LOCAL GOVERNMENT ENERGY AUDIT PROGRAM: ENERGY AUDIT REPORT

PREPARED FOR: **HARRISON TOWNSHIP BOE**
120 NORTH MAIN STREET
MULLICA HILL, NJ 08062
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SCHOOL BUSINESS ADMINISTRATOR

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I. EXECUTIVE SUMMARY

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

Harrison Township Board of Education
Harrison Elementary School
120 North Main Street
Mullica Hill, NJ 08062

School Contact Person: Robert E. Scharlé
Facility Contact Person: Richard Brown

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	$ 180,247
Natural Gas	$ 108,154
Total	$ 288,401

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 - General	$5,840	$5,503	1.1	1313.4%
ECM #2	Lighting Controls	$19,315	$2,203	8.8	71.1%
ECM #3	Boiler Burner - Upgrade	$36,852	$4,712	7.8	168.5%
ECM #4	Premium Efficient Pump Motor Replacement	$2,007	$221	9.1	98.4%
ECM #5	DDC Controls System on 1989 Addition	$81,200	$2,722	29.8	-49.7%
ECM #6	Demand Control Ventilation	$174,625	$4,813	36.3	-58.7%
ECM #7	Exhaust Fan Control	$210,000	$30,585	6.9	118.5%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	Solar PV 372.37 kW System	$3,351,330	$217,865	15.4	62.5%

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 - General	11.5	39,029.0	0.0
ECM #2	Lighting Controls	46.2	30,332.0	0.0
ECM #3	Boiler Burner - Upgrade	0.0	0.0	3,080.0
ECM #4	Premium Efficient Pump Motor Replacement	0.4	1,569.0	0.0
ECM #5	DDC Controls System on 1989 Addition	0.0	83,194.0	10,126.0
ECM #6	Demand Control Ventilation	0.0	135,190.0	18,999.0
ECM #7	Exhaust Fan Control	6.4	36,163.0	16,657.2
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
REM #1	Solar PV 372.37 kW System	372.4	443,717.0	-
Notes:	A. Demand Savings for Renewable Energy Measures fluctuate with the seasons and are estimated based on the demand the Photovoltaic System will produce.			

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 #3:** Boiler Burner Upgrade
- **ECM #4:** Premium Efficiency Pump Motor Replacement
- **ECM #7:** Exhaust Fan Control

ECM #1 – Lighting Upgrade:

The lighting upgrade potential at Harrison Elementary consists of incandescent bulbs installed in the majority of the bathrooms, closets, and other misc. rooms throughout the school. The gymnasium and multi-purpose room utilize old style metal halide fixtures. These fixtures have direct replacements that save considerable energy. The lighting retrofit includes compact fluorescent bulb replacements for the incandescent fixtures and new high bay T-5 high output fluorescent fixtures to replace the metal halide fixtures. Advantages include extended life, instant lamp start and superior light quality, making this ECM both financially beneficial and aesthetically / operationally beneficial. This ECM has a simple payback of 1.1 years making it the fastest simple payback of all ECMs available.

ECM #2 – Lighting Occupancy Sensors / Daylight Sensors:

Lighting controls provide a simple and effective solution to the problem of lights being unnecessarily left on. Occupancy sensors provide a very fast payback since the installation costs are minimal per control device. Daylight Sensors provide valuable savings from daylight harvesting in addition to occupancy sensors. This ECM includes the installation of occupancy sensors for classrooms and daylight sensors for entryways and hallways with adequate natural light. The combination of both options has a simple payback of approximately 8.8 years and therefore is a valuable retrofit available for the school.

ECM #3 – Condensing Boiler:

The Harrison Elementary School currently has a boiler which is not yet ready to be replaced, but has a burner which is past its useful life. A burner installation for the boiler would be very beneficial for this facility since the combustion efficiency will rise and the boiler will be able to more efficiently heat the facility. This is a very simple retrofit for the time being and provides a simple pay back in less than 10 years. This is a very quick simple payback for mechanical equipment upgrades and therefore is highly recommended.

ECM #4 – NEMA Premium Efficiency Motors:

The existing motors for the hot water pumping distribution system utilize standard efficiency motors. These motors can be simply retrofitted with NEMA Premium Efficiency motors to add a small but effective efficiency increase. This incremental savings multiplied over extended operating hours for the hot water pumps allows the savings to pay for the installation in approximately 9.1 years.

ECM #7 – Exhaust Fan Control:

The current HVAC systems controls do not control exhaust fans. The exhaust fans run continuously wasting energy in both fan power and heat energy. During unoccupied hours, the only fans required to operate are the combustion air supply fan at each boiler room. All other fans can be turned off which reduces fan energy year round and heating the infiltrating winter air. A list of exhaust fans can be located in **APPENDIX D-2**. Implementing this ECM will save an estimated 6.4 kW, 36,136 kWh, 16,657.2 Therms with a total cost savings of $30,585 per year. The simple payback for this ECM is 2.3 years.

REM #1 – Solar Photovoltaic System:

Solar photovoltaic systems have progressed over the years to become a realistic approach for many facilities. With the incentives and energy credits available today, solar PV system installation costs have dropped to provide paybacks less than 15 years such as this facility. Power Purchase Agreements (PPAs) provide another opportunity for facilities with limited funding to invest in a clean renewable source of energy. Based on the calculated estimate for the maximum roof area available for solar panels (26,445 SF), this facility could generate approximately 35% of their current electric use annually. The BOE should consider this approach for considerable renewable energy improvements.

Additional Recommendations:

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 over time. 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 in order to limit energy use from task lighting.

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

5. 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.

6. Turn off computer monitors and set computers to sleep when not being used. Computer monitors and computers are becoming one of the largest energy consumers in buildings today. Set computers to sleep when not being used and automatically turn off the computer monitors. Do not set computer monitors to "screen saver" mode which saves the screen life, not energy.

Overall, the Harrison Elementary School appears to be operating at a low efficiency level compared to other schools in the region. With the implementation of the above recommended measures the Harrison Township BOE will realize further energy savings at the Harrison Elementary School.

II. INTRODUCTION

The comprehensive energy audit covers the 97,903 square foot Harrison Elementary School, which includes the following spaces: classrooms, Multi-purpose rooms, Art room, Music room, Library, Restrooms, Kitchen, Mechanical room, storage, Maintenance room and Administration offices.

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 are based on Interest Rate of 3%.

IV. HISTORIC ENERGY CONSUMPTION/COST

A. Energy Usage / Tariffs

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

The electric usage profile represents the actual electrical usage for the facility. Atlantic City Electric provides electricity to the facility under their Annual General Service rate structure. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

The gas usage profile shows the actual natural gas energy usage for the facility. South Jersey Gas provides natural gas to the facility under the Basic General Supply Service (BGSS) rate structure. 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	14.1¢ / kWh
Natural Gas	$1.53/ Therm

Table 3
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: Atlantic City Electric
Rate: Annual General Service
Meter No: 58511971, 82532017, 28551086, Street & Private Lighting
Customer ID No: 0438 5769 9995, 1079 8819 9991, 1207 8169 9992, 1207 8169 9984
Third Party Utility Provider: S.J. Energy Co.
TPS Meter / Acct No: 58511971, 82532017, 28551086

MONTH OF USE	CONSUMPTION	DEMAND	TOTAL BILL
Oct-08	110,791	365.6	$16,050
Nov-08	84,792	261.8	$12,240
Dec-08	93,987	261.6	$13,642
Jan-09	89,418	263.7	$13,091
Feb-09	88,785	264.8	$13,081
Mar-09	93,269	272.3	$13,418
Apr-09	94,195	367.8	$13,092
May-09	100,001	401.2	$13,639
Jun-09	153,525	436.3	$21,197
Jul-09	110,399	307.9	$15,383
Aug-09	135,263	452.8	$18,588
Sep-09	120,491	417.8	$16,827
Totals	**1,274,916**	**452.8 Max**	**$180,247**

AVERAGE DEMAND **339.5 KW average**
AVERAGE RATE **$0.141** **$/kWh**

Figure 1
Electricity Usage Profile

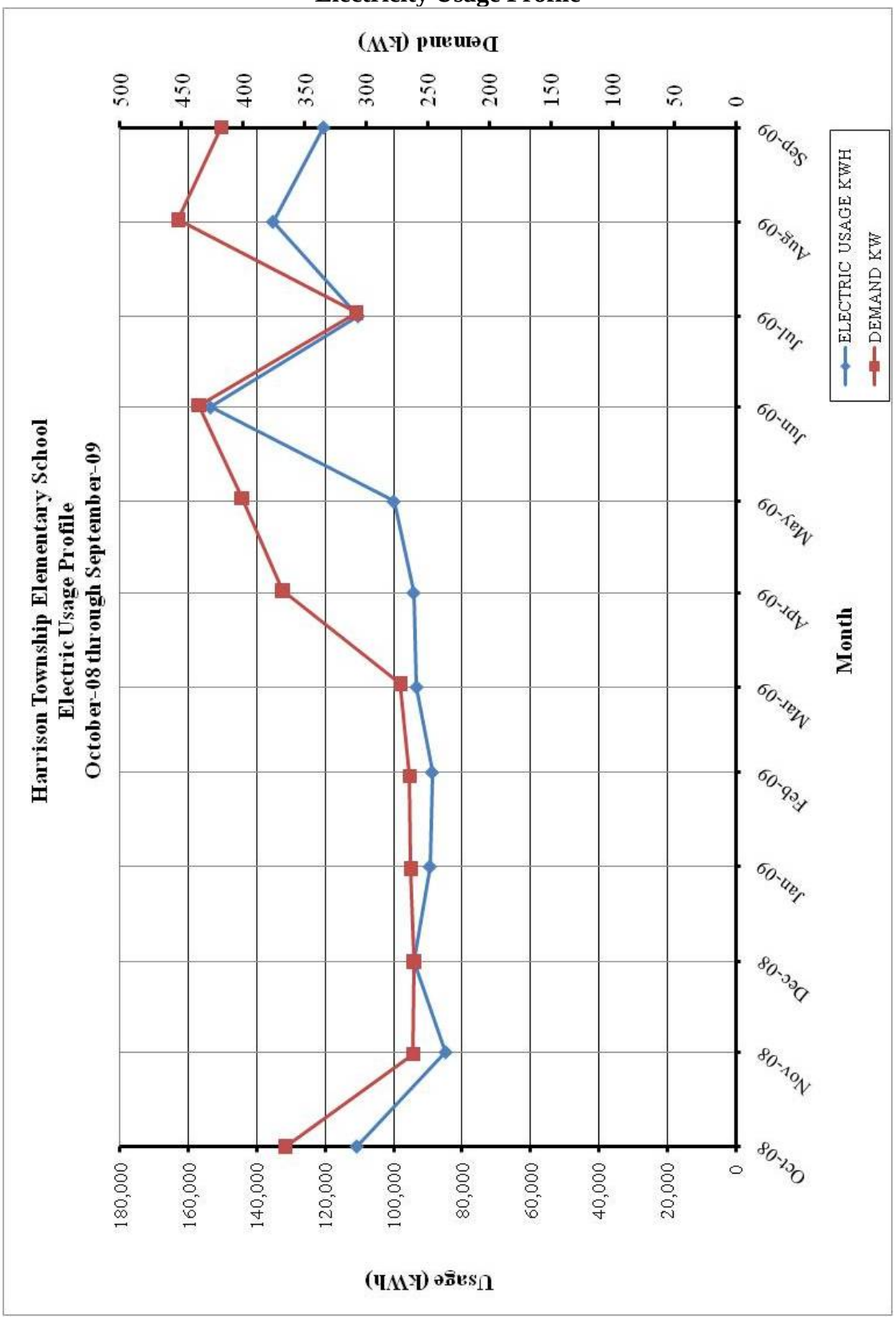
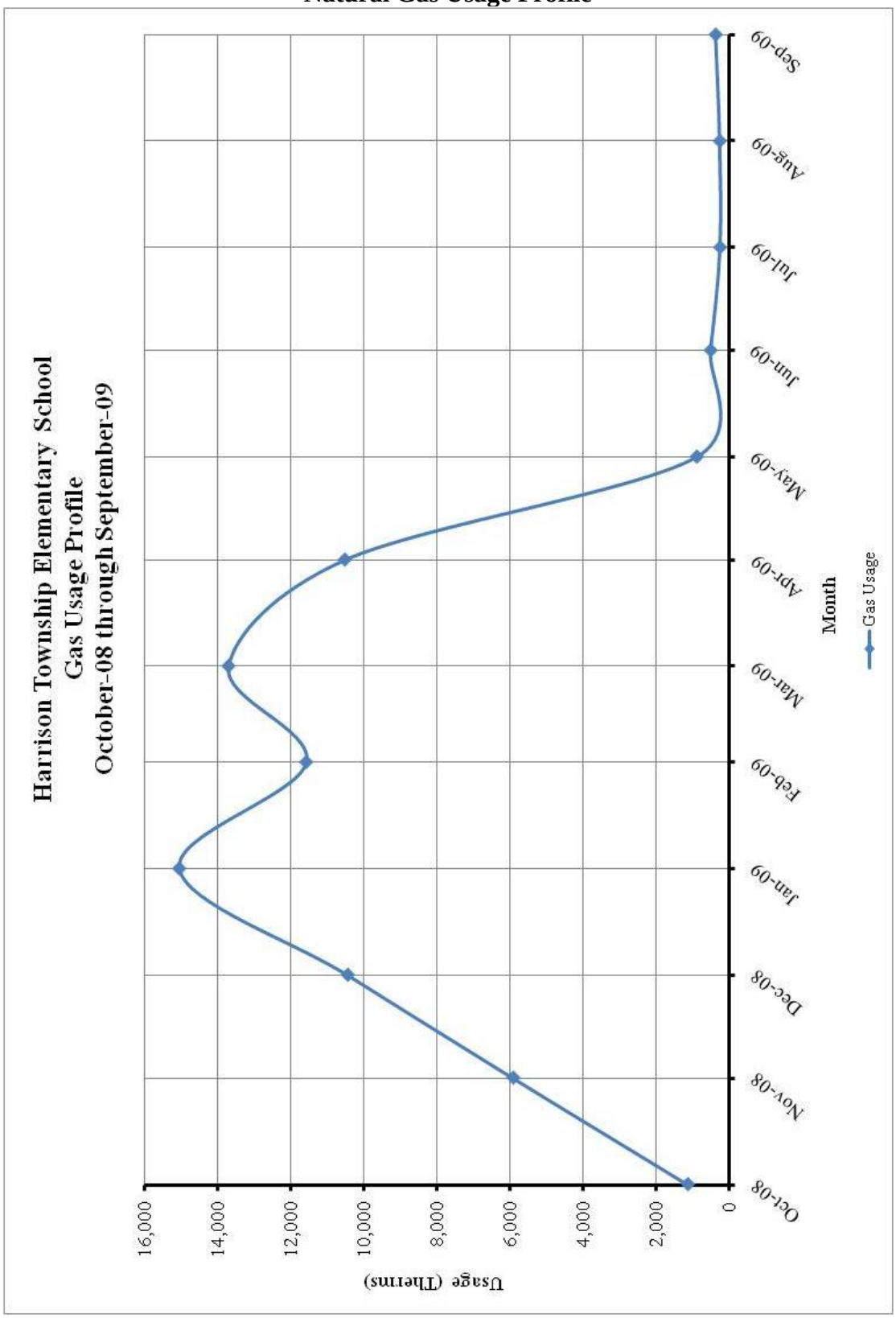


Table 4
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider:	South Jersey Gas	
Rate:	BGSS	
Meter No:	351256, 351487	
Point of Delivery ID:	21037009202, 21037009004	
Third Party Utility Provider:	Pepco	
TPS Meter No:	21037009202, 21037009004	
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Oct-08	1,125.10	$1,815.17
Nov-08	5,905.10	$8,502.63
Dec-08	10,436.66	$15,904.61
Jan-09	15,049.96	$19,148.12
Feb-09	11,575.23	$21,669.46
Mar-09	13,701.86	$17,860.14
Apr-09	10,514.14	$20,132.74
May-09	880.12	$1,416.24
Jun-09	500.95	$624.41
Jul-09	242.52	$381.82
Aug-09	252.15	$253.61
Sep-09	363.52	$444.59
TOTALS	**70,547.31**	**$108,153.54**
AVERAGE RATE:	**$1.53**	**$/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:

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

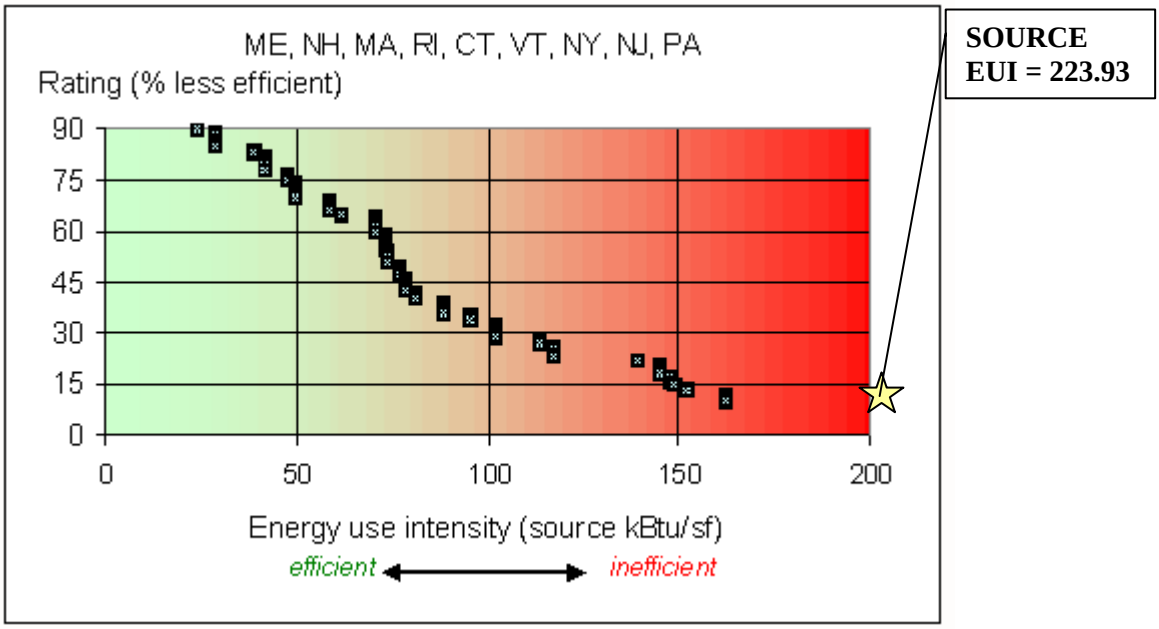
$$Building\ \ Source\ EUI = \frac{(Electric\ Usage\ in\ kBtu\ \ X\ \ SS\ \ Ratio + Gas\ Usage\ in\ kBtu\ \ X\ \ SS\ \ Ratio)}{Building\ \ Square\ \ Footage}$$

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	1,274,916.0			4,352,563	3.340	14,537,561
NATURAL GAS		70,547.3		7,054,731	1.047	7,386,303
TOTAL				11,407,294		21,923,865
*Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.						
BUILDING AREA		97,903	SQUARE FEET			
BUILDING SITE EUI		*116.52*	kBtu/SF/YR			
BUILDING SOURCE EUI		*223.93*	kBtu/SF/YR			

Figure 3 below depicts a national EUI grading for the source use of *Elementary School Building*.

Figure 3
Source Energy Use Intensity Distributions: Elementary School



C. EPA Energy Benchmarking System

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

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

In accordance with the Local Government Energy Audit Program, CEG has created an ENERGY STAR account for the school district 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: harrisontwpboe
Password: lgeaceg2009

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

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**
Harrison Elementary School	14	50

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

V. FACILITY DESCRIPTION

The 97,903 SF Harrison Township Elementary School Building is a one story facility comprised of classrooms, Multi-purpose rooms, Art room, Music room, Library, Restrooms, Kitchen, Mechanical room, Storage, Maintenance room and Administration offices. The original Boiler room is in a basement. The original section of the school was built in 1950. There were additions to the school in 1988 and in 1993. There was a renovation in 2004 to the original portion of the building and adding a pitched roof, where new fan coil units and ductwork were added to the Attic space.

The typical hours of operation for this facility are between 6:00 am and 10:00 pm. Exterior walls are brick with block construction with minimum insulation typical of the time period. The amount of insulation within the wall is unknown. The windows throughout the facility are in good condition and appear to be maintained. Typical windows throughout the facility are double pane, ¼" clear glass with aluminum frames. Shades are utilized through the facility per occupant comfort. The shades are valuable because they help to reduce heat loss in the winter and reduce solar heat in the summer. The 1950 and 1988 sections of the building have a built-up roof with light grey gravel ballast. In 2004, a pitched standing seam roof was added to the 1950 section of the building creating an attic space. The built up roof with gravel ballast in the 1950 section now serves as the attic floor. The 1993 addition has a Carlisle EPDM roof system. From the 1988 Drawing A-20, there is a ½" retrofit board and 1-1/2" rigid insulation on the 1950 portion of the roof. From the 1988 Drawing A-15, there is a ½" retrofit board and 3" rigid insulation on the 1988 portion of the roof. From the 1993 Drawing A-3, there is EPDM roofing membrane over 2" rigid insulation on metal decking.

HVAC Systems

Cooling for the 1950 and 1988 sections of the building is provided by a Trane model RTAA100A, 100 nominal ton air cooled water chiller. The unit is seven (7) years old, in good condition and has thirteen (13) years of ASHRAE expected useful service life remaining. The chilled water is circulated by two (2) Bell & Gossett model 1510 BF 3BC base mounted pumps with 15 hp motors. The pumps are rated at 260 GPM @80 feet of head. They are located in the pump room in the 1950 section and operate on a lead/lag configuration. The pumps are six (6) years old, in good condition and have fourteen (14) years of ASHRAE expected useful service life remaining.

Heating in the 1950 and 1988 sections of the building is provided by a H.B. Smith Mills 450L 12 section steam boiler. The boiler is twenty-one (21) years old, in good condition and has fourteen (14) years of ASHRAE expected useful service life remaining. The boiler burner is a Preferred Utilities Mfg. Corp. model BF 35 3M4 oil/gas burner. The oil tank and line sets were removed in 1988 and only natural gas is used today. The burner has a natural gas input capacity of 4,676 MBH, is in fair to poor condition and is at the end of its ASHRAE expected useful service life and should be replaced.

The steam is converted to hot water. The hot water for the 1950 building is circulated by two (2) base mounted pumps with 7.5 hp US Electric Motors. They are located in the 1950 boiler room and operate on a lead/lag configuration. The pumps are eight (8) years old, in good condition and

have twelve (12) years of ASHRAE expected useful service life remaining. The hot water for the 1988 building is circulated by two (2) base mounted pumps with 3 hp Ingersoll Rand Motors. They are located in the 1950 boiler room and operate on a lead/lag configuration. The pumps are twenty-two (22) years old, in fair to poor condition and are two (2) years past their ASHRAE expected useful service life. The pumps should be replaced with newer more efficient pump motor.

There are nineteen (19) fan coil units located in the attic of the 1950 building. The fan coil units are single zone, constant volume with ducted supply and returns. The units have a pre-heat coil, a chilled water coil and a ¾ hp fan motor. The units are controlled by a space mounted thermostat. The fan coil units are six (6) years old, in good condition and have nine (9) years of ASHRAE expected useful service life remaining.

In the 1950 section of the building, UV-8 and RCU-5 are serving Computer Lab 11A. The unit ventilator draws outside air from a roof air intake, has capacity of 65 MBH hot water heating, 5 ton nominal direct expansion cooling and controlled by a pneumatic control system. The unit ventilator and condensing unit are twenty-two years old, are in fair to poor condition and are seven (7) years past their ASHRAE expected useful service life.

In the 1950 section of the building, RCU-2 is a Payne model PA10PA048 roof mounted condensing unit and AHU-1 is a matching wall mounted air handling unit serving the PE Office. The split system is five (5) years old, in good condition and has ten (10) years of ASHRAE expected useful service life remaining.

In the 1950 section of the building, RCU-3 is a Snyder General model ST-008 roof mounted condensing unit and AHU-2 is a matching air handling unit serving the Teacher Resource Center. The split system is twenty-two (22) years old, in fair condition and is seven (7) years past its ASHRAE expected useful service life remaining.

In the 1950 section of the building, RCU-4 is a Snyder General model ST-008 roof mounted condensing unit and AHU-3 is a matching air handling unit serving the Music / Activities Center. The split system is twenty-two (22) years old, in fair condition and is seven (7) years past its ASHRAE expected useful service life remaining.

The 1988 section of the building is partially conditioned by six (6) classroom unit ventilators with a two-pipe heating only piping loop. They are located in classrooms 13, 16, 17, 20, 21 and 22. The units have an outside air intake at the outside wall louver, a fractional horsepower fan motor and controlled by a local thermostat with the night set back function on the pneumatic control system. The pump set, control panel and air compressor are located in the basement boiler room. The unit ventilators are twenty-two years old, are in fair to poor condition and are seven (7) years past their ASHRAE expected useful service life.

The 1988 section of the building is partially conditioned by eight (8) self contained classroom unit ventilators. The units have an outside air intake at the outside wall louver, a fractional horsepower fan motor. These units are controlled by a local thermostat and has a night set back function controlled by the pneumatic control system. These units installed in 1998 and 1999 have DDC capabilities but have not been connected to the head end. The unit ventilators are eleven

years old, are in fair condition and have four (4) years of expected ASHRAE useful service life remaining.

In the 1988 section of the building, UV-6 and RCU-1 are serving SG1 room. The unit ventilator draws outside air from a roof air intake, has capacity of 34 MBH hot water heating, 1.5 ton nominal direct expansion cooling and controlled by a pneumatic control system. The unit ventilator and condensing unit are twenty-two years old, are in fair to poor condition and are seven (7) years past their ASHRAE expected useful service life.

In the 1950 section of the building, there is an EMI model SCH24 roof mounted condensing unit and matching indoor air handling unit. The split system is eleven (11) years old, in fair condition and has four (4) years of ASHRAE expected useful service life remaining.

The Faculty work room in the South East side of the 1950 section of the building has a through the wall room air conditioner. It is a Sears Roebuck & Co. model 25378055892 with 5500 BTUH capacity, is in fair condition, is twelve (12) years old and has three (3) years of ASHRAE expected useful service life remaining.

Cooling for the 1993 section of the building is provided by a McQuay model ALR175C, 175 nominal ton air cooled water chiller. The unit is seventeen (17) years old and has failed. Water is breeching the refrigerant circuit and has filled one of the refrigerant circuits with water. Although there are three (3) years of ASHRAE expected useful service life remaining, the unit will be replaced this year due to the failure. The chilled water is circulated by two (2) Amtrol Thrush 2G series 2 x 2-1/2 x 12PF base mounted pumps rated at 275 GPM @ 97 feet of head. They are located in the pump room in the 1950 section and operate on a lead/lag configuration. The pumps are sixteen (16) years old, in good condition and have four (4) years of ASHRAE expected useful service life remaining.

Heating in the 1993 section of the building is provided by two (2) H.B. Smith Series 28A 7 section water boilers. The boilers are seventeen (17) years old, in good condition and have eighteen (18) years of ASHRAE expected useful service life remaining. The boiler burners are Webster model Cyclone JB1G 05 natural gas burners. Each burner has a natural gas input capacity of 2,163 MBH, is in fair condition and has four (4) years of ASHRAE expected useful service life remaining.

The hot water for the 1993 building is circulated by two (2) base mounted pumps with 5 hp Marathon Electric motors. The two (2) pumps are Amtrol Thrush E series 1 1/4 x 1-1/2 x 9PF base mounted pumps rated at 75 GPM @ 65 feet of head. They are located in the 1993 Mechanical room and operate on a lead/lag configuration. The pumps are sixteen (16) years old, in fair condition and have four (4) years of ASHRAE expected useful service life remaining.

Refer to Appendix D for additional information regarding building equipment.

The 1993 office administration area is conditioned by a central VAV rooftop unit made by McQuay. The packaged rooftop unit model CUR160ETSC includes a hot water heat exchanger to heat the primary supply air. Cooling is achieved with direct expansion of R-22 refrigerant. The system includes terminal variable air volume (VAV) boxes with hot water re-heat for office

zoning. Local thermostats control each VAV box's airflow to regulate space temperature. VAV box re-heat is activated in the heating season where additional heating is required. Conditioned air is distributed to the offices through ductwork to ceiling and sidewall diffusers.

The reheat for the office VAV is provided by a Weil McLain model CGA-3-PIDN series 1 water boiler. The boiler has 70 MBH natural gas input capacity, is in good condition, is three (3) years old and has thirty-two (32) years of ASHRAE expected useful service life. The reheat pump is a TACO series 007-F5 fractional hp pump. The pump is in fair condition, is sixteen (16) years old and is six (6) years past its expected ASHRAE useful service life. The pump should be maintained/replaced as a maintenance project.

In the 1993 section of the building, HVAC-2A McQuay model SHD061 and matching condensing unit model AD018GDB1 are serving the Physical Education & Main offices. The unit draws outside air from a roof air intake, has capacity of 12 MBH hot water heating, 1.5 ton nominal direct expansion cooling and controlled by the DDC control system. The air handling unit and condensing unit are seventeen (17) years old, are in fair condition and are two (2) years past their ASHRAE expected useful service life.

In the 1993 section of the building, HVAC-3A and HVAC-3B are each a McQuay model RDS708BY. These units are serving the Multi-purpose room. The units each have a capacity of 430.5 MBH hot water heating, 20 tons nominal chilled water cooling and are controlled by the DDC control system. The units are seventeen (17) years old, are in fair condition and are two (2) years past their ASHRAE expected useful service life.

In the 1993 section of the building, HVAC-4 McQuay model SHB301A is serving the Library. The unit draws outside air from a roof air intake, has capacity of 82.8 MBH hot water heating, 8 tons nominal chilled water cooling and controlled by a DDC control system. The unit is seventeen (17) years old, is in fair condition and is two (2) years past its ASHRAE expected useful service life.

In the 1993 section of the building, HVAC-5 McQuay model SHB121B is serving the corridor. The unit draws outside air from a roof air intake, has capacity of 35.7 MBH hot water heating, 3 tons nominal chilled water cooling and controlled by a DDC control system. The unit is seventeen (17) years old, is in fair condition and is two (2) years past its ASHRAE expected useful service life.

In the 1993 section of the building, HVAC-6 McQuay model SHB161B is serving the corridor. The unit draws outside air from a roof air intake, has capacity of 34.3 MBH hot water heating, 4 tons nominal chilled water cooling and controlled by a DDC control system. The unit is seventeen (17) years old, is in fair condition and is two (2) years past its ASHRAE expected useful service life.

In the 1993 section of the building, HVAC-7 McQuay model SHB161B is serving the corridor. The unit draws outside air from a roof air intake, has capacity of 34.3 MBH hot water heating, 4 tons nominal chilled water cooling and controlled by a DDC control system. The unit is seventeen (17) years old, is in fair condition and is two (2) years past its ASHRAE expected useful service life.

In the 1993 section of the building, HVAC-8 McQuay model SHB121B is serving the corridor. The unit draws outside air from a roof air intake, has capacity of 35.7 MBH hot water heating, 3 tons nominal chilled water cooling and controlled by a DDC control system. The unit is seventeen (17) years old, is in fair condition and is two (2) years past its ASHRAE expected useful service life.

In the 1993 section of the building, there is an air cooled condensing unit Inter City Products model AG080G1. The unit has capacity of 6.5 tons nominal direct expansion cooling and controlled by a local thermostat. The unit is seventeen (17) years old, is in fair condition and is two (2) years past its ASHRAE expected useful service life.

In the 1993 section of the building, there is an air cooled condensing unit Inter City Products model AG024G1. The unit has capacity of 2 tons nominal direct expansion cooling and controlled by a local thermostat. The unit is seventeen (17) years old, is in fair condition and is two (2) years past its ASHRAE expected useful service life.

In the 1993 section of the building, there is an Ares model SC1-BE1E (model 175.T75) is serving the kitchen hood. The unit has 175 MBH natural gas input and 135 MBH output. The unit is sixteen (16) years old, is in fair condition and is one (1) year past its ASHRAE expected useful service life.

Entrance doorways are heated via hot water cabinet heaters with fractional horsepower fan motors. The cabinet heaters are in fair condition. They are seventeen (17) to twenty-two (22) years old and are two (2) years past to having three (3) years remaining of expected ASHRAE useful service life. The cabinet heaters will not have an efficiency improvement so they should be maintained / replaced as needed as a maintenance project.

Exhaust System

Air is exhausted from various locations throughout the building. Locations being exhausted include rest rooms, storage rooms, kitchen, Library, corridor, Maintenance room and computer class room. These fans have fractional horsepower fan motors and are in good to fair condition. The expected ASHRAE useful service life for these fans is twenty years. Due to the small power usage of a fractional horsepower motor there would be no efficiency improvement. These fans should be maintained and replaced only when needed.

Corridor 04B in the 1993 section of the building is exhausted by a 5 hp Dynex DY24 fan per drawing M-3 of the 1993 drawing set. This fan is seventeen (17) years old, in fair condition and has one (1) of expected ASHRAE useful service life remaining. This fan can be replaced with a more efficient fan.

The 1950 boiler room combustion air is provided by a 1 hp Penn MU-4012 fan per the M-4 drawing in the 1987 drawing set. This fan is twenty-two (22) years old, in fair condition and is four (4) years past its expected ASHRAE useful service life. This fan can be replaced with a more efficient fan.

The exhaust fans are operated continuously on a 24/7 basis.

HVAC System Controls

The HVAC systems within the 1988 section of the building are controlled via local thermostats with night set back on a pneumatic control system. The air compressor is located in the basement boiler room. The air compressor has two (2) Baldor 1.5 hp electric motors. The pneumatic control system is twenty-two years old, in fair to poor condition and is two (2) years past its expected useful ASHRAE service life. The Staff has noted dissatisfaction with the operation of the classroom ventilation units. The source of dissatisfaction is unknown at this time. Possible sources could be excessive outside air, malfunctioning sensors or incorrect set points. The equipment is being replaced a few units at a time over the last couple of years. There are six units left to be replaced in rooms 13, 16, 17, 20, 21, and 22. The units that have been replaced have been fitted with DDC capability but have not been connected to the front end. The remaining six units should be replaced, fitted with DDC capabilities and the 1988 wing connected to the DDC head end.

The 1950 section of the building has been retrofitted with Honeywell DDC controls in 2004. The 1993 section of the building was constructed with DDC controls by CM3. The existing DDC system can be extended for use with the 1988 section of the building. The staff has indicated satisfaction with the operation of the DDC system and the systems controlled by the DDC system.

Domestic Hot Water

Domestic hot water for the 1950 building girl's restrooms is provided by a 50 gallon Bradford White electric water heater; model M2-50S6DS, capacity of 3500 Watts. The heater is four (4) years old, appeared to be in good condition and has eight (8) years of expected useful service life remaining. The domestic hot water is circulated by one (1) Armstrong model S-25 AB/BI in-line circulator pump with fractional hp motors. The pumps are rated at 10 GPM @ 8 feet of head. They are located in the boiler room in the 1950 section and operate on a lead/lag configuration. The pumps are six (6) years old, in good condition and have four (4) years of ASHRAE expected useful service life remaining.

Domestic hot water for the 1950 building Boy's restrooms is provided by a 30 gallon Bradford White electric water heater; model M2-30S6DS, capacity of 3500 Watts. The heater is one (1) year old, appeared to be in good condition and has eleven (11) years of expected useful service life remaining.

Domestic hot water for the 1950 building Teacher's restrooms and Janitor's closet is provided by a 80 gallon A.O. Smith electric water heater; model DVE 8 916, capacity of 9000 Watts. The heater is seven (7) years old, appeared to be in good condition and has five (5) years of expected useful service life remaining.

Domestic hot water for the 1988 building restrooms and Janitor's closet is provided by a 30 gallon Bradford White electric water heater; model M2-30S6DS, capacity of 3500 Watts. The heater is two (2) year old, appeared to be in good condition and has ten (10) years of expected useful service life remaining.

Domestic hot water for the 1993 building restrooms, Nurse Office, Kitchen is provided by a A.O Smith natural gas model HW 300 892, capacity of 300 MBH input and a A.O Smith model TJV-120M tank with 119 gallon capacity. The heater and tank are each sixteen (16) years old, appeared to be in fair condition and is four (4) years past their useful service life.

Lighting

Typical lighting throughout building is fluorescent tube lay-in fixtures with T-8 lamps and electronic ballasts. Majority of the bathrooms, closets, and other misc. rooms throughout the school are lit with a mixture of incandescent lamps and compact fluorescent lamps. The gymnasium and multi-purpose room utilize old style metal halide fixtures. The parking lot is lit with light poles and high pressure sodium lamps.

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 Upgrades

Description:

Compact fluorescent lamps (CFL's) were created to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp. The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light. The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 26-Watt CFL for a 100-Watt incandescent lamp. The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output. A CFL can be chosen to screw right into your existing fixtures, or hardwired into your existing fixtures.

Metal halide fixtures are utilized in the gymnasium and multi-purpose room of Harrison Elementary School. The 400 watt metal halide fixtures are fairly efficient; however they have some draw backs including poor lumen maintenance (approximately 30% reduction in lighting output at 40% of rated lamp life). Also, the fixture ballast can be noisy, require up to 10 minutes to re-strike after shutdown, and there is a noticeable color shift as the lamp approaches the end of its life. T-5 and T-8 high output fixtures are designed to be direct replacements for old metal halide fixtures. T-5 & T-8 fixtures are more efficient than probe start metal halides, as well as provide excellent lumen maintenance, no color shift, and minimal warm up time.

This ECM includes replacement of all incandescent bulbs with compact fluorescent bulbs. Where the existing fixture is controlled by a dimmer switch, the CFL bulb must be compatible with a dimmer switch. The energy usage of an incandescent compared to a compact fluorescent is approximately 3 to 4 times greater. In addition to the energy savings, compact fluorescent fixtures burn-hours are 8 to 15 times longer than incandescent fixtures ranging from 6,000 to 15,000 burn-hours compared to incandescent fixtures ranging from 750 to 1000 burn-hours. This ECM also includes installation of T-5 high output fluorescent fixtures to replace the existing metal halide fixtures. The fluorescent replacement for metal halide fixtures uses approximately 40% less energy. The life span and total replacement cost of metal halides and fluorescent fixtures are similar and therefore maintenance savings are minimal.

Est. Hours of Operation:

Classrooms, Bathrooms, & Office:	2600 Hrs per year.
Restrooms:	2600 Hrs per year.
Hallways:	3600 Hrs per year.
Storage rooms and janitor closets:	800 Hrs per year.
Exterior Lights:	3600 Hrs per year.

Energy Savings Calculations:

Refer to the **Investment Grade Lighting Audit Appendix** for a detailed energy savings calculation for the lighting replacements.

From the **NJ Smart Start Appendix**, the installation of new T-5 fluorescent fixtures in lieu of the existing 400W metal halide fixtures warrants the following incentive:

$$\text{Smart Start®}\ \textit{Incentive} = (\#\ \textit{of}\ \ \textit{fixtures} \times\ \$\ 25) = (35 \times \$25) = \$875$$

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$9,340
NJ Smart Start Equipment Incentive ($):	$3,500
Net Installation Cost ($):	$5,840
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$5,503
Total Yearly Savings ($/Yr):	$5,503
Estimated ECM Lifetime (Yr):	15
Simple Payback	1.1
Simple Lifetime ROI	1313.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$82,545
Internal Rate of Return (IRR)	94%
Net Present Value (NPV)	$59,854.46

ECM #2: Lighting Occupancy Sensors / Daylight Sensors

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 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors and 20% to 28% 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:

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

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

Installation cost per dual-technology sensors (Basis: Sensor switch or equivalent) are as follows:

Wall Mounted Sensor =	$160/unit including material and labor.
2 Pole Power Pack w/Dual Tech. Occupancy Sensor =	$225/unit including material and labor.
Daylight Sensor/Dimming Ballast =	$280/Unit including material and labor.

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

$$\text{Smart Start®}\ Incentive = \left(\#\ of\ \ wall\ mount \times\ \$\ 20\right) + \left(\#\ of\ ceiling\ mount \times 35\right)$$
$$= \left(90 \times \$35\right) + \left(11 \times \$20\right) = \$3{,}370$$

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$22,850
NJ Smart Start Equipment Incentive ($):	$3,535
Net Installation Cost ($):	$19,315
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,203
Total Yearly Savings ($/Yr):	$2,203
Estimated ECM Lifetime (Yr):	15
Simple Payback	8.8
Simple Lifetime ROI	71.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$33,045
Internal Rate of Return (IRR)	8%
Net Present Value (NPV)	$6,984.27

ECM #3: Boiler Burner Replacement

Description:

Harrison Elementary School has two boiler plants which provide hot water to the entire facility. Within the original building the burner in the HB Smith Mills 450L-12 is functioning properly but the burner is worn and old. The current burner has a combustion efficiency of 80% but the age of this burner in conjunction with radiation losses has brought the efficiency down to approximately 75%. This burner is 21 years old and has just surpasses its ASHRAE useful service life.

This energy conservation measure will replace the gas fired burner serving the original facility. Calculation is based on the following equipment: Power Flame FD C3-G-25BSI burner or equivalent. The existing burner will be replaced with a higher energy efficient unit with capacity typical of the existing unit.

Energy Savings Calculations:

Existing 4,676 MBh Gas Fired Burner:

Rated Capacity = 4,676 MBh Max Input
Combustion Efficiency = 80%
Age & Radiation Losses = 5%
Thermal Efficiency = 75%

Replacement Power Flame Gas Fired Burner:

Rated Capacity = 4,676 MBh Max Input

Combustion Efficiency = 83%
Radiation Losses = 0.5%
Thermal Efficiency = 82.5%

NATURAL GAS EQUIPMENT LIST - ESTIMATED ANNUAL USAGE PER UNIT

Concord Engineering Group

Harrison Elementary School

Manufacturer	Qty.	Model #	Serial #	Input (MBh)	% of Total Input	Estimated Annual Therms
HB Smith	1	Mills 450L-12	NJ968406H	4,340	0.4803	33,884
HB Smith	1	Series 28A-7	N93-919	2,163	0.2394	16,887
HB Smith	1	Series 28A-7	N93-920	2,163	0.2394	16,887
Weil -McLain	1	CGA-3-PIDN SERIES 1	CP5352717	70	0.0077	547
A.O. SMITH	1	HW 300 892	892 A 94 22956	300	0.0332	2,342
			Total Input MBH	9,036	1.00	70,547
			Total Input Therms	90.36		
			Total Gas Consumption Therms/yr.	70,547		

Operating Data:

Heating Season Fuel Consumption = 33,884 Therms/yr

$$Heating\ Energy\ Savings = Fuel\ Consumption \times (New\ Boiler\ Efficiency - Old\ Boiler\ Efficiency)$$

Heating Energy Savings = 33,884 Therms x ((82.5% - 75%) / (82.5%)) = 3,080 Therms

Total Heating Cost savings

Heating Energy Cost Savings = Annual Energy Savings x $/Therm

Heating Energy Cost Savings = (3,080 Therms) x $1.53/Therm = $4,712/ yr.

Installed cost of (1) one new Power Flame FD C3-G-25BSI, IRI 4,676MBH input gas fired burner and installation is $36,852.

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$36,852
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$36,852
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$4,712
Total Yearly Savings ($/Yr):	$4,712
Estimated ECM Lifetime (Yr):	21
Simple Payback	7.8
Simple Lifetime ROI	168.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$98,952
Internal Rate of Return (IRR)	11%
Net Present Value (NPV)	$35,783.59

ECM #4: Install NEMA Premium Efficient Pump Motor

Description:

Replacing the old system pump motors with new efficient motors is a simple change that can provide substantial savings. The current setup at the Harrison Township Elementary School uses two (2) hot water pumps, both at 3 hp each. The pumps run an average of eight hours per day during the winter and rarely run during the summer.

Existing electric motors equal to or greater than one horsepower ranged from 78 to 93% efficient. The improved efficiency of the NEMA premium efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate 30-60 hours per week, even small increases in efficiency can yield substantial energy and dollar savings.

This energy conservation measure would replace all motors equal to or greater than 1 HP with NEMA Premium® Efficient Motors. NEMA Premium® is the most efficient motor designation in the marketplace today.

Energy Savings Calculations:

Motor Operating Cost =
{0.746 Watt/HP x Motor HP x Load Factor x Hours of Operation x Cost of Electricity] ÷ Motor Efficiency

Hours of Operation = 4,261 Hours/ Year
Motor Load Factor = 75%
Cost Of Electricity = $ .141/kWh

SmartStart Building® incentive for 3 hp NEMA motor = $60/motor.

NEMA Premium Efficient Motor Replacement					
Motor HP	**Existing Efficiency**	**NEMA Premium Efficiency**	**kW Savings**	**kWh Savings**	**Cost Savings**
3	81.5%	89.5%	0.18	784	$111
3	81.5%	89.5%	0.18	784	$111
Total Savings			**0.4**	**1,569**	**$221**

The following table outlines the motor replacement plan for this facility:

MOTOR REPLACEMENT PLAN

MOTOR REPLACEMENT PLAN							
Motor HP	**QTY**	**ENCL. TYPE**	**No. of POLEs**	**INSTALLED Cost ****	**TOTAL COST**	**TOTAL SAVINGS**	**Simple Payback**
3	1	TEFC	4-Pole	$1,003	$1,003	$110.60	9.1
3	1	TEFC	4-Pole	$1,003	$1,003	$110.60	9.1
				Totals:	*$2,007*	*$221*	*9.1*

****Net Cost after the SmartStart Buildings® incentive is applied.**

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,127
NJ Smart Start Equipment Incentive ($):	$120
Net Installation Cost ($):	$2,007
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$221
Total Yearly Savings ($/Yr):	$221
Estimated ECM Lifetime (Yr):	18
Simple Payback	9.1
Simple Lifetime ROI	98.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$3,982
Internal Rate of Return (IRR)	8%
Net Present Value (NPV)	$1,035.78

ECM #5: DDC Controls System on 1989 Addition

Description:

The current HVAC systems within the 1988 addition of the Elementary School are controlled via pneumatic thermostats while the rest of the building is controlled by a Direct Digital Control (DDC) system. The original building has a CM3 DDC system that was installed most recently in 2003. A separate Honeywell DDC system was installed in 1993 for control of the newest part of the building. Thermostats in the 1988 addition are pneumatic 2-stage controls for a day/night (occupied/unoccupied) function by means if a mechanical time clock.

This ECM includes installing a Building Automation system with Direct Digital Controls (DDC) wired through an Ethernet backbone and front end controller within the school. The system will include new thermostat controllers for all unit ventilator 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 High School has diverse 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 10% 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 $4.00 per SF in accordance with recent Contractor pricing for systems of this magnitude. 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 = ($4.00/SF x 20,300 SF) = $81,200

Heating Season Heating Degree Days base 65°F = 4,930 HDD65
Average Cost of Gas = $1.53 / Therm

Cooling Season Full Load Cooling Hrs. = 1,238 hrs / yr
Average Cost of Electricity = $0.141 / kWh

Note: Degree Days referenced from www.degreedays.net (using temperature data from www.wunderground.com) Weather Data for Glassboro, NJ, Station: Glassboro, Glassboro, NJ, US, Station ID: KNJGLASS5.

Energy Savings Calculations:

10% Savings on Heating Calculations

$$Est\ Heat\ Cons. = \frac{Heat\ Load\left(\frac{kBtu}{Hr}\right) \times Heat\ Deg\ Days \times 24\ Hrs \times Correction\ Factor}{Design\ Temp\ Difference\left(°F\right) \times Efficiency\left(\%\right) \times Fuel\ Heat\ Value\left(\frac{kBtu}{Therm}\right)}$$

$$Est\ Heat\ Cons. = \frac{751\left(\frac{kBtu}{Hr}\right) \times 4{,}930\ \left(HDD\right) \times 24\ Hrs \times 0.6}{65\ \left(°F\right) \times 81\% \times 100\left(\frac{kBtu}{Therm}\right)} = 10{,}126\left(Therms\right)$$

$$Savings. = Heat\ Cons.\left(Therms\right) \times 10\%\ Savings \times Ave\ Gas\ Cost\left(\frac{\$}{Therm}\right)$$

$$Savings. = 10{,}126\ \left(Therms\right) \times 10\% \times 1.53\left(\frac{\$}{Therm}\right) = \underline{\$1{,}549}$$

10% Savings on Cooling Calculations**:**

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

$$Est\ Cool\ Cons. = \frac{56\ \left(Tons\right) \times 12{,}000\left(\frac{Btu}{Ton\ Hr}\right) \times 1{,}238\ Hrs.}{10.0\left(\frac{Btu}{Wh}\right) \times 1000\left(\frac{Wh}{kWh}\right)} = 83{,}194\left(kWh\right)$$

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

$$Savings. = 83{,}194\ (kWh) \times 10\% \times 0.141\left(\frac{\$}{kWh}\right) = \underline{\$1{,}173}$$

Total Annual Energy Savings = $1,549 + $1,173 = $2,722 per year

It is pertinent to note that electric demand savings were unable to be estimated. Also, incentives for the installation of the DDC system are not currently available and maintenance savings could not be adequately calculated because information was not available to baseline the savings.

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$81,200
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$81,200
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,722
Total Yearly Savings ($/Yr):	$2,722
Estimated ECM Lifetime (Yr):	15
Simple Payback	29.8
Simple Lifetime ROI	-49.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$40,830
Internal Rate of Return (IRR)	-8%
Net Present Value (NPV)	($48,704.94)

ECM #6: Demand Control Ventilation

Description:

The library, multi-purpose room, music room and other large areas are conditioned by large air handling units (AHUs) with outside are dampers for ventilation. The air handling units are running on a set schedule for the school's hours of operation. During the school day the outside air quantity is constant since the existing AHUs are constant volume units. The outside air quantity is set to provide enough outside air for the full occupancy of the space. Many times during the day these areas have occupancies which are less than maximum occupancy. The result of over ventilation is increased energy use and difficulty in providing humidity control.

Demand control ventilation provides control of the outside air quantity introduced into a space. The implementation of this control would reduce the outside air heated and cooled by the AHU and as a result, reduce the heating and cooling load on the central plants. Demand control ventilation regulates outside air based on the actual occupancy of the space. CO2 sensors provide accurate control of the rate of outside air needed at any given time. This control is beneficial for spaces which have been unoccupied for long periods prior to an event, or for spaces which are only occupied for short periods. The system would respond to CO2 levels rather than a set schedule.

Energy Savings Calculations

This ECM includes installation of CO2 sensors installed in the return ductwork of each AHU serving the library, multi-purpose room, music room and other large areas. CO2 sensors would be installed directly in the space for each room.

Savings resulting from the implementation of this ECM for Demand Control Ventilation is estimated to be 10% of the total energy cost for the facility.

The cost of a full DCV system with new field devices, controllers, computer, software, programming, etc. is approximately $4.00 per SF in accordance with recent Contractor pricing for systems of this magnitude. 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 DCV System = ($4.00/SF x 253,663 SF) = $1,014,650

Heating Season Heating Degree Days base 65°F	= 4,930 HDD65
Average Cost of Gas	= $1.53 / Therm
Cooling Season Full Load Cooling Hrs.	= 1,238 hrs / yr
Average Cost of Electricity	= $0.141 / kWh

Note: Degree Days referenced from www.degreedays.net (using temperature data from www.wunderground.com) Weather Data for Glassboro, NJ, Station: Glassboro, Glassboro, NJ, US, Station ID: KNJGLASS5.

Energy Savings Calculations:

10% Savings on Heating Calculations

$$Est\ Heat\ Cons. = \frac{Heat\ Load\left(\frac{kBtu}{Hr}\right) \times Heat\ Deg\ Days \times 24\ Hrs \times Correction\ Factor}{Design\ Temp\ Difference\left(^{\circ}F\right) \times Efficiency\left(\%\right) \times Fuel\ Heat\ Value\left(\frac{kBtu}{Therm}\right)}$$

$$Est\ Heat\ Cons. = \frac{1{,}409\left(\frac{kBtu}{Hr}\right) \times 4{,}930\ \left(HDD\right) \times 24\ Hrs \times 0.6}{65\ \left(^{\circ}F\right) \times 81\% \times 100\left(\frac{kBtu}{Therm}\right)} = 18{,}999\left(Therms\right)$$

$$Savings. = Heat\ Cons.\left(Therms\right) \times 10\%\ Savings \times Ave\ Gas\ Cost\left(\frac{\$}{Therm}\right)$$

$$Savings. = 18{,}999\ \left(Therms\right) \times 10\% \times 1.53\left(\frac{\$}{Therm}\right) = \underline{\$2{,}907}$$

10% Savings on Cooling Calculations**:**

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

$$Est\ Cool\ Cons. = \frac{91\ \left(Tons\right) \times 12{,}000\left(\frac{Btu}{Ton\ Hr}\right) \times 1{,}238\ Hrs.}{10.0\left(\frac{Btu}{Wh}\right) \times 1000\ \left(\frac{Wh}{kWh}\right)} = 135{,}190\left(kWh\right)$$

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

$$Savings. = 135{,}190\ (kWh) \times 10\% \times 0.141 \left(\frac{\$}{kWh} \right) = \underline{\$1{,}906}$$

Total Annual Energy Savings = $2,907 + $1,906 = $4,813 per year

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$174,625
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$174,625
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$4,813
Total Yearly Savings ($/Yr):	$4,813
Estimated ECM Lifetime (Yr):	15
Simple Payback	36.3
Simple Lifetime ROI	-58.7%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$72,195
Internal Rate of Return (IRR)	-9%
Net Present Value (NPV)	($117,167.72)

ECM #7: Exhaust Fan Control – Harrison Elementary School

Description:

The current HVAC systems within the Harrison Elementary School does not control exhaust fans. The exhaust fans run continuously and waste energy in both fan power and heat energy. During unoccupied hours, the HVAC system runs in unoccupied mode where units cycle to maintain a set back or set up temperature and outside air for ventilation is not required. The only fans required to operate are the combustion air supply fan at each boiler room. All other fans can be turned off. The exhaust fans exert a negative pressure within the building during unoccupied hour and causes infiltration of outside air. The amount of infiltration equates to approximately 75% of the design exhaust air flow. A list of exhaust fans can be located in **APPENDIX D-2**.

There is a CM3 Direct Digital Control (DDC) system serving the 1993 addition and a Honeywell system in the 1950 building section. During initial discussions with the Owner it was noted that the hours of operation of the facility are generally 60 hours per week. Therefore, controlling the exhaust fans and turning them off during unoccupied hours will provide the Owner with an energy saving opportunity.

This ECM includes relays, control wiring, remote panels and all necessary material and labor to install and tie-in to the existing DDC system, including programming and instructing the school maintenance staff. The installation cost is approximately $1,400 per fan.

Cost of controlling the exhaust fans = ($3000/fan x 1.4 overhead and profit x 50 fans) = $210,000

Heating Season Heating Degree Days base 60°F	= 3,969 HDD60
Average Cost of Gas	= $1.53 / Therm
Average Cost of Electricity	= $0.141 / kWh

Note: Degree Days referenced from www.degreedays.net (using temperature data from www.wunderground.com) Weather Data for Mullica Hill, NJ, Station: APRSWXNET Mullica Hill NJ US, Mullica Hill, NJ, US, Station ID: MC0566.

Energy Savings Calculations:

There would be an insignificant savings in the cooling season because the ambient temperature is approximately the same as the unoccupied set up temperature and is therefore assumed to be zero.

The electricity savings from turning off the fans is calculated in APPENDIX D-2 as 6.4 kW with 36,163 kWh per year saved. This equates to an annual cost savings of $5,099 for just for turning off the fans.

The heat load from infiltration due to the exhaust fans is calculated as:

$$Heat\ Load = \frac{FANcfm \times 1.085 \times (SpaceSetUp\ Temp \times W\ \text{int}\ erDesignTe\ mp)}{1000\left(\frac{Btu}{kBtu}\right)}$$

$$Heat\ Load = \frac{26935 \times 1.085 \times (60 \times 10)}{1000\left(\frac{Btu}{kBtu}\right)} = \underline{1{,}461.2\ \text{kBTU/hr}}$$

The estimated unoccupied infiltration heat load due to the exhaust fans is calculated as:

$$Est\ UnoccInfiltratHeat\ Cons. = \frac{Heat\ Load\left(\frac{kBtu}{Hr}\right) \times Heat\ Deg\ Days \times 24\ Hrs \times Correction\ Factor}{Design\ Temp\ Difference(^{\circ}F) \times Efficiency(\%) \times Fuel\ Heat\ Value\left(\frac{kBtu}{Therm}\right)}$$

$$Est\ UnoccInfiltratHeat\ Cons = \frac{1{,}461.2\left(\frac{kBtu}{Hr}\right) \times 3{,}969\ (HDD) \times 24\ Hrs \times 0.75 \times (5640\ hrsunocc\ /\ 8760 total)}{60\ (^{\circ}F) \times 80.7\% \times 100\left(\frac{kBtu}{Therm}\right)}$$

$$Est\ UnoccInfiltratHeat\ Cons = \underline{16{,}657.2\ \text{Therms}}$$

$$Savings. = Est\ UnoccInfiltratHeat\ Cons \times Ave\ Gas\ Cost\left(\frac{\$}{Therm}\right)$$

$$Savings. = 16{,}657.2\ (Therms) \times 1.53\left(\frac{\$}{Therm}\right) = \underline{\$25{,}486}$$

Total Annual Energy Savings = $5,099 + $25,486 = $\underline{30,585}$ per year

Incentives for the installation of the exhaust fan controls are not currently available and maintenance savings could not be adequately calculated because information was not available to baseline the savings.

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$210,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$210,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$30,585
Total Yearly Savings ($/Yr):	$30,585
Estimated ECM Lifetime (Yr):	15
Simple Payback	6.9
Simple Lifetime ROI	118.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$458,775
Internal Rate of Return (IRR)	12%
Net Present Value (NPV)	$155,121.74

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

CEG has reviewed the existing roof area of the building being audited for the purposes of determining a potential for a roof mounted photovoltaic system. A roof area of 26,445 S.F. can be utilized for a PV system. A depiction of the area utilized is shown in **Renewable / Distributed Energy Measures Calculation Appendix**. Using this square footage it was determined that a system size of 372.37 kilowatts could be installed. A system of this size has an estimated kilowatt hour production of 443,717 KWh annually, reducing the overall utility bill by approximately 34.7% 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 roof space on 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 81%. The PVWatts Calculator program then calculates estimated system generation based on average monthly solar irradiance and user provided inputs. The monthly energy generation and offset electric costs from the PVWatts calculator is shown in the **Renewable/Distributed Energy Measures Calculation Appendix**.

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

Direct purchase involves the school 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**	**SIMPLE ROI**	**INTERNAL RATE OF RETURN**
Direct Purchase	15.38 Years	62.5%	4.7%

*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.

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 the average wind speed is not adequate for purchase of a commercial wind turbine. Therefore, wind energy is not a viable option to implement.

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 Electric Usage Profile demonstrates a fairly typical load profile for a school. The profile shows a very steady baseline usage throughout the school season with an increase in electrical usage in the early and late summer. The mid summer months show a decrease in usage due to lower occupancies, however it is important to note that the usage does not drop below the baseline usage throughout the school year. The reduction in operating hours in the summer months, account for a reduction in usage and demand measured in the month of July. August however shows increased usage despite the building remaining unoccupied. This increase is likely due to the increase in air conditioning load when teachers return to set up classrooms. The demand has a fairly steady profile throughout the school months mimicking the usage profile based on cooling loads throughout the building. The majority of the building has some form of air conditioning which attribute to higher energy costs compared to heated only schools. The overall load factor (L.F.) of the building is 32%. Load factor is the total usage divided by the demand times the hours. A load factor of 32% means that the equivalent full load electrical draw accounts for 32% of the total time. Load factor is a measurement of a building's unpredictability with respect to electric use. A high load factor means the building's electric use is steadier and therefore more advantageous for energy suppliers. In general terms, a higher load factor of 50% or more along with a flat load profile will allow for more competitive energy prices when shopping for alternative suppliers.

Natural Gas:

The natural gas usage profile demonstrates a very typical heat load profile. The summer months demonstrate very low consumption May through September. There is an increase in consumption October through April. It was noted that there was an unusual drop in usage in the month of February which was un-expected. It is unclear why the building's overall usage would be significantly reduced in the middle of the heating season. Heat is provided for this facility by natural gas-fired boilers. Gas fired domestic hot water heaters also contribute to the gas consumption. A base-load shaping (flat profile) will secure more competitive energy prices when procuring through an alternative energy source.

Tariff Analysis:

Electricity:

This facility receives multiple electrical services through Atlantic City Electric on their Annual General Service (AGS-Secondary) rate. This service classification is available for general service purposes on secondary voltages. This facility's rate is a three phase service at secondary voltages. For electric supply (generation), the customer has the option to purchase energy through the utility's Generation Charge or a Third Party Supplier (TPS). This facility utilizes the generation service provide through Atlantic City Electric (BGS), Therefore, they will pay according to the default service. The Delivery Service includes the following charges: Customer Charge, Distribution Charge (kW Demand), Reactive Demand Charge (kvar Demand, over 1/3 kW), Distribution Charge kWh, Non-utility Generation Charge, Societal benefits Charge kWh, Regulatory Assets Recovery Charge kWh, Transition Bond Charge kWh, Market Transition Charge Tax kWh, System Control Charge kWh, CIEP Standby Fee kWh, Transmission Demand Charge kW, Reliability Must Run Transmission Surcharge kWh, Transmission Enhancement Charge kWh, Basic Generation Service Charge kWh, Regional Greenhouse Gas Initiative Recovery Charge kWh, Infrastructure Investment Surcharge.

The Demand charges are based on a ratchet demand rate of 80% of the highest demand set in the months of June through September. The usage charges are based on a stepped rate structure. The demand charges are approximately equal to usage charges on a typical basis making this rate structure somewhat dependent on demand for the delivery portion of the electric charges. The steps for the usage charges are very small increments of change which result in fairly steady costs per kWh per month. It was noted that after a switch to a third party supplier in April / May of 2009, the rate paid for electricity by the BOE dropped by approximately 5%.

Natural Gas:

This facility receives natural gas service through South Jersey Gas Company on its General Service Gas rate. This is a firm delivery service (higher level of delivery) for general purposes where 1) customer does not qualify for any other rate schedule. Customers may either purchase gas supply from a Third Party (TPS) or from Public Services Basic Gas Supply Service default service as detailed in the rate schedule. This service has a much higher priority of delivery, based on the pipeline capacity. The "firm" service is the highest priority, and does not get interrupted.

This rate schedule has a Delivery Charge Mechanism which includes: Basic Gas Supply Service Charge, Capital Investment Recovery Charge, Transportation Initiation Charge, Societal Benefits Charge, Temperature Adjustment Charge, Balancing Service Charge, Economic Development Rate Charge, Conservation Incentive Program Charge, and Energy Efficiency Tracker Charge. The customer can elect to have the Supply Charge (Commodity Charge) serviced through the utility or by a Third Party Supplier (TPS). Note: If the facility should choose to utilize a third party supplier (TPS) and the TPS does not deliver, the customer may receive service from South Jersey Gas under Emergency Sales Service. Emergency Sales Service carries an extremely high penalty cost of service. Should the TPS un-deliver to the utility on behalf of the client, the utility will automatically supply this default service to the client.

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

Recommendations:

CEG recommends a global approach that will be consistent with all facilities within the BOE. Based on the latest electric utility bill, the average price per kWh (kilowatt hour) for the building based on 1-year historical average price is $.1030/kWh (this is the average third party supply charges if the client intends to shop for energy). The average price per decatherm for natural gas based on 1-year historical average price is $ 10.80 / dth (this is the third party supply charges for comparison if the client intends to shop for energy, dth is the common unit of measure). Energy commodities are among the most volatile of all commodities, however at this point and time, energy is fairly competitive. The prices currently paid for electric and natural gas appear to be average or slightly low compared to the average reported prices from the Energy Information Administration website (EIA) for the past few months. The average retail price for electricity in 2008 was $.1444/kWh (this is the overall retail price). The average third party supply price for natural gas in Dec-09 through Feb-10 was $10.70/ dth (this is the commodity costs only). It is recommended that the BOE continue to utilize third party suppliers as an avenue for reducing overall energy prices and continue to shop for the most competitive prices available.

CEG also recommends that the BOE schedule a meeting with the current utility providers to review their utility charges and current tariff structures for electricity and natural gas. This meeting would provide insight regarding alternative procurement options that are currently available. Through a meeting with the Local Distribution Company (LDC), the BOE can learn more about the competitive supply process. Pine Hill can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at www.nj.gov/bpu. The BOE should consider using a billing-auditing service to further analyze the utility invoices, manage the data and use the information for ongoing demand-side management projects. Furthermore, special attention should be given to credit mechanisms, imbalances, balancing charges and commodity charges when meeting with the utility representative. The BOE should ask the utility representative about alternative billing options, such as consolidated billing when utilizing the service of a Third Party Supplier. Finally, if the supplier for energy (natural gas) is changed, closely monitor balancing, particularly when the contract is close to termination. This could be performed with the aid of an “energy advisor”.

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%.

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 entrance doors

C. Clean all light fixtures to maximize light output in order to limit energy use from task lighting.

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. Turn off computer monitors and set computers to sleep when not being used. Computer monitors and computers are becoming one of the largest energy consumers in buildings today. Set computers to sleep when not being used and automatically turn off the computer monitors. Do not set computer monitors to “screen saver” mode which saves the screen life, not energy.

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

Harrison Township Elementary School Building

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 - General	$9,340	$0	$3,500	$5,840	$5,503	$0	$5,503	15	$82,545	$0	1313.4%	1.1	94.22%	$59,854.46
ECM #2	Lighting Controls	$22,850	$0	$3,535	$19,315	$2,203	$0	$2,203	15	$33,045	$0	71.1%	8.8	7.61%	$6,984.27
ECM #3	Boiler Burner - Upgrade	$26,000	$10,852	$0	$36,852	$4,712	$0	$4,712	21	$98,952	$0	168.5%	7.8	11.48%	$35,783.59
ECM #4	Premium Efficient Pump Motor Replacement	$1,414	$713	$120	$2,007	$221	$0	$221	18	$3,982	$0	98.4%	9.1	8.47%	$1,035.78
ECM #5	DDC Controls System on 1989 Addition	$40,600	$40,600	$0	$81,200	$2,722	$0	$2,722	15	$40,830	$0	-49.7%	29.8	-7.58%	($48,704.94)
ECM #6	Demand Control Ventilation	$139,700	$34,925	$0	$174,625	$4,813	$0	$4,813	15	$72,195	$0	-58.7%	36.3	-9.44%	($117,167.72)
ECM #7	Exhaust Fan Control	$210,000	$0	$0	$210,000	$30,585	$0	$30,585	15	$458,775	$0	118.5%	6.9	11.85%	$155,121.74
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	Solar PV 372.37 kW System	$3,351,330	$0	$0	$3,351,330	$62,564	$155,301	$217,865	25	$5,446,625	$3,882,525	62.5%	15.4	4.15%	$442,385.42

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

Concord Engineering Group, Inc.

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

SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives as of 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	$15 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%

STATEMENT OF ENERGY PERFORMANCE
Harrison Elementary School

Building ID: 2312241
For 12-month Period Ending: September 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: May 17, 2010

Facility
Harrison Elementary School
120 North Main Street
Mullica Hill, NJ 08062

Facility Owner
Harrison Township School District
120 North Main Street
Mullica Hill, NJ 08062

Primary Contact for this Facility
Robert Scharlé
120 North Main Street
Mullica Hill, NJ 08062

Year Built: 1950
Gross Floor Area (ft²): 97,903

Energy Performance Rating[2] (1-100) 14

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	4,350,013
Natural Gas (kBtu)[4]	7,054,731
Total Energy (kBtu)	11,404,744

Energy Intensity[5]

Site (kBtu/ft²/yr)	116
Source (kBtu/ft²/yr)	224

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	1,038

Electric Distribution Utility
Pepco - Atlantic City Electric Co

National Average Comparison

National Average Site EUI	82
National Average Source EUI	157
% Difference from National Average Source EUI	42%
Building Type	K-12 School

Stamp of Certifying Professional

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

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

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

Certifying Professional
Michael Fischette
520 South Burnt Mill Road
Voorhees, NJ 08043

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Harrison Elementary School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	120 North Main Street, Mullica Hill, NJ 08062	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Harrison E.S. 1988 Addition (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	20,300 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	55	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	0	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	No	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		☐

Harrison E.S. 1993 Addition (K-12 School)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	47,853 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	139	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐
High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		☐

Harrison Elementary School (K-12 School)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	29,750 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐

Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		
Number of PCs	51	Is this the number of personal computers in the K12 School?		
Number of walk-in refrigeration/freezer units	0	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		
Presence of cooking facilities	No	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		
Percent Cooled	90 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		
High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Pepco - Atlantic City Electric Co

Fuel Type: Electricity

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

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
09/01/2009	09/30/2009	120,491.00
08/01/2009	08/31/2009	135,263.00
07/01/2009	07/31/2009	110,399.00
06/01/2009	06/30/2009	153,525.00
05/01/2009	05/31/2009	100,001.00
04/01/2009	04/30/2009	94,195.00
03/01/2009	03/31/2009	93,269.00
02/01/2009	02/28/2009	88,785.00
01/01/2009	01/31/2009	89,418.00
12/01/2008	12/31/2008	93,987.00
11/01/2008	11/30/2008	84,792.00
10/01/2008	10/31/2008	110,791.00
Electric Meter Consumption (kWh (thousand Watt-hours))		**1,274,916.00**
Electric Meter Consumption (kBtu (thousand Btu))		**4,350,013.39**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**4,350,013.39**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: Harrison E.S. Natural Gas (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
09/01/2009	09/30/2009	363.52
08/01/2009	08/31/2009	252.15
07/01/2009	07/31/2009	242.52
06/01/2009	06/30/2009	500.95
05/01/2009	05/31/2009	880.12
04/01/2009	04/30/2009	10,514.14
03/01/2009	03/31/2009	13,701.86
02/01/2009	02/28/2009	11,575.23
01/01/2009	01/31/2009	15,049.96
12/01/2008	12/31/2008	10,436.66

11/01/2008	11/30/2008	5,905.10
10/01/2008	10/31/2008	1,125.10
Harrison E.S. Natural Gas Consumption (therms)		**70,547.31**
Harrison E.S. Natural Gas Consumption (kBtu (thousand Btu))		**7,054,731.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**7,054,731.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

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

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Harrison Elementary School
120 North Main Street
Mullica Hill, NJ 08062

Facility Owner
Harrison Township School District
120 North Main Street
Mullica Hill, NJ 08062

Primary Contact for this Facility
Robert Scharlé
120 North Main Street
Mullica Hill, NJ 08062

General Information

Harrison Elementary School	
Gross Floor Area Excluding Parking: (ft²)	97,903
Year Built	1950
For 12-month Evaluation Period Ending Date:	September 30, 2009

Facility Space Use Summary

Harrison E.S. 1988 Addition	
Space Type	K-12 School
Gross Floor Area(ft²)	20,300
Open Weekends?	No
Number of PCs	55
Number of walk-in refrigeration/freezer units	0
Presence of cooking facilities	No
Percent Cooled	100
Percent Heated	100
Months°	12
High School?	No
School District°	Harrison Township School District

Harrison Elementary School	
Space Type	K-12 School
Gross Floor Area(ft²)	29,750
Open Weekends?	No
Number of PCs	51
Number of walk-in refrigeration/freezer units	0
Presence of cooking facilities	No
Percent Cooled	90
Percent Heated	100
Months°	12
High School?	No
School District°	Harrison Township School District

Harrison E.S. 1993 Addition	
Space Type	K-12 School
Gross Floor Area(ft²)	47,853
Open Weekends?	No
Number of PCs	139
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months°	12
High School?	No
School District°	Harrison Township School District

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 09/30/2009)	**Baseline** (Ending Date 09/30/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	14	14	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	116	116	64	N/A	82
Source (kBtu/ft²)	224	224	123	N/A	157

Energy Cost					
$/year	$ 288,401.54	$ 288,401.54	$ 158,399.27	N/A	$ 202,566.86
$/ft²/year	$ 2.95	$ 2.95	$ 1.62	N/A	$ 2.07
Greenhouse Gas Emissions					
$MtCO_2e$/year	1,038	1,038	570	N/A	729
$kgCO_2e/ft^2$/year	11	11	6	N/A	8

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

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

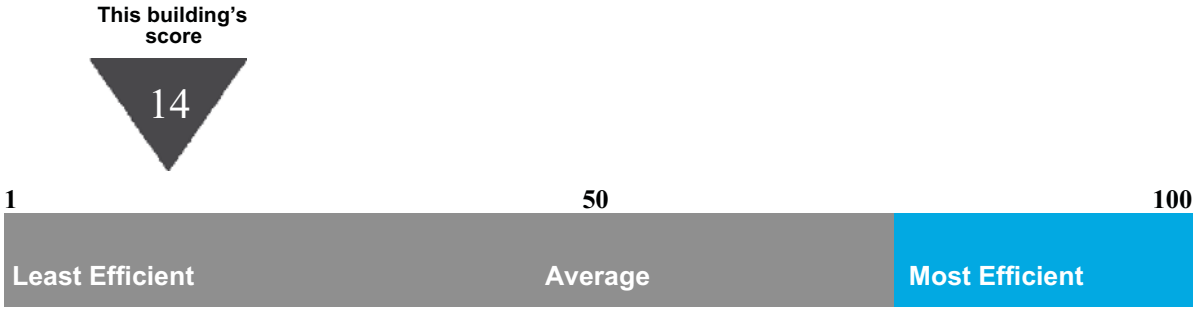
Statement of Energy Performance

2009

Harrison Elementary School
120 North Main Street
Mullica Hill, NJ 08062

Portfolio Manager Building ID: 2312241

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



This building uses 224 kBtu per square foot per year.*

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

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 05/17/2010

MAJOR EQUIPMENT LIST

Concord Engineering Group

Harrison Elementary School

Liquid Chiller

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Nominal Tons	Service	EWT	LWT	GPM	Efficiency EER	Volt / Phase	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Admin-3rd Gr	1950 Wing	1950 Wing -Admin	Trane	1	RTAA100AY001A3COBFCHKNC	U04B04387	100	Air Conditioning	56	42	260	9.5	200/3	2003	20	13	SV CAPACITY 9,081,537 BTUH, 9.7 EER @ ARI 550/590, Y-Delta, no chilled water rese
K-1	1993 Wing	1993 wing	McQUAY	1	ALR175C	5ZB81758 01	162.9	Air Conditioning	56	42	260	10.2	460/3	1993	20	3	SV CAPACITY 9,081,537 BTUH

Boiler

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Input (MBh)	Output (MBh)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Front Boiler	1950 Bsmt Boiler Room	1950, 1987	HB Smith	1	Mills 450L-12	NJ968406H	4340	3578	82.4	Nat. Gas	1989	35	14	7 PSIG,
#2-K1	Boiler Room - 1993 add'n.	1993	HB Smith	1	Series 28A-7	N93-919	2163	1,699	78.5	Nat. Gas	1993	35	18	Orig. State No. - NJ96-8403H and Other No. - NJ000075723H
#1-K1	Boiler Room - 1993 add'n.	1993	HB Smith	1	Series 28A-7	N93-920	2163	1,699	78.5	Nat. Gas	1993	35	18	Orig. State No. - NJ96-8402H and Other No. - NJ000075722H
Sm. Boiler K-1	Boiler Room - 1993 add'n.	1993	Weil -McLain	1	CGA-3-PIDN SERIES 1	CP5352717	70	59	83.3	Natural Gas	2007	35	32	Reheat boiler burner is part of boiler.

Boiler - Burner

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Max. Input (MBh)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Front Boiler	1950 Bsmt Boiler Room	Mills 450	Preferred Utilities Mfg. Corp.	1	BF 35 3M4	30215	4676	80	Natural Gas	1989	21	0	
#2-K1	Boiler Room - 1993 add'n.	HB Smith 28A-7	Webster	1	Cyclone JB1G 05 R7795A-L.20-UL	U33846A-01	2163	80	Natural Gas	1993	21	4	New gas valve 1-24-2008
#1-K1	Boiler Room - 1993 add'n.	HB Smith 28A-7	Webster	1	Cyclone JB1G 05 R7795A-L.20-UL	U33846A-02	2163	80	Natural Gas	1993	21	4	

Pumps

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	HP	RPM	GPM	Ft. Hd	Frame Size	Volts / Phase	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	1950 Bsmt Boiler Room	1950 Wing -HW	US Electrical Motors	1	Cat # DJ7P2HU-P	ID# H02 03025211 100F	7.5	1765	-	-	213JM	200 / 3	2002	20	12	89.5% Eff.
-	1950 Bsmt Boiler Room	1950 Wing -HW	US Electrical Motors	1	Cat # DJ7P2HU-P	ID# H02 03025211 100F	7.5	1765	-	-	213JM	200 / 3	2002	20	12	89.5% Eff.
P-1A	1950 Bsmt Boiler Room	1988 Wing -HW	Ingersoll Rand	1	2-1/2 x 1-1/2 x 10 BT-E	-	3	1730	80	75	182T	208 -230/460 / 3	1988	20	(-2)	UVL 182TTDR7026DF L, CAT# H123, 81.5% Eff., 60% pump Eff.
P-1B	1950 Bsmt Boiler Room	1988 Wing - HW	Ingersoll Rand	1	2-1/2 x 1-1/2 x 10 BT-E		3	1730	80	75	182T	208 -230/460 / 3	1988	20	(-2)	UVL 182TTDR7026DF L, CAT# H123, 81.5% Eff., 60% pump Eff.
-	1950 Pump Room	1950 Wing -CHW	Bell & Gossett	1	1510 BF 3BC	CP5907-01 C40	15	1800	260	80	S254T	200/3	Mar-04	20	14	91.7% Eff. AO Smith Century E Plus E451 cat. No. 7-85000B-01-OJ, s/n BY12, 1760 RPM, 9.125 DIA., motor mfg date 2003
-	1950 Pump Room	1950 Wing - CHW	Bell & Gossett	1	1510 BF 3BC	CP5907-02 C40	15	1800	260	80	S254T	200/3	Mar-04	20	14	91.7% Eff. AO Smith Century E Plus E451 s/n BY12, 1760 RPM, 9.125 DIA., motor mfg date 2003
P-9B	1993 Boiler Room	1993 Wing	AMTROL, Inc.	1	Thrush E Series; 1-1/4x1-1/2x9PF BR	171238 B94	5	1740	75	65	184T	208-230/460	Feb-94	20	4	Imp. Dia.: 8.19,Marathon Electric cat # H124, 85.5% Eff.
P-9A	1993 Boiler Room	1993 Wing	AMTROL, Inc.	1	Thrush E Series; 1-1/4x1-1/2x9PF BR	171238 B94	5	1740	75	65	184T	208-230/460	Feb-94	20	4	Imp. Dia.: 8.19,Marathon Electric cat # H124, 85.5% Eff.
P-8B	1993 Boiler Room	1993 Wing - CHW	AMTROL, Inc.	1	Thrush 2G Series; 2x2-1/2x12PF BF	171238 B94	15	1740	275	97	254T	208-230/460	Feb-94	20	4	Imp. Dia.: 10.56,Marathon Electric 1VB 254TTD5026AA L, 88.5% Eff., cat # H127
P-8A	1993 Boiler Room	1993 Wing - CHW	AMTROL, Inc.	1	Thrush 2G Series; 2x2-1/2x12PF BF	171238 B94	15	1740	275	97	254T	208-230/460	Feb-94	20	4	Imp. Dia.: 10.56,Marathon Electric 1VB 254TTD5D26AA 88.5% Eff., cat # H127
-	1993 Boiler Room	Weil McLain reheat boiler	TACO	1	007-F5	-	1/25	3250	-	-	-	115/1	1994	10	(-6)	CARTRIDGE CIRCULATOR

Domestic Water Heater

Tag	Location	Area Served	Manufacturer	Qty	Model #	Serial #	Input (MBh)	Recovery (gal/h)	Capacity (gal)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	1950 Bsmt Boiler Room	1950 Wing - Girls	Bradford White Corporation	1	M2-50S6DS-1NCWW	CH8038974	3500 WATTS	67 FIRST HOUR	50	0.92	ELECTRIC	8/1/2006	12	8	
-	1950 Jan Closet	1950 Wing - Teacher	AO SMITH	1	DVE 80 916	MM030016834	9000 WATTS	37 @ 100°F	80	ASHRAE/ISENA 90.1	ELECTRIC	12/1/2003	12	5	Item # 9290466024
-	1950 Jan Closet	1950 Wing - Boys	Bradford White	1	M2-30R6DS-1NCWW	FE11909773	3500 WATTS	50 FIRST HOUR	30	0.93	ELECTRIC	5/1/2009	12	11	
-	1988 Jan Closet	1988 Wing - Restroom	Bradford White Corporation	1	M2-30R6DS-1NCWW	EH11019656	3500 WATTS	50 FIRST HOUR	30	0.93	ELECTRIC	Aug-08	12	10	
K1	1993 Boiler Room	1993 Wing	A.O. SMITH	1	HW 300 892	892 A 94 22956	300	323 @ 90°F	-	78	NATURAL GAS	Jan-94	12	(-4)	Coil Type, NJ96-8404H, NEW GAS VA. 1/24/08, NAT'L BD. 22956
-	1993 Boiler Room	1993 Wing	A.O. SMITH	1	TJV-120M	MC940330748830	-	-	119	-	-	Mar-94	12	(-4)	Glass-lined Hot Water Storage Tank, Number on Tank: NJ000075724, ASHRAE 90A-1980 (1982 requirements)

DHW - Pumps

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	HP	Volts / Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	1950 Bsmt Boiler Room	1950 Wing	Armstrong	1	S-25 AB/BI	-	FRACTIONAL	115/1	-	Jan-04	10	4	

Air Handling Units

Tag	Location	Area Served	Manufacturer	Qty	Model #	Serial #	Cooling Coil (GPM)	Cooling Eff. (EER)	Cooling Capacity	Heating Type	Input (GPM)	Output (MBh)	Fuel	Volts / Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
HVAC-1	1993 Roof	1993 Wing Admin	McQuay	1	CUR160ETSC	5ZA83849-01	DX	9.1	190 TC / 132 SC	HW	15	152	ELECTRICITY	460/3	50 MCA	1993	15	(-2)	
HVAC-2A	1993 Roof	PHYS ED & MAIN OFFICE	McQuay	1	SHD061 / AD018GDB1	- / L934494206	DX	9.1	16.5 TC / 9 SC	HW	1	12	ELECTRICITY	INDOOR 277/1, OUTDOOR 208/1	-	1993	15	(-2)	AD018GDB1
HVAC-3A	1993 Multi purpose Room	1993 Multi purpose Room	McQuay	1	RDS708BY	3YV01312 03	30	N/A	243.8 TC / 175.2 SC	HW	21	430.5	ELECTRICITY	460/3	-	1993	15	(-2)	5HP, 1/2 HP
HVAC-3B	1993 Multi purpose Room	1993 Multi purpose Room	McQuay	1	RDS708BY	3YV01311 03	30	N/A	243.8 TC / 175.2 SC	HW	21	430.5	ELECTRICITY	460/3	-	1993	15	(-2)	5HP, 1/2 HP
HVAC-4	Library	Library	McQuay	1	SHB301A	-	13.5	N/A	96.2 TC / 64.9 SC	HW	3.3	82.8	ELECTRICITY	430/3	-	1993	15	(-2)	1-1/2 HP
HVAC-5	Corridor	Corridor	McQuay	1	SHB121B	-	4.6	N/A	33.8 TC / 27.5 SC	HW	2.2	35.7	ELECTRICITY	120/1	-	1993	15	(-2)	1/2 HP
HVAC-6	Small Group	Small Group	McQuay	1	SHB161B	-	7	N/A	46.2 TC / 35.4 SC	HW	1.5	34.3	ELECTRICITY	120/1	-	1993	15	(-2)	3/4 HP
HVAC-7	Corridor	Corridor	McQuay	1	SHB161B	-	7	N/A	46.2 TC / 35.2 SC	HW	1.5	34.3	ELECTRICITY	120/1	-	1993	15	(-2)	1/2 HP
HVAC-8	Corridor	Corridor	McQuay	1	SHB121B	-	4.6	N/A	33.8 TC / 27.5 SC	HW	2.5	35.7	ELECTRICITY	120/1	-	1993	15	(-2)	3/4 HP
AHU-2	1988 Wing	Teacher Resource Center	McQuay	1	LSL106	-	SEN1103C	N/A	101.03 TC / 77.49 SC	5WB08011H	8.2 GPM	83.959	ELECTRICITY	208/3	-	1988	15	(-7)	1-1/2 HP, RCU-3
AHU-3	1988 Wing	Music / Activities Room	McQuay	1	LSL104	-	SEN1002C	N/A	83.35 TC / 29.68 SC	5WB14011H	7.5 GPM	77.6	ELECTRICITY	208/3	-	1988	15	(-7)	3/4 HP, RCU-4
-	1993 Roof	Kitchen Hood MUA	Ares	1	SC1-BE1E	94799	-	-	-	-	-	-	ELECTRICITY	208/3	-	1994	15	(-1)	1850-6450 CFM

AC Condensers

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Cooling Capacity MBH	EER	Refrigerant	Volts / Phase	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
CU	1988 ROOF	1988 Wing	EMI	1	SHC24DE00A0AA0A	1-99-M-3081-52	23.6	10.3	R-22	208/1	1999	15	(-1)	
CU	1993 roof at roof hatch	1993 wing	Inter-City Products	1	AG080G1	B931235561	80	9.5	R-22	460/3	1993	15	(-2)	HVAC-4
CU	1993 roof	1993 wing	Inter-City Products	1	AG024G1	L944366867	24	9.5	R-22	208/230-1	Oct-94	15	(-1)	
RCU-1	1988 ROOF	1988 Wing	Snyder General	1	RCU18-1	-	21	9.5	R-22	208/1	1988	15	(-7)	UV - 6 AFF 3000, 750 CFM, 2 GPM, 34 MBH, 208-1
RCU-2	1988 ROOF	PE Office	Payne Heating & Cooling	1	PA10PA048-H	0905X19556	48	10	R-22	208/1	2005	15	10	AHU-1
RCU-3	1988 ROOF	1988 Wing	Snyder General	1	ST-008	could not read	101	9.5	R-22	208/3	1988	15	(-7)	AHU-2, 101.03 TC, Hot Gas Bypass and Low Ambiant control
RCU-4	1988 ROOF	1988 Wing	Snyder General	1	ST-008	could not read	90	9.5	R-22	208/3	1988	15	(-7)	AHU-3, 83.35 TC, Hot Gas Bypass and Low Ambiant control
RCU-5	1988 ROOF	1950 Wing	(AFF CF748-3)	1	3160-7-40A	28902129877	60	9.5	R-22	208/3	1988	15	(-7)	UV-8, AFF6000, 1500 CFM, 3 GPM, 65 MBH, 208/1

Split Systems and AC Condensers

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Cooling Capacity (MBH)	Eff.	Refrigerant	Volts / Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
AHU-1	PE Office	PE Office	Payne Heating & Cooling	1	-	-	48	-	R-22	208/1	-	2005	15	10	CU: PA10PA048-H

Heat Pumps

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Cooling Capacity	EER	COP	Refrigerant	Volts / Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
UV-7	Main Office	Main Office	AFF	1	AE-42	-	41.8 TC / 25.9 SC	8.19	-	R-22	208/3	-	1988	20	(-2)	4 Element, 45.5 MBH heating, 13.33 kW input (not confirmed)

Air Compressor

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	HP	Pressure	Capacity	Volts / Phase	FLA	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	1950 Bsmt Boiler Room	HVAC CONTROLS	Baldor	2	M3154T	F1188	1.5	-	-	208-230/460	-	1988	20	(-2)	145T FRAME,

Heating and Ventilation Units

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Heating Coil (GPM)	Heating Capacity (MBH)	Cooling Capacity (MBH)	Cooling Coil	Fan HP	Volts / Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
UV-1	CR 14, 15, 16, 20-26	CR 14, 15, 16, 20-26	AFF	10	AFF5000	-	HW	46	-	-	1/3	208/1	-	1988	15	(-7)	
UV-2	CR 19	CR 19	AFF	1	AFF5000	-	HW	52	-	-	1/3	208/1	-	1988	15	(-7)	
UV-3	SGI 13	SGI 13	AFF	1	AFF3000	-	HW	34	-	-	1/3	208/1	-	1988	15	(-7)	
UV-4	CR 18	CR 18	AFF	1	AFF6000	-	HW	54	-	-	1/3	208/1	-	1988	15	(-7)	
UV-5	CR 17	CR 17	AFF	1	AFF6000	-	HW	52	-	-	1/3	208/1	-	1988	15	(-7)	
UV-6	SG1 (Speech 18 -1988 Wing)	SG1	AFF	1	AFF3000	-	HW	34	21 TC / 15.9 SC	DX	1/3	208/1	-	1988	15	(-7)	RCU-1
UV-8	Computer / Lab 11A (1950 wing)	Computer / Lab 11A	AFF	1	AFF6000	-	HW	65	52.7 TC / 13.5 SC	DX	1/8	208/1	-	1988	15	(-7)	RCU-5

Fan Coil Units

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Heating Coil (GPM)	Heating Capacity (MBH)	Cooling Capacity (MBH)	Fan HP	Volts / Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
FC-1	*North 1950 Wing Attic*	-	*Trane*	*1*	*BCHC036A*	*T03M813***	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	Not verified
FC-2	*North 1950 Wing Attic*	-	*Trane*	*1*	*BCHC036A*	*T03M813***	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	Not verified
FC-3	*North 1950 Wing Attic*	-	*Trane*	*1*	*BCHC036A*	*T03M813***	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	Not verified
FC-4	*North 1950 Wing Attic*	-	*Trane*	*1*	*BCHC036A*	*T03M813***	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	Not verified
FC-5	*North 1950 Wing Attic*	-	*Trane*	*1*	*BCHC036A*	*T03M813***	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	Not verified
FC-6	*North 1950 Wing Attic*	-	*Trane*	*1*	*BCHC036A*	*T03M813***	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	Not verified
FC-7	*North 1950 Wing Attic*	-	*Trane*	*1*	*BCHC036A*	*T03M813***	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	Not verified
FC-8	*North 1950 Wing Attic*	-	*Trane*	*1*	*BCHC036A*	*T03M813***	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	Not verified
FC-9	South 1950 Wing Attic	Transportation Office	Trane	1	BCHC036A	T03M813**	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-10	South 1950 Wing Attic	OT/PT Room 2	Trane	1	BCHC036A	T03M813**	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-11	South 1950 Wing Attic	Class Room 3	Trane	1	BCHC036A	T03M813**	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-12	South 1950 Wing Attic	Class Room 4	Trane	1	BCHC036A	T03M81370	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	FC-2, 2" MERV 8 throwaway
FC-13	South 1950 Wing Attic	Class Room 5	Trane	1	BCHC036A	T03M81359	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-14	South 1950 Wing Attic	Class Room 11	Trane	1	BCHC036A	T03M81363	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-15	South 1950 Wing Attic	Class Room 10	Trane	1	BCHC036A	T03M81371	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-16	South 1950 Wing Attic	Class Room 6	Trane	1	BCHC036A	T03M81368	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-17	South 1950 Wing Attic	Class Room 7	Trane	1	BCHC036A	T03M81364	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-18	South 1950 Wing Attic	Class Room 9	Trane	1	BCHC036A	T03M81369	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway
FC-19	South 1950 Wing Attic	Class Room 8	Trane	1	BCHC036A	T03M81361	2.3	46.9	41.2TC / 30.8 SC	3/4	115/1	15 MCA	2004	15	9	2" MERV 8 throwaway

Kitchen Hood

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Fan HP	Fan RPM	Volts/Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	1993 Kitchen	Kitchen	-	1	-	-	Fractional	-	-	-	1993	20	3	

Window Air Conditioner

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Cooling Capacity - DX	EER	Fan HP	Volts/Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	Faculty Work Room (1950 wing)	Faculty Work Room (1950 wing)	Sears Roebuck & Co.	1	25378055892	JK83031972	5500	10	FRACTIONAL	115/1	5.2	Jul-98	15	3	

Fans

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	Fan HP	Fan RPM	Volts/Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	Roof	Boiler Combustion air supply	Penn	1	MU-4012	-	1	1760	208/3	-	1988	18	(-4)	2420 CFM @ 0.5 SPNot verified.
EF-17	1993 Corr. 4B - Sector B Common	1993 Corr. 4B - Sector B	Penn	1	Domex DY24	-	5	1760	480/3	-	1993	18	1	5790 cfm

NOTE: IF AN ITEM IS LEFT BLANK, THE INFORMATION IS EITHER NOT AVAILABLE OR NOT APPLICABLE FOR THIS PIECE OF EQUIPMENT.

MAJOR EQUIPMENT LIST

Concord Engineering Group
Harrison Elementary School

ECM #7 - Exhaust Fan Control

Cost of Electricity	0.141	$/kWh	1 Therm = 100 kBtuh	
Unoccupied hours	5640	hours/year	HDD60 =	3969
1 horsepower =	746	watts	Hours/year =	8760
Load Factor =	0.75		Winter Design Temp =	10 °F
Average Boiler Efficiency	80.7%		Set back Temp =	60 °F
Cost of Natural Gas = $	1.53	$/Therm		

EXHAUST FANS

drawing set	TAG	SERVICE	LOCATION	CFM	HP	ELECTRIC	Watts	KWH SAVED	$ SAVED
1993	EF-1	GIRLS 011, BOYS 013, JAN 012	ROOF	930	1/6	120/1	93.3	525.9	$74.16
	EF-2	GIRLS 036, BOYS 038, JAN 037	ROOF	860	1/4	120/1	139.9	788.9	$111.23
	EF-3	MAINT 076, JAN 077, C COMMON	ROOF	440	1/12	120/1	46.6	263.0	$37.08
	EF-4	WOMEN 061, MEN 062	ROOF	230	1/10	120/1	56.0	315.6	$44.49
	EF-5	HEALTH OFF TOILET 059	ROOF	200	1/10	120/1	56.0	315.6	$44.49
	EF-6	TOILET 088	ROOF	100	1/25	120/1	22.4	126.2	$17.80
	EF-7	CHANGING 019, CHAIR STOR 018, PHYS ED OFF 017	ROOF	460	1/6	120/1	93.3	525.9	$74.16
	EF-8	CHANGING 022, CHAIR STOR 023	ROOF	400	1/6	120/1	93.3	525.9	$74.16
	EF-9	COMPUTER 083, K 070, CORRIDOR 069	ROOF	840	1/6	120/1	93.3	525.9	$74.16
	EF-10	AV STORAGE 032	ROOF	100	1/25	120/1	22.4	126.2	$17.80
	EF-11	CLASS ROOM TOILET 056	ROOF	80	1/25	120/1	22.4	126.2	$17.80
	EF-12	CLASS ROOM TOILET 057	ROOF	80	1/25	120/1	22.4	126.2	$17.80
	EF-13	K TOILET 066, CLOSET 067	ROOF	150	1/10	120/1	56.0	315.6	$44.49
	EF-14	K TOILET 071, CLOSET 072	ROOF	150	1/10	120/1	56.0	315.6	$44.49
	EF-15	K TOILET 074, CLOSET 075	ROOF	150	1/10	120/1	56.0	315.6	$44.49
	EF-16	CORR 031A, SECT A COMMON	ROOF	675	1/6	120/1	93.3	525.9	$74.16
	EF-17	CORR 04B, SECT B COMMON	ROOF	5790	5	480/3	2797.5	15777.9	$2,224.68
	EF-18	ART SUPPLY 029	ROOF	50	1/25	120/1	22.4	126.2	$17.80
	EF-19	STOR 026, STOR 027	ROOF	200	1/10	120/1	56.0	315.6	$44.49
	EF-20	KITCHEN STORAGE	ROOF	200	1/10	120/1	56.0	315.6	$44.49
	EF-21	KITCHEN	ROOF	700	1/6	120/1	93.3	525.9	$74.16
	EF-22	ALTERNATE LINK	ROOF	160	1/10	120/1	56.0	315.6	$44.49
	SAF-23	BOILER ROOM - interlocked with boiler	-	-	-	-	-	0.0	$0.00

1988	EF-1	ASSUMED DATA	-	350	1/10	120/1	56.0	315.6	$44.49
	EF-2	ASSUMED DATA	-	350	1/10	120/1	56.0	315.6	$44.49
	EF-3	ASSUMED DATA	-	350	1/10	120/1	56.0	315.6	$44.49
	EF-4	ASSUMED DATA	-	350	1/10	120/1	56.0	315.6	$44.49
	EF-5	ASSUMED DATA	-	110	1/25	120/1	22.4	126.2	$17.80
	EF-6	ASSUMED DATA	-	110	1/25	120/1	22.4	126.2	$17.80
	EF-7	ASSUMED DATA	-	110	1/25	120/1	22.4	126.2	$17.80
	EF-8	-	-	1075	1/3	120/1	186.5	1051.9	$148.31
	EF-9	-	ROOF	1330	1/2	120/1	279.8	1577.8	$222.47
	EF-10	-	ROOF	365	1/12	120/1	46.6	263.0	$37.08
	EF-11	-	ROOF	195	1/12	120/1	46.6	263.0	$37.08
	EF-12	-	ROOF	2400	3/4	120/1	419.6	2366.7	$333.70
	EF-13	-	ROOF	2500	3/4	120/1	419.6	2366.7	$333.70
	EF-14	-	ROOF	110	1/25	120/1	22.4	126.2	$17.80
	EF-15	-	ROOF	220	1/10	120/1	56.0	315.6	$44.49
	EF-16	-	ROOF	110	1/25	120/1	22.4	126.2	$17.80
	EF-17	-	ROOF	350	1/10	120/1	56.0	315.6	$44.49
	EF-18	-	ROOF	350	1/10	120/1	56.0	315.6	$44.49
	EF-19	-	ROOF	350	1/10	120/1	56.0	315.6	$44.49
	EF-20	-	ROOF	350	1/10	120/1	56.0	315.6	$44.49
	EF-21	-	ROOF	350	1/10	120/1	56.0	315.6	$44.49
	EF-22	-	ROOF	350	1/10	120/1	56.0	315.6	$44.49
	EF-23	-	ROOF	775	1/12	120/1	46.6	263.0	$37.08
	EF-24		ROOF	640	1/12	120/1	46.6	263.0	$37.08
	EF-25	-	ROOF	110	1/25	120/1	22.4	126.2	$17.80
	EF-26	-	ROOF	110	1/25	120/1	22.4	126.2	$17.80
	EF-27	-	ROOF	110	1/25	120/1	22.4	126.2	$17.80
	EF-28	-	ROOF	110	1/25	120/1	22.4	126.2	$17.80
Total CFM				26,935					
kW Saved							6.4		
Total kWh Saved								36,163	
Total $ saved									$5,099

Investment Grade Lighting Audit

CEG Job #: 9C09188

Project: Harrison Elementary School
120 N Main St
Mullica Hill, NJ 08062

Harrison Elementary School

KWH COST: $0.141

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
221.31	Boiler Room & Stairways	2600	8	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	58	0.46	1,206.4	$170.10	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
613		250	2	1	"Keyless" Socket, 100w A19 Lamp	100	0.20	50.0	$7.05	2	1	(1) 26w CFL Lamp	26	0.05	13	$1.83	$20.00	$40.00	0.15	37	$5.22	7.67
232.21	Classroom	2600	10	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.86	2,236.0	$315.28	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Staff Work Room	2600	7	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.41	1,055.6	$148.84	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Storage Corridor	2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	0.52	1,352.0	$190.63	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Room 1	1300	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.12	150.8	$21.26	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		1300	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.12	150.8	$21.26	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Room 2	1300	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.12	150.8	$21.26	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		1300	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.12	150.8	$21.26	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Room 3	1300	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	904.8	$127.58	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Room 4	1300	25	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	1.45	1,885.0	$265.79	25	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Pump Room 5	1300	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	904.8	$127.58	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.11		1300	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	150.8	$21.26	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Custodial Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.24	District Offices	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	58	0.46	1,206.4	$170.10	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.24	Office	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	58	0.23	603.2	$85.05	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
800		2600	3	1	Recessed Down Light, 100w A19 Lamp	100	0.30	780.0	$109.98	3	1	26w CFL Lamp	26	0.08	202.8	$28.59	$20.00	$60.00	0.22	577.2	$81.39	0.74

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222.24	Office	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.24	Conference Room	2600	9	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	58	0.52	1,357.2	$191.37	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
800		2600	8	1	Recessed Down Light, 100w A19 Lamp	100	0.80	2,080.0	$293.28	8	1	26w CFL Lamp	26	0.21	540.8	$76.25	$20.00	$160.00	0.59	1539.2	$217.03	0.74
222.21	Admin Corridor	3600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.23	835.2	$117.76	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Business Office Corridor	3600	2	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	417.6	$58.88	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21		3600	5	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.29	1,044.0	$147.20	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Preschool Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.03	2,683.2	$378.33	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	BA Secretary Office	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1,081.6	$152.51	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	BA Office	2600	7	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.73	1,892.8	$266.88	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	BA Copy Room	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$76.25	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Office	2600	3	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	0.31	811.2	$114.38	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Business Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.21	540.8	$76.25	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	13	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.75	1,960.4	$276.42	13	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Business Office Corridor	3600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.23	835.2	$117.76	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.22		3600	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	30	0.72	2,592.0	$365.47	24	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
770	Multi Purpose Room	3600	19	1	400w MH LoBay, Prismatic Lens	465	8.84	31,806.0	$4,484.65	19	4	2x4 54w T5HO 4 Lamp w/Reflective Lens, Wire Cage	236	4.48	16142.4	$2,276.08	$240.00	$4,560.00	4.35	15663.6	$2,208.57	2.06
221.34	Stage	2600	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.23	603.2	$85.05	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
613		2600	6	1	"Keyless" Socket, 100w A19 Lamp	100	0.60	1,560.0	$219.96	6	1	(1) 26w CFL Lamp	26	0.16	405.6	$57.19	$20.00	$120.00	0.44	1154.4	$162.77	0.74
241.11	MPR Side Entrance	2600	2	4	1x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	0.21	540.8	$76.25	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.31	MPR Storage	800	7	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	58	0.41	324.8	$45.80	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

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222.21	MPR Office	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	ESL	2600	22	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	2.29	5,948.8	$838.78	22	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	ESL Closet	800	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.12	92.8	$13.08	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45	Transportation Office	2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21		2600	5	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.29	754.0	$106.31	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	4	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.23	603.2	$85.05	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Corridor	3600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	1.56	5,616.0	$791.86	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 2 Office	2600	6	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.35	904.8	$127.58	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Boy's Restroom	2600	3	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 3 Classroom	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.93	2,412.8	$340.20	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 4 Classroom	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.93	2,412.8	$340.20	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 5 Classroom	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.93	2,412.8	$340.20	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 6 Classroom	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.93	2,412.8	$340.20	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Office	2600	1	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	2	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 7 Classroom	2600	20	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	1.16	3,016.0	$425.26	20	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	H24 Vestibule	3600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	208.8	$29.44	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 8 Classroom	2600	14	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.81	2,111.2	$297.68	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 9 Classroom	2600	14	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.81	2,111.2	$297.68	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 10 Classroom	2600	14	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.81	2,111.2	$297.68	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

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221.11	Rm # 11 Classroom	2600	14	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.81	2,111.2	$297.68	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Therapy Dept.	2600	17	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.99	2,563.6	$361.47	17	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Girl's Restroom	2600	3	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.32	TRC 3rd Grade	2600	46	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Parabolic Lens	58	2.67	6,936.8	$978.09	46	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.47		2600	10	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	58	0.58	1,508.0	$212.63	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	TRC Office & Storage	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1,081.6	$152.51	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	TRC Corridor	3600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	0.42	1,497.6	$211.16	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	ESL Corridor	3600	10	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	1.04	3,744.0	$527.90	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45	Staff Restroom (2)	2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Boy's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45	Custodial Closet	800	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Girl's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Rm # 12 Speech Classroom	2600	6	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.35	904.8	$127.58	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Rm # 13 Work Room	2600	13	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.75	1,960.4	$276.42	13	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 14 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 15 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

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221.11	Rm # 16 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 17 Classroom	2600	15	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.87	2,262.0	$318.94	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 18 Classroom	2600	15	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.87	2,262.0	$318.94	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 19 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 20 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 21 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 22 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 23 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 24 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 25 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 26 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1,809.6	$255.15	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Connector Corridor	3600	12	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.70	2,505.6	$353.29	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Corridor "B"	3600	19	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	1.10	3,967.2	$559.38	19	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
801		3600	17	1	Recessed Down Light, 100w A19 Lamp	100	1.70	6,120.0	$862.92	17	1	26w CFL Lamp	26	0.44	1591.2	$224.36	$20.00	$340.00	1.26	4528.8	$638.56	0.53
242.22	Rm # 88 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 87 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 86 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 85 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 84 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

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242.22	Rm # 83 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 82 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 81 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 80 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 79 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 78 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 77 Classroom	2600	14	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.46	3,785.6	$533.77	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 76 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4,056.0	$571.90	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 75 Classroom	2600	14	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.46	3,785.6	$533.77	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Boy's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		2600	3	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260.0	$36.66	1	1	26w CFL Lamp	26	0.03	67.6	$9.53	$20.00	$20.00	0.07	192.4	$27.13	0.74
221.34	Roof Access	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Girl's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		2600	3	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260.0	$36.66	1	1	26w CFL Lamp	26	0.03	67.6	$9.53	$20.00	$20.00	0.07	192.4	$27.13	0.74
222.22	Library Corridor	3600	17	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.99	3,549.6	$500.49	17	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
801		3600	3	1	Recessed Down Light, 100w A19 Lamp	100	0.30	1,080.0	$152.28	3	1	26w CFL Lamp	26	0.08	280.8	$39.59	$20.00	$60.00	0.22	799.2	$112.69	0.53
221.14		3600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.70	2,505.6	$353.29	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
650		3600	2	2	Wall Sconce, (2) 26w PL Quad Lamp	54	0.11	388.8	$54.82	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

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222.21	Restrooms (2)	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 90 Classroom	2600	16	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.66	4,326.4	$610.02	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Rm # 90 Classroom Restroom	2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.14	Rm # 90 Classroom Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 92 Classroom	2600	16	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.66	4,326.4	$610.02	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Rm # 92 Classroom Restroom	800	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.14	Rm # 92 Classroom Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 94 Classroom	2600	16	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.66	4,326.4	$610.02	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Rm # 94 Classroom Restroom	800	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.14	Rm # 94 Classroom Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.34	Rm # 96 Electrical Room	800	8	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.46	371.2	$52.34	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 97 Guidance	2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.52	1,352.0	$190.63	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 95 Guidance	2600	6	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.62	1,622.4	$228.76	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 93 Guidance	2600	6	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.62	1,622.4	$228.76	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Computer Lab	2600	18	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.87	4,867.2	$686.28	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Lunch Room	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.46	1,206.4	$170.10	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22	Lobby	3600	10	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.58	2,088.0	$294.41	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Main Office - New Wing	2600	9	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.52	1,357.2	$191.37	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Conference Room	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.46	1,206.4	$170.10	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

222.22	Principal's Office	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45	Restrooms (2)	2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Main Office	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$85.05	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Conference Room	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.46	1,206.4	$170.10	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$85.05	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22	Office Hall	2600	3	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Classroom	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$85.05	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260.0	$36.66	1	1	26w CFL Lamp	26	0.03	67.6	$9.53	$20.00	$20.00	0.07	192.4	$27.13	0.74
222.22	Gym Corridor	3600	10	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.58	2,088.0	$294.41	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Girl's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	3	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260.0	$36.66	1	1	26w CFL Lamp	26	0.03	67.6	$9.53	$20.00	$20.00	0.07	192.4	$27.13	0.74
222.21	Boy's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	3	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.17	452.4	$63.79	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260.0	$36.66	1	1	26w CFL Lamp	26	0.03	67.6	$9.53	$20.00	$20.00	0.07	192.4	$27.13	0.74
221.34	Custodial Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Music	2600	20	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	2.08	5,408.0	$762.53	20	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

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242.21	Kitchen	2600	13	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.35	3,515.2	$495.64	13	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	5	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.29	754.0	$106.31	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
617		2600	3	1	Hood Light w/Globe & Cage, 100w A19 Lamp	100	0.30	780.0	$109.98	3	1	(1) 26w CFL Lamp	26	0.08	202.8	$28.59	$20.00	$60.00	0.22	577.2	$81.39	0.74
226.41	Restroom	2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.06	150.8	$21.26	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.34	Custodial Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Kitchen Storage	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.21	540.8	$76.25	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22	Storage	800	2	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.12	92.8	$13.08	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
766	Gym	3600	16	1	400w MH, 2x2, Recessed Mnt., Prismatic Lens	465	7.44	26,784.0	$3,776.54	16	4	2x4 54w T5HO 4 Lamp w/Reflective Lens, Wire Cage	236	3.78	13593.6	$1,916.70	$240.00	$3,840.00	3.66	13190.4	$1,859.85	2.06
222.21	Gym Office	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Changing Area	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.31	Mezzanine Storage	800	11	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	58	0.64	510.4	$71.97	11	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Gym Vestibule	3600	2	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	417.6	$58.88	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Gym Storage	800	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	92.8	$13.08	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Chair Storage	800	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	139.2	$19.63	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Gym Storage	800	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	139.2	$19.63	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.22	Art	2600	5	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.29	754.0	$106.31	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22		2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.52	1,352.0	$190.63	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22		2600	10	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.04	2,704.0	$381.26	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Art Storage	800	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	166.4	$23.46	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.31	Mechanical Room	800	8	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	58	0.46	371.2	$52.34	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

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804	Media Center	2600	38	2	Recessed Down Light, (2) 26w PL Lamp	54	2.05	5,335.2	$752.26	38	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.37		2600	88	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	30	2.64	6,864.0	$967.82	88	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Media Center Storage	800	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	185.6	$26.17	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$85.05	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
655	Exterior	3600	4	2	30" Round, Surface Mnt., White Diffuser, (2) 26w PL Quad Lamp	54	0.22	777.6	$109.64	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
700		3600	3	1	70w HPS, 1x1 Surface Mnt., Prismatic Lens	92	0.28	993.6	$140.10	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
706		3600	12	1	70w HPS Wallpack	92	1.10	3,974.4	$560.39	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
725		3600	10	1	150w HPS Wallpack	188	1.88	6,768.0	$954.29	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
761		3600	1	1	400w HPS Wallpack	465	0.47	1,674.0	$236.03	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
712		3600	19	1	100w HPS Recessed, 18" Square, Fresnel Lens	125	2.38	8,550.0	$1,205.55	19	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
730		3600	2	1	150w MH Flood	188	0.38	1,353.6	$190.86	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
711		3600	4	1	100w HPS Bollards	125	0.50	1,800.0	$253.80	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
767		3600	1	1	400w MH Flood	465	0.47	1,674.0	$236.03	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
	Totals		1,562	454			128.00	356,604	$50,281	1,562	20			9.5	33,311	$4,697		$9,340	11.5	39,029	$5,503	1.70

CEG Job #: 9C09188
Project: Harrison Elementary School
Address: 120 N Main St
Mullica Hill, NJ 08062
Building SF: 97,903

Harrison Elementary School

KWH COST: $0.141

ECM #2: Lighting Controls

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
221.31	Boiler Room & Stairways	2600	8	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	58	0.46	1206.4	$170.10	8	0	No Change	58	0.09	0%	1206.4	$170.10	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
613		250	2	1	"Keyless" Socket, 100w A19 Lamp	100	0.20	50	$7.05	2	0	No Change	100	0.04	0%	50	$7.05	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Classroom	2600	10	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.86	2236	$315.28	10	0	No Change	86	0.17	0%	2236	$315.28	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Staff Work Room	2600	7	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.41	1055.6	$148.84	7	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	58	0.08	10%	950.04	$133.96	$160.00	$160.00	0.32	105.56	$14.88	10.75
242.11	Storage Corridor	2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	0.52	1352	$190.63	5	0	No Change	104	0.10	0%	1352	$190.63	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Room 1	1300	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.12	150.8	$21.26	2	0	No Change	58	0.02	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		1300	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.12	150.8	$21.26	2	0	No Change	58	0.02	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Room 2	1300	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.12	150.8	$21.26	2	0	No Change	58	0.02	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		1300	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.12	150.8	$21.26	2	0	No Change	58	0.02	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Room 3	1300	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	904.8	$127.58	12	0	No Change	58	0.14	0%	904.8	$127.58	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Room 4	1300	25	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	1.45	1885	$265.79	25	0	No Change	58	0.29	0%	1885	$265.79	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Pump Room 5	1300	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	904.8	$127.58	12	0	No Change	58	0.14	0%	904.8	$127.58	$0.00	$0.00	0.00	0	$0.00	0.00
227.11		1300	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	150.8	$21.26	2	0	No Change	58	0.02	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Custodial Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
222.24	District Offices	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	58	0.46	1206.4	$170.10	8	0	No Change	58	0.09	0%	1206.4	$170.10	$0.00	$0.00	0.00	0	$0.00	0.00
222.24	Office	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	58	0.23	603.2	$85.05	4	0	No Change	58	0.05	0%	603.2	$85.05	$0.00	$0.00	0.00	0	$0.00	0.00
800		2600	3	1	Recessed Down Light, 100w A19 Lamp	100	0.30	780	$109.98	3	0	No Change	100	0.06	0%	780	$109.98	$0.00	$0.00	0.00	0	$0.00	0.00
222.24	Office	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00

222.24	Conference Room	2600	9	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	58	0.52	1357.2	$191.37	9	0	No Change	58	0.10	0%	1357.2	$191.37	$0.00	$0.00	0.00	0	$0.00	0.00
800		2600	8	1	Recessed Down Light, 100w A19 Lamp	100	0.80	2080	$293.28	8	0	No Change	100	0.16	0%	2080	$293.28	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Admin Corridor	3600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.23	835.2	$117.76	4	0	No Change	58	0.05	0%	835.2	$117.76	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Business Office Corridor	3600	2	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	417.6	$58.88	2	0	No Change	58	0.02	0%	417.6	$58.88	$0.00	$0.00	0.00	0	$0.00	0.00
222.21		3600	5	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.29	1044	$147.20	5	0	No Change	58	0.06	0%	1044	$147.20	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Preschool Classroom	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.03	2683.2	$378.33	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	86	0.21	10%	2414.88	$340.50	$225.00	$450.00	0.83	268.32	$37.83	11.89
242.22	BA Secretary Office	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1081.6	$152.51	4	0	No Change	104	0.08	0%	1081.6	$152.51	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	BA Office	2600	7	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.73	1892.8	$266.88	7	0	No Change	104	0.15	0%	1892.8	$266.88	$0.00	$0.00	0.00	0	$0.00	0.00
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	BA Copy Room	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$76.25	2	0	No Change	104	0.04	0%	540.8	$76.25	$0.00	$0.00	0.00	0	$0.00	0.00
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Office	2600	3	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	0.31	811.2	$114.38	3	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	104	0.06	10%	730.08	$102.94	$160.00	$160.00	0.25	81.12	$11.44	13.99
242.21	Business Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.21	540.8	$76.25	2	0	No Change	104	0.04	0%	540.8	$76.25	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	13	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.75	1960.4	$276.42	13	0	No Change	58	0.15	0%	1960.4	$276.42	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Business Office Corridor	3600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.23	835.2	$117.76	4	0	No Change	58	0.05	0%	835.2	$117.76	$0.00	$0.00	0.00	0	$0.00	0.00
211.22		3600	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	30	0.72	2592	$365.47	24	0	No Change	30	0.14	0%	2592	$365.47	$0.00	$0.00	0.00	0	$0.00	0.00
770	Multi Purpose Room	3600	19	1	400w MH LoBay, Prismatic Lens	465	8.84	31806	$4,484.65	19	0	No Change	465	1.77	0%	31806	$4,484.65	$0.00	$0.00	0.00	0	$0.00	0.00
221.34	Stage	2600	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.23	603.2	$85.05	4	0	No Change	58	0.05	0%	603.2	$85.05	$0.00	$0.00	0.00	0	$0.00	0.00
613		2600	6	1	"Keyless" Socket, 100w A19 Lamp	100	0.60	1560	$219.96	6	0	No Change	100	0.12	0%	1560	$219.96	$0.00	$0.00	0.00	0	$0.00	0.00
241.11	MPR Side Entrance	2600	2	4	1x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	0.21	540.8	$76.25	2	0	No Change	104	0.04	0%	540.8	$76.25	$0.00	$0.00	0.00	0	$0.00	0.00

221.31	MPR Storage	800	7	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	58	0.41	324.8	$45.80	7	0	No Change	58	0.08	0%	324.8	$45.80	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	MPR Office	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	ESL	2600	22	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	2.29	5948.8	$838.78	22	0	No Change	104	0.46	0%	5948.8	$838.78	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	ESL Closet	800	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.12	92.8	$13.08	2	0	No Change	58	0.02	0%	92.8	$13.08	$0.00	$0.00	0.00	0	$0.00	0.00
226.45	Transportation Office	2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
222.21		2600	5	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.29	754	$106.31	5	0	No Change	58	0.06	0%	754	$106.31	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	4	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.23	603.2	$85.05	4	0	No Change	58	0.05	0%	603.2	$85.05	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	Corridor	3600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	1.56	5616	$791.86	15	0	No Change	104	0.31	0%	5616	$791.86	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 2 Office	2600	6	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.35	904.8	$127.58	6	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	58	0.07	10%	814.32	$114.82	$160.00	$160.00	0.28	90.48	$12.76	12.54
227.21	Boy's Restroom	2600	3	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 3 Classroom	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.93	2412.8	$340.20	16	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.19	10%	2171.52	$306.18	$225.00	$450.00	0.74	241.28	$34.02	13.23
221.11	Rm # 4 Classroom	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.93	2412.8	$340.20	16	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.19	10%	2171.52	$306.18	$225.00	$450.00	0.74	241.28	$34.02	13.23
221.11	Rm # 5 Classroom	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.93	2412.8	$340.20	16	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.19	10%	2171.52	$306.18	$225.00	$450.00	0.74	241.28	$34.02	13.23
221.11	Rm # 6 Classroom	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.93	2412.8	$340.20	16	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.19	10%	2171.52	$306.18	$225.00	$450.00	0.74	241.28	$34.02	13.23
222.21	Office	2600	1	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$160.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	2	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$160.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 7 Classroom	2600	20	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	1.16	3016	$425.26	20	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.23	10%	2714.4	$382.73	$225.00	$450.00	0.93	301.6	$42.53	10.58
227.21	H24 Vestibule	3600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	208.8	$29.44	1	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	58	0.01	10%	187.92	$26.50	$160.00	$160.00	0.05	20.88	$2.94	54.35

221.11	Rm # 8 Classroom	2600	14	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.81	2111.2	$297.68	14	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.16	10%	1900.08	$267.91	$225.00	$450.00	0.65	211.12	$29.77	15.12
221.11	Rm # 9 Classroom	2600	14	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.81	2111.2	$297.68	14	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.16	10%	1900.08	$267.91	$225.00	$450.00	0.65	211.12	$29.77	15.12
221.11	Rm # 10 Classroom	2600	14	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.81	2111.2	$297.68	14	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.16	10%	1900.08	$267.91	$225.00	$450.00	0.65	211.12	$29.77	15.12
221.11	Rm # 11 Classroom	2600	14	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.81	2111.2	$297.68	14	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.16	10%	1900.08	$267.91	$225.00	$450.00	0.65	211.12	$29.77	15.12
221.11	Therapy Dept.	2600	17	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.99	2563.6	$361.47	17	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.20	10%	2307.24	$325.32	$225.00	$450.00	0.79	256.36	$36.15	12.45
227.21	Girl's Restroom	2600	3	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
221.32	TRC 3rd Grade	2600	46	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Parabolic Lens	58	2.67	6936.8	$978.09	46	4	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.53	10%	6243.12	$880.28	$225.00	$900.00	2.13	693.68	$97.81	9.20
221.47		2600	10	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	58	0.58	1508	$212.63	10	0	No Change	58	0.12	0%	1508	$212.63	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	TRC Office & Storage	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1081.6	$152.51	4	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	104	0.08	10%	973.44	$137.26	$160.00	$160.00	0.33	108.16	$15.25	10.49
242.11	TRC Corridor	3600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	0.42	1497.6	$211.16	4	0	No Change	104	0.08	0%	1497.6	$211.16	$0.00	$0.00	0.00	0	$0.00	0.00
242.11	ESL Corridor	3600	10	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	104	1.04	3744	$527.90	10	0	No Change	104	0.21	0%	3744	$527.90	$0.00	$0.00	0.00	0	$0.00	0.00
226.45	Staff Restroom (2)	2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00

222.21	Boy's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
226.45	Custodial Closet	800	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Girl's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Rm # 12 Speech Classroom	2600	6	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.35	904.8	$127.58	6	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.07	10%	814.32	$114.82	$225.00	$450.00	0.28	90.48	$12.76	35.27
222.21	Rm # 13 Work Room	2600	13	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.75	1960.4	$276.42	13	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	58	0.15	10%	1764.36	$248.77	$160.00	$160.00	0.60	196.04	$27.64	5.79
221.11	Rm # 14 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 15 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 16 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 17 Classroom	2600	15	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.87	2262	$318.94	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.17	10%	2035.8	$287.05	$225.00	$450.00	0.70	226.2	$31.89	14.11
226.45		2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 18 Classroom	2600	15	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.87	2262	$318.94	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.17	10%	2035.8	$287.05	$225.00	$450.00	0.70	226.2	$31.89	14.11
226.45		2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Rm # 19 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 20 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64

221.11	Rm # 21 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 22 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 23 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 24 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 25 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
221.11	Rm # 26 Classroom	2600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	58	0.70	1809.6	$255.15	12	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	58	0.14	10%	1628.64	$229.64	$225.00	$450.00	0.56	180.96	$25.52	17.64
222.21	Connector Corridor	3600	12	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.70	2505.6	$353.29	12	1	Daylight Sensor (Sensorswitch PP-20 & CM-PC or equal)	58	0.14	10%	2255.04	$317.96	$160.00	$160.00	0.56	250.56	$35.33	4.53
222.22	Corridor "B"	3600	19	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	1.10	3967.2	$559.38	19	0	No Change	58	0.22	0%	3967.2	$559.38	$0.00	$0.00	0.00	0	$0.00	0.00
801		3600	17	1	Recessed Down Light, 100w A19 Lamp	100	1.70	6120	$862.92	17	0	No Change	100	0.34	0%	6120	$862.92	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 88 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 87 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 86 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 85 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 84 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 83 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87

242.22	Rm # 82 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 81 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 80 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 79 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 78 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 77 Classroom	2600	14	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.46	3785.6	$533.77	14	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.29	10%	3407.04	$480.39	$225.00	$450.00	1.16	378.56	$53.38	8.43
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 76 Classroom	2600	15	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.56	4056	$571.90	15	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.31	10%	3650.4	$514.71	$225.00	$450.00	1.25	405.6	$57.19	7.87
242.22	Rm # 75 Classroom	2600	14	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.46	3785.6	$533.77	14	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.29	10%	3407.04	$480.39	$225.00	$450.00	1.16	378.56	$53.38	8.43
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Boy's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		2600	3	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260	$36.66	1	0	No Change	100	0.02	0%	260	$36.66	$0.00	$0.00	0.00	0	$0.00	0.00
221.34	Roof Access	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00

222.21	Girl's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		2600	3	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260	$36.66	1	0	No Change	100	0.02	0%	260	$36.66	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Library Corridor	3600	17	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.99	3549.6	$500.49	17	0	No Change	58	0.20	0%	3549.6	$500.49	$0.00	$0.00	0.00	0	$0.00	0.00
801		3600	3	1	Recessed Down Light, 100w A19 Lamp	100	0.30	1080	$152.28	3	0	No Change	100	0.06	0%	1080	$152.28	$0.00	$0.00	0.00	0	$0.00	0.00
221.14		3600	12	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.70	2505.6	$353.29	12	1	Daylight Sensor (Sensorswitch PP-20 & CM-PC or equal)	58	0.14	20%	2004.48	$282.63	$280.00	$280.00	0.56	501.12	$70.66	3.96
650		3600	2	2	Wall Sconce, (2) 26w PL Quad Lamp	54	0.11	388.8	$54.82	2	0	No Change	54	0.02	0%	388.8	$54.82	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Restrooms (2)	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
226.41		2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 90 Classroom	2600	16	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.66	4326.4	$610.02	16	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.33	10%	3893.76	$549.02	$225.00	$450.00	1.33	432.64	$61.00	7.38
227.21	Rm # 90 Classroom Restroom	2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
221.14	Rm # 90 Classroom Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 92 Classroom	2600	16	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.66	4326.4	$610.02	16	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.33	10%	3893.76	$549.02	$225.00	$450.00	1.33	432.64	$61.00	7.38
227.21	Rm # 92 Classroom Restroom	800	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
221.14	Rm # 92 Classroom Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 94 Classroom	2600	16	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.66	4326.4	$610.02	16	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.33	10%	3893.76	$549.02	$225.00	$450.00	1.33	432.64	$61.00	7.38
227.21	Rm # 94 Classroom Restroom	800	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
221.14	Rm # 94 Classroom Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
221.34	Rm # 96 Electrical Room	800	8	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.46	371.2	$52.34	8	0	No Change	58	0.09	0%	371.2	$52.34	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Rm # 97 Guidance	2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.52	1352	$190.63	5	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	104	0.10	10%	1216.8	$171.57	$160.00	$160.00	0.42	135.2	$19.06	8.39
242.22	Rm # 95 Guidance	2600	6	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.62	1622.4	$228.76	6	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	104	0.12	10%	1460.16	$205.88	$160.00	$160.00	0.50	162.24	$22.88	6.99

242.22	Rm # 93 Guidance	2600	6	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.62	1622.4	$228.76	6	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	104	0.12	10%	1460.16	$205.88	$160.00	$160.00	0.50	162.24	$22.88	6.99
242.22	Computer Lab	2600	18	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.87	4867.2	$686.28	18	2	2 Pole Power Pack w/Dual Tech. Occupancy Sensor (Sensorswitch or equal)	104	0.37	10%	4380.48	$617.65	$225.00	$450.00	1.50	486.72	$68.63	6.56
222.22	Lunch Room	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.46	1206.4	$170.10	8	1	Dual Technology Occupancy Sensor (Sensorswitch or equal)	58	0.09	10%	1085.76	$153.09	$160.00	$160.00	0.37	120.64	$17.01	9.41
227.22	Lobby	3600	10	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.58	2088	$294.41	10	0	No Change	58	0.12	0%	2088	$294.41	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Main Office - New Wing	2600	9	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.52	1357.2	$191.37	9	0	No Change	58	0.10	0%	1357.2	$191.37	$0.00	$0.00	0.00	0	$0.00	0.00
227.22		2600	1	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Conference Room	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.46	1206.4	$170.10	8	0	No Change	58	0.09	0%	1206.4	$170.10	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Principal's Office	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
226.45	Restrooms (2)	2600	2	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Main Office	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$85.05	4	0	No Change	58	0.05	0%	603.2	$85.05	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Conference Room	2600	8	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.46	1206.4	$170.10	8	0	No Change	58	0.09	0%	1206.4	$170.10	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$85.05	4	0	No Change	58	0.05	0%	603.2	$85.05	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
227.22	Office Hall	2600	3	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Classroom	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$85.05	4	0	No Change	58	0.05	0%	603.2	$85.05	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260	$36.66	1	0	No Change	100	0.02	0%	260	$36.66	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Gym Corridor	3600	10	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.58	2088	$294.41	10	0	No Change	58	0.12	0%	2088	$294.41	$0.00	$0.00	0.00	0	$0.00	0.00

222.21	Girl's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	3	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260	$36.66	1	0	No Change	100	0.02	0%	260	$36.66	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Boy's Restroom	2600	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
226.45		2600	3	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., White Diffuser	58	0.17	452.4	$63.79	3	0	No Change	58	0.03	0%	452.4	$63.79	$0.00	$0.00	0.00	0	$0.00	0.00
801		2600	1	1	Recessed Down Light, 100w A19 Lamp	100	0.10	260	$36.66	1	0	No Change	100	0.02	0%	260	$36.66	$0.00	$0.00	0.00	0	$0.00	0.00
221.34	Custodial Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Music	2600	20	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	2.08	5408	$762.53	20	0	No Change	104	0.42	0%	5408	$762.53	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Kitchen	2600	13	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.35	3515.2	$495.64	13	0	No Change	104	0.27	0%	3515.2	$495.64	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	5	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.29	754	$106.31	5	0	No Change	58	0.06	0%	754	$106.31	$0.00	$0.00	0.00	0	$0.00	0.00
617		2600	3	1	Hood Light w/Globe & Cage, 100w A19 Lamp	100	0.30	780	$109.98	3	0	No Change	100	0.06	0%	780	$109.98	$0.00	$0.00	0.00	0	$0.00	0.00
226.41	Restroom	2600	1	2	6"x4, 2 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Prismatic Lens	58	0.06	150.8	$21.26	1	0	No Change	58	0.01	0%	150.8	$21.26	$0.00	$0.00	0.00	0	$0.00	0.00
221.34	Custodial Closet	800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	58	0.06	46.4	$6.54	1	0	No Change	58	0.01	0%	46.4	$6.54	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Kitchen Storage	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.21	540.8	$76.25	2	0	No Change	104	0.04	0%	540.8	$76.25	$0.00	$0.00	0.00	0	$0.00	0.00
227.22	Storage	800	2	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.12	92.8	$13.08	2	0	No Change	58	0.02	0%	92.8	$13.08	$0.00	$0.00	0.00	0	$0.00	0.00
766	Gym	3600	16	1	400w MH, 2x2, Recessed Mnt., Prismatic Lens	465	7.44	26784	$3,776.54	16	0	No Change	465	1.49	0%	26784	$3,776.54	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Gym Office	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Changing Area	2600	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	301.6	$42.53	2	0	No Change	58	0.02	0%	301.6	$42.53	$0.00	$0.00	0.00	0	$0.00	0.00
221.31	Mezzanine Storage	800	11	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	58	0.64	510.4	$71.97	11	0	No Change	58	0.13	0%	510.4	$71.97	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Gym Vestibule	3600	2	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	417.6	$58.88	2	0	No Change	58	0.02	0%	417.6	$58.88	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Gym Storage	800	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.12	92.8	$13.08	2	0	No Change	58	0.02	0%	92.8	$13.08	$0.00	$0.00	0.00	0	$0.00	0.00

222.21	Chair Storage	800	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	139.2	$19.63	3	0	No Change	58	0.03	0%	139.2	$19.63	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Gym Storage	800	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	58	0.17	139.2	$19.63	3	0	No Change	58	0.03	0%	139.2	$19.63	$0.00	$0.00	0.00	0	$0.00	0.00
227.22	Art	2600	5	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.29	754	$106.31	5	1	Daylight Sensor (Sensorswitch PP-20 & CM-PC or equal)	58	0.06	20%	603.2	$85.05	$280.00	$280.00	0.23	150.8	$21.26	13.17
242.22		2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.52	1352	$190.63	5	1	Daylight Sensor (Sensorswitch PP-20 & CM-PC or equal)	104	0.10	20%	1081.6	$152.51	$280.00	$280.00	0.42	270.4	$38.13	7.34
242.22		2600	10	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.04	2704	$381.26	10	0	No Change	104	0.21	0%	2704	$381.26	$0.00	$0.00	0.00	0	$0.00	0.00
242.22	Art Storage	800	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	166.4	$23.46	2	0	No Change	104	0.04	0%	166.4	$23.46	$0.00	$0.00	0.00	0	$0.00	0.00
221.31	Mechanical Room	800	8	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	58	0.46	371.2	$52.34	8	0	No Change	58	0.09	0%	371.2	$52.34	$0.00	$0.00	0.00	0	$0.00	0.00
804	Media Center	2600	38	2	Recessed Down Light, (2) 26w PL Lamp	54	2.05	5335.2	$752.26	38	0	No Change	54	0.41	0%	5335.2	$752.26	$0.00	$0.00	0.00	0	$0.00	0.00
211.37		2600	88	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	30	2.64	6864	$967.82	88	0	No Change	30	0.53	0%	6864	$967.82	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Media Center Storage	800	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	185.6	$26.17	4	0	No Change	58	0.05	0%	185.6	$26.17	$0.00	$0.00	0.00	0	$0.00	0.00
222.22	Office	2600	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	58	0.23	603.2	$85.05	4	0	No Change	58	0.05	0%	603.2	$85.05	$0.00	$0.00	0.00	0	$0.00	0.00
655	Exterior	3600	4	2	30" Round, Surface Mnt., White Diffuser, (2) 26w PL Quad Lamp	54	0.22	777.6	$109.64	4	0	No Change	54	0.04	0%	777.6	$109.64	$0.00	$0.00	0.00	0	$0.00	0.00
700		3600	3	1	70w HPS, 1x1 Surface Mnt., Prismatic Lens	92	0.28	993.6	$140.10	3	0	No Change	92	0.06	0%	993.6	$140.10	$0.00	$0.00	0.00	0	$0.00	0.00
706		3600	12	1	70w HPS Wallpack	92	1.10	3974.4	$560.39	12	0	No Change	92	0.22	0%	3974.4	$560.39	$0.00	$0.00	0.00	0	$0.00	0.00
725		3600	10	1	150w HPS Wallpack	188	1.88	6768	$954.29	10	0	No Change	188	0.38	0%	6768	$954.29	$0.00	$0.00	0.00	0	$0.00	0.00
761		3600	1	1	400w HPS Wallpack	465	0.47	1674	$236.03	1	0	No Change	465	0.09	0%	1674	$236.03	$0.00	$0.00	0.00	0	$0.00	0.00
712		3600	19	1	100w HPS Recessed, 18" Square, Fresnel Lens	125	2.38	8550	$1,205.55	19	0	No Change	125	0.48	0%	8550	$1,205.55	$0.00	$0.00	0.00	0	$0.00	0.00
730		3600	2	1	150w MH Flood	188	0.38	1353.6	$190.86	2	0	No Change	188	0.08	0%	1353.6	$190.86	$0.00	$0.00	0.00	0	$0.00	0.00
711		3600	4	1	100w HPS Bollards	125	0.50	1800	$253.80	4	0	No Change	125	0.10	0%	1800	$253.80	$0.00	$0.00	0.00	0	$0.00	0.00
767		3600	1	1	400w MH Flood	465	0.47	1674	$236.03	1	0	No Change	465	0.09	0%	1674	$236.03	$0.00	$0.00	0.00	0	$0.00	0.00
0	Totals		1,562	454			128.0	356,603.8	$50,281	1,562	104		0	25.6		340,976.4	$48,077.67		$22,850	46.22	15,627	$2,203	10.37

Project Name: LGEA Solar PV Project - Harrison Twp. Elementary School
Location: Mullica Hill, NJ 08062
Description: Photovoltaic System - Direct Purchase

Simple Payback Analysis

	Photovoltaic System - Direct Purchase
Total Construction Cost	$3,351,330
Annual kWh Production	443,717
Annual Energy Cost Reduction	$62,564
Annual SREC Revenue	$155,301
First Cost Premium	**$3,351,330**
Simple Payback:	**15.38** **Years**

Life Cycle Cost Analysis

Analysis Period (years):	25	Financing %:	0%
Financing Term (mths):	0	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.141**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	0.00%	SREC Value ($/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	$3,351,330	0	0	0	$0	(3,351,330)	0
1	$0	443,717	$62,564	$0	$155,301	$217,865	($3,133,465)
2	$0	441,498	$64,441	$0	$154,524	$218,965	($2,914,499)
3	$0	439,291	$66,374	$0	$153,752	$220,126	($2,694,373)
4	$0	437,094	$68,365	$0	$152,983	$221,349	($2,473,025)
5	$0	434,909	$70,416	$4,480	$152,218	$218,155	($2,254,870)
6	$0	432,734	$72,529	$4,457	$151,457	$219,529	($2,035,341)
7	$0	430,571	$74,705	$4,435	$150,700	$220,970	($1,814,371)
8	$0	428,418	$76,946	$4,413	$149,946	$222,480	($1,591,892)
9	$0	426,276	$79,254	$4,391	$149,197	$224,060	($1,367,832)
10	$0	424,144	$81,632	$4,369	$148,451	$225,714	($1,142,118)
11	$0	422,024	$84,081	$4,347	$147,708	$227,442	($914,675)
12	$0	419,914	$86,603	$4,325	$146,970	$229,248	($685,427)
13	$0	417,814	$89,201	$4,303	$146,235	$231,133	($454,294)
14	$0	415,725	$91,877	$4,282	$145,504	$233,099	($221,195)
15	$0	413,646	$94,634	$4,261	$144,776	$235,149	$13,954
16	$0	411,578	$97,473	$4,239	$144,052	$237,286	$251,240
17	$0	409,520	$100,397	$4,218	$143,332	$239,511	$490,751
18	$0	407,473	$103,409	$4,197	$142,615	$241,827	$732,579
19	$0	405,435	$106,511	$4,176	$141,902	$244,238	$976,816
20	$0	403,408	$109,707	$4,155	$141,193	$246,744	$1,223,560
21	$1	401,391	$112,998	$4,134	$140,487	$249,350	$1,472,911
22	$2	399,384	$116,388	$4,114	$139,784	$252,058	$1,724,969
23	$3	397,387	$119,879	$4,093	$139,086	$254,872	$1,979,841
24	$4	395,400	$123,476	$4,073	$138,390	$257,793	$2,237,634
25	$5	393,423	$127,180	$4,052	$137,698	$260,826	$2,498,460
	Totals:	10,452,176	$2,281,041	$89,513	$3,658,262	$5,849,790	($10,094,664)
				Net Present Value (NPV)			**$2,498,485**
				Internal Rate of Return (IRR)			**4.7%**

Building	Roof Area (sq ft)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Panel Weight (33 lbs)	W/SQFT
Harrison Twp. E.S.	26445	Sunpower SPR230	1619	14.7	23,806	372.37	443,717	53,427	15.64

.= Proposed PV Layout

PVWatts

AC Energy & Cost Savings

Cautions for Interpreting the Results

Harrison Twp. ES

Station Identification	
City:	Atlantic_City
State:	New_Jersey
Latitude:	39.45° N
Longitude:	74.57° W
Elevation:	20 m
PV System Specifications	
DC Rating:	372.4 kW
DC to AC Derate Factor:	0.810
AC Rating:	301.6 kW
Array Type:	Fixed Tilt
Array Tilt:	10.0°
Array Azimuth:	135.0°
Energy Specifications	
Cost of Electricity:	0.1 ¢/kWh

Results			
Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	2.44	22686	31.99
2	3.19	27151	38.28
3	4.20	38926	54.89
4	5.11	44719	63.05
5	5.79	51045	71.97
6	6.11	50370	71.02
7	6.01	50602	71.35
8	5.47	46303	65.29
9	4.74	39546	55.76
10	3.64	31786	44.82
11	2.54	21873	30.84
12	2.11	18708	26.38
Year	4.29	443717	625.64

Notes:

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