NEW BRUNSWICK
BOARD OF EDUCATION

NEW BRUNSWICK MIDDLE SCHOOL

1125 LIVINGSTON AVENUE
NEW BRUNSWICK, NJ 08901

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

Natural Gas Utility Provider:	Public Service Electric & Gas
Utility Rate Structure:	Large Volume Gas (LVG)
Third Party Supplier:	None

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: LPLS
Meter No: 9197971
Account # 42-008-661-02
Third Party Utility Direct Energy
TPS Meter / Acct No: N/A

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Nov-11	72,636	248.1	$9,363
Dec-11	76,019	250.6	$9,642
Jan-12	82,227	261.4	$10,488
Feb-12	75,053	253.0	$9,457
Mar-12	57,543	247.9	$6,622
Apr-12	58,184	306.5	$5,865
May-12	103,228	423.4	$16,256
Jun-12	100,757	381.2	$15,676
Jul-12	122,299	392.3	$19,016
Aug-12	115,356	413.9	$18,387
Sep-12	101,434	442.8	$13,219
Oct-12	62,217	262.0	$8,020
Totals	**1,026,953**	**442.8 Max**	**$142,011**

AVERAGE DEMAND **323.6 KW average**
AVERAGE RATE **$0.138 $/kWh**

***Note:** Total consumption of electricity in the above table does not include solar generated from rooftop Solar System. Please see Table 2 for total consumption analysis.

Figure 1
Electricity Usage Profile

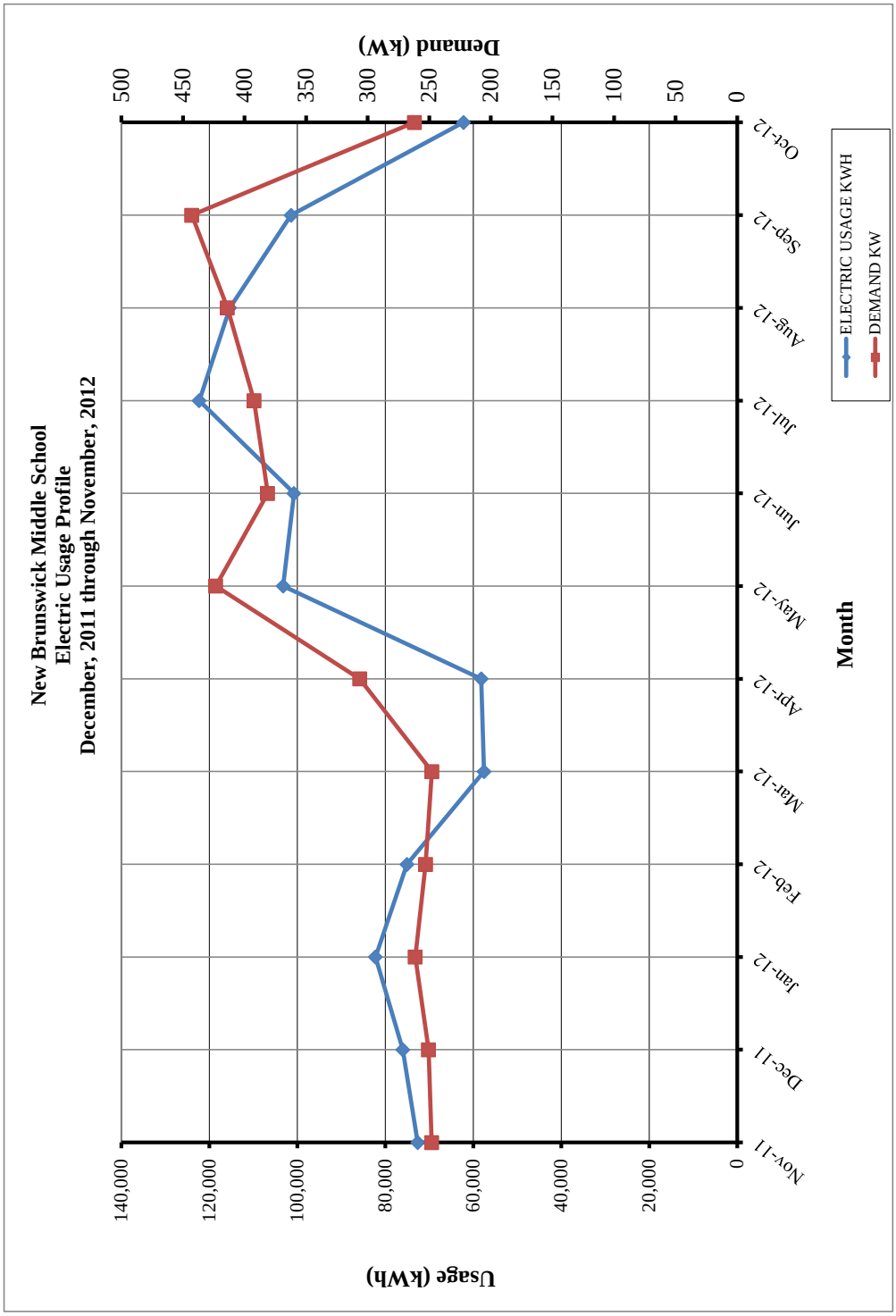


Table 2
Electric & Existing Solar Generation

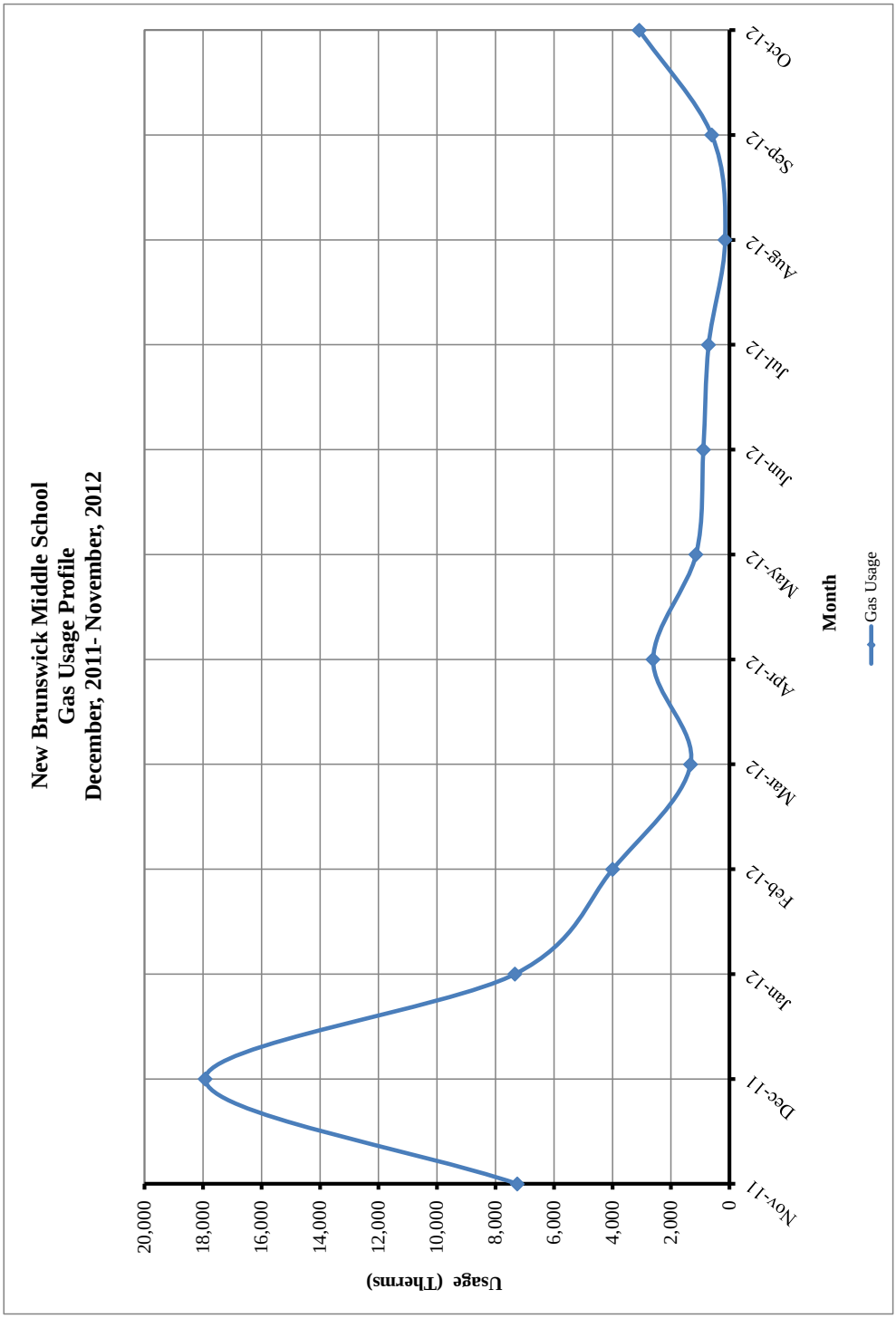
ELECTRIC & SOLAR GENERATION			
MONTH OF USE	**CONSUMPTION KWH**	**SOLAR GENERATION KWH**	**TOTAL FACILITY CONSUMPTION**
Nov-11	72,636	24252.0	96,888
Dec-11	76,019	21760.0	97,779
Jan-12	82,227	26730.0	108,957
Feb-12	75,053	32405.0	107,458
Mar-12	57,543	45353.0	102,896
Apr-12	58,184	50248.0	108,432
May-12	103,228	59781.0	163,009
Jun-12	100,757	58417.0	159,174
Jul-12	122,299	57963.0	180,262
Aug-12	115,356	53686.0	169,042
Sep-12	101,434	46190.0	147,624
Oct-12	62,217	38022.0	100,239
Totals	**1,026,953**	**514,807**	**1,541,760**

The above table represents the facility electric consumption as well as the approximate solar generation of the 445.51 KW solar photo-voltaic system that New Brunswick Middle School currently has installed. The system size of 445.51 KW was provided by the Board of Education, while the estimated yearly generation for this size system was generated by PV Watts program.

Table 3
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider:	PSE&G	
Rate:	LVG	
Meter No:	1810091	
Point of Delivery ID:	42-008-661-02	
Third Party Utility Provider:	N/A	
TPS Meter No:	N/A	
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Nov-11	7,256.00	$7,999.99
Dec-11	17,925.00	$16,373.78
Jan-12	7,337.00	$7,324.50
Feb-12	3,991.00	$2,458.40
Mar-12	1,330.00	$819.47
Apr-12	2,611.00	$1,618.02
May-12	1,144.00	$788.20
Jun-12	894.00	$682.96
Jul-12	713.00	$588.85
Aug-12	150.00	$203.86
Sep-12	607.00	$507.42
Oct-12	3,087.00	$4,156.73
TOTALS	**47,045.00**	**$43,522.18**
AVERAGE RATE:	**$0.93**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The New Brunswick Middle School is located at 1125 Livingston Avenue in New Brunswick, New Jersey. The 88,595 SF New Brunswick Middle School was built in 1967 with the addition of the media center in 1988 and the additions for the 1st and 5th grade wings in 2008. The building is a single-story structure and consists of office space for administrative use, gymnasium, classrooms, kitchen, media center, cafeteria and mechanical rooms.

Occupancy Profile

The typical hours of operation for New Brunswick Middle School are Monday through Friday between 8:10 am and 2:30 pm, with custodial services running until 11:00 pm. The school has a student population of approximately 1,147 present for 10 months, and a year round occupancy of approximately 85 administrative staff.

Building Envelope

Exterior walls for the School are brick faced with a concrete block construction. The windows in the school are in below average condition with single pane glass. The roof is a flat, built up rubber roof with the original building containing stone ballasts that appears to be in good condition.

Heating Plant

Heating is provided to the facility from the Mechanical Room which houses two natural gas fired, cast iron sectional steam boilers made by Weil McClain. Both boilers have equivalent heating capacity characteristics having an input capacity of 8,371 MBH and output of 5,186 MBH. Both boilers appear to be maintained and in average condition. Combustion tests were not available for review but based on age the estimated fuel-to-thermal efficiency for the boilers is 65%, based on radiation losses and inefficiencies in operation inherent to the older technology. Both boilers are approximately 24 years old which is within their typical ASHRAE service life of 35 years. At this time, the boilers are recommended for replacement. The heating hot water is circulated throughout the building via two constant speed end-suction pumps located in the Mechanical Room. The pumps are driven with standard efficiency motors that are recommended to be replaced with NEMA premium efficient motors. The hot water heating system provides heating hot water to the classroom units, hot water fin-tube radiators and heating and ventilation units throughout the facility.

Cooling Plant

Cooling is provided to the school from the Mechanical Room which houses two (2) centrifugal, water cooled chillers. These chillers were installed approximately 21 years ago, per nameplate data. These chillers are both Trane Centravac model chillers. Chiller #1 is rated for 215 Tons of cooling and Chiller #2 is rated for 255 Tons of cooling. Based on the overall size of the building, these chillers operated in parallel and are staged to handle the building load. Chilled water is circulated throughout the building via two (2) 40 HP, constant speed, base mounted, end suction pumps. These pumps are driven with NEMA premium efficient motors. Chilled water is

circulated throughout the building to the classroom unit ventilators and air handling units. Both chillers are 19 years old and are approaching the end of their useful service life, as defined by ASHRAE.

The condenser water is served by a single closed cell cooling tower, located on the roof. This cooling tower is a Baltimore Air Coil. Model number information was not available for this cooling tower. The cooling tower is approximately 25 years old and is approaching the end of its useful service life, per ASHRAE Standards.

HVAC Systems

The classrooms of the school are served by hydronic unit ventilators. These units are equipped with both hot and chilled water coils for heating and cooling. Some of these units are constant volume, and other air handling units have variable frequency drives on the fan motors. Several of these air handling units have recently been replaced or are in the process of being replaced.

Common areas, such as the Gymnasium and Library are served by indoor, central station air handling units with chilled and hot water coils. The corridors and restrooms are served by above ceiling hydronic heating only fan coil units.

Exhaust System

Air is exhausted from the toilet rooms and other areas of the facility through the roof exhaust fans.

HVAC System Controls

The HVAC systems within the Middle School are controlled by a combination of Trane DDC controls systems and stand-alone electronic controls.

Domestic Hot Water

The source of domestic hot water for Middle School is two (2) RBI Futura II series high efficiency hot water heaters. These heaters/boilers are each rated for a gas input of 1,000 MBH and a recovery rate of 1,020 gallons per hour. These hot water heaters were installed approximately 4 years ago and are in excellent condition.

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.

Solar Photovoltaic

The New Brunswick Middle School currently has a rooftop solar array equaling approximately 350 kW and producing 400,000 kWh based on an approximation of the size of the system.

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	Gym Lighting Upgrade	$41,265	$3,391	12.2	23.3%
ECM #2	Lighting Controls	$28,680	$5,487	5.2	187.0%
ECM #3	Boiler Upgrade	$214,029	$11,187	19.1	25.4%
ECM #4	Computer Automatic Standby or Hibernate Modes	$2,617	$3,344	0.8	538.9%
ECM #5	Boiler Burner and Controls Upgrade	$46,000	$2,697	17.1	23.1%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	338.4 KW PV System	$2,172,113	$126,393	17.2	-12.7%
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	Gym Lighting Upgrade	9.5	24,570	-
ECM #2	Lighting Controls	-	39,760	-
ECM #3	Boiler Upgrade	-	-	12,029
ECM #4	Computer Automatic Standby or Hibernate Modes	-	24,233	-
ECM #5	Boiler Burner and Controls Upgrade	-	-	2,900
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	**DESCRIPTION**	**ANNUAL UTILITY REDUCTION**		
		ELECTRIC DEMAND (KW)	**ELECTRIC CONSUMPTION (KWH)**	**NATURAL GAS (THERMS)**
REM #1	338.4 KW PV System	338.4	384,075	-

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**
Gym Lighting Upgrade	$3,391	$47,565	$6,300	$41,265	12.2
Lighting Controls	$5,487	$31,500	$2,820	$28,680	5.2
Boiler Upgrade	$11,187	$214,029	$0	$214,029	19.1
Computer Automatic Standby or Hibernate	$3,344	$2,617	$0	$2,617	0.8
Boiler Burner and Controls Upgrade	$2,697	$46,000	$0	$46,000	17.1
Design / Construction Extras (15%)	*$0*	*$51,257*	*$0*	*$51,257*	
Total Project	**$26,106**	**$392,968**	**$9,120**	**$383,848**	**15**

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 – Gymnasium

Description:

The gymnasium at New Brunswick Middle School is currently lit via 400 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 six lamp, 54 watt high output fixtures.

This measure replaces all the HID, 400 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 #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$47,565
NJ Smart Start Equipment Incentive ($):	$6,300
Net Installation Cost ($):	$41,265
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$3,391
Total Yearly Savings ($/Yr):	$3,391
Estimated ECM Lifetime (Yr):	15
Simple Payback	12.2
Simple Lifetime ROI	23.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$50,860
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	($787.52)

ECM #2: Lighting Controls Upgrade – Occupancy Sensors

Description:

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

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

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors (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 #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$31,500
NJ Smart Start Equipment Incentive ($):	$2,820
Net Installation Cost ($):	$28,680
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$5,487
Total Yearly Savings ($/Yr):	$5,487
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.2
Simple Lifetime ROI	187.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$82,303
Internal Rate of Return (IRR)	17%
Net Present Value (NPV)	$36,821.56

ECM #3: Condensing Boiler Installation

Description:

There are two existing Weil McLain steam boilers which are used as the primary source of heat for New Brunswick Middle School. These boilers are connected to a steam to hot water heat exchanger which then distributes hot water to the air handling units and unit ventilators throughout the system. The Weil McLain boilers are approximately 25 years old and have not yet surpassed their life expectancy of a typical cast iron boiler but considering the system can be converted over to hot water without extensive rework of the system, 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 62%, which makes the condensing boilers an 30% 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 steam cast iron boilers. Additionally, the piping in the boiler room will require some work due to the removal of the heat exchanger from the system, which requires new piping to be laid out from the boilers to the existing loop pumps. The basis for this ECM is Aerco condensing boiler; model number BMK – 6.0. 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: 47,045 Therms

Baseline Hot Water Gas Use: 10,155 Therms

For Old Boiler Section: 47,045 Therms – 10,155 Domestic HW = 36,890 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)	36,890	0	
Boiler Efficiency (%)	62%	92%	30%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	2,287	2,287	
Gas Cost ($/Therm)	0.93	0.93	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	36,890	24,861	12,029
Energy Cost ($)	$34,308	$23,120	$11,187
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 #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$214,029
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$214,029
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$11,187
Total Yearly Savings ($/Yr):	$11,187
Estimated ECM Lifetime (Yr):	24
Simple Payback	19.1
Simple Lifetime ROI	25.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$268,495
Internal Rate of Return (IRR)	2%
Net Present Value (NPV)	($24,566.35)

ECM #4: Set Computers to Automatic Stand-by or Hibernate Modes

Description:

During the survey, it was noticed that the majority of the computers were left at ON position with the monitors at Screen Saver or OFF positions.

Many personal computers (PC) came equipped with automatic Sleep Mode or Hibernate (power down) mode features. Normally computers boot up from Sleep Mode or Hibernate mode much faster than powering up from Shut Down position.

Based on an independent study by the U.S. Department of Energy, Energy star® rated computers use approximately 70% less power during Sleep Mode. It is recommended to set up the PCs at this facility to switch into Sleep Mode after a short period of inactivity and Hibernate mode after a long period of inactivity.

This ECM includes configuring the computers in the classrooms and the offices such that they automatically switch into:

- Sleep Mode after 15 minutes of inactivity
- Hibernate after 60 minutes of inactivity

The inactivity times above can be adjusted based on experience or preference. Even though this ECM can be implemented easily in house, the calculations assume an independent computer technician performing the task at a typical market rate.

Energy Savings Calculations:

No. of CRT Computers:	157
Operating Weeks per Yr:	42
Estimated percentage of computers left ON over night:	75%

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

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

The cost of configuring the computers to automatically sleep or hibernate is based on 10 minutes per computer per technician at an hourly rate indicated below.

Implementation Costs: = # Computers X Configuration Time X Cost per Hour
= 157 Monitors X 10 Minutes/Computer X $100 per Hour

= $2,617

AUTOMATIC SLEEP OR HIBERNATE MODES FOR COMPUTERS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Manual Operation	Auto Power Save	-
# of Computers	157	157	-
% Computers left ON	75%	75%	-
Power when left ON (Watt)	50	50	-
Power at Stand-by (Watt)	5	5	-
Power at Hibernate (Watt)	4	4	-
Power when OFF (Watt)	0	0	-
Operating Weeks per Yr	42	42	-
Operating Hours per Week	168	168	-
Hours/Wk Computers ON	120	20	-
Hours/Wk at Sleep Mode	0	20	-
Hours/Wk at Hibernate Mode	0	80	-
Hours/Wk at Power Down	48	48	-
Elec Cost ($/kWh)	0.138	0.138	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	29,673	5,440	24,233
Energy Cost ($)	$4,095	$751	$3,344
COMMENTS:	Calculation assumes computers currently run throughout work week and get shut down over the weekend.		

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,617
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$2,617
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$3,344
Total Yearly Savings ($/Yr):	$3,344
Estimated ECM Lifetime (Yr):	5
Simple Payback	0.8
Simple Lifetime ROI	538.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$16,721
Internal Rate of Return (IRR)	126%
Net Present Value (NPV)	$12,698.21

ECM #5: STEAM BOILER BURNER & CONTROLS UPGRADE

Description:

The majority of the heating is provided to the Middle School facility by Weil McLain 200 Boiler Horsepower (BHP) natural gas-fired boilers that produces steam for the heating season. The boilers are 1989 vintage and are well maintained and currently should be capable of achieving an efficiency rating of 70 to 75 percent while operating. Given the limitations of the current system burner and controls and the vast improvement in boiler controls today over what was available then, it is recommended that a burner and new controls upgrade be performed.

This ECM will install new Cleaver Brooks Profire burner with Honeywell controls on each of these boilers with separate motors that will control fuel flow, excess air oxygen trim and variable speed on the blower. Installation of this system will result in improved operating efficiency of the boilers and less cycling of boilers since the boilers can operate closer to the demanded load requirement. These burners can also be equipped with parallel positioning for further control.

Energy Savings Using Hand Calculations:

Annual Heating Energy Savings = Existing Fuel Consumption x 8% Efficiency Increase

Heating Cost Savings = Annual Heating Energy Savings x Fuel Cost ($/Unit)**Error! Bookmark not defined.Error! Bookmark not defined.**
Error! Bookmark not defined.Error! Bookmark not defined.
Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$46,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$46,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,697
Total Yearly Savings ($/Yr):	$2,697
Estimated ECM Lifetime (Yr):	21
Simple Payback	17.1
Simple Lifetime ROI	23.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$56,637
Internal Rate of Return (IRR)	2%
Net Present Value (NPV)	($4,425.68)

REM #1: 338.4 kW Solar System

Description:

The New Brunswick Middle School has available roof and parking lot space that could accommodate a significant amount of solar generation. Based on the available areas a 338.4 kilowatt solar array could be installed, assuming the existing roof structure is capable of supporting an array. The array will produce approximately 384,075 kilowatt-hours annually that will reduce the overall electric usage of the facility by 37.4%.

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}):	338.40
Electric Generation (KWH/Yr):	384,075
Installation Cost ($):	$2,172,113
SREC Revenue ($/Yr):	$73,391
Energy Savings ($/Yr):	$53,002
Total Yearly Savings ($/Yr):	$126,393
ECM Analysis Period (Yr):	15
Simple Payback (Yrs):	17.2
Analysis Period Electric Savings ($):	$985,786
Analysis Period SREC Revenue ($):	$1,063,154
Net Present Value (NPV)	($950,687.94)

V. ADDITIONAL RECOMMENDATIONS

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

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

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

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

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

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

G. Steam Trap Replacement Survey and Analysis by Spirax/Sarco is a recommendation for the school to provide additional energy and operational savings.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

New Brunswick Board of Education - New Brunswick Middle School

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	Gym Lighting Upgrade	$15,750	$31,815	$6,300	$41,265	$3,391	$0	$3,391	15	$50,860	$0	23.3%	12.2	2.73%	($787.52)
ECM #2	Lighting Controls	$26,400	$5,100	$2,820	$28,680	$5,487	$0	$5,487	15	$82,303	$0	187.0%	5.2	17.41%	$36,821.56
ECM #3	Boiler Upgrade	$127,010	$87,019	$0	$214,029	$11,187	$0	$11,187	24	$268,495	$0	25.4%	19.1	1.90%	($24,566.35)
ECM #4	Computer Automatic Standby or Hibernate Modes	$0	$2,617	$0	$2,617	$3,344	$0	$3,344	5	$16,721	$0	538.9%	0.8	125.60%	$12,698.21
ECM #5	Boiler Burner and Controls Upgrade	$46,000	$0	$0	$46,000	$2,697	$0	$2,697	21	$56,637	$0	23.1%	17.1	1.97%	($4,425.68)
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	338.4 KW PV System	$2,172,113	$0	$0	$2,172,113	$53,002	$73,391	$126,393	15	$1,895,897	$1,100,862	-12.7%	17.2	-1.65%	($663,239.36)

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
4-New Brunswick BOE - New Brunswick Middle School

Building ID: 3415898
For 12-month Period Ending: October 31, 2012[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: February 27, 2013

Facility
4-New Brunswick BOE - New Brunswick Middle School
1125 Livingston Avenue
New Brunswick, NJ 08901

Facility Owner
New Brunswick Board of Education
268 Baldwin Street 3rd Floor
New Brunswick, NJ 08901

Primary Contact for this Facility
Jack Humma
268 Baldwin Street 3rd Floor
New Brunswick, NJ 08901

Year Built: 1964
Gross Floor Area (ft²): 166,000

Energy Performance Rating[2] (1-100) 62

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	3,499,857
Electricity - On-Site Solar(kBtu)	1,756,521
Natural Gas (kBtu)[4]	4,697,454
Total Energy (kBtu)	9,953,832

Energy Intensity[4]	
Site (kBtu/ft²/yr)	60
Source (kBtu/ft²/yr)	111

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	994

Electric Distribution Utility
Public Service Electric & Gas Co

National Median Comparison	
National Median Site EUI	67
National Median Source EUI	124
% Difference from National Median Source EUI	-11%
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.

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

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**

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	4-New Brunswick BOE - New Brunswick Middle School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	1125 Livingston Avenue, New Brunswick, NJ 08901	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.		☐
New Brunswick Middle School (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	166,000 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.		☐
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	157	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	90 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	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 Meter # 9197971 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
09/03/2012	10/02/2012	101,434.00
08/03/2012	09/02/2012	115,356.00
07/03/2012	08/02/2012	122,299.00
06/03/2012	07/02/2012	100,757.00
05/03/2012	06/02/2012	103,228.00
04/03/2012	05/02/2012	58,184.00
03/03/2012	04/02/2012	57,543.00
02/03/2012	03/02/2012	75,053.00
01/03/2012	02/02/2012	82,227.00
12/03/2011	01/02/2012	76,019.00
11/03/2011	12/02/2011	72,636.00
Electric Meter # 9197971 Consumption (kWh (thousand Watt-hours))		**964,736.00**
Electric Meter # 9197971 Consumption (kBtu (thousand Btu))		**3,291,679.23**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**3,291,679.23**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Meter: Solar (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** On-Site Solar		
Start Date	**End Date**	**Energy Used On-Site (kWh (thousand Watt-hours))**
10/01/2012	10/31/2012	38,022.00
09/01/2012	09/30/2012	46,190.00
08/01/2012	08/31/2012	53,686.00
07/01/2012	07/31/2012	57,963.00
06/01/2012	06/30/2012	58,417.00
05/01/2012	05/31/2012	59,781.00
04/01/2012	04/30/2012	50,248.00
03/01/2012	03/31/2012	45,353.00
02/01/2012	02/29/2012	32,405.00
01/01/2012	01/31/2012	26,730.00
12/01/2011	12/31/2011	21,760.00

11/01/2011	11/30/2011	24,252.00
Solar Consumption (kWh (thousand Watt-hours))		**514,807.00**
Solar Consumption (kBtu (thousand Btu))		**1,756,521.48**
Total Electricity (On-Site Solar) Consumption (kBtu (thousand Btu))		**1,756,521.48**
Is this the total amount of solar electricity generated on site and used at this facility?		☐

Fuel Type: Natural Gas

Meter: Gas Meter # 1810091 (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
09/03/2012	10/02/2012	607.00
08/03/2012	09/02/2012	150.00
07/03/2012	08/02/2012	713.00
06/03/2012	07/02/2012	894.00
05/03/2012	06/02/2012	1,144.00
04/03/2012	05/02/2012	2,611.00
03/03/2012	04/02/2012	1,330.00
02/03/2012	03/02/2012	3,991.00
01/03/2012	02/02/2012	7,337.00
12/03/2011	01/02/2012	17,925.00
11/03/2011	12/02/2011	7,256.00
Gas Meter # 1810091 Consumption (therms)		**43,958.00**
Gas Meter # 1810091 Consumption (kBtu (thousand Btu))		**4,395,800.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**4,395,800.00**
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
4-New Brunswick BOE - New Brunswick Middle School
1125 Livingston Avenue
New Brunswick, NJ 08901

Facility Owner
New Brunswick Board of Education
268 Baldwin Street 3rd Floor
New Brunswick, NJ 08901

Primary Contact for this Facility
Jack Humma
268 Baldwin Street 3rd Floor
New Brunswick, NJ 08901

General Information

4-New Brunswick BOE - New Brunswick Middle School	
Gross Floor Area Excluding Parking: (ft^2)	166,000
Year Built	1964
For 12-month Evaluation Period Ending Date:	October 31, 2012

Facility Space Use Summary

New Brunswick Middle School	
Space Type	K-12 School
Gross Floor Area (ft^2)	166,000
Open Weekends?	No
Number of PCs	157
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	90
Percent Heated	100
Months °	10
High School?	No
School District °	New Brunswick

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 10/31/2012)	**Baseline** (Ending Date 10/31/2012)	**Rating of 75**	**Target**	**National Median**
Energy Performance Rating	62	62	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	60	60	53	N/A	67
Source (kBtu/ft²)	111	111	97	N/A	124
Energy Cost					
$/year	$ 184,747.36	$ 184,747.36	$ 162,439.64	N/A	$ 207,732.94
$/ft²/year	$ 1.11	$ 1.11	$ 0.98	N/A	$ 1.25
Greenhouse Gas Emissions					
$MtCO_2e$/year	994	994	874	N/A	1,118
$kgCO_2e/ft^2$/year	6	6	5	N/A	7

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.

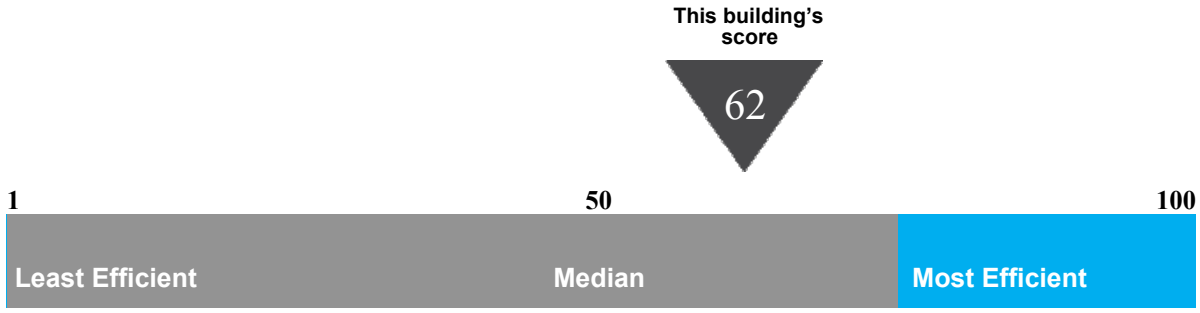
Statement of Energy Performance

2012

4-New Brunswick BOE - New Brunswick Middle School
1125 Livingston Avenue
New Brunswick, NJ 08901

Portfolio Manager Building ID: 3415898

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 111 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending October 2012

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: 02/27/2013

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Brunswick Middle School

Boilers

Tag	**B-1,2**		
Unit Type	Cast Iron Sectional Steam Boiler		
Qty	2		
Location	Boiler Room		
Area Served	Hot Water Loop		
Manufacturer	Weil McLain		
Model #	2494		
Serial #	Series 3		
Input Capacity (Btu/Hr)	8,371		
Rated Output Capacity (Btu/Hr)	5,186		
Approx. Efficiency %	70.0%		
Fuel	Natural Gas		
Approx Age	24		
ASHRAE Service Life	35		
Remaining Life	11		
Comments	Boilers are in fair condition		

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Brunswick Middle School

Chillers

Tag	CH-1	CH-2	
Unit Type	Water Cooled Centrifugal Chiller	Water Cooled Centrifugal Chiller	
Qty	1	1	
Location	Mechanical Room	Mechanical Room	
Area Served	Chilled Water Loop	Chilled Water Loop	
Manufacturer	Trane	Trane	
Model #	Centravac RTHB255FM	Centravac RTHB255FM	
Serial #	U92E09328	U94MD2081	
Refrigerant	R-22	R-22	
Cooling Capacity (Tons)	255	255	
Cooling Efficiency (KW/Ton)	0.77	0.77	
Volts / Phase / Hz	460V / 3 PH / 60 Hz	460V / 3 PH / 60 Hz	
Fuel	N/A	N/A	
Chilled Water GPM / ΔT	-	-	
Condenser Water GPM / ΔT	-	-	
Approx Age	21	21	
ASHRAE Service Life	23	23	
Remaining Life	2	2	
Comments	Chiller is in fair condition	Chiller is in fair condition	

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Brunswick Middle School

Cooling Towers

Tag	**CT-1**		
Unit Type	Closed Circuit		
Qty	1		
Location	Roof		
Area Served	Chiller Condenser Loop		
Manufacturer	Baltimore Air Coil		
Model #	3514R		
Serial #	-		
Rated Flow GPM	629 GPM		
EWT / LWT	95°F / 85°F		
Motor HP	-		
Electrical	460V/3Ph		
Approx Age	21		
ASHRAE Service Life	20		
Remaining Life	(1)		
Comments	Cooling tower is in poor condition		

Note:

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Brunswick Middle School

Domestic Water Heaters

Tag			
Unit Type	Domestic Hot Water Heater		
Qty	2		
Location	Boiler Room		
Area Served	Domestic Hot Boiler		
Manufacturer	RBI Futura II		
Model #	FW1000		
Serial #	081056579 ; 050849962		
Size (Gallons)	100 Gallons		
Input Capacity (MBH/KW)	1000		
Recovery (Gal/Hr)	1020		
Efficiency %	85%		
Fuel	Natural Gas		
Approx Age	4		
ASHRAE Service Life	24		
Remaining Life	20		
Comments	Boilers/Heaters are new and in excellent condition		

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Brunswick Middle School

Pumps

Tag	P-1,2	P-3	P-4
Unit Type	Base Mounted End Suction	Base Mounted End Suction	Base Mounted End Suction
Qty	2	1	1
Location	Boiler Room	Boiler Room	Boiler Room
Area Served	Chilled Water Loop	Condenser Water Loop	Condenser Water Loop
Manufacturer	B&G	B&G	B&G
Model #	-	-	-
Serial #	-	-	-
Horse Power	40	10	20
Flow	580 GPM @ 122 Ft	629 GPM @ 40 Ft	789 GPM @ 60 Ft
Motor Info	Super E	Super E	Super E
Electrical Power	230/460V 3Ph	230/460V 3Ph	230/460V 3Ph
RPM	1780	1170	1765
Motor Efficiency %	94.1%	91.0%	93.0%
Approx Age	16	16	16
ASHRAE Service Life	18	18	18
Remaining Life	2	2	2
Comments	NEMA Premium Motors	NEMA Premium Motor	NEMA Premium Motor

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

Pumps

Tag	P-5,6	
Unit Type	Base Mounted End Suction	
Qty	2	
Location	Boiler Room	
Area Served	Hot Water Loop	
Manufacturer	B&G	
Model #	-	
Serial #	-	
Horse Power	30	
Flow	570 GPM @ 105 Ft	
Motor Info	Super E	
Electrical Power	230/460V 3Ph	
RPM	1780	
Motor Efficiency %	92.4%	
Approx Age	16	
ASHRAE Service Life	18	
Remaining Life	2	
Comments	NEMA Premium Motors	

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

APPENDIX E

CEG Project #: 9C12064
Facility Name: New Brunswick Middle School
Address: 1125 Livingston Avenue
City, State, Zip New Brunswick, NJ 08901

			Existing Fixtures						Proposed Fixtures Retrofit							Retrofit Energy Savings			Lighting Retrofit Costs					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, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
211.31	Laundry	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	2	0.07	79	Existing to Remain	Existing to Remain	1	33	0	0.07	79	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Trainer	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	2	0.07	172	Existing to Remain	Existing to Remain	1	33	0	0.07	172	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Boys Locker Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	31	1.02	2,660	Existing to Remain	Existing to Remain	1	33	0	1.02	2,660	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	3	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	0.5	20.0%	532	$73
211.45	Boys Locker Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	3	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	0.5	20.0%	103	$14
211.31	Boys LR Side Office Bathroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	1	0.03	86	Existing to Remain	Existing to Remain	1	33	0	0.03	86	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Boys LR Side Office	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	103	$14
222.21	Boys LR Entrance	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	Boys LR Back Hall	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Girls LR Back Storage	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	2	0.07	79	Existing to Remain	Existing to Remain	1	33	0	0.07	79	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Girls Locker Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	31	1.02	2,660	Existing to Remain	Existing to Remain	1	33	0	1.02	2,660	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	3	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	0.5	20.0%	532	$73
211.45	Girls Locker Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	3	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	0.5	20.0%	103	$14
211.31	Girls LR Side Office Bathroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	1	0.03	86	Existing to Remain	Existing to Remain	1	33	0	0.03	86	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Girls LR Side Office	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	103	$14
222.21	Girls LR Entrance	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	Girls LR Back Hall	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
768	Gym	2600	400w MH, Hi-Bay	1	465	63	29.30	76,167	Remove and Return	1x4, 6 Lamp, 54w T5HO, Elect. Ballast, Lo Bay	6	315	63	19.85	51,597	9.45	24,570	$3,391	$15,750.00	$31,815.00	$47,565.00	$6,300.00	12.17	0	No New Controls	0	0.0%	0	$0
222.21	Gym Hallway	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	20	1.24	3,720	Existing to Remain	Existing to Remain	2	62	0	1.24	3,720	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	Main Entrance	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	7	0.43	1,302	Existing to Remain	Existing to Remain	2	62	0	0.43	1,302	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	1030 Cafeteria	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	189	6.24	16,216	Existing to Remain	Existing to Remain	1	33	0	6.24	16,216	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	1030 Cafeteria	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	1026 Kitchen	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	47	2.91	7,576	Existing to Remain	Existing to Remain	2	62	0	2.91	7,576	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	Kitchen Side Office	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Girls Restroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	2	0.07	172	Existing to Remain	Existing to Remain	1	33	0	0.07	172	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.45	Girls Restroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	3	0.10	257	Existing to Remain	Existing to Remain	1	33	0	0.10	257	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0

			Existing Fixtures						Proposed Fixtures Retrofit							Retrofit Energy Savings			Lighting Retrofit Costs					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, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
211.45	Boys Restroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	3	0.10	257	Existing to Remain	Existing to Remain	1	33	0	0.10	257	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	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	1	0.06	161	Existing to Remain	Existing to Remain	2	62	0	0.06	161	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	2047 Health	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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	$0.00	$0.00	$0.00	$0.00	-	3	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	0.5	20.0%	451	$62
227.21	2047 Health	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	$0.00	$0.00	$0.00	$0.00	-	3	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	0.5	20.0%	34	$5
222.21	2047 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	2047 Side Classroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	2047 Side Office	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	2047 Bathroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Kitchen Back Hallway	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	7	0.43	1,128	Existing to Remain	Existing to Remain	2	62	0	0.43	1,128	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Kitchen Back Office	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
770	Kitchen Janitor CL	1200	1 Lamp, 60w Incandescent, Pendant Mnt.	1	60	1	0.06	72	Relamp	(1) 26w CFL Lamp	1	26	1	0.03	31	0.03	41	$6	$10.00	$20.00	$30.00	$0.00	5.33	0	No New Controls	0	0.0%	0	$0
770	Kitchen Storage	1200	1 Lamp, 60w Incandescent, Pendant Mnt.	1	60	1	0.06	72	Relamp	(1) 26w CFL Lamp	1	26	1	0.03	31	0.03	41	$6	$10.00	$20.00	$30.00	$0.00	5.33	0	No New Controls	0	0.0%	0	$0
221.11	Kitchen Office	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Kitchen Office	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	54 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	20	0.66	1,716	Existing to Remain	Existing to Remain	1	33	0	0.66	1,716	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	343	$47
770	Custodian Storage	1200	1 Lamp, 60w Incandescent, Pendant Mnt.	1	60	9	0.54	648	Relamp	(1) 26w CFL Lamp	1	26	9	0.23	281	0.31	367	$51	$90.00	$180.00	$270.00	$0.00	5.33	0	No New Controls	0	0.0%	0	$0
780	Custodian Storage	1200	8", 1 Lamp, 26w CFL, Elect. Ballast, Recessed Mnt., No Lens	1	26	1	0.03	31	Existing to Remain	Existing to Remain	1	26	0	0.03	31	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Boys Bathroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	4	0.25	645	Existing to Remain	Existing to Remain	2	62	0	0.25	645	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Girls Bathroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	4	0.25	645	Existing to Remain	Existing to Remain	2	62	0	0.25	645	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	Auditorium Hallway	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	28	1.74	5,208	Existing to Remain	Existing to Remain	2	62	0	1.74	5,208	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Music 113	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	48	1.58	4,118	Existing to Remain	Existing to Remain	1	33	0	1.58	4,118	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	824	$114
211.31	Music 126	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	48	1.58	4,118	Existing to Remain	Existing to Remain	1	33	0	1.58	4,118	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	824	$114
551	1038 Auditorium	2600	Recessed Down Light, 90w Lamp	1	90	49	4.41	11,466	Relamp	18w LED PAR38	1	18	49	0.88	2,293	3.53	9,173	$1,266	$4,165.00	$2,450.00	$6,615.00	$0.00	5.23	0	No New Controls	0	0.0%	0	$0
790	134 Stage	1200	1 Lamp, 26w CFL, Elect. Ballast, Pendant Mnt., No Lens	1	26	28	0.73	874	Existing to Remain	Existing to Remain	1	26	0	0.73	874	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
227.21	D126 Music Hall	3000	2x2, 2 Lamp U-Tube, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	65	1	0.07	195	Existing to Remain	Existing to Remain	2	65	0	0.07	195	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	D126 Music Office 1	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0

			Existing Fixtures						Proposed Fixtures Retrofit							Retrofit Energy Savings			Lighting Retrofit Costs					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, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
221.11	D126 Music Office 2	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	D126 Music Office 3	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	D126 Music Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.45	Stairwells x 6	3000	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	24	0.79	2,376	Existing to Remain	Existing to Remain	1	33	0	0.79	2,376	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Stairwells x 6	3000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	101 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	30	0.99	2,574	Existing to Remain	Existing to Remain	1	33	0	0.99	2,574	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	515	$71
211.31	102 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	103 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	104 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	Office	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	4	0.13	343	Existing to Remain	Existing to Remain	1	33	0	0.13	343	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	69	$9
242.31	Office	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Parabolic Lens	4	107	1	0.11	278	Existing to Remain	Existing to Remain	4	107	0	0.11	278	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	56	$8
227.21	Office	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	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	34	$5
211.31	108 SGI	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	12	0.40	1,030	Existing to Remain	Existing to Remain	1	33	0	0.40	1,030	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	206	$28
211.31	109 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	111 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	112 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	113 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	24	0.79	2,059	Existing to Remain	Existing to Remain	1	33	0	0.79	2,059	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	412	$57
221.11	114 Office	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	4	0.25	645	Existing to Remain	Existing to Remain	2	62	0	0.25	645	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	129	$18
211.31	115 CST	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	103	$14
211.31	117 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	119 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	120 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
221.11	121 Office	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	5	0.31	806	Existing to Remain	Existing to Remain	2	62	0	0.31	806	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	161	$22
211.31	122 Res	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	103	$14
211.31	123 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
222.21	Downstairs Hallway	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	71	4.40	13,206	Existing to Remain	Existing to Remain	2	62	0	4.40	13,206	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0

			Existing Fixtures						Proposed Fixtures Retrofit							Retrofit Energy Savings			Lighting Retrofit Costs					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, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
211.31	131 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
221.11	Security Office	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	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$9
241.11	131 Storage	1200	1x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	4	107	2	0.21	257	Existing to Remain	Existing to Remain	4	107	0	0.21	257	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	128A CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	18	0.59	1,544	Existing to Remain	Existing to Remain	1	33	0	0.59	1,544	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	309	$43
221.11	128B Office	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	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$9
242.31	128 Hallway	3000	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Parabolic Lens	4	107	1	0.11	321	Existing to Remain	Existing to Remain	4	107	0	0.11	321	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.34	Dance Studio	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	18	1.12	2,902	Existing to Remain	Existing to Remain	2	62	0	1.12	2,902	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	580	$80
211.31	Change Room	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	3	0.10	119	Existing to Remain	Existing to Remain	1	33	0	0.10	119	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Change Room	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	3	0.10	119	Existing to Remain	Existing to Remain	1	33	0	0.10	119	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.14	Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	2	62	1	0.06	74	Existing to Remain	Existing to Remain	2	62	0	0.06	74	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.14	Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No Lens	2	62	1	0.06	74	Existing to Remain	Existing to Remain	2	62	0	0.06	74	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	126A CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	18	0.59	1,544	Existing to Remain	Existing to Remain	1	33	0	0.59	1,544	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	309	$43
221.11	126B Office	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	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$9
221.34	126 Low Level Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	18	1.12	1,339	Existing to Remain	Existing to Remain	2	62	0	1.12	1,339	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	125A CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	18	0.59	1,544	Existing to Remain	Existing to Remain	1	33	0	0.59	1,544	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	309	$43
227.11	125 Hall	3000	2x2, 2 Lamp, 32w T8, Elect. Ballast, Surface 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	125 Hall	3000	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	1	0.03	99	Existing to Remain	Existing to Remain	1	33	0	0.03	99	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	125B Office	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	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$9
222.21	125 Low Level CR	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed 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	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	0.5	20.0%	516	$71
211.31	125 Low Level CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	9	0.30	772	Existing to Remain	Existing to Remain	1	33	0	0.30	772	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	0.5	20.0%	154	$21
770	125 Low Level Storage	1200	1 Lamp, 60w Incandescent, Pendant Mnt.	1	60	1	0.06	72	Relamp	(1) 26w CFL Lamp	1	26	1	0.03	31	0.03	41	$6	$10.00	$20.00	$30.00	$0.00	5.33	0	No New Controls	0	0.0%	0	$0
221.34	Boiler Room 1	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	18	1.12	1,339	Existing to Remain	Existing to Remain	2	62	0	1.12	1,339	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.34	Boiler room 2	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No Lens	2	62	15	0.93	1,116	Existing to Remain	Existing to Remain	2	62	0	0.93	1,116	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
227.11	126 Hall	3000	2x2, 2 Lamp, 32w T8, Elect. Ballast, Surface 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	126 Hall	3000	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	1	0.03	99	Existing to Remain	Existing to Remain	1	33	0	0.03	99	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	1032 Library	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	147	4.85	12,613	Existing to Remain	Existing to Remain	1	33	0	4.85	12,613	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	2,523	$348

			Existing Fixtures						Proposed Fixtures Retrofit							Retrofit Energy Savings			Lighting Retrofit Costs					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, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
211.31	Library CST	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	8	0.26	686	Existing to Remain	Existing to Remain	1	33	0	0.26	686	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	137	$19
211.31	Library Storage	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	4	0.13	158	Existing to Remain	Existing to Remain	1	33	0	0.13	158	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Library Storage	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	4	0.13	158	Existing to Remain	Existing to Remain	1	33	0	0.13	158	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
242.21	Library Entrance	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	4	107	2	0.21	556	Existing to Remain	Existing to Remain	4	107	0	0.21	556	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	129 CR	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	21	0.69	1,802	Existing to Remain	Existing to Remain	1	33	0	0.69	1,802	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	360	$50
221.11	Nurse Office 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Nurse Office 1	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Nursing Area	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	5	0.31	806	Existing to Remain	Existing to Remain	2	62	0	0.31	806	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Nurse Office 2	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Nurse Bathroom	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Nurse Bathroom	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
232.21	Guidance Common Area	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
232.21	Guidance Office 1	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	86	2	0.17	447	Existing to Remain	Existing to Remain	3	86	0	0.17	447	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
232.21	Guidance Office 2	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	86	2	0.17	447	Existing to Remain	Existing to Remain	3	86	0	0.17	447	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
232.21	Guidance Office 3	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	86	2	0.17	447	Existing to Remain	Existing to Remain	3	86	0	0.17	447	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
232.21	Guidance Office 4	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	86	2	0.17	447	Existing to Remain	Existing to Remain	3	86	0	0.17	447	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
232.21	Main Admin Area	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Main Admin Area	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	4	0.25	645	Existing to Remain	Existing to Remain	2	62	0	0.25	645	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
232.22	Side 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	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	179	$25
232.22	Vice Principal	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	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	179	$25
232.22	Conference Room	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	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	179	$25
242.22	Office	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Parabolic Lens	4	107	4	0.43	1,113	Existing to Remain	Existing to Remain	4	107	0	0.43	1,113	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	223	$31
111.44	Mechanical Closet	1200	1x4, 1 Lamp, 34w T12, Magnetic Ballast, Wall Mnt, No Lens	1	35	1	0.04	42	Reballast & Relamp	Reballast & Relamp; 28w T8 Elec. Ballast	1	25	1	0.03	30	0.01	12	$2	$30.00	$50.00	$80.00	$0.00	48.31	0	No New Controls	0	0.0%	0	$0
222.21	IT 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	131 Work Room	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	5	0.31	806	Existing to Remain	Existing to Remain	2	62	0	0.31	806	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	161	$22
211.31	Vault	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	2	0.07	79	Existing to Remain	Existing to Remain	1	33	0	0.07	79	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0

			Existing Fixtures						Proposed Fixtures Retrofit							Retrofit Energy Savings			Lighting Retrofit Costs					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, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
232.21	A151 Principal	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	86	4	0.34	894	Existing to Remain	Existing to Remain	3	86	0	0.34	894	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	179	$25
222.21	A160 Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Existing to Remain	Existing to Remain	2	62	0	0.25	645	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	129	$18
211.45	Girls Restroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.45	Boys Restroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	127 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	48	1.58	4,118	Existing to Remain	Existing to Remain	1	33	0	1.58	4,118	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	824	$114
211.31	107 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	106 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	110A SCSE	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	12	0.40	1,030	Existing to Remain	Existing to Remain	1	33	0	0.40	1,030	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	206	$28
211.31	110B Res	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	12	0.40	1,030	Existing to Remain	Existing to Remain	1	33	0	0.40	1,030	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	206	$28
211.31	116 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	118 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	124 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	48	1.58	4,118	Existing to Remain	Existing to Remain	1	33	0	1.58	4,118	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	824	$114
221.11	Faculty Hall	3000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	3	0.19	558	Existing to Remain	Existing to Remain	2	62	0	0.19	558	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	Faculty Mens Room	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.45	Faculty Mens Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	4	0.13	343	Existing to Remain	Existing to Remain	1	33	0	0.13	343	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
222.21	Faculty Womens Room	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.45	Faculty Womens Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	4	0.13	343	Existing to Remain	Existing to Remain	1	33	0	0.13	343	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
232.21	Faculty Room	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic 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	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	537	$74
211.31	201 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	24	0.79	2,059	Existing to Remain	Existing to Remain	1	33	0	0.79	2,059	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	412	$57
211.31	203 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	205 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	207 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
222.21	208 Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Existing to Remain	Existing to Remain	2	62	0	0.25	645	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	129	$18
211.31	Vice Principal Office	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	5	0.17	429	Existing to Remain	Existing to Remain	1	33	0	0.17	429	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$12
211.31	211 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	213 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59

			Existing Fixtures						Proposed Fixtures Retrofit							Retrofit Energy Savings			Lighting Retrofit Costs					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, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
211.31	215 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	216 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	24	0.79	2,059	Existing to Remain	Existing to Remain	1	33	0	0.79	2,059	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	412	$57
221.11	217 Office/Storage	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	4	0.25	645	Existing to Remain	Existing to Remain	2	62	0	0.25	645	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	218 SGI	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	12	0.40	1,030	Existing to Remain	Existing to Remain	1	33	0	0.40	1,030	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	206	$28
211.31	219 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	220 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	221 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	Prep Room	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	4	0.13	343	Existing to Remain	Existing to Remain	1	33	0	0.13	343	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	69	$9
211.31	223 Science Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	30	0.99	2,574	Existing to Remain	Existing to Remain	1	33	0	0.99	2,574	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	515	$71
211.31	225 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	30	0.99	2,574	Existing to Remain	Existing to Remain	1	33	0	0.99	2,574	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	515	$71
211.31	227 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	30	0.99	2,574	Existing to Remain	Existing to Remain	1	33	0	0.99	2,574	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	515	$71
211.31	229 Art Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	30	0.99	2,574	Existing to Remain	Existing to Remain	1	33	0	0.99	2,574	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	515	$71
211.31	230 Faculty Lounge	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	18	0.59	1,544	Existing to Remain	Existing to Remain	1	33	0	0.59	1,544	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	309	$43
211.31	230 Faculty Lounge Bathroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	1	0.03	86	Existing to Remain	Existing to Remain	1	33	0	0.03	86	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	230 Faculty Lounge Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface 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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Pantry	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	10	0.33	858	Existing to Remain	Existing to Remain	1	33	0	0.33	858	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	172	$24
211.31	231 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	6	0.20	515	Existing to Remain	Existing to Remain	1	33	0	0.20	515	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	103	$14
221.11	231 Classroom	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	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	64	$9
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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	233 CAD Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	30	0.99	2,574	Existing to Remain	Existing to Remain	1	33	0	0.99	2,574	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	515	$71
211.31	234 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	235 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	236 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	237 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59
211.31	239 Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	25	0.83	2,145	Existing to Remain	Existing to Remain	1	33	0	0.83	2,145	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	429	$59

			Existing Fixtures						Proposed Fixtures Retrofit							Retrofit Energy Savings			Lighting Retrofit Costs					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, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $
211.31	240 Office	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	12	0.40	1,030	Existing to Remain	Existing to Remain	1	33	0	0.40	1,030	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	206	$28
221.11	241 Office	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	4	0.25	645	Existing to Remain	Existing to Remain	2	62	0	0.25	645	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	129	$18
211.31	238 Computer Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	32	1.06	2,746	Existing to Remain	Existing to Remain	1	33	0	1.06	2,746	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	549	$76
221.11	Office	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	5	0.31	806	Existing to Remain	Existing to Remain	2	62	0	0.31	806	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	161	$22
211.31	Storage	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	1	0.03	40	Existing to Remain	Existing to Remain	1	33	0	0.03	40	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	Storage	1200	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	1	0.03	40	Existing to Remain	Existing to Remain	1	33	0	0.03	40	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	202 Computer Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	45	1.49	3,861	Existing to Remain	Existing to Remain	1	33	0	1.49	3,861	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	772	$107
211.31	232 Art Classroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	32	1.06	2,746	Existing to Remain	Existing to Remain	1	33	0	1.06	2,746	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	549	$76
211.31	204 Computer Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	45	1.49	3,861	Existing to Remain	Existing to Remain	1	33	0	1.49	3,861	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	772	$107
211.31	206 Computer Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	45	1.49	3,861	Existing to Remain	Existing to Remain	1	33	0	1.49	3,861	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	772	$107
211.45	Boys Restroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	9	0.30	772	Existing to Remain	Existing to Remain	1	33	0	0.30	772	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.45	Girls Restroom	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Wall Mnt., Indirect	1	33	9	0.30	772	Existing to Remain	Existing to Remain	1	33	0	0.30	772	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Art Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	5	0.31	372	Existing to Remain	Existing to Remain	2	62	0	0.31	372	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Toilet	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	Toilet	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
221.11	electrical Closet	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	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
211.31	228 Science Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	32	1.06	2,746	Existing to Remain	Existing to Remain	1	33	0	1.06	2,746	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	549	$76
211.31	226 Science Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	32	1.06	2,746	Existing to Remain	Existing to Remain	1	33	0	1.06	2,746	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	549	$76
211.31	224 Science Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	32	1.06	2,746	Existing to Remain	Existing to Remain	1	33	0	1.06	2,746	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	549	$76
211.31	210 Science Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	36	1.19	3,089	Existing to Remain	Existing to Remain	1	33	0	1.19	3,089	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	618	$85
211.31	212 Science Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	36	1.19	3,089	Existing to Remain	Existing to Remain	1	33	0	1.19	3,089	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	618	$85
211.31	214 Science Lab	2600	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	1	33	36	1.19	3,089	Existing to Remain	Existing to Remain	1	33	0	1.19	3,089	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	4	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	618	$85
221.11	Prep Room	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	6	0.37	967	Existing to Remain	Existing to Remain	2	62	0	0.37	967	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	193	$27
221.11	Prep Room	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	5	0.31	806	Existing to Remain	Existing to Remain	2	62	0	0.31	806	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	5	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	161	$22
222.21	Upstairs Hallways	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	69	4.28	12,834	Existing to Remain	Existing to Remain	2	62	0	4.28	12,834	0.00	0	$0	$0.00	$0.00	$0.00	$0.00	-	0	No New Controls	0	0.0%	0	$0
	TOTAL					**3,068**	**150**	**387,114**					**125**	**137**	**352,870**	**13**	**34,244**	**4,726**	**20,065**	**34,555**	**54,620**	**6,300**	**11.56**			**102**		**39,760**	**5,487**

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
New Brunswick Middle School	24000	SHARP NU-U235F2	1440	17.5	25,259	338.40	384,075	274.1	60,336	13.40

.= Existing 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 - New Brunswick Middle School**
Location: **New Brunswick, NJ**
Description: **Photovoltaic System 100% Financing - 15 year**

Simple Payback Analysis

	Photovoltaic System 100% Financing - 15 year
Total Construction Cost	$2,172,113
Annual kWh Production	384,075
Annual Energy Cost Reduction	$53,002
Average Annual SREC Revenue	$73,391

Simple Payback: **17.19** Years

Life Cycle Cost Analysis

Analysis Period (years): 15
Discount Rate: 3%
Average Energy Cost ($/kWh) **$0.138**
Financing Rate: 6.00%
Financing %: 100%
Maintenance Escalation Rate: 3.0%
Energy Cost Escalation Rate: 3.0%
Average SREC Value ($/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	384,075	$53,002	$0	$96,019	$127,820	$92,134	($70,933)	($70,933)
2	$0	382,155	$54,592	$0	$95,539	$122,138	$97,816	($69,823)	($140,756)
3	$0	380,244	$56,230	$0	$95,061	$116,105	$103,850	($68,663)	($209,419)
4	$0	378,343	$57,917	$0	$94,586	$109,700	$110,255	($67,451)	($276,871)
5	$0	376,451	$59,655	$3,877	$94,113	$102,899	$117,055	($70,064)	($346,935)
6	$0	374,569	$61,444	$3,858	$74,914	$95,680	$124,275	($87,454)	($434,390)
7	$0	372,696	$63,288	$3,839	$74,539	$88,015	$131,940	($85,966)	($520,356)
8	$0	370,832	$65,186	$3,820	$74,166	$79,877	$140,077	($84,421)	($604,777)
9	$0	368,978	$67,142	$3,800	$73,796	$71,237	$148,717	($82,817)	($687,594)
10	$0	367,133	$69,156	$3,781	$55,070	$62,065	$157,890	($99,510)	($787,104)
11	$0	365,298	$71,231	$3,763	$54,795	$52,326	$167,628	($97,691)	($884,795)
12	$0	363,471	$73,368	$3,744	$54,521	$41,987	$177,967	($95,810)	($980,605)
13	$0	361,654	$75,569	$3,725	$54,248	$31,011	$188,943	($93,863)	($1,074,468)
14	$0	359,846	$77,836	$3,706	$35,985	$19,357	$200,597	($109,840)	($1,184,308)
15	$0	358,046	$80,171	$3,688	$35,805	$6,985	$212,969	($107,667)	($1,291,975)
	Totals:	5,563,790	$985,786	$41,601	$1,063,154	$1,127,201	$2,172,113	($1,291,975)	($9,495,287)

Net Present Value (NPV) **($950,688)**