CHERRY HILL TOWNSHIP SCHOOLS
BRET HARTE ELEMENTARY SCHOOL

1909 QUEEN ANN ROAD
CHERRY HILL, NJ 08003

FACILITY ENERGY REPORT

TABLE OF CONTENTS

I. HISTORIC ENERGY CONSUMPTION/COST

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.

Electric Utility Provider:	Public Service Electric & Gas
Electric Utility Rate Structure:	General Lighting & Power (GLP)
Third Party Supplier:	South Jersey Energy Company

Natural Gas Utility Provider:	South Jersey Natural Gas
Utility Rate Structure:	Large Volume Gas (LVG)
Third Party Supplier:	Hess

The electric usage profile represents the actual electrical usage for the facility. 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 within each facility report shows the actual natural gas energy usage for the facility. 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.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: PSE&G
Rate: GLP
Meter No: 278007135
Account # 69615138303
Third Party Utility South Jersey Electric Company
TPS Meter / Acct No:

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
May-10	21,540	97.2	$3,295
Jun-10	22,260	102.0	$4,376
Jul-10	10,800	50.4	$2,163
Aug-10	10,770	33.6	$1,961
Sep-10	19,680	96.3	$3,997
Oct-10	20,400	90.9	$3,206
Nov-10	25,500	81.3	$3,874
Dec-10	30,720	82.5	$4,853
Jan-11	27,870	84.3	$1,336
Feb-11	32,160	81.6	$1,270
Mar-11	27,750	78.6	$10,575
Apr-11	23,460	83.4	$3,597
Totals	**272,910**	**102.0 Max**	**$44,502**

AVERAGE DEMAND **80.2 KW average**
AVERAGE RATE **$0.163** **$/kWh**

Figure 1
Electricity Usage Profile

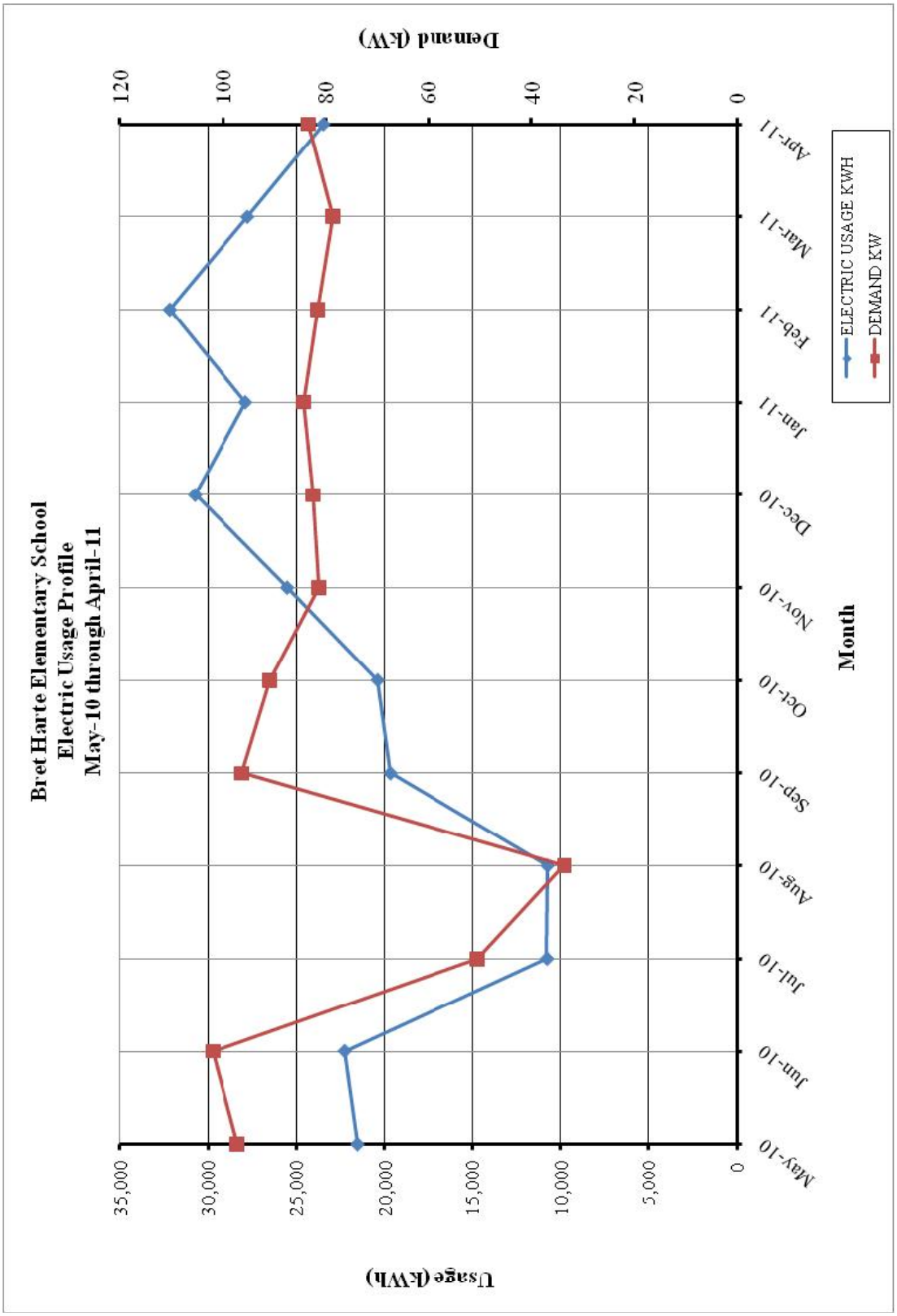
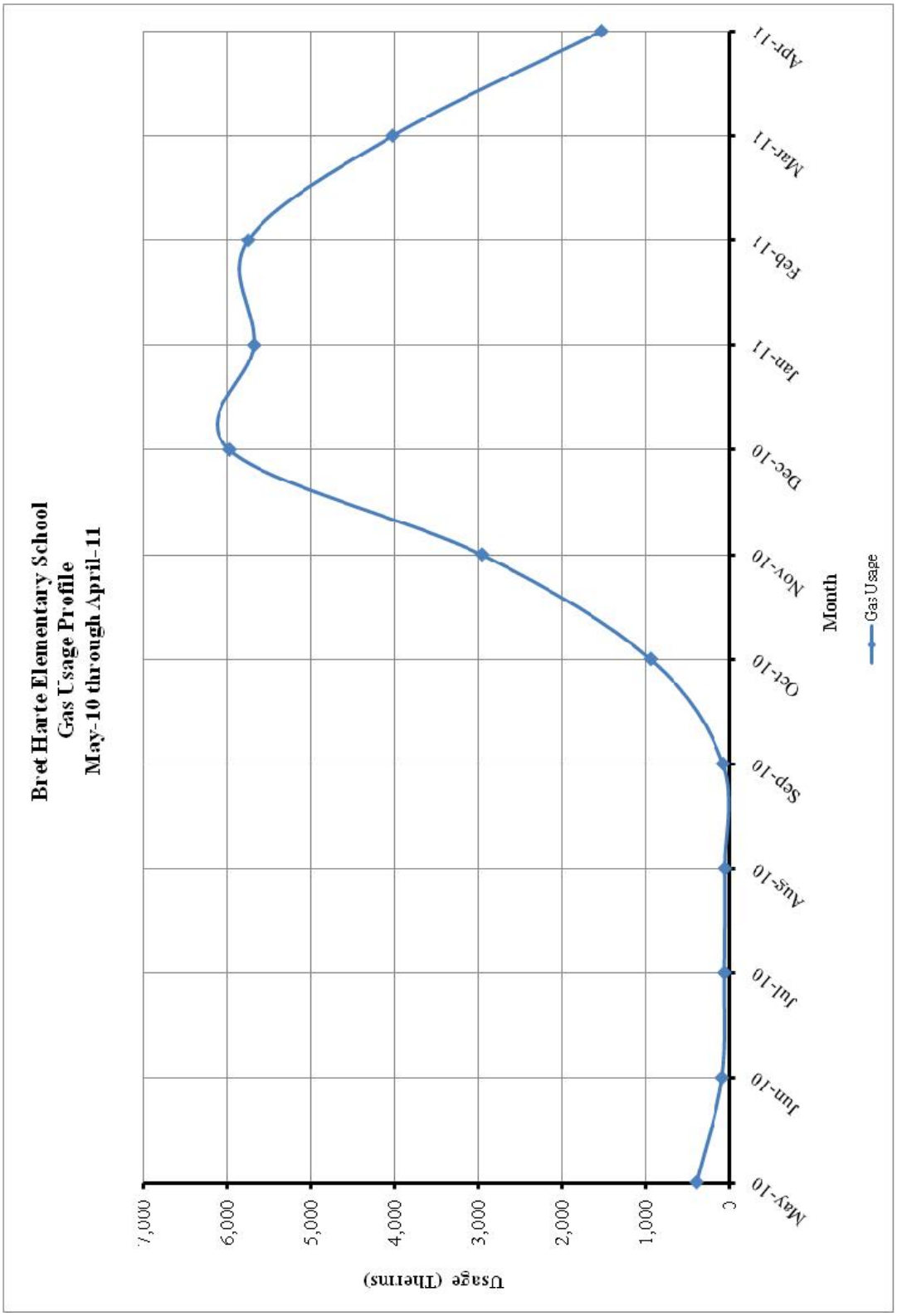


Table 4
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: PSE&G		
Rate: LVG		
Meter No: 2523522		
Point of Delivery ID: PG00008343867198376		
Third Party Utility Provider: Hess		
TPS Meter No: 367885		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
May-10	393.07	$493.20
Jun-10	84.99	$155.49
Jul-10	54.75	$446.62
Aug-10	49.27	$135.42
Sep-10	72.33	$146.03
Oct-10	938.15	$799.72
Nov-10	2,957.74	$3,219.24
Dec-10	5,977.76	$5,628.90
Jan-11	5,689.94	$5,692.76
Feb-11	5,760.30	$5,639.63
Mar-11	4,024.23	$4,204.63
Apr-11	1,526.69	$1,248.92
TOTALS	**27,529.22**	**$27,810.56**
AVERAGE RATE:	**$1.01**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The Cherry Hill Township BOE Bret Harte Elementary School is located on 1909 Queen Ann Road, in Cherry Hill, NJ 08003. The original building constructed in 1967 was 45,619 SF. Two additions were added in 1968 a 5,769 SF addition, and in 2000 a 5,192 SF addition. The 56,600 SF building is a two story facility utilized to educate students in grades one through five. The building contains administration offices, classrooms, a library, a small cooking facility, and a gym that also serves as the student's cafeteria.

Occupancy Profile

The typical hours of operation for Bret Harte Elementary School are Monday through Friday between 6:30 am and 4:00 pm. The student enrollment at the Bret Harte Elementary School is approximately 370.

Building Envelope

The exterior walls of the original building and 1968 addition are a brick and block type with minimal insulation that would be typical for a building constructed in the 1960's. The additions also are of a brick and block type construction. The amount of insulation could not be determined but due to the newer construction it is estimated they provide a tighter building envelope than the original construction.

The majority of windows have been replaced from the original construction with ¼" thermal panels with aluminum frames. A section of windows at the front entrance of the building are of single pane construction from the original building construction and should be replaced. The weather stripping and caulking on the outside of the windows is in good to fair condition. Blinds are utilized in the building for occupant comfort, and provide a minimal amount of solar heat gain in the summer months.

The original construction received a new corrugated steel roof at an undetermined point. The addition in 2000 uses an EPDM and stones roofing system. Upon inspection the amount of roof insulation could not be determined. Building maintenance staff stated that the roof had no insulation between the roof structure and the drop ceiling tiles.

HVAC Systems

Heating for the building is provided through a combination of hot water boiler plants, baseboard corridor heating, and unit ventilators. These systems are described in a brief description below:

- *Heating Plant*: The hot water plant consists of two Kewanee gas fired hot water boilers rated at an input of 2930 MBH each. This boiler was converted at an undetermined timeframe from originally being an oil fired unit to post conversion operating as a gas fired unit. The original efficiency of the boiler is rated at 80% but due to the age of the unit and conversion it is estimated to be at a reduced efficiency. The unit which was manufactured before the original construction in 1967 has passed its useful service life as defined by ASHRAE. Upon inspection the unit appears to be in poor condition and

should be replaced. Two Bell and Gossett base mounted end suction hot water pumps that provide hot water pumping from the boiler room to the rest of the building. These pumps operate at 5 HP with a constant flow of 130 GPM. One pump motor was recently replaced and is in new condition. The other pump is in poor condition with an estimated age of 25 years, and is exceeded its service life defined by ASHRAE. The addition is served by heating pumps located on the roof units, with air handlers serving each room.

- *Baseboard Heating*: Heating is provided in the building corridors by sections of baseboard heating. 13 foot sections are located below the corridor windows in the original construction. Additional 10 foot sections of baseboard heating are located next to exit doors of the building. Specific unit specifications could not be obtained, but based on visual inspection the units appeared in fair to poor condition, and may have only been replaced upon unit failure. These units are operated with simple knob controls located directly on the unit.

- *Unit Ventilators*: Nesbitt model A110 unit ventilators are located throughout the classrooms. These feed into the boiler hot water systems described above and provide individual heating to each room. These systems can be controlled via a wall mounted thermostat for occupant comfort.

Cooling for the original construction and 1968 addition is provided by various makes and models of window Air Conditioning units. The addition is cooled by condensing units located on the additions roof. A brief description of these units is provided below.

- *Condensing Units*: There are multiple condensing units that serve various areas throughout the 2000 building addition. All of the units are located on the 2000 addition's roof. The units are identified as CU-1 thru CU-4. These ComfortMaster models are rooftop condensing units using R22 refrigerant with a heat pump. The compressor has a rating of ¼ HP. Based on inspection the units are in good condition and were installed with the 2000 addition. They are 10 years old, therefore within their ASHRAE service life.

- *Window Units*: Additionally window mounted air conditioning units are located in the classrooms of the original construction and administration offices. These units provide cooling for the majority of the original classrooms, though not all rooms are served with an individual unit. The units in the classrooms are from manufacturers Frigidaire, GE, Airtemp, Panasonic, and Kenmore. They range in size from 1-2 Ton units based on the square footage of the area that is being served. The units have an EER rating from 9.5 – 10.7, the newer models with higher efficiency. The GE, Airtemp, Panasonic, and Kenmore units are estimated to be in poor condition based on their age and efficiency rating, those in the administration sections appear in poor condition and should be replaced with high efficiency units. The Frigidaire DX R22 units are a higher efficiency of 10.7 and appear in good condition. These units have been installed in recent years to replace older failed units. It appears based on inspection that units are only replaced when they have a complete failure and are no longer operable.

Exhaust System

Air is exhausted from the toilet rooms through the roof exhausters.

HVAC System Controls

The building HVAC is controlled by a Honeywell DDC controller that converts the existing pneumatic room systems to DDC use P/E switches. The original equipment from 1967/1968 has all pneumatic controls that control room or zone thermostats.

The addition in 2000 is fitted with controls to allow them to be monitored and controlled from the base system. This system uses a modem allowing information to be sent to the administration building to be reviewed by the district engineer. The system monitors the outside air temperature, status of hot water pumps, air compressor, boiler failure, and hot water supply temperatures. This system is capable of shutting down systems in the building or adjusting the minimum unoccupied set points in building zones.

Domestic Hot Water

Domestic hot water for the facility is fed from two separate systems located throughout the facility, one for the original construction and 1968 addition, and a separate from the new wing added in 2000. The following is a brief description of each system:

- *Original Construction and 1968 Addition*: Domestic hot water for the original construction and the 1968 addition is provided by a State Sandblaster model gas fired hot water heater. The heater is located in the same mechanical room as the two boilers. This unit is rated at 250MBH with a capacity of 75 gallons. A booster pump of low horsepower in good condition was connected to the DHW system. Based on visual inspection the DHW unit appears in fair condition, and was replaced at some point after the initial construction from 1967.

- *2000 Addition*: Domestic hot water for the addition is provided by one 43 gallon capacity AO Smith electric hot water heater, with an input of 6 KW. The domestic hot water heater is located in a small mechanical room in a corridor in the building addition. Based on visual inspection the unit appears to be in good condition and was installed with the addition.

Lighting and Electronics

Bret Harte Elementary School contains a mixture of newer LCD based computer monitors and CRT monitors. Based on the building survey approximately half of the monitors in use are of CRT type. The CRT monitors use additional power and lack the energy saving features of newer model LCD monitors. In addition the majority of classrooms contain a CRT television for displaying content to students. A number of CRT televisions are also used on pushcarts to display content to students in other areas of the school.

Refer to the **Investment Grade Lighting Audit Appendix** for a detailed list of the lighting throughout the facility and estimated operating hours per space.

III. 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.

IV. ENERGY CONSERVATION MEASURES

Energy Conservation Measures are developed specifically for this facility. The energy savings and calculations are highly dependent on the information received from the site survey and interviews with operations personnel. The assumptions and calculations should be reviewed by the owner to ensure accurate representation of this facility. The following ECMs were analyzed:

Table 1
ECM Financial Summary

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	$6,887	$2,891	2.4	529.7%
ECM #2	LED Exit Signs	$470	$67	7.1	112.6%
ECM #3	Vending Miser Controls	$179	$386	0.5	3135.1%
ECM #4	Computer Monitor Replacement	$2,300	$461	5.0	200.7%
ECM #5	Condensing Boiler Replacement	$213,245	$4,814	44.3	-43.6%
ECM #6	VFD on Hot Water Pumps	$19,962	$1,108	18.0	-16.7%
ECM #7	Lighting Controls	$9,075	$1,799	5.0	197.4%
ECM #8	Water Efficiency	$1,519	$155	9.8	53.1%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	Solar Photovoltaic System	$645,519	$70,720	9.1	64.3%
Notes:	A. Cost takes into consideration applicable NJ Smart StartTM incentives.				
	B. Savings takes into consideration applicable maintenance savings.				

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
ECM #1	Lighting Upgrade	6.80	17734.00	0.00
ECM #2	LED Exit Signs	0.14	408.80	0.00
ECM #3	Vending Miser Controls	0.00	2368.00	0.00
ECM #4	Computer Monitor Replacement	0.00	2760.00	0.00
ECM #5	Condensing Boiler Replacement	0.00	1469.00	4529.00
ECM #6	VFD on Hot Water Pumps	0.00	6796.00	0.00
ECM #7	Lighting Controls	4.24	11034.00	0.00
ECM #8	Water Efficiency	0.00	0.00	53.00
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
REM #1	Solar Photovoltaic System	105.5	128,909	0

Table 3
Facility Project Summary

ENERGY SAVINGS IMPROVEMENT PROGRAM - POTENTIAL PROJECT					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade	$2,891	$7,337	$450	$6,887	2.4
LED Exit Signs	$67	$650	$180	$470	7.1
Vending Miser Controls	$386	$179	$0	$179	0.5
Computer Monitor Replacement	$461	$2,300	$0	$2,300	5.0
Condensing Boiler Replacement	$4,814	$218,245	$5,000	$213,245	44.3
VFD on Hot Water Pumps	$1,108	$20,070	$108	$19,962	18.0
Lighting Controls	$1,799	$10,200	$1,125	$9,075	5.0
Water Efficiency	$155	$1,519	$0	$1,519	9.8
Design / Construction Extras (15%)		*$6,338*		*$6,338*	
Total Project	**$6,867**	**$48,593**	**$1,863**	**$46,730**	**6.8**

Highlighted ECMs are not included in total

Design / Construction Extras is shown as an additional cost for the facility project summary. This cost is included to estimate the costs associated with construction management fees for a larger combined project.

ECM #1: Lighting Upgrade

Description:

There are still some T-12 fixtures throughout the Bret Harte Elementary School. Improved fluorescent lamps and ballasts are available as direct replacements for the existing lamps and ballasts. A simple retrofit of the existing fixture can provide substantial savings. For example, a conventional drop-ceiling lay in fixture with four, 4-foot lamps (34 Watt lamps with magnetic ballast) has a total wattage of 144 Watts per fixture. By using T-8 lamps and electronic ballasts, the total wattage would be reduced to 86 Watts. The light levels would increase by about 15% and the light quality would increase by 35%.

Some of the remaining interior lighting at the Bret Harte Elementary School is provided with fluorescent fixtures with older generation, 700 series 32W T8 lamps and electronic ballasts. Although 700 series T8 lamps are considered fairly efficient, further energy savings can be achieved by replacing the existing T8 lamps with new generation, 800 series 28W T8 lamps without compromising light output. CEG recommends, re-lamping all of the fixtures with 28W T8 lamps.

This ECM includes retrofitting each of the existing T-12 fluorescent lamp and magnetic ballast fixtures with T-8 lamps and high-power electronic ballasts. High efficiency electronic ballasts reduce overall wattage while maintaining the existing lumen levels of the various rooms. This ECM also includes re-lamping of the existing fluorescent fixtures with 800 series, 28W T8 lamps. Additionally, the retrofit of all older fluorescent fixtures with T8 or T5 fluorescent fixtures with electronic ballasts in the building would prove to be more energy efficient. The new, energy efficient T8 fixtures will provide adequate lighting and will save on electrical costs due to better performance of the lamp and ballasts. This ECM also includes maintenance savings through the reduced number of lamps replaced per year. The expected lamp life of a T8 lamp is approximately 30,000 burn-hours, in comparison to the existing T12 lamps which is approximately 20,000 burn-hours. The facility will need approximately 33% less lamps replaced per year for each one for one fixture replaced.

The ECM also includes replacement of any incandescent lamps with compact fluorescent lamps. Compact fluorescent lamps (CFL's) were designed 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. Where the existing fixture is controlled by a dimmer switch, the CFL bulb must be compatible with a dimmer switch. In some

locations the bulb replacement will need to be tested to make sure the larger base of the CFL will fit into the existing fixture. The energy usage of an incandescent compared to a compact fluorescent 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. However, the maintenance savings due to reduced lamp replacement is offset by the higher cost of the CFL's compared to the incandescent lamps.

Energy Savings Calculations:

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

Rebates and Incentives:

From the **NJ Smart Start Incentive Appendix**, the retrofit of a T-12 fixture to a T-5 or T-8 fixture or the retrofit of existing 32 watt T-8 system to reduced wattage (28w/25w 4') warrants the following incentive: $10 per fixture.

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$7,337
NJ Smart Start Equipment Incentive ($):	$450
Net Installation Cost ($):	$6,887
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,891
Total Yearly Savings ($/Yr):	$2,891
Estimated ECM Lifetime (Yr):	15
Simple Payback	2.4
Simple Lifetime ROI	529.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$43,365
Internal Rate of Return (IRR)	42%
Net Present Value (NPV)	$27,625.57

ECM #2: Install LED Exit Signs

Description:

LED is an acronym for light-emitting-diode. LED's are small light sources that are readily associated with electronic equipment. LED exit signs have been manufactured in a variety of shapes and sizes. There are also retrofit kits that allow for simply modification of existing exit signs to accommodate LED technology. The benefits of LED technology are substantial. LED exit signs will last for 20-30 years without maintenance. This results in tremendous maintenance savings considering that incandescent or fluorescent lamps need to be replaced at a rate of 1-5 times per year. Lamp costs ($2-$7 each) and labor costs ($4-$10 per lamp) add up rapidly. Additionally, LED exit lights only uses 4 Watts. In comparison, conventional exit signs use 10-40 Watts. It is recommended that samples of the products be installed to confirm that they are compatible with the existing electrical system.

This ECM replaces all exit signs with incandescent or fluorescent lamps with new exit signs containing LED technology.

Energy Savings Calculations:

A detailed Investment Grade Lighting Audit can be found in **Investment Grade Lighting Audit Appendix** that outlines the proposed retrofits, costs, savings, and payback periods.

From the **Smart Start Incentive Appendix**, $20/LED Exit sign (≤75kW facility connected load) and $10/LED Exit sign (≥75kW facility connected load).

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$650
NJ Smart Start Equipment Incentive ($):	$180
Net Installation Cost ($):	$470
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$67
Total Yearly Savings ($/Yr):	$67
Estimated ECM Lifetime (Yr):	15
Simple Payback	7.1
Simple Lifetime ROI	112.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$999
Internal Rate of Return (IRR)	11%
Net Present Value (NPV)	$325.42

ECM #3: Vending Miser Controls

Description:

Bret Harte Elementary School currently utilizes a cold drink vending machine in the faculty area within the building. The Vending machine is only in use for a limited part of the day. The installation of the Vending Miser system will help reduce the operating hours of vending machines.

Cold beverage machines regularly operate inefficiently trying to maintain a constant temperature within the machine and snack machines have display lights that operate continuously. The VendingMiser® system incorporates innovative energy-saving technology into a small plug-and-play device that in conjunction with a passive infrared sensor regulate the operation of the cold beverage and snack machines based on occupancy and room temperature. This ECM approximates the installation of two of these control systems, one for the cold beverage machine, and one for the snack machines

Energy Savings Calculations:

See **Vending Miser Appendix** for calculation methods and analysis.

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$179
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$179
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$386
Total Yearly Savings ($/Yr):	$386
Estimated ECM Lifetime (Yr):	15
Simple Payback	0.5
Simple Lifetime ROI	3135.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$5,791
Internal Rate of Return (IRR)	216%
Net Present Value (NPV)	$4,429.64

ECM #4: Computer Monitor Replacement

Description:

The computers throughout Bret Harte Elementary School utilize a mixture of CRT computer monitors and LCD computer monitors. Computers are located in the offices, computer labs, media centers, and classrooms. The CRT computer monitors are outdated and have several disadvantages such as; significantly increased higher energy consumption, uses large amount of desk space, poor picture quality, distortions and flickering image, secular glare problems, and high weight, and electromagnetic emissions. Many of these drawbacks are difficult to quantify except for the energy use. CRT monitors use considerably more energy than an alternative flat panel LCD monitor. Replacement of the existing CRT monitors with LCD monitors saves considerable energy as well as provides other ergonomic benefits.

Based on the site survey it was noted that in some conditions the computers were left on and allowed to run 24 / 7, while in other rooms the computers were shut down. Some of the monitors were left in screen saver mode, which is deceiving since this mode only saves the computer screen from image burn in, however it does not save on energy consumption. The average operating hours for all computers and monitors is estimated based on the site survey observations. Energy consumption of computer monitors is based on manufacture's specifications.

This ECM includes replacement of all existing CRT monitors with LCD flat panel monitors throughout the school. Installation costs were neglected for this ECM with the intention that this ECM would be replaced by the school employees. The calculations are based on the following operating assumptions:

Energy Savings Calculations:

No. of CRT Monitors:	23
Weeks per Yr:	40
Hrs per Week:	60 (12 hrs per day. 5 days a week)

$$Electric\,Usage = \frac{\#\,of\ \ Computers \times Monitor\ \ Power\,(W) \times Operation\,(Hrs)}{1000\left(\frac{W}{KW}\right)}$$

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

COMPUTER MONITOR CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CRT Monitors	LCD Monitor	
# of Computers	23	23	
Monitor Power Cons. (W)	75	25	
Operating Hrs per Week	60	60	
Operating Weeks per Yr	40	40	
Elec Cost ($/kWh)	0.167	0.167	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	4,140	1,380	2,760
Energy Cost ($)	$691	$230	$461
COMMENTS:	CRT Monitor consumption based on Dell CRT monitor M/N: CRT-E771MM. Operating hours based on estimated average.		

Installation cost of new monitors is estimated based on current pricing for a 17" LCD monitor on the market today. No labor costs were included for replacing the existing monitors with the new monitors. No incentives are available for installation of computer monitors. Net cost per monitor was estimated to be $100.

Installation Costs: # Monitors X Cost per Monitor
23 Monitors X $100 per Monitor
$2,300

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,300
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$2,300
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$461
Total Yearly Savings ($/Yr):	$461
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.0
Simple Lifetime ROI	200.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$6,915
Internal Rate of Return (IRR)	18%
Net Present Value (NPV)	$3,203.39

ECM #5: Condensing Boiler Installation

Description:

The central heating system consists of two Kewanee fire tube gas-fired boilers that serve the original building's heating hot water loop. These boilers were installed as part of the original construction of the building in 1967 and are 20 years beyond its useful service life as defined by ASHRAE. With the increased efficiency of the condensing boilers, the savings can be substantial.

New condensing boilers could substantially improve the operating efficiency of the heating system of the building. Condensing boiler's peak efficiency tops out at 99% depending on return water temperature. Due to the operating conditions of the building, the annual average operating efficiency of the proposed condensing boiler is expected to be 88%. The existing boiler's efficiency is approximately 65%, which makes the condensing boiler an 18% increase in efficiency. This ECM is based on variable supply water temperature adjusted based on outdoor temperature.

This ECM includes installation of two condensing gas fired boilers to replace the existing fire tube boiler located in the original boiler room. The basis for this ECM is Aerco, Benchmark BMK-2.0LN-1 and BMK-3.0LN-1 condensing boilers or equivalent. The boiler installation is based on a one for one replacement based on capacity of the existing boiler.

Energy Savings Calculations:

Savings Calculations were calculated with energy modeling software, Trane Trace 700 version 6.2.6.5, to compare the existing conditions to the alternative energy conservation measure. The model was built using existing information collected and provided by Bret Harte Elementary School regarding lighting power density, occupancy profiles, HVAC information, and available floor plans.

ENERGY USAGE SAVINGS	
Electric Demand (kW)	0.00
Electric Consumption (kWh)	1,469
Natural Gas Consumption (therms)	4,529
ENERGY COST SAVINGS	
Electric Cost	$239
Natural Gas Cost	$4,574
Total Energy Cost	$4,814

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$218,245
NJ Smart Start Equipment Incentive ($):	$5,000
Net Installation Cost ($):	$213,245
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$4,814
Total Yearly Savings ($/Yr):	$4,814
Estimated ECM Lifetime (Yr):	25
Simple Payback	44.3
Simple Lifetime ROI	-43.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$120,350
Internal Rate of Return (IRR)	-4%
Net Present Value (NPV)	($129,418.11)

ECM #6: Pump Motor & VFD Retrofit

Description:

The unit ventilators are utilizing a constant volume pumping design. The unit ventilators have pneumatic 2-way control valves which only allow flow through the unit ventilators when heating or cooling is necessary.

This ECM includes the installation of Variable Frequency Drives on the two (2) existing 5 horsepower pumps. The VFD's would be controlled by a differential pressure sensor in the water loop to measure demand for water. This ECM also includes replacement of the existing pump motors with inverter duty motors that meet NEMA Premium Efficiency Standard, which also helps to reduce energy consumption.

Energy Savings Calculations:

Savings Calculations were calculated with energy modeling software, Trane Trace 700 version 6.2.6.5, to compare the existing conditions to the alternative energy conservation measure. The model was built using existing information collected and provided by Clara Barton Elementary School regarding lighting power density, occupancy profiles, HVAC information, and available floor plans.

ENERGY USAGE SAVINGS	
Electric Demand (kW)	0.00
Electric Consumption (kWh)	6,796
Natural Gas Consumption (therms)	0
ENERGY COST SAVINGS	
Electric Cost	$1,108
Natural Gas Cost	$0
Total Energy Cost	$1,108

There are no incentives available for installation of variable frequency drives for boiler water systems.

From the **NJ Smart Start Incentive Appendix**, the replacement of the existing standard efficiency motors with NEMA premium efficiency motors warrants the following incentive: 5 HP motor = $54 per motor

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$20,070
NJ Smart Start Equipment Incentive ($):	$108
Net Installation Cost ($):	$19,962
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,108
Total Yearly Savings ($/Yr):	$1,108
Estimated ECM Lifetime (Yr):	15
Simple Payback	18.0
Simple Lifetime ROI	-16.7%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$16,620
Internal Rate of Return (IRR)	-2%
Net Present Value (NPV)	($6,734.77)

ECM #7: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the Bret Harte Elementary School are 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 daylight sensors (The majority of the savings is expected to be after school hours when rooms are left with lights on)

This ECM includes installation of ceiling or switch mount sensors for 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:

$$\text{Energy Savings} = \left(\%\ \text{Savings} \times \text{Controlled Light Energy}\ \left(\text{kWh/Yr}\right)\right)$$

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

Cost and Incentives:

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

Dual Technology Occupancy Sensor - Remote Mnt.	$300 per installation
Dual Technology Occupancy Sensor - Switch Mnt	$150 per installation

Cost includes material and labor.

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

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

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$10,200
NJ Smart Start Equipment Incentive ($):	$1,125
Net Installation Cost ($):	$9,075
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,799
Total Yearly Savings ($/Yr):	$1,799
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.0
Simple Lifetime ROI	197.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$26,985
Internal Rate of Return (IRR)	18%
Net Present Value (NPV)	$12,401.35

ECM #8: Water Conservation

Description:

Bret Harte Elementary School utilizes standard plumbing fixtures. The typical sink water consumption only meets the minimum federally required standard for water efficiency. New fixtures are available that use less water than today's requirements and can add up to significant water reduction over a long period.

This ECM includes the replacement of the existing sink faucets within the bathrooms. The estimated usage of the plumbing fixtures is based on the total population of the facility. The number of plumbing fixtures to be replaced is based on site survey of the facilities.

The proposed retrofit includes installation of auto flow sink faucets and low flow aerators. For the basis of this calculation the LEED rating system was used to estimate the occupancy usage for students within the school. When water consumption information was not available, the GPF values were estimated for the existing fixtures.

Energy Savings Calculations:

Faucets:

$$\text{Water Consumption} = \text{Occupancy}\left(\frac{\text{Days}}{\text{Yr}}\right) \times \text{Use}\left(\frac{\text{Use}}{\text{Person per Day}}\right) \times \text{Use Time}\left(\frac{\text{Sec}}{\text{Use}}\right) \times \text{Fixture}\left(\frac{\text{Gal}}{\text{Min}}\right)$$

$$\text{Water Cost} = \frac{\text{Water Consumption (Gallons)} \times \text{Ave Cost}\left(\frac{\$}{1000\ \text{Gal}}\right)}{1000(\text{Gal})}$$

$$\text{Gas Cost (Therms)} = \text{Faucet Water Consumption (Gallons)} \times \frac{8.34\ \text{BTU}}{\text{Gal}} \times \frac{\text{Therm}}{100{,}000\ \text{BTU}}$$

WATER CONSERVATION CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Fixtures	Low Flow / Auto Flow Fixtures	-
Total Number of Students	370	370	-
% Male to Female	50%	50%	-
Estimated % Floor Area Served by Older Bathrooms	100%	100%	-
Occupied Days Per Year	250	250	-
Lavatory Uses per Day per Person	0.5	0.5	-
Sink flow time per use, sec	15	12	-
Sink Aerator Flow, GPM	1.5	0.5	-
**** Water Cost ($/1000 Gal)**	$8.00	$8.00	-
Gas Cost ($/Therm)	$1.01	$1.01	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Total Water Consumption, (Gal)	17,344	4,625	12,719
Water Cost ($)	$139	$37	$102
Gas Consumption (Therms)	72	19	53
Gas Cost ($/Year)	$73	$19	$54
COMMENTS:	*Savings are based on LEED Reference Guide for Green Building Design and Construction - 2009 Edition for WC and Urinal water usage. ** Cost of Water estimated.		

There are no Smart Start rebates for installation of low flow plumbing fixtures.

Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$1,519
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$1,519
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$155
Total Yearly Savings ($/Yr):	$155
Estimated ECM Lifetime (Yr):	15
Simple Payback	9.8
Simple Lifetime ROI	53.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$2,325
Internal Rate of Return (IRR)	6%
Net Present Value (NPV)	$331.38

REM #1: 105.52 kW Solar System

Description:

The Bret Harte Elementary School has available roof space that could accommodate a significant amount of solar generation. Based on the available area a 105.52 kilowatt solar array could be installed, assuming the existing roof structure is capable of supporting an array. The array will produce approximately 128,909 kilowatt-hours annually that will reduce the overall electric usage of the facility by 47.23%.

Energy Savings Calculations:

See **Renewable / Distributed Energy Measures Calculations Appendix** for detailed financial summary and proposed solar layout areas. Financial results in table below are based on 100% financing of the system over a fifteen year period.

Energy Savings Summary:

REM #1 - ENERGY SAVINGS SUMMARY	
System Size (KW_{DC}):	105.52
Electric Generation (KWH/Yr):	128,909
Installation Cost ($):	$645,519
SREC Revenue ($/Yr):	$49,708
Energy Savings ($/Yr):	$21,012
Total Yearly Savings ($/Yr):	$70,720
ECM Analysis Period (Yr):	15
Simple Payback (Yrs):	9.1
Analysis Period Electric Savings ($):	$390,803
Analysis Period SREC Revenue ($):	$720,080
Net Present Value (NPV)	$103,433.86

V. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures with attractive paybacks. These measures are not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

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

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

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

E. Turn off computers when not in use. Ensure computers are not running in screen saver mode which saves the monitor screen not energy.

F. Ensure outside air dampers are functioning properly and only open during occupied mode.

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

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Cherry Hill Public Schools – Bret Harte Elementary School

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
ECM #1	Lighting Upgrade	$5,870	$1,467	$450	$6,887	$2,891	$0	$2,891	15	$43,365	$0	529.7%	2.4	41.75%	$27,625.57
ECM #2	LED Exit Signs	$650	$0	$180	$470	$67	$0	$67	15	$999	$0	112.6%	7.1	11.35%	$325.42
ECM #3	Vending Miser Controls	$179	$0	$0	$179	$386	$0	$386	15	$5,791	$0	3135.1%	0.5	215.67%	$4,429.64
ECM #4	Computer Monitor Replacement	$2,300	$0	$0	$2,300	$461	$0	$461	15	$6,915	$0	200.7%	5.0	18.47%	$3,203.39
ECM #5	Condensing Boiler Replacement	$111,538	$106,707	$5,000	$213,245	$4,814	$0	$4,814	25	$120,350	$0	-43.6%	44.3	-3.99%	($129,418.11)
ECM #6	VFD on Hot Water Pumps	$5,908	$14,162	$108	$19,962	$1,108	$0	$1,108	15	$16,620	$0	-16.7%	18.0	-2.21%	($6,734.77)
ECM #7	Lighting Controls	$8,160	$2,040	$1,125	$9,075	$1,799	$0	$1,799	15	$26,985	$0	197.4%	5.0	18.21%	$12,401.35
ECM #8	Water Efficiency	$450	$1,069	$0	$1,519	$155	$0	$155	15	$2,325	$0	53.1%	9.8	5.86%	$331.38
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	Solar Photovoltaic System	$645,519	$0	$0	$645,519	$21,012	$49,708	$70,720	15	$1,060,800	$745,620	64.3%	9.1	6.97%	$198,731.77

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	$10 per fixture (1-4 lamps)
Replacement of T12 with new T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities	$25 per fixture (1-2 lamps) $30 per fixture (3-4 lamps)
Replacement of incandescent with screw-in PAR 38 or PAR 30 (CFL) bulb	$7 per bulb
T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
Hard-Wired Compact Fluorescent	$25 - $30 per fixture
Metal Halide w/Pulse Start	$25 per fixture
LED Exit Signs	$10 - $20 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $284 per fixture
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture
HID ≥ 100w Replacement with new HID ≥ 100w	$70 per fixture
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$42 per 5 foot $65 per 6 foot

Lighting Controls – Occupancy Sensors

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

Lighting Controls – HID or Fluorescent Hi-Bay Controls

Occupancy hi-low	$75 per fixture controlled
Daylight Dimming	$75 per fixture controlled
Daylight Dimming - office	$50 per fixture controlled

Premium Motors

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

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2004 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and a IRR of at least 10%.
Multi Measures Bonus	15%

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Cherry Hill BOE - Bret Harte Elementary

Building ID: 2787749
For 12-month Period Ending: April 30, 2011[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: August 02, 2011

Facility
Cherry Hill BOE - Bret Harte Elementary
1909 Queen Anne Drive
Cherry Hill, NJ 08003

Facility Owner
Cherry Hill Public Schools
45 Ranoldo Terrace
Cherry Hill, NJ 08034

Primary Contact for this Facility
James Devereaux
45 Ranoldo Terrace
Cherry Hill, NJ 08034

Year Built: 1967
Gross Floor Area (ft²): 56,579

Energy Performance Rating[2] (1-100) 71

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	931,169
Natural Gas (kBtu)[4]	2,752,922
Total Energy (kBtu)	3,684,091

Energy Intensity[5]

Site (kBtu/ft²/yr)	65
Source (kBtu/ft²/yr)	106

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	278

Electric Distribution Utility
Public Service Electric & Gas Co

National Average Comparison

National Average Site EUI	80
National Average Source EUI	130
% Difference from National Average Source EUI	-19%
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. Values represent energy intensity, annualized to a 12-month period.
5. 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) or a Registered Architect (RA) 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 or RA 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	Cherry Hill BOE - Bret Harte Elementary	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	1909 Queen Anne Drive, Cherry Hill, NJ 08003	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		☐
Cherry Hill BOE - Bret Harte Elementary (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	56,579 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	44	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	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	70 %	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	10(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: Public Service Electric & Gas Co

Fuel Type: Electricity

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

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
04/01/2011	04/30/2011	23,460.00
03/01/2011	03/31/2011	27,750.00
02/01/2011	02/28/2011	32,160.00
01/01/2011	01/31/2011	27,870.00
12/01/2010	12/31/2010	30,720.00
11/01/2010	11/30/2010	25,500.00
10/01/2010	10/31/2010	20,400.00
09/01/2010	09/30/2010	19,680.00
08/01/2010	08/31/2010	10,770.00
07/01/2010	07/31/2010	10,800.00
06/01/2010	06/30/2010	22,260.00
05/01/2010	05/31/2010	21,540.00
Electric Consumption (kWh (thousand Watt-hours))		**272,910.00**
Electric Consumption (kBtu (thousand Btu))		**931,168.92**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**931,168.92**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

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

Start Date	End Date	Energy Use (therms)
04/01/2011	04/30/2011	1,526.69
03/01/2011	03/31/2011	4,024.23
02/01/2011	02/28/2011	5,760.30
01/01/2011	01/31/2011	5,689.94
12/01/2010	12/31/2010	5,977.76
11/01/2010	11/30/2010	2,957.74
10/01/2010	10/31/2010	938.15
09/01/2010	09/30/2010	72.33
08/01/2010	08/31/2010	49.27
07/01/2010	07/31/2010	54.75

06/01/2010	06/30/2010	84.99
05/01/2010	05/31/2010	393.07
Gas Consumption (therms)		**27,529.22**
Gas Consumption (kBtu (thousand Btu))		**2,752,922.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**2,752,922.00**
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 PE or RA 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
Cherry Hill BOE - Bret Harte Elementary
1909 Queen Anne Drive
Cherry Hill, NJ 08003

Facility Owner
Cherry Hill Public Schools
45 Ranoldo Terrace
Cherry Hill, NJ 08034

Primary Contact for this Facility
James Devereaux
45 Ranoldo Terrace
Cherry Hill, NJ 08034

General Information

Cherry Hill BOE - Bret Harte Elementary	
Gross Floor Area Excluding Parking: (ft^2)	56,579
Year Built	1967
For 12-month Evaluation Period Ending Date:	April 30, 2011

Facility Space Use Summary

Cherry Hill BOE - Bret Harte Elementary	
Space Type	K-12 School
Gross Floor Area(ft^2)	56,579
Open Weekends?	No
Number of PCs	44
Number of walk-in refrigeration/freezer units	0
Presence of cooking facilities	Yes
Percent Cooled	70
Percent Heated	100
Months[o]	10
High School?	No
School District[o]	Cherry Hill

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 04/30/2011)	**Baseline** (Ending Date 04/30/2011)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	71	71	75	N/A	50
Energy Intensity					
Site (kBtu/ft^2)	65	65	63	N/A	80
Source (kBtu/ft^2)	106	106	102	N/A	130
Energy Cost					
$/year	N/A	N/A	N/A	N/A	N/A
$/$ft^2$/year	N/A	N/A	N/A	N/A	N/A
Greenhouse Gas Emissions					
$MtCO_2e$/year	278	278	267	N/A	342
$kgCO_2e/ft^2$/year	5	5	5	N/A	6

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.

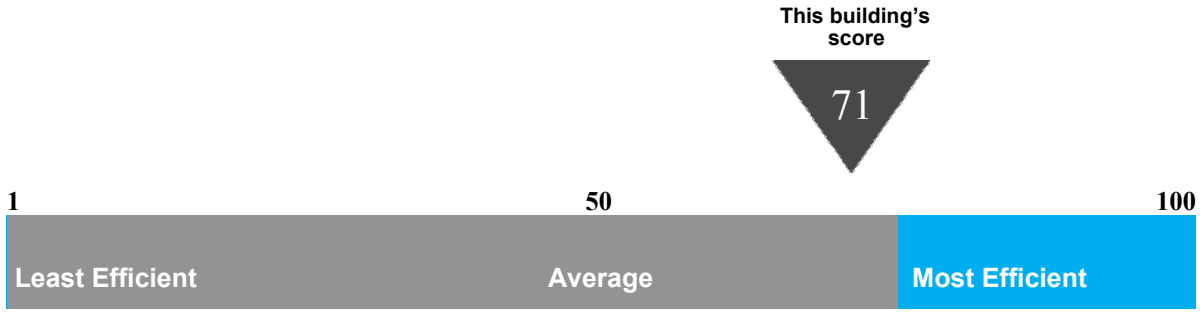
Statement of Energy Performance

2011

Cherry Hill BOE - Bret Harte Elementary
1909 Queen Anne Drive
Cherry Hill, NJ 08003

Portfolio Manager Building ID: 2787749

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 106 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending April 2011

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: 08/02/2011

MAJOR EQUIPMENT LIST

Concord Engineering Group

Cherry Hill BOE - Bret Harte Elementary School

AC Units

Tag			
Unit Type	Heat Pump	Window AC Units	Window AC Units
Qty	4	17	2
Location	New Wing Roof	Classrooms	Classrooms
Area Served	New Wing Classroom	Classrooms	Classrooms
Manufacturer	Comfort Maker	Frigidaire	Kenmoore
Model #	CHP248AKAA	FAM187R2A	58075180700
Serial #	2002266678	IK74627555	-
Cooling Type	DX, R-22	DX, R-22	DX, R-22
Cooling Capacity (Tons)	4 Tons	18,500 BTUH	17,500 BTUH
Cooling Efficiency (SEER/EER)	12 SEER	10.7 EER	9.7 EER
Heating Type	Heat Pump	N/A	N/A
Heating Input (MBH)	33 MBH (est)	N/A	N/A
Efficiency	8 HSPF	N/A	N/A
Fuel	Heat Pump	N/A	N/A
Approx Age	9	4	15 (est)
ASHRAE Service Life	15	15	15
Remaining Life	6	11	0
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AC Units

Tag			
Unit Type	Window AC Units	Window AC Units	Window AC Units
Qty	5	3	2
Location	Classrooms	Classrooms	Classrooms
Area Served	Classrooms	Classrooms	Classrooms
Manufacturer	General Electric	Air Temp	Panosonic
Model #	AGN12ACG1	B7D24E7A	CW-XC184HU
Serial #	ZZ394024	CR589105069E	403KACA00435
Cooling Type	DX, R-22	DX, R-22	DX, R-22
Cooling Capacity (Tons)	12,000 BTUH	24,000 BTUH	17,800 BTUH
Cooling Efficiency (SEER/EER)	9.8 EER	9.5 EER	10.7 EER
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	20 (est)	20	10
ASHRAE Service Life	15	15	15
Remaining Life	(5)	(5)	5
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Cherry Hill BOE - Bret Harte Elementary School

Boilers

Tag			
Unit Type	Gas Fire Tub Boilers		
Qty	2		
Location	Boiler Room		
Area Served	Original building		
Manufacturer	Kewanee		
Model #	LW 70 05		
Serial #	N6764		
Input Capacity (Btu/Hr)	2930 MBH		
Rated Output Capacity (Btu/Hr)	2344 MBH		
Approx. Efficiency %	80.0%		
Fuel	Nat Gas		
Approx Age	44		
ASHRAE Service Life	24		
Remaining Life	(20)		
Comments	Converted to NG from Oil/ Burner BPR 22 3A4		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Cherry Hill BOE - Bret Harte Elementary School

Domestic Water Heaters

Tag			
Unit Type	Electric Domestic Hot Water	Gas Fired Domestic Hot Water	
Qty	1	1	
Location	New wing storage closet	Boiler Room	
Area Served	new addition	Original Building	
Manufacturer	AO Smith	State	
Model #	DEL 40 104	SBF 75 250	
Serial #	MF00-0947322-104	H98338543	
Size (Gallons)	40 Gallons	75 Gallons	
Input Capacity (MBH/KW)	6 KW	250 MBH	
Recovery (Gal/Hr)	43 Gal/Hr	227.3 Gal/Hr	
Efficiency %	100%	80%	
Fuel	Electric	Nat Gas	
Approx Age	11	13	
ASHRAE Service Life	12	12	
Remaining Life	1	(1)	
Comments			

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Cherry Hill BOE - Bret Harte Elementary School

Pumps

Tag			
Unit Type	End Suction Pumps		
Qty	2		
Location	Boiler Room		
Area Served	Hot water loop		
Manufacturer	B&G		
Model #			
Serial #			
Horse Power	5 HP		
Flow	130 GPM @ 60 FT HD		
Motor Info	US Electric Motors		
Electrical Power	208v		
RPM	1715 RPM		
Motor Efficiency %	-		
Approx Age	25		
ASHRAE Service Life	20		
Remaining Life	(5)		
Comments	1 motor is a new Baldor Super E.		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Investment Grade Lighting Audit

CEG Job #: 9C11001
Project: Bret Harte
1909 Queen Ann Road
Cherry Hill, NJ
Bldg. Sq. Ft.

Bret Harte

KWH COST: $0.163

ECM #1 & 2: Lighting Upgrade - General & Re-Lamping

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
211.14	Electrical Room	800	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.10	79.2	$12.91	3	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.08	60	$9.78	$7.00	$21.00	0.02	19.2	$3.13	6.71
211.14	Boiler Room	4200	5	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.17	693.0	$112.96	5	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.13	525	$85.58	$7.00	$35.00	0.04	168	$27.38	1.28
211.15	Boiler Room Hall	3000	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.10	297.0	$48.41	3	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.08	225	$36.68	$7.00	$21.00	0.02	72	$11.74	1.79
211.11	Room 100	2600	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.03	85.8	$13.99	1	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.03	65	$10.60	$7.00	$7.00	0.01	20.8	$3.39	2.06
111.11		2600	1	1	1x4, 1-Lamp, 34w T12, Elec. Ballast, Surface Mnt., Prismatic Lens	38	0.04	98.8	$16.10	1	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.03	65	$10.60	$80.00	$80.00	0.01	33.8	$5.51	14.52
211.11	Library	2600	41	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	1.35	3,517.8	$573.40	41	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	1.03	2665	$434.40	$7.00	$287.00	0.33	852.8	$139.01	2.06
601		2600	2	2	(2) 7w CFL Exit Sign	16	0.03	83.2	$13.56	2	1	LED Exit Sign	2	0.00	10.4	$1.70	$65.00	$130.00	0.03	72.8	$11.87	10.96
211.11	Library Room	2600	4	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.13	343.2	$55.94	4	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.10	260	$42.38	$7.00	$28.00	0.03	83.2	$13.56	2.06
211.11	Library Conference Room	2600	2	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.07	171.6	$27.97	2	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.05	130	$21.19	$7.00	$14.00	0.02	41.6	$6.78	2.06
111.11	Men's Restroom	2600	1	1	1x4, 1-Lamp, 34w T12, Elec. Ballast, Surface Mnt., Prismatic Lens	38	0.04	98.8	$16.10	1	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.03	65	$10.60	$80.00	$80.00	0.01	33.8	$5.51	14.52
111.11	Women's Restroom	2600	1	1	1x4, 1-Lamp, 34w T12, Elec. Ballast, Surface Mnt., Prismatic Lens	38	0.04	98.8	$16.10	1	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.03	65	$10.60	$80.00	$80.00	0.01	33.8	$5.51	14.52
211.11	Classroom 105	2600	20	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.66	1,716.0	$279.71	20	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.50	1300	$211.90	$7.00	$140.00	0.16	416	$67.81	2.06
211.11	Classroom 106	2600	20	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.66	1,716.0	$279.71	20	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.50	1300	$211.90	$7.00	$140.00	0.16	416	$67.81	2.06
211.11	Classroom 107	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 108	2600	13	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.43	1,115.4	$181.81	13	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.33	845	$137.74	$7.00	$91.00	0.10	270.4	$44.08	2.06

Investment Grade Lighting Audit

ECM #1 & 2: Lighting Upgrade - General & Re-Lamping

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
211.11	Classroom 109	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 110	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 111	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
242.25	First Floor Corridor	3000	18	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	104	1.87	5,616.0	$915.41	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
601		3000	4	2	(2) 7w CFL Exit Sign	16	0.06	192.0	$31.30	4	1	LED Exit Sign	2	0.01	24	$3.91	$65.00	$260.00	0.06	168	$27.38	9.49
232.21	Classroom 101	2600	19	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.63	4,248.4	$692.49	19	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.37	3556.8	$579.76	$21.00	$399.00	0.27	691.6	$112.73	3.54
232.21	First Floor Corridor - New Wing	3000	9	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.77	2,322.0	$378.49	9	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.65	1944	$316.87	$21.00	$189.00	0.13	378	$61.61	3.07
232.21	Classroom 102	2600	23	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.98	5,142.8	$838.28	23	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.66	4305.6	$701.81	$21.00	$483.00	0.32	837.2	$136.46	3.54
232.22	Classroom 103	2600	23	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	86	1.98	5,142.8	$838.28	23	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.66	4305.6	$701.81	$21.00	$483.00	0.32	837.2	$136.46	3.54
232.22	Boy's Restroom	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	86	0.17	447.2	$72.89	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$61.03	$21.00	$42.00	0.03	72.8	$11.87	3.54
232.22	Girl's Restroom	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	86	0.17	447.2	$72.89	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$61.03	$21.00	$42.00	0.03	72.8	$11.87	3.54
211.11	Classroom 115	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 114	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 113	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 112	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
222.11	Classroom 116	2600	4	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	644.8	$105.10	4	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.20	520	$84.76	$14.00	$56.00	0.05	124.8	$20.34	2.75
211.11	Boys Restroom	2600	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.10	257.4	$41.96	3	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.08	195	$31.79	$7.00	$21.00	0.02	62.4	$10.17	2.06

Investment Grade Lighting Audit

ECM #1 & 2: Lighting Upgrade - General & Re-Lamping

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
211.11	Girl's Restroom	2600	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.10	257.4	$41.96	3	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.08	195	$31.79	$7.00	$21.00	0.02	62.4	$10.17	2.06
5	Custodian Closet	800	1	1	34w Circuline Fluor.	40	0.04	32.0	$5.22	1	2	2 Lamp, 9w PL; new fixture	19	0.02	15.2	$2.48	$100.00	$100.00	0.02	16.8	$2.74	36.52
211.14	Storage	800	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.03	26.4	$4.30	1	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.03	20	$3.26	$7.00	$7.00	0.01	6.4	$1.04	6.71
222.21	Stairway 2	3000	4	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	744.0	$121.27	4	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.20	600	$97.80	$14.00	$56.00	0.05	144	$23.47	2.39
601		3000	1	2	(2) 7w CFL Exit Sign	16	0.02	48.0	$7.82	1	1	LED Exit Sign	2	0.00	6	$0.98	$65.00	$65.00	0.01	42	$6.85	9.49
211.11	Classroom 205	2600	18	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.59	1,544.4	$251.74	18	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.45	1170	$190.71	$7.00	$126.00	0.14	374.4	$61.03	2.06
211.11	Classroom 206	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 207	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 208	2600	11	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.36	943.8	$153.84	11	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.28	715	$116.55	$7.00	$77.00	0.09	228.8	$37.29	2.06
211.11	Classroom 209	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 210	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 211	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
222.21	Stairway 2	3000	4	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	744.0	$121.27	4	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.20	600	$97.80	$14.00	$56.00	0.05	144	$23.47	2.39
601		3000	1	2	(2) 7w CFL Exit Sign	16	0.02	48.0	$7.82	1	1	LED Exit Sign	2	0.00	6	$0.98	$65.00	$65.00	0.01	42	$6.85	9.49
211.11	Classroom 215	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 214	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 213	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06

Investment Grade Lighting Audit

ECM #1 & 2: Lighting Upgrade - General & Re-Lamping

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
211.11	Classroom 212	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
122.11	Classroom 216	2600	1	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mnt., Clear Acrylic Lens	78	0.08	202.8	$33.06	1	2	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	50	0.05	130	$21.19	$100.00	$100.00	0.03	72.8	$11.87	8.43
222.11		2600	3	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	483.6	$78.83	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	390	$63.57	$14.00	$42.00	0.04	93.6	$15.26	2.75
211.11	Boy's Restroom	2600	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.10	257.4	$41.96	3	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.08	195	$31.79	$7.00	$21.00	0.02	62.4	$10.17	2.06
211.11	Women's Restroom	2600	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.10	257.4	$41.96	3	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.08	195	$31.79	$7.00	$21.00	0.02	62.4	$10.17	2.06
5	Custodian Closet	800	1	1	34w Circuline Fluor.	40	0.04	32.0	$5.22	1	2	2 Lamp, 9w PL; new fixture	19	0.02	15.2	$2.48	$100.00	$100.00	0.02	16.8	$2.74	36.52
211.14	Storage	800	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.03	26.4	$4.30	1	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.03	20	$3.26	$7.00	$7.00	0.01	6.4	$1.04	6.71
232.21	All Purpose Room	2600	20	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.72	4,472.0	$728.94	20	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.44	3744	$610.27	$21.00	$420.00	0.28	728	$118.66	3.54
211.11	Kitchen	2600	2	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.07	171.6	$27.97	2	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.05	130	$21.19	$7.00	$14.00	0.02	41.6	$6.78	2.06
211.11	Men's Restroom	2600	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.03	85.8	$13.99	1	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.03	65	$10.60	$7.00	$7.00	0.01	20.8	$3.39	2.06
211.11	Women's Restroom	2600	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.03	85.8	$13.99	1	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.03	65	$10.60	$7.00	$7.00	0.01	20.8	$3.39	2.06
211.11	Classroom 204	2600	23	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.76	1,973.4	$321.66	23	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.58	1495	$243.69	$7.00	$161.00	0.18	478.4	$77.98	2.06
211.11	Classroom 203	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 202	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Classroom 201	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.73	1,887.6	$307.68	22	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	$7.00	$154.00	0.18	457.6	$74.59	2.06
211.11	Corridor 201 - 204	3000	12	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.40	1,188.0	$193.64	12	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.30	900	$146.70	$7.00	$84.00	0.10	288	$46.94	1.79
601		3000	2	2	(2) 7w CFL Exit Sign	16	0.03	96.0	$15.65	2	1	LED Exit Sign	2	0.00	12	$1.96	$65.00	$130.00	0.03	84	$13.69	9.49

Investment Grade Lighting Audit

ECM #1 & 2: Lighting Upgrade - General & Re-Lamping

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
211.11	Storage	800	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	33	0.10	79.2	$12.91	3	1	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.08	60	$9.78	$7.00	$21.00	0.02	19.2	$3.13	6.71
222.21	Faculty Lounge	2600	5	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806.0	$131.38	5	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$105.95	$14.00	$70.00	0.06	156	$25.43	2.75
	Totals		789	96				86,933	$14,170	789	89			24.2	63,174	$10,297		$7,987	7.0	18,143	$2,957	2.70

NOTES: 1. Simple Payback noted in this spreadsheet does not include Maintenance Savings and NJ Smart Start Incentives.

2. Lamp totals only include T-12 tube replacement calculations

Notes:

3. Total Amount of EER 10.7 A/C Units: 17; Total Amount of EER 9.8 A/C Units: 5; Total Amount of EER 9.7 A/C Units: 1; Total Amount of EER 9.4 A/C Units: 1; Total Amount of EER 9.8 A/C Units: 5; Total Amount of Old A/C Units: 10; Total Amount of None & N/A A/C Units: 19

4. Total Amount of LCDs: 23; Total Amount of CRTs: 21

5. Total Amount of TVs: 14

32.99

chk kwh$ 0.635703

CEG Job #: 9C11001
Project: Bret Harte
Address: 1909 Queen Ann Road
Cherry Hill. NJ
Building SF:

Bret Harte

KWH COST: $0.163

#REF!

ECM #7: Lighting Controls

EXISTING LIGHTING												PROPOSED LIGHTING CONTROLS									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Existing Fixture **For Reference Only**	Retrofitted 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
211.14	Electrical Room	800	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.075	60	$9.78	3	0	no change	25	0.08	0%	60	$9.78	$0.00	$0.00	0.00	0	$0.00	0.00
211.14	Boiler Room	4200	5	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.125	525	$85.58	5	0	no change	25	0.13	0%	525	$85.58	$0.00	$0.00	0.00	0	$0.00	0.00
211.15	Boiler Room Hall	3000	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.075	225	$36.68	3	0	no change	25	0.08	0%	225	$36.68	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Room 100	2600	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.025	65	$10.60	1	0	no change	25	0.03	0%	65	$10.60	$0.00	$0.00	0.00	0	$0.00	0.00
111.11		2600	1	1	1x4, 1-Lamp, 34w T12, Elec. Ballast, Surface Mnt., Prismatic Lens	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.025	65	$10.60	1	0	no change	25	0.03	0%	65	$10.60	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Library	2600	41	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	1.025	2665	$434.40	41	3	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.82	20%	2132	$347.52	$300.00	$900.00	0.21	533	$86.88	10.36
601		2600	2	2	(2) 7w CFL Exit Sign	LED Exit Sign	2	0.004	10.4	$1.70	2	0	no change	2	0.00	0%	10.4	$1.70	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Library Room	2600	4	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.1	260	$42.38	4	0	no change	25	0.10	0%	260	$42.38	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Library Conference Room	2600	2	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.05	130	$21.19	2	0	no change	25	0.05	0%	130	$21.19	$0.00	$0.00	0.00	0	$0.00	0.00
111.11	Men's Restroom	2600	1	1	1x4, 1-Lamp, 34w T12, Elec. Ballast, Surface Mnt., Prismatic Lens	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.025	65	$10.60	1	0	no change	25	0.03	0%	65	$10.60	$0.00	$0.00	0.00	0	$0.00	0.00
111.11	Women's Restroom	2600	1	1	1x4, 1-Lamp, 34w T12, Elec. Ballast, Surface Mnt., Prismatic Lens	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.025	65	$10.60	1	0	no change	25	0.03	0%	65	$10.60	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Classroom 105	2600	20	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.5	1300	$211.90	20	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.40	20%	1040	$169.52	$300.00	$300.00	0.10	260	$42.38	7.08
211.11	Classroom 106	2600	20	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.5	1300	$211.90	20	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.40	20%	1040	$169.52	$300.00	$300.00	0.10	260	$42.38	7.08
211.11	Classroom 107	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 108	2600	13	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.325	845	$137.74	13	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.26	20%	676	$110.19	$300.00	$300.00	0.07	169	$27.55	10.89
211.11	Classroom 109	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44

ECM #7: Lighting Controls

EXISTING LIGHTING													PROPOSED LIGHTING CONTROLS								SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Existing Fixture **For Reference Only**	Retrofitted 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
211.11	Classroom 110	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 111	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
242.25	First Floor Corridor	3000	18	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Direct/Indirect	No Change	104	1.872	5616	$915.41	18	0	no change	104	1.87	0%	5616	$915.41	$0.00	$0.00	0.00	0	$0.00	0.00
601		3000	4	2	(2) 7w CFL Exit Sign	LED Exit Sign	2	0.008	24	$3.91	4	0	no change	2	0.01	0%	24	$3.91	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Classroom 101	2600	19	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.368	3556.8	$579.76	19	1	Dual Technology Occupancy Sensor - Remote Mnt.	72	1.09	20%	2845.44	$463.81	$300.00	$300.00	0.27	711.36	$115.95	2.59
232.21	First Floor Corridor - New Wing	3000	9	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.648	1944	$316.87	9	0	no change	72	0.65	0%	1944	$316.87	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Classroom 102	2600	23	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.656	4305.6	$701.81	23	1	Dual Technology Occupancy Sensor - Remote Mnt.	72	1.32	20%	3444.48	$561.45	$300.00	$300.00	0.33	861.12	$140.36	2.14
232.22	Classroom 103	2600	23	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.656	4305.6	$701.81	23	1	Dual Technology Occupancy Sensor - Remote Mnt.	72	1.32	20%	3444.48	$561.45	$300.00	$300.00	0.33	861.12	$140.36	2.14
232.22	Boy's Restroom	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.144	374.4	$61.03	2	0	no change	72	0.14	0%	374.4	$61.03	$0.00	$0.00	0.00	0	$0.00	0.00
232.22	Girl's Restroom	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.144	374.4	$61.03	2	0	no change	72	0.14	0%	374.4	$61.03	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Classroom 115	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 114	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 113	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 112	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
222.11	Classroom 116	2600	4	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.2	520	$84.76	4	1	Dual Technology Occupancy Sensor - Switch Mnt.	50	0.16	20%	416	$67.81	$150.00	$150.00	0.04	104	$16.95	8.85
211.11	Boys Restroom	2600	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.075	195	$31.79	3	0	no change	25	0.08	0%	195	$31.79	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Girl's Restroom	2600	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.075	195	$31.79	3	0	no change	25	0.08	0%	195	$31.79	$0.00	$0.00	0.00	0	$0.00	0.00

ECM #7: Lighting Controls

EXISTING LIGHTING													PROPOSED LIGHTING CONTROLS								SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Existing Fixture **For Reference Only**	Retrofitted 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
5	Custodian Closet	800	1	1	34w Circuline Fluor.	2 Lamp, 9w PL; new fixture	19	0.019	15.2	$2.48	1	0	no change	19	0.02	0%	15.2	$2.48	$0.00	$0.00	0.00	0	$0.00	0.00
211.14	Storage	800	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.025	20	$3.26	1	0	no change	25	0.03	0%	20	$3.26	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Stairway 2	3000	4	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.2	600	$97.80	4	0	no change	50	0.20	0%	600	$97.80	$0.00	$0.00	0.00	0	$0.00	0.00
601		3000	1	2	(2) 7w CFL Exit Sign	LED Exit Sign	2	0.002	6	$0.98	1	0	no change	2	0.00	0%	6	$0.98	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Classroom 205	2600	18	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.45	1170	$190.71	18	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.36	20%	936	$152.57	$300.00	$300.00	0.09	234	$38.14	7.87
211.11	Classroom 206	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 207	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 208	2600	11	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.275	715	$116.55	11	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.22	20%	572	$93.24	$300.00	$300.00	0.06	143	$23.31	12.87
211.11	Classroom 209	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 210	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 211	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
222.21	Stairway 2	3000	4	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.2	600	$97.80	4	0	no change	50	0.20	0%	600	$97.80	$0.00	$0.00	0.00	0	$0.00	0.00
601		3000	1	2	(2) 7w CFL Exit Sign	LED Exit Sign	2	0.002	6	$0.98	1	0	no change	2	0.00	0%	6	$0.98	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Classroom 215	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 214	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 213	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 212	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44

ECM #7: Lighting Controls

EXISTING LIGHTING												PROPOSED LIGHTING CONTROLS									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Existing Fixture **For Reference Only**	Retrofitted 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
122.11	Classroom 216	2600	1	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mnt., Clear Acrylic Lens	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	50	0.05	130	$21.19	1	0	no change	50	0.05	0%	130	$21.19	$0.00	$0.00	0.00	0	$0.00	0.00
222.11		2600	3	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	390	$63.57	3	0	no change	50	0.15	0%	390	$63.57	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Boy's Restroom	2600	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.075	195	$31.79	3	0	no change	25	0.08	0%	195	$31.79	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Women's Restroom	2600	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.075	195	$31.79	3	0	no change	25	0.08	0%	195	$31.79	$0.00	$0.00	0.00	0	$0.00	0.00
5	Custodian Closet	800	1	1	34w Circuline Fluor.	2 Lamp, 9w PL; new fixture	19	0.019	15.2	$2.48	1	0	no change	19	0.02	0%	15.2	$2.48	$0.00	$0.00	0.00	0	$0.00	0.00
211.14	Storage	800	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.025	20	$3.26	1	0	no change	25	0.03	0%	20	$3.26	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	All Purpose Room	2600	20	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.44	3744	$610.27	20	1	Dual Technology Occupancy Sensor - Remote Mnt.	72	1.15	20%	2995.2	$488.22	$300.00	$300.00	0.29	748.8	$122.05	2.46
211.11	Kitchen	2600	2	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.05	130	$21.19	2	0	no change	25	0.05	0%	130	$21.19	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Men's Restroom	2600	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.025	65	$10.60	1	0	no change	25	0.03	0%	65	$10.60	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Women's Restroom	2600	1	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.025	65	$10.60	1	0	no change	25	0.03	0%	65	$10.60	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Classroom 204	2600	23	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.575	1495	$243.69	23	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.46	20%	1196	$194.95	$300.00	$300.00	0.12	299	$48.74	6.16
211.11	Classroom 203	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 202	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Classroom 201	2600	22	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.55	1430	$233.09	22	1	Dual Technology Occupancy Sensor - Remote Mnt.	25	0.44	20%	1144	$186.47	$300.00	$300.00	0.11	286	$46.62	6.44
211.11	Corridor 201 - 204	3000	12	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.3	900	$146.70	12	0	no change	25	0.30	0%	900	$146.70	$0.00	$0.00	0.00	0	$0.00	0.00
601		3000	2	2	(2) 7w CFL Exit Sign	LED Exit Sign	2	0.004	12	$1.96	2	0	no change	2	0.00	0%	12	$1.96	$0.00	$0.00	0.00	0	$0.00	0.00
211.11	Storage	800	3	1	1x4, 1 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	25	0.075	60	$9.78	3	0	no change	25	0.08	0%	60	$9.78	$0.00	$0.00	0.00	0	$0.00	0.00

ECM #7: Lighting Controls

EXISTING LIGHTING											PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Existing Fixture **For Reference Only**	Retrofitted 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
222.21	Faculty Lounge	2600	5	2	2x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$105.95	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	50	0.20	20%	520	$84.76	$150.00	$150.00	0.05	130	$21.19	7.08
	Totals		789	96				26.0	68,789.6	$11,213	789	35			21.8		57,755.2	$9,414.10		$10,200	4.24	11,034	$1,799	5.67

Location Description	Area (Sq FT)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Total KW_{AC}	Panel Weight (41.9 lbs)	W/SQFT
Bret Harte Elementary School	11,010	SHARP NU-U235F2	449	17.5	7,876	105.52	128,909	85.5	18,813	13.40

.= Proposed PV Layout

Notes:

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

PVWatts Program Data Output - Flat Roof Panels

PVWatts * * * AC Energy & Cost Savings

Cautions for interpreting the Results

(Type comments here to appear on printout; maximum 1 row of 80 characters.)

Station Identification	
City:	Atlantic City
State:	New_Jersey
Latitude:	39.45° N
Longitude:	74.57° W
Elevation:	20 m
PV System Specifications	
DC Rating:	105.5 kW
DC to AC Derate Factor:	0.810
AC Rating:	85.5 kW
Array Type:	Fixed Tilt
Array Tilt:	10.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	0.2 ¢/kWh

Results			
Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	2.58	6854	11.17
2	3.33	8091	13.19
3	4.31	11304	18.43
4	5.20	12876	20.99
5	5.85	14705	23.97
6	6.14	14313	23.33
7	6.06	14459	23.57
8	5.54	13288	21.66
9	4.85	11425	18.62
10	3.76	9329	15.21
11	2.65	6537	10.66
12	2.23	5724	9.33
Year	4.38	128909	210.12

Project Name: **LGEA Solar PV Project - 9C11001**
Location: **Bret Harte Elementary School**
Description: **Photovoltaic System 100% Financing - 15 year**

Simple Payback Analysis

	Photovoltaic System 100% Financing - 15 year
Total Construction Cost	$645,519
Annual kWh Production	128,909
Annual Energy Cost Reduction	$21,012
Average Annual SREC Revenue	$49,708

Simple Payback: **9.13** Years

Life Cycle Cost Analysis

Analysis Period (years): 15
Discount Rate: 3%
Average Energy Cost ($/kWh) **$0.163**
Financing Rate: 6.00%
Financing %: 100%
Maintenance Escalation Rate: 3.0%
Energy Cost Escalation Rate: 3.0%
Average SREC Value ($/kWh) $0.386

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	$0	0	0	0	$0	0	0	0	0
1	$0	128,909	$21,012	$0	$70,900	$37,986	$27,381	$26,545	$26,545
2	$0	128,264	$21,643	$0	$70,545	$36,298	$29,070	$26,821	$53,366
3	$0	127,623	$22,292	$0	$63,812	$34,505	$30,863	$20,736	$74,102
4	$0	126,985	$22,961	$0	$57,143	$32,601	$32,766	$14,737	$88,839
5	$0	126,350	$23,649	$1,301	$56,858	$30,580	$34,787	$13,838	$102,677
6	$0	125,718	$24,359	$1,295	$56,573	$28,435	$36,933	$14,270	$116,947
7	$0	125,090	$25,090	$1,288	$50,036	$26,157	$39,210	$8,470	$125,417
8	$0	124,464	$25,842	$1,282	$49,786	$23,738	$41,629	$8,979	$134,396
9	$0	123,842	$26,618	$1,276	$43,345	$21,171	$44,196	$3,320	$137,716
10	$0	123,223	$27,416	$1,269	$43,128	$18,445	$46,922	$3,908	$141,624
11	$0	122,607	$28,239	$1,263	$36,782	$15,551	$49,817	($1,609)	$140,014
12	$0	121,994	$29,086	$1,257	$36,598	$12,478	$52,889	($940)	$139,074
13	$0	121,384	$29,958	$1,250	$30,346	$9,216	$56,151	($6,313)	$132,761
14	$0	120,777	$30,857	$1,244	$30,194	$5,753	$59,614	($5,560)	$127,202
15	$0	120,173	$31,783	$1,238	$24,035	$2,076	$63,291	($10,788)	$116,414
Totals:		1,867,402	$390,803	$13,963	$720,080	$334,987	$645,519	$116,414	$1,657,095

Net Present Value (NPV) **$103,434**