CLIFTON PUBLIC SCHOOLS
PUBLIC SCHOOL #14

99 ST. ANDREWS BOULEVARD
CLIFTON, NEW JERSEY 07012

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:	Champion Energy Services LLC

Natural Gas Utility Provider:	Public Service Electric & 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: 727000704
Account No: 69 575 301 08
Third Party Utility Provider: Champion Energy Services LLC
TPS Meter / Acct No: -

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Mar-12	21,760	150.8	$3,719
Apr-12	17,960	140.4	$3,253
May-12	12,540	104.4	$2,645
Jun-12	19,900	145.2	$3,964
Jul-12	16,320	117.6	$3,258
Aug-12	13,360	119.6	$2,952
Sep-12	16,760	168.4	$2,489
Oct-12	23,720	151.6	$3,146
Nov-12	39,000	184.4	$4,890
Dec-12	37,600	181.6	$4,925
Jan-13	50,120	196.4	$6,355
Feb-13	39,960	176.0	$5,100
Totals	**309,000**	**196.4 Max**	**$46,696**

AVERAGE DEMAND **153.0 KW average**
AVERAGE RATE **$0.151** **$/kWh**

Figure 1
Electricity Usage Profile

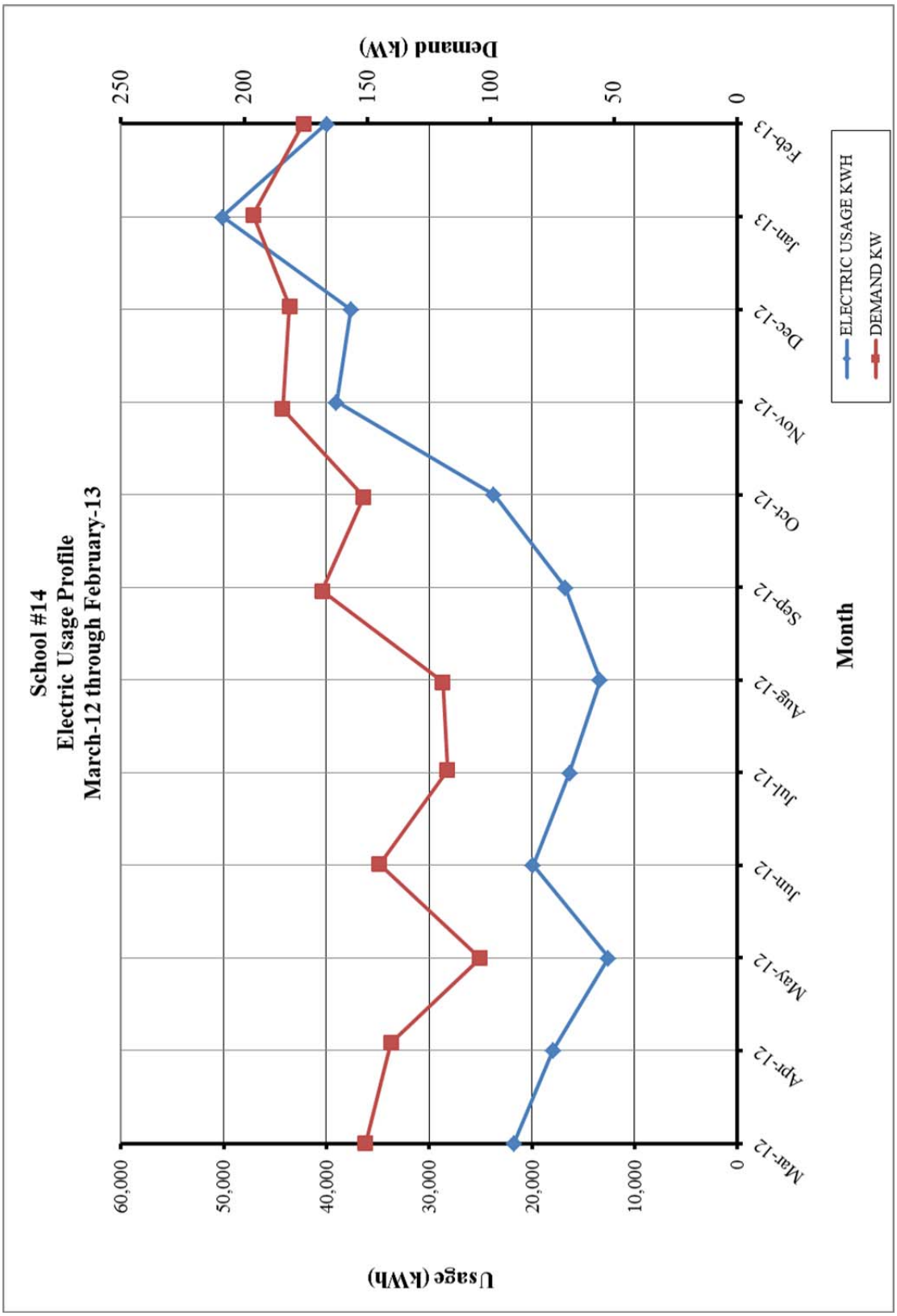
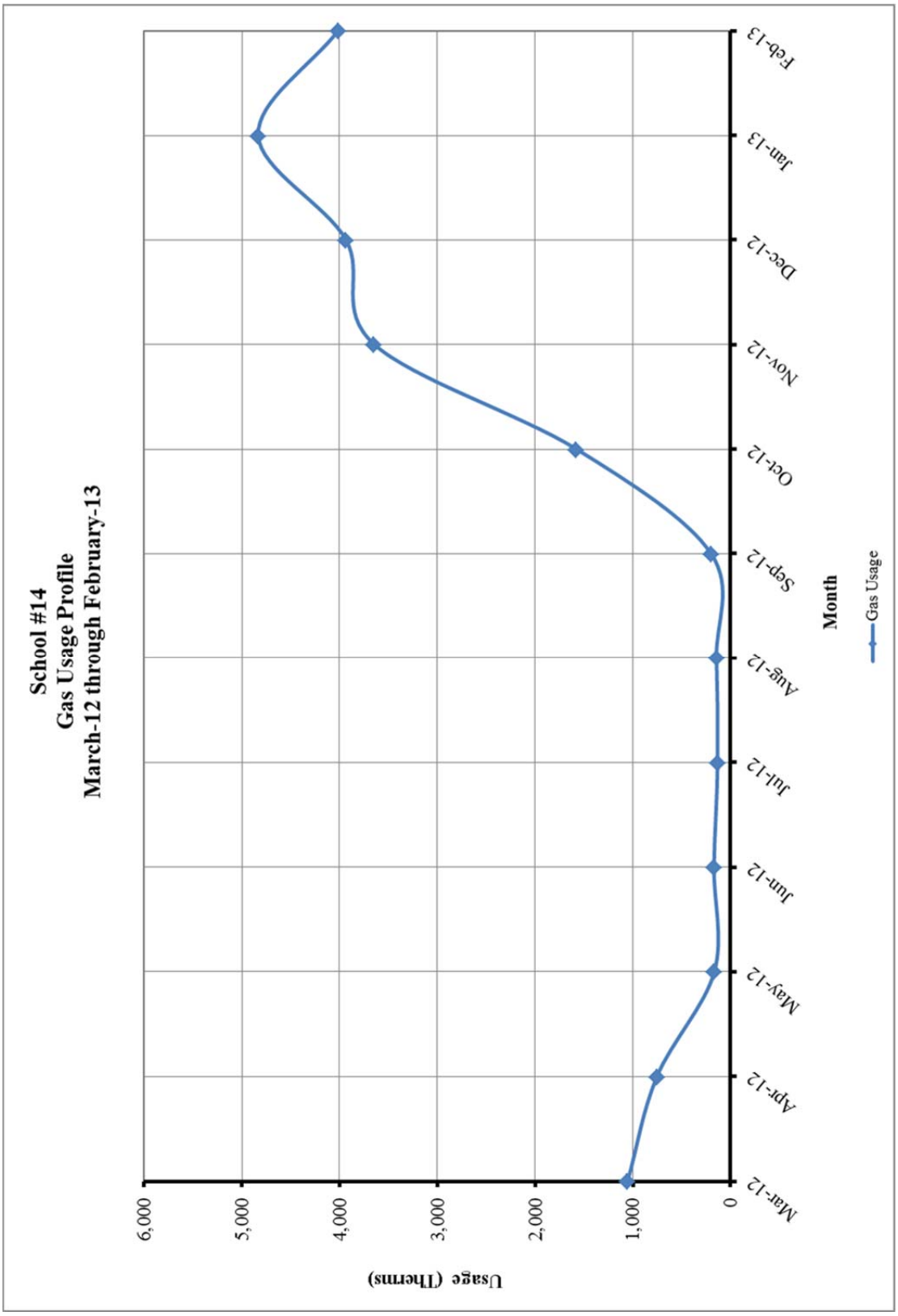


Table 2
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: PSE&G		
Rate: LVG		
Meter No: 1785431		
Account No: 69 575 301 08		
Third Party Utility Provider: Hess		
TPS Meter No: 446575/519241		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Mar-12	1,053.78	$708.28
Apr-12	753.73	$472.09
May-12	166.06	$185.28
Jun-12	170.73	$195.10
Jul-12	132.23	$177.72
Aug-12	144.82	$184.22
Sep-12	201.02	$216.87
Oct-12	1,580.57	$1,649.76
Nov-12	3,647.46	$3,211.02
Dec-12	3,936.02	$3,531.42
Jan-13	4,834.26	$4,179.69
Feb-13	4,013.81	$3,609.76
TOTALS	**20,634.49**	**$18,321.21**
AVERAGE RATE:	**$0.89**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

School #14 is located at 99 Saint Andrew's Boulevard in Clifton, New Jersey. This 39,815 SF school was built in 1953 with an addition in 1993. The building is a single-story facility comprised of administration offices, teacher's room, audio-visual room, general classrooms, special education classrooms, small group instruction rooms, child study team room, nurse's office, kitchen serving area, multi-purpose gym/cafeteria/assembly, stage, storage rooms, and mechanical/electrical rooms.

Occupancy Profile

The typical hours of operation for School #14 are Monday through Friday between 7:00 am and 4:00 pm. Maintenance staff is present in the building as early as 6:00 am, and nighttime cleaning staff present until 10:00 pm. The school's enrollment is approximately 320 students and has 96 teachers, support staff, and administrative personnel.

Building Envelope

Exterior walls for this school are brick faced with a concrete block construction. The amount of insulation within the walls is unknown. The windows throughout the school are in good condition and appear to be well maintained. Typical windows throughout the school are double-section, double pane, operable, ¼" clear glass with aluminum frames. The roofing is built-up asphalt sheets over cover board, rigid roof insulation and metal decking along with a covering of light colored gravel. The amount of roofing insulation is unknown.

HVAC Systems

School #14 HVAC systems consists of two (2) heating hot water boilers, seven (7) zone heating hot water pumps, classroom heating and ventilating units, and approximately nine (9) window air conditioning units. In addition, the temporary classroom units have BARD heating/cooling units mounted on the end of each modular unit.

The two (2) boilers are gas-fired, cast iron sectional hot water boilers approximately 20 years old with a rated input of 2,396 MBH and a rated output of 1,904 (when new). Manufactured by Weil-McLain and having an existing thermal efficiency of approximately 75%, these boilers feed hot water coils throughout the facility. Hot water is circulated via seven (7) Model UPS in-line, zone pumps manufactured by Grundfos. These zone pumps supply hot water to classroom unit ventilators, fin-tube radiators, cabinet/unit heaters, etc.

The modular units are heated and cooled by twelve (12) exterior, wall-mounted, Bard units rated at 4-tons for cooling and two stage (7.5/10 kW) electric resistive heating. Various offices and classrooms are cooled by window air conditioning units. Four (4) of the nine (9) units are in very poor condition along with being very inefficient (EER= 7.0) and should be replaced with Energy Star rated units with a cooling efficiency of 10.8 EER.

Fresh air is supplied to the classrooms via the unit ventilators & outside air intake louvers for the storage rooms, mechanical rooms, and modular classrooms.

Exhaust System

Air is exhausted from the toilet rooms through the roof exhausters. There are also several roof exhausters for the offices, storage rooms, mechanical rooms, corridors, etc. The modular classrooms exhaust through the exterior, wall-mounted Bard units.

HVAC System Controls

The various hot water valves in the boiler plant are controlled by 1990s vintage Powers pneumatic valve actuators and on/off switches. Some of the controls have proportional band logic but the sensors/controls are far out of calibration. The hot water supply temperature is reset via an outside air thermostat. Each unit ventilator in the classrooms is controlled by a Powers thermostat on the opposite wall with a temperature control dial that allows the occupant local temperature control. The cabinet/unit heaters are controlled by local thermostats.

Domestic Hot Water

Domestic hot water for the facility is supplied by a RHEEM Guardian Fury Model 22V40F1 high-efficiency gas-fired, hot water heater with a capacity of 40 gallons and an input of 38 MBH (gas). A 1/15 HP Bell & Gossett pump circulates the domestic hot water throughout the facility.

Lighting

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

Miscellaneous

The serving kitchen is equipped with Turbo-Air Deluxe Energy Star freezer and refrigerator units along with two portable heated rack cabinets and two milk refrigerators owned by the vendor.

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 - General	$12,772	$2,161	5.9	153.8%
ECM #2	Lighting Upgrade - MPR	$5,000	$259	19.3	-22.3%
ECM #3	Lighting Controls Upgrade	$9,387	$2,616	3.6	318.0%
ECM #4	Boiler Upgrade	$192,800	$3,056	63.1	-60.4%
ECM #5	Energy Star Refrigerator	$679	$61	11.1	34.8%
ECM #6	Window AC Replacements	$1,400	$236	5.9	68.6%
ECM #7	Water Conservation	$655	$1,144	0.6	2519.8%
ECM #8	DDC Controls Upgrade	$99,220	$2,656	37.4	-59.8%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	114.21 KW PV System	$697,051	$45,146	15.4	-2.8%
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 - General	7.1	14,310	-
ECM #2	Lighting Upgrade - MPR	0.7	1,716	-
ECM #3	Lighting Controls Upgrade	-	17,326	-
ECM #4	Boiler Upgrade	-	-	3,434
ECM #5	Energy Star Refrigerator	-	401	-
ECM #6	Window AC Replacements	1.6	1,244	-
ECM #7	Water Conservation	-	-	619 (118,800 Gallons of Water)
ECM #8	DDC Controls Upgrade	-	6,635	1,858
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	**DESCRIPTION**	**ANNUAL UTILITY REDUCTION**		
		ELECTRIC DEMAND (KW)	**ELECTRIC CONSUMPTION (KWH)**	**NATURAL GAS (THERMS)**
REM #1	114.21 KW PV System	114.2	131,975	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 - General	$2,161	$14,072	$1,300	$12,772	5.9
Lighting Upgrade - MPR	$259	$5,600	$600	$5,000	19.3
Lighting Controls Upgrade	$2,616	$10,597	$1,210	$9,387	3.6
~~Boiler Upgrade~~	~~$3,056~~	~~$196,800~~	~~$4,000~~	~~$192,800~~	~~63.1~~
Energy Star Refrigerator	$61	$679	$0	$679	11.1
Window AC Replacements	$236	$1,400	$0	$1,400	5.9
Water Conservation	$1,144	$655	$0	$655	0.6
~~DDC Controls Upgrade~~	~~$2,656~~	~~$99,220~~	~~$0~~	~~$99,220~~	~~37.4~~
Design / Construction Extras (15%)		$4,950		*$4,950*	
Total Project	**$6,477**	**$37,953**	**$3,110**	**$34,843**	**5.4**

Note: ECM's with the strike-through font are not included in the ESIP.

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 – General

Description:

The majority of the interior lighting throughout Clifton Elementary School #14 is provided with fluorescent fixtures with older generation, 700 series and 741/ECO 32W T8 lamps and electronic ballasts. Although these 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. Concord Engineering recommends that most of these fixtures remain unmodified due to the extensive costs which will be incurred if these fixtures are to be re-lamped and re-ballasted which results in a long payback period. For other areas that are over lit, Concord Engineering recommends that the fixture be retrofitted with new Super T-8 lamps/reflector, de-lamped to the appropriate light levels, and a new high-efficiency electronic ballast be installed. Finally, there are some fixtures that can be retrofitted to the Super T-8 lamp and Ballast system along with a reflector that would produce an economical payback period.

This 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. 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. 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. 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.

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$14,072
NJ Smart Start Equipment Incentive ($):	$1,300
Net Installation Cost ($):	$12,772
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,161
Total Yearly Savings ($/Yr):	$2,161
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.9
Simple Lifetime ROI	153.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$32,415
Internal Rate of Return (IRR)	15%
Net Present Value (NPV)	$13,025.88

ECM #2: Lighting Upgrade – Multi-Purpose Room

Description:

The Multi-Purpose Room at Clifton Elementary School #14 is currently lit via 250 watt Metal Halide HID fixtures. The space would be better served with a more efficient, fluorescent lighting system. Concord Engineering recommends upgrading the lighting to an energy-efficient T5 high output system that includes new four lamp, 54 watt high output fixtures.

This measure replaces all the HID, 250 watt HID MH fixtures with a well-designed T5 high output (HO) system. T5 High output fixtures with reflectors and wire guards will be required in order to meet the mandated 50 foot-candle average within the spaces.

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.

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$5,600
NJ Smart Start Equipment Incentive ($):	$600
Net Installation Cost ($):	$5,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$259
Total Yearly Savings ($/Yr):	$259
Estimated ECM Lifetime (Yr):	15
Simple Payback	19.3
Simple Lifetime ROI	-22.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$3,885
Internal Rate of Return (IRR)	-3%
Net Present Value (NPV)	($1,908.07)

ECM #3: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the Clifton Elementary School #14 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 (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 Media Centers. 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:

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

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

Rebates and Incentives:

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

Smart Start Incentive
= (# Wall mount sensors × $20 per sensor)
+ (# Ceiling mount sensors × $35 per sensor)

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$10,597
NJ Smart Start Equipment Incentive ($):	$1,210
Net Installation Cost ($):	$9,387
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,616
Total Yearly Savings ($/Yr):	$2,616
Estimated ECM Lifetime (Yr):	15
Simple Payback	3.6
Simple Lifetime ROI	318.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$39,240
Internal Rate of Return (IRR)	27%
Net Present Value (NPV)	$21,842.64

ECM #4: Condensing Boiler Installation

Description:

There are two existing Weil McLain hot water boilers which are used as the primary source of heat for Clifton Elementary School #14. These boilers are connected to several zone pumps which then distribute hot water to the baseboard heaters throughout the system. The Weil McLain boilers are approximately 20 years old and have not yet surpassed their life expectancy of a typical cast iron sectional boiler but the savings of new hot water condensing boilers can be significant.

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 92%. The existing boiler's efficiency is approximately 75%, which makes the condensing boilers an 17% 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 Weil McLain hot water cast iron sectional boilers. The basis for this ECM is Aerco condensing boiler; model number BMK – 2.0. The boiler installation is based on a one for one replacement based on capacity of the existing boiler.

Energy Savings Calculations:

Total Gas Therms Used: 20,634 Therms

Domestic Hot Water Gas Use: 2,052 Therms

Heating HW Boiler Gas Usage: 20,634 Therms – 2,052 Domestic HW = 18,582 Therms

$$Bldg\ \ Heat\ \mathrm{Re}quired = Existing\ \ Nat\ Gas\ (Therms) \times Heating\ \ Eff.(\%) \times Fuel\ \ HeatValue\left(\frac{BTU}{Therm}\right)$$

$$\mathrm{Pr}oposed\ \ Heating\ Gas\ Usage = \frac{Bldg\ \ Heat\ \mathrm{Re}quired\ (BTU)}{Heating\ \ Eff.(\%) \times Fuel\ \ Heat\ Value\left(\frac{BTU}{Therm}\right)}$$

$$Energy\ Cost = Heating\ Gas\ Usage(Therms) \times Ave\ Fuel\ Cost\left(\frac{\$}{Therm}\right)$$

CONDENSING BOILER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Cast Iron Boilers	New Condensing Boilers	
Existing Nat Gas (Therms)	18,582	0	
Boiler Efficiency (%)	75%	92%	17%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	1,394	1,394	
Gas Cost ($/Therm)	0.89	0.89	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	18,582	15,148	3,434
Energy Cost ($)	$16,538	$13,482	$3,056
COMMENTS:			

Note: Concord Engineering is utilizing a seasonal average efficiency of 92% to account for efficiencies based on an outside air reset schedule.

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$196,800
NJ Smart Start Equipment Incentive ($):	$4,000
Net Installation Cost ($):	$192,800
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$3,056
Total Yearly Savings ($/Yr):	$3,056
Estimated ECM Lifetime (Yr):	25
Simple Payback	63.1
Simple Lifetime ROI	-60.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$76,400
Internal Rate of Return (IRR)	-6%
Net Present Value (NPV)	($139,585.42)

ECM #5: Refrigerator Replacement

Description:

The Clifton Elementary School #14 has two residential style refrigerators in the faculty dining area. These units are older top freezer models that could be replaced with a new Energy Star rated models.

The proposed replacement is a one-for-one with a unit of similar size and dimensions that has the most up-to-date Energy Star Rating. The model selected is a 2013 model manufactured by Frigidaire.

Energy Savings Calculations:

ENERGY STAR REFRIGERATOR CALCULATION			
ECM INPUTS	**EXISTING 1**	**PROPOSED 1**	**SAVINGS**
Quantity	1	1	
Manufacturer	Admiral	Frigidaire	
Type	Top/Bottom	Top / Bottom	
Model	RTSA154AAE	FFTR1513LQ	
Size (Cu-Ft)	14.8	14.8	
Per Unit Electric Usage (kWh)	761	360	401
Electric Rate ($/kWh)	$0.151	$0.151	
ENERGY SAVINGS CALCULATIONS			
Electric Usage (kWh)	761	360	401
Energy Cost ($)	$115	$54	$61
COMMENTS:	Calculations based Energy Star Website http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator		

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$679
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$679
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$61
Total Yearly Savings ($/Yr):	$61
Estimated ECM Lifetime (Yr):	15
Simple Payback	11.1
Simple Lifetime ROI	34.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$915
Internal Rate of Return (IRR)	4%
Net Present Value (NPV)	$49.21

ECM #6: Window AC Unit Replacement

Description:

Cooling is provided to several offices and classrooms via window air conditioning units. These units vary in size, capacity and efficiency. The units have been fixed or replaced on an "as needed" basis throughout the building. These window AC units are old and inefficient.

It is recommended to utilize the energy star ratings as a minimum standard for replacing any window unit that is in need of replacement. Existing units that are old but still working should be considered for replacement if the efficiency is below 8.0 to 8.5 EER. Window AC units that are over 10 years old are very likely to fall in this efficiency range.

This ECM shows the savings and payback for replacing inefficient window air conditioners with new, Energy Star rated units. Qualifying product list can be found at Energy Star website at: www.energystar.gov/products. Although energy star rated products provide a valuable benchmark, it is recommended to consider even higher EER ratings for potential AC unit replacements where available.

Energy Savings Calculations:

Average Summer Electric Cost: $0.19/kWh (June through September)
Typical AC Unit Size: 12,000 BTU/HR

Estimated Full Load Hours of Unit: 800/Year

$$\text{Energy Savings, kWh} = \text{Cooling Capacity,} \frac{\text{BTU}}{\text{Hr}} \times \left(\frac{1}{\text{EER}_{\text{Old}}} - \frac{1}{\text{EER}_{\text{New}}} \right) \times \frac{\text{Full Load Hours}}{1000 \frac{\text{W}}{\text{kWh}}}$$

$$\text{Demand Savings, kW} = \frac{\text{Energy Savings (kWh)}}{\text{Hours of Cooling}}$$

$$\text{Cooling Cost Savings} = \text{Energy Savings (kWh)} \times \text{Average Summer Elec. Cost} \left(\frac{\$}{\text{kWh}} \right)$$

The following table depicts the replacement plan for the window air conditioning units:

ENERGY SAVINGS CALCULATIONS									
Capacity BTU/H	Amount of Units	Full Load Hrs	Typical Eff. (10 Yrs & Older) EER	New Eff. EER	Energy Savings kWh	Demand Savings kW	Cooling Cost Savings	Net Installed Cost	Simple Payback
12,000	4	800	8	10.8	1244	1.56	$236	$1,400	5.9

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$1,400
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$1,400
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$236
Total Yearly Savings ($/Yr):	$236
Estimated ECM Lifetime (Yr):	10
Simple Payback	5.9
Simple Lifetime ROI	68.6%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$2,360
Internal Rate of Return (IRR)	11%
Net Present Value (NPV)	$613.13

ECM #7: Water Conservation

Description:

The facility utilizes standard plumbing fixtures. The typical sink aerator consumption only meets the minimum federally required standard for water efficiency. New fixtures and aerators 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 aerators with low flow sink aerators in the restrooms.

Energy Savings Calculations:

Faucets:

$$\text{Water Consumption} = \text{Occupancy}\left(\frac{\text{Days}}{\text{Yr}}\right) \times \text{Use}\left(\frac{\text{min}}{\text{Day}}\right) \times \textit{FixtureQuantity} \times \text{Fixture}\left(\frac{\text{Gal}}{\text{Min}}\right)$$

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

$$\text{Water Heating Usage (therm)} = \frac{\text{Gallons}}{\text{year}} \times 8.33\frac{\text{Btu}}{\text{gal}} \times \Delta\text{T}\ (50°\text{F}) \times \frac{1}{\text{Heater Eff}\ (80\%)} \times \frac{\text{therm}}{100{,}000\ \text{Btu}}$$

LOW FLOW WATER SAVING DEVICES			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Quantity of Sinks	22	22	
Flow Rate (GPM)	2.2	1.0	1.2
Device Usage (min per day)	30	30	
Facility Operation (days / year)	150	150	
Natural Gas Rate ($/therm)	$0.890	$0.890	
Water Rate ($/1000gal)	$5.000	$5.000	
ENERGY SAVINGS CALCULATIONS			
Natural Gas Usage (Therm)	1,134	515	619
Water Usage (gallons)	217,800	99,000	118,800
Energy Cost ($)	$2,098	$954	$1,144
COMMENTS:			

Note water savings are shown as maintenance savings in summary tables.

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$655
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$655
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,144
Total Yearly Savings ($/Yr):	$1,144
Estimated ECM Lifetime (Yr):	15
Simple Payback	0.6
Simple Lifetime ROI	2519.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$17,160
Internal Rate of Return (IRR)	175%
Net Present Value (NPV)	$13,002.00

ECM #8: Digital Energy Management System (DDC EMS)

Description:

Currently, Clifton Elementary School #14 uses a pneumatic control system with manual boiler start-up controls. This system is very old and offers little more than an on/off cycling control of the heating system.

Concord Engineering recommends installing a DDC system throughout the school to control all of the HVAC systems including the boilers, indoor air handling units, and roof exhaust fans.

The system will include new temperature sensors and new local thermostats with limited over-ride capability, a front end computer and main controller. With the communication between the control devices and the front end computer interface, the facility manager will be able to take advantage of scheduling for occupied and unoccupied periods based on the actual occupancy of each space in the facility. Due to the fact that the building may have diverse hours of occupancy, including evening and weekend activities, having supervisory control over all of the equipment makes sense. The DDC system will also aid in the response time to service / maintenance issues when the facility is not under normal maintenance supervision, i.e. after-hours.

The new DDC system has the potential to provide significant savings by controlling the HVAC systems as a whole and provide operating schedules and features such as space averaging, night set-back, temperature override control, etc. The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the referenced report:

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

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 5% of the electricity and 10% for natural gas in these buildings.

The basis for the DDC system expansion is the Automated Logic Energy Management System or similar.

Energy Savings Calculations:

Energy savings for each utility is calculated with the equation below.

$$\text{Energy Savings (Utility)} = \text{Current Energy Consumption} \times \text{Estimated Savings, \%}$$

Following table summarizes energy savings for this facility via implementation of an Energy Management System:

DDC ENERGY MANAGEMENT SYSYEM CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Controls w/ Local Thermostats	DDC Controls	
Existing Nat Gas Usage (Therms)	18,582	-	
Existing Electricity Usage (kWh)	132,709	-	
Energy Savings, Nat Gas	-	10%	
Energy Savings, Electricity	-	5%	
Gas Cost ($/Therm)	*$0.89*	$0.89	
Electricity Cost ($/kWh)	*$0.151*	$0.151	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Nat Gas Usage (Therms)	18,582	16,724	1,858
Electricity Usage (kWh)	132,709	126,073	6,635
Nat Gas Cost ($)	$16,538	$14,884	$1,654
Electricity Cost ($)	$20,039	$19,037	$1,002
Energy Cost ($)	$36,577	$33,921	$2,656
COMMENTS:			

Demand savings due to implementation of this ECM is minimal.

The cost of a full DDC system with new field devices, controllers, computer, software, programming, etc. is approximately $3.35 per SF in accordance with recent Contractor pricing for systems of this magnitude. Savings from the implementation of this ECM will be from the reduced energy consumption currently used by the HVAC system by proper control of schedule and temperatures via the DDC system.

Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$99,220
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$99,220
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,656
Total Yearly Savings ($/Yr):	$2,656
Estimated ECM Lifetime (Yr):	15
Simple Payback	37.4
Simple Lifetime ROI	-59.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$39,840
Internal Rate of Return (IRR)	-10%
Net Present Value (NPV)	($67,512.84)

REM #1: 114.21 kW Solar System

Description:

The Clifton Elementary School #14 has available roof space that could accommodate a significant amount of solar generation. Based on the available areas a 114.21 kilowatt solar array could be installed. The array will produce approximately 131,975 kilowatt-hours annually that will reduce the overall electric usage of the facility by 42.71%.

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}):	114.21
Electric Generation (KWH/Yr):	131,975
Installation Cost ($):	$697,051
SREC Revenue ($/Yr):	$25,218
Energy Savings ($/Yr):	$19,928
Total Yearly Savings ($/Yr):	$45,147
ECM Analysis Period (Yr):	15
Simple Payback (Yrs):	15.4
Analysis Period Electric Savings ($):	$370,643
Analysis Period SREC Revenue ($):	$365,319
Net Present Value (NPV)	($246,907.56)

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. While the District is already performing many of these functions through routine maintenance it is important to continue to address these items as they provide an energy savings benefit.

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.

F. Replace older style CRT monitors with newer energy efficient LCD/LED monitors.

G. Ensure classroom televisions are turned off at the end of the day and while not in use.

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

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Clifton Public Schools – School #14

ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY														
ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Lighting Upgrade - General	$6,632	$7,440	$1,300	$12,772	$2,161	$0	$2,161	15	$32,415	$0	153.8%	5.9	14.78%	$13,025.88
ECM #2	Lighting Upgrade - MPR	$2,700	$2,900	$600	$5,000	$259	$0	$259	15	$3,885	$0	-22.3%	19.3	-3.00%	($1,908.07)
ECM #3	Lighting Controls Upgrade	$7,048	$3,549	$1,210	$9,387	$2,616	$0	$2,616	15	$39,240	$0	318.0%	3.6	27.11%	$21,842.64
ECM #4	Boiler Upgrade	$87,555	$109,245	$4,000	$192,800	$3,056	$0	$3,056	25	$76,400	$0	-60.4%	63.1	-6.14%	($139,585.42)
ECM #5	Energy Star Refrigerator	$579	$100	$0	$679	$61	$0	$61	15	$915	$0	34.8%	11.1	3.98%	$49.21
ECM #6	Window AC Replacements	$1,400	$0	$0	$1,400	$236	$0	$236	10	$2,360	$0	68.6%	5.9	10.83%	$613.13
ECM #7	Water Conservation	$440	$215	$0	$655	$1,144	$0	$1,144	15	$17,160	$0	2519.8%	0.6	174.66%	$13,002.00
ECM #8	DDC Controls Upgrade	$99,220	$0	$0	$99,220	$2,656	$0	$2,656	15	$39,840	$0	-59.8%	37.4	-9.71%	($67,512.84)
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	114.21 KW PV System	$697,051	$0	$0	$697,051	$19,928	$25,218	$45,146	15	$677,190	$378,270	-2.8%	15.4	-0.36%	($158,100.98)

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* .

APPENDIX B

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 11, 2013:

Electric Chillers

Water-Cooled Chillers	$16 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Energy Efficiency must comply with ASHRAE 90.1-2007

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 - $92 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
A/C Economizing Controls	≤ 5 tons $85/unit; >5 tons $170/unit

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Heating

Gas Fired Boilers < 300 MBH	$2.00 per MBH, but not less than $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	$400 per unit, AFUE ≥ 95%
Boiler Economizing Controls	$1,200 - $2,700
Low Intensity Infrared Heating	$300 - $500 per unit

Ground Source Heat Pumps

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

Energy Efficiency must comply with ASHRAE 90.1-2007

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps	$60 per VFD rated hp
Compressors	$5,250 to $12,500 per drive
Cooling Towers ≥ 10 hp	$60 per VFD rated hp
Boiler Fans ≥ 5 HP	$65 to $155 per hp
Boiler Feed Water Pumps ≥ 5 HP	$60 to $155 per hp
Commercial Kitchen Hood up to 50 HP	Retrofit $55 – $300 per hp New Hood $55 - $250 per hp

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons, 0.67 energy factor or better	$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 (Expires 3/1/2013)	$10 per fixture (1-4 lamps)
Replacement of T12 with new T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities (Expires 3/1/2013)	$25 per fixture (1-4 lamps)
T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
For retrofit of T-8 fixtures by permanent de-lamping & new reflectors (Electronic ballast replacement required)	$15 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $200 per fixture
Metal Halide w/Pulse Start Including Parking Lot	$25 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

Prescriptive Lighting - LED

LED Display Case Lighting	$30 per display case
LED Shelf-Mtd. Display & Task Lights	$15 per linear foot
LED Portable Desk Lamp	$20 per fixture
LED Wall-wash Lights	$30 per fixture
LED Recessed Down Lights	$35 per fixture
LED Outdoor Pole/Arm-Mounted Area and Roadway Luminaries	$175 per fixture
LED Outdoor Pole/Arm-Mounted Decorative Luminaries	$175 per fixture
LED Outdoor Wall-Mounted Area Luminaries	$100 per fixture
LED Parking Garage Luminaries	$100 per fixture
LED Track or Mono-Point Directional Lighting Fixtures	$50 per fixture
LED High-Bay and Low-Bay Fixtures for Commercial & Industrial Bldgs.	$150 per fixture
LED High-Bay-Aisle Lighting	$150 per fixture
LED Bollard Fixtures	$50 per fixture
LED Linear Panels (1x4, 2x2, 2x4 Troffers only)	$100 per fixture
LED Fuel Pump Canopy	$100 per fixture
LED Screw-based & Pin-based (PAR, MR, BR, R) Standards (A-Style) and Decorative Lamps	$20 per lamp
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$30 per 4 foot $42 per 5 foot $65 per 6 foot
LED Retrofit Kits	To be evaluated through the customer measure path

Lighting Controls – Occupancy Sensors

Wall Mounted	$20 per control
Remote Mounted	$35 per control
Daylight Dimmers	$25-$50 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

Premium Motors

Three-Phase Motors (Expires 3/1/2013)	$45 - $700 per motor
Fractional HP Motors Electronic Commutated Motors (replacing shaded pole motors in refrigerator/freezer cases)	$40 per electronic commutated motor

Refrigeration Doors/Covers

Energy-Efficient Doors/Covers for Installation on Open Refrigerated Cases	$100 per door
Aluminum Night Curtains for Installation on Open Refrigerated Cases	$3.50 per linear foot

Refrigeration Controls

Door Heater Controls	$50 per control
Electric Defrost Controls	$50 per control
Evaporator Fan Controls	$75 per control
Novelty Cooler Shutoff	$50 per control

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2007 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 an IRR of at least 10%.

APPENDIX C

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
11-Clifton BOE - PS 14

Building ID: 3477583
For 12-month Period Ending: February 28, 2013[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: April 11, 2013

Facility
11-Clifton BOE - PS 14
99 St. Andrews Boulevard
Clifton, NJ 07012

Facility Owner
Clifton BOE
745 Clifton Avenue
Clifton, NJ 07013

Primary Contact for this Facility
Karen Perkins
745 Clifton Avenue
Clifton, NJ 07013

Year Built: 1953
Gross Floor Area (ft²): 39,815

Energy Performance Rating[2] (1-100) 59

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	549,578
Natural Gas (kBtu)[4]	1,918,173
Total Energy (kBtu)	2,467,751

Energy Intensity[4]

Site (kBtu/ft²/yr)	62
Source (kBtu/ft²/yr)	97

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	180

Electric Distribution Utility
Public Service Electric & Gas Co

National Median Comparison

National Median Site EUI	68
National Median Source EUI	105
% Difference from National Median Source EUI	-8%
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[5] **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	11-Clifton BOE - PS 14	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	99 St. Andrews Boulevard, Clifton, NJ 07012	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 a hospital, k-12 school, hotel and senior care facility) nor can they be submitted as representing only a portion of a building.		☐
Elementary School 14 (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	39,815 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	24	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	0	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	No	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	60 %	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))
01/17/2013	02/16/2013	33,920.00
12/17/2012	01/16/2013	24,400.00
11/17/2012	12/16/2012	22,800.00
10/17/2012	11/16/2012	13,040.00
09/17/2012	10/16/2012	6,320.00
08/17/2012	09/16/2012	4,720.00
07/17/2012	08/16/2012	7,200.00
06/17/2012	07/16/2012	9,760.00
05/17/2012	06/16/2012	2,400.00
04/17/2012	05/16/2012	7,040.00
03/17/2012	04/16/2012	11,200.00

Electric Consumption (kWh (thousand Watt-hours))	**142,800.00**
Electric Consumption (kBtu (thousand Btu))	**487,233.60**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))	**487,233.60**
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)
01/17/2013	02/16/2013	4,834.26
12/17/2012	01/16/2013	3,936.02
11/17/2012	12/16/2012	3,647.46
10/17/2012	11/16/2012	1,580.57
09/17/2012	10/16/2012	201.02
08/17/2012	09/16/2012	144.82
07/17/2012	08/16/2012	132.23
06/17/2012	07/16/2012	170.73
05/17/2012	06/16/2012	166.06
04/17/2012	05/16/2012	753.73
03/17/2012	04/16/2012	1,053.78

gas Consumption (therms)	**16,620.68**
gas Consumption (kBtu (thousand Btu))	**1,662,068.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**1,662,068.00**
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
11-Clifton BOE - PS 14
99 St. Andrews Boulevard
Clifton, NJ 07012

Facility Owner
Clifton BOE
745 Clifton Avenue
Clifton, NJ 07013

Primary Contact for this Facility
Karen Perkins
745 Clifton Avenue
Clifton, NJ 07013

General Information

11-Clifton BOE - PS 14	
Gross Floor Area Excluding Parking: (ft^2)	39,815
Year Built	1953
For 12-month Evaluation Period Ending Date:	February 28, 2013

Facility Space Use Summary

Elementary School 14	
Space Type	K-12 School
Gross Floor Area (ft^2)	39,815
Open Weekends?	No
Number of PCs	24
Number of walk-in refrigeration/freezer units	0
Presence of cooking facilities	No
Percent Cooled	60
Percent Heated	100
Months °	10
High School?	No
School District °	clifton

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2013)	**Baseline** (Ending Date 02/28/2013)	**Rating of 75**	**Target**	**National Median**
Energy Performance Rating	59	59	75	N/A	50
Energy Intensity					
Site ($kBtu/ft^2$)	62	62	53	N/A	68
Source ($kBtu/ft^2$)	97	97	82	N/A	105
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	180	180	153	N/A	196
$kgCO_2e/ft^2$/year	5	5	4	N/A	5

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 Median column presents energy performance data your building would have if your building had a median rating of 50.

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

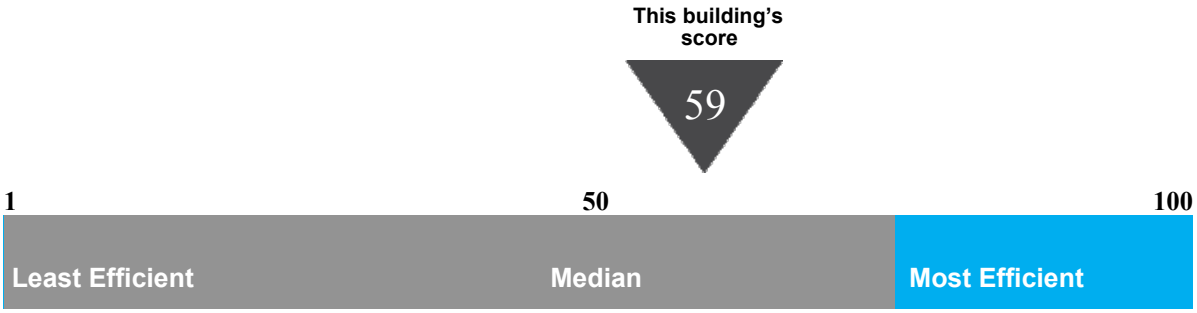
Statement of Energy Performance

2013

11-Clifton BOE - PS 14
99 St. Andrews Boulevard
Clifton, NJ 07012

Portfolio Manager Building ID: 3477583

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 97 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending February 2013

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: 04/11/2013

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

School # 14

AC Units

Tag				
Unit Type	Window AC Unit	Window AC Unit	Heating/Cooling Unit	Heating/Cooling Unit
Qty	4	5	4	8
Location	Classrooms and Offices	Classrooms and Offices	Modular Classrooms	Modular Classrooms
Area Served	Classrooms and Offices	Classrooms and Offices	Modular Classrooms	Modular Classrooms
Manufacturer	Various	Electrolux	Bard	Bard
Model #	Various	FAC125T1A	WA484A20XX4	W48AI A20VXX
Serial #	Various	Various	Various	Various
Cooling Type	DX Coil	DX Coil	DX Coil	DX Coil
Cooling Capacity (Tons)	9,000 to 18,000 BTUH	9,000 to 18,000 BTUH	4-Ton	4-Ton
Cooling Efficiency (SEER/EER)	EER=7.0	EER = 10.8		
Heating Type	N/A	N/A	10/7.5 kW	10/7.5 kW
Heating Input (MBH)	N/A	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A	N/A
Fuel	Electric	Electric	Electric	Electric
Approx Age	11	4	5	2
ASHRAE Service Life	10	10	10	10
Remaining Life	(1)	6	5	8
Comments	Very Poor Condition			

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

School # 14

Boilers

Tag	B-1	B-2
Unit Type	Cast Iron Sectional	Cast Iron Sectional
Qty	1	1
Location	Boiler Room	Boiler Room
Area Served	Entire Facility	Entire Facility
Manufacturer	Weil-McLain	Weil-McLain
Model #	BGL 888 SW	BGL 888 SW
Serial #	N/A	N/A
Input Capacity (Btu/Hr)	2,396	2,396
Rated Output Capacity (Btu/Hr)	1,904	1,904
Approx. Efficiency %	75.0%	75.0%
Fuel	Gas-Fired	Gas-Fired
Approx Age	20	20
ASHRAE Service Life	25	25
Remaining Life	5	5
Comments	Power Flame Burner Model CR2-GO-20A with __HP Blower Motor	Power Flame Burner Model CR2-GO-20A with __HP Blower Motor

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

School # 14

Domestic Water Heaters

Tag	DHW-1	
Unit Type	High-Efficiency, Gas-Fired, Water Heater	
Qty	1	
Location	Boiler Room	
Area Served	Entire Facility	
Manufacturer	RHEEM Guardian Fury	
Model #	22V40F1	
Serial #	RHLNO106419176	
Size (Gallons)	40	
Input Capacity (MBH)	38 MBH	
Recovery (Gal/Hr)	-	
Efficiency %	80%	
Fuel	Gas	
Approx Age	7	
ASHRAE Service Life	15	
Remaining Life	8	
Comments	**Bell & Gossett 189034 - H60 Circulation Pump 1/15 HP**	

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

School # 14

Pumps

Tag	P-1	P-2	P-3
Unit Type	In-Line Zone Pump	In-Line Zone Pump	In-Line Zone Pump
Qty	1	1	1
Location	Boiler Room	Boiler Room	Boiler Room
Area Served	Zone 1	Zone 2	Zone 3
Manufacturer	Grundfos	Grundfos	Grundfos
Model #	UPS 50-160/2F	UPS 65-160	UPS 40-80/4 F
Type	Model A	Model B	Model C
Horse Power	N/A	N/A	N/A
Flow	N/A	N/A	N/A
Motor Info	N/A	N/A	N/A
Electrical Power	208V / 3-Phase	208V / 3-Phase	208V / 3-Phase
RPM	N/A	N/A	N/A
Motor Efficiency %	N/A	N/A	N/A
Approx Age	N/A	N/A	N/A
ASHRAE Service Life	15	15	15
Remaining Life			
Comments			

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

Pumps

Tag	P-4	P-5	P-6	P-7
Unit Type	In-Line Zone Pump	In-Line Zone Pump	In-Line Zone Pump	In-Line Zone Pump
Qty	1	1	1	1
Location	Boiler Room	Boiler Room	Boiler Room	Boiler Room
Area Served	Zone 4	Zone 5	Zone 6	Zone 7
Manufacturer	Grundfos	Grundfos	Grundfos	Grundfos
Model #	UPS 50-160 F	UPS 50-160 F	UPS 50-160	UPS 65-160
Type	Model C	Model C	Model B	Model B
Horse Power	N/A	N/A	N/A	N/A
Flow	N/A	N/A	N/A	N/A
Motor Info	N/A	N/A	N/A	N/A
Electrical Power	208V / 3-Phase	208V / 3-Phase	208V / 3-Phase	208V / 3-Phase
RPM	N/A	N/A	N/A	N/A
Motor Efficiency %	N/A	N/A	N/A	N/A
Approx Age	N/A	N/A	N/A	N/A
ASHRAE Service Life	15	15	15	15
Remaining Life				
Comments				

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

APPENDIX E

CEG Project #: 9C12066
Facility Name: School #14
Address: 99 St. Andrew's Blvd
City, State, Zip Clifton, NJ 07012

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
242.21	Classroom 1 Special Ed	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	14	1.53	3,968	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	14	1.01	2,621	0.52	1,347	$203	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	524	$79
221.11	Classroom 2 Special Ed	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
221.11	Classroom 3	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
221.11	Classroom 4 Special Ed	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
221.11	Classroom 5	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
221.11	Classroom 6	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
221.11	Hallway	3000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,976	Existing To Remain	Existing To Remain	2	62	0	0.99	2,976	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	595	$90
221.11	Vestibule	3000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	186	Existing To Remain	Existing To Remain	2	62	0	0.06	186	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Vestibule	3000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	186	Existing To Remain	Existing To Remain	2	62	0	0.06	186	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
242.21	Main Hallway	3000	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	42	4.58	13,734	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	42	3.02	9,072	1.55	4,662	$704	0	No New Controls	0	0.0%	0	$0
221.11	Vestibule	3000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	186	Existing To Remain	Existing To Remain	2	62	0	0.06	186	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Vestibule	3000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	186	Existing To Remain	Existing To Remain	2	62	0	0.06	186	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
3	Electrical Room	1200	150w Incandescent	1	150	3	0.45	540	Re-Lamp	42w CFL Screw Base	1	42	3	0.13	151	0.32	389	$59	0	No New Controls	0	0.0%	0	$0
3	Storage	1200	150w Incandescent	1	150	8	1.20	1,440	Re-Lamp	42w CFL Screw Base	1	42	8	0.34	403	0.86	1,037	$157	0	No New Controls	0	0.0%	0	$0
3	Mechanical Room	1200	150w Incandescent	1	150	7	1.05	1,260	Re-Lamp	42w CFL Screw Base	1	42	7	0.29	353	0.76	907	$137	0	No New Controls	0	0.0%	0	$0
2	Mechanical Room	1200	28w CFL	1	28	4	0.11	134	Existing To Remain	Existing To Remain	1	28	0	0.11	134	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Classroom 28	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	14	0.87	2,257	Existing To Remain	Existing To Remain	2	62	0	0.87	2,257	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	451	$68
1	Classroom 28 Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Classroom 27	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	14	0.87	2,257	Existing To Remain	Existing To Remain	2	62	0	0.87	2,257	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	451	$68
1	Classroom 27 Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
221.11	Classroom 26	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	14	0.87	2,257	Existing To Remain	Existing To Remain	2	62	0	0.87	2,257	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	451	$68
1	Classroom 26 Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Classroom 25	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	0.33	20.0%	516	$78
242.21	Classroom 25	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	1	0.11	283	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	1	0.07	187	0.04	96	$15	5	Dual Technology Occupancy Sensor - Remote Mnt.	0.33	20.0%	37	$6
1	Classroom 25	2600	60w Incandescent	1	60	1	0.06	156	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	34	0.05	122	$18	5	Dual Technology Occupancy Sensor - Remote Mnt.	0.33	20.0%	7	$1
1	Classroom 25 Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
3	Classroom 25 Storage	1200	150w Incandescent	1	150	1	0.15	180	Re-Lamp	42w CFL Screw Base	1	42	1	0.04	50	0.11	130	$20	0	No New Controls	0	0.0%	0	$0
221.11	Classroom 24	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	0.5	20.0%	516	$78
242.21	Classroom 24	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	1	0.11	283	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	1	0.07	187	0.04	96	$15	5	Dual Technology Occupancy Sensor - Remote Mnt.	0.5	20.0%	37	$6
1	Classroom 24 Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
3	Classroom 24 Storage	1200	150w Incandescent	1	150	1	0.15	180	Re-Lamp	42w CFL Screw Base	1	42	1	0.04	50	0.11	130	$20	0	No New Controls	0	0.0%	0	$0
227.11	Classroom 24 to 25 Exit connection	3000	2x2, 2 Lamp, F17 T8, 17w, Elect. Ballast, Wall Mnt., Prismatic Lens	2	33	1	0.03	99	Existing To Remain	Existing To Remain	2	33	0	0.03	99	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Classroom 23	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	14	0.87	2,257	Existing To Remain	Existing To Remain	2	62	0	0.87	2,257	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	451	$68
1	Classroom 23 Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Classroom 22	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	14	0.87	2,257	Existing To Remain	Existing To Remain	2	62	0	0.87	2,257	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	451	$68
1	Classroom 22 Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Classroom 21	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	14	0.87	2,257	Existing To Remain	Existing To Remain	2	62	0	0.87	2,257	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	451	$68
1	Classroom 21 Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Boys Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	3	0.19	484	Existing To Remain	Existing To Remain	2	62	0	0.19	484	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Girls Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	2	0.12	322	Existing To Remain	Existing To Remain	2	62	0	0.12	322	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
3	Stage	2600	150w Incandescent	1	150	3	0.45	1,170	Re-Lamp	42w CFL Screw Base	1	42	3	0.13	328	0.32	842	$127	0	No New Controls	0	0.0%	0	$0

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
5	Multi-Purpose Room	2600	250w Metal Halide Pendant	1	295	12	3.54	9,204	Remove & Replace New Fixture	2x4, 4 Lamp, 54w T5, (2) 2/54 Elect. Ballast, Singlepoint Mnt., High Bay, Wire Guard, Lens	4	240	12	2.88	7,488	0.66	1,716	$259	0	No New Controls	0	0.0%	0	$0
3	Janitor Closet	1200	150w Incandescent	1	150	2	0.30	360	Re-Lamp	42w CFL Screw Base	1	42	2	0.08	101	0.22	259	$39	0	No New Controls	0	0.0%	0	$0
242.21	Teachers Room	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	4	0.44	1,134	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	4	0.29	749	0.15	385	$58	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	150	$23
227.21	Teachers Room	2600	2x2, 2 Lamp U-Tube, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	65	1	0.07	169	Re-Lamp / Re-Ballast Reflector	Sylvania Lamp FO17/841/XP/ECO Sylvania Ballast QHE2X32T8/UNV ISL-SC	2	34	1	0.03	88	0.03	81	$12	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	18	$3
221.11	Mens Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	161	Existing To Remain	Existing To Remain	2	62	0	0.06	161	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Womens Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	2	0.12	322	Existing To Remain	Existing To Remain	2	62	0	0.12	322	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
1	Womens Restroom	2600	60w Incandescent	1	60	1	0.06	156	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	34	0.05	122	$18	0	No New Controls	0	0.0%	0	$0
242.21	Nurse	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	2	0.22	567	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	2	0.14	374	0.07	192	$29	0	No New Controls	0	0.0%	0	$0
1	Nurse Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
242.21	Main Office	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	3	0.33	850	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	3	0.22	562	0.11	289	$44	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	112	$17
242.21	Principal Office	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	3	0.33	850	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	3	0.22	562	0.11	289	$44	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	112	$17
1	Principal Restroom	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Kitchen	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	2	0.12	322	Existing To Remain	Existing To Remain	2	62	0	0.12	322	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
242.21	Boys Restroom	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	2	0.22	567	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	2	0.14	374	0.07	192	$29	0	No New Controls	0	0.0%	0	$0
1	Boys Restroom	2600	60w Incandescent	1	60	1	0.06	156	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	34	0.05	122	$18	0	No New Controls	0	0.0%	0	$0
221.11	Girls Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	3	0.19	484	Existing To Remain	Existing To Remain	2	62	0	0.19	484	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
3	Janitor Closet	1200	150w Incandescent	1	150	2	0.30	360	Re-Lamp	42w CFL Screw Base	1	42	2	0.08	101	0.22	259	$39	0	No New Controls	0	0.0%	0	$0
221.11	Classroom 7	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
221.11	Classroom 8	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
221.11	Classroom 9	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
221.11	Classroom 10	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
221.11	Classroom 11	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	16	0.99	2,579	Existing To Remain	Existing To Remain	2	62	0	0.99	2,579	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	516	$78
242.21	Small Services Offices	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	14	1.53	3,968	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28/841/XP/XL/SS/ECO3 Sylvania Ballast QHE2X32T8/UNV ISL-SC	3	72	14	1.01	2,621	0.52	1,347	$203	0	No New Controls	0	0.0%	0	$0
221.11	Media Center	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	24	1.49	3,869	Existing To Remain	Existing To Remain	2	62	0	1.49	3,869	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	774	$117
221.11	Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 1 CR1	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	13	0.81	2,096	Existing To Remain	Existing To Remain	2	62	0	0.81	2,096	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	419	$63
1	Trailer 1 RR1	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
4	Trailer 1 ST1	1200	Combination Incandescent A-Lamp/ Exhaust Fan	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 1 CR2	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	13	0.81	2,096	Existing To Remain	Existing To Remain	2	62	0	0.81	2,096	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	419	$63
1	Trailer 1 RR2	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
4	Trailer 1 ST2	1200	Combination Incandescent A-Lamp/ Exhaust Fan	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 2 CR1	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	13	0.81	2,096	Existing To Remain	Existing To Remain	2	62	0	0.81	2,096	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	419	$63
1	Trailer 2 RR1	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
4	Trailer 2 ST1	1200	Combination Incandescent A-Lamp/ Exhaust Fan	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 2 CR2	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	13	0.81	2,096	Existing To Remain	Existing To Remain	2	62	0	0.81	2,096	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	419	$63
1	Trailer 2 RR2	1200	60w Incandescent	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
4	Trailer 2 ST2	1200	Combination Incandescent A-Lamp/ Exhaust Fan	1	60	1	0.06	72	Re-Lamp	13w CFL Screw Base	1	13	1	0.01	16	0.05	56	$9	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 1 Entrance	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	161	Existing To Remain	Existing To Remain	2	62	0	0.06	161	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 2 Entrance	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	161	Existing To Remain	Existing To Remain	2	62	0	0.06	161	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 3 CR1	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	17	1.05	2,740	Existing To Remain	Existing To Remain	2	62	0	1.05	2,740	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	548	$83
221.11	Trailer 3 RR1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 3 ST1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
221.11	Trailer 3 CR2	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	17	1.05	2,740	Existing To Remain	Existing To Remain	2	62	0	1.05	2,740	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	548	$83
221.11	Trailer 3 RR2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 3 ST2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 3 Entrance	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	2	0.12	322	Existing To Remain	Existing To Remain	2	62	0	0.12	322	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 4 CR1	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	17	1.05	2,740	Existing To Remain	Existing To Remain	2	62	0	1.05	2,740	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	548	$83
221.11	Trailer 4 RR1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 4 ST1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 4 CR2	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	17	1.05	2,740	Existing To Remain	Existing To Remain	2	62	0	1.05	2,740	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	548	$83
221.11	Trailer 4 RR2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 4 ST2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 4 Entrance	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	2	0.12	322	Existing To Remain	Existing To Remain	2	62	0	0.12	322	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 5 CR1	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	17	1.05	2,740	Existing To Remain	Existing To Remain	2	62	0	1.05	2,740	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	548	$83
221.11	Trailer 5 RR1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 5 ST1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 5 CR2	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	17	1.05	2,740	Existing To Remain	Existing To Remain	2	62	0	1.05	2,740	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	548	$83
221.11	Trailer 5 RR2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 5 ST2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 5 Entrance	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	2	0.12	322	Existing To Remain	Existing To Remain	2	62	0	0.12	322	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 6 CR1	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	17	1.05	2,740	Existing To Remain	Existing To Remain	2	62	0	1.05	2,740	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	548	$83
221.11	Trailer 6 RR1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 6 ST1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
221.11	Trailer 6 CR2	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	17	1.05	2,740	Existing To Remain	Existing To Remain	2	62	0	1.05	2,740	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	548	$83
221.11	Trailer 6 RR2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 6 ST2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	1	0.06	74	Existing To Remain	Existing To Remain	2	62	0	0.06	74	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
221.11	Trailer 6 Entrance	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	2	0.12	322	Existing To Remain	Existing To Remain	2	62	0	0.12	322	0.00	0	$0	0	No New Controls	0	0.0%	0	$0
	TOTAL					**700**	**52**	**130,422**					**147**	**45**	**114,396**	**8**	**16,026**	**$2,420**			**36**	**8**	**17,326**	**$2,616**

APPENDIX F

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
School #14	11900	SHARP NU-U235F2	486	17.5	8,525	114.21	131,975	92.5	20,363	13.40

= Proposed Roof PV Layout = Proposed Parking PV Layout

Notes:

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

Project Name: **LGEA Solar PV Project - School #14**
Location: **Clifton, NJ**
Description: **Photovoltaic System 100% Financing - 15 year**

Simple Payback Analysis

	Photovoltaic System 100% Financing - 15 year
Total Construction Cost	$697,051
Annual kWh Production	131,975
Annual Energy Cost Reduction	$19,928
Average Annual SREC Revenue	$25,218

Simple Payback: **15.44** Years

Life Cycle Cost Analysis

Analysis Period (years): 15
Discount Rate: 3%
Average Energy Cost ($/kWh) **$0.151**
Financing Rate: 6.00%

Financing %: 100%
Maintenance Escalation Rate: 3.0%
Energy Cost Escalation Rate: 3.0%
Average SREC Value ($/kWh) $0.191

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	131,975	$19,928	$0	$32,994	$41,019	$29,567	($17,663)	($17,663)
2	$0	131,315	$20,526	$0	$32,829	$39,195	$31,390	($17,231)	($34,894)
3	$0	130,659	$21,142	$0	$32,665	$37,259	$33,326	($16,779)	($51,673)
4	$0	130,005	$21,776	$0	$32,501	$35,204	$35,382	($16,308)	($67,981)
5	$0	129,355	$22,429	$1,332	$32,339	$33,021	$37,564	($17,150)	($85,130)
6	$0	128,708	$23,102	$1,326	$25,742	$30,704	$39,881	($23,067)	($108,197)
7	$0	128,065	$23,795	$1,319	$25,613	$28,245	$42,341	($22,496)	($130,694)
8	$0	127,425	$24,509	$1,312	$25,485	$25,633	$44,952	($21,904)	($152,597)
9	$0	126,787	$25,244	$1,306	$25,357	$22,861	$47,725	($21,289)	($173,887)
10	$0	126,154	$26,002	$1,299	$18,923	$19,917	$50,668	($26,960)	($200,846)
11	$0	125,523	$26,782	$1,293	$18,828	$16,792	$53,793	($26,268)	($227,114)
12	$0	124,895	$27,585	$1,286	$18,734	$13,474	$57,111	($25,552)	($252,667)
13	$0	124,271	$28,413	$1,280	$18,641	$9,952	$60,634	($24,812)	($277,479)
14	$0	123,649	$29,265	$1,274	$12,365	$6,212	$64,373	($30,229)	($307,707)
15	$0	123,031	$30,143	$1,267	$12,303	$2,241	$68,344	($29,406)	($337,114)
	Totals:	1,911,817	$370,643	$14,295	$365,319	$361,729	$697,051	($337,114)	($2,425,643)

Net Present Value (NPV) **($246,908)**