM #2: Lighting Controls

not rebate eligible

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS												SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description		Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
232.21	Cafeteria	2600	76	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	6.536	16993.6	$2,158.19	76	3	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		86	5.23	20%	13594.88	$1,726.55	$300.00	$900.00	1.31	3398.72	$431.64	2.09
602		8760	1	2	Incandescent Exit Sign	20	0.02	175.2	$22.25	1	0	No Change		20	0.02	0%	175.2	$22.25	$0.00	$0.00	0.00	0	$0.00	0.00
601		8760	2	2	(2) 7w CFL Exit Sign	16	0.032	280.32	$35.60	2	0	No Change		16	0.03	0%	280.32	$35.60	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Kitchen	2600	20	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	2.14	5564	$706.63	20	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.71	20%	4451.2	$565.30	$300.00	$300.00	0.43	1112.8	$141.33	2.12
617		2600	6	1	Hood Light w/Globe & Cage, 100w A19 Lamp	100	0.6	1560	$198.12	6	0	No Change		100	0.60	0%	1560	$198.12	$0.00	$0.00	0.00	0	$0.00	0.00
770	Aux Gym	2600	30	1	400w MH, Down Light	465	13.95	36270	$4,606.29	30	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		465	11.16	20%	29016	$3,685.03	$300.00	$300.00	2.79	7254	$921.26	0.33
601		8760	5	2	(2) 7w CFL Exit Sign	16	0.08	700.8	$89.00	5	0	No Change		16	0.08	0%	700.8	$89.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Boy's Locker Room	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
602		8760	1	2	Incandescent Exit Sign	20	0.02	175.2	$22.25	1	0	No Change		20	0.02	0%	175.2	$22.25	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Boy's Restroom	2600	2	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.214	556.4	$70.66	2	0	No Change		107	0.21	0%	556.4	$70.66	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Girl's Locker Room	2600	5	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.535	1391	$176.66	5	0	No Change		107	0.54	0%	1391	$176.66	$0.00	$0.00	0.00	0	$0.00	0.00
602		8760	1	2	Incandescent Exit Sign	20	0.02	175.2	$22.25	1	0	No Change		20	0.02	0%	175.2	$22.25	$0.00	$0.00	0.00	0	$0.00	0.00
221.31	Team Room	2600	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.124	322.4	$40.94	2	0	No Change		62	0.12	0%	322.4	$40.94	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Boiler Room Stairs	4400	1	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.107	470.8	$59.79	1	0	No Change		107	0.11	0%	470.8	$59.79	$0.00	$0.00	0.00	0	$0.00	0.00
613.1	Boiler Room	4400	4	1	Industrial Fixture, 300w A19 Lamp	300	1.2	5280	$670.56	4	0	No Change		300	1.20	0%	5280	$670.56	$0.00	$0.00	0.00	0	$0.00	0.00
602		8760	1	2	Incandescent Exit Sign	20	0.02	175.2	$22.25	1	0	No Change		20	0.02	0%	175.2	$22.25	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Girl's Restroom	2600	1	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.107	278.2	$35.33	1	0	No Change		107	0.11	0%	278.2	$35.33	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	A16 Classroom	2600	12	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.744	1934.4	$245.67	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		62	0.60	20%	1547.52	$196.54	$300.00	$300.00	0.15	386.88	$49.13	6.11
222.21	A14 Classroom	2600	14	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.868	2256.8	$286.61	14	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		62	0.69	20%	1805.44	$229.29	$300.00	$300.00	0.17	451.36	$57.32	5.23

242.22	A12 Nurse	2600	8	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.832	2163.2	$274.73	8	0	No Change		104	0.83	0%	2163.2	$274.73	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	4	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.26	676	$85.85	4	0	No Change		65	0.26	0%	676	$85.85	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Main Office	2600	4	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.428	1112.8	$141.33	4	1	Dual Technology Occupancy Sensor - Switch Mnt.		107	0.34	20%	890.24	$113.06	$150.00	$150.00	0.09	222.56	$28.27	5.31
242.21	VP Office	2600	2	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.214	556.4	$70.66	2	1	Dual Technology Occupancy Sensor - Switch Mnt.		107	0.17	20%	445.12	$56.53	$150.00	$150.00	0.04	111.28	$14.13	10.61
242.21	Main Office - Counter Area	2600	13	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.391	3616.6	$459.31	13	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	1.11	20%	2893.28	$367.45	$300.00	$300.00	0.28	723.32	$91.86	3.27
121.14	Vault	2600	1	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., No Lens	78	0.078	202.8	$25.76	1	0	No Change		78	0.08	0%	202.8	$25.76	$0.00	$0.00	0.00	0	$0.00	0.00
121.34	Copy Room	2600	1	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mnt., No Lens	78	0.078	202.8	$25.76	1	0	No Change		78	0.08	0%	202.8	$25.76	$0.00	$0.00	0.00	0	$0.00	0.00
121.11	Kitchenette	2600	2	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	78	0.156	405.6	$51.51	2	1	Dual Technology Occupancy Sensor - Switch Mnt.		78	0.12	20%	324.48	$41.21	$150.00	$150.00	0.03	81.12	$10.30	14.56
222.21	Office	2600	2	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.124	322.4	$40.94	2	1	Dual Technology Occupancy Sensor - Switch Mnt.		62	0.10	20%	257.92	$32.76	$150.00	$150.00	0.02	64.48	$8.19	18.32
242.21	Principal's Office	2600	4	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.428	1112.8	$141.33	4	1	Dual Technology Occupancy Sensor - Switch Mnt.		107	0.34	20%	890.24	$113.06	$150.00	$150.00	0.09	222.56	$28.27	5.31
242.21	Media Center	2600	41	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	4.387	11406.2	$1,448.59	41	2	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	3.51	20%	9124.96	$1,158.87	$300.00	$600.00	0.88	2281.24	$289.72	2.07
211.35		2600	36	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., White Diffuser	30	1.08	2808	$356.62	36	2	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		30	0.86	20%	2246.4	$285.29	$300.00	$600.00	0.22	561.6	$71.32	8.41
232.21	Media Center Office	2600	7	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.602	1565.2	$198.78	7	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.48	20%	1252.16	$159.02	$150.00	$150.00	0.12	313.04	$39.76	3.77
232.21	Media Center Storage	2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.344	894.4	$113.59	4	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.28	20%	715.52	$90.87	$150.00	$150.00	0.07	178.88	$22.72	6.60
222.22	Media Center Classroom	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.464	1206.4	$153.21	8	1	Dual Technology Occupancy Sensor - Switch Mnt.		58	0.37	20%	965.12	$122.57	$150.00	$150.00	0.09	241.28	$30.64	4.90
232.21	Study Room	2600	3	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.258	670.8	$85.19	3	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.21	20%	536.64	$68.15	$150.00	$150.00	0.05	134.16	$17.04	8.80
222.22	Tech Room	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.232	603.2	$76.61	4	1	Dual Technology Occupancy Sensor - Switch Mnt.		58	0.19	20%	482.56	$61.29	$150.00	$150.00	0.05	120.64	$15.32	9.79
221.31	TV Studio	2600	8	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.496	1289.6	$163.78	8	0	No Change		62	0.50	0%	1289.6	$163.78	$0.00	$0.00	0.00	0	$0.00	0.00
232.21		2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.344	894.4	$113.59	4	0	No Change		86	0.34	0%	894.4	$113.59	$0.00	$0.00	0.00	0	$0.00	0.00

242.21	A7 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
232.21	Guidance - Reception Area	2600	13	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.118	2906.8	$369.16	13	0	No Change		86	1.12	0%	2906.8	$369.16	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Guidance - Side Offices	2600	24	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	2.064	5366.4	$681.53	24	0	No Change		86	2.06	0%	5366.4	$681.53	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Guidance - File Storage	2600	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.124	322.4	$40.94	2	0	No Change		62	0.12	0%	322.4	$40.94	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	A5 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	A2 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	A3 Classroom	2600	8	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.856	2225.6	$282.65	8	1	Dual Technology Occupancy Sensor - Switch Mnt.		107	0.68	20%	1780.48	$226.12	$150.00	$150.00	0.17	445.12	$56.53	2.65
242.21	A1 Classroom	2600	28	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	2.996	7789.6	$989.28	28	2	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	2.40	20%	6231.68	$791.42	$300.00	$600.00	0.60	1557.92	$197.86	3.03
601		8760	2	2	(2) 7w CFL Exit Sign	16	0.032	280.32	$35.60	2	0	No Change		16	0.03	0%	280.32	$35.60	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	A1 Office	2600	4	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.248	644.8	$81.89	4	0	No Change		62	0.25	0%	644.8	$81.89	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Practice Rooms (3)	1200	3	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.186	223.2	$28.35	3	0	No Change		62	0.19	0%	223.2	$28.35	$0.00	$0.00	0.00	0	$0.00	0.00
227.211	A1 Hall	2600	8	2	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	34	0.272	707.2	$89.81	8	0	No Change		34	0.27	0%	707.2	$89.81	$0.00	$0.00	0.00	0	$0.00	0.00
602		8760	3	2	Incandescent Exit Sign	20	0.06	525.6	$66.75	3	0	No Change		20	0.06	0%	525.6	$66.75	$0.00	$0.00	0.00	0	$0.00	0.00
563	Auditorium Lobby	2600	10	2	Recessed Down Light, 26w Quad PL Lamp	52	0.52	1352	$171.70	10	0	No Change		52	0.52	0%	1352	$171.70	$0.00	$0.00	0.00	0	$0.00	0.00
650		2600	6	2	Wall Sconce, (2) 26w PL Quad Lamp	54	0.324	842.4	$106.98	6	0	No Change		54	0.32	0%	842.4	$106.98	$0.00	$0.00	0.00	0	$0.00	0.00
221.21		2600	7	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Acrylic Lens	58	0.406	1055.6	$134.06	7	0	No Change		58	0.41	0%	1055.6	$134.06	$0.00	$0.00	0.00	0	$0.00	0.00
221.44	Stage	1200	7	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic	58	0.406	487.2	$61.87	7	0	No Change		58	0.41	0%	487.2	$61.87	$0.00	$0.00	0.00	0	$0.00	0.00
611		1200	13	1	Wall Mnt. Globe w/Cage, (1) 60w A19 Lamps	60	0.78	936	$118.87	13	0	No Change		60	0.78	0%	936	$118.87	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Women's Dressing Room	1200	3	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.258	309.6	$39.32	3	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.21	20%	247.68	$31.46	$150.00	$150.00	0.05	61.92	$7.86	19.07
232.21	Men's Dressing Room	1200	3	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.258	309.6	$39.32	3	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.21	20%	247.68	$31.46	$150.00	$150.00	0.05	61.92	$7.86	19.07
562	Auditorium	1200	42	1	Recessed Down Light, (1) 150w PAR Lamp	150	6.3	7560	$960.12	42	0	No Change		150	6.30	0%	7560	$960.12	$0.00	$0.00	0.00	0	$0.00	0.00
221.44	Cat Walk	150	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic	58	0.174	26.1	$3.31	3	0	No Change		58	0.17	0%	26.1	$3.31	$0.00	$0.00	0.00	0	$0.00	0.00

242.11	Boy's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Girl's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	B1 Classroom	2600	6	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.516	1341.6	$170.38	6	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.41	20%	1073.28	$136.31	$150.00	$150.00	0.10	268.32	$34.08	4.40
242.21	S1 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.605	4173	$529.97	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.28	20%	3338.4	$423.98	$300.00	$300.00	0.32	834.6	$105.99	2.83
242.21	S2 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.605	4173	$529.97	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.28	20%	3338.4	$423.98	$300.00	$300.00	0.32	834.6	$105.99	2.83
242.11	Boy's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Girl's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	S3 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.605	4173	$529.97	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.28	20%	3338.4	$423.98	$300.00	$300.00	0.32	834.6	$105.99	2.83
242.21	S4 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.605	4173	$529.97	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.28	20%	3338.4	$423.98	$300.00	$300.00	0.32	834.6	$105.99	2.83
242.21	S5 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.605	4173	$529.97	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.28	20%	3338.4	$423.98	$300.00	$300.00	0.32	834.6	$105.99	2.83
242.21	S6 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.605	4173	$529.97	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.28	20%	3338.4	$423.98	$300.00	$300.00	0.32	834.6	$105.99	2.83
242.21	S7 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.605	4173	$529.97	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.28	20%	3338.4	$423.98	$300.00	$300.00	0.32	834.6	$105.99	2.83
242.21	S8 Classroom	2600	15	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.605	4173	$529.97	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.28	20%	3338.4	$423.98	$300.00	$300.00	0.32	834.6	$105.99	2.83
242.21	B5 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	B6 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54

242.21	B7 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	B8 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	B9 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	B10 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	B11 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	B12 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	B13 Classroom	2600	6	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.642	1669.2	$211.99	6	1	Dual Technology Occupancy Sensor - Switch Mnt.		107	0.51	20%	1335.36	$169.59	$150.00	$150.00	0.13	333.84	$42.40	3.54
3520	B13 Restroom	1200	1	2	Ceiling Mount White Globe, (2) 100w A Lamp	200	0.2	240	$30.48	1	0	No Change		200	0.20	0%	240	$30.48	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	B14 School Store	2600	8	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.856	2225.6	$282.65	8	1	Dual Technology Occupancy Sensor - Switch Mnt.		107	0.68	20%	1780.48	$226.12	$150.00	$150.00	0.17	445.12	$56.53	2.65
242.21	M4 Classroom	2600	10	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	2782	$353.31	10	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	0.86	20%	2225.6	$282.65	$300.00	$300.00	0.21	556.4	$70.66	4.25
242.21	M5 Classroom	2600	10	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	2782	$353.31	10	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	0.86	20%	2225.6	$282.65	$300.00	$300.00	0.21	556.4	$70.66	4.25
242.21	M6 Classroom	2600	10	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	2782	$353.31	10	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	0.86	20%	2225.6	$282.65	$300.00	$300.00	0.21	556.4	$70.66	4.25
242.21	M7 Classroom	2600	10	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	2782	$353.31	10	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		107	0.86	20%	2225.6	$282.65	$300.00	$300.00	0.21	556.4	$70.66	4.25
242.21	Teacher's Lounge	2600	2	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.214	556.4	$70.66	2	1	Dual Technology Occupancy Sensor - Switch Mnt.		107	0.17	20%	445.12	$56.53	$150.00	$150.00	0.04	111.28	$14.13	10.61
242.22	M8 Classroom	2600	12	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.248	3244.8	$412.09	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - remote mount		104	1.00	20%	2595.84	$329.67	$300.00	$300.00	0.25	648.96	$82.42	3.64

242.22	M9 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$515.11	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		104	1.25	20%	3244.8	$412.09	$300.00	$300.00	0.31	811.2	$103.02	2.91
242.22	M10 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$515.11	15	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		104	1.25	20%	3244.8	$412.09	$300.00	$300.00	0.31	811.2	$103.02	2.91
242.21	M11 Classroom	2600	17	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.819	4729.4	$600.63	17	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.46	20%	3783.52	$480.51	$300.00	$300.00	0.36	945.88	$120.13	2.50
242.11	Boy's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Girl's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	C1 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C2 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C3 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C4 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C5 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C6 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C7 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C8 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C9 Classroom	2600	16	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.712	4451.2	$565.30	16	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.37	20%	3560.96	$452.24	$300.00	$300.00	0.34	890.24	$113.06	2.65
242.21	C10 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54

242.21	C11 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	C12 Classroom	2600	16	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.712	4451.2	$565.30	16	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.37	20%	3560.96	$452.24	$300.00	$300.00	0.34	890.24	$113.06	2.65
221.14	C13 Shop	2600	44	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	2.552	6635.2	$842.67	44	2	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		58	2.04	20%	5308.16	$674.14	$300.00	$600.00	0.51	1327.04	$168.53	3.56
121.32	Prep Room	2600	4	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Recessed Mnt., Prismatic Lens	78	0.312	811.2	$103.02	4	1	Dual Technology Occupancy Sensor - Switch Mnt.		78	0.25	20%	648.96	$82.42	$150.00	$150.00	0.06	162.24	$20.60	7.28
221.14	C14 Shop	2600	38	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	2.204	5730.4	$727.76	38	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		58	1.76	20%	4584.32	$582.21	$300.00	$300.00	0.44	1146.08	$145.55	2.06
242.21	C15 Classroom	2600	19	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	2.033	5285.8	$671.30	19	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.63	20%	4228.64	$537.04	$300.00	$300.00	0.41	1057.16	$134.26	2.23
121.37	C16 Classroom	2600	18	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mnt., Clear Acrylic Lens	78	1.404	3650.4	$463.60	18	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		78	1.12	20%	2920.32	$370.88	$300.00	$300.00	0.28	730.08	$92.72	3.24
601		8760	2	2	(2) 7w CFL Exit Sign	16	0.032	280.32	$35.60	2	0	No Change		16	0.03	0%	280.32	$35.60	$0.00	$0.00	0.00	0	$0.00	0.00
221.31	C16 Storage	2600	3	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.186	483.6	$61.42	3	1	Dual Technology Occupancy Sensor - Switch Mnt.		62	0.15	20%	386.88	$49.13	$150.00	$150.00	0.04	96.72	$12.28	12.21
221.15	Greenhouse	1200	7	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.406	487.2	$61.87	7	0	No Change		58	0.41	0%	487.2	$61.87	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	D1 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D2 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D3 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D4 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D5 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D6 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54

242.21	D7 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D8 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D9 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D10 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D11 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.11	Boy's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Girl's Restroom	2600	3	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	107	0.321	834.6	$105.99	3	0	No Change		107	0.32	0%	834.6	$105.99	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	D12 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D13 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D14 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D15 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
242.21	D16 Classroom	2600	12	4	2x4, 4 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.284	3338.4	$423.98	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		107	1.03	20%	2670.72	$339.18	$300.00	$300.00	0.26	667.68	$84.80	3.54
142.31	Storage	2600	3	4	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mnt., Parabolic Lens	156	0.468	1216.8	$154.53	3	1	Dual Technology Occupancy Sensor - Switch Mnt.	not rebate eligible	156	0.37	20%	973.44	$123.63	$150.00	$150.00	0.09	243.36	$30.91	4.85
613		2600	2	1	Industrial Fixture, 100w A19 Lamp	100	0.2	520	$66.04	2	0	No Change		100	0.20	0%	520	$66.04	$0.00	$0.00	0.00	0	$0.00	0.00
770	E1 Weight Room	2600	12	1	400w MH, Down Light	465	5.58	14508	$1,842.52	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		465	4.46	20%	11606.4	$1,474.01	$300.00	$300.00	1.12	2901.6	$368.50	0.81
232.21	E2 Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.032	2683.2	$340.77	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		86	0.83	20%	2146.56	$272.61	$300.00	$300.00	0.21	536.64	$68.15	4.40

232.21	Kiln Room	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.172	447.2	$56.79	2	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.14	20%	357.76	$45.44	$150.00	$150.00	0.03	89.44	$11.36	13.21
232.21	E3 Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.032	2683.2	$340.77	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		86	0.83	20%	2146.56	$272.61	$300.00	$300.00	0.21	536.64	$68.15	4.40
232.21	E5 Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.032	2683.2	$340.77	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		86	0.83	20%	2146.56	$272.61	$300.00	$300.00	0.21	536.64	$68.15	4.40
232.21	E4 Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.032	2683.2	$340.77	12	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		86	0.83	20%	2146.56	$272.61	$300.00	$300.00	0.21	536.64	$68.15	4.40
232.11	E7 Office	2600	9	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	86	0.774	2012.4	$255.57	9	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.62	20%	1609.92	$204.46	$150.00	$150.00	0.15	402.48	$51.11	2.93
232.21	E7 Side Offices (3)	2600	6	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.516	1341.6	$170.38	6	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.41	20%	1073.28	$136.31	$150.00	$150.00	0.10	268.32	$34.08	4.40
232.11	M14 Teacher's Lounge	2600	10	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	86	0.86	2236	$283.97	10	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.69	20%	1788.8	$227.18	$150.00	$150.00	0.17	447.2	$56.79	2.64
221.34	Copy Room	2600	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.232	603.2	$76.61	4	1	Dual Technology Occupancy Sensor - Switch Mnt.		58	0.19	20%	482.56	$61.29	$150.00	$150.00	0.05	120.64	$15.32	9.79
221.31	Custodial Receiving	2600	9	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.558	1450.8	$184.25	9	0	No Change		62	0.56	0%	1450.8	$184.25	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Custodial Office	2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.344	894.4	$113.59	4	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.28	20%	715.52	$90.87	$150.00	$150.00	0.07	178.88	$22.72	6.60
770	New Gym	2600	36	1	400w MH, Down Light	465	16.74	43524	$5,527.55	36	2	Dual Tech. Occupancy Sensor w/2 Pole Powerpack remote mount		465	13.39	20%	34819.2	$4,422.04	$300.00	$600.00	3.35	8704.8	$1,105.51	0.54
232.21	Boy's Locker Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.688	1788.8	$227.18	8	0	No Change		86	0.69	0%	1788.8	$227.18	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Gym Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.172	447.2	$56.79	2	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.14	20%	357.76	$45.44	$150.00	$150.00	0.03	89.44	$11.36	13.21
232.21	Girl's Locker Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.688	1788.8	$227.18	8	0	No Change		86	0.69	0%	1788.8	$227.18	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Gym Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.172	447.2	$56.79	2	1	Dual Technology Occupancy Sensor - Switch Mnt.		86	0.14	20%	357.76	$45.44	$150.00	$150.00	0.03	89.44	$11.36	13.21
232.21	Men's Restroom	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.172	447.2	$56.79	2	0	No Change		86	0.17	0%	447.2	$56.79	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Corridors	3400	234	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	20.124	68421.6	$8,689.54	234	0	No Change		86	20.12	0%	68421.6	$8,689.54	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		3400	28	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	1.82	6188	$785.88	28	0	No Change		65	1.82	0%	6188	$785.88	$0.00	$0.00	0.00	0	$0.00	0.00
601		8760	9	2	(2) 7w CFL Exit Sign	16	0.144	1261.44	$160.20	9	0	No Change		16	0.14	0%	1261.44	$160.20	$0.00	$0.00	0.00	0	$0.00	0.00
602		8760	2	2	Incandescent Exit Sign	20	0.04	350.4	$44.50	2	0	No Change		20	0.04	0%	350.4	$44.50	$0.00	$0.00	0.00	0	$0.00	0.00
711	Exterior	4400	26	1	100w HPS Bollards	125	3.25	14300	$1,816.10	26	0	No Change		125	3.25	0%	14300	$1,816.10	$0.00	$0.00	0.00	0	$0.00	0.00
710		4400	49	1	100w HPS Wallpack	125	6.125	26950	$3,422.65	49	0	No Change		125	6.13	0%	26950	$3,422.65	$0.00	$0.00	0.00	0	$0.00	0.00
725		4400	6	1	150w HPS Wallpack	188	1.128	4963.2	$630.33	6	0	No Change		188	1.13	0%	4963.2	$630.33	$0.00	$0.00	0.00	0	$0.00	0.00
712		4400	14	1	100w HPS Recessed, 18" Square, Fresnel Lens	125	1.75	7700	$977.90	14	0	No Change		125	1.75	0%	7700	$977.90	$0.00	$0.00	0.00	0	$0.00	0.00

738		4400	3	1	175w Mercury Vapor Area Light	210	0.63	2772	$352.04	3	0	No Change		210	0.63	0%	2772	$352.04	$0.00	$0.00	0.00	0	$0.00	0.00
	Totals		1,947	499			213.1	587,382.3	$74,598	1,947	109				182.2		507,431.2	$64,443.76		$28,500	30.81	79,951	$10,154	2.81

Project Name: LGEA Solar PV Project - 9C10089
Location: Lower Cape May Regional HS, Cape May, NJ
Description: Photovoltaic System - Direct Purchase

Simple Payback Analysis

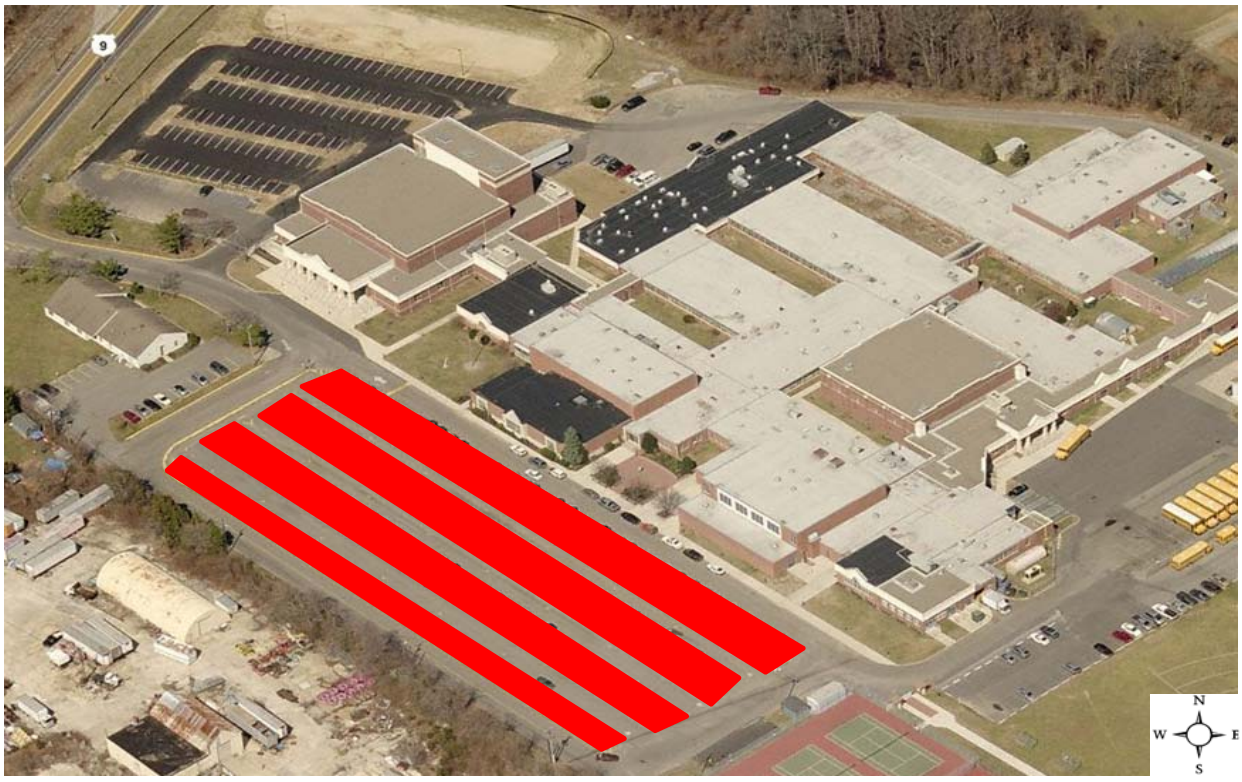
	Photovoltaic System - Direct Purchase
Total Construction Cost	$5,094,040
Annual kWh Production	800,118
Annual Energy Cost Reduction	$101,615
Annual SREC Revenue	$280,041
First Cost Premium	**$5,094,040**
Simple Payback:	**13.35** **Years**

Life Cycle Cost Analysis

Analysis Period (years):	25	Financing %:	0%
Financing Term (mths):	0	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.127**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	0.00%	SREC Value ($/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	$5,094,040	0	0	0	$0	(5,094,040)	0
1	$0	800,118	$101,615	$0	$280,041	$381,656	($4,712,384)
2	$0	796,117	$104,663	$0	$278,641	$383,305	($4,329,079)
3	$0	792,137	$107,803	$0	$277,248	$385,051	($3,944,028)
4	$0	788,176	$111,037	$0	$275,862	$386,899	($3,557,129)
5	$0	784,235	$114,369	$8,078	$274,482	$380,773	($3,176,356)
6	$0	780,314	$117,800	$8,037	$273,110	$382,872	($2,793,483)
7	$0	776,413	$121,334	$7,997	$271,744	$385,081	($2,408,402)
8	$0	772,530	$124,974	$7,957	$270,386	$387,402	($2,021,000)
9	$0	768,668	$128,723	$7,917	$269,034	$389,839	($1,631,161)
10	$0	764,824	$132,585	$7,878	$267,689	$392,395	($1,238,765)
11	$0	761,000	$136,562	$7,838	$266,350	$395,074	($843,692)
12	$0	757,195	$140,659	$7,799	$265,018	$397,878	($445,813)
13	$0	753,409	$144,879	$7,760	$263,693	$400,812	($45,002)
14	$0	749,642	$149,225	$7,721	$262,375	$403,879	$358,877
15	$0	745,894	$153,702	$7,683	$261,063	$407,082	$765,959
16	$0	742,165	$158,313	$7,644	$259,758	$410,426	$1,176,385
17	$0	738,454	$163,062	$7,606	$258,459	$413,915	$1,590,300
18	$0	734,762	$167,954	$7,568	$257,167	$417,553	$2,007,853
19	$0	731,088	$172,993	$7,530	$255,881	$421,343	$2,429,196
20	$0	727,432	$178,182	$7,493	$254,601	$425,291	$2,854,487
21	$1	723,795	$183,528	$7,455	$253,328	$429,401	$3,283,888
22	$2	720,176	$189,034	$7,418	$252,062	$433,678	$3,717,566
23	$3	716,575	$194,705	$7,381	$250,801	$438,125	$4,155,691
24	$4	712,992	$200,546	$7,344	$249,547	$442,749	$4,598,441
25	$5	709,427	$206,562	$7,307	$248,300	$447,555	$5,045,996
	Totals:	18,847,541	$3,704,808	$161,411	$6,596,639	$10,140,036	$838,344
				Net Present Value (NPV)		**$5,046,021**	
				Internal Rate of Return (IRR)		**6.0%**	

Description	Area (sq ft)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Panel Weight (33 lbs)	W/SQFT
Array 1	6650	Sunpower SPR230	452	14.7	6,646	103.96	114,303	14,916	15.64
Array 2	13300	Sunpower SPR231	904	14.7	13,293	207.92	228,605	29,832	15.64
Array 3	13300	Sunpower SPR232	904	14.7	13,293	207.92	228,605	29,832	15.64
Array 4	13300	Sunpower SPR233	904	14.7	13,293	207.92	228,605	29,832	15.64
	46,550					727.72	800,118		



= Proposed PV Layout

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

		EXISTING USAGE		HTG & DHW LOAD	
Month	Days	Est. Fuel Usage, kBtu	Fuel Usage, therms	Actual Load, kBtu	Actual Avg. Btu/h
Jan.	31	1,801,773	18,018	1,261,241	1,695,216
Feb.	28	1,765,240	17,652	1,235,668	1,838,792
Mar.	31	1,272,604	12,726	890,823	1,197,342
Apr	30	536,839	5,368	375,787	521,927
May	31	0	0	0	0
Jun	30	0	0	0	0
July	31	0	0	0	0
Aug.	31	0	0	0	0
Sept.	30	0	0	0	0
Oct.	31	0	0	0	0
Nov.	30	505,867	5,059	354,107	491,815
Dec.	31	1,139,160	11,392	797,412	1,071,791
Total	365	7,021,483	70,215	4,915,038	568,074

COMBINED HEAT AND POWER OPERATION					
Load Capacity, kW	Fuel Usage, therms	Electric Generation, kWh	Recovered Heat, kBtu	Remaining Load Fuel Usage, therms	Total Fuel Usage, therms
150.0	5,692	46,500	303,800	12,447	18,138
150.0	5,141	42,000	274,400	12,496	17,637
150.0	5,692	46,500	303,800	7,631	13,323
79.9	2,933	23,966	156,578	2,850	5,783
0.0	0	0	0	0	0
0.0	0	0	0	0	0
0.0	0	0	0	0	0
0.0	0	0	0	0	0
0.0	0	0	0	0	0
0.0	0	0	0	0	0
75.3	2,764	22,583	147,545	2,685	5,450
150.0	5,692	46,500	303,800	6,417	12,109
150.0	27,913	228,049	1,489,923	44,527	72,440

Existing System Specifications	
Quantity of Boilers	2
Boiler Size (MBH)	8761
Manufacturer	H.B. Smith
Model	MB2003
Efficiency	70%

Constant Parameters	
CHP Availability	42%
Electric Heat Value (Btu/kWh)	3,412
Gas Heat Value (Btu/therm)	100,000
Electric Cost ($/kWh)	$0.127
Natural Gas Cost ($/therm)	$1.250

Primary Mover	Existing Fuel Cost	CHP Fuel Cost	Offset Electric Savings	Total CHP Savings
Natural Gas	$87,769	$90,550	$28,962	$26,181

System Cost, $/kW	Total Cost	Simple Payback, Years	Internal Rate of Return (IRR)	Net Present Value (NPV)
$3,500.00	$525,000	20.05	0.0%	($135,491)

CHP System Specifications	
Quantity of Units	2
Total System kW	150
Manufacturer	Tecogen
Model	
Electric Output, kW	75
Voltage (VAC)	208 or 460
Electric Service	3-P, 3 wire
Electrical Efficiency LHV	27.9%
Natural Gas HHV (Btu/scf)	1,020
Fuel Flow HHV (Btu/hr)	918,000
Net Heat Rate LHV (Btu/hr)	814,500
Recoverable Energy (Btu/hr)	490,000
Heat Rate Efficiency	53.4%
Overall System Efficiency	81.3%

SENSITIVITY ANALYSIS				
Primary Mover	Case 1 Savings	Case 2 Savings	Case 3 Savings	Case 4 Savings
Natural Gas	$26,752	$26,967	$27,490	$25,658
Electric Increase	2.20%	3.00%	5.00%	-2.00%
Nat. Gas Increase	2.40%	3.00%	5.00%	-2.00%

	Nat. Gas Payback, Years
Case 1	19.63
Case 2	19.47
Case 3	19.10
Case 4	20.46