

**CLIFTON PUBLIC SCHOOLS
HIGH SCHOOL ANNEX**

**290 BRIGHTON ROAD
CLIFTON, NEW JERSEY 07012**

FACILITY ENERGY REPORT

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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:	Large Power & Lighting Service (LPLP)
Third Party Supplier:	None

Natural Gas Utility Provider:	Public Service Electric & Gas
Utility Rate Structure:	Large Volume Gas (LVG)
Third Party Supplier:	Hess

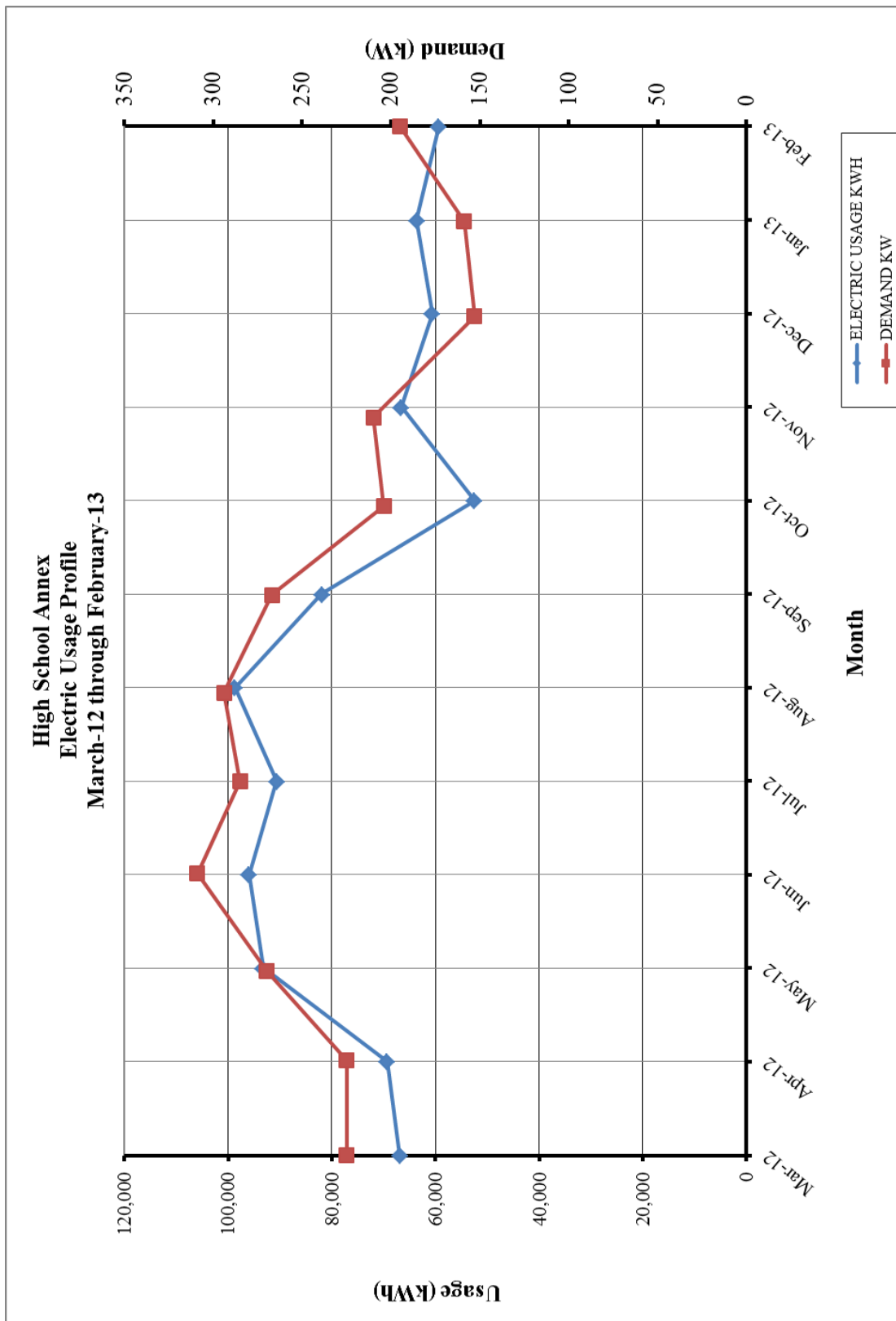
The electric usage profile represents the actual electrical usage for the facility. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts 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: PSEG			
Rate: LPLS			
Meter No: 778020073			
Account No: 4205050003 / PE000011895943623036			
Third Party Utility Provider: None			
TPS Meter / Acct No: None			
MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Mar-12	66,900	225.0	\$10,653
Apr-12	69,300	225.0	\$10,805
May-12	93,300	270.0	\$15,835
Jun-12	96,000	309.0	\$16,877
Jul-12	90,600	285.0	\$15,981
Aug-12	98,700	294.0	\$16,595
Sep-12	81,900	267.0	\$12,501
Oct-12	52,500	204.0	\$9,264
Nov-12	66,600	210.0	\$10,555
Dec-12	60,600	153.0	\$9,782
Jan-13	63,600	159.0	\$10,187
Feb-13	59,400	195.0	\$10,060
Totals	899,400	309.0 Max	\$149,095
AVERAGE DEMAND		233.0 KW average	
AVERAGE RATE		\$0.166 \$/kWh	

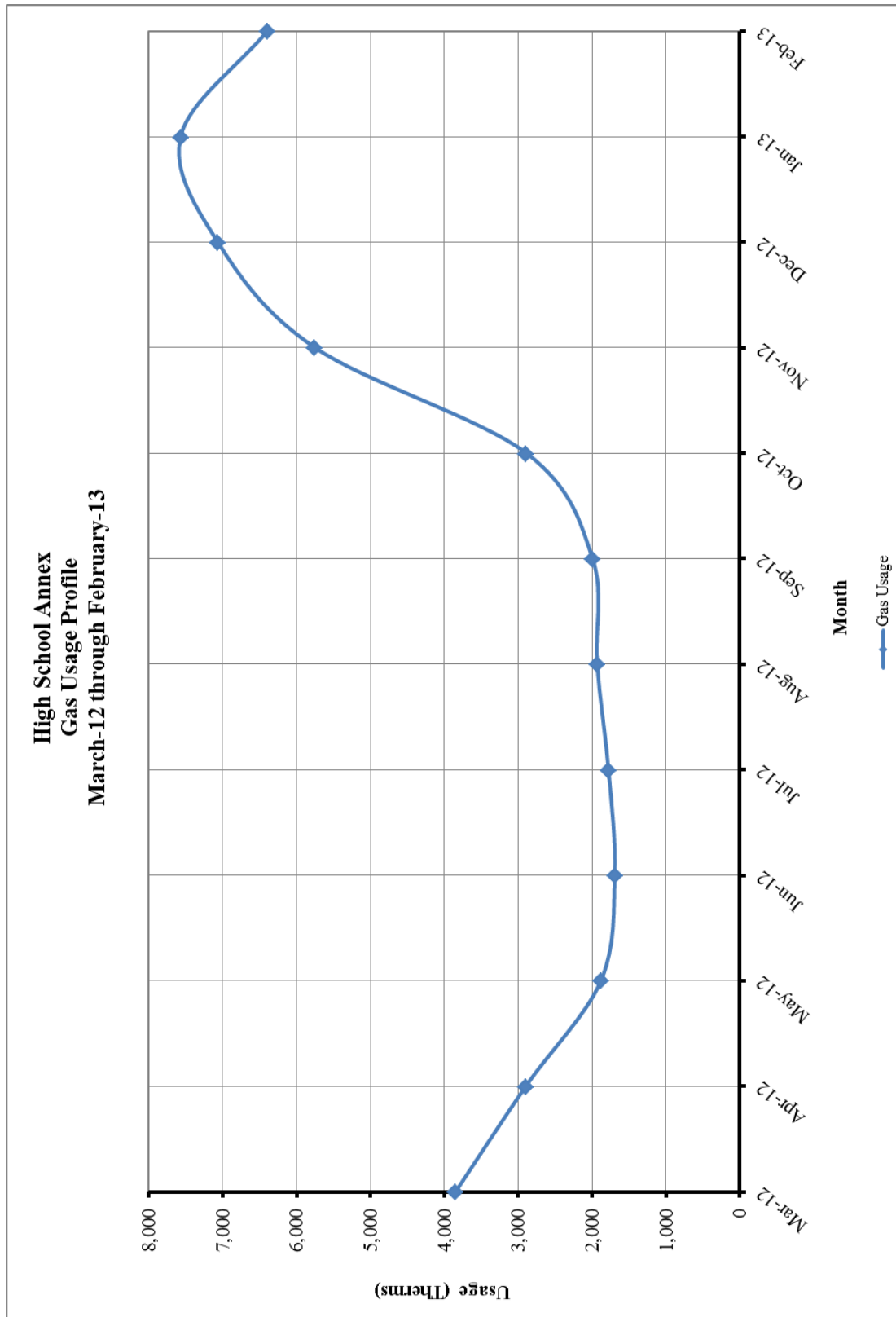
Figure 1
Electricity Usage Profile



**Table 4
Natural Gas Billing Data**

NATURAL GAS USAGE SUMMARY		
Utility Provider: PSEG		
Rate: LVG		
Meter No: 2750785		
Account No: 6641911918		
Third Party Utility Provider: HESS		
TPS Meter No: 446575/619366		
MONTH OF USE	CONSUMPTION (THERMS)	TOTAL BILL
Mar-12	3,846.89	\$2,388.65
Apr-12	2,897.06	\$1,771.34
May-12	1,880.66	\$1,210.74
Jun-12	1,695.44	\$1,011.46
Jul-12	1,779.61	\$1,109.41
Aug-12	1,934.09	\$1,198.31
Sep-12	1,995.53	\$1,207.68
Oct-12	2,895.06	\$2,641.18
Nov-12	5,757.72	\$4,828.18
Dec-12	7,069.17	\$6,014.45
Jan-13	7,571.06	\$6,347.49
Feb-13	6,394.56	\$5,542.01
TOTALS	45,716.84	\$35,270.90
AVERAGE RATE:	\$0.77	\$/THERM

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The Clifton High School Annex is located at 290 Brighton Road in Clifton, New Jersey. The original 70,000 SF one-story building built in 1970, was renovated/upgraded into a high school annex in 2009. The renovations and upgrades to this existing one-story facility comprised of administration offices, general classrooms, music/art room, science labs, nurse's office, CST, kitchen, cafeteria, gym, locker rooms, stage, custodial office/supplies, teacher's room, boiler room, storage rooms, and numerous mechanical/electrical rooms.

Occupancy Profile

The typical hours of operation for the High School Annex are Monday through Friday between 7:00 am and 4:00 pm with some after-school activities until 8 PM. Maintenance staff is present in the building as early as 6:00 am, and nighttime cleaning staff present until 11:00 pm. The total high school enrollment is approximately 3,375 students and the High School Annex facility has 50 teachers, support staff, and administrative personnel.

Building Envelope

Exterior walls are constructed of structural steel and precast panel construction. The amount of insulation within the walls is unknown. The exterior windows and doors throughout the school are in good condition and appear to be well maintained. Typical windows and doors throughout the building are double pane, 1/4" tinted glass with aluminum frames. The building roof is built-up Bitchumen type with asphalt cap sheet, rigid roof insulation and metal deck surface.

HVAC Systems

Boiler Plant

The boiler plant consists of three (3) Aerco Benchmark 2.0 gas-fired, modular, condensing boilers. The boilers each have an input capacity rating of 2,000 MBH and an output rating of 1,780 MBH for a thermal efficiency of 89%. Heating hot water is circulated via two (2) Taco pumps rated at 400 gallons per minute. Each pump has a 7.5 horsepower Baldor Super-E motor with a variable speed drive controller. Only one pump is required to operate in order to satisfy the building hot water flow requirements, with the remaining as a backup.

Chiller Plant

Chilled water is supplied to the building via a Trane Model RTAC 275A air-cooled, screw chiller located on the roof. The chiller is rated at a nominal 275 tons with three (3) screw compressors. The chiller has a full load efficiency rated of 9.8 EER and part load (IPLV) rating of 13.2 EER. The primary and secondary chilled water is circulated via four (4) Taco pumps rated at 650 gallons per minute. The two (2) primary chilled water pumps each have a 20 horsepower Baldor Super-E motor and the two (2) secondary pumps have a 10 horsepower Baldor Super-E motor with a variable speed drive controller. Only one pump is required to operate in order to satisfy the building chilled water flow requirements, with the remaining as a backup.

Rooftop Units

There are four (4) large rooftop air handling units that provide hot water heating and chilled water cooling to the interior spaces. The Administration area is heated and cooled by a Trane Model TSCB006 T-Series Climate Changer Air Handler rated at 1,380, the Media Center by a Trane Model TSC035 unit rated at 16,340 CFM, the Gymnasium by a Trane Model TSC030 rated at 13,950 CFM, and the Cafeteria by a Trane Model TSC025 rated at 5,250 CFM.

In addition, there are two (2) ductless split air conditioning units that are manufactured by EMI that are rated at 24 MBH that cool the MDF closet and one of the Administration offices.

Miscellaneous HVAC Units

The classrooms are heated, cooled, and ventilated by Trane Model VUVC unit ventilators with hot water and chilled water coils that range in size from 750 CFM to 1,300 CFM. The Administration interior spaces are heated and cooled by VAV terminal units that range in size from 300 CFM to 3,000 CFM. The perimeter offices in the Administration section are additionally heated with radiant ceiling panels manufactured by SUN-EL and rated at 265 BTUH per foot which are installed the full length of the room (wall-to-wall). Trane Model BCHC Fan Coil Units (FCU) are used to heat and cool the corridors and to provide conditioned make-up air for the two science rooms. Finally, hot water cabinet and unit heaters are used at the entrances, mechanical & electrical rooms and vestibules.

Exhaust System

Air is exhausted from the toilet rooms through roof exhausters. There are also several exhausters for some of the science classrooms, music room, science lab hoods, convection oven, mechanical rooms, storage rooms, kitchen, etc. Air is exhausted from classrooms by a series of dedicated exhaust fans. All of the exhaust fans are controlled by occupancy schedules in the Building Automation System (BAS).

HVAC System Controls

The major HVAC systems throughout the facility are controlled through a Honeywell Excel 5000 Building Automation & Energy Management System. This HVAC control system includes occupancy schedules, setpoints, monitoring, etc. for the rooftop air handlers, VAV terminal units, boilers, chillers, pumps, etc. Special features of this system include humidity control, CO₂ demand ventilation controls, etc. for the rooftop air handlers.

Domestic Hot Water

Domestic hot water for the facility is provided by two (2) Bradford White, Ultra High Efficiency, gas-fired, water heaters with an input of 250 MBH, a thermal efficiency of 95%, a storage capacity of 100 gallons each, and a recovery rate of 294 gallons per hour.

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. The facility lighting is controlled by switch and ceiling mounted occupancy sensors in most spaces.

Kitchen

The serving kitchen is equipped with Energy Star rated reach-in freezers & refrigerators and mobile warm cabinets.

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 - Kitchen	\$1,768	\$208	8.5	76.5%
ECM #2	Vending Miser Controls	\$300	\$425	0.7	2024.8%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	DESCRIPTION	NET INSTALLATION COST	ANNUAL SAVINGS	SIMPLE PAYBACK (Yrs)	SIMPLE LIFETIME ROI
REM #1	74.73 KW PV System	\$461,838	\$30,836	15.0	0.2%
Notes:	A. Cost takes into consideration applicable NJ Smart Start TM 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 - Kitchen	0.5	1,251	-
ECM #2	Vending Miser Controls	-	2,560	-
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
REM #1	74.73 KW PV System	74.7	86,354	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 - Kitchen	\$208	\$1,963	\$195	\$1,768	8.5
Vending Miser Controls	\$425	\$300	\$0	\$300	0.7
<i>Design / Construction Extras (15%)</i>		\$339		\$339	
Total Project	\$633	\$2,602	\$195	\$2,407	3.8

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 – Kitchen

Description:

The majority of the interior lighting throughout Clifton High School Annex 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 the kitchen area, which is over lit, Concord Engineering recommends that the fixtures 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.

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 (\$):	\$1,963
NJ Smart Start Equipment Incentive (\$):	\$195
Net Installation Cost (\$):	\$1,768
Maintenance Savings (\$/Yr):	\$0
Energy Savings (\$/Yr):	\$208
Total Yearly Savings (\$/Yr):	\$208
Estimated ECM Lifetime (Yr):	15
Simple Payback	8.5
Simple Lifetime ROI	76.5%
Simple Lifetime Maintenance Savings	\$0
Simple Lifetime Savings	\$3,120
Internal Rate of Return (IRR)	8%
Net Present Value (NPV)	\$715.09

ECM #2: Vending Miser Controls

Description:

The High School Annex currently utilizes vending machines in select areas within the building. Vending machines are common within cafeteria's and faculty rooms which can be in use for a limited time during 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 cool temperature within the machine and snack machines with no cooling usually have lights that operate 24/7. 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 (2) of these control systems, one for the cold beverage machine and one for the snack machine.

Energy Savings Calculations:

Cold Drink and Snack Vending Machine Energy Conservation Project			
	Input Variables		
Energy Analysis Prepared For:	Energy Costs (\$0.000 per kwh)		\$0.166
	Facility Occupied Hours per Week		60
High School Annex	Number of Cold Drink Vending Machines		1
	Number of Uncooled Snack Machines		1
www.VendingMiserStore.com	Power Requirements of Cold Drink Machine (avg watts)		427
	Power Requirements of Snack Machine (avg watts)		100
	VendingMiser Sale Price (for cold drink machines)		\$200.00
	OfficeMiser Sale Price (for snack machines)		\$100.00
Savings Analysis			
	Before	After	
Cold Drink Machines	\$621.35	\$289.62	Cost of Operation
	3,743	1,745	kWh
		53%	% Energy Savings
Snack Machines	\$145.02	\$51.79	Cost of Operation
	874	312	kWh
		64%	% Energy Savings
Project Summary			
Present kWh	Projected kWh	kWh Savings per Year	
4,617	2,057	2,560	
Present Cost	Projected Costs	Annual Savings	Per Cent Savings
\$766.37	\$341.42	\$424.95	55%
			Total Project Cost
			\$300.00
			Break Even (Months)
			8.5

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost (\$):	\$300
NJ Smart Start Equipment Incentive (\$):	\$0
Net Installation Cost (\$):	\$300
Maintenance Savings (\$/Yr):	\$0
Energy Savings (\$/Yr):	\$425
Total Yearly Savings (\$/Yr):	\$425
Estimated ECM Lifetime (Yr):	15
Simple Payback	0.7
Simple Lifetime ROI	2024.8%
Simple Lifetime Maintenance Savings	\$0
Simple Lifetime Savings	\$6,374
Internal Rate of Return (IRR)	142%
Net Present Value (NPV)	\$4,773.03

REM #1: 74.73 kW Solar System**Description:**

The Clifton High School Annex has available roof space that could accommodate a significant amount of solar generation. Based on the available areas a 74.73 kilowatt solar array could be installed. The array will produce approximately 86,354 kilowatt-hours annually that will reduce the overall electric usage of the facility by 9.60%.

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}):	74.73
Electric Generation (KWH/Yr):	86,354
Installation Cost (\$):	\$461,838
SREC Revenue (\$/Yr):	\$16,501
Energy Savings (\$/Yr):	\$14,335
Total Yearly Savings (\$/Yr):	\$30,836
ECM Analysis Period (Yr):	15
Simple Payback (Yrs):	15.0
Analysis Period Electric Savings (\$):	\$266,611
Analysis Period SREC Revenue (\$):	\$239,036
Net Present Value (NPV)	(\$150,314.72)

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 – High School Annex

ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME (Yr)	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)	(\$)	(\$)
ECM #1	Lighting Upgrade - Kitchen	\$923	\$1,040	\$195	\$1,768	\$208	\$0	\$208	15	\$3,120	\$0	76.5%	8.5	8.11%	\$715.09
ECM #2	Vending Miser Controls	\$300	\$0	\$0	\$300	\$425	\$0	\$425	15	\$6,374	\$0	2024.8%	0.7	141.65%	\$4,773.03
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	74.73 KW PV System	\$461,838	\$0	\$0	\$461,838	\$14,335	\$16,501	\$30,836	15	\$462,535	\$247,514	0.2%	15.0	0.02%	(\$93,723.74)

- Notes:**
- 1) The variable C_n 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 C_n 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 \geq 16
	\$600 per ton, EER \geq 18
	\$750 per ton, EER \geq 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 \geq 10 hp	\$60 per VFD rated hp
Boiler Fans \geq 5 HP	\$65 to \$155 per hp
Boiler Feed Water Pumps \geq 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 \leq 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 \geq 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	\$50 per fixture
HID \geq 100w Replacement with new HID \geq 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 (<i>Expires 3/1/2013</i>)	\$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



STATEMENT OF ENERGY PERFORMANCE

18-Clifton BOE - Clifton High School Annex

Building ID: 3477629

For 12-month Period Ending: February 28, 2013¹

Date SEP becomes ineligible: N/A

Date SEP Generated: April 11, 2013

Facility

18-Clifton BOE - Clifton High School Annex
290 Brighton Road
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: 2008

Gross Floor Area (ft²): 70,000Energy Performance Rating² (1-100) 7**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	3,083,260
Natural Gas (kBtu) ⁴	4,443,728
Total Energy (kBtu)	7,526,988

Energy Intensity⁴

Site (kBtu/ft ² /yr)	108
Source (kBtu/ft ² /yr)	214

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	673
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Electric Distribution Utility

Public Service Electric & Gas Co

National Median Comparison

National Median Site EUI	67
National Median Source EUI	133
% Difference from National Median Source EUI	61%
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 Standards⁵ 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	<input checked="" type="checkbox"/>
Building Name	18-Clifton BOE - Clifton High School Annex	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		<input type="checkbox"/>
Type	K-12 School	Is this an accurate description of the space in question?		<input type="checkbox"/>
Location	290 Brighton Road, Clifton, NJ 07012	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		<input type="checkbox"/>
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.		<input type="checkbox"/>
HS Annex (K-12 School)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	<input checked="" type="checkbox"/>
Gross Floor Area	70,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		<input type="checkbox"/>
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.		<input type="checkbox"/>
Number of PCs	123 (Default)	Is this the number of personal computers in the K12 School?		<input type="checkbox"/>
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.		<input type="checkbox"/>
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".		<input type="checkbox"/>
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		<input type="checkbox"/>
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		<input type="checkbox"/>
Months	10(Optional)	Is this school in operation for at least 8 months of the year?		<input type="checkbox"/>

High School?	Yes	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'.		<input type="checkbox"/>
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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))
01/13/2013	02/12/2013	63,600.00
12/13/2012	01/12/2013	60,600.00
11/13/2012	12/12/2012	66,600.00
10/13/2012	11/12/2012	52,500.00
09/13/2012	10/12/2012	81,900.00
08/13/2012	09/12/2012	98,700.00
07/13/2012	08/12/2012	90,600.00
06/13/2012	07/12/2012	96,000.00
05/13/2012	06/12/2012	93,300.00
04/13/2012	05/12/2012	69,300.00
03/13/2012	04/12/2012	66,900.00
electric Consumption (kWh (thousand Watt-hours))		840,000.00
electric Consumption (kBtu (thousand Btu))		2,866,080.00
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		2,866,080.00
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		<input type="checkbox"/>
Fuel Type: Natural Gas		
Meter: gas (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
01/13/2013	02/12/2013	7,571.06
12/13/2012	01/12/2013	7,069.17
11/13/2012	12/12/2012	5,757.72
10/13/2012	11/12/2012	2,895.06
09/13/2012	10/12/2012	1,995.53
08/13/2012	09/12/2012	1,934.09
07/13/2012	08/12/2012	1,779.61
06/13/2012	07/12/2012	1,695.44
05/13/2012	06/12/2012	1,880.66
04/13/2012	05/12/2012	2,897.06
03/13/2012	04/12/2012	3,846.89

gas Consumption (therms)	39,322.29
gas Consumption (kBtu (thousand Btu))	3,932,229.00
Total Natural Gas Consumption (kBtu (thousand Btu))	3,932,229.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	<input type="checkbox"/>

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.	<input type="checkbox"/>

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.	<input type="checkbox"/>

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

18-Clifton BOE - Clifton High School
Annex
290 Brighton Road
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

18-Clifton BOE - Clifton High School Annex	
Gross Floor Area Excluding Parking: (ft ²)	70,000
Year Built	2008
For 12-month Evaluation Period Ending Date:	February 28, 2013

Facility Space Use Summary

HS Annex	
Space Type	K-12 School
Gross Floor Area (ft ²)	70,000
Open Weekends?	No
Number of PCs ^d	123
Number of walk-in refrigeration/freezer units	0
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months ^o	10
High School?	Yes
School District ^o	clifton

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 02/28/2013)	Baseline (Ending Date 02/28/2013)	Rating of 75	Target	National Median
Energy Performance Rating	7	7	75	N/A	50
Energy Intensity					
Site (kBtu/ft ²)	108	108	52	N/A	67
Source (kBtu/ft ²)	214	214	104	N/A	133
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 ₂ e/year	673	673	327	N/A	418
kgCO ₂ e/ft ² /year	10	10	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 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.

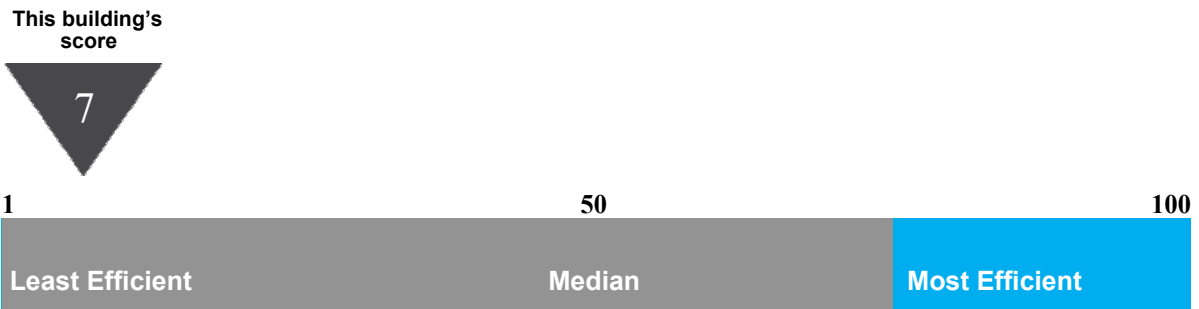
Statement of Energy Performance

2013

18-Clifton BOE - Clifton High School Annex
290 Brighton Road
Clifton, NJ 07012

Portfolio Manager Building ID: 3477629

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 214 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



APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

High School Annex

AC Units

Tag			
Unit Type	Unit Ventilators	Unit Ventilators	Unit Ventilators
Qty	2	4	21
Location	Classrooms	Classrooms	Classrooms
Area Served	Classrooms	Classrooms	Classrooms
Manufacturer	Trane	Trane	Trane
Model #	VUVC1001	VUVC1001	VUVC1501
Unit Size	1,000 CFM	750 CFM	1,300 CFM
Cooling Type	Chilled Water Coil	Chilled Water Coil	Chilled Water Coil
Cooling Capacity (MBH)	35.7	26.8	46.5
Cooling Efficiency (SEER/EER)	N/A	N/A	N/A
Heating Type	Hot Water Coil	Hot Water Coil	Hot Water Coil
Heating Input (MBH)	49	37	64
Efficiency	N/A	N/A	N/A
Fuel			
Approx Age	3	3	3
ASHRAE Service Life	20	20	20
Remaining Life	17	17	17
Comments			

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

AC Units

Tag		
Unit Type	Unit Ventilators	Ductless Split AC Unit
Qty	1	2
Location	Classrooms	Roof
Area Served	Classrooms	Office and MDF Room
Manufacturer	Trane	EMI
Model #	VUVC1501	S1CA4000D00
Unit Size	1,200 CFM	750 CFM
Cooling Type	Chilled Water Coil	DX Coil
Cooling Capacity (MBH)	42.9	24
Cooling Efficiency (SEER/EER)	N/A	SEER = 13
Heating Type	Hot Water Coil	N/A
Heating Input (MBH)	54	N/A
Efficiency	N/A	N/A
Fuel		
Approx Age	3	3
ASHRAE Service Life	20	15
Remaining Life	17	12
Comments		

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

High School Annex

AHUs

Tag	AHU-1	AHU-2
Unit Type	Rooftop Air Handler	Rooftop Air Handler
Qty	1	1
Location	Roof	Roof
Area Served	Admin Area	Media Center
Manufacturer	Trane	Trane
Model #	TSCB006U0F000...	TSCB035U0F000...
Unit Size	1,380	16,340
Cooling Type	Chilled Water Coil	Chilled Water Coil
Cooling Capacity (MBH)	231.2	808.5
Heating Type	Hot Water Coil	Hot Water Coil
Heating Input (MBH)	353	1,281
Supply Fan (HP)	3	8
Return Fan (HP)	2	5
Electrical (V/H/P)	208V/ 3-Phase	208V/ 3-Phase
Approx Age	3	3
ASHRAE Service Life	20	20
Remaining Life	17	17
Comments		

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

AHUs

Tag	AHU-3	AHU-4
Unit Type	Rooftop Air Handler	Rooftop Air Handler
Qty	1	1
Location	Roof	Roof
Area Served	Gym	Cafeteria
Manufacturer	Trane	Trane
Model #	TSCB030U0F000...	TSCB025U0F000...
Unit Size	13,950	5,250
Cooling Type	Chilled Water Coil	Chilled Water Coil
Cooling Capacity (MBH)	564.2	444.5
Heating Type	Hot Water Coil	Hot Water Coil
Heating Input (MBH)	786	614
Supply Fan (HP)	8	5
Return Fan (HP)	5	3
Electrical (V/H/P)	208V/ 3-Phase	208V/ 3-Phase
Approx Age	3	3
ASHRAE Service Life	20	20
Remaining Life	17	17
Comments		

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

High School Annex

Boilers

Tag	B-1 thru B-3	
Unit Type	Gas-Fired Modular Condensing Boiler	
Qty	3	
Location	Boiler Room	
Area Served	Entire Facility	
Manufacturer	AERCO Benchmark 2.0	
Model #	BMK 2.0 LN GWB	
Serial #	G-08-1331, 1332, & 1333	
Input Capacity (MBH)	2,000	
Rated Output Capacity (MBH)	1,780	
Approx. Efficiency %	89.0%	
Fuel	Gas	
Approx Age	3	
ASHRAE Service Life	20	
Remaining Life	17	
Comments		

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

High School Annex

Chiller

Tag	ACU-1
Unit Type	Air-Cooled Chiller
Qty	1
Location	Roof
Area Served	Entire Facility
Manufacturer	Trane
Model #	RTAC 275A URON UAFN N1TY ...
Serial #	U08K01689
Refrigerant	R134A
Cooling Capacity (Tons)	275
Cooling Efficiency	EER=9.8
EWT/LWT	52/44
Volts / Phase / Hz	208V/ 3-Phase/60 Hz
Chilled Water GPM / ΔT	814 GPM @ 8 degree F ΔT
Ambient Design Temperature	95 degrees F
Approx Age	3
ASHRAE Service Life	25
Remaining Life	22
Comments	30 % Glycol System

Note:

"N/A" = Not Applicable.

"-"

= Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

High School Annex

Domestic Water Heaters

Tag	DHW-1 & DHW-2	
Unit Type	Gas-Fired Water Heaters	
Qty	2	
Location	Boiler Room	
Area Served	Entire Facility	
Manufacturer	Bradford White	
Model #	EF100T250E3NA2	
Serial #	EF10674585 & EF10772333	
Size (Gallons)	100 Gallons	
Input Capacity (MBH)	250 MBH	
Recovery (Gal/Hr)	293.9 Gal/Hr	
Efficiency %	97%	
Fuel	Gas	
Approx Age	3	
ASHRAE Service Life	10	
Remaining Life	7	
Comments	Ultra High Efficiency Unit	

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

High School Annex

Pumps

Tag	P-1 & P-2	P-3 & P-4	P-5 & P-6
Unit Type	Base-Mounted Centrifugal	Base-Mounted Centrifugal	Base-Mounted Centrifugal
Qty	2	2	2
Location	Central Plant	Central Plant	Central Plant
Area Served	Entire Facility	Entire Facility	Entire Facility
Manufacturer	TACO	TACO	TACO
Model #	FI4009E2JAJ	FI5009E2GA	FI3009EZFHJ
System Served	Chilled Water Primary	Chilled Water Secondary	Heating Hot Water
Horse Power	20	10	7.5
Flow (GPM)	650	650	400
Motor Info	Baldor EM2515T	Baldor EM3313T	Baldor EM3311T
Electrical Power	208V/3-Phase/60HZ	208V/3-Phase/60HZ	208V/3-Phase/60HZ
RPM	1765	1770	1770
Motor Efficiency %	93.0%	91.7%	91.7%
Approx Age	3	3	3
ASHRAE Service Life	20	20	20
Remaining Life	17	17	17
Comments	Variable Speed Controller	Variable Speed Controller	Variable Speed Controller

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

High School Annex

Large Exhaust Fans

Tag	EF-15	EF-16	EF-17
Unit Type	Centrifugal	Centrifugal	Centrifugal
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	Convection Oven	Mech Rm 177	Toilets & Showers
Manufacturer	Greenheck	Greenheck	Greenheck
Model #	GB-200-4	GB-200-4	GB-200-4
Unit Size (CFM)	1,625	1,420	1,400
Motor (HP)	1/4	1/4	1/4
Electrical (V/H/P)	208V/3-Phase	208V/3-Phase	208V/3-Phase
Approx Age	3	3	3
ASHRAE Service Life	15	15	15
Remaining Life	12	12	12
Comments			

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

Large Exhaust Fans

Tag	EF-30	EF-31	EF-32
Unit Type	Centrifugal	Centrifugal	Centrifugal
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	Science Lab Hood	Science Lab Hood	Science Room
Manufacturer	Greenheck	Greenheck	Greenheck
Model #	SFD10C	SFD10C	GB-200-4
Unit Size (CFM)	1,000	1,000	1,600
Motor (HP)	1/3	1/3	1/4
Electrical (V/H/P)	208V/3-Phase	208V/3-Phase	208V/3-Phase
Approx Age	3	3	3
ASHRAE Service Life	15	15	15
Remaining Life	12	12	12
Comments			

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

APPENDIX E

CEG Project #: 9C12066
 Facility Name: High School Annex
 Address: 290 Brighton Road
 City, State, Zip: Clifton, NJ 07011

Fixture Reference #	Location	Average Burn Hours	EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						
			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, \$
232.22	Main Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	537	\$89
232.22	Copy Room	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	3	0.26	671	Existing To Remain	Existing To Remain	3	86	0	0.26	671	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	134	\$22
232.22	Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	4	0.34	894	Existing To Remain	Existing To Remain	3	86	0	0.34	894	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	179	\$30
232.22	Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	6	0.52	1,342	Existing To Remain	Existing To Remain	3	86	0	0.52	1,342	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	268	\$45
222.21	Restroom	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
232.22	Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	89	\$15
232.22	Nurse	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	8	0.69	1,789	Existing To Remain	Existing To Remain	3	86	0	0.69	1,789	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	358	\$59
222.21	Nurse Restroom	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
222.21	Entrance Vestibule	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	372	Existing To Remain	Existing To Remain	2	62	0	0.12	372	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Main Corridor	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	12	0.74	2,232	Existing To Remain	Existing To Remain	2	62	0	0.74	2,232	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
1	Main Corridor	3000	Hi-Hat 2 Lamp Biax CFL	2	32	8	0.26	768	Existing To Remain	Existing To Remain	2	32	0	0.26	768	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Corridor	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	43	2.67	7,998	Existing To Remain	Existing To Remain	2	62	0	2.67	7,998	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Corridor	3000	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	16	1.38	4,128	Existing To Remain	Existing To Remain	3	86	0	1.38	4,128	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Corridor	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	52	3.22	9,672	Existing To Remain	Existing To Remain	2	62	0	3.22	9,672	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
1	Corridor	3000	Hi-Hat 2 Lamp Biax CFL	2	32	19	0.61	1,824	Existing To Remain	Existing To Remain	2	32	0	0.61	1,824	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
211.14	Corridor	3000	1x4, 1 Lamp, 25w T8, Elect. Ballast, Surface Mnt., No Lens	1	25	6	0.15	450	Existing To Remain	Existing To Remain	1	25	0	0.15	450	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
221.34	Maintenance	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	5	0.31	372	Existing To Remain	Existing To Remain	2	62	0	0.31	372	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	ESL	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	8	0.69	1,789	Existing To Remain	Existing To Remain	3	86	0	0.69	1,789	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	10	0.86	2,236	Existing To Remain	Existing To Remain	3	86	0	0.86	2,236	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0

Fixture Reference #	Location	Average Burn Hours	EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						
			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, \$
221.34	Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	4	0.25	298	Existing To Remain	Existing To Remain	2	62	0	0.25	298	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Eng/Sci Studies	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Eng.	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Eng	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Eng	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
221.34	Maintenance	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	7	0.43	521	Existing To Remain	Existing To Remain	2	62	0	0.43	521	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
221.33	Media Center	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Direct/Indirect	2	62	61	3.78	9,833	Existing To Remain	Existing To Remain	2	62	0	3.78	9,833	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
1	Media Center	2600	Hi-Hat 2 Lamp Biax CFL	2	32	5	0.16	416	Existing To Remain	Existing To Remain	2	32	0	0.16	416	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Media Center	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Storage	1200	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	3	0.26	310	Existing To Remain	Existing To Remain	3	86	0	0.26	310	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Media Center Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	CST	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	10	0.86	2,236	Existing To Remain	Existing To Remain	3	86	0	0.86	2,236	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	447	\$74
1	Conference Room	2600	Hi-Hat 2 Lamp Biax CFL	2	32	14	0.45	1,165	Existing To Remain	Existing To Remain	2	32	0	0.45	1,165	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
211.33	Conference Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Direct/Indirect	1	33	8	0.26	686	Existing To Remain	Existing To Remain	1	33	0	0.26	686	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Copy Room	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Restroom	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
232.22	Office 1	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	3	0.26	671	Existing To Remain	Existing To Remain	3	86	0	0.26	671	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Office 2	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Office 3	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	3	0.26	671	Existing To Remain	Existing To Remain	3	86	0	0.26	671	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Girls Restroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
227.21	Girls Restroom	2600	2x2, 2 Lamp U-Tube, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	65	1	0.07	169	Existing To Remain	Existing To Remain	2	65	0	0.07	169	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0

Fixture Reference #	Location	Average Burn Hours	EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						
			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, \$
222.21	Boys Restroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
227.21	Boys Restroom	2600	2x2, 2 Lamp U-Tube, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	65	1	0.07	169	Existing To Remain	Existing To Remain	2	65	0	0.07	169	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Janitor Closet	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
211.33	Computer Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Direct/indirect	1	33	21	0.69	1,802	Existing To Remain	Existing To Remain	1	33	0	0.69	1,802	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	360	\$60
232.22	Classroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	537	\$89
232.22	Teacher Lounge	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	11	0.95	2,460	Existing To Remain	Existing To Remain	3	86	0	0.95	2,460	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	492	\$82
222.21	IT Closet	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
232.22	Speech	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	89	\$15
232.22	ESL	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	7	0.60	1,565	Existing To Remain	Existing To Remain	3	86	0	0.60	1,565	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	313	\$52
222.21	Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	149	Existing To Remain	Existing To Remain	2	62	0	0.12	149	0.00	0	\$0	1	Existing Occupancy Controls	0	20.0%	30	\$5
222.21	Boys Restroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
222.21	Girls Restroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
222.21	Teacher Loung Restroom	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
2	Gym	2600	8 Lamp CFL, Baix Pendants 42w	8	336	20	6.72	17,472	Existing To Remain	Existing To Remain	8	336	0	6.72	17,472	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Gym	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	10	0.62	1,612	Existing To Remain	Existing To Remain	2	62	0	0.62	1,612	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0

Fixture Reference #	Location	Average Burn Hours	EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						
			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, \$
232.22	Coach Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
1	Boys Locker Room	2600	Hi-Hat 2 Lamp Biax CFL	2	32	11	0.35	915	Existing To Remain	Existing To Remain	2	32	0	0.35	915	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.21	Boys Locker Room	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	86	6	0.52	1,342	Existing To Remain	Existing To Remain	3	86	0	0.52	1,342	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
1	Girls Locker Room	2600	Hi-Hat 2 Lamp Biax CFL	2	32	11	0.35	915	Existing To Remain	Existing To Remain	2	32	0	0.35	915	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.21	Girls Locker Room	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	86	6	0.52	1,342	Existing To Remain	Existing To Remain	3	86	0	0.52	1,342	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
221.34	Gym Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	4	0.25	298	Existing To Remain	Existing To Remain	2	62	0	0.25	298	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
221.34	Mech room/Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	4	0.25	298	Existing To Remain	Existing To Remain	2	62	0	0.25	298	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Res Room	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	8	0.69	1,789	Existing To Remain	Existing To Remain	3	86	0	0.69	1,789	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
211.33	Music Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Direc/indirect	1	33	36	1.19	3,089	Existing To Remain	Existing To Remain	1	33	0	1.19	3,089	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Music Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
232.22	Music Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Music Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	4	0.34	894	Existing To Remain	Existing To Remain	3	86	0	0.34	894	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Music Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	4	0.34	894	Existing To Remain	Existing To Remain	3	86	0	0.34	894	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Music Hall	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Science Lab 1	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	20	1.72	4,472	Existing To Remain	Existing To Remain	3	86	0	1.72	4,472	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Science Prep	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	6	0.52	1,342	Existing To Remain	Existing To Remain	3	86	0	0.52	1,342	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Science Lab 2	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	20	1.72	4,472	Existing To Remain	Existing To Remain	3	86	0	1.72	4,472	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	149	Existing To Remain	Existing To Remain	2	62	0	0.12	149	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
232.22	ESL	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Science	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0

Fixture Reference #	Location	Average Burn Hours	EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						
			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, \$
232.22	Math	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	RES Room	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	8	0.69	1,789	Existing To Remain	Existing To Remain	3	86	0	0.69	1,789	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Math	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Math	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
211.33	Art	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Direct/indirect	1	33	24	0.79	2,059	Existing To Remain	Existing To Remain	1	33	0	0.79	2,059	0.00	0	\$0	1	Existing Occupancy Controls	1	20.0%	412	\$68
222.21	Art Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	149	Existing To Remain	Existing To Remain	2	62	0	0.12	149	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Art Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
232.22	WL	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	WL	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	WL	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Health	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Health	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	86	12	1.03	2,683	Existing To Remain	Existing To Remain	3	86	0	1.03	2,683	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
242.21	Kitchen	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	109	13	1.42	3,684	De-lamp / Re-Lamp / Re-Ballast / Reflector	Sylvania Lamp FO28841/XP/SL/SS/ECO3 Sylvania Ballast OHE2X32T8/UNV ISL-SC	3	72	13	0.94	2,434	0.48	1,251	\$208	0	No New Controls	0	0.0%	0	\$0
222.21	Kitchen Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	149	Existing To Remain	Existing To Remain	2	62	0	0.12	149	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.21	Cafeteria	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	86	45	3.87	10,062	Existing To Remain	Existing To Remain	3	86	0	3.87	10,062	0.00	0	\$0	1	Existing Occupancy Controls	1	20.0%	2,012	\$334
222.21	Café Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	149	Existing To Remain	Existing To Remain	2	62	0	0.12	149	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Boys Restroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
222.21	Girls Restroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
222.21	Mens Room	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
222.21	Womens Room	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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
222.21	Janitor Closet	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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

Fixture Reference #	Location	Average Burn Hours	EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						
			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, \$
221.34	Mechanical Room	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mt., No Lens	2	62	12	0.74	893	Existing To Remain	Existing To Remain	2	62	0	0.74	893	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
222.21	Storage	1200	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mt., Prismatic Lens	2	62	2	0.12	149	Existing To Remain	Existing To Remain	2	62	0	0.12	149	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
232.22	Maintenance Office	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mt., Parabolic Lens	3	86	2	0.17	447	Existing To Remain	Existing To Remain	3	86	0	0.17	447	0.00	0	\$0	0	No New Controls	0	0.0%	0	\$0
TOTAL						969	74	189,689					13	73	188,439	0	1,251	\$208			2	3	6,258	\$1,039

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
High School Annex	7800	SHARP NU-U235F2	318	17.5	5,578	74.73	86,354	60.5	13,324	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 - High School Annex										
Location:										
Description: Photovoltaic System 100% Financing - 15 year										
Simple Payback Analysis										
		Photovoltaic System 100% Financing - 15 year								
Total Construction Cost		\$461,838								
Annual kWh Production		86,354								
Annual Energy Cost Reduction		\$14,335								
Average Annual SREC Revenue		\$16,501								
Simple Payback:		14.98								Years
Life Cycle Cost Analysis										
Analysis Period (years):		15				Financing %:		100%		
Discount Rate:		3%				Maintenance Escalation Rate:		3.0%		
Average Energy Cost (\$/kWh)		\$0.166				Energy Cost Escalation Rate:		3.0%		
Financing Rate:		6.00%				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	86,354	\$14,335	\$0	\$21,589	\$27,177	\$19,590	(\$10,844)	(\$10,844)	
2	\$0	85,922	\$14,765	\$0	\$21,481	\$25,969	\$20,798	(\$10,522)	(\$21,365)	
3	\$0	85,493	\$15,208	\$0	\$21,373	\$24,686	\$22,081	(\$10,186)	(\$31,552)	
4	\$0	85,065	\$15,664	\$0	\$21,266	\$23,324	\$23,443	(\$9,837)	(\$41,388)	
5	\$0	84,640	\$16,134	\$872	\$21,160	\$21,879	\$24,888	(\$10,345)	(\$51,733)	
6	\$0	84,217	\$16,618	\$867	\$16,843	\$20,344	\$26,423	(\$14,173)	(\$65,906)	
7	\$0	83,796	\$17,116	\$863	\$16,759	\$18,714	\$28,053	(\$13,755)	(\$79,661)	
8	\$0	83,377	\$17,630	\$859	\$16,675	\$16,984	\$29,783	(\$13,321)	(\$92,982)	
9	\$0	82,960	\$18,159	\$854	\$16,592	\$15,147	\$31,620	(\$12,871)	(\$105,852)	
10	\$0	82,545	\$18,704	\$850	\$12,382	\$13,196	\$33,571	(\$16,532)	(\$122,384)	
11	\$0	82,132	\$19,265	\$846	\$12,320	\$11,126	\$35,641	(\$16,028)	(\$138,413)	
12	\$0	81,722	\$19,843	\$842	\$12,258	\$8,927	\$37,840	(\$15,508)	(\$153,920)	
13	\$0	81,313	\$20,438	\$838	\$12,197	\$6,594	\$40,173	(\$14,970)	(\$168,890)	
14	\$0	80,906	\$21,051	\$833	\$8,091	\$4,116	\$42,651	(\$18,459)	(\$187,349)	
15	\$0	80,502	\$21,683	\$829	\$8,050	\$1,485	\$45,282	(\$17,863)	(\$205,212)	
Totals:		1,250,942	\$266,611	\$9,354	\$239,036	\$239,667	\$461,838	(\$205,212)	(\$1,477,452)	
Net Present Value (NPV)							(\$150,315)			